

PERPETUAL TROUBLE SHOOTER'S MANUAL

Reg. U.S. Pat. Off.

VOLUME XI

by

JOHN F. RIDER



JOHN F. RIDER PUBLISHER, INC.

404 Fourth Avenue

New York 16, N. Y.

Compliments of www.nucow.com

Other Books
by
JOHN F. RIDER

CATHODE-RAY TUBE AT WORK

SERVICING SUPERHETERODYNES

**SERVICING RECEIVERS BY MEANS OF RESISTANCE
MEASUREMENT**

PERPETUAL TROUBLE SHOOTER'S MANUAL

VOLUMES I TO V ABRIDGED (ONE VOLUME)

VOLUME VI

VOLUME VII

VOLUME VIII

VOLUME IX

VOLUME X

VOLUME XI

VOLUME XII

VOLUME XIII

VOLUME XIV

AUTOMATIC RECORD CHANGERS AND RECORDERS

INSIDE THE VACUUM TUBE

ALIGNING PHILCO RECEIVERS, VOLUMES I AND II

AUTOMATIC FREQUENCY CONTROL SYSTEMS

FREQUENCY MODULATION

SERVICING BY SIGNAL TRACING

THE OSCILLATOR AT WORK

THE METER AT WORK

VACUUM TUBE VOLTMETERS

AN HOUR A DAY WITH RIDER

ON

RESONANCE AND ALIGNMENT

AUTOMATIC VOLUME CONTROL

ALTERNATING CURRENTS IN

RADIO RECEIVERS

D-C. VOLTAGE DISTRIBUTION IN

RADIO RECEIVERS

+

A-C. CALCULATION CHARTS

BY

R. LORENZEN

The servicing data appearing on Philco, RCA and other pages carrying individual copyright notices, are copyrighted by the respective companies and are reproduced herein with their permission.

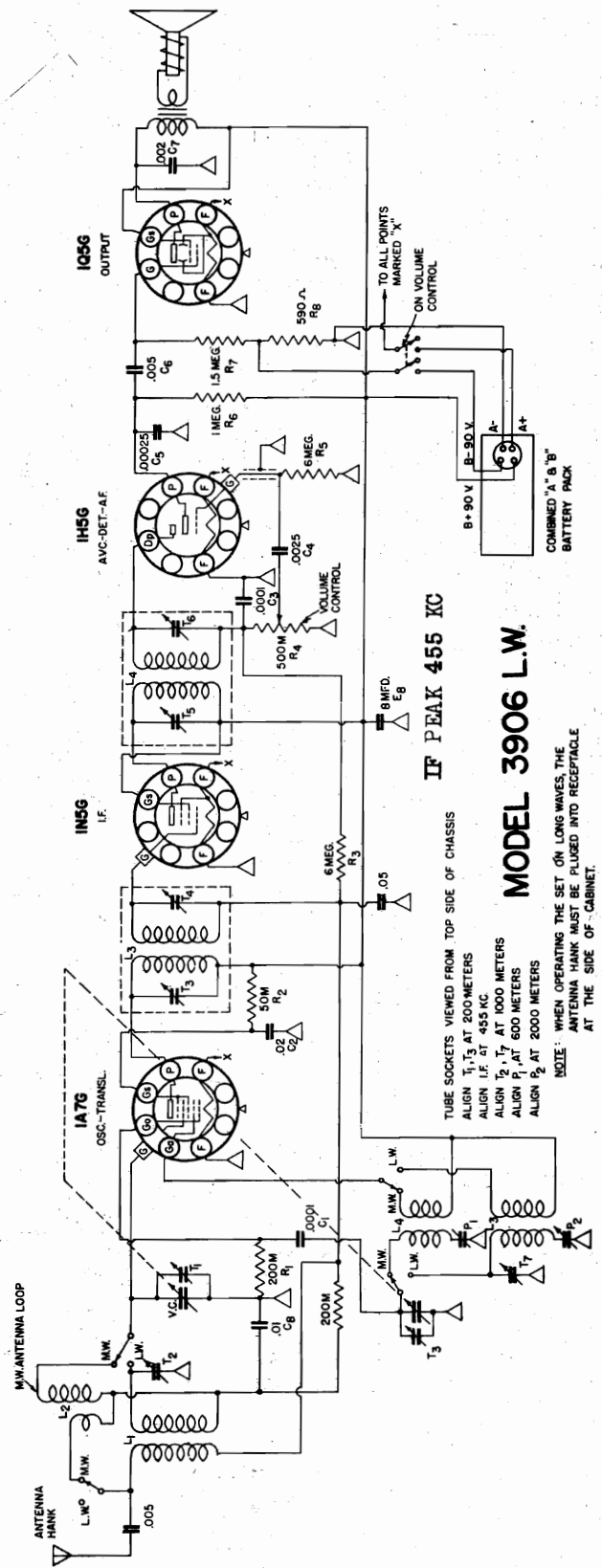
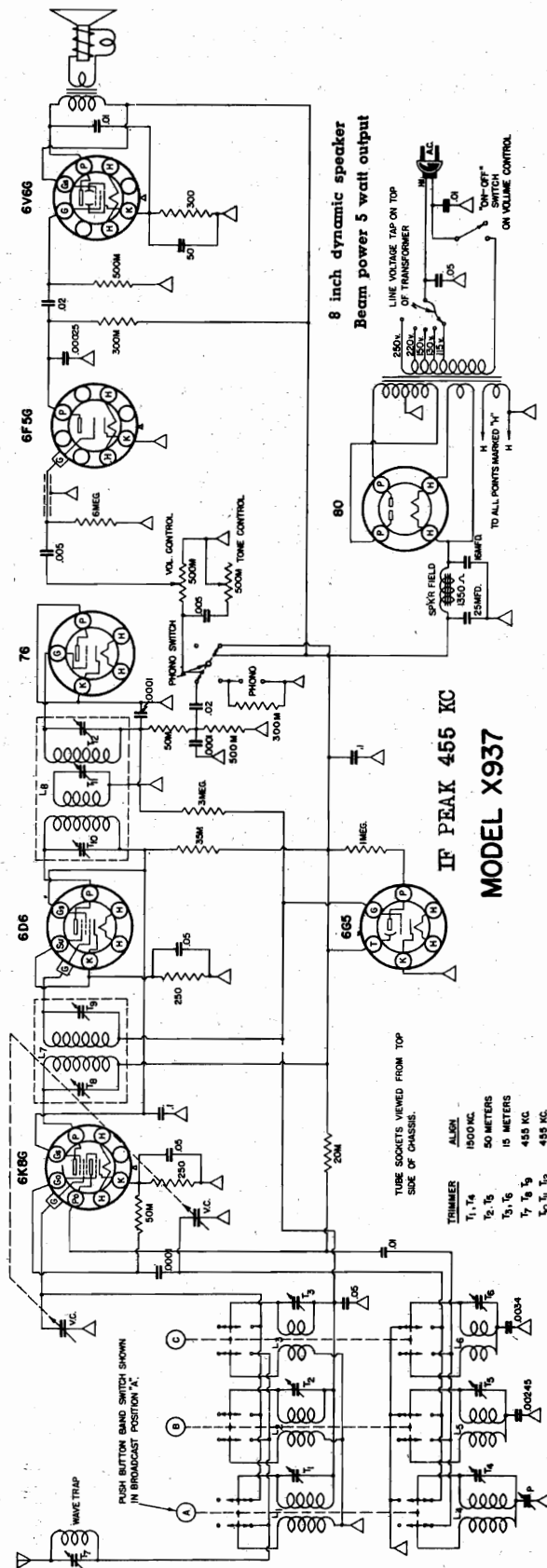
Entire contents copyrighted 1940 by John F. Rider.

Printed in U. S. A.

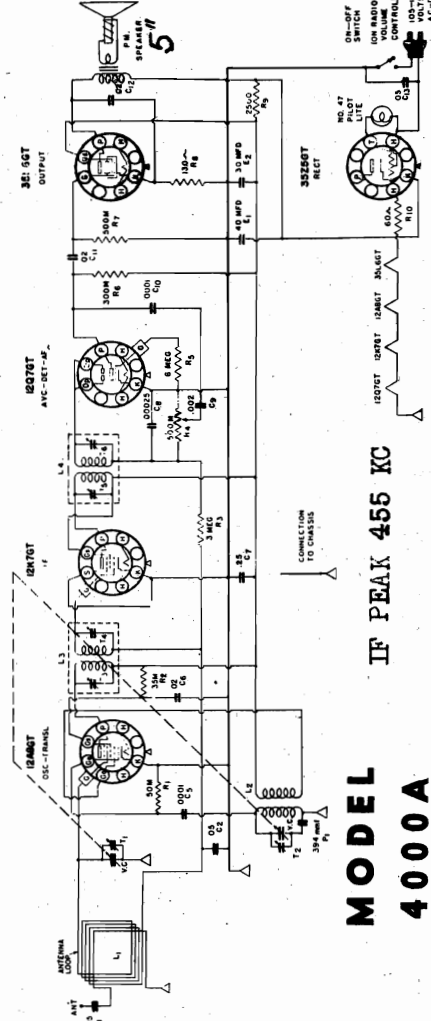
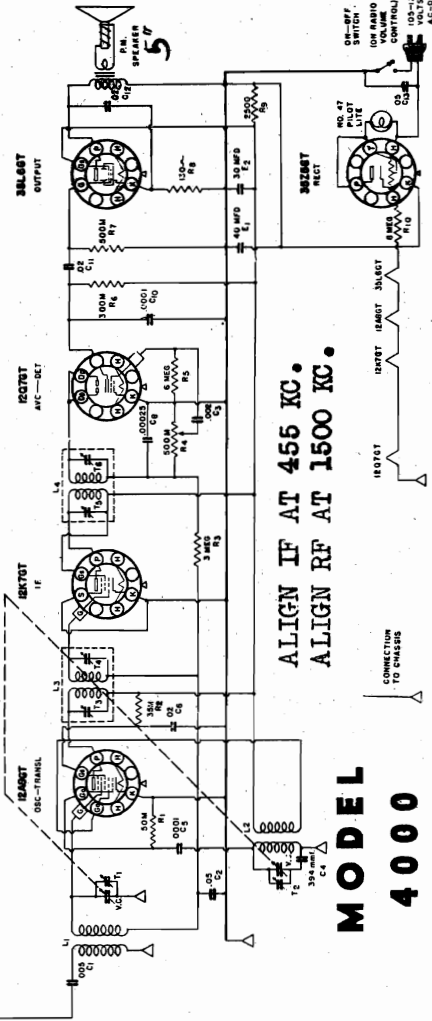
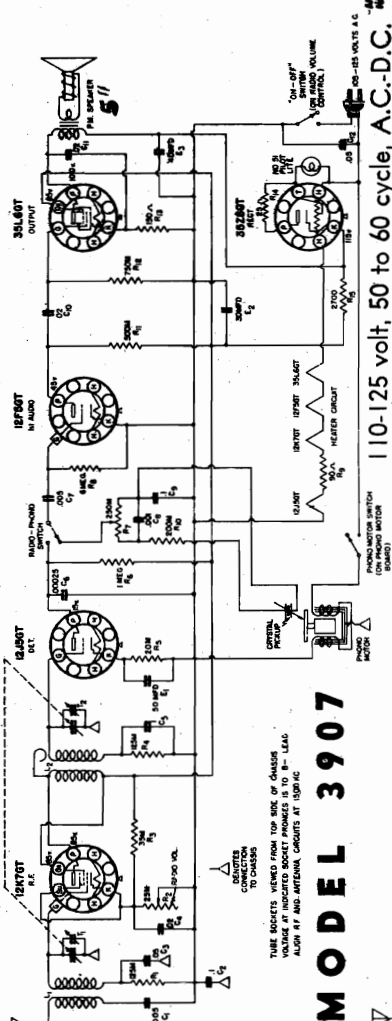
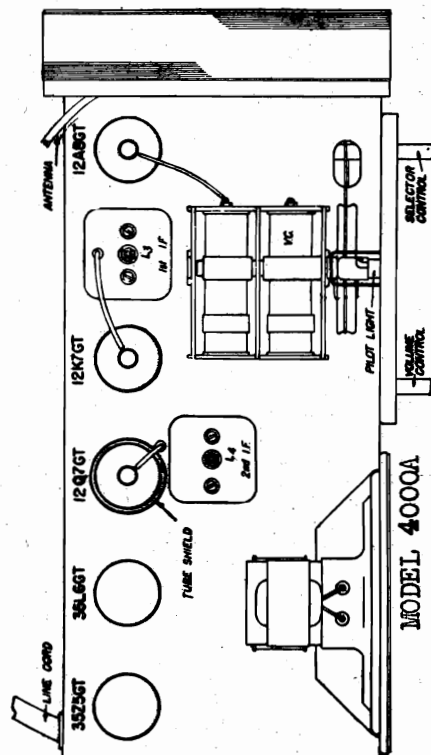
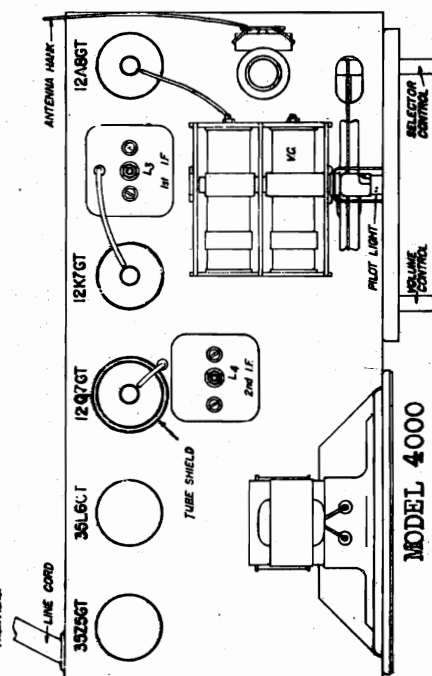
**MODELS 4,23X,9722,
9822,9822A,9823,9922**

AIR-KING PRODUCTS CORP.

MODEL X937
MODEL 3906 LW
Schematics

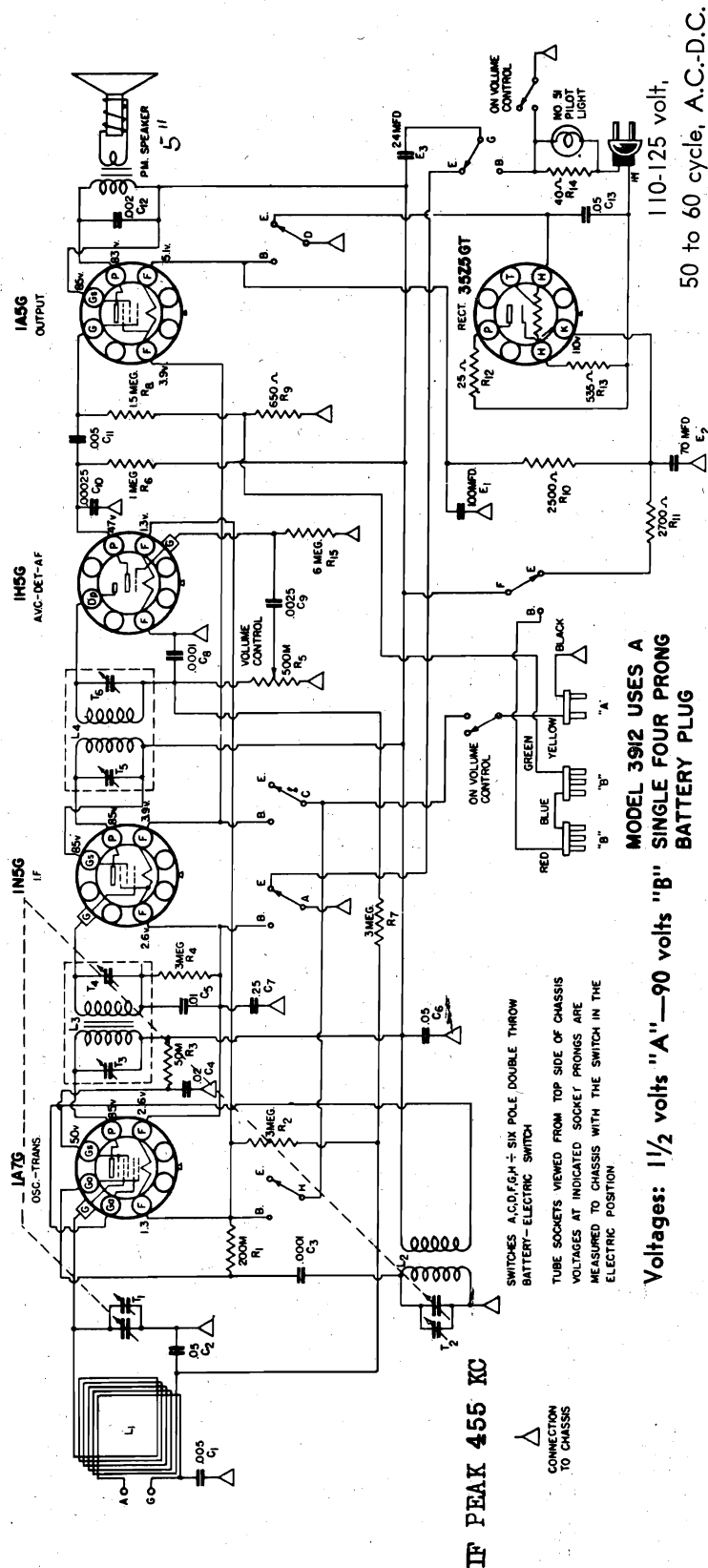


MODEL 4000A
Schematics, Socket

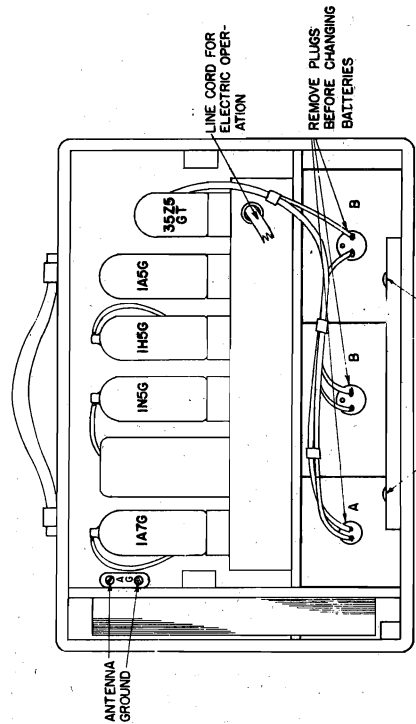
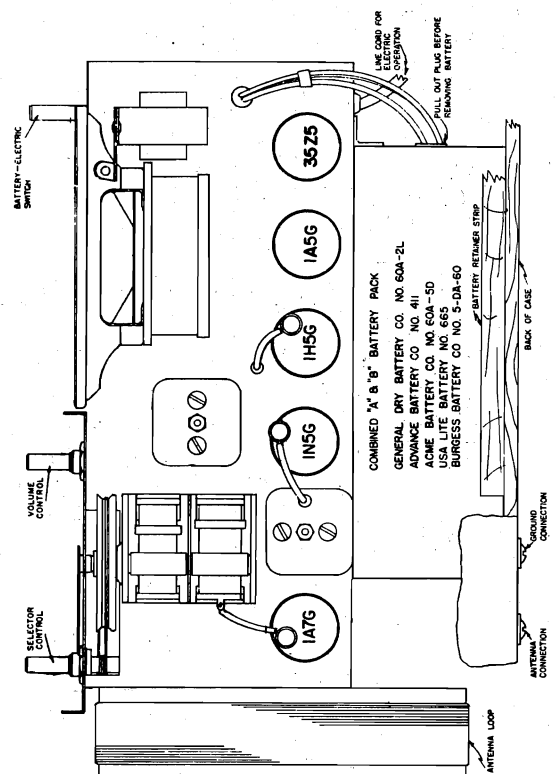


AIR KING PRODUCTS CORP.

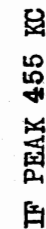
MODELS 3912, 3916
Schematic, Socket
Voltage



LOCATION OF TUBES & BATTERIES



MODEL 4001
Schematic, Socket
Alignment



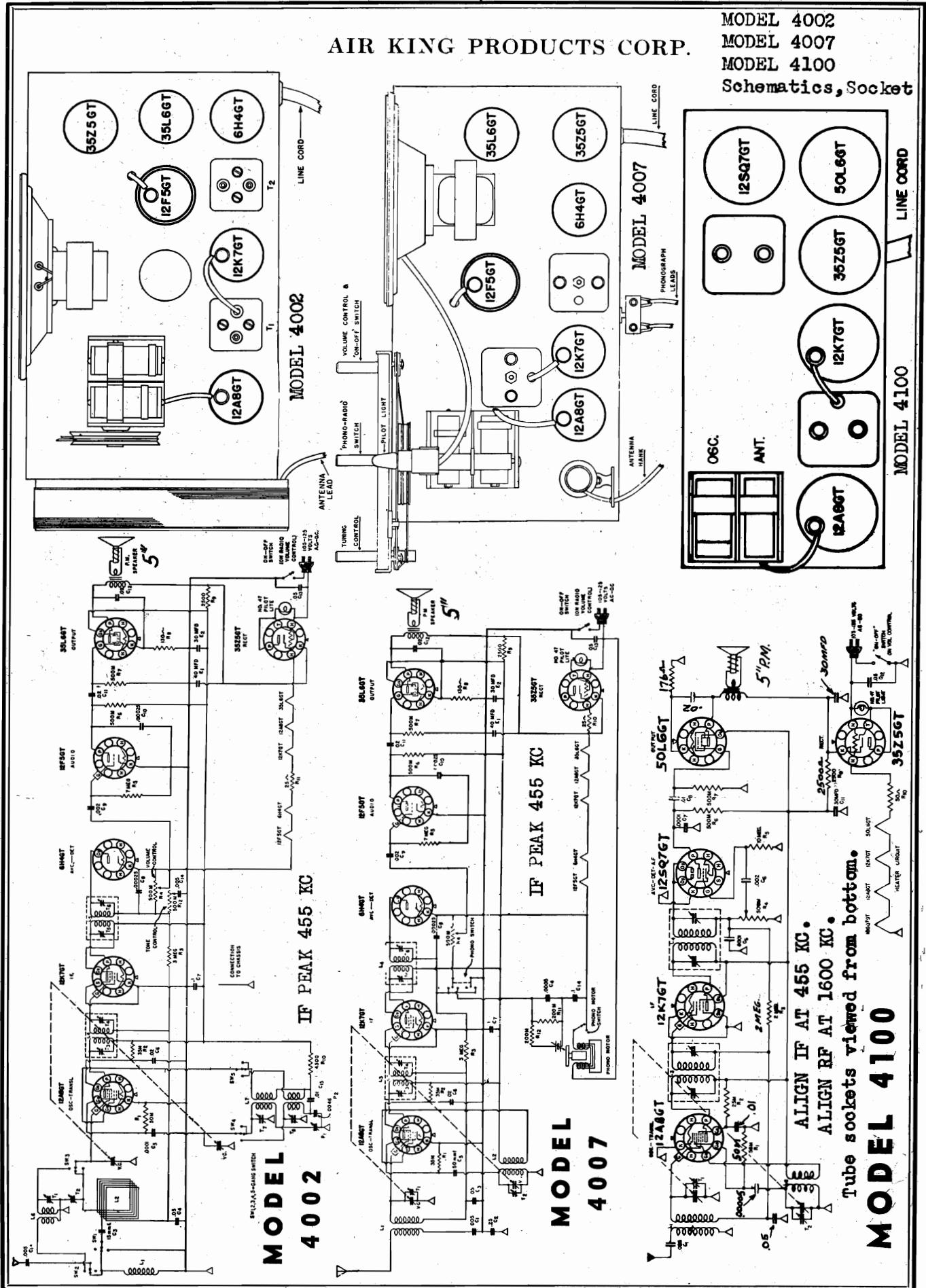
MODEL 3950

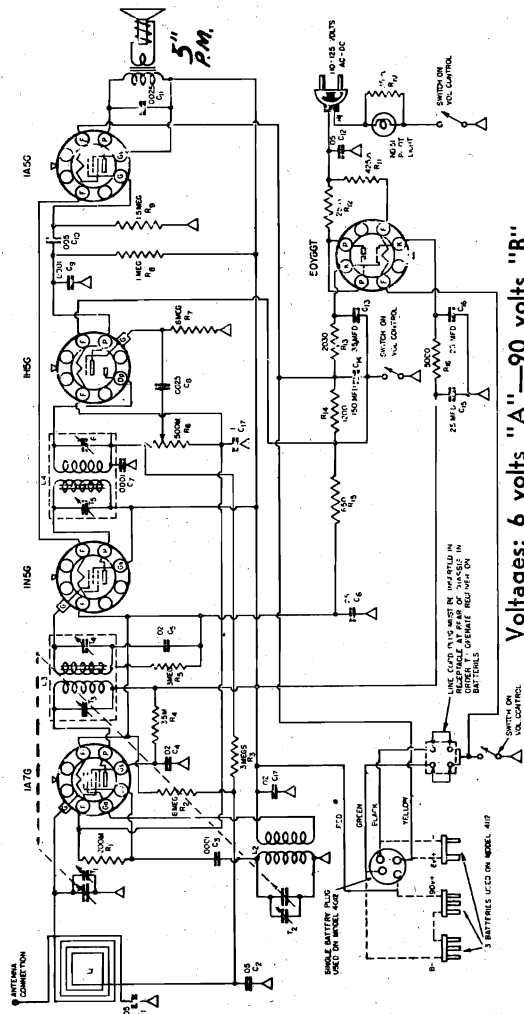


ALIGN TF AT 455 KC.
ALIGN RF AT 1550 KC.

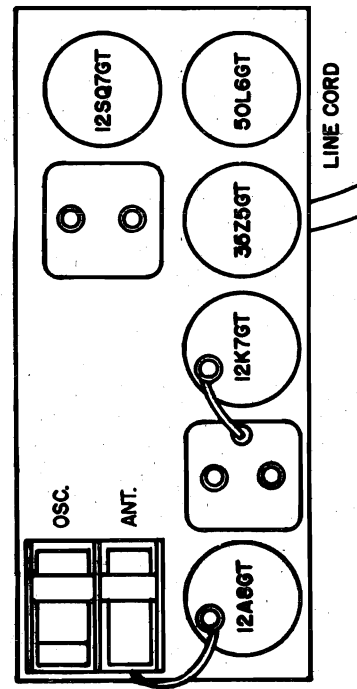
AIR KING PRODUCTS CORP.

MODEL 4002
MODEL 4007
MODEL 4100
Schematics, Socket

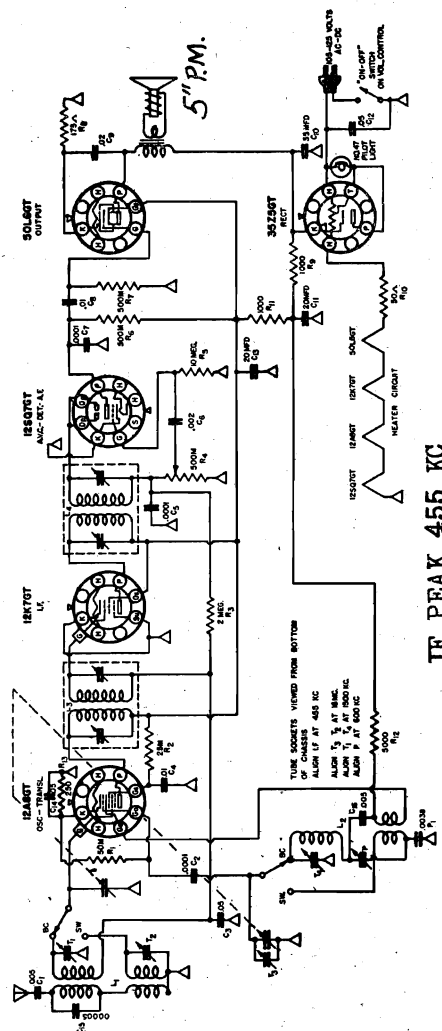




IF PEAK 455 KC



MODEL 4200

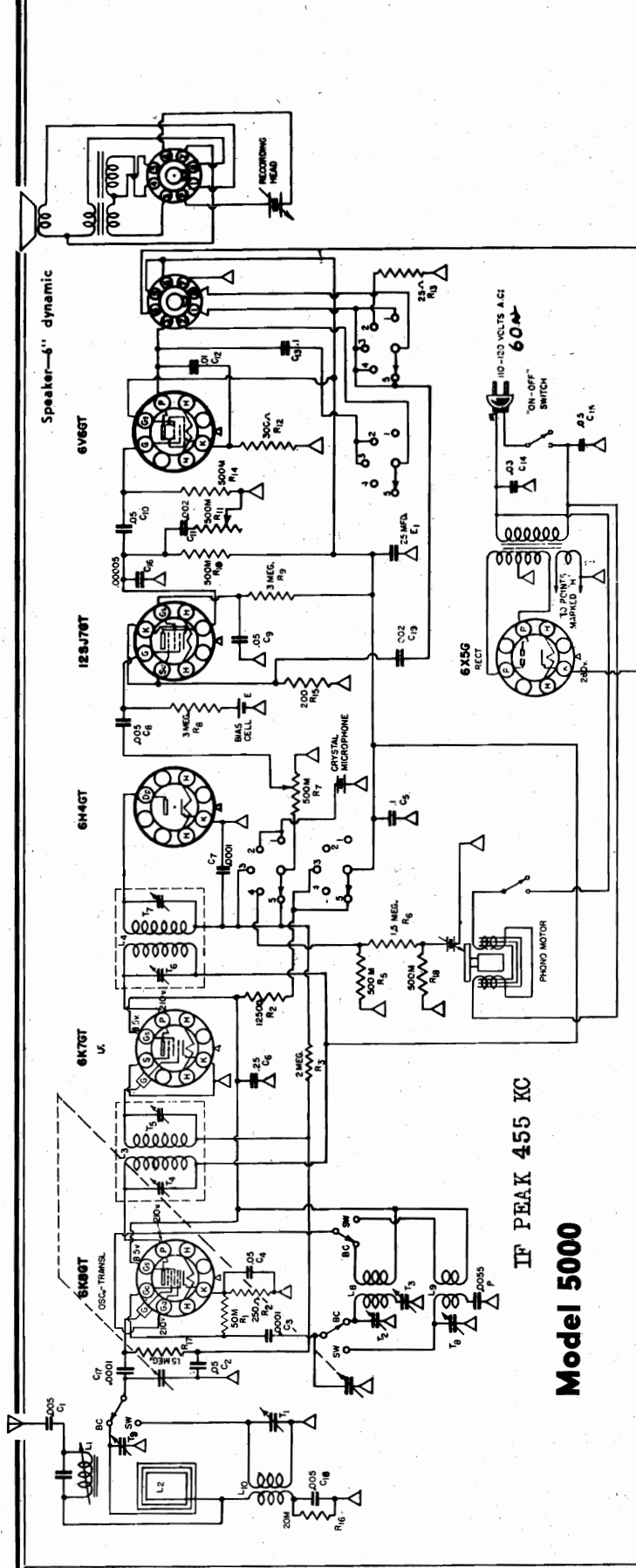


IF PEAK 455 KC

Socket, Trimmers
Recording Data

AIR KING PRODUCTS CORP.

MODEL 5000
Schematic, Voltage



RADIO HOME RECORDING

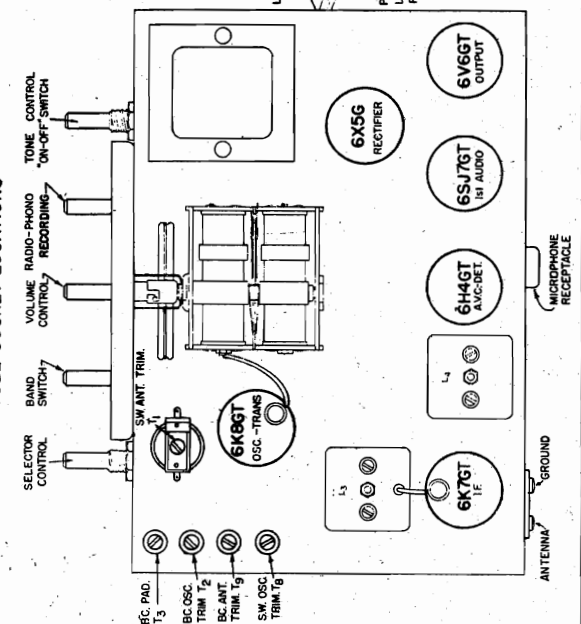
To record radio programs set "PhonoRadio Switch" so that number "5" is opposite brass marker above the knob. Set volume control for loud and clear reception. Then set switch so that number "3" is opposite the marker and record the program. Do not allow needle to cut disc when it reaches the inner label. Do not allow the fine threads which form to collect under the needle, brush lightly with a soft cloth or brush towards the center of the disc.

MICROPHONE

For microphone recording set switch so that number 1 is opposite marker and test for operation. Then turn switch so that number "2" is opposite the marker. Turn volume control fully to the right. In speaking use normal voice with microphone at least six inches from the mouth.

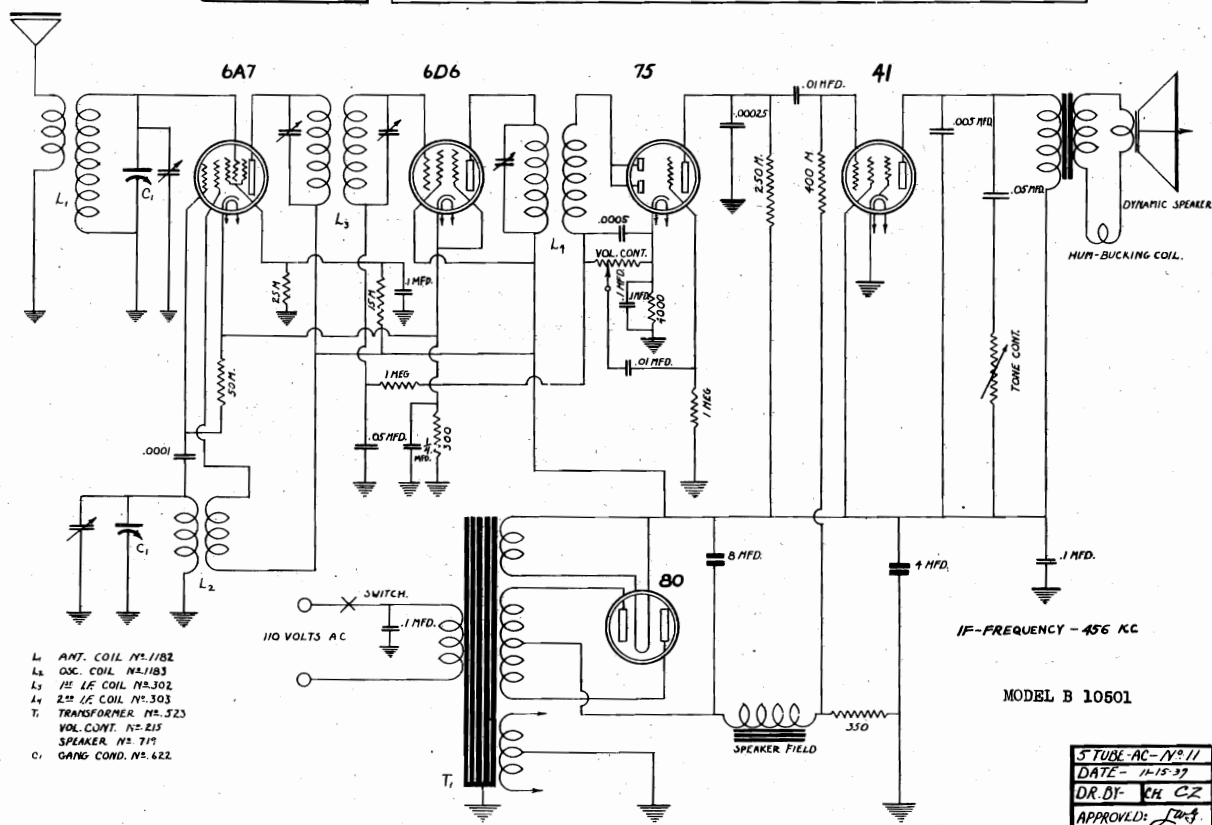
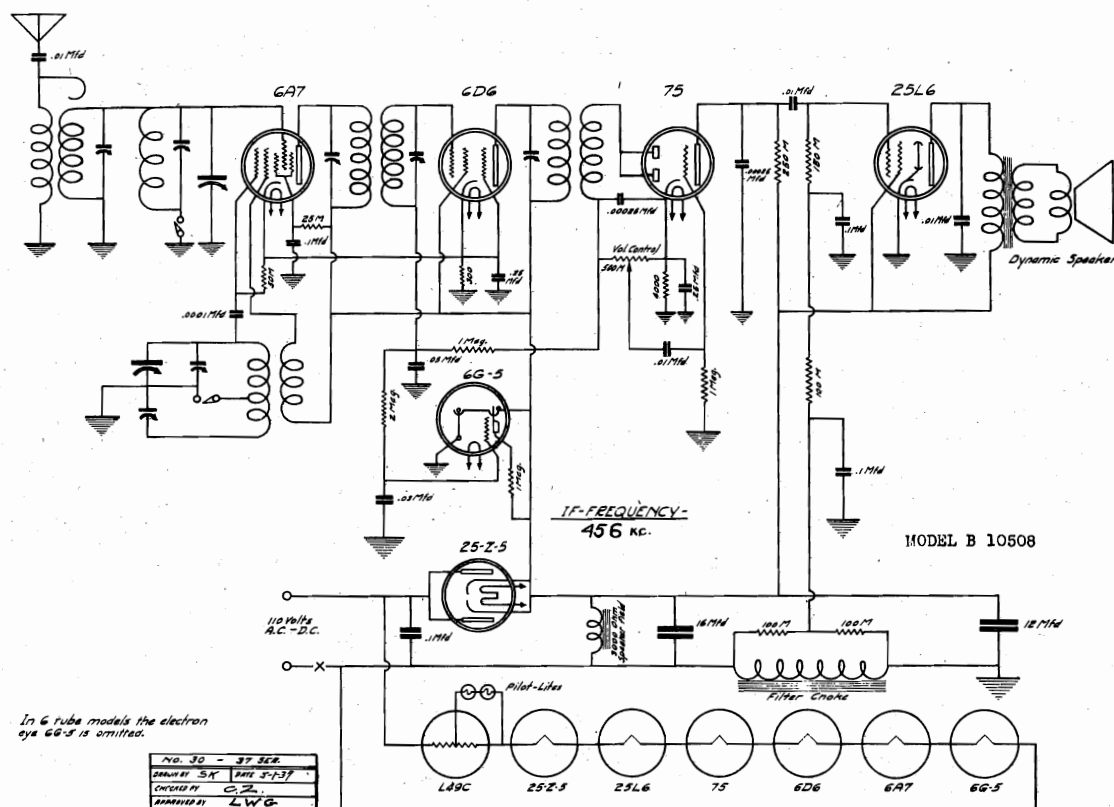
NOTE:-Be sure needle is firmly in place and that the flat side points towards the rear of the cabinet. Check that the small pin projects through one of the three holes on the blank to prevent the disc from slipping.

TUBE SOCKET LOCATIONS



ALLIED RADIO CORP.

MODEL B10501
MODEL B10508
Schematics



MODELS B10718, B10719

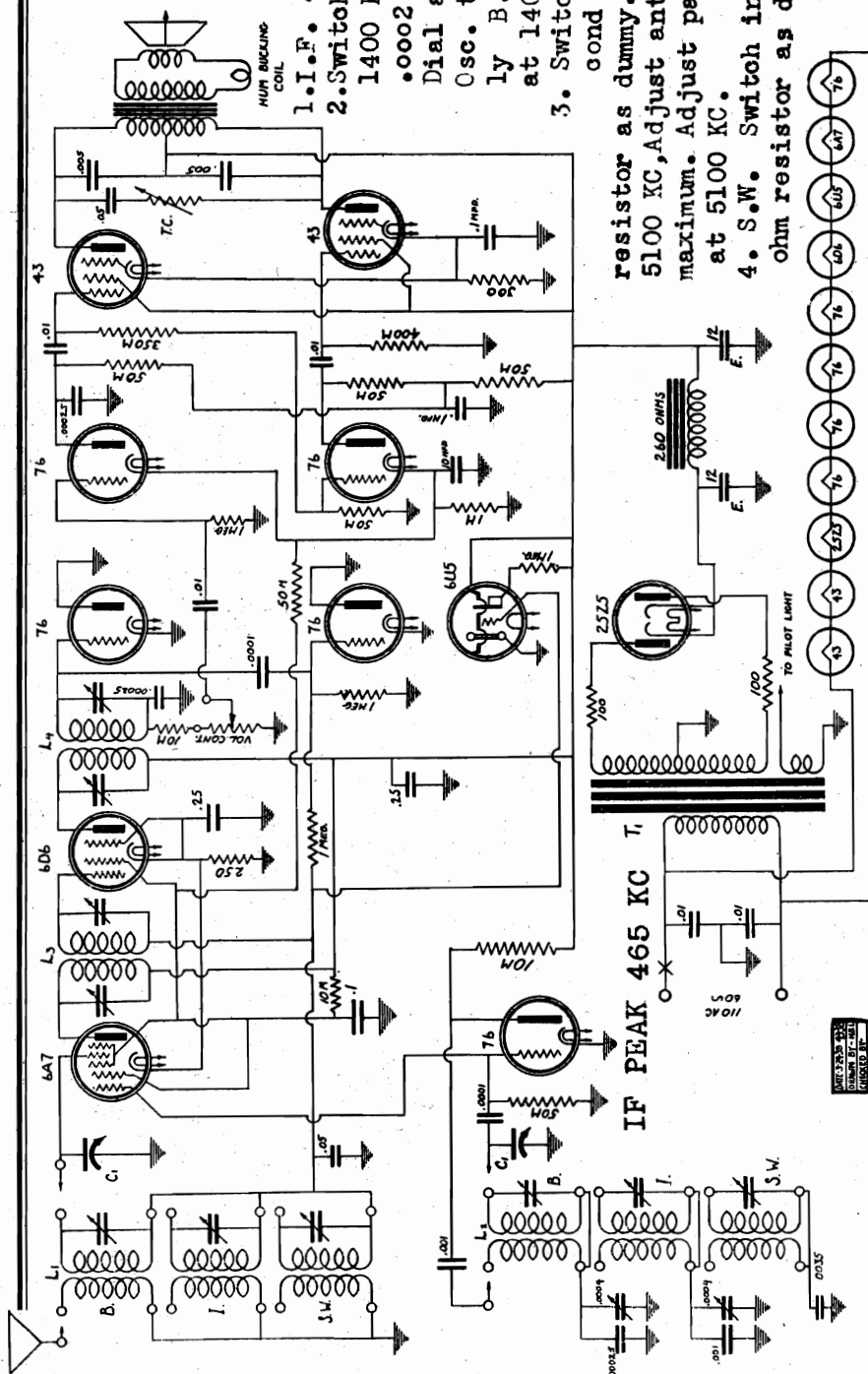
Schematic, Alignment
Socket, Trimmers

ALLIED RADIO CORP.

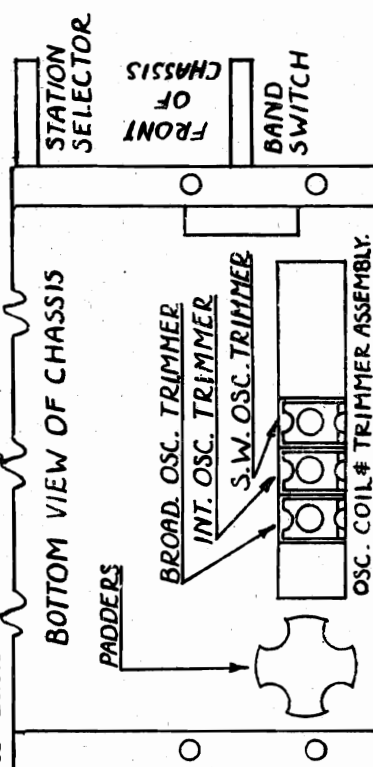
- L₁-ANT. COIL ASSEMBLY NO. 1774
- L₂-OSC. COIL ASSEMBLY NO. 1793
- L₃-12 IF TRANSFORMER NO. 301
- L₄-250 IF TRANSFORMER NO. 302
- T₁-POWER TRANSFORMER NO. 32A
- DYNAMIC SPEAKER NO. 741 8" NO. 742
- VOL. CONT. & SWITCH NO. 221
- TOKE CONTROL NO. 305
- C₁-VARIABLE COND. NO. 624
- E-ELECTROLYTIC FILTER COND. NO. 1771
- BAND SWITCH NO. 123
- PADDER COND. NO. 1012

ALIGNMENT

1. I.F. 465 KC to grid of 6A7.
2. Switch in B.C., Osc. at 1400 KC to antenna post, use .0002 dummy, Vol. Cont. Max. Dial at 1400 KC Adjust B.C. Osc. trimmer to max. Similarly B.C. Pad at 600 KC. Recheck at 1400 KC.
3. Switch in INT. use .0002 mfd cond with 400 ohm series resistor as dummy. Dial and oscillator at 5100 KC, Adjust ant. and osc. trimmers to maximum. Adjust pad at 1800 KC. Recheck at 5100 KC.
4. S.W. Switch in S.W. position. Use 400 ohm resistor as dummy, Oscillator and dial at 15 M.C. Adjust S.W. ant. and osc. trimmers to maximum. Sensitivity check at 6000 KC. If receiver lacks sensitivity check .0035 cond for short.

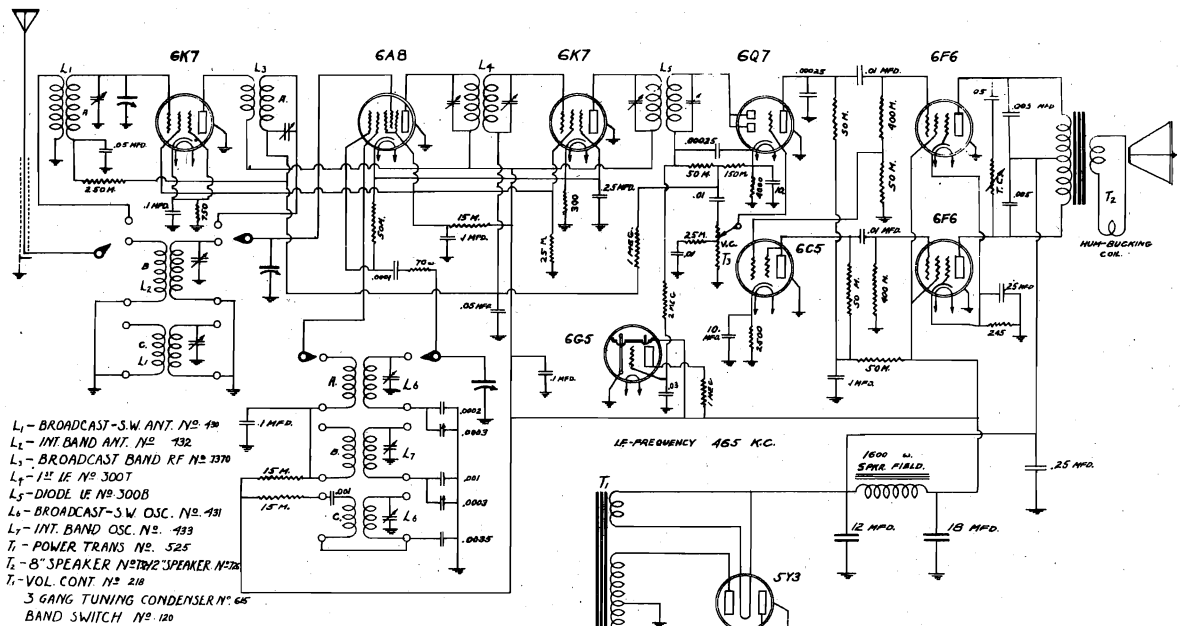


Sensitivity check at 6000 KC
If receiver lacks sensitivity check .0035 cond for short.

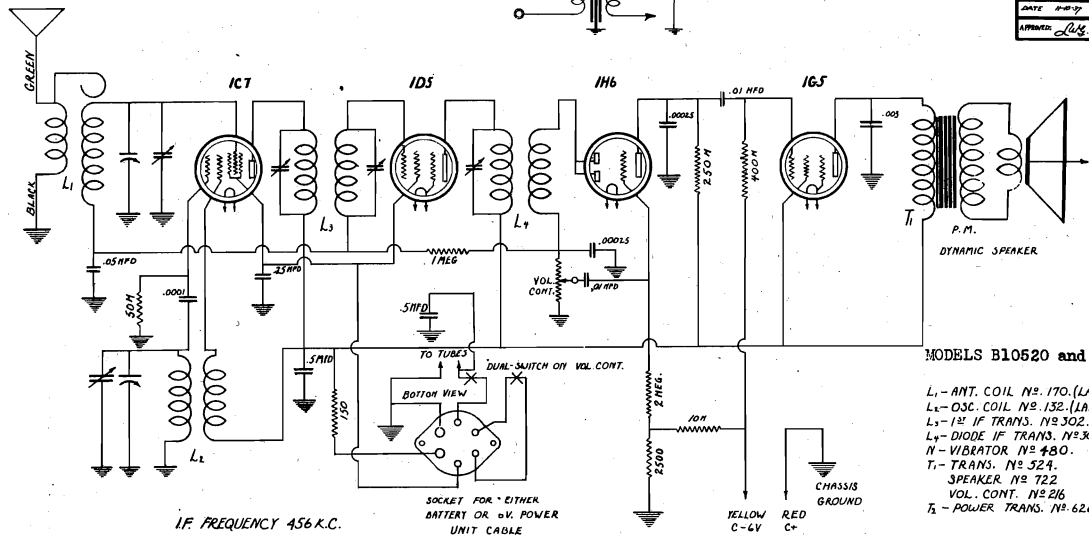


ALLIED RADIO CORP.

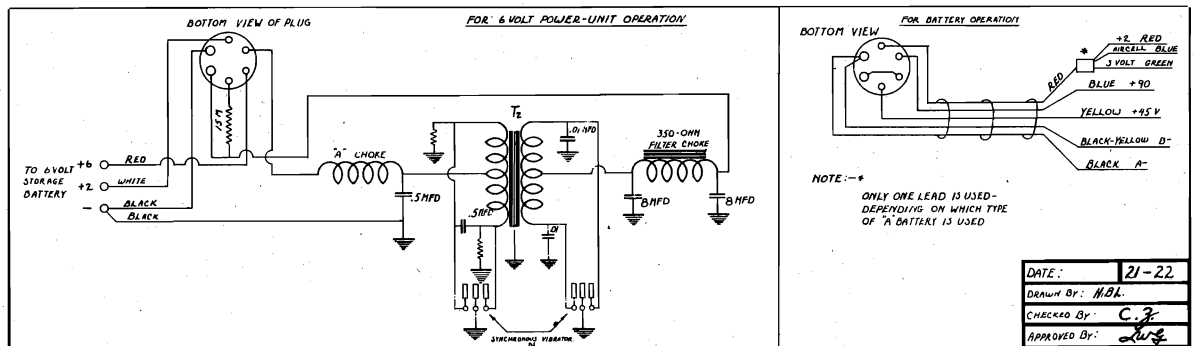
MODELS B10515 to B10518,
B10525 to B10527
MODELS B10520, B10521
Schematics



MODELS B10515, B10516, B10517, B10518
B10525, B10526, B10527



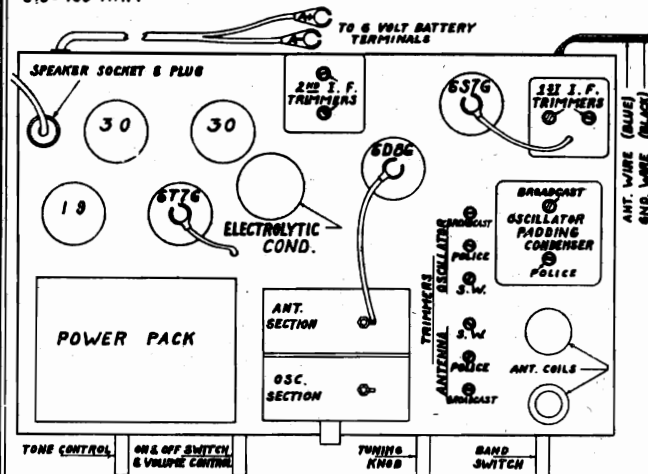
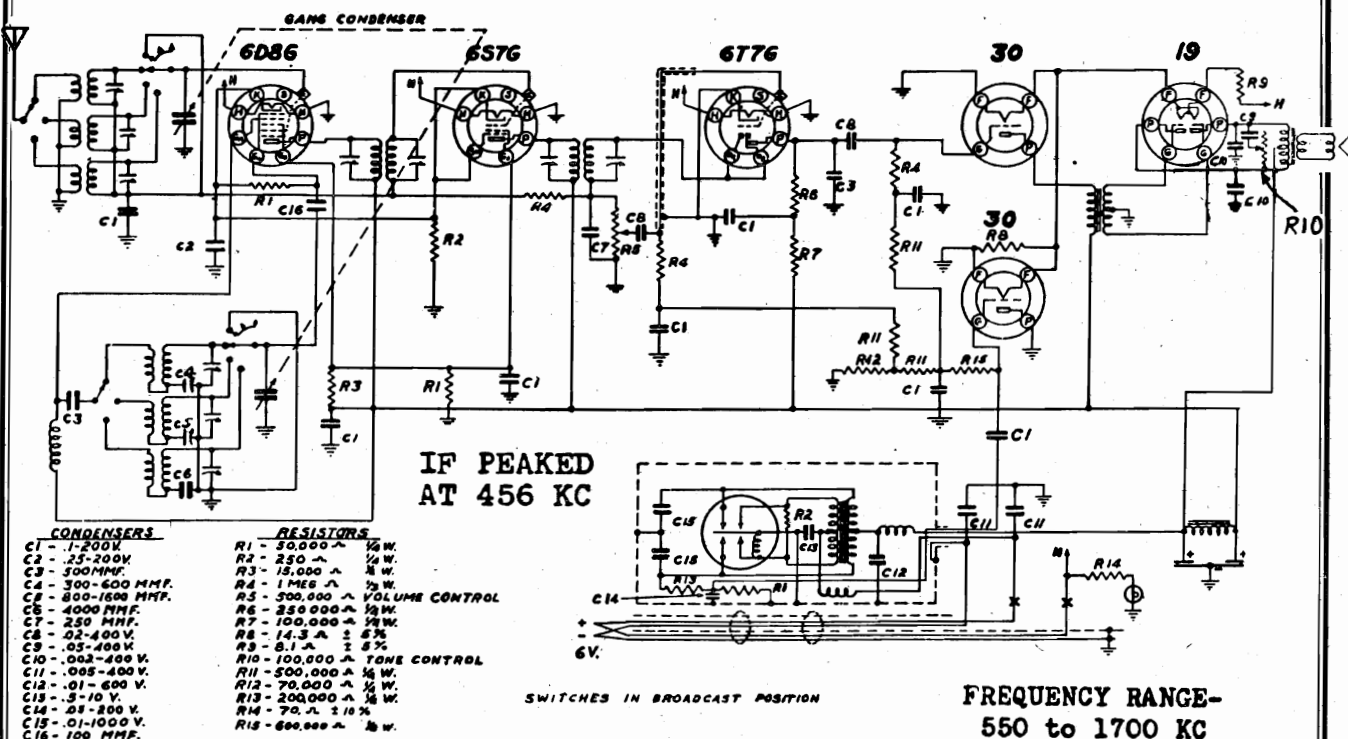
MODELS B10520 and B10521



MODELS B10545 to B10549,
B10553

ALLIED RADIO CORP.

Schematic, Socket, Trimmers
Alignment



same time, continuously tuning back and forth across the signal with the receiver until the maximum reading is obtained on the output meter. This adjustment may seem a little complicated but is the easiest way to adjust the oscillator to the antenna. Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustment was made at 600 KC.

POLICE BAND ALIGNMENT

The police band is adjusted by first replacing the .0002 dummy with a 400 ohm resistor and setting the generator to 5600 KC. With the gang set at minimum, adjust the "police oscillator trimmer" to receive this signal, then set the signal generator to 4000 KC and adjust "police antenna trimmer" to give maximum output. Next, set the oscillator to 1800 KC and "pad" the circuit at this frequency as described in the instructions for padding the broadcast circuits.

SHORT WAVE BAND ALIGNMENT

The short wave band is adjusted by setting the generator to 18,100 KC and with the gang at minimum, adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC and adjust the "short wave antenna" to give maximum output. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 6000 KC to determine whether the circuits are in line at this frequency. Should the receiver lack sensitivity at 6000 KC, the antenna and oscillator coils, as well as the .004 mica padding condenser, should be tested for defects as sometimes these components become subject to mechanical or electrical injuries, despite their rugged construction and liberal ratings.

SERVICE DATA FOR ALL BANDS

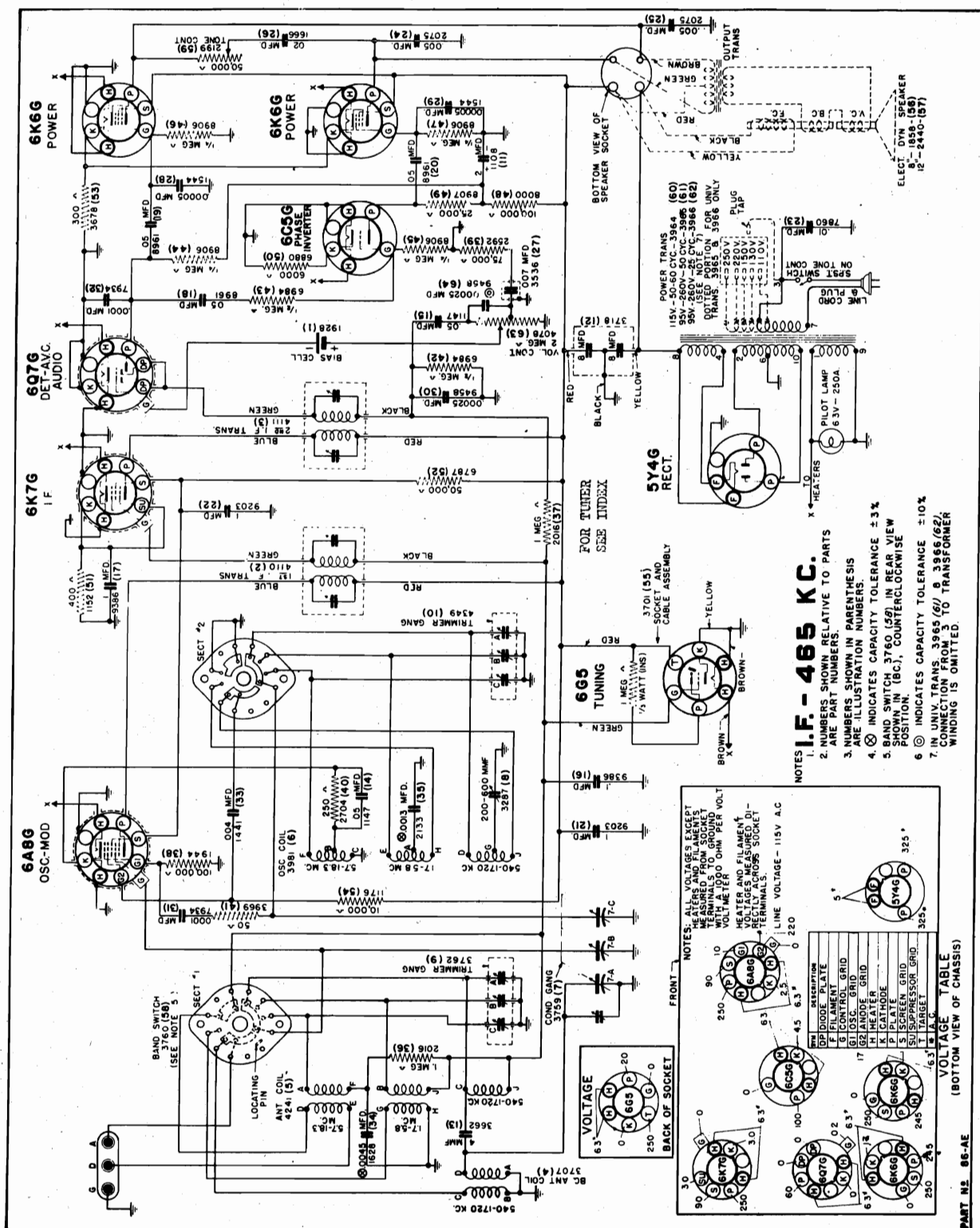
If it is suspected that the oscillator has stopped but is doubtful due to the presence of the usual amount of noise level, it is suggested that the oscillator plate voltage be checked. To ascertain whether the tube is oscillating, ground the oscillator grid of the 6D8G (short stator and rotor plates of oscillator section on gang condenser). If oscillating properly, grounding the grid will cause an appreciable drop in oscillator voltage.

I.F. ALIGNMENT

With the wave switch in the broadcast band and the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6D8G) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

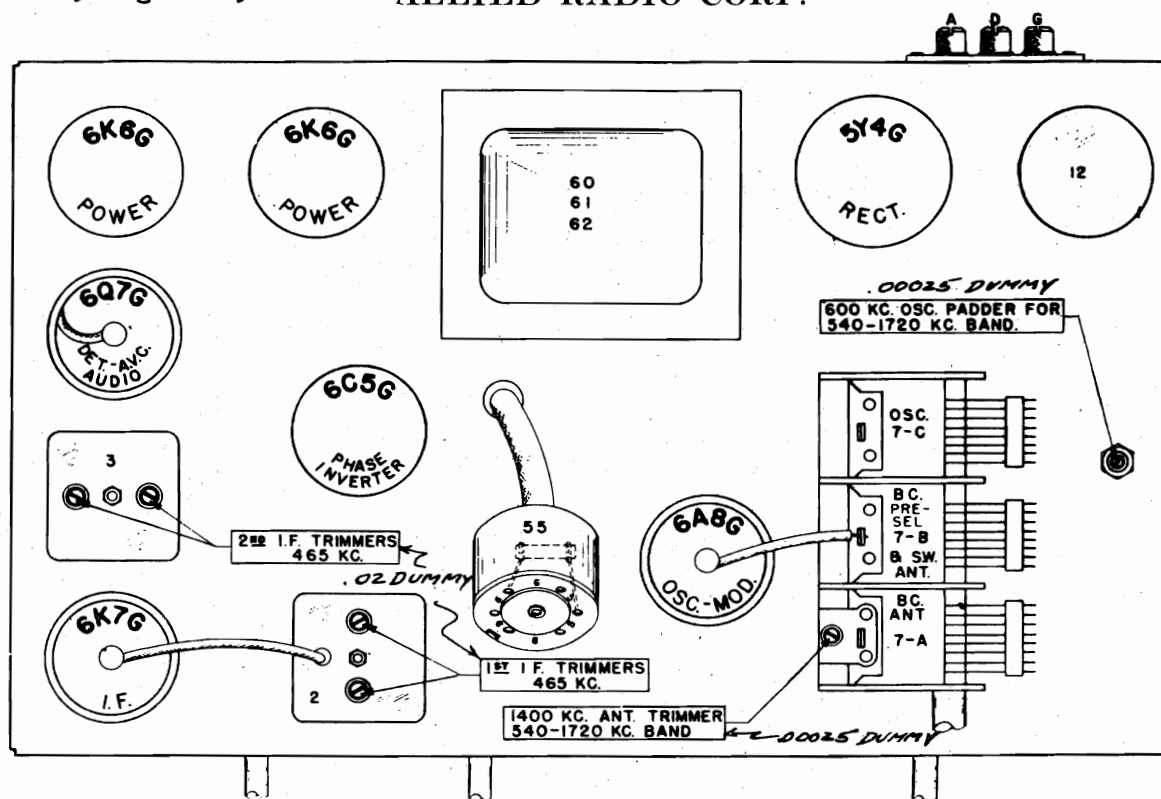
BROADCAST BAND ALIGNMENT

Connect the output of the signal generator to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum and the oscillator to 1730 KC and adjust the "oscillator trimmer" to receive this signal. Make no other adjustments at this frequency. Then set the generator to 1400 KC and tune in this signal by rotating the gang to 1400 on the dial. Adjust the "antenna" trimmer to maximum signal. Set the signal generator to 600 KC and tune in the signal on the receiver. **Note:** Approximately the same sensitivity should be noted at this point as was at 1400 KC. The signal strength may sometimes be improved by padding the circuits. This is done by slowly increasing or decreasing the oscillator padding condenser and, at the

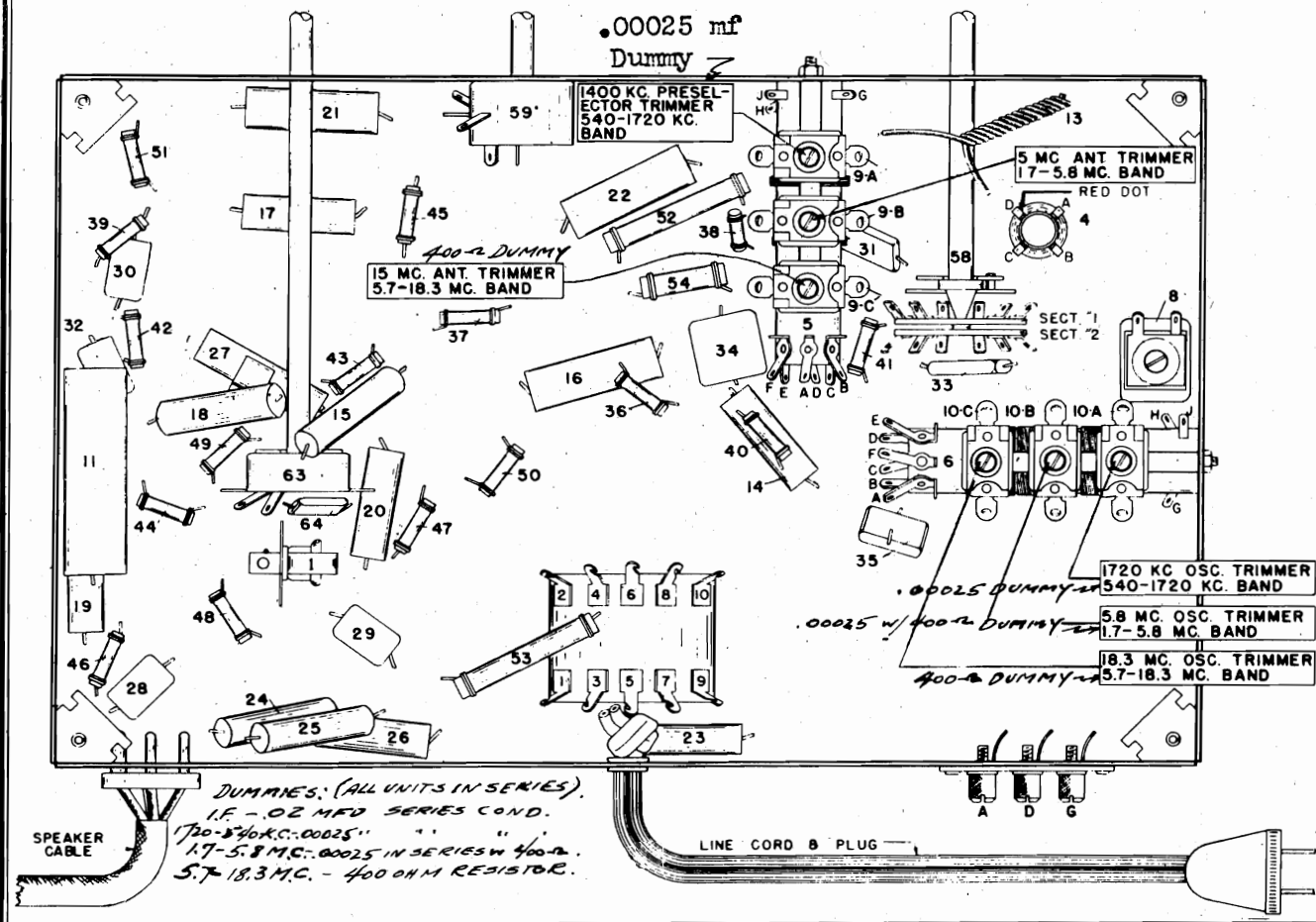


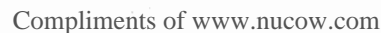
MODELS B10565 to B10568

Trimmers, Alignment, Chassis ALLIED RADIO CORP.

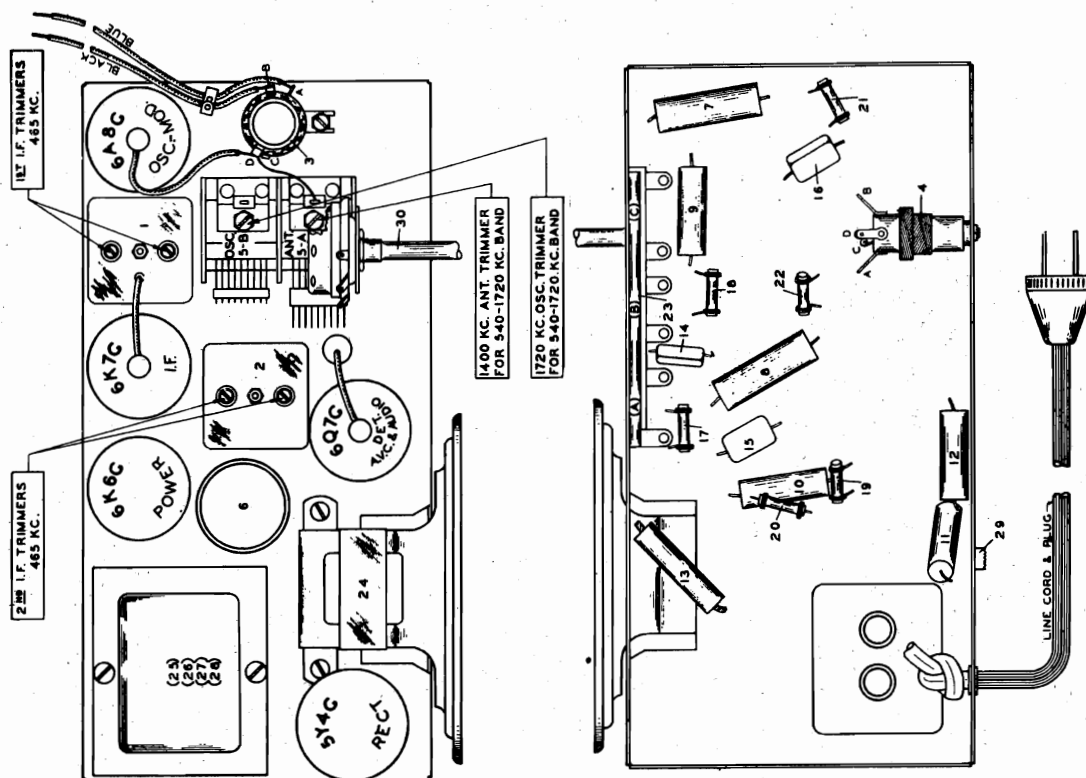


CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII.





- (c) Set receiver dial and test oscillator frequency to EXACTLY 1720 kilocycles.
- (d) Bring in 1720 KC test oscillator signal to maximum output by adjusting the trimmer condenser mounted on top of the oscillator section of the gang condenser. Looking at the front of the receiver the rear section of the gang condenser is the oscillator section.
- (e) Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles.
- (f) Adjust trimmer on top of the front section gang condenser (antenna section) for maximum 1400 kilocycle test signal response.



THIS RADIO IS DESIGNED SO THAT IT MAY BE PLACED IN A HORIZONTAL OR UPRIGHT POSITION. AS THE OPERATION AND PERFORMANCE OF THE RECEIVER IS THE SAME IN EITHER POSITION, IT IS A MATTER OF PERSONAL PREFERENCE AS TO WHICH POSITION TO USE.

The approximate position on the dial that any nine stations will be tuned in may be quickly determined--by pressing a paper tab having the station call letters into the round depressions on the front of the cabinet.

THE STATIONS SELECTED MUST OPERATE ON A FREQUENCY 40 KILOCYCLES OR MORE APART, OTHERWISE IT WILL BE IMPOSSIBLE TO PLACE THE CALL LETTER TABS IN THEIR PROPER POSITION IN CABINET DEPRESSIONS.

While it will be found that only the approximate location will be indicated, the station will tabs properly located will be an extremely helpful tuning aid.

To set the proper station call letter tabs into the cabinet depressions proceed as follows:

- (a) Determine which nine stations call letters you wish to have on the cabinet—press call letter tabs out of the call letter sheets provided.
- (b) Carefully tune in the selected station that broadcasts on the lowest frequency—the least number of kilocycles.
- (c) Place a little mucilage or celluloid on back of paper tab. Press the paper call letter tab—so that the printed call letters of the station tuned in are at the same angle as the printing on the dial—into the round depression on the cabinet front that is nearest to the dial pointer. By placing call letter tab on angle the call letter can easily be read with cabinet in either a horizontal or upright position.
- (d) Tune in the next selected station having the next lowest station frequency, pressing the call letter for this station into the round cabinet depression nearest to the dial pointer needle—continuing on in this way until station call letters have been placed into all nine cabinet depressions.

After the station call letters are set it will be a simple matter to determine the approximate dial position of any of these stations—just rotate the tuning knob until the dial pointer needle points to station call letter of desired station. It must be remembered that only the approximate tuning location will be indicated by the dial pointer needle—each station must be correctly tuned in by ROTATING THE TUNING CONTROL KNOB UNTIL A STATION IS TUNED IN WITH GREATEST CLARITY.

ALIGNMENT PROCEDURE:

NOTE: BE SURE TO FOLLOW PROCEDURE CAREFULLY WHEN ALIGNING. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS AND PADDING CONDENSERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER.

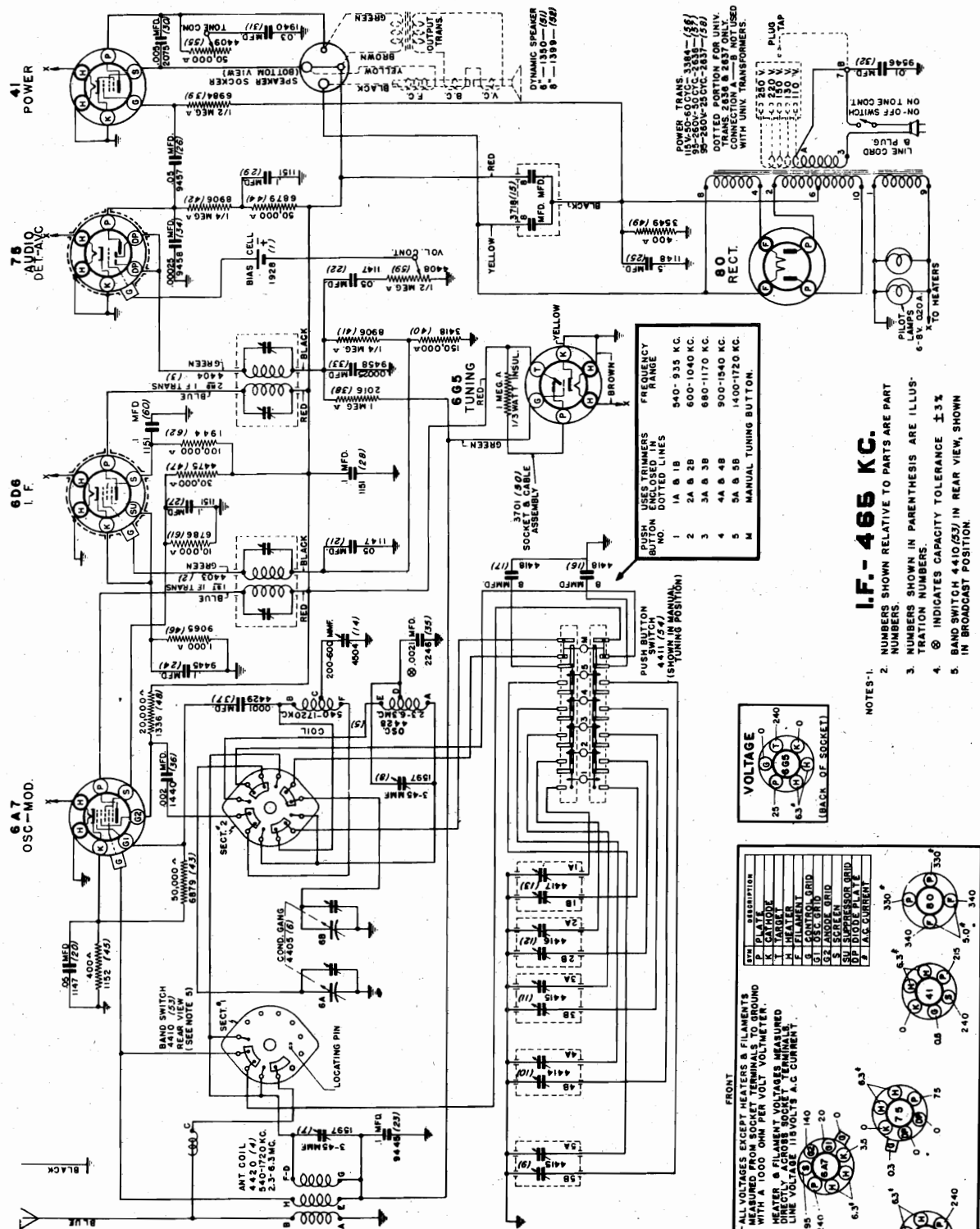
ALIGNING I.F. STAGE AT 465 KILOCYCLES:

- (a) Connect the ground lead of the test oscillator to the chassis or set ground lead. Connect the other lead of the test oscillator to the grid cap of the 6A8G tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.
- (b) Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.
- (c) Peak each of the second I.F. transformer trimmers.
- (d) Peak each of the first I.F. transformer trimmers.

To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

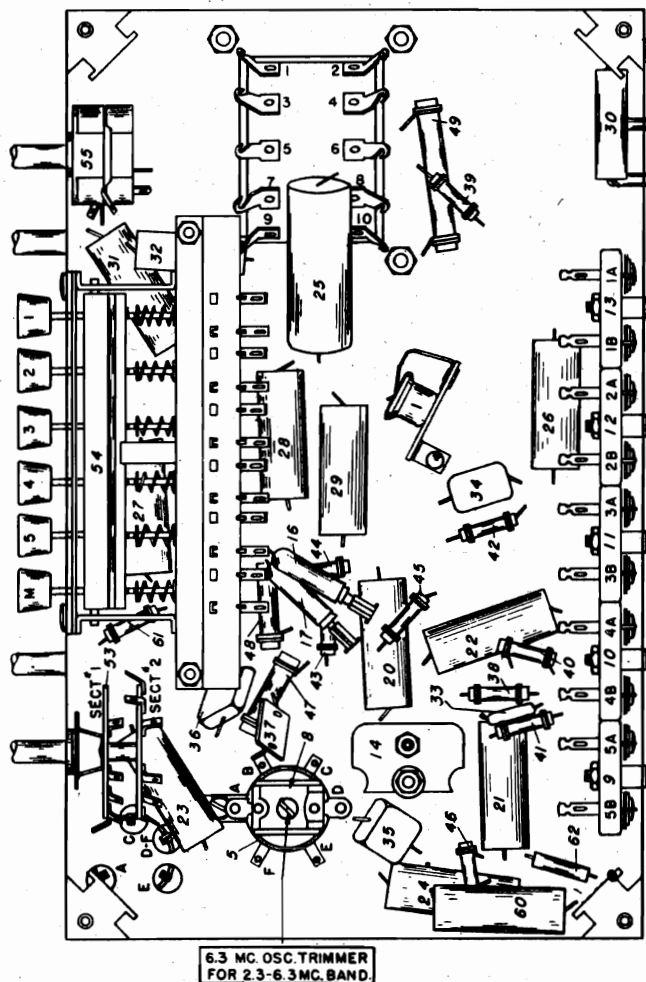
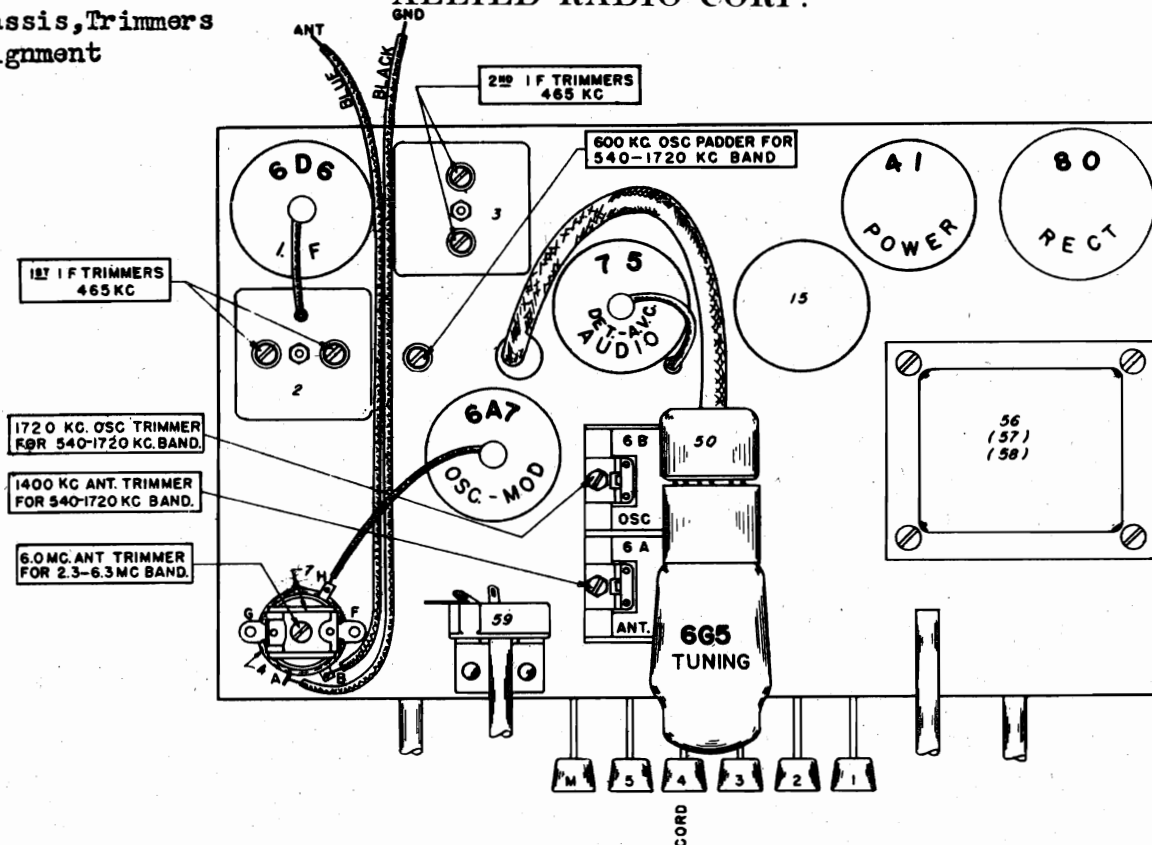
ALIGNING 1720-540 KILOCYCLE BAND:

- (a) Remove test oscillator lead from grid of 8AG tube and attach it to the receiver antenna lead through a .00025 Mfd. series condenser.
- (b) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line move needle to correct position.



MODEL B10579
Chassis, Trimmers
Alignment

ALLIED RADIO CORP.



ALIGNMENT PROCEDURE:

ALIGNING I.F. STAGE AT 465 KILOCYCLES:

- Connect the ground lead of the test oscillator to the chassis or set ground lead. Connect the other lead of the test oscillator to the grid cap of the 6A7 tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.
- Set test oscillator to EXACTLY 465 kilocycles and turn receiver volume control on full.
- Peak each of the second I.F. transformer trimmers.
- To assure most accurate trimmer setting repeat above adjustment several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

ALIGNING 1720-540 KILOCYCLE BAND:

- Remove test oscillator lead from grid of the 6A7 tube and attach it to the receiver antenna lead through a .002 Mfd. series condenser.
- Bring in 1720 KC test oscillator signal to maximum output by adjusting the trimmer condenser mounted on top of the oscillator section of the gang condenser. Looking at the front of the receiver the rear section of the gang condenser is the oscillator section.
- Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles.
- Adjust trimmer on top of the front section gang condenser (antenna section) for maximum 1400 kilocycle test signal response.
- Tune receiver dial and set test oscillator frequency to approximately 600 kilocycles.
- While rocking the tuning condenser back and forth adjust 600 KC oscillator paddler condenser which is accessible through the hole in the top of chassis adjacent to the gang condenser for maximum 600 kilocycle signal response.

ALIGNING 2.3-6.3 MEGACYCLE BAND:

- Replace .00025 Mfd. test oscillator antenna lead series condenser with a 400 ohm resistor.
- Adjust band selector switch for 2.3-6.3 megacycle band operation, tune receiver dial and set test oscillator frequency to EXACTLY 6.3 megacycles.
- Bring in 6.3 megacycle test oscillator signal to maximum output by adjusting 6.3 M.C. oscillator trimmer.
- Tune receiver dial and set test oscillator frequency to EXACTLY 6 megacycles, and adjust 6 M.C. antenna trimmer for maximum sensitivity.

MODEL B10579 ALLIED RADIO CORP. MODELS B10750, B10760, B10761, B10762, B10770, B10771 Tuner Data

SETTING UP SELECTOR MECHANISM

MODELS B10750, B10770, B10771,
B10760, B10761, B10762.

1. Using the manual selector knob, tune in station No. 1, the station near the left hand end of the dial—the 170 K.C. end. Make certain that the station is properly tuned in.

2. From the back of the receiver loosen thumb screw No. 1 (See Figure 2) just enough to allow it to slide freely in the groove.

3. Now adjust the thumb screw until the contact is resting directly on the fibre dead spot.

4. Tighten thumb screw securely, making sure that in tightening you do not move the contact off the fibre dead spot.

5. Check the above operation by pressing button No. 1 and note if there is any pointer movement. If there is no pointer movement, the contact is properly set. If the pointer moves, the contact was not set directly on fibre dead spot. In this case, the station should be re-tuned manually, and procedure No. 3 should be repeated.

6. Using the same procedure, set up the remaining five stations, in each case using the station of the next highest frequency and the thumb screw having the same number as the corresponding button. Never skip buttons, always set up in numerical order from button 1 to 6 from left to right.

7. After all the stations have been set up, insert the proper station call tabs (found with the instructions) into the recesses of their respective buttons.

8. To receive any of the six stations set up as described above turn receiver "ON" by rotating the left hand knob to the right until the switch clicks. Allow the tubes to heat up, press the buttons designated by the call letter of the station desired and hold the button in until the pointer stops moving and the station comes in. Adjust tone and volume. IMPORTANT: Be sure the band switch is in the position for Standard Broadcast Reception.

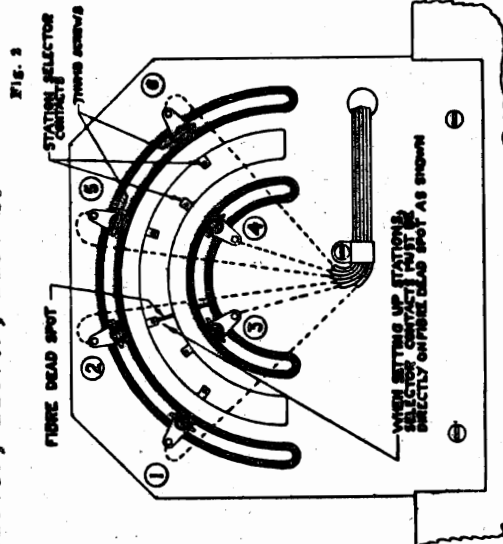


Fig. 3

- BE SURE TO OPERATE THE SET AT LEAST ONE-HALF HOUR BEFORE ADJUSTING TRIMMERS. If set is not properly warmed up, when trimmers are adjusted, the station may drift out of tune.
- When adjusting trimmers, use the "MANUAL" tuning knob, not the "AUTOMATIC" push-button.
- FOR BEST RESULTS SET PUSH-BUTTONS FOR LOCAL OR STRONG, NEARBY STATIONS ONLY. Obtain the transmitter frequency—number of kilocycles—and call letters of the station. Then adjust the trimmer to the transmitter frequency.
- Place band selector switch for operation on 1720-540 kilocycle band.
- Press in "MANUAL" tuning button—see diagram.
- It is advisable that if a station is selected whose transmitter frequency is not between 540-985 kilocycles that the two trimmers marked "540-985 K.C." on paper label attached to back of chassis be adjusted first.
- Using "MANUAL" tuning knob carefully tune in selected station whose transmitter frequency is between 540-985 kilocycles.
- Press in push-button marked "540-985 K.C."—see diagram. NOTE: IN STATION SIGNAL WILL DISAPPEAR OR MAY BE DISTORTED, AND IN SOME INSTANCES ANOTHER STATION MAY BE HEARD.
- With a small screw driver carefully tune in the selected 540-985 kilocycle station by slowly adjusting trimmer 1A and 1B. Watch tuning eye and adjust trimmers so THAT THE TWO OPEN ENDS OF THE GREEN INVERT-ED "V" ON THE TUNING EYE ARE CLOSEST TOGETHER. GRAB THE POINTS OF THE "V" WITH THE TIPS OF YOUR FINGERS AND PULL THEM TOGETHER. This will tune the station in. Adjust trimmer 1A and 1B until station is properly tuned.
- Motion cammed back of selected 540-985 K.C. station paper tab and press into round depression in 540-985 K.C. push-button.
- After trimmers 1A and 1B have been properly set for the selected station operating between 540-985 kilocycles, adjust other trimmers in the same manner and in the following order:
 - Set trimmers 2A and 2B for selected station operating between 600-1040 kilocycles.
 - Adjust trimmers 3A and 3B for the selected station operating between 600-1040 kilocycles.
 - Set trimmers 4A and 4B for selected station operating between 900-1540 kilocycles.
 - Adjust trimmers 5A and 5B for selected station operating between 1400-1720 kilocycles.

MODEL B10579

INSTRUCTIONS FOR INSTALLING AND OPERATING "AUTOMATIC" PUSH BUTTON"

Five stations operating in the 1720-540 kilocycle broadcast band may be received by using the "AUTOMATIC" push-button tuned by properly setting the ten trimmer screws accessible through holes in the back of the chassis.

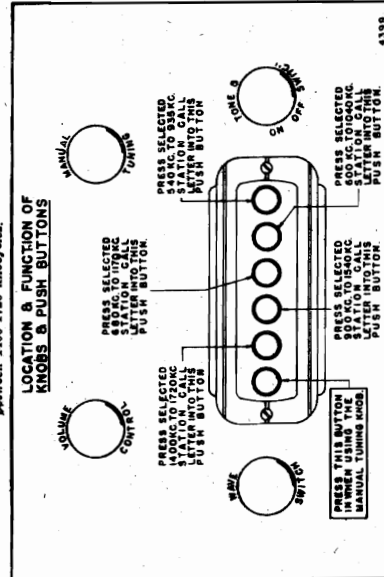
AS THE PUSH-BUTTONS ARE NOT PRE-SET AT THE FACTORY FOR ANY DEFINITE STATION BE SURE TO SET THEM PROPERLY. It is important to have the aerial, which will be used with the set, attached to the radio when adjusting the trimmers.

AS THE TRIMMERS SHOULD NEVER BE TOO LOOSELY OR TOO TIGHTLY ADJUSTED IT IS IMPORTANT THAT THE PROPER TRIMMERS BE USED.

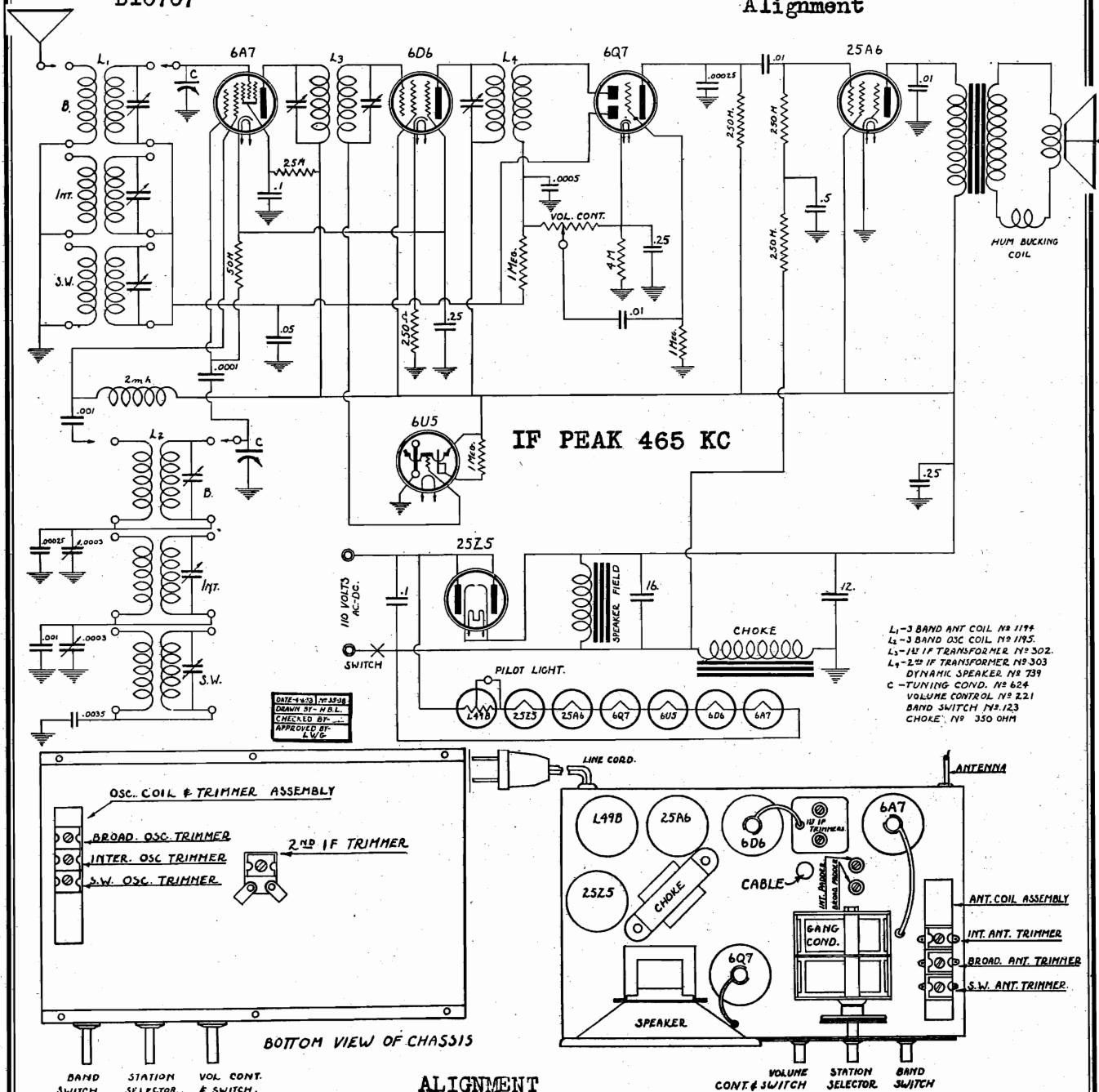
In some instances it may be necessary after the set is operated for a period of time to reset the trimmers as they may drift due to heat, humidity, etc.

| USE FOR STATION BETWEEN | USE FOR STATION BETWEEN | USE FOR STATION BETWEEN | USE FOR STATION BETWEEN | USE FOR STATION BETWEEN |
|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 540 TO 935 KC | 600 TO 1040 KC | 680 TO 1170 KC | 900 TO 1340 KC | 1400 TO 1720 KC |
| 1A | 2A | 3A | 4A | 5A |
| 1B | 2B | 3B | 4B | 5B |

This diagram, which is similar to the one attached to the back of chassis over trimmer holes, shows the minimum-maximum range of the five groups of trimmers.



4399

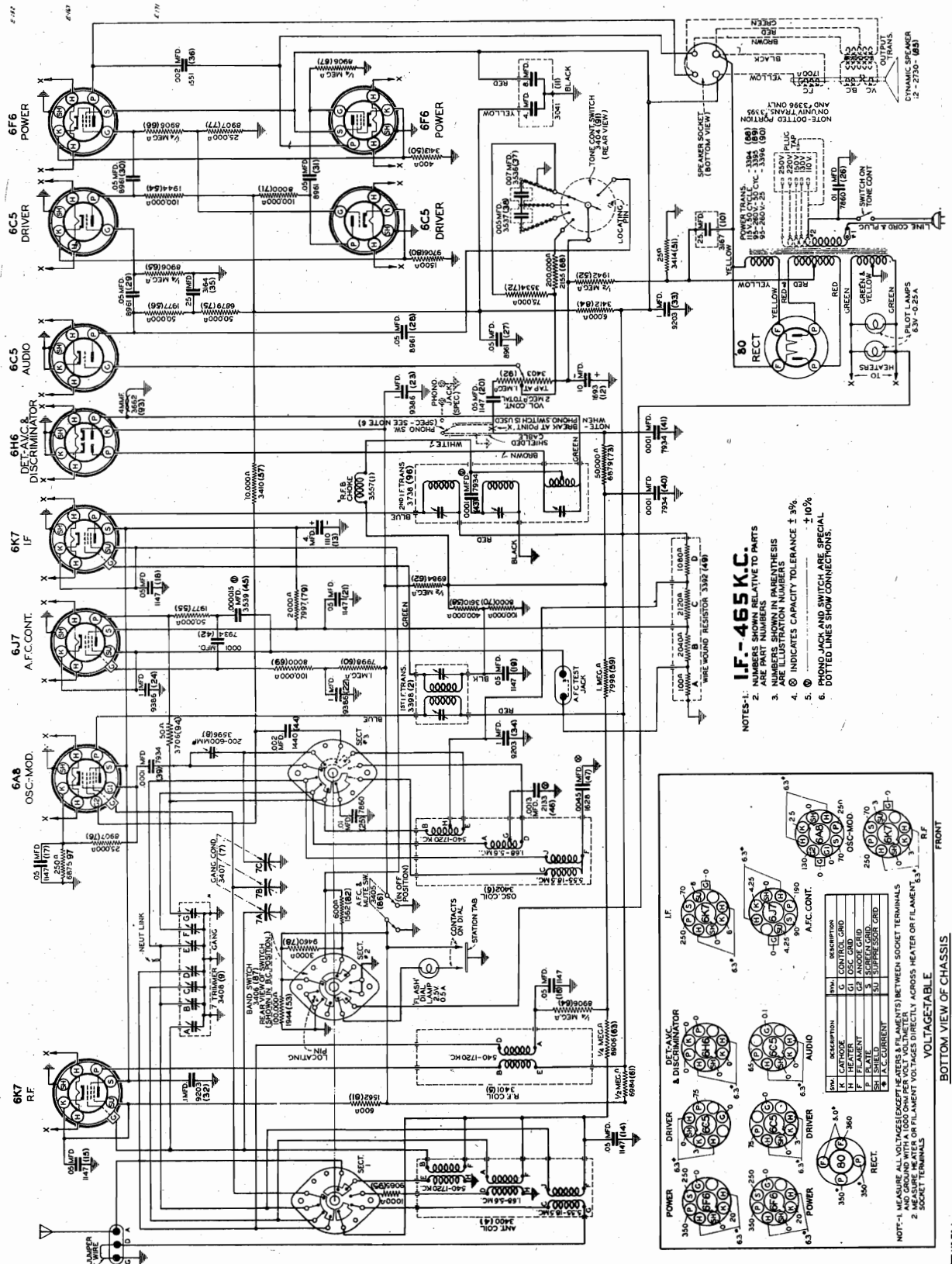
MODELS B10702, B10706,
B10707ALLIED RADIO CORP. Schematic, Socket, Trimmers
Alignment

ALLIED RADIO CORP.

MODELS B10580, B10581

B10582

Schematic, Voltage
Socket



MODELS B10580, B10581, B10582 Alignment, Tuner

ALLIED RADIO CORP.

CATE INCORRECT ADJUSTMENT AND THE DISCRIMINATOR TRIMMER SHOULD BE SET TO ABOUT 1/2 CAPACITY AND THE ADJUSTMENT OF THE DISCRIMINATOR TRIMMER MADE ALL OVER AGAIN.

ALIGNING 1.85-5.5 MEGACYCLE BAND:

- Replace .00025 Mfd. test oscillator antenna lead series condenser with a 400 ohm resistor.
- Adjust band selector switch to 1.85-5.5 megacycles, tune receiver dial and set test oscillator frequency to EXACTLY 5.5 megacycles. Bring in 5.5 megacyycle test signal to maximum output by adjusting 5.5 M. C. oscillator trimmer.
- Tune receiver dial and test oscillator frequency to EXACTLY 5 megacycles and adjust 5 M.C. antenna trimmer for maximum sensitivity.

ALIGNING 5.5-18.5 MEGACYCLE BAND:

- Leave 400 ohm resistor in series with test oscillator lead and place band selector switch for operation on 5.5-18.5 megacycle band, tune receiver dial and set test oscillator frequency to EXACTLY 18.5 megacycles.
- Adjust 18.5 M.C. oscillator trimmer to bring in 18.5 megacyycle test signal to maximum output.

NOTE: When adjusting this trimmer two peaks, the fundamental and the image peak will be noticed. CARE MUST BE TAKEN THAT THE FUNDAMENTAL PEAK AND NOT THE IMAGE PEAK IS USED FOR ALIGNING THE RECEIVER AT 18.5 MEGACYCLES. Always back off the trimmer to minimum capacity, then screw down the trimmer (add capacity) until the FIRST peak which is the fundamental and the proper one to use is tuned in. If the trimmer is screwed down beyond the point where the first peak is received the incorrect image peak will be tuned in. After completing adjustment of the oscillator trimmer at 18.5 megacycles, always check to see if the proper peak has been used. To do this leave test oscillator frequency at 18.5 megacycles, increase the output of the test oscillator and tune receiver dial to approximately 17.5 megacycles. Then vary the receiver dial slightly to the right and left of 17.5 megacycles, and if the fundamental peak was used in aligning at 18.5 megacycles the test oscillator signal will be heard at approximately 17.5 megacycles on the receiver dial.

- Tune receiver dial and set test oscillator frequency to EXACTLY 15 megacycles.
- Rock gang condenser slightly to right and left and adjust 15 M.C. antenna trimmer for maximum 15 megacycycle test signal response.

To assure more accurate trimmer setting, repeat all above adjustments several times always using lowest possible test oscillator output consistent with readable output meter scale deflection.

PROCEDURE FOR REMOVING RECEIVER FROM CABINET.

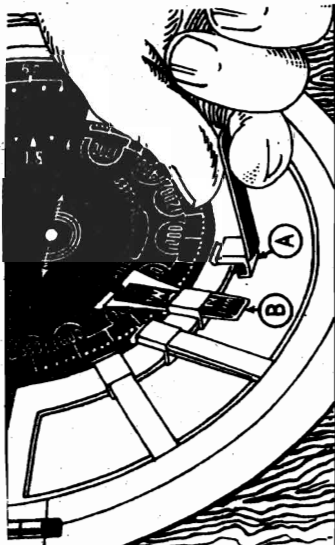
- Unscure the two knurled head screws mounted on front of the glass frame and then holding onto the screws pull dial glass away from the cabinet.
- Swing "rapid tuning" lever to center position as shown, loosen (do not remove) screw thru hole in bottom center, and remove lever knob.
- Loosen set screws on all five tuning knobs, and remove knobs from shafts. (Not shown in sketch).
- Remove four bolts at bottom side of chassis mtg. shelf (not shown in sketch).
- Remove wood screws on the pressure brackets at rear of chassis (not shown in sketch) and then slide receiver out of cabinet.
- When replacing receiver in cabinet, reverse entire procedure given above.

- Place band selector switch for operation on 1720-540 K.C. broadcast band—and set receiver dial somewhere near 1000 kilocycles at a point where no station is heard.

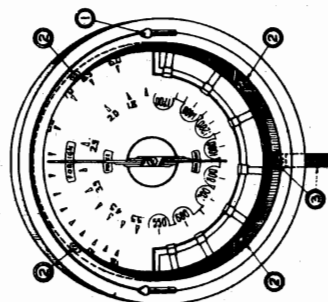
- Rotate A.F.C. switch knob from A.F.C. "on" to A.F.C. "off" position and note whether the milliammeter reading changes as the position of the A.F.C. switch is changed. No change in reading indicates probable proper discriminator trimmer adjustment, while a noticeable change indicates improper discriminator trimmer adjustment.

- IMPORTANT: DO NOT ADJUST DISCRIMINATOR TRIMMER UNLESS IT IS ABSOLUTELY NECESSARY. Place A.F.C. switch in A.F.C. "off" position and note milliammeter reading, then place A.F.C. switch in A.F.C. "on" position and CAREFULLY ADJUST DISCRIMINATOR TRIMMER UNTIL MILLIAMMETER READING IS EXACTLY THE SAME AS IT WAS WITH THE A.F.C. SWITCH IN THE "OFF" POSITION.

NOTE: As the discriminator trimmer screw is screwed in (increasing capacity) the milliammeter reading should decrease and as the discriminator trimmer is unscrewed (decreasing capacity) the milliammeter reading should increase. IF WHEN ADJUSTING THE DISCRIMINATOR TRIMMER THE MILLIAMMETER READING DOES NOT SHARPLY INCREASE OR DECREASE AS THE TRIMMER IS ADJUSTED EVEN AFTER SEVERAL TURNS OF THE TRIMMER SCREW, THIS DOES NOT INDICATE PROPER BALANCING BUT DOES INDICATE



Above Diagram shows method of inserting and setting tabs.



ALIGNING I.F. STAGE AT 465 KILOCYCLES:

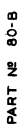
- Place automatic frequency control in the maximum left hand A.F.C. "off" position.
- Attach the ground lead of the test oscillator to the chassis. Connect the other lead to the grid cap of the 6A8 tube through a .02 Mfd. series condenser. DO NOT REMOVE GRID CLIP.
- Set test oscillator to EXACTLY 465 kilocycles and turn volume control on full.
- Remove shields held in position by snap fasteners over A.F.C. test jack and over trimmer screw holes in the first and second I.F. transformer shield cans.
- Peak second I.F. transformer trimmers for maximum 465 kilocycle output by adjusting the two trimmers accessible through the two top holes in the second I.F. transformer shield can. DO NOT TOUCH DISCRIMINATOR (BOTTOM) SCREW.
- Peak each of the first I.F. transformer trimmers for maximum 465 kilocycle signal output.

ALIGNING 1720-540 KILOCYCLE BAND:

- Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh), at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If the dial needle does not point exactly to the last line, move needle to correct position.
- Remove test oscillator lead from grid of 6A8 tube and connect to receiver "A" antenna post through a .00025 Mfd. condenser.
- Adjust A.F.C. control to maximum left hand A.F.C. "off" position and band selector switch for operation on the 1720-540 kilocycle band.
- Set test oscillator frequency and receiver dial to EXACTLY 1720 kilocycles and BRING IN 1720 KILOCYCLE TEST OSCILLATOR SIGNAL TO MAXIMUM OUTPUT BY ADJUSTING 1720 KILOCYCLE OSCILLATOR TRIMMER.
- Tune receiver dial and set test oscillator frequency to EXACTLY 1400 kilocycles. Adjust 1400 K.C. R.F. and antenna trimmers for maximum sensitivity.
- Set test oscillator frequency and receiver dial to approximately 600 kilocycles. Then while rocking gang condenser slightly to right and left, adjust 600 K.C. oscillator padder for maximum signal response.

ALIGNING DISCRIMINATOR CIRCUIT:

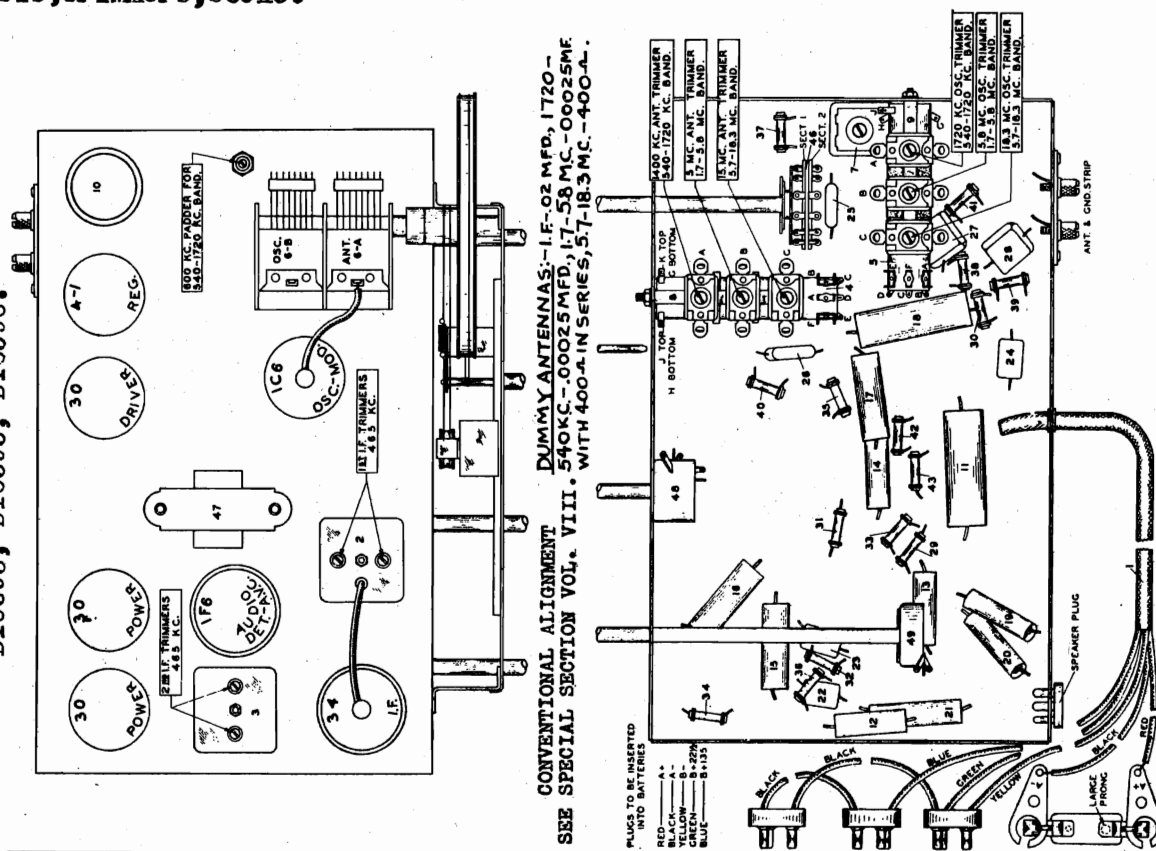
- After completing 1720-540 kilocycle adjustment, set test oscillator to EXACTLY 465 KILOCYCLES and connect to grid of 6A8 tube through a .02 Mfd. Condenser—insert lead of double scale 0 to 1 and 0 to 5 milliammeter into A.F.C. test jack located on top of chassis adjacent to the 6L7 tube. To avoid possibility of damaging the meter should one of the milliammeter leads short to the metal chassis, ALWAYS TURN OFF RECEIVER WHEN INSERTING OR REMOVING MILLIAMMETER LEADS FROM A.F.C. TEST JACK.
- Short out A.F.C. mute switch by grounding the second from the left (looking at the front of the chassis) of the four lugs mounted on top of the dial assembly. The proper lug to ground is indicated in the "Note X" on chassis top parts view.
- Turn receiver on, place A.F.C. switch knob in A.F.C. "off" position and if meter needle jumps off scale adjust output of test oscillator until an approximate 2 M.A. deflection is obtained on the 0 to 5 milliammeter scale.



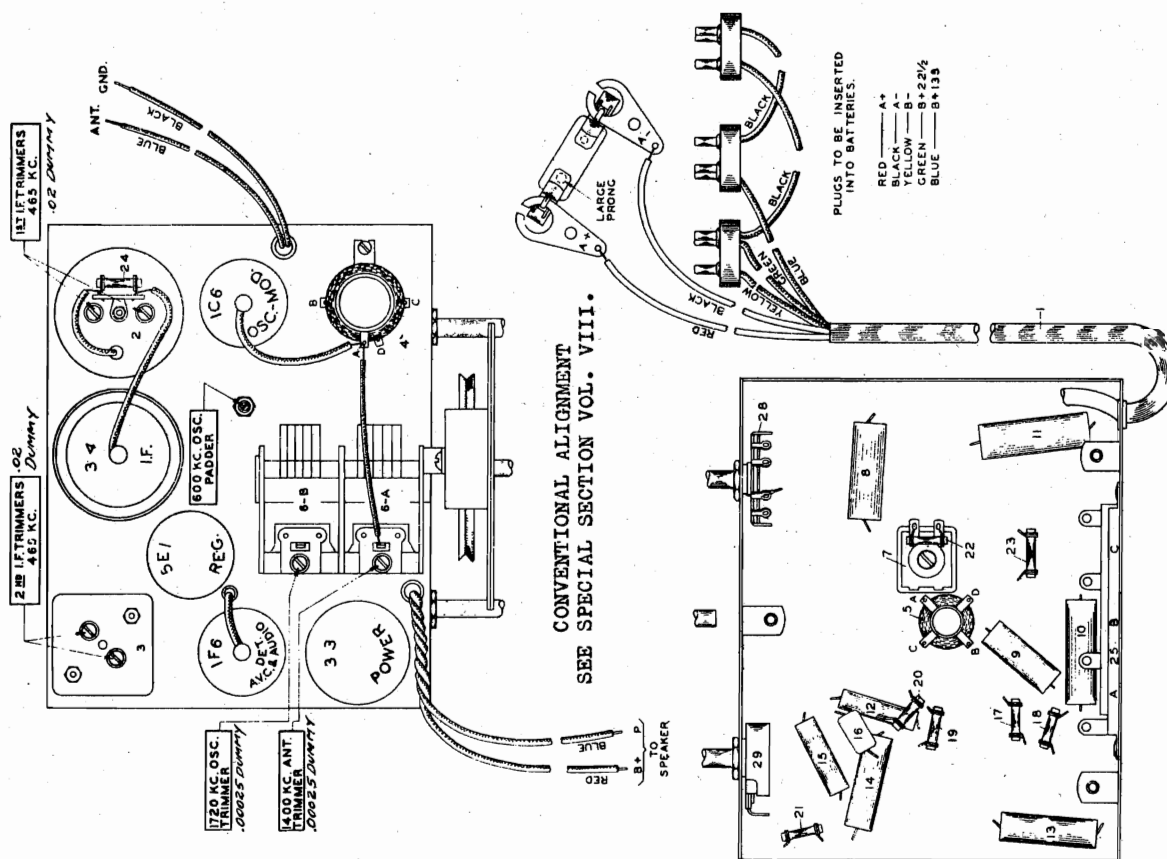
MODELS B10588,B10589
MODELS B10590 to B10593,
B10595,B10596
Chassis,Trimmers,Socket

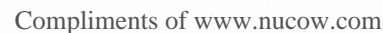
ALLIED RADIO CORP.

MODELS B10590, B10591, B10592
B10593, B10595, B10596.



MODELS B10588 and B10589.





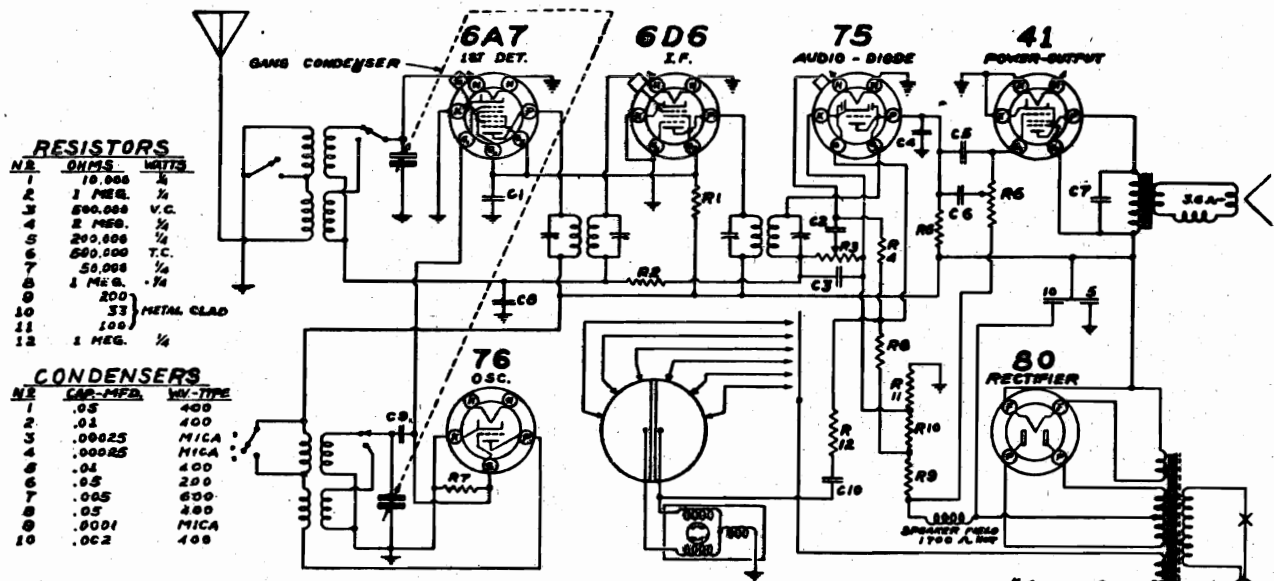
MODELS B10750,B10760,B10761,

B10762,B10770,B10771

Schematic, Trimmers, Socket

Alignment

ALLIED RADIO CORP.

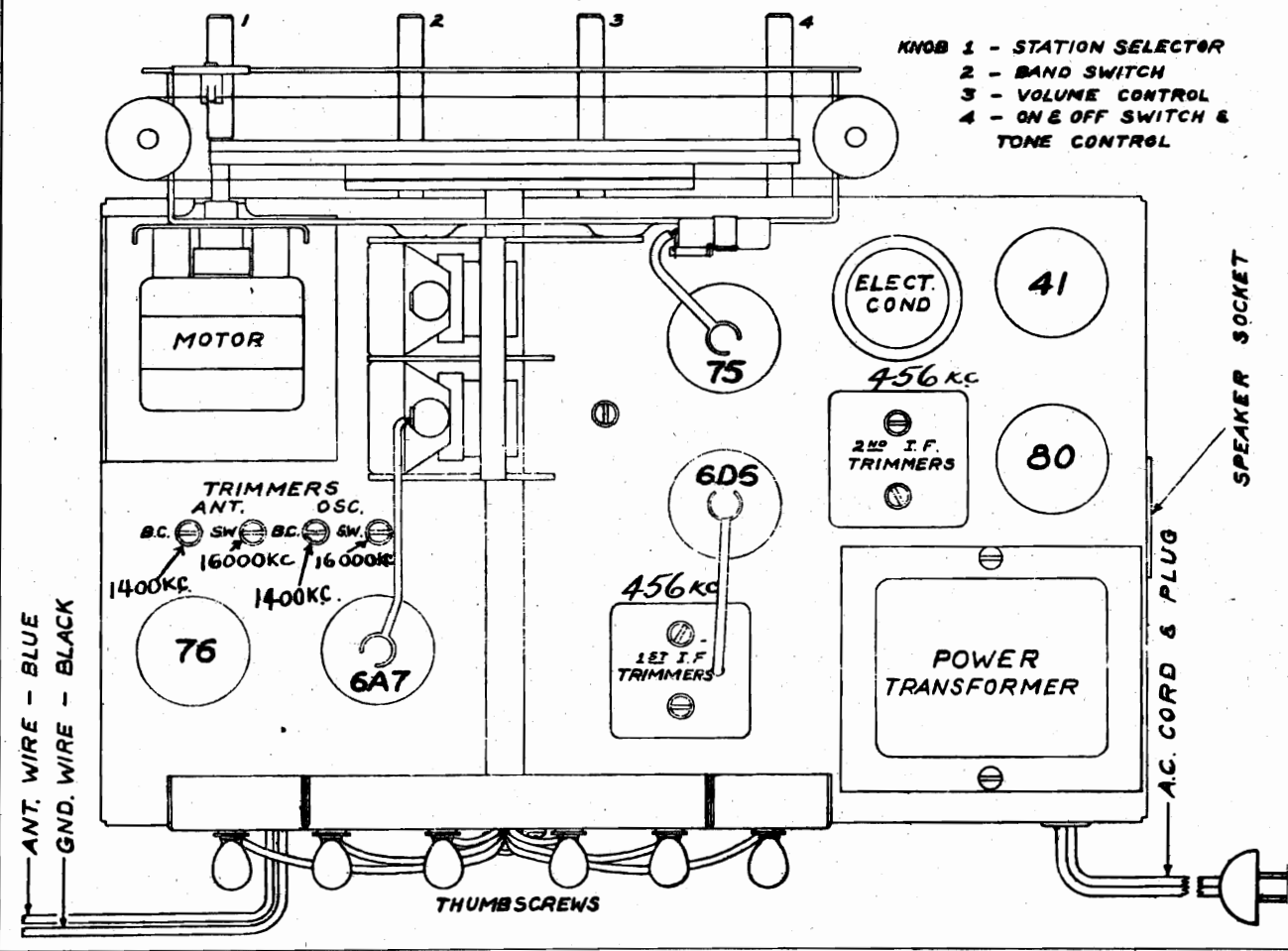


CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII

535 to 1730 Kilocycles
5650 to 18,100 Kilocycles

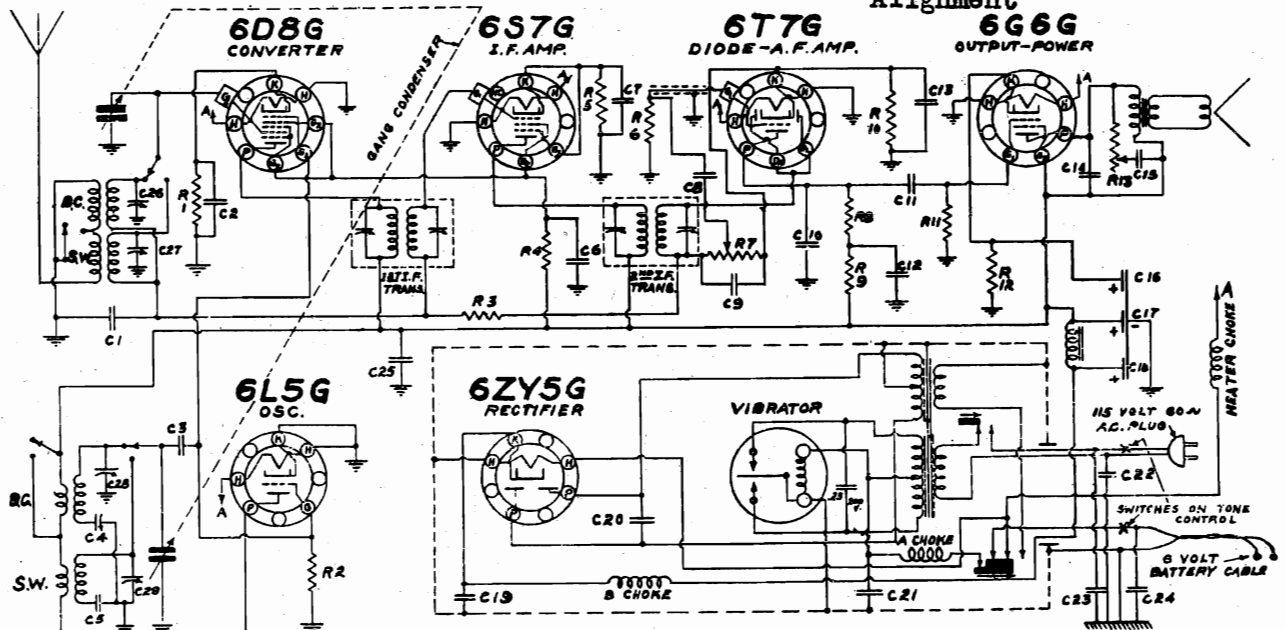
IF PEAK 456 KC

BAND SWITCH IN BROADCAST POSITION
I.F. - 456 K.C.
V.C. - VOLUME CONTROL
T.C. - TONE CONTROL



ALLIED RADIO CORP.

MODELS B10782, B10784
B10786
Schematic, Socket, Trimmers
Alignment

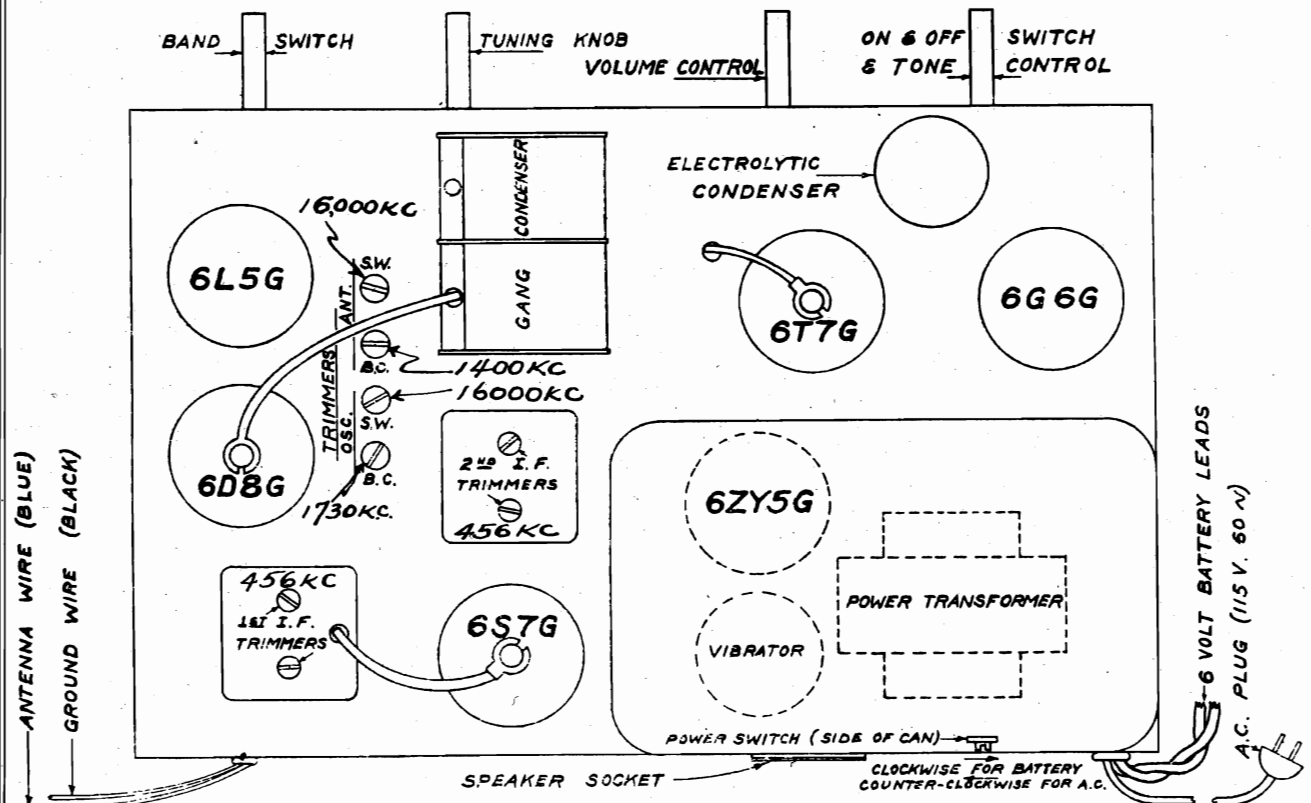


| CONDENSERS | | | | RESISTORS | | | |
|------------|--------------|--------|-----|-----------|-------|--------------|--|
| NO. | CAPACITY | TYPE | NO. | OHMS | WATTS | SPL. TOL. | |
| 1 | .05 Mfd. | 200V. | 13 | 1,500 | 1/4 | ± 10 % | |
| 2 | .05 Mfd. | 200V. | 14 | 50,000 | 1/4 | | |
| 3 | 100 MFD. | MICA | 15 | 1,000,000 | 1/4 | | |
| 4 | 300-500 MFD. | " | 16 | 30,000 | 1/4 | | |
| 5 | 4000 MFD. | M. 25% | 17 | 25V. | 1/4 | ± 10 % | |
| 6 | .1 Mfd. | 200V. | 18 | 200V. | 1/4 | (VOL. CONT.) | |
| 7 | .05 " | 200V. | 19 | 1,000,000 | 1/4 | | |
| 8 | .01 " | 400V. | 20 | 500,000 | 1/4 | | |
| 9 | 250 MFD. | MICA | 21 | 500,000 | 1/4 | | |
| 10 | 250 " | " | 22 | 200,000 | 1/4 | | |
| 11 | .01 Mfd. | 400V. | 23 | 10V. | 1/4 | ± 10 % | |
| 12 | .1 " | 200V. | 24 | 400V. | 1/4 | ± 10 % | |
| | | | 25 | 450V. | 1/4 | (TONE CONT.) | |
| | | | | 200V. | 1/4 | | |

IF PEAK 456 KC

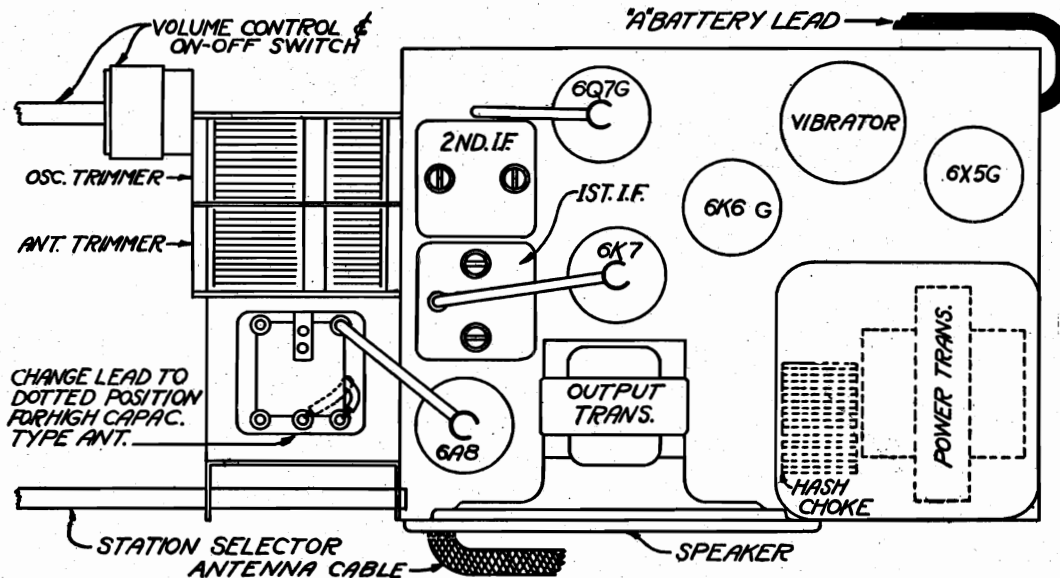
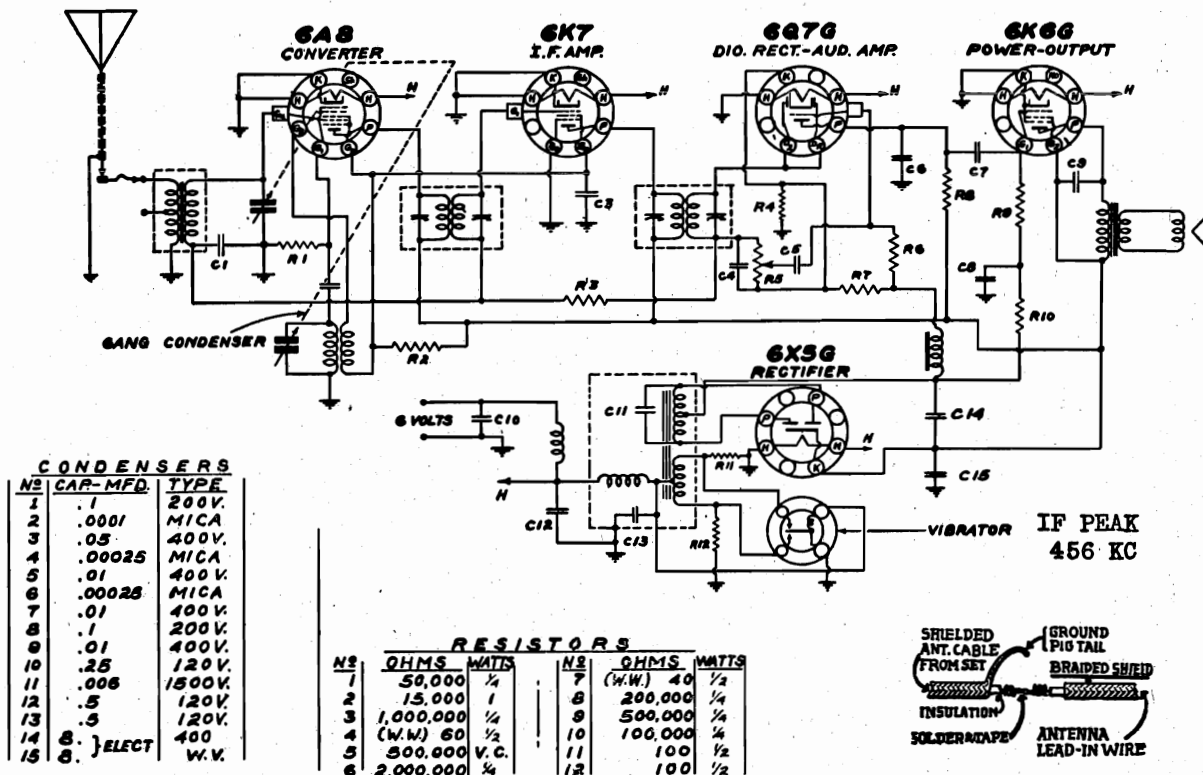
BAND SWITCH IN BROADCAST POSITION.
POWER SWITCH IN BATTERY POSITION.
I.F. = 456 K.C.
C26 TO C29 - 2 TO 20 MFD. TRIMMERS

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII



MODELS B10790, E10890
Schematic, Alignment
Socket, Trimmers

ALLIED RADIO CORP.



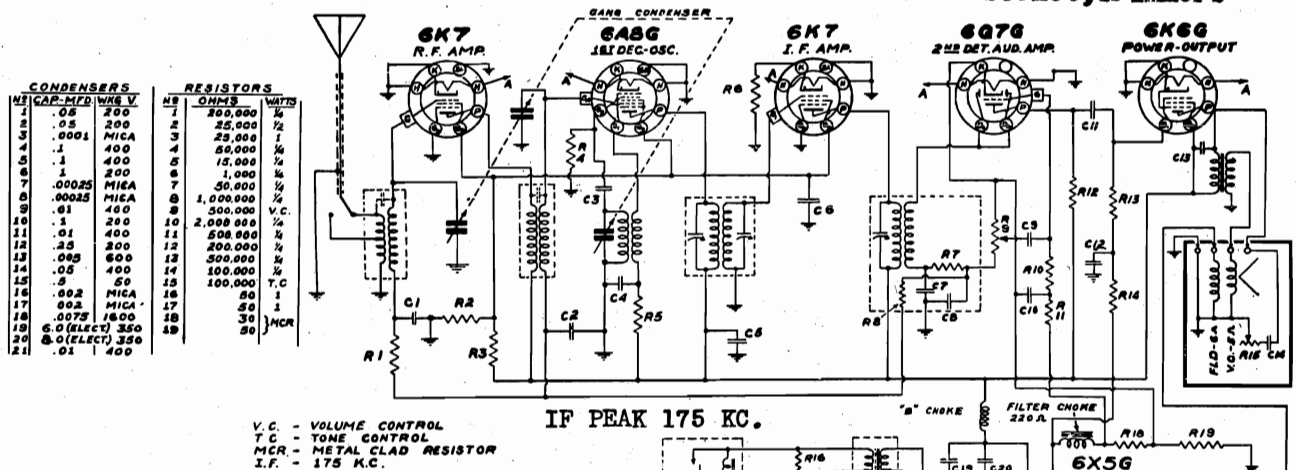
IF. ALIGNMENT. Adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tubes (6A8) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the output of the oscillator to the antenna lead of the receiver through a 50 mmfd. condenser. This antenna

lead should be a two foot length of standard low capacity shielded loom fitted with the proper bayonet type plug to accommodate the antenna input receptacle on the receiver. Set the oscillator to 1550 KC and with the gang condenser at minimum, adjust the oscillator trimmer to receive this signal. Then set the oscillator to 1400 KC and adjust the antenna trimmer to give maximum output.

ALLIED RADIO CORP.

MODELS B10791, E10891
Schematic, Alignment
Socket, Trimmers



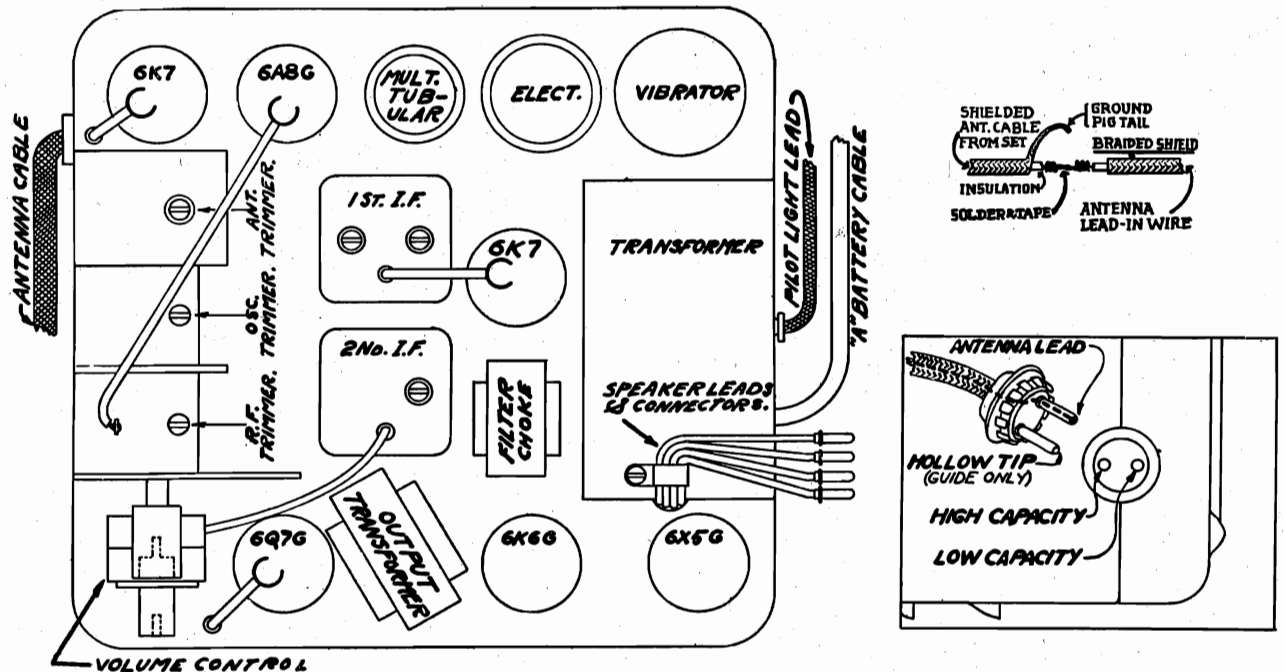
6 Tube Automobile Radio ALIGNMENT DATA

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 175, 600, 1400 and 1550 K.C., and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignment should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the A.V.C. from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) transformers should be aligned properly as the first step.

I.F. ALIGNMENT. Adjust the test oscillator to 175 K.C. and connect the output to the grid of the first detector tube, 6A8G, through a .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align the trimmers of the first and second I.F. transformers to peak or maximum reading on the output meter.

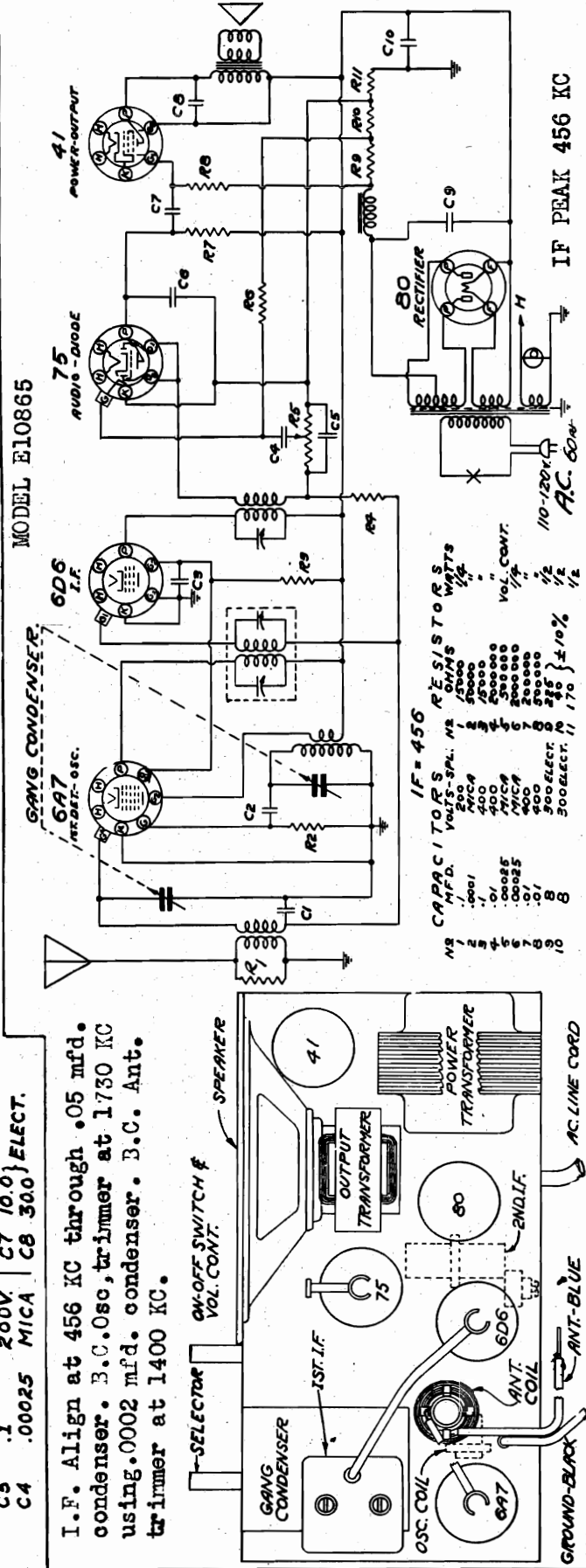
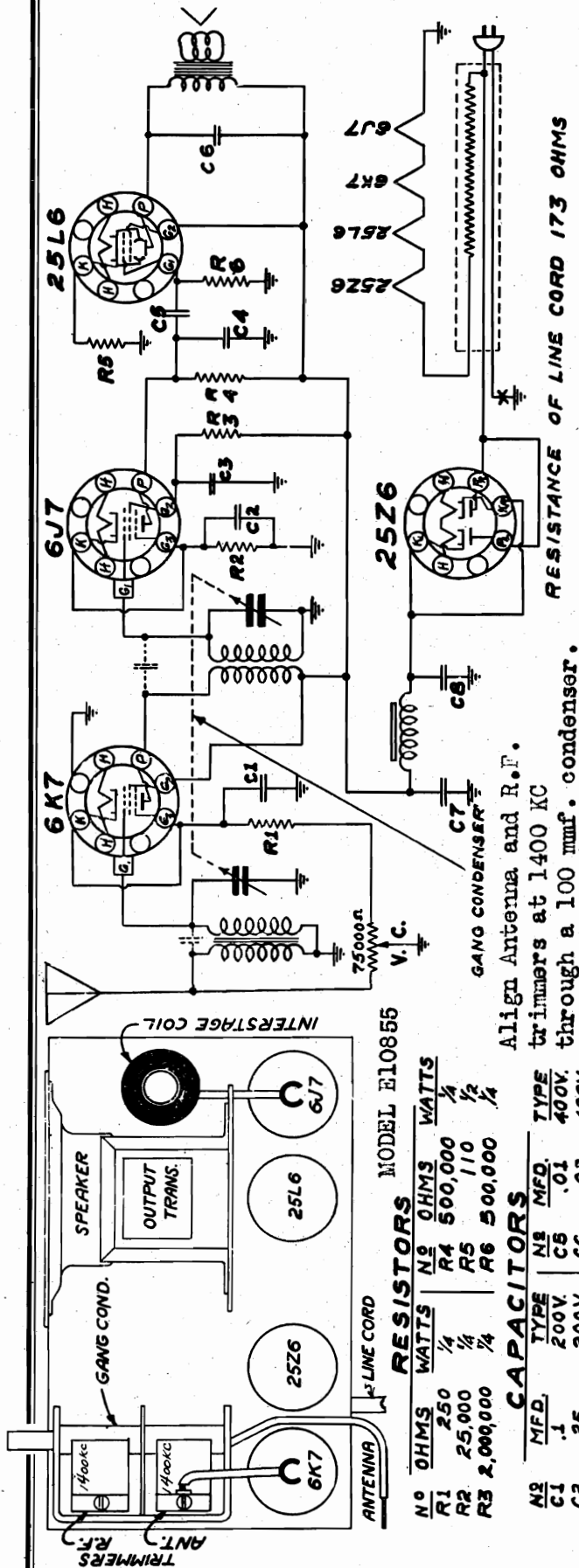
R.F. ALIGNMENT. Adjust the test oscillator to 1550 K.C. and connect the output to the antenna through a .00005 mfd. mica condenser to give the equivalent of a low capacity average auto antenna. When this adjustment is made, the signal must be introduced into the receiver through the shielded lead supplied with the receiver. The plug should be inserted to conform with the "Low Capacity" position. (See Figure 18). Set the gang condenser to minimum and adjust the oscillator trimmer to peak. (Center section of gang condenser). The next step is to set the test oscillator and receiver to 1400 K.C. and adjust the front and rear trimmers of the gang condenser to peak. The rear section of the gang condenser tunes the antenna amplifier stage (6K7 tube), and the front condenser section tunes the detector grid coil of the 6A8G tube.



MODEL E10855
MODEL E10865

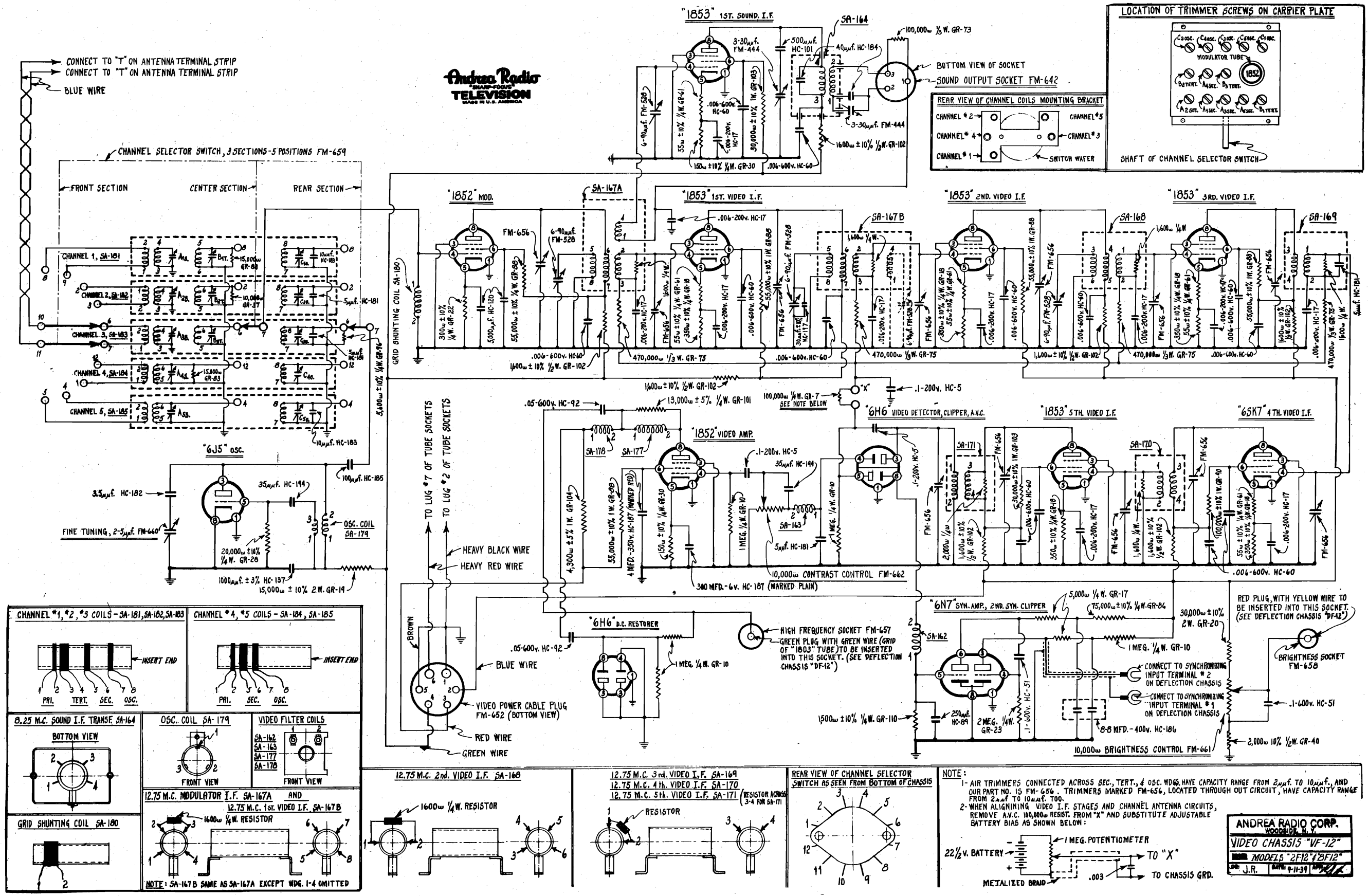
ALLIED RADIO CORP.

Schematics, Socket
Alignment, Trimmers



ANDREA RADIO CORP.

MODELS 2F-12, 3F-12
Video Chassis VF-12
Schematic, Trimmers, Coils



ANDREA RADIO CORP.

MODELS 2F12, 8F12
Controls, Assembly
Chassis Wiring

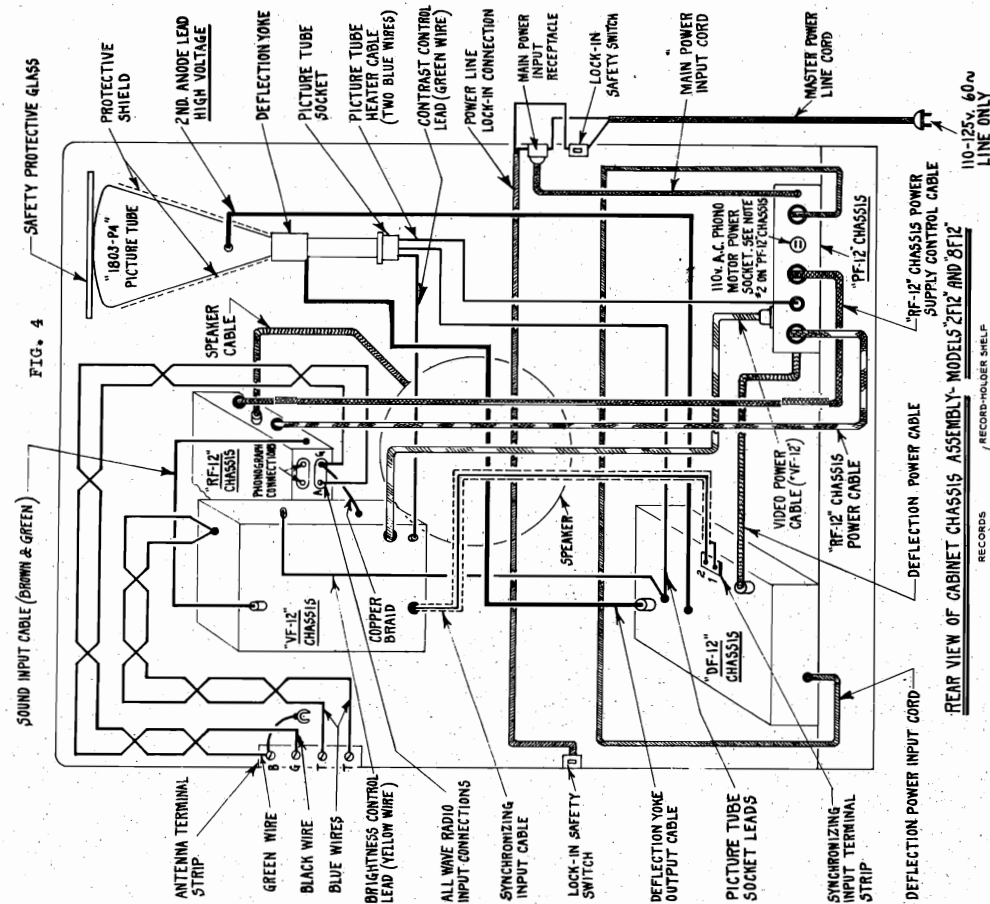
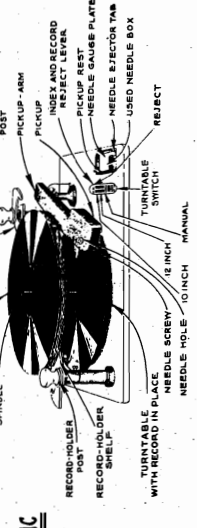


FIG. 4

FIG. 3



REAR VIEW OF CABINET CHASSIS ASSEMBLY- MODELS 2F12 AND 8F12

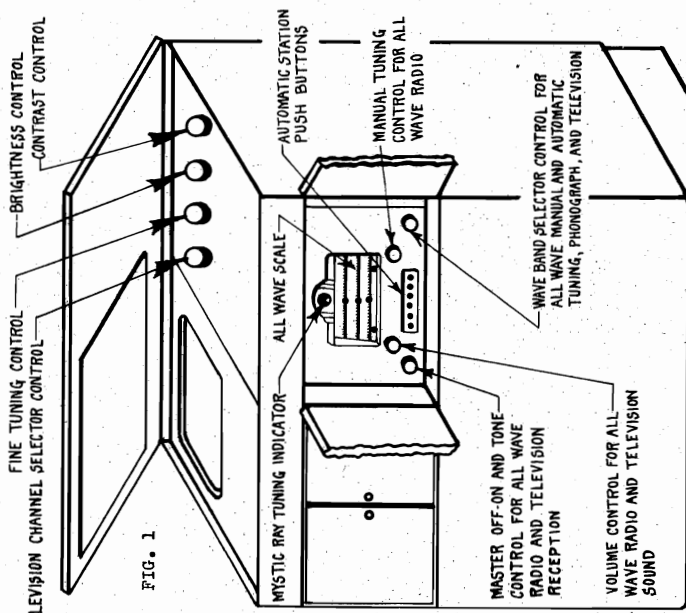


FIG. 2

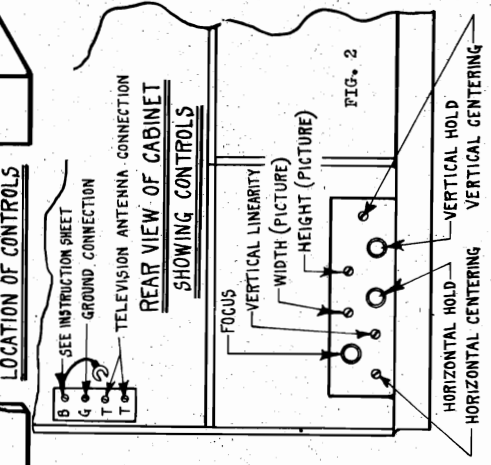


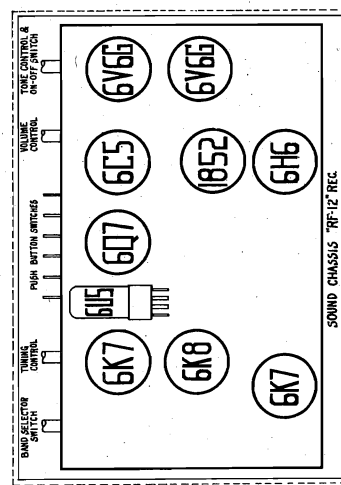
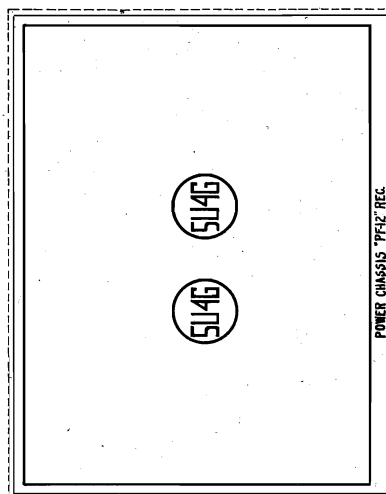
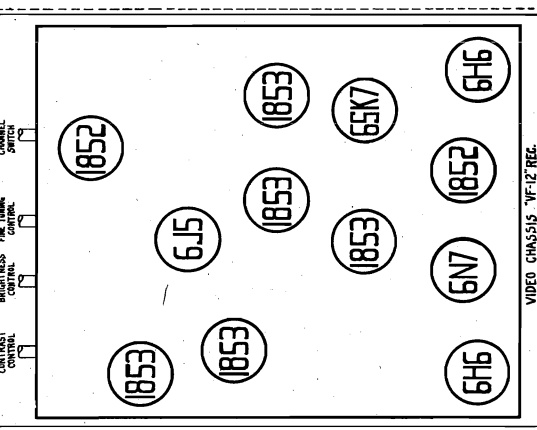
FIG. 2

CONTROLS - There are eight controls on the end of the Deflection Chassis. Three of these are knobs and five are screwdriver adjustments.

-
- The diagram shows a row of eight controls for a screwdriver, each with a knob and a label. From left to right, the controls are: FOCUSING (a knob with a crosshair symbol), HORIZONTAL CENTERING (a knob with a circle and a horizontal line), VERTICAL LINEARITY (a knob with a circle and a vertical line), WIDTH (a knob with a circle and two horizontal lines), HEIGHT (a knob with a circle and two vertical lines), VERTICAL CENTERING (a knob with a circle and a crosshair), HORIZONTAL HOLD (a knob with a circle and a horizontal line), and VERTICAL HOLD (a knob with a circle and a vertical line). A power cord is connected to the bottom of the controls.
1. Horizontal Centering - This is a screwdriver adjustment on the extreme left of the control panel. It serves to center the picture horizontally on the Kinescope screen and is made at the time of installation of the complete receiver. It will require resetting due primarily to the earth's magnetic field whenever the receiver location is changed, the cabinet turned around, or the Kinescope replaced.
 2. Focusing Control - The next control is a knob for adjustment of the first anode voltage to properly focus the picture. Make this adjustment carefully when the receiver is first placed in operation and it should then remain permanent but may be occasionally checked to insure continuous best focusing.
 3. Vertical Linearity - This is controlled by means of a screwdriver adjustment. It is operated in conjunction with the Height Control to give the correct vertical proportions to the picture. It may require readjustment if the Vertical Centering Control is reset.
 4. Width - This screwdriver control determines the width of the picture and should be adjusted when the receiver is installed. Further adjustment will occasionally be necessary in order to compensate for the gradual reduction in horizontal deflection with tube life.
 5. Horizontal Hold - This is a knob which controls the free running speed of the horizontal oscillator. It is adjusted to a point approximately at the center of the range in which the picture "locks in" horizontally. Synchronizing voltage, when properly applied, will hold the horizontal oscillator in step, and then correct setting will be indicated by the horizontal stability of the picture.
 6. Height - This screwdriver control determines the height of the picture and should be adjusted in conjunction with vertical linearity when the receiver is installed. Further adjustment will occasionally be necessary in order to compensate for the gradual reduction in vertical deflection with tube life.
 7. Vertical Hold - This is a knob which controls the free running speed of the vertical oscillator. It is adjusted to a point approximately in the center of the range in which the picture "locks in" vertically. Synchronizing voltage, when properly applied, will hold the vertical oscillator interlocked in step and the correct setting will be indicated by the vertical stability of the picture.
 8. Vertical Centering - This is a screwdriver adjustment on the extreme right of the control panel. It serves to center the picture vertically on the Kinescope screen and is made at the time of installation of the complete receiver. It will require resetting whenever the receiver location is changed, the cabinet turned around or the Kinescope replaced. Some readjustment of linearity may be required if the centering is shifted appreciably.

CONTROLS

DEFLECTION CHASSIS



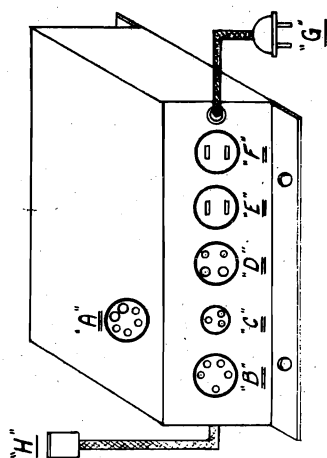


MODELS 2F12, 8F12
Power Chassis PF-12

ANDREA RADIO CORP.

Schematic Notes

LOCATION OF RECEPTACLES ON "PF-12" CHASSIS

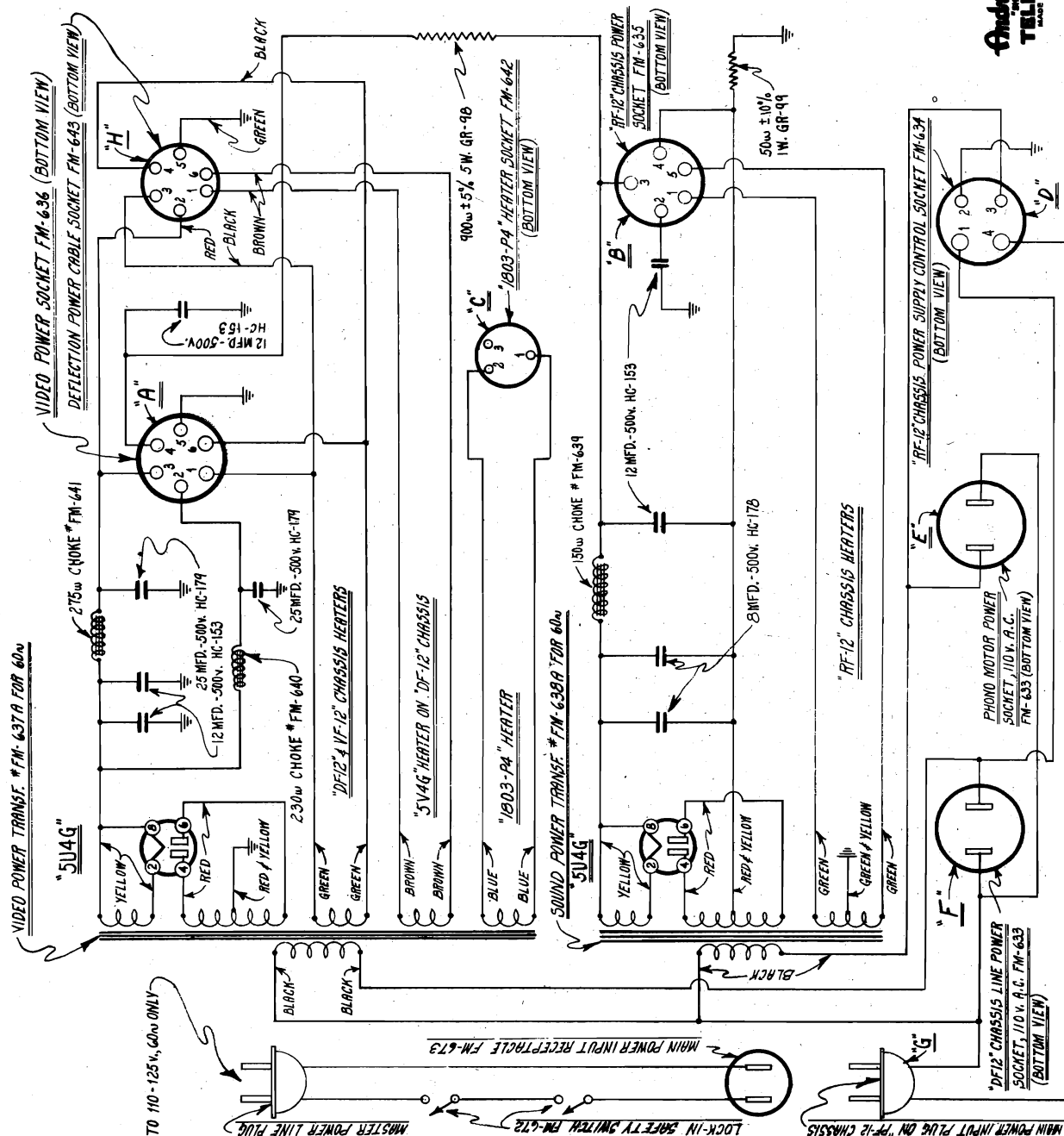


- "A" - RECEPTACLE FOR VIDEO POWER CABLE PLUG FROM "VF-12" CHASSIS.
- "B" - RECEPTACLE FOR "RF-12" CHASSIS POWER CABLE PLUG FROM "RF-12" CHASSIS.
- "C" - RECEPTACLE FOR "1803-P4" HEATER CABLE PLUG FROM SOCKET ASSY. CABLE FOR "1803-P4" TUBE ON "DF-12" CHASSIS.
- "D" - RECEPTACLE FOR "RF-12" CHASSIS POWER SUPPLY CABLE PLUG FROM "RF-12" CHASSIS.
- "E" - RECEPTACLE FOR PHONO MOTOR POWER PLUG FROM MOTOR OF RECORD CHANGER. SEE NOTE 2 BELOW.
- "F" - RECEPTACLE FOR DEFLECTION LINE POWER PLUG FROM "DF-12" CHASSIS. SEE NOTE 1 BELOW.
- "G" - PLUG TO BE INSERTED INTO MAIN POWER INPUT RECEPTACLE LOCATED ON SIDE OF CABINET.
- "H" - DEFLECTION POWER CABLE SOCKET TO BE INSERTED INTO DEFLECTION POWER INPUT PLUG ON "DF-12" CHASSIS.

IMPORTANT:
1- POWER PLUG FROM "DF-12" CHASSIS MUST ONLY BE INSERTED INTO RECEPTACLE "F". IF INSERTED IN RECEPTACLE "E", THE POWER OF "DF-12" CHASSIS WILL NOT BE CONTROLLED.
2- RECEPTACLE "E" TO BE USED ONLY FOR 110V. A.C. PHONO MOTOR POWER.

| |
|---------------------------------------|
| ANDREA RADIO CORP. WOODSIDE, N. Y. |
| POWER CHASSIS PF-12 |
| MODELS 2F12, 8F12 |
| DR. J. R. [initials] |

Andrea Radio
TELEVISION
MADE IN U.S.A.



ANDREA RADIO CORP.

MODELS 2F12, 8F12
Operating Notes

POWER RATING The ANDREA 2F12 and 8F12 receivers operate only on 110 to 125 volt, 60 cycle AC current. Make sure your current supply is correct for the instrument before you plug it into the house outlet or socket.

This receiver is equipped with two safety lock-in switch devices and when the back is removed, power is cut off from all apparatus. The two switches are on the inside of the two side panels. No danger is possible from the high voltage television apparatus unless these two switches are simultaneously pushed in. Under no circumstances should these switches be tampered with.

ANTENNA A television receiving antenna and its installation must conform to much higher standards than an antenna for reception of international short wave and standard broadcast signals because:

1. At the ultra short wave lengths employed in television, intervening obstacles have a pronounced shielding effect, causing low intensity signals, and often severe trouble with multi-path transmissions. These produce blurring and multi-image pictures. See picture chart - figure 20 - for effect.

2. The picture signal is comprised of a very wide band or range of frequencies, all of which must be received with good efficiency.

3. The discernment of the eye is much more critical than that of the ear.

The receiver antenna should preferably be at a good height, without interruption in direct "line of sight" of the transmitter antenna, of the correct type, and correctly installed. Buildings and other structures may obstruct and reflect the television waves. Automobile ignition systems, distasteful apparatus in hospitals and airplanes flying low may all have an adverse effect.

Television pictures may be compared in certain ways with motion pictures. The illumination in the room should be dimmed - no light close to or falling on the screen. During the day it will usually suffice to draw the curtains.

The special ANDREA Teleceptor - picture and sound antenna - Model 66 - is available.

TELEVISION OPERATION

CAUTION Before the receiver is turned on at any time, turn wave band Selector control knob (Fig.1) to either the S, I, M, A or P position, and rotate counter-clockwise contrast and brightness controls (Fig.1) all the way.

HOW TO TURN RECEIVER ON Turn master Off-on Tone Control knob clockwise (Fig.1) to switch power on. Further rotation varies the tone of the television sound - full tone reproduction being with the knob turned fully counter-clockwise. **AND OFF AND CONTROL TONE** This knob is the master control knob for turning the entire instrument "off" or "on". After about 30 seconds, turn the Wave Band Selector knob (Fig.1) to position "W". This turns the television section of the instrument "on" and automatically removes the dial illumination. Allow sufficient time for the tubes to heat before proceeding further.

HOW TO CONTROL TELEVISION SOUND VOLUME Turning Volume Control knob (Fig.1) clockwise increases the television sound volume; counter-clockwise decreases volume.

TELEVISION CHANNEL SELECTOR CONTROL SWITCH The television Channel Selector Control (Fig.1) selects automatically the desired station and accompanying sound from which it is desired to receive television programs. This knob is marked 1,2,3,4,5 - representing the first, second, third, etc. television channel:

| | | | |
|-----------|----------|---|----------|
| CHANNEL 1 | 44-50 MC | 4 | 78-84 MC |
| " | 50-56 MC | 2 | 50-56 MC |
| " | 66-72 MC | 3 | 66-72 MC |
| " | | 5 | 84-90 MC |

Set the knob to the channel corresponding to the television station desired.

FINE TUNING CONTROL This control is used to obtain best picture reception by eliminating possible distortion from interfering signals which show up as horizontal ripples in the picture. Should the controls be incorrectly set, the picture will be distorted. In most cases this control should be adjusted for each television channel by listening to the accompanying sound until maximum volume is obtained using a medium or low level and noting that the picture is not distorted at this setting. See picture chart (Fig.5) illustrates the test chart picture when all controls are correctly adjusted. (Fig.9) illustrates the effect on the picture of extraneous interference contrast. In some cases can be eliminated by a slight readjustment of the fine tuning control. (Fig.10) shows what also may occur when the fine tuning control is incorrectly set.

CONTRAST CONTROL The contrast knob, located in the top panel (Fig.1), regulates the

contrast level of the picture. Turning this control slowly clockwise increases the picture contrast from grays to black and white. Excessive contrast gives blurred or feathered outlines to the images which lack half tones, while too little contrast results in extremely flat, washed out pictures of objects. The correct adjustment is made by turning the Contrast and Brightness controls until the black objects appear as the very dark gray. Picture chart (Fig.5) shows the effect of the Contrast control. The picture is set correctly. (Fig.6) illustrates the picture with the contrast advanced too far.

BRIGHTNESS CONTROL For controlling brightness level of picture, observe the difference between operating this control and the Contrast control. Both controls should be operated together. For example, if the contrast is adjusted correctly and the picture illumination is too low or too bright, and the Brightness control readjusted for more or less illumination, the picture contrast will change. Hence, the Contrast control must be readjusted. Therefore, whenever the Contrast control is turned clockwise, the Brightness control must be turned counter-clockwise. (See picture chart - (Fig.7 and Fig.8).

NOTE FIG.8 If the Brightness control is operated too high and the Contrast control too low, the white diagonal line will be seen across the picture, which indicates that the Brightness control must be reduced. In some cases, if the antenna pickup is insufficient, the same results will occur. Always remember to turn the Brightness and Contrast controls completely counter-clockwise when viewing is over. (Fig.7) indicates what occurs to the picture when the Brightness control is advanced too far. The picture is thin and lacks blacks.

HOW TO RECEIVE Before turning the receiver on, proceed as follows:

THE PICTURE

1. Turn Brightness and Contrast controls (Fig.1) completely counter-clockwise.
2. Open doors of radio panels (Fig.1). Turn wave band Selector knob marked S-I-M-A-P-T to any position but "W".
3. Turn Master Off-ON Control (Fig.1) clockwise until click is heard.
4. Turn Volume Control (Fig.1) 1/4 turn clockwise.
5. Turn Wave Band Selector knob S-I-M-A-P-T to position "W".
6. Turn Television Selector switch to correct position.
7. Turn Contrast control fully counter-clockwise and then turn Brightness Control clockwise slowly until a slight illumination appears on the screen. Then turn counter-clockwise until illumination just disappears.
8. Advance the Contrast control until the picture appears at its best. Then, advance Brightness Control clockwise slowly, if necessary, and readjust both controls for most suitable picture. A little practice of these adjustments will enable you to easily obtain the correct setting. Incorrect control settings give similar results to under or over exposed photograph prints.
9. If an interfering ripple is observed in the picture, adjustment of the fine tuning knob (Fig.1) may reduce or eliminate the trouble.
10. Readjust the sound volume and tone controls (Fig.1) to your liking.
11. Always turn wave band Selector knob (Fig.1) to any position but that marked "W" before turning receiver "off".

RADIO OPERATION

THE DIAL AND CONTROLS In Fig.1 is shown the cabinet front, incorporating the controls necessary for correct operation.

Turn Master Power Off-ON Tone Control clockwise to apply power to receiver. Should tuning scale fail to light, then the Wave Band Selector knob is in position "W". Turning to another position will light the scale.

WAVE RANGE SELECTOR The Wave Range Selector controls the type of service.

The knob is marked S-I-M-A-P-T.

CONTROL

"S" position - short wave reception.

"I" position - intermediate short wave reception.

"M" position - manual tuning of standard broadcast.

"A" position - automatic push-button tuning of your six favorite Standard Broadcast stations.

"P" position - phonograph operation.

"W" position - television and accompanying sound.

PHONOGRAPH Model 8F12 contains an Automatic Record Changer which plays either eight 10" records or seven 12" records automatically. In Figure 3 is illustrated the method of operation.

Model 2F12 can be used with an external phonograph pickup of 4000 ohms or more by plugging into the phono jacks provided on the rear of the radio chassis.

EXTERNAL INTERCONNECTING OF COMPONENTS

Figure 4 illustrates the interconnecting of the parts in the cabinet chassis assembly.

MODELS 2F12, 8F12

Operating Notes, Cont'd.
Tuner Data

ANDREA RADIO CORP.

SERVICE NOTES

ANTENNA-GROUND Connect the ANDREA Teleceptor transmission cable to the terminals marked "T" - "W". Attach well-grounded insulated wire to terminal marked "G". Note that a wire from the rear of terminal marked "P" is connected to one side of screw terminal "T". This connection utilizes the Teleceptor antenna for all-wave radio reception.

Should a separate all-wave noise reducing antenna, such as the ANDREA No. 50, be used for broadcast reception, remove above wire connection from terminal "T" and connect to terminal "P". Connect all-wave coupler to terminal "P" and "G".

HORIZONTAL CENTERING The horizontal centering control is a screw driven adjustment located as shown in Fig. 2 and made at the time of installation. It serves to center the picture horizontally on the picture screen. It may require slight resetting if the receiver location is changed, tubes replaced or power line conditions varied. See picture chart - Figure 11 indicates what occurs when this control is incorrectly set. Figure 5 is the correct position.

VERTICAL CENTERING The Vertical Centering control is a screw driven adjustment shown in Fig. 2 and is used to center the picture vertically with respect to the screen opening. Resetting may be necessary for the same conditions outlined under "Horizontal Centering". See picture chart - Figure 12 indicates what occurs when this control is incorrectly adjusted. Figure 5 is the correct position.

PICTURE HEIGHT This control varies the height of the picture and is a screw driven adjustment made when the receiver is installed. See picture chart - Figure 13 shows what occurs when this control is incorrectly adjusted. Figure 5 is the correct position.

PICTURE WIDTH This control increases or decreases the width of the picture and is a screw driven adjustment made at the time of installation. See picture chart - Figure 14 shows what occurs when this control is incorrectly set. Figure 5 is the correct picture.

FOCUS CONTROL Located as shown in Fig. 2, this control is designed to bring the television images into sharp focus or definition. This control, once adjusted, should not be tampered with. When correctly focused the lines of which the picture is composed are sharply defined. A slight rotation one way or the other will indicate defocusing. See picture chart - Figure 15 illustrates what happens when the focus control is incorrectly set. Figure 5 shows the correct setting. At times during a given program, scenes may be out of focus while others are sharp. This condition arises at the transmitter and cannot be corrected at the receiver.

HORIZONTAL HOLD CONTROL The purpose of this control is to reconstruct the receiver picture lines in exact synchronization with the transmitter. If they are not, the scan will be affected as follows:

- (a) Distortion in shape.
- (b) Several images will be seen.
- (c) Numerous black dashes over screen.

A slight adjustment of this control in the one or the other direction will eliminate the above effects. See picture chart - Figures 16 and 17 shows what the picture looks like when this control is incorrectly set. Figure 5 shows the correct setting.

VERTICAL HOLD CONTROL This control synchronizes the pictures at the receiver vertically with the transmitter. When out of adjustment, the picture may slip or revolve upwards or downwards at either a slow or fast rate. Turn the control in one direction if the revolving motion is faster, then turn in other direction until the picture "locks in" as a single complete scene. See picture chart - Figure 18 illustrates the effect on the picture when this control is incorrectly set. Figure 5 shows the correct picture setting.

VERTICAL LINEARITY This is controlled by means of a screw driven adjustment. The adjustment must be correct and in conjunction with the Height control to give the correct vertical proportions to the picture. It may require readjustment if the Vertical Centering control is reset. See picture chart - Figure 19 indicates the unbalance in vertical height of the picture when this control is incorrectly set. Figure 5 shows the correct setting.

SETTING RADIO STATION
BUTTON CONTROLS

The simplicity of the ANDREA RADIO push-button controls, requiring only the use of a thin-blade screw driver, makes it easy to set them accurately. This is essential, for unless the controls are set exactly, the tone quality will be destroyed.

CHOOSING YOUR STATIONS Make a list of the desired six stations to operate on the push-buttons. Set down their call letters and put them in the order of their kilocycle rating, the highest at the left to correspond to station 1 selecting button at the left. The kilocycle tuning ranges of the button controls are as follows:

| | |
|---------------|------------------------------|
| Extreme Left | Station 1 - 1100 to 1600 KC. |
| | Station 2 - 800 to 1450 KC. |
| | Station 3 - 700 to 1250 KC. |
| | Station 4 - 700 to 1250 KC. |
| | Station 5 - 580 to 1050 KC. |
| Extreme Right | Station 6 - 530 to 1000 KC. |

It is necessary to choose stations whose kilocycle ratings come within these push-button tuning ranges. The ranges given in the list above are conservative. Consequently, it may be possible to tune in a station which is just outside the range of any particular push-button control. For example, on Station 3, although the range is shown as 700-1250 KC., it may be possible to tune in a station on 660 KC., or one on 1300 KC. Select the proper markers for the stations on your list, insert the markers in the same order as your kilocycle list, starting with Station 1 on the first button on the left. Do not attempt to glue the markers in place. In the event you want to change a marker, you can pry it out with the point of a pin.

ADJUSTING THE HIGH-
BUTTON STATION CONTROLS

Remove push-button escutcheon cover plate (Fig. 1). All station adjustment screws and switch are now accessible for station adjustment from the front of the cabinet.

Remember to set the push-button adjusting switch. Located in the right hand corner of the push-button opening is a small lever. When adjusting the station controls, and only at that time, the lever should be turned to upper position, designated by red dot. Put wave band Selector switch in the "W" position for dial tuning.

Tune in the station manually, using call letters you have put on the first push-button. Then turn the Band switch to position "A". Push in the push-button you are going to adjust, and turn the volume control to maximum. When the set has been turned "ON" for at least 10 minutes so that it has become thoroughly warm, you will be ready to make the push-button adjustment. The adjusting screws can be reached easily. Each push-button has two adjustment controls marked "ANTW" and "OSC", in pairs. The pair corresponding to Station 1 on your list at the extreme left. This set is so designed that the tuning indicator operates with the push-buttons as well as with manual tuning. Therefore, you can adjust the controls with absolute accuracy by watching the opening and closing of the indicator.

The exact setting for each adjustment is obtained when the Mystic Ray indicator is closed as far as possible.

Use a thin-blade screw driver to adjust the screws. Do not force a thick blade into the slots. First adjust the oscillator screw for Station 1, turning it until you hear the station you tuned in previously on the dial. If the speaker breaks into a howl during this adjustment, turn the Station 1 antenna screw to the right or left until the howl stops.

After you have an accurate setting of the oscillator screw, adjust the corresponding antenna screw for maximum volume. The final adjustment should be made by turning the oscillator screw while you watch the opening of the Mystic Ray indicator. Then, in the same way, get a final adjustment for the antenna screw.

Repeat the same routine adjustments for Station 2 by tuning the station on the dial first with Wave Selector switch in "W" position, then changing "OSC" screws. Continue this method for each station and button.

To check the accuracy of the settings, turn the Wave Band switch to position "M". The station should sound practically the same whether the switch is in the "A" or "M" position. If there is considerable difference, the station is not tuned accurately with the dial, or else the corresponding push-button controls were not set correctly. To change any button to another station, if the station's kilocycle rating is within the range of the corresponding controls, it is only necessary to put in a new button marker, and to reset the controls in accordance with the preceding instructions.

CAUTION

This is very important: When all adjustments have been made, it is necessary to touch up each one again, to assure absolute accuracy. After this has been done, turn the push-button adjusting lever down to black dot marked normal operation. Otherwise, loss of efficiency and quality will result. Replace push-button escutcheon cover plate, taking care that the holes in cover align with buttons.

ANDREA RADIO CORP.

MODELS 2F12,8F12
Test Patterns

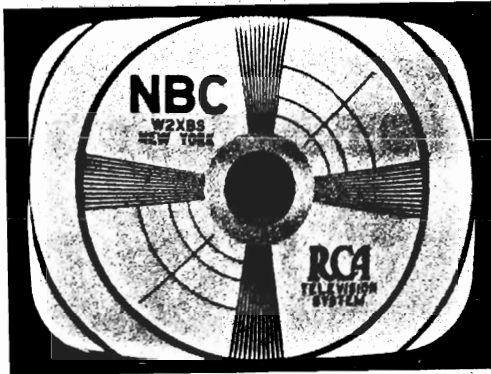


Figure 5—



Figure 6—

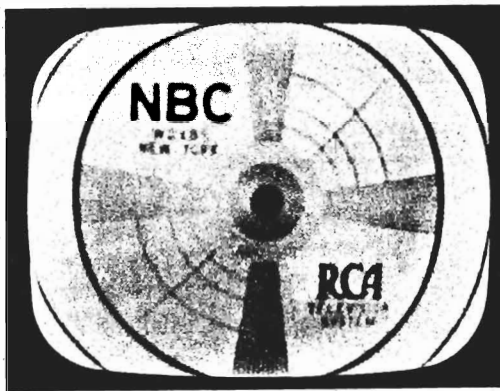


Figure 7—



Figure 8—



Figure 9—

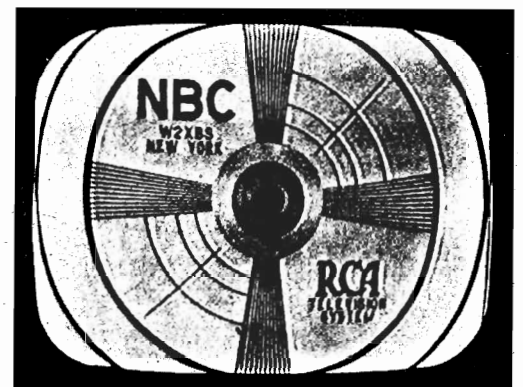


Figure 10—

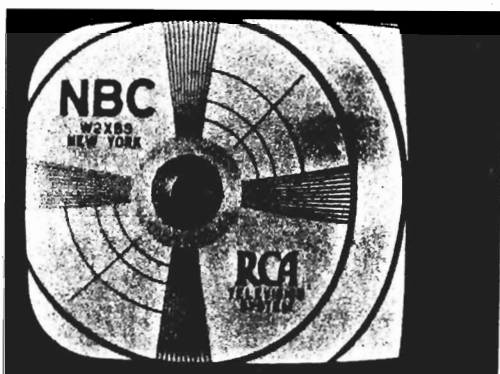


Figure 11—



Figure 12—

MODELS 2F12,8F12
Test Patterns

ANDREA RADIO CORP.

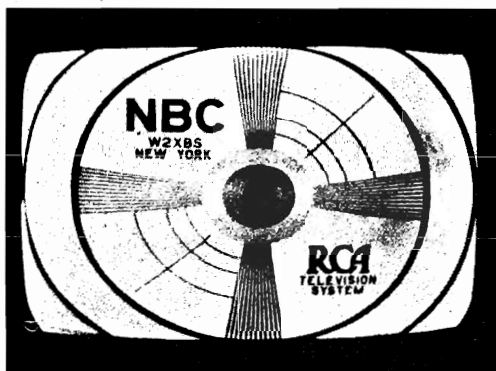


Figure 13—

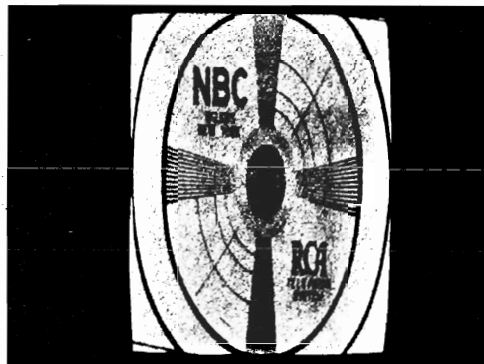


Figure 14—

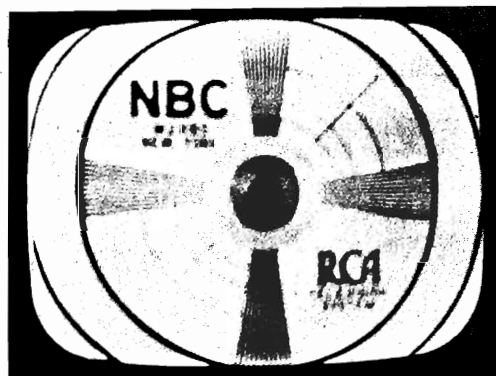


Figure 15—

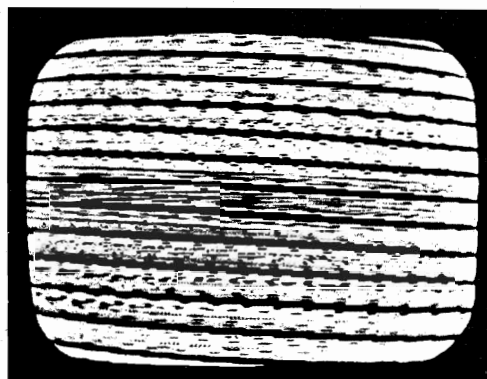


Figure 16—

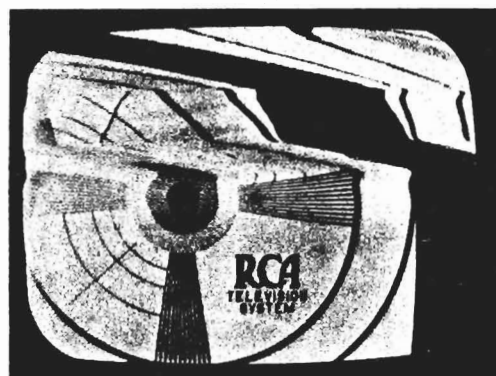


Figure 17—

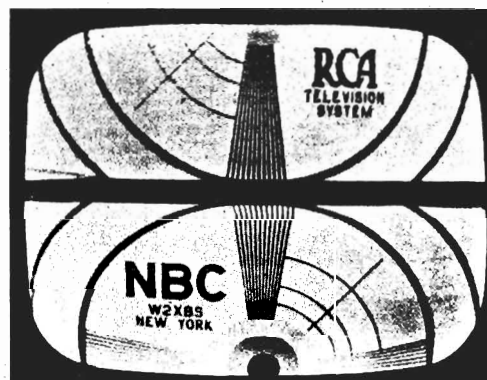


Figure 18—



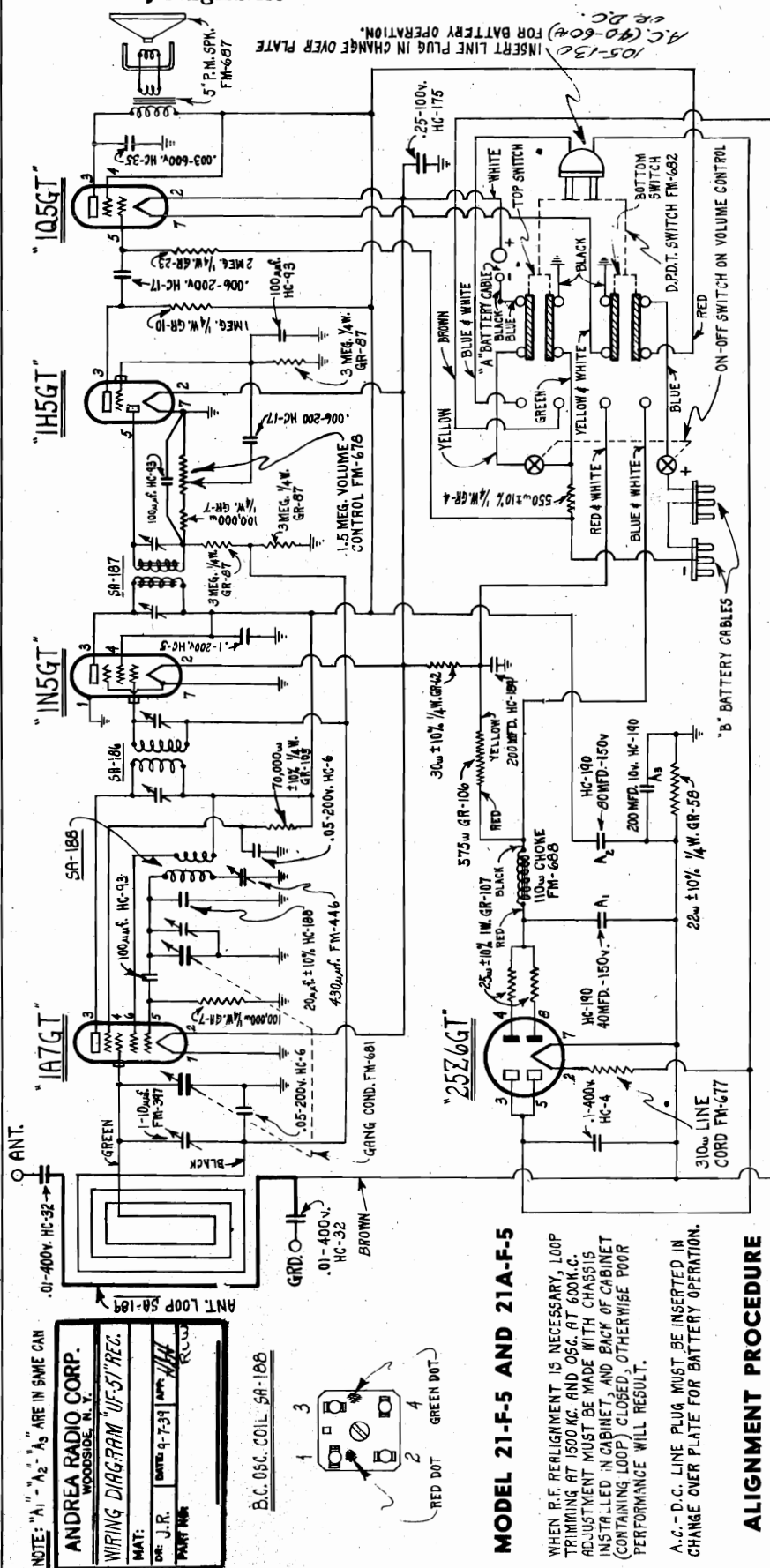
Figure 19—



Figure 20—

MODELS 21F5, 21AF5
Chassis UF-51
Schematic, Alignment

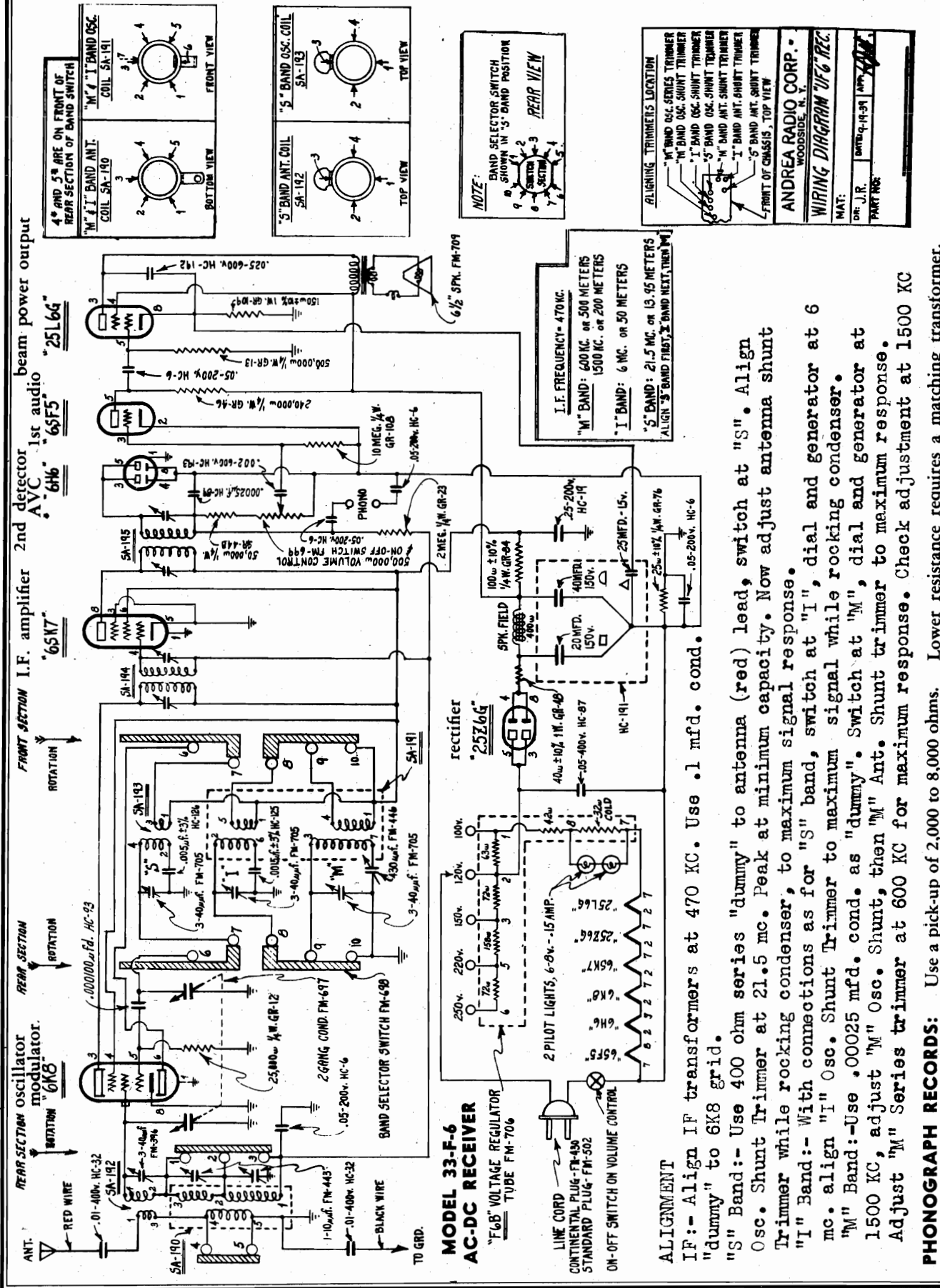
ANDREA RADIO CORP.

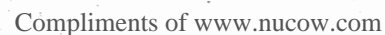


MODEL 33F6
Chassis UF6

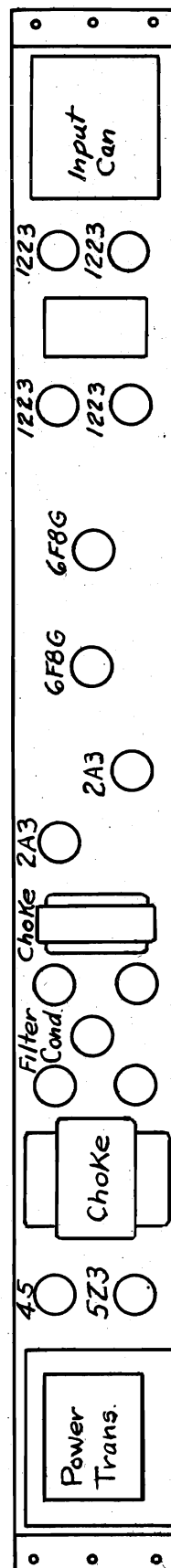
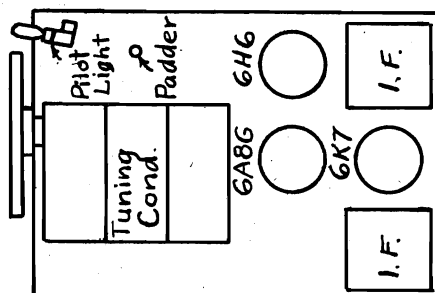
ANDREA RADIO CORP.

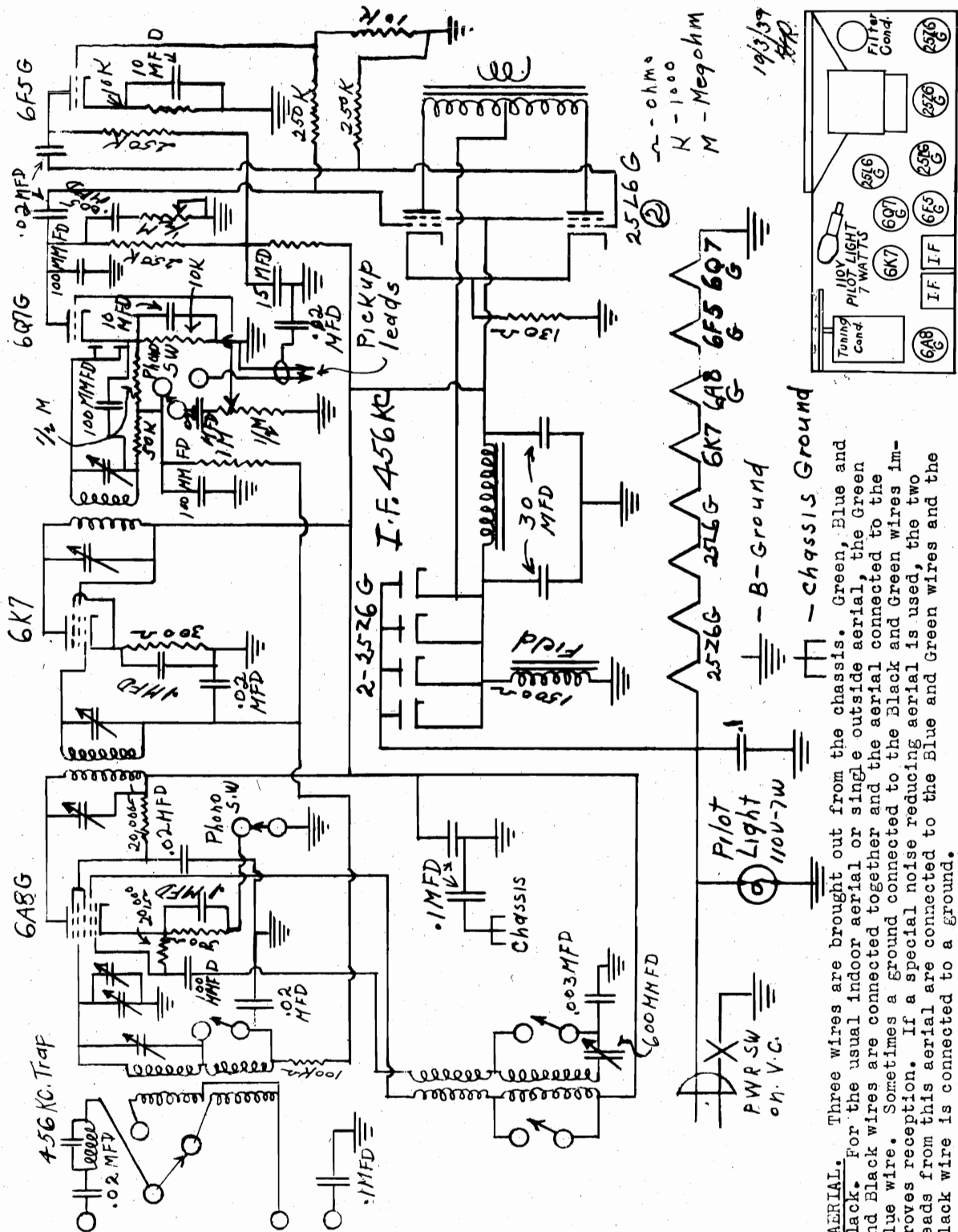
Schematic, Trimmers Alignment





SERVICE: ELECTRICAL SYSTEM. The most common cause of trouble is dirt falling bet. strings and pick-up heads causing noise. To elim. this shut off current, press down sustaining pedal, and bang on keys up and down the keyboard. If not dislodged take off back panel and blow out obstruction with hand bellows. Another source of trouble might be tube with microphonic characteristics, which would show up as high-pitched whistle or singing in speaker. If any note is too loud or soft take off back panel, trace strings to lower end, loosen lock nut and turn screw back a bit to soften, or in a bit to louden the note, being careful that pick-up head never touches strings at their extreme of vibration. Tighten lock nut after this operation. Amplifier is located under top cover. For tuning strings remove the 2-large screws holding amplifier brackets to back frame. Amp. can then be tilted back and held in raised pos. by 2 hinged wooden strips designed to hold it up for tuning or service. INSTALLATION (AC only). Ground spring clip. If pilot light does not indicate current flowing, a fuse in cable plug may have blown out. Use a five-ampere fuse - never more than 10-ampere. Connect lead-in wire from aerial to upper binding post marked "ANT" Gnd.conn. in cable usually suffices, but may be improved if cable clip is conn. to plate of wall socket, extra gnd.wire run from lower bind. post to clamp on radiator or pipe. CONTROLS: RADIO DIAL. Covers standard American bc band, 550 to 1,600 kc. TUNING KNOB. Operating pointer on radio dial. TO NE CONTROL KNOB. For records and radio - variable. Turned to left, high freq. reduced, static and needle scratch reduced; to right for high fidelity. VOL. CONTROL KNOB. For records and radio, increasing to right. Should be turned to "off" pos. when neither is in use, or when switching from one to the other. DYNAPHONE TURNTABLE. Motor speed regulator set for correct 78 r.p.m. with pointer in center of scale. MAIN SWITCH & PILOT LIGHT. Pilot light glows if power is on. VOL. CONTROL FOR DYNATONE. Turned to extreme left there is no amplification and harpsichord quality is produced; to right, piano quality; in median pos., to 6-ft. grand piano. Should be turned off when Dynaphone or Radio is in use, unless to accompany a record at the keyboard. SOFT PEDAL, at left. SUSTAINING PEDAL, at right. Keyboard and action are standard in every way. Pedals are regular soft and sustaining or "loud", having usual functions in correct location of the lyre of the grand piano. There is nothing unusual about playing the ANSLEY DYNATONE. The pianist simply has the privilege of altering the general volume level and character of the tone by means of the controls provided; an advantage the earlier or acoustical piano cannot offer. Below the keyboard at the right, back of the small door, are the customary controls for Dynaphone and Radio. In case of serious trouble with amplifier and power units, it may be necessary to disconnect and return to the factory. All connections to these parts are made with detachable plugs. RADIO-DYNAPHONE SELECTOR KNOB. Turn to the left to play records, to the right for radio.





AERIAL. Three wires are brought out from the chassis. Green, Blue and Black. For the usual indoor aerial or single outside aerial, the Green and Black wires are connected together and the aerial connected to the Blue wire. Sometimes a Ground connected to the Black and Green wires improves reception. If a special noise reducing aerial is used, the two leads from this aerial are connected to the Blue and Green wires and the Black wire is connected to a ground.

D29, D30

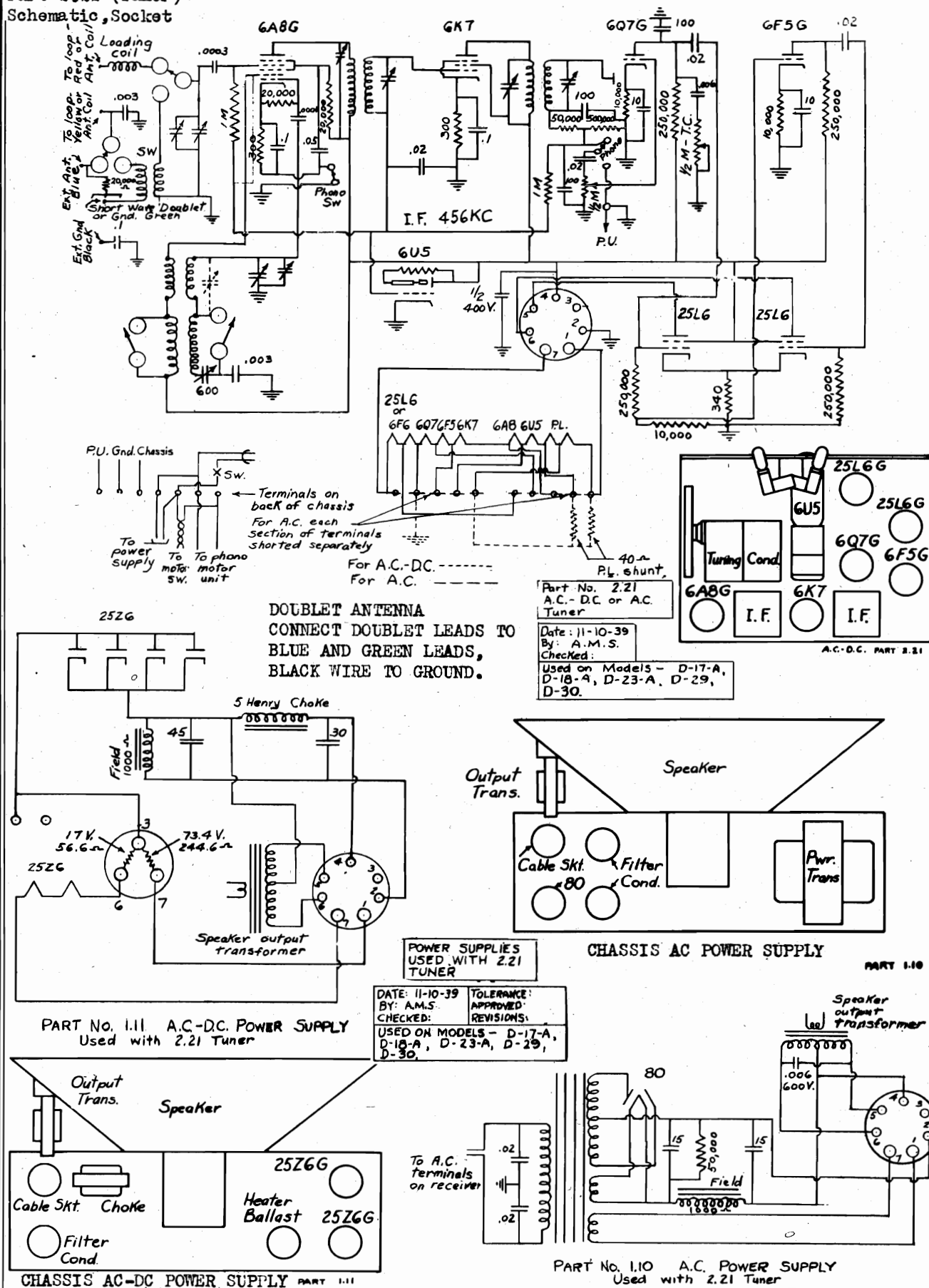
Part 2.21 (Tuner)

Schematic, Socket

ANSLEY RADIO CORP.

Parts No.1.10, 1.11

S.P.U. Schematics

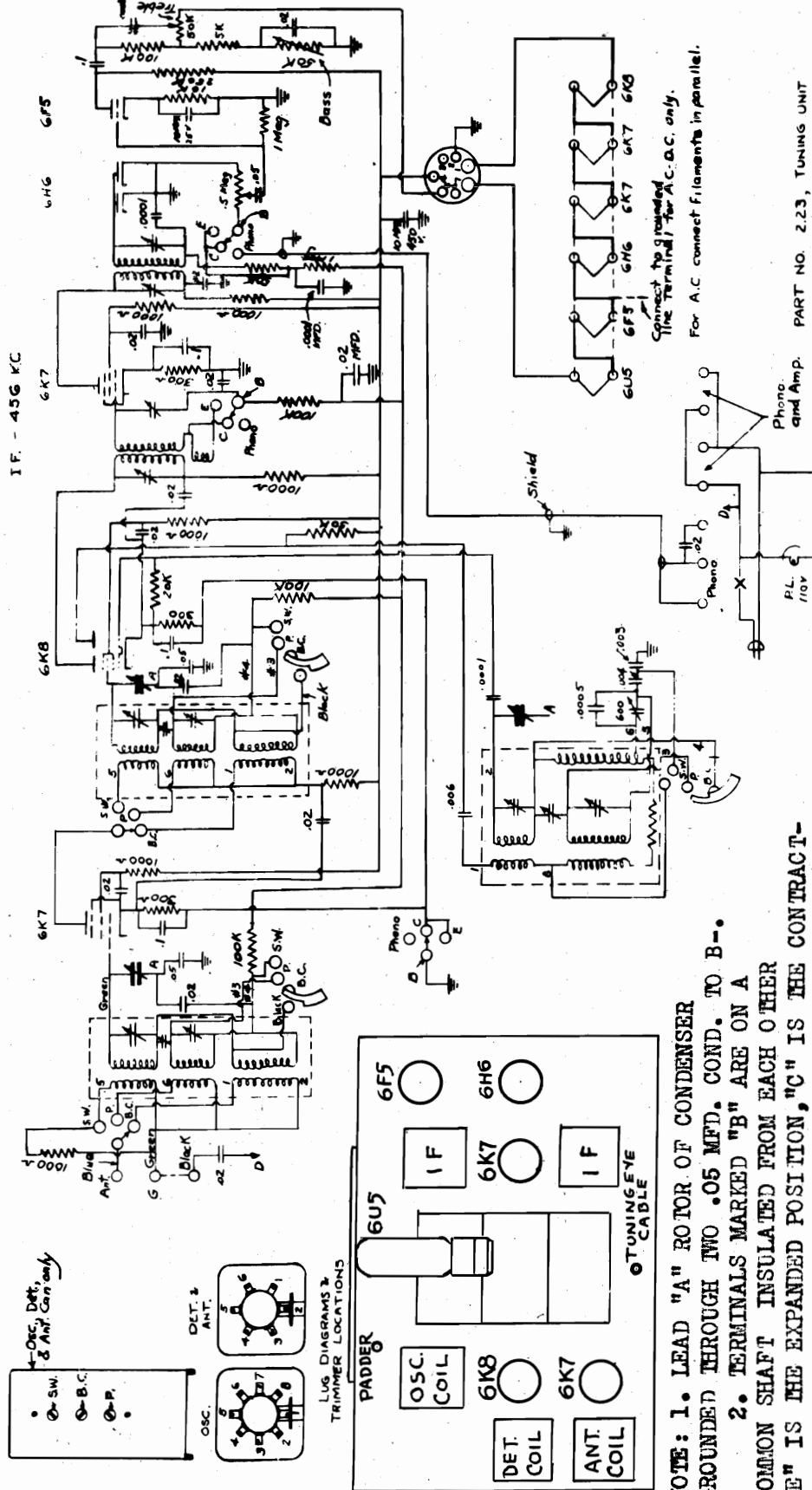


MODELS D-24A, D-25A

Part No. 2.23

Schematic, Socket, Notes

ANSLEY RADIO CORP.



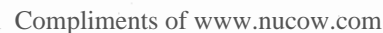
- NOTE:** 1. LEAD "A" ROTOR OF CONDENSER GROUNDED THROUGH TWO .05 MFD. COND. TO B-.
2. TERMINALS MARKED "B" ARE ON A COMMON SHAFT INSULATED FROM EACH OTHER
- "E" IS THE EXPANDED POSITION, "C" IS THE CONTRACTED POSITION OF THE IF, AND PHONO IS THE PHONO-GRAPH POSITION
3. LEADS MARKED "D" ARE CONNECTED TOGETHER.

FOR AC AND AC-DC AMPLIFIERS AND POWER SUPPLIES
(PARTS 1.12 AND 1.13) USED WITH THESE MODELS
SEE INDEX.

AERIAL AND GROUND CONNECTIONS. If a regular indoor or outside aerial is used, connect it to the Blue wire and connect the Green and Black wires together to a ground connection -- (a water pipe or radiator). If a special "doublet" aerial is used, connect the two leads from this to the Blue and Green wires and connect the Black wire to the ground.

CIRCUIT DIAGRAM /
FOR MODELS D-24A
AND D-25A

DATE: 1-8-40
BY: A.M.S.
CHECKED



MODEL 106

Tuner Data

MODEL 148

MODEL 148-2

AUTOCRAT RADIO CO.

MODEL 168

Tuner, Alignment, Socket, Trimmers

MODEL 213 Phono-Oscillator

Schematic

MODEL 359 Tuner Data

SETTING PUSH BUTTONS MODELS 106, 148, 148-2, 168, 359

1. By means of the Station Selector Knob tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the lowest frequency—that is, your selected station which is tuned in nearest the right-hand side of the dial.

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of lowest frequency and the Call Letter Tab for this station should be at the extreme right of the Call Letter Holder.

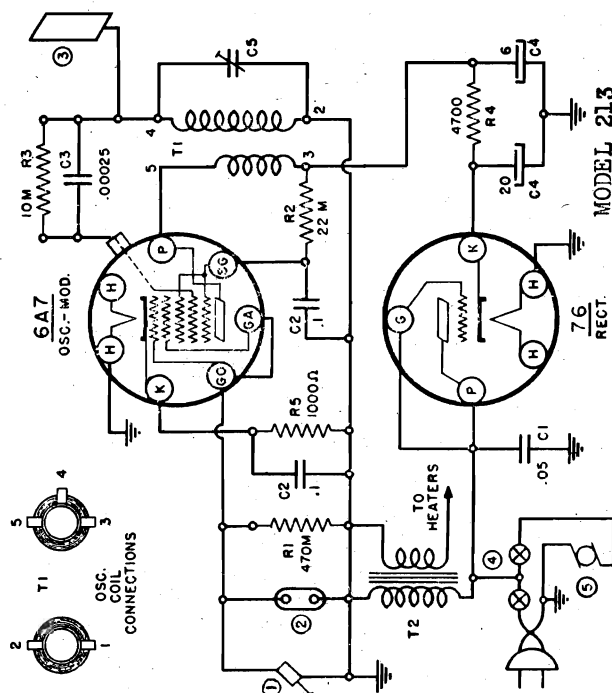
ALIGNMENT PROCEDURE MODELS 148, 148-2, 168.

All alignments must be made with the volume control turned full on and with the signal input from the generator reduced to as low a value as possible while still giving a sufficient output to be easily read on the output meter.

Connect the output meter, through a .5 M.F. condenser and a resistance of such a value as to make the total meter resistance approximately 7000 ohms, to plate of output tube and B+, or a low voltage A. C. meter may be used connected across speaker voice coil. The output meter remains connected during the entire alignment procedure.

Connect the signal generator to the grid cap of the 6A7 tube through a .1 M.F. condenser. Connect the ground of the generator to the ground lead of the receiver. Set the dial to about 1000 K.C., feed in a 455 K.C. signal: Adjust first and second I.F. trimmers for maximum output. Refer to chassis lay-out for location of trimmers.

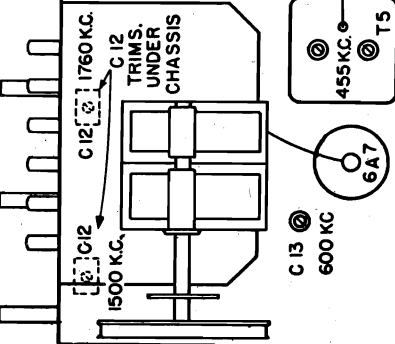
Turn the dial to the extreme high frequency end. Feed a 1760 KC signal to the receiver antenna lead through a .00025 MF mica condenser. Adjust the 1760 KC oscillator trimmer until maximum output is shown. Set the generator to 1500 KC and tune in this signal on the receiver. Then adjust the 1500 KC antenna trimmer to the maximum output. Then impress a 600 KC signal into the receiver antenna lead and tune in this signal on the receiver. Adjust oscillator padding condenser to the maximum output. Follow through with this procedure several times in order to obtain the best alignment adjustment possible. This completes the alignment.



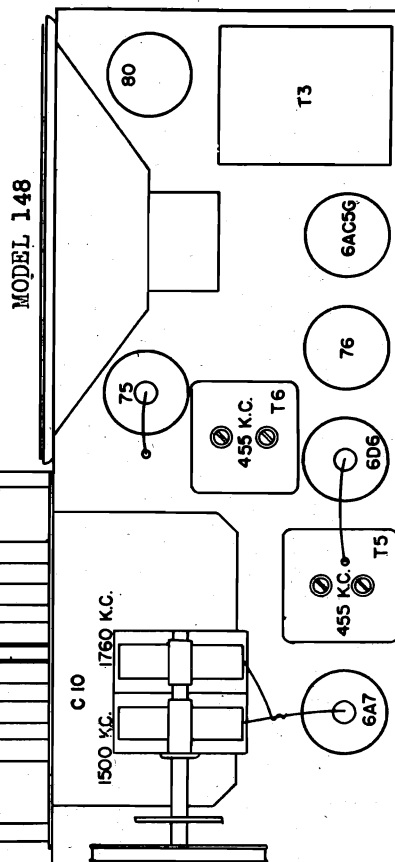
MODEL 213
Two Tube Phono-Oscillator.

| CODE | PART NO. | DESCRIPTION | CODE | PART NO. | DESCRIPTION |
|------|----------|----------------------|------|----------|---------------------------|
| R1 | 60-178 | 470M-OHM 1/3 W. RES. | C1 | 1607 | .05 MFD. 400V. TUB. COND. |
| R2 | 60-185 | 22 M. " | C2 | 16-115 | .00025 MFD. 200V. MICA " |
| R3 | 60-185 | 47 M. " | C3 | 1504 | .00025 MFD. 150V. ELECT. |
| R4 | 60-185 | 47 M. " | C4 | 16-241 | 20 X 25 MFD. 150V. ELECT. |
| R5 | 60-217 | 1000 " | C5 | 20-119 | 5 PLATE TRIMMER |
| 1 | 83-130 | PICKUP | T1 | 10-240 | OSCILLATOR TRANS. |
| 2 | 12-1 | MICROPHONE TERMINAL | T2 | 80-170 | FILAMENT TRANS. |
| 3 | 82-1 | ANTENNA PLATE | | | |
| 4 | 69-129 | SWITCH (DUAL) | 5 | 59-1 | PHONOGRAPH MOTOR |

MODELS 148-2, 168.



MODEL 148



Schematics, Voltage

AUTOCRAT RADIO CO.

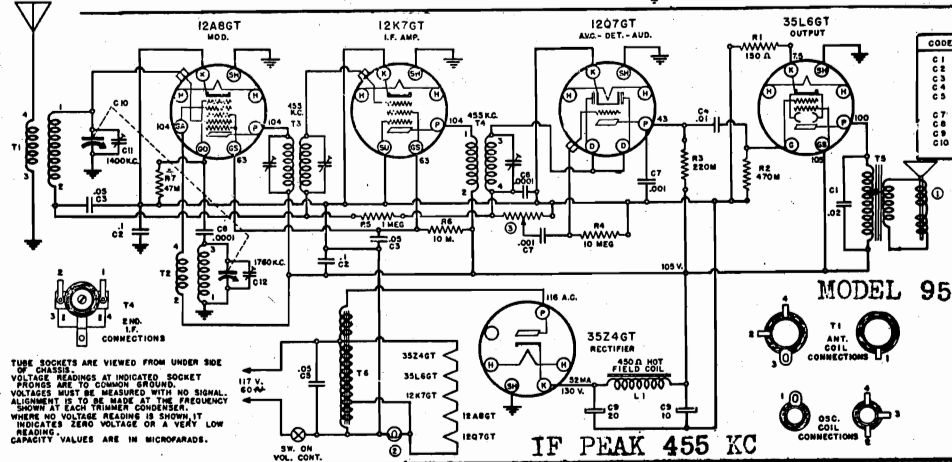
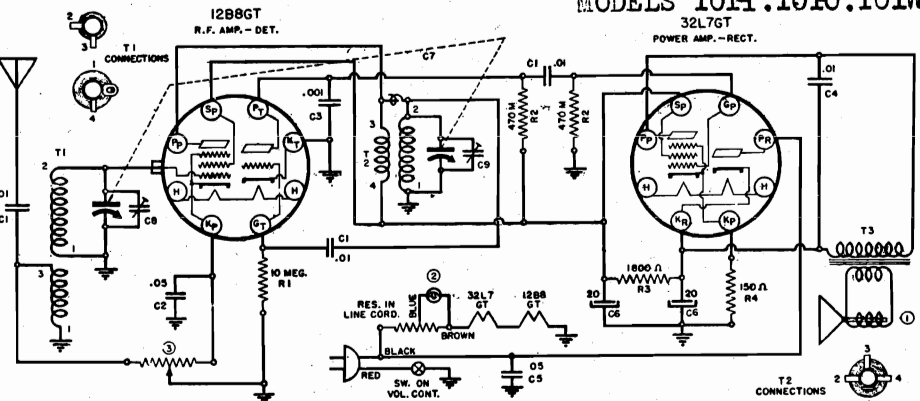
MODEL 91
MODEL 95
MODEL 98
MODELS 101H, 1010, 101W

MODEL 91

| CODE | PART NO. | DESCRIPTION |
|------|----------|---------------------------|
| R1 | 60-193 | 10 MEGOHM 1/3 W. RESISTOR |
| R2 | 60-178 | 470 M OHMS |
| R3 | 60-229 | 1000 |
| R4 | 60-184 | 150 |

| CODE | PART NO. | DESCRIPTION |
|------|----------|----------------------------------|
| C1 | 16-121 | .01 MFD. 200V. TUBULAR COND. |
| C2 | 1622 | .05 |
| C3 | 16-124 | .001 - 400V. |
| C4 | 16-119 | .01 |
| C5 | 1607 | .05 |
| C6 | 18-249 | 20 X 20 MFD. 150V. ELECTROLYTIC |
| C7 | 19-147 | 2 GANG VAR. COND. (ALSO C8 & C9) |

| CODE | PART NO. | DESCRIPTION | 9-22 |
|------|----------|----------------------------|------|
| T1 | 10-288 | ANTENNA COIL | |
| T2 | 10-289 | R.F. COIL | |
| T3 | 80-176 | OUTPUT TRANSFORMER | |
| 1 | 79-270 | P.M. SPEAKER | |
| 2 | -86-4 | #47 PILOT LIGHT 150 MA. | |
| 3 | 24-136 | VOLUME CONTROL WITH SWITCH | |



| CODE | PART NO. | DESCRIPTION |
|------|----------|---|
| C1 | 16-123 | .05 MFD. 200V. TUBULAR CONDENSER |
| C2 | 16-119 | .01 |
| C3 | 1622 | .05 |
| C4 | 16-121 | .001 - 400V. |
| C5 | 1607 | .05 |
| C7 | 16-124 | .001 - 200V. |
| C8 | 18-241 | 20 X 10 MFD. ELECTROLYTIC COND. 157V. |
| C9 | 18-241 | 2 GANG VARIABLE CONDENSER, ALSO C8 & C9 |
| C10 | 18-144 | |

| CODE | PART NO. | DESCRIPTION |
|------|----------|-------------------------|
| R1 | 60-184 | 150 OHM 1/3 W. RESISTOR |
| R2 | 60-178 | 470 M |
| R3 | 60-180 | 250 M |
| R4 | 60-193 | 10 MEG |
| R5 | 60-193 | 10 M |
| R6 | 60-213 | 10 M |
| R7 | 60-177 | 47 |

| CODE | PART NO. | DESCRIPTION | 9-23 |
|------|----------|--------------------------|------|
| T1 | 10-270 | ANTENNA TRANSFORMER | |
| T2 | 10-272 | OSCILLATOR | |
| T3 | 10-269 | 1ST. I.F. | |
| T4 | 10-271 | 2ND. I.F. | |
| T5 | 80-175 | OUTPUT TRANS. (ON SPKR.) | |
| T6 | 80-175 | POWER TRANSFORMER | |
| 1 | 79-268 | 5" DYNAMIC SPEAKER | |
| 2 | 86-4 | #47 PILOT LIGHT | |
| 3 | 24-132 | VOLUME CONTROL & SWITCH | |

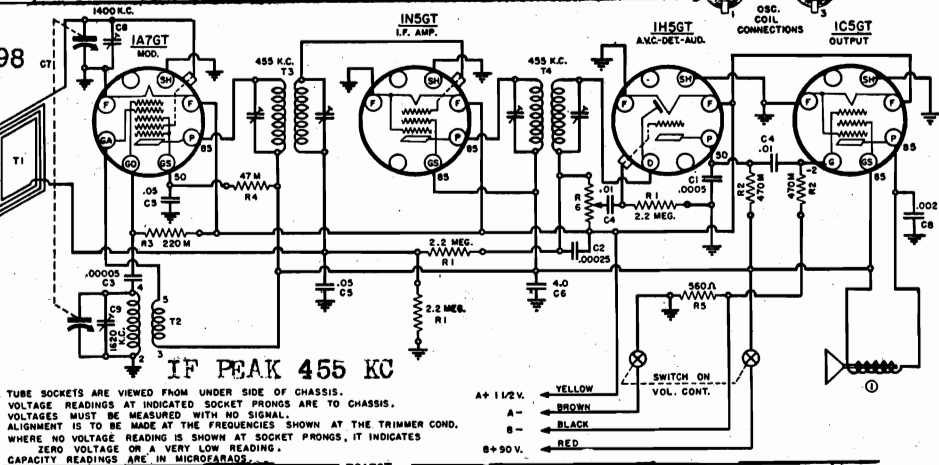
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GROUND. VOLTAGES MUST BE MEASURED WITH NO SIGNAL. ALIGNMENT IS TO BE MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER. WHERE NO VOLTAGE READING IS SHOWN IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. CAPACITY VALUES ARE IN MICROFARADS.

MODEL 98

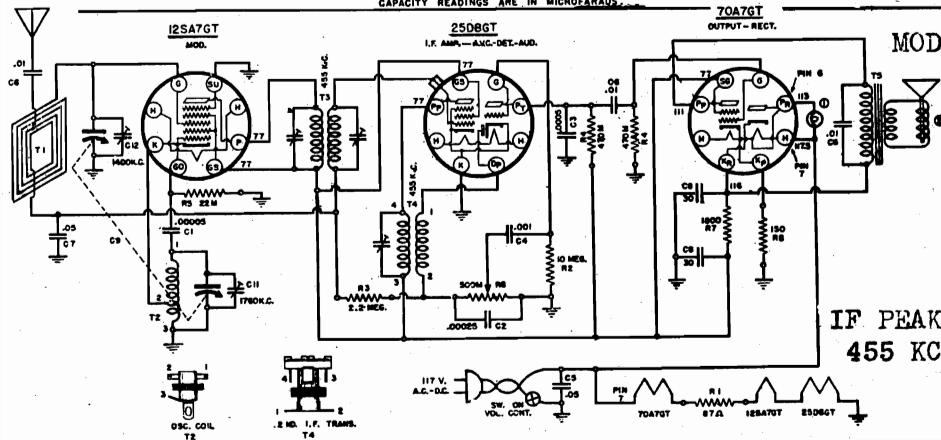
| CODE | PART NO. | DESCRIPTION |
|------|----------|------------------------------------|
| C1 | 15-112 | .0005 MFD. MICA CONDENSER |
| C2 | 1504 | .00025 |
| C3 | 1503 | .00005 |
| C4 | 16-119 | .01 MFD. 200 V. TUBULAR CONDENSER |
| C5 | 1622 | .05 |
| C6 | 18-250 | 4.0 - 150WV. |
| C7 | 18-149 | 2 GANG VARIABLE COND. ALSO C8 & C9 |
| C8 | 1509 | .002 MFD. 400 V. TUBULAR CONDENSER |

| CODE | PART NO. | DESCRIPTION |
|------|----------|------------------------------|
| R1 | 60-179 | 2.2 MEGOHM 1/3 WATT RESISTOR |
| R2 | 60-178 | 470 M OHM |
| R3 | 60-180 | 250 M |
| R4 | 60-177 | 47 M |
| R5 | 60-201 | 360 A |
| R6 | 24-138 | 1 MEGOHM VOLUME CONTROL |

| CODE | PART NO. | DESCRIPTION | 0-40 |
|------|----------|-----------------------|------|
| T1 | 82-2 | ANTENNA LOOP | |
| T2 | 10-294 | OSCILLATOR COIL | |
| T3 | 10-293 | 1ST. I.F. TRANSFORMER | |
| T4 | 10-281 | 2ND. I.F. TRANSFORMER | |
| 1 | 79-272 | 5" SPEAKER | |



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. VOLTAGES MUST BE MEASURED WITH NO SIGNAL. ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER COND. WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. CAPACITY READINGS ARE IN MICROFARADS.



MODELS 101H, 1010, 101W.

| CODE | PART NO. | DESCRIPTION |
|------|----------|------------------------------------|
| C1 | 1503 | .00005 MFD. MICA CONDENSER |
| C2 | 1504 | .00025 |
| C3 | 15-112 | .01 MFD. 200 V. TUBULAR CONDENSER |
| C4 | 1622 | .05 |
| C5 | 16-121 | .001 - 400V. TUBULAR CONDENSER |
| C6 | 18-251 | 30 X 30 |
| C7 | 18-150 | 2 GANG VARIABLE COND. ALSO C8 & C9 |

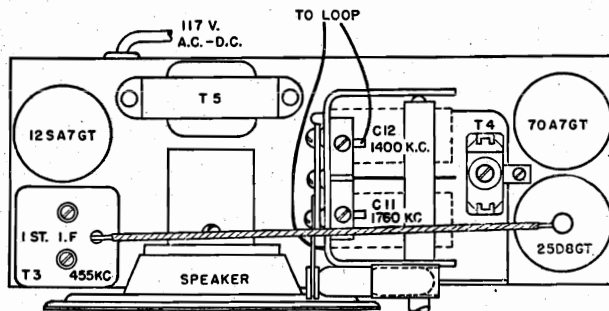
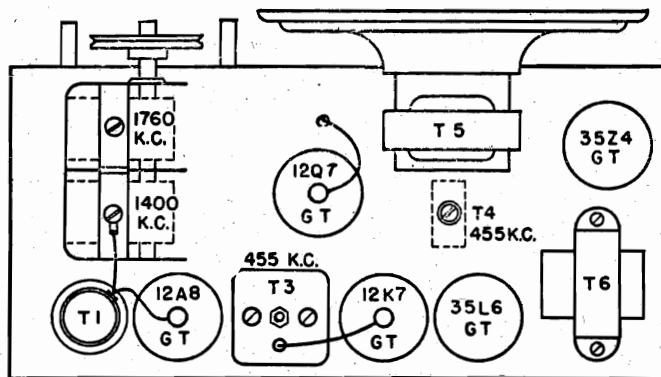
| CODE | PART NO. | DESCRIPTION |
|------|----------|----------------------------------|
| R1 | 60-238 | 8T OHMS 2 W. WIRE WOUND RESISTOR |
| R2 | 60-225 | 20 MEGOHM 1/2 W. CARBON RESISTOR |
| R3 | 60-208 | 470 M OHM |
| R4 | 60-223 | 25 M |
| R5 | 60-240 | 150 |
| R6 | 60-241 | 1000 |
| R7 | 24-138 | 500 M - VOLUME CONTROL |

| CODE | PART NO. | DESCRIPTION | 0-30 |
|------|----------|-----------------------|------|
| T1 | 82-4 | ANTENNA LOOP | |
| T2 | 10-299 | OSCILLATOR COIL | |
| T3 | 10-298 | 1ST. I.F. TRANSFORMER | |
| T4 | 10-297 | 2ND. I.F. TRANSFORMER | |
| T5 | 80-176 | OUTPUT | |
| 1 | 82-4 | #47 PILOT LIGHT | |
| 2 | 79-270 | SPEAKER | |

AUTOCRAT RADIO CO.

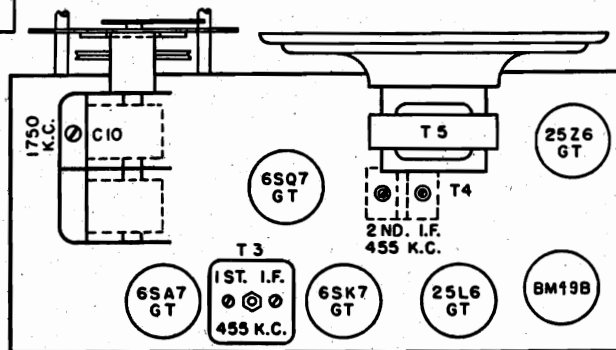
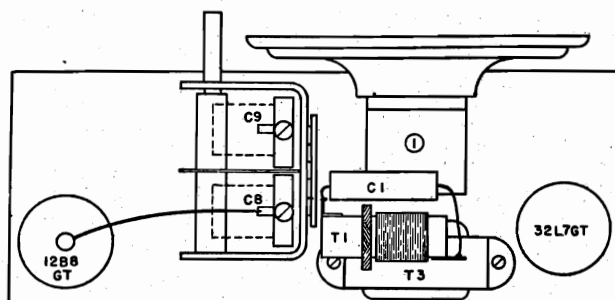
MODEL 91
MODEL 95
MODEL 98
MODELS 101I, 1010, 101W
MODELS 102I, 1020, 102W

MODELS 103I, 1030, 103W
MODELS 107I, 107W
MODELS 109, 110
Socket, Trimmers, Alignment



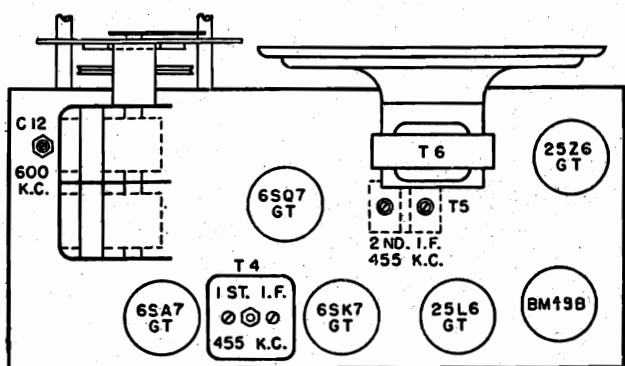
MODELS 101I, 1010, 101W.

MODEL 95

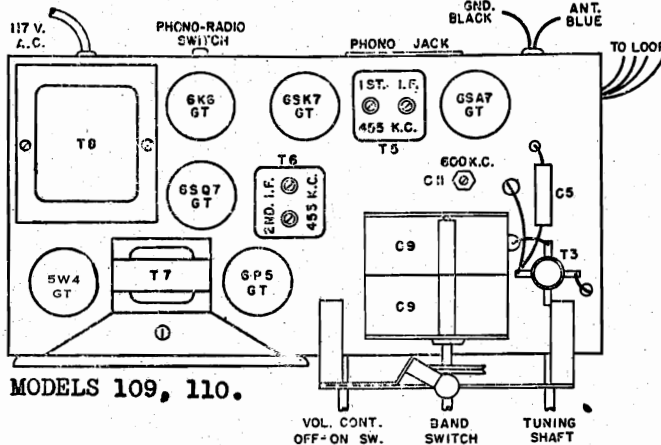


MODELS 103I, 1030, 103W.

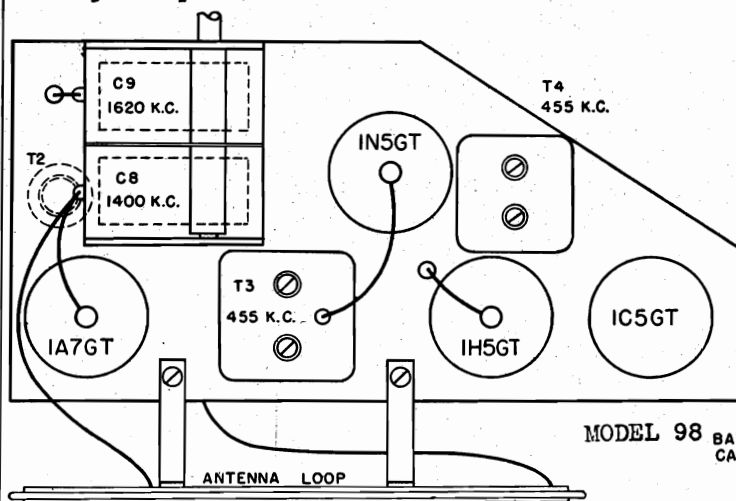
MODEL 91



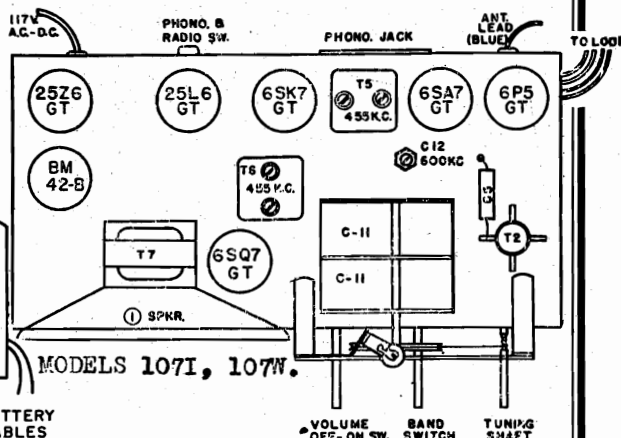
MODELS 102I, 1020, 102W



MODELS 109, 110.

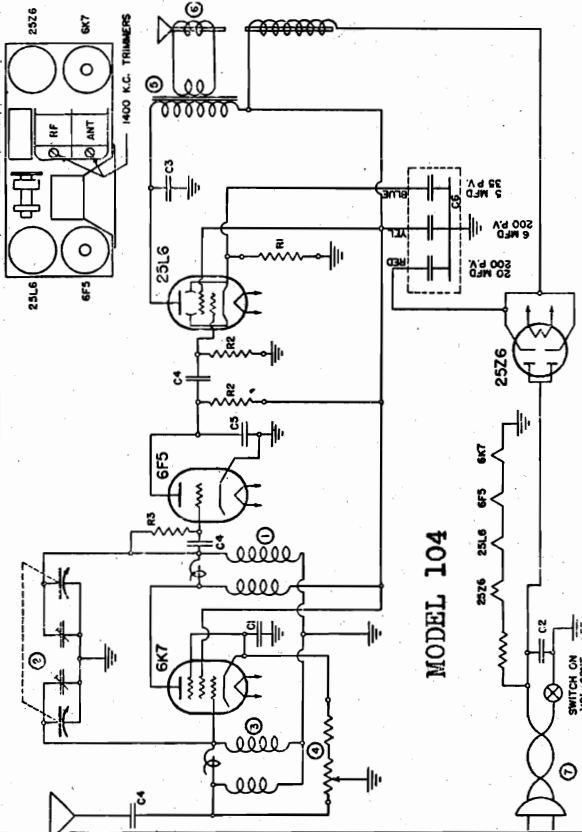


MODEL 98 BATTERY CABLES

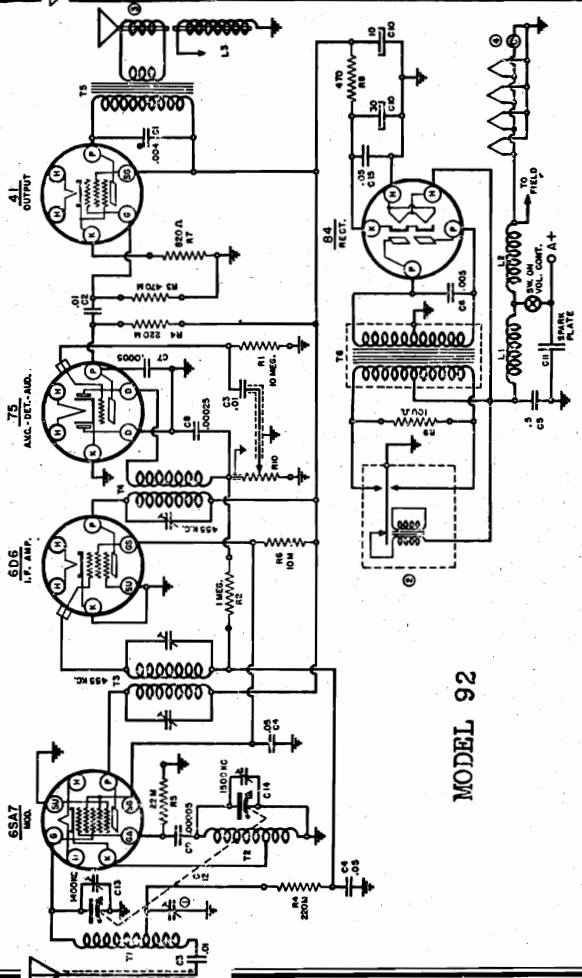


MODELS 107I, 107W.

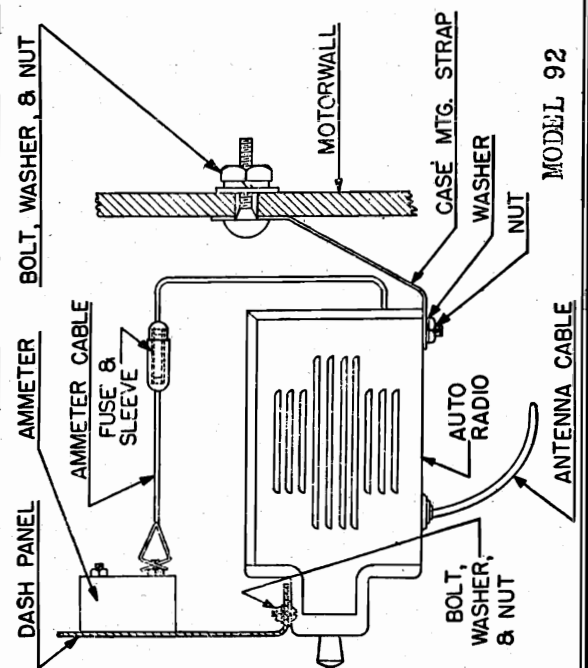
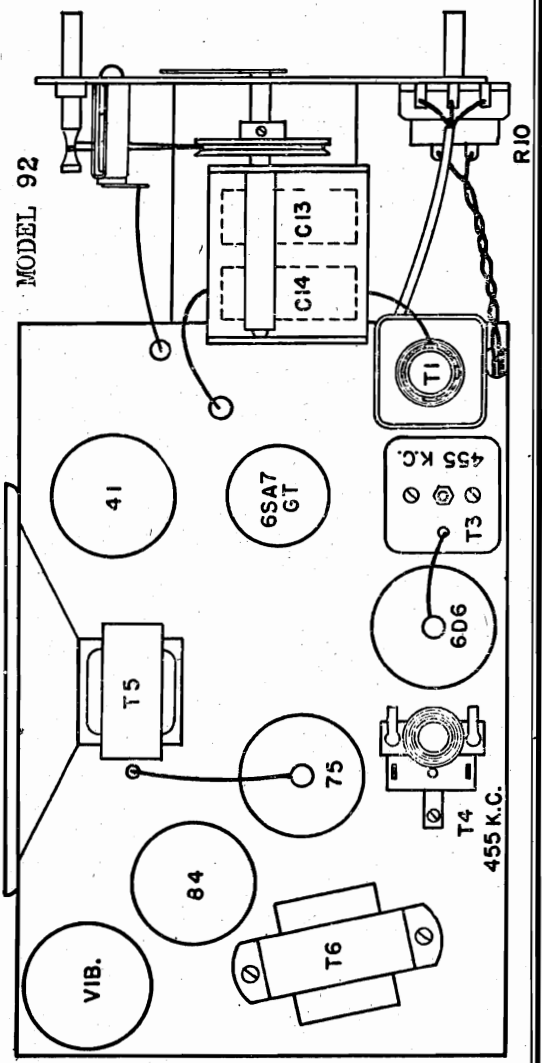
MODEL 104
 Schematic, Socket, Trimmers

AUTOCRAT RADIO CO.
MODEL 92
 Schematic, Socket, Trimmers,
 Assembly

MODEL 104

| CODE | PART NO. | DESCRIPTION | CODE | PART NO. | DESCRIPTION |
|------|----------|-------------------------|------|----------|---------------------------|
| 1 | 10-234 | RF COIL CONDENSER | 7 | 18-230 | FILTER CONDENSER |
| 2 | 10-235 | ANTENNA COIL | 8 | 18-231 | 150 OHM 1/2 WATT RESISTOR |
| 3 | 10-236 | VOLUME CONTROL & SWITCH | 9 | 18-232 | 50 OHM 1/2 WATT RESISTOR |
| 4 | 10-237 | SPK. TRANSFORMER | 10 | 18-233 | 50 OHM 1/2 WATT RESISTOR |
| 5 | 10-238 | SPK. | 11 | 18-234 | 50 OHM 1/2 WATT RESISTOR |
| 6 | 10-239 | LINE CORD | 12 | 18-235 | 50 OHM 1/2 WATT RESISTOR |


MODEL 92

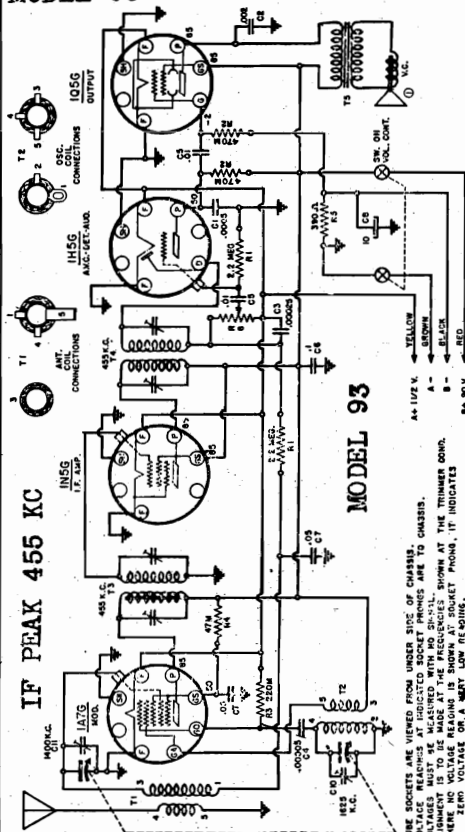
| CODE | PART NO. | DESCRIPTION | CODE | PART NO. | DESCRIPTION |
|------|----------|-------------------------|------|----------|---------------------------|
| 1 | 10-234 | RF COIL CONDENSER | 7 | 18-230 | FILTER CONDENSER |
| 2 | 10-235 | ANTENNA COIL | 8 | 18-231 | 150 OHM 1/2 WATT RESISTOR |
| 3 | 10-236 | VOLUME CONTROL & SWITCH | 9 | 18-232 | 50 OHM 1/2 WATT RESISTOR |
| 4 | 10-237 | SPK. TRANSFORMER | 10 | 18-233 | 50 OHM 1/2 WATT RESISTOR |
| 5 | 10-238 | SPK. | 11 | 18-234 | 50 OHM 1/2 WATT RESISTOR |
| 6 | 10-239 | LINE CORD | 12 | 18-235 | 50 OHM 1/2 WATT RESISTOR |


MODEL 92


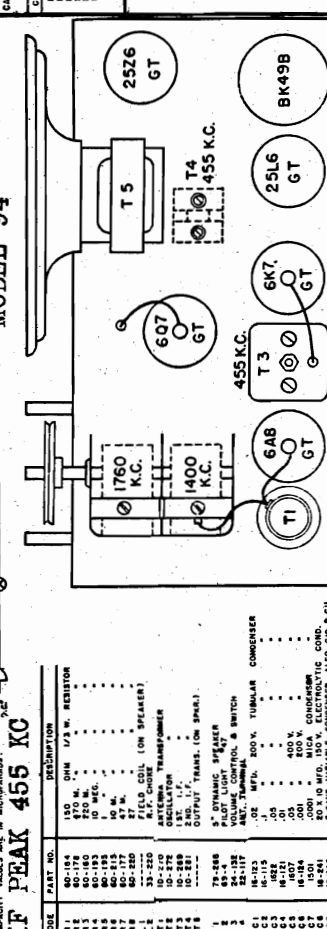
AUTOCRAT RADIO CO.

Schematics, Socket Trimmers, Alignment

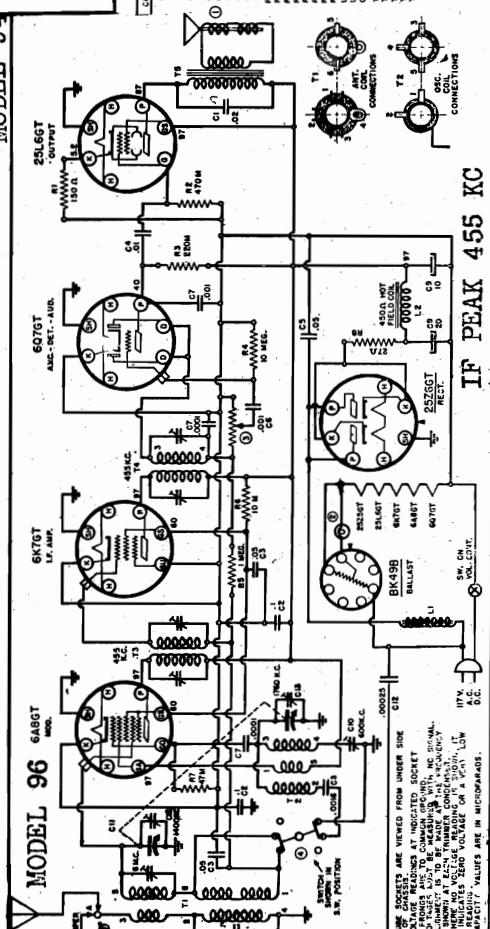
MODEL 93
MODEL 94
MODEL 96



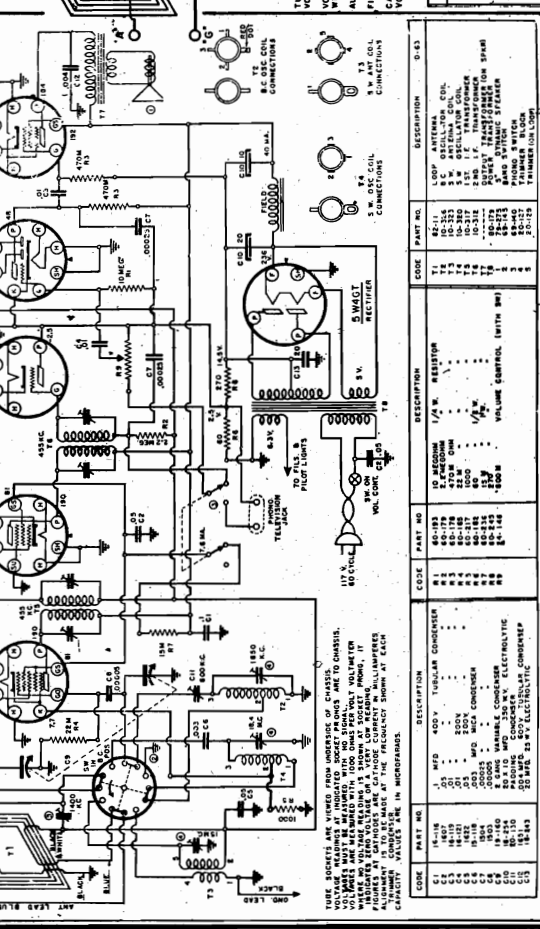
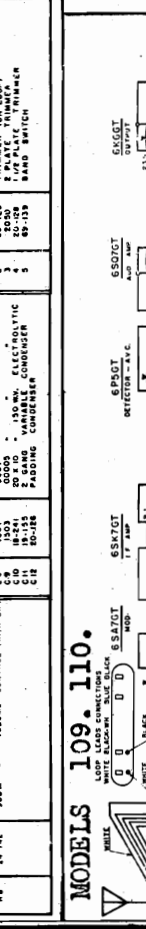
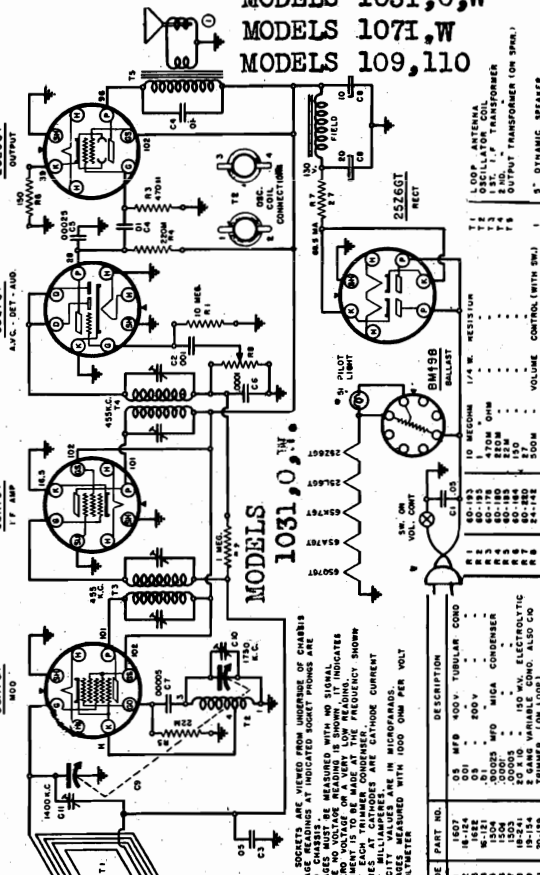
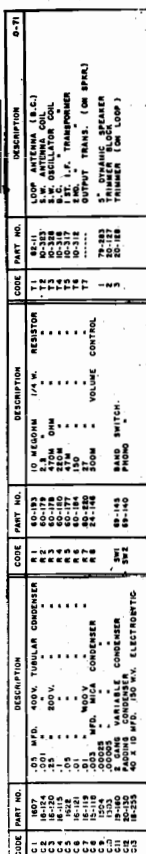
| CODE | PART NO. | DESCRIPTION | CODE | PART NO. | DESCRIPTION |
|------|----------|-------------------------------|------|----------|--------------|
| 1 | 60-179 | 2.2 MEG OHM 1/2 WATT RESISTOR | 1 | 10-233 | ANTENNA COIL |
| 2 | 60-178 | 220 OHM 1/2 WATT RESISTOR | 2 | 10-232 | OSC. COIL |
| 3 | 60-177 | 470 OHM 1/2 WATT RESISTOR | 3 | 10-231 | OSC. COIL |
| 4 | 60-176 | 470 OHM 1/2 WATT RESISTOR | 4 | 10-230 | OSC. COIL |
| 5 | 60-175 | 470 OHM 1/2 WATT RESISTOR | 5 | 10-229 | OSC. COIL |
| 6 | 60-174 | 470 OHM 1/2 WATT RESISTOR | 6 | 10-228 | OSC. COIL |
| 7 | 60-173 | 470 OHM 1/2 WATT RESISTOR | 7 | 10-227 | OSC. COIL |
| 8 | 60-172 | 470 OHM 1/2 WATT RESISTOR | 8 | 10-226 | OSC. COIL |
| 9 | 60-171 | 470 OHM 1/2 WATT RESISTOR | 9 | 10-225 | OSC. COIL |
| 10 | 60-170 | 470 OHM 1/2 WATT RESISTOR | 10 | 10-224 | OSC. COIL |
| 11 | 60-169 | 470 OHM 1/2 WATT RESISTOR | 11 | 10-223 | OSC. COIL |
| 12 | 60-168 | 470 OHM 1/2 WATT RESISTOR | 12 | 10-222 | OSC. COIL |
| 13 | 60-167 | 470 OHM 1/2 WATT RESISTOR | 13 | 10-221 | OSC. COIL |
| 14 | 60-166 | 470 OHM 1/2 WATT RESISTOR | 14 | 10-220 | OSC. COIL |
| 15 | 60-165 | 470 OHM 1/2 WATT RESISTOR | 15 | 10-219 | OSC. COIL |
| 16 | 60-164 | 470 OHM 1/2 WATT RESISTOR | 16 | 10-218 | OSC. COIL |
| 17 | 60-163 | 470 OHM 1/2 WATT RESISTOR | 17 | 10-217 | OSC. COIL |
| 18 | 60-162 | 470 OHM 1/2 WATT RESISTOR | 18 | 10-216 | OSC. COIL |
| 19 | 60-161 | 470 OHM 1/2 WATT RESISTOR | 19 | 10-215 | OSC. COIL |
| 20 | 60-160 | 470 OHM 1/2 WATT RESISTOR | 20 | 10-214 | OSC. COIL |
| 21 | 60-159 | 470 OHM 1/2 WATT RESISTOR | 21 | 10-213 | OSC. COIL |
| 22 | 60-158 | 470 OHM 1/2 WATT RESISTOR | 22 | 10-212 | OSC. COIL |
| 23 | 60-157 | 470 OHM 1/2 WATT RESISTOR | 23 | 10-211 | OSC. COIL |
| 24 | 60-156 | 470 OHM 1/2 WATT RESISTOR | 24 | 10-210 | OSC. COIL |
| 25 | 60-155 | 470 OHM 1/2 WATT RESISTOR | 25 | 10-209 | OSC. COIL |
| 26 | 60-154 | 470 OHM 1/2 WATT RESISTOR | 26 | 10-208 | OSC. COIL |
| 27 | 60-153 | 470 OHM 1/2 WATT RESISTOR | 27 | 10-207 | OSC. COIL |
| 28 | 60-152 | 470 OHM 1/2 WATT RESISTOR | 28 | 10-206 | OSC. COIL |
| 29 | 60-151 | 470 OHM 1/2 WATT RESISTOR | 29 | 10-205 | OSC. COIL |
| 30 | 60-150 | 470 OHM 1/2 WATT RESISTOR | 30 | 10-204 | OSC. COIL |
| 31 | 60-149 | 470 OHM 1/2 WATT RESISTOR | 31 | 10-203 | OSC. COIL |
| 32 | 60-148 | 470 OHM 1/2 WATT RESISTOR | 32 | 10-202 | OSC. COIL |
| 33 | 60-147 | 470 OHM 1/2 WATT RESISTOR | 33 | 10-201 | OSC. COIL |
| 34 | 60-146 | 470 OHM 1/2 WATT RESISTOR | 34 | 10-200 | OSC. COIL |
| 35 | 60-145 | 470 OHM 1/2 WATT RESISTOR | 35 | 10-199 | OSC. COIL |
| 36 | 60-144 | 470 OHM 1/2 WATT RESISTOR | 36 | 10-198 | OSC. COIL |
| 37 | 60-143 | 470 OHM 1/2 WATT RESISTOR | 37 | 10-197 | OSC. COIL |
| 38 | 60-142 | 470 OHM 1/2 WATT RESISTOR | 38 | 10-196 | OSC. COIL |
| 39 | 60-141 | 470 OHM 1/2 WATT RESISTOR | 39 | 10-195 | OSC. COIL |
| 40 | 60-140 | 470 OHM 1/2 WATT RESISTOR | 40 | 10-194 | OSC. COIL |
| 41 | 60-139 | 470 OHM 1/2 WATT RESISTOR | 41 | 10-193 | OSC. COIL |
| 42 | 60-138 | 470 OHM 1/2 WATT RESISTOR | 42 | 10-192 | OSC. COIL |
| 43 | 60-137 | 470 OHM 1/2 WATT RESISTOR | 43 | 10-191 | OSC. COIL |
| 44 | 60-136 | 470 OHM 1/2 WATT RESISTOR | 44 | 10-190 | OSC. COIL |
| 45 | 60-135 | 470 OHM 1/2 WATT RESISTOR | 45 | 10-189 | OSC. COIL |
| 46 | 60-134 | 470 OHM 1/2 WATT RESISTOR | 46 | 10-188 | OSC. COIL |
| 47 | 60-133 | 470 OHM 1/2 WATT RESISTOR | 47 | 10-187 | OSC. COIL |
| 48 | 60-132 | 470 OHM 1/2 WATT RESISTOR | 48 | 10-186 | OSC. COIL |
| 49 | 60-131 | 470 OHM 1/2 WATT RESISTOR | 49 | 10-185 | OSC. COIL |
| 50 | 60-130 | 470 OHM 1/2 WATT RESISTOR | 50 | 10-184 | OSC. COIL |
| 51 | 60-129 | 470 OHM 1/2 WATT RESISTOR | 51 | 10-183 | OSC. COIL |
| 52 | 60-128 | 470 OHM 1/2 WATT RESISTOR | 52 | 10-182 | OSC. COIL |
| 53 | 60-127 | 470 OHM 1/2 WATT RESISTOR | 53 | 10-181 | OSC. COIL |
| 54 | 60-126 | 470 OHM 1/2 WATT RESISTOR | 54 | 10-180 | OSC. COIL |
| 55 | 60-125 | 470 OHM 1/2 WATT RESISTOR | 55 | 10-179 | OSC. COIL |
| 56 | 60-124 | 470 OHM 1/2 WATT RESISTOR | 56 | 10-178 | OSC. COIL |
| 57 | 60-123 | 470 OHM 1/2 WATT RESISTOR | 57 | 10-177 | OSC. COIL |
| 58 | 60-122 | 470 OHM 1/2 WATT RESISTOR | 58 | 10-176 | OSC. COIL |
| 59 | 60-121 | 470 OHM 1/2 WATT RESISTOR | 59 | 10-175 | OSC. COIL |
| 60 | 60-120 | 470 OHM 1/2 WATT RESISTOR | 60 | 10-174 | OSC. COIL |
| 61 | 60-119 | 470 OHM 1/2 WATT RESISTOR | 61 | 10-173 | OSC. COIL |
| 62 | 60-118 | 470 OHM 1/2 WATT RESISTOR | 62 | 10-172 | OSC. COIL |
| 63 | 60-117 | 470 OHM 1/2 WATT RESISTOR | 63 | 10-171 | OSC. COIL |
| 64 | 60-116 | 470 OHM 1/2 WATT RESISTOR | 64 | 10-170 | OSC. COIL |
| 65 | 60-115 | 470 OHM 1/2 WATT RESISTOR | 65 | 10-169 | OSC. COIL |
| 66 | 60-114 | 470 OHM 1/2 WATT RESISTOR | 66 | 10-168 | OSC. COIL |
| 67 | 60-113 | 470 OHM 1/2 WATT RESISTOR | 67 | 10-167 | OSC. COIL |
| 68 | 60-112 | 470 OHM 1/2 WATT RESISTOR | 68 | 10-166 | OSC. COIL |
| 69 | 60-111 | 470 OHM 1/2 WATT RESISTOR | 69 | 10-165 | OSC. COIL |
| 70 | 60-110 | 470 OHM 1/2 WATT RESISTOR | 70 | 10-164 | OSC. COIL |
| 71 | 60-109 | 470 OHM 1/2 WATT RESISTOR | 71 | 10-163 | OSC. COIL |
| 72 | 60-108 | 470 OHM 1/2 WATT RESISTOR | 72 | 10-162 | OSC. COIL |
| 73 | 60-107 | 470 OHM 1/2 WATT RESISTOR | 73 | 10-161 | OSC. COIL |
| 74 | 60-106 | 470 OHM 1/2 WATT RESISTOR | 74 | 10-160 | OSC. COIL |
| 75 | 60-105 | 470 OHM 1/2 WATT RESISTOR | 75 | 10-159 | OSC. COIL |
| 76 | 60-104 | 470 OHM 1/2 WATT RESISTOR | 76 | 10-158 | OSC. COIL |
| 77 | 60-103 | 470 OHM 1/2 WATT RESISTOR | 77 | 10-157 | OSC. COIL |
| 78 | 60-102 | 470 OHM 1/2 WATT RESISTOR | 78 | 10-156 | OSC. COIL |
| 79 | 60-101 | 470 OHM 1/2 WATT RESISTOR | 79 | 10-155 | OSC. COIL |
| 80 | 60-100 | 470 OHM 1/2 WATT RESISTOR | 80 | 10-154 | OSC. COIL |
| 81 | 60-99 | 470 OHM 1/2 WATT RESISTOR | 81 | 10-153 | OSC. COIL |
| 82 | 60-98 | 470 OHM 1/2 WATT RESISTOR | 82 | 10-152 | OSC. COIL |
| 83 | 60-97 | 470 OHM 1/2 WATT RESISTOR | 83 | 10-151 | OSC. COIL |
| 84 | 60-96 | 470 OHM 1/2 WATT RESISTOR | 84 | 10-150 | OSC. COIL |
| 85 | 60-95 | 470 OHM 1/2 WATT RESISTOR | 85 | 10-149 | OSC. COIL |
| 86 | 60-94 | 470 OHM 1/2 WATT RESISTOR | 86 | 10-148 | OSC. COIL |
| 87 | 60-93 | 470 OHM 1/2 WATT RESISTOR | 87 | 10-147 | OSC. COIL |
| 88 | 60-92 | 470 OHM 1/2 WATT RESISTOR | 88 | 10-146 | OSC. COIL |
| 89 | 60-91 | 470 OHM 1/2 WATT RESISTOR | 89 | 10-145 | OSC. COIL |
| 90 | 60-90 | 470 OHM 1/2 WATT RESISTOR | 90 | 10-144 | OSC. COIL |
| 91 | 60-89 | 470 OHM 1/2 WATT RESISTOR | 91 | 10-143 | OSC. COIL |
| 92 | 60-88 | 470 OHM 1/2 WATT RESISTOR | 92 | 10-142 | OSC. COIL |
| 93 | 60-87 | 470 OHM 1/2 WATT RESISTOR | 93 | 10-141 | OSC. COIL |
| 94 | 60-86 | 470 OHM 1/2 WATT RESISTOR | 94 | 10-140 | OSC. COIL |
| 95 | 60-85 | 470 OHM 1/2 WATT RESISTOR | 95 | 10-139 | OSC. COIL |
| 96 | 60-84 | 470 OHM 1/2 WATT RESISTOR | 96 | 10-138 | OSC. COIL |
| 97 | 60-83 | 470 OHM 1/2 WATT RESISTOR | 97 | 10-137 | OSC. COIL |
| 98 | 60-82 | 470 OHM 1/2 WATT RESISTOR | 98 | 10-136 | OSC. COIL |
| 99 | 60-81 | 470 OHM 1/2 WATT RESISTOR | 99 | 10-135 | OSC. COIL |
| 100 | 60-80 | 470 OHM 1/2 WATT RESISTOR | 100 | 10-134 | OSC. COIL |



MODEL 94

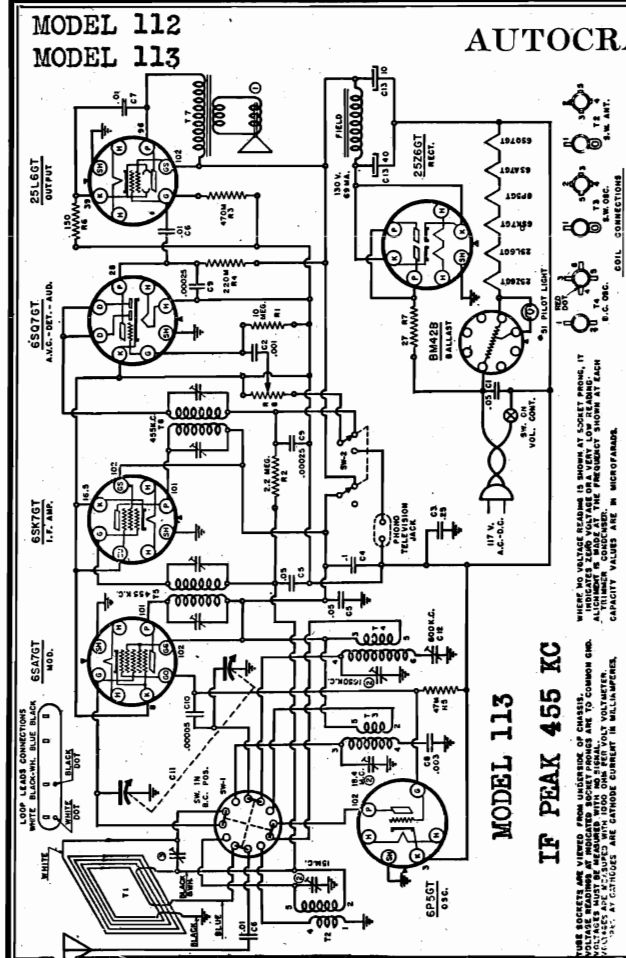


MODEL 96



AUTOCRAT RADIO CO.

MODEL 112
MODEL 113
MODEL 114
MODEL 116
Schematics, Voltage

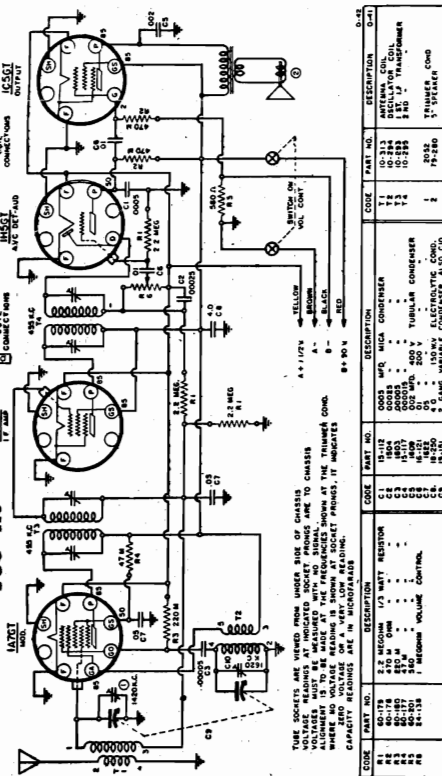


MODEL 113
IF PEAK 455 KC

WHERE NO VOLTAGE READINGS ARE SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE. READINGS AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE. READINGS AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE. READINGS AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE.

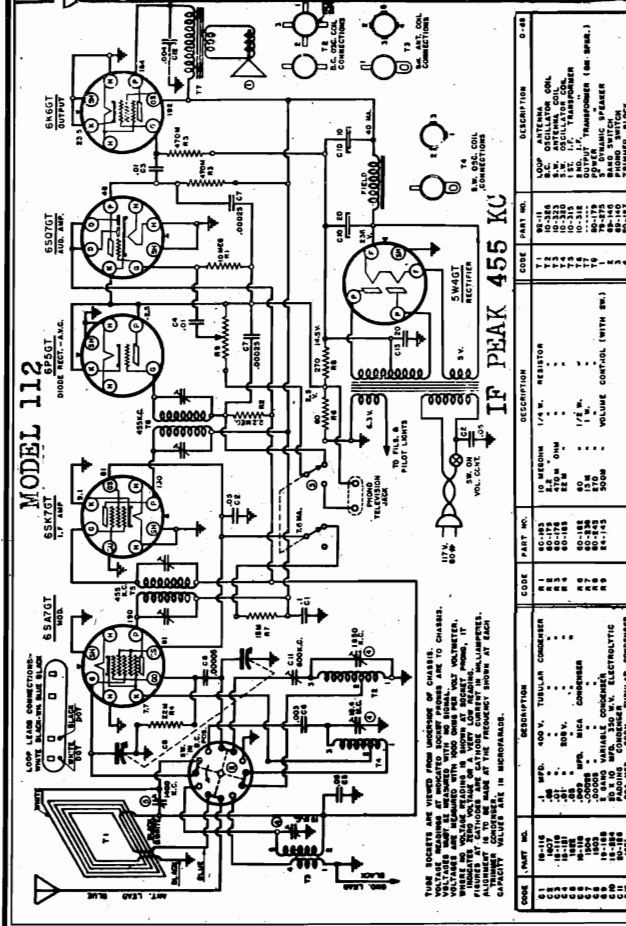
| CODE | PART NO. | DESCRIPTION | CODE | PART NO. | DESCRIPTION |
|------|----------|-------------|------|----------|-------------|
| 1 | 650T | OSCILLATOR | 1 | 650T | OSCILLATOR |
| 2 | 650T | AMPLIFIER | 2 | 650T | AMPLIFIER |
| 3 | 650T | DETECTOR | 3 | 650T | DETECTOR |
| 4 | 650T | RECTIFIER | 4 | 650T | RECTIFIER |
| 5 | 650T | OUTPUT | 5 | 650T | OUTPUT |

MODEL 116
IF PEAK 455 KC



WHERE NO VOLTAGE READINGS ARE SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE. READINGS AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE. READINGS AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE. READINGS AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE.

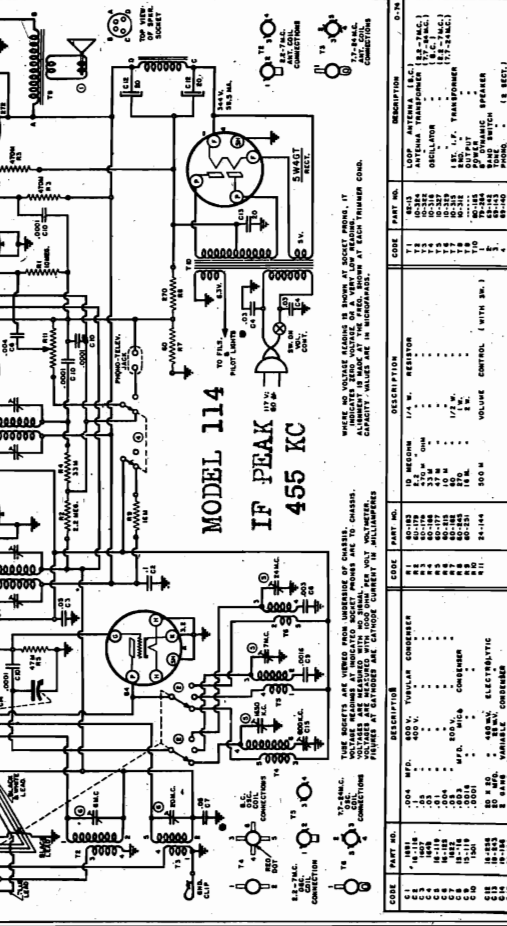
| CODE | PART NO. | DESCRIPTION | CODE | PART NO. | DESCRIPTION |
|------|----------|-------------|------|----------|-------------|
| 1 | 650T | OSCILLATOR | 1 | 650T | OSCILLATOR |
| 2 | 650T | AMPLIFIER | 2 | 650T | AMPLIFIER |
| 3 | 650T | DETECTOR | 3 | 650T | DETECTOR |
| 4 | 650T | RECTIFIER | 4 | 650T | RECTIFIER |
| 5 | 650T | OUTPUT | 5 | 650T | OUTPUT |



MODEL 112
IF PEAK 455 KC

WHERE NO VOLTAGE READINGS ARE SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE. READINGS AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE. READINGS AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE. READINGS AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE.

| CODE | PART NO. | DESCRIPTION | CODE | PART NO. | DESCRIPTION |
|------|----------|-------------|------|----------|-------------|
| 1 | 650T | OSCILLATOR | 1 | 650T | OSCILLATOR |
| 2 | 650T | AMPLIFIER | 2 | 650T | AMPLIFIER |
| 3 | 650T | DETECTOR | 3 | 650T | DETECTOR |
| 4 | 650T | RECTIFIER | 4 | 650T | RECTIFIER |
| 5 | 650T | OUTPUT | 5 | 650T | OUTPUT |



MODEL 114
IF PEAK 455 KC

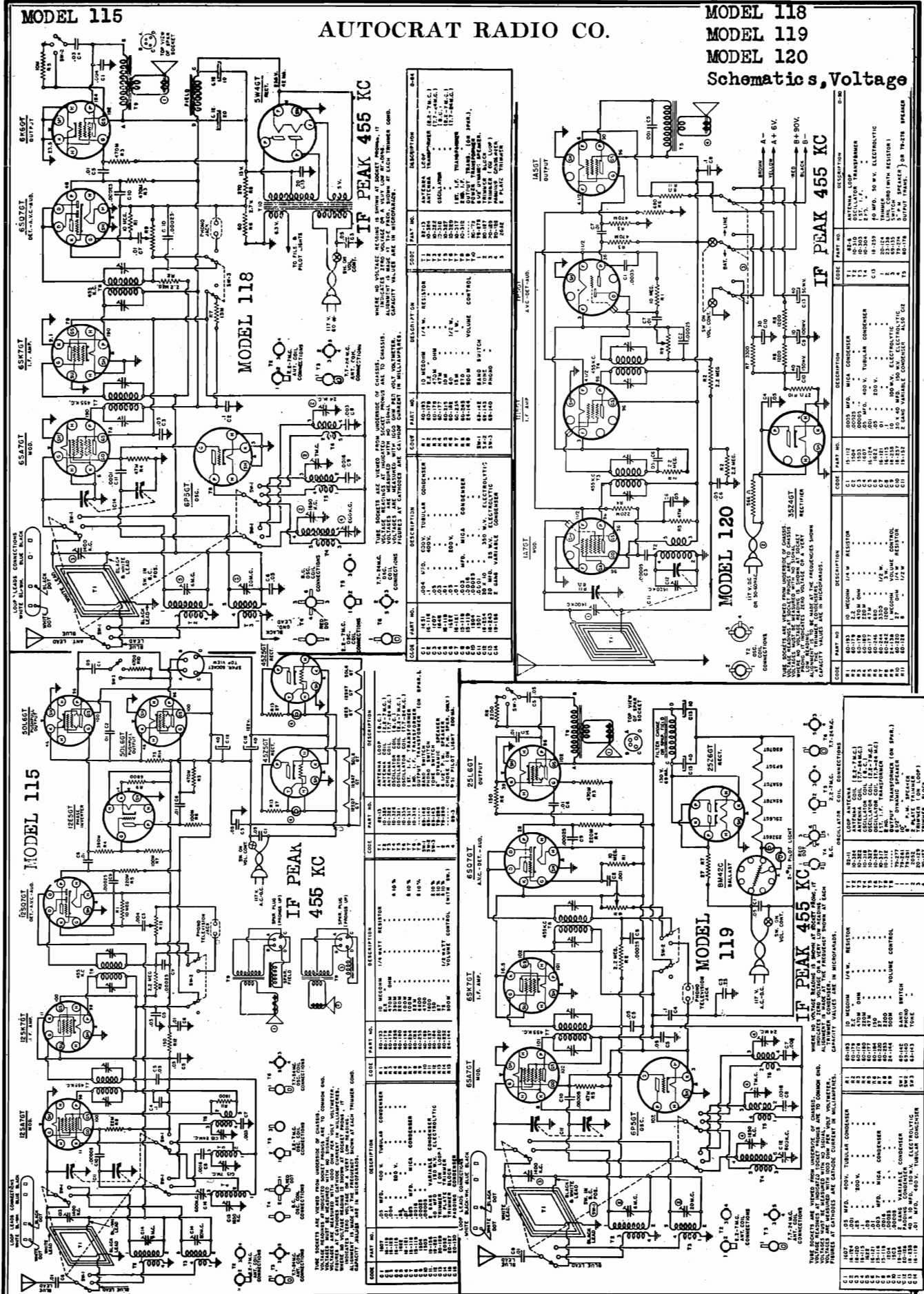
WHERE NO VOLTAGE READINGS ARE SHOWN AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE. READINGS AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE. READINGS AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE. READINGS AT SOCKET PRONGS, IT INDICATES ZERO VOLTAGE.

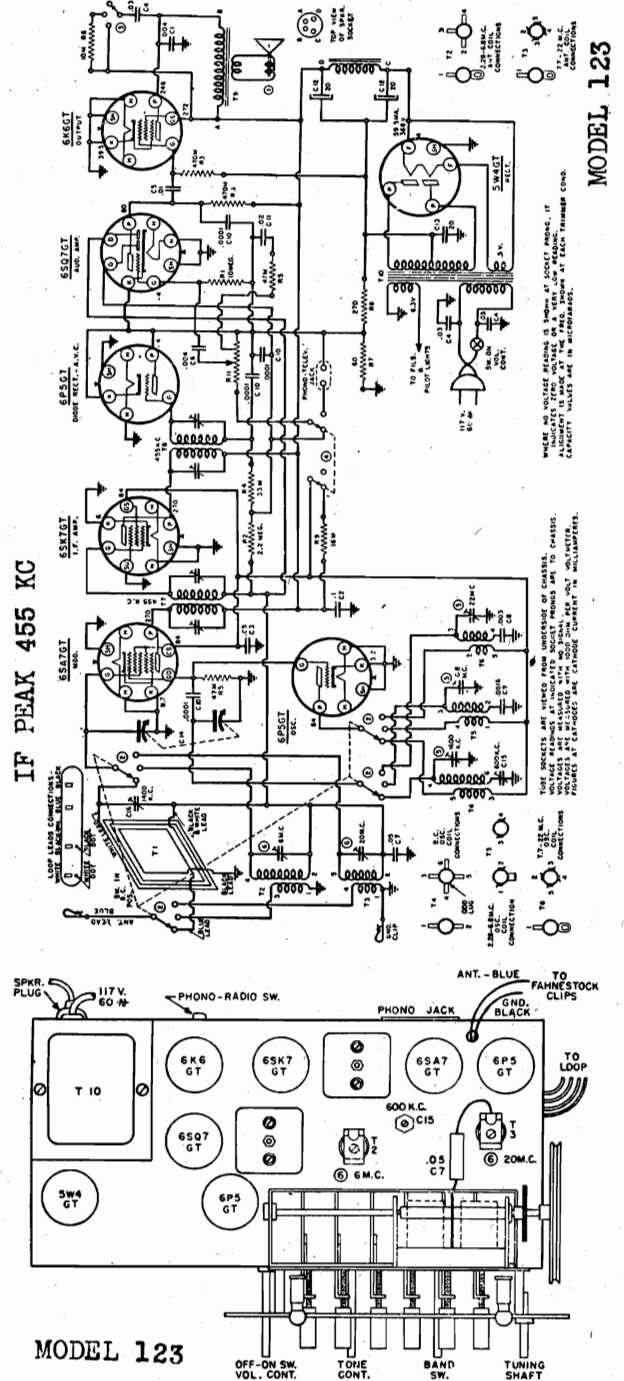
| CODE | PART NO. | DESCRIPTION | CODE | PART NO. | DESCRIPTION |
|------|----------|-------------|------|----------|-------------|
| 1 | 650T | OSCILLATOR | 1 | 650T | OSCILLATOR |
| 2 | 650T | AMPLIFIER | 2 | 650T | AMPLIFIER |
| 3 | 650T | DETECTOR | 3 | 650T | DETECTOR |
| 4 | 650T | RECTIFIER | 4 | 650T | RECTIFIER |
| 5 | 650T | OUTPUT | 5 | 650T | OUTPUT |



AUTOCRAT RADIO CO.

MODEL 118
MODEL 119
MODEL 120
Schematics, Voltage





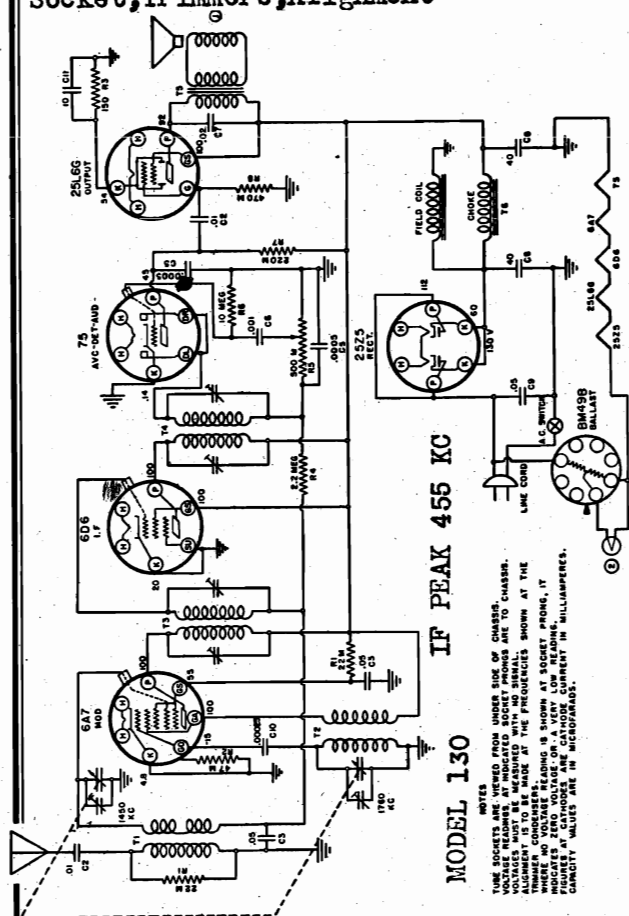
MODEL 130

Schematic, Voltage Socket, Trimmers, Alignment

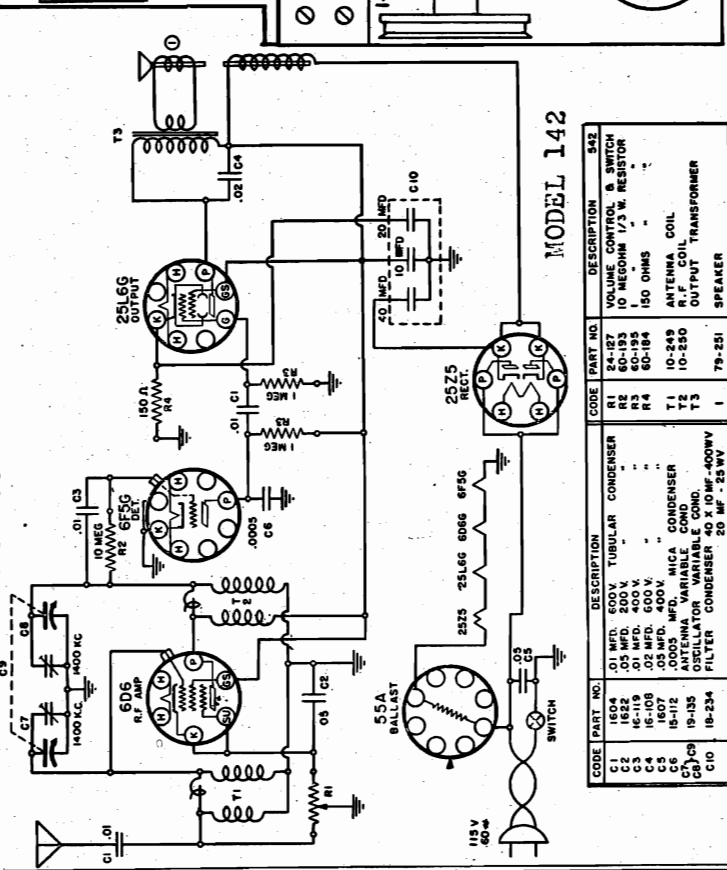
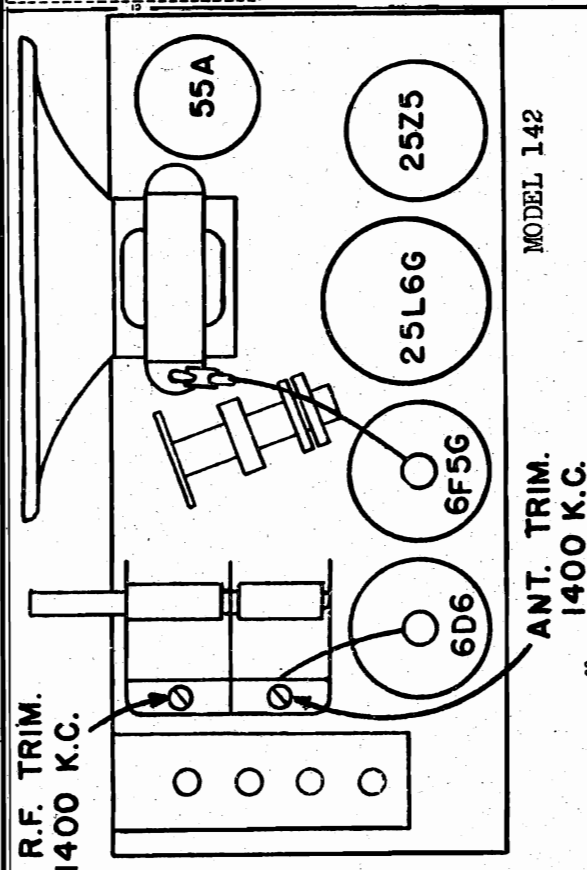
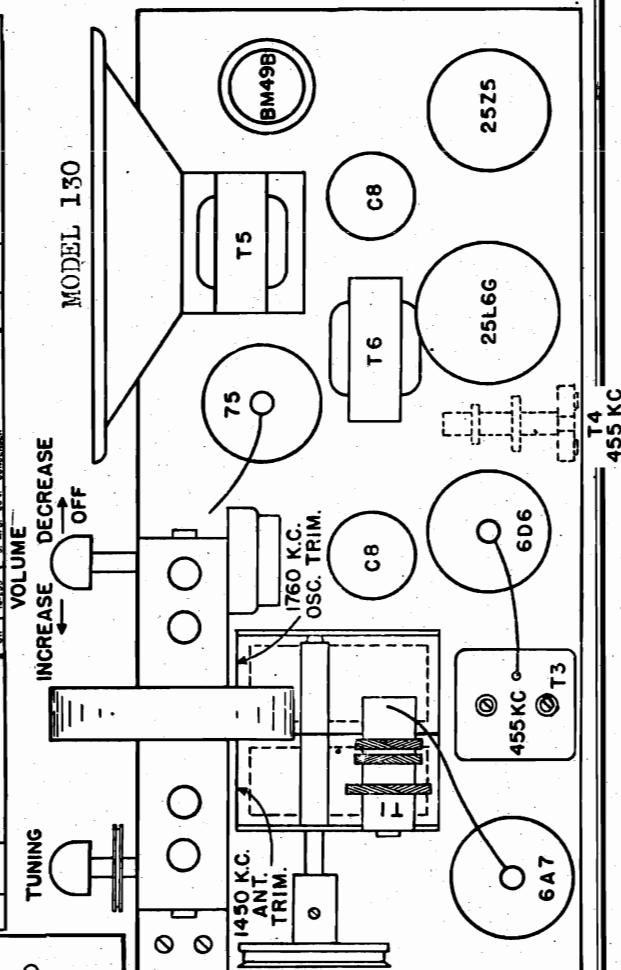
AUTOCRAT RADIO CO.

MODEL 142

Schematic, Socket



| CODE | PART NO | DESCRIPTION | CODE | PART NO | DESCRIPTION | CODE | PART NO | DESCRIPTION |
|------|---------|------------------|------|---------|-----------------------|------|---------|------------------------|
| RI | 50-149 | 225 OHM RESISTOR | C1 | 15-32 | VARIABLE CONDENSER | 71 | 10-239 | ANTENNA TRANSFORMER |
| RJ | 50-150 | 225 OHM RESISTOR | C2 | 15-32 | VARIABLE CONDENSER | 72 | 10-240 | 100V 1000 OHM RESISTOR |
| RL | 50-151 | 100 OHM | C3 | 15-12 | 1000 MF 50V CONDENSER | 73 | 10-241 | 100V 1000 OHM RESISTOR |
| RM | 50-152 | 100 OHM | C4 | 15-12 | 1000 MF 50V CONDENSER | 74 | 10-242 | 100V 1000 OHM RESISTOR |
| RA | 50-153 | 250 OHM RESISTOR | C5 | 15-12 | 1000 MF 50V CONDENSER | 75 | 10-243 | 100V 1000 OHM RESISTOR |
| RB | 50-154 | 250 OHM RESISTOR | C6 | 15-12 | 1000 MF 50V CONDENSER | 76 | 10-244 | 100V 1000 OHM RESISTOR |
| RC | 50-155 | 250 OHM RESISTOR | C7 | 15-12 | 1000 MF 50V CONDENSER | 77 | 10-245 | 100V 1000 OHM RESISTOR |
| RD | 50-156 | 250 OHM RESISTOR | C8 | 15-12 | 1000 MF 50V CONDENSER | 78 | 10-246 | 100V 1000 OHM RESISTOR |
| RE | 50-157 | 250 OHM RESISTOR | C9 | 15-12 | 1000 MF 50V CONDENSER | 79 | 10-247 | 100V 1000 OHM RESISTOR |
| RF | 50-158 | 250 OHM RESISTOR | C10 | 15-12 | 1000 MF 50V CONDENSER | 80 | 10-248 | 100V 1000 OHM RESISTOR |
| RG | 50-159 | 250 OHM RESISTOR | C11 | 15-12 | 1000 MF 50V CONDENSER | 81 | 10-249 | 100V 1000 OHM RESISTOR |
| RH | 50-160 | 250 OHM RESISTOR | C12 | 15-12 | 1000 MF 50V CONDENSER | 82 | 10-250 | 100V 1000 OHM RESISTOR |
| RI | 50-161 | 250 OHM RESISTOR | C13 | 15-12 | 1000 MF 50V CONDENSER | 83 | 10-251 | 100V 1000 OHM RESISTOR |
| RJ | 50-162 | 250 OHM RESISTOR | C14 | 15-12 | 1000 MF 50V CONDENSER | 84 | 10-252 | 100V 1000 OHM RESISTOR |
| RL | 50-163 | 250 OHM RESISTOR | C15 | 15-12 | 1000 MF 50V CONDENSER | 85 | 10-253 | 100V 1000 OHM RESISTOR |
| RM | 50-164 | 250 OHM RESISTOR | C16 | 15-12 | 1000 MF 50V CONDENSER | 86 | 10-254 | 100V 1000 OHM RESISTOR |
| RA | 50-165 | 250 OHM RESISTOR | C17 | 15-12 | 1000 MF 50V CONDENSER | 87 | 10-255 | 100V 1000 OHM RESISTOR |
| RB | 50-166 | 250 OHM RESISTOR | C18 | 15-12 | 1000 MF 50V CONDENSER | 88 | 10-256 | 100V 1000 OHM RESISTOR |
| RC | 50-167 | 250 OHM RESISTOR | C19 | 15-12 | 1000 MF 50V CONDENSER | 89 | 10-257 | 100V 1000 OHM RESISTOR |
| RD | 50-168 | 250 OHM RESISTOR | C20 | 15-12 | 1000 MF 50V CONDENSER | 90 | 10-258 | 100V 1000 OHM RESISTOR |

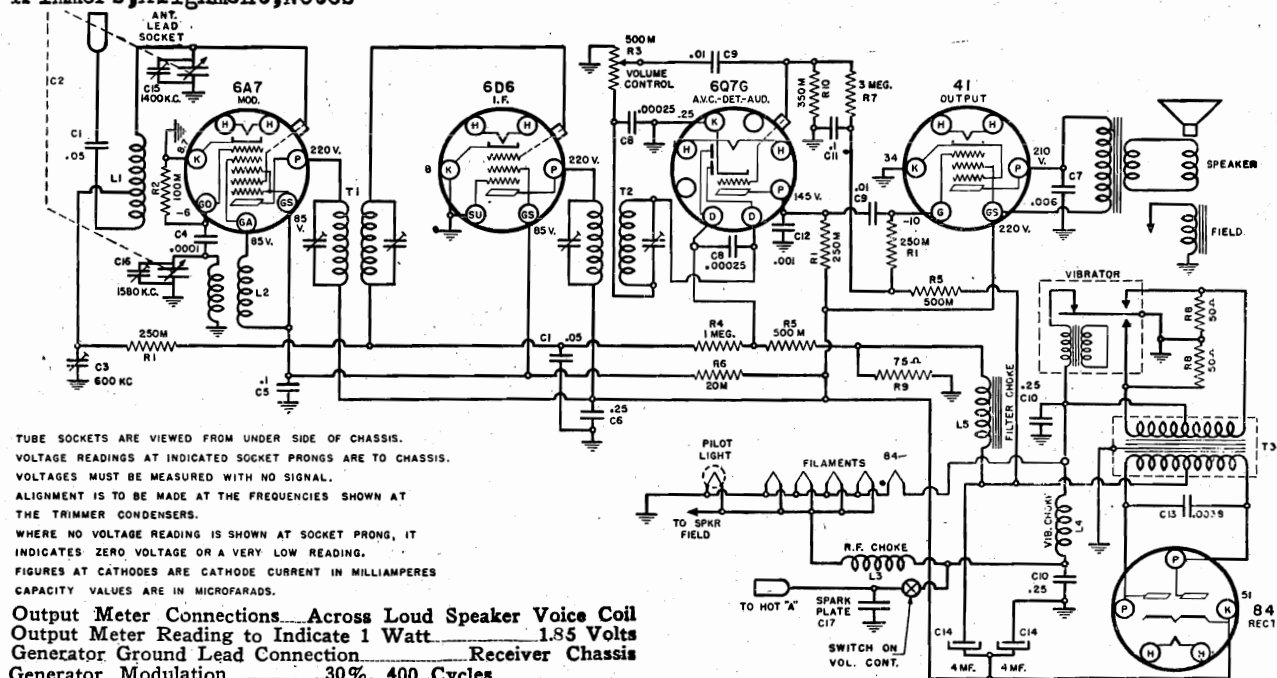


| CODE | PART NO. | DESCRIPTION | CODE | PART NO. | DESCRIPTION |
|------|----------|----------------------------------|------|----------|---------------------------|
| C1 | 1804 | .01 MFD. 600V. TUBULAR CONDENSER | R1 | 24-127 | VOLUME CONTROL & SWITCH |
| C2 | 1822 | " .05 MFD. 200 V." | R2 | 60-193 | 10 MEGOHM 1/2 W. RESISTOR |
| C3 | 1810 | " .01 MFD. 500 V." | R3 | 50-183 | " " |
| C4 | 1807 | " .05 MFD. 400V." | R4 | 50-184 | " " |
| C5 | 1807 | " .05 MFD. 400V." | T1 | 10-249 | ANTENNA COIL |
| C6 | 15-112 | ".0005 MFD. MICA CONDENSER | T2 | 10-250 | AUDIO OUTPUT TRANSFORMER |
| C7 | 19-135 | ANTENNA VARIABLE COND. | T3 | 10-250 | " " |
| C8 | 18-234 | FILTER CONDENSER 20 MF - 50 WV | I | 79-251 | SPEAKER |

MODEL 359

Schematic, Voltage, Socket
Trimmers, Alignment, Notes

AUTOCRAT RADIO CO.



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
CAPACITY VALUES ARE IN MICROFARADS.

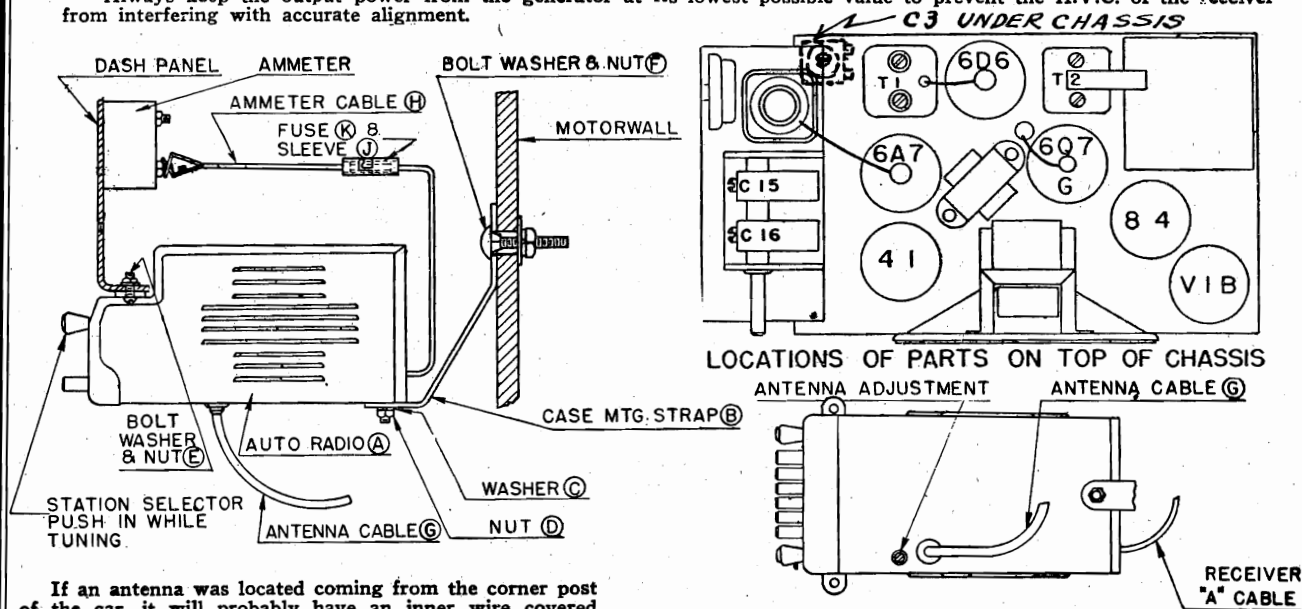
Output Meter Connections Across Loud Speaker Voice Coil
Output Meter Reading to Indicate 1 Watt 1.85 Volts
Generator Ground Lead Connection Receiver Chassis
Generator Modulation 30%, 400 Cycles
Position of Volume Control Fully On

| Position of Variable | Generator Frequency | Dummy Antenna | Generator Connection | Trimmer Adjustments (In Order Shown) | Trimmer Function |
|----------------------|---------------------|---------------|----------------------|--------------------------------------|--------------------|
| Closed | 456 KC | .1 mfd. | 6A7 Grid | T2, T1 | I. F. |
| Fully Open | 1580 KC | .0002 mfd. | Antenna Conn. | C16 | Oscillator Trimmer |
| 1400 KC | 1400 KC | .0002 mfd. | Antenna Conn. | C15 | Antenna Trimmer |
| 600 KC | 600 KC | .0002 mfd. | Antenna Conn. | C3 | Antenna Padder |

The variable condenser should be at 600 k.c. for antenna adjustment.

The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy. A final adjustment of antenna padder condenser C3 is always made after the receiver is installed in the car, in order to match the car antenna.

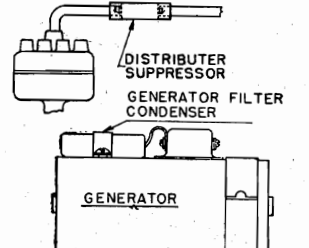
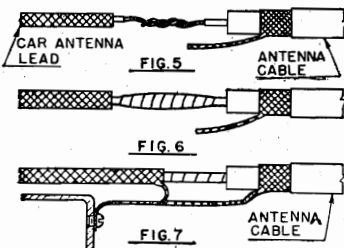
Always keep the output power from the generator at its lowest possible value to prevent the A.V.C. of the receiver from interfering with accurate alignment.



If an antenna was located coming from the corner post of the car, it will probably have an inner wire covered with the metal braid. (If it has a plug at its end, cut off the plug). Scrape clean and solder the white wire of the receiver's antenna lead to the inner wire of the car antenna lead. Be certain these inner wires do not at any time touch the outer shield. (See Fig. 5.)

After the connection is cleaned and connected, cover the joint carefully with tape. (See Fig. 6.)

Connect the pigtail of the receiver's antenna wire to the pigtail braid of the car's antenna lead-in. Wrap pig-tails and solder together using rosin core solder. IMPORTANT—Make certain when bolting soldered pigtail ends to car that the section is scraped clean and a good chassis ground. (See Fig. 7.)



[illegible]

MODELS P43,P45

MODEL P57

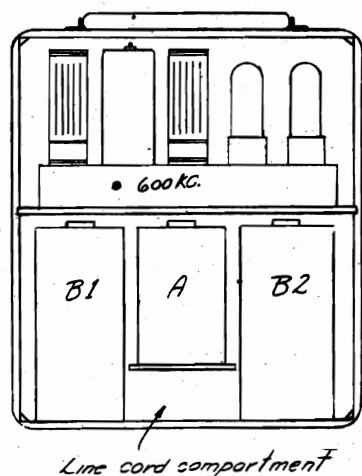
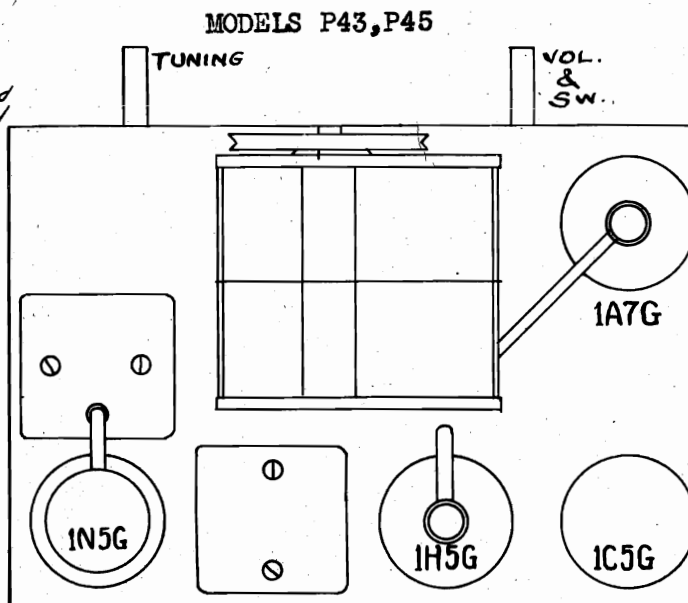
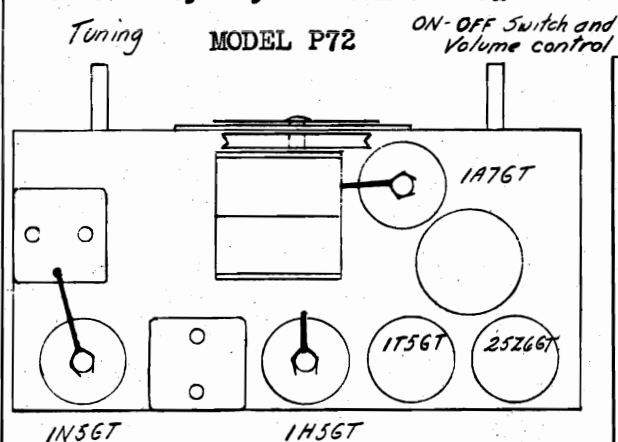
MODEL P72

Socket Layouts

MODELS 402,403,404,405,406,408

MODELS 442,443,446 Tuner Data

AUTOMATIC RADIO MFG. CO., INC.



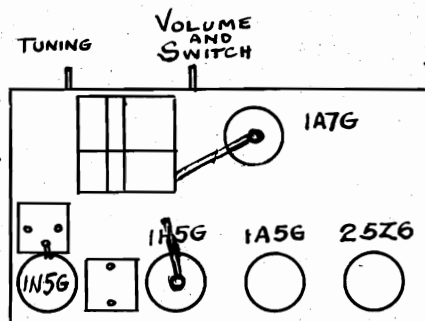
MODEL P72

PUSH-BUTTON LINE-UP MODELS 442,443,446

To adjust push-buttons to desired stations:

1. Press second button from right and tune in manually the one of the four desired stations having the lowest number of kilocycles (nearest right hand end of tuning dial). Note its program.
2. Press third button from right with volume control set to full volume, insert screwdriver blade into slot of large screw in corresponding hole at rear of set directly behind this button, and rotate one turn or two in either direction until same station is heard at maximum volume, then adjust small screw in same hole until greatest volume and best quality are obtained.
3. Adjust fourth button in the same manner to the desired station with the next higher kilocycle reading (next station to the left on the manual tuning dial).
4. Repeat this procedure for buttons 5 and 6.

In some cases it may be desirable to make a slight final readjustment on all four buttons some time after the original setting, to compensate for changes due to temperature and climatic conditions.



MODEL P57

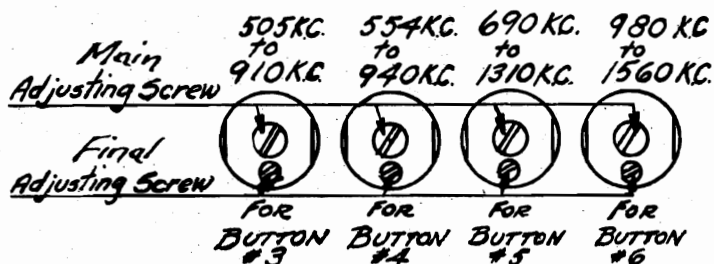
PUSH-BUTTON DATA MODELS 402,403,404,405,406,408

1. Loosen all buttons by turning them counter-clockwise.
2. Locate a desired station by manual tuning.
3. Adjust one button to this station by pushing button in as far as it will go, keeping the station tuned in, then release.
4. When button returns to original position, tighten it by turning clockwise. Station is now tuned in permanently on this button.
5. Repeat operations 2, 3 and 4 on each succeeding button until all have been adjusted to stations desired.

In some cases it may be desirable to make a slight final readjustment on all four buttons some time after the original setting to compensate for changes due to temperature and climatic conditions.

CAUTION: In setting up push buttons, for consistent reception, be sure the adjustments are made to the local station on a network broadcast, and that a weaker, distant station with the same program is not selected.

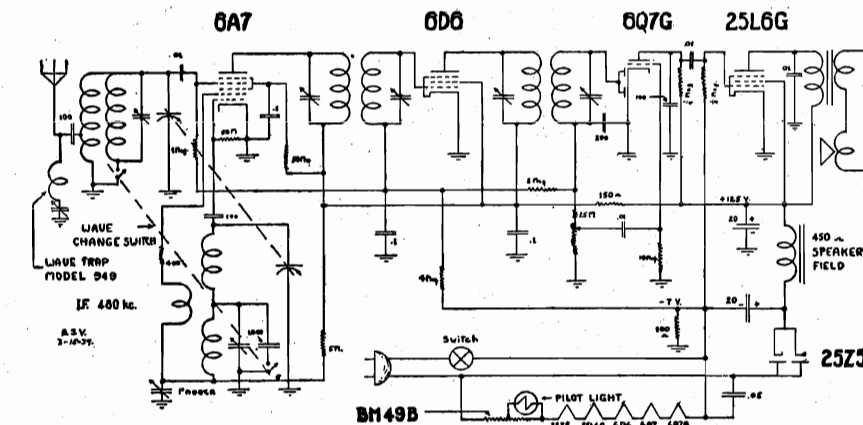
PUSH-BUTTON DATA MODELS 442,443,446



NOTE: To adjust to desired station, press in corresponding button directly in front. Turn main adjusting screw to obtain selected station, then turn final adjusting screw to obtain best clarity and volume. Do not turn volume control on full while making adjustments.

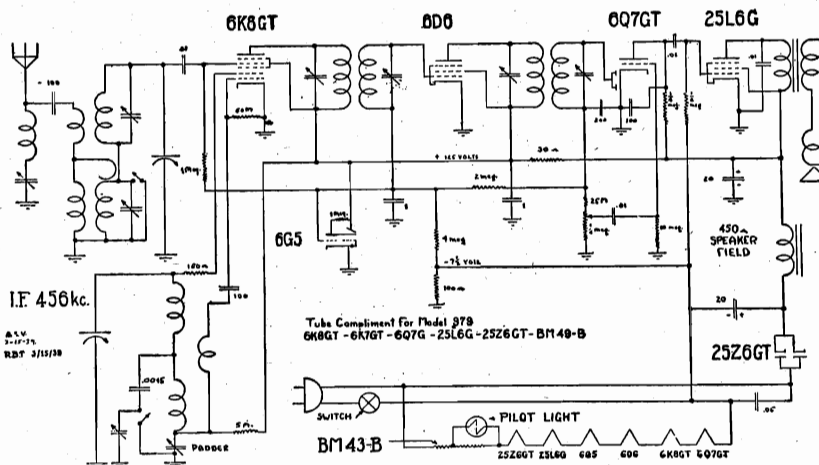
AUTOMATIC RADIO MFG. CO., INC.

MODELS M-66, M-77
MODELS 939, 949
MODELS 975, 979, 988
Schematics



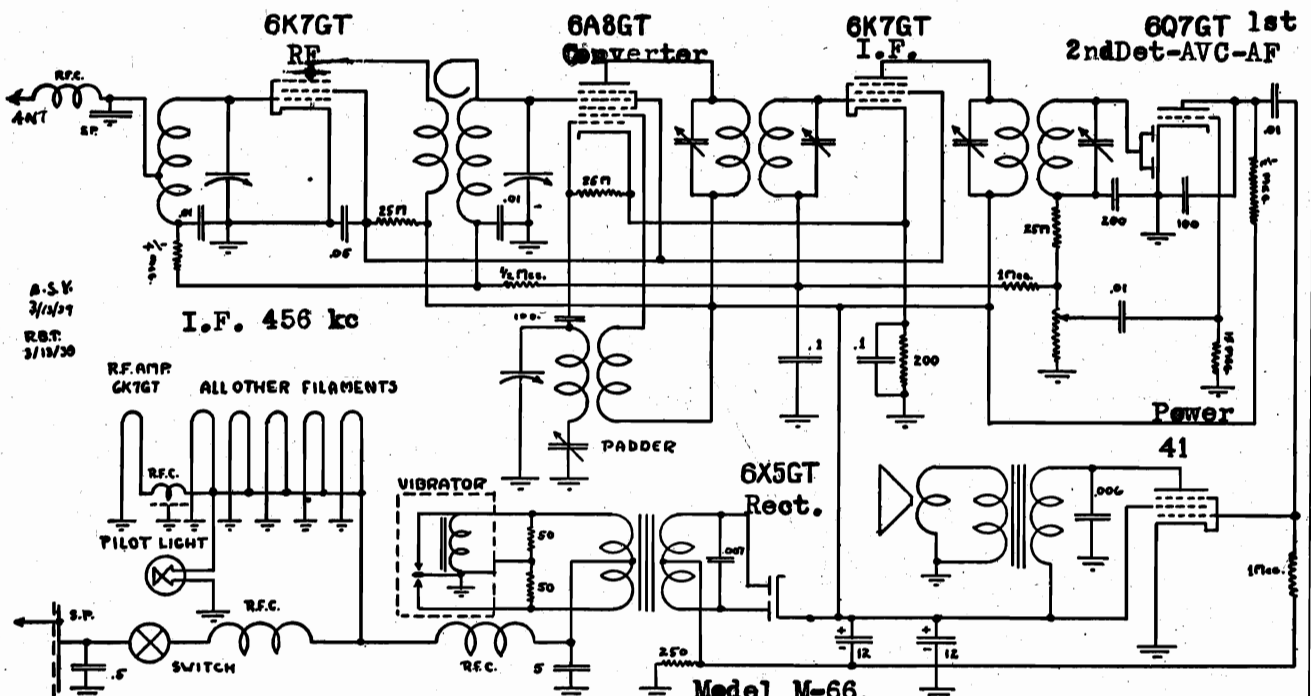
Models
939 and 949

6A7- Converter
6D6- I. F.
6Q7G- 2nd Det-AVC-1st AF
25L6G-Power
25Z5-Rect.



Models
975
979
988

6K8GT- Converter
6D6- I.F.
6Q7GT-2nd Det-AVC-1st AF
25L6G-Power
25Z6GT-Rect.



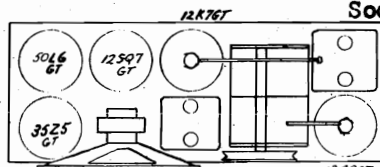
Model M-66,
also as M-77 (without push-buttons)

MODELS M-66,M-77
MODELS 400,401
MODELS 402,403,406
MODELS 404,405,408

AUTOMATIC RADIO MFG. CO., INC.

MODELS 440 to 444, 446
MODELS 448,
450, 452, 454
MODEL 480
Socket Layouts

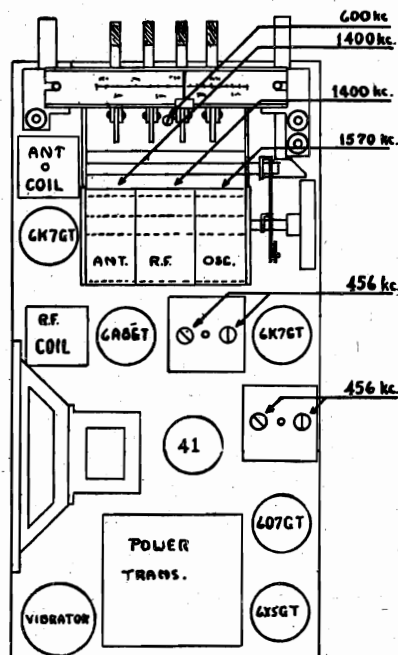
TUBE LOCATION CHART —



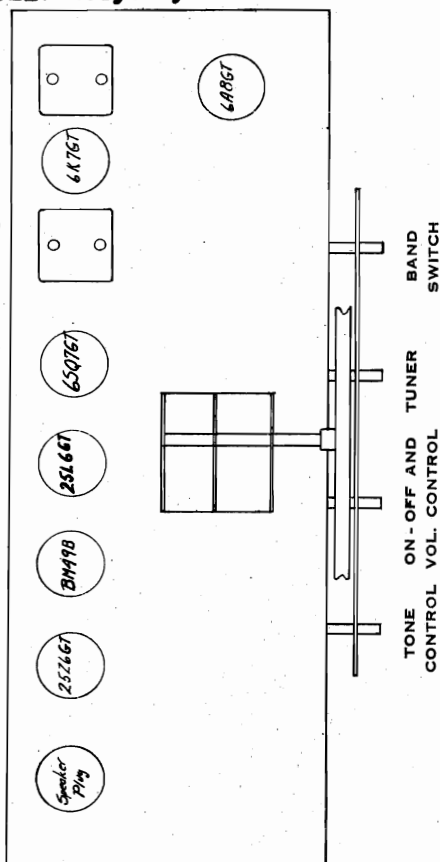
MODELS 402-403-406

MODELS M66 & M77

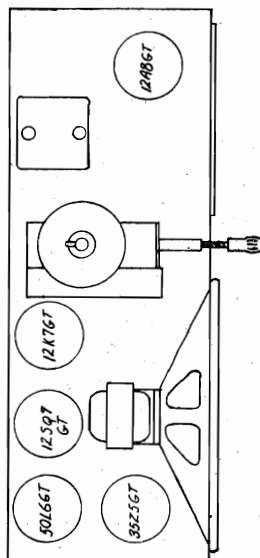
VOLUME PUSHBUTTONS MANUEL



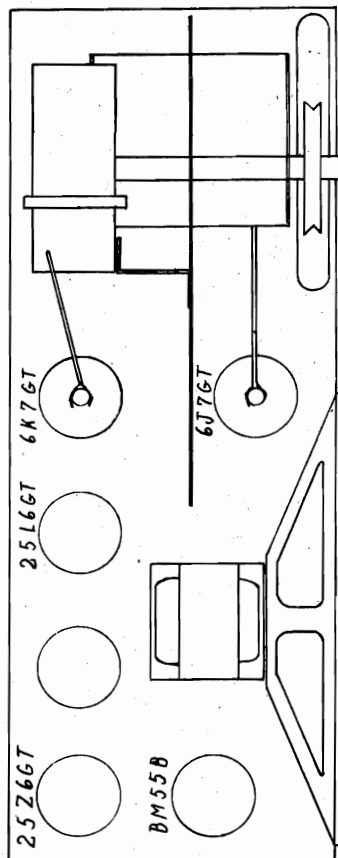
TUBE LOCATION—MODEL 480



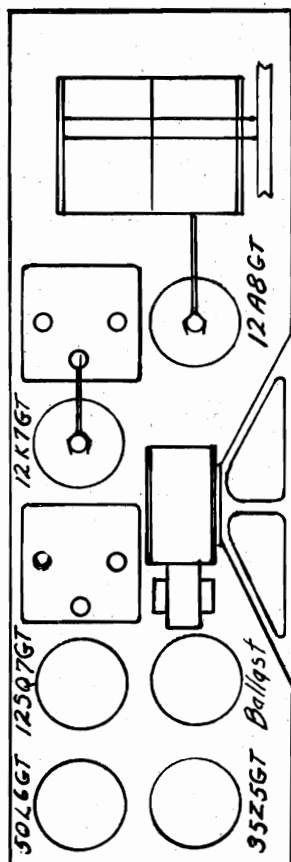
TUBE LOCATION CHART — MODELS 404-405-408



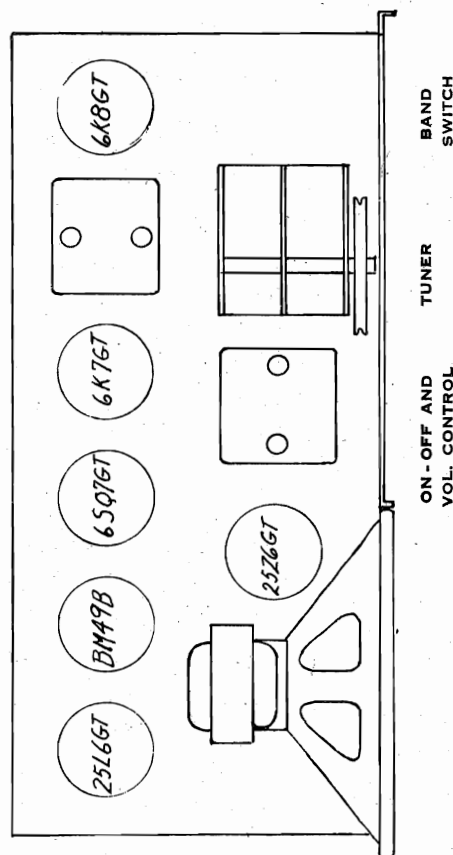
TUBE LOCATION CHART — MODELS 400-401



TUBE LOCATION — MODELS 440-441-442-443-444-446

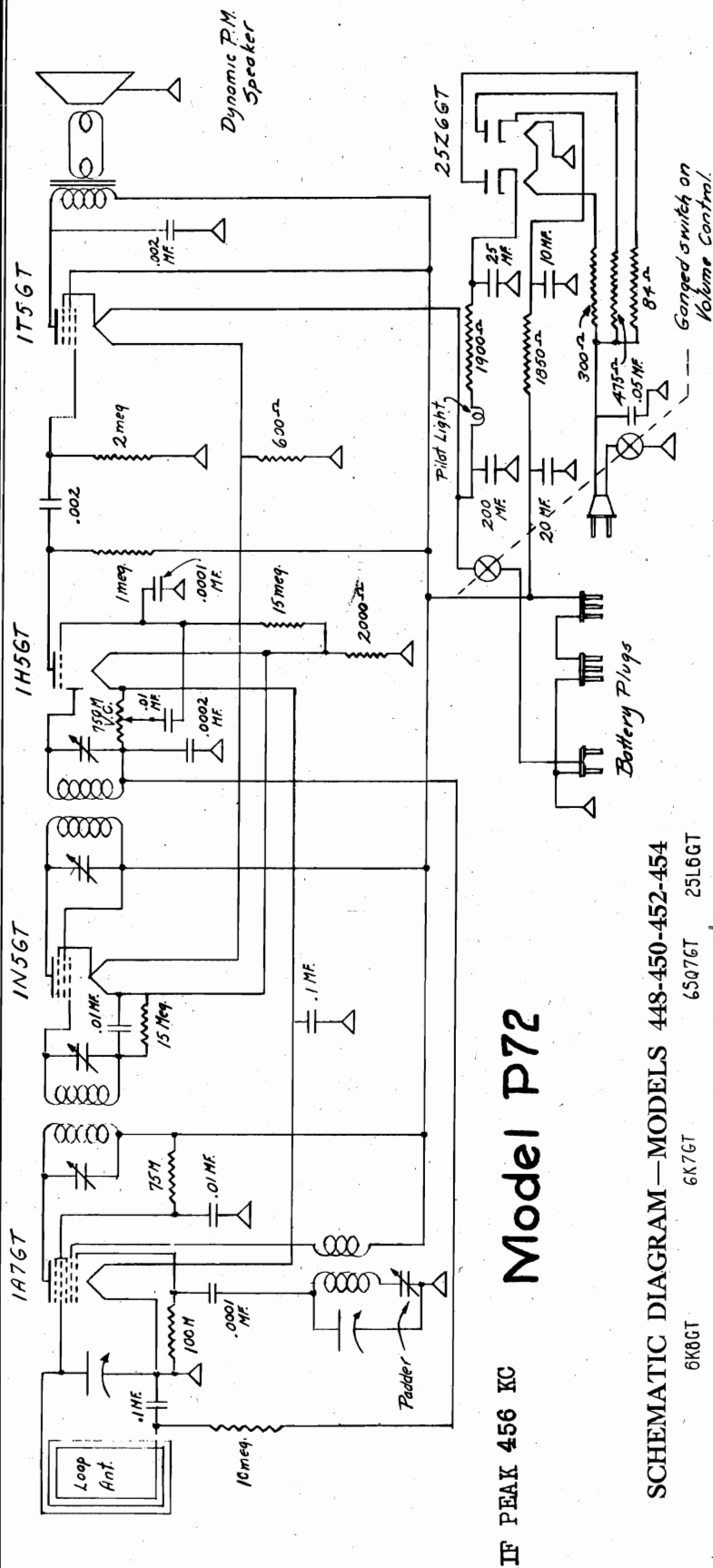


TUBE LOCATION—MODELS 448-450-452-454



AUTOMATIC RADIO MFG. CO. INC.

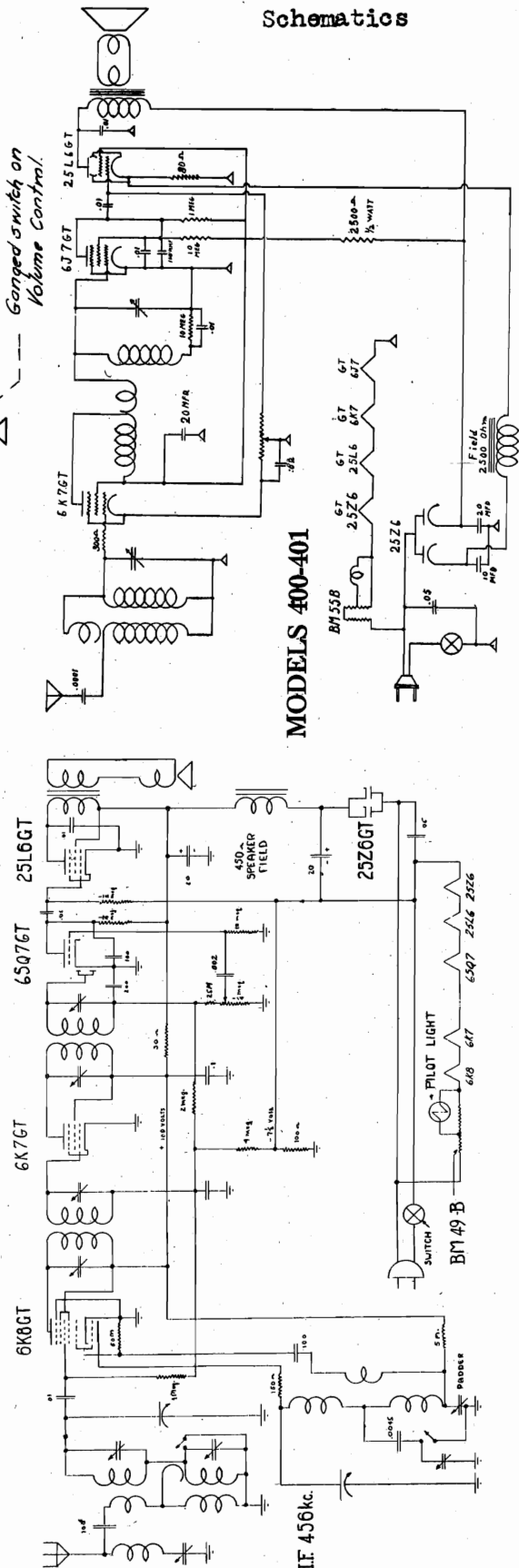
MODEL P72
MODELS 400, 401
MODELS 448, 450, 452
454
Schematics



Model P72

IF PEAK 456 KC

SCHEMATIC DIAGRAM—MODELS 448-450-452-454



MODELS 400-401

MODELS 402 to 406, 408

MODELS 440, 441, 444 AUTOMATIC RADIO MFG. CO., INC.

MODELS 442, 443, 446

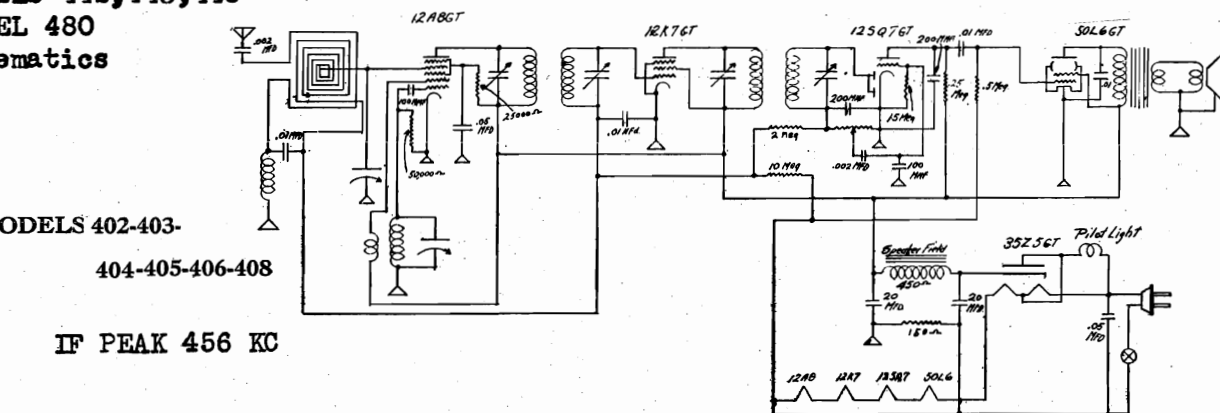
MODEL 480

Schematics

MODELS 402-403-

404-405-406-408

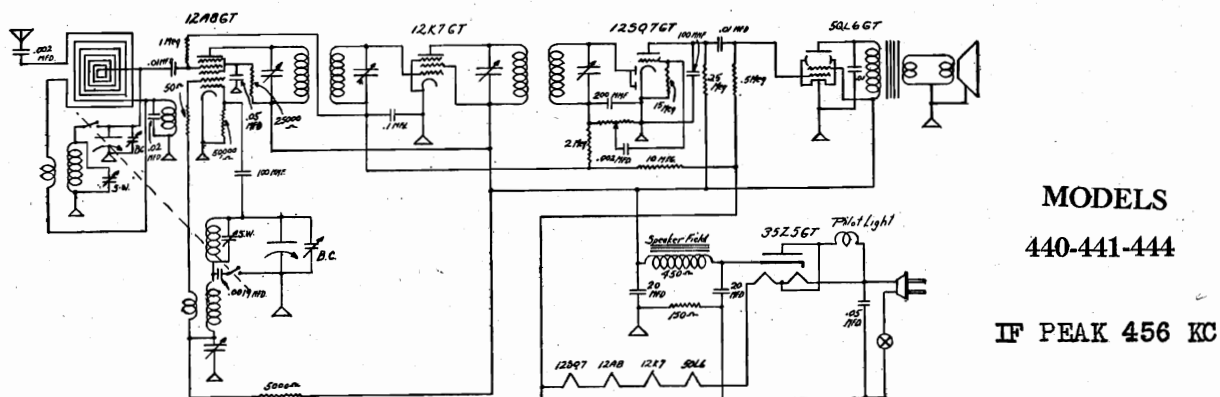
IF PEAK 456 KC



MODELS

440-441-444

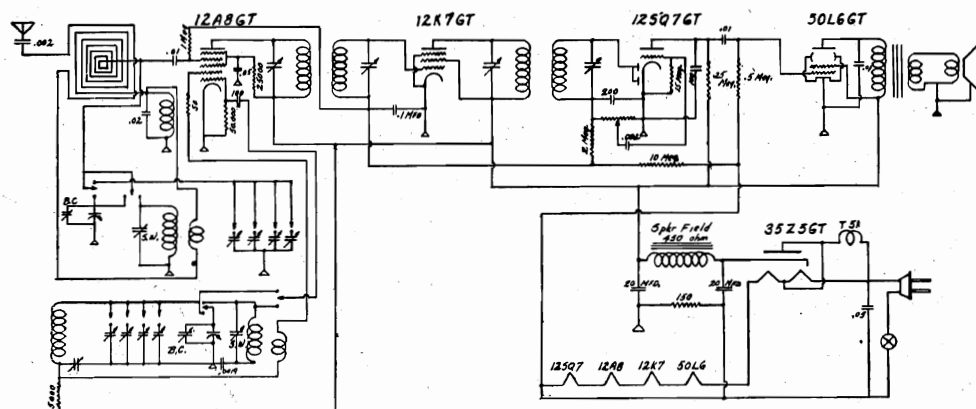
IF PEAK 456 KC



MODELS

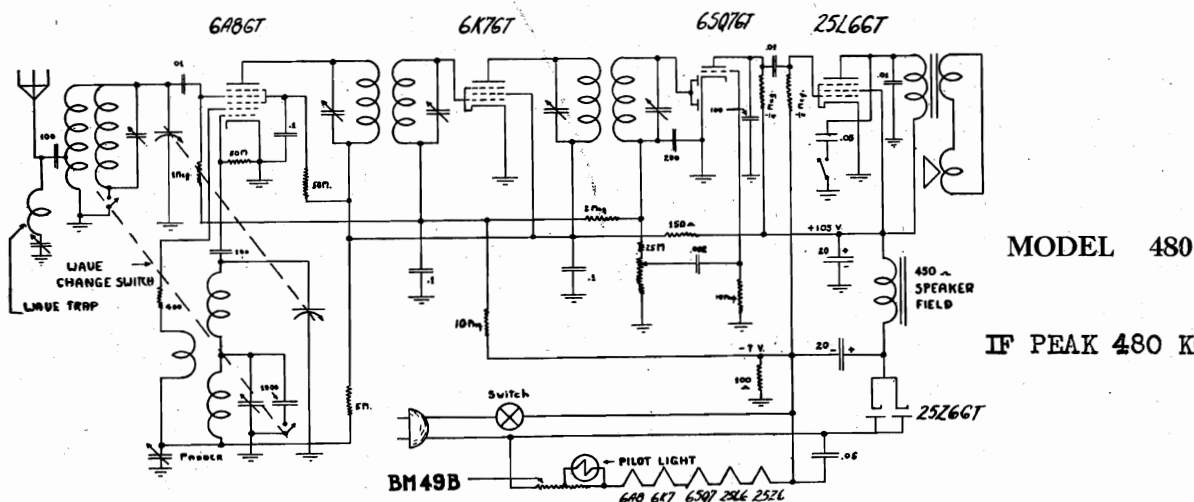
442-443-446

IF PEAK 456 KC



MODEL 480

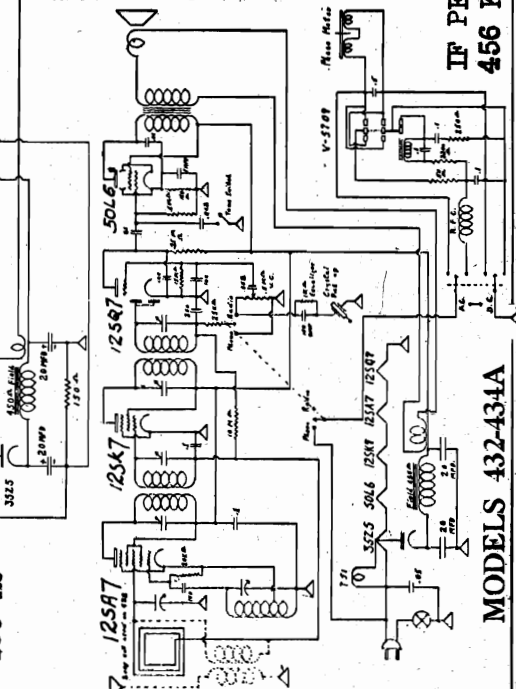
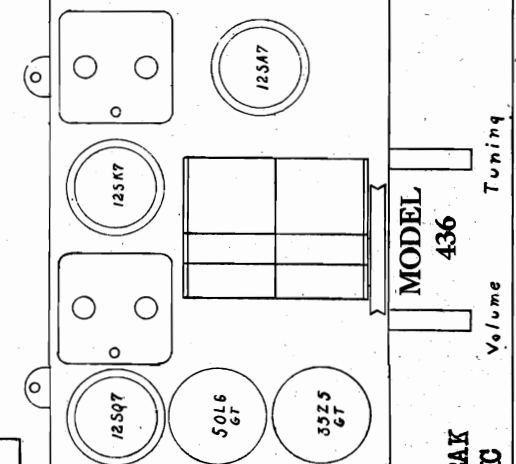
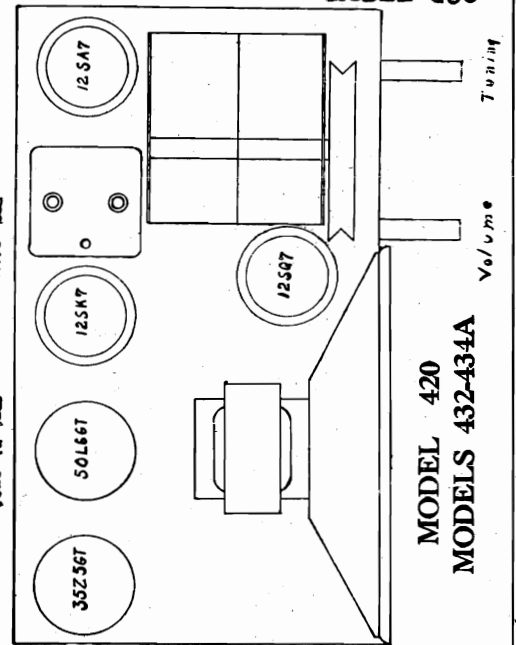
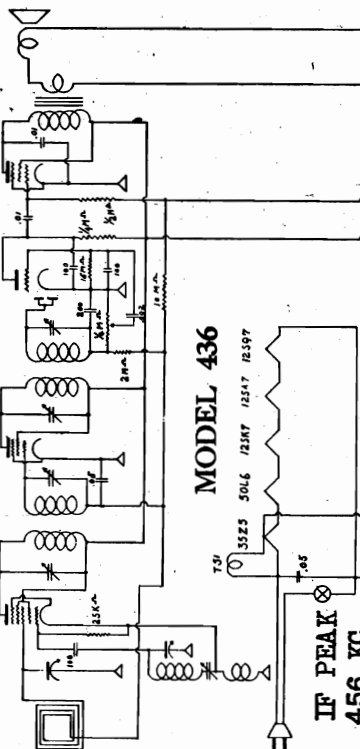
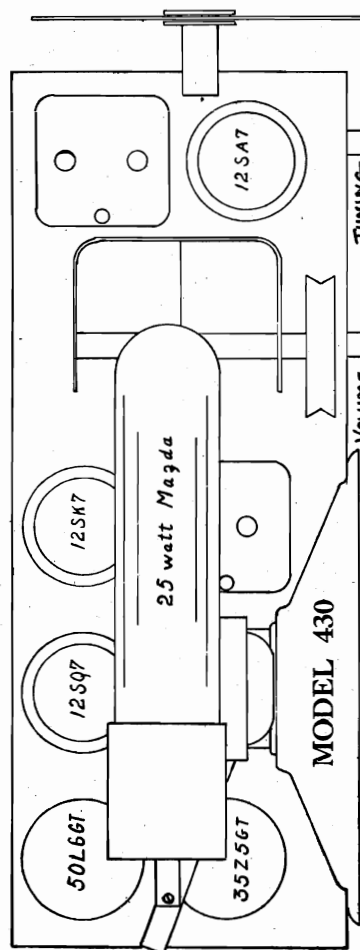
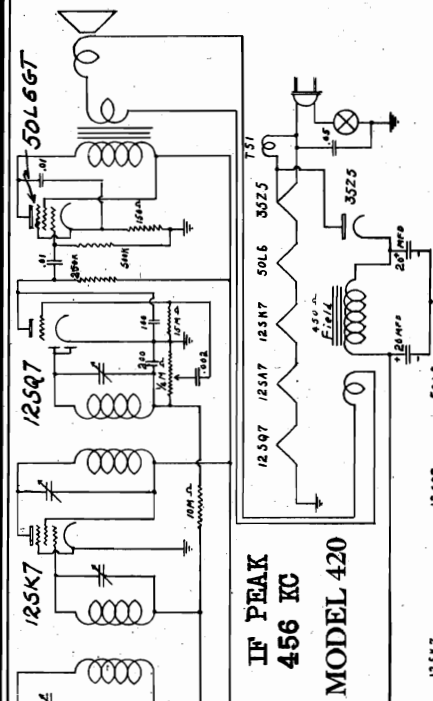
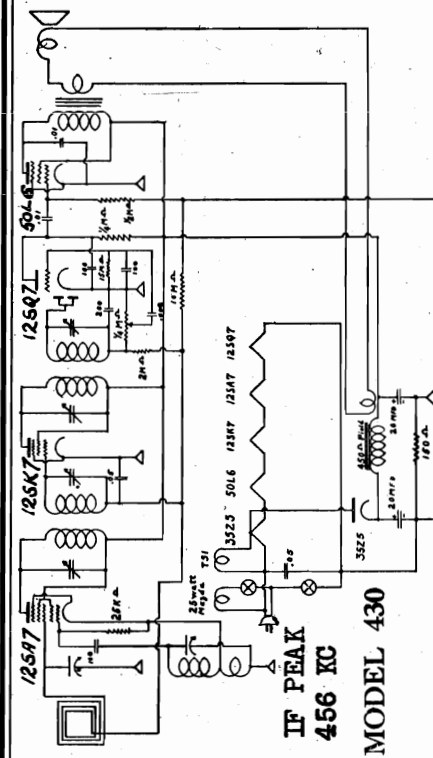
IF PEAK 480 KC



MODELS 432, 434A
MODEL 436
Schematics, Socket

AUTOMATIC RADIO MFG. CO., INC.

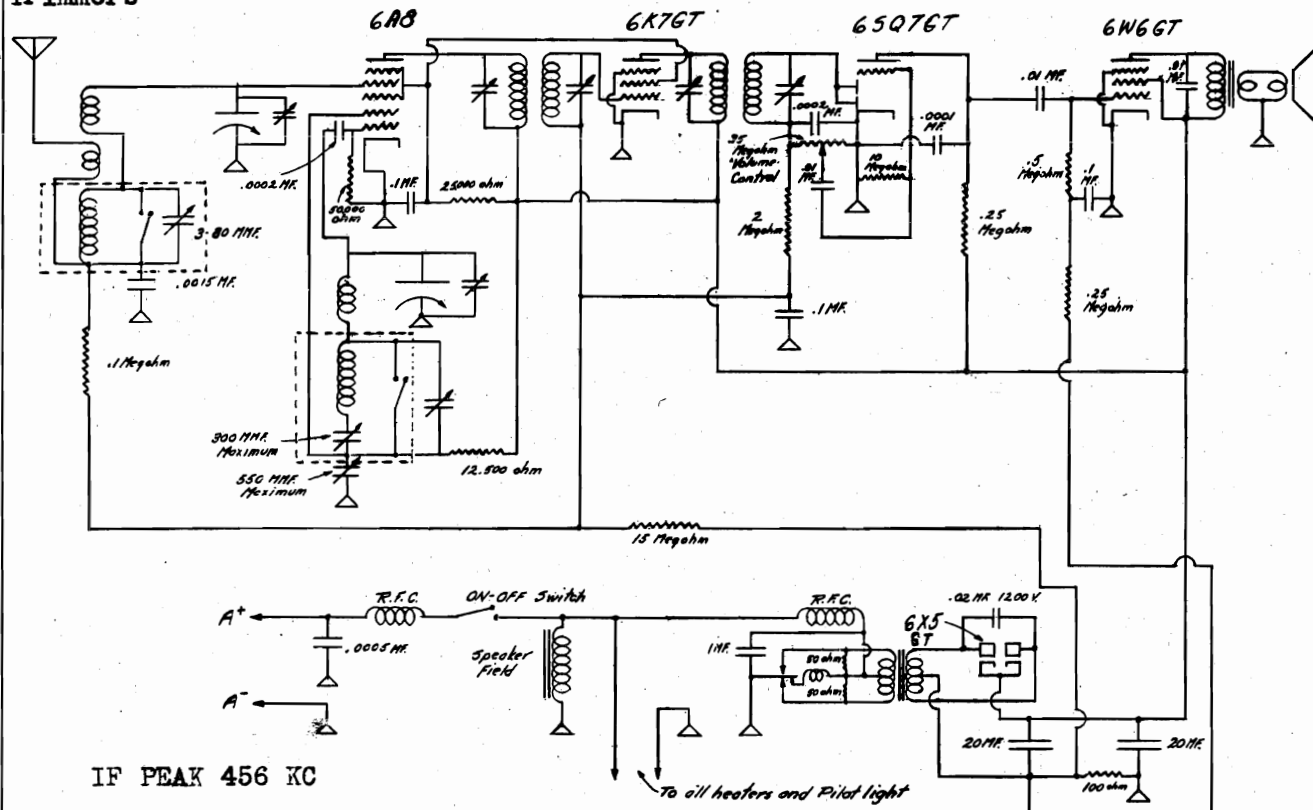
MODEL 420
MODEL 430



MODEL 911

Schematic, Alignment Trimmers

AUTOMATIC RADIO MFG. CO., INC.



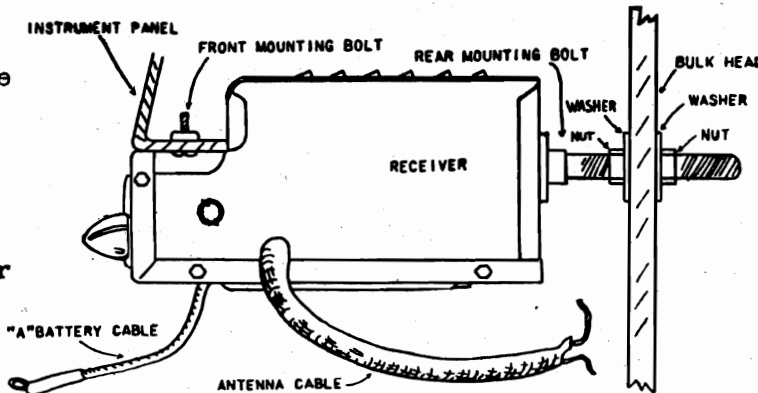
ALIGNMENT AND TRIMMER LOCATIONS

IF. Connect signal lead at 456 KC to the 6A8 control grid. Connect output meter across secondary of speaker output transformer. With weakest signal necessary to obtain .5 volt deflection on the output meter, peak the trimmers on the first and second IF transformers.

RF. Align intermediate band first. Follow procedure carefully. Connect a 200 mmf. condenser in series with the signal lead to the antenna terminal of the receiver. Turn the band switch counter-clockwise to the intermediate band position. Adjust oscillator trimmer located at the rear of the variable condenser, to 1560 KC with the variable condenser set at mechanical zero. Pad lower section of the dual pad-der, located under the composite coil, to 600 KC. Trim antenna section (front) of the variable condenser at 1400 KC.

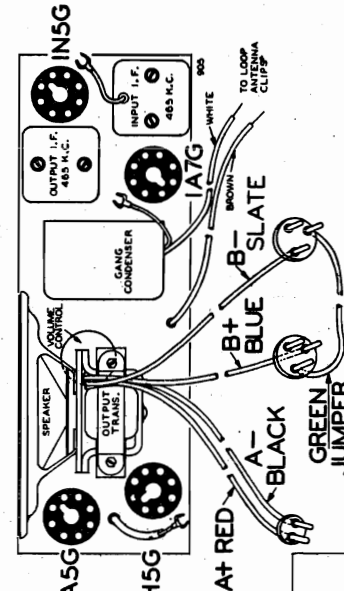
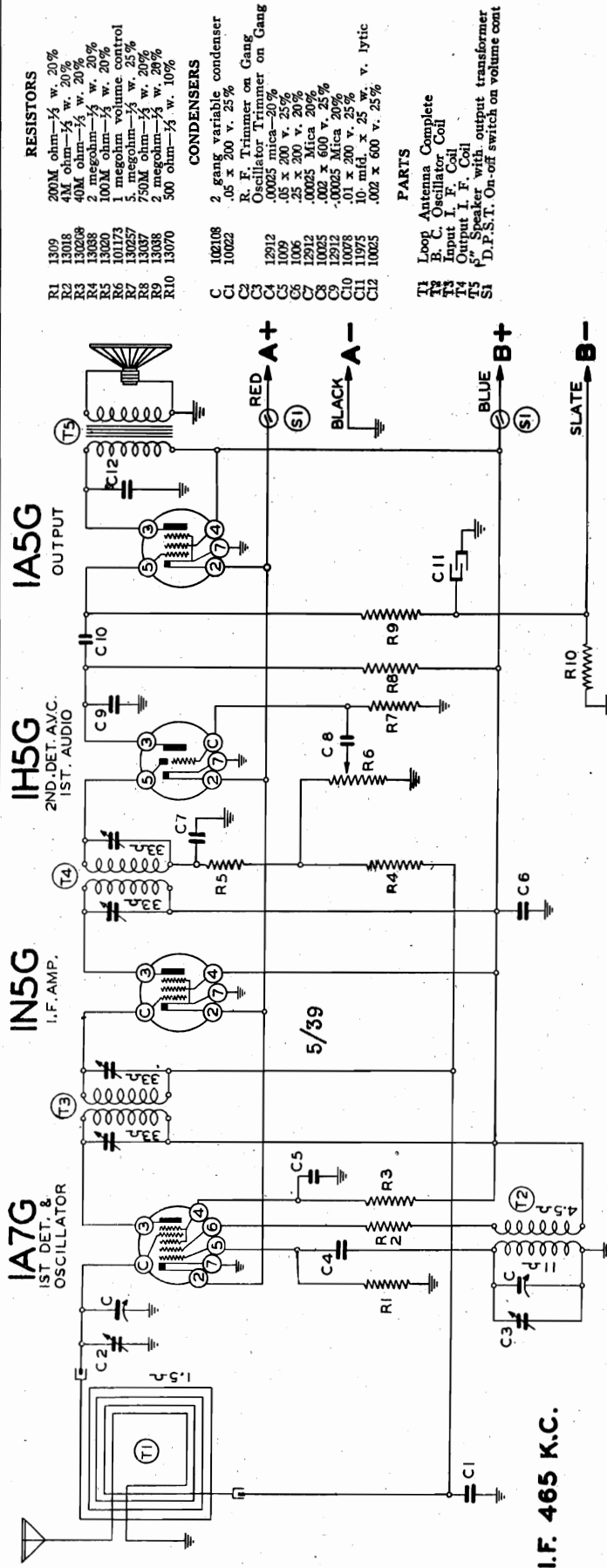
Turn wave switch to the clockwise or long wave position. Adjust oscillator trimmer mounted on the wave switch to 346 KC with the variable condenser set at mechanical zero. Pad upper section of the dual padder at 149 KC. Adjust antenna trimmer to 300 KC through hole on top of the antenna coil.

When installed in an automobile best results will be had on the long wave band if the trimmer is readjusted. Tune in some station near 900 meters; remove the plug located on the right hand side of the receiver; insert a screwdriver into the trimmer condenser slot; and rotate slowly in either direction until best results are obtained.



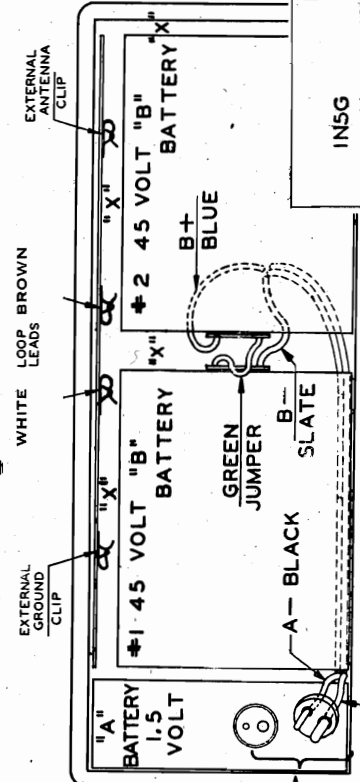
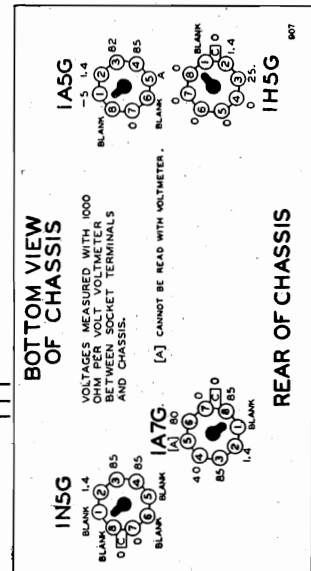
BELMONT RADIO CORP.

MODEL 407

 Schematic, Voltage, Socket
Trimmers, Alignment


When aligning IF and Osc. - disconnect loop and connect 1 meg. resistor bet. loop leads from chassis. Trim osc. at 1650 Kc. To align loop, reconnect same and remove 1 meg. resistor. Trim at 1400 KC.

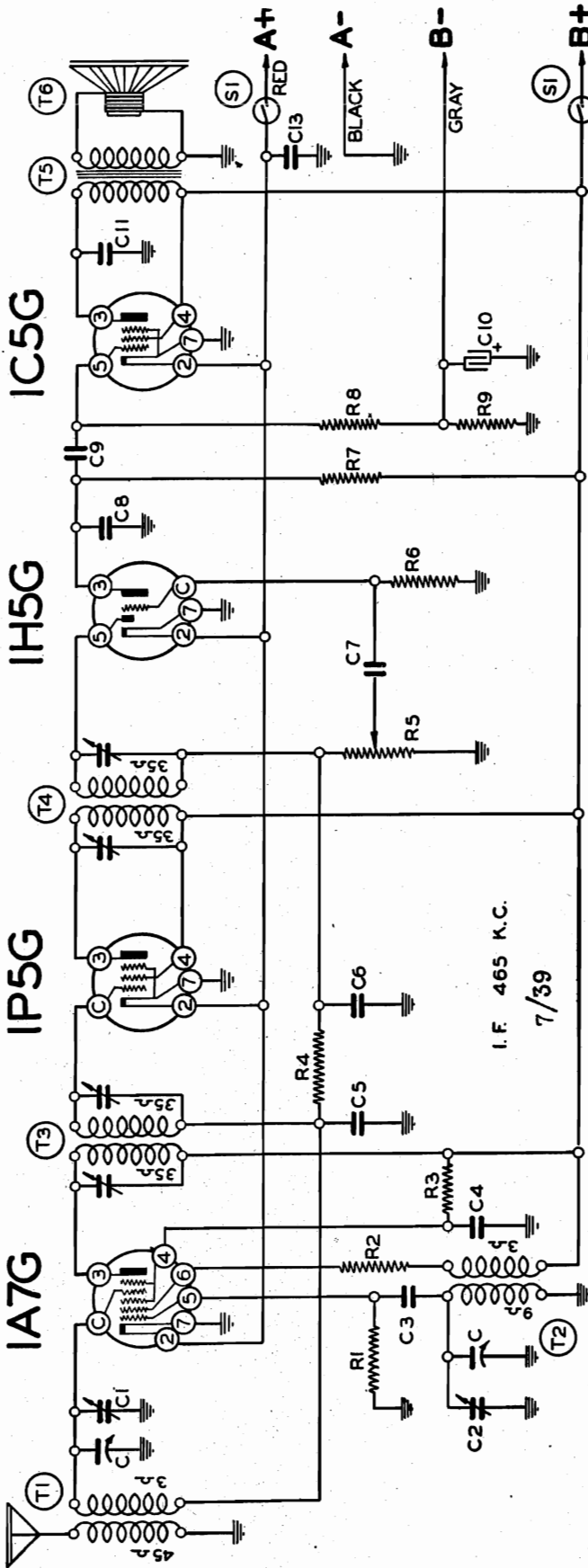
At right-
Top View
of
Chassis



NOTE: The "A" battery should be placed in the cabinet so that the plug-in socket on the top of the battery is nearer to the side of the cabinet which is faced down than to the side of the cabinet which is facing up. Also, the "A" battery should be pushed all the way into the cabinet so that it fits between the left end of the radio chassis and the side of the cabinet.

MODEL 460, Series A
Schematic, Voltage, Socket
Trimmers, Alignment

BELMONT RADIO CORP.



RESISTORS

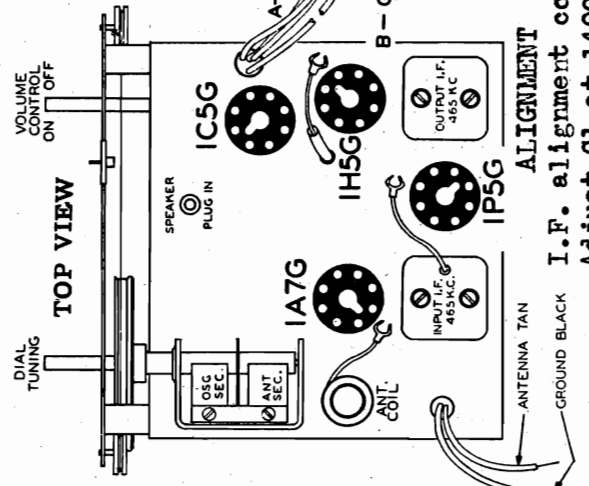
| | |
|----|----------------------------|
| R1 | 200M ohm- $\frac{1}{2}$ w. |
| R2 | 40M ohm- $\frac{1}{2}$ w. |
| R3 | 40M ohm- $\frac{1}{2}$ w. |
| R4 | 3 megohm- $\frac{1}{2}$ w. |
| R5 | 1 megohm volume control |
| R6 | 5 megohm- $\frac{1}{2}$ w. |
| R7 | 500M ohm- $\frac{1}{2}$ w. |
| R8 | 1 megohm- $\frac{1}{2}$ w. |
| R9 | 700 ohm- $\frac{1}{2}$ w. |

CONDENSERS

| | |
|-----|----------------------------|
| C1 | 2 gang variable condenser |
| C2 | Antenna Trimmer on gang |
| C3 | Oscillator trimmer on gang |
| C4 | .00025 mica |
| C5 | .05 x 200 v. |
| C6 | .05 x 200 v. |
| C7 | .0001 mica |
| C8 | .003 x 600 v. |
| C9 | .001 mica |
| C10 | .01 x 400 v. |
| C11 | 10 mid. x 25 w. v. |
| C12 | .003 x 600 v. |
| C13 | .25 x 200 v. |
| C14 | .1 x 200 v. |

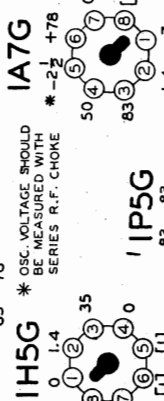
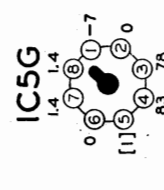
PARTS

| | |
|----|---------------------------------|
| T1 | Antenna Coil |
| T2 | Oscillator Coil |
| T3 | Input I. F. - 465 kc. |
| T4 | Output I. F. - 465 kc. |
| T5 | Output Transformer |
| T6 | 5 in. P. M. Speaker |
| S1 | Off-on switch on Volume control |



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH
1000 OHM PER VOLT VOLTMETER
BETWEEN SOCKET TERMINALS
AND CHASSIS

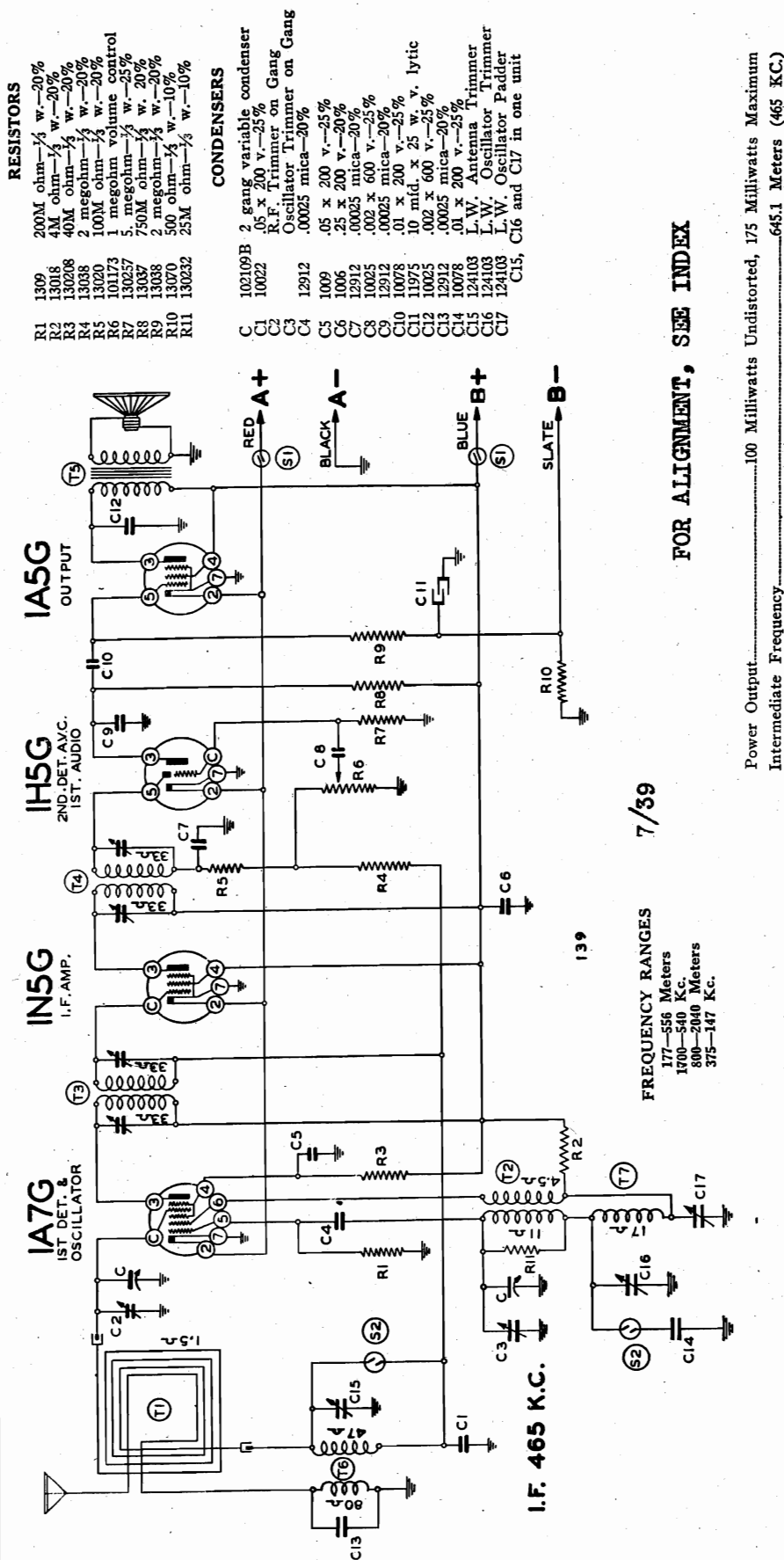


NOTE: ABOVE VOLTAGES ARE
TAKEN WITH A FULL
90 V. 'B' BATTERY AND
1.5 V. 'A' BATTERY

REAR OF CHASSIS

ALIGNMENT
I.F. alignment conventional
Adjust C1 at 1400 kc
Adjust C2 at 1730 kc

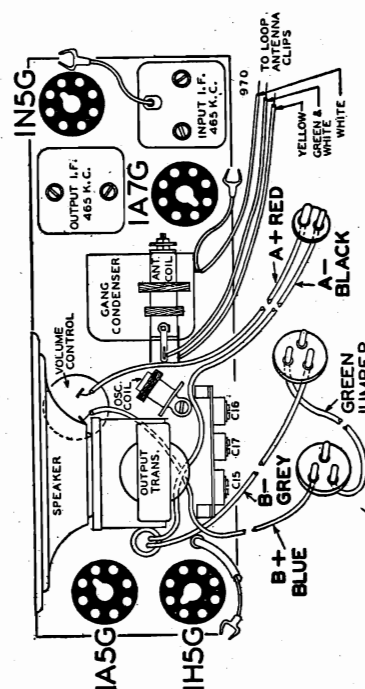
BELMONT RADIO CORP.

MODEL 411, Series A
Schematic, Voltage
Socket, TrimmersBOTTOM VIEW
OF CHASSIS

VOLTAGES MEASURED WITH 1000
OHM PER VOLT VOLTMETER
BETWEEN SOCKET TERMINALS
AND CHASSIS.

[A] CANNOT BE READ WITH VOLTMETER.

REAR OF CHASSIS



MODEL 411, Series A
MODEL 510, Series A
Alignment
BELMONT RADIO CORP.

The alignment procedures for Belmont Model 411, Series A, and Model 510, Series A, are given below. Note "C" for Model 411 applies also to Models 407, 635, Series A, and 636, Series A and B.

MODEL 411 (Series A)

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Position of Band Switch | Condenser Setting | Variable Setting | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|------------------------|--|------------------|------------------------|----------------------------|---|---|--|---------------------------|--|
| I. F. | 465 Kc. | .1 MFD. | Grid of 1A7G Tube | "M.W." | Rotor full open (Plates out of mesh) | Rotor full open (Plates out of mesh) | Four trimmers on top (See Fig. 1) | Output and input I. F. | (See Note "A") Adjust to maximum output |
| MEDIUM WAVE BAND | 1700 Kc. | .1 MFD. | Grid of 1A7G Tube | "M.W." | Rotor full open (Plates out of mesh) | Rotor full open (Plates out of mesh) | Trimmer (C3) front sec- tion of gang (See Fig. 4) | Medium Wave Oscillator | (See Note "A") Adjust to maximum output |
| | 1400 Kc. | | See Note "C" | "M.W." | Set dial at 1400 Kc. | Set dial at 1400 Kc. | Trimmer (C2) rear sec- tion of gang (See Fig. 4) | Antenna | (See Note "B") Adjust to maximum output |
| LONG WAVE BAND | 375 Kc. | | See Note "C" | "L.W." | Rotor full open (Plates out of mesh) | Rotor full open (Plates out of mesh) | Trimmer (C16) | Long Wave Oscillator | Adjust to maximum output |
| | 375 Kc. | | See Note "C" | "L.W." | Rotor full open (Plates out of mesh) | Rotor full open (Plates out of mesh) | Trimmer (C15) | Antenna | Adjust to maximum output |
| | 150 Kc. | | See Note "C" | "L.W." | Set dial at 150 Kc. | Set dial at 150 Kc. | Trimmer (C17) | Long Wave Osc. Pad. | Adjust to maximum rock dial. (See note "D") |

TEST FREQUENCIES USED:

| Kilocycles | Meters |
|------------|--------|
| 465 | 645.1 |
| 150 | 2000 |
| 375 | 800 |
| 1400 | 214 |
| 1700 | 177 |

NOTE "A"—A 1 megohm resistor must be connected between the two loop antenna leads from the chassis when aligning the I. F. transformers and setting the oscillator trimmer, (C3). The loop antenna must be disconnected from the chassis.

NOTE "B"—Remove the 1 megohm resistor from the loop antenna leads; mount the chassis and the loop antenna in the cabinet, connect the loop antenna to the chassis. Adjust trimmer (C2). (See note "C").

NOTE "C"—Lay the output lead from the signal generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the signal generator.

NOTE "D"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

MODEL 510 (Series A)

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Position of Iron Cores (Dial Setting) | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|------------------------|--|------------------|---------------------------|--|--|----------------------------|--|
| I. F. | 465 Kc. | .1 MFD. | Terminal "P" (See Fig. 4) | Iron Cores All the way out | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Terminal "B" (See Fig. 4) | Iron Cores All the way out | Two trimmers on top (See Fig. 1) | Input I. F. | Adjust to maximum output |
| BROAD- CAST BAND | 1720 Kc. | .1 MFD. | Terminal "P" (See Fig. 4) | Iron Cores All the way out | Trimmer (C6) | Oscillator | Adjust to maximum output |
| | 1720 Kc. | 200 MMF. | Terminal "A" (See Fig. 4) | Iron Cores All the way out | Trimmer (C3) | Antenna | Adjust to maximum output (See Note "A") |
| | 1400 Kc. | 200 MMF. | Terminal "A" (See Fig. 4) | Turn Dial to 1400 Kc. | Adjust position of antenna coil up or down (see Fig. 4) | Antenna Coil Adjustment | Adjust to maximum output |
| | 1720 Kc. | 200 MMF. | Terminal "A" (See Fig. 4) | Turn Dial to 1720 Kc. | Adjust trimmer (C3) (See Fig. 3) | Antenna | Check for tracking (See Note "B") |

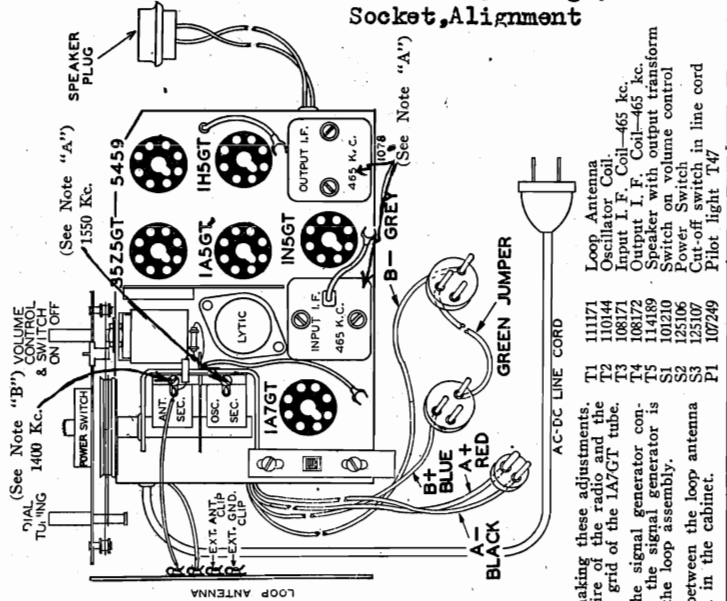
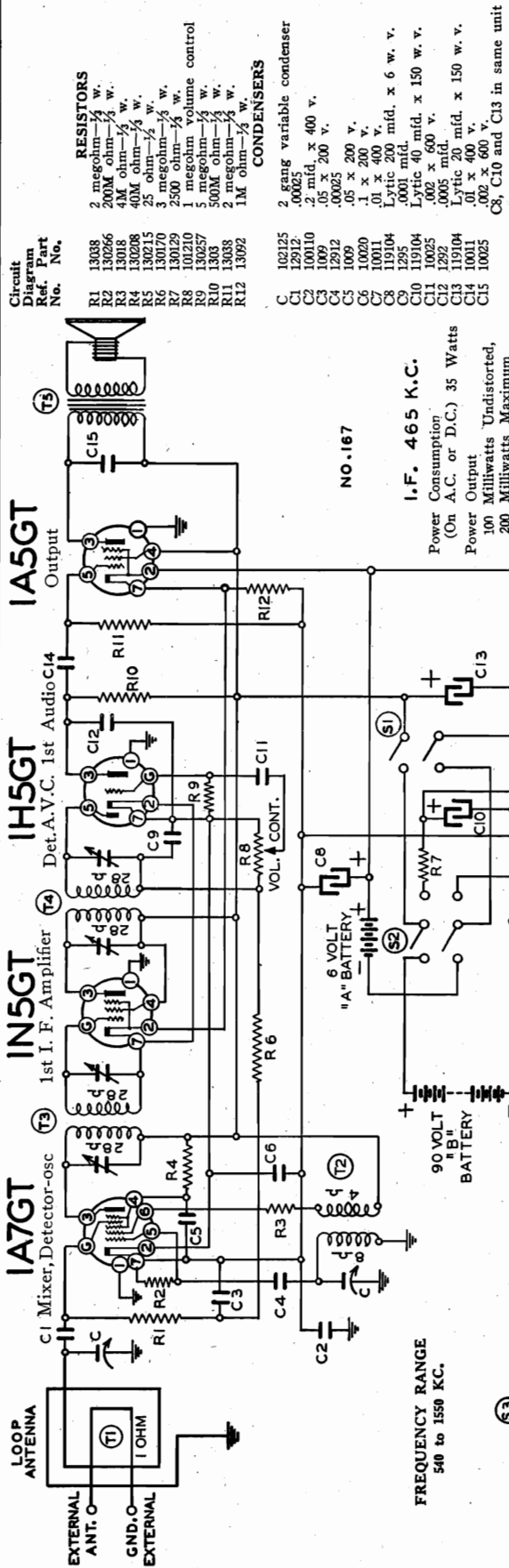
NOTE "A"—The antenna coil assembly is made so that it is movable up or down. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by turning the adjusting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

Connect -B of radio chassis to ground post
of signal generator through .1 mf condenser.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna coil (C3) adjustment again at 1720 Kc. If an appreciable change in trimmer adjustment is made the coil is in track. If the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

BELMONT RADIO CORP.

MODELS 507, 513, Series A
Serial 211,300 and up
Schematic, Voltage, Trimmers
Socket, Alignment



MODELS 507 and 513 SERIES A (SERIAL No. 211,300 and UP)

Rectifier
tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. All voltages are indicated on the voltage chart.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

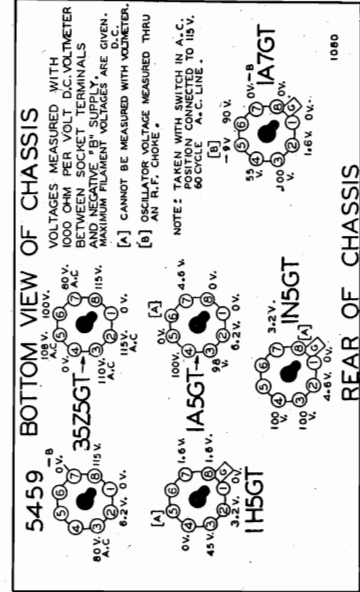
The approximate current consumption is as follows:
"A"—50 ma., "B"—8 ma.

ALIGNMENT NOTES

NOTE "A"—The loop antenna need not be connected to the radio when making these adjustments. The ground of the signal generator is connected to the negative "B" wire of the radio and the other lead from the signal generator in series with 1 MFD. dummy to the grid of the 1A7GT tube.

NOTE "B"—This adjustment should be made with the ground lead of the signal generator connected to the ground terminal of the loop assembly. The other lead of the signal generator is connected in series with a 200 Mmi. dummy to the antenna terminal of the loop assembly.

It is important when making this adjustment that the same distance between the loop antenna and the chassis be maintained as when the chassis and loop are installed in the cabinet.



SERVICE NOTES

Voltages taken from different points of circuit to chassis are measured with volume control full on, all

MODEL 510, Series A
Schematic, Voltage
Socket, Trimmers

BELMONT RADIO CORP.

RESISTORS

| | | |
|-----|--------|----------------------------|
| R1 | 130176 | 20M ohm— $\frac{1}{2}$ w. |
| R2 | 130100 | 150M ohm— $\frac{1}{2}$ w. |
| R3 | 130279 | 1M ohm—1 watt |
| R4 | 1304 | 3 megohm— $\frac{1}{2}$ w. |
| R5 | 101196 | 500M ohm volume control |
| R6 | 130293 | 30 ohm—1 watt |
| R7 | 130257 | 5 megohm— $\frac{1}{2}$ w. |
| R8 | 130288 | 50 ohm—1.5 watt |
| R9 | 1302 | 75M ohm— $\frac{1}{2}$ w. |
| R10 | 13011 | 250M ohm— $\frac{1}{2}$ w. |
| R11 | 130166 | 150 ohm— $\frac{1}{2}$ w. |

CONDENSERS

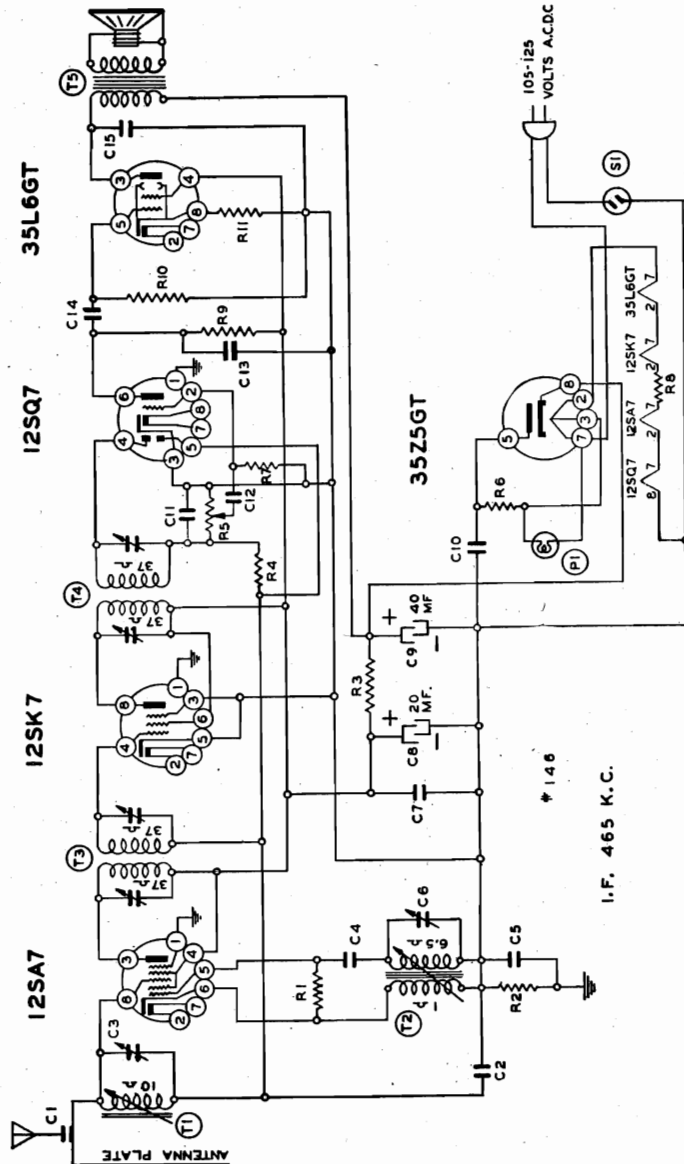
| | | |
|-----|--------|--|
| C1 | 131262 | .00001 washer condenser (on Antenna plate) |
| C2 | 10022 | .05 x 200 v. |
| C3 | 124100 | Antenna Trimmer |
| C4 | 12930 | .00005 Mica |
| C5 | 10091 | .15 x 400 v. |
| C6 | 124100 | Oscillator Trimmer |
| C7 | 10022 | .05 x 200 v. |
| C8 | 11992 | 20 mfd. x 150 v. lytic |
| C9 | 11992 | 40 mfd. x 150 v. lytic |
| C10 | 10013 | .05 x 400 v. |
| C11 | 12912 | .00025 mica |
| C12 | 10025 | .002 x 600 v. |
| C13 | 1292 | .0005 mica |
| C14 | 10011 | .01 x 400 v. |
| C15 | 10011 | .01 x 400 v. |

C3 and C6 in one unit.
C8 and C9 in one unit.

FOR ALIGNMENT, SEE INDEX

PARTS

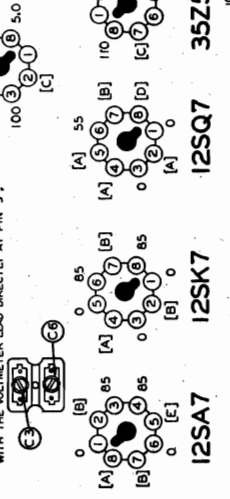
| | | |
|----|---------|----------------------------------|
| T1 | 111136B | Antenna Coil Complete |
| T2 | 110126B | Oscillator Coil |
| T3 | 108157C | Input I. F. Coil—465 kc. |
| T4 | 108157C | Output I. F. Coil—465 kc. |
| T5 | 114170 | 4" P. M. Speaker and Transformer |
| SI | 101196 | Off-on switch on volume control |
| P1 | 107249 | 6-8 v. pilot light T-47 |



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM. PER
VOLT VOLTMETER BETWEEN SOCKET TERMINALS
AND B—

| | |
|-----|---|
| [A] | CANNOT BE READ WITH VOLTMETER |
| [B] | — 12V. A.C. BETWEEN PINS 2 & 7. |
| [C] | — 32V. A.C. BETWEEN PINS 2 & 7. |
| [D] | — 17V. A.C. BETWEEN PINS 2 & 6. |
| [E] | — 9 VOLTS. OSCILLATOR GRID VOLTAGE SHOULD BE MEASURED WITH AN A.F. CHOKE PLACED IN SERIES WITH THE GRID LEAD DIRECTLY AT PIN 5. |



REAR OF CHASSIS

FIG. 3.—BOTTOM VIEW

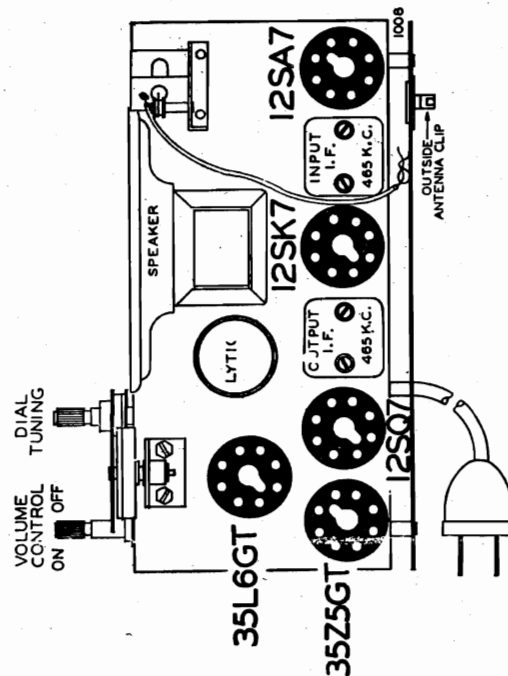
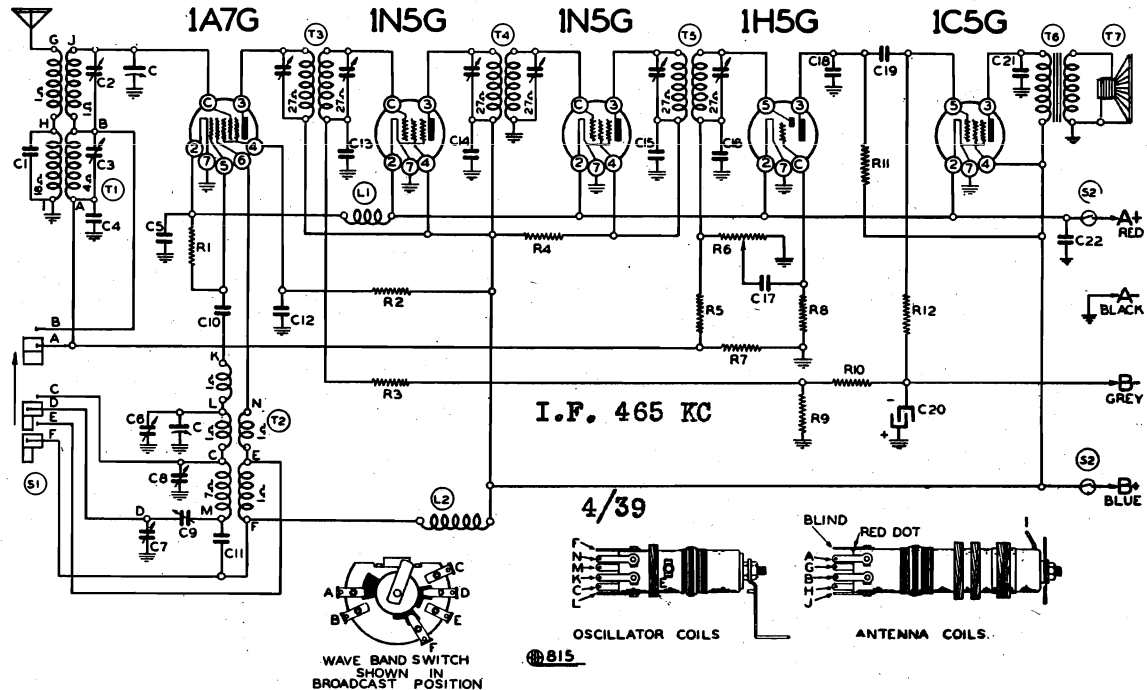


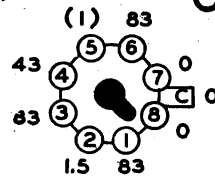
FIG. 1.—TOP VIEW

BELMONT RADIO CORP.

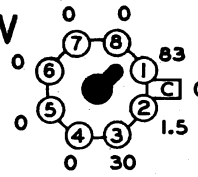
MODEL 511, Series A
Schematic, Voltage
Socket, Alignment



(Conv.) 1A7G BOTTOM VIEW
OF CHASSIS

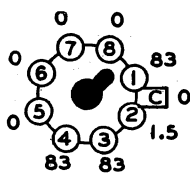


(2nd Det.) 1H5G
(AVC-AF)

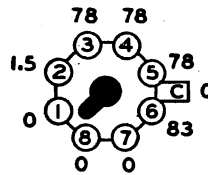


VOLTAGES MEASURED WITH 1000 OHM PER VOLT
VOLTMETER BETWEEN SOCKET TERMINALS & CHASSIS.

(1) CANNOT BE READ WITH VOLTMETER.



1N5G (I.F.)



1N5G (I.F.)

REAR OF CHASSIS

PARTS

| | | |
|----|--------|------------------------------------|
| T1 | 111117 | Antenna Coil Complete |
| T2 | 110106 | Oscillator Coil Complete |
| T3 | 108133 | Input I. F. 465 kc. complete |
| T4 | 108135 | Interstage I. F.—465 kc. complete |
| T5 | 108134 | Output I.F.—465 kc. complete |
| T6 | 114115 | 6" P. M. Speaker |
| L1 | 10568 | "A" Choke |
| L2 | 1233 | R. F. "B" Choke |
| S1 | 12573 | Wave Band Switch |
| S2 | | D.P. S.T. Switch on Volume Control |
| T7 | 10569 | Output Transformer |

ALIGNMENT

I.F. alignment conventional
SW- Trim 17 MC; pad 6MC
BB- Trim osc at 1750 kc
Trim ant. at 1400 kc
Pad at 600 kc

RESISTORS

| | |
|-----|----------------------------|
| R1 | 200M ohm— $\frac{1}{2}$ w. |
| R2 | 50M ohm— $\frac{1}{2}$ w. |
| R3 | 1 megohm— $\frac{1}{2}$ w. |
| R4 | 3M ohm— $\frac{1}{2}$ w. |
| R5 | 2 megohm— $\frac{1}{2}$ w. |
| R6 | 250M ohm—volume control |
| R7 | 4 megohm— $\frac{1}{2}$ w. |
| R8 | 1 megohm— $\frac{1}{2}$ w. |
| R9 | 180 ohm— $\frac{1}{2}$ w. |
| R10 | 450 ohm— $\frac{1}{2}$ w. |
| R11 | 500M ohm— $\frac{1}{2}$ w. |
| R12 | 1 megohm— $\frac{1}{2}$ w. |

CONDENSERS

| | |
|-----|-------------------------------------|
| C | 2 gang variable condenser |
| C1 | .0001 mica |
| C2 | S.W. Antenna Adj. Trimmer |
| C3 | B.C. Antenna Adj. Trimmer |
| C4 | .05 x 200 v. |
| C5 | .25 x 200 v. |
| C6 | S.W. Osc. Adj. Trimmer on gang |
| C7 | S.W. Adj. Series pad .003 w. c. |
| C8 | B.C. Osc. Adj. Trimmer |
| C9 | B.C. Adj. Series Pad 580 mmf. w. c. |
| C10 | .00005 mica |
| C11 | .05 x 200 v. |
| C12 | .1 x 200 v. |
| C13 | .05 x 200 v. |
| C14 | .25 x 200 v. |
| C15 | .1 x 200 v. |
| C16 | .00025 mica |
| C17 | .006 x 600 v. |
| C18 | .0002 mica |
| C19 | .01 x 400 v. |
| C20 | 20 mfd. lytic w. v. 25 v. |
| C21 | .004 x 600 v. |
| C22 | .25 x 200 v. |

MODEL 551B, Series A

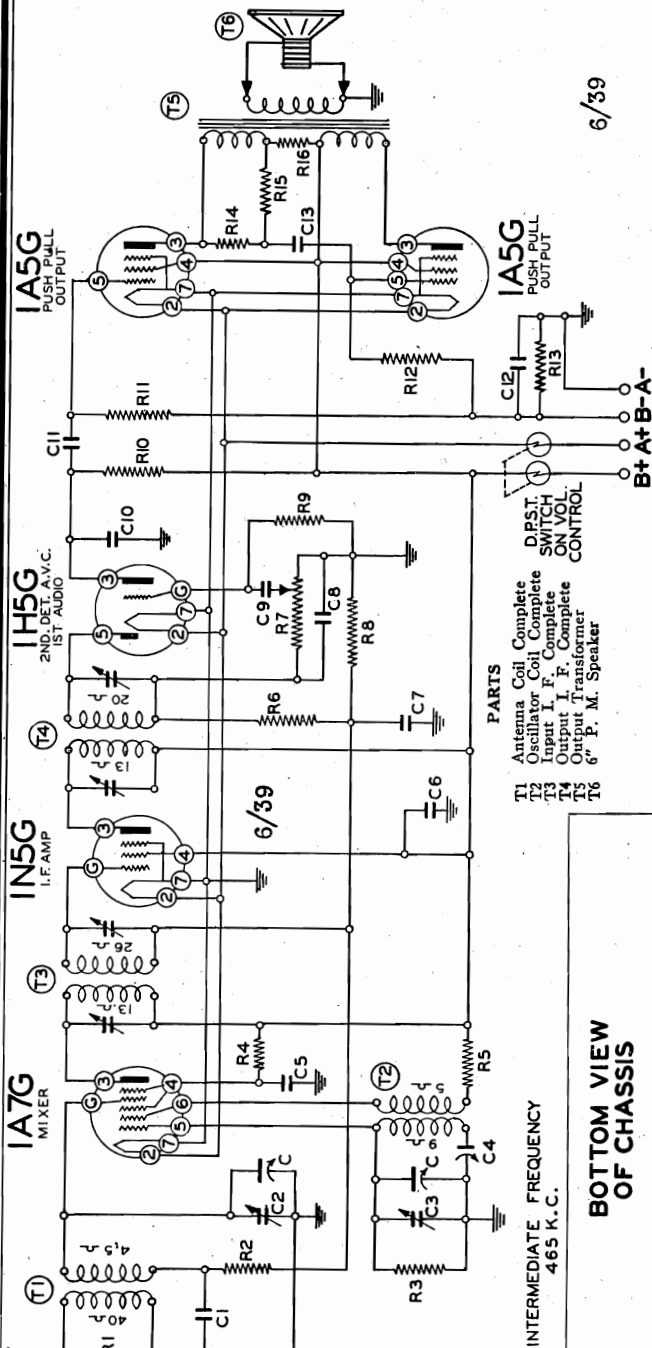
Issue B

Schematic, Voltage, Socket
Trimmers, Alignment

BELMONT RADIO CORP.

| RESISTORS | | CONDENSERS | |
|-----------|--------|--------------------------|----------|
| R1 | 13021 | 2 gang Variable | Condens. |
| R2 | 13020 | .05 x 200 v.-25% | |
| R3 | 1309 | Antenna Section | Trimmer |
| R4 | 130208 | Oscillator Section | Trimmer |
| R5 | 13071 | Series Pad | |
| R6 | 13038 | .5 x 120 v.-20% | |
| R7 | 101140 | .25 x 200 v. | |
| R8 | 13038 | .05 x 200 v. | |
| R9 | 13019 | .001 Mica | |
| R10 | 13037 | .002 Mica | |
| R11 | 13019 | .01 x 200 v. | |
| R12 | 13022 | 10 mid. x 25 volts-lytic | |
| R13 | 13022 | .01 x 200 v. | |
| R14 | 13022 | | |
| R15 | 13022 | | |
| R16 | 13024 | | |

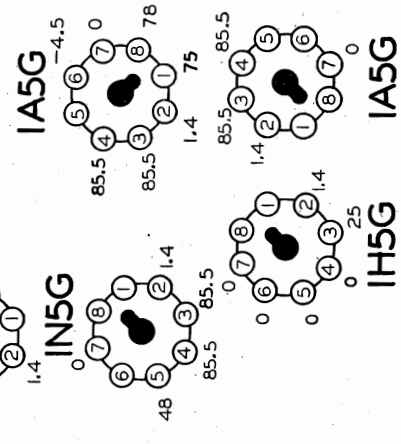
ALIGNMENT
I.F.-conventional
Trim osc at 1735 kc
Pad osc at 600 kc
Trim ant. at 1400 kc



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLT-METER BETWEEN SOCKET TERMINALS AND CHASSIS.

ANTENNA GROUNDED VOLUME CONTROL AT MINIMUM.



REAR OF CHASSIS

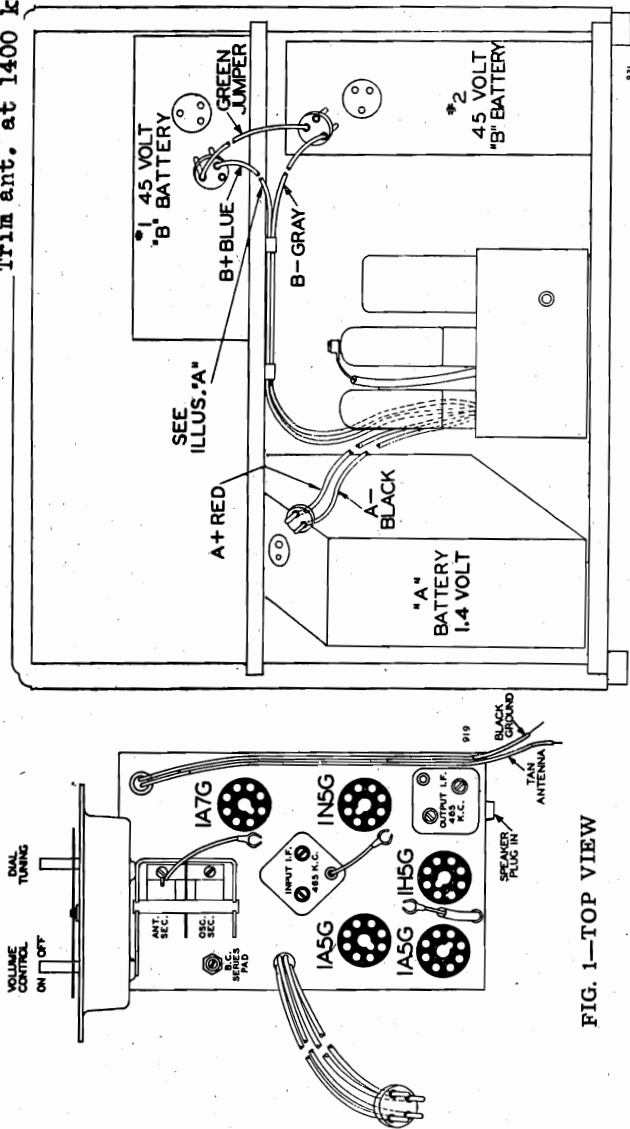


FIG. 1—TOP VIEW

Serial 9M259100 and up
Schematic, Voltage, Socket
Trimmers

BELMONT RADIO CORP. MODELS 539-415, etc. (Export)
Chassis 539, Series A

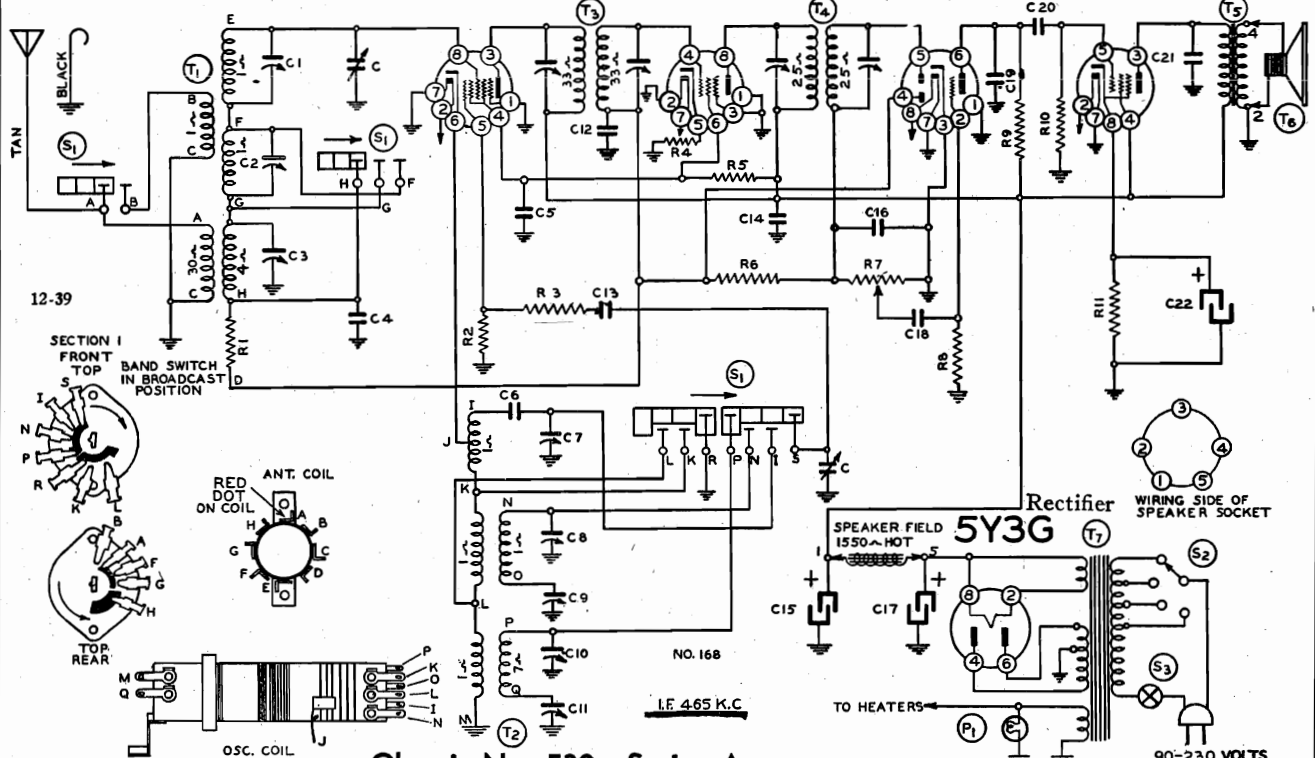
First Detector-Oscillator. I. F. Amplifier. Second Detector, A.V.C.
First Audio. Output Amplifier

6SA7

6SK7

6SQ7

6K6G



Ref. Part
No. No. Description
RESISTORS

| | | |
|-----|--------|-----------------------------|
| R1 | 13011 | 250M ohm— $\frac{1}{2}$ w. |
| R2 | 130194 | 35M ohm— $\frac{1}{2}$ w. |
| R3 | 130299 | 10 ohm— $\frac{1}{2}$ w. |
| R4 | 130239 | 250 ohm— $\frac{1}{2}$ w. |
| R5 | 130242 | 12M ohm—1 watt |
| R6 | 1304 | 3 megohm— $\frac{1}{2}$ w. |
| R7 | 101208 | 1 megohm volume control |
| R8 | 130223 | 10 megohm— $\frac{1}{2}$ w. |
| R9 | 13011 | 250M ohm— $\frac{1}{2}$ w. |
| R10 | 13019 | 1 megohm— $\frac{1}{2}$ w. |
| R11 | 13070 | 500 ohm— $\frac{1}{2}$ w. |

CONDENSERS

| | | |
|-----|--------|------------------------------------|
| C1 | 102124 | Two Gang Variable Condenser |
| C2 | 124124 | S. W. Antenna Trimmer |
| C3 | 124124 | M. W. Antenna Trimmer |
| C4 | 1009 | .05 x 400 v. |
| C5 | 1001 | .1 x 400 v. |
| C6 | 129153 | .006—S. W. Padder (Set at Factory) |
| C7 | 124123 | S. W. Oscillator Trimmer |
| C8 | 124123 | M. W. Oscillator Trimmer |
| C9 | 129154 | .0025 M. W. Padder |
| C10 | 124123 | B. C. Oscillator Trimmer |
| C11 | 129155 | B. C. Padder |
| C12 | 10026 | .02 x 400 v. |
| C13 | 1295 | .0001 Mica |
| C14 | 1001 | .1 x 400 v. |

| | | |
|-----|--------|--------------------------|
| C15 | 119103 | 40 mfd. lytic |
| C16 | 1295 | .0001 Mica |
| C17 | 119103 | 10 mfd. lytic |
| C18 | 10025 | .002 x 600 v. |
| C19 | 1292 | .0005 Mica |
| C20 | 10026 | .02 x 400 v. |
| C21 | 10071 | .004 x 600 v. |
| C22 | 119103 | 20 mfd. lytic x 25 w. v. |

C15, C17 and C22 in same unit

Chassis No. 539—Series A
(Serial No. 9M259100 and up)
For Models 539-415, Etc.

PARTS

| | | |
|----|---------|---|
| T1 | 111169 | Antenna Coil |
| T2 | 110143 | Oscillator Coil |
| T3 | 108169B | Input I. F. |
| T4 | 108170 | Output I. F. |
| T5 | 10575 | Output Transformer |
| T6 | 114176 | 6" Dynamic Speaker (1550 ohm field) |
| T7 | 104193 | Power Transformer 40-60 cycles 90-230 volts |
| S1 | 125105 | Band Switch |
| S2 | | Voltage Switch on Power Transformer |
| S3 | | Volume Control—On-Off switch |
| P1 | 10794 | Pilot Light Bulb T-44 |

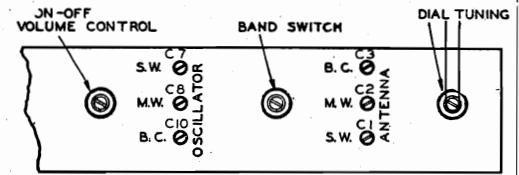


FIG. 3—FRONT OF CHASSIS

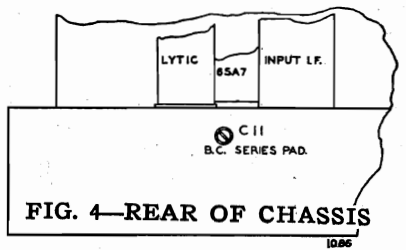
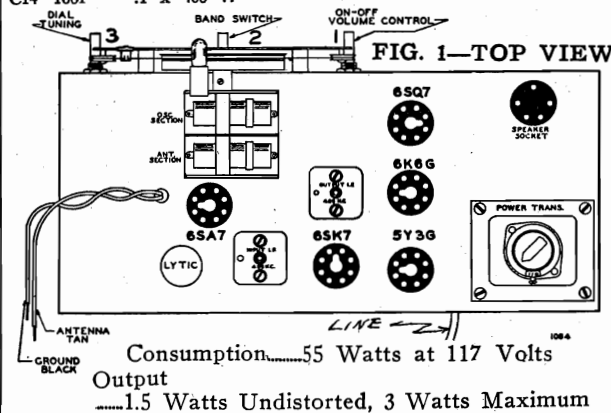


FIG. 4—REAR OF CHASSIS



Consumption.....55 Watts at 117 Volts

Output

.....1.5 Watts Undistorted, 3 Watts Maximum

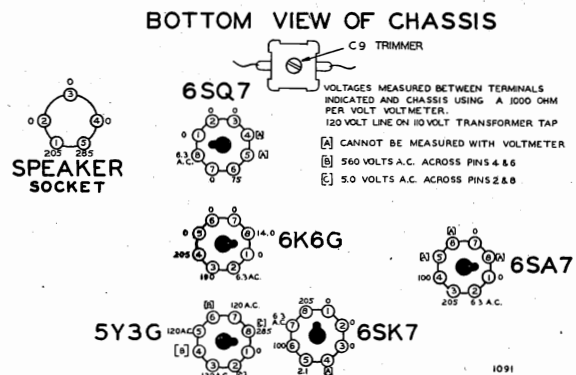


FIG. 5

REAR OF CHASSIS

MODELS 539-415, etc. (Export)
Chassis 539, Series A
Alignment
MODEL 577D
Tuner Data

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE CHASSIS 539.

- No aligning adjustments should be attempted with the chassis in the cabinet.
- The following equipment is required for aligning:
- Volume control—Maximum all adjustments.
 - Connect radio chassis to ground post of signal generator with a short heavy lead.
 - Connect dummy antenna value in series with generator output lead.
 - Connect output meter across primary of output transformer.
 - Allow chassis and signal generator to "heat up" for several minutes.
- The following equipment is required for aligning:
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
 - Output indicating meter.
 - Non-metallic screwdriver.
 - Dummy antennas—1 Mf., 200 Mmf., 400 Ohms.

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Position of Band Switch | Variable Condenser Setting | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|------------------|------------------------------------|---------------|-------------------------|-------------------------------------|--------------------------------------|------------------------------------|------------------------------------|---|
| I. F. | 465 Kc. | .1 MFD. | Grid of 6SK7 I. F. Tube | Broadcast | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Grid of 6SA7 | Broadcast (Extreme Left Rotation) | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Input I. F. | Adjust to maximum output |
| SHORT WAVE BAND | 21 Mc. | 400 ohms | Antenna lead | Short Wave (Extreme Right Rotation) | Set Dial at 21 MC | Trimmer (C7) (See Fig. 3) | Short wave oscillator | See Note "A" Adjust to maximum output |
| | 21 Mc. | 400 ohms | Antenna lead | Short Wave (Extreme Right Rotation) | Set Dial at 21 MC | Trimmer (C1) (See Fig. 3) | Short wave antenna | Adjust to maximum output |
| MEDIUM WAVE BAND | 6 Mc. | 400 ohms | Antenna lead | Medium Wave | Set Dial at 6 MC | Trimmers (C3, C2) (See Fig. 3) | Medium wave oscillator and antenna | Adjust to maximum output |
| | 2.3 Mc. | 400 ohms | Antenna lead | Medium Wave | Set Dial at 2.3 MC | Trimmer (C9) (See Fig. 5) | Medium wave osc. series pad | Adjust to maximum output (See note "B") |
| BROADCAST BAND | 1730 Kc. | 200 mmf. | Antenna lead | Broadcast (Extreme Left Rotation) | Rotor full open (Plates out of mesh) | Trimmer (C10) (See Fig. 3) | Broadcast oscillator | Adjust to maximum output |
| | 1500 Kc. | 200 mmf. | Antenna lead | Broadcast | Set Dial at 1500 Kc. | Trimmer (C3) (See Fig. 3) | Broadcast antenna | Adjust to maximum output |
| | 600 Kc. | 200 mmf. | Antenna lead | Broadcast | Set Dial at 600 Kc. | Trimmer (C11) (See Fig. 4) | Broadcast oscillator series pad | Adjust to maximum output (See note "B") |

NOTE "A"—It is extremely necessary when making this adjustment that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental.

NOTE "B"—Turn the dial back and forth slightly (rock) and adjust

trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS MODEL 577D

There are five levers on the dial by means of which five stations may be selected, (See "B" Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including five.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner lever an opening is provided for inserting the call letter tabs, (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings of each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 1) the station you have assigned to this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station assigned to this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now rotate the tuning knob (No. 1) to the right (clockwise) as far as it will turn, and tighten the special locking screw ("C") located on left side of tuner dial assembly (See Fig. 2).

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, loosen the locking screw "C" one or two turns, select the new station as explained. Be sure to retighten the locking screw, otherwise the stations you have selected will not stay adjusted to the levers.

The automatic dial is now set up for quick tuning. Press down on the lever and your favorite station is selected.

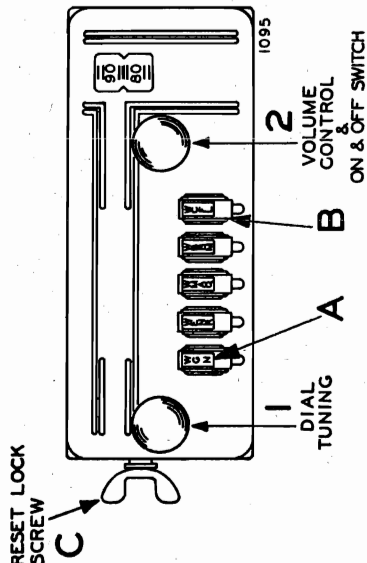
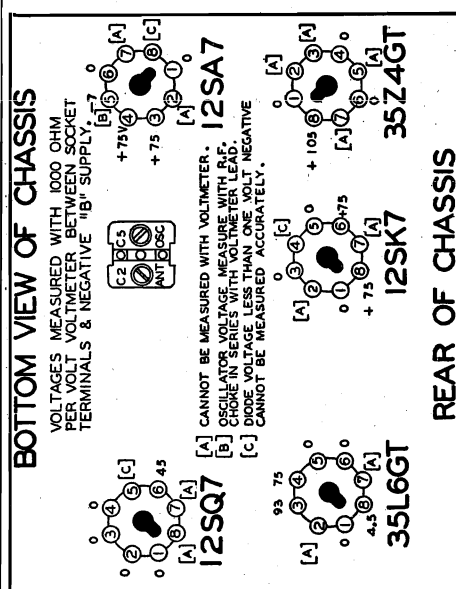


FIG. 2—FRONT VIEW



Model 571 Series A **FIG. 3—BOTTOM VIEW**
(Serial No. 189300 and up) **Circuit Diagram**

| Diagram No. | Ref. Part No. | Description | Kes. Part No. | Description |
|----------------|------------------|------------------------------------|------------------|--|
| R1 | 130176 | 20M ohm- $\frac{1}{4}$ w. | C5 | 10013 .05 x 400 v. |
| R2 | 130215 | 25 ohm- $\frac{1}{2}$ w. | C7 | .0001 Mica |
| R3 | 130288 | 50 ohm- $\frac{1}{2}$ w. | C8 | 10025 .002 x 600 v. |
| R4 | 130494 | 5 Megohm- $\frac{1}{2}$ w. | C9 | 10091 .15 x 400 v. |
| R5 | 130509 | 3 Megohm Control- $\frac{1}{2}$ w. | C10 | .0005 Mica |
| R6 | 130510 | 150M ohm- $\frac{1}{2}$ w. | C11 | .0005 Mica |
| R7 | 130100 | 5 Megohm- $\frac{1}{2}$ w. | C12 | 11992 20 Mf electrolytic |
| R8 | 130257 | 150M ohm- $\frac{1}{2}$ w. | C13 | 11992 20 Mf electrolytic |
| R9 | 130100 | 5 Megohm- $\frac{1}{2}$ w. | C14 | .01 x 400 v. |
| R10 | 130100 | 5 Megohm- $\frac{1}{2}$ w. | C15 | 10011 C2 and C5 in one unit. C12 and C13 in one unit. |

| CONDENSERS | | PARTS | |
|------------|---------------------------|-------|-----------------------------------|
| R10 130166 | 150 ohm— $\frac{1}{2}$ w. | T1 | 111136 Antenna Coil Complete |
| R11 130168 | 150 ohm— $\frac{1}{2}$ w. | T2 | 110126 Oscillator Coil |
| R12 130169 | 150 ohm— $\frac{1}{2}$ w. | T3 | 108157D Input I. F. Coil—465 Kc. |
| | | T4 | 108157E Output I. F. Coil—465 Kc. |
| | | T5 | 108157F Output Transformer |
| | | T6 | 114136 " " |
| | | T7 | 114138 " " |
| | | T8 | 104188 Electric Clock Complete |
| | | T9 | On-Off Switch on Volume Control |
| | | S1 | |

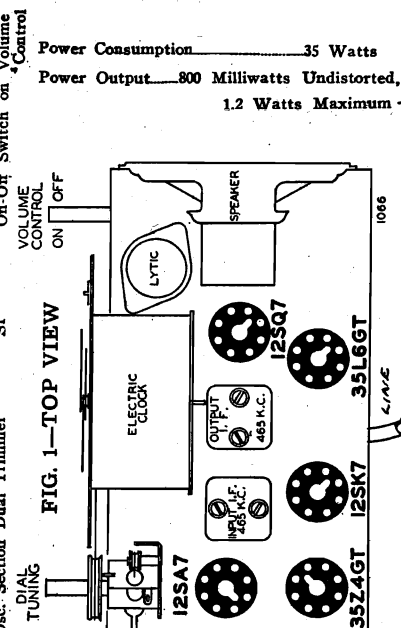
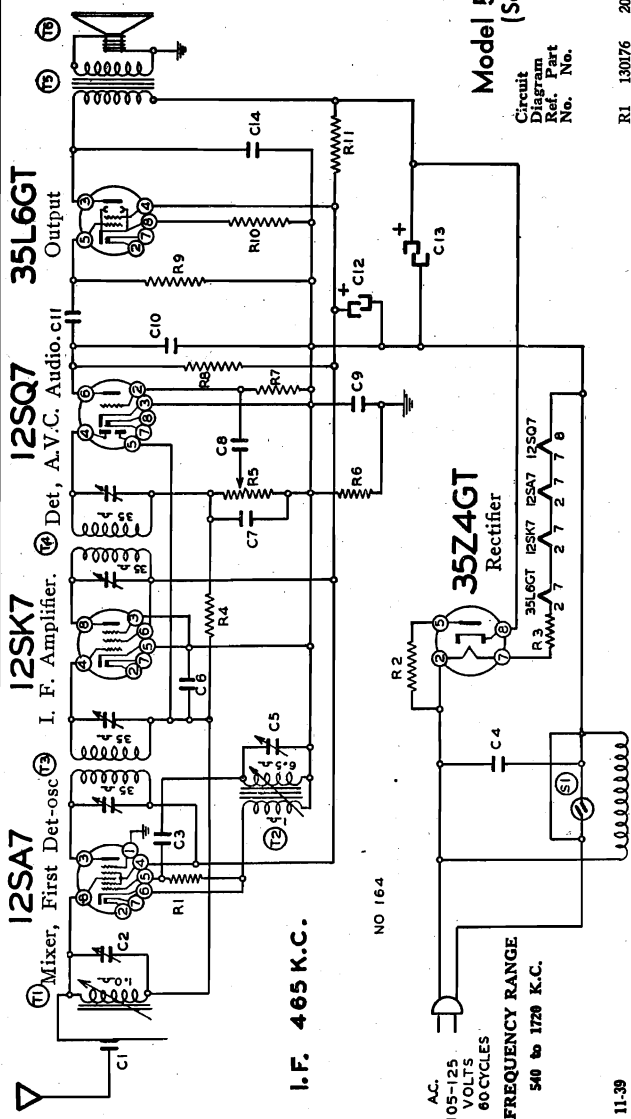


FIG. 1—TOP VIEW



Slight adjustments to the oscillator and antenna circuits can be made without removing the chassis from the cabinet through a hole which is provided on the bottom of the cabinet. (Remove snap-in button.)

The two adjustments on the trimmer assembly can be reached with a long insulated type screwdriver through this hole.

SERVICE NOTES:

Voltages taken from different points of circuit to —B— are measured with all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on the voltage chart are measured with 117 volt A.C. line.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D. C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

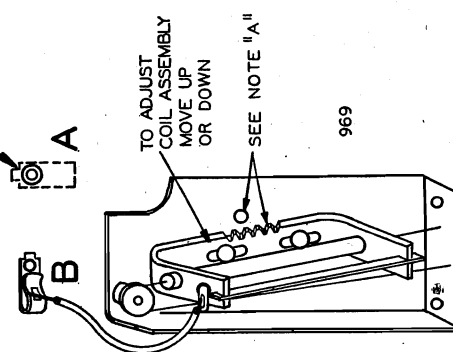


FIG. 4

MODEL 571, Series A
MODEL 629, Series A
Alignment

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.

- Connect —B of radio chassis to ground post of signal generator through .1 Mfd. Condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.

Model 571 Series A (Serial No. 189300 and up)

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Position of Iron Cores (Dial Setting) | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|-----------------|---------------------------------------|---------------|--------------------------------------|---------------------------------------|---|-------------------------|---|
| I. F. | 465 Kc. | .1 MFD. | Terminal "B" (See Fig. 4) | Iron Cores All the way out | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Terminal "A" (See Fig. 4) | Iron Cores All the way out | Two trimmers on top (See Fig. 1) | Input I. F. | Adjust to maximum output |
| BROAD-CAST BAND | 1720 Kc. | .1 MFD. | Connect to Terminal "B" (See Fig. 4) | Iron Cores All the way out | Trimmer (C5) (See bottom of Radio, Fig. 3) | Oscillator | Adjust to maximum output |
| | 1720 Kc. | 200 MMF. | Connect to Terminal "A" (See Fig. 4) | Iron Cores All the way out | Trimmer (C2) (See bottom of Radio, Fig. 3) | Antenna | Adjust to maximum output |
| | 1400 Kc. | 200 MMF. | Connect to Terminal "A" (See Fig. 4) | Turn Dial to 1400 Kc. | Adjust position of antenna coil up or down (see Fig. 4) | Antenna Coil Adjustment | Adjust to maximum output (See Note "A") |
| | 1720 Kc. | 200 MMF. | Connect to Terminal "A" (See Fig. 4) | Turn Dial to 1720 Kc. | Adjust trimmer (C2) (See Fig. 3) | Antenna | Check for tracking (See Note "B") |

NOTE "A"—The antenna coil assembly is made so that it is movable up or down. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the plate of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C2) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track; if the trimmer requires considerable change, it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be made several times until no change of trimmer adjustment is required at 1720 Kc.

MODEL 629 SERIES A (Serial No. 9L225000 and up)

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Position of Band Switch | Variable Condenser Setting | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|-----------------|---------------------------------------|---------------|---------------------|-------------------------------------|--------------------------------------|------------------------------------|---|---|
| I. F. | 465 Kc. | .1 MFD. | Grid of 6SK7 | Broadcast (Extreme left rotation) | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Grid of 6SA7 | Broadcast (Extreme left rotation) | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Input I. F. | Adjust to maximum output |
| SHORT WAVE BAND | 18.3 Mc. | 400 ohms | Antenna lead | Short Wave (Extreme right rotation) | Rotor full open (Plates out of mesh) | Trimmer (C4) (See Fig. 4) | Short Wave oscillator | Adjust to maximum output |
| | 17 Mc. | 400 ohms | Antenna lead | Short Wave (Extreme right rotation) | Dial Set at 17 MC. | Trimmer (C5) | Short Wave antenna | Adjust to maximum output |
| BROAD-CAST BAND | 1720 Kc. | 200 mmf. | Antenna lead | Broadcast (Extreme left rotation) | Rotor full open (Plates out of mesh) | Trimmer (C8) (See Fig. 4) | Broadcast oscillator | Adjust to maximum output |
| | 1400 Kc. | 200 mmf. | Antenna lead | Broadcast (Extreme left rotation) | Set Dial at 1400 Kc. | Trimmer (C6) | Broadcast antenna | Adjust to maximum output |
| | 600 Kc. | 200 mmf. | Antenna lead | Broadcast (Extreme left rotation) | Set Dial at 600 Kc. | Trimmer (C7) (See Fig. 5) | Broadcast oscillator series pad (Bottom of chassis) | Adjust to maximum rock dial. (See note "A") |
| | | | | | | | | |

NOTE "A." Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

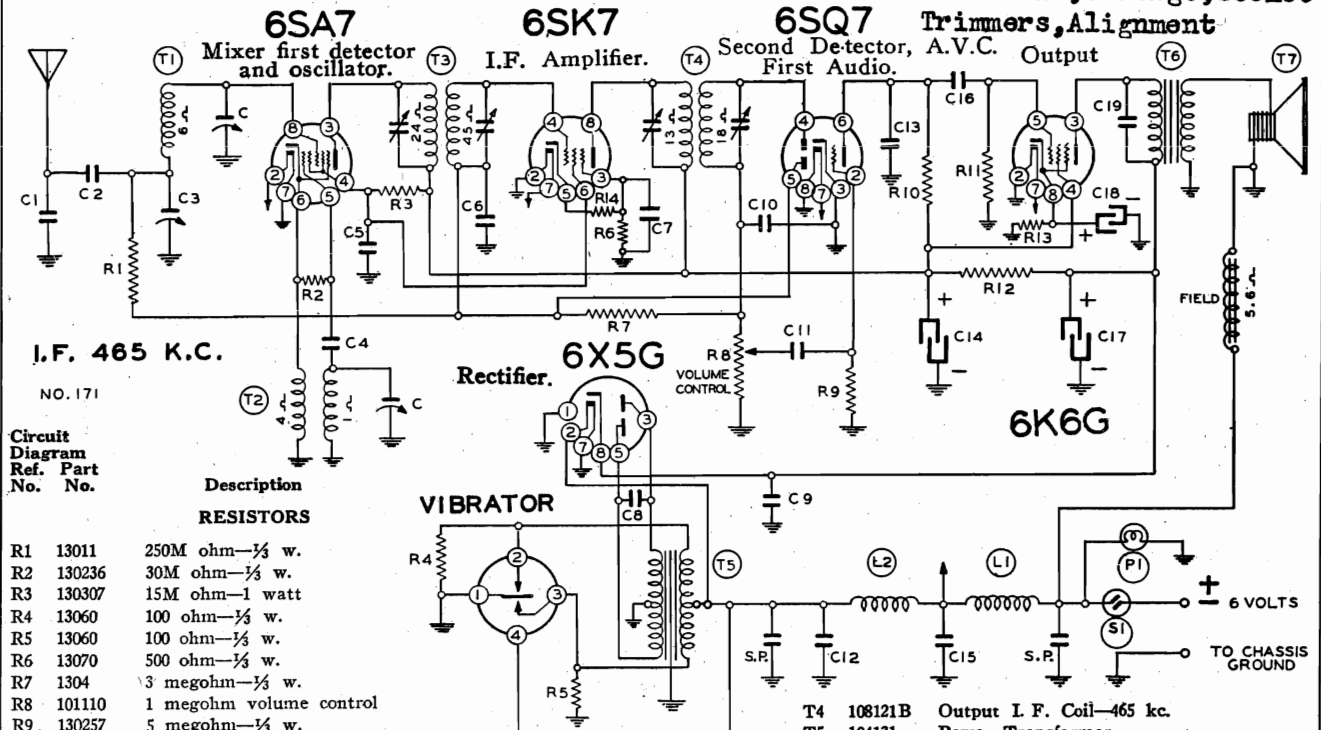
FIG. 4.—FRONT OF CHASSIS

1054

BELMONT RADIO CORP.

MODEL 577D

Serial 214845 up

Schematic, Voltage, Socket
Trimmers, AlignmentCircuit
Diagram
Ref. Part
No. No.Description
RESISTORS

| | |
|------------|----------------------------|
| R1 13011 | 250M ohm— $\frac{1}{2}$ w. |
| R2 130236 | 30M ohm— $\frac{1}{2}$ w. |
| R3 130307 | 15M ohm—1 watt |
| R4 13060 | 100 ohm— $\frac{1}{2}$ w. |
| R5 13060 | 100 ohm— $\frac{1}{2}$ w. |
| R6 13070 | 500 ohm— $\frac{1}{2}$ w. |
| R7 1304 | 3 megohm— $\frac{1}{2}$ w. |
| R8 101110 | 1 megohm volume control |
| R9 130257 | 5 megohm— $\frac{1}{2}$ w. |
| R10 13011 | 250M ohm— $\frac{1}{2}$ w. |
| R11 1303 | 500M ohm— $\frac{1}{2}$ w. |
| R12 130199 | 1500 ohm—1 watt |
| R13 130308 | 750 ohm—1 watt |
| R14 130174 | 50 ohm— $\frac{1}{2}$ w. |

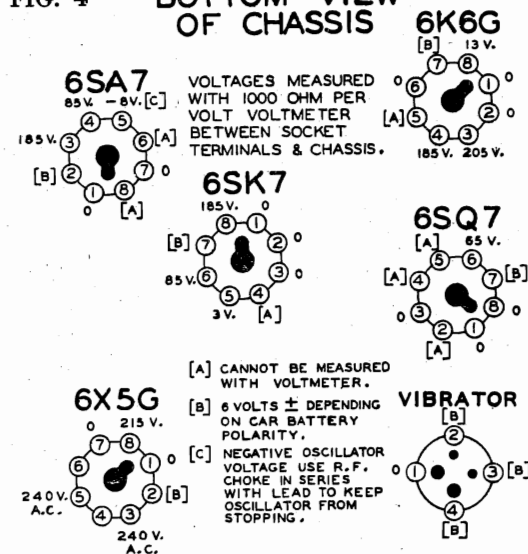
CONDENSERS

| | |
|-----------|---------------------------|
| C 10269 | 2 gang variable condenser |
| C1 1293 | .00002 mica |
| C2 10055 | .01 x 400 volts |
| C3 12434 | Adj. Antenna Trimmer |
| C4 12921 | .0002 mica |
| C5 100115 | .05 x 400 v. |
| C6 1009 | .05 x 200 v. |
| C7 10020 | .1 x 200 v. |
| C8 10034 | .005 x 1200 v. |
| C9 12912 | .00025 mica |
| C10 1295 | .0001 mica |
| C11 10025 | .002 x 600 v. |

| | |
|------------|---------------------------|
| C12 10031 | .5 x 120 v. |
| C13 1292 | .0005 mica |
| C14 119105 | 15 ufd. lytic x 350 w. v. |
| C15 10031 | .5 x 120 v. |
| C16 10078 | .01 x 200 v. |
| C17 119105 | 15 ufd. lytic x 350 w. v. |
| C18 119105 | 20 ufd. lytic x 25 w. v. |
| C19 10087 | .01 x 600 v. |

C14, C17 and C18 in same unit
PARTS

| | |
|-----------|--------------------------|
| T1 11195B | Antenna Coil |
| T2 110146 | Oscillator Coil |
| T3 108139 | Input I. F. Coil—465 kc. |

FIG. 4
BOTTOM VIEW
OF CHASSIS

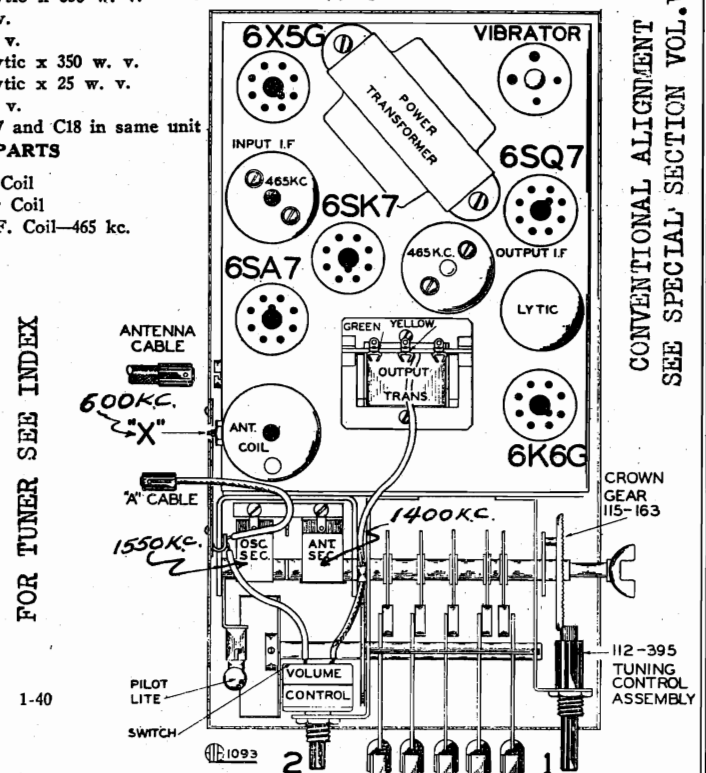
REAR OF CHASSIS

FOR TUNER SEE INDEX

ADJUST ANTENNA TRIMMER

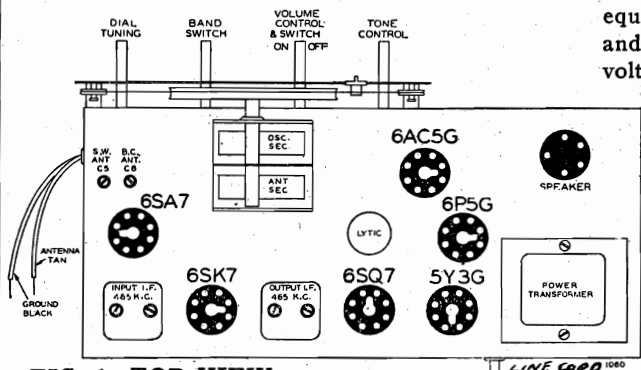
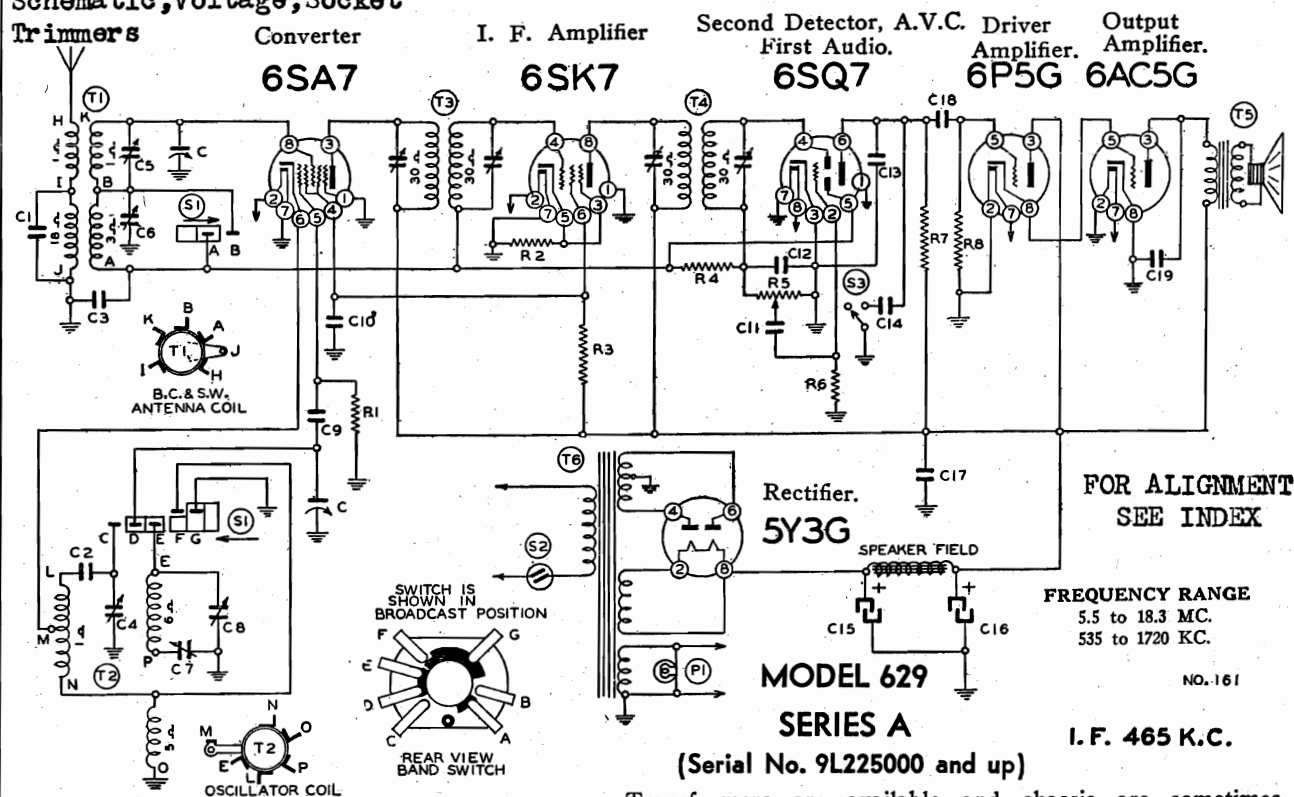
FIG. 3—TOP VIEW

Tune in a weak signal at approximately 600 K.C. with volume control about three-fourths on. Adjust trimmer screw "X" until maximum output is obtained.

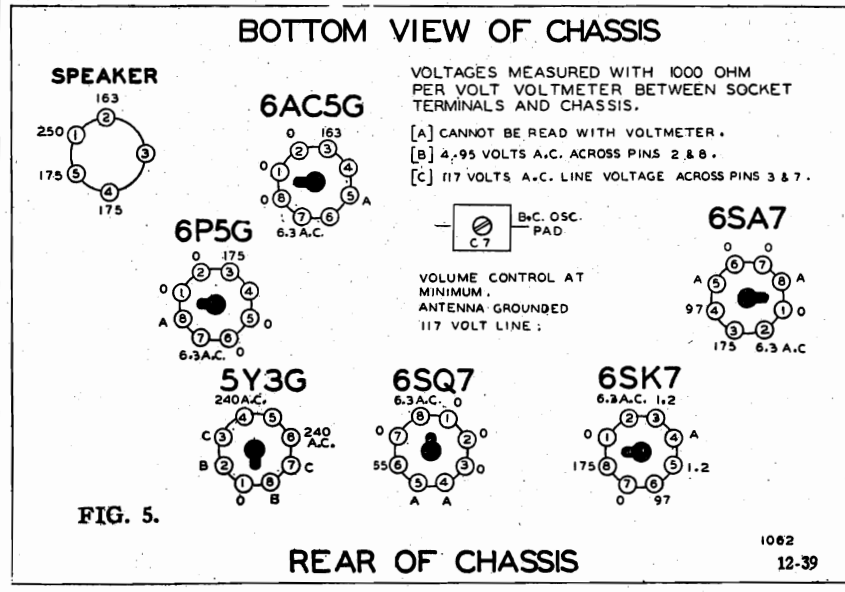
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.

MODEL 629, Series A
Serial 9L225000 up
Schematic, Voltage, Socket

BELMONT RADIO CORP.



| Ref. No. | Part No. | Description |
|-------------------|----------|--|
| CONDENSERS | | |
| C | 102124 | 2 gang variable condenser |
| C1 | 1295 | .0001 mica |
| C2 | 12964 | .00275 mica |
| C3 | 10022 | .05 x 200 v. |
| C4 | 124121 | Dual Adjustable Condenser (S.W. Osc.) |
| C5 | 124122 | Dual Adjustable Condenser (S.W. Ant.) |
| C6 | 124122 | Dual Adjustable Condenser (Bc. Ant.) |
| C7 | 129151 | .000468 comp. condenser (Bc. Osc. Pad) |
| C8 | 124121 | Dual Adjustable Condenser (Bc. Osc.) |
| C9 | 12939 | .00005 mica |
| C10 | 10013 | .05 x 400 v. |
| C11 | 10071 | .004 x 600 v. |
| C12 | 1295 | .0001 mica |
| C13 | 1292 | .0005 mica |
| C14 | 10012 | .003 x 600 v. |
| C15 | 119102 | 10 mfd. lytic condenser |
| C16 | 119102 | 30 mfd. lytic condenser |
| C17 | 1001 | .1 x 400 v. |
| C18 | 10026 | .02 x 400 v. |
| C19 | 10012 | .003 x 600 v. |
| RESISTORS | | |
| R1 | 130208 | 40M ohm—1/2 w. |
| R2 | 130168 | 100 ohm—1/2 w. |
| R3 | 130306 | 7500 ohm—1 watt |
| R4 | 1304 | 3 megohm—1/2 w. |
| R5 | 101208 | Volume Control and Switch (1 Megohm) |
| R6 | 130257 | 5 megohm—1/2 w. |
| R7 | 13011 | 250M ohm—1/2 w. |
| R8 | 13019 | 1 megohm—1/2 w. |

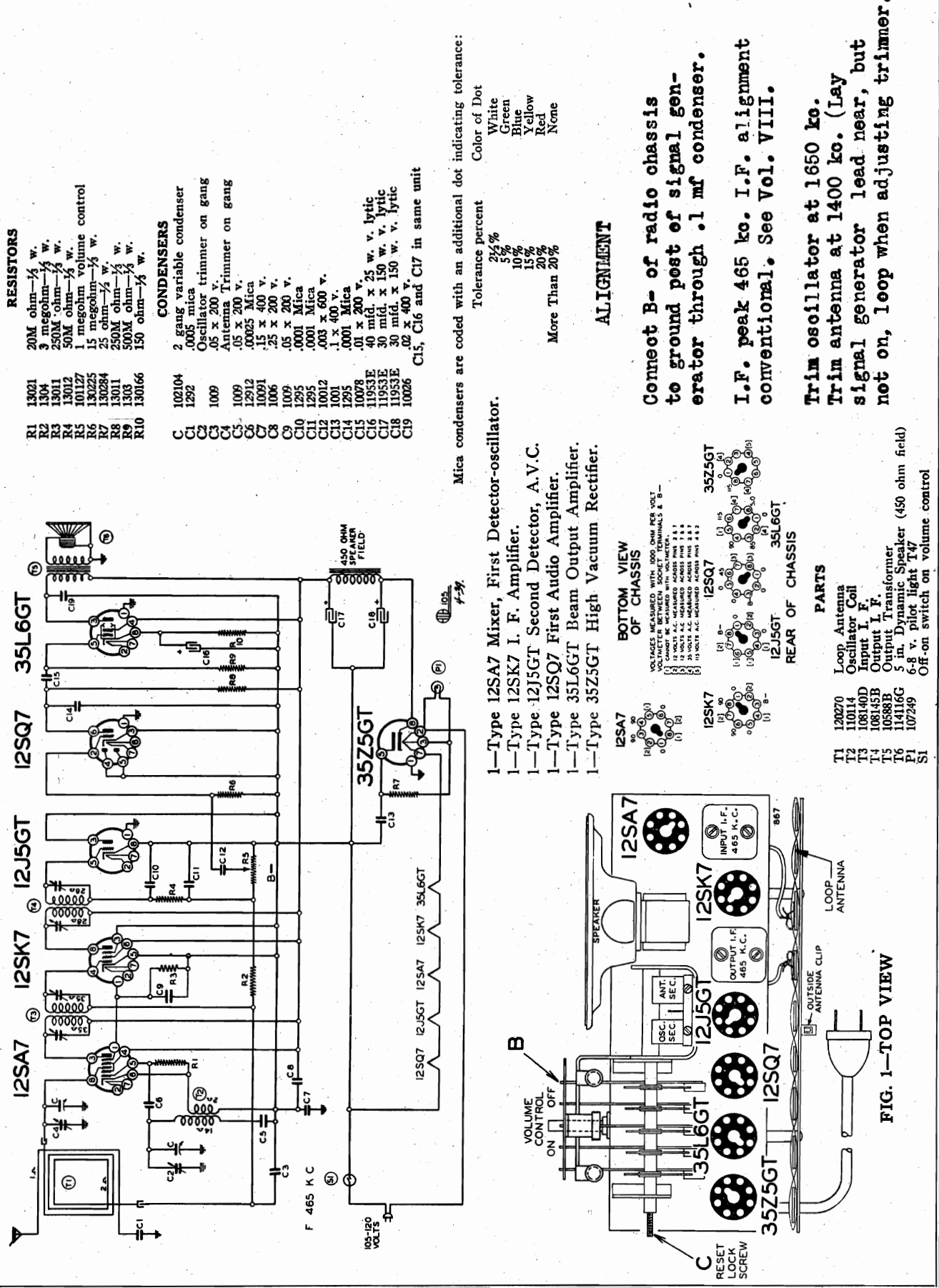


| Ref. No. | Part No. | Description |
|-------------------|----------|--------------------------------------|
| CONDENSERS | | |
| C12 | 1295 | .0001 mica |
| C13 | 1292 | .0005 mica |
| C14 | 10012 | .003 x 600 v. |
| C15 | 119102 | 10 mfd. lytic condenser |
| C16 | 119102 | 30 mfd. lytic condenser |
| C17 | 1001 | .1 x 400 v. |
| C18 | 10026 | .02 x 400 v. |
| C19 | 10012 | .003 x 600 v. |
| RESISTORS | | |
| R1 | 130208 | 40M ohm—1/2 w. |
| R2 | 130168 | 100 ohm—1/2 w. |
| R3 | 130306 | 7500 ohm—1 watt |
| R4 | 1304 | 3 megohm—1/2 w. |
| R5 | 101208 | Volume Control and Switch (1 Megohm) |
| R6 | 130257 | 5 megohm—1/2 w. |
| R7 | 13011 | 250M ohm—1/2 w. |
| R8 | 13019 | 1 megohm—1/2 w. |
| PARTS | | |
| T1 | 111168 | B.C. S.W. Antenna Coil |
| T2 | 110142 | B.C. S.W. Oscillator Coil |
| T3 | 108169 | Input I.F. Coil—465 kc. |
| T4 | 108106S | Output I.F. Coil—465 kc. |
| T5 | 114188 | 6" Dynamic Speaker (1500 Ohm Field) |
| T6 | 104189 | Power Transformer |
| S1 | 125103 | Band Switch |
| S2 | | On-Off switch on volume control |
| S3 | 125104 | Tone Control Switch |
| P1 | 10794 | Pilot light T4 |

Socket, Trimmers
Alignment

BELMONT RADIO CORP.

MODEL 635, Series A
Schematic, Voltage



MODEL 636, Series A
Schematic, Voltage
Socket, Trimmers, Alignment

BELMONT RADIO CORP.

RESISTORS

| | | |
|-----|--------|-------------------------|
| R1 | 130218 | 5M ohm—1/4 w. |
| R2 | 13020 | 100M ohm—1/4 w. |
| R3 | 130176 | 20M ohm—1/4 w. |
| R4 | 130295 | 25 ohm—1 watt |
| R5 | 130295 | 25 ohm—1 watt |
| R6 | 130100 | 150M ohm—1/4 w. |
| R7 | 130303 | 40 ohm—1/4 w. |
| R8 | 1304 | 3 megohm—1/4 w. |
| R9 | 13012 | 50M ohm—1/4 w. |
| R10 | 101127 | 1 megohm volume control |
| R11 | 130257 | 5 megohm—1/4 w. |
| R12 | 13011 | 250M ohm—1/4 w. |
| R13 | 1303 | 500M ohm—1/4 w. |
| R14 | 130166 | 150 ohm—1/4 w. |

CONDENSERS

| | | |
|-----|---------|----------------------------|
| C1 | 102104B | 2 gang variable condenser |
| C2 | 12951 | .000125 Mica |
| C3 | 12912 | .00025 Mica |
| C4 | 10026 | .02 x 400 v. |
| C5 | | Antenna Trimmer on gang |
| C6 | 1001 | Oscillator trimmer on gang |
| C7 | 1006 | .1 x 400 v. |
| C8 | 1295 | .25 x 200 v. |
| C9 | 1295 | .0001 Mica |
| C10 | 1295 | .0001 Mica |
| C11 | 1295 | .05 x 200 v. |
| C12 | 1295 | .0001 Mica |
| C13 | 10012 | .003 x 600 v. |
| C14 | 10010 | .2 x 400 v. |
| C15 | 11953E | 30 mid. lytic—150 w. v. |
| C16 | 11953E | 30 mid. lytic—150 w. v. |
| C17 | 1295 | .0001 Mica |
| C18 | 10078 | .01 x 200 v. |
| C19 | 11953E | 40 mid.—25 w. v. lytic |
| C20 | 10026 | .02 x 400 v. |

C15, C16, and C19 in same unit

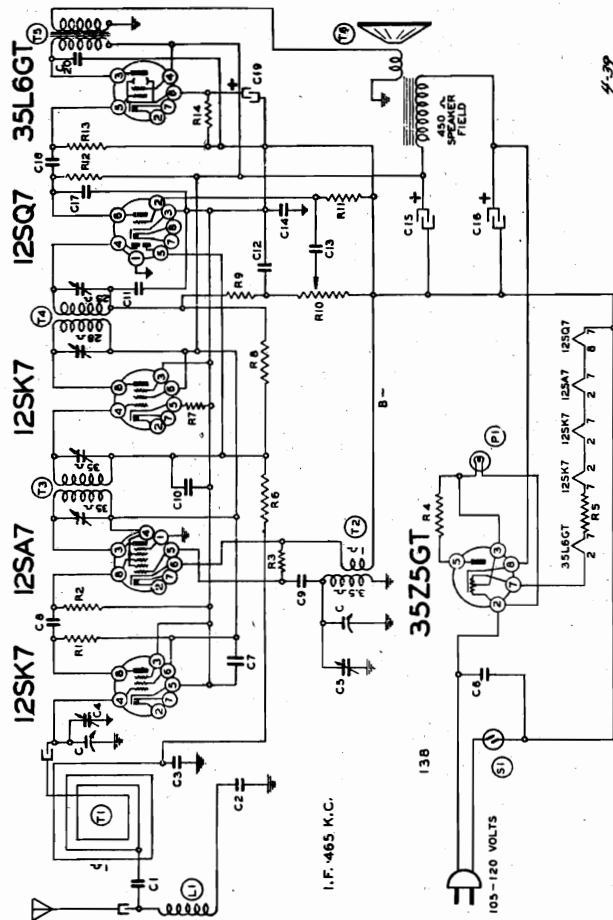
I.F. 465 KC

- 1—Type 12SK7 R. F. Amplifier.
- 1—Type 12SA7 Mixer, First Detector-oscillator.
- 1—Type 12SK7 I. F. Amplifier.
- 1—Type 12SQ7 Second Detector, A.V.C. and First Audio.
- 1—Type 35L6GT Beam Output Amplifier.
- 1—Type 35Z5GT High Vacuum Rectifier.

PARTS

| | | |
|----|---------|------------------------------------|
| T1 | 111139 | Loop Antenna |
| T2 | 110128 | Oscillator Coil |
| T3 | 108140F | Input I. F. Coil |
| T4 | 108145B | Output I. F. Coil |
| T5 | 10888B | Output Transformer |
| T6 | 11416G | 5" Dynamic Speaker (450 ohm field) |
| L1 | 1237 | Antenna Loading Coil |
| P1 | 107249 | 6-8 volt, Pilot light - T-47 |
| S1 | | Off-on Switch on Volume Control |

For alignment procedure, see
instructions for Belmont
Model 635, Series A.



4-39

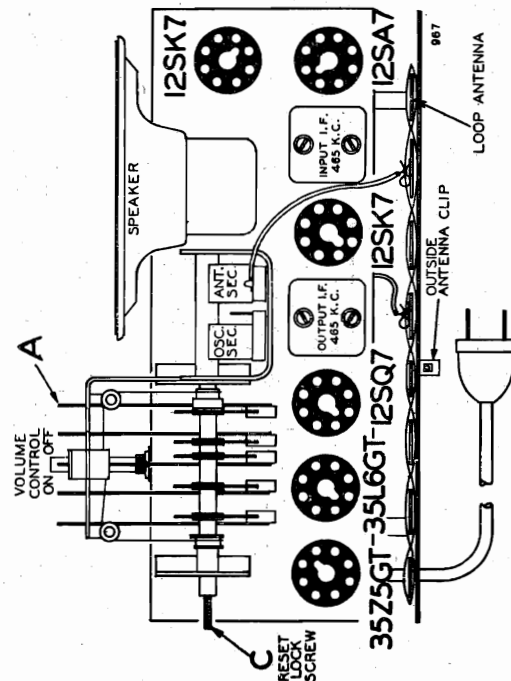


FIG. 1—TOP VIEW

BOTTOM VIEW
OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT
VOLTMETER BETWEEN SOCKET TERMINALS AND
GROUND. (1) CANNOT BE MEASURED WITH VOLTMETER.
* REGULATOR VOLTAGE SHOULD BE MEASURED WITH
N.T. CHORE IN SERIES.



REAR OF CHASSIS

Chassis 706, Series A
Schematic, Socket, Trimmers
MODEL 709 AC S.P.U.

BELMONT RADIO CORP.

MODELS 706-391, 706-398
706-378, etc.

Power Consumption.....
3.8 Amps. at 6.3 Volts

Power Output.....
2 Watts Undistorted,
3 Watts Maximum

I.F. 465 K.C.

Models
706-391, 706-398 and 706-378,
Etc. Chassis No. 706 Series A
(Serial No. 9K166700 and up)

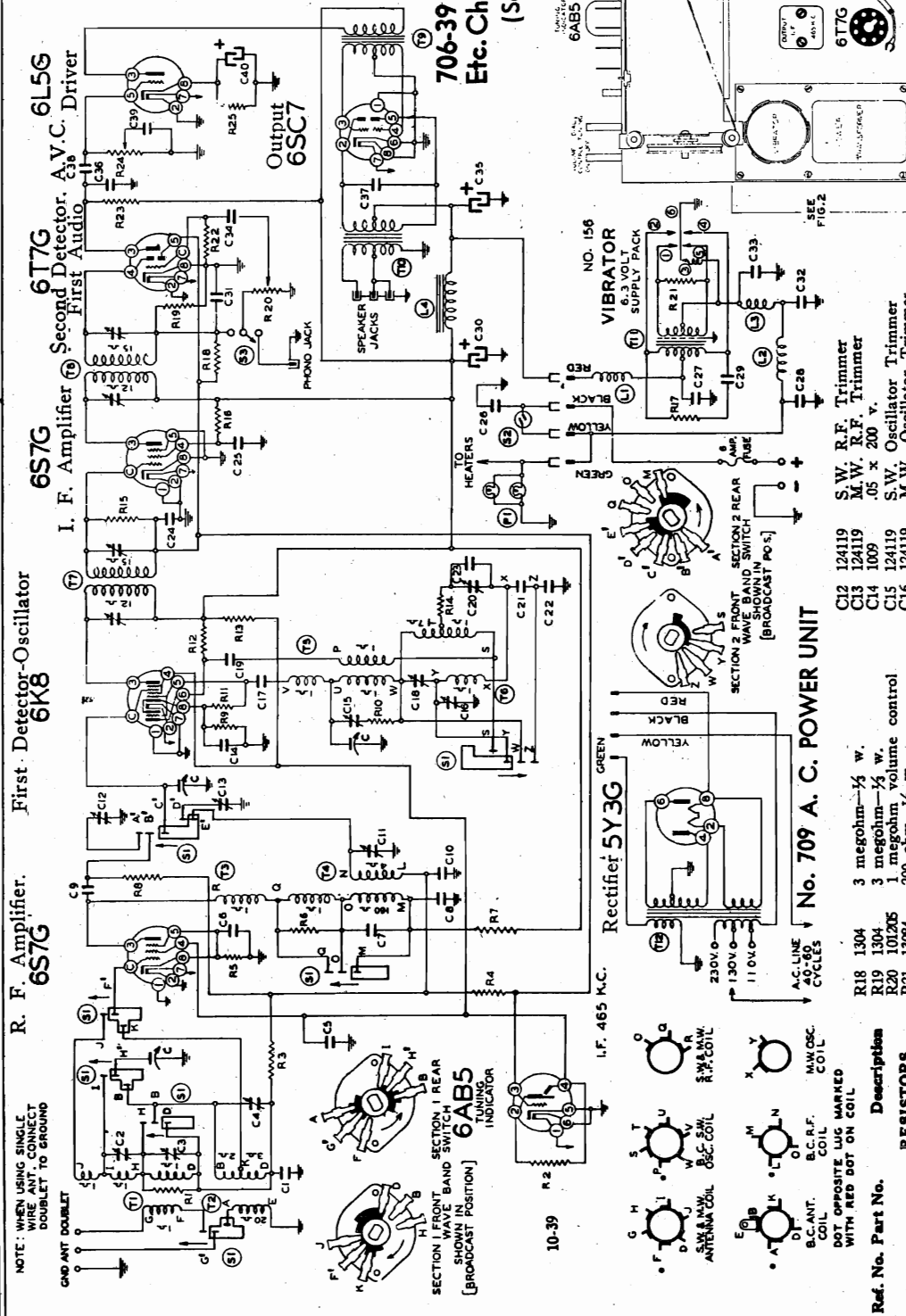


FIG. 1 - TOP VIEW

FOR TUNER SEE INDEX
C35 11998 30 uf. lytic-300 w.v.
C36 12912 .0025 mica
C37 10071 .01 x 400 v.
C38 10011 .01 x 200 v.
C39 10078 .01 x 200 v.
C40 11998 40 uf. lytic-25 w.v.
C1, C12, C15, C16, C18 and C20 are in same unit
C30, C35 and C40 are in same unit.

| Ref. No. | Part No. | Description |
|----------|----------|-------------------------------|
| R1 | 1304 | 50M ohm-1/2 w. |
| R2 | 1304 | 3 megohm-1/2 w. |
| R3 | 13026 | 100M ohm-1/2 w. |
| R4 | 13026 | 1000 ohm-1/2 w. |
| R5 | 13070 | 25M ohm-1/2 w. |
| R6 | 13026 | 1000 ohm-1/2 w. |
| R7 | 13026 | 1000 ohm-1/2 w. |
| R8 | 13083 | 1 megohm-1/2 w. |
| R9 | 13097 | 300 ohm-1/2 w. |
| R10 | 13012 | 50M ohm-1/2 w. |
| R11 | 13048 | 15M ohm-1/2 w. |
| R12 | 130245 | 10M ohm-1 watt |
| R13 | 130299 | 10 ohm-1/2 w. |
| R14 | 13019 | 1 megohm-1/2 w. |
| R15 | 13012 | 50M ohm-1/2 w. |
| R16 | 13012 | 50M ohm-1/2 w. |
| R17 | 13064 | 3500 ohm-1/2 w. |
| C1 | 102121 | Three Gang Variable Condenser |
| C2 | 10090 | .02 x 400 v. |
| C3 | 12418 | S.W. Antenna Trimmer |
| C4 | 12418 | M.W. Antenna Trimmer |
| C5 | 10013 | .05 x 400 v. |
| C6 | 1009 | .05 x 200 v. |
| C7 | 12938 | .00005 mica |
| C8 | 10090 | .02 x 400 v. |
| C9 | 10090 | .02 x 400 v. |
| C10 | 10090 | .02 x 400 v. |
| C11 | 124119 | B.C. R.F. Trimmer |
| C12 | 124119 | S.W. R.F. Trimmer |
| C13 | 124119 | .05 x 200 v. |
| C14 | 1009 | .05 x 200 v. |
| C15 | 124119 | S.W. Oscillator Trimmer |
| C16 | 124119 | M.W. Oscillator Trimmer |
| C17 | 12962 | .00003 mica |
| C18 | 124119 | B.C. Oscillator Trimmer |
| C19 | 10025 | .02 x 600 v. |
| C20 | 124119 | B.C. Oscillator Trimmer |
| C21 | 129105 | .028 Compression (M.W. Pad) |
| C22 | 129105 | .003 Compression (S.W. Pad) |
| C23 | 129105 | .003 mica |
| C24 | 1009 | .05 x 200 v. |
| C25 | 10013 | .05 x 400 v. |
| C26 | 10078 | .01 x 200 v. |
| C27 | 10013 | .05 x 400 v. |
| C28 | 10013 | .05 x 400 v. |
| C29 | 100114 | .006 x 1200 v. oil type |
| C30 | 11998 | 30 uf. lytic-300 w.v. |
| C31 | 1295 | .0001 mica |
| C32 | 10031 | .5 x 120 v. |
| C33 | 10031 | .5 x 120 v. |
| C34 | 10025 | .02 x 600 v. |

CHASSIS 706
CHASSIS 707
CHASSIS 708

BELMONT RADIO CORP.

Alignment, Trimmers

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

The following equipment is required for aligning.

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—1 mlf., 200 mmf. 400 ohms.

SERVICE NOTES:

Volts taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

- Tone control—in treble position.
- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Position of Band Switch | Variable Condenser Setting | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|------------------|------------------------------------|---------------|----------------------------|--|---|-------------------------------------|---------------------------------|---|
| I. F. | 465 Kc. | .1 MFD. | Grid of 6K7* I. F. Tube | Broadcast | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Grid of 6K8 | Broadcast (Extreme Left Rotation) | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Input I. F. | Adjust to maximum output |
| SHORT WAVE BAND | 23 Mc. | 400 ohms | Antenna lead | Short Wave (Extreme Right Rotation) | Set Dial at 23 MC | Trimmer (C18) (See Fig. 3) | Short wave oscillator | See Note "A" Adjust to maximum output |
| | 23 Mc. | 400 ohms | Antenna lead | Short Wave (Extreme Right Rotation) | Dial Set at 23 MC | Trimmer (C2, C12) (See Fig. 3) | Short wave antenna and R. F. | See Note "B" Adjust to maximum output |
| MEDIUM WAVE BAND | 6.5 Mc. | 400 ohms | Antenna lead | Medium Wave | Set Dial at 6.5 MC | Trimmer (C16) (See Fig. 3) | Medium wave oscillator | Adjust to maximum output |
| | 6.5 Mc. | 400 ohms | Antenna lead | Medium Wave | Set Dial at 6.5 MC | Trimmer (C3, C13) (See Fig. 3) | Medium wave antenna and R. F. | Adjust to maximum output |
| BROADCAST BAND | 2000 Kc. | 200 mmf. | Antenna lead | Broadcast (Extreme Left Rotation) | Rotor full open (Plates out of mesh) | Trimmer (C18) (See Fig. 3) | Broadcast oscillator | Adjust to maximum output |
| | 1800 Kc. | 200 mmf. | Antenna lead | Broadcast | Set Dial at 1800 Kc. | Trimmer (C4, C11) (See Fig. 3) | Broadcast antenna and R. F. | Adjust to maximum output |
| | 550 Kc. | 200 mmf. | Antenna lead | Broadcast | Set Dial at 550 Kc. | Trimmer (C20) (See Fig. 3) | Broadcast oscillator series pad | Adjust to maximum rock dial. (See note "C") |

NOTE "A"—It is extremely necessary when making this adjustment that the fundamental oscillator signal be tuned in and not the image frequency which will fall below the fundamental. As an example of this a fundamental 23 megacycle signal can be tuned in not only at 23 on the dial, but also at approximately 22 megacycles.

NOTE "B"—When adjusting the antenna and R.F. trimmers be sure and "follow" the signal to exact resonance by slight readjustment of the gang condenser as trimmer reaction on oscillator frequency is quite noticeable at high frequencies.

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

Chassis No. 707—Series A
(Serial No. 9K167300 and up)
BALLAST RESISTOR TUBES:

Use one of the following:

Type No. 5465 for 100 to 125 volt line voltage.

Type No. 5463 for 125 to 145 volt line voltage.

Type No. 5464 for 210 to 250 volt line voltage.

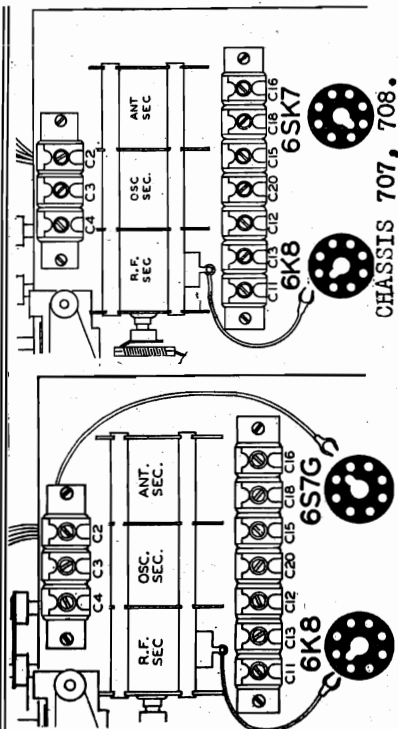


FIG. 3—TOP OF CHASSIS

CHASSIS 706

CHASSIS 707, 708.

CHASSIS 707
CHASSIS 708
CHASSIS 792
CHASSIS 793B
Tuner Data

BELMONT RADIO CORP.

MODEL 709 S.P.U.
Installation Notes
CHASSIS 706
Voltage, Tuner

INSTALLING THE MODEL 709 POWER UNIT (For 100-250 Volt 40/60 Cycle A. C. Operation)

In Chassis 706.

1. Remove the chassis from the cabinet, by removing the four chassis mounting bolts from the bottom of the cabinet.
2. Referring to Fig. 1, note that the 6-volt power unit is fastened to the top of the radio chassis with **eight copper head screws**, (six on top of chassis, and two on rear flange of chassis).
3. Remove the eight copper head screws.
4. Disconnect the four flexible leads of the power unit from the chassis connector strip. These leads clip into pin jacks. Note that the color of each flexible lead matches the color dot on the chassis pin jack connector strip.
5. Place the model 709 A.C. power unit (see Fig. 2) on the top of the radio chassis and plug the four flexible leads into the pin jacks on the chassis connector strip.

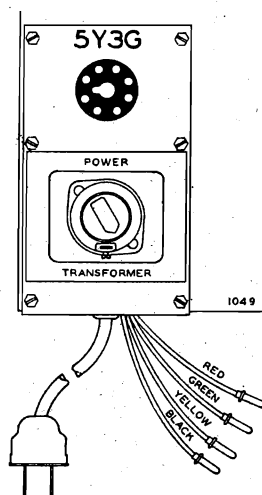


FIG. 2—MODEL 709
A. C. POWER UNIT

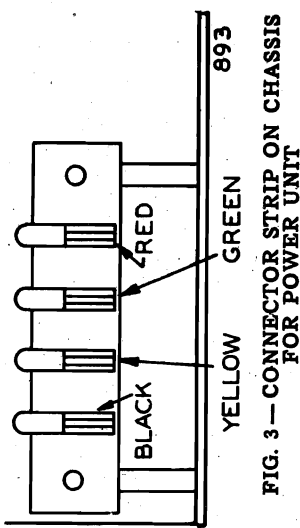


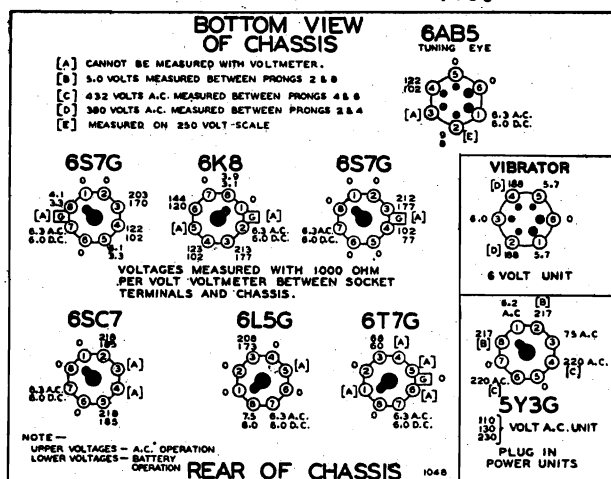
FIG. 3—CONNECTOR STRIP ON CHASSIS
FOR POWER UNIT

- (a) The red lead should be plugged into the pin jack which is marked with a red dot.
 - (b) The green lead connects to the pin jack which is marked with a green dot.
 - (c) The yellow lead connects to the pin jack which is marked with a yellow dot.
 - (d) The black lead connects to the pin jack which is marked with a black dot.
6. Mount the power unit to the chassis using the eight copper head screws.

IMPORTANT:

After the A.C. power unit has been installed check the connections again to make sure you have followed the instructions correctly. Set the switch on the top of the power transformer to the proper voltage.

VOLTAGE DATA CHASSIS 706.



All voltages as indicated on the voltage chart are measured with a fully charged 6 volt storage battery or from 117 volt A. C. line if the Model 709 A. C. power unit is installed in place of the 6 volt power unit.

PROCEDURE FOR SETTING THE AUTOMATIC PUSH BUTTONS

For Chassis 706, 707, 708, 792, and 793B.

1. Pull the "Reset" button all the way out (see control No. 6,) and rotate the button to the left (counter-clockwise) until it cannot be turned any further.

You will note that as the button is rotated it will turn easily until the pointer reaches the end of the dial scale and then a slight amount of force will be required to actually start unlocking the tuner mechanism. Beyond this point the button will turn quite easily again until the tuner mechanism is completely unlocked. At this point do not force the button any further. The tuner mechanism is now unlocked.

(NOTE:—Automatic tuner mechanism is locked tight when radio is shipped from the factory.)

2. Push in all the way any one of the push buttons and at the same time push in firmly on the dial tuning knob. Both the dial tuning knob and the push button should be pushed hard enough to make them stay latched in.

You may find it necessary to rotate the dial tuning knob slightly when pushing it in to make certain that the gears mesh properly.

For Chassis 792 and 793B only.

3. Both the pushbutton and the dial tuning knob are now latched in. Do not hold the pushbutton in by hand while tuning in a station. Tune in by means of the dial tuning knob the station indicated on the station call letter tab on the pushbutton which is latched in. Turn the dial tuning knob very slowly back and forth until the station is clearest. The station will then be accurately tuned in.

For Chassis 706, 707, and 708 only.

3. Press in on the push button which is latched in. Holding it in firmly, tune in by means of the dial tuning knob

the station indicated on the station call letter tab on this push button. Turn the dial tuning knob very slowly back and forth (while still pressing in firmly on the push button).

For all Models

4. Push in all the way another push button, at the same time push the dial tuning knob in so that both the push button and the dial tuning knob are latched in together. Holding the push button in firmly, tune in the station indicated on the call letter tab on this push button.

5. Follow this procedure until you have tuned in all of your favorite stations.

6. Pull the "Reset" button all the way out and rotate the button to the right (clockwise) until it cannot be turned any further. This will lock the automatic tuner mechanism and the stations you have set up for automatic tuning will be locked in place.

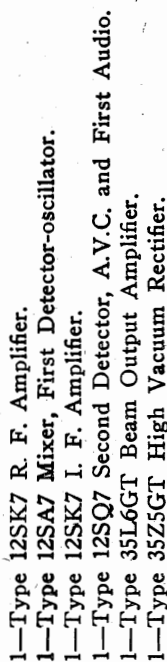
CHANGING STATIONS:

If you should desire to change any station you selected to another, pull the "Reset" button all the way out and rotate the button to the left (counter-clockwise) and unlock the tuner mechanism. Select the new station as explained.

(NOTE:—If the dial mechanism works hard when setting up a new station for one of the automatic tuner push buttons, it is due to the tuner mechanism not being unlocked all the way. Pull the "Reset" button out all the way and rotate the button to the left (counter-clockwise) until it will turn no further. The dial mechanism should work freely with the tuner push button pressed in.)

After you have selected the new station, pull the "Reset" button all the way out and rotate the button to the right (clockwise) to lock the tuner mechanism. Be sure the button is turned until it will turn no further.

I.F. 465 KC



1—Type 12SK7 R. F. Amplifier.

1—Type 12SA7 Mixer, First Det

1—Type 12SK7 I. F. Amplifier.

1—Type 12SQ7 Second Detector

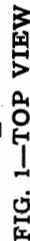
1—Type 35L6GT Beam Output

1—Type 35Z5GT High Vacuum

PARTS

| | | |
|----|---------|---------------------------------|
| T1 | 11139 | Loop Antenna |
| T2 | 11028 | Oscillator Coil |
| T3 | 108140F | Input I. F. Coil |
| T4 | 108145B | Output I. F. Coil |
| T5 | 105104 | Output Transformer |
| T6 | 114180 | 5° P.M. Dynamic Speaker |
| T7 | 1237 | Antenna Loading Coil |
| T8 | 107249 | 6-8 volt, Pilot light - T-47 |
| S1 | | Off-on Switch on Volume Control |

For alignment procedure, see instructions for Belmont Model 635, Series A.



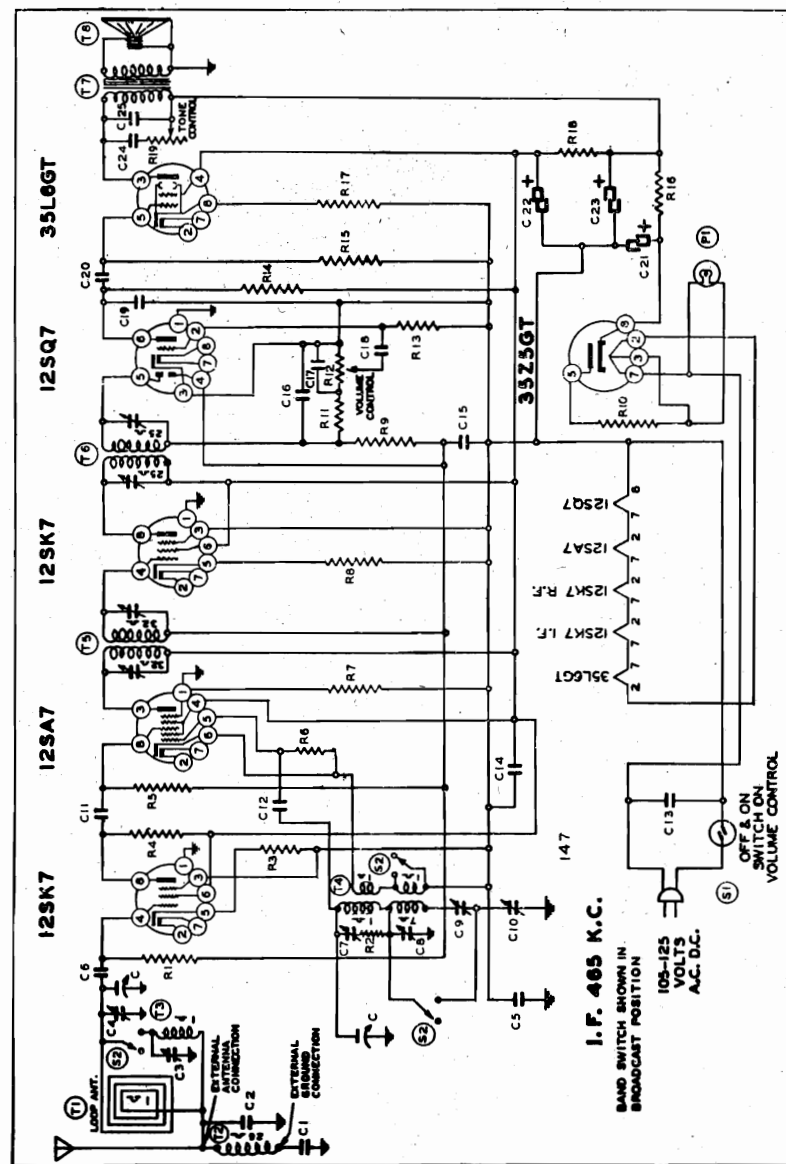


FIG. 1

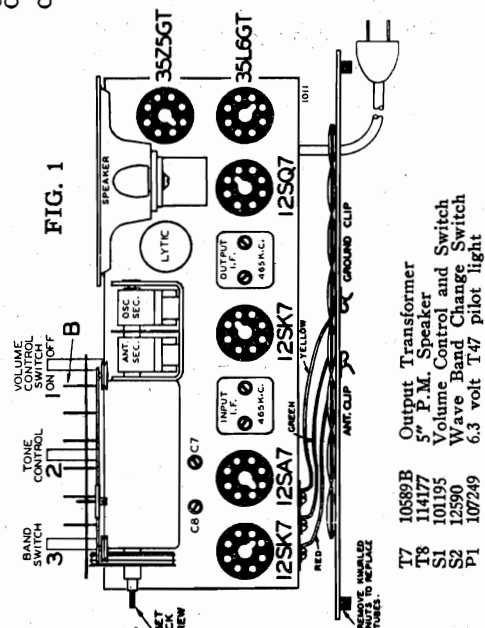
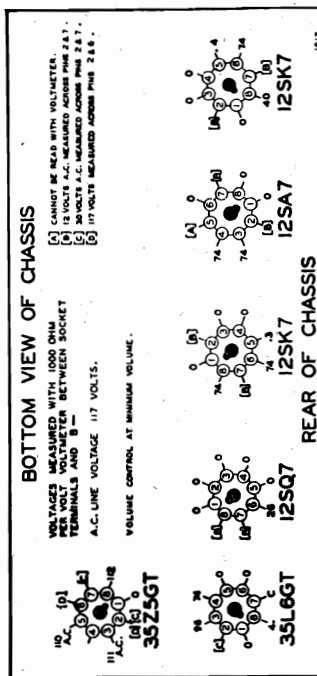


FIG. 4—BOTTOM VIEW



9-39

MODEL 637

Alignment, Notes

BELMONT RADIO CORP.

TUBES:

The tube complement of this chassis consists of the following octal base glass and metal tubes.

The type and function of each tube is as follows.

- 1—Type 12SK7 R. F. Amplifier.
- 1—Type 12SA7 Mixer, First Detector-oscillator.
- 1—Type 12SK7 I. F. Amplifier.
- 1—Type 12SQ7 Second Detector, A.V.C. and First Audio.
- 1—Type 35L6GT Beam Output Amplifier.
- 1—Type 35Z5GT High Vacuum Rectifier.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control at minimum, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on the voltage chart are measured with 117 volt A.C. or D.C. line.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduc-

tion in all D.C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltage, defective tubes, condensers and resistors. In order to properly align this radio, the chassis should be removed from the cabinet. It is important during alignment that the same distance between the loop antenna and the chassis be maintained as when the chassis is installed in the cabinet.

IMPORTANT: SEE ALIGNING INSTRUCTIONS.

- Loop antenna connected to radio.
- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

ALIGNMENT PROCEDURE

The following equipment is required for aligning.

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—1 mf., 200 mmf.

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Position of Band Switch | Variable Condenser Setting | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|------------------------|--|------------------|------------------------|----------------------------|---|---------------------------------------|-------------------------------------|---|
| I. F. | 465 Kc. | .1 MFD. | Grid of 12SK7 I. F. | Broadcast | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Grid of 12SA7 Mixer | Broadcast | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Input I. F. | Adjust to maximum output |
| SHORT WAVE BAND | 4050 Kc. | 200 mmf. | Antenna Clip | Short Wave | Rotor full open (Plates out of mesh) | Trimmer C7 (See Fig. 3) | Short Wave oscillator | Adjust to maximum output |
| | 3500 Kc. | 200 mmf. | Antenna Clip | Short Wave | Set Dial at 3.5 Mc. | Trimmer C3 (See Fig. 3) | Short Wave antenna | Adjust to maximum output |
| | 1650 Kc. | 200 mmf. | Antenna Clip | Short Wave | Set Dial at 1.65 Mc. | Trimmer C10 (See Fig. 3) | Short Wave oscillator series pad | Adjust to maximum, rock dial. (See note "A") |
| BROAD- CAST BAND | 1550 Kc. | 200 mmf. | Antenna Clip | Broadcast | Rotor full open (Plates out of mesh) | Trimmer C3 (See Fig. 3) | Broadcast oscillator | Adjust to maximum output |
| | 1400 Kc. | 200 mmf. | Antenna Clip | Broadcast | Set Dial at 1400 Kc. | Trimmer C4 (See Fig. 3) | Broadcast antenna | Adjust to maximum output |
| | 600 Kc. | 200 mmf. | Antenna Clip | Broadcast | Set Dial at 600 Kc. | Trimmer C9 (See Fig. 3) | Broadcast oscillator series pad | Adjust to maximum, rock dial. (See note "B") |

NOTE "A"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

NOTE "B"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

| BAND SWITCH | BAND | FREQUENCY RANGE |
|------------------------|---|-----------------|
| Extreme Right Rotation | Short Wave | 1.5 to 4.0 MC. |
| Extreme Left Rotation | Broadcast | 540 to 1550 KC. |
| Power Consumption | | 35 Watts |
| Power Output | 1.25 Watts Undistorted, 1.8 Watts Maximum | |
| Intermediate Frequency | | 465 KC. |

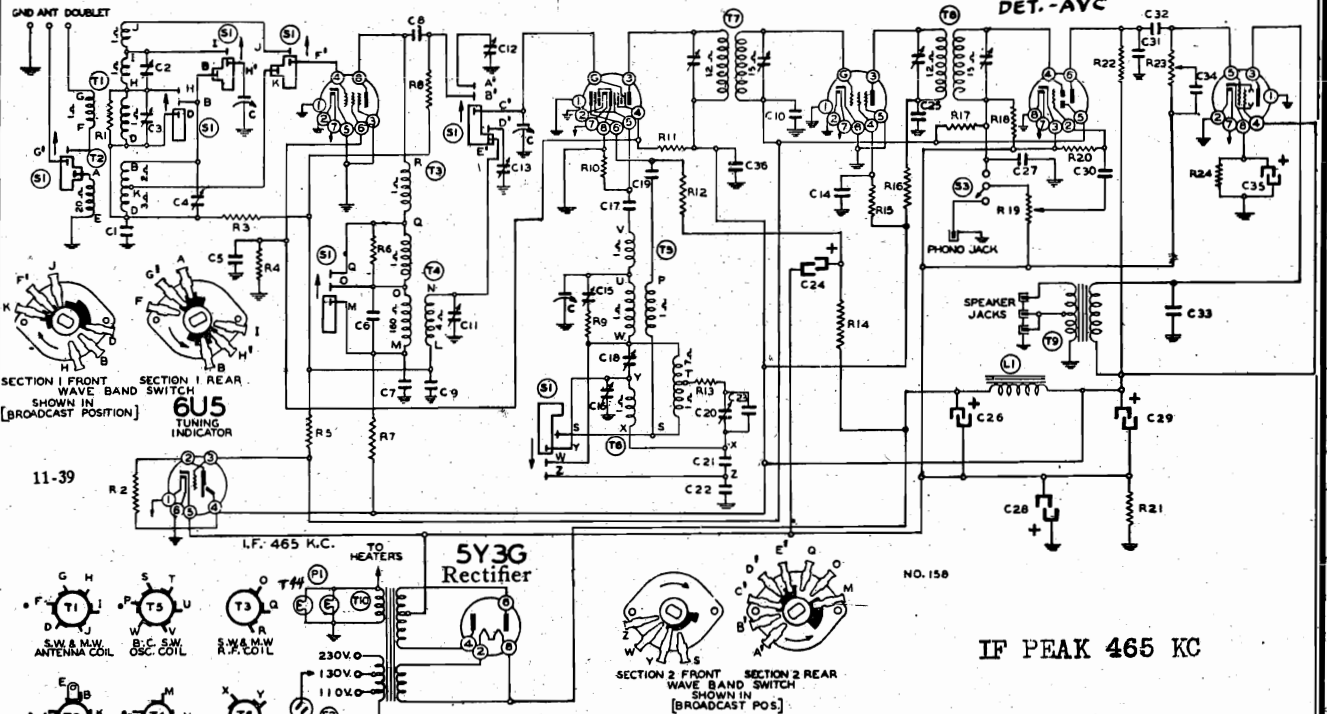
Serial 9K188300 up
Schematic, Voltage, Socket
Trimmers

BELMONT RADIO CORP.

MODELS 708-391, 708-398
708-378, etc.
Chassis 708, Series A
First Audio Output
6SQ7 6V6G

R. F. Amplifier 6SK7 First Detector-Oscillator I. F. Amplifier 6K7

NOTE: WHEN USING SINGLE
WIRE ANT. CONNECT
DOUBLET TO GROUND.



| Ref. Part No. | Description |
|------------------|-------------------------------|
| RESISTORS | |
| R1 13094 | 50M ohm— $\frac{1}{2}$ w.—10% |
| R2 1303 | 500M ohm— $\frac{1}{2}$ w. |
| R3 13020 | 100M ohm |
| R4 13012 | 50M ohm— $\frac{1}{2}$ w. |
| R5 13026 | 1000 ohm— $\frac{1}{2}$ w. |
| R6 130232 | 25M ohm— $\frac{1}{2}$ w. |
| R7 13026 | 1000 ohm— $\frac{1}{2}$ w. |
| R8 13019 | 1 megohm— $\frac{1}{2}$ w. |
| R9 13097 | 200 ohm— $\frac{1}{2}$ w. |
| R10 13012 | 50M ohm— $\frac{1}{2}$ w. |
| R11 130304 | 12M ohm—2 watt |
| R12 13017 | 10M ohm— $\frac{1}{2}$ w. |
| R13 130299 | 10 ohm— $\frac{1}{2}$ w. |
| R14 13017 | 10M ohm— $\frac{1}{2}$ w. |
| R15 13020 | 100M ohm— $\frac{1}{2}$ w. |
| R16 13023 | 2M ohm— $\frac{1}{2}$ w. |
| R17 1304 | 3 megohm— $\frac{1}{2}$ w. |
| R18 1304 | 3 megohm— $\frac{1}{2}$ w. |
| R19 101205 | 1 megohm volume control |
| R20 130225 | 15 megohm— $\frac{1}{2}$ w. |
| R21 130303 | 35 ohm— $\frac{1}{2}$ w. |
| R22 1309 | 200M ohm— $\frac{1}{2}$ w. |
| R23 101206 | 150M ohm tone control |
| R24 130227 | 250 ohm—1 watt |

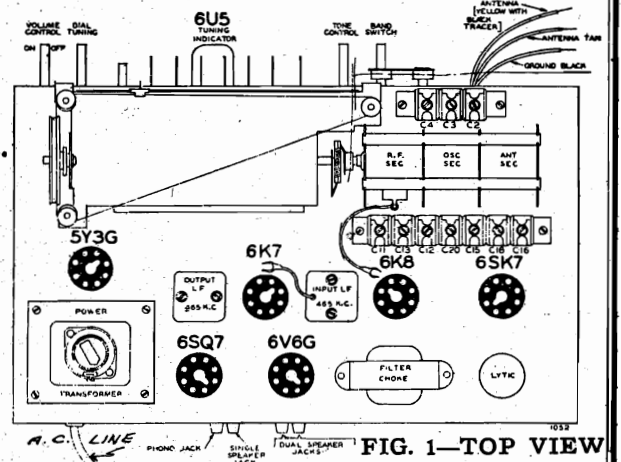
Chassis No. 708—Series A
(Serial No. 9K188300 and up)

For Models 708-391,
708-398 and 708-378, Etc.

| | |
|------------|--------------------------|
| C26 119100 | 30 uf. lytic x 450 w. v. |
| C27 1295 | .0001 mica |
| C28 11991 | 40 uf. lytic x 25 w. v. |
| C29 119100 | 30 uf. lytic x 450 w. v. |
| C30 10025 | .002 x 600 v. |
| C31 12912 | .00025 mica |
| C32 10013 | .05 x 400 v. |
| C33 10097 | .02 x 600 v. |
| C34 10078 | .01 x 200 v. |
| C35 119100 | 40 uf. lytic—25 w. v. |
| C36 10013 | .05 x 400 v. |

C26, C29, and C35 in same unit.

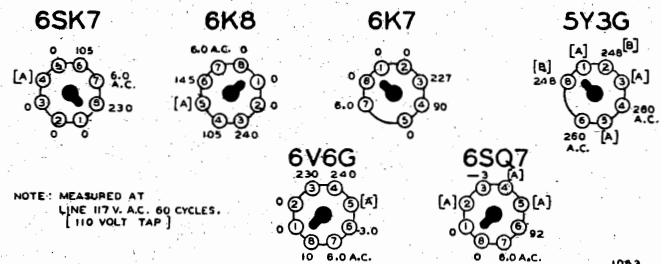
| | |
|-------------------|----------------------------|
| CONDENSERS | |
| C 102121 | 3 gang variable condenser |
| C1 10090 | .02 x 400 v. |
| C2 124118 | S.W. Antenna Trimmer |
| C3 124118 | M.W. Antenna Trimmer |
| C4 124118 | B.C. Antenna Trimmer |
| C5 10013 | .05 x 400 v. |
| C6 12938 | .00005 mica |
| C7 10090 | .02 x 400 v. |
| C8 10090 | .02 x 400 v. |
| C9 10090 | .02 x 400 v. |
| C10 1009 | .05 x 200 v. |
| C11 124119 | B.C. R.F. Trimmer |
| C12 124119 | S.W. R.F. Trimmer |
| C13 124119 | M.W. R.F. Trimmer |
| C14 10013 | .05 x 400 v. |
| C15 124119 | S.W. Oscillator Trimmer |
| C16 124119 | M.W. Oscillator Trimmer |
| C17 12962 | .00003 Mica |
| C18 124119 | B.C. Oscillator Trimmer |
| C19 10025 | .002 x 600 v. |
| C20 124119 | B.C. Padding Condenser |
| C21 129149 | .0028 Compression M.W. Pad |
| C22 129105 | .0035 Compression S.W. Pad |
| C23 12959 | .0003 mica |
| C24 11981 | 16 uf. lytic x 400 w. v. |
| C25 1001 | .1 x 400 v. |



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT
VOLTMETER BETWEEN SOCKET TERMINALS
AND CHASSIS.

- [A] CANNOT BE READ WITH VOLTMETER.
[B] 5 VOLTS A.C. BETWEEN PINS 2 & 8
[C] USING 250 VOLT SCALE ON VOLTMETER.



REAR OF CHASSIS

MODEL 791

Schematic, Voltage, Socket.

BELMONT RADIO CORP.

Oct. '39

FOR ALIGNMENT SEE INDEX

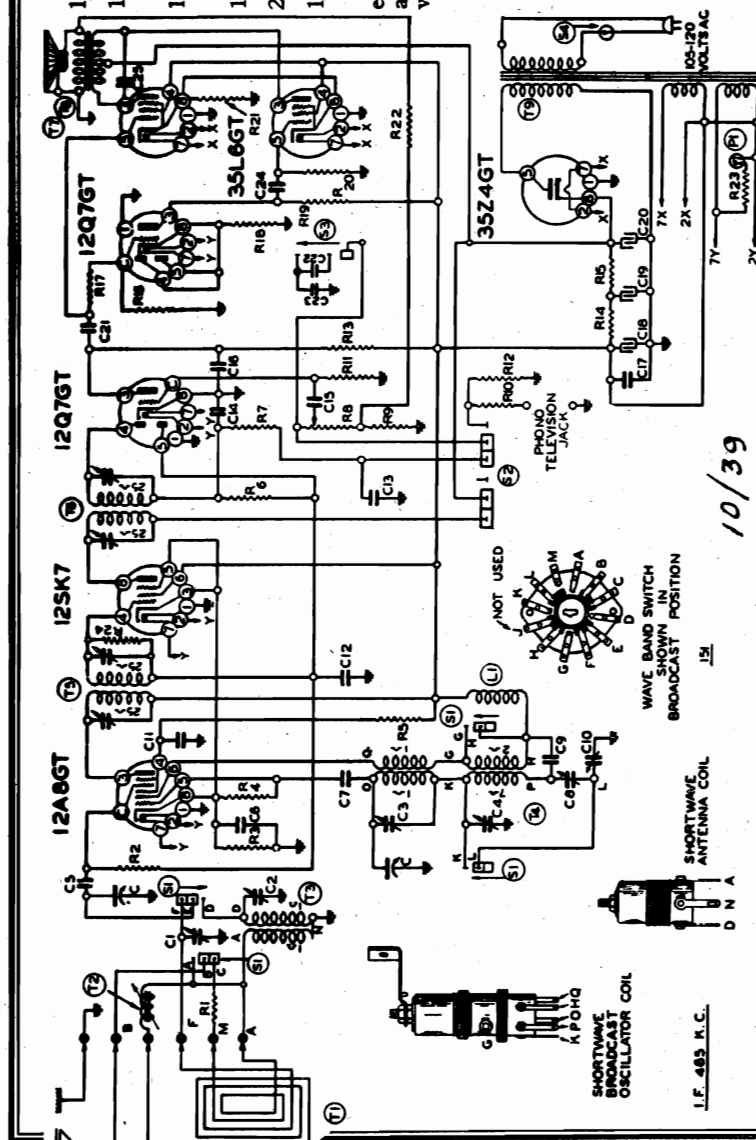
The type and function of each tube is as follows:

- 1—Type 12A8GT First Detector-oscillator.
- 1—Type 12SK7 Remote Cut-Off Pentode, I. F. Amplifier (465 K. C.).
- 1—Type 12Q7GT Duplex Diode Triode Second Detector, A.V.C. and First Audio.
- 1—Type 12Q7GT Phase Inverter.
- 2—Type 35L6GT Push-Pull Output Amplifier.
- 1—Type 35Z4GT High Vacuum Rectifier.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 110, 130, and 230 volts, (see parts list).

| Circuit Diagram Ref. No. | Part No. | Description |
|---|----------|--------------------------------|
| CONDENSERS | | |
| C | 102123 | 2 gang variable condenser |
| C1 | 124117 | B.C. Adj. Trimmer (Antenna) |
| C2 | 124116 | S.W. Adj. Trimmer (Antenna) |
| C3 | 124112 | S.W. Adj. Trimmer (Oscillator) |
| C4 | 124112 | B.C. Adj. Trimmer (Oscillator) |
| C5 | 1292 | .0005 mica |
| C6 | 100104 | .5 x 100 v. |
| C7 | 12939 | .00005 mica |
| C8 | 124113 | B.C. Series Pad |
| C9 | 1009 | .05 x 200 v. |
| C10 | 124113 | S.W. Series Pad |
| C11 | 10220 | .1 x 200 v. |
| C12 | 1009 | .05 x 200 v. |
| C13 | 1295 | .0001 mica |
| C14 | 1295 | .0001 mica |
| C15 | 10025 | .002 x 600 v. |
| C16 | 1292 | .0005 mica |
| C17 | 10020 | .1 x 200 v. |
| C18 | 19101 | 20 mid. lytic |
| C19 | 19101 | 20 mid. lytic |
| C20 | 19101 | 40 mid. lytic |
| C21 | 10026 | .02 x 400 v. |
| C22 | 1298 | .0006 mica |
| C23 | 10012 | .001 x 200 v. |
| C24 | 10026 | .02 x 400 v. |
| C25 | 10087 | .01 x 600 v. |
| C8 and C10 in same unit, C18, C19 and C20 in same unit C3 and C4 in same unit | | |
| FREQUENCY RANGE | | |
| | | 5.7 to 18.3 MC. |
| | | 540 to 1550 KC. |

| | | |
|--------------|---------|---------------------------------|
| PARTS | | |
| T1 | 111157 | Loop Antenna (Complete) |
| T2 | 111162 | Loop Adjusting Coil |
| T3 | 111163 | E.C. S.W. Oscillator Coil |
| T4 | 101135 | B.C. S.W. Oscillator Coil |
| T5 | 10163C | Input I.F.—465 kc. |
| T6 | 10163D | Output I.F.—465 kc. |
| T7 | 114182 | 6" P.M. Speaker |
| T8 | 10596 | Output Transformer |
| T9 | 104175B | Power Transformer |
| S1 | 125100 | Band Switch |
| S2 | 12570 | Phono Radio Switch |
| S3 | 12599 | Tone Switch |
| S4 | 1233 | Off-on switch on volume control |
| L1 | 10794 | R.F. Choke |
| P1 | | 6-8 v. pilot light |



Power Consumption.....55 Watts

Power Output 3 Watts Undistorted, 3.6 Watts Maximum

| Diagram Ref. No. | Part No. | Description |
|------------------|----------|-------------|
|------------------|----------|-------------|

| | | |
|------------------|--------|------------------|
| RESISTORS | | |
| R1 | 13079 | 400 ohm—1/4 w. |
| R2 | 13019 | 1 megohm—1/4 w. |
| R3 | 13018 | 100 ohm—1/4 w. |
| R4 | 13012 | 50M ohm—1/4 w. |
| R5 | 130149 | 15M ohm—1/4 w. |
| R6 | 130170 | 3 megohm—1/4 w. |
| R7 | 13012 | 30M ohm—1/4 w. |
| R8 | 10195 | 1 megohm—1/4 w. |
| R9 | 130215 | 25 ohm—1/4 w. |
| R10 | 13038 | 2 megohm—1/4 w. |
| R11 | 130225 | 15 megohm—1/4 w. |
| R12 | 13019 | 1 megohm—1/4 w. |
| R13 | 1909 | 200M ohm—1/4 w. |
| R14 | 130294 | 1200 ohm—1/4 w. |
| R15 | 130294 | 1200 ohm—1/4 w. |
| R16 | 130236 | 30M ohm—1/4 w. |
| R17 | 130102 | 500M ohm—1/4 w. |
| R18 | 13022 | 5M ohm—1/4 w. |
| R19 | 1309 | 200M ohm—1/4 w. |
| R20 | 130102 | 500M ohm—1/4 w. |
| R21 | 13097 | 200 ohm—1/4 w. |
| R22 | 130168 | 100 ohm—1/4 w. |
| R23 | 130301 | 25 ohm—1/4 w. |
| R24 | 13019 | 1 megohm—1/4 w. |

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS

- [1] CANNOT BE MEASURED WITH VOLTMETER
- [2] 20 VOLTS A.C. READ ACROSS PINS 2 & 7
- [3] 10 VOLTS A.C. READ ACROSS PINS 2 & 7
- [4] 10 VOLTS A.C. READ ACROSS PINS 2 & 7
- [5] N.C.—NO CONNECTION
- [6] T.R.—TIE POINT



REAR OF CHASSIS

1026

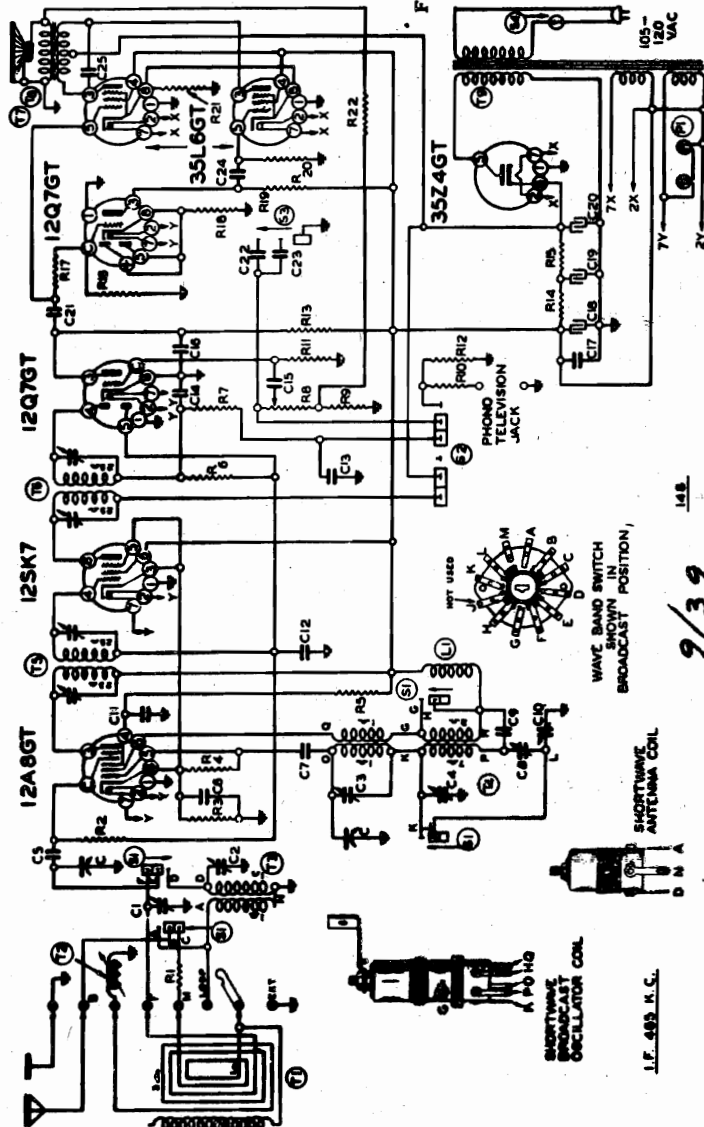
BELMONT RADIO CORP.

MODEL 792, Series A
Schematic, Voltage
Socket

The tube complement of this chassis consists of the following octal base glass and metal tubes:

The type and function of each tube is as follows:

- 1—Type 12A8GT First Detector-oscillator.
- 1—Type 12SK7 Remote Cut-Off Pentode, I. F. Amplifier (465 K. C.).
- 1—Type 12Q7GT Duplex Diode Triode Second Detector, A.V.C. and First Audio.
- 1—Type 12Q7GT Phase Inverter.
- 2—Type 35L6GT Push-Pull Output Amplifier.
- 1—Type 35Z4GT High Vacuum Rectifier.



| FREQUENCY RANGE | |
|---------------------------------|--------|
| 5.7 to 18.3 MC. | C |
| 540 to 1550 KC. | C1 |
| CONDENSERS | |
| 2 gang variable condenser | 102119 |
| B. C. Adj. Trimmer (Antenna) | 124111 |
| S. W. Adj. Trimmer (Antenna) | 124111 |
| S. W. Adj. Trimmer (Oscillator) | 124112 |
| B. C. Adj. Trimmer (Oscillator) | 124112 |
| .005 mica | 102104 |
| .3 x 100 v. | 102104 |
| .0005 mica | 124113 |
| B. C. Series Pad | 102109 |
| .05 x 200 v. | 102109 |
| S. W. Series Pad | 102109 |
| .1 x 200 v. | 102109 |
| .05 x 200 v. | 102109 |
| .0001 mica | 102109 |
| .0001 mica | 102109 |
| .002 x 600 v. | 102109 |
| .0005 mica | 102109 |
| .1 x 200 v. | 102109 |
| 20 mfd. electrolytic | 102109 |
| 40 mfd. electrolytic | 102109 |
| .02 x 400 v. | 102109 |
| .0006 mica | 102109 |
| .001 x 200 v. | 102109 |
| .02 x 400 v. | 102109 |
| .003 x 600 v. | 102109 |
| .03 x 600 v. | 102109 |
| C1 and C2 in same unit | 102109 |
| C8 and C10 in same unit | 102109 |
| C18, C19 and C20 in same unit | 102109 |
| C3 and C4 in same unit. | 102109 |

Power Consumption.....55 Watts

Power Output 3 Watts Undistorted, 3.6 Watts Maximum

Diagram Ref. No. Part No. Description

| RESISTORS | |
|-----------|-------------------------|
| R1 | 400 ohm—1/2 w. |
| R2 | 1 megohm—1/2 w. |
| R3 | 100 ohm—1/2 w. |
| R4 | 50M ohm—1/2 w. |
| R5 | 15M ohm—1/2 w. |
| R6 | 3 megohm—1/2 w. |
| R7 | 30M ohm—1/2 w. |
| R8 | 1 megohm—volume control |
| R9 | 25 ohm—1/2 w. |
| R10 | 2 megohm—1/2 w. |
| R11 | 15 megohm—1/2 w. |
| R12 | 1 megohm—1/2 w. |
| R13 | 200M ohm—1/2 w. |
| R14 | 120 ohm—1/2 w. |
| R15 | 120 ohm—1/2 w. |
| R16 | 30M ohm—1/2 w. |
| R17 | 500M ohm—1/2 w. |
| R18 | 5M ohm—1/2 w. |
| R19 | 200M ohm—1/2 w. |
| R20 | 500M ohm—1/2 w. |
| R21 | 200 ohm—1/2 w. |
| R22 | 100 ohm—1/2 w. |

PARTS

| | | |
|----|---------|-----------------------------|
| T1 | 111154 | Loop Antenna |
| T2 | 111153 | Loop Adjusting Coil |
| T3 | 111151 | S. W. Antenna Coil |
| T4 | 110135 | B. C. S. W. Oscillator Coil |
| T5 | 108163 | Input I. F.—465 kc. |
| T6 | 108163B | 10" P. M. Speaker |
| T7 | 114178 | Output Transformer |
| T8 | 10596 | Power Transformer |
| T9 | 104175 | Band Switch |
| S1 | 12594 | Phono Radio Switch |
| S2 | 12570 | Tone Control Switch |
| S3 | 12598 | Off-on switch |
| S4 | 123 | R. F. "B" Choke |
| L1 | 10794 | 2 6-8 v. pilot lights |

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 500 OHM
VOLT-Ohm-MILLI-AMPERE METER BETWEEN
SOCKET TERMINALS AND CHASSIS.

CANNOT BE MEASURED WITH VOLTMETER.
20 VOLTS A.C. READ ACROSS PIN 2 & 7.
115 VOLTS A.C. READ ACROSS PIN 2 & 7.

115 VOLTS A.C. LINE VOLTAGE READ BETWEEN PINS 3 & 4.

35Z4GT

12A8GT

12Q7GT

35L6GT

12SK7

12Q7GT

35L6GT

12SK7

12Q7GT

35L6GT

12SK7

12Q7GT

35L6GT

MODEL 791
MODEL 792, Series A
Alignment, Trimmers

BELMONT RADIO CORP.

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Position of Band Switch | Condenser Setting | Trimmers Adjusted (In Order Shown) | Trimmer Function | Adjustment |
|-----------------|---------------------------------------|---------------|-----------------------------|-------------------------|---|---------------------------------------|----------------------------------|--|
| I. F. | 465 Kc. | .1 MFD. | Grid of 12SK7 | Broadcast | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 2) | Output I. F. | Adjust to maximum output |
| I. F. | 465 Kc. | .1 MFD. | Grid of 12A8GT Mixer | Broadcast | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 2) | Input I. F. | Adjust to maximum output |
| SHORT WAVE BAND | 17 Mc. | 400 Ohms | External Antenna and Ground | Short Wave | Set Dial at 17 Mc. | Trimmer C3 (See Fig. 2) | Short Wave oscillator | Adjust to maximum output |
| SHORT WAVE BAND | 17 Mc. | 400 Ohms | External Antenna and Ground | Short Wave | Set Dial at 17 Mc. | Trimmer C2 (See Fig. 2) | Short Wave antenna | Adjust to maximum output |
| (See Note A) | 6 Mc. | 400 Ohms | External Antenna and Ground | Short Wave | Set Dial at 6 Mc. | Trimmer C10 (See Fig. 4) | Short Wave oscillator series pad | Adjust to maximum output dial. (See note "C") |
| BROADCAST BAND | 1550 Kc. | 200 mmf. | Grid of 12A8GT | Broadcast | Rotor full open (Plates out of mesh) | Trimmer C4 (See Fig. 2) | Broadcast oscillator | Adjust to maximum output |
| BROADCAST BAND | 540 Kc. | 200 mmf. | Grid of 12A8GT | Broadcast | Set Dial at 540 Kc. | Trimmer C3 (See Fig. 4) | Broadcast oscillator series pad | Adjust to maximum output |
| LOOP ALIGNMENT | 1400 Kc. | 200 mmf. | External Antenna and Ground | Broadcast | Set Dial at 1400 Kc. | Trimmer C1 (See Fig. 2) | Broadcast antenna | Adjust to maximum output |
| ALIGNMENT | 600 Kc. | 200 mmf. | External Antenna and Ground | Broadcast | Set Dial at 600 Kc. | Trimmer T2 (See Fig. 2) | Iron Core Tracking Coil | Adjust to maximum output |

(See Fig. 2) FOR MODEL 792, SEE "A."

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the Short Wave Band and to the grid of the 12A8GT tube and ground terminal when setting the Broadcast Band oscillator frequencies, (1550 and 540 Kc.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the

loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals. (See Fig. 1).

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

NOTE:—FIGURES TO LEFT REFER TO MODEL 791;

FIGURES TO RIGHT REFER TO MODEL 792 Series A.

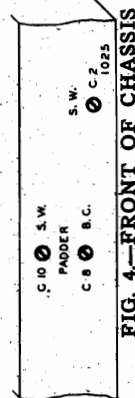


FIG. 2.—TOP VIEW

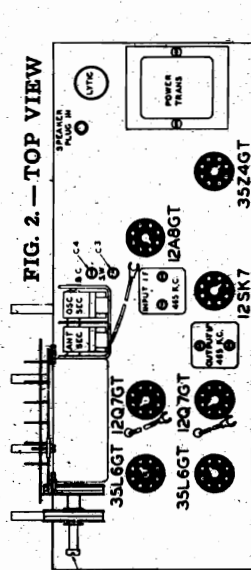


FIG. 1.—REAR VIEW OF CHASSIS

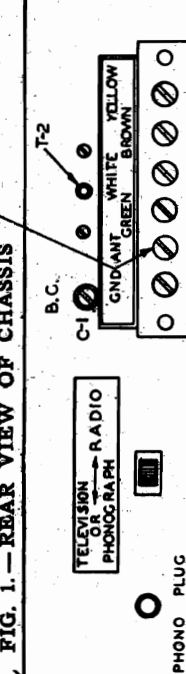


FIG. 1.—REAR VIEW OF CHASSIS

Schematic, Voltage, Socket
Trimmers

BELMONT RADIO CORP.

MODEL 792, Series B

Serial 9L200500 up

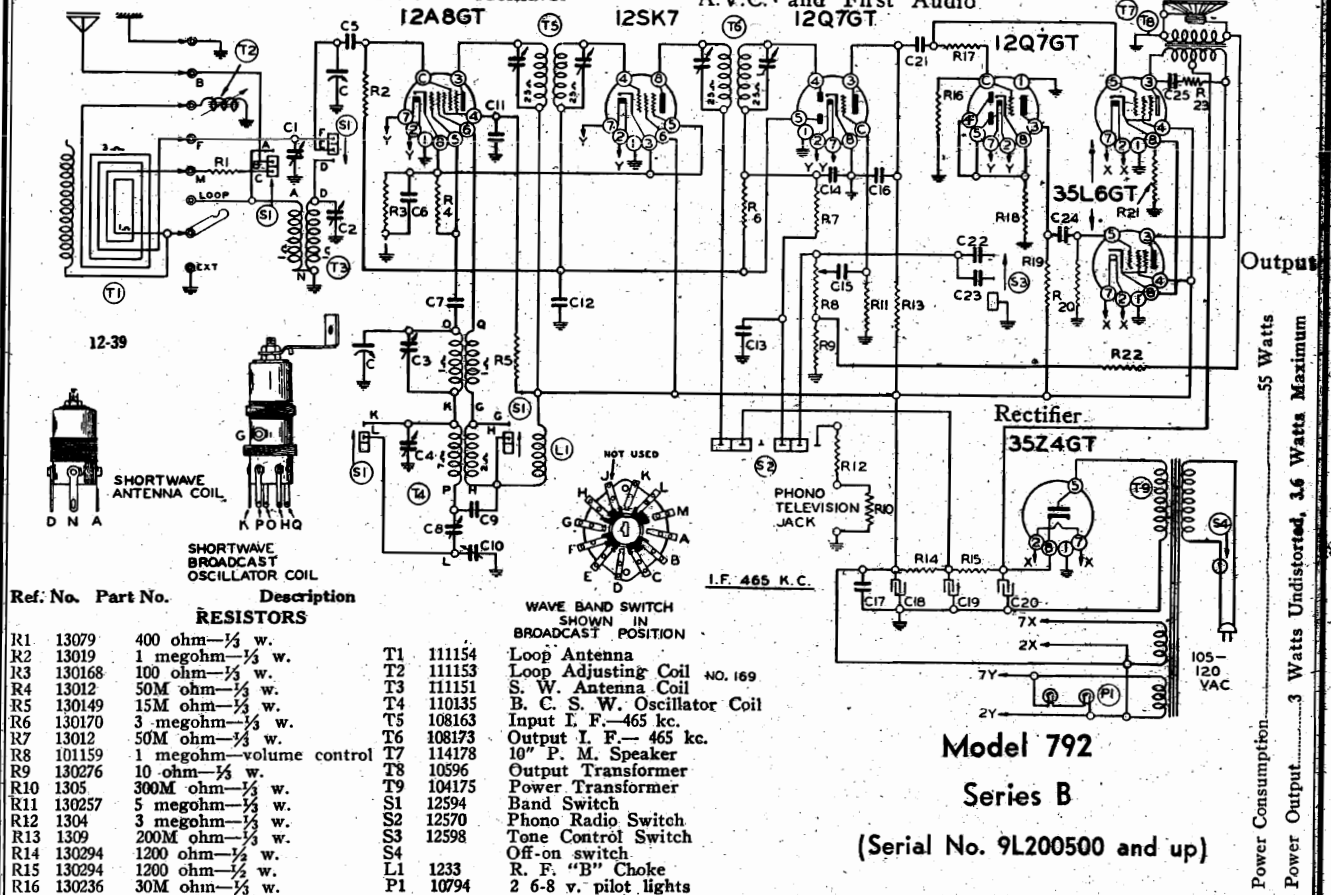
First Detector-oscillator
I. F. Amplifier Second Detector, Phase Inverter
A.V.C. and First Audio

FIG. 1.—REAR VIEW OF CHASSIS

PHONO PLUG

TELEVISION OR PHONOGRAPH

RADIO

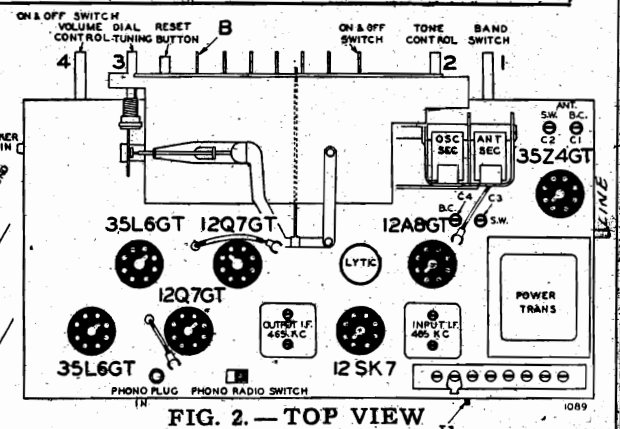
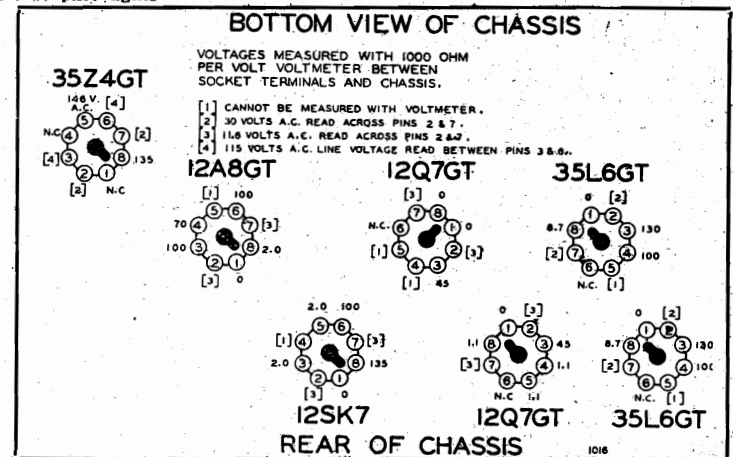
TERMINAL BOARD

EXTERNAL ANTENNA

EXTERNAL GROUND

WHEN OUTSIDE ANTENNA IS USED, MOVE CONNECTOR BAR FROM TERMINAL MARKED "LOOP" AND CONNECT IT TO TERMINAL MARKED "EXT."

1017



MODEL 792, Series B
MODEL 793, Series B
Alignment, Trimmers

BELMONT RADIO CORP.

CHASSIS 792, 793B. ALIGNMENT PROCEDURE

The following equipment is required for aligning.

- Volume control—Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna valve in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

SIGNAL GENERATOR

| BAND | Frequency Setting | Dummy Antenna | Connection to Radio | Position of Band Switch | Variable Condenser Setting | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|------------------------------|-------------------|---------------|-----------------------------|-------------------------|--------------------------------------|------------------------------------|----------------------------------|---|
| I. F. | 465 Kc. | .1 MFD. | Grid of 12SK7 | Broadcast | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 2) | Output I. F. | Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Grid of 12A8GT Mixer | Broadcast | Rotor full (Plates out of mesh) | Two trimmers on top (See Fig. 2) | Input I. F. | Adjust to maximum output |
| SHORT WAVE BAND (See Note A) | 17 Mc. | 400 Ohms | External Antenna and Ground | Short Wave | Set Dial at 17 Mc. | Trimmer C3 (See Fig. 5) | Short Wave oscillator | Adjust to maximum output |
| | 17 Mc. | 400 Ohms | External Antenna and Ground | Short Wave | Set Dial at 17 Mc. | Trimmer C2 (See Fig. 5) | Short Wave antenna | Adjust to maximum output |
| | 6 Mc. | 400 Ohms | External Antenna and Ground | Short Wave | Set Dial at 6 Mc. | Trimmer C10 (See Fig. 4) | Short Wave oscillator series pad | Adjust to maximum rock dial. (See note "C") |
| BROADCAST BAND (See Note A) | 1550 Kc. | 200 mmf. | Grid of 12A8GT | Broadcast | Rotor full open (Plates out of mesh) | Trimmer C4 (See Fig. 5) | Broadcast oscillator | Adjust to maximum output |
| | 540 Kc. | 200 mmf. | Grid of 12A8GT | Broadcast | Set Dial at 540 Kc. | Trimmer C8 (See Fig. 4) | Broadcast oscillator series pad | Adjust to maximum output |
| LOOP ALIGNMENT (See Note B) | 1400 Kc. | 200 mmf. | External Antenna and Ground | Broadcast | Set Dial at 1400 Kc. | Trimmer C1 (See Fig. 5) | Broadcast antenna | Adjust to maximum output |
| | 600 Kc. | 200 mmf. | External Antenna and Ground | Broadcast | Set Dial at 600 Kc. | Trimmer T2 (See Fig. 5) | Iron Core Tracking Coil | Adjust to maximum output |

It is important during loop alignment that the same distance between the loop antenna and the chassis be maintained as when the chassis is installed in the cabinet.

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the Short Wave Band and to the grid of the 12A8GT tube and ground terminal when setting the Broadcast Band oscillator end frequencies, (1550 and 540 Kc.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals and the jumper on the terminal board connected to the "EXT." terminal (See Fig. 1).

NOTE "C"—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

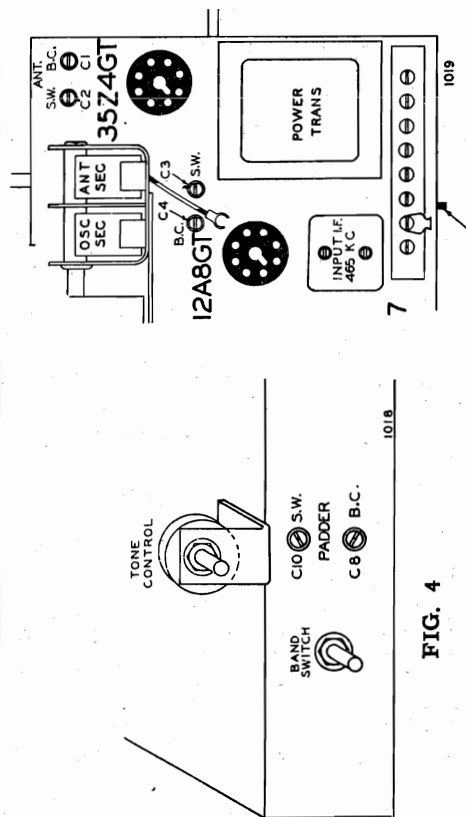
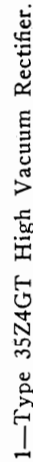


FIG. 5—TOP VIEW



| | | |
|----|--------|---------------------------------|
| C | 102119 | 2 gang variable condenser |
| C1 | 124111 | B. C. Adj. Trimmer (Antenna) |
| C2 | 124111 | S. W. Adj. Trimmer (Antenna) |
| C3 | 124112 | S. W. Adj. Trimmer (Oscillator) |
| C4 | 124112 | B. C. Adj. Trimmer (Oscillator) |

| Circuit Diagram Ref. No. | Part No. | Description |
|--------------------------------|----------|----------------------------|
| | | RESISTORS |
| R1 | 13079 | 400 ohm— $\frac{1}{2}$ w. |
| R2 | 13019 | 1 megohm— $\frac{1}{2}$ w. |
| R3 | 130168 | 100 ohm— $\frac{1}{2}$ w. |
| R4 | 13012 | 50M ohm— $\frac{1}{2}$ w. |
| R5 | 130149 | 15M ohm— $\frac{1}{2}$ w. |
| R6 | 130170 | 3 megohm— $\frac{1}{2}$ w. |
| R7 | 13012 | 50M ohm— $\frac{1}{2}$ w. |
| R8 | 101202 | 1 megohm—volume control |
| R9 | 130276 | 10 ohm— $\frac{1}{2}$ w. |
| R10 | 130378 | 2 megohm— $\frac{1}{2}$ w. |
| R11 | 130257 | 5 megohm— $\frac{1}{2}$ w. |
| R12 | 13019 | 1 megohm— $\frac{1}{2}$ w. |
| R13 | 1309 | 200M ohm— $\frac{1}{2}$ w. |
| R14 | 130294 | 1200 ohm— $\frac{1}{2}$ w. |
| R15 | 130294 | 1200 ohm— $\frac{1}{2}$ w. |
| R16 | 130236 | 30M ohm— $\frac{1}{2}$ w. |
| R17 | 130102 | 500M ohm— $\frac{1}{2}$ w. |
| R18 | 13022 | 5M ohm— $\frac{1}{2}$ w. |
| R19 | 1309 | 200M ohm— $\frac{1}{2}$ w. |
| R20 | 130102 | 500M ohm— $\frac{1}{2}$ w. |
| R21 | 130296 | 200 ohm— $\frac{1}{2}$ w. |
| R22 | 130168 | 100 ohm— $\frac{1}{2}$ w. |
| R23 | 13094 | 50M ohm— $\frac{1}{2}$ w. |

| PARTS | |
|--------|--|
| 111154 | Loop Antenna |
| 111153 | Loop Adjusting Coil (Iron Core Track- ing Coil) |
| 111151 | S. W. Antenna Coil |
| T3 | B. C. S. W. Oscillator Coil |
| T4 | Input I. F. - 465 Kc. |
| T5 | Output I. F. - 465 Kc. |
| T6 | 10" P. M. Speaker |
| T7 | 14178 |
| T8 | Output Transformer |
| T9 | 10596 |
| T10 | Power Transformer |
| T11 | 104175 |
| T12 | Automatic Record Changer complete |
| S1 | Band Switch |
| S2 | 12594 |
| S3 | 125101 |
| S4 | 12598 |
| S5 | Tone Switch |
| S6 | Off-on switch on volume control |
| S7 | Off-on switch on record changer |
| S8 | R. F. "B" Choke |
| S9 | 2 6-8 v. pilot lights |
| P1 | Indicator Light |
| P2 | 1233 |
| | 10794 |
| | 107290 |

MODEL 793, Series A
Alignment, Trimmers
Phono Data

BELMONT RADIO CORP.

| BAND | SIGNAL GENERATOR | | Connection to Radio | Position of Band Switch | Variable Condenser Setting | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|---------------------------------|------------------|---------------|-----------------------------|-------------------------|---|-------------------------------------|----------------------------------|---|
| | Frequency | Dummy Antenna | | | | | | |
| I. F. | 465 Kc. | .1 MFD. | Grid of 12SK7 I. F. | Broadcast | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 2) | Output I. F. | Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Grid of 12A8GT Mixer | Broadcast | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 2) | Input I. F. | Adjust to maximum output |
| SHORT WAVE BAND (See Note A) | 17 Mc. | 400 Ohms | External Antenna and Ground | Short Wave | Set Dial at 17 Mc. | Trimmer C3 (See Fig. 5) | Short Wave | Adjust to maximum output |
| | 17 Mc. | 400 Ohms | External Antenna and Ground | Short Wave | Set Dial at 17 Mc. | Trimmer C2 (See Fig. 5) | Short Wave antenna | Adjust to maximum output |
| | 6 Mc. | 400 Ohms | External Antenna and Ground | Short Wave | Set Dial at 6 Mc. | Trimmer C10 (See Fig. 4) | Short Wave oscillator series pad | Adjust to maximum rock dial. (See note "C") |
| BROADCAST BAND (See Note A) | 1550 Kc. | 200 mmf. | Grid of 12A8GT | Broadcast | Rotor full open (Plates out of mesh) | Trimmer C4 (See Fig. 5) | Broadcast oscillator | Adjust to maximum output |
| | 540 Kc. | 200 mmf. | Grid of 12A8GT | Broadcast | Set Dial at 540 Kc. | Trimmer C3 (See Fig. 4) | Broadcast oscillator series pad | Adjust to maximum output |
| LOOP ALIGNMENT (See Note B) | 1400 Kc. | 200 mmf. | External Antenna and Ground | Broadcast | Set Dial at 1400 Kc. | Trimmer C1 (See Fig. 5) | Broadcast antenna | Adjust to maximum output |
| | 600 Kc. | 200 mmf. | External Antenna and Ground | Broadcast | Set Dial at 600 Kc. | Trimmer T2 (See Fig. 5) | Iron Core Tracking Coil | Adjust to maximum output |

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the Short Wave Band and to the grid of the 12AGT tube and ground terminal when setting the Broadcast Band oscillator and frequencies, (1550 and 540 K. C.).

The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals and the jumper on the terminal board connected to the "EXT." terminal. (See Fig. 1).

NOTE "c".—Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained. Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each band is completed, repeat the procedure as a final check.

| BAND SWITCH | BAND | FREQUENCY RANGE |
|--|----------------------------|-------------------|
| Extreme Right Rotation | Short Wave | 5.7 to 18.3 MC. |
| Extreme Left Rotation | Broadcast | 540 to 1550 KC. |
| Power Consumption (Radio Chassis only, less Phono Motor) | | 55 Watts |
| Power Output | 3 Watts Undistorted, | 3.6 Watts Maximum |
| Intermediate Frequency | | 465 K. C. |

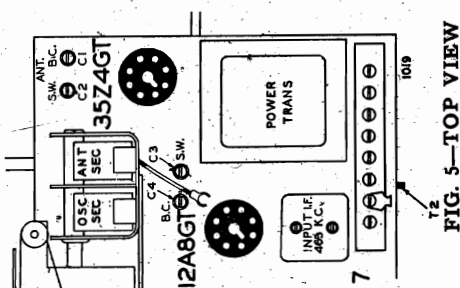


FIG. 5—TOP VIEW

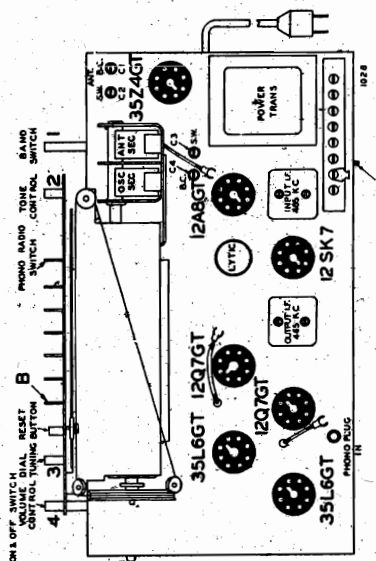


FIG. 2.—TOP VIEW

PHONOGRAPH OPERATION:

The Phono-Radio switch is of the push button type, (See button 5, fig. 3).

For Phono operation push Phono push button, all the way in. This will disconnect the radio and connect the phonograph pick-up. The volume and tone controls on the front panel of the radio are used for either radio or for phonograph.

To switch back to radio playing position push in on any one of the automatic tuning push buttons or the manual dial tuning control knob.

Included with this manual is a separate instruction manual for the Automatic Record Changer. Before operating the Record Changer familiarize yourself with the controls and the operation of the mechanism.

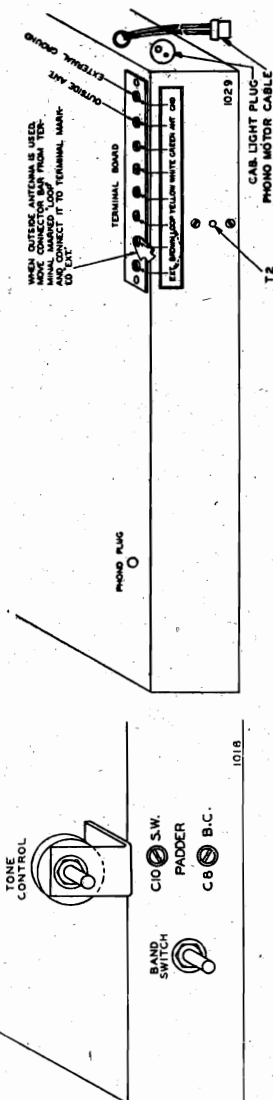


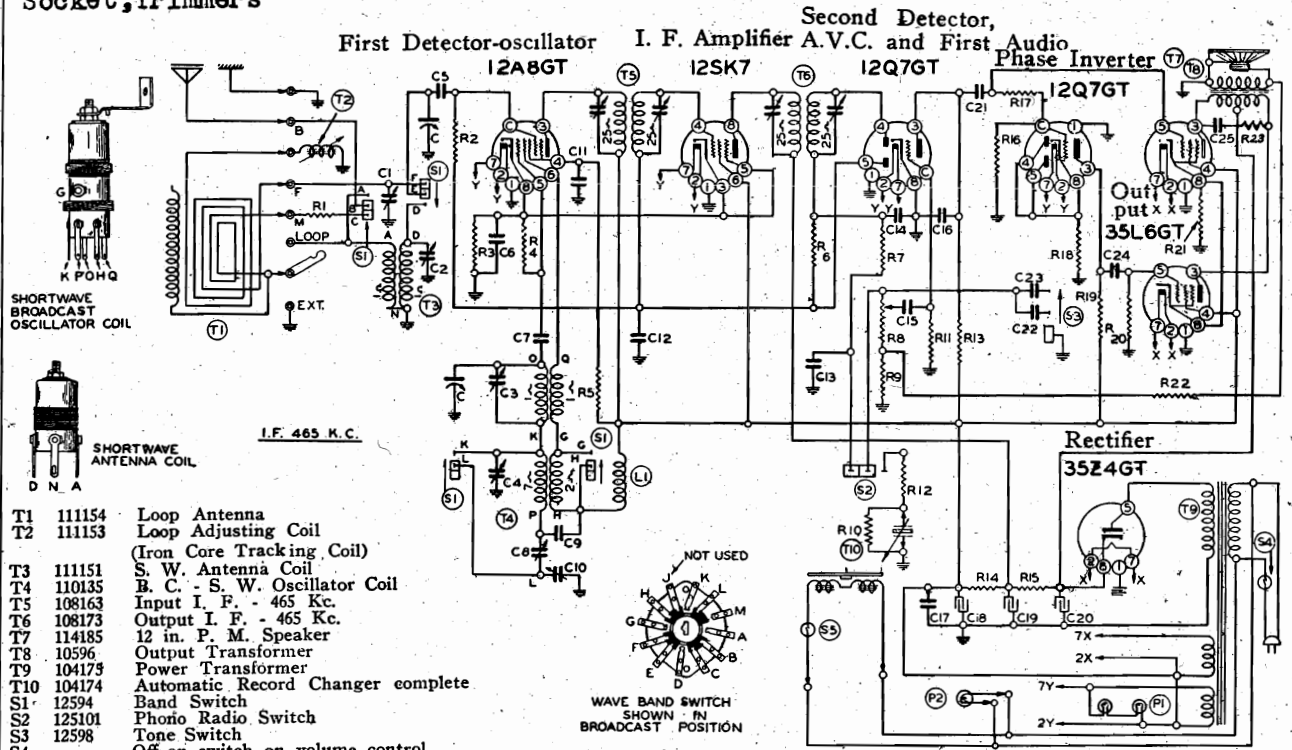
FIG. 4

FIG. 1.—REAR VIEW OF CHASSIS

Schematic, Voltage
Socket, Trimmers

BELMONT RADIO CORP.

MODEL 793, Series B
Serial 9L199900 up



Ref. No. Part No. Description

RESISTORS

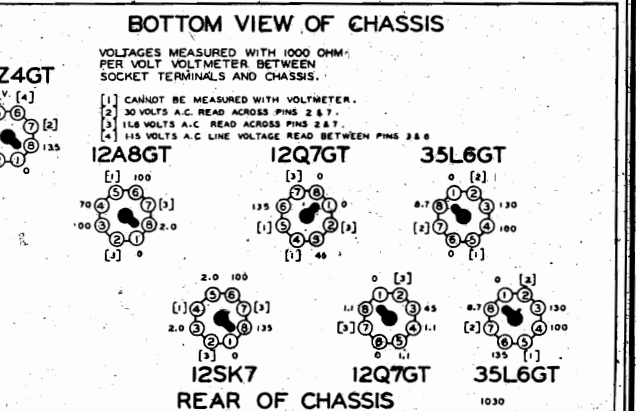
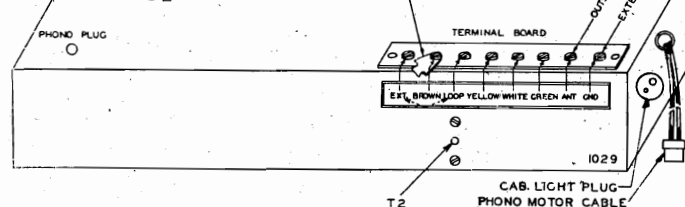
| | | |
|-----|--------|----------------------------|
| R1 | 13079 | 400 ohm- $\frac{1}{2}$ w. |
| R2 | 13019 | 1 megohm- $\frac{1}{2}$ w. |
| R3 | 130168 | 100 ohm- $\frac{1}{2}$ w. |
| R4 | 13012 | 50M ohm- $\frac{1}{2}$ w. |
| R5 | 130149 | 15M ohm- $\frac{1}{2}$ w. |
| R6 | 130170 | 3 megohm- $\frac{1}{2}$ w. |
| R7 | 13012 | 50M ohm- $\frac{1}{2}$ w. |
| R8 | 101202 | 1 megohm- $\frac{1}{2}$ w. |
| R9 | 130276 | 10 ohm- $\frac{1}{2}$ w. |
| R10 | 1305 | 300M ohm- $\frac{1}{2}$ w. |
| R11 | 130257 | 5 megohm- $\frac{1}{2}$ w. |
| R12 | 1304 | 3 megohm- $\frac{1}{2}$ w. |
| R13 | 1309 | 200M ohm- $\frac{1}{2}$ w. |
| R14 | 130294 | 1200 ohm- $\frac{1}{2}$ w. |
| R15 | 130294 | 1200 ohm- $\frac{1}{2}$ w. |
| R16 | 130236 | 30M ohm- $\frac{1}{2}$ w. |
| R17 | 130102 | 500M ohm- $\frac{1}{2}$ w. |
| R18 | 13022 | 5M ohm- $\frac{1}{2}$ w. |
| R19 | 1309 | 200M ohm- $\frac{1}{2}$ w. |
| R20 | 130182 | 500M ohm- $\frac{1}{2}$ w. |
| R21 | 130296 | 200 ohm- $\frac{1}{2}$ w. |
| R22 | 130168 | 100 ohm- $\frac{1}{2}$ w. |
| R23 | 13094 | 50M ohm- $\frac{1}{2}$ w. |

SERVICE NOTES:

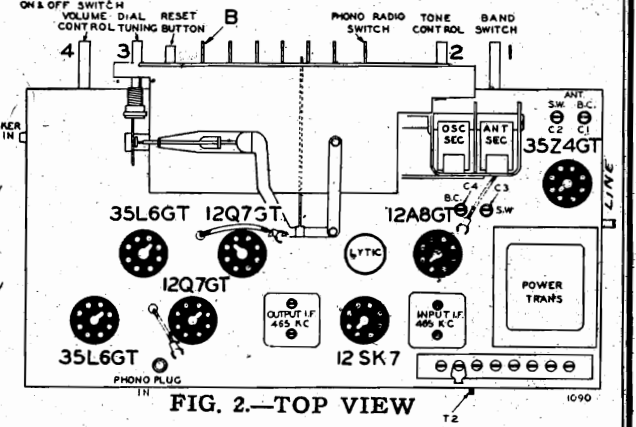
Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on the voltage chart are measured with 115 volts A. C. on the primary of the power transformer.

FIG. 1.—REAR VIEW OF CHASSIS



Consumption (Radio Chassis only, less Phono Motor).....55 Watts
Power Output.....3 Watts Undistorted, 3.6 Watts Maximum



MODELS 707-391, 707-398

707-378, etc.

Chassis 707, Series A

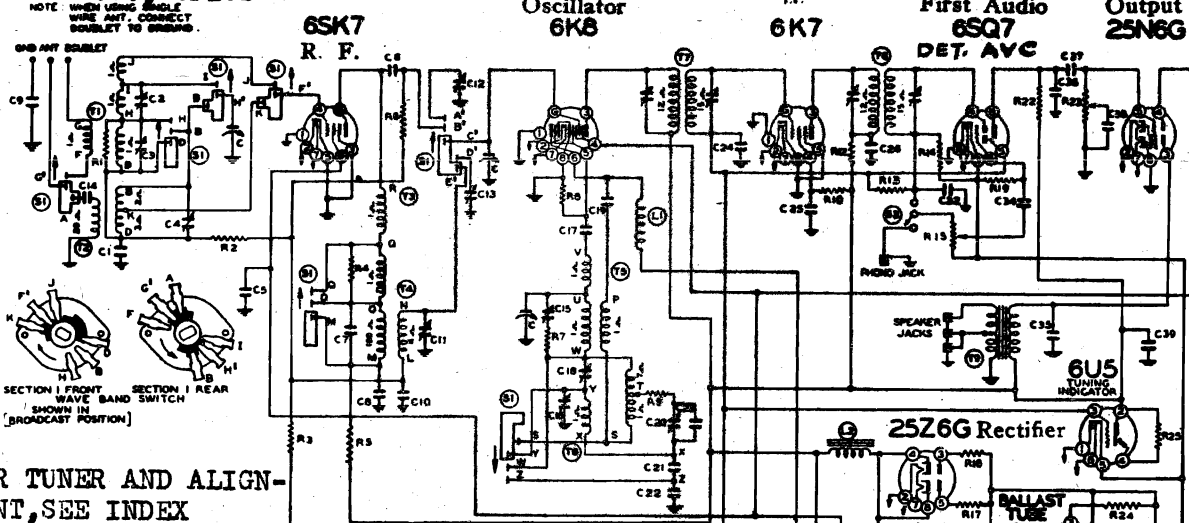
BELMONT RADIO CORP. Serial 9K167300 up
Schematic, Voltage, Trimmers

First Detector-
Oscillator
6K8

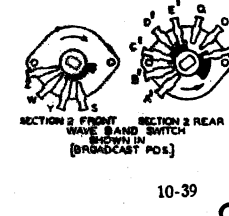
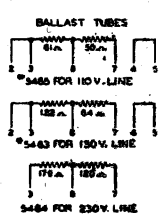
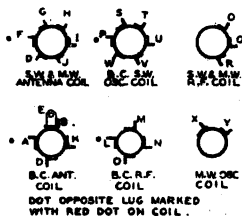
I.F.
6K7

First Audio
6SQ7
DET. AVC

Output
25N6G



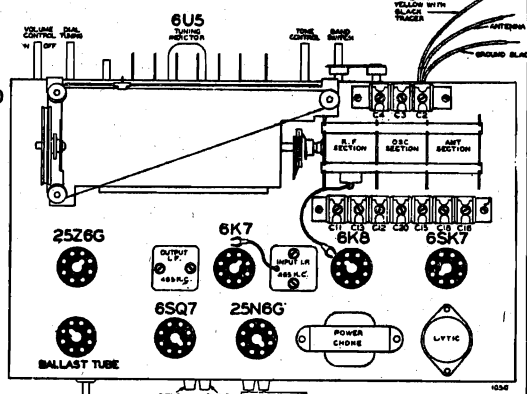
Power Consumption.....110 Watts at 230 Volts
Power Output.....4 Watts Undistorted, 5 Watt Maximum
(Measured with 230 Volt Line Voltage)



| Ref. No. | Part No. | Description |
|------------------|----------|-------------------------------|
| RESISTORS | | |
| R1 | 13094 | 50M ohm— $\frac{1}{2}$ w. |
| R2 | 13020 | 100M ohm— $\frac{1}{2}$ w. |
| R3 | 13026 | 1000 ohm— $\frac{1}{2}$ w. |
| R4 | 130232 | 25M ohm— $\frac{1}{2}$ w.—10% |
| R5 | 13026 | 1000 ohm— $\frac{1}{2}$ w. |
| R6 | 13019 | 1 megohm— $\frac{1}{2}$ w. |
| R7 | 13097 | 200 ohm— $\frac{1}{2}$ w.—10% |
| R8 | 13012 | 50M ohm— $\frac{1}{2}$ w. |
| R9 | 130299 | 10 ohm— $\frac{1}{2}$ w. 10% |
| R10 | 13020 | 100M ohm— $\frac{1}{2}$ w. |
| R11 | 130197 | 20 ohm— $\frac{1}{2}$ w. 10% |
| R12 | 13023 | 2000 ohm— $\frac{1}{2}$ w. |
| R13 | 1304 | 3 megohm— $\frac{1}{2}$ w. |
| R14 | 1304 | 3 megohm— $\frac{1}{2}$ w. |
| R15 | 101205 | 1 megohm volume control |
| R16 | 13022 | 5000 ohm— $\frac{1}{2}$ w. |
| R17 | 130168 | 100 ohm— $\frac{1}{2}$ w. |
| R18 | 130168 | 100 ohm— $\frac{1}{2}$ w.—10% |
| R19 | 130225 | 15 megohm— $\frac{1}{2}$ w. |
| R20 | 130176 | 20M ohm— $\frac{1}{2}$ w. 10% |
| R21 | 130302 | 9M ohm—1.5 watt—10% |
| R22 | 1309 | 200M ohm— $\frac{1}{2}$ w. |
| R23 | 101207 | 1 megohm tone control |
| R24 | 10658 | 300 ohm—10%—50 watt |
| R25 | 13019 | 1 megohm— $\frac{1}{2}$ w. |

| | | |
|--------------------------------------|-------------------|-------------------------------------|
| C30 | 11964 | 15 uf. lytic—400 w.v. |
| C31 | 11964 | 10 uf. lytic—350 w.v. |
| C32 | 1295 | .0001 mica |
| C33 | 10013 | .05 x 400 v. |
| C34 | 10025 | .002 x 600 v. |
| C35 | 10026 | .02 x 400 v. |
| C36 | 12912 | .00025 mica |
| C37 | 10013 | .05 x 400 v. |
| C38 | 10078 | .01 x 200 v. |
| C39 | 10013 | .05 x 400 v. |
| C2, C3 and C4 | are in same unit. | |
| C11, C12, C13, C15, C16, C18 and C20 | in same unit. | |
| C27, C28 and C29 | in same unit. | |
| C30 and C31 | in same unit. | |
| T1 | 111156 | S.W. M.W. Antenna Coil |
| T2 | 111158 | B.C. Antenna Coil |
| T3 | 10955 | S.W. M.W. R.F. Coil |
| T4 | 10956 | B.C. R.F. Coil |
| T5 | 110140 | B.C. S.W. Oscillator Coil |
| T6 | 110138 | M.W. Oscillator Coil |
| T7 | 108165 | 1st I.F. Input Coil |
| T8 | 108119 | 2nd I.F. Output Coil |
| T9 | 10598 | Output Transformer |
| | 114179 | 8" P.M. Speaker |
| | or | |
| | 114186 | 12" P.M. Speaker |
| L1 | 1234 | R.F. Choke |
| L2 | 10597B | "B" Filter Choke |
| S1 | 12595 | Wave Band Switch |
| S2 | | On and Off Switch on volume control |
| S3 | 125101 | Radio-Phono Switch |
| P1 | 10794 | (2) Pilot Lights T-44 |

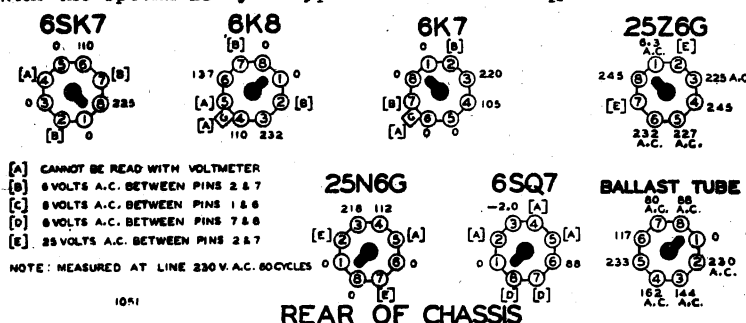
Chassis No. 707—Series A
(Serial No. 9K167300 and up) For
Models 707-391, 707-398 and 707-378, Etc.



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT
VOLTMETER BETWEEN SOCKET TERMINALS
AND CHASSIS.

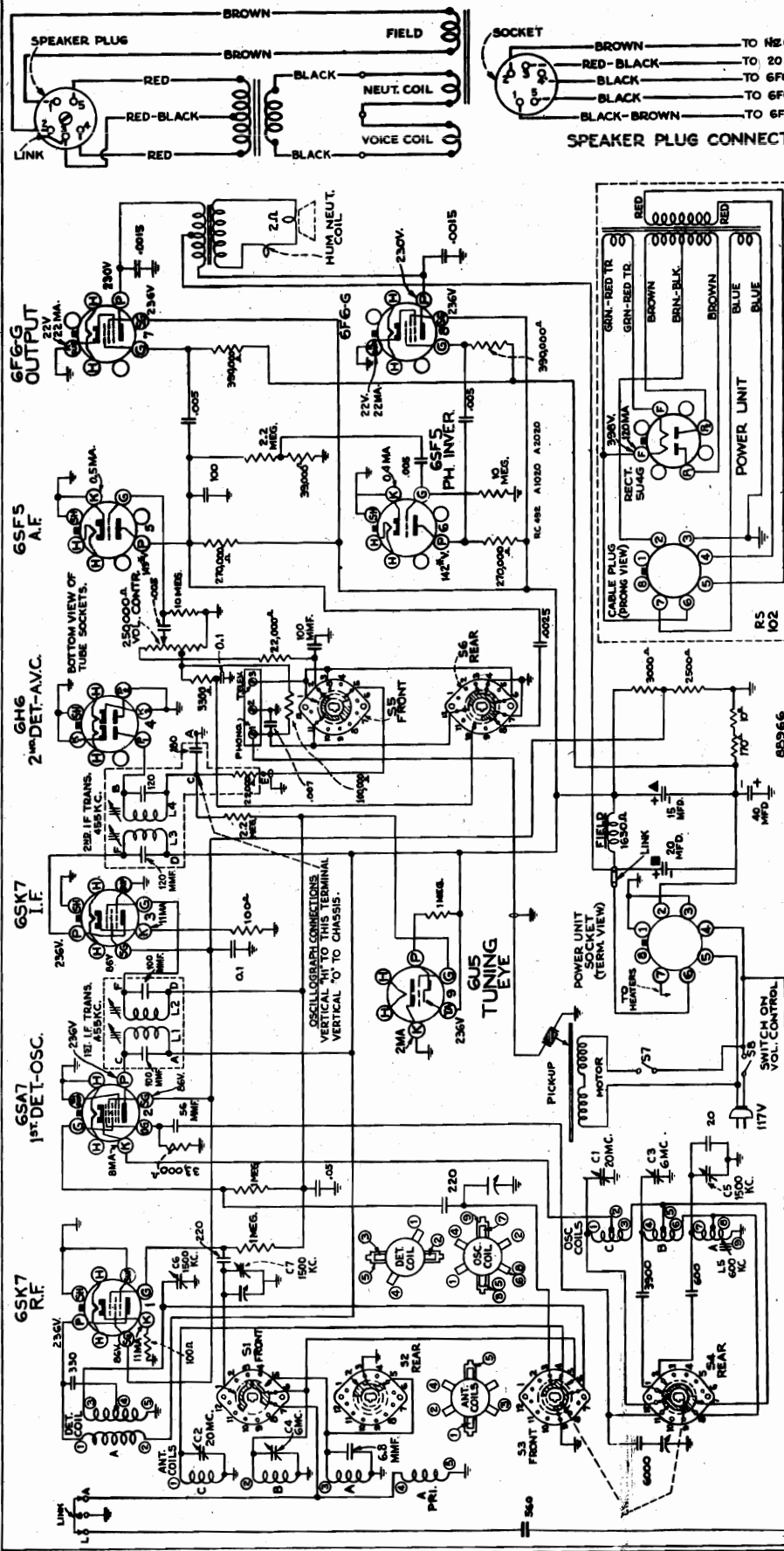
NOTE:—For 25 cycle A.C. operation the filter condenser must be replaced with the special 25 cycle type



REAR OF CHASSIS

BRUNSWICK DIV.-MERSMAN BROS.

MODELS A1020, A2020

Schematic, Voltage
Notes

hole is located in the motor casting, adjacent to the spindle bearing, and is covered with a screw plug.

Television Attachment.—A terminal board is provided on the rear of the chassis for connecting a Television attachment into the audio-amplifying circuit. The cable from the attachment should be connected to terminals 2 and 3, the shielded or ground lead going to terminal 2.

A Radio-Phono-Television switch is built into the chassis, allowing switching to be accomplished through the "Tone-Radio-Phono-Television" control on the control panel.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

The crystal pickup is sealed in a metal case as protection against extreme changes of climate. If failure occurs, do not attempt to repair the unit, but install a new crystal unit.

Volatages should hold within $\pm 20\%$ with 117 V. A.C. supply.
* Starred Voltages are operating voltages in circuits with high series resistance; the actual measured voltages will be lower, depending on the voltmeter loading.

Models A-1020 and A-2020 Brunswick Panatropes are combination ten-tube, three-band superheterodyne receivers and automatic phonographs.

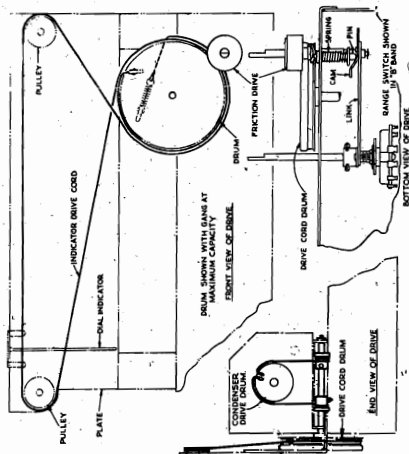
Power Supply Rating

| | |
|-----------------------|--|
| Rating A..... | 105-125 volts, 50-60 cycles, 130 watts |
| Power Output | |
| Undistorted..... | 10 watts |
| Maximum..... | 12 watts |
| Loudspeaker (RL-70K2) | |
| Type..... | 12-inch electrodynamic |
| V-C Impedance..... | 2.2 ohms at 400 cycles |

Motor Lubrication.—Apply a few drops of light machine oil to the spindle bearing and oil hole every six months. The oil

MODELS A1020, A2020 MODELS 1680, 2660, 2689, BRUNSWICK DIV.-MERSMAN BROS. A2600, 3689

Alignment, Trimmers, Socket, Dial Drive Data



A-1020 & A-2020 Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct frequency is given in the alignment table.

As the first step in π -f alignment, check the position of the drum. The 120° mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the drum is in the correct position. The drum is held to the shaft by means of two set-screws, which should be tightened securely when the drum is in the correct position.

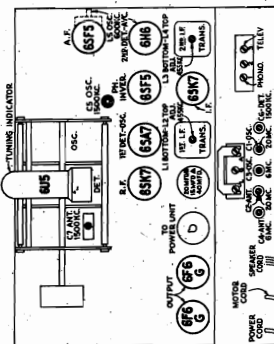
On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop condenser is in the center of the tuning drum. Just as the gang condenser plates are becoming fully extended, thus preventing stress on the gang due to extreme rotation.

| Steps | Connect the high side of the test-osc. to— | Turn radio dial to— | Tune test-osc. to— | Adjust the following for maximum peak output |
|-------|--|--|--------------------|--|
| 1 | 6SK7 grid in series with .01 mfd. | "A" band Quiet point between 550-750 kc | 455 kc | "L3 and L4 (2nd I-F trans.) |
| 2 | 6SA7 grid in series with .01 mfd. | "L1 and L2 (1st I-F trans.) | 20 mc | C1 (osc.) C3 (ant.) |
| 3 | Ant. terminal in series with 300 ohms | 6 mc (194°) "B" band | 6 mc | C3 (osc.) C4 (ant.) |
| 4 | Ant. terminal in series with 200 mfd. | 1,500 kc (198.5°) "A" band | 1,500 kc | C5 (osc.) C6 (det.) C7 (ant.) |
| 5 | | 600 kc (38°) "A" band | 600 kc | L5 (osc.) Rock gang |
| 6 | | | | |
| 7 | | | | Repeat step 5. |

* Use minimum capacity peak if two can be obtained. Check to determine that C1 has been adjusted to correct peak by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

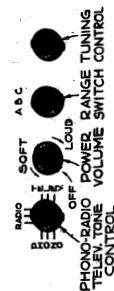
** Use minimum capacity peak if two can be obtained. Check to determine that C3 has been adjusted to correct peak by tuning receiver to approximately 5.09 mc where a weaker signal should be received.

Note—Oscillator tracks above signal on all bands.

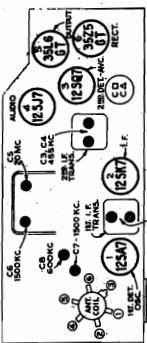


Pointer for Calibration Scale—Improve a pointer for the calibration scale by fastening a piece of wire to the chassis, and attach a spring clip to the end of the wire. The pointer should scale when the plates are fully extended.

Dial Indicator Adjustment—After fastening the chassis in the cabinet, adjust the dial indicator so that the 0° mark on the indicator at the 530 kc mark, and gang condenser fully extended. The indicator has a spring clip for attachment to the cable.



Tube and Trimmer Locations



1680, 2660, 2689 & A-2600

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator—For all alignment operations, connect the low side of the test-oscillator to the receiver ground binding post, and keep the output as low as possible to avoid a-v-c action.

Calibration Marks—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment. Therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct frequency is given in the alignment table.

As the first step in π -f alignment, check the position of the drum. The 120° mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the drum is in the correct position. The drum is held to the shaft by means of two set-screws, which should be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop condenser is in the center of the tuning drum. Just as the gang condenser plates are becoming fully extended, thus preventing stress on the gang due to extreme rotation.

| Steps | Connect the high side of the test-osc. to— | Turn radio dial to— | Tune test-osc. to— | Adjust the following for maximum peak output |
|-------|--|--|--------------------|--|
| 1 | Antenna terminal | "A" Band Quiet point between 550-750 kc | 455 kc | C3 and C4 (2nd I-F trans.) |
| 2 | | "C" Band 20 mc calibration mark | 20 mc | C1 (osc.) C3 (ant.) |
| 3 | Antenna terminal in series with 300 ohms | "A" Band 1,500 kc calibration mark | 1,500 kc | C5 (osc.) C7 (ant.) |
| 4 | Antenna terminal in series with 200 mfd. | "A" Band 600 kc calibration mark | 600 kc | C8 (osc.) Rock gang |
| 5 | | | | |
| 6 | | | | Repeat step 4 |

* Use minimum peak if two can be obtained. Check to determine that C3 has been adjusted properly by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

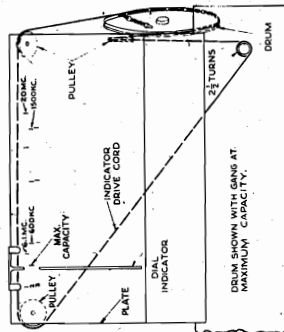
Note: Oscillator tracks above signal on both bands.

Adjustments for Push-Button Tuning

1680, 2660, 2689 & A-2600 A-1020 & A-2020

The push-buttons should be adjusted for six favorite stations after the receiver has been aligned. The adjustment is made in the period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push-buttons by turning counter-clockwise about one turn from their right position so they turn freely.
2. Check to be sure the Phono-Radio switch is in "Radio" position.
3. Press in push-button No. 1 (left) as far as it will go without undue pressure, hold in, tune station with manual tuning knob, and then turn the button clockwise until the screw begins to grip or damage to the mechanism may result.
4. Proceed in a similar manner for the remainder of the push-buttons.
5. Insert the station marker tabs in the recesses above the push-buttons.



Dial Indicator and Drive Mechanism

Refer to "Alignment Procedure" for explanation of the "alignment marks" shown in this drawing

BRUNSWICK DIV.-MERSMAN BROS.

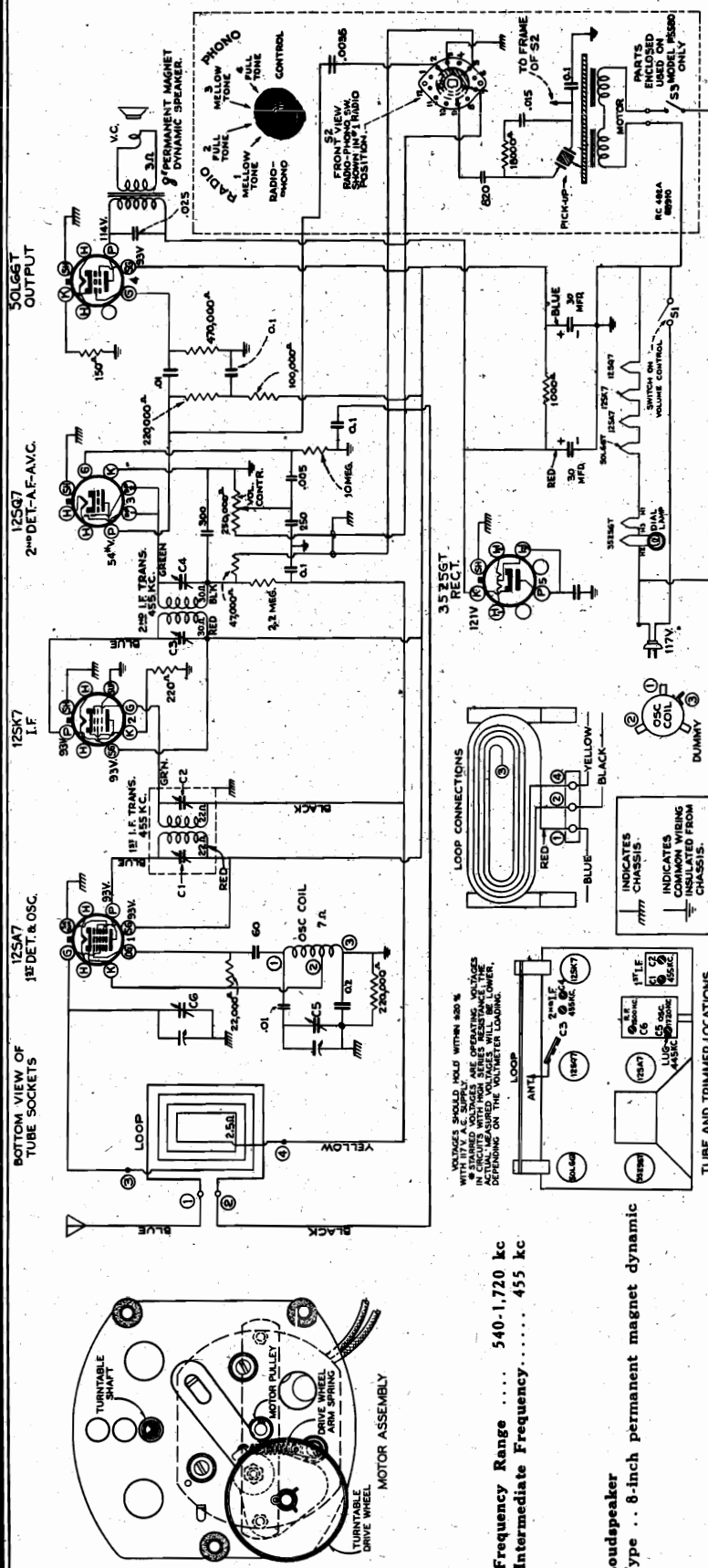
MODELS T1580, T2580, 3580

4580, Chassis RC-482

P5580, Chassis RC-482A

Schematic, Voltage

Alignment, Notes



Power Output (125 volts, 60 cycle supply)

Undistorted 0.75 watts

Maximum 1.5 watts

Dial Lamp Mazda 51, 7.5 volts, 0.2 amp.

Power Supply Rating (Models 3580, 4580, T-1580 and T-2580)

A-C Rating 105-125 volts, 50-60 cycles, 30 watts

D-C Rating 105-125 volts, direct current, 30 watts

Model P-5580—Although this model employs an ac-dc chassis it is

not suitable for use on dc, as this would damage the motor.

The phonograph motor on Model P-5580 is a self-starting, constant-

speed induction type. It should be lubricated every six months by

applying a few drops of light machine oil to the top and bottom motor

spindle bearings, to the turntable spindle and to the turntable drive

wheel bearings.

CAUTION: Keep oil away from drive bushing on top of motor spindle

and from rubber driving tire on turntable drive wheel.

Power-Supply Polarity.—For operation on d-c (except Model P-5580)

the power plug must be inserted in the outlet for correct polarity. If

the set does not function, reverse the plug. On a-c, reversal of the plug

may reduce hum.

Antenna.—The set is equipped with a built-in loop antenna. If

an outdoor antenna is used, it may be connected to the "ANT" lead

on rear of cabinet. It should not be longer than 100 feet, including

lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series

with the lead-in.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.**Test-Oscillator.**—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.**Pre-setting Dial.**—With gang condenser in full mesh, the pointer should be horizontal.

| Steps | Connect the high side of test-oscillator to— | Tune test-osc. to— | Turn radio dial to— | Adjust the following for max. peak output— |
|-------|--|--------------------|-------------------------------------|---|
| 1 | Tuning condenser stator (osc.) in series with .01 mfd. | 455 kc | Quiet point at 1,600 kc end of dial | C1, C2, C3, C4 (1st and 2nd I-F transformers) |
| 2 | Antenna term. of ant. loop in series with 100 mmfd. | 1,720 kc | Full clockwise (out of mesh) | C5 (oscillator) |
| 3 | | 1,500 kc | Resonance on 1,500 kc signal | C6 (antenna) |

MODELS A1020, A2020

MODEL A2600

BRUNSWICK DIV.-MERSMAN BROS. Automatic Record Changer

MODELS 1700, A2700, A3720

Notes

Automatic Record Changer

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc. are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable

ADJUSTMENTS

A. Main Lever.—This lever is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle; and adjust rubber bumper bracket (A) so that the roller clears the nose of the cam plate by 1/16 inch.

B. Friction Clutch.—

The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5." If the motion of the pickup is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B." If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.

C. Pickup Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper elevation, stop the changer "in-cycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "20" to obtain 1 inch spacing between needle point and turntable top surface.

D. & E. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10 inch record. Position of eccentric stud "E" governs the landing of the needle on a 12 inch record; this, however, is dependent on the proper 10 inch adjustment.

To adjust for needle landing, place 10 inch record on turntable; push index lever to reject position and return to the 10 inch position; see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is 4-11/16 inches from the nearest side of the turntable spindle; loosen the two screws "D", and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17." Leave approximately 1/32 inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone pointed screw "D."

After adjusting for needle landing on a 10 inch record, place 12 inch record on turntable; push index lever to reject and return to 12 inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5-11/16 inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motor board, otherwise incorrect landing may occur with 10 inch records.

MISCELLANEOUS SERVICE HINTS

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and the usual misadjustments will enable ready adjustment in most cases.

1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A."
2. Needle does not land properly on both 10 and 12 inch records—Make complete adjustments "D" and "E."
3. Needle does not land properly on 12 inch record but correct on 10 inch—Effect adjustment "E."
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B." Also, see that levers "7" and "12" are free to move without touching each other.
5. Pickup strikes lower record of stack or drags across top record on turntable—Adjust lift cable per adjustment "C."
6. Needle does not track after landing—Friction clutch "5" ad-

by hand. Six turntable revolutions are required for one change cycle.

If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

The 10 and 12 inch records must be absolutely flat for smooth operation when using a mixture of the two sizes.

A shorting switch, located in the pickup head, operates due to pressure when the pickup is placed on the pickup rest.

F. & G. Record Separating Knife.—The upper plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the rotating record shelf "27" be accurately maintained. The spacing for the 10 inch record is nominally .058 inch, and for the 12 inch record is .075 inch.

To adjust, rotate the knife to the point of minimum vertical separation from the record shelf and turn screw and locknut "F" to give .055—.061 inch separation. Screw "G" must not be depressed during this adjustment. After setting screw "F" adjust screw "G" so that when its tip is depressed flush with top of record shelf, the vertical spacing between the knife, in its lowest rotational position, and the shelf, is .072—.078 inch.

H. Record Support Shelf.—The record shelf revolves during the change cycle to allow the lower record to drop onto the turntable. Both posts are rotated simultaneously by a gear and rack coupled to the main lever "15," and it is necessary that adjustment be such that the record is released from both shelves at the same instant. To adjust, place a 12 inch record on the turntable, rotate mechanism into cycle to the point where tone arm is at maximum distance outward from turntable; lift record upward until it is in contact with both separating knives, then loosen screws "H" and shift record shelves so that the curved inner edges of the shelves are uniformly spaced at least 1/16 inch from record edge. Tighten the blunt nose screw "H," run mechanism through cycle several times to check action, then tighten cone pointed screw "H."

If record shelves or knives are bent, or not perfectly horizontal, improper operation and jamming of mechanism will occur.

J. Tone Arm Rest Support (not shown).—When the changer is out-of-cycle, the front lower edge of the pickup head should be 5/16 inch above surface of motor board. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

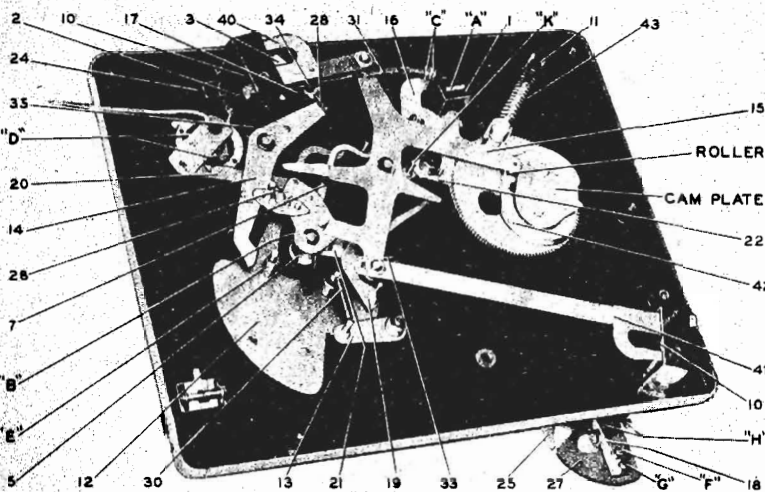
Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers on underside of motor board.

Apply a few drops of light machine oil to the motor spindle bearing and oil hole adjacent to the spindle bearing. The oil hole has a screw plug.

Do not allow oil or grease to come in contact with, rubber mounting of tone arm base, rubber bumper, or rubber spindle cap.

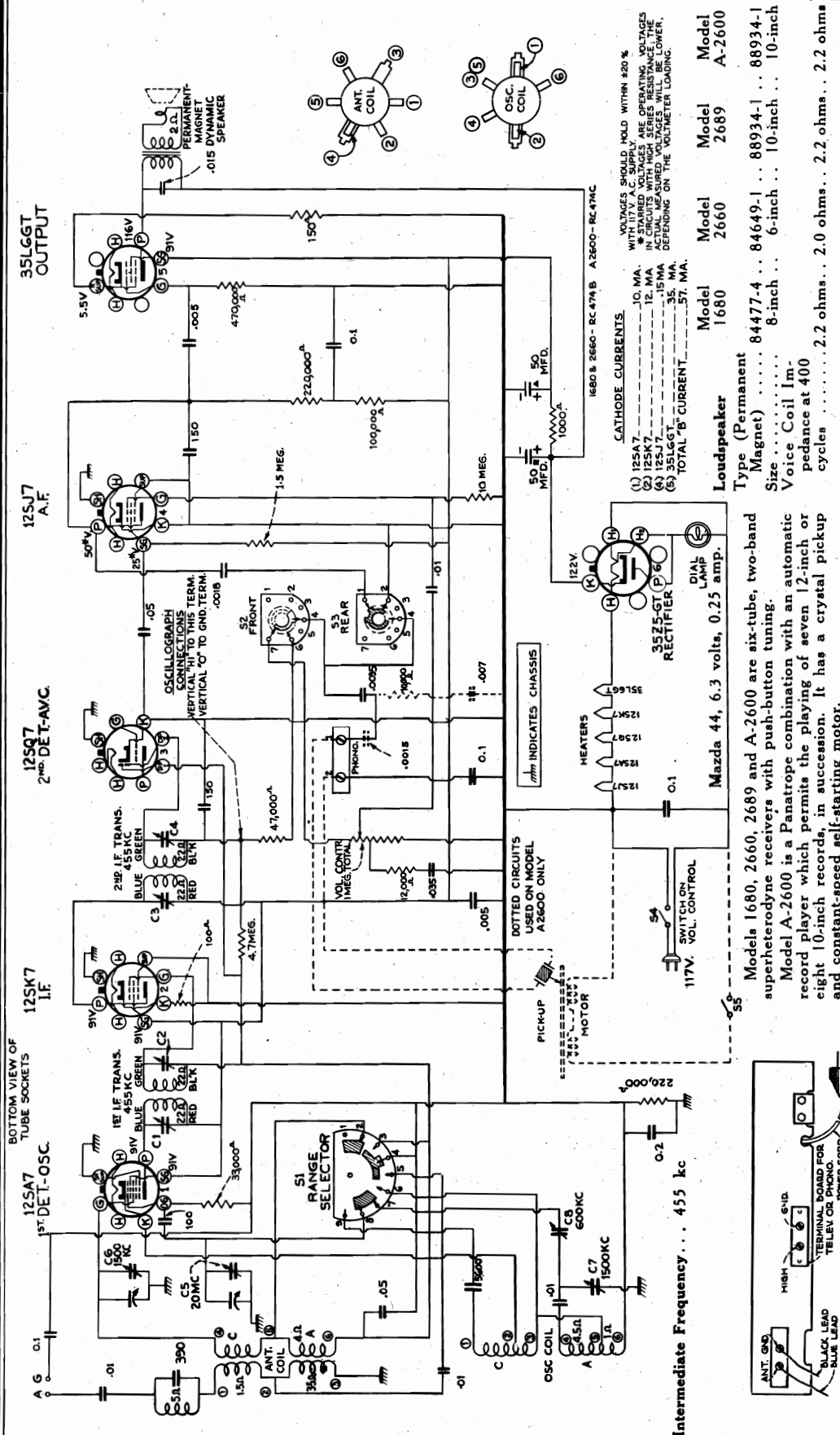
justment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pickup output cable twisted.

7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; or instrument is not being operated at normal room temperature (65° F.).
9. Record knives strike edge of records—Records warped; record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H."
11. Needle lands in 10 inch position on 12 inch record or misses record when playing both types mixed—Increase tension of pickup locating lever spring "34."



NOTE: Numbers refer to parts—letters refer to adjustments

Schematic, Notes
Voltage



The crystal pickup is sealed in a metal case as protection against extreme changes of climate. If failure occurs, do not attempt to repair the unit, but install a new crystal unit.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

Motor Lubrication.—Apply a few drops of light machine oil to the spindle bearing and oil hole every six months. The oil hole is located in the motor casting, adjacent to the spindle bearing, and is covered with a screw plug.

| | |
|--|---|
| Power Output (125 volts, 60 cycle supply) | |
| Undistorted..... | 0.8 watts |
| Maximum..... | 1.4 watts |
| Power Supply Ratings (Models 1680, 2689 and 2660) | |
| A-C Rating..... | 105-125 volts, 50-60 cycles, 35 watts |
| D-C Rating..... | 105-125 volts, direct current, 35 watts |

MODEL A-2600.—Although this model employs an ac-dc chassis it is not suitable for use on dc, as this would damage the motor.

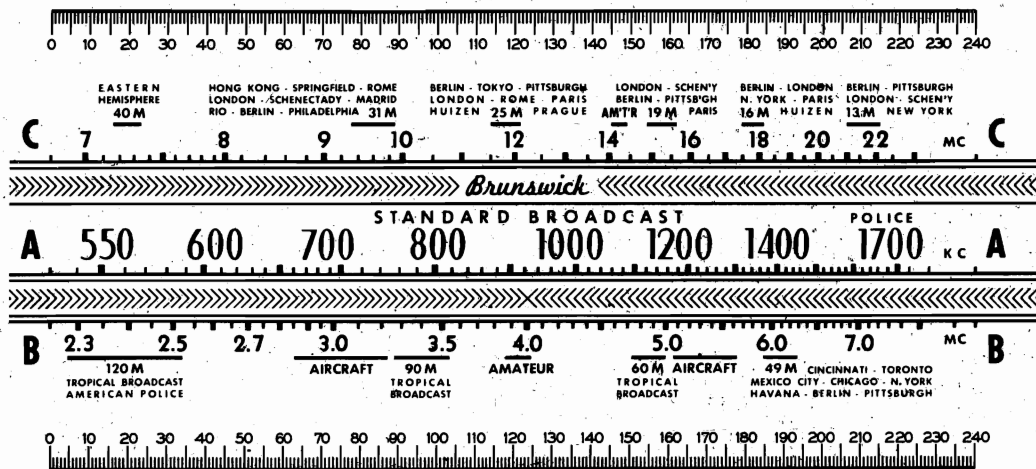
| Tube Complement | |
|-----------------|---------------------------------------|
| (1) | RCA-12SA7.....1st Detector—Oscillator |
| (2) | RCA-12SK7.....1st I.F. Amplifier |
| (3) | RCA-12SQ7.....2nd Detector, A.V.C. |
| (4) | RCA-12SJ7.....A-F Amplifier |
| (5) | RCA-35L6GT.....Power Output |
| (6) | RCA-35Z5GT.....Half-Wave Rectifier |

First Edition

MODELS 1700, A2700, A3720

Dial Data. Phono Data

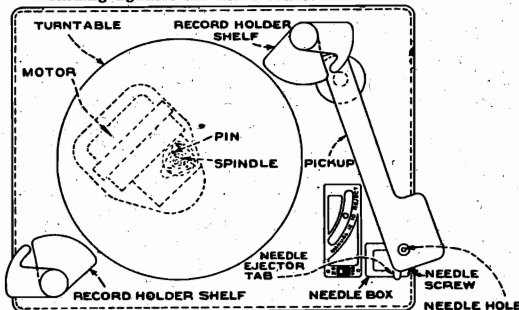
BRUNSWICK DIV.-MERSMAN BROS.



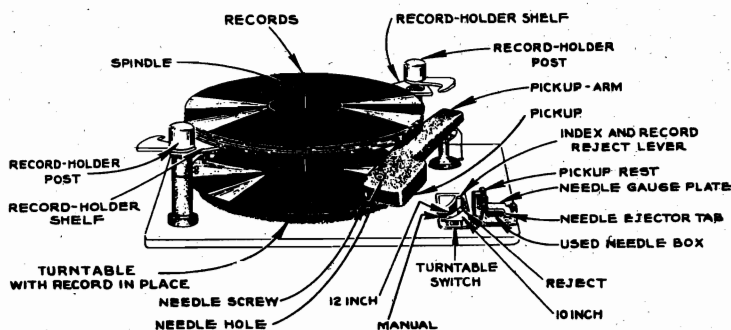
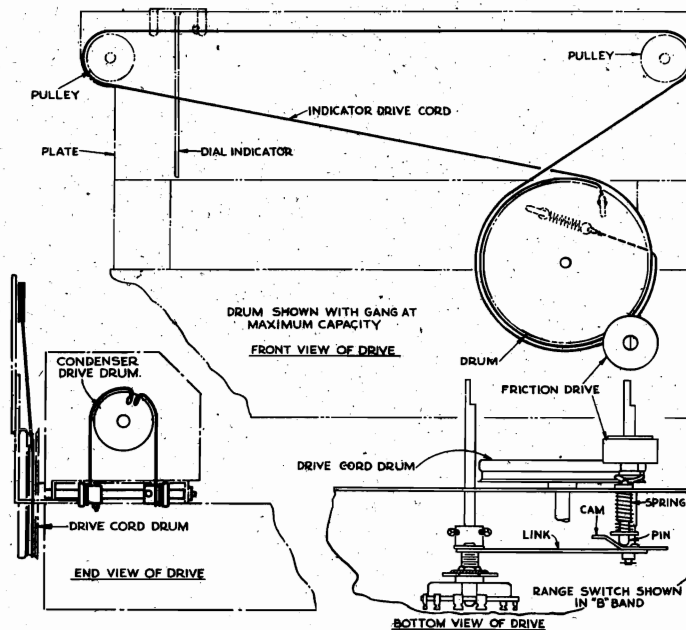
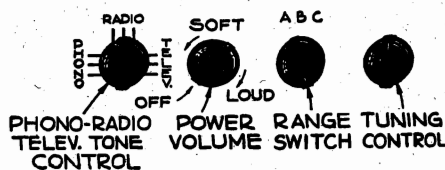
Receiver Dial Scales, and Corresponding 0-240° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example, 40° on the calibration scale corresponds to 600 kc on "A" band. Read instructions under "Alignment Procedure."

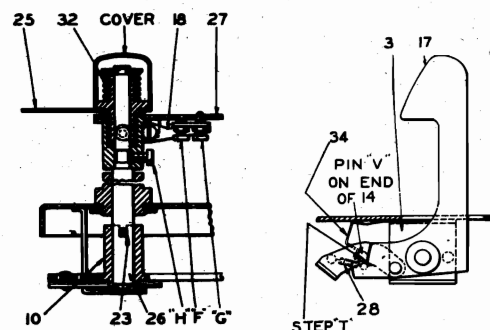
Note: In the Dial Indicator Drive Cord Assembly drawing at the right the mechanism is shown with the range switch in the "B" band position. In the "A" band position the trip arm on the range shaft must be adjusted so that when the push-buttons are operated, the drive cord drum will turn freely without rubbing or binding against the drive roller.



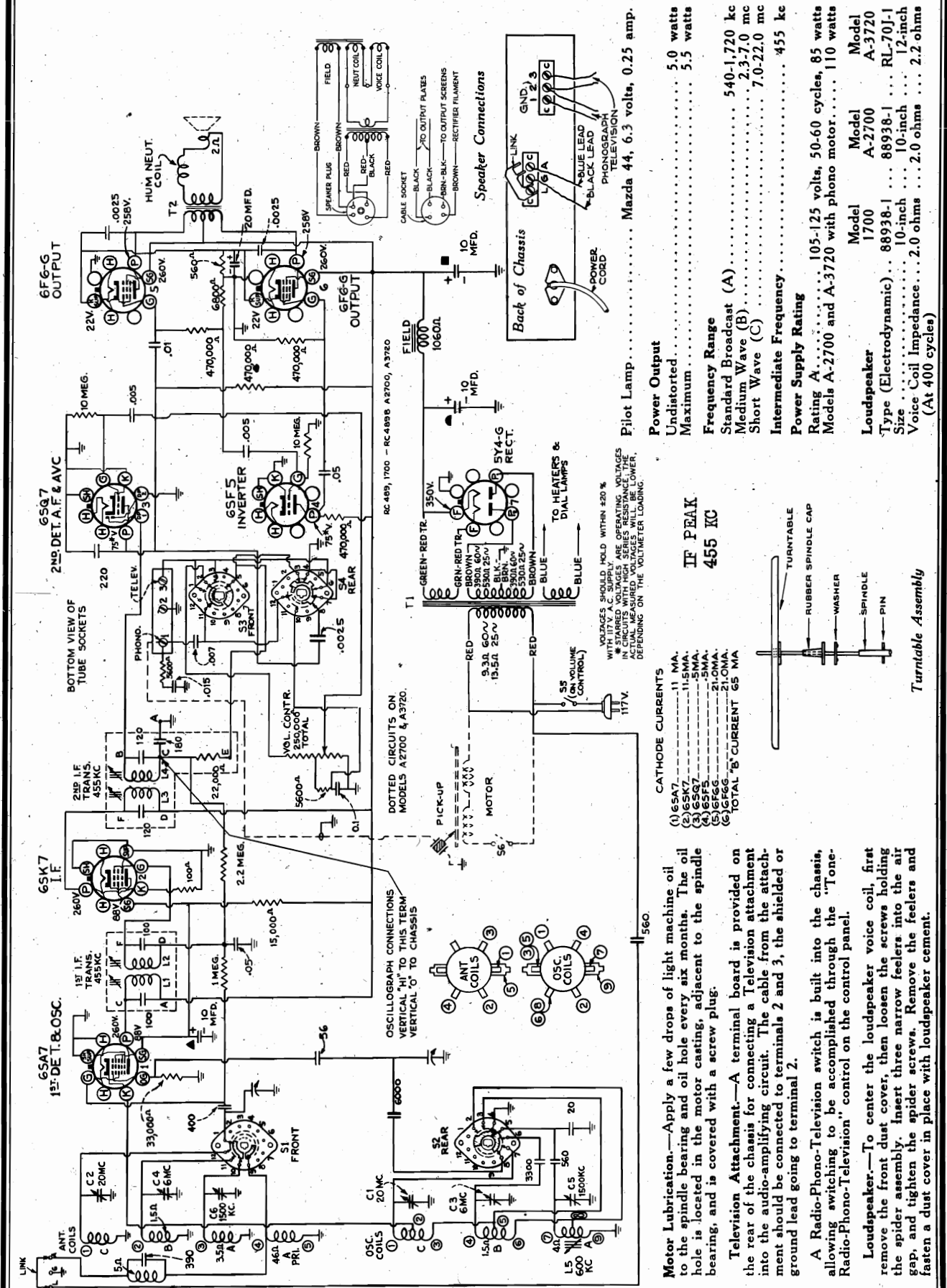
Motorboard and Controls



Top View of Automatic Record Changer



Details of Record Shelf Posts and Locating Lever Assemblies

BRUNSWICK DIV.-MERSMAN BROS. MODELS 1700, A2700, A3720
Schematic, Voltage, Notes

MODELS 1700, A2700, A3720

Alignment, Trimmers,

Socket, Tuner Data

BRUNSWICK DIV.-MERSMAN BROS.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

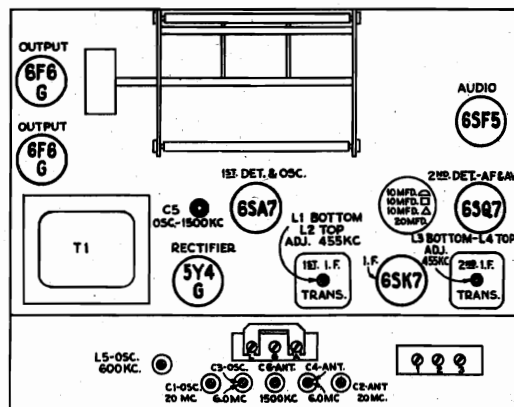
Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 120° mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.



Tube and Trimmer Locations

| Steps | Connect the high side of the test-osc. to— | Tune test-osc. to— | Turn radio dial to— | Adjust the following for maximum peak output |
|-------|--|--------------------|--|--|
| 1 | 6SK7 grid in series with .01 mfd. | 455 kc | "A" band Quiet point between 550-750 kc | L3 and L4 (2nd I-F trans.) |
| 2 | 6SA7 grid in series with .01 mfd. | | | L1 and L2 (1st I-F trans.) |
| 3 | Ant. terminal in series with 300 ohms | 20 mc | 20 mc (199°) "C" band | C1 (osc.)* C2 (ant.) |
| 4 | | 6 mc | 6 mc (187.2°) "B" band | C3 (osc.)* C4 (ant.) |
| 5 | Ant. terminal in series with 200 mmfd. | 1,500 kc | 1,500 kc (198.2°) "A" band | C5 (osc.) C6 (ant.) |
| 6 | | 600 kc | 600 kc (40°) "A" band | L5 (osc.) Rock gang |
| 7 | Repeat step 5. | | | |

* Use minimum capacity peak if two can be obtained. Check to determine that C1 has been adjusted to correct peak by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

** Use minimum capacity peak if two can be obtained. Check to determine that C3 has been adjusted to correct peak by tuning receiver to approximately 5.09 mc where a weaker signal should be received.

Note.—Oscillator tracks above signal on all bands.

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

- Loosen the push-buttons by turning counter-clockwise about one turn from their tight position so they turn freely.
- Check to be sure the Phono-Radio switch is in "Radio" position.
- Press in push-button No. 1 (left) as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully

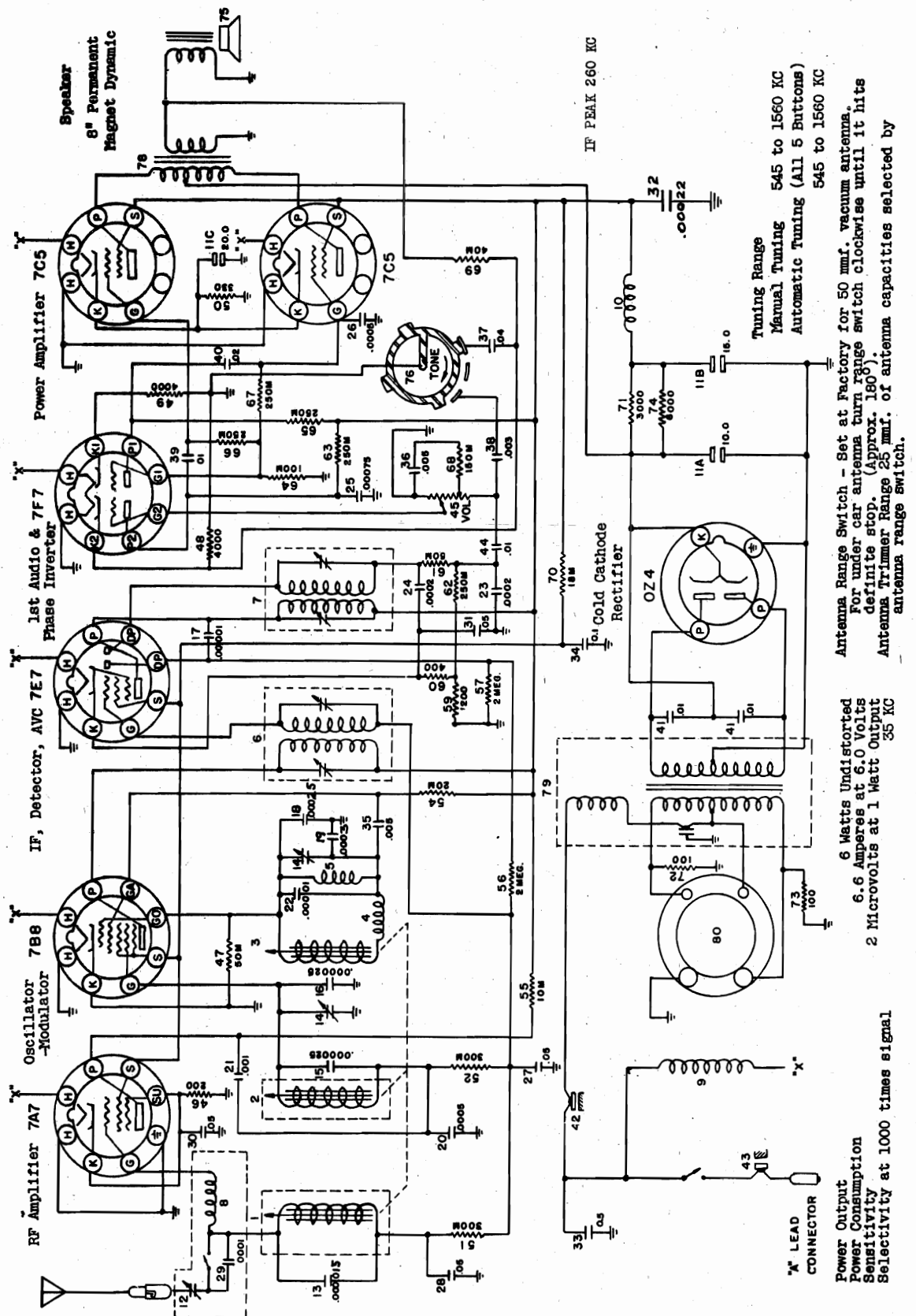
tighten up the button. Do not tighten more than 1/4 turn after the screw begins to grip or damage to the mechanism may result.

- Proceed in a similar manner for the remainder of the push-buttons.
- Insert the station marker tabs in the recesses above the push-buttons.

The crystal pickup is sealed in a metal case as protection against extreme changes of climate. If failure occurs, do not attempt to repair the unit, but install a new crystal unit.

CADILLAC DIV.—GEN. MOTORS

MODEL 77
Schematic



MODEL 77

Voltage, Alignment

Socket, Trimmers, Chassis

CADILLAC DIV.—GEN. MOTORS

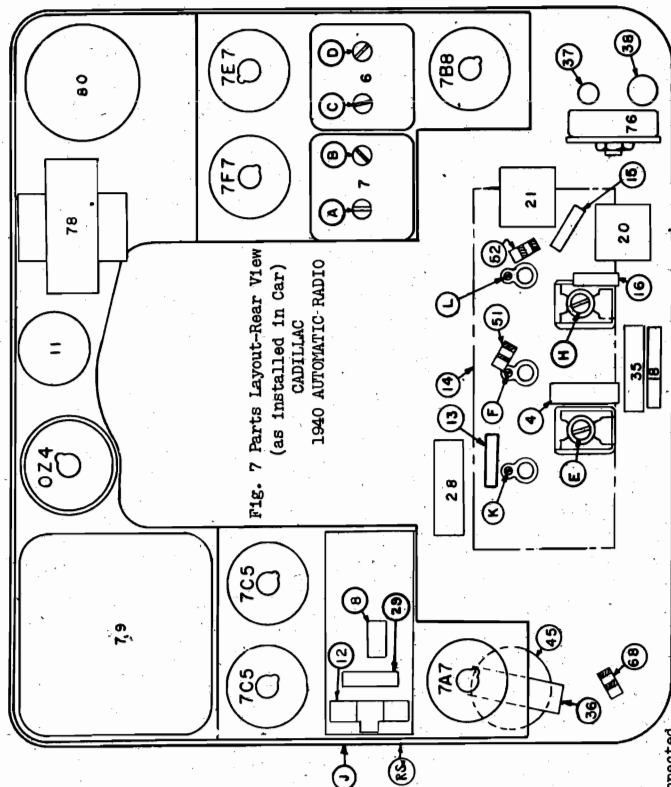


Fig. 7 Parts Layout-Rear View
(as installed in Car)
CADILLAC
1940 AUTOMATIC RADIO

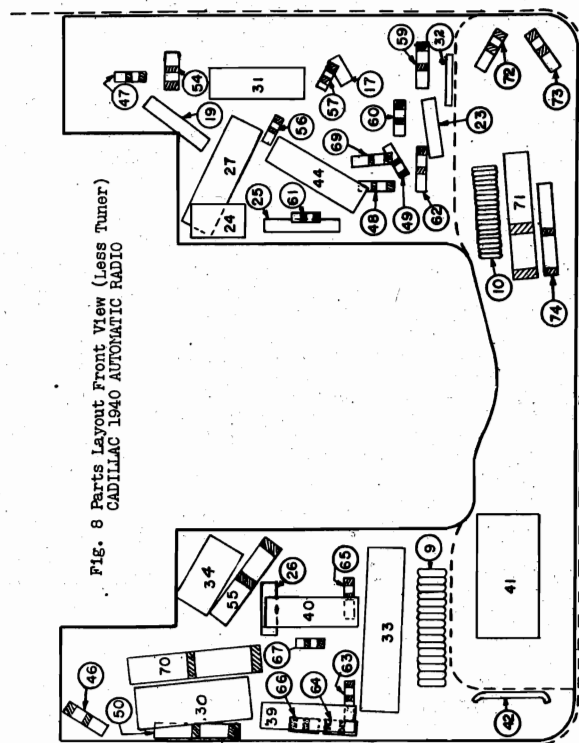


Fig. 8 Parts Layout Front View (Less Tuner)
CADILLAC 1940 AUTOMATIC RADIO

ALIGNMENT CHART

Set Volume Control fully on. Connect output meter across voice coil, leaving speaker connected.

| Signal Generator Frequency Setting | Connect Output Lead of Signal Generator to | Dummy Antenna | Receiver Dial Setting | Adjust Trimmers to Maximum Output | Remarks |
|---|--|---------------|-----------------------|---|--|
| 260 | Through 7239928 IF Alignment Dummy to junction of condensers 15 and 16 at R.F. trimmer. H Fig. 1 | .1 mf. | 1560 | IF Trimmers A & B, C & D Fig. 7 | Attenuate signal and recheck |
| 1580 | Antenna terminal of set thru 7239929 Dummy | 50 mmf. | High freq. end | Back out osc. coil adj. screw 1/16" F in Fig. 7 | Rotate dial indicator to the high freq. end of dial as far as it will go |
| 1580 | " | " | " | Oscillator Trimmer E in Fig. 7 | Attenuate signal and repeat |
| 1560 | " | " | 1560 | Screw in oscillator coil adj. screw E in Fig. 7 | Adjust screw for maximum output |
| 600 | " | " | Tune to signal | RF and Antenna Trimmers H & J Fig. 7 | |
| 1400 | " | " | " | RF and Antenna Coil Adj. Screws K & L Fig. 7 | |
| 600 | " | " | " | Check F & J Fig. 7 | |
| Set installed in car. Connected to car antenna. | Tune to weak station | Car Antenna | Between 800 to 700 KC | Adjust Antenna Trimmer for Maximum Volume. | Vacuum Section of Antenna fully extended, tune to a weak signal. |

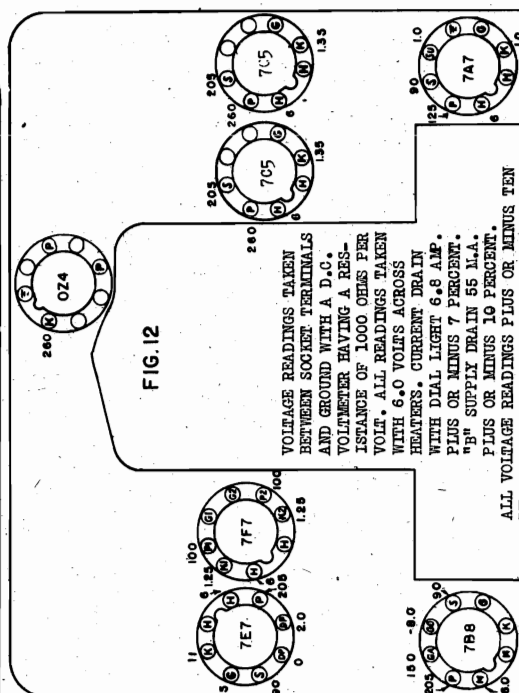


FIG. 12

VOLTAGE READINGS TAKEN BETWEEN SOCKET TERMINALS AND GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT. ALL READINGS TAKEN WITH 6.0 VOLTS ACROSS HEATERS. CURRENT DRAIN WITH DIAL LIGHT 6.8 AMP. PLUS OR MINUS 7 PERCENT. "B" SUPPLY DRAIN 55 M.A. PLUS OR MINUS 10 PERCENT. ALL VOLTAGE READINGS PLUS OR MINUS TEN PERCENT.

CADILLAC DIV.—GEN. MOTORS

MODEL 77
Dial Drive and Tuner
Assembly

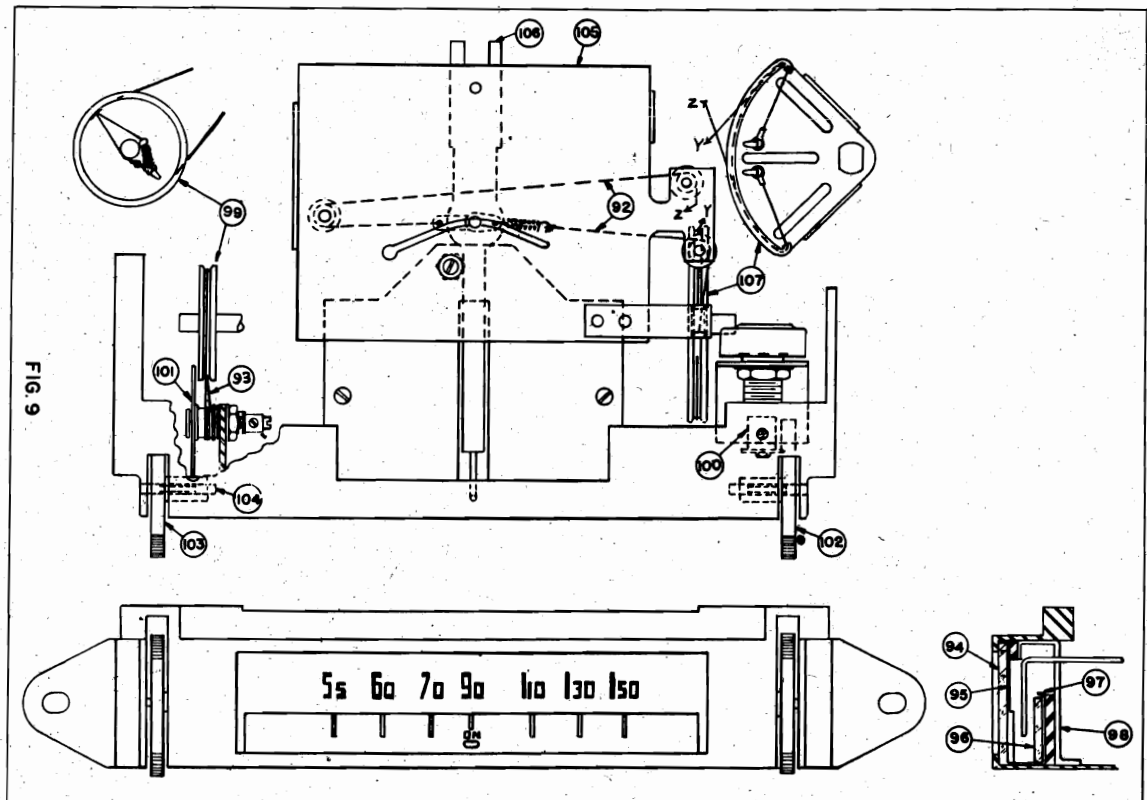


Fig. 9 General Arrangement - Dial & Drive Assembly

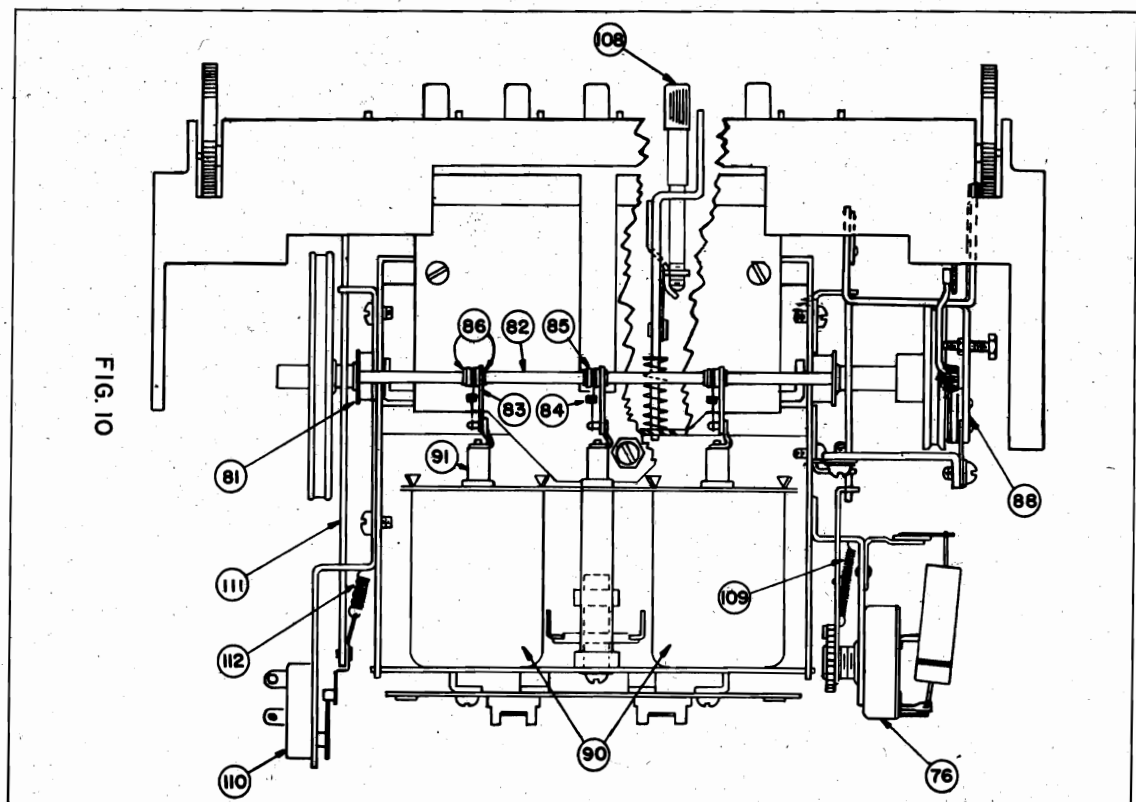


Fig. 10 Parts Layout - Tuner Unit - Bottom View

MODEL 77

Dial Drive Data

CADILLAC DIV.—GEN. MOTORS



Fig. 1 Remove these 8 screws to disassemble



Fig. 2 Removing speaker cover

SERVICE HINTSDisassembling For Parts Replacements

To replace condensers, resistors, coils, etc., remove eight screws as shown in Fig. 1. Raise the bottom edge of the speaker cover, keeping it pushed forward so that the speaker field will clear the power supply shield, as shown in Figs. 2 and 3.

Un solder voice coil lead "A" in Fig. 3 and set the speaker to the left of the set, as shown in Fig. 4. This exposes all of the wiring side of the chassis and component parts.

To replace tubes, vibrator or to realign when required, it is only necessary to remove the back cover.

To replace dial drive cord, remove the speaker and back cover as outlined above and remove eight screws holding the tuner cover, as shown in Fig. 5. Lay the cover back, as shown in Fig. 6, exposing the tuner unit and component parts.

Dial Cord or Pointer Replacement

1. Unhook the cord eyelets from drive pulley. Illustration 99 in Fig. 10.
2. Move pointer by hand toward the 1500 KC end of the dial until the pointer pivot pin drops through the enlarged end of the pointer guide slot.
3. Lift the pointer and pointer cord out of the tuner from the dial side.
4. File off the lower tip of the pointer guide pin, releasing the retaining washer and the cord pivot arms. Fig. 10.
5. With the pointer upside down and pointing away from the operator, put the long cord pivot arm on the left. Cord side up.
6. Place the short pivot arm (spring assembly) on the right. Cord side up.
7. Replace the retaining washer and solder it to the guide pin.
8. Replace the pointer. Place pivot pin in the enlarged end of the guide slot and then slide the rear end of the pointer into the rear support bearing.
9. Place the long cord behind the pointer and over pulleys. (Illustration 92 in Fig. 9 Page 130) Hook the cord eyelet over the drive pulley hook nearest the front of the tuner and push the cord into position around the pulley rim.
10. Put the spring loaded cord over pulleys in between the longer string and the tuner frame before hooking the cord eyelet to the drive pulley.

CADILLAC DIV.—GEN. MOTORS

MODEL 77
Assembly Views

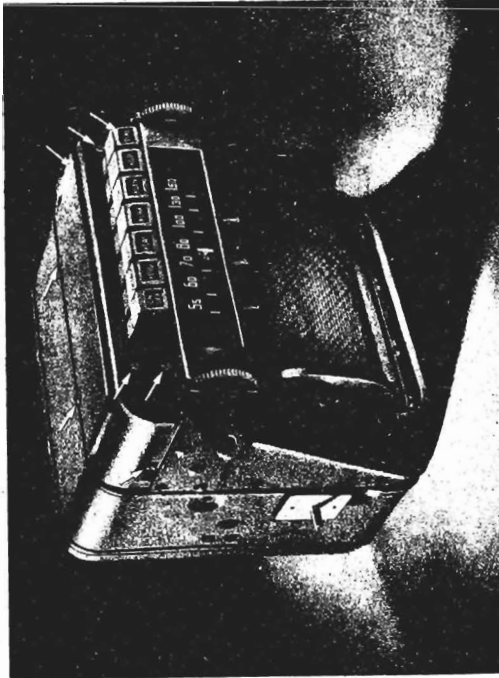


Fig. 5 Remove these 8 Screws to Disassemble tuner cover

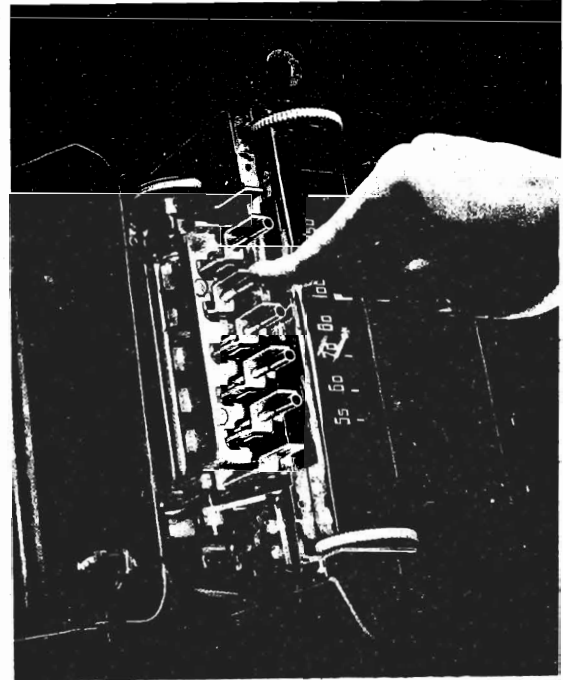


Fig. 6 Tuner accessible for service

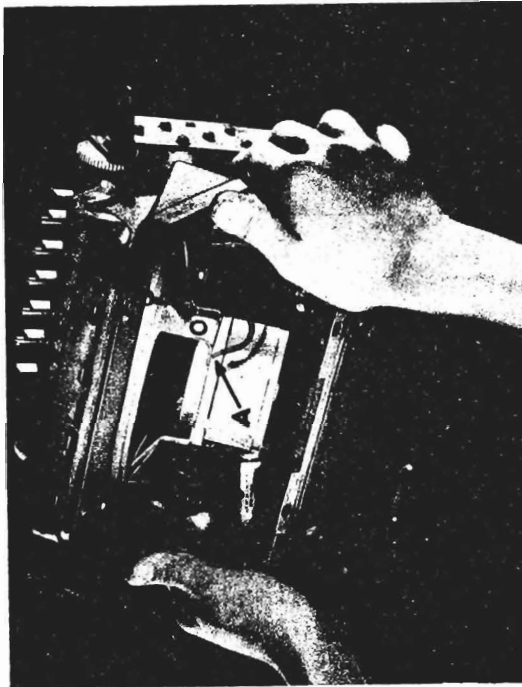


Fig. 3 Disconnect Voice Coil Lead before
completing removal of cover

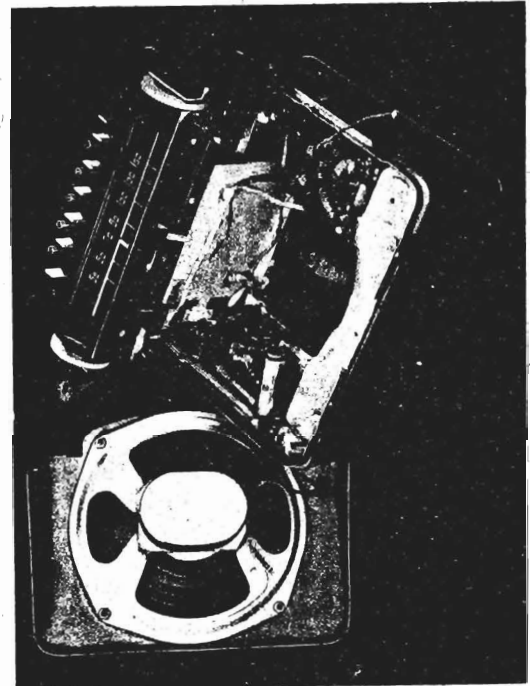


Fig. 4 Disassembled for service

15 numbered and lettered shapes for a visual discrimination task:

- 1: Circle with a dot in the center.
- 2: Square with two diagonal lines (top-left to bottom-right and bottom-left to top-right).
- 3: Square with two diagonal lines (top-left to bottom-right and bottom-left to top-right).
- 4: Rectangle with a horizontal line across the middle.
- 5: Circle with a dot in the center.
- 6: Circle with a dot in the center.
- 7: Circle with a dot in the center.
- 8: Circle with a dot in the center.
- 9: Circle with a dot in the center.
- 10: Circle with a dot in the center.
- 11: Circle with a dot in the center.
- 12: Circle with a dot in the center.
- 13: Circle with a dot in the center.
- 14: Circle with a dot in the center.
- 15: Circle with a dot in the center.

Fig. 5-Parts Layout-Top View-Cadillac 1940 Rear Compartment Radio

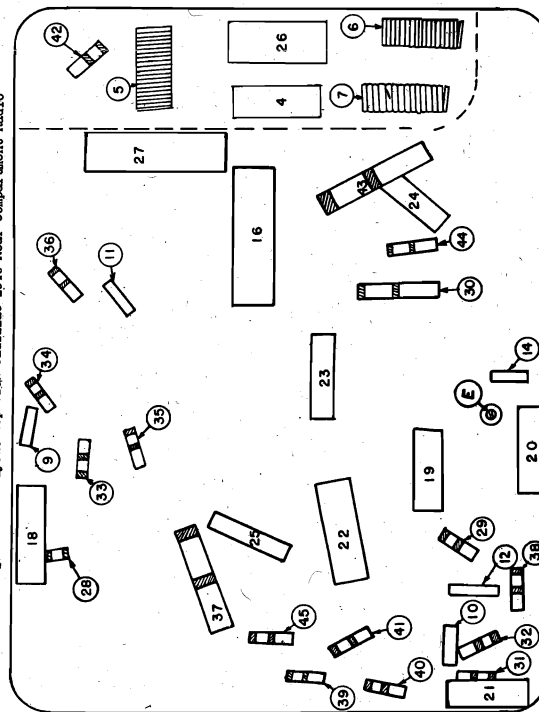


FIG. 6-Parts Layout-Bottom View-Cadillac 1940 Rear Compartment Radio

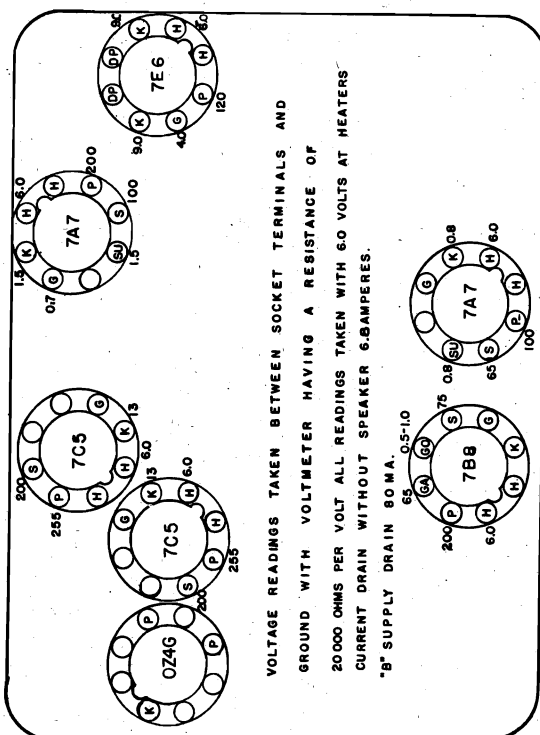


Fig. 8-Voltage Chart-Cadillac 1940 Rear Compartment Radio

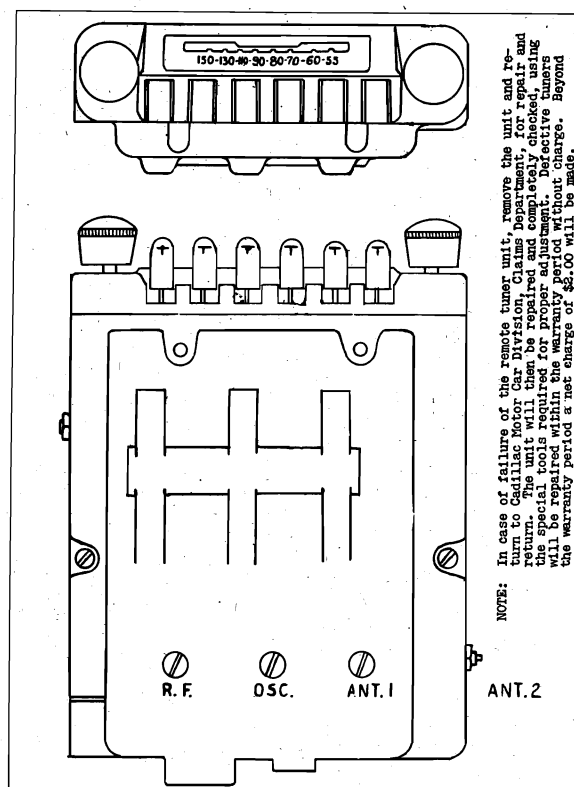
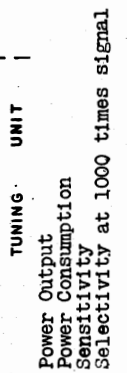


Fig. 7-Automatic Tuner Outline-Cadillac 1940 Rear Compartment Radio

NOTE: In case of failure of the remote tuner unit, remove the unit and return to Cadillac Motor Car Division, Claims Department, for repair and return. The unit will then be repaired and completely checked, using the special tools required for proper adjustment. Defective tuners will be repaired within the warranty period without charge. Beyond the warranty period a net charge of \$2.00 will be made.



MODEL 7238399
Antenna Data

CADILLAC DIV.—GEN. MOTORS

ANTENNA INSTALLATION INSTRUCTIONS

Three Vacuum Antenna packages released for use on 1940 Cadillac and LaSalle cars are:

| Part Number | Series |
|-------------|--------------------|
| 1436388 | 40-50 |
| 1436389 | 40-52, 60S, 62, 72 |
| 1436390 | 40-75, 90 |

These packages are identical except for the insulators and attaching parts, but it is extremely important that the proper assembly be used for the particular car on which the installation is being made, else the bakelite insulators will not properly fit the hood contours.

TO INSTALL VACUUM ANTENNA

1. Place the template supplied in the antenna package on the cowl and punch the center of the 1-1/32" hole with a center punch, using the 1/4" pilot drill of Hinkley-Myers J-1272-C tool to drill through the cowl at the angle shown in the top view of Fig. 1. After this hole is drilled raise the drill to a vertical position as shown in the lower view of Fig. 1 and drill through with the 1-1/32" cutter.

If a Hinkley-Myers J-1272-C tool is not available this hole may be cut by drilling around the edge of the outline of the hole on the template with a 5/32" drill and filing off the rough edges. Care should be exercised so that the finished hole will not be too large.

Hinkley-Myers tool J-1272-C may be purchased direct from Hinkley-Myers Co., Jackson, Michigan.

2. Remove side panel kick pad.

3. Assemble the hoses supplied with the antenna to the control valve as shown in Fig. 2 and install in the far left hole provided in the left end of the lower flange of the instrument panel.

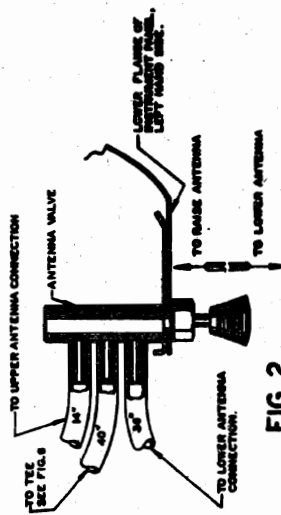


FIG. 2

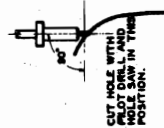


FIG. 1

4. Attach the bottom antenna support bracket (L) to the front end body brace on Series 40-50, 52, 62 and 72 with self tapping screw, as shown in Fig. 3. The hole is provided in Series 40-50 but must be drilled in Series 40-52, 62 and 72. On Series 40-60S, 75 and 90 this support is built into the body brace and it is only necessary to insert the rubber grommet through the hole.

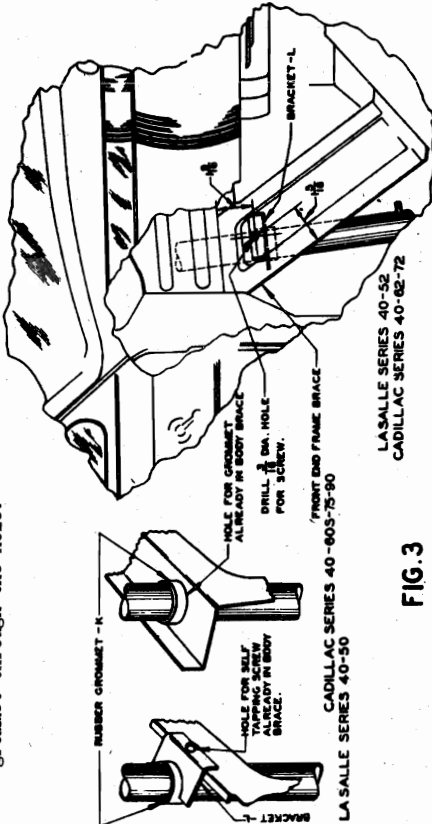


FIG. 3

5. Lower the antenna assembly through the hole in the cowl and put on rubber grommet (K) in Fig. 3 and washer (J) and rubber spacer (H) in Fig. 4.

6. Assemble lower hose connection to the bottom of the antenna, as shown in Fig. 5.

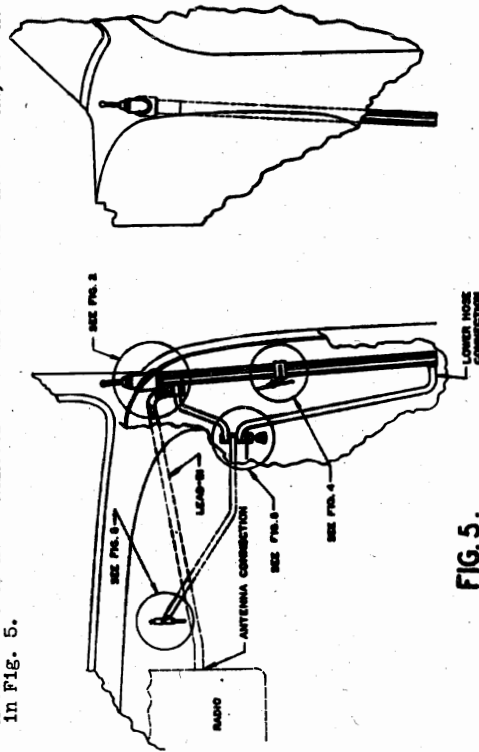


FIG. 5

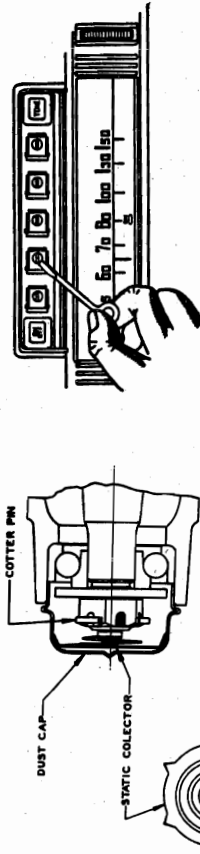
Antenna and Noise Suppression Notes

CADILLAC DIV.—GEN. MOTORS

MODEL 7238399
Tuner Data

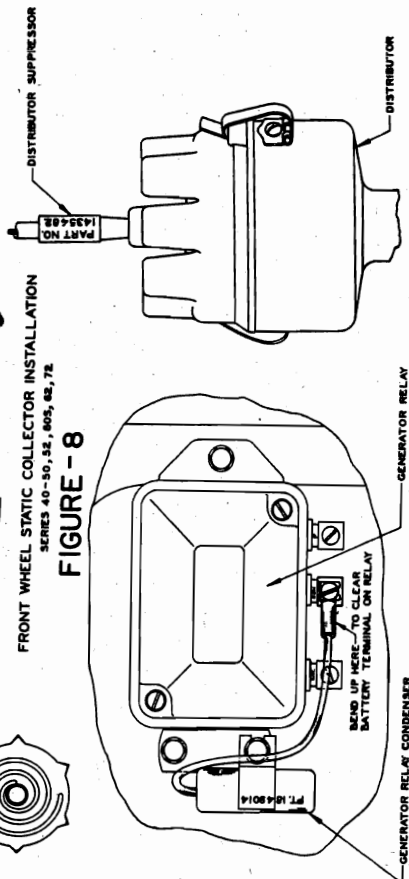
TO SET UP PUSH BUTTONS

It is important that the buttons be set accurately. This may be accomplished by lowering the vacuum aerial to a point where the signal is just being heard. Setting the stations selected by the push buttons has been made easy. Pulling off a button reveals a screwdriver slot recessed in a brass tube next to the button plunger arm. This screw, when rotated counter-clockwise by means of a screwdriver furnished with the set in the call letter envelope, unlocks the tuner setting for that particular button. The plunger arm is then held in a fully depressed position while the station is tuned in by means of the manual tuning wheels. The plunger arm is then released and the lock-up screw is tightened by rotating in a clockwise direction with the screwdriver provided. Check for accuracy of setting by tuning in from each end of the dial with the button.



FRONT WHEEL STATIC COLLECTOR INSTALLATION
SERIES 40-50, 52, 60S, 62, 72

FIGURE - 8



DISTRIBUTOR SUPPRESSOR INSTALLATION

FIGURE - 7

Install generator relay condenser, Part #1849014, on the generator terminal of the relay box.

Install suppressor, Part #1435482, in the center terminal of the static collector in the front wheels on Series 40-50, 52, 62, 60S, and 72. See Fig. 8. Bend cotter key over the nut as shown, so that it does not interfere with static collector.

On some cars it may be necessary to bend the oil and throttle line to the dash.

Bond ~~the~~ or to the frame at the two front motor supports, using the bond straps supplied in the antenna package.

Bond exhaust system to the frame, using bond straps supplied with the antenna.

Bond transmission mainshaft housing to center or crossmember.

Bond transmission housing to the floorboard, making the bond as short as possible.

Bond both engine blocks to the dash.

IGNITION SUPPRESSION

AND

WHEEL STATIC SUPPRESSION

7. Assemble antenna lead and upper hose connection with parts in order as shown in Fig. 4.
8. Ground antenna lead shield to upper body brace with self tapping screw. The hole for this screw is provided on Series 40-50, 60S, 75 and 90. On Series 40-52, 62 and 72 it will be necessary to drill a 9/64" hole for this screw.
9. Attach the 14" length of hose securely to the upper antenna connection through cap, as shown in Fig. 4.
10. Attach the 36" length of hose to the lower hose connection on the antenna, as shown in Fig. 5.
11. Raise the antenna through the hole in the cowl and install the rubber pad (G) Bakelite insulator (F) Washer (E) Spring (D) Brass Washer (C) Packing gland (B) and nut (A). Tighten nut (A) until the shoulder and the antenna insulator seats against the top of antenna shield as shown in Fig. 4. IMPORTANT - When tightening nut (A) do not get it too tight. Turn it down carefully until the stop is reached, then back off slightly.
12. Push grommet (K) into place in bracket (L) or the hole in the support brace, as shown in Fig. 3.
13. Cut windshield wiper hose and insert the tee connection. Attach the 40-1 inch length of hose to the tee connection, as shown in Fig. 6.
14. Plug the antenna lead into the radio set and check adjustment of the antenna trimmer for proper setting. Radios shipped from the factory are set for use with the vacuum aerial.
15. Start the motor and check the operation of the antenna. Push the control valve up to raise the antenna and pull down and lower the antenna. For best operation occasionally wipe the antenna rod free of dust and other accumulation.

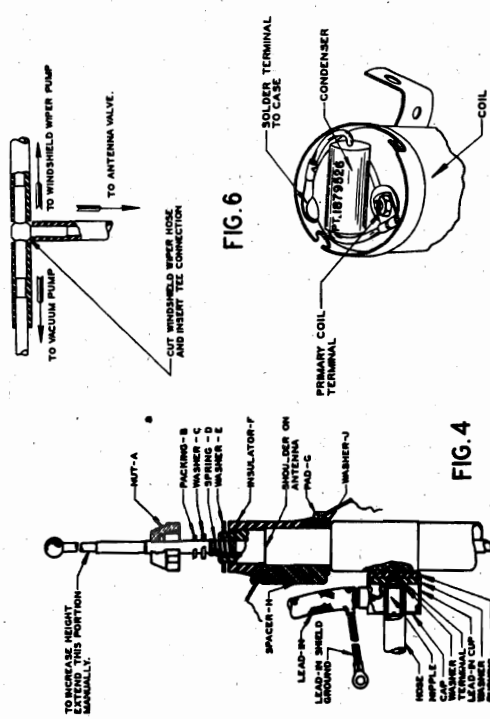


FIG. 4

COIL CONDENSER INSTALLATION

Install coil condenser, Part #1879526, in the top of the ignition coil, using Tool J-728 to remove the cover. Make sure the coil is well grounded to the dash by scraping off the paint on the dash and coil bracket.

FIG. 6

MODEL 7238399

Tuner Data, Alignment

CADILLAC DIV.—GEN. MOTORS

CADILLAC 1940 AUTOMATIC RADIO FOR REAR COMPARTMENT INSTALLATION

SETTING UP STATIONS ON PUSH BUTTONS

There are six push buttons on the remote tuner unit by means of which six stations may be set up for automatic tuning. (See B, Fig. 1.)

Select the six stations desired and punch out from the set of station call letter tabs supplied the call letters of the stations selected. On the top of each push button a slot is provided for inserting the call letter tabs (See A, Fig. 1). Insert the tabs, then proceed as follows:

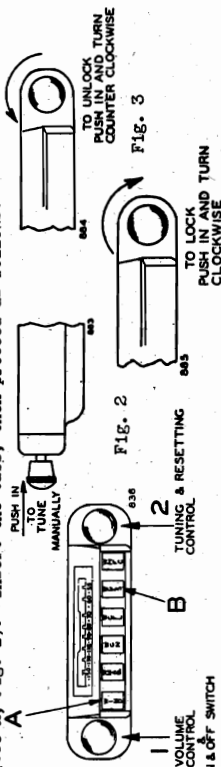


Fig. 1—Front View of Remote Tuner Unit

TO UNLOCK

1. Push on the dial tuning knob hard enough to make it latch in. (See Fig. 2.)
2. Rotate the dial tuning knob to the left (counter-clockwise), until the knob cannot be turned any further without forcing. (See Fig. 3.)

As the knob is rotated it will turn easily until the pointer reaches the end of the dial scale and then a slight amount of force will be required to actually start unhooking the tuner mechanism. Beyond this point the knob will turn quite easily again until the tuner mechanism is completely unlocked. At this point do not force the knob any further. The tuner mechanism is now unlocked.

(NOTE: Automatic tuner mechanism is locked tight when radio is shipped from the factory.)

SETTING PUSH BUTTONS

1. Push in all the way any one of the push buttons and at the same time hold in firmly the dial tuning knob. Both the dial tuning knob and the push button should be pushed hard enough to make them stay latched in. The reason for holding the dial tuning knob in firmly when the push button is pressed in is due to the latching mechanism in the remote tuner unit which is so constructed as to release the dial tuning knob entirely when a push button is pressed in. When setting up stations for automatic tuning, however, it is necessary that both the dial tuning knob and the push button be latched in together.

2. Press in on the push button which is latched in. Holding it in firmly, tune in by means of the manual tuning knob the station indicated on the station call letter tab on this push button. Turn the dial tuning knob very slowly back and forth (while still pressing in firmly on the push button), until the station is accurately tuned in.

3. Push in all the way another push button, at the same time holding the dial tuning knob in so that both the push button and the dial tuning knob are latched in together. Holding the push button in firmly, tune in the station indicated on the call letter tab on this push button.

4. Follow this procedure until you have tuned in all six selected stations.

5. When the last push button has been properly set up it is necessary to release it from the latched-in position before the tuner mechanism can be locked. To release this push button, slightly depress any other push button, this will trip the latching mechanism and all the push buttons will be released to out position.

TO LOCK

(NOTE: All the push buttons must be in out position when locking the tuner mechanism.)

To lock the tuner mechanism push on the dial tuning knob hard enough to make it stay latched in. Rotate the dial tuning knob to the right (clockwise) until the knob cannot be turned any further with forcing it. (See Fig. 4) This will lock the tuner mechanism and all the stations that have been set up on the buttons will be locked in place for automatic tuning.

ANTENNA

An under car antenna must be used with the rear compartment radio. Instructions for installation are supplied with each antenna.

ALIGNMENT PROCEDURE

Two separate alignment procedures are included in these instructions. The first is to be considered the usual alignment procedure and the second to be used only when a tuning coil has been replaced or when some major change has been made in the tuning apparatus.

CAPACITY ALIGNMENT

I.F. Alignment at 455 KC

- (a) Connect an output meter across the voice coil of the speaker leaving speaker connected or connecting a 1.7 ohm load instead of the speaker.
- (b) Connect the ground lead of the signal generator to the set chassis and the signal lead to the "G" prong of the 758 tube through a .1 mfd. condenser.
- (c) With signal generator frequency set at 455 kilocycles adjust the I.F. trimmers A, B, D & E and I.F. core adjustment E in the sequence named until maximum output is obtained. (Fig. 5 & 6.)
- (d) Connect the signal lead of the signal generator to the antenna connection of the set through a 150 mfd. condenser. Adjust the I.F. trap adjustment F for MINIMUM response. (Generator frequency 455 KC) Fig. 5.

Alignment at 1530 KC

- (a) Set frequency of the signal generator to 1530 KC.
- (b) By means of the manual tuning control adjust the tuning control of the set to its highest frequency position against the high frequency stop.
- (c) Adjust the oscillator trimmer ("osc" on tuning unit) for maximum output. See Fig. 7.

Alignment at 600 KC

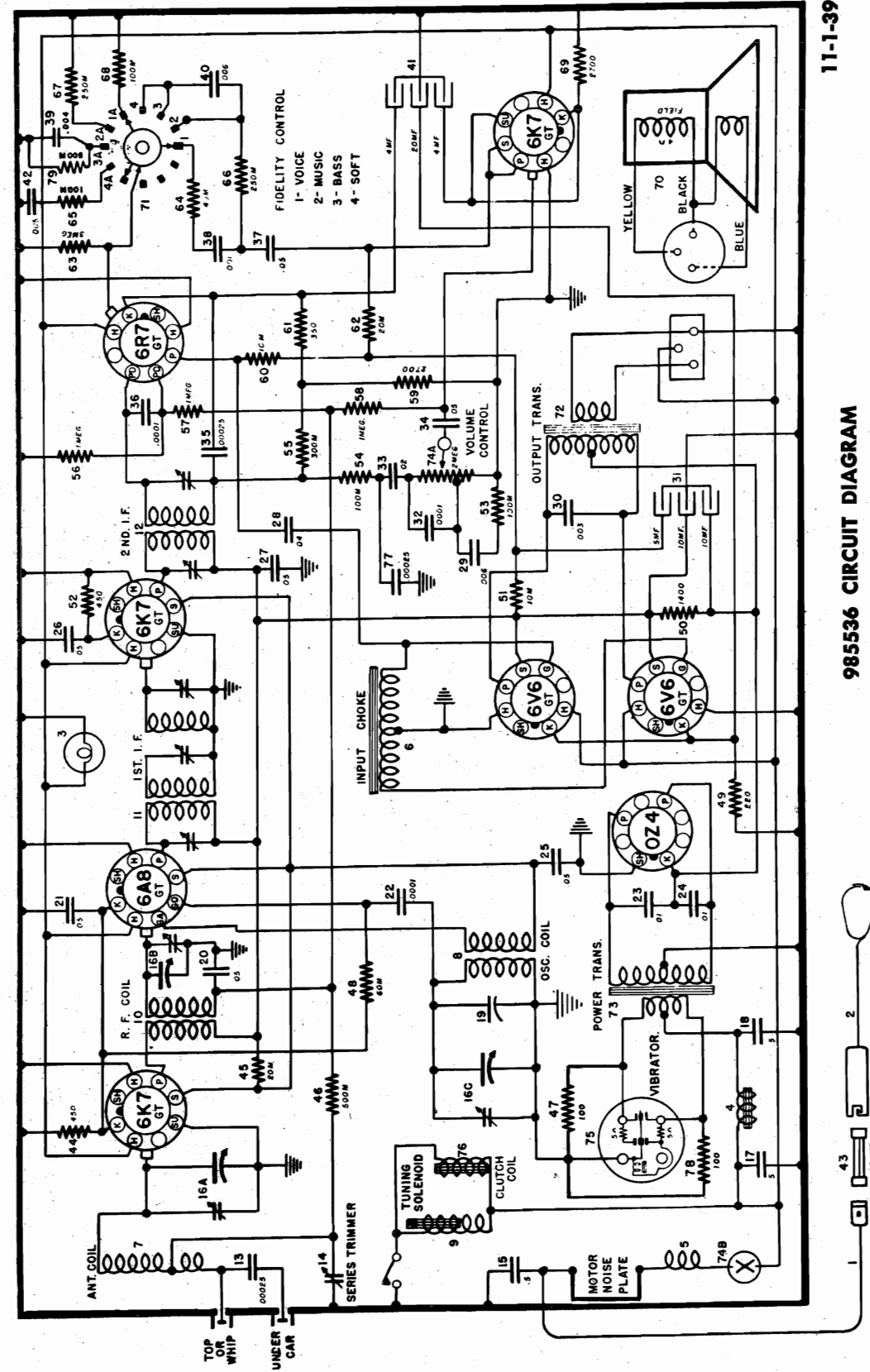
- (a) Set the signal generator frequency to 600 KC.
- (b) Tune set to this signal and adjust the RF trimmer ("R.F." on tuning unit) for maximum output, while rocking tuning control back and forth through the signal. See Fig. 7.
- (c) Adjust the antenna trimmers ("Ant 1" and "Ant 2" on the tuning unit for maximum output. Fig. 7.

Alignment at 1400 KC

- (a) Set signal generator frequency to 1400 kilocycles and tune set to this signal.
- (b) Using an insulated three cornered prong tool adjust the core positions for maximum output reading.

CHEVROLET DIV.—GEN. MOTORS

MODEL 985536
Schematic



11-1-39

985536 CIRCUIT DIAGRAM

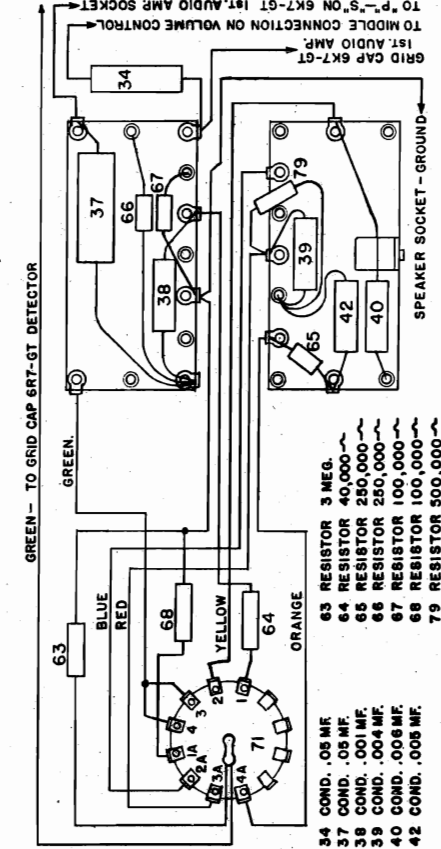
IF PEAK 262.5 KC

Tube Complement

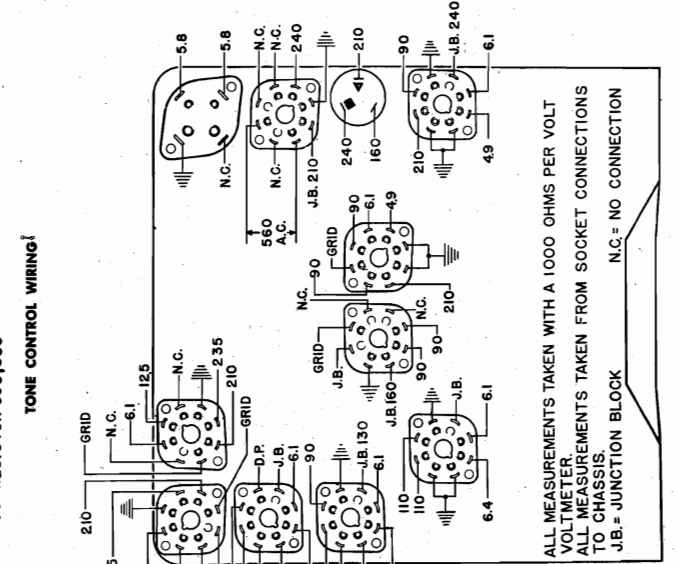
| Type | Function | Type | Function |
|-------|-------------------------------|-------|-------------------------------|
| 6K7GT | R.F. Amplifier | 6K7GT | 1st Audio (A.V.C. Controlled) |
| 6A8GT | Oscillator-Modulator | 6V6GT | Output |
| 6K7GT | I.F. Amplifier | OZ4 | Rectifier |
| 6R7GT | 2nd Detector A.V.C. Rectifier | | |

MODEL 985536
Voltage, Alignment
Chassis, Trimmers
Socket, Data

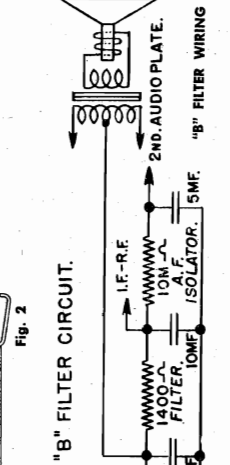
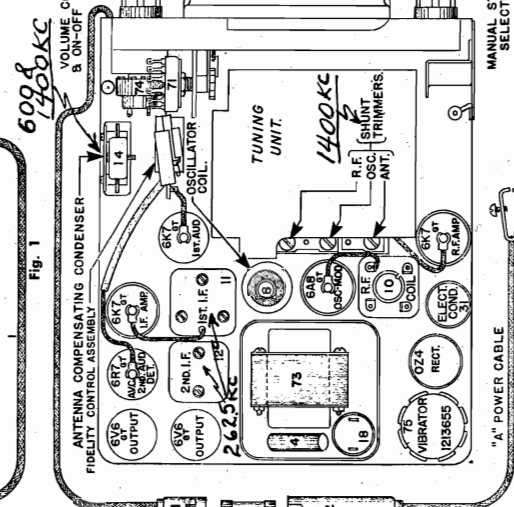
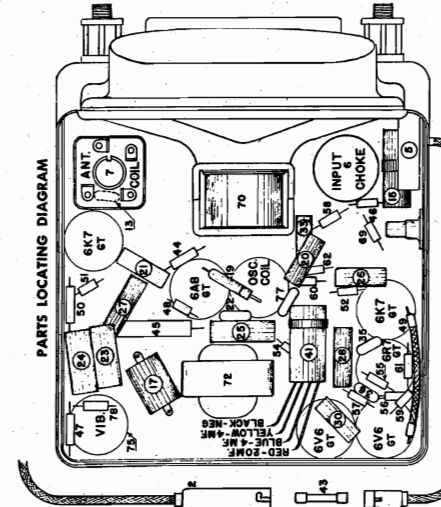
CHEVROLET DIV.—GEN. MOTORS



ANTENNA SYSTEM: There are three antennas available for use with this receiver; the under car, the turret-top, or the telescopic cowl. Any one of these antennas will operate very efficiently when used with this Chevrolet radio.



SOCKETS AND VOLTAGES DIAGRAM



MODEL 985536
Circuit Data, Tuner
Alignment Notes, Parts

| Parts List | | | |
|---------------------|------------------|------------|---|
| Production Part No. | Service Part No. | Part Name | Description-Function |
| 1212932 | | Lead Assy. | "A" Lead—Set to Fuse..... |
| 1212933 | | Lead Assy. | "A" Lead—Fuse to Ammeter..... |
| 115273 | | Bulb | Dial Light..... |
| 1213883 | | Coil | "A" Filter Choke..... |
| 1213884 | | Coil | Motor Noise Choke..... |
| 1213641 | | Coil | Audio Input Choke..... |
| 1213645 | | Coil | Antenna..... |
| 1212893 | | Coil | Oscillator..... |
| 1213885 | | Coil | Tuning Solenoid..... |
| 1212979 | | Coil | R.F..... |
| 1213646 | | Coil | 1st I.F. Trans. Assy..... |
| 1213849 | | Coil | 2nd I.F. Trans. Assy..... |
| 1209055 | | Condenser | Molded—.00025 mfd. Ant. Coupling..... |
| 1211535 | | Condenser | Antenna Series Compensating..... |
| 1213648 | | Condenser | Tubular—.5 mfd. 200 Volt—H.F. Noise Filter..... |
| 1213643 | | Condenser | Variable—3 Gang Tuning..... |
| 7232390 | | Condenser | Tubular—.5 mfd. 160 Volt—Filter..... |
| 7232390 | | Condenser | Tubular—.5 mfd. 160 Volt—Filter..... |
| 7234975 | | Condenser | Thermal—Temp. Compensating (Osc.)..... |
| 1210295 | 7230592 | Condenser | Tubular—.05 mfd. 200 Volt—R.F. Return..... |
| 1210295 | 7230592 | Condenser | Tubular—.05 mfd. 200 Volt—R.F. Cathode By-Pass..... |
| 1210275 | | Condenser | Molded—.0001 mfd. Mica—Osc. Coupling..... |
| 1212316 | 1208600 | Condenser | Tubular—.01 mfd. 650 Volt—Vib. Phasing..... |
| 1212316 | 1208600 | Condenser | Tubular—.01 mfd. 650 Volt—Vib. Phasing..... |
| 1209308 | 7230592 | Condenser | Tubular—.05 mfd. 400 Volt—Screen By-Pass..... |
| 1210295 | 7230592 | Condenser | Tubular—.05 mfd. 200 Volt—I.F. Cathode By-Pass..... |
| 1209308 | 7230592 | Condenser | Tubular—.05 mfd. 400 Volt—B+, R.F. By-Pass..... |
| 1213651 | 7230910 | Condenser | Tubular—.04 mfd. 400 Volt—2nd A.F. Output..... |
| 1210293 | 7230593 | Condenser | Tubular—.006 mfd. 160 Volt—V.C. Bass Compensating..... |
| 1208942 | 1207893 | Condenser | Tubular—.003 mfd. 400 Volt—Plate By-Pass..... |
| 1213652 | | Condenser | Electrolytic—3 Section (10-10-5 mfd.) B. Filter..... |
| 1210275 | | Condenser | Molded—.0001 mfd.—H.F. By-Pass..... |
| 1210257 | 1207799 | Condenser | Tubular—.02 mfd. 160 Volt—A.F. Coupling..... |
| 1210295 | 7230592 | Condenser | Tubular—.05 mfd. 200 Volt—1st A.F. Coupling..... |
| 1209055 | | Condenser | Molded—.00025 mfd.—Diode Rectifying..... |
| 1210275 | | Condenser | Molded—.0001 mfd.—Diode Coupling..... |
| 1209308 | 7230592 | Condenser | Tubular—.05 mfd. 400 Volt—A.F. Coupling..... |
| 1213647 | 1212097 | Condenser | Tubular—.001 mfd. 160 Volt—Bass Limiting (F.C.)..... |
| 1213650 | 7233243 | Condenser | Tubular—.004 mfd. 160 Volt—H.F. By-Pass (F.C.)..... |
| 1210293 | 7230593 | Condenser | Tubular—.006 mfd. 160 Volt—Bass Limiting (F.C.)..... |
| 1213653 | | Condenser | Electrolytic—3 Section (4-20-4 mfd.) Cathode By-Pass..... |
| 1213649 | 7230912 | Condenser | Tubular—.005 mfd. 160 Volt—H.F. By-Pass (F.C.)..... |
| 106653 | 603156 | Fuse | 20 Ampere..... |
| 1211701 | 1208110 | Resistor | Flexible—450 ohm, ½ Watt—R.F. and Det. Bias..... |
| 1212668 | | Resistor | Insulated—20,000 ohm, 2 Watt—Screen Dropping..... |
| 1210470 | | Resistor | Insulated—500,000 ohm, ½ Watt—AVC Filter..... |
| 1211703 | 1209015 | Resistor | Flexible—100 ohm, ½ Watt—Vib. Damping..... |
| 1210881 | | Resistor | Insulated—60,000 ohm, ½ Watt—Osc. Grid Leak..... |
| 1208321 | | Resistor | Flexible—220 ohm, 2½ Watt—Output Bias..... |
| 1212981 | | Resistor | Insulated—1400 ohm, 1½ Watt—Hum Filter..... |
| 1210834 | | Resistor | Insulated—10,000 ohm, ½ Watt—Audio Plate Filter..... |
| 1211701 | 1208110 | Resistor | Flexible—450 ohm, ½ Watt—I.F. Bias..... |
| 1209883 | | Resistor | Insulated—100,000 ohm, ½ Watt—Bass Comp..... |
| 1209883 | | Resistor | Insulated—100,000 ohm, ½ Watt—I.F. Filter..... |
| 1209884 | | Resistor | Insulated—300,000 ohm, ½ Watt—A.F. Diode Load..... |
| 1209885 | | Resistor | Insulated—1 megohm, ½ Watt—AVC Diode Load..... |
| 1209885 | | Resistor | Insulated—1 megohm, ½ Watt—AVC Filter..... |
| 1209885 | | Resistor | Insulated—1 megohm, ½ Watt—AVC Isolating..... |
| 1211049 | | Resistor | Insulated—2700 ohm, ½ Watt—2nd A.F. Bias..... |
| 1210834 | | Resistor | Insulated—10,000 ohm, ½ Watt—2nd A.F. Plate..... |
| 1211704 | 1208802 | Resistor | Flexible—350 ohm, ½ Watt—2nd A.F. Bias..... |
| 1210882 | | Resistor | Insulated—20,000 ohm, ½ Watt—1st A.F. Plate..... |
| 1211149 | | Resistor | Insulated—3 megohm, ½ Watt—2nd A.F. Grid Return..... |
| 1211104 | | Resistor | Insulated—40,000 ohm, ½ Watt—Voltage Divider (F.C.)..... |
| 1209883 | | Resistor | Insulated—100,000 ohm, ½ Watt—Voltage Divider (F.C.)..... |
| 1210117 | | Resistor | Insulated—250,000 ohm, ½ Watt—Voltage Divider (F.C.)..... |
| 1210117 | | Resistor | Insulated—250,000 ohm, ½ Watt—Voltage Divider (F.C.)..... |
| 1209883 | | Resistor | Insulated—100,000 ohm, ½ Watt—Voltage Divider (F.C.)..... |
| 1211049 | | Resistor | Insulated—2700 ohm, ½ Watt..... |

CHEVROLET DIV.—GEN. MOTORS

| | | | |
|---------|-------------|--|----|
| 1213644 | Switch | Tone Control—not to be serviced..... | 71 |
| 1213642 | Transformer | Output..... | 72 |
| 1213640 | Transformer | Power..... | 73 |
| 1213639 | Switch | Volume Control and On-Off Switch—2 megohm..... | 74 |
| 7239439 | Vibrator | | 75 |
| 1213886 | Coil | Clutch..... | 76 |
| 1209055 | Condenser | Molded—.00025 mfd.—I.F. Filter..... | 77 |
| 1211703 | Resistor | Flexible—100 ohm, ½ Watt—Vib. Damping..... | 78 |
| 1210470 | Resistor | Insulated—500,000 ohm, ½ Watt—Bass Leveler (F.C.)..... | 79 |

Circuit Description

The circuit used in this receiver is the conventional superheterodyne type and does not use any regeneration. The eight tubes employed are an R. F. Amplifier, combination Oscillator-Modulator Tube, 262.5 kilocycle I. F. amplifier the first transformer of which is triple tuned, push-pull output and power supply. The 6R7GT tube supplies A.V.C. voltage to the grids of the 6K7GT R. F. amplifier, the 6A8GT and the 6K7GT first audio amplifier. It also serves as second detector and second audio amplifier driver. The bias for the 6K7GT R. F. amplifier and the 6A8GT tubes is developed across a 450 ohm resistor, item No. 44. The bias for the 6K7GT I. F. amplifier tube is developed across a 450 ohm resistor, item No. 52. Bias for the 6R7GT first audio tube is developed across a 2700 ohm resistance, item No. 69. Bias for the 6R7GT tube is developed across two resistances, item numbers 59-350 ohms and 61-2700 ohms. Bias for the 6V6GT tubes is developed across a 220 ohm resistance, item No. 49. Between the 6K7GT first audio plate and the 6R7GT ground is the fidelity control resistor capacity network. The 6R7GT plate is coupled through a .04 mfd. condenser to one side of the center tapped audio input choke.

Explanation of Tone Control Positions and Automatic Volume Control

Automatic Volume Control

The 6R7GT diode furnishes A.V.C. voltage developed across item 56, 1 megohm load resistor, to the 6A8GT through item 57, 1 megohm filter resistor; from the 1 megohm filter through a 500,000 ohm isolating resistor (item 46) to the R-F 6K7GT grid; likewise from the 1 megohm filter through a 1 megohm isolating resistor (item 58) to the grid of the 6K7GT first audio tube.

Tone Control

The fidelity control and its tone compensating network is between the 1st audio amplifier and driver tube. When the switch is in the VOICE position the signal is fed through a .05 condenser (item 37) then through a .001 condenser (item 38) which limits or acts as a high impedance to low frequencies, limiting the frequencies passed to the middle and high range. From the .001 condenser the signal passes through a 40,000 ohm (item 64) and a 100,000 ohm (item 68) resistor to ground. These two resistors act as a voltage divider and the signal to the 6R7GT driver grid is taken off at the junction of the 40,000 and 100,000 ohm resistors. Likewise there is a 3 megohm resistor (item 63) from the 6R7 grid to ground, while this is shunted across the 100,000 ohm resistor (item 68) its effect on the circuit is negligible and its real purpose is to form a d-c grid return when the fidelity switch is in the SOFT position.

The path of the audio with the fidelity switch in the MUSIC position is as follows: Through .05 condenser (item 37) a 250,000 ohm resistor (item 66) and a 250,000 ohm resistor (item 67) to ground. Items 66 and 67 form divider and 6R7 grid is fed from junction of these two resistors. This position provides normal response which is well rounded with both lows and highs.

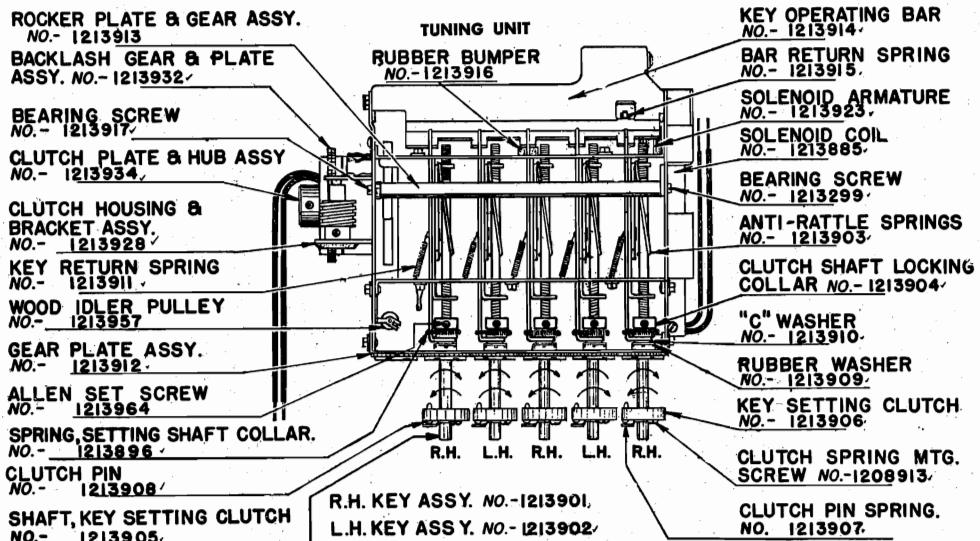
For the BASS position, the signal from the 6K7GT plate passes through the .05 condenser (item 37) the 250,000 ohm resistor (item 66) and a 500,000 ohm resistor (item 79) to ground. Item 79, the 500,000 ohm resistor is shunted by a .004 condenser (item 39). This condenser bypasses the highs so that the lows and the middle range predominate. The grid of the 6R7GT is fed from the junction of items 66, 79, and 39.

For the SOFT position the a-f is fed through the coupling condenser (.05 uf. item 37) the 250,000 ohm resistor (item 66) then through a .006 uf. condenser (item 40) to a 100,000 ohm resistor (item 65) through a .005 uf. condenser (item 42) to ground. The 6R7GT grid is fed from the junction of items 40 and 65. The function of Item 40 the .006 uf. condenser, is to pass highs and middle frequencies while the purpose of Item 42, the .005 uf. condenser is to bypass the highs so the resultant output covers the middle range cutting both the highs and lows. Item 63, the 3 megohm resistor from the 6R7GT grid to ground, is the d.c. grid return.

Setting the Push Buttons

The order in which the stations are set up on the push buttons will in no way affect the operation of the tuning unit. To set the push buttons, no tools are required, but an understanding of the operation of the push-button switch is essential. There

are two definite pressures and movements required to actuate the switch. First, a slight touch and a movement of less than one-quarter inch is all that is required to tune the receiver with a push button after the button has been adjusted. Second, a heavier pressure and a movement of a little more than one-quarter inch is required when the push button is to be set to the station selected. To adjust the button, push the button all the way down and hold it in that position while you tune in as accurately as possible with the manual tuning knob the station selected. Release the button and the station is set. Follow the same procedure in setting the remaining buttons.



Aligning I.F. Stages at 262.5 Kilocycles Alignment.

USE A .02 MFD. DUMMY TO GRID OF 6K7GT TUBE (LEAVE GRID CAP IN PLACE). SET AUDIO FIDELITY TO "MUSIC" POSITION. AT 262.5 KC ADJUST SECOND IF TRIMMERS. THEN APPLY SIGNAL TO GRID OF 6A8GT TUBE (LEAVE GRID CAP IN PLACE). OPEN MIDDLE TRIMMER OF FIRST IF TRANSFORMER ADJUST TWO OTHER TRIMMERS TO MAXIMUM AND THEN THE MIDDLE TRIMMER FOR MAXIMUM. DO NOT READJUST SECOND IF.

Oscillograph Alignment

- Disconnect the conventional signal generator from the receiver.
- Connect the vertical plates of the oscillograph to the receiver connecting the (HI) terminal through a .02 mfd. condenser to the grid cap of the 6K7GT audio amplifier tube, leaving the tube's grid clip in place. (Condenser is built into most oscillographs.) Connect the ground terminal to the frame of the receiver chassis.
- Connect the output of the R.F. modulated signal generator, also through a .02 mfd. condenser to the grid cap of the 6A8GT tube, leaving the tube's grid clip in place. Connect the ground lead to the frame of the receiver chassis.
- Adjust the signal generator to 262.5 kilocycles.
- With the modulator switch of the signal generator turned off, a horizontal line will appear on the window of the oscillograph by means of the amplitude control on the oscillograph. Adjust the length of the line so that it is equal to the width of the celluloid scale supplied with the oscillograph.
- Turn the frequency modulator switch of the signal generator on.
- Adjust the vertical control of the oscillograph so that the image is just within the top and bottom lines of the oscillograph scale. NOTE: Use the lowest signal generator output that will give a stable image on the oscillograph window. If too much signal input is used, the humps desired on the wave form will not be visible even at perfect alignment.
- Readjust the middle trimmer on the 1st I.F. transformer for maximum symmetry above the vertical resonance line in the center of the celluloid scale. The hump or shoulder appearing on each side of the wave form will be equal distance from the numbers of the curve when maximum symmetry is reached.

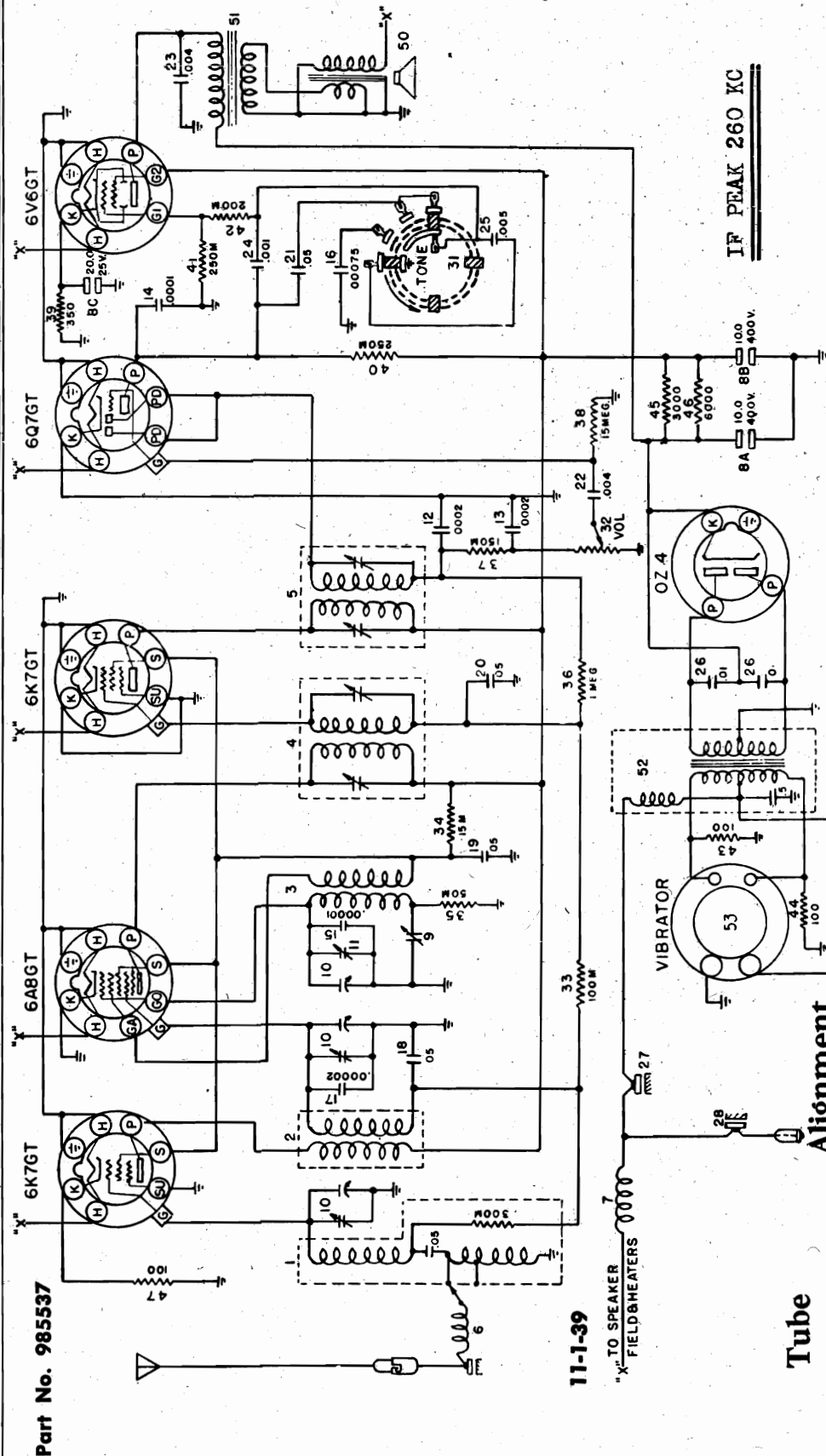
Aligning the R.F. Amplifier

USE A .00016 MFD. DUMMY TO ANTENNA LEAD. AT 1400 KC ADJUST OSCILLATOR TRIMMER FOR MAXIMUM. THEN ADJUST RF AND ANTENNA TRIMMER FOR MAXIMUM. READJUST STATION SELECTOR FOR MAXIMUM. DO NOT READJUST OSCILLATOR TRIMMER.

Adjusting Antenna Compensating Condenser

SET SIGNAL AND DIAL AT 600 KC, ADJUST FOR MAXIMUM. ADJUST ALSO AT 1400 KC. WHEN INSTALLED IN CAR TUNE A WEAK STATION BETWEEN 55 AND 65 ON DIAL AND ADJUST FOR MAXIMUM VOLUME IN SPEAKER.

CHEVROLET DIV.—GEN. MOTORS

MODEL 985537
Schematic, Alignment

Tube

Complement

Type Function

| | |
|-------|-------------------------|
| 6K7GT | R.F. Amplifier |
| 6A8GT | Oscillator-Modulator |
| 6K7GT | I.F. Amplifier |
| 6Q7GT | 2nd Detector and A.V.C. |
| 6V6GT | Power Output |
| OZ4 | Rectifier |

At 260 KC:— Use a .1 mfd. condenser as dummy. Signal to 6A8GT grid (LEAVE GRID CAP IN PLACE). Adjust second and then first IF trimmers.

At 1560 KC:— Use a .00007 mfd. condenser as dummy. Signal to antenna post. Adjust oscillator parallel trimmer (e) for maximum output.

At 1400 KC:— Use a .00007 mfd. condenser as dummy. Connections as for 1560 KC. Adjust antenna RF (f) and (g) trimmers for maximum output.

At 600 KC:— With same connections adjust oscillator pad (h) at 600 KC while rocking condenser, for maximum output. Readjust at 1400 KC. With station selector, tune in 1400 KC signal for maximum output. Readjust trimmer on antenna section of gang condenser for maximum output.

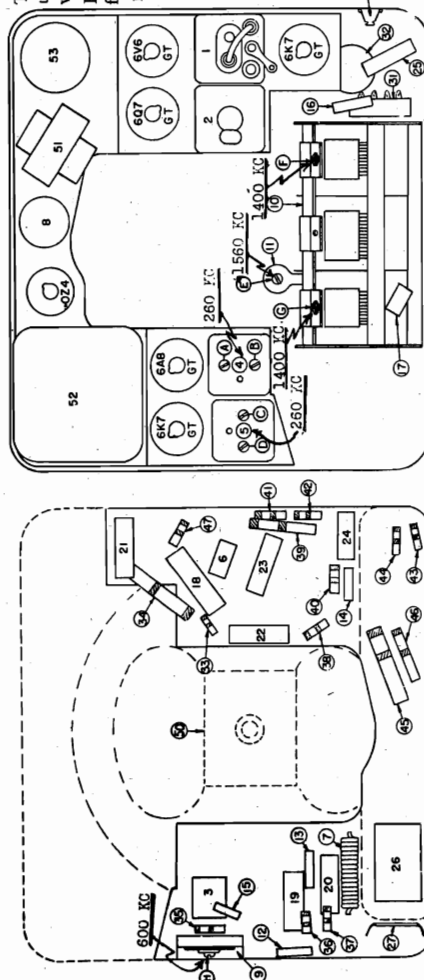
MODEL 985537

Voltage, Chassis
Tuner, Parts

CHEVROLET DIV.—GEN. MOTORS

The circuit used in this receiver is the conventional superheterodyne type and does not use any regeneration. A special tone control circuit is employed to give the desired tone with no distortion.

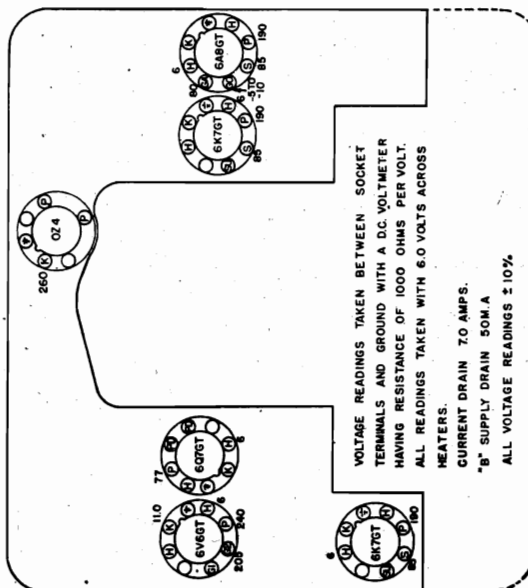
POWER SUPPLY: The power supply uses an OZ4 rectifier tube in conjunction with a full wave primary type vibrator.



PARTS LOCATING DIAGRAM

ANTENNA SYSTEM: There are three antenna systems available for use with this receiver: the under car, the turret top, or the telescopic cowl antenna. Any one of these antennas will operate very efficiently when used with this Chevrolet radio.

ANTENNA CIRCUIT: The antenna circuit is directly coupled to the antenna. Two plug-in terminals are provided on the antenna coil; one for use with the under car antenna, and the other for use with the turret top or the cowl antenna. The antenna coil is connected at the factory for cowl antenna operation and must be changed to the under car antenna connection if an under car antenna is used.



SOCKETS AND VOLTAGES

VOLTAGE READINGS TAKEN BETWEEN SOCKET TERMINALS AND GROUND WITH A D.C. VOLTMETER HAVING RESISTANCE OF 1000 OHMS PER VOLT. ALL READINGS TAKEN WITH 6.0 VOLTS ACROSS HEATERS.

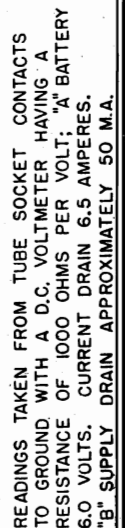
CURRENT DRAIN 7.0 AMPS.

"B" SUPPLY DRAIN 50M A.

ALL VOLTAGE READINGS $\pm 10\%$

| Production Part No. | Service Part No. | Part Name | Description—Function | Illustration No. |
|---------------------|------------------|----------------|---|------------------|
| 7239170 | | Coil | Antenna Coil Assembly | 1 |
| 7238665 | | Coil | R.F. Coil Assembly | 2 |
| 7238676 | | Coil | Oscillator Coil Assembly | 3 |
| 7239165 | | Coil | 1st I.F. Assembly | 4 |
| 7239164 | | Coil | 2nd I.F. Assembly | 5 |
| 7236560 | | Coil | Antenna Series Choke—Spark Noise Filter | 6 |
| 7238679 | | Coil | Flament Choke—Motor Noise Filter | 7 |
| 7239053 | | Condenser | Electrolytic | 8 |
| | | | Section A—10.0 mfd. 400V—"B" Input Filter | |
| | | | Section B—15.0 mfd. 400V—"B" Output Filter | |
| | | | Section C—20.0 mfd. 25V—Output Tube Cathode By-Pass | |
| 7238678 | | Condenser | Oscillator Trimmer—Oscillator Padding | 9 |
| 7238550 | | Condenser | Variable Gang Tuning Plus Plungers | 10 |
| 7239191 | | Condenser | Air Trimmer—Oscillator Shunt Trimmer | 11 |
| 7231178 | | Condenser | Molded Mica .0002 mfd.—Diode Load By-Pass | 12 |
| 7231178 | | Condenser | Molded Mica .0002 mfd.—Diode Load By-Pass | 13 |
| 7239184 | | Condenser | Molded Mica .0001 mfd.—Audio Plate By-Pass | 14 |
| 7239335 | 1210275 | Condenser | Ceramic .00010 mfd.—Temp. Compensating | 15 |
| 7238578 | | Condenser | Molded Mica .0007 mfd.—Tone Control (Music) | 16 |
| 7238580 | | Condenser | Molded Mica .00020 mfd.—R.F. Stage Padding | 17 |
| 7230842 | 7230592 | Condenser | Tubular .05 mfd. 200V—A.V.C. By-Pass | 18 |
| 7230842 | 7230592 | Condenser | Tubular .05 mfd. 200V—Screen By-Pass | 19 |
| 7230841 | 7230592 | Condenser | Tubular .05 mfd. 400V—A.V.C. By-Pass | 20 |
| 7239185 | 7230592 | Condenser | Tubular .06 mfd. 400V—Tone Control (Voice) | 21 |
| 7239186 | 7233243 | Condenser | Tubular .04 mfd. 200V—Audio Coupling | 22 |
| 7239243 | | Condenser | Tubular .04 mfd. 800V—Output Pad | 23 |
| 7239188 | 1212067 | Condenser | Tubular .001 mfd. 400 V—Audio Coupling | 24 |
| 7239256 | 7230012 | Condenser | Tubular .005 mfd. 200V—Tone Control (Bass) | 25 |
| 7238669 | | Condenser | Dual .01 x .01 1200 V—Buffer | 26 |
| 7238841 | 7238841 | Condenser | Spark Plate on Power Supply Shield—Motor Noise Filter | 27 |
| 7239020 | | Control | Spark Plate—Motor Noise Filter | 28 |
| | | | Tone Control Switch—3 Point Tone Control | 31 |
| 7239120 | | Control | Volume Control—With Switch | 32 |
| 1211118 | 1209883 | Resistor, Ins. | 100,000 ohms $\frac{1}{2}$ Watt—A.V.C. Isolator | 33 |
| 7233653 | | Resistor, Ins. | 15,000 ohm $\frac{1}{2}$ Watt—Screen Dropping | 34 |
| 1211110 | 1210116 | Resistor, Ins. | 50,000 ohm $\frac{1}{2}$ Watt—Oscillator Padder | 35 |
| 1211139 | 1209885 | Resistor, Ins. | 1 megohm $\frac{1}{2}$ Watt—A.V.C. Isolator | 36 |
| 1211120 | 1211163 | Resistor, Ins. | 150,000 ohm $\frac{1}{2}$ Watt—Diode Filter | 37 |
| 1213343 | 7235837 | Resistor, Ins. | 15 megohm $\frac{1}{2}$ Watt—607GT—Grid | 38 |
| 7234563 | | Resistor, Ins. | 350 ohm 1 Watt—Output Tube Bias | 39 |
| 1211124 | 1210117 | Resistor, Ins. | 250,000 ohm $\frac{1}{2}$ Watt—Plate Dropping | 40 |
| 1211124 | 1210117 | Resistor, Ins. | 250,000 ohm $\frac{1}{2}$ Watt—6V6CT—Grid | 41 |
| 1211122 | 1210119 | Resistor, Ins. | 200,000 ohm $\frac{1}{2}$ Watt—Audio Coupling | 42 |
| 1211000 | | Resistor, Ins. | 100 ohm $\frac{1}{2}$ Watt—Power Trans. Primary Load | 43 |
| 1211000 | | Resistor, Ins. | 100 ohm $\frac{1}{2}$ Watt—Power Trans. Primary Load | 44 |
| 7239306 | | Resistor, Ins. | 3000 ohm 2 Watt—"B" Filter | 45 |
| 1211071 | | Resistor, Ins. | 6000 ohm 1 Watt—"B" Filter | 46 |
| 1211000 | | Resistor, Ins. | 100 ohm $\frac{1}{2}$ Watt—6K7GT—Bias | 47 |
| 7239162 | | Speaker | Audio Output | 51 |
| 7239160 | | Transformer | Vibrator Power | 52 |
| 7238894 | | Vibrator | Bulb | 53 |
| 1213881 | 1212966 | | Dial Light | |
| 125588 | | | | |

TUNER PARTS LAYOUT



MODEL 985538
Chassis, Trimmers,
Dial Data, Parts

CHEVROLET DIV.—GEN. MOTORS

| | | | |
|---------|---------|-----------|----|
| 1213851 | 1212966 | Vibrator | 37 |
| 1207799 | | Condenser | 38 |
| 1211012 | | Resistor | 39 |

GENERAL: This auto radio is a five tube single unit universal receiver with automatic push button tuning. Tuning is accomplished by a mechanical unit of rugged construction assuring accuracy. A special compensating condenser is employed in the oscillator circuit to minimize all receiver drift due to normal variation in car voltages and temperature ranges. The power supply consists of a 6X5GT power rectifier tube used in conjunction with a full wave plug in vibrator. The receiver is designed to mount in 1940 Chevrolet cars, and also in all other cars and trucks.

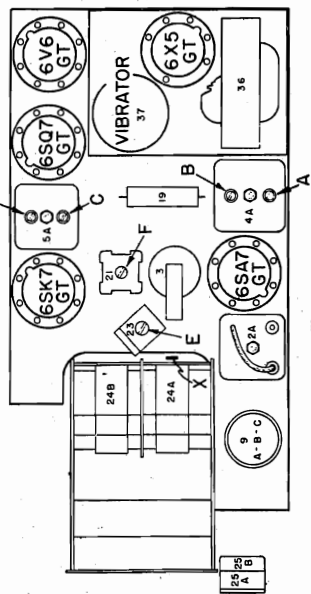


Fig. 1

| ALIGNMENT FREQUENCIES | FREQUENCY |
|-----------------------|----------------|
| TRIMMER | 455 KC |
| A, B, C, D | 1520 KC |
| E | 540 KC |
| F | 540 and 600 KC |
| G | 1400 KC |

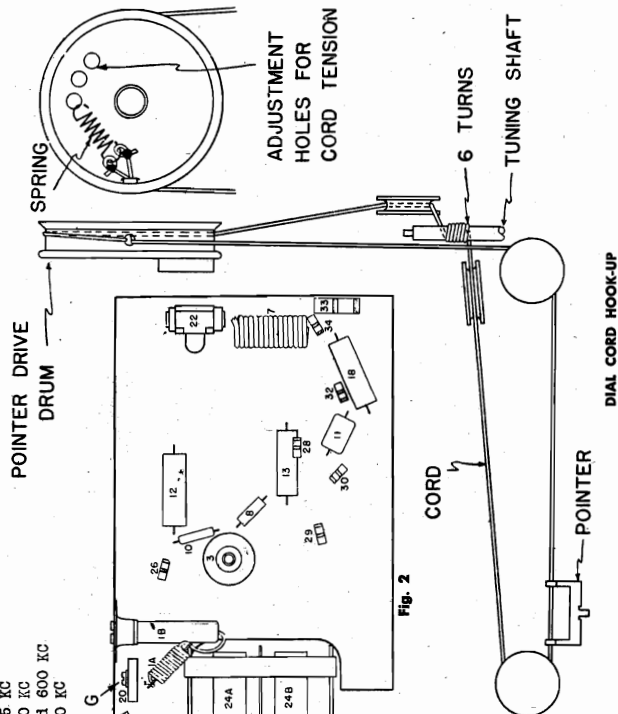


Fig. 2

| Production Part No. | Service Part No. | Part Name | Description—Function | Illus. No. |
|---------------------|------------------|-------------------------|---|------------|
| 1213855 | | Coil | Antenna Filter Assy. | 1 |
| | | Sec. A | Choke | |
| | | Sec. B | Spark Noise By-Pass | |
| 1213859 | | Coil | Antenna Coil Assy. | 2 |
| | | Sec. A | Antenna Coil | |
| | | Sec. B | Cond. .05 mfd. 100V A.V.C. Blocking | |
| | | Sec. C | Resistor 1 megohm—Grid Filter | |
| 1213860 | | Coil | Oscillator | 3 |
| 1213861 | | Coil | 1st I.F. Assembly | 4 |
| | | Sec. A | I.F. Transformer | |
| | | Sec. B | Primary Trimmer | |
| | | Sec. C | Secondary Trimmer | |
| 1213862 | | Coil | 2nd I.F. Assembly | 5 |
| | | Sec. A | I.F. Transformer | |
| | | Sec. B | Primary Trimmer | |
| | | Sec. C | Secondary Trimmer and Filter | |
| | | Sec. D | Resistor 56,000 ohm Diode Filter | |
| 1213863 | | Choke | Vibrator Hash | 6 |
| 1212452 | | Choke | "A" Lead Spark Filter | 7 |
| 7238087 | | Condenser | Compensating .000015 mfd. | 8 |
| 1213868 | | Condenser | Electrolytic Filter | 9 |
| | | Sec. A | 10 mfd. 350 Volt—"B" Filter | |
| | | Sec. B | 15 mfd. 300 Volt—"B" Filter | |
| | | Sec. C | 20 mfd. 25 Volt—6V6GT Cathode By-Pass | |
| 1207025 | | Condenser | Molded .00005 mfd.—Osc. Coupling | 10 |
| 1209055 | | Condenser | Molded .00025 mfd.—Filter | 11 |
| 7230592 | | Condenser | .05 mfd. 200 Volt—Screen By-Pass | 12 |
| 1210295 | | Condenser | .05 mfd. 200 Volt—A.V.C. Filter | 13 |
| 1213854 | | Condenser | .004 mfd. 1500 Volt—Buffer | 14 |
| 7237076 | | Condenser | .5 mfd. 100 Volt—Hash Filter | 15 |
| 7237076 | | Condenser | .5 mfd. 100 Volt—Hash Filter | 16 |
| 7230912 | | Condenser | .005 mfd. 200 Volt—Audio Coupling | 17 |
| 1209308 | | Condenser | .05 mfd. 400 Volt—Audio Coupling | 18 |
| 7230592 | | Condenser | .01 mfd. 600 Volt—Plate By-Pass | 19 |
| 1213865 | | Condenser | Antenna Compensating | 20 |
| 1213866 | | Condenser | Oscillator Padder | 21 |
| 1212278 | | Condenser | Spark Plate—175-275 mmfd. Filter | 22 |
| 1213580 | | Condenser | Oscillator Trimmer | 23 |
| 1213867 | | Condenser | Variable and Tuner Unit | 24 |
| | | Sec. A | Antenna Coil Tuning | |
| | | Sec. B | Oscillator Tuning | |
| | | Control | Volume—On-Off Switch | 25 |
| 1213863 | | Sec. A | Vol. Control 500,000 ohms | |
| | | Sec. B | On-Off Switch | |
| 1211095 | 1210882 | Resistor | 22,000 ohm, 1/2 watt Osc. Grid Lead | 26 |
| 1211005 | | Resistor | 150 ohm 1 watt Vib. Filter | 27 |
| 1209885 | | Resistor | 1 megohm 1/2 watt A.V.C. Filter | 28 |
| 1213342 | | Resistor | 27,000 ohm 1 watt Screen Voltage | 29 |
| 1213343 | 7235837 | Resistor | 15 megohm 1/2 watt—Grid Leak | 30 |
| 1211051 | | Resistor | 2700 ohm 1 watt, "B" Voltage Filter | 31 |
| 1209885 | | Resistor | 1 megohm 1/2 watt, Plate Load | 32 |
| 1213846 | | Resistor | 270 ohm 1 watt, Grid Bias | 33 |
| 1211163 | | Resistor | 150,000 ohm 1/2 watt, Grid Leak | 34 |
| 1213864 | | Speaker and Transformer | Electro Dynamic with Output Transformer | 35 |
| 1213670 | | Transformer | Power | 36 |
| 1213655 | 1212966 | Vibrator | | 37 |

Part No. 985538
Date 11-1-39



NOTE: Voltages as indicated are measured with power switch in AC-DC position and radio connected to 115 volt 60 cycle AC line.

MODEL 985651
Alignment, Chassis
Trimmers, Socket

CHEVROLET DIV.—GEN. MOTORS

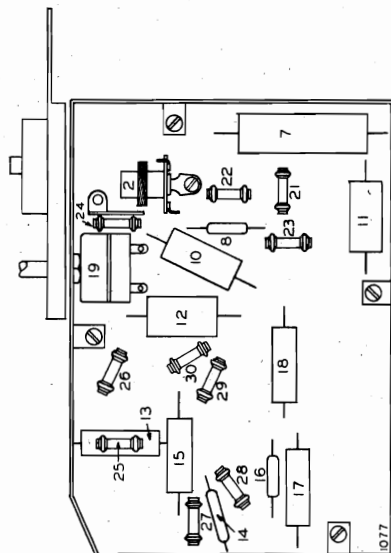


FIG. 3 PARTS LOCATING DIAGRAM PORTABLE RADIO #985651

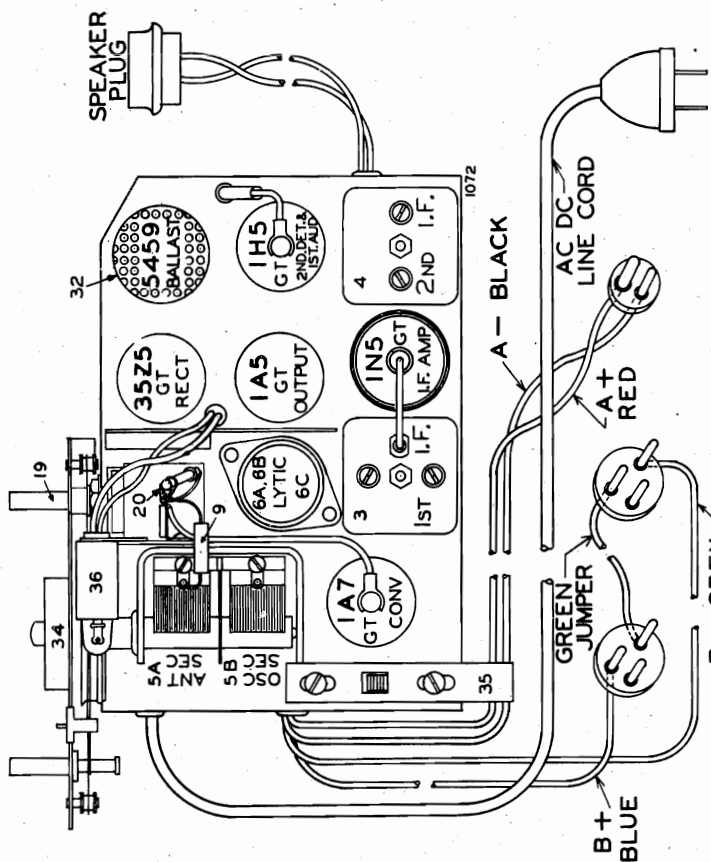


FIG. 1 TUBE LAYOUT PORTABLE RADIO #985651

CIRCUIT ALIGNMENT

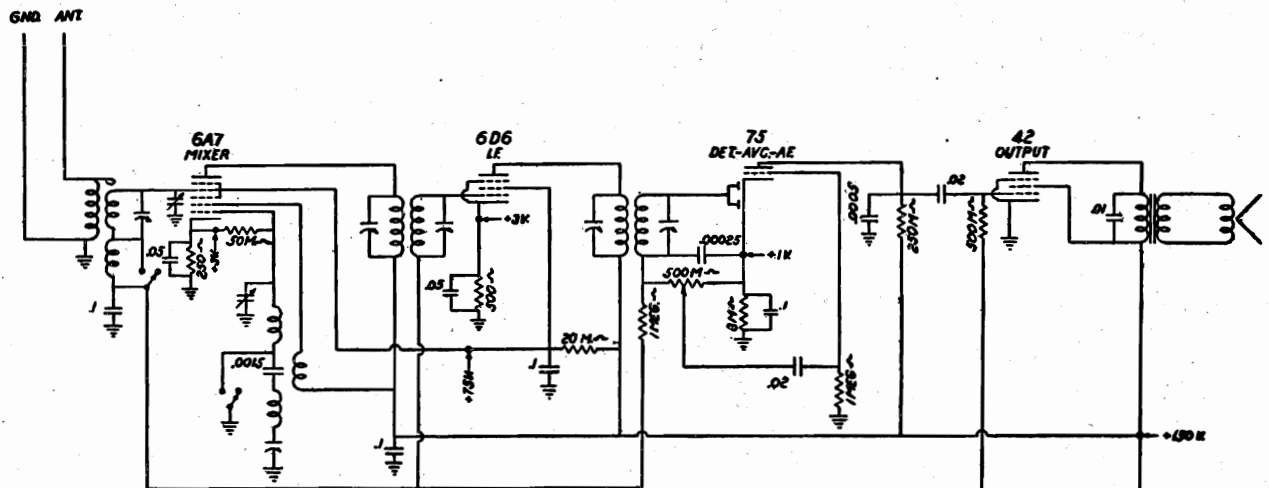
IMPORTANT: If maximum sensitivity is to be obtained from this receiver, after re-alignment, it is very important that the following procedure be closely observed:

1. Aligning I.F. stages at 465 kilocycles.
 - a. Connect the signal lead of the test oscillator to the grid of the 1A7GT tube, through a .1 mfd. condenser.
 - b. Connect the ground lead of the test oscillator to the negative "B" lead of the radio (grey wire of the "B" battery lead assembly).
 - c. Connect the output meter across primary winding of the output transformer.
 - d. Set the test oscillator to exactly 465 kilocycles.
 - e. Adjust the trimmers on the 1st and 2nd I.F. transformers (illus. No. 3 and No. 4, Fig. 1) carefully for maximum output.

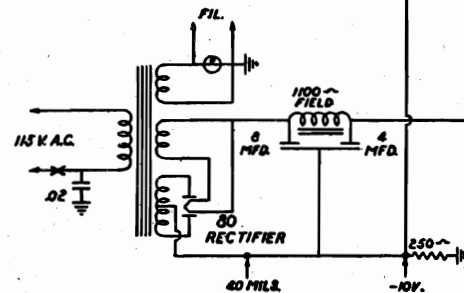
These adjustments should be repeated several times and during the alignment the test oscillator output should be kept to as low a value as is consistent with obtaining readable indication on the output meter.

2. Aligning at 1550 kilocycles.
 - a. Leave the test oscillator leads connected the same as for aligning the I.F. circuits.
 - b. Turn the rotor plates of the gang condenser all the way out and against the high frequency stop.
 - c. Set the test oscillator to 1550 kilocycles.
 - d. Adjust the trimmer for the oscillator section of the condenser gang (illus. No. 5B, Fig. 1) for maximum output. It is very important that this frequency be set accurately as a slight mis-setting will cause the receiver to be out of track over the entire high frequency end of the dial.
3. Aligning at 1400 kilocycles.
 - a. This adjustment should be made with the loop antenna placed alongside the chassis. It is important that the same distance between the loop antenna and the chassis be maintained as when the chassis and loop are installed in the cabinet.
 - b. Connect the signal lead of the test oscillator to the external antenna terminal on the loop antenna through a 200 mmfd. dummy.
 - c. Connect the ground lead of the test oscillator to the external ground terminal on the loop antenna.
 - d. Set the test oscillator to exactly 1400 K.C.
 - e. Turn the condenser rotor plates until this frequency is tuned in with maximum output.
 - f. Adjust the trimmer on the condenser gang (illus. No. 5A, Fig. 1) for maximum output.

MODEL B1 CONTINENTAL RADIO & TELEVISION CORP. Schematic, Socket Alignment, Trimmers



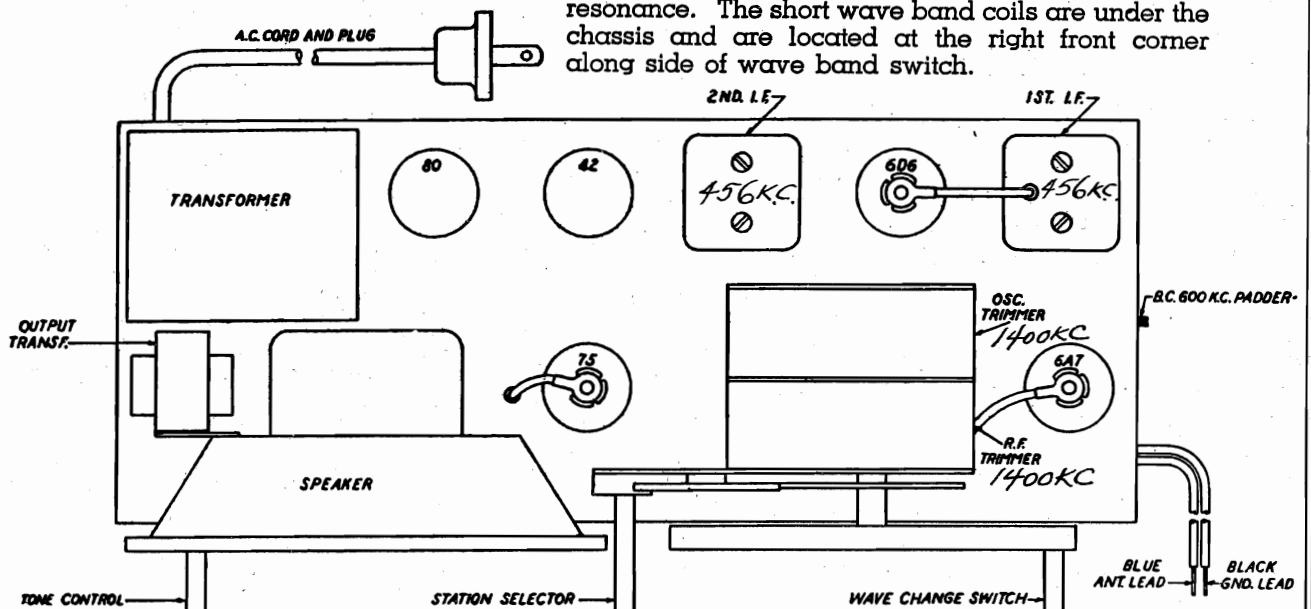
SCHEMATIC DIAGRAM
B1 CHASSIS
S TUBE A.C. 2 BAND
BC-540 TO 1720 K.C.
S.W.-2000 TO 7000 K.C.
I.F. = 456 K.C.
SWITCH SHOWN IN B.C. POSITION
ALL VOLTAGES SHOWN TO GROUND



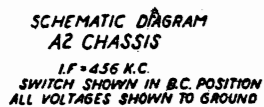
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

S.W. ALIGNMENT:

Set the dial pointer to 6000KC (also the test oscillator) and adjust the antenna and antenna trimmer to resonance. The short wave band coils are under the chassis and are located at the right front corner along side of wave band switch.

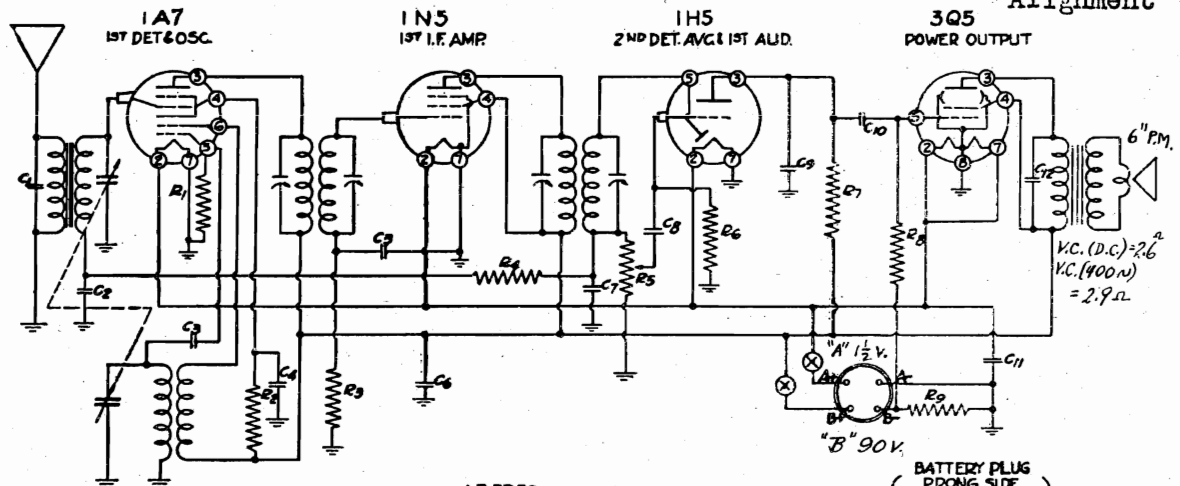


Alignment, Trimmers

[illegible]

CONTINENTAL RADIO & TELEV. CORP.

MODELS A4,B4
MODELS C5,XC5
Schematics,
Alignment



RESISTORS

| No. | Ohms | Watts |
|-----|---------|-------|
| R1 | 200,000 | 1/2 |
| R2 | 70,000 | 1/2 |
| R3 | 5 Meg. | 1/4 |
| R4 | 1 Meg. | 1/4 |
| R5 | 500,000 | V.C. |

I.F. FREQ. -
455 KC.

| No. | Ohms | Watts |
|-----|---------|---------|
| R6 | 5 Meg. | 1/4 |
| R7 | 250,000 | 1/4 |
| R8 | 500,000 | 1/4 |
| R9 | 440 | 10% 1/4 |

CONDENSERS

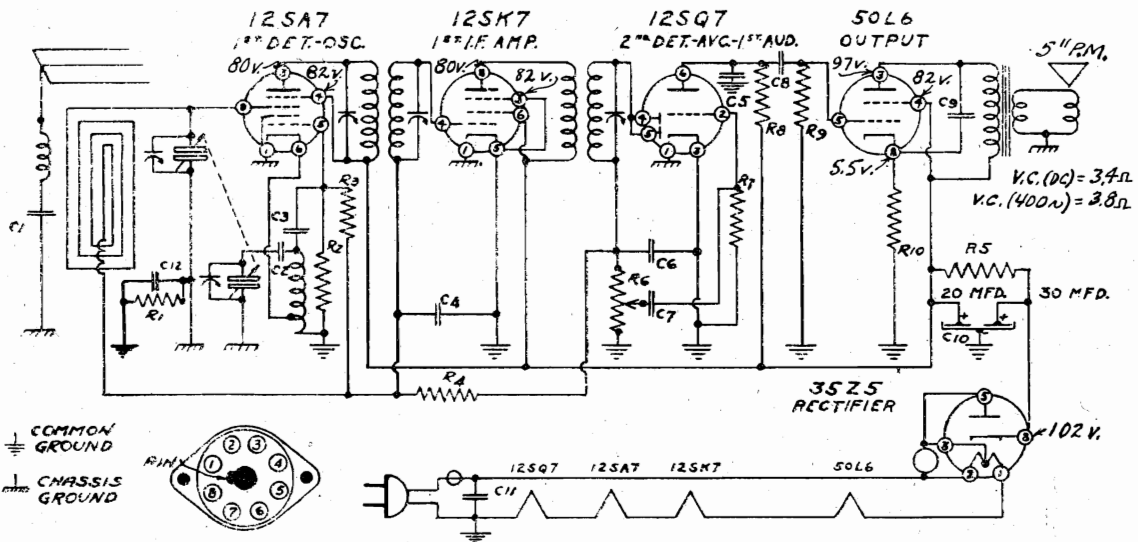
| No. | Capacity (Mfd.) | Volts |
|-----|-----------------|-------|
| C1 | .00005 | Mica |
| C2 | .05 | 200 |
| C3 | .00005 | Mica |
| C4 | .1 | 200 |
| C5 | .002 | 400 |
| C6 | .001 | 200 |
| C7 | .00025 | Mica |
| C8 | .01 | 400 |
| C9 | .00025 | Mica |
| C10 | .01 | 400 |
| C11 | 20 (Elect.) | 25 |
| C12 | .005 | 400 |

I.F. PEAK - 455 KC
TRIM OSC. - 1730 KC
TRIM ANT. - 1400 KC

ISSUE A
MARCH 1940

A4, B4

For SOCKET LAYOUT
See INDEX



COMMON
GROUND
CHASSIS
GROUND



| CONDENSERS | | | RESISTORS | | |
|------------|----------|-------|-----------|------------|--------------|
| No. | Capacity | Volts | No. | Ohms | Watts |
| C1 | .001 | 600 | R2 | 20,000 | 1/2 Watt |
| C2 | .02 | 400 | R3 | 15,000,000 | 1/2 Watt |
| C3 | .00005 | Mica | R4 | 2,000,000 | 1/2 Watt |
| C4 | .05 | 200 | R5 | 1,000 | 1 Watt |
| C5 | .0005 | Mica | R6 | 500,000 | Vol. Cont. |
| C6 | .00025 | Mica | R7 | 5,000,000 | 1/2 Watt |
| C7 | .01 | 400 | R8 | 250,000 | 1/2 Watt |
| C8 | .002 | 600 | R9 | 500,000 | 1/2 Watt |
| C9 | .01 | 400 | R10 | 150 | 10% 1/2 Watt |
| C10 | 20.0 | 150 | | | |
| C11 | 30.0 | 150 | | | |
| C12 | .05 | 400 | | | |
| | .25 | 400 | | | |

C5 & XC5

ISSUE A
MARCH 1940

C2, C12 and R1 are used in Model XC5 only. In C5 Model only, all common grounds are connected to chassis ground.

I.F. PEAK - 455 KC
TRIM OSC. - 1730 KC
TRIM ANT. - 1400 KC

VOLTAGES: Line 115 v. AC. Power consumption, 30 watts.
Volume control maximum. Meter 1000 ohms per
volt. Read from point indicated to common
ground.

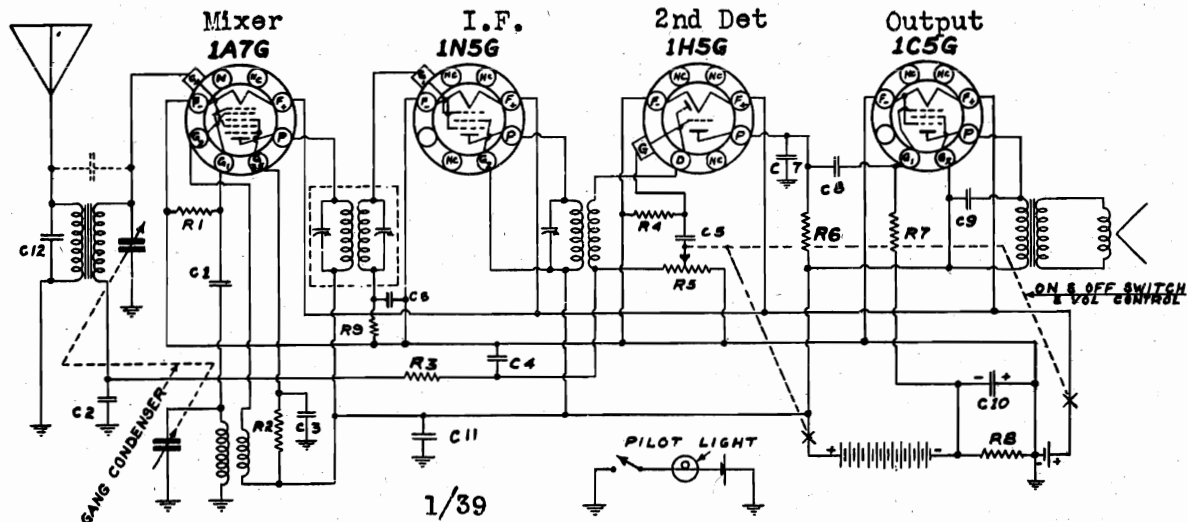
For SOCKET LAYOUT
See INDEX

MODEL 4C

MODEL 4J

Schematics, Alignment

CONTINENTAL RADIO & TELEV. CORP.



| CAPACITORS | | | |
|------------|-----------|-------|-------|
| NO. | CAP.-MFD. | TYPE | VOLTS |
| C1 | .00025 | MICA | 400V. |
| C2 | .05 | 200V. | |
| C3 | .1 | 200V. | |
| C4 | .00025 | MICA | 25V. |
| C5 | .01 | 400V. | |
| C6 | .002 | 400V. | |

| RESISTORS | | | |
|-----------|---------|-------|--------------|
| NO. | OHMS | WATTS | TYPE |
| R1 | 200,000 | 1/4 | |
| R2 | 70,000 | 1/4 | |
| R3 | 1 MEG. | 1/4 | |
| R4 | 2 MEG. | 1/4 | |
| R5 | 500,000 | | VOL. CONTROL |

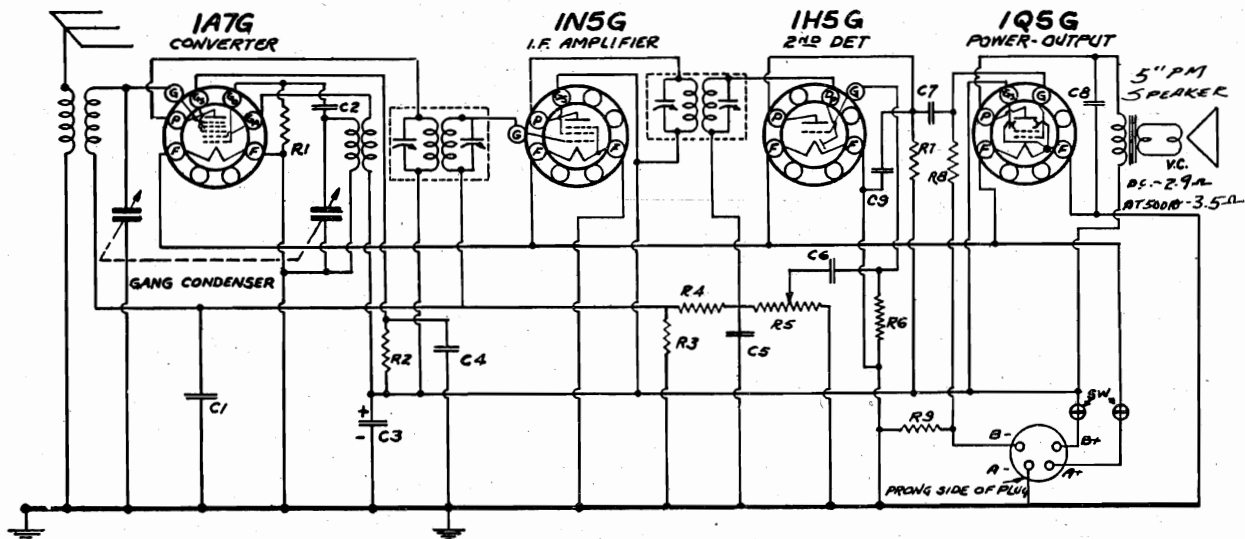
I.F. 456 KC

TRIM OSC- 1730 KC

TRIM ANT- 1400 KC

FOR SOCKET LAYOUT SEE INDEX

MODEL 4C



| CAPACITORS | | | |
|------------|--------------|-------|------|
| NO. | MFD. | VOLTS | TYPE |
| C1 | .05 | 200 | |
| C2 | .00005 | MICA | 400 |
| C3 | 4.0 (ELECT.) | 150 | |
| C4 | .05 | 200 | |
| C5 | .00025 | MICA | |

| RESISTORS | | | |
|-----------|-----------|-------|------|
| NO. | OHMS | WATTS | TYPE |
| R1 | 200,000 | 1/2 | |
| R2 | 70,000 | 1/2 | |
| R3 | 2,000,000 | 1/2 | |
| R4 | 2,000,000 | 1/2 | |
| R5 | 300,000 | | V.C. |

I.F. 455 KC

TRIM OSC-1730 KC

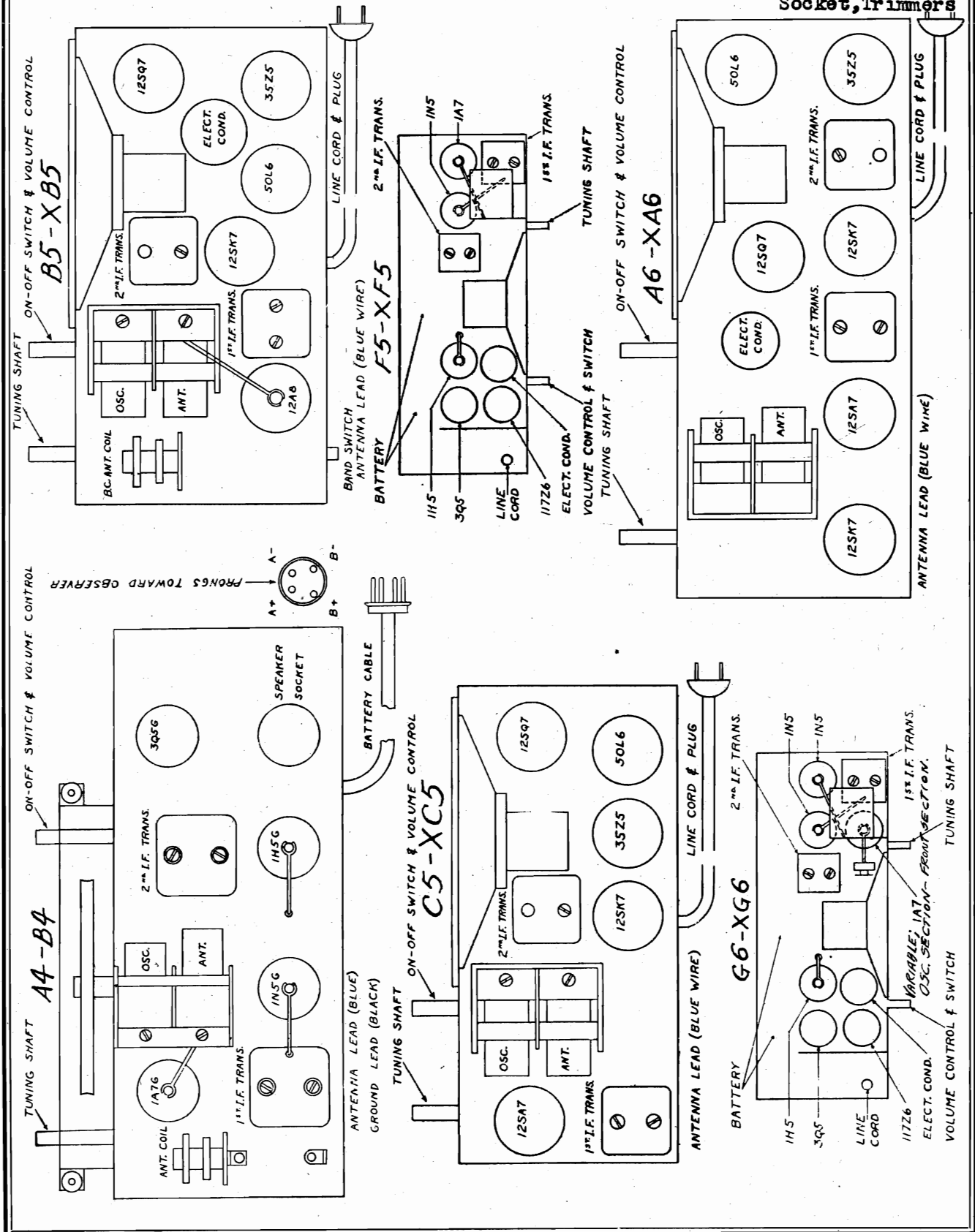
TRIM ANT-1400 KC

FOR SOCKET LAYOUT SEE INDEX

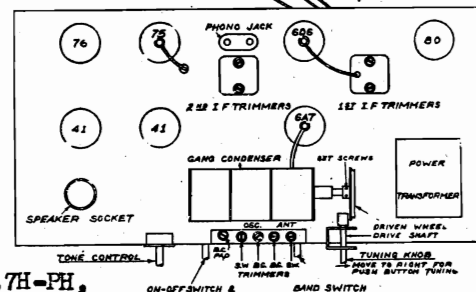
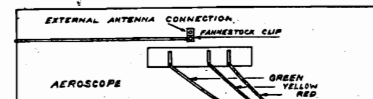
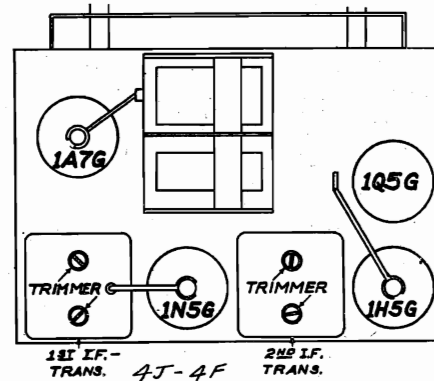
MODEL 4J

CONTINENTAL RADIO & TELEV. CORP.

MODELS A4,B4
 MODELS B5,XB5
 MODELS C5,XC5
 MODELS F5,XF5
 MODELS G6,XG6
 MODELS A6,XA6
 Socket, Trimmers

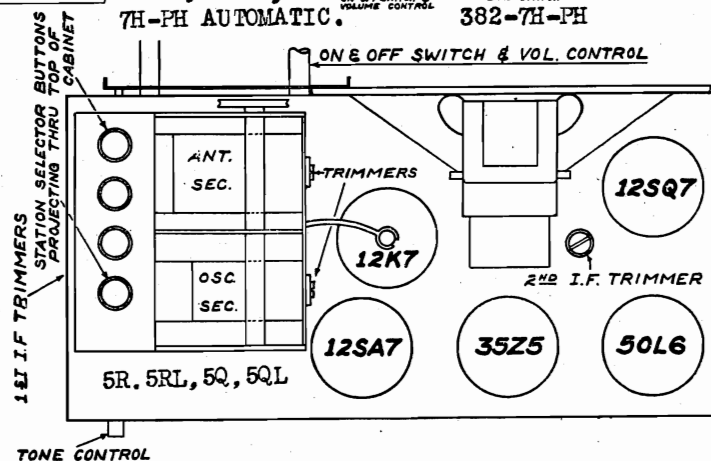


MODEL 382-7H-PH
MODELS 7C, 7C-PH
MODELS 7H, 7H-PH
Socket, Trimmers



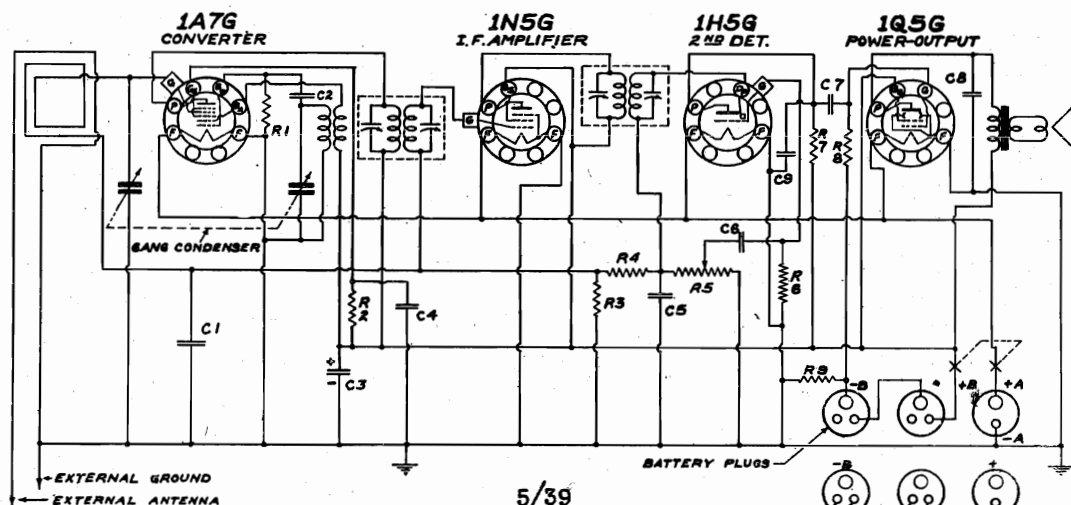
7H, 7H-PH,
7H-PH AUTOMATIC.

382-7H-PH



CONTINENTAL RADIO & TELEV. CORP.

MODEL 4F
MODELS 5Q, 5QL
Schematics, Alignment



| CAPACITORS | | | |
|------------|-------------|-------|--|
| NO. | MFDS. | VOLTS | |
| C1 | .05 | 200 | |
| C2 | .00008 | MICA | |
| C3 | 4.0 (ELECT) | 150 | |
| C4 | .05 | 200 | |
| C5 | .00025 | MICA | |
| C6 | .01 | 400 | |
| C7 | .01 | 400 | |
| C8 | .002 | 400 | |
| C9 | .00025 | MICA | |

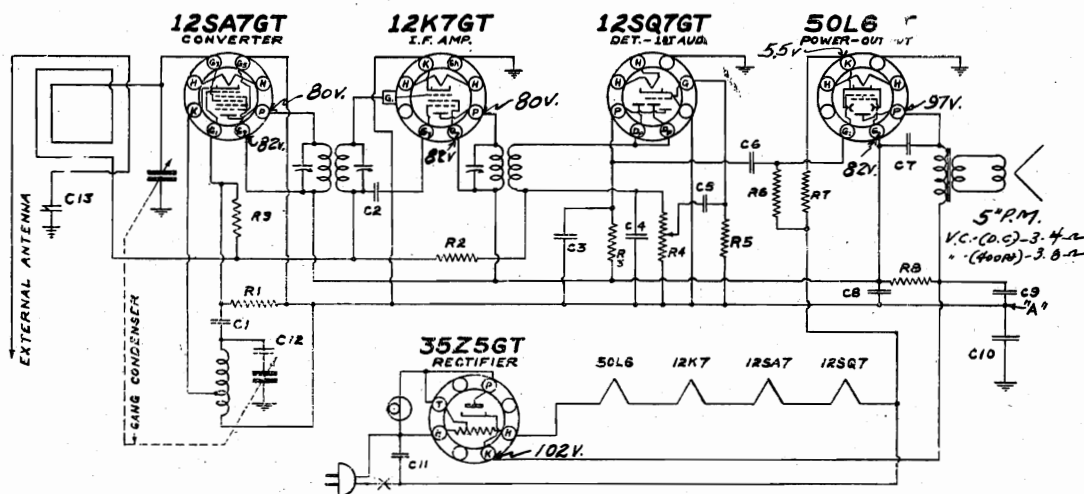
| RESISTORS | | | |
|-----------|-----------|-------|--|
| NO. | OHMS | WATTS | |
| R1 | 200,000 | 1/2 | |
| R2 | 70,000 | 1/2 | |
| R3 | 2,000,000 | 1/2 | |
| R4 | 2,000,000 | 1/2 | |
| R5 | 500,000 | 1/2 | |
| R6 | 2,000,000 | 1/2 | |
| R7 | 500,000 | 1/2 | |
| R8 | 1,000,000 | 1/2 | |
| R9 | 440 | 1/2 | |

BATTERY JACKS OR SOCKETS
BATTERY PLUGS SHOWN WITH PRONGS AWAY FROM OBSERVER
I.F. - 455 K.C.

TRIM OSC- 1610 KC
TRIM ANT- 1400 KC

MODEL 4F

I.F. ALIGNMENT CONVENTIONAL
FOR SOCKET LAYOUT SEE INDEX



| RESISTORS | | | |
|-----------|-----------|-------|--|
| NO. | OHMS | WATTS | |
| R1 | 20,000 | 1/2 | |
| R2 | 2 MEG. | 1/2 | |
| R3 | 250,000 | 1/2 | |
| R4 | 500,000 | 1/2 | |
| R5 | 5 MEG. | 1/2 | |
| R6 | 500,000 | 1/2 | |
| R7 | 150 ± 10% | 1/2 | |
| R8 | 1,000 | 1 | |
| R9 | 15 MEG. | 1/2 | |

| CAPACITORS | | | |
|------------|--------|-------|--|
| NO. | MFDS. | VOLTS | |
| C1 | .0001 | MICA | |
| C2 | .02 | 400 | |
| C3 | .0005 | MICA | |
| C4 | .00025 | MICA | |
| C5 | .01 | 400 | |
| C6 | .002 | 400 | |
| C7 | .01 | 400 | |
| C8 | 20.0 | 150 | |
| C9 | 30.0 | 150 | |
| C10 | .25 | 200 | |
| C11 | .05 | 400 | |
| C12 | .02 | 400 | |
| C13 | .001 | 600 | |

10/39

I.F. 455 K.C.
TUBES SHOW BOTTOM VIEW

C10 and C12 used in model 5QL only. On model 5Q point "A" is connected to chassis.
VOLTAGES:- LINE 115V. A.C. - POWER CONSUMPTION 30 WATTS;- VOL. CONTR-MAX;-
ANTENNA SHORTED TO GROUND;- METER 1000-Ω PER VOLT, 150 VOLT SCALE;-
TAKEN FROM POINT INDICATED TO POINT "A".

TRIM OSC-1730 KC
TRIM ANT-1400 KC

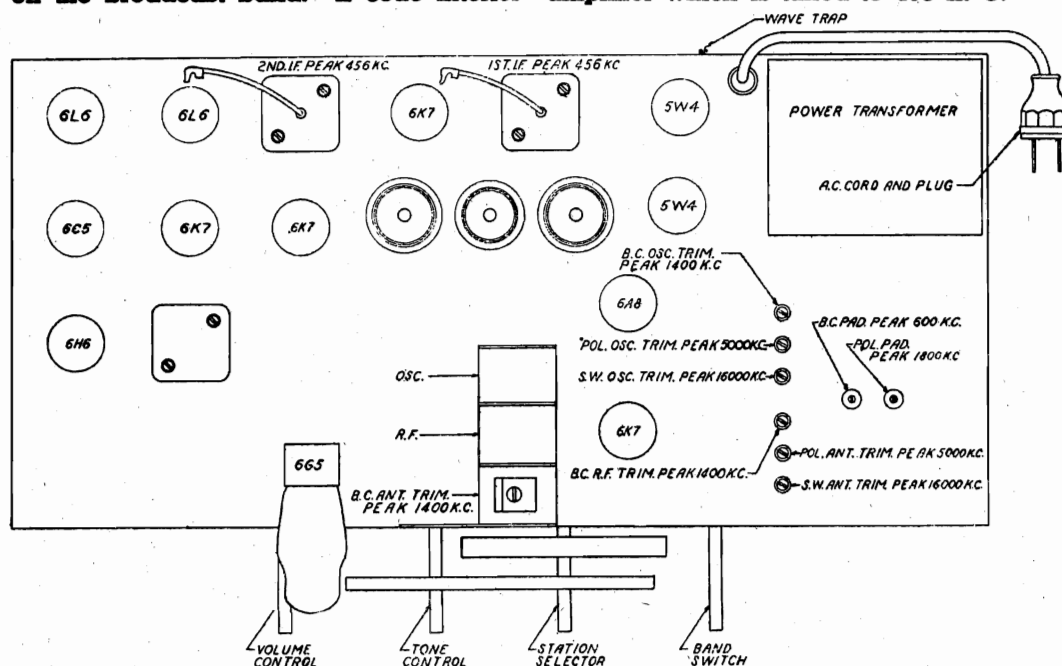
MODELS 5Q, 5QL

I.F. 455 KC
I.F. ALIGNMENT CONVENTIONAL
FOR SOCKET LAYOUT SEE INDEX

WAVE TRAP ADJUSTMENT

WAVE TRAP ADJUSTMENT

At the rear of the chassis near the Antenna and Ground posts is an adjustment screw connected to a trap circuit for elimination of code interference when operating on the broadcast band. If code interference is encountered adjustment of this screw will filter it out. It is to be used only if such interference is experienced in broadcast reception. It's use prevents code transmitters operating on a frequency around 456 K. C. from being received by the I. F. amplifier which is tuned to 456 K. C.

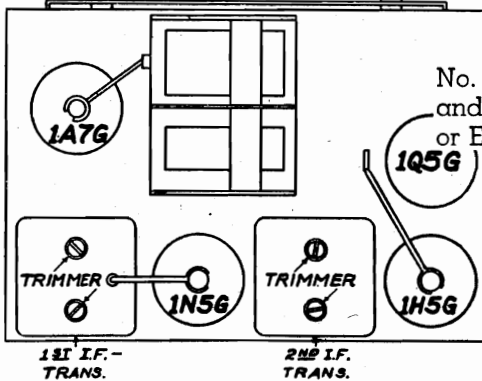
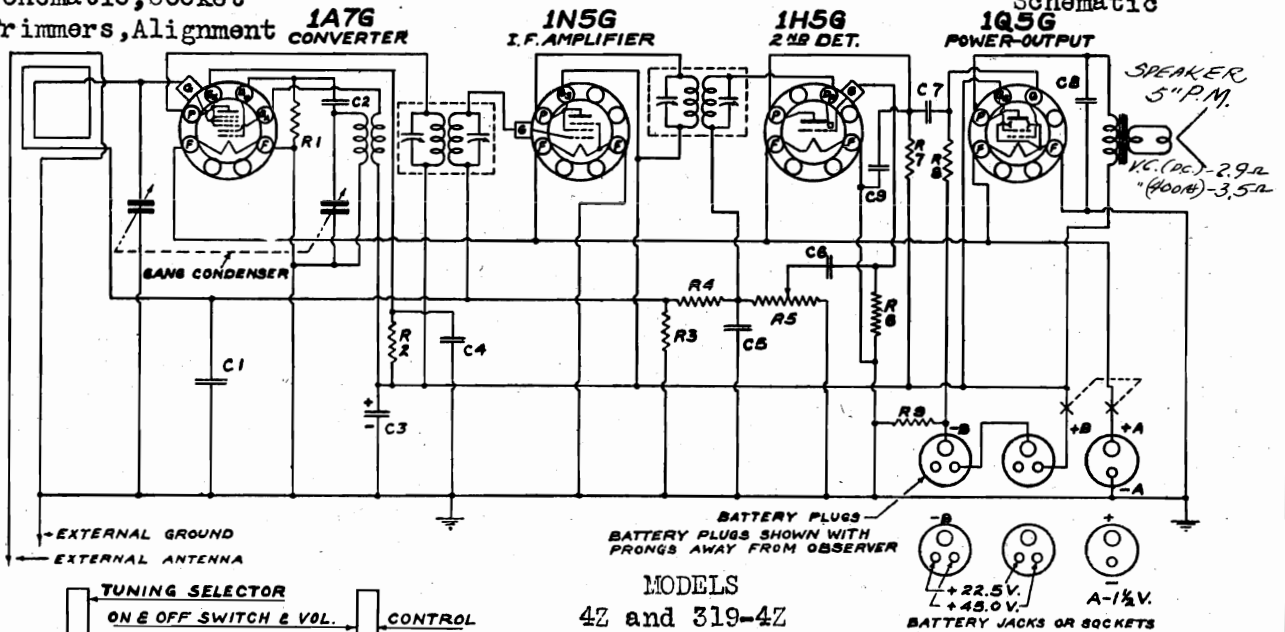


If it is suspected that the oscillator has stopped but components should be accomplished by grounding is doubtful due to the presence of the usual amount the stator mounting nut to the frame of the condenser with a screw-driver or any metallic conductor. voltage be checked. To ascertain whether the tube

(short stator and rotor plates of oscillator section on gang condenser). If oscillating properly, grounding this is liable to permanently warp the plates and the grid will cause an appreciable drop in oscillator voltage. Grounding or shorting the stator and grid thus prevent the oscillator section of the gang condenser from tracking probably.

MODELS 4Z, 319-4Z
Schematic, Socket
Trimmers, Alignment

CONTINENTAL RADIO & TELEV. CORP. MODEL CW13 Phono. Schematic



POWER SUPPLY

The power supply of this portable radio uses one Ray-O-Vac No. P96A, General No. 6-F-1, Burgess No. 6FP1 or Eveready No. 743. Portable "A" battery and two Ray-O-Vac No. 5303, General No. V-30-B, Burgess No. B30P1 or Eveready No. 762 Portable "B" batteries.

ALIGNMENT BROADCAST BAND

Trim Ant.- 1400 kc
" Osc.- 1610 kc

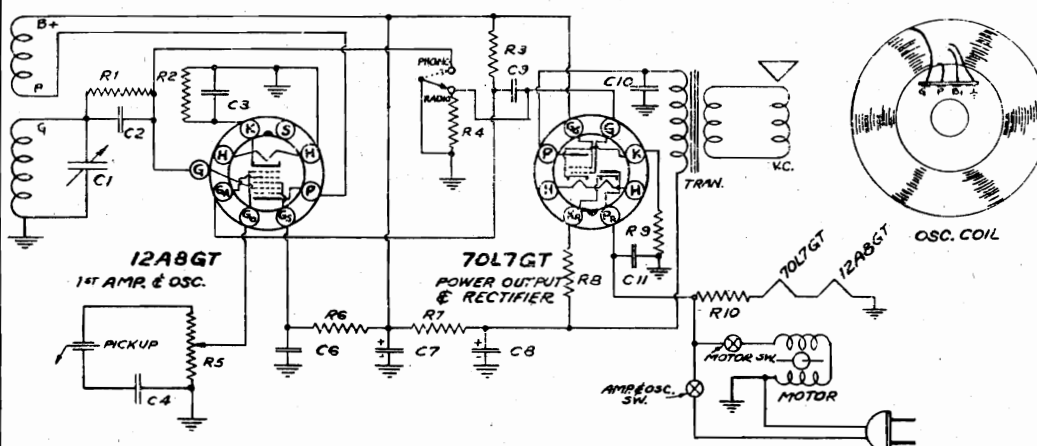
I.F.- 455 kc

I.F. ALIGNMENT

Remove the chassis from the cabinet and connect one end of a 100,000 ohm resistor to the grid of the 1A7 tube and the other end to the A.V.C. fahnestock clip (See "antenna and ground" for location of this clip). Adjust the signal generator to 455 KC and connect the output to the grid of the first detector tube (1A7) thru a .05 or .1 mfd. condenser. The ground of the signal generator should be connected to the chassis ground. Align all I.F. trimmers to peak or maximum reading on the output meter.

| CAPACITORS | | | | | |
|------------|------------|-------|-----|--------|-------|
| NO. | MFDs. | VOLTS | NO. | MFDs. | VOLTS |
| C1 | .05 | 200 | C6 | .01 | 400 |
| C2 | .00005 | MICA | C7 | .01 | 400 |
| C3 | 40 (ELECT) | 150 | C8 | .002 | 400 |
| C4 | .05 | 200 | C9 | .00025 | MICA |
| C5 | .00025 | MICA | | | |

| RESISTORS | | | | | |
|-----------|-----------|-------|-----|-----------|-------|
| NO. | OHMS | WATTS | NO. | OHMS | WATTS |
| R1 | 200,000 | 1/2 | R6 | 2,000,000 | 1/2 |
| R2 | 70,000 | 1/2 | R7 | 500,000 | 1/2 |
| R3 | 2,000,000 | 1/2 | R8 | 1,000,000 | 1/2 |
| R4 | 2,000,000 | 1/2 | R9 | 440 | 1/2 |
| R5 | 500,000 | V.C. | | | |



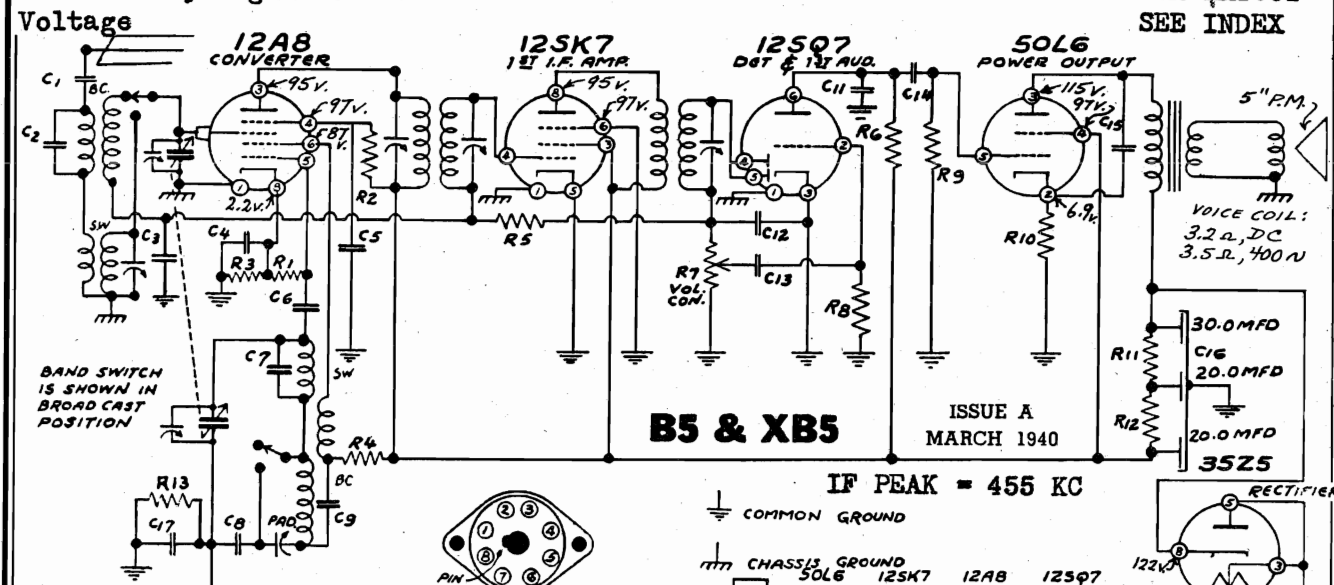
| RESISTORS | | |
|-----------|-------------|------|
| R1 | 50,000.0 | 1/2w |
| R2 | 1,000.0 | 1/2w |
| R3 | 50,000.0 | 1/2w |
| R4 | 500,000.0 | 1/2w |
| R5 | 1,000,000.0 | 1/2w |
| R6 | 10,000.0 | 1/2w |
| R7 | 3,000.0 | 1/2w |
| R8 | 30.0 | 1/2w |
| R9 | 250.0 ± 10% | 1/2w |
| R10 | 232.0 | 5w |

| CONDENSERS | | |
|------------|-----------|-------|
| C1 | 400-600µf | PAD |
| C2 | 100µf | MICA |
| C3 | 20µf | 25V. |
| C4 | .05µf | 200V. |
| C6 | .05µf | 200V. |
| C7 | 20µf | 150V. |
| C8 | 40µf | 150V. |
| C9 | .01µf | 400V. |
| C10 | .02µf | 400V. |
| C11 | .05µf | 400V. |

PHONO AMPLIFIER & OSCILLATOR
SCHEMATIC DIAGRAM MODEL CW-13

SET AT 1575 KC
8/39

FOR LAYOUT
SEE INDEX



NOTE:-
C17 & R13 USED ON XB5 MODEL ONLY.
ON B5 MODEL ONLY ALL COMMON GROUNDS
ARE CONNECTED TO CHASSIS GROUND

| No. | Ohms | | No. | Ohms | | C8 | .003-5% Mica | VOLTAGES: Line=117v.AC; Power=30W. Volume |
|-----|-----------|------------|--------------|---------|----------|-----|--------------|---|
| R1 | 50,000 | 1/2 Watt | R12 | 500 | 1/2 Watt | C9 | .005 | 600 |
| R2 | 20,000 | 1/2 Watt | R13 | 150,000 | 1/2 Watt | C10 | .05 | 400 |
| R3 | 440 | 1/2 Watt | | | | C11 | .0005 | Mica |
| R4 | 3,000 | 1/2 Watt | No. Capacity | Volts | | C12 | .00025 | Mica |
| R5 | 2,000,000 | 1/2 Watt | C1 | .001 | 600 | C13 | .01 | 400 |
| R6 | 250,000 | 1/2 Watt | C2 | .00005 | Mica | C14 | .002 | 400 |
| R7 | 500,000 | Vol. Cont. | C3 | .05 | 200 | C15 | .01 | 400 |
| R8 | 5,000,000 | 1/2 Watt | C4 | .05 | 200 | | 30.0 | 150 |
| R9 | 500,000 | 1/2 Watt | C5 | .05 | 200 | C16 | 20.0 | 150 |
| R10 | 200 | 1/2 Watt | C6 | .0001 | Mica | | 20.0 | 150 |
| R11 | 500 | 1/2 Watt | C7 | .00001 | Mica | C17 | .25 | 200 |

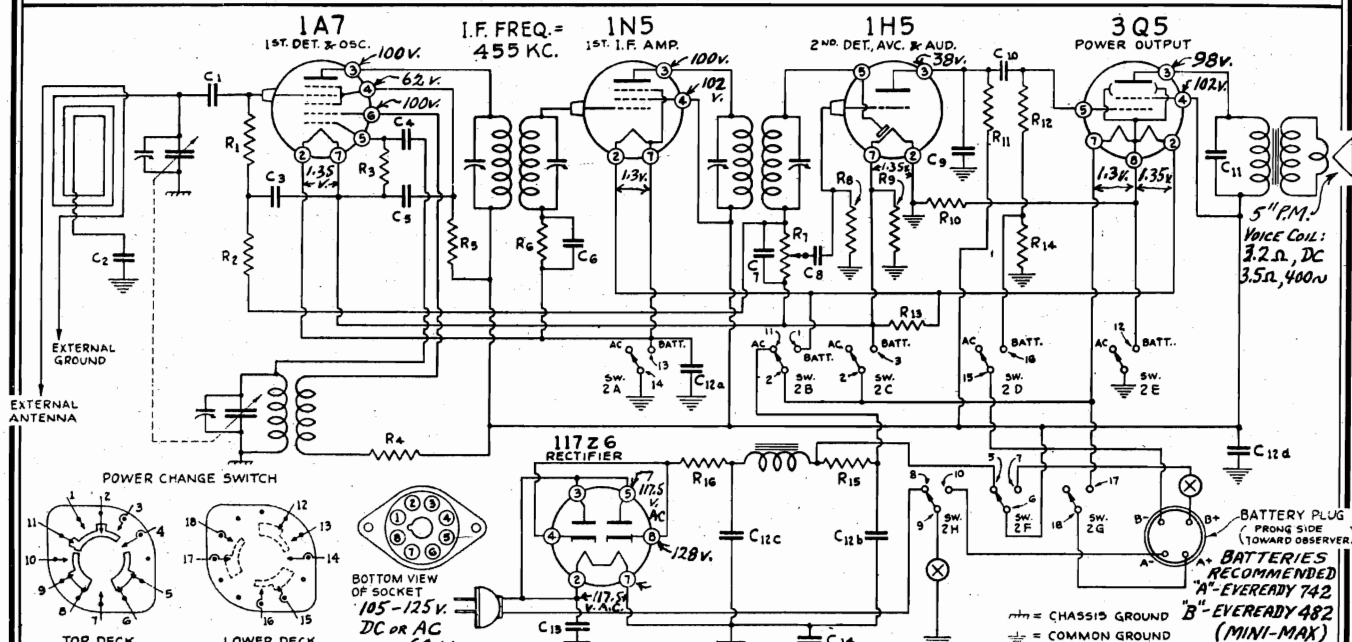
ALIGNMENT PROCEDURE (See 7C-PH Automatic):

Trim OSC. at 1730 KC (Broadcast)

Pad OSC. at 600 KC (Broadcast)

Trim ANT. at 1400 KC (Broadcast)

Trim ANT at 15000 KC (Short Wave)



| No. | Ohms | Watts | | Capacity (Mfd.) | Volts | |
|-----|-----------|-------|-----|-----------------|-------|-----------|
| R1 | 1,000,000 | 1/2 | R9 | 110 | 1/2 | C2 .00025 |
| R2 | 1,000,000 | 1/2 | R10 | 750—10% | 1/2 | C1 .00025 |
| R3 | 200,000 | 1/2 | R11 | 250,000 | 1/2 | C3 .01 |
| R4 | 500 | 1/2 | R12 | 1,000,000 | 1/2 | C4 .0005 |
| R5 | 30,000 | 1/2 | R13 | 400 | 1/2 | C5 .05 |
| R6 | 5,000,000 | 1/2 | R14 | 400—10% | 1/2 | C6 .01 |
| R7 | 1,000,000 | V.C. | R15 | 2,100 | 1/2 | C7 .00025 |
| R8 | 5,000,000 | 1/2 | R16 | 30 | 1/2 | C8 .01 |
| | | | | | 1/2 | C9 .00025 |

VOLTAGES: Line=117.5v. AC; Power=25 W.
 Vol. Cont'l=Max. Meter=1000 ohms/volt
 Measure with respect to common gnd.
 ALIGNMENT (use common gnd): IF=455KC
 Trim Osc. at 1550 KC, Ant. at 1400KC
 TRIM USING EXTERNAL GND.

In Model F5 switch points 4, 15, 16, 17 and 18 are not used. Switch points 4 is also not used on Model XF5. Power change switch 2A thru 2H and the pictorial view shown in the "AC-DC" position.

F5 & XF5 **ISSUE A**
FEB. 1940

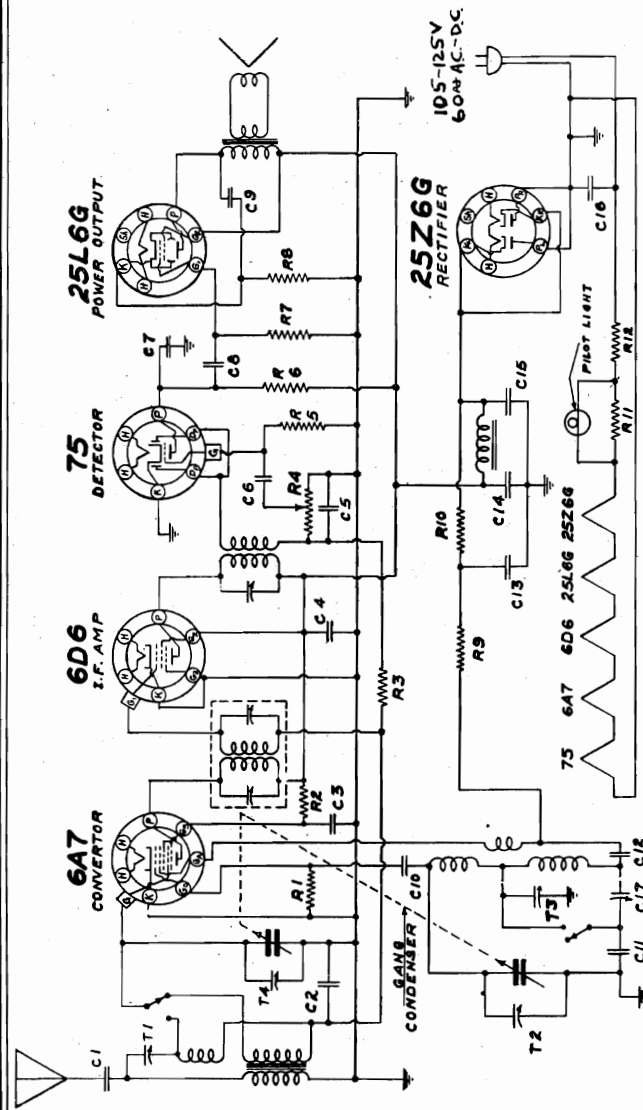
CONTINENTAL RADIO & TELEVISION CORP.

MODEL 5LS
Schematic, Socket
Alignment, Trimmers

| CONDENSERS | | | |
|----------------|--------|-------|-----------|
| N ^o | MFDS | VOLTS | VALUES |
| C1 | .0015 | MICA | .0001 |
| C2 | .05 | 200 | .0017-25% |
| C3 | .05 | 200 | .0017-25% |
| C4 | .05 | 200 | .0017-25% |
| C5 | .00025 | MICA | 25.0 |
| C6 | .01 | 400 | 25.0 |
| C7 | .00025 | MICA | .05 |
| C8 | .01 | 400 | .05 |
| C9 | .05 | 400 | .00068 |

| RESISTORS | | | |
|----------------|---------|-------|--------|
| N ^o | OHMS | WATTS | VALUES |
| R1 | 50,000 | 1/2 | 70,000 |
| R2 | 30,000 | 1/2 | 70,000 |
| R3 | 1 MEG | 1/2 | 70,000 |
| R4 | 1/2 MEG | 1/2 | 70,000 |
| R5 | 5 MEG | 1/2 | 70,000 |
| R6 | 250,000 | 1/2 | 70,000 |
| R7 | 150 | 1/2 | 70,000 |
| R8 | 10,000 | 1/2 | 70,000 |

| TRIMMERS | |
|----------------|----------------------|
| N ^o | USE |
| T1 | SW. ANT. 1.6 TO 2.0 |
| T2 | SW. OSC. 1.6 TO 2.0 |
| T3 | B.C. OSC. 1.6 TO 2.0 |
| T4 | B.C. ANT. 1.6 TO 2.0 |

SCHEMATIC DIAGRAM
MODEL 5LS

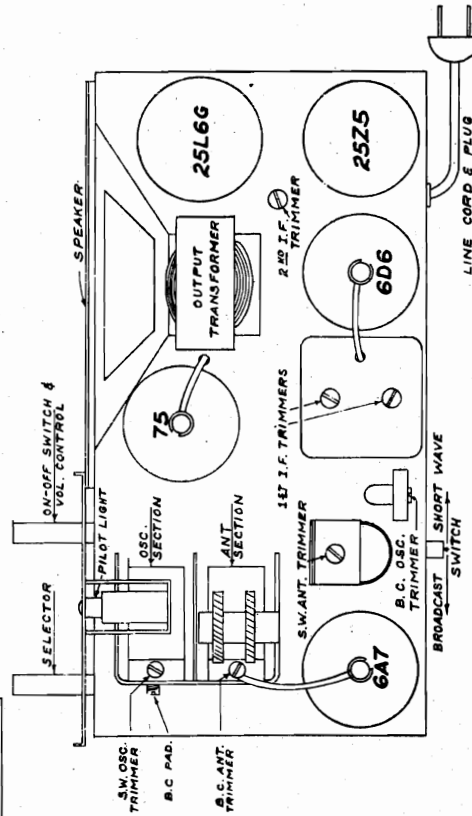
I.F. ALIGNMENT

Adjust the test oscillator to 456 KC and with the band switch in B.C. position connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. Connect ground of test oscillator to chassis ground through a .1 mfd. condenser. Align all three I.F. trimmers to peak or maximum reading on the output meter.

SHORTWAVE ALIGNMENT

Adjust the oscillator to 18,100 KC and connect the output to the antenna lead, through a 400 ohm resistance. Set the gang condenser to minimum capacity and adjust the gang condenser trimmer (short wave oscillator) to receive this signal. After this has been carefully done, the next step is to set the generator to 16000 K.C. and after tuning in the signal adjust the shortwave antenna trimmer to peak.

The receiver should now be tuned to the 6 megacycle signal from the generator and the sensitivity checked. No adjustment is required at this point.



BROADCAST BAND ALIGNMENT

The broadcast band may now be aligned. Using a .0002 dummy antenna, set the generator to 1730 kilocycles. With the gang condenser at minimum capacity, adjust the broadcast oscillator trimmer to receive this signal. Then set the generator to 1400 kilocycles and adjust the broadcast antenna trimmer to peak. The generator is now set to 600 kilocycles and the broadcast padding condenser adjusted.

[illegible]

Diagram illustrating the internal components and wiring of a radio receiver chassis, showing various trimmers, capacitors, and control elements.

Wiring and Connections:

- BLUE - PLATE
- RED - CENTER TAP
- BLUE - PLATE

Components and Labels:

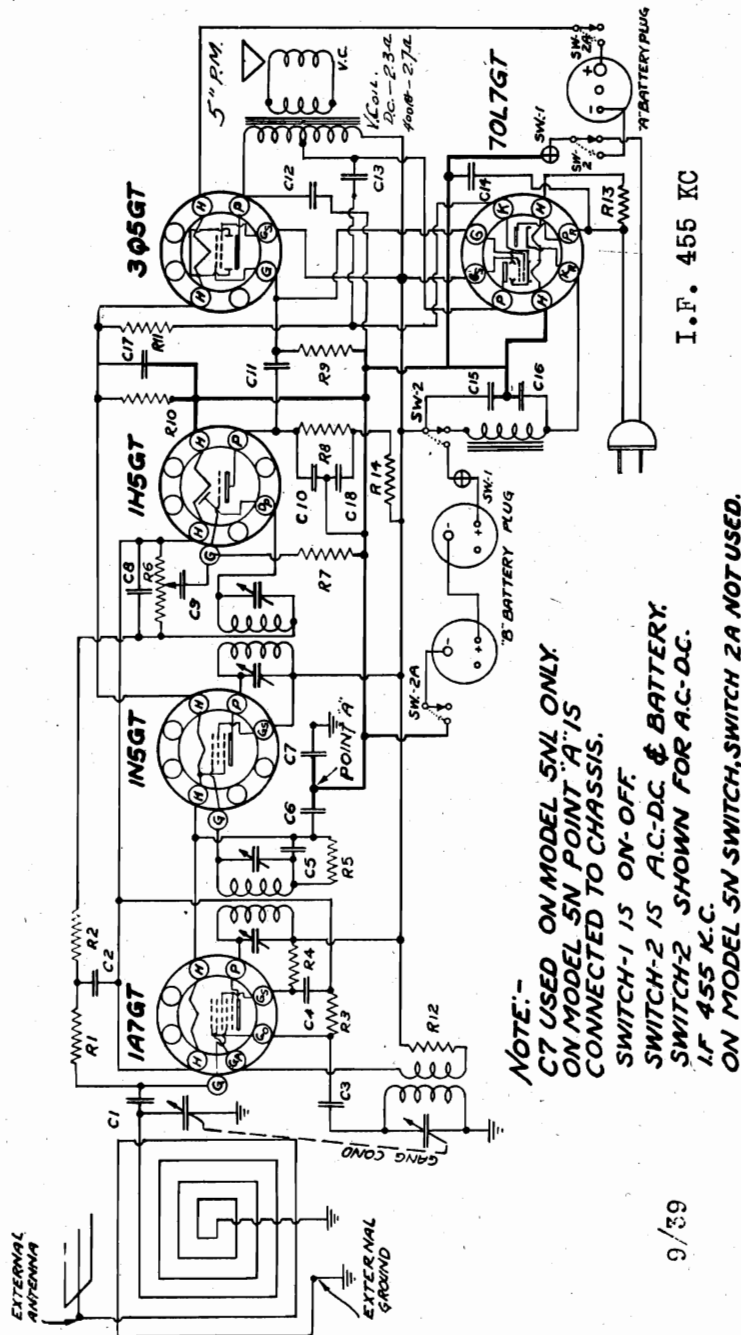
- VIBRATOR AND POWER PACK
- 6 VOLT BATTERY
- CAUTION EXTENSION WIRES MUST NOT BE USED
- 19
- 30
- 30
- 30
- BC PRESELECT. TRIMMER - PEAK 1400 KC.
- OSC
- ANT.
- BC
- PRESELECT
- IC6
- 2ND IF
- IF-PEAK 456 KC
- 120 IF
- SECTIONAL FRONT VIEW
- SW ANT TRIMMER - PEAK 16 MC.
- POL. BAND ANT. TRIMMER - PEAK 5.0 MC.
- B.C. ANT. TRIMMER - PEAK 1400 KC.
- SECTIONAL SIDE VIEW
- POL. BAND PADDER - PEAK 18 MC.
- B.C. PADDOR - PEAK 600 KC.
- B.C. TRIMMER - PEAK 120 KC.
- POL. BAND TRIMMER - PEAK 565 MC.
- VOL. CONTROL + ON-OFF SWITCH
- TONE CONTROL
- STATION SELECTOR
- WAVE CHANGE SWITCH

CONTINENTAL RADIO & TELEV. CORP. MODELS 5N, 5NL

Schematic, Socket Alignment, Trimmers

| CONDENSERS | |
|------------|--------------------------------------|
| C1 - | .002 mfd. 600 volt |
| C2 - | .05 mfd. 400 volt |
| C3 - | .00005 mfd. mica |
| C4 - | .05 mfd. 400 volt |
| C5 - | .002 mfd. 600 volt |
| C6 & C17 - | 40-40 mfd. 25 volt elect. |
| C7 - | .25 mfd. 200 volt (used in 5NL only) |
| C8 - | .00025 mfd. mica |
| C9 - | .01 mfd. 400 volt |
| C10 - | .00025 mica |
| C11 - | .01 mfd. 400 volt |
| C12 - | .002 mfd. 600 volt |
| C13 - | .01 mfd. 400 volt |
| C14 - | .05 mfd. 400 volt |
| C15 | 20-30 mfd. 150 volt elect. |
| C16 - | .1 mfd. 200 volt |
| C18 - | Gang Condenser |
| | Trimmer Condenser |

| RESISTORS | |
|-----------|---------------------------------------|
| R1 - | 2,000,000 ohm ½ watt |
| R2 - | 2,000,000 ohm ½ watt |
| R3 - | 200,000 ohm ½ watt |
| R4 - | 25,000 ohm ½ watt |
| R5 - | 5,000,000 ohm ½ watt |
| R6 - | 1,000,000 ohm Volume Control & Switch |
| R7 - | 5,000,000 ohm ½ watt |
| R8 - | 250,000 ohm ½ watt |
| R9 - | 500,000 ohm ½ watt |
| R10 - | 1,000 ohm ½ watt 10% |
| R11 - | 30 ohm ½ watt 10% |
| R12 - | 750 ohm ½ watt |
| R13 - | 335 ohm 10 watt |
| R14 - | 100,000 ohm ½ watt |



9/39

SCHEMATIC DIAGRAM MODEL 5N & 5NL

TUBE FUNCTIONS
 1A7GT- MIXER-OSCILLATOR
 1N5GT- I.F. AMPLIFIER
 1H5GT- 2ND DET-AVC-1ST A.F.
 3Q5GT- OUTPUT
 70L7GT-RECTIFIER

FOR CONVENTIONAL ALIGNMENT
 SEE SPECIAL SECTION VOL. VIII.
 TRIM OSC- 1550 KC, TRIM ANT- 1400 KC
 PAD- 600 KC

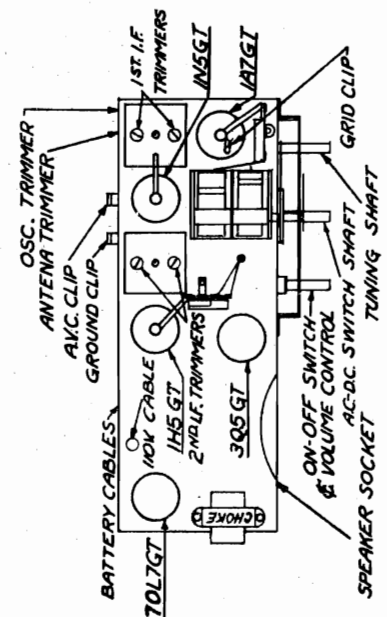


Fig. 1—Top View

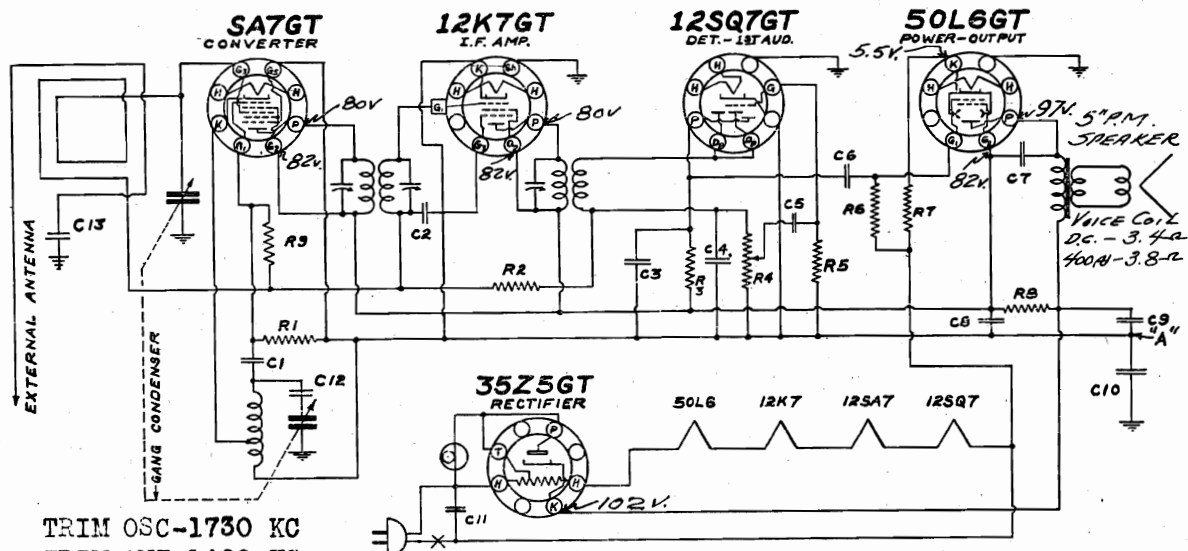
MODELS 5R, 5RL

MODELS 5S, 5SL

Schematics, Voltage

Alignment

CONTINENTAL RADIO & TELEV. CORP.



TRIM OSC-1730 KC

TRIM ANT-1400 KC

I.F. ALIGNMENT CONVENTIONAL

| RESISTORS | | | |
|-----------|-----------|-------|--|
| NO | OHMS | WATTS | |
| R1 | 20,000 | 1/2 | |
| R2 | 2 MEG. | 1/2 | |
| R3 | 250,000 | 1/2 | |
| R4 | 500,000 | V.C. | |
| R5 | 5 MEG. | 1/2 | |
| R6 | 500,000 | 1/2 | |
| R7 | 150 ± 10% | 1/2 | |
| R8 | 1,000 | 1 | |
| R9 | 15 MEG. | 1/2 | |

| CAPACITORS | | | |
|------------|--------|-------|--|
| NO | MFD. | VOLTS | |
| C1 | .0001 | MICA | |
| C2 | .02 | 400 | |
| C3 | .0005 | MICA | |
| C4 | .00025 | MICA | |
| C5 | .01 | 400 | |
| C6 | .002 | 600 | |
| C7 | .01 | 400 | |
| C8 | 20.0 | 150 | |
| C9 | 30.0 | 150 | |
| C10 | .25 | 200 | |
| C11 | .05 | 400 | |
| C12 | .02 | 400 | |
| C13 | .001 | 600 | |

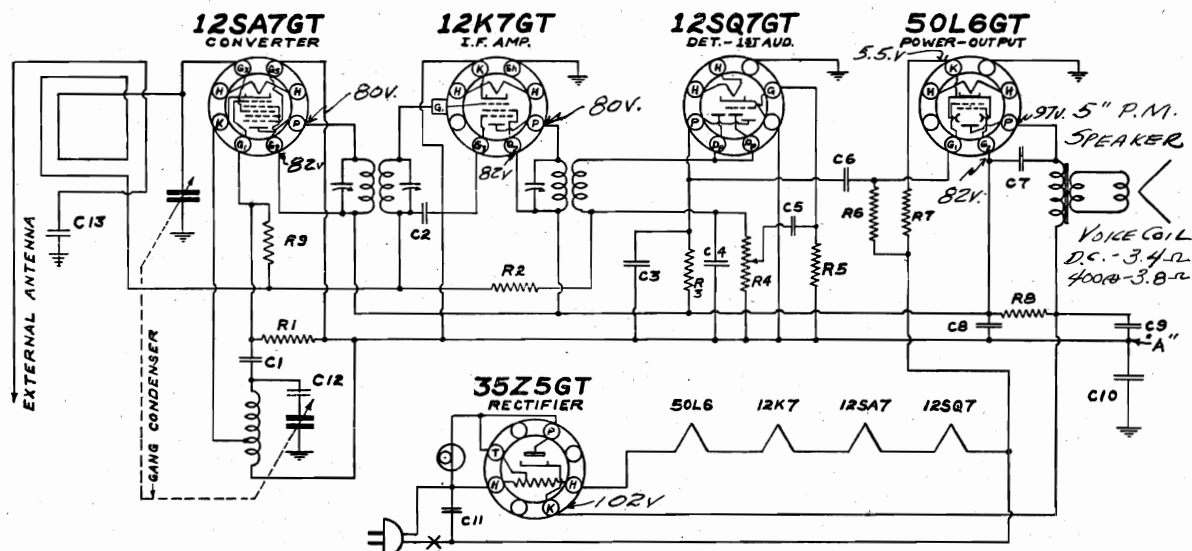
I.F. 455KC

MODELS 5R, 5RL

C10 and C14 used in model 5RL only. On model 5R point "A" is connected to ground.

Voltages:-From point indicated to "A", Line 115 V. A.C. Power consumption 30 watts, Meter 1000 ohms per volt. 150 volt scale.

FOR SOCKET LAYOUT SEE INDEX



ALIGNMENT SAME AS MODEL 5R ABOVE

| RESISTORS | | | |
|-----------|-----------|-------|--|
| NO | OHMS | WATTS | |
| R1 | 20,000 | 1/2 | |
| R2 | 2 MEG. | 1/2 | |
| R3 | 250,000 | 1/2 | |
| R4 | 500,000 | V.C. | |
| R5 | 5 MEG. | 1/2 | |
| R6 | 500,000 | 1/2 | |
| R7 | 150 ± 10% | 1/2 | |
| R8 | 1,000 | 1 | |
| R9 | 15 MEG. | 1/2 | |

| CAPACITORS | | | |
|------------|--------|-------|--|
| NO | MFD. | VOLTS | |
| C1 | .0001 | MICA | |
| C2 | .02 | 400 | |
| C3 | .0005 | MICA | |
| C4 | .00025 | MICA | |
| C5 | .01 | 400 | |
| C6 | .002 | 600 | |
| C7 | .01 | 400 | |
| C8 | 20.0 | 150 | |
| C9 | 30.0 | 150 | |
| C10 | .25 | 200 | |
| C11 | .05 | 400 | |
| C12 | .02 | 400 | |
| C13 | .001 | 600 | |

I.F. 455KC

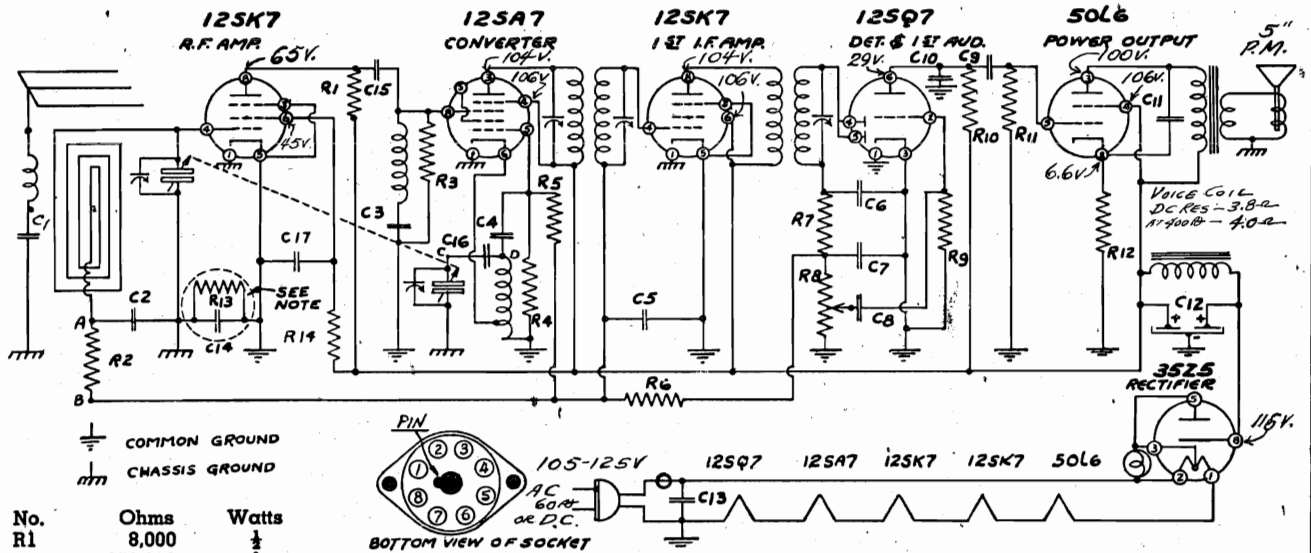
MODELS 5S, 5SL

C10 and C12 used in model 5SL only. On model 5S point "A" is connected to chassis.

Voltages:- (See note Model 5R above).

Schematics, Voltage
Alignment

CONTINENTAL RADIO & TELEV. CORP.

MODELS A6, XA6
MODELS G6, XG6

| No. | Ohms | Watts |
|-----|------------|-------|
| R1 | 8,000 | 1/2 |
| R2 | 250,000 | 1/2 |
| R3 | 250,000 | 1/2 |
| R4 | 20,000 | 1/2 |
| R5 | 15,000,000 | 1/2 |
| R6 | 2,000,000 | 1/2 |
| R7 | 50,000 | 1/2 |
| R8 | 500,000 | 1/2 |
| R9 | 5,000,000 | 1/2 |
| R10 | 250,000 | 1/2 |
| R11 | 500,000 | 1/2 |
| R12 | 200-10% | 1/2 |
| R13 | 150,000 | 1/2 |
| R14 | 40,000 | 1/2 |

| No. | Capacity | Voltage |
|-----|------------|---------|
| C1 | .001 | 600 |
| C2 | .05 | 200 |
| C3 | .000060-5% | Mica |
| C4 | .00005 | Mica |
| C5 | .05 | 200 |
| C6 | .0001 | Mica |
| C7 | .00025 | Mica |
| C8 | .005 | 400 |
| C9 | .005 | 400 |
| C10 | .00025 | Mica |
| C11 | .01 | 400 |

A6 & XA6

ISSUE A
JAN. 1940

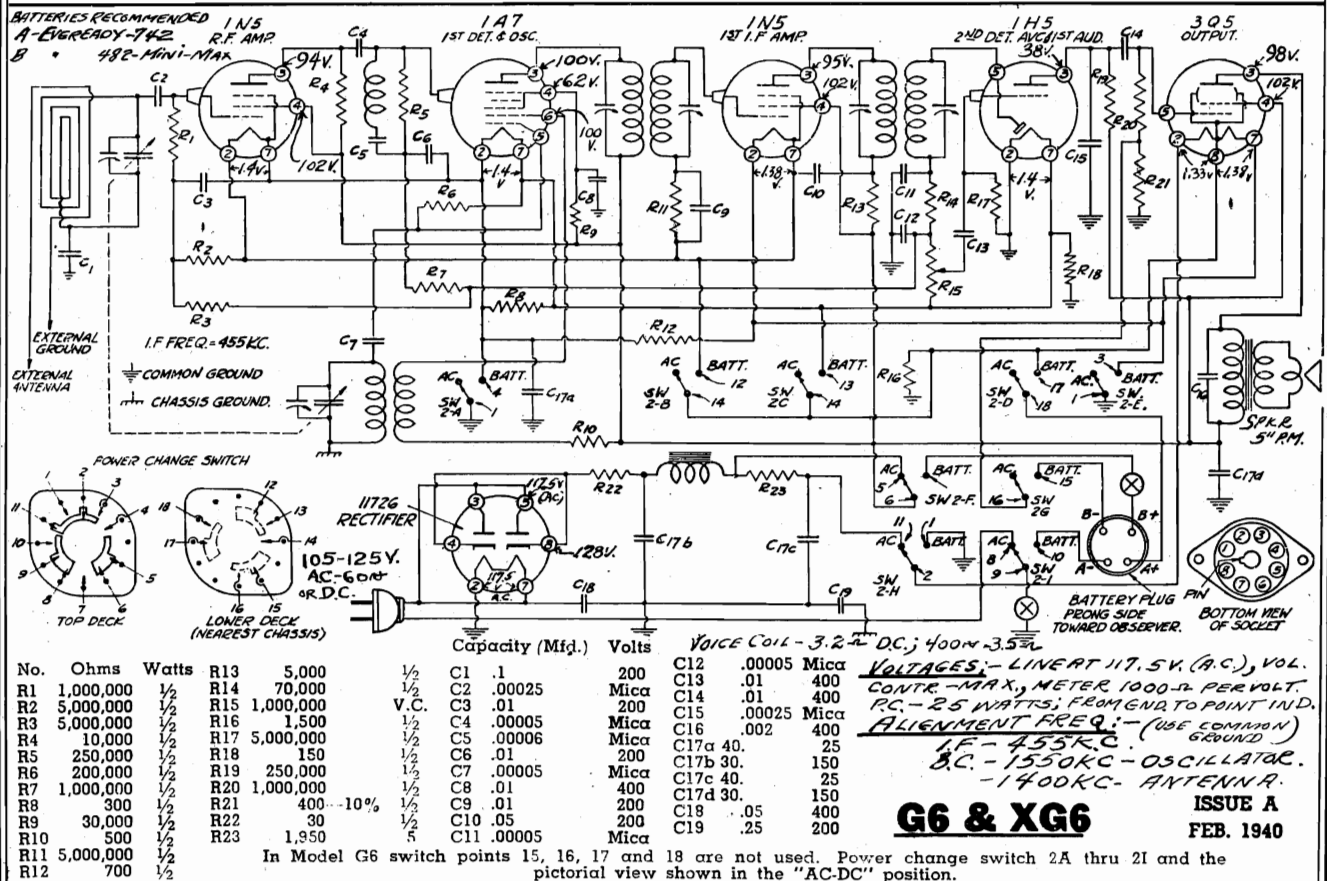
| | | |
|-----|--------------|------|
| C12 | 30-30 Elect. | 150 |
| C13 | .05 | 400 |
| C14 | .25 | 200 |
| C15 | .00025 | Mica |
| C16 | .02 | 400 |
| C17 | .01 | 400 |

VOLTAGES: TAKEN FROM POINT INDICATED TO GROUND; LINE-115V. A.C.-VOL. CONTROL AT MAX.-METER-1000-Ω PER VOLT; PWR CONSUMPTION 35W.

ALIGNMENT FREQ:-

I.F. - 455KC
B.C. - 1730KC-OSCILLATOR
1400KC-ANTENNA
(A6-CHASSIS END-XA6 COMMON GND USE 1MFD (GND))

In model A6 all common grounds become chassis grounds; C2, C14, C16, R2 and R13 are omitted and point A is connected to point B and point C is connected to point D.



| No. | Ohms | Watts |
|-----|-----------|-------|
| R1 | 1,000,000 | 1/2 |
| R2 | 5,000,000 | 1/2 |
| R3 | 5,000,000 | 1/2 |
| R4 | 10,000 | 1/2 |
| R5 | 250,000 | 1/2 |
| R6 | 200,000 | 1/2 |
| R7 | 1,000,000 | 1/2 |
| R8 | 300 | 1/2 |
| R9 | 30,000 | 1/2 |
| R10 | 500 | 1/2 |
| R11 | 5,000,000 | 1/2 |
| R12 | 700 | 1/2 |

| No. | Capacity | Voltage |
|-----|----------|---------|
| C1 | .1 | 200 |
| C2 | .00025 | Mica |
| C3 | .01 | 200 |
| C4 | .00005 | Mica |
| C5 | .00006 | Mica |
| C6 | .01 | 200 |
| C7 | .00005 | Mica |
| C8 | .01 | 400 |
| C9 | .01 | 200 |
| C10 | .05 | 200 |
| C11 | .00005 | Mica |

| | | |
|------|--------|------|
| C12 | .00005 | Mica |
| C13 | .01 | 400 |
| C14 | .01 | 400 |
| C15 | .00025 | Mica |
| C16 | .002 | 400 |
| C17a | 40 | 25 |
| C17b | 30 | 150 |
| C17c | 40 | 25 |
| C17d | 30 | 150 |
| C18 | .05 | 400 |
| C19 | .25 | 200 |

VOLTAGES: LINE AT 117.5V (A.C.), VOL. CONTR.-MAX., METER 1000-Ω PER VOLT. P.C.-25 WATTS; FROM END TO POINT IND. ALIGNMENT FREQ:- (USE COMMON GROUND)
I.F. - 455KC
B.C. - 1550KC-OSCILLATOR
-1400KC-ANTENNA

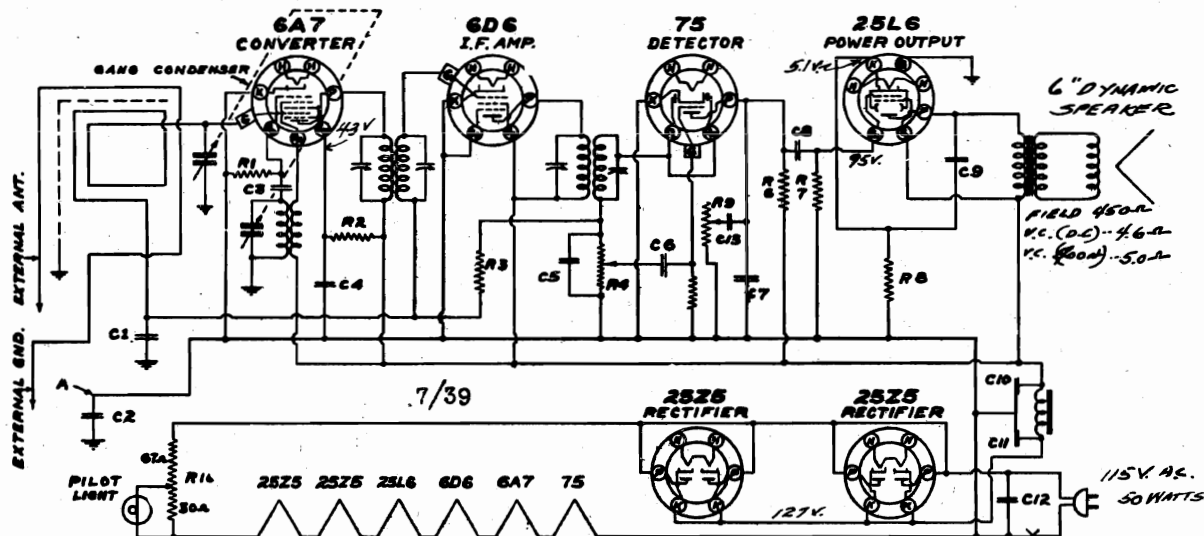
G6 & XG6

ISSUE A
FEB. 1940

In Model G6 switch points 15, 16, 17 and 18 are not used. Power change switch 2A thru 2I and the pictorial view shown in the "AC-DC" position.

MODELS 6J,6JL
MODELS 6M,6ML
Schematics,Alignment

CONTINENTAL RADIO & TELEV. CORP.



RESISTORS

| N ^o | OHMS | WATTS |
|----------------|-----------|------------|
| R1 | 50,000 | 1/2 |
| R2 | 30,000 | 1/2 |
| R3 | 1,000,000 | 1/2 |
| R4 | 500,000 | VOL. CONT. |
| R5 | 3,000,000 | 1/2 |
| R6 | 250,000 | 1/2 |
| R7 | 500,000 | 1/2 |
| R8 | 150 ± 10% | 1/2 |
| R9 | 250,000 | TONE CONT. |
| R10 | 675 30 | 1/2 |

CONDENSERS

| N ^o | MFD. | VOLTS |
|----------------|--------|-------|
| C1 | .01 | 200 |
| C2 | .25 | 200 |
| C3 | .00005 | MICA |
| C4 | .05 | 200 |
| C5 | .00025 | MICA |
| C6 | .01 | 450 |
| C7 | .00025 | MICA |
| C8 | .01 | 400 |
| C9 | .02 | 400 |

CONDENSERS

| N ^o | MFD. | VOLTS |
|----------------|-------|-------|
| C10 | 20 | 150 |
| C11 | 20 | 150 |
| C12 | 0.05 | 400 |
| C13 | 0.005 | 600 |

NOTE: C2 USED ON MODEL 6JL ONLY
ON MODEL 6J POINT "A" IS
CONNECTED TO CHASSIS.

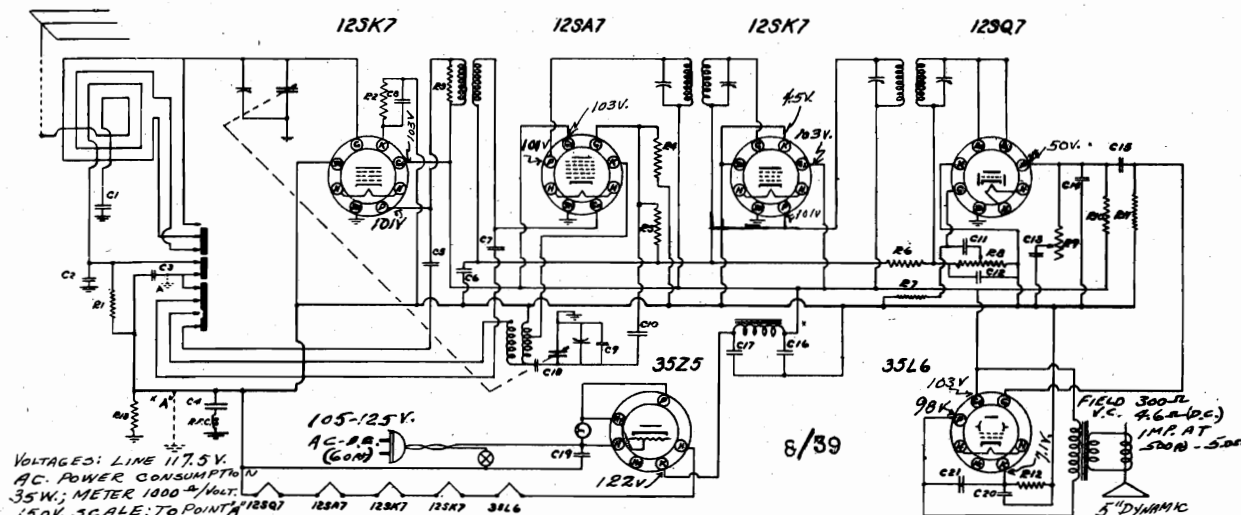
I.F. 455 K.C.
+ INDICATES CHASSIS GROUND
VOLTAGES: WITH METER 100Ω/VOLT
TO GROUND; ANT. SHORTEST TO GROUND.

SCHEMATIC DIAGRAM
MODEL 6JL
MODEL 6J

I.F. ALIGNMENT CONVENTIONAL (SEE VOL. VIII).

BROADCAST BAND
TRIM OSC 1630 KC
TRIM ANT 1400 KC

(See Index for tube layout)



VOLTAGES: LINE 117.5V.
AC POWER CONSUMPTION
35W.; METER 1000 Ω/VOLT.
150V. SCALE; TO POINT "A" (125V)

RESISTORS

| N ^o | OHMS | WATTS | N ^o | OHMS | WATTS |
|----------------|------------|-------|----------------|------------|-------|
| R1 | 150K ± 10% | 1/2 | R8 | 500K ± 10% | 1/2 |
| R2 | 600 ± 10% | 1/2 | R9 | 500K ± 10% | 1/2 |
| R3 | 5K ± 10% | 1/2 | R10 | 150K | 1/2 |
| R4 | 15Meg. | 1/2 | R11 | 250K | 1/2 |
| R5 | 25K | 1/2 | R12 | 200 ± 10% | 1/2 |
| R6 | 2Meg. | 1/2 | R13 | 150K | 1/2 |
| R7 | 5Meg. | 1/2 | | | |

CAPACITORS

| N ^o | MFD. | VOLTS | N ^o | MFD. | VOLTS |
|----------------|-------------|-------|----------------|---------|-------|
| C1 | .001 | 600 | C8 | .05 | 200 |
| C2 | .00127 ± 5% | Mica | C9 | .000010 | Mica |
| C3 | .05 | 400 | C10 | .00005 | Mica |
| C4 | .25 | 200 | C11 | .01 | 400 |
| C5 | .00006 ± 5% | Mica | C12 | .00025 | Mica |
| C6 | .05 | 200 | C13 | .005 | 600 |
| C7 | .00006 ± 5% | Mica | C14 | .0005 | Mica |
| | | | C15 | .01 | 400 |
| | | | C16 | 20 | 150 |
| | | | C17 | 20 | 150 |
| | | | C18 | .02 | 400 |
| | | | C19 | .05 | 400 |
| | | | C20 | 20 | 25 |
| | | | C21 | .02 | 400 |

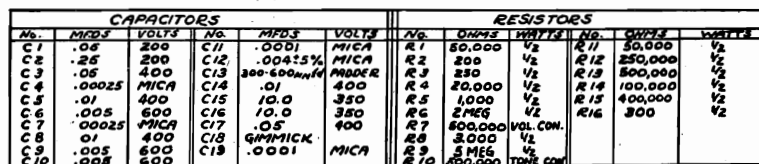
I.F. 455 K.C.

In model 6M only C3, C4, C18, R13 and the R.F. choke (RFC) are not used and points "A" are connected to chassis.

I.F. ALIGNMENT CONVENTIONAL (SEE VOL. VIII).

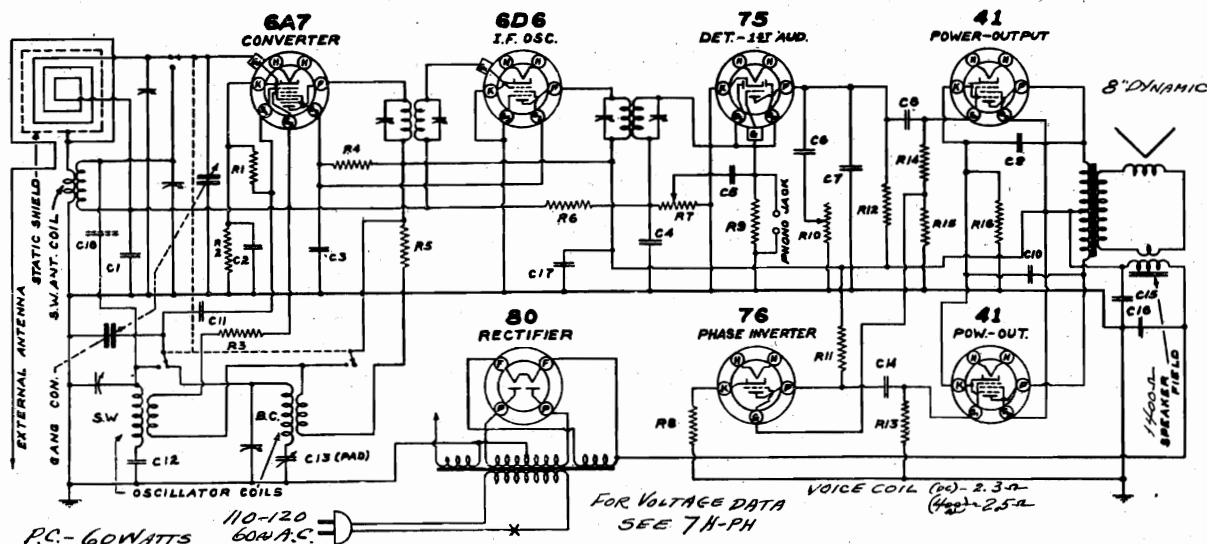
BROADCAST BAND
TRIM OSC 1630 KC
TRIM ANT 1400 KC

MODELS 6M, 6ML
(See Index for tube layout)



BAND SWITCHES SHOWN IN BROADCAST
POSITION
BOTTOM VIEW OF TUBE SOCKETS SHOWN
GANG CONDENSER CAPACITY 443MMF.

FOR
ALIGNMENT PROCEDURE
SEE MODEL 7C-PH AUTOMATIC
OR SOCKET LAYOUT SEE INDEX



| CAPACITORS | | | | | |
|----------------|--------|-------|----------------|-----------|----------|
| N ₁ | MFDs | VOLTS | N ₂ | MFDs | VOLTS |
| C1 | .05 | 200 | C10 | .001 | 500 |
| C2 | .25 | 200 | C11 | .0001 | 500 |
| C3 | .05 | 400 | C12 | .004 ± 5% | 500 |
| C4 | .00025 | 500 | C13 | 300-600 | μ.f.d.s. |
| C5 | .01 | 400 | C14 | .01 | 400 |
| C6 | .005 | 600 | C15 | 10.0 | 350 |
| C7 | .00025 | 500 | C16 | 10.0 | 350 |
| C8 | .01 | 400 | C17 | .05 | 400 |
| C9 | .005 | 600 | C18 | GIMMICK | |

| RESISTORS | | | |
|-----------|---------|---------------|-------------|
| NA | OHMS | WATTS | |
| R1 | 50,000 | $\frac{1}{2}$ | R10 50,000 |
| R2 | 300 | $\frac{1}{2}$ | R11 50,000 |
| R3 | 250 | $\frac{1}{2}$ | R12 250,000 |
| R4 | 20,000 | $\frac{1}{2}$ | R13 500,000 |
| R5 | 1,000 | $\frac{1}{2}$ | R14 400,000 |
| R6 | 2 MEG. | $\frac{1}{2}$ | R15 100,000 |
| R7 | 500,000 | VOL.COM. | R16 300 |
| R8 | 3,000 | $\frac{1}{2}$ | |
| R9 | 5 MEG. | $\frac{1}{2}$ | |

SWITCHES SHOWN IN BROADCAST POSITION
BOTTOM VIEW OF SOCKETS SHOWN.
GANG CONDENSER CAPACITY 443 μ mf

FOR SOCKET LAYOUT SEE INDEX

MODEL 7C-PH

Tuner Data

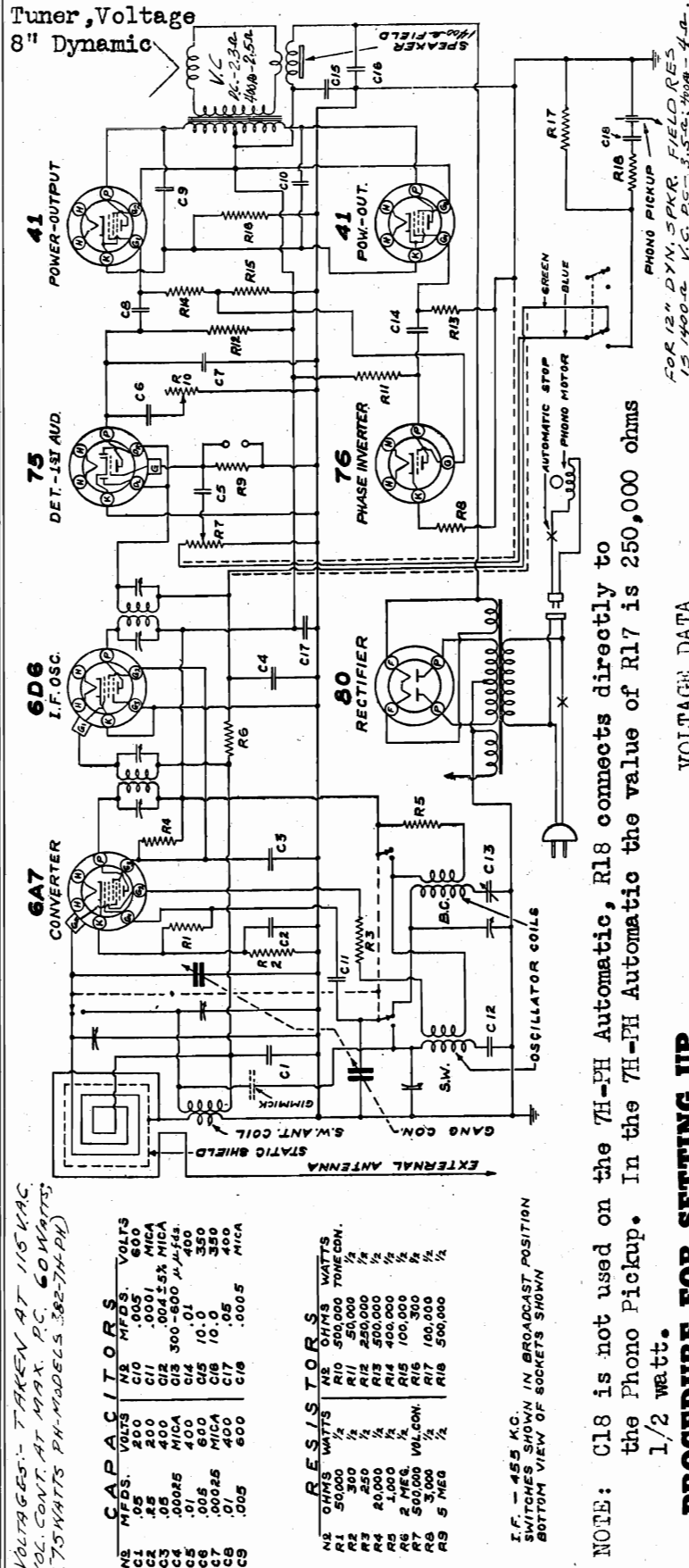
MODEL 7H

Tuner, Voltage

8" Dynamic

CONTINENTAL RADIO & TELEV. CORP. 382-7H-PH

MODELS 7H-PH, 7H-PH Automatic,

Schematic, Voltage, Tuner
Alignment

PROCEDURE FOR SETTING UP PUSH BUTTONS

Loosen one of the push buttons by turning the push button knob counter clockwise a turn or less and push it in; while holding the button in, tune in a desired station by means of the station selector knob. Turn the selector very slowly back and forth until the signal is clearest. Now while holding the push button in, tighten it by turning clockwise. Release the push button and turn the station selector to one end of the dial; push the tuning knob to the right and then check the button by pushing it in and if the station is tuned to the center of the area on the dial covered by the station the adjustment is correct.

Release the push button and loosen another push button and repeat the above procedure, doing this for the remaining buttons.

IF PEAK 455 KC

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII.

ALIGNMENT FREQUENCIES
BROADCAST BAND

TRIM OSC. ---1550 KC

TRIM ANT. ---1400 KC

PAD --- 600 KC

SHORT WAVE BAND

TRIM OSC. ---18100 KC

TRIM ANT. ---16000 KC

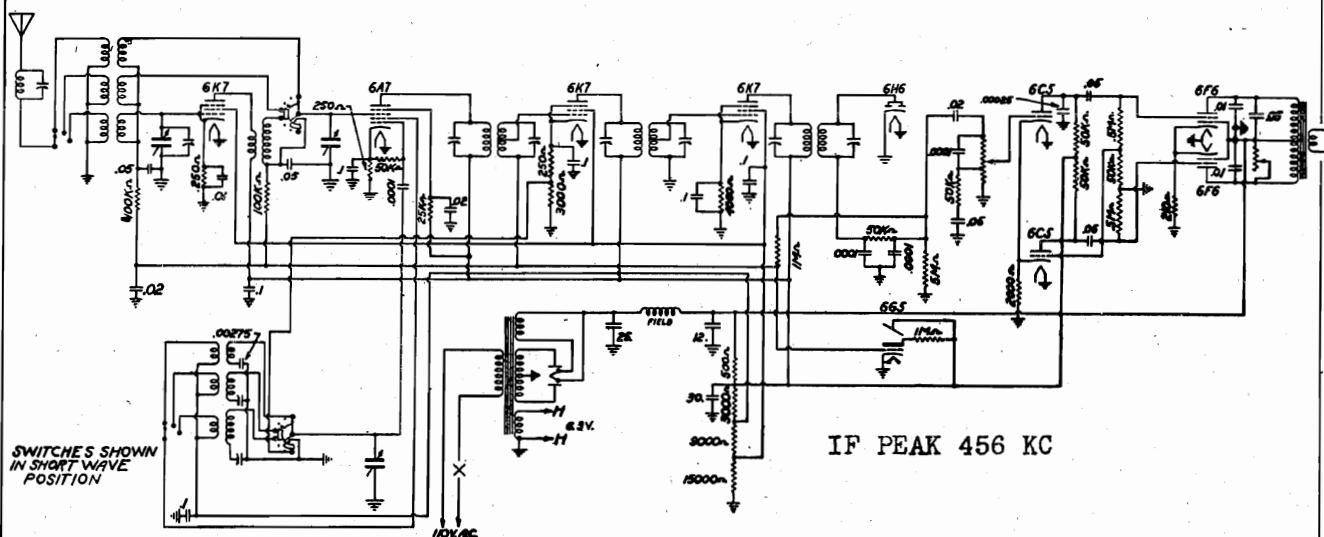
FOR TRIMMER LOCATIONS

SEE SOCKET LAYOUT.

MODEL AM7
Schematic, Socket
Trimmers, Alignment

CONTINENTAL RADIO & TELEV. CORP.

MODEL AM8
Socket, Trimmers

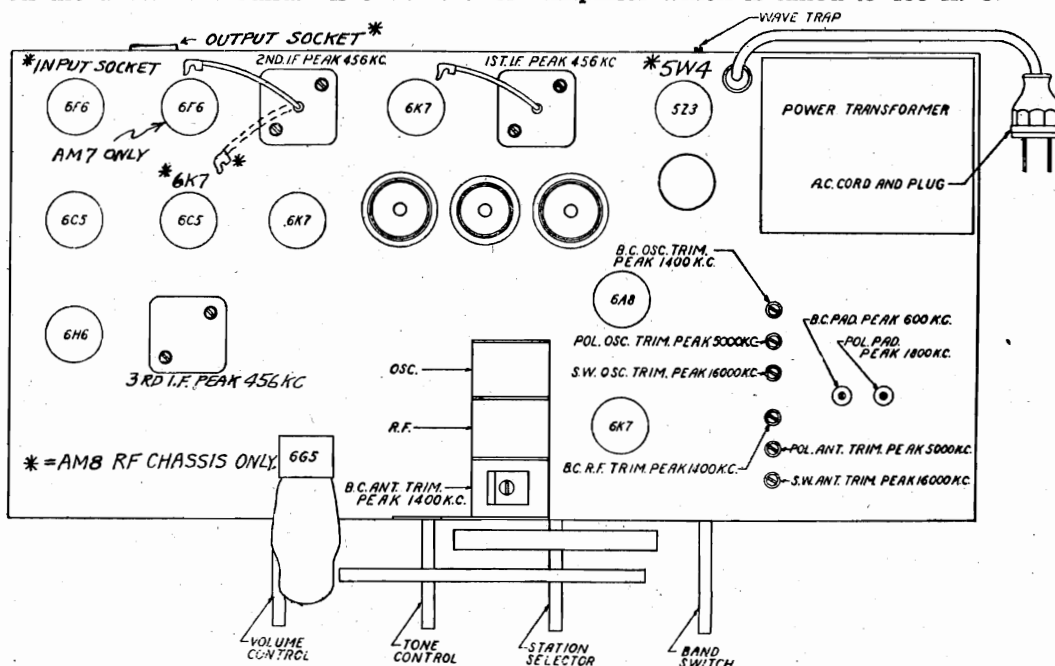


CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

WAVE TRAP
ADJUSTMENT

At the rear of the chassis near the Antenna and Ground posts is an adjustment screw connected to a trap circuit for elimination of code interference when operating on the broadcast band. If code interference

is encountered adjustment of this screw will filter it out. It is to be used only if such interference is experienced in broadcast reception. Its use prevents code transmitters operating on a frequency around 456 K. C. from being received by the I. F. amplifier which is tuned to 456 K. C.



SERVICE DATA FOR ALL BANDS

If it is suspected that the oscillator has stopped but is doubtful due to the presence of the usual amount of noise level, it is suggested that the oscillator plate voltage be checked. To ascertain whether the tube is oscillating, ground the oscillator grid of the 6A8

(short stator and rotor plates of oscillator section on gang condenser). If oscillating properly, grounding this is liable to permanently warp the plates and the grid will cause an appreciable drop in oscillator voltage. Grounding or shorting the stator and grid

components should be accomplished by grounding the stator mounting nut to the frame of the condenser with a screw-driver or any metallic conductor.

Do not wedge a screw-driver between the plates for this is liable to permanently warp the plates and thus prevent the oscillator section of the gang condenser from tracking

CONTINENTAL RADIO & TELEV. CORP.

MODEL 7C-PH

MODEL 7H-PH

MODEL 11B-PH

Record Changer Data

AUTOMATIC RECORD CHANGER

This Record Changer will automatically play a series of eight 10" or seven 12" records of the standard 78 R.P.M. type. Records of the last few years with the standard eccentric or spiral stopping groove on the inside and an eccentric on the outside will operate the automatic mechanism. However, records of any size up to 12" may be played manually.

OPERATION

Before operating the phonograph, either automatically or manually, be sure that the pickup is down and can be moved by hand. If not, a "cycle" must be completed to bring it down. To do this, throw Turntable Switch "On". The turntable will begin to revolve and the cycle of motion on the pickup arm will be resumed. When the pickup arm comes down, turn off the Turntable Switch.

CAUTIONS

1. Never use force to start or stop the motor or any part of the record-changing mechanism or pickup arm.
2. The use of records which have become warped or damaged through improper care, may cause the mechanism to jam and damage the instrument. Records which have become warped, will slide on one another when playing, resulting in unsatisfactory reproduction.
3. This instrument is not recommended for playing 10" and 12" records in mixed sequence. If this service is desired, all records must be perfectly flat and free from warp. The index and record reject lever must be set at "10" and after playing the last selection, the pickup will come down in position for a 10" record and repeat the playing of the record on a 10" diameter unless the turntable switch is turned off. Any jamming of the mechanism under

CONTROLS AND MECHANISM

INDEX AND RECORD REJECT LEVER

This lever is located near the right front corner of the motorboard with its index plate marked for four positions—"Manual", "12", "10", and "Reject". When it is desired to change record selections manually, this lever should be set in the "Manual" position. With the lever in the "12" position, the mechanism is set to play a series of 12" records automatically. To play either a series of 10" records or 10" and 12" records mixed, the lever should be set at the "10" position. To reject a record being played, or to start the record changing cycle in case the record just played does not have the standard eccentric or spiral stopping groove, simply push the lever to the "reject" position and let go. The pickup will rise and swing outwards and the next record will drop down. Upon releasing the lever, it will automatically return to the "10" position. If a series of 12" records is to be played, the lever should be returned to the "12" position after rejecting a record. Keep the lever in its "Manual" position when not actually playing records automatically.

TURNABLE SWITCH

The Slide Switch located just in front of the Index and Record Reject Lever controls the current to the turntable motor. To start the turntable, push the switch to the "On" position. To stop the turntable, push the switch to the "Off" position.

NEEDLES

The use of high grade long playing needles is absolutely essential for the proper operation of this instrument, as the regular needles are only good for one or at the most two records. If any needle is used too long, distortion and poor quality will be obtained and also the records will be damaged.

PICKUP AND TOP-LOADING NEEDLE SOCKET

The pickup is the new crystal type, with a hole in the top for insertion of needles. When not playing records, the pickup arm should be moved out to the right beyond the turntable and placed at rest on the support with the edge of the pickup arm in the groove and the pickup over the needle gauge plates. The pickup must be in this position to change needles.

To insert a needle initially, loosen the needle screw on the front of the pickup, place needle in hole at top so that it drops down against the needle plate and then tighten the needle screw.

NEEDLE EJECTOR

The extending tab on the needle gauge plate of the needle box operates the needle ejector. To change a needle, place pickup in rest position,

RECORD HOLDER SHELVES

To place a record on the turntable or to remove records, raise the record holder shelves by lifting with the fingers under the shelf, and swing clear of the outer edge of record. Also push back vertical lever adjacent to the rear record holder post. The turntable is now accessible. Before loading the magazine for automatic operation, swing the record holder shelves back into position.

AUTOMATIC OPERATION

1. See that the pickup is over the needle gauge plate with the needle properly in place. If not, complete a "cycle" as explained in the first paragraph under "Operation".
2. With the Index and Record Reject Lever at "Manual", place the first of the series of records on the turntable and the remainder of the series (up to seven 10" or six 12" records) on the record holder posts (as shown in Fig. 2). The records should be arranged in the desired order with the desired selection face up and the last selection on top.
3. Set the Index and Record Reject Lever to the proper position. (See Controls: Index and Record Reject Lever.)

4. Push the turntable switch to the left—"On"—turntable should commence to revolve.
5. When the turntable has attained speed, lift pickup and lower gently on to the record so that the needle point enters the outside groove.
6. Adjust volume control to the desired intensity and tone control to the preferred setting.
7. Close the lid of the cabinet to eliminate mechanical reproduction of sound by the needle.

The whole series of records will now play without further attention, and the last record will repeat until the Turntable Switch is turned off. Allow the record-changing mechanism to complete its cycle before the turntable is stopped. Then lift the pickup, swing the arm to the right beyond the edge of the record and lower it onto the pickup rest with the record over the needle gauge plate. The record player is then ready for reloading, or for manual operation.

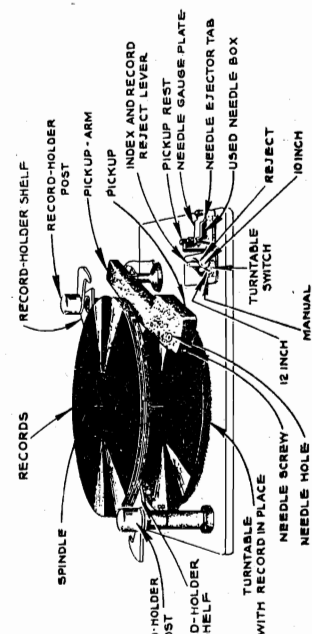
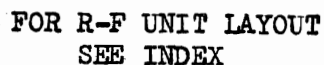
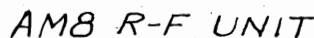
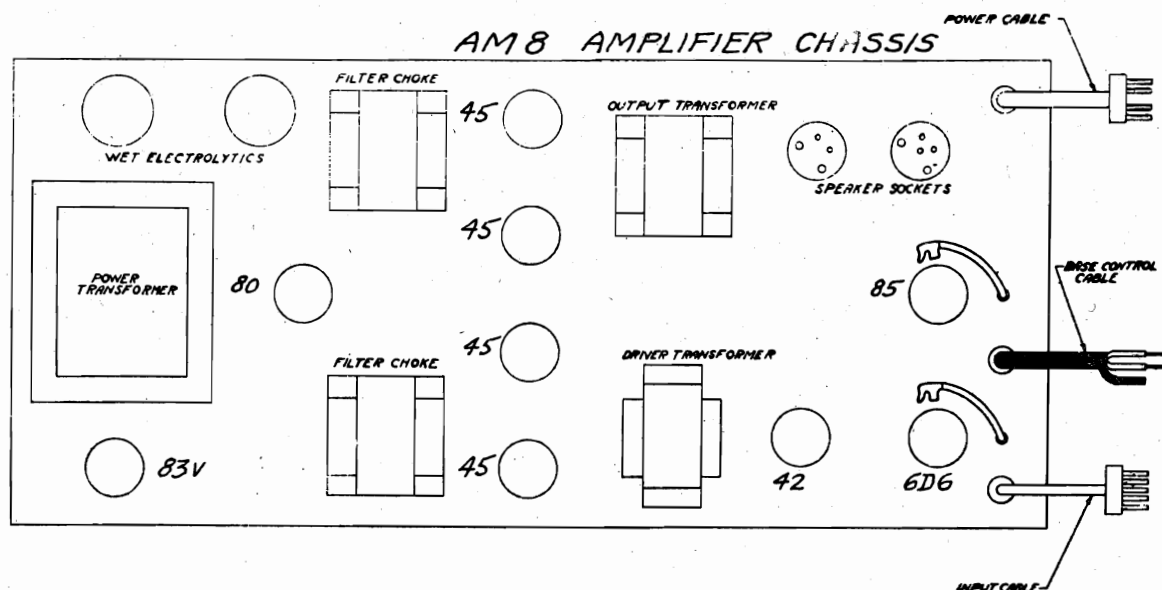


Fig. 2—Top View of Automatic Record Changer

MODEL AM8
Schematic
Amplifier

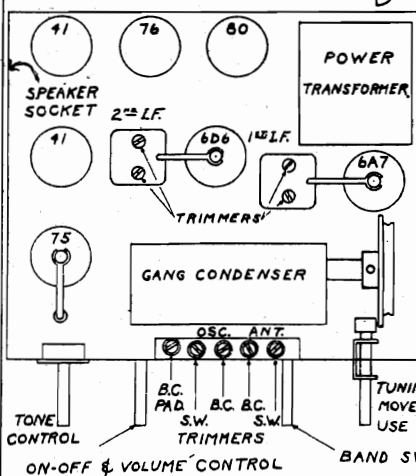
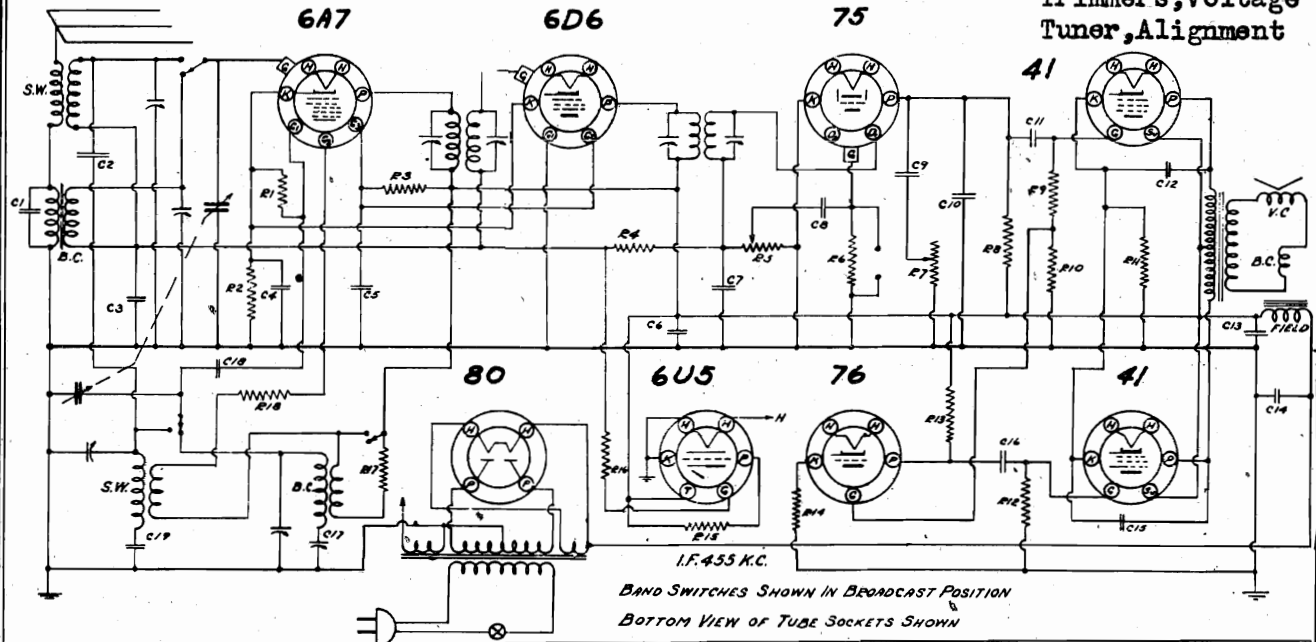


AM8 AMPLIFIER



CONTINENTAL RADIO & TELEV. CORP.

MODEL 8C

Schematic, Socket
Trimmers, Voltage
Tuner, Alignment

| RESISTORS | | | | | | CAPACITORS | | | | | |
|-----------|---------|-------|-----|--------|-------|------------|---------|-------|-----|-------------|--------|
| No. | OHMS | WATTS | No. | OHMS | WATTS | No. | MFDS. | VOLTS | No. | MFDS. | VOLTS |
| R1 | 50,000 | 1/2 | R11 | 300 | 1/2 | C1 | .0001 | 400 | C11 | .01 | 400 |
| R2 | 200 | 1/2 | R12 | 1/2 Mc | 1/2 | C2 | GIMMICK | 400 | C12 | .005 | 400 |
| R3 | 20,000 | 1/2 | R13 | 50,000 | 1/2 | C3 | .05 | 200 | C13 | 10.0 | 350 |
| R4 | 2 Mc | 1/2 | R14 | 3,000 | 1/2 | C4 | .25 | 200 | C14 | 10.0 | 350 |
| R5 | 1/2 | 1/2 | R15 | 1 Mc | 1/2 | C5 | .05 | 400 | C15 | .005 | 400 |
| R6 | 1/2 | 1/2 | R16 | 1/2 | 1/2 | C6 | .05 | 400 | C16 | .01 | 400 |
| R7 | 1/2 | 1/2 | R17 | 1000 | 1/2 | C7 | .00025 | 400 | C17 | .0005-.0006 | PADDER |
| R8 | 1/2 | 1/2 | R18 | 250 | 1/2 | C8 | .01 | 400 | C18 | .0001 | 400 |
| R9 | 400,000 | 1/2 | | | | C9 | .005 | 600 | C19 | .004 ± 5% | 400 |
| R10 | 100,000 | 1/2 | | | | C10 | .00025 | 400 | | | |

IF PEAK 455 KC FOR CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION OF VOLUME VIII.

ALIGNMENT

BROADCAST BAND

TRIM B.C. OSC. AT 1730 KC

TRIM B.C. ANT. AT 1400 KC

PAD B.C. PAD AT 600 KC

SHORT WAVE BAND

TRIM S.W. OSC. AT 18100 KC

TRIM S.W. ANT. AT 16000 KC

SPEAKER (Part No. P3499) 6" Dynamic

Field resistance 1500 ohms

D.C. voice coil resistance 3.2 ohms

Voice coil impedance at 400 cycles 3.8 ohms

Voltages—Line 115 volts A.C. Power consumption
75 watts. Volume control maximum. Meter 1000
ohms per volt.

6A7 tube

Plate (P) to ground 195 volts

Screen grid (G3) to ground 95 volts

Anode grid (G2) to ground 187 volts

Cathode (K) to ground 3 1/2 volts

6D6 tube

Plate (P) to ground 195 volts

Screen grid (G2) to ground 95 volts

Cathode (K) to ground 3 1/2 volts

75 tube

Plate (P) to ground 75 volts

76 tube

Plate (P) to ground 100 volts

Cathode (K) to ground 5 volts

41 tube

Plate (P) to ground 184 volts

Screen grid (G2) to ground 196 volts

Cathode (K) to ground 13.5 volts

80 tube

Filament (F) to ground 302 volts

PROCEDURE FOR SETTING UP

PUSH BUTTONS

Loosen one of the push buttons by turning the push button knob counter clockwise a turn or less and push it in; while holding the button in, tune in a desired station by means of the station selector knob. Turn the selector very slowly back and forth until the signal is clearest. Now while holding the push button in, tighten it by turning clockwise. Release the push button and turn the station selector to one end of the dial; push the tuning knob to the right and then check the button by pushing it in and if the station is tuned to the center of the area on the dial covered by the station the adjustment is correct.

MODELS 11B, 11B-PH

Schematic, Socket, CONTINENTAL RADIO & TELEV. CORP.

Trimmers, Voltage
Alignment

| CONDENSERS | |
|------------|------------------------------------|
| C 1— | .0001 mfd. mica |
| C 2— | .05 mfd. 400 volt tubular |
| C 3— | .05 mfd. 200 volt tubular |
| C 4— | .25 mfd. 200 volt tubular |
| C 5— | .05 mfd. 200 volt tubular |
| C 6— | .0001 mfd. mica |
| C 7— | .0001 mfd. mica |
| C 8— | .05 mfd. 400 volt tubular |
| C 9— | .25 mfd. 200 volt tubular |
| C 10— | .00005 mfd. mica |
| C 11— | .05 mfd. 400 volt tubular |
| C 12— | .1 mfd. 400 volt tubular |
| C 13— | .1 mfd. 400 volt tubular |
| C 14— | .15 mfd. 400 volt tubular |
| C 15— | .15 mfd. 400 volt tubular |
| C 16— | .002 mfd. 600 volt tubular |
| C 17— | .002 mfd. 600 volt tubular |
| C 18— | .02 mfd. 400 volt tubular |
| C 19— | .25 mfd. 475 volt wet electrolytic |
| C 20— | 20 mfd. 450 volt dry electrolytic |
| C 21— | 15 mfd. 450 volt dry electrolytic |
| C 22— | 300—800 mfd., B. C. pad |
| C 23— | .004 mfd. mica, 5% S.W. pad |
| C 24— | .05 mfd. 200 volt tubular |
| C 25— | .05 mfd. 400 volt tubular |
| C 26— | .00025 mfd. mica |
| C 27— | .25 mfd. 200 volt tubular |
| C 28— | .01 mfd. 400 volt tubular |

ALIGNMENT

BROADCAST BAND

Pad—600 kc

Trim osc—1550 kc

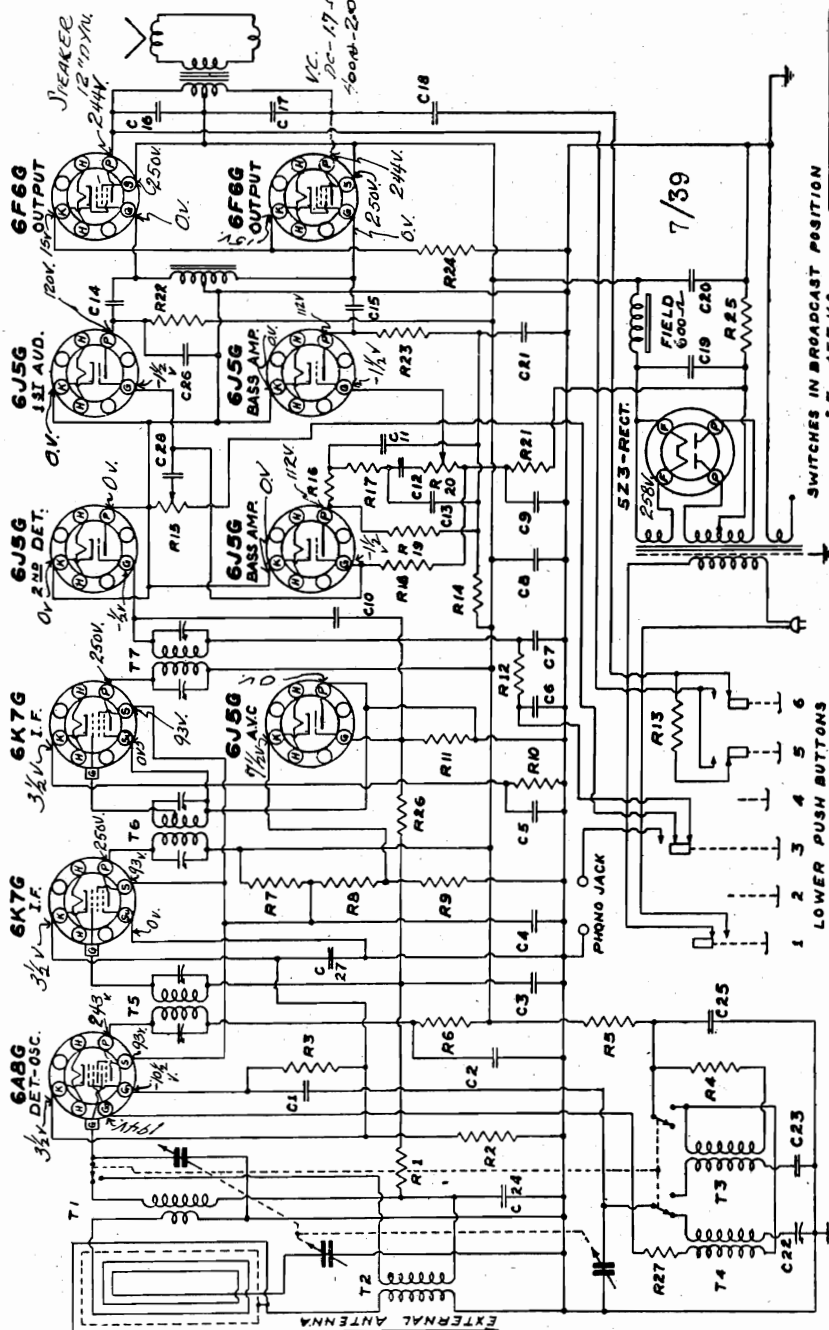
" ant—1400 kc

SHORTWAVE BAND

Trim osc—18,100 kc

" ant—16,000 kc

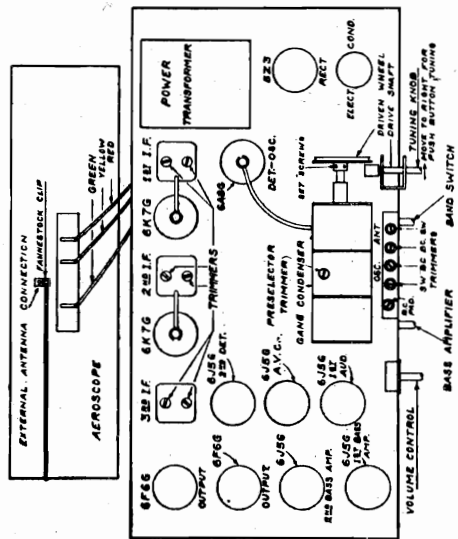
| | |
|-------|----------------------------|
| R 17— | 20,000 ohm ½ watt |
| R 18— | 1,000,000 ohm ½ watt |
| R 19— | 25,000 ohm ½ watt |
| R 20— | 500,000 ohm ½ watt |
| R 21— | 500,000 ohm ½ watt |
| R 22— | 30,000 ohm ½ watt |
| R 23— | 25,000 ohm ½ watt |
| R 24— | 220 ohm 2 watt 10% |
| R 25— | 30 ohm (wire wound) ½ watt |
| R 26— | 250,000 ohm ½ watt |
| R 27— | 150 ohm ½ watt |



| RESISTORS | |
|-----------|--------------------------|
| R 1— | 250,000 ohm ½ watt |
| R 2— | 170 ohm 1/3 watt 10% |
| R 3— | 50,000 ohm ½ watt |
| R 4— | 1,000 ohm ½ watt |
| R 5— | 10,000 ohm ½ watt |
| R 6— | 3,000 ohm ½ watt |
| R 7— | 20,000 ohm 2 watt |
| R 8— | 30,000 ohm ½ watt |
| R 9— | 3,000 ohm ½ watt |
| R 10— | 500 ohm ½ watt |
| R 11— | 1,000,000 ohm ½ watt |
| R 12— | 20,000 ohm ½ watt |
| R 13— | 10,000 ohm ½ watt |
| R 14— | 5,000 ohm ½ watt |
| R 15— | 500,000 ohm vol. control |
| R 16— | 10,000 ohm ½ watt |

I.F. 455 KC
FOR CONVENTIONAL
ALIGNMENT SEE SPECIAL
SECTION OF VOL. VIII

AT LEFT
TOP VIEW OF CHASSIS
VOLTAGES:— FROM POINT
INDICATED TO GROUND.
LINE 115V.A.C. P.C. 125W.





This model Crosley is a six tube single unit automobile receiver. It incorporates an unusual electric push button tuning system of simple, rugged mechanical and electrical construction. The tubes used and their functions are as follows: one 6SK7 as resistance coupled R-F amplifier, one 6SA7 as oscillator-modulator, one 6SK7 as I-F amplifier, one 6SQ7 as detector, A.V.C., 1st audio, one 6K6GT as power output and one 6X5GT as rectifier. Improvements to be noted in the circuit are, the resistance coupled R-F stage and the method of connecting oscillator coil and variable level bias compensation. Bias voltage for the 6SK7 R-F amplifier and the 6SK7 I-F amplifier is developed across item 38, a 450 ohm resistor. Bias voltage for the 6K6GT is developed across item 43, a 600 ohm resistor. The 6SQ7 is operated at zero bias. A.V.C. is applied to 6SK7 (R-F) and the 6SA7. The volume control serves as the A.V.C. load and items 29 and 36, $\frac{1}{2}$ and 1 megohms respectively, act as filters. Item 29 is a chemical condenser which automatically compensates for temperature differences, preventing station drift. The filter circuit is similar to that of Model A-259 using a resistive circuit.

battery drain at 5 volts = 7 amps

N.C. -- NO CONNECTION

FOR ALIGNMENT AND TUNER
DATA, SEE INDEX

JANUARY, 1940

**MODEL A169
MODEL A259
Alignment, Trimmers
Tuner**

THE CROSLEY CORP.

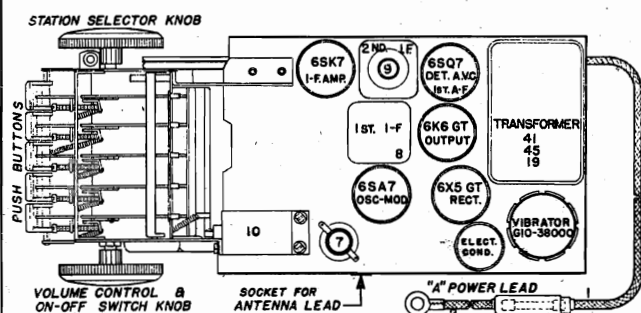


Fig. 2-A—Top View A-259

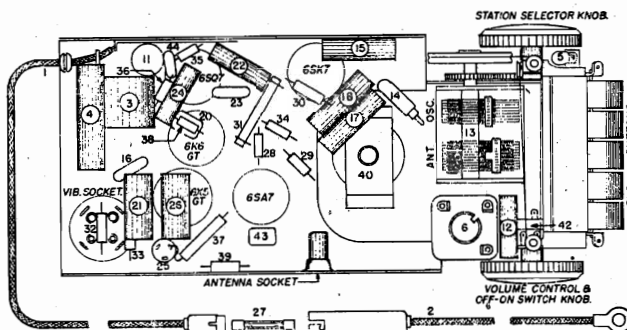


Fig. 3-A—Bottom View A-259

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary, such as when an I-F assembly has been changed and etc., the circuit can best be properly aligned with the use of a MODULATED SIGNAL GENERATOR and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to the plate and screen of the 6K6GT output tube. Be sure the meter is protected from D.C. by connecting a condenser (0.1 mf. or larger—not electrolytic) in series with one of the meter leads.

1. Aligning the I-F to 455 Kilocycles

- Connect the ground lead from the signal generator to the chassis frame. Connect the high side of generator through an .02 mf. condenser to the grid (pin No. 8) of the 6SA7 oscillator-modulator. Care should be exercised to keep signal generator leads as far as possible from the other grid leads.
- Open gang condenser all the way (minimum) turn volume control to maximum and then set signal generator to 455 kilocycles.
- Adjust both 2nd I-F trimmers for maximum output. Trimmers are accessible from bottom of the chassis between the 6SQ7 and 6SK7 sockets.
- Adjust both 1st I-F trimmers for maximum output. Trimmers accessible from bottom of the chassis.
- Repeat (c) and (d) with as low an output as gives a reasonable indication on output meter for more accurate adjustment.

2. Aligning the R-F

- If the receiver is to be used with a whip or streamlined antenna, the output lead from the signal generator should be connected through a .0001 mf. condenser to the "ANT" connection of the receiver. If a large antenna such as a running board type or built-in top antenna is to be used, a .0002 mf. condenser should be used in place of the .0001 mf. condenser.
- Set the signal generator to 1400 kilocycles.
- Adjust the station selector to 140 on the dial.
- Adjust the trimmer on the "OSC" section of the tuning condenser for maximum output.
- Adjust the trimmer on the "ANT" section of the tuning condenser for maximum output.
- Readjust the station selector for maximum output.
- Repeat operation (e) for more accurate adjustment.

3. Adjusting Antenna Compensating Condenser on Model A-169 only.

- Set the signal generator to 600 kilocycles.

- Tune in the 600 kilocycle signal with the station selector for maximum output.
- Adjust the antenna compensating condenser, located near antenna receptacle, for maximum output.
- Repeat operations (b) and (c) alternately until no further improvement can be obtained.

- Set the signal generator to 1400 kilocycles again.
- Tune in the 1400 kilocycle signal with the station selector for maximum output.
- Readjust the trimmer on the "ANT" section of the tuning condenser for maximum output.

It will be necessary to adjust the antenna compensating condenser to the car antenna after the receiver has been installed in the car.

- After the installation is complete, tune in a WEAK station between 55 and 65 on the dial.
- Adjust the antenna compensating condenser for maximum volume in the speaker.

4. Setting the Push Buttons

The push buttons are easily and accurately set from the front of the case without removing any panels, etc.

To set push buttons, lift up on push button and the setting screw is easily accessible. Loosen the screws of the buttons to be set, two or three turns to the left. It is not necessary that all the buttons be set at the same time.

Determine the five favorite stations whose call letters are to be placed in the call letter holder (holder enclosed in the instruction envelope). Place the call letters in the order of their frequency (kilocycles), that is, the station that is tuned-in nearest the 150 marking on the dial, should be placed in the right-hand opening, etc. After call letters have been placed in the holder, break off the celluloid strip five pieces to insert in front of the call letters to protect and hold them in place.

With the special screws provided (two, enclosed in the instruction envelope) mount the call letter holder in place above the push buttons.

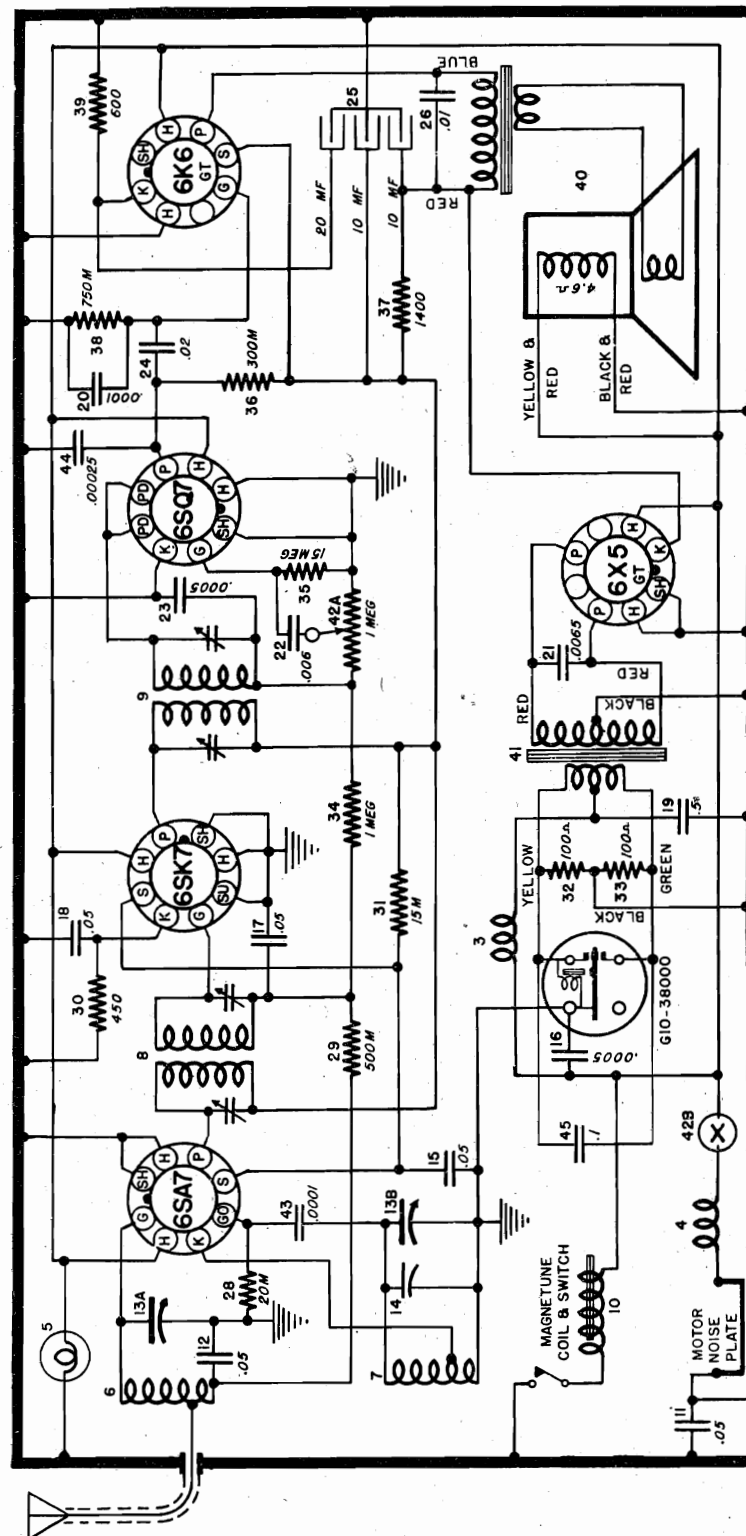
By means of the manual tuning knob tune-in AS ACCURATELY AS POSSIBLE, the station whose call letter has been placed in the right-hand opening. REMEMBER: the accuracy of the push buttons depends upon how accurate YOU tune-in the station when setting them.

Lift up the right-hand push button and with a small screw driver push the key all the way down. While holding the key down, securely tighten the setting screw. It is essential that you apply pressure while tightening the setting screw, in order to keep mechanism lined up with station tuned-in.

Remove screw driver and the first button is set, follow through with the same procedure to set the rest of the push buttons.

THE CROSLEY CORP.

MODEL A259
Schematic, Voltage
Socket, Notes



JANUARY, 1940

| TUBE & FUNCTION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------|-----|------|-----|-----|-----------|------|-----|-----|
| 6SA7 OSC-MOD. | GR. | GR. | 210 | 100 | END CATH. | 5.85 | GR. | 210 |
| 6SK7 I.F. AMP. | GR. | 5.85 | GR. | 2.8 | 100 | GR. | 210 | |
| 6X5GT RECT. | GR. | 256 | 256 | 256 | 256 | 256 | 256 | 256 |
| 6K6GT DET-OSC. | GR. | 5.85 | 220 | 210 | END | 15 | GR. | 15 |
| 6X5GT RECT. | GR. | 256 | 256 | 256 | 256 | 256 | 256 | 256 |

* 50 VOLT SCALE, 1000 OHMS PER VOLT.

⊕ A.C. TO GROUND

6.5 AMPERES AT 6 VOLTS, NORMAL OPERATING CURRENT.
7.0 AMPERES AT 6 VOLTS, SOLENOID OPERATING CURRENT.

VOLTAGES MEASURED WITH 1000 Ω PER VOLT
VOLT-METER FROM TUBE PRONG TO CHASSIS
AND MAY VARY PLUS OR MINUS 10% OF VALUES
GIVEN. GR - GROUND. J.B. - JUNCTION BLOCK.

OPEN - NO CONNECTION. J.B. - JUNCTION BLOCK.

IF PEAK 455 KC

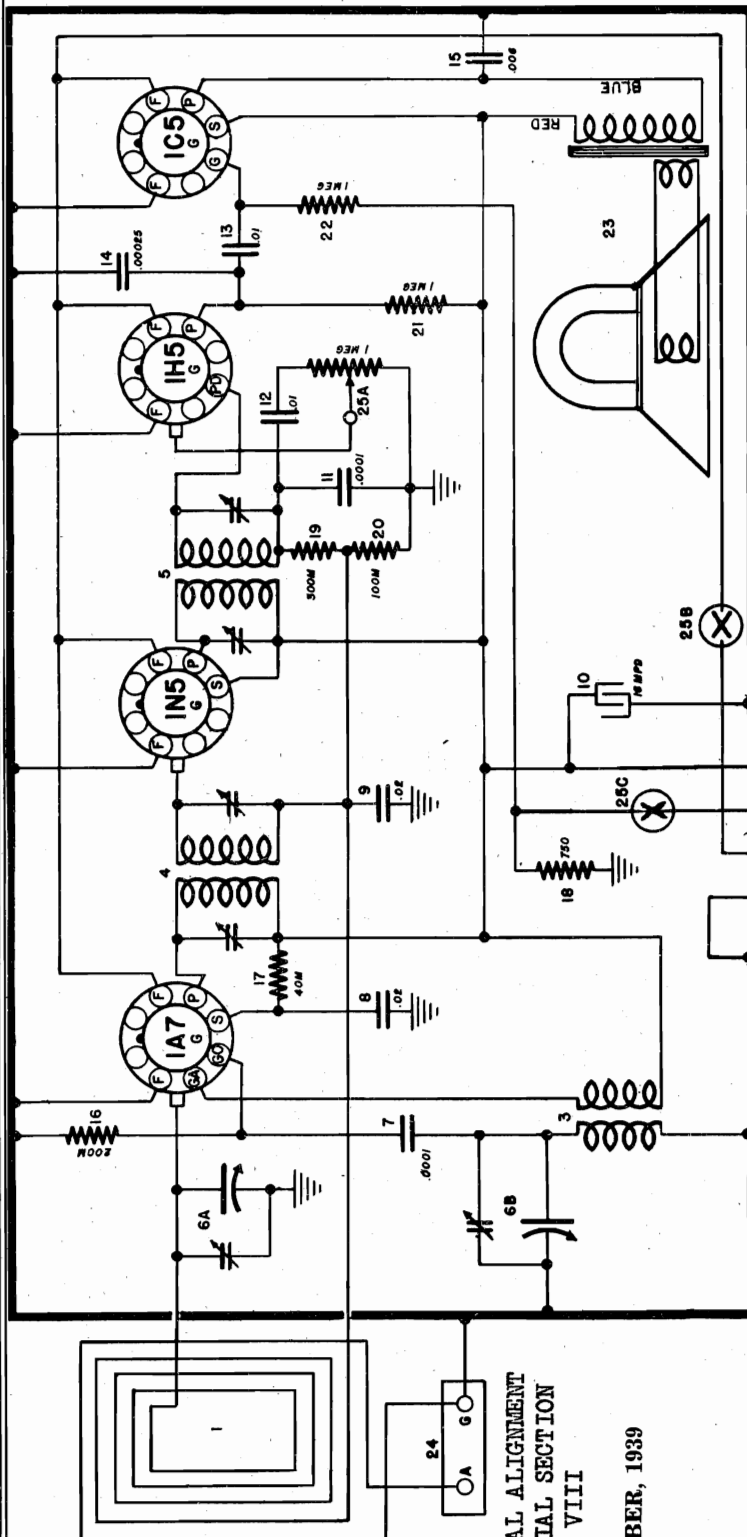
MODEL A-259 SPECIFICATIONS

This model Crosley Roamio is a single unit five tube super-heterodyne receiver. It incorporates an unusual electric push button tuning system of simple, rugged mechanical and electrical construction. The tubes used and their functions are as follows: one 6SA7 as oscillator-modulator, one 6SK7 I-F amplifier, one 6X5GT as diode detector, A.V.C., and 1st audio, one 6K6GT as pentode output and one 6X5GT as rectifier. The 6SA7 oscillator circuit is unusual in that the cathode is tied to a tap on the oscillator coil which is several turns above ground. Bias for the 6SK7 is obtained from the drop across item 30, a 450 ohm resistor and bias for the 6K6GT is obtained from the drop across item 39, a 600 ohm resistor. The 6SK7 is operated at zero bias. A.V.C. is supplied to the 6SA7 and 6SK7 through item 29, a 500,000 ohm filter and item 34, a 1 megohm filter respectively. The B circuit is filtered by means of item 37, a 1,400 ohm resistor, and the 10 mf. sections of item 25, a three section electrolytic condenser. Item 14 is a chemical temperature compensating condenser used in the oscillator circuit to prevent station drift.

MODEL 429

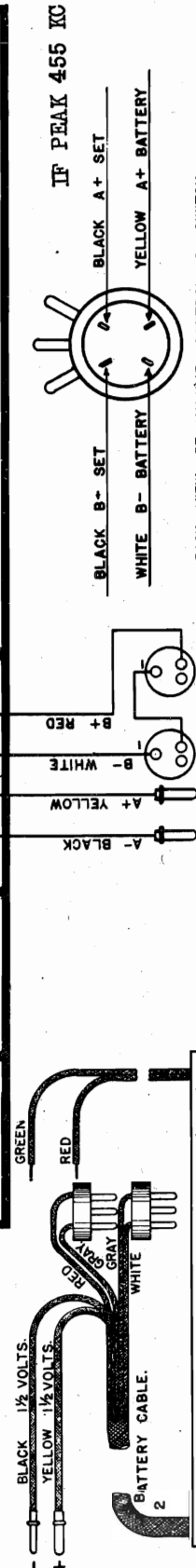
Schematic, Socket, Voltage
Trimmers, Alignment, Chassis

THE CROSLLEY CORP.



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

NOVEMBER, 1939



BACK VIEW OF VOLUME CONTROL & SWITCH

| Tube | Function | H | P | S | C | Ga |
|-------|-------------------------|-----|----|----|----|----|
| 1A7-G | Oscillator-Modulator | 1.5 | 82 | 48 | 0 | 82 |
| 1N5-G | I-F Amplifier | 1.5 | 82 | 82 | 0 | — |
| 1H5-G | Detector & 1st A-F Amp. | 1.5 | 17 | — | 0 | — |
| 1C5-G | Output | 1.5 | 78 | 82 | 6* | — |

Power Output approximately .5 Watt.
"A" Battery Drain approximately .25 Ampere at 1.5 Volts.
"B" Battery Drain approximately 8.5 Milliamperes at 90 Volts.
*Measured across item 18.

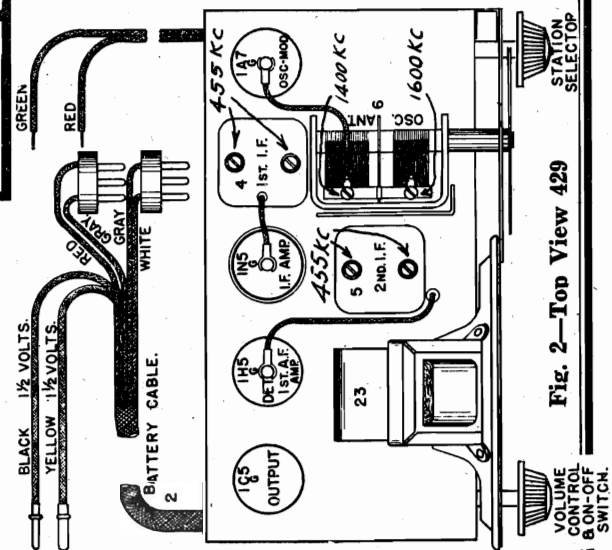
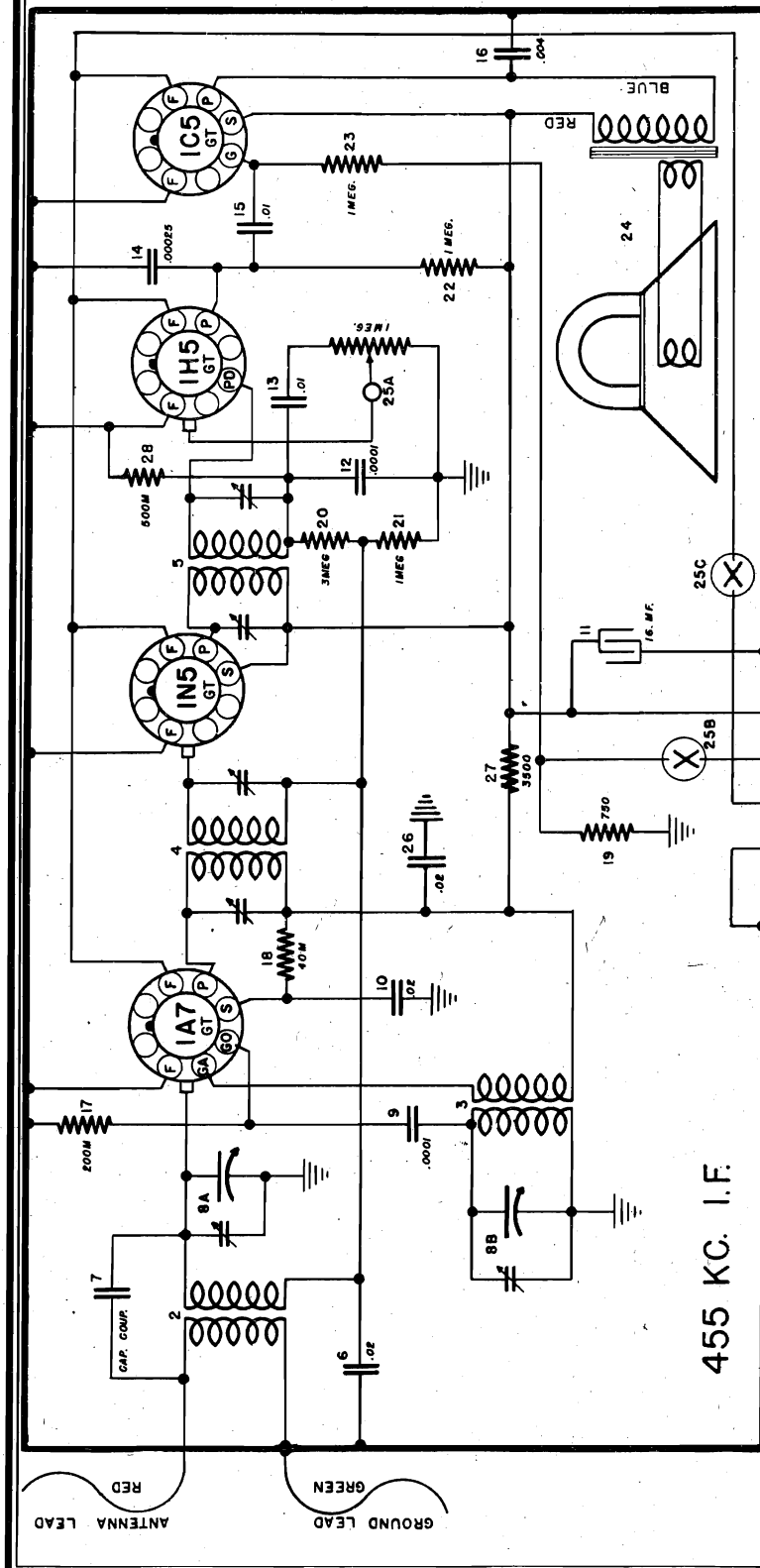


Fig. 2—Top View 429

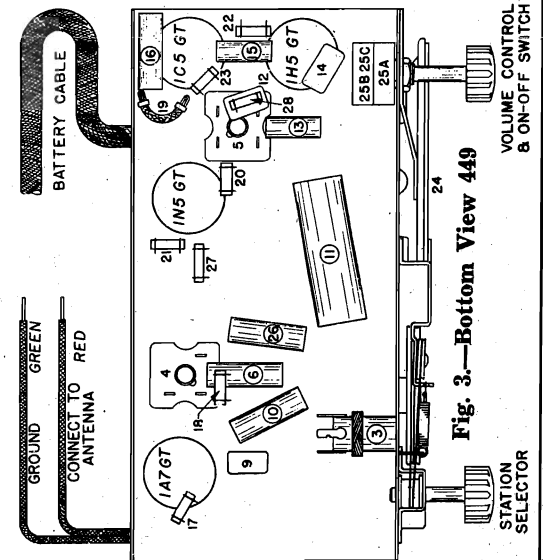
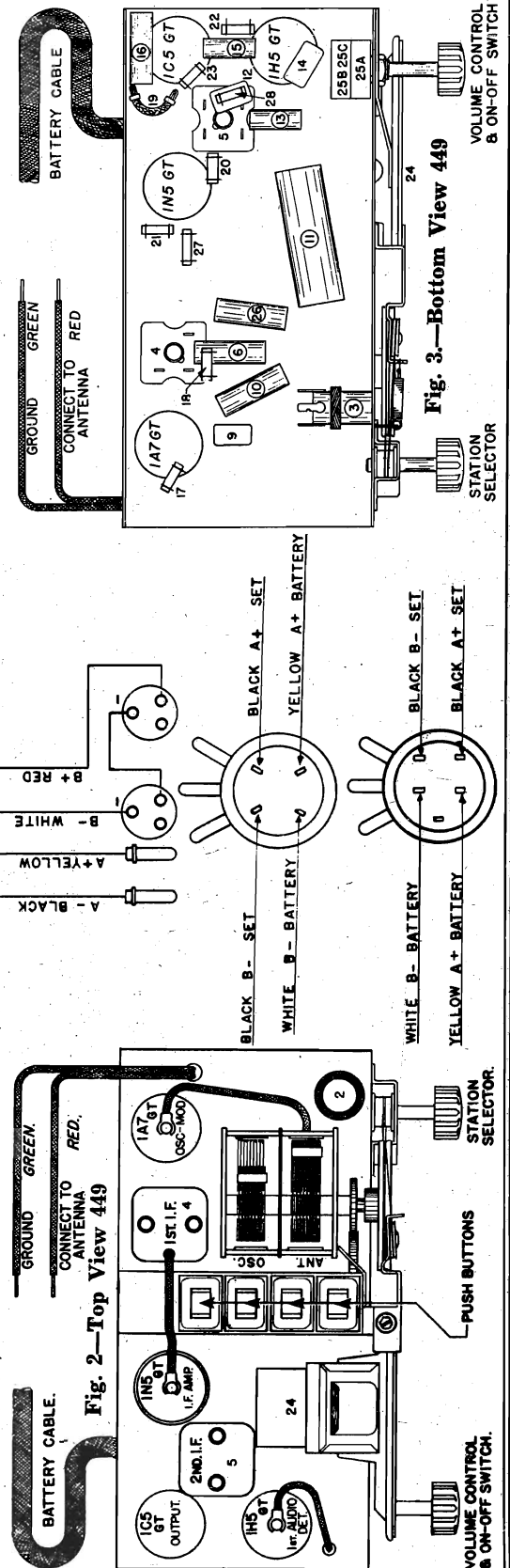
Fig. 3—Bottom View 429

THE CROSLEY CORP.

MODELS 449, 459
Schematic, Socket, Trimmers
Chassis



NOVEMBER, 1939



MODELS 449, 459

Voltage, Alignment

Parts

THE CROSLEY CORP.

PARTS LIST — MODEL 449 & 459

| Figures in first column refer to parts in Diagrams. | | | |
|---|------------|---|------------|
| Item No. | Part No. | Description | Part No. |
| 1 | C | Battery Cable (449) | W |
| 2 | C | Antenna Coil (459) | G178-35447 |
| 3 | G185-33002 | Oscillator Coil | |
| 4 | G201-33002 | 1st I. F. Transformer | |
| 5 | G194-33004 | 2nd I. F. Transformer | |
| 6 | G195-33004 | Condenser, .02 Mf. 200 V. Paper | |
| 7 | G6-56640 | Condenser Capacity Coupling | |
| 8A | G66-33001 | 2 Gang Var. Cond. (Oscillator Section) | |
| 8B | G12-46750 | Riveted Back Plate | |
| | G15-46564 | Pulley and Hub Assembly | |
| | B | Dial Face Back | |
| | B | No. 8 x 1/2" H. P. K. Screw (Dial) | |
| | B | R. Back (Drive Shaft Brkl.) | |
| | W | Dial Pointer | |
| | W | Drive Shaft | |
| | W | Drive Shaft Bracket | |
| | W | Drive Spring | |
| | W | Drive Cord (30") | |
| | W | Drive Cord Clamp | |
| | W | No. 8-32 x 1/2" Set Screw (Pulley and Hub Assembly) | |
| | G4 | Guide Cord (9") | |
| | W | Guide Cord Spring | |
| | W | Dial Glass (2 Req.) (8AK, 8AH and 8AG) (849 Only) | |
| | W | Condenser, .001 Mf. Milled | |
| | G2 | Condenser, .02 Mf. 200 V. Paper | |
| | W | Condenser, 16 Mf. 250 V. Elect. | |
| | G2 | Condenser, .01 Mf. 200 V. Paper | |
| | G13 | Condenser, .0025 Mf. Milled | |
| | G1 | Condenser, .01 Mf. 200 V. Paper | |
| | W | Resistor, 200,000 Ohms 1/2 W. Carb. | |
| | W | Resistor, 400,000 Ohms 1/2 W. Carb. | |
| | W | Resistor, 1 Megohm 1/2 W. Carb. | |
| | W | Resistor, 3 Megohms 1/2 W. Carb. | |
| | W | Resistor, 1 Megohm 1/2 W. Carb. | |
| | W | Resistor, 1 Megohm 1/2 W. Carb. | |
| | W | Speaker, Spec. (Model 449) | |
| | W | Speaker, Spec. (Model 459) | |
| | W | Output Transformer | |
| | W | Volume Control | |
| | W | Switch "A" Supply | |
| | W | Switch "B" Supply | |
| | W | Switch "C" Supply | |
| | W | Switch "D" Supply | |
| | W | 1/2" Flat Nut (Volume Control) | |
| | W | Condenser, .02 Mf. 200 V. Paper | |
| | W | Resistor, 500,000 Ohms 1/2 W. Carb. | |
| | W | Resistor, 500,000 Ohms 1/2 W. Carb. | |

TUBES AND VOLTAGE LIMITS

The following table gives the function of the tubes used, together with the voltage reading between the tube socket contacts and the chassis. Voltage readings should be taken with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with receiver in operating condition and the volume control full on and no signal input. The filament voltages should be measured with an accurate low range DC voltmeter (approximately 0 to 10 volts). Voltage limits may vary plus or minus 10% of values given.

TUBE SOCKET VOLTAGE READINGS

| Tube | Function | H | P | S | G | Ca | Go |
|-------|-------------------------|-----|----|----|----|----|----|
| 1A7-G | Oscillator-Modulator | 1.5 | 72 | 30 | — | 72 | — |
| 1N6-G | I-F Amplifier | 1.5 | 82 | 82 | — | — | — |
| 1H6-G | Detector & 1st A-F Amp. | 1.5 | 10 | 10 | — | — | — |
| 1C5-G | Output | 1.5 | 80 | 82 | 8* | — | — |

Power Output approximately 5 Watt.
 "A" Battery Drain approximately 25 Amperes at 1.5 Volts.
 "B" Battery Drain approximately 9 Milliamperes at 90 Volts.
 *Measured at No. 8 Socket Lug and Chassis.

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary, the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter across the "p" and "s" terminals of the 1C5G output tube. Be certain that the meter is protected from DC by connecting a condenser (1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier To 455 Kilocycles

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 1A7G tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the GREEN LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.
 (b) Set the station selector so that the tuning condenser plates are completely in mesh and turn the volume control knob to the right (ON).
 (c) Set the signal generator to 455 kilocycles.
 (d) Adjust both 2nd I-F trimmers for maximum reading on the output meter. (Fig. 2).
 (e) Adjust both trimmers on the 1st I-F transformer for maximum output. (Fig. 2).
 (f) Check operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

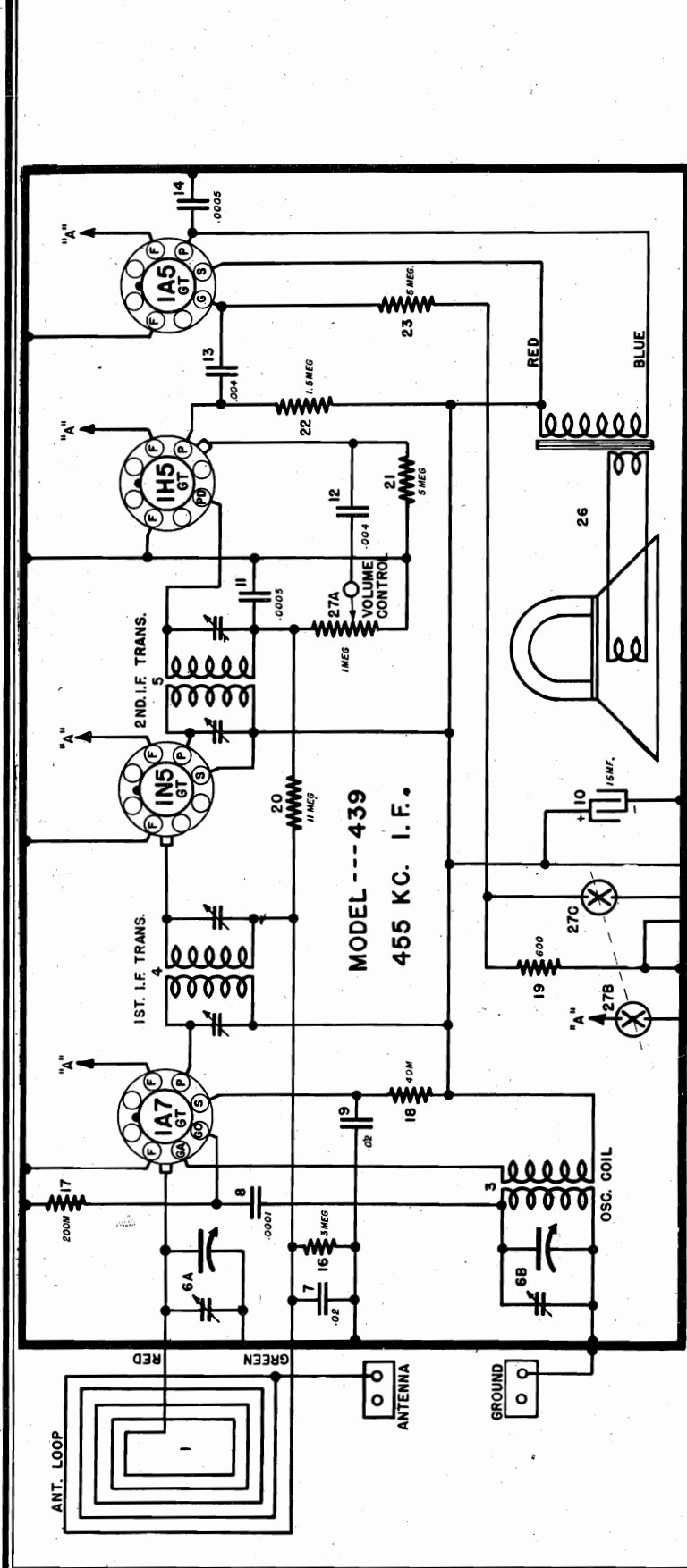
2. Aligning R-F Amplifier.

When aligning the R-F amplifier the output lead from the signal generator should be connected through a .0002 mfd. condenser to the RED lead of the receiver.
 (a) Set the signal generator to 1725 kilocycles.
 (b) Open the condenser gang all the way.
 (c) Adjust the "OSC" trimmer condenser on gang for maximum output.
 (d) Set the signal generator to 1400 kilocycles.
 (e) Tune the receiver to the generator signal for maximum output (approximately 140 on the dial).
 (f) Adjust the "ANT" trimmer condenser on gang for maximum output. DO NOT READJUST THE "OSC" TRIMMER AT 1400 KILOCYCLES.
 (g) Repeat operations (c) and (f) alternately until no further improvement in output can be obtained. If any of the circuits have been re-adjusted it may be necessary to reset the push buttons.

SETTING THE PUSH BUTTONS

Remove push buttons by pulling straight up. With a small screw driver loosen the set screw a turn or two. With the manual tuning knob tune-in as ACCURATELY AS POSSIBLE the station for which the button is to be set. Then push the button key all the way down and while you hold it in that position SECURELY TIGHTEN the set screw. Replace the push button. Use same procedure in resetting or adjusting the rest of the push buttons.

THE CROSLEY CORP.

MODEL 439
Schematic, Voltage
Socket, Trimmers, Chassis
Alignment


JANUARY, 1940

| Tube | Function | No. 1 No. 2 | No. 3 No. 4 | No. 5 No. 6 | No. 7 No. 8 |
|------|----------|-------------|-------------|-------------|-------------|
|------|----------|-------------|-------------|-------------|-------------|

| | | | | | |
|-------|-------------------------|-----|----|------|------|
| 1A7GT | Oscillator-Modulator | 1.5 | 34 | Neg. | 58 |
| 1N5GT | I-F Amplifier | 1.5 | 58 | — | J.B. |
| 1H5GT | Detector & 1st A-F Amp. | 1.5 | 10 | — | — |
| 1A5GT | Output | 1.5 | 58 | 3* | J.B. |

Power Output approximately 100 milliwatts.
 "A" Battery Drain approximately .20 Ampere at 1.5 Volts.
 "B" Battery Drain approximately 5.2 Milliampers at 61.5 Volts.
 *Measured across item 19.
 J.B. = Junction Block.

When aligning the R-F amplifier the output lead from the signal generator should be connected through a .0001 mfd. condenser to the "ANT" terminal (right-hand bracket used to fasten back) of the receiver. (Check dial pointer to see that it covers complete range.)

- Set the signal generator to 1500 kilocycles.
- Open the condenser gang all the way.
- Adjust the "OSC" trimmer condenser on gang for maximum output.
- Set the signal generator to 1400 kilocycles.
- Tune the receiver to the generator signal for maximum output (approximately 140 on the dial).
- Adjust the "ANT" trimmer condenser on gang for maximum output. **DO NOT READJUST THE "OSC" TRIMMER AT 1400 KILOCYCLES.**
- Repeat operations (e) and (f) alternately until no further improvement in output can be obtained.

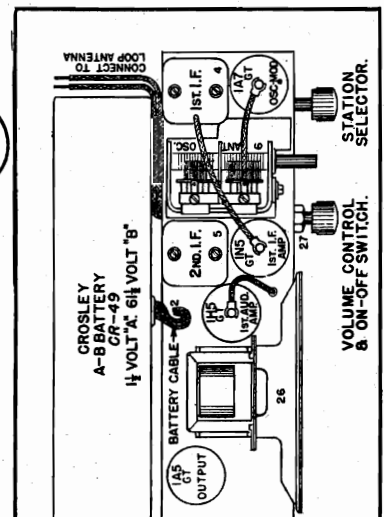
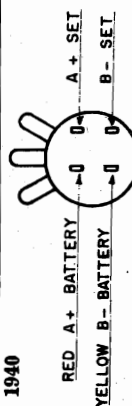


Fig. 2—Top View Model 439

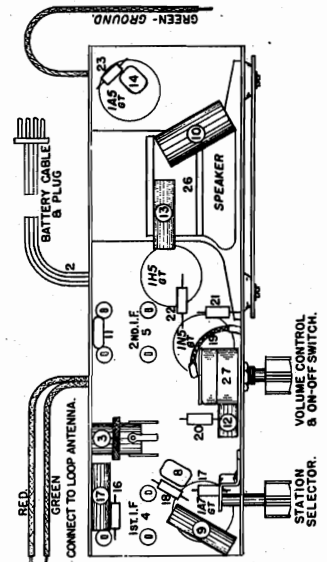
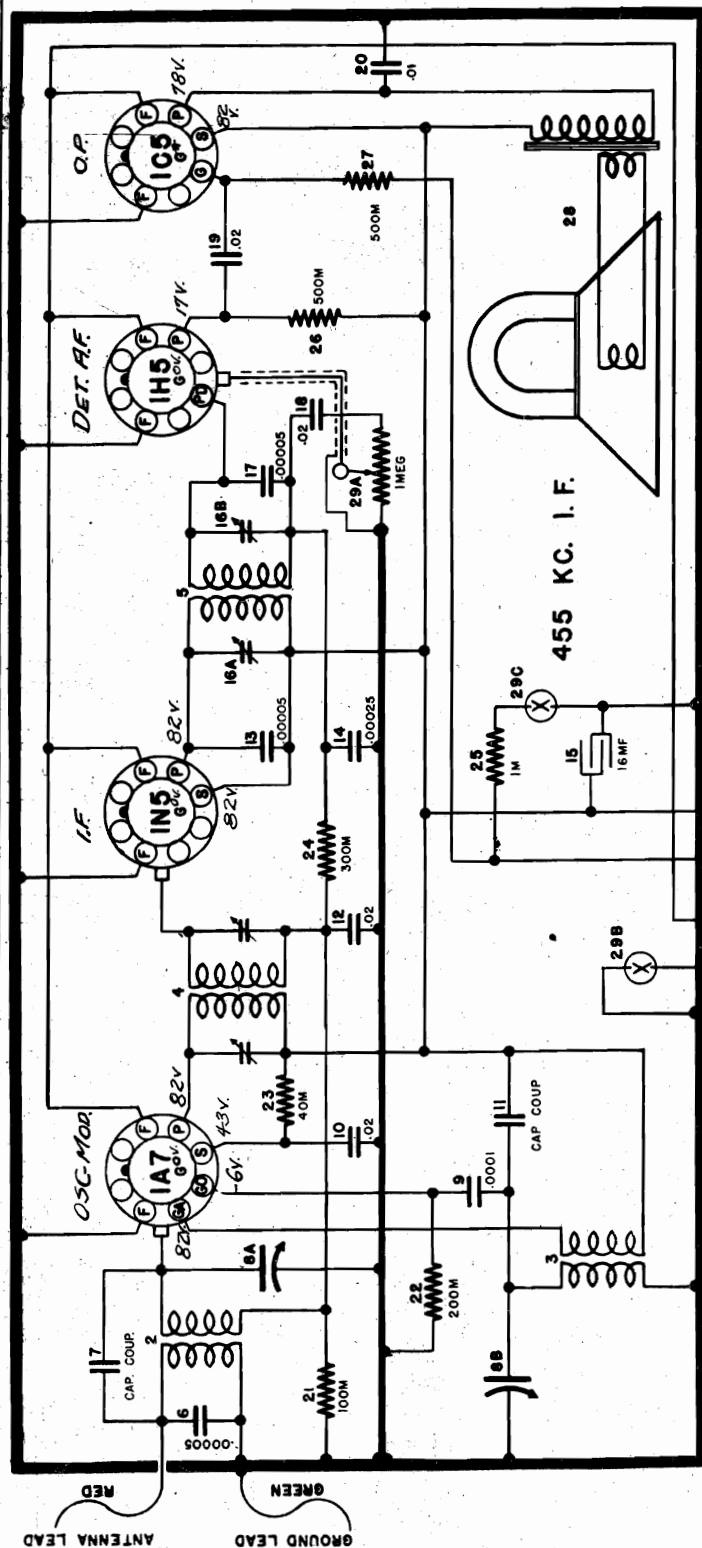


Fig. 3—Bottom View Model 439

THE CROSLEY CORP.



The method of connecting the battery cable to the batteries is shown on the Wiring Diagram. The batteries required are: one 1.5 volt "A", (EVEREADY No. 740 or equivalent) or 3 or 4 No. 6 DRY CELLS in parallel, and two plug-in type 45 Volt. 6 "B" batteries, (Eveready No. 485 or equivalent). — 290-1F TRIMMERS

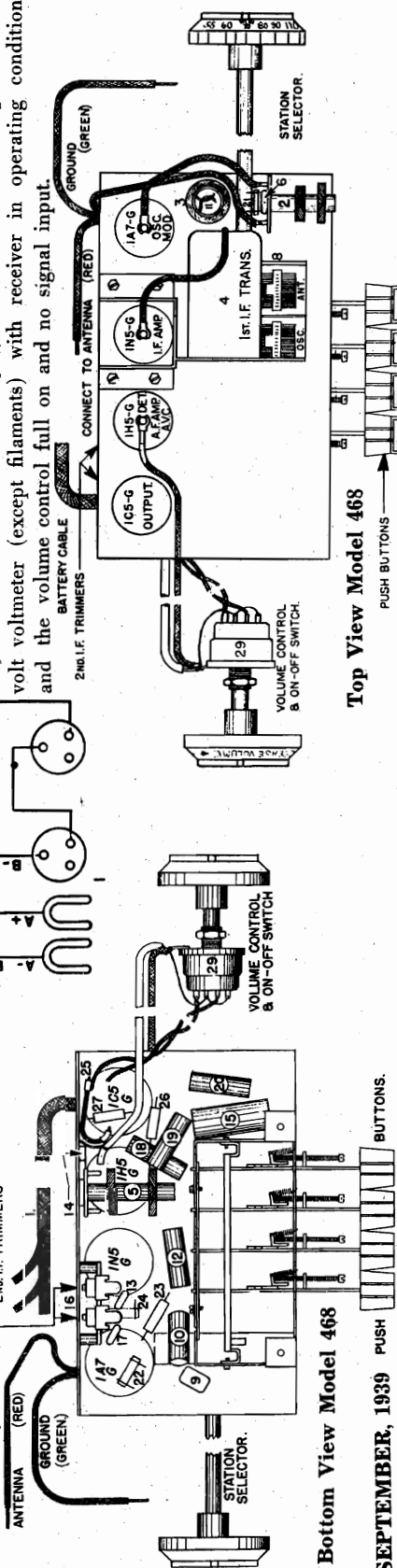
615 g volts *Measured at No. 8 Socket Lug and Chassis.

Power Output approximately .5 Watt.

"A" Battery Drain approximately .25 Ampere at 1.5 Volts.

"B". Battery Drain approximately 9 Milliampers at 90 Volts.

Voltage readings should be taken between the tube socket contacts and the negative side of the "A" battery circuit with a 1000 ohm per volt, 250 volt voltmeter (except filaments) with receiver in operating condition and the volume control full on and no signal input.



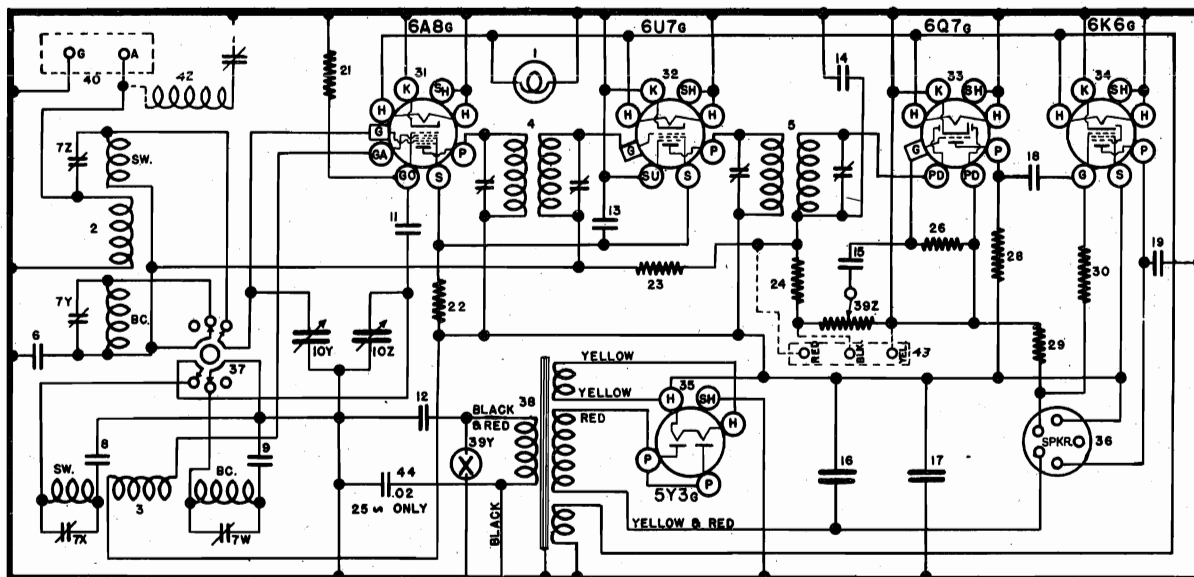
Top View Model 468

Bottom View Model 468

SEPTEMBER, 1939 PUSH BUTTONS.

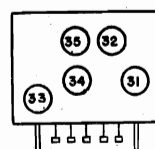
MODELS 518, 6518
Schematic, Socket
Trimmers, Chassis
Parts

THE CROSLEY CORP.



- 1 Dial Light, 6-8 Volt
- 2 Dial Light Socket Assembly
- 3 Antenna Coil, B. C. and S. W.
- 4 Oscillator Coil, B. C. and S. W.
- 5 1st I. F. Transformer
- 6 2nd I. F. Transformer
- 7Z Condenser, .02 Mf. 160 V.
- 7Y } Trimmer Condenser (S. W. Antenna
- 7X } B. C. Antenna
- 7W } S. W. Osc.
- 8 Condenser, .0014 Mf. Molded
- 9 Condenser, .0004 Mf. Molded
- 10Y 2 Section Gang Condenser (Ant.
- 10Z } Osc.
- Dial Glass
- Dial Mask (Polished Metal)
- Dial Glass Clip, L. H.
- Dial Glass Clip, R. H.
- Dial Glass Cushion
- Dial Pointer (White Celluloid)
- Dial Hand Guide
- 1/8"-No. 6 x 32 R. H. Screw for Dial Hand Guide
- Felt Strip
- 1/8"-No. 8 P. K. Screw (Dial Glass Clips)
- Riveted Dial Support, R. H.
- Riveted Dial Support, L. H.
- Drive Shaft (Manual)
- Drive Shaft Bracket
- 1/8"-No. 8 P. K. Screws for Drive Shaft Bracket
- Drive Cord (44 Inches Long)
- Drive Pulley Assembly
- 1/8"-No. 8 x 32 Set Screw for Drive Pulley (2 Req.)
- Spring Cord Tension
- Condenser, .00005 Mf. Molded
- Condenser, .01 Mf. 400 V.
- Condenser, .02 Mf. 200 V.
- Condenser, .00025 Mf. Molded
- Condenser, .006 Mf. 200 V.
- Condenser, 16 Mf. 250 V. Elect. (60 Cycle)
- Condenser, 30 Mf. 250 V. Elect. (25 Cycle only)
- Condenser, 16 Mf. 250 V. Elect.
- Condenser, .02 Mf. 200 V.
- Condenser, .006 Mf. 400 V.
- Power Cord
- Resistor, 40,000 Ohms 1/4 W. Ins.
- Resistor, 20,000 Ohms 1/4 W. Carb.
- Resistor, 3 Megohms 1/4 W. Carb.
- Resistor, 100,000 Ohms 1/4 W. Carb.
- Resistor, 60 Ohms 1/2 W. Flex.
- Resistor, 3 Megohms 1/4 W. Carb.
- Resistor, 40 Ohms 3/4 W. Flex.
- Resistor, 300,000 Ohms 1/4 W. Carb.
- Resistor, 275 Ohms 1 W. Flex.
- Resistor, 500,000 Ohms 1/4 W. Carb.
- 8 Prong Socket
- 5 Prong Socket (Speaker)
- Tube Shield

MODEL... 518. 6518
455 KC. I.F.

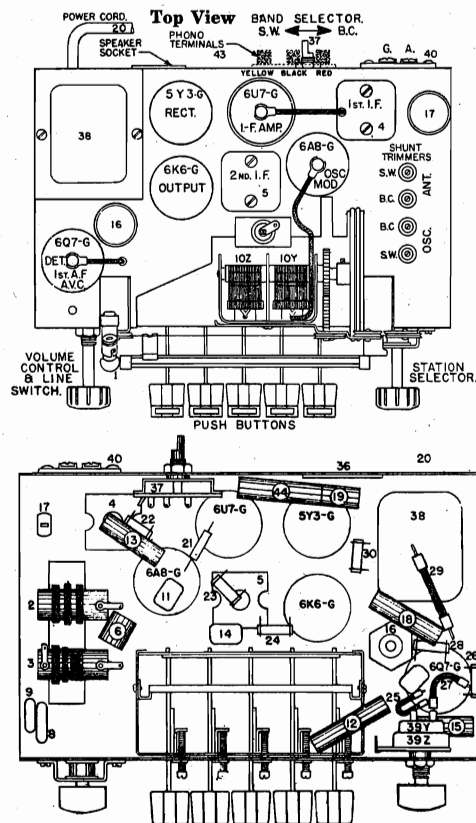
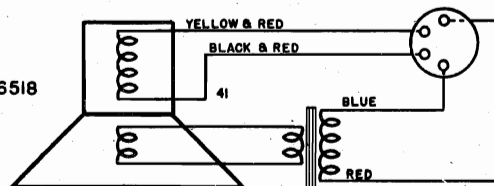


- Band Change Switch
- Power Transformer, 110 V. 25 Cycle
- Power Transformer, 220 V. 25 Cycle
- Power Transformer, Universal
- (Volume Control) 6518
- (On-Off Switch) 6518
- (Volume Control, 1 Megohm) 518
- (On-Off Switch) 518
- Terminal Strip, A-G
- Speaker, Spec. S-5274-J-5
- Speaker Cone Assy.
- Cardboard Ring
- Output Transformer
- Push Button Assembly
- Key Assembly (6518)
- Key Assembly (518)
- Key Clip
- 1 1/2"-No. 6 x 32 Screw (Clamp)
- Spring (Key Return)
- Adjusting Clip
- 1/8"-No. 6 P. K. Screw (Clip Mtg.)
- Key Plate (Rear Guide)
- Rocker Plate Assembly
- 1/4"-No. 6 x 40 Fil. Hed. Screw (Rocker Plate Bearing)
- Push Button (Black)
- Push Button (Brown)
- Celluloid Cover
- Call Letter Sheet (U. S. A. Stations)
- Knob Tuning (Black)
- Knob Tuning (Brown)
- Knob, Vol. and Switch (Black)
- Knob, Vol. and Switch (Brown)
- 8A Cabinet (Black)
- 8AA Cabinet (Brown)
- Wave Trap
- Phono Terminal
- Condenser, .02 Mf. 400 V. (25 Cycle only)
- Speaker Plug Clamp
- Call Letter Sheet (European)
- Escutcheon (6518 only)
- Screw (Escutcheon Mtg.)
- Cabinet (6518)
- Knob (6518 only) (2 Req.)
- Knob (6518) (Band Switch)

CIRCUIT CHANGES

SEPTEMBER, 1939

Item 22 was a 30,000 ohm resistor. Item 25, a 60 ohm 1/4 watt flexible resistor added from 607 cathode to ground. Item 26 should be 3 megohm resistor not 11 megs. Item 27, a 40 ohm 1/4 watt resistor should connect from the junction of items 26 and 29 at one end to low side of volume control. Item 29, a 275 resistor was a 375 ohm resistor.



Bottom View

MODELS 519, 529**Alignment****MODEL 668****Wave trap Data, Notes
Tuner**

CHASSIS NO. 519 & 529

**ALIGNMENT PROCEDURE
CONNECTING OUTPUT METER**

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 50L6GT output tube. Be certain that the meter is protected from DC by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning the I-F Amplifier To 455 Kilocycles.

(a) Disconnect the antenna roll from the receiver and connect the output of the signal generator through a 50 mmf. condenser to the antenna connection on the receiver. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condenser, Item 14, located on top of coil (Fig. 2) for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers located on the rear of chassis for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier.

(a) Set the signal generator to 1725 kilocycles.

(b) With the condenser gang turned to the minimum capacity position, adjust the trimmer condenser on the "OSC" section of the gang so that the 1725 kilocycle signal is heard. It is not necessary that the receiver tune through this signal.

(c) Set the signal generator to 1400 kilocycles.

(d) Tune-in the 1400 kilocycle signal in the region of 140 on the dial for maximum output.

(e) Adjust the trimmer condenser located on the "ANT" section of the gang for maximum output.

NOTE: Do not readjust the "OSC" trimmer.

(f) Repeat operations (d) and (e) for more accurate adjustments.

MODELS 519 & 529, 668.

WAVE TRAP

Some chassis of this model are equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 kilocycles. This assembly is located on the underneath side of the chassis and consists of a coil, a fixed condenser and a trimmer condenser as illustrated by dotted lines in the Wiring Diagram.

The wave trap should not be adjusted until all other adjustments have been made. To make the adjustment, feed a 455 kilocycle signal from the signal generator through a 100 mmf. condenser into the antenna terminal of the receiver. With the band selector switch turned to the Broadcast Band position, the gang condenser open and the volume control full on, adjust the trimmer condenser on the wave trap for MINIMUM output.

Should the interfering station be operating on a frequency of slightly more or less than 455 kilocycles, the exact frequency should be determined with the aid of the signal generator. Then, instead of feeding a 455 kilocycle signal into the receiver the exact frequency of the interfering signal should be used. If it is not possible to determine the exact frequency of the interfering signal the antenna may be attached to the receiver and the receiver tuned to the position where the interfering signal is most noticeable. Then adjust the wave trap for minimum interference.

CHASSIS MODEL 668

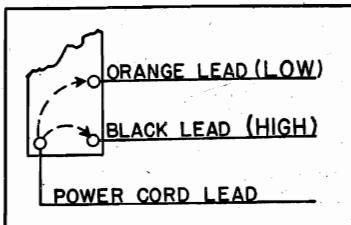
This model is a six-tube superheterodyne, phono combination receiver. The tuning range is from 540 to 1725 kilocycles. The Phono Assembly consists of a sensitive crystal pickup, a small efficient self-starting motor and a separate switch for changing from radio to phono operation.

For adapting the phono-motor to 50 cycle operation it is only necessary to change the rubber drive bushing on the motor shaft, using pulley No. 46991.

THE CROSLEY CORP.**50 CYCLE POWER TRANSFORMER
ADJUSTMENT**

Receivers equipped with a 50 cycle power transformer have a "high" and "low" voltage tap on the under side of the chassis. The "high" voltage lead (BLACK) and the "low" voltage lead (ORANGE) are connected to a terminal strip near the transformer.

The voltage range of the "low" tap of the 95-130 volt



transformer is from 95 to 112½ volts and of the "high" tap is from 112½ to 130 volts.

The accompanying illustration shows the connections for changing from high to low or low to high line voltage. Note the "jumper" wire which is attached to the terminal at which one side of the power cord is attached. The other end of this jumper wire should be connected to the ORANGE or BLACK lead of the transformer primary, according to the line voltage the receiver is to be used on.

NOTE: Any change made in the power supply circuit of the receiver should be plainly stamped or otherwise permanently recorded on the rear of the chassis.

SETTING THE PUSH BUTTONS

With a small screw driver or pen knife remove celluloid cover and the call letters. Insert screw driver in the hole in the front of the button and loosen the set screw a turn or two. With the manual tuning knob, tune-in as ACCURATELY AS POSSIBLE the station whose call letters were in the button or that station for which the button is to be set. Then push the button all the way down and while you hold it in that position SECURELY TIGHTEN the set screw. Replace the call letters and call letter cover. Use same procedure in resetting or adjusting the rest of the push buttons.

MODELS 548 & 5548, 558.

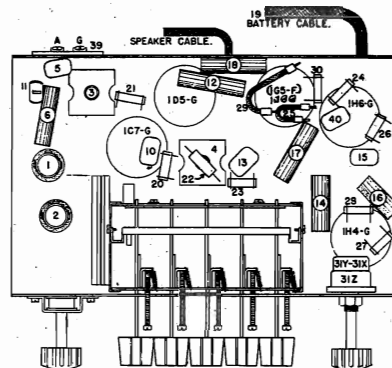
**ALIGNMENT PROCEDURE
CONNECTING OUTPUT METER**

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 1G5G Output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning the I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd., or larger condenser to the top cap of the 1C7G Osc-Mod tube, leaving the tube's grid clip in place. Connect the ground lead from the signal generator to the "GND" terminal of the receiver.

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON).

MODELS 548, 558, 5548**Alignment, Voltage
Tuner, Chassis**

Bottom View

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both trimmers located on top of the 2nd I-F transformer for maximum output. Fig. 2.

(e) Adjust both trimmers located on top of the 1st I-F transformer for maximum output.

(f) Check operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

2. Aligning the R-F Amplifier.

(a) Connect the output lead from the signal generator through a .0001 mfd. condenser to the "ANT." terminal of the receiver. Connect generator ground lead to the chassis.

(b) Set signal generator to 1725 kilocycles.

(c) Open condenser gang all the way.

(d) Adjust "OSC" trimmer on gang to 1725 kc. signal, the gang does not have to tune through this signal.

(e) Set signal generator to 1400 kilocycles.

(f) Tune in 1400 kc. signal with station selector, should be approximately 140 on dial.

(g) Adjust "ANT." trimmer on gang for maximum output. Do not readjust "OSC" trimmer. Repeat above operations for more accurate adjustments.

SETTING THE PUSH BUTTONS

If any of the circuits have been readjusted it may be necessary to reset the push button tuning system.

Remove the call letters from the buttons or remove the complete button. Loosen set screws a turn or two by turning to the left. Then tune-in as accurately as possible the station to which the button is to be set. With the screw driver inserted in adjustment screw slot push the key all the way down and while holding in that position securely tighten the adjusting screw. It should be remembered that when tightening the adjusting screw in this manner, to all apply a steady pressure when tightening the screw in order to keep the key aligned with the station tuned-in.

Repeat the above procedure for resetting the rest of the buttons.

NOTE:

The schematic, socket layout, and parts list of Models 548 and 5548 will be found on Crosley page 9-38 in Volume IX.

MODELS 548 — 3 & 558

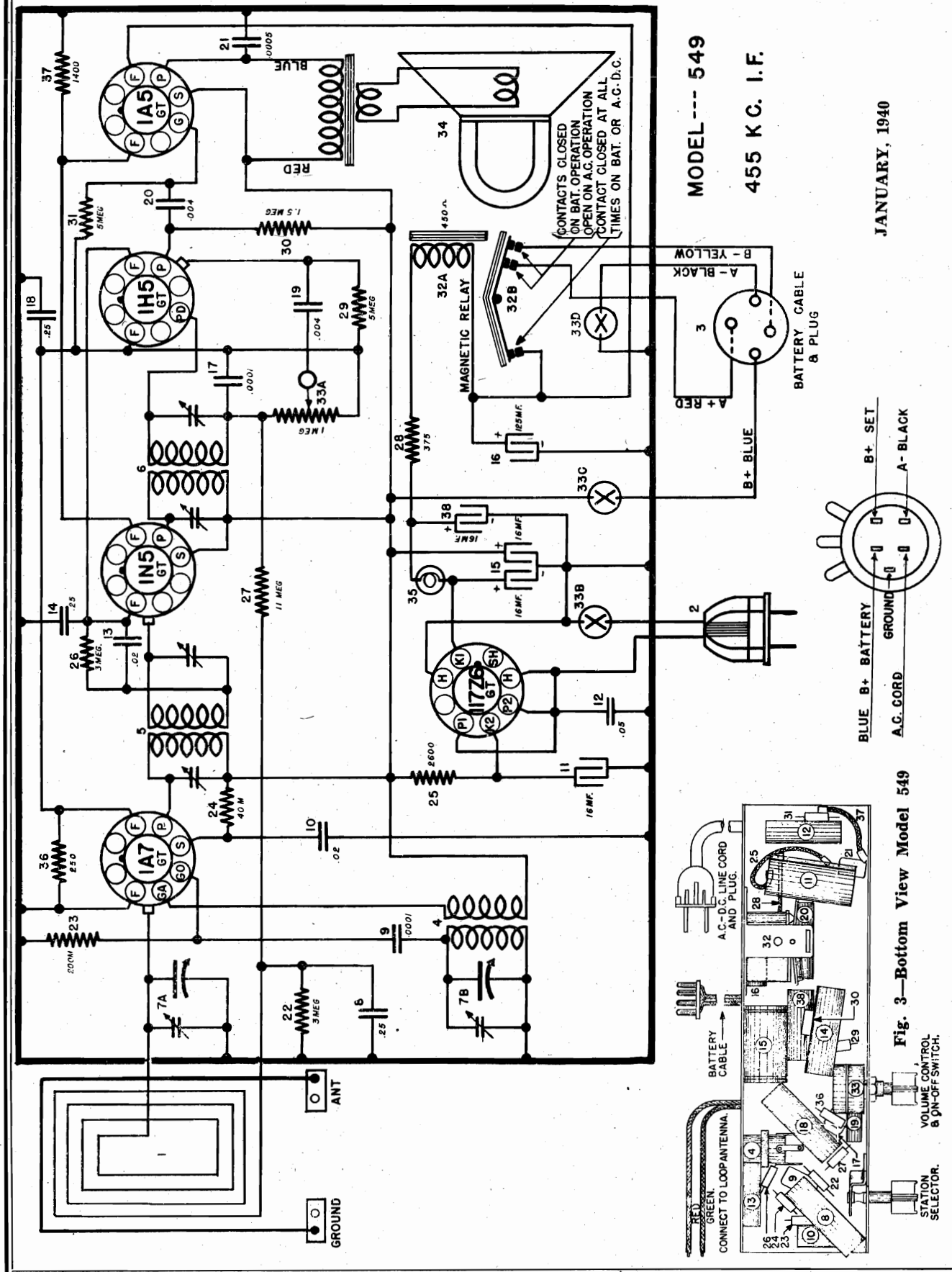
TUBE SOCKET VOLTAGE READINGS

| Tube | Function | H | P | S | G | Ga | Go |
|-------|-------------------------|-----|-----|-----|----|-----|----|
| 1C7-G | Oscillator-Modulator | 2.0 | 120 | 40 | 0 | 120 | -3 |
| 1D5-G | I-F Amplifier | 2.0 | 120 | 40 | 0 | — | — |
| 1H6-G | Detector & 1st A-F Amp. | 2.0 | 50 | — | 0 | — | — |
| 1H4-G | 2nd A-F Amplifier | 2.0 | 50 | — | 0 | — | — |
| 1G5-G | Output | 2.0 | 123 | 129 | -6 | — | — |

Power Output approximately .750 Watt. 2 W FOR MODEL 548
"A" Battery Drain approximately .42 Ampere at 2 Volts. PLUS 120 MA FOR MODEL 558
"B" Battery Drain approximately .18 Milliamperes at 135 Volts.

Voltage readings should be taken between the tube socket contacts and the negative side of the "A" battery circuit.

THE CROSLEY CORP.

MODEL 549
Schematic, Chassis

MODEL 549

Voltage, Socket

Trimners, Alignment

THE CROSLEY CORP.

The circuit is a conventional superheterodyne with a tuned loop antenna stage. Four 1.4 volt tubes and one 117Z6GT tube are employed as follows: one 1A7GT as oscillator-modulator, one 1N5GT as 455 kc. I-F amplifier, one 1H5GT as diode detector, A.V.C. and first audio, one 1A5GT as power output and the 117Z6GT as rectifier (used only when plugged into 110 volt power circuits).

The filaments of the 1.4 volt tubes are connected in series and have plate current compensating resistors one, item 36, a 250 ohm resistor across the 1A7GT filament and the other, item 37, a 1,400 ohm resistor from the negative leg of the 1A5GT to chassis.

When used on 110 volt power circuits one half the 117Z6GT supplies the filament voltage and the other half the B voltage. The rectified voltage for the filament string is well filtered by the following, item 35, which is a $7\frac{1}{2}$ watt 110 volt miniature lamp

and does triple duty—, 1, regulates the voltage—2, acts as a filter—3, as an ON-OFF indicator; item 28 a 375 ohm resistor and item 32A, the relay coil which serves as a choke and their associated electrolytic condensers, i.e., item 15, 16 mf.—item 38, 16 mf. and item 16, 125 mf. The above mentioned miniature lamp (item 35) should always be replaced with an exact duplicate should replacement become necessary.

The "b" voltage is filtered by means of item 25, a 2,600 ohm resistor and item 11—a 16 mf. electrolytic and one section of item 15 (twin electrolytic) 16 mf. condenser.

The relay automatically disconnects the batteries from the circuit when the receiver is operated on 110 volt circuits.

VOLTAGE READINGS—WITH CR649 BATTERY PACK

| Tube | Tube Socket Function | PIN NUMBER | | | | | | | |
|---------|----------------------|------------|-------|-------|-------|-------|-------|-------|-------|
| | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 | No. 7 | No. 8 |
| 1A7GT | Oscillator-Modulator | 0 | 1.5 | 70 | 40 | Neg. | 70 | 0 | 0 |
| 1N5GT | I-F Amplifier | 0 | 4.5 | 70 | 70 | 1.5 | — | 3 | 0 |
| 1H5GT | Det, AVC, 1st Audio | 0 | 3.0 | 11 | 11 | — | 0 | 1.5 | 6 |
| 1A5GT | Output | 0 | 6.0 | 68 | 70 | — | 6 | 4.5 | 1.5 |
| 117Z6GT | Rectifier | 0 | 0 | 0 | 68 | 0 | 0 | 0 | 6.0 |

Power Output approximately 100 M. W.

"A" Battery Drain 50 M. A.

"B" Battery Drain 5.2 M. A.

VOLTAGE READINGS—@ 117.5 VOLT LINE (A.C.)

| Tube | Tube Socket Function | PIN NUMBER | | | | | | | |
|---------|----------------------|------------|------------|------------|-------|------------|-------|-------|-------|
| | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 | No. 7 | No. 8 |
| 1A7GT | Oscillator-Modulator | 0 | 1.4 | 102 | 56 | -3 | 102 | 0 | 0 |
| 1N5GT | I-F Amplifier | 0 | 4.5 | 102 | 102 | 1.5 | — | 3.0 | 0 |
| 1H5GT | Det, AVC, 1st Audio | 0 | 3.0 | 17 | 17 | — | 0 | 1.5 | 45 |
| 1A5GT | Output | 0 | 6.0 | 98 | 102 | — | 28 | 4.5 | 1.5 |
| 117Z6GT | Rectifier | 58 5 A.C. | 117.5 A.C. | 117.5 A.C. | 142 | 117.5 A.C. | 0 | 0 | 126 |

Power Output approximately 200 M. W.

Watts @ 117.5 volts 20 watts.

Above readings will be approximately 10% less when checked on D.C. power circuit.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power supply and for this reason all test equipment should be thoroughly insulated in order that the power supply will not become short circuited while aligning the receiver.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 1A5GT output tube. Be certain that the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning the I-F Amplifier to 455 Kilocycles

(a) Connect the output of the signal generator through a .02 mf. condenser to the grid cap of the 1A7GT oscillator-modulator tube leaving the tubes' grid cap in place. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condensers for maximum reading on the output meter.

(e) Adjust the trimmer condensers located on the 1st I-F transformer for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier

When aligning the R-F amplifier the output lead from the signal generator should be connected through a .0001 mf. condenser to "A" terminal and the ground lead to the "G" terminal on the back of the cabinet.

It is essential that the following alignment be made with the receiver in the cabinet and the battery and back in position. Trimmer adjustments may be made on the two luggage type carrying cases through the two holes in the top, beneath the carrying handle. On the walnut cabinet model the oscillator will have to be aligned before placing chassis in the cabinet and then adjust the antenna trimmer provided on the back.

Before aligning receiver check the position of the pointer by opening gang all the way, the pointer should then split the 1600 kilocycle calibration point.

(a) Set signal generator to 1400 kilocycles.

(b) Tune gang to 140 on the dial, then adjust oscillator trimmer (rear section of gang) for maximum output.

(c) Adjust antenna trimmer (front section of gang) for maximum output.

RELAY

The receiver, when plugged into 110 volt circuit, will operate on the batteries until rectifier warms up and trips the relay. When relay trips there should be no decrease or dead spot in output as rectifier should be warmed up sufficiently to carry load and give a slight increase in output due to higher plate voltage available.

The relay is insulated from the chassis and care should be exercised when probing so as not to short it.

In earlier models the relays have three sets of contacts and the single side must make contact at all times. The double side must make contact when batteries are used and both contacts (double contact side) must break when operated on 110 volt circuits. Later models the single contact side was omitted and a flexible braid connection used instead.

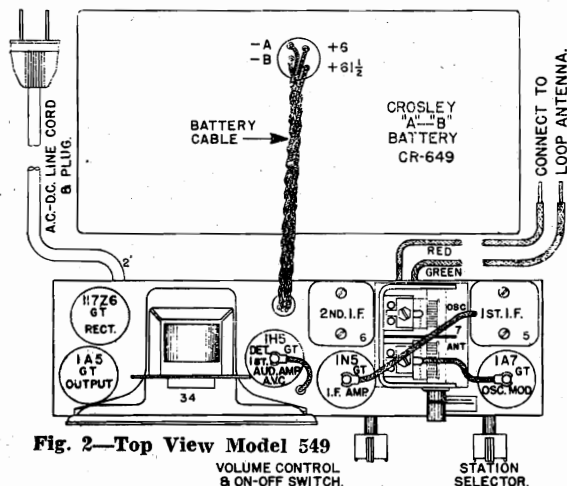
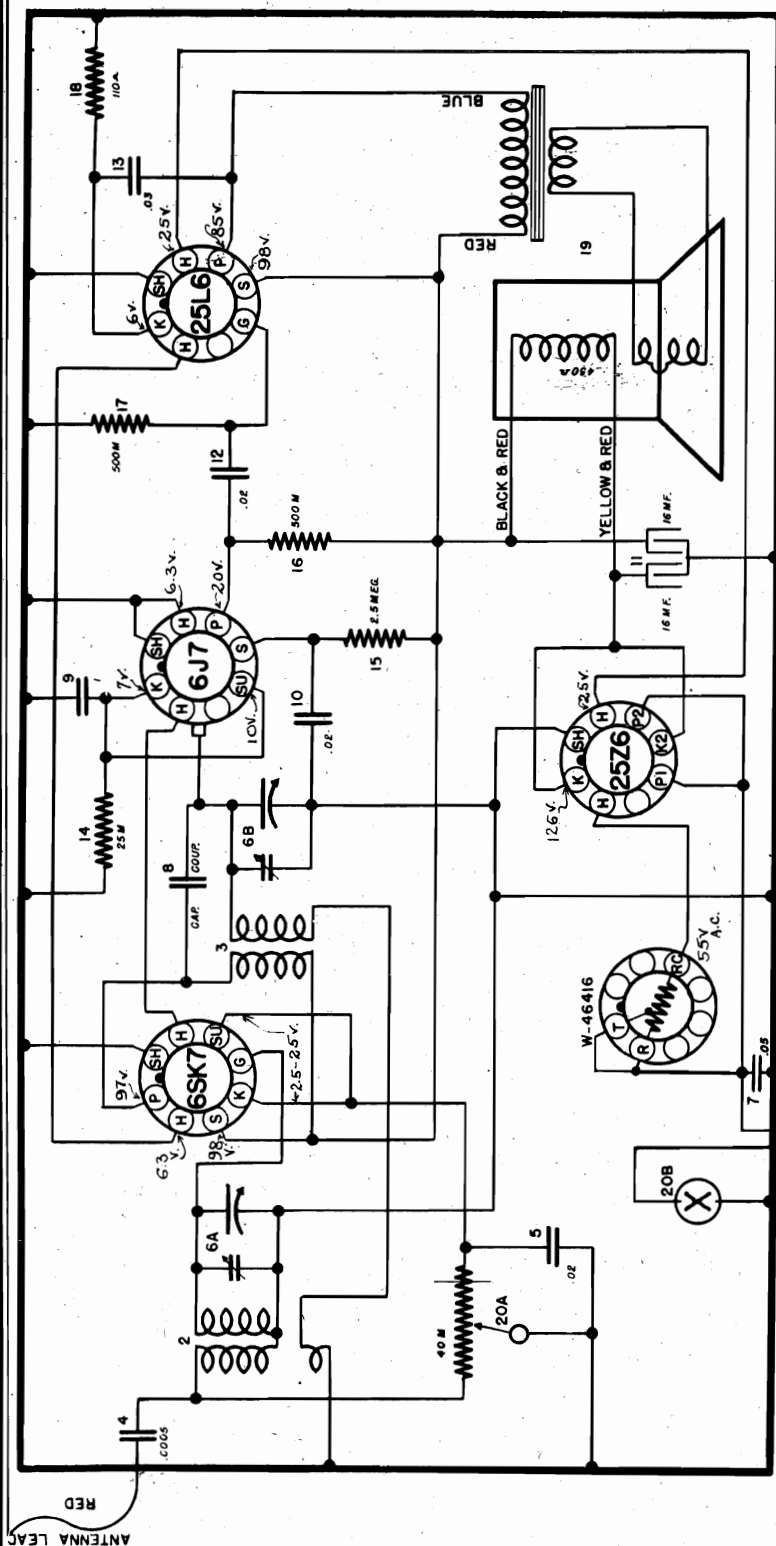


Fig. 2—Top View Model 549

Trimmers, Chassis
Alignment, Voltage

Power output approximately 2 watts. Drop across field 28 volts.
Power consumption at 117.5 volts line 45 watts (A.C.).
All readings except filaments will be approximately 10% lower on 117.5 D. C.



- (a) Connect the output lead of the signal generator through a .0001 mf. condenser to the antenna lead on the receiver. The ground lead of the generator should be connected through a .001 mf. condenser to the chassis.
- (b) Open the gang condenser all the way.
- (c) Set the generator to 1725 kilocycles.
- (d) Adjust the trimmer condensers on the gang until the 1725 kc. signal is heard. The gang does not have to tune through this signal.
- (e) Set the generator to 1400 kc.

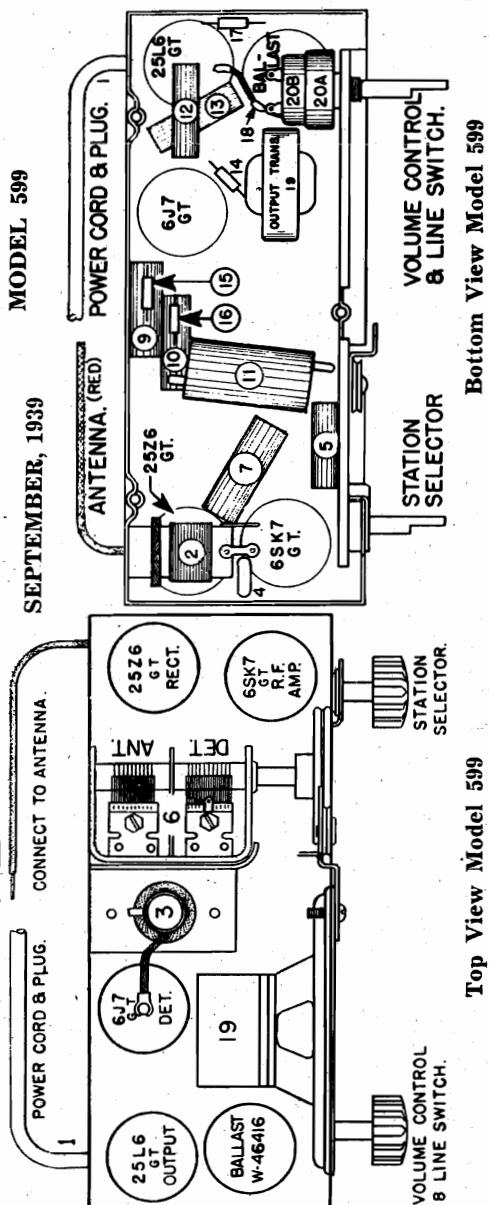
- (f) Tune the set to the 1400 kc. signal, then alternately adjust the trimmers on the gang until no further improvement can be noticed on the output meter.
- NOTE: Always use the lowest signal generator output that will give a reasonable indication on the output meter.

NOTE: Always use the lowest signal generator output that will give a reasonable indication on the output meter.

Keep the two grid leads as far as possible from each other.

Voltage readings between the tube socket contacts and chassis.

SEPTEMBER, 1939



Top View Model 599

Bottom View Model 599

For adapting the phono-motor to 50 cycle operation it is only necessary to change the drive pulley on the motor shaft, using pulley No. 48536.



| Tube | Function | H | P | S | K | G | Ga | Go |
|-------|---------------------------|-----|-----|----|-----|-----|----|------|
| 6A8G | Oscillator-Modulator | 6.3 | 230 | 68 | — | — | 68 | Neg. |
| 6K7G | I-F Amplifier | 6.3 | 230 | 68 | — | — | — | — |
| 6Q7G | Detector—A. V. C.—1st A-F | 6.3 | 74 | — | — | — | — | — |
| 6P5G | Driver | 6.3 | 230 | — | +13 | — | — | — |
| 6AC5G | Power Output | 6.3 | 225 | — | — | +13 | — | — |
| 5Y3G | Rectifier | 5.0 | — | — | — | — | — | — |

Voltage drop across speaker field 44 volts.
Maximum power output approximately 5 watts.
Power consumption at 117.5 volts approximately 85 watts

Voltage drop across speaker field 44 volts.
Maximum power output approximately 5 watts.
Power consumption at 117.5 volts approximately

MODEL 639

Socket, Trimmers
Phono Assembly

THE CROSLEY CORP.

FIGURE 1

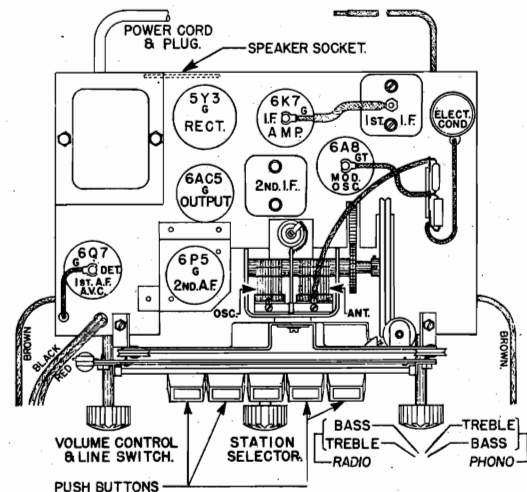
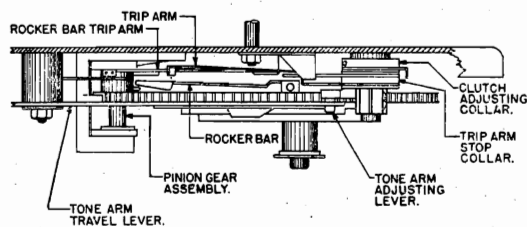


Fig. 2—Top View Model 639

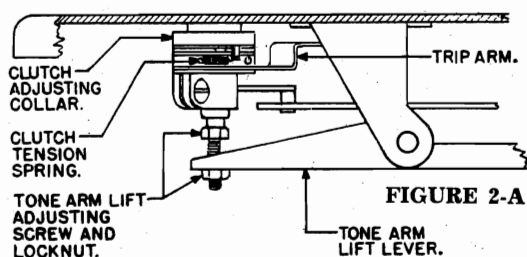


FIGURE 2-A

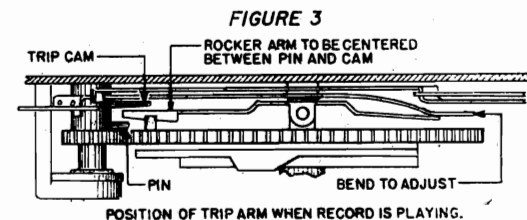


FIGURE 3

FIGURE 4.

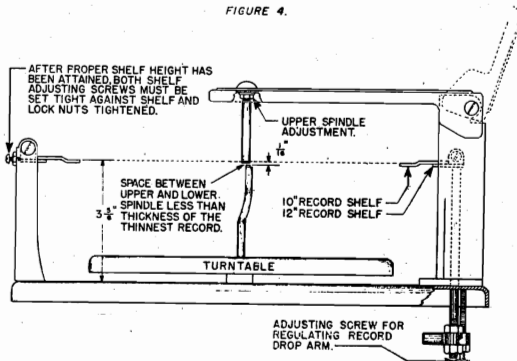


FIGURE 5

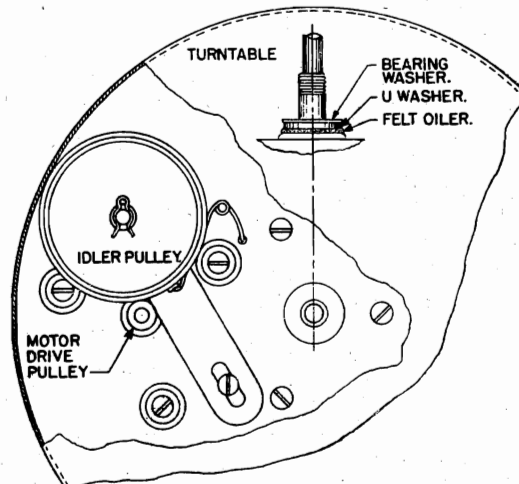
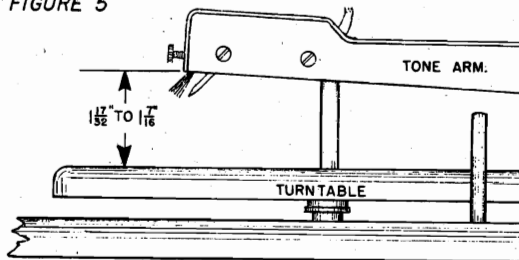
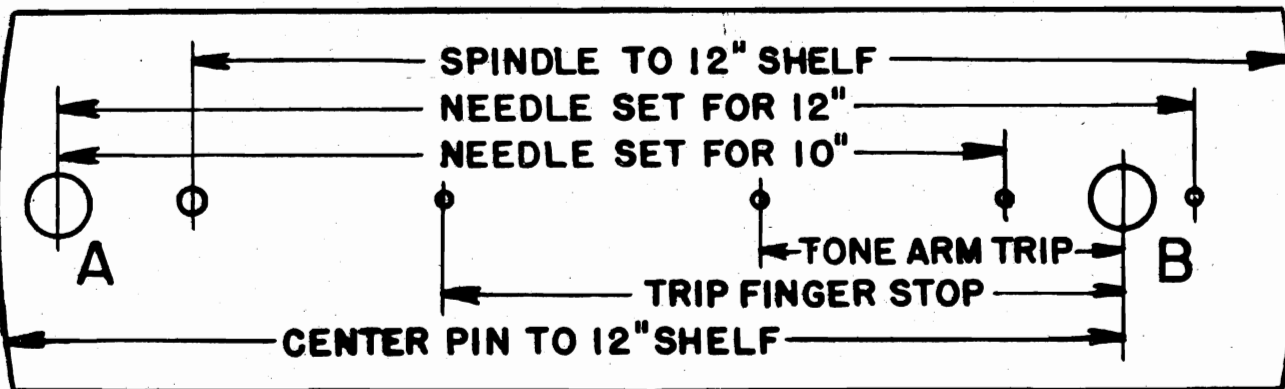


FIGURE 6



ADJUSTING GAUGE TEMPLATE

THE CROSLEY CORP.

MODEL 639
Alignment
Record Changer Data

right a fraction of an inch. Tighten set screw. Check operation.

5. **Records Do Not Drop.**
 1. Record hole tight or record warped.
 2. Shelf height not correct. To adjust see Fig. 4 for correct height; adjust for 10" records first.
 3. Spindles may not be in correct relation. See Fig. 5 for correct relation.
 4. Record drop cam roller out of adjustment. Set correct shelf height (10" shelf) by loosening lock nut and turning screw; tighten locknut.
6. **Drops More Than One Record.**
 1. Warped record.
 2. Spindle alignment and etc. Same procedure as listed under 5.
7. **Tone Arm Drags On Record.**
 1. Too many records on the turntable.
 2. Records may be thicker than average or warped.
 3. Needle too long or not properly seated.
 4. Tone arm lift adjusting screw loose or out of adjustment.

To check the tone arm for correct lift, rotate turntable (clockwise) to hand and place record on turntable to actuate trip. Turn tone arm up until it reaches maximum height and starts to travel toward tone arm rest, then stop when the arm is approximately one inch from edge of turntable. Check the height of the tone arm from the surface of the turntable as indicated in Figure 5. From the lower edge of the tone arm to the top of the turntable the distance should be one inch. If the distance is less than one inch, adjust the tone arm lift screw (Fig. 2-A) loosen locknut and turn screw until arm is within above tolerance, then tighten locknut.

SOCKET VOLTAGES

The tube socket voltages are measured from the tube socket contacts to the chassis with a 1000 ohm per volt 500-volt D. C. voltmeter (except filaments) with receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range A. C. voltmeter (approximately 0.10 volts). Readings may vary plus or minus 10% of values given.

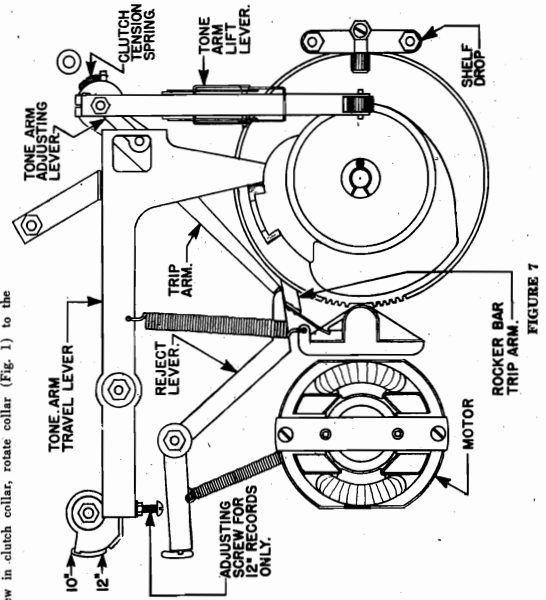


FIGURE 7

the center of the record, sufficient torque is developed to cause the trip arm to move. To adjust the trip arm, use a No. 6 Bristol wrench to loosen the special set screw in the collar nearest the base of the changer, see Fig. 1. Loosen set screw and turn collar a fraction of an inch to the left (counter clockwise) to tighten set screw. Check and repeat until record plays to end.

4. Does Not Trip After Record Is Finished.

1. Center groove on record does not have sufficient pitch to develop enough torque to actuate clutch. This may result from improperly cut trip groove in record or loose clutch setting.

2. It may be possible that the trip arm may have jumped to the wrong side of the rocker bar trip arm, see Fig. 7. It should be on the same side as reject arm. 3. To check the trip action adjustment, place the gauge (hole marked B) on the tone arm rest and the 1/16" or 1/8" hole on the tone arm rest. When in this position the cam on the center pinion shaft should be pointing toward tone arm. With cam as stated, the starting lever should be touching cam when cam and starting lever are in this position. The tone arm tripping lever should be in contact with the starting lever. Likewise the rocker bar (Fig. 3) [bar which engages pinion gear] must be in contact (beneath) the end of the starting lever (Fig. 3). The end of starting lever may be bent sufficiently to make contact. The end of starting lever must not be bent any more than that which is necessary to center the other end of the rocker bar between the cam and the pin on the small pinion gear (Fig. 3) (running position).

After the above has been checked and adjusted the trip arm should be checked. The trip arm should be in contact with the starting lever when the needle is about 3 1/4 inches from the center line of the spindle. This may be adjusted by loosening the Bristol set screw in tripping lever stop collar (Fig. 1) and turning collar a fraction of an inch to the left. Check operation after tightening set screw.

4. The clutch may be too loose, thereby not developing sufficient torque. To adjust loosen Bristol set screw in clutch collar, rotate collar (Fig. 1) to the

signal the antenna may be attached to the receiver and the receiver tuned to the position where the interfering signal is most noticeable. Then adjust the wave trap for minimum interference.

AUTOMATIC RECORD CHANGER

This record changer is mounted on a heavy metal base which is rubber mounted to the cabinet. The turntable is rim driven and in turn drives the automatic changing mechanism. Each changer is thoroughly tested before it leaves the factory and should not need any further adjustments. It is possible that adjustments in settings may have to be made. Under the following headings are listed effects, possible cause and method of correcting.

1. A word of caution when checking for quality.
 1. Make sure that all the packing has been removed, around motor, turntable, etc.
 2. See that the changer unit does not touch the cabinet, it must float on the four rubber mountings. The four screws which mount base to cabinet should be removed (AFTER RECEIVER IS TUNED TO RECORD). UNDER NO CIRCUMSTANCES SHOULD THE NEEDLE SCREW BE TIGHT.
3. ALWAYS USE A GOOD NEEDLE AND SEE THAT IT IS SEATED AND THAT THE NEEDLE SCREW IS TIGHT.

1. Motor Will Not Start.

1. Plug not in receptacle, house fuse blown, defective outlet.
2. Defective switch (Phono-Radio), open motor winding or fastened.
3. Motor not oiled.

NOTE: The turntable screws down on the record spindle. To remove, turn in clockwise direction by hand until the curve on the spindle is toward the load. Then turn the curve on the spindle in that position. Spindle must NOT turn. Uncover turntable (counter clockwise).

4. Friction drive pulley stuck, friction drive pulley not touching turntable rim or bushing on motor shaft not touching friction drive pulley. Oil on friction drive pulley.

5. Center pinion shaft stuck or tight. Free and oil. When replacing be very careful so as not to bend or spring the friction drive pulley which will have to be pushed under the edge while screwing the turntable in position.

2. Tone Arm Does Not Drop In Correct Position.

1. 10 inch or 12 inch lever not in correct position for record being played. Check setting of lever.
2. Tone arm drop not set correctly to meet record variations. Records may vary as much as 1/2 inch in diameter. Adjust for average conditions.

To adjust tone arm drop, place gauge on turntable large hole (A) and the hole in tone arm rest. Then place tone arm so the needle sets in small hole marked "NEEDLE SET FOR 10\". Throw 10\" record lever in correct position. The tone arm adjusting lever, see Fig. 7, must have its stud in contact with the tone arm travel lever, this lever must be in contact with the die cast cam and gear. Loosen screw in adjusting lever and adjust lever, then tighten. Check operation and repeat until tone arm drops in correct position. To adjust for 12-inch records, throw lever to left place tone arm in position marked "NEEDLE SET FOR 12\". Loosen lock nut on tone arm travel lever and adjust screw to stop. Tighten lock nut and check. Repeat until needle drops in correct position.

For the above adjustments use a small cotter pin instead of a needle. This prevents any scratching or marring of records or turntable.

3. **Trips Before Record Is Finished.** This condition invariably is caused by the clutch being too tight. This clutch is the friction type and when the pickup moves at an increased speed toward

ALIGNMENT PROCEDURE

Tuning I-F Amplifier To 455 Kilocycles.

- (a) Connect the output of the signal generator through 100 ohm resistor to the top cap of the 6AC6 tube, leaving the tube's grid lead in place. Connect the ground lead from the signal generator to the ground terminal of the receiver. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.
- (b) Set the station selector so that the tuning condenser plate knob is clearly set of mesh. Turn the volume control knob to the right (ON).
- (c) Set the signal generators located on top of the 2nd I-F transformer for maximum output. (Item 6, Fig. 2).
- (d) Adjust both trimmers located on top of the 1st I-F transformer for maximum output. (Item 6, Fig. 2).
- (e) Adjust both trimmers located on top of the 1st I-F transformer for maximum output. (Item 5, Fig. 2).
- (f) Check operations (d) and (e) for more accuracy.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning R.F. Amplifier.

When aligning the R. F. amplifier the output lead from the signal generator is connected to the antenna lead of the receiver, a 100 mhf. condenser should be connected in series with the output lead of the signal generator.

(a) With the station selector adjusted so that the tuning condenser plates are completely open, tune the CAPACITY SIGNAL (C) in heard (it is not necessary that the receiver tune through this signal).

(b) Adjust the station selector so that the SHUNT ALIGNMENT signal is tuned-in with maximum output. Then adjust the "ANT" shunt trimmer for maximum output. Readjust the station selector slightly so that the generator signal is tuned-in with maximum output. READJUST THE OSCILLATOR TRIMMER. DO NOT adjust the trimmer until the signal is at maximum. If any of the circuits have been re-adjusted it may be necessary to reset the push buttons.

SETTING THE PUSH BUTTONS

Remove push buttons and with a small screw driver loosen the set screws a turn or two. With the manual push button, tune in as ACCURATELY AS POSSIBLE the station whose call letters were in the button or that station for which the button is to be set. Then push the key all the way down and while you hold it in that position SECURELY TIGHTEN the set screw.

(C) SIGNAL INPUT FREQUENCIES

| Minimum Capacity Signal | Shunt Alignment Signal |
|-------------------------|------------------------|
| 1775 Kilocycles | 1400 Kilocycles |
| I-F Alignment Signal | 455 Kilocycles |

WAVE TRAP

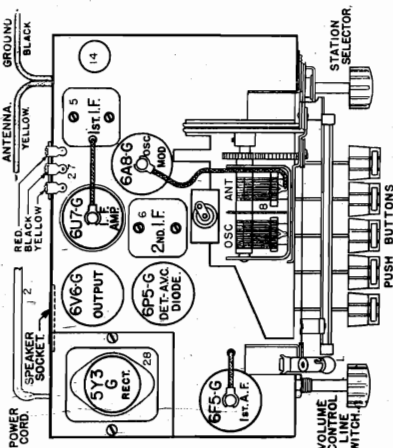
Some chassis of this model are equipped with a wave trap for the purpose of reducing interference from stations operating on a frequency of approximately 455 kilocycles. This assembly is located on the underside side of the chassis and consists of a coil and a trimmer condenser as illustrated by dotted lines in the Wiring Diagram (Item 31).

The wave trap should not be adjusted until all other adjustments have been made. To adjust the wave trap, turn the 455 100 mhf. condenser into the antenna terminal of the receiver. With the band selector switch turned to the Broadcast Band position, the gang connected to the Broadcast Band position, adjust the trimmer condenser and the volume control full on, adjust the trimmer condenser on the wave trap for MINIMUM output.

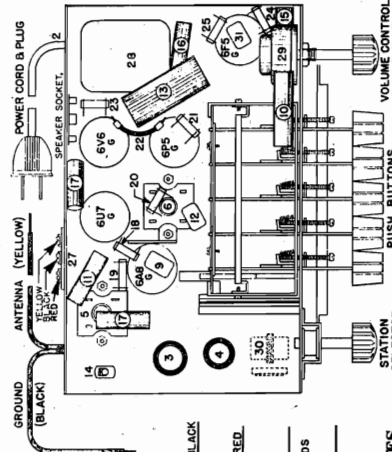
Should the interfering station be operating on a frequency of slightly more or less than the frequency of the wave trap, then, instead of feeding a 455 kilocycle signal into the receiver, the exact frequency of the interfering signal should be used. If it is not possible to determine the exact frequency of the interfering

MODEL 668
Schematic, Voltage
Socket, Trimmers
Chassis

THE CROSLEY CORP



Top View Model 668



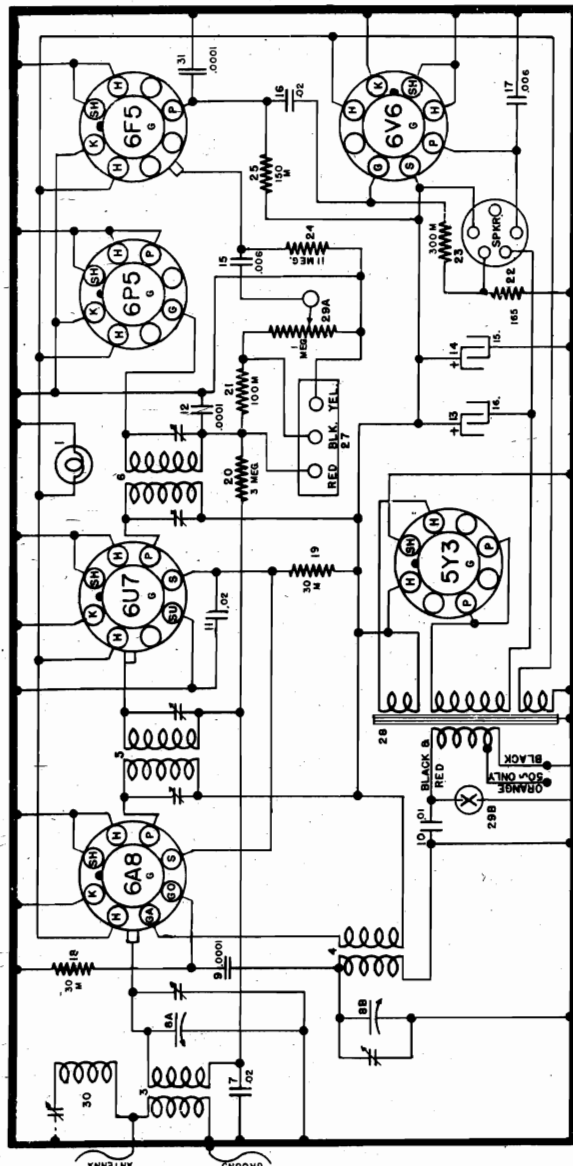
Bottom View Model 668

SEPTEMBER, 1939

TUBE SOCKET VOLTAGE READINGS

| Tube | Function | H | P | S | K | G | Ga | Co |
|------|------------------------|-----|-----|----|---|------|-----|-----|
| 6A8G | Oscillator-Modulator | 6.3 | 186 | 70 | — | — | 186 | -15 |
| 6U7G | I-F Amplifier | 6.3 | 186 | 70 | — | — | — | — |
| 6P5G | Detector-A. V. C. | 6.3 | 93 | — | — | — | — | — |
| 6V6G | St A-S Amplifier | 6.3 | 186 | — | — | — | — | — |
| 5Y3G | Power Output Rectifier | 6.3 | 180 | — | — | -9.5 | — | — |

Voltage drop across speaker field 50 volts, using 396-BP-12 speaker.
Maximum power output approximately 3 watts.
Power consumption at 117.5 volts approximately 63 watts with phono operating.



MODEL -- 668
455 K.C. I.F.

ALIGNMENT PROCEDURE

CONNECTING OUTPUT METER

Connect the output meter to the plate and screen of the 6V6G output tube. Be certain that the meter is protected from D. C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning the I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a .02 mfd. condenser to the top cap of the 6A8G tube, leaving the tube's grid lead in place. Connect the ground lead from the signal generator to the ground terminal of the receiver. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Set the station selector so that the tuning condenser plates are completely out of mesh. Turn the volume control knob to the right (ON).
(c) Set the signal generator to 455 kilocycles.
(d) Adjust both trimmers located on top of the 2nd I-F transformer for maximum output. (Item 6, Fig. 2).
(e) Adjust both trimmers located on top of the 1st I-F transformer for maximum output. (Item 5, Fig. 2).
(f) Check operations (d) and (e) for more accurate adjustment.

ALWAYS USE THE LOWEST SIGNAL GENERA

TOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier.

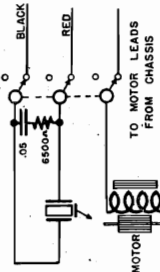
When aligning the R-F amplifier the output lead from the signal generator is connected to the antenna lead of the receiver, a 100 mmf. condenser should be connected in series with the output lead of the signal generator.
(a) With the station selector adjusted so that the tuning condenser plates are completely out of mesh adjust the "OSC" shunt trimmer so that the MINIMUM CAPACITY SIGNAL (C) is heard (it is not necessary that the receiver tune through this signal).

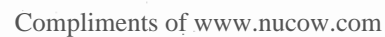
(b) Adjust the station selector so that the SHUNT ALIGNMENT signal is tuned-in with maximum output. Then adjust the "ANT" shunt trimmer for maximum output. Readjust the station selector slightly so that the generator signal is tuned-in with maximum output and check the adjustment of the "ANT" trimmer. **DO NOT READJUST THE OSCILLATOR TRIMMER.**

If any of the circuits have been re-adjusted it may be necessary to reset the push buttons.

SOCKET VOLTAGES

The tube socket voltages are measured from the tube socket contacts to the chassis with a 1000 ohm per volt, 500-volt D. C. voltmeter (except filaments) with receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range A. C. voltmeter (approximately 0-10 volts). Readings may vary plus or minus 10% of values given.





MODELS 649, 5648
Voltage, Chassis
Socket, Trimmers
Alignment, Tuner

THE CROSLEY CORP.

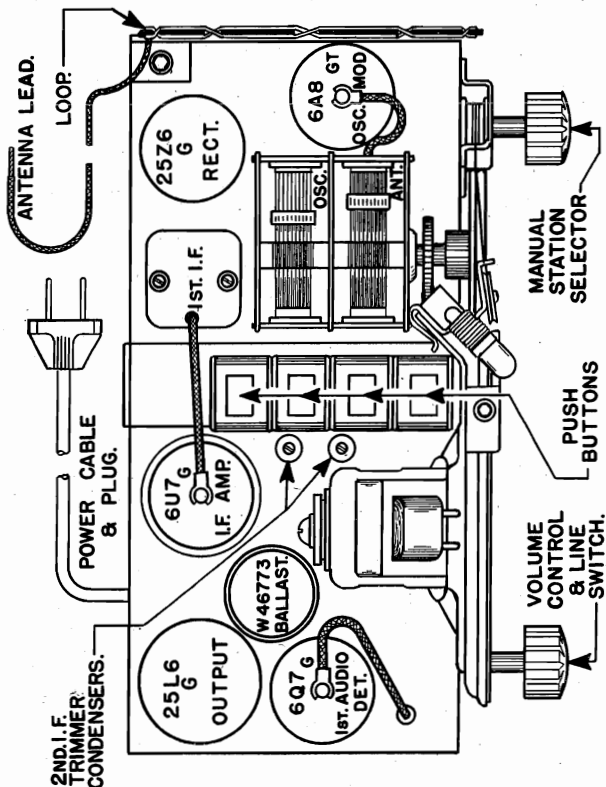


Fig. 2—Top View Model 649

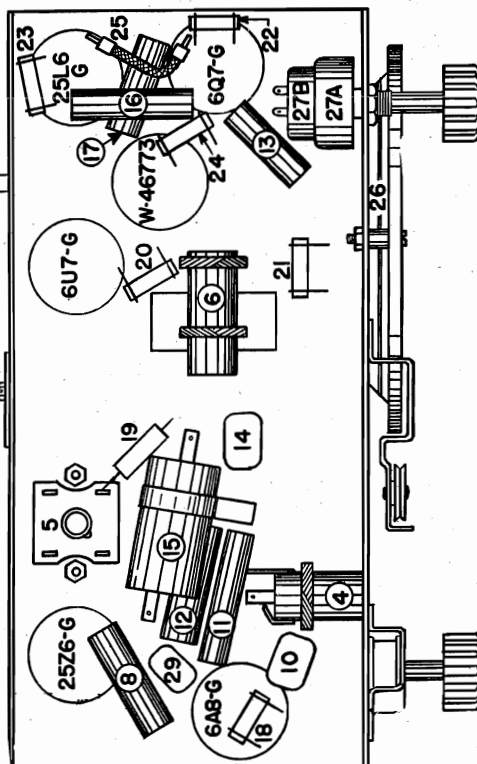


Fig. 3—Bottom View Model 5648-649

SPECIFICATIONS
 Crosley radios, Models 5648 and 649, are designed for operation on 115-125 volts, 50-60 cycles, 60 watts.
 The tuning range of Model 5648 is from 1550 to 540 kilocycles.
 The tuning range of Model 649 is from 1725 to 540 kilocycles.
 The difference between Models 5648 and 649 lies in the design and mounting of the built-in loop antenna. Model 5648 has the rectangular loop mounted on the back of the receiver and includes an electrostatic shield. Model 649 loop antenna is a newly developed spider form which mounts on the end of the chassis, making for a more compact design.

CIRCUIT DESCRIPTION
 Five G or GT tubes and one metal Ballast tube are employed in a superheterodyne circuit which consists of a combination oscillator-modulator tube, 455 kilocycle I-F amplifier, Beam Power output and power supply. The 6Q7 tube serves as the

| Tube | Function | H | P | S | Su | K | Co | Ga |
|---------|---------------------------|------|------------|-----|----|-----|-----|-----|
| 6A8GT | Oscillator-Modulator | 6.3 | 105 | 70 | — | — | —10 | 105 |
| 6U7G | I-F Amplifier | 6.3 | 105 | 70 | — | — | — | — |
| 6Q7G | Det, A.V.C, A-F Amplifier | 6.3 | 35 | — | — | — | — | — |
| 25L6G | Output | 25.1 | 100 | 105 | — | 6 | — | — |
| 25Z6G | Rectifier | 25.1 | 117.5 A.C. | — | — | 132 | — | — |
| W-46773 | Ballast Tube | — | — | — | — | — | — | — |

Power output approximately 2 watts.
 Power consumption approximately 48 watts.
 Voltage drop across speaker field 27 volts.
 All voltages except filaments will be approximately 10% lower if measured on 117.5 volts DC power supply.

ALIGNMENT PROCEDURE
 The chassis of this receiver is connected to one side of the power supply and for this reason all test equipment should be thoroughly insulated in order that the power supply will not become short circuited while aligning the receiver.

CONNECTING OUTPUT METER
 Connect one terminal of the output meter to the plate and the other terminal to the screen of the 25L6 output tube. Be certain that the meter is provided with a D.C. winding and a coil of (1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning the I-F Amplifier to 455 Kilocycles
 (a) Connect the output of the signal generator through a .02 mfd. condenser to the grid cap of 6A8GT, leaving grid cap in place. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. (b) It is not necessary to connect the signal generator to the antenna lead. (c) The signal generator should be connected in series with the ground terminal of the signal generator and the receiver chassis. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.
 (d) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).
 (e) Set the signal generator to 455 kilocycles.
 (f) Set the 2nd I-F trimmer condensers, Fig. 2, located on chassis between Push Button Assembly and speaker field, for maximum reading on the output meter.
 (g) Adjust the 1st I-F trimmer condensers for maximum output.

(h) Repeat operations (d) and (e) for more accurate adjustments.
WAYS TO USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.
 (a) Connect the output lead of signal generator through a .0001 mfd. condenser to the antenna lead of the receiver.
 (b) Set the signal generator to 1550 kilocycles.
 (c) With the condenser gang open all the way, adjust the "OSC." section of the gang for maximum signal.
 (d) Set the signal generator to 1400 kilocycles.
 (e) Tune in the 1400 kc. signal with the manual tuning knob.

Aligning the R-F Amplifier Model 5648
 Connect output lead of signal generator through a .0001 mfd. condenser to the antenna lead of the receiver.
 (a) Set the signal generator to 1550 kilocycles.
 (b) With the condenser gang open all the way, adjust the "OSC." section of the gang for maximum signal.
 (c) Set the signal generator to 1400 kilocycles.
 (d) Tune in the 1400 kc. signal with the manual tuning knob.

detector and 1st A-F amplifier and supplies A.V.C. voltage to the grid of the 6A8-G and 6U7-G tubes. The bias for the 25L6-G tube is obtained from item 25 a 140 ohm resistor. A Ballast tube is used to provide the proper heater voltage to the tubes. The filaments of the tubes are wired in series. A .05 mfd. condenser, item 11, is connected across the power supply leads to reduce electrical interference from that source.

TUBES AND VOLTAGE LIMITS
 The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts. The voltage readings are given in volts A.C. and in ohms per volt. 250 volt voltmeter (except filaments) with the volume control full "ON" and no signal input. The filament voltages should be measured with an accurate low range voltmeter. When measured on a 117.5 volt A.C. line voltage limits may vary plus or minus 10% of the values given.

| Tube | Function | H | P | S | Su | K | Co | Ga |
|---------|---------------------------|------|------------|-----|----|-----|-----|-----|
| 6A8GT | Oscillator-Modulator | 6.3 | 105 | 70 | — | — | —10 | 105 |
| 6U7G | I-F Amplifier | 6.3 | 105 | 70 | — | — | — | — |
| 6Q7G | Det, A.V.C, A-F Amplifier | 6.3 | 35 | — | — | — | — | — |
| 25L6G | Output | 25.1 | 100 | 105 | — | 6 | — | — |
| 25Z6G | Rectifier | 25.1 | 117.5 A.C. | — | — | 132 | — | — |
| W-46773 | Ballast Tube | — | — | — | — | — | — | — |

Power output approximately 2 watts.
 Power consumption approximately 48 watts.
 Voltage drop across speaker field 27 volts.
 All voltages except filaments will be approximately 10% lower if measured on 117.5 volts DC power supply.

(e) Adjust the trimmer condenser on the "ANT" section of the gang for maximum signal.
 NOTE: Do not readjust the "OSC." section at this time. Repeat (b) and (c) for more accurate adjustments.

Aligning the R-F Amplifier Model 649
 Connect output of signal generator through a .0001 mfd. condenser to the antenna lead of receiver.
 (a) Set the signal generator to 1725 kilocycles.
 (b) With the condenser gang turned to the minimum capacity position, adjust the trimmer condenser on the "OSC." section of the gang so that the 1725 kilocycle signal is heard. It is not necessary to connect the signal generator to the antenna lead.
 (c) Set the generator to 1400 kilocycles.
 (d) Tune in the 1400 kilocycle signal in the region of 140 on the dial for maximum output.
 (e) Adjust the trimmer condenser located on the "ANT" section of the gang for maximum output.

NOTE: Do not readjust the "OSC." trimmer.
 (f) Repeat operations (d) and (e) for more accurate adjustments.
 If any of the circuits have been re-aligned, check push buttons to see if they need resetting.

SETTING THE PUSH BUTTONS
 The push buttons are easily and accurately set for the top of the receiver. It is not necessary that all the buttons be set at the same time. The push buttons are set by holding the tuning straight up. Loosen the set screws on the keys but do not move them.

Determine the favorite broadcasting stations whose call letters are to be placed in the buttons. By means of the manual tuning knob, tune-in AS ACCURATELY AS POSSIBLE the station having the highest frequency—that is the station that is tuned-in all the 1500 kc. and then the station that is tuned-in to the 540 kc. and then the station that is tuned-in to the 1725 kc. CURIOUSLY TIGHTEN THE SET SCREW. Replace push button on key.

The push button tuning system is now correctly set for the first station. Follow through with this same procedure, setting the other stations in the order of their frequency (kilocycles). Detach the call letters of the favorite stations from the list supplied with your receiver and press them into the openings in the front of the push buttons. The call letters should be stamped in the supplied in small end of the knob and should be stamped in place over the call letters to protect and hold them in place.

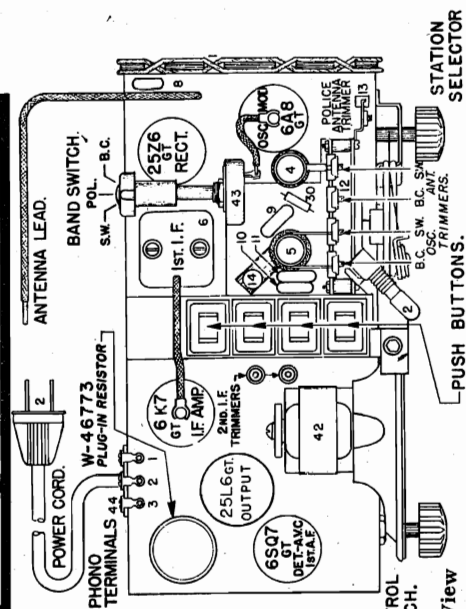


Fig. 2—Top View

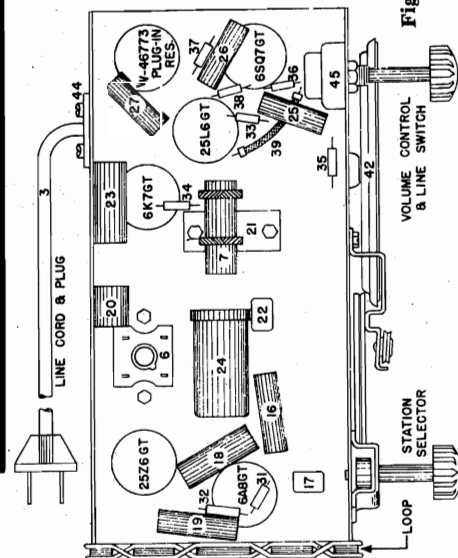
JANUARY, 1940

MODEL -- 689

TUBES MAY BE G OR GT TYPES EXCEPT 6A8

455 KC. I.F.

Fig. 3—Bottom View



MODEL 689

Voltage, Tuner
Alignment

THE CROSLEY CORP.

MODEL 689

TUBE SOCKET VOLTAGE READINGS

| Tube | Function | H | P | S | Su | K | Go | Ga |
|---------|-------------------------|------------------------|------------|-----|----|-----|-----|-----|
| 6A8GT | Oscillator-Modulator | 6.3 | 105 | 70 | — | — | -10 | 105 |
| 6K7GT | I-F Amplifier | 6.3 | 105 | 70 | — | — | — | — |
| 6SQ7GT | Det. AVC, A-F Amplifier | 6.3 | 35 | — | — | — | — | — |
| 25L6GT | Output | 25.1 | 100 | 105 | — | 6 | — | — |
| 25Z6GT | Rectifier | 25.1 | 117.5 A.C. | — | — | 132 | — | — |
| W-46773 | Ballast Tube | Approx. 48.4 A.C. Drop | | | | | | |

Power output approximately 2 watts.

Power consumption approximately 48 watts.

Voltage drop across speaker field 27 volts.

All voltages except filaments will be approximately 10% lower if measured on 117.5 volts DC power supply.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power supply and for this reason all test equipment should be thoroughly insulated in order that the power supply will not become short circuited while aligning the receiver.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 25L6GT output tube. Be certain that the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning The I-F Amplifier to 455 Kilocycles

(a) Connect the output of the signal generator through a .02 mf. condenser to the grid cap of 6A8GT, leaving grid cap in place. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh, turn the volume control to the right (ON), and turn the band switch to the right (B.C.).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condensers, Fig. 2, located between Push Button Assembly and speaker field, for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR

OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier

When aligning the R-F amplifier the output lead of the signal generator should be connected, through a dummy antenna, to the BLUE lead extending from the rear of the chassis. For the standard Broadcast Band and special police band use a .0001 mf. condenser and for the short wave band a 250 ohm carbon resistor instead of the condenser.

(a) Set the signal generator to 1725 kilocycles.

(b) With the condenser gang turned to the minimum capacity position and band switch turned to B.C. position, adjust the B.C. "OSC" trimmer condenser of the gang so that the 1725 kilocycle signal is heard. It is not necessary that the receiver tune through this signal.

(c) Set the generator to 1400 kilocycles.

(d) Tune in the 1400 kilocycle signal in the region of 140 on the dial for maximum output.

(e) Adjust the trimmer condenser B.C. "ANT" for maximum output.

NOTE: Do not readjust the "OSC" trimmer.

(f) Repeat operations (d) and (e) for more accurate adjustments.

(g) Set signal generator to 2.5 megacycles and turn band switch to special police band (middle position).

(h) Tune in 2.5 signal on receiver and then adjust POL. "ANT" trimmer condenser (Fig. 2) for maximum output. There is no "OSC" adjustment for this band.

(i) Set signal generator to 18.3 megacycles, turn band switch to S.W. position (left) and open gang all the way.

(j) Adjust S.W. "OSC" trimmer condenser for maximum

output.

(k) Set signal generator to 18 megacycles.

(l) Tune in 18 mc. signal on receiver, then adjust the S.W. "ANT" trimmer condenser for maximum output.

(m) Repeat (i) to (l) for more accurate adjustments.

NOTE: When shunt aligning the short wave band care should be exercised so that the circuits will be aligned on the correct frequency (fundamental) rather than on the image frequency which is approximately 910 kilocycles more than the fundamental. To check on this, increase the signal generator output approximately 10 times or more, and try to tune in the signal both at the generator frequency as indicated on the station selector dial and at approximately 910 kilocycles less than the correct frequency. (18.0 mc. fundamental 17.09 mc. image). If circuits have been properly aligned the signal can be tuned in at both positions but with a much stronger signal on the fundamental.

A few of the earlier releases of this model used a 6Q7GT in place of the 6SQ7GT. This change was made to improve performance especially on the short wave band.

If any of the circuits have been re-aligned, check push buttons to see if they need resetting.

SETTING THE PUSH BUTTONS

The push buttons are easily and accurately set from the top of the receiver. It is not necessary that all the buttons be set at the same time. Remove the push buttons to be set by grasping the button between the forefinger and thumb and pulling straight up. Loosen the set screws on the keys but do not remove them.

Determine the favorite broadcasting stations whose call letters are to be placed in the buttons. By means of the manual tuning knob, tune in AS ACCURATELY AS POSSIBLE the station having the highest frequency—that is the station that is tuned in nearest the 1500 Kc. end of the dial. Then push the front key all the way down, and while you hold it in that position SECURELY TIGHTEN THE SET SCREW. Replace push button on key.

The push button tuning system is now correctly set for the first station. Follow through with this same procedure, setting the other stations in the order of their frequency (kilocycles). Detach the call letters of the favorite stations from the list supplied with your receiver and press them into the openings in the front of the push buttons. Thin pieces of clear celluloid are supplied in a small envelope and should be snapped in place over the call letters to protect and hold them in place.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and chassis. Voltage readings should be taken with a 1,000 ohm per volt, 250 volt volt-meter (except filaments) with the volume control full "ON" and no signal input. The filament voltages should be measured with an accurate low range volt-meter. When measured on a 117.5 volt A.C. line voltage limits may vary plus or minus 10% of the values given.

SPECIFICATIONS

This model Crosley receiver is a three band superheterodyne receiver designed for operation on 110 volt A.C. (50-60 cycles) or D.C. power circuits.

The receiver incorporates an improved mechanical push button tuning system, built in loop antenna, A.V.C., terminals for phono or television sound and many improved circuit developments.

THE CROSLLEY CORP.

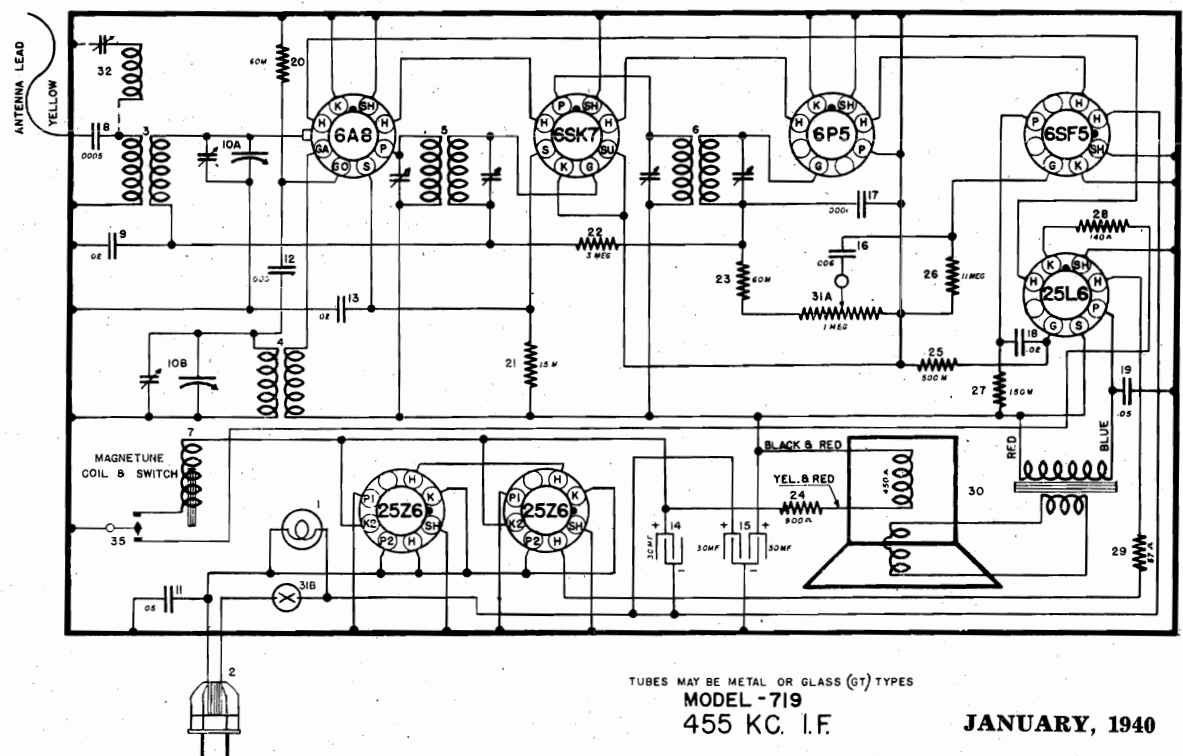
MODEL 719 (3 Types)
Schematics

FIG. 1-A—WIRING DIAGRAM—MODEL 719

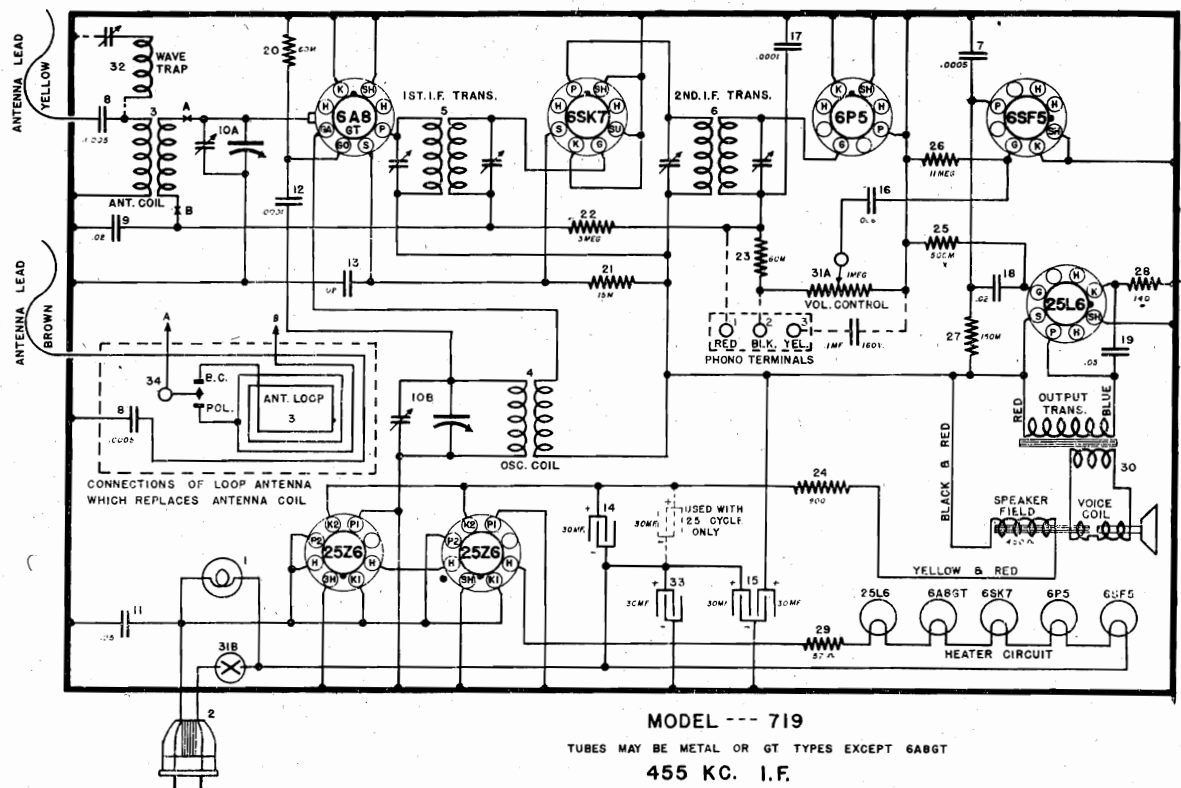


FIG. 1-B—WIRING DIAGRAM—MODEL 719

MODEL 719

Voltage, Circuit Data

Socket, Trimmers, Alignment

THE CROSLEY CORP.

SPECIFICATIONS

This model Crosley is a seven tube superheterodyne receiver designed for operation on 110 volt—50 or 60 cycle power circuits. It may be adapted for 25 cycle operation by the addition of another filter condenser as indicated in wiring diagram.

CIRCUIT DESCRIPTION

There are three versions of this model in the field namely: one version with an improved mechanical push button tuning system; one version with mechanical push button tuning and loop antenna, and one version has the Magnetune electric push button tuning system.

The circuit is a conventional super with no regeneration. Item 23, a 60,000 ohm resistor in series with the volume control form the A.V.C. load. Item 22, a 3 megohm resistor acts as a filter for the A.V.C. voltage applied to the 6A8GT and the 6SK7. Bias for the 25L6GT is obtained from the voltage drop

across item 28, a 140 ohm resistor. The two 25Z6GT rectifiers are in parallel and connected for voltage doubling.

The B voltage is filtered with the 900 ohm resistor, item 24, the speaker field (450 ohms) item 15, a twin 30 mf. electrolytic, and item 14, a single 30 mf. electrolytic.

The filaments of the tubes are wired in series. A .05 mfd. condenser, item 11, is connected across the power supply leads to reduce electrical interference from that source.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and chassis. Voltage readings should be taken with a 1,000 ohm per volt, 250 volt volt-meter (except filaments) with the volume control full "ON" and no signal input. The filament voltages should be measured with an accurate low range volt-meter. When measured on a 117.5 volt A.C. line voltage limits may vary plus or minus 10% of the values given.

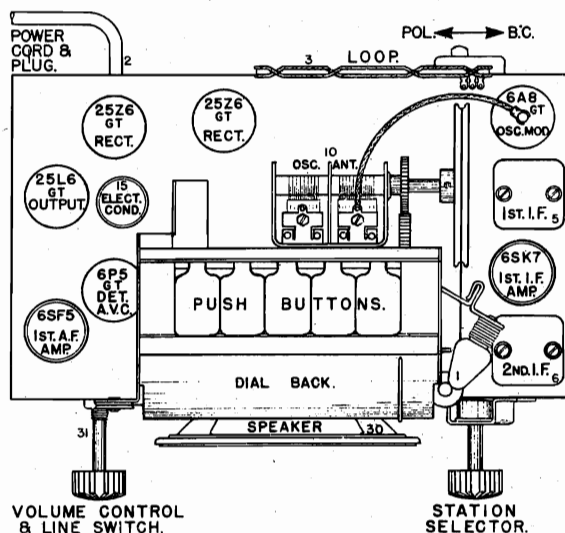


Fig. 2—Top View Model 719

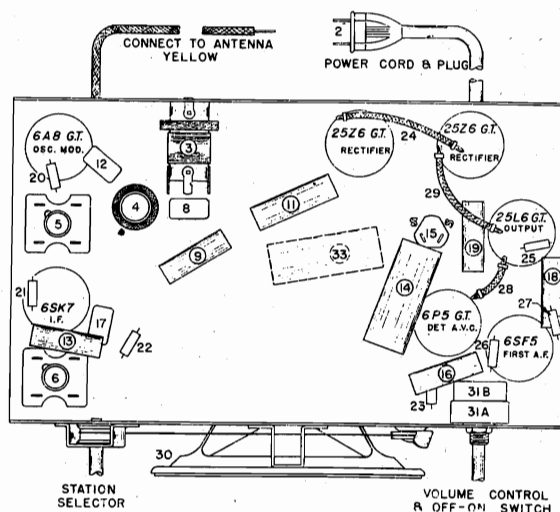


Fig. 3—Bottom View Model 719

TUBE SOCKET VOLTAGE READING

| Tube | Function | PIN NUMBER | | | | | | | |
|--------|----------------------|------------|-------|-------|-------|-------|-------|-------|-------|
| | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 | No. 7 | No. 8 |
| 6A8GT | Oscillator-Modulator | — | H | 130 | 70 | -17 | 130 | H | — |
| 6SK7 | I-F Amplifier | — | H | — | — | — | 70 | H | 130 |
| 6P5 | Det. AVC Diode | — | H | — | J.B. | — | J.B. | H | — |
| 6SF5 | 1st Audio | — | — | — | — | 68 | — | H | H |
| 25L6 | Output | — | H | 121 | 128 | — | J.B. | H | 6 |
| 2-25Z6 | Rectifier | — | H | A.C. | 232 | — | — | H | 130 |

Maximum power output 2.5 watts.

Drop across speaker field 40 volts.

Power consumption @ 117.5 volt line = 65 watts. Those with "Magnetune" coil 40 watts additional.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power supply and for this reason all test equipment should be thoroughly insulated in order that the power supply will not become short circuited while aligning the receiver.

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 25L6GT output tube. Be certain that the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning The I-F Amplifier to 455 Kilocycles

(a) Connect the output of the signal generator through a 100 mmf. condenser to the antenna lead on the receiver. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condensers, item 6, for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers, item 5, for

maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.

Aligning the R-F Amplifier

(a) Set the signal generator to 1725 kilocycles.

(b) With the condenser gang turned to the minimum capacity position, adjust the trimmer condenser on the "OSC" section of the gang so that the 1725 kilocycle signal is heard. It is not necessary that the receiver tune through this signal.

(c) Set the signal generator to 1400 kilocycles.

(d) Tune-in the 1400 kilocycle signal in the region of 140 on the dial for maximum output.

(e) Adjust the trimmer condenser located on the "ANT" section of the gang for maximum output.

NOTE: Do not readjust the "OSC" trimmer.

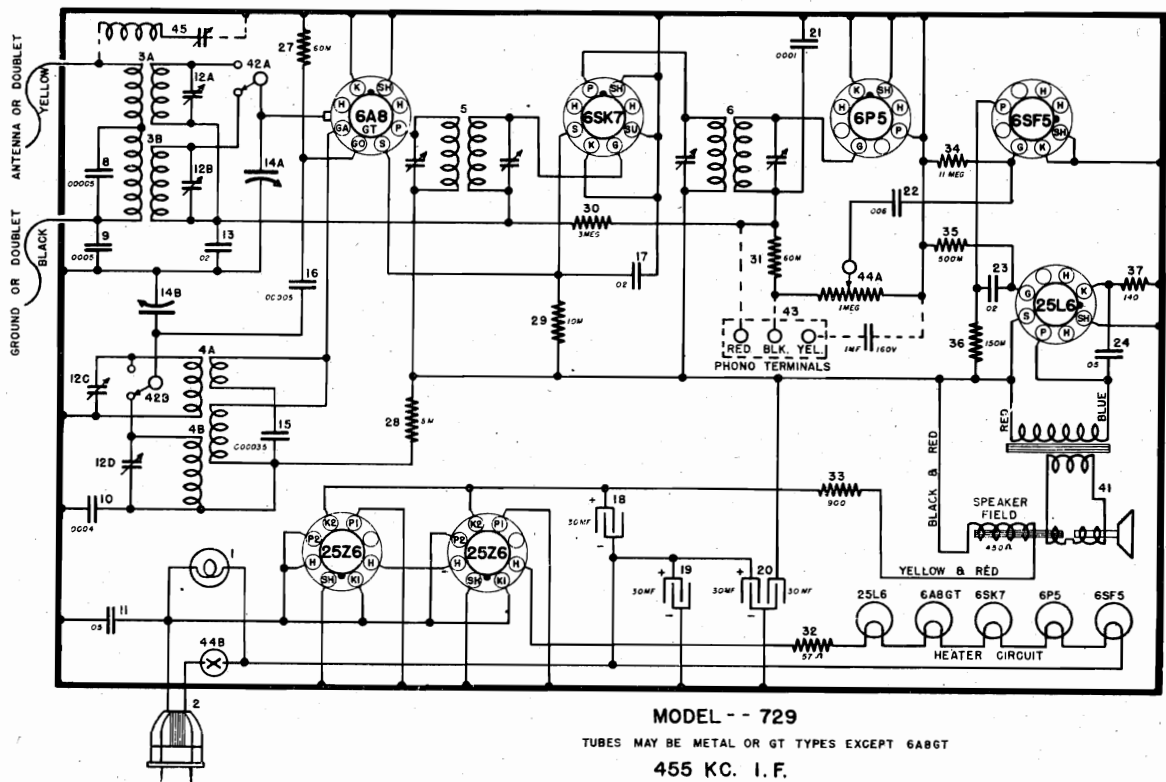
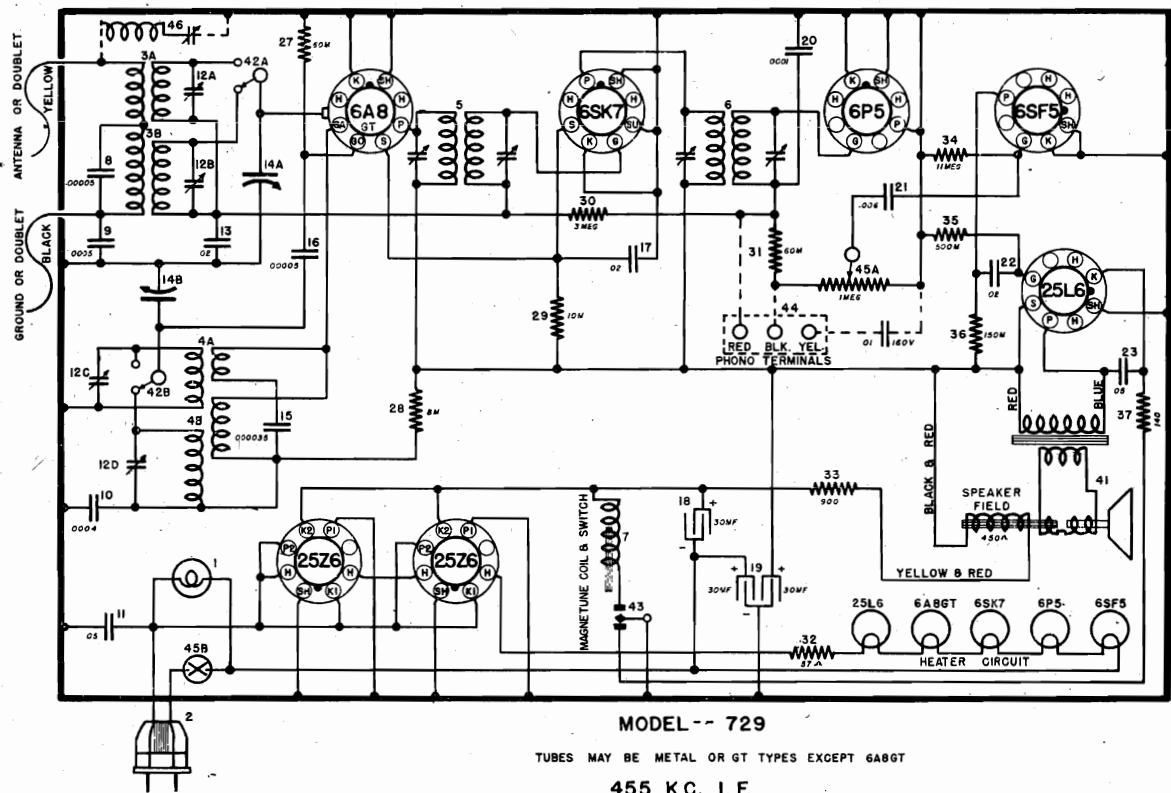
(f) Repeat operations (d) and (e) for more accurate adjustments.

The special police band has no provisions for alignment.

WAVE TRAP

Some chassis of this model may be equipped with a wave trap for the purpose of eliminating interference from code stations which operate on a frequency of approximately 455 kilocycles. This assembly is located on the top side of the chassis and consists of a coil and a condenser as illustrated by dotted lines in the Wiring Diagram, Fig. 1A.

THE CROSLLEY CORP. MODEL 729 (Types 1 and 2) Schematics



MODEL 729 (Type 3)
Schematic, Voltage
Socket, Trimmers, Chassis

THE CROSLEY CORP.

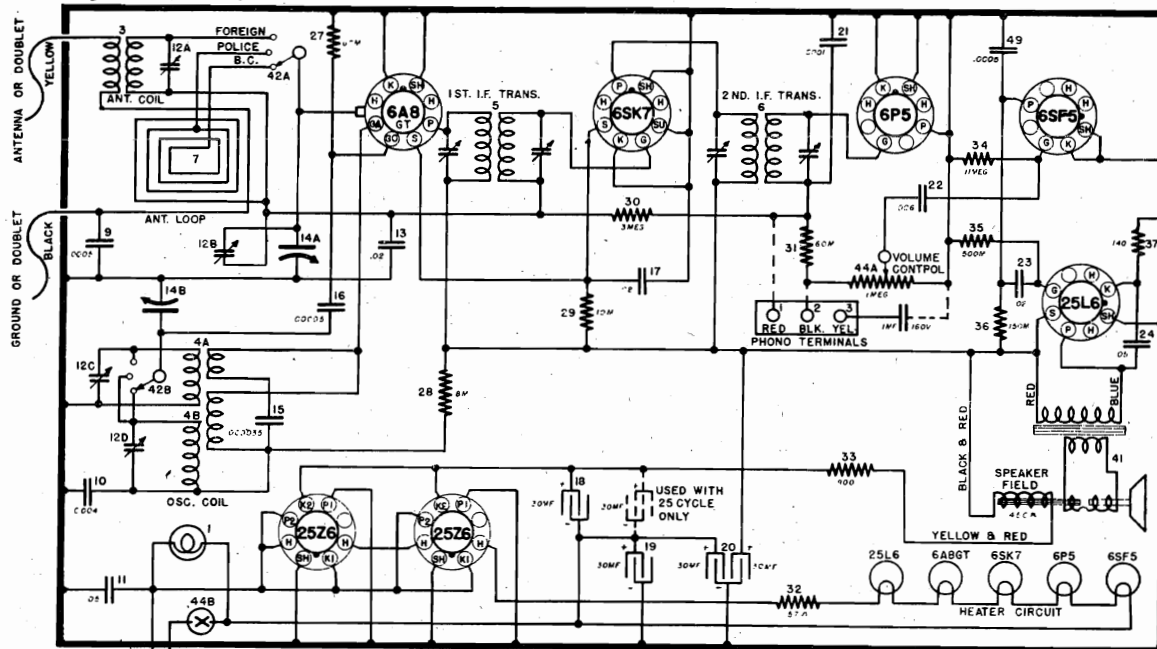


FIG. 1-C—WIRING DIAGRAM—

MODEL --- 729

TUBES MAY BE METAL OR GT TYPES EXCEPT 6A8GT

MODEL 729 (MECH. P. B. LOOP)

455 K.C. I.F.

SOCKET VOLTAGE READINGS AT 117.5 VOLT LINE

| Tube | Purpose | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 | No. 7 | No. 8 |
|--------|----------------------|-------|-------|------------|-------|-----------|-------|-------|-------|
| 6A8GT | Oscillator-Modulator | — | H | 125 | 74 | Osc. Grid | 130 | H | — |
| 6SK7 | I-F Amplifier | — | H | — | Grid | — | 74 | H | 125 |
| 6P5 | Diode | — | H | — | — | Grid | — | H | — |
| 6SF5 | 1st Audio | — | — | Grid | — | 65 | — | H | H |
| 25L6 | Output | — | H | 120 | 125 | Grid | — | H | 8 |
| 2-25Z6 | Rectifier | — | H | 117.5 A.C. | 232 | — | — | H | 122 |

Drop across speaker field 35 volts.
Drop across Item 33 72 volts.
Maximum power output 4.3 watts @ 125 volts line.
Power consumption @ 117.5 volts line—60 watts.
J.B. = junction block

H = heater.

JANUARY, 1940

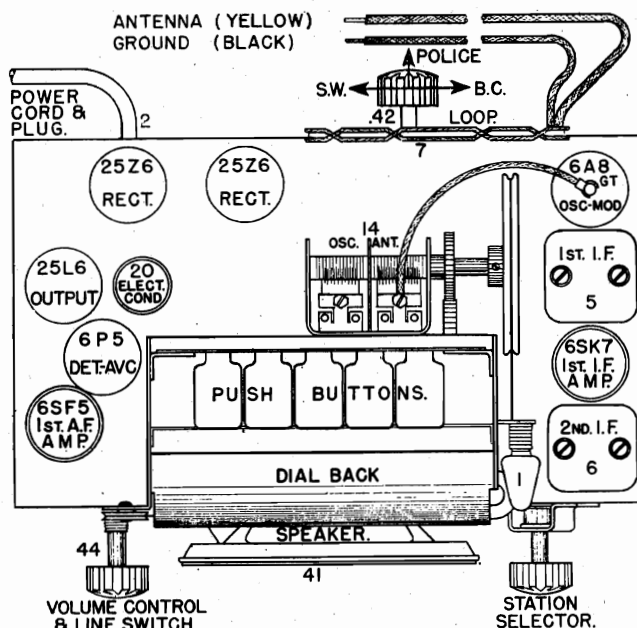


Fig. 1—Top View Model 729

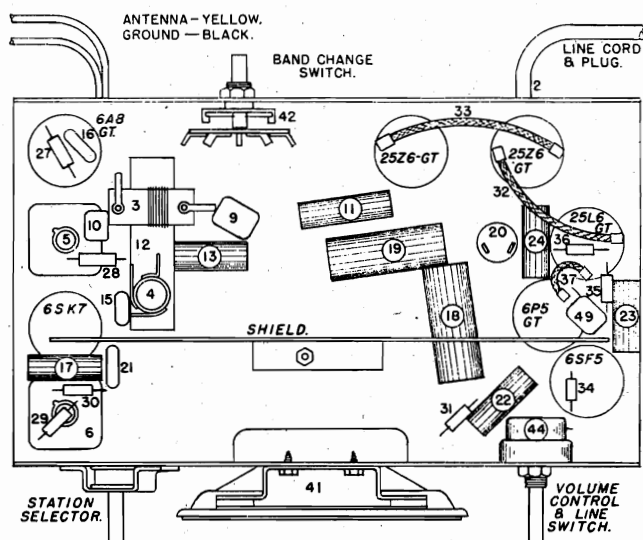


Fig. 3—Bottom View Model 729

MODEL 739(Loop Type)
Schematic

THE CROSLEY CORP.

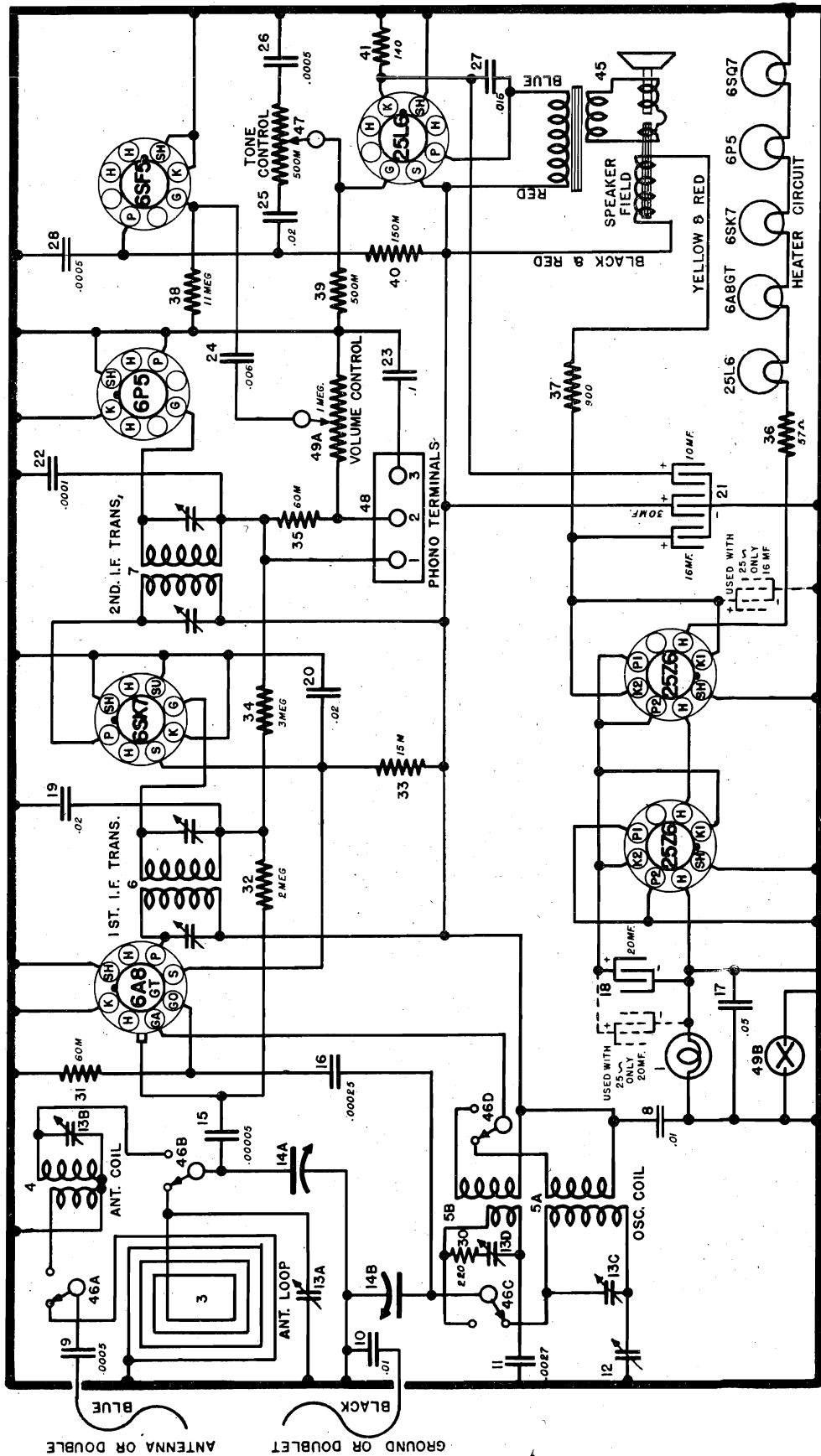


FIG. 1-A—MODEL 739 (MECHANICAL P. B. & LOOP)

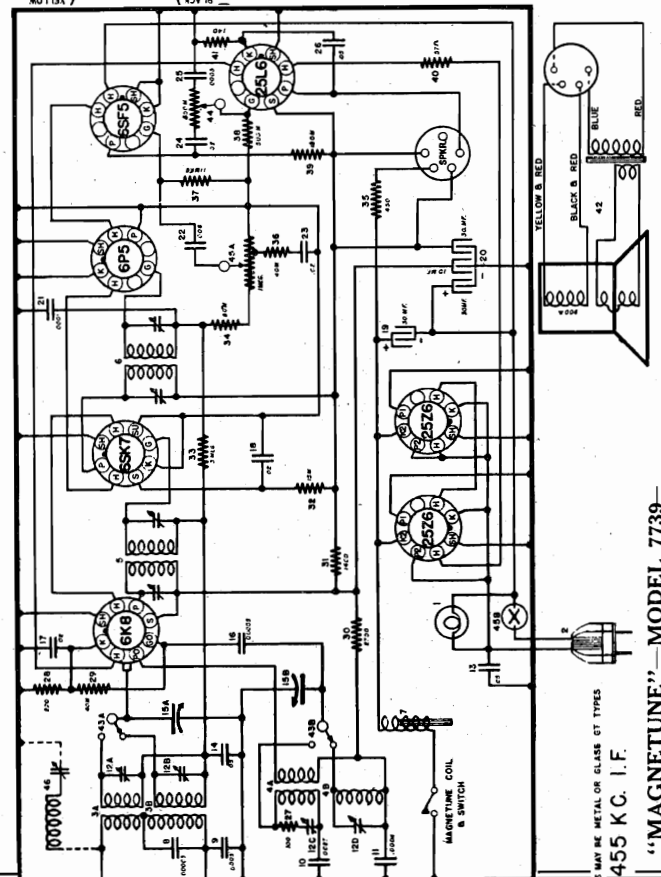
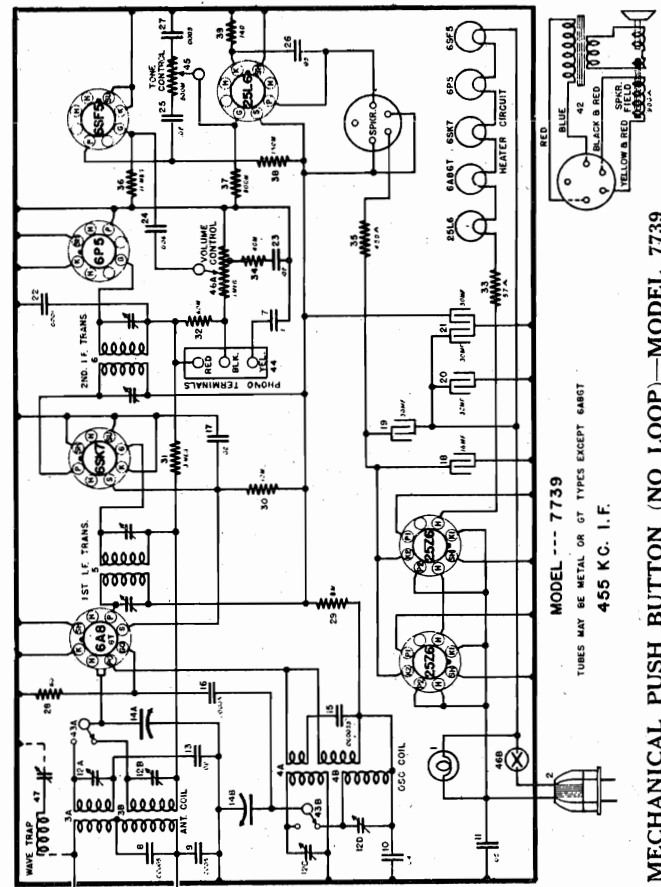
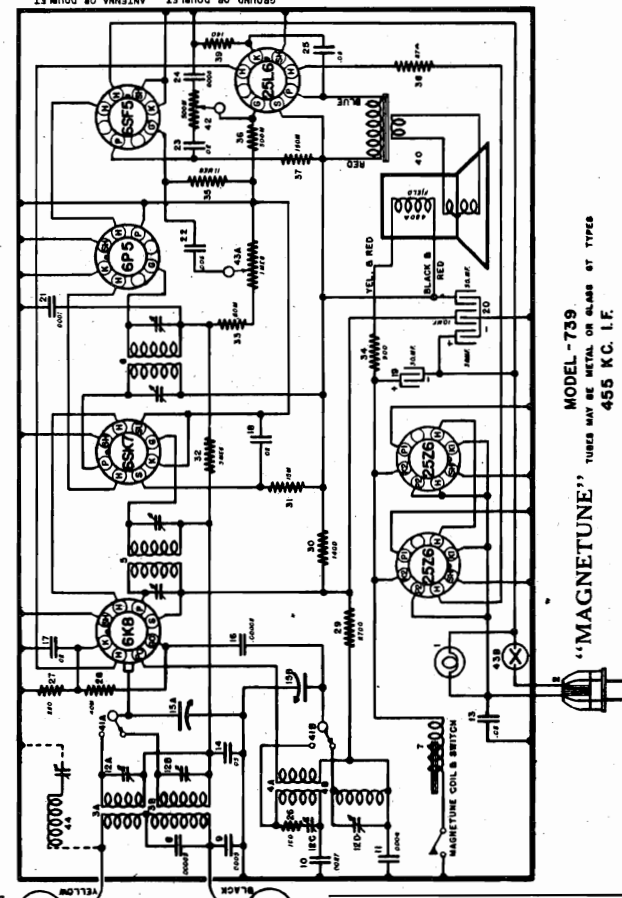
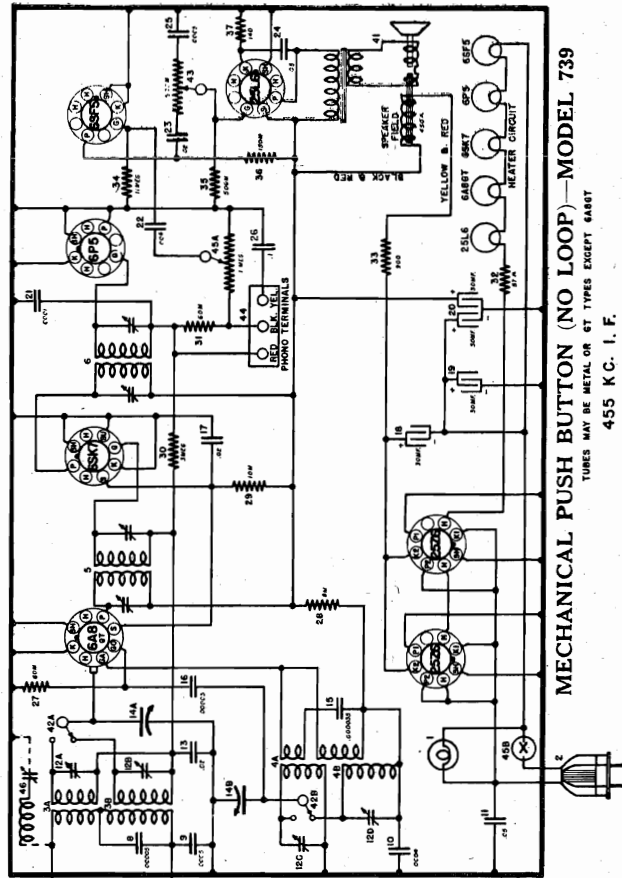
MODEL --- 739

TUBES MAY BE METAL OR GT TYPES EXCEPT 6A8

455 KC. I.F.

THE CROSLEY CORP.

MODELS 739(2 Types),
7739 (2 Types)
Schematics



MODELS 739, 7739
Voltage, Alignment

THE CROSLEY CORP.

MODELS 739, 7739
J739, J7739
Voltage, Alignment

MODELS 739, 7739, J-739 AND J-7739

SOCKET VOLTAGE READINGS AT 117.5 VOLT LINE

| Tube | Function | PIN NUMBER | | | | | | | |
|--------|----------------------|------------|-------|------------|-------|-------|-------|-------|-------|
| | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 | No. 7 | No. 8 |
| 6A8GT | Oscillator-Modulator | — | H | 123 | 80 | -11 | 123 | H | — |
| 6SK7 | I-F. Amplifier | — | H | — | Grid | — | 80 | H | 123 |
| 6P5 | Diode | — | H | — | — | Grid | — | H | — |
| 6SF5 | 1st Audio | — | — | Grid | V.C. | 68 | — | H | H |
| 25L6 | Output | — | H | 115 | 123 | Grid | — | H | +6 |
| 2-25Z6 | Rectifier | — | H | 117.5 A.C. | 220 | — | — | H | 115 |

Drop across speaker field 35 volts, 739—65 volts on 7739.

Drop across Item 33—72 volts.

Maximum power output 4.3 watts @ 125 volts line.

Power consumption @ 117.5 volts line—63 watts.

H=heater.

ALIGNMENT PROCEDURE

All circuits have been accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an adjustment is necessary the circuits can best be properly aligned with the use of a modulated signal generator and an output meter.

NOTE: The circuit of this receiver is such that if the signal generator has one side of the line connected to the case or ground side and the generator and receiver are plugged into the same line, serious damage may result to either or both instruments. **ALWAYS ISOLATE SIGNAL GENERATOR GROUND LEAD BY INSERTING A .01 mf. OR SMALLER CONDENSER IN SERIES WITH THE LEAD BEFORE CONNECTING TO THE CHASSIS.**

CONNECTING OUTPUT METER

One terminal of the output meter should be connected to the plate (No. 3 pin) and the other terminal to the screen (No. 4 pin) of the 25L6GT output tube. Be sure the meter is protected from D. C. by connecting a .25 mf. condenser in series with one of the leads.

1.—I-F Amplifier Alignment

(a) Connect the output lead of the signal generator through a .02 mf. condenser to the top (GRID) cap of the 6A8GT tube (leaving the tubes grid connector in place) or to the antenna lead.

(b) Connect the ground lead of the signal generator through a .01 mf. (or smaller, .001 mf.) condenser to the chassis.

(c) Adjust station selector so that the rotor plates of the gang are completely disengaged, turn band to B. C. position and turn the volume control to maximum.

(d) Set the signal generator to 455 kc.

(e) Adjust the trimmer condensers on the 2nd I-F transformer for maximum output.

(f) Adjust the trimmer condensers on the 1st I-F transformer for maximum output.

(g) Repeat (e) and (f) for more accurate adjustments. **IN ORDER TO PREVENT A. V. C. ACTION, ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.**

2.—Aligning R-F Amplifier

(a) Connect the signal generator output lead through a .0001 mf. condenser to the antenna lead (YELLOW OR BLUE) and the generator ground lead to the Black lead of the receiver. Turn band switch to B. C. band, open gang all the way and turn volume control on full and tone control to treble position.

(b) Set signal generator to 1725 kilocycles. (Generator should be set to 1620 kilocycles for Model 7739).

(c) Adjust B. C. oscillator trimmer for maximum output (receiver does not have to tune through this signal).

(d) Set signal generator to 1400 kilocycles.

(e) Tune in generator signal on receiver by means of manual tuning knob.

(f) Adjust B. C. antenna trimmer for maximum output. **DO NOT** readjust oscillator trimmer.

(g) Repeat above procedure for more accurate adjustments.

(h) Set signal generator to 600 kilocycles.

(i) Tune in 600 kilocycle signal on receiver. While rocking the gang back and forth adjust the B. C. oscillator series condenser for maximum output.

(j) Repeat operations (d), (e) and (f) to correct any change caused by series alignment.

(k) Connect the signal generator output lead through a 250 ohm carbon resistor to the antenna lead of the receiver. Turn band switch to S. W. position, open gang condenser all the way, and turn volume on full, etc.

(l) Set signal generator to 18.3 megacycles.

(m) Adjust S. W. oscillator trimmer for maximum output.

(n) Set signal generator to 18 megacycles.

(o) Tune in 18 mc. signal with manual control, then adjust the S. W. antenna trimmer condenser for maximum output.

Check to see that receiver is aligned on the fundamental and not the image frequency. Increase signal generator output approximately 10 times and tune in image frequency (2 x 455 kc. + fundamental) which will be approximately 910 kilocycles less than 18 mc. as indicated by the dial calibrations (17.1 mc.). If correctly aligned, the image will come in as stated but will be much weaker than the fundamental.



FIG. 1-B—MODEL 7739 (MECHANICAL P. B. & LOOP)

MODELS 739, 7739 **Socket, Trimmers** **Chassis, Notes**

THE CROSLEY CORP.

MODELS J739, J7739 **Socket, Trimmers**

The circuit used is a conventional superheterodyne without regeneration using a 6A8GT as Oscillator-Modulator (biased 6K8GT in some of the earlier models), a 6SK7 as I-F amplifier, a 6P5GT as diode detector, A. V. C., a 6SF5 as first audio amplifier, a 25L6GT as beam power output and two 25Z6GT rectifiers (connected for voltage doubling). A. V. C. is applied to the oscillator-modulator and I-F tubes. All tubes are operated at zero bias except the 25L6GT which obtains its bias from the voltage drop across a 140 ohm resistor between cathode and chassis.

Model 7739 uses a tapped volume control for variable level bass compensation. Models of either chassis in the later series are equipped with terminals for connecting a phonograph attachment.

Models J-739 and J-7739 are the same as models 739 and 7739 except for the following:

Model J-739 differs from Model 739 in that the negative or ground return is isolated from the chassis by a .2 mf.—160 volt condenser. For alignment procedure use same as outlined for Model 739. The voltage readings are the same as given for Model 739 except the MEASUREMENTS SHOULD BE TAKEN BETWEEN SOCKET CONTACTS AND THE LOW SIDE OF THE VOLUME CONTROL.

Model J-7739 is the same as Model 7739 except that Model J-7739 has a 1 to 1 isolating power transformer. For alignment procedure and socket voltages use same as given for the Model 739 etc.

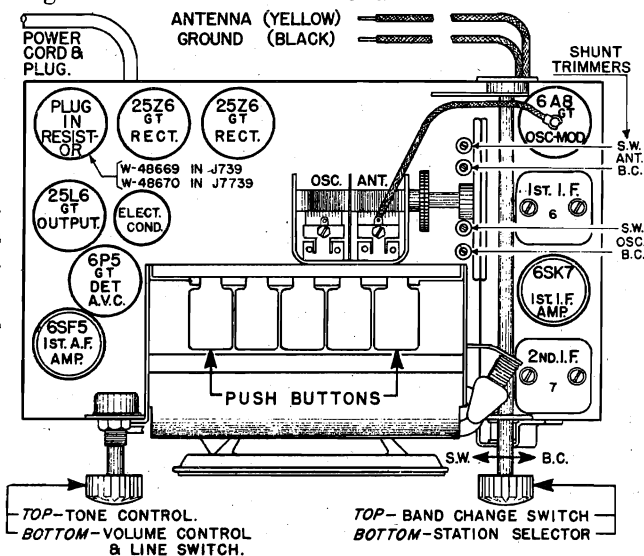


Fig. 2-C—Top View Models J-739, J-7739

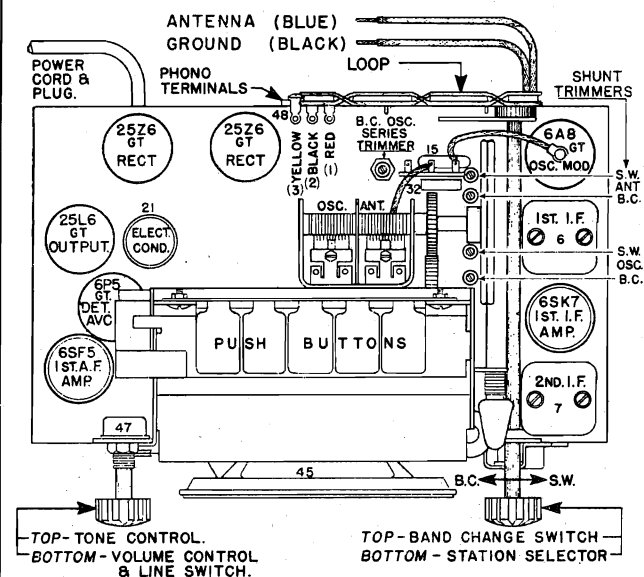


Fig. 2-A—Top View Model 739

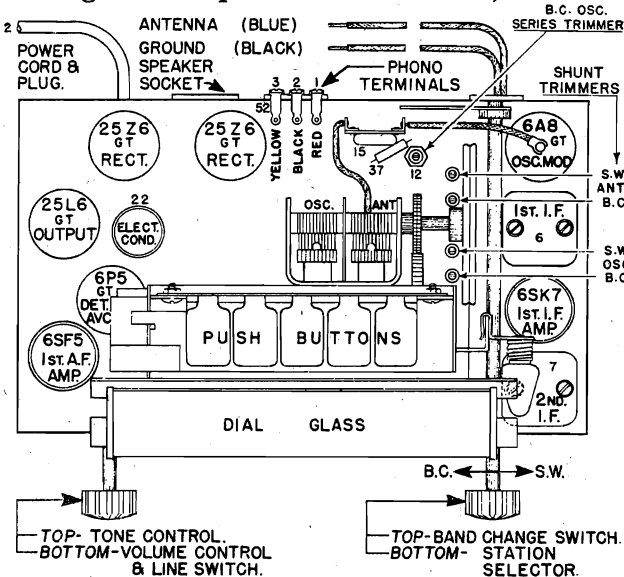


Fig. 2-B—Top View Model 7739

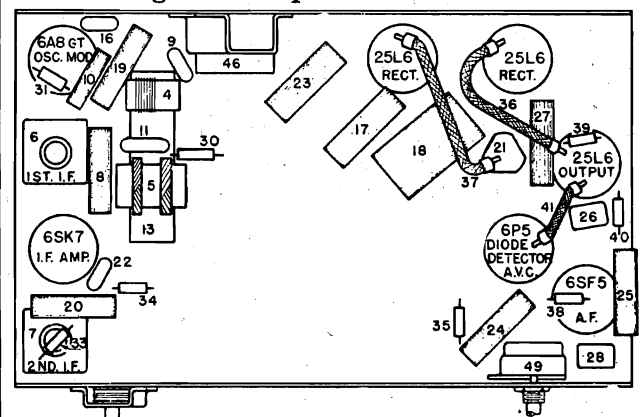


Fig. 3-A—Bottom View Model 739

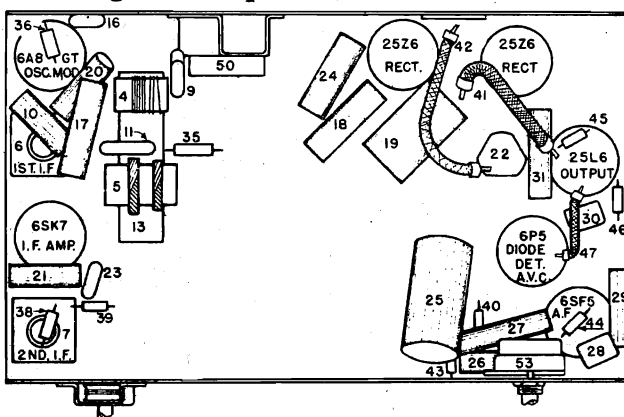
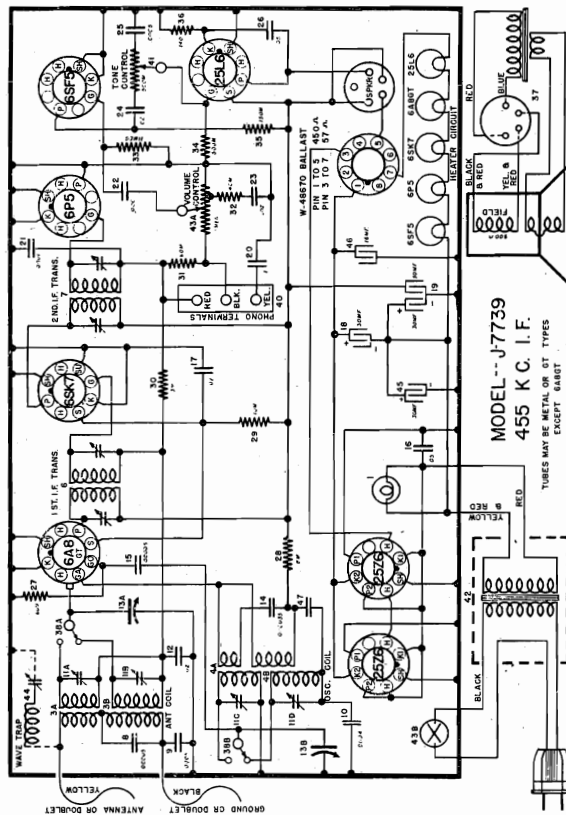


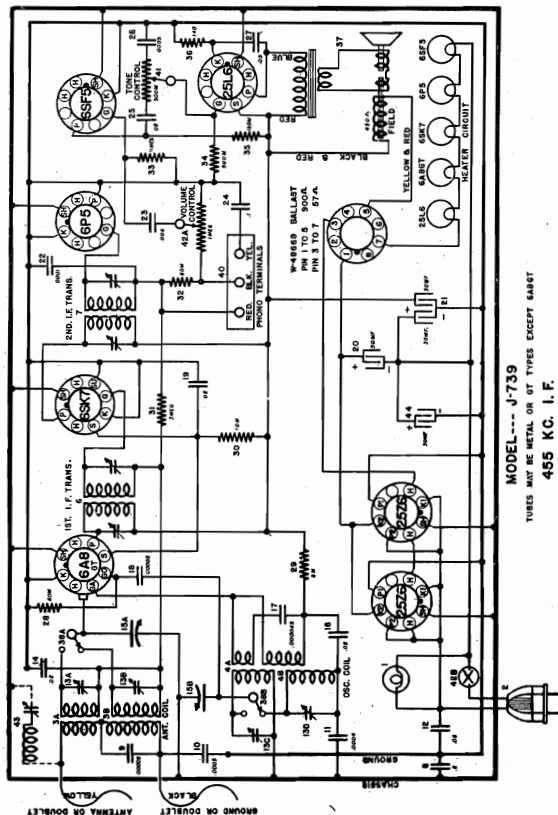
Fig. 3-B—Bottom View Model 7739

THE CROSLEY CORP.

MODELS J739, J7739
Schematics, PartsMODEL J7739—WIRING DIAGRAM
PARTS LIST

| | | | | |
|----|------------|--|------------|------------------------------------|
| 1 | -47977 | Dial Lamp, 110 Volt | -45780 | Condenser, .02 Mf. 160 V. |
| 2 | -45769 | Power Cord and Plug | -34002 | Condenser, .0005 Mf. Mica |
| 3 | G201-32000 | Antenna Coils Assy. | -45817 | Condenser, .05 Mf. 160 V. |
| 4 | G206-32002 | A—S. W. Antenna Coil B—B. C. Antenna Coil Oscillator Coils Assy. | -21237 | Resistor, 60,000 Ohms ½ W. |
| 5 | None | A—S. W. Oscillator Coil B—B. C. Oscillator Coil | -37905 | Resistor, 8,000 Ohms ¼ W. |
| 6 | G221-32004 | 1st I.F. Assy. | -36317 | Resistor, 10,000 Ohms ¼ W. |
| 7 | G188-32004 | 2nd I.F. Assy. | -26577 | Resistor, 3 Megohms ¼ W. |
| 8 | G5-34002 | Condenser, .0005 Mf. Mica | -21237 | Resistor, 60,000 Ohms ½ W. |
| 9 | G3-34002 | Condenser, .0005 Mf. Mica | -21453 | Resistor, 40,000 Ohms ½ W. |
| 10 | G18-34002 | Condenser, .0004 Mf. Mica | -36322 | Resistor, 11 Megohms ¼ W. |
| 11 | -41247 | 4 Sect. Shunt Trimmer Cond. Assy. | -23403 | Resistor, 500,000 Ohms ¼ W. |
| 12 | -45780 | Condenser, .02 Mf. 160 V. | -48753 | Resistor, 150,000 Ohms ¼ W. |
| 13 | G80-33001 | 2 Section Var. Tuning Condenser | 495-BF-10 | Speaker |
| 14 | G13-34002 | Condenser, .00035 Mf. Mica | 495-BF-10 | Band Switch (No Loop) |
| 15 | G5-34002 | Condenser, .0005 Mf. Mica | 495-BF-10 | Band Switch (With Loop) |
| 16 | -45782 | Condenser, .05 Mf. 120 V. | None | Phono Terminals |
| 17 | -45780 | Condenser, .02 Mf. 160 V. | G41-26719 | Tone Control, 500,000 Ohms |
| 18 | -47702 | Condenser, 30 Mf. 125 V. | -48020 | Power Transformer |
| 19 | -48596 | Condenser, 30-30 Mf. 135 V. | -48019 | Line Sw. and Vol. Control (1 Meg.) |
| 20 | -50105 | Condenser, 1 Mf. 160 V. | G193-32004 | Wave Trap |
| 21 | -34002 | Condenser, .0001 Mf. Mica | -47702 | Condenser, 30 Mf. 125 V. |
| 22 | -45810 | Condenser, .006 Mf. 160 V. | -48122 | Condenser, 16 Mf. 250 V. |
| 23 | -45780 | Condenser, .02 Mf. 160 V. | -45780 | Condenser, .02 Mf. 160 V. |
| | | | -48670 | Ballast Resistor |

For miscellaneous parts not listed use Model 7739 Parts List.

MODEL J-739—WIRING DIAGRAM
PARTS LIST

| | | | | |
|----|------------|---|------------|------------------------------------|
| 1 | -47977 | Dial Lamp, 110 Volt | -50105 | Condenser, 1 Mf. 160 V. |
| 2 | -45769 | Power Cord and Plug | -45780 | Condenser, .02 Mf. 160 V. |
| 3 | G201-32000 | Antenna Coils Assy. | -34002 | Condenser, .0005 Mf. Mica |
| 4 | G208-32002 | A—Short Wave Antenna Coil B—Broadcast Antenna Coil Oscillator Coils Assy. | -21237 | Resistor, 60,000 Ohms ½ W. |
| 5 | None | A—Short Wave Oscillator Coil B—Broadcast Oscillator Coil | -37905 | Resistor, 8,000 Ohms ¼ W. |
| 6 | G221-32004 | 1st I.F. Assy. | -36317 | Resistor, 10,000 Ohms ¼ W. |
| 7 | G188-32004 | 2nd I.F. Assy. | -26577 | Resistor, 3 Megohms ¼ W. |
| 8 | -48686 | Condenser, 2 Mf. 160 V. | -21237 | Resistor, 60,000 Ohms ½ W. |
| 9 | G5-34002 | Condenser, .0005 Mf. Mica | -21453 | Resistor, 40,000 Ohms ½ W. |
| 10 | G3-34002 | Condenser, .0005 Mf. Mica | -36322 | Resistor, 11 Megohms ¼ W. |
| 11 | G18-34002 | Condenser, .0004 Mf. Mica | -23403 | Resistor, 500,000 Ohms ¼ W. |
| 12 | -45782 | Condenser, .05 Mf. 120 V. | -48753 | Resistor, 150,000 Ohms ¼ W. |
| 13 | -41247 | 4 Sect. Shunt Trimmer Cond. Assy. | 281-UL-7 | Speaker |
| 14 | -45780 | Condenser, .02 Mf. 160 V. | 281-UL-7 | Band Switch (No Loop) |
| 15 | G80-33001 | 2 Section Var. Tuning Gang Cond. | 281-UL-7 | Band Switch (With Loop) |
| 16 | -45780 | Condenser, .02 Mf. 160 V. | None | Phono Terminal Board |
| 17 | -45780 | Condenser, .02 Mf. 160 V. | G41-26719 | Tone Control, 500,000 Ohms |
| 18 | G13-34002 | Condenser, .00035 Mf. Mica | -48181 | Line Sw. and Vol. Control (1 Meg.) |
| 19 | G5-34002 | Condenser, .0005 Mf. Mica | -47702 | Condenser, 30 Mf. 125 V. |
| 20 | -47702 | Condenser, .02 Mf. 160 V. | -48020 | Power Transformer |
| 21 | -48596 | Condenser, 30-30 Mf. 135 V. | -48019 | Line Sw. and Vol. Control (1 Meg.) |
| 22 | -34002 | Condenser, .0001 Mf. Mica | G193-32004 | Wave Trap |
| 23 | -45810 | Condenser, .006 Mf. 160 V. | -47702 | Condenser, 30 Mf. 125 V. |
| | | | -48122 | Condenser, 16 Mf. 250 V. |
| | | | -45780 | Condenser, .02 Mf. 160 V. |
| | | | -48670 | Ballast Resistor |

For miscellaneous parts not listed use Model 739 Parts List.

FEBRUARY, 1940

MODELS 819 (2 Types),

J819,1019

THE CROSLLEY CORP.

Parts Lists

PARTS LIST—MODEL 819
(Series Using 2526 Rectifiers)

| Item No. | Part No. | Description | Part No. | Description | Item No. |
|----------|----------|------------------------------|----------|----------------------------------|----------|
| 1 | G1 | Dial Lamp—110 Volt | 48318 | V. C. and Cone Assy.—"R" | 48622 |
| 2 | G1 | Socket—Watt Lamp | 48319 | Cardboard Ring—Cone Mounting | 48623 |
| 3 | G1 | Power Cord and Plug | 48320 | Rectifier—Type "R" | 48624 |
| 4 | G1 | Power Trans. 110 V.—50 Cycle | 48321 | Output Transformer | 48625 |
| 5 | G1 | Power Trans. 220 V.—50 Cycle | 48322 | Band Change Switch | 48626 |
| 6 | G1 | Push Button Tuning Unit | 48323 | Phono Terminal Board Assy. | 48627 |
| 7 | G1 | Reverberator Assy. | 48324 | Tone Control Switch | 48628 |
| 8 | G1 | Loop Antenna—B. C. | 48325 | Switch and Volume Control—1 Meg. | 48629 |
| 9 | G1 | Antenna Coil—H. F. | 48326 | 455 Kc. Wave Trap | 48630 |
| 10 | G1 | Oscillator Coil—B. C. | 48327 | Switch—Push Button | 48631 |
| 11 | G1 | Reverberator Key Assy. | 48328 | Sorting—Switch Blade | 48632 |
| 12 | G1 | Oscillator Coil—H. F. | 48329 | Contact and Blade Assy. | 48633 |
| 13 | G1 | Scillator Coil—B. C. | 48330 | Band Change Switch | 48634 |
| 14 | G1 | Scillator Coil—H. F. | 48331 | Phono Terminal Board Assy. | 48635 |
| 15 | G1 | Scillator Coil—B. C. | 48332 | Push Button Tuning Unit—Complete | 48636 |
| 16 | G1 | Scillator Coil—H. F. | 48333 | Riveted Key Assy. | 48637 |
| 17 | G1 | Scillator Coil—B. C. | 48334 | Rocker Plate and Gear Assy. | 48638 |
| 18 | G1 | Scillator Coil—H. F. | 48335 | Riveted Switch Rocker Bar | 48639 |
| 19 | G1 | Scillator Coil—B. C. | 48336 | Armature and Pin Assy. | 48640 |
| 20 | G1 | Scillator Coil—H. F. | 48337 | Push Button Shaft | 48641 |
| 21 | G1 | Scillator Coil—B. C. | 48338 | Magnet Rocker Plate | 48642 |
| 22 | G1 | Scillator Coil—H. F. | 48339 | Glass Dial | 48643 |
| 23 | G1 | Scillator Coil—B. C. | 48340 | Bracket—Dial Support | 48644 |
| 24 | G1 | Scillator Coil—H. F. | 48341 | Bracket—Dial Support | 48645 |
| 25 | G1 | Scillator Coil—B. C. | 48342 | L. H. Clip—Dial Mtg. | 48646 |
| 26 | G1 | Scillator Coil—H. F. | 48343 | Clip—Dial Mtg. | 48647 |
| 27 | G1 | Scillator Coil—B. C. | 48344 | Cushion—Dial Glass | 48648 |
| 28 | G1 | Scillator Coil—H. F. | 48345 | Pointer—Dial Hand | 48649 |
| 29 | G1 | Scillator Coil—B. C. | 48346 | Drive Shaft and Pulley | 48650 |
| 30 | G1 | Scillator Coil—H. F. | 48347 | Bracket—Shaft Retaining | 48651 |
| 31 | G1 | Scillator Coil—B. C. | 48348 | Drive Cord (85½" Long) | 48652 |
| 32 | G1 | Scillator Coil—H. F. | 48349 | Lord Clamped Drive Cord | 48653 |
| 33 | G1 | Scillator Coil—B. C. | 48350 | Spring—Drive Cord | 48654 |
| 34 | G1 | Scillator Coil—H. F. | 48351 | Felt Light Guard | 48655 |
| 35 | G1 | Scillator Coil—B. C. | 48352 | Guide—Cord on Pulley | 48656 |
| 36 | G1 | Scillator Coil—H. F. | 48353 | Cabinet | 48657 |
| 37 | G1 | Scillator Coil—B. C. | 48354 | Shipping Carton | 48658 |
| 38 | G1 | Scillator Coil—H. F. | 48355 | Push Button—Magnet | 48659 |
| 39 | G1 | Scillator Coil—B. C. | 48356 | Push Button Mtg. | 48660 |
| 40 | G1 | Scillator Coil—H. F. | 48357 | Cabinet Back | 48661 |
| 41 | G1 | Scillator Coil—B. C. | 48358 | Excuteon | 48662 |
| 42 | G1 | Scillator Coil—H. F. | 48359 | Hummer—Back Mtg. | 48663 |
| 43 | G1 | Scillator Coil—B. C. | 48360 | Speaker Baffle | 48664 |
| 44 | G1 | Scillator Coil—H. F. | 48361 | Headed Bushing—Speaker Baffle | 48665 |
| 45 | G1 | Scillator Coil—B. C. | 48362 | Dust Cloth—Speaker Baffle | 48666 |
| 46 | G1 | Scillator Coil—H. F. | 48363 | Excuteon Mtg. Strip | 48667 |
| 47 | G1 | Scillator Coil—B. C. | 48364 | Excuteon Mtg. Strip | 48668 |
| 48 | G1 | Scillator Coil—H. F. | 48365 | Excuteon Mtg. Strip | 48669 |
| 49 | G1 | Scillator Coil—B. C. | 48366 | Excuteon Mtg. Strip | 48670 |
| 50 | G1 | Scillator Coil—H. F. | 48367 | Excuteon Mtg. Strip | 48671 |
| 51 | G1 | Scillator Coil—B. C. | 48368 | Excuteon Mtg. Strip | 48672 |
| 52 | G1 | Scillator Coil—H. F. | 48369 | Excuteon Mtg. Strip | 48673 |
| 53 | G1 | Scillator Coil—B. C. | 48370 | Excuteon Mtg. Strip | 48674 |
| 54 | G1 | Scillator Coil—H. F. | 48371 | Excuteon Mtg. Strip | 48675 |
| 55 | G1 | Scillator Coil—B. C. | 48372 | Excuteon Mtg. Strip | 48676 |
| 56 | G1 | Scillator Coil—H. F. | 48373 | Excuteon Mtg. Strip | 48677 |
| 57 | G1 | Scillator Coil—B. C. | 48374 | Excuteon Mtg. Strip | 48678 |

PARTS LIST — MODELS 819, J-819, 1019
(Model with 5Y3G Rectifiers)

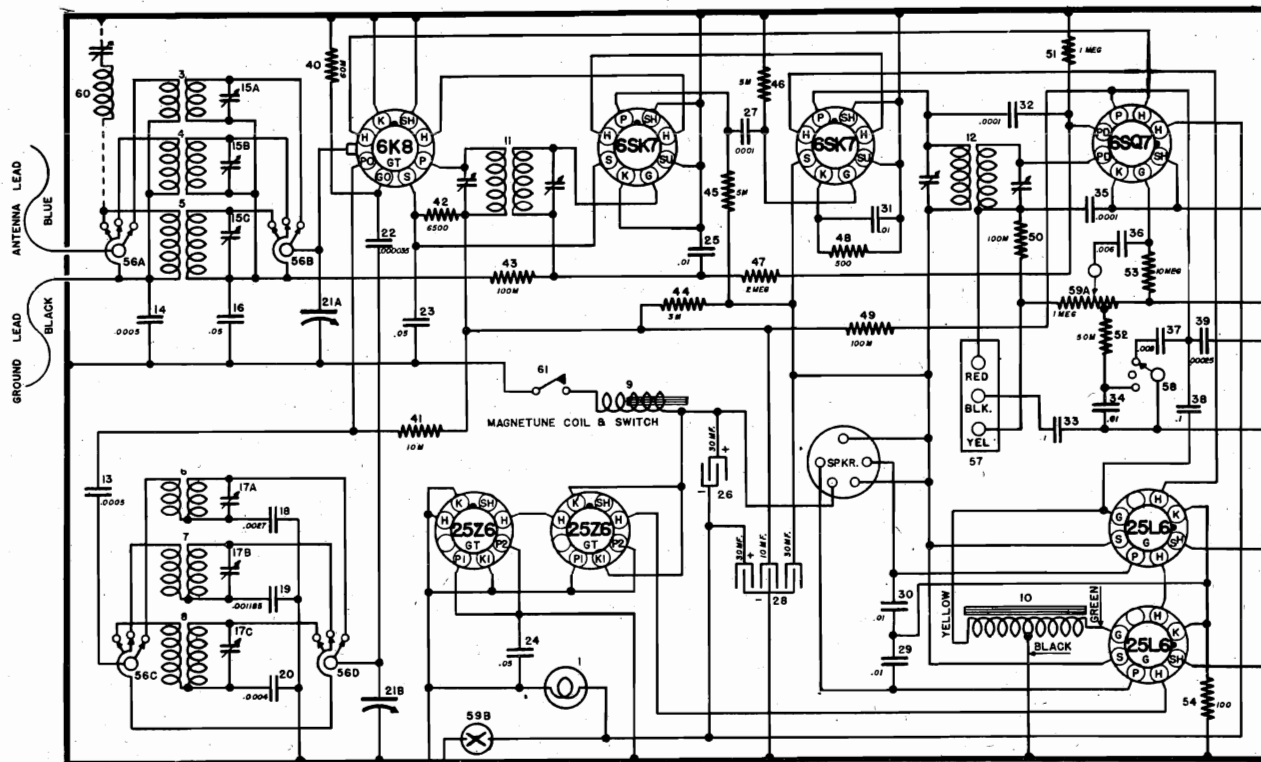
| Item No. | Part No. | Description | Part No. | Description | Item No. |
|----------|----------|------------------------------|----------|------------------------------------|----------|
| 1 | W | Dial Lamp—110 Volt | 48318 | Power Trans. 110 V.—50 Cycle | 48902 |
| 2 | G1 | Socket—Watt Lamp | 48319 | Power Trans. 220 V.—50 Cycle | 48903 |
| 3 | B | Power Cord and Plug | 48320 | Power Trans. 110 V.—60 Cycle—1819 | 48904 |
| 4 | B | Power Trans. 110 V.—50 Cycle | 48321 | Push Button Tuning Unit | 48905 |
| 5 | G1 | Reverberator Assy. | 48322 | Reverberator Assy. | 48906 |
| 6 | G1 | Loop Antenna—B. C. | 48323 | Screws—Rocker Plate Bearing | 48907 |
| 7 | G1 | Antenna Coil—H. F. | 48324 | Adjusting Screw | 48908 |
| 8 | G1 | Oscillator Coil—B. C. | 48325 | Shafts (End of Adjusting Screw) | 48909 |
| 9 | G1 | Reverberator Key Assy. | 48326 | No. 8—32 x 1/4" Headless Set Screw | 48910 |
| 10 | G1 | Oscillator Coil—H. F. | 48327 | Bracket—Dial Support | 48911 |
| 11 | G1 | Scillator Coil—B. C. | 48328 | Glass Dial | 48912 |
| 12 | G1 | Scillator Coil—H. F. | 48329 | R. H. Clip—Dial Mtg. (1 Req.) | 48913 |
| 13 | G1 | Scillator Coil—B. C. | 48330 | L. H. Clip—Dial Mtg. (1 Req.) | 48914 |
| 14 | G1 | Scillator Coil—H. F. | 48331 | Cushion—Dial Glass | 48915 |
| 15 | G1 | Scillator Coil—B. C. | 48332 | Pointer—Dial Hand | 48916 |
| 16 | G1 | Scillator Coil—H. F. | 48333 | Pulley and Hub Assy. | 48917 |
| 17 | G1 | Scillator Coil—B. C. | 48334 | Drive Shaft and Pulley | 48918 |
| 18 | G1 | Scillator Coil—H. F. | 48335 | Bracket—Drive Shaft Retaining | 48919 |
| 19 | G1 | Scillator Coil—B. C. | 48336 | Drive Cord (85½" Long) | 48920 |
| 20 | G1 | Scillator Coil—H. F. | 48337 | Lord Clamped Drive Cord | 48921 |
| 21 | G1 | Scillator Coil—B. C. | 48338 | Spring—Drive Cord | 48922 |
| 22 | G1 | Scillator Coil—H. F. | 48339 | Felt Light Guard | 48923 |
| 23 | G1 | Scillator Coil—B. C. | 48340 | Guide—Cord on Pulley | 48924 |
| 24 | G1 | Scillator Coil—H. F. | 48341 | Cabinet | 48925 |
| 25 | G1 | Scillator Coil—B. C. | 48342 | Shipping Carton | 48926 |
| 26 | G1 | Scillator Coil—H. F. | 48343 | Thumb Screws—Back Mtg. | 48927 |
| 27 | G1 | Scillator Coil—B. C. | 48344 | Excuteon Mtg. Strip—FS18 | 48928 |
| 28 | G1 | Scillator Coil—H. F. | 48345 | Excuteon Mtg. Strip | 48929 |
| 29 | G1 | Scillator Coil—B. C. | 48346 | Excuteon Mtg. Strip | 48930 |
| 30 | G1 | Scillator Coil—H. F. | 48347 | Excuteon Mtg. Strip | 48931 |
| 31 | G1 | Scillator Coil—B. C. | 48348 | Excuteon Mtg. Strip | 48932 |
| 32 | G1 | Scillator Coil—H. F. | 48349 | Excuteon Mtg. Strip | 48933 |
| 33 | G1 | Scillator Coil—B. C. | 48350 | Excuteon Mtg. Strip | 48934 |
| 34 | G1 | Scillator Coil—H. F. | 48351 | Excuteon Mtg. Strip | 48935 |
| 35 | G1 | Scillator Coil—B. C. | 48352 | Excuteon Mtg. Strip | 48936 |
| 36 | G1 | Scillator Coil—H. F. | 48353 | Excuteon Mtg. Strip | 48937 |
| 37 | G1 | Scillator Coil—B. C. | 48354 | Excuteon Mtg. Strip | 48938 |
| 38 | G1 | Scillator Coil—H. F. | 48355 | Excuteon Mtg. Strip | 48939 |
| 39 | G1 | Scillator Coil—B. C. | 48356 | Excuteon Mtg. Strip | 48940 |
| 40 | G1 | Scillator Coil—H. F. | 48357 | Excuteon Mtg. Strip | 48941 |
| 41 | G1 | Scillator Coil—B. C. | 48358 | Excuteon Mtg. Strip | 48942 |
| 42 | G1 | Scillator Coil—H. F. | 48359 | Excuteon Mtg. Strip | 48943 |
| 43 | G1 | Scillator Coil—B. C. | 48360 | Excuteon Mtg. Strip | 48944 |
| 44 | G1 | Scillator Coil—H. F. | 48361 | Excuteon Mtg. Strip | 48945 |
| 45 | G1 | Scillator Coil—B. C. | 48362 | Excuteon Mtg. Strip | 48946 |
| 46 | G1 | Scillator Coil—H. F. | 48363 | Excuteon Mtg. Strip | 48947 |
| 47 | G1 | Scillator Coil—B. C. | 48364 | Excuteon Mtg. Strip | 48948 |
| 48 | G1 | Scillator Coil—H. F. | 48365 | Excuteon Mtg. Strip | 48949 |
| 49 | G1 | Scillator Coil—B. C. | 48366 | Excuteon Mtg. Strip | 48950 |
| 50 | G1 | Scillator Coil—H. F. | 48367 | Excuteon Mtg. Strip | 48951 |
| 51 | G1 | Scillator Coil—B. C. | 48368 | Excuteon Mtg. Strip | 48952 |
| 52 | G1 | Scillator Coil—H. F. | 48369 | Excuteon Mtg. Strip | 48953 |
| 53 | G1 | Scillator Coil—B. C. | 48370 | Excuteon Mtg. Strip | 48954 |
| 54 | G1 | Scillator Coil—H. F. | 48371 | Excuteon Mtg. Strip | 48955 |
| 55 | G1 | Scillator Coil—B. C. | 48372 | Excuteon Mtg. Strip | 48956 |
| 56 | G1 | Scillator Coil—H. F. | 48373 | Excuteon Mtg. Strip | 48957 |
| 57 | G1 | Scillator Coil—B. C. | 48374 | Excuteon Mtg. Strip | 48958 |



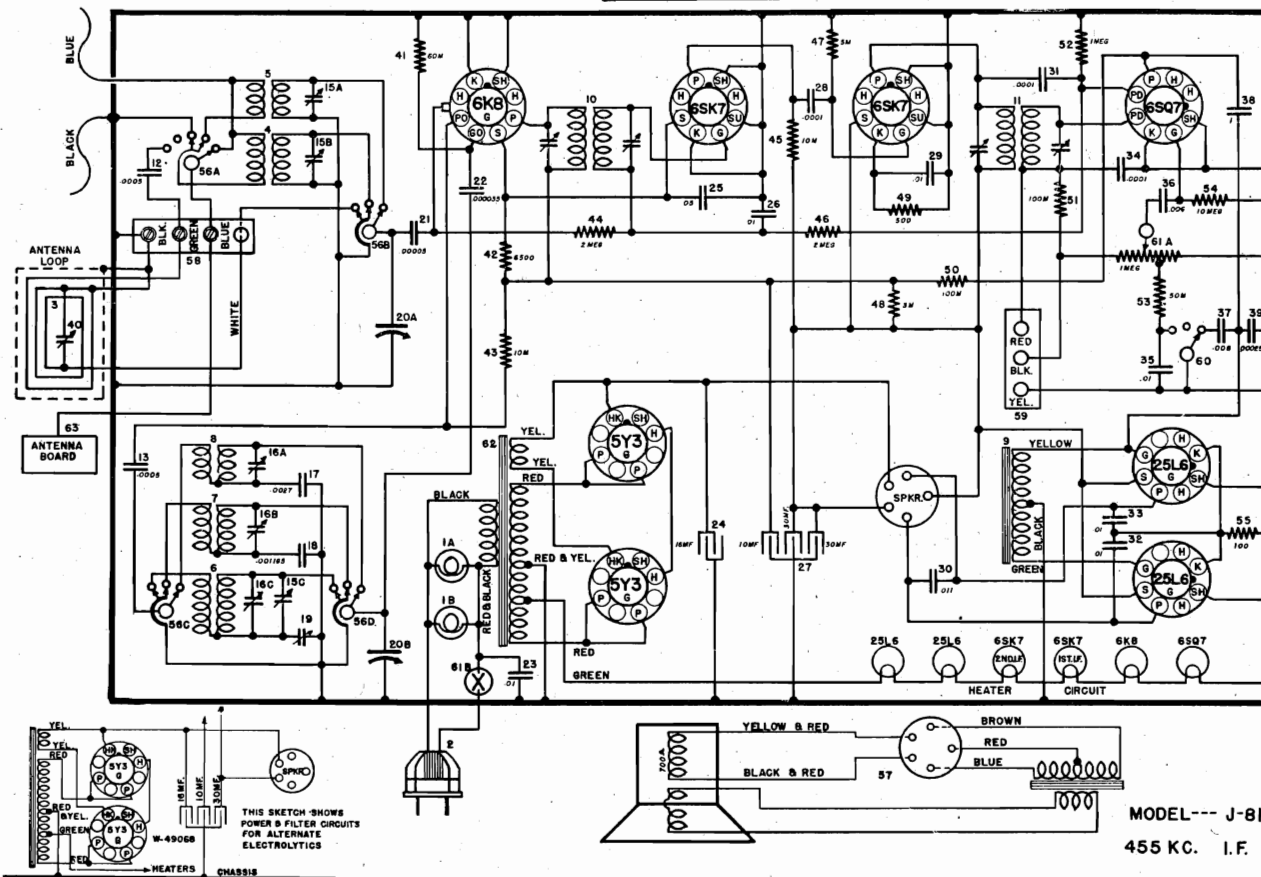
FIG. 1—WIRING DIAGRAM—MODELS 819 and 1019
455 KC. I.F.

MODELS 819, J819
Schematics

THE CROSLLEY CORP.

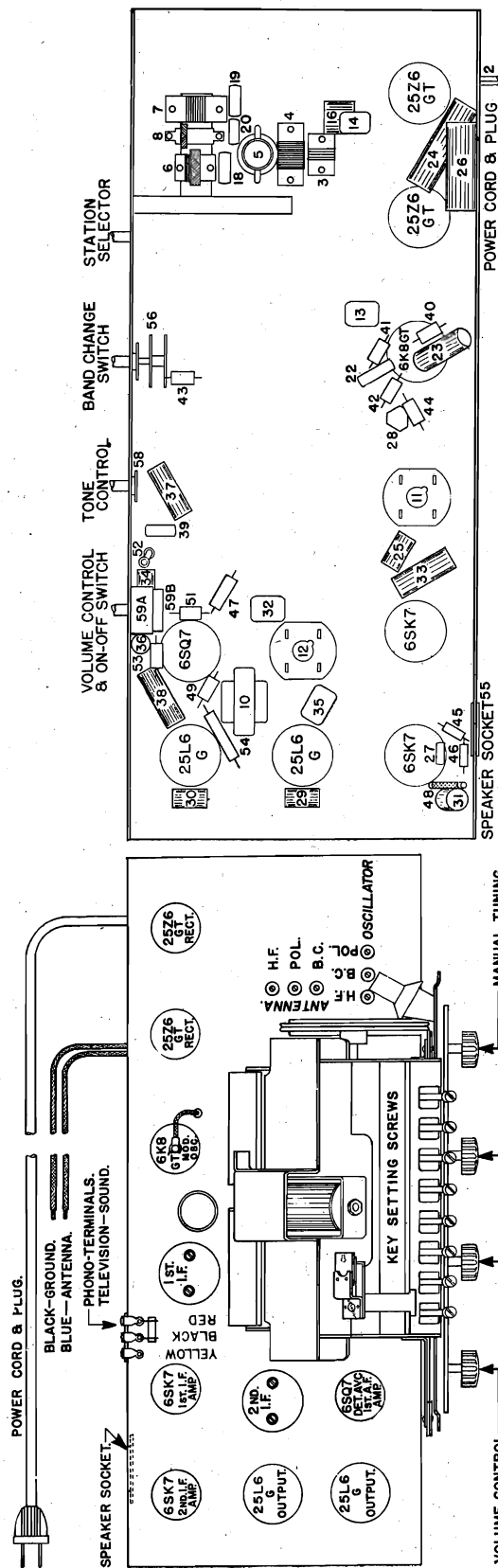


MODEL -- 819
455 KC. I.F.



MODEL --- J-819
455 KC. I.F.

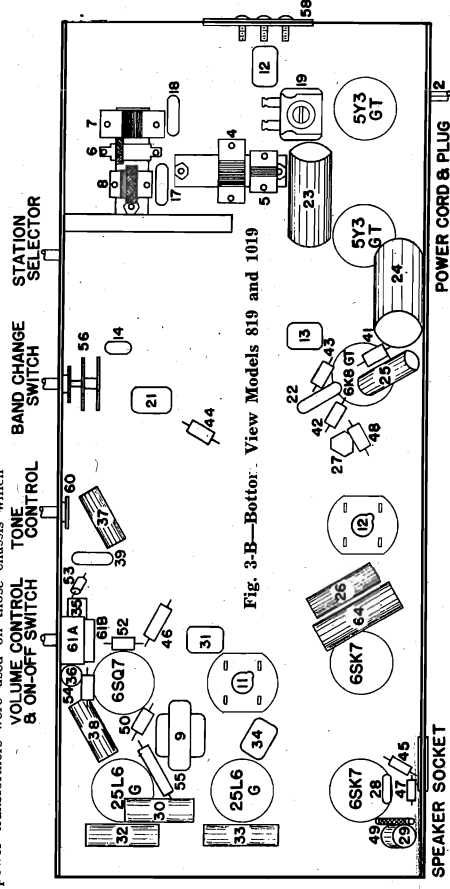
THE CROSLEY CORP.

MODELS 819, J819, 1019
Socket, Trimmers, Chassis

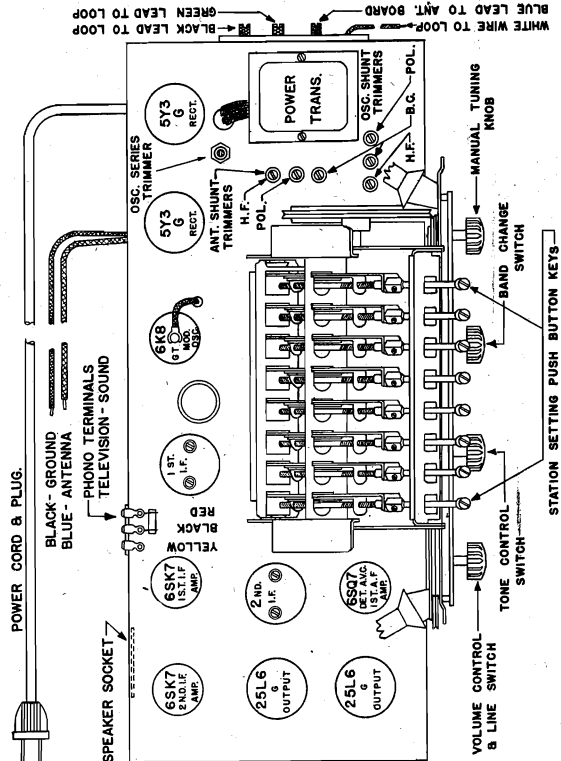
The circuit is a conventional superheterodyne with no regeneration, having two stages of LF amplification, the first of which is resistance coupled, variable level bass compensation, a three position tone control and impedance coupled push pull beam power output. No power transformers were used on those chassis which used two 25Z6GT Rectifiers. The power transformer used on the later versions having two 5Y3C Rectifiers is quite different from the regular type power transformer used in Model J-819, and care should be exercised when checking its voltages.

Fig. 3-A—Bottom View Model 819 (No Loop)

The diagram illustrates the bottom view of the Model 819 chassis. Key components include the power cord and plug, power transformer, speaker socket, volume control & line switch, tone control switch, band change switch, station selector, and various vacuum tubes (6SK7, 25L6, 25Z6, 6K8, 6SQ7, 6SK7, 25L6, 25Z6). It also shows a manual tuning knob and key setting screws.



Model 1019 is the same as model 819 except for the cabinet, dial, escutcheon and knobs used. There are two versions of the model 819 in the field. The first few releases had an electrical (magnatone) push button tuning system and two 25Z6GT Rectifier tubes. The later releases had a mechanical push button tuning system, loop antenna, two 5Y3C Rectifier tubes and a power transformer. Models J-819 and 1019 falls in this group.



MODELS 819, J819, 1019

Voltage, Alignment

Drive Cord Data

THE CROSLLEY CORP.

mental and not the image frequency. When correctly aligned the image should be heard approximately 17.4 on the dial but will be comparatively weak compared to the fundamental signal.

- (n) Set signal generator to 18.0 megacycles.
- (o) Tune in the signal generator signal for maximum output; then adjust the H. F. antenna shunt trimmers for maximum output. When aligning the RF circuits always use the lowest signal input, which will give a reasonable indication on the output meter, to prevent A.V.C. action.

REPLACING DRIVE CORD

- (1) Remove the broken drive cord, saving the small metal cord clamp, the tension spring and pointer.
- (2) Carefully remove the dial glass.
- (3) Cut a piece of drive cord about 85 inches long. Fasten the tension spring approximately one inch from one end.
- (4) Open the condenser gang all the way. The eyelet in the large drive pulley should be near the top with the gang in this position.
- (5) Hook the loose end of the tension spring on small ear formed in pulley rim from the inside.
- (6) Bring cord forward over pulley then down to small pulley on manual drive shaft, make one complete turn around small pulley in a clockwise direction.
- (7) Continue cord from the under side of drive shaft pulley over the lower left hand idler pulley, then making a half turn over left hand idler continue over to the top of pulley on drive shaft.
- (8) Continue around pulley in a clockwise direction over to lower left hand idler, over lower left hand idler and up to upper left hand idler pulley, continue cord over upper left hand idler to upper right hand idler pulley.
- (9) Bring cord over right hand idler pulley and down and under and around large drive pulley to eyelet.
- (10) Insert end through the eyelet. Tie securely to tension spring. The cord should be so tied that the tension spring when hooked on ear formed in pulley, will be stretched to approximately 1 1/4 inches in length.
- (11) Hook the pointer on drive cord, the solid end pointer to the drive cord between the upper left hand and right hand idler pulleys. The cutout end of pointer is fastened to the top cord between the lower left hand and the pulley on the drive shaft. Replace dial glass.
- Before clamping pointer or cementing it to the drive cord, open gang all the way. The pointer should then split the last graduation on the dial. Check travel from end to end then fasten pointer securely.
- (12) Replace the cord clamp on drive cord inside the large drive pulley. The position of clamp should be no more than 1/16" from inside end of eyelet.

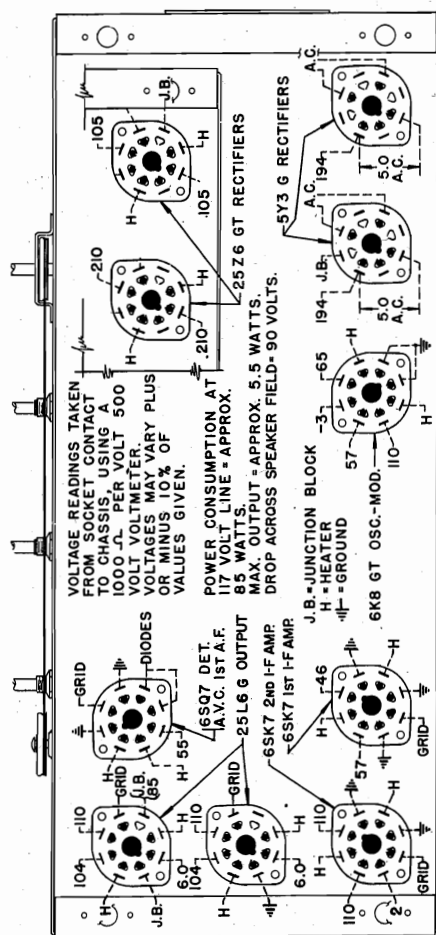


Fig. 4—Socket Voltages Models 819, J-819, 1019

Aligning The I-F Amplifier To 455 Kilocycles.

- (a) Connect the output lead of the signal generator through a .0002 mf. condenser to the receiver antenna lead (Blue). Connect the signal generator ground lead through a .01 mf. or smaller condenser to the receiver ground lead (Black).
- (b) Set the signal generator to 455 kilocycles. Turn the receiver band switch to the Broadcast band (left), the tone control switch to the speech position (left), open the gang condenser all the way then turn the volume control on full (all the way to the right).
- (c) Adjust the two trimmer condensers on the second I-F assembly for maximum output (Fig. 2).
- (d) Adjust the two trimmer condensers on the first I-F assembly for maximum output. (Fig. 2).
- (e) Repeat (c) and (d) for more accurate adjustments.

Aligning The R-F Amplifier.

- (a) For aligning the broadcast band the setup remains the same. Using a .0002 mf. condenser for a dummy antenna and etc.
- (b) For models without loop antenna set the signal generator to 1725 kilocycles. For models with a loop antenna set the signal generator to 1550 kilocycles. Open condenser gang all the way, turn band switch to left (B. C.), tone control to left (speech) and the volume control on full.
- (c) For models without the loop antenna adjust B. C. oscillator shunt trimmer condenser (Fig. 2) for maximum output (gang does not have to tune through this signal). For models with a loop antenna there are two oscillator shunt trimmer condensers as will be noted in figure 2. Close the front oscillator shunt trimmer all the way, then open about 1/2 turn. Proceed to tune in with the other (rear) trimmer the 1550 kilocycle signal for maximum output.

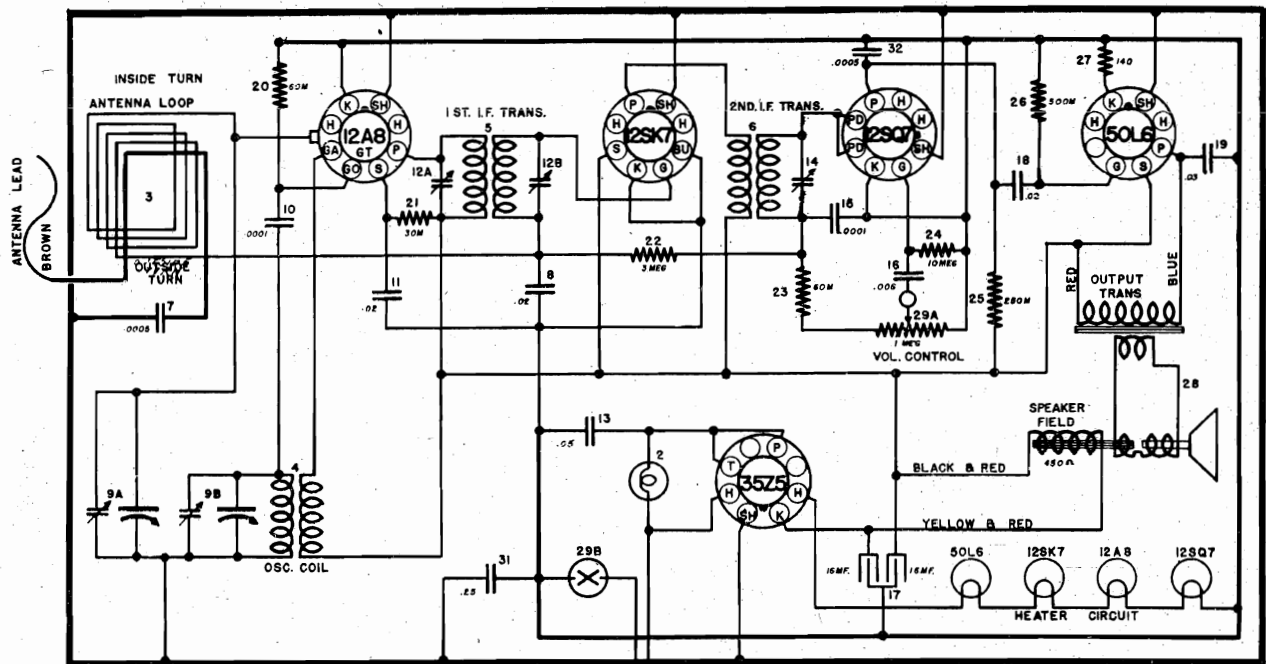
- (d) Set the signal generator to 1400 kilocycles.
- (e) Tune the receiver to generator signal for maximum output (approximately 140 on the dial).
- (f) On models without the loop adjust the B. C. antenna shunt trimmer for maximum output, see (Fig. 2). On models with a loop a B. C. antenna shunt trimmer is located on top the loop antenna; adjust for maximum output.
- Models equipped with a loop antenna have provisions for series aligning the oscillator circuit:
 - (1) Set signal generator to 600 kilocycles.
 - (2) Tune in generator signal on receiver.
 - (3) While rocking tuning condenser back and forth adjust oscillator series trimmer (Fig. 2) for maximum output. Then repeat (d) and (f) for more accurate alignment.
 - (g) Change dummy antenna from a .0002 mf. condenser to a 250 ohm carbon resistor.
 - (h) For models without loop antenna set the signal generator to 5.8 megacycles. Open gang condenser, turn band switch to center position, T. C. to left (speech) and volume on full. For models with a loop antenna set signal generator to 5.0 megacycles.
 - (i) Adjust "Pol." oscillator shunt trimmer condenser (Fig. 2) for maximum output.
 - (j) For models without loop antenna set signal generator to 5.5 megacycles. For models with a loop antenna set signal generator to 4.0 megacycles.
 - (k) Tune in generator signal with manual control for maximum output (approximate 5.5 or 4.0 megacycles on the dial). Adjust the "Pol." antenna shunt trimmer condenser for maximum output.
 - (l) Set signal generator to 18.3 megacycles.
 - (m) With gang open and band switch turned to the right (H. F.), adjust the H. F. (high frequency) oscillator trimmer (Fig. 2) for maximum output. Care should be taken to align the oscillator on the funda-

THE CROSLLEY CORP.

MODELS 5519, 5529, 6519

J5519, J5529

Schematics



TUBES MAY BE METAL OR GT TYPE EXCEPT 12A8

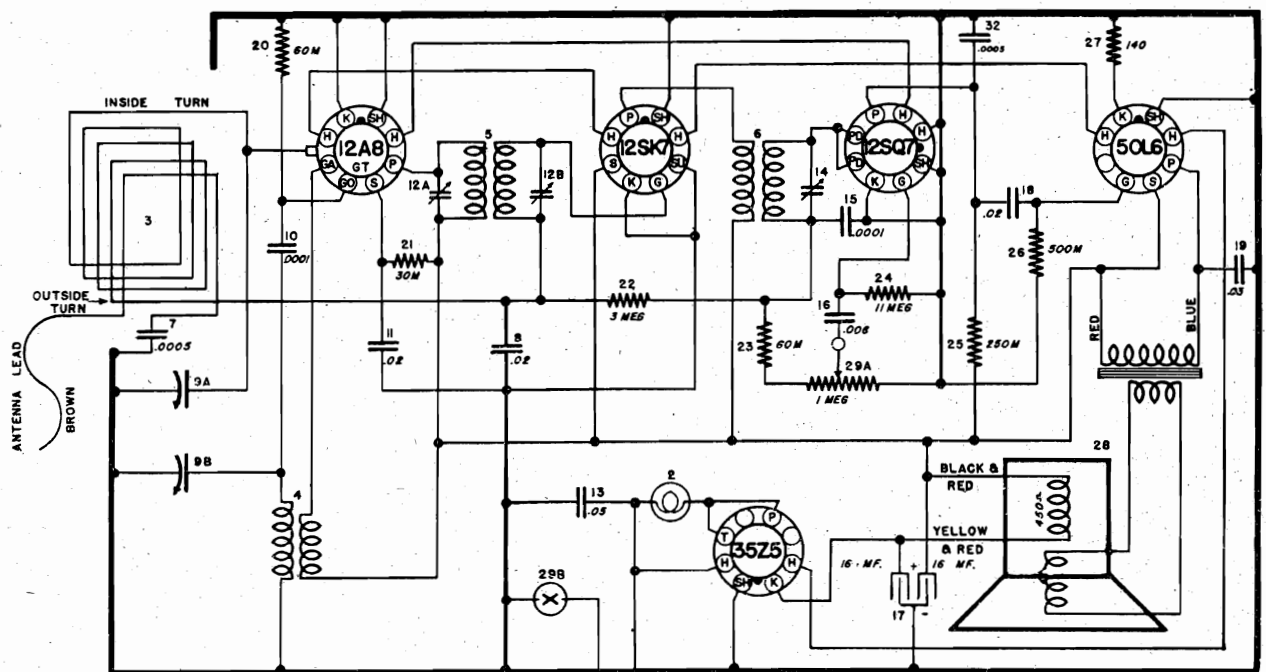
455 KC. I.F.

MODEL-- J5519 & J5529

FEBRUARY, 1940

MODEL J-5519—Same as model 5519 except the negative "B" circuit or ground return (one side of the

line) is isolated from the chassis by a .25MF. condenser.



TUBES MAY BE METAL OR GT TYPE EXCEPT 12A8

MODELS--- 5519 & 5529 & 6519

455 KC. I.F.

MODEL J-5529—Same as model 5529 except the negative "B" or ground return circuit (one side of the

line) is isolated from the chassis by a .25 mfd. condenser.

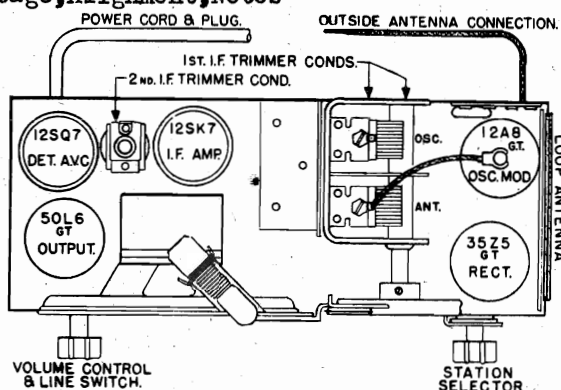
MODELS 5519, 5529, 6519

J5519, J5529

Socket, Trimmers, Chassis

Voltage, Alignment, Notes

THE CROSLLEY CORP.



Models 5519, J-5519, 6519

Fig. 2—Top View

Models 5529, J-5529

TUBE SOCKET VOLTAGE READINGS

| Tube | Function | H | P | S | Su | K | Go | Ga |
|---------|-------------------------|----|-------|----|----|-----|----|----|
| 12A8GT | Oscillator-Modulator | 12 | 90 | 48 | — | 3 | -4 | 90 |
| 12SK7GT | I-F Amplifier | 12 | 90 | 90 | — | — | — | — |
| 12SQ7GT | Det. AVC, A-F Amplifier | 12 | 40 | — | — | — | — | — |
| 50L6GT | Output | 50 | 84 | 90 | — | 6 | — | — |
| 35Z5GT | Rectifier | 35 | 117.5 | — | — | 117 | — | — |

Power output approximately 2 watts.

Power consumption approximately 27 watts.

Voltage drop across speaker field 25 volts.

All voltages except filaments will be approximately 10% lower if measured on 117.5 volts DC power supply.

ALIGNMENT PROCEDURE

The chassis of this receiver is connected to one side of the power supply and for this reason all test equipment should be thoroughly insulated in order that the power supply will not become short circuited while aligning the receiver. (J Models have a .25 mf. condenser isolating line from chassis).

CONNECTING OUTPUT METER

Connect one terminal of the output meter to the plate and the other terminal to the screen of the 50L6GT output tube. Be certain that the meter is protected from DC by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

Tuning the I-F Amplifier To 455 Kilocycles.

(a) Connect the output of the signal generator through a 50 mmf. condenser to the antenna connection on the receiver. Do not use a ground return from the signal generator unless it is found to be absolutely necessary. If it is found to be necessary, a small condenser (approximately .001 mfd.) should be connected in series with the ground terminal of the signal generator and the receiver chassis. **KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.**

(b) Set the station selector so that the plates of the condenser gang are completely out of mesh and turn the volume control to the right (ON).

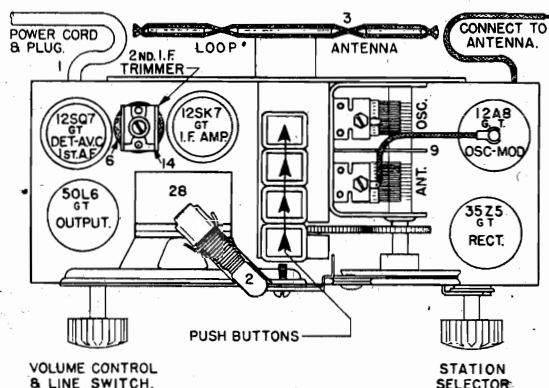
(c) Set the signal generator to 455 kilocycles.

(d) Adjust the 2nd I-F trimmer condenser, Item 14, located on top of coil (Fig. 2) for maximum reading on the output meter.

(e) Adjust the 1st I-F trimmer condensers located on the rear of chassis for maximum output.

(f) Repeat operations (d) and (e) for more accurate adjustments.

ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE READING ON THE OUTPUT METER.



Aligning the R-F Amplifier.

(a) Set the signal generator to 1725 kilocycles.

(b) With the condenser gang turned to the minimum capacity position, adjust the trimmer condenser on the "OSC" section of the gang so that the 1725 kilocycle signal is heard. It is not necessary that the receiver tune through this signal.

(c) Set the signal generator to 1400 kilocycles.

(d) Tune-in the 1400 kilocycle signal in the region of 140 on the dial for maximum output.

(e) Adjust the trimmer condenser located on the "ANT" section of the gang for maximum output.

NOTE: Do not readjust the "OSC" trimmer.

(f) Repeat operations (d) and (e) for more accurate adjustments.

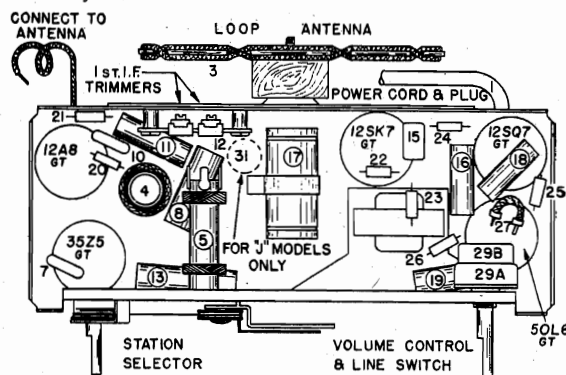


Fig. 3—Bottom View Models 5519, J-5519, 6519, 5529, J-5529

MODEL 6519—Same electrically as model 5519. Has special spider loop mounted to a bracket on right side of chassis and is housed in a wood cabinet.

MODEL 5529—Same electrically as model 5519. Has a four station mechanical push button tuning system. There are two series of this model in the field, one series has a spider form loop antenna mounted on the BACK of the receiver and the other series has the pancake type loop mounted in the cabinet between chassis and right end of the cabinet.

MODEL 5519—Five tube superheterodyne with a pancake type loop antenna mounted between chassis and right side of the cabinet. Has a handle on top for carrying.

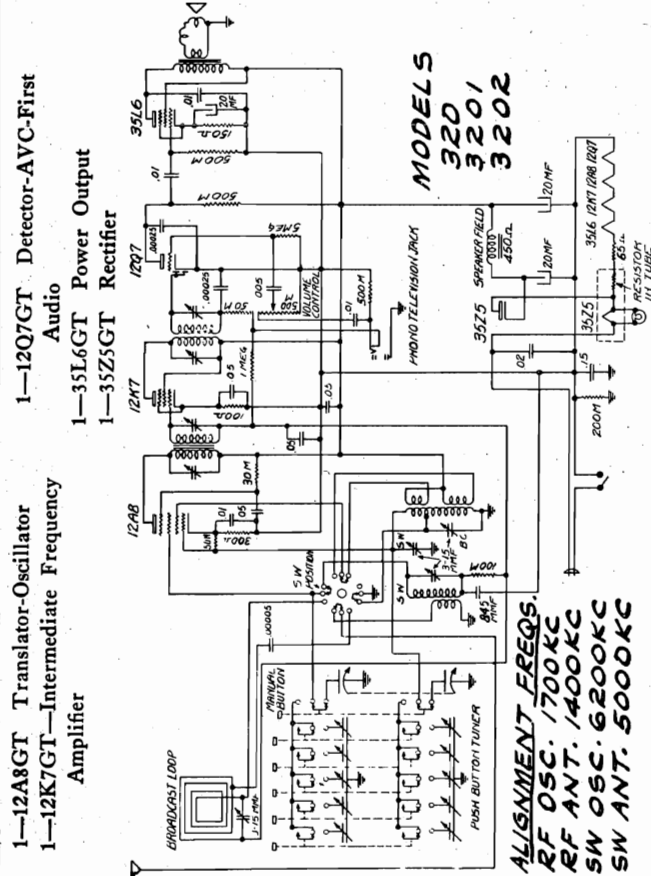
MODELS 310, 3101
MODELS 320, 3201, 3202

DETROLA CORP.

MODEL 3281
Socket, Trimmers

Schematics, Socket, Alignment, Trimmers

FOR CONVENTIONAL ALIGNMENT SEE
SPECIAL SECTION OF VOLUME VIII -
FOR SIMILAR PUSH BUTTON ADJUSTMENTS
SEE DETROLA MODEL 258 in VOLUME X



STATION
SELECTOR

VOLUME CONTROL
ON-OFF SWITCH

IF PEAK
455 KC

35L6GT

12Q7GT

2ND I.F.
455 KC

12K7GT

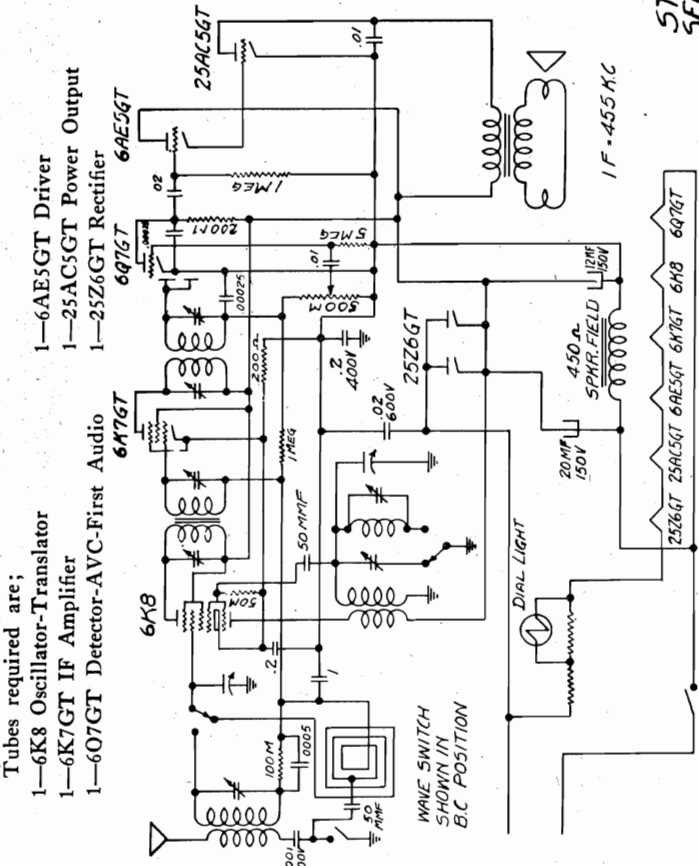
1ST I.F.
455 KC

12A8GT

35Z5GT

BAND SWITCH

LOOP ANTENNA



STATION
SELECTOR

VOLUME CONTROL
ON-OFF SWITCH

MODEL 3281 ONLY

2ND I.F.
455 KC

6K42BG

ALIGNMENT FREQS.
RF OSC. 1700 KC
RF ANT. 1400 KC
SW OSC. 6200 KC
SW ANT. 5000 KC

25Z6GT

25AC5GT

6Q7GT

6K7GT

1ST I.F.
455 KC

6K8

BAND SWITCH

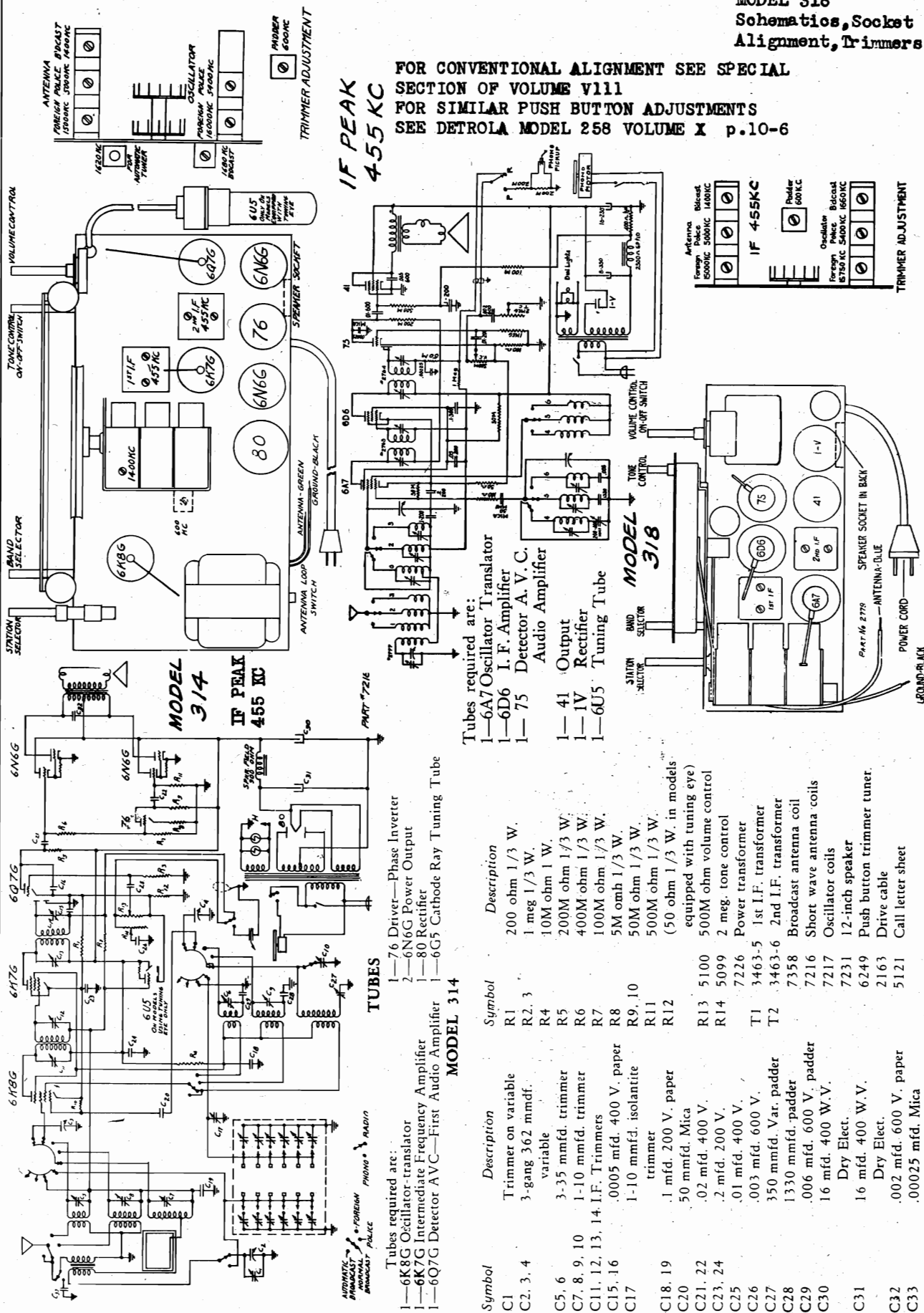
POWER CORD

CHASSIS LAYOUT FOR MODELS 310, 3101, 3281.

DETROLA CORP.

MODEL 314
MODEL 318
Schematics, Socket
Alignment, Trimmers

FOR CONVENTIONAL ALIGNMENT SEE SPECIAL
SECTION OF VOLUME VIII
FOR SIMILAR PUSH BUTTON ADJUSTMENTS
SEE DETROLA MODEL 258 VOLUME X p.10-6



MODEL 315

Schematic, Socket,
Alignment, Trimmers, Parts

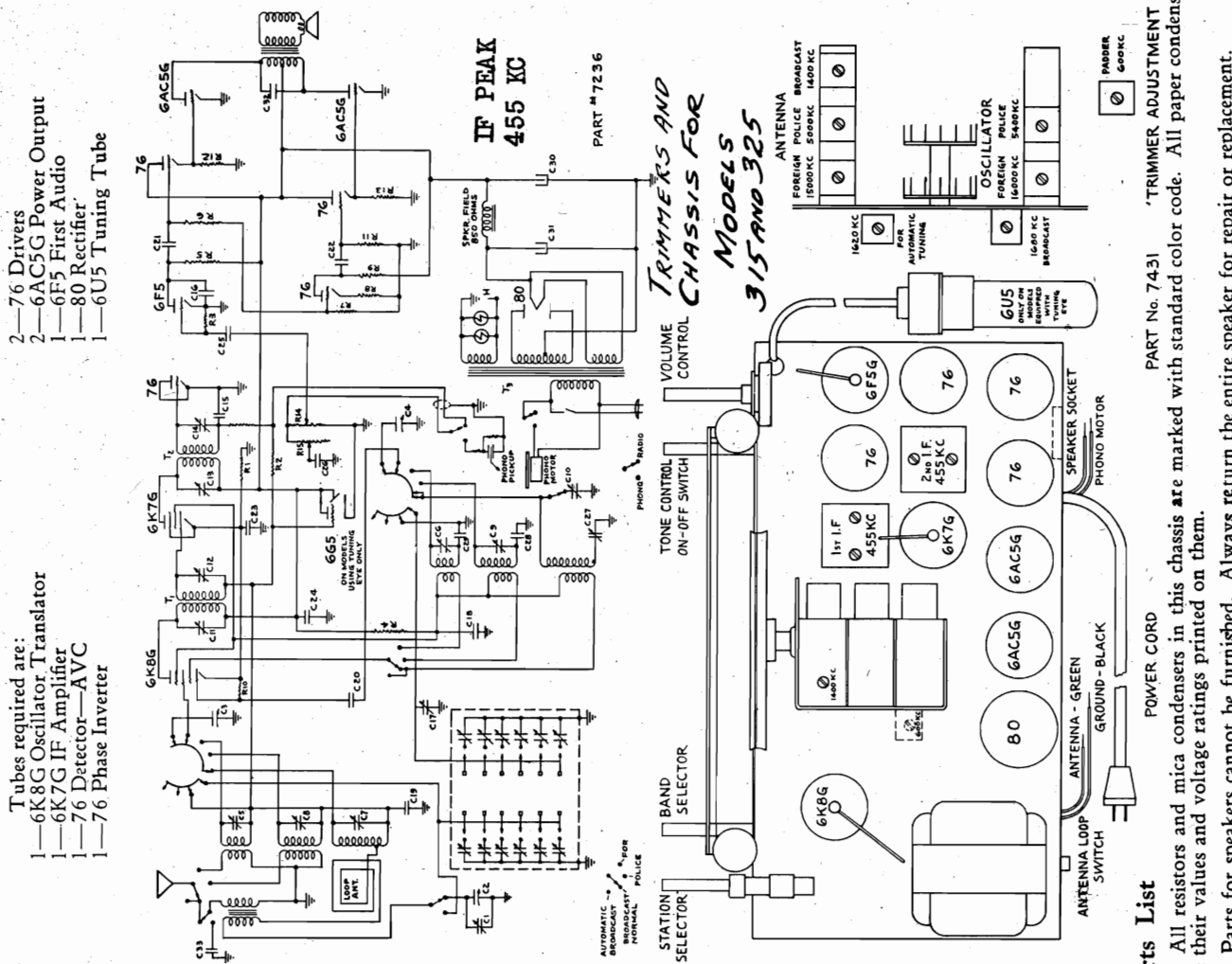
DETROLA CORP.

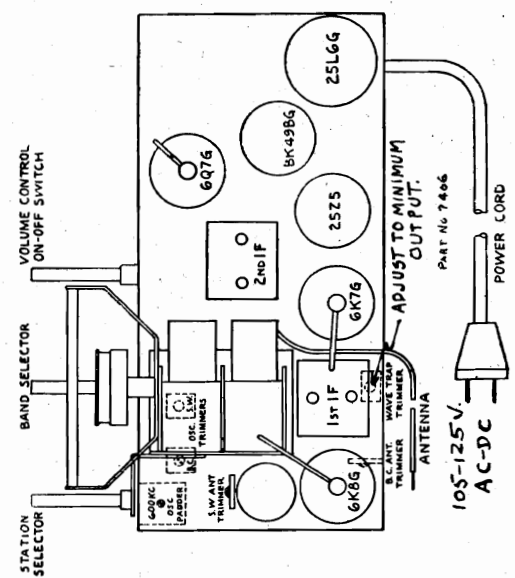
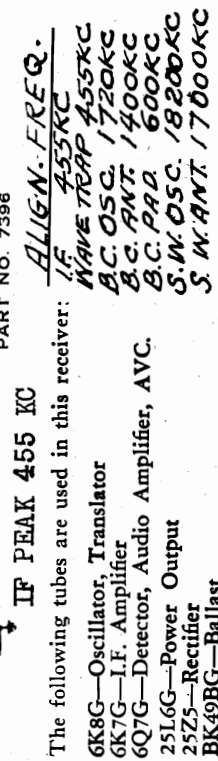
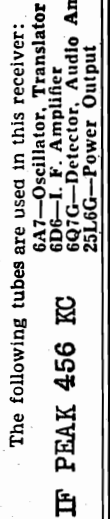
MODEL 325

Socket, Trimmers

FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION, VOL. VIII
FOR SIMILAR PUSHBUTTON ADJUSTMENTS SEE DETROLA PAGE 10-6
IN VOL. X FOR MODEL 258.

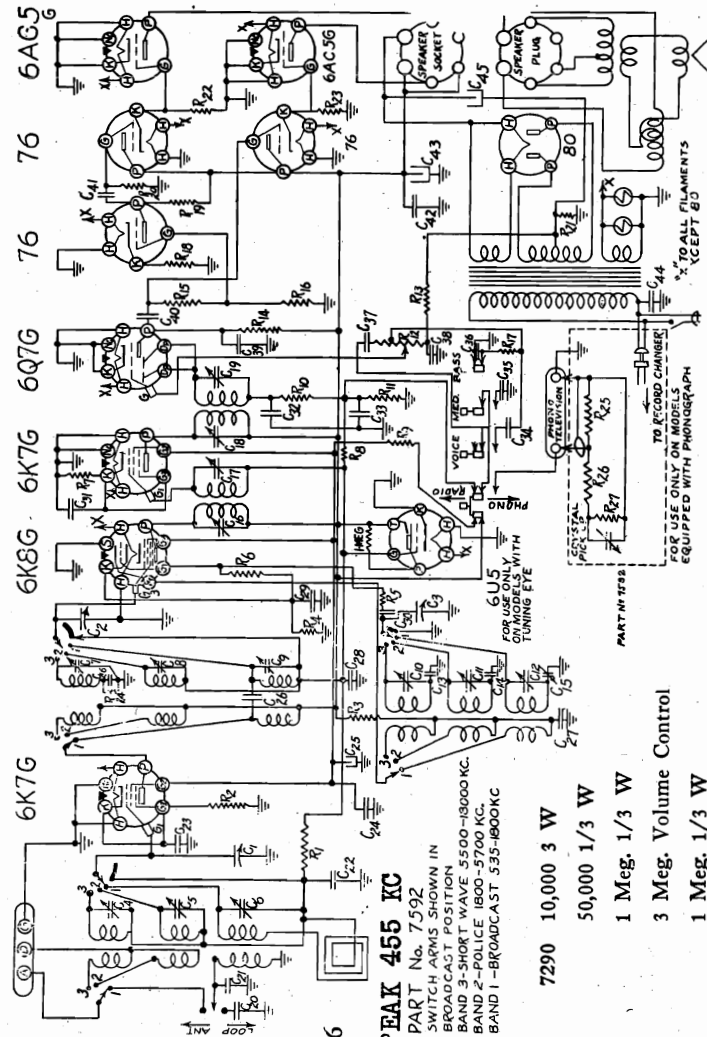
| Symbol | Part No. | Description |
|-----------------|----------|-----------------------------------|
| C1 | | Trimmer on Tuning Condenser |
| C2, 3, 4 | 5092 | Tuning Condenser |
| C5, 6 | 3157 | 3-35 mmf. Trimmer |
| C7, 8, 9, 10 | 5565 | 1-10 mmf. Trimmer |
| C11, 12, 13, 14 | | Trimmers in IF Transformers |
| C15, 16, 33 | | 250 mmf. Mica |
| C18, 19 | | 50 mmf. Mica |
| C21, 22 | | .02 mf. 400 volt |
| C23, 24 | | .2 mf. 200 volt |
| C25 | | .01 mf. 400 volt |
| C26 | | .003 mf. 600 volt |
| C27 | 2560 | Oscillator Padding Condenser |
| C28 | 2741 | 1330 mmf. Mica 5% |
| C29 | | .006 mf. 600 volt |
| C30, 31 | 7113 | 16 mf. 400 volt electrolytic |
| C32 | | .002 mf. 600 volt |
| R1, 7 | | 200 ohm 1/3 watt |
| R2, 11 | | 1 meg. 1/3 watt |
| R4 | | 10M 1 watt |
| R5 | | 200M 1/3 watt |
| R6 | | 800M 1/3 watt |
| R8 | | 5M 1/3 watt |
| R9, 10 | | 50M 1/3 watt |
| R3 | | 5 meg. 1/3 watt |
| R12, 13 | | 25M 1/3 watt |
| R14 | 5100 | 500M volume control |
| R15 | 5099 | 2 meg. tone control and switch |
| T1 | 3463-5 | 1st IF Transformer |
| T2 | 7241 | 2nd IF Transformer |
| T3 | 7242 | Power Transformer |
| 7358 | | Antenna Coil |
| 7216 | | Presselector Coil |
| 7217 | | Oscillator Coil |
| 7219 | | Dial Chart |
| 5112 | | Pointer |
| 4830 | | Dial Light Socket |
| 6249 | | Push Button Tuning Unit |
| 2981 | | Tuning Tube Knob |
| 5129 | | Push Buttons |
| 7181 | | Cabinet |
| 7245 | | Shipping Carton |
| 7247 | | Escutcheon |
| 7230 | | Tuning Tube Escutcheon |
| 4732 | | Tuning Knob |
| 4733 | | Volume Knob |
| 4735 | | Tone Knob |
| 4734 | | Band Switch Knob |
| 3466 | | Radio-Phono Knob |
| 5241 | | Phono-Radio Plate |
| 7087 | | Automatic Record Changer |





MODEL 326
Schematic, Socket
Trimmers, Parts

DETROLA CORP.



SERIES 326

IF PEAK 455 KC

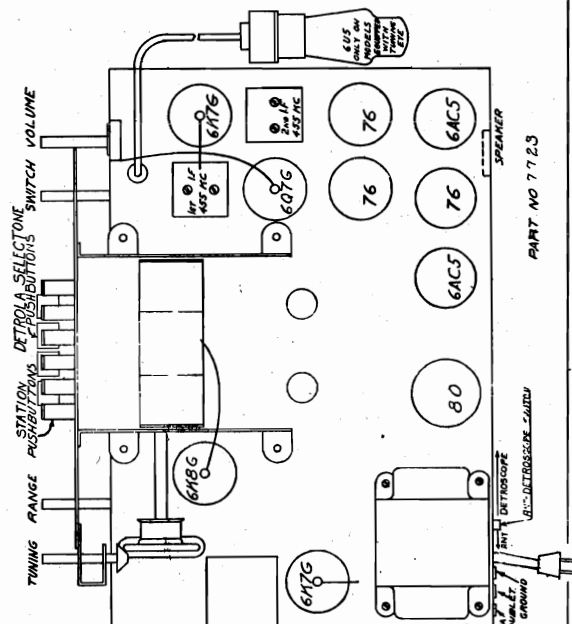
PART No. 7592
SWITCH ARM POSITION
BROADCAST POSITION
BAND 3—SHORT WAVE 5500-18000 KC.
BAND 2—POLICE 1800-5700 KC.
BAND 1—BROADCAST 535-1800 KC

| Symbol | Part No. | Description | Value |
|--------------|----------|-------------------------------|-------|
| C1,2,3 | 7591 | Tuning Condenser | |
| C4 to C12 | 7197 | Trimmer Condensers, 3-20 mmf. | |
| C13 | 7721 | .007 mfd. plus or minus 5% | |
| C14 | 7312 | 1440 mmf. plus or minus 3% | |
| C15 | 7314 | Condenser Padder Adj. | |
| C20,34 | 1286 | 250 mmf. Mica | |
| C21,30 | 2780 | 50 mmf. Mica | |
| C22,23,28,46 | 580 | .05-200 | |
| C24 | 575 | 1-400 | |
| C25 | 5780 | 20 mmfd., 150 V. Electrolytic | |
| C26 | 7473 | 2.5 mmf. | |
| C27 | 2600 | 02-600V | |
| C29,31,38 | 572 | 1-200V | |
| C32,33 | 1285 | 100 mmf. | |
| C35,36,37 | 824 | .002-600V | |
| C39 | 1285 | 100 mmf. | |
| C40,41 | 2782 | .005-600 | |
| C42 | 3352 | 2-400 | |
| C43,45 | 7400 | 16 mfd. 400 V Electrolytic | |
| C44 | | .0012 Mica | |
| R1 | | 10,000 1/3 W | |
| R2,4 | | 300 1/3 W | |
| R3 | | 20,000 1/2 W | |
| R5 | | 200 1/3 W | |
| R6,19 | | 50,000 1/3 W | |
| R7 | | 400 1/3 W | |
| R8 | | 2 Meg. 1/3 W | |
| R9 | 7290 | 10,000 3 W | |
| R10 | | 50,000 1/3 W | |
| R11 | | 1 Meg. 1/3 W | |
| R12 | | 3 Meg. Volume Control | |
| R13 | | 1 Meg. 1/3 W | |
| R14,17 | | 200,000 1/3 W | |
| R15 | | 400,000 1/3 W | |
| R16 | | 100,000 1/3 W | |
| R18 | | 5000 1/3 W | |
| R20 | | 500,000 1/3 W | |
| R21 | 2965 | 20 1/2 Flexohm | |
| R22,23 | | 25,000 1/3 W | |
| R24 | | 75,000 1/3 W | |
| R25,26 | | 500,000 1/3 W | |
| R27 | | 200,000 1/3 W | |

ANTENNA-GROUND CONNECTIONS

The antenna and ground leads to the receiver are attached to a terminal strip at the rear of the chassis. The terminals on this strip are marked "A," "D," and "G," which are the abbreviations for "Antenna," "Doublet," and "Ground" respectively.

The receiver is normally shipped from the factory with a wire connecting terminal "D" to terminal "G." In such a condition the receiver is ready for a normal antenna and a ground wire to be attached to the terminals "A" and "G" respectively. If a doublet is used, the wire connecting terminal "D" to terminal "G" should be removed and the two leads from the doublet antenna connected to terminals "A" and "D." For best operation with the doublet, a normal ground lead should be connected to the "G" terminal.



PART NO 7723

FRONT EDGE OF CHASSIS

MODEL 326
Tuner Data
MODEL 333
MODEL 3281
Alignment

DETROLA CORP.

MODEL 3231
Socket, Trimmers
Alignment

MODELS 333 - 3281

ALIGNMENT PROCEDURE

Turn the band switch to the Broadcast position.

Connect an output meter across the speaker voice coil. The volume control should be set a few degrees from the maximum volume position. Use a weak signal from the generator, strong signals tend to cause improper adjustments.

IF alignment: Connect the signal generator ground to the receiver chassis through a .1 mfd. condenser. Using a .1 mfd. condenser in series with the high side of the generator, apply 455 kc. signal to the grid of the 6K7GT tube and align the 2nd IF transformer. Connect to the grid of the 6K8 tube and align the 1st IF transformer. (See Tube Layout Diagram for location of these adjustments.) From this position re-check both transformers again.

Broadcast Band Alignment: Turn the band switch to the Broadcast position, turn the tuning condenser all the way to the right, (minimum capacity), apply a 1720 kc. signal to the grid of the 6K8 tube and adjust the broadcast oscillator trimmer. The oscillator coil is under the right hand end of the chassis and this trimmer is the one nearest the front of the chassis. To align the loop antenna, connect a single turn loop across the terminals of the generator, place the receiver about one foot in front of the single turn loop, set the generator at about 1400 kc., tune in the signal and adjust the trimmer on the loop antenna assembly for maximum response.

Short Wave Alignment: Using a 400 ohm resistor between the high side of the generator and the antenna terminal (on the LOOP frame), turn the tuning condenser to minimum capacity, set the generator at 18,500 kc., and adjust the short wave oscillator trimmer. This trimmer is immediately in back of the broadcast oscillator trimmer. Set the generator at about 17,000 kc., tune in the signal and adjust the short wave antenna trimmer for maximum response. This trimmer is mounted on the loop antenna.

NOTE: If considerable hum appears when the generator is connected as described above use smaller condensers between the generator and the receiver. The best way is to use a 1:1 transformer to isolate either the receiver or the generator from the line. The adjustments of this receiver are very stable and no aligning should be attempted unless absolutely necessary.

MODEL 326

PROCEDURE FOR SETTING THE STATION BUTTONS

There are 6 buttons on the automatic tuning dial by means of which 6 stations may be set for quick tuning. Make a list of your favorite stations, those which you tune in regularly.

It is better to list the station with the lowest kilocycle number first, the station with the next higher kilocycle number next and so on.

Any button may be used for any station you can receive, although it will be better to set the stations so that the kilocycle numbers increase from left to right.

SETTING A STATION BUTTON

Pull the button at the extreme left off the shaft. When this is done, the locking screw under the shaft will be exposed.

Loosen this screw with a small screwdriver by turning several turns in a counter-clockwise direction. Continue to press in firmly on the screwdriver, thus holding the station button shaft depressed. Select the first station button shaft depressed. Select the first station from the list you have prepared and carefully tune in this station by means of the manual tuning knob.

Continue to press in firmly on the screwdriver and lock the mechanism by turning the locking screw in a clockwise direction until it is tight. The station is now set on this button.

Proceed in the same manner to set any additional stations on your list on the remaining station buttons. Select the proper station call letter tab from the sheet provided and place it in the recess in the proper push button. Cover the call letter tab with one of the heavy celluloid retainers provided. Replace the button on the shaft. Follow the same procedure for inserting the station call letters in any other buttons.

After the stations are set and the mechanism is locked, tune in each of them by depressing the proper button. If any of them does not appear to be properly tuned in after the button has been depressed, reset the station for that button following the procedure as outlined above. If at any time you wish to change the setting of a button from one station to another, repeat the above procedure. Changing the setting of one button will not affect the setting of the others.

MODEL 3231

ALIGNMENT PROCEDURE

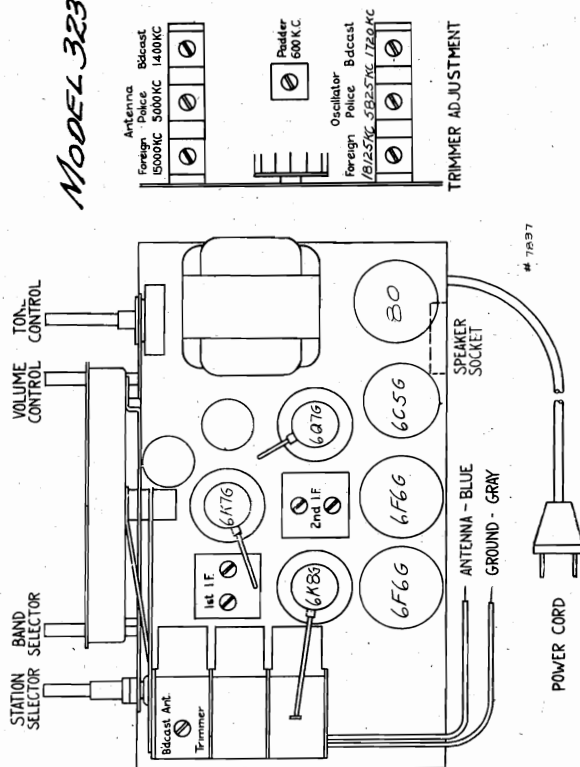
Connect a high impedance AC voltmeter across the loudspeaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from the generator, strong signals tend to cause improper adjustments.

IF. Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of the generator, apply 455 kc. signal to the grid of the 6K7G IF amplifier tube and align second IF transformer trimmers. Repeat for first IF transformer, applying signal to grid of the 6K8G tube.

RF. (See diagram for location of trimmers.) Using a 200 mmf. condenser in series with the high side of the generator, turn band selector switch to position "B," tuning condenser to minimum capacity. Feed 1720 kc. signal to antenna terminal and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at some point around 1400-1500 kc., and adjust broadcast antenna and RF trimmers. Set generator for 600 kc., tune receiver to signal and adjust the padder. The tuning condenser should be rocked back and forth through the signal while varying the padder in order to assure perfect alignment.

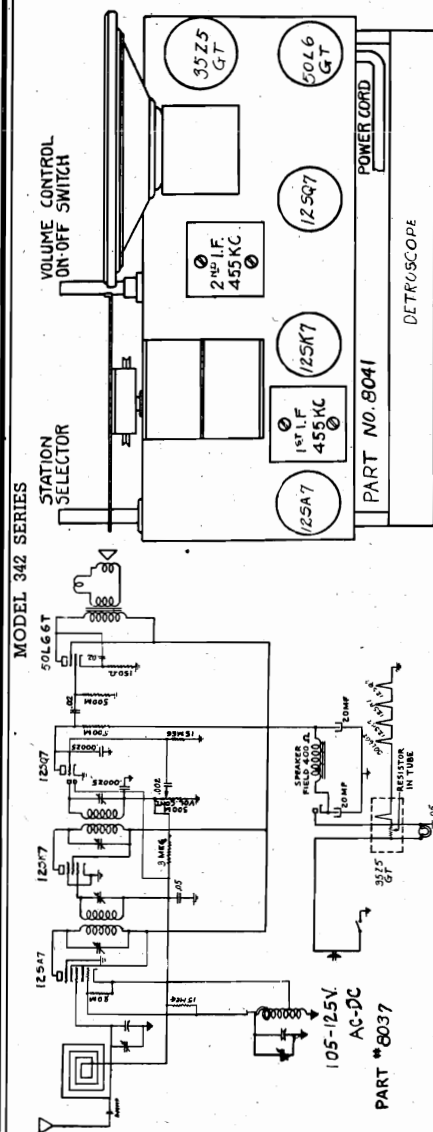
A 400 ohm resistor must be used in series with the generator as a "dummy" antenna for proper alignment of the two short wave bands. Set the band selector switch in the "P" position, adjust the oscillator top frequency for 5825 kc., then align the antenna trimmer at about 5000 kc. With the band selector in the extreme right position, adjust the top frequency of the high frequency band to 18,125 kc., and align the antenna trimmer at about 15,000 kc. In order to make sure that the top end of the 1st band is set properly, it is best to screw the oscillator trimmer tight, then unscrew to the second peak. The antenna trimmer should be screwed down tight, then unscrewed to the first peak. This procedure must be followed in order that the oscillator and RF circuits will be set in the correct relation to each other, otherwise a "dead" spot at a lower frequency will result, and the dial calibration will not be correct. Usually, it is best to rock the tuning condenser back and forth slightly while making these adjustments at high frequencies.


MODEL 3231



DETROLA CORP.

MODEL 329
MODEL 333
MODEL 342
Schematics, Socket
Trimms



IF PEAK 455 KC  0.5

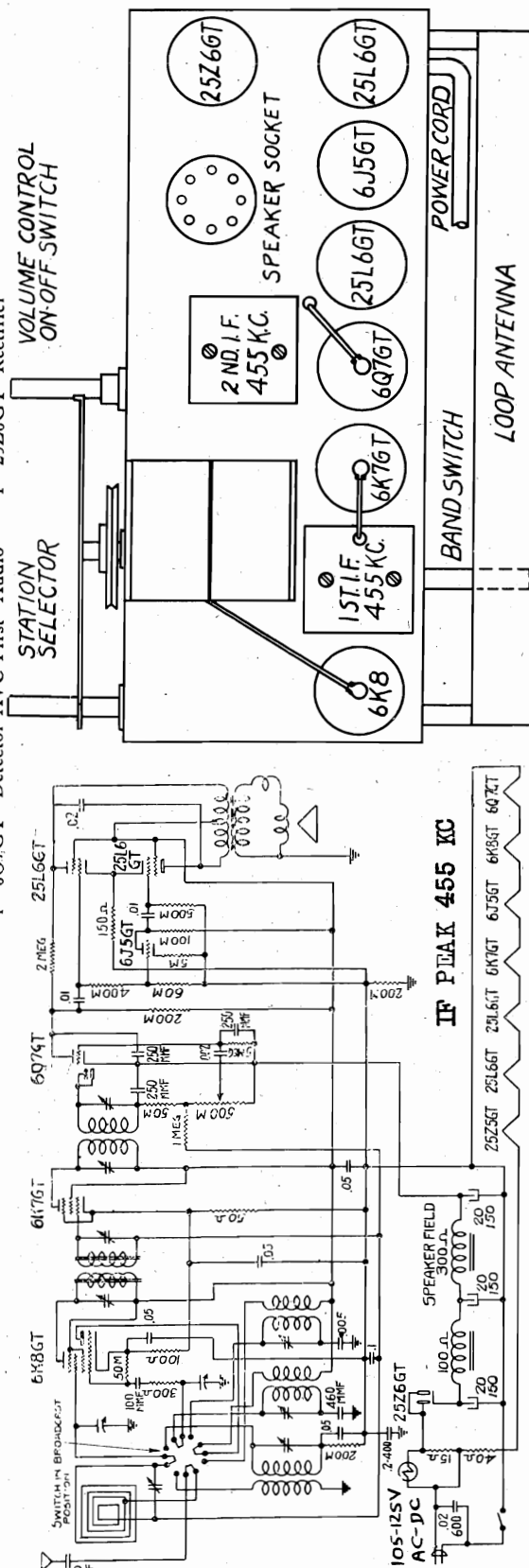
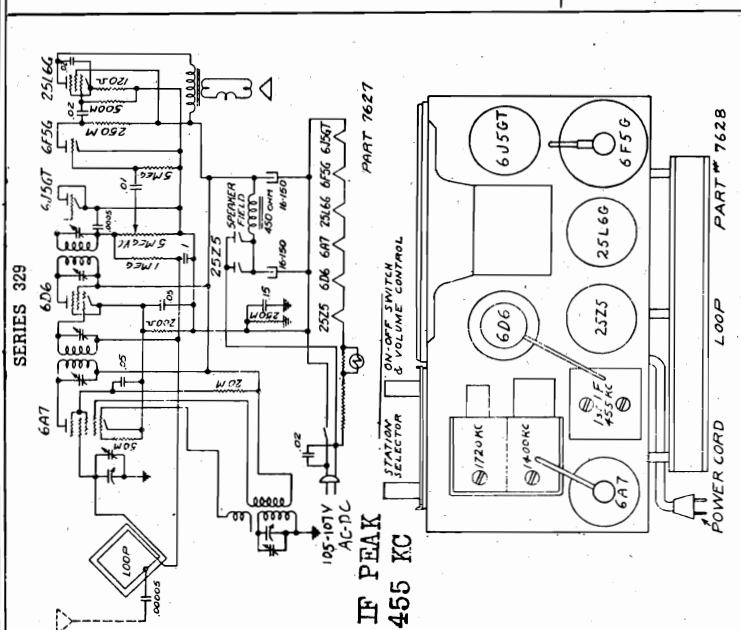
| | | | |
|-------|--------------|--------|--------------|
| 12SA7 | Translator | 12SQ7 | Detector AVC |
| 12SK7 | IF Amplifier | 50L6GT | Output |
| | | 35Z5GT | Rectifier |

FOR CONVENTIONAL
ALIGNMENT FOR
THESE MODELS, SEE
SPECIAL SECTION
VOLUME VIII.

A.C.-D.C. SUPERHETERODYNE SERIES 333

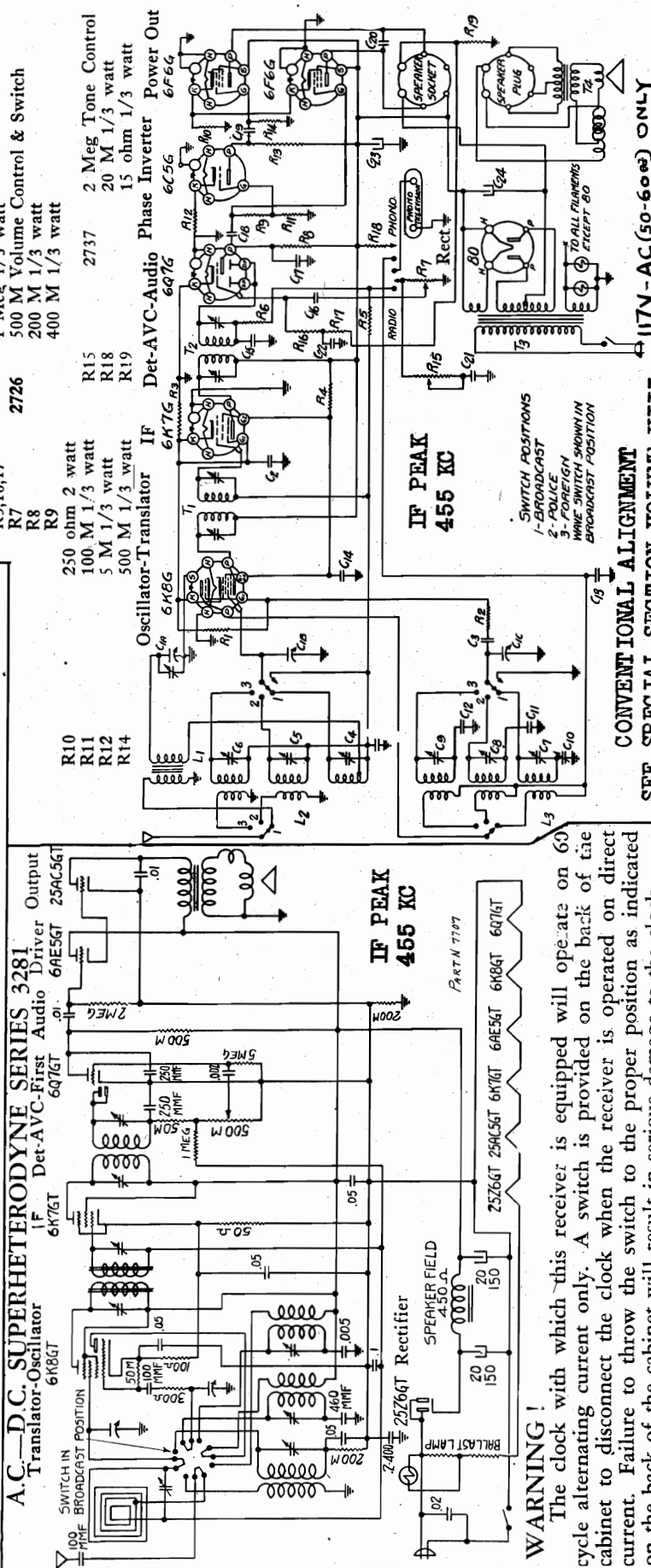
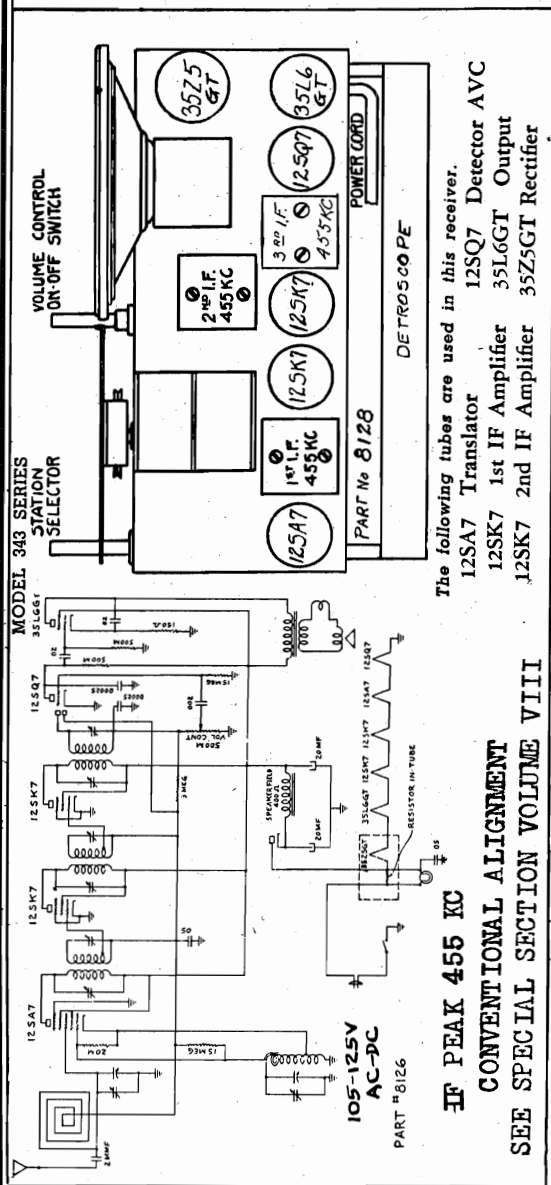
TUBES

- 1-6K8 Translator-Oscillator
6K7GT-Intermediate Frequency Amplifier
1-607GT Detector-AVC-First Audio
1-6J5GT Phase Inverter
2-25L6GT Power Output
1-25Z6GT Rectifier



FOR LAYOUTS
SEE INDEX

| MODEL 3231 | MODEL 3281 | Schematics | |
|------------|-------------------------------|------------|--|
| Part No. | Description | | |
| 7483 | Variable Condenser | | |
| | .1 mf 200 volt | | |
| | .2 mf. 200 volt | | |
| | 50 mmf Mica | | |
| 2597 | 1-10 mmf Trimmer | | |
| 1611 | 3-35 mmf Trimmer | | |
| 3157 | 2-25 mmf Trimmer | | |
| 2560 | 200-500 mmf B.C. Osc Padder | | |
| 2471 | 1330 mmf 5% Mica | | |
| 2793 | .006 600 volt 10% | | |
| | .1 mf 400 volt | | |
| | .2 mf 400 volt | | |
| | 250 mmf Mica | | |
| | .01 mf 200 volt | | |
| | .02 mf 400 volt | | |
| | .002 mf 600 volt | | |
| | .005 mf 600 volt | | |
| 7113 | 16 mf 450 volt Electrolytic | | |
| | 50 M 1/3 watt | | |
| | 100 ohm 1/3 watt | | |
| | 10 M 1/3 watt | | |
| | 1 Meg 1/3 watt | | |
| 2726 | 500 M Volume Control & Switch | | |
| | 200 M 1/3 watt | | |
| | 400 M 1/3 watt | | |

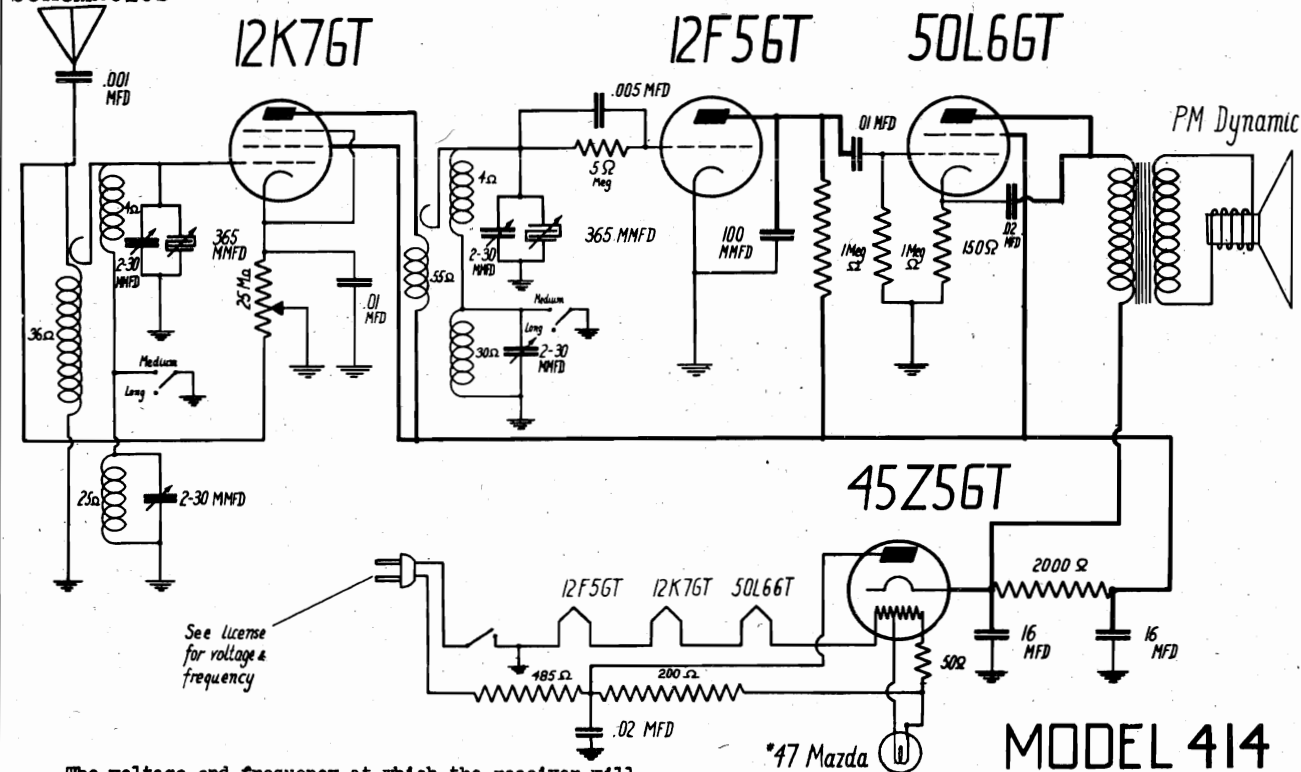


MODEL 414

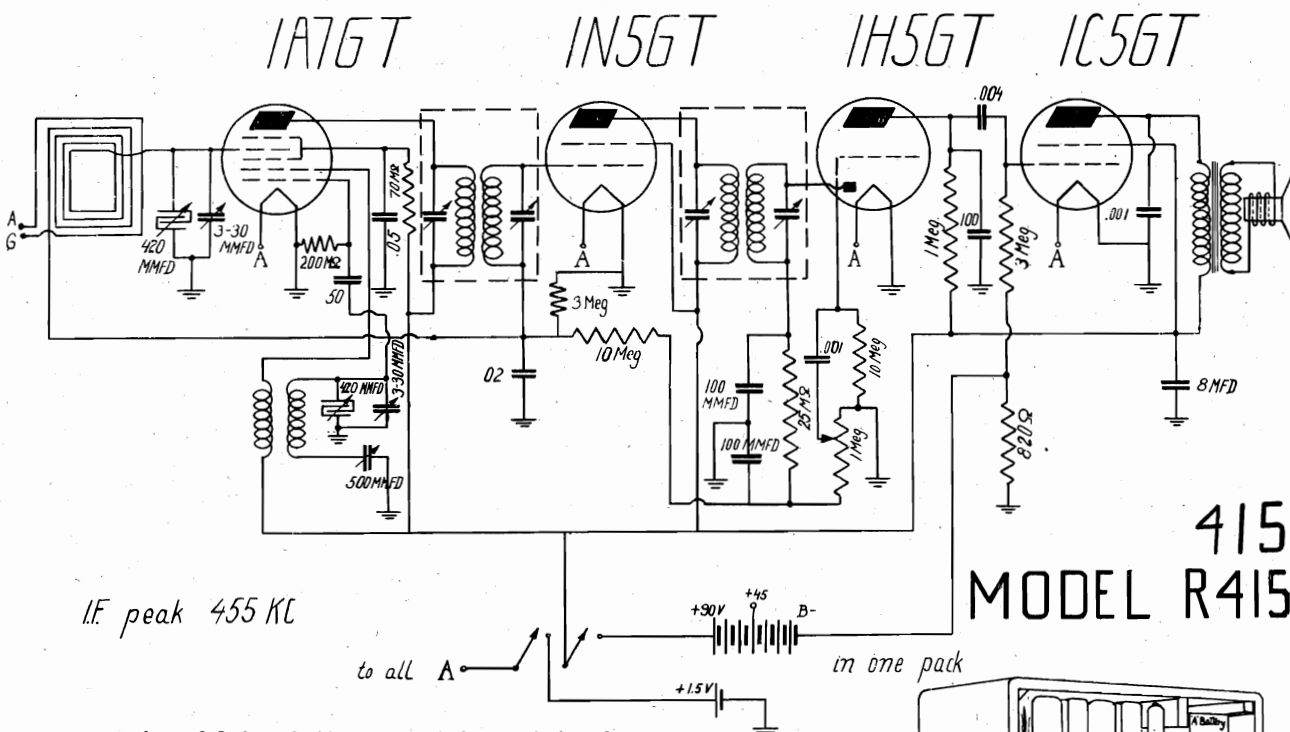
MODELS 415, R415

Schematics

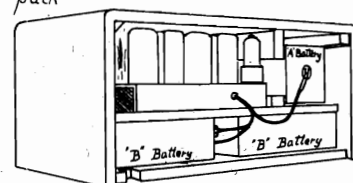
DEWALD RADIO MFG. CORP.



The voltage and frequency at which the receiver will operate is specified on the back of the cabinet. The broadcast range coverage is 180-560 meters. The long wave range coverage is 850-2040 meters.



This model is a battery operated superheterodyne receiver with full automatic volume control. A self-contained loop is incorporated which makes the use of an antenna unnecessary. It is designed to operate with an "A" supply of 1.5 volts and a "B" supply of 90 volts. The broadcast range coverage is 540 - 1600 kilocycles. For the "A" supply one Eveready #743, Burgess #6F or the equivalent may be used. For the "B" supply two Eveready #727, Burgess #A30X or the equivalent batteries may be used.



R415 BACKVIEW

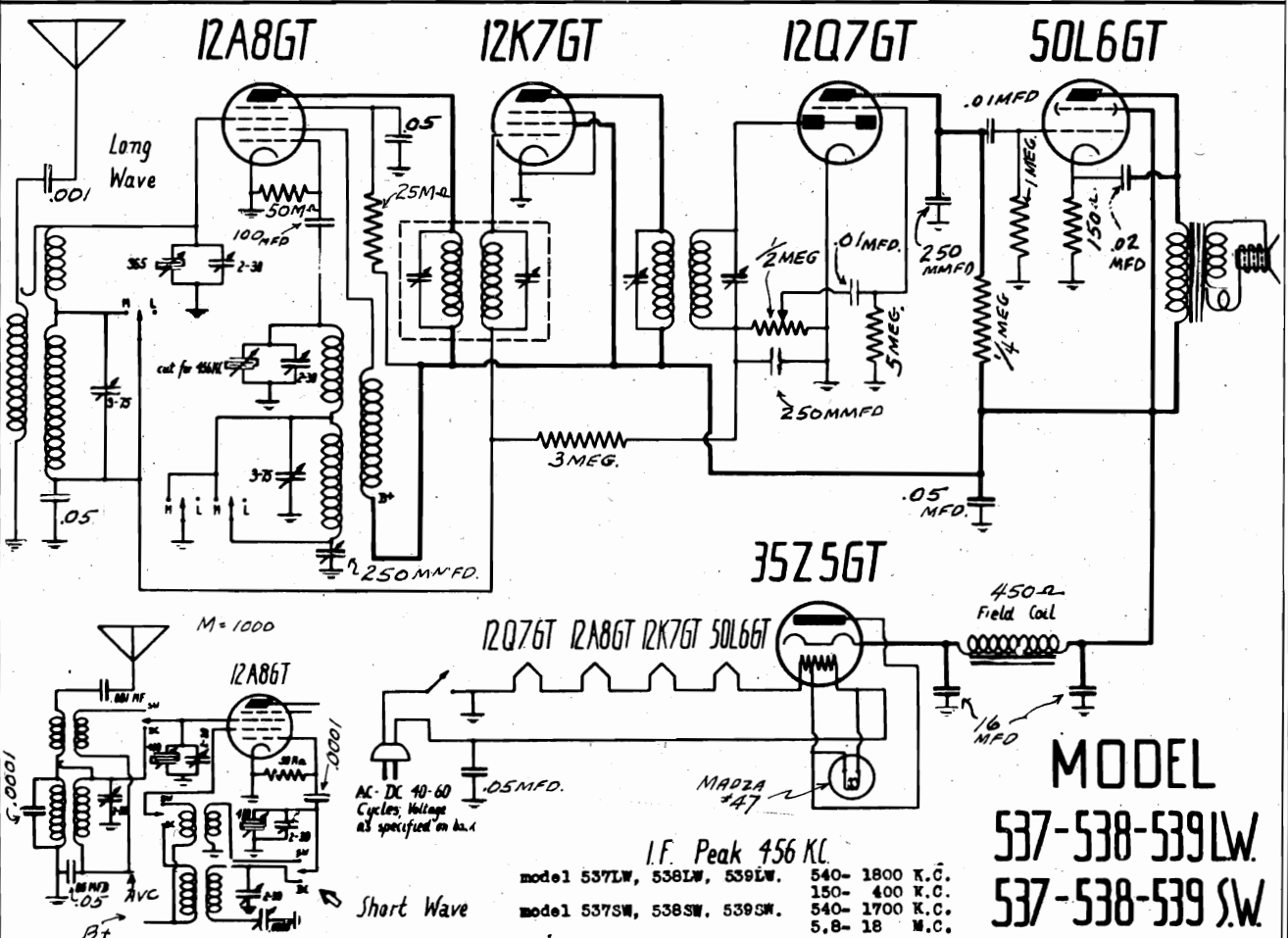
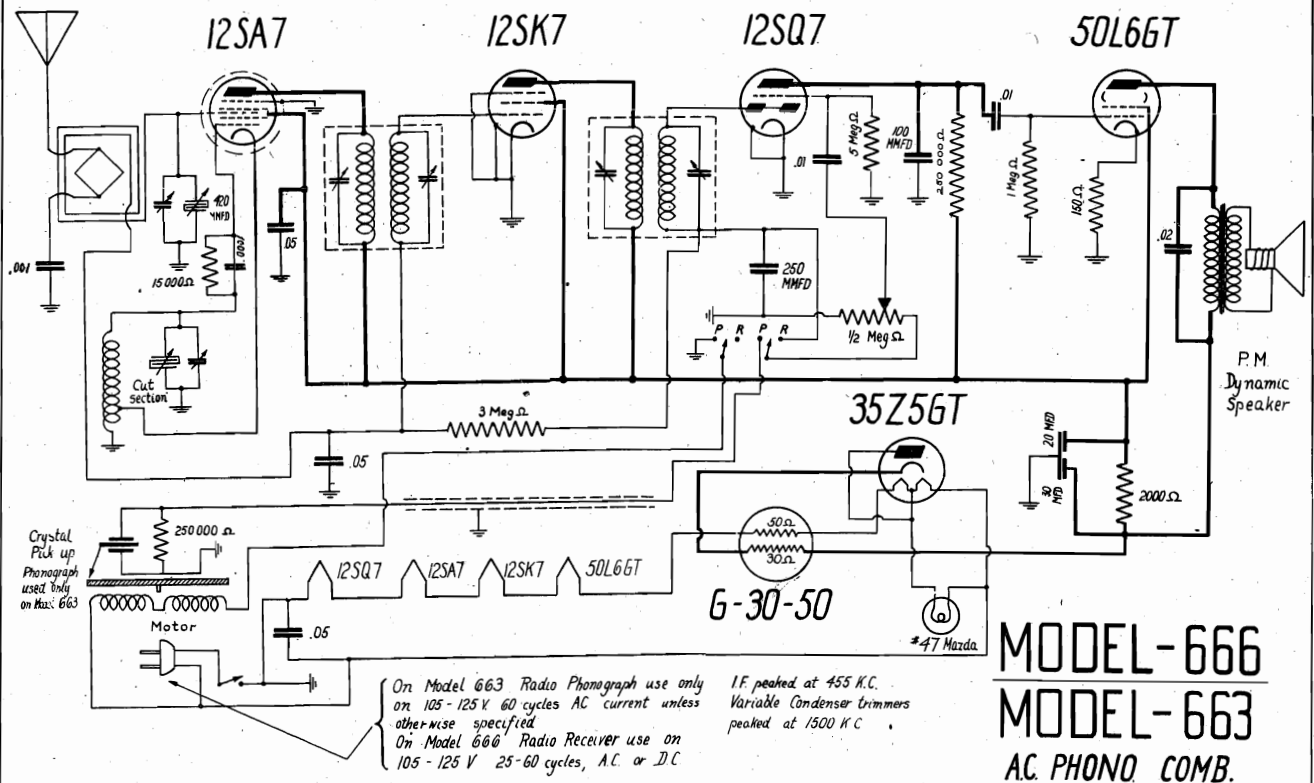
DEWALD RADIO MFG. CORP.

MODELS 537, 538, 539

LW and SW

MODELS 663, 666

Schematics



MODELS 542, 542LW
Schematic, Socket
Alignment

DEWALD RADIO MFG. CORP.

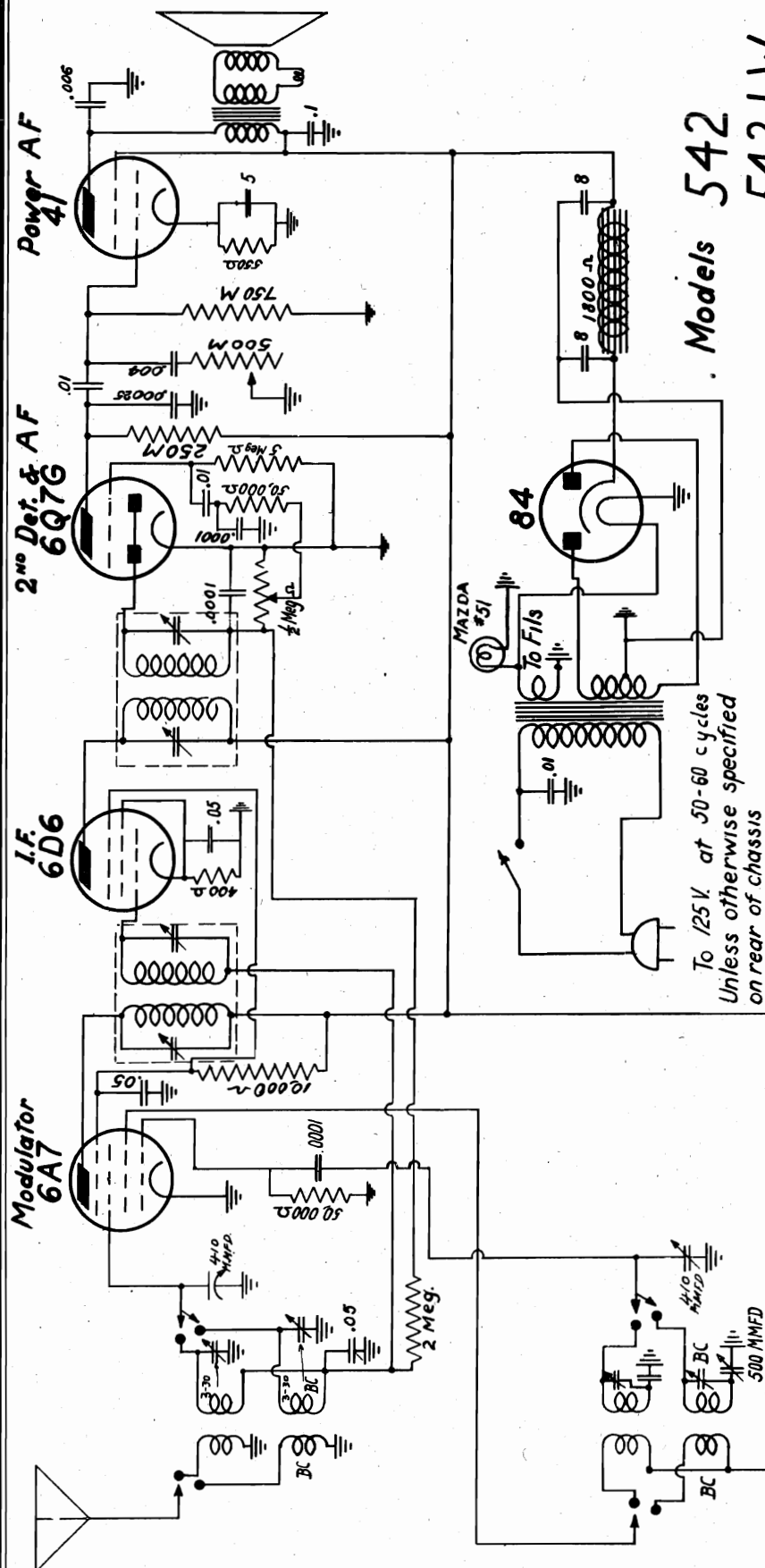
Models 542
542 L.W.

IF PEAK 456 KC

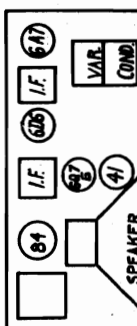
peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

For 6.0-18.5 M.C. (Model 542) Turn wave band switch to this band. Adjust the generator and receiver to 16.0 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

(Model 542 L.W.) Turn wave band switch to long wave band. Adjust the generator and receiver to 300 K.C. and peak trimmers for Maximum signal. Adjust generator and receiver to 175 K.C. and peak Long Wave padder for maximum signal. The variable condenser should be "rocked" during this operation. Recheck 300 K.C.



To 125 V. at 50-60 cycles
Unless otherwise specified
on rear of chassis



RANGE COVERAGE

- 555-174 meters, 50-16 meters
- 540-1725 K.C., 6.0-18.5 M.C.
- 555-174 meters, 2000-750 meters
- 540-1725 K.C. 150-400 K.C.

TO CALIBRATE RECEIVER

Connect antenna lead of the signal generator to antenna lead of receiver and ground lead of generator to receiver chassis. Short circuit front section of variable condenser. Adjust generator to 456 K.C. and peak I.F. trimmers for maximum signal.

Remove short from variable condenser. Have wave band switch on broadcast position. Adjust generator and receiver to 1500 K.C. Peak trimmers for maximum signal. Adjust generator and receiver to 600 K.C.;

MODEL

542

542L.W.

I.F. ALIGNMENT:

BROADCAST ALIGNMENT:

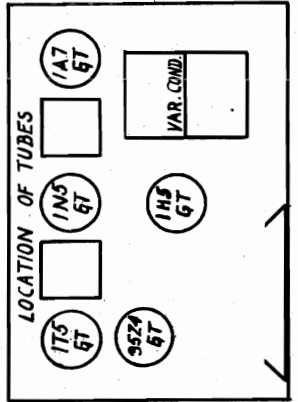
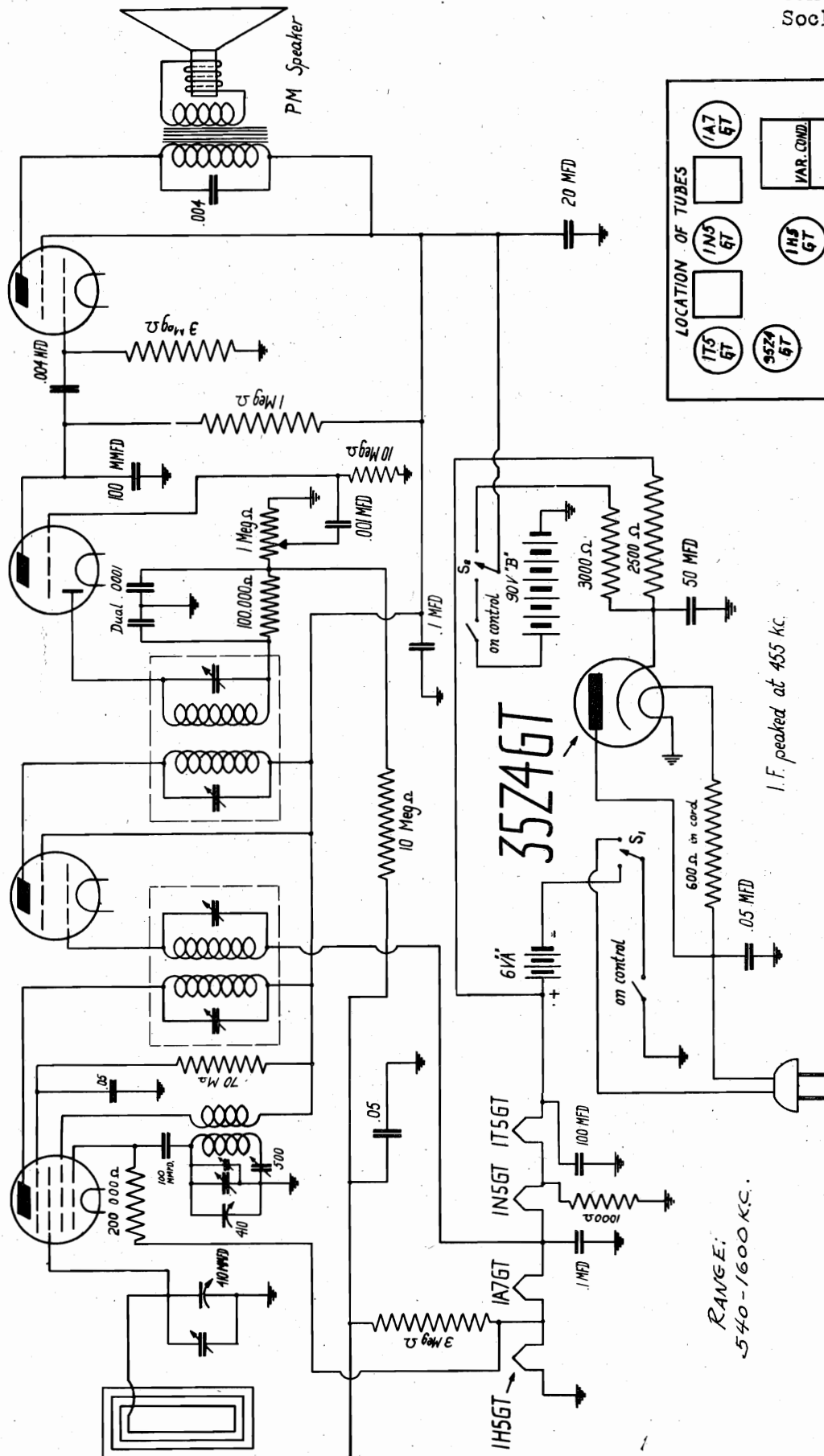
SHORT WAVE ALIGNMENT:

LONG WAVE ALIGNMENT:

DEWALD RADIO MFG. CORP.

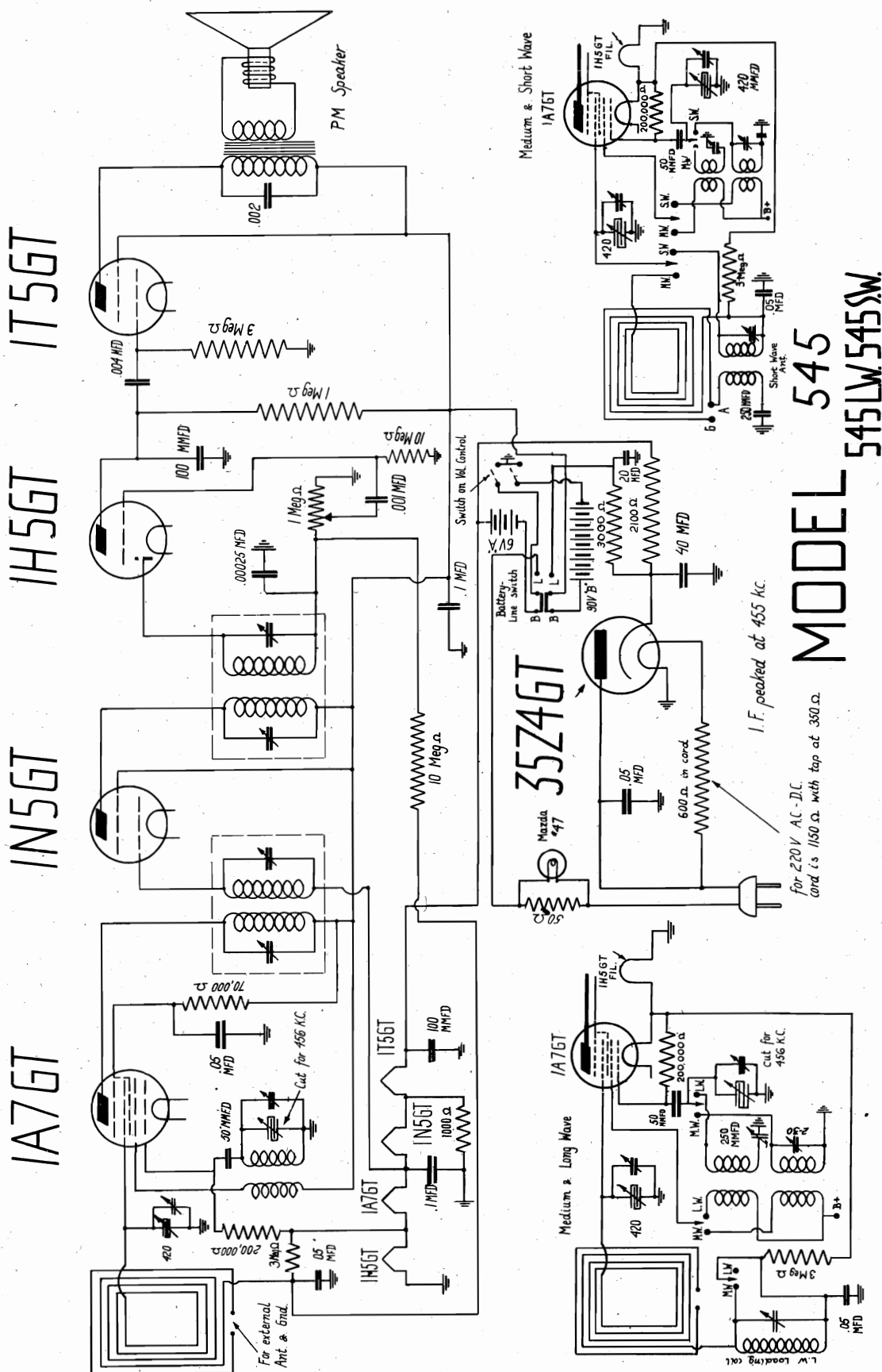
MODEL 544
Schematic
Socket

1A7GT 1N5GT 1H5GT 1T5GT



I.F. peaked at 455 kc.

 S_1 & S_2 automatic line-battery switch105-125 Volts
40-60 W AC-DC.RANGE:
540-1600 KC.



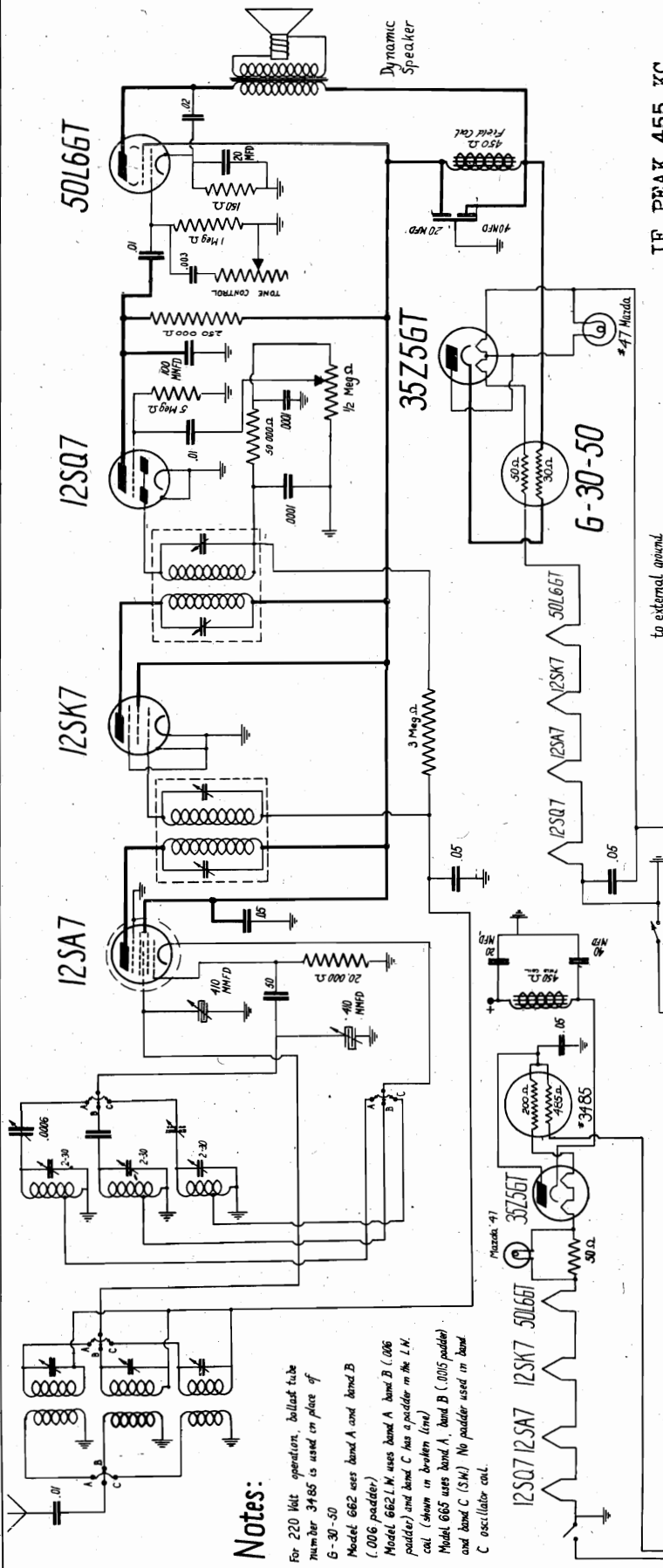
The range coverage is as follows:

These models are portable combination battery and electric operated superheterodyne receivers with full automatic volume control. A self-contained loop is incorporated which makes the use of an outside aerial unnecessary for broadcast reception. The receivers will operate with an "A" supply of 6 volts and a "B" supply of 90 volts. They will also operate on 105-125 volts, 40-60 cycles A.C. or D.C. unless otherwise specified.

| | |
|----------------|--------------------------------|
| MODEL 545 | 1700 - 540 KC. |
| MODEL 545 L.W. | 1700 - 540 KC. & 350 - 145 KC. |
| MODEL 545 S.W. | 1700 - 540 KC. & 17 - 5.5 MC. |

DEWALD RADIO MFG. CORP.

MODELS 662, 662L, 665
Schematic, Socket
Alignment, Notes



Notes:

For 220 Volt operation, ballast tube number 3485 is used in place of G-30-50.
Model 662 uses band A and band B (.0016 padder).
Model 662L uses band A, band B (.0016 padder) and band C has a padder in the L.M. coil (shown in broken line).
Model 665 uses band A, band B (.0015 padder) and band C (SW). No padder used in band C oscillator coil.

IF PEAK 455 KC

RANGE COVERAGE

| MODEL | RANGE COVERAGE |
|-------|--|
| 662 | 555-174 meters, 50-16 meters 540-1725 K.C., 6.0-18.5 M.C. |
| 662 L | 555-174 meters, 2000-750 meters 540-1725 K.C., 6.0-18.5 M.C. 150-400 K.C. |
| 665 | 555-174 meters, 38-12.5 meters 540-1725 K.C., 2.7-8.2 M.C. |

MODEL-662

MODEL-665

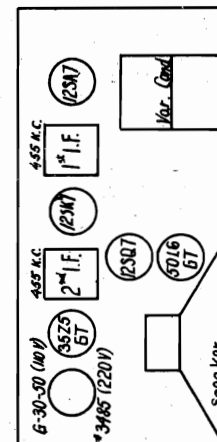
AC-DC Receiver

I.F. ALIGNMENT Connect antenna lead of the signal generator to antenna lead of receiver and ground lead of generator to receiver chassis. Short circuit front section of variable condenser. Adjust generator to 455 K.C. and peak I.F. trimmers for maximum signal.

BROADCAST ALIGNMENT Remove short from variable condenser. Have wave band switch on broadcast position. Adjust generator and receiver to 1500 K.C. Peak trimmers for maximum signal. Adjust generator and receiver to 600 K.C., peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

SHORT WAVE ALIGNMENT For 2.7-8.2 M.C. (Model 665). Turn wave band switch to this band. Adjust the generator and receiver to 7.0 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

TO CALIBRATE RECEIVER

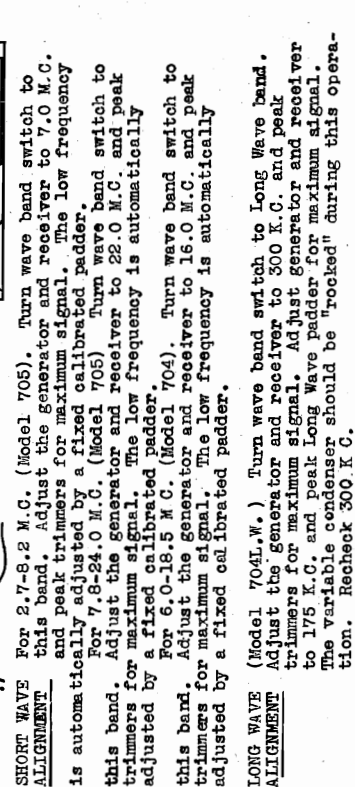


for 210-240 volt operation

to external ground

LONG WAVE ALIGNMENT Model 662 L.W. Turn wave band switch to Long Wave band. Adjust the generator and receiver to 300 K.C. and peak trimmers for maximum signal. Adjust generator and receiver to 175 K.C. and peak Long Wave padder for maximum signal. The variable condenser should be "rocked" during this operation. Retune 300 K.C.

MODELS 704,704LW,705
Schematic,Socket
Tuner,Alignment



HOW TO ADJUST THE PUSH-BUTTONS

HOW TO ADJUST THE PUSH-BUTTON. Turn in the desired station with the station selector knob. Determine which button is to be used to receive that station. Loosen this button. Then push the button in as far as it will go and tighten it by turning it clockwise. The adjustment may be checked by setting the pointer in any position, pushing the button in as far as it will go and noting if the intended station is received. After all adjustments have been made the station tabs may be placed in the escutcheon recess

TO CALIBRATE RECEIVER

I.F. ALIGNMENT Connect antenna lead of the signal generator to antenna lead of receiver and ground lead of generator to receiver chassis. Short circuit front section of variable condenser. Adjust generator to 455 K.C. and peak i.f. trimmers for maximum signal.

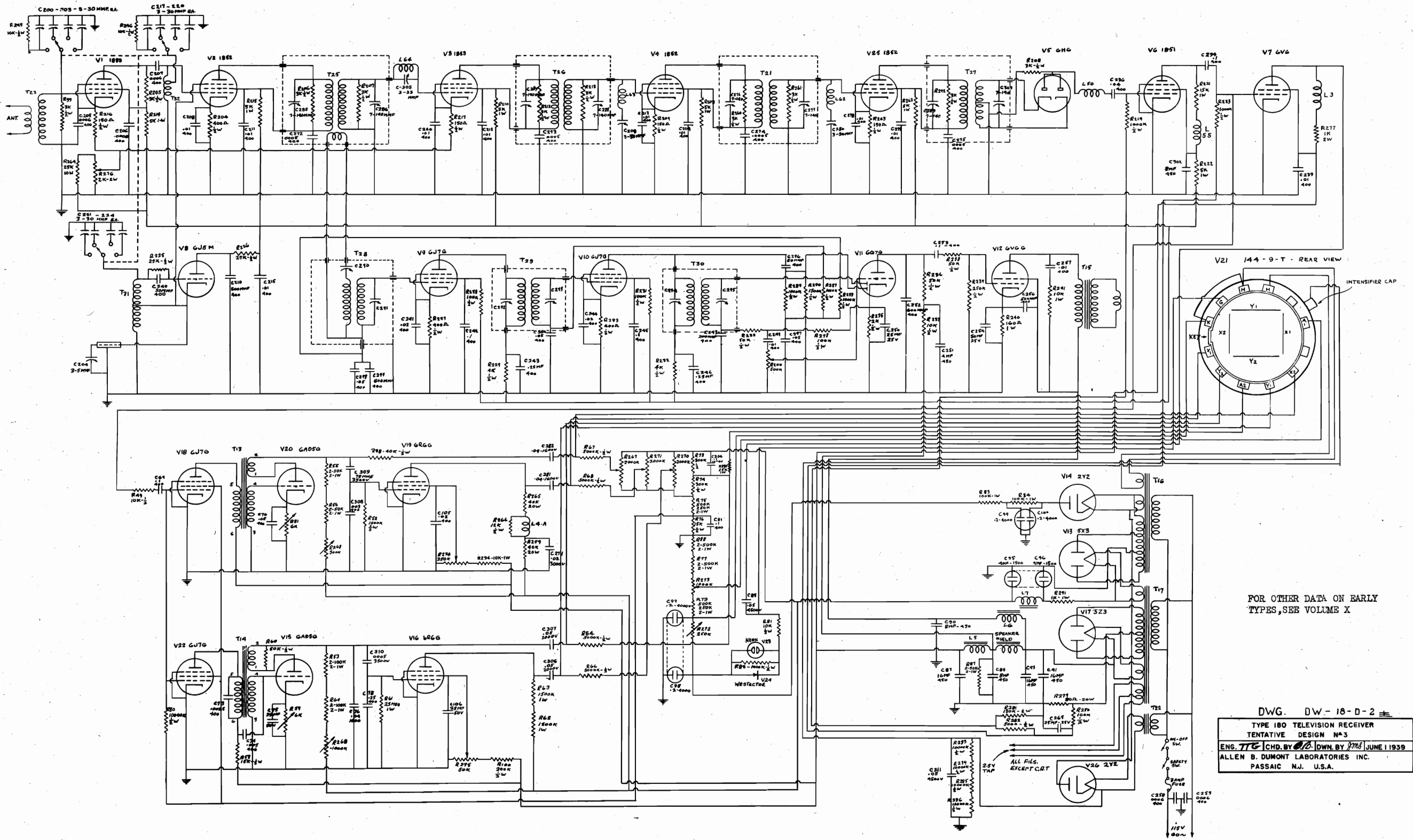
BROADCAST ALIGNMENT Remove short from variable condenser. Have wave band switch on broadcast position. Adjust generator and receiver to 1500 K.C. peak trimmers for maximum signal. Adjust generator and receiver to 500 K.C. peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

LONG WAVE ALIGNMENT

this band. Adjust the generator and receiver to 16.0 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated paddler.

(Model 704L.W.) Turn wave band switch to Long Wave band. Adjust the generator and receiver to 300 K.C. and peak trimmers for maximum signal. Adjust generator and receiver to 175 K.C. and peak Long Wave paddler for maximum signal. The variable condenser should be "rocked" during this operation. Recheck 300 K.C.

ALLEN B. DUMONT LABS., INC.

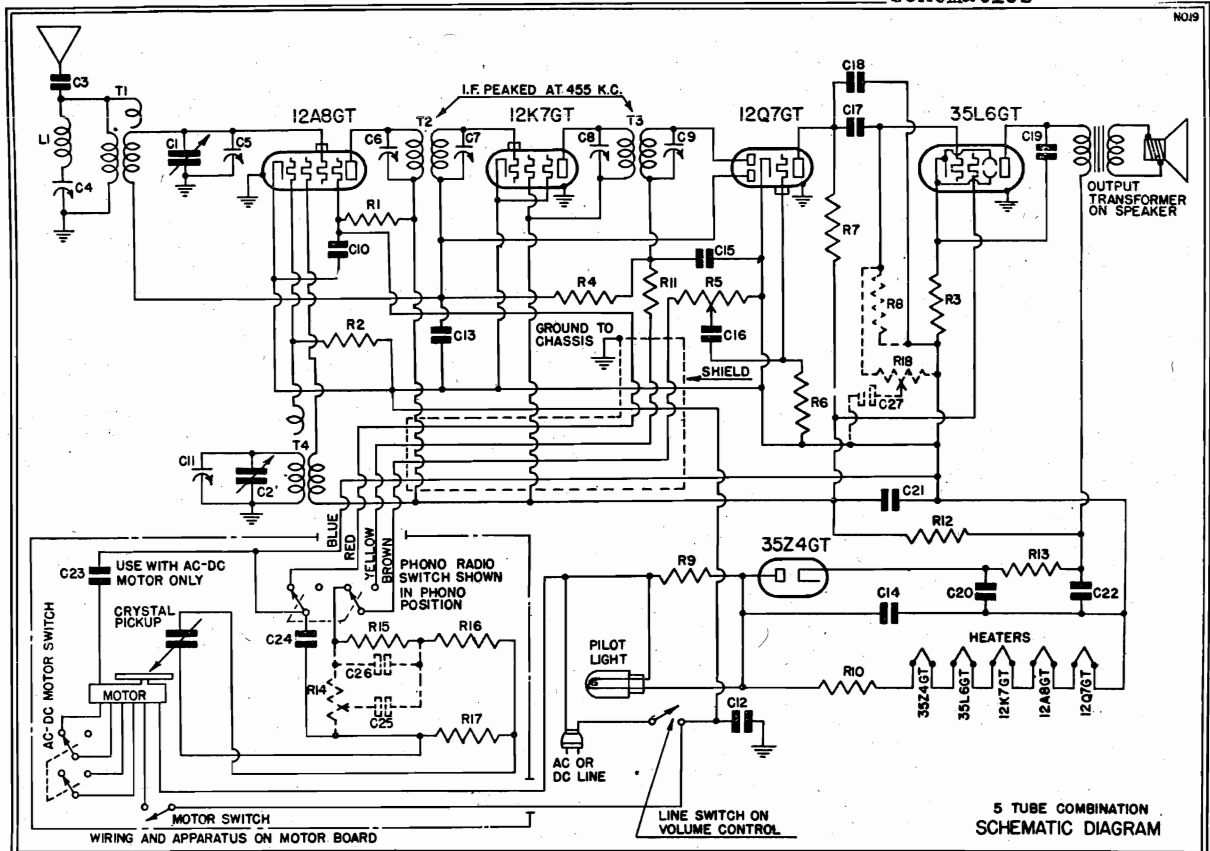


FOR OTHER DATA ON EARLY
TYPES, SEE VOLUME X

DWG. DW-18-D-2
TYPE 180 TELEVISION RECEIVER
TENTATIVE DESIGN NO. 3
ENG. TFC CHD. BY J. B. DOWN BY J. B. JUNE 1, 1939
ALLEN B. DUMONT LABORATORIES INC.
PASSAIC, N.J., U.S.A.

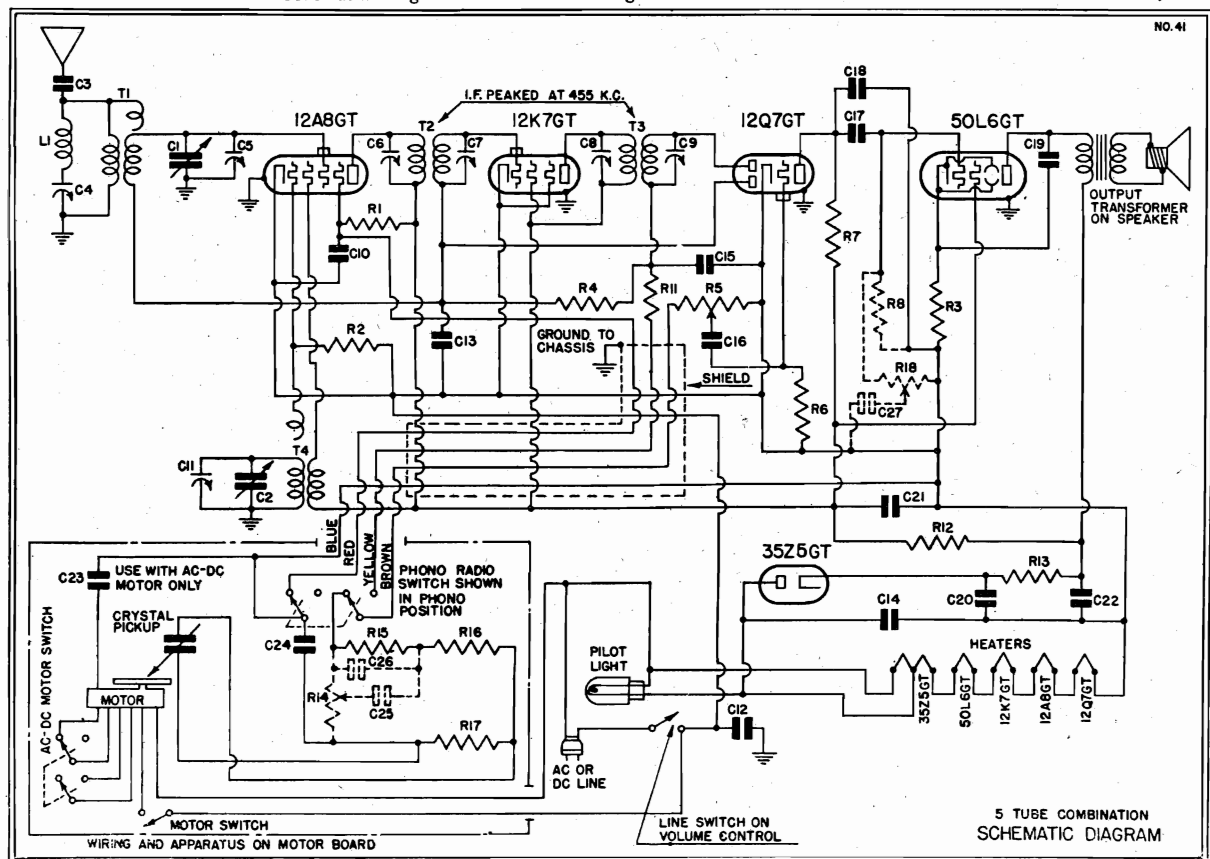
EMERSON RADIO & PHONOGRAPH CORP.

MODELS CJ221, CJ232 AC,
CJ1-221, CJ1-232 AC-DC
Chassis CJ, CJ1, Early, Late
Schematics



Schematic Diagram for Chassis Bearing Serial Numbers below 2700250

Nov. 1, 1939



Schematic Diagram for Chassis Bearing Serial Numbers above 2700250

MODELS CJ221, CJ232 AC CJ1-221, CJ1-232 AC-DC EMERSON RADIO & PHONOGRAPH CORP. Chassis CJ, CJ1 Voltage, Alignment, Parts Changes, Coil Data

Tube Data

| For serial numbers below 2,700,250: | For serial numbers above 2,700,250: |
|-------------------------------------|---------------------------------------|
| 1-12A8 or 12A8GT | pentagrid oscillator modulator |
| 1-12Q7 or 12Q7GT | first i-f amplifier |
| 1-12Q7 or 12Q7GT | diode detector, a-f amplifier, a.v.c. |
| 1-31L6 or 31L6GT | beam power output |
| 1-31Z4 or 31Z4GT | full-wave rectifier |
| 1-31Z5 or 31Z5GT | |

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohm-per-volt meter. Voltages listed below are from point indicated to B minus (switch, with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

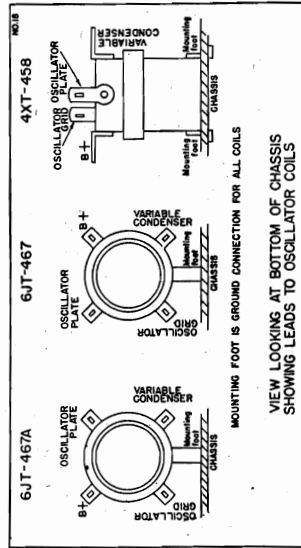
| Tube | Plate | Screen | Cathode | Fill |
|--------|-------|--------|---------|------|
| 12A8GT | 65 | 40 | 0 | 12 |
| 12Q7GT | 65 | 65 | 0 | 12 |
| 12Q7GT | 65 | 40 | 0 | 12 |
| 31L6GT | 100 | 65 | 5.7 | 50 |
| 31Z4GT | | | | |
| 31Z5GT | | | | |

All tubes are replaceable with either metal or equivalent bantam glass tubes. The letters "GT" at the end of the tube number indicate that the tube has a bantam size glass envelope. In all other respects it is the same as the metal tube bearing the same number without the "GT."

Voltage across pilot light—4.5 volts.

† In chassis using 31Z4GT and 31L6GT plate and screen voltage readings will be slightly higher.

CHASSIS MODEL CJ
Voltage rating — 105-125 volts
Power consumption — 30 watts for receiver
20 watts for 221 a.c. or 232 a.c. motor
30 watts for 221 and 232 a.c.-d.c. motors
Frequency range — 540-1730 kc.



Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the left of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis directly beneath the variable condenser.

The trimmers for the antenna and oscillator coils are located on the front section of the antenna coil.

The 455 kc wave-trap is mounted on the same form as the antenna coil between the 12K7 and 31Z5 tubes. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis. The oscillator coil is located underneath the chassis, beneath the first i-f transformer.

i-f and Wave-Trap Alignment

Swing the variable condenser to the maximum capacity position. Feed 455 kc to the grid-cap of the 12A8 tube through a .01 mf condenser. Adjust the trimmer for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap for minimum response. (See General Notes, paragraph No. 4.)

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

REPLACEMENT PARTS

List Price as Effective as of July 1, 1939
(Subject to change without notice)

| Part No. | DESCRIPTION | PRICE |
|----------|--|-------|
| 4XT-432 | Antenna coil with adjustable 455 kc wave-trap | .35 |
| 6JT-467A | Oscillator coil. (See production change no. 2.) | .90 |
| 6JT-467A | Double-tuned 455 kc first i-f transformer. | 1.10 |
| 4XR-342 | Double-tuned 455 kc second i-f transformer. | .85 |
| 4XR-342 | 30,000 ohm 1/2 watt carbon resistor. | .16 |
| 4XR-342 | 140 ohm 1/2 watt carbon resistor. | .16 |
| 4XR-342 | 2 megohm 1/2 watt carbon resistor. | .16 |
| 4XR-342 | Volume control .25 megohm with line switch. | .90 |
| 4XR-342 | 15 megohm 1/4 watt carbon resistor. | .16 |
| 4XR-342 | 500,000 ohm 1/4 watt carbon resistor. (See production change no. 1.) | .16 |
| 4XR-342 | Tapped metal-clad wire-wound resistor. (Each section—2watts) | .25 |
| 4XR-342 | 100,000 ohm 1/2 watt carbon resistor. | .16 |
| 4XR-342 | 2,500 ohm 1 watt carbon resistor. | .16 |
| 4XR-342 | 177 ohm 1 watt carbon resistor. | .16 |
| 4XR-342 | Two-gang variable condenser (for CJ-221). | 2.40 |
| 4XR-342 | Two-gang variable condenser (for CJ-232). | 2.75 |
| 4XR-342 | 0.00055 mf mica condenser. | .20 |
| 4XR-342 | Trimmer, part of wave-trap assembly. | .20 |
| 4XR-342 | Trimmer, part of i-f transformer. | .20 |
| 4XR-342 | Trimmer, part of i-f transformer. | .20 |
| 4XR-342 | 0.05 mf, 200 volt tubular condenser. | .20 |
| 4XR-342 | 0.1 mf, 200 volt tubular condenser. | .20 |
| 4XR-342 | 0.05 mf, 400 volt tubular condenser. | .20 |
| 4XR-342 | 0.0022 mf mica condenser. | .20 |
| 4XR-342 | 0.024 mf, 400 volt tubular condenser. | .20 |
| 4XR-342 | Dual 20 mf, 150 volt dry electrolytic condenser. | .90 |
| 4XR-342 | 20 mf, 135 volt dry electrolytic condenser. | .65 |
| 4XR-342 | 0.01 mf, 400 volt tubular condenser (for AC-DC motors only). | .20 |
| 4XR-342 | Pilot light, 6.3 volt, 15 amp., Mazda No. 47. | .35 |
| 4XR-342 | Dial face | .05 |
| 4XR-342 | Drive cord | .05 |
| 4XR-342 | Drive cord spring | .05 |
| 4XR-342 | Dial pointer | .05 |
| 4XR-342 | Dial pulley | .10 |
| 4XR-342 | Tone control, 5 megohm with line switch. | 1.05 |
| 4XR-342 | 1 megohm 1/4 watt carbon resistor. | .20 |
| 4XR-342 | Phonograph needle cup | .20 |
| 4XR-342 | Phonograph needle | .20 |
| 4XR-342 | 117 volt a.c. phonograph motor (for 221 a.c.) | 12.00 |
| 4XR-342 | 117 volt a.c.-d.c. phonograph motor (for 221 a.c.-d.c.) | 43.20 |
| 4XR-342 | Crystal pick up | 8.10 |
| 4XR-342 | 6" permanent magnet dynamic speaker | 6.20 |
| 4XR-342 | Phono-radio switch | .55 |
| 4XR-342 | Dial crystal | .20 |
| 4XR-342 | Record holder block | .60 |
| 4XR-342 | 5 megohm 1/4 watt carbon resistor. | .16 |
| 4XR-342 | Tone control, 5 megohm | .70 |
| 4XR-342 | 0.0003 mf mica condenser. | .20 |
| 4XR-342 | 0.006 mf 600 volt tubular condenser. | .20 |
| 4XR-342 | 117 volt a.c. phonograph motor (for 232 a.c.-d.c.) | 66.00 |
| 4XR-342 | 117 volt a.c. phonograph motor (for 232 a.c.) | 42.60 |
| 4XR-342 | Crystal pick up | 9.85 |
| 4XR-342 | 6" permanent magnet dynamic speaker | 6.70 |
| 4XR-342 | Phono-radio switch | .55 |
| 4XR-342 | Dial crystal | .20 |
| 4XR-342 | Record holder block | .60 |

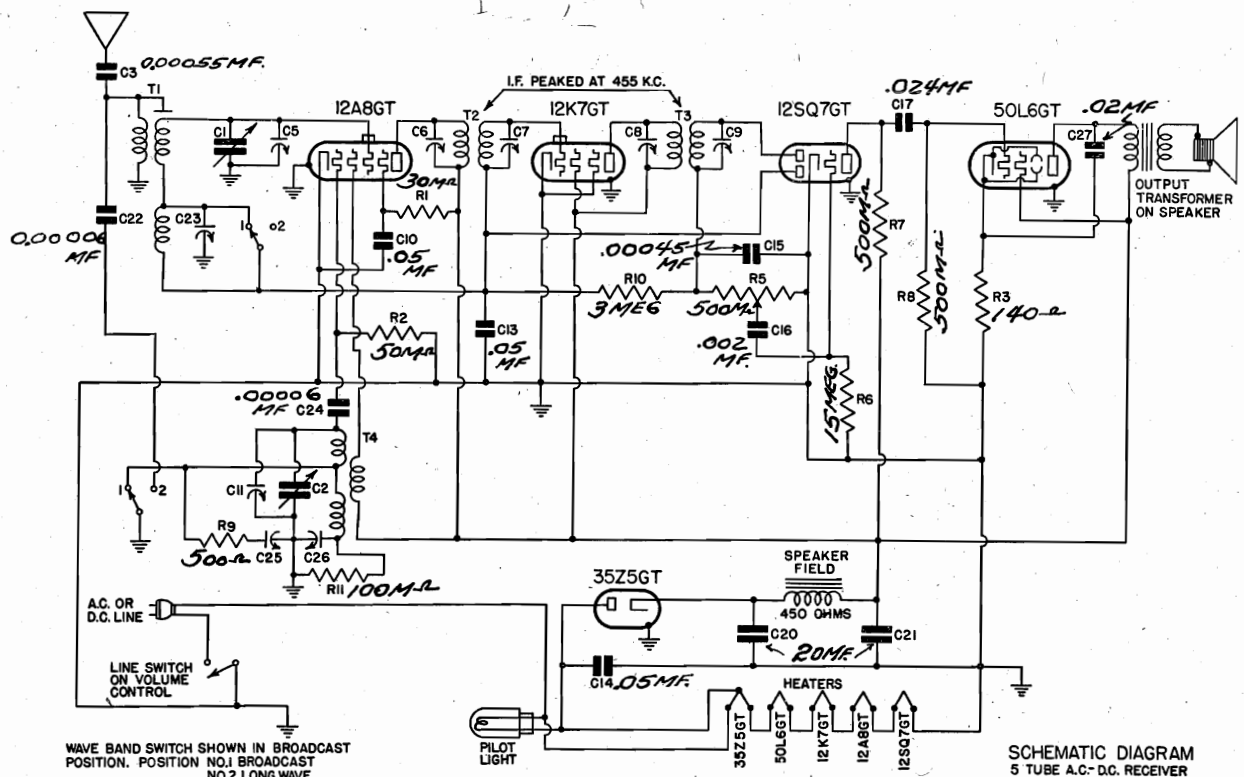
When ordering replacement parts specify part number.

*Item number locates the article on the schematic diagram.
†Not supplied separately.

PRODUCTION CHANGES

- In CJ chassis bearing serial numbers below 2,700,250: R7, the 12Q7 plate resistor, is 250,000 ohms.
- CJ chassis also use oscillator coil 4XT-458 or 6JT-467. For correct lug connections to any of these coils see illustration.
- R9, R10 is not used on CJ chassis above serial number 2,700,250.
- CJ-221 chassis uses dotted portion R8, R14, and C25.
- CJ-232 chassis uses dotted portion R18, C26, and C27.

EMERSON RADIO & PHONOGRAPH CORP. MODELS CRLW261, CRLW262

CRLW274, Chassis CRLW
Schematic, Voltage
Alignment, TrimmersSCHEMATIC DIAGRAM
5 TUBE A.C.-D.C. RECEIVER

Oct. 1st, 1939

Pilot light, 6.3 volt, .15 amp., Mazda No. 47

The color coding of the i-f transformer leads is as follows:

| | |
|-------------------|------------|
| Grid—green | Plate—blue |
| Grid return—black | B plus—red |

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

| Tube | Plate | Screen | Cathode | Osc. Plate | Fil. |
|--|-------|--------|---------|------------|------|
| 12A8GT—pentagrid oscillator modulator.... | 88 | 45 | 0 | 88 | 12 |
| 12K7GT—first i-f amplifier..... | 88 | 88 | 0 | — | 12 |
| 12SQ7GT—diode detector, a-f amplifier, a.v.c. 40 | — | — | 0 | — | 12 |
| 50L6GT—beam power output..... | 82 | 88 | 5.7 | — | 50 |

Voltage at 35Z5 cathode—115 volts.

Voltage across speaker field—27 volts.

Voltage across pilot light—4.5 volts.

Voltage rating 105 to 125 volts, a.c. or d.c.

Power consumption 30 watts

Frequency ranges { 588 to 1650 kc (558 to 182 meters)
{ 157 to 375 kc (1905 to 804 meters)

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the speaker. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis directly beneath the variable condenser.

The two-band antenna coil is located to the left of the speaker. The trimmer for the broadcast antenna coil is located on the front section of the variable condenser. The trimmer for the long-wave antenna coil is mounted on the top of the antenna coil form. The two-band oscillator coil is located underneath the chassis below the antenna coil. The trimmer for the broadcast oscillator coil is located on the rear section of the variable condenser. The trimmer and series padder (condensers C25 and C26 resp.) for the long-wave oscillator coil are located beneath the chassis and can be reached from the bottom only. The section toward the rear of the chassis is C25, the shunt trimmer. The section toward the front of the chassis is C26, the series padding condenser.

Alignment

I.F. Turn the band switch clockwise to broadcast position and swing the variable condenser to the maximum capacity position. Feed 455 kc to the grid-cap of the 12A8GT tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

B.C. With the band switch in broadcast position set the dial pointer at 200 meters. Feed 1500 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

L.W. Turn the band switch counter-clockwise to the long-wave position. With the dial pointer set at 850 meters, feed 350 kc through a .0001 mf condenser to the antenna and adjust first the oscillator trimmer (rear trimmer beneath the chassis), then the antenna trimmer (on antenna coil) for maximum response. Move the pointer to 1750 meters, feed 172 kc, and adjust the series padder (front trimmer beneath the chassis), rocking the variable condenser back and forth while adjusting for maximum response. Return to 350 kc and repeat alignment.

MODELS CULW261, CULW262

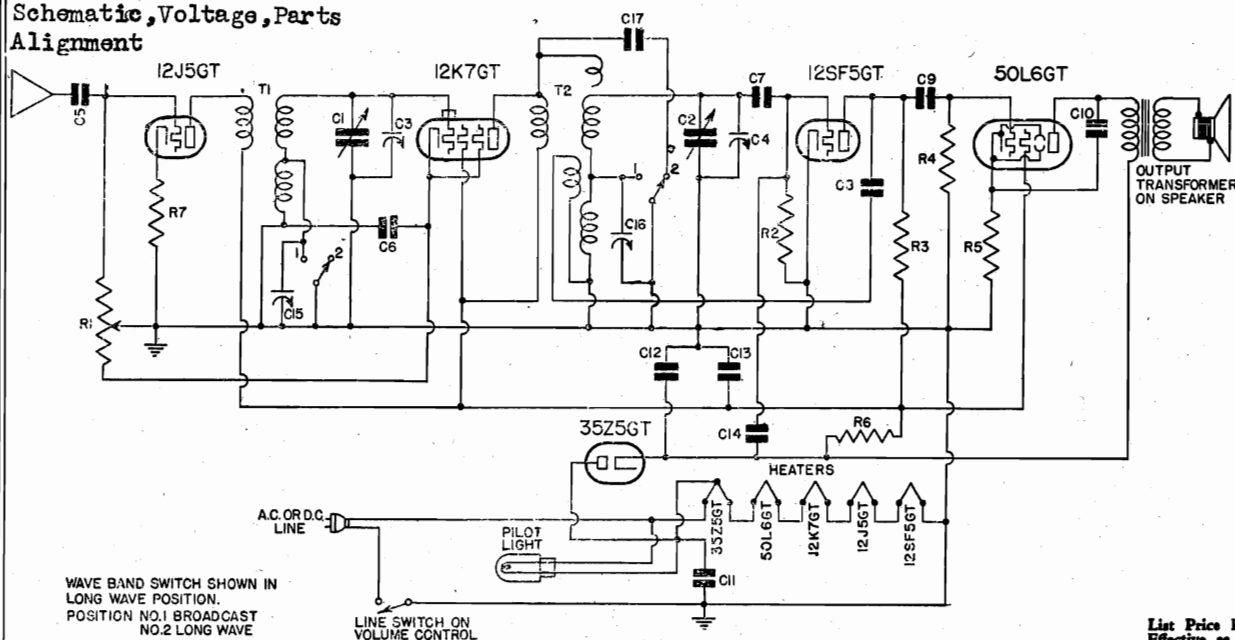
CULW265, CULW274

EMERSON RADIO & PHONOGRAPH CORP.

Chassis CULW

Schematic, Voltage, Parts

Alignment

List Price Ea.
Effective as of
Oct. 1st, 1939

(Subject to change without notice)

| *Item | Part No. | DESCRIPTION | PRICE |
|----------|----------|--|-------|
| T1 | 6UT-517 | Two-band r-f coil..... | \$.65 |
| T2 | 6UT-518 | Two-band detector coil..... | 1.10 |
| R1 | 6UR-360 | Volume control 75,000 ohms with 200 ohm bias stop and line switch..... | .85 |
| R2 | 3RR-275 | 10 megohm 1/4 watt carbon resistor..... | .16 |
| R3, R4 | KR-56 | 500,000 ohm 1/4 watt carbon resistor..... | .16 |
| R5 | 3FR-293 | 140 ohm 1/2 watt wire-wound resistor..... | .16 |
| R6 | 6FR-348 | 2,400 ohm 1/2 watt carbon resistor..... | .16 |
| R7 | KR-50 | 500 ohm 1/4 watt carbon resistor..... | .16 |
| C1, C2 | 6UC-439 | Two-gang variable condenser..... | 2.30 |
| †C3, C4 | | Trimmers, part of variable condenser..... | |
| C5, C8 | 5AC-384 | 0.0002 mf, 600 volt tubular or mica condenser..... | .20 |
| C6 | BC-12 | 0.05 mf, 200 volt tubular condenser..... | .20 |
| C7 | KC-58 | 0.01 mf, 400 volt tubular condenser..... | .20 |
| C9 | LC-65 | 0.02 mf, 400 volt tubular condenser..... | .20 |
| C10 | 5JC-417 | 0.035 mf, 400 volt tubular condenser..... | .20 |
| C11 | LC-64 | 0.05 mf, 400 volt tubular condenser..... | .20 |
| C12, C13 | 6UC-447 | Multiple 30 and 10 mf, 150 volt dry electrolytic condenser..... | .90 |
| C14 | 6UC-440A | 0.000002 mf mica condenser..... | .20 |
| C15, C16 | 3AC-278 | Trimmer..... | .15 |
| C17 | 4VC-371A | 0.0003 mf mica condenser..... | .20 |
| | 6JL-104 | Pilot light, 6.3 volt, .15 amp., Mazda No. 47 | |

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with volume control turned on full and no signal. The line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

| Tube | Plate | Screen | Cathode | Heater |
|----------------------------------|-------|--------|---------|--------|
| 12J5GT, first r-f amplifier..... | 85 | — | 2.3 | 12 |
| 12K7GT, second r-f amplifier.. | 85 | 85 | 1.6 | 12 |
| 12SF5GT, grid leak detector .. | 25 | — | 0 | 12 |
| 50L6GT, beam power output.. | 110 | 85 | 6 | 50 |

Voltage at rectifier cathode—120 volts.

Power consumption 30 watts.

ALIGNMENT PROCEDURE

An oscillator with frequencies of 1500 kc and 350 kc is required.

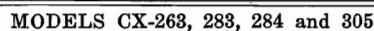
Use as weak a test signal as possible. An output meter should be used across the voice coil or output transformer for observing maximum response.

Rotate variable condenser to the maximum capacity position and set the pointer at the next calibration mark beyond 550. Rotate band-switch clockwise to broadcast (medium-wave) position. Then rotate the variable condenser until the pointer is at 200 meters, feed 1500 kc to the antenna through a .0001 mf mica condenser and adjust both trimmer condensers on the variable condenser for maximum response.

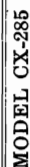
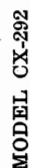
Turn wave-band switch counter-clockwise to long-wave position. Rotate variable condenser until pointer is at 850 meters and feed 350 kc to antenna. Adjust the two long-wave interstage coil trimmers for maximum output. The first long-wave interstage coil trimmer is located on the speaker frame. The second (detector coil) long-wave trimmer is located beneath the chassis and is reached from the right end of the chassis.

MODELS CX263,CX283,CX284
CX285,CX305,CX292
Chassis CX (3 Types)
Schematics

Chassis CX (3 Types) Schematics

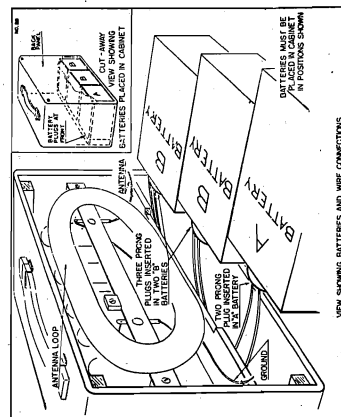
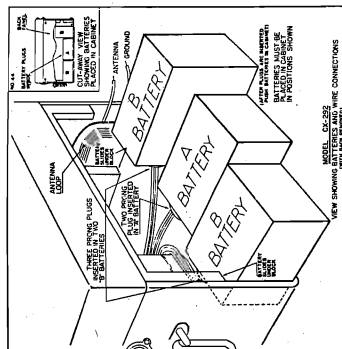
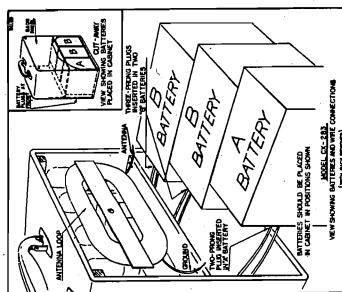


Current drain "A" battery—0.3 amps.
 "B" battery—0.10 amps. with no signal
Frequency range .. All Models except CX-285—540 to 1600 kc
 Model CX-285—540 to 1730 kc



MODELS CX263,CX283,CX284
CX285,CX292,CX305
Voltage,Alignment,Parts
Batt.Data,Changes

EMERSON RADIO & PHONOGRAPH CORP.



ADDITIONAL PARTS USED ON CX-292

| | | |
|-----|----------|---|
| R15 | XR-55 | 0.25 megohm $\frac{1}{4}$ watt resistor |
| R16 | HR-42 | 2 megohm $\frac{1}{4}$ watt carbon resistor |
| R22 | RC-14 | 0.001 mf 600 volt tubular condenser |
| R23 | RC-14 | 0.001 mf 600 volt tubular condenser |
| R24 | 3VC-324 | 0.0001 mf 600 volt tubular condenser |
| R25 | 3VC-324 | 0.0001 mf 600 volt tubular condenser |
| | 3GM-251 | Phonograph needle cup |
| | 3GM-251 | Phonograph needle cup |
| | 4XPW-48 | Spring-driven phonograph motor |
| | 4XS-492 | Phone-radio switch |
| | 8GS-202B | Tone control switch |

Item number locates the article on the schematic diagram.

Not supplied separately.

ADJUSTMENTS

An oscillator with frequencies of 455 and 1400 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The oscillator coil is located beneath the chassis. The trimmer for the oscillator is on the rear section of the variable condenser.

On Model CX-285 the antenna coil is located between the two π -transformers. On all other CX Models the loop antenna acts as

the antenna coil. The trimmer for the loop C4 is on the loop frame for Models CX-263, 284 and 305. On Models CX-288, 285 and 292, C4 is on the front section of the variable condenser.

The i-f transformers are located in cans mounted on top of the chassis. The first i-f transformer is at the extreme left end of the chassis. The diode i-f transformer is just to the left of the variable condenser. The trimming condensers for both transformers can be reached through holes in the tops of the cans.

-f Alignment

Swing variable condenser to minimum capacity position. Feed 55 kc to the grid of the 1A7GT tube through a 0.01 mf condenser. Adjust the four i-f trimmers for maximum response.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna connection and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance. Align at 140. Set the dial at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may then be swung to either side of the center to give maximum response. Realign at 140.

**Battery Installation for Models CX-263, CX-283,
CX-284, CX-292 and CX-305**

The portable cabinets contain a shelf under the receiver for housing the batteries. To install and connect the batteries observe the following procedure:

- Remove the back panel of the cabinet by taking out the wood screws.
- Locate the battery cable on the bottom shelf of the cabinet.
- With the batteries out of the cabinet insert the three-prong plug in the battery cable into the two "B" batteries and the small two-prong plug into the "A" battery.
- Place the batteries in the cabinet as indicated in the illustration (note that the plug end of the battery is up against the front panel of the cabinet).
- Reattach the back panel of the cabinet and fasten it in place with the screws.

GENERAL NOTES

4. Batteries: The Model CX is designed to house the complete set of batteries within the cabinet. The battery complement should be as follows:

THE BUREAU COMPLIMENTED SHAWA FOR HIS EXCELLENCE

FOR MODELS CX-263, CX-283, CX-284, CX-292 AND CX-305

| Type Battery | No. Req. | Eveready Part No. | Raychem Part No. | Burgess Part No. |
|--------------|----------|-----------------------|--------------------------|--------------------------|
| 1½ volt "A" | 1 | 741 (plug-in type) | P-36A (plug-in type) | 8F (plug-in type) |
| 45 volt "B" | 2 | 762 (plug-in type) | P-5303 (plug-in type) | B80-P1 (plug-in type) |

FOR MODEL CX-285

| "A" and "B" Pack | No. Req. | Eveready Part No. | Raychem Part No. | Burgess Part No. |
|------------------|----------|-----------------------|------------------------|---------------------------|
| 1 | 1 | 748 (plug-in type) | AB82 (plug-in type) | JTG-D60 (plug-in type) |

2. The color coding of the i-f transformer leads is as follows:

| | |
|-------------------|------------|
| Grid—green | Plate—blue |
| Grid return—black | B plus—red |

3. The color coding of the battery cable is as follows:

| | |
|----------------------|--------------------------|
| Red—B plus, 90 volts | Yellow—A plus, 1.5 volts |
| B minus | Black—A minus |

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 90 volts.

| Volume control turned on and no signal | Plate | Screen | Obs. Plate | Fil. |
|--|-------|--------|------------|------|
| 1A6GT oscillator-modulator..... | 82 | 82 | 82 | 1.5 |
| 1A6GT 1st af amplifier..... | 72 | 82 | 82 | 1.5 |
| 1N6GT 2nd af amplifier..... | 82 | 82 | 82 | 1.5 |
| 1N6GT 2nd detector, a.v.c., af amplifier, 25 | 82 | 82 | 82 | 1.5 |
| 1N6GT beam power output..... | 77 | 82 | 82 | 1.5 |

Bias for the 1Q5G₁ tube is obtained across the resistor R11. The voltage drop across this resistor should be 7.0 volts.

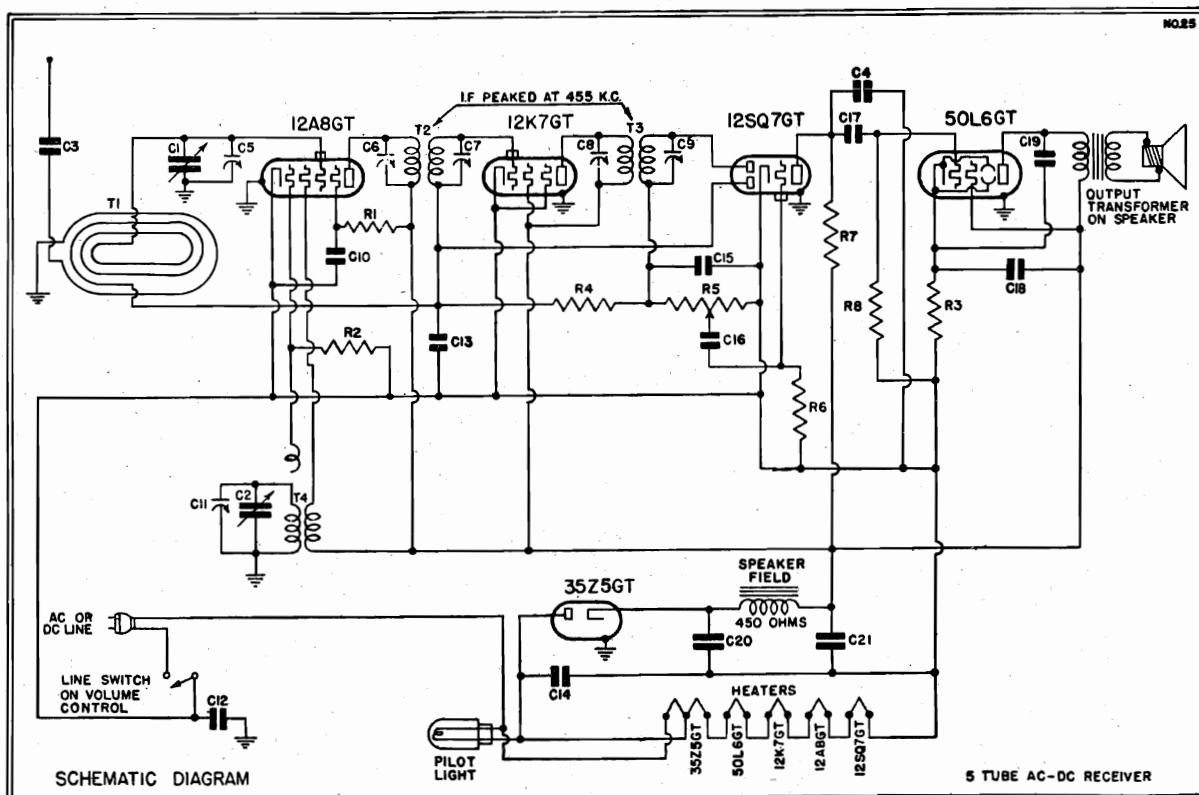
DESCRIPTION

| | | |
|---------------------|-----------|--|
| T1, L1 | 4XT-432B | Antenna coil with 465 kc adjustable wave trap (for CX-285 only) |
| L2 | 4XT-432A | Antenna coil with 465 kc adjustable wave trap (for CX-285) |
| L3 | 4XW-175A | Loop antenna assembly (for CX-283) |
| L4 | 4XW-174 | Loop antenna assembly (for CX-283, 284 and 305) |
| T2 | 6RT-476 | Oscillator coil |
| T3 | 6RT-466DU | Double-tuned 465 kc first i-f transformer |
| T4 | 6XT-5014 | Double-tuned 465 kc diode i-f transformer |
| R1 | 6RT-477 | 50,000 ohm $\frac{1}{4}$ watt carbon resistor |
| R2 | 72R-196 | 30,000 ohm $\frac{1}{4}$ watt carbon resistor |
| R3 | KR-50 | 500 ohm $\frac{1}{4}$ watt carbon resistor |
| R4 | KR-54 | 100,000 ohm $\frac{1}{4}$ watt carbon resistor |
| R5, R10, R13, R17 } | HR-42 | 2 megohm $\frac{1}{4}$ watt carbon resistor. (See production change No. 3) |
| R6 | KR-56 | 25,000 ohm $\frac{1}{4}$ watt carbon resistor |
| R7 | KR-58 | 0.5 megohm $\frac{1}{4}$ watt carbon resistor |
| R11 | 6ER-358 | 680 ohm $\frac{1}{4}$ watt wire-wound resistor |
| R12 | 3HR-240C | Volume control—500,000 ohms with double pole battery switch. |
| C1 | C2 | Two-gang variable condenser (for CX-283, 284, 285 and 305) |
| C1 | C2 | 4RC-436A |
| C1 | C2 | 4RC-436B |
| C3 | BC-12 | Trimming unit of variable condenser. (See production change No. 4) |
| C4, C7, C21 | BC-12 | 0.05 mf, 200 volt tubular condenser |
| C5, C9, C18 | LC-95 | 0.02 mf, 400 volt tubular condenser |
| +C10, C11, C12, C13 | C13 | Trimmers, part of i-f transformer. |
| C14 | 5AC-384 | 0.0002 mf, 600 volt tubular or mica condenser |
| C15 | 4C-584A | 0.01 mf, 400 volt tubular condenser |
| C16 | 4C-584 | 0.01 mf, 400 volt tubular condenser |
| C19 | NNC-199 | 0.001 mf, 600 volt tubular condenser (for CX-283, 292 and 305) |
| | | (See production change No. 1) |
| C20 | 6EC-432 | 8 mf, 100 volt dry electrolytic condenser (for CX-285) |
| | 6XS-402 | 5 $\frac{1}{2}$ permanent magnet dynamic speaker (for CX-283) |
| | 6ES-971A | 5 $\frac{1}{2}$ permanent magnet dynamic speaker (for CX-283, 284, 285, 292 and 305) |
| | 6XD-97 | 6 $\frac{1}{2}$ permanent magnet dynamic speaker (for CX-283, 284, 285, 292 and 305) |
| | 6XD-87 | Dial face (not used on CX-285) |
| | 6XD-94 | Dial face (for CX-285 only) |
| | 6ED-69A | Indicator dial |
| | 6EF-52 | Dial pointer |
| | 6EF-53 | Dial pointer (for CX-285 and 305) |
| | 6XE-26A | Dial crystal (for CX-283, 283, 284 and 292) |
| | 6BW-162 | Drive cord spring |
| | 4VZ-772 | Drive cord cord |
| | 6BW-148 | Battery cable (for CX-285) |
| | 6BW-135A | Battery cable (for CX-283, 284, 285, 292 and 305) |
| | 6BW-94 | Dial pointer |

PRODUCTION CHANGES

1. On CX-263, 284 and 285 condenser C19 is part no. 3VC-324 0.003 mf, 600 volt tubular condenser.
2. On CX-263, 284 and 305 trimmer C4 is mounted on the loop antenna frame.
3. Chassis bearing serial numbers below 921,400 use .5 megohm at R10.

EMERSON RADIO & PHONOGRAPH CORP. MODELS CV264, CV280, CV295
CV298, CV313, CV314, CV316
Chassis CV (2 Types)
Schematics

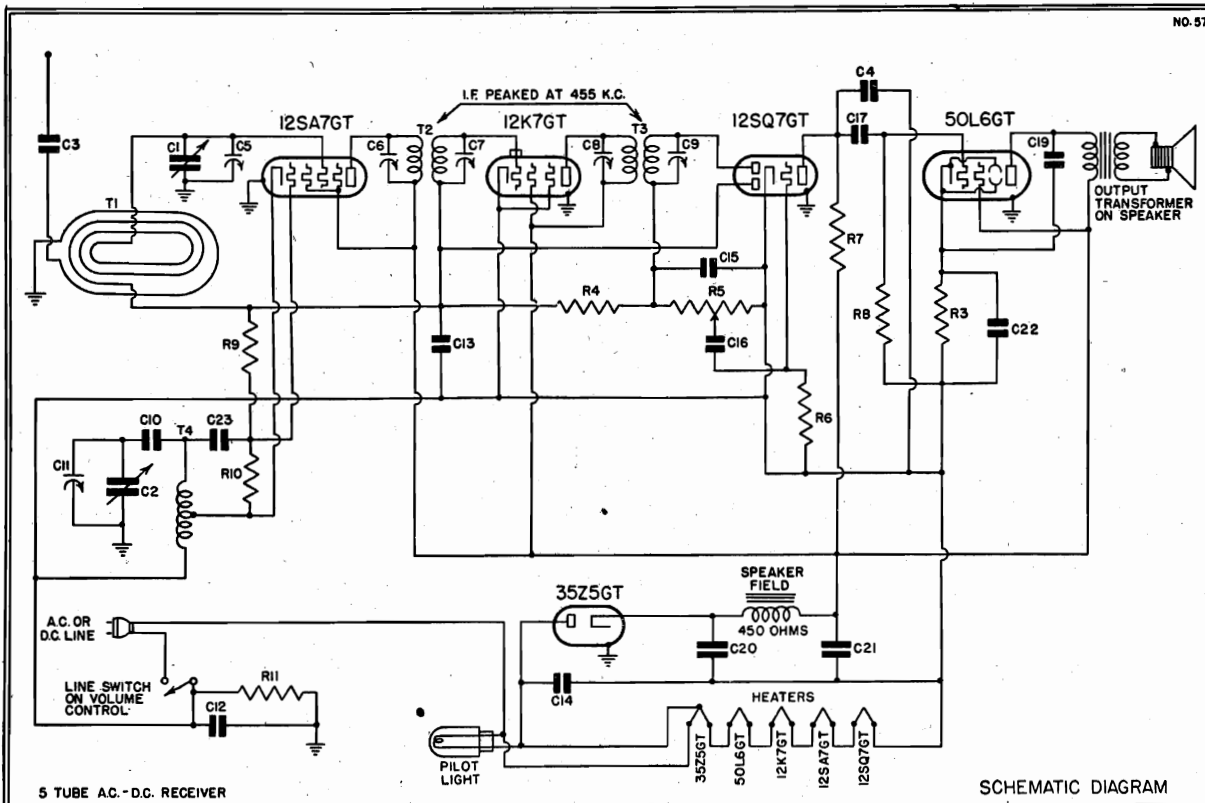


SCHEMATIC FOR CHASSIS USING 12A8GT TUBE

Voltage rating105-125 volts, a.c. or d.c.
Power consumption30 watts.

The color coding of the i-f transformer leads is as follows:

Grid—green Plate—blue
Grid return—black B plus—red



SCHEMATIC FOR CHASSIS USING 12SA7GT TUBE

Oct. 15, 1939

MODELS CV264, CV280, CV295

CV298, CV313, CV314, CV316 EMERSON RADIO & PHONOGRAPH CORP.

Chassis CV

Voltage, Parts, Changes

Alignment, Trimmers

TUBE DATA

THE TUBE COMPLEMENT IS AS FOLLOWS:

One 12SA7GT—pentagrid oscillator modulator
 One 12K7GT—first i-f amplifier
 One 12SQ7GT—diode detector, a-f amplifier, a.v.c.
 One 50L6GT—beam power output
 One 35Z5GT—half-wave rectifier

(NOTE: Chassis bearing serial numbers
 below 2920685 use 12A8GT instead of 12SA7GT)

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

| Tube | Plate | Screen | Cathode | Fil. |
|----------|-------|--------|---------|------|
| †12SA7GT | 88 | 88 | 0 | 12 |
| 12K7GT | 88 | 88 | 0 | 12 |
| 12SQ7GT | 40 | — | 0 | 12 |
| 50L6GT | 82 | 88 | 5.7 | 50 |

Voltage at 35Z5 cathode—115 volts.

Voltage across pilot light—4.5 volts.

Voltage across speaker field—27 volts.

†Chassis using 12A8GT measures 88 volts at oscillator plate and 45 volts at screen.

*Item

Part No.

| | | |
|-----------------|----------|---|
| T1 | 6VW-172A | Loop antenna assembly (see production change no. 4b) |
| T4 | 7BT-486A | Oscillator coil (see production change no. 2) |
| T2 | 7BT-488C | Double-tuned 455 kc first i-f transformer (see production change no. 3a) |
| T3 | 7FT-513D | Double-tuned 455 kc second i-f transformer (see production change no. 3b) |
| R1 | 2CR-193 | 30,000 ohm ½ watt carbon resistor (see production change no. 1a) |
| R2 | KR-53 | 50,000 ohm ¼ watt carbon resistor (see production change no. 1a) |
| R3 | 3FR-293 | 140 ohm ½ watt wire-wound resistor |
| R4 | NNR-220 | 3 megohm ¼ watt carbon resistor. |
| R5 | 6VR-364 | Volume control .25 megohm with line switch |
| R6 | 4XR-327 | 15 megohm ¼ watt carbon resistor. |
| R7, R8 | KR-56 | 500,000 ohm ¼ watt carbon resistor. |
| R10 | LR-60 | 20,000 ohm ¼ watt carbon resistor (see production change no. 1b) |
| R11 | LR-61 | 200,000 ohm ¼ watt carbon resistor (see production change no. 1b) |
| C1, C2 | 6RC-436 | Two-gang variable condenser |
| C3, C16 | 3HC-274 | 0.002 mf, 600 volt tubular condenser |
| C4, C15, C23 | 4XC-394A | 0.00022 mf mica condenser |
| †C5, C11 | | Trimmers, part of variable condenser. |
| †C6, C7, C8, C9 | | Trimmers, part of i-f transformers. |
| C10, C13 | BC-12 | 0.05 mf, 200 volt tubular condenser |
| C12 | 3CC-302 | 0.15 mf, 200 volt tubular condenser |
| C14 | LC-64 | 0.05 mf, 400 volt tubular condenser |
| C17 | 6JC-425 | 0.024 mf, 400 volt tubular condenser |
| C18 | 6VC-446 | 20 mf, 150 watt dry electrolytic condenser (see change no. 1a) |
| C19 | LC-65 | 0.02 mf, 400 volt tubular condenser (see change no. 3c) |
| C20, C21 | 6JC-426B | Dual 20 mf, 150 volt dry electrolytic condenser |
| C22 | 6ZC-460 | 20 mf, 25 volt dry electrolytic condenser (see change no. 1b) |
| | 6JS-268U | 4" dynamic speaker |

*Item number locates the article on the schematic diagram.

†Not supplied separately.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the left of the speaker. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis to the right of the speaker. The trimmers are accessible through holes in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil (loop). The oscillator coil is located directly beneath the speaker.

Alignment

I.F.—Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7GT tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. The grid of the 12SA7GT tube may be reached by clipping the input lead to the stator loop of the antenna (front) section.

R.F.—Set the dial pointer at 140. Feed 1400 kc from the signal generator into a loop of wire about one foot in diameter. Hold this radiating loop about 12 inches away from and parallel to the receiver loop antenna. Advance the input to the loop until a satisfactory deflection is obtained on the output meter. Adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response. If the loop antenna has been replaced it may be necessary to retrack the loop inductance. With the dial set at 60 feed 600 kc to the antenna lead. A portion of the outside may be swung to either side of the center to give maximum response. Repeat the trimmer alignment at 140.

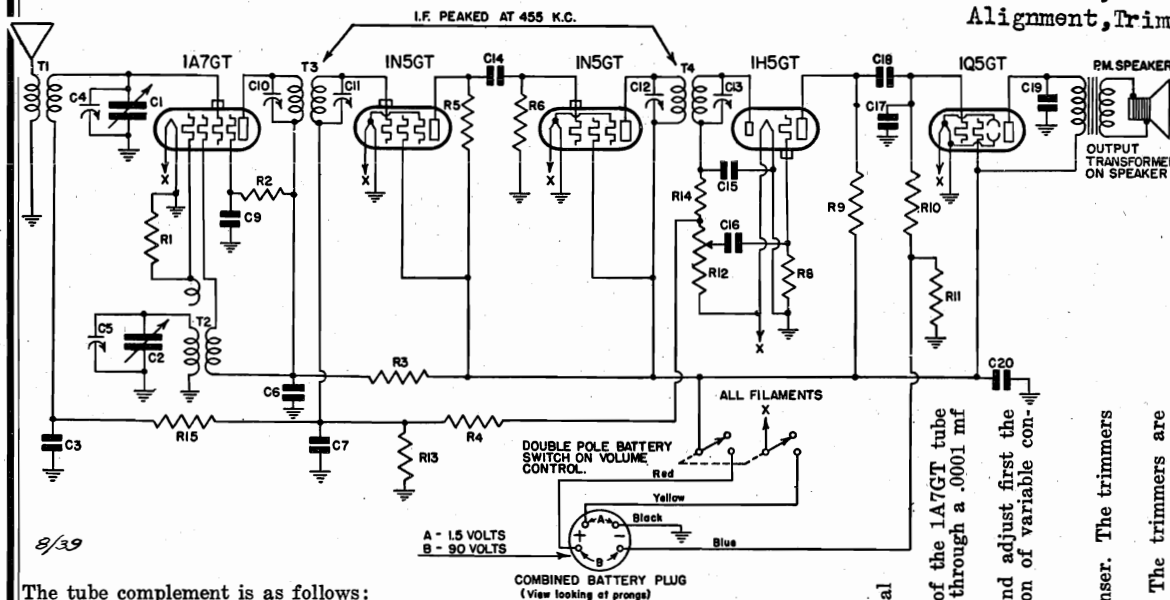
DIAL PARTS

6JL-104 Pilot light, 6.3 volt, .15 amp., Mazda No. 47
 6VD-82A Dial face (see production change no. 4a)
 4YZ-772 Drive cord 6JH-24B Drive shaft
 6RW-162 Drive cord spring 6RF-52 Dial pointer
 6RE-20 Dial crystal

PRODUCTION CHANGES

1. (a) Used only in chassis using 12A8GT.
 (b) Used only in chassis using 12SA7GT.
2. (a) Chassis bearing serial numbers below 2764502 use oscillator coil 6RT-476
 (b) Chassis bearing serial numbers between 2764502 and 2920685 use oscillator coil 7CT-511
3. Chassis bearing serial numbers below 2920685 use
 (a) First i-f transformer 6RT-479A
 (b) Second i-f transformer 7BT-489A
 (c) Condenser C19—.03 mf—400 volt.
4. Chassis bearing serial numbers below 2764502 use
 (a) Dial face 6VD-82
 (b) Loop antenna 6VW-172.

EMERSON RADIO & PHONOGRAPH CORP.

MODEL DH264, Chassis DH
Schematic, Voltage, Parts
Alignment, Trimmers

The tube complement is as follows:

- 1—1A7GT oscillator-modulator.
- 1—1N5GT 1st i-f amplifier.
- 1—1N5GT 2nd i-f amplifier.
- 1—1H5GT 2nd detector, a.v.c., a-f amplifier.
- 1—1Q5GT beam power output.

| *Item | Part No. | DESCRIPTION |
|---------------------|----------|---|
| T1 | 4XT-432A | Antenna coil with 455 kc adjustable wave-trap |
| T2 | 6RT-476 | Oscillator coil |
| T3 | 6RT-479B | Double-tuned 455 kc first i-f transformer |
| T4 | 4XT-435D | Double-tuned 455 kc diode i-f transformer |
| R1, R14 | KR-53 | 50,000 ohm 1/4 watt carbon resistor |
| R2 | ZZR-196 | 30,000 ohm 1/4 watt carbon resistor |
| R6, R15 | KR-54 | 100,000 ohm 1/4 watt carbon resistor |
| R3 | KR-50 | 500 ohm 1/4 watt carbon resistor |
| R4, R8, R13 | HR-42 | 2 megohm 1/4 watt carbon resistor |
| R5 | LR-65 | 10,000 ohm 1/4 watt carbon resistor |
| R9, R10 | KR-56 | 0.5 megohm 1/4 watt carbon resistor |
| R11 | 6ER-358 | 680 ohm 1/2 watt wire-wound resistor |
| R12 | 7HR-373 | Volume control—500,000 ohms with double pole battery switch |
| C1, C2 | 6RC-436 | Two-gang variable condenser |
| C3 | AC-6 | 0.1 mf, 200 volt tubular condenser |
| †C4, C5 | | Trimmers, part of variable condenser |
| C6, C7 | BC-12 | 0.05 mf, 200 volt tubular condenser |
| C9, C18 | LC-65 | 0.02 mf, 400 volt tubular condenser |
| †C10, C11, C12, C13 | | Trimmers, part of i-f transformer |
| C14 | 5AC-384 | 0.0002 mf, 600 volt tubular or mica condenser |
| C15, C17 | 4XC-394A | 0.00022 mf mica condenser |
| C16, C19 | KC-58 | 0.01 mf, 400 volt tubular condenser |
| C20 | 6EC-432 | 8 mf, 100 volt dry electrolytic condenser |

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 90 volts.

| Tube | Plate | Screen | Osc. Plate | Fil. |
|---------------|-------|--------|------------|------|
| 1A7GT | 82 | 52 | 82 | 1.5 |
| 1N5GT 1st i-f | 48 | 82 | — | 1.5 |
| 1N5GT 2nd i-f | 82 | 82 | — | 1.5 |
| 1H5GT | 25 | — | — | 1.5 |
| 1Q5GT | 77 | 82 | — | 1.5 |

Bias for the 1Q5GT tube is obtained across the resistor R11. The voltage drop across this resistor should be 7.0 volts.

Alignment
IF—Swing the variable condenser to the maximum capacity position. Feed 455 kc to the grid-cap of the 1A7GT tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap for minimum response.
RF—Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the left of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis directly beneath the variable condenser.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.

The 455 kc wave-trap is mounted on the same form as the antenna coil to the left of the speaker. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the left side of the chassis. The oscillator coil is located underneath the chassis, beneath the antenna coil.

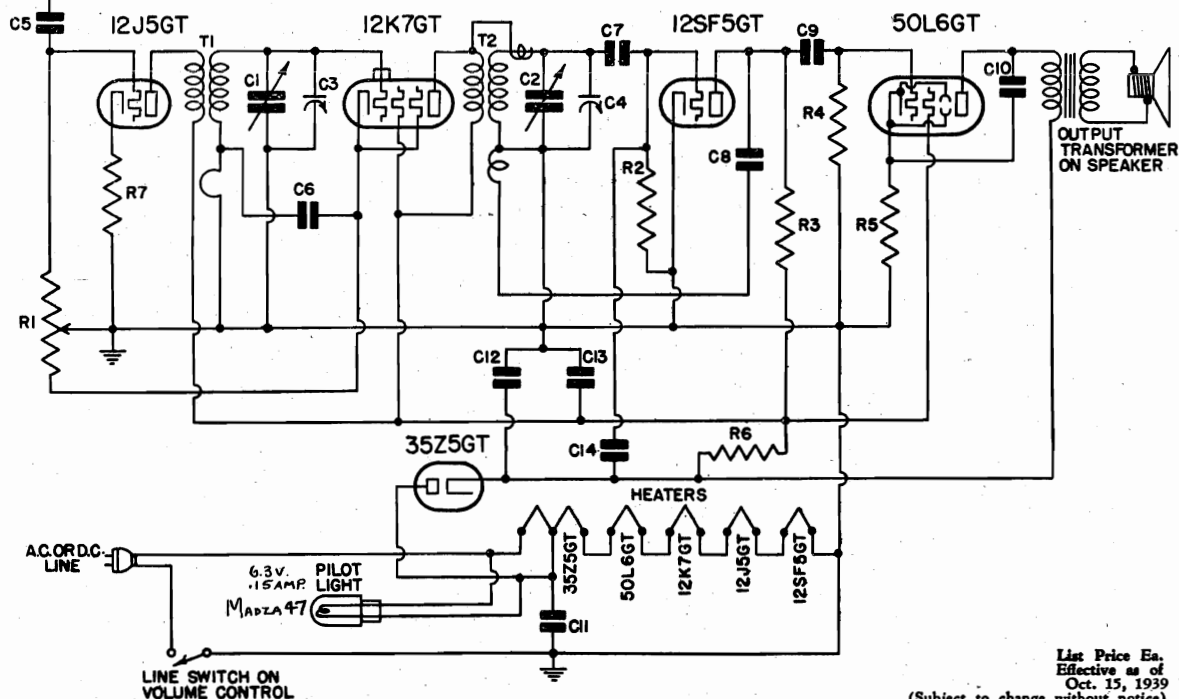
MODEL CU265

Chassis CU

EMERSON RADIO & PHONOGRAPH CORP.

Schematic, Voltage, Parts

Alignment



List Price Ea.
Effective as of
Oct. 15, 1939
(Subject to change without notice)

| *Item | Part No. | DESCRIPTION | PRICE |
|----------|----------|--|-------|
| T1 | 6UT-478 | Broadcast r-f coil..... | .45 |
| T2 | 6FT-462B | Broadcast detector coil..... | .50 |
| R1 | 6UR-360 | Volume control 75,000 ohms with 200 ohm bias stop and line switch..... | .85 |
| R2 | 3RR-275 | 10 megohm 1/4 watt carbon resistor..... | .16 |
| R3, R4 | KR-56 | 500,000 ohm 1/4 watt carbon resistor..... | .16 |
| R5 | 3FR-293 | 140 ohm 1/2 watt wire-wound resistor..... | .16 |
| R6 | 6FR-348 | 2,400 ohm 1/2 watt carbon resistor..... | .16 |
| R7 | PR-79 | 1000 ohm 1/4 watt carbon resistor..... | .16 |
| C1, C2 | 6UC-439 | Two-gang variable condenser..... | 2.30 |
| C3, C4 | | Trimmers, part of variable condenser..... | |
| C5, C8 | 5AC-384 | 0.0002 mf, 600 volt tubular or mica condenser..... | .20 |
| C6 | BC-12 | 0.05 mf, 200 volt tubular condenser..... | .20 |
| C7 | KC-58 | 0.01 mf, 400 volt tubular condenser..... | .20 |
| C9 | LC-65 | 0.02 mf, 400 volt tubular condenser..... | .20 |
| C10 | 5JC-417 | 0.035 mf, 400 volt tubular condenser..... | .20 |
| C11 | LC-64 | 0.05 mf, 400 volt tubular condenser..... | .20 |
| C12, C13 | 6UC-447 | Multiple 30 and 10 mf, 150 volt dry electrolytic condenser..... | .90 |
| C14 | 6UC-440A | 0.000002 mf mica condenser..... | .20 |

The tube complement is as follows:

- 1—12J5GT, first r-f amplifier
- 1—12K7GT, second r-f amplifier
- 1—12SF5GT, grid leak detector
- 1—50L6GT, beam power output
- 1—35Z5GT, single half-wave rectifier

Voltage rating 105 to 125 volts, a.c. or d.c.

Power consumption 30 watts.

Frequency range 540 to 1730 kc.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with volume control turned on full and no signal. The line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

| Tube | Plate | Screen | Cathode | Heater |
|---------|-------|--------|---------|--------|
| 12J5GT | 85 | — | 2.3 | 12 |
| 12K7GT | 85 | 85 | 1.6 | 12 |
| 12SF5GT | 25 | — | 0 | 12 |
| 50L6GT | 110 | 85 | 6 | 50 |

Voltage at rectifier cathode—120 volts.

ALIGNMENT PROCEDURE

Use as weak a test signal as possible. An output meter should be connected across the voice coil or output transformer for observing maximum output.

With the pointer set at 150 feed 1500 kc to the antenna lead through a .0001 mf condenser, and adjust the trimmers, located on the variable condenser, for maximum response.

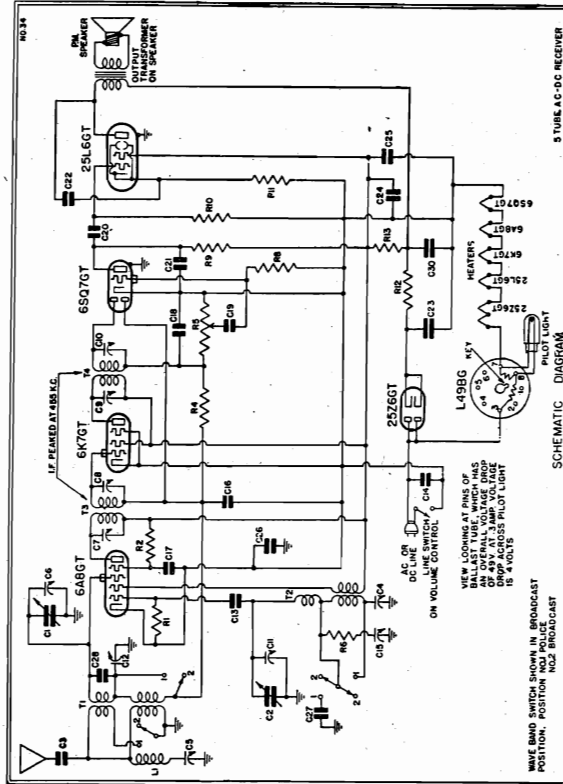
EMERSON RADIO & PHONOGRAPH CORP.

Voltage rating 105 to 125 volts, a.c. or d.c.
 Power consumption 43 watts.
 Frequency ranges 540 to 1700 kc and 2300 to 6600 kc. (Model CG)
 540 to 1700 kc and 2250 to 7500 kc. (Model CY)

MODELS CG268, CG270, CG272
 CG276, CG318 Chassis CG
 CY269, CY271, CY273, CY286
 CY288, CY319 Chassis CY
 Schematics, Voltage

Octal-base tubes in this receiver may be replaced with either metal or bantam-type octal-base glass tubes. The letters "GT" at the end of the tube number indicates that the tube has a bantam glass envelope. In all other respects it is the same as the metal tube bearing the same number without the "GT."

- 1-6A8GT pentagrid oscillator-modulator.
- 1-6K7GT first i-f amplifier.
- 1-6SQ7GT diode detector, a-f amplifier, a.v.c. (see note).
- 1-25L6GT beam power output.
- 1-25Z6GT dual half-wave rectifier.



SCHEMATIC DIAGRAM No. 34 FOR MODELS CY-286 AND 288

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

| Tube | Plate | Screen | Cathode | Osc. Plate | Fil. |
|--------|-------|--------|---------|------------|------|
| 6A8GT | 95 | 45 | 0 | 95 | 6.3 |
| 6K7GT | 95 | 95 | 0 | — | 6.3 |
| 6SQ7GT | 38 | — | 0 | — | 6.3 |
| 25L6GT | 90 | 95 | 6.5 | — | 25.0 |

Voltage at 25Z6 cathode—125 volts.

Voltage across speaker field—28 volts.

Voltage drop across ballast resistor (pins nos. 3, 7)—49 volts.

Voltage drop across pilot light section of ballast resistor (pins nos. 8 and 7)—4 volts.

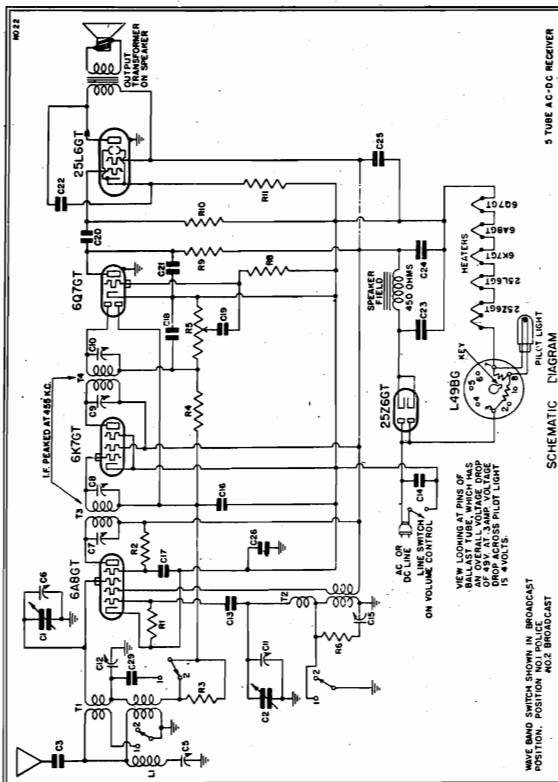
*Note: CG chassis bearing serial numbers below 2,616,849 use 6Q7GT.

*Plate voltage of 25L6 tube in CY-286 and 288 measures 112 volts.

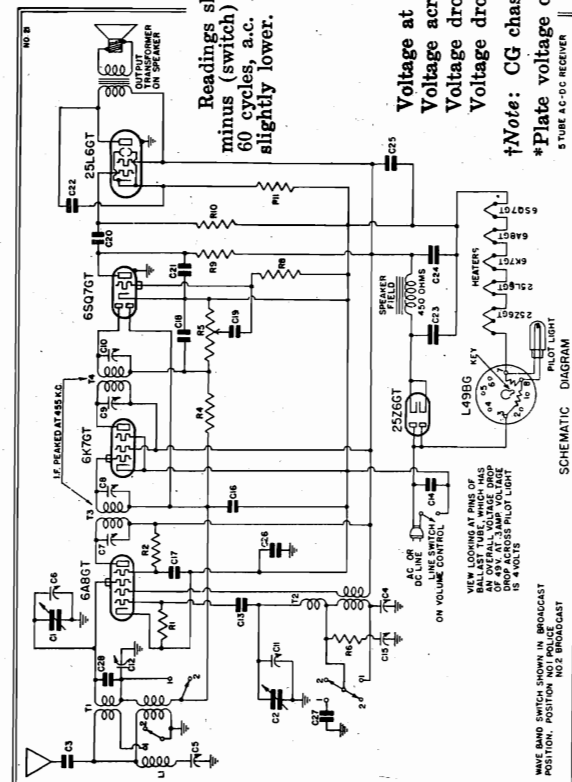
The color coding of the i-f transformer leads is as follows:

6/59
 Grid—green
 Grid return—black

Plate—blue
 B plus—red



SCHEMATIC DIAGRAM No. 22 FOR MODEL CG



SCHEMATIC DIAGRAM No. 21 FOR MODELS CY-269, 271 AND 273 AND 319

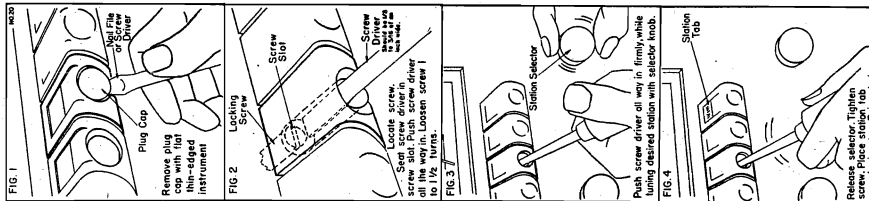
CHASSIS CG and CY

Alignment, Trimmers EMERSON RADIO & PHONOGRAPH CORP.

Parts, Tuner Data

CHASSIS CQ and CS

Tuner Data



ADJUSTMENTS

An oscillator with frequencies of 455, 600, 1500 kc is required. Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is located on top of the chassis deck. The trimmers are available through holes in the top of the can. The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are available through holes in the rear wall underneath the chassis.

The trimmers for the antenna and oscillator are located on the variable condenser. The trimmer for the front section of the antenna coil assembly directly behind the variable condenser. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis.

i-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc through a .002 mf paper condenser to the grid cap of the 6AG tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna (upper terminal of antenna coil) for maximum response. (See General Note No. 6.) and adjust the wave-trap trimmer for minimum response.

Short-Wave Alignment

With the wave-band switch in the short-wave position, counter-clockwise, set the dial pointer at 6 mc. and feed 6000 kc through a standard dummy antenna (a .0002 mf condenser connected to the antenna terminal of the antenna coil). Adjust the antenna trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

MODEL CY: Adjust first the oscillator trimmer (on left-hand section of variable condenser) then the antenna trimmer (on right-hand section of variable condenser) for maximum response.

Broadcast Alignment

MODEL CG: Rotate the wave-band switch clockwise to the broadcast position, set the pointer at 150 and feed 1500 kc through a standard dummy antenna to the antenna lead. Adjust first the broadcast oscillator trimmer (lower of dual trimmer assembly located underneath the variable condenser) and then the antenna trimmer (upper trimmer of antenna coil) for maximum response. (See General Note No. 6.) MODEL CY: Fully identify the antenna trimmer as outlined above for CG. Then feed 600 kc and adjust the variable padding condenser (reached through hole in rear wall) while rocking the variable condenser for maximum response. Return to 1500 and retrim if necessary.

PREADJUSTMENT OF AUTOMATIC TUNING KEYS

Select four nearby stations desired for automatic tuning. Choose one of these stations and any button to be adjusted for it. Follow the procedure outlined below:

1. Remove the small plug cap in the front of the tuning key by prying at its lower end with a flat thin-edged tool such as a nail file or screw-driver. See Fig. 1 of right.
2. Insert a screw-driver into the hole in the tuning key. The locking screw is accessible through the tuning key hole. Seat the screw-driver in the slot of the locking screw and push in the screw-driver as far as it will go. Loosen the screw about 1 to 1 1/2 turns. It is important to use a screw-driver in which the flat portion is not wider than 1/8". A larger screw-driver cannot be inserted.
3. With the screw-driver seated in the screw slot, press the screw in as far as possible and holding it in firmly with one hand, tune in the desired station with the other hand, using the selector knob and tighten the screw firmly.
4. Check the adjustment by turning well past the station, using the selector knob, and then pushing down the key. The station should come back in again clearly and with maximum volume.
5. After the adjustment is tested, check to see that the locking screw is tightened firmly.
6. Replace the plug cap in the front of the key. Remove the tab bearing the station call letters from one of the cards supplied in a separate envelope with the receiver. Moisten the tab and place it on the top of the tuning key as indicated in Fig. 4.

REPLACEMENT PARTS LIST

| * Item | Part No. | DESCRIPTION | PRICE |
|---------------|-----------------------|---|--------|
| T1, L1 | 6GT-468 | Two-band antenna coil with 455 kc wave-trap (CG only) | \$1.10 |
| T2, L2 | 6GT-483 | Two-band antenna coil with 455 kc wave-trap (CY only) | 1.10 |
| T3, L3 | 6GT-489 | Two-band antenna coil (CG only) | .55 |
| T4, L4 | 4XT-484DU | 455 kc first i-f transformer | 1.80 |
| T5, L5 | 4XT-484U | 455 kc second i-f transformer | 1.80 |
| R1, R2 | KE-53 | 50,000 ohm 1/4 watt carbon resistor | .16 |
| R3, R6 | FR-79 | 1000 ohm 1/4 watt carbon resistor | .16 |
| R4, R5 | NN-220 | 15 megohm 1/4 watt carbon resistor | .16 |
| R8 | 4XR-327 | 15 megohm 1/4 watt carbon resistor | .16 |
| R9, R10 | 4XR-367 | 500,000 ohm 1/4 watt carbon resistor | .16 |
| R11 | 3FR-293 | 140 ohm 1/4 watt wire-wound resistor | .16 |
| L1, L2 | L-49BG | Plug-in type ballast resistor. Interchangeable with L-49B | .16 |
| C1, C2 | CG-518 | Two-gang variable condenser (complete with 4 gang push-button assembly) | 2.35 |
| C3, C4 | NN-199 | .0001 mf, 600 volt tubular condenser | .545 |
| C5, C6 | 2NC-231A | Single adjustable padding condenser (CY only) | .30 |
| C7, C8 | — | Trimmer, part of wave-trap assembly | .20 |
| C9, C10 | — | Trimmers, part of first i-f transformer assembly | .20 |
| C11, C12 | — | Trimmers, part of second i-f transformer assembly | .20 |
| C13 | 6GC-430 | Dual trimmer assembly | .35 |
| C14 | IC-138A | .000025 mf mica condenser | .20 |
| C15 | IC-139 | .000025 mf mica condenser | .20 |
| C16, C17, C25 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C18, C21 | SAC-384 | .00002 mf, 600 volt tubular condenser | .20 |
| C19 | 3HC-274 | .0002 mf, 600 volt tubular condenser | .20 |
| C20 | LC-65 | .002 mf, 400 volt tubular condenser | .20 |
| C22 | LC-65 | .0015 mf, 400 volt tubular condenser | .20 |
| C23, C24 | 61C-426U or 61C-426AU | 20 mf, 150 volt dry electrolytic condenser | .90 |
| C26 | 3CC-302 | .015 mf, 200 volt tubular condenser | .20 |
| C27 | 6YC-448 | .00083 mf mica condenser | .20 |
| C28 | IC-139 | .00001 mf mica condenser | .20 |
| C29 | IC-139 | .00001 mf mica condenser | .20 |
| C30 | 6GS-375A | Wave-band switch (CG only) | .60 |
| C31 | 6GS-375A | Wave-band switch (CY only) | .60 |
| C32 | 6GS-379 | 5" dynamic speaker (not used on CY-288 or CY-288) | 4.20 |
| C33 | 6GD-72 | Dial face (CG only) | .45 |
| C34 | 6GD-72 | Dial face (CY only) | .45 |
| C35 | 4R-84 | Plug face 6.3 amp, 25 amp, Mean No. 44 | .20 |
| C36 | 4XZ-811C | Dial drive shaft (CG only) | .05 |
| C37 | 6QH-31 | Dial pointer | .20 |
| C38 | 4M7-588A | Drive cord spring (CG only) | .05 |
| C39 | 5U7-224 | Drive cord spring (CY only) | .05 |
| C40 | 4Y7-772 | Drive cord (CG only) | .02 |
| C41 | 6QZ-863 | Drive cord (CY only) | .04 |
| C42 | 5FZ-758A | Dial crystal (for CG-268 and CY-269) | .25 |
| C43 | 6GE-29A | Dial crystal (not used on CG-268 and CY-269) | .25 |
| C44 | 6WT-135 | Shielded push-button (CG only) | .25 |
| C45 | 6WT-135 | Shielded push-button (CY only) | .25 |
| C46 | 4R-325 | 175 ohm 1 watt metalized resistor | .16 |
| C47 | 6YR-369 | 1000 ohm 1 watt carbon resistor | .16 |
| C48 | 6YC-460 | 40 mf, 135 volt dry electrolytic condenser | .80 |
| C49 | 6YR-413 | permanent magnet dynamic speaker | 7.30 |
| C50 | 81W-126 | Speaker cable | .25 |

If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.

The filament dropping resistor (L-49B on schematic) is located at the rear of the chassis. This resistor will become quite hot under normal operating conditions. For voltage drop specifications, see below.

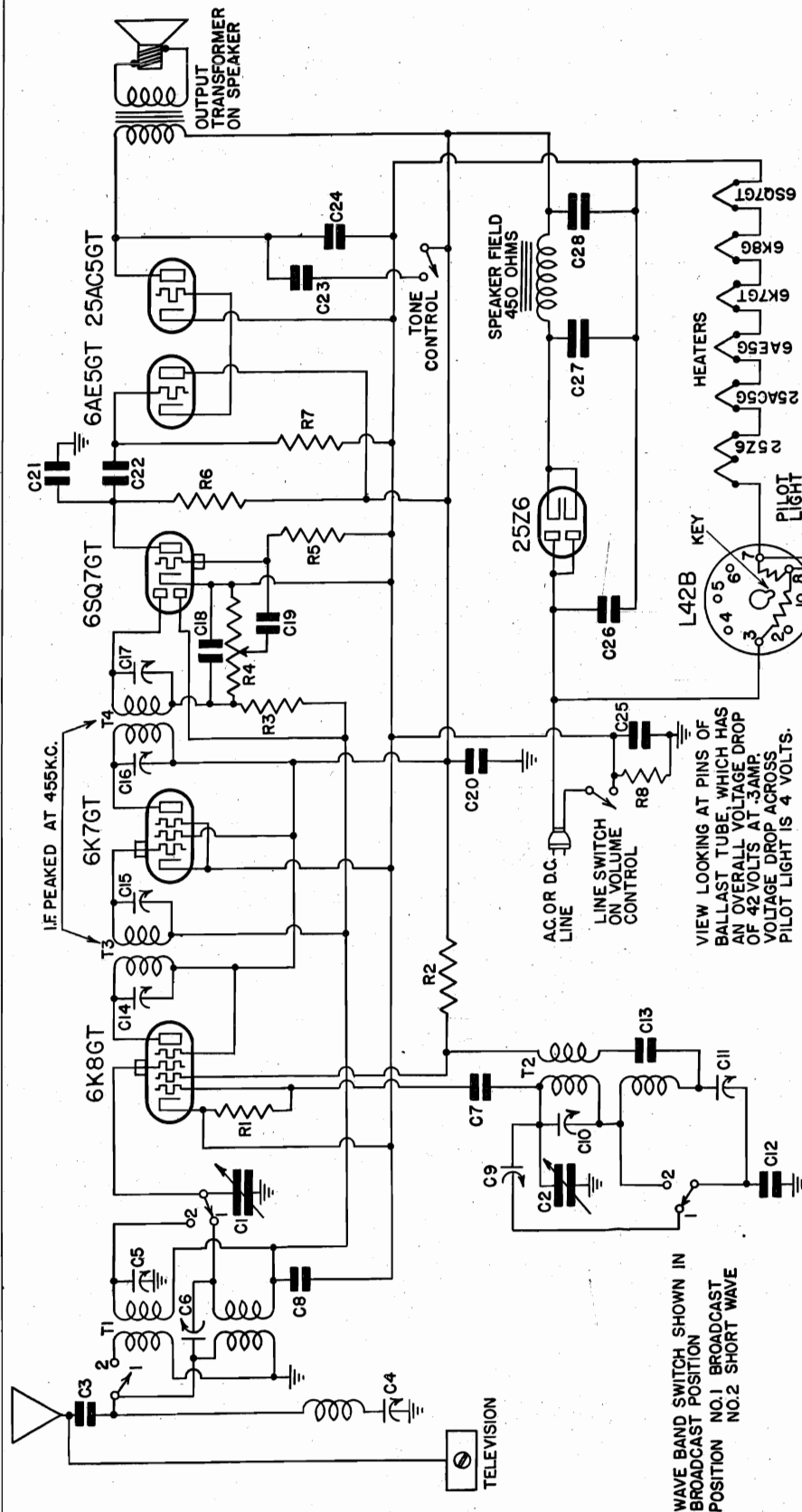
When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.

The first i-f transformer is held to the chassis by snap-on fasteners. To remove it, unsolder all its leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.

The wave-trap has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS CQ269, CQ271, CQ273
CS268, CS270, CS272, CS276
Chassis CQ, CS
Schematic, Voltage



VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on d.c. will be slightly lower.

| Tube | Plate | Screen | Cathode | Osc. Plate | Fil. |
|---------|-------|--------|-----------------|------------|------|
| 6K8GT | 95 | 95 | 0 | 70 | 6.3 |
| 6K7GT | 95 | 95 | 0 | — | 6.3 |
| 6SQ7GT | 30 | — | 0 | — | 6.3 |
| 6AE5GT | 95 | — | 1 $\frac{1}{2}$ | — | 6.3 |
| 25AC5GT | 90 | — | 0 | — | 25.0 |

Voltage at 25Z6—128 volts.

Voltage across speaker field—33 volts.

Voltage drop across ballast resistor (pins nos. 3, 7)—42 volts.

Voltage drop across pilot light section of ballast resistor (pins nos. 8 and 7)—4 volts.

Pilot light, 6.3 volt, .25 amp., Mazda No. 44

Voltage rating 105 to 125 volts, a.c. or d.c.
Power consumption 43 watts.

Frequency ranges 540 to 1730 kc and 5.6 to 18 m

Tube Data

- 1—6K8GT pentagrid oscillator-modulator.
- 1—6K7GT first i-f amplifier.
- 1—6SQ7GT diode detector, a-f amplifier, a.v.c.
- 1—6AE5GT audio amplifier.
- 1—25AC5GT dynamic coupled output.
- 1—25Z6GT dual half-wave rectifier.

Oct. 15, 1939

CHASSIS CQ,CS

Alignment, Trimmers EMERSON RADIO & PHONOGRAPH CORP.

Parts

CHASSIS DA

Alignment, Socket, Trimmers

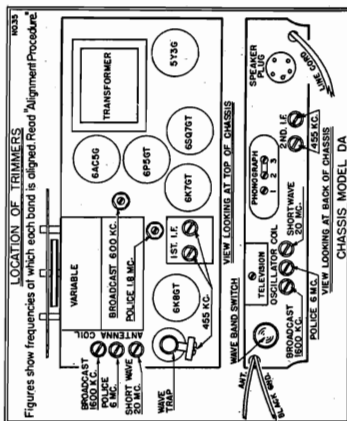
Six-Tube, A.C., Three-Band Superheterodyne

MODEL DA-287

CHASSIS MODEL DA

ADJUSTMENTS

An oscillator with frequencies of 455, 600, 1600, 1800, 6000 and 20,000 kc should be used. An output meter should be used across the voice coil or speaker output transformer for observing maximum response. Use a dummy antenna for aligning any of the three bands. A .0002 mf condenser may be used for broadcast band dummy antenna, a .0001 mf condenser for the police band dummy antenna and a 400 ohm non-inductive resistor for the short-wave band dummy antenna. The alignment is in frequency then the signal on all three bands, so images should be observed on the low frequency side of the signals. Always use a .0001 mf condenser as possible during alignment. Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. The last motion in adjusting trimmers should always be a tightening one, not a loosening one. Never leave the trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or use a .0001 mf condenser to hold it in place. In aligning antenna trimmers on the high-frequency signals there is always a danger of the oscillator to drift, due to interlocking. To compensate for this always keep tuning the variable condenser as the trimmers are being adjusted.



I-f and Wave-Trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc through a .002 mf paper condenser, to the grid cap of the 6X8 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna (using a standard dummy antenna) and adjust the 455 kc wave trap for minimum response. (See General Notes No. 6.)

Broadcast Alignment

Set the wave-band switch at the broadcast (clockwise) position, and the pointer at 60. Feed 600 kc to the antenna (using a standard dummy antenna) and adjust the broadcast-band series padder for maximum response. Move the pointer to 1600, feed 1600 kc and adjust the oscillator coil trimmer for maximum response, then adjust the antenna coil trimmer for maximum response. Reset the pointer at 60, feed 600 kc and rock the variable condenser while adjusting the series padder for maximum response. Return to 1600 and check alignment. If readjustment is necessary return to 600 and repeat entire procedure. (The broadcast padder is located beneath the chassis to the left of the variable condenser.)

Police Alignment

Set the wave-band switch at the police-band (central) position and the pointer at 1.8. Feed 1800 kc to the antenna (using a .0001 mf dummy antenna) and adjust the police-band series padder for maximum response. Move the pointer to 1600, feed 1600 kc and adjust the oscillator trimmer for maximum response. Then adjust the antenna trimmer for maximum response. Return to 1.8 and check alignment. If readjustment is necessary return to 1600 and repeat entire procedure. (The broadcast padder is located beneath the chassis to the left of the variable condenser.)

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the pointer to 20 and feed 20,000 kc to the antenna. Adjust the short-wave oscillator trimmer for maximum response. Then adjust the antenna coil trimmer for maximum response. If two peaks are obtained choose the minimum capacity peak. Then adjust the antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.

MODELS CQ269, CQ 271, CQ 273
MODELS CS268, CS 270, CS 272 & CS 276

| Item | Part No. | DESCRIPTION | PRICE |
|------|--|---|--------|
| T1 | 6QT-474 or 48T-418 or 6QT-481 | Two-band antenna coil with 455 kc wave-trap. | \$1.85 |
| T2 | 6QT-480 | Two-band oscillator coil | 1.10 |
| T3 | 455 kc first i-f transformer | | 1.30 |
| T4 | 455 kc second i-f transformer | | .80 |
| R1 | 50,000 ohm 1/2 watt carbon resistor | | .16 |
| R2 | 3 megohm 1/2 watt carbon resistor | | .16 |
| R3 | 3 megohm 1/2 watt carbon resistor | | .16 |
| R4 | Volume control with line switch—500,000 ohms | | .90 |
| R5 | 15 megohm 1/2 watt carbon resistor | | .16 |
| R6 | 500,000 ohm 1/2 watt carbon resistor | | .16 |
| R7 | 200,000 ohm 1/2 watt carbon resistor | | .16 |
| R8 | 200,000 ohm 1/2 watt carbon resistor | | .16 |
| C1 | L-4236G | Plug-in type ballast resistor. Interchangeable with L-423B | .55 |
| C2 | 69M-482 | Two-gang variable condenser. Complete with 4 button tuning unit (CQ only) | 5.45 |
| C3 | ASC-438 | Two-gang variable condenser (CS only) | .20 |
| C4 | ANC-189 | Trimmer, part of wave-trap assembly | .20 |
| C5 | Trimmers, part of antenna coil assembly. | | .20 |
| C6 | 4XC-393A | .000006 mf mica condenser | .20 |
| C7 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C8 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C9 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C10 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C11 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C12 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C13 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C14 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C15 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C16 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C17 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C18 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C19 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C20 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C21 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C22 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C23 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C24 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C25 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C26 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |
| C27 | BC-12 | .05 mf, 200 volt tubular condenser | .20 |

Location of Coils and Trimmer Adjustments

The first i-f transformer is located on top of the chassis deck. The trimmers are available in the rear wall underneath the chassis. The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are available through holes in the rear. The trimmers for the antenna coil are mounted on the antenna coil assembly behind and to the right of the variable condenser. The trimmer for the oscillator coil is located on the rear wall underneath the chassis. The trimmer for the broadcast band is located on the rear wall underneath the chassis. The trimmer for the police band is located on the rear wall underneath the chassis. The trimmer for the short-wave band is located on the rear wall underneath the chassis. The trimmer for the antenna coil is located on the rear wall underneath the chassis. The trimmer for the oscillator coil is located on the rear wall underneath the chassis. The trimmer for the broadcast band is located on the rear wall underneath the chassis. The trimmer for the police band is located on the rear wall underneath the chassis. The trimmer for the short-wave band is located on the rear wall underneath the chassis.

I-f and Wave-Trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc through a .002 mf paper condenser to the grid cap of the 6X8 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna (using a standard dummy antenna) and adjust the 455 kc wave trap for minimum response. (See General Note No. 6.)

Short-Wave Alignment

With the wave-band switch in the short-wave position, counter-clockwise, set the dial pointer at 16. Feed 16,000 kc through a .002 mf paper condenser to the grid cap of the 6X8 tube (do not remove the grid clip from the tube). Adjust the short-wave oscillator trimmer for maximum response. Then adjust the antenna coil trimmer for maximum response. If two peaks are obtained choose the minimum capacity peak. Then adjust the antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.

Broadcast Alignment

Rotate the wave-band switch clockwise and set the pointer at 160. Feed 1600 kc through a standard broadcast dummy antenna to the antenna lead (a .0002 mf condenser may be used as a substitute) and adjust first the broadcast oscillator trimmer and then the antenna trimmer for maximum response.

The color coding of the i-f transformer leads is as follows:

Grid—green
Grid return—black
Plate—blue
B plus—red

The wave-trap has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS DD268, DD270, DD272
DD276. Chassis DD
Schematic, Voltage, Socket
Trimmers, Alignment

Three-Band, Six-Tube Superheterodyne Receiver

MODELS DD-268, DD-270, DD-272 and DD-276

CHASSIS MODEL DD

Voltage rating 105 to 125 volts, a.c. or d.c.
Power consumption 43 watts
Frequency ranges { 141 to 353 kc (2130 to 850 meters)
535 to 1600 kc (560 to 187 meters)
5.6 to 18.3 mc (83.5 to 16.4 meters)

Tube Data

The tube complement is as follows:

- 1-6SA7GT pentagrid oscillator-modulator.
- 1-6X7GT diode detector, a-f amplifier, a.v.c.
- 1-6AQ6GT audio amplifier.
- 1-25A0GT dynamic coupled output.
- 1-50Z6GT dual half-wave rectifier.

GENERAL NOTE

The color coding of the i-f transformer leads is as follows:
Grid—green
Grid return—black
Plate—blue
B plus—red

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch antenna) or ground. Voltages for best response were taken on 200 volt scale. Readings taken on d.c. will be slightly lower.

| Tube | Plate | Screen | Cathode | FUL |
|--------|-------|--------|---------|------|
| 6SA7GT | 95 | 95 | 0 | 6.3 |
| 6X7GT | 95 | 95 | 0 | 6.3 |
| 6AQ6GT | 35 | 35 | 0 | 6.3 |
| 25A0GT | 95 | — | 14 | 6.3 |
| 50Z6GT | 90 | — | 0 | 25.0 |

Voltage at 25Z6—180 volts.

Voltage across speaker field—85 volts.

Voltage drop across ballast resistor (pins nos. 3, 7)—42 volts.

Voltage drop across pilot light section of ballast resistor (pins nos. 8 and 7)—4 volts.

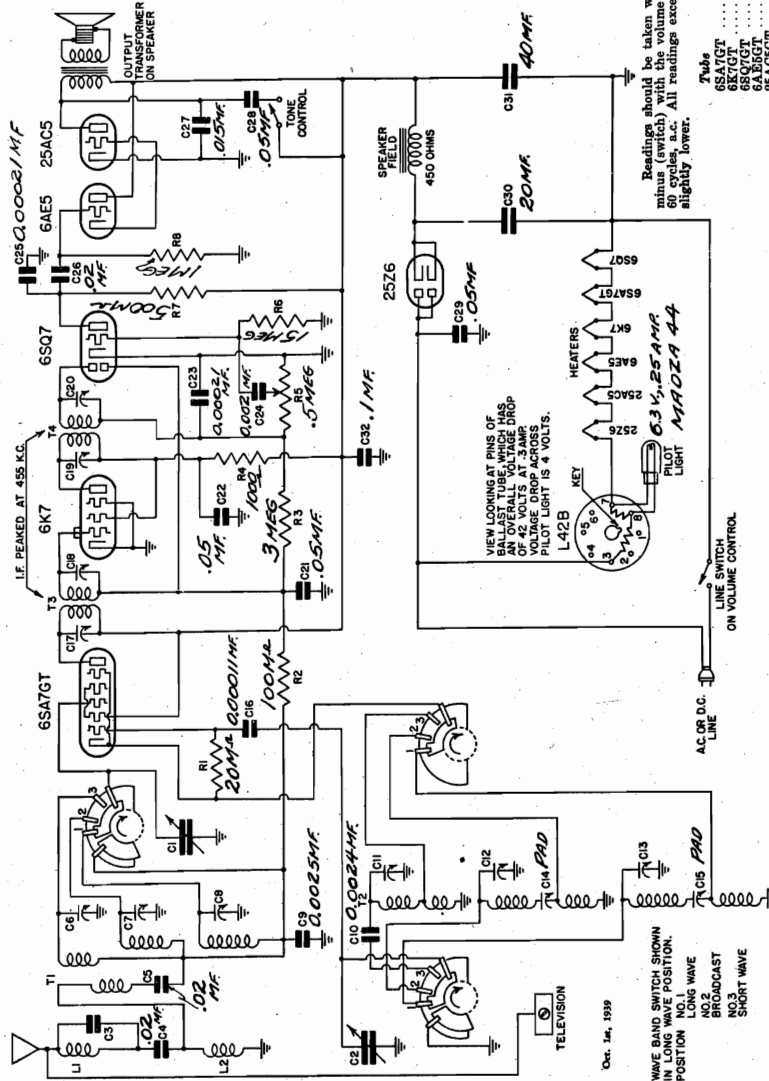
ADJUSTMENTS

Broadcast Alignment

Set the wave-band switch at the broadcast (central) position, and the pointer at 500 (meters). Feed 600 kc to the antenna (using a standard dummy antenna) and adjust the broadcast-band series paddler for maximum response. Move the pointer to 200 (meters), feed 1500 kc and adjust the oscillator coil trimmer for maximum response, then adjust the antenna coil trimmer for maximum response. Return to 500 (meters) and check alignment. If readjustment is necessary return to 500 meters and repeat entire procedure.

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the pointer to 20 (meters) and feed 15,000 kc to the antenna using a 400 ohm dummy antenna. Adjust the antenna coil trimmer for maximum response. If two peaks are obtained choose the minimum capacity peak. Then adjust the antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.



Oct. 1st, 1939

WAVE BAND SWITCH SHOWN
IN LONG WAVE POSITION.
NO. 1 WAVE
NO. 2 BROADCAST
NO. 3 SHORT WAVE

Television

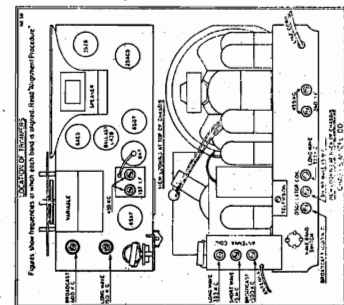
The outlet marked "Television" at the rear of the chassis may be used in connection with television sets. It is not suitable for use with television attachments which feed audio to a separate amplifier.

I-f Alignment

Rotate the wave-band switch to the broadcast (central) position. Set the variable condenser at the minimum capacity position and feed 455 kc through a 0.02 mf paper condenser, to the grid of the 6SA7GT tube (clip signal input to sector of front variable condenser section). Adjust the four i-f trimmers for maximum response.

Long-Wave Alignment

Set the wave-band switch at the long-wave (clockwise) position and the pointer at 2000 (meters). Feed 150 kc to the antenna (using a standard dummy antenna) and adjust the long-wave series paddler for maximum response. Move the pointer to 900 (meters), feed 333 kc to the antenna, and adjust first the oscillator trimmer then the antenna trimmer for maximum response. Return to 2000 meters, feed 150 kc, and rock the variable condenser for maximum response. Return to 900 (meters) and check alignment.

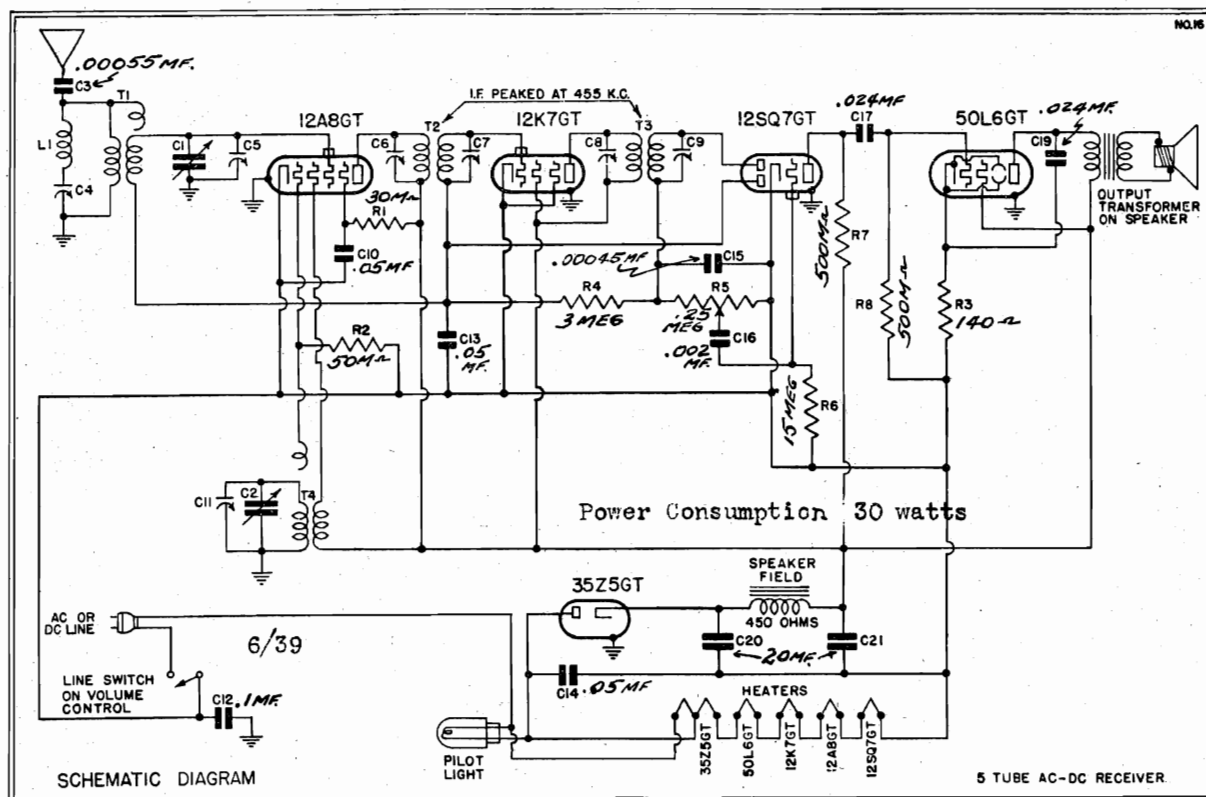


MODELS CW279, Chassis CW

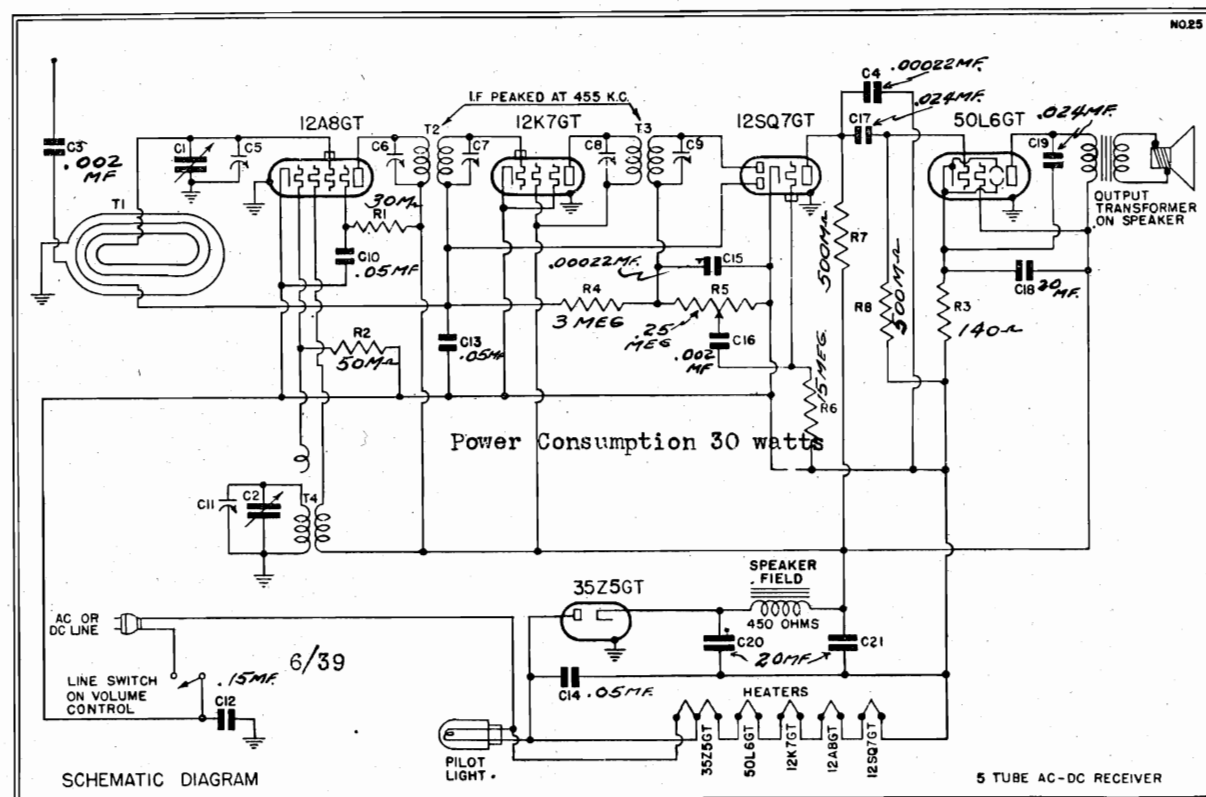
CZ282, Chassis CZ

EMERSON RADIO & PHONOGRAPH CORP.

Schematics



MODEL CW



MODEL CZ

EMERSON RADIO & PHONOGRAPH CORP.

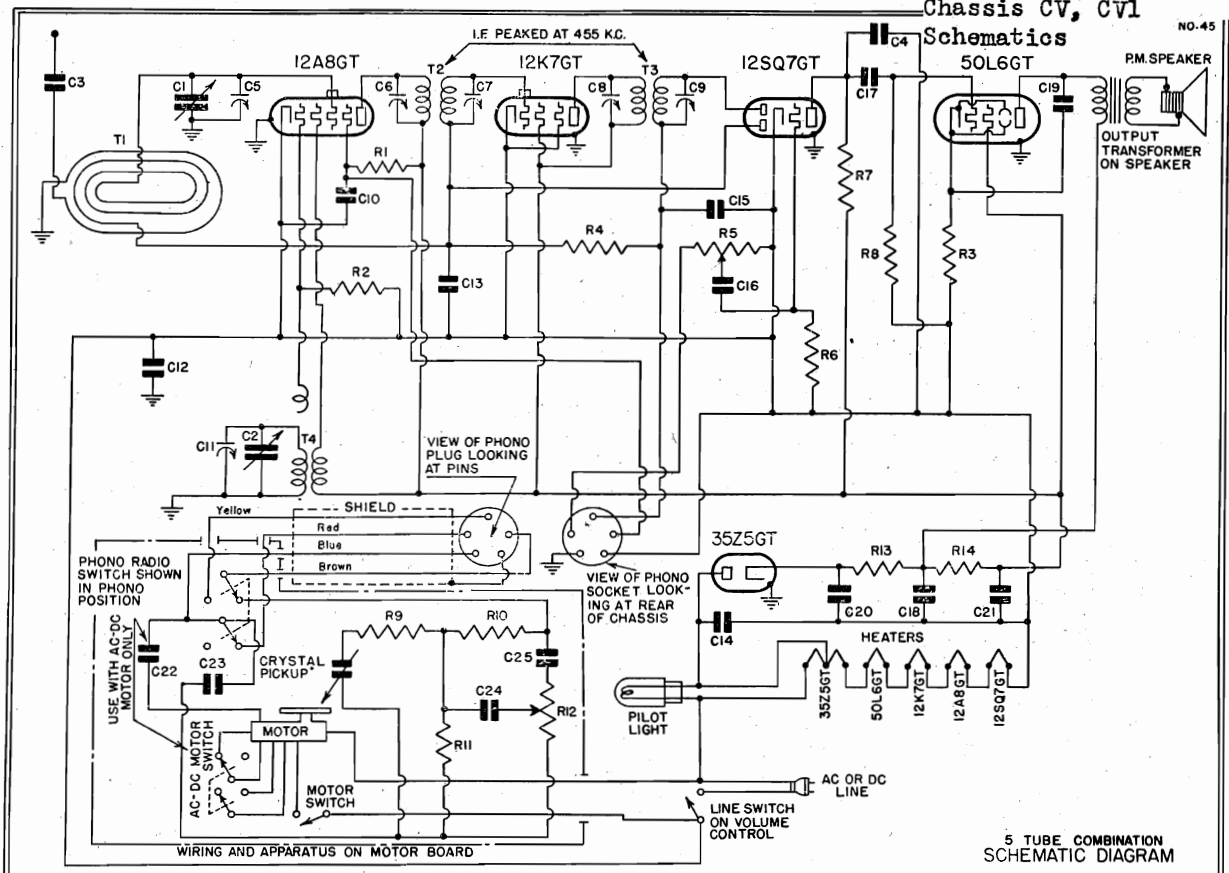
MODELS CV289, CV290, CV291

CV1-290, CV1-291

Chassis CV, CV1

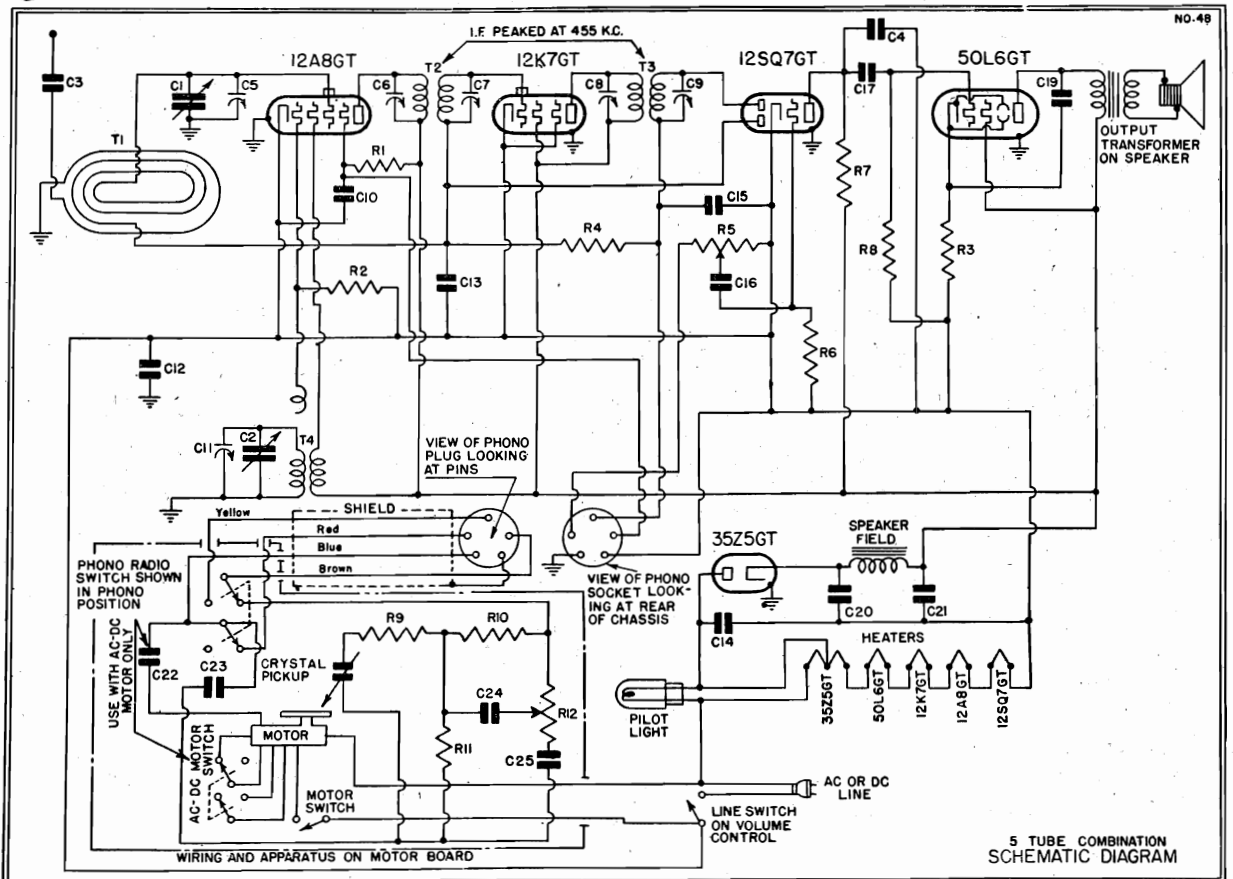
Schematics

NO. 45



9.39

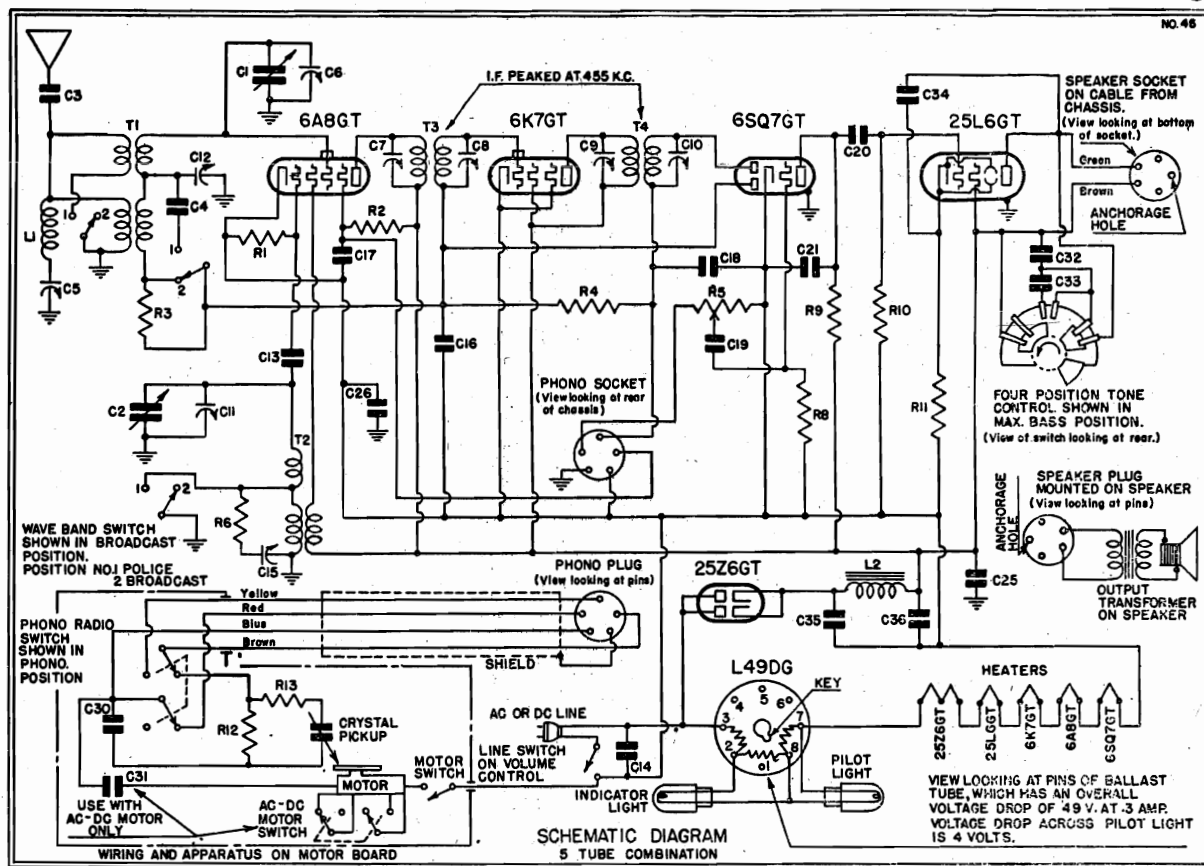
MODELS CV-291 AND CV1-291



MODELS CV-289, CV-290 AND CV1-290

CHASSIS CR, CR1 EMERSON RADIO & PHONOGRAPH CORP. Record Changer Data

MODELS CG293, CG294, CG1-293
CG1-294, Chassis CG, CG1
Schematic, Record Changer



AUTOMATIC RECORD CHANGER

(A)—Record Removing Lever.

A locknut provides adjustment for raising or lowering the record finger to engage the next to last record on the turntable. No adjustment is required unless the motor mounting screws should loosen and allow motor and turntable to shift upward or downward, or should record finger become bent.

Raising the record removing lever to the vertical position will repeat the top record on the turntable, either 10-inch or 12-inch for as long as desired.

(B)—Latch Mechanism.

The latch should engage one-half the depth of the notch. This may be adjusted by turning the eccentric washer.

(C)—Speed Regulator.

The motor speed can be regulated for "fast" or "slow" by moving lever to either side.

(D)—Adjustment for 10-inch and 12-inch Records.

The motor panel is stamped "10" and "12." Set the change lever opposite the size of record to be played.

(G)—Motor Mounting Screws.

(H)—Trip Mechanism.

All records having either the spiral or oscillating type trip groove are handled automatically by this trip mechanism. No adjustment required.

(L)—Record Reject Lever.

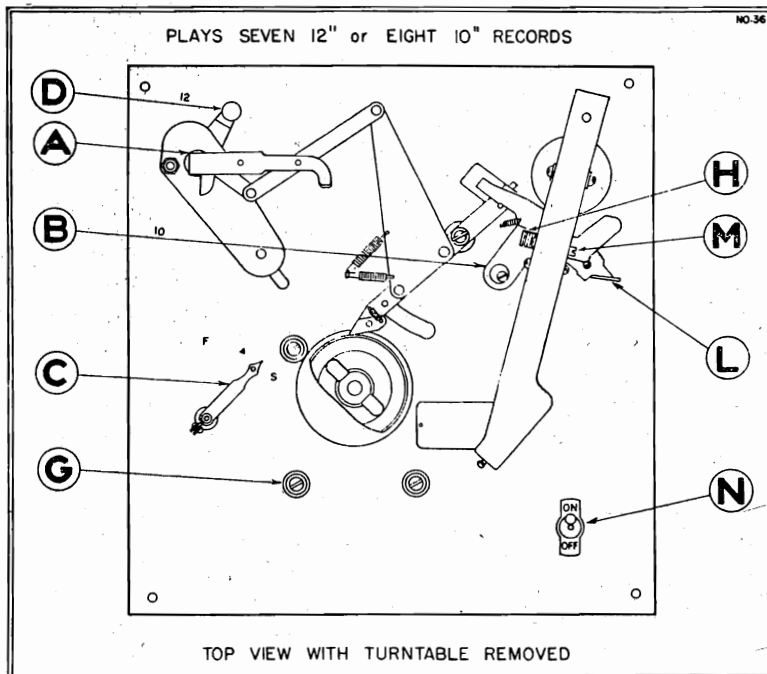
Pull the reject lever forward if removal of a record is desired before it is completely played.

(M)—Pick-up and Tone Arm.

Turn screw in or out to place the needle properly on the edge of the record.

(N)—On-off Switch.

On-off switch for motor.



CHASSIS CG,CG1

Voltage, Alignment, Parts EMERSON RADIO & PHONOGRAPH CORP.

Trimmers

I-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacitance position. Turn the dial pointer to the 455 kc position. Adjust the four i-f trimmers (do not remove the grid clip from the tube) until the four i-f trimmers are adjusted to the 455 kc position. Then adjust the wave-trap trimmer for minimum response. (See General Note No. 6.)

Short-Wave Alignment

With the wave-band switch in the short-wave position, counter-clockwise, set the dial pointer at 6 mc. and feed 6000 kc through a 400 ohm resistor to the antenna lead.

Adjust first the oscillator trimmer (on front section of the variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

Broadcast Alignment

Rotate the wave-band switch clockwise to the broadcast position, set the pointer at 1500 kc and feed 1500 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead. Adjust first the broadcast oscillator trimmer (lower of dual trimmer assembly located underneath the variable condenser) and then the antenna trimmer (upper trimmer of dual assembly) for maximum response.

Voltage rating 105 to 125 volts, a.c. or d.c.

Power consumption 43 watts for radio

30 watts for a.c.-d.c. motor

Frequency ranges 540 to 1700 kc and 2800 to 6000 kc

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
2. The alignment dropping resistor (L49DG on schematic) is located at the rear of the chassis. This resistor will become quite hot under normal operating conditions. For voltage drop specifications, see below.
3. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
4. The first i-f transformer is held to the chassis by snap-on fasteners. To remove it, unsolder all its leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
5. The color coding of the i-f transformer leads is as follows:
Grid—green
Grid return—black
B plus—red
Plate—blue
6. The wave-trap has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the station is minimum.
7. The receivers in these combinations are of the a.c.-d.c. type. The motors, however, used in Models CG-293 and 294 are of the a.c. only type and will be damaged if operated on direct current.
8. Any series of records to be played automatically should be of one size. The changer will not play intermixed sizes. Select seven 12-inch records or eight 10-inch records and place them on the turntable with the selection to be played facing upwards.
9. Adjust the lever "A" for the size of records to be played. (See illustration.) Lower the pick-up carefully so that the needle rides on the smooth surface on the outside edge of the record.
10. On the Model CG1-293 and CG1-294 only, before turning the motor on check the a.c.-d.c. switch underneath the turntable. The switch should be in the "a.c." position. To change to the "d.c." position, pull the switch to the "d.c." position and for an a.c. supply to the a.c. position. When replacing the turntable be sure it is seated all the way down over its shaft.

Tube Data

The tube complement is as follows:

- 1—6ASGT pentagrid oscillator-modulator.
- 1—6K7GT first i-f amplifier.
- 1—6S7GT diode detector, a-f amplifier, a.v.c. (see note).
- 1—25Z6GT beam power output.
- 1—25L6GT full-wave rectifier.

Octal-base tubes in this receiver may be replaced with either metal or hantam-type octal-base glass tubes. The letters "GT" at the end of the tube number indicates that the tube has a hantam glass envelope. In all other respects it is the same as the metal tube bearing the same number without the "GT."

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohm-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

| Tube | Plate | Screen | Cathode | Oct. Plate | Fil. |
|--------|-------|--------|---------|------------|------|
| 6ASGT | 113 | 113 | 0 | 113 | 6.3 |
| 6K7GT | 113 | 113 | 0 | 113 | 6.3 |
| 6S7GT | 113 | 113 | 0 | 113 | 6.3 |
| 25Z6GT | 125 | 113 | 6.5 | — | 25.0 |
| 25L6GT | 125 | 113 | 6.5 | — | 25.0 |

Voltage at 2525 cathode—125 volts.

Voltage across filter capacitor—125 volts.

Voltage across pilot light sections of ballast resistor (pins nos. 3, 7)—49 volts.

Voltage drop across pilot light sections of ballast resistor (pins nos. 8 and 7, 2 and 8)—4 volts.

Note: CG chassis bearing serial numbers below 2,616,849 use 6Q7GT.

See Price List
Subject to change without notice

| Part No. | DESCRIPTION | PRICE |
|---|--|--------|
| Two-band antenna coil with 455 kc wave-trap | | \$1.10 |
| 6GT-468 | 750 ohm 1/2 watt carbon resistor | .16 |
| 6GT-469 | 455 kc first i-f transformer | .16 |
| 4XT-434CU | 455 kc second i-f transformer | .16 |
| 4XT-435CU | 455 kc 2nd i-f transformer | .16 |
| KR-53 | 50,000 ohm 1/4 watt carbon resistor | .16 |
| R1, R2 | 1,000 ohm 1/2 watt carbon resistor | .16 |
| R3, R6 | 1,000 ohm 1/2 watt carbon resistor | .16 |
| PR-79 | Variable 100,000 ohm potentiometer | .16 |
| R4 | Variable 100,000 ohm potentiometer | .16 |
| SR-362 | Variable 100,000 ohm potentiometer | .16 |
| R5 | 15 megohm 1/4 watt carbon resistor | .16 |
| R8 | 15 megohm 1/4 watt carbon resistor | .16 |
| 4XB-327 | 500,000 ohm 1/4 watt carbon resistor | .16 |
| R9, R10 | 140 ohm 1/2 watt wire-wound resistor | .16 |
| 3FR-293 | 140 ohm 1/2 watt wire-wound resistor | .16 |
| R11 | 140 ohm 1/2 watt wire-wound resistor | .16 |
| R12 | 140 ohm 1/2 watt wire-wound resistor | .16 |
| R13 | 140 ohm 1/2 watt wire-wound resistor | .16 |
| CR-57 | Plug-in type ballast resistor, interchangeable with L49D | .55 |
| L-49DG | Two-gang variable condenser | .25 |
| 6GC-428 | 0.001 mf, 900 volt tubular condenser | .25 |
| C3 | 0.00064 mf mica condenser | .20 |
| NNC-199 | 0.00064 mf mica condenser | .20 |
| 6GC-429 | 0.001 mf, 900 volt tubular condenser | .20 |
| Trimmers, part of variable condenser | | .35 |
| Trimmers, part of first i-f transformer assembly | | .20 |
| Trimmers, part of second i-f transformer assembly | | .20 |
| Dual trimmer assembly | | .20 |
| 0.05 mf, 400 volt tubular condenser | | .20 |
| 0.05 mf, 200 volt tubular condenser | | .20 |
| 0.0002 mf, 600 volt tubular condenser | | .20 |
| 0.0002 mf, 600 volt tubular condenser | | .20 |
| 0.02 mf, 400 volt tubular condenser | | .20 |
| 0.02 mf, 400 volt tubular condenser | | .20 |
| 0.15 mf, 200 volt tubular condenser | | .20 |
| 0.15 mf, 200 volt tubular condenser | | .20 |
| 0.01 mf, 400 volt tubular condenser (for a.c.-d.c. motors only) | | .20 |
| 0.03 mf, 200 volt tubular condenser | | .20 |
| 0.03 mf, 200 volt tubular condenser | | .20 |
| 0.005 mf, 400 volt tubular condenser | | .20 |
| Multiple 20 and 40 mf, 150 volt electrolytic condenser | | .110 |
| 6GC-437 | C35—40 mf | .40 |
| Wave-band switch | | .45 |
| Dial face | | .45 |
| 6GT-72 | Pilot light, 6.3 volt, 25 amp., Mazda No. 44 | .45 |
| 4ZL-341C | 100 ohm 1/2 watt carbon resistor | .05 |
| 4ZL-341C | 100 ohm 1/2 watt carbon resistor | .05 |
| 4MZ-588A | Dial pointer | .20 |
| 53Z-824 | Drive cord spring | .05 |
| 4YZ-772 | Drive cord | .02 |
| 6CE-25A | Dial crystal | .02 |
| 6CE-25A | Dial crystal | .02 |
| 31M-255 | Needle cup cover | .15 |
| 4PT-404 | Iron core filter choke | .15 |
| 6GS-422 | 12" permanent magnet dynamic speaker | 12.25 |
| 6VS-414A | Phono-radio switch | .75 |
| 6GS-406A | Tone control switch | .30 |
| ADDITIONAL PARTS USED IN CG-294 AND CG1-294 | | |
| 6GPM-50 | A.C. phonograph motor (for CG-294) | 34.20 |
| 6GPM-50A | A.C.-D.C. phonograph motor (for CG1-294) | 51.00 |
| 6GC-462 | Crystal phono pick-up | 14.35 |
| ADDITIONAL PARTS USED IN CG-293 AND CG1-293 | | |
| 6JPM-46 | 117 volt a.c. rim-drive phonograph motor (for CG-293) | 9.00 |
| 4XPM-303B | 117 volt a.c. phonograph motor (for CG-293) | 12.25 |
| 3GPM-1 | 117 volt a.c.-d.c. phonograph motor (for CG1-293) | 43.20 |
| 4XC-418A | Crystal pick-up | 8.10 |
| 4RS-301 | Automatic stop switch | 2.50 |

ADJUSTMENTS

An oscillator with frequencies of 455, 600, 1500 kc and 6000 kc is required. An output meter should be used across the voice coil or output transformer for observing maximum response. Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is located on top of the chassis deck. The trimmers are available through holes in the top of the can. The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are available through holes in the rear. The trimmer for the antenna and oscillator are located on the variable condenser. The trimmer on the front section is for the oscillator. The 455 kc wave-trap is part of the antenna coil assembly directly behind the variable condenser. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis.

EMERSON RADIO & PHONOGRAPH CORP. MODEL DA 287

Chassis DA

Schematic, Voltage, Parts Notes

REPLACEMENT PARTS LIST

| Part No. | * Item | DESCRIPTION |
|----------|---------------|--|
| 4DT-343A | L1 | Adjustable 455 kc wave trap |
| 7AT-485 | T1 | Three-band antenna coil |
| 5RT-447A | T2 | Double tuned 455 kc first i-f transformer |
| 7AT-490 | T3 | Double tuned 455 kc second i-f transformer |
| 42T-495B | T4 | Power transformer 117 volts, 60 cycles |
| 3BR-247 | R1, R3 | 40,000 ohm 1/4 watt carbon resistor |
| KR-53 | R2 | 50,000 ohm 1/4 watt carbon resistor |
| 7AR-395 | R4 | 16,000 ohm 1/2 watt carbon resistor |
| HR-42 | R5 | 2 megohm 1/4 watt carbon resistor |
| 6GR-352 | R6 | Volume control 25 megohm with line switch |
| 4XR-327 | R7 | 15 megohm 1/4 watt carbon resistor |
| KR-56 | R8 | .5 megohm 1/4 watt carbon resistor |
| KR-57 | R9 | 1 megohm 1/4 watt carbon resistor |
| 7AC-442 | C1, C2 | Two-gang variable condenser |
| | +C3 | Trimmer, part of wave trap assembly |
| | +C4, C5, C6 | Trimmers, part of antenna coil assembly |
| 4XC-393A | C7 | 0.00006 mf, with condenser |
| KC-58 | C8, C16 | 0.01 mf, 400 volt tubular condenser |
| BC-12 | C9 | 0.05 mf, 200 volt tubular condenser |
| | C10, C11, C12 | Trimmers, part of oscillator coil assembly |
| 3EC-287 | C13 | 0.0042 mf mica condenser |
| 2NC-231B | C14 | Single adjustable padding condenser: (range 750-1500 mmf.) |
| 2NC-231A | C15 | Single adjustable padding condenser: (range 300-600 mmf.) |
| 4HC-395A | C17 | 0.000028 mf mica condenser |
| EEC-132 | C18, C31 | 0.1 mf, 400 volt tubular condenser |
| | +C19, C20 | Trimmers, part of first i-f transformer |
| | C21, C22 | Trimmer, part of second i-f transformer |
| 3HC-374 | C23 | 0.002 mf, 600 volt tubular condenser |
| 4XC-394A | C24, C25 | 0.00022 mf mica condenser |
| LC-65 | C26 | 0.02 mf, 400 volt tubular condenser |
| NNC-199 | C27 | 0.001 mf, 600 volt tubular condenser |
| EC-23 | C28 | 0.03 mf, 400 volt tubular condenser |
| 3XC-331 | C29 | 0.15 mf, 400 volt tubular condenser |
| 3LC-297A | C30 | 0.01 mf, 400 volt molded condenser |
| 7AC-443 | C32 | 16 mf, 450 volt dry electrolytic condenser |
| 7AC-444 | C33 | 16 mf, 400 volt dry electrolytic condenser |

GENERAL NOTES

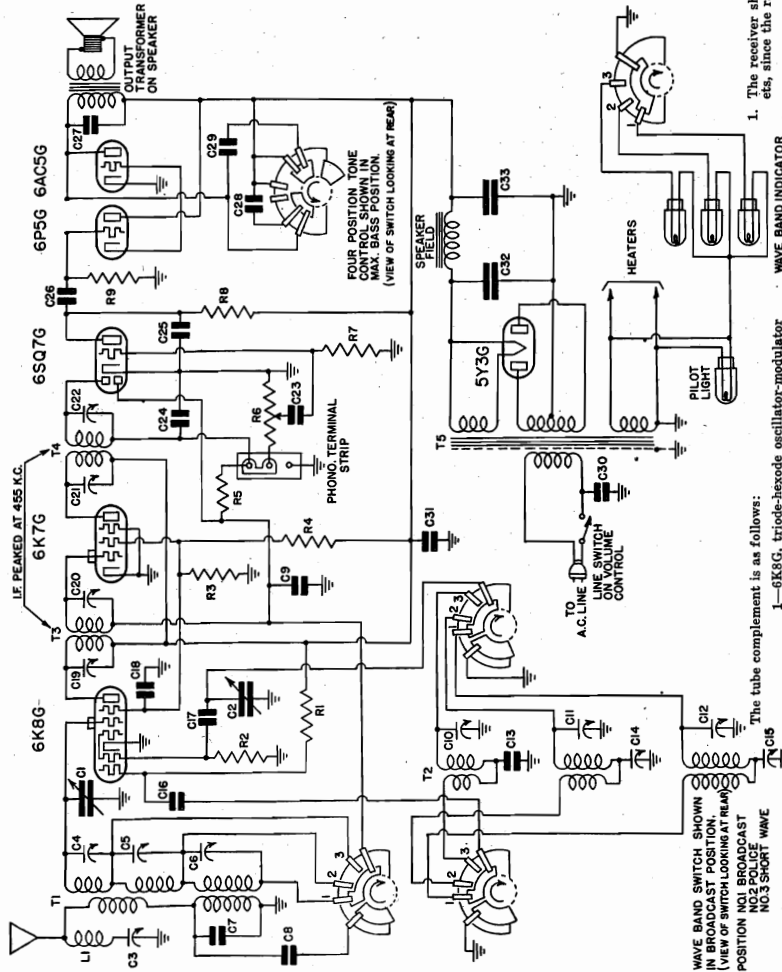
- The receiver should never be turned on with either the speaker plug or the 6AC5G tube out of their respective sockets, since the rapid rise in rectifier voltage will damage the electrolytic condenser.
- When replacing the chassis in the cabinet take precautions to keep any part of the dial and condenser assembly from touching the cabinet, otherwise microphonism will result.
- The color coding of the i-f transformers is as follows:
Grid—green
B plus—red
Plate—blue
Grid return—black

FOR ALIGNMENT
SEE INDEX

- The color coding of the power transformer is as follows:
Primary—two black leads
High-voltage secondary—two red leads
High-voltage secondary center tap—red and yellow lead
6.3 volt secondary—two green leads
5 volt secondary—two yellow leads

- The adjustable padding condensers for the broadcast and police bands are mounted on the top of the chassis with the screw adjustment accessible through holes in the top of the chassis. The short-wave band has a fixed paddler, C13 specified value, otherwise the short-wave coils may not track.
- The wave trap in the receiver has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave trap trimmer until the response from the interfering station is at a minimum.
- The outlet marked "Television" at rear of the chassis may be used with any "Television Attachment" which is designed to feed the sound intermediate or audio frequency to separate amplifier.

- Detailed instructions for such a connection is given with any "Television Attachment."



The tube complement is as follows:

- 6K8G, triode-hexode oscillator-modulator
- 6K7GT, i-f amplifier
- 6SQT, diode detector, audio amplifier and a.v.c.
- 6AC5G, full-wave rectifier
- 5Y3G, full-wave rectifier

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms per volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and the tone control turned on. All readings are for 110 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 250 volt scale.

| Tube | Plate | Screen | Cathode | Occ. Plate | FIL |
|-------|-------|--------|---------|------------|----------|
| 6K8G | 220 | 95 | 0 | 100 | 6.3 a.c. |
| 6K7GT | 220 | 95 | 0 | — | 6.3 a.c. |
| 6SQT | 220 | — | 12 | — | 6.3 a.c. |
| 6AC5G | 205 | — | 0 | — | 6.3 a.c. |

Voltage at 5Y3G filament to ground—300 volts.

Voltage across speaker field—80 volts.

Voltage rating 105-125 volts, 60 cycle, a.c. (unless otherwise specified)
Power consumption 540 to 1800 kc, 1800 to 6250 kc
Frequency ranges and 6.8 to 23 megacycles

MODELS DB296, DB301, DL330
Chassis DB, DL EMERSON RADIO & PHONOGRAPH CORP.
Schematic, Voltage, Trimmers
Alignment

MODEL DL1-330

Chassis DL1

Alignment

Voltage, Trimmers

Five-Tube A. C. D. C., Superheterodyne Receiver

MODELS DB-296 and DB-301

CHASSIS MODEL DB

MODEL: DL-330

CHASSIS MODEL DL

Voltage rating 105-125 volts, a.c. or d.c.
Power consumption 30 watts.
Frequency range 540 to 1600 kc.

TUBE DATA

THE TUBE COMPLEMENT IS AS FOLLOWS:

| | |
|--------------------|---------------------------------------|
| 1-12SA7 or 12SA7GT | pentagrid oscillator modulator |
| 1-12K7 or 12K7GT | first i-f amplifier |
| 1-12SQ7 or 12SQ7GT | diode detector, a-f amplifier, a.v.c. |
| 1-35Z5 or 35Z5GT | beam power output |
| 1-31Z5 or 31Z5GT | half-wave rectifier |

All tubes are replaceable with either metal or equivalent vacuum glass tubes. The letters "GT" at the end of the tube number indicate that the tube has a filament size glass envelope. In all other respects it is the same as the metal tube bearing the same number without the "GT".

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohm-per-volt meter. Voltages listed below are from point indicated to B minus (chassis) with the volume control turned on full and equal. 1. Voltages are for chassis DB-296 and DB-301. 2. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

| Tube | Plate | Screen | Cathode | Fil. |
|-------|-------|--------|---------|------|
| 12SA7 | 88 | 88 | 0 | 12 |
| 12K7 | 88 | 88 | 0 | 12 |
| 12SQ7 | 30 | 30 | 0 | 12 |
| 35Z5 | 82 | 88 | 5.6 | 50 |

Voltage at 31Z5 cathode—120 volts.

Voltage across speaker field—32 volts.

Voltage across pilot light—4.5 volts.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

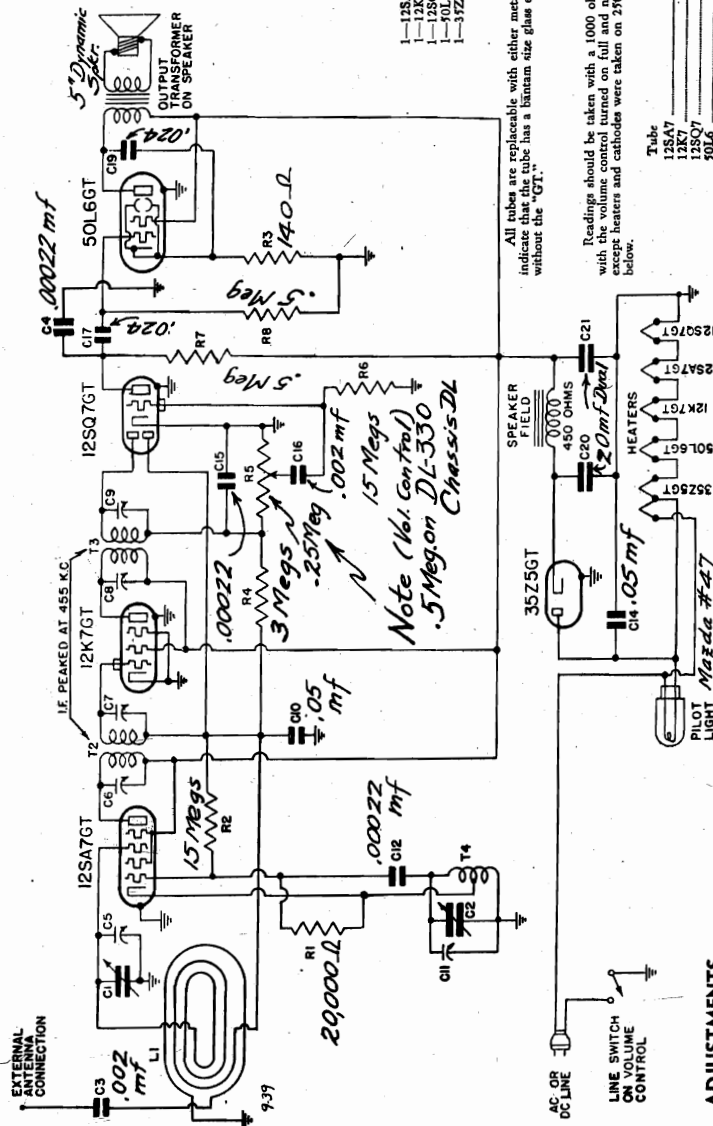
The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

1. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully realigned.
2. In operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.
3. The color coding of the i-f transformer leads is as follows:

Grid—green
Grid return—black
Plate—blue
B plus—red

4. Models DB-296 and 301 have self-contained antennas and do not require additional antenna connections. For permanent home installations of either model, however, if it is desired to improve reception of weak stations, an additional outdoor antenna should be used. For this purpose a lead has been brought out of the rear near the line cord.
5. The self-contained loop antenna operates at maximum efficiency when its position is at right angles to the broadcasting source. It is important, therefore, once the station is tuned in, to rotate the cabinet back and forth through a quarter of a circle (90 degrees), leaving it at the position where the station is received with maximum volume.



ADJUSTMENTS

An oscillator with frequencies of 455 and 1400 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

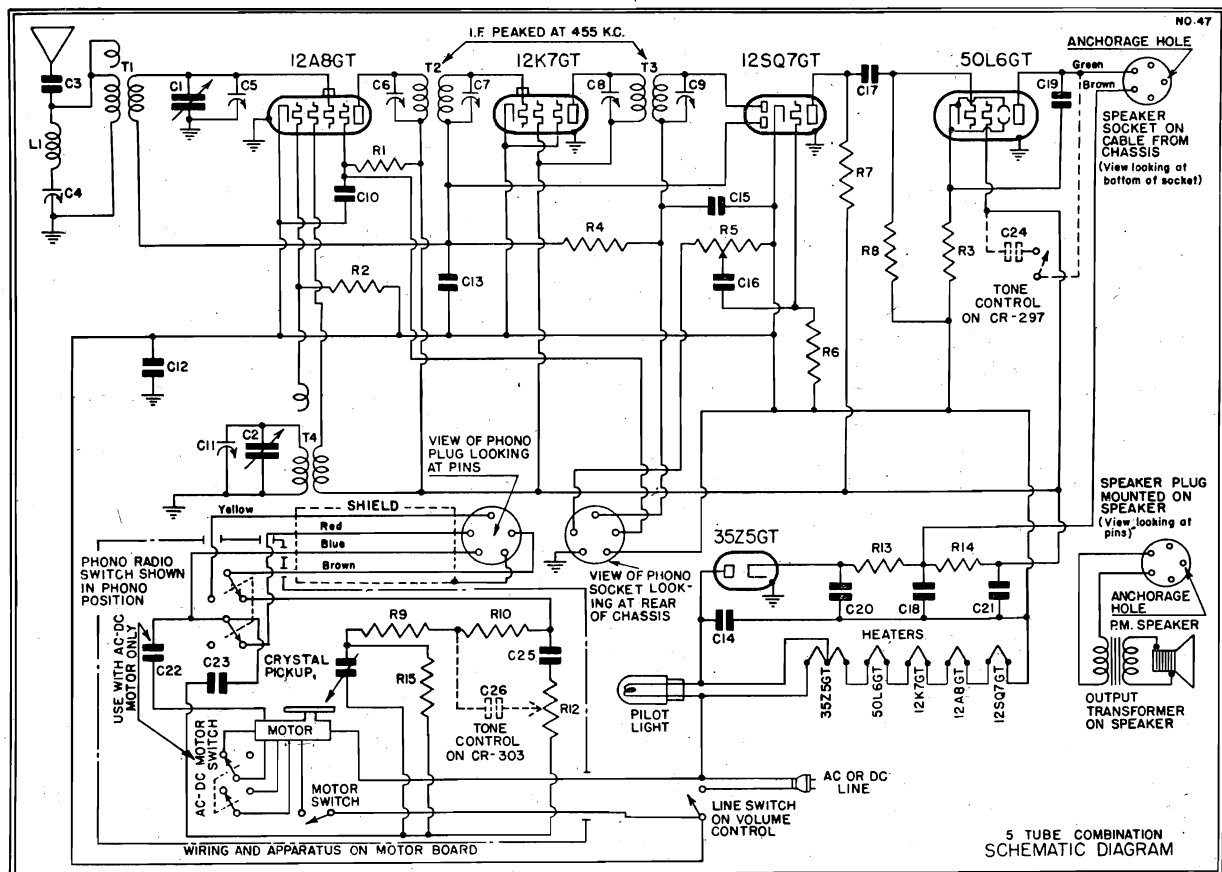
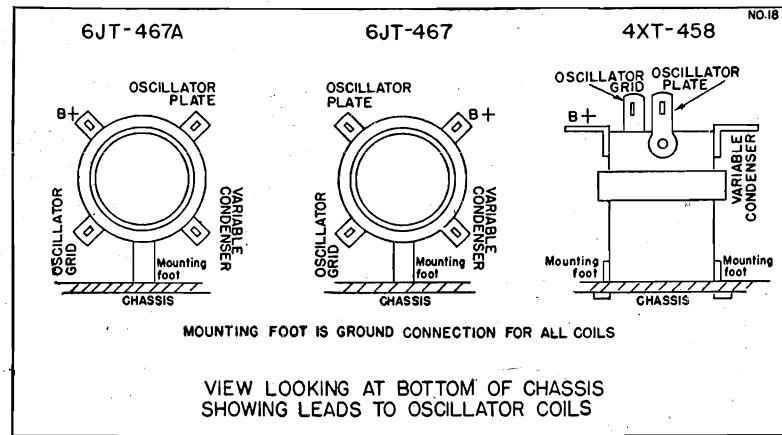
Note: The grid of the 12SA7 tube is connected to the lower stator lug of the rear variable condenser section. Connection may be made with a test clip to the upper stator lug. This lug is easily identified by the connection of the green lead to the loop.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna connection and adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. At position of the condenser turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

EMERSON RADIO & PHONOGRAPH CORP. CR1-303 Chassis CR, CR1
MODELS CR297, CR303, CR1-297
Schematic, Voltage



VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

| Tube | Plate | Screen | Cathode | Osc. Plate | Fil. |
|---------|-------|--------|---------|------------|------|
| 12A8GT | 65 | 40 | 0 | 65 | 12 |
| 12K7GT | 65 | 65 | 0 | — | 12 |
| 12SQ7GT | 40 | — | 0 | — | 12 |
| 50L6GT | 100 | 65 | 5.7 | — | 50 |

Voltage at 35Z5 cathode—110 volts.

Voltage across pilot light—4.5 volts.

Voltage rating 105-125 volts
 30 watts for receiver
 Power consumption 20 watts for a.c. motor
 30 watts for a.c.-d.c. motor
 Frequency range 540 to 1730 kc
 10-39

The tube complement is as follows:

One 12A8GT—pentagrid oscillator modulator
 One 12K7GT—first i-f amplifier
 One 12SQ7GT—diode detector, a-f amplifier, a.v.c.
 One 50L6GT—beam power output
 One 35Z5GT—half-wave rectifier

Trimmers

Location of MODEL CW

MODEL CR1-303 (AC-DC Portable Automatic Record Changer)

ingér)

| Item | Part No. | DESCRIPTION | PRICE |
|---------------------|----------|---|-------|
| T1, L1 | 4XT-492A | Antenna coil with 455 kc wave trap | .90 |
| T2 | 6R7-479 | Oscillator coil (see sub-section class no. 1) | .35 |
| T3 | 6R7-479 | Double-tuned 455 kc first i-f transformer | 1.10 |
| T7 | 4X3-435E | Double-tuned 455 kc second i-f transformer | .80 |
| T8 | 6R7-479 | 500 ohm 1/2 watt carbon resistor | .16 |
| T9 | 6R7-479 | 500 ohm 1/2 watt carbon resistor | .16 |
| R1 | 3F2-293 | 140 ohm 1/4 watt wire-wound resistor | .16 |
| R2 | 3F2-293 | 2 megohm 1/4 watt carbon resistor | .16 |
| R3 | HR-42 | Volume control 3 megohm with wiper switch | .16 |
| R4 | HR-42 | 15 megohm 1/4 watt carbon resistor | .16 |
| R5, R3, R9 | 4X3-435E | 500,000 ohm 1/4 watt carbon resistor | .16 |
| R6, R10, R15 | 4X3-435E | 250,000 ohm 1/4 watt carbon resistor | .16 |
| R7, R11, R13 | 4X3-435E | 250,000 ohm 1/4 watt carbon resistor | .16 |
| R8, R12, R14 | 4X3-435E | 250,000 ohm 1/4 watt carbon resistor | .16 |
| R16, C3 | 6R7-436 | Two-gang variable condenser | 2.30 |
| R17, C8 | 4XC-401 | 0.00055 mica condenser | .20 |
| R18, C1 | 4XC-401 | 0.00055 mica condenser | .20 |
| R19, C6, C7 | 4XC-401 | 0.00055 mica condenser | .20 |
| R20, C2, C4, C5, C9 | RC-12 | Trimmers, part of variable condenser assembly | .30 |
| R21, C10, C13, C23 | RC-12 | Trimmers, part of i-f transformers | .30 |
| R22, C11 | LC-64 | .05 mf, 200 volt tubular condenser | .20 |
| R23, C12 | LC-64 | .05 mf, 200 volt tubular condenser | .20 |
| R24, C14 | LC-64 | .05 mf, 400 volt tubular condenser | .20 |
| R25, C15 | 6R7-441 | 0.00045 mf mica condenser | .20 |
| R26, C16 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R27, C17 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R28, C18 | LC-66 | .002 mf, 400 volt tubular condenser | .20 |
| R29, C19 | LC-66 | .002 mf, 400 volt tubular condenser | .20 |
| R30, C21 | 4C-426B | Dual 20 mf, 150 volt tubular dry electrolytic condenser | .90 |
| R31, C13 | 3HC-504 | .002 mf, 135 volt dry electrolytic condenser | .90 |
| R32, C13 | 3HC-504 | .002 mf, 135 volt dry electrolytic condenser | .90 |
| R33, C13 | 3HC-504 | .002 mf, 135 volt dry electrolytic condenser | .90 |
| R34, C13 | 3HC-504 | .002 mf, 135 volt dry electrolytic condenser | .90 |
| R35, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R36, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R37, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R38, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R39, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R40, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R41, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R42, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R43, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R44, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R45, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R46, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R47, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R48, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R49, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R50, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R51, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R52, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R53, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R54, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R55, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R56, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R57, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R58, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R59, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R60, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R61, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R62, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R63, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R64, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R65, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R66, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R67, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R68, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R69, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R70, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R71, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R72, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R73, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R74, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R75, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R76, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R77, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R78, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R79, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R80, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R81, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R82, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R83, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R84, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R85, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R86, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R87, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R88, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R89, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R90, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R91, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R92, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R93, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R94, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R95, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R96, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R97, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R98, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R99, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |
| R100, C25 | 3HC-574 | .0002 mf, 600 volt tubular condenser | .20 |

ADDITIONAL PARTS USED ON CR-297 AND CR1-297

| | | | |
|-----|--------------------------|--|-------|
| R12 | 1R-154 | 7500 ohm 1/4 watt carbon resistor | 1.0 |
| C24 | 1C-24 | 0.001 microfarad electrolytic capacitor | 1.0 |
| | 3LM-253 | Phonograph needle cup | 20 |
| | 3LM-255 | Needle cup cover | 15 |
| | 4JPM-46 | 117 volt a.c. phonograph motor (rim drive) | 9.00 |
| | 4XP-200B or 3GPM-1 | 117 volt a.c. phonograph motor | 12.25 |
| | 4XC-418A | Crystal phono pick-up | 43.20 |
| | 4VZ-418 | P. permanent magnet dynamic speaker | 8.10 |
| | 4RS-301 | Automatic stop switch | 7.25 |
| | 3ES-256L | Tone control switch | 2.50 |

ADDITIONAL PARTS USED ON CR-303 AND CR1-303

| | | | |
|-----|----------|-------------------------------------|-------|
| R12 | 6RR-372 | Potentiometer for tone control. | 95 |
| C26 | 1C-473 | 0.0005 mf mica condenser | 70 |
| | 2C-473 | 0.0005 mf mica condenser | 70 |
| | 6RPM-51 | A.C. phonograph motor | 34.20 |
| | 6RPM-52 | A.C. phonograph motor | 34.20 |
| | or | | |
| | 6RPM-52A | A.C.-D.C. phonograph motor | 51.00 |
| | 6JS-586 | 6% permanent magnet dynamic speaker | 6.70 |
| | 6JS-587 | 6% permanent magnet dynamic speaker | 6.70 |
| | 6RC-143 | Crystal pick-up | 14.35 |
| | 6RC-143 | Crystal pick-up | 14.35 |

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the left of the variable condenser. The trimmer is accessible through holes in the top of the case. The second i-f transformer is mounted under the chassis beneath the variable condenser. The trimmers are accessible through holes in the top of the chassis. The trimmers for the antenna and oscillator coils are located on the front section of the chassis for the antenna coil. The oscillator coil is located underneath the chassis, beneath the speaker and the antenna coil and wave-trap assembly is mounted at the left side of the chassis.

Self and Wave-Trap Alignment

Swing the variable condenser to the maximum capacity position. Feed 455 kc to the grid-cap of the 12AG6 tube through a .01 mfd condenser and adjust the four I-F trimmers for maximum response. Feed 455 kc through a .0001 mfd condenser to the antenna lead and adjust the wave-trimmer for minimum response. (See General Notes, paragraph No. 4.)

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mfd condenser to the antenna connection and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response.

PRODUCTION CHANGES

1. CR chassis also uses oscillator, coil 6JT-467A or 6RT-476. For correct lug connections to either of these coils see illustration on previous page.

Location of MODEL CW

The first i-f transformer is located between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can. The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are accessible through holes in the rear of the chassis.

The antenna coil is located to the left of the speaker and the oscillator coil underneath the chassis below the speaker.

The trimmers for the antenna and oscillator coils are located on the variable condenser, the trimmer on the section adjacent to the 10L0GT tube being for the oscillator.

The 455 kc wave trap is wound on the same form as the antenna coil and may be adjusted from the left side of the chassis.

FIG. 1 LEFT TOWER SETS

MODEL CZ

The first *i/f* transformer is located to the left of the speaker and the second *i/f* transformer, to the right of the speaker. Trimmers for both coils are accessible through holes in the tops of the cans.

The oscillator coil is located directly beneath the speaker. The loop antenna acts as the antenna coil. Trimmers for both oscillator and antenna coil are located on the variable condenser, the trimmer on the section adjacent to the 50L6GT tube being for the oscillator.

1-f and Wave-Trap Alignment

MODEL CW

Rotate the variable condenser to the minimum capacity position. Feed 455 kc to the grid-cap of the 12AX7 tube through a .01 mf condenser and adjust the four 14 trimmers for maximum response. Feed 455 kc through a .0001 mf condenser to the antenna lead and adjust the wave-trap trimmer for minimum response. (See General Notes, paragraph No. 4.)

MODEL CZ

Repeat the same procedure as for Model CW except for trap alignment. Model CZ does not use a wave trap.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer (on section of variable condenser near 70LO) then the antenna trimmer (on section of variable condenser near 12KY) for maximum response.

Preadjustment of Automatic Tuning Keys

Select four nearby stations desired for automatic tuning. Choose one of these stations and any key to be adjusted for it. Follow the procedure outlined below.

3. Remove all four keys. The two center keys should be taken out first. Grasp the key firmly with the thumb and pull it down. Then, with the index finger, pry the key out by prying them up with a screw-driver; the screw-driver should be inserted in the slot at the side of the key. See Fig. 1.
4. Set the screw-driver in the slot of the locking screw to be turned. Press down the screw-driver firmly and loosen the screw about 1 to 1 1/4 turns. See Fig. 2.
5. With the screw-driver seated in the locking-screw, press it down firmly with the left hand while tuning in the desired station with the right hand, using the station selector. See Fig. 3.
6. Release the station selector knob and tighten the locking screw as much as possible.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given

| Tube | Plate | Screen | Cathode | Occ. Plate | Fil. |
|---------|--------------------------------------|--------|---------|------------|------|
| 12A6GT | pentagrid oscillator modulator | 88 | — | 88 | 12 |
| 12K7GT | frs. i-f amplifier | 88 | 0 | — | 12 |
| 12SQ7GT | beam detector, a-f amplifier, a.v.c. | 40 | — | — | 12 |
| 50L6GT | beam power output | 82 | 88 | — | 50 |
| | | | 57 | — | 10 |

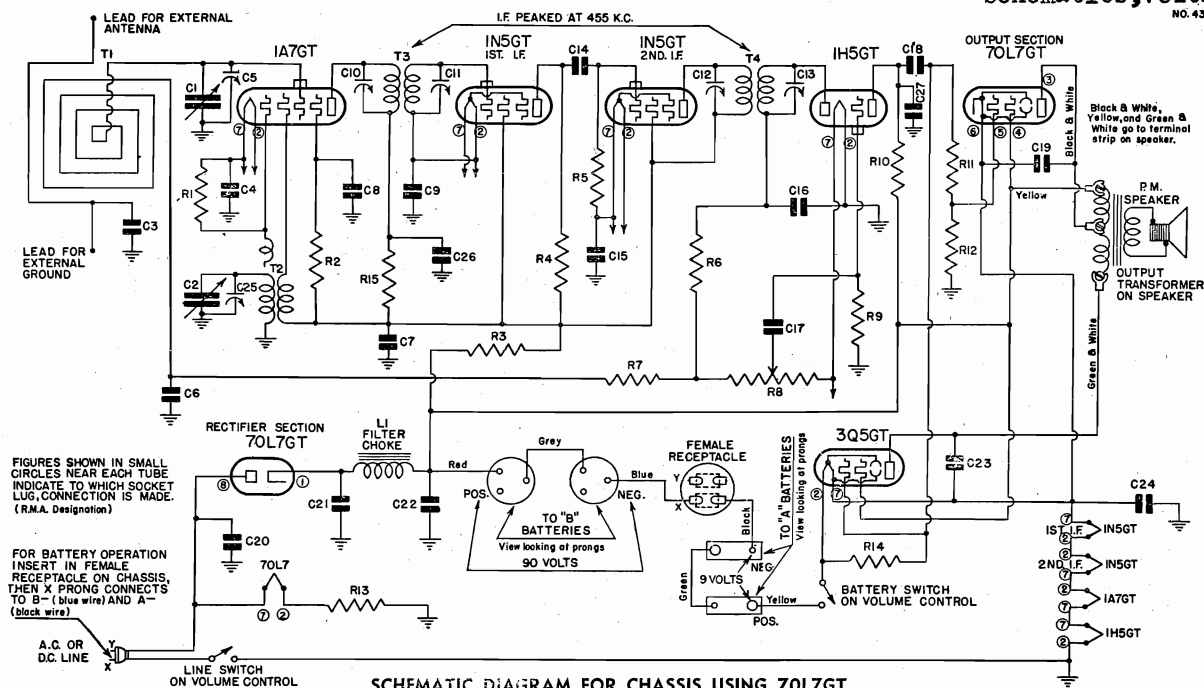
Voltage at 35Z5 cathode—115 volts.

Voltage across speaker field—27 volts,

Voltage across pilot light—4.5 volts.

EMERSON RADIO & PHONOGRAPH CORP.

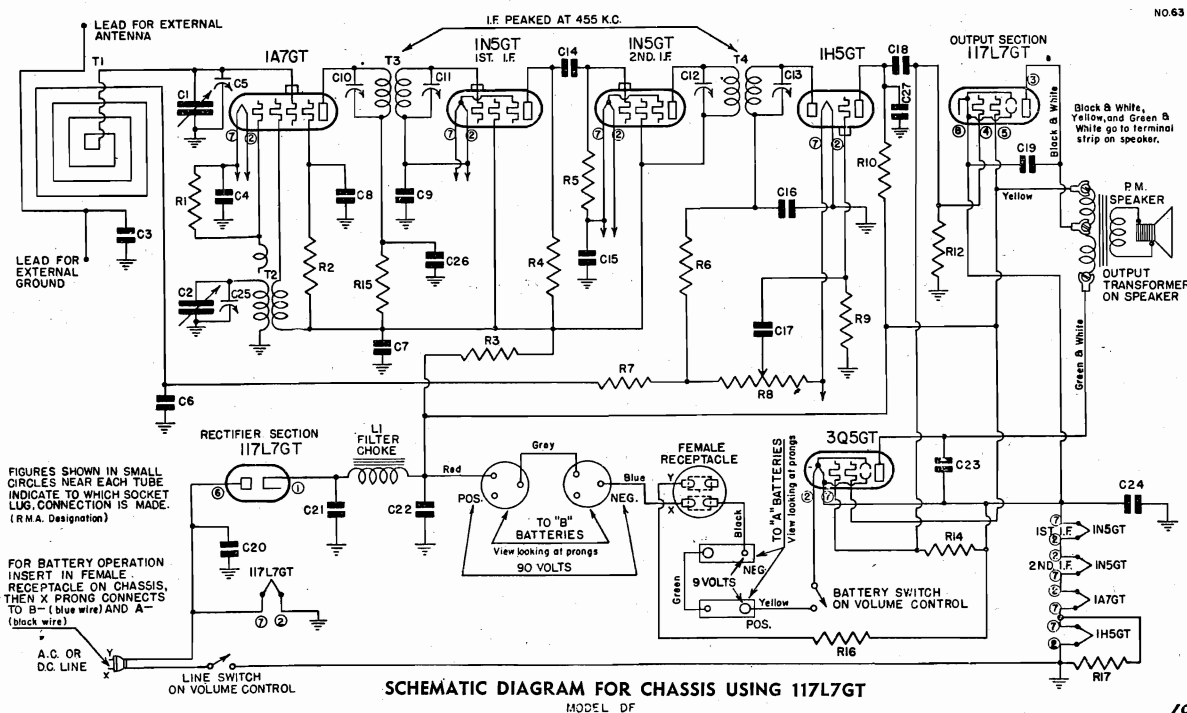
MODELS DF302, DF306
Chassis DF (2 Types)
Schematics, Voltage
NO. 43



VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 9.0 volts, "B" 90 volts.

| Tube | Plate | Screen | Osc. Plate | Fil. |
|---|-------|--------|------------|------|
| 1A7GT | 88 | 50 | 82 | 1.5 |
| 1N5GT 1st i-f. | 50 | 88 | — | 1.5 |
| 1N5GT 2nd i-f. | 88 | 88 | — | 1.5 |
| 1H5GT | 27 | — | — | 1.5 |
| 3Q5GT | 85 | 88 | — | 3.0 |
| 70L7GT (line operation only) | 86 | 95 | — | 70.0 |
| 70L7GT rectifier cathode (Pin no. 1) (line operation only) | — | — | — | — |
| or 117L7GT (line operation only) | 86 | 95 | — | 117 |
| 117L7GT rectifier cathode (Pin no. 1) (line operation only) | — | — | — | — |



MODELS DF302, DF306

Chassis DF

Alignment, Trimmers

Changes, Parts

EMERSON RADIO & PHONOGRAPH CORP.

| Item | Part No. | DESCRIPTION | PRICE (Subject to change without notice) |
|---------------------------|----------|---|---|
| †Not supplied separately. | | | |
| T1 | 6XW-174 | Loop antenna assembly | \$1.15 |
| L1 | 7FT-512 | Iron core filter choke | .90 |
| T2 | 6RT-476 | Oscillator Coil | .35 |
| T3 | 7BT-488A | Double-tuned 455 kc first i-f transformer | 1.00 |
| T4 | 7FT-513 | Double-tuned 455 kc diode i-f transformer | .95 |
| R1, R6 | KR-53 | 50,000 ohm 1/4 watt carbon resistor | .16 |
| R2 | ZZR-196 | 30,000 ohm 1/4 watt carbon resistor | .16 |
| R3 | KR-50 | 500 ohm 1/4 watt carbon resistor | .16 |
| R4 | OR-73 | 25,000 ohm 1/4 watt carbon resistor | .16 |
| R5 | KR-54 | 100,000 ohm 1/4 watt carbon resistor | .16 |
| R7, R14 | NNR-220 | 3 megohm 1/4 watt carbon resistor | .16 |
| R8 | 3HR-240C | Volume control with line and battery switch | 1.05 |
| R9 | 3RR-274 | 5 megohm 1/4 watt carbon resistor | .16 |
| R10, R12 | KR-56 | 500,000 ohm 1/4 watt carbon resistor | .16 |
| R11 | LR-61 | 200,000 ohm 1/4 watt carbon resistor | .16 |
| R13 | 7FR-370 | 315 ohm metal clad resistor (see Production Change No. 2) | .35 |
| R15, R16 | PR-79 | 1,000 ohm 1/4 watt carbon resistor (see General Note No. 9 and Production Change No. 3) | .16 |
| R17 | 7JR-376 | 330 ohm 1/4 watt carbon resistor (see General Note No. 9 and Production Change No. 3) | .16 |
| C1, C2 | 6RC-436B | Two gang variable condenser | 2.35 |
| C3 | 3HC-274 | 0.002 mf, 600 volt tubular condenser | .20 |
| C4, C6, C9, C26 | BC-12 | 0.05 mf, 200 volt tubular condenser | .20 |
| †C5 | | Trimmer part of loop assembly | |
| C7 | BC-13 | 0.25 mf, 200 volt tubular condenser | .20 |
| C8, C18 | LC-65 | 0.02 mf, 400 volt tubular condenser | .20 |
| †C10, C11, C12, C13 | | Trimmers, part of i-f transformers | |
| C14, C27 | 4XC-394A | 0.00022 mf, mica condenser | .20 |
| C15 | 5AC-388 | 0.25 mf, 100 volt tubular condenser | .20 |
| C16 | 5AC-384 | 0.0002 mf, 600 volt tubular or mica condenser | .20 |
| C17 | HC-34 | 0.006 mf, 600 volt tubular condenser | .20 |
| C19 | 3VC-324 | 0.003 mf, 600 volt tubular condenser | .20 |
| C20 | LC-64 | 0.05 mf, 400 volt tubular condenser | .20 |
| C21, C22 | 6JC-426E | Dual 20 mf, 150 volt dry electrolytic condenser | .85 |
| C23 | NNC-199 | 0.001 mf, 600 volt tubular condenser (see Production Change No. 1) | .20 |
| C24 | 7FC-451 | 40 mf, 25 volt dry electrolytic condenser | .80 |
| C25 | | Trimmer, part of variable condenser | |

List Price Ea.
Effective as of
Oct. 1st, 1939

PRODUCTION CHANGES

- Chassis using certain speakers use output condenser C23 part no. KC-58—.01 mf.—400 volt.
- Chassis bearing serial numbers between 3000651 and 3001051 and between 3325600 and 3326599 use 117L7GT in place of 70L7GT and do not use resistor R13.
- The schematic diagram of chassis using 70L7GT does not show resistors R16 and R17. These resistors occupy the same position in this chassis as they are shown in the schematic of chassis using 117L7GT.

Some chassis do not contain resistors R16 and R17. These resistors should be added to increase tube life.

On chassis bearing serial numbers between 2,888,350 and 2,963,000 use only bakelite base tubes when replacing the 1N5GT's.

To permit the use of metal base 1N5GT's in the above chassis, the following change must be made in the chassis:

- Unsolder and remove the three leads from the #1 pin soldering lug of the 1N5GT socket at the rear of the chassis. (Three leads are condenser C26, resistor R15, and one wire.)
- Solder these three leads to the #8 pin soldering lug of the 1A7GT socket. (This lug is a blank.)

The tube complement is as follows:

- 1—1A7GT oscillator-modulator.
- 1—1N5GT 1st i-f amplifier.
- 1—1N5GT 2nd i-f amplifier.
- 1—1H5GT 2nd detector, a.v.c., a-f amplifier.
- 1—3Q5GT beam power output (battery operation only).
- 1—70L7GT beam power output and half wave rectifier (line operation only).
- 1—117L7GT beam power output and half wave rectifier (see Production Change No. 2)

See Note above.

| | |
|------------------------------------|--|
| Range | 540—1600 kc. |
| Voltage Rating (Line Operation) | 105-125 volts a.c. or d.c. |
| Power Consumption (Line Operation) | 30 watts |
| Current Drain (Battery Operation) | "A" Battery 0.05 amps. "B" Battery 0.01 amps. |

Location of Coils and Trimmer Adjustments

The oscillator coil is located beneath the chassis. The trimmer for the oscillator is on the rear section of the variable condenser.

The loop antenna acts as the antenna coil. The trimmer for the loop is on the loop frame.

The i-f transformers are located in cans mounted on top of the chassis. The first i-f transformer is the one at the left end of the chassis. The diode i-f transformer is located between the 1N5GT first i-f tube and the variable condenser. The trimming condensers for both transformers can be reached through holes in the tops of the cans.

Alignment

LF—Swing variable condenser to minimum capacity position.

Feed 455 kc to the grid of the 1A7GT tube through a 0.01 mf condenser. Adjust the four i-f trimmers for maximum response.

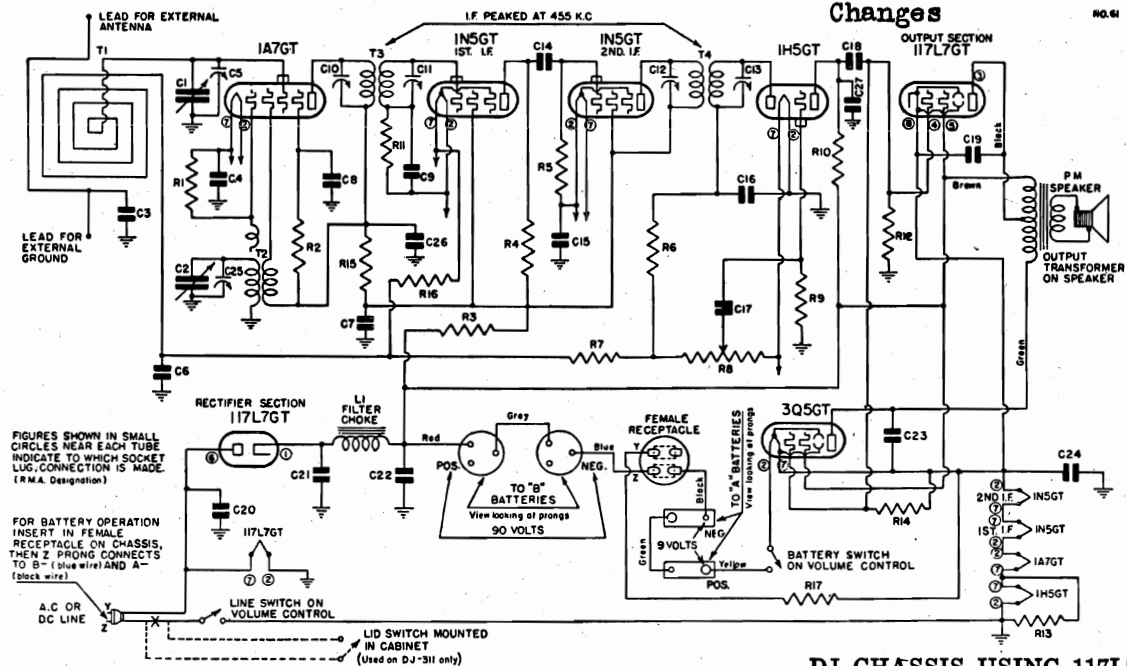
RF—Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna connection and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on loop frame) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance. Align at 140. Set the dial at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop, may then be swung to either side of the center to give maximum response. Realign at 140.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS DJ310, DJ311, DJ312
Chassis DJ (2 Types)
Schematics, Voltage
Changes

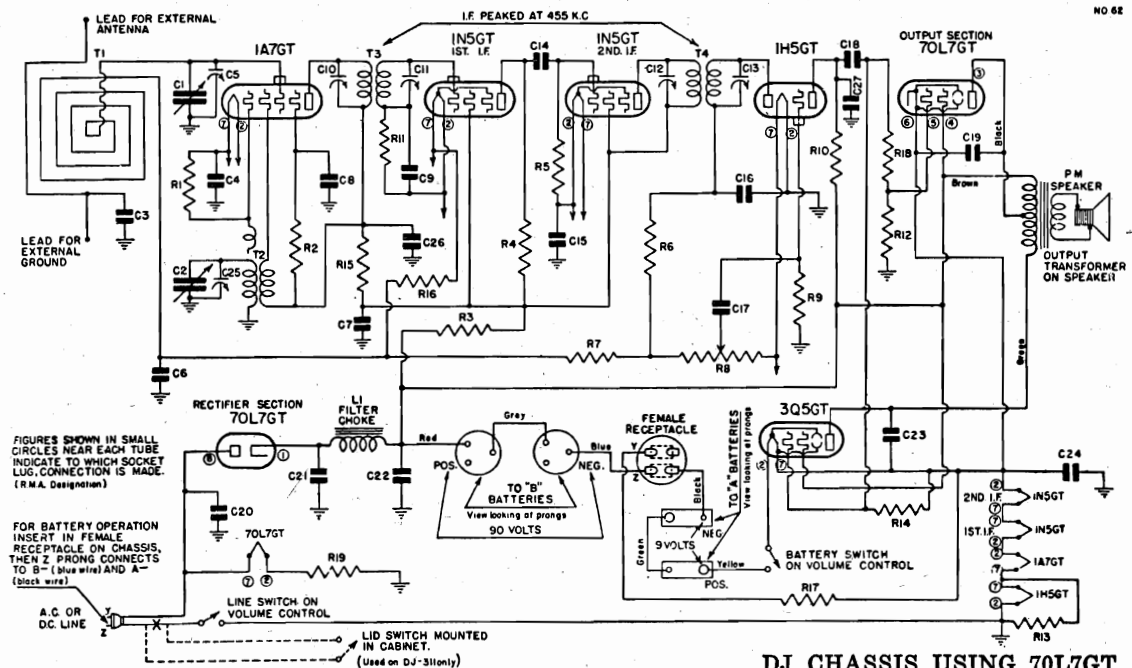
NO. 61



DJ CHASSIS USING 117L7GT

PRODUCTION CHANGES

1. DJ chassis bearing serial numbers below 3,017,129 use 70L7GT rectifier-output tube. See lower schematic.
2. In Model DJ-311 receivers after serial number 3,021,529, the door switch, part No. 7JS-444, has been omitted.



DJ CHASSIS USING 70L7GT

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 9.0 volts, "B" 90 volts.

| Tube | Plate | Screen | Osc. Plate | Fil. |
|---|-------|--------|------------|------|
| 1A7GT | 88 | 50 | 82 | 1.5 |
| 1N5GT 1st i-f. | 50 | 88 | — | 1.5 |
| 1N5GT 2nd i-f. | 88 | 88 | — | 1.5 |
| 1H5GT | 27 | — | — | 1.5 |
| 3Q5GT | 85 | 88 | — | 3.0 |
| 117L7GT (line operation only) | 86 | 95 | — | 117 |
| 117L7GT rectifier cathode (Pin no. 1) (line operation only)—125 volts. (See production change no. 1.) | | | | |

MODELS DJ310, DJ311, DJ312

Chassis DJ

EMERSON RADIO & PHONOGRAPH CORP.

Alignment, Batt. Data, Parts

Trimmers

MODELS: DJ-310, DJ-311 and DJ-312

CHASSIS MODEL: DJ

BATTERY COMPLEMENT

The cabinet is designed to house the complete set of batteries. The battery complement should be as follows:

| Type Battery | No. Req. | Eveready Part No. | Rayovac Part No. | Burgess Part No. |
|--------------|----------|-------------------------------|---------------------------------|----------------------|
| 4½ volt "A" | 2 | 746 (plug-in type) | P83A or EM-83 (plug-in type) | 3G (plug-in type) |
| 45 volt "B" | 2 | 482 Minimax (plug-in type) | | |

DESCRIPTION

Type: Universal (Battery, A.C.-D.C.) Superheterodyne.

Frequency Range: 540-1600 kc.

Power Supply: Battery, A.C. or D.C.

Voltage Rating: (Line operation) 105-125 volts, a.c.-d.c.

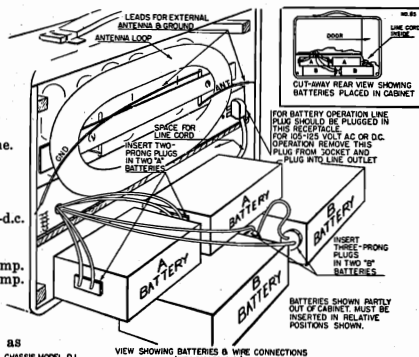
Power Consumption: (Line operation) 30 watts.

Current Drain: (Battery operation) "A" battery 0.05 amp. "B" battery 0.01 amp.

GENERAL NOTES

- The color coding of the i-f transformer leads is as follows:
Grid—green Plate—blue
Grid return—black B plus—red
- The color coding of the battery cable is as follows:
Red—B plus, 90 volts Yellow—A plus, 9 volts
Blue—B minus Black—A minus
- If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.
- A.C.-D.C. Operation: Open the small door at the back of the cabinet. It is important that this small door be left open while operating the receiver on either a.c. or d.c. power. Take out the line cord, removing the plug from its receptacle at the rear of the chassis. Insert the plug in the wall outlet. If the power supply is d.c. and the receiver does not operate at first, remove the plug from the wall outlet, turn it half way around and re-insert it in the outlet, thus obtaining the proper polarity.

- Battery Operation: Important: Remove the line plug from the electrical outlet. Insert the plug into the receptacle at the rear of the receiver. This is important since the receiver will not operate from batteries with the plug out of the receptacle. The loose portion of the cord can then be coiled and placed in the cabinet underneath the shelf.



- The receiver has a self-contained antenna and normally does not require additional antenna or ground connection. For permanent home installations of this model, however, in a location far removed from broadcasting stations, an additional outside antenna should be used. The outside antenna and ground connections should be made to the two leads at the rear of the cabinet. See the illustration.
- The self-contained loop antenna has directional properties. It is important, therefore, once the station is tuned in, that the cabinet be rotated on its base back and forth through a quarter of a circle (90 degrees), and left at the position where the station is received with maximum volume.

ADJUSTMENTS

Location of Coils and Trimmer Adjustments

The oscillator coil is located beneath the chassis. The trimmer for the oscillator is on the front section of the variable condenser.

The loop antenna acts as the antenna coil. The trimmer for the loop is on the rear section of the variable condenser.

The i-f transformers are located in cans mounted on top of the chassis. The first i-f transformer is at the right of the variable condenser and the diode i-f transformer is to the left of the variable condenser. The trimming condensers for both transformers can be reached through holes in the tops of the cans.

I-f Alignment

Swing variable condenser to minimum capacity position. Feed 455 kc to the grid of the 1A7GT tube through a 0.01 mf condenser. Adjust the four i-f trimmers for maximum response.

R-f Alignment

Set the dial pointer at 140. Feed 1400 kc from the signal generator into a loop of wire about one foot in diameter. Hold this radiating loop approximately one foot away from and parallel to the receiver loop antenna and advance the output of the signal generator until a suitable deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance. Align at 140. Set the dial at 60 and feed 600 kc to the radiating loop. A portion of the outside turn of the loop may then be swung to either side of the center to give maximum response. Re-align at 140.

Battery Installation

To install and connect the batteries in this cabinet observe the following procedure:

- Remove the back panel of the cabinet by taking out the screws.
- Locate the battery cable coming from the receiver and identify the plugs on the cable ends.
- Insert the three-prong plug on the battery cable into the two "B" batteries. Place the two batteries in the bottom of the cabinet with the plug-ends of the batteries facing each other. Push the batteries up against the front of the cabinet. The wood blocks at the rear corners and rear center of the cabinet serve to hold the "B" batteries in place.
- Insert the two-prong plug on the battery cable into the two "A" batteries. Place the "A" batteries, one at a time, above the "B" batteries in the cabinet. The plug-ends of the "A" batteries should be facing to the left, as indicated in the illustration. Push the "A" batteries to the left, when placing them in the cabinet, in order to clear the small wood block in the front right-hand corner of the cabinet.
- Replace the back panel of the cabinet and fasten it in place with the screws.

| *Item | Part No. | DESCRIPTION | PRICE | *Item | Part No. | DESCRIPTION | PRICE |
|----------------------|----------|---|-------|---------------------|----------|---|-------|
| T1 | 7JW-206 | Loop antenna assembly..... | .95 | C8, C18 | LC-65 | 0.02 mf, 400 volt tubular condenser..... | .20 |
| L1 | 7JT-524 | Iron core filter choke..... | .85 | †C10, C11, C12, C13 | | Trimmers, part of i-f transformers. | |
| T2 | 7CT-511 | Oscillator coil..... | .40 | C14, C27 | 4XC-394A | 0.00022 mf, mica condenser..... | .20 |
| T3 | 7BT-488E | Double-tuned 455 kc first i-f transformer..... | .95 | C15 | 5AC-388 | 0.25 mf, 100 volt tubular condenser..... | .20 |
| T4 | 7JT-544A | Double-tuned 455 kc diode i-f transformer..... | .95 | C16 | 5AC-384 | 0.0002 mf, 600 volt tubular or mica condenser..... | .20 |
| R1, R6 | KR-53 | 50,000 ohm ¼ watt carbon resistor..... | .16 | C17 | HC-34 | 0.006 mf, 600 volt tubular condenser..... | .20 |
| R2 | ZZR-196 | 30,000 ohm ¼ watt carbon resistor..... | .16 | C19 | 3VC-324 | 0.003 mf, 600 volt tubular condenser..... | .20 |
| R3 | KR-50 | 500 ohm ¼ watt carbon resistor..... | .16 | C20 | LC-64 | 0.05 mf, 400 volt tubular condenser..... | .20 |
| R4 | OR-73 | 25,000 ohm ¼ watt carbon resistor..... | .16 | C21, C22 | 6JC-426E | Dual 20 mf, 150 volt dry electrolytic condenser..... | .90 |
| R5 | KR-54 | 100,000 ohm ¼ watt carbon resistor..... | .16 | C23 | NNC-199 | 0.001 mf, 600 volt tubular condenser..... | .20 |
| R7, R14 | NNR-220 | 3 megohm ¼ watt carbon resistor..... | .16 | C24 | 7FC-451 | 40 mf, 25 volt dry electrolytic condenser..... | .80 |
| R8 | 3HR-240E | Volume control with line and battery switch (500,000 ohms)..... | .95 | C25, C5 | | Trimmer, part of variable condenser. | |
| R9, R11 | 3RR-274 | 5 megohm ¼ watt carbon resistor..... | .16 | C29 | AC-6 | 0.1 mf, 200 volt tubular condenser..... | .20 |
| R10, R12 | KR-56 | 500,000 ohm ¼ watt carbon resistor..... | .16 | | 7JS-444 | Door switch (for DJ-311)..... | .50 |
| R18 | LR-61 | 200,000 ohm ¼ watt carbon resistor (see production change no. 1)..... | .16 | | 7JS-440 | 5½" permanent magnet dynamic speaker (for DJ-310 and DJ-326)..... | 5.10 |
| R13 | 7JR-376 | 330 ohm ¼ watt carbon resistor (see production change no. 1)..... | .16 | | 7JS-443 | 6½" permanent magnet dynamic speaker (for DJ-311 and 312)..... | 5.75 |
| R15, R17 | PR-79 | 1,000 ohm ¼ watt carbon resistor..... | .16 | | 7JD-98 | DIAL PARTS | |
| R16 | 4XR-327 | 15 megohm ¼ watt carbon resistor..... | .16 | | 4MZ-588A | Dial face..... | .10 |
| C1, C2 | 7BC-445 | Two-gang variable condenser..... | 2.30 | | 7BH-40B | Dial pointer..... | .20 |
| C3 | 3HC-274 | 0.002 mf, 600 volt tubular condenser..... | .20 | | 6RW-162 | Dial drive shaft..... | .10 |
| C6, C7, C9, C26, C28 | BC-12 | 0.05 mf, 200 volt tubular condenser..... | .20 | | 7JW-217 | Drive cord spring..... | .02 |
| | | | | | 7BZ-867A | Battery cable (DJ)..... | .60 |
| | | | | | 7JE-30A | Dial drive cord..... | .02 |
| | | | | | 7JE-30 | Dial crystal (for 310, 311)..... | .25 |
| | | | | | | Dial crystal (for 312)..... | .20 |

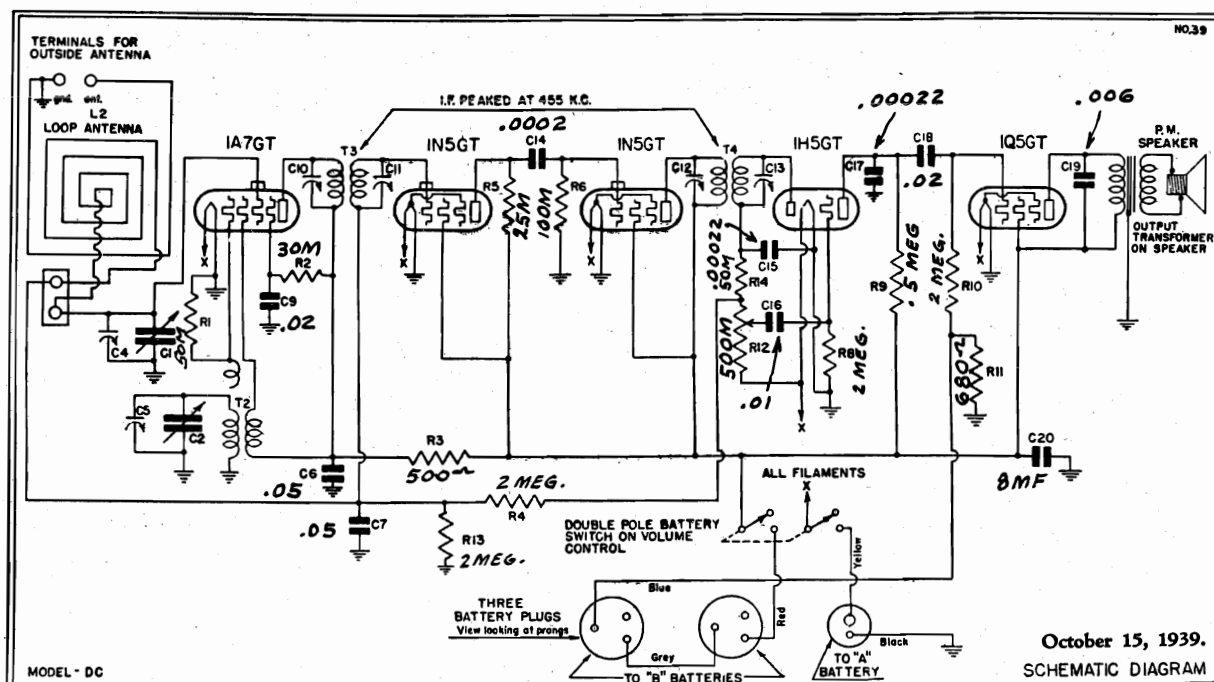
*Item number/locates article on schematic diagram. †Not supplied separately.

Specify part numbers when ordering—List price each effective as of October 15, 1939. (Subject to change without notice.)

EMERSON RADIO & PHONOGRAPH CORP.

MODEL DC308

Chassis DC

Schematic, Voltage, Changes
Alignment, Trimmers

The tube complement is as follows:

- 1—1A7GT oscillator-modulator
- 1—1N5GT 1st i-f amplifier
- 1—1N5GT 2nd i-f amplifier
- 1—1H5GT 2nd detector, a.v.c., a-f amplifier
- 1—1Q5GT pentode output

PRODUCTION CHANGES

1. Chassis bearing serial numbers below 2,936,285 use .5 megohm at R10.
2. Chassis bearing serial numbers below 2,939,151 use diode i-f transformer

Current drain "A" battery—0.3 amps.

"B" battery—0.010 amps. with no signal

Frequency range 530 to 1600 kc.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 90 volts.

| Tube | Plate | Screen | Osc. Plate | Fil. |
|---------------|-------|--------|------------|------|
| 1A7GT | 82 | 52 | 82 | 1.5 |
| 1N5GT 1st i-f | 70 | 82 | — | 1.5 |
| 1N5GT 2nd i-f | 82 | 82 | — | 1.5 |
| 1H5GT | 25 | — | — | 1.5 |
| 1Q5GT | 77 | 82 | — | 1.5 |

Bias for the 1Q5GT tube is obtained across the resistor R11. The voltage drop across this resistor should be 6.8 volts.

Location of Coils and Trimmer Adjustments

The first i-f transformer is located to the right of the variable condenser and the diode i-f transformer to the left of the variable condenser. Trimmers for both transformers are accessible through holes in the tops of the cans.

The oscillator coil is located under the chassis, beneath the variable condenser. Trimmer for the oscillator is located on the front section of the variable condenser.

The loop antenna acts as the antenna coil. Trimmer for the loop is located on the rear section of the variable condenser.

I-f Alignment

Swing variable condenser to minimum capacity position.

Feed 455 kc to the grid of the 1A7GT tube through a 0.01 mf condenser. Adjust the four i-f trimmers for maximum response.

R-f Alignment

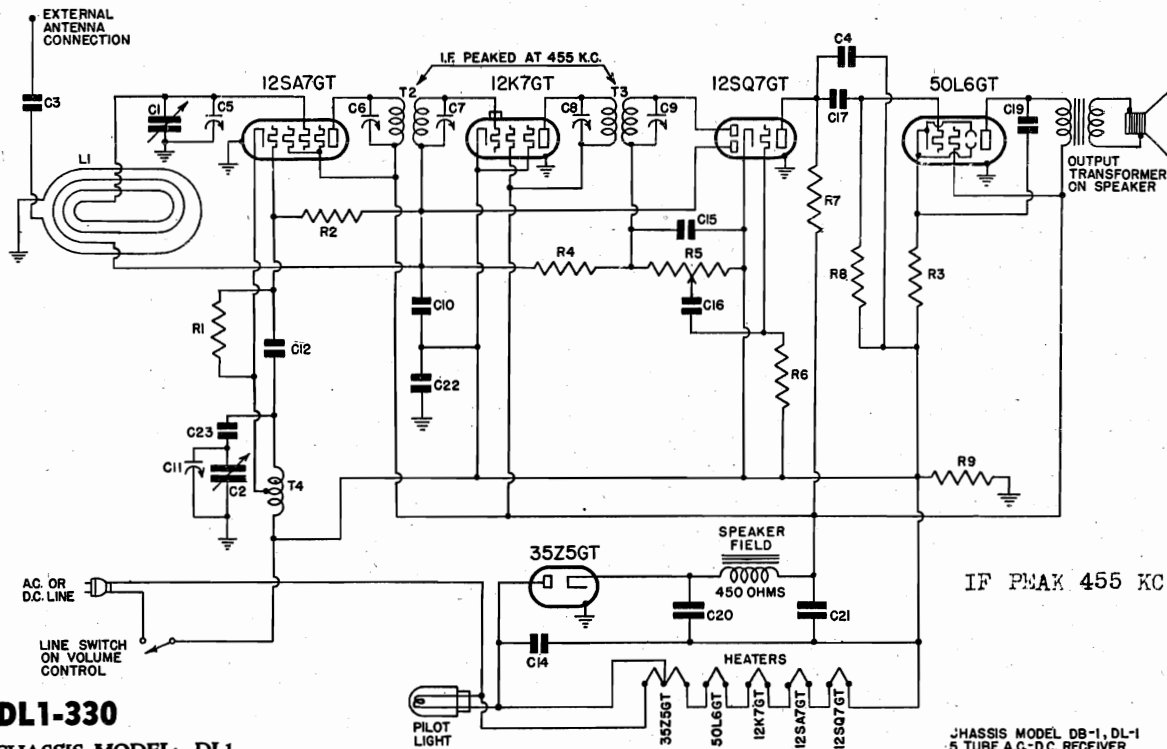
Set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna connection and adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance, align at 140. With the pointer set at 60 feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Repeat the alignment at 140.

MODEL DL1-330
Chassis DL1
Schematic, Parts

EMERSON RADIO & PHONOGRAPH CORP.

NO. 73

**DL1-330**

CHASSIS MODEL: DL1

FOR ALIGNMENT, VOLTAGE, AND TRIMMERS SEE DL-330 CHASSIS DL.

When ordering, specify part numbers. List price each, effective as of Jan. 1, 1940. Subject to change without notice.

| *Item | Part No. | DESCRIPTION | PRICE |
|-----------------|----------|---|-------|
| L1 | 7BW-179 | Loop antenna assembly..... | .90 |
| T4 | 7BT-486 | Oscillator coil (DL)..... | .40 |
| T4 | 7BT-486A | Oscillator coil (DL1)..... | .40 |
| T2 | 7BT-488 | Double-tuned 455 kc first i-f transformer..... | 1.00 |
| T3 | 7BT-550B | Double-tuned 455 kc second i-f transformer..... | .95 |
| R1 | LR-60 | 20,000 ohm $\frac{1}{4}$ watt carbon resistor..... | .16 |
| R3 | 3FR-293 | 140 ohm $\frac{1}{2}$ watt wire-wound resistor..... | .16 |
| R4 | NNR-220 | 3 megohm $\frac{1}{4}$ watt carbon resistor..... | .16 |
| R5 | 7LR-378 | Volume control 0.5 megohm with line switch..... | .85 |
| R6, R2 | 4XR-327 | 15 megohm $\frac{1}{4}$ watt carbon resistor..... | .16 |
| R7, R8 | KR-56 | 500,000 ohm $\frac{1}{4}$ watt carbon resistor..... | .16 |
| R9 | LR-61 | 200,000 ohm $\frac{1}{4}$ watt carbon resistor (DL1)..... | .16 |
| C1, C2 | 7BC-445A | Two-gang variable condenser..... | 2.25 |
| †C5, C11 | | Trimmers, part of variable condenser..... | |
| †C6, C7, C8, C9 | | Trimmers, part of i-f transformers..... | |
| C10, C23 | BC-12 | 0.05 mf, 200 volt tubular condenser..... | .20 |
| C14 | LC-64 | 0.05 mf, 400 volt tubular condenser..... | .20 |
| C12, C15, C4 | 4XC-394A | 0.00022 mf mica condenser..... | .20 |
| C16, C3 | 3HC-274 | 0.002 mf, 600 volt tubular condenser..... | .20 |
| C17, C19 | 6JC-425 | 0.024 mf, 400 volt tubular condenser..... | .20 |
| C20, C21 | 6JC-426C | Dual 20 mf, 150 volt dry electrolytic condenser..... | .90 |
| C22 | 3CC-302 | 0.15 mf, 200 volt tubular condenser (DL1 only)..... | .20 |
| | 7BS-409 | 5" dynamic speaker (DL)..... | 3.80 |
| | 7BS-435 | 5" dynamic speaker (DL1)..... | 3.85 |
| | 6JL-104 | Pilot light, 6.3 volt, .15 amp., Mazda No. 47..... | .20 |
| | 7BB-77 | Pilot light socket..... | .15 |
| | 7LD-96 | Dial face..... | .25 |
| | 7BZ-867A | Drive cord..... | .02 |
| | 6RW-162 | Drive cord spring..... | .02 |
| | 7BH-40C | Drive shaft and pulley..... | .10 |
| | 7QD-103 | Dial pointer..... | .15 |
| | 5FZ-758 | Dial crystal (DL)..... | .25 |
| | 5FZ-758A | Dial crystal (DL1)..... | .25 |

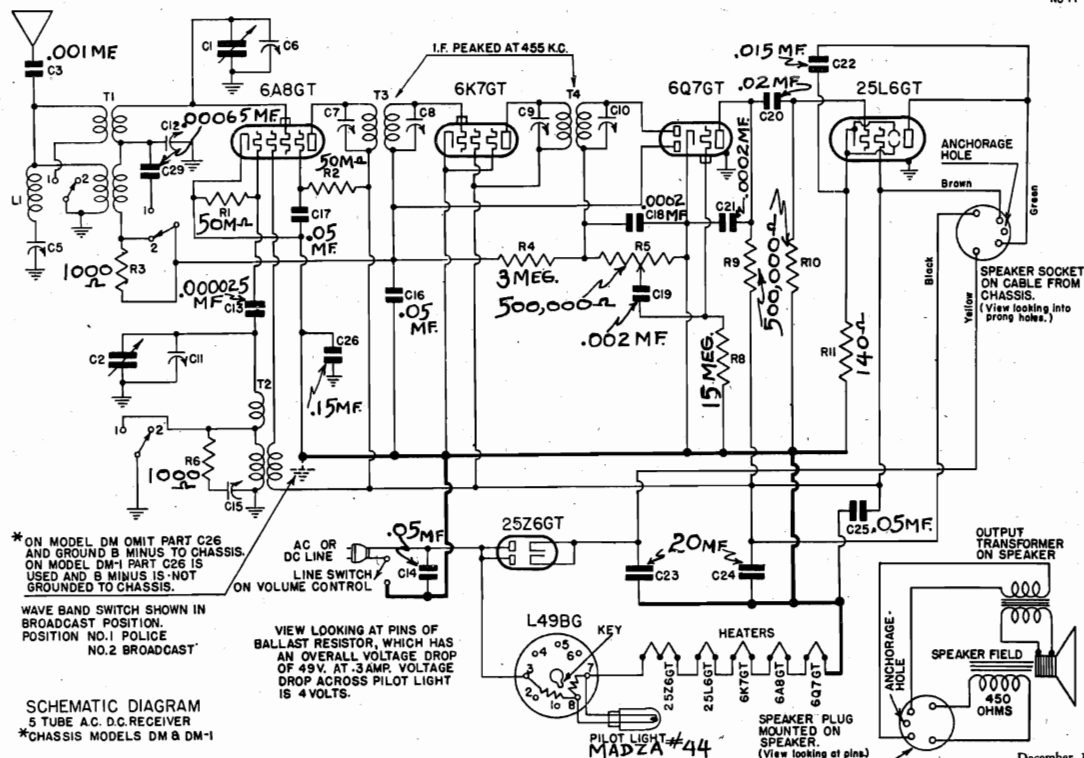
*Item number locates the article on the schematic diagram.

†Not supplied separately.

EMERSON RADIO & PHONOGRAPH CORP. Chassis DM, DM1

Schematic, Voltage Alignment, Trimmers

NO 71



MODEL: DM-331 MODEL: DM1-331

CHASSIS MODEL: DM CHASSIS MODEL: DM1

DESCRIPTION

Type: Two-band superheterodyne.

Frequency ranges: 540 -1700 kc
2300-6600 kc

Number of Tubes: Five.

Type of tubes:

- 1-6A8GT, pentagrid oscillator-modulator
- 1-6K7GT, first i-f amplifier
- 1-6SQ7GT, diode detector, a-f amplifier, a.v.c.
- 1-25L6GT, beam power output
- 1-25Z6GT, dual half-wave rectifier.

Octal-base tubes in this receiver may be replaced with either metal or "bantam-type" octal-base glass tubes. The letters "GT" at the end of the tube number indicates that the tube has a bantam glass envelope. In all other respects it is the same as the metal tube bearing the same number without the "GT."

Power supply: A.C. or D.C.

Voltage rating: 105-125 volts.

Power consumption: 45 watts.

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the i-f portion of the circuit, the receiver should be carefully re-aligned.
2. The filament dropping resistor (L49BG on schematic) is located at the rear of the chassis. This resistor will become

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

| Tube | Plate | Screen | Cathode | Osc. Plate | Fil. |
|--------|-------|--------|---------|------------|------|
| 6A8GT | 95 | 45 | 0 | 95 | 6.3 |
| 6K7GT | 95 | 95 | 0 | — | 6.3 |
| 6SQ7GT | 38 | — | 0 | — | 6.3 |
| 25L6GT | 90 | 95 | 6.5 | — | 25.0 |

Voltage at 25Z6 cathode—125 volts. Voltage drop across ballast resistor (pins nos. 3, 7)—49 volts.

Voltage across speaker field—28 volts. Voltage drop across pilot light section of ballast resistor (pins nos. 8 and 7)—4 volts.

quite hot under normal operating conditions. For voltage drop specifications, see below.

3. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
4. The first i-f transformer is held to the chassis by snap-on fasteners. To remove it, unsolder all its leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
5. The color coding of the i-f transformer leads is as follows:
Grid—green
Plate—blue
Grid return—black
B plus—red
6. The wave-trap has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

ADJUSTMENTS

An oscillator with frequencies of 455, 1500 and 6000 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Location of Coils and Trimmer Adjustments

The first i-f transformer is located on top of the

chassis deck. The trimmers are available through holes in the top of the can. The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are available through holes in the rear.

The trimmers for the short-wave antenna and oscillator are located on the variable condenser. The trimmer on the front section is for the oscillator.

The trimmers for the broadcast oscillator and antenna coil are mounted on a dual assembly just below the variable condenser underneath the chassis.

The 455 kc wave-trap is part of the antenna coil assembly directly behind the variable condenser. The trimmer for the 455 kc wave-trap is mounted on the coil and is accessible from the rear of the chassis.

I-f and Wave-Trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a .002 mf paper condenser, to the grid cap of the 6A8 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) and adjust the wave-trap trimmer for minimum response. (See General Note No. 6.)

Short-Wave Alignment

(Short-wave alignment should precede broadcast alignment.)

With the wave-band switch in the short-wave position, counter-clockwise, set the dial pointer at 6 mc. and feed 6000 kc through a standard dummy antenna to the antenna lead. If an I.R.E. standard dummy antenna is not available, a .0002 mf mica condenser in series with 400 ohm non-inductive resistor may be used as a substitute.

Adjust first the oscillator trimmer (on front section of the variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

Broadcast Alignment

Rotate the wave-band switch clockwise to the broadcast position, set the pointer at 150 and feed 1500 kc through a standard dummy antenna to the antenna lead. A .0002 mf mica condenser may be used as a substitute. Adjust first the broadcast oscillator trimmer (lower of dual trimmer assembly located underneath the variable condenser) and then the antenna trimmer (upper trimmer of dual assembly) for maximum response.

MODELS DP332, DP1-332

Chassis DP, DP1

EMERSON RADIO & PHONOGRAPH CORP.

Schematic, Voltage
Alignment, Trimmers

Location of Coils and Trimmer Adjustments

The first i-f transformer is located on top of the chassis deck. The trimmers are available through holes in the top of the can. The second i-f transformer is located on the rear wall underneath the chassis. The trimmers are available through holes in the rear.

The trimmers for the antenna coil are mounted on the antenna coil assembly behind and to the right of the variable condenser. The trimmer in the center is for the broadcast band and the trimmer at the bottom for the short-wave band.

The trimmers for the oscillator coil are mounted on the oscillator coil assembly, located on the rear wall underneath the chassis. The trimmer farthest from the end is for the broadcast band. The center trimmer is the broadcast series padding condenser, and the trimmer closest to the end is for the short-wave band.

The 455 kc wave-trap is part of the antenna coil assembly. The trimmer for the trap is the uppermost trimmer of the assembly.

I-f and Wave-Trap Alignment

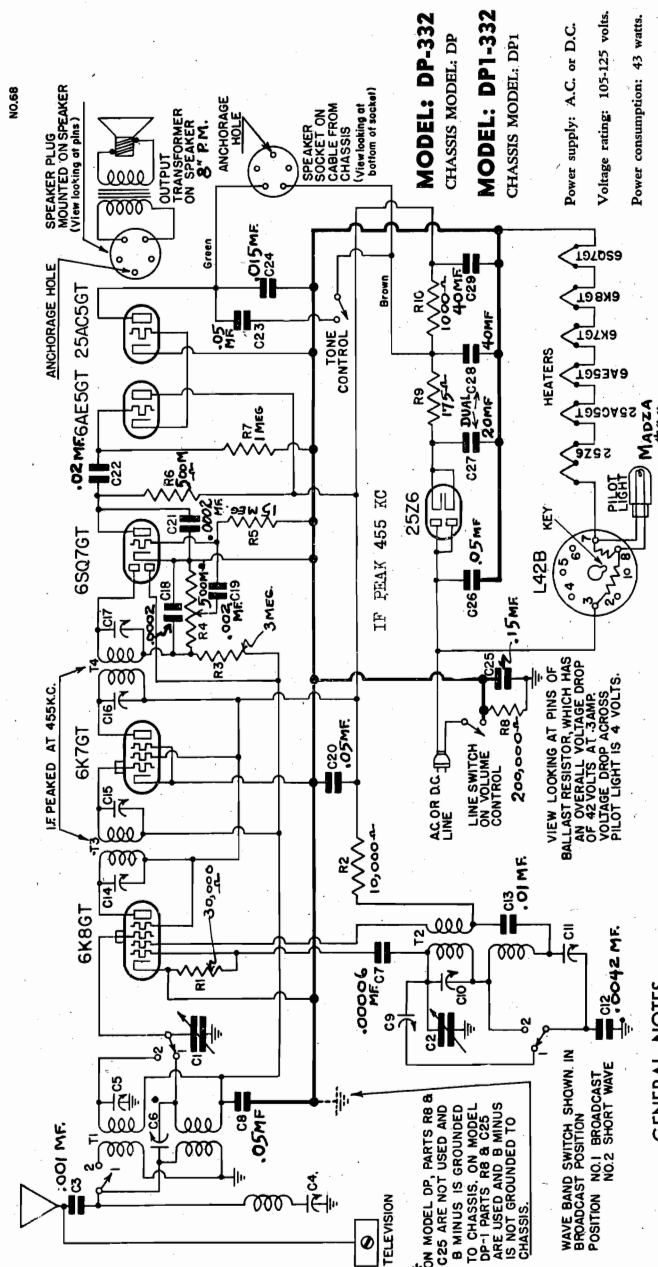
Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a .002 mf paper condenser, to the grid cap of the 6A8 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) and adjust the wave-trap trimmer for minimum response. (See General Note No. 6.)

Short-Wave Alignment

With the wave-band switch in the short-wave position, counter-clockwise, set the dial pointer at 16 mc. Feed 16,000 kc through a standard short-wave dummy antenna (a 400 ohm resistor may be used as a substitute) to the antenna lead and adjust first the oscillator trimmer, then the antenna trimmer for maximum response.

Broadcast Alignment

Rotate the wave-band switch clockwise and set the pointer at 160. Feed 1600 kc through a standard broadcast dummy antenna to the antenna lead (a .0002 mf condenser may be used as a substitute) and adjust first the broadcast oscillator trimmer and then the antenna trimmer for maximum response. Move pointer to 60, feed 600 kc and adjust series paddler (while rocking the variable) for maximum response.



MODEL: DP-332
CHASSIS MODEL: DP
MODEL: DP1-332
CHASSIS MODEL: DP1

Power supply: A.C. or D.C.
Voltage rating: 105-125 volts.
Power consumption: 43 watts.

* CHASSIS MODELS DP & DP-1
6 TUBE A.C. D.C. RECEIVER

December 15, 1939.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except cathodes and heaters were taken on 250 volt scale. Readings taken on d.c. will be slightly lower.

| Tube | Plate | Screen | Cathode | Osc. Plate | Fil. |
|----------|-------|--------|---------|------------|------|
| 6K8GT | 90 | 90 | 0 | 70 | 6.3 |
| 6SQ7GT | 90 | 90 | 0 | — | 6.3 |
| 6AE5GT | 30 | — | 0 | — | 6.3 |
| 25A5C5GT | 90 | — | 14 | — | 6.3 |
| | 110 | — | 0 | — | 25.0 |

Voltage drop across ballast resistor (pins nos. 3, 7)—42 volts.

Voltage drop across pilot light section of ballast resistor (pins nos. 8 and 7)—4 volts.

ADJUSTMENTS

An oscillator, with frequencies of 455, 1600 and 16,000 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

DESCRIPTION

Type of tubes:

- 1—6K8GT, pentagrid oscillator-modulator
- 1—6SQ7GT, first i-f amplifier
- 1—6SQ7GT, diode detector, a-f amplifier, a.v.c.
- 1—6AE5GT, audio amplifier
- 1—25A5C5GT, dynamic coupled output
- 1—25Z6GT, dual half-wave rectifier.

Type: Two-band superheterodyne.

Frequency range: 540-1730 kc
5.6-18 mc.

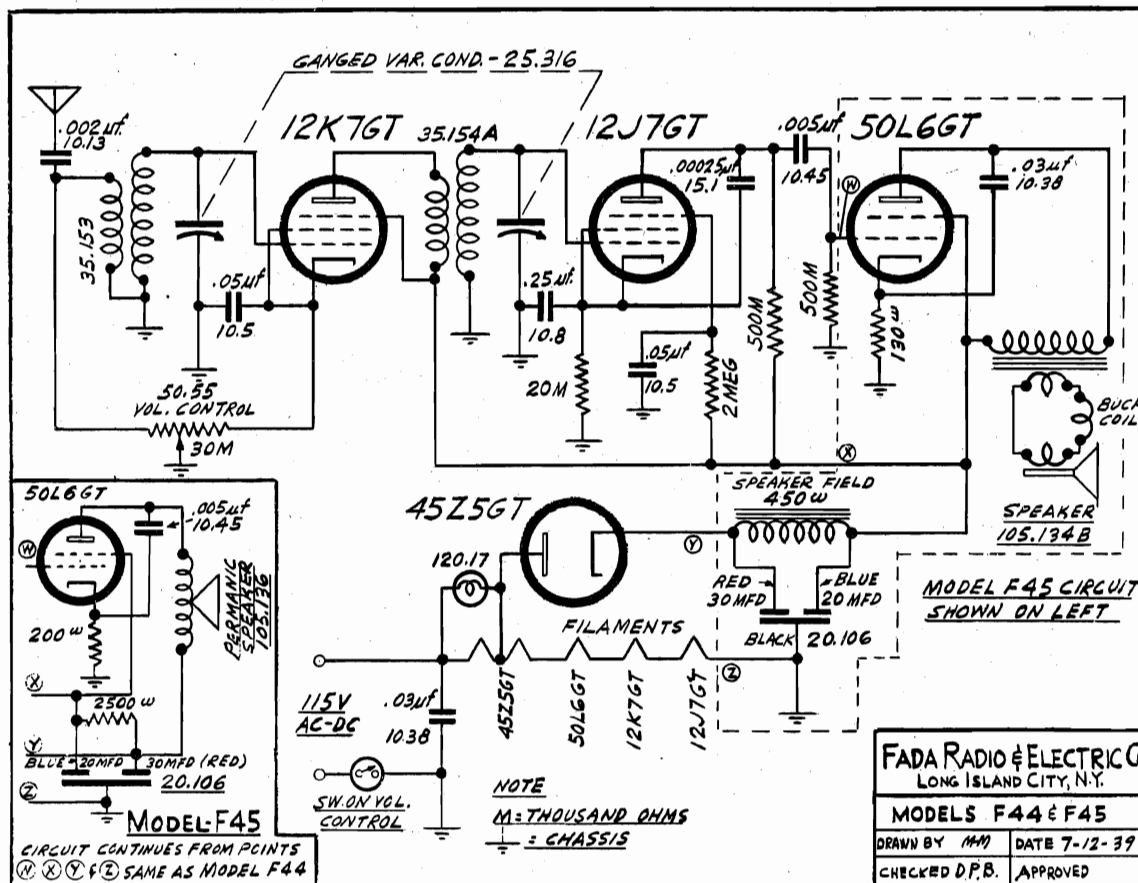
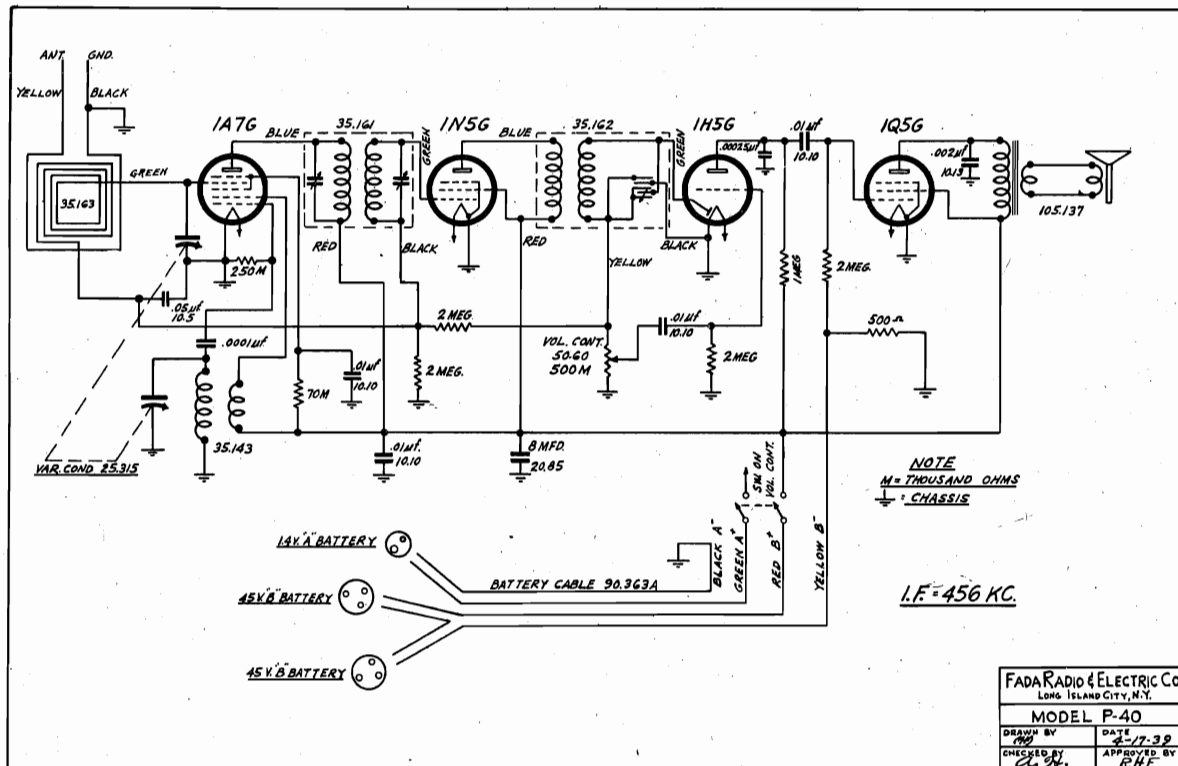
Number of tubes: Six.

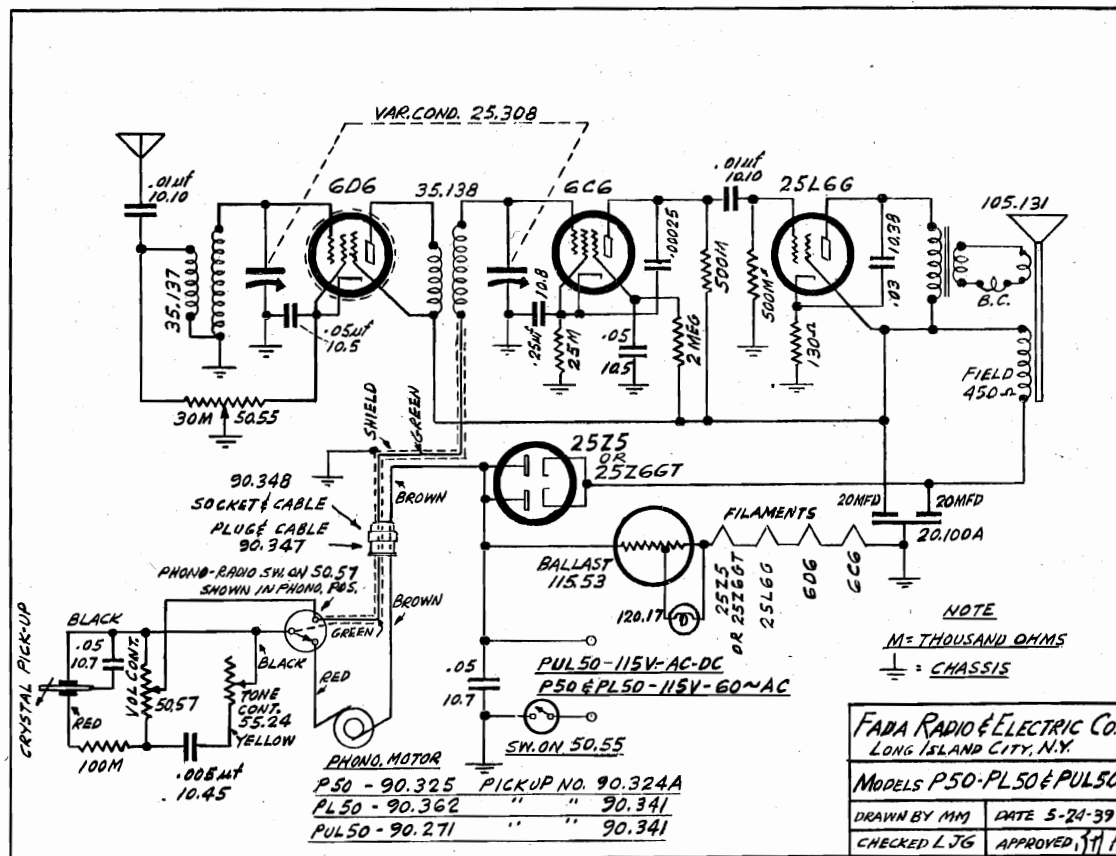
GENERAL NOTES

- If replacements are made or the wiring disturbed in the i-f portion of the circuit, the receiver should be carefully re-aligned.
- The filament dropping resistor (L42B on schematic) is located at the rear of the chassis. This resistor will become quite hot under normal operating conditions. For voltage drop specifications, see below.
- When operating the receiver on d.c., it may be necessary to reverse the line plug to obtain the correct polarity.
- The first i-f transformer is held to the chassis by snap-on fasteners. To adjust the trimmers, all the prongs of the snap-on fastener and lift the i-f can from the chassis.
- The color coding of the i-f transformer leads is as follows:
Plate—blue
Grid—green
Grid return—black
- The wave-trap has been adjusted for maximum signal rejection at 455 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

MODEL P40
MODELS F44, F45
Schematics

FADA RADIO & ELECTRIC CO

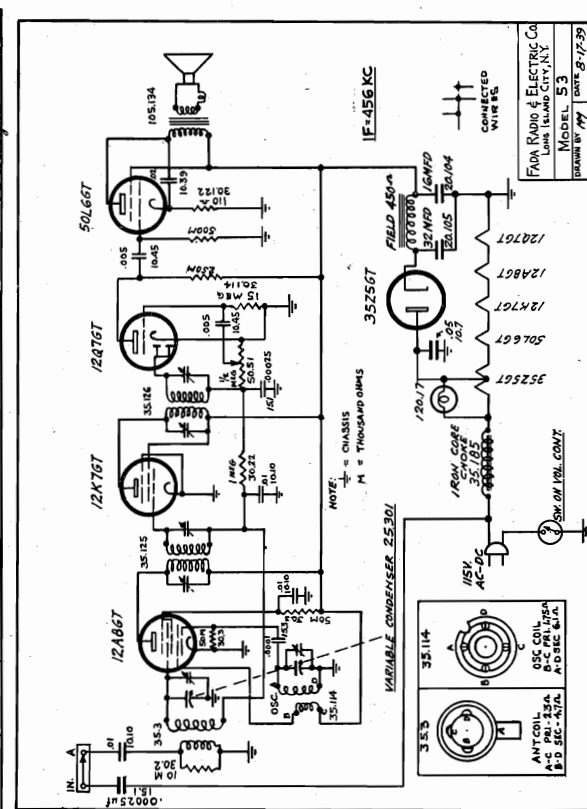
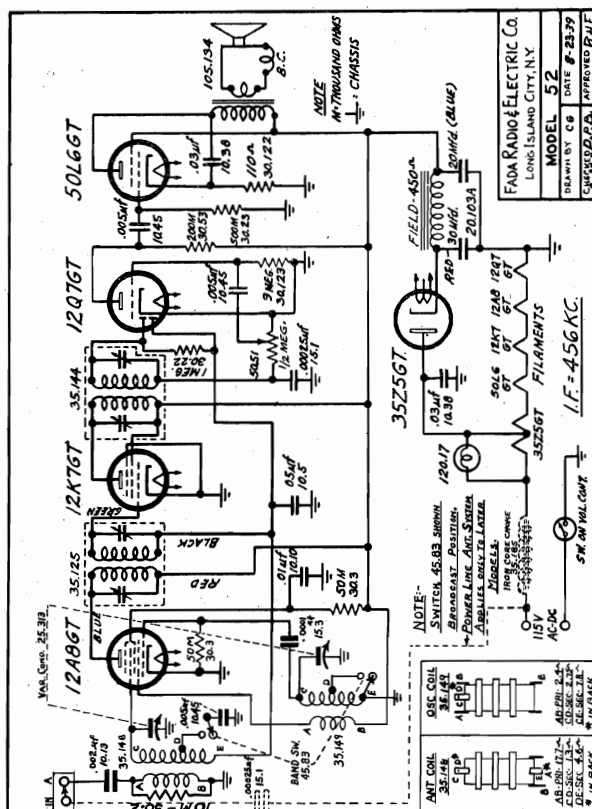
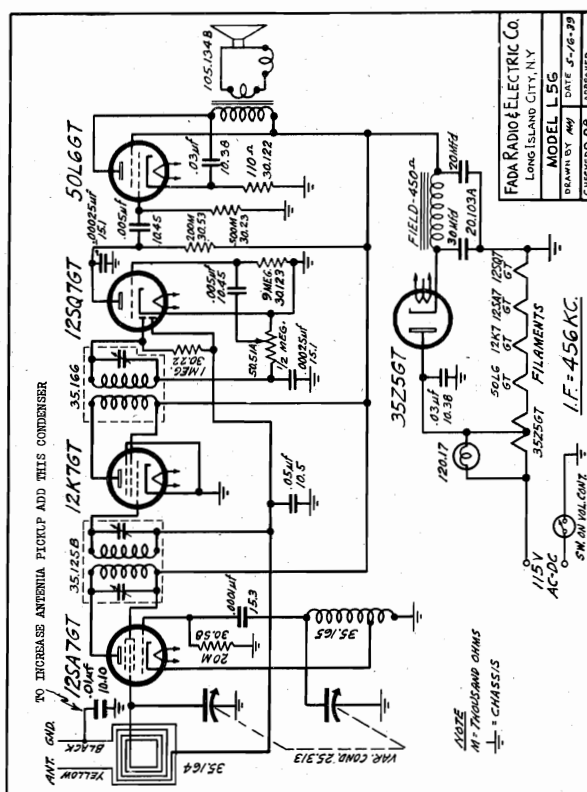
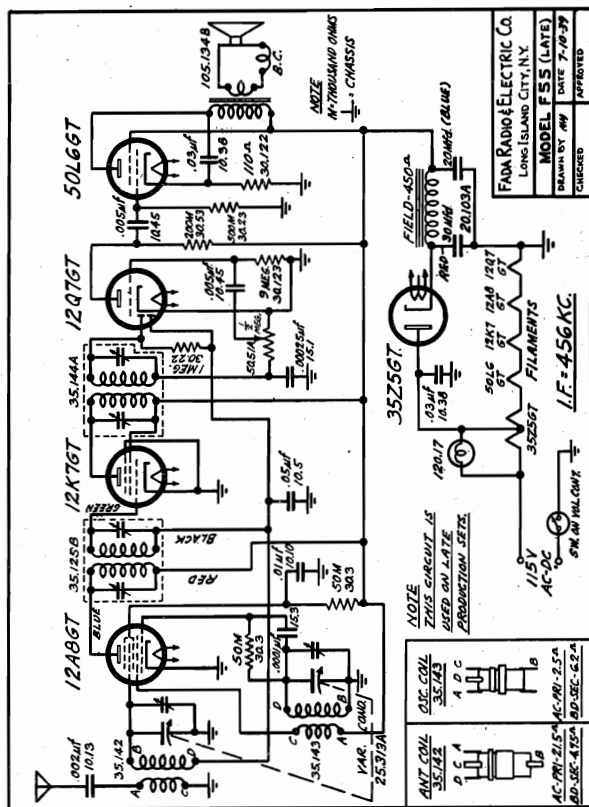




MODELS 52,F52
MODEL 53
MODEL F55 Late

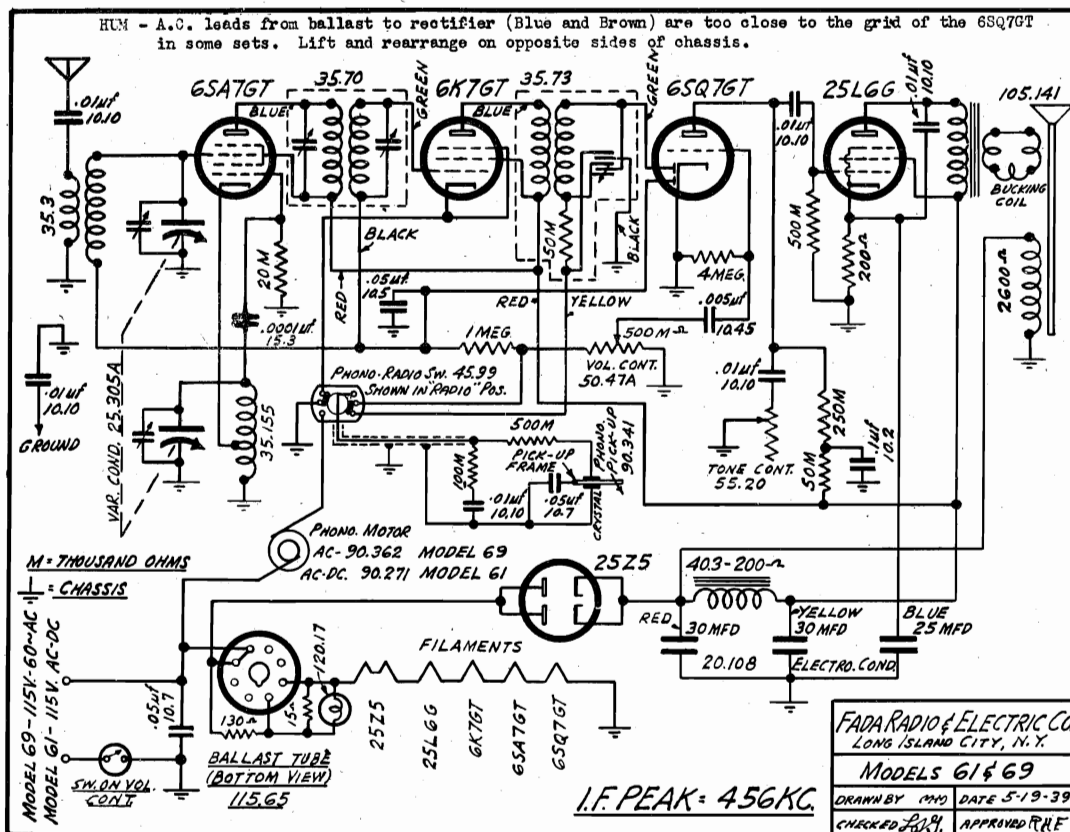
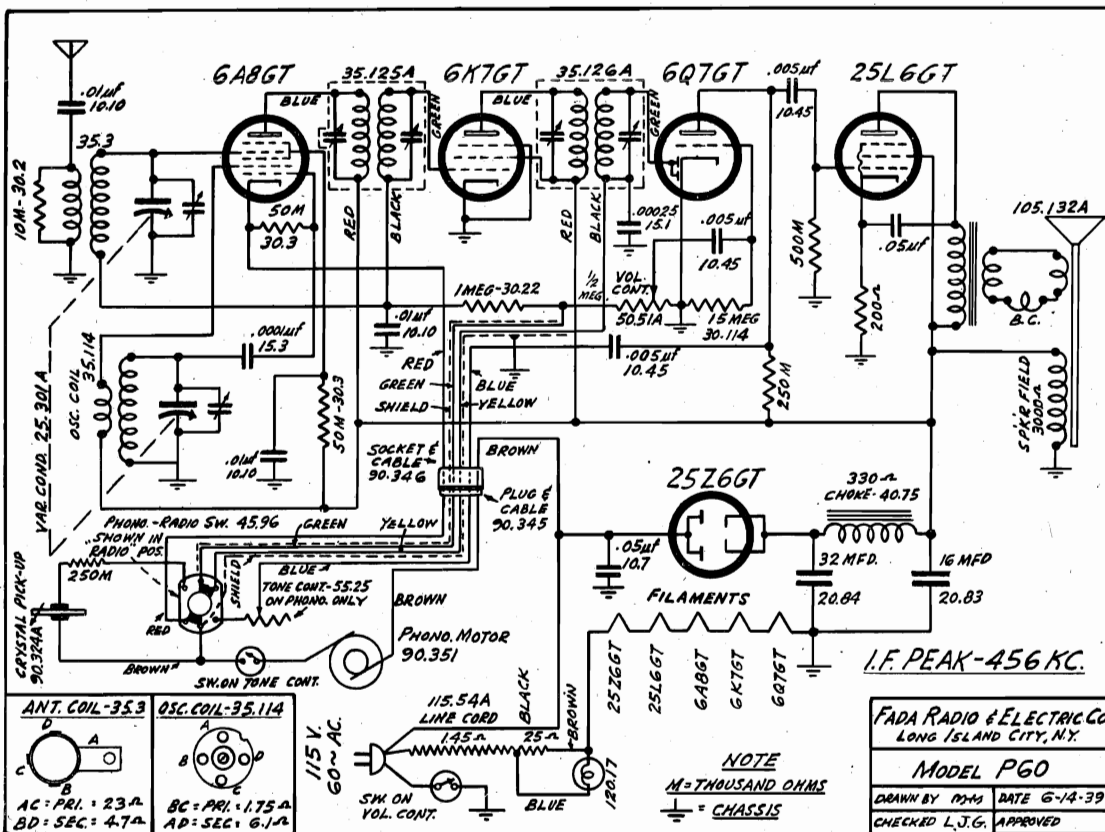
FADA RADIO & ELECTRIC CO

MODEL L56 Schematics



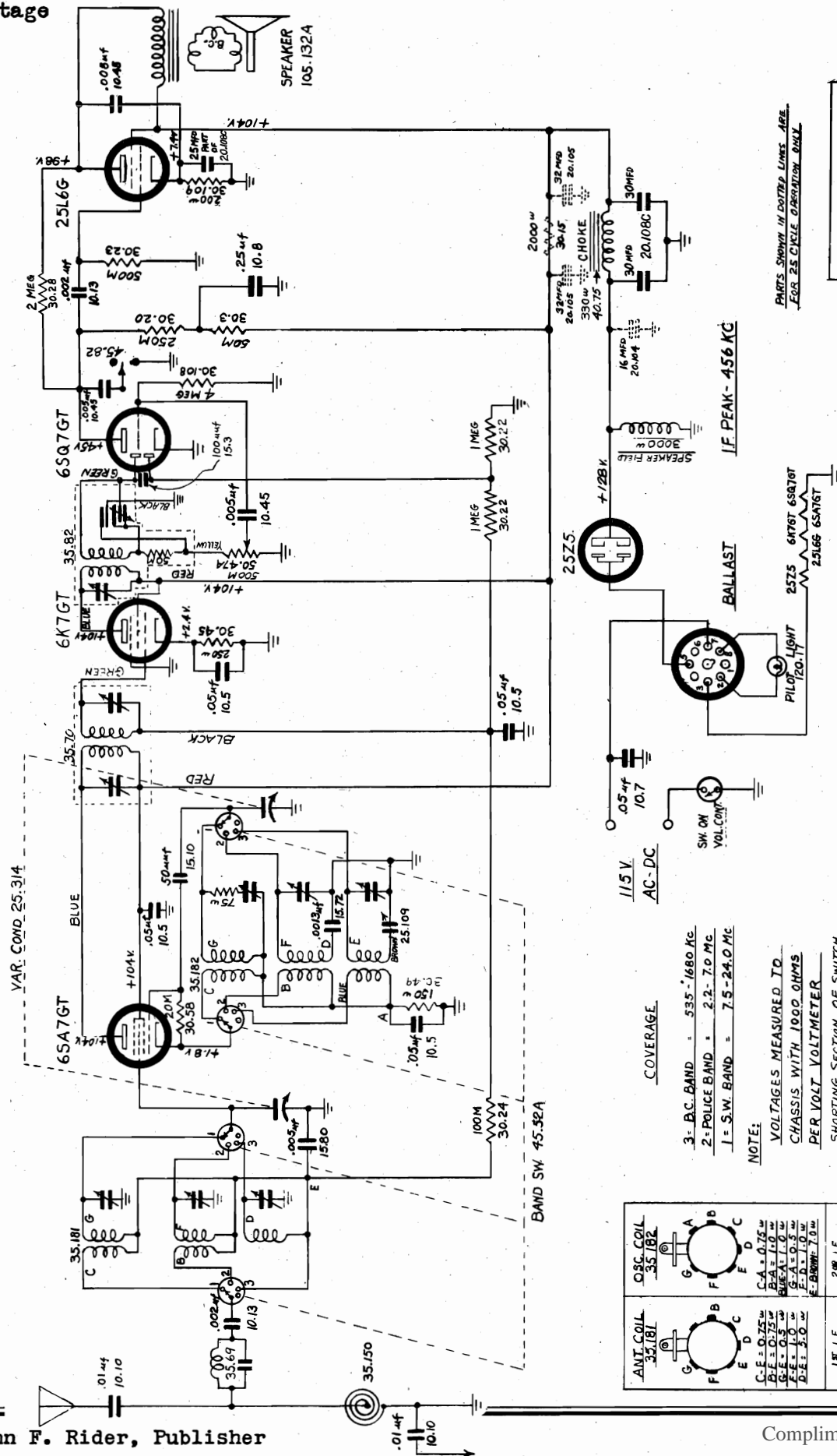
MODEL P60
MODELS 61,69
Schematics

FADA RADIO & ELECTRIC CO



MODEL 63
Schematic
Voltage

FADA RADIO & ELECTRIC CO



| | |
|---|---------------------|
| FADA RADIO & ELECTRIC CO. LONG ISLAND CITY, N.Y. | |
| MODEL 63 | |
| DRAWN BY CG | DATE 10-14-39 |
| CHECKED <i>AL</i> | APPROVED <i>WHE</i> |

PARTS SHOWN IN DOTTED LINES ARE
FOR 25 CYCLE OPERATION ONLY

BALLAST FOR 110 V. OPERATION 115.78

BALLAST FOR 220V. OPERATION 115.79

7 5 2 15 ω 8 6 130 ω 3
7 180 ω 5 50 ω 6 8 15 ω 2 130 ω 3

COVERAGE.

3 = B.C. BAND = 535 - 1680 Mc
2 = POLICE BAND = 2.2 - 7.0 Mc
1 = S.W. BAND = 7.5 - 24.0 Mc

NOTE:

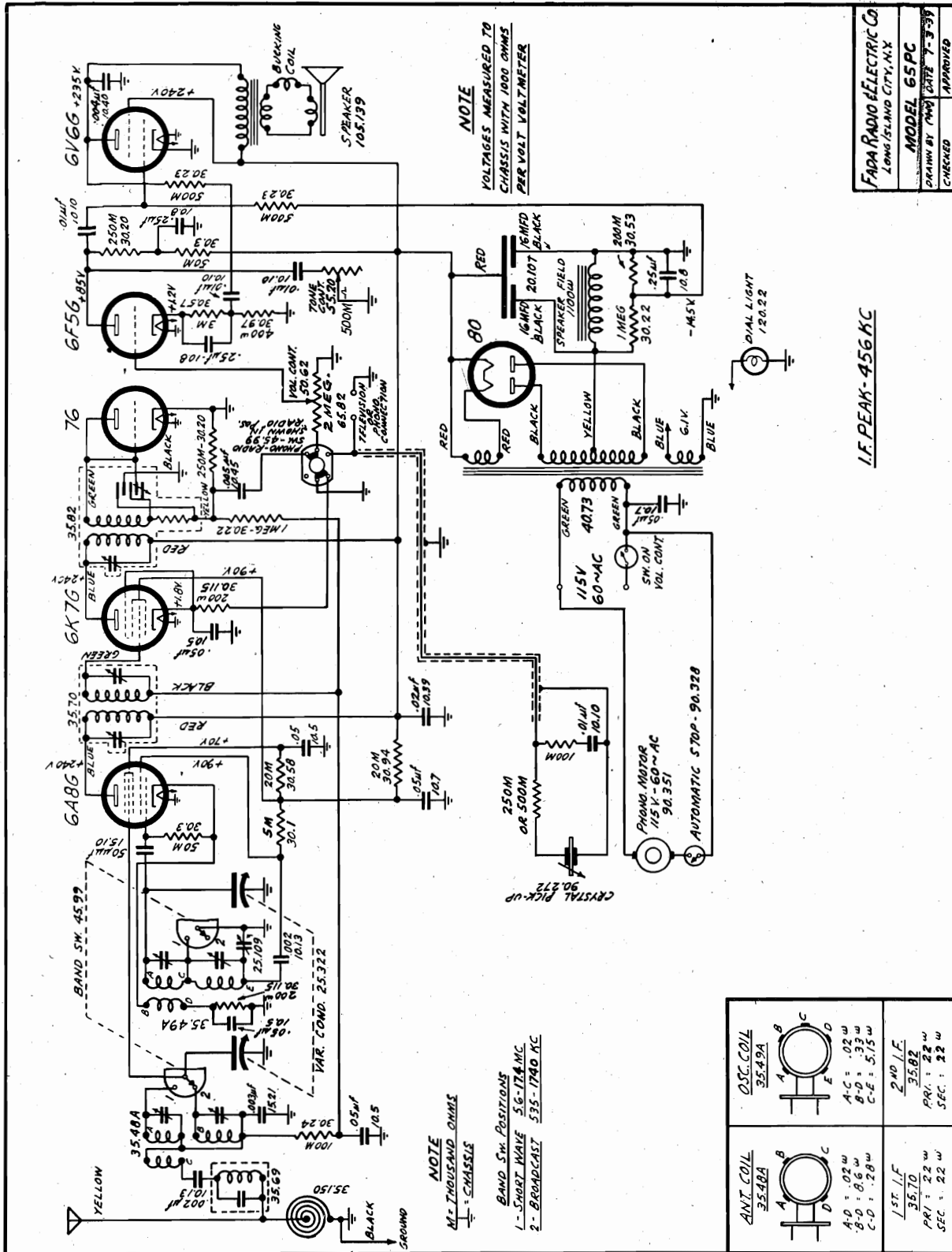
VOLTAGES MEASURED TO
CHASSIS WITH 1000 OHMS
PER VOLT VOLTMETER

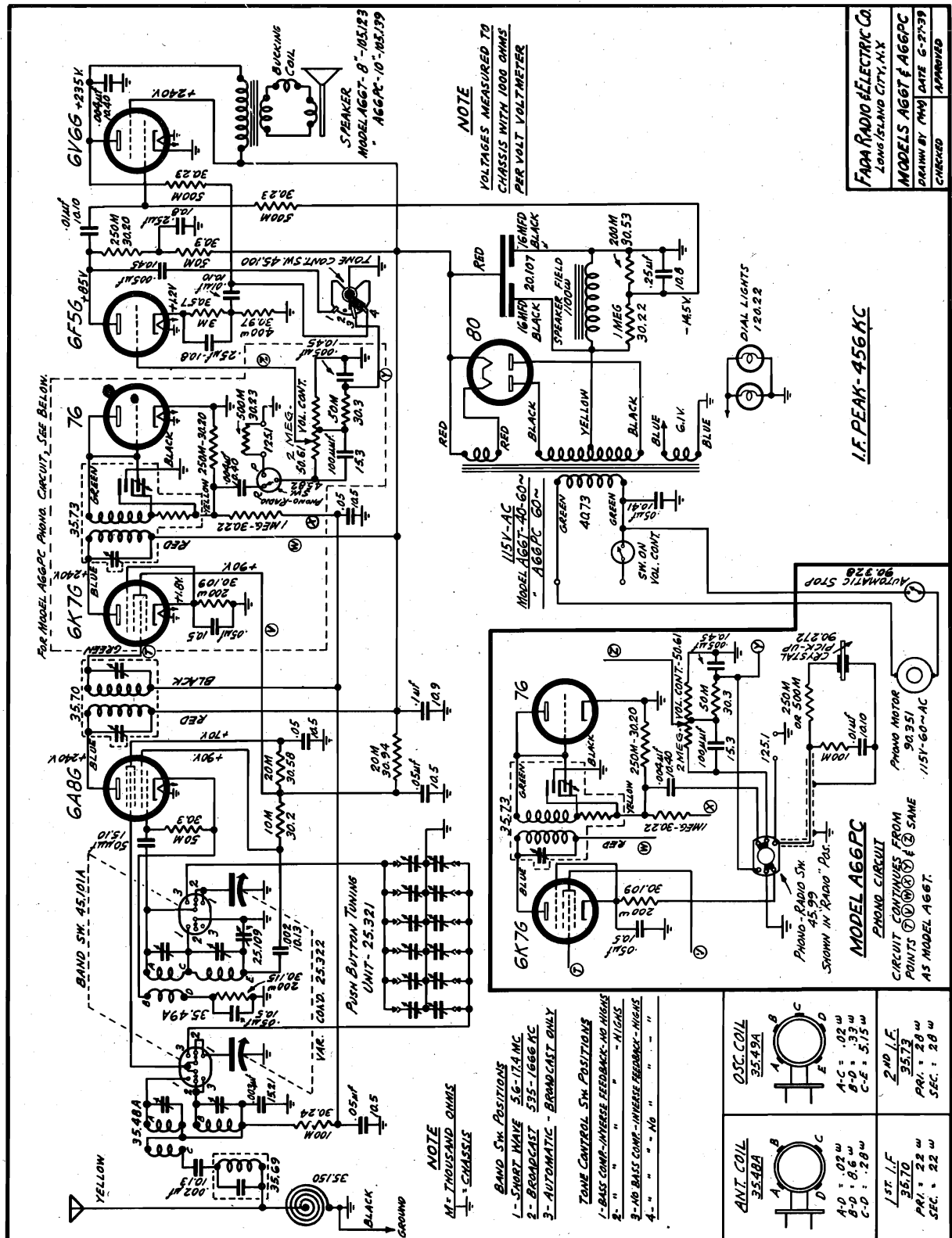
SHORTING SECTION OF SWITCH
NOT SHOWN

[illegible]

MODEL 65PC
Schematic
Voltage

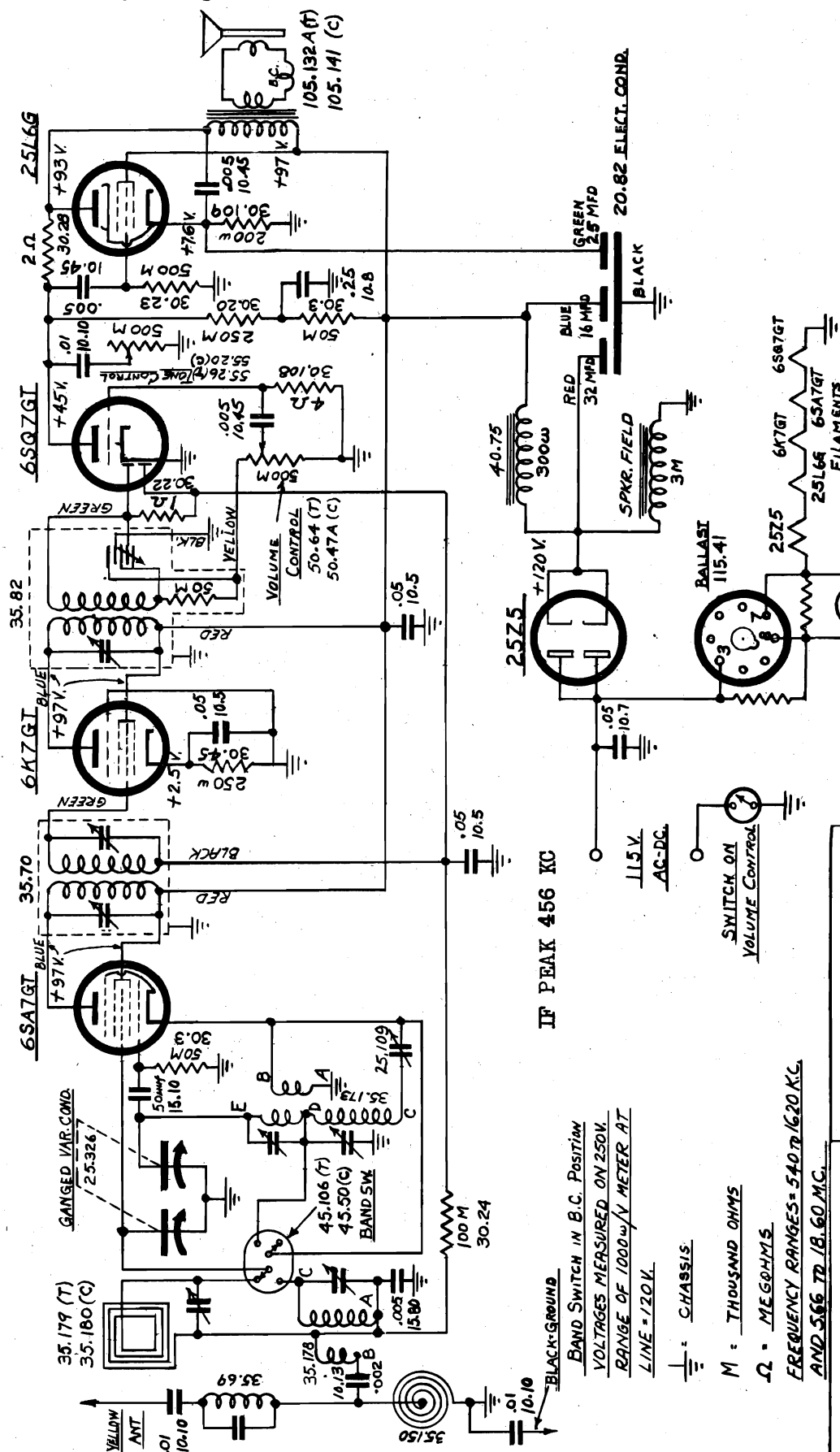
FADA RADIO & ELECTRIC CO







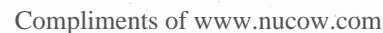
MODELS L67T,L67C
Schematic,Voltage

FADA RADIO & ELECTRIC CO



| | |
|---------------------------|--------------|
| FADA RADIO & ELECTRIC CO. | |
| LONG ISLAND CITY, N.Y. | |
| MODEL | L67 (T) 4(C) |
| DRAWN BY | CG |
| CHECKED BY | DATE 8-18-39 |
| APPROVED DATE | |

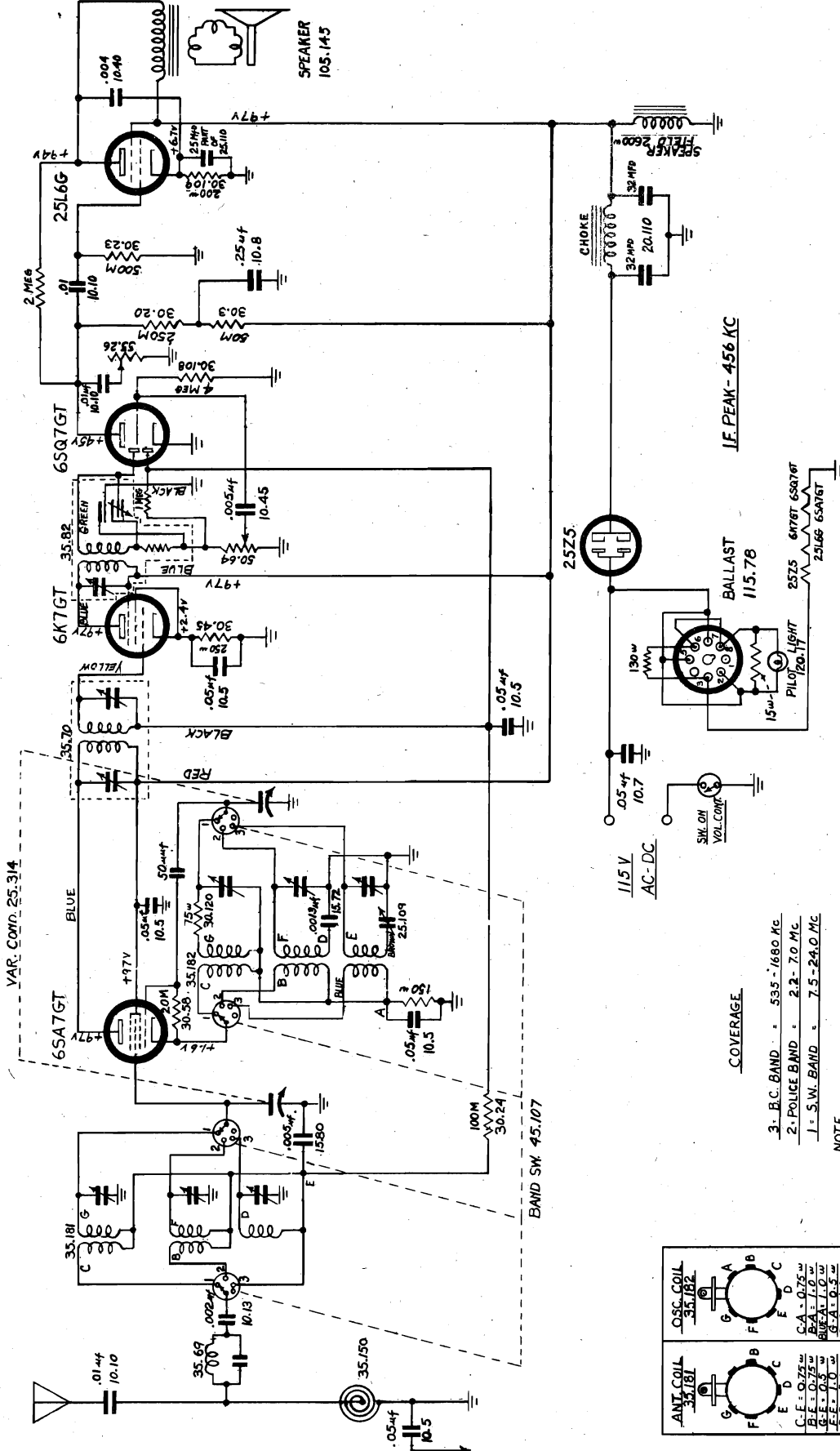
| | | |
|-----------------------------------|---|---|
| <u>OSC. COIL</u> <u>35.173</u> |  | <u>AB-PR1 =</u> <u>CD-BC SEC =</u> <u>DE-SW SEC =</u> |
| <u>ANT. COIL</u> <u>35.178</u> |  | <u>AB-PR1 =</u> <u>AC-SW SEC =</u> |



MODEL 68

Schematic, Voltage

FADA RADIO & ELECTRIC CO.

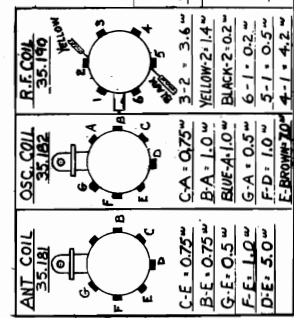


| |
|---------------------------|
| FADA RADIO & ELECTRIC CO. |
| LONG ISLAND CITY, N.Y. |
| Model 68 |
| DRAWN BY C.G. |
| CHECKED R.W. |
| DATE 8-25-39 |
| APPROVED N.Y. |

| ANT. COIL | OSC. COIL |
|----------------|-----------------|
| 35.181 | 35.182 |
| <div> </div> | <div> </div> |
| C.F. - 0.75w | C.F. - 0.75w |
| B.A. - 0.75w | B.A. - 0.75w |
| B.E. - 0.5w | B.E. - 0.5w |
| F.F. - 1.0w | F.F. - 1.0w |
| D.E. - 5.0w | D.E. - 5.0w |
| E - 200w 7.0w | E - 200w 7.0w |
| 1st IF - 35.70 | 2nd IF - 35.182 |
| PRI - 22w | PRI - 22w |
| SEC - 22w | SEC - 22w |

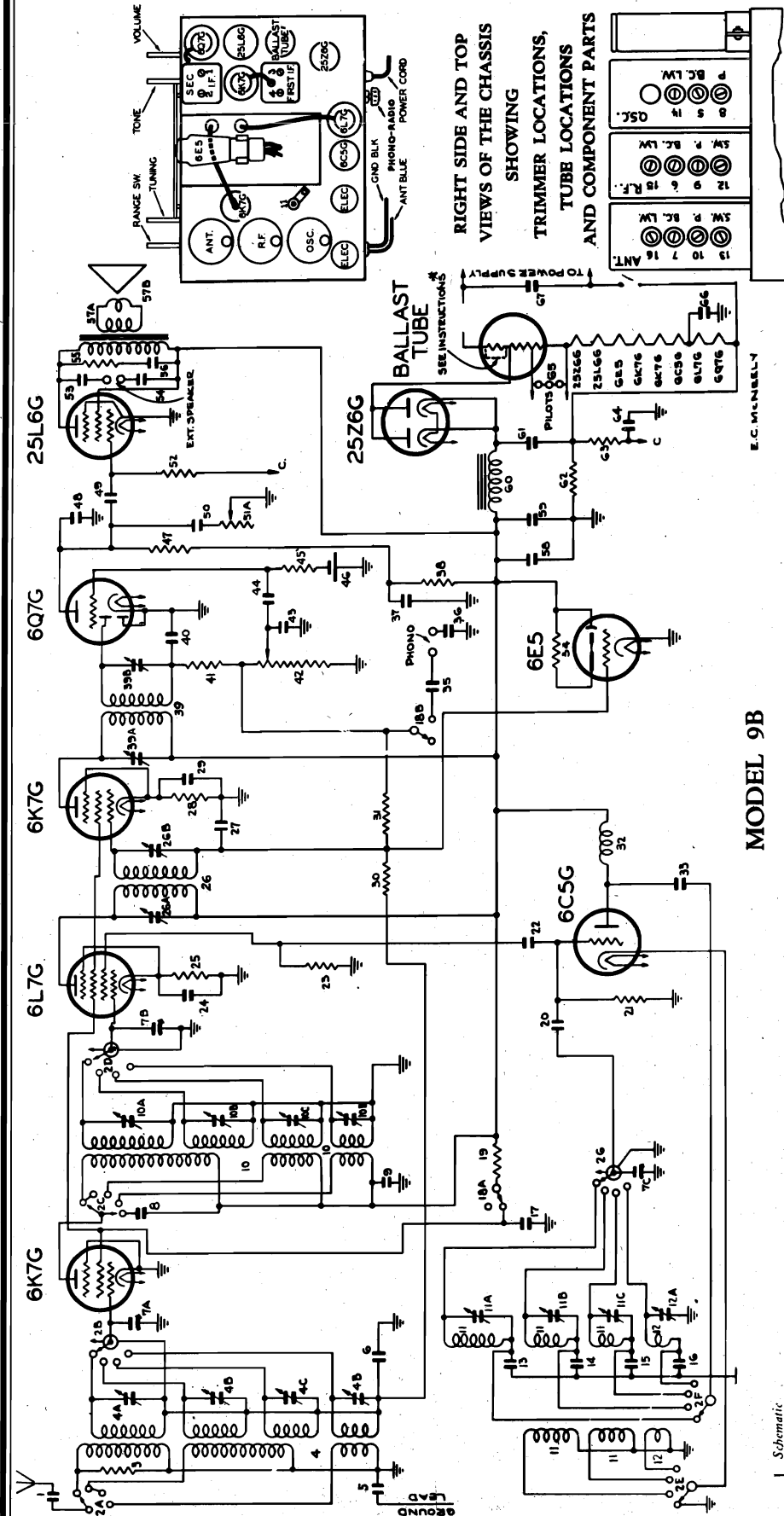


FADA RADIO & ELECTRIC CO



FAIRBANKS, MORSE & CO.

MODEL 9B Schematic, Trimmers Socket



RIGHT SIDE AND TOP
VIEWS OF THE CHASSIS
SHOWING
TRIMMER LOCATIONS,
TUBE LOCATIONS
AND COMPONENT PARTS

IF PEAK 456 KC

MODEL 9B

ELECTROLYTIC CONDENSER COLOR CODE

(All Other Color Codes Standard R. M. A.)

With the positive (+) or center solder lug toward you, read the colored markings as follows from left to right:

| LEFT HAND OR CAPACITY COLOR | SECOND FROM LEFT OR MAXIMUM VOLTAGE COLOR |
|-----------------------------|---|
| Black | 0 to 99 volts |
| Brown | 99 to 199 volts |
| Red | 199 to 299 volts |
| Orange | 299 to 399 volts |
| Yellow | 399 to 499 volts |
| | 499 to 599 volts |

If a third (blue) stripe is shown, the condenser is a regulator and should be in the position farthest from the rectifier tube in the filter circuit.

| Part Number | Description | Schematic Reference Number |
|-------------|---|----------------------------|
| 340-8 | Coil Assembly—HF Oscillator | 12 |
| 340-9 | Condenser—Tubular Paper .05-200 volt | 12A |
| 340-10 | Condenser—Tubular Paper .1-200 volt | 12B |
| 340-11 | Condenser—Tubular Paper .25-200 volt | 12C |
| 340-12 | Condenser—Tubular Paper .5-200 volt | 12D |
| 340-13 | Condenser—Tubular Paper 1-200 volt | 12E |
| 340-14 | Condenser—Tubular Paper 2-200 volt | 12F |
| 340-15 | Condenser—Tubular Paper 5-200 volt | 12G |
| 340-16 | Condenser—Tubular Paper 10-200 volt | 12H |
| 340-17 | Condenser—Tubular Paper 20-200 volt | 12I |
| 340-18 | Condenser—Tubular Paper 50-200 volt | 12J |
| 340-19 | Condenser—Tubular Paper 100-200 volt | 12K |
| 340-20 | Condenser—Tubular Paper 200-200 volt | 12L |
| 340-21 | Condenser—Tubular Paper 500-200 volt | 12M |
| 340-22 | Condenser—Tubular Paper 1000-200 volt | 12N |
| 340-23 | Condenser—Tubular Paper 2000-200 volt | 12O |
| 340-24 | Condenser—Tubular Paper 5000-200 volt | 12P |
| 340-25 | Condenser—Tubular Paper 10000-200 volt | 12Q |
| 340-26 | Condenser—Tubular Paper 20000-200 volt | 12R |
| 340-27 | Condenser—Tubular Paper 50000-200 volt | 12S |
| 340-28 | Condenser—Tubular Paper 100000-200 volt | 12T |
| 340-29 | Condenser—Tubular Paper 200000-200 volt | 12U |
| 340-30 | Condenser—Tubular Paper 500000-200 volt | 12V |
| 340-31 | Condenser—Tubular Paper 1000000-200 volt | 12W |
| 340-32 | Condenser—Tubular Paper 2000000-200 volt | 12X |
| 340-33 | Condenser—Tubular Paper 5000000-200 volt | 12Y |
| 340-34 | Condenser—Tubular Paper 10000000-200 volt | 12Z |
| 340-35 | Condenser—Tubular Paper 20000000-200 volt | 12AA |
| 340-36 | Condenser—Tubular Paper 50000000-200 volt | 12AB |
| 340-37 | Condenser—Tubular Paper 100000000-200 volt | 12AC |
| 340-38 | Condenser—Tubular Paper 200000000-200 volt | 12AD |
| 340-39 | Condenser—Tubular Paper 500000000-200 volt | 12AE |
| 340-40 | Condenser—Tubular Paper 1000000000-200 volt | 12AF |
| 340-41 | Condenser—Tubular Paper 2000000000-200 volt | 12AG |
| 340-42 | Condenser—Tubular Paper 5000000000-200 volt | 12AH |
| 340-43 | Condenser—Tubular Paper 10000000000-200 volt | 12AI |
| 340-44 | Condenser—Tubular Paper 20000000000-200 volt | 12AJ |
| 340-45 | Condenser—Tubular Paper 50000000000-200 volt | 12AK |
| 340-46 | Condenser—Tubular Paper 100000000000-200 volt | 12AL |
| 340-47 | Condenser—Tubular Paper 200000000000-200 volt | 12AM |
| 340-48 | Condenser—Tubular Paper 500000000000-200 volt | 12AN |
| 340-49 | Condenser—Tubular Paper 1000000000000-200 volt | 12AO |
| 340-50 | Condenser—Tubular Paper 2000000000000-200 volt | 12AP |
| 340-51 | Condenser—Tubular Paper 5000000000000-200 volt | 12AQ |
| 340-52 | Condenser—Tubular Paper 10000000000000-200 volt | 12AR |
| 340-53 | Condenser—Tubular Paper 20000000000000-200 volt | 12AS |
| 340-54 | Condenser—Tubular Paper 50000000000000-200 volt | 12AT |
| 340-55 | Condenser—Tubular Paper 100000000000000-200 volt | 12AU |
| 340-56 | Condenser—Tubular Paper 200000000000000-200 volt | 12AV |
| 340-57 | Condenser—Tubular Paper 500000000000000-200 volt | 12AW |
| 340-58 | Condenser—Tubular Paper 1000000000000000-200 volt | 12AX |
| 340-59 | Condenser—Tubular Paper 2000000000000000-200 volt | 12AY |
| 340-60 | Condenser—Tubular Paper 5000000000000000-200 volt | 12AZ |
| 340-61 | Condenser—Tubular Paper 10000000000000000-200 volt | 12BA |
| 340-62 | Condenser—Tubular Paper 20000000000000000-200 volt | 12BB |
| 340-63 | Condenser—Tubular Paper 50000000000000000-200 volt | 12BC |
| 340-64 | Condenser—Tubular Paper 100000000000000000-200 volt | 12BD |
| 340-65 | Condenser—Tubular Paper 200000000000000000-200 volt | 12BE |
| 340-66 | Condenser—Tubular Paper 500000000000000000-200 volt | 12BF |
| 340-67 | Condenser—Tubular Paper 1000000000000000000-200 volt | 12BG |
| 340-68 | Condenser—Tubular Paper 2000000000000000000-200 volt | 12BH |
| 340-69 | Condenser—Tubular Paper 5000000000000000000-200 volt | 12BI |
| 340-70 | Condenser—Tubular Paper 10000000000000000000-200 volt | 12BJ |
| 340-71 | Condenser—Tubular Paper 20000000000000000000-200 volt | 12BK |
| 340-72 | Condenser—Tubular Paper 50000000000000000000-200 volt | 12BL |
| 340-73 | Condenser—Tubular Paper 100000000000000000000-200 volt | 12BM |
| 340-74 | Condenser—Tubular Paper 200000000000000000000-200 volt | 12BN |
| 340-75 | Condenser—Tubular Paper 500000000000000000000-200 volt | 12BO |
| 340-76 | Condenser—Tubular Paper 1000000000000000000000-200 volt | 12BP |
| 340-77 | Condenser—Tubular Paper 2000000000000000000000-200 volt | 12BQ |
| 340-78 | Condenser—Tubular Paper 5000000000000000000000-200 volt | 12BR |
| 340-79 | Condenser—Tubular Paper 10000000000000000000000-200 volt | 12BS |
| 340-80 | Condenser—Tubular Paper 20000000000000000000000-200 volt | 12BT |
| 340-81 | Condenser—Tubular Paper 50000000000000000000000-200 volt | 12BU |
| 340-82 | Condenser—Tubular Paper 100000000000000000000000-200 volt | 12BV |
| 340-83 | Condenser—Tubular Paper 200000000000000000000000-200 volt | 12BW |
| 340-84 | Condenser—Tubular Paper 500000000000000000000000-200 volt | 12BX |
| 340-85 | Condenser—Tubular Paper 1000000000000000000000000-200 volt | 12BY |
| 340-86 | Condenser—Tubular Paper 2000000000000000000000000-200 volt | 12BZ |
| 340-87 | Condenser—Tubular Paper 5000000000000000000000000-200 volt | 12CA |
| 340-88 | Condenser—Tubular Paper 10000000000000000000000000-200 volt | 12CB |
| 340-89 | Condenser—Tubular Paper 20000000000000000000000000-200 volt | 12CC |
| 340-90 | Condenser—Tubular Paper 50000000000000000000000000-200 volt | 12CD |
| 340-91 | Condenser—Tubular Paper 100000000000000000000000000-200 volt | 12CE |
| 340-92 | Condenser—Tubular Paper 200000000000000000000000000-200 volt | 12CF |
| 340-93 | Condenser—Tubular Paper 500000000000000000000000000-200 volt | 12CG |
| 340-94 | Condenser—Tubular Paper 1000000000000000000000000000-200 volt | 12CH |
| 340-95 | Condenser—Tubular Paper 2000000000000000000000000000-200 volt | 12CI |
| 340-96 | Condenser—Tubular Paper 5000000000000000000000000000-200 volt | 12CJ |
| 340-97 | Condenser—Tubular Paper 10000000000000000000000000000-200 volt | 12CK |
| 340-98 | Condenser—Tubular Paper 20000000000000000000000000000-200 volt | 12CL |
| 340-99 | Condenser—Tubular Paper 50000000000000000000000000000-200 volt | 12CM |
| 340-100 | Condenser—Tubular Paper 100000000000000000000000000000-200 volt | 12CN |

MODEL 9B

Voltage, Alignment
Resistance

FAIRBANKS, MORSE & CO.

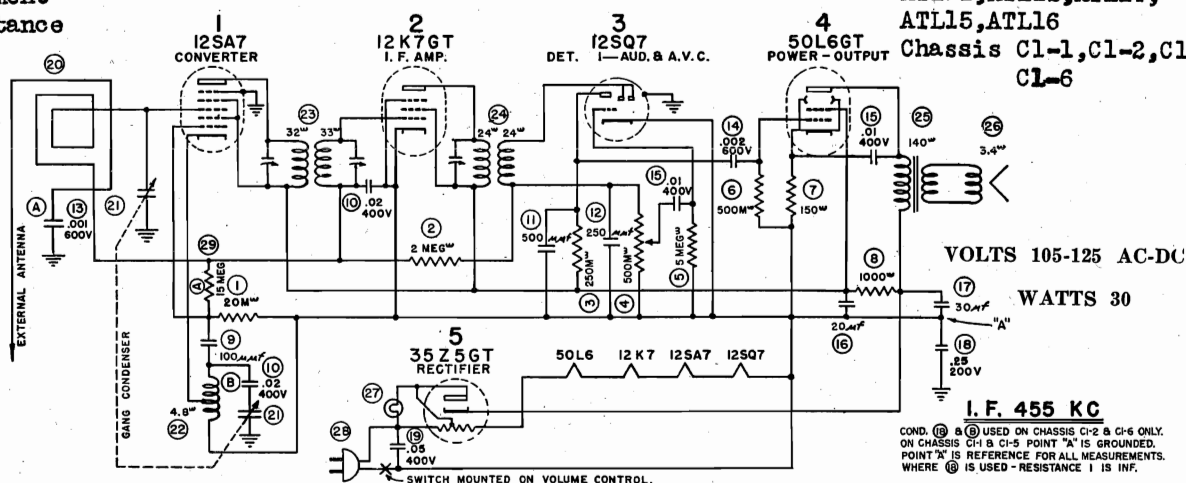
| OHMS | VOLTS | 6K7G R.F. | VOLTS | OHMS | OHMS | VOLTS | 6C5G OSCILLATOR | VOLTS | OHMS | OHMS | VOLTS | 6L7G | VOLTS | OHMS |
|-------|---------|---------------|--------|-------|-------|---------|-----------------|--------|--------|-------|-------|-------|-------|-------|
| 4 MEG | 85V.DC | | 0 | 0 | INF | 0 | | 12V.DC | 40M | 4 MEG | 85 | | -3 | 43 M |
| 4 MEG | 105V.DC | | N.C. | N.C. | 4 MEG | 105V.DC | | 12V.DC | 40M | 4 MEG | 105 | | N.C. | N.C. |
| 102 | 21V.AC | | -.4 | 1 MEG | 4 MEG | 100 | | 21V.AC | 101 | 4 MEG | 99 | 8.2AC | 0 | 19AC |
| 0 | 0 | | 25V.AC | 104 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 2.4 | 330 |
| OHMS | VOLTS | 6K7G I.F. | VOLTS | OHMS | OHMS | VOLTS | 6Q7G | VOLTS | OHMS | OHMS | VOLTS | 25L6G | VOLTS | OHMS |
| 4 MEG | 85 | | 1.6 | 220 | 0 | 0 | | 4 | 1 MEG | 4 MEG | 110 | | -7 | 440M |
| 4 MEG | 105 | | N.C. | N.C. | 4 MEG | 55 | | 105 | 4 MEG | 4 MEG | 105 | | 105 | 4 MEG |
| 108 | 23AC | | -.6 | 1 MEG | 4 MEG | 95 | | -.6 | 500000 | 4 MEG | 125 | 60AC | 34 AC | 117 |
| 0 | 0 | | 29AC | 110 | 0 | 0 | | 8AC | 98 | 0 | 0 | 0 | 0 | 0 |
| OHMS | VOLTS | 80B-1 BALLAST | VOLTS | OHMS | OHMS | VOLTS | 25Z6G | VOLTS | OHMS | OHMS | VOLTS | 6E5 | VOLTS | OHMS |
| 190 | 115AC | | N.C. | N.C. | 4 MEG | 125 | | 120AC | 190 | 1 MEG | -.6 | | 110 | 4 MEG |
| 190 | 115AC | | N.C. | N.C. | 189 | 120AC | | 110 | 4 MEG | N.C. | N.C. | | 0 | 0 |
| N.C. | N.C. | | 85AC | 137 | 136 | 87AC | | 60AC | 121 | N.C. | N.C. | | 0 | 0 |
| N.C. | N.C. | | 80AC | 140 | 0 | 0 | | 125 | 4 MEG | 110 | 34AC | | 29AC | 113 |

VOLTAGE AND RESISTANCE DATA

| No. | Connect Generator To | Signal Generator Setting Freq. Meters | Dummy | Range Switch | Dial Setting Freq. Meters | Stage | Trimmer No. | Peak For | Special Instructions |
|-----|----------------------|---------------------------------------|---------------------|--------------|---------------------------|-------------|-------------|----------|--|
| 1 | 6L7G Grid | 456 KC 658 | .1 mfd. Condenser | Broadcast | 550 KC 550 | 2nd IF | 1 | Max. | Note: On all bands—Do not connect low side of signal generator to chassis pan. Connect to black ground lead. |
| 2 | 6L7G Grid | 456 KC 658 | .1 mfd. Condenser | Broadcast | 550 KC 550 | 2nd IF | 2 | Max. | |
| 3 | 6L7G Grid | 456 KC 658 | .1 mfd. Condenser | Broadcast | 550 KC 550 | 1st IF | 3 | Max. | |
| 4 | 6L7G Grid | 456 KC 658 | .1 mfd. Condenser | Broadcast | 550 KC 550 | 1st IF | 4 | Max. | |
| 5 | Antenna Lead | 350 KC 850 | .1 mfd. Condenser | LW-A | 350 KC 850 | LW Osc. | 14 | Max. * | *On LW Band—Keep Antenna and speaker leads separated when aligning, to avoid regeneration. |
| 6 | Antenna Lead | 350 KC 850 | .1 mfd. Condenser | LW-A | 350 KC 850 | LW R.F. | 15 | Max. * | |
| 7 | Antenna Lead | 350 KC 850 | .1 mfd. Condenser | LW-A | 350 KC 850 | LW Ant. | 16 | Max. * | Check Calibration at 175 KC., 1700 Meters. |
| 8 | Antenna Lead | 1500 KC 200 | 200 mmfd. Condenser | BC-B | 1500 KC 200 | BC Osc. | 5 | Max. | |
| 9 | Antenna Lead | 1500 KC 200 | 200 mmfd. Condenser | BC-B | 1500 KC 200 | BC R.F. | 6 | Max. | Check Calibration at 600 KC., 500 Meters. |
| 10 | Antenna Lead | 1500 KC 200 | 200 mmfd. Condenser | BC-B | 1500 KC 200 | BC Ant. | 7 | Max. | |
| 11 | Antenna Lead | 6.0 MC 50 | 400 ohm Resistor | Pol.-C | 6.0 MC. 50 | Police Osc. | 8 | Max. | **Check for image at 17.1 MC., or 17.5 meters approx. If not received, oscillator is not aligned on fundamental. |
| 12 | Antenna Lead | 6.0 MC. 50 | 400 ohm Resistor | Pol.-C | 6.0 MC. 50 | Police R.F. | 9 | Max. | |
| 13 | Antenna Lead | 6.0 MC. 50 | 400 ohm Resistor | Pol.-C | 6.0 MC. 50 | Police Ant. | 10 | Max. | Check Calibration at 2.5 MC., 120 Meters. |
| 14 | Antenna Lead | 18 MC 17 | 400 ohm Resistor | SW-D | 18 MC. 17 | SW Osc. | 11 | Max. ** | |
| 15 | Antenna Lead | 18 MC 17 | 400 ohm Resistor | SW-D | 18 MC. 17 | SW R.F. | 12 | Max. | Check Calibration at 7.5 MC., 40 meters. |
| 16 | Antenna Lead | 18 MC 17 | 400 ohm Resistor | SW-D | 18 MC. 17 | SW Ant. | 13 | Max. | |

ALIGNMENT PROCEDURE CHART

MODELS AT10,AT11,AT12
AT14,AT15,AT16,ATL10,
ATL11,ATL12,ATL14,
ATL15,ATL16
Chassis C1-1,C1-2,C1-
C1-6



| <u>VOLTAGE</u> | | <u>RESISTANCE</u> | | <u>VOLTAGE</u> | | <u>RESISTANCE</u> | | <u>VOLTAGE</u> | | <u>RESISTANCE</u> | | <u>VOLTAGE</u> | | <u>RESISTANCE</u> | |
|----------------|------------|-------------------|-----------|----------------|----------|-------------------|----------|----------------|----------|-------------------|----------|----------------|----------|-------------------|----------|
| 1 NONE | 1 NONE | 1 NONE | 1 NONE | 1 NONE | 1 NONE | 1 NONE | 1 NONE | 1 NONE | 1 NONE | 1 NONE | 1 NONE | 1 NONE | 1 NONE | 1 NONE | 1 NONE |
| 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC | 2 30° AC |
| 3 NONE | 3 INF* | 3 INF* | 3 INF* | 3 NONE | 3 NONE | 3 NONE | 3 NONE | 3 NONE | 3 NONE | 3 INF* | 3 INF* | 3 INF* | 3 INF* | 3 INF* | 3 INF* |
| 4 82° | 4 INF* | 4 82° | 4 INF* | 4 82° | 4 INF* | 4 82° | 4 INF* | 4 82° | 4 INF* | 4 82° | 4 INF* | 4 82° | 4 INF* | 4 82° | 4 INF* |
| 5 500W | 5 500W | 5 500W | 5 500W | 5 500W | 5 500W | 5 500W | 5 500W | 5 500W | 5 500W | 5 500W | 5 500W | 5 500W | 5 500W | 5 500W | 5 500W |
| 6 NONE | 6 NONE | 6 2.5 MEG | 6 2.5 MEG | 6 NONE | 6 NONE | 6 55° | 6 55° | 6 NONE | 6 NONE | 6 55° | 6 55° | 6 NONE | 6 NONE | 6 55° | 6 55° |
| 7 11AC | 7 12W | 7 22AC | 7 24W | 7 11AC | 7 12W | 7 11AC | 7 12W | 7 11AC | 7 12W | 7 11AC | 7 12W | 7 11AC | 7 12W | 7 11AC | 7 12W |
| 8 NONE | 8 2.5 MEGW | 8 NONE | 8 NONE | 8 NONE | 8 NONE | 8 NONE | 8 NONE | 8 NONE | 8 NONE | 8 78AC | 8 78AC | 8 NONE | 8 NONE | 8 130° | 8 130° |

- † - THIS VALUE WILL VARY WITH VOLTMETER DUE TO SERIES RESISTOR.
- * - RESISTANCE WILL DEPEND ON CONDITION OF ELECTROLYTIC CONDENSER.

BOTTOM VIEW OF SOCKETS

VOLTMETER RESISTANCE 1000^Ω PER VOLT.
LINE VOLTAGE 117 VOLTS.

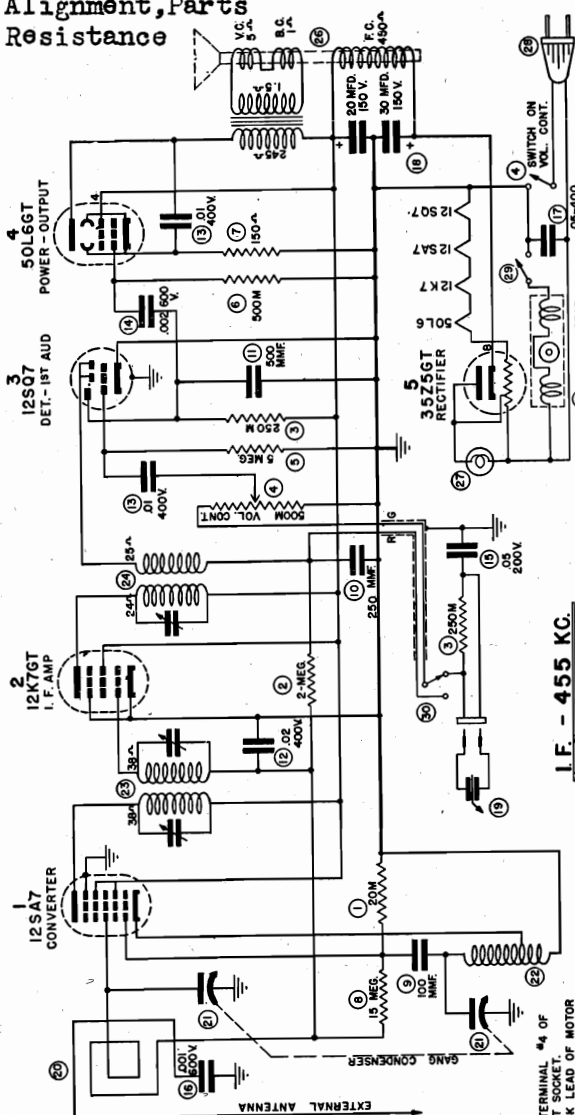
With the low side (G) of the signal generator connected to the chassis through a .01 mfd. 200 Volt condenser, the following procedure should be used when aligning the receiver:

TABULATION FOR ALIGNMENT

| STEPS | Connect High Side of Generator to | Set Generator at | Set Gang at | Adjust the following | Located | To obtain |
|-------|---|-------------------------------|------------------|----------------------------|------------------------|----------------|
| 1. | SET VOLUME CONTROL AT MAXIMUM | | | | | MAXIMUM OUTPUT |
| 2. | 12K7GT I.F. Grid Cap in Series with .01 Mfd.* | 455 Kc. | A Quiet Point | 2nd I .F. Trimmer Only one | Top of Chassis | |
| 3. | High Side of Loop in Series with .01 Mfd. | | | 1st I. F. Trimmers 2 used | End of Chassis | |
| 4. | Antenna in Series with 1000 mmf. | 1730 Kc. | Minimum Capacity | Oscillator Trimmer | Side of Gang Condenser | |
| 5. | | 1400 Kc. | 1400 Kc. | Antenna Trimmer | | |
| 6. | | 600 Kc. | 600 Kc. | End Plates of Gang | | |
| 7. | | RECHECK ALL ABOVE ADJUSTMENTS | | | | |

*Do not remove grid cap.

| Ref. No. | Part No. | DESCRIPTION |
|----------|----------|--------------------------------|
| 1 | 773-16 | 20 M ohms— $\frac{1}{2}$ W. |
| 2 | 773-25 | 2 Meg.— $\frac{1}{2}$ W. |
| 3 | 773-21 | 250 M ohms— $\frac{1}{2}$ W. |
| 4 | 782-1 | 500 M ohms Var. Vol. Cont. |
| 5 | 773-27 | 5 Meg.— $\frac{1}{2}$ W. |
| 6 | 773-23 | 500 M ohms— $\frac{1}{2}$ W. |
| 7 | 773-35 | 150 ohms— $\frac{1}{2}$ W.—10% |
| 8 | 775-9 | 1000 ohms—1 W. |
| 9 | 253-1 | 100 mmf.—Mica |
| 10 | 255-3 | .02 mfd. 400 V. |
| 11 | 253-3 | 500 mmf.—Mica |
| 12 | 253-2 | 250 mmf.—Mica |
| 13 | 255-1 | .01 mfd. 400 V. |
| 14 | 254-5 | .002 mfd. 600 V. |
| 15 | 255-1 | .01 mfd. 400 V. |
| 16 & 17 | 259-1 | 20 mfd. - 30 mfd.—150 V. |
| 18 | 256-3 | .25 mfd. 200 V. |
| 19 | 255-2 | .05 mfd. 400 V. |
| 20 | 388-1 | Lcop & Shield Assembly |



ALIGNMENT **WATTS 50 VOLTS 105-125 AC**

With the low side of the signal generator connected to the chassis through a .01 mfd. 200 volt condenser, the following procedure should be used when aligning the receiver:

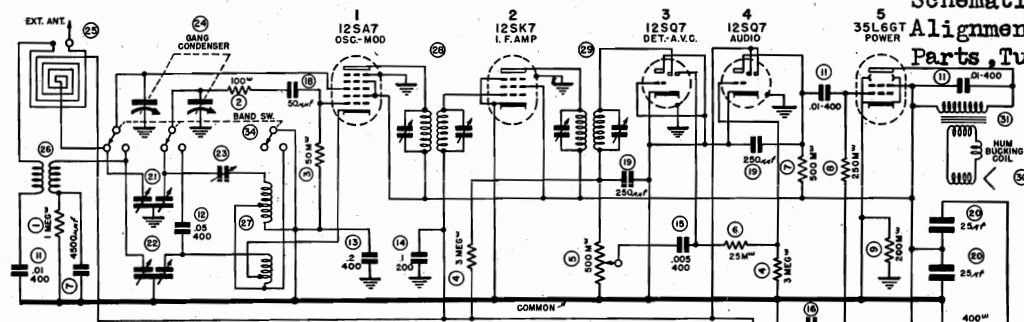
| STEPS | Use in Series With Generator | Set Generator at | Set Gang at | Adjust | Located | To obtain |
|-------------------------------|--|---|-------------|---|----------------------------------|-----------|
| SET VOLUME CONTROL AT MAXIMUM | | | | | | |
| 1. | Replacement Cartridge Loop & Shield assy. Gang Condenser. Oscillator Coil. 1st I. F. Transformer. 2nd I. F. Transformer. | | | | | |
| 2. | Phono Motor. Speaker Complete. Pilot Lamp | .01 mfd. to grid cap of 12K7GT I. F.* .01 to high side of loop | 455 Kc. | 2nd I. F. trimmer (1) 1st I. F. trimmers (2) | Top of Chassis End of Chassis | |
| 3. | Line Cord. Automatic Stop Assembly. Phono-radio Switch | | 1730 Kc. | Oscillator Trimmer | Side of Gang | |
| 4. | Cardboard back. Tone Arm. Tone Arm Rest Dial Scale | 1000 mmf. to antenna | 1400 Kc. | Antenna Trimmer | Condenser | |
| 5. | Dial Cover. Dial Pointer. Dial Pointer. Knob Walnut. | 600 Kc. | 600 Kc. | End Plates of Gang | | |
| 6. | Idle Retaining Spring Phono Idler Pulley Snap Buttons (for back) Needle Cup Needle Screw | | | | | |
| 7. | RECHECK ALL ABOVE ADJUSTMENTS | | | | | |
| *Do not remove grid cap. | | | | | | |

***Do not remove grid cap.**

FARNESWORTH TELEV. & RADIO CORP.

MODELS AT-20 to AT23

Chassis C5-1

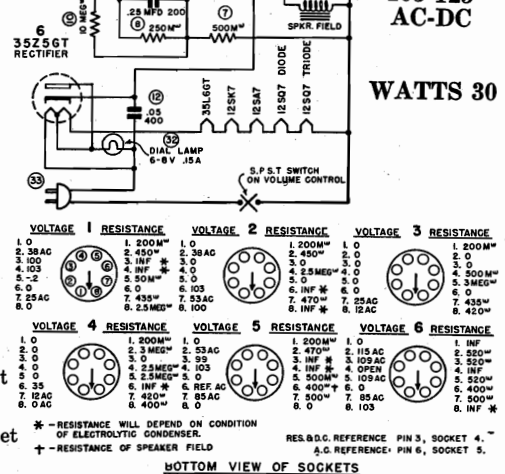
Schematic, Voltage
Alignment, Resistance
Parts, TunerVOLTS
105-125
AC-DC

WATTS 30

Ref.
No. Part No.

INTERMEDIATE FREQUENCY 455 KC

| | | | | | |
|----|--------|---------------------------|----|--------|--------------------------------|
| 1 | 771-24 | 1 meg. ohm | 26 | 3828-1 | S.W. Antenna Coil |
| 2 | 771-34 | 100 ohm | 27 | 3829-1 | Oscillator Coil |
| 3 | 771-48 | 50 M ohm | 28 | 3826-1 | 1st I. F. Transformer |
| 4 | 771-26 | 3 meg. ohm | 29 | 3827-1 | 2nd I. F. Transformer |
| 5 | 785-1 | 500 M ohms Volume | 30 | 816-1 | Complete Speaker |
| 6 | 771-16 | 25 M ohms Control | 32 | 421-1 | Dial Light Mazda No. 47 |
| 7 | 771-23 | 500 M ohms | 34 | 906-1 | Wave Changes Switch |
| 8 | 771-21 | 250 M ohms | | 413-1 | Call Letter Kit |
| 9 | 771-21 | 200 M ohms | | 3116-1 | Dial Scale |
| 10 | 771-29 | 10 meg ohms | | 921-2 | Dial Cord |
| 11 | 255-1 | .01 mfd. 400 V. | | 1311-1 | Dial Pointer |
| 12 | 255-2 | .05 mfd. 400 V. | | 3117-1 | Dial Crystal |
| 13 | 255-6 | .2 mfd. 400 V. | | 0710-1 | Dial Escutcheon |
| 14 | 256-2 | .1 mfd. 200 V. | | 5647-1 | Button Escutcheon |
| 15 | 255-5 | .005 mfd. 400 V. | | 5914-3 | Tuning Knob Beetle W-23 |
| 16 | 256-3 | .25 mfd. 200 V. | | 5914-1 | Tuning Knob Red |
| 17 | 2513-4 | 4500 mmfd. \pm 3% | | 5914-2 | Tuning Knob for Wood Cabinet |
| 18 | 253-3 | 50 mmfd. | | 5915-1 | Tuning Button Beetle W-23 |
| 19 | 253-2 | 250 mmfd. | | 5915-2 | Tuning Button Red |
| 20 | 2515-1 | 25 mfd. 200 V. | | 5916-1 | Tuning Button for Wood Cabinet |
| 21 | 2613-1 | Dual Antenna Trimmer | | 5646-1 | Dial Shaft |
| 22 | 2612-1 | Dual Oscillator Trimmer | | | |
| 23 | 2614-1 | 600 Kc. Pac 200—600 mmfd. | | | |
| 24 | 2611-1 | Gang Condenser | | | |
| 25 | 3830-1 | Loop Antenna | | | |



PUSH BUTTON SET UP

At the right hand end of the top of the cabinet four buttons project. These buttons are set for stations by—

1. Loosen button to be set by unscrewing it about one full turn.
2. Depress button which is to be set up.

3. While holding button down, carefully tune in the station to be set up.

4. Tighten button—detune set and check button by depressing it.

The other three buttons are set up in the same manner.

ALIGNMENT PROCEDURE

To properly align this set an output meter and a signal generator are required. The generator must be calibrated at the following points: 455 Kc., 600 Kc., 1400 Kc., 1600 Kc., 6 Mc., 10 Mc., 15 Mc., and 18.3 Mc.

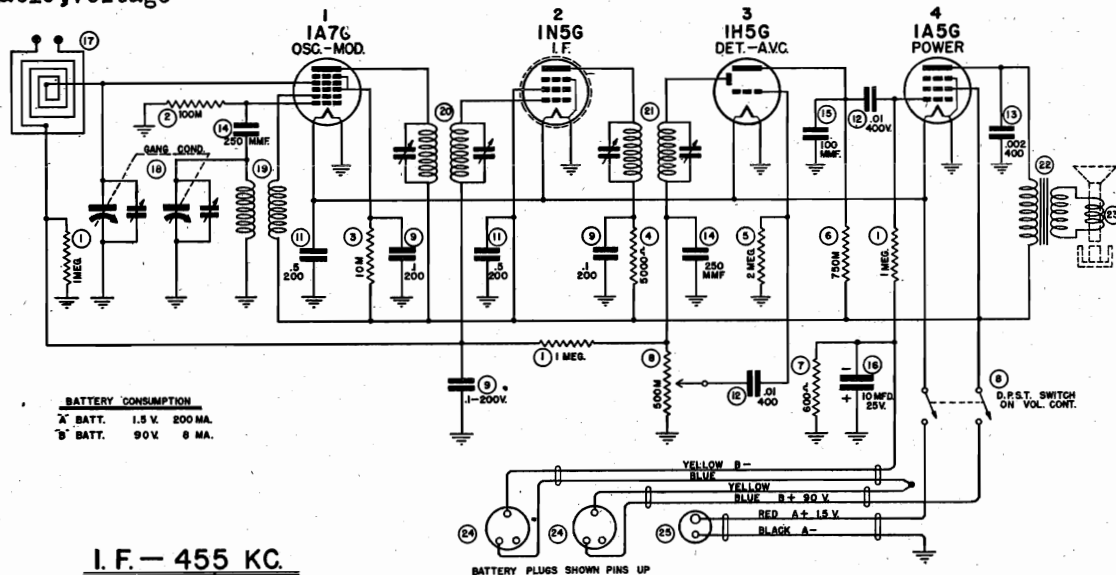
Always run the output of the signal generator as low as possible and still have accurate readings of the output meter. Connect high side of generator to antenna lead and low side to chassis through .01 condenser.

| STEPS | In Series With Antenna | Set Generator at | Set Gang at | Adjust | Located | To obtain |
|-------|----------------------------------|---------------------|---|-----------------------|--|----------------|
| 1. | SET VOLUME CONTROL AT MAXIMUM | | | | | MAXIMUM OUTPUT |
| 2. | 250 mmfd. | 455 Kc. | Minimum | 2nd I. F. Trimmers | Front Top of Chassis | |
| 3. | | | | 1st I. F. Trimmers | Rear Top of Chassis | |
| 4. | | 1600 Kc. | | B. C. Osc. Trimmer | Rear Side | |
| 5. | | 1400 Kc. | Strongest Sig. & Rock Gang While Adjust. Is Made | B.C. R.F. Trimmer | Osc. is Right hand. R.F. Left Hand Screw | |
| 6. | | 600 Kc. | | B.C. Pad | Top of Chassis | |
| 7. | Recheck | 1400 Kc. | | | | |
| 8. | 400 ohms No Condenser | 18.3 Mc. | Minimum | S.W. Osc. Trimmer | Bottom of Osc. Coil. | |
| 9. | | 15.0 Mc. | Strongest Sig. & Rock Gang | S.W. R.F. Trimmer | Osc. Trimmer Is Nearest Rear of Chassis | |
| 10. | CHECK SIGNAL AT 6 Mc. and 10 Mc. | | | | | |

MODEL AT-30
Chassis C6-1
Schematic, Voltage

FARNESWORTH TELEV. & RADIO CORP.

Alignment, Parts
Resistance



I.F. — 455 KC.

Any combination of one 11½ volt "A" battery and two 45 volt "B" batteries that will fit in the receiver case will be satisfactory. Battery drain is .2 amp., at 11½ volts and 9 ma., at 90 volts.

| VOLTAGE | 1 | RESISTANCE | VOLTAGE | 2 | RESISTANCE | VOLTAGE | 3 | RESISTANCE | VOLTAGE | 4 | RESISTANCE |
|---------|---|------------|---------|---|------------|---------|---|------------|---------|---|------------|
| 1. 0 | 1 | 1 MEG | 1. 0 | 1 | 1 MEG | 1. 0 | 1 | 1 MEG | 1. 0 | 1 | 1 MEG |
| 2. 0 | 2 | 0 | 2. 0 | 2 | 0 | 2. 0 | 2 | 0 | 2. 0 | 2 | 0 |
| 3. 0.5 | 3 | 0.5 | 3. 0.5 | 3 | 0.5 | 3. 0.5 | 3 | 0.5 | 3. 0.5 | 3 | 0.5 |
| 4. 0.5 | 4 | 0.5 | 4. 0.5 | 4 | 0.5 | 4. 0.5 | 4 | 0.5 | 4. 0.5 | 4 | 0.5 |
| 5. 0.5 | 5 | 0.5 | 5. 0.5 | 5 | 0.5 | 5. 0.5 | 5 | 0.5 | 5. 0.5 | 5 | 0.5 |
| 6. 0.5 | 6 | 0.5 | 6. 0.5 | 6 | 0.5 | 6. 0.5 | 6 | 0.5 | 6. 0.5 | 6 | 0.5 |
| 7. 1.5 | 7 | 1.5 | 7. 1.5 | 7 | 1.5 | 7. 1.5 | 7 | 1.5 | 7. 1.5 | 7 | 1.5 |
| 8. 0 | 8 | 0 | 8. 0 | 8 | 0 | 8. 0 | 8 | 0 | 8. 0 | 8 | 0 |
| CAP. 0 | | | CAP. 0 | | | CAP. 0 | | | CAP. 0 | | |

BOTTOM VIEW OF SOCKETS

*DEPENDS ON SENSITIVITY OF METER.
RESISTANCE MEASUREMENTS MADE WITH BATTERIES DISCONNECTED.
VOLTAGE & RESISTANCE MEASURED TO GROUND WITH A 1000 Ω PER VOLT VOLTMETER.

| Ref. No. | Part No. | Resistors | 16 | 2518-1 | Electrolytic Condensers |
|----------|----------|-----------------------------|----|--------|--------------------------|
| 1 | 771-24 | 1 meg | 17 | 3839-1 | 10 mfd. 25 V. |
| 2 | 771-19 | 100 M | 18 | 2617-1 | Miscellaneous |
| 3 | 771-44 | 10 M | 19 | 3840-1 | Loop Antenna |
| 4 | 771-13 | 5 M | 20 | 3841-1 | Gang Condensers |
| 5 | 771-25 | 2 meg | 21 | 3842-1 | Oscillator Coil |
| 6 | 771-91 | 750 M | 22 | 9412-1 | 1st I. F. Transformer |
| 7 | 771-88 | 600 ohms | 23 | 817-1 | 2nd I. F. Transformer |
| 8 | 788-1 | 500 M Volume Control | 24 | 8016-1 | Output Transformer |
| 9 | 256-2 | Tubular Condensers & Switch | 25 | 8019-1 | Speaker |
| 11 | 256-5 | .1 mfd. 200 V. | | 3130-1 | 3 Prong Battery Plug |
| 12 | 255-1 | .5 mfd. 200 V. | | 3129-1 | 2 Prong Battery Plug |
| 13 | 255-4 | .01 mfd. 400 V. | | 5657-1 | Dial Crystal |
| | | .002 mfd. 400 V. | | 9210-1 | Dial Scale |
| 14 | 253-2 | Mica Condensers | | 5917-2 | Dial Pointer |
| 15 | 253-1 | 250 mmfd. | | 5920-1 | Dial Drive Cable |
| | | 100 mmfd. | | 644-1 | Knob Marked "Tuning" |
| | | | | | Knob Marked "Off-Volume" |
| | | | | | Dial Cord Spring |

ALIGNMENT

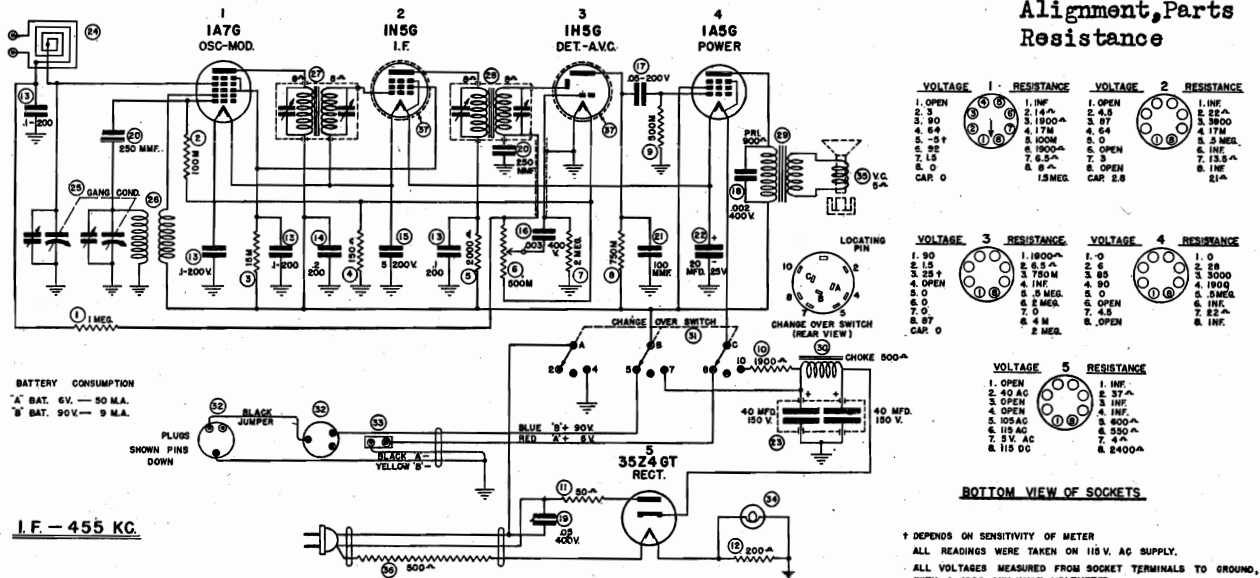
To properly align this receiver, a signal generator calibrated at 455 Kc., 1400 Kc., and 1730 Kc., is required. After aligning the I. F. stages, replace receiver in cabinet and FASTEN LOOP IN NORMAL POSITION before aligning the R. F. end through the openings in the end of the cabinet. These openings are closed by snap fasteners. The oscillator trimmer is nearest the front panel and the loop trimmer is directly behind it.

| STEPS | Use in Series With Generator | Set Generator at | Set Gang at | Adjust | Located | To obtain |
|-------|---|---------------------|---------------------------|------------------------|------------------------|-------------------|
| 1. | .02 mfd. to Chassis Connect high side of Generator to grid cap of 1A7G tube. | 455 Kc. | Quiet Point | 2nd I. F. Trimmers | Top of I. F. Trans. | MAXIMUM OUTPUT |
| | | | | 1st I. F. Trimmers | | |
| 2. | Loop** | 1730 Kc. | 1730 Kc. | Oscillator Trimmer* | See Note Below | |
| 3. | Loop** | 1400 Kc. | 1400 Kc. and Rock Gang | Loop Trimmer* | | |

*See preceding paragraph for location of trimmers.

**Loop to consist of five to ten turns of insulated wire wound on a three to four inch form to be closely coupled to the loop antenna in the receiver.

FARNESWORTH TELEV. & RADIO CORP.

MODEL AT-31
Chassis C7-1
Schematic, Voltage
Alignment, Parts
Resistance


| Ref. No. | Part No. | WATTS 30 | VOLTS 105-125 AC-DC |
|----------|----------|--------------------------|---------------------|
| 1 | 771-24 | 1 meg..... | 23 2516-1 |
| 2 | 773-19 | 100 M ohm..... | 24 3833-1 |
| 3 | 771-45 | 15 M ohm..... | 25 2615-1 |
| 4 | 771-50 | 150 ohm..... | 26 3834-1 |
| 5 | 771-41 | 2 M ohm..... | 27 3831-1 |
| 6 | 786-1 | 500 M ohm volume control | 28 3832-1 |
| 7 | 771-25 | 2 meg..... | 29 9410-1 |
| 8 | 771-91 | 750 M ohm..... | 30 9411-1 |
| 9 | 771-23 | 500 M ohm..... | 31 908-1 |
| 10 | 779-1 | 1900 ohm candohm..... | 32 8016-1 |
| 11 | 771-32 | 50 ohm..... | 33 8017-1 |
| 12 | 778-1 | 200 ohm flexible..... | 34 422-1 |
| 13 | 256-2 | .1 200 V..... | 35 818-1 |
| 14 | 256-4 | .2 200 V..... | 36 222-1 |
| 15 | 256-5 | .5 200 V..... | 3118-1 |
| 16 | 254-3 | .003 400..... | 5651-1 |
| 17 | 256-1 | .05 200..... | 0712-1 |
| 18 | 255-4 | .002 400..... | 5917-1 |
| 19 | 255-2 | .05 400..... | 5917-2 |
| 20 | 253-2 | 250 mmfd. Mica..... | 5918-1 |
| 21 | 253-1 | 100 mmfd. Mica..... | 926-1 |
| 22 | 2517-1 | 20 mfd. 25 V..... | 5652-1 |

WHEN INSTALLING BATTERIES

1. Remove corner brackets. These lift out readily.
2. Put "B" battery against left wall of cabinet. Push against front panel, then slide as far to right as possible against wooden block. Insert other "B" battery in space just vacated.
3. If batteries stick, opening bottom door will facilitate installation.

ALIGNMENT

A signal generator calibrated at 455 Kc., 1400 Kc., and 1730 Kc., is necessary to properly align this receiver. After aligning the I. F. stages, replace receiver in cabinet and fasten loop in normal position before aligning the R. F. end through the openings in the end of the cabinet. These openings are closed by snap fasteners. The oscillator trimmer is nearest the front panel and the loop trimmer is directly behind it.

| STEPS | Use in Series with Generator | Set Generator at | Set Gang at | Adjust | Located | To obtain |
|-------|--|---------------------|-------------------------|--|------------------------|-------------------|
| 1. | .02MFD in each lead Connect high side of generator to grid cap of 1A7G tube | 455 Kc. | Quiet Point | 2nd I. F. Trimmers 1st I. F. Trimmers | Top of I. F. Trans. | MAXIMUM OUTPUT |
| 2. | Loop** | 1730 Kc. | Minimum | Oscillator Trimmer* | See Note Below | |
| 3. | Loop** | 1400 Kc. | 1400 Kc. & Rock Gang | Loop Trimmer* | | |

*See preceding paragraph for location of trimmers.

**Loop to consist of five to ten turns of insulated wire wound on a three to four inch form to be closely coupled to the loop antenna in the receiver.

MODEL AT-40

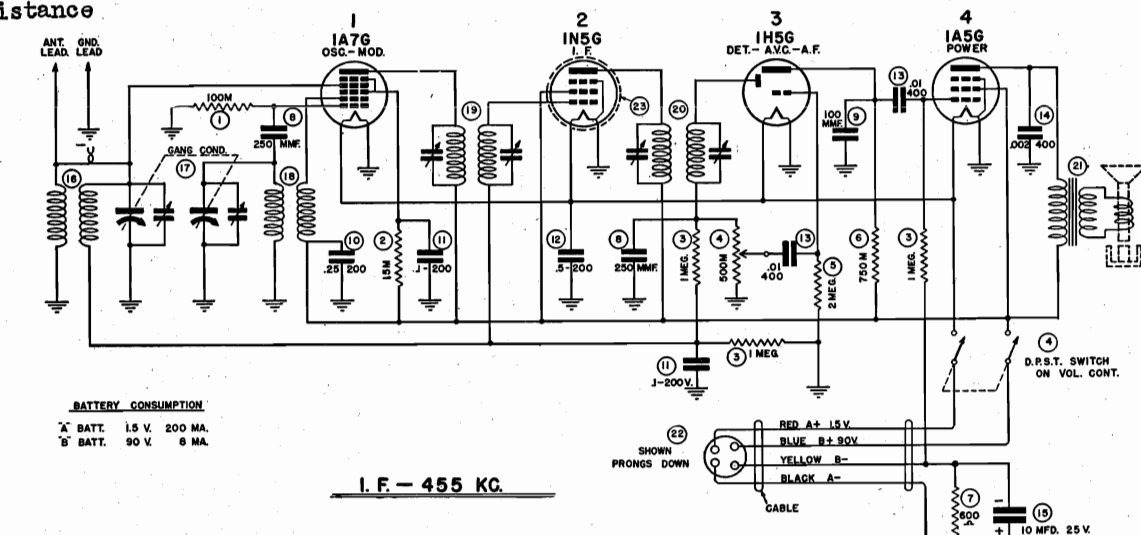
Chassis C8-1.

FARNESWORTH TELEV. & RADIO CORP.

Schematic, Voltage

Alignment, Parts

Resistance



BATTERY CONSUMPTION

A BATT. 1.5 V. 200 MA.
B BATT. 90 V. 8 MA.

I. F. - 455 KC.

| VOLTAGE | RESISTANCE |
|---------|------------|
| 1. OPEN | 1. INF. |
| 2. 0 | 2. 0* |
| 3. 85 | 3. INF. |
| 4. 57 | 4. INF. |
| 5. -57 | 5. 100M |
| 6. 85 | 6. 1 MEG. |
| 7. 1.5 | 7. 2.4 |
| 8. 85 | 8. INF. |

| VOLTAGE | RESISTANCE |
|---------|------------|
| 1. OPEN | 1. INF. |
| 2. 0 | 2. 0* |
| 3. 85 | 3. INF. |
| 4. 85 | 4. INF. |
| 5. 85 | 5. INF. |
| 6. 85 | 6. INF. |
| 7. 1.5 | 7. 2.4 |
| 8. OPEN | 8. INF. |

| VOLTAGE | RESISTANCE |
|---------|------------|
| 1. OPEN | 1. INF. |
| 2. 1.5 | 2. 2.4 |
| 3. 85 | 3. INF. |
| 4. 0 | 4. INF. |
| 5. 0 | 5. INF. |
| 6. 0 | 6. INF. |
| 7. 0 | 7. 0 |
| 8. 0 | 8. INF. |

| VOLTAGE | RESISTANCE |
|----------|------------|
| 1. OPEN | 1. INF. |
| 2. 1.5 | 2. 2.4 |
| 3. 85 | 3. INF. |
| 4. 85 | 4. INF. |
| 5. -0.2* | 5. INF. |
| 6. -5 | 6. 600 |
| 7. 0 | 7. 0 |
| 8. OPEN | 8. INF. |

BOTTOM VIEW OF SOCKETS

* DEPENDS ON SENSITIVITY OF METER.
ALL VOLTAGES AND RESISTANCE MEASURED TO GROUND.
MEASURE RESISTANCE WITH BATTERY DISCONNECTED.

| Ref. No. | Part No. | | | | | |
|----------|----------|--|----|--------|--|--------------------------------|
| | | Resistors | | | | Electrolytic Condensers |
| | | 100 M ohm..... | 15 | 2518-1 | | 10 mfd. 25 V..... |
| | | 15 M ohm..... | 16 | 3837-1 | | Miscellaneous |
| | | 1 meg..... | 17 | 2616-1 | | Antenna Coil..... |
| | | 500 M ohm Volume Control & Switch..... | 18 | 3838-1 | | Gang Condenser..... |
| | | 2 meg..... | 19 | 3835-1 | | Oscillator Coil..... |
| | | 750 M ohm..... | 20 | 3836-1 | | 1st I. F. Transformer..... |
| | | 600 ohm..... | 21 | 819-1 | | 2nd I. F. Transformer..... |
| | | Mica Condensers | 22 | 8018-1 | | Speaker Complete..... |
| | | 250 mmfd. Mica..... | 23 | | | Battery Plug 4 Prong..... |
| | | 100 mmfd. Mica..... | | | | Tube Shield..... |
| | | Tubular Condensers | | | | Dial Pointer..... |
| | | .25 mfd. 200 V..... | | 5655-1 | | Dial Escutcheon..... |
| | | .1 mfd. 200 V..... | | 5656-1 | | Dial Scale..... |
| | | .5 mfd. 200 V..... | | 3120-1 | | Knobs..... |
| | | .01 mfd. 400 V..... | | 5919-1 | | Dial Cord..... |
| | | .002 mfd. 400 V..... | | 926-2 | | Dial Shaft..... |
| | | | | 5653-1 | | Dial Indicator..... |
| | | | | 5654-1 | | Dial Crystal..... |
| | | | | 3121-1 | | |

This set is designed to be used with an outdoor antenna which should be placed as high as possible and as far as possible from sources of interference. A good ground connection should be used.

ALIGNMENT

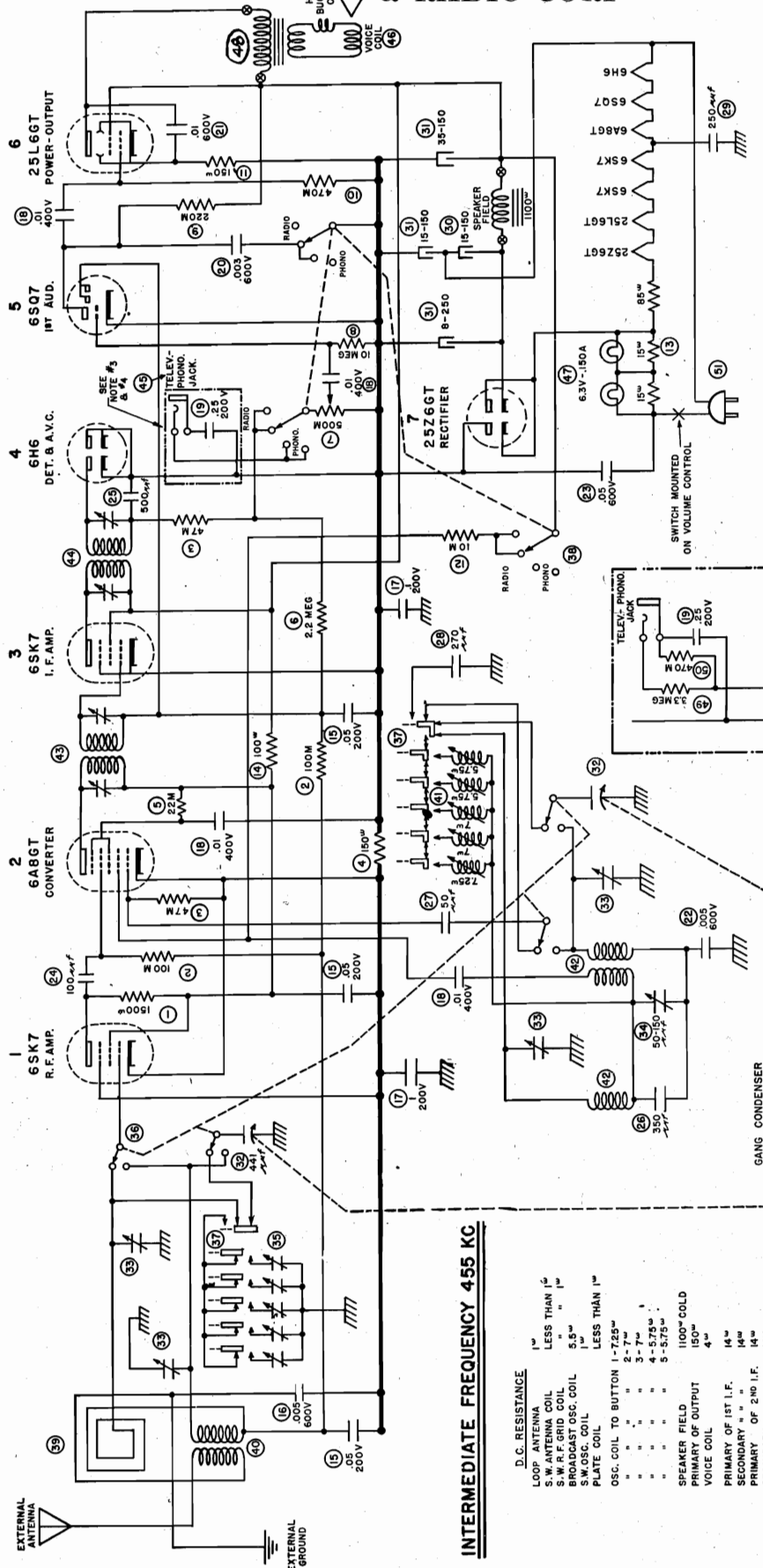
To properly align this receiver, an output meter and a signal generator are required. The generator must be calibrated at the following frequencies: 455 Kc., 600 Kc., 1400 Kc., and 1700 Kc. The volume control must be set at maximum and the signal generator at the lowest value that will give an accurate reading on the output meter. The high side of the generator is connected to the blue antenna lead and the low side is connected to the black lead.

| STEPS | In Series With Antenna | Set Generator at | Set Gang at | Adjust | Located | To obtain |
|-------|--------------------------------|------------------|---|---------------------|-------------------|----------------|
| 1. | SET VOLUME CONTROL AT MAXIMUM. | | | | | |
| 2. | 250 mmf. | 455 Kc. | Minimum | 2nd I. F. Trimmers | Top of I. F. | MAXIMUM OUTPUT |
| 3. | | | | 1st I. F. Trimmers | | |
| 4. | | 1700 Kc. | 1700 Kc. | Oscillating Trimmer | Top Front of Gang | |
| 5. | | 1400 Kc. | Strongest Signal and Rock Gang While Adjustment is Made | Antenna Trimmer | Top Rear of Gang | |

Schematic, Voltage Resistance

FARNESWORTH TELEVISION & RADIO CORP

MODELS ATL50, -52
Chassis C2-1
ATL51, Chassis C2-2
ATL55, -56, Ch. C2-3
ATL58, -59, Ch. C2-4



VOLTS 105-125 AC

WATTS 60

NOTE: 3-ABOVE CIRCUIT CHANGE APPLIES TO COMBINATION MODELS AK-58 & AK-59 ONLY.

INTERMEDIATE FREQUENCY 455 KC

| D.C. RESISTANCE | 1" |
|-----------------------|--------------|
| LOOP ANTENNA | LESS THAN 1" |
| S.W. ANTENNA COIL | LESS THAN 1" |
| S.W. R.F. GRID COIL | LESS THAN 1" |
| BROADCAST OSC. COIL | LESS THAN 1" |
| OSC. COIL TO BUTTON | 1-725" |
| OSC. COIL TO BUTTON | 3-7" |
| OSC. COIL TO BUTTON | 4-575" |
| OSC. COIL TO BUTTON | 5-575" |
| SPEAKER FIELD | 1100" COLD |
| PRIMARY OF OUTPUT | 150" |
| VOICE COIL | 4" |
| PRIMARY OF 1ST I.F. | 14" |
| SECONDARY OF 2ND I.F. | 14" |
| SECONDARY " | 14" |

| VOLTAGE | RESISTANCE |
|---------|------------|
| 1 0 AC | 1 INF |
| 2 0 AC | 2 INF |
| 3 0 AC | 3 INF |
| 4 0 AC | 4 INF |
| 5 0 AC | 5 INF |
| 6 0 AC | 6 INF |
| 7 0 AC | 7 INF |
| 8 0 AC | 8 INF |
| 9 0 AC | 9 INF |
| 10 0 AC | 10 INF |

| VOLTAGE | RESISTANCE |
|---------|------------|
| 1 0 AC | 1 INF |
| 2 0 AC | 2 INF |
| 3 0 AC | 3 INF |
| 4 0 AC | 4 INF |
| 5 0 AC | 5 INF |
| 6 0 AC | 6 INF |
| 7 0 AC | 7 INF |
| 8 0 AC | 8 INF |
| 9 0 AC | 9 INF |
| 10 0 AC | 10 INF |

| VOLTAGE | RESISTANCE |
|---------|------------|
| 1 0 AC | 1 INF |
| 2 0 AC | 2 INF |
| 3 0 AC | 3 INF |
| 4 0 AC | 4 INF |
| 5 0 AC | 5 INF |
| 6 0 AC | 6 INF |
| 7 0 AC | 7 INF |
| 8 0 AC | 8 INF |
| 9 0 AC | 9 INF |
| 10 0 AC | 10 INF |

| VOLTAGE | RESISTANCE |
|---------|------------|
| 1 0 AC | 1 INF |
| 2 0 AC | 2 INF |
| 3 0 AC | 3 INF |
| 4 0 AC | 4 INF |
| 5 0 AC | 5 INF |
| 6 0 AC | 6 INF |
| 7 0 AC | 7 INF |
| 8 0 AC | 8 INF |
| 9 0 AC | 9 INF |
| 10 0 AC | 10 INF |

| VOLTAGE | RESISTANCE |
|---------|------------|
| 1 0 AC | 1 INF |
| 2 0 AC | 2 INF |
| 3 0 AC | 3 INF |
| 4 0 AC | 4 INF |
| 5 0 AC | 5 INF |
| 6 0 AC | 6 INF |
| 7 0 AC | 7 INF |
| 8 0 AC | 8 INF |
| 9 0 AC | 9 INF |
| 10 0 AC | 10 INF |

| VOLTAGE | RESISTANCE |
|---------|------------|
| 1 0 AC | 1 INF |
| 2 0 AC | 2 INF |
| 3 0 AC | 3 INF |
| 4 0 AC | 4 INF |
| 5 0 AC | 5 INF |
| 6 0 AC | 6 INF |
| 7 0 AC | 7 INF |
| 8 0 AC | 8 INF |
| 9 0 AC | 9 INF |
| 10 0 AC | 10 INF |

| VOLTAGE | RESISTANCE |
|---------|------------|
| 1 0 AC | 1 INF |
| 2 0 AC | 2 INF |
| 3 0 AC | 3 INF |
| 4 0 AC | 4 INF |
| 5 0 AC | 5 INF |
| 6 0 AC | 6 INF |
| 7 0 AC | 7 INF |
| 8 0 AC | 8 INF |
| 9 0 AC | 9 INF |
| 10 0 AC | 10 INF |

NOTE: 1-CONNECTION #1 ON ALL SOCKETS CONNECTED TO CHASSIS.
2-CONNECTION #2 ON SOCKET 4 IS REFERENCE POINT FOR A.C. FILAMENT VOLTAGES.

BOTTOM VIEW OF SOCKETS

FOR ALIGNMENT
SEE INDEX

† VOLTAGE READING WILL VARY WITH SENSITIVITY OF METER.
* RESISTANCE WILL DEPEND ON CONDITION OF ELECTROLYTIC CONDENSER.

Chassis C4-1,C4-2
Tuner Data

FARNESWORTH TELEV. & RADIO CORP.

MODELS AC70,AC71
Chassis C3-1
AK76,Chassis C3-2
Schematic,Voltage
Tuner,Resistance

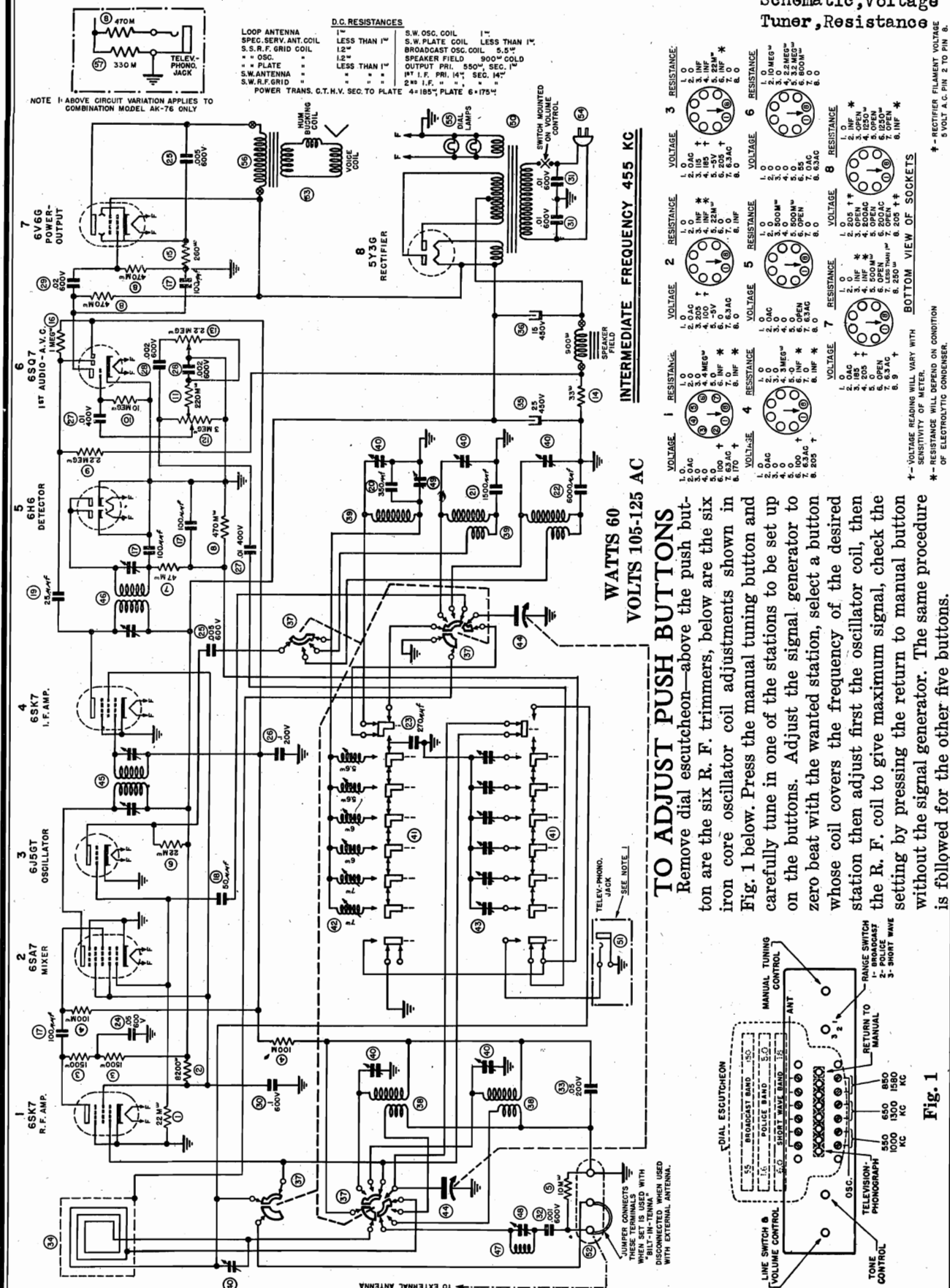


Fig. 1

Compliments of www.nucow.com

CHASSIS C2-1,C2-2,
C2-3,C2-4
CHASSIS C3-1,C3-2
CHASSIS C4-1,C4-2

FARNESWORTH TELEV. & RADIO CORP.

Alignment, Tuner

MODELS AC-70, AC-71 (Ch.C3-1), AK-76 (Ch.C3-2) AC-90, AC-91 (Ch.C4-1), and AK-95, AK-96 (Ch.C4-2).

TO REMOVE CHASSIS

Before removing the chassis it is necessary to remove the loop antenna, this is done as follows: First remove the 3 prong plug from top of loop frame. Loosen the bolt which goes through the wooden member at the bottom of the speaker enclosure. This will allow the bottom pivot (wood) to drop—allowing the top pivot of the loop to be removed from its bearing. Caution should be used so that the heavy rubber washer is not lost, also when the loop is removed from the top bearing, a lead which plugs into the top of the loop axis, must be disconnected, if the loop is dropped this lead may break. After the loop is free the set should be manually tuned to 900 K. C. and the pointer disconnected from the drive cord by bending the center tab toward the back of the cabinet and releasing the cord.

The chassis bolts may be removed and the chassis lifted out taking care that the two sets of leads to the loop do not catch on the chassis shelf. When replacing the loop after the chassis, chassis pointer and the single lead to the center of the loop have been reinstated, before replacing aligning tighten wave trap-trimmer screw.

PUSH BUTTON SET UP

At the rear of the chassis between the television jack and the antenna and ground leads are five pairs of holes. The lower hole is for the adjustment of the iron cores for the oscillator coils. The upper hole is for the R.F. stage adjustment. It is suggested that a signal generator be used for alignment. Tune in by means of the tuning knob, one of the stations that is to be set up. Select the button in the range covering the station selected, as shown by the label on the back of the chassis and Fig. 1 below. Before pushing the button adjust the signal generator to zero beat with the desired station, then push button. Adjust the oscillator (lower screw) first, then the R.F. stage against manual tuning by the manual tuning button. When the screws are turned to the right the frequency of the associated circuit is lowered.

CHASSIS REMOVAL

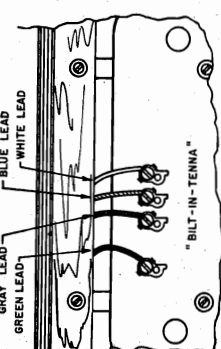


Fig. 2

When removing the chassis from the cabinet for service, first remove the loop antenna in table models. Second—disconnect the pointer from the drive cable by bending tongue toward the rear of the chassis to release drive cord, before loosening chassis hold down bolts. In consoles the loop is mounted below the chassis shelf, so it is not necessary to remove the loop assembly. However, the four leads from the chassis to the four screw type terminals on the loop shield should be removed by loosening the screws. See Fig. 2 for color code, when replacing chassis.

ALIGNMENT

Before re-aligning the set be sure all adjusting screws for the iron core oscillator coils are flush with or inside the chassis base.

Connect the low side of the signal generator to the black (ground) lead of the set and the high 18Mc. Use the one found at the minimum setting side of the generator to the green (antenna) lead, of the oscillator trimmer.

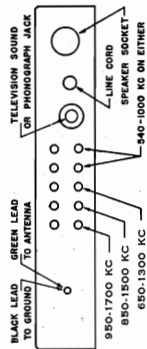


Fig. 1

| STEPS | Use in series with antenna | Set Generator at | Set Gang at | Adjust | Located | To obtain |
|-------------------------------|----------------------------------|------------------|-------------|--------|--------------------|---------------------|
| SET VOLUME CONTROL AT MAXIMUM | | | | | | |
| 1. | | | | | 2nd I. F. Trimmers | Top 2nd I. F. Tran. |
| 2. | | 455 Kc. | | | 1st I. F. Trimmers | Top 1st I. F. Tran. |
| 3. | | | | | B.C. Osc. Trimmer | Top of Chassis |
| 4. | 250 mmfd. | 1600 Kc. | | | B.C.R.F. Trimmer | |
| 5. | | 1500 Kc. | | | B.C. Pad | |
| 6. | | 600 Kc. | | | | |
| 7. | | | | | | |
| 8. | 400 Ohms | 18.1 Mc. | | | S.W. Osc. Trimmer | |
| 9. | | 16 Mc. | | | S.W.R.F. Trimmer | |
| 10. | Check Signal at 6 Mc. and 10 Mc. | | | | | |

MAXIMUM OUTPUT

TO REMOVE CHASSIS

Before removing the chassis it is necessary to remove the loop antenna, this is done as follows: First remove the 3 prong plug from top of loop frame. Loosen the bolt which goes through the wooden member at the bottom of the speaker enclosure. This will allow the bottom pivot (wood) to drop—allowing the top pivot of the loop to be removed from its bearing. Caution should be used so that the heavy rubber washer is not lost, also when the loop is removed from the top bearing, a lead which plugs into the top of the loop axis, must be disconnected, if the loop is dropped this lead may break. After the loop is free the set should be manually tuned to 900 K. C. and the pointer disconnected from the drive cord by bending the center tab toward the back of the cabinet and releasing the cord.

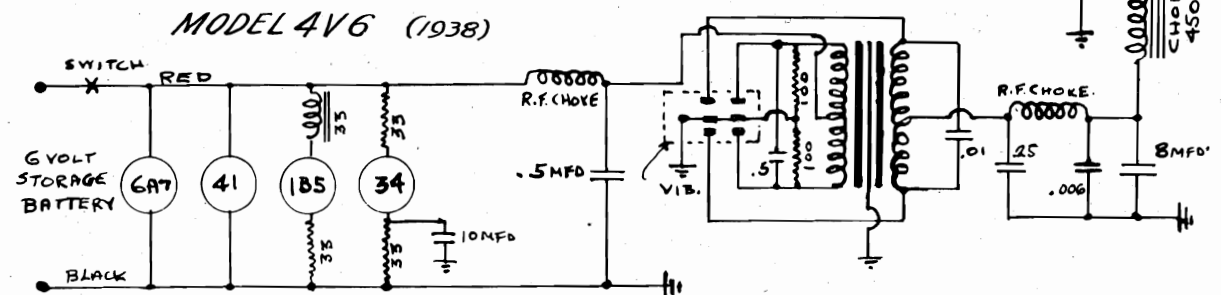
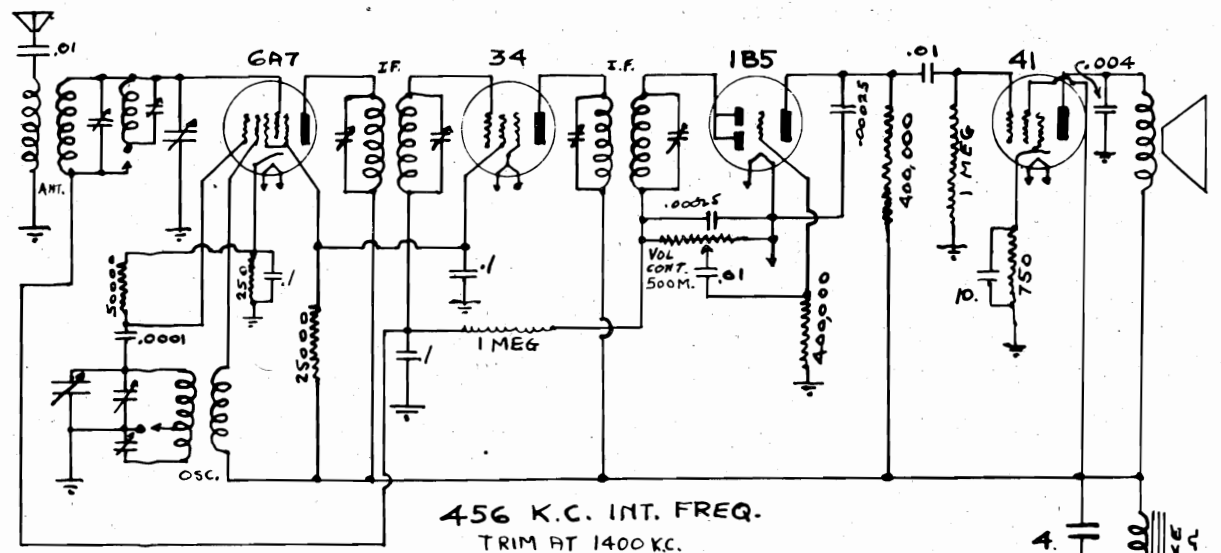
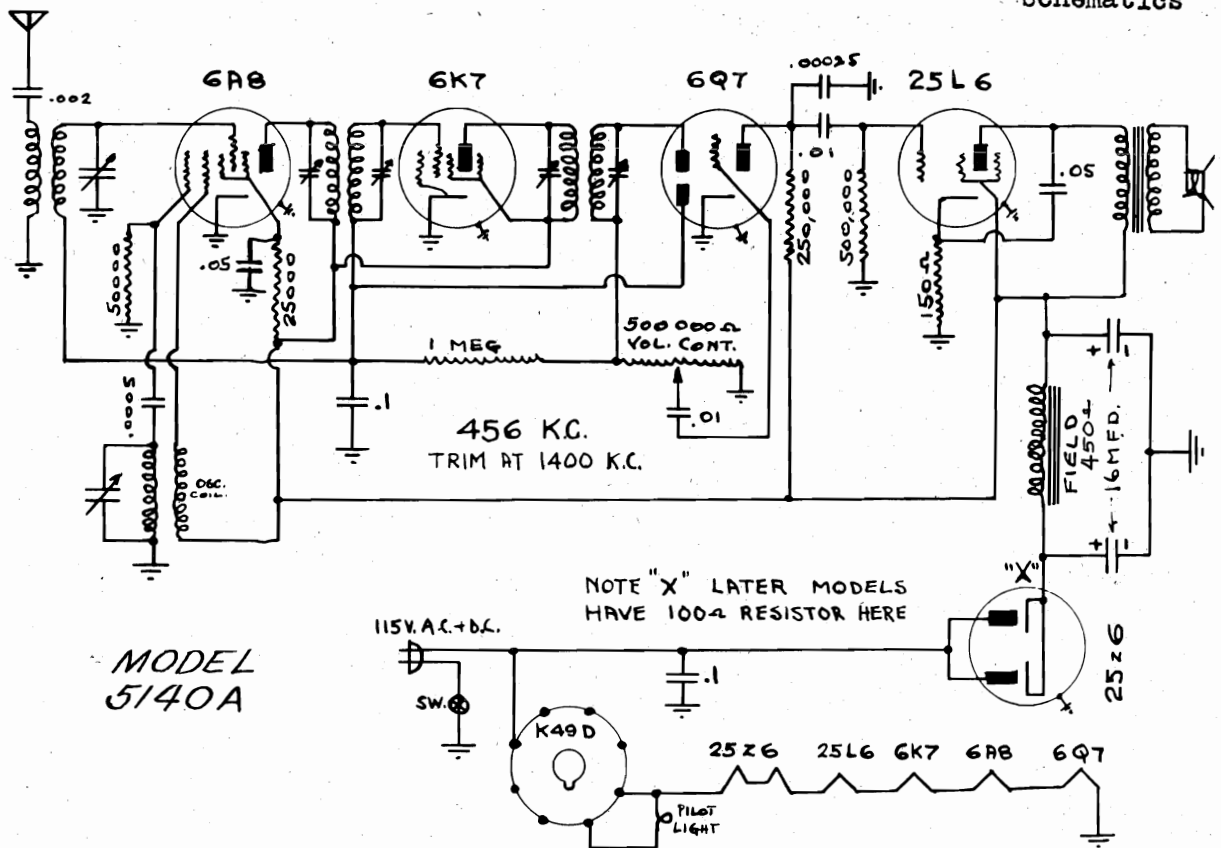
The chassis bolts may be removed and the chassis lifted out taking care that the two sets of leads to the loop do not catch on the chassis shelf. When replacing the loop after the chassis, chassis pointer and the single lead to the center of the loop have been reinstated, before replacing aligning tighten wave trap-trimmer screw.

| STEPS | In Series With Antenna | Set Generator at | Set Gang at | Adjust | Located | To Obtain |
|---|------------------------|------------------|-------------|--------|----------------------------|----------------|
| SET VOLUME AND TONE CONTROLS AT MAXIMUM | | | | | | |
| 1 | | | | | 2nd I. F. Trimmers | Maximum Output |
| 2 | | 455 Kc. | | | 1st I. F. Trimmers | Maximum Output |
| 3 | | | | | Wave Trap Trimmer | Minimum Output |
| 4 | 250 mmfd. | 1600 Kc. | | | Osc. B. C. Trimmer | |
| 5 | | 1500 Kc. | | | R. F. B. C. Trimmer | |
| 6 | | 600 Kc. | | | 600 Kc. Pad | |
| 7 | | | | | | |
| 8 | Recheck 1500 Kc. | | | | | |
| 9 | 400 Ohms. | 5.6 | | | Osc. Police Trimmer | Maximum Output |
| 10 | | 5 Mc. | | | R. F. Police Trimmer | |
| 11 | Check 1.8 Mc. | | | | | |
| 12 | 400 Ohms. | 18.1 Mc. | | | Osc. S. W. Trimmer | |
| 13 | | 16 Mc. | | | Strongest Sig. & Rock Gang | |
| 14 | Check 6 and 10 Mc. | | | | | |

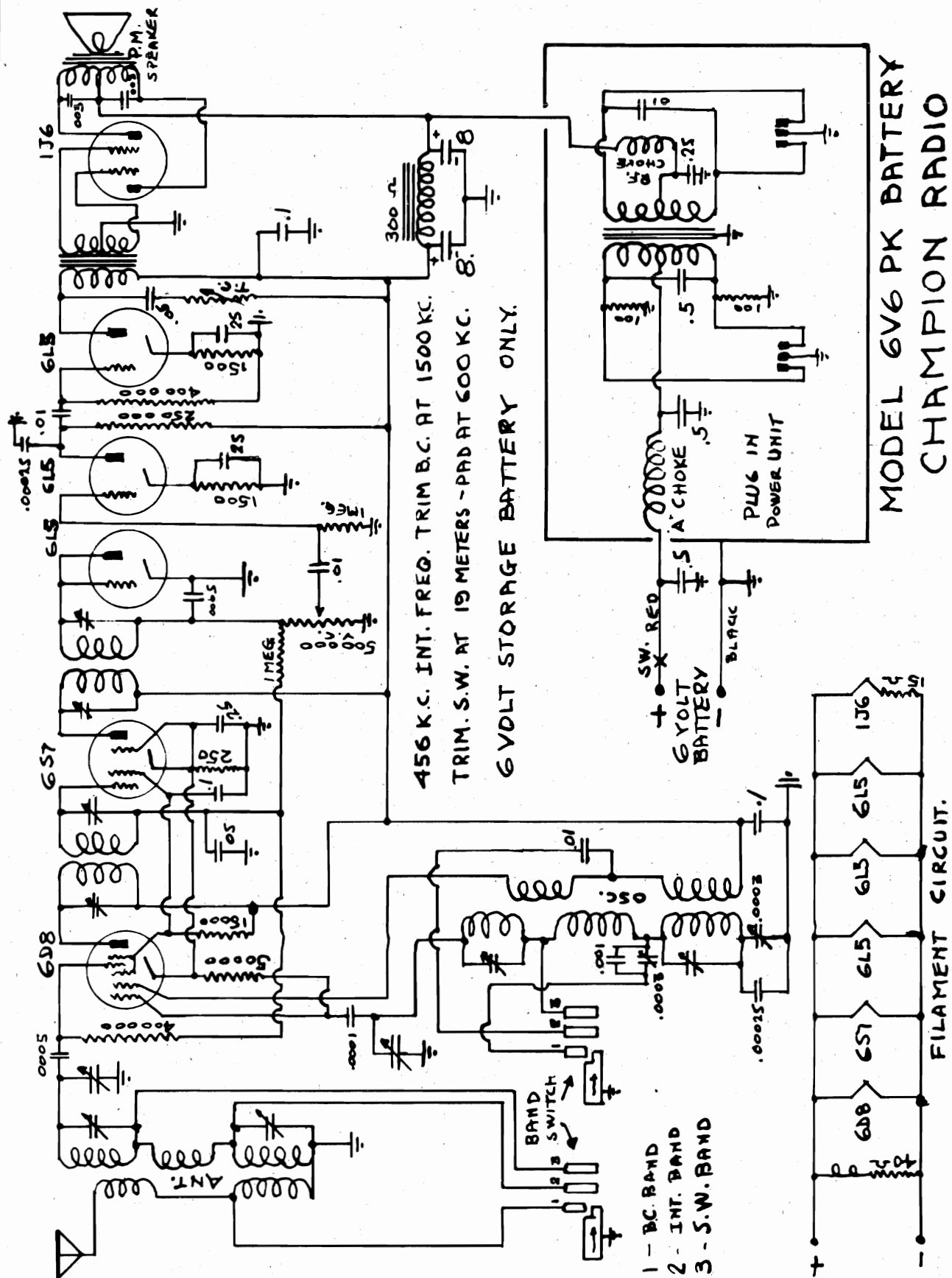
*Tighten oscillator trimmer screw for maximum capacity, then unscrew until second peak is secured.
**Tighten R. F. trimmer screw for maximum capacity, then unscrew until first peak is secured.

FERGUSON RADIO, INC.

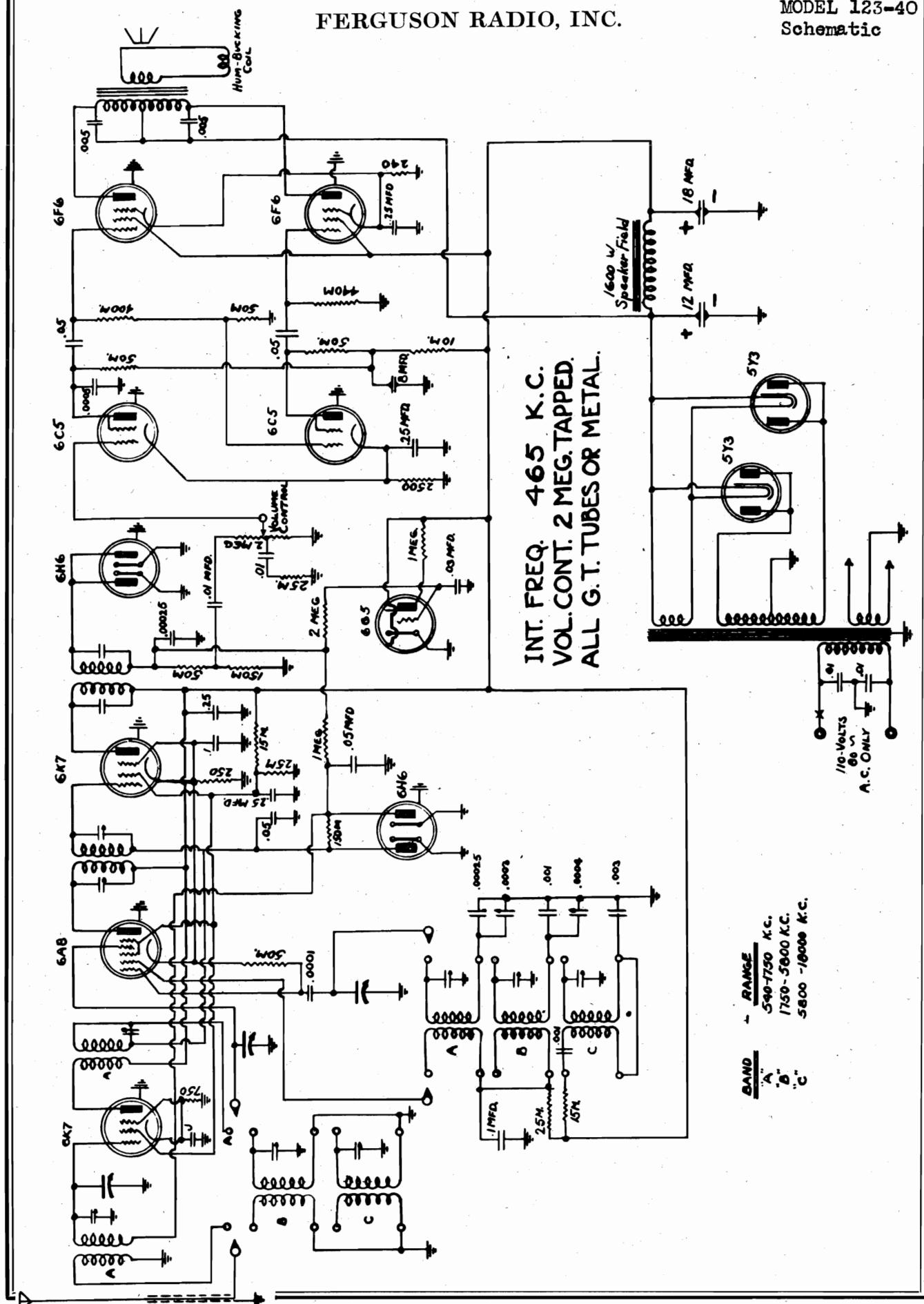
MODEL 4V6 (1938)
MODEL 5140A
Schematics



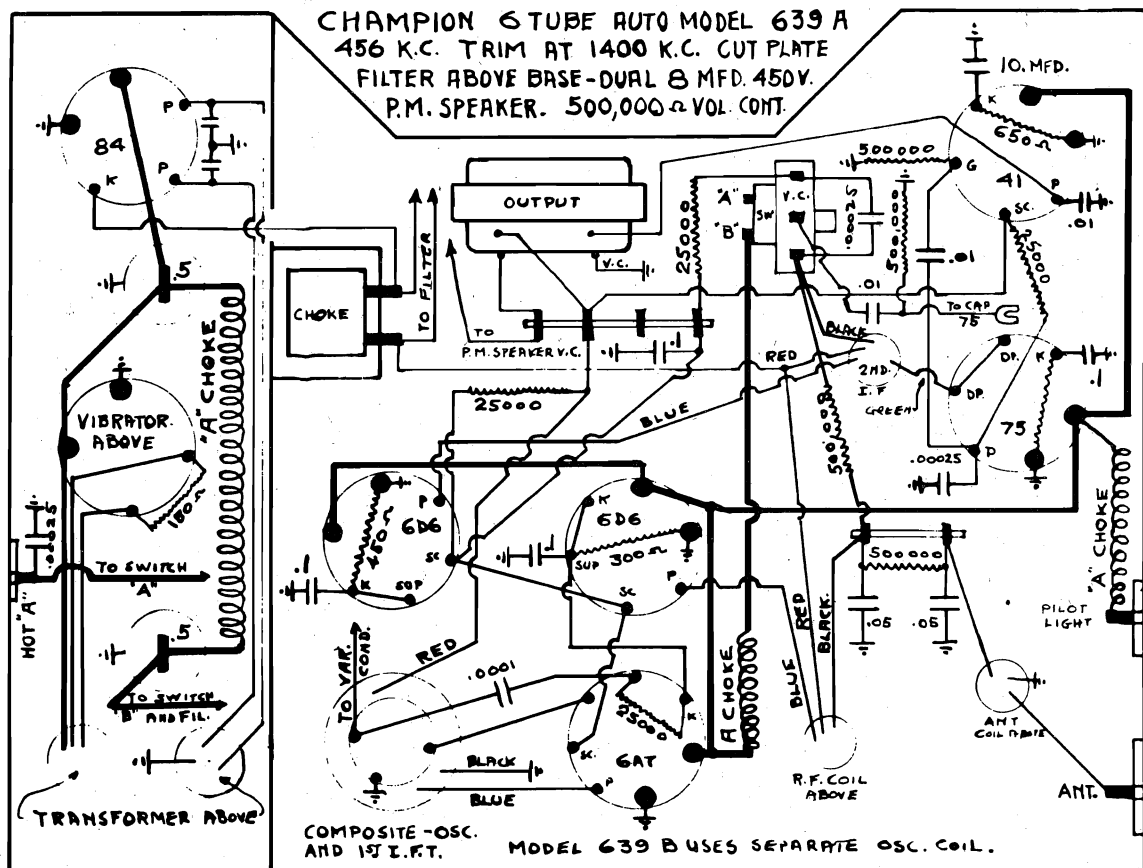
FERGUSON RADIO, INC.



INT. FREQ. 465 K.C.
VOL. CONT. 2 MEG. TAPPED.
ALL G. T. TUBES OR METAL.



3 TUBE ELECTRIC PHONOGRAPH



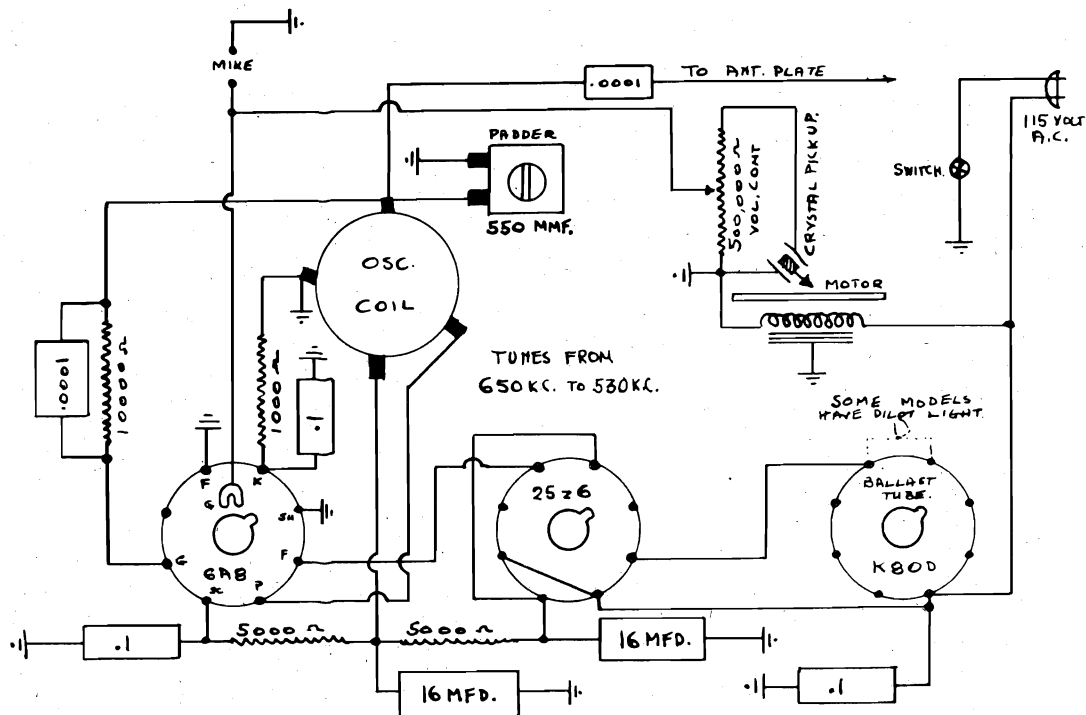
Compliments of www.nucow.com

MODEL Wireless Record
Player
MODEL 6L40AK
Serial 9293 up
Schematics

FERGUSON RADIO, INC.

CHAMPION RADIO - WIRELESS RECORD PLAYER

NOTE MIKE CONNECTION AND VOL CONTROL ON DE LUXE MODEL ONLY
NOT ON JUNIOR MODEL - RADIATOR EITHER IN LINE CORD OR BOTTOM

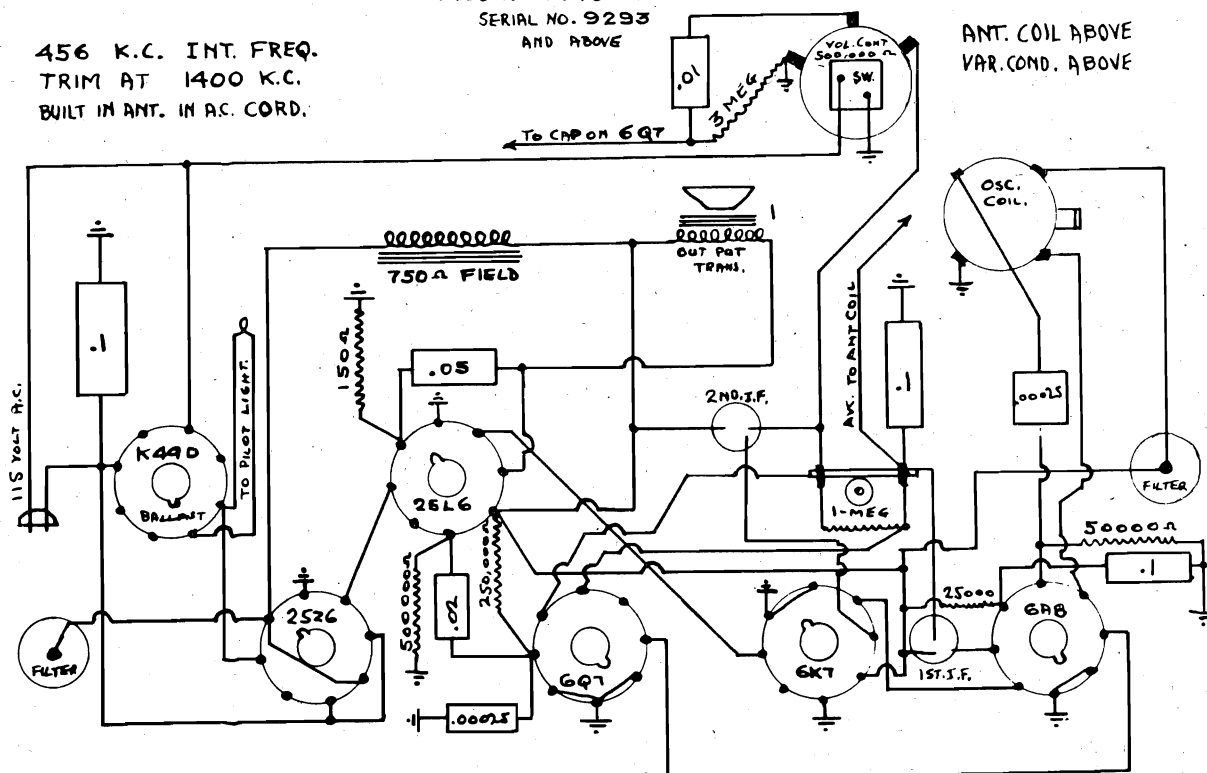


MODEL 6140 AK.

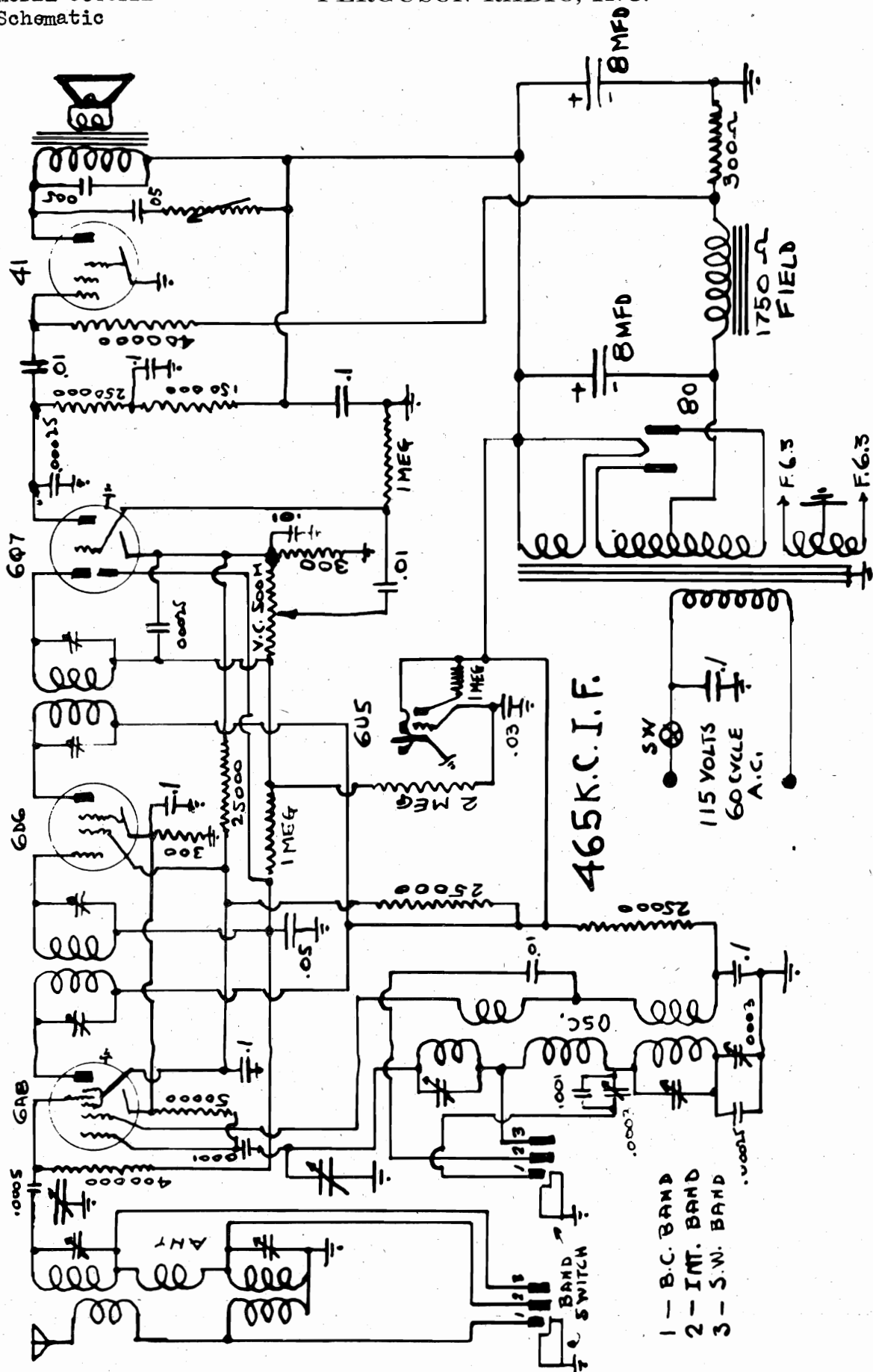
SERIAL NO. 9293
AND ABOVE

456 K.C. INT. FREQ.
TRIM AT 1400 K.C.
BUILT IN ANT. IN AC. CORD.

ANT. COIL ABOVE
VAR. COND. ABOVE



ON SOME MODELS A 6K6 G.I. TUBE IS USED
IN PLACE OF THE 41 OUTPUT TUBE.



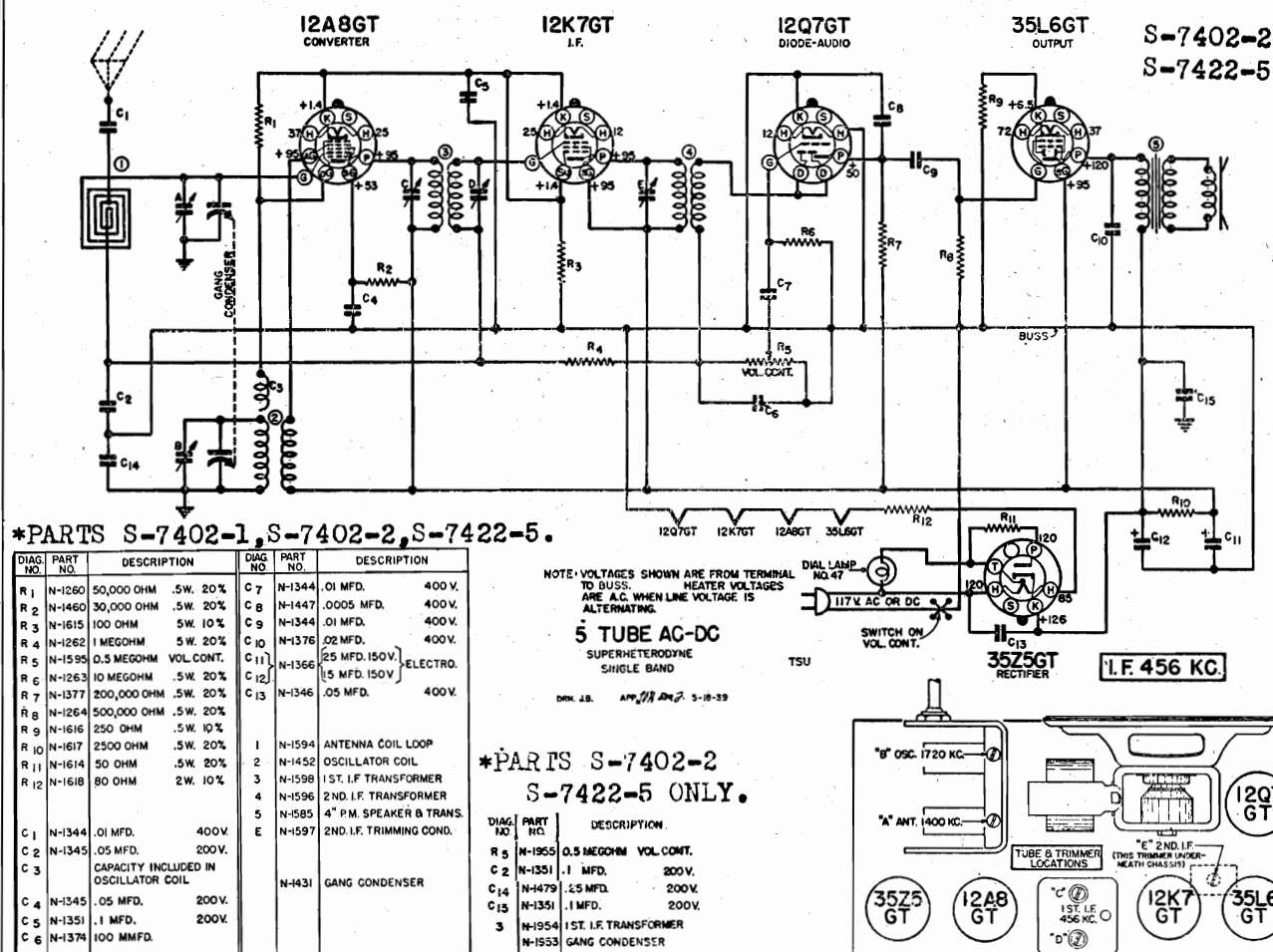
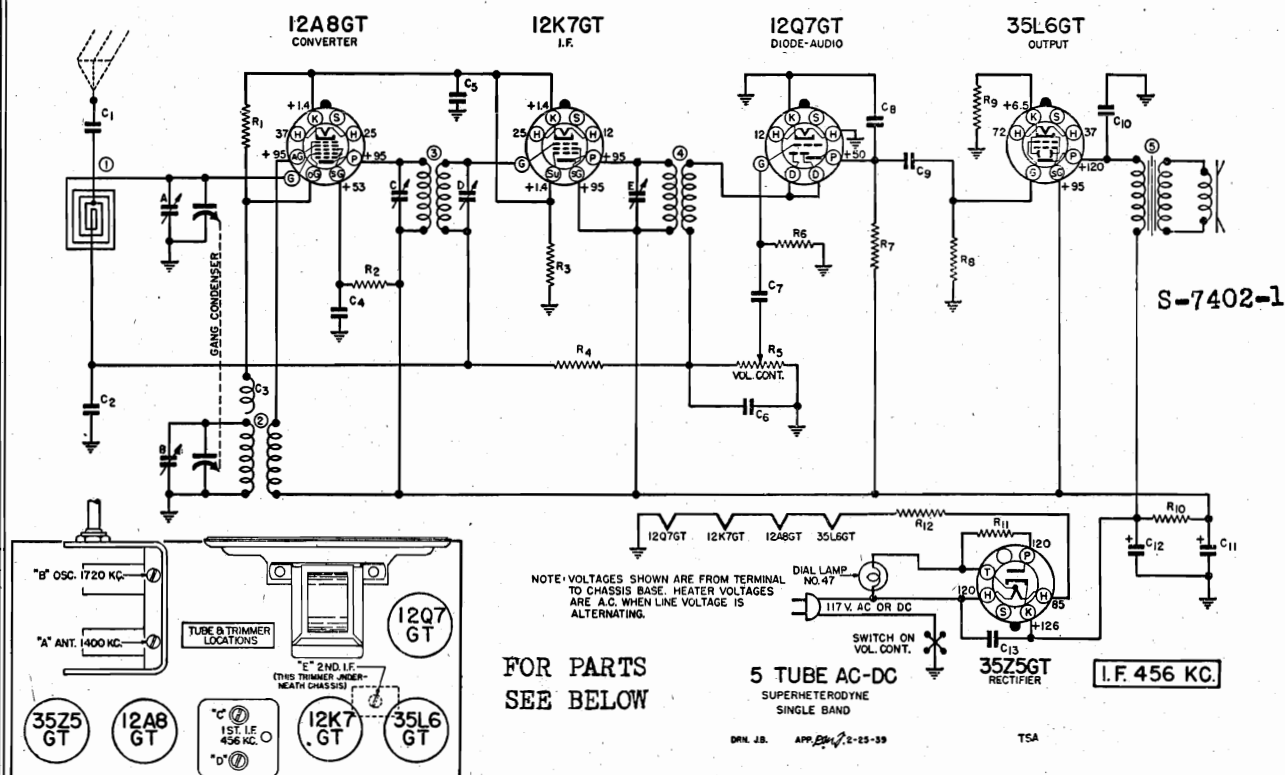
Socket, Trimmers, Parts Alignment

FIRESTONE TIRE & RUBBER CO. Schematics, Voltage

MODEL S7402-1

MODELS S7402-2, S7422-5

Schematics, Voltage



FIRESTONE TIRE & RUBBER CO.



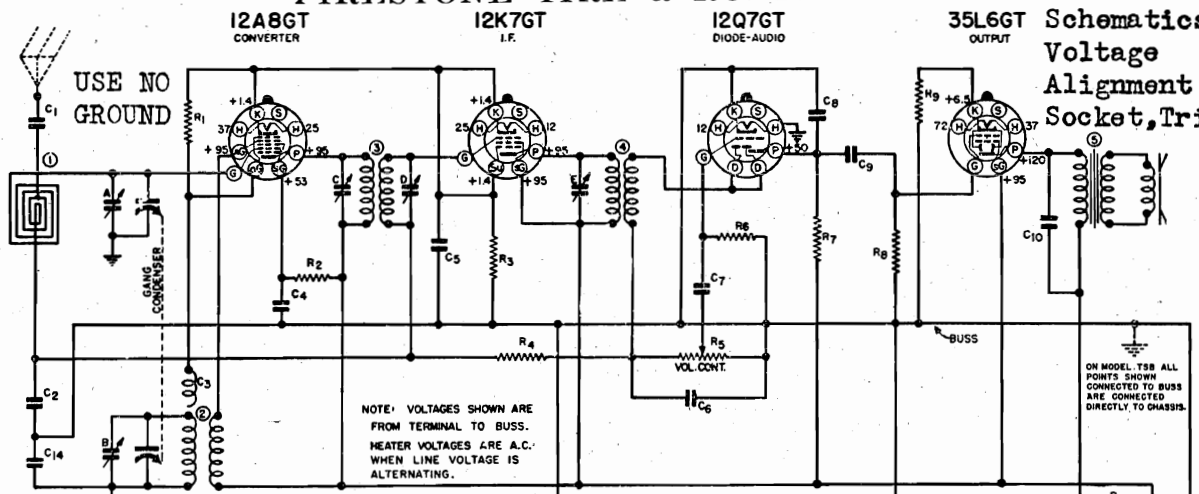
Before starting alignment:

- | TEST OSCILLATOR | | | |
|---|--------------------------------------|---|--|
| Set receiver dial to: | Adjust test oscillator frequency to: | Use dummy antenna in series with output of test oscillator consisting of: | Attach output of test oscillator to: |
| <p>LF.</p> <p>Any point where no interfering signal is received</p> | 455 K. C. | .02 MFD condenser | <p>High side to grid terminal of 6SA7 tube</p> <p>DO NOT REMOVE CAP.</p> |
| (1) Exactly 1730 K. C. | Exactly 1730 K. C. | .00025 MFD condenser | Receiver "A" antenna post. |
| (2) Approx. 1400 K. C. | Exactly 1400 K. C. | .00025 MFD condenser | Receiver "A" antenna post. |
- Refer to parts layout diagram for location of trimmers mentioned below:
- Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
- Adjust 1730 K. C. oscillator trimmer for maximum output.
- While rocking, gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

FIRESTONE TIRE & RUBBER CO.

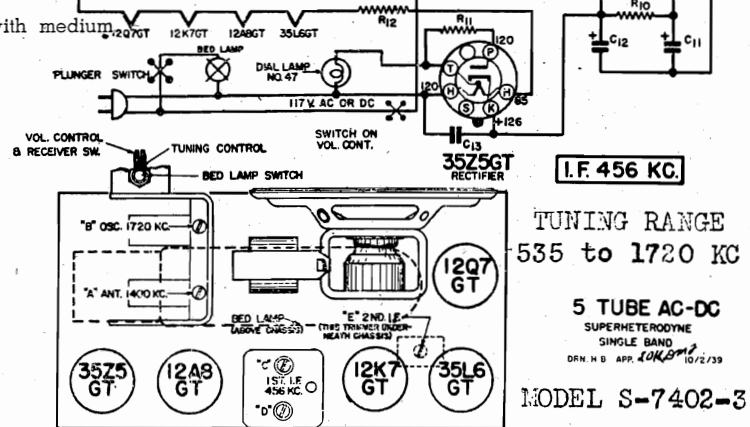
MODEL S7402-3

MODEL S7403-4

Schematics
Voltage
Alignment
Socket, Trimmers

LAMP USED. Show case lamp 120 volt, 25 watts with medium screw base. (Never use a lamp larger than 25 watts.)

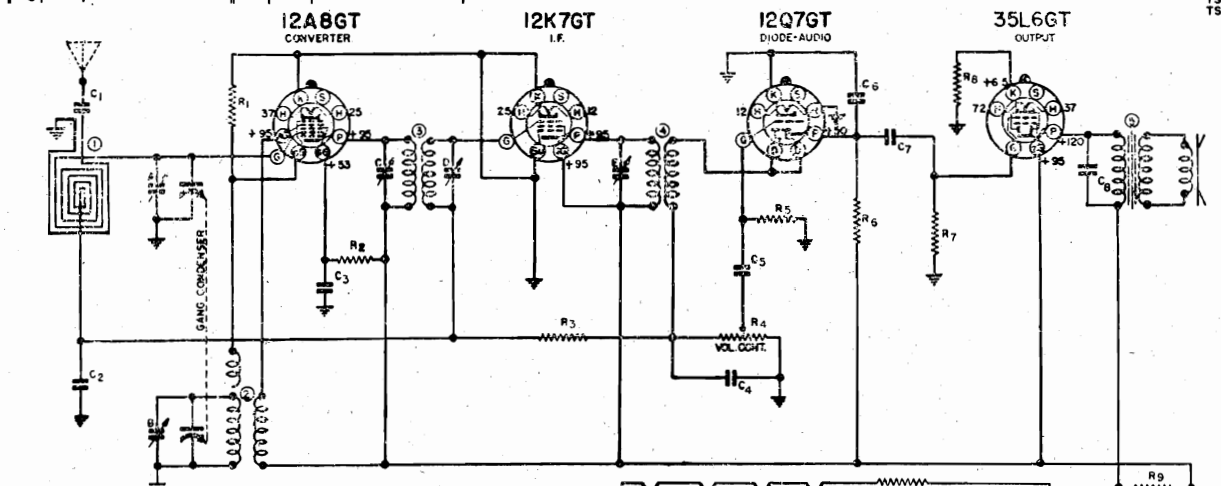
| DIAG. NO. | PART NO. | DESCRIPTION | DIAG. NO. | PART NO. | DESCRIPTION |
|-----------|----------|-----------------------------|-----------|----------|------------------------------|
| R1 | N-1260 | 50,000 OHM .5W. 20% | C7 | N-1344 | .01 MFD. 400V. |
| R2 | N-1527 | 20,000 OHM .5W. 20% | C8 | N-1447 | .0005 MFD. 400V. |
| R3 | N-1742 | 25 OHM .5W. 20% | C9 | N-1344 | .01 MFD. 400V. |
| R4 | N-1262 | 1 MEG OHM .5W. 20% | C10 | N-1376 | .02 MFD. 400V. |
| R5 | N-1255 | .5 MEG OHM VOL. CONT. (TSB) | C11 | N-2898 | 30 MFD. 150V. ELECTRO. |
| R6 | N-1263 | 10 MEG OHM .5W. 20% | C12 | N-2898 | 15 MFD. 150V. ELECTRO. |
| R7 | N-1377 | 200,000 OHM .5W. 20% | C13 | N-1346 | .05 MFD. 400V. |
| R8 | N-1264 | 500,000 OHM .5W. 20% | C14 | N-1479 | .25 MFD. 400V. |
| R9 | N-1616 | 250 OHM .5W. 10% | 1 | N-2146 | ANTENNA COIL LOOP |
| R10 | N-1617 | 2500 OHM .5W. 20% | 2 | N-1452 | OSCILLATOR COIL |
| R11 | N-1614 | 50 OHM .5W. 20% | 3 | N-1558 | 1ST. I.F. TRANS. (TSB) |
| R12 | N-1618 | 80 OHM 2W. 10% | 4 | N-1536 | 2ND I.F. TRANSFORMER |
| C1 | N-1344 | .01 MFD. 400V. | 5 | N-2074 | 4" P.M. SPEAKER TRANS. (TSB) |
| C2 | N-1345 | .05 MFD. 200V. (TSB) | 6 | N-2408 | 4" P.M. SPEAKER TRANS. (TSB) |
| C3 | N-1351 | .1 MFD. 200V. (TSB) | E | N-1597 | 2ND I.F. TRIMMING COND. |
| C4 | N-1345 | .05 MFD. 200V. | | | |
| C5 | N-1351 | .1 MFD. 200V. | | | |
| C6 | N-1376 | 100 MMFD. | | | |



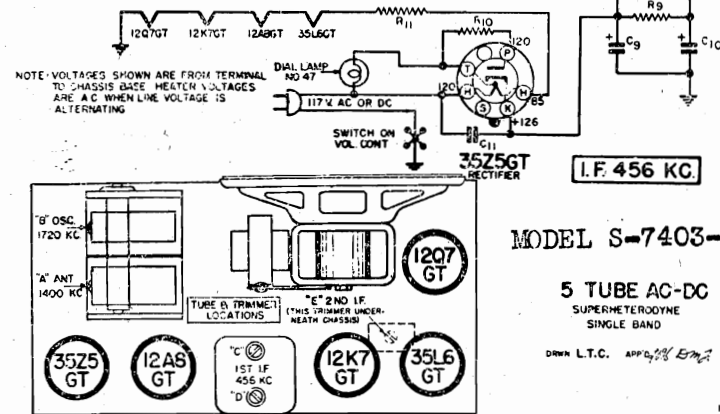
TUNING RANGE
535 to 1720 KC

5 TUBE AC-DC
SUPERMETERODYNE
SINGLE BAND
DRN. H. B. APP. 10/2/39

MODEL S-7402-3

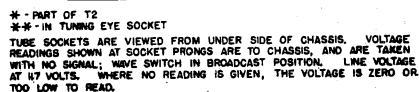
TSB
TSBU

| DIAG. NO. | PART NO. | DESCRIPTION | DIAG. NO. | PART NO. | DESCRIPTION |
|-----------|----------|------------------------|-----------|----------|-------------------------|
| R1 | N-1260 | 50,000 OHM .5W. 20% | 1 | N-2502 | ANTENNA COIL LOOP |
| R2 | N-1259 | 15,000 OHM .5W. 20% | 2 | N-1452 | OSCILLATOR COIL |
| R3 | N-1262 | 1 MEG OHM .5W. 20% | 3 | N-1506 | 1ST. I.F. TRANSFORMER |
| R4 | N-2898 | .5 MEG OHM VOL. CONT. | 4 | N-2898 | 2ND I.F. TRANSFORMER |
| R5 | N-1263 | 10 MEG OHM .5W. 20% | 5 | N-2898 | 4-1/2" SPEAKER & TRANS. |
| R6 | N-1377 | 200,000 OHM .5W. 20% | E | N-1597 | 2ND I.F. TRIMMING COND. |
| R7 | N-1264 | 500,000 OHM .5W. 20% | | | |
| R8 | N-1616 | 250 OHM .5W. 10% | | | |
| R9 | N-1257 | 2,000 OHM .5W. 20% | | | |
| R10 | N-1742 | 25 OHM .5W. 20% | | | |
| R11 | N-1618 | 80 OHM 2W. 10% | | | |
| C1 | N-1344 | .01 MFD. 400V. | | | |
| C2 | N-1345 | .05 MFD. 200V. | | | |
| C3 | N-1345 | .05 MFD. 200V. | | | |
| C4 | N-1374 | 100 MMFD. | | | |
| C5 | N-1344 | .01 MFD. 400V. | | | |
| C6 | N-1447 | .0005 MFD. 400V. | | | |
| C7 | N-1344 | .01 MFD. 400V. | | | |
| C8 | N-1376 | .02 MFD. 400V. | | | |
| C9 | N-1365 | 30 MFD. 60V. ELECTRO. | | | |
| C10 | N-1365 | 15 MFD. 150V. ELECTRO. | | | |
| C11 | N-1346 | .03 MFD. 400V. | | | |

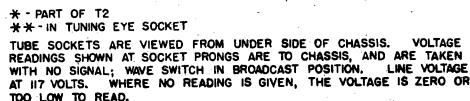


MODEL S-7403-4

5 TUBE AC-DC
SUPERMETERODYNE
SINGLE BAND
DRN. L.T.C. APP. 10/2/39



MODEL
S-7404-2 (With serial numbers prefixed with "C").



MODEL
S-7427-8

MODEL S-7402-3

MODEL S-7403-4

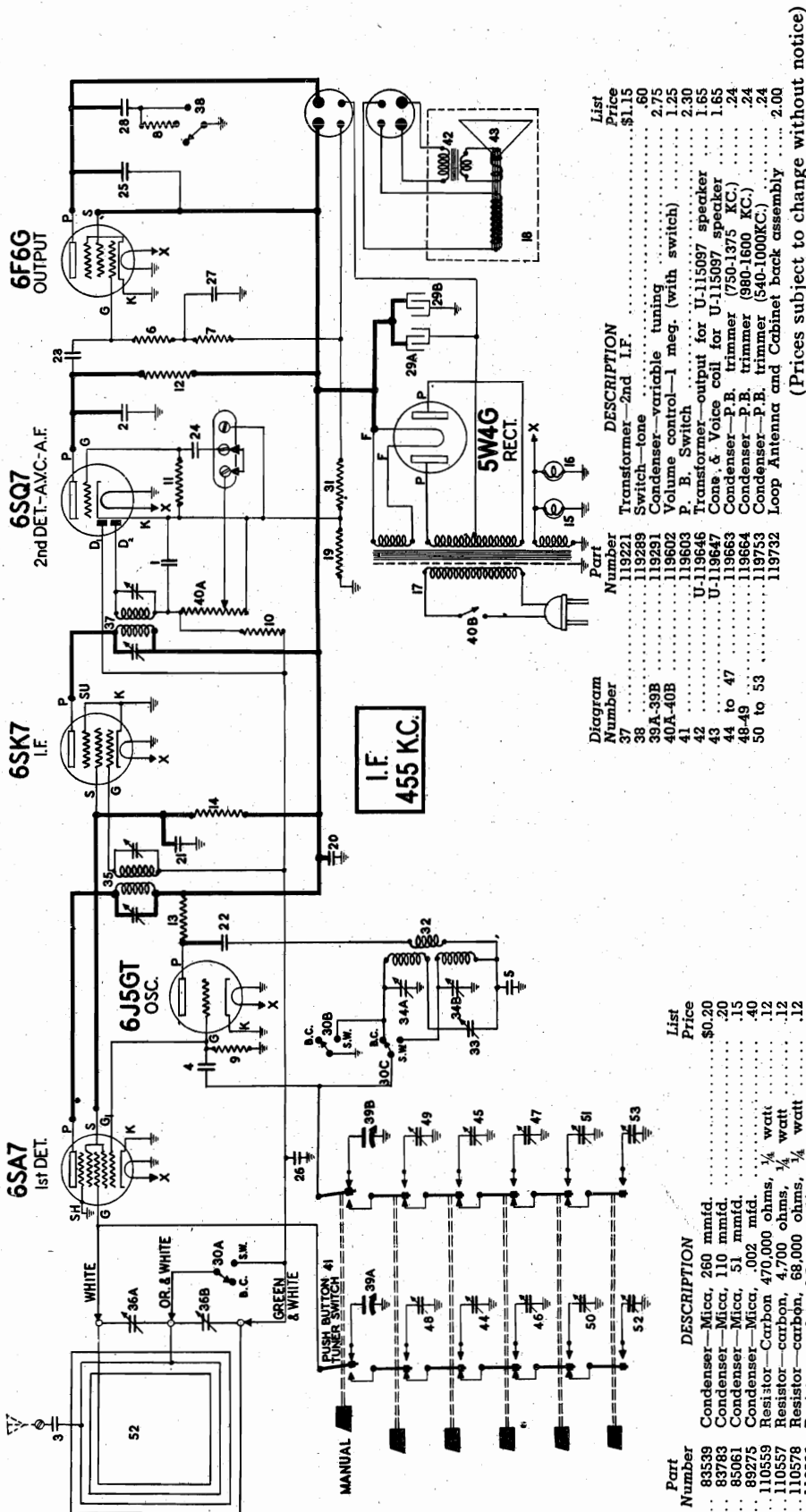
BROADCAST BAND ALIGNMENT. Remove chassis from cabinet and set it up on the bench. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench.

I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (12A8GT) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove chassis, shield, and loop antenna from cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set up on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

FIRESTONE TIRE & RUBBER CO.

MODEL S7403-8
Schematic, Voltage

| Diagram Number | Part Number | DESCRIPTION | List Price |
|----------------|-------------|---|------------|
| 37 | 119221 | Transformer—2nd I.F. | \$1.15 |
| 38 | 119289 | Switch—tone | .60 |
| 39A-39B | 119291 | Condenser—variable tuning | 2.75 |
| 40A-40B | 119602 | Volume control—1 meg. (with switch) | 1.25 |
| 41 | 119603 | P. B. Switch | 2.30 |
| 42 | U-119646 | Transformer—output for U-115097 speaker | 1.65 |
| 43 | U-119647 | Cone & Voice coil for U-115097 speaker | 1.65 |
| 44 to 47 | 119663 | Condenser—P.B. trimmer (750-1375 KC.) | .24 |
| 48-49 | 119664 | Condenser—P.B. trimmer (980-1600 KC.) | .24 |
| 50 to 53 | 119753 | Condenser—P.B. trimmer (540-1000 KC.) | .24 |
| | 119732 | Loop Antenna and Cabinet back assembly | 2.00 |

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

| TUBE | FUNCTION | H | K | G ₁ | S | SU | P | D ₁ | D ₂ |
|-------|----------------------|----------|----|----------------|-----|----|-----|----------------|-------------------------|
| 6SA7 | 1st DET. | 6.0 A.C. | O | Note A | —8 | 90 | 240 | | |
| 6J5GT | OSC. | 6.0 A.C. | O | —8 | | | 145 | | |
| 6SK7 | I.F. AMP. | 6.0 A.C. | O | Note A | 90 | O | 240 | | |
| 6SQ7 | 2nd DET.-A.V.C.-A.F. | 6.0 A.C. | —3 | Note A | | | 50 | Note A | Note A |
| 6F6G | Output | 6.0 A.C. | O | Note B | 240 | | 220 | | |
| 5W4G | Rectifier | 5.0 A.C. | | | | | | | Plates—340 A.C. to C.T. |

VOLUME ON FULL WITH NO SIGNAL

DIAL TUNED TO 540 KC.

| Diagram Number | Part Number | DESCRIPTION | List Price |
|----------------|-------------|--|------------|
| 1-2 | 83539 | Condenser—Mica, 260 mmfd. | \$0.20 |
| 3 | 83783 | Condenser—Mica, 110 mmfd. | .20 |
| 4 | 85061 | Condenser—Mica, 51 mmfd. | .15 |
| 5 | 89275 | Condenser—Mica, .002 mfd. | .40 |
| 6 | 110559 | Resistor—Carbon, 470,000 ohms, 1/4 watt | .12 |
| 8 | 110557 | Resistor—Carbon, 4,700 ohms, 1/4 watt | .12 |
| 9 | 110578 | Resistor—Carbon, 68,000 ohms, 1/4 watt | .12 |
| 10-11 | 110580 | Resistor—Carbon, 3.3 meg., 1/4 watt | .12 |
| 12 | 110591 | Resistor—Carbon, 3.3 meg., 1/4 watt | .12 |
| 13-14 | 110592 | Resistor—Carbon, 22,000 ohms, 1 watt | .12 |
| 15-16 | 110629 | Lamp—6.3 volt, .25 amps. | .15 |
| 17 | 114530 | Power transformer, 117 volt—60 cycle | 3.50 |
| 18 | U-115097 | Speaker—dynamic 6" | 5.20 |
| 19 | 116275 | Resistor—Carbon, 470,000 ohms, 1/4 watt | .12 |
| 20-21 | 116225 | Condenser—.01 mfd., 600 volt | .25 |
| 22-23 | 116640 | Condenser—.01 mfd., 600 volt | .15 |
| 24-25 | 116647 | Condenser—.05 mfd., 600 volt | .20 |
| 26 | 116819 | Condenser—Electrolytic, 10 mfd., 35 volt | .80 |
| 27 | 110377 | Condenser—.04 mfd., 600 volts | .20 |
| 28 | 116984 | Condenser—multiple electrolytic | |
| 29A-29B | 117034 | 15 mfd.—450 volt | 1.45 |
| 30A-30B-30C | 117532 | Range switch | .76 |
| 31 | 116812 | Resistor—180 ohms—1 W. WW. | .12 |
| 32 | 118916 | Coil—oscillator | .52 |
| 33 | 118919 | Condenser—padding | .40 |
| 34A-34B | 118920 | Trimmer condensers (2 section) | .30 |
| 35 | 119042 | Transformer—1st I.F. | 1.10 |
| 36A-36B | 119126 | Trimmer Condensers (2 section) | .35 |

NOTE A: The voltage at these elements is —3 volts measured across resistor 19.

NOTE B: The voltage at this grid is —14 volts measured across resistors 19 and 31.

Use a high resistance voltmeter of at least 1000 ohms per volt.

MODEL S7403-8

Alignment, Socket
Trimmers

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT EQUIPMENT & PROCEDURE

ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

Connect the output meter across the voice coil or between the plate of the 6F6G output tube and ground in series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)

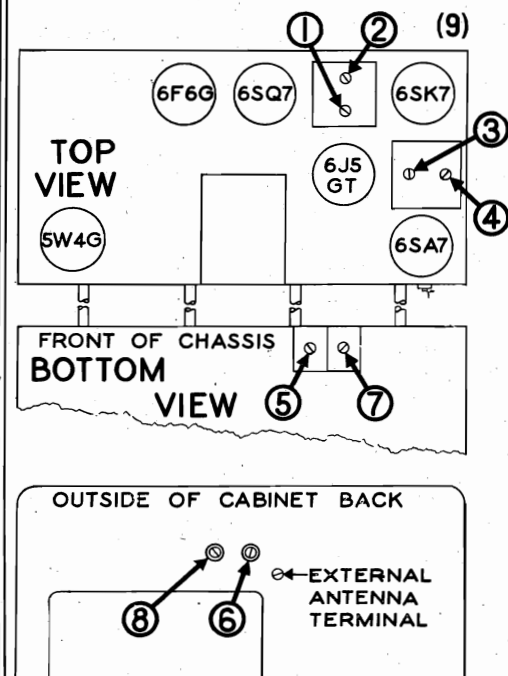
Connect the ground lead of the signal generator to the chassis.

Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.

Be sure the loop is properly connected and in the same relative position it occupies when in the cabinet.

| Dummy Ant. in Series with Sig. Gen. | Connection of Sig. Generator Output To Receiver | Signal Generator Frequency | Band Switch Position | Receiver Dial Setting | Trimmer Number | Trimmer Description | Type of Adjustment |
|-------------------------------------|---|----------------------------|----------------------|---|----------------|-----------------------------------|--|
| .1 MFD. Condenser | Rear Lug of Gang Condenser | 455 KC | Broadcast | Any Point Where It Does Not Affect The Signal | 1-2 | 2nd I. F. | Adjust for maximum output. Then repeat adjustment. |
| | | | | | 3-4 | 1st I. F. | |
| 400 OHM Carbon Resistor | External Antenna Terminal | 6 MC | Foreign | 6 MC | 5 | Foreign Oscillator (Shunt) | Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 5.1 MC. If image does not appear realign at 6 MC. with trimmer screw farther out. Recheck image. |
| 400 OHM Carbon Resistor | External Antenna Terminal | 6 MC | Foreign | Tune to 6 MC. Generator Signal. | 6* | Foreign Antenna | Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained. |
| 200 MMFD. Mica Condenser | External Antenna Terminal | 1500 KC | Broadcast | 1500 KC | 7 | Broadcast Oscillator (Shunt) | Adjust for maximum output. |
| 200 MMFD. Mica Condenser | External Antenna Terminal | 1500 KC | Broadcast | Tune To 1500 KC Generator Signal | 8* | Broadcast Antenna | Adjust for maximum output. |
| 200 MMFD. Mica Condenser | External Antenna Terminal | 600 KC | Broadcast | Tune To 600 KC Generator Signal | 9 | Broadcast Oscillator (Series Pad) | Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained. |

*NOTE: Trimmers must be aligned in order shown. After set is in cabinet realign No. 6 at 6MC. Then No. 8 at 1500 KC. on weak signals. Signal generator should be disconnected.



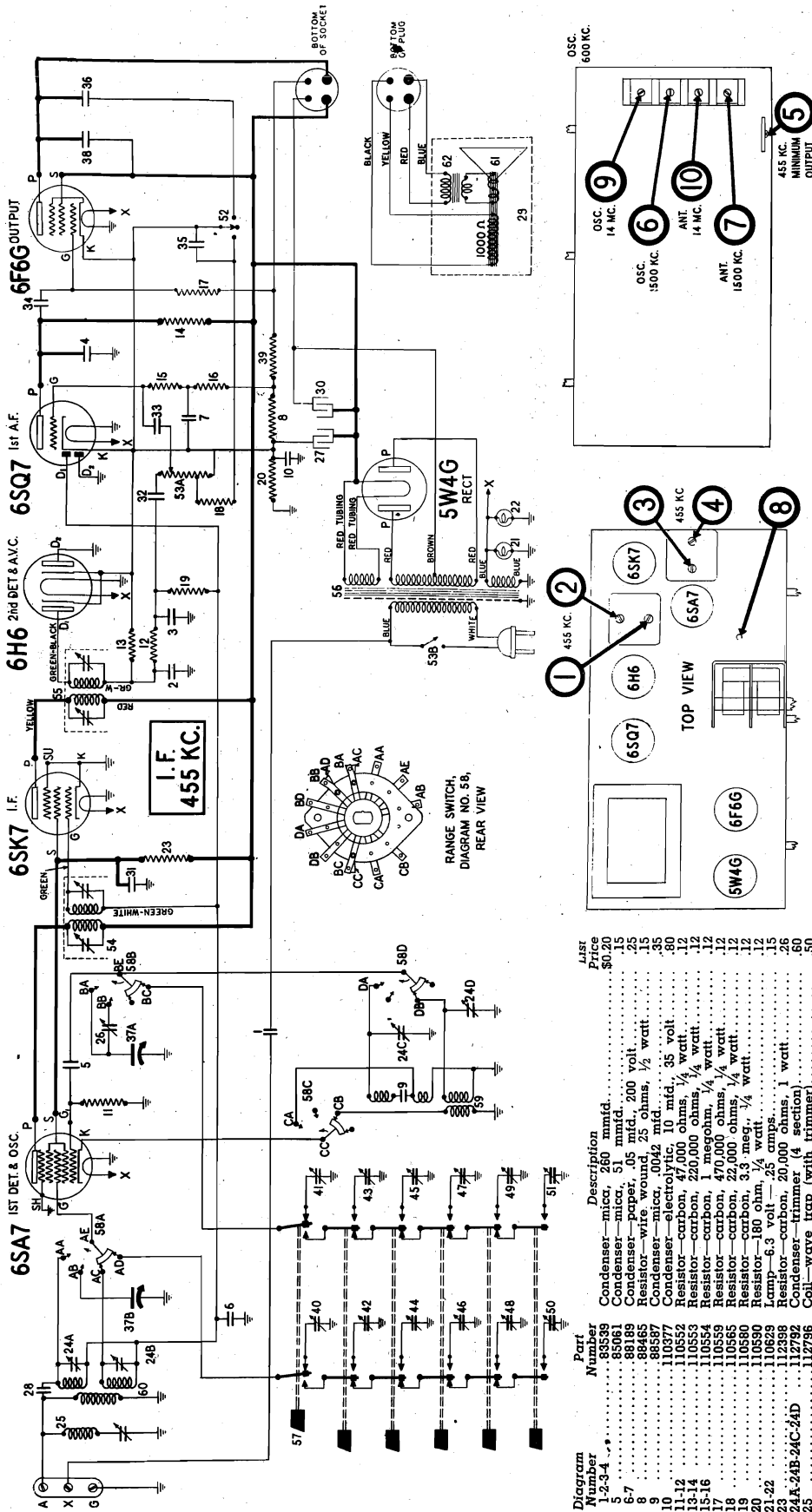
DIAL AND MISCELLANEOUS PARTS

| Part Number | Description | List Price |
|-------------|---|--------------|
| 114955 | Clamp for dial cord | \$0.01 |
| 119559 | Clamp—dial scale retaining | .08 |
| 112745 | Clip—coil mounting | .01 |
| 117057 | Cord—drive (supplied in 2 foot lengths) | .15 |
| 119655 | Dial escutcheon | .85 |
| 119694 | Dial background | .06 |
| 119777 | Dial scale | .55 |
| 117029 | Drive drum and bushing | .50 |
| 88348 | Eyelet for dial cord | Per doz. .05 |
| 119644 | Knob | .18 |
| 119577 | Pointer | .12 |
| 119654 | Push button | .85 |
| 81145 | Retaining ring—for drive shaft | Per C .50 |
| 83624 | Screw—self tapping 8x1/4 | .01 |
| 119218 | Screw—Escutcheon mounting | .02 |
| 85040 | Screw—No. 6 Hex. Hd. | Per C .35 |
| 112874 | Screw—No. 10x1 1/8 Chassis mtg. | .01 |
| 85827 | Set Screw—8-32 Square Head | .02 |
| 113191 | Screw—No. 8-32x1 1/8 | .01 |
| 110501 | Socket—4 prong (for speaker) | .16 |
| 116690 | Socket—small octal base | .12 |
| 117078 | Socket—octal with special grounding lug | .12 |
| 111090 | Spacer—steel mtg. | .02 |
| 113177 | Spring—dial cord tension | .09 |
| 119739 | Station call letter tabs | .48 |
| 119824 | Terminal strip—phono | .05 |
| 118606 | Tuning shaft | .18 |
| 110829 | Washer—chassis mounting | .01 |
| 111456 | Washer—spring washer | Per C .50 |
| 116530 | Washer—for back of knobs | .005 |

(Prices Subject to Change without Notice)

FIRESTONE TIRE & RUBBER CO.

MODEL S7404-1
Schematic, Voltage
Socket, Trimmers
Parts



SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

ANTENNA GROUNDED

| TUBE | FUNCTION | H | K | G | G ₁ | S | SU | P | D ₁ | D ₂ |
|------|-------------------|----------|-------|-------|----------------|----|----|------|----------------|--------------------|
| 6SA7 | 1st Det. & Osc. | 6.0 A.C. | 0 | -2.8 | -8 | 85 | 0 | 255 | | |
| 6SK7 | I.F. | 6.0 A.C. | 0 | -2.8 | | 85 | 0 | 255 | | |
| 6H6 | 2nd Det. & A.V.C. | 6.0 A.C. | -3.5* | | | | | -2.8 | 0 | |
| 6SQ7 | 1st A.F. | 6.0 A.C. | -3.5* | -4.0* | | | | 130 | -2.8 | 0 |
| 6F6G | Output | 6.0 A.C. | -3.5* | -20* | | | | 235 | | |
| 5W4G | Rectifier | 5.0 A.C. | | | | | | | | Plates 250 V. A.C. |

DIAL TUNED TO 540 KC.

545 KC. MINIMUM OUTPUT

***Measured at Bias Resistor**

Use a high resistance voltmeter of at least 1000 ohms per volt.

MODEL S7404-1
Alignment, Tuner
MODEL S7404-2
MODEL S7404-3

FIRESTONE TIRE & RUBBER CO.

MODEL S7426-8
MODEL S7427-1, Late
Tuner Data

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 6F6G output tube and ground in series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the "G" terminal or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. Remove the connector from between the "A" and "X" terminals. Check the pointer to see that it is correctly set.

| Dummy Ant. in Series with Sig. Gen. | Connection of Sig. Generator Output To Receiver | Signal Generator Frequency | Band Switch Position | Receiver Dial Setting | Trimmer Number | Trimmer Description | Type of Adjustment |
|-------------------------------------|---|----------------------------|----------------------|---|----------------|-----------------------------------|--|
| .1 MFD. Condenser | Front Lug of Gang Condenser | 455 KC | Broadcast | Any Point Where It Does Not Affect The Signal | 1-2 | 2nd I. F. | Adjust for maximum output. Then repeat adjustment. |
| | | | | | 3-4 | 1st I. F. | |
| 200 MMFD. Mica Condenser | "A" Terminal | 455 KC | Broadcast | Any Point Where It Does Not Affect The Signal | 5 | Wave Trap | Adjust for minimum output using a strong generator signal. |
| 200 MMFD. Mica Condenser | "A" Terminal | 1500 KC | Broadcast | 1500 KC | 6 | Broadcast Oscillator (Shunt) | Adjust for maximum output. |
| 200 MMFD. Mica Condenser | "A" Terminal | 1500 KC | Broadcast | Tune To 1500 KC Generator Signal | 7 | Broadcast Antenna | Adjust for maximum output. |
| 200 MMFD. Mica Condenser | "A" Terminal | 600 KC | Broadcast | Tune To 600 KC Generator Signal | 8 | Broadcast Oscillator (Series Pad) | Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained. |
| 400 OHM Carbon Resistor | "A" Terminal | 14 MC | Foreign | 14 MC | 9 | Foreign Oscillator (Shunt) | Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 13.1 MC. If image does not appear realign at 14 MC. with trimmer screw farther out. Recheck image. |
| 400 OHM Carbon Resistor | "A" Terminal | 14 MC | Foreign | 14 MC | 10 | Foreign Antenna | Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained. |

TO SET UP THE BUTTONS FOR AUTOMATIC TUNING:

1. Turn the set on and allow it to operate at least fifteen minutes before attempting to set up the buttons.
2. Make a list of the frequencies of six nearby stations to which you wish to set up the buttons. Be sure to select the most powerful nearby stations, since weak signals will not give as satisfactory results. Also be sure to select stations that fall within the frequency range of the buttons.
3. Be sure the antenna is connected before proceeding further. It will be impossible to set up buttons properly without an antenna.
4. With the range switch in the Broadcast (Manual) position (position B) tune in the station to be set up. Then turn the range switch to Automatic Position (Position A) and push in the button to be set up, being sure to select a button with the proper frequency range (see Fig. 1). ALWAYS TRY TO SELECT THE BUTTON WHICH CAN BE SET UP TO A STATION WHOSE FREQUENCY IS WELL WITHIN THE BUTTON'S OPERATING RANGE.
5. At the back of the chassis will be found 6 holes numbered to correspond to the numbers of the buttons. See Fig. 1. Adjust the large screw with the number corresponding to the number of the button you have pushed in, until the same station is again heard. Tune accurately, adjusting for deepest tone.
6. Now adjust the small screw (located adjacent to the large screw just adjusted) until maximum output is obtained. Make a final adjustment on the large screw, always tuning for deepest tone.
7. The set-up is now complete for this button. The remaining buttons may be set up in the same way.
8. Call letter tabs which may be used to label the buttons are supplied with this radio.

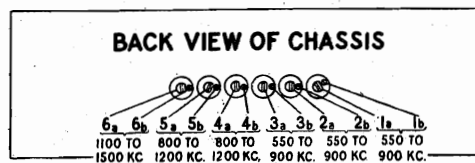
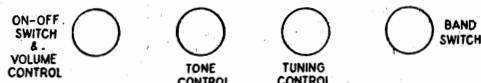
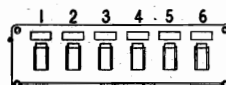
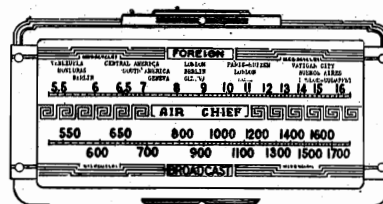
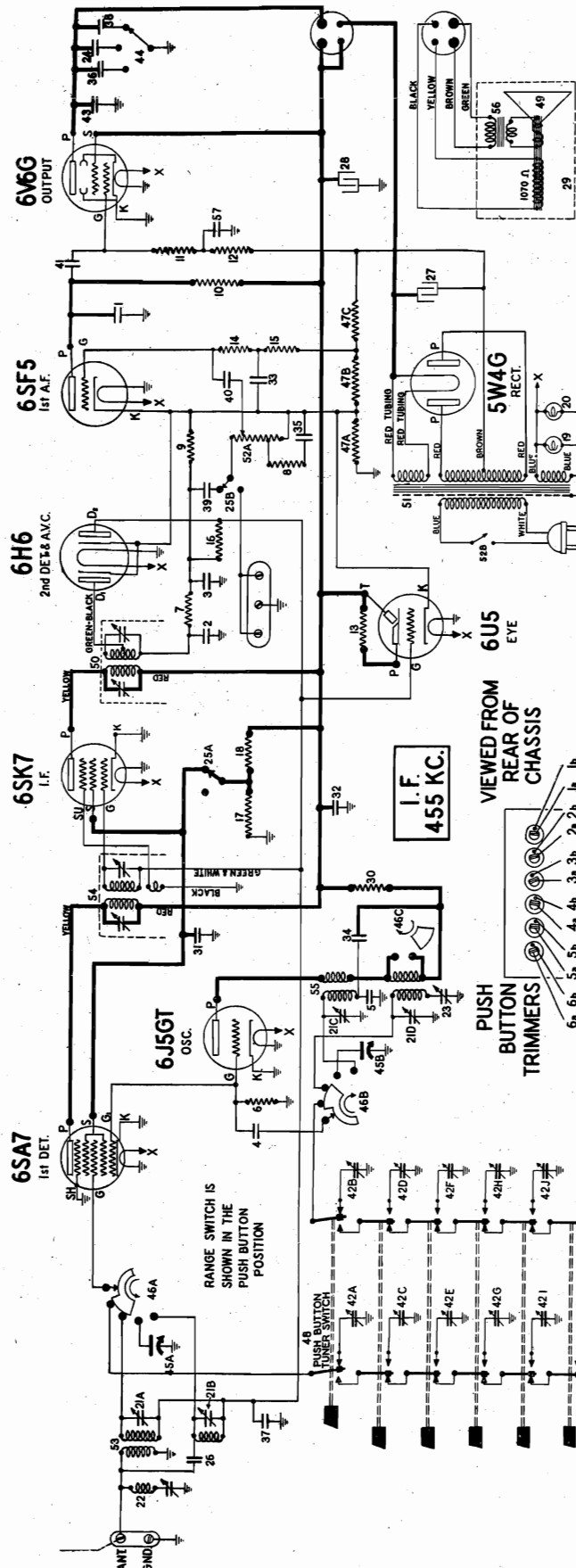


Fig. 1

FIRESTONE TIRE & RUBBER CO (Serials Prefixed with A)

Schematic, Voltage, Parts

MODEL S7404-2



ELECTRICAL PARTS (Continued)

| Diagram Number | Part Number | Description | List Price |
|----------------|-------------|--|------------|
| 1 | U-118659 | Cone & Voice coil for U-115078 speaker. | \$2.35 |
| 2-3 | 118664 | Transformer—2nd I.F. | 1.30 |
| 4 | 118665 | Transformer—power | 6.00 |
| 5 | 52A-52B | Volume control (1 Meg.) with switch. | 1.40 |
| 6-7-8 | 118671 | Coil—antenna | .80 |
| 9-10-11-12 | 118672 | Transformer—1st I.F. | 1.30 |
| 13-14-15 | 118675 | Coil—oscillator | 1.00 |
| 16 | U-118678 | Transformer—output for U-115078 speaker. | 1.80 |
| 17 | 118693 | Condenser—.02 mid., 600 volt. | .15 |

Fig. 1

| Diagram Number | Part Number | Description | List Price |
|----------------|-------------|--|------------|
| 1 | 83539 | Condenser—mica, 260 mmfd. | \$0.20 |
| 2-3 | 83783 | Condenser—mica, 110 mmfd. | .20 |
| 4 | 85061 | Condenser—mica, 51 mmfd. | .15 |
| 5 | 88587 | Condenser—mica, .0042 mid. | .35 |
| 6-7-8 | 110552 | Resistor—carbon, 47,000 ohms, 1/4 watt. | .12 |
| 9-10-11-12 | 110553 | Resistor—carbon, 220,000 ohms, 1/4 watt. | .12 |
| 13-14-15 | 110554 | Resistor—carbon, 1 megohm, 1/4 watt. | .12 |
| 16 | 110580 | Resistor—carbon, 3.3 meg., 1/4 watt. | .12 |
| 17 | 110581 | Resistor—carbon, 18,000 ohms, 2 watts. | .30 |
| 18-20 | 110585 | Resistor—carbon, 12,000 ohms, 3 watts. | .30 |
| 21A to 21D | 110629 | Lamp—6.3 volts—.25 amps. | .15 |
| 22 | 112726 | Condenser—trimmer (4 section) | .60 |
| 23 | 113246 | Condenser—trimmer (with trimmer) | .35 |
| 24 | 114108 | Condenser—.03 mid., 750 volt. | .44 |
| 25A-25B | 114141 | Switch—D.P.D.T. | .44 |
| 26 | 114869 | Condenser—mica, 15 mmfd. | .12 |
| 27-28 | 114972 | Condenser—electrolytic, 16 mid., 450 volt. | .78 |
| 29 | U-115078 | Speaker—dynamic, 10" | 9.00 |
| 30 | 116055 | Resistor—carbon, 22,000 ohms, 1/2 watt. | .25 |
| 31-32-33 | 116625 | Resistor—1 mid., 600 volt. | .12 |
| 34-35-36 | 116640 | Condenser—.01 mid., 600 volt. | .25 |
| 37-38 | 116819 | Condenser—.05 mid., 600 volt. | .15 |
| 39-40-41 | 116893 | Condenser—.02 mid., 600 volt. | .15 |
| 42A to 42L | 117081 | Push button trimmer gang condenser assembly. | 5.20 |
| 43 | 118194 | Condenser—.006 mid., 600 volts. | .15 |
| 44 | 118616 | Switch—tone | .80 |
| 45A-45B | 118619 | Condenser—variable tuning | 3.00 |
| 46A-46B-46C | 118622 | Range switch | 1.20 |
| 47A-47B-47C | 118624 | Resistor—bias (carbon type). | .35 |
| 48 | 118631 | Push button switch (carbon type). | 2.85 |

ELECTRICAL PARTS

| Diagram Number | Part Number | Description | List Price |
|----------------|-------------|--|------------|
| 1 | U-118659 | Cone & Voice coil for U-115078 speaker. | \$2.35 |
| 2-3 | 118664 | Transformer—2nd I.F. | 1.30 |
| 4 | 118665 | Transformer—power | 6.00 |
| 5 | 52A-52B | Volume control (1 Meg.) with switch. | 1.40 |
| 6-7-8 | 118671 | Coil—antenna | .80 |
| 9-10-11-12 | 118672 | Transformer—1st I.F. | 1.30 |
| 13-14-15 | 118675 | Coil—oscillator | 1.00 |
| 16 | U-118678 | Transformer—output for U-115078 speaker. | 1.80 |
| 17 | 118693 | Condenser—.02 mid., 600 volt. | .15 |

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS

| TUBE | FUNCTION | H | K | G | G ₁ | S | SU | P | D ₁ | D ₂ |
|------|-------------------|----------|----|--------|----------------|-----|----|-----|----------------|-------------------|
| 6SA7 | 1st Det. | 6.0 A.C. | 0 | —3* | —10 | 90 | | 255 | | |
| 6U5 | Osc. | 6.0 A.C. | 0 | —10 | | | | 145 | | |
| 6SK7 | I.F. Amp. | 6.0 A.C. | 0 | —3* | | 90 | 0 | 255 | | |
| 6H6 | 2nd Det. & A.V.C. | 6.0 A.C. | —3 | | | | | | | —3* |
| 6SF5 | 1st A.F. | 6.0 A.C. | —3 | —4.5* | | | | 155 | | |
| 6V6G | Output | 6.0 A.C. | 0 | —14.5* | | 255 | | 230 | | |
| 6U5 | Tuning Eye | 6.0 A.C. | —3 | —3* | | | | | | T=255 Volts |
| 5W4G | Rectifier | 5.0 A.C. | | | | | | | | Plates=300 V.A.C. |

*Measured at Bias Resistor.

Use a high resistance voltmeter of at least 1000 ohms per volt.

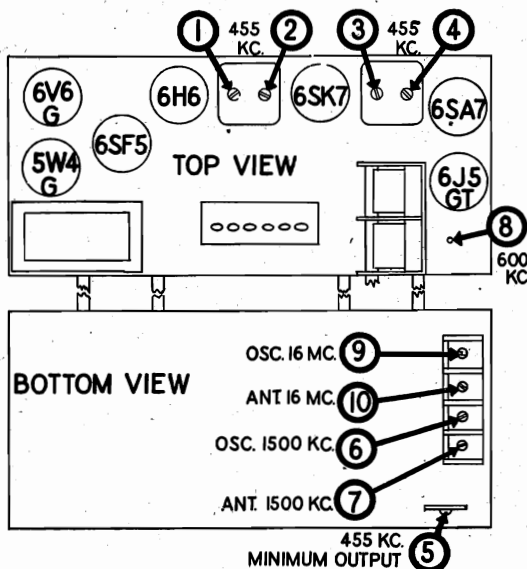
FOR PUSH BUTTON DATA, SEE INDEX

MODEL S7404-2

(Serials Prefixed with A) FIRESTONE TIRE & RUBBER CO.
Alignment, Socket, Trimmers**FOR ALIGNMENT:** An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 6V6G output tube and ground in series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the "GND" terminal or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. Check the pointer to see that it is correctly set.

| Dummy Ant. in Series with Sig. Gen. | Connection of Sig. Generator Output To Receiver | Signal Generator Frequency | Band Switch Position | Receiver Dial Setting | Trimmer Number | Trimmer Description | Type of Adjustment |
|-------------------------------------|---|----------------------------|----------------------|---|----------------|-----------------------------------|--|
| .1 MFD. Condenser | Front Lug of Gang Condenser | 455 KC | Broadcast | Any Point Where It Does Not Affect The Signal | 1-2 | 2nd I. F. | Adjust for maximum output. Then repeat adjustment. |
| | | | | | 3-4 | 1st I. F. | |
| 200 MMFD. Mica Condenser | "Ant." Terminal | 455 KC | Broadcast | Any Point Where It Does Not Affect The Signal | 5 | Wave Trap | Adjust for minimum output using a strong generator signal. |
| 200 MMFD. Mica Condenser | "Ant." Terminal | 1500 KC | Broadcast | 1500 KC | 6 | Broadcast Oscillator (Shunt) | Adjust for maximum output. |
| 200 MMFD. Mica Condenser | "Ant." Terminal | 1500 KC | Broadcast | Tune To 1500 KC Generator Signal | 7 | Broadcast Antenna | Adjust for maximum output. |
| 200 MMFD. Mica Condenser | "Ant." Terminal | 600 KC | Broadcast | Tune To 600 KC Generator Signal | 8 | Broadcast Oscillator (Series Pad) | Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained. |
| 400 OHM Carbon Resistor | "Ant." Terminal | 16 MC | Foreign | 16 MC | 9 | Foreign Oscillator (Shunt) | Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 15.1 MC. If image does not appear realign at 16 MC. with trimmer screw farther out. Recheck image. |
| 400 OHM Carbon Resistor | "Ant." Terminal | 16 MC | Foreign | 16 MC | 10 | Foreign Antenna | Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained. |



| Part Number | Description | List Price |
|-------------|--|------------|
| 118749 | Back—cabinet complete with antenna and terminal | \$1.65 |
| 118648 | Band indicator | .22 |
| 118601 | Band indicator lever | .03 |
| 113442 | Bracket—for tuning eye | .16 |
| 114001 | Clamp for dial scale retaining | .08 |
| 114003 | Clamp—for dial cord | .01 |
| 110808 | Clip—for tuning eye support | .14 |
| 112745 | Clip—coil mounting | .01 |
| 112798 | Clip—for mtg. wave trap coil | .01 |
| 113178 | Cord—dial—for tone indicator (supplied in 4 ft. lengths) | .30 |
| 116948 | Cord—dial drive (supplied in 6 ft. lengths) | .18 |
| 117057 | Cord—drive (supplied in 2 ft. lengths) | .15 |
| 118663 | Dial Gasket | .42 |
| 118547 | Dial mounting plate & brackets | 1.10 |
| 118700 | Dial Scale | 1.00 |
| 113402 | Drum—dial cord drive | .56 |
| 114052 | Escutcheon—dial | 2.00 |
| 113890 | Escutcheon—eye | .10 |
| 118626 | Escutcheon for push buttons | .45 |
| 117087 | Knob—for tuning or volume | .12 |
| 118605 | Pointer | .14 |
| 118625 | Push button | .50 |
| 81145 | Retaining ring—for drive shaft | Per C |
| 83694 | Screw—self tapping 8 x 1/4 | .35 |
| 85040 | Screw—No. 6 Hex. Hd. | Per C |
| 113191 | Screw—special No. 8-32 x 1 1/4 | .01 |
| 114914 | Screw—special head for mtg. escutcheon | Per Dz. |
| 85827 | Set Screw—8-32 Square Head | .02 |
| 111085 | Sleeve—felt for tuning eye | .03 |
| 85427 | Socket—octal base (standard) | .15 |
| 110501 | Socket—4 prong (for speaker) | .16 |
| 113025 | Socket—octal base (with special ground) | .15 |
| 114117 | Socket—dial lamp | .18 |
| 111090 | Spacer—steel, mechanism mtg. to chassis | .02 |
| 113177 | Spring—dial cord tension | .09 |
| 114046 | Spring—for band indicator drive | .05 |
| 117315 | Tab—station call letters | .55 |
| 85785 | Terminal strip—antenna—ground | .15 |
| 117703 | Tuning eye cable and socket | 1.00 |
| 118606 | Tuning eye cable and socket | .18 |
| 87580 | Washer—steel; chassis mtg. | .50 |
| 111456 | Washer—spring washer | Per C |
| 111972 | Washer—extension and tap (for mtg.) | .05 |
| 116530 | Washer—(paper) for back of knobs | .005 |

PHONOGRAPH CONNECTIONS: Connect the wires from a phonograph record player to the left hand and middle terminals on the terminal strip nearest the middle of the chassis on the back of the chassis. Push the black sliding button on the back of the chassis to the right for phonograph or television reception. This switch must be pushed to the left for radio reception. Turn the volume knob on the record player to the maximum volume position and control volume by means of the volume control on the radio.

TELEVISION CONNECTIONS: Connect the wires from a television picture receiver to the right hand and middle terminals on the terminal strip. Operation will now be the same as for phonograph operation.

FIRESTONE TIRE & RUBBER CO.

MODEL S7404-2
(Serials Prefixed with C)
MODEL S7427-8
Alignment, Trimmers
Socket

MODEL S-7427-8

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections Across loud speaker voice coil
Generator ground lead connection Receiver chassis
Dummy antenna value to be in series with generator output See chart below
Connection of output lead See chart below
Generator modulation 30%, 400 cycles
Position of Volume Control Fully on
Position of Tone Control Brilliant
Position of Dial Pointer with variable fully closed On mark to left of
550 kc calibration mark.

| WAVE BAND SWITCH POSITION | POSITION OF VARIABLE | GENERATOR FREQUENCY | DUMMY ANTENNA | GENERATOR CONNECTION | TRIMMER ADJUSTED (IN ORDER SHOWN) | TRIMMER FUNCTION |
|------------------------------|-------------------------|------------------------|------------------|-------------------------|--|---------------------|
| Manual B.C. | Closed | 455 kc | .1 mfd. | G3 of 6SA7 | T2, T1 | IF |
| Manual B.C. | 500 kc | 500 kc | .0002 mfd. | Ant. Term. | C4* | Wave Trap. |
| Manual B.C. | 1400 kc | 1400 kc | .0002 mfd. | Ant. Term. | C13** | Oscillator |
| Manual B.C. | 1400 kc | 1400 kc | .0002 mfd. | Ant. Term. | C13 | Translator |
| Manual B.C. | 600 kc | 600 kc | .0002 mfd. | Ant. Term. | C5 | Translator |
| Manual S.W. | 15 mc (rock) | 15 mc | 400 ohms | Ant. Term. | | |

IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

** Mounted under the chassis.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

PRELIMINARY:

Output meter connections Across loud speaker voice coil
Generator ground lead connection Receiver chassis
Dummy antenna value to be in series with generator output See chart below
Connection of output lead See chart below
Generator modulation 30%, 400 cycles
Position of Volume Control Fully on
Position of Tone Control Brilliant
Position of Dial Pointer with variable fully closed On mark to left of
550 kc calibration mark.

| WAVE BAND SWITCH POSITION | POSITION OF VARIABLE | GENERATOR FREQUENCY | DUMMY ANTENNA | GENERATOR CONNECTION | TRIMMER ADJUSTED (IN ORDER SHOWN) | TRIMMER FUNCTION |
|------------------------------|-------------------------|------------------------|------------------|-------------------------|--|---------------------|
| Manual B.C. | Closed | 455 kc | .1 mfd. | G3 of 6SA7 | T2, T1 | IF |
| Manual B.C. | 500 kc | 500 kc | .0002 mfd. | Ant. Term. | C9 | Oscillator |
| Manual B.C. | 1400 kc | 1400 kc | .0002 mfd. | Ant. Term. | C1* | Translator |
| Manual B.C. | 600 kc | 600 kc | .0002 mfd. | Ant. Term. | C10 | Padder |
| Manual S.W. | 15 mc (rock) | 15 mc | 400 ohms | Ant. Term. | C3 | Translator |

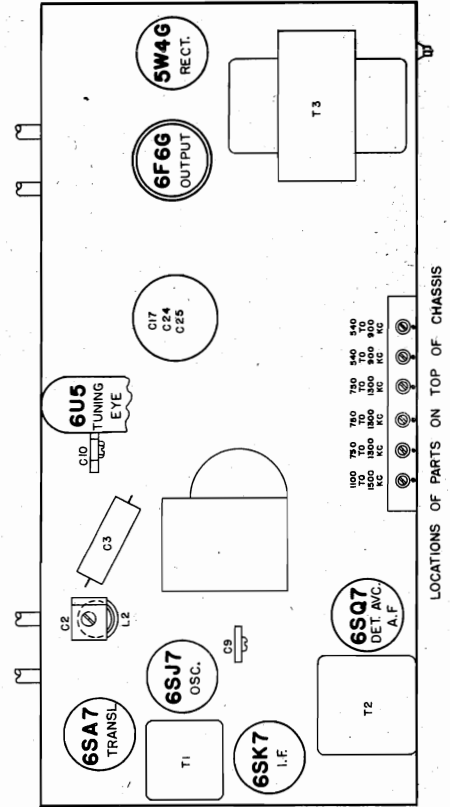
IMPORTANT ALIGNMENT NOTES

* Mounted on loop.

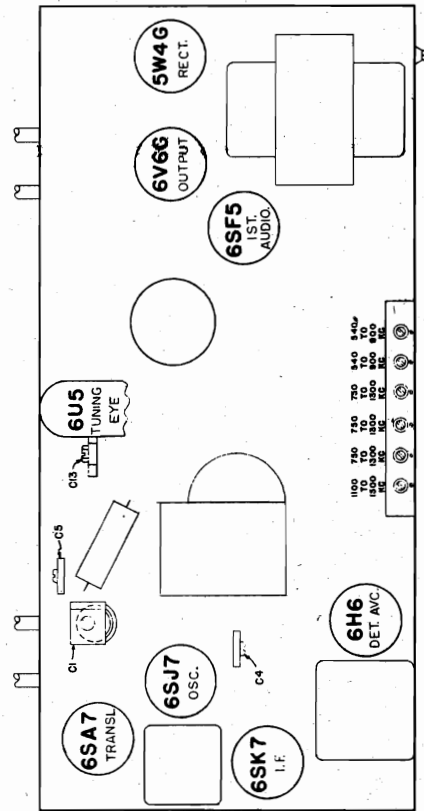
Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

With the signal generator disconnected, tune in a weak broadcast station at about 1400 kc and readjust C1 for the final adjustment.



LOCATIONS OF PARTS ON TOP OF CHASSIS



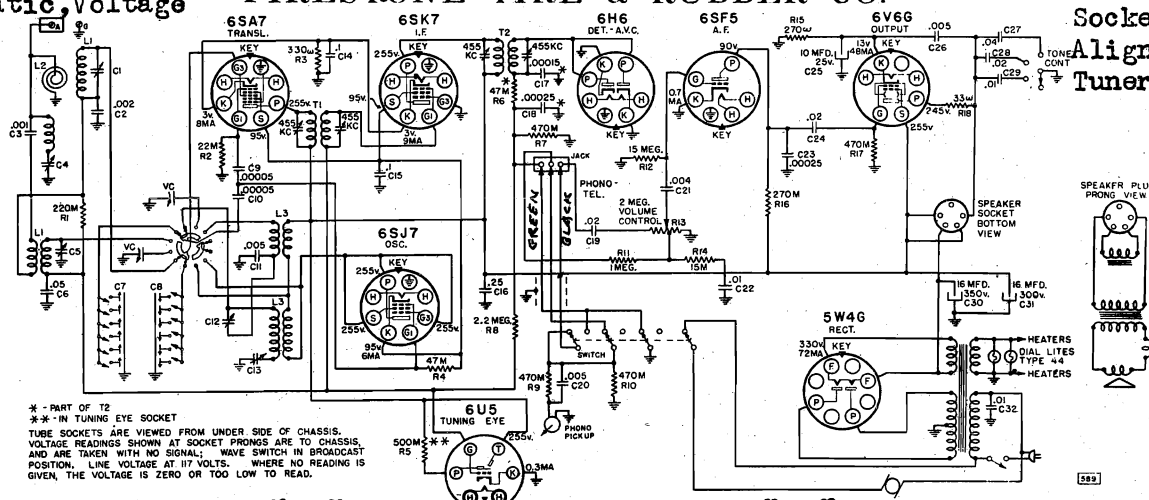
LOCATIONS OF PARTS ON TOP OF CHASSIS

MODEL S7404-4

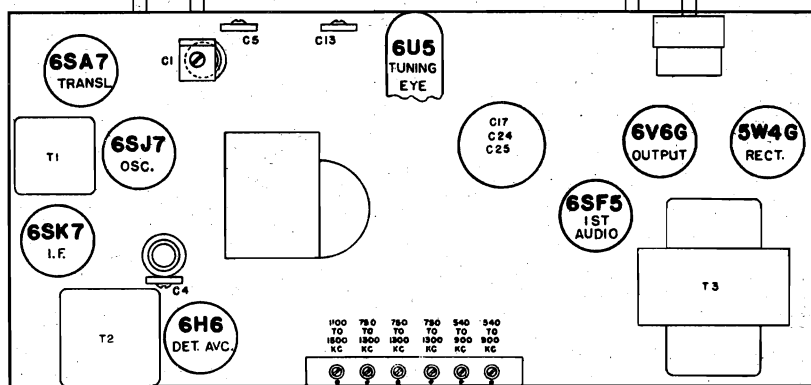
Schematic, Voltage

FIRESTONE TIRE & RUBBER CO.

Trimmers
Socket
Alignment
Tuner



* - PART OF T2
* - IN TUNING EYE SOCKET
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS,
AND ARE TAKEN WITH NO SIGNAL. WAVE SWITCH IN BROADCAST
POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS
GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.



PRELIMINARY:

Output meter connections . . . LOCATIONS OF PARTS ON TOP OF CHASSIS . . . Across loud speaker voice coil
Generator ground lead connection . . . Receiver chassis
Dummy antenna value to be in series with generator output . . . See chart below
Connection of output lead . . . See chart below
Generator modulation . . . 30%, 400 cycles
Position of Volume Control . . . Fully on
Position of Tone Control . . . Brilliant
Position of Dial Pointer with variable fully closed . . . On mark to left of
550 kc calibration mark.

| WAVE BAND SWITCH POSITION | POSITION OF VARIABLE | GENERATOR FREQUENCY | DUMMY ANTENNA | GENERATOR CONNECTION | ADJUSTED (IN ORDER SHOWN) | TRIMMER FUNCTION |
|---------------------------------|-------------------------|------------------------|------------------|-------------------------|---------------------------------|---------------------|
| Manual B.C. | Closed | 455 kc | .1 mfd. | G3 of 6SA7 | T2, T1 | IF |
| Manual B.C. | 600 kc | 600 kc | .0002 mfd. | Ant. Term. | C4* | Wave Trap |
| Manual B.C. | Fully open | 1730 kc | .0002 mfd. | Ant. Term. | C12** | Oscillator |
| Manual B.C. | 1400 kc | 1400 kc | .0002 mfd. | Ant. Term. | C1 | Translator |
| Manual B.C. | 600 kc | 600 kc | .0002 mfd. | Ant. Term. | C13 | Padder |
| Manual S.W. | 15 mc (rock) | 15 mc | 400 ohms | Ant. Term. | C5 | Translator |

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

** Mounted under the chassis.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

PUSH BUTTON TUNING

Each of the buttons will be set up in the following manner:

1. Turn the BAND knob to the MANUAL BROADCAST position and tune in the desired station.
 2. Turn the BAND knob to PUSH BUTTON. Push in the button that is to be set to the desired station.
 3. Turn the large screw of the corresponding adjustment until the station is tuned in; then the small screw for finer tuning. Repeat with the large screw for final adjustment. Use the Tuning Eye to secure exact tuning. The BAND knob can be turned back to MANUAL BROADCAST in order to check if the station is the desired one.
 4. Fasten the proper call letters in the escutcheon.
- Proceed in the same manner for the remaining buttons.

FIRESTONE TIRE & RUBBER CO.

MODEL S7405-5
Schematic, Voltage

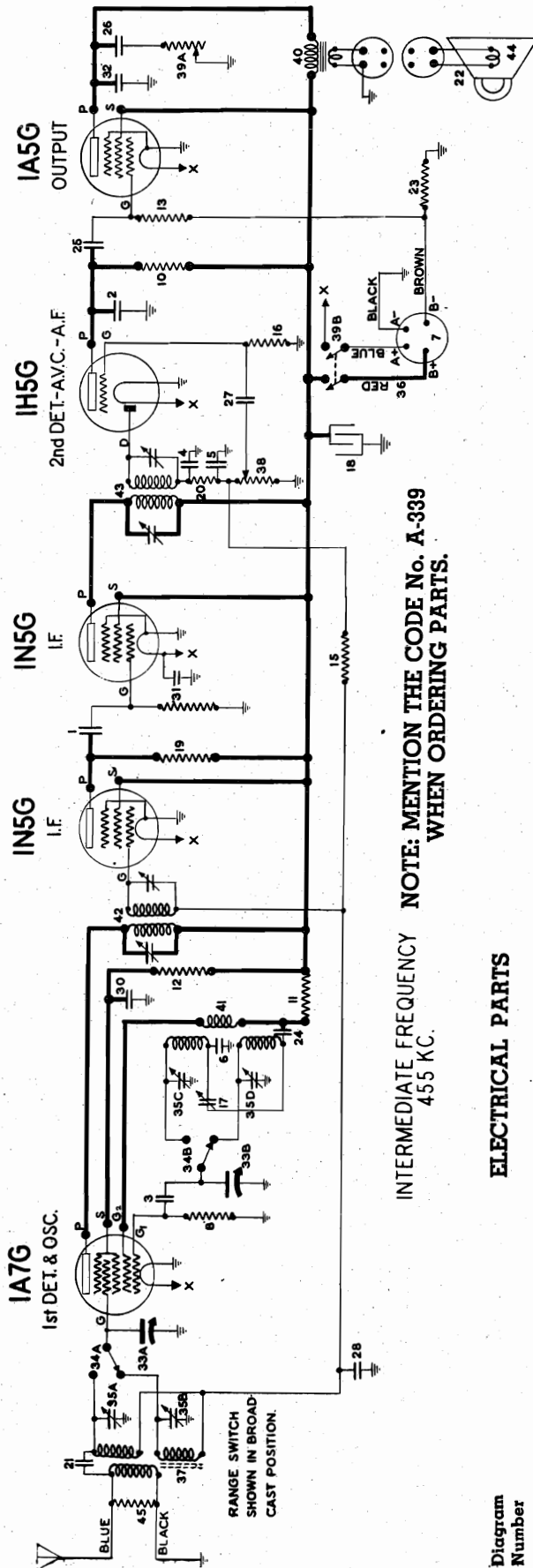


Diagram Number

ELECTRICAL PARTS

| Part Number | Description | List Price | Diagram Part Number | Description | List Price |
|-------------|--|------------|---------------------|---|------------|
| 1 | 83539 Condenser—mica, 250 mmfd. | \$0.20 | 23 | 116078 Resistor—560 ohms, 1/4 watt. | \$0.12 |
| 2 | 83783 Condenser—mica, 110 mmfd. | .20 | 24-25-26 | 116640 Condenser—.01 mfd., 600 volt. | .15 |
| 3-4-5 | 85081 Condenser—mica, 51 mmfd. | .15 | 27 | 116647 Condenser—.004 mfd., 600 volt. | .15 |
| 6 | 88587 Condenser—mica, .0042 mfd. | .35 | 28 to 31 | 116819 Condenser—.05 mfd., 600 volt. | .20 |
| 7 | 88631 Plug—4 prong, male. | .06 | 32 | 117022 Condenser—.002 mfd., 600 volt. | .15 |
| 8 | 110553 Resistor—carbon, 220,000 ohms, 1/4 watt. | .12 | 33A-33B | 119533 Condenser—tuning (with drum). | 3.30 |
| 9 | 110580 Resistor—carbon, 3.3 meg., 1/4 watt. | .12 | 34A-34B | 119534 Range switch | .80 |
| 10 | 110554 Resistor—carbon 1 megohm, 1/4 watt. | .12 | 35A-35D | 119536 Condenser—trimmer (4 sections). | .60 |
| 11 | 110557 Resistor—carbon, 4,700 ohms, 1/4 watt. | .12 | 36 | 119537 Battery cable | .40 |
| 12 | 110566 Resistor—carbon, 33,000 ohms, 1/4 watt. | .12 | 37 | 119541 Coil—antenna | 1.25 |
| 13 | 110570 Resistor—carbon, 2.2 meg., 1/4 watt. | .15 | 38 | 119551 Volume control—1 meg. | .95 |
| 15-16 | 110580 Resistor—carbon, 3.3 meg., 1/4 watt. | .12 | 39A-39B | 119552 Tone control—100,000 ohms, with switch | .95 |
| 17 | 112799 Condenser—padder | .36 | 40 | 119651 Transformer—output | 1.50 |
| 18 | 112898 Condenser—electrolytic 16 mfd., 150 volt. | .50 | 41 | 119669 Coil—oscillator | .75 |
| 19 | 118816 Resistor—carbon, 6,700 ohms, 1/4 watt. | .12 | 42 | 119720 Transformer—1st I.F. | 1.25 |
| 20 | 110565 Resistor—carbon, 22,000 ohms, 1/4 watt. | .12 | 43 | 119673 Transformer—2nd I.F. | 1.25 |
| 21 | 114969 Condenser—mica, 15 mmfd. | .12 | 44 | M-119750 Cone & voice coil for M-115093 speaker | 1.60 |
| 22 | M-115093 Speaker—P.M. (8") | 7.50 | 45 | 118805 Resistor—carbon, 10,000 ohms, 1 watt. | .12 |

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SOCKET VOLTAGES

| Tube | Function | G | G ₁ | G ₂ | P | D | S | F(x) |
|------|----------------------|--------|----------------|----------------|--------|---|----|------|
| 1A7G | 1st Det. & Osc. | 0 | -1 | 74 | 85 | — | 49 | 1.4 |
| 1N5G | I. F. | 0 | — | — | 60 | — | 85 | 1.4 |
| 1N5G | I. F. | 0 | — | — | 85 | — | 85 | 1.4 |
| 1H5G | 2nd Det. A.V.C.—A.F. | 0 | — | — | Note A | 0 | — | 1.4 |
| 1A5G | Output | Note B | — | — | 83 | — | 85 | 1.4 |

Note A: Only a small voltage will be measured at the plate of the 1H5G when using a voltmeter having a resistance of 1000 ohms per volt.
Note B: The bias on the 1A5G grid is —5 volts measured across resistor No. 23.

MODEL S7405-5

Alignment, Trimmers
Socket

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT PROCEDURE

FOR ALIGNMENT an output meter and an accurately calibrated signal generator are required.

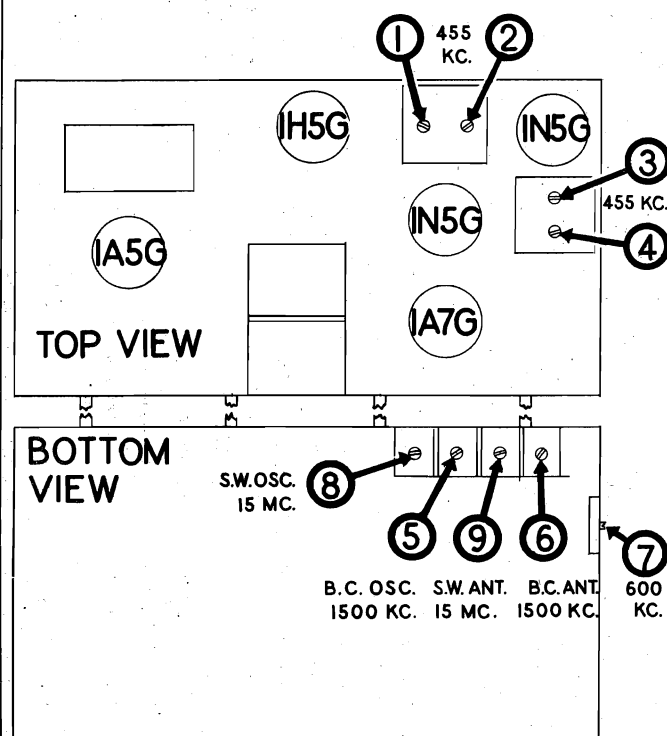
Connect the output meter across the voice coil or between the plate of the 1A5G output tube and ground through a 0.1 Mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)

Connect the ground lead of the signal generator to the black ground wire or the chassis.

Turn the volume control to the maximum volume position and keep it in this position while aligning.

With the gang condenser in full mesh, set the dial pointer to the low frequency edge of the dial scale.

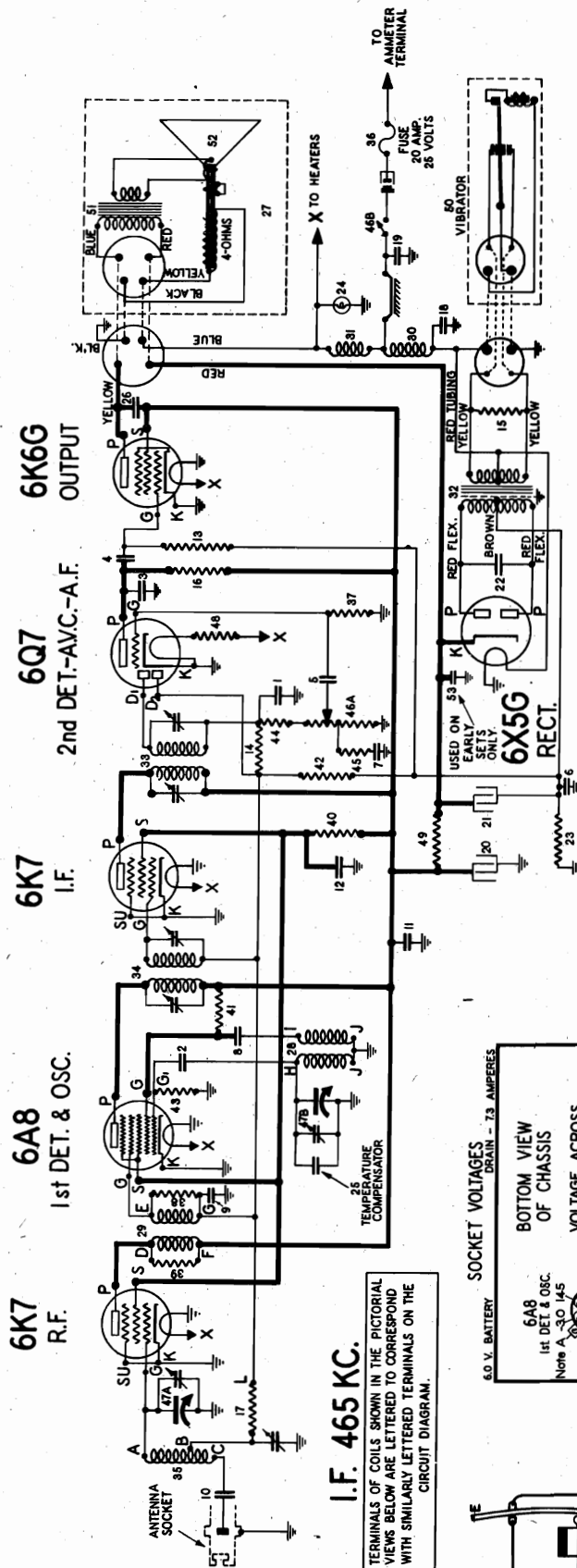
| Dummy Ant. in Series with Sig. Gen. | Connection of Sig. Generator Output To Receiver | Signal Generator Frequency | Band Switch Position | Receiver Dial Setting | Trimmer Number | Trimmer Description | Type of Adjustment |
|-------------------------------------|---|----------------------------|----------------------|---|----------------|-----------------------------------|--|
| .1 MFD. Condenser | Control Grid of 1A7G | 455 KC | Broadcast | Any Point Where It Does Not Affect The Signal | 1-2 3-4 | 2nd I. F. 1st I. F. | Adjust for maximum output. Then repeat adjustment. |
| 200 MMFD. Mica Condenser | Antenna Lead (Blue Wire) | 1500 KC | Broadcast | 1500 KC | 5 | Broadcast Oscillator (Shunt) | Adjust for maximum output. |
| 200 MMFD. Mica Condenser | Antenna Lead (Blue Wire) | 1500 KC | Broadcast | Tune To 1500 KC Generator Signal | 6 | Broadcast Antenna | Adjust for maximum output. |
| 200 MMFD. Mica Condenser | Antenna Lead (Blue Wire) | 600 KC | Broadcast | Tune To 600 KC Generator Signal | 7 | Broadcast Oscillator (Series Pad) | Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained. |
| 400 OHM Carbon Resistor | Antenna Lead (Blue Wire) | 15 MC | Foreign | 15 MC | 8 | Foreign Oscillator (Shunt) | Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 14.1 MC. If image does not appear realign at 15 MC, with trimmer screw farther out. Recheck image. |
| 400 OHM Carbon Resistor | Antenna Lead (Blue Wire) | 15 MC | Foreign | 15 MC | 9 | Foreign Antenna | Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained. |

**MISCELLANEOUS PARTS**

| Part Number | Description | List Price |
|-------------|---|------------|
| 119538 | Cabinet Back | .45 |
| 114955 | Clamp—for dial cord | .01 |
| 112745 | Clip—coil mounting | .01 |
| 117057 | Cord—drive (supplied in 2 ft. lengths) | .15 |
| 119523 | Dial Scale | .40 |
| 112265 | Escutcheon—with celluloid window | 2.10 |
| 116411 | Indicator lever assembly | .09 |
| 119644 | Knob—push on | .18 |
| 119588 | Pointer | .25 |
| 81145 | Retaining ring—for drive shaft | Per C .50 |
| 83624 | Screw—self tapping 8 x 1/4 | .01 |
| 113191 | Screw—special No. 8-32 x 1 1/8 | .01 |
| 119587 | Screw—No. 2 x 3/8 Phillips Round Head | .02 |
| 85827 | Set Screw—8-32 Square Head | .02 |
| 119549 | Shaft—extension for volume control | .25 |
| 116392 | Shield base—tube | .03 |
| 116395 | Shield—tube | .08 |
| 85427 | Socket—octal base (standard) | .15 |
| 110501 | Socket—4 prong (for speaker) | .16 |
| 111090 | Spacer—steel mounting | .02 |
| 113169 | Spring—for indicator lever | .01 |
| 114968 | Spring—dial cord tension | .03 |
| 111972 | Washer—extension and top (for mounting) | .05 |
| 111456 | Washer—spring washer | Per C .50 |

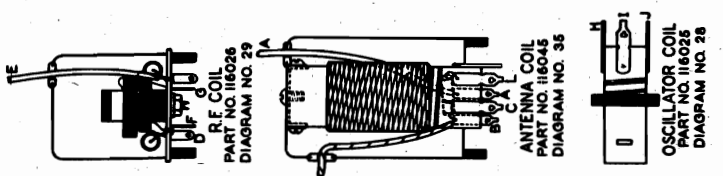
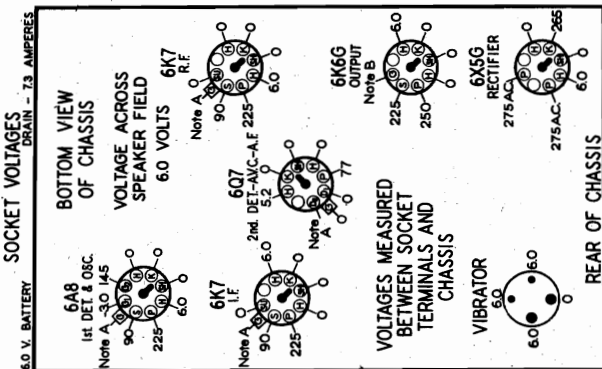
FIRESTONE TIRE & RUBBER CO.

MODEL S7407-6
Schematic, Voltage
Socket, Coils, Parts



PARTS LIST

| DIAGRAM NUMBER | PART NUMBER | DESCRIPTION | LIST PRICE |
|----------------|-------------|--|------------|
| 1 | 85339 | Condenser - mica 260 mmfd. | .20 |
| 2 | 83783 | Condenser - mica 110 mmfd. (10%) | .20 |
| 3 | 83764 | Condenser - mica .001 mfd. | .25 |
| 4 | 86026 | Condenser - paper .02 mfd. 400 V. | .25 |
| 5-6 | 86029 | Condenser - paper .004 mfd. 400 V. | .25 |
| 7-8 | 86030 | Condenser - paper .01 mfd. 400 V. | .25 |
| 9 | 86189 | Condenser - paper .05 mfd. 200 V. | .25 |
| 10 | 86205 | Condenser - mica 2100 mmfd. | .25 |
| 11 | 86682 | Condenser - paper .1 mfd. 400 V. | .25 |
| 12 | 89421 | Condenser - paper .1 mfd. 200 V. | .25 |
| 13 | 112971 | Resistor - insulated 470,000 ohms 1/4 watt | .15 |
| 14 | 112973 | Resistor - insulated 1.5 meg. 1/4 watt | .15 |
| 15 | 112976 | Resistor - wire wound 220 ohms 1/2 watt (10%) | .15 |
| 16 | 112987 | Resistor - insulated 220,000 ohms 1/4 watt | .15 |
| 17 | 112993 | Resistor - carbon 470,000 ohms 1/10 watt | .12 |
| 18-19 | 113561 | Condenser - paper .5 mfd. 150 volt | .38 |
| 20-21 | 114258 | Condenser - elect. 8 mfd. 450 volt | .98 |
| 22 | 114277 | Condenser - oil filled .01 mfd. 2000 volts | .24 |
| 23 | 114334 | Resistor - wire wound 360 ohms 2 watts (10%) | .20 |
| 24 | 114401 | Dial Lamp - 6 volt | .18 |
| 25 | 114499 | Condenser - temp. comp. for osc. | .48 |
| 26 | 114528 | Condenser - paper .005 mfd. 600V. | .15 |
| 27 | U-115046 | Speaker - dynamic 8" | 5.95 |
| 28 | 116025 | Oscillator coil | 1.40 |
| 29 | 116026 | R.F. Coil & Shield Assembly | 1.40 |
| 30 | 116032 | Choke coil in "A" supply (long) | .35 |
| 31 | 116035 | Choke coil in "A" supply (short) | .25 |
| 32 | 116038 | Transformer - power (6 volt) | 3.50 |
| 33 | 116040 | Transformer - 2nd I.F. | 1.00 |
| 34 | 116043 | Transformer - 1st I.F. | 1.25 |
| 35 | 116045 | Ant. Coil - with shield & brkt. | 1.25 |
| 36 | 116049 | Fuse - 20 amp. 25 volt. | .05 |
| 37 | 116050 | Resistor - insul. 10 meg. 1/4 W. | .12 |
| 38 | 116053 | Resistor - carb. 33,000 ohm 1/10W | .12 |
| 39 | 116054 | Resistor - carb. 68,000 ohm 1/10W | .12 |
| 40 | 116055 | Resistor - carb. 27,000 ohm 1/4 W. | .12 |
| 41 | 116056 | Resistor - carb. 22,000 ohm 1/4 W. | .12 |
| 42 | 116057 | Resistor - carb. 10 meg. 1/4 W. (10%) | .12 |
| 43-44-45 | 116058 | Resistor - carb. 47,000 ohm 1/4 W. | .12 |
| 46A | 48B-116125 | Volume control - 500,000 ohms with off-on switch | 1.00 |
| 47A | 47B-116127 | Condenser - variable gang | 2.75 |
| 48 | 116166 | Resistor - W.M. 3 ohms 1 watt | .15 |
| 49 | 116167 | Resistor - W.M. 1,500 ohms 1 watt | .15 |
| 50 | 116202 | Vibrator | 3.00 |
| 51 | U-116207 | Output transformer for U-115046 speaker | 1.70 |
| 52 | U-116208 | Cone & Voice coil assembly for U-115046 speaker | 1.50 |
| 53 | 88030 | Condenser - paper .01 mfd. 400 V. | .25 |



MODEL S7407-6

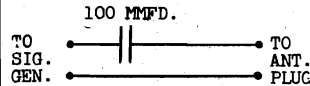
Alignment, Trimmers
Parts

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT PROCEDURE

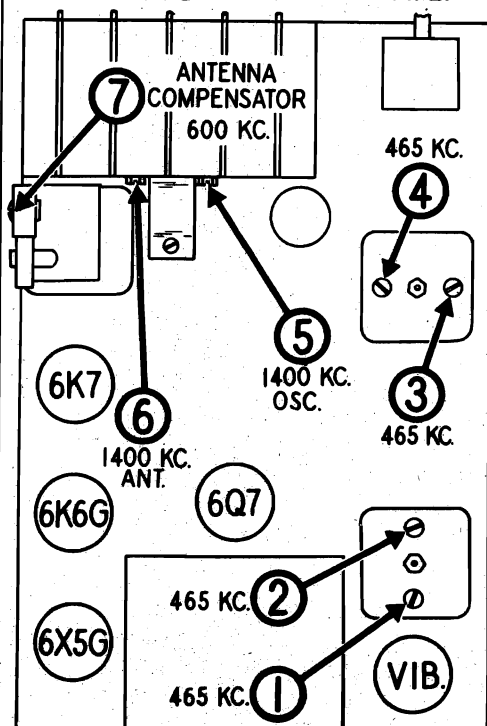
FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC. to 1400 KC. are required.

- 1- Connect the output meter across the speaker voice coil or between the plate of the 6K6G output tube and ground through a .1 mfd. condenser. The more sensitive type meter should be connected across the voice coil.
- 2- Connect the ground lead of the signal generator to the receiver chassis and leave it connected in this manner throughout the entire alignment procedure.
- 3- Turn the volume control to the maximum volume position.
- 4- With the gang condenser in full mesh, set the pointer to the last division on the low frequency end of the dial scale. This can be done by releasing the clip holding the pointer to the dial cord and slide the pointer to the correct position. Then retighten the pointer clip on the dial cord.

| DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR | CONNECTION OF SIG. GEN. OUTPUT TO RECEIVER | SIGNAL GENERATOR FREQUENCY | RECEIVER DIAL SETTING | TRIMMER NUMBER | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT |
|---|--|----------------------------|---|----------------|--|--|
| .1 MFD. CONDENSER | CONTROL GRID OF 6A8 | 465 KC. | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 1-2 | 2ND. I. F. | ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT. |
| | | | | 3-4 | 1ST I. F. | |
| WHEN ALIGNING TRIMMERS NO. 5, 6 AND 7 CONNECT THE SIGNAL GENERATOR OUTPUT TO THE ANTENNA LEAD-IN PLUG ON THE LEFT SIDE OF THE RECEIVER CASE WITH A 100 MMFD. (APPROX.) MICA CONDENSER IN SERIES WITH GENERATOR OUTPUT.  TO SIG. GEN. --- TO ANT. PLUG | | 1400 KC. | TUNE TO 1400 KC GENERATOR SIGNAL | 5 | OSCILLATOR (Shunt) CONDENSER | ADJUST FOR MAXIMUM OUTPUT. |
| | | | | 6 | ANTENNA (Shunt) CONDENSER | ADJUST FOR MAXIMUM OUTPUT. |
| | | 600 KC | TUNE TO 600 KC GENERATOR SIGNAL | 7 | ANTENNA COMPENSATOR (Series Condenser) | ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED. |

IMPORTANT: IF THIS CONDENSER IS OMITTED THE ALIGNMENT WILL BE INCORRECT.

AFTER THE SET IS INSTALLED IN THE CAR. TUNE IN A FAIRLY WEAK STATION NEAR 600 KC. AND ADJUST TRIMMER 7 FOR MAXIMUM OUTPUT.



FORM NO. 8958 PRINTED IN U.S.A.

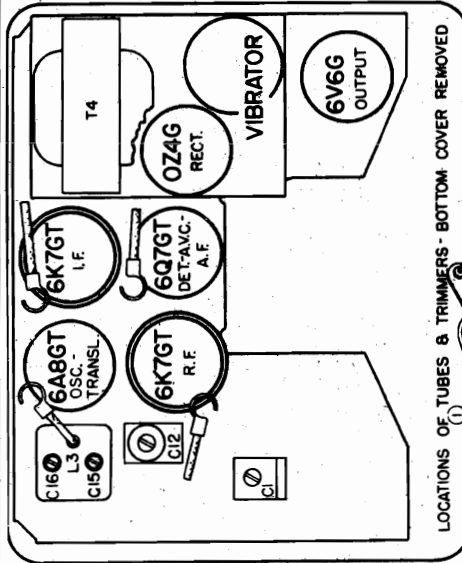
PARTS LIST

| PART NUMBER | DESCRIPTION | LIST PRICE | PART NUMBER | DESCRIPTION | LIST PRICE |
|---|-------------|------------|-------------------------------------|-------------|------------|
| INSTALLATION PARTS | | | | | |
| 116155-"A" Cable with fuse hous. | | .30 | 116217-Screw for mtg. nose esc. | | .06 |
| 116158-"A" Cable (chassis end)- | | .28 | 116218-Speed Nut - for nose esc. | | .01 |
| 83319-Fuse insulator tube---- | | .02 | 114339-Trunk clamp-upper sect.- | | .16 |
| 77650-Nut for mtg. back of rec. | | .02 | 114341-Trunk clamp-lower sect.- | | .08 |
| 61086-Lockwasher-for mtg. front bracket---- | | .25 | DIAL AND MISCELLANEOUS PARTS | | |
| 79056-Lockwasher-1/4" for mtg. back of rece.ver. doz. | | .08 | 113170-Adjusting lug-for shafts- | | .01 |
| 116269-Lockwasher - double edge for rear brkt. mtg.---- | | .01 | 110087-Antenna lead receptacle-- | | .03 |
| 116225-Mtg. Bracket - for rear- | | .35 | 116171-Cable & Plug for spkr.--- | | .30 |
| 116285-Mtg. Brkt.R.H.for front- | | .10 | 114253-Clamp - for vibrator----- | | .12 |
| 116286-Mtg. Brkt.L.H. for front- | | .10 | 112745-Clip - coil mounting----- | | .01 |
| 116264-Mtg. Bolt (1/4-20 X 1 1/2)- | | .02 | 113178-Cord - dial----- (4 ft.) | | .30 |
| 45569-Nut-#10-32 for front brkt | | .01 | 116148-Dial Drive Drum & Pinion-- | | 1.00 |
| 77854-Screw-10-32 for frt.brkt. | | .08 dz | 116153-Dial Frame & Pulley----- | | .50 |
| NOISE SUPPRESSION PARTS | | | 116150-Dial Scale - glass----- | | .28 |
| 110236-Anti Rattle Clips----- | | .05 | 116200-Knob-for tun. or vol.----- | | .10 |
| 110402-Braided Ground Bond (10") | | .22 | 116346-Mechanical Tuner Assem.--- | | 2.50 |
| 110403-Braided Ground Bond (6") | | .18 | 12349-Nut for spkr. mtg.--Per C | | .45 |
| 110410-Cond.--.5 mfd. 100 volt-- | | .35 | 116109-Pointer - for dial----- | | .06 |
| 88429-Distributor suppressors---- | | .35 | 116201-Push button----- | | .10 |
| 88430-Dome light filter----- | | 1.00 | 116117-Retainer-for dial (large) | | .02 |
| 88422-Ford distributor cond.--- | | .75 | 116118-Retainer-for dial (small) | | .01 |
| 88350-Gen.cond.--.5 mfd. 150 V. | | .75 | 81145-Retaining ring-----Per C | | .50 |
| CASE SECTIONS AND ASSOCIATED PARTS | | | 114327-Spring-push button key--- | | .04 |
| 116121-Bottom cover-(spkr.case) | | 1.50 | 111403-Set Screw - fluted head--- | | .12 |
| 116214-Escutcheon - for nose---- | | .65 | 116243-Shaft - for push buttons--- | | .08 |
| 116169-Grill - for speaker----- | | .30 | 116124-Socket - for dial lamp----- | | .15 |
| 116213-Nose for receiver case---- | | .60 | 116168-Speaker plug - male end---- | | .20 |
| 110430-Nose Mounting screws---- | | .01 | 113177-Spring - for dial cord----- | | .09 |
| 116120-Receiver case - less bottom cover----- | | 2.00 | 114356-Tab - cellulod-----Per Dz | | .08 |
| | | | 116268-Tabs - call letters-----Set | | .50 |
| | | | 110237-Tube shield cap----- | | .06 |
| | | | 114611-Tube socket - octal type---- | | .15 |
| | | | 114612-Tube socket (spec. grd.)---- | | .15 |
| | | | 116154-Tuning shaft----- | | .08 |
| | | | 8F262-Vibrator socket(4 prong)- | | .14 |

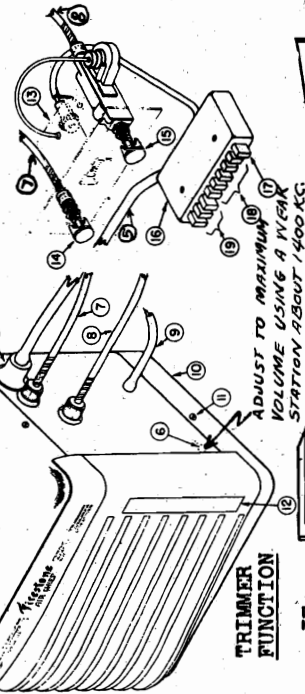
MODEL S7407-8
Alignment

FIRESTONE TIRE & RUBBER CO.

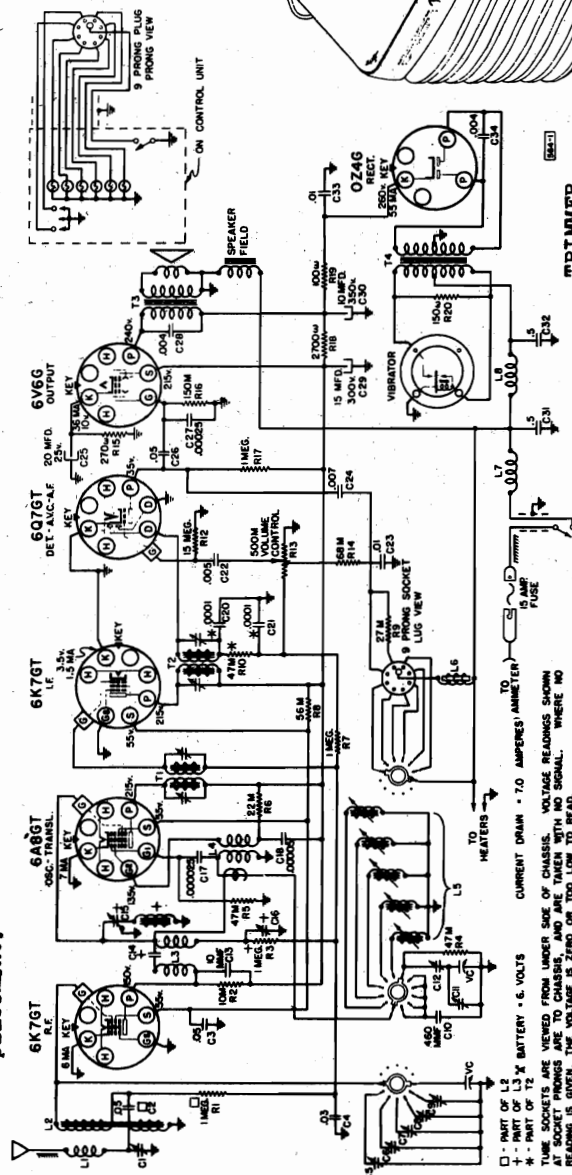
MODEL S7407-5, Late
Schematic, Voltage
Socket, Trimmers
Alignment, Assembly



CONNECTING
THE RECEIVER



1. Fuse Container.
2. Connection of Ammeter.
3. Grounding of Ammeter Condenser.
4. Ammeter Condenser.
5. Push Button and Tone Control cable.
6. Hole for Antenna Matching Adjustment.
7. Volume Control Cable.
8. Station Selector Cable.
9. Antenna Lead-in Cable.
10. Bottom Cover, Removable for Tube Re-
placement.
11. Screw Holding Bottom Cover.
12. Cover Over MONOMATIC TUNING Adjust-
ments. (SEE INDEX FOR SETTING TUNER)
13. Manual Tuning Control.
14. On-Off Switch and Volume Control Knob.
15. Station Selector Knob.
16. Push Button Tuning Button.
17. MONOMATIC TUNING Button.
18. Station Call Letter Indicators.
19. TRIMATIC Tone Control Buttons.



TRIMMER
ADJUSTMENTS
(IN ORDER
SHOWN)

GENERATOR
CONNECTION S-7407-5 S-7407-8

DUMMY
ANTENNA

POSITION OF
VARIABLE

FOR TUNER SEE
PAGE 10-2, VOL. X

GENERATOR
FREQUENCY

Closed 455 kc
Closed 455 kc
Open 1530 kc
Open 3430 kc
Open 540 kc
Open 1530 kc
Open 1400 kc
600 kc (rock)

RF Grid
RF Grid
Ant. Conn.
Ant. Conn.
Ant. Conn.
Ant. Conn.
Ant. Conn.
Ant. Conn.

T2, T1
C16*
C11
C15*
C12
C11
C1
C12

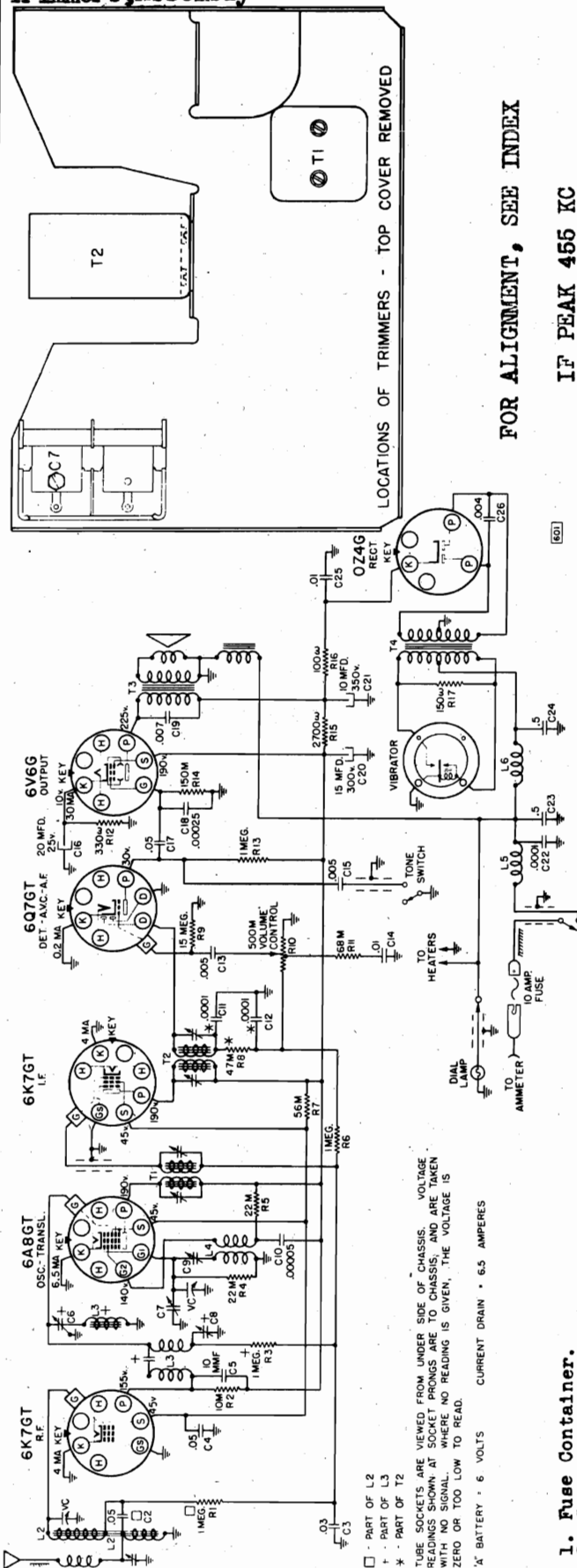
IF Wave Trap
Oscillator
Image Rejector
Padder
Oscillator
Antenna
Padder

The receiver must be in its case during alignment.
* The signal generator should be adjusted for high output and the trimmer should be ad-
justed for minimum response.
The alignment procedure should be repeated in the original order, step by step, to insure
greater accuracy.
Always keep the output power from the generator at its lowest possible value to prevent
the AVC of the receiver from interfering with accurate alignment, except as noted by (*) above.

MODEL S7407-8

Schematic, Socket, Voltage
Trimmers, Assembly

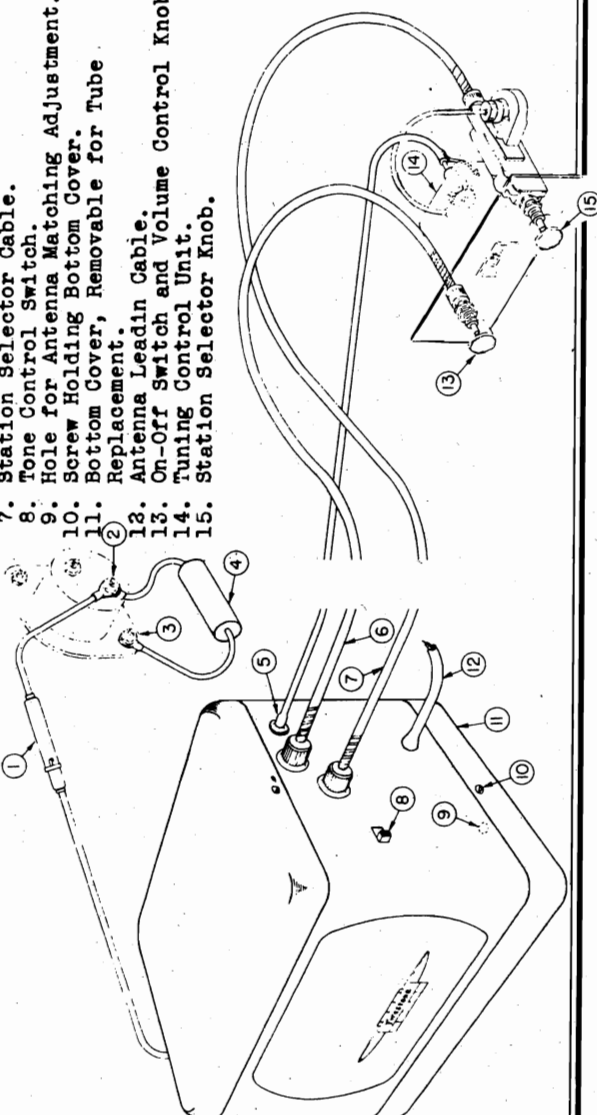
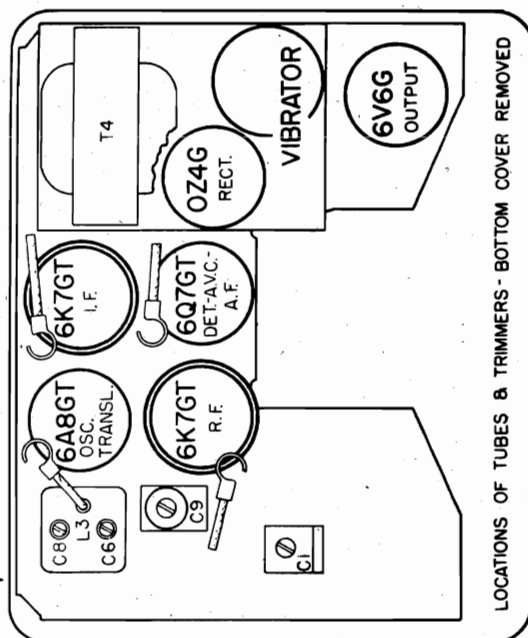
FIRESTONE TIRE & RUBBER CO.



FOR ALIGNMENT, SEE INDEX

IF PEAK 455 KC

1. Fuse Container.
2. Connection to Ammeter.
3. Grounding of Ammeter Condenser.
4. Ammeter Condenser.
5. Dial Light Connection.
6. Volume Control Cable.
7. Station Selector Cable.
8. Tone Control Switch.
9. Hole for Antenna Matching Adjustment.
10. Screw Holding Bottom Cover.
11. Bottom Cover, Removable for Tube Replacement.
12. Antenna Lead-in Cable.
13. On-Off Switch and Volume Control Knob.
14. Tuning Control Unit.
15. Station Selector Knob.



FIRESTONE TIRE & RUBBER CO.

MODEL S7425-3
Schematic, Voltage
Chassis, Socket
Trimmers

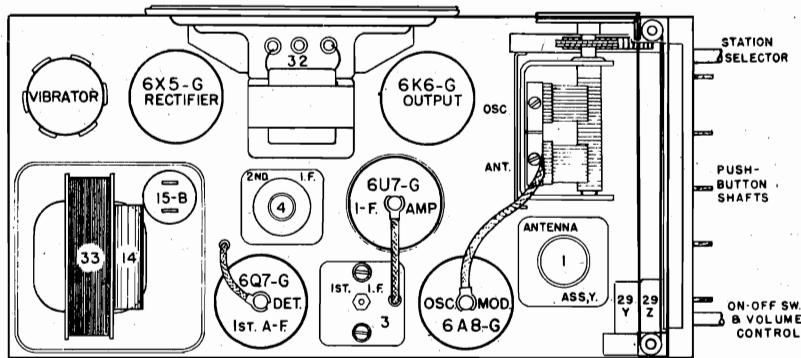


Fig. 2. Top View

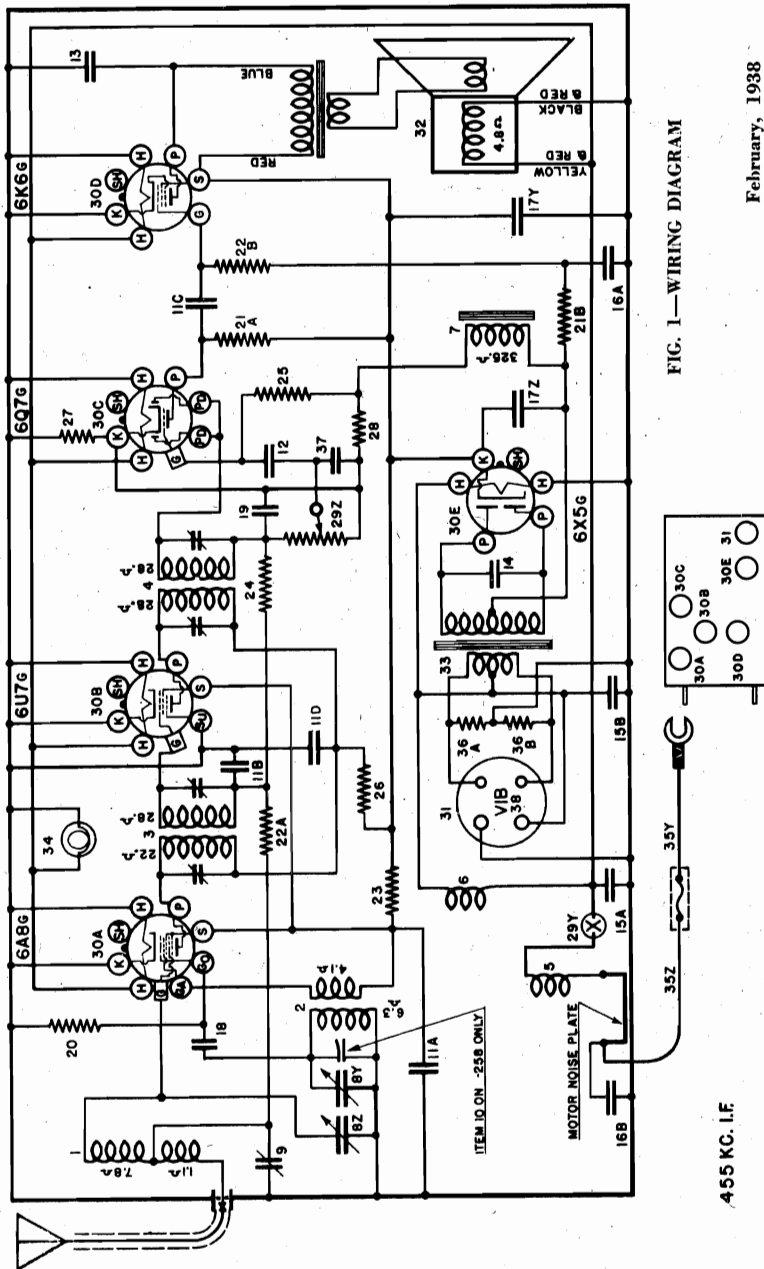


Fig. 1—WIRING DIAGRAM

February, 1938

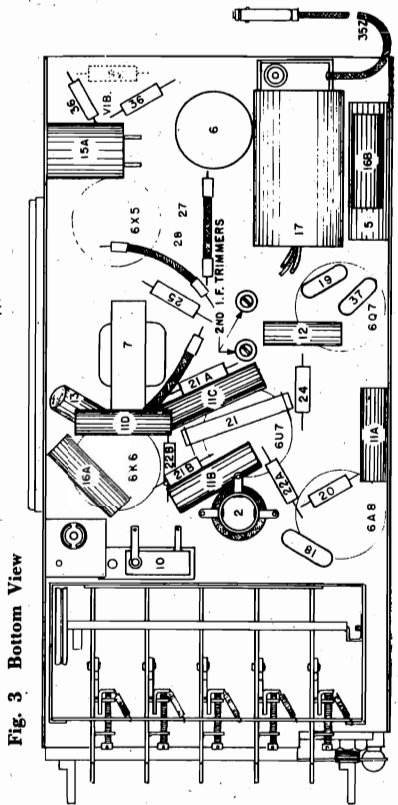


Fig. 3 Bottom View

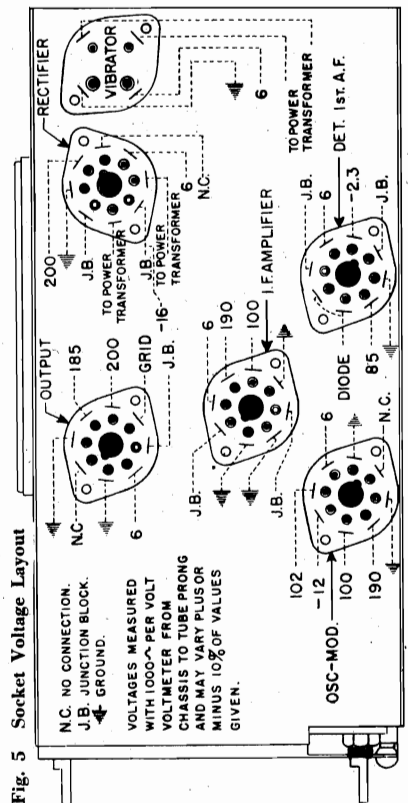


Fig. 5 Socket Voltage Layout

MODEL S7425-3 Alignment, Tuner Dial Data, Parts

FIRESTONE TIRE & RUBBER CO.

5) Thread the cord through the eyelet in the pulley and extend one side up and over the vertical brass pulley. Loop this lead around the horizontal idler pulley at the left-hand side of the dial and then around the idler pulley at the right-hand side of the dial and then over the top of the large drive pulley. The tension on the spring should be sufficient to stretch it to within approximately 1/2" of the eyelet.

(6) With the gang closed, move the pointer to the extreme right-hand end of the dial. Press the cord into the slots in the back of the pointer and check to see that the pointer travels from one end of the dial to the other as the gang is opened and closed. It may be advisable to place some Aratex or other liquid adhesive on the cord where it fits into the pointer.

REPLACING THE DRIVE CORD

- 1.—Remove the broken cord and the cord tension spring.
- 2.—Cut a 30 inch length of drive cord and tie the tension spring approximately 4 inches from one end. Thread both ends through the eyelet in the large pulley from the inside. Hook the other end of the spring to the catch in the pulley and bend catch to secure spring.
- 3.—Close the condenser gang and see that the eyelet in pulley is on top and that the end of the condenser shaft is flush with the inside of the pulley.
- 4.—Take the long end of cord and place on small brass idler pulley on the right side of the dial bracket. Loop around pulley in a clockwise direction and then continue on over the top of the large pulley and down to the drive shaft. From the under side of drive shaft wrap 2 turns around shaft in a counter-clockwise direction, bringing cord up on the left side of large pulley. Be sure the cord is on all the pulleys then tie a knot, pulling with sufficient force to stretch the tension spring to within 1/2 inch of the edge of pulley.
- 5.—Close gang and place the pointer on the cord at the extreme left end of the dial. Check to see that pointer travels full length of the dial. It may be advisable to place some "ARATEX" or other liquid adhesive on cord where it fits into the pointer.

When referring to manually tuned model disregard all parts listed between items 7 and 11 and all parts listed under the heading Miscellaneous Mechanical Parts.

maximum volume in the speaker.

REPLACING DIAL DRIVE CORDS

Two dial drive cords are used and should the innermost cord break, it will be necessary to remove the outer cord and large pulley before the inner cord can be replaced.

To replace the inner cord:

- (1) After removing the broken cord, place the chassis on end with the push buttons "up" and the speaker toward you.
- (2) Thread an 18" length of drive cord through the hook on one end of the tension spring which was removed from the pulley on the end of the push button rocker plate.
- (3) Insert both ends of this cord through the eyelet in the rocker plate pulley from the inside. Pull the cord through until the tension spring is pulled into the pulley, then hook the free end of the spring over the catch in the pulley in the side opposite the eyelet.
- (4) Open the condenser gang all the way.
- (5) Pull all but approximately 4 1/2" of the cord around through the eyelet. Loop the 4 1/2" end of the cord around the lower half of the pulley.
- (6) Loop the long end of the cord over the top of the pulley and back over the brass idler pulley to the drive shaft. Continue the cord around the drive shaft, threading from the inside and over the top. Wrap four complete turns of the cord around the drive shaft and continue the cord over the top of the rocker plate pulley.
- (7) Pull on the short end of the cord until the tension spring in the pulley is stretched to within 1/2" of the eyelet. Maintain this tension and tie a knot in the two ends of the cord over the catch which holds the spring. Loop the cord over the spring catch so that the knot is turned in. (A drop of bees' wax on the knot would be an added protection against coming untied.)

To replace the outer cord:

- (1) Place the chassis in a horizontal position with the push buttons to the left and the speaker toward you.
- (2) Close the condenser gang and mount the large drive pulley on the shaft. Place the pulley on the condenser shaft so that the shaft is flush with the outside horizontal with the shaft and toward the dial.
- (3) Cut a 22" length of drive cord and tie a knot 1/2" from the two ends.
- (4) Hook one end of the tension spring over the catch provided in the pulley and hook the other end over the drive cord at the knot.

The following are parts to fill the deletions to complete Parts List

| Item No. | Part No. | Description |
|----------|------------|---|
| 8 | G49-33001 | 2 Section Gang Condenser |
| | C-50455B | Glass Dial Face |
| | MC23-50500 | Dial Support Bracket (Riveted to chassis) |
| | W-43549 | Retaining Washer (Drive Shaft) |
| | W-30512 | Drive Shaft |
| | G9-43564 | Pulley & Hub assembly |
| 9 | W-50054B | Drive Cord (30 in.) |
| | W-50105 | Ant. Comp. Condenser |
| | W-50503B | Condenser 0.1 Mf. 160 V. |
| | D-50503B | Felt (Dial window) |
| | C-50504B | Case (Front section) |
| 16B | C-50505 | Knob (2 Required) |

in place. Connect the ground lead from the signal generator to the receiver chassis frame. KEEP THE GENERATOR LEADS AS FAR AS POSSIBLE FROM THE GRID LEADS OF THE OTHER SCREEN GRID TUBES.

(b) Adjust the station selector so that the rotor plates of the tuning condenser are completely disconnected and turn Vol. Cont. to maximum position (RIGHT).

(c) Set the signal generator to 455 kilocycles.

(d) Adjust both 2nd I. F. trimmer condensers for maximum output. Fig. 3.

(e) Transfer generator lead to top of 6A8G Osc. Mod. tube, leaving the tube's grid clip in place.

(f) Adjust both trimmers located on the 1st I.F. transformer for maximum output.

(g) Repeat operations (d) and (f) for more accurate adjustments.

IN ORDER TO PREVENT A. V. C. ACTION ALWAYS USE THE LOWEST SIGNAL GENERATOR OUTPUT THAT WILL GIVE A REASONABLE OUTPUT METER READING.

2. Aligning R-F Amplifier.

To obtain the greatest gain from the R. F. amplifier, the capacity of the dummy antenna should be equal to the capacity of the antenna with which the receiver is to be used. The capacities of auto radio antennas range from 65 mmf. (.000065 mf.) to 250 mmf. (.00025 mf.), depending upon the size and type. If the receiver is adjusted for maximum efficiency when used with an antenna having a high capacity, it will not operate at its maximum efficiency on an antenna having a much lower capacity and vice versa.

(a) If the receiver is to be used with a whip or streamlined antenna, the output lead from the signal generator should be connected through a .0001 mf. condenser to the "Ant" connection of the receiver. If a large antenna such as a running board type or built-in top antenna is to be used, a .0002 mf. condenser should be used in place of the .0001 mf. condenser.

(b) Set the signal generator to 1400 kilocycles.

(c) Adjust the station selector to 140 on the dial.

(d) Adjust the trimmer on the "OSC" section of the tuning condenser for maximum output.

(e) Adjust the trimmer on the "ANT" section of the tuning condenser for maximum output.

(f) Readjust the station selector for maximum output. DO NOT READJUST THE OSC. TRIMMER.

(g) Repeat operation (e) for more accurate adjustment.

3. Adjusting Antenna Compensating Condenser.

- Set the signal generator to 600 kilocycles.
- Tune in the 600 kilocycle signal with the station selector for maximum output.
- Adjust the antenna compensating condenser, located between the control knobs on the front of the chassis, for maximum output.
- Repeat operations (b) and (c) alternately until no further improvement can be obtained.
- Set the signal generator to 1400 kilocycles again.
- Tune in the 1400 kilocycle signal with the station selector for maximum output.
- Readjust the trimmer on the "Ant" section of the tuning condenser for maximum output.
- It will be necessary to adjust the antenna compensating condenser to the car antenna after the receiver has been installed in the car.
- After the installation is complete, tune in a WEAK station between 55 and 65 on the dial.
- Adjust the antenna compensating condenser for

SPECIFICATIONS

This model is a single unit five-tube superheterodyne receiver. It incorporates an unusual push button tuning system of rugged mechanical design that is positive, accurate, and easy to adjust and operate. A highly efficient superheterodyne circuit employs five tubes to the utmost advantage as follows: one 6A8G as an oscillator and mixer or modulator, one 6U7G as an intermediate frequency amplifier, one 6U7G as detector, A. V. C. and 1st A. F. amplifier, one 6K6G as power output amplifier and a 6X5G as a rectifier. A full wave vibrator is used. Bias for the 6A8G and 6U7G tubes is obtained across item 27 (60 ohm resistor), for the 6U7G tube across item 28 (40 ohm resistor) and for the 6K6G across the "B" Filter choke, item 7, and items 27 and 28.

TUBES AND VOLTAGE LIMITS

The following table gives the functions of the tubes used, together with the voltage readings between the tube socket contacts and the receiver chassis. Voltage readings taken with a 1000 ohm per volt, 500 volt voltmeter (except filaments) with receiver in operating condition and no signal input. The filament voltages should be measured with an accurate low range D-C voltmeter (approximately 0 to 10 volts). Voltage limits may vary plus or minus 10% of values given.

SOCKET VOLTAGE LAYOUT

The socket layout in the illustration Fig. 5, shows the voltage readings taken between the tube prongs and receiver chassis. It will be noted that certain unused terminals are used as junction blocks while others are not used at all. All readings are taken with the receiver in operating condition and no signal input.

SETTING PUSH BUTTONS

Should it become necessary to realign the circuits of the receiver, it may also be necessary to reset the push buttons. The push buttons may be quickly and accurately set, either with the receiver in the case or with the case removed.

Insert a small screw driver in the hole through each push button and loosen (do not remove) the set screw in the bottom of the hole. By means of the conventional tuning knob, tune in AS ACCURATELY AS POSSIBLE the favorite station having the highest frequency—that is, the station nearest the left-hand end of the dial. Completely depress and hold the No. 1 push button on the left and tighten the set screw SECURELY. The push button tuning system is now correctly set for the 1st station. Follow through with this same procedure, setting the other four stations in the order of their frequency (kilocycles).

ALIGNMENT PROCEDURE

All the circuits in this receiver are very accurately adjusted at the factory and normally should need no further adjustment. However, if it is definitely known that an alignment is necessary the circuits can best be properly adjusted with the use of a modulated signal generator and an output meter.

CONNECTING OUTPUT METER

Connect the output meter to P and S of the 6K6G Output tube. Be sure the meter is protected from D.C. by connecting a condenser (.1 mfd. or larger—not electrolytic) in series with one of the leads.

1. Tuning I-F Amplifier To 455 Kilocycles.

- Connect the output of the signal generator through a .02 mfd. or larger, condenser to the top cap of the 6U7G I. F. tube, leaving the tube's grid clip

FIRESTONE TIRE & RUBBER CO.

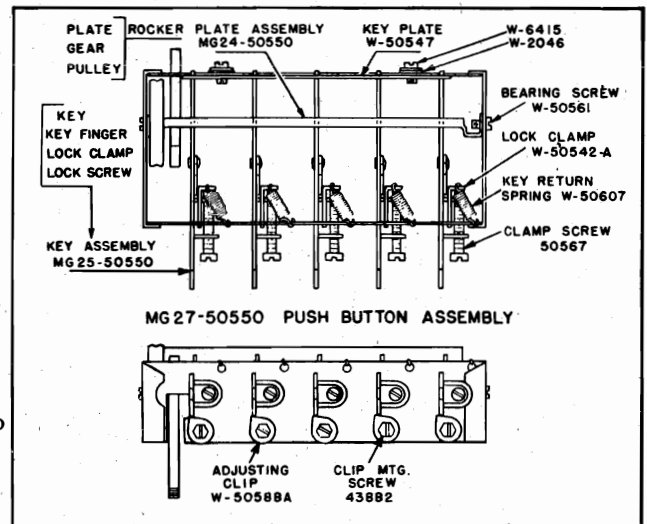
MODEL S7425-3
Voltage, Parts
Tuner Assembly

PARTS LIST

Figures in first column refer to parts in Diagrams.

| Item No. | Part No. | Description |
|----------|------------|---|
| 1 | G167-32000 | Ant. Coil |
| 2 | G167-32002 | Osc. Coil |
| 3 | G185-32004 | 1st I-F Assy., 455 Kc. |
| 4 | G186-32004 | 2nd I-F Assy., 455 Kc. |
| 5 | G19-32977 | Motor Noise Check |
| 6 | G27-28067 | "A" Filter Choke |
| 7 | G16-29535 | "B" Filter Choke |
| 8 | G50-33001 | 2 Section Gang Cond. |
| 9 | 50054B | Ant. Compensating Cond. |
| | C-50623 | Glass Dial Face |
| | W-50545 | L. H. Dial Mtg. Clip |
| | W-50560 | R. H. Dial Mtg. Clip |
| | W-50517B | Dial Mask (Maroon) |
| | W-50518 | Pointer |
| | B-78 | Screw—Dial Clip Mtg. |
| | MG23-50550 | Dial Mtg. Bracket Assy. (Riveted to Chassis) |
| | MG28-50550 | Manual Drive Shaft Brkt. Assy. |
| | G8-43564 | Pulley and Hub Assy. |
| | W-23877 | Set Screw—Hub |
| | 41582 | Drive Cord—40 Inches |
| | W-50590 | Spring—Cord Tension—Large Pulley |
| | W-43561 | Spring—Cord Tension—Small Pulley |
| | W-50524B | Manual Drive Shaft |
| 10 | G3-50369 | Temp. Compensating Cond. |
| 11A | W-32380 | Condenser, .05 Mf. 200 V. |
| 11B | W-32380 | Condenser, .05 Mf. 200 V. |
| 11C | W-32380 | Condenser, .05 Mf. 200 V. |
| 11D | W-32380 | Condenser, .05 Mf. 200 V. |
| 12 | W-37226 | Condenser, .02 Mf. 160 V. |
| 13 | W-23191A | Condenser, .01 Mf. 400 V. |
| 14 | W-50203 | Condenser, .0065 Mf. 1,000 V. |
| 15A | W-50161 | Condenser, .5 Mf. 120 V. |
| 15B | W-50161 | Condenser, .5 Mf. 120 V. |
| 16A | W-50105 | Condenser, .1 Mf. 160 V. |
| 16B | W-50105 | Condenser, .1 Mf. 160 V. |
| 17Z | W-50528 | Condenser, 4. Mf. 350 V. |
| 17Y | W-50224 | Cond. Clamp |
| 18 | G1-34002 | Condenser, .00025 Mf. Molded |
| 19 | G3-34002 | Condenser, .0005 Mf. Molded |
| 20 | 35600 | Resistor, 100,000 Ohm $\frac{1}{4}$ W. |
| 21A | 35601 | Resistor, 300,000 Ohm $\frac{1}{4}$ W. |
| 21B | 35601 | Resistor, 300,000 Ohm $\frac{1}{4}$ W. |
| 22A | 36322 | Resistor, 500,000 Ohm $\frac{1}{4}$ W. |
| 22B | 36322 | Resistor, 500,000 Ohm $\frac{1}{4}$ W. |
| 23 | 23616 | Resistor, 15,000 Ohm 1 W. |
| 24 | 35602 | Resistor, 1. Megohm $\frac{1}{4}$ W. |
| 25 | 35927 | Resistor, 2. Megohm $\frac{1}{4}$ W. |
| 26 | 50641 | Resistor, 750 Ohm $\frac{1}{2}$ W. |
| 27 | 50643 | Resistor, 60 Ohm $\frac{1}{2}$ W. |
| 28 | 50642 | Resistor, 40 Ohm $\frac{1}{2}$ W. |
| | | Mounting Parts |
| | W-38038D | Distributor Suppressor |
| | W-29754C | Generator Condenser |
| | 25846 | $\frac{3}{4}$ " No. 10 P. K. Screw (Set Mtg.) |
| | 6213 | $\frac{1}{4}$ "—20 Hex. Nut (Brkt. Mtg.) |
| | 35065 | $\frac{1}{4}$ "—20 Screw (Brkt. Mtg.) |
| | W-38205 | $\frac{1}{4}$ " Lock Washer (Brkt. Mtg.) |
| | 32783 | Ant. Cable (Accessory) |
| | W-50167 | Mtg. Bracket (Set) |
| | W-50395 | Ammeter Cond. (Accessory) |
| | W-38935 | Case Ground Clip |

Fig. 4 Push Button Assembly



| | |
|-------------|---|
| —50526 | Volume Control, 1. Meg. |
| G178-36400 | On-Off Switch |
| W-50176 | 8 Prong Socket |
| W-31210 | Tube Shield Half (2 Req.) |
| G105-28807 | Tube Shield Ring |
| W-50123A | Vib. Socket |
| 278-BL-7"U" | Vib. Gnd. Clip |
| —45889 | Speaker, Mfg. Spec. 5B-122 |
| B-50644 | Output Trans. |
| W-50130 | Power Trans. |
| G1-50631 | Power Trans. Can |
| G29-32750 | Dial Light Bulb—6-8 V. |
| G27-32750 | "A" Lead—Set to Fuse |
| —38915 | "A" Lead—Fuse to Ammeter |
| —38915 | Resistor, 100 Ohm $\frac{1}{2}$ W. W. W. |
| G2-34002 | Resistor, 100 Ohm $\frac{1}{2}$ W. W. W. |
| G10-38000 | Condenser, .0001 Mf. Molded |
| G13-38000 | Vibrator, Interchangeable |
| W-32757 | Vibrator |
| W-32776 | Fuse (12 Amp.) |
| | Fuse Insulator |
| | Miscellaneous Mechanical Parts |
| MG27-50550 | Push Button Unit Assy. |
| MG25-50550 | Key Assy. |
| W-50542A | Key Clip (Lock Clamp) |
| —50567 | $\frac{1}{8}$ "—6x32 Screw (Clamp) |
| W-50607 | Spring—(Key Return) |
| W-50588A | Adjusting Clip (Heart Shaped) |
| —43882 | $\frac{1}{4}$ " No. 8 P. K. Screw (Clip Mtg.) |
| W-50547 | Key Plate (Rear Guide) |
| MG24-50550 | Rocker Plate Assy. |
| W-50561 | $\frac{1}{8}$ "—6x40—Fil. H. Screw (Rocker Plate Bearing) |
| W-45553B | Push Button |
| W-50551A | Celluloid Cover |
| —50549 | Call Letter Sheet |
| —50503B | Case (Rear Half) FS49 |
| —50554A | Case (Front Half) FS49 |
| W-50589 | Felt (Dial Window) |
| —50505 | Knob (2 Req.) |

TUBE SOCKET VOLTAGE READINGS

| Tube | Function | H | P | S | Su | K | Ga | Go |
|-------|---------------------------|-----|-----|-----|----|------|-----|----|
| 6A8-G | Oscillator-Modulator | 6.0 | 190 | 100 | — | 0 | 102 | 0 |
| 6U7-G | I-F Amplifier | 6.0 | 190 | 100 | 0 | 0 | — | — |
| 6Q7-G | Diode Detector & A-F Amp. | 6.0 | 85 | — | — | -2.3 | — | — |
| 6K6-G | Output | 6.0 | 185 | 200 | — | 0 | — | — |
| 6X5-G | Rectifier | 6.0 | — | — | — | 200 | — | — |

Power Output approximately 4 Watts.

Battery Drain approximately 5.7 Amperes at 6 Volts.

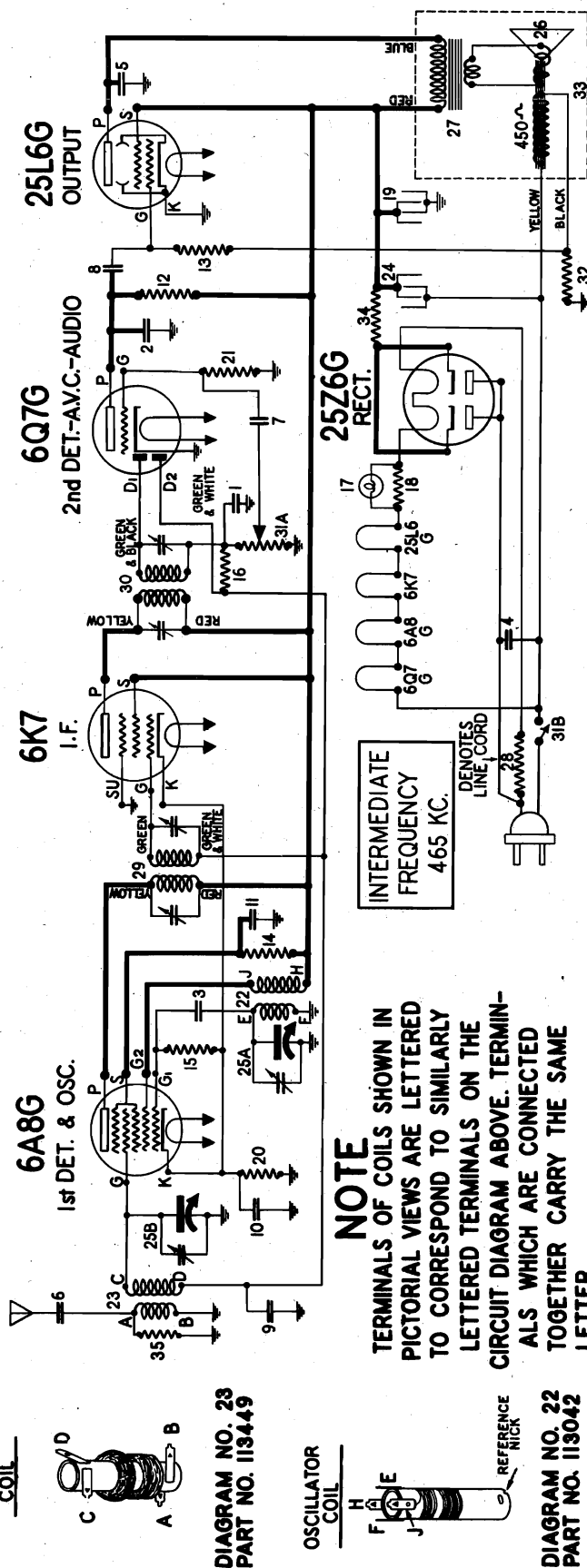
MODEL S7425-6

Chassis R-320

Schematic, Voltage

Socket, Coils

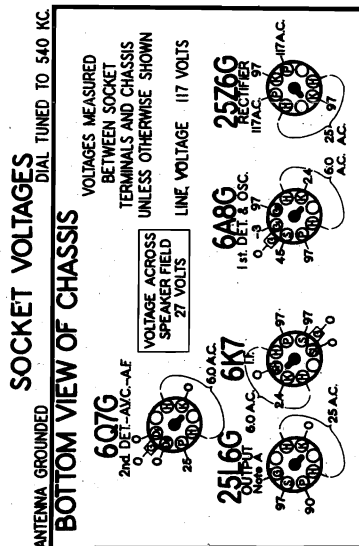
FIRESTONE TIRE & RUBBER CO.



PARTS LIST

ELECTRICAL PARTS

| DIAGRAM NUMBER | PART NUMBER | DESCRIPTION | LIST PRICE |
|----------------|-------------|--|------------|
| 1-2 | 83539 | Condenser - mica 250 mfd. | .20 |
| 3 | 83783 | Condenser - mica 110 mfd. | .20 |
| 4-5 | 88026 | Condenser - paper .02 mfd. 400 V. | .25 |
| 6 | 88028 | Condenser - paper .004 mfd. 400 V. | .25 |
| 7-8 | 88030 | Condenser - paper .01 mfd. 400 V. | .25 |
| 9-10 | 88189 | Condenser - paper .05 mfd. 200 V. | .25 |
| 11 | 69421 | Condenser - paper .1 mfd. 200 V. | .25 |
| 12 | 110553 | Resistor - carb. 220000 ohms \pm W. | .12 |
| 13 | 110556 | Resistor - carb. 470000 ohms \pm W. | .12 |
| 14 | 110566 | Resistor - carb. 330000 ohms \pm W. | .12 |
| 15 | 110578 | Resistor - carb. 68000 ohms \pm W. | .12 |
| 16 | 110580 | Resistor - carb. 3.3 meg. 1/4 watt | .12 |
| 17 | 110629 | Lamp - 6.3 volt - .25 amp. | .15 |
| 18 | 110975 | Resistor - W.W. 33 ohms \pm W. (10%) | .12 |
| 19 | 112998 | Condenser - elect. 16 mfd. 150 V. | .50 |
| 20 | 112974 | Resistor - carb. 220 ohm \pm W. (10%) | .15 |
| 21 | 112975 | Resistor - carbon 10 meg. 1/4 watt | .12 |
| 22 | 113042 | Coil - oscillator | .45 |
| 23 | 113449 | Coil - antenna | .78 |
| 24 | 113472 | Condenser - variable gaging | 3.20 |
| 25A | 25B | 25B-113478-Condenser - variable gaging | 3.20 |
| 26 | R-114081 | Cone voice coil assembly (for 25L6G) | 1.50 |
| 27 | R-114082 | Transformer - output | 1.20 |
| 28 | 114951 | Power cord - (dropping resistance 143 ohms - 10% I.F.) | .98 |
| 29 | 114802 | Transformer - 1st I.F. | 1.10 |
| 30 | 114804 | Transformer - 2nd I.F. | .86 |
| 31A | 31B-114814 | Volume control 1 megohm with off-on switch | .96 |
| 32 | 114815 | Resistor - W.W. 110 ohms \pm W. (10%) | .14 |
| 33 | R-115039 | Speaker - dynamic 5 inch | 3.96 |
| 34 | 116013 | Resistor - W.W. 50 ohms 1 watt | .18 |
| 35 | 110569 | Resistor - carb. 10,000 ohms \pm W. | .12 |



FIRESTONE TIRE & RUBBER CO.

MODEL S7425-6
 Chassis R-320
 Alignment, Tuner
 Socket, Trimmers
 MODEL S7425-1, Late
 MODEL S7426-1
 Tuner Data

ALIGNMENT EQUIPMENT & PROCEDURE

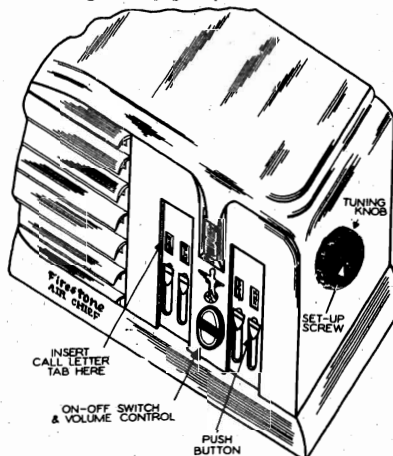
FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 1500 KC are required.

- ①—Connect the output meter across the voice coil or between the plate of the 25L6-G output tube and ground through a .1 mfd. condenser, depending upon the type of meter. The more sensitive type should be connected across the voice coil.
- ②—Connect the ground lead of the signal generator to the chassis of the receiver through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to do this may have serious results as the signal generator may be connected to one side of the power line, or it may be grounded externally.
- ③—Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
- ④—TO CALIBRATE THE DIAL— Remove the chassis from the cabinet and set it on a flat surface (insulated from ground). Release the set screw in the collar which connects the gang condenser shaft with the tuning unit. Holding the gang in full mesh turn the dial until the last dial division (just below 55) on the low frequency end is exactly 4 3/8 inch above the table surface. Now retighten the set screw in the coupler collar. The 4 3/8 inch division on the ruler (when measured vertically from table surface) is to be used as the dial indicator for all calibrations and alignment.

| DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR | CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER | SIGNAL GENERATOR FREQUENCY | RECEIVER DIAL SETTING | TRIMMER NUMBER | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT |
|--|---|----------------------------|---|----------------|------------------------------|--|
| 200 MMFD. MICA CONDENSER | CONTROL GRID OF 6A8-G TUBE | 465 KC | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 1-2 3-4 | 1ST I. F. 2ND I. F. | ADJUST FOR MAXIMUM OUTPUT THEN REPEAT ADJUSTMENT |
| 200 MMFD. MICA CONDENSER | ANTENNA LEAD (Blue Wire) | 1500 KC | 1500 KC | 5 | BROADCAST OSCILLATOR (Shunt) | ADJUST TRIMMER TO BRING IN SIGNAL. |
| 200 MMFD. MICA CONDENSER | ANTENNA LEAD (Blue Wire) | 1500 KC | TUNE TO 1500 KC GENERATOR SIGNAL | 6 | BROADCAST ANTENNA (Shunt) | ADJUST FOR MAXIMUM OUTPUT. |

HOW TO SET UP THE PUSH BUTTONS.

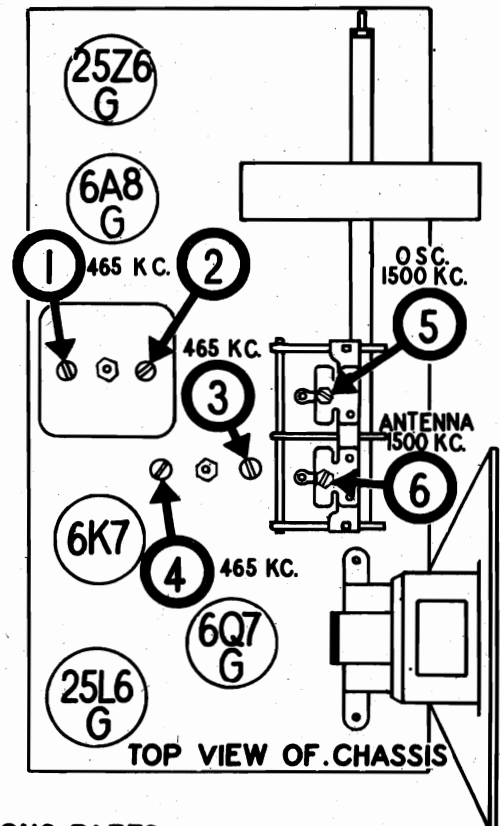
1. Be sure that the antenna wire furnished with the set is extended to its full length and placed under the carpet or around the floor molding. In most instances the 20 feet of brown insulated wire included with the radio will make a satisfactory antenna. However in localities remote from powerful broadcast stations, it may be found necessary to use an outside antenna.
2. Turn the set on and allow it to operate at least one quarter hour before setting up the push buttons.
3. Select the four nearby stations to which you wish to set up the buttons. Be sure to select nearby, powerful stations, since weak signals generally give poor results.



4. The large tuning knob at the side of your set has a set screw located in the center. Grasp this tuning knob firmly and then using a screw driver or a coin, turn the screw counter-clockwise not more than two whole turns.
5. Push down any one of the four buttons and holding it down tune in the desired station using the tuning knob. The push button must be held down firmly while the station is being tuned in otherwise the setting will be incorrect.
6. Release the button that you have just set up. WARNING:— Do not attempt to use any button until you have completed the set-up of all four buttons. Do not retighten the set-

up screw until all buttons have been set up.

7. Proceed to set up the next button by pushing down on the button firmly and tuning in the desired station, using the tuning knob. The rest of the buttons should be set-up in a similar manner.
8. After all of the buttons have been set-up YOU MUST RE-TIGHTEN THE SCREW IN THE TUNING KNOB; OTHERWISE ALL SETTINGS OF THE BUTTONS WILL BE DESTROYED. GRASP THE KNOB FIRMLY AND USE A SMALL SCREW DRIVER OR A COIN TO TIGHTEN THE SCREW SECURELY.

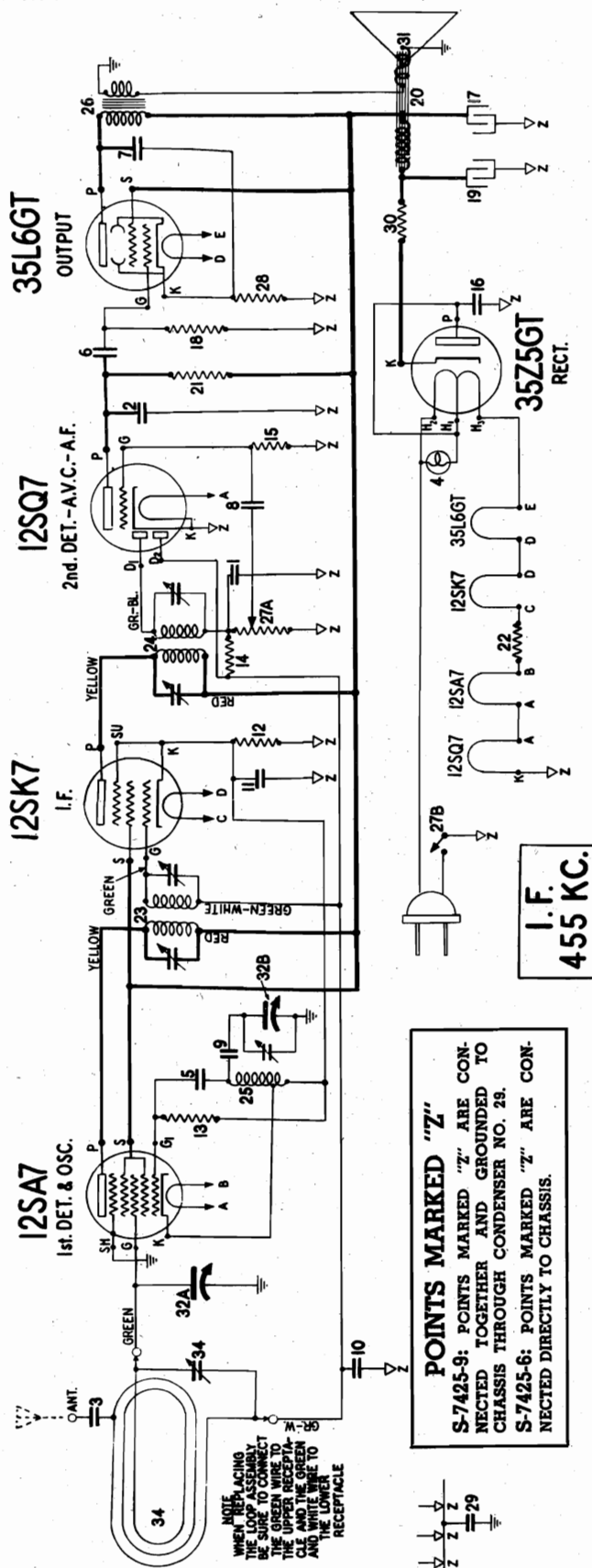


DIAL & MISCELLANEOUS PARTS

| PART NUMBER | DESCRIPTION | LIST PRICE | PART NUMBER | DESCRIPTION | LIST PRICE |
|-------------|---|------------|-------------|---|------------|
| 112745 | Clip - coil mounting (osc. & ant.) | .01 | 113500 | Mechanical Tuner Unit - less tenite tips for push buttons | 3.90 |
| 113558 | Clutch Spring - for tuner (on cam shaft) | .04 | 113699 | Screw - #8 X 1" for chassis mtg. | .01 |
| 113504 | Collar - Coupling (between tuner unit and gang condenser shaft) | .08 | 113538 | Screw - for tuning knob (chrome head) | .14 |
| 113560 | Dial Scale - celluloid strip | .22 | 85427 | Socket - octal base (standard) | .15 |
| 113753 | Dial Window - celluloid | .16 | 113543 | Socket - dial lamp | .18 |
| 113557 | Key - for push button tuner (left hand) | .24 | 113559 | Spring - for key return | .02 |
| 113572 | Key - for push button tuner (right hand) | .24 | 113550 | Tab - station call letters | .28 |
| 113531 | Knob - tuning (ivory) | .30 | 113529 | Tip - for push button (ivory) | .05 |
| 113574 | Knob - volume (ivory) | .18 | | | |

MODELS S7425-6, late
S7425-9, Loop
Schematic, Voltage
Socket

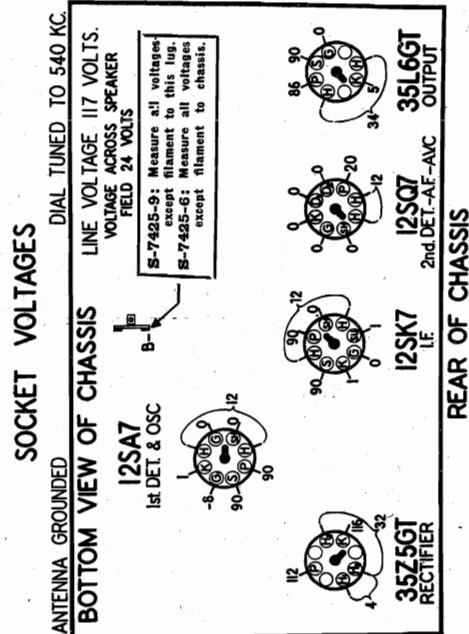
FIRESTONE TIRE & RUBBER CO.



ELECTRICAL PARTS

| Diagram Number | Part Number | Description | Price |
|----------------|-------------|---|-------|
| 1-2 | 83539 | Condenser—mica, 260 mmfd. | .20 |
| 3 | 83783 | Condenser—mica, 110 mmfd. | .20 |
| 4 | 85296 | Lamp—dial, 6 to 8 volt (maxda #51) | .16 |
| 5 | 85394 | Condenser—mica, 510 mmfd. | .25 |
| 6-7 | 88026 | Condenser—paper, .02 mfd., 400 volt | .25 |
| 8 | 88030 | Condenser—paper, .01 mfd., 400 v. | .25 |
| 9 | 88030 | Condenser—paper, .01 mfd., 400 v. | .25 |
| 10 | 88189 | Condenser—paper, .05 mfd., 200 volt (S-7425-9 only) | .25 |
| 11 | 88193 | Condenser—paper, .25 mfd., 150 volt | .35 |
| 12 | 110560 | Resistor—carbon, 100 ohms, 1/4 watt | .12 |
| 13 | 110565 | Resistor—22,000 ohms, 1/4 watt | .12 |
| 14-15 | 110580 | Resistor—carbon, 3.3 meg., 1/4 watt | .12 |
| 16 | 111252 | Condenser—paper, .05 mfd., 400 volt | .13 |
| 17 | 112898 | Condenser—electrolytic, 16 mfd., 150 volt | .50 |
| 18 | 112971 | Resistor—insulated 470,000 ohms, 1/4 watt | .15 |
| 19 | 113472 | Condenser—electrolytic 40 mfd., 150 volt | .56 |
| 20 | U-115055 | Speaker—electro dynamic, 6800 ohm, 1/4 watt—20% in- sulated | 3.60 |
| 21 | 116087 | Resistor—100 ohms—10% 3 watt W.W. | .12 |
| 22 | 116527 | Transformer—1st I.F. | .26 |
| 23 | 116687 | Transformer—2nd I.F. | 1.00 |
| 24 | 116672 | Coil—oscillator | 1.00 |
| 25 | 116674 | Transformer—output for U-115055 speaker | .35 |
| 26 | U-116676 | Volume control with switch. | 1.00 |
| 27A-27B | 116691 | Resistor—140 ohms—10% 1/2 watt W.W. | 1.00 |
| 28 | 116702 | Condenser—.02 mfd., 600 volt (S-7425-9 only) | .12 |
| 29 | 116706 | Resistor—33 ohms, 1 watt W.W. | .35 |
| 30 | 116752 | Cone & Voice Coil Assem. for U-115055 speaker | .15 |
| 31 | U-116727 | Condenser—2 gang. | 1.20 |
| 32A-32B | 116755 | Loop antenna. | 3.50 |
| 33 | 116775 | Condenser—trimmer for loop ant. assembly | 1.00 |
| 34 | 116781 | | .22 |

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

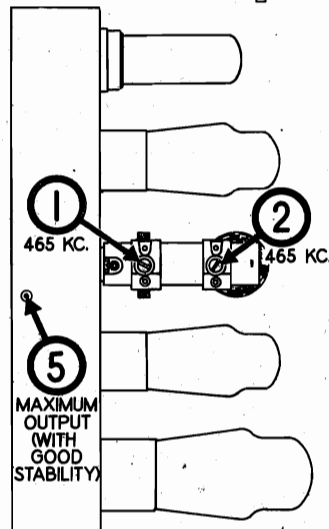
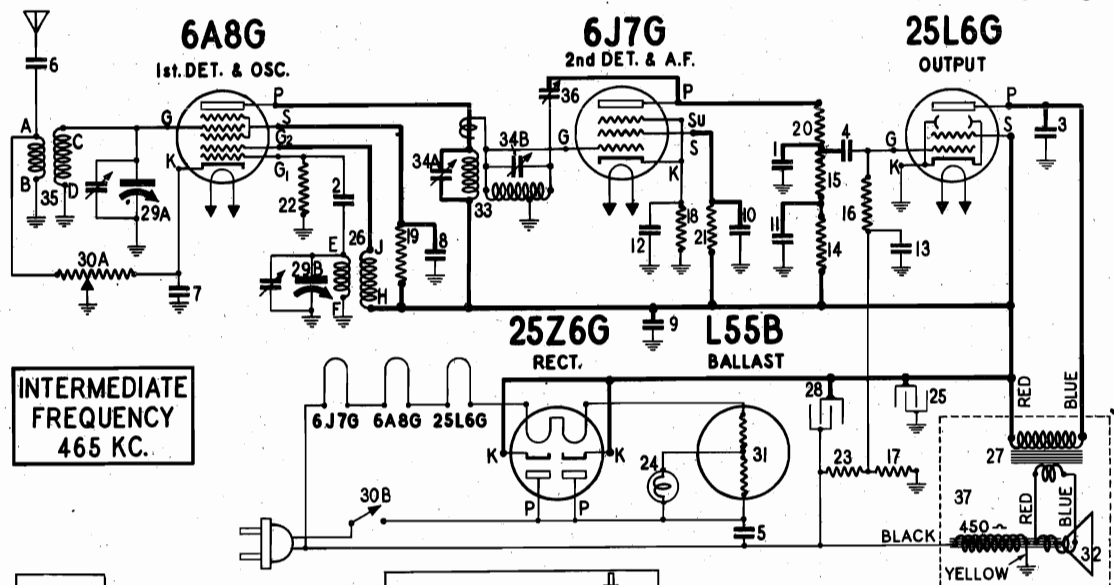


Use a high resistance voltmeter of at least 1000 ohms per volt.

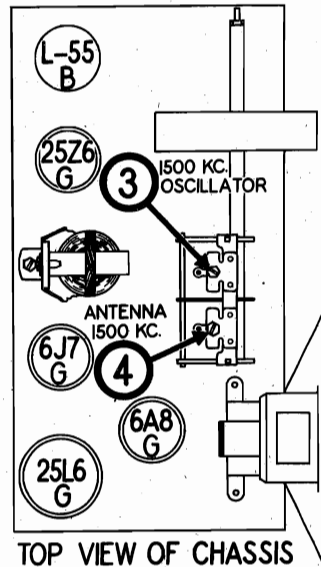
Schematics, Socket
Trimmers, Coils

FIRESTONE TIRE & RUBBER CO.

MODELS S7425-8UA,
S7425-9, Ch. R317
MODEL S7426-1
Chassis R311



REAR VIEW OF CHASSIS



TOP VIEW OF CHASSIS

TERMINALS OF COILS SHOWN IN PICTORIAL
VIEWS BELOW ARE LETTERED TO CORRESPOND
TO SIMILARLY LETTERED TERMINALS
ON THE CIRCUIT DIAGRAM ABOVE. TERMINALS
WHICH ARE CONNECTED TOGETHER
CARRY THE SAME LETTER.

ANTENNA
COIL



DIAGRAM NO. 35
PART NO. 113744

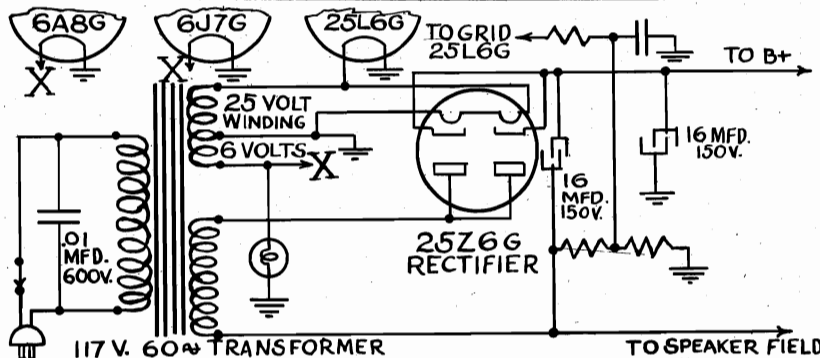
OSCILLATOR
COIL



DIAGRAM NO. 27
PART NO. 113042

ELECTRICAL PARTS

| DIAGRAM NUMBER | PART NUMBER | DESCRIPTION | LIST PRICE |
|-------------------|----------------|--|---------------|
| 1----- | 83539 | Condenser - mica 260 mmf. | .20 |
| 2----- | 83783 | Condenser - mica 110 mmf. | .20 |
| 3-4-5 | 88026 | Condenser - paper .02 mfd. | .25 |
| 6----- | 88029 | 400 volt Condenser - paper .004 mfd. | .25 |
| 7-8-9 | 89421 | Condenser - paper .1 mfd. | .25 |
| 10-11 | 89421 | 200 volt | .25 |
| 12-13 | 89532 | Condenser - paper .25 mfd. | .32 |
| 14----- | 110553 | Resistor - carbon 220,000 ohm 1/4 watt | .12 |
| 15-16 | 110559 | Resistor - carbon 470,000 ohm 1/4 watt | .12 |
| 17----- | 110564 | Resistor - carbon 100,000 ohm 1/4 watt | .12 |
| 18----- | 110565 | Resistor - carbon 22,000 ohm 1/4 watt | .12 |
| 19----- | 110566 | Resistor - carbon 35,000 ohm 1/4 watt | .12 |
| 20----- | 110569 | Resistor - carbon 10,000 ohm 1/4 watt | .12 |
| 21----- | 110570 | Resistor - carbon 2.2 meg. 1/4 watt | .15 |
| 22----- | 110578 | Resistor - carbon 68,000 ohm 1/4 watt | .12 |
| 23----- | 110584 | Resistor - carbon 330,000 ohm 1/4 watt | .12 |
| 24----- | 110629 | Lamp - 6.3 volt .25 amps. | .15 |
| 25----- | 112898 | Condenser - electrolytic 16 mfd. 150 volt | .50 |
| 26----- | 113042 | Coil - oscillator | .45 |
| 27----- | R-113343 | Transformer output for R-115013 spkr. | 1.00 |
| 28----- | 113472 | Condenser - electrolytic 40 mfd. 150 volt | .58 |
| 29A-29B | 113478 | Condenser - variable gang- Volume Control-20,000 ohms | 3.20 |
| 30A-30B | 113501 | with on-off switch | .92 |
| 31----- | 113506 | Ballast Resistor - L55B | .65 |
| 32----- | R-113737 | Cone - voice coil Assem. for R-115025 spkr. | 1.90 |
| 33----- | 113738 | Transformer - I.F. (with trimmer) | 1.28 |
| 34A-34B | 113743 | Condenser - trimmer (2 section for I.F.) | .30 |
| 35----- | 113744 | Coil - antenna | .72 |
| 36----- | 113745 | Condenser - trimmer (regen control) | .28 |
| 37----- | R-115025 | Speaker - dynamic - 5" (sub. R-115013) | 4.80 |



MODELS S7425-8UA
S7425-9, Ch. R317
MODEL S7426-1
Chassis R311

FIRESTONE TIRE & RUBBER CO.

Alignment, Voltage
Circuit Data

comparable to that which is obtained from a set employing an intermediate frequency stage.

When aligning the intermediate frequency transformer the set should be tuned to 465 KC and the 6A8-G tube in the customary manner. The primary and secondary windings are tuned by adjusting Trimmer Screws No. 1 and No. 2 until a maximum deflection is obtained on the output meter. If the set has a tendency to oscillate when adjusting these locations until the oscillation ceases. The signal generator is next coupled to the antenna lead, and Trimmer No. 3 and No. 4 are aligned for maximum output, using a generator frequency of 1500 KC. Now connect the set to the CUSTOMER antenna and tune in a station on the low frequency band. The station should be tuned in on the low frequency band. The set is now adjusted to give maximum output of the set, consistent with good stability and tone quality. After changing the setting of Trimmer No. 5 it is necessary to re-adjust Trimmers No. 1 and No. 2, as their setting will be affected. The signal generator is set at 465 KC and is coupled to the antenna lead. The 6A8-G tube through a .1 mfd. condenser and Trimmers No. 1 and No. 2 adjusted, as was done previously.

A-C OPERATION

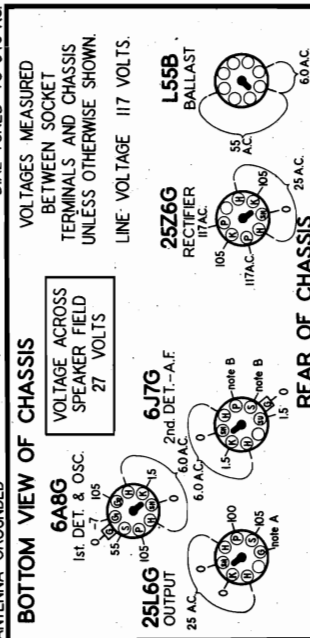
When the set is used on alternating current, all D-C potentials are supplied by a 2526G rectifier tube and its associated filter circuit. The tube is connected for half-wave rectification of the A-C supply.

If any hum is noticed when the set is used on A-C, reversing the power plug in the receptacle will sometimes reduce the hum level. When the set has not been used for some time on the filter, the condensers have been replaced, or the power plug has been reversed, it is necessary to run on. This hum may not clear up immediately upon reversal of the power plug. However, it will probably be eliminated after approximately five minutes operation by which time the anode plates of the electrolytic capacitors in the filter system will have reformed.

D-C OPERATION

If the set fails to operate after allowing time for the tubes to reach their normal operating temperatures, reverse the power plug in the receptacle. When the set is used on direct current, the 2526G rectifier tube and the filter system remains in the circuit and serve two purposes. First, they protect the set from damage due to incorrect polarity. The 2526G tube protects the filter condensers from damage. On correct D-C polarity the 2526G tube passes the D-C and the filter circuit aids in smoothing the supply voltage, thus minimizing line noise.

ANTENNA GROUNDED



Use a high resistance voltmeter of a least 1000 ohms per volt.

NOTE A: The bias for the control grid of the 2516G output tube is -6.0 volts to the high resistance in this grid circuit the voltage measured will be extremely small.

NOTE B: Due to the high resistance in the plate and screen grid circuits, the voltages measured at these terminals will be very small.

Voltage

R-311.....117 volts A.C. or D.C.

This chassis is a 5 tube single band push-button tuning superheterodyne receiver. It is designed for operation on either alternating or direct current, and incorporates an L-55-B ballast resistor tube. The tuning range of the receiver is 540 to 1720 KC.

IMPORTANT: In cases where it is found that the push-button tuner does not tune in stations correctly due to extreme misalignment in tuning it is only necessary to back off (turn clockwise) the regeneration control trimmer (#5) slightly. This will make tuning broader and will result in more accurate tuning when using the push button tuner.

ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 1500 KC are required.

1 Connect the output meter across the voice coil or between the 2516-G output tube and ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)

2 Connect the lead of the signal generator to the chassis of the receiver through a .1 mfd. condenser, and keep it connected to the antenna lead. Failure to do this may have serious results as one side of the power line may be grounded in the signal generator.

3 Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.

4 With the gang condenser in full mesh, set the indicator to the last mark on the top end of the dial scale. If the pointer is only slightly off, call attention to the fact that the set screw on the condenser shaft. Then grasp the end of the tuning shaft and turn the dial until the last division of the scale is directly under the indicator. When the gang is in full mesh, then tighten the set-screw.

| ADJUSTMENT OF IN THE SIGNAL GEN. | CONNECTION OF SIGNAL GENERATOR FREQUENCY | RECEIVER DIAL SETTING | TRIMMER NUMBER | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT |
|--|---|---|-------------------|------------------------------------|--|
| 1 MFD. CONDENSER | 465 KC | ANY POINT WHERE IT DOES NOT TUNE IN THE STATION | 1-2 | I. F. | ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT. IF OSCILLA- TION DOES NOT OCCUR, THE REGEN- ERATION CONTROL TRIMMER # 5. |
| 200 MFD. CONDENSER | 1500 KC | 1500 KC | 3 | BROADCAST OSCILLATOR (SHUNT) | ADJUST FOR MAXIMUM OUTPUT. |
| 200 MFD. CONDENSER | 1500 KC | TUNE TO GEN. SIG. | 4 | BROADCAST OSCILLATOR (SHUNT) | ADJUST FOR MAXIMUM OUTPUT. |
| CONNECT RECEIVER TO CUSTOMER ANTENNA OR TO A 50 MFD. MICA CONDENSER IN SERIES WITH THE SIGNAL GENERATOR. | | | 5 | REGENERATION CONTROL | ADJUST TRIMMER TO GIVE MAXIMUM OUTPUT. CONSISTENT WITH GOOD STABILITY AND TONE QUALITY. |
| 1 MFD. CONDENSER | 465 KC | ANY POINT WHERE IT DOES NOT TUNE IN THE STATION | 1-2 | I. F. | ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT. |

THIS ADJUSTMENT MUST AGAIN BE MADE AFTER THE REGENERATION CONTROL TRIMMER HAS BEEN SET.

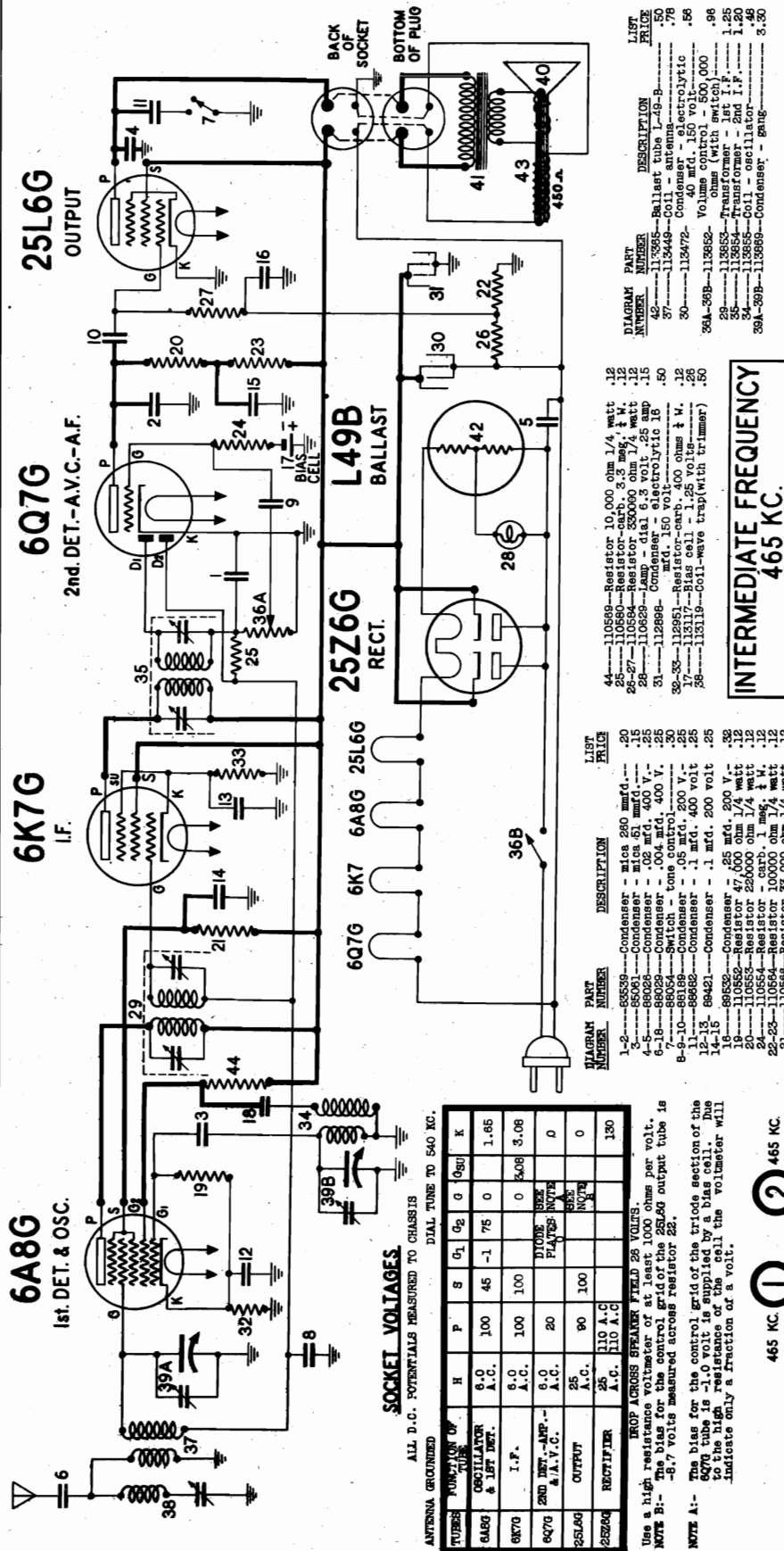
| PART NUMBER | DESCRIPTION | LIST PRICE |
|----------------|--|---------------|
| 83624 | Screw - Self Tapping 8 X 1/4 for mounting I.F. transformer | .04 |
| 85427 | Socket - tube, 8 prong | .02 |
| 85627 | Set Screw - 8/32 square head | .24 |
| 88161 | Shield Tube - (short section) | .18 |
| 88162 | Shield Tube - (long section) | .01 |
| 88164 | Shield Cap - tube, grid type | .01 |
| 88911 | Shield - tube, base | .16 |
| 88912 | Clip - grounding, for tube base | .04 |
| 112745 | Clip - coil mounting (osc. & ant.) | .02 |
| 113500 | Mechanical Tuner Unit - less tenite type for push buttons | 3.90 |
| 113504 | Collar - Coupling (between tuner unit and push button) | .08 |
| 113510 | Tip for tuning knob (walnut) | .05 |
| 113530 | Knob - tuning knob (walnut) | .25 |
| 113537 | Screw for tuning knob & set-up | .18 |
| 113543 | Socket - dial lamp | .01 |
| 113548 | Felt Pad - behind push buttons | .01 |
| 113550 | Tab - station call letters | .28 |
| 113557 | Key - for push button tuner (left hand) | .24 |

I.F. TRANSFORMER & REGENERATION CONTROL

This R-311 chassis employs only one intermediate frequency transformer, the windings of which are capacitively coupled. The two trimmers used to tune the primary and secondary circuits are accessible from the rear of the chassis. Also associated with this intermediate frequency transformer is an additional trimmer condenser, which is accessible through a hole in the rear of the chassis. This condenser is used to feed back a portion of the induced voltage from the secondary winding in the plate circuit of the 6J7-G tube. This signal is introduced into the 6J7-G grid circuit through a coupling coil, which is a part of the secondary coil. The regeneration obtained increases the amplification and the selectivity of the receiver. The alignment of this transformer, and makes the performance of this set

FIRESTONE TIRE & RUBBER CO.

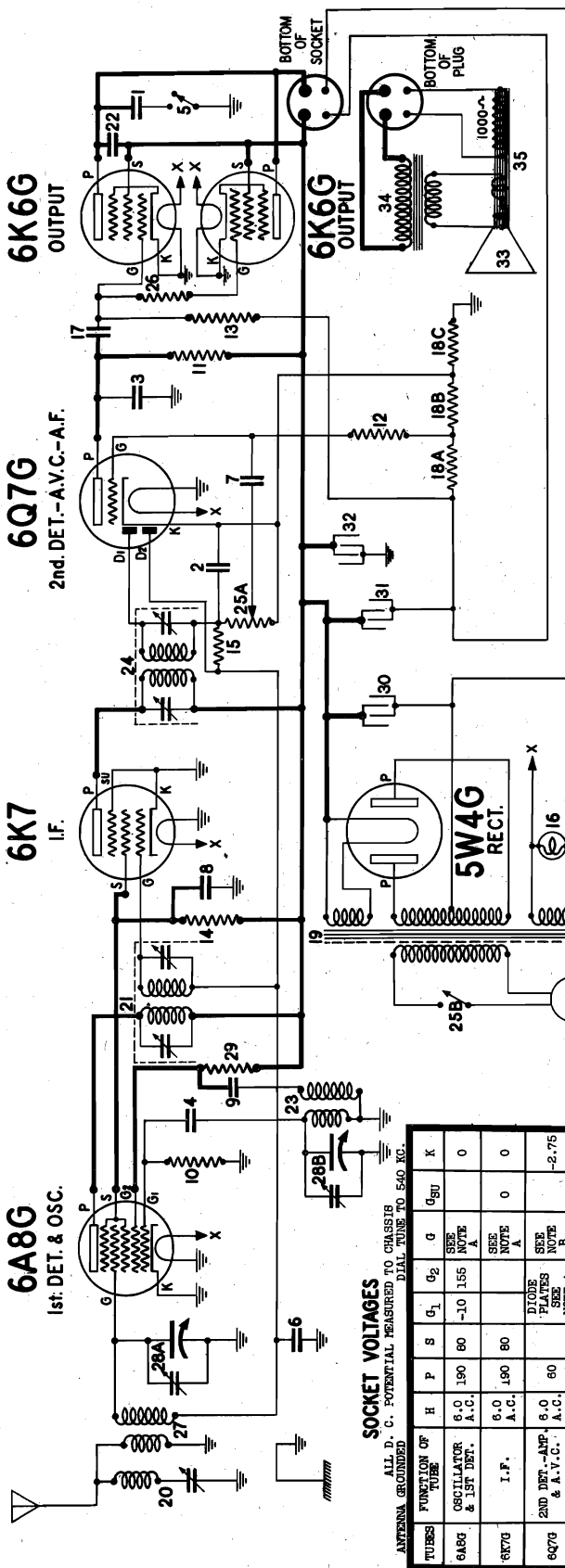
MODEL S7426-2
Schematic, Voltage
Socket, Trimmers
Alignment



| DUMMY ANT. IN SERIES WITH SIG. GEN. | CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER | SIGNAL GENERATOR FREQUENCY | RECEIVER DIAL SETTING | TRIMMER NUMBER | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT |
|-------------------------------------|---|----------------------------|---|----------------|----------------------|--|
| .1 MFD. CONDENSER | CONTROL GRID OF 6A8G TUBE (Do not remove grid clip) | 465 KC. | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 1-2 | 2ND I.F. | ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT. |
| 200 MFD. MICA CONDENSER | ANTENNA LEAD | 465 KC. | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 3-4 | 1ST I.F. | ADJUST FOR MINIMUM OUTPUT USING STRONG GENERATOR SIGNAL. |
| 200 MFD. MICA CONDENSER | ANTENNA LEAD | 1500 KC. | 1500 KC. | 5 | WAVE TRAP | ADJUST FOR MAXIMUM OUTPUT. |
| 200 MFD. MICA CONDENSER | ANTENNA LEAD | 1500 KC. | 1500 KC. | 6 | BROADCAST OSCILLATOR | ADJUST FOR MAXIMUM OUTPUT. |
| 200 MFD. MICA CONDENSER | ANTENNA LEAD | 1500 KC. | 1500 KC. | 7 | BROADCAST ANTENNA | ADJUST FOR MAXIMUM OUTPUT. |

MODELS S7426-3, S7426-4
Chassis R313
Schematic, Voltage
Socket, Trimmers
Alignment

FIRESTONE TIRE & RUBBER CO.



INTERMEDIATE FREQUENCY
465 KC.

| DIAGRAM NUMBER | PART NUMBER | DESCRIPTION | LIST PRICE |
|-----------------|-------------|------------------------------------|------------|
| 15 | 110560 | Resistor - 3.3 meg. 1/4 watt | .12 |
| 16 | 110562 | Condenser - .05 mfd. 50 v. | .15 |
| 17 | 110563 | Resistor - .05 mfd. 50 v. | .13 |
| 18A to C-113010 | | Section A - 180 ohms | .40 |
| | | Section B - 25 ohms | |
| | | Section C - 45 ohms | |
| 19 | 113012 | Transformer - 117 V. 60 Cy. - 5.00 | 5.00 |
| 20 | 113013 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 21 | 113014 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 22 | 113015 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 23 | 113016 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 24 | 113017 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 25 | 113018 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 26 | 113019 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 27 | 113020 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 28 | 113021 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 29 | 113022 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 30 | 113023 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 31 | 113024 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 32 | 113025 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 33 | 113026 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 34 | 113027 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |
| 35 | 113028 | Transformer - 117 V. 60 Cy. - 1.25 | 1.25 |

| DIAGRAM NUMBER | PART NUMBER | DESCRIPTION | LIST PRICE |
|----------------|-------------|-----------------------------|------------|
| 1 | 88217 | Condenser - .04 mfd. 500 V. | .25 |
| 2 | 88218 | Condenser - .04 mfd. 500 V. | .25 |
| 3 | 88219 | Condenser - .04 mfd. 500 V. | .25 |
| 4 | 88220 | Condenser - .04 mfd. 500 V. | .25 |
| 5 | 88221 | Condenser - .04 mfd. 500 V. | .25 |
| 6 | 88222 | Condenser - .04 mfd. 500 V. | .25 |
| 7 | 88223 | Condenser - .04 mfd. 500 V. | .25 |
| 8 | 88224 | Condenser - .04 mfd. 500 V. | .25 |
| 9 | 88225 | Condenser - .04 mfd. 500 V. | .25 |
| 10 | 88226 | Condenser - .04 mfd. 500 V. | .25 |
| 11 | 88227 | Condenser - .04 mfd. 500 V. | .25 |
| 12 | 88228 | Condenser - .04 mfd. 500 V. | .25 |
| 13 | 88229 | Condenser - .04 mfd. 500 V. | .25 |
| 14 | 88230 | Condenser - .04 mfd. 500 V. | .25 |
| 15 | 88231 | Condenser - .04 mfd. 500 V. | .25 |
| 16 | 88232 | Condenser - .04 mfd. 500 V. | .25 |
| 17 | 88233 | Condenser - .04 mfd. 500 V. | .25 |
| 18 | 88234 | Condenser - .04 mfd. 500 V. | .25 |
| 19 | 88235 | Condenser - .04 mfd. 500 V. | .25 |
| 20 | 88236 | Condenser - .04 mfd. 500 V. | .25 |
| 21 | 88237 | Condenser - .04 mfd. 500 V. | .25 |
| 22 | 88238 | Condenser - .04 mfd. 500 V. | .25 |
| 23 | 88239 | Condenser - .04 mfd. 500 V. | .25 |
| 24 | 88240 | Condenser - .04 mfd. 500 V. | .25 |
| 25 | 88241 | Condenser - .04 mfd. 500 V. | .25 |
| 26 | 88242 | Condenser - .04 mfd. 500 V. | .25 |
| 27 | 88243 | Condenser - .04 mfd. 500 V. | .25 |
| 28 | 88244 | Condenser - .04 mfd. 500 V. | .25 |
| 29 | 88245 | Condenser - .04 mfd. 500 V. | .25 |
| 30 | 88246 | Condenser - .04 mfd. 500 V. | .25 |
| 31 | 88247 | Condenser - .04 mfd. 500 V. | .25 |
| 32 | 88248 | Condenser - .04 mfd. 500 V. | .25 |
| 33 | 88249 | Condenser - .04 mfd. 500 V. | .25 |
| 34 | 88250 | Condenser - .04 mfd. 500 V. | .25 |
| 35 | 88251 | Condenser - .04 mfd. 500 V. | .25 |

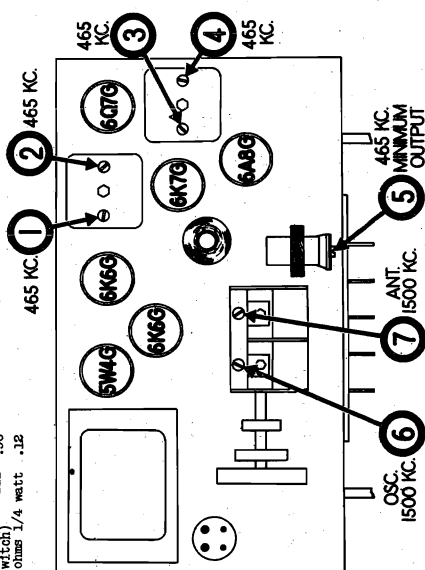
SOCKET VOLTAGES

ALL D. C. POTENTIAL MEASURED TO CHASSIS
DIAL TUNE TO 540 KC.

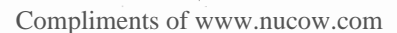
| TUBES | FUNCTION OF TUBE | H | P | S | G ₁ | G ₂ | G | G _{5U} | K |
|-------|------------------------|-----|-----|------|----------------|----------------|--------|-----------------|---|
| 6A8G | OSCILLATOR & 1ST DET. | 6.0 | 190 | 80 | -10 | 155 | NOTE A | 0 | 0 |
| 6K7G | I.F. | 6.0 | 190 | 80 | | | NOTE A | 0 | 0 |
| 6Q7G | 2ND DET.-AMP. & A.V.C. | 6.0 | 190 | 80 | | | NOTE A | -2.75 | |
| 6K6G | OUTPUT | 6.0 | 175 | 190 | | | NOTE C | 0 | |
| 6K6G | OUTPUT | 6.0 | 175 | 190 | | | NOTE C | 0 | |
| 5W4G | RECTIFIER | 5.0 | 335 | A.C. | | | NOTE C | 0 | |

DROP ACROSS SPEAKER FIELD 55 VOLTS
USE A HIGH RESISTANCE VOLTMETER OF AT LEAST 1,000 OHMS PER VOLT.
NOTE A: The control grid bias for the 6Q7G tube is -2.75 volts measured across resistors 18A and 18C. 6K6G tubes is -15 volts measured across resistors 18A, 18B and 18C.

| DUMMY ANT. IN SERIES WITH SIG. GEN. | CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER | SIGNAL GENERATOR FREQUENCY | RECEIVER DIAL SETTING | TRIMMER NUMBER | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT |
|-------------------------------------|---|----------------------------|---|----------------|----------------------|--|
| .1 MFD. CONDENSER | CONTROL GRID OF 6A8G TUBE (Do not remove grid clip) | 465 KC. | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 1-2 | 2ND I.F. | ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT. |
| 200 MFD. MICA CONDENSER | ANTENNA LEAD | 465 KC. | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 3-4 | 1ST I.F. | ADJUST FOR MINIMUM OUTPUT USING STRONG GENERATOR SIGNAL. |
| 200 MFD. MICA CONDENSER | ANTENNA LEAD | 1500 KC. | 1500 KC. | 5 | BROADCAST OSCILLATOR | ADJUST FOR MAXIMUM OUTPUT. |
| 200 MFD. MICA CONDENSER | ANTENNA LEAD | 1500 KC. | 1500 KC. | 6 | BROADCAST ANTENNA | ADJUST FOR MAXIMUM OUTPUT. |



MODEL S7426-8
Schematic, Voltage



MODEL S7426-8
Alignment, Socket
Trimmers

FIRESTONE TIRE & RUBBER CO.

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 6F6-G output tube and chassis, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the "G" terminal or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. Remove the connector from between the "A" and "X" terminals.
5. Push in the "MANUAL" button, and keep it depressed during the entire alignment procedure.

| Dummy Ant. in Series with Sig. Gen. | Connection of Sig. Generator Output to Receiver | Signal Generator Frequency | Receiver Dial Setting | Trimmer Number | Trimmer Description | Type of Adjustment |
|-------------------------------------|---|----------------------------|---|----------------|------------------------------|--|
| .1 MFD CONDENSER | FRONT LUG ON GANG CONDENSER | 455 KC | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 1-2 | 2nd I.F. | ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT. |
| | | | | 3-4 | 1st I.F. | |
| 200 MMFD. MICA CONDENSER | "A" TERMINAL | 455 KC | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 5 | WAVE TRAP | ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL. |
| 200 MMFD. MICA CONDENSER | "A" TERMINAL | 1500 KC | 1500 KC | 6 | BROADCAST OSCILLATOR (Shunt) | ADJUST FOR MAXIMUM OUTPUT. |
| 200 MMFD. MICA CONDENSER | "A" TERMINAL | 1500 KC | TUNE TO 1500 KC GENERATOR SIGNAL | 7 | BROADCAST ANTENNA (Shunt) | ADJUST FOR MAXIMUM OUTPUT. |

MISCELLANEOUS PARTS

| Part Number | Description | List Price |
|-------------|---|--------------|
| 117208 | Background for dial..... | \$0.05 |
| 83552 | Bolt—chassis mtg. (No. 10 x 7/8)..... | .03 |
| 114955 | Clamp—for dial cord..... | .01 |
| 112745 | Clip—coil mounting..... | .01 |
| 112798 | Clip—for mtg. wave trap coil..... | .01 |
| 116009 | Clip—for antenna coil mtg..... | .01 |
| 85321 | Connector—for internal antenna..... | .01 |
| 116948 | Cord—dial—6 ft. lengths..... | .18 |
| 117057 | Cord—drive—3 ft. lengths..... | .15 |
| 117222 | Dial scale..... | .60 |
| 117023 | Drive drum and bushing..... | .50 |
| 117232 | Escutcheon for dial—with glass..... | .75 |
| 117233 | Escutcheon for push buttons..... | .35 |
| 117087 | Knob for volume..... | .12 |
| 117245 | Pin—push buttons..... | .03 |
| 117227 | Pointer..... | .25 |
| 117234 | Push button..... | .08 |
| 117192 | Retainer for dial scale..... | .01 |
| 81145 | Retaining ring—for drive shaft..... | Per C .50 |
| 83624 | Screw—self tapping 8 x 1/4..... | .01 |
| 85040 | Screw—No. 6 Hex. Hd..... | Per C .35 |
| 85827 | Set Screw—8-32 Square Head..... | .02 |
| 114914 | Screw—special head for mtg. escutcheon..... | Per Doz. .15 |
| 114117 | Socket—dial lamp..... | .18 |
| 110501 | Socket—4 prong (for spkr.)..... | .16 |
| 116690 | Socket—(octal base) (small)..... | .12 |
| 111090 | Spacer—steel mechanism mtg. to chassis..... | .02 |
| 113177 | Spring—dial cord tension..... | .09 |
| 116536 | Terminal strip (G.X.A.)..... | .15 |
| 116530 | Washer (paper) for back of knobs..... | .005 |
| 111456 | Washer—spring washer..... | Per C .50 |

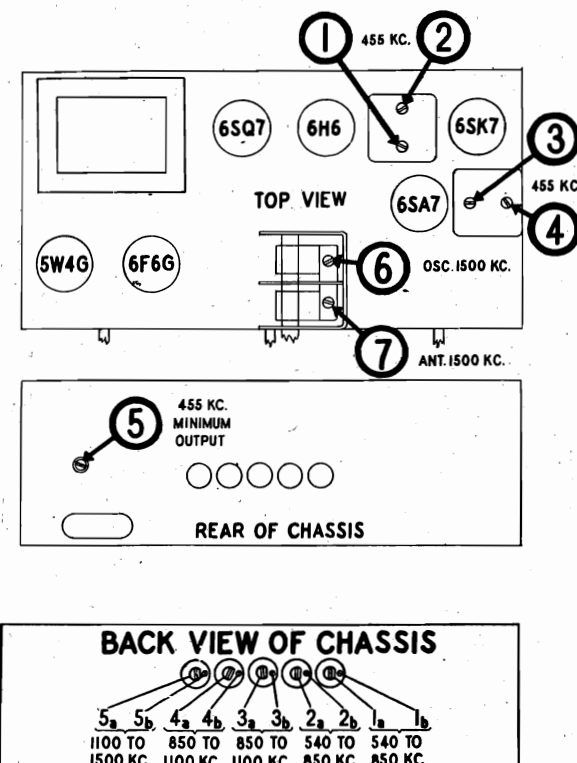
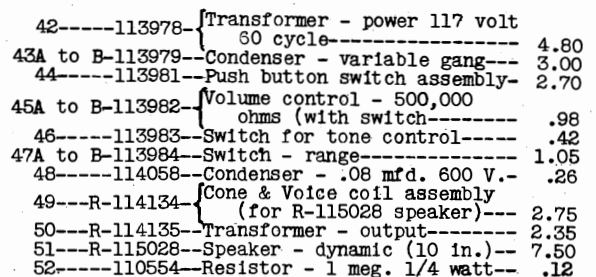


Fig. 1

FOR
SETTING UP PUSH BUTTONS
SEE INDEX



MODEL S7427-1, Early
Chassis R314
Alignment, Trimmers
Socket

FIRESTONE TIRE & RUBBER CO.

ALIGNMENT EQUIPMENT & PROCEDURE

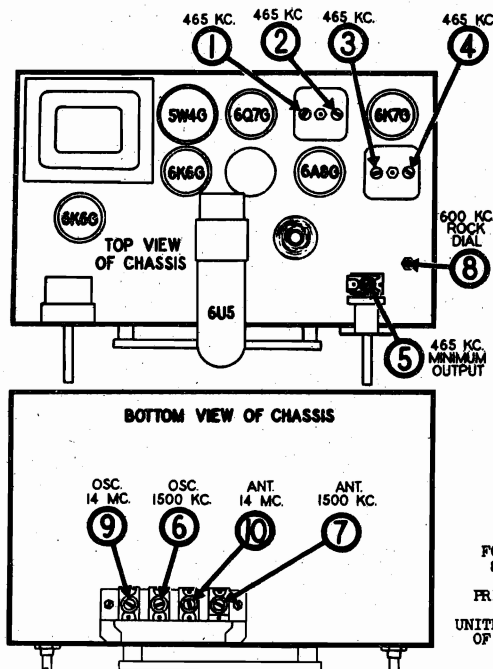
For alignment, an output meter and an accurately calibrated signal generator with a tuning range from 465 KC. to 14 MC. are required.

- 1- Connect the output meter across the voice coil or between the plate of either of the 6K6G tubes and ground through a .1 mfd. condenser, (these tubes are connected in parallel, not push-pull). The connection will depend upon the type of raster. (The more sensitive type should be connected across the voice coil.)
- 2- Connect the ground lead of the signal generator to the chassis of the receiver and keep it connected in this manner throughout the entire alignment procedure.
- 3- Turn the volume control to the maximum volume position and leave it in this position throughout the entire alignment procedure.
- 4- With the gang condenser in full mesh, set the pointer to the last mark on the left end of the dial scale. If the pointer is only slightly off calibration, loosen the set screw in the pointer cord drive drum, and with the gang condenser in full mesh turn the drum until the pointer is in the correct position. If the pointer is off calibration several dial divisions, release it from the pointer drive cord by spreading the clip on the pointer. Then slide the pointer along the cord until it is set to the last division on the left end of the dial scale. Hold the pointer in place and check to see if the gang condenser is still fully meshed, then tighten the pointer clip being careful not to cut the cord. Place a drop of household or speaker cement on the cord and pointer clip to prevent the pointer from slipping.

| DUMMY ANT. IN SERIES WITH SIG. GEN. | CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POSITION | RECEIVER DIAL SETTING | TRIMMER NUMBER | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT |
|-------------------------------------|---|----------------------------|-----------------------------|---|----------------|----------------------------------|--|
| .1 MFD. CONDENSER | CONTROL GRID OF 6AG6 TUBE | 465 KC | AMERICAN (CENTER) | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 1-2 3-4 | 2ND I.F. 1ST I.F. | ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT. |
| 400 OHM CARBON RESISTOR | ANTENNA LEAD (Blue Wire) | 465 KC | AMERICAN (CENTER) | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 5 | WAVE TRAP | ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL. |
| 400 OHM CARBON RESISTOR | ANTENNA LEAD (Blue Wire) | 1500 KC | AMERICAN (CENTER) | 1500 KC | 6 | AMERICAN OSCILLATOR (Shunt) | ADJUST TRIMMER TO BRING IN SIGNAL. |
| 400 OHM CARBON RESISTOR | ANTENNA LEAD (Blue Wire) | 1500 KC | AMERICAN (CENTER) | TUNE TO 1500 KC GENERATOR SIGNAL | 7 | AMERICAN ANTENNA | ADJUST FOR MAXIMUM OUTPUT |
| 400 OHM CARBON RESISTOR | ANTENNA LEAD (Blue Wire) | 600 KC | AMERICAN (CENTER) | TUNE TO 600 KC GENERATOR SIGNAL | 8 | AMERICAN OSCILLATOR (Series Pad) | ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED. |
| 400 OHM CARBON RESISTOR | ANTENNA LEAD (Blue Wire) | 20 MC | FOREIGN (COUNTER-CLOCKWISE) | 14 MC | 9 | FOREIGN OSCILLATOR (Shunt) | ADJUST TO BRING IN SIGNAL. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 13.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 14 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE. |
| 400 OHM CARBON RESISTOR | ANTENNA LEAD (Blue Wire) | 20 MC | FOREIGN (COUNTER-CLOCKWISE) | 14 MC | 10 | FOREIGN ANTENNA | ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED. |

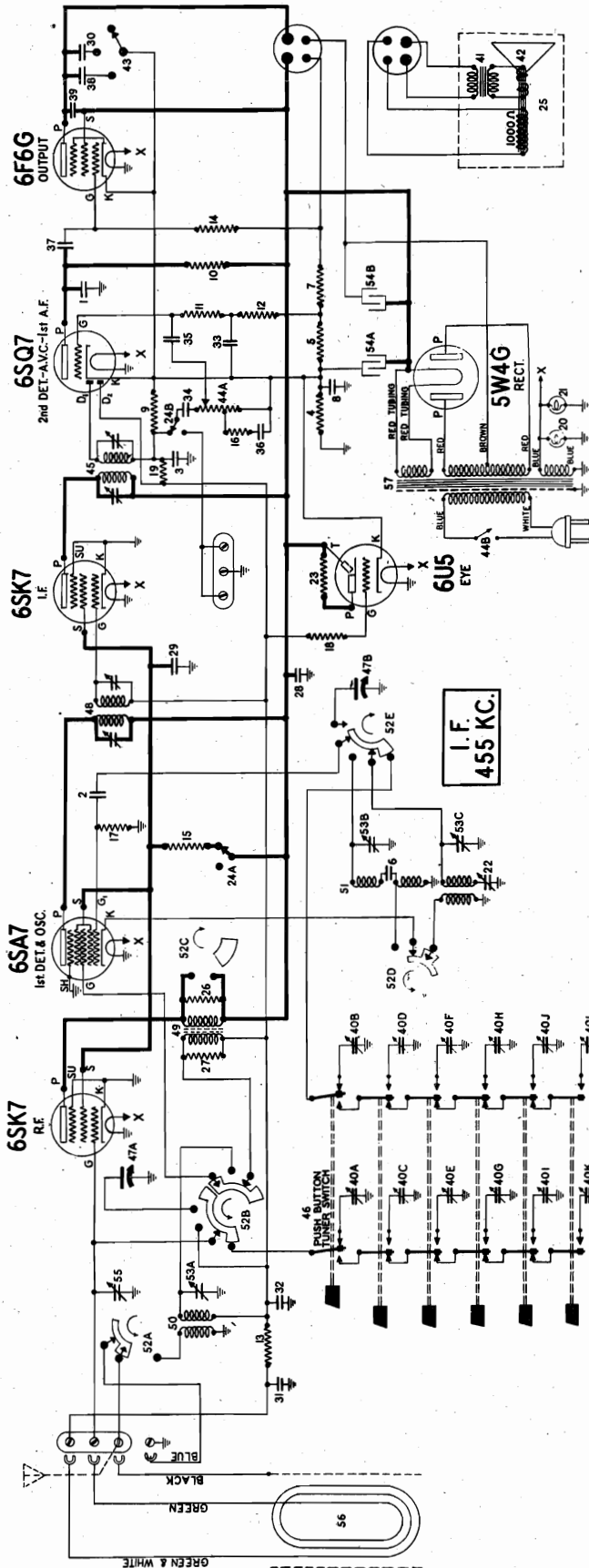
DIAL & MISCELLANEOUS PARTS

| PART NUMBER | DESCRIPTION | LIST PRICE |
|-------------|---|------------|
| 81145 | Retaining Ring-for drive shaft-Per C | .50 |
| 85427 | Socket - octal base (standard) | .15 |
| 85827 | Set Screw - 8/32 square head for tone or band indicator | .02 |
| 88348 | Eyelet - for dial cord-Per dz. | .05 |
| 89746 | Washer - (paper) for back of knobs | .005 |
| 110496 | Plug - speaker (4 prong) | .12 |
| 110501 | Socket - 4 prong (for spkr.) | .16 |
| 110829 | Washer - chassis mtg. | .01 |
| 111085 | Sleeve - felt for tuning eye | .03 |
| 111302 | Cord - dial drive 6 or 50 ft. lengths | .05 |
| 111357 | Spring - drive cord tension | .03 |
| 112745 | Clip - coil mtg. (osc. & ant.) | .01 |
| 112885 | Shield - base, for tubes | .03 |
| 112874 | Bolt - chassis mtg. | .01 |
| 112879 | Screw - escutcheon mtg. | .03 |
| 113025 | Socket-octal base (with special ground) | .15 |
| 113077 | Shield - tube | .15 |
| 113093 | Socket - for dial lamp | .18 |
| 113442 | Bracket - for tuning eye | .18 |
| 113710 | Washer - ceramic for push button trimmer | .015 |
| 113722 | Knob - tone and band switch | .08 |
| 113723 | Knob - tuning and volume | .08 |
| 113800 | Escutcheon - dial | 1.00 |
| 113815 | Escutcheon - push button | .80 |
| 113887 | Push button | .04 |
| 113890 | Escutcheon - eye | .10 |
| 113973 | Dial drum and bushing assembly | .45 |
| 113987 | Shaft - tuning | .10 |
| 113990 | Band indicator & link assembly | .30 |
| 113994 | Spring - for tone indicator | .015 |
| 113995 | Tone indicator & link assembly | .30 |
| 113998 | Cable & plug for tuning eye | .80 |
| 114000 | Dial scale | .85 |
| 114001 | Clamp - for dial scale retaining | .08 |
| 114002 | Pointer - for dial | .12 |
| 114007 | Dial mtg. plate & bracket | .60 |
| 114041 | Tab - station call letters | .35 |



FIRESTONE TIRE & RUBBER CO.

MODEL S7427-1, Late
Schematic, Voltage



ELECTRICAL PARTS (Continued)

| Diagram Number | Part Number | Description | List Price |
|----------------|-------------|---|------------|
| 46 | 117225 | Switch—push button | 3.00 |
| 47A-47B | 117527 | Condenser—variable tuning | 3.25 |
| 48 | 118337 | Transformer—1st I.F. | 1.20 |
| 49 | 118338 | Transformer—R.F. | 1.00 |
| 50 | 118342 | Coil—short wave antenna | .80 |
| 51 | 118343 | Coil—oscillator | .70 |
| 52A to 52E | 118414 | Range switch | 1.50 |
| 53A-53B-53C | 118417 | Condenser—3 section trimmer | .70 |
| 54A-54B | 118421 | Condenser—electrolytic, 10 mid., 450 v. | 1.50 |
| 55 | 118431 | Condenser—trimmer | .22 |
| 56 | 118482 | Loop antenna | 1.00 |
| 57 | 118498 | Power transformer | 3.00 |

ELECTRICAL PARTS

| Diagram Number | Part Number | Description | List Price |
|----------------|-------------|--|------------|
| 1 | 83539 | Condenser—mica, 280 mmfd. | \$0.20 |
| 2 | 85061 | Condenser—mica, 51 mmfd. | .15 |
| 3 | 85394 | Condenser—mica, 510 mmfd. | .25 |
| 4 | 88461 | Wire wound resistor, 150 ohms, 1/4 W. | .12 |
| 5 | 88465 | Wire wound resistor, 25 ohms, 1/4 watt | .15 |
| 6 | 88587 | Condenser—mica, .0042 mid. | .35 |
| 7 | 89762 | Resistor—220 ohms, wire wound, 1 watt | .16 |
| 8 | 110377 | Condenser—electrolytic, 10 mid., 35 volt | .90 |
| 9-10 | 110533 | Resistor—carbon, 250,000 ohms, 1/4 watt | .12 |
| 11-12 | 110534 | Resistor—carbon, 250,000 ohms, 1/4 watt | .12 |
| 13-14 | 110539 | Resistor—carbon, 250,000 ohms, 1/4 watt | .12 |
| 15 | 110541 | Resistor—carbon, 250,000 ohms, 1/4 watt | .12 |
| 16 | 110551 | Resistor—carbon, 250,000 ohms, 1/4 watt | .12 |
| 17 | 110552 | Resistor—carbon, 250,000 ohms, 1/4 watt | .12 |
| 18-19 | 110580 | Resistor—carbon, 3.3 meg., 1/4 watt | .12 |
| 20-21 | 110582 | Lamp—6.3 volt—25 amps. | .15 |
| 22 | 112789 | Condenser—Padder (530 to 630 mmfd.) | .36 |
| 23 | 112972 | Resistor—Insulated—1 megohm—1/4 watt | .15 |
| 24A-24B | 114141 | Switch—D.P.D.T. | .44 |
| 25 | M-115059 | Speaker—electro dynamic, 10" | 7.80 |
| 26 | 118053 | Resistor—carbon, 68,000 ohms, 1/10 watt | .12 |
| 27 | 118096 | Resistor—carbon, 22,000 ohms, 1/10 watt | .10 |
| 28-29 | 118625 | Condenser—.01 mid. 600 volt | .25 |
| 30 | 118640 | Condenser—.05 mid. 600 volt | .25 |
| 31-32-33 | 118619 | Condenser—.02 mid. 600 volt | .15 |
| 34-35-36-37 | 118693 | Condenser—.02 mid. 600 volt | .15 |
| 38 | 117924 | Condenser—.02 mid. 600 volt | .20 |
| 39 | 117925 | Condenser—.002 mid. 600 volt | .15 |
| 40A to 40E | 117081 | Push Button Trimmer Gang Cond. Assembly | 5.20 |
| 41 | M-117081 | Transformer—output for M-115059 speaker | 1.50 |
| 42 | M-117092 | Cone and voice coil for M-115059 speaker | 2.20 |
| 43 | 117203 | Switch—tone control | .65 |
| 44A-44B | 117212 | Volume control—1 meg., with switch | 1.30 |
| 45 | 117216 | Transformer—2nd I.F. | 1.50 |

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS
ANTENNA GROUNDED
DIAL TUNED TO 540 K.C.

| TUBE | FUNCTION | H | K | G | G ₁ | S | SU | P | D ₁ | D ₂ |
|------|-------------------------------|----------|------|-------|----------------|-----|----|-----|----------------|----------------|
| 6SK7 | R.F. Amp. | 6.0 A.C. | 0 | —3.2* | | 80 | 0 | 240 | | |
| 6SA7 | 1st Det. & Osc. | 6.0 A.C. | 0 | —3.2* | —8 | 80 | | 240 | | |
| 6SK7 | I.F. Amp. | 6.0 A.C. | 0 | —3.2* | | 80 | 0 | 240 | | |
| 6SQ7 | 2nd DET.—A. V. C. & 1st A. F. | 6.0 A.C. | —3.2 | —4.5* | | | | 135 | —3.2* | |
| 6F6G | Output | 6.0 A.C. | —3.2 | —19* | | 240 | | 220 | | |
| 6U5 | Eye | 6.0 A.C. | —3.2 | —3.2* | | | | | | |
| 5W4G | Rectifier | 5.0 A.C. | | | | | | | | |

*Measured at Bias Resistor
Use a high resistance voltmeter of at least 1000 ohms per volt.

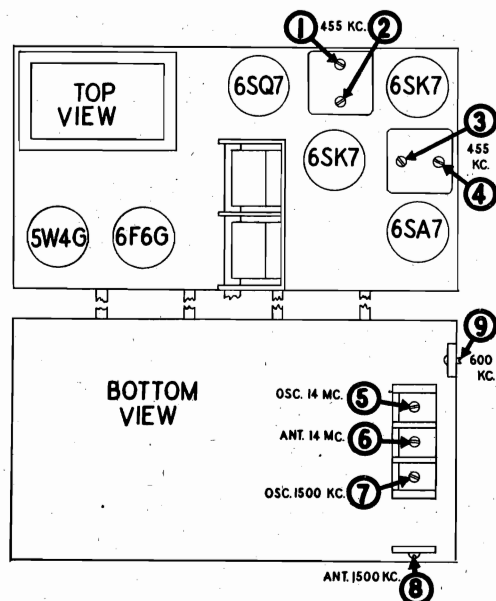
MODEL S7427-1, Late
Alignment, Trimmers
Socket, Notes

FIRESTONE TIRE & RUBBER CO.

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 6F6G output tube and ground in series with a .1 mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure.
4. Remove the blue wire from the extreme left hand screw at the rear of the chassis and allow it to float free.

| Dummy Ant in Series with Sig. Gen. | Connection of Sig Generator Output To Receiver | Signal Generator Frequency | Band Switch Position | Receiver Dial Setting | Trimmer Number | Trimmer Description | Type of Adjustment |
|------------------------------------|--|----------------------------|----------------------|---|----------------|-----------------------------------|--|
| .1 MFD. Condenser | Front Lug of Gang Condenser | 455 KC | Broadcast | Any Point Where It Does Not Affect The Signal | 1-2 3-4 | 2nd I. F. 1st I. F. | Adjust for maximum output. Then repeat adjustment. |
| 400 OHM Carbon Resistor | Black Wire on Antenna Terminal Strip | 14 MC | Foreign | 14 MC | 5 | Foreign Oscillator (Shunt) | Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 13.1 MC. If image does not appear realign at 14 MC. with trimmer screw farther out. Recheck image. |
| 400 OHM Carbon Resistor | Black Wire on Antenna Terminal Strip | 14 MC | Foreign | 14 MC | 6 | Foreign Antenna | Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained. |
| 200 MMFD. Mica Condenser | Black Wire on Antenna Terminal Strip | 1500 KC | Broadcast | 1500 KC | 7 | Broadcast Oscillator (Shunt) | Adjust for maximum output. |
| 200 MMFD. Mica Condenser | Black Wire on Antenna Terminal Strip | 1500 KC | Broadcast | Tune To 1500 KC Generator Signal | 8 | Broadcast Antenna | Adjust for maximum output. |
| 200 MMFD. Mica Condenser | Black Wire on Antenna Terminal Strip | 600 KC | Broadcast | Tune To 600 KC Generator Signal | 9 | Broadcast Oscillator (Series Pad) | Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained. |



DIAL AND MISCELLANEOUS PARTS

| Part Number | Description | List Price |
|-------------|---|------------|
| 116280 | Back-cabinet | \$0.36 |
| 83552 | Bolt—chassis mounting No. 10 x 7/8 | .03 |
| 113442 | Bracket—for tuning eye | .16 |
| 114955 | Clamp—for dial cord | .01 |
| 114001 | Clamp—for dial scale retaining | .08 |
| 112745 | Clip—coil mounting | .01 |
| 116948 | Cord—dial drive (supplied in 6 ft. lengths) | .18 |
| 117057 | Cord—drive | .15 |
| 118450 | Dial scale | 1.00 |
| 118480 | Disc—for end of loop mounting | .05 |
| 117029 | Drive drum and bushing | .50 |
| 113800 | Escutcheon—for dial | 1.00 |
| 113890 | Escutcheon—for tuning eye | .10 |
| 117233 | Escutcheon—for push buttons | .35 |
| 117087 | Knob—for tuning or volume | .12 |
| 118483 | Mounting board for loop antenna | 2.50 |
| 118484 | Mounting block for loop antenna | .60 |
| 117245 | Pin for push buttons | .03 |
| 114002 | Pointer—for dial | .12 |
| 117234 | Push button | .08 |
| 81145 | Retaining ring—for drive shaft | Per C .50 |
| 83624 | Screw—self tapping 8 x 1/4 | .01 |
| 85040 | Screw—No. 6 Hex. Hd. | Per C .35 |
| 113191 | Screw—special No. 8—32 x 1 1/2 | .01 |
| 114914 | Screw—special head for mounting escutcheon | .15 |
| 85827 | Set screw—8-32 square head | .02 |
| 118475 | Shield—for loop antenna | 1.00 |
| 110501 | Socket—4 prong (for speaker) | .16 |
| 114117 | Socket—dial lamp | .18 |
| 116690 | Socket—small octal base | .12 |
| 113177 | Spring—dial cord tension | .09 |
| 117315 | Station call letter tabs | .55 |
| 118416 | Tuning eye cable and socket | .70 |
| 116530 | Washer (paper) for back of knobs | .005 |
| 111456 | Washer—spring washer | Per C .50 |

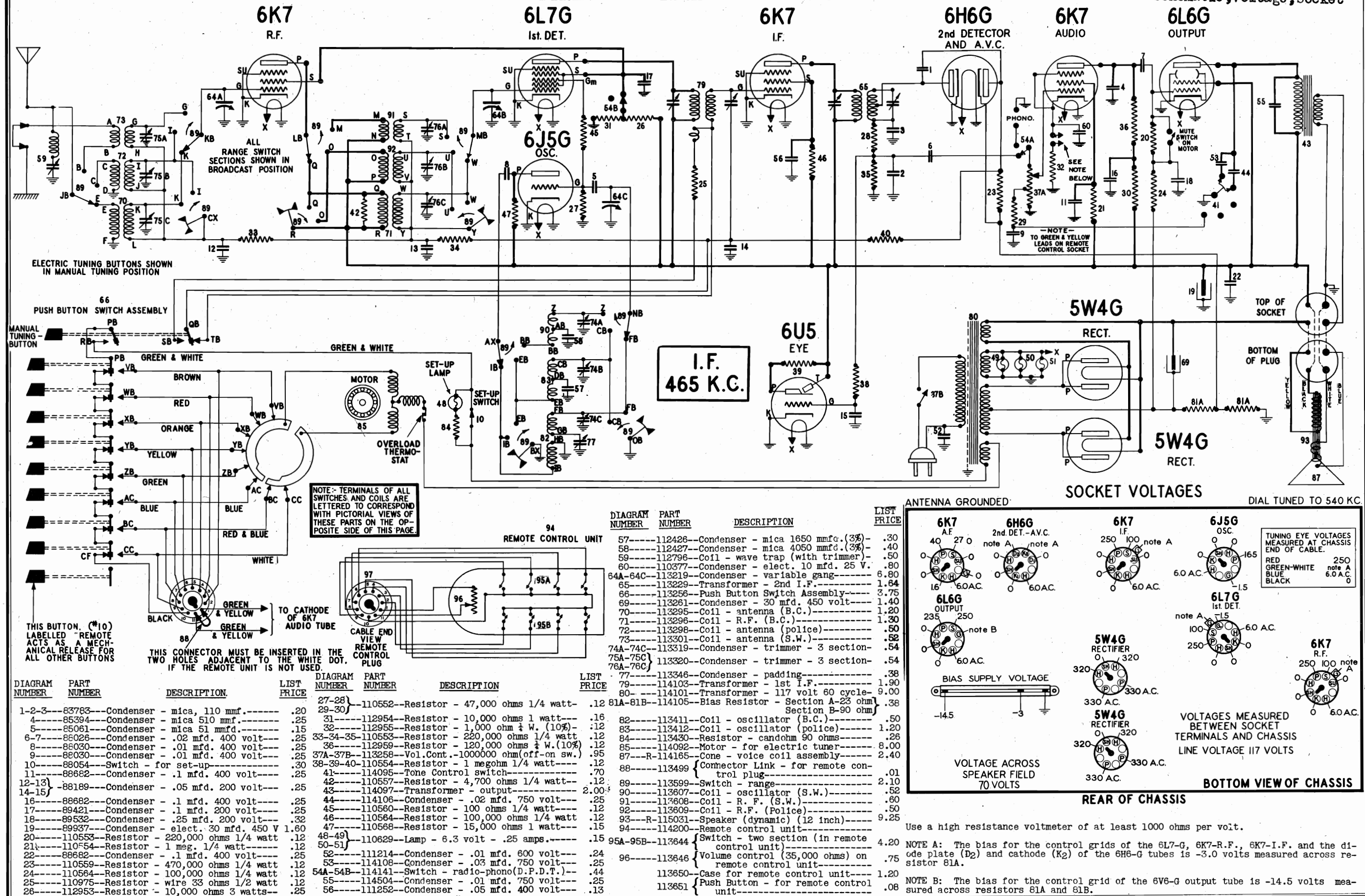
PHONOGRAPH & TELEVISION CONNECTIONS

PHONOGRAPH CONNECTIONS: Connect the wires from a phonograph record player to the left hand and middle terminals on the terminal strip nearest the middle of the chassis on the back of the chassis. Push the black sliding button on the back of the chassis to the right ("TELE. PHONO" position) for phonograph or television operation. This switch must be in the "RADIO" position for radio reception.

Turn the volume knob on the record player to the maximum volume position and control volume by means of the volume control on the radio.

TELEVISION CONNECTIONS: Connect the wires from a television attachment unit to the right hand and middle terminals on the terminal strip. Operation will now be the same as for phonograph operation.

FIRESTONE TIRE & RUBBER CO.

MODEL S7427-3, Chassis R316
Schematic, Voltage, Socket

MODEL S7427-3, Chassis R316
Alignment, Socket, Trimmers
Coils, Tuner, Dial Drive

ALIGNMENT EQUIPMENT & PROCEDURE

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator with a tuning range from 465 KC to 20 MC. are required.

1 Connect the output meter across the voice coil or, in series with .1 mfd. condenser, from the plate of the 6L6-G output tube to ground, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)

2 Connect the ground lead of the signal generator to the "G" post on the antenna terminal strip at the rear of the chassis, or to the metal chassis. The ground and doublet terminals on the antenna terminal strip must be connected together throughout the alignment procedure.

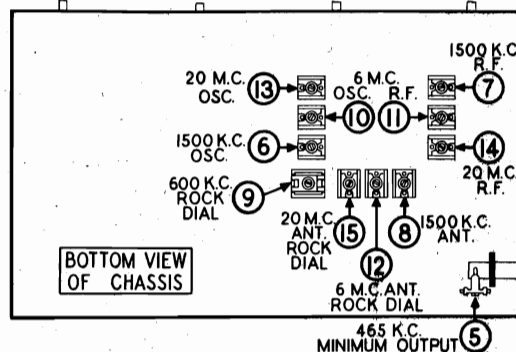
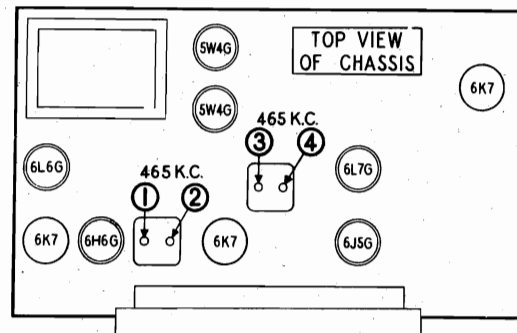
3 With the gang condenser in full mesh set the pointer to the last mark on the left end of the dial scale. If the pointer is incorrectly set, it is only necessary to loosen the set screw on the dial cord drive drum and push the gang condenser to full mesh with the pointer properly set, then retighten the set screw.

4 Turn the volume control to the maximum volume position and keep it in this position throughout the entire alignment procedure. IMPORTANT: If the remote control unit is plugged in, be sure that its volume control is also in the maximum volume position.

- IMPORTANT -

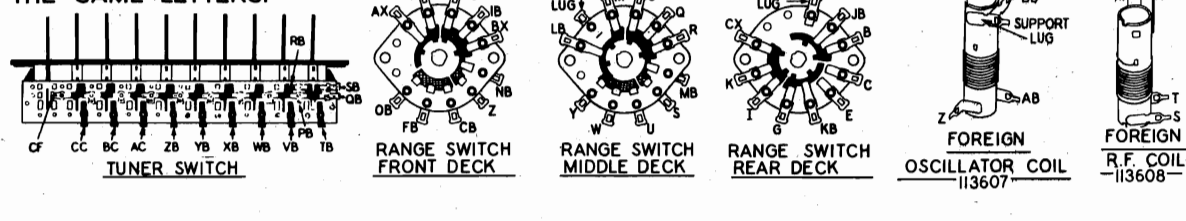
THE FIRST PUSH-BUTTON ON THE LEFT, LABELLED "MANUAL", MUST BE PUSHED IN WHEN ALIGNING. FAILURE TO PUSH IN THIS BUTTON WILL MAKE CORRECT ALIGNMENT IMPOSSIBLE.

| DUMMY ANT IN SERIES WITH SIGNAL GENERATOR | CONNECTION OF SIGNAL GENERATOR OUTPUT TO RECEIVER | SIGNAL GENERATOR FREQUENCY | RANGE SWITCH POSITION | RECEIVER SETTING | TRIMMER NUMBER | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT |
|---|---|----------------------------|-----------------------------|---|----------------|--|--|
| 1 MFD. CONDENSER | CONTROL GRID OF 6L7-G TUBE | 465 KC. | BROADCAST (CLOCKWISE) | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 1-2 | 2ND I.F. | ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT. |
| | | | | | 3-4 | 1ST I.F. | |
| 400 OHM CARBON RESISTOR | ANTENNA TERMINAL | 465 KC. | BROADCAST (CLOCKWISE) | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 5 | WAVE TRAP | ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL. |
| 400 OHM CARBON RESISTOR | ANTENNA TERMINAL | 1500 KC. | BROADCAST (CLOCKWISE) | 1500 KC. | 6 | BROADCAST OSCILLATOR (SHUNT) | ADJUST FOR MAXIMUM OUTPUT. |
| 400 OHM CARBON RESISTOR | ANTENNA TERMINAL | 1500 KC. | BROADCAST (CLOCKWISE) | TUNE TO 1500 KC. GENERATOR SIGNAL | 7 | BROADCAST R. F. | ADJUST FOR MAXIMUM OUTPUT. |
| | | | | | 8 | BROADCAST ANTENNA | |
| 400 OHM CARBON RESISTOR | ANTENNA TERMINAL | 600 KC. | BROADCAST (CLOCKWISE) | TUNE TO 600 KC. GENERATOR SIGNAL | 9 | BROADCAST OSCILLATOR (SERIES PAD) | ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED. |
| 400 OHM CARBON RESISTOR | ANTENNA TERMINAL | 6 MC. | INTERMEDIATE (CENTER) | 6 MC. | 10 | INTERMEDIATE (POLICE) OSCILLATOR (SHUNT) | ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 5.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 6 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE. |
| 400 OHM CARBON RESISTOR | ANTENNA TERMINAL | 6 MC. | INTERMEDIATE (CENTER) | TUNE TO 6 MC. GENERATOR SIGNAL | 11 | INTERMEDIATE R. F. | ADJUST FOR MAXIMUM OUTPUT |
| | | | | | 12 | INTERMEDIATE ANTENNA | |
| 400 OHM CARBON RESISTOR | ANTENNA TERMINAL | 20 MC. | FOREIGN (COUNTER-CLOCKWISE) | 20 MC. | 13 | FOREIGN OSCILLATOR (SHUNT) | ADJUST FOR MAXIMUM OUTPUT. CHECK TO SEE IF PROPER PEAK WAS OBTAINED BY TUNING IN IMAGE AT APPROX. 19.1 MC. IF IMAGE DOES NOT APPEAR REALIGN AT 20 MC. WITH TRIMMER SCREW FARTHER OUT. RECHECK IMAGE. |
| 400 OHM CARBON RESISTOR | ANTENNA TERMINAL | 20 MC. | FOREIGN (COUNTER-CLOCKWISE) | TUNE TO 20 MC. GENERATOR SIGNAL | 14 | FOREIGN R. F. | ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED. |
| | | | | | 15 | FOREIGN ANTENNA | |



PICTORIAL VIEWS OF COILS AND SWITCHES

ALL TERMINALS ARE LETTERED TO CORRESPOND WITH THE SIMILARLY LETTERED TERMINALS SHOWN ON THE CIRCUIT DIAGRAM. TERMINALS WHICH ARE CONNECTED TOGETHER CARRY THE SAME LETTERS.



FIRESTONE TIRE & RUBBER CO.

CHASSIS DESCRIPTION

The R-316 chassis is a 10 tube, Electric Push-Button Tuning Superheterodyne receiver. The tuning ranges are 535 to 1730 KC, 2.2 to 7.0 MC, and 3.8 to 22.5 MC.

Incorporated in each chassis is a ruggedly constructed Electric Push-Button Tuner Unit, which was primarily designed to give long-life and consistent accuracy of tuning. Aside from the automatic tuning system this receiver incorporates several features described in the following paragraph which the service man should carefully read as they may aid him in rapidly locating the source of trouble.

CIRCUIT FEATURES

VARIABLE SELECTIVITY: Two degrees of selectivity can be obtained by proper use of the first push-button labelled "Manual". When the button is in the "out" position the tuning of the receiver will be broad. With this button in the "in" position the tuning will be sharp. Broadening is accomplished by inserting a resistor and coil in series with the secondary of the first I. F. transformer. The series coil is mutually coupled into the primary of the same I. F. transformer thereby causing a flattening of the overall selectivity.

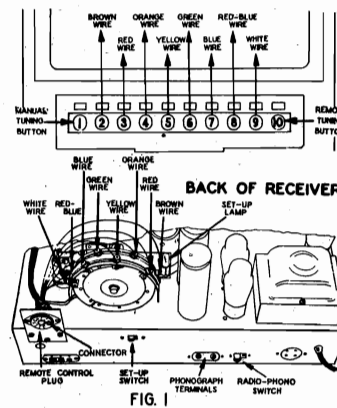
HOW TO SET UP THE PUSH BUTTONS

1. Be sure that your set is first connected to a good antenna system.
2. Turn on the set and allow it to operate at least one-quarter hour before setting up the push buttons.
3. Make a list of eight nearby stations which you wish to tune in with automatic tuning buttons. Be sure to select nearby powerful stations, since weak stations will generally give better results when tuned manually. Arrange the list so that the lowest frequency station appears first, then the next lowest frequency continuing in this manner until the eight stations are arranged in the numerical order of their frequency. The frequency of your local stations may be obtained from your newspaper or radio call magazine.

Only buttons No. 2 to No. 9 are used for automatic tuning. IT IS IMPERATIVE THAT THESE BUTTONS BE SET-UP IN THE FOLLOWING ORDER: Button No. 2 must be set to tune in the station whose frequency is lowest in your list of eight stations. Button No. 3 must be set to tune in the station next higher in frequency. Continue to follow this procedure until Button No. 9 will be set to tune in the station whose frequency is highest in your list. The actual setting up of the buttons is done as follows:

4. Push in the "MANUAL" button and use the tuning knob to tune in the station (lowest frequency on your list) that you have selected for Button No. 2. Be sure to tune in the station correctly using the "Tuning Eye". The correct tuning point is indicated when the two open ends of the inverted "V" shaped shadow in the "Tuning Eye" are closest together.
5. Place the small black "set-up switch" button which appears on the back of the chassis in the right hand position. (See label on back of chassis.) LEAVE THIS SWITCH BUTTON IN THIS POSITION UNTIL ALL BUTTONS HAVE BEEN SET-UP.
6. PUSH IN BUTTON No. 2. The lamp mounted on the back of the chassis just to the right of the selector drum will be illuminated when the button is depressed. (See Fig. 1)

NOTE: If the lamp does not light up when the switch is in this position it indicates that Button No. 2 is already correctly set to the desired station and further adjustment need not be made for this button.



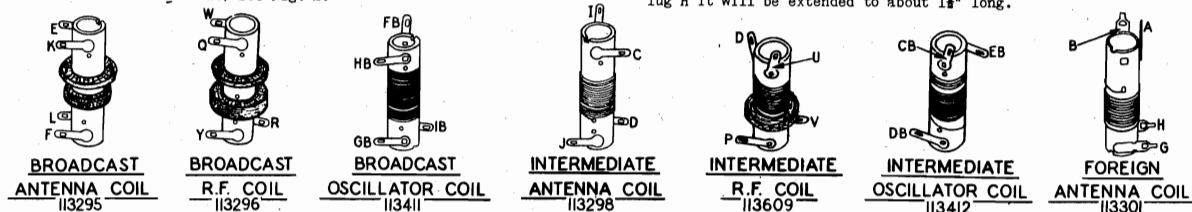
REMOTE CONTROL UNIT

This Air-Chief radio is designed to permit tuning from a remote point such as your armchair or any point within 20 ft. of the receiver cabinet. A special "Remote Tuner Kit" part No. 114200 is available to adapt your receiver for remote control. It can be purchased from any Firestone Store or Dealer. This accessory kit consists of a remote control unit incorporating eight push buttons and a remote volume control. The unit is connected by a flat flexible cable to an eleven prong plug, which fits into a corresponding socket at the left rear of the receiver chassis. Following are the instructions for installation of the remote control unit:

1. Turn off the radio set.
2. Remove the wire connector which joins the two holes adjoining the white dot on the eleven hole socket. IMPORTANT: If at any time you decide to discontinue the use of the remote control unit, remove the plug and reinsert this wire connector in the two holes adjoining the white dot. Failure to replace the connector will make the set inoperative.
3. Insert the remote control plug in its socket and locate the remote control unit at some convenient point within 20 ft. of the set. The connecting cable may be placed beneath the rug, or along the floor.
4. PRESS IN THE "REMOTE" BUTTON (#10) on the Push Button Tuner and the unit is now ready for operation.

REPLACING THE POINTER DRIVE CORD.

1. Tie one end of 53" of special dial cord (part No. 111302) to the spring, which is attached to Lug H.
2. Thread the free end of the cord through hole A in drum C (threading from the inside of the drum out) See Fig. 2.



AUDIO SYSTEM: The audio voltage developed across the diode load resistor is fed to the volume control which in turn couples the desired amount of this audio voltage to the control grid of the 6K7 1st audio tube. The output of this stage is coupled to the 6L6-G output tube. A mute switch connected across the control grid load resistor of the 6L6-G output tube is utilized to silence the receiver while the automatic tuning unit is in operation. This is accomplished by placing the mute switch on the back of the tuner motor. When the motor starts to operate the rotor pulls into the magnetic field of the stator, which causes the end of the motor shaft to push against the mute switch and close its contacts.

TUNER MOTOR

Failure of the Tuner Motor to operate will generally be found due to the following causes:

1. The small black set-up switch on the rear of the tuner must be in the left hand position. If this switch is in the right hand position, the set-up lamp is connected in series with the motor, and the motor cannot operate.
2. The overload thermostat on the motor will open when the temperature of the motor reaches a dangerous value (approximately 95° C.). The thermostat will close automatically when the motor cools down.

7. Locate the contactor corresponding to Button No. 2. This contactor has a BROWN lead attached to it (see Fig. 1 or label on back of chassis for the color of the wire associated with each button), and is the extreme right hand contact on the inner circle of the semi-circular bridge, when viewed from rear of chassis. Loosen the knurled nut on this contactor (not more than one-half turn), THEN SLIDE THIS CONTACTOR ALONG THE BRIDGE TO THE POINT INDICATED BY THE WHITE ARROWHEAD ON THE SIDE OF THE ROUND DRUM. When this point is reached, the lamp will go out. If the contactor is moved farther than the point at which the lamp extinguishes, the lamp will again be illuminated. Move the contactor back and forth between the two points at which the lamp extinguishes, and set the contactor midway between these two points. Then tighten the knurled nut as tightly as possible, with the fingers. The lamp should still be out after tightening the contactor. If it is not, the contactor must be reset.

8. Set up for Button No. 2 is now complete.
9. Set up the remaining seven buttons in a similar manner. The contactors for the remaining buttons can be identified as follows: (See Fig. 1 or label on back of chassis.)

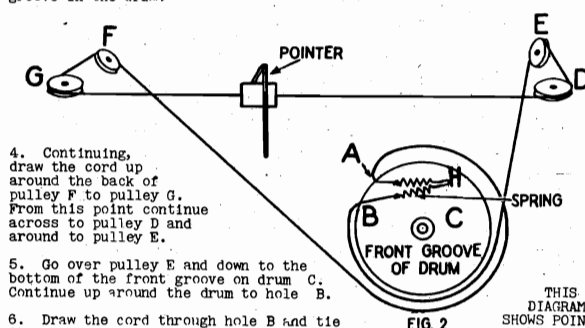
- Button No. 2 - Brown Lead.
- Button No. 3 - Red Lead.
- Button No. 4 - Orange Lead.
- Button No. 5 - Yellow Lead.
- Button No. 6 - Green Lead.
- Button No. 7 - Blue Lead.
- Button No. 8 - Red-Blue Lead.
- Button No. 9 - White Lead.

10. AFTER ALL THE BUTTONS HAVE BEEN SET-UP YOU MUST PLACE THE SMALL BLACK SET-UP SWITCH BUTTON IN THE LEFT HAND POSITION (white dot showing). OTHERWISE THE ELECTRIC TUNER MOTOR WILL NOT OPERATE. (See label on back of chassis just below this switch.) This re-connects the motor and enables you to tune to any of the eight selected stations by pushing the proper button.

11. To use the Push Button Tuner it is only necessary to push the button for the station you desire.
12. The Push Button Tuner buttons may also be used on the Foreign or Intermediate bands. However, on these bands we recommend that rather than setting a button to a station, you set the buttons to some particular location on the dial where "foreign, police, aircraft or amateur" stations are frequently received. Attempts to set buttons to short-wave stations are not recommended due to the extreme sharpness of tuning on these bands.

13. Label each button with the call letters of the stations you have selected, using the call letter tabs packed with your receiver. These tabs are to be moistened on their gummed side and inserted in the recesses in the escutcheon, directly above the push buttons.

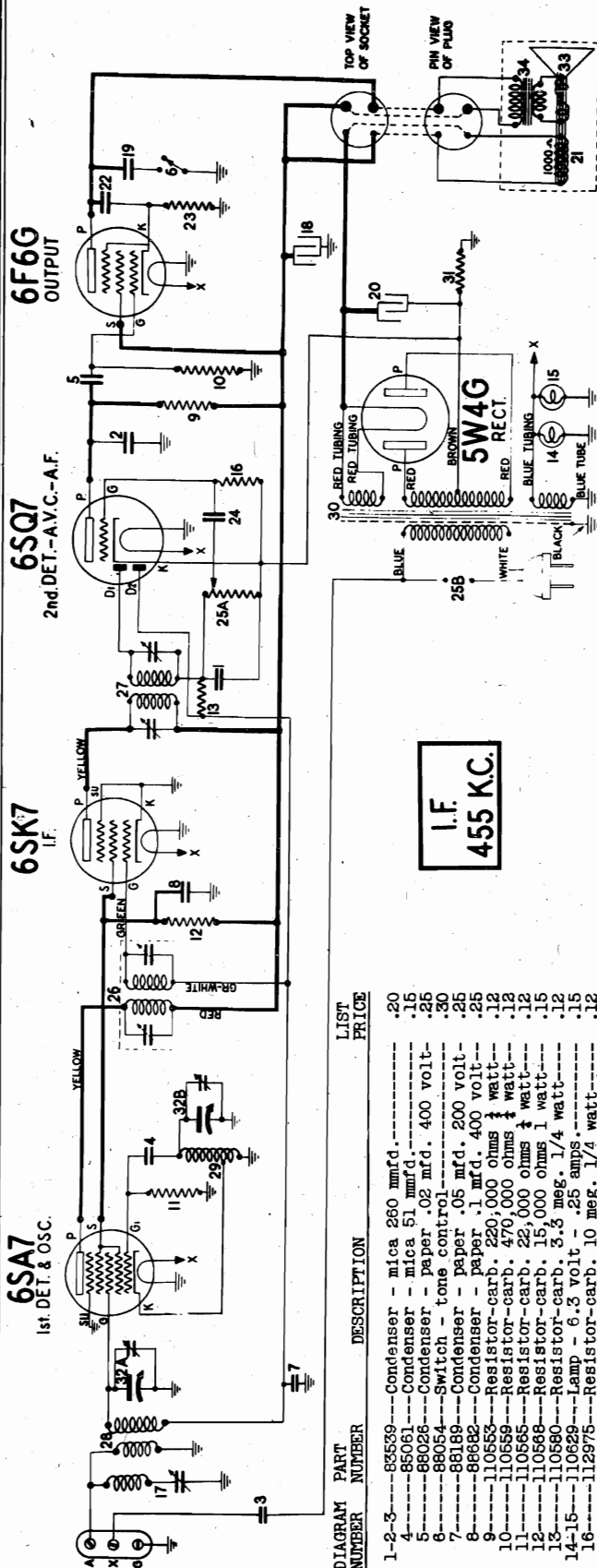
3. After pulling the cord through hole A, make one half turn around the drum C in a clockwise direction (viewed from the front) using the front groove in the drum.



4. Continuing, draw the cord up around the back of pulley F to pulley G. From this point continue across to pulley D and around to pulley E.
5. Go over pulley E and down to the bottom of the front groove on drum C. Continue up around the drum to hole B.
6. Draw the cord through hole B and tie it to the end of the tension spring in such a manner that when the spring is clipped on to lug H it will be extended to about 1 1/2" long.

THIS DIAGRAM SHOWS POINTER DRIVE CORD ONLY

FIRESTONE TIRE & RUBBER CO.

MODEL S7427-7
Schematic, Voltage

| TUBES | FUNCTION OF TUBE | H | P | S | G | G ₁ | SK | K |
|-------|----------------------------|----------|-----|-----|--------|----------------|----|--------|
| 6SA7 | OSCILLATOR & 1st DET. | 6.0 A.C. | 220 | 90 | NOTE A | -8 | | 0 |
| 6SK7 | I.F. | 6.0 A.C. | 220 | 90 | | | 0 | 0 |
| 6F6G | 2ND DET. A.V.C. & 1st A.F. | 6.0 A.C. | 95 | | | | | NOTE A |
| 5W4G | RECTIFIER | 5.0 A.C. | 285 | 285 | 0 | | | 14 |

Use a high resistance voltmeter of at least 1000 ohms per volt.

NOTE A: This voltage is measured across resistor No. 31 and is 3.1 volts.

NOTE B: The voltage on diode plates at no signal is 3.1 volts.

Voltage across speaker field = 52 volts.

| DIAGRAM PART NUMBER | DESCRIPTION | LIST PRICE |
|---------------------|--|------------|
| 1-2-3 | 85539-Condenser - mica 280 mmfd. | .20 |
| 4 | 85061-Condenser - mica 51 mmfd. | .15 |
| 5 | 88026-Condenser - paper .02 mfd. 400 volt | .25 |
| 6 | 88054-Switch - tone control | .30 |
| 7 | 88189-Condenser - paper .05 mfd. 200 volt | .25 |
| 8 | 88682-Condenser - paper .1 mfd. 400 volt | .25 |
| 9 | 110553-Resistor-carb. 220,000 ohms 1/2 watt | .12 |
| 10 | 110552-Resistor-carb. 470,000 ohms 1/2 watt | .12 |
| 11 | 110568-Resistor-carb. 22,000 ohms 1/2 watt | .12 |
| 12 | 110568-Resistor-carb. 15,000 ohms 1/2 watt | .15 |
| 13 | 110568-Resistor-carb. 3.3 meg. 1/4 watt | .12 |
| 14-15 | 110629-Lamp - 6.3 volt - .25 amps | .15 |
| 16 | 112975-Resistor-carb. 10 meg. 1/4 watt | .12 |
| 17 | 113119-Coil - wave trap (with trimmer) | .50 |
| 18 | 113808-Condenser - elect. 8 mfd. 350 volts | .66 |
| 19 | 114108-Condenser - paper .03 mfd. 750 volts | .25 |
| 20 | 114972-Condenser - elect. 16 mfd. 450 volts | .78 |
| 21 | 115062-Speaker - dynamic | 4.80 |
| 22 | 118647-Condenser - .004 600 volt | .15 |
| 23 | 118978-Resistor - 420 ohms 1/2 watt W.W. | .15 |
| 24 | 117022-Condenser - .002 mfd. 600 volt | .15 |
| 25A-25B | 117086-Volume control with switch | 1.25 |
| 26 | 117098-Transformer - 1st I.F. | 1.00 |
| 27 | 117100-Transformer - 2nd I.F. | 1.00 |
| 28 | 117120-Coil - antenna | .60 |
| 29 | 117121-Coil - oscillator | .30 |
| 30 | 117124-Transformer - power | 3.90 |
| 31 | 117148-Resistor - 68 ohms 1/2 watt W.W. | .15 |
| 32A-32B | 117160-Condenser - 2 gang | 5.50 |
| 33 | 117190-Cone & voice coil for 115062 speaker | 1.70 |
| 34 | 117191-Output transformer for 115062 speaker | 2.50 |
| 112745 | Clip - coil mounting | .01 |
| 112798 | Clip - for mounting wave trap coil | .01 |
| 116008 | Clip - for antenna coil mtg. | .01 |
| 116948 | Cord - dial - in 6 foot lengths | .18 |
| 117152 | Cup, dial retaining | .05 |
| 117158 | Dial background | .08 |
| 117155 | Dial drum & bushing assembly | .42 |
| 117155 | Dial pulley & cup assembly | .20 |
| 117165 | Dial scale (glass) | .50 |
| 113861 | Dial scale retainer | .03 |
| 113755 | Escutcheon - dial | .40 |
| 116975 | Knob for tuning | .12 |
| 113756 | Escutcheon for Push Buttons | .32 |
| 117087 | Knob for volume | .12 |
| 114914 | Screw-spec. hd.-for mtg. escut. | .15 |
| 88827 | Set Screw - 8-32 Square head | .02 |
| 85427 | Socket - octal base (standard) | .15 |
| 110501 | Socket - 4 prong (for spkr.) | .16 |

CHASSIS R312
CHASSIS R313
CHASSIS R315
Tuner Data
Drive Cord Data

FIRESTONE TIRE & RUBBER CO.

HOW TO SET UP THE PUSH BUTTON TUNER

1. Be sure that your set is connected to a good antenna system.

2. Turn on the set and allow it to operate at least one-quarter hour before setting up the push buttons.

3. Make a list of the frequencies of six nearby stations to which you wish to set up the buttons. Be sure to select nearby, powerful stations, since weak stations will generally give better results when tuned manually. Also BE SURE TO SELECT STATIONS FALLING WITHIN THE TUNING RANGE OF THE INDIVIDUAL BUTTONS, AS INDICATED IN FIG. 1.

Each of the buttons on your Push-Button Tuner has a definite range of frequencies to which it can be tuned as shown in Fig. 1. It is imperative that in setting up the buttons, you select stations whose frequency is in the indicated tuning range of that button. FAILURE TO SELECT THE PROPER BUTTON WILL RESULT IN THE INCORRECT SETTING OF THE TRIMMER ADJUSTING SCREW AND WILL ALSO CAUSE "DRIFTING". The correct frequencies of your local stations may be obtained from your newspaper of radio call magazine. For example, suppose you want to set a button to station WLW whose frequency is 700 Kilocycles. Refer to Fig. 1 which shows that this frequency falls within the operating range of buttons No. 3 or No. 4, whose range is 500 to 1000 KC. Therefore either button No. 3 or No. 4 can be used for the automatic tuning of WLW.

4. Remove the escutcheon around the push buttons by taking out the six screws holding it to the cabinet. This will expose to view six pairs of adjusting screws, each pair of which is used to tune in a station that you wish to set-up on a particular button.

5. Turn the band switch (Right hand knob) clockwise until the word "BROADCAST" appears in the lower opening in the dial scale. Then using the tuning knob (Center) tune in the station you desire to set to button No. 3. This is done so that you may identify the station by hearing its program.

6. Now turn the band switch knob to the extreme clockwise position (the word "AUTOMATIC" will now appear in the center dial scale opening). You will note when this switch is turned, the station previously tuned in will not be heard.

7. Now push in the third button from the left (No. 3 in Fig. 10). Using a small screw driver, insert it in the second screw from the left (No. 3a in Fig. 1). Rotate the screw SLOWLY until the program that you have previously tuned in manually is again tuned in. If it cannot be heard, advance the volume control. BE SURE THAT YOU ADJUST THIS PARTICULAR SCREW (3a) UNTIL THE INVERTED "V" SHADOW IN THE "TUNING EYE" IS NARROWEST. It is advisable that you turn the screw in and out so that you will tune across the station several times in order that you may be sure that you have located the correct tuning point.

8. Next insert the screw driver in the first screw on the left (No. 3b, Fig. 1) and turn it until the program is received with maximum volume. The correct position is indicated by the ends of the inverted "V" in the "Tuning Eye" being closest together. Now go back to screw No. 3a and see if any improvement in the reception can be made by adjusting it. Also repeat this adjustment for screw No. 3b.

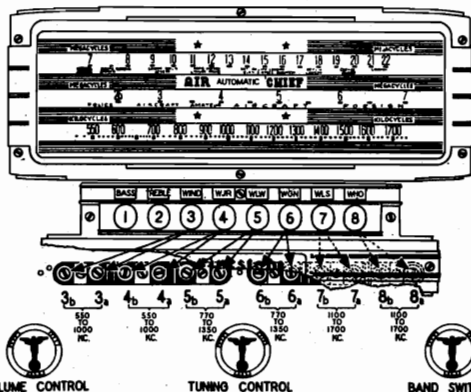


FIG. 1

9. Set up button No. 4 for the selected station in a similar manner, using screws No. 4a and 4b, and proceed to set up the remaining buttons in the same fashion, always tuning in the station initially with the "a" screw for that particular button.

10. Replace the escutcheon with its six retaining screws.

11. Label each button with the call letters of the stations you have selected, using the call letter tabs packed with your receiver. These tabs are to be moistened on their gummed side and inserted in the recesses in the escutcheon, directly above the push buttons.

HOW TO CHANGE THE OPERATING RANGE OF A BUTTON

The operating range of a button may be changed by merely changing the dual trimmer used with that button. Dual trimmers with the ranges indicated below can be obtained from your Firestone Dealer or serviceman under the following part numbers:

| Part Number | Tuning Range | List Price |
|-------------|------------------|------------|
| 112942 | 1100 to 1700 KC. | \$0.38 |
| 114505 | 770 to 1350 KC. | .45 |
| 112944 | 550 to 1000 KC. | .50 |

To make the change proceed as follows:

1. Remove the chassis from the cabinet.
2. By referring to Fig. 1, determine the dual trimmer associated with the button whose range you wish to change.
3. Unsolder the lead from the four terminals on the back of this dual trimmer.
4. Remove the 6/32 machine screw holding the dual trimmer to the front of the chassis.
5. From the above list select a dual trimmer which will cover the desired range.
6. Mount it on the front of the chassis with the 6/32 machine screw, and solder the leads to its four terminals. The button is now ready to be set to any strong station whose frequency is within the range of this new trimmer unit.

REPLACING THE DIAL POINTER DRIVE CORD

1. Tie a large knot in one end of about 51" of special dial cord, part No. 111302.
2. Thread the free end of the cord through hole A in drum C (threading from the inside of the drum out) See Fig. 2.
3. After pulling the cord through hole A, make one half turn around the drum C in a clockwise direction (viewed from the front), using the front groove in the drum.

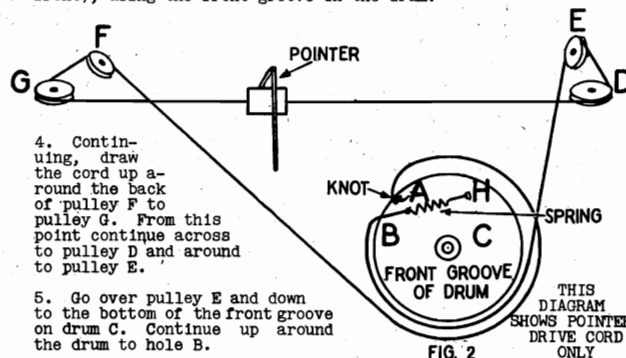


FIG. 2

4. Continuing, draw the cord up around the back of pulley F to pulley G. From this point continue across to pulley D and around to pulley E.
5. Go over pulley E and down to the bottom of the front groove on drum C. Continue up around the drum to hole B.
6. Draw the cord through hole B and tie it to the end of the tension spring in such a manner that when the spring is clipped on to lug H it will be extended to about 1 1/2" long.

MODEL 25F Alignment, Socket Trimmers, Notes Dial Assembly

GALVIN MFG. CORP.

ALIGNMENT PROCEDURE

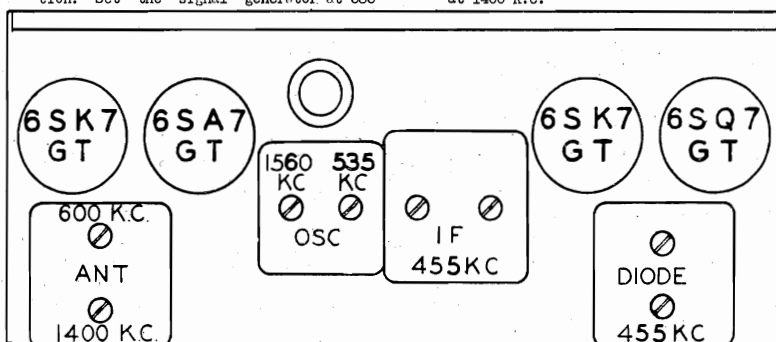
Remove the back cover (D) and place the radio on the service bench. Turn the volume control to maximum and leave it there throughout the alignment, reducing the signal generator output, if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid. (terminal No. 8) of the 6SA7GT oscillator -- modulator tube and to chassis ground using a .1 MFD. condenser in series with lead. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.
2. Set the signal generator at 455 K.C. and carefully adjust the two trimmers in the
3. diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator, if necessary, to pick up signal.).
4. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.
5. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 should be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.
2. Set the signal generator at 1580 K.C. and with the condenser gang still completely out of mesh, adjust the 1580 K.C. trimmer in the oscillator coil can to the point showing the highest output reading.
3. Turn condenser gang to fully meshed position. Set the signal generator at 535 K.C. and adjust the 535 K.C. oscillator pad in the oscillator coil can to point showing highest reading.
4. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the 1400 K.C. antenna trimmer in the antenna coil can to point showing highest reading.
5. Set the signal generator at 600 K.C. and turn the condenser gang until the pointer reads 600 K.C. while adjusting the antenna padder to point showing highest output reading. Rock the gang while making this adjustment. Recheck trimmer adjustment at 1400 K.C.



TO REMOVE THE CHASSIS FROM THE HOUSING

1. Place the radio in an upside down position on the service bench. (See Fig. 4)
2. Disconnect the speaker plug.
3. Remove the speaker mounting bracket (C) from the set housing and speaker support bracket (B). (4 screws)
4. Pull the push-buttons off.
5. Remove the chrome medallion plate (2 screws)
6. Remove the celluloid dial background (2 snap-in plugs)
7. Remove the top cover (A) (13 screws). Lift the dial light assembly off of the
8. front cover.
9. Remove the speaker support bracket (B). (2 screws)
10. Turn radio over in an upright position. Remove 11 screws from the back cover (D).
11. Lay set on side and remove the remaining 3 screws on the back cover - (14 screws).
12. Remove the remaining 8 screws from the housing and unsolder the various leads from the spark plate assembly. (See Fig. 5)

Note: When remounting, the long screw is to be used in position along side the antenna receptacle.

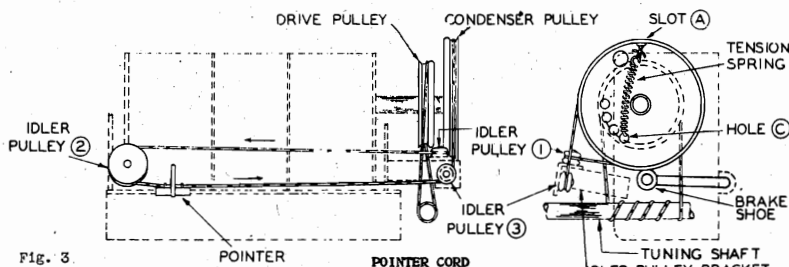


Fig. 3

1. Remove the chassis from the housing, and place on service bench.
2. Remove broken string.
3. Set condenser gang to fully closed position.
4. Cut a length of 30 lb. silk fish cord 27 inches long.

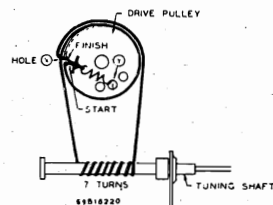
5. Thread one end of cord through slot "A" in condenser pulley and with an ordinary paper clip fasten it to the idler pulley bracket to hold in place. (See Fig. 3)
6. In a clock-wise direction run cord around condenser pulley, under brake shoe and over to idler pulley No.1 and around it in a clockwise direction.
7. Route string across chassis to idler

pulley No. 2 and around it in a counter-clockwise direction.

8. Route cord back across chassis and up under idler pulley No. 3.
9. Route cord up and around condenser pulley 1/4 turn to slot "A".
10. Remove the paper clip from end of cord and knot the two ends of cord together inside of drive pulley. Fasten one end of the tension spring (41A 11091) to cord and the other end to hole "C" in the condenser pulley.
11. Cut off surplus cord.
12. To set pointer to correct frequency, tune in a station of known frequency and adjust pointer on string.

TUNING CORD

1. Remove the chassis from the housing, and place on service bench.
2. Remove the broken string.
3. Turn the condenser gang to fully meshed position.
4. Cut a length of 30 lb. silk fish cord 25 inches long.
5. Thread one end of cord thru hole (X) in drive pulley and with an ordinary paper clip fasten to tuning control bracket so that cord will stay in place.
6. In a clock-wise direction, wind cord one half turn around drive pulley and down to tuning shaft. (See Fig. 2)
7. Route cord 7 turns around tuning shaft as shown in Fig. 2 and up to drive pulley.
8. Continue in a clock-wise direction, one full turn to hole (X).
9. Knot the two ends of cord together inside of drive pulley and fasten one end of spring (41A14759) to cord and the other end to hole (Y) in drive pulley.
10. Cut off surplus cord.



(Fig. 2)

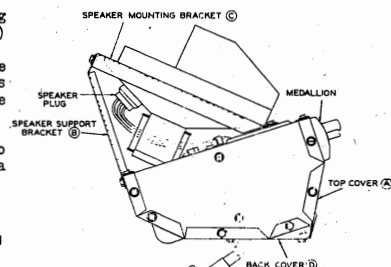


Fig. 4

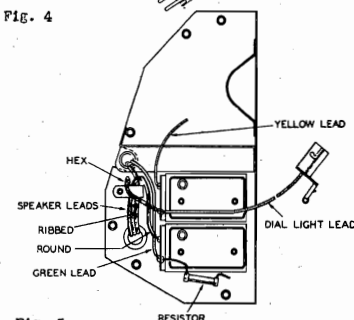
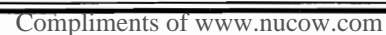


Fig. 5

MODEL 26-C
MODEL 26-C7
Chevrolet
Schematics



MODEL 26-C

MODEL 26-C7

Alignment, Trimmers

Voltage, Socket, Gain

Sensitivity, Drive Cord Data

GALVIN MFG. CORP.

MODELS 28-0,30-P

Dial Cord Data, Notes

TO REMOVE CHASSIS FROM HOUSING

1. Lay the radio face down on the service bench and remove the back cover by removing the two thumb screws.
2. Remove the rattle clip from the housing which is bonded to the push button assembly, and pull the speaker pin terminals from their receptacles. Also remove the dial light from its mounting bracket.
3. Remove the elimnode assembly (2 screws).
4. Remove the screw along side of the antenna receptacle.
5. Turn the radio over on its back.
6. Pull the push buttons out.
7. Remove the four housing screws located near the medallion plate, but do not remove the four screws that hold the medallion plate to the housing.
8. Remove the 3 screws from each side of the housing (12 screws).
9. Remove the volume control bushing.
10. Turn the set over on its face.
11. Pull the wrap around housing off from the back.
12. Lift the front cover off.

CAUTION: When the front plate is reassembled to the chassis, make sure the tuning shaft does not bind in its bushing, thereby causing the push buttons to work hard.

NOTE: Some screws are longer than others and they must be put back in original positions so that no short circuits will occur.

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Turn the volume control to maximum and leave it there throughout the

alignment, reducing the signal generator output, if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid of the oscillator tube and to chassis ground using a .1 Mfd. condenser in series with lead. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.
2. Set the signal generator at 455 K.C. and carefully adjust the trimmer in the diode coil can to the point showing the highest reading on the

output meter. (Advance the signal generator attenuator, if necessary, to pick up signal.)

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.

4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.

2. Set the signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.

3. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C.

Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.

4. Set the signal generator at 600 K.C. and turn the condenser gang until the dial pointer reads 600 K.C. Adjust the oscillator padder to point giving highest output reading.

5. Adjust the antenna padder located in the copper antenna coil can to the point giving the highest output reading.

NOTE: Step No. 4 is for Model 26-C-7 only. There is no 600 K.C. oscillator padder in the 26-C-2.

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the Signal Generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500 M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring overall sensitivity at the antenna terminal, use a special dummy, part No. 1X18018, in place of the .1 MF. It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same type, due to difference of tube characteristics, etc.

| 26-C Average Microvolt Input | 26C-7 Average Microvolt Input | GENERATOR SET AT | GENERATOR FEEDER CONNECTED TO | DUMMY ANTENNA CAPACITY | LEAK RESISTANCE | OUTPUT METER READINGS |
|---------------------------------------|--|---------------------|-------------------------------------|------------------------------|--------------------|-----------------------------|
| 8200 | 7000 | 455 K.C. | I.F. Grid | .1 | .5 Meg | 1.76 |
| 145 | 190 | 455 K.C. | MOD. Grid | .1 | .5 Meg | 1.76 |
| 160 | 215 | 600 K.C. | MOD. Grid | .1 | .5 Meg | 1.76 |
| 42 | 35 | 600 K.C. | R.F. Grid | .1 | .5 Meg | 1.76 |
| 5 | 3 | 600 K.C. | Ant. Lead | *** | None | 1.76 |

* For one watt output.

** Meter connected across voice coil.

1.76 volts equals 1 watt output for 3 ohm voice coil.

*** Use special dummy part No. 1X18018 or M484B Booster Coil No. 17908 in series with a 25 MMF condenser.

NOTE: If set is not used with a Motorola Booster antenna, substitute a 40 MMF condenser for the Special Dummy.

TUNING CORD

1. Remove the chassis from the housing, and place on service bench.
2. Remove the broken string.
3. Turn the condenser gang to fully meshed position.
4. Cut a length of 30 lb. silk fish cord 27 inches long.
5. Thread one end of cord thru Slot B in drive pulley and with an ordinary paper clip fasten to tuning control bracket so that cord will stay in place.
6. In a clock-wise direction, wind cord one full turn around drive pulley and up to tuning shaft. (See Fig. 2.)
7. Route cord 7 turns around tuning shaft as shown in Fig. 3 and down to drive pulley.
8. Continue in a clock-wise direction, three quarter turns to slot "B".
9. Knot the two ends of cord together inside of drive pulley and fasten one end of spring to cord and the other end to hole (c) in condenser pulley.
10. Cut off surplus cord.

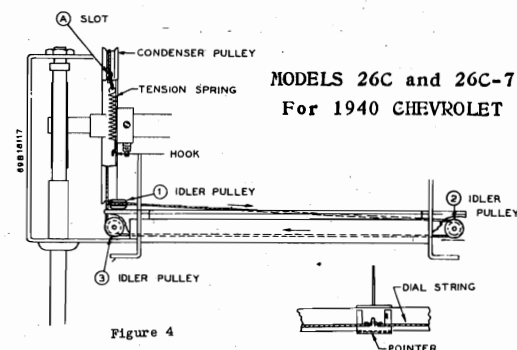
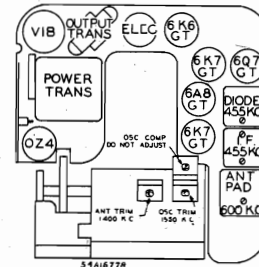
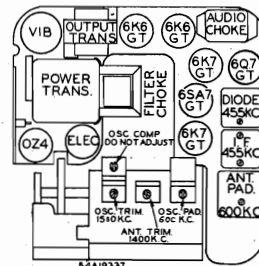


Figure 4

MODELS 26C and 26C-7
For 1940 CHEVROLET

MODEL 26-C

Figure 1



MODEL 26-C7

Figure 2

PONTON CORD

1. Remove the chassis from housing and place on service bench.
2. Remove broken string.
3. Set condenser gang to fully open position.
4. Cut a length of 30 lb. silk fish cord 29 inches long.
5. Thread one end of cord thru slot A in condenser pulley and with an ordinary paper clip fasten it to the tuning shaft bracket to hold in place. (See Fig. 4.)
6. In a clock-wise direction run cord around condenser pulley, under brake shoe and over to idler pulley No. 3 and around it in counter-clockwise direction.
7. Route string across chassis to idler pulley No. 2 and around it in a counter-clockwise direction.
8. Route cord back across chassis and down over idler pulley No. 1.
9. Route cord down and around condenser pulley 1/2 turn to slot "A".
10. Remove the paper clip from end of cord and knot the two ends of cord together inside of drive pulley and fasten one end of spring to cord and the other end to hook in condenser pulley.
11. Cut off surplus cord.
12. To set pointer to correct frequency, tune in a station of known frequency and adjust pointer on string.

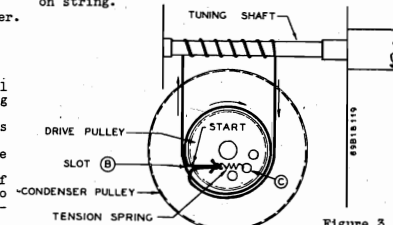


Figure 3

U.S. CORP.

| 26C | | | VOLTAGE CHART | | | 26C-7 | | |
|---|-------|--------|---------------|---------------------------------|--------|---------|--|--|
| TUBE POSITION | PLATE | SCREEN | CATHODE | PLATE | SCREEN | CATHODE | | |
| R.F. | 115 | 95 | 0 | 200 | 80 | 2.75 | | |
| Osc. Mod. | 180 | 95 | 0 | 200 | 80 | 0 | | |
| I.F. | 180 | 95 | 0 | 200 | 80 | 2.75 | | |
| Det. AVC A.F. | 60 | - | 2.3 | 112 | - | 0 | | |
| Output | 230 | 180 | .6 | 210 | 200 | 13.5 | | |
| Output | - | - | - | 210 | 200 | 13.5 | | |
| Rect. | A.C. | - | 235 | A.C. | - | 210 | | |
| Current 6 amps at 6.3 volts. | | | | Current 7 amps. at 6.3 volts. | | | | |
| Maximum power output 3.5 watts. | | | | Maximum power output 5.5 watts. | | | | |
| All voltages measured from socket terminal to chassis ground using 1000 Ohms per volt meter. | | | | | | | | |

Motorola

MODEL 27-D

MODEL 27-D

Alignment, Trimmers
Voltage, Socket, Gain
Sensitivity, Dial Drive

GALVIN MFG. CORP.

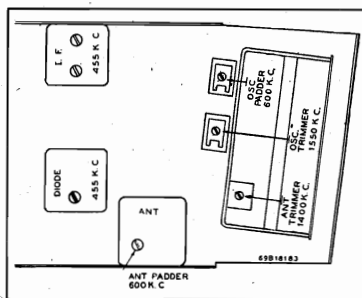
ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench.

Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary. Fig. 1 shows trimmer locations.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid (terminal No. 8) of the 6SA7GT oscillator-modulator tube thru a .1 MF condenser and to chassis ground. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.
2. Set the signal generator at 455 K.C. and carefully adjust the trimmer in the diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator, if necessary, to pick up signal.)



(FIG. 1)

REMOVING CHASSIS FROM HOUSING

1. Lay the radio on the service bench on its right side.
2. Remove the left hand side of the housing by taking off the thumb nut.
3. Leave the radio in this position.
4. Remove the seven screws on the right hand side of the housing, including the two which hold the "A" lead clips.
5. Now remove the six screws from the other side.
6. Turn the radio over so that it is in an upright position.
7. Remove speaker cable and grommet from slot in housing.
8. Remove right hand side of housing, after removing the hex nut. Do not remove the two screws in the right hand side of the control head.
9. Now pull chassis out of housing, guiding "A" lead out carefully.
10. When placing the chassis back in the housing, the long self-tapping screw is to be used in the position along side of the antenna receptacle.
11. Be sure "A" battery wire is routed as it was originally and held securely under the cable clips.

SENSITIVITY AND STAGE GAIN MEASUREMENT

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a special dummy part #1X18018 in place of the .1 MF.*** It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

| AVERAGE MICROVOLT INPUT | GENERATOR SET AT | GENERATOR FEEDER CONNECTED TO | DUMMY ANTENNA CAPACITY | LEAK RESISTANCE | OUTPUT METER READING* |
|-------------------------|------------------|-------------------------------|------------------------|-----------------|-----------------------|
| 13000 | 455 K.C. | I.F. Grid | .1 MF | .5 Meg | 1.76 Volts |
| 350 | 455 K.C. | Mod. Grid | .1 MF | .5 Meg | 1.76 Volts |
| 400 | 600 K.C. | Mod. Grid | .1 MF | .5 Meg | 1.76 Volts |
| 25 | 600 K.C. | R.F. Grid | .1 MF | .5 Meg | 1.76 Volts |
| 3 | 600 K.C. | Ant. Lead | *** | None | 1.76 Volts |

*For one watt output

**Meter connected across voice coil

1.76 Volts equals 1 watt output for 3 ohm voice coil

***Use special dummy part No. 1X18018, or M434B booster coil Part No. 17908 in series with 25 MMF cond. (See Fig. 2)

VOLTAGE CHART

| POSITION | PLATE | SCREEN | CATHODE |
|---------------|-------|--------|---------|
| R.F. | 180 | 70 | 2.3 |
| Osc. Mod. | 180 | 70 | 0 |
| I.F. | 180 | 70 | 2.3 |
| Det. AVC A.F. | 110 | 0 | 0 |
| Output | 220 | 180 | 12 |
| Output | 220 | 180 | 12 |
| Rect. | A.C. | 225 | |

All measurements from chassis ground to socket terminal using 1000 ohms per volt meter.

Current consumption—8 amps. Battery voltage—6.3.

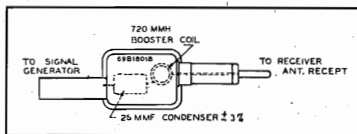
Maximum power output—5 watts.

3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.
4. Repeat the I.F. and diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

NOTE:—A special dummy antenna, Motorola part 1X18018 should be used in series with the lead from the signal generator to the antenna receptacle, if the receiver is to be operated on a Motorola Booster antenna. If the car antenna is not Booster equipped, use a 50 MMF condenser instead. See Fig. 2.

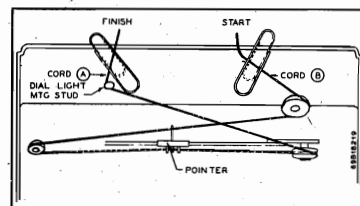
1. Change the signal generator connection to the antenna lead, using the special dummy.
2. Set the signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.
3. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.
4. Set the signal generator at 600 K.C. and turn the condenser gang until the dial pointer reads 600 K.C. Adjust the oscillator paddler to point giving highest output reading. Also adjust the antenna paddler located in the copper antenna coil can to the point giving the highest output reading. (DO NOT ROCK GANG FOR EITHER ADJUSTMENT).



(FIG. 2)

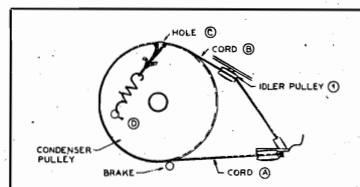
POINTER CORD

1. Remove push buttons and dial light assembly.
2. Cut broken dial cord and remove control head from chassis. (This requires removal of 2 self-tapping screws from right hand side of head and removal of "C" washer from volume control shaft.)
3. Cut 30 inch length of 30# test silk fish cord.
4. Lay control head on service bench and route cord around the three idler pulleys exactly as shown in Fig. 4.
5. Adjust cord so both ends are approximately equal length and clip to control head as shown in Fig. 4.
6. Set dial pointer at approximately 550 K.C. on dial scale and interlace cord in pointer clips.
7. Mount control head assembly back on chassis with 2 self tapping screws. Replace "C" washer on volume control shaft.



(FIG. 4)

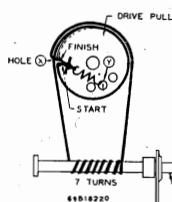
8. Set gang to fully meshed position. This will place hole in condenser pulley at the top.
9. Remove paper clip from cord "A" and fish end of cord under brake shoe and around condenser pulley 1/2 turn to hole "C". Thread end of cord thru hole (C) and clip to control head. (See Fig. 5)
10. Remove paper clip from cord "B" and route cord the short distance from idler pulley No. 1 to hole "C" in condenser pulley.
11. Tie both ends of cord together inside pulley, then tie in tension spring (41A11091). Hook other end of spring in hole (D). Cut off surplus cord.
12. Replace dial light.
13. Tune in station of known frequency and adjust dial pointer to correct dial reading.
14. Reassemble in housing.



(FIG. 5)

TUNING CORD

1. Remove the chassis from the housing, and place on service bench with the tubes up.
2. Remove the broken string.
3. Turn the condenser gang to fully meshed position.
4. Cut a length of 30# silk fish cord 25 inches long.
5. Thread one end of cord thru hole (x) in drive pulley and with an ordinary paper clip fasten to volume control bracket so that cord will stay in place.
6. In a counter-clockwise direction, wind cord one full turn around drive pulley and down to tuning shaft. (See Fig. 3).
7. Wind cord in clockwise direction 7 turns around tuning shaft and up to drive pulley.
8. Continue in a counter-clockwise direction, three quarter turns to hole (x).
9. Knot the two ends of cord together inside of drive pulley and fasten one end of spring (41A14759) to cord and the other end to hole (Y) in condenser pulley.
10. Cut off surplus cord.



(FIG. 3)

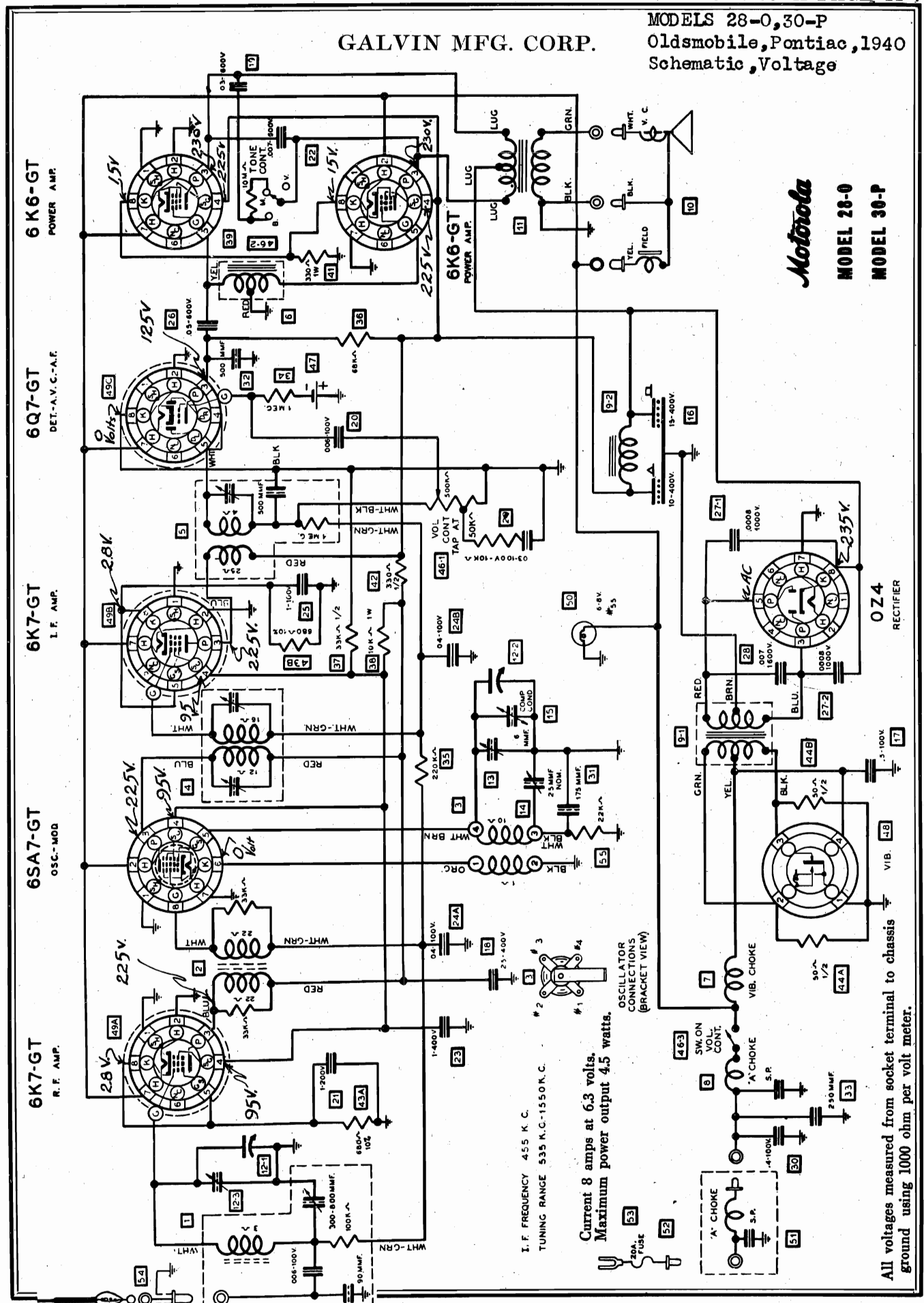
GALVIN MFG. CORP.

MODELS 28-0,30-P
Oldsmobile, Pontiac, 1940
Schematic, Voltage

Motorola

MODEL 28-0

MODEL 30-P



MODELS 28-0,30-P
Alignment, Trimmers
Sensitivity, Gain

GALVIN MFG. CORP.

MODEL 35-N
Alignment, Trimmers
Dial Cord Data

Model 35-N
SPECIFICALLY DESIGNED TO INSTALL IN 1940 NASH

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Turn the volume control to maximum and leave it there throughout the alignment, reducing the signal generator output, if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid (terminal No. 8) of the 6SA7GT oscillator-modulator tube and to chassis ground using a .1 Mfd. condenser in series with lead. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.
2. Set the signal generator at 455 K.C. and carefully adjust the two trimmers in the

R. F. ALIGNMENT

1. If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator connection to the antenna lead, using the special dummy.
2. Set the signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.
3. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.
4. Set the signal generator at 600 K.C. and turn the condenser gang until the dial pointer reads 600 K.C. Adjust the antenna trimmer to point giving highest output reading. Also adjust the antenna padder located in the copper antenna coil can to the point giving the highest output reading. (Do not rock gang for either adjustment.)

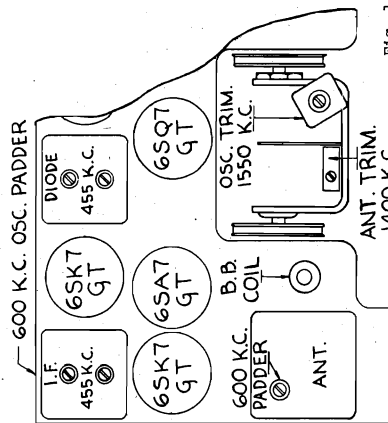


Fig. 1

DIAL CORD INSTRUCTIONS

1. Remove the chassis from the housing.
2. Lay down:
- (a) Dial scale (4 self-tapping screws)
- (b) Hook.
- (c) Knob.
- (d) Tension spring.
- (e) Speaker pin terminals.
3. Remove broken cord.
4. Cut a 28 inch length of silk fish cord and thread through hole "A", temporarily clipping the end to the push-button assembly.
5. Wind cord around condenser pulley and around condenser pulley and through slot in front of push-button assembly.
6. Attach other end of spring to hook and cut off surplus known frequency, and adjust pointer on string to correct known frequency.
7. Run cord around pulley 1, counter-clockwise and across chassis to idler pulley 2. See Fig. 2.
8. Run cord around idler pulley 2, in counter-clockwise direction.
9. Run cord across chassis to idler pulley 3.
10. Wind cord around condenser pulley in counter-clockwise direction and down to slot.
11. Knot the cord and attach to the tension spring inside of pulley and tie in tension spring.
12. Attach other end of spring to hook and cut off surplus known frequency, and adjust pointer on string to correct known frequency.
13. To set pointer to correct frequency, tune in a station of known frequency, and adjust pointer on string to correct known frequency.
14. Reassemble in housing.
15. Reassemble in housing.

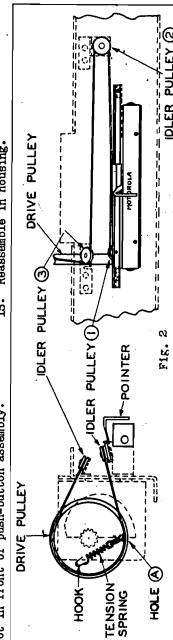


Fig. 2

MODEL 28-0 FOR 1940 OLDSMOBILE
MODEL 30-P FOR 1940 PONTIAC
ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Turn the volume control to maximum and leave it there throughout the alignment, reducing the signal generator output, if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid (terminal No. 8) of the 6SA7GT oscillator-modulator tube and to chassis ground using a .1 Mfd. condenser in series with lead. Turn the condenser gang completely out of mesh. Connect an output meter across the speaker voice coil.
2. Set the signal generator at 455 K.C. and carefully adjust the trimmer in the diode coil can to the point showing the highest output reading.
3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.
4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. If the radio is to be operated on a Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. See Fig. 2. Change the signal generator connection to the antenna lead, using the special dummy.
2. Set the signal generator at 1560 K.C. and with the condenser gang still completely out of mesh, adjust the oscillator trimmer to the point showing the highest output reading.
3. Set the signal generator at 1400 K.C. and turn the condenser gang to the signal at 1400 K.C. Adjust the antenna trimmer on the condenser gang to the point showing the highest output reading.
4. Set the signal generator at 600 K.C. and turn the condenser gang until the dial pointer reads 600 K.C. Adjust the antenna trimmer to point giving highest output reading. Also adjust the antenna padder located in the copper antenna coil can to the point giving the highest output reading. (Do not rock gang for either adjustment.)

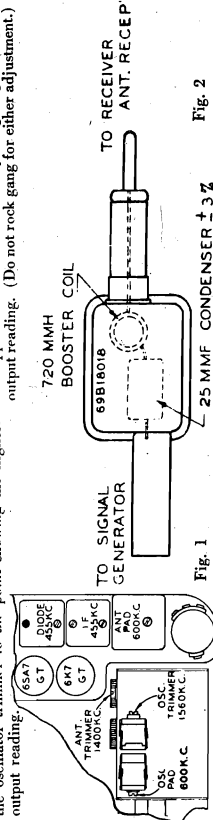


Fig. 1

Fig. 2

SENSITIVITY AND STAGE GAIN MEASUREMENTS

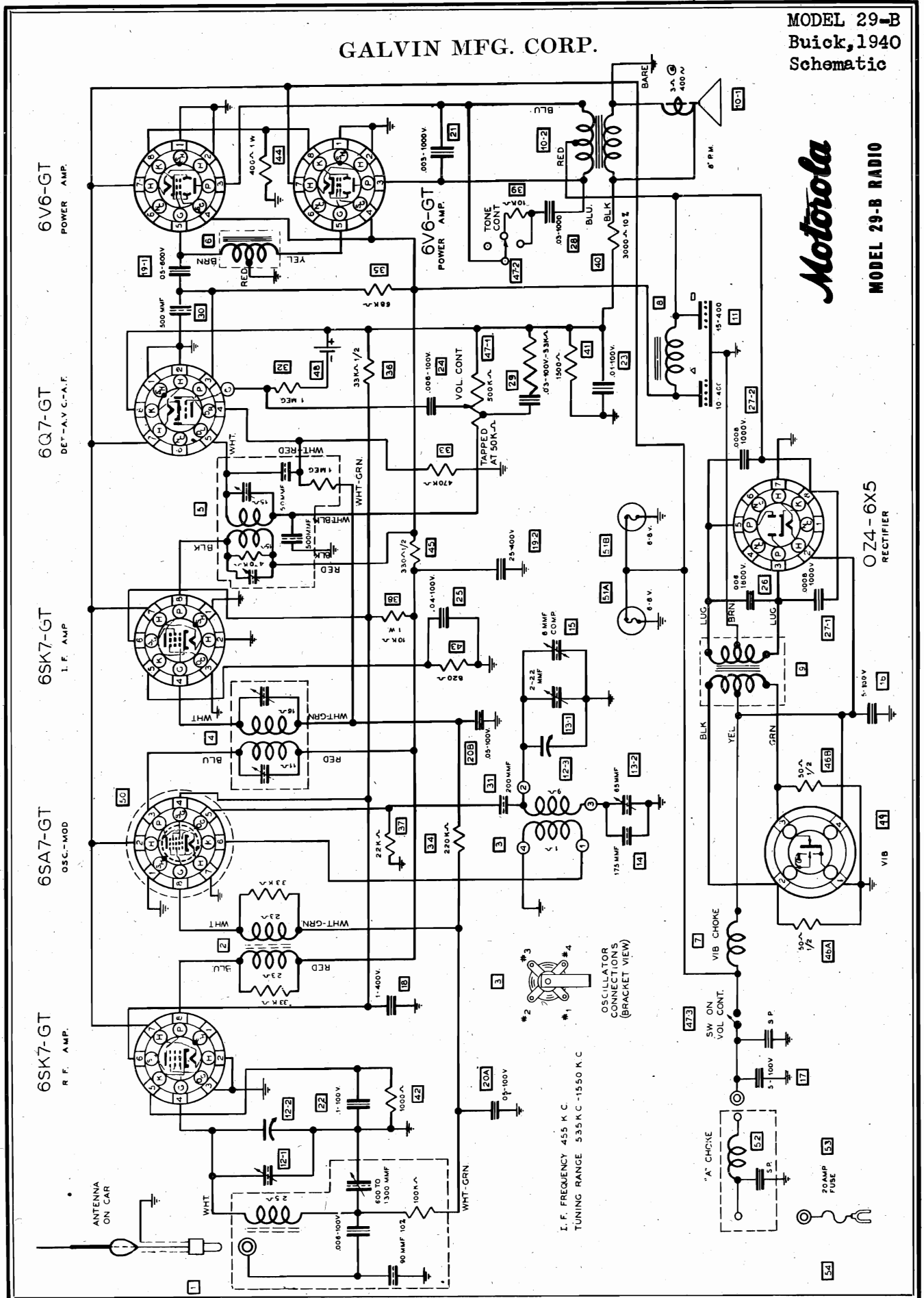
All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the Signal Generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

| AVERAGE MICROVOLT INPUT | GENERATOR SET AT | GENERATOR FEEDER CONNECTED TO | DUMMY ANTENNA CAPACITY | LEAK RESISTANCE | OUTPUT METER READINGS |
|-------------------------|------------------|-------------------------------|------------------------|-----------------|-----------------------|
| 7000 | 455 K.C. | I. F. Grid | .1 | .5 Meg | 1.76 |
| 190 | 455 K.C. | MOD. Grid | .1 | .5 Meg | 1.76 |
| 215 | 600 K.C. | MOD. Grid | .1 | .5 Meg | 1.76 |
| 35 | 600 K.C. | R. F. Grid | .1 | .5 Meg | 1.76 |
| 3 | 600 K.C. | Ant. Lead | *** | None | 1.76 |

* For one watt output.
** Meter indicates across voice coil.
*** Use special dummy part No. 1X18018 or M434B Booster Coil No. 17908 in series with a 25 MMF condenser.
NOTE: If set is not used with a Motorola Booster antenna, substitute a 50 MMF condenser for the Special Dummy.

TO REMOVE CHASSIS FROM HOUSING AND DIAL CORD INSTRUCTIONS SEE INDEX (MODEL 28-C).

Motorola
MODEL 29-B RADIO



MODEL 29-B **Alignment, Trimmers** **Sensitivity, Gain** **Drive Cord Data** **Voltage, Notes**

GALVIN MFG. CORP.

MODEL 29-B-6 **Alignment, Gain** **Sensitivity, Drive Cord**

1. Lay the radio face down on the service bench and lift the housing off.
2. When remounting, the long screw is to be used in position along side of antenna receptacle.
3. The eliminator assembly is to be mounted last.

POINTER CORD

1. Remove the chassis from housing.
2. Pull out the five push-buttons.
3. Remove the screws which hold the escutcheon and remove same from front cover.
4. Rotate broken cord.
5. Rotate condenser gang to fully meshed position.
6. Cut 28 inch length of 30 pound silk fish cord.
7. Thread one end of cord through slot (A). This is the slot nearest the front of chassis when condenser is fully meshed.
8. Run cord up and over rear idler pulley No. 1 in clockwise direction.
9. Thread the cord back across chassis to front idler pulley No. 2 in a clockwise direction.
10. Run cord under brake shoe and around condenser pulley to slot (A).
11. Thread through slot (A).
12. Knot both ends of cord securely inside the slot.
13. Tie in one end of tension spring (41A11091) and hook other end to hook in condenser pulley, through hooks in dial pointer.
14. To set pointer to correct frequency, tune in a station of known frequency and adjust position of pointer on string.
15. Remount escutcheon plate.

Model 29-B

TO INSTALL IN **1940 BUICK**

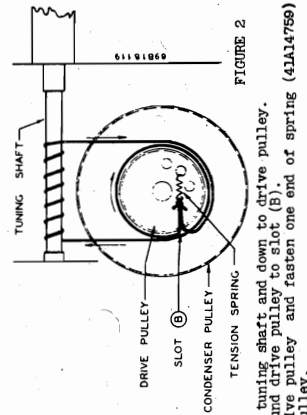
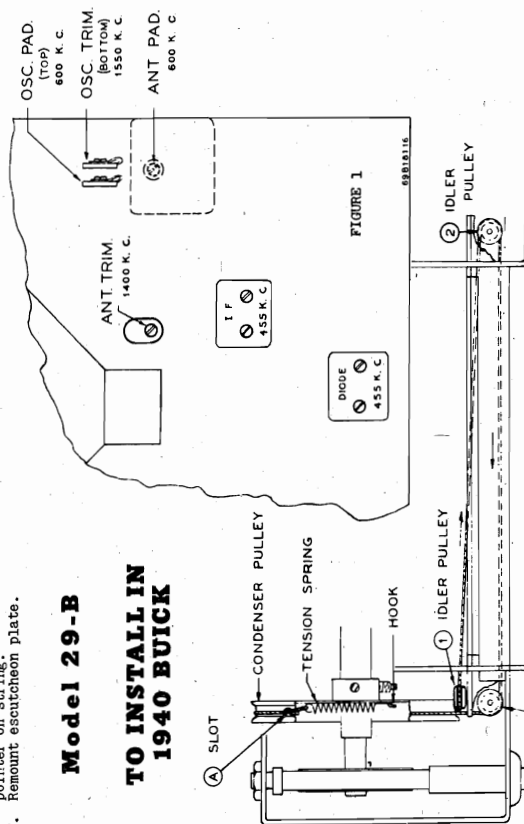


FIGURE 1

FIGURE 2

1. Remove the chassis from the housing, and place condenser pulley with the tubes up.
2. Remove the broken string.
3. Turn the condenser gang to fully meshed position.
4. Cut a length of 30 lb silk fish cord 28 inches long.
5. Thread one end of cord through slot in drive pulley and around condenser pulley and up to tuning shaft bracket so that cord will stay in place.
6. In a counter clockwise direction wind cord one full turn around drive pulley and up to tuning shaft.
7. Wind cord in clockwise direction 7 turns around tuning shaft and down to drive pulley.
8. Knot the two ends of cord together inside of drive pulley and fasten one end of spring (41A14759) to cord and the other end to hole in condenser pulley.

FIGURE 3

ALIGNMENT PROCEDURE

Remove the chassis from its housing and place it on the service bench. Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

I. F. ALIGNMENT

1. Connect the signal generator to the control grid (terminal No. 8) of the 6SA7GT oscillator-modulator tube and to chassis ground. Turn the condenser gang completely out of mesh. Connect and output meter across the speaker voice coil. Use 1 IF condenser in signal generator lead.
2. Set the signal generator at 455 K.C. and carefully adjust the two trimmers in the Diode coil can to the point showing the highest reading on the output meter. (Advance the signal generator attenuator, if necessary, to pick up signal.)
3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.
4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R. F. ALIGNMENT

1. Change the signal generator connection to the antenna lead, using a 50 MUF condenser in series with it.
2. Set the signal generator at 1550 K.C. and with the condenser gang still completely out of mesh, 14. adjust the trimmer in the antenna lead to the point showing the highest output reading.
3. Set the signal generator at 1400 K.C. and turn the condenser gang to the point showing the highest output reading.
4. Adjust the antenna trimmer on the condenser gang (through hole in chassis base) to the point showing the highest output reading.
5. Set the signal generator at 600 K.C. and turn the condenser gang until the dial pointer reads 17.
6. 600 K.C. Adjust the oscillator padder to point giving highest output reading. Also adjust the antenna padder located in the copper antenna coil can to the point giving the highest output reading. (DO NOT ROCK GANG FOR EITHER ADJUSTMENT)

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500K ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a 50 MUF condenser in place of .1 MF.

The figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

| AVERAGE MULTIMETER INPUT * | GENERATOR SET AT | GENERATOR FREQUENCY CONNECTED TO | DUMMY ANTENNA CAPACITY | LEAK RESISTANCE | OUTPUT READING ** |
|----------------------------|------------------|--|------------------------|-----------------|-------------------|
| 10,000 12,500 | 455 K.C. | 6SK7GT Grid (IF) I.F. Grid 1 MF | Mod. Grid 1 MF | .5 Meg | 1.76 Volts |
| 200 | 455 K.C. | 6SA7GT I.F. Grid 1 MF | Mod. Grid 1 MF | .5 Meg | 1.76 Volts |
| 100 220 | 600 K.C. | 6SK7GT I.F. Grid 1 MF | Mod. Grid 1 MF | .5 Meg | 1.76 Volts |
| 10 10 | 600 K.C. | 6SK7GT I.F. Grid 1 MF | Mod. Grid 1 MF | .5 Meg | 1.76 Volts |
| 3 | 600 K.C. | Antenna Lead Ant. Lead 50 MUF 40 MUF*** None | | | |

* For 1 Watt output.
 ** Output meter connected across voice coil.
 *** NOTE: If a Motorola Booster antenna is used 1.76 volts equals 1 Watt output for 3 ohm voice coil.
 VOLTAGE CHART No. 1718018.

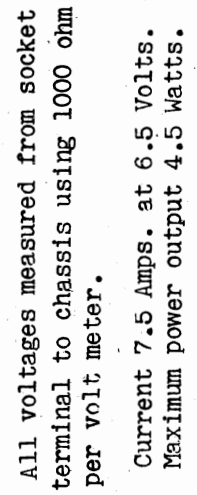
| TUBE | POSITION | PLATE | SCREEN | CATHODE |
|--------------|-----------|-------|--------|---------|
| * 6SK7GT | R.F. | 250 | 100 | 4 |
| * 6SA7GT | Osc. Mod. | 250 | 100 | 0 |
| * 6SK7GT | I.F. | 250 | 100 | 4 |
| * 6SK7GT | Det.-AVC | 125 | - | 4 |
| * 6BG7 | Power | 235 | 230 | 16 |
| * 6BG7 | Rect. | 235 | 230 | 16 |
| * 024 or 6X5 | | AC | | 240 |

* 7A7 Local tube was used in some chassis.

TO REMOVE CHASSIS FROM HOUSING

Current 7.1 Amp. at 6.1 Volts. Maximum power output 10 Watts.

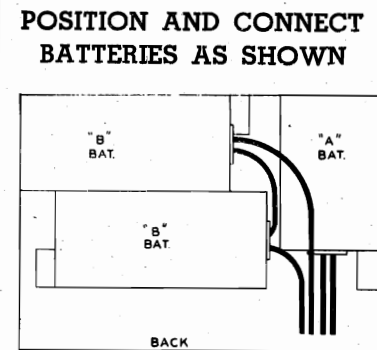
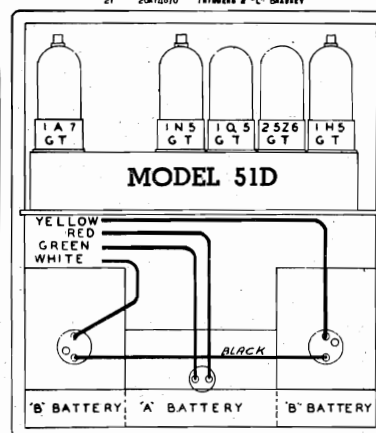
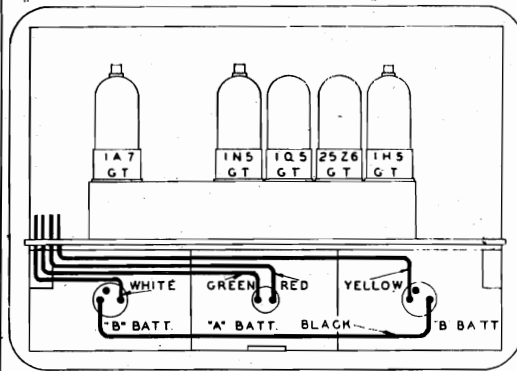
1. Remove the eliminator assembly on the right side of chassis. (2 screws)
2. Remove the bottom cover (4 thumb screws) Then pull back.
3. Remove the 9 screws around the top and 2 sides of the front.
4. Remove the 3 remaining screws on the right side of the housing.
5. Remove the 3 remaining screws on the left side of the housing, including the one adjacent to the antenna receptacle.
6. Remove the 3 screws on the back of the housing.



FOR ALIGNMENT PROCEDURE, DIAL CORD INSTRUCTIONS, SENSITIVITY AND GAIN MEASUREMENTS, SEE INDEX.



| | | |
|-----|----------|-------------------------------------|
| 27 | 196-1389 | VER. CARR. & STEVEN (1/2) WEG |
| 28 | 660479 | CARRON, CARRON (3/3) WEG-3/20) N.H. |
| 29 | 660480 | CARRON, CARRON (3/3) WEG-3/20) N.H. |
| 30 | 660481 | CARRON, CARRON (3/2) WEG-3/20) N.H. |
| 31 | 660482 | CARRON, CARRON (1) WEG-3/20) N.H. |
| 32 | 660483 | CARRON, CARRON (1) WEG-3/20) N.H. |
| 33 | 660484 | CARRON, CARRON (200,000-3/20) N.H. |
| 34 | 660485 | CARRON, CARRON (1/2) WEG-3/20) N.H. |
| 35 | 660486 | CARRON, CARRON (10,000-3/20) N.H. |
| 36 | 660487 | CARRON, CARRON (10,000-3/20) N.H. |
| 37 | 660488 | CARRON, CARRON (100-3/20) N.H. |
| 38 | 660489 | CARRON, CARRON (100-3/20) N.H. |
| 39 | 660490 | CARRON, CARRON (100-3/20) N.H. |
| 40 | 660491 | CARRON, CARRON (100-3/20) N.H. |
| 41 | 660492 | CARRON, CARRON (100-3/20) N.H. |
| 42 | 660493 | CARRON, CARRON (100-3/20) N.H. |
| 43 | 660494 | CARRON, CARRON (100-3/20) N.H. |
| 44 | 660495 | CARRON, CARRON (100-3/20) N.H. |
| 45 | 660496 | CARRON, CARRON (100-3/20) N.H. |
| 46 | 660497 | CARRON, CARRON (100-3/20) N.H. |
| 47 | 660498 | CARRON, CARRON (100-3/20) N.H. |
| 48 | 660499 | CARRON, CARRON (100-3/20) N.H. |
| 49 | 660500 | CARRON, CARRON (100-3/20) N.H. |
| 50 | 660501 | CARRON, CARRON (100-3/20) N.H. |
| 51 | 660502 | CARRON, CARRON (100-3/20) N.H. |
| 52 | 660503 | CARRON, CARRON (100-3/20) N.H. |
| 53 | 660504 | CARRON, CARRON (100-3/20) N.H. |
| 54 | 660505 | CARRON, CARRON (100-3/20) N.H. |
| 55 | 660506 | CARRON, CARRON (100-3/20) N.H. |
| 56 | 660507 | CARRON, CARRON (100-3/20) N.H. |
| 57 | 660508 | CARRON, CARRON (100-3/20) N.H. |
| 58 | 660509 | CARRON, CARRON (100-3/20) N.H. |
| 59 | 660510 | CARRON, CARRON (100-3/20) N.H. |
| 60 | 660511 | CARRON, CARRON (100-3/20) N.H. |
| 61 | 660512 | CARRON, CARRON (100-3/20) N.H. |
| 62 | 660513 | CARRON, CARRON (100-3/20) N.H. |
| 63 | 660514 | CARRON, CARRON (100-3/20) N.H. |
| 64 | 660515 | CARRON, CARRON (100-3/20) N.H. |
| 65 | 660516 | CARRON, CARRON (100-3/20) N.H. |
| 66 | 660517 | CARRON, CARRON (100-3/20) N.H. |
| 67 | 660518 | CARRON, CARRON (100-3/20) N.H. |
| 68 | 660519 | CARRON, CARRON (100-3/20) N.H. |
| 69 | 660520 | CARRON, CARRON (100-3/20) N.H. |
| 70 | 660521 | CARRON, CARRON (100-3/20) N.H. |
| 71 | 660522 | CARRON, CARRON (100-3/20) N.H. |
| 72 | 660523 | CARRON, CARRON (100-3/20) N.H. |
| 73 | 660524 | CARRON, CARRON (100-3/20) N.H. |
| 74 | 660525 | CARRON, CARRON (100-3/20) N.H. |
| 75 | 660526 | CARRON, CARRON (100-3/20) N.H. |
| 76 | 660527 | CARRON, CARRON (100-3/20) N.H. |
| 77 | 660528 | CARRON, CARRON (100-3/20) N.H. |
| 78 | 660529 | CARRON, CARRON (100-3/20) N.H. |
| 79 | 660530 | CARRON, CARRON (100-3/20) N.H. |
| 80 | 660531 | CARRON, CARRON (100-3/20) N.H. |
| 81 | 660532 | CARRON, CARRON (100-3/20) N.H. |
| 82 | 660533 | CARRON, CARRON (100-3/20) N.H. |
| 83 | 660534 | CARRON, CARRON (100-3/20) N.H. |
| 84 | 660535 | CARRON, CARRON (100-3/20) N.H. |
| 85 | 660536 | CARRON, CARRON (100-3/20) N.H. |
| 86 | 660537 | CARRON, CARRON (100-3/20) N.H. |
| 87 | 660538 | CARRON, CARRON (100-3/20) N.H. |
| 88 | 660539 | CARRON, CARRON (100-3/20) N.H. |
| 89 | 660540 | CARRON, CARRON (100-3/20) N.H. |
| 90 | 660541 | CARRON, CARRON (100-3/20) N.H. |
| 91 | 660542 | CARRON, CARRON (100-3/20) N.H. |
| 92 | 660543 | CARRON, CARRON (100-3/20) N.H. |
| 93 | 660544 | CARRON, CARRON (100-3/20) N.H. |
| 94 | 660545 | CARRON, CARRON (100-3/20) N.H. |
| 95 | 660546 | CARRON, CARRON (100-3/20) N.H. |
| 96 | 660547 | CARRON, CARRON (100-3/20) N.H. |
| 97 | 660548 | CARRON, CARRON (100-3/20) N.H. |
| 98 | 660549 | CARRON, CARRON (100-3/20) N.H. |
| 99 | 660550 | CARRON, CARRON (100-3/20) N.H. |
| 100 | 660551 | CARRON, CARRON (100-3/20) N.H. |



MODEL 41D

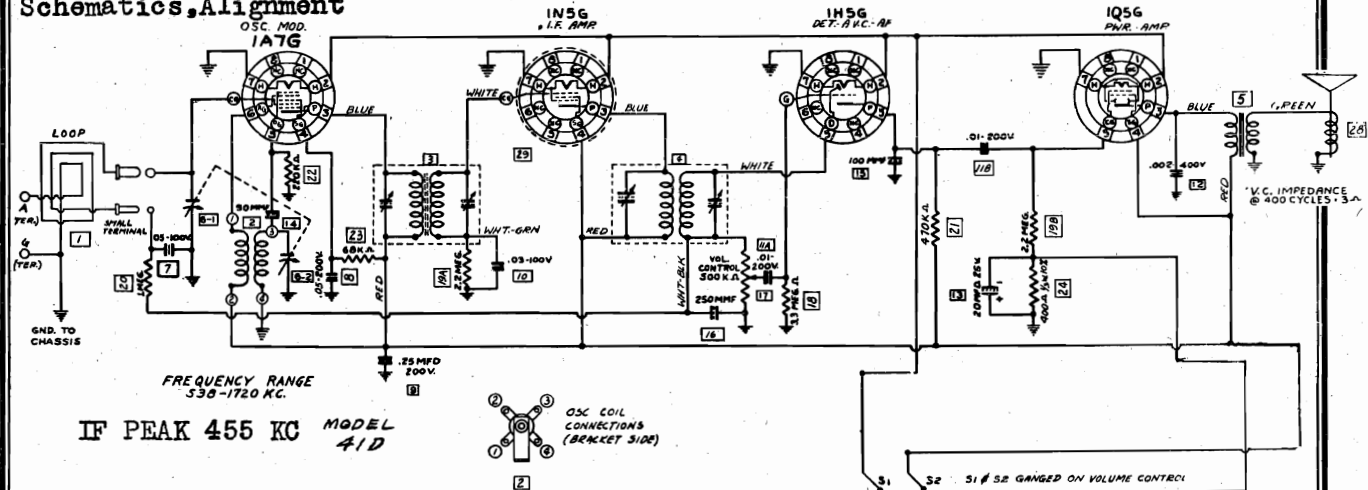
MODELS 41B, 41F ALIGNMENT 1. Conn. sig. gen. to 1A7G thru .05 MF cond. and to chassis. Conn. o.p. meter across spkr. voice coil. Turn cond. gang out of mesh. Set band swi. in B.C. pos. UP pos. is for S.W. DOWN pos. is for B.C. 2. Sig. gen. at 455 KC, adj. 4 I.F. trims. top of I.F. coil cans for max. read. 3. Band swi. in S.W. pos. Sig. gen. to ant. and tnd terms, using 400 ohm carbon res. in ant. lead. 4. Sig. gen. at 18.0 MC, cond. gang out of mesh adj. the S.W. OSC. trim. until the 18.0 MC sig. is heard. 5. Sig. gen. at 16.0 MC, turn cond. gang to sig. at 16.0 MC. Adj. S.W. ANT. for max. read. 6. Band swi. in B.C. pos - replace 400 ohm res. in sig. gen. lead with .0002 MF cond. 7. Sig. gen. at 1720 KC turn cond. gang to out of mesh pos. Adj. B.C. OSC. trim until 1720 KC sig. is heard. 8. Sig. gen. at 600 KC - rock pointer at 600 KC pos. on dial scale, while adj. B.C. padder for highest o.p. read. If noise at 600 KC padder can be adj. to max. noise without rocking gang and without use of sig. gen.

MODELS 41D1, 41D2

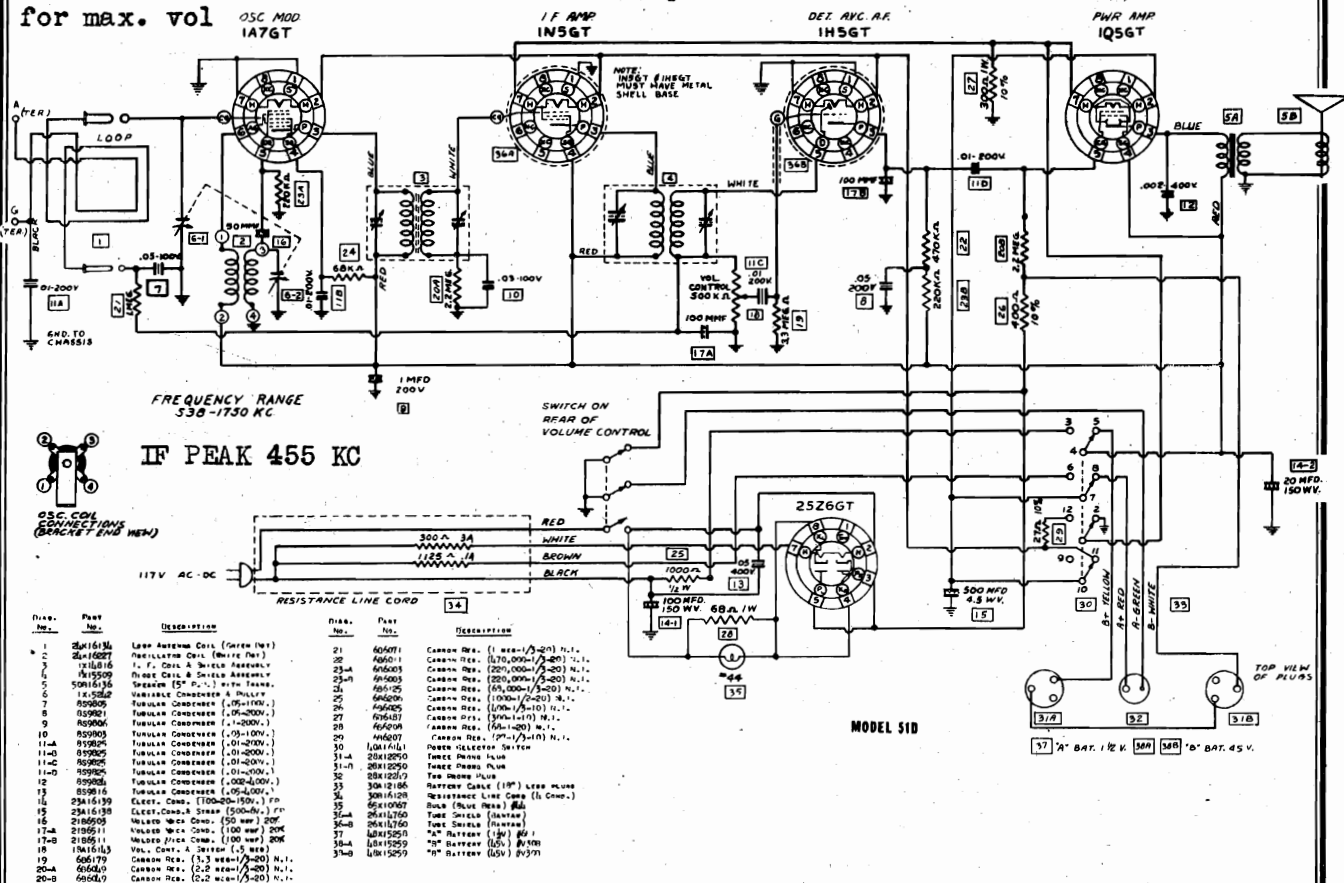
MODELS 51D1, 51D2

Schematics, Alignment

GALVIN MFG. CORP.

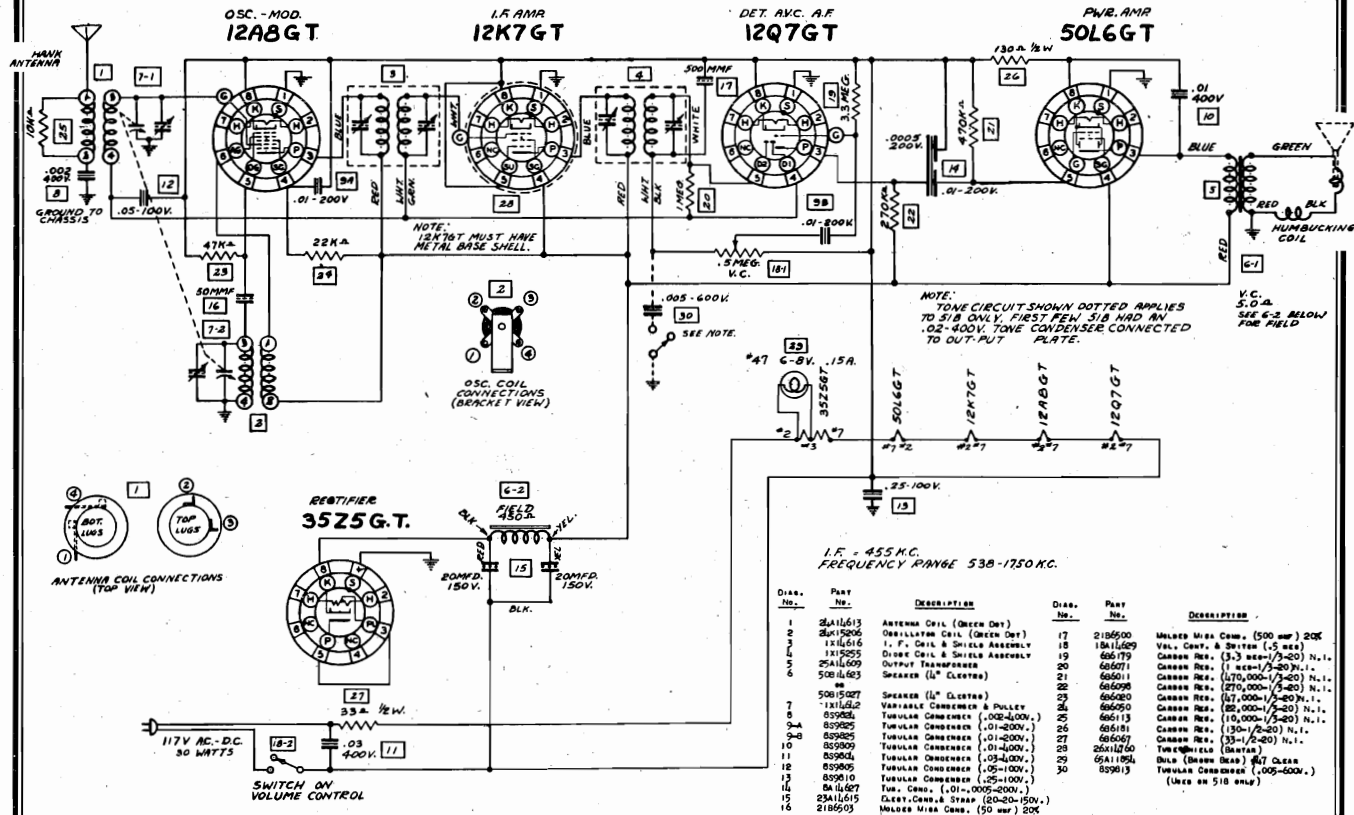


ALIGN. PROCEDURE 1. Conn. sig. gen. to grid of first det. tube thru a .05 MF cond. and to chass. Do not remove grid cap. Conn. o.p. metr across spkr. voice coi. Turn cond. gang completely out of mesh. Loop must be conn. to chass. at all times. 2. Set sig. gen. at 455 KC; carefully adj. the two IF trim. and the two DIODE trim. to point show. highest read. on o.p. meter. 3. Turn sig. gen. to 1720 KC and with cond. gang completely out of mesh adj. OSC. trim until 1720 KC sig. is heard. 4. Place chass. in cab., conn. loop terms. and fasten back on cab. 5. Remove plug butt. from side of cab. to expose ANT. trim.; 6. Tune in a weak station near 1400 or 1500 KC and adj. ANT. trim. thru hole in cab. for max. vol

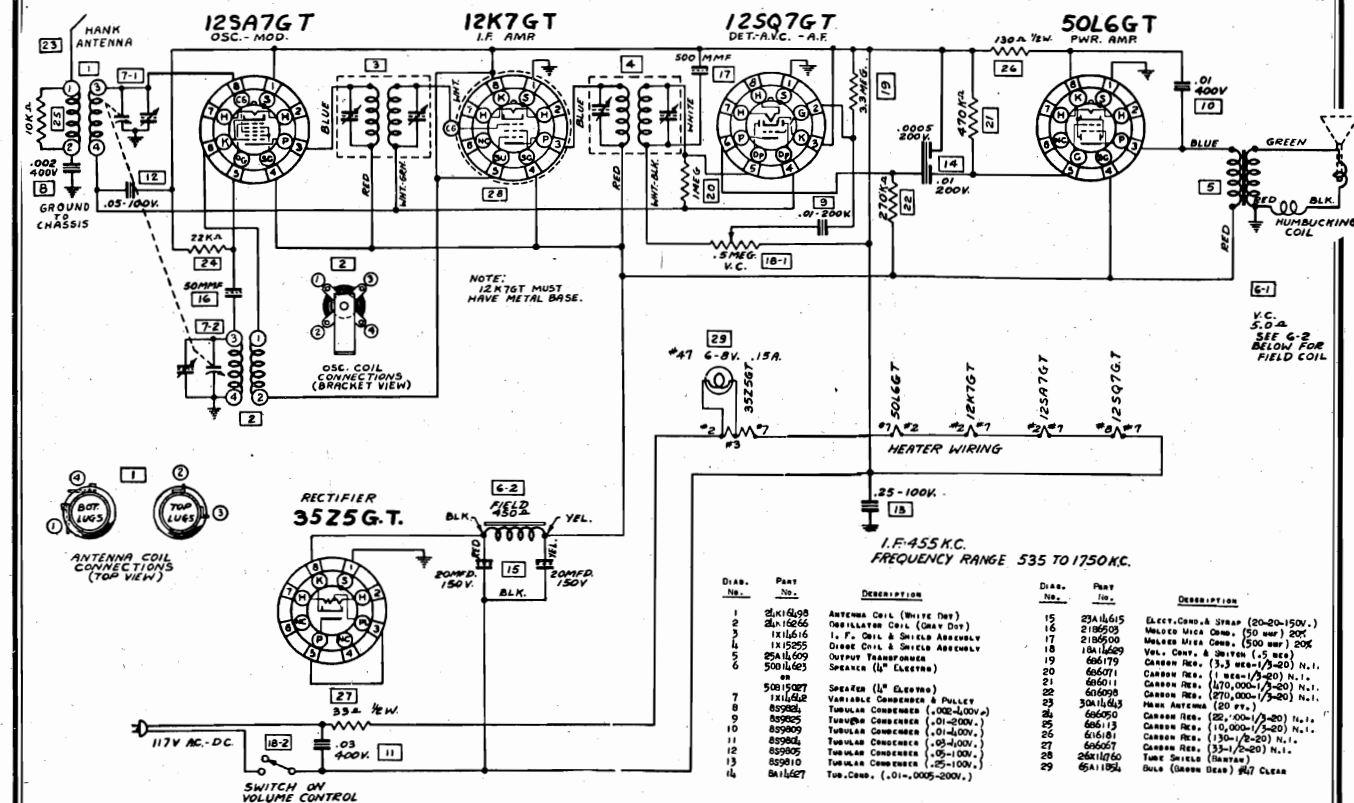


GALVIN MFG. CORP.

MODELS 51A, 53A, 54A
Chassis 5A, 5AA
Schematics



5A Chassis (Models 51A, 53A and 54A)



5AA Chassis (Models 51A, 53A and 54A)

CHASSIS 5A, 5AA
CHASSIS 5C
CHASSIS 6A, 6B
CHASSIS 6E

GALVIN MFG. CORP.

Sensitivity, Gain
Voltage, Dial Drive Data
Trimmers

TO RESTRING DIAL DRIVE CORD

1. Remove dial crystal, pointer, dial scale and plate.
2. Cut a length of silk fish cord approximately 24 inches long.
3. Thread one end of cord through hole "A" in condenser pulley and clip it to the chassis with a paper clip.
4. Continue other end of cord over idler pulley "B" and down to tuning shaft. Make two turns counter-clockwise around tuning shaft. (See Fig. 3.)
5. Continue cord up to pointer pulley making one turn around it counter-clockwise.
6. Take cord over idler pulley "C" and around condenser pulley to the hole "A".
7. Tie both ends of cord together inside hole "A".
8. Tie in one end of tension spring and hook the free end of the spring in hole "D". Cut off surplus cord.

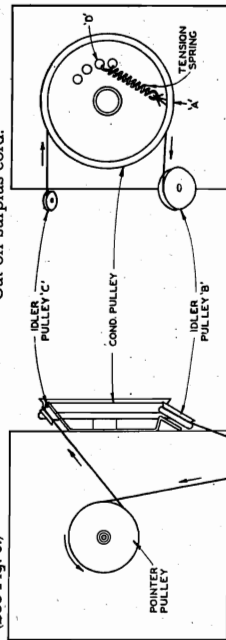


FIG. 3

TO RESTRING DIAL DRIVE CORD

1. Remove dial crystal, pointer, dial scale, and plate.
2. Cut a length of silk fish cord approximately 12 inches long.
3. Make two turns with cord around tuning shaft. (See Fig. 2.)
4. Continue both ends of cord around condenser pulley in opposite directions until they meet at the hole (A) in the rim of the pulley.
5. Thread both ends through the hole and tie them securely together inside the hole.
6. Tie in the dial cord tension spring and hook the free end of the spring in the hole (B). Cut off surplus cord.

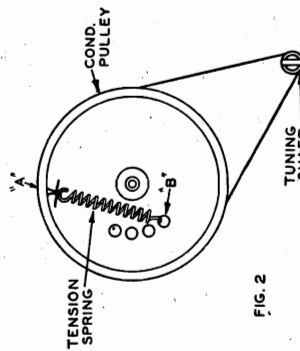


FIG. 2

| TUBE | POSITION | PLATE | SCREEN | CATHODE | OSC. PLATE |
|--------|--------------|-------|--------|---------|------------|
| 12ABGT | Osc.-Mod. | 95 | 85 | 0 | 90 |
| 12B7GT | IF | 95 | 95 | 0 | 105 |
| 12B6GT | Det. Arc. | 85 | 85 | 0 | 105 |
| 50L6GT | Output Rect. | AC | — | 5 | — |
| 35Z5GT | Rect. | AC | — | 120 | — |

| TUBE | POSITION | PLATE | SCREEN | CATHODE | OSC. PLATE |
|---------|--------------|-------|--------|---------|------------|
| 12SA7GT | Osc.-Mod. | 105 | 85 | 0 | 105 |
| 12B7GT | IF | 105 | 105 | 0 | 105 |
| 12B6GT | Det. Arc. | 85 | 105 | 0 | 105 |
| 50L6GT | Output Rect. | AC | — | 6 | — |
| 35Z5GT | Rect. | AC | — | 130 | — |

| TUBE | POSITION | PLATE | SCREEN | CATHODE | OSC. PLATE |
|------|--------------|-------|--------|---------|------------|
| 6A7 | Osc.-Mod. | 105 | 85 | 0 | 105 |
| 6D6 | IF | 105 | 105 | 0 | 105 |
| 6Z5 | Det. Arc. | 85 | 105 | 0 | 105 |
| 2325 | Output Rect. | AC | — | 0 | — |
| 35Z5 | Rect. | AC | — | 130 | — |

All measurements from B— to socket terminal, using 1000 ohms per volt meter.

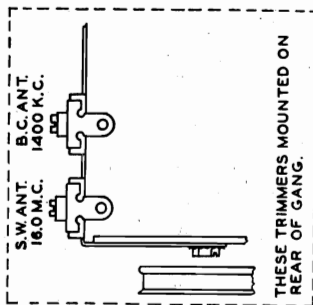
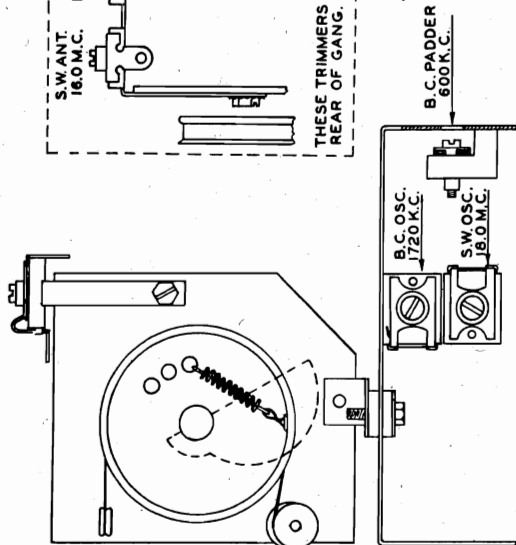


Fig. 1



SENSITIVITY AND STAGE GAIN MEASUREMENTS

To measure over-all sensitivity of loop models, connect the signal generator to the coupling turn in the loop, using a 400 ohm dummy. The lead, including the resistor should be thoroughly shielded and the receiver must be at least 3 ft. away from the signal generator. The figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

| Average Microvolt Input | Generator Set at | Generator Connected to | Dummy Antenna Capacity | Leak Resistance | Output Meter Reading |
|-------------------------|------------------|------------------------|------------------------|-----------------|----------------------|
| 4500 | 455 K.C. | IF Grid | .1 MF | .5 Meg | .45 Volts |
| 75 | 455 K.C. | Mod. Grid | .1 MF | .5 Meg | .45 Volts |
| 85 | 600 K.C. | Mod. Grid | .1 MF | .5 Meg | .45 Volts |
| 25 | 600 K.C. | Ant. Lead | 200 MMF | None | .45 Volts |

| Average Microvolt Input | Generator Set at | Generator Connected to | Dummy Antenna Capacity | Leak Resistance | Output Meter Reading |
|-------------------------|------------------|------------------------|------------------------|-----------------|----------------------|
| 4500 | 455 K.C. | IF Grid | .1 MF | .5 Meg | .45 Volts |
| 75 | 455 K.C. | Mod. Grid | .1 MF | .5 Meg | .45 Volts |
| 85 | 600 K.C. | Mod. Grid | .1 MF | .5 Meg | .45 Volts |
| 25 | 600 K.C. | Ant. Lead | 200 MMF | None | .45 Volts |

| Average Microvolt Input | Generator Set at | Generator Connected to | Dummy Antenna Capacity | Leak Resistance | Output Meter Reading |
|-------------------------|------------------|------------------------|------------------------|-----------------|----------------------|
| 4500 | 455 K.C. | IF Grid | .1 MF | .5 Meg | .45 Volts |
| 75 | 455 K.C. | Mod. Grid | .1 MF | .5 Meg | .45 Volts |
| 85 | 600 K.C. | Mod. Grid | .1 MF | .5 Meg | .45 Volts |
| 25 | 600 K.C. | Ant. Lead | 200 MMF | None | .45 Volts |

| Average Microvolt Input | Generator Set at | Generator Connected to | Dummy Antenna Capacity | Leak Resistance | Output Meter Reading |
|-------------------------|------------------|------------------------|------------------------|-----------------|----------------------|
| 4500 | 455 K.C. | IF Grid | .1 MF | .5 Meg | .45 Volts |
| 75 | 455 K.C. | Mod. Grid | .1 MF | .5 Meg | .45 Volts |
| 85 | 600 K.C. | Mod. Grid | .1 MF | .5 Meg | .45 Volts |
| 25 | 600 K.C. | Ant. Lead | 200 MMF | None | .45 Volts |

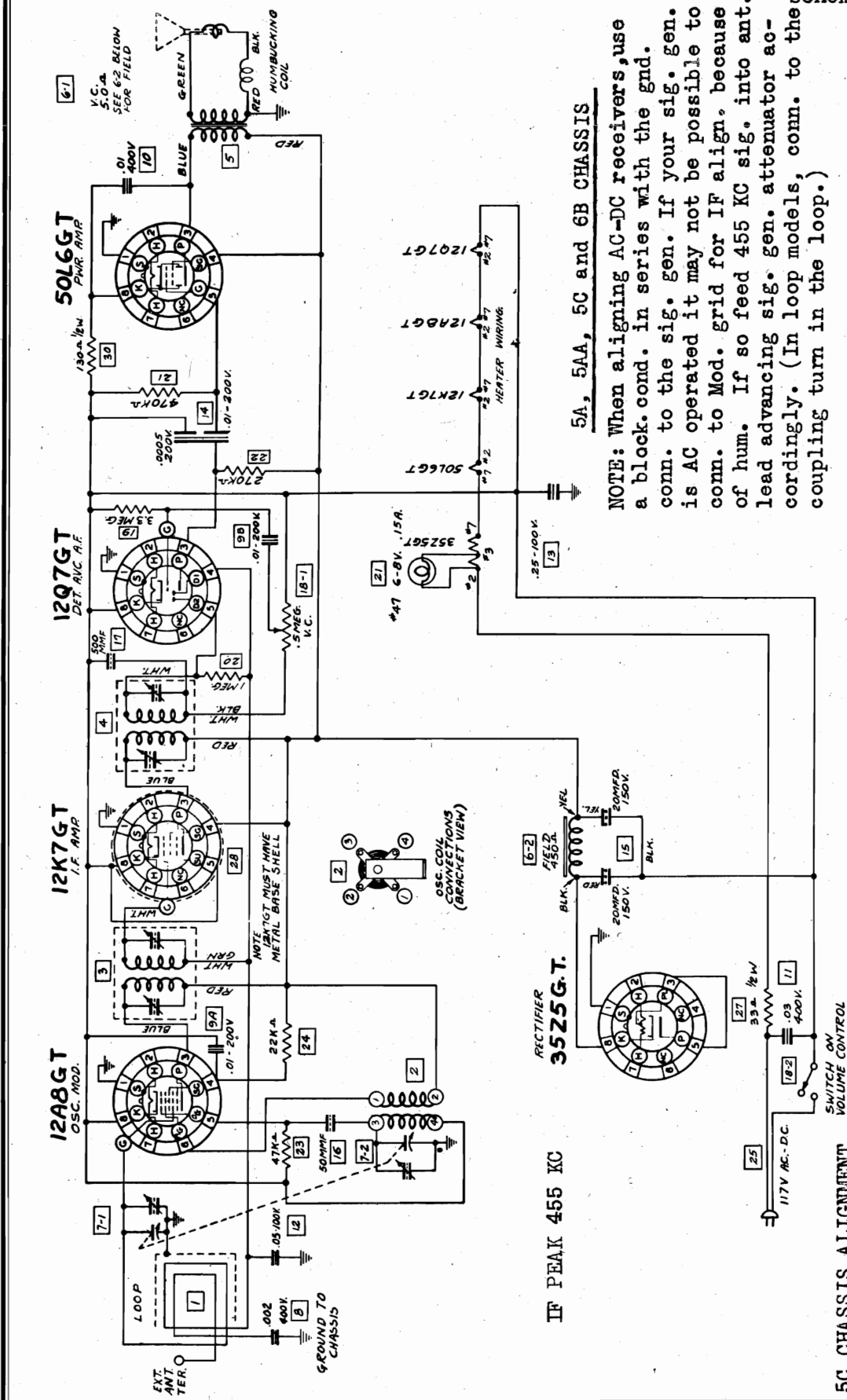
* For .05 Watt output.
** Output meter connected across voice coil.
V.C. resistance — 8 Ohms.

CHASSIS 5A,5AA,6B

Aligning Note

GALVIN MFG. CORP.

MODELS 51C,52C,53C
Chassis 5C
Schematic,Alignment



5C CHASSIS ALIGNMENT

1. Conn. sig. gen. to grid of first det. tube thru a .05 MF cond., and to chass. Do not remove grid cap. Conn. o.p. meter across spkr. voice coil. Turn cond. gang completely out of mesh. Loop must be conn. to the chass. at all times. 2. Set sig. gen. at 455 KC and carefully adj. the two IF trims. and the two DIODE trims. to point show. highest read. on o.p. meter. 3. Turn sig. gen. to 1720 KC and, with cond. gang completely out of mesh, adj. OSC. trim. until 1720 KC sig. is heard. 4. Disconn. sig. gen. and tune in weak station near 1400 or 1500 KC. Adj. ANT. trim. for max. volume.

NOTE: When aligning AC-DC receivers, use a block cond. in series with the gnd. conn. to the sig. gen. If your sig. gen. is AC operated it may not be possible to conn. to Mod. grid for IF align. because of hum. If so feed 455 KC sig. into ant. lead advancing sig. gen. attenuator accordingly. (In loop models, conn. to the coupling turn in the loop.)

MODELS 61A, 62A, 63A

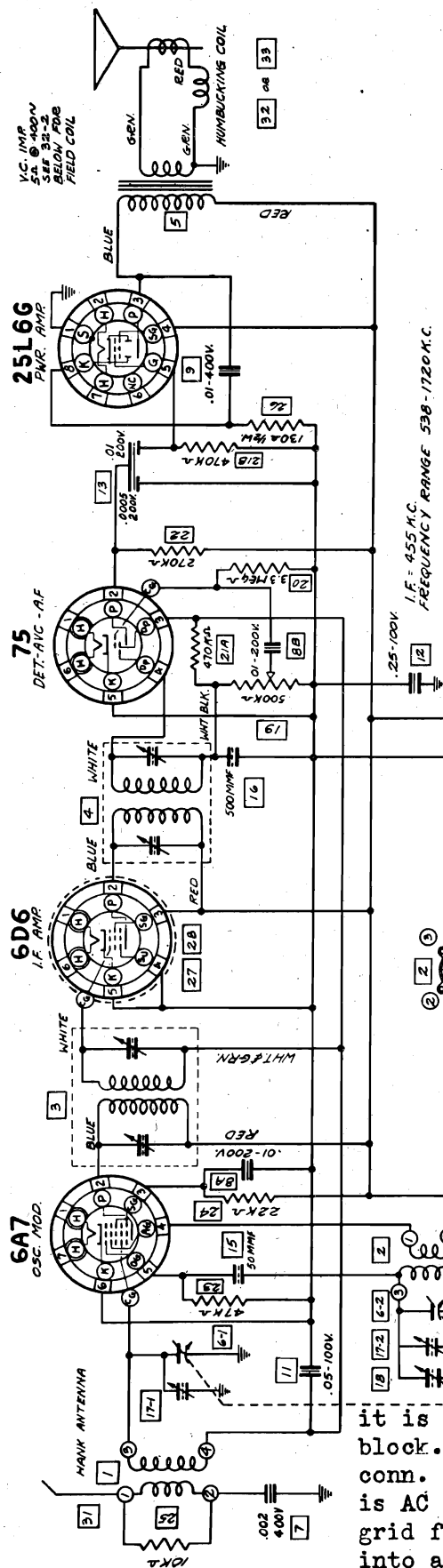
Chassis 6A

Schematic, Alignment

GALVIN MFG. CORP.

CHASSIS 5A, 5AA

Alignment



6A Chassis (Models 61A, 62A and 63A)

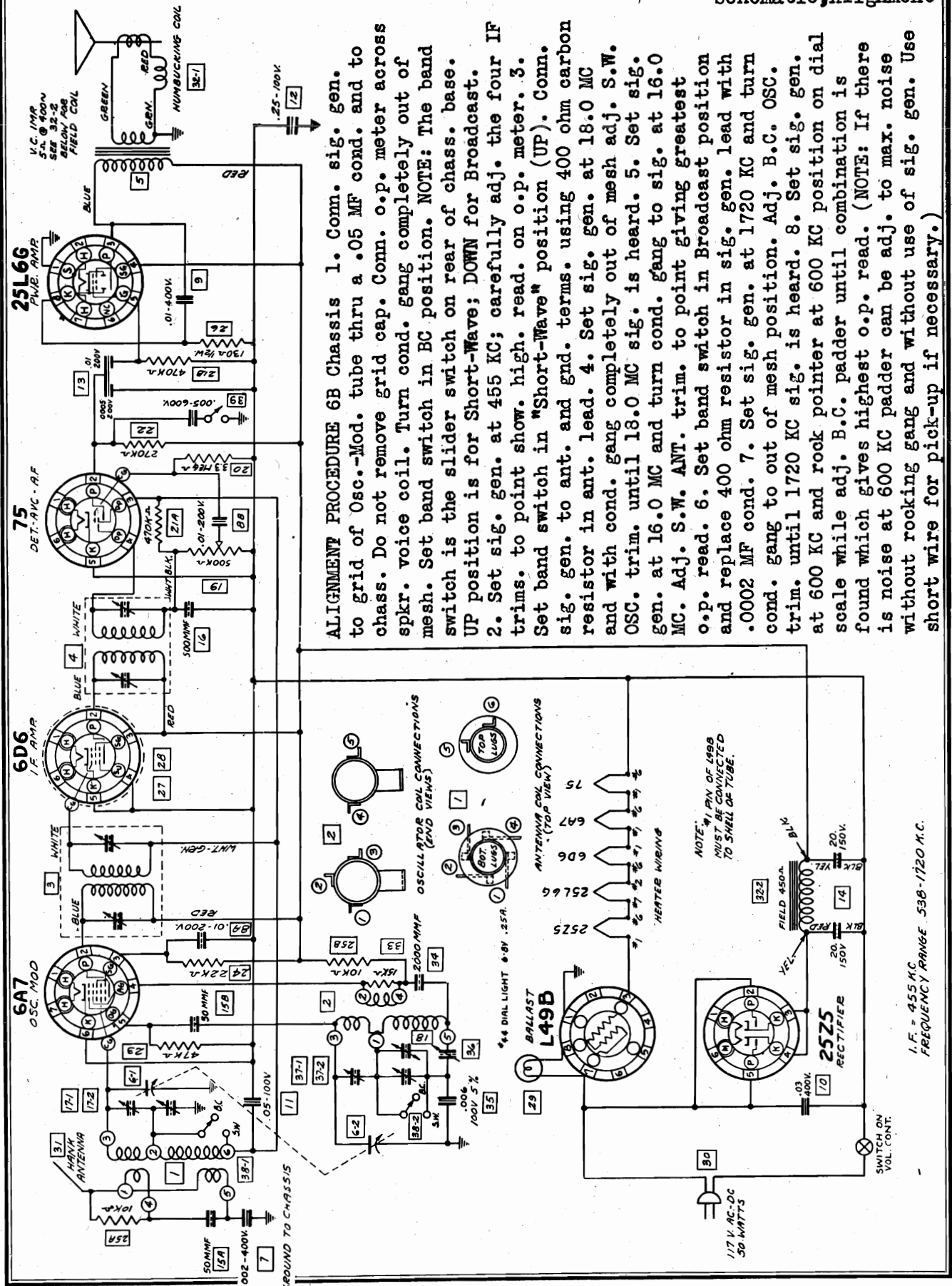
ALIGNMENT 1. Conn. sig. gen. to ant. lead thru 200 MMF cond. and to chass. gnd. Turn cond. gang out of mesh. Conn. o.p. meter across spkr. voice coil. 2. Sig. gen. at 455 KC - carefully adj. 2 I.F. trims. and 2 DIODE trims. to highest read. on o.p. meter. Advance sig. gen. atten. if nec. 3. Turn sig. gen. to 1750 KC and with cond. gang out of mesh adj. OSC. trim. until 1750 KC sig. is heard. 4. Set sig. gen. at 1400 KC and turn cond. gang to sig. at 1400 KC. Adj. ANT. trim. to point showing highest reading on o.p. meter.

| Diag. No. | Part No. | Description | Diag. No. | Part No. | Description |
|-----------|----------|------------------------------|-----------|----------|-----------------------------------|
| 1 | 25L1606 | ANTENNA COIL (Blue Dot) | 19 | 18011651 | VOL. CONT. & SWITCH (.5 sec) |
| 2 | 25L1606 | OSCILLATOR COIL (Blue Dot) | 20 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 3 | 25L1606 | 1. P. COIL & SHIELD ASSEMBLY | 21-A | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 4 | 25L1606 | Output Transformer | 21-B | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 5 | 25L1606 | Output Transformer | 22 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 6 | 25L1606 | Output Transformer | 23 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 7 | 25L1606 | Output Transformer | 24 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 8 | 25L1606 | Output Transformer | 25 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 9 | 25L1606 | Output Transformer | 26 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 10 | 25L1606 | Output Transformer | 27 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 11 | 25L1606 | Output Transformer | 28 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 12 | 25L1606 | Output Transformer | 29 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 13 | 25L1606 | Output Transformer | 30 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 14 | 25L1606 | Output Transformer | 31 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 15 | 25L1606 | Output Transformer | 32 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 16 | 25L1606 | Output Transformer | 33 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 17 | 25L1606 | Output Transformer | 34 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |
| 18 | 25L1606 | Output Transformer | 35 | 666011 | CARBON RES. (175,000-1/2-20) N.I. |

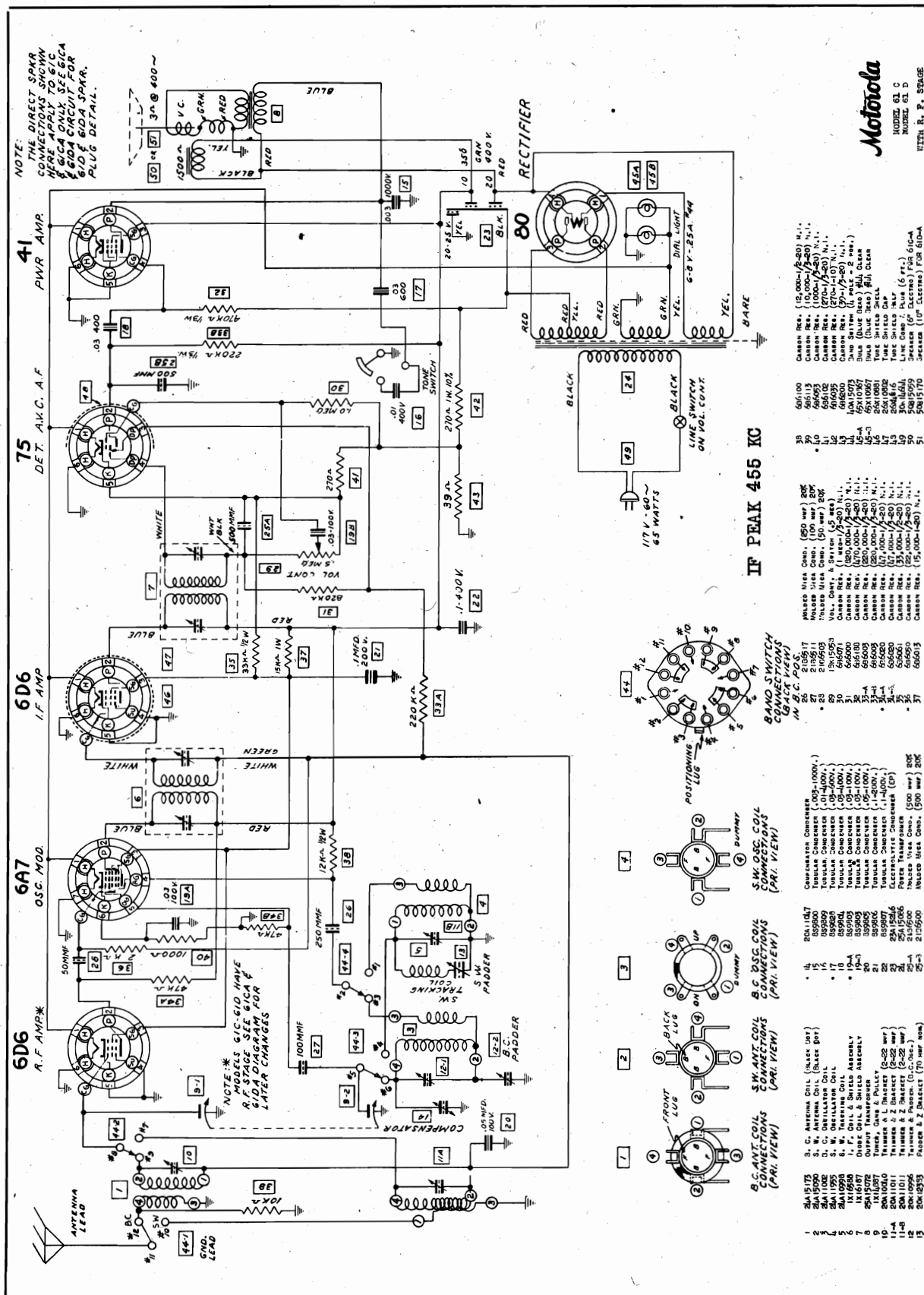
NOTE: When align. AC-DC receivers it is advisable to use a block. cond. in series with gnd. conn. to sig. gen. If sig. gen. is AC operated it may not be possible to conn. to Mod. grid for IF align. because of hum. If so feed 455 KC sig. into ant. lead advancing sig. gen. attenuator accordingly.

GALVIN MFG. CORP.

MODELS 61B, 62B
Chassis 6B
Schematic, Alignment



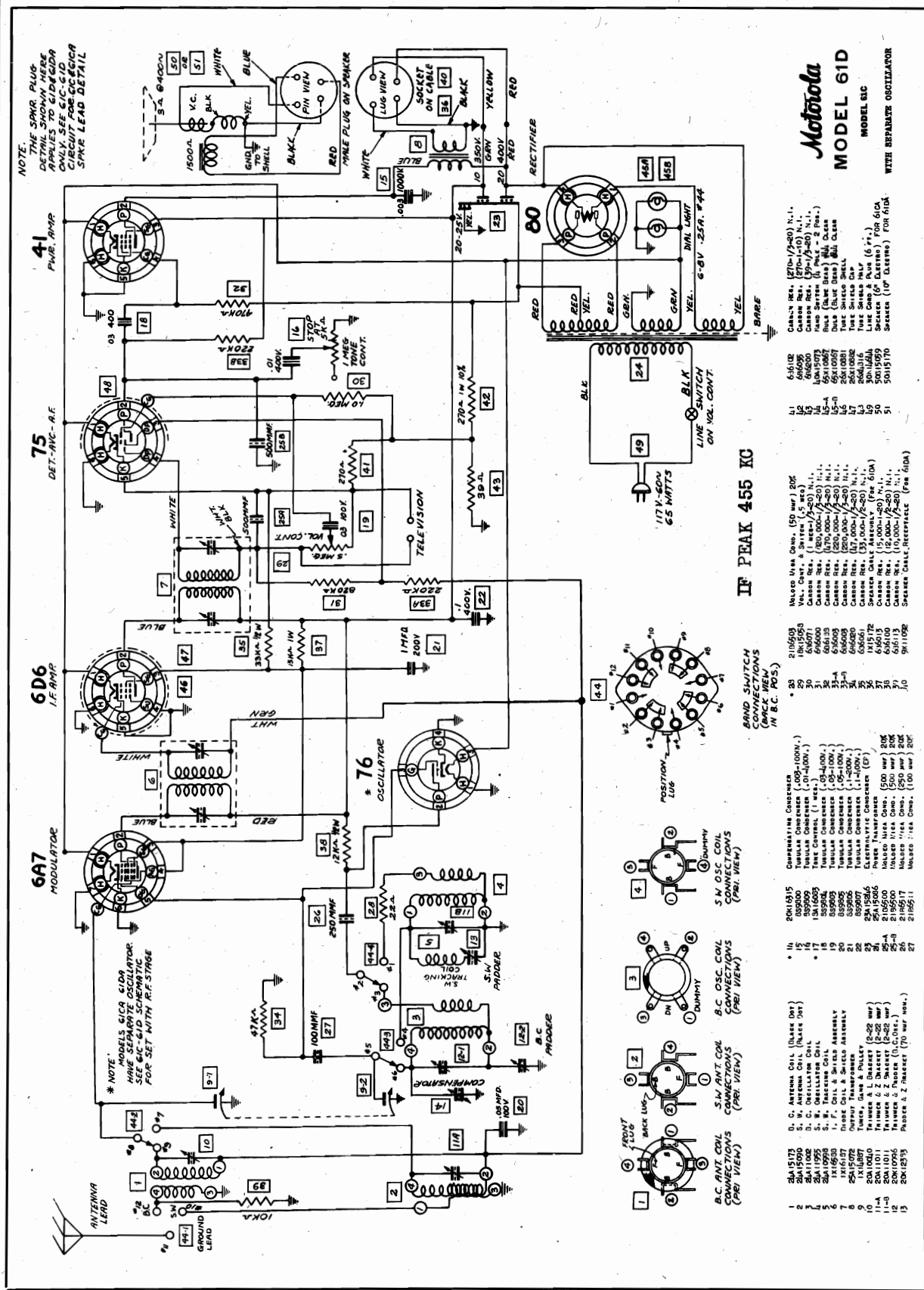
GALVIN MFG. CORP.



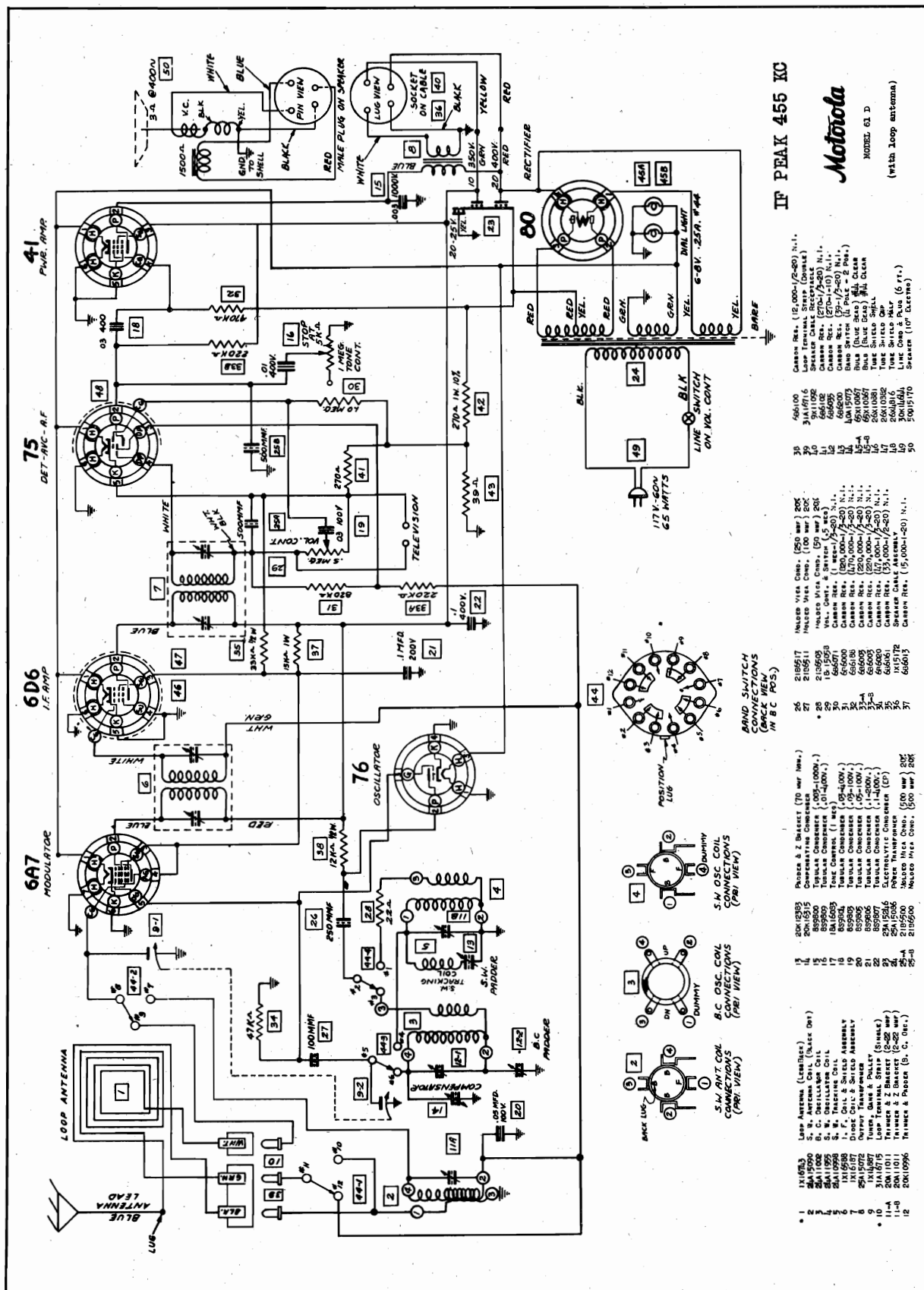
MODEL 61 C
MODEL 61 D
WITH R. P. STAGE

MODELS 61C and 61D (with R. F. stage)

MODELS 61CA, 61DA
(With Separate Osc)
Schematic, Coils



GALVIN MFG. CORP.



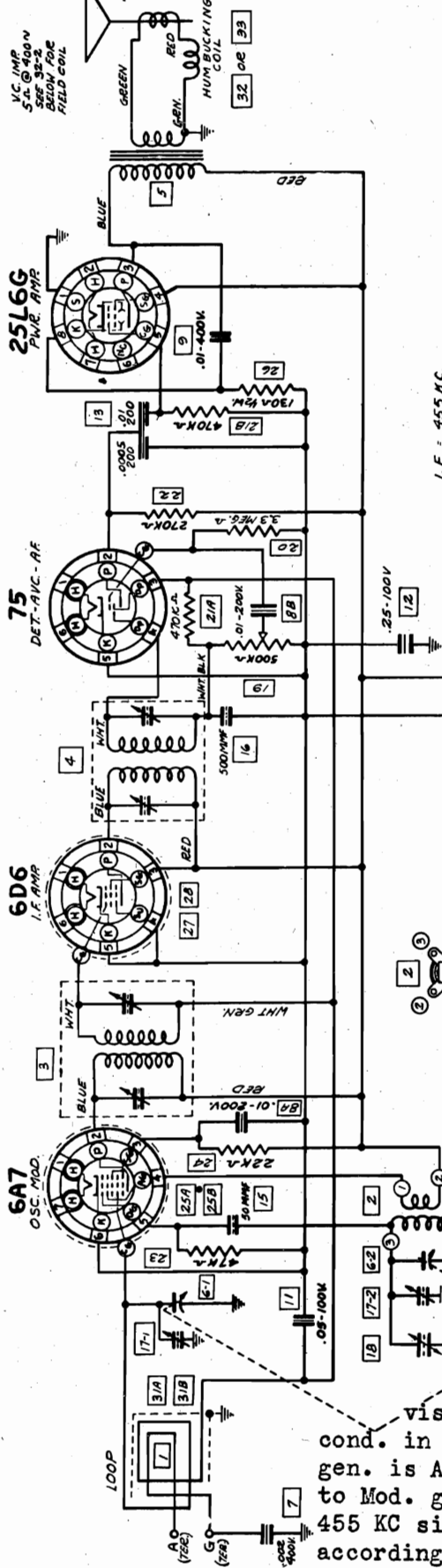
MODEL 61D (with loop antenna)

MODELS 61E, 62E, 63E

Chassis 6E

Schematic Alignment

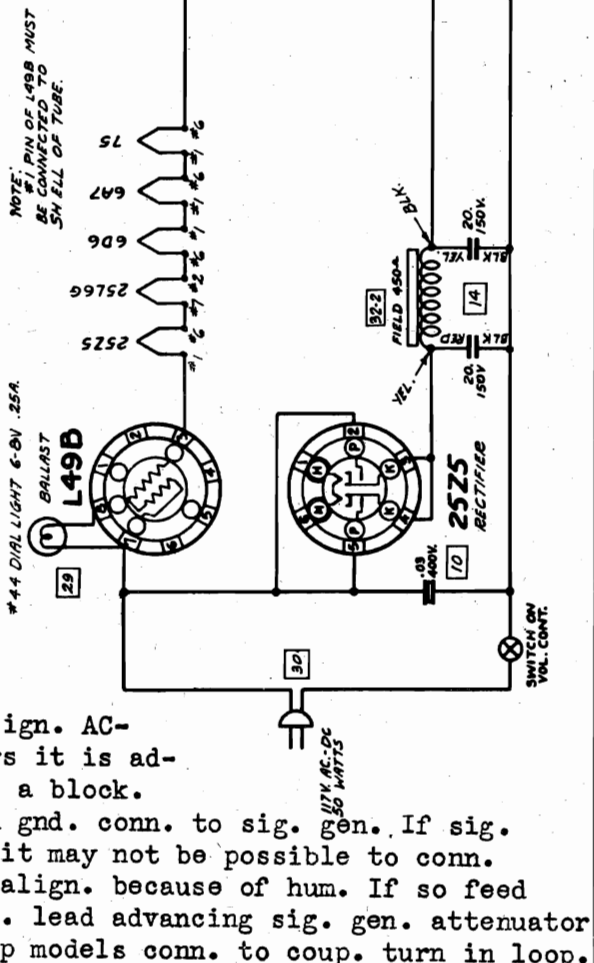
GALVIN MFG. CORP.



ALIGNMENT 1. Connect sig. gen. to control grid of first det. tube thru a .05 MF cond. and to chassis. Do not remove grid cap. Also connect o.p. meter across speaker voice coil. Turn cond. gang completely out of mesh. Loop must be connected to chassis at all times. 2. Set sig. gen. at 455 KC and adj. the 2 IF trims. and 2 DIODE trims. to point showing highest reading on o.p. meter. 3. Turn sig. gen. to 1720 KC and with cond. gang out of mesh adj. OSC. trim. until 1720 KC sig. is heard. 4. Disconnect sig. gen. and tune in weak sta. near 1400 or 1500 KC. Adj. ANT. trim. for max. volume.

I.F. = 455 KC.
FREQUENCY RANGE 538-1720 KC

| No. | No. | DESCRIPTION | No. | DESCRIPTION | No. | DESCRIPTION |
|-----|---------|--------------------------------|-----|-------------|-----|-------------|
| 1 | 24K1629 | Loop Antenna Coil (Wet) | 26 | 25L6G | 26 | 25L6G |
| 2 | 24K1630 | Oscillator Coil (Black Dot) | 27 | 25Z5 | 27 | 25Z5 |
| 3 | 1X14716 | I. F. Coil & Shield Assembly | 28 | 25L6G | 28 | 25L6G |
| 4 | 1X14717 | Direct Coil & Shield Assembly | 29 | 25L6G | 29 | 25L6G |
| 5 | 25A1629 | Output Transformer | 30 | 25L6G | 30 | 25L6G |
| 6 | 1X15519 | Tuning Unit, Gang & Pulley | 31 | 25L6G | 31 | 25L6G |
| 7 | 1X15520 | Tubular Condenser (.005-.0100) | 32 | 25L6G | 32 | 25L6G |
| 8 | 85520 | Tubular Condenser (.01-.0200) | 33 | 25L6G | 33 | 25L6G |
| 9 | 85520 | Tubular Condenser (.01-.0200) | | | | |
| 10 | 85520 | Tubular Condenser (.01-.0200) | | | | |
| 11 | 85520 | Tubular Condenser (.01-.0200) | | | | |
| 12 | 85520 | Tubular Condenser (.01-.0200) | | | | |
| 13 | 25A1630 | Loop Antenna Coil (Wet) | | | | |
| 14 | 25A1631 | Oscillator Coil (Black Dot) | | | | |
| 15 | 25A1632 | Direct Coil & Shield Assembly | | | | |
| 16 | 25A1633 | Output Transformer | | | | |
| 17 | 25A1634 | Tuning Unit, Gang & Pulley | | | | |
| 18 | 25A1635 | Tubular Condenser (.005-.0100) | | | | |
| 19 | 25A1636 | Tubular Condenser (.01-.0200) | | | | |
| 20 | 25A1637 | Tubular Condenser (.01-.0200) | | | | |
| 21 | 25A1638 | Tubular Condenser (.01-.0200) | | | | |
| 22 | 25A1639 | Tubular Condenser (.01-.0200) | | | | |
| 23 | 25A1640 | Tubular Condenser (.01-.0200) | | | | |
| 24 | 25A1641 | Tubular Condenser (.01-.0200) | | | | |
| 25 | 25A1642 | Tubular Condenser (.01-.0200) | | | | |
| 26 | 25A1643 | Tubular Condenser (.01-.0200) | | | | |
| 27 | 25A1644 | Tubular Condenser (.01-.0200) | | | | |
| 28 | 25A1645 | Tubular Condenser (.01-.0200) | | | | |
| 29 | 25A1646 | Tubular Condenser (.01-.0200) | | | | |
| 30 | 25A1647 | Tubular Condenser (.01-.0200) | | | | |
| 31 | 25A1648 | Tubular Condenser (.01-.0200) | | | | |
| 32 | 25A1649 | Tubular Condenser (.01-.0200) | | | | |
| 33 | 25A1650 | Tubular Condenser (.01-.0200) | | | | |

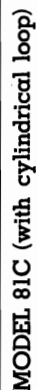


NOTE: #1 PIN OF L49B MUST BE CONNECTED TO SHIELD OF TUBE.

#44 DIAL LIGHT 6-V. 25A.

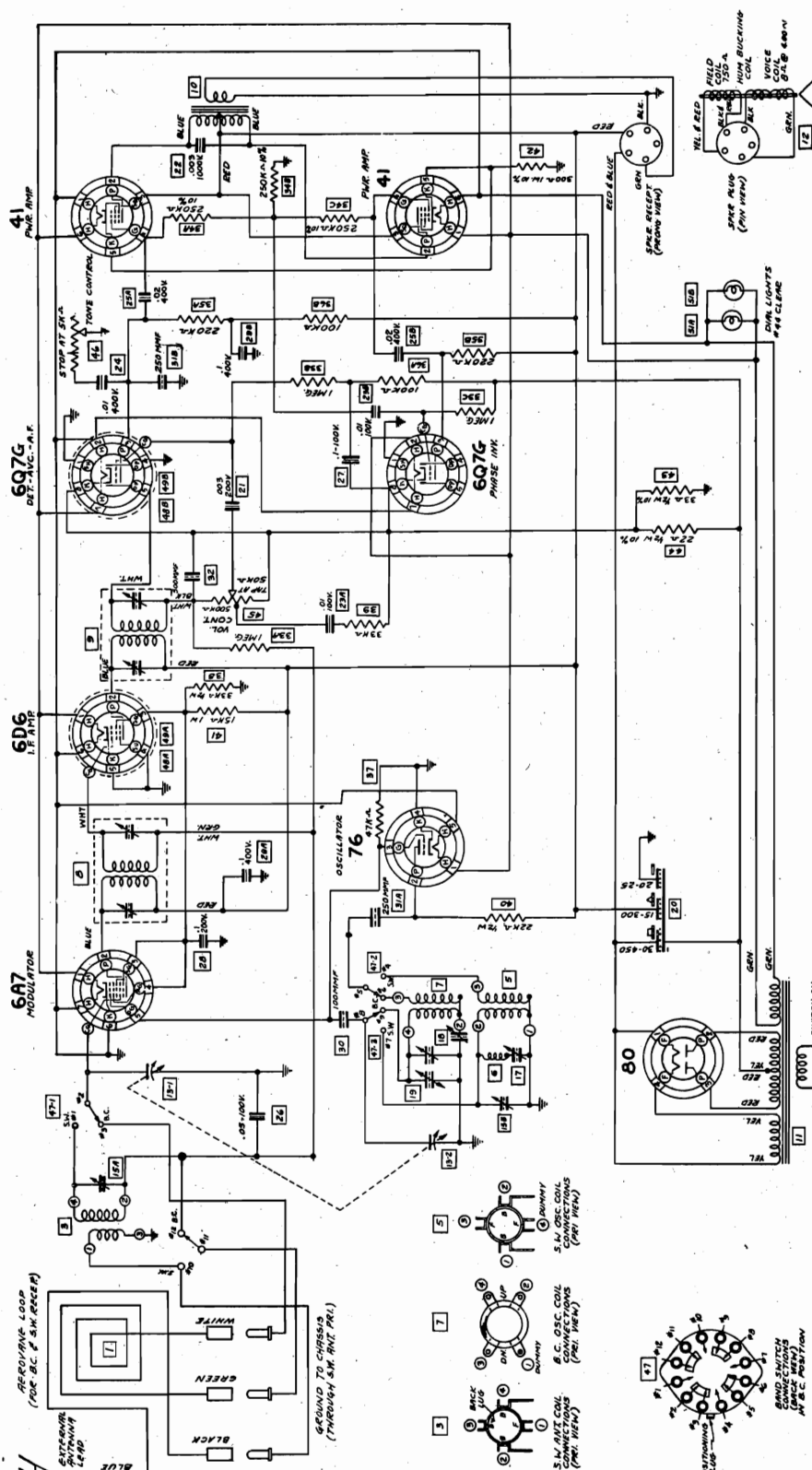
BALAST

SWITCH ON VOL. CONT.



IF PEAK 455 KC

Motorola
MODEL 81C
WITH SQUARE LOOP



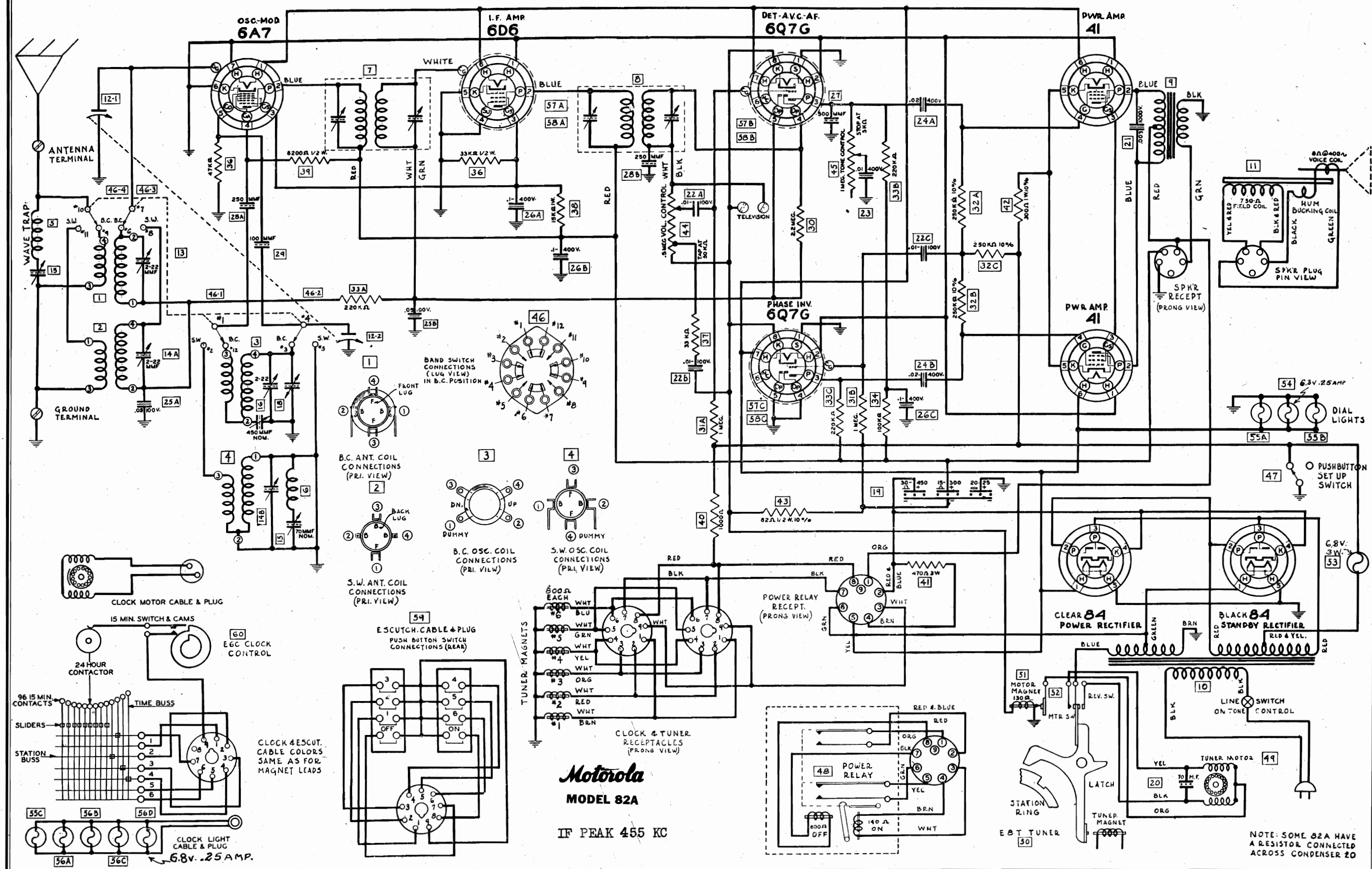
| Station | Time | Program | Genre | Length | Repeats | Notes |
|---------|-------------|---------|-------|--------|---------|-------|
| 12-1 | 12:00-12:30 | News | News | 30 | 1 | 12-1 |
| 12-2 | 12:00-12:30 | News | News | 30 | 1 | 12-2 |
| 12-3 | 12:00-12:30 | News | News | 30 | 1 | 12-3 |
| 12-4 | 12:00-12:30 | News | News | 30 | 1 | 12-4 |
| 12-5 | 12:00-12:30 | News | News | 30 | 1 | 12-5 |
| 12-6 | 12:00-12:30 | News | News | 30 | 1 | 12-6 |
| 12-7 | 12:00-12:30 | News | News | 30 | 1 | 12-7 |
| 12-8 | 12:00-12:30 | News | News | 30 | 1 | 12-8 |
| 12-9 | 12:00-12:30 | News | News | 30 | 1 | 12-9 |
| 12-10 | 12:00-12:30 | News | News | 30 | 1 | 12-10 |
| 12-11 | 12:00-12:30 | News | News | 30 | 1 | 12-11 |
| 12-12 | 12:00-12:30 | News | News | 30 | 1 | 12-12 |
| 12-13 | 12:00-12:30 | News | News | 30 | 1 | 12-13 |
| 12-14 | 12:00-12:30 | News | News | 30 | 1 | 12-14 |
| 12-15 | 12:00-12:30 | News | News | 30 | 1 | 12-15 |
| 12-16 | 12:00-12:30 | News | News | 30 | 1 | 12-16 |
| 12-17 | 12:00-12:30 | News | News | 30 | 1 | 12-17 |
| 12-18 | 12:00-12:30 | News | News | 30 | 1 | 12-18 |
| 12-19 | 12:00-12:30 | News | News | 30 | 1 | 12-19 |
| 12-20 | 12:00-12:30 | News | News | 30 | 1 | 12-20 |
| 12-21 | 12:00-12:30 | News | News | 30 | 1 | 12-21 |
| 12-22 | 12:00-12:30 | News | News | 30 | 1 | 12-22 |
| 12-23 | 12:00-12:30 | News | News | 30 | 1 | 12-23 |
| 12-24 | 12:00-12:30 | News | News | 30 | 1 | 12-24 |
| 12-25 | 12:00-12:30 | News | News | 30 | 1 | 12-25 |
| 12-26 | 12:00-12:30 | News | News | 30 | 1 | 12-26 |
| 12-27 | 12:00-12:30 | News | News | 30 | 1 | 12-27 |
| 12-28 | 12:00-12:30 | News | News | 30 | 1 | 12-28 |
| 12-29 | 12:00-12:30 | News | News | 30 | 1 | 12-29 |
| 12-30 | 12:00-12:30 | News | News | 30 | 1 | 12-30 |
| 12-31 | 12:00-12:30 | News | News | 30 | 1 | 12-31 |
| 12-32 | 12:00-12:30 | News | News | 30 | 1 | 12-32 |
| 12-33 | 12:00-12:30 | News | News | 30 | 1 | 12-33 |
| 12-34 | 12:00-12:30 | News | News | 30 | 1 | 12-34 |
| 12-35 | 12:00-12:30 | News | News | 30 | 1 | 12-35 |
| 12-36 | 12:00-12:30 | News | News | 30 | 1 | 12-36 |
| 12-37 | 12:00-12:30 | News | News | 30 | 1 | 12-37 |
| 12-38 | 12:00-12:30 | News | News | 30 | 1 | 12-38 |
| 12-39 | 12:00-12:30 | News | News | 30 | 1 | 12-39 |
| 12-40 | 12:00-12:30 | News | News | 30 | 1 | 12-40 |
| 12-41 | 12:00-12:30 | News | News | 30 | 1 | 12-41 |
| 12-42 | 12:00-12:30 | News | News | 30 | 1 | 12-42 |
| 12-43 | 12:00-12:30 | News | News | 30 | 1 | 12-43 |
| 12-44 | 12:00-12:30 | News | News | 30 | 1 | 12-44 |
| 12-45 | 12:00-12:30 | News | News | 30 | 1 | 12-45 |
| 12-46 | 12:00-12:30 | News | News | 30 | 1 | 12-46 |
| 12-47 | 12:00-12:30 | News | News | 30 | 1 | 12-47 |
| 12-48 | 12:00-12:30 | News | News | 30 | 1 | 12-48 |
| 12-49 | 12:00-12:30 | News | News | 30 | 1 | 12-49 |
| 12-50 | 12:00-12:30 | News | News | 30 | 1 | 12-50 |
| 12-51 | 12:00-12:30 | News | News | 30 | 1 | 12-51 |
| 12-52 | 12:00-12:30 | News | News | 30 | 1 | 12-52 |
| 12-53 | 12:00-12:30 | News | News | 30 | 1 | 12-53 |
| 12-54 | 12:00-12:30 | News | News | 30 | 1 | 12-5 |

| TABLE 1 | Temperature | Time | Pressure | Yield | Conversion | Product | Structure |
|---------|-------------|------|----------|-------|------------|---------|--|
| | (°C) | (hr) | (atm) | (%) | (%) | (g) | ($\text{C}_{10}\text{H}_{10}\text{O}_2$) |
| 1 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 2 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 3 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 4 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 5 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 6 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 7 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 8 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 9 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 10 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 11 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 12 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 13 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 14 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 15 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 16 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 17 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 18 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 19 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 20 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 21 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 22 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 23 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 24 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 25 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 26 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 27 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 28 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 29 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 30 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 31 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 32 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 33 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 34 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 35 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 36 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 37 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 38 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 39 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 40 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 41 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 42 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 43 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 44 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 45 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 46 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 47 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 48 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 49 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 50 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 51 | 200 | 100 | 1 | 100 | 100 | 100 | 100 |
| 52 | 200 | 100 | 1 | 100 | 100 | 100</ | |

| | | |
|-----|----------|--------------------------------|
| 1 | 1016926 | Lead Batteries Assembly |
| 2 | 20415289 | S. W. Anderson Coil. (Reg Day) |
| 3 | 20416671 | S. W. Anderson Coil. (Reg Day) |
| 4 | 20416672 | S. W. Anderson Coil. (Reg Day) |
| 5 | 20416998 | S. W. Anderson Coil. (Reg Day) |
| 6 | 20416999 | S. W. Anderson Coil. (Reg Day) |
| 7 | 20417000 | S. W. Anderson Coil. (Reg Day) |
| 8 | 20417001 | S. W. Anderson Coil. (Reg Day) |
| 9 | 1016187 | Coil. (Reg Day) |
| 10 | 1016188 | Coil. (Reg Day) |
| 11 | 20416263 | Coil. (Reg Day) |
| 12 | 20416264 | Coil. (Reg Day) |
| 13 | 20416265 | Coil. (Reg Day) |
| 14 | 20416266 | Coil. (Reg Day) |
| 15 | 20416267 | Coil. (Reg Day) |
| 16 | 20416268 | Coil. (Reg Day) |
| 17 | 20416269 | Coil. (Reg Day) |
| 18 | 20416270 | Coil. (Reg Day) |
| 19 | 20416271 | Coil. (Reg Day) |
| 20 | 20416272 | Coil. (Reg Day) |
| 21 | 20416273 | Coil. (Reg Day) |
| 22 | 20416274 | Coil. (Reg Day) |
| 23 | 20416275 | Coil. (Reg Day) |
| 24 | 20416276 | Coil. (Reg Day) |
| 25 | 20416277 | Coil. (Reg Day) |
| 26 | 20416278 | Coil. (Reg Day) |
| 27 | 20416279 | Coil. (Reg Day) |
| 28 | 20416280 | Coil. (Reg Day) |
| 29 | 20416281 | Coil. (Reg Day) |
| 30 | 20416282 | Coil. (Reg Day) |
| 31 | 20416283 | Coil. (Reg Day) |
| 32 | 20416284 | Coil. (Reg Day) |
| 33 | 20416285 | Coil. (Reg Day) |
| 34 | 20416286 | Coil. (Reg Day) |
| 35 | 20416287 | Coil. (Reg Day) |
| 36 | 20416288 | Coil. (Reg Day) |
| 37 | 20416289 | Coil. (Reg Day) |
| 38 | 20416290 | Coil. (Reg Day) |
| 39 | 20416291 | Coil. (Reg Day) |
| 40 | 20416292 | Coil. (Reg Day) |
| 41 | 20416293 | Coil. (Reg Day) |
| 42 | 20416294 | Coil. (Reg Day) |
| 43 | 20416295 | Coil. (Reg Day) |
| 44 | 20416296 | Coil. (Reg Day) |
| 45 | 20416297 | Coil. (Reg Day) |
| 46 | 20416298 | Coil. (Reg Day) |
| 47 | 20416299 | Coil. (Reg Day) |
| 48 | 20416300 | Coil. (Reg Day) |
| 49 | 20416301 | Coil. (Reg Day) |
| 50 | 20416302 | Coil. (Reg Day) |
| 51 | 20416303 | Coil. (Reg Day) |
| 52 | 20416304 | Coil. (Reg Day) |
| 53 | 20416305 | Coil. (Reg Day) |
| 54 | 20416306 | Coil. (Reg Day) |
| 55 | 20416307 | Coil. (Reg Day) |
| 56 | 20416308 | Coil. (Reg Day) |
| 57 | 20416309 | Coil. (Reg Day) |
| 58 | 20416310 | Coil. (Reg Day) |
| 59 | 20416311 | Coil. (Reg Day) |
| 60 | 20416312 | Coil. (Reg Day) |
| 61 | 20416313 | Coil. (Reg Day) |
| 62 | 20416314 | Coil. (Reg Day) |
| 63 | 20416315 | Coil. (Reg Day) |
| 64 | 20416316 | Coil. (Reg Day) |
| 65 | 20416317 | Coil. (Reg Day) |
| 66 | 20416318 | Coil. (Reg Day) |
| 67 | 20416319 | Coil. (Reg Day) |
| 68 | 20416320 | Coil. (Reg Day) |
| 69 | 20416321 | Coil. (Reg Day) |
| 70 | 20416322 | Coil. (Reg Day) |
| 71 | 20416323 | Coil. (Reg Day) |
| 72 | 20416324 | Coil. (Reg Day) |
| 73 | 20416325 | Coil. (Reg Day) |
| 74 | 20416326 | Coil. (Reg Day) |
| 75 | 20416327 | Coil. (Reg Day) |
| 76 | 20416328 | Coil. (Reg Day) |
| 77 | 20416329 | Coil. (Reg Day) |
| 78 | 20416330 | Coil. (Reg Day) |
| 79 | 20416331 | Coil. (Reg Day) |
| 80 | 20416332 | Coil. (Reg Day) |
| 81 | 20416333 | Coil. (Reg Day) |
| 82 | 20416334 | Coil. (Reg Day) |
| 83 | 20416335 | Coil. (Reg Day) |
| 84 | 20416336 | Coil. (Reg Day) |
| 85 | 20416337 | Coil. (Reg Day) |
| 86 | 20416338 | Coil. (Reg Day) |
| 87 | 20416339 | Coil. (Reg Day) |
| 88 | 20416340 | Coil. (Reg Day) |
| 89 | 20416341 | Coil. (Reg Day) |
| 90 | 20416342 | Coil. (Reg Day) |
| 91 | 20416343 | Coil. (Reg Day) |
| 92 | 20416344 | Coil. (Reg Day) |
| 93 | 20416345 | Coil. (Reg Day) |
| 94 | 20416346 | Coil. (Reg Day) |
| 95 | 20416347 | Coil. (Reg Day) |
| 96 | 20416348 | Coil. (Reg Day) |
| 97 | 20416349 | Coil. (Reg Day) |
| 98 | 20416350 | Coil. (Reg Day) |
| 99 | 20416351 | Coil. (Reg Day) |
| 100 | 2041635 | |

MODEL 81C (with square loop)

GALVIN MFG. CORP.

MODEL 82A
Schematic

GALVIN MFG. CORP.

MODEL 82A
Clock Data
Tuner Notes

CHECKING CLOCK CONTINUITY

Although we have sealed the Time Tuning Clock against unauthorized tinkering, and have established a policy of voiding the guarantee if the seal is broken, it is possible to completely check the clock circuit for defects without removing the mechanism from its housing. This can be done by "ear" and by continuity.

The first step in checking a clock is to make sure that the motor runs and that it keeps accurate time. Just plug it into its receptacle on the chassis and check its time-keeping qualities against a known source of accurate time.

If this test indicates that the clock motor is not running, it would be advisable to make certain that the receptacle on the chassis base is "live" and that 110 volts, 60 cycle A.C. is available at that point.

Before attempting to check the clock continuity, it would be helpful to go through a little practice course in listening to the sounds the clock makes. First, remove the clock assembly from its mounting on the control panel of the receiver, and hold it in your hands while you turn the time set knob on the back. While turning the knob, hold the clock up to your ear, listening for the clicks. When the minute hand passes any of the four quarter-hour intervals into which each hour is divided, you will hear two clicks, the second of which falls very closely after the first one. These clicks are caused by the quarter-hour cam switch blades dropping off of the cams.

As you turn the time set knob, you will notice another single click which is a little louder and sounds a trifle more metallic than the double click which you get at the exact quarter-hour intervals. This single click will be heard when the minute hand is passing a point that is approximately half way between the quarter-hour positions. This click is caused by the contact on the twenty-four hour hand as it falls off of one time bar to make contact upon the next time bar.

If you will go through this operation several times, you will soon be able to identify these sounds. Once you are able to recognize them, you will be able to thoroughly check the continuity of the clock control circuit, without the necessity of looking inside the mechanism. Proceed as follows:

1. With the time set knob, turn the clock hands until they read fifteen minutes to twelve on the day cycle. Look through the peep-hole to make sure of this.
2. Slowly turn the time set knob forward until the minute hand indicates approximately two minutes to twelve. In the course of this movement you will hear, unless the clock is defective, a single click which indicates that the twenty-four hour contact has come to rest upon the twelve o'clock noon time bar.
3. Now very slowly continue to turn the time set knob forward until you hear the first click, which indicates that the top blade of the twenty-four hour cam switch has fallen off of the large cam, causing the cam switch circuit to close. As soon as you hear this first click, stop turning the time set knob, for if you turn it far enough to hear the second click, the con-

tact will be broken. The trick is to turn it just far enough, but not too far.

4. Clear the clock of all previous settings by inserting a finger in the "OFF" position of the finger dial, and dialing counter-clockwise until the stop is reached.

5. With the round time-selecting knob on the front of the clock, turn the red time selecting pointer to 12:00 o'clock noon.
6. With a continuity meter, check continuity between Terminal No. 9 and all of the other terminals on the plug at the end of the clock cable. You should get no reading. Terminal No. 9 is connected to the common lead.
7. Dial the "OFF" position just as you would if you were setting up the clock to turn the radio off at 12:00 o'clock noon. Check continuity between Terminal No. 9 and Terminal No. 7. You should get a full scale reading indicating a complete circuit. (Terminal No. 7 connects to the off relay when the clock is plugged into the chassis).

8. Dial Station No. 1 and check continuity between Terminal No. 9 and Terminal No. 1 of the clock cable. A full scale reading should result.

9. In their respective order, dial Stations 2, 3, 4, 5, and 6, checking continuity after each dialing between Terminal No. 9 and Terminals 2, 3, 4, 5, and 6, respectively. In each case you should get a full scale deflection of your continuity meter between Terminal No. 9 and the terminal which corresponds in number to the position you have dialed on the finger ring.

The procedure through which you have gone up to this point will, if the proper readings have been obtained, tell you that the slider on the time bar which represents the 12:00 o'clock noon position, is making a proper contact with each of the station rings and the "OFF" ring in the clock.

10. Next turn the clock hands knob to the 12:15 o'clock position, also turn the red time-selecting pointer to the 12:15 o'clock position, and repeat Steps 1 to 9 for the 12:15 o'clock position. To check the clock 100%, it will be necessary to repeat the procedure ninety-six times, one for each fifteen minute interval of the twenty-four hour day.

However, if the test which you have made at the 12:00 o'clock noon position shows the mechanism to be O.K., it should not be necessary to go through the entire operation. A test made at 12:00 o'clock noon and 12:00 o'clock midnight, and tests at 6:00 A.M. and 6:00 P.M. should give you a fairly accurate test. However, it is possible that, due to damage or improper adjustment of one individual time bar or slider, the clock fails to operate at one particular quarter-hour period, although it operates as it should at all other times. In this case, a continuity test would be advisable at the particular time setting at which failure has been noted.

ELECTRIC TUNER SERVICE SUGGESTIONS

Following you will find a list of troubles you may experience with the automatic tuning system.

Each possible failure is followed by suggestions which may aid you in quickly solving your service problems with this model.

MOTOR DOES NOT RUN

1. Burned out 84 Tube (Black). This is a standby tube and should burn at all times.
2. Poor Contact at Push-Button Plug. Inspect the contacts between the plug and the receptacle on the chassis.
3. Open Circuit in Motor. Check all connections to motor and check motor winding for continuity.
4. 70 Mfd. motor starting condenser opened.
5. Motor magnet coil opened. (See Fig. 3.)
6. B plus fuse (No. 55 Pilot bulb) burned out. Accessible from rear of chassis base. (See Fig. 1.)
7. Magnet Fails To Release. If the magnet which has previously been energized, fails to release the latch bar for any reason, the motor cannot turn the mechanism.

MECHANISM RUNS SLUGGISHLY

1. Poor Contact Between Push-Button Plug and Receptacle. This will also result in voltage drop, and lessened motor power.
2. Tension on motor contact armature too great.
3. Gears Not Properly Meshed. Check all gears in assembly for binding due to improper meshing.
4. Defective Motor.—Replace.

MOTOR FAILS TO REVERSE

1. Reversing Switch Not Properly Adjusted. See instructions elsewhere in this book.
2. Open Circuit in Motor. If one side of motor circuit is open, motor will run in one direction only.
3. Open Magnet Winding. An open magnet will not pull latch down; consequently will not cause motor switch to reverse.
4. Latch Bar Spring Too Tight. If the latch bars operate under too much tension the magnet may not be able to pull the latch down.

FAILS TO RETAIN ORIGINAL SETTING

1. Latch Rings Not Locked Securely. The locking screw must be pulled down securely, otherwise, the shock of the sudden stopping will tend to slide the rings away from the original setting.
2. Original Setting Not Accurate. Resetting of magnets may be necessary after several days' use, during which time the mechanism goes thru a "Shaking down" process.
3. Cable assembly from station magnets touching latch bars. Dress cable.

IMPOSSIBLE TO SET UP STATIONS

1. Too Much Tension On Locking Levers. When the automatic locking screw is loose, the station rings should move freely. If the levers still hold

the station rings partially locked, the screws which hold the levers in position should be loosened one-quarter to one-half turn.

2. Latch Rings "Out of Range." If the loosened latch rings slip on the drum until the notch falls out of reach of the latch bar, they can be brought back to position by following exactly the "setting procedure" outlined elsewhere in this book.

FAILS TO STOP AT STATION

1. Open Magnet Winding. Check for continuity and replace if necessary. Check latch bar cable assembly. See No. 6 below.
2. Latch Bar Defective. Inspect latch bar to make sure that it has not been damaged. Replace latch bar, if required.
3. Poor Contact at Push-Button Plug. A poor contact here means a voltage drop which reduces the pulling power of the magnet.
4. Improper Spacing of Magnet. Check the spacing between the latch bar armature and the magnet pole. When the tip of the latch bar is seated all the way down in the notch in the latch ring, the armature should not quite touch the magnet pole. A hair line of light should be visible between them.
5. Latch Rings Not Locked Securely. If the latch rings are very loose the motor will continue to run.
6. Cable assembly from station magnets, touching latch bars. Dress cable.

LATCH BAR STICKS IN NOTCH

1. Latch Bar Spring Weak. Check latch bar tension spring to make sure it is pulling away from the magnet with sufficient force. Spring tension is adjustable.
2. Armature Rivet Worn. There is a brass rivet at the tip of the armature, to prevent the armature freezing to the magnet. If this rivet is worn down, permitting the steel armature to actually touch the magnet pole, it may freeze in that position.
3. Burr On Tip of Latch. Latch tip should be smooth and shiny.
4. Binding in Latch Bearings. Latch must move freely but not sloppy.

5. Latch Tips Not Centered On Latch Rings. Latch tips must not rub bakelite guide rings. The latch bar bearing shaft is adjustable.

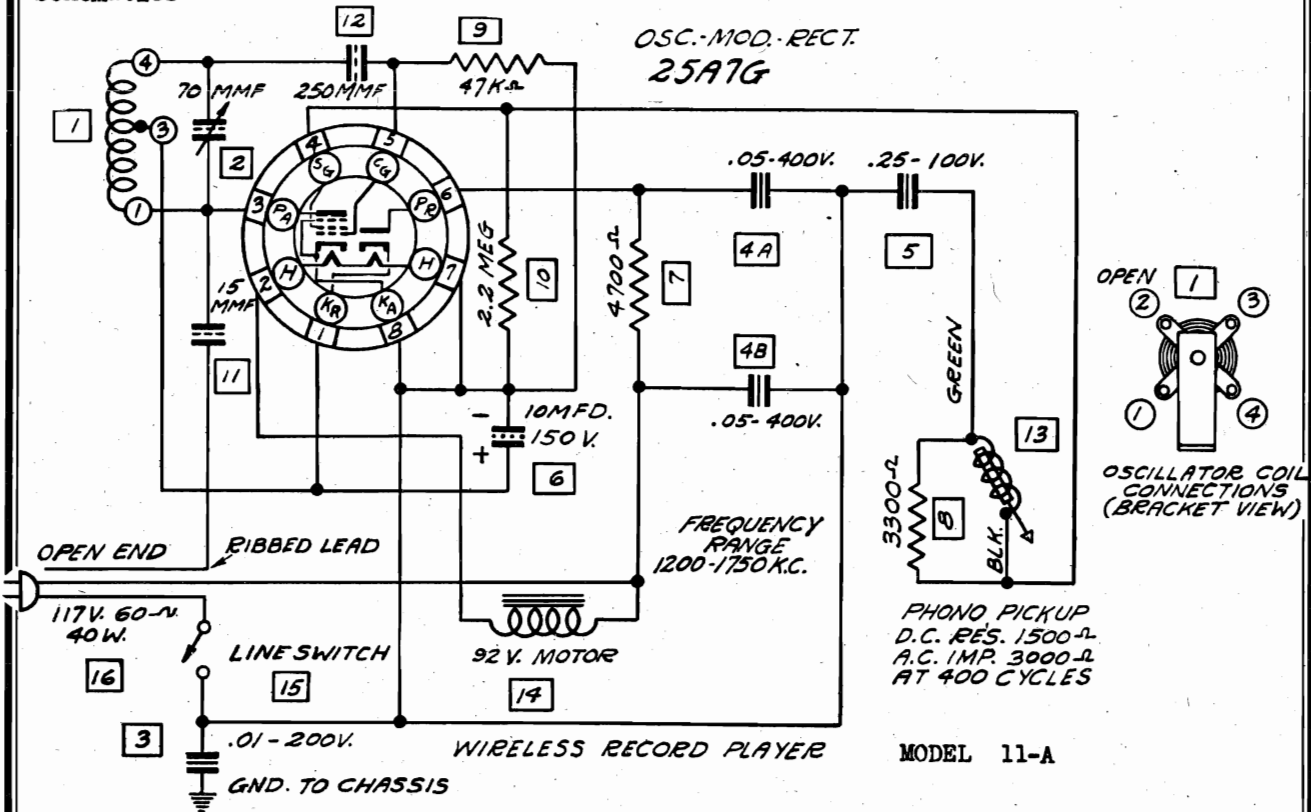
6. Friction Clutch Too Tight. A tension washer between the motor pinion and the brass pinion collar acts as a friction clutch to absorb the shock of stopping the motor quickly when a station is tuned. If the tension is too tight, the torque of the stopped motor will hold the latch bar tip in the notch.

SET DOES NOT TURN ON

1. "B" Fuse burned out (No. 55 Pilot Bulb). See Fig. 1.
2. Standby rectifier (black 84 tube) burned out.
3. Defective relay. See Fig. 1. Return to your Motorola distributor or factory for service. Relay plugs into socket in chassis base.

MODEL 11A
MODEL 21A
Wireless Record Players
Schematics

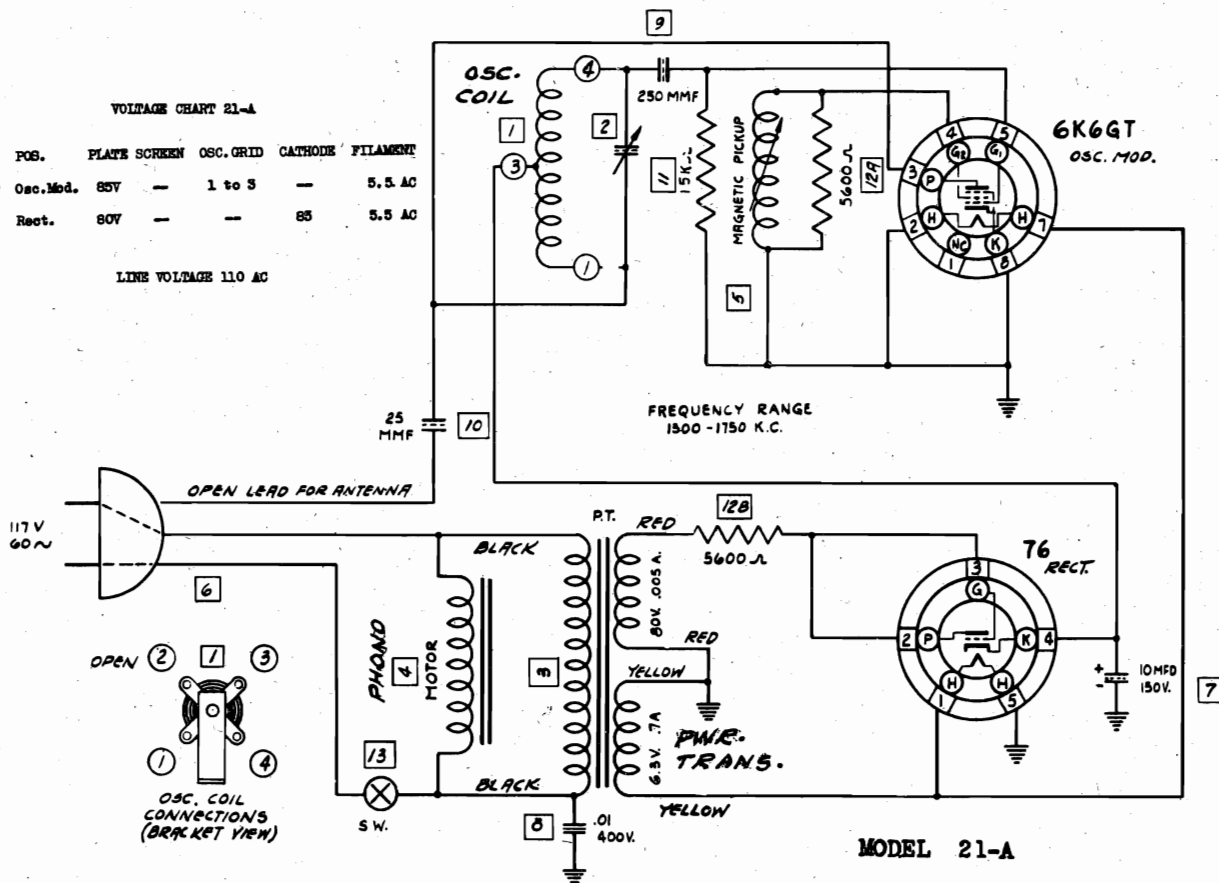
GALVIN MFG. CORP.



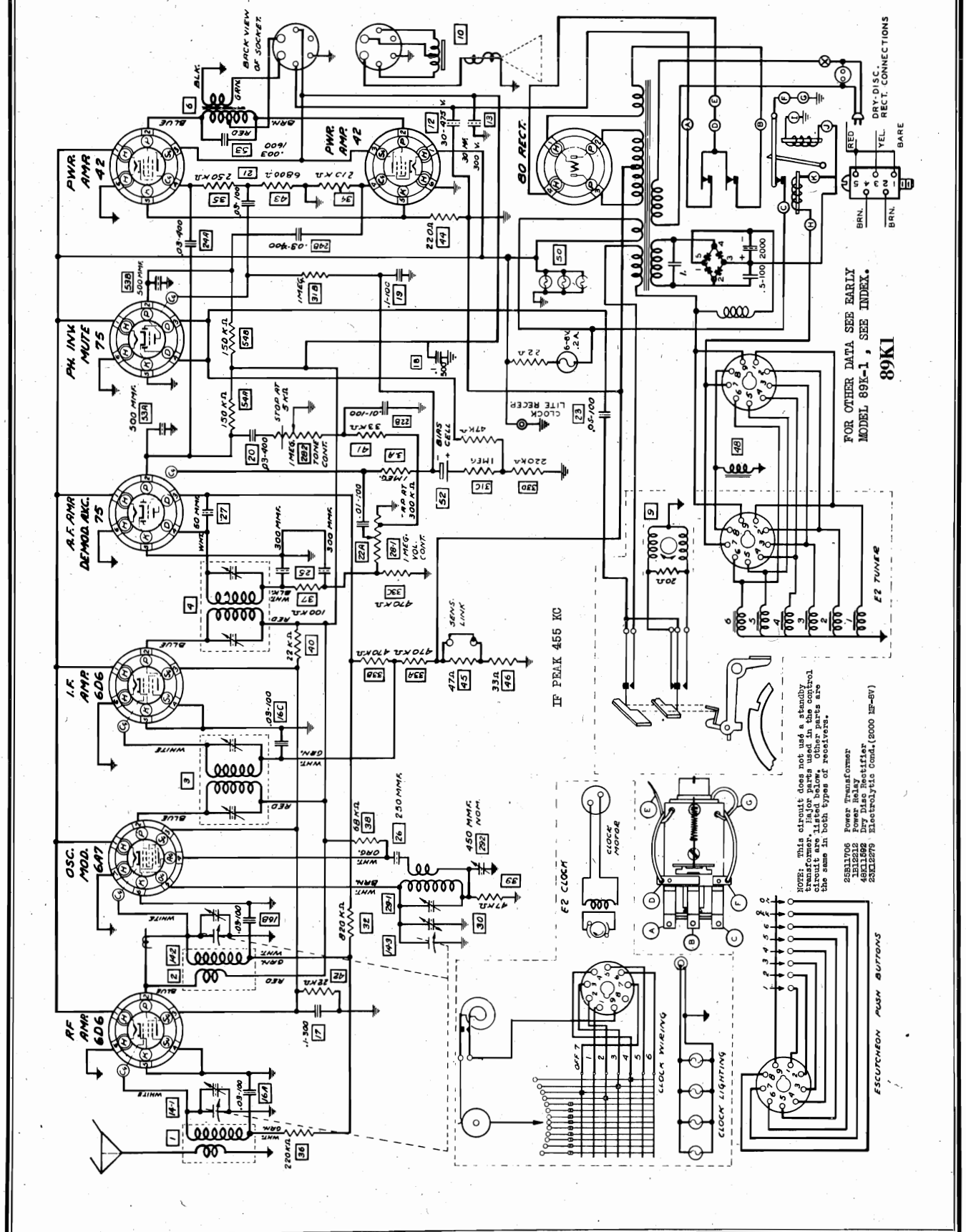
VOLTAGE CHART 21-A

| TUBE | POS. | PLATE | SCREEN | OSC. GRID | CATHODE | FILAMENT |
|-------|-----------|-------|--------|-----------|---------|----------|
| 6K6GT | Osc. Mod. | 85V | - | 1 to 3 | - | 5.5 AC |
| 76 | Rect. | 80V | - | - | 85 | 5.5 AC |

LINE VOLTAGE 110 AC



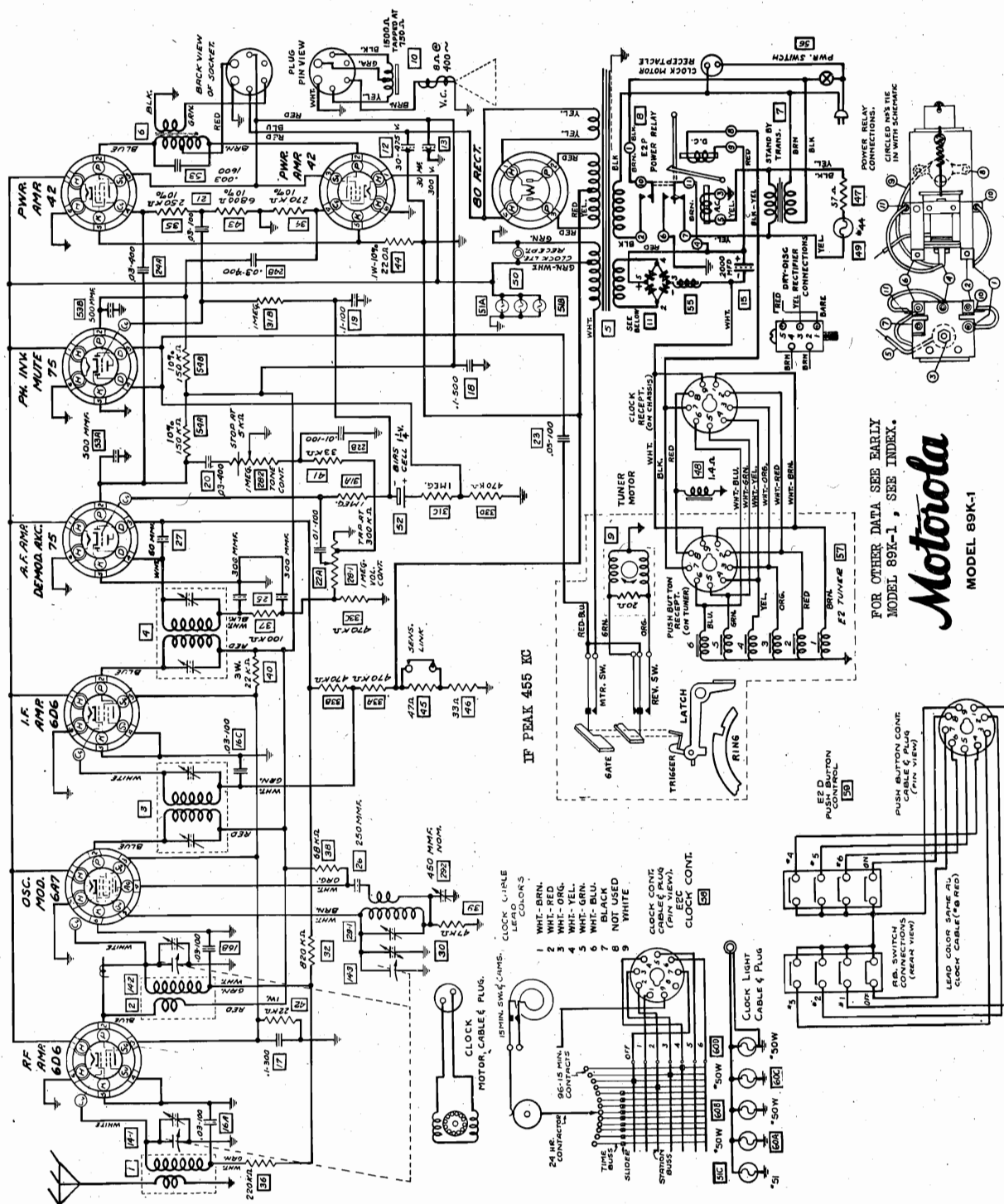
GALVIN MFG. CORP.

MODEL 89K1, Type 2
Schematic

FOR OTHER DATA SEE EARLY
MODEL 89K-1, SEE INDEX.

Motorola

MODEL 89K-1

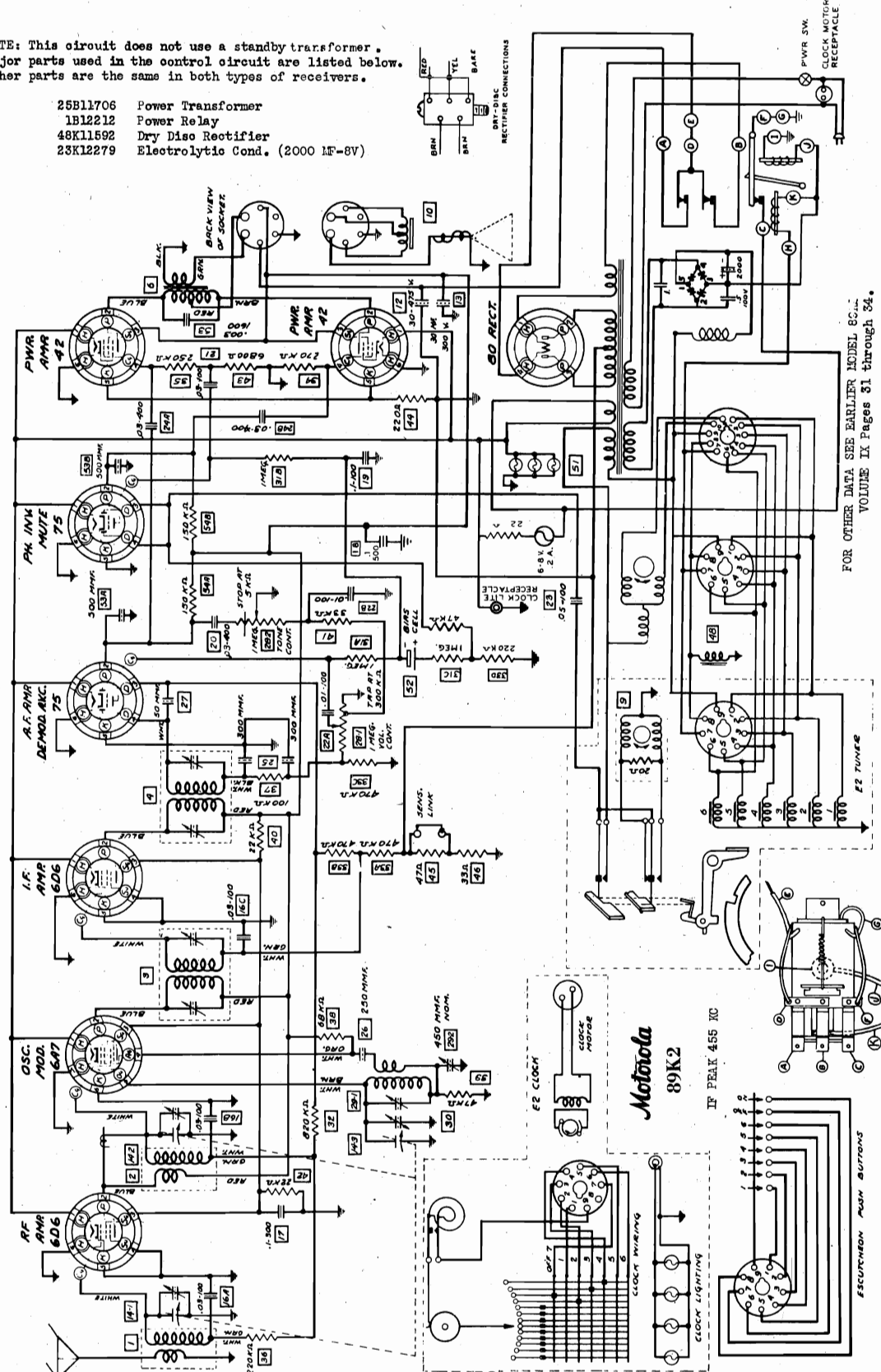
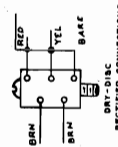


MODEL 89K2, Type 2
Schematic

GALVIN MFG. CORP.

NOTE: This circuit does not use a standby transformer.
Major parts used in the control circuit are listed below.
Other parts are the same in both types of receivers.

25B11706 Power Transformer
1B12212 Power Relay
48K11592 Dry Disc Rectifier
23K12279 Electrolytic Cond. (2000 MF-8V)



FOR OTHER DATA SEE EARLIER MODEL 89K2
VOLUME IX Pages 51 through 54.

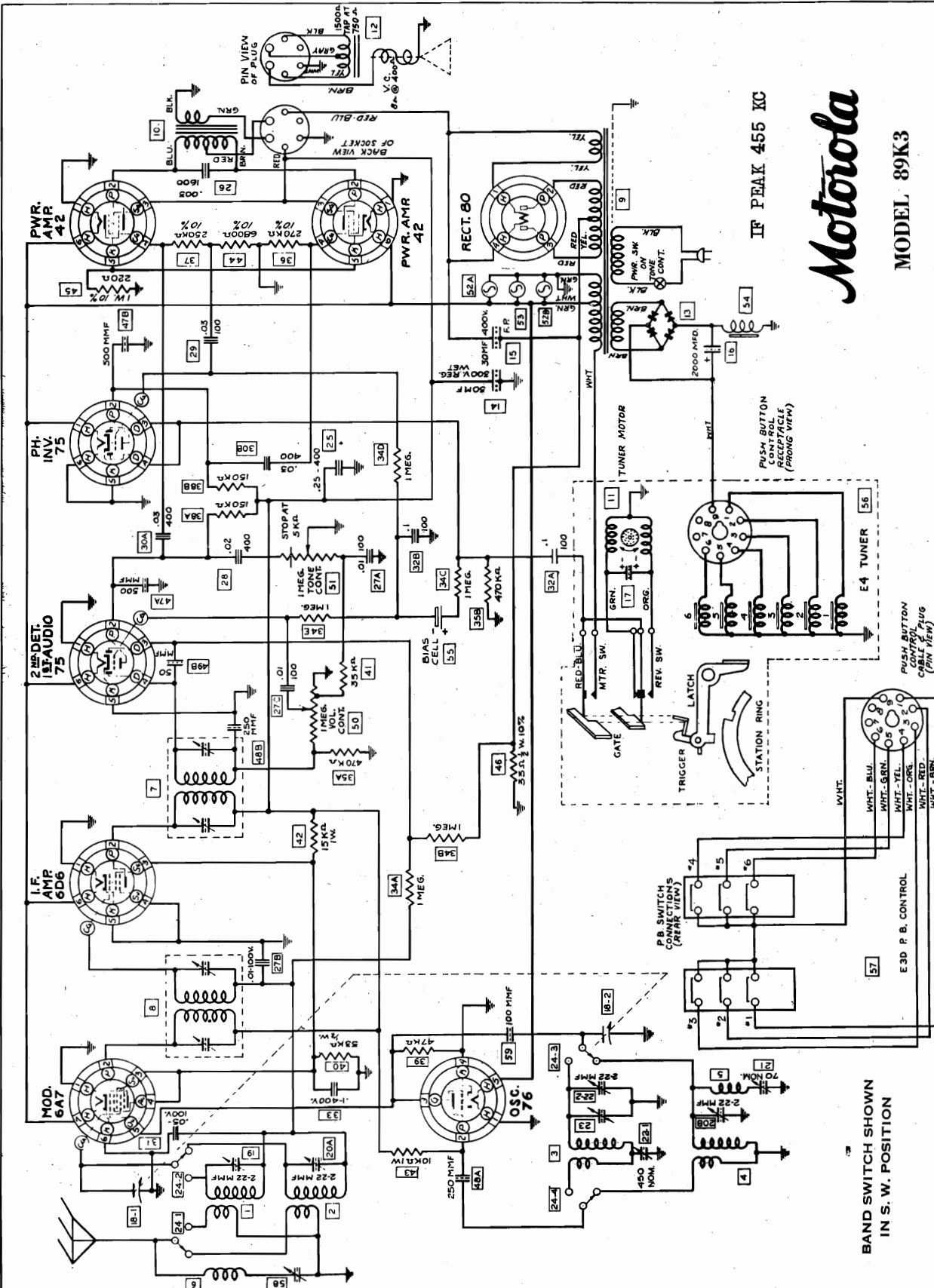
MODEL 89K3
Schematic

GALVIN MFG. CORP.

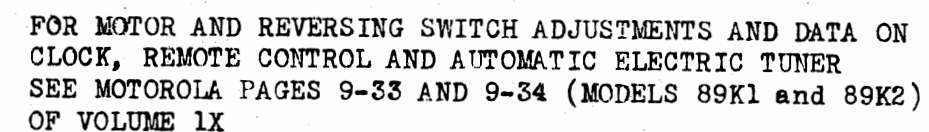
IF PEAK 455 KC

Motorola

MODEL 89K3



Motorola



MODEL 109K1, Types 1, 2

MODEL 109K2, Types 1, 2

Alignment, Voltage, Sensitivity, Trimmers

ALIGNMENT PROCEDURE—MODELS 109K1 AND 109K2

1. Connect signal generator to control grid of Modulator tube (6A8G) through a .05 MF. condenser and to chassis. Do not remove grid cap. Also connect output meter across speaker voice coil. Turn band switch to "Broadcast" position. Turn condenser gang completely out of mesh.

2. Set signal generator at 455 K.C. and carefully adjust the I.F. trimmers (located in top of I.F. coil cans) to point showing highest reading on output meter.

3. Leave band Switch in "Broadcast" position. Connect signal generator to antenna and ground terminals, using a .0002 MF condenser in antenna lead.

4. Set signal generator and receiver dial both at 1700 K.C. Adjust BC OSC. trimmer until 1700 K.C. signal is heard.

5. Set signal generator at 1400 K.C. and turn condenser gang to the signal at 1400 K.C. Adjust BC ANT. and BC RF trimmers to point showing highest reading on output meter.

6. Set signal generator at 600 K.C. and rock pointer at 600 K.C. position on dial scale, while adjusting BC paddler, until combination is found which gives highest output reading. (NOTE: If there is noise level at 600 K.C., paddler can be adjusted to maximum noise with-

MODEL 109K1, Type 2

Schematic

GALVIN MFG. CORP.

out rocking gang and without use of signal generator. (Use short wire for pick-up if necessary.)

7. Turn band switch to "Police" position. Replace .0002 MF condenser in signal generator lead with a 400 ohm carbon resistor.

8. Set signal generator and receiver dial both at 7.0 MC. Adjust POLICE OSC. trimmer until 7.0 MC signal is heard.

9. Set signal generator at 6.0 MC and turn condenser gang to signal at 6.0 MC. Adjust POLICE ANT. and POLICE RF trimmers to point giving greatest output reading, while slightly rocking condenser gang.

10. Turn band switch to "Short Wave" position, still using 400 ohm carbon resistor in antenna lead to signal generator.

11. Set signal generator and receiver dial both at 22.0 MC. Adjust SW OSC. trimmer until 22.0 MC signal is heard.

12. Set signal generator at 18 MC and turn condenser gang to the signal at 18 MC. Adjust SW ANT. and SW RF trimmers to point giving greatest output reading, while slightly rocking condenser gang.

13. Padders on "Police" and "Short Wave" bands are fixed. (No adjustment necessary).

SOCKET VOLTAGES—MODELS 109K1 AND 109K2

Numerals refer to socket terminals as indicated on circuit diagram.

| TUBE | POSITION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------|-----------|-----|-------|-----|-----|-----|----|-------|----|
| 6K7G | R.F. | 0 | 6. AC | 210 | 95 | 0 | 0 | 0 | 0 |
| 6J5G | Osc. | 0 | 6. AC | 130 | 0 | -25 | 0 | 0 | 0 |
| 6A8G | Mod. | 0 | 6. AC | 210 | 95 | -25 | 95 | 0 | 0 |
| 6K7G | I.F. | 0 | 6. AC | 210 | 95 | 0 | 0 | 0 | 0 |
| 6H6G | Det.-Avc. | 0 | 6. AC | -2 | 0 | 0 | 0 | 0 | 0 |
| 6Q7G | A.F. Mute | 0 | 6. AC | 115 | 0 | 0 | 0 | 0 | 0 |
| 6V7G | Ph. Inv. | 0 | 0. AC | 115 | 0 | 0 | 0 | 6. AC | 10 |
| 6F6G | Output | 0 | 6. AC | 240 | 250 | 0 | 0 | 0 | 10 |
| 6F6G | Output | 0 | 6. AC | 240 | 250 | 0 | 0 | 0 | 10 |
| 5Z3 | Rect. | 310 | AC | AC | 310 | | | | |

SENSITIVITY DATA—MODELS 109K1 AND 109K2

| Microvolt Input * | Generator Set at | Generator Connected to | Dummy Antenna Capacity | Leak Resistance | Output Meter ** |
|-------------------|------------------|------------------------|------------------------|-----------------|-----------------|
| 20,000 | 455 K.C. | 6K7G Grid (I.F.) | .1 MF | .5 Meg. | 2.82 Volts |
| 300 | 455 K.C. | 6A8G Grid | .1 MF | .5 Meg. | 2.82 Volts |
| 350 | 600 K.C. | 6A8G Grid | .1 MF | .5 Meg. | 2.82 Volts |
| 15 | 600 K.C. | 6K7G Grid (R.F.) | .1 MF | .5 Meg. | 2.82 Volts |
| 2 | 600 K.C. | Ant. Lead | .0002 MF | None | 2.82 Volts |

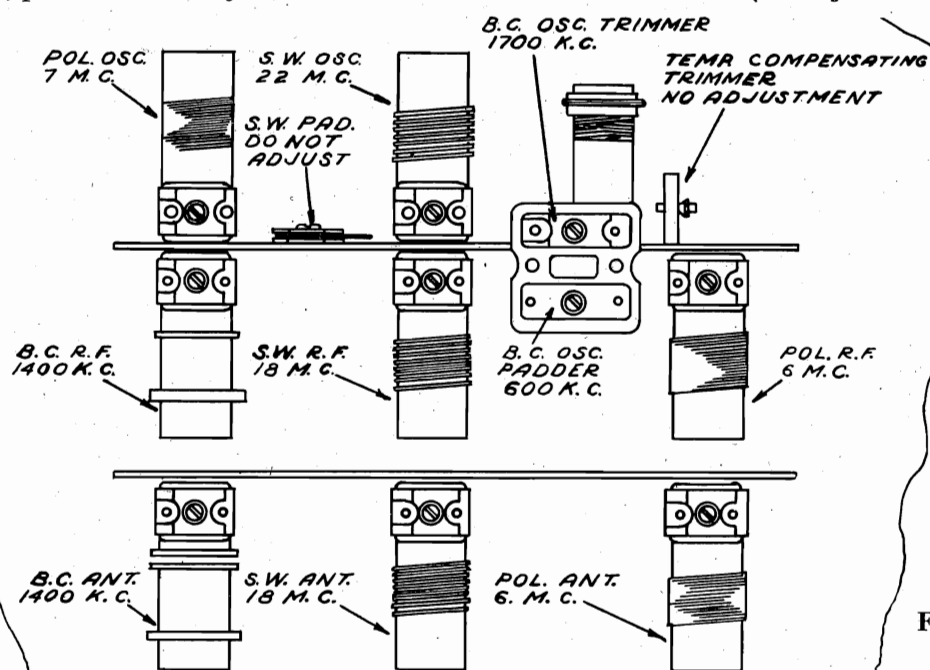
*For 1 Watt output.

**Output meter connected across voice coil.

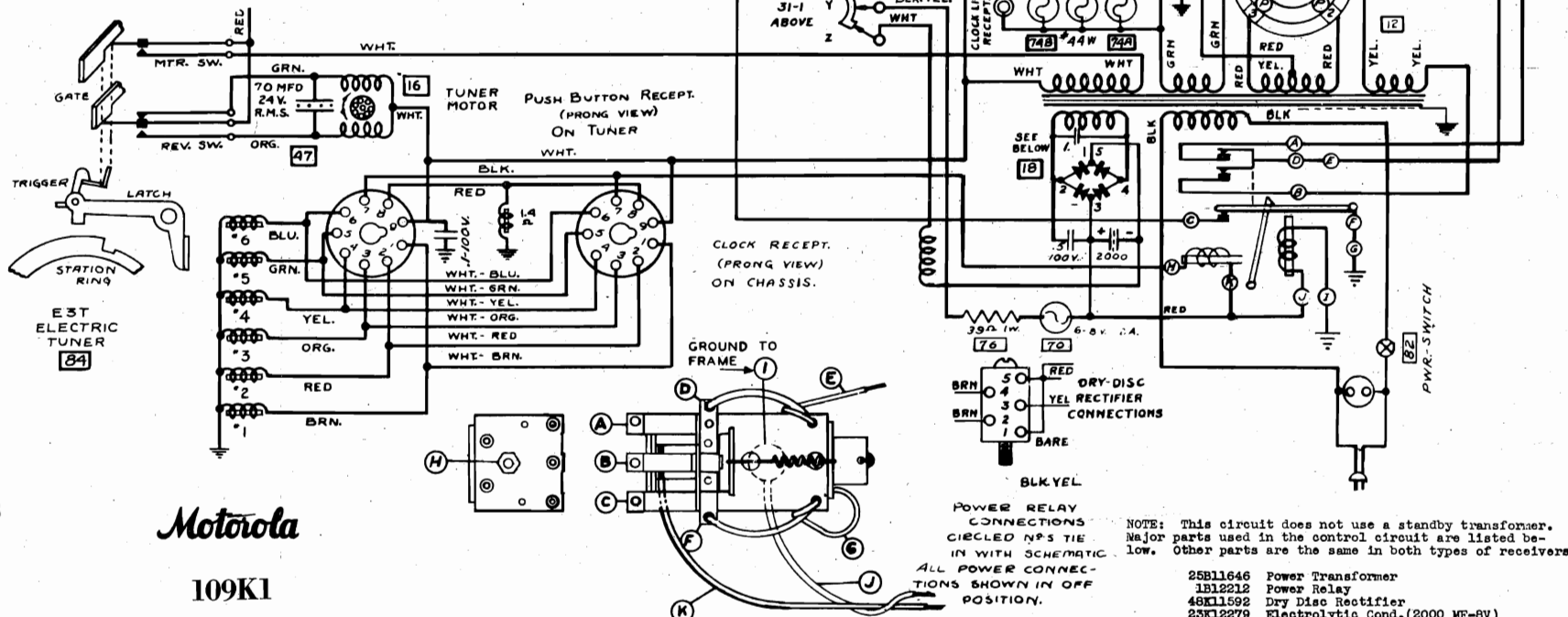
MOTOROLA 109K-1 2nd TYPE

OTHERWISE
SCHEMATIC
IS SAME AS
1st TYPE

IF PEAK 455 KC



109K1 AND 109K2 TRIMMERS

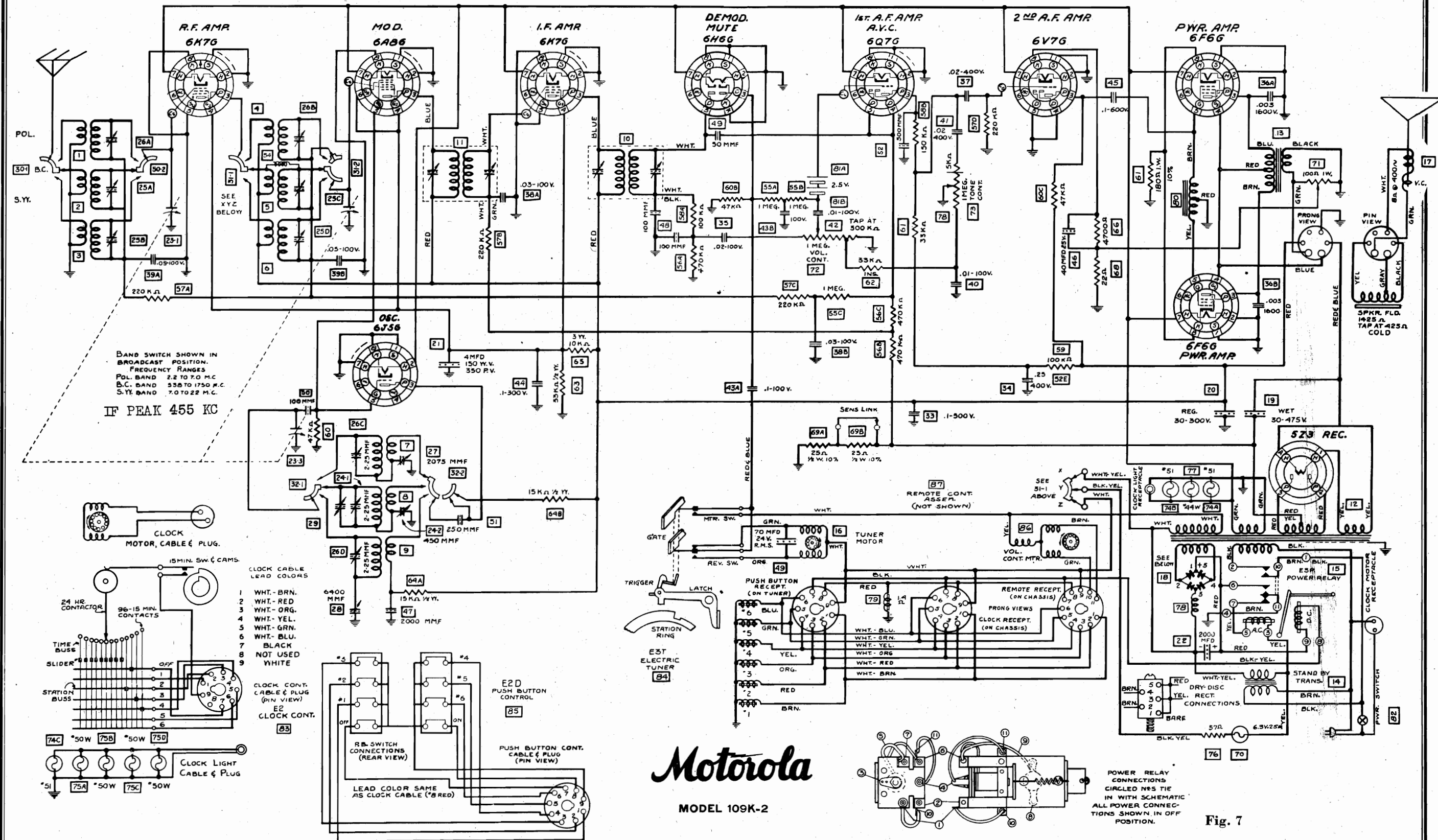


Motorola

109K1

GALVIN MFG. CORP.

FOR MOTOR AND REVERSING SWITCH ADJUSTMENTS AND DATA FOR CLOCK, REMOTE CONTROL,
AND AUTOMATIC ELECTRIC TUNER, SEE MOTOROLA PAGES 9-33 AND 9-34 (MODELS 89K1, 89K2) VOL. 1X



MODEL 89K3

Alignment, Trimmers, Voltage

Sensitivity, Switch Data

MODEL 109K2, Type 2

Schematic

Switch

Data

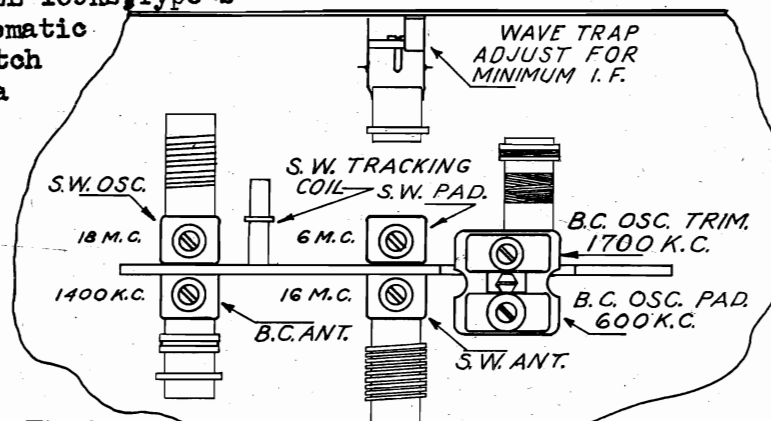


Fig. 9

89K3 TRIMMERS

SENSITIVITY DATA—MODEL 89K3

| Microvolt Input * | Generator Set at | Generator Connected to | Dummy Antenna Capacity | Leak Resistance | Output Meter ** |
|-------------------------|---------------------|------------------------------|------------------------------|--------------------|-----------------------|
| 2800 | 455 K.C. | 6D6 Grid | .1 MF | .5 Meg. | .65 Volts |
| 20 | 455 K.C. | 6A7 Grid | .1 MF | .5 Meg. | .65 Volts |
| 25 | 600 K.C. | 6A7 Grid | .1 MF | .5 Meg. | .65 Volts |
| 5 | 600 K.C. | Ant. Lead | .0002 MF | None | .65 Volts |

*For .05 Watts output.

****Output meter connected across voice coil.**

SOCKET VOLTAGES—MODEL 89K3

Numerals refer to socket terminals as indicated on circuit diagram.

| TUBE | POSITION | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|------|-------------------|-------|-----|-----|----|-----|---|---|
| 6A7 | Modulator | 6. V. | 220 | 80 | 80 | 0 | 0 | 0 |
| 6D6 | I.F. Amp. | 6. V. | 220 | 80 | 0 | 0 | 0 | |
| 75 | Diode Det. Avc-AF | 6. V. | 125 | 0 | -5 | 0 | 0 | |
| 75 | Phase Inv. | 6. V. | 125 | 0 | 0 | 0 | 0 | |
| 76 | Oscillator | 6. V. | 155 | 0 | 0 | 0 | | |
| 42 | Pwr. Audio Amp. | 6. V. | 250 | 220 | 0 | 13. | 0 | |
| 42 | Pwr. Audio Amp. | 0. V. | 250 | 220 | 0 | 13. | 6 | |
| 80 | Rectifier | 340 | AC | AC | DC | | | |

MODELS 89K3 AND 109K2

MOTOR AND REVERSING SWITCH ADJUSTMENTS

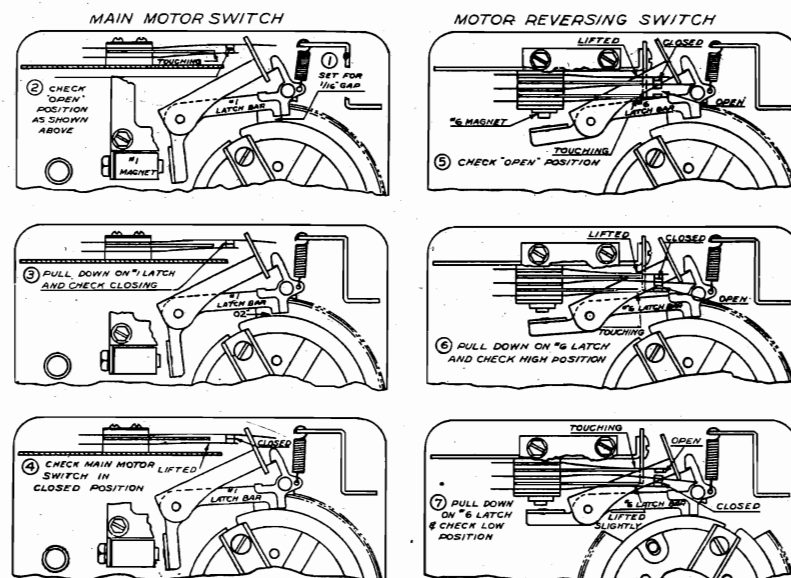
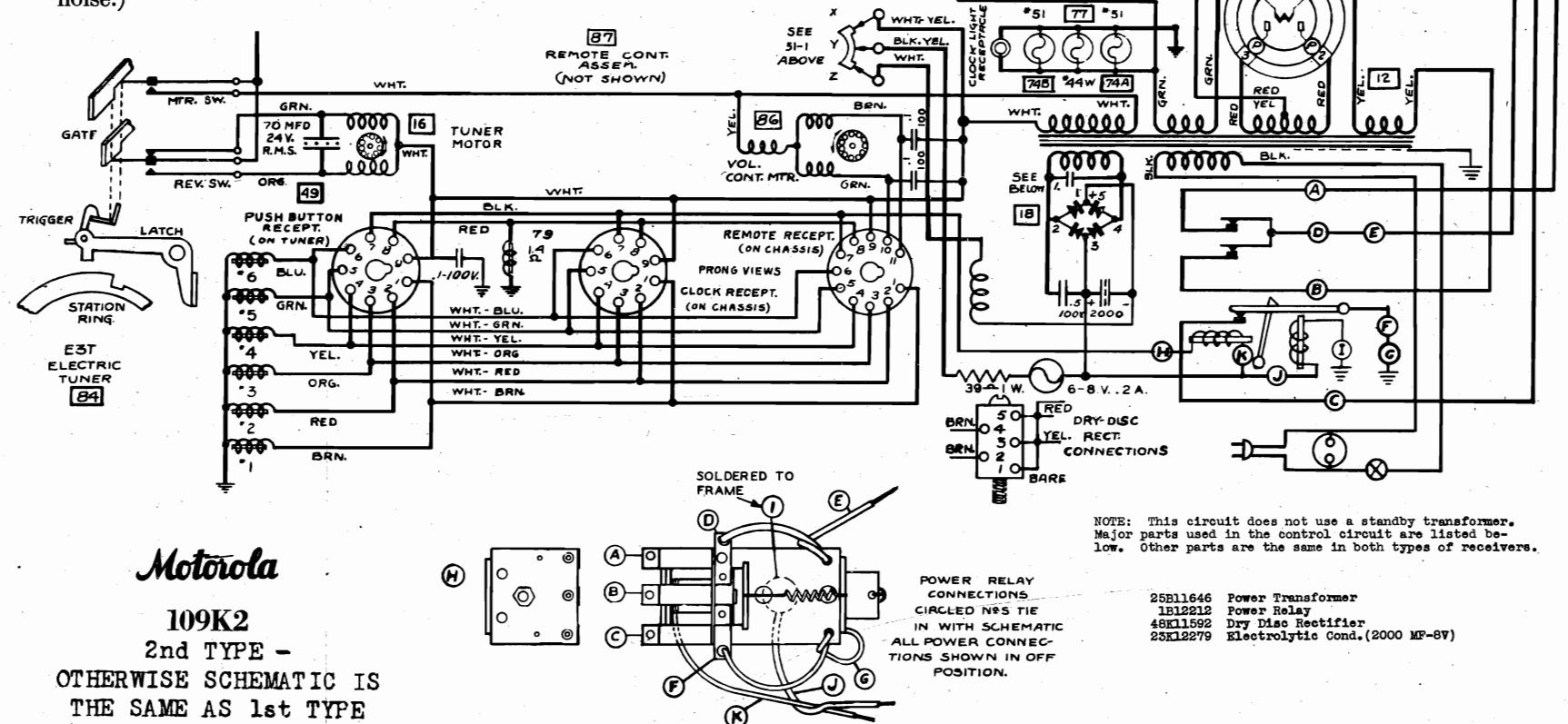


Fig. 1

GALVIN MFG. CORP.

ALIGNMENT PROCEDURE—MODEL 89K3

1. Connect signal generator to control grid of Mod. tube (6A7) through a .05 MF. condenser and to chassis. Do not remove grid cap. Also connect output meter across speaker voice coil. Turn band switch to "Broadcast" position. Turn condenser gang completely out of mesh.
2. Set signal generator at 455 K.C. and carefully adjust the four I.F. trimmers (located in top of I.F. coil cans) to point showing highest reading on output meter.
3. Leave band switch in "Broadcast" position. Connect signal generator to antenna and ground terminals, using a .0002 MF condenser in antenna lead.
4. Set signal generator at 455 K.C. and adjust wave trap trimmer for minimum deflection of output meter.
5. Set signal generator and receiver dial both at 1700 K.C. Adjust BC OSC. trimmer until 1700 K.C. signal is heard.
6. Set signal generator at 1400 K.C. and turn condenser gang to the signal at 1400 K.C. Adjust BC ANT. trimmer to point showing highest reading on output meter.
7. Set signal generator at 600 K.C. and rock pointer at 600 K.C. position on dial scale, while adjusting BC padder, until combination is found which gives highest output reading. (NOTE: If there is noise level at 600 K.C., padder can be adjusted to maximum noise without rocking gang and without use of signal generator. Use short wire for pick-up if necessary.)
8. Turn band switch to "Short Wave" position. Replace .0002 MF condenser in signal generator lead with a 400 ohm carbon resistor.
9. Set signal generator and receiver dial both at 18.0 MC. Adjust S.W. OSC. trimmer until 18.0 MC signal is heard.
10. Set signal generator at 16.0 MC and turn condenser gang to signal at 16.0 MC. Adjust S.W. ANT. trimmer to point giving greatest output reading. (Use non-metallic screw driver.)
11. Set signal generator at 6.0 MC and rock pointer at 6.0 MC position on dial scale, while adjusting S.W. padder, until combination is found which gives highest output reading. (NOTE: May also be adjusted to maximum noise.)



NOTE: This circuit does not use a standby transformer. Major parts used in the control circuit are listed below. Other parts are the same in both types of receivers.

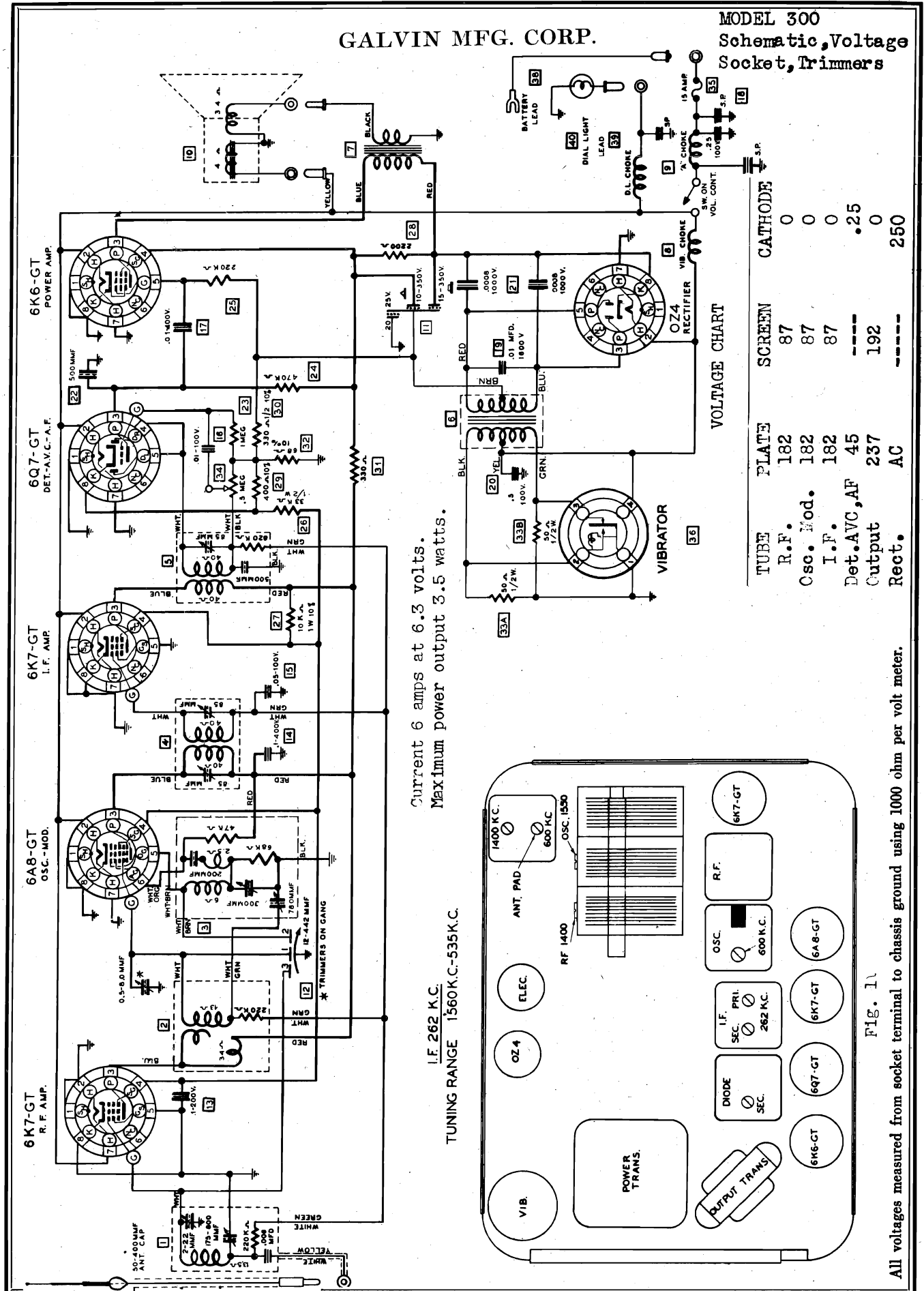
25B11646 Power Transformer
1B12212 Power Relay
48K11592 Dry Disc Rectifier
25K12279 Electrolytic Cond. (2000 MF-8V)

| | |
|----------|--------------------|
| 1B12212 | POWER Relay |
| 48K11592 | Dry Disc Rectifier |

23K12279 Electrolytic Cond.(

GALVIN MFG. CORP.

MODEL 300
Schematic, Voltage
Socket, Trimmers



[illegible]

Current - 6.5 Amps. at 6.3 Volts
Maximum power output - 3.5 Watts

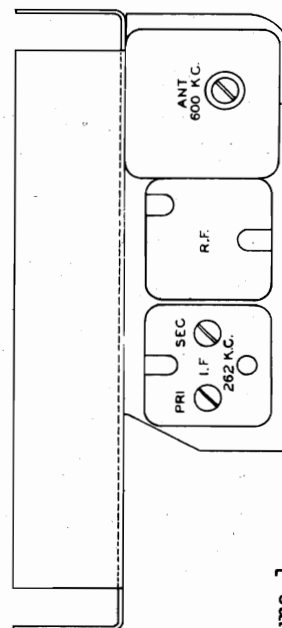
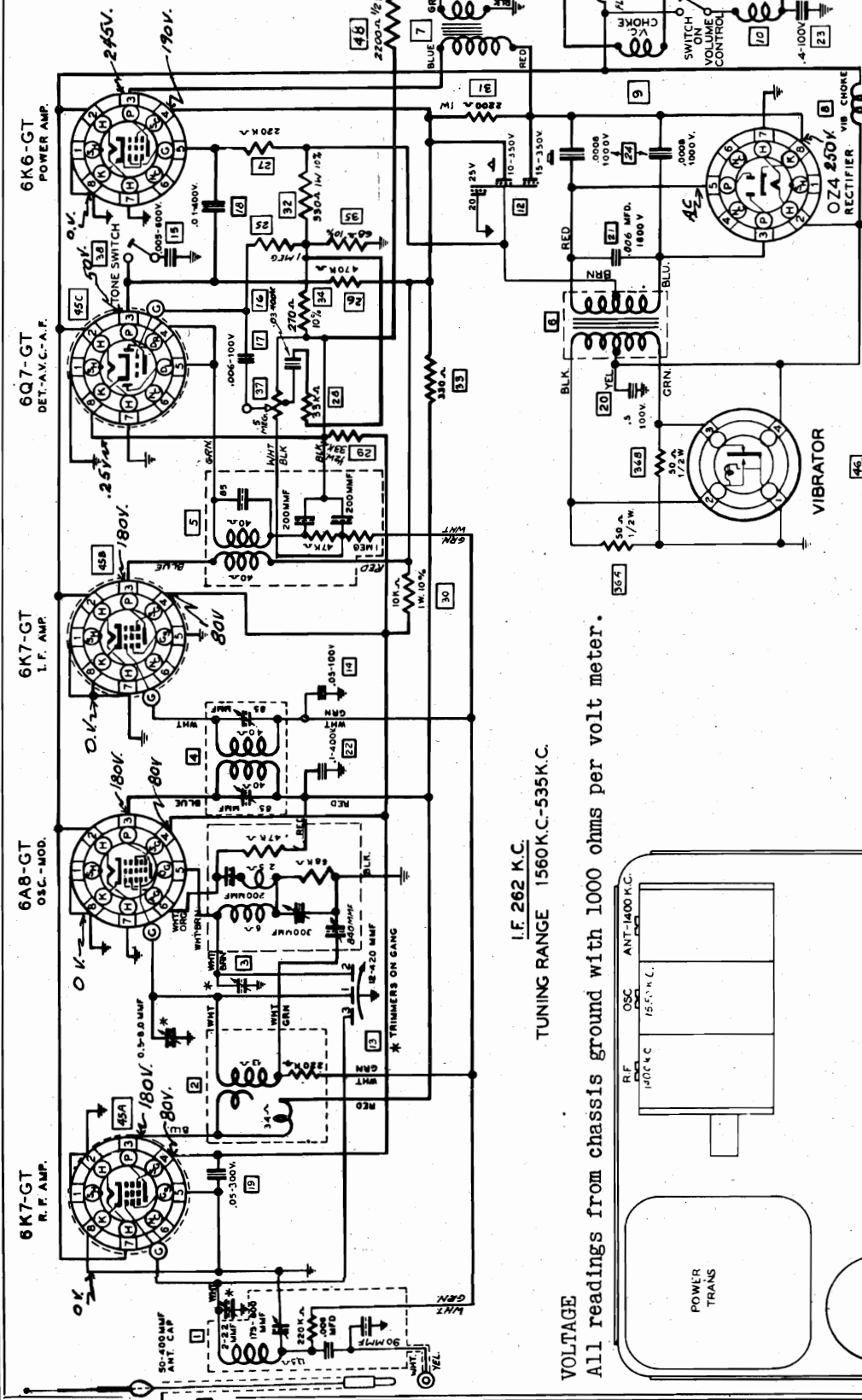


Figure 1

493320.57

GALVIN MFG. CORP.

MODEL 300
MODEL 350
Alignment, Sensitivity
Model 350

Place the chassis on the service bench with the speaker and battery connected to it. Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

NOTE: Do not adjust the trimmer in the Osc. coil can that is covered with Scotch Tape. The original adjustment, made in the factory should not be tampered with. (Fig. 1 below, shows all trimmer locations.)

I. F. ALIGNMENT

1. Connect the signal generator to the control grid of the Osc.-Mod. tube (6AG7) through a .1 MF condenser, having first removed the grid cap from the top of the tube. Connect a 500,000 ohm leak resistor from the grid of the tube to the grid cap just removed from the tube. Turn the condenser gang completely out of mesh. Connect an output meter across speaker voice coil.
2. Set the signal generator at 262 K.C. and carefully adjust the single trimmer in the Diode coil can to the point showing the highest reading on the output meter.
3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.
4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

SETTING THE RANGE

1. Connect the signal generator to the control grid of the R.F. tube (6K7GT) using the same Motorola Booster Antenna, a special dummy antenna Motorola part No. 1X18018 must be used in series with the lead from the signal generator to the antenna receptacle. Change the signal generator to the .1 MF condenser.
2. Set the signal generator at 1550 K.C. and with the condenser gang completely out of mesh adjust the 1550 K.C. oscillator trimmer to the point showing the highest output reading.
3. Set the signal generator at 535 K.C. Turn the condenser gang completely in mesh and adjust just the 1400 K.C. antenna trimmer on the condenser gang for maximum output reading.
4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

R.F. and ANTENNA ALIGNMENT

NOTE: If the radio is to be operated on a

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a special dummy part 1X18018 in place of the .1 MF.*** It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

| AVERAGE MICROVOLT INPUT * | GENERATOR SET AT | GENERATOR FEEDER CONNECTED TO | DUMMY ANTENNA CAPACITY | LEAK RESISTANCE | OUTPUT METER READINGS ** |
|---------------------------|------------------|-------------------------------|------------------------|-----------------|--------------------------|
| 25,000 | 455 K.C. | I.F. Grid | .1 MF | .5 Meg | 1.76 Volts |
| 535 | 455 K.C. | Mod. Grid | .1 MF | .5 Meg | 1.76 Volts |
| 615 | 600 K.C. | Mod. Grid | .1 MF | .5 Meg | 1.76 Volts |
| 30 | 600 K.C. | R.F. Grid | .1 MF | .5 Meg | 1.76 Volts |
| 7 | 600 K.C. | Ant. Lead | 40 MUF *** | None | 1.76 Volts |

* For one watt output

** Meter connected across voice coil

1.76 Volts equals 1 watt output for 3 ohm voice coil

*** Use special dummy part No. 1X18018, or M434B booster coil Part No. 17908 in series with 25 MUF cond. If a Motorola Booster antenna is used.

Model 300**ALIGNMENT PROCEDURE**

Place the chassis on the service bench with the speaker and battery connected to it. Turn the volume control to maximum position and leave it there throughout the alignment, reducing the signal generator output if necessary.

NOTE: Do not adjust the trimmer in the Osc. coil can that is covered with Scotch Tape. The original adjustment, made in the factory should not be tampered with. (Fig. 1/below, shows all trimmer locations.)

I. F. ALIGNMENT

1. Connect the signal generator to the control grid of the Osc.-Mod. tube (6AG7) through a .1 MF condenser, having first removed the grid cap from the top of the tube. Connect a 500,000 ohm leak resistor from the grid of the tube to the grid cap just removed from the tube. Turn the condenser gang completely out of mesh. Connect an output meter across speaker voice coil.
2. Set the signal generator at 262 K.C. and carefully adjust the single trimmer in the Diode coil can to the point showing the highest reading on the output meter.
3. Adjust the two trimmers in the I.F. coil can to the point showing the highest output reading.
4. Repeat the I.F. and Diode adjustment several times for maximum accuracy.

SETTING THE RANGE

1. Connect the signal generator to the control grid of the R.F. tube (6K7GT) using

SENSITIVITY AND STAGE GAIN MEASUREMENTS

All stage gain measurements must be made with the volume control set for full volume. The shielded lead from the signal generator is connected to the grid terminal of the tube through a .1 MF condenser, with a 500M ohm resistor connected as a leak resistance between the grid of the tube and the grid lead which has been removed.

When measuring over-all sensitivity at the antenna terminal, use a special dummy, part No. 1X18018, in place of the .1 MF.*** It must be remembered that the figures in the table are average and allowance must be made for variations between two sets of the same general type, due to difference of tube characteristics, etc.

| AVERAGE MICROVOLT INPUT * | GENERATOR SET AT | GENERATOR FEEDER CONNECTED TO | DUMMY ANTENNA CAPACITY | LEAK RESISTANCE | OUTPUT METER READINGS ** |
|---------------------------|------------------|-------------------------------|------------------------|-----------------|--------------------------|
| 38,000 | 262 K.C. | I.F. Grid | .1 | .5 Meg | 1.76 |
| 1,200 | 262 K.C. | Mod. Grid | .1 | .5 Meg | 1.76 |
| 1,200 | 600 K.C. | Mod. Grid | .1 | .5 Meg | 1.76 |
| 60 | 600 K.C. | R.F. Grid | .1 | .5 Meg | 1.76 |
| 11 | 600 K.C. | Ant. Lead | *** | None | 1.76 |

* For one watt output.

** Meter connected across voice coil.

1.76 volts equals 1 watt output for 3 ohm voice coil.

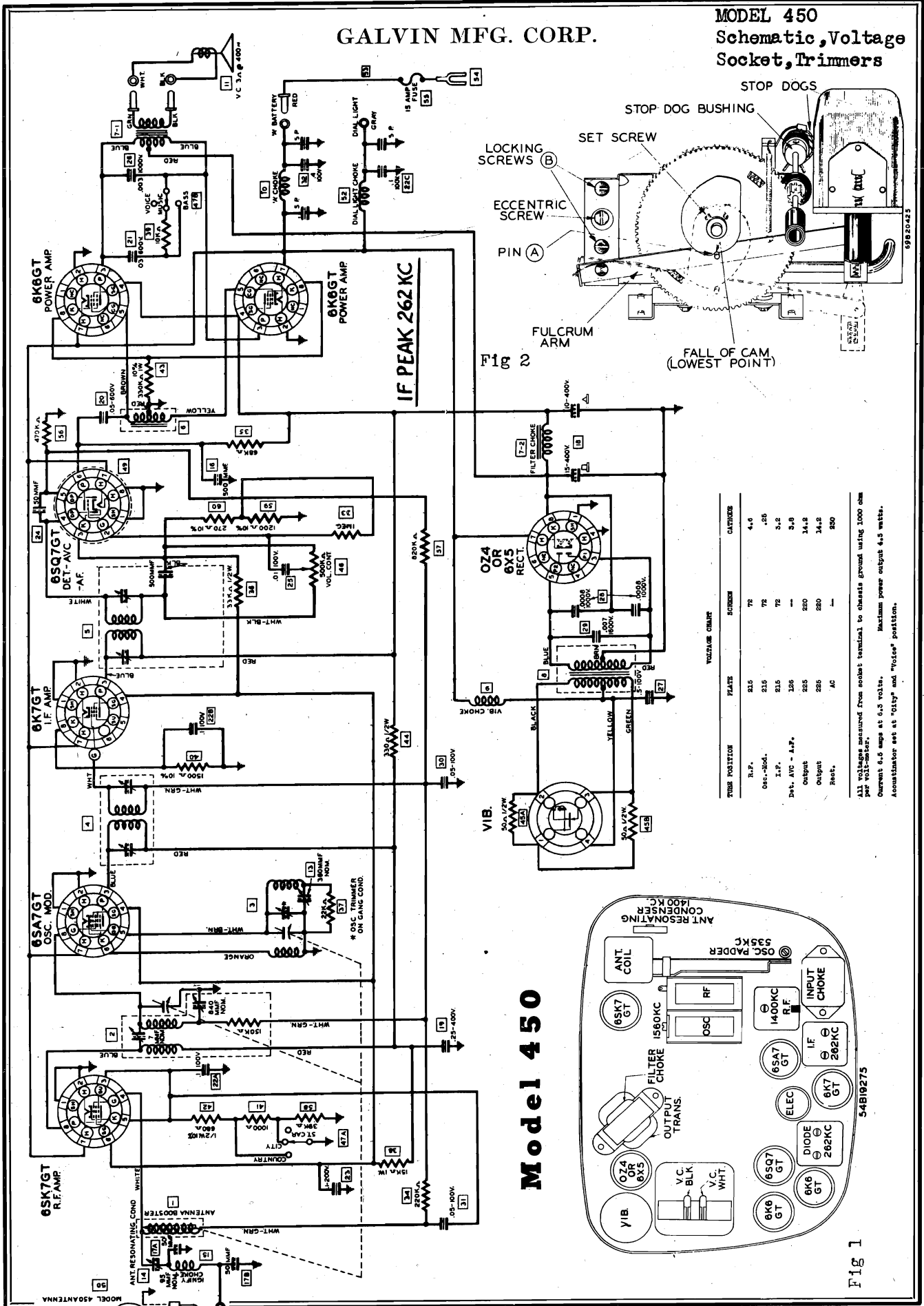
*** Use special dummy part No. 1X18018.

NOTE: If set is not used with a Motorola Booster antenna, substitute a 40 MUF condenser for the Special Dummy.

[illegible]

All voltages measured from socket terminal to chassis ground using 1000 ohm per volt-meter.
Current 6 amps. at 6.3 volts. Maximum power output 4.25 watts.

GALVIN MFG. CORP.

MODEL 450
 Schematic, Voltage
 Socket, Trimmers


GAMBLE-SKOGMO INC.

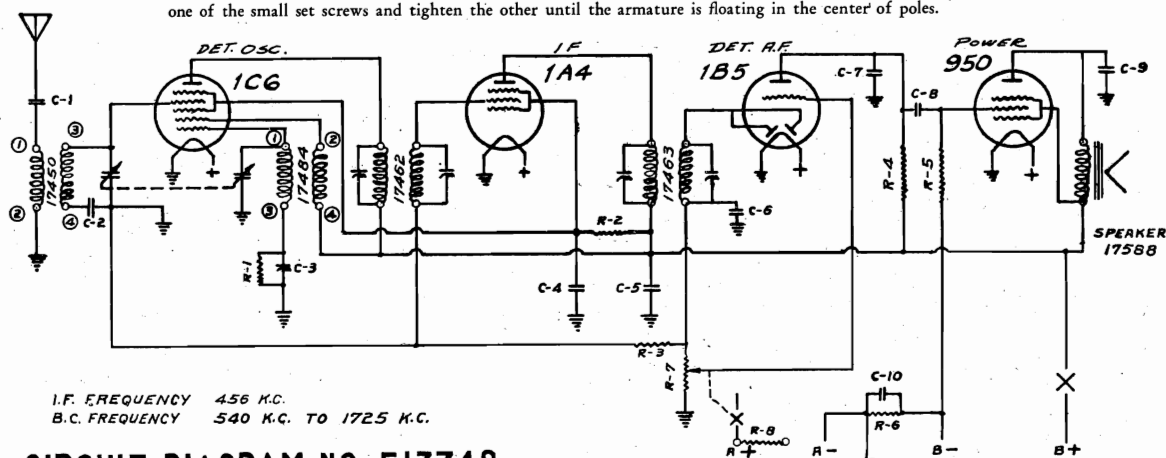
MODEL 6B Power Converter
MODEL 540, Late
Schematics

K.R.C. 8-18-36

SPEAKER. This model is equipped with a balanced armature magnetic speaker. Should the armature "strike", causing a rattle or distortion, proceed as follows:

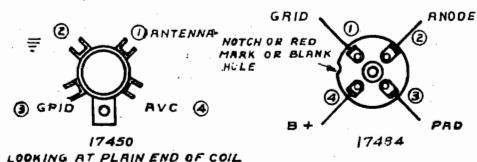
QUAM TYPES (used on early production). Bend bracket holding armature snubber cup up or down until armature centers. This bracket is located on bottom of magnet housing.

WRIGHT DECOSTER TYPE. To center armature: remove small aluminum plate on bottom of magnet housing, loosen one of the small set screws and tighten the other until the armature is floating in the center of poles.

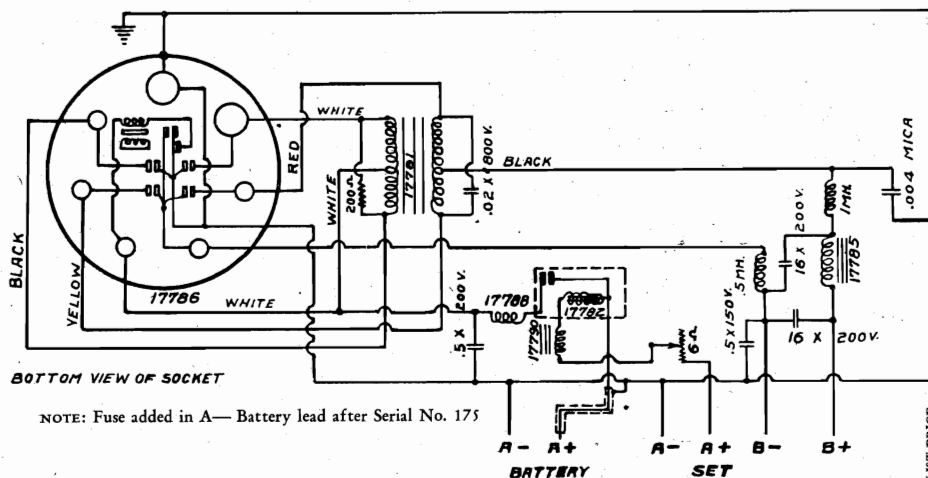


CIRCUIT DIAGRAM NO. E17749

MODEL 540 LATE



| | | | | |
|------|------------------------|-------|-----|--|
| C-1 | .01 | 200V. | R-1 | 500000 OHMS |
| C-2 | .05 | 200V. | R-2 | 15 000 OHMS |
| C-3 | 500 MMF. PAD | | R-3 | 2000 000 OHMS |
| C-4 | .05 | 200V. | R-4 | 250 000 OHMS |
| C-5 | .25 | 200V. | R-5 | 1000000 OHMS |
| C-6 | .0005 | 600V. | R-6 | 400 OHMS |
| C-7 | .0005 | 600V. | R-7 | 500 000 OHMS VOL. CONT. #17589 |
| C-8 | .01 | 200V. | R-8 | 2.5 V. WIRE WOUND USE WHEN SET IS USED WITH 3V. A BATTERY OR 4 DRY CELLS CONNECTED SERIES PARALLEL |
| C-9 | .002 | 600V. | | |
| C-10 | 10 x 25V. ELECTROLYTIC | | | |



NOTE: Fuse added in A— Battery lead after Serial No. 175

CIRCUIT DIAGRAM 6 VOLT POWER UNIT

Diagnosis of Troubles

6-B POWER CONVERTER

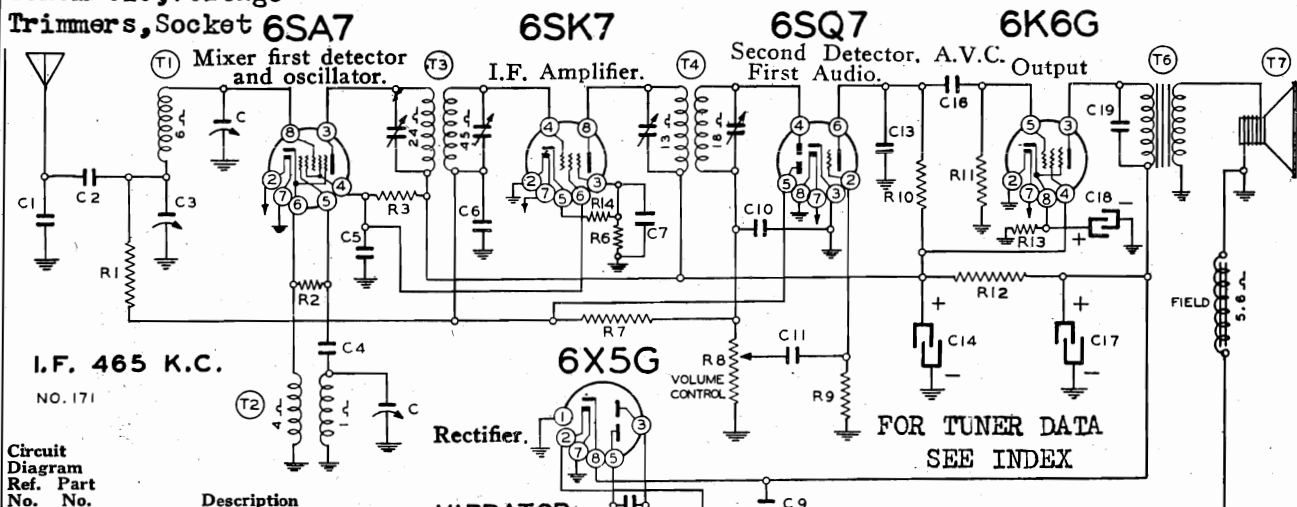
| EFFECT | CAUSE |
|---|--|
| Does not operate | Storage Battery run-down. Battery connections loose. Relay not closing—heavy red or black battery wires may be twisted inside unit and holding relay armature open. "Blown" fuse—check all wiring before inserting new fuse. A defective vibrator will also "blow" the fuse. A good vibrator will have a smooth "hum" when holding your ear close to the unit; a worn vibrator will "sputter". |
| R. F. "Hash" noise in set, usually a frying-buzzing sound | A good antenna and ground must be used on the set. Power unit should be located away from the set by the length of the cable. On sets having short wave bands, noise may always be noticed on some parts of the band but is usually not objectionable. |
| High battery drain | The total drain on the six volt battery should be approximately one ampere plus the normal "A" drain of the set. Example: with model 650, 1 amp. plus .5 amp. total 1.5 amps. Excessive drain may be caused by defective transformer, vibrator, or filter condenser in the power unit or defective switch or by pass condenser in the set. |

| PART NO. | DESCRIPTION | LIST PRICE |
|----------|---------------------------------------|------------|
| 17785 | Asb.—"A" Choke | 2.50 |
| 17825 | Asb.—Cable & Markers | 1.50 |
| 17828 | Asb.—Wire Battery "A" Plus | .70 |
| 17829 | Asb.—Wire Battery "A" Minus | .50 |
| 17790 | Choke—Filter "B" | .30 |
| 17788 | Choke—R. F. "A" | .30 |
| 17794 | Choke—5 M. H. | .30 |
| 17795 | Choke—1 M. H. | .30 |
| 17806 | Clip—Battery "Plus" | .18 |
| 17807 | Clip—Battery "Minus" | .18 |
| 4925 | Clip—Fuse | .04 |
| 17808 | Condenser—Electrolytic 16 x 200 R. H. | .90 |
| 17809 | Condenser—Electrolytic 16 x 200 L. H. | .90 |
| 17093 | Condenser—Mica .004 | .30 |
| 17811 | Condenser—Tubular .02 x 800 | .20 |
| 17813 | Condenser—Tubular (Braid) .5 x 150 | .40 |
| 17303 | Condenser—Tubular .5 x 200 | .30 |
| 17832 | Fuse—Auto 5-Amp. Low Resistance | .06 |
| 17796 | Knob—Control | .20 |
| 17782 | Relay | 1.60 |
| 17787 | Resistor—Carbon 1 Watt 200 Ohm | .20 |
| 17757 | Rheostat | .60 |
| 17789 | Socket—Plain 7-Prong | .20 |
| 17781 | Transformer | 2.50 |
| 17786 | Vibrator—Unit | 3.50 |

MODEL 577D

Serial 214845 up
Schematic, Voltage
Trimners, Socket

GAMBLE-SKOGMO INC.



Circuit
Diagram
Ref. Part
No. No.

Description
RESISTORS

| | | |
|-----|--------|----------------------------|
| R1 | 13011 | 250M ohm— $\frac{1}{2}$ w. |
| R2 | 130236 | 30M ohm— $\frac{1}{2}$ w. |
| R3 | 130307 | 15M ohm—1 watt |
| R4 | 13060 | 100 ohm— $\frac{1}{2}$ w. |
| R5 | 13060 | 100 ohm— $\frac{1}{2}$ w. |
| R6 | 13070 | 500 ohm— $\frac{1}{2}$ w. |
| R7 | 1304 | 3 megohm— $\frac{1}{2}$ w. |
| R8 | 101110 | 1 megohm volume control |
| R9 | 130257 | 5 megohm— $\frac{1}{2}$ w. |
| R10 | 13011 | 250M ohm— $\frac{1}{2}$ w. |
| R11 | 1303 | 500M ohm— $\frac{1}{2}$ w. |
| R12 | 130199 | 1500 ohm—1 watt |
| R13 | 130308 | 750 ohm—1 watt |
| R14 | 130174 | 50 ohm— $\frac{1}{2}$ w. |

CONDENSERS

| | | |
|-----|--------|---------------------------|
| C | 10269 | 2 gang variable condenser |
| C1 | 1293 | .00002 mica |
| C2 | 10055 | .01 x 400 volts |
| C3 | 12434 | Adj. Antenna Trimmer |
| C4 | 12921 | .0002 mica |
| C5 | 100115 | .05 x 400 v. |
| C6 | 1009 | .05 x 200 v. |
| C7 | 10020 | .1 x 200 v. |
| C8 | 10034 | .005 x 1200 v. |
| C9 | 12912 | .00025 mica |
| C10 | 1295 | .0001 mica |
| C11 | 10025 | .002 x 600 v. |

| | | |
|-----|--------|---------------------------|
| C12 | 10031 | .5 x 120 v. |
| C13 | 1292 | .0005 mica |
| C14 | 119105 | 15 ufd. lytic x 350 v. v. |
| C15 | 10031 | .5 x 120 v. |
| C16 | 10078 | .01 x 200 v. |
| C17 | 119105 | 15 ufd. lytic x 350 v. v. |
| C18 | 119105 | 20 ufd. lytic x 25 v. v. |
| C19 | 10087 | .01 x 600 v. |

C14, C17 and C18 in same unit

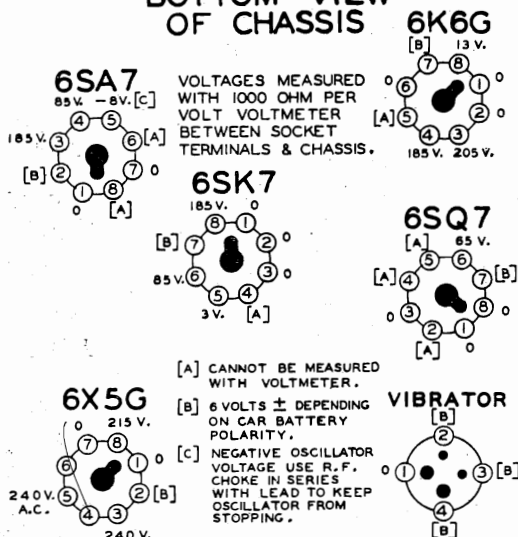
PARTS

| | | |
|----|--------|--------------------------|
| T1 | 11195B | Antenna Coil |
| T2 | 110146 | Oscillator Coil |
| T3 | 108139 | Input I. F. Coil—465 kc. |

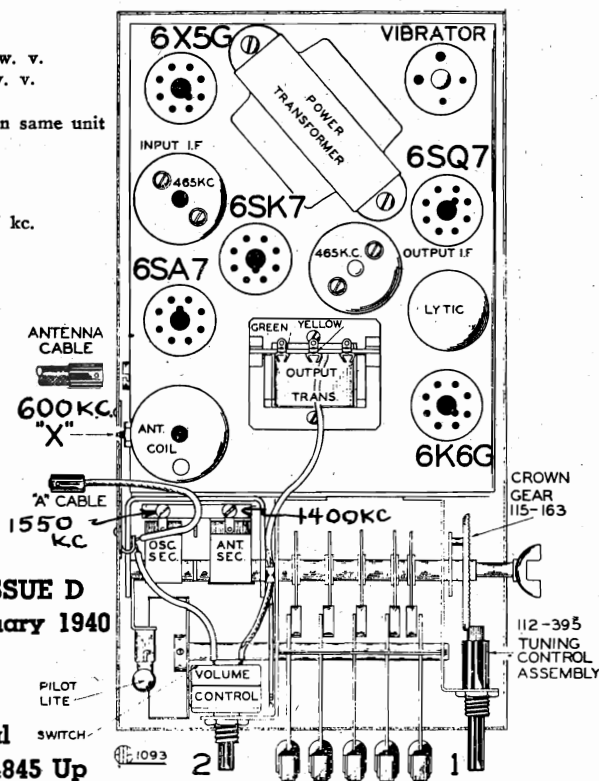
| | | |
|------|----------|------------------------------------|
| T4 | 108121B | Output I. F. Coil—465 kc. |
| T5 | 104131 | Power Transformer |
| T6 | 10567 | Output Transformer |
| T7 | 114114-R | 5" Dynamic Speaker (5.6 ohm field) |
| L1 | 10568 | "A" Choke |
| L2 | 10566 | "A" Choke |
| S1 | | Switch on volume control |
| P1 | 10797 | Pilot light (T51) 6-8 volts |
| S.P. | 11749 | (2) Spark Plates |

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

BOTTOM VIEW
OF CHASSIS



REAR OF CHASSIS



577 ISSUE D
January 1940

Serial
No. 214845 Up

ADJUST ANTENNA TRIMMER

FIG. 3—TOP VIEW

Tune in a weak signal at approximately 600 K.C. with volume control about three-fourths on. Adjust trimmer screw "X" until maximum output is obtained.

GAMBLE-SKOGMO INC.

MODEL 571, Series A
Serial 189300 up
Schematic, Voltage
Socket, Trimmers

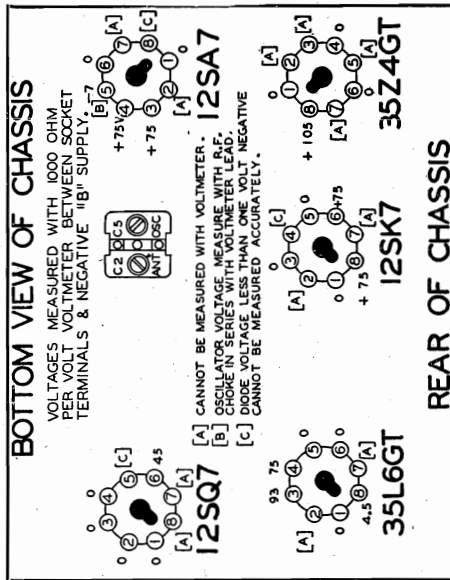


FIG. 3-BOTTOM VIEW

Power Consumption 800 Milliwatts Undistorted, 1.2 Watts Maximum

Power Output 35 Watts

Circuit Diagram Ref. Part No.

Description

RESISTORS

20M ohm-1/2 w.

25 ohm-1/2 w.

50 ohm-1/2 w.

1 Megohm-1/2 w.

5 Megohm-1/2 w.

100K ohm-1/2 w.

150M ohm-1/2 w.

250M ohm-1/2 w.

150 ohm-1/2 w.

150 ohm-1 w.

CONDENSERS

.002 Washer Condenser (Ant. Clip

on Ant. Plate)

Ant. Section Dual Trimmer

.0005 Mica

1 x 400 v.

Osc. Section Dual Trimmer

1 x 400 v.

1 x 400 v.

1 x 400 v.

1 x 400 v.

1 x 400 v.

1 x 400 v.

1 x 400 v.

1 x 400 v.

1 x 400 v.

1 x 400 v.

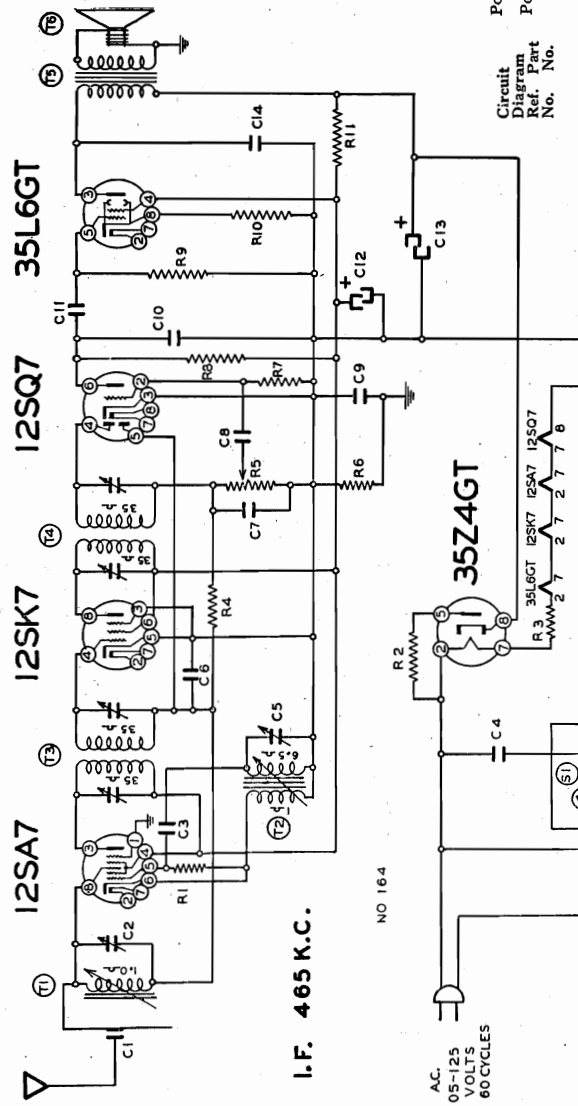
1 x 400 v.

1 x 400 v.

1 x 400 v.

1 x 400 v.

1 x 400 v.



The type and function of each tube is as follows:

1-Type 12SA7 Mixer, First Detector-oscillator.

1-Type 12SK7 I. F. Amplifier.

1-Type 12SQ7 Second Detector, A.V.C. and First Audio.

1-Type 35L6GT Beam Output Amplifier.

1-Type 35Z4GT Rectifier.

SERVICE NOTES:

Voltages taken from different points of circuit to —B are measured with all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on the voltage chart are measured with 117 volt A.C. line.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D. C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

MODEL 571, Series A
Alignment
MODEL 577D
Tuner Data

GAMBLE-SKOGMO INC.

Press down another automatic tuner lever. Holding it down **FIRMLY** carefully tune in the station assigned to this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now rotate the tuning knob (No. 1) to the right (clockwise) as far as it will turn, and tighten the special locking screw ("C") located on left side of tuner dial assembly (See Fig. 2).

It is **VERY IMPORTANT** that this locking screw is turned until it is **ABSOLUTELY TIGHT**.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, loosen the locking screw "C" one or two turns, select the new station as explained. Be sure to **retighten** the locking screw, otherwise the stations you have selected will not stay adjusted to the levers.

The automatic dial is now set up for quick tuning. Press down on the lever and your favorite station is selected.

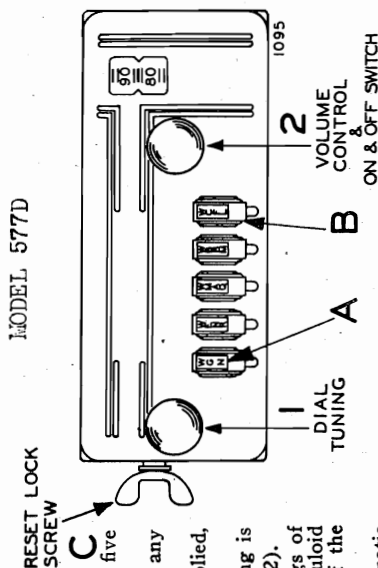


FIG. 2—FRONT VIEW

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS

There are five levers on the dial by means of which five stations may be selected. (See "B" Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including five.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner lever an opening is provided for inserting the call letter tabs. (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings of each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

PRESS DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down **FIRMLY**, tune in by means of the tuning knob (No. 1) the station you have assigned to this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

MODEL 571

ALIGNMENT PROCEDURE

IMPORTANT: See Aligning Instructions on Page 4.

- Volume control—Maximum all adjustments.

- Connect —B of radio chassis to ground post of signal generator through .1 Mfd. Condenser.

- Connect dummy antenna value in series with generator output lead.

- Connect output meter across primary of output transformer.

- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—1 mfd. and 200 mmf.

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Position of Iron Cores (Dial Setting) | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|------------------------|--|------------------|---|--|--|----------------------------|--|
| I. F. | 465 Kc. | .1 MFD. | Connect to Terminal "B" (See Fig. 4) | Iron Cores All the way out | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Connect to Terminal "B" (See Fig. 4) | Iron Cores All the way out | Two trimmers on top (See Fig. 1) | Input I. F. | Adjust to maximum output |
| BROAD- CAST BAND | 1720 Kc. | .1 MFD. | Connect to Terminal "B" (See Fig. 4) | Iron Cores All the way out | Trimmer (C5) (See bottom of Radio, Fig. 3) | Oscillator | Adjust to maximum output |
| | 1720 Kc. | 200 MMF. | Connect to Terminal "A" (See Fig. 4) | Iron Cores All the way out | Trimmer (C2) (See bottom of Radio, Fig. 3) | Antenna | Adjust to maximum output |
| | 1400 Kc. | 200 MMF. | Connect to Terminal "A" (See Fig. 4) | Turn Dial to 1400 Kc. | Adjust position of antenna coil up or down (See Fig. 4) | Antenna Coil Adjustment | Adjust to maximum output (See Note "A") |
| | 1720 Kc. | 200 MMF. | Connect to Terminal "A" (See Fig. 4) | Turn Dial to 1720 Kc. | Adjust trimmer (C2) (See Fig. 3) | Antenna | Check for tracking (See Note "B") |

NOTE "A"—The antenna coil assembly is made so that it is movable up or down. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by rotating one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

NOTE "B"—After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C2) adjustment again at 1720 Kc. If the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.

GAMBLE-SKOGMO INC.

MODEL 577C
Schematic, Voltage
Battery Notes

GENERATOR INTERFERENCE

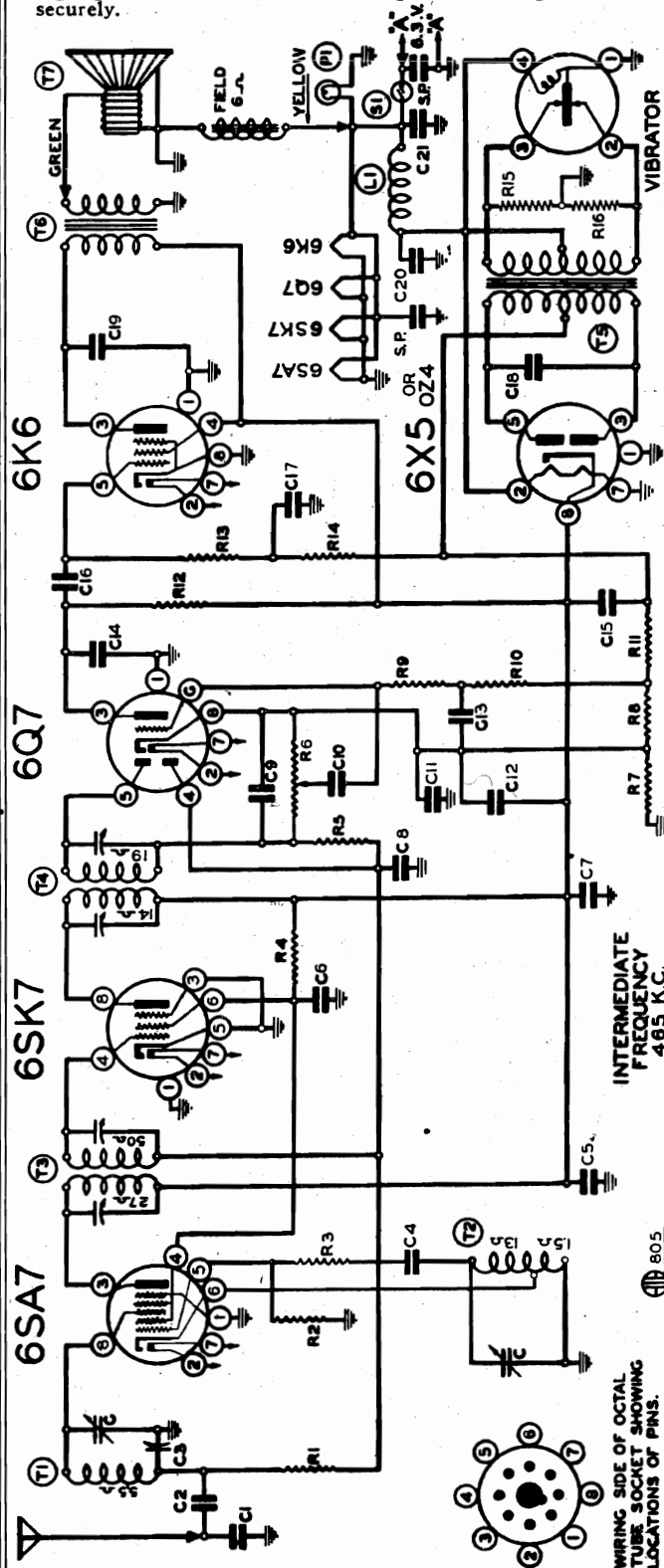
Remove the generator cutout mounting screw and fasten the condenser (100-81) bracket on the generator cutout mounting lug. Replace the cutout mounting screw and tighten down securely.

Connect the condenser lead to the battery terminal of the cutout. The generator condenser is absolutely necessary as it is used to eliminate a high pitched whining noise which would otherwise be heard as the motor is accelerated

CONNECTIONS TO BATTERY

The battery cable, number 107-82, (red wire with fuse receptacle at one end and terminal lug at other end) must be connected to battery terminal of ammeter. At the same time connect ammeter capacitor, number 100-82, to battery terminal of ammeter, other end of condenser to any convenient grounded screw on back of instrument panel. Make certain that insulating sleeve is slipped over fuse when fuse is placed in receptacle, before connecting to short battery cable from receiver.

When connected properly, the discharge due to current drawn by the receiver should not indicate on the ammeter. This is important, since if improperly connected, as shown by the deflection of ammeter, additional motor interference may be encountered.



ADJUST ANTENNA TRIMMER

Tune in a weak signal at approximately 600 K.C. with volume control about three-fourths on. Adjust trimmer screw "X" until maximum output is obtained. (See Fig. 1, Adjust-ment "X" on right side of radio)

Description

Code Part No.

Description

Code Part No.

| Description | Code Part No. |
|----------------------|---------------|
| .05 x 200 v. 25% | C8 1009 |
| .0001 Mica 20% | C9 1295 |
| .01 x 200 v. 25% | C10 10078 |
| .1 x 200 v. | C11 10020 |
| 8 mid. lytic | C12 11950 |
| .01 x 200 v. | C13 10078 |
| .0005 Mica | C14 1292 |
| 8 mid. lytic | C15 11950 |
| .01 x 400 v. 25% | C16 10055 |
| .005 x 600 v. | C17 10019 |
| .005 x 1200 v. | C18 10034 |
| .01 x 600 v. | C19 10087 |
| .5 x 120 v. + 50-10% | C20 10031 |
| .5 x 120 v. + 50-10% | C21 10031 |

| Description | Code Part No. |
|-------------------------|---------------|
| 250M ohm - 1/2 w. 20% | R1 13011 |
| 20M ohm - 1/2 w. 10% | R2 130176 |
| 10 ohm - 1/2 w. 10% | R3 130272 |
| 10M ohm - 1 w. 10% | R4 130245 |
| 3 megohm - 1/2 w. 20% | R5 1304 |
| 1 megohm volume control | R6 101110 |
| 50 ohm - 1/2 w. 10% | R7 130174 |
| 30 ohm - 1/2 w. 10% | R8 130211 |
| 2 megohm - 1/2 w. 20% | R9 130209 |
| 1 megohm - 1/2 w. 20% | R10 130210 |
| 250 ohm - 1 watt 10% | R11 130212 |
| 250M ohm - 1/2 w. 20% | R12 13011 |
| 250M ohm - 1/2 w. 20% | R13 13011 |
| 100 ohm - 1/2 w. 10% | R14 13011 |
| 100 ohm - 1/2 w. 10% | R15 13060 |
| 100 ohm - 1/2 w. 10% | R16 13060 |

PARTS

| Code Part No. | Description |
|---------------|---------------------------------|
| T1 11195B | Antenna coil complete |
| T2 110107 | Oscillator coil complete |
| T3 108139 | Input I.F. 465 kc. - complete |
| T4 108121 | Output I.F. 465 kc. - complete |
| T5 104131 | Power Transformer |
| T6 10567 | Output Transformer |
| T7 114114 | 5" Dynamic Speaker |
| L1 10568 | "A" Filter Choke |
| P1 10797 | 6.8 v. pilot light |
| SP | Off-on Switch on Volume Control |

CONDENSERS

| Code Part No. | Description |
|---------------|---------------------------|
| C 10269 | 2 gang variable condenser |
| C1 1293 | .0002 Mica 20% |
| C2 10055 | .01 x 400 v. 25% |
| C3 12434 | Antenna Trimmer |
| C4 12912 | .00025 Mica 20% |
| C5 1001 | .1 x 400 v. 25% |
| C6 10020 | .1 x 200 v. 25% |
| C7 1295 | .0001 Mica |

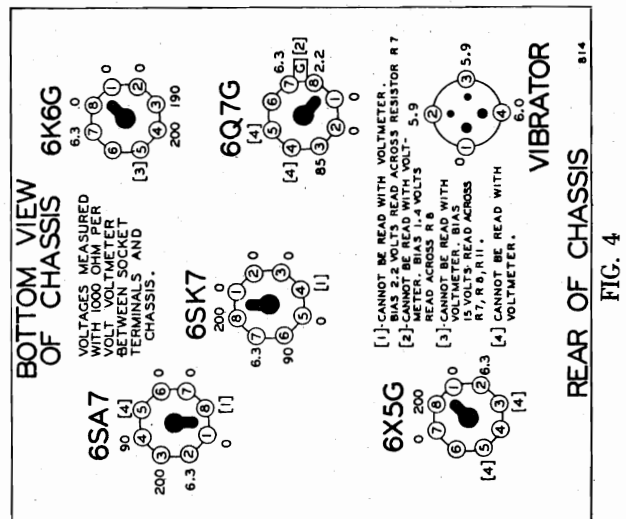


FIG. 4

January 1939

Serial No. 203070 Up

MODEL 577C

Alignment, Trimmers
Socket, Tuner

GAMBLE-SKOGMO INC.

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the bottom view.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

ALIGNING INSTRUCTIONS

All of the adjustments have been very carefully set with signal generators at the factory and require no further adjustment, unless it becomes necessary to replace a coil or transformer, or if the adjustments have been tampered with in the field. Under no circumstances attempt any adjustments without first making certain that adjustment is necessary and only after voltages, tubes and condensers have been checked and found to be normal. To properly re-align this receiver, a test oscillator, as well as an output meter, must be used.

DUMMY ANTENNAS

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .5 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 125 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 6K6 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

I.F. ALIGNMENT: (465 K.C.)

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 465 K.C. in series with I.F. dummy antenna, to grid of 6SK7 I.F. tube.
2. Adjust trimmer condensers of output I.F. transformer No. 108121 to resonance with oscillator.
3. Move test oscillator connection to grid of 6SA7 tube and adjust trimmer condensers of input I.F. transformer No. 108139 to resonance with oscillator. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver. (See Fig. 3—top view, page 3.)

BROADCAST ALIGNMENT

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. in series with broadcast dummy to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance. (This adjustment is the rear section of the two-gang condenser—see top view, Fig. 3).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust antenna trimmer (front section of gang condenser) to resonance (see top view, Fig. 3).
4. Re-set test oscillator to 600 K.C. and rotate variable condenser to 600 K.C. Adjust series pad in the antenna circuit for maximum gain. This pad is mounted on the side of the antenna can, adjustment "X."

5. Go back and check 1400 K.C. If adjustment is made here, check 600 K.C. again.

6. Check for sensitivity at 1000 K.C. by setting test oscillator to this frequency and picking up the signal by rotating variable condenser. Under no circumstances bend plates of variable condenser sections to correct tracking.

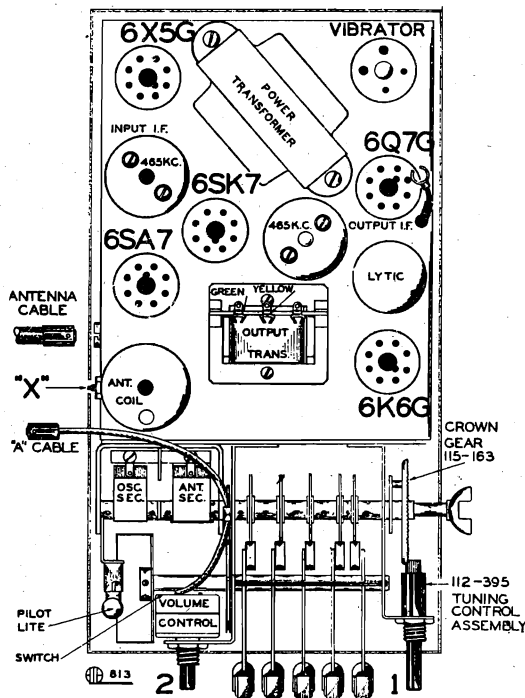


FIG. 3—TOP VIEW

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS

There are five levers on the dial by means of which five stations may be selected, (See "B" Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including five.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner lever an opening is provided for inserting the call letter tabs, (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings of each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 1) the station you have assigned to this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station assigned to this lever. Release this lever.

Follow this procedure until you have selected all of your favorite stations.

Now rotate the tuning knob (No. 1) to the right (clockwise) as far as it will turn, and tighten the special locking screw ("C") located on left side of tuner dial assembly (See Fig. 2).

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

If you should desire to change any station you selected to another, loosen the locking screw "C" one or two turns, select the new station as explained. Be sure to retighten the locking screw, otherwise the stations you have selected will not stay adjusted to the levers.

The automatic dial is now set up for quick tuning. Press down on the lever and your favorite station is selected.

GAMBLE-SKOGMO INC.

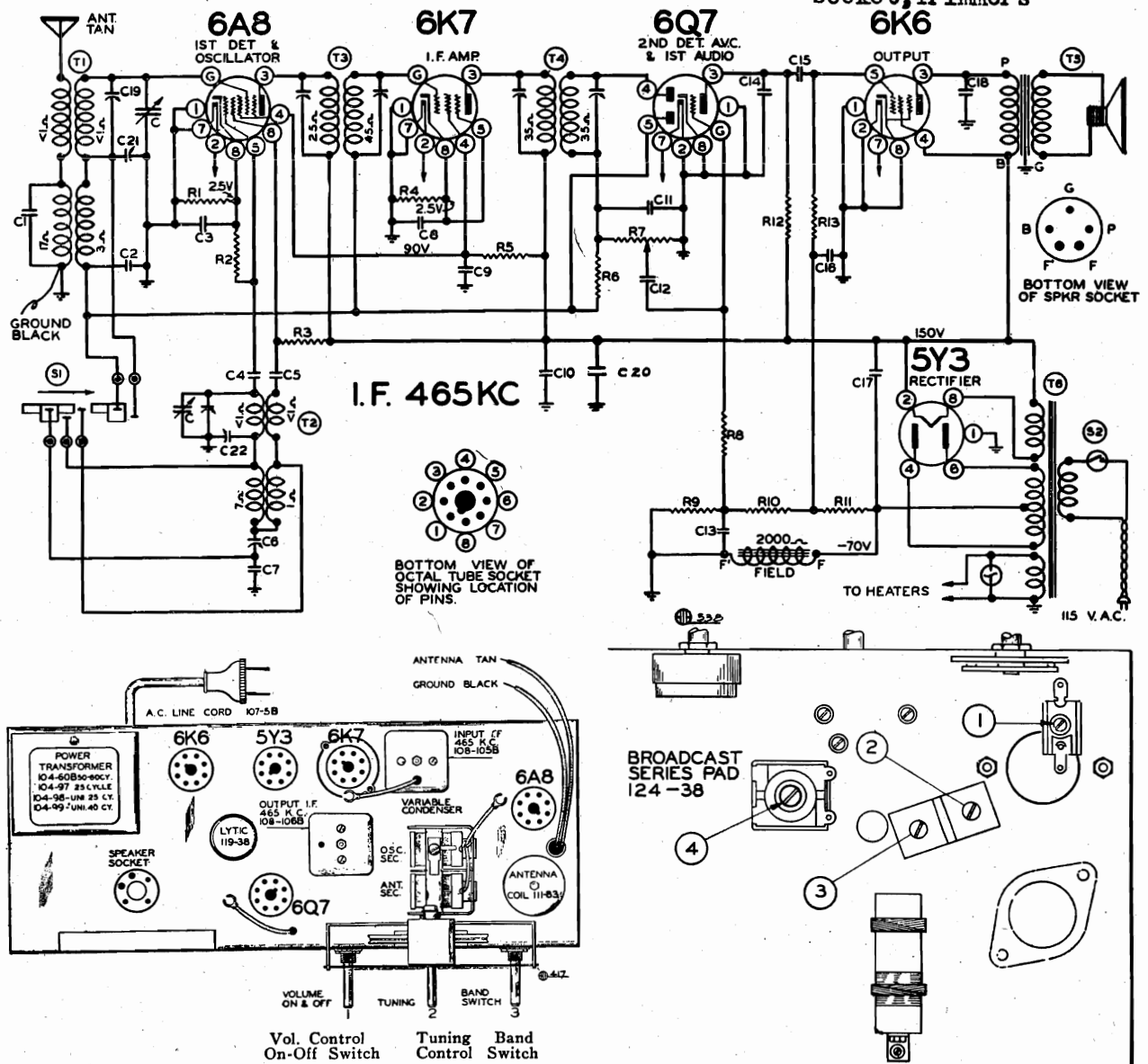
MODEL 589, Series A, Iss. B
Schematic, Alignment
Socket, Trimmers

FIG. 3.—BOTTOM VIEW SHOWING TRIMMERS

| RESISTORS | | | CAPACITORS | | |
|------------|---------|---------------------------|------------|---------|-----------------------------|
| R1 | 130-83 | 300 ohm - 1/3 w. 10% | C9 | 100-1 | .1 x 400 v. - 50 - 10% |
| R2 | 130-12 | 50M ohm - 1/3 w. 20% | C10 | 119-38 | 5.0 mfd. - 250 w. v. 'Lytic |
| R3 | 130-17 | 10M ohm - 1/3 w. 20% | C11 | 129-5 | .0001 - 20% Mica |
| R4 | 130-93 | 450 ohm - 1/3 w. 10% | C12 | 100-11 | .01 x 400 v. - 25% |
| R5 | 130-149 | 15M ohm - 1/3 w. 20% | C13 | 100-20 | .1 x 200 v. - 25% |
| R6 | 130-4 | 3 megohm - 1/3 w. 20% | C14 | 129-2 | .0005 - 20% Mica |
| R7 | 101-71 | 1 megohm Volume control | C15 | 100-26 | .02 x 400 v. - 25% |
| R8 | 130-4 | 3 megohm - 1/3 w. 20% | C16 | 100-20 | .1 x 200 v. - 25% |
| R9 | 130-176 | 20M ohm - 1/3 w. 10% | C17 | 119-38 | 5.0 mfd. - 250 w.v. 'Lytic |
| R10 | 130-80 | 150M ohm - 1/3 w. 10% | C18 | 100-37 | .003 x 600 v. - 10% |
| R11 | 130-46 | 800M ohm - 1/3 w. 10% | C19 | 124-39B | 2 - 25 mmf. Adj. Cond. |
| R12 | 130-9 | 200M ohm - 1/3 w. 20% | C20 | 100-13 | .05 x 400 v. - 25% |
| R13 | 130-3 | 500M ohm - 1/3 w. 20% | C21 | 124-30C | Adj. Trimmer 1 - 10 mmf. |
| CONDENSERS | | | C22 | 124-30C | Adj. Trimmer 2 - 20 mmf. |
| C | 102-43B | 2 gang variable Condenser | | | |
| C1 | 129-5 | .0001 Mica | | | |
| C2 | 100-22 | .05 x 200 v. - 25% | | | |
| C3 | 100-20 | .1 x 200 v. - 25% | | | |
| C4 | 129-39 | .00005 - 20% - Mica | | | |
| C5 | 100-25 | .002 x 600 v. - 20% | | | |
| C6 | 124-38 | 600 mmf. Series Pad. Adj. | | | |
| C7 | 129-54 | .003 - 2 1/2% Mica | | | |
| C8 | 100-20 | .1 x 200 v. - 25% | | | |

PARTS

Ant. Coil
Osc. Coil
Input I.F. - 465 kc.
Output I.F. - 465 kc.
6" Dynamic speaker (2000 OHM FIELD)
Power Transformer
Wave Band Switch
On-off switch on volume control

ALIGNMENT

IF adj. 465 KC thru .1mf cond.
SW Osc. adj. - 17 MC thru .1 mf cond.- trim. located on top of rear gang sect.
SW Ant. adj.- 17 MC
See Fig. 3, Adj. 1
BC Osc. adj: 1720 KC thru 200 mmf and 20 ohm res.
See Fig. 3, Adj. 3
BC Ant. adj. 1400 KC thru 200 mmf and 20 ohm res.
See Fig. 3, Adj. 2
Padder adj. 600 KC
See Fig. 3, Adj. 4

MODEL 601, Series A, B, C

Schematic, Voltage
Alignment, Trimmers
Socket, Notes

GAMBLE-SKOGMO INC.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

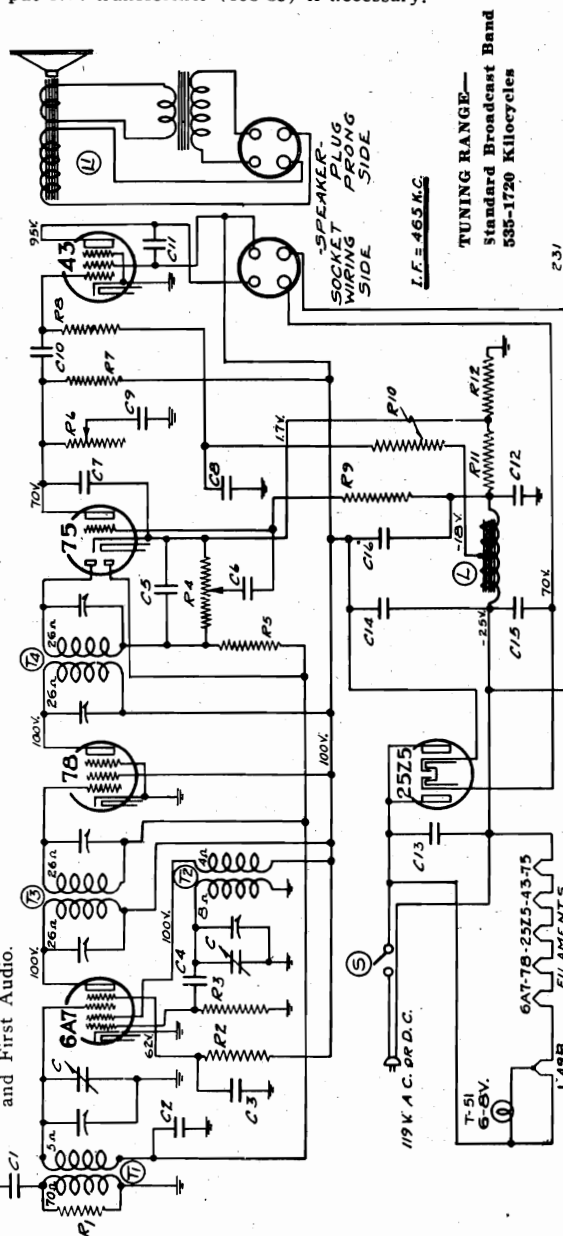
Part No. 108-83 Output I.F. Transformer

Part No. 108-82 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

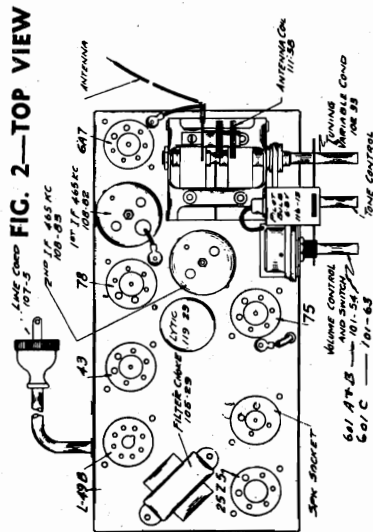
1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments

- (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd. condenser, to the control grid cap of the type 78 tube, and adjust the output I.F. transformer (No. 108-83) to resonance.
- (b) Move oscillator output clip from grid of 78 grid cap of 6A7 and adjust input I.F. transformer (No. 108-82) to resonance.
- (c) With oscillator still connected to 6A7, readjust output I.F. transformer (108-83) if necessary.



R.F. ALIGNMENT: (535-1720 K.C.)

1. Unsolder the antenna wire from its terminal on the antenna coil and with gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 50 mmf. condenser to the antenna terminal on the antenna coil and chassis ground and make the following adjustments:
 - (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer (rear of gang condenser).
 - (b) Re-set external oscillator to 1550 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance (front section of gang condenser).
 - (c) Check sensitivity at 600 and 1000 kilocycles.



| | | | |
|-----|--------|--------|-------------------------------|
| C1 | 100-25 | .002 | x600 Volt-25% |
| C2 | 100-22 | .05 | x200 Volt-25% |
| C3 | 100-22 | .05 | x200 Volt-25% |
| C4 | 100-22 | .05 | x200 Volt-25% |
| C5 | 129-12 | .00025 | Mica-MT-20% |
| C6 | 129-12 | .00025 | Mica-MT-20% |
| C7 | 129-12 | .00025 | Mica-MT-20% |
| C8 | 100-11 | .01 | x400 Volt-25% |
| C9 | 100-11 | .01 | x400 Volt-25% |
| C10 | 100-11 | .01 | x400 Volt-25% |
| C11 | 100-11 | .01 | x400 Volt-25% |
| C12 | 100-6 | .25 | x200 Volt-20% |
| C13 | 100-39 | .1 | x400 Volt-20% |
| C14 | 119-25 | 16 | mfd.x100 Volt-Working Voltage |
| C15 | 119-25 | 5 | mfd.x100 Volt-Working Voltage |
| C16 | 119-25 | 8 | mfd.x100 Volt-Working Voltage |

NOTE: C14, C15, and C16 in one unit—No. 119-25

C 102-33 One section of two gang condenser

T1 111-57 Antenna Coil

T2 110-46 Oscillator Coil

T3 108-82 Input I.F. Coil—465 Kc.

NOTE: R11 and R12 in one unit—No. 106-28.

T4 108-83 Output I.F. Coil—465 Kc.

L 105-29 Filter Choke (Resistance 600 Ohms)

L1 114-43 Five Inch Speaker (Field Resistance 3000 Ohms)

S 101-54 On and off switch on Volume Control

S 101-63 On and off switch on Volume Control

MODEL 601—SERIES A See schematic and parts above.

MODEL 601—SERIES B is the same as Series A, except for the following changes:—
1 - The C15 condenser was eliminated.

2 - The C14 condenser was replaced by a C15 (Part #119-29) 30 mfd. capacity, and the C16 was replaced by a C14 (Part #119-29) 5 mfd. capacity.

MODEL 601—SERIES C is the same as Series B (see above changes) except for the substitution of the following parts:

| | | | |
|----|---------|------|--------------------------|
| R4 | 101-63 | 500M | Ohm Volume Control |
| R7 | 130-102 | 500M | Ohm—1/4W-20%-100V—Carbon |
| R9 | 130-102 | 500M | Ohm—1/4W-20%-100V—Carbon |

C7 129-5 .0001 Mica—MT-20%

S 101-63 On and off switch on Volume Control

MODELS 665, 765, Series A Alignment

GAMBLE-SKOGMO INC.

MODELS 665 & 765 SERIES A

DESCRIPTION

TUBES:

The tube complement of this chassis consists of the following octal base glass and metal tubes:

- The type and function of each tube is as follows:
- 1—Type 6K8G, Triode Hexode, First Detector-oscillator.
- 1—Type 6K7 Remote Cut-Off Pentode, I. F. Amplifier (465 K. C.)
- 1—Type 6Q7G Duplex Diode Triode Second Detector, A. V. C. and First Audio.
- 1—Type 6P5G Driver Stage.
- 1—Type 6AC5G Positive Grid Triode Output Amplifier.
- 1—Type 5Y3G High Vacuum Rectifier.
- 1—Type 6U5 Cathode-Ray Tuning Indicator Tube (for Model 765).

Transformers are available and chassis are sometimes

equipped with universal transformers for operation on 25, 40 and 60 cycles and with primary taps for 110, 130, and 230 volts, (see parts list).

SERVICE NOTES:

Voltage taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on the voltage chart are measured with 115 volts on the primary of the power transformer.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D. C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltage, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

TO REMOVE CHASSIS FROM THE CABINET:

Remove the four bolts which are used to fasten the chassis to the cabinet shelf; pull the knob off their shafts and pull off the six button lever keys on front of dial.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.

- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—1 mlf., 200 mml., and 400 ohms.

| BAND | Frequency Setting | SIGNAL GENERATOR Dummy Antenna Connection to Radio | Position of Band Switch | Variable Condenser Setting | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|-----------------------------|-------------------|---|-------------------------------------|--------------------------------------|---|---------------------------------|---|
| I. F. | 465 Kc. | Grid of 6K7 | Broadcast (Extreme left rotation) | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| | 465 Kc. | Grid of 6K8 | Broadcast (Extreme left rotation) | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Input I. F. | Adjust to maximum output |
| SHORT WAVE BAND | 17 Mc. | Antenna lead | Short wave (Extreme right rotation) | Set dial at 17 MC | Trimmer (C7) (See Fig. 3) | Short wave Oscillator | Adjust to maximum output |
| | 17 Mc. | Antenna lead | Short wave (Extreme right rotation) | Dial set at 17 MC | Trimmer (C4) (See Fig. 3) | Short wave Antenna | Adjust to maximum output |
| BROADCAST BAND | 1720 Kc. | Antenna lead | Broadcast (Extreme left rotation) | Rotor full open (Plates out of mesh) | Trimmer (C8) (See Fig. 3) | Broadcast Oscillator | Adjust to maximum output |
| | 1400 Kc. | Antenna lead | Broadcast (Extreme left rotation) | Set dial at 1400 Kc. | Trimmer (C5) (See Fig. 3) | Broadcast Antenna | Adjust to maximum output |
| | 600 Kc. | Antenna lead | Broadcast (Extreme left rotation) | Set dial at 600 Kc. | Trimmer (C11) (See Fig. 3) | Broadcast oscillator series pad | Adjust to maximum, rock dial. (See note "A") |
| | 2100 Kc. | Antenna lead | Broadcast (Extreme left rotation) | Pick up signal at 1170 Kc. on dial | Wire capacitor (CB) (See circuit diagram) | Image rejection | Adjust by twisting for minimum output. (See note "B") |
| IMAGE REJECTION ADJUSTMENTS | 2630 Kc. | Antenna lead | Broadcast (Extreme left rotation) | Pick up signal at 1700 Kc. on dial | Wire capacitor (CA) (See circuit diagram) | Image rejection | Adjust by moving for minimum output. (See note "C") |

NOTE "A": Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

NOTE "B": 2100KC is the image frequency of 1170 KC. Adjust wire capacity (CB) by twisting the two wires until a minimum output is obtained.

NOTE "C": 2630KC is the image frequency of 1700KC. Adjust wire capacity (CA) by moving the wire either toward or away from the antenna coil winding until a minimum output is obtained on the output meter.

- Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.
- After each band is completed, repeat the procedure as a final check.

GAMBLE-SKOGMO INC.

MODEL 678, Issue A
Schematic, Voltage
Socket, Trimmers

Power Output..... 7 Watts Undistorted, 9 Watts Maximum
Power Consumption..... 7.7 Amperes at 6.3 Volts

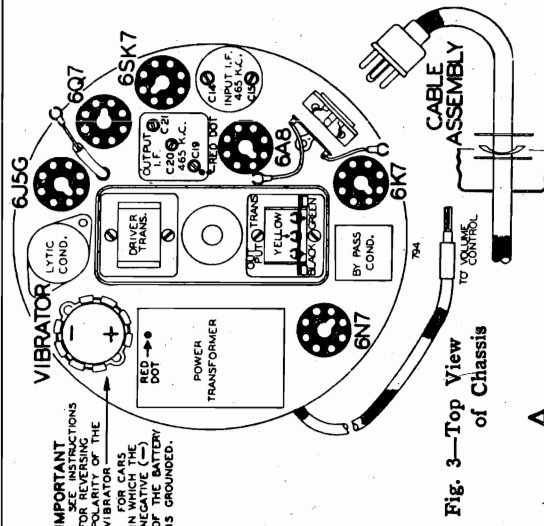


Fig. 3-Top View of Chassis

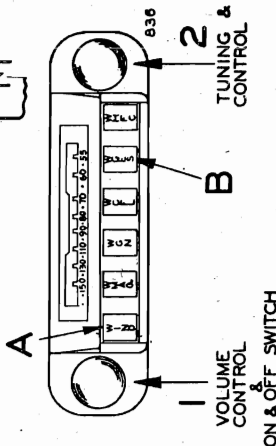
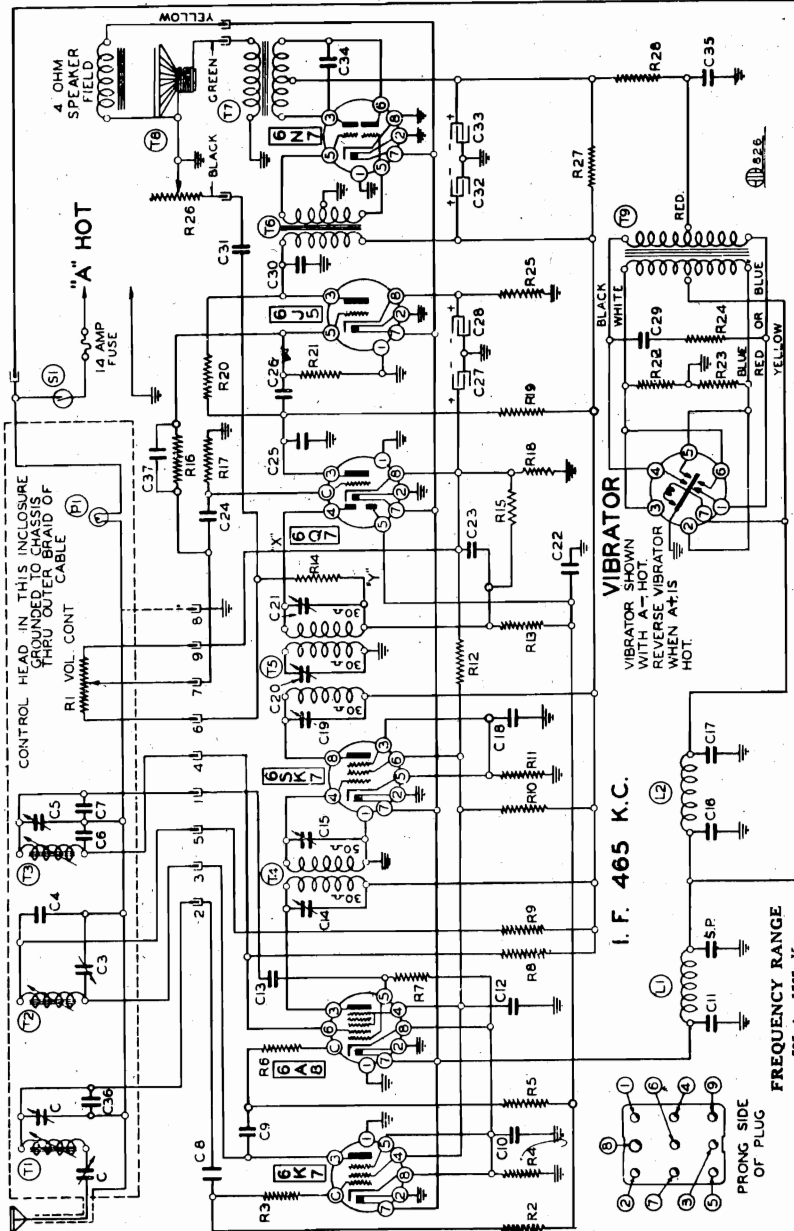


Fig. 2-Front View of Remote Tuner Unit



MODEL 678, Issue A MARCH 1939 Serial No. 50,001 UP

Circuit Diagram

Ref. Part No.

Description

RESISTORS

CONDENSERS

PARTS

| | | | | | | | | |
|-----|--------|---------------------------|-----|--------|--------------------------|-----|---------|--------------------------------------|
| R1 | 100161 | 1.2 megohm volume control | C1 | 12480 | Antenna Shunt Trimmer | T1 | 11118 | P. B. Antenna Coil Assembly Complete |
| R2 | 13019 | 500 ohm-1/2 w. | C2 | 12481 | Antenna Series Trimmer | T2 | 10949 | P. B. R. F. Coil Assembly Complete |
| R3 | 130275 | 400 ohm-1/2 w. | C3 | 12482 | R. F. Shunt Trimmer | T3 | 108120B | Input P. F. Coil-465 kc. |
| R4 | 13019 | 1 megohm-1/2 w. | C4 | 100102 | Oscillator Shunt Trimmer | T4 | 108115B | Output I. F. Coil-465 kc. |
| R5 | 13019 | 500 ohm-1/2 w. | C5 | 129137 | .0005 Mica | T5 | 10834 | Audio Driver Transformer |
| R6 | 13019 | 500 ohm-1/2 w. | C6 | 129136 | .0005 Mica | T6 | 10835 | Output Transformer |
| R7 | 13012 | 50M ohm-1/2 w. | C7 | 129135 | .0005 Mica-5% | T7 | 14155 | Power Transformer |
| R8 | 13021 | 30M ohm-1/2 w. | C8 | 129134 | .0005 Mica | T8 | 10838 | Power Transformer |
| R9 | 130196 | 20M ohm-1 watt | C9 | 129133 | .0005 Mica | T9 | 10839 | Power Transformer |
| R10 | 130235 | 1500 ohm-1/2 w. | C10 | 11625 | .05 x 200 v. | T10 | 10840 | Power Transformer |
| R11 | 130235 | 40M ohm-1/2 w. | C11 | 11626 | .05 x 200 v. | T11 | 10841 | Power Transformer |
| R12 | 13019 | 1 megohm-1/2 w. | C12 | 11627 | .05 x 200 v. | T12 | 10842 | Power Transformer |
| R13 | 13019 | 500 ohm-1/2 w. | C13 | 11628 | .05 x 200 v. | T13 | 10843 | Power Transformer |
| R14 | 13020 | 100M ohm-1/2 w. | C14 | 11629 | .05 x 200 v. | T14 | 10844 | Power Transformer |
| R15 | 13018 | 600M ohm-1/2 w. | C15 | 10031 | .05 x 200 v. | T15 | 10845 | Power Transformer |
| R16 | 130257 | 5 megohm-1/2 w. | C16 | 10032 | .05 x 200 v. | T16 | 10846 | Power Transformer |
| R17 | 13019 | 500 ohm-1/2 w. | C17 | 10033 | .05 x 200 v. | T17 | 10847 | Power Transformer |
| R18 | 13019 | 500 ohm-1/2 w. | C18 | 10034 | .05 x 200 v. | T18 | 10848 | Power Transformer |
| R19 | 13019 | 500 ohm-1/2 w. | C19 | 10035 | .05 x 200 v. | T19 | 10849 | Power Transformer |
| R20 | 13018 | 20M ohm-1/2 w. | C20 | 11625 | .05 x 200 v. | T20 | 10850 | Power Transformer |
| R21 | 13038 | 500M ohm-1/2 w. | C21 | 11626 | .05 x 200 v. | T21 | 10851 | Power Transformer |
| R22 | 130269 | 100 ohm-1/2 w. | C22 | 11627 | .05 x 200 v. | T22 | 10852 | Power Transformer |
| R23 | 130269 | 100 ohm-1/2 w. | C23 | 11628 | .05 x 200 v. | T23 | 10853 | Power Transformer |

BOTTOM VIEW OF CHASSIS

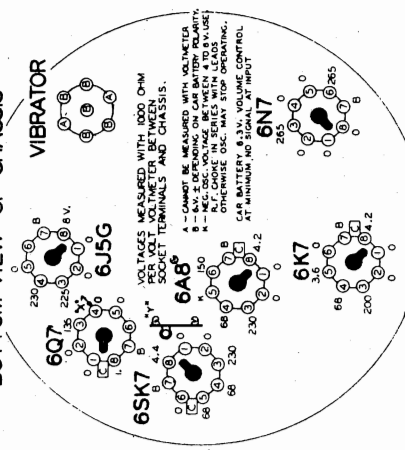


FIG. 5

This unit has been carefully designed to facilitate servicing; the entire case can be removed by loosening three wing head screws, exposing all tubes, vibrator and receiver circuits. All adjustments are accessible being located on the side and bottom of the Remote Tuner unit (See Fig. 4), a full eight inch electro dynamic speaker is used.

2. To set a pushbutton, Push in all the way and hold in firmly both the pushbutton and the dial tuning knob so that both latch in. Hold in firmly the pushbutton and tune in the station by means of the dial tuning knob. Set all the pushbuttons in the same manner.



ANTENNA CONNECTION:

Insert the antenna plug in cable into the back of the remote tuner unit (see Fig. 1A). The wire at the other end of the antenna cable is connected to the lead-in wire from the antenna. Keep the antenna cable as far away from car wiring as possible and ground the pigtail of the antenna cable shield to the antenna.

A 36 inch shielded antenna cable is regularly supplied. If a roof or door hinge type antenna is used, this cable will be long enough in practically all cases to reach the corner post or column at which the antenna lead comes down. The shielded cable should be pushed up into the column as far as possible. The reason for this is that ignition interference may be picked up by any unshielded portion of the antenna cable at the antenna end.

If an under car or running board antenna is used, the shielding must be extended to the antenna in all cases. The pigtail on the end of the antenna cable shield must be well grounded at the extreme antenna end. If it is necessary to extend the antenna cable, be sure that a pigtail is put on the end of the shielded extension and that it is well grounded at the extreme antenna end.

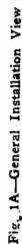
To extend the antenna cable shielding, the antenna lead wire should be covered with heavy insulation, such as loom, to properly separate the shielding from the wire. Then connect the two wires together and connect the two shields

Aerials suitable for steel roof and convertible cars can be

The majority of 1937, 1938 and 1939 cars have steel roofs, and a running board or other car antenna such as the fish tail, door hinge or over the top types must be used. The 1936 Chrysler Motors cars (except Plymouth—but including Chrysler, Dodge and De-Soto) have a steel roof, separated from the body proper, which is used as an antenna.

PROCEDURE FOR SETTING THE AUTOMATIC PUSHBUTTONS:

There are six pushbuttons on the Remote Tuner Unit by means of which six stations may be set up for automatic tuning (see B, Fig. 2).



CONNECTIONS TO BATTERY:

CAUTION: Before making any battery connections, check the polarity of the vibrator unit (contained in radio unit) to determine whether it corresponds with the polarity of the storage battery in the car.

The radio is shipped from the factory with the vibrator inserted in its socket so that it will operate in cars in which the positive (+) post of the storage battery is grounded to the frame of the car.

In cars in which the negative (—) post of the storage battery is grounded to the frame of the car, the vibrator must be pulled out of its socket and rotated and reinserted into its socket so that the (—) sign on the top of the vibrator is opposite the red dot on the top of the transformer cover; see Figure 3, top view of radio chassis).

Check the polarity of the storage battery in' car either by checking the actual wire connections on the battery or by using a voltmeter.

The ammeter cable, number 107236 (red wire with fuse receptacle at one end and terminal lug at other end), must be connected to battery terminal of ammeter. At the same time, connect ammeter capacitor, number 10082 to battery terminal of ammeter, other end of capacitor to any convenient grounded screw on back of instrument dash panel.

Make certain the fuse is in the receptacle and the ammeter cable is properly connected to the short cable (number 107238), coming from the Remote Tuner Unit. (See Fig. 1A.)

In some installations it is advisable to connect the ammeter cable to the terminal on the ammeter which will not allow the current drawn by the radio to indicate on the ammeter, additional motor interference may be encountered.

GENERATOR INTERFERENCE:
Remove the generator cutout mounting screw and fasten the condenser (10081) bracket on the generator cutout mounting lug. Replace the cutout mounting screw and tighten securely.

Connect the condenser lead to the battery terminal of the output. The generator condenser is absolutely necessary as it is used to eliminate a high pitched whining noise which would otherwise be heard as the motor is accelerated.

MODEL 678, Issue A
Alignment, Tuner Trimmers

ALIGNMENT PROCEDURE

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

ALIGNING INSTRUCTIONS:

All of the adjustments have been very carefully set with signal generators at the factory and require no further adjustment, unless it becomes necessary to replace a coil or transformer, or if the adjustments have been tampered with in the field. Under no circumstances attempt any adjustments without first making certain that adjustment is necessary and only after voltages, tubes and condensers have been checked and found to be normal. To properly re-align this receiver, a test oscillator, as well as an output meter, must be used.

IMPORTANT—ADJUSTING ANTENNA TRIMMER:

Tune in any weak station between 600 and 800 kc.

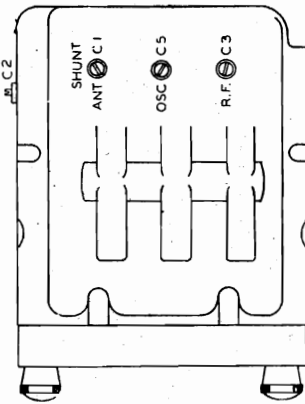
Make sure that the antenna shunt trimmer on the Bottom of the Remote Tuner is turned all the way out (counter clockwise), (see adjustment "C1," Fig. 4.).

Adjust antenna series trimmer on the side of the remote Tuner Unit. For maximum output. (See adjustment "C2," Fig. 4.).

NOTE: If resonance (maximum output) cannot be obtained within the range of the antenna series trimmer "C2," turn the adjustment screw all the way out (counter clockwise) and then adjust the antenna shunt trimmer "C1" on the bottom of the remote tuner unit for a peak of maximum output.

The above arrangement will cover any antenna capacity that is now in use.

Fig. 4.—Bottom View of Remote Tuner



SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt storage battery and uses the automotive type 6.3 volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the voltage chart.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating which is known to be good, until the defective unit is located.

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—1 mlf., 125 mml.

DESCRIPTION:

Model 678 is a six tube superheterodyne receiver having a tuning range of 535 K. C. to 1565 K. C.; operates from a six tube storage battery and uses the automotive type 6.3 volt meter having a resistance of 1000 ohms per volt. The "B" supply is obtained from a synchronous type vibrator.

The I. F. frequency used is 465 K. C. The output I. F. coil has three tuned circuits giving superior band pass qualities and selectivity as compared to the conventional two tuned circuit coils. Antenna, R. F. and oscillator circuits are permeability tuned, offering automatic tuning applications that are both accurate and stable. The entire coil assembly is mounted in the Remote Tuner control head being connected to the oscillator and R. F. circuits by an R. F. transmission cable.

The R. F. oscillator, I. F. and audio amplifier including the power supply is contained in the speaker case.

- Volume control—Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Remote Tuner Dial Setting | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|-----------------|---------------------------------------|---------------|-------------------------|------------------------------|---------------------------------------|---------------------|--|
| I. F. | 465 Kc. | .1 MFD. | Grid of 6SK7 I. F. Tube | Set dial at 1400 Kc. | Trimmers C19, C20 (See Fig. 3) | Output I. F. | See note "A" Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Grid of 6SK7 | Set dial at 1400 Kc. | Trimmer C21 (See Fig. 3) | Output I. F. | See note "B" Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Grid of 6A8 | Set dial at 1400 Kc. | Trimmers C14, C15 (See Fig. 2) | Input I. F. | Adjust to maximum output |
| BROAD-CAST BAND | 1565 Kc. | 125 mml. | Antenna lead | Set dial at 1565 Kc. | Trimmer C5 (See Fig. 4) | Oscillator | Adjust to maximum output |
| | 1400 Kc. | 125 mml. | Antenna lead | Set dial at 1400 Kc. | Trimmers C1, C3 (See Fig. 4) | Antenna and R. F. | Adjust to maximum output |
| | 600 Kc. | 125 mml. | Antenna lead | Set dial at 600 Kc. | Trimmer C2 (See Fig. 4) | Antenna series adj. | See note "C" ANTENNA SERIES TRIMMER C2 |

NOTE "A" IMPORTANT: To align the output I. F. transformer without using a cathode ray oscillograph a 10M ohm resistor must be shunted across the diode tuned circuit. Connect the resistor as indicated by points "X" and "Y" on the circuit diagram and the bottom view of the radio chassis Fig. 5. A red dot on top of output I. F. can designate location of trimmer "C5".

NOTE "B": Before adjusting trimmer C21 disconnect the 10M ohm resistor. Under no circumstances re-adjust trimmers C19 or C20 after the 10M ohm resistor has been removed.

For alignment of the output I. F. transformer using a cathode ray oscillograph the 10M ohm resistor is not used.

NOTE "C": Maximum gain for this adjustment depends on the capacity of the antenna system of the car in which the radio is installed. For the proper alignment of this adjustment: see "Adjusting Antenna Trimmer".

ALIGNMENT OF THE IRON CORES

The iron cores for the antenna, R. F. and oscillator permeability coils have been very carefully adjusted at the factory and require no further adjustment, unless it becomes necessary to replace a coil, or if the adjustments have been tampered with.

The procedure for aligning the iron cores will be supplied with replacement coils which are ordered.

TUBE COMPLEMENT:

The tube complement of this chassis consists of the following: 1—Type No. 6A8—Pentagrid Converter (composite first detector and oscillator). 1—Type No. 6SK7—Remote Cut-off Pentode as an I. F. Amplifier.

1—Type No. 6K7 R. F. Amplifier.

1—Type No. 6Q7—Duplex Diode Triode Second Detector, A.V.C. and First Audio.

1—Type No. 615G—Driver Amplifier.

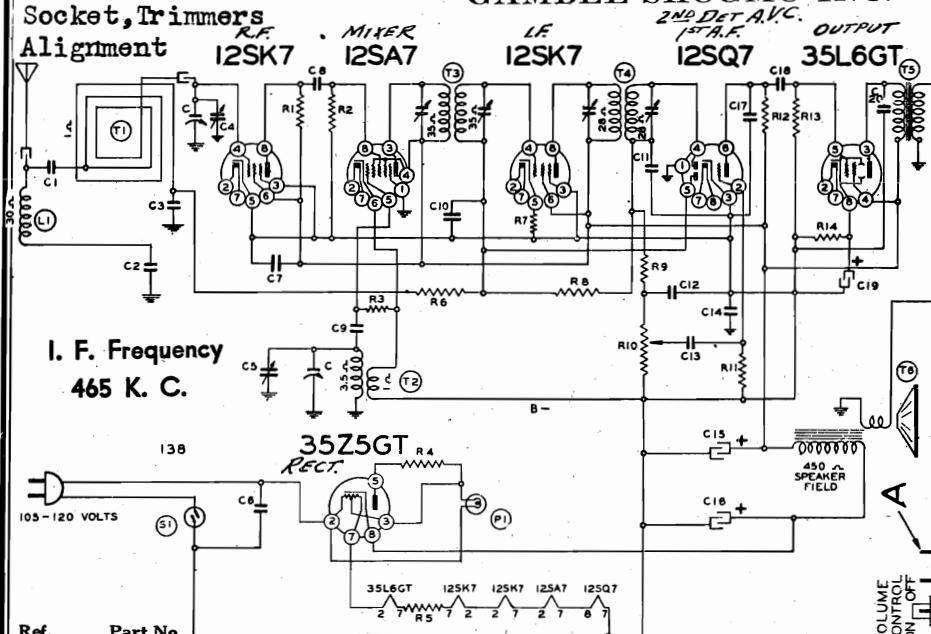
1—Type No. 6N7—Push-Pull Output Amplifier.

MODEL 678, Issue A

MODEL 636

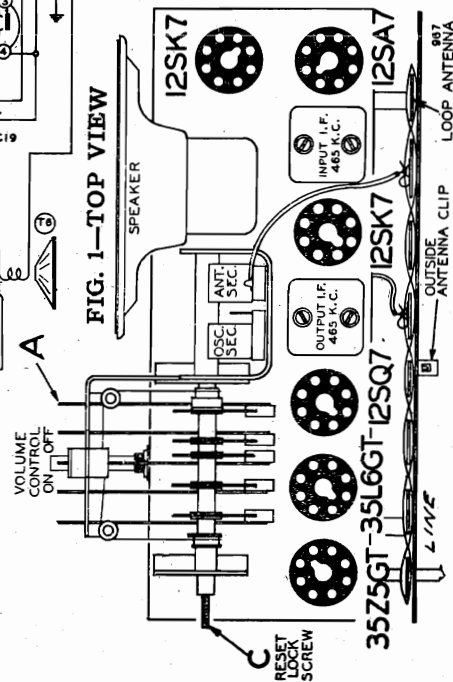
Schematic, Voltage
Socket, Trimmers
Alignment

GAMBLE-SKOGMO INC.



FOR TUNER ADJUSTMENT
SEE MODEL 677A VOL. X
GAMBLE PAGE 10 - 20.

FIG. 1—TOP VIEW

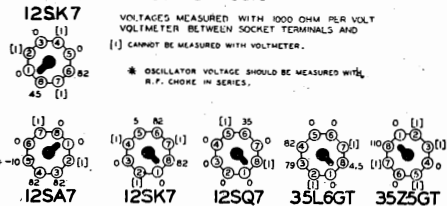


PARTS

| | | |
|----|---------|------------------------------------|
| T1 | 111139 | Loop Antenna |
| T2 | 110128 | Oscillator Coil |
| T3 | 108140F | Input I. F. Coil |
| T4 | 108145B | Output I. F. Coil |
| T5 | 10588B | Output Transformer |
| T6 | 114116G | 5" Dynamic Speaker (450 ohm field) |
| L1 | 1237 | Antenna Loading Coil |
| P1 | 107249 | 6-8 volt, Pilot light - T-47 |
| S1 | | Off-on Switch on Volume Control |

| Ref. | Part No. | | |
|------|----------|----------------------------|--|
| R1 | 130218 | 5M ohm— $\frac{1}{2}$ w. | |
| R2 | 13020 | 100M ohm— $\frac{1}{2}$ w. | |
| R3 | 130176 | 20M ohm— $\frac{1}{2}$ w. | |
| R4 | 130295 | 25 ohm—1 watt | |
| R5 | 130295 | 25 ohm—1 watt | |
| R6 | 130100 | 150M ohm— $\frac{1}{2}$ w. | |
| R7 | 130203 | 40 ohm— $\frac{1}{2}$ w. | |
| R8 | 1304 | 3 megohm— $\frac{1}{2}$ w. | |
| R9 | 13012 | 50M ohm— $\frac{1}{2}$ w. | |
| R10 | 101127 | 1 megohm volume control | |
| R11 | 130257 | 5 megohm— $\frac{1}{2}$ w. | |
| R12 | 13011 | 250M ohm— $\frac{1}{2}$ w. | |
| R13 | 1303 | 500M ohm— $\frac{1}{2}$ w. | |
| R14 | 130166 | 150 ohm— $\frac{1}{2}$ w. | |
| C | 102104B | 2 gang variable condenser | |
| C1 | 12951 | .000125 Mica | |
| C2 | 12912 | .00025 Mica | |
| C3 | 10026 | .02 x 400 v. | |
| C4 | | Antenna Trimmer on gang | |
| C5 | | Oscillator trimmer on gang | |
| C6 | 1001 | .1 x 400 v. | |
| C7 | 1006 | .25 x 200 v. | |
| C8 | 1295 | .0001 Mica | |
| C9 | 1295 | .0001 Mica | |
| C10 | 1009 | .05 x 200 v. | |
| C11 | 1295 | .0001 Mica | |
| C12 | 1295 | .0001 Mica | |
| C13 | 10012 | .003 x 600 v. | |
| C14 | 100110 | .2 x 400 v. | |
| C15 | 11953E | 30 mid. lytic—150 w. v. | |
| C16 | 11953E | 30 mid. lytic—150 w. v. | |
| C17 | 1295 | .0001 Mica | |
| C18 | 10078 | .01 x 200 v. | |
| C19 | 11953E | 40 mid.—25 w. v. lytic | |
| C20 | 10026 | .02 x 400 v. | |

C15, C16, and C19 in same unit

BOTTOM VIEW
OF CHASSIS

REAR OF CHASSIS

FIG. 3

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B - of radio chassis to ground post of signal generator through .1 Mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

ALIGNING
INSTRUCTIONS:

Do not remove the back cover of the radio which contains the loop antenna from the chassis. It is important during alignment that the same distance between the loop antenna and the chassis be maintained as when the chassis is installed in the cabinet.

Slight adjustments to the oscillator and antenna circuits can be made without removing the chassis from the cabinet through two holes which are provided on the bottom of the cabinet.

The two adjustments on the variable gang condenser can be reached with a long insulated type screw driver through these two holes.

The following equipment is required for aligning:

- An all wave signal generator.
- Output indicating meter.
- Non-metallic screwdriver.
- Dummy antennas—.1 Mfd.

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Variable Condenser Setting | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|------------------------|--|------------------|------------------------|---|--|--------------------------|-----------------------------|
| I. F. | 465 Kc. | .1 MFD. | Grid of 12SA7 | Rotor full open (Plates out of mesh) | Four Trimmers on Top (See Fig. 1) | Output and Input I.F. | Adjust to maximum output |
| BROAD- CAST BAND | 1650 Kc. | .1 MFD. | Grid of 12SA7 | Rotor full open (Plates out of mesh) | Trimmer bottom of Front section of gang. (See bottom of radio) | Oscillator | Adjust to maximum output |
| | 1400 Kc. | See Note "A" | | Set dial at 1400 Kc. | Trimmer bottom of Rear section of gang. (See bottom of radio) | Antenna | Adjust to maximum output |

NOTE "A" Lay the output lead from the generator in back of the loop antenna. Turn up the output of the generator, picking up the energy in the loop antenna without any electrical connection from the generator.

Power Consumption.....40 Watts
Power Output.....800 Milliwatts Undistorted, 1.5 Watts Maximum
Intermediate Frequency.....465 K.C.

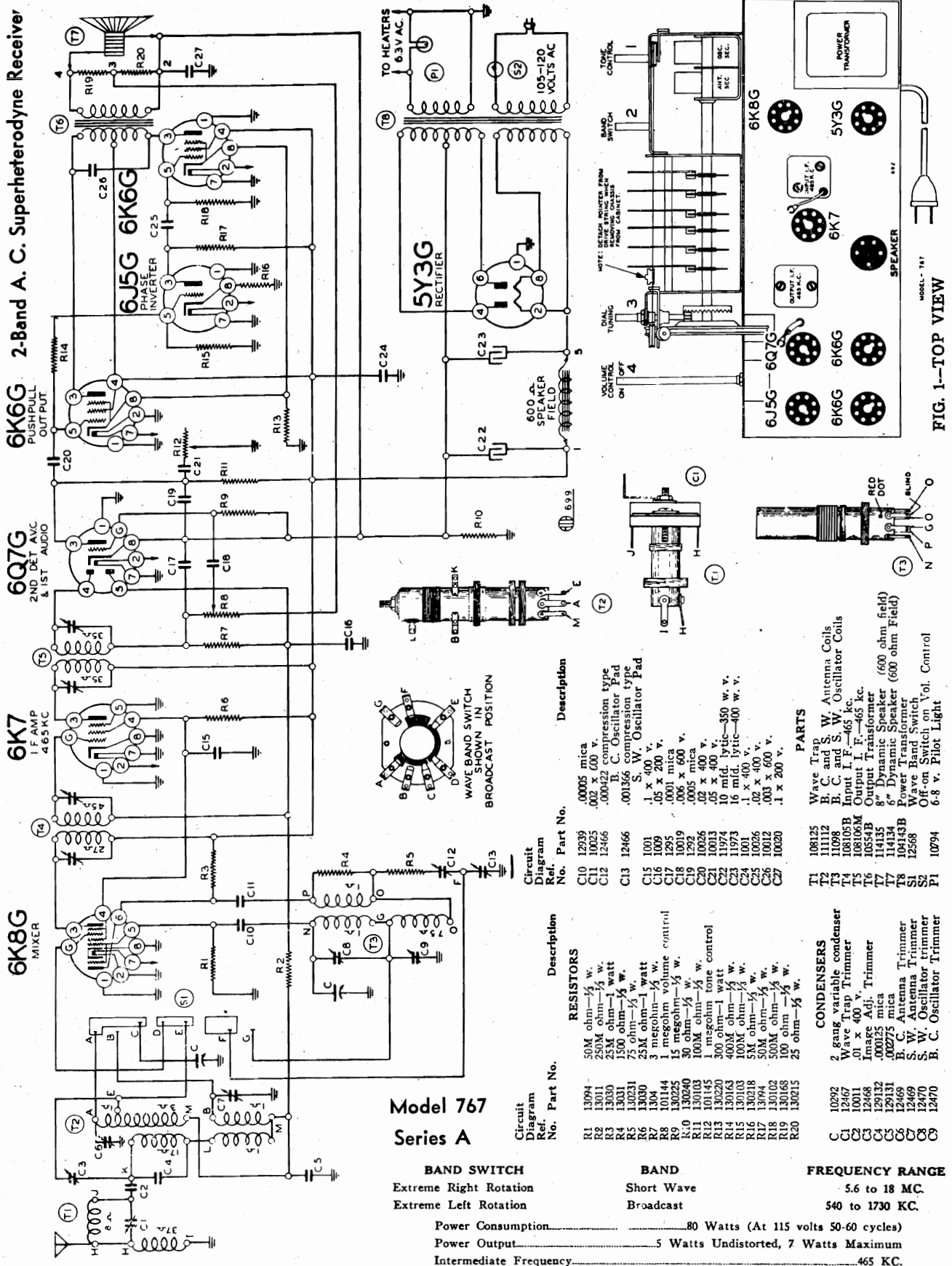
FREQUENCY RANGE
540 to 1650 K.C.

7-39

GAMBLE-SKOGMO INC.

MODEL 767, Series A
Schematic, Socket
Trimmers

6K6G 2-Band A. C. Superheterodyne Receiver



MODEL 767, Series A

Tuner Data

GAMBLE-SKOGMO INC.

SERVICE NOTES:

Voltage taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

All voltages are to be measured with 115 volts A.C. line or a fully charged 6 volt storage battery.

Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagrams.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser, open by-pass condensers frequently cause oscillation and distorted tone.

SETTING THE AUTOMATIC TUNER LEVERS:

IMPORTANT—Read carefully before setting the automatic levers.

There are six levers by means of which six stations may be selected. Make a list of local stations or stations you tune in regularly; any number up to and including six.

Punch out from the set of station call letter tabs supplied, the call letters of the stations you have selected.

On the front of each automatic tuner lever button an opening is provided for inserting the call letter tabs.

Insert the call letter tabs in the rectangular openings of each of the automatic tuner buttons. One of the small celluloid tabs supplied should be inserted into place over each of the station call letter tabs.

NOW, PROCEED AS FOLLOWS:—

1. Pull the dial tuning knob all the way out (See Illus. "B," Fig. 3), and rotate the tuning knob to the left (counterclockwise) until it cannot be turned any further (See Illus. "D," Fig. 3). This will unlock the automatic tuner mechanism. (NOTE:—Automatic tuner mechanism is locked tight when radio is shipped from the factory.)

2. Press down all the way any one of the automatic tuner levers. Holding it down firmly, press in on the dial tuning knob No. 3 and tune in the station indicated on the station call letter tab on this lever. You will note that in order to

tune the station, the dial tuning knob will have to be pressed in (See Illus. "E," Fig. 3). Turn the dial tuning knob very slowly back and forth (while still holding the automatic tuner lever in downward position), noting the width of the shadow on the screen of the cathode-ray tuning indicator. Minimum width on the tuning indicator indicates the ideal tuning position (resonance). The station will then be clearest and accurately tuned in.

3. Press down another automatic tuner lever. Holding it down firmly, press in on the dial tuning knob and carefully tune in the station indicated on the call letter tab on this lever.

4. Follow this procedure until you have selected all of your favorite stations.

5. Pull the dial tuning knob all the way out (See Illus. "B," Fig. 3) and rotate the tuning knob to the right (clockwise) until it cannot be turned any further (See Illus. "C," Fig. 3). This will lock the automatic tuner mechanism and the stations you have set up for automatic tuning will be locked in place. After you have locked the tuner mechanism, push the dial tuning knob in.

6. If you should desire to change any station you selected to another, pull the dial tuning knob all the way out and rotate the knob to the left (counterclockwise) and unlock the tuner mechanism. Select the new station as explained.

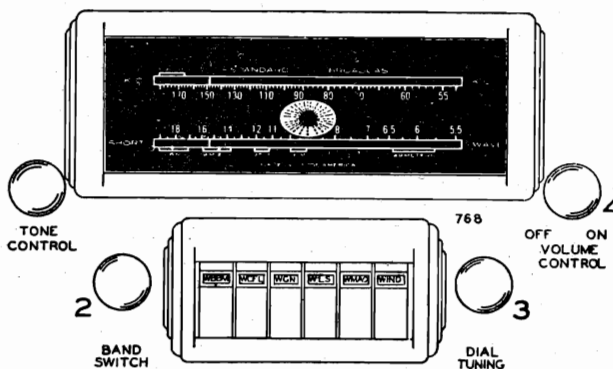


FIG. 2—FRONT VIEW

(NOTE:—If the dial mechanism works hard when setting up a new station for one of the automatic tuner levers, it is due to the tuner mechanism not being unlocked all the way. Pull the dial tuning knob out all the way and rotate the knob to the left (counterclockwise) until it will turn no further. The dial mechanism should work freely with the tuner lever pressed down.)

7. After you have selected the new station, pull the dial tuning knob all the way out and rotate the knob to the right (clockwise) to lock the tuner mechanism. Be sure the knob is turned until it will turn no further, then press the dial tuning knob in.

8. The automatic tuner levers are now set up for quick tuning. Press down the lever key and—YOUR FAVORITE STATION IS SELECTED!

The important steps to remember when setting up stations on the tuner levers for automatic tuning are:

1. To unlock the tuner mechanism pull the dial tuning knob all the way out. You may find it necessary to rotate the knob slightly when pulling it out to make certain that the gears mesh properly. Rotate the dial tuning knob to the left (counterclockwise) as far as it will turn without forcing.

2. To set a lever, press down all the way and hold in this position while tuning in by means of the dial tuning knob the station you want this lever to be tuned to. (NOTE:—you will notice that it will be necessary to keep pressing in on the dial tuning knob while tuning in the station as a spring tends to push the knob out.) Set all the levers in the same manner before locking the mechanism.

3. To lock the tuner mechanism pull the dial tuning knob all the way out. Rotate the dial tuning knob to the right as far as it will turn making certain that it is tight, but it is not necessary to use force.

4. After locking or unlocking the tuner mechanism always return the dial tuning knob to its normal position (pushed in).

KNOB NO.3 (DIAL TUNING)

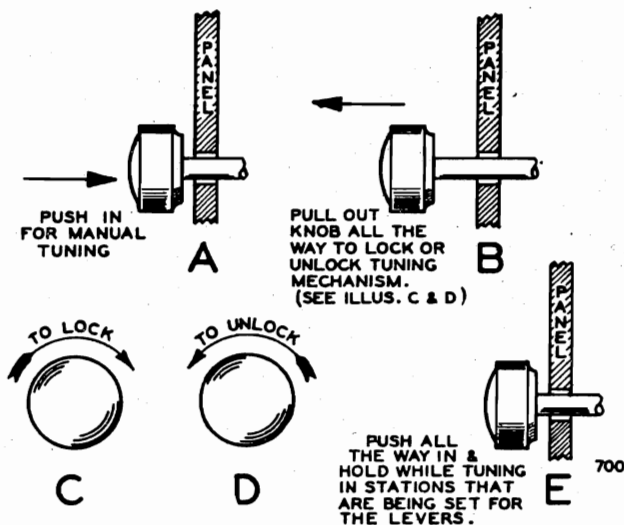


FIG. 3

GAMBLE-SKOGMO INC.

MODEL 767, Series A
Alignment, Voltage
Trimmers

ALIGNMENT PROCEDURE

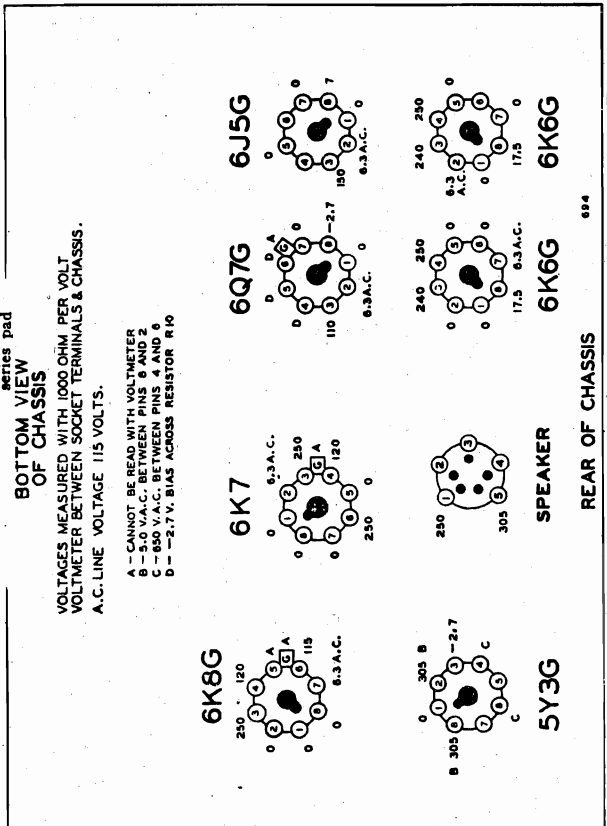
Model 767 Series A

NOTE "A" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

NOTE "B" 1400 KC is the image frequency of 2330 KC. Adjust Trimmer (C3) until a minimum output is obtained.

- The following equipment is required for aligning:
- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
 - Output indicating meter.
 - Non-metallic screwdriver.
 - Dummy antennas—1 mf., 200 mmf. and 400 ohms.

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Position of Band Switch | Variable Condenser Setting | Trimmers Adjusted (In Order Shown) | Trimmer Function | Adjustment |
|-----------------------------|------------------------------------|---------------|---------------------|-------------------------------------|--------------------------------------|------------------------------------|----------------------------------|---|
| I. F. | 465 Kc. | .1 MFD. | Grid of 6K7 | Broadcast (Extreme left rotation) | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Grid of 6K8G | Broadcast (Extreme left rotation) | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Input I. F. | Adjust to maximum output |
| BROADCAST BAND | 1730 Kc. | 200 mmf. | Antenna lead | Broadcast (Extreme left rotation) | Rotor full open (Plates out of mesh) | Trimmer (C9) (See Fig. 4) | Broadcast oscillator | Adjust to maximum output |
| | 1500 Kc. | 200 mmf. | Antenna lead | Broadcast (Extreme left rotation) | Set Dial at 1500 Kc. | Trimmer (C6) (See Fig. 4) | Broadcast antenna | Adjust to maximum output |
| | 600 Kc. | 200 mmf. | Antenna lead | Broadcast (Extreme left rotation) | Set Dial at 600 Kc. | Trimmer (C12C) (See Fig. 4) | Broadcast oscillator series pad | Adjust to maximum rock dial. (See note "A") |
| | 465 Kc. | 200 mmf. | Antenna lead | Broadcast (Extreme left rotation) | Set Dial at 600 Kc. | Trimmer (C1) (See Fig. 4) | I. F. Wave Trap | Adjust for minimum output |
| IMAGE REJECTION ADJUSTMENTS | 2330 Kc. | 200 mmf. | Antenna lead | Broadcast (Extreme left rotation) | Pick up signal at 1400 Kc. on dial | Trimmer (C3) (See Fig. 4) | Image rejection | Adjust for minimum output (See note "B") |
| SHORT WAVE BAND | 17 Mc. | 400 ohms | Antenna lead | Short Wave (Extreme right rotation) | Set Dial at 17 Mc. | Trimmer (C8) (See Fig. 4) | Short Wave oscillator | Adjust to maximum output |
| | 17 Mc. | 400 ohms | Antenna lead | Short Wave (Extreme right rotation) | Dial Set at 17 Mc. | Trimmer (C7) (See Fig. 4) | Short Wave antenna | Adjust to maximum output |
| | 6 Mc. | 400 ohms | Antenna lead | Short Wave (Extreme right rotation) | Set Dial at 6 Mc. | Trimmer (C13) (See Fig. 4) | Short Wave oscillator series pad | Adjust to maximum rock dial. (See note "A") |



Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.
After each band is completed, repeat the procedure as a final check.

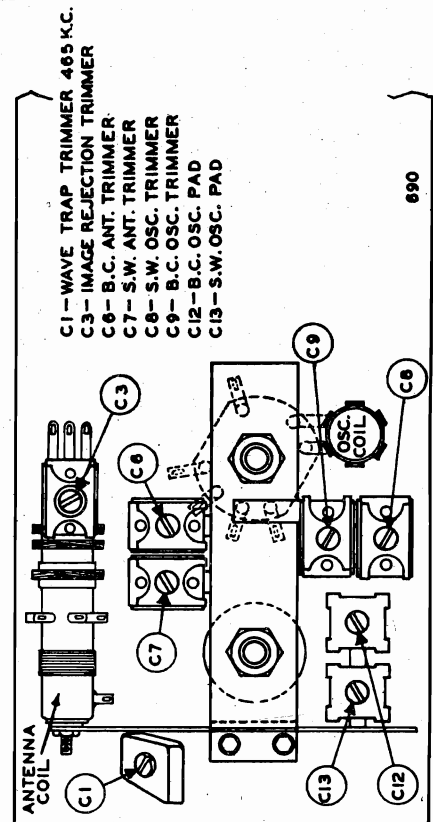
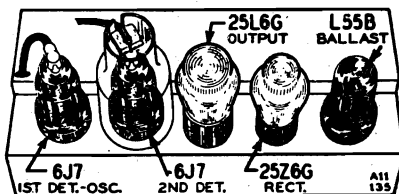


FIG. 4

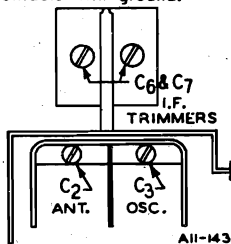
MODELS 802, 804

Schematic, Voltage
Alignment, Trimmers
Socket

DC OPERATION—Filament and ballast tube voltages will be the same as AC (for 117 volt line). The plate, screen and bias voltages will be slightly lower than those shown above. When operated on DC, the rectifier tube acts as a low resistance series resistor with a drop of approximately 6 volts between plate and cathode.



CAUTION—In any service work on the AC-DC chassis, keep it on a wood or other insulated surface to avoid contacts with ground.



MAY, 1938

Power Consumption - 48 Watts (At 117 volts AC Supply)
Power Output - .8 Watts Undistorted
Selectivity - 30 KC Broad at 100 times Signal.
Tuning Frequency Range - 530 to 1730 KC
Sensitivity - 180 Microvolts Average

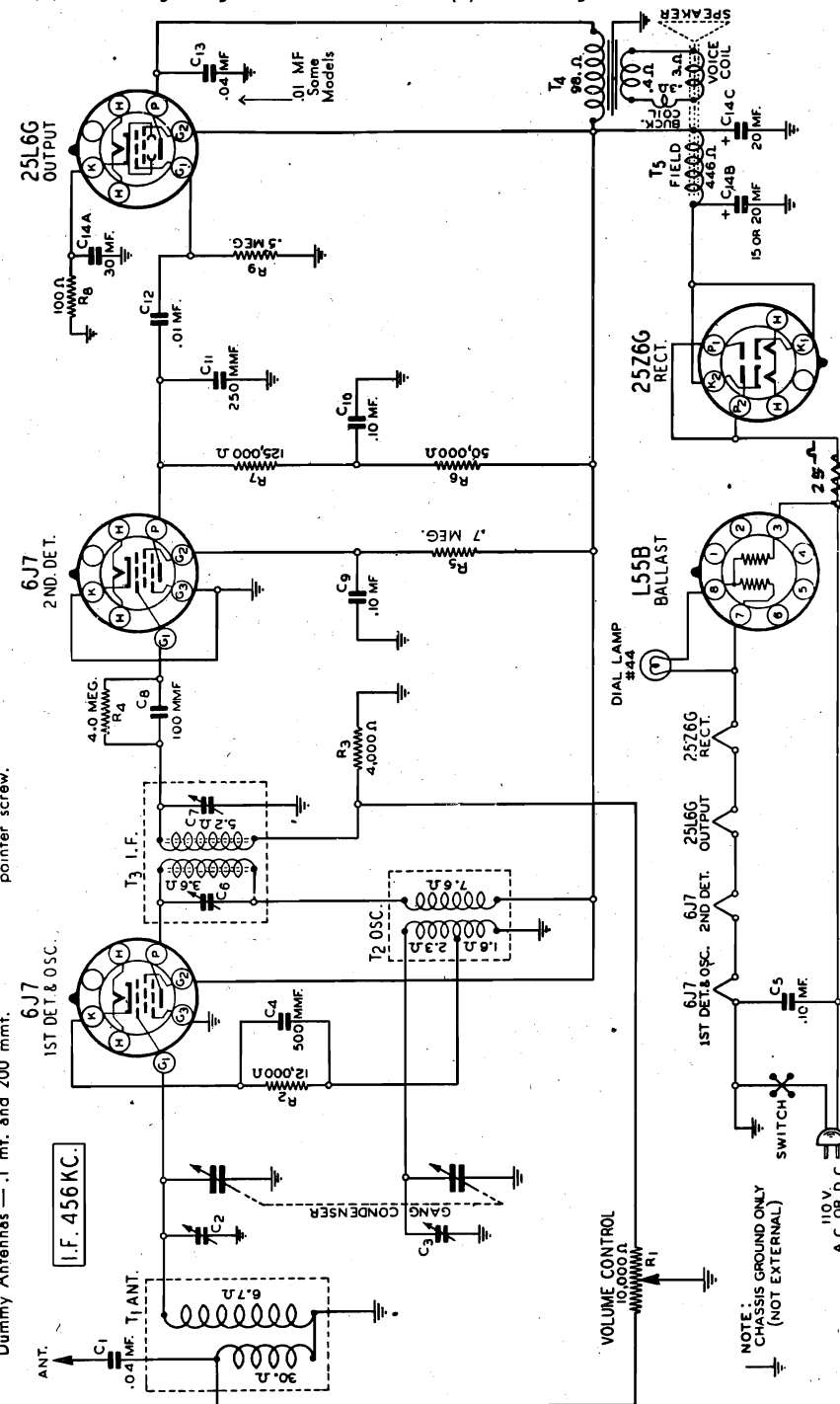
ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for Several Minutes.

| SIGNAL GENERATOR FREQUENCY SETTING | DUMMY CONNECTION ANTENNA | CONDENSER SETTING | ADJUST TRIMMERS TO MAXIMUM (See Illustration) |
|--|--------------------------------|----------------------|---|
| 456 KC | Grid of 1st Det. | .1 mf. | Turn rotor to full open |
| 1730 KC | Antenna Lead | 200 mmf. | Turn rotor to full open |
| 1500 KC | Antenna Lead | 200 mmf. | Turn rotor to max. output |

The following equipment is required for aligning:
Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter; Non-Metallic Screwdriver.
Dummy Antennas—.1 mf. and 200 mmf.

NOTE—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, loosen the pointer screw, set the pointer at the 800 KC mark and retighten the pointer screw.



GAMBLE-SKOGMO INC.

VOLTAGES AT SOCKETS FOR 117 VOLT AC LINE

See Note Below Regarding Voltages when Operated on DC
Volume Control Maximum—Antenna Lead Grounded—Readings taken with 1000 Ohm-per-volt Meter.

| TUBE | FUNCTION | Voltage Between Socket Prong and Ground (Unless Otherwise Indicated) | | | | | | | |
|-------|-----------------|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | | Prong No. 1 | Prong No. 2 | Prong No. 3 | Prong No. 4 | Prong No. 5 | Prong No. 6 | Prong No. 7 | Prong No. 8 |
| 6J7 | 1st Det. & Osc. | | 6.3(1) | 98 | 98 | | | 6.3(1) | 6.0 |
| 6J7 | 2nd Det. | | 6.3(1) | 10 | 13 | | | 6.3(1) | |
| 25L6G | Output | | 24(1) | 92 | 98 | | | 24(1) | 5 |
| 25Z6G | Rectifier | | 24(1) | 117(2) | 125 | 117(2) | | 24(1) | 125 |
| L55B | Ballast | | | 56.6(3) | | | | 56.6(3) | 4.5(4) |

(1) AC voltage across terminals 2 and 7.
(2) AC voltage to ground.

(3) AC voltage across terminals 3 and 7.
(4) AC voltage across terminals 7 and 8.

GAMBLE-SKOGMO INC.

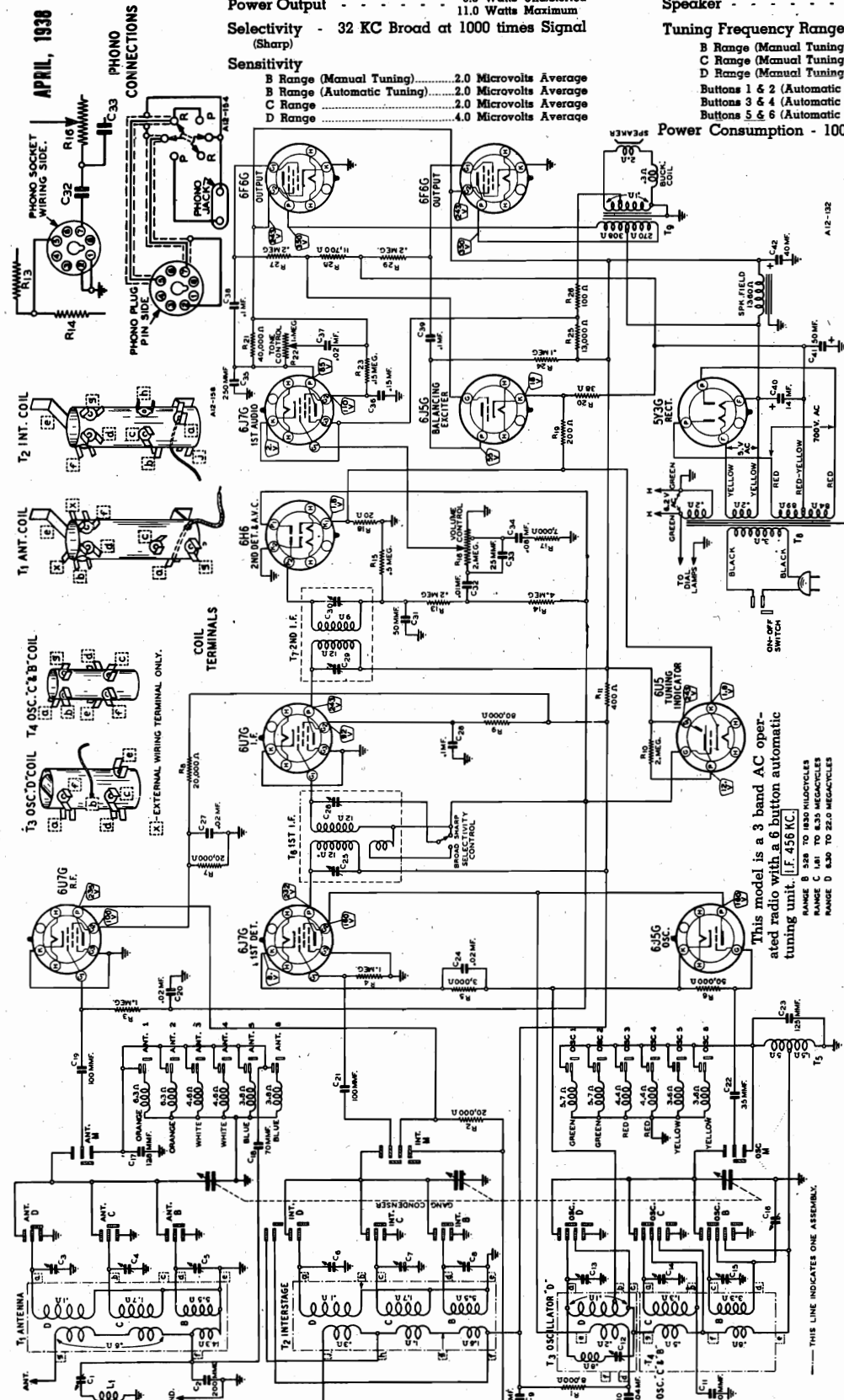
MODEL 864

Schematic, Voltage
Socket, Sensitivity

Power Output - - - - - 8.5 Watts Undistorted
11.0 Watts Maximum
Selectivity - 32 KC Broad at 1000 times Signal
(Sharp)
Sensitivity
B Range (Manual Tuning).....2.0 Microvolts Average
B Range (Automatic Tuning).....2.0 Microvolts Average
C Range.....2.0 Microvolts Average
D Range.....4.0 Microvolts Average

Speaker - - - - - 12" Dynamic
Tuning Frequency Range
B Range (Manual Tuning).....528 to 1839 KC
C Range (Manual Tuning).....1810 to 6355 KC
D Range (Manual Tuning).....6300 to 22000 KC
Buttons 1 & 2 (Automatic Tuning).....520 to 980 KC
Buttons 3 & 4 (Automatic Tuning).....850 to 1250 KC
Buttons 5 & 6 (Automatic Tuning).....820 to 1600 KC

Power Consumption - 100 Watts (At 117 volts 60 cycles)



Oscillation on D Band

If oscillation is encountered on the D band, change the oscillator grid resistor to 35,000 ohms.

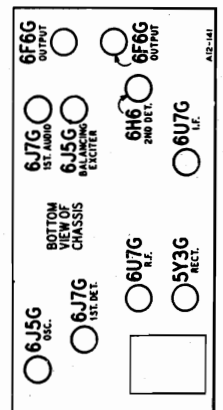
Twenty-Five Cycle Models
The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used.

Readings taken with 1000 ohm-per-volt meter.
The voltage between the control grids of the 6J5G balancing exciter and the 6J5G output tubes and ground is 22. This voltage cannot be read at the socket terminal because of the high resistance circuit, but can be read across resistors R18, 19, and 20.

Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram. Unless otherwise specified, the voltage indicated is between the socket terminal and ground.
These voltages are read under the following conditions:
Line Voltage—117.
Volume Control—Maximum.
Antenna Shorted to Ground.

This model is a 3 band AC operated radio with a 6 button automatic tuning unit. [F. 456 KC.]
RANGE B 528 TO 1839 HERTZ
RANGE C 1810 TO 6355 HERTZ
RANGE D 6300 TO 22000 HERTZ



MODEL 864

Alignment, Trimmers

Drive Cord Data

GAMBLE-SKOGMO INC.

Phonograph Connections
Phonograph connections are made drilled in the back panel. As shown in the schematic circuit diagram. On the back panel of the chassis base is a round knockout 1 1/4 inches in diameter. An octal plug base socket is then mounted in this graph-radio switch and double tip jack.

Phonograph Connections
Phonograph connections are made drilled in the back panel. As shown in the schematic circuit diagram. On the back panel of the chassis base is a round knockout 1 1/4 inches in diameter. An octal plug base socket is then mounted in this graph-radio switch and double tip jack.

Phonograph Connections
Phonograph connections are made drilled in the back panel. As shown in the schematic circuit diagram. On the back panel of the chassis base is a round knockout 1 1/4 inches in diameter. An octal plug base socket is then mounted in this graph-radio switch and double tip jack.

ATTACHING DIAL POINTER—Tune in a 1500 KC signal. Move the pointer to the 1500 KC mark on the dial and clamp it tightly over the fabric tubing on the cord.

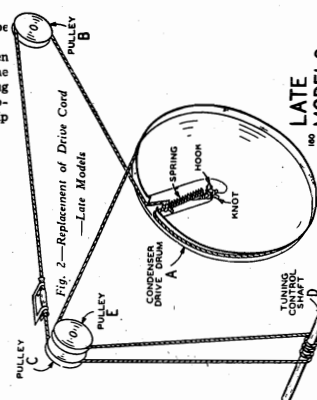


Fig. 2—Replacement of Drive Cord—Late Models

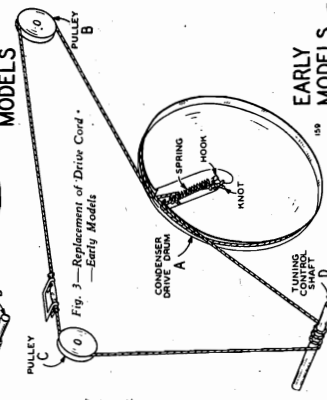


Fig. 3—Replacement of Drive Cord—Early Models

Phonograph Connections
Phonograph connections are made drilled in the back panel. As shown in the schematic circuit diagram. On the back panel of the chassis base is a round knockout 1 1/4 inches in diameter. An octal plug base socket is then mounted in this graph-radio switch and double tip jack.

Phonograph Connections
Phonograph connections are made drilled in the back panel. As shown in the schematic circuit diagram. On the back panel of the chassis base is a round knockout 1 1/4 inches in diameter. An octal plug base socket is then mounted in this graph-radio switch and double tip jack.

Phonograph Connections
Phonograph connections are made drilled in the back panel. As shown in the schematic circuit diagram. On the back panel of the chassis base is a round knockout 1 1/4 inches in diameter. An octal plug base socket is then mounted in this graph-radio switch and double tip jack.

ATTACHING DIAL POINTER—Tune in a 1500 KC signal. Move the pointer to the 1500 KC mark on the dial and clamp it tightly over the fabric tubing on the cord.

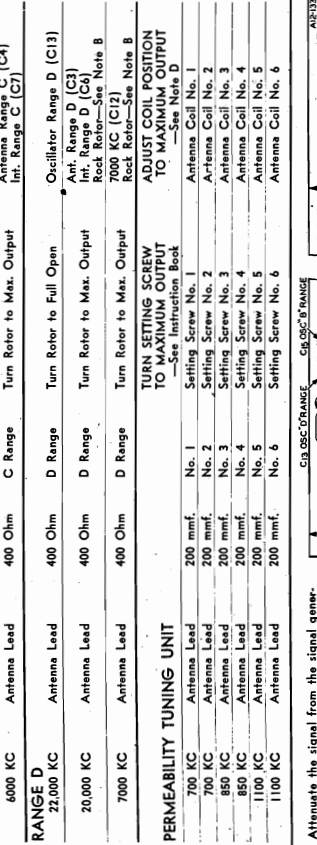


Fig. 2—Replacement of Drive Cord—Late Models

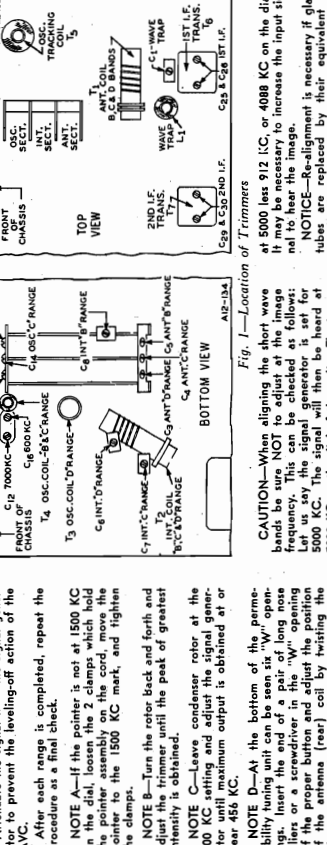
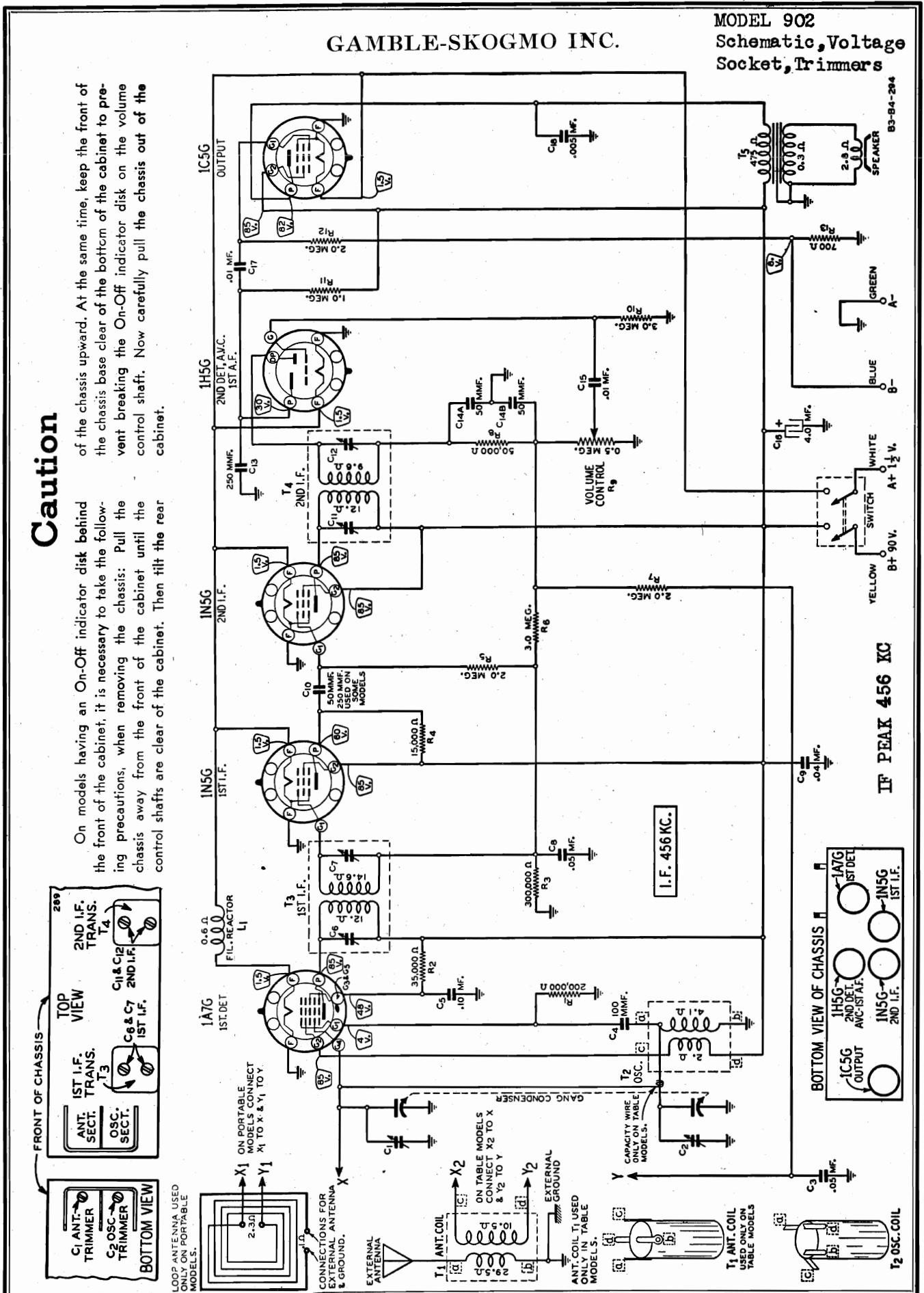


Fig. 3—Replacement of Drive Cord—Early Models

On models having an On-Off indicator disk behind the front of the cabinet, it is necessary to take the following precautions, when removing the chassis: Pull the chassis away from the front of the cabinet until the control shafts are clear of the cabinet. Then tilt the rear



| | | | |
|------------------------|--|-------------|---|
| Power Consumption | - 28 Watts (At 117 volts AC Supply) | Speaker | - - - - - 5" Electro Dynamic |
| Power Output | - - - - - .8 Watt Undistorted | Tuning | - - - - - 528 to 1730 KC |
| Selectivity | - - - 60 KC Broad at 1000 times Signal | Range | - - - - - 35 Microvolts per Meter Average |
| Intermediate Frequency | - - - - - 458 KC | Sensitivity | - - - - - (For .05 Watt Output) |

SPECIFICATIONS

| | | | |
|------------------------|-------------------------------------|------------------------|--|
| Power Consumption | - 28 Watts (At 117 volts AC Supply) | Speaker | - - - 5" Electro Dynamic |
| Power Output | - .8 Watt Undistorted | Tuning Frequency Range | - 528 to 1730 KC |
| Selectivity | - .60 KC Broad at 1000 times Signal | Sensitivity | - 35 Microvolts per Meter Average (For .05 Watt Output) |
| Intermediate Frequency | - 458 KC | | |

ALIGNMENT PROCEDURE

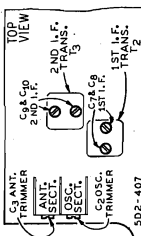
Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several Minutes. Connect Ground Post of Signal Generator to B-12SK7—Prong No. 31 in Chassis.

| SIGNAL GENERATOR FREQUENCY SETTING | CONNECTION AT RADIO | DUMMY ANTENNA | CONDENSER SETTING | ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration) |
|--|---|------------------|---------------------------|---|
| 465 KC | Signal Grid of 1st Det. Stator of at least 1st A.G.C. Stage | .1 mf. | Turn Rotor to full open | 1st I.F. (C7) & (C8) 2nd I.F. (C9) & (C10) |
| 1710 KC | Antenna Clip | 200 mmf. | Turn Rotor to full open | Oscillator (C2) |
| 1500 KC | Antenna Clip | 200 mmf. | Turn Rotor to max. output | Antenna (C3) |

The following equipment is required for aligning:

Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter; Non-Metallic Screwdriver.
Dummy Antenna—1 mf. and 200 mmf.

NOTE—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, first remove the celluloid crystal by taking out the 4 buttons at the corner. Hold the tuning knob and shift the pointer to the 800 KC mark.



Caution

The metal chassis is connected to one side of the power transformer. Both AC and DC through the 25 ohm resistor. If the power lines are generally connected to one side: If the line not connected to the metal chassis of the line not connected to the metal chassis this condenser is grounded and the metal chassis is in contact with an external ground, this condenser will be connected across the line and there will be an increase in hum.

Antenna

A loop antenna is mounted on the back of the chassis base. For reception of local or powerful nearby stations no other antenna or ground is usually required.

However, more stations will be heard and noise will often be reduced by using an external antenna. This should preferably be on the outside of the building. For locations in the city or close to the broadcasting stations, the antenna should be 20 to 35 feet in length while for locations in the country or at a distance from the broadcasting stations, use a 35 to 60 foot antenna.

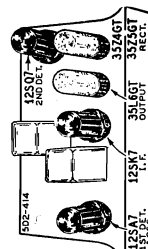
Power Supply

This radio will operate on a power supply of 117 volts AC, 50 to 60 cycles only, or 117 volts DC.

When using the radio on AC, if there appears to be excessive hum, reverse the plug. Leave the plug inserted the way which gives the least hum.

Radios for 25 to 60 cycle AC operation are so marked.

CAUTION—110 Volt DC Operation
—when used on a DC line, if the set



SPECIFICATIONS

| | | |
|----------------------------------|----------------------------------|------------------|
| Input Voltages and Currents | Intermediate Frequency | 458 KC. |
| "A" Battery | Speaker | 6" P.M. Dynamic |
| "B" Battery | Tuning Frequency Range | \$40 to 1600 KC. |
| Power Output | Sensitivity (For JS Watt Output) | |
| 140 Milliwatts Undistorted | Portable Model | |
| 41 KC Broad at 1000 Times Signal | 50 Microvolts Per Meter Average | |

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

| FREQUENCY SETTING | GENERATOR OR ANTENNA | DUMMY ANTENNA | CONDENSER SETTING | AUGUST TRIMMERS TO MAXIMUM (See Trimmer Illustration) |
|----------------------|----------------------------|------------------|---------------------------|---|
| 455 KC | Grid of 1st Det. | .1 mf. | Turn rotor to full open | 1st I.F. (C6) & (C7) 2nd I.F. (C11) & (C12) |
| 1600 KC | Grid of 1st Det. | .1 mf. | Turn rotor to full open | Oscillator (C2) |
| 1500 KC | None—See Note | | Turn rotor to max. output | Antenna (C1) |

calculated dial scale.—To obtain dial scale calibration, tune in 800 KC signal. The pointer should be at the 100 mark. **IF THE POINTER IS AT A HIGHER KC MARK THAN 100, THE DRIVE CORD IS ABOVE THE TENSION SPRING.** Hold the tuning coil below the tension spring. Hold the tuning coil shaft motionless and slowly pull the drive cord down until the pointer is at the 100 KC mark. **IF THE POINTER IS AT A LOWER KC MARK THAN 800 KC, THE DRIVE CORD IS BELOW THE TENSION SPRING.** Hold the tuning coil above the tension spring. Hold the tuning coil shaft motionless and slowly pull the drive cord up until the pointer is at the 800 KC mark.

Output Indicating Meter: Non-Metallic Screwdriver.
Dummy Antenna—1 mfd.

NOTE—Connect one foot in diameter across the antenna and ground posts of the antenna. Connections for the output meter may be made through the antenna.

The following equipment is required for aligning: Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

CALIBRATION [For models with pointer in front of dial only]—To obtain dial scale calibration, tune in an 800 KC pointer. The pointer should be at the 800 KC mark on the dial. If it is off, loosen the pointer screw, set the pointer at the 800 KC mark and retighten the pointer screw.

Antenna

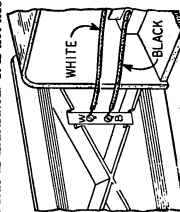
An outside antenna and ground are not required for this radio.

A loop antenna is built on the back cover of the cabinet. This makes the radio suitable for portable use.

If the radio is installed in a permanent location, a long outside antenna (50 to 100 feet) and a ground may be used. At the bottom of the cabinet near the back is an opening through which will be seen two connecting posts marked "A" and "G" or the outside antenna and ground connections respectively.

Batteries

Taking Off Back of Cabinet—To take off the back of the cabinet, first remove the wood screws which hold it in place. Then swing the back to the side as illustrated. It is not nec-



Adjusting Antenna Trimmer

After the batteries are installed and the back of the cabinet is in place, adjust the antenna trimmer.

Accurately tune in a weak station signal between 1400 and 1500 KC on the dial. With a screwdriver turn the adjusting screw of the antenna trimmer up or down until maximum output is obtained. This trimmer is reached through an opening in the bottom of the cabinet—see illustration. CAUTION: Do not remove the cork from the other opening at the bottom of the cabinet.

Readjust the antenna trimmer when a new set of batteries is installed.

DO NOT REMOVE THIS CORK

TUNING KNOB

ANTENNA TRIMMER

284

Tubes

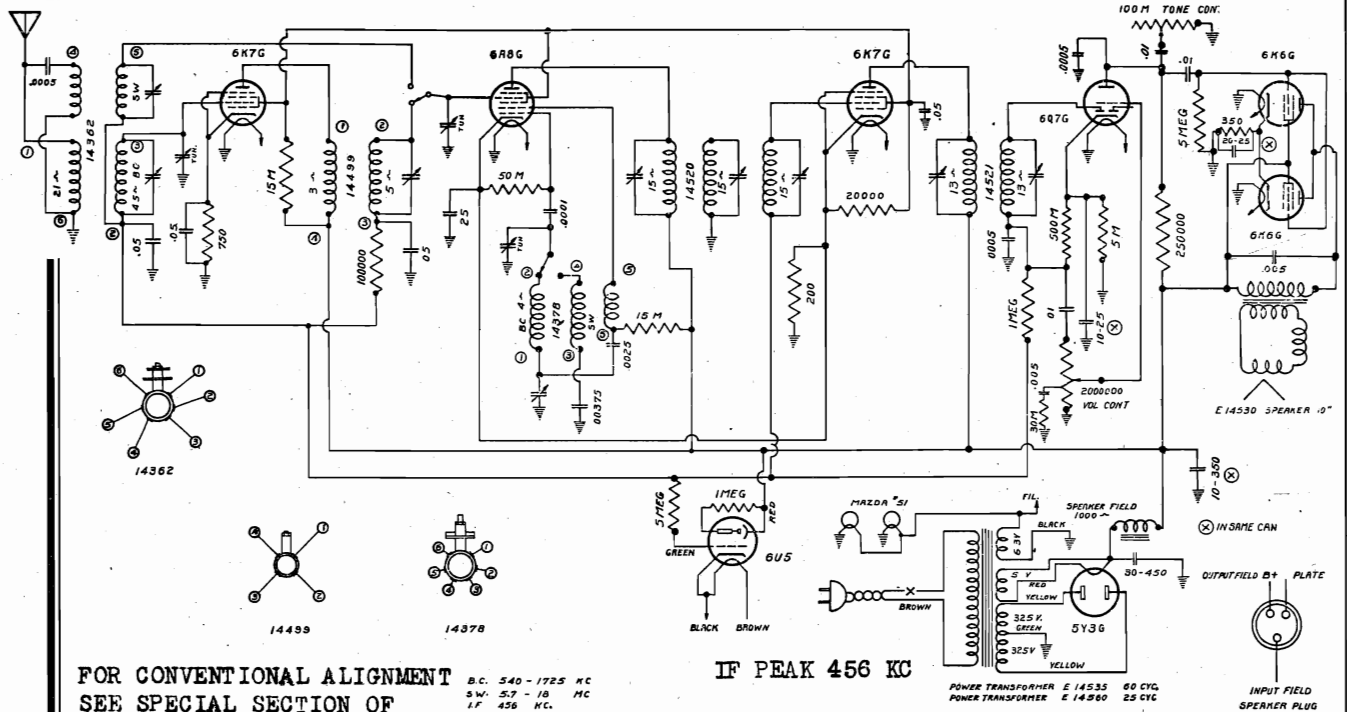
The tube types and position of the tubes are shown on the label in the cabinet. To replace a tube, it will be necessary to remove the wood bar in the back of the chassis by taking out the 2 screws which hold it in place.



GAMBLE-SKOGMO INC.

MODELS 816,816B
MODEL 990
Schematics,Alignment

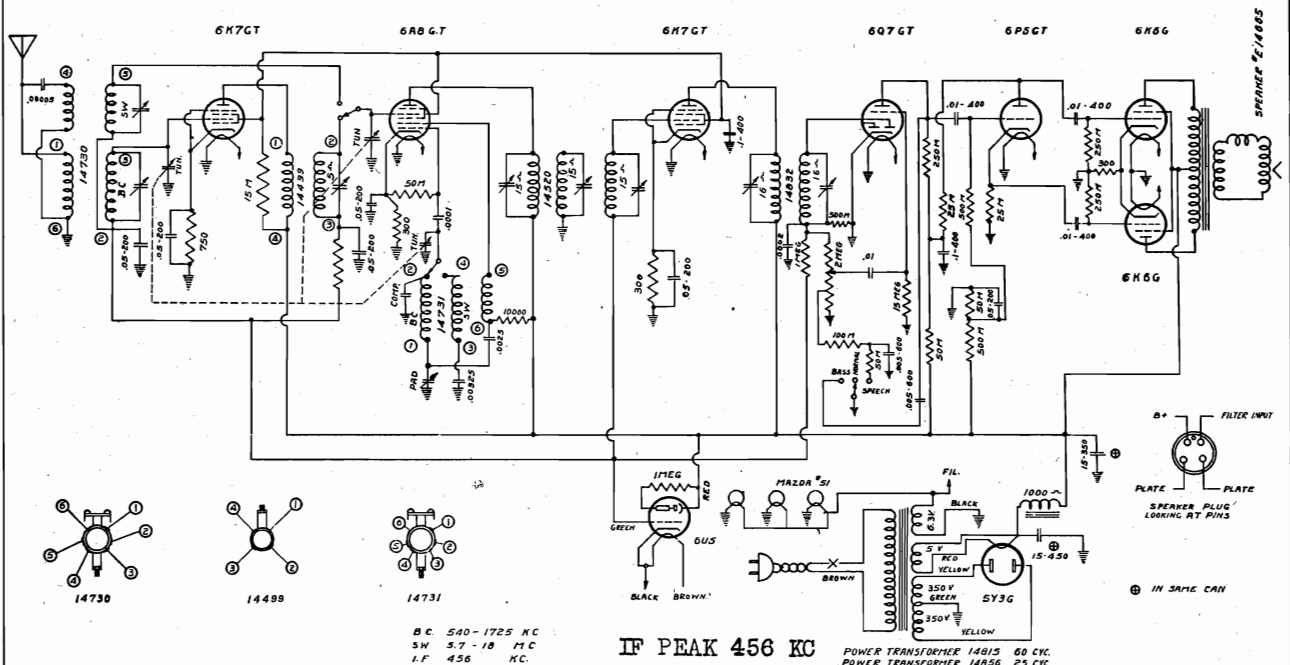
**MODEL 816 ,816B
CIRCUIT DIAGRAM NO.14561**



**MODEL 990
CIRCUIT DIAGRAM NO.14855**

TELEVISION AND PHONOGRAPH JACK

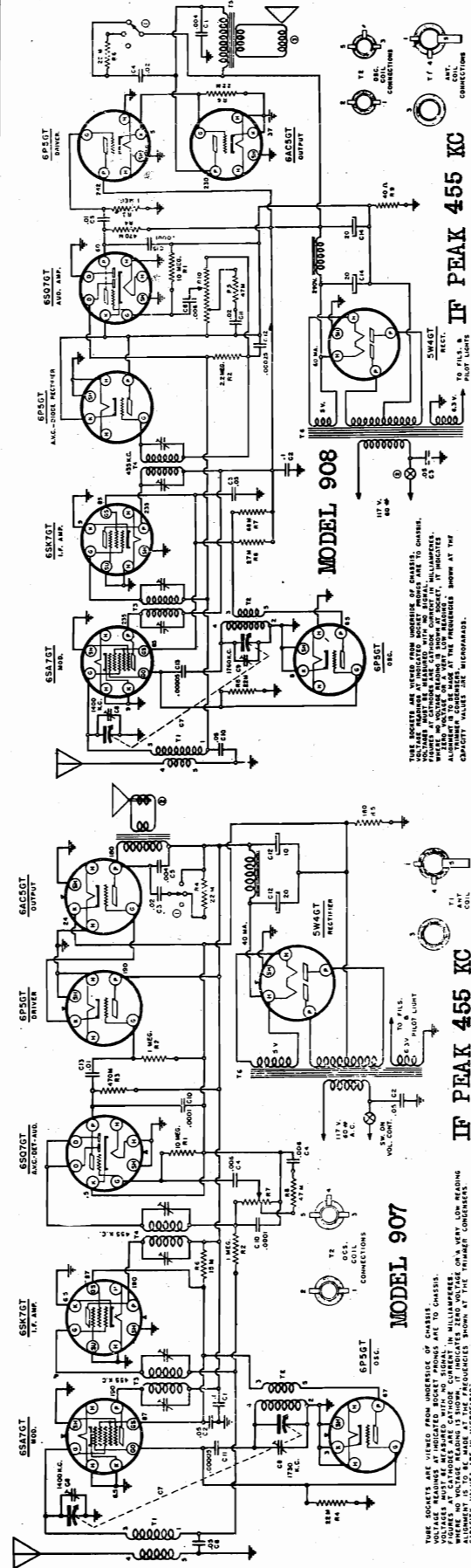
The jack on the back of the chassis may be used to connect a Television "Video Adaptor", or phonograph pick up. A standard phone plug fits this jack. A crystal pick up is recommended for phonograph use.



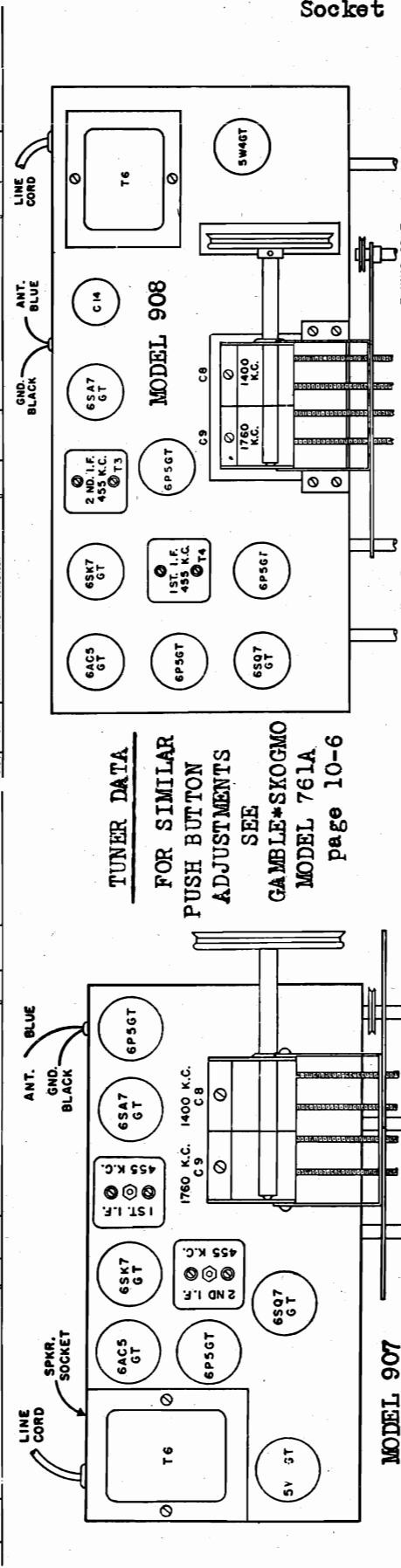
MODEL 907
MODEL 908

GAMBLE-SKOGMO INC.

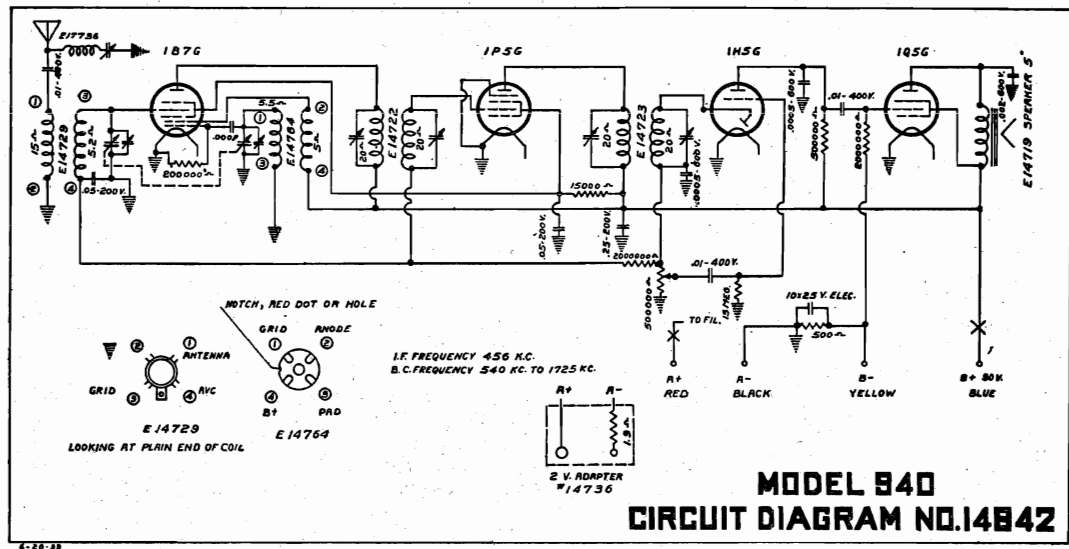
Schematics, Voltage
Alignment, Trimmers
Socket



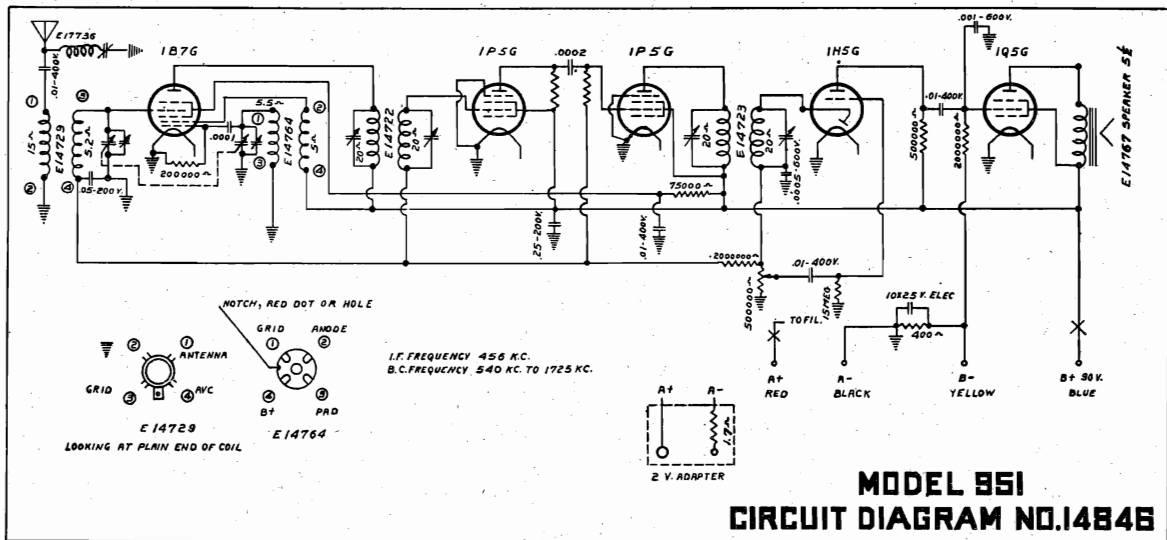
| CODE | PART NO. | DESCRIPTION | CODE | PART NO. | DESCRIPTION |
|------|----------|--------------------------------|------|----------|------------------------|
| C1 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T1 | 10-233 | ANTENNA COIL |
| C2 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T2 | 10-233 | 1ST I.F. TRANSFORMER |
| C3 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T3 | 10-233 | 2ND I.F. TRANSFORMER |
| C4 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T4 | 10-233 | 3RD I.F. TRANSFORMER |
| C5 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T5 | 10-233 | 4TH I.F. TRANSFORMER |
| C6 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T6 | 10-233 | 5TH I.F. TRANSFORMER |
| C7 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T7 | 10-233 | 6TH I.F. TRANSFORMER |
| C8 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T8 | 10-233 | 7TH I.F. TRANSFORMER |
| C9 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T9 | 10-233 | 8TH I.F. TRANSFORMER |
| C10 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T10 | 10-233 | 9TH I.F. TRANSFORMER |
| C11 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T11 | 10-233 | 10TH I.F. TRANSFORMER |
| C12 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T12 | 10-233 | 11TH I.F. TRANSFORMER |
| C13 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T13 | 10-233 | 12TH I.F. TRANSFORMER |
| C14 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T14 | 10-233 | 13TH I.F. TRANSFORMER |
| C15 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T15 | 10-233 | 14TH I.F. TRANSFORMER |
| C16 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T16 | 10-233 | 15TH I.F. TRANSFORMER |
| C17 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T17 | 10-233 | 16TH I.F. TRANSFORMER |
| C18 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T18 | 10-233 | 17TH I.F. TRANSFORMER |
| C19 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T19 | 10-233 | 18TH I.F. TRANSFORMER |
| C20 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T20 | 10-233 | 19TH I.F. TRANSFORMER |
| C21 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T21 | 10-233 | 20TH I.F. TRANSFORMER |
| C22 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T22 | 10-233 | 21TH I.F. TRANSFORMER |
| C23 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T23 | 10-233 | 22TH I.F. TRANSFORMER |
| C24 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T24 | 10-233 | 23TH I.F. TRANSFORMER |
| C25 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T25 | 10-233 | 24TH I.F. TRANSFORMER |
| C26 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T26 | 10-233 | 25TH I.F. TRANSFORMER |
| C27 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T27 | 10-233 | 26TH I.F. TRANSFORMER |
| C28 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T28 | 10-233 | 27TH I.F. TRANSFORMER |
| C29 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T29 | 10-233 | 28TH I.F. TRANSFORMER |
| C30 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T30 | 10-233 | 29TH I.F. TRANSFORMER |
| C31 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T31 | 10-233 | 30TH I.F. TRANSFORMER |
| C32 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T32 | 10-233 | 31TH I.F. TRANSFORMER |
| C33 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T33 | 10-233 | 32TH I.F. TRANSFORMER |
| C34 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T34 | 10-233 | 33TH I.F. TRANSFORMER |
| C35 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T35 | 10-233 | 34TH I.F. TRANSFORMER |
| C36 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T36 | 10-233 | 35TH I.F. TRANSFORMER |
| C37 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T37 | 10-233 | 36TH I.F. TRANSFORMER |
| C38 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T38 | 10-233 | 37TH I.F. TRANSFORMER |
| C39 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T39 | 10-233 | 38TH I.F. TRANSFORMER |
| C40 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T40 | 10-233 | 39TH I.F. TRANSFORMER |
| C41 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T41 | 10-233 | 40TH I.F. TRANSFORMER |
| C42 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T42 | 10-233 | 41TH I.F. TRANSFORMER |
| C43 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T43 | 10-233 | 42TH I.F. TRANSFORMER |
| C44 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T44 | 10-233 | 43TH I.F. TRANSFORMER |
| C45 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T45 | 10-233 | 44TH I.F. TRANSFORMER |
| C46 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T46 | 10-233 | 45TH I.F. TRANSFORMER |
| C47 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T47 | 10-233 | 46TH I.F. TRANSFORMER |
| C48 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T48 | 10-233 | 47TH I.F. TRANSFORMER |
| C49 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T49 | 10-233 | 48TH I.F. TRANSFORMER |
| C50 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T50 | 10-233 | 49TH I.F. TRANSFORMER |
| C51 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T51 | 10-233 | 50TH I.F. TRANSFORMER |
| C52 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T52 | 10-233 | 51TH I.F. TRANSFORMER |
| C53 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T53 | 10-233 | 52TH I.F. TRANSFORMER |
| C54 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T54 | 10-233 | 53TH I.F. TRANSFORMER |
| C55 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T55 | 10-233 | 54TH I.F. TRANSFORMER |
| C56 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T56 | 10-233 | 55TH I.F. TRANSFORMER |
| C57 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T57 | 10-233 | 56TH I.F. TRANSFORMER |
| C58 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T58 | 10-233 | 57TH I.F. TRANSFORMER |
| C59 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T59 | 10-233 | 58TH I.F. TRANSFORMER |
| C60 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T60 | 10-233 | 59TH I.F. TRANSFORMER |
| C61 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T61 | 10-233 | 60TH I.F. TRANSFORMER |
| C62 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T62 | 10-233 | 61TH I.F. TRANSFORMER |
| C63 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T63 | 10-233 | 62TH I.F. TRANSFORMER |
| C64 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T64 | 10-233 | 63TH I.F. TRANSFORMER |
| C65 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T65 | 10-233 | 64TH I.F. TRANSFORMER |
| C66 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T66 | 10-233 | 65TH I.F. TRANSFORMER |
| C67 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T67 | 10-233 | 66TH I.F. TRANSFORMER |
| C68 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T68 | 10-233 | 67TH I.F. TRANSFORMER |
| C69 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T69 | 10-233 | 68TH I.F. TRANSFORMER |
| C70 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T70 | 10-233 | 69TH I.F. TRANSFORMER |
| C71 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T71 | 10-233 | 70TH I.F. TRANSFORMER |
| C72 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T72 | 10-233 | 71TH I.F. TRANSFORMER |
| C73 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T73 | 10-233 | 72TH I.F. TRANSFORMER |
| C74 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T74 | 10-233 | 73TH I.F. TRANSFORMER |
| C75 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T75 | 10-233 | 74TH I.F. TRANSFORMER |
| C76 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T76 | 10-233 | 75TH I.F. TRANSFORMER |
| C77 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T77 | 10-233 | 76TH I.F. TRANSFORMER |
| C78 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T78 | 10-233 | 77TH I.F. TRANSFORMER |
| C79 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T79 | 10-233 | 78TH I.F. TRANSFORMER |
| C80 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T80 | 10-233 | 79TH I.F. TRANSFORMER |
| C81 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T81 | 10-233 | 80TH I.F. TRANSFORMER |
| C82 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T82 | 10-233 | 81TH I.F. TRANSFORMER |
| C83 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T83 | 10-233 | 82TH I.F. TRANSFORMER |
| C84 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T84 | 10-233 | 83TH I.F. TRANSFORMER |
| C85 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T85 | 10-233 | 84TH I.F. TRANSFORMER |
| C86 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T86 | 10-233 | 85TH I.F. TRANSFORMER |
| C87 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T87 | 10-233 | 86TH I.F. TRANSFORMER |
| C88 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T88 | 10-233 | 87TH I.F. TRANSFORMER |
| C89 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T89 | 10-233 | 88TH I.F. TRANSFORMER |
| C90 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T90 | 10-233 | 89TH I.F. TRANSFORMER |
| C91 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T91 | 10-233 | 90TH I.F. TRANSFORMER |
| C92 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T92 | 10-233 | 91TH I.F. TRANSFORMER |
| C93 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T93 | 10-233 | 92TH I.F. TRANSFORMER |
| C94 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T94 | 10-233 | 93TH I.F. TRANSFORMER |
| C95 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T95 | 10-233 | 94TH I.F. TRANSFORMER |
| C96 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T96 | 10-233 | 95TH I.F. TRANSFORMER |
| C97 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T97 | 10-233 | 96TH I.F. TRANSFORMER |
| C98 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T98 | 10-233 | 97TH I.F. TRANSFORMER |
| C99 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T99 | 10-233 | 98TH I.F. TRANSFORMER |
| C100 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T100 | 10-233 | 99TH I.F. TRANSFORMER |
| C101 | 10-112 | 10 MFD. 50V. TUBULAR CONDENSER | T101 | 10-233 | 100TH I.F. TRANSFORMER |



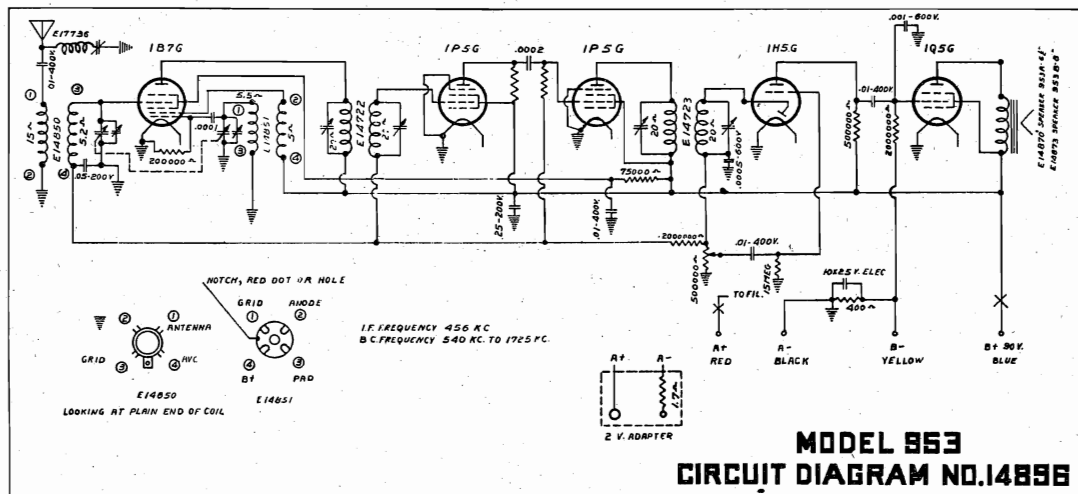
| Position of Variable | Generator Freq. | Dummy Antenna Mfd. | Generator Connections | Trimmer Adjustments | Trimmer Function |
|----------------------|-----------------|--------------------|-----------------------|---------------------|------------------|
| Closed | 455 K. C. | .1 | 6SA7 (Grid) | T4 - T3 | I. F. |
| Fully Open | 1730 K. C. | .0002 | Antenna | C9 | Osc. |
| 1400 K. C. | 1400 K. C. | .0002 | Antenna | C8 | Ant. |



MODEL 940
CIRCUIT DIAGRAM NO.14B42



MODEL 951
CIRCUIT DIAGRAM NO.14846



MODEL 953
CIRCUIT DIAGRAM NO.14896

TUNER DATA MODEL 953

FOR SIMILAR PUSH BUTTON ADJUSTMENTS SEE MODEL 761A.
GAMBLE - SKOGMO PAGE 10-6

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

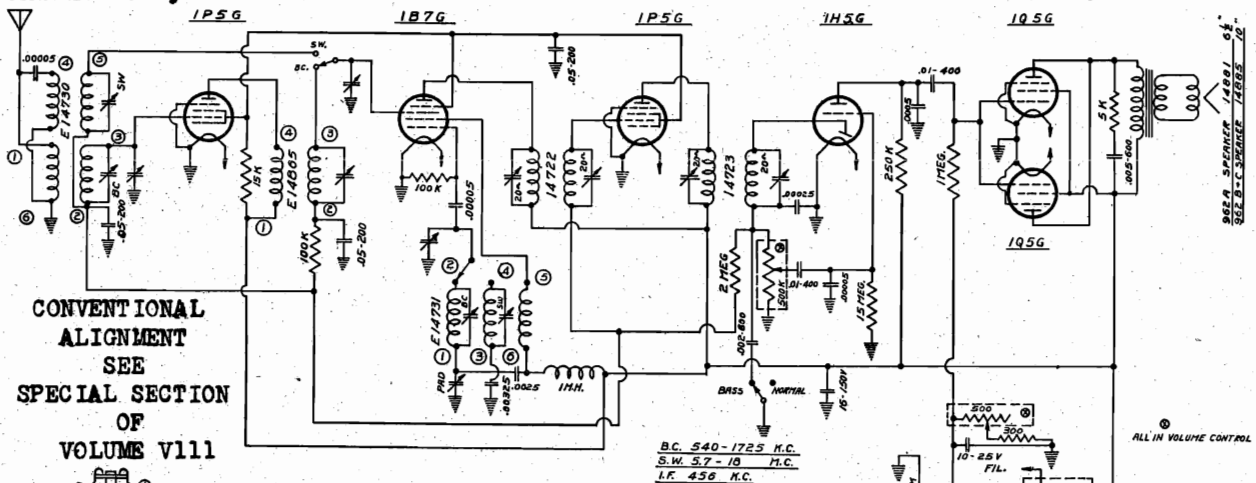
GENERAL: This receiver is equipped with the new type high efficiency battery operated tubes. Their use makes for greater economy of operation than has ever been possible before. They are designed to operate directly from a 1½ volt dry "A" battery or from a 2 volt storage battery—by properly connecting the adaptor socket # 14824 which contains proper resistor. (SOCKET # 14736 FOR MODEL 940A)

MODEL 962

MODELS 970B, 970BX
MODELS 980B, 980BX

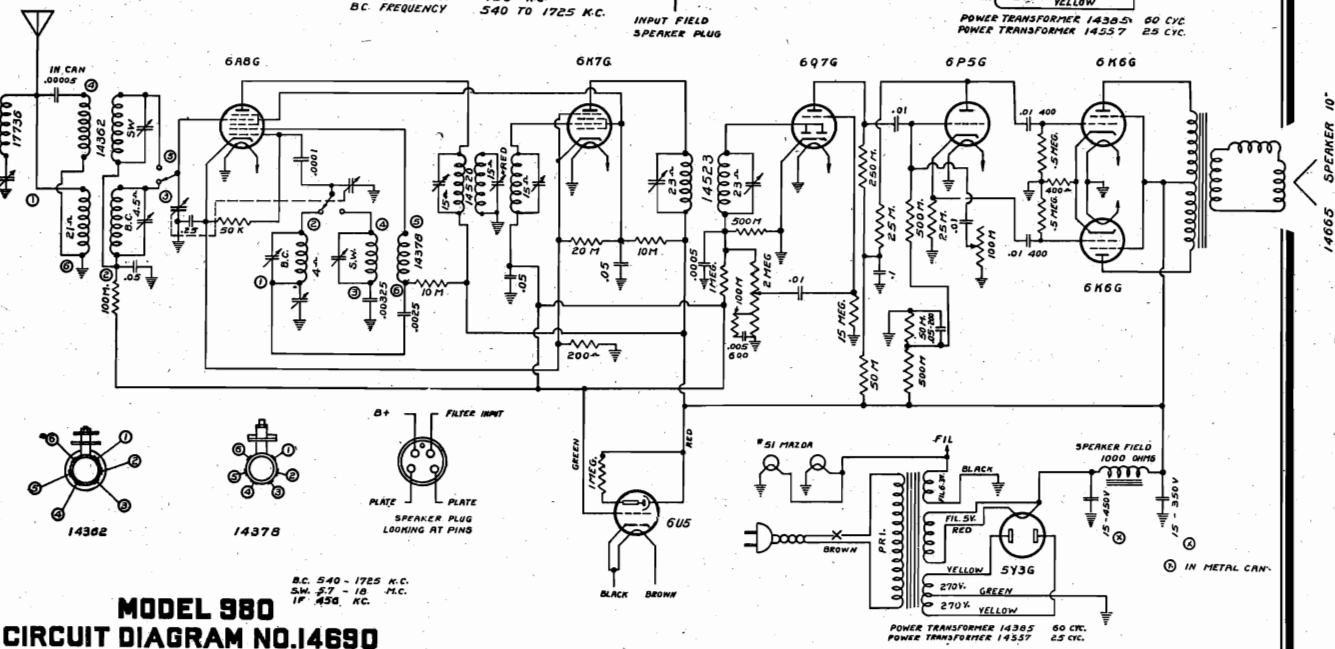
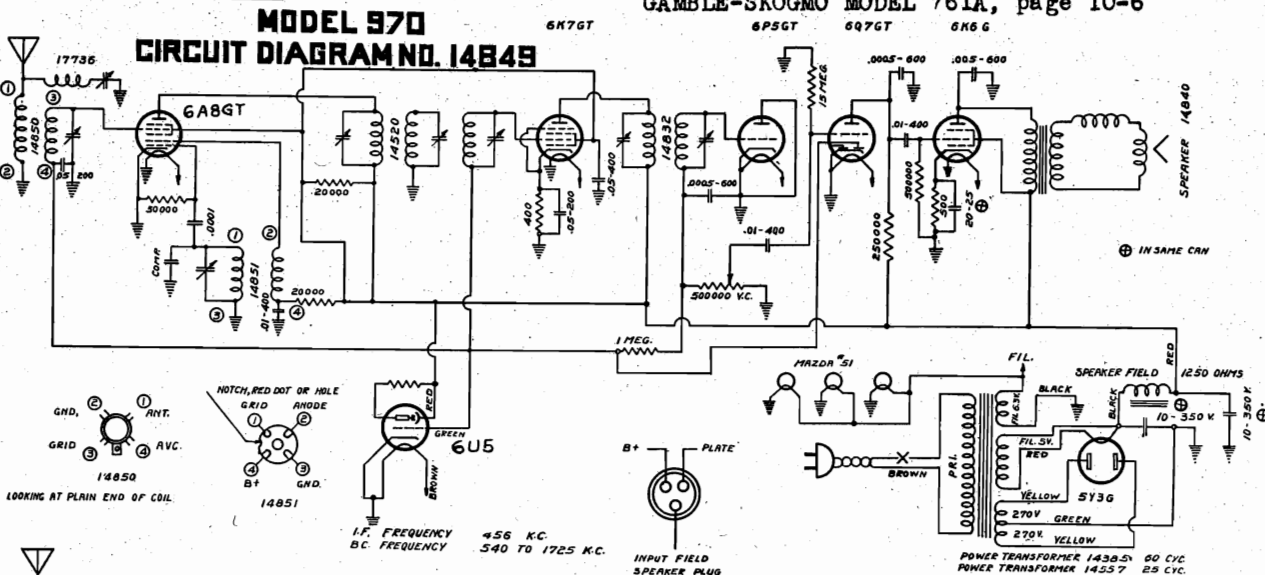
GAMBLE-SKOGMO INC.

Schematic s, Tuner



MODEL 962
CIRCUIT DIAGRAM NO.14897

FOR SIMILAR TUNER ADJUSTMENTS SEE
GAMBLE-SKOGMO MODEL 761A, page 10-6



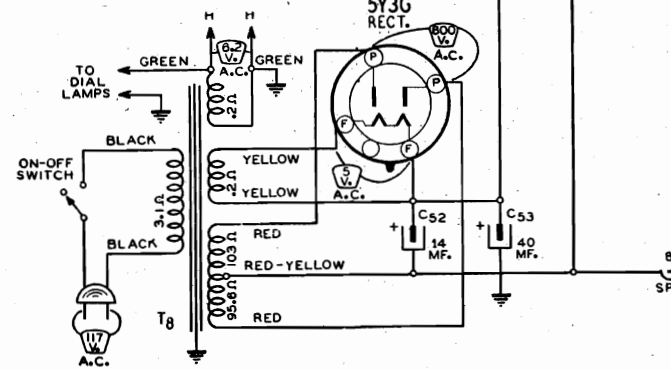
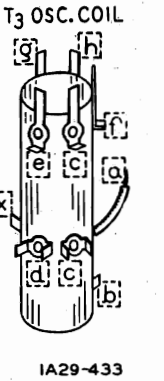
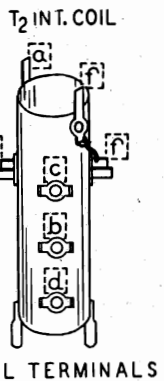
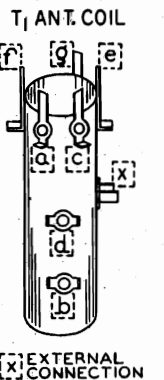
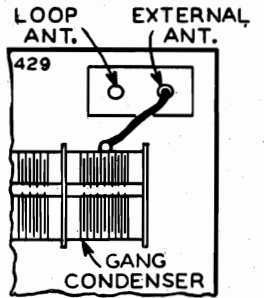
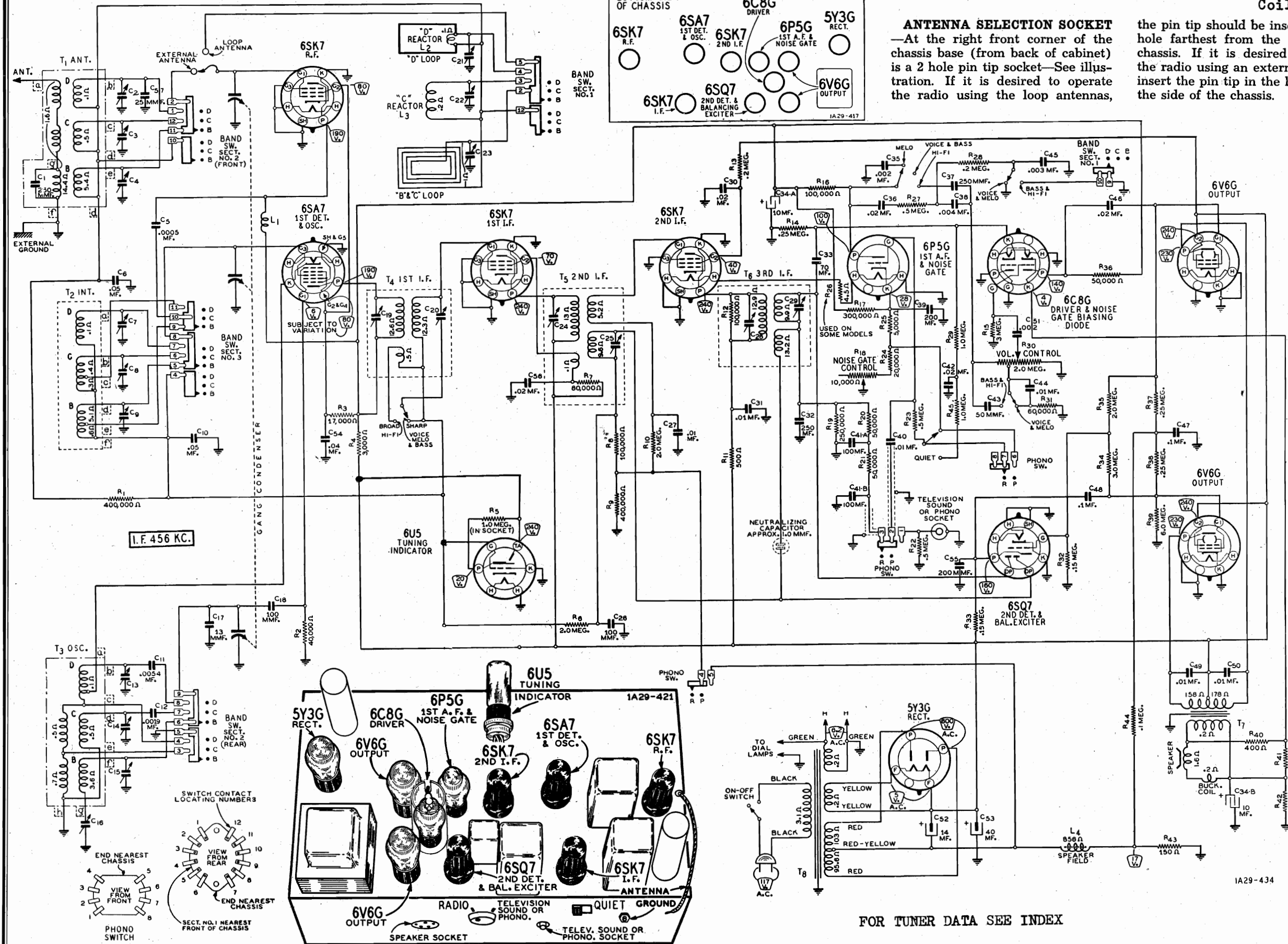
GAMBLE-SKOGMO INC.

BOTTOM VIEW OF CHASSIS

MODEL 4954
Schematic, Voltage, Socket
Coils, Notes

ANTENNA SELECTION SOCKET
—At the right front corner of the chassis base (from back of cabinet) is a 2 hole pin tip socket—See illustration. If it is desired to operate the radio using the loop antennas,

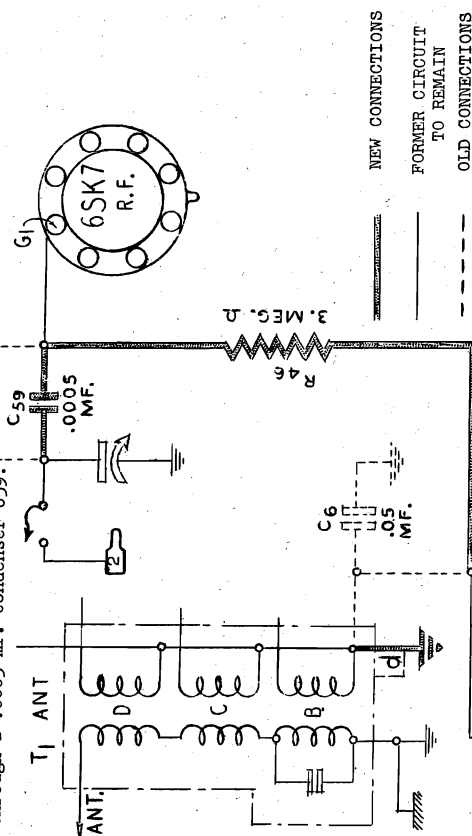
the pin tip should be inserted in the hole farthest from the side of the chassis. If it is desired to operate the radio using an external antenna, insert the pin tip in the hole nearest the side of the chassis.



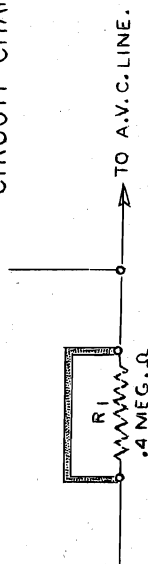
FOR TUNER DATA SEE INDEX

GAMBLE-SKOGMO INC.

G1 of the 6SK7 R.F. tube, which was formerly connected directly to the stator of the gang condenser, is now connected to this point through a .0005 mf. condenser C59. -----



"B" ISSUE CIRCUIT CHANGES



Television Sound or Phonograph Connections

If television programs ever become available in your community, you will need a television set. This radio may be used to tune into the television sound track. Many "Television Sound in Picture Receiver" sets are available. The radio and sound converter. Phonograph records may also be played through the radio.

On the back panel of the chassis base is a switch knob and a socket for a single shielded pin tip at which the cable from a television receiver or from a phono pickup can be inserted in the socket. (The cable connector must be a single shielded pin tip type, Part No. M33.)

When phonograph or television sound reproduction is desired, the cable should be turned to the "Phono-Television Sound" position. For radio reception, the knob should be in the "Radio" position.

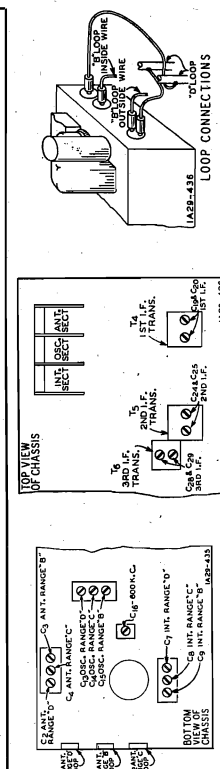
Tuning Frequency Range

| | |
|--|---|
| Power Consumption - 100 Watts (At 117 volts 60 cycles) | |
| Power Output - 8 Watts Unidirectional | |
| Power Output - 10 Watts Maximum | |
| Selectivity - 26 KC Broad at 1000 tunes Signal | |
| (Sharp) | |
| Intermediate Frequency - 455 KC | |
| 12" Electro-Kymic | |
| Speaker | |
| Tuning Frequency Range | 550 to 1500 KC C Range..... D Range..... D Range..... 2300 to 7000 KC C Range..... D Range..... D Range..... 7000 to 22000 KC C Range..... D Range..... D Range..... |
| Sensitivity (For 0.5 Watt output) | 1.0 Microvolt - Festive C Range..... D Range..... D Range..... 1.0 Microvolt - Average C Range..... D Range..... D Range..... 3.0 Microvolt - Average C Range..... D Range..... D Range..... |

The following equipment is required for aligning:

- An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output Indicating Meter—Non-Metallic Screwdriver.
- Dummy Antennas—1 mt., 200 mmf., and 400 ohms.

| SIGNAL GENERATOR | | PUMPY ANTENNA | BAND SWITCH SETTING | CONDENSER SETTING | ADJUST TRIMMERS TO MAXIMUM |
|----------------------|------------------------|------------------|---------------------------|--|---|
| FREQUENCY SETTING | CONNECTION AT RADIO | | | | |
| F. | | | | | |
| 465 KC | Grid of 1st Det. | .1 mf. | B Range See Note A | Turn Rotor to Full Open | 1st I.F. (C19) & (20) 2nd I.F. (C24) & (C25) 3rd I.F. (C28) & (C29) |
| ANGE B | | | | | |
| 1750 KC | Antenna Lead | 200 mmf. | B Range | Turn Rotor to Full Open | Oscillator Range B (C15) |
| 1500 KC | Antenna Lead | 200 mmf. | B Range | Turn Rotor to Full Open Set Indicator to 1500 KC— See Note B | Ant. Range B (C4) Inf. Range B (C5) 600 KC (C16) Rood Rotor—See Note C |
| ANGE C | | | | | |
| 600 KC | Antenna Lead | 200 mmf. | B Range | Turn Rotor to Max. Output | |
| 7000 KC | Antenna Lead | 400 Ohm | C Range | Turn Rotor to Full Open | Oscillator Range C (C14) |
| 6000 KC | Antenna Lead | 400 Ohm | C Range | Turn Rotor to Max. Output | Antenna Range (C3) Inf. Range C (C6) |
| ANGE D | | | | | |
| 22,000 KC | Antenna Lead | 400 Ohm | D Range | Turn Rotor to Full Open | Oscillator Range D (C13) |
| 21,000 KC | Antenna Lead | 400 Ohm | D Range | Turn Rotor to Max. Output | Ant. Range D (C2) Inf. Range D (C7) Rood Rotor—See Note C |
| LOOP RANGE B | | | | | |
| 500 KC | None—See Note D | | B Range | Turn Rotor to Max. Output | Loop Trimmer (C22) See Note E |
| LOOP RANGE C | | | | | |
| 21,000 KC | None—See Note D | | C Range | Turn Rotor to Max. Output | Loop Trimmer (C22) See Note E |
| LOOP RANGE D | | | | | |
| 21,000 KC | None—See Note D | | D Range | Turn Rotor to Max. Output | Loop Trimmer (C21) Rood Rotor—See Note C |



NOTE E—Turn knob of loop until output is maximum.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.

Attenuate the signal from the signal generator 1500 KC mark on the dial scale. Attach

NOTE 2—Turn the outer back and forth and the inner back and forth until the signal is obtained. **NOTE 3**—Turn the trimmer until the peak of greatest intensity is obtained.

NOTE 4—Reconnect set in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place signal generator so that the loop is in the plane of the antenna. Turn the trimmer until the peak of the antenna signal is obtained. See illustration of Antenna Selection. See illustration on page one.

NOTE 5—If the signal is not at 1500 KC, turn the dial, remove pointer from drive cord, and the 1500 KC signal. Set pointer at the

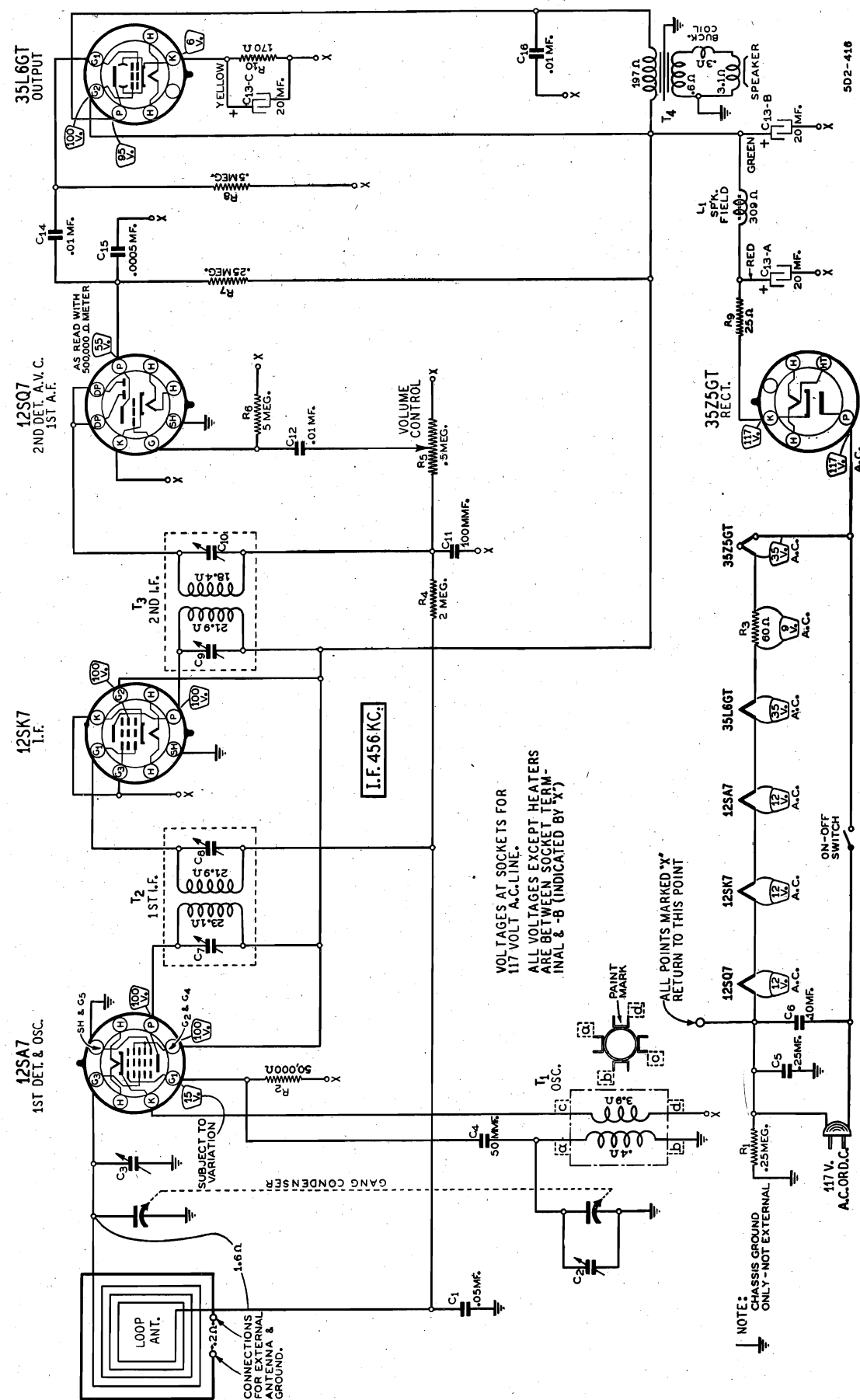
NOTE 6—After all adjustments, repeat the 3 loop range adjustment, the 1000 KC range adjustment, and the external antenna selection. See the Antenna Selection Section—See the Antenna Selection Section.

NOTE 7—If the signal is not at 1500 KC, turn the dial, remove pointer from drive cord, and the 1500 KC signal. Set pointer at the

NOTE B—If the pointer is not at 1500 KC the dial, remove pointer from drive cord. e in a 1500 KC signal. Set pointer at the

GAMBLE-SKOGMO INC.

**5 TUBE AC-DC RADIO
WITH SELF CONTAINED LOOP ANTENNA**

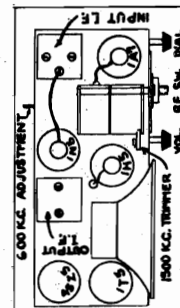


5D2-418

BD 9-10



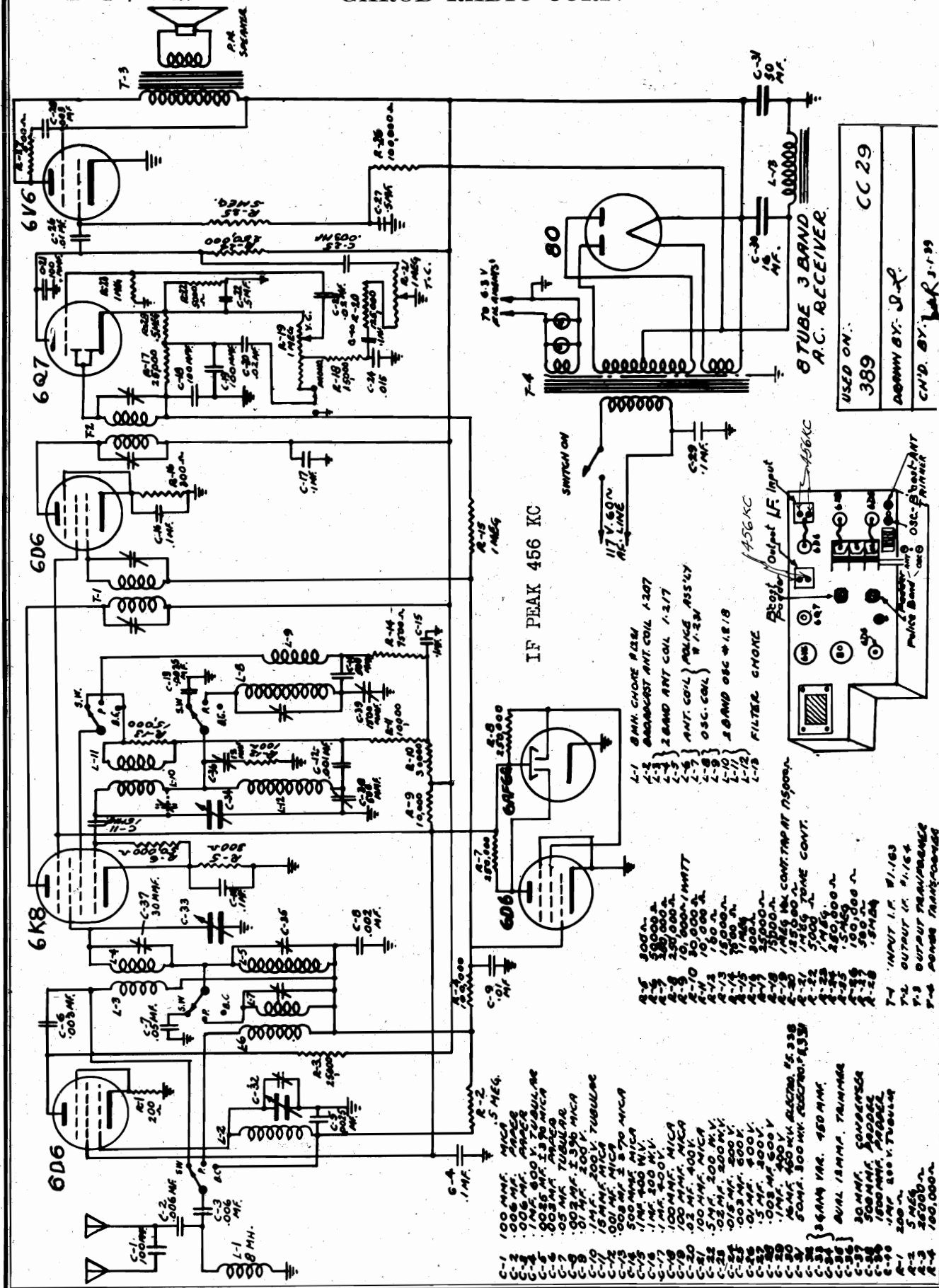
NOTE: When used in Electric operation, the line cord should be extended to its full length. If it is left closely folded while operating from the light line, the concentrated heat may damage the cord.



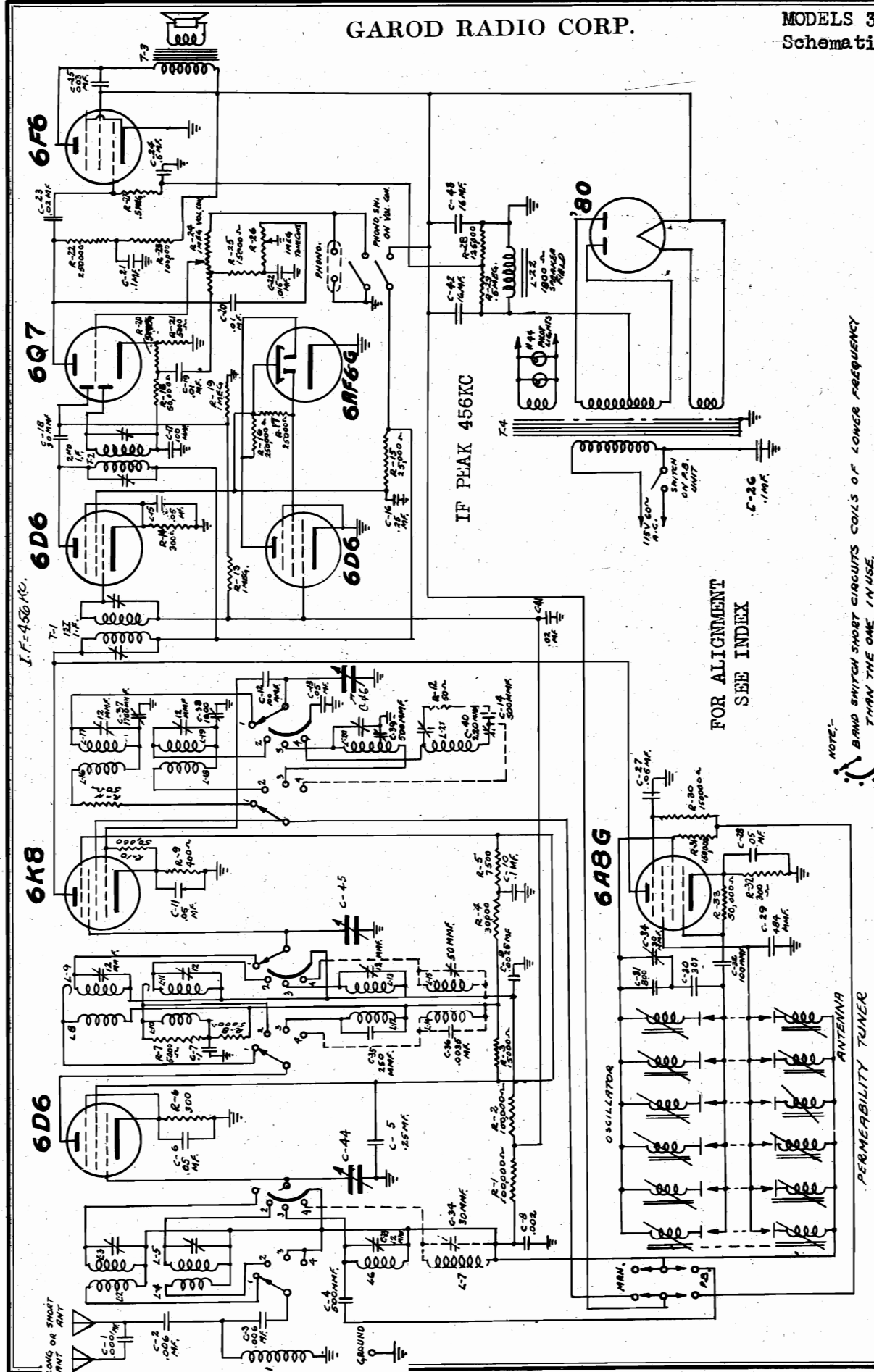
MODEL 389

Schematic, Socket

GAROD RADIO CORP.

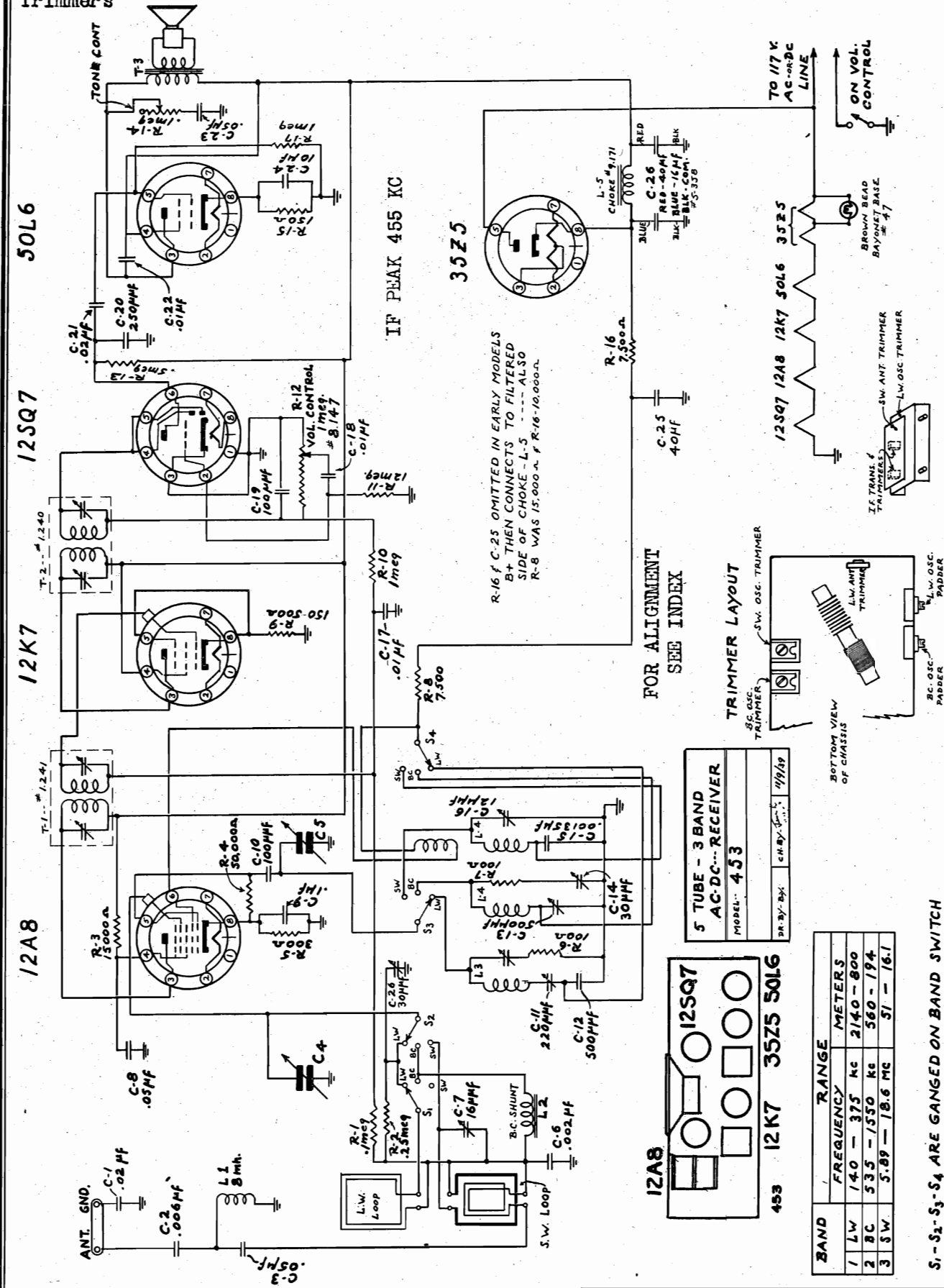


GAROD RADIO CORP.

MODELS 399, 4990
Schematic

MODEL 453
Schematic, Socket
Trimmers

GAROD RADIO CORP.



[illegible]

**FOR ALIGNMENT
SEE INDEX**

LOCATION OF TRIMMERS & PADDERS

S.W. OSC. PRODER FIXED

S.W. OSC: TRIMMER NONVE

S.W. ANT. TRIMMER ON ANT. COIL UNDER CHASSIS

P.O. OSC. PADDER ON TOP OF CHASSIS

P.O. OSC. TRIMMER }

PO. ANT. TRIMMER } ON COIL ASS'LY FRONT APRON OF CHASSIS

B.C OSC. PADDLE ON REAR OF CHASSIS APRON

B.C. ANT. TRIMMER ON VAR. COND. FRONT SECTION

B.C. R.F TRIMMER ON TOP OF CHASSIS TOWARD FRONT APRON

B.C. OSC. TRIMMER ON TOP OF CHASSIS TOWARD FRONT APRON 1.164 OUTPUT I.F.

1.728 S.W. ANT B.C R.F.

1-729 SW. OSC B.C. OSC

1.231 P.O. ANT ASS'LY.

1.231 P.O. OSC.

1.230 B.C. - ANT

1.163 INPUT I.F.

1.164 OUTPUT I.F.

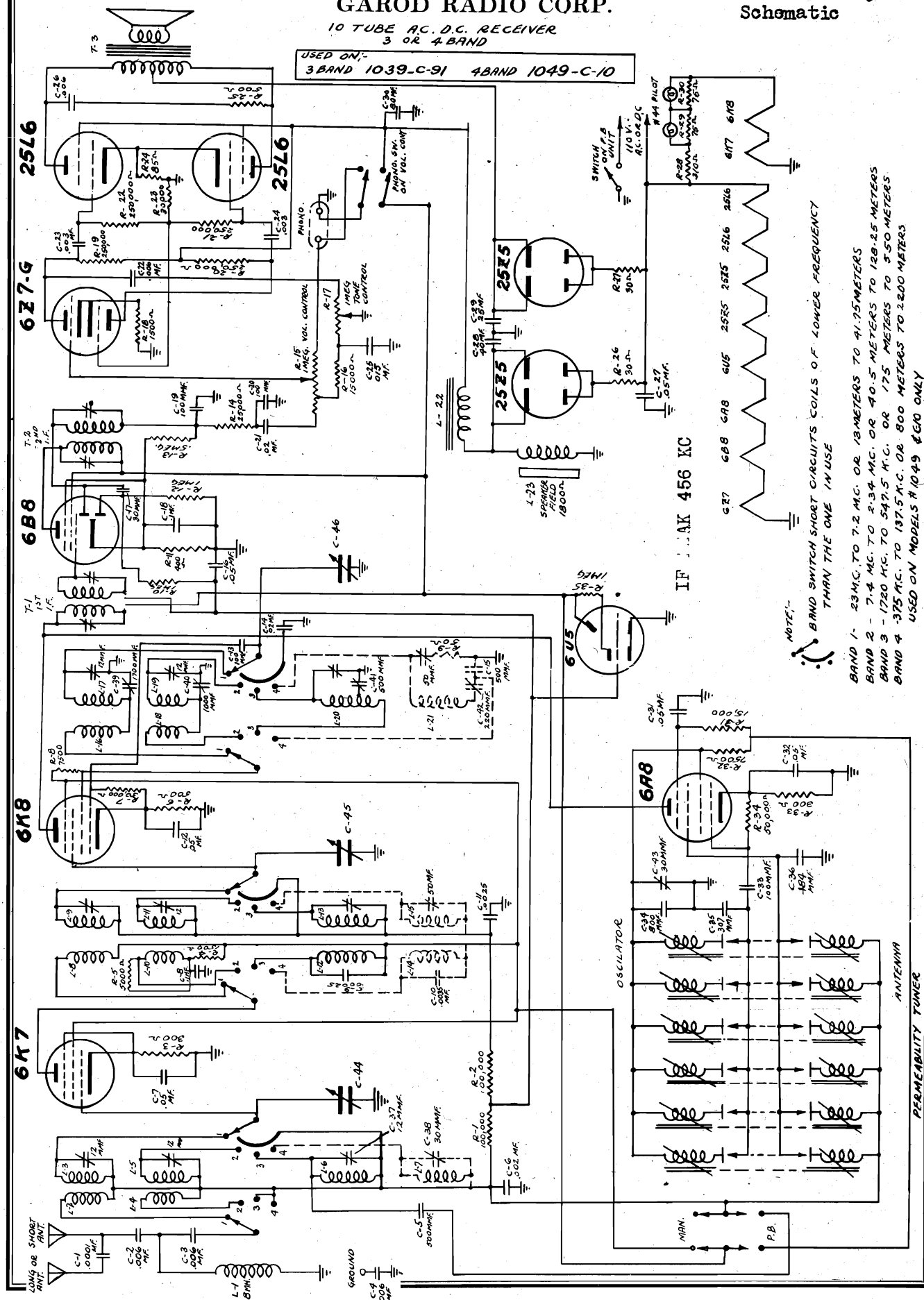
9TUBE - 3B AND
A.C. - D.C. RECEIVER

Model 939 CC 98

DWN J.L. CH'0 B

MODELS 1039, 1049
Schematic

GAROD RADIO CORP.

10 TUBE A.C. D.C. RECEIVER
3 OR 4 BANDUSED ON:-
3 BAND 1039-C-91 4 BAND 1049-C-10

[illegible]

L.W. Padder under chassis on front apron adjacent to L.W. Oscillator coil.

12 TUBE 3 BAND
AC-DC. RECEIVER

CC-97 1239

FOR ALIGNMENT
SEE INDEX

TRIMMER LOCATIONS

Input IF Transformer is adjacent to the IF Tube.

Output Transformer is directly behind the gang condenser.

S.W.1 Antenna trimmer located under chassis on antenna coil.

L.W. Osc. Trimmer under chassis on L.W. condenser which is between the band switch and padder condenser.

L.W. Padder under chassis on front apron adjacent to L.W. Oscillator coil.

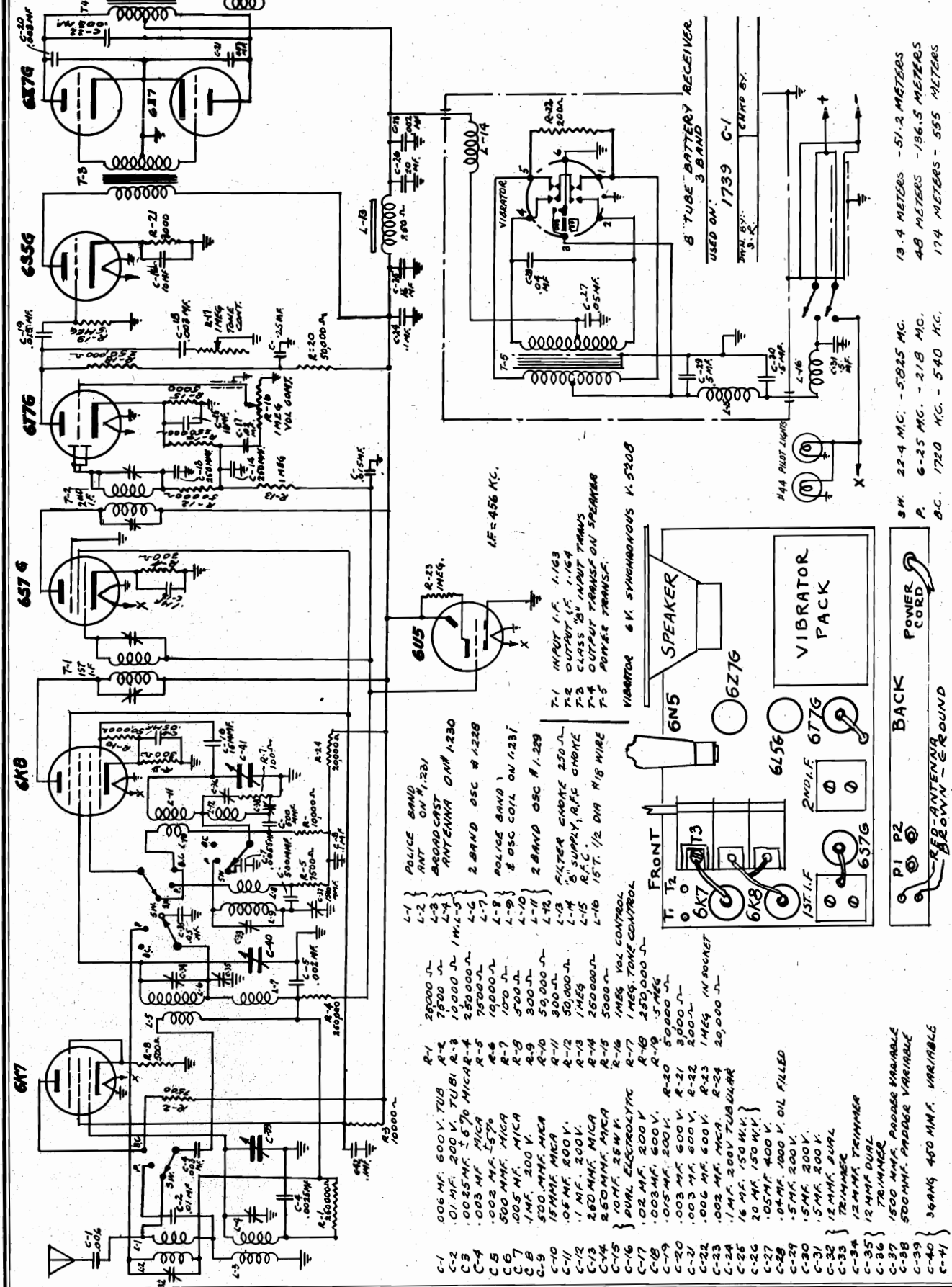
MODEL 1540
Schematic, Socket



MODEL 1739

Schematic, Socket
Trimmers

GAROD RADIO CORP.



MODEL 389
MODEL 453
MODEL 493

GAROD RADIO CORP.

MODEL 939
MODEL 1239
Alignment

GAROD MODELS 389; 453; 493; 939, 1239.

If this procedure is not adhered to, all adjustments will appear very broad. This is due to the action of the automatic volume control.

I.F. ADJUSTMENT - The signal generator is set at 455 KC and is connected to the grid of the converter tube (12A8) through a .5 MFD condenser. Be sure to connect a resistor of approximately 25,000 OHMS between the converter grid and ground so that the grid circuit is at ground potential for D.C.

The Input I.F. Transformer trimmers - are both adjusted for maximum output as indicated by the output meter connected across either the voice coil or the primary coil of the loud speaker.

The Output I.F. Transformer trimmers - are adjusted for maximum output as indicated on the output meter. The Input I.F. should now be re-checked for maximum output.

SHORT-WAVEBAND #1

MODELS 453, 493, 939 (ONLY) - Set the band switch to the extreme left-hand position which is short-wave band #1. Set the generator at 15.5 MC, turn the condenser until a response is indicated. The pointer should co-incide with the 15.5 MC mark on the dial. Adjust the antenna trimmer for the short-wave band for maximum output while rocking the condenser gang from left to right.

SHORT-WAVEBAND #1

MODEL 389 (ONLY) - Set the band switch to the extreme right hand position which is short wave band #1. Turn the dial control knob to the extreme high frequency end so that the condenser plates are entirely out of mesh. The signal generator is connected to the "short-antenna" lead through a dummy antenna, consisting of a 250 MMFD condenser and a 400 OHM non-inductive resistor in series. Set the generator at 19 MC, turn the condenser until a response is indicated. The pointer should co-incide with the 19 MC mark on the dial. Adjust the antenna trimmer for the short-wave band located under the chassis on the antenna coils for maximum output while rocking the condenser gang from left to right.

BROADCASTBAND

MODEL 1239 (ONLY) The dummy antenna for this band consists of only a 250 MMFD condenser. Set the Band Switch in the middle position and condenser plates completely out of mesh. Set the generator at 1500 KC. Turn the variable condenser until a response is indicated. The dial pointer should now co-incide with the 1500 KC mark on the dial. Adjust the 1500 KC Antenna trimmer (located under the chassis near the band switch) for maximum output. Set the generator at 600 KC and turn the variable condenser control until a response is indicated. Adjust the broadcast oscillator padder condenser (located on top of the chassis between the variable condenser and the output I.F. transformer) for maximum response while "rocking" the gang condenser.

BROADCASTBAND MODELS

The high frequency adjustments should now be re-checked.

389, 453, 493, 939. The dummy antenna for this band consists of only a 250 MMFD condenser. Set the Band Switch in the Broadcast position and condenser plates completely out of mesh. Set the signal generator at 1550 KC and adjust the broadcast oscillator trimmer until a response is indicated on the output meter. The generator is now set at 1500 KC. Turn the variable condenser until a response is indicated. The dial pointer should now co-incide with the 1500 KC mark on the dial. Set the generator at 600 KC and turn the variable condenser control until a response is indicated. Adjust the broadcast oscillator padder condenser for maximum response while "rocking" the gang condenser. The high frequency adjustments should now be re-checked.

SHORT-WAVEBAND #2

MODELS 389, 493, 939. - Set the band switch to the middle position. Turn the dial control knob to the extreme high frequency end so that the condenser plates are entirely out of mesh. The signal generator is left connected as for band #1. The generator is set at 6.25 MC and the Band #2 osc. trimmer is opened until a response is indicated at the lower capacity setting of the trimmer. Set the generator at 6 MC and turn the variable condenser until a response is indicated. The pointer should now co-incide with the 6 MC mark on the dial. The antenna trimmer is then adjusted for maximum output while the condenser gang is rocked from right to left. Set the generator at 2.4 MC and turn the variable condenser knob until a response is indicated. The padder for this band is now adjusted for maximum output while rocking the condenser gang from left to right. The high frequency adjustments should then be rechecked.

Long Wave Band: MODELS 453, 1239. The band selector switch is set in position for operation on the long wave band (extreme right hand position). The receiver and generator are both tuned to 300 kc and the oscillator trimmer is adjusted for maximum response. The antenna and first detector trimmers are adjusted in the order named for maximum output. The signal generator is then set at 150 kc and the signal is tuned in. The long wave padder condenser is adjusted for maximum response while the gang tuning condenser is rocked slightly to the left and right. The 300 kc adjustment should then be re-checked.

①. 456 KC FOR MODELS 389, 493, 939, 1239. ④. 1720 KC FOR MODELS 389, 939.

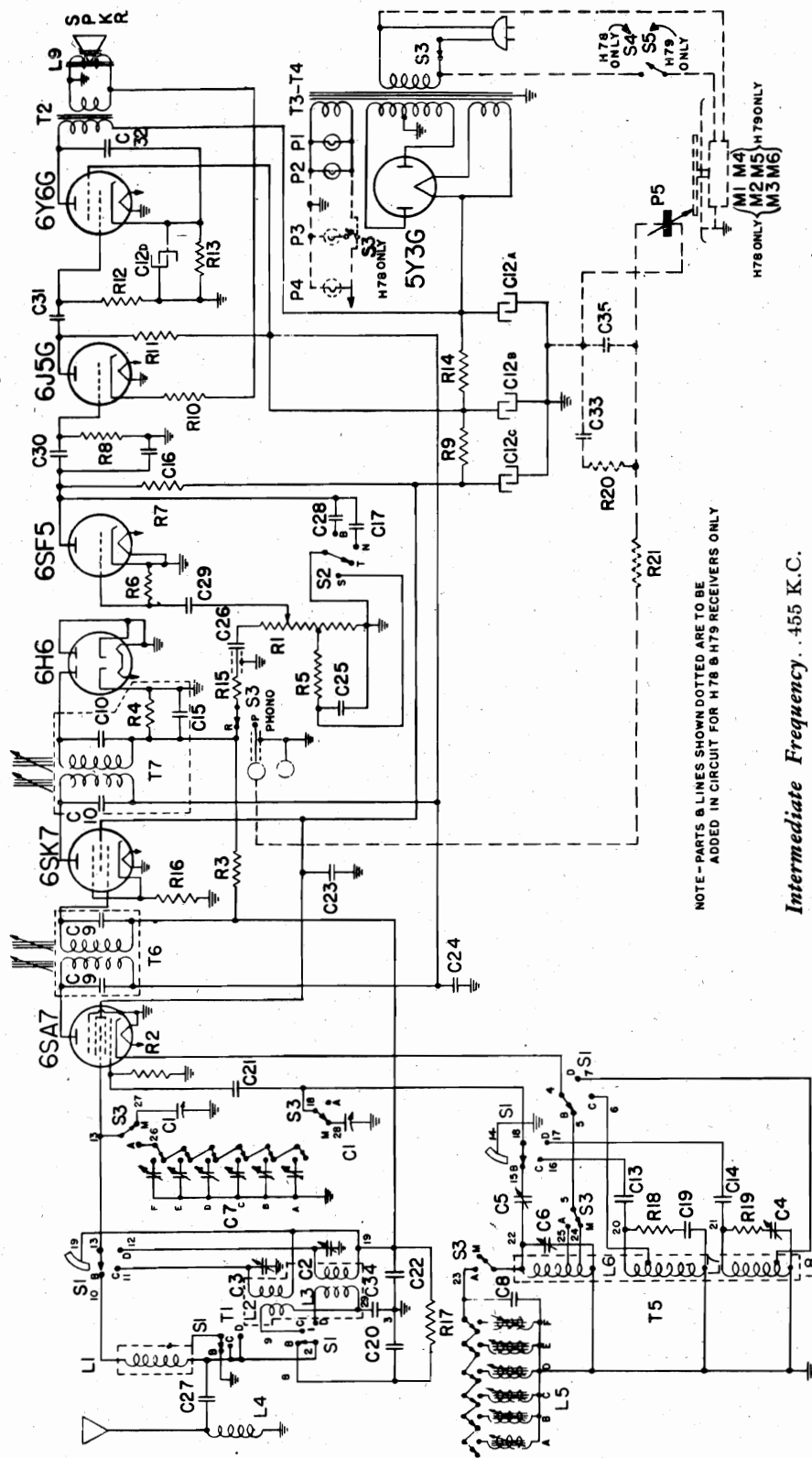
②. 6K8 TUBE ⑤. 23 MC 493, 939.

③. 19 MC FOR MODELS 493, 939.

⑥. MODEL 389-ADJUST ANTENNA TRIMMER AT 1500 KC
for MAXIMUM.

GENERAL ELECTRIC CO.

MODELS H73, H77, H78
H79 (Final)
Schematic, Data



NOTE—PARTS & LINES SHOWN DOTTED ARE TO BE
ADDED IN CIRCUIT FOR H78 & H79 RECEIVERS ONLY

Intermediate Frequency... 455 K.C.

Electrical Specifications

| Model | Rating | Power Supply Volts | Frequency (Cycles per Second) | Power Consumption (Watts) |
|-------|--------|--------------------|-------------------------------|---------------------------|
| H-73 | A | 115-125 | 50-60 | 75 |
| H-77 | C | 115-125 | 25-60 | 80 |
| | V | 103-117 | | |
| | | 118-133 | 50-60 | 75 |
| | | 134-155 | | |
| | | 188-212 | | |
| | | 213-237 | | |
| | | 238-262 | | |
| H-78 | A6 | 115-125 | 60 | 95 |
| H-79 | A5 | 115-125 | 50 | 95 |
| | A2 | 115-125 | 25 | 100 |

Fig. 3. Schematic Diagram

Loud-speaker—"Alnico" Magnet Dynamic
Model.....H-73.....H-77, H-78, H-79
Outside Cone Diameter.....6½ in.....12 in.
Voice Coil Impedance.....3.5 ohms at 400 cycles

Phonograph

Model.....H-78.....H-79
Type.....Manual.....Automatic
Record Capacity.....One.....Twelve
10-inch.....One.....Ten
12-inch.....One.....Crystal
Type Pick-up.....Crystal
Turntable Speed.....78 R.P.M.....78 R.P.M.

Electrical Power Output

Undistorted.....3.7 watts
Maximum.....5.0 watts

Tone Control.....4-position

MODELS H73,H77,H78
H79 (Final)
Chassis Wiring,Voltage
Socket,Dial Drive Data

GENERAL ELECTRIC CO.

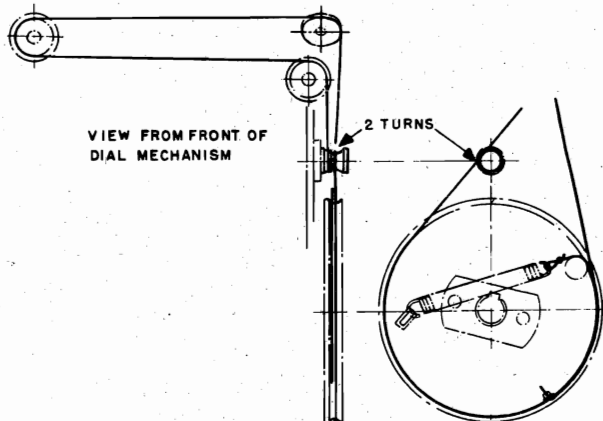
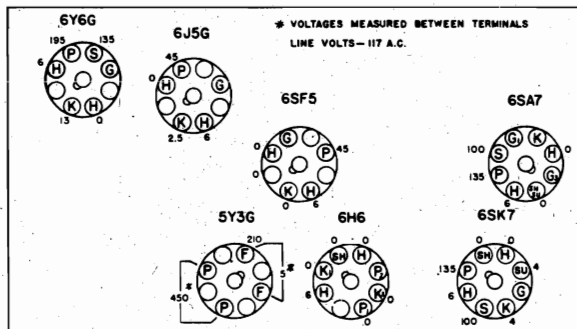


Fig. 6. Dial Drive Stringing Diagram



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS.
No signal input—Max. Volume—Band "B."

Fig. 5. Socket Voltages

Models H-73, H-77, H-78, and H-79 employ three-band a-c receivers of the superheterodyne type using seven General Electric Pre-tested Tubes. Features of design include the new "Alnico" dynapower speaker, nine Feathertouch Tuning keys, six of which may be set up for favorite stations, a television audio or phonograph key, Visualux dial, iron-core I.F. transformers, iron-core oscillator trimmer coils for station keys and automatic volume control. In addition Model H-73 is equipped with the built-in "Beam-a-Scope" while Models

H-77, H-78, and H-79 are equipped with the built-in "Super Beam-a-scope."

Models H-78 and H-79 each contain a phonograph mechanism for reproducing records. Model H-78 phonograph manually plays 10-inch or 12-inch records. Model H-79 phonograph incorporates an automatic record changer which will play either 10-inch or 12-inch records. Both mechanisms contain high-quality crystal pick-ups and constant speed, self-starting, silent electric motors.

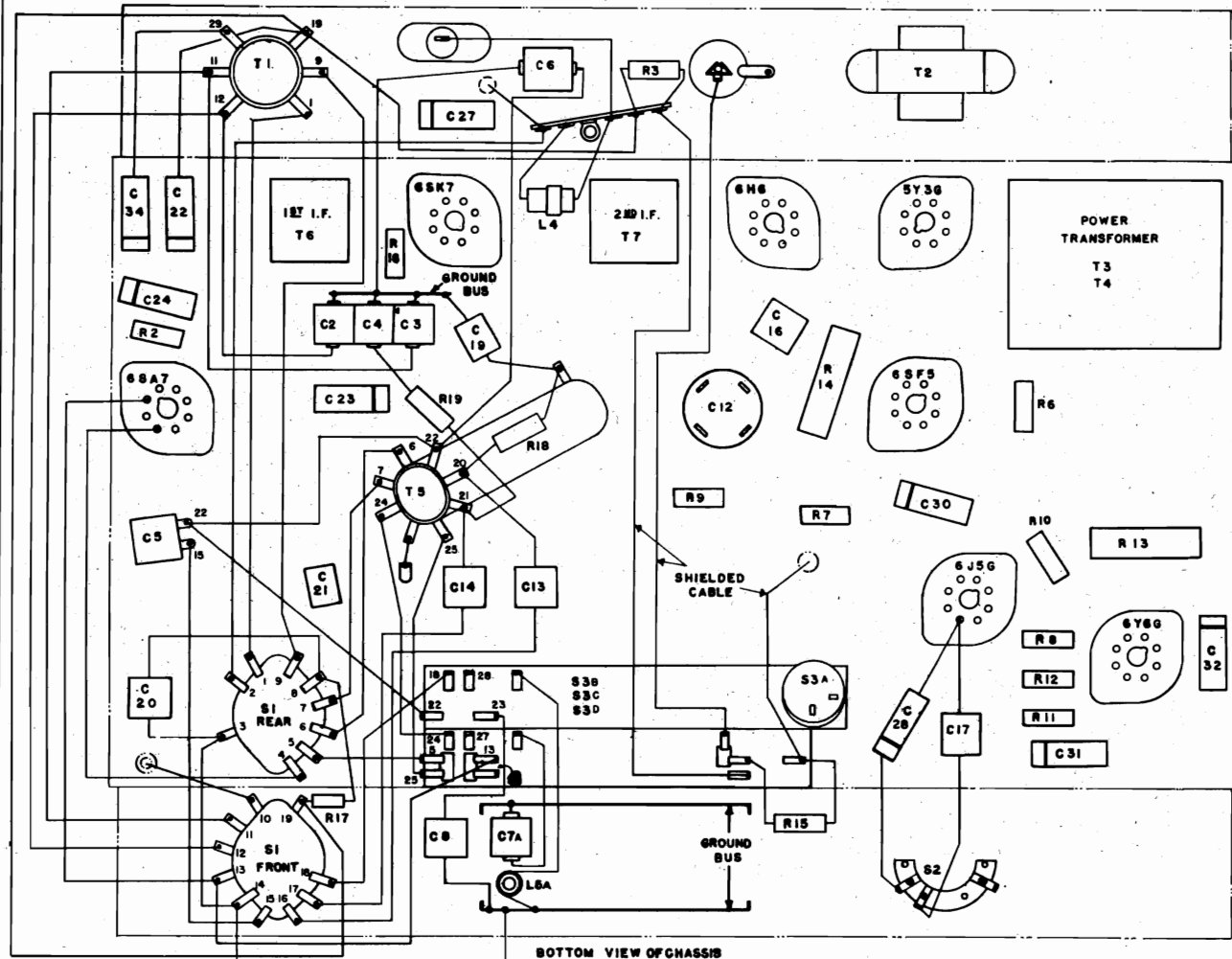


Fig. 4. Chassis Parts Layout

MODELS H73, H77, H78
H79 (Final)
Alignment, Parts

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

I. F. ALIGNMENT WITH OSCILLOSCOPE

| Band Switch Setting | Input Freq. | Point of Input | Dummy Antenna | Trimmer | Comments |
|---------------------|----------------|----------------|--------------------|-----------------------------------|---|
| 1. Band "B" | 455 K.C. Sweep | I.F. Grid | .05 Mfd. or Larger | 2nd I.F. Sec. 2nd I.F. Pri. (T-7) | Gang condenser plates closed—"Manual" key depressed—connect audio input of oscilloscope to chassis and to junction of R-3 and R-15. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. The resultant curve is shown in Fig. 1. |
| 2. Band "B" | 455 K.C. Sweep | Converter Grid | .05 Mfd. or Larger | 1st I.F. Sec. 1st I.F. Pri. (T-6) | |

I. F. ALIGNMENT WITH OUTPUT METER

| | | | | | |
|-------------|----------------|----------------|--------------------|-----------------------------------|---|
| 1. Band "B" | 455 K.C. Sweep | I.F. Grid | .05 Mfd. or Larger | 2nd I.F. Sec. 2nd I.F. Pri. (T-7) | Gang condenser plates closed—connect output meter across voice coil—keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output. |
| 2. Band "B" | 455 K.C. Sweep | Converter Grid | .05 Mfd. or Larger | 1st I.F. Sec. 1st I.F. Pri. (T-6) | |

R. F. ALIGNMENT

| | | | | | |
|-------------|---------------------------|--------------|--------|-----------------------|--|
| 1. Band "B" | | | | | Close gang plates—adjust pointer to first line at left end of tuning scale. Connect output meter across voice coil—tone control on "Bass" position. The image of any "D" band signal should be heard 910 K.C. below signal input when (C-4) is on proper peak. Example: 18 M.C. image 17.09 M.C. Peak (C-2) while rocking the gang condenser. Peak for maximum output with a low input signal. |
| 2. Band "D" | 21 M.C. with Modulation | Antenna Post | I.R.E. | Osc. (C-4) Ant. (C-2) | |
| 3. Band "C" | 6 M.C. with Modulation | Antenna Post | I.R.E. | Ant. (C-3) | |
| 4. Band "B" | 580 K.C. with Modulation | Antenna Post | I.R.E. | Osc. Padder (C-5) | |
| 5. Band "B" | 1500 K.C. with Modulation | Antenna Post | I.R.E. | Osc. (C-6) | |
| 6. Band "B" | 580 K.C. with Modulation | Antenna Post | I.R.E. | Osc. Padder (C-5) | |

| Stock No. | Description | List Price |
|-----------|--|------------|
| | PHONOGRAPH ASSEMBLY (H-78) | |
| | Tone Arm Assembly | |
| RA-414 | ARM—Tone arm..... | 1.20 |
| RC-8152 | CORD—Tone arm lamp cord..... | .40 |
| RP-505 | PICK-UP—Crystal cartridge..... | 5.40 |
| RP-800 | PIVOT—Tone arm pivot..... | 1.20 |
| RS-272 | SOCKET—Lamp socket assembly..... | .50 |
| RS-876 | SCREW—Needle clamping screw (Pkg. 10)..... | .10 |
| RT-915 | TONE ARM—Tone arm assembly (complete)..... | \$6.70 |
| RX-069 | ASSEMBLY—Pilot light connector assembly..... | .20 |
| | Automatic Stop Assembly | |
| RA-411 | ARM—Trip arm tension washer and screw assembly..... | .25 |
| RS-469 | SPRING—Automatic stop locking spring (Pkg. 3)..... | .25 |
| RX-064 | ASSEMBLY—Automatic stop assembly..... | 1.85 |
| | Motor Turntable Assembly | |
| RB-184 | BRACKET—Turntable drive wheel bracket assembly..... | .15 |
| RB-185 | BRACKET—Lower motor bearing bracket assembly complete..... | .40 |
| RF-502 | FIELD—60-cycle field stator assembly complete..... | 3.60 |
| RF-503 | FIELD—50-cycle field stator assembly complete..... | 3.60 |
| RF-504 | FRAME—Upper motor frame assembly..... | .60 |
| RM-127 | MOTOR—60-cycle motor assembly complete less turntable..... | 5.85 |
| RM-128 | MOTOR—50-cycle motor assembly complete less turntable..... | 6.40 |
| RN-101 | NEEDLE CUP—Needle cup (Model H-78)..... | .10 |
| RP-151 | PLATE—Motor mounting plate assembly..... | .45 |
| RP-152 | PLUG—Phono motor power connector plug..... | .25 |

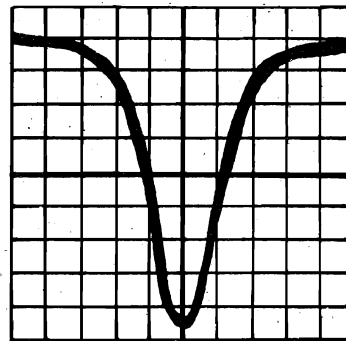


Fig. 1. Over-all I. F. Curve Taken on G-E Oscilloscope OFM-1

| | | |
|--------|--|------|
| RP-311 | PULLEY—60-cycle motor pulley and set-screw..... | .20 |
| RP-312 | PULLEY—50-cycle motor pulley and set-screw..... | .25 |
| RR-406 | ROTOR—Rotor complete..... | 1.55 |
| RS-467 | SPRING—Turntable drive tension spring..... | .10 |
| RS-875 | SETSCREW—Motor pulley setscrew (Pkg. 12)..... | .25 |
| RS-932 | SPINDLE—Turntable spindle and cotter..... | .30 |
| RT-913 | TURNTABLE—10-inch turntable..... | 1.20 |
| RW-909 | WHEEL—Rubber edged drive wheel..... | .50 |
| RX-065 | ASSEMBLY—Turntable drive wheel bracket mounting washer, screw and nut assembly (Pkg. 5)..... | .20 |
| RX-066 | ASSEMBLY—Lower bearing bracket screw and nut assembly (Pkg. 3)..... | .05 |
| RX-067 | ASSEMBLY—Motor mounting screw, washer and grommet assembly (Pkg. 3)..... | .25 |
| RX-068 | ASSEMBLY—Drive wheel oil retainer, cotter and thrust washer assembly (Pkg. 5)..... | .10 |

(Prices Subject to Change without Notice)

GENERAL ELECTRIC CO.

MODELS H73, H77, H78

H79 (Final)

Parts List

MODELS H622, H623

Dial Drive Data, Parts

REPLACEMENT PARTS LIST
MODELS H-73, H-77, H-78 AND H-79

| Stock No. | Description | List Price | Stock No. | Description | List Price |
|-------------------------|---|------------|---|--|------------|
| CHASSIS ASSEMBLY | | | | | |
| *RB-008 | BOARD—Terminal board (2 lug)..... | \$0.10 | *RQ-1365 | RESISTOR—15 megohm, $\frac{1}{4}$ W. carbon (R-6) (Pkg. 5)..... | .70 |
| *RB-009 | BOARD—Terminal board (1 lug—end mounted)..... | .10 | *RS-236 | SOCKET—Pilot lamp socket..... | .10 |
| *RB-026 | BOARD—Antenna terminal board..... | .10 | *RS-252 | SOCKET—Octal tube socket..... | .15 |
| *RB-046 | BOARD—Terminal board (5 lug)..... | .15 | *RS-263 | SOCKET—Electrolytic mounting socket..... | .10 |
| *RB-096 | BOARD—Terminal board (3 lug)..... | .10 | *RS-270 | SOCKET—Phono motor connector socket..... | .25 |
| *RB-021 | BEZEL—Pilot lamp bezel (Model H-79)..... | .10 | *RS-423 | SPRING—Knob spring (Pkg. 10)..... | .25 |
| RB-910 | BACK COVER—Cabinet back cover (Model H-73)..... | .30 | *RS-464 | SPRING—Tuning and volume wheel spring (Pkg. 10)..... | .05 |
| RB-929 | BACK COVER—Cabinet back cover (Model H-77)..... | .45 | RS-1805 | SHIELD—Beam-A-Scope electrostatic shield (Models H-78, 79)..... | 1.10 |
| RB-1009 | BOARD—Phono terminal board..... | .10 | RS-1808 | SHIELD—Beam-A-Scope electrostatic shield (Model H-77)..... | 1.10 |
| RB-1010 | BOARD—Beam-A-Scope terminal board (Model H-77)..... | .10 | RS-3022 | SWITCH—Touch Tuning switch assembly (S-3)..... | 7.60 |
| *RC-009 | CAPACITOR—.001 mfd. 600 V. paper (C-35)..... | .30 | RS-3023 | SWITCH—Tone control switch (S-2)..... | .50 |
| RC-016 | CAPACITOR—.002 mfd. 600 V. paper (C-28)..... | .25 | RS-3024 | SWITCH—Band-change switch (S-1)..... | \$1.00 |
| *RC-023 | CAPACITOR—.005 mfd. 600 V. paper (C-26, 30)..... | .25 | RS-3055 | SWITCH—Power switch on key assembly (S-5)..... | .40 |
| *RC-039 | CAPACITOR—.01 mfd. 600 V. paper (C-29, 32, 33)..... | .25 | RT-0520 | TRANSFORMER—60 cycle power transformer (T-3)..... | 4.35 |
| *RC-048 | CAPACITOR—.02 mfd. 600 V. paper (C-31)..... | .30 | RT-0521 | TRANSFORMER—25 cycle power transformer (T-4)..... | 7.90 |
| RC-057 | CAPACITOR—.0072 mfd. 600 V. paper (C-25)..... | .25 | RT-531 | TRANSFORMER—1st I.F. transformer (T-6)..... | 1.70 |
| *RC-092 | CAPACITOR—.05 mfd. 600 V. paper (C-22, 23, 24, 34)..... | .25 | RT-314 | TRANSFORMER—2nd I.F. transformer (T-7)..... | 1.90 |
| *RC-096 | CAPACITOR—.01 mfd. 200 V. paper (C-27)..... | .30 | RT-462 | TRANSFORMER—Output transformer (T-2)..... | 1.40 |
| RC-206 | CAPACITOR—50 mmf. mica (C-21)..... | .30 | RT-862 | TRIMMER STRIP—Ant. Touch Tuning trimmer strip (C-7)..... | 1.20 |
| RC-233 | CAPACITOR—22 mmf. mica (C-19)..... | .25 | RT-863 | TRIMMER STRIP—"C" "D" band ant., "D" band osc. trimmers (C-2, 3, 4)..... | .45 |
| RC-235 | CAPACITOR—100 mmf. mica (C-15, 16)..... | .25 | *RT-952 | TERMINAL—Beam-A-Scope pin terminal (Pkg. 10)..... | .05 |
| RC-301 | CAPACITOR—680 mmf. mica (C-17)..... | .25 | RT-954 | TERMINAL—Speaker lead terminal (Pkg. 10)..... | .10 |
| RC-307 | CAPACITOR—750 mmf. silvered mica (C-8)..... | .35 | RV-067 | VOLUME CONTROL—2.0 megohm volume control (150,000 ohm tap) (R-1)..... | .65 |
| RC-358 | CAPACITOR—2000 mmf. mica (C-13)..... | .40 | *RW-101 | WASHERS—Felt washers for knobs (Pkg. 10)..... | .05 |
| RC-389 | CAPACITOR—5600 mmf. mica (C-14)..... | .45 | RW-908 | WHEEL—Tuning or volume control wheel..... | .30 |
| RC-875 | CORD—Power cord..... | .40 | SPEAKER ASSEMBLY | | |
| RC-1987 | CLAMP—Clamp for osc. or ant. coil (Pkg. 2)..... | .05 | RC-9009 | CONE ASSEMBLY—Cone assembly (Models H-77, 78, 79)..... | .95 |
| RC-1989 | CUSHION—Tuning condenser cushion (Pkg. 5)..... | .05 | RC-9010 | CONE ASSEMBLY—Cone assembly Model H-73..... | .10 |
| RC-5148 | CAPACITOR—40 mfd., 250 V., 20 mfd., 250 V.; 20 mfd., 250 V.; 20 mfd., 25 V.; dry electrolytic (C-12a, 12b, 12c, 12d)..... | 1.75 | RP-128 | PLUG—Speaker plug (Model H-73)..... | .10 |
| RC-6509 | CAPACITOR—"B" band padder capacitor (C-5)..... | .35 | RP-129 | PLUG—Speaker plug (Model H-77)..... | .10 |
| RC-6510 | CAPACITOR—"B" band osc. trimmer (C-6)..... | .35 | RS-1011 | SPEAKER—12 inch P.M. speaker (Models H-77, 78, 79)..... | 4.80 |
| RC-6526 | CAPACITOR—7.65 mmf. trimmer (C-7F)..... | .35 | RS-1012 | SPEAKER—6 $\frac{1}{2}$ inch P.M. speaker (Model H-73)..... | 3.25 |
| RC-6527 | CAPACITOR—20-180 mmf. trimmer (C-7D, 7E)..... | .35 | POINTER DRIVE ASSEMBLY | | |
| RC-6528 | CAPACITOR—100-490 mmf. trimmer (C-7A, 7B, 7C)..... | .35 | RB-177 | BRACKET—Pulley assembly mounting bracket (L.H.) (Models H-78, 79)..... | .15 |
| RC-7011 | CONDENSER—Tuning condenser (C-1a, 1b)..... | 2.15 | RB-178 | BRACKET—Pulley bracket assembly..... | .60 |
| RC-8500 | CARDS—Station letter cards (set)..... | .20 | RB-195 | BRACKET—Pulley assembly mounting bracket (L.H.) (Models H-73, 77)..... | .20 |
| RC-8503 | CARDS—"Manual" tabs (Pkg. 10)..... | .05 | RB-196 | BRACKET—Pulley assembly mounting bracket (R.H.) (Models H-73, 77)..... | .30 |
| RC-8506 | CARDS—"Phono-Tele" tabs (Pkg. 10)..... | .05 | RB-197 | BRACKET—Pulley assembly mounting bracket (R.H.) (Models H-78, 79)..... | .30 |
| RC-8507 | CARDS—"Off" tabs (Pkg. 10)..... | .05 | RB-625 | BUSHING—Tuning control shaft bushing..... | .10 |
| RD-108 | DIAL—Dial scale..... | .70 | RC-8125 | CORD—Tuning drive cord assembly..... | .20 |
| RE-056 | ESCUTCHEON—Dial scale escutcheon..... | 1.25 | RD-407 | DRUM—Condenser tuning drum assembly..... | .40 |
| RE-057 | ESCUTCHEON—Touch Tuning key escutcheon..... | 1.15 | RD-408 | HAIRPIN COTTER—Tuning drive shaft hairpin cotter (Pkg. 10)..... | .10 |
| RE-208 | ESCUTCHEON ASSEMBLY—Dial scale escutcheon complete..... | 2.25 | RM-501 | MASK—Reflector mask (Pkg. 10)..... | .05 |
| RF-017 | FOOT—Chassis mounting foot (Pkg. 5)..... | .10 | RP-127 | POINTER—Dial scale pointer (Pkg. 5)..... | .25 |
| RK-044 | KNOB—Tone control and band-change knob (Pkg. 2)..... | \$0.40 | RP-303 | PULLEY—Tuning drive pulley and pins (Pkg. 2)..... | .10 |
| RK-204 | KEY—Touch Tuning key..... | .10 | RS-463 | SPRING—Tuning drive cord spring (Pkg. 5)..... | .10 |
| RL-083 | COIL—Antenna coil "C," "D" bands (T-1)..... | .15 | RS-924 | SHAFT—Tuning control shaft..... | .10 |
| RL-287 | COIL—Oscillator coil "C," "D" bands (T-5)..... | .85 | *Used on previous receivers. | | |
| RL-345 | CHOKE— $\frac{1}{2}$ mhy. antenna choke (L-4)..... | .30 | (Prices Subject to Change without Notice) | | |
| RL-504 | BEAM-A-SCOPE—Beam-A-Scope assembly (Model H-73)..... | 1.80 | MODELS H-622 AND H-623 | | |
| RL-505 | BEAM-A-SCOPE—Beam-A-Scope assembly (Model H-77)..... | 5.85 | RR-772 | RESISTOR—100 ohms, $\frac{1}{4}$ W. carbon (R-10) (Pkg. 5)..... | .70 |
| RL-510 | BEAM-A-SCOPE—Beam-A-Scope assembly (Model H-78, 79)..... | 6.60 | RR-941 | RESISTOR—150 ohms, $\frac{1}{4}$ W. carbon (R-18) (Pkg. 5)..... | .70 |
| RL-9513 | COIL—Touch Tuning trimmer coil assembly (L-5)..... | 1.80 | RS-200 | SOCKET—Octal tube socket (Pkg. 5)..... | .75 |
| RL-9513 | COIL—Touch Tuning trimmer coil (Range: 1200-1500 K.C.) (Code—None) (L-5F)..... | .15 | RS-256 | SOCKET—Electrolytic mounting socket (Pkg. 5)..... | .25 |
| RL-9514 | COIL—Touch Tuning trimmer coil (Range: 850-1400 K.C.) (Code—Red) (L-5D, 5E)..... | .15 | RS-261 | SOCKET—Pilot lamp socket..... | .20 |
| RL-9515 | COIL—Touch Tuning trimmer coil (Range: 540-900 K.C.) (Code—Blue) (L-5A, 5B, 5C)..... | .15 | RS-426 | SPRING—Condenser drive cord spring (Pkg. 5)..... | .10 |
| RP-133 | PLUG—Loop terminal plug (Models H-77, 78, 79)..... | .05 | RS-510 | SPACER—Station key spacer (Pkg. 10)..... | .10 |
| *RQ-642 | RESISTOR—220 ohm, 2 W. carbon (R-19) (Pkg. 5)..... | .70 | RS-929 | SHAFT—Tuning shaft..... | .15 |
| *RQ-670 | RESISTOR—3300 ohm, 2 W. carbon (R-14) (Pkg. 5)..... | .70 | RS-1012 | SPEAKER—6.5 inch P.M. speaker..... | 3.25 |
| *RQ-1231 | RESISTOR—68 ohm, $\frac{1}{4}$ W. carbon (R-19) (Pkg. 5)..... | .70 | RS-3036 | SWITCH—Band change switch (Pkg. 5)..... | .60 |
| *RQ-1239 | RESISTOR—150 ohm, $\frac{1}{4}$ W. carbon (R-18) (Pkg. 5)..... | .70 | RT-328 | TRANSFORMER—1st I.F. transformer (T-1)..... | 1.00 |
| *RQ-1261 | RESISTOR—470 ohm, $\frac{1}{4}$ W. carbon (R-10) (Pkg. 5)..... | .70 | RT-329 | TRANSFORMER—2nd I.F. transformer (T-6)..... | 1.20 |
| *RQ-1271 | RESISTOR—3300 ohm, $\frac{1}{4}$ W. carbon (R-10) (Pkg. 5)..... | .70 | RT-409 | TRANSFORMER—Output transformer (T-1)..... | 1.25 |
| *RQ-1273 | RESISTOR—3900 ohms, $\frac{1}{4}$ W. carbon (R-9) (Pkg. 5)..... | .70 | RT-954 | TERMINAL—Speaker lead terminal (Pkg. 10)..... | .10 |
| *RQ-1291 | RESISTOR—22,000 ohms, $\frac{1}{4}$ W. carbon (R-2) (Pkg. 5)..... | .70 | RV-072 | VOLUME CONTROL—2.0 megohms volume control (R-4)..... | .80 |
| *RQ-1299 | RESISTOR—7,000 ohms, $\frac{1}{4}$ W. carbon (R-15, 17) (Pkg. 5)..... | .70 | RW-039 | WINDOW—Celluloid station letter window (Pkg. 25)..... | .10 |
| *RQ-1301 | RESISTOR—56,000 ohms, $\frac{1}{4}$ W. carbon (R-5) (Pkg. 5)..... | .70 | *RW-101 | WASHER—Control shaft felt washer (Pkg. 10)..... | .05 |
| *RQ-1307 | RESISTOR—100,000 ohms, $\frac{1}{4}$ W. carbon (R-30) (Pkg. 5)..... | .70 | *RX-035 | ASSEMBLY—Condenser mounting foot assembly..... | .15 |
| *RQ-1315 | RESISTOR—220,000 ohms, $\frac{1}{4}$ W. carbon (R-7) (Pkg. 5)..... | .70 | *RX-061 | ASSEMBLY—Chassis mounting assembly..... | .10 |
| *RQ-1319 | RESISTOR—330,000 ohms, $\frac{1}{4}$ W. carbon (R-12) (Pkg. 5)..... | .70 | *RX-062 | ASSEMBLY—Speaker mounting assembly..... | .10 |
| *RQ-1323 | RESISTOR—470,000 ohms, $\frac{1}{4}$ W. carbon (R-4) (Pkg. 5)..... | .70 | | | |
| *RQ-1331 | RESISTOR—1.0 megohm, $\frac{1}{4}$ W. carbon (R-8, 21) (Pkg. 5)..... | .70 | | | |
| *RQ-1339 | RESISTOR—2.2 megohm, $\frac{1}{4}$ W. carbon (R-3) (Pkg. 5)..... | .70 | | | |

MODELS H-622 AND H-623

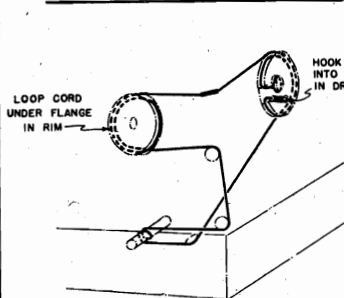


Fig. 4. Dial Drive Stringing Diagram

REPLACEMENT PARTS LIST
Models H-622 and H-623

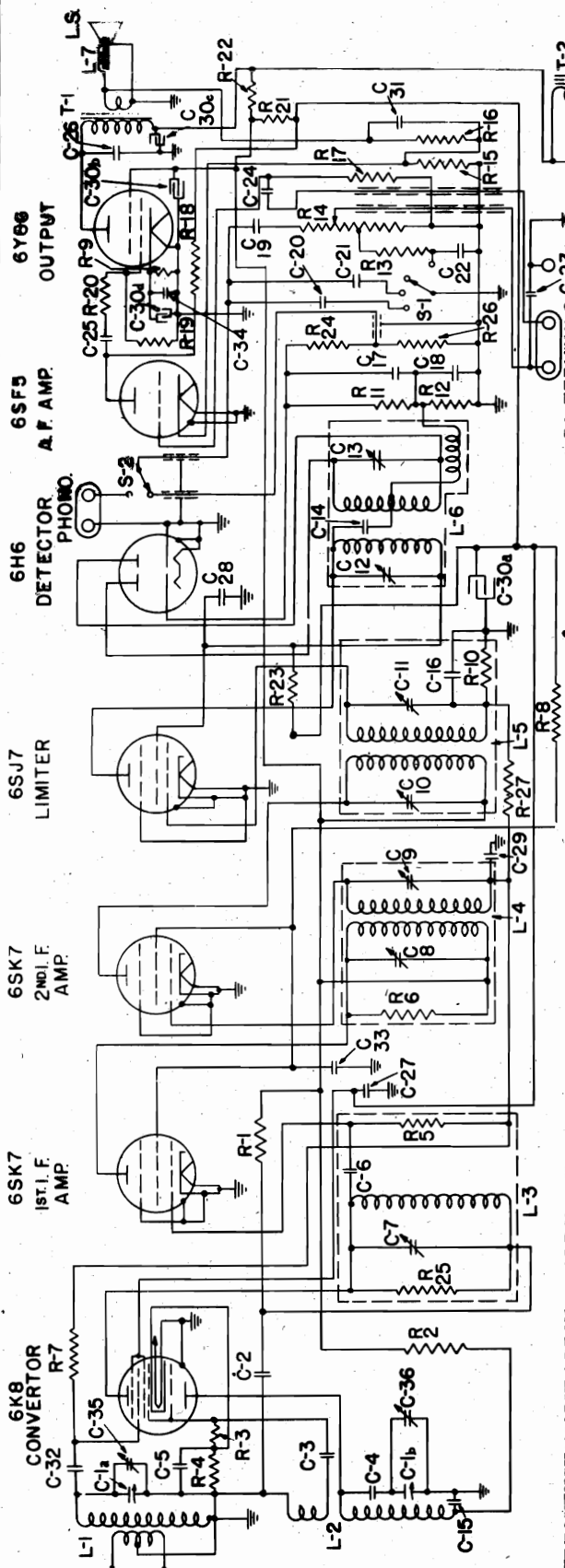
| Stock No. | Description | List Price |
|-------------------------|---|------------|
| CHASSIS ASSEMBLY | | |
| RA-315 | CONDENSER ASSEMBLY—Tuning condenser and drive unit complete..... | \$5.75 |
| *RB-023 | BOARD—Terminal board (4 lugs)..... | .10 |
| RB-041 | BOARD—Terminal board (2 lugs)..... | .10 |
| RB-182 | BRACKET—Beam-A-Scope bracket..... | .10 |
| RB-936 | BACK COVER—Cardboard cabinet back..... | .15 |
| RB-1018 | BOARD—Antenna terminal board..... | .10 |
| *RC-011 | CAPACITOR—.002 mfd. 600 V. paper (C-14)..... | .25 |
| *RC-023 | CAPACITOR—.005 mfd. 600 V. paper (C-18, 19)..... | .25 |
| *RC-039 | CAPACITOR—.01 mfd. 600 V. paper (C-10, 20, 25)..... | .25 |
| *RC-048 | CAPACITOR—.02 mfd. 600 V. paper (C-16)..... | .30 |
| *RC-092 | CAPACITOR—.05 mfd. 600 V. paper (C-7, 24)..... | .30 |
| *RC-123 | CAPACITOR—.01 mfd. 400 V. paper (C-8, 28)..... | .35 |
| *RC-210 | CAPACITOR—.47 mmf. mica (C-20)..... | .25 |
| *RC-250 | CAPACITOR—.220 mmf. mica (C-17)..... | .25 |
| *RC-263 | CAPACITOR—.470 mmf. mica (C-13)..... | .30 |
| *RC-390 | CAPACITOR—.3900 mmf. mica (C-4)..... | .35 |
| *RC-645 | CAPACITOR—Beam-A-Scope and "B" band osc. trimmers (C-9, 21)..... | .15 |
| RC-749 | CONDENSER—Tuning condenser (C-1, 2)..... | 4.15 |
| *RC-863 | CORD—Power cord..... | .65 |
| RC-1995 | CLAMP—Oscillator coil clamp (Pkg. 5)..... | .10 |
| RC-5136 | V. dry electrolytic (C-22a, 22b)..... | 1.15 |
| RC-6510 | CAPACITOR—"B" band padder (C-3)..... | .30 |
| RC-6517 | CAPACITOR—"D" band ant. and osc. trimmers (C-5, 6)..... | .30 |
| RC-8130 | CABLE—Tuning drive cable assembly..... | .15 |
| RC-8500 | CARD—Station letter card (1 set) (Used on keys of both models)..... | .20 |
| RC-8517 | CARD—Station tab card (1 set) (Model H-623) (Used on escutcheon)..... | .60 |
| RC-9010 | CONE ASSEMBLY—.65 inch speaker cone assembly..... | .90 |
| RD-110 | DIAL—Dial scale..... | 1.00 |
| RG-302 | GROMMET—Tuning shaft drive cord grommet (Pkg. 10)..... | .10 |
| RK-055 | KNOB—Light oak control knob (Pkg. 5)..... | .50 |
| RK-209 | KEY—Light oak station selector key..... | .15 |
| RK-217 | KEY—Green station selector key (Model H-623)..... | .15 |
| RL-098 | COIL—"D" band antenna coil (Code—Orange) (L-2)..... | .65 |
| RL-296 | COIL—Oscillator coil (L-3)..... | .70 |
| RL-340 | CHOKE—Antenna choke (L-8)..... | .30 |
| RL-522 | BEAM-A-SCOPE—Beam-A-Scope antenna (L-1)..... | .85 |
| RL-937 | LUG—Key pin binding lug (Pkg. 10)..... | .10 |
| RM-503 | MASK—Dial scale mask (Pkg. 10)..... | .20 |
| RN-200 | NAMEPLATE—Dial scale metal nameplate (Model H-622)..... | .20 |
| RN-201 | NAMEPLATE—Dial scale metal nameplate (Model H-623)..... | .25 |
| RP-134 | PIN—Station selector key pin (Pkg. 10)..... | .05 |
| RP-144 | POINTER—Dial scale pointer (Pkg. 5)..... | \$0.25 |
| RP-307 | PULLEY—Condenser drive cord pulley (Pkg. 5)..... | .25 |
| RP-308 | PULLEY—.75 inch drive cord idler pulley (Pkg. 5)..... | .10 |
| RP-309 | PULLEY—.75 inch drive cord idler pulley (Pkg. 5)..... | .10 |
| *RQ-1235 | RESISTOR—100 ohms, $\frac{1}{4}$ W. carbon (R-10) (Pkg. 5)..... | .70 |
| *RQ-1239 | RESISTOR—150 ohms, $\frac{1}{4}$ W. carbon (R-12) (Pkg. 5)..... | .70 |
| *RQ-1259 | RESISTOR—1000 ohms, $\frac{1}{4}$ W. carbon (R-13) (Pkg. 5)..... | .70 |
| *RQ-1271 | RESISTOR—3300 ohms, $\frac{1}{4}$ W. carbon (R-9) (Pkg. 5)..... | .70 |
| *RQ-1295 | RESISTOR—33,000 ohms, $\frac{1}{4}$ W. carbon (R-1) (Pkg. 5)..... | .70 |
| *RQ-1297 | RESISTOR—39,000 ohms, $\frac{1}{4}$ W. carbon (R-10) (Pkg. 5)..... | .70 |
| *RQ-1323 | RESISTOR—470,000 ohms, $\frac{1}{4}$ W. carbon (R-5, 7, 11, 15) (Pkg. 5)..... | .70 |
| *RQ-1381 | RESISTOR—1.0 megohm, $\frac{1}{4}$ W. carbon (R-8) (Pkg. 5)..... | .70 |
| *RQ-1339 | RESISTOR—2.2 megohms, $\frac{1}{4}$ W. carbon (R-2) (Pkg. 5)..... | .70 |
| *RQ-1365 | RESISTOR—15 megohms, $\frac{1}{4}$ W. carbon (R-6) (Pkg. 5)..... | .70 |
| RR-772 | RESISTOR—BL42D ballast resistor (R-14)..... | .45 |
| RS-200 | SOCKET—Octal tube socket (Pkg. 5)..... | .75 |
| RS-256 | SOCKET—Electrolytic mounting socket (Pkg. 5)..... | .25 |
| RS-261 | SOCKET—Pilot lamp socket..... | .20 |
| RS-426 | SPRING—Condenser drive cord spring (Pkg. 5)..... | .10 |
| RS-510 | SPACER—Station key spacer (Pkg. 10)..... | .10 |
| RS-929 | SHAFT—Tuning shaft..... | .15 |
| RS-1012 | SPEAKER—6.5 inch P.M. speaker..... | 3.25 |
| RS-3036 | SWITCH—Band change switch (Pkg. 5)..... | .60 |
| RT-328 | TRANSFORMER—1st I.F. transformer (T-1)..... | 1.00 |
| RT-329 | TRANSFORMER—2nd I.F. transformer (T-6)..... | 1.20 |
| RT-409 | TRANSFORMER—Output transformer (T-1)..... | 1.25 |
| RT-954 | TERMINAL—Speaker lead terminal (Pkg. 10)..... | .10 |
| RV-072 | VOLUME CONTROL—2.0 megohms volume control (R-4)..... | .80 |
| RW-039 | WINDOW—Celluloid station letter window (Pkg. 25)..... | .10 |
| *RW-101 | WASHER—Control shaft felt washer (Pkg. 10)..... | .05 |
| *RX-035 | ASSEMBLY—Condenser mounting foot assembly..... | .15 |
| *RX-061 | ASSEMBLY—Chassis mounting assembly..... | .10 |
| *RX-062 | ASSEMBLY—Speaker mounting assembly..... | .10 |

*Used on previous receivers

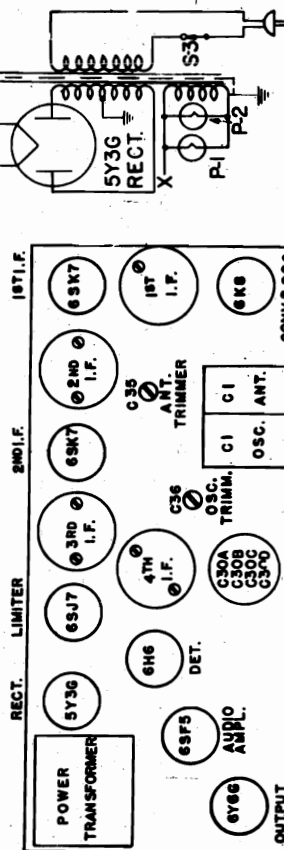
(Prices subject to change without notice)

MODEL HM80
Schematic, Socket
Trimmers

GENERAL ELECTRIC CO.



FREQUENCY MODULATION - ALIGNMENT similar to Model G.M. 125 as explained on page 54 of the "How It Works" Section of Volume X. IF PEAK 2.1 MC.



| Symbol | Description |
|--------|-------------|
| C-1 | - 20 mmf. |
| C-2 | - .02 mfd. |
| C-3 | - 47 mmf. |
| C-4 | - 1200 mmf. |
| C-5 | - .05 mfd. |
| C-6 | - 500 mmf. |
| C-14 | - 47 mmf. |
| C-15 | - 470 mmf. |
| C-16 | - 22 mmf. |
| C-17 | - 100 mmf. |
| C-18 | - 100 mmf. |
| C-19 | - .005 mfd. |
| C-20 | - .002 mfd. |
| C-21 | - 470 mmf. |
| C-22 | - .002 mfd. |
| C-23 | - 220 mmf. |
| C-24 | - .005 mfd. |
| C-25 | - .05 mfd. |

| Symbol | Description |
|--------|--------------|
| C-26 | - .005 mfd. |
| C-27 | - .005 mfd. |
| C-28 | - .05 mfd. |
| C-29 | - .05 mfd. |
| C-30a | - 20 mfd. |
| C-30b | - 20 mfd. |
| C-30c | - 40 mfd. |
| C-30d | - 20 mfd. |
| C-31 | - 0.1 mfd. |
| C-32 | - 470 mmf. |
| C-33 | - 0.1 mfd. |
| C-34 | - .05 mfd. |
| C-35 | - 2-15 mmf. |
| C-36 | - 7-23 mmf. |
| R-1 | - 2200 ohms |
| R-2 | - 6000 ohms |
| R-3 | - 47000 ohms |
| R-4 | - 330 ohms |

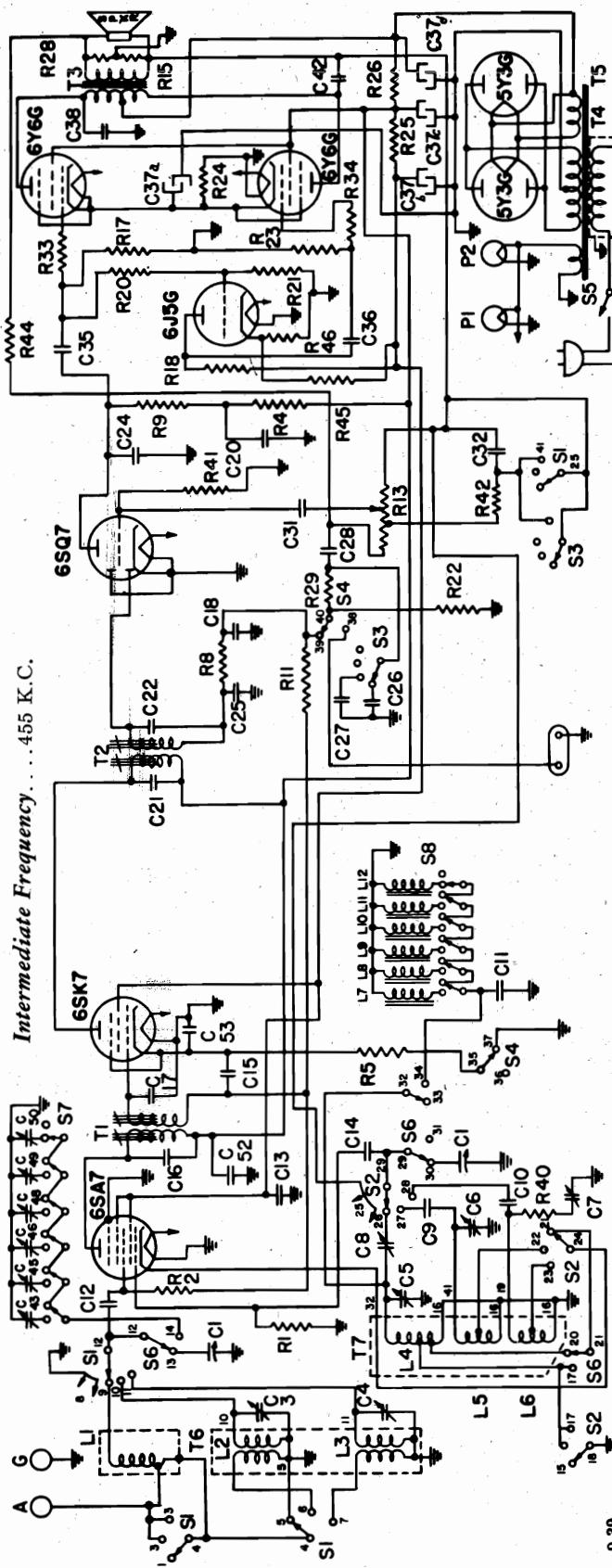
| Symbol | Description |
|--------|------------------|
| R-5 | - 470 000 ohms |
| R-6 | - 47 000 ohms |
| R-7 | - 470 000 ohms |
| R-8 | - 4 700 ohms |
| R-9 | - 220 ohms |
| R-10 | - 330 000 ohms |
| R-11 | - 100 000 ohms |
| R-12 | - 100 000 ohms |
| R-13 | - 120 000 ohms |
| R-14 | - 2 megohm v. o. |

| Symbol | Description |
|--------|----------------|
| R-15 | - 82 ohms |
| R-16 | - 220 ohms |
| R-17 | - 15 megohms |
| R-18 | - 220 000 ohms |
| R-19 | - 470 000 ohms |
| R-20 | - 1500 ohms |
| R-21 | - 2200 ohms |
| R-22 | - 1600 ohms |
| R-23 | - 2200 ohms |
| R-24 | - 100 000 ohms |

| Symbol | Description |
|--------|----------------|
| R-25 | - 33 000 ohms |
| R-26 | - 220 000 ohms |
| R-27 | - 2.2 megohms |

IF PEAK 2.1 MC

GENERAL ELECTRIC CO.

MODEL H87
Schematic, Socket
Trimmers

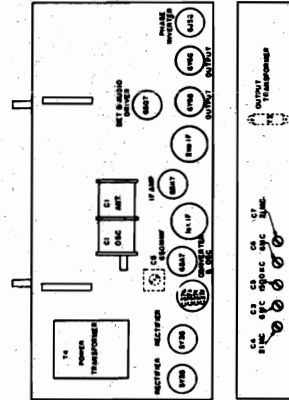
9-39

| Symbol | Description | Symbol | Description | Symbol | Description |
|--------|---------------------------------------|--------|-------------------------------|--------|-----------------------------------|
| C-1 | Tuning Capacitor | C-42 | .01 mfd., Paper Capacitor | R-20 | 3.3 megohms, Carbon Resistor |
| C-3 | "C" Band Antenna Trimmer | C-43 | 7-65 mfd., Antenna Trimmer | R-21 | 270,000 ohms, Carbon Resistor |
| C-4 | "D" Band Antenna Trimmer | C-44 | 20-180 mfd., Antenna Trimmer | R-22 | 220,000 ohms, Carbon Resistor |
| C-5 | "B" Band Oscillator Trimmer | C-45 | 20-180 mfd., Antenna Trimmer | R-23 | 150,000 ohms, Carbon Resistor |
| C-6 | "C" Band Oscillator Trimmer | C-46 | 100-490 mfd., Antenna Trimmer | R-24 | 100 ohms, 3-4-W. Wire Wound |
| C-7 | "D" Band Oscillator Trimmer | C-47 | 100-490 mfd., Antenna Trimmer | R-25 | 2400 ohms, 2-W. Wire Wound |
| C-8 | "B" Band Padder | C-48 | 100-490 mfd., Antenna Trimmer | R-26 | 2200 ohms, 2-6-W. Wire Wound |
| C-9 | 1600 mfd., Mica Capacitor #5% | C-49 | .25 mfd., Paper Capacitor | R-27 | 68 ohms, Carbon Resistor |
| C-10 | 4300 mfd., Mica Capacitor #5% | C-50 | .08 mfd., Paper Capacitor | R-28 | 47,000 ohms, Carbon Resistor |
| C-11 | 750 mfd., Silvered Mica Capacitor #5% | C-51 | Beam-a-Scope | R-29 | 1000 ohms, Carbon Resistor |
| C-12 | 150 mfd., Mica Capacitor | C-52 | "C" Band Antenna Coil | R-30 | 1000 ohms, Carbon Resistor |
| C-13 | 0.1 mfd., Paper Capacitor | C-53 | "D" Band Antenna Coil | R-31 | 33 ohms, Carbon Resistor |
| C-14 | 47 mfd., Mica Capacitor | L-1 | "B" Band Oscillator Coil | R-32 | 33 ohms, Carbon Resistor |
| C-15 | 0.1 mfd., Paper Capacitor | L-2 | "C" Band Oscillator Coil | R-33 | 4.7 megohms, Carbon Resistor |
| C-16 | 47 mfd., Mica Capacitor | L-3 | "D" Band Oscillator Coil | R-34 | 15,000 ohms, 1-W. Carbon Resistor |
| C-17 | 25 mfd., Paper Capacitor | L-4 | Tuning Coil (Code—None) | R-35 | 270 ohms, Carbon Resistor |
| C-18 | 100 mfd., Mica Capacitor | L-5 | Tuning Coil (Code—Red) | R-36 | 270 ohms, Carbon Resistor |
| C-19 | 47 mfd., Mica Capacitor | L-6 | | R-37 | 270 ohms, Carbon Resistor |
| C-20 | 47 mfd., Mica Capacitor | L-7 | | R-38 | 270 ohms, Carbon Resistor |
| C-21 | 47 mfd., Mica Capacitor | L-8 | | R-39 | 270 ohms, Carbon Resistor |
| C-22 | 47 mfd., Mica Capacitor | L-9 | | R-40 | 270 ohms, Carbon Resistor |
| C-23 | 47 mfd., Mica Capacitor | L-10 | | R-41 | 270 ohms, Carbon Resistor |
| C-24 | 47 mfd., Mica Capacitor | L-11 | | R-42 | 270 ohms, Carbon Resistor |
| C-25 | 47 mfd., Mica Capacitor | L-12 | | R-43 | 270 ohms, Carbon Resistor |
| C-26 | 47 mfd., Mica Capacitor | L-13 | | R-44 | 270 ohms, Carbon Resistor |
| C-27 | 47 mfd., Mica Capacitor | L-14 | | R-45 | 270 ohms, Carbon Resistor |
| C-28 | 47 mfd., Mica Capacitor | L-15 | | R-46 | 270 ohms, Carbon Resistor |
| C-29 | 47 mfd., Mica Capacitor | L-16 | | R-47 | 270 ohms, Carbon Resistor |
| C-30 | 47 mfd., Mica Capacitor | L-17 | | R-48 | 270 ohms, Carbon Resistor |
| C-31 | 47 mfd., Mica Capacitor | L-18 | | R-49 | 270 ohms, Carbon Resistor |
| C-32 | 47 mfd., Mica Capacitor | L-19 | | R-50 | 270 ohms, Carbon Resistor |
| C-33 | 47 mfd., Mica Capacitor | L-20 | | R-51 | 270 ohms, Carbon Resistor |
| C-34 | 47 mfd., Mica Capacitor | L-21 | | R-52 | 270 ohms, Carbon Resistor |
| C-35 | 47 mfd., Mica Capacitor | L-22 | | R-53 | 270 ohms, Carbon Resistor |
| C-36 | 47 mfd., Mica Capacitor | L-23 | | R-54 | 270 ohms, Carbon Resistor |
| C-37a | 20 mfd., 250 V. Dry Electrolytic | L-24 | | R-55 | 270 ohms, Carbon Resistor |
| C-37b | 20 mfd., 250 V. Dry Electrolytic | L-25 | | R-56 | 270 ohms, Carbon Resistor |
| C-37c | 40 mfd., 250 V. Dry Electrolytic | L-26 | | R-57 | 270 ohms, Carbon Resistor |
| C-37d | 40 mfd., 250 V. Dry Electrolytic | L-27 | | R-58 | 270 ohms, Carbon Resistor |
| C-38 | .02 mfd., Paper Capacitor | L-28 | | R-59 | 270 ohms, Carbon Resistor |

Tubes

Converter and Osc. GE-6SA7
I.F. Amplifier GE-6SK7
Det., Aud., AVC GE-6SK7
Phase Inverter GE-6J5G
Power Output (2) GE-6Y6G
Rectifier (2) GE-5Y3G

Fig. 1. Trimmer Location

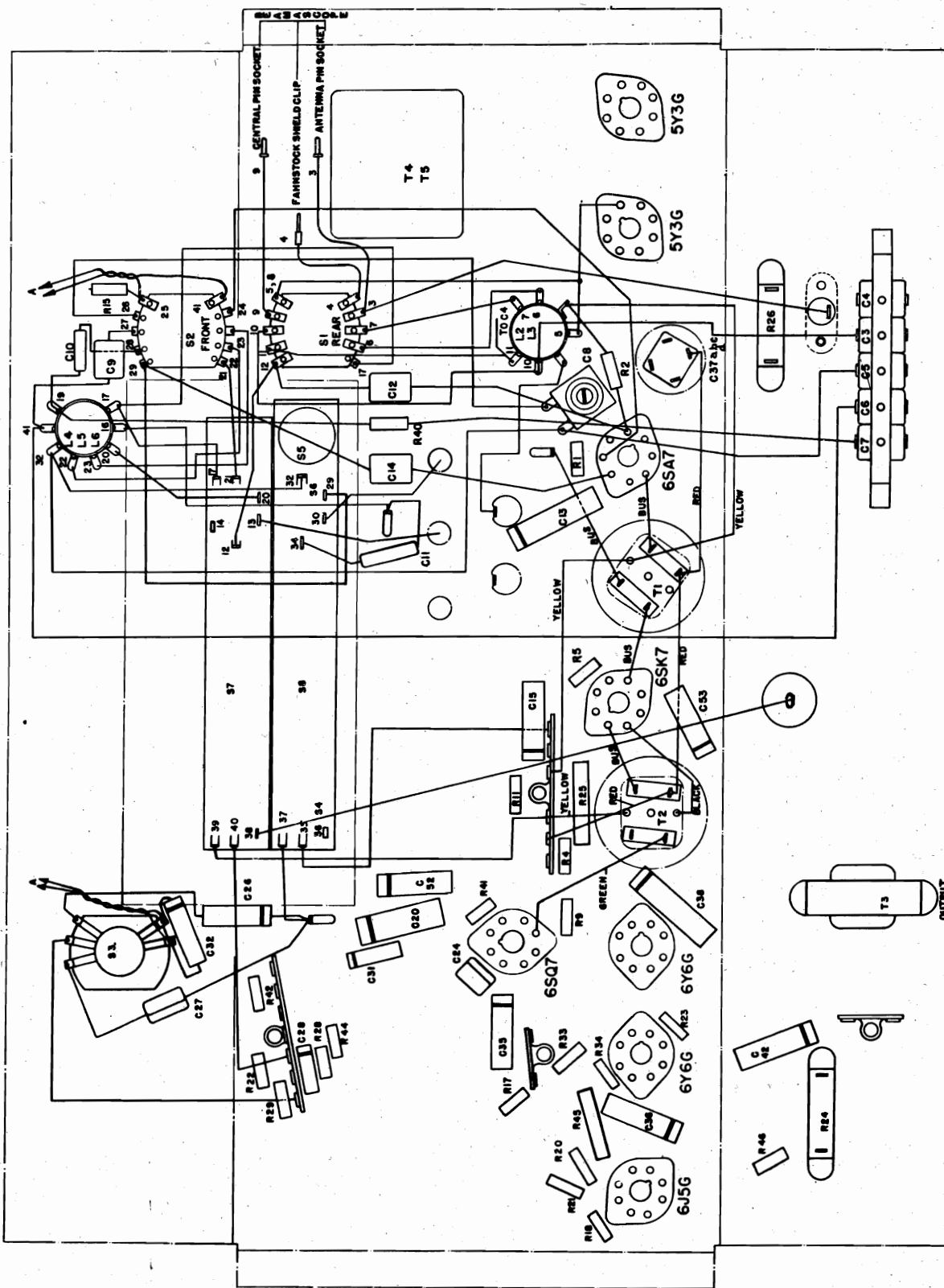


Tuning Frequency Range

| | |
|---------------|------------------|
| Band "B"..... | 540-1600 K.C. |
| Band "C"..... | 2300-7000 K.C. |
| Band "D"..... | 7000-22,000 K.C. |

Electrical Specifications

Rating "A"—110-125 volts, 50-60 cycles, 125 watts
Rating "C"—110-125 volts, 25-60 cycles, 125 watts



CHASSIS VIEWED FROM BOTTOM

Electrical Power Output

| | |
|------------------|-----------|
| Undistorted..... | 8.5 watts |
| Maximum..... | 10 watts |

Loud-speaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter.....12-inch

Voice Coil Impedance.....3.5 ohms

Tone Control.....4-position

MODEL H87

Voltage, Socket

GENERAL ELECTRIC CO.

MODEL H87

MODEL HJ1005

Alignment, Gain

Coils, Dial Drive

ALIGNMENT PROCEDURE

MODEL H-87

MODEL HJ1005

I.F. Alignment with Oscilloscope*

| Band- switch Setting | Input Frequency | Tone Control Position | Point of Input* | Trimmer | Comments |
|----------------------------|-------------------------------|-----------------------------|------------------------|--------------------------------|--|
| 1. Band B | 455 K.C. and 30 K.C. sweep | Bass | I.F. 6SK7 Grid | 2nd I.F. Sec. 2nd I.F. Pri. | Condenser gang at minimum capacity—Manual key depressed—vertical input to ground and junction of R-29, R-11, and R-22. Adjust trimmers in order mentioned for a single curve of maximum amplitude. |
| 2. Band B | 455 K.C. and 30 K.C. sweep | Bass | Converter 6SA7 Grid | 1st I.F. Sec. 1st I.F. Pri. | |
| 3. Band B | 455 K.C. and 30 K.C. sweep | Bass | Converter 6SA7 Grid | All I.F. Trimmers | |

I.F. Alignment with Output Meter*

| Band- switch Setting | Input Frequency | Tone Control Position | Point of Input* | Trimmer | Comments |
|----------------------------|-----------------------|-----------------------------|------------------------|--------------------------------|---|
| 1. Band B | 455 K.C. modulated | Bass | I.F. 6SK7 Grid | 2nd I.F. Sec. 2nd I.F. Pri. | Condenser gang at minimum capacity—manual key depressed—output meter connected across voice coil—volume control at maximum—input as low as practical. Adjust all trimmers in order listed for maximum output. |
| 2. Band B | 455 K.C. modulated | Bass | Converter 6SA7 Grid | 1st I.F. Sec. 1st I.F. Pri. | |
| 3. Band B | 455 K.C. modulated | Bass | Converter 6SA7 Grid | All I.F. Trimmers | |

R.F. Alignment

| Band- switch Setting | Input Frequency | Tone Control Position | Point of Input | Trimmer | Comments |
|----------------------------|------------------------|-----------------------------|----------------------|------------|--|
| 1. Band B | 6 MC | Bass | Antenna Post*** | Osc. (C-6) | Mechanically adjust dial pointer to first line at left-hand end of dial scale with condenser gang fully meshed. Connect output meter across voice coil. |
| 2. Band C | 200 K.C. modulated | Bass | Antenna Post*** | Osc. (C-3) | Set pointer to 6 M.C. mark and align (C-6). |
| 3. Band D | 200 K.C. modulated | Bass | Antenna Post*** | Osc. (C-3) | Set peak (C-3) for maximum output align (C-7). Peak C-4 while rocking gang condenser. The image of any signal on the D band should be 910 K.C. below input signal. Example: 15 M.C. image 14.09 M.C. |
| 4. Band B | 580 K.C. modulated | Bass | Antenna Post*** | Osc. (C-8) | Set dial pointer to 580 K.C. mark and tune in signal with (C-8). |
| 5. Band B | 1500 K.C. modulated | Bass | Antenna Post*** | Osc. (C-5) | Adjust C-5 for maximum output in vicinity of 1500 K.C. while rocking gang condenser. |
| 6. Band B | 580 K.C. modulated | Bass | Antenna Post*** | Osc. (C-8) | Retrim (C-8). |
| 7. Band B | 1500 K.C. modulated | Bass | Antenna Post*** | Osc. (C-5) | Repeak (C-5). |

* Use "dummy" antenna consisting of .05 mfd. capacitor between signal generator and point of input.
** Use a "dummy" antenna consisting of 70 mmf. capacitor between signal generator and point of input with Beam-a-Scope disconnected.
*** Use an I.R.E. "dummy" antenna as shown in Fig. 2 between the signal generator and the point of input.

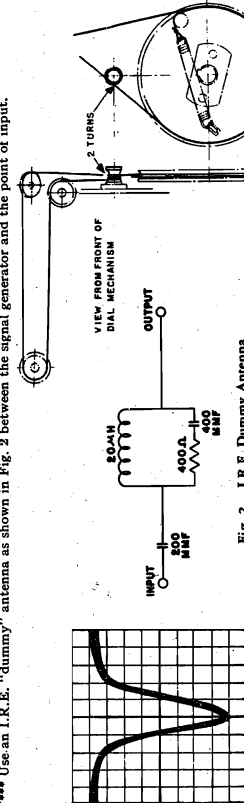


Fig. 2. I.R.E. Dummy Antenna

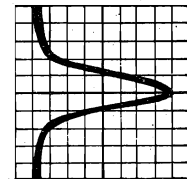


Fig. 3. I.F. Curve taken on G-E Oscilloscope OFM-1

SPECIAL SERVICE INFORMATION

MODELS H-87; HJ1005

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

- Stage Gain:
 - Antenna Post to Converter Grid
 - Band "B" (Beam-a-Scope connected)—3 at 1000 K.C.
 - Band "C" (Beam-a-Scope disconnected)—3 at 4 M.C.
 - Band "D" (Beam-a-Scope disconnected)—3 at 18 M.C.
 - Converter Grid to 6SK7 Grid—60 at 455 K.C.
 - 6SK7 Grid to 6SQ7 Det. Plate—100 at 455 K.C.

Fig. 7. Dial Drive Strapping Diagram

- A 400-cycle signal of .05 volts across volume control will give 1/2-watt speaker output.† (Volume Control turned to minimum.)
- (Average) DC voltage developed across oscillator grid resistor (R-1) with gang closed.

| | |
|---------------|-----------|
| Band "B"..... | 6.5 volts |
| Band "C"..... | 7 volts |
| Band "D"..... | 2.8 volts |
- Use I.R.E. "dummy" antenna.
- Use 70 mmf. capacitor between signal generator and antenna post with Beam-a-Scope disconnected.
- † Variations of + 10%, -20% permissible.

GENERAL INFORMATION

MODEL H-87

The Model H-87 is a three-band a-c operated receiver employing eight General Electric Pre-tested Tubes in a super-heterodyne circuit. This receiver is equipped with nine Peartouch Tuning Keys, six of which may be set up for favorite stations. The three remaining keys allow power control, manual tuning and phonograph or television audio reception. The new Super Beam-a-Scope, which is a highly efficient self-contained antenna circuit, is standard equipment on this model. Other features of design include "Alnico" dynapower speaker, floodlighted station key finder, visualux dial, iron core I.F. transformers, automatic tone compensation, automatic volume control and push-pull output.

The "C" and "D" band antenna coils are wound on a single coil form 7-D as shown in Schematic J-7. The oscillator transformer for the "B," "C" and "D" bands. All switch points are numbered to facilitate in locating these switch points on the pictorial wiring diagram.

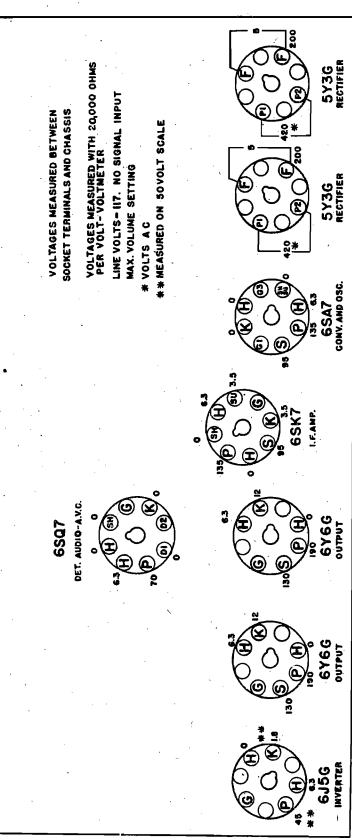
The following table gives the coils in use for the various positions of the band switch.

| Band- switch Position | Antenna Primary | Antenna Secondary | Oscillator Primary | Oscillator Secondary |
|-----------------------------|-----------------------|---------------------------|-----------------------|-------------------------|
| Band "B" | Lower portion of L-1 | Upper portion of L-1 | Lower portion of L-4 | Upper portion of L-4 |
| Band "C" | L-2 Primary (shorted) | L-2 Secondary (to ground) | Lower portion of L-5 | Upper portion of L-5 |
| Band "D" | L-3 Primary (shorted) | L-3 Secondary (to ground) | Lower portion of L-6 | Upper portion of L-6 |

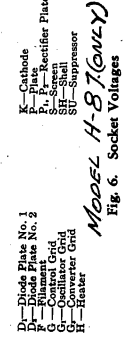
Alignment Procedure Models H-87; HJ1005

The alignment procedure is given in table form on the opposite page. Use the designated "dummy" antenna in making each individual alignment. I.F. alignment may be performed with the chassis removed from the cabinet and the Beam-a-Scope disconnected. R.F. alignment on "C" and "D" bands should be performed with the Beam-a-Scope disconnected and a 70 mmf. mica capacitor between the signal generator and the point of input. R.F. alignment on "B" band should be performed with the chassis and Beam-a-Scope mounted in the cabinet and properly connected.

FRONT OF CHASSIS



BOTTOM VIEW OF CHASSIS



MODEL H-87 (ONLY)

Fig. 6. Socket Voltages

GENERAL ELECTRIC CO.

REPLACEMENT PARTS LIST MODEL H-87

[illegible]

GENERAL INFORMATION

These models are compact superheterodyne receivers using five General Electric Pre-tested Tubes and operating from either a DC or AC source of power. Features of design include: a variable frequency control; a volume control; a high flame-voltage tube and automatic volume control; a push-button tuning; a speaker; and a battery-operated Model H-5100T (W and X inc.) have four "Pushbutton Tuning." Keys Models H-5000T and H-5100T (W and X inc.) have attack potentiometer while Model H-5200T (W and X inc.) has attack potentiometer and a speaker. All models are fully adapted to underwriter's laboratories.

H-500U and H-510U which use a 12SA7GT converter-oscillator tube. Tune these Models to a 580 KC signal after keying at 1000 Hz. The H-500U Model requires an oscillator paddler for making the gang condenser tune.

On Models H-500U and H-510U, we can apply a 1500 KC signal either through a standard I.R.E. diplexer to the antenna terminal or through an additional loop connected to the signal generator output which can be magnetically coupled to the antenna. The 1500 KC signal can be applied prior to the 1500 KC dial mark and will be (C-25) prior to the 1500 KC mark. On Models H-500U and H-510U, we can apply a 1500 KC signal after the 1500 KC dial mark and will be (C-26) after the 1500 KC mark. Return receiver to 580 KC signal and peak (C-20) while rocking the gang condenser.

GENERAL ELECTRIC CO.

MODELS H116, H118, HJ119 (Final)
Schematic, Socket, Trimmers, Dial Drive

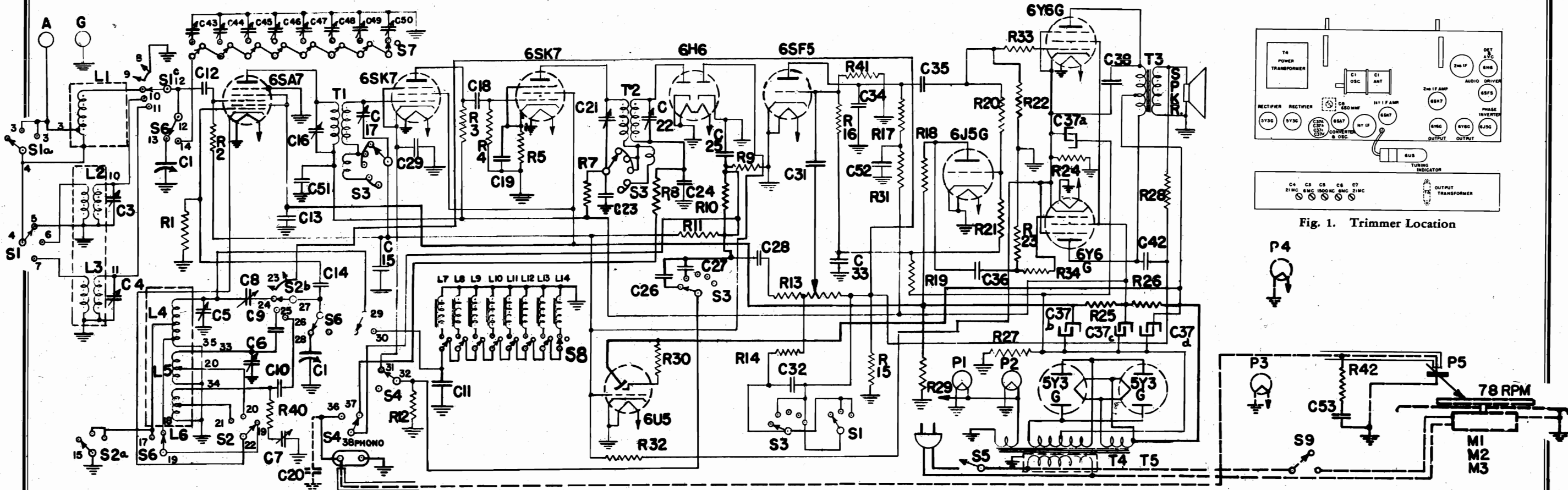


Fig. 1. Trimmer Location

| Symbol | Description | Symbol | Description | Symbol | Description | Symbol | Description |
|--------|--------------------------------------|--------|---------------------------------|----------------|-------------------------------|-----------------|--|
| C-1 | Tuning Capacitor | C-33 | 0.1 mfd. Paper Capacitor | L-6 | "D" Band Oscillator Coil | R-23 | 220,000 ohms, Carbon Resistor |
| C-3 | "C" Band Antenna Trimmer | C-34 | 47 mmf. Mica Capacitor | L-7, -8 | Tuning Coils (No code) | R-24 | 100 ohms, 3.4 W. Wire Wound |
| C-4 | "D" Band Antenna Trimmer | C-35 | .05 mfd. Paper Capacitor | L-9, -10, -11 | Tuning Coils (Code—Red) | R-25 | 2400 ohms, 2 W. Carbon Resistor |
| C-5 | "B" Band Oscillator Trimmer | C-36 | .05 mfd. Paper Capacitor | L-12, -13, -14 | Tuning Coils (Code—Blue) | R-26 | 2200 ohms, 2.6 W. Wire Wound |
| C-6 | "C" Band Oscillator Trimmer | C-37a | 20 mfd. 25 V. Dry Electrolytic | R-1 | 22,000 ohms, Carbon Resistor | R-27 | 12 ohms, Carbon Resistor |
| C-7 | "D" Band Oscillator Trimmer | C-37b | 20 mfd. 300 V. Dry Electrolytic | R-2 | 1.0 megohm, Carbon Resistor | R-28 | 68 ohms, Carbon Resistor |
| C-8 | "B" Band Padder | C-37c | 20 mfd. 300 V. Dry Electrolytic | R-3 | 6800 ohms, Carbon Resistor | R-29 | 47,000 ohms, Carbon Resistor |
| C-9 | 1600 mmf. Mica Capacitor ±5% | C-37d | 40 mfd. 350 V. Dry Electrolytic | R-4 | 47,000 ohms, Carbon Resistor | R-30 | 1.0 megohm, Carbon Resistor |
| C-10 | 4300 mmf. Mica Capacitor ±5% | C-38 | .02 mfd. Paper Capacitor | R-5 | 3300 ohms, Carbon Resistor | R-31 | 47,000 ohms, Carbon Resistor |
| C-11 | 750 mmf. Silvered Mica Capacitor ±5% | C-42 | .01 mfd. Paper Capacitor | R-7 | 1000 ohms, Carbon Resistor | R-32 | 5.6 megohms, Carbon Resistor |
| C-12 | 150 mmf. Mica Capacitor | C-43 | 7.65 mmf. Antenna Trimmer | R-8 | 47,000 ohms, Carbon Resistor | R-33 | 1000 ohms, Carbon Resistor |
| C-13 | 0.1 mfd. Paper Capacitor | C-44 | 7.65 mmf. Antenna Trimmer | R-9 | 220,000 ohms, Carbon Resistor | R-34 | 1000 ohms, Carbon Resistor |
| C-14 | 47 mmf. Mica Capacitor | C-45 | 20-180 mmf. Antenna Trimmer | R-10 | 47,000 ohms, Carbon Resistor | R-40 | 33 ohms, Carbon Resistor |
| C-15 | 0.1 mfd. Paper Capacitor | C-46 | 20-180 mmf. Antenna Trimmer | R-11 | 2.2 megohms, Carbon Resistor | R-41 | 4.7 megohms, Carbon Resistor |
| C-18 | 47 mmf. Mica Capacitor | C-47 | 20-180 mmf. Antenna Trimmer | R-12 | 470 ohms, Carbon Resistor | R-42 | 18,000 ohms, Carbon Resistor |
| C-19 | .05 mfd. Paper Capacitor | C-48 | 100-490 mmf. Antenna Trimmer | R-13 | 2 megohm Volume Control | P-1, -2, -3, -4 | Pilot Lights, Mazda No. 44 |
| C-20 | .002 mfd. Paper Capacitor | C-49 | 100-490 mmf. Antenna Trimmer | R-14 | 150,000 ohms, Carbon Resistor | S-1 | Antenna Band Switch |
| C-23 | .05 mfd. Paper Capacitor | C-50 | 100-490 mmf. Antenna Trimmer | R-15 | 15 ohms, Carbon Resistor | S-2 | Oscillator Band Switch |
| C-24 | 100 mmf. Mica Capacitor | C-51 | 0.1 mfd. Paper Capacitor | R-16 | 4.7 megohms, Carbon Resistor | S-3 | Tone Switch |
| C-25 | 47 mmf. Mica Capacitor | C-52 | .25 mfd. Paper Capacitor | R-17 | 150,000 ohms, Carbon Resistor | S-4 | Phono Switch |
| C-26 | .001 mfd. Paper Capacitor | C-53 | .01 mfd. Paper Capacitor | R-18 | 47,000 ohms, Carbon Resistor | S-5 | Power Switch |
| C-27 | 470 mmf. Mica Capacitor | L-1 | Beam-a-Scope | R-19 | 1.0 megohms, Carbon Resistor | S-6 | Manual Switch |
| C-28 | .01 mfd. Paper Capacitor | L-2 | "C" Band Antenna Coil | R-20 | 3.3 megohms, Carbon Resistor | S-7 | Antenna Section Touch Tuning Switch |
| C-29 | .05 mfd. Paper Capacitor | L-3 | "D" Band Antenna Coil | R-21 | 270,000 ohms, Carbon Resistor | S-8 | Oscillator Section Touch Tuning Switch |
| C-31 | .01 mfd. Paper Capacitor | L-4 | "B" Band Oscillator Coil | R-22 | 220,000 ohms, Carbon Resistor | S-9 | Phono Motor Power Switch |
| C-32 | .003 mfd. Paper Capacitor | L-5 | "C" Band Oscillator Coil | | | | |

Electrical Specifications

Model H-116

Rating "A"—110-125 volts, 50-60 cycles, 130 watts
Rating "C"—110-125 volts, 25-60 cycles, 130 watts

Model H-118

Rating "A6"—110-125 volts, 60 cycles, 150 watts
Rating "A5"—110-125 volts, 50 cycles, 150 watts
Rating "C2"—110-125 volts, 25 cycles, 150 watts

Tuning Frequency Range

Band "B".....540-1600 KC
Band "C".....2300-7000 KC
Band "D".....7000-22,000 KC

Intermediate Frequency.....455 KC

Electric Power Output

Undistorted.....8.5 watts
Maximum.....10 watts

Tone Control.....5-position

Loud-speaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter.....12 inches
Voice Coil Impedance.....3.5 ohms

Tubes

Converter and Oscillator.....GE-6SA7
1st I.F. Amplifier.....GE-6SK7
2nd I.F. Amplifier.....GE-6SK7
Detector and A.V.C.....GE-6H6
Audio Driver.....GE-6SF5
Audio Inverter.....GE-6J5G
Audio Power Amplifier.....(2)GE-6Y6G
Tuning Indicator.....GE-6U5
Rectifier.....(2)GE-5Y3G
Dial-Lamp.....(4)MAZDA No. 44

VIEW FROM FRONT OF
DIAL MECHANISM

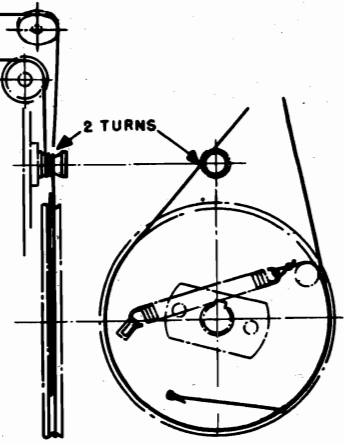


Fig. 6. Dial Drive Stringing Diagram

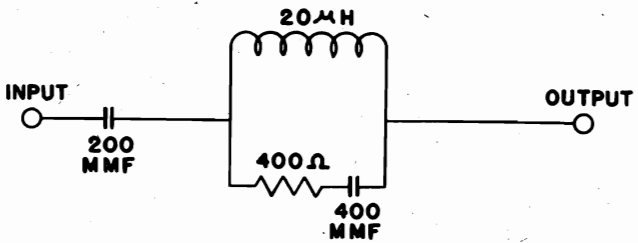


Fig. 7. I.R.E. Dummy Antenna

GENERAL ELECTRIC CO.

MODELS H116, H118, HJ119
MODEL H79

Record Changer Data

- any point, they may be tightened accordingly.
5. CHANGER IS NOISY WHEN IN CYCLE. Check oiling.
 6. MOTION OF TONE ARM TOWARD RECORD PIN WILL NOT TRIP CHANGER MECHANISM.
 - a. It may be found that, instead of trigger being actuated, there is stretching of Swivel Spring 95 (joining the lugs at ends of Swivel Spreaders 90 and 91), allowing the Spreaders to open. **Increase tension of Spring 95**, by bending slightly the lug on either Spreader. If this increased tension causes needle to jump across the record, needle may be a little out of vertical, radially—it may "lean" toward center of record. To remedy this, grasp Pickup arm and twist it, very slightly, in a clockwise direction, so that it stands vertical, or even leans a little in outward direction.
 - b. If trigger is being properly actuated, probably Cam Lever 39 is binding against Sub-Plate 41. Look for dirt or obstructions; see that rivets are working freely. If the Lever engages Cam Lever Pawl 34, so that Lift 37 forces its roller up into the groove on Cam gear 82, and if setscrews are tight, the change-cycle must operate, as Cam-Gear turns.
 7. PRESSING "R" BUTTON DOESN'T TRIP CHANGER MECHANISM.
 - a. Check Push-button Switch Unit 75: see whether there is an obstruction or a bent part which prevents "R" button from going clear down to the end of its travel.
 - b. Examine Reject Rod 78. If it does not trip, even when properly revolved by complete depressing of "R" button, the rod has probably been bent, and must be restored in same way. **Grasp the two ends and twist it slightly.**
 - c. If Trigger 16 is being properly actuated but without starting a change-cycle, see directions above, Paragraph 6-b.
 8. PRESSING "M" BUTTON FAILS TO PUT CHANGER MECHANISM OUT OF ACTION SO AS TO ENABLE MANUAL OPERATION. Check Push-button Switch Unit as in preceding paragraph. First see that button goes clear down; then follow its action through Manual Rod 77.
 9. MOTOR STOPS IMMEDIATELY WHEN PHONO SWITCH IS TURNED OFF DURING A CHANGE-CYCLE (instead of continuing to run, as it should, until needle is again upon a record, and then stopping). Or—
 10. TURNING PHONO SWITCH OFF FAILS TO STOP CHANGER AT ALL. Either of these two conditions would indicate failure of Cycling Switch 85. Cycling Switch operates normally to short-circuit the manual Changer Switch (which may be located in position shown at 54, or elsewhere) during change-cycle only. Such damage to Cycling Switch (not likely to occur) would necessitate returning the entire Changer to factory.
 11. CHANGER FAILS TO REPEAT LAST RECORD. See Paragraph 6, above.
 12. NEEDLE LANDS PROPERLY BUT FAILS TO MOVE OVER INTO RECORD GROOVE. Tone arm is normally impelled toward center of records by Lead Spring 97. Should a slight increase in its tension be found necessary, this can be easily obtained by bending the lug, to which it is attached, down against Main Plate. If tendency then appears for needle to jump across record, check angle of needle (see Paragraph 6-a above).
 13. RECORDS FALL UNEVENLY UPON TURNTABLE. Seldom objectionable, this is due to Record Pin not being correctly centered between Posts. If necessary, it can be corrected as described above; see "Motor Replacement."

table, and loosen slightly the screw or screws nearest the Record Holder to which record appeared closest. This should improve evenness of operation. However, unless the unevenness is very slight, it will be necessary for a permanent repair to insert a shim or two on one or more of the three screws (or change shims from one screw to another). The shims used are shaped like an ordinary washer, cut out at one side (see cut-away view at 52 in Fig. 11 showing a shim in place upon one of the Grommet Sleeves). Shims can readily be cut out with shears and punch from thin metal or cardboard. They should be inserted, around proper screws (when screws have been sufficiently loosened) between Motor Frame and metal Grommet Sleeve. **Do not insert shims next to rubber grommet.** In wiring up, consult schematic diagram for particular installation. Use only Underwriters' approved wire.

Trouble Shooting

Cases of failure to operate satisfactorily will generally be found due either to neglect of proper lubrication, or to tampering with the mechanism after it leaves the factory, or to injuries accidentally sustained as by external vibration or by impact of some heavy object. In addition there is always the possibility that any kind of spring may "go dead" (cease to operate without any visible breakage) even though the utmost factory precautions are taken against it—or that setscrews may work loose due to some external vibration. Damage from tampering is likely to take the form of bent parts; never bend any part during examination. Be careful, especially, **never to push upward** from below on Cam Connecting Rod Lift 37 while mechanism is operating; bending may result, and even slight bending here might interfere with correct timing of the cycle operations.

Among the principal trouble symptoms to which such causes may give rise, are the following:

1. MECHANISM IS SLOW IN STARTING, OR STALLS DURING A CHANGE-CYCLE, BUT A SLIGHT FORWARD PUSH WITH THE HAND STARTS IT AGAIN. May be caused by
 - a. Failure to lubricate properly. Oil thoroughly, per instructions above.
 - b. Loose setscrews.
 - c. Weakness of drive: line voltage may be abnormally low, or motor windings damaged.
2. MOTOR FAILS TO RUN, EVEN WHEN IT IS ENTIRELY DISCONNECTED FROM OTHER WIRING AND PROPER VOLTAGE IS APPLIED DIRECTLY TO THE TWO ENDS OF ITS WINDINGS. This indicates trouble in motor windings. Unless the damage is easily seen and repaired, replace Motor, as above described.
3. MOTOR IS SLOW IN STARTING.
 - a. **Check oiling**, as directed above. It may not have been properly done; old oil may have become gummy.
 - b. Changer may have been in a very cold place, and may not yet have reached room temperature. Give it a fair chance to get warmed up, before concluding that Motor is defective, and proceeding as in Paragraph 2 above.
4. SQUEAKS OR OTHER NOISES, DURING PLAYING OF RECORDS.
 - a. **Check oiling**, as directed above. (If squeaks are heard, they will usually be found to come from the records—not from the mechanism.)
 - b. See that all setscrews are tight.
 - c. Examine Motor windings; especially the shading coils which encircle a portion of each laminated pole and make the Motor self-starting. If coils have been jarred loose at

Adjustments

There are three adjustments that can be made. All are correctly made at the factory, and ordinarily need never be altered. Should it become necessary to remake any of these adjustments, due to accident or tampering, proceed as follows:

A. ADJUSTING LANDING POSITION OF NEEDLE ON THE RECORD. (See Fig. 8.) This adjustment is made with a screw-driver from above—does not require removing Record Changer from cabinet. If needle comes down too far from edge of record, playing of records will not start at their beginning. **Turn Needle-drop Adjustment Screw very slightly counterclockwise.** If needle comes down too close to edge of record, needle may slip off edge of record. **Turn the adjusting screw clockwise.**

Compare also Paragraph 12 on page 11.

B. ADJUSTING DISTANCE FROM RECORD PIN AT WHICH TRIGGER WILL TRIP AND CHANGE-CYCLE WILL BEGIN. Turn Trip Adjusting Screw 18, toward the trigger for earlier tripping, or away from it for later tripping. This Record Changer does not depend, for automatic tripping, on the records being provided with any special grooves at end; it trips whenever needle comes within a certain distance of Record Pin. The factory adjustment is for $1\frac{1}{4}$ in. from center of Record Pin. This is the most generally satisfactory distance; no modern record will then be cut off before playing is finished, and none will fail to trip at end. For certain records of early manufacture, it may not be possible to find an adjustment that will always trip and never cut off.

C. ADJUSTING HEIGHT TO WHICH TONE ARM RISES. The arm should rise, during the change-cycle, high enough so that it clears by only $\frac{1}{8}$ in. the record above it, next to be played. (Be careful, before deciding that adjustment is necessary, to see that the record at bottom of stack is not a warped one.) To make this adjustment, **loosen the lock nut on Pickup Sleeve 22** (see Fig. 10) and **turn the sleeve to lengthen or shorten Pickup Plunger 21.** When correct adjustment is found, **tighten lock nut again.**

Motor Replacement

The service mechanic may be called upon to adapt the Record Changer to a different power supply. For this purpose, or in case of any service fault within Motor, remove entire Motor (with Record Pin and connecting gear drive) from the Record Changer, and replace it with a suitable new Motor. (In ordering a replacement Motor, specify the power supply.)

When mounting replacement Motor, it is most important to see that Record Pin is centered between the two posts of the Record Changer, that it stands perpendicular to Main Plate 53, and that it has not become bent so as to wobble. Even though the Posts are stout and not easy to bend, it is well to check them also, with a 12-in. combination square laid clear across the concave upper surface of Main Plate. When the new Motor has been attached, with three screws through Grommet Sleeves 51 (spacers) into its frame, and Record Pin is seen to revolve without appreciable wobble (a wobble would indicate that it has been bent in transit from factory) the correct position of Pin midway between the Posts can be accurately checked in this way: Place a single 12-in. record on the Record Holder, press "R" button, and turn turntable forward by hand. Immediately after the Record Holders open and let it fall, **turn Turntable slightly backward**, and with other hand **support the record between the Record Holders**; it can then be readily seen whether Record Pin is off center. **If it is, remove the record and Turn-**

MODELS H116, H118, HJ119

MODEL H79

GENERAL ELECTRIC CO.

Record Changer Data, Parts

| Stock No. | Description | List Price |
|--|---|------------|
| AUTOMATIC RECORD-CHANGER ASSEMBLY | | |
| RA-412 | ARM—Swivel guide arm assembly (13, 88) | .75 |
| RB-189 | BRACKET—Adjusting rod bracket (86) | .10 |
| RB-190 | BRACKET—Manual and rejection rod spring bracket (76) | .10 |
| RB-628 | BUTTON—Switch push button (Pkg. of 4) | 1.00 |
| RC-1999 | CLAMP—Crystal cartridge clamp and screws (Pkg. of 2) | .25 |
| RC-2000 | COLLAR—Rear changer shaft collar and setscrew | .60 |
| RC-5003 | CRYSTAL—Crystal cartridge assembly | 6.00 |
| RC-8146 | CABLE—Pick-up cable and plug | .85 |
| RG-109 | GUIDE—Pick-up lifter guide | .40 |
| RG-303 | GROMMET—Motor mounting grommet (Pkg. of 6) | .15 |
| RG-707 | GEAR—Cam gear assembly (11, 82) | 2.40 |
| RG-708 | GEAR—Drive pinion gear assembly | .75 |
| RH-113 | HINGE—Adjusting rod hinge on switch unit (Pkg. of 3) | .10 |
| RK-069 | KNOB—Changer post knob | \$0.25 |
| RM-130 | MOTOR—Motor and record pin assembly with mounting accessories, 115 V., 60 cycles, 78 rpm (55) | 13.60 |
| RM-131 | MOTOR—Motor and record pin assembly with mounting accessories, 115 V., 50 cycles, 78 rpm (55) | 15.20 |
| RM-132 | MOTOR—Motor and record pin assembly, 115 V., 25 cycles, 78 rpm (55) | 38.00 |
| RP-158 | PLATE—Tone arm lift plate | .20 |
| RP-159 | PLATE—Sub-plate and lever assembly (14, 16, 17, 32, 34, 39, 41, 42, 83) | 4.40 |
| RG-711 | GEAR—Idle gear and shoulder rivet assembly | .60 |
| RS-886 | SCREW—Lift shoulder screw and nut | .30 |
| RP-160 | PLATE—Selector plate Assembly (Record holder and release lever) | 3.80 |
| RP-405 | PIN—Tone arm hinge pin (Pkg. of 6) | .20 |
| RP-406 | POST—Front or rear changer post with mounting washer and nut (71) | .80 |
| RP-407 | POST—Swivel post with mounting washer and nut | .75 |
| RR-932 | ROLLER—Rear post spring roller (61) | .40 |
| RR-933 | ROD—Manual key rod (77) | .10 |
| RR-934 | ROD—Rejection key rod (78) | .15 |
| RR-935 | ROD—Cam connecting rod assembly (31, 35, 37, 58, 59) | 1.40 |
| RR-936 | ROD—Adjusting rod assembly (79, 81, 92, 94) | 1.60 |
| RR-937 | ROD—Changer connecting rod assembly (57, 72) | 2.20 |
| RR-938 | REST—Tone arm rest | .20 |
| RS-473 | SPRING—Selector plate spring (Pkg. of 5) | .10 |
| RS-474 | SPRING—Release trigger spring (15) (Pkg. of 3) | .25 |
| RS-475 | SPRING—Cam connecting rod lift spring (Pkg. of 3) | .25 |
| RS-476 | SPRING—Pawl or extension rod spring (38, 79) (Pkg. of 3) | .25 |
| RS-477 | SPRING—Cam lever spring (36, 84) (Pkg. of 3) | .25 |
| RS-478 | SPRING—Rod or swivel guide arm spring (96, 87) (Pkg. of 3) | \$0.30 |
| RS-479 | SPRING—Changer spreader spring (62) (Pkg. of 2) | .25 |
| RS-480 | SPRING—Swivel spreader spring (95) (Pkg. of 3) | .15 |
| RS-481 | SPRING—Manual and rejection rod spring (73) (Pkg. of 3) | .25 |
| RS-482 | SPRING—Motorboard mounting spring (Pkg. of 6) | .25 |
| RS-483 | SPRING—Adjusting screw lock spring (19) (Pkg. of 12) | .10 |
| RS-484 | SPRING—Pick-up plunger spring (Pkg. of 3) | .25 |
| RS-485 | SPRING—Pick-up lead spring (97) (Pkg. of 3) | .20 |
| RS-486 | SPRING—Hinge pin spring (Pkg. of 6) | .90 |
| RS-512 | SWIVEL—Swivel shaft and head assembly (23) | .25 |
| RS-513 | SLEEVE—Motor mounting grommet sleeve (51) (Pkg. of 3) | .20 |
| RS-514 | SWIVEL SPREADERS—Upper or lower swivel spreaders (90, 91) | .10 |
| RS-887 | SCREW—Needle screw | .25 |
| RS-889 | SCREW—Trunnion shoulder screw (Pkg. of 3) | .20 |
| RS-878 | SCREW—Motorboard mounting screw (Pkg. of 4) | .60 |
| RS-935 | SHAFT—Front changer shaft and pin (74) | .60 |
| RS-936 | SHAFT—Rear changer shaft and pin (60) | .90 |
| RS-3053 | SWITCH—OFF-ON switch with lockwasher and 16-inch leads (54) | 1.70 |
| RS-3054 | SWITCH—Push-button switch unit (75) | 2.20 |
| RT-1918 | TURNABLE—11 1/4-inch mahogany flock turntable for Model H-118 | 2.40 |
| RT-220 | TOPE ARM—Tone arm assembly with lamp bracket and cord assembly | .65 |
| RX-070 | ASSEMBLY—Pick-up plunger, sleeve and nut assembly (21, 22) | .55 |
| RX-071 | ASSEMBLY—Stop lever and hub assembly (93) | 1.00 |
| RX-072 | ASSEMBLY—Swivel tube and trunnion assembly (20, 24, 25) | |

FOR MODEL HJ-119

*Used on previous receivers.

(Prices subject to change without notice)

14. LAST RECORD DROPS ON ONE SIDE ONLY. This suggests a Post bent out of perpendicular to Main Plate. Test with square as directed (see "Motor Replacement"). If Post must be straightened, be careful not to bend other parts.

15. CHANGER CONTINUES CYCLING. Due to failure of Lift 37 to fall back out of engagement with Cam Gear. Check the various rivets at which motion occurs, to find the

54 - Changer Switch

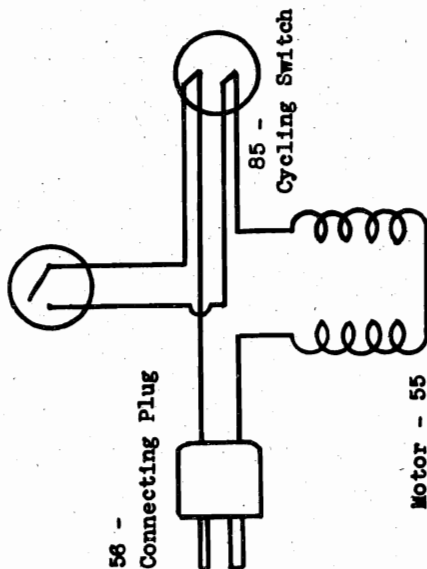


Fig. 12. Record Changer Wiring Diagram

point where friction or binding is interfering with freedom of motion.

16. RECORD IS DRIVEN, BUT NOT HEARD, OR NOT HEARD WITH PROPER VOLUME. See that Pickup cord is plugged in. Check amplifier and speaker and connections to them, thoroughly. If then trouble is still suspected in pickup, test its output with a vacuum-tube voltmeter. Playing an average record, output should test 1 to 2.5 volts. If pickup cartridge is found not to deliver proper output, remove it and install another.

17. SELECTOR PLATE FAILS TO SEPARATE BOTTOM RECORD FROM STACK. This is due either to a badly warped condition of the record, or to its being of a thickness very considerably different from those now in standard use. The design of both Release Levers and Record Holders is such as to accommodate a maximum variation in thickness and flatness of records, but certain records may be found which are so far out as to be impracticable for use in automatic changers.

If Necessary to Disassemble the Changer

Before attempting to remove Sub-Plate Assembly, 83, detach Push-button Switch Unit 75 from Main Plate. To do this, start with Switch Unit Truss Bar 80. Then take out the screw which holds left end of Adjusting Rod Lever 94. Next remove Adjusting Rod 92 and Adjusting Rod Extension 79. Take out the screw Spring 73; then the screws holding Push-button Switch Unit 75 to Main Plate. Rods 77 and 78 can then, with due care, be extracted without bending. Free the Cam Connecting Rod 58 by loosening setscrew holding Spreader and Hub Assembly 59. Sub-Plate Assembly can then be detached without bending parts. In reassembling, reverse the procedure.

GENERAL ELECTRIC CO.

MODELS H116, H118, HJ119

MODEL H79

Record Changer Data

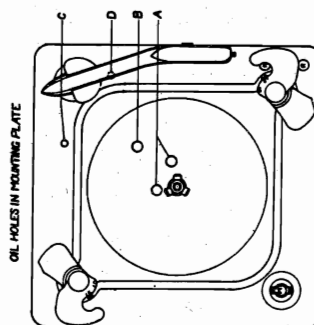
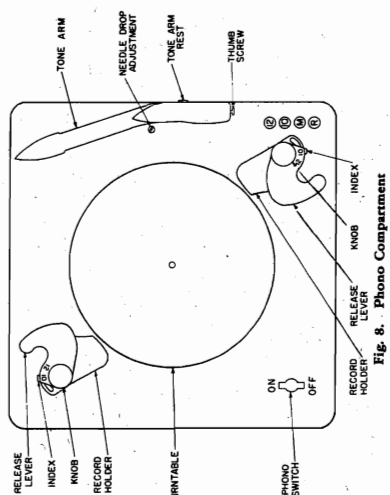


Fig. 9. Oiling Diagram

The Models H-116 and H-118 contain three-band a-c operated receivers employing eleven General Electric Pre-Selected Stations. The Model H-119 contains a receiver equipped with eleven Feathertouch Tuning. The three remaining keys allow power control, manual tuning and phonograph or television audio reception. Each model is equipped with the new Super-Blascope, a highly efficient self-contained Cathode Ray Oscilloscope. Other design include: 'Alnico' dynapower speaker, floodlighted station-key finder, visualux dial, iron-core I.F. transformers, automatic tone compensation, automatic volume control, and push-pull output.

The Model H-118 also incorporates an automatic record changer. The Model H-119 also incorporates an automatic record changer. The design of the automatic record changer mechanism which permits record rejection at any time during the reproduction by merely pressing the reject button. A high-quality crystal pick-up and tone arm assures full tone range and smooth needle tracking. A constant-speed, synchronous alternating current motor provides uniform turntable operation.

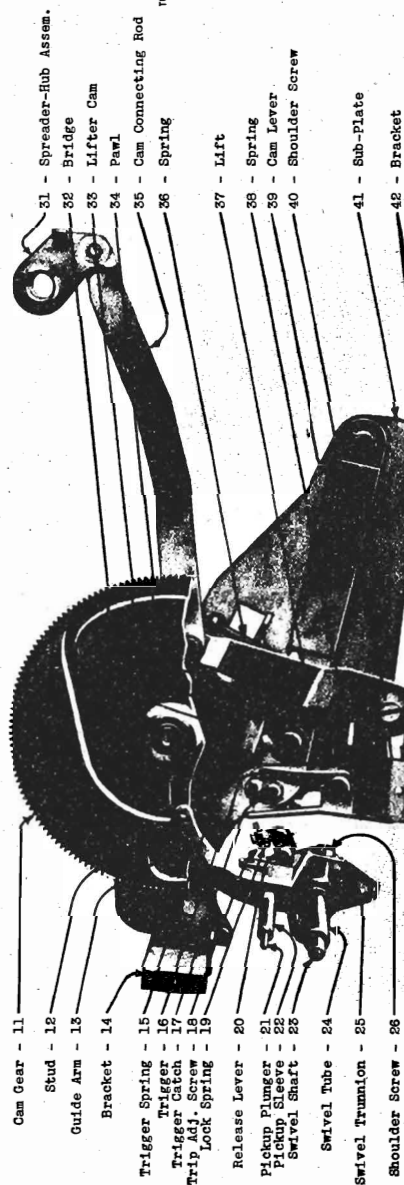


Fig. 10. Sub-Plate Assembly

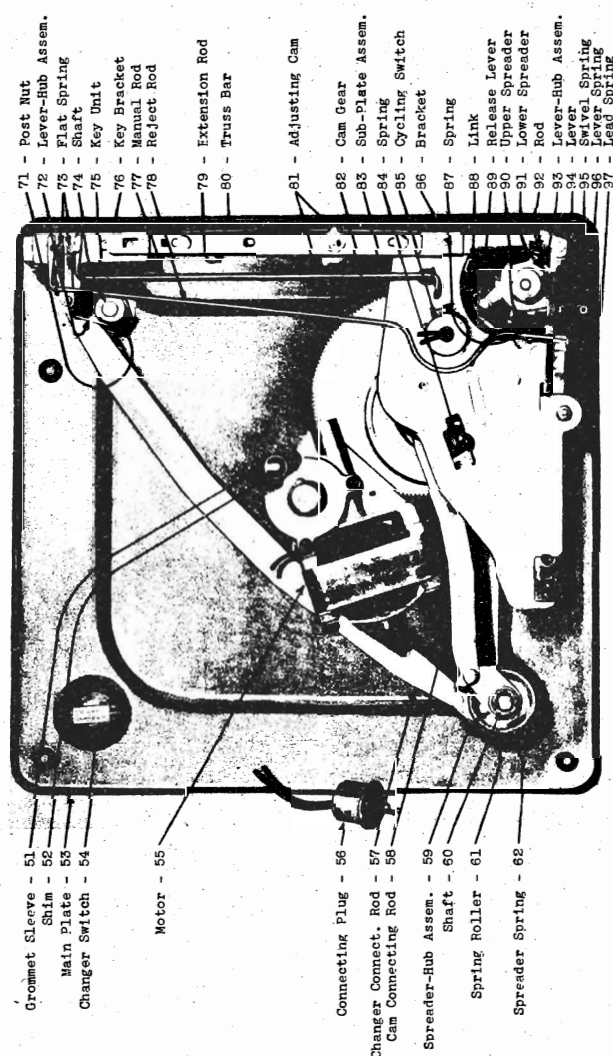
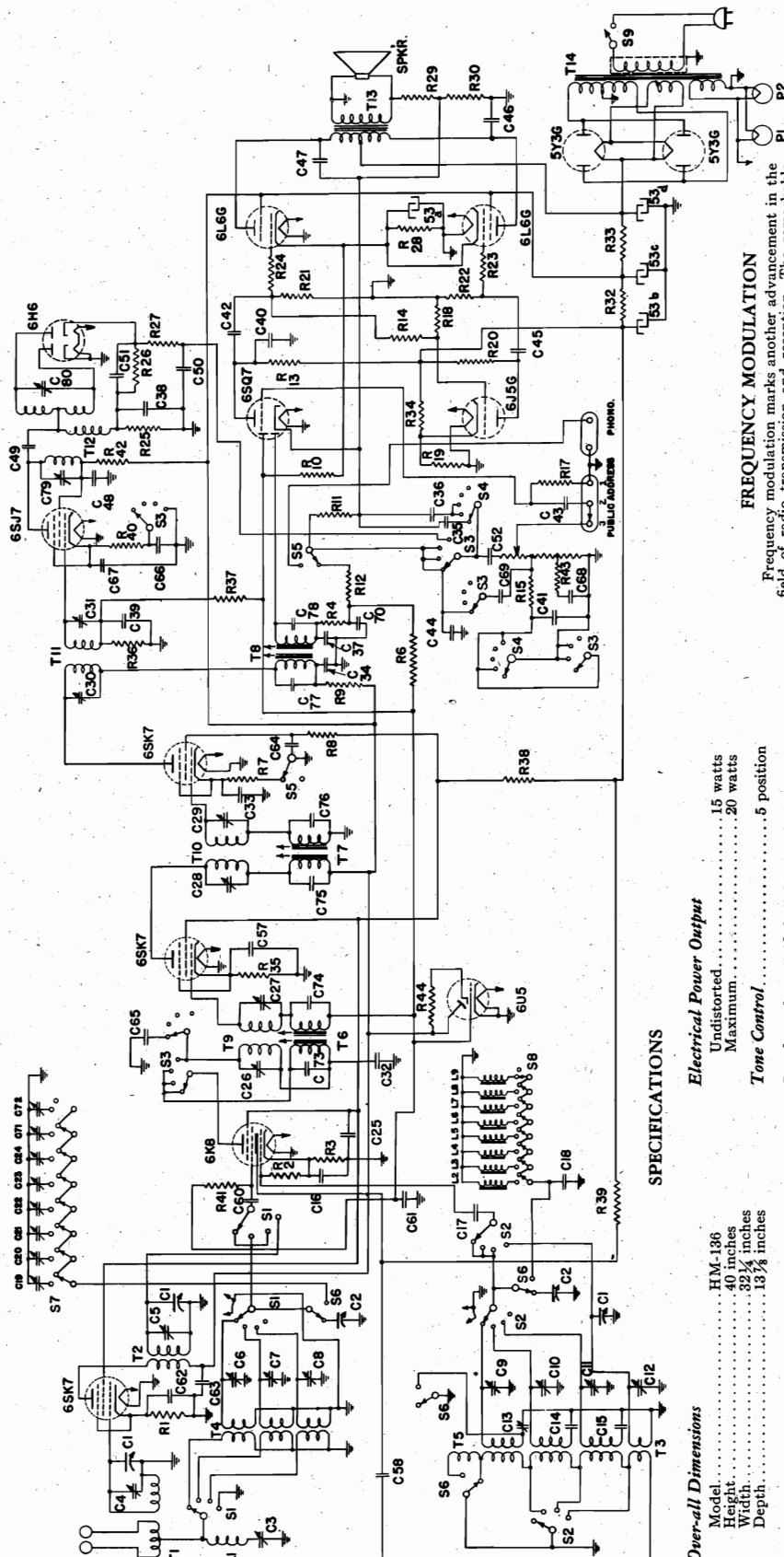


Fig. 11. Bottom View of Record Changer

GENERAL ELECTRIC CO.

REPLACEMENT PARTS LIST
MODELS H-116 AND H-118[illegible]

Used on previous receivers. (Price subject to change without notice)

MODEL HML36
Schematic Notes
GENERAL ELECTRIC CO.

FREQUENCY MODULATION

Frequency modulation marks another advancement in the field of radio transmission and reception. The remarkable realism and lack of noise which can be attained by this form of transmission has created widespread interest.

Present-day broadcasting stations superimpose sound programs on the radio frequency carrier signal by varying the carrier amplitude at the sound frequency rate. This is known as amplitude modulation.

Frequency modulated signals are obtained by varying the frequency of the carrier signal at the sound frequency rate. The amount the carrier frequency is varied is representative of the strength of the sound. The use of frequency variations as high as 60 or 70 KC positive and negative (120 or 140 over-all) requires the use of specially designed wide-band R.F. and I.F. amplifier stages. Such band widths preclude the use of amplifier signals in the neighborhood of the broadcast band where 120 KC would cover a considerable portion of the band. Therefore, transmission frequencies have been established in the short-wave band between 39 and 44 MC.

SPECIFICATIONS
Electrical Power Output

Undistorted..... 15 watts
Maximum..... 20 watts

Tone Control..... 5 position

Load-speaker—"Ainco" Magnetic Dynamic

Type Cone..... Curvilinear
Outside Cone Diameter..... 10 inches
Voice Coil Impedance (400 cycles)..... 3.5 ohms

Tubes

R.F. Amplifier..... GE-6SK7
Converter-Oscillator..... GE-6K8
I.F. Amplifiers..... (2) GE-6SK7
Noise Limiter..... GE-6SJ7
Discriminator..... GE-6H6
Det., Aud., AVC..... GE-6SQ7
Phase Inverter..... GE-6L6G
Power Output..... (2) GE-6L6G
Rectifier..... (2) GE-5Y3G
Tuning Indicator..... GE-6U5
Dial Lamp..... (2) MAZDA No. 44

Over-all Dimensions

Model..... HM-136
Height..... 40 inches
Width..... 32 1/4 inches
Depth..... 13 1/8 inches

Manual Tuning Drive Ratio..... 7:1

Electrical Specifications

115 Volts AC, 50-60 cycles, 140 watts.

Tuning Frequency Range

Short-wave..... 39-44 MC
Police-Amateur..... 7500-22,000 KC
Standard Broadcast..... 2400-7500 KC
Standard Broadcast..... 540-1700 KC

Intermediate Frequency

Frequency Modulation..... 2100 KC
"B", "C" and "D" Bands..... 455 KC

MODEL HM136
Voltage, Socket, Notes
Chassis Wiring
GENERAL ELECTRIC CO.

FRONT OF CHASSIS

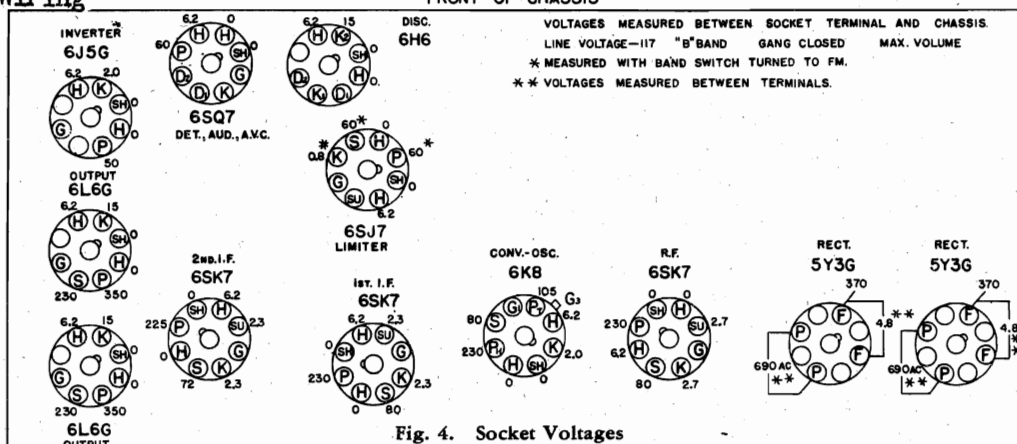


Fig. 4. Socket Voltages

GENERAL INFORMATION

The Model HM-136 is a combination frequency-modulation receiver and three-band radio using thirteen General Electric Pre-tested Tubes. Separate channels working into common tubes are employed for the detection and amplification of the frequency-modulated and amplitude-modulated R.F. and I.F. signals. An R.F. stage is employed in the frequency-modulated channel for increased sensitivity. Double interstage I.F. transformers are used with the frequency-modulated sections capacity-tuned and the amplitude-modulated sections inductively tuned. Other features of design include single-ended tubes in all stages except the converter-oscillator stage which uses a double section tube for increased stability, iron-core tuned oscillator coils for automatic station selection, noise limiter, discriminator, terminal board for conveniently connecting detector outputs to a public address system, "plug-in" type phono terminal,

10-inch curvilinear-type cone Dynapower speaker, and beam-power push-pull output.

ANTENNA

As a result of the high transmission frequencies the use of ordinary antennas for the reception of frequency-modulation signals is not satisfactory. General Electric builds a specially designed dipole antenna Model HT-9 for use with frequency-modulation receivers. For distances up to thirty miles from the transmitter a simple horizontal dipole with an over-all arm length of 10 feet 8 inches should give excellent results. The antenna should be located free of all obstructions and placed as high as is practicable. A noticeable gain in signal strength will be obtained as antenna height is increased. Generally best results will be obtained if the dipole arms are horizontal and at right angles to the direction of the frequency-modulation station. The lead-in transmission line may be of any length up to 100 feet and should consist of low-loss antenna lead-in wire.

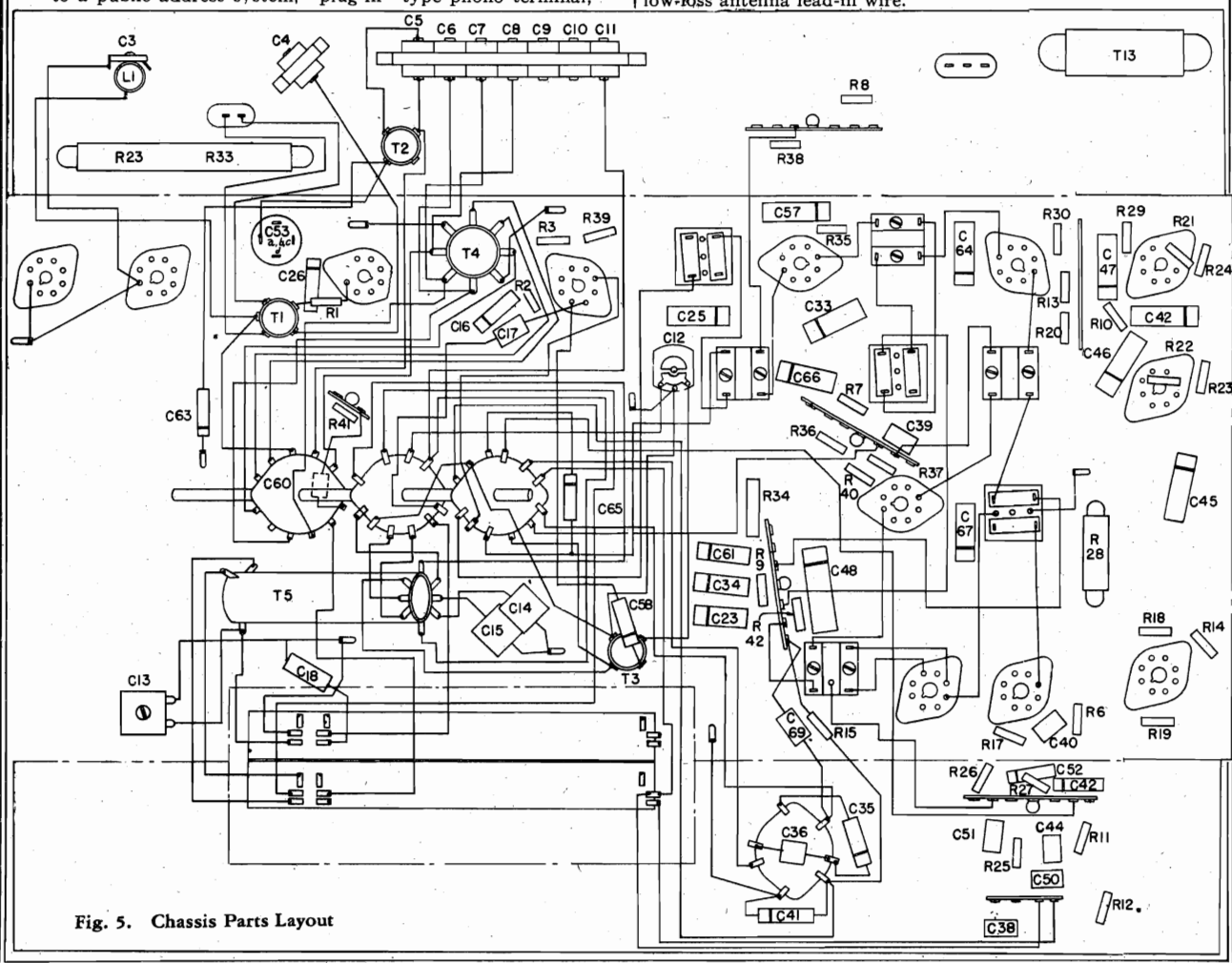


Fig. 5. Chassis Parts Layout

GENERAL ELECTRIC CO.

MODEL HM136
Alignment, Parts

AMPLITUDE MODULATION

I.F. ALIGNMENT WITH OSCILLOSCOPE

| Band-switch Setting | Input Frequency | Tone Control Position | Point of Input* | Iron-core Trimmer | Comments |
|---------------------|----------------------------|-----------------------|--------------------|--------------------------------|--|
| 1. Band B | 455 K.C. and 30 K.C. sweep | Bass | 2nd I.F. 6SK7 Grid | 3rd I.F. Sec. 3rd I.F. Pri. | Condenser gang at minimum capacity—Manual key depressed—vertical input to ground and junction of R-4 and R-12. Adjust iron core trimmers in order mentioned for a single curve of maximum amplitude. Since iron-core trimmers are at top and bottom of shield cans most effective alignment can be obtained by using two non-metallic screwdrivers simultaneously. |
| 2. Band B | 455 K.C. and 30 K.C. sweep | Bass | 1st I.F. 6SK7 Grid | 2nd I.F. Sec. 2nd I.F. Pri. | |
| 3. Band B | 455 K.C. and 30 K.C. sweep | Bass | Converter Grid | 1st I.F. Sec. 1st I.F. Pri. | |
| 4. Band B | 455 K.C. and 30 K.C. sweep | Bass | Converter Grid | All I.F. Trimmers | |

I.F. ALIGNMENT WITH OUTPUT METER

| | | | | | |
|-----------|--------------------|------|--------------------|--------------------------------|---|
| 1. Band B | 455 K.C. modulated | Bass | 2nd I.F. 6SK7 Grid | 3rd I.F. Sec. 3rd I.F. Pri. | Condenser gang at minimum capacity—Manual key depressed—output meter connected across voice coil—volume control at maximum—input as low as practical. Adjust all trimmers in order listed for maximum output. Since iron-core trimmers are at top and bottom of shield cans most effective alignment can be obtained by using two non-metallic screwdrivers simultaneously. |
| 2. Band B | 455 K.C. modulated | Bass | 1st I.F. 6SK7 Grid | 2nd I.F. Sec. 2nd I.F. Pri. | |
| 3. Band B | 455 K.C. modulated | Bass | Converter Grid | 1st I.F. Sec. 1st I.F. Pri. | |
| 4. Band B | 455 K.C. modulated | Bass | Converter Grid | All I.F. Trimmers | |

R. F. ALIGNMENT

| | | | | | |
|-----------|---------------------|------|----------------|---------------------------|---|
| 1. Band B | | | | | Connect output meter across voice coil and depress manual key. |
| 2. Band B | 1500 K.C. modulated | Bass | Antenna Post** | Osc. (C-9) Ant. (C-6) | Tune in signal by adjusting C-9. Peak C-6 for maximum meter reading. |
| 3. Band B | 580 K.C. modulated | Bass | Antenna Post** | Osc. Padder (C-13) | Set dial pointer to 580 K.C. mark and align C-13 for maximum meter reading while rocking the gang condenser. |
| 4. Band C | 6 MC modulated | Bass | Antenna Post** | Osc. (C-10) Ant. (C-7) | Set pointer to 6 M.C. mark and align (C-10). Peak (C-7) for maximum output. |
| 5. Band D | 21 M.C. modulated | Bass | Antenna Post** | Osc. (C-11) Ant. (C-8) | Set pointer to 21 M.C. mark and align (C-11). Peak C-8 while rocking the gang condenser. The image of any signal on the D band should be 910 K.C. below input signal. Example: 21 M.C. image 20.09 M.C. |

* Use "dummy" antenna consisting of .05 mfd. capacitor between signal generator and point of input.

** Use an I.R.E. "dummy" antenna as shown in Fig. 1 between the signal generator and the point of input.

| Stock No. | Description | List Price | | | |
|-----------|---|------------|------------------------------|--|--------|
| | | | *RC-092 | CAPACITOR—.05 mfd. 600 V. paper (C-34, 42, 45, 64) | .30 |
| | | | *RC-096 | CAPACITOR—.01 mfd. 200 V. paper (C-61, 66, 67) | .30 |
| *RB-008 | BOARD—Terminal board (2 lug) | \$0.10 | *RC-123 | CAPACITOR—.01 mfd. 400 V. paper (C-25, 32) | .35 |
| *RB-049 | BOARD—Antenna terminal board | .10 | RC-147 | CAPACITOR—.25 mfd. 400 V. paper (C-48) | .35 |
| *RB-062 | BOARD—Terminal board (6 lug) | .10 | RC-191 | CAPACITOR—.002 mfd. 1500 V. paper (C-46, 47) | .35 |
| *RB-093 | BOARD—Terminal board (6 lug) | .10 | *RC-206 | CAPACITOR—50 mmf. mica (C-17) | .35 |
| RB-094 | BOARD—Terminal board (7 lug) | .10 | RC-232 | CAPACITOR—47 mmf. mica (C-37, 49, 50, 51, 70) | .25 |
| RB-172 | BRACKET—Volume control mounting bracket | .05 | RC-233 | CAPACITOR—22 mmf. mica (C-39) | \$0.25 |
| RB-173 | BRACKET—Tuning drum support bracket | .20 | *RC-235 | CAPACITOR—100 mmf. mica (C-44, 69) | .25 |
| RB-183 | BRACKET—Small removable support bracket for mounting tuning condenser | .05 | *RC-242 | CAPACITOR—150 mmf. mica (C-40, 60) | .25 |
| RB-1009 | BOARD—Phono terminal board | .10 | RC-249 | CAPACITOR—220 mmf. mica (C-38) | .25 |
| RB-1016 | BOARD—External amplifier terminal | .15 | *RC-293 | CAPACITOR—470 mmf. mica (C-36) | .30 |
| *RC-006 | CAPACITOR—.0015 mfd. 600 V. paper (C-35) | .25 | RC-307 | CAPACITOR—750 mmf. mica (C-18) ±5% | .40 |
| *RC-009 | CAPACITOR—.001 mfd. 600 V. paper (C-65) | .25 | *RC-347 | CAPACITOR—1800 mmf. mica (C-14) ±5% | .35 |
| *RC-011 | CAPACITOR—.002 mfd. 600 V. paper (C-58) | .25 | RC-389 | CAPACITOR—4300 mmf. mica (C-15) ±5% | .40 |
| *RC-023 | CAPACITOR—.005 mfd. 600 V. paper (C-63) | .25 | RC-676 | CAPACITOR—B band padding capacitor (C-13) | .35 |
| *RC-039 | CAPACITOR—.01 mfd. 600 V. paper (C-43; 52, 68) | .25 | *RC-681 | CAPACITOR—FM oscillator air trimmer (C-12) | .90 |
| *RC-055 | CAPACITOR—.003 mfd. 600 V. paper (C-41) | .25 | RC-863 | CABLE—Power cable | .65 |
| *RC-072 | CAPACITOR—.05 mfd. 200 V. paper (C-16, 33, 57, 62) | .25 | | | |
| | | | *Used on previous receivers. | | |
| | | | | (Prices subject to change without notice) | |

*Used on previous receivers.

(Prices subject to change without notice)

MODEL HM136**Circuit Data****Alignment Procedure****GENERAL ELECTRIC CO.****LOUD-SPEAKER**

In order to realize the high fidelity inherent in a frequency-modulated system or present in a well-designed amplitude-modulated system, the audio amplifiers and loud-speaker must be capable of reproducing the signal as received. Conventional conical-type cone loud-speakers because of the sharp break at the cone throat tend to cut off the higher audio frequencies. The use of a curvilinear-type cone loud-speaker in the Model HM-136 eliminates this possible suppression of the higher audio tones and excellent frequency response from 30 to 10,000 cycles per second is obtainable.

To center the voice coil, loosen the two screws which clamp the speaker spider in position. These two screws are accessible from the rear of the speaker. Shift the spider around until the voice coil is centered, then tighten the screws in position.

Phonograph or Television Audio Connections

Each receiver is equipped with a phono terminal (pin jack) to allow the convenient connection of a record player or the detector output of a television converter. General Electric plug, Stock No. RP-145 fits the pin jack. When using a crystal type pick-up, a suitable load consisting of a 100,000 ohm resistor in series with a .01 mfd. capacitor should be connected across the pick-up leads.

Public Address System Connections

A terminal board is located on the back apron of the chassis permitting easy attachment of a public address system. This provision permits feeding programs from either type of transmission into an external amplifier and loud-speaker system. Three terminals are provided and are numbered 1, 2 and 3. To connect an external amplifier to his receiver remove the link connection between terminals No. 2 and No. 3 and reinsert between terminals No. 1 and No. 2. Connect the external amplifier between terminals No. 1 and No. 3, the ground side of the amplifier being connected to terminal No. 1. If the external amplifier input is not a high impedance type, an impedance matching network will have to be used to insure matching to the 2.0 megohm volume control.

Noise Limiter

The frequency-modulation noise limiter circuit which uses a 6SJ7 tube is essentially a fourth I.F. stage. The tube operates at low plate voltage (60 volts DC) so that plate current cut-off occurs with relatively small grid bias. A small cathode bias developed in R-40 establishes the operating point at the center of the linear portion of the grid-voltage plate-current characteristic. Normal signal input will swing the grid voltage considerably above and below the linear portion of the curve. Negative peaks of the signal voltage will be clipped off by tube cutoff. Positive peaks will be clipped off by grid bias limiting.

Since noise creates wiggles (variations) in the peaks of the carrier signal it can be eliminated by cutting off the carrier peaks. This function takes place in the noise limiter as described above providing, of course that the carrier signal is sufficiently strong to cause grid voltage swing above and below the cut-off points.

Discriminator

The discriminator circuit for a frequency-modulated signal input must secure the audio information by operating on frequency variations. Referring to the schematic diagram, Fig. 3, the frequency-modulated (FM) signal, after passing through the 6SJ7 limiter tube, is applied to the primary winding of the detector transformer (T-12). The secondary is a center tapped winding with the outer ends connected to the 6H6 detector plates as shown. Two 100,000 ohm resistors (R-25 and R-26) are connected in series across the 6H6 cathodes and it is across these resistors that the audio signal appears. The detector transformer (T-12) is tuned to the intermediate frequency (2.1 MC). An I.F. signal of 2.1 MC which is not modulated will swing the detector plates positive and negative an equal amount resulting in equal DC voltages appearing across diode resistors R-25 and R-26. Since these voltages are of opposite polarity the resultant voltage measured across the diode resistors will be zero. When the incoming I.F. signal is frequency modulated it will be swinging above and below the intermediate frequency of 2.1 MC by an amount proportional to the degree of modulation. As the modulated signal swings off the resonant frequency of 2.1 MC unequal voltages will be developed across resistors R-25 and R-26. The resultant voltage measured across both resistors will be equal to the differ-

ence between the voltage across R-25 and the voltage across R-26. This resultant voltage will vary in magnitude directly as the degree of modulation. The number of times per second the I.F. signal swings above and below the resonant point produces the audio signal. Hence, the volume of an audio signal is transmitted as the magnitude of the frequency swing of a carrier, and the frequency of an audio signal is transmitted as the rate at which the carrier frequency is swung.

ALIGNMENT PROCEDURE**Frequency Modulation****I.F. Alignment**

Due to the good stability of components and the wide-band characteristics of the I.F. circuits, alignment should be unnecessary under normal operating conditions. Should I.F. alignment become necessary, it will require a cathode ray oscilloscope and a 211 megacycle signal generator with a superimposed ± 200 KC sweep frequency. Many signal generators and mechanical frequency wobblers are available wherein the above requirements are fulfilled. As for example: GE Model TMV-97-C oscillator used in conjunction with the Frequency Modulator TMV-128-A will give a 200-300 KC sweep when operating on the 1500-3100 KC band of the test oscillator. To obtain the proper test oscillator mid-frequency (2.1 MC) the following procedure may be followed. Set "wobbler" condenser for about mid-capacity. Tune broadcast receiver to 2.1 MC. Adjust test oscillator tuning until signal is heard at maximum strength in the broadcast receiver. Connect the vertical plates of the oscilloscope across resistor R-36. A 100,000 ohm resistor should be connected in series with the high side of the oscilloscope. Using a .05 mfd. capacitor in series with the high side of the test oscillator output, insert the oscillator sweep signal into the receiver circuit first at the control grid of the 2nd I.F. 6SK7 and align transformer trimmers T-11. The resultant curve should be sharp on either side and quite broad and flat at the peak. Change the signal input to the 1st I.F. 6SK7 grid and align transformer trimmers T-10. The resultant curve should appear as the above stage only less broad at the peak. Align transformer trimmers T-9 with the signal input at the converter grid for sharpness and a flat peak. If peak will not flatten retouch the grid trimmer of transformer T-10. Do not retouch any other trimmers.

Leave the input of the oscillator sweep signal at the converter grid and connect the vertical oscilloscope plates across the resistors R-25 and R-26. Align transformer T-12 for an X-shaped crossover curve. Proper alignment of C-80 is indicated when the curve crosses about midway in the vertical plane. Proper alignment of C-79 is indicated when the sides of the curve near crossover are nearest to a straight line.

NOTE:—Keep signal input high enough so that noise limiter is functioning. This point is indicated when an increase in signal input no longer changes the size of the curve.

R.F. Alignment

Make sure the dial pointer coincides with the first division on the low frequency end of the dial scale when the gang condenser is completely closed.

1. Connect a 0-50 or 0-100 microammeter in series with the low end of R-36. A high resistance 0-10 V., D.C. voltmeter may be used instead of the microammeter. Connect the voltmeter across R-36 with a 100,000 ohm resistor in series with the high side.

2. Apply an unmodulated signal in the region of 43 megacycles to one of the antenna terminals using a 50-ohm resistor in series with the high side of the signal generator output.

3. Adjust pointer so it is set to the scale mark of the signal used and peak trimmers C-12, C-5 and C-4 progressively for maximum meter reading.

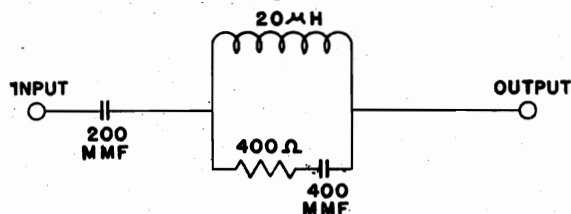


Fig. 1. Standard I.R.E. Dummy Antenna

MODEL HML36
Socket, Trimmers
Parts

| Stock No. | Description | List Price | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | </ |
|-----------|-------------|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----|
|-----------|-------------|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----|

Fig. 2. Trimmer Location

MODEL H406U
Schematic, Voltage
Alignment, Trimmers

GENERAL ELECTRIC CO.

VOLTAGE CHART

| Tube No. | 12SK7GT | 12SF5GT | 50L6GT | 45Z5GT |
|---------------------|---------|---------|--------|-----------------|
| Plate to -B Volts | 170 | 170 | 120 | 115 AC |
| Screen to -B Volts | 110 | 110 | 120 | 120 |
| Cathode to -B Volts | 0 | 0 | 7.5 | 130 |
| Filament Volts | 12.6 | 12.6 | 50 | Entire filament |
| | | | | 45 |

Voltage measured when volume control is set to maximum.

Line Voltage—115 AC. No signal input. On DC, voltages should read approximately 10 per cent lower.

*Measured on 250-volt scale—1000 ohms per volt-meter.

**Measured between socket terminal No. 2 and No. 7.

GENERAL INFORMATION

Model H-406U is a compact four-tube AC-DC tuned radio frequency receiver that tunes the broadcast band of frequencies. This model has the full approval of the Underwriters' Laboratories.

When operating from a DC source of power, it is necessary to insert the power plug with the proper polarity; otherwise, the receiver will fail to function. If any hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

ALIGNMENT

Connect the high side of the signal generator through a 250 mmf. condenser to the antenna terminal. The low side of the signal generator output should be connected to the receiver chassis through a .05 mfd. condenser. Connect a suitable output meter across the voice coil leads; then proceed as follows:

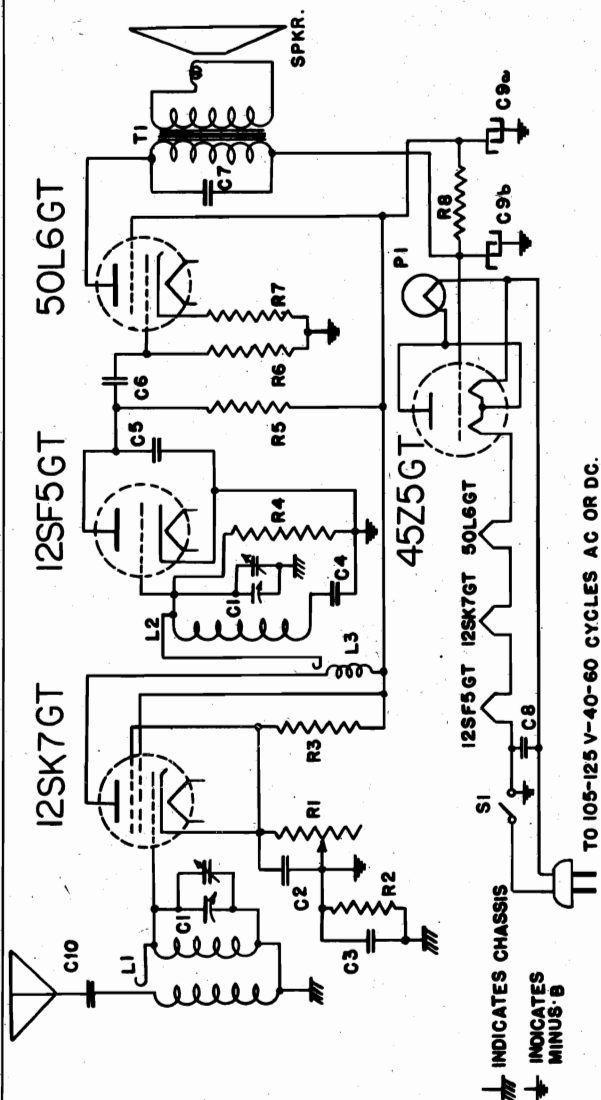
1. With gang condenser plates completely closed, the tuning pointer should be over the last mark on the dial.
2. Tune receiver to the 1500 KC point on the dial; then align trimmers on the gang condenser at 1500 KC for a maximum output meter reading.

Electrical Power Output

| | |
|------------------|-----------|
| Undistorted..... | 0.9 watts |
| Maximum..... | 1.8 watts |

Load-speaker—"Alnico" Magnet Dynamic

| | |
|--|----------|
| Outside Cone Diameter..... | 4 inches |
| Voice Coil Impedance (400 cycles)..... | 3.5 ohms |



| Symbol | Description | Symbol | Description |
|--------|--------------------------|--------|-----------------------------|
| C-1 | Tuning condenser | R-3 | 50,000 ohm carbon resistor |
| C-2 | .02 mfd. paper capacitor | R-4 | 5.6 megohms carbon resistor |
| C-3 | 0.1 mfd. paper capacitor | R-5 | 3.0 megohms carbon resistor |
| C-4 | .02 mfd. paper capacitor | R-6 | 1.0 megohms carbon resistor |
| C-5 | 100 mmf. mica capacitor | R-7 | 150 ohms carbon resistor |
| C-6 | .01 mfd. paper capacitor | R-8 | 2000 ohms carbon resistor |
| C-7 | .02 mfd. paper capacitor | | |

Fig. 2. Schematic Diagram

Tubes

| | |
|---------------------|------------|
| R.F. Amplifier..... | GE-12SK7GT |
| Detector-Audio..... | GE-12SF5GT |
| Power Output..... | GE-50L6GT |
| Rectifier..... | GE-45Z5GT |

| Power Supply (Volts) | Frequency (Cycles on AC) | Power Consumption (Watts) |
|----------------------|--------------------------|---------------------------|
| 105-125 AC or DC | 40-60 | 30 |

Tuning Frequency Range

| | |
|--------------------------|-------------|
| Band "B"..... | 540-1700 KC |
| Alignment Frequency..... | 1500 KC |

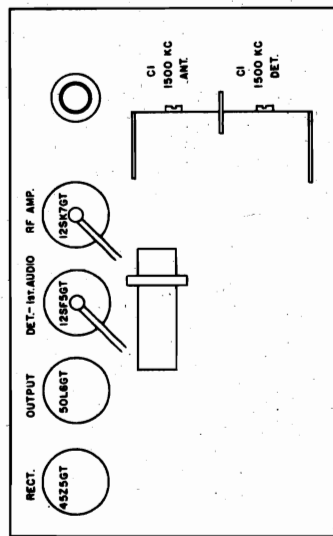


Fig. 1. Trimmer Location

GENERAL ELECTRIC CO.

MODEL HM171
Schematic

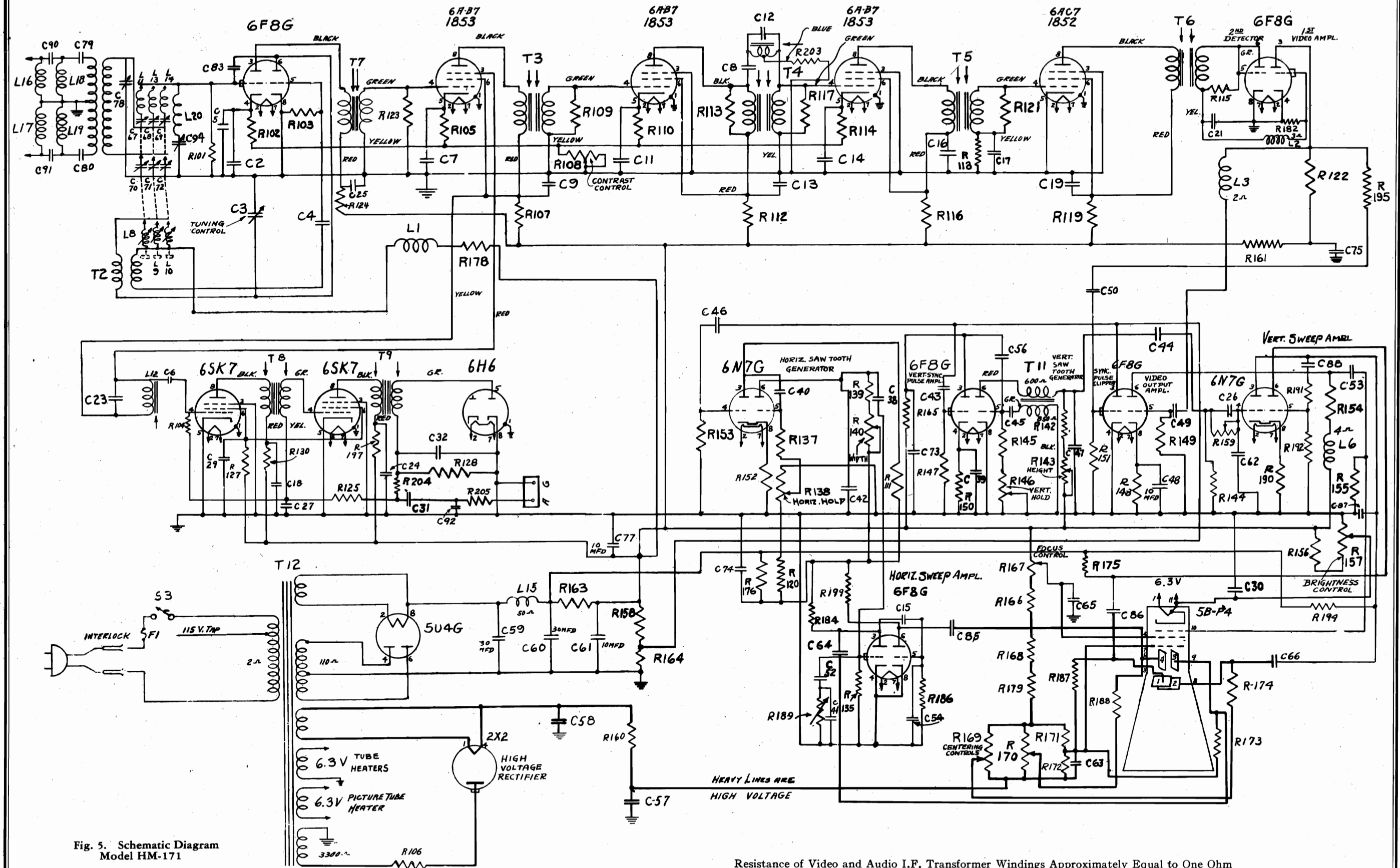


Fig. 5. Schematic Diagram
Model HM-171

Resistance of Video and Audio I.F. Transformer Windings Approximately Equal to One Ohm

MODEL HM171
MODEL HM185
Voltage, Chassis, Notes

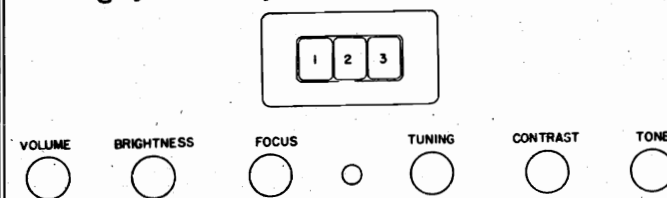


Fig. 2. Front Panel Control Location
Model HM-185

(Note—Model HM-171 Control Location is same as above with Volume and Tone Controls removed.)

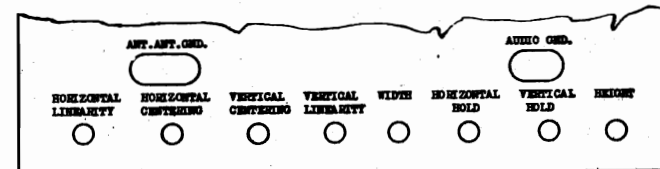


Fig. 3. Rear Cover Control Location
Models HM-171 and HM-185

RECEIVER CIRCUIT DESCRIPTION

R.F. Unit

Starting at the antenna terminal posts, there follows a single-stage high-pass filter in the antenna primary to reduce video I.F. interference, a shunt capacity coupled secondary (C-78), and a video I.F. wave trap (C-95, L-20). The wave trap is broadly tuned at 11.75 MC. Any one of the three tuned circuits for each of the three television transmission

bands can be connected into the secondary circuit by pressing appropriate button. The secondary circuit when properly tuned gives a broad, flat response curve.

Converter-Oscillator and Amplifier

The 6F8G converter employs one half as the oscillator and the other half as the biased first detector. The oscillator is plate-tuned with vernier tuning permitted from the front control panel through trimmer (C-3). The resultant video I.F. signal of 12.75 MC and the audio I.F. signal of 8.25 MC developed in the converter-oscillator tube circuit is coupled through transformer T-7 to the first 1853 amplifier tube.

Audio Unit

The audio I.F. signal is taken off the suppressor of this first 1853 tube. Two stages of 8.25 MC audio I.F. using 6SK7's follow. In the case of the HM-171 the audio I.F. signal is then detected and the resultant audio signal is made available at terminals for insertion into a radio output circuit. In Model HM-185 the 6SK7 stages are followed by a 6SQ7 detector and driver, and a 6F6G output stage.

Video Unit

Four stages of video I.F. follow the converter stage. The third stage incorporates a wave trap for the adjacent audio channel at 14.25 MC. The nominal pass band for these amplifiers is 12.75 to 10.75 MC. The second detector uses one half of a 6F8G connected as a diode. The other half of the 6F8G is used as the first video amplifier. The video output is coupled directly to the picture tube grid.

Sync Pulse Clipper

Sync-pulses are taken off the plate of the clipper section of the clipper and video output tube. The video signals are separate by tube cut-off since the plate voltage is only about 12 volts.

Horizontal Oscillator-output

The clipper feeds the horizontal multivibrator 6N7G directly with needle-point, negative sync pulses. C-46 blocks the flow of vertical sync pulses, into the horizontal multivibrator since they are of a low order of frequency. The horizontal sync pulses which are amplified by the first section of the 6N7G are coupled to the grid of the second section and drive the circuit into violent oscillation. Resulting plate and grid current flow sends the tube to cut-off. The sawtooth wave so generated is applied to the horizontal sweep amplifier one section of which is a phase inverter. This push-pull sweep is coupled to the horizontal deflecting plates of the picture tube. Horizontal hold is controlled by varying the charging rate of the generator circuit, through (R-138). Compensating for high frequency loss adds a means of controlling horizontal linearity which is done through R-189. Width is varied by regulating the magnitude of the charge through R-140.

Vertical Oscillator-output

The sync pulses are also coupled into the vertical oscillator 6F8G where the circuits composed of C-73 and R-165 bypasses the horizontal sync pulses. The vertical sync pulses are coupled into the vertical sweep generator circuit causing violent oscillatory swings which result in sawtooth waves.

The height control (R-146) determines the magnitude of the charge before the next oscillation thus governing the height of the picture. R-146, the horizontal hold control, governs the rate of charging. The vertical linearity control (R-159) accomplishes results similar to the horizontal linearity control. The vertical sweep amplifier produces push-pull output by phase inversion and this output is applied to the vertical deflecting plates of the picture tube.

Low Voltage Rectifier

Low voltage power is obtained from a 5U4G using one stage of choke filtering and the remaining of the resistance filter type.

High Voltage Rectifier

The anode voltage of the picture tube is obtained from a single half-wave rectifier with a protective resistor in series with the transformer plate lead.

Loudspeaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering it will be necessary to replace the entire cone and voice coil assembly.

NOTE—In no case should the magnet be removed from the assembled position without remagnetizing after replacing it.

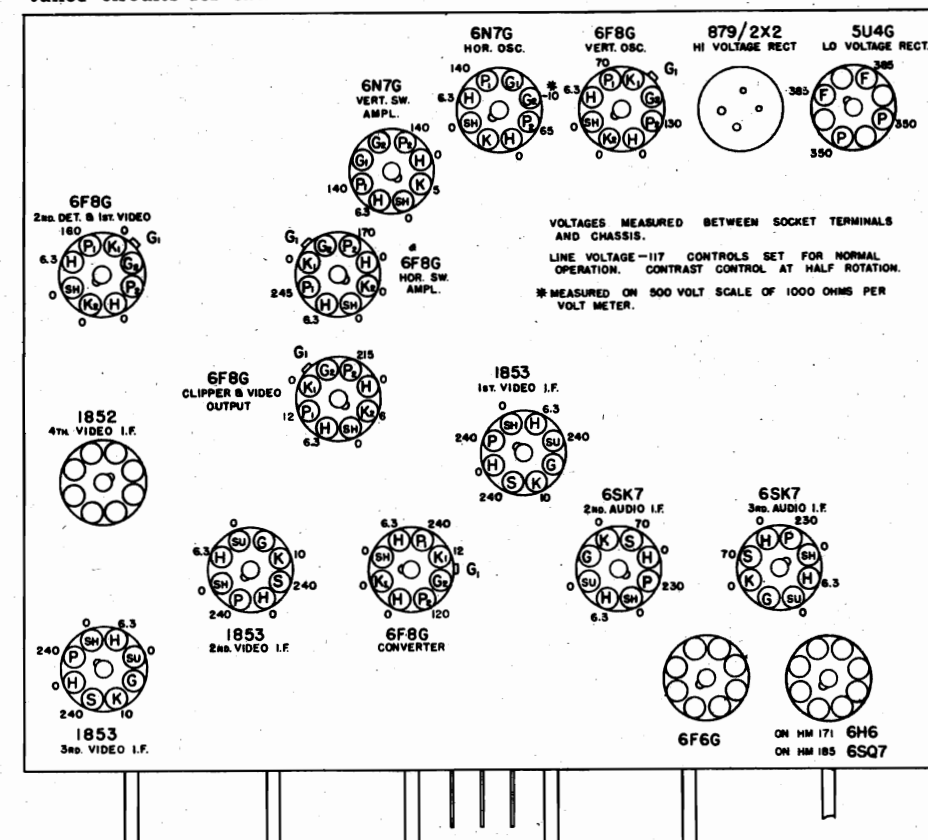


Fig. 9. Socket Voltages
Models HM-171 and HM-185

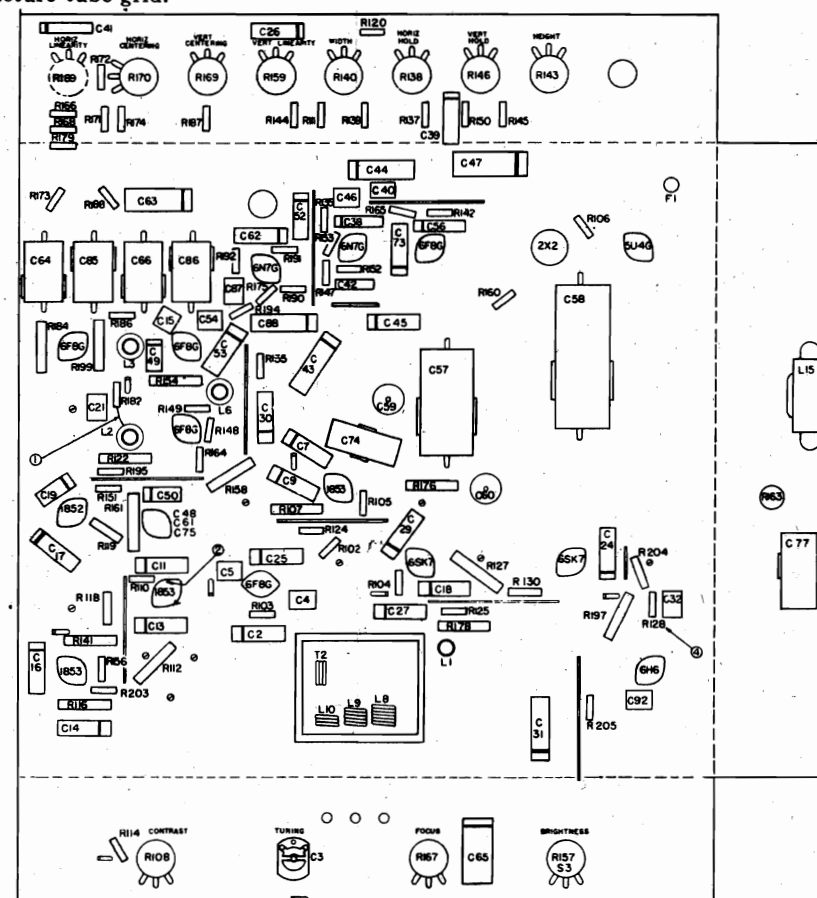


Fig. 1. Chassis Parts Layout
Model HM-171

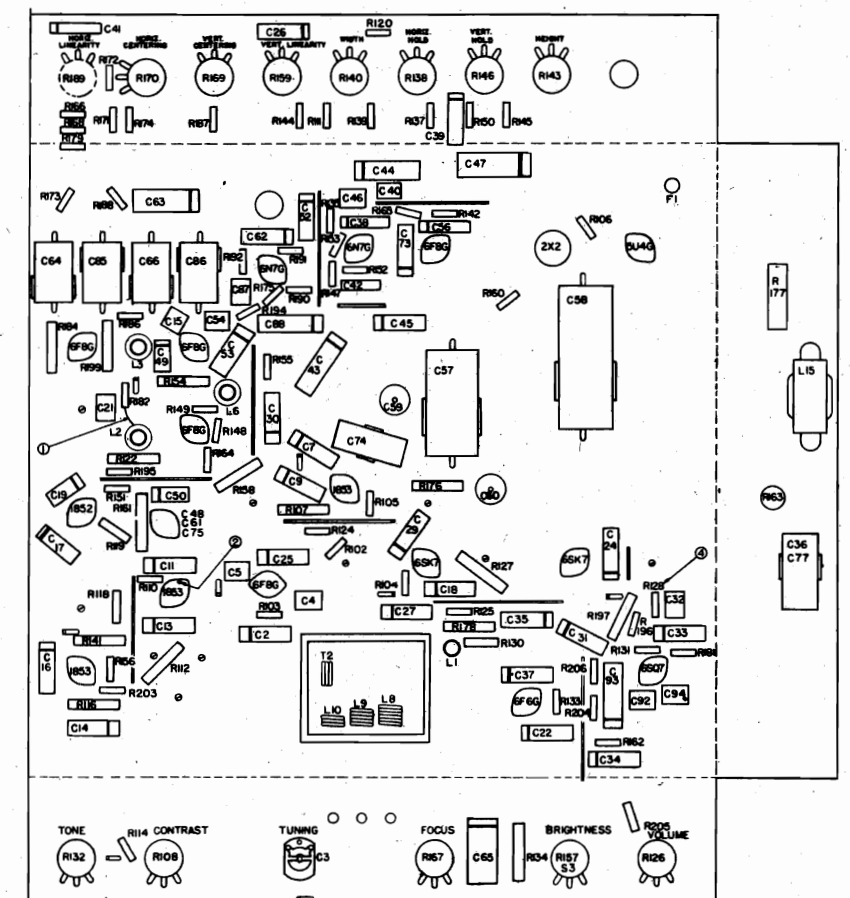


Fig. 4. Chassis Parts Layout
Model HM-185

GENERAL ELECTRIC CO.

MODEL HM185
Schematic

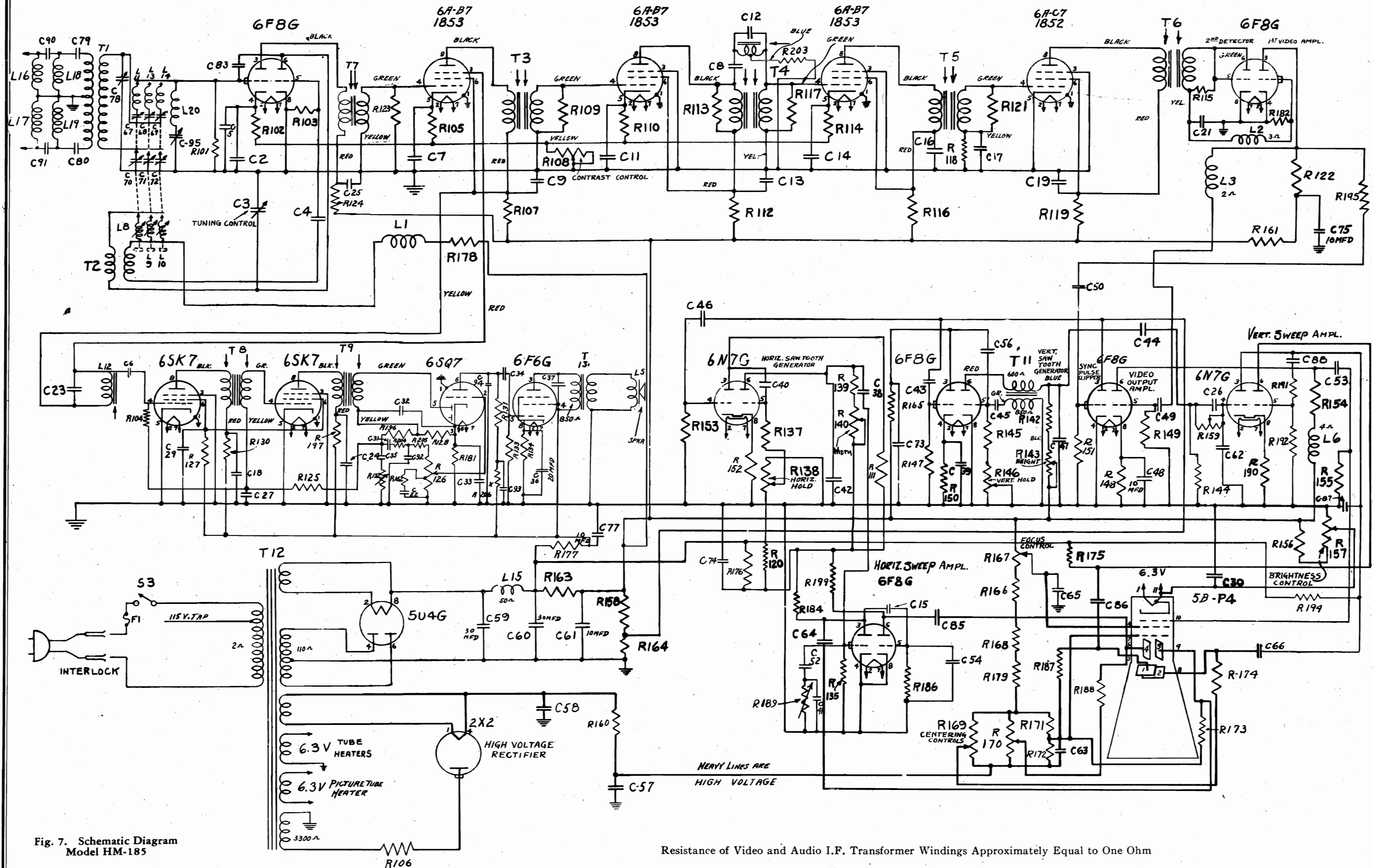


Fig. 7. Schematic Diagram
Model HM-185

Resistance of Video and Audio I.F. Transformer Windings Approximately Equal to One Ohm

GENERAL ELECTRIC CO.

MODEL HM171
MODEL HM185
Alignment

GENERAL INFORMATION

General Electric Picture Receiver and Sound Converter Model HM-171, is a table type, 17-tube, superheterodyne receiver equipped with a 5-inch, electrostatic-deflected, picture tube. The receiver works in conjunction with any radio receiver, which is designed for phonograph reproduction, to reproduce the sound portion of the television broadcast.

General Electric Television Receiver, Model HM-185 is a console type, 18-tube, superheterodyne receiver with a complete sound channel and using a 5-inch, electrostatic-deflected picture tube.

Additional design features include iron-core I.F. tuning, automatic tone compensation, automatic volume control and constant high-gain antenna coupling circuit.

TELEVISION ALIGNMENT PROCEDURE

The problem of aligning the several circuits in a television receiver is much more involved and requires more specialized equipment than the alignment of conventional radio receivers. Fortunately, the use of stable components in carefully engineered circuits of wide-band characteristic reduces to a minimum the necessity for alignment under normal operating conditions. Should alignment become necessary the following equipment will be needed:

(A) For Video I.F. Alignment

- (1) Cathode ray oscilloscope
- (2) Wide band sweep oscillator capable of sweeping from 7.5 to 15 MC.
- (3) Marker system either provided in sweep oscillator or from separate signal generator for locating 12.75 and 10.75 MC points.

- (B) Sound I.F. Alignment
- (1) Cathode ray oscilloscope
 - (2) Wide band sweep oscillator capable of sweeping from 7.75 to 8.75 MC.
- (C) R.F. Alignment
- (1) Cathode ray oscilloscope
 - (2) Wide-band sweep oscillator capable of sweeping the following bands.
 - (a) 44 to 50
 - (b) 50 to 56
 - (c) 66 to 72

Electrical Specifications

| Model | Power Supply (Volts) | Frequency (Cycles per Second) | Power Consumption (Watts) |
|--------|----------------------|-------------------------------|---------------------------|
| HM-171 | 115-125 | 60 | 170 |
| HM-185 | 115-125 | 60 | 170 |

Tuning Frequency Range

- Band No. 1.....44-50 MC.
- Band No. 2.....50-56 MC.
- Band No. 3.....66-72 MC.

Intermediate Frequencies

- Television Video (Picture).....12.75 MC.
- Television Audio.....8.25 MC.

VIDEO I.F. ALIGNMENT

| Input Freq. | Point of Input | Adjustments | Comments |
|--|---------------------------------------|---|---|
| 1. | | | Connect vertical input cable of cathode ray oscilloscope across resistor R-182 of 6F8G video detector. See Fig. 1 or 4, arrow (1). |
| 2. 7.5-15 MC Sweep | Control grid of 1853 (2nd video I.F.) | | Connect output tap of video I.F. Sweep oscillator to control grid of 1853 (2nd video I.F.) See Fig. 1 or 4, arrow (2). Connect ground lead to chassis. Turn contrast control (R-108) to about half of maximum or to a point which gives satisfactory vertical deflection without overloading. Set horizontal centering and gain controls on oscilloscope to give suitable horizontal deflection. Adjust sweep phase to give curve similar to Fig. 6, curve 1. |
| NOTE: If sweep oscillator has marker points internally supplied, steps 3 and 4 may be omitted. | | | |
| 3. Same as in No. 2 plus 12.75 MC | Same as in No. 2 | | Superimpose an accurately calibrated 12.75 MC signal in parallel with sweep signal. Signal will appear on sweep curve in oscilloscope as a wiggle, the center of which is a thin black line. With a pen or crayon mark this point on the screen of the oscilloscope. (NOTE: Hereafter the horizontal controls on the oscilloscope must not be touched.) |
| 4. Same as in No. 2 plus 10.75 MC | Same as in No. 2 | | Superimpose an accurately calibrated 10.75 MC signal in parallel with sweep signal. Mark screen at point where signal appears on curve as in No. 3 above. |
| 5. 7.5-15 MC Sweep | Same as in No. 2 | Iron cores of detector transformer T-6 | (Do not touch horizontal controls of oscilloscope. Adjust iron cores of T-6 until curve appears similar to Fig. 6, curve 1, with relatively flat top, 12.75 MC mark at corner of one side and 10.75 MC mark at corner of other side. These conditions plus maximum amplitude insure correct alignment. |
| 6. 7.5-15 MC Sweep | Same as in No. 2 | Iron cores of 4th video transformer T-5 | Adjust iron cores for maximum gain, flatness and proper centering between markers as described in step No. 5 and illustrated in Fig. 6, curve 1. |
| 7. 7.5-15 MC Sweep | Same as in No. 2 | Iron cores of 3rd video transformer T-4 | Adjust primary and secondary iron cores for maximum gain, flatness and proper centering. See Fig. 6, curve 1. |
| 8. 7.5-15 MC Sweep | Converter grid, 6F8G | Iron cores of 2nd video transformer T-3 | Connect low tap to grid (On top of tube). Adjust primary and secondary iron cores for maximum gain, flatness and proper centering. See Fig. 6, curve 2. |
| 9. 7.5-15 MC Sweep | Converter grid, 6F8G | Iron cores of 1st video transformer T-7 | Connect low tap to grid. Adjust iron cores for maximum gain flatness and proper centering. |
| 10. 14.25 MC | Converter grid, 6F8G | Series iron core of 3rd video transformer T-4 | Connect low tap to grid. Reduce horizontal gain to minimum. Adjust iron core for minimum line length. |

GENERAL ELECTRIC CO.

MODEL HM171
MODEL HM185
Alignment

Maximum Electrical Output

Model HM-171. (Dependent upon radio receiver output)
Model HM-185.....5 watts

Loudspeaker—"Alnico" Magnetic Dynamic

Model.....HM-185
Cone Diameter.....12 inches
Voice Coil Impedance (400 cycles).....3.5 ohms

Picture Size

Height.....3¼ inches
Width.....4¼ inches

Tubes

Converter-Oscillator.....GE-6F8G
Audio & Video I.F. Amplifier.....GE-1853/6AB7
2nd and 3rd Audio I.F. Amplifiers... (2)GE-6SK7
Det., Audio, AVC (HM-185).....GE-6SQ7
Det. and AVC (HM-171).....GE-6H6
Audio Output (HM-185).....GE-6F6G
2nd and 3rd Video I.F. Amplifiers... (2)GE-1853/6AB7
4th Video I.F. Amplifier.....GE-1852/6AC7
Video Det. and 1st Video Amplifier...GE-6F8G
Video Output and Sync. Clipper.....GE-6F8G
Vertical Oscillator.....GE-6F8G
Vertical Output.....GE-6N7G
Horizontal Oscillator.....GE-6N7G
Horizontal Output.....GE-6F8G
High Voltage Rectifier.....GE-879/2X2
Low Voltage Rectifier.....GE-5U4G
Picture Tube.....GE-5BP4

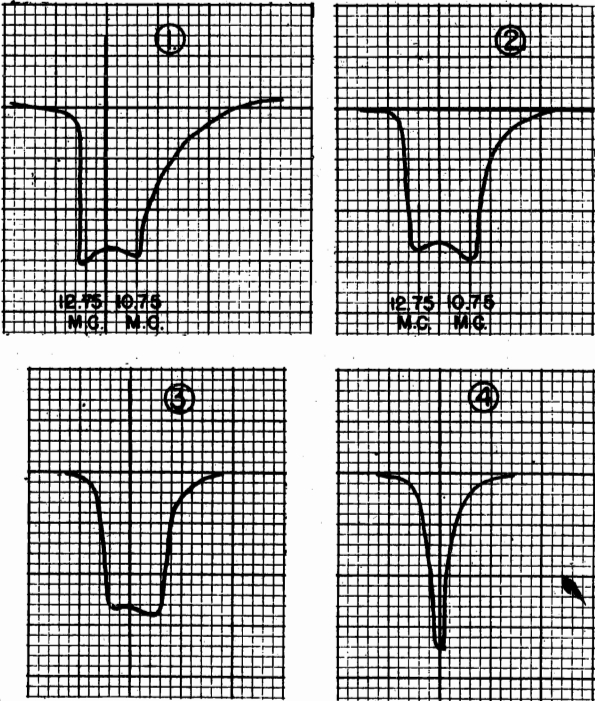


Fig. 6. Television Alignment Curves

R.F. ALIGNMENT

| Signal Input | Point of Input | Adjustments | Comments |
|----------------------|-------------------|--|--|
| 1. | | Band width adjustment coupling condenser | Turn (C-78) in until tight, then open approximately 1/16 of a turn. |
| 2. 44 to 50 MC Sweep | Antenna terminals | (L-8), (C-70), (C-67) | Depress band No. 1 push button. Set tuning control to mid-rotation. Adjust L-8 until curve is centered between maximum horizontal sweep points. Adjust C-70 and C-67 for maximum amplitude. See Fig. 6, curve 3. |
| 3. 50 to 56 MC Sweep | Antenna terminals | (L-9), (C-71), (C-68) | Depress band No. 2 push button. Leave tuning control at mid-rotation point. Adjust L-9 for centering; C-71 and C-68 for maximum amplitude. See Fig. 6, curve 3. |
| 4. 66 to 72 MC Sweep | Antenna terminals | (L-10), (C-72), (C-69) | Depress band No. 3 push button. Adjust L-10 for centering; C-72, C-69 for maximum amplitude. See Fig. 6, curve 3. |

WAVE TRAP ALIGNMENT

| | | | |
|---------------------------------------|-------------------|-------------------------|---|
| 1. 11.75 MC with 400 cycle modulation | Antenna terminals | Wave trap trimmer, C-95 | Adjust for minimum signal response as seen on oscilloscope. |
|---------------------------------------|-------------------|-------------------------|---|

AUDIO I.F. ALIGNMENT

| Input Freq. | Point of Input | Adjustments | Comments |
|--------------------------|----------------------|---|---|
| 1. | | | Connect vertical input cable of cathode ray oscilloscope across R-128. See Fig. 1 or 4 arrow (4). |
| 2. 7.75 to 8.75 MC Sweep | Converter grid, 6F8G | Iron cores of 4th audio I.F. transformer T-9 | Align for maximum amplitude. See Fig. 6, curve 4. |
| 3. 7.75 to 8.75 | Converter grid, 6F8G | Iron cores of 3rd audio I.F. transformer T-8 | Align for maximum amplitude. See Fig. 6, curve 4. |
| 4. 7.75 to 8.75 | Converter grid, 6F8G | Iron cores of 2nd audio I.F. transformer L-12 | Align for maximum amplitude. See Fig. 6, curve 4. |

ANTENNA

In general, the television antenna should be of the dipole type located as high as is practical and in an area where the horizon in the direction of the television transmitter is not obstructed by buildings or structures. A noticeable gain in signal strength will be obtained as antenna height is increased. Since television radiation reacts similarly to light waves, reflection problems arise which often modify otherwise ideal installation locations. Consideration must also be given noise sources within buildings, or ignition noises from vehicles on adjacent streets. It is usually best to locate the dipole antenna on the side of the building away from the street thus allowing the building to shield the antenna from ignition noises.

The dipole should be erected with arms parallel to the ground and at right angles to the direction of the television station. If noise or reflection interference exist it may be better to point the dipole arms in the direction of the interference.

Noise interference and poor signal strength may dictate the use of a reflector. A reflector will increase the signal strength appreciably as well as increase the horizontal directivity.

Extremely high voltages (2500 volts or more) are used in the operation of this receiver; therefore, every precaution must be exercised to insure safety to the service engineer and to the customer.

The back cover while in place, protects the user and should never be removed except by a qualified television service engineer.

The power-cord plug should not be inserted in a power supply outlet until a good, solid ground connection has been properly made to the receiver chassis.

For safety, the following operations must be performed with the power plug disconnected before working on the receiver with the back cover removed:

1. Locate the 879/2X2 high voltage rectifier tube socket.
2. Unsolder the lead (color-coded brown and yellow and measuring 3300 ohms to chassis) which is connected to the 879/2X2 tube socket.
3. Thoroughly insulate the exposed end of this lead.

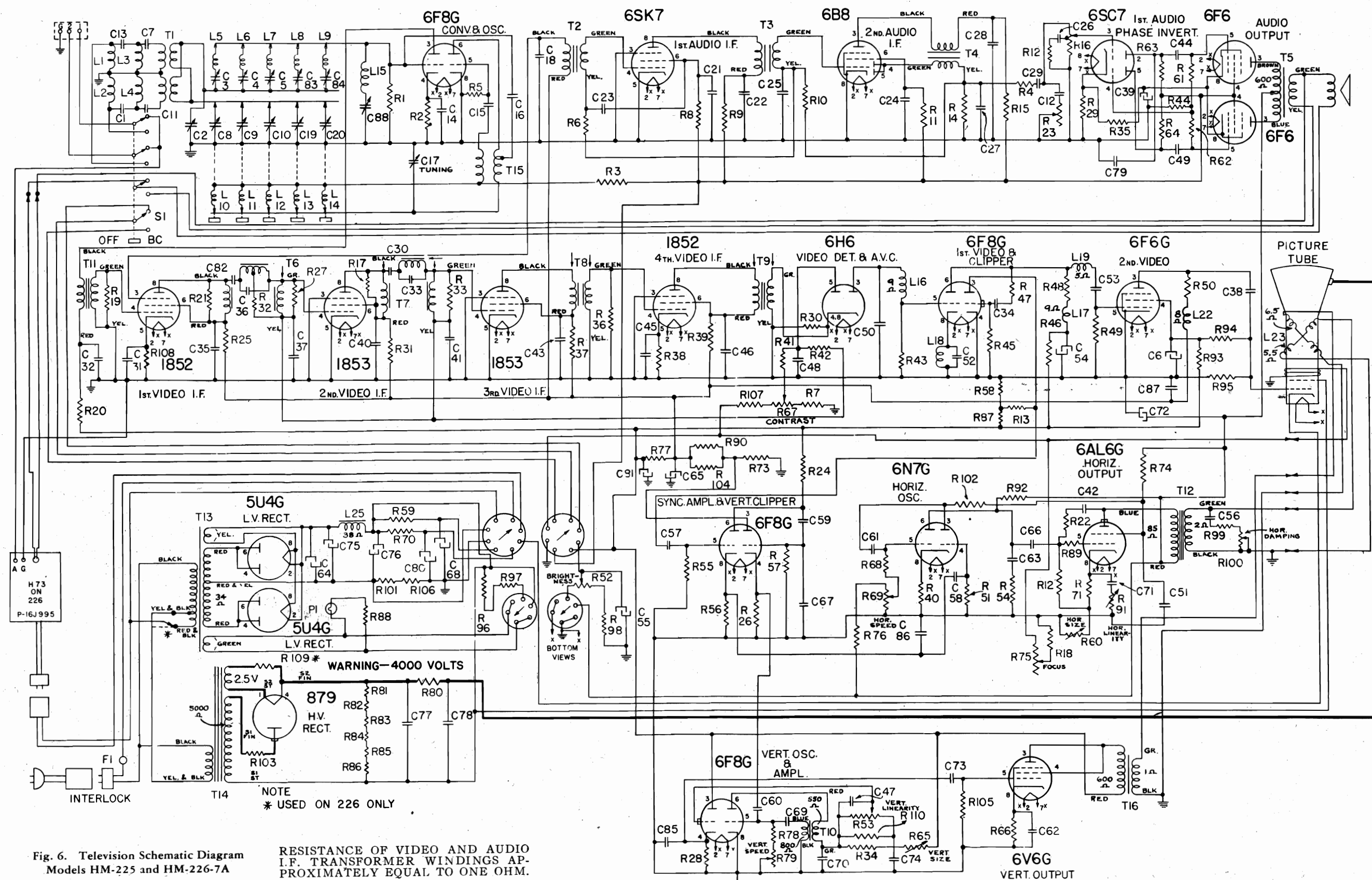
All adjustments not accessible with the back cover in place can be made without energizing the high-voltage circuits.

Servicing of the high-voltage circuits can be satisfactorily performed with the power-cord removed from any power supply outlet. A resistance check of the circuit components will indicate any trouble existing. (HIGH VOLTAGES SHOULD NEVER BE MEASURED.)

The "picture tube" is highly evacuated and is consequently subject to a very great air pressure. If it is broken, glass fragments will be violently expelled. Handle with care, using safety goggles and gloves.

The large end of the "picture tube" particularly that part at the rim of the viewing surface—must not be struck, scratched, or subjected to more than moderate pressure. **DO NOT FORCE THE SOCKET ONTO THE TUBE OR STRAIN ANY EXTERNAL CONNECTIONS.** If it fails to slip into place smoothly, investigate and remove the cause of the trouble.

GENERAL ELECTRIC CO.

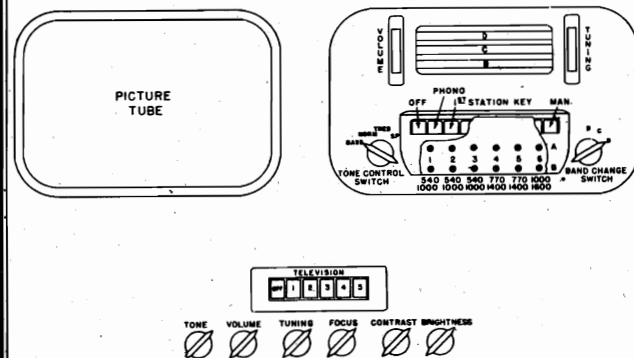
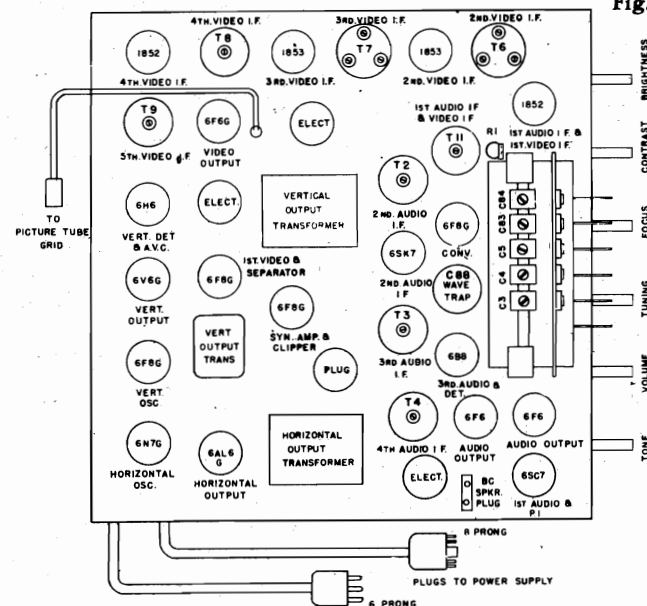
MODEL HM225, HM226-7A
Schematic

MODELS HM225, HM226-7A
Voltage, Trimmers, Socket, Chassis
Controls, Notes
GENERAL ELECTRIC CO.
ANTENNA

In general, the television antenna should be of the dipole type located as high as is practical and in an area where the horizon in the direction of the television transmitter is not obstructed by buildings or structures. A noticeable gain in signal strength will be obtained as antenna height is increased. Since television radiation reacts similarly to light waves, reflection problems arise which often modify otherwise ideal installation locations. Consideration must also be given noise sources within buildings, or ignition noises from vehicles on adjacent streets. It is usually best to locate the dipole antenna on the side of the building away from the street thus allowing the building to shield the antenna from ignition noises.

The dipole should be erected with arms parallel to the ground and at right angles to the direction of the television station. If noise or reflection interference exist it may be better to point the dipole arms in the direction of the interference.

Noise interference and poor signal strength may dictate the use of a reflector. A reflector will increase the signal strength appreciably as well as increase the horizontal directivity.


Fig. 2. Front Control Location
Model HM-226-7A

Fig. 7. Television Chassis Trimmer Location
Models HM-225 and HM-226-7A

General Electric Television Receiver, Model HM-225, is a console type, 22-tube, superheterodyne receiver equipped with a full magnetic, short, 9-inch picture tube. The rectifier power supply is on a separate chassis mounted in the lower cabinet compartment with the speaker.

General Electric Television and Radio Receiver, Model HM-226-7A, is a console type instrument using the same television receiver as the Model HM-225 with minor alterations for use in conjunction with a 7-tube radio receiver. Model HM-226-7A is equipped with a full magnetic, short, 12-inch picture tube.

Additional design features include iron-core I.F. tuning, automatic contrast control, automatic brightness control, automatic tone compensation, automatic volume control and a constant high-gain antenna coupling circuit.

SERVICE DATA
Electrical Specifications

| Model | Power Supply (Volts) | Frequency (Cycles per Second) | Power Consumption (Watts) |
|-----------|----------------------|-------------------------------|-----------------------------------|
| HM-225 | 115-125 | 60 | 300 |
| HM-226-7A | 115-125 | 60 | 300 (Television) 75 (Radio) |

Tuning Frequency Range

Television Receiver (used in both models)

| | |
|------------|------------|
| Band No. 1 | 44-50 M.C. |
| Band No. 2 | 50-56 M.C. |
| Band No. 3 | 66-72 M.C. |
| Band No. 4 | 78-84 M.C. |
| Band No. 5 | 84-90 M.C. |

Tone Control

| | |
|------------------|-----------------------|
| Television Audio | Continuously variable |
| Radio Audio | 4-position |

Tubes
Television

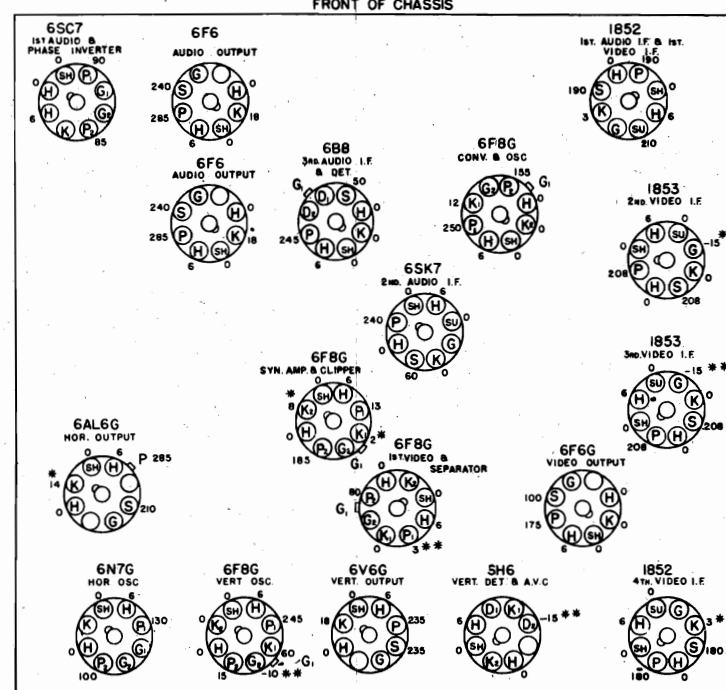
| | |
|---------------------------------------|-----------------|
| Converter-Oscillator | GE-6F8G |
| 1st Audio I.F. Amplifier | GE-6SK7 |
| 2nd Audio I.F. Amplifier | GE-6B8 |
| Audio Amplifier and Phase Inverter | GE-6SC7 |
| Audio Output | (2)GE-6F6 |
| 1st and 4th Video I.F. Amplifier | (2)GE-1852/6AC7 |
| 2nd and 3rd Video I.F. Amplifier | (2)GE-1853/6AB7 |
| Video Detector and AVC | GE-6H6 |
| 1st Video Amplifier and Sync. Clipper | GE-6F8G |
| 2nd Video Amplifier | GE-6F6G |
| Sync. Amplifier and Vertical Clipper | GE-6F8G |
| Vertical Oscillator and Amplifier | GE-6F8G |
| Horizontal Oscillator | GE-6N7G |
| Vertical Output | GE-6V6G |
| Horizontal Output | GE-6AL6G |
| Low Voltage Rectifier | (2)GE-5U4G |
| High Voltage Rectifier | GE-879/2X2 |
| Picture Tube (HM-225) | GE-MW-22-2 |
| Picture Tube (HM-226-7A) | GE-MW-31-3 |

Intermediate Frequencies

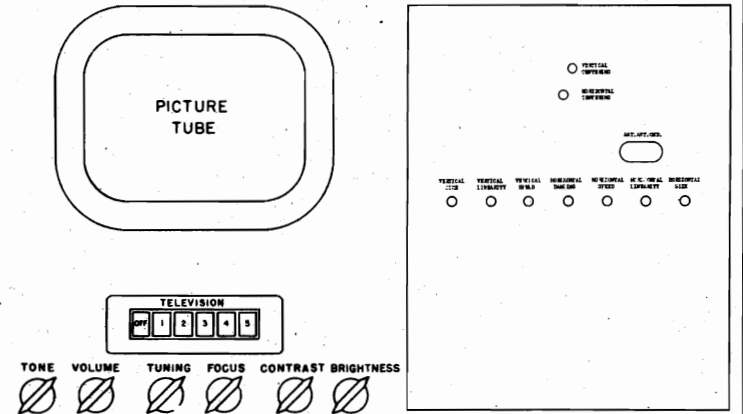
| | |
|----------------------------|------------|
| Television Video (Picture) | 12.75 M.C. |
| Television Audio | 8.25 M.C. |
| Radio | 455 K.C. |

Maximum Electrical Output

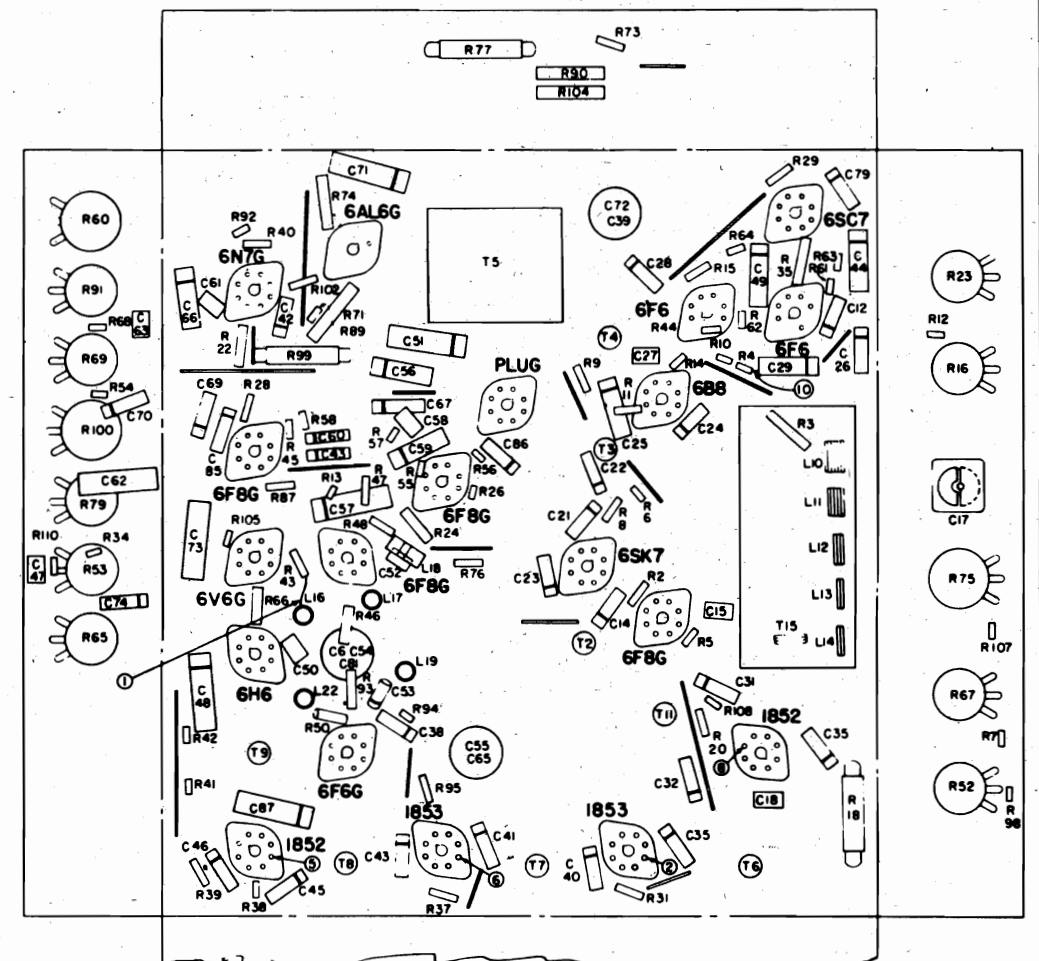
| | |
|------------------|----------|
| Television Audio | 10 Watts |
| Radio Audio | 5 Watts |



ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINAL AND CHASSIS.
 ALL FRONT PANEL CONTROLS TURNED MAXIMUM COUNTERCLOCKWISE EXCEPT VOLUME
 CONTROL WHICH IS ROTATED TO MAXIMUM VOLUME.
 LINE VOLTAGE - 115
 * MEASURED ON 100 VOLT SCALE OF 1000 OHMS PER VOLT METER
 ** MEASURED ON 250 VOLT SCALE OF 1000 OHMS PER VOLT METER

Fig. 9. Television Socket Voltages

Fig. 3. Rear Control Location
Model HM-225
Fig. 1. Front Control Location
Model HM-225
Picture Size

| | | |
|--------|--------------|--------------|
| Model | HM-225 | HM-226-7A |
| Height | 5 1/4 inches | 7 1/2 inches |
| Width | 7 1/4 inches | 10 inches |


Fig. 5. Television Chassis Parts Layout
Models HM-225 and HM-226-7A

GENERAL ELECTRIC CO

MODELS HM225, HM226-7A
Video Alignment

TELEVISION ALIGNMENT PROCEDURE

The problem of aligning the several circuits in a television receiver is much more involved and requires more specialized equipment than the alignment of conventional radio receivers. Fortunately, the use of stable components in carefully engineered circuits of wide-band characteristics reduces to a minimum the necessity for alignment under normal operating conditions. Should alignment become necessary the following equipment will be needed:

(A) For Video I.F. Alignment

- (1) Cathode ray oscilloscope
- (2) Wide-band sweep oscillator capable of sweeping from 7.5 to 15 MC.

- (3) Marker system either provided in sweep oscillator or from separate signal generator for locating 12.75 and 9.75 MC points.

(B) Sound I.F. Alignment

- (1) Cathode ray oscilloscope
- (2) Wide band sweep oscillator capable of sweeping from 7.75 to 8.75 MC.

(C) R.F. Alignment

- (1) Cathode ray oscilloscope.
- (2) Wide-band sweep oscillator capable of sweeping the following bands.
 - (a) 44 to 50 (d) 78 to 84
 - (b) 50 to 56 (e) 84 to 90
 - (c) 66 to 72

VIDEO I. F. ALIGNMENT

| Input Freq. | Point of Input | Adjustments | Comments |
|-------------------|---------------------------------------|-------------|--|
| 1. | | | Connect vertical input cable of cathode ray oscilloscope across resistor R-43 of 6H6 video detector. See Fig. 5, arrow one. |
| 2. 7.5-15MC Sweep | Control grid of 1853 (2nd video I.F.) | | Connect low output tap of video I.F. sweep oscillator to control grid of 1853 (2nd video I.F.). See Fig. 5, arrow two. Connect ground lead to chassis. Turn contrast control (R-67) to about half of maximum or to a point which gives satisfactory vertical deflection without overloading. Set horizontal centering and gain controls on oscilloscope to give suitable horizontal deflection. Adjust sweep phase to give curve similar to Fig. 8, curve 3. |

NOTE: If sweep oscillator has marker points internally supplied, steps 3 and 4 may be omitted.

| | | | |
|-----------------------------------|---------------------------------------|---|---|
| 3. Same as in No. 2 plus 12.75 MC | Same as in No. 2 | | Superimpose an accurately calibrated 12.75 MC signal in parallel with sweep signal. Signal will appear on sweep curve in oscilloscope as a wiggle, the center of which is a thin black line. With a pen or crayon mark this point on the screen of the oscilloscope. (NOTE: Hereafter the horizontal controls on the oscilloscope must not be touched.) |
| 4. Same as in No. 2 plus 9.75 MC | Same as in No. 2 | | Superimpose an accurately calibrated 9.75 MC signal in parallel with sweep signal. Mark screen at point where signal appears on curve as in No. 3 above. |
| 5. 7.5-15 MC Sweep | Control grid of 1852 (4th video I.F.) | Iron cores of detector transformer T-9 | Connect high tap of video I.F. sweep oscillator to control grid of 1852 (4th video I.F.) See Fig. 5, arrow five. (Do not touch horizontal controls of oscilloscope.) Turn sweep phase to give as near a single curve as possible. Adjust iron cores of T-9 until curve appears similar to Fig. 8, curve 1, with relatively flat top, 12.75 MC mark half-way down one side and 9.75 MC mark at corner of other side. These conditions plus maximum amplitude insure correct alignment. |
| 6. 7.5-15 MC Sweep | Control grid of 1853 (3rd video I.F.) | Iron cores of 4th video transformer T-8. | Connect low tap of video I.F. sweep oscillator to control grid of 1853 (3rd video I.F.). See Fig. 5, arrow six. Adjust iron cores for maximum gain, flatness and proper centering between markers as described in step No. 5 and illustrated in Fig. 8, curve 2. |
| 7. 7.5-15 MC Sweep | Control grid of 1853 (2nd video I.F.) | Iron cores of 3rd video transformer T-7. | Connect low tap to grid. See Fig. 5, arrow two. Adjust primary and secondary iron cores for maximum gain, flatness and proper centering. Adjust series iron core for sharp cut-off on 9.75 MC side of curve. See Fig. 8, curve 3. |
| 8. 7.5-15 MC Sweep | Control grid of 1852 (1st video I.F.) | Iron cores of 2nd video transformer T-6 | Connect low tap to grid. See Fig. 5, arrow eight. Adjust primary and secondary iron cores for maximum gain, flatness and proper centering. Adjust series iron core for sharp cut-off on 12.75 MC side of curve. See Fig. 8, curve 4. |
| 9. 7.5-15 MC Sweep | Converter Grid, 6F8G | Iron cores of 1st video transformer T-11 | Connect low tap to grid. Adjust iron cores for maximum gain flatness and proper centering. |
| 10. 14.25 MC | Converter Grid, 6F8G | Series iron core of 2nd video transformer T-6 | To check alignment of 14.25 MC trap proceed as follows: Connect low tap to grid. Reduce horizontal gain of oscilloscope to minimum. Adjust iron core for minimum line length. |
| 11. 8.25 MC | Converter Grid, 6F8G | Series iron core of 3rd video transformer T-7 | To check alignment of 8.25 MC trap proceed as follows: Connect low tap to grid. Reduce horizontal gain of oscilloscope to minimum. Adjust iron core for minimum line length. |

MODELS HM225, HM226-7A

Alignment

GENERAL ELECTRIC CO.

R. F. ALIGNMENT

| Signal Input | Point of Input | Adjustments | Comments |
|----------------------|-------------------|--|---|
| 1. | | Band width adjustment coupling condenser | Turn (C-2) in until tight, then open approximately $\frac{1}{8}$ of a turn. |
| 2. 44 to 50 MC sweep | Antenna terminals | (L-10), (C-3), (C-8) | Depress band No. 1 push button. Set tuning control to mid-rotation. Adjust L-10 until curve is centered between maximum horizontal sweep points. Adjust C-3 and C-8 for maximum amplitude. See Fig. 8, curve 5. |
| 3. 50 to 56 MC sweep | Antenna terminals | (L-11), (C-4), (C-9) | Depress band No. 2 push button. Leave tuning control at mid-rotation point. Adjust L-11 for centering; C-4 and C-9 for maximum amplitude. See Fig. 8, curve 5. |
| 4. 66 to 72 MC sweep | Antenna terminals | (L-12), (C-5), (C-10) | Depress band No. 3 push button. Adjust L-12 for centering; C-5 and C-10 for maximum amplitude. See Fig. 8, curve 5. |
| 5. 78 to 84 MC sweep | Antenna terminals | (L-13), (C-83), (C-19) | Depress band No. 4 push button. Adjust L-13 for centering; C-83 and C-19 for maximum amplitude. See Fig. 8, curve 5. |
| 6. 84 to 90 MC sweep | Antenna terminals | (L-14), (C-84), (C-20) | Depress band No. 5 push button. Adjust L-14 for centering; C-84 and C-20 for maximum amplitude. See Fig. 8, curve 5. |

WAVE TRAP ALIGNMENT

| Signal Input | Point of Input | Adjustments | Comments |
|--------------|-------------------|-------------------------|---|
| 1. 11.75 MC | Antenna terminals | Wave trap trimmer, C-88 | Adjust for maximum dip in oscilloscope curve. |

AUDIO I. F. ALIGNMENT

| Input Freq. | Point of Input | Adjustments | Comments |
|--------------------------|------------------------|--|---|
| 1. | | | Connect vertical input cable of cathode ray oscilloscope between junction of R-4 and C-29 and chassis. See Fig. 5, arrow ten. |
| 2. 7.75 to 8.75 MC sweep | Control grid of 6B8 | Iron cores of 4th audio I.F. transformer T-4 | Align for maximum amplitude. See Fig. 8, curve 6. |
| 3. 7.75 to 8.75 | Control grid of 6SK7 | Iron cores of 3rd audio I.F. transformer T-3 | Align for maximum amplitude. See Fig. 8, curve 6. |
| 4. 7.75 to 8.75 | Converter grid of 6F8G | Iron cores of 2nd audio I.F. transformer T-2 | Align for maximum amplitude. See Fig. 8, curve 7. |

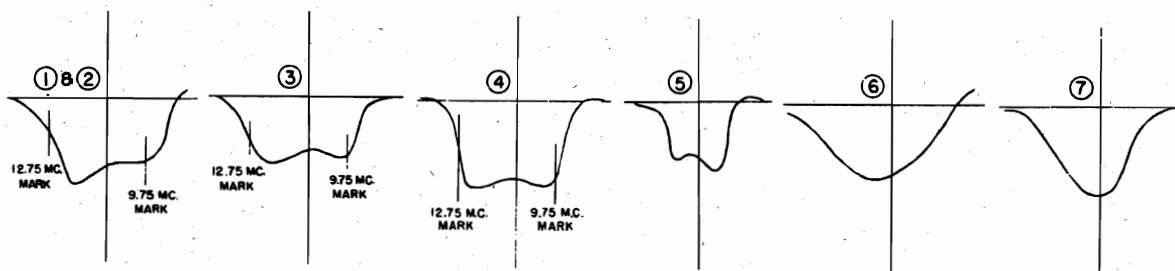


Fig. 8. Television Alignment Curves

GENERAL ELECTRIC CO.

MODELS HM225, HM226-7A

Parts List

| Stock No. | Description | List Price | Stock No. | Description | List Price |
|---|---|------------|-----------|--|------------|
| Television Chassis Parts Common to Radio | | | | | |
| *RB-008 | BOARD—Terminal board (2 lug) | \$0.10 | *RQ-1259 | RESISTOR—1000 ohms ½ W. carbon (R-1, 7, 56, 73) (Pkg. 5) | \$0.70 |
| *RB-013 | BOARD—Terminal board (2 lug) | .10 | *RQ-1263 | RESISTOR—1500 ohms ½ W. carbon (R-19, 33) (Pkg. 5) | .70 |
| *RB-023 | BOARD—Terminal board (4 lug) | .10 | *RQ-1267 | RESISTOR—2200 ohms ½ W. carbon (R-2, 9, 15, 17, 20, 25, 31, 36, 37, 39) (Pkg. 5) | .70 |
| *RB-058 | BOARD—Ant. gnd. terminal board | .10 | *RQ-1269 | RESISTOR—2700 ohms ½ W. carbon (R-21, 27) (Pkg. 5) | .70 |
| *RB-060 | BOARD—Terminal board (8 lug) | .10 | *RQ-1271 | RESISTOR—3300 ohms ½ W. carbon (R-30, 43) (Pkg. 5) | .70 |
| *RB-096 | BOARD—Terminal board (3 lug) | .10 | *RQ-1275 | RESISTOR—4700 ohms ½ W. carbon (R-48) (Pkg. 5) | .70 |
| *RB-621 | BEZEL—Pilot light bezel | .20 | *RQ-1279 | RESISTOR—6800 ohms ½ W. carbon (R-32, 96) (Pkg. 5) | .70 |
| RB-1026 | BOARD—Terminal board (2 lugs and 2 anchor lugs) | .05 | *RQ-1283 | RESISTOR—10,000 ohms ½ W. carbon (R-26, 42, 47, 58, 98, 107) (Pkg. 5) | .70 |
| RC-007 | CAPACITOR—.001 mfd. 1500 V. paper (C-32) | .15 | *RQ-1293 | RESISTOR—27,000 ohms ½ W. carbon (R-5, 41) (Pkg. 5) | .70 |
| RC-011 | CAPACITOR—.002 mfd. 600 V. paper (C-60) | .25 | *RQ-1299 | RESISTOR—47,000 ohms ½ W. carbon (R-4, 12, 28, 54) (Pkg. 5) | .70 |
| *RC-023 | CAPACITOR—.005 mfd. 600 V. paper (C-12, 14, 21, 22, 23, 24, 26, 28, 31, 32, 35, 37, 38, 40, 41, 43, 45, 78) | .25 | *RQ-1307 | RESISTOR—100,000 ohms ½ W. carbon (R-8, 14, 102) (Pkg. 5) | .70 |
| *RC-039 | CAPACITOR—.01 mfd. 600 V. paper (C-74, 85, 86) | .25 | *RQ-1313 | RESISTOR—180,000 ohms ½ W. carbon (R-13) (Pkg. 5) | .70 |
| *RC-048 | CAPACITOR—.02 mfd. 600 V. paper (C-34, 67, 69, 70) | .30 | *RQ-1315 | RESISTOR—220,000 ohms ½ W. carbon (R-11, 44, 61, 62, 63, 64, 68, 78, 87) (Pkg. 5) | .70 |
| RC-090 | CAPACITOR—.04 mfd. 600 V. paper (C-56) | .30 | *RQ-1323 | RESISTOR—470,000 ohms ½ W. carbon (R-49, 72, 92, 105) (Pkg. 5) | .70 |
| *RC-092 | CAPACITOR—.05 mfd. 600 V. paper (C-29, 44, 49, 53, 59, 66) | .30 | *RQ-1331 | RESISTOR—1.0 megohm ½ W. carbon (R-6, 10, 34, 45, 55) (Pkg. 5) | .70 |
| *RC-096 | CAPACITOR—.01 mfd. 200 V. paper (C-25) | .30 | *RQ-1339 | RESISTOR—2.2 megohms ½ W. carbon (R-57, 95) (Pkg. 5) | .70 |
| *RC-123 | CAPACITOR—.01 mfd. 400 V. paper (C-51, 57) | .35 | *RQ-1355 | RESISTOR—10 megohms ½ W. carbon (R-94) (Pkg. 5) | .70 |
| *RC-147 | CAPACITOR—.25 mfd. 400 V. paper (C-87) | .20 | RQ-1457 | RESISTOR—820 ohms 1 W. carbon (R-66) | .10 |
| *RC-156 | CAPACITOR—.5 mfd. 100 V. paper (C-4, 71, 73) | .45 | RQ-1483 | RESISTOR—10,000 ohms 1 W. carbon (R-3, 24, 74) | .20 |
| *RC-202 | CAPACITOR—.4 mmf. mica L.P.F. (C-16) | .25 | *RQ-1491 | RESISTOR—22,000 ohms 1 W. carbon (R-97) | .20 |
| *RC-226 | CAPACITOR—.10 mmf. mica (C-50) | .25 | *RQ-1497 | RESISTOR—39,000 ohms 1 W. carbon (R-93) | .20 |
| RC-233 | CAPACITOR—.22 mmf. mica (C-52) | .25 | RQ-1510 | RESISTOR—100,000 ohms 1 W. carbon (R-103) | .10 |
| RC-241 | CAPACITOR—.33 mmf. mica L.P.F. (C-15, 36) | .20 | RQ-1530 | RESISTOR—2.2 megohms 1 W. carbon (R-22, 81, 82, 83, 84, 85, 86) | .10 |
| *RC-242 | CAPACITOR—.150 mmf. mica (C-27, 47) | .25 | *RS-217 | SOCKET—879—2 X 2 tube socket (Pkg. 5) | .50 |
| RC-243 | CAPACITOR—.150 mmf. mica L.P.F. (C-18, 58) | .15 | RS-252 | SOCKET—Octal tube socket | .15 |
| RC-251 | CAPACITOR—.220 mmf. mica L.P.F. (C-63) | .10 | RS-257 | SOCKET—Electrolytic mounting socket | .05 |
| *RC-269 | CAPACITOR—.330 mmf. mica L.P.F. (C-30, 32) | .20 | RS-267 | SOCKET—Pilot light socket | .30 |
| RC-293 | CAPACITOR—.470 mmf. mica (C-61) | .30 | RS-1023 | SPEAKER—12 inch P.M. Speaker | 9.10 |
| RC-314 | CAPACITOR—.47 mmf. mica L.P.F. (C-1, 13) | .20 | RT-954 | TERMINAL—Speaker lead contact terminal (Pkg. 10) | .10 |
| RC-316 | CAPACITOR—.56 mmf. mica L.P.F. (C-33) | .10 | *RW-101 | WASHER—Felt washer for control knob (Pkg. 10) | .95 |
| RC-318 | CAPACITOR—.82 mmf. mica L.P.F. (C-7, 11) | .15 | RW-112 | WASHER—I.F. tuning shaft tension washer (Pkg. 10) | .10 |
| *RC-429 | CAPACITOR—.30 mfd. 450 V. wet electrolytic (C-64, 68, 75, 76, 80) | 1.35 | *RX-030 | ASSEMBLY—Speaker mounting assembly | .10 |
| RC-698 | CAPACITOR—Coupling padder (C-2) | .40 | RX-063 | ASSEMBLY—Electrolytic mounting assembly (washers and pal nuts) | .20 |
| RC-1995 | CONV. ASSEMBLY—12 inch P.M. speaker cone assembly | 2.20 | | | |
| RC-9016 | GRID CLIP—6F6G control grid clip (Pkg. 5) | .10 | | | |
| *RK-016 | GRID CLIP—6F6G control grid clip (Pkg. 5) | .10 | | | |
| RK-044 | KNOB—Control knob and spring assembly (Pkg. 2) | .40 | | | |
| *RL-359 | CHOKE—Filter choke (L-25) | 1.50 | | | |
| RP-129 | BOARD—Speaker plug terminal board (Pkg. 2) | .10 | | | |
| RQ-640 | RESISTOR—240 ohms 2 W. carbon = 5% (R-71) | .25 | | | |
| RQ-643 | RESISTOR—270 ohms 2 W. carbon (R-35, 106) | .30 | | | |
| RQ-650 | RESISTOR—820 ohms 2 W. carbon (R-50) | .15 | | | |
| *RQ-687 | RESISTOR—15,000 ohms 2 W. carbon (R-46) | .35 | | | |
| RQ-694 | RESISTOR—33,000 ohms 2 W. carbon (R-90, 104) | .15 | | | |
| *RQ-1215 | RESISTOR—15 ohms ½ W. carbon (R-29) (Pkg. 5) | .70 | | | |
| *RQ-1241 | RESISTOR—180 ohms ½ W. carbon (R-38, 108) (Pkg. 5) | .70 | | | |
| *RQ-1247 | RESISTOR—330 ohms ½ W. carbon (R-89) (Pkg. 5) | .70 | | | |
| *RQ-1251 | RESISTOR—470 ohms ½ W. carbon (R-40) (Pkg. 5) | .70 | | | |
| Television Chassis Parts Used in Television Only | | | | | |
| RTB-500 | KEY—Station selector key | \$0.15 | RTQ-1005 | RESISTOR—150 ohms 7.4 W. wire wound (R-18) | .55 |
| RTB-1502 | BACK COVER—Cardboard back cover for model HM-225 | .85 | RTQ-1006 | RESISTOR—700 ohms 7.4 W. wire wound (R-77, 99) | .55 |
| RTB-1503 | BACK COVER—Cardboard back cover for model HM-226-7A | .95 | RTQ-1007 | RESISTOR—1,500 ohms, 6 W.; 150 ohms, 9 W. wire wound (R-59, 101) | .85 |
| RTB-2001 | BUSHING—R.F. coil tuning bushing | .10 | RTQ-2010 | RESISTOR—33 ohms 1 W. wire wound (R-88) | .40 |
| RTB-2500 | BRACKET—Right R.F. unit support assembly | .30 | RTQ-001 | RING—Picture tube support ring | .30 |
| RTB-2501 | BRACKET—Left R.F. unit support assembly | .30 | RTS-100 | SOCKET—Power chassis power receptacle | 1.00 |
| RTC-1002 | TRIMMER STRIP—Front station selector trimmer strip (C-8, 9, 10, 19, 20) | .80 | RTS-102 | SOCKET—Power fuse socket | .15 |
| RTC-1003 | TRIMMER STRIP—Top station selector trimmer strip (C-3, 4, 5, 83, 84) | .85 | RTS-103 | SOCKET—6 prong connector socket | .15 |
| RTC-2000 | CAPACITOR—.06 mfd. 4000 V. paper (C-77, 78) | 2.80 | RTS-301 | SHAFT—R.F. coil tuning core shaft | .15 |
| RTC-3000 | CAPACITOR—.20 mfd. 25 V. 40 mfd. 450 V. dry electrolytic (C-39, 72) | 1.75 | RTS-501 | SWITCH—Station selector switch | 4.65 |
| RTC-3001 | CAPACITOR—.40 mfd. 25 V. dry electrolytic (C-62) | .60 | RTS-702 | SLIDE—Focus coil adjustment stud | .15 |
| RTC-3002 | CAPACITOR—.10 mfd. 450 V., 5 mfd. 450 V., 20 mfd. 450 V. dry electrolytic (C-6, 54, 55, 65, 81) | 1.80 | RTS-703 | SLEEVE—Picture tube rubber sleeve | .20 |
| RTC-5005 | CONTROL—100,000 ohms horizontal speed control (R-69) | .60 | RTS-704 | SCREW—Thumb screw for mounting picture tube bracket (Pkg. 2) | .10 |
| RTC-5007 | CONTROL—2.0 megohms vertical linearity or size control (R-53, 65) | .75 | RTC-6000 | CARD—Station No. 1 tab card (Pkg. 10) | \$0.05 |
| RTC-5009 | CONTROL—500,000 ohms vertical speed control (R-70) | .60 | *RTC-6001 | CARD—Station No. 2 tab card (Pkg. 10) | .05 |
| RTC-5011 | CONTROL—10,000 ohms brightness or contrast control (R-52, 67) | .70 | RTC-6002 | CARD—Station No. 3 tab card (Pkg. 10) | .05 |
| RTC-5012 | CONTROL—200 ohms 2 W. focus control (R-75) | 1.00 | RTC-6003 | CARD—Station No. 4 tab card (Pkg. 10) | .05 |
| RTC-5013 | CONTROL—1000 ohms horizontal linearity control (R-91) | .70 | RTC-6004 | CARD—Station No. 5 tab card (Pkg. 10) | .05 |
| RTC-5014 | CONTROL—.05 megohm volume or tone control (R-16, 23) | .60 | RTC-6005 | CARD—Station "Off" tab card (Pkg. 10) | .05 |
| RTC-5015 | CONTROL—Tuning control (C-17) | 2.10 | RTC-7000 | CORD—Power cord assembly | 1.80 |
| RTC-5025 | CONTROL—1000 ohm horizontal size control (R-60) | .75 | RTC-7002 | CABLE—Kinescope cable assembly on power chassis | 1.25 |
| RTL-1003 | COIL—RF coil band No. 1 (L-5) | \$0.30 | RTC-7003 | CABLE—Interconnecting power cable assembly (First hole from rear on right side of receiver chassis) | 1.00 |
| RTL-1004 | COIL—RF coil band No. 2 (L-6) | .30 | RTC-7004 | CABLE—Interconnecting power cable assembly (Second hole from rear on right side of receiver chassis) | 1.00 |
| RTL-1005 | COIL—RF coil band No. 3 (L-7) | .30 | RTC-8002 | CLAMP—Picture tube clamp | .20 |
| RTL-1006 | COIL—RF coil band No. 4 (L-8) | .30 | RTC-8003 | CLAMP—Deflection yoke clamp | .20 |
| RTL-1007 | COIL—RF coil band No. 5 (L-9) | .30 | RTC-8004 | CLAMP—Dry electrolytic mounting clamp (.06 mfd. 4,000 V.) | .20 |
| RTL-2002 | CONV. Converter-oscillator plate coil (1½ turn) (T-15) | .30 | RTC-8005 | CUSHION—12 inch picture tube cushion | 2.10 |
| RTL-2003 | COIL—Converter-oscillator grid coil (1 turn) (T-15) | .30 | RTC-8006 | CUSHION—12 inch picture tube cushion | 2.40 |
| RTL-3003 | COIL—Oscillator tuning coil band No. 1 (L-10) | .30 | RTE-101 | ESCUTCHEON—Television station selector escutcheon | .05 |
| RTL-3004 | COIL—Oscillator tuning coil band No. 2 (L-11) | .30 | RTG-101 | GRID CLIP—6AL6G control grid clip | .35 |
| RTL-3005 | COIL—Oscillator tuning coil band No. 3 (L-12) | .30 | RTG-102 | GRID CAP—High voltage rectifier grid cap | 2.00 |
| RTL-3006 | COIL—Oscillator tuning coil band No. 4 (L-13) | .30 | RTG-202 | GROMMET—Receiver chassis grommets (¼ inch dia. black) | .05 |
| RTL-3007 | COIL—Oscillator tuning coil band No. 5 (L-14) | .30 | RTG-203 | GROMMET—Power chassis grommet (1 inch dia.) | .05 |
| RTL-4004 | CHOKE—Video choke (L-19) | .75 | RTG-300 | GUIDE—Screwdriver guide on focus coil assembly | .05 |
| RTL-4005 | CHOKE—Video choke (L-22) | .75 | RTI-001 | INSULATOR—High voltage rectifier socket mounting board | .90 |
| RTL-4006 | CHOKE—Video cathode choke (L-18) | .95 | RTI-002 | INSULATOR—Television station trimmer strip mounting insulator board | .05 |
| RTL-4007 | CHOKE—Video diode choke (L-16, 17) | .75 | RTI-003 | INSULATOR—Stand off insulator | .05 |
| RTL-5500 | COIL—Focusing coil (L-24) | 5.10 | RTS-705 | SHIELD—Back cover tube projection shield for model HM-226-7A | \$0.40 |
| RTL-6000 | YOKE—Deflection yoke (L-23) | 12.00 | RTS-800 | SPRING—Picture tube support adjustment spring (Pkg. 5) | .10 |
| RTN-001 | NUT—Pal nut for all controls (Pkg. 5) | .10 | RTT-0220 | TRANSFORMER—High voltage power transformer (T-14) | 17.70 |
| RTP-001 | PLUG—Female single slot plug on television chassis | .20 | RTT-0221 | TRANSFORMER—Low voltage power transformer (T-13) | 29.95 |
| RTP-002 | PLUG—Male plug on deflection yoke and focus cable | .40 | RTT-2000 | TRANSFORMER—Antenna transformer (T-1) | 1.00 |
| RTQ-1003 | RESISTOR—400 ohms damping (R-100) | 1.00 | | | |
| RTQ-1004 | RESISTOR—400 ohms 17.9 W. wire wound (R-70) | .85 | | | |

MODELS HM225, HM226-7A
Circuit Data
GENERAL ELECTRIC CO.
Parts list continued.

| | | |
|----------|--|-------|
| RTT-3001 | TRANSFORMER—1st video I.F. transformer (T-1) | 4.15 |
| RTT-3501 | TRANSFORMER—2nd video I.F. transformer (T-6) | 6.70 |
| RTT-4001 | TRANSFORMER—3rd video I.F. transformer (T-7) | 6.70 |
| RTT-4501 | TRANSFORMER—4th video I.F. transformer (T-8) | 4.15 |
| RTT-5001 | TRANSFORMER—5th video I.F. transformer (T-9) | 4.15 |
| RTT-6500 | TRANSFORMER—Horizontal output transformer (T-12) | 15.40 |
| RTT-6750 | TRANSFORMER—Vertical output transformer (T-13) | 6.00 |
| RTT-7001 | TRANSFORMER—1st audio I.F. transformer (T-2) | 4.15 |
| RTT-7501 | TRANSFORMER—2nd audio I.F. transformer (T-3) | 4.15 |
| RTT-8001 | TRANSFORMER—3rd audio I.F. transformer (T-4) | 4.15 |
| RTT-9000 | TRANSFORMER—Vertical oscillator transformer (T-10) | 2.80 |
| RTT-9500 | TRANSFORMER—Audio output transformer (T-5) | 3.25 |
| RTW-501 | WINDOW—Station letter window (Pkg. 5) | .05 |
| RTW-503 | WINDOW—Safety glass window for Model HM-225 | 4.30 |
| RTW-504 | WINDOW—Safety glass window for Model HM-226-7A | 3.50 |
| RTX-1001 | ASSEMBLY—Wave trap assembly (L-1, 2, 3, 4, C-1, 7, 11, 13) | .80 |
| RTX-1003 | ASSEMBLY—Wave trap assembly (L-15, C-88) | .20 |
| RTX-2000 | ASSEMBLY—Chassis mounting assembly | |

* Used on previous radio receivers.

(Prices Subject to Change without Notice)

CAUTIONARY INSTRUCTIONS

All adjustments not accessible with the back cover in place can be made without energizing the high-voltage circuits.

Servicing of the high-voltage circuits can be satisfactorily performed with the power-cord plug removed from any power supply outlet. A resistance check of the circuit components will indicate any trouble existing. **HIGH VOLTAGES SHOULD NEVER BE MEASURED.**

The "picture tube" is highly evacuated and is consequently subject to a very great air pressure. If it is broken, glass fragments will be violently expelled. Handle with care, using safety goggles and gloves.

The large end of the "picture tube"—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure. **DO NOT FORCE THE SOCKET ONTO THE TUBE OR STRAIN ANY EXTERNAL CONNECTIONS.** If it fails to slip into place smoothly, investigate and remove the cause of the trouble.

Extremely high voltages (4000 volts or more) are used in the operation of this receiver; therefore, every precaution must be exercised to insure safety to the service engineer and to the customer.

The back cover, while in place, protects the user and should never be removed except by a qualified television service engineer.

The power-cord plug should not be inserted in a power supply outlet until a good, solid ground connection has been properly made to the receiver chassis.

For safety, the following operations must be performed with power plug disconnected before working on the receiver with the back cover removed:

1. Remove 879/2X2 tube from socket.
2. Detach top cap lead of 879/2X2 tube and insulate the contact end of this cap lead.
3. Ground the receiver chassis.

TELEVISION RECEIVER CIRCUITS

The television receiver circuits are divided into the following sections:

1. R.F. Unit
2. Converter-Oscillator and Amplifier
3. Audio Unit
4. Video Unit
5. Sync Pulse Clipper—Amplifier
6. Horizontal Oscillator—Output
7. Vertical Oscillator—Output
8. Low Voltage Rectifier
9. High Voltage Rectifier

R. F. Unit

This unit, comprising all circuits between the antenna terminal posts and the converter grid, consists of a high pass

filter input, a series tuned antenna coil primary, a shunt capacity coupled secondary (C-2) and a video I.F. wave trap (C-88, L-15). The wave trap is broadly tuned at 11.75 M.C. to prevent I.F. interference. Any one of the five tuned circuits for each of the five television transmission bands can be connected into the secondary circuit by pressing the appropriate button. The secondary circuit trimmers when properly tuned give a broad, flat response curve.

Converter-Oscillator and Amplifier

A plate-tuned oscillator is used with vernier tuning permitted from the front control panel through trimmer C-17. The resultant video I.F. signal of 12.75 M.C. and the audio I.F. signal of 8.25 M.C. developed in the converter-oscillator tube circuit is coupled through transformer T-11 to the 1852 amplifier tube.

Audio Unit

The audio unit is a conventional-type superheterodyne sound receiver with the I.F. stages tuned to 8.25 M.C. The audio I.F. signal is taken off through the suppressor of the 1st video I.F. tube.

Video Unit

This unit includes all the video I.F. amplifier stages, the video detector, two stages of video amplification and the picture tube input. Three wave traps are provided in this unit; one at T-6 for rejecting the audio I.F. of the adjacent television band, one at T-7 for rejecting the audio I.F. of the band concerned, and one in the cathode circuit of the 1st video, 6F8G, comprising L-18 and C-52, for removing the 12.75 M.C. video I.F. from the detected signal amplifier stages. A sensitivity control, known as contrast control, (R-67), is provided in the AVC circuits of the 6H6 video detector for varying the grid bias on the 2nd and 3rd video I.F. tubes.

D.C. reinsertion (automatic background control) is accomplished in the 2nd-video 6F6G tube circuit by using part of the varying screen voltage developed across R-93 to control the picture tube grid voltage. A high impedance voltage divider, R-94 and R-95, is used and the coupling condenser, C-38, is made small to prevent low frequency variations in the plate supply from getting to the picture tube grid.

Sync-pulse Clipper—Amplifier

Sync-pulses are taken off the plate of the right section of the 1st video and clipper tube, 6F8G. The video signals are separated by tube cut-off since the plate voltage is only about 10 volts. The sync-pulses are then amplified in the sync amplifier tube and coupled through a high-pass filter to the grid of the horizontal oscillator.

Horizontal Oscillator—Output

The horizontal oscillator is a multi-vibrator with speed controlled by varying the small positive grid voltage through R-69. The horizontal pulses are passed through proper wave shaping and amplifier circuits to the horizontal deflection coils of the picture tube. Horizontal linearity is adjustable by varying R-91. Horizontal sweep size is controlled by R-60 in the cathode circuit of the 6AL6G. The degeneration resistor R-22 and series circuit across the secondary of the 6AL6G output transformer damp the output transient. Damping is adjustable through R-100.

Vertical Oscillator—Output

Vertical sync-pulses are separated from the horizontal pulses in the vertical clipper right section of 6F8G and are fed to the vertical oscillator. This oscillator is of the blocking type, transformer coupled. The generated sawtooth wave across C-70 is shaped by the vertical linearity control, R-53. The speed of the oscillator is controlled by R-79 and the length of sweep (size) is adjustable through R-65. The output is amplified and coupled to the vertical deflection coils of the picture tube.

Low-voltage Rectifier

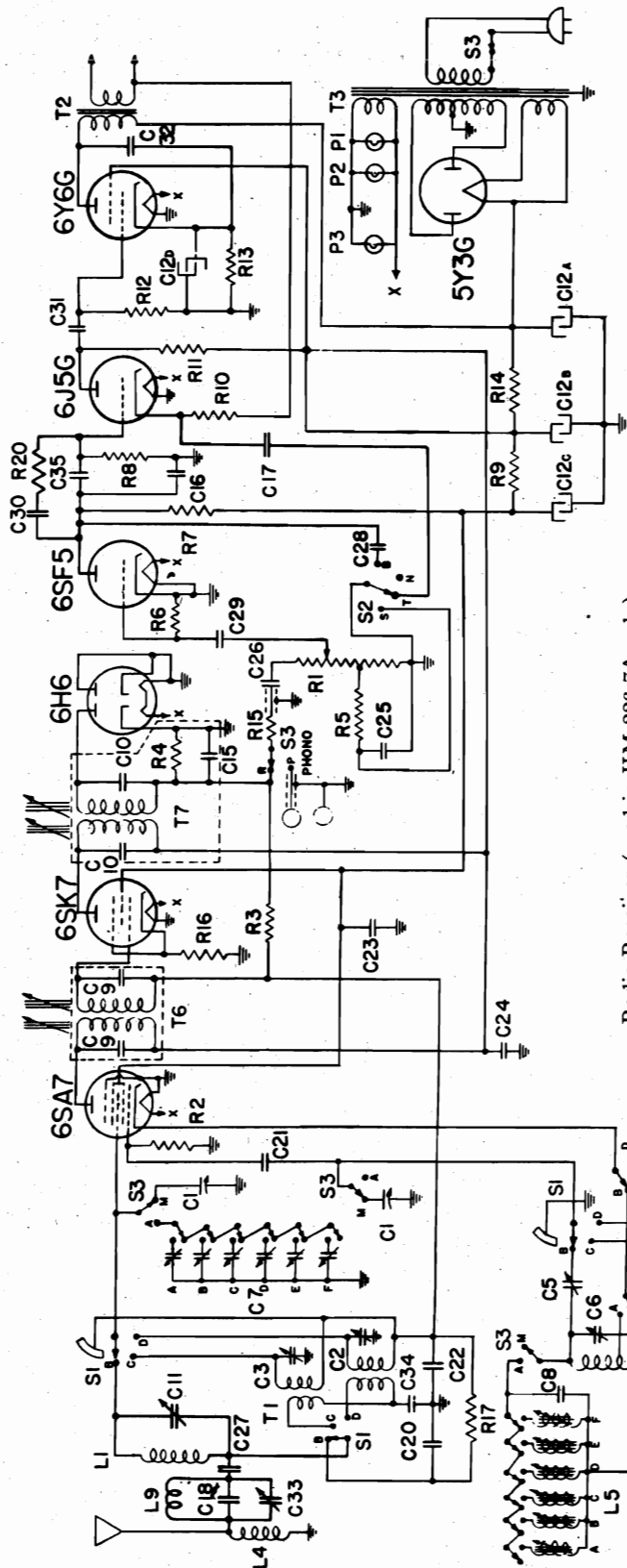
Two 5U4G rectifiers are necessary to supply plate current which is over 300 ma. A combination of choke and resistance filters is used so that the audio and oscillator plate supplies will be free from video and sweep signals.

High-voltage Rectifier

The high voltage rectifier uses a resistance filter. The bleeder is connected across the filter input to reduce ripple. R-103 is inserted in the plate lead for protection.

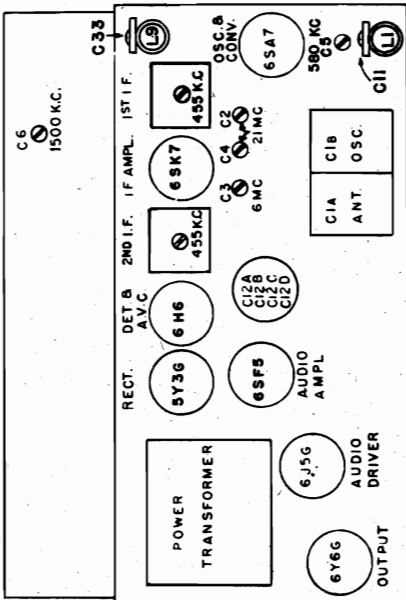
GENERAL ELECTRIC CO.

MODEL HM226-7A

Radio Receiver Schematic
Socket, Voltage, TrimmersFig. 12. Radio Schematic Diagram
(Model HM-226-7A only)

Radio Receiver (used in HM-226-7A only)
 Band "B".....540-1600 K.C.
 Band "C".....2.1-6.5 M.C.
 Band "D".....6.25-22.5 M.C.

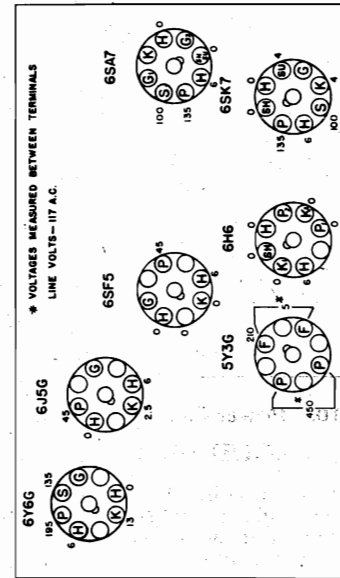
FRONT VIEW OF CHASSIS

Fig. 11. Radio Chassis Trimmer Location
(Model HM-226-7A)

Radio (used in HM-226-7A only)
 Converter-Oscillator.....GE-6SA7
 I.F. Amplifier.....GE-6SK7
 Detector and AVC.....GE-6H6
 1st Audio Amplifier.....GE-6SF5
 2nd Audio Amplifier.....GE-6J5G
 Audio Output.....GE-6Y3G
 Rectifier.....GE-6V6G
 Dial Lamps.....(3) Mazda No. 44

Loud-speaker—"Alnico" Magnetic Dynamic

Type of Cone.....Curvilinear
 Cone Diameter.....12 inches
 Voice Coil Impedance (400 cycles). 3.5 ohms



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET
 TERMINALS AND CHASSIS.
 Band "B." No signal input. Max. volume.

Fig. 13. Radio Chassis Socket Voltages

MODEL HM226-7A

Radio Chassis Wiring

Phono.Data,Power Chassis

GENERAL ELECTRIC CO.

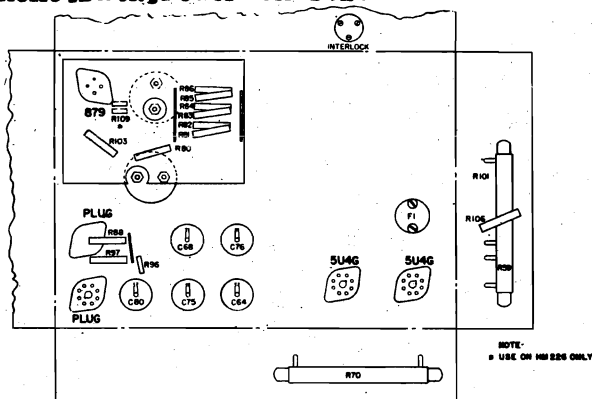


Fig. 10. Power Chassis Parts Layout
LOUD-SPEAKER

To center the voice coil, loosen the two screws which clamp the speaker spider in position. These two screws are available from the rear of the speaker. Shift the spider around until the voice coil is centered, then tighten the screws in position.

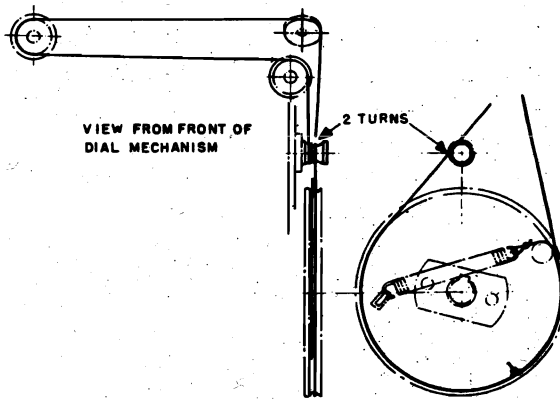


Fig. 14. Dial Drive Stringing Diagram
PHONOGRAPH CONNECTIONS

Model HM-226-7A radio receiver is equipped with a phono-terminal (pin jack) to allow the convenient connection of a record player. General Electric plug, Stock No. RP-145, fits the pin jack.

NOTE—A suitable load consisting of a 100,000 ohm resistor in series with a .01 mfd. capacitor should be connected across the pick-up leads when using a crystal-type unit.

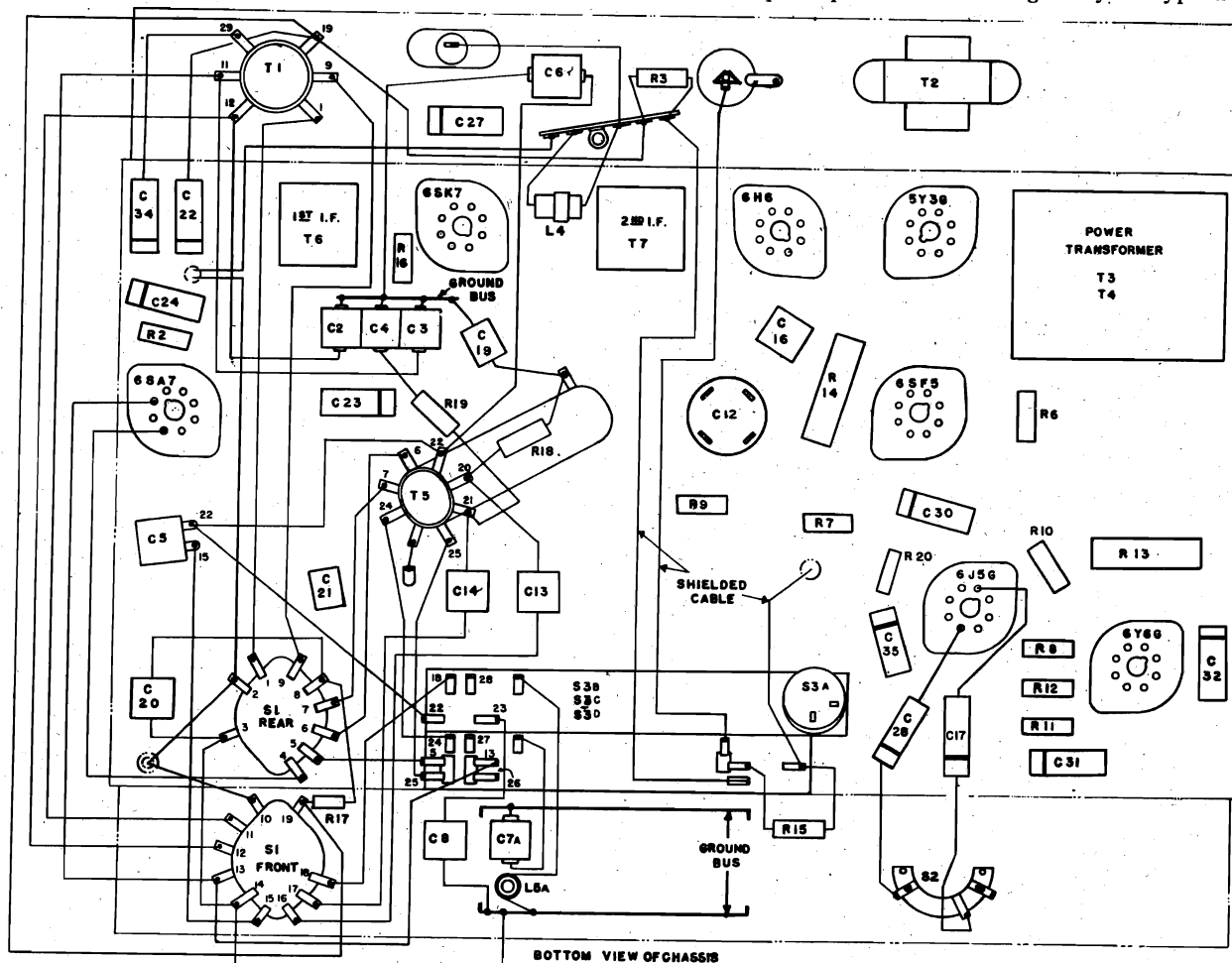


Fig. 15. Radio Chassis Parts Layout
(Model HM-226-7A only)

GENERAL ELECTRIC CO.

MODEL HM226-7A
Radio Alignment
Parts

RADIO ALIGNMENT PROCEDURE

(Model HM-226-7A only)

I. F. ALIGNMENT WITH OSCILLOSCOPE

| Band Switch Setting | Input Freq. | Point of Input | Dummy Antenna | Trimmer | Comments |
|---------------------|----------------|----------------|--------------------|-----------------------------------|---|
| 1. Band "B" | 455 K.C. Sweep | I.F. Grid | .05 Mfd. or Larger | 2nd I.F. Sec. 2nd I.F. Pri. (T-7) | Gang condenser plates closed—"Manual" key depressed—connect audio input of oscilloscope to chassis and to junction of R-3 and R-15. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. |
| 2. Band "B" | 455 K.C. Sweep | Converter Grid | .05 Mfd. or Larger | 1st I.F. Sec. 1st I.F. Pri. (T-6) | |

I. F. ALIGNMENT WITH OUTPUT METER

| Band Switch Setting | Input Freq. | Point of Input | Dummy Antenna | Trimmer | Comments |
|---------------------|----------------|----------------|--------------------|-----------------------------------|---|
| 1. Band "B" | 455 K.C. Sweep | I.F. Grid | .05 Mfd. or Larger | 2nd I.F. Sec. 2nd I.F. Pri. (T-7) | Gang condenser plates closed—connect output meter across voice coil—keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output. |
| 2. Band "B" | 455 K.C. Sweep | Converter Grid | .05 Mfd. or Larger | 1st I.F. Sec. 1st I.F. Pri. (T-6) | |

R. F. ALIGNMENT

| Band Switch Setting | Input Freq. | Point of Input | Dummy Antenna | Trimmer | Comments |
|---------------------|---------------------------|----------------|---------------|------------------------|--|
| 1. Band "B" | | | | | Close gang plates—adjust pointer to first line at left end of tuning scale. Connect output meter across voice coil—tone control on "Bass" position. |
| 2. Band "D" | 21 M.C. with Modulation | Antenna Post | I.R.E. | Osc. (C-4) Ant. (C-2) | |
| 3. Band "C" | 6 M.C. with Modulation | Antenna Post | I.R.E. | Ant. (C-3) | The image of any "D" band signal should be heard 910 K.C. below signal input when (C-4) is on proper peak. Example: 18 M.C. image, 17.09 M.C. Peak (C-2) while rocking the gang condenser. |
| 4. Band "B" | 1500 K.C. with Modulation | Antenna Post | I.R.E. | Osc. (C-6) Ant. (C-11) | Peak for maximum output with a low input signal. |
| 5. Band "B" | 580 K.C. with Modulation | Antenna Post | I.R.E. | Osc. Padder (C-5) | Align (C-6) on 1500 K.C. and peak output with (C-11). |
| 6. Band "B" | 1500 K.C. with Modulation | Antenna Post | I.R.E. | Osc. (C-6) Ant. (C-11) | Align for maximum output with a low input signal, rocking gang condenser. |
| | | | | | Retrim at 1500 K.C. |

RADIO CHASSIS PARTS

(Model HM-226-7A Radio)

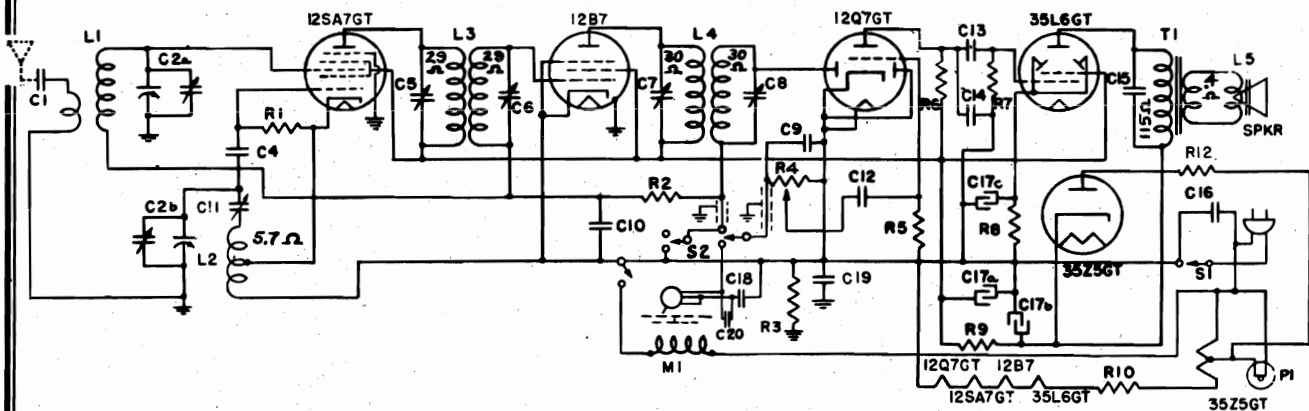
(Prices Subject to Change without Notice)

| | | | | | |
|---------|---|--------|----------|--|--------|
| *RB-008 | BOARD—Terminal board (2 lug) | \$0.10 | RK-044 | KNOB—Radio control knob (Pkg. 2) | \$0.40 |
| *RB-009 | BOARD—Terminal board (1 lug) | .15 | RK-204 | KEY—Station key | .10 |
| *RB-026 | BOARD—Antenna terminal board | .20 | RL-083 | COIL—C and D band antenna coil (T-1) | .85 |
| *RB-046 | BOARD—Terminal board (5 lug) | .15 | RL-096 | COIL—B band antenna coil (L-1) | .15 |
| *RB-096 | BOARD—Terminal board (3 lug) | .10 | RL-287 | COIL—Oscillator coil (T-5) | 1.15 |
| *RB-098 | BOARD—Ant. gnd. terminal board | .10 | RL-345 | CHOKE—Antenna choke (L-4) | .30 |
| RB-625 | BUSHING—Tuning control shaft bushing | .10 | RL-606 | COIL—Wave trap coil (L-9) | .10 |
| RB-1009 | BOARD—Phono terminal board | .10 | RL-9510 | COIL—Station selector coil assembly (L-5) | 1.80 |
| *RC-009 | CAPACITOR—.001 mfd. 600 V. paper (C-35) | .30 | RM-501 | MASK—Dial scale mask (Pkg. 10) | .05 |
| RC-016 | CAPACITOR—.002 mfd. 600 V. paper (C-28) | .25 | RP-127 | POINTER—Dial pointer assembly (Pkg. 5) | .25 |
| *RC-023 | CAPACITOR—.005 mfd. 600 V. paper (C-26, 30) | .25 | RP-303 | PULLEY—Pulley and C clip (Pkg. 2) | .10 |
| *RC-039 | CAPACITOR—.01 mfd. 600 V. paper (C-29) | .25 | RO-642 | RESISTOR—220 ohms 2 W. carbon (R-13) | .20 |
| *RC-048 | CAPACITOR—.02 mfd. 600 V. paper (C-17, 25, 31) | .30 | RO-670 | RESISTOR—3,300 ohms 2 W. carbon (R-14) | .35 |
| *RC-060 | CAPACITOR—.03 mfd. 600 V. paper (C-32) | .25 | *RQ-1231 | RESISTOR—68 ohms ½ W. carbon (R-19) (Pkg. 5) | .70 |
| *RC-092 | CAPACITOR—.05 mfd. 600 V. paper (C-22, 23, 24, 34) | .30 | *RQ-1239 | RESISTOR—150 ohms ½ W. carbon (R-18) (Pkg. 5) | .70 |
| *RC-096 | CAPACITOR—.01 mfd. 200 V. paper (C-27) | .30 | *RQ-1251 | RESISTOR—470 ohms ½ W. carbon (R-16) (Pkg. 5) | .70 |
| *RC-206 | CAPACITOR—50 mmf. wax treated mica (C-21) | .35 | *RQ-1271 | RESISTOR—3,300 ohms ½ W. carbon (R-10) (Pkg. 5) | .70 |
| RC-233 | CAPACITOR—22 mmf. mica (C-19) | .25 | *RQ-1273 | RESISTOR—3,900 ohms ½ W. carbon (R-9) (Pkg. 5) | .70 |
| *RC-235 | CAPACITOR—100 mmf. mica (C-15, 16) | .25 | *RQ-1291 | RESISTOR—22,000 ohms ½ W. carbon (R-2) (Pkg. 5) | .70 |
| RC-307 | CAPACITOR—750 mmf. silvered mica (C-8) | .40 | *RQ-1299 | RESISTOR—47,000 ohms ½ W. carbon (R-15, 17) (Pkg. 5) | .70 |
| RC-337 | CAPACITOR—1,800 mmf. mica ±5% (C-18) | .25 | *RQ-1301 | RESISTOR—56,000 ohms ½ W. carbon (R-5) (Pkg. 5) | .70 |
| RC-358 | CAPACITOR—2,000 mmf. mica ±5% (C-13) | .30 | *RQ-1307 | RESISTOR—100,000 ohms ½ W. carbon (R-11) (Pkg. 5) | .70 |
| RC-394 | CAPACITOR—4,700 mmf. mica ±5% (C-20) | .40 | *RQ-1315 | RESISTOR—220,000 ohms ½ W. carbon (R-7) (Pkg. 5) | .70 |
| RC-396 | CAPACITOR—5,600 mmf. mica ±5% (C-14) | .45 | *RQ-1319 | RESISTOR—330,000 ohms ½ W. carbon (R-12) (Pkg. 5) | .70 |
| RC-875 | CABLE—Power cable | .40 | *RQ-1323 | RESISTOR—470,000 ohms ½ W. carbon (R-4, 20) (Pkg. 5) | .70 |
| RC-1987 | CLAMP—Oscillator and antenna coil clamp (Pkg. 2) | .05 | *RQ-1331 | RESISTOR—1.0 megohm ½ W. carbon (R-8) (Pkg. 5) | .70 |
| RC-1989 | CUSHION—Condenser cushion (Pkg. 5) | .05 | RQ-1339 | RESISTOR—2.2 megohms ½ W. carbon (R-3) (Pkg. 5) | .70 |
| RC-5130 | CAPACITOR—40 mfd. 300 V.; 20 mfd. 300 V.; 20 mfd. 300 V.; 20 mfd. 25 V. dry electrolytic (C-12a, 12b, 12c, 12d) | 2.10 | *RQ-1365 | RESISTOR—15 megohms ½ W. carbon (R-6) (Pkg. 5) | .70 |
| RC-6509 | CAPACITOR—B band padder (C-5) | .35 | *RS-236 | SOCKET—Radio dial light socket | .10 |
| RC-6510 | CAPACITOR—B band oscillator trimmer (C-6) | .20 | RS-252 | SOCKET—Octal tube socket | .15 |
| RC-6523 | CAPACITOR—B band antenna trimmer (C-11) | .15 | RS-253 | SOCKET—Electrolytic mounting socket | .10 |
| RC-6524 | CAPACITOR—Wave trap trimmer (C-33) | .20 | RS-268 | SOCKET—Bezel pilot lamp socket | .35 |
| RC-7011 | CONDENSER—Tuning condenser (C-1a, 1b) | 2.15 | *RS-401 | SPRING—Drive cord spring (Pkg. 2) | .20 |
| RC-8125 | CABLE—Condenser drive cable assembly | .20 | RS-924 | SHAFT—Tuning control shaft | .10 |
| RC-8141 | CABLE—Power cable to radio (Power chassis end) | .20 | RT-862 | TRIMMER STRIP—Station selector trimmer strip (C-7a, 7b, 7c, 7d, 7e, 7f) | 1.20 |
| RC-8500 | CARD—Station letter cards (1 set) | .20 | RT-863 | TRIMMER STRIP—D and C antenna trimmers, D oscillator trimmer (C-2, 3, 4) | .45 |
| RC-8505 | CARD—Key manual tab card (Pkg. 10) | .05 | *RT-952 | TERMINAL—Speaker lead terminal (Pkg. 10) | .05 |
| RC-8507 | CARD—Key off tab card (Pkg. 10) | .05 | RV-067 | VOLUME CONTROL—2 megohm volume control (R-1) | .65 |
| RC-8512 | CARD—Key phono tab card (Pkg. 10) | .05 | *RW-101 | WASHER—Knob felt washer (Pkg. 10) | .05 |
| RD-135 | DIAL—Radio dial | .10 | RW-908 | WHEEL—Dial tuning volume wheel | .30 |
| RD-407 | DRUM—Condenser drive drum assembly | .40 | | | |
| RE-204 | ESCUTCHEON—Station key escutcheon | 2.40 | | | |
| RE-205 | ESCUTCHEON—Tuning and volume escutcheon | .20 | | | |
| RH-006 | HAIRPIN COTTER—Tuning drive shaft hairpin cotter (Pkg. 10) | .10 | | | |
| RS-3022 | SWITCH—Station selector switch (S-3) | \$7.60 | | | |
| RS-3047 | SWITCH—Tone control switch (S-2) | .40 | | | |
| RS-3048 | SWITCH—Band change switch (S-1) | 1.00 | | | |
| RT-0520 | TRANSFORMER—60 cycle power transformer (T-3) | 4.35 | | | |
| RT-313 | TRANSFORMER—1st I.F. transformer (T-6) | 1.70 | | | |
| RT-314 | TRANSFORMER—2nd I.F. transformer (T-7) | 1.90 | | | |
| RT-462 | TRANSFORMER—Output transformer (T-2) | 1.40 | | | |

* Used on previous radio receivers.

MODEL H508
Schematic, Socket
Trimmers, Alignment

GENERAL ELECTRIC CO.



| Symbol | Description | Symbol | Description | Symbol | Description |
|--------|-------------------------------------|--------|---------------------------------|--------|----------------------------------|
| C-1 | .002 mfd. paper capacitor | C-17b | 40 mfd. 150 V. dry electrolytic | R-4 | 500,000 ohms volume control |
| C-2a | Antenna section tuning condenser | C-17c | 20 mfd. 25 V. dry electrolytic | R-5 | 15 megohms carbon resistor |
| C-2b | Oscillator section tuning condenser | C-18 | 0.1 mfd. paper capacitor | R-6 | 470,000 ohms carbon resistor |
| C-4 | 47 mmf. mica capacitor | C-19 | 0.2 mfd. paper capacitor | R-7 | 470,000 ohms carbon resistor |
| C-9 | 470 mmf. mica capacitor | C-20 | .001 mfd. paper capacitor | R-8 | 150 ohms carbon resistor |
| C-10 | .05 mfd. paper capacitor | L-1 | Beam-a-Scope | R-9 | 1200 ohms carbon resistor |
| C-11 | B band padder | L-2 | Oscillator coil | R-10 | 100 ohms wire wound resistor |
| C-12 | .03 mfd. paper capacitor | L-3 | 1st I.F. transformer | R-12 | 15 ohms carbon resistor |
| C-13 | .005 mfd. paper capacitor | L-4 | 2nd I.F. transformer | S-1 | Power switch (on Volume Control) |
| C-14 | 330 mmf. mica capacitor | P-1 | Dial Lamp MAZDA No. 47 | S-2 | Radio-Phono switch |
| C-15 | .01 mfd. paper capacitor | R-1 | 33,000 ohms carbon resistor | T-1 | Output transformer |
| C-16 | .05 mfd. paper capacitor | R-2 | 2.2 megohms carbon resistor | | |
| C-17a | 30 mfd. 150 V. dry electrolytic | R-3 | 470,000 ohms carbon resistor | | |

SERVICE DATA**Over-all Dimensions**

Height—10 1/8 inches. Width—15 1/4 inches. Depth—13 1/2 inches.

Tubes

Converter-Oscillator.....GE-12SA7GT
 I. F. Amplifier.....GE-12B7
 Det., Aud. AVC.....GE-12Q7GT
 Power Output.....GE-35L6GT
 Rectifier.....GE-35Z5GT
 Dial Lamp.....MAZDA No. 47

Tuning Frequency Range.....540-1600 KC

Electrical Specifications

| Rating | Power Supply (volts) | Frequency (cycles) | Power Consumption (watts) |
|--------|----------------------|--------------------|---------------------------|
| A-6 | 115 | 60 | 55 |
| A-5 | 115 | 50 | 55 |
| C-2 | 115 | 25 | 55 |

Electrical Power Output (115-line volts)

Undistorted.....1.2 watts
 Maximum.....2.0 watts

Loud-speaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter.....4 inches
 Voice Coil Impedance (400 cycles).....3.5 ohms

I.F. Alignment

Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply this signal to the grid of the 12B7 through a .05 mfd. capacitor and align the 2nd I.F. transformer. Repeat the procedure, applying the 455 KC signal to the control grid of the 12SA7GT and aligning the 1st I.F. transformer. Do not remove grid leads from the tubes. Finish alignment by over-all adjustments.

R.F. Alignment

Apply a 1500 KC signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the generator output which can be magnetically coupled to the receiver Beam-a-Scope. Align (C-2b) at 1500 KC and peak (C-2a) for maximum output. Change signal to 580 KC and tune receiver to signal. Peak (C-11) on the 580 KC signal by rocking the gang condenser. Retrim at 1500 KC.

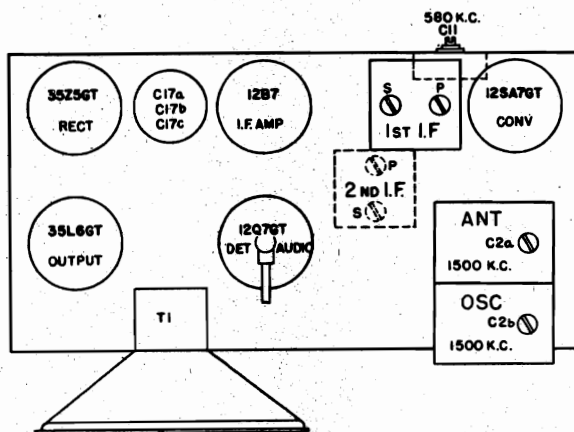


Fig. 2. Trimmer Location

ALIGNMENT PROCEDURE**Alignment Frequencies**

I.F.....455 KC R.F.....1500 and 580 KC
 The location of all trimmers is shown in Fig. 2.

GENERAL ELECTRIC CO.

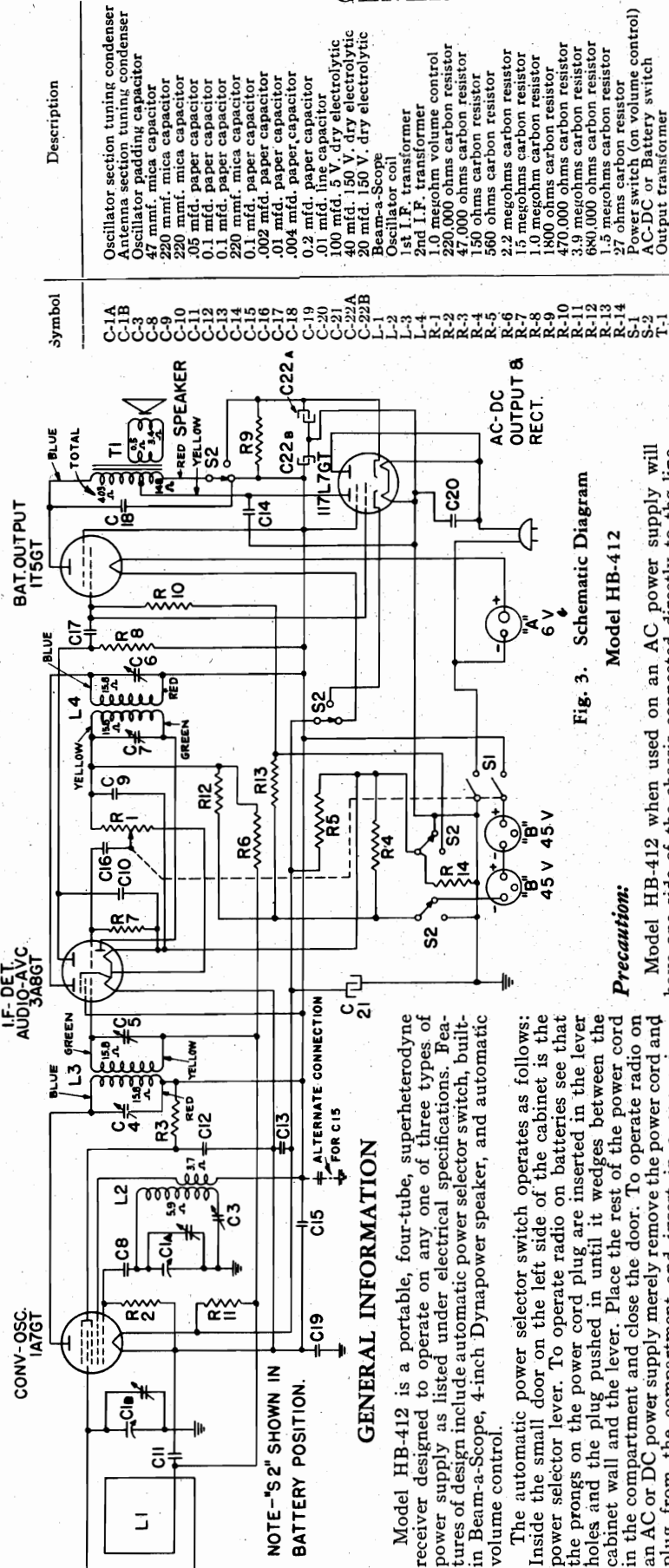
MODEL HB412
Schematic Notes

Fig. 3. Schematic Diagram
Model HB-412

Precaution:

Model HB-412 when used on an AC power supply will have one side of the chassis connected directly to the line. In order to prevent injury to alignment equipment or shock to the servicemen, use an isolating transformer between the convenience outlet and the receiver power cord.

Tubes

Converter-Oscillator.....GE-1A7GT
I.F.—Det.—Aud.—AVC.....GE-3A8GT
Battery Power Output.....GE-117L7GT
AC-DC Power Output—Rectifier.....GE-117L7GT

SERVICE DATA**Electrical Specifications**

1. AC or DC Power Supply
110-120 Volts, 25-60 cycles on AC, 25 watts
2. Battery Power Supply
6-volt "A" supply, 90-volt "B" supply.

Recommended batteries for long life.

- (a) "A" supply—Eveready No. 747 or equivalent
- (b) "B" supply—two Eveready No. 482 or equivalent

Tuning Frequency Range.....550-1600 KC

Intermediate Frequency.....455 KC

Loud-speaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter.....4 inches
Voice Coil Impedance (400 cycles).....3.5 ohms

Maximum Power Output

Battery Operation.....275 milliwatts
AC or DC Operation.....2 watts

Symbol Description

| | |
|-------|-------------------------------------|
| C-1A | Oscillator section tuning condenser |
| C-1B | Antenna section tuning condenser |
| C-3 | Oscillator padding capacitor |
| C-8 | 47 mmf. mica capacitor |
| C-9 | 220 mmf. mica capacitor |
| C-10 | 220 mmf. mica capacitor |
| C-11 | .05 mfd. paper capacitor |
| C-12 | 0.1 mfd. paper capacitor |
| C-13 | 0.1 mfd. paper capacitor |
| C-14 | 220 mmf. mica capacitor |
| C-15 | 0.1 mfd. paper capacitor |
| C-16 | .002 mfd. paper capacitor |
| C-17 | .01 mfd. paper capacitor |
| C-18 | .004 mfd. paper capacitor |
| C-19 | 0.2 mfd. paper capacitor |
| C-20 | 0.1 mfd. line capacitor |
| C-21 | 100 mfd. 5 V. dry electrolytic |
| C-22A | 40 mfd. 150 V. dry electrolytic |
| C-22B | 20 mfd. 150 V. dry electrolytic |
| L-1 | Beam-a-Scope |
| L-2 | Oscillator coil |
| L-3 | 1st I.F. transformer |
| L-4 | 2nd I.F. transformer |
| R-1 | 1.0 megohm volume control |
| R-2 | 220,000 ohms carbon resistor |
| R-3 | 47,000 ohms carbon resistor |
| R-4 | 150 ohms carbon resistor |
| R-5 | 560 ohms carbon resistor |
| R-6 | 2.2 megohms carbon resistor |
| R-7 | 1.5 megohms carbon resistor |
| R-8 | 1.0 megohm carbon resistor |
| R-9 | 1800 ohms carbon resistor |
| R-10 | 470,000 ohms carbon resistor |
| R-11 | 3.9 megohms carbon resistor |
| R-12 | 680,000 ohms carbon resistor |
| R-13 | 1.5 megohms carbon resistor |
| R-14 | 27 ohms carbon resistor |
| S-1 | Power switch (on volume control) |
| S-2 | AC-DC or Battery switch |
| T-1 | Output transformer |

MODEL HB412
Voltage, Socket
Trimmers, Alignment

GENERAL ELECTRIC CO.

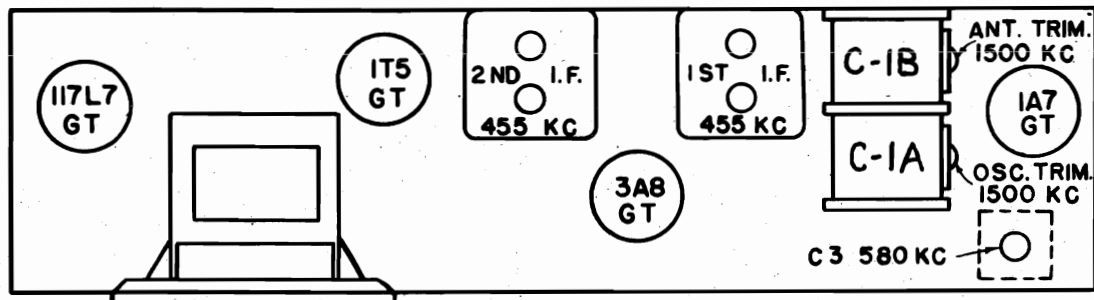


Fig. 1. Trimmer Location

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F. 455 KC
R.F. 1500 and 580 KC
The location of all trimmers is shown in Fig. 1.

General Alignment Notes

This receiver must be removed from the carrying case in order to perform the alignment. Special care must be exercised to place the batteries, Beam-a-Scope and chassis in the same relative positions with respect to one another as these components occupied in the case; otherwise, alignment will not be satisfactory.

I.F. Alignment

With batteries, Beam-a-Scope and chassis in position for alignment as mentioned above, and using an isolating transformer if operating from an AC power source (refer to precaution under "General Information"), set up and align as follows: Connect an output meter across the voice coil. Rotate

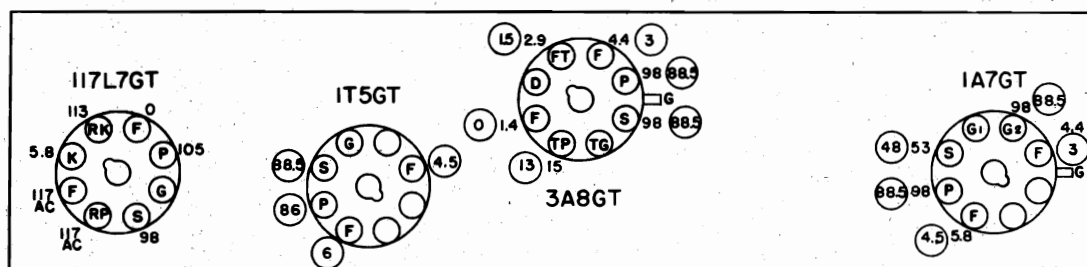
the volume control to maximum. Set test oscillator to 455 KC and apply signal to the control grid of the 3A8GT tube through a .05 mfd. capacitor. Align the 2nd I.F. transformer trimmers. Next apply signal to the control grid of the 1A7GT through the same .05 mfd. capacitor and align the 1st I.F. transformer trimmers. Retouch the 2nd I.F. transformer trimmers while applying signal to the 1A7GT tube. Do not remove the grid leads from the tubes when applying the oscillator signal and keep the test oscillator output as low as a readable meter reading will permit.

R.F. Alignment

Place a one turn coupling loop not closer than six inches from the receiver Beam-a-Scope. Apply a 1500 KC signal to the coupling loop. Set pointer to 1500 KC and align the oscillator trimmer (C-1A). Peak (C-1B) for maximum output. Change test signal to 580 KC and with pointer in region of 580 KC peak (C-3) while rocking the gang condenser. Retrim at 1500 KC.

The Beam-a-Scope leads should be dressed the same after the components are mounted in the cabinet as during alignment.

FRONT OF CHASSIS



BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED BETWEEN SOCKET TERMINAL AND CHASSIS.
VOLTAGE READINGS ENCIRCLED INDICATE VALUES OBTAINED WHEN OPERATING
WITH A 6-VOLT "A" BATTERY AND A 90-VOLT "B" BATTERY.
REMAINING VOLTAGE READINGS OBTAINED WHEN OPERATING ON A 117-VOLT AC POWER SUPPLY.
READINGS GREATER THAN 50 OBTAINED ON 250-VOLT SCALE OF 1000 OHMS PER VOLT METER.

D- DIODE PLATE
F- FILAMENT
FT- FILAMENT TAP
G- CONTROL GRID

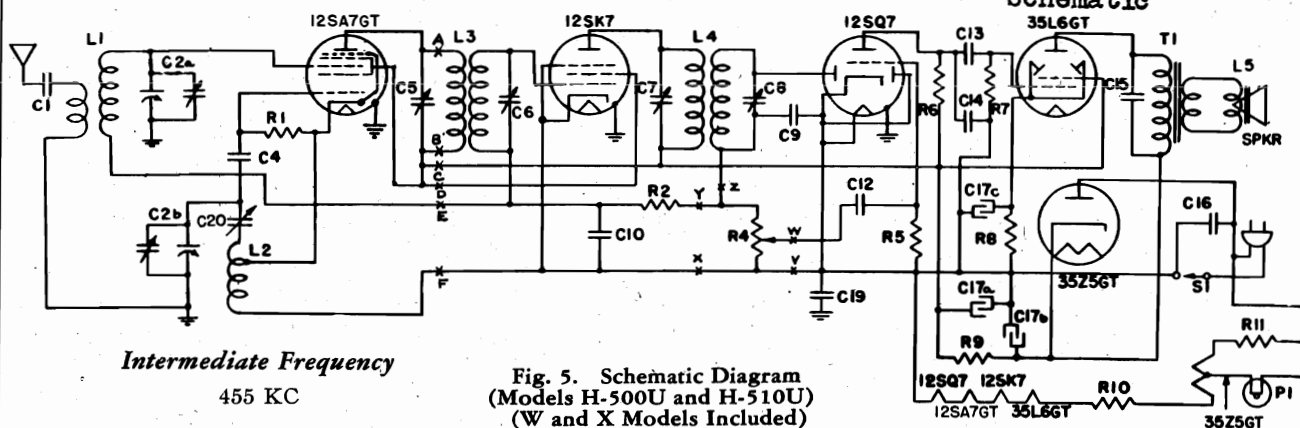
G1- OSCILLATOR GRID
G2- OSCILLATOR PLATE
K- CATHODE
P- PLATE

RK- RECTIFIER CATHODE
RP- RECTIFIER PLATE
S- SCREEN
TG- TRIODE GRID
TP- TRIODE PLATE

Fig. 2. Socket Voltages

GENERAL ELECTRIC CO.

MODELS H500U, H510U
(W, X) Early, Late
Schematics, Changes
MODEL H520U (W, X)
Schematic

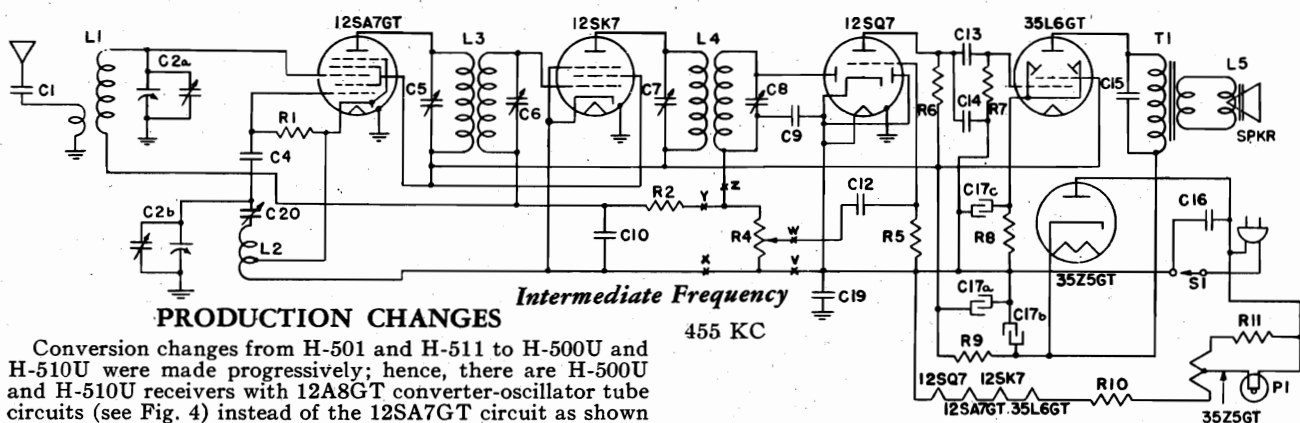


Intermediate Frequency

455 KC

Fig. 5. Schematic Diagram
(Models H-500U and H-510U)
(W and X Models Included)

* Refer to Production Changes for circuits with 12A8GT tube and 2.0 megohm volume control. Lettered points indicate break-points for insertion of circuits shown in Figs. 3 and 4.



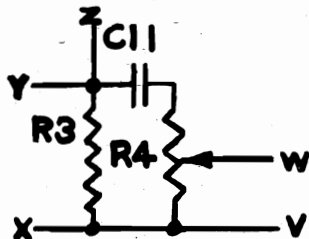
PRODUCTION CHANGES

455 KC

Conversion changes from H-501 and H-511 to H-500U and H-510U were made progressively; hence, there are H-500U and H-510U receivers with 12A8GT converter-oscillator tube circuits (see Fig. 4) instead of the 12SA7GT circuit as shown in the schematic diagram, Fig. 5. Insert the 12A8GT circuit in place of the 12SA7GT circuit for those models having a 12A8GT tube. When ordering replacement parts for the 12A8GT circuit be sure to refer to the special replacement parts list.

Similarly there will be found receivers of Model H-500U, H-510U and H-520U which have a 2.0 megohm volume control circuit (see Fig. 3). If such is the case insert the 2.0 megohm volume control circuit in place of the 500,000 ohm volume control circuit shown in the schematic diagram (Figs. 5 and 6). When ordering replacement parts for the 2.0 megohm volume control circuit be sure to refer to the special replacement parts list.

Capacitor (C-12) was .002 mfd. in all early production receivers. It was later changed to .03 mfd. to improve performance.

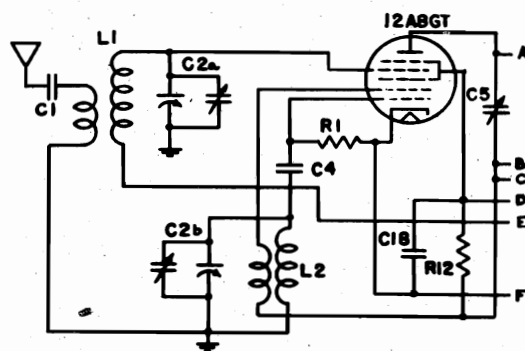


| Symbol | Description |
|--------|----------------------------------|
| C-11 | .002 mfd. paper capacitor |
| R-3 | 500,000 ohms carbon resistor |
| R-4 | 2 megohm volume control (RV-070) |

Fig. 3. 2.0 Megohm Volume Control Circuit
(Refer to Production Changes)

* Refer to Production Changes for circuits with 2.0 megohm volume control. Lettered points indicate break-points for insertion of circuit shown in Fig. 3.

Fig. 6. Schematic Diagram
Model H-520U
(W and X Models Included)



| Symbol | Description |
|--------|-------------------------------------|
| C-1 | .002 mfd. paper capacitor |
| C-2a | Antenna section tuning condenser |
| C-2b | Oscillator section tuning condenser |
| C-4 | 47 mmf. mica capacitor |
| C-18 | .05 mfd. paper capacitor |
| L-1 | Antenna coil (RL-085) |
| L-2 | Oscillator coil (RL-290) |
| R-1 | 47,000 ohms carbon resistor |
| R-12 | 8200 ohms carbon resistor |

Fig. 4. 12A8GT Converter-Oscillator Tube Circuit—Models
H-500U and H-510U
(Refer to Production Changes)

MODELS H500U, H510U(W,X)

MODEL H520U(W,X)

Gain, Voltage, Trimmers

Coils, Socket

Color Specifications

| Model | Color and Material |
|-----------------------|--------------------|
| H-500U, 510U, 520U | Oak—Plastic |
| H-500UW, 510UW, 520UW | Ivory—Plastic |
| H-500UX, 510UX, 520UX | Onyx—Plastic |

Tuning Frequency Range

| Model | H-500U, 510U (W and X Models Included) | H-520U (W and X Models Included) |
|-------|---|---|
| Range | 540-1800 KC | 540-1600 KC |

Electrical Power Output (115-line volts)

| | |
|------------------|-----|
| Undistorted..... | 0.9 |
| Maximum..... | 1.8 |

Loud-speaker—"Alnico" Magnetic Dynamic

| | |
|--------------------------------------|----------|
| Outside Cone Diameter..... | 4 inches |
| Voice Coil Impedance (400 cycles)... | 3.5 ohms |

Electrical Specifications

| Power Supply (Volts) | Frequency (Cycles on AC) | Power Consumption (Watts) |
|-------------------------|-----------------------------|---------------------------------|
| 115 Volts AC or DC | 25-60 | 30 |

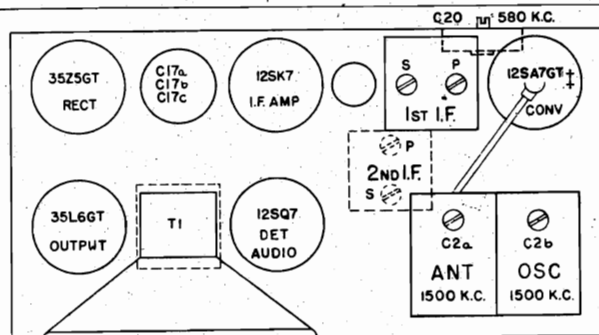


Fig. 1. Trimmer Location

† GE-12A8GT used on early production Model H-500U and H-510U.

COIL RESISTANCE CHART

| Coil | Section | Resistance (Ohms) |
|-----------------------------|-----------------|-------------------|
| Antenna Coil (H-500U, 510U) | Primary | 7 |
| | Secondary | 26 |
| Oscillator Coil (12SA7GT) | From C-20 to -B | 5 |
| Oscillator Coil (12A8GT) | Plate Section | 1.9 |
| | Grid Section | 5.2 |
| 1st I.F. Transformer | Primary | 29 |
| | Secondary | 29 |
| 2nd I.F. Transformer | Primary | 30 |
| | Secondary | 30 |
| Output Transformer | Primary | 115 |
| | Secondary | 0.4 |

GENERAL ELECTRIC CO.

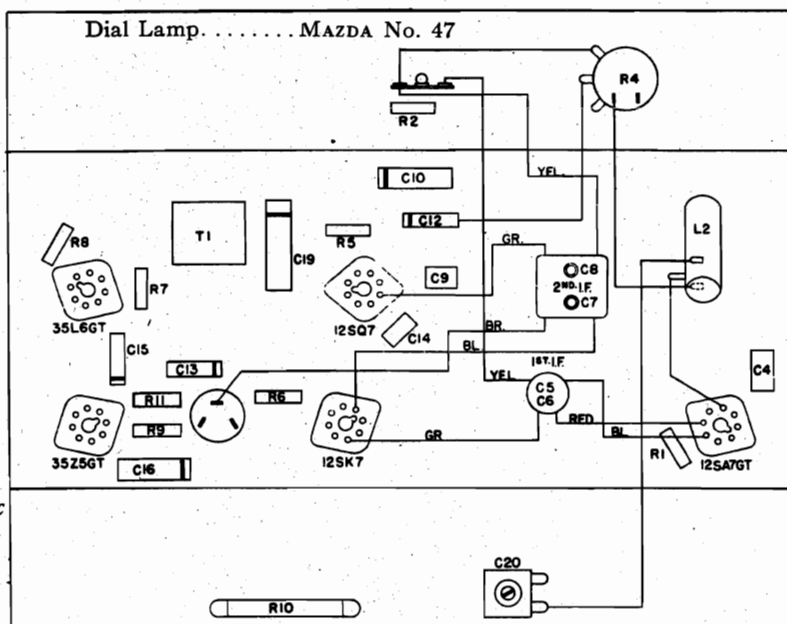
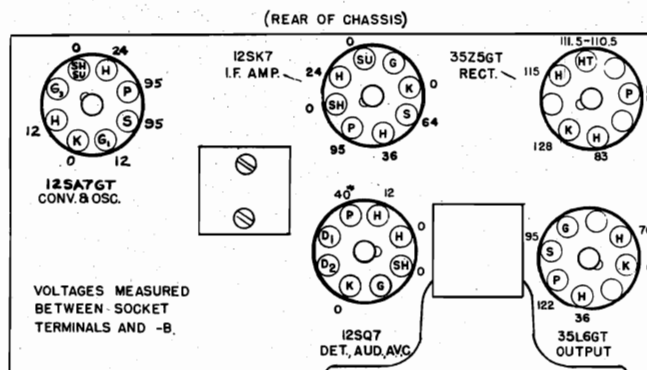


Fig. 7. Chassis Parts Layout

Special Service Information

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

- Stage Gains
Antenna to 12SA7GT..... 3 to 4 at 1000 KC
12SA7GT to 12SK7 grid..... 42 at 455 KC†
12SK7 grid to 12SQ7 detector plate..... 70 at 455 KC†
- 0.1 volt, 400 cycle signal across volume control will give ½ watt speaker output.† (Volume turned to maximum.)
- Average DC voltage developed across oscillator grid resistor (R-1)—12 volts.
† Variation of +10%, -20% permissible.



Bottom View of Chassis

Line volts—115. No signal input. When operated on a d-c power supply, voltages are about 15% lower. Use a high resistance voltmeter.
* Measured on 500 volt scale of 1000 ohms per volt meter.

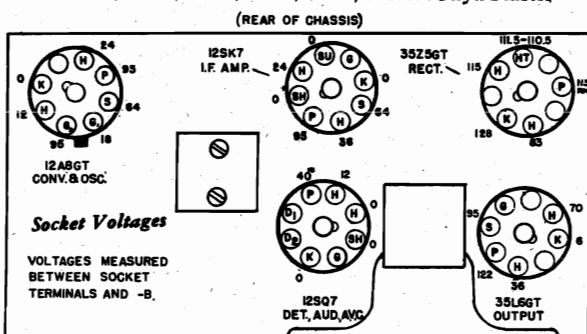
Fig. 2. Socket Voltages

Voltage, Socket, Chassis Wiring Gain, Parts List

GENERAL ELECTRIC CO.

**MODELS H500, H501, H510, H511
H520, H521 (W and X)**

H-500, 501, 510, 511, 520, 521..... Oak Plastic
H-500W, 501W, 510W, 511W, 520W, 521W. Ivory Plastic
H-500X, 501X, 510X, 511X, 520X, 521X.. Onyx Plastic



Line volts—115.
No signal input.
When operated on a DC power supply, voltages are about 15% lower.
Use a high-resistance voltmeter.

*Measured on 500-volt scale of 1000 ohms per volt meter.

D₁—Diode Plate G₁—Oscillator Plate HT—Heater Tap S—Screen
D₂—Diode Plate G₂—Control Grid K—Cathode SU—Suppressor
G₁—Oscillator Grid H—Heater P—Plate SH—Shell

| MODEL | H-500, 501, 510, 511 (W and X Models Included) | H-520, 521 (W and X Models Included) |
|------------------------------|--|--|
| Range | 540-1800 KC | 540-1800 KC |
| Power Supply (Volts) | 115 Volts AC or DC | 25-60 |
| Frequency (Cycles on AC) | 25-60 | 30 |
| Power Consumption (Watts) | | 30 |

Electrical Power Output (115-line volts)
Undistorted.....0.9
Maximum.....1.8 mfd. in all early production

Loudspeaker "Alnico" Magnetic Dynamic receivers. As production progressed this capacitor was
Outside Cone Diameter.....4 inches
Voice Coil Impedance (400 cycles) 3.5 ohms changed to .03 mfd. to improve performance.

Special Service Information

The following information will be found very useful in servicing of receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

- (1) Stage Gains
Antenna to 12ABGT grid.....5 to 5.5 at 1000 KC
12ABGT grid to 12SK7 grid.....42 at 455 KC
12SK7 grid to 12SQ7 detector plate.....60 at 455 KC
- (2) 0.1 volt, 400 cycle signal across volume control will give 1/2 watt speaker output. (Volume control turned to maximum).
- (3) Average DC voltage developed across oscillator grid leak.....18 volt

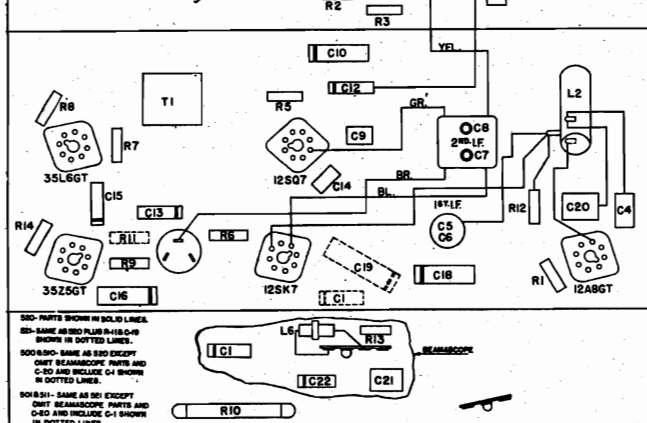
Alignment

†Variations of +10%, -20% permissible
Precaution—If the signal generator is AC operated use an isolating transformer between the power supply and the radio receiver power input. The use of an isolating capacitor is not recommended as AC current through the capacitor will introduce hum modulation and/or create the possibility of a burned-out signal generator attenuator.

FOR OTHER DATA

SEE VOLUME X

Chassis Parts Layout


**Stock
No.**
Description
**List
Price**

| | | |
|----------|--|--------|
| RL-291 | COIL—Oscillator coil for Models H-520 and H-521 (W & X inc.) (L-2)..... | \$0.50 |
| RL-346 | CHOKE—RF choke for Models H-520 and H-521 (W & X inc.) (L-6)..... | .30 |
| RL-510 | LOOP—Beam-a-Scope assembly for Models H-520 and H-521 (W & X inc.) (L-1)..... | .70 |
| RL-937 | LUG—Key pin binding lug (Pkg. 10)..... | .10 |
| RP-134 | PIN—Key pin for Models H-510, 511, 520, 521 (W & X inc.) (Pkg. 10)..... | .05 |
| *RQ-1215 | RESISTOR—15 ohms, 1/2 W. carbon (R-14) (Pkg. 5)..... | .70 |
| *RQ-1283 | RESISTOR—10,000 ohms, 1/2 W. carbon (R-13) Models H-520 and H-521 (W & X inc.) (Pkg. 5)..... | .70 |
| RS-256 | SOCKET—Electrolytic mounting socket for Models H-501, 511, 521 (W & X inc.)..... | .05 |
| RS-257 | SOCKET—Electrolytic mounting socket for Models H-500, 510, 520 (W & X inc.)..... | \$0.05 |
| RS-1016 | SPEAKER—4-inch speaker for Models H-501, 511, 521 (W & X inc.) (L-5)..... | 3.35 |
| RS-1017 | SPEAKER—4-inch speaker for Models H-500, 510, 520 (W & X inc.) (L-5)..... | 3.25 |
| RT-321 | TRANSFORMER—1st IF transformer (L-3) for Models H-520 and H-521 (W & X inc.)..... | .95 |
| RT-323 | TRANSFORMER—1st IF transformer for Models H-500, H-501, H-510, H-511 (W & X inc.)..... | .90 |
| RW-039 | WINDOW—Celluloid station letter window for Models H-510, 511, 520, 521 (W & X inc.) (Pkg. 25)..... | .10 |
| *RB-013 | BOARD—Terminal board (2 lug) for Models H-500, 501, 510, 511 (W & X inc.)..... | .10 |
| *RB-070 | BOARD—Terminal board (3 lug) for Models H-520 and H-521 (W & X inc.)..... | .10 |
| RB-179 | BRACKET—Bracket for Beam-a-Scope frame for Models H-520 and H-521 (W & X inc.)..... | .10 |
| RC-016 | CAPACITOR—.002 mfd., 600 V. paper (C-1, 11)..... | .25 |
| *RC-060 | CAPACITOR—.03 mfd., 600 V. paper (C-12)..... | .25 |
| *RC-130 | CAPACITOR—.2 mfd., 400 V. paper for Models H-501, 511, 521 (W & X inc.) (C-19)..... | .30 |
| *RC-348 | CAPACITOR—1600 mmf. mica for Models H-520, 521 (W & X inc.) (C-20)..... | .35 |
| *RC-390 | CAPACITOR—3900 mmf. mica for Models H-520 and H-521 (W & X inc.) (C-21)..... | .35 |
| RC-1990 | CLAMP—Antenna coil clamp for Models H-500, 501, 510, 511 (W & X inc.) (Pkg. 5)..... | .10 |
| RC-7012 | CONDENSER—Tuning condenser for Models H-510, 511, 520, 521 (W & X inc.) (C-2a, 2b)..... | 4.00 |
| RC-7013 | CONDENSER—Tuning condenser for Models H-500, 501 (W & X inc.) (C-2a, 2b)..... | 2.00 |
| RC-8508 | CARDS—Station letter cards for Models H-510, 511, 520, 521 (W & X inc.)..... | .30 |
| RD-111 | DIAL—Dial scale for Models H-500, 501, 510, 511 (W & X inc.)..... | .20 |
| RD-112 | DIAL—Dial scale for Models H-520 and H-521 (W & X inc.)..... | .20 |
| RD-411 | DRUM—Tuning condenser drive drum assembly for all models in ivory..... | .60 |
| RD-414 | DRUM—Tuning condenser drive drum assembly for all models in onyx..... | .60 |
| RH-007 | HANK—Antenna hank for Models H-500, 501, 510, 511 (W & X inc.)..... | .20 |
| RK-048 | KNOB—Control knob for all models in ivory..... | .15 |
| RK-051 | KNOB—Control knob for all models in brown..... | .15 |
| RK-065 | KNOB—Control knob for all models in onyx..... | .15 |
| RK-206 | KEY—Station selector key for Models H-510, 511, 520, 521, 510W, 511W, 520W, 521W (Pkg. 5)..... | .50 |
| RK-208 | KEY—Station selector key for Models H-510X, H-511X, H-520X, H-521X (Pkg. 5)..... | .70 |
| RL-085 | COIL—Antenna coil for Models H-500, 501, 510, 511 (W & X inc.) (L-1)..... | .50 |
| RL-290 | COIL—Oscillator coil for Models H-500, 501, 510, 511, (W & X inc.) (L-2)..... | .50 |

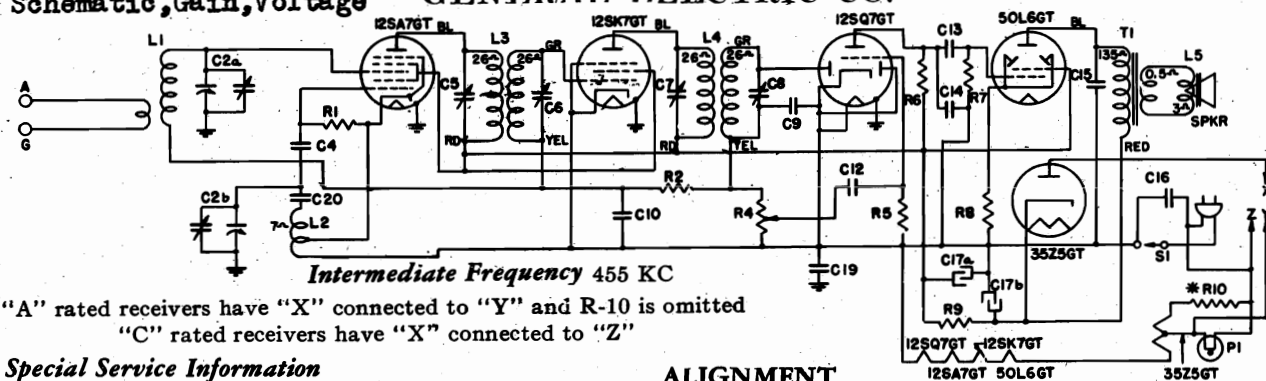
*Used on previous receivers
Prices subject to change without notice
(When ordering drums, knobs, or keys, specify color)

MODEL HJ514

Schematic, Gain, Voltage

GENERAL ELECTRIC CO.

Socket, Alignment, Trimmers



"A" rated receivers have "X" connected to "Y" and R-10 is omitted
 "C" rated receivers have "X" connected to "Z"

Special Service Information

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

- Stage Gains
 Antenna to 12SA7GT grid... 3 to 3.5 at 1000 KC
 12SA7GT grid to 12SK7GT grid... 50 at 455 KC
 12SK7GT grid to 12SQ7GT detector plate... 50 at 455 KC
 Gains shown in the first two stages do not contain the conversion gain which amounts to 1.1 at 1000 KC.
- 0.15 volt, 400 cycle signal across the volume control will give $\frac{1}{2}$ watt speaker output. (Volume control turned to maximum.)
- Average DC voltage developed across oscillator grid leak... 15 volts

† Variations of +10%, -20% permissible.

The glass tubes used in the I.F. amplifier and 2nd detector stages are interchangeable with metal tubes.

ALIGNMENT

I.F. Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

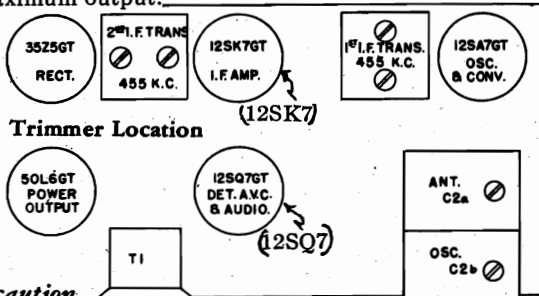
Apply signal to the converter grid of the 12SA7GT through a 0.05 mfd. capacitor and align progressively the trimmers in the 2nd and 1st I.F. transformer cans. Do not remove the grid lead from the 12SA7GT.

R.F. To insert the R.F. signal use either a standard I.R.E. dummy between the signal generator and the receiver antenna post or a loop connected across the generator output which can be magnetically coupled to the receiver Beam-a-Scope. When using an I.R.E. dummy antenna for R.F. alignment, the ground lead from the signal generator to the receiver ground post should be omitted.

With the gang condenser wide open, align oscillator trimmer (C-2b) to 1650 KC. Change generator signal to 1500 KC, tune receiver to the signal and peak antenna trimmer (C-2a) for maximum output.

| Stock No. | Description |
|-----------|---|
| *RB-008 | BOARD—Terminal board (2 lug) |
| *RB-179 | BRACKET—Cabinet back chassis mounting bracket |
| *RB-626 | BUSHING—Tuning shaft bushing |
| *RB-1015 | BOARD—Terminal board (1 lug) |
| RB-1102 | BRACKET—Condenser mounting bracket |
| *RC-023 | CAPACITOR—.005 mfd. 600 V. paper (C-13) |
| *RC-039 | CAPACITOR—.01 mfd. 600 V. paper (C-15, 20) |
| *RC-060 | CAPACITOR—.03 mfd. 600 V. paper (C-12) |
| *RC-072 | CAPACITOR—.05 mfd. 200 V. paper (C-10) |
| *RC-092 | CAPACITOR—.05 mfd. 600 V. paper (C-16) |
| *RC-130 | CAPACITOR—.2 mfd. 400 V. paper (C-19) |
| *RC-232 | CAPACITOR—47 mmf. mica (C-4) |
| *RC-274 | CAPACITOR—330 mmf. mica (C-14) |
| *RC-293 | CAPACITOR—470 mmf. mica (C-9) |
| *RC-863 | CORD—Power cord |
| RC-5159 | CAPACITOR—30 mfd. 150 V; 40 mfd. 150 V; dry electrolytic (C-17a, 17b) |
| RC-7026 | CONDENSER—Tuning condenser (C-2a, 2b) |
| RC-8160 | CABLE—Tuning condenser drive cable |
| *RC-9015 | CONE ASSEMBLY—4-inch Dynapower speaker cone assembly |
| RD-147 | DIAL—Dial scale |
| *RH-111 | HAIRPIN COTTER—Tuning shaft retaining cotter (Pkg. 10) |
| *RK-074 | KNOB—Volume and tuning knobs (Pkg. 5) |
| RL-525 | BEAM-A-SCOPE—Cabinet back and Beam-a-Scope assembly (L-1) |
| RL-2025 | COIL—Oscillator coil (L-2) |
| *RTN-001 | NUT—Volume and tuning control pal nut (Pkg. 5) |
| RP-173 | POINTER—Dial pointer |
| RQ-1214 | RESISTOR—13 ohms, $\frac{1}{4}$ -W. carbon $\pm 5\%$ (R-10) (Pkg. 5) |
| *RQ-1239 | RESISTOR—150 ohms, $\frac{1}{4}$ -W. carbon (R-8) (Pkg. 5) |
| *RQ-1295 | RESISTOR—33,000 ohms, $\frac{1}{4}$ -W. carbon (R-1) (Pkg. 5) |
| *RQ-1323 | RESISTOR—470,000 ohms, $\frac{1}{4}$ -W. carbon (R-6, 7) (Pkg. 5) |
| *RQ-1339 | RESISTOR—2.2 meg. $\frac{1}{4}$ -W. carbon (R-2) (Pkg. 5) |
| *RQ-1365 | RESISTOR—15 meg. $\frac{1}{4}$ -W. carbon (R-5) (Pkg. 5) |
| *RQ-1460 | RESISTOR—1,200 ohms, 1-W. carbon (R-9) (Pkg. 5) |
| *RS-238 | SOCKET—Octal tube socket |
| RS-278 | SOCKET—Dial lamp socket assembly |
| *RS-426 | SPRING—Drive cable tension spring (Pkg. 5) |
| RS-954 | SPACER—Cardboard dial spacer (Pkg. 5) |
| RS-1030 | SPEAKER—4-inch Dynapower speaker (Complete with output transformer) |
| RS-4002 | SPRING—Dial scale retaining spring (Pkg. 3) |
| RS-9000 | SHAFT—Tuning control shaft |
| RT-352 | TRANSFORMER—1st I.F. transformer (L-3) |
| RT-353 | TRANSFORMER—2nd I.F. transformer (L-4) |
| RT-482 | TRANSFORMER—Output transformer (T-1) |
| RT-955 | TERMINAL—Antenna or ground terminal (Pkg. 5) |
| RV-091 | VOLUME CONTROL—0.5 megohm volume control (R-4) |
| RW-046 | WINDOW—Dial scale window |
| RW-121 | WASHER—Pointer felt washer (Pkg. 10) |

| List Price |
|------------|
| \$0.10 |
| .10 |
| .10 |
| .10 |
| .10 |
| .25 |
| .25 |
| .25 |
| .25 |
| .25 |
| .30 |
| .25 |
| .30 |
| .30 |
| .65 |
| .20 |
| .10 |
| .80 |
| .05 |
| .50 |
| .90 |
| .30 |
| .10 |
| .20 |
| .70 |
| .70 |
| .70 |
| .70 |
| .15 |
| .30 |
| .10 |
| .05 |
| \$3.25 |
| .05 |
| .10 |
| .70 |
| .70 |
| .90 |
| .10 |
| .80 |
| .15 |
| .05 |



Precaution

If the signal generator is AC operated use an isolating transformer between the power supply and the radio receiver power input.

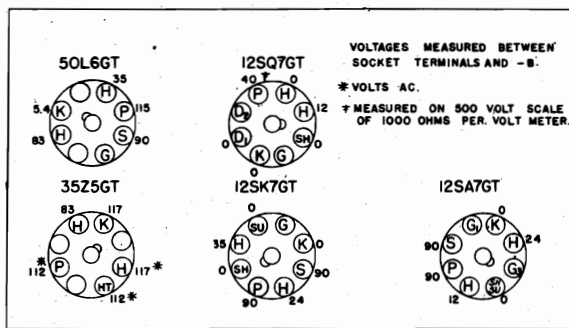
| Rating | Power Supply (Volts) | Frequency (Cycles on AC) | Power Consumption (Watts) |
|--------|----------------------|--------------------------|---------------------------|
| A | 115—AC or DC | 40-60 | 30 |
| C | 115—AC or DC | 25 | 30 |

Electrical Power Output (117-line volts)

Undistorted... 1.3 watts
 Maximum... 1.9 watts

Loud-speaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter... 4 inches
 Voice Coil Impedance (400 cycles)... 3.5 ohms
 FRONT OF CHASSIS



BOTTOM VIEW OF CHASSIS

AC LINE VOLTS-117 MAX. VOLUME GANG CLOSED NO-SIGNAL

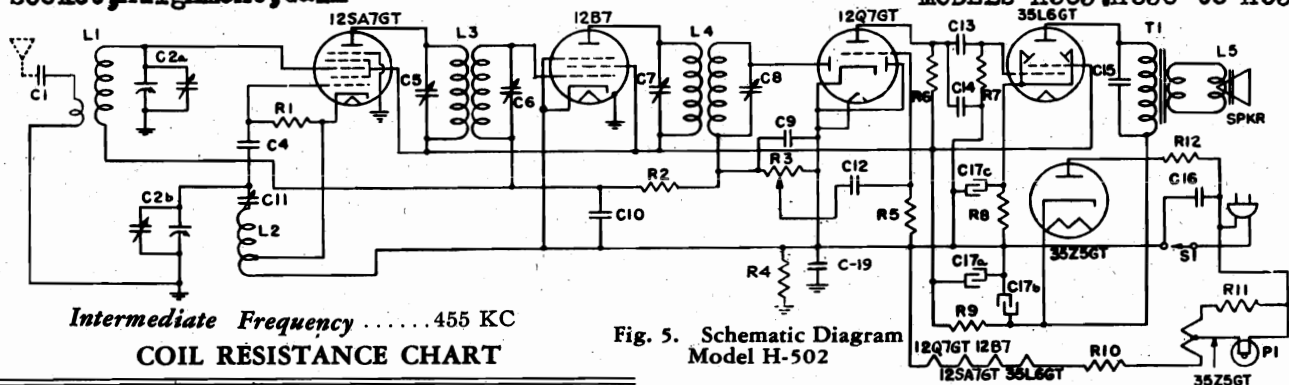
* Used on previous receivers—(Prices subject to change without notice).

Schematics, Voltage, Coils Socket, Alignment, Gain

GENERAL ELECTRIC CO.

MODEL H502

MODELS H503, H530 to H532

Fig. 5. Schematic Diagram
Model H-502

Intermediate Frequency 455 KC

COIL RESISTANCE CHART

| Coil | Section | Resistance |
|----------------------|---------------------|------------|
| Oscillator Coil | Between C-11 and -B | 5 ohms |
| 1st I.F. Transformer | Primary | 29 ohms |
| | Secondary | 29 ohms |
| 2nd I.F. Transformer | Primary | 30 ohms |
| | Secondary | 30 ohms |
| Output Transformer | Primary | 115 ohms |
| | Secondary | 0.4 ohms |

| Model | Color | Material |
|-------|---------------|-------------------------|
| H-502 | Mahogany | Plastic |
| H-503 | Walnut | Wood |
| H-530 | Walnut | Wood |
| H-531 | Maroon | Texti-leather over wood |
| H-532 | Eggshell Gray | Texti-leather over wood |

GENERAL INFORMATION

These Models are compact superheterodyne receivers using five General Electric Pre-tested Tubes. Operation is permitted on either a DC or AC source of power. Features of design include the new "Alnico" Dynapower speaker, single-ended tubes in the detector circuits, high-filament voltage tubes which eliminate line dropping resistors, and full approval of the Underwriters' Laboratories.

| Model | Power Supply (Volts) | Frequency (Cycles on A-C) | Power Consumption (Watts) |
|----------------------|----------------------|---------------------------|---------------------------|
| H-502 | 115 Volts AC or DC | 25-60 | 30 |
| H-503, 530, 531, 532 | 115 Volts AC or DC | 40-60 | 30 |

Electrical Power Output (115-line volts)

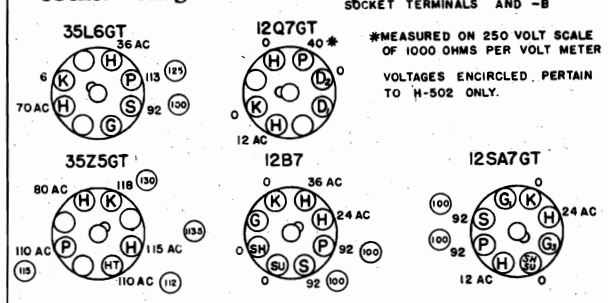
| | |
|------------------|-----------|
| Undistorted..... | 1.2 watts |
| Maximum..... | 2.3 watts |

Special Service Information

The following data will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

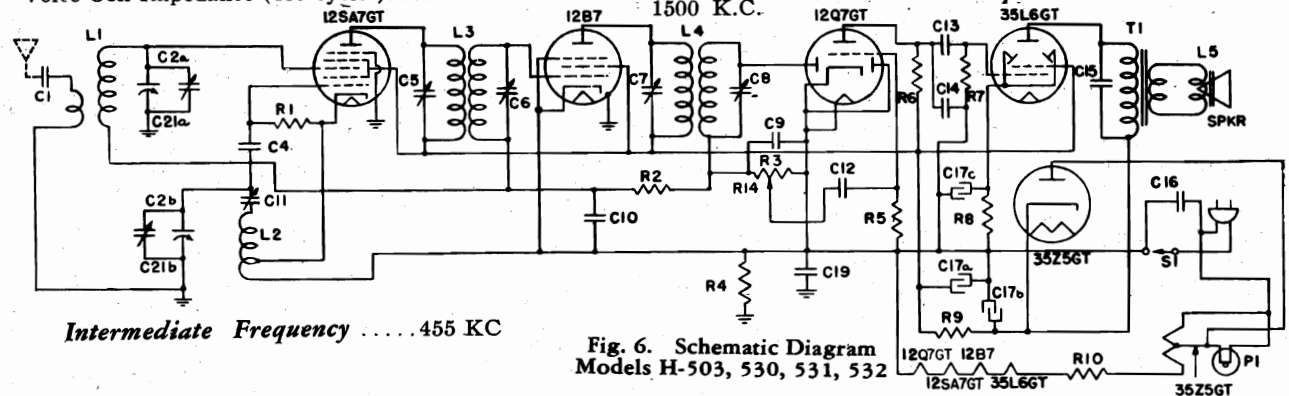
- (1) Stage Gains
- | | Gain |
|-----------------------------|-------------------|
| Antenna to Converter Grid | 3 to 4 at 1000 KC |
| Converter Grid to 12B7 Grid | 45 at 455 KC† |
| 12B7 Grid to 12Q7GT Grid | 80 at 455 KC† |
- (2) 0.1 volt, 400 cycle signal across volume control will give ½ watt speaker output. †(Volume Control turned to Maximum).
- (3) Average DC voltage developed across oscillator grid resistor (R-1)—12 volts.
- Variations of +10%, -20%, permissible.

Socket Voltages



Loud-speaker—"Alnico" Magnetic Dynamic

| | |
|--|----------|
| Outside Cone Diameter..... | 4 inches |
| Voice Coil Impedance (400 cycles)..... | 3.5 ohms |

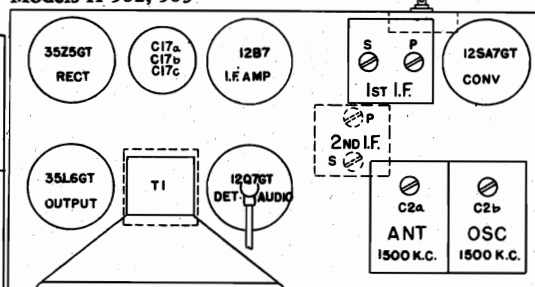
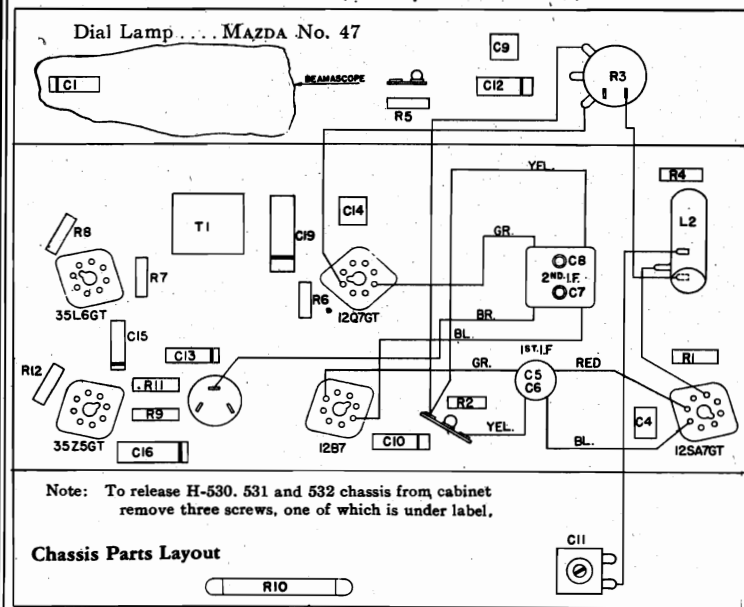
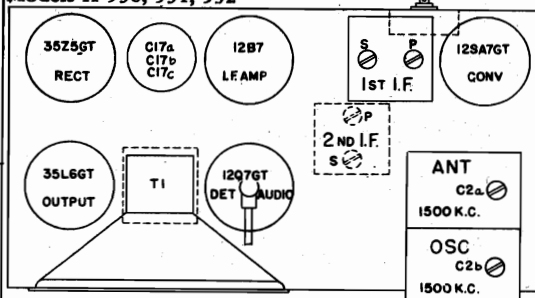
Fig. 6. Schematic Diagram
Models H-503, 530, 531, 532

Intermediate Frequency 455 KC

MODEL H502
MODELS H503, H530 to H532
GENERAL ELECTRIC CO.
Chassis Wiring, Trimmers
Parts List

| Stock No. | Description | List Price | Symbol | Description | List Price |
|-----------|--|------------|----------|---|------------|
| *RB-008 | BOARD—Terminal board (2 lug)..... | \$0.10 | RK-072 | KNOB—Control knob for Model H-531... | .20 |
| *RB-013 | BOARD—Terminal board (2 lug)..... | .10 | RL-518 | LOOP—Beam-a-Scope assembly (L-1)... | .80 |
| RB-179 | BRACKET—Bracket for "Beam-a-Scope" frame..... | .10 | RL-2018 | COIL—Oscillator coil (L-2)..... | .40 |
| RB-193 | BRACKET—Pilot light bracket for Model H-502..... | .05 | RM-505 | MASK—Drum dial felt masks for Model H-503..... | .05 |
| RB-194 | BRACKET—Pilot lamp bracket for Model H-503..... | .05 | *RQ-1215 | RESISTOR—15 ohms $\frac{1}{2}$ W. Carbon (R-12) (Pkg. 5)..... | .70 |
| RB-915 | BACK COVER—Cabinet back cover for Model H-502..... | 1.00 | *RQ-1223 | RESISTOR—33 ohms $\frac{1}{2}$ W. Carbon (R-11) (Pkg. 5)..... | .70 |
| RB-927 | BACK COVER—Cabinet back cover for Model H-503..... | .10 | *RQ-1239 | RESISTOR—150 ohms $\frac{1}{2}$ W. Carbon (R-8) (Pkg. 5)..... | .70 |
| RB-928 | BACK COVER—Cabinet back cover for Models H-530, 531, and 532..... | .10 | *RQ-1261 | RESISTOR—1200 ohms $\frac{1}{2}$ W. Carbon (R-9) (Pkg. 5)..... | .70 |
| *RC-011 | CAPACITOR—.002 mfd. 600 V. paper (C-1)..... | .25 | *RQ-1295 | RESISTOR—33,000 ohms $\frac{1}{2}$ W. Carbon (R-1) (Pkg. 5)..... | .70 |
| *RC-023 | CAPACITOR—.005 mfd. 600 V. paper (C-13)..... | .25 | *RQ-1323 | RESISTOR—470,000 ohms $\frac{1}{2}$ W. Carbon (R-4, 6, 7) (Pkg. 5)..... | .70 |
| *RC-039 | CAPACITOR—.01 mfd. 600 V. paper (C-15)..... | .25 | *RQ-1339 | RESISTOR—2.2 megohms $\frac{1}{2}$ W. Carbon (R-2) (Pkg. 5)..... | .70 |
| *RC-060 | CAPACITOR—.03 mfd. 600 V. paper (C-12)..... | .25 | *RQ-1365 | RESISTOR—15 megohms $\frac{1}{4}$ W. Carbon (R-5) (Pkg. 5)..... | .70 |
| *RC-072 | CAPACITOR—.05 mfd. 200 V. paper (C-10)..... | .25 | RR-351 | RESISTOR—100 ohms wire wound (R-10)..... | .20 |
| *RC-092 | CAPACITOR—.05 mfd. 600 V. paper (C-16)..... | .30 | *RS-238 | SOCKET—Octal tube socket..... | .15 |
| *RC-130 | CAPACITOR—.02 mfd. 400 V. paper (C-19)..... | .30 | RS-256 | SOCKET—Electrolytic mounting socket..... | .05 |
| *RC-216 | CAPACITOR—47 mmf. mica (C-4)..... | .25 | RS-258 | SOCKET—Pilot lamp socket..... | .25 |
| *RC-274 | CAPACITOR—330 mmf. mica (C-14)..... | .30 | RS-263 | SOCKET—12B7 tube socket..... | .15 |
| *RC-294 | CAPACITOR—470 mmf. mica (C-9)..... | .30 | RS-464 | SPRING—Tuning drum spring (Pkg. 10)..... | .05 |
| RC-676 | CAPACITOR—B band padder (C-11)..... | .35 | RS-1016 | SPEAKER—4-inch P.M. speaker for Models H-503, 530, 531 and 532 (L-5)..... | 3.35 |
| *RC-863 | CORD—Power cord..... | .65 | RS-1026 | SPEAKER—4-inch P.M. speaker for Model H-502 (L-5)..... | 3.25 |
| RC-5135 | CAPACITOR—30 mfd. 150 V., 40 mfd. 150 V., 20 mfd. 25 V., dry electrolytic (C-17a, 17b, 17c)..... | 1.15 | RT-322 | TRANSFORMER—2nd I.F. transformer (L-4)..... | 1.00 |
| RC-7019 | CONDENSER—Tuning condenser for Models H-502 and 503 (C-2a, 2b)..... | 2.05 | RT-343 | TRANSFORMER—1st I.F. transformer (L-3)..... | .95 |
| RC-7020 | CONDENSER—Tuning condenser for Models H-530, 531, and 532 (C-21a, 21b)..... | 2.05 | RT-465 | TRANSFORMER—Output transformer for Models H-503, 530, 531 and 532 (T-1)..... | 1.00 |
| RC-9013 | CONE ASSEMBLY—4-inch P.M. Cone Assembly for all models..... | .80 | RT-476 | TRANSFORMER—Output transformer for Model H-502 (T-1)..... | 1.30 |
| RD-140 | DIAL—Dial scale for Models H-502 and 503..... | .20 | RV-080 | VOLUME CONTROL—500,000 ohm volume control for Model H-502 (R-3)..... | .75 |
| RD-141 | DIAL—Dial scale for Models H-530, 531, and 532..... | .45 | RV-081 | VOLUME CONTROL—500,000 ohm volume control for Model H-503 (R-3)..... | .75 |
| RD-410 | DRUM—Tuning condenser drive drum for Model H-502..... | .20 | RV-082 | VOLUME CONTROL—500,000 ohm volume control for Models H-530, 531 and 532 (R-14)..... | .75 |
| RD-416 | DRUM—Tuning condenser drive drum for Model H-503..... | .35 | RZ-170 | CABINET—Brown Cabinet for Model H-502..... | 2.95 |
| *RG-016 | GRID CLIP—Control grid clip (Pkg. 5)..... | .10 | | | |
| RK-051 | KNOB—Control knob for Model H-502..... | .15 | | | |
| RK-057 | KNOB—Control knob for Model H-503..... | \$0.10 | | | |
| RK-071 | KNOB—Control knob for Models H-530 and 532..... | .20 | | | |

* Used on previous receivers.
 (Prices Subject to Change without Notice)

Trimmer Location
Models H-502, 503

Trimmer Location
Models H-530, 531, 532


GENERAL ELECTRIC CO.

MODEL HB504
MODEL HB505
Schematics

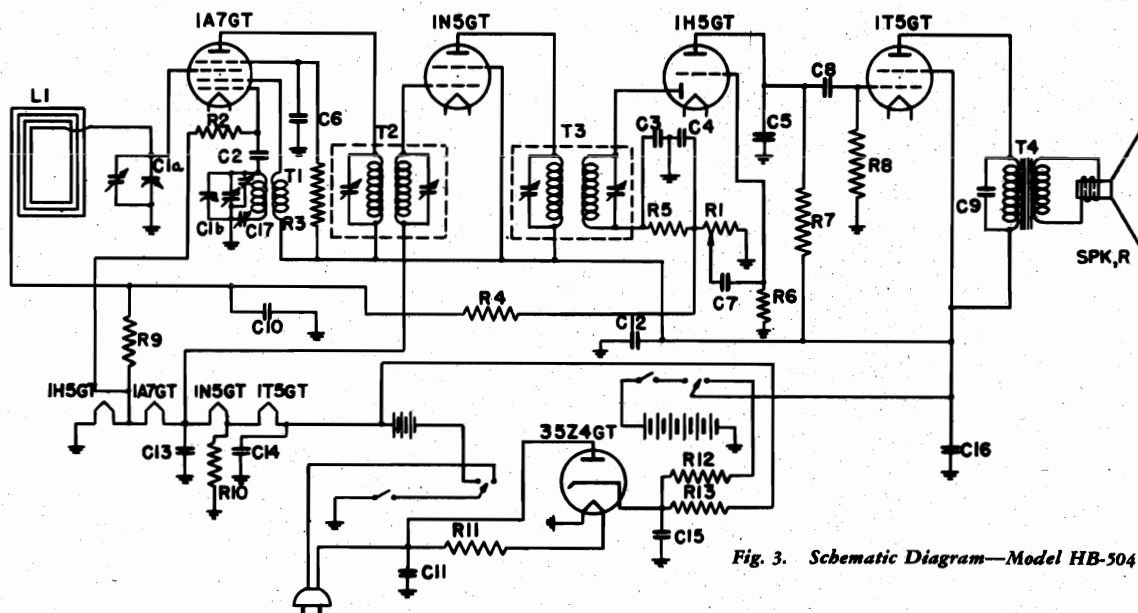


Fig. 3. Schematic Diagram—Model HB-504

| Symbol | Description | Symbol | Description | Symbol | Description |
|--------|----------------------------|--------|----------------------------------|--------|----------------------------------|
| C-1 | Tuning Condenser | C-13 | 0.1 mfd., Paper Capacitor | R-7 | 1.0 megohms, Carbon Resistor |
| C-2 | 50 mmf., Mica Capacitor | C-14 | 100 mfd., 15 V. Dry Electrolytic | R-8 | 3.0 megohms, Carbon Resistor |
| C-3 | 100 mmf., Mica Capacitor | C-15 | 50 mfd., 150 V. Dry Electrolytic | R-9 | 3.0 megohms, Carbon Resistor |
| C-4 | 100 mmf., Mica Capacitor | C-16 | 20 mfd., 150 V. Dry Electrolytic | R-10 | 1000 ohms, Carbon Resistor |
| C-5 | 100 mmf., Mica Capacitor | C-17 | 600 KC. Padding Capacitor | R-11 | 600 ohms, Cord Dropping Resistor |
| C-6 | .05 mfd., Paper Capacitor | L-1 | Beam-a-scope | R-12 | 3000 ohms, Carbon Resistor |
| C-7 | .001 mfd., Paper Capacitor | R-1 | 1.0 megohm, Volume Control | R-13 | 2500 ohms, Wire-wound Resistor |
| C-8 | .004 mfd., Paper Capacitor | R-2 | 200,000 ohms, Carbon Resistor | T-1 | Oscillator Coil |
| C-9 | .002 mfd., Paper Capacitor | R-3 | 70,000 ohms, Carbon Resistor | T-2 | 1st I.F. Transformer |
| C-10 | .05 mfd., Paper Capacitor | R-4 | 10 megohms, Carbon Resistor | T-3 | 2nd I.F. Transformer |
| C-11 | .05 mfd., Paper Capacitor | R-5 | 100,000 ohms, Carbon Resistor | T-4 | Output Transformer |
| C-12 | 0.1 mfd., Paper Capacitor | R-6 | 10 megohms, Carbon Resistor | | |

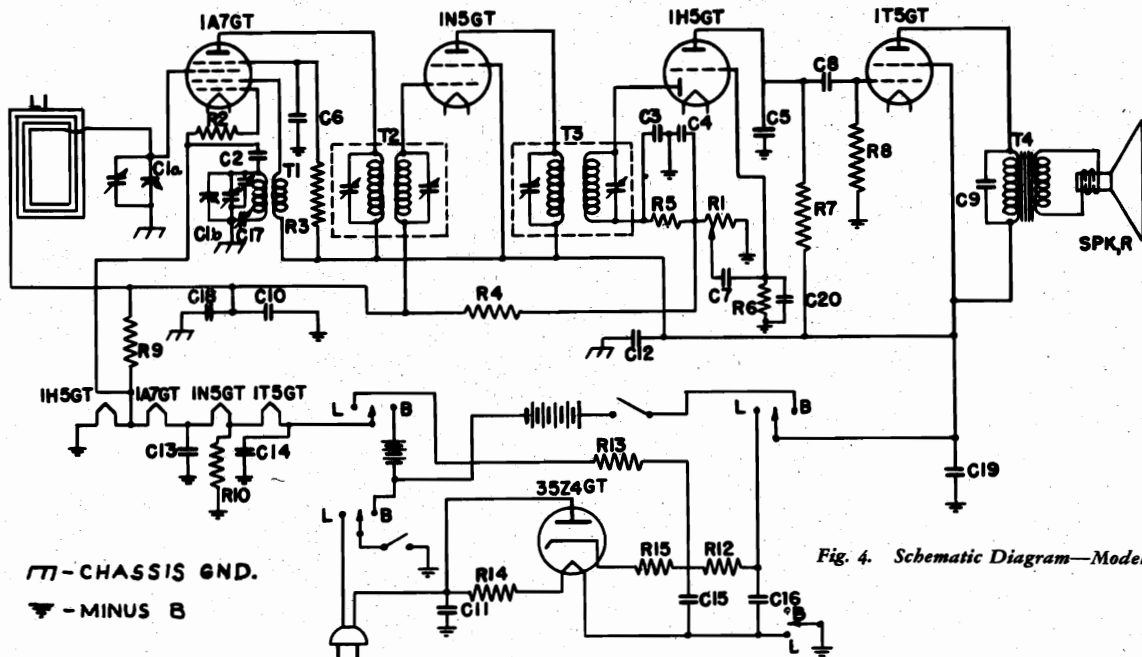


Fig. 4. Schematic Diagram—Model HB-505

/T1-CHASSIS GND.

- MINUS B

| Symbol | Description | Symbol | Description | Symbol | Description |
|--------|----------------------------|--------|----------------------------------|--------|--------------------------------|
| C-1 | Tuning Condenser | C-14 | 100 mfd., 15 V. Dry Electrolytic | R-6 | 10 megohms, Carbon Resistor |
| C-2 | 50 mmf., Mica Capacitor | C-15 | 50 mfd., 150 V. Dry Electrolytic | R-7 | 1.0 megohm, Carbon Resistor |
| C-3 | 100 mmf., Mica Capacitor | C-16 | 20 mfd., 150 V. Dry Electrolytic | R-8 | 3.0 megohms, Carbon Resistor |
| C-4 | 100 mmf., Mica Capacitor | C-17 | 600 KC. Padding Capacitor | R-9 | 3.0 megohms, Carbon Resistor |
| C-5 | 100 mmf., Mica Capacitor | C-18 | .25 mfd., Paper Capacitor | R-10 | 1000 ohms, Carbon Resistor |
| C-6 | .05 mfd., Paper Capacitor | C-19 | .05 mfd., Paper Capacitor | R-12 | 3000 ohms, Carbon Resistor |
| C-7 | .001 mfd., Paper Capacitor | C-20 | 100 mmf., Mica Capacitor | R-13 | 2500 ohms, Wire-wound Resistor |
| C-8 | .004 mfd., Paper Capacitor | L-1 | Beam-a-scope | R-14 | 50 ohms, Carbon Resistor |
| C-9 | .002 mfd., Paper Capacitor | R-1 | 1.0 megohm, Volume Control | R-15 | 50 ohms, Carbon Resistor |
| C-10 | .05 mfd., Paper Capacitor | R-2 | 200,000 ohms, Carbon Resistor | T-1 | Oscillator Coil |
| C-11 | .05 mfd., Paper Capacitor | R-3 | 70,000 ohms, Carbon Resistor | T-2 | 1st I.F. Transformer |
| C-12 | 0.1 mfd., Paper Capacitor | R-4 | 10 megohms, Carbon Resistor | T-3 | 2nd I.F. Transformer |
| C-13 | 0.1 mfd., Paper Capacitor | R-5 | 100,000 ohms, Carbon Resistor | T-4 | Output Transformer |

MODEL HB504

MODEL HB505

GENERAL ELECTRIC CO.

Voltage, Socket, Trimmers

Alignment, Notes

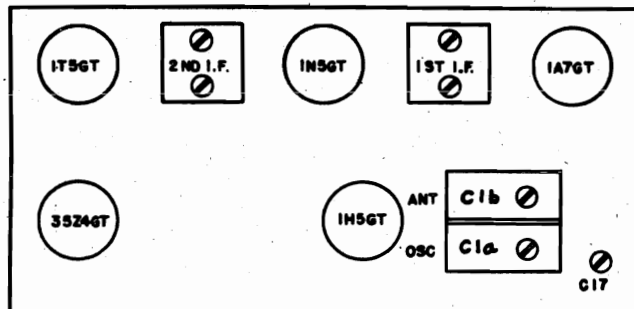


Fig. 1. Trimmer Location

Precaution: The Model HB-504 when used on an AC power supply will have one side of the chassis connected directly to the line. In order to prevent injury to the signal generator, if AC operated, or shock to the serviceman, use an isolating transformer between the convenience outlet and the receiver power cord.

Tubes

| | |
|-------------------------------|-----------|
| Converter and Oscillator..... | GE-1A7GT |
| I.F. Amplifier..... | GE-1N5GT |
| Det., Aud., AVC..... | GE-1H5GT |
| Power Output..... | GE-1T5GT |
| Rectifier..... | GE-35Z4GT |

SERVICE DATA**Physical Dimensions**

| | |
|-------------------------|-------------------|
| Models..... | HB-504 and HB-505 |
| Height..... | 9½ inches |
| Width..... | 13¼ inches |
| Depth..... | 6½ inches |
| Wt. with batteries..... | 16¾ lbs |

Tuning Control Drive Ratio..... 5:1

Electrical Specifications

- AC or DC Power Supply
105-125 Volts, 40-60 cycles on AC.
- Battery Power Supply
1.5 volt "A" supply, 90-volt "B" supply.
Recommended batteries for 300-hour life:
 - "A" supply—Eveready No. 718 or equivalent.
 - "B" supply—Eveready No. 762 or equivalent.

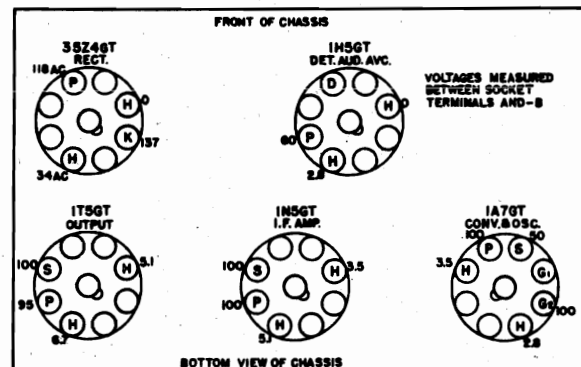
Tuning Frequency Range..... 540-1600 KC

Intermediate Frequency..... 455 KC

Maximum Power Output..... 175 milliwatts

Loud-speaker—"Alnico" Magnet Dynamic

Outside Cone Diameter—5 inches.
Voice Coil Impedance (400) cycles 4.6 ohms.



Line volts—118. No signal input.

When operated on a DC power supply, voltages are about 15% lower. Voltages measured with a 20,000 ohms per volt meter.

D—Diode Plate
G₁—Oscillator Grid
G₂—Oscillator Plate
H—Heater
K—Cathode
P—Plate
S—Screen

Fig. 2. Socket Voltages

GENERAL INFORMATION

The Models HB-504 and HB-505 are portable, five-tube, superheterodyne receivers which are designed to operate on any one of three types of power supplies as listed under electrical specifications. Features of design include automatic power selector switch, built-in Beam-a-scope, 5-inch "Alnico" magnet dynapower speaker and automatic volume control.

The automatic power selector switch operates as follows: When the door-cover at the side of the case is opened for the purpose of connecting the power cord to a convenience outlet, all batteries are automatically disconnected from the circuit. When the power cord is replaced and the door-cover is closed the radio is automatically returned to battery operation.

When operating from a DC source of power, it is necessary to insert the power plug with proper polarity; otherwise the receiver will fail to function. If any hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

ALIGNMENT PROCEDURE**Alignment Frequencies**

I.F.—455 KC Broadcast—1500 and 600 KC
The location of all trimmers is shown in Fig. 1.

General Alignment Notes

This receiver must be removed from the carrying case in order to perform the alignment. Special care must be exercised to place the batteries, Beam-a-scope and chassis in the same relative positions with respect to one another as these components occupied in the case, otherwise, alignment will not be satisfactory.

I.F. Alignment

With batteries, Beam-a-scope and chassis in position for alignment as mentioned above, connect an output meter across the voice coil. Rotate the volume control to maximum. Set test oscillator to 455 KC and apply signal to the control grid of the 1A7GT tube through a .05 mfd. capacitor. Do not remove the grid lead from the 1A7GT. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers for maximum output.

R.F. Alignment

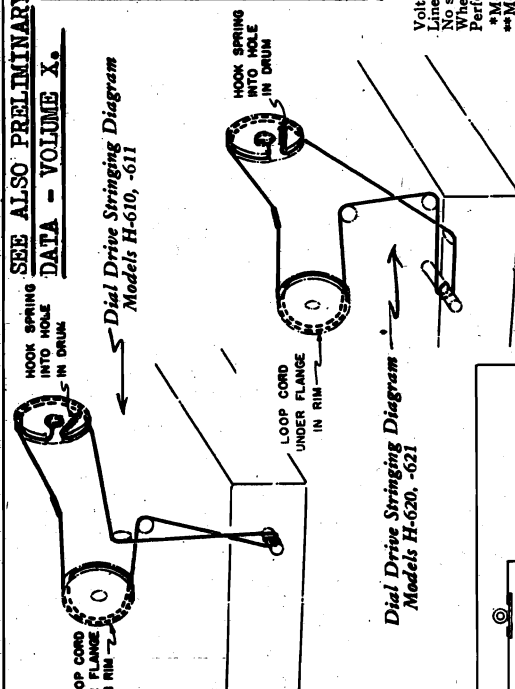
Place a coupling loop six inches from the receiver Beam-a-scope. Apply a 1500 KC signal to the coupling loop. Set pointer to 1500 KC and align the oscillator trimmer (C-1a). Peak (C-1b) for maximum output. Change test signal to 600 KC and with pointer in region of 600 KC peak (C-17) while rocking the gang condenser.

GENERAL ELECTRIC CO.

MODELS H600, H601, H610, H611
MODELS H620, H621 (W, X) Final
Chassis Wiring, Gain, Voltage
Dial Drive, Socket

SEE ALSO PRELIMINARY

DATA - VOLUME X.

**Special Service Information**

The following data will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

- (1) Stage Gains.
Antenna to Converter Grid..... 2.7 at 1000 K.C.
Converter Grid to 6SK7 Grid..... 28 at 455 K.C.
6SK7 Grid to 6SQ7 Diode Plate..... 87 at 455 K.C.

†Variations of +10%, -20% permissible.

- (2) Audio Gain.
.05 volts, 400 cycle signal across volume control with control set to maximum will give approximately ½ watt output at speaker.

- (3) DC voltage developed across oscillator grid leak averages 13 volts.

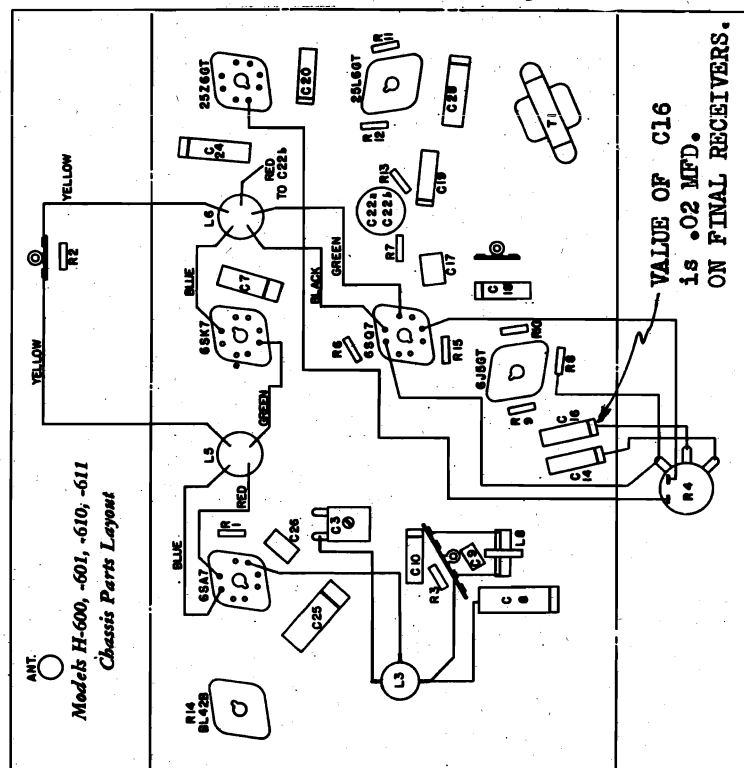
Power Consumption is 55 watts at 115 volts AC or DC . AC frequency 25 - 60 cycles.

Power Output at 117 volts line:-

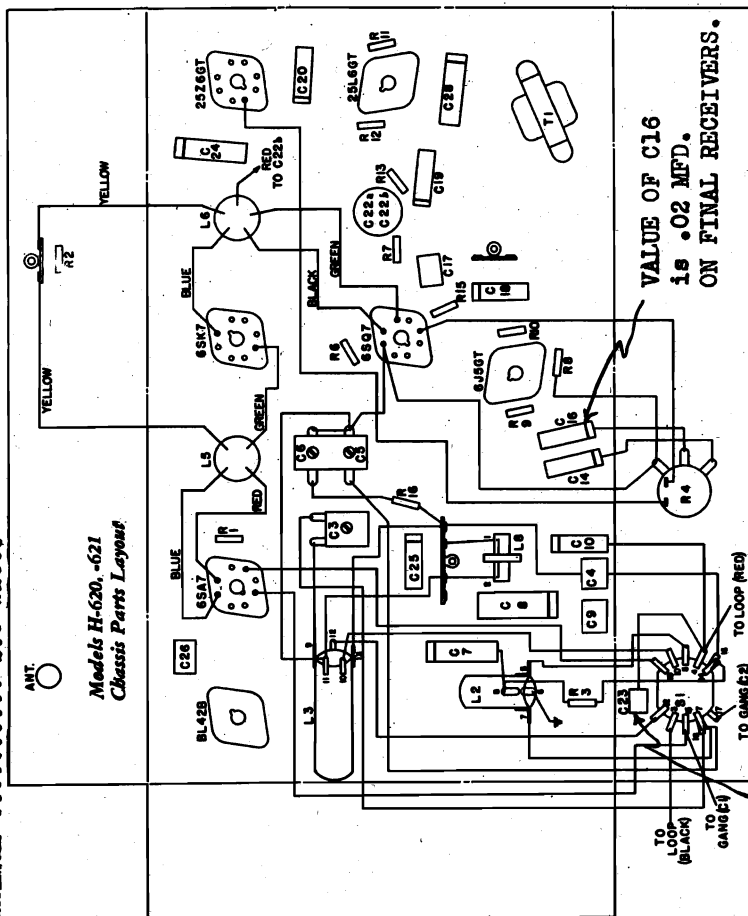
Undistorted..... 1.4 watt.

Maximum 2.5 watt.

Voltages measured between socket terminal and -B.
Line Voltage=115
No signal input—Volume control at maximum.
When operated on DC power supply, voltages are about 15% lower.
Perform measurements with a high resistance voltmeter.
*Measured on 10 volt scale of a 20,000 ohms per volt meter.
**Measured on 50 volt scale of a 20,000 ohms per volt meter.



VALUE OF C16
is .02 MFD.
ON FINAL RECEIVERS.



VALUE OF C16
is .02 MFD.
ON FINAL RECEIVERS.

C23 is added between C10 and S1 in series with the ground with ground on final receivers.

MODELS H600U, H610U, H620U
H630U, H632U

GENERAL ELECTRIC CO.

MODELS H600UW, H610UW, H620UW

MODELS H600UX, H610UX, H620UX

Chassis Wiring, Trimmers

Dial Drive Data

LOOP CORD
UNDER FLANGE
IN RIM

HOOK SPRING
INTO HOLE
IN DRUM

LOOP CORD
UNDER FLANGE
IN RIM

HOOK SPRING
INTO HOLE
IN DRUM

Fig. 4. Dial Drive Stringing Diagram
Models H-600U, 610U

Fig. 5. Dial Drive Stringing Diagram
Models H-620U, 630U, 632U

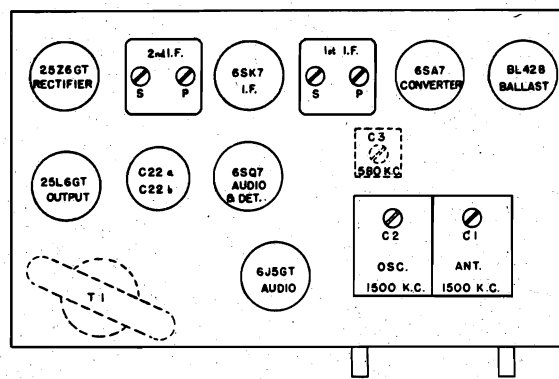
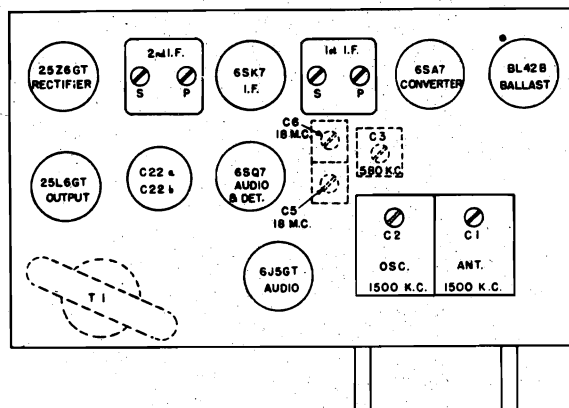


Fig. 2. Trimmer Location—Models H-620U, 630U, 632U

Fig. 1. Trimmer Location—Models H-600U, 610U

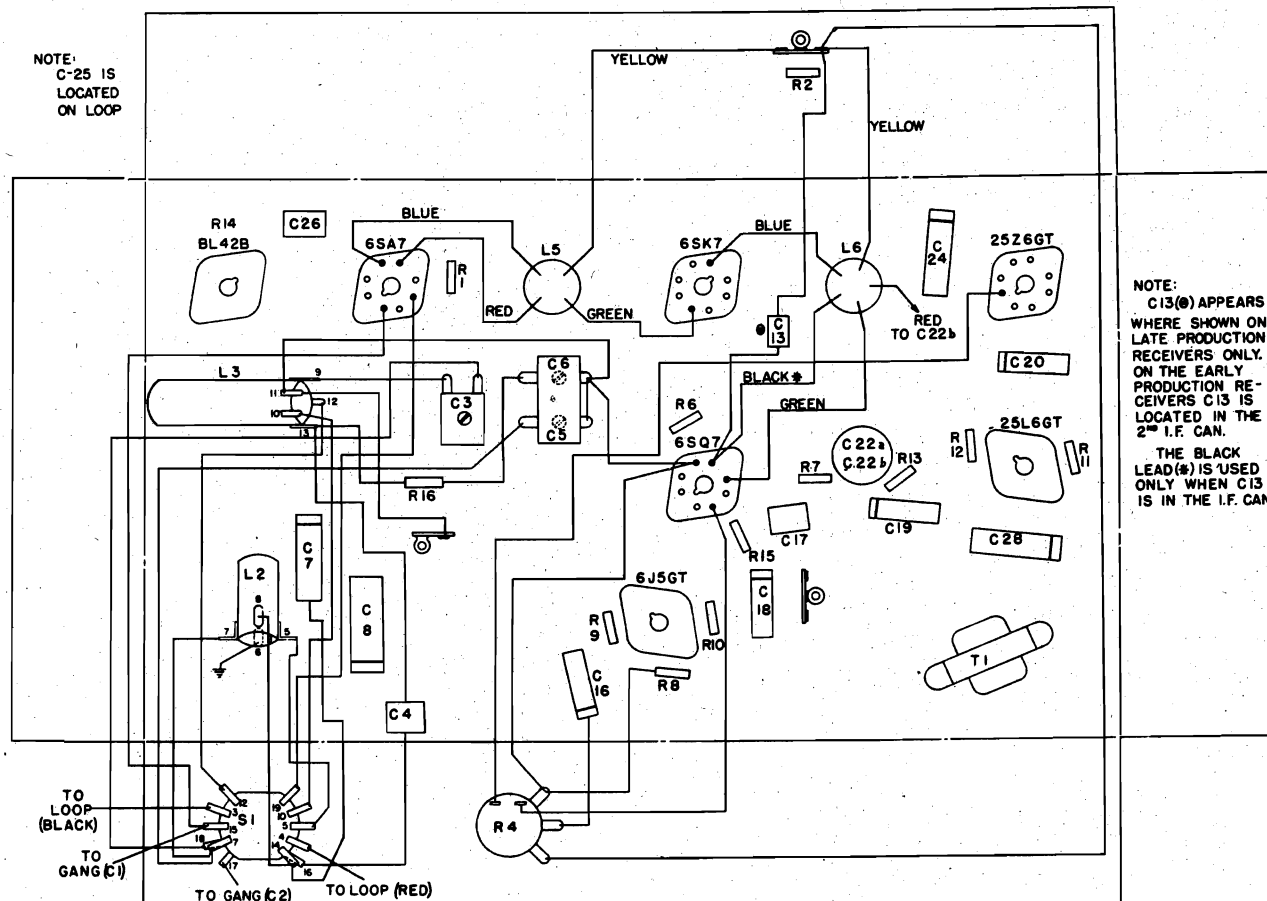


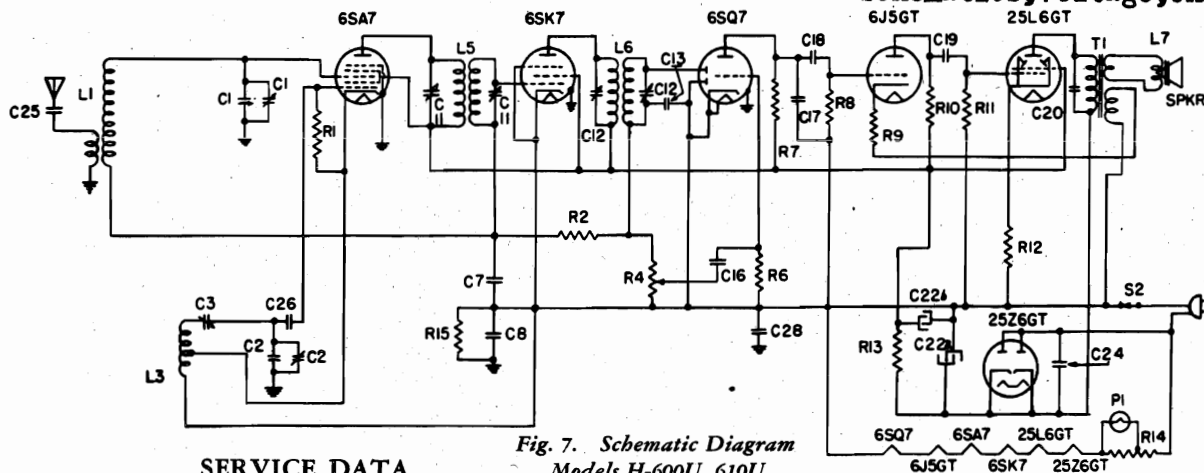
Fig. 6. Chassis Parts Layout for Models H-620U, 630U and 632U

(Chassis Parts Layout for Models H-600U and 610U are the same as above except for band switch, "D" band coils and associated parts which are omitted.)

GENERAL ELECTRIC CO

MODELS H600U, H610U, H620U (W, X)
H630U, H632U

Schematics, Voltage, Changes

Fig. 7. Schematic Diagram
Models H-600U, 610U

SERVICE DATA

Color Specifications

| Model | Color | Material |
|-----------------------|---------------|----------|
| H-600U, 610U, 620U | Mottled brown | Plastic |
| H-600UW, 610UW, 620UW | Ivory | Plastic |
| H-600UX, 610UX, 620UX | Onyx | Plastic |
| H-630U, 632U | Walnut | Wood |

Electrical Specifications

| Power Supply (Volts) | Frequency (Cycles on AC) | Power Consumption (Watts) |
|----------------------|--------------------------|---------------------------|
| 115 AC or DC | 25-60 | 55 |

Tuning Control Drive Ratio.....4:1

Tuning Frequency Range

| Models | H-600U, 610U | H620U, 630U, 632U |
|--------|---------------|----------------------------------|
| Range | 550-1600 K.C. | 550-1600 K.C. 5800-18000 K.C. |

Intermediate Frequency.....455 K.C.

Electrical Power Output (117 line volts)

| | |
|------------------|-----------|
| Undistorted..... | 1.4 watts |
| Maximum..... | 2.5 watts |

Loud-speaker—"Alnico" Magnetic Dynamic

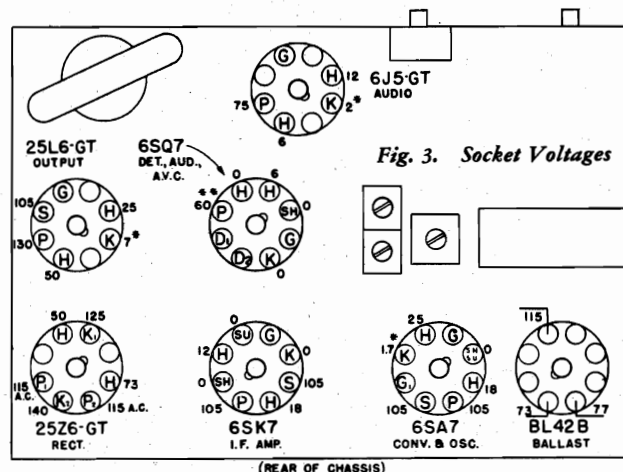
| | |
|--|----------|
| Outside Cone Diameter..... | 5 inches |
| Voice Coil Impedance (400 cycles)..... | 3.5 ohms |

Tubes

| | |
|-------------------------------|--------------|
| Converter and Oscillator..... | GE-6SA7 |
| I.F. Amplifier..... | GE-6SK7 |
| Det., Aud., AVC..... | GE-6SQ7 |
| 2nd Audio Amplifier..... | GE-6J5GT |
| Power Output..... | GE-25L6GT |
| Rectifier..... | GE-25Z6GT |
| Dial Lamp..... | MAZDA No. 44 |

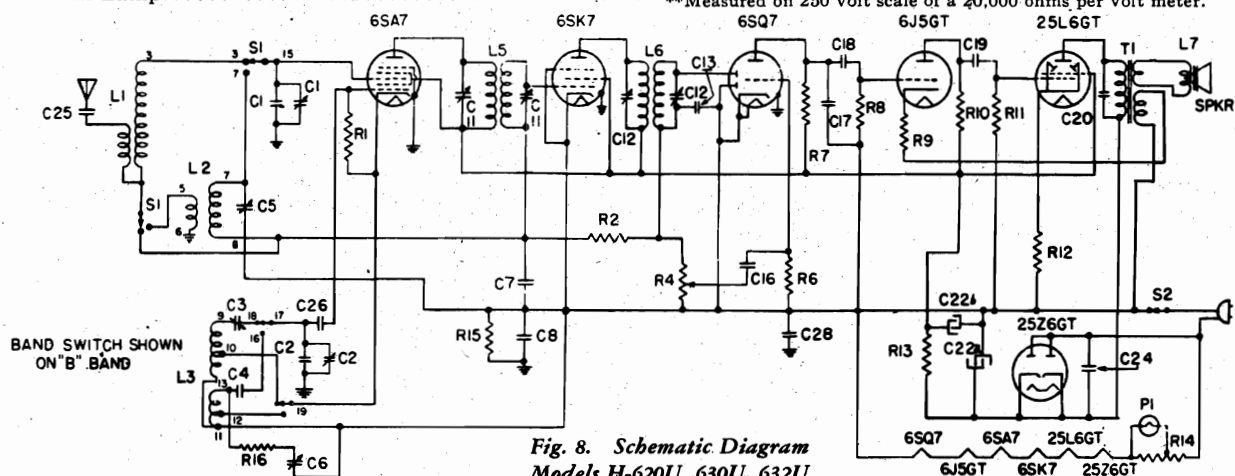
PRODUCTION CHANGES

In changing from Models H-601, 611, 621, 631 and 633 to Models H-600U, 610U, 620U, 630U, and 632U several hundred receivers were built of the former type but labeled with the "U" series labels. These receivers can be identified by a 2.0 megohm volume control. Service information on receivers with 2.0 megohm volume controls will be found in Service Notes for Models H-600U, 610U, and 620U (EARLY), and in Service Notes for Models H-630U and 632U (EARLY).



(REAR OF CHASSIS)

Volts measured between socket terminal and -B.
Line Volts—115.
No signal input—Volume control at maximum.
When operated on DC power supply, voltages are about 15% lower.
Perform measurements with a high resistance voltmeter.
*Measured on 10 volt scale of a 20,000 ohms per volt meter.
**Measured on 250 volt scale of a 20,000 ohms per volt meter.

Fig. 8. Schematic Diagram
Models H-620U, 630U, 632U

**MODELS H600U, H610U, H620U(W, X)
H630U, H632U**
Alignment, Gain, Coils, Parts

GENERAL ELECTRIC CO.

REPLACEMENT PARTS LIST
Models H-600U, 610U, 620U, 630U, and 632U
(W AND X MODELS INCLUDED)

| Stock No. | Description | List Price | Stock No. | Description | List Price | Stock No. | Description | List Price |
|-----------|--|------------|-----------|--|------------|-----------|--|------------|
| RA-313 | CONDENSER ASSEMBLY—Tuning condenser and drive unit complete (Model H-610U) | \$5.50 | RK-055 | KNOB—Control knob for all models in ivory, and Models H-630U, 632U (Pg. 5) | \$0.50 | RS-927 | SHAFT—Tuning shaft (Models H-600U, 610U) | \$0.05 |
| RA-314 | CONDENSER ASSEMBLY—Tuning condenser and drive unit complete with point-to-point wiring (Models H-620U, 630U, 632U) | 5.70 | RK-066 | KNOB—Control knob for all models in ivory, and Models H-630U, 632U (Pg. 5) | .45 | RS-929 | SHAFT—Tuning shaft (Models H-620U, 630U, 632U) | .10 |
| *RB-013 | BOARD—Terminal board (2 lug) | .10 | RK-209 | KEY—Station selector key (Models H-610U, 620U, 630U, 632U) | .15 | RS-1018 | SPEAKER—5 inch P.M. speaker with ivory and onyx (Pg. 5) | 2.50 |
| *RB-041 | BOARD—Terminal board (2 lug) | .10 | RK-211 | KEY—Station selector key (Models H-610U, 620U, 630U, 632U) | .15 | RS-1019 | SPEAKER—5 inch P.M. speaker (Model H-632U) | 3.40 |
| *RB-181 | BRACKET—Beam-a-Scope bracket (Models H-600U, 610U) | .50 | RL-098 | COIL—"D" band antenna coil (L-2) (Model H-610U, 620U, 630U) | .20 | RS-1809 | SHIELD—Dial lamp shield for models in ivory and onyx (Pg. 5) | .15 |
| RB-182 | BRACKET—Beam-a-Scope bracket (Models H-600U, 610U) | .50 | RL-320 | COIL—"D" band antenna coil (L-2) (Model H-610U, 620U, 630U) | .65 | RS-3036 | SWITCH—Band change switch | .80 |
| RB-626 | BACK COVER—Plastic cabinet back cover for plastic models in brown | 1.00 | RL-321 | COIL—"D" band antenna coil (L-2) (Model H-610U, 620U, 630U) | .80 | RT-1-928 | TRANSFORMER—1st I.F. transformer (L-5) | 1.00 |
| RB-918 | BACK COVER—Plastic cabinet back cover for plastic models in ivory | 1.00 | RL-322 | COIL—"D" band antenna coil (L-2) (Model H-610U, 620U, 630U) | .80 | RT-2-329 | TRANSFORMER—2nd I.F. transformer (L-6) | 1.20 |
| RB-919 | BACK COVER—Plastic cabinet back cover for plastic models in onyx | 1.00 | RL-323 | COIL—"D" band antenna coil (L-2) (Model H-610U, 620U, 630U) | .80 | RT-469 | TRANSFORMER—Output transformer (L-7) | 1.25 |
| RB-920 | BACK COVER—Plastic cabinet back cover for plastic models in brown | 1.00 | RL-324 | COIL—"D" band antenna coil (L-2) (Model H-610U, 620U, 630U) | .80 | RV-087 | VOLUME CONTROL—500,000 ohm volume control | .80 |
| RB-921 | BACK COVER—Plastic cabinet back cover for plastic models in onyx | 1.00 | RP-134 | PIN—Station selector key pin (Models H-610U, 620U, 630U, 632U) | .05 | RW-039 | WINDOW—Celluloid station letter window (All station key models) (Pg. 25) | .10 |
| RB-922 | BOARD—5 inch speaker terminal board (C-18, 19) | .15 | RP-141 | POINTER—Dial scale pointer (Model H-610U) (Pg. 5) | .10 | *RW-101 | WASHER—Control shaft felt washer (Pg. 10) | .05 |
| *RC-023 | CAPACITOR—.005 mfd., 600 V. paper (C-18, 19) | .05 | RP-142 | POINTER—Dial scale pointer (Model H-610U) (Pg. 5) | .10 | RX-035 | ASSEMBLY—Condenser mounting foot as shown (Key models) | \$0.15 |
| *RC-039 | CAPACITOR—.01 mfd., 600 V. paper (C-18, 19) | .25 | RP-143 | POINTER—Dial scale pointer (Model H-610U) (Pg. 5) | .10 | RX-061 | ASSEMBLY—Chassis mounting assembly (Models H-630U, 632U) | .10 |
| *RC-048 | CAPACITOR—.02 mfd., 600 V. paper (C-18, 19) | .30 | RP-307 | PULLEY—1/4 inch drive cord idler pulley (Models H-610U, 620U, 630U, 632U) | .25 | RZ-158 | CABINET—Plastic cabinet for Model H-600U | 3.60 |
| *RC-072 | CAPACITOR—.05 mfd., 200 V. paper (C-18, 19) | .30 | RP-308 | PULLEY—1/4 inch drive cord idler pulley (Models H-610U, 620U, 630U, 632U) | .25 | RZ-159 | CABINET—Plastic cabinet for Model H-610U | 5.50 |
| *RC-092 | CAPACITOR—.05 mfd., 600 V. paper (C-24) | .35 | RP-309 | PULLEY—1/4 inch drive cord idler pulley (Models H-610U, 620U, 630U, 632U) | .25 | RZ-160 | CABINET—Plastic cabinet for Model H-620U | 5.50 |
| *RC-123 | CAPACITOR—.01 mfd., 400 V. paper (C-4, 28) | .35 | *RQ-1235 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | RZ-161 | CABINET—Plastic cabinet for Model H-610U | 3.60 |
| *RC-216 | CAPACITOR—.01 mfd., 400 V. paper (C-4, 28) | .35 | *RQ-1236 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | RZ-162 | CABINET—Plastic cabinet for Model H-620U | 5.50 |
| *RC-220 | CAPACITOR—.01 mfd., 400 V. paper (C-4, 28) | .35 | *RQ-1237 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | RZ-163 | CABINET—Plastic cabinet for Model H-610U | 5.50 |
| *RC-276 | CAPACITOR—.01 mfd., 400 V. paper (C-4, 28) | .35 | *RQ-1238 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | RZ-164 | CABINET—Plastic cabinet for Model H-620U | 5.50 |
| *RC-747 | CONDENSER—Tuning condenser (C-1, 2) (Models H-620U, 630U, 632U) | 2.15 | *RQ-1239 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | RZ-165 | CABINET—Plastic cabinet for Model H-610U | 3.60 |
| RC-748 | CONDENSER—Tuning condenser (C-1, 2) (Model H-610U) | 4.15 | *RQ-1240 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | RZ-166 | CABINET—Plastic cabinet for Model H-620U | 5.50 |
| RC-749 | CONDENSER—Tuning condenser (C-1, 2) (Models H-620U, 630U, 632U) | 4.15 | *RQ-1241 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RC-893 | CLAMP—Power cord (Models H-620U, 630U, 632U) | .10 | *RQ-1242 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RC-1965 | CLAMP—Power cord (Models H-620U, 630U, 632U) | .10 | *RQ-1243 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RC-5136 | CAPACITOR—50 mfd., 150 V., 30 mfd., 150 V. dry electrolytic (C-22a, 22b) | 1.15 | *RQ-1244 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RC-6515 | CAPACITOR—50 mfd., 150 V., 30 mfd., 150 V. dry electrolytic (C-22a, 22b) | 1.15 | *RQ-1245 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RC-6517 | CAPACITOR—50 mfd., 150 V., 30 mfd., 150 V. dry electrolytic (C-22a, 22b) | 1.15 | *RQ-1246 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RC-8130 | CABLE—Tuning drive cable assembly (Models H-610U, 620U, 630U, 632U) | .30 | *RQ-1247 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RC-8131 | CABLE—Tuning drive cable assembly (Models H-610U, 620U, 630U, 632U) | .30 | *RQ-1248 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RC-8508 | CARD—Station letter card (Models H-610U, 620U, 630U, 632U) | .30 | *RQ-1249 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RC-9014 | CONE ASSEMBLY—Speaker cone assembly (Models H-600U, 610U, 620U, 630U, 632U) | .30 | *RQ-1250 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RD-114 | DIAL—Dial scale (Models H-620U, 630U, 632U) | .20 | *RQ-1251 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RG-302 | GROMMET—Tuning shaft drive cord surmount (Pg. 10) | .05 | *RQ-1252 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RH-111 | HAIRPIN—Tuning shaft hairpin (Pg. 10) | .05 | *RQ-1253 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |
| RK-064 | KNOB—Control knob for all models in brown (Pg. 3) | .45 | *RQ-1254 | RESISTOR—100 ohms, 1/4 W. carbon (R-12) (Pg. 5) | .70 | | | |

COIL RESISTANCE CHART

| Coil | Section | Resistance (Ohms) |
|----------------------|----------------|-------------------|
| "D" antenna coil | Primary | 1.2 |
| | Secondary | .04 |
| "B" oscillator coil | C-3 to minus B | 5 |
| "D" oscillator coil | C-4 to minus B | 1.2 |
| 1st I.F. transformer | Primary | 32.4 |
| | Secondary | 32.4 |
| 2nd I.F. transformer | Primary | 32.4 |
| | Secondary | 32.4 |
| Output transformer | Primary | 194 |
| | Secondary | .4 |

*Used on previous models.
†Variations of +10% -20% permissible.
‡Prices Subject to Change without Notice.

GENERAL INFORMATION

The above listed models are compact six-tube AC-DC superheterodyne receivers employing General Electric Pre-tested Tubes. Features of design include the built-in "Beam-a-Scope," 5-inch Dynapower speaker, single-ended tubes in the R.F. and I.F. sections, and automatic volume control. Models H-620U (W & X inc.), H-630U and H-632U incorporate four "Feather-touch Tuning" keys and an additional frequency band permitting short-wave reception. All models are fully equipped with the standard "Feather-touch" tuning keys, and the "Beam-a-Scope" feature. Models are available in ivory or onyx. Models in ivory or onyx indicate cabinet colors are in ivory or onyx respectively. When operating from a DC source of power, it is necessary to insert the power plug with the proper polarity; otherwise, the receiver will fail to function. When the power plug in the receiver is used on AC, reverse the power plug in the receptacle.

ALIGNMENT PROCEDURE

Alignment Frequencies

I.F.—455 K.C. R.F.—1500 and 580 K.C.
The location of trimmers for the above models are shown in their respective diagrams, Figs. 1 and 2.

I.F. Alignment

Connect an output meter across the voice coil. Rotate the variable capacitor until the meter indicates maximum output. Completely close the gang condenser plates and set the dial pointer to the first dial mark at the low end of the scale. Turn the band switch to "B" band on the two band receivers. C and apply signal to the set test oscillator. Adjust the 68K grid leak through a .05 mfd. capacitor. Do not remove the 68K grid lead. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers for maximum meter reading.

R.F. Alignment

(1) All models.

Apply a 1500 K.C. signal either through a standard I.F. alignment loop or through a standard R.F. alignment loop connected to the generator output which can be magnetically coupled to the receiver (C-1) for maximum output. Change signal to 580 K.C. and tune receiver to signal. Peak (C-3) on the 580 K.C. signal by rocking the gang condenser. Retrim at 1500 K.C.

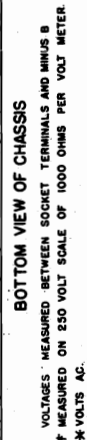
(2) Models H-620U, 630U and 632U.

Turn the band switch to "B" band after aligning on 580 K.C. signal. Then tune to 1500 K.C. signal. The image of the 18 M.C. signal should be heard at approximately 17 M.C.

Special Service Information

The following data will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

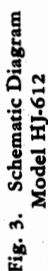
- (1) Stage Gains.
Antenna to Converter Grid.....2.7 at 1000 K.C.
Converter Grid to 6SK7 Grid.....28 at 455 K.C.
6SK7 Grid to 6SQ7 Diode Plate.....87 at 455 K.C.
- (2) Audio Gain.
.05 volts, 400 cycle signal across volume control with control set to maximum will give approximately 1/2 watt output at speaker.
- (3) DC voltage developed across oscillator grid leak averages 18 volts.



LINE VOLTS = 117 AC. GANG CLOSED MAX. VOLUME
SPECIAL SERVICE INFORMATION

The following data will be very useful to servicemen equipped with vacuum-tube voltmeters or similar voltage measuring instruments.

- | | Stage Gains | Gain \uparrow |
|-----|---|-----------------|
| (1) | Antenna Post to Converter Grid..... | 27 at 1000 KC |
| | Converter Grid to 6SK7 Grid..... | 2.8 at 455 KC |
| | 6SK7 Grid to 6Q7GT Diode Plate..... | .87 at 455 KC |
| (2) | Audio Gain | |
| | A 400-cycle signal of .05 volts across volume control will give approximately $\frac{1}{2}$ -watt speaker output. (Volume control turned to maximum.) | |
| (3) | DC voltage developed across oscillator grid resistor (R-1) averages 13 volts at 1000 KC. Variation of $\pm 10\%$, -20% permissible. | 1-40 |



Tubes

- | | |
|-------------------------------|-------------------|
| Converter and Oscillator..... | GE-6SA7/6SA7GT |
| I.F. Amplifier..... | GE-6SK7GT |
| Det., Aud., AVC..... | GE-6Q7GT/6Q7G/6Q7 |
| 2nd Audio Amplifier..... | GE-615GT/615G |
| Power Output..... | GE-25L6GT |
| Rectifier..... | GE-25Z6GT/25Z6G |

| Power Supply Volts | Frequency (Cycles on AC) | Power Consumption (Watts) |
|-----------------------|-----------------------------|---------------------------------|
| 115 AC or DC | 25-60 | 50 |

Electrical Power Output (117 Line Volts)

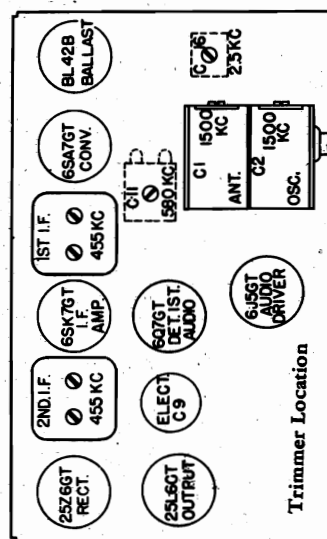
| | |
|------------------|-----------|
| Undistorted..... | 1.4 watts |
| Maximum..... | 2.5 watts |

Maximum
Tuning Frequency Range

| | |
|----------------|--------------|
| 3and "B" | 540-1620 KC |
| 3and "C" | 1550-3500 KC |

Loud-speaker—"Alnico" Magnet Dynamic

| | |
|--|----------|
| Outside Cone Diameter..... | 5 inches |
| Voice Coil Impedance (400 cycles)..... | 3½ ohms |



PARTS LIST

- | | | |
|----|----------------------------------|---|
| 1 | Antenna section tuning condenser | R |
| 2 | Antenna section tuning condenser | R |
| 3 | 0.05 Mfd. paper capacitor | R |
| 4 | 0.05 Mfd. paper capacitor | R |
| 5 | 0.05 Mfd. paper capacitor | R |
| 6 | 0.05 Mfd. paper capacitor | R |
| 7 | 0.05 Mfd. paper capacitor | R |
| 8 | 0.05 Mfd. paper capacitor | R |
| 9 | 0.01 Mfd. paper capacitor | R |
| 10 | 150 V. dry electrolytic | R |
| 11 | 0.01 Mfd. paper capacitor | R |
| 12 | 300-675 Mfd. paper capacitor | R |
| 13 | 0.03 Mfd. paper capacitor | R |
| 14 | 0.03 Mfd. mica capacitor | R |
| 15 | 470 Mfd. mica capacitor | R |
| 16 | 220 Mfd. mica capacitor | R |
| 17 | 470 Mfd. mica capacitor | R |
| 18 | 5-40 Mmf. "C" antenna trimmer | R |
| 19 | 50-135 Mmf. I.F. trimmer | R |
| 20 | 50-135 Mmf. I.F. trimmer | R |
| 21 | 50-135 Mmf. I.F. trimmer | R |
| 22 | 50-135 Mmf. I.F. trimmer | R |
| 23 | Beam-A-Scope | R |
| 24 | Oscillator coil | R |
| 25 | 1st I.F. transformer | R |
| 26 | 2nd I.F. transformer | R |
| 27 | "C" band antenna coil | R |
| 28 | Dial lamp, MAZDA No. 44 | R |
| 29 | 2.2 megohms carbon resistor | R |
| 30 | 2.2 megohms carbon resistor | R |

GENERAL INFORMATION

The Model HJ-612 is a compact 6-tube AC-DC superheterodyne receiver employing General Electric Pre-tested 7 tubes. Features of design include built-in Beam-a-Scope, airplane-type dial, broadcast and police-amateur-aircraft coverage, and automatic volume control.

When operating from a DC source of power it is necessary to insert the power plug with the proper polarity; otherwise, the receiver will fail to function. If excessive hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.

ALIGNMENT PROCEDURE

ALIGNMENT PROCEDURE
I.F.F. Connect an output meter across the voice coil. Rotate the volume control to maximum. Completely close the gang condenser plates and set the dial pointer to the first dial mark at the low end of the scale. Throw the band switch to "BC" (uv).

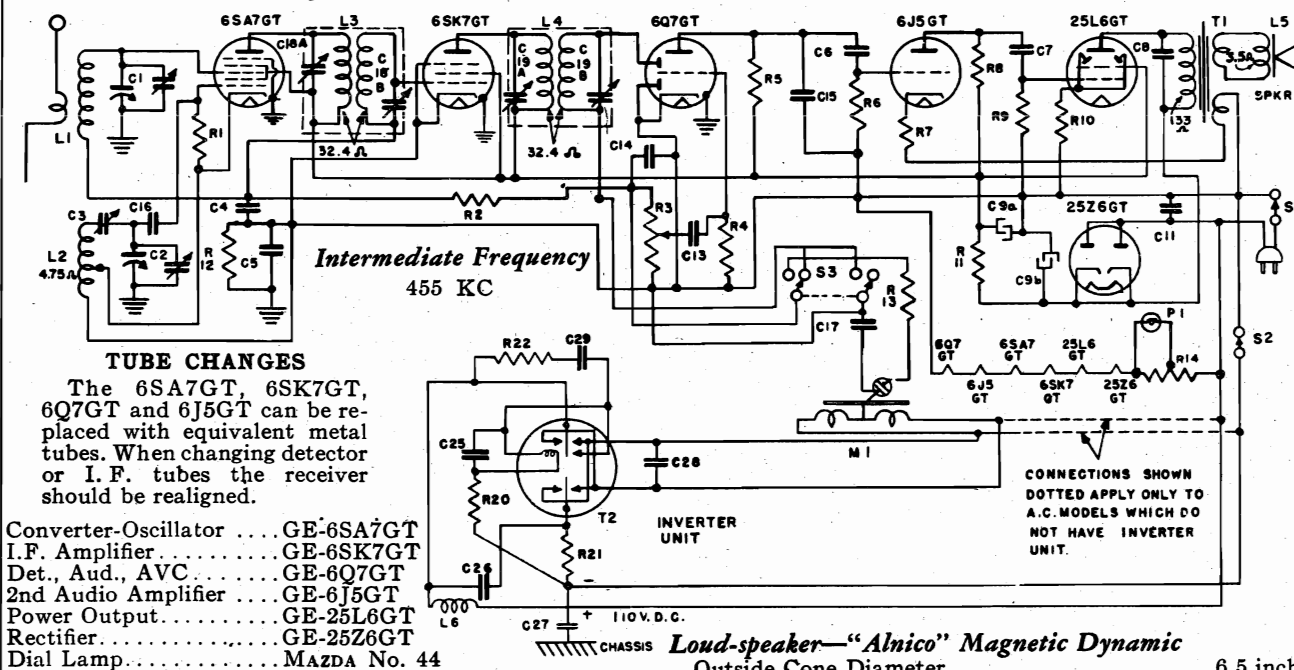
Set test oscillator to 455 KC and apply signal to the control grid of the 6SA7 tube through a .05 mfd. capacitor. Do not remove the 6SA7 grid lead. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all μ F. trimmers for maximum meter reading.

all I.F. trimmers for maximum meter reading. Apply a 1500 KC signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the signal generator output which can be magnetically coupled to the receiver Beam-a-Scope. When using an I.R.E. dummy antenna for R.F. alignment do not connect a ground lead between the signal generator and the receiver. Align (C-2) at 1500 KC and peak (C-1) for maximum output. Change signal to 580 KC and tune receiver to signal. Peak (C-11) on the 580 KC signal by rocking the gang condenser. Retrim at 1500 KC. Throw the band switch to "SW" band. Peak (C-16) on 2500 KC.

MODELS HJ618AC, HJ618DC
Schematic, Voltage, Gain
Alignment, Trimmers, Socket

GENERAL ELECTRIC CO.

MODELS HJ624, HJ628
Alignment



GENERAL INFORMATION

Models HJ-618 AC and HJ-618 DC are compact, table-model, radio-phonograph combinations using six General Electric Pre-tested Tubes in a superheterodyne circuit. Model HJ-618 AC is designed to operate on a 60-cycle source of power as shown under electrical specifications. Model HJ-618 DC incorporates the same chassis and phonograph as the Model HJ-618 AC but includes in addition an inverter unit which will allow operation on a DC source of power.

Phonograph

Type Pick-up Crystal
 Turntable Speed 78 R.P.M.

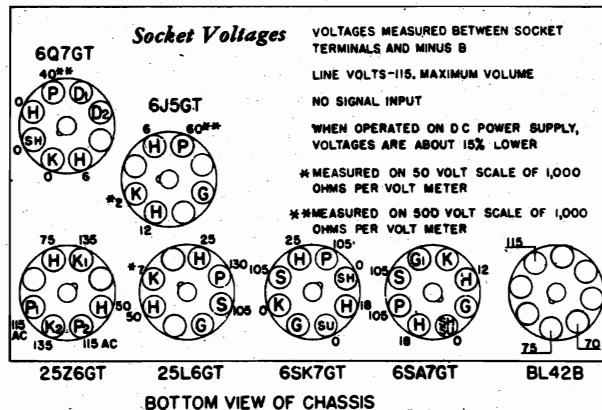
Special Service Information

The following data will be very useful to servicemen equipped with vacuum-tube voltmeters or similar voltage-measuring instruments.

- (1) Stage Gains
 Antenna Post to Converter Grid—4 at 1000 KC†
 Converter Grid to 6SK7GT Grid—30 at 455 KC†
 6SK7GT Grid to 6Q7GT Det. Plate—100 at 455 KC†
- (2) Audio Gains
 .06 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½-watt speaker output.
- (3) DC voltage developed across oscillator grid resistor (R-1) averages 12 volts.

† Variations of + 10%, -20% permissible.

FRONT OF CHASSIS



Loud-speaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter 6.5 inches
 Voice Coil Impedance (400 cycles) 3.5 ohms

NOTE—In no case should the magnet be removed from the assembled position without remagnetizing after replacing it.

| Model | Power Supply (Volts) | Frequency (Cycles on AC) | Power Consumption (Watts) |
|-----------|----------------------|--------------------------|---------------------------|
| HJ-618 AC | 115 AC | 60 | 75 |
| HJ-618 DC | 115 DC | | 85 |

Electrical Power Output

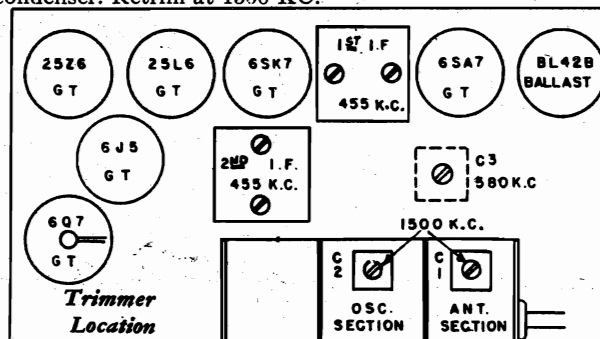
Undistorted 2.0 watts
 Maximum 2.5 watts

ALIGNMENT PROCEDURE

I.F. Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the grid of the 6SK7GT through a .05 mfd. capacitor and align the 2nd I.F. transformer. Repeat the procedure, applying the 455 KC signal to the control grid of the 6SA7GT and aligning the 1st I.F. transformer. Finish by over-all adjustments.

R.F. With gang condenser plates completely closed, set dial pointer to the first mark at the left end of the scale. Apply a 1500 KC signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the generator output which can be magnetically coupled to the receiver Beam-a-Scope. Align (C-2) at 1500 KC and peak (C-1 on HJ-628) or (C-20 on HJ-624) for maximum output. Peak (C-3) on 580 KC while rocking the gang condenser. Retrim at 1500 KC.



GENERAL ELECTRIC CO.

MODELS HJ-624 AND HJ-628

SERVICE DATA

Electrical Specifications

| Model | Rating | Power Supply (Volts) | Frequency (Cycles on AC) | Power Consumption (Watts) |
|--------|--------|----------------------|--------------------------|---------------------------|
| HJ-624 | | 115 AC or DC | 25-60 | 50 |
| HJ-628 | A6 | 115-125 | 60 | 75 |
| | A5 | 115-125 | 50 | 75 |
| | C2 | 115-125 | 25 | 90 |

Electrical Power Output

| | |
|------------------|-----------|
| Undistorted..... | 2.0 watts |
| Maximum..... | 2.5 watts |

Phonograph

| | |
|----------------------|-----------|
| Model..... | HJ-628 |
| Type Pick-up..... | Crystal |
| Turntable Speed..... | 78 R.P.M. |

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs centering it will be necessary to replace the entire cone and voice coil assembly.

NOTE—In no case should the magnet be removed from the assembled position without remagnetizing after replacing it.

MODELS HJ-618 AC and HJ-618 DC HJ-624 HJ-628

H-639 AC AND H-639 DC

| Stock No. | Description | List Price |
|-------------------------|---|------------|
| CHASSIS ASSEMBLY | | |
| *RB-908 | BOARD—Terminal board (2 lug)..... | \$0.10 |
| *RB-046 | BOARD—Terminal board (5 lug)..... | .15 |
| RB-186 | BRACKET—Volume control bracket..... | .10 |
| *RC-023 | CAPACITOR—.005 mfd. 600 V. paper (C-6, 7)..... | .25 |
| *RC-039 | CAPACITOR—.01 mfd. 600 V. paper (C-8)..... | .25 |
| *RC-060 | CAPACITOR—.03 mfd. 600 V. paper (C-13)..... | .25 |
| *RC-072 | CAPACITOR—.05 mfd. 200 V. paper (C-4)..... | .25 |
| *RC-092 | CAPACITOR—.05 mfd. 600 V. paper (C-11)..... | .30 |
| *RC-123 | CAPACITOR—.01 mfd. 400 V. paper (C-17)..... | .35 |
| *RC-130 | CAPACITOR—.02 mfd. 400 V. paper (C-5)..... | .30 |
| *RC-216 | CAPACITOR—.47 mmf. mica (C-16)..... | .25 |
| *RC-250 | CAPACITOR—.220 mmf. mica (C-15)..... | .25 |
| RC-293 | CAPACITOR—.470 mmf. mica (C-14)..... | .30 |
| *RC-863 | CORD—Power cord..... | .65 |
| RC-1995 | CLAMP—Oscillator coil clamp (Pkg. 5)..... | .10 |
| RC-5145 | CAPACITOR—.30 mfd. 150 V., 50 mfd. 150 V., dry electrolytic (C-9a, 9b)..... | .75 |
| RC-6515 | CAPACITOR—"B" band padder (C-3)..... | .30 |
| RC-6530 | CAPACITOR—Antenna trimmer (Model HJ-624)..... | .95 |
| RC-9009 | CONE ASSEMBLY—14-inch speaker cone assembly (Model HJ-628)..... | .95 |
| RC-9010 | CONE ASSEMBLY—Speaker cone assembly (Model HJ-624, H-639AC, H-639DC)..... | \$0.90 |
| RC-9010 | CONE ASSEMBLY—Speaker cone assembly, Models HJ-618 AC and HJ-618 DC..... | .90 |
| RE-068 | ESCUTCHEON—Dial scale escutcheon..... | .65 |
| RE-072 | ESCUTCHEON—Station letter escutcheon (Model HJ-628)..... | .10 |
| *RG-016 | GRID CLIP—Tube control grid clip (Pkg. 5)..... | .90 |
| RL-516 | LOOP—Beam-a-Scope assembly (L-1) (Model HJ-628)..... | .90 |
| RL-523 | LOOP—Beam-a-Scope and cabinet back assembly (Model HJ-624)..... | \$1.00 |
| RL-528 | LOOP—Beam-a-Scope and cabinet back assembly (L-1) HJ-618AC, HJ-618DC..... | \$1.00 |
| RL-2016 | COIL—Oscillator coil (L-2)..... | .25 |
| RN-102 | NEEDLE CUP—Phonograph needle cup..... | .10 |
| *RQ-1239 | RESISTOR—150 ohms 1/2 W. carbon (R-10) (Pkg. 5)..... | .70 |
| *RQ-1271 | RESISTOR—3300 ohms 1/2 W. carbon (R-7) (Pkg. 5)..... | .70 |
| *RQ-1295 | RESISTOR—33,000 ohms 1/2 W. carbon (R-1) (Pkg. 5)..... | .70 |
| *RQ-1297 | RESISTOR—39,000 ohms 1/2 W. carbon (R-8) (Pkg. 5)..... | .70 |
| *RQ-1307 | RESISTOR—100,000 ohms 1/2 W. carbon (R-13) (Pkg. 5)..... | .70 |
| *RQ-1323 | RESISTOR—470,000 ohms, 1/2 W. carbon (R-5, 9, 12) (Pkg. 5)..... | .70 |
| *RQ-1331 | RESISTOR—1.0 megohm 1/2 W. carbon (R-6) (Pkg. 5)..... | .70 |
| *RQ-1339 | RESISTOR—2.2 megohms 1/2 W. carbon (R-2) (Pkg. 5)..... | .70 |
| *RQ-1365 | RESISTOR—15 megohms 1/2 W. carbon (R-4) (Pkg. 5)..... | .70 |
| *RQ-1459 | RESISTOR—1000 ohms 1 W. carbon (R-11)..... | .20 |
| RR-773 | RESISTOR—BL-42B ballast resistor (R-14)..... | .40 |
| *RS-238 | SOCKET—Octal tube socket..... | \$0.15 |
| RS-261 | SOCKET—Pilot lamp socket assembly..... | .20 |
| RS-1012 | SPEAKER—6 1/4-inch Alnico magnet dynamic speaker..... | 3.25 |

HJ-624, HJ-618AC, HJ-618DC, H-639AC, H-639DC

MODELS HJ618AC, HJ618DC
MODELS HJ624, HJ628
MODELS H-639AC, H-639DC
Parts, Phono Switch

| | | |
|---------|---|------|
| RS-1014 | SPEAKER—14-inch Alnico magnet dynamic speaker (Model HJ-628)..... | 6.00 |
| RT-341 | TRANSFORMER—1st I.F. transformer (L-3)..... | .80 |
| RT-342 | TRANSFORMER—2nd I.F. transformer (L-4)..... | .80 |
| RT-475 | TRANSFORMER—Output transformer (T-1)..... | 1.00 |
| RT-954 | TERMINAL—Speaker contact terminal (Pkg. 10)..... | .10 |
| RV-078 | VOLUME CONTROL—.05 megohm volume control (R-3)..... | .80 |
| RX-062 | ASSEMBLY—Speaker mounting assembly..... | .16 |

CONDENSER AND DIAL SCALE

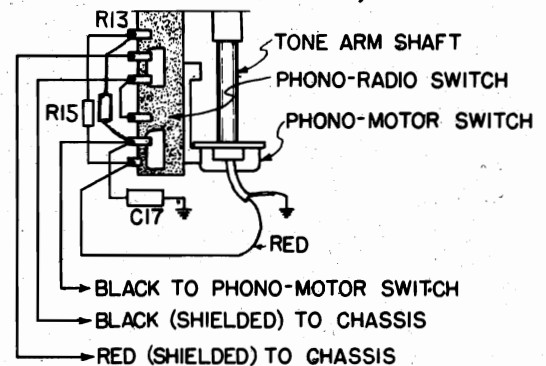
| | | |
|---------|---|------|
| RC-7017 | CONDENSER—Tuning condenser and reflector assembly (C-1, 2)..... | 5.80 |
| RD-415 | DRUM—Tuning or volume control drum..... | .20 |
| RF-752 | FASTENER—Dial and window snap fastener (Pkg. 25)..... | .10 |
| RK-209 | KEY—Feathertouch tuning key for extreme left station selector..... | .15 |
| RK-214 | KEY—Feathertouch tuning key for all station selectors except for one on left..... | .10 |
| RL-937 | BINDING LUG—Station pin binding lug (Pkg. 10)..... | .10 |
| RP-154 | PIN—Station key adjusting pin (Pkg. 10)..... | .10 |
| RP-155 | POINTER—Dial scale pointer..... | .15 |
| RP-156 | PLATE—Reflector plate..... | .10 |
| RP-313 | PULLEY—Wooden idler pulley..... | .05 |
| RP-314 | PULLEY—Pointer drive pulley and "C" washer..... | .15 |
| RS-464 | SPRING—Drum tension spring (Pkg. 10)..... | .05 |
| RS-470 | SPRING—Drive cord idler pulley tension spring..... | .05 |
| RW-043 | WINDOW—Dial scale window..... | .15 |

tone arm and switch assembly

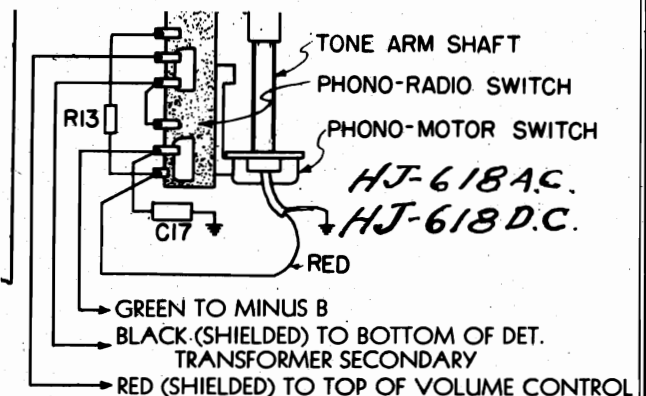
Except Model HJ-624

| | | |
|----------|---|------|
| *RC-123 | CAPACITOR—.01 mfd. 400 V. paper (C-17)..... | .35 |
| RP-505 | PICKUP—Crystal pickup and leads..... | 5.40 |
| *RQ-1307 | RESISTOR—100,000 ohms 1/2 W. carbon (R-13) (Pkg. 5)..... | .70 |
| *RQ-1315 | RESISTOR—220,000 ohms 1/2 W. carbon (R-15) (Pkg. 5)..... | .70 |
| RS-472 | SNAP RING—Tone arm spindle snap ring..... | .10 |
| *RS-854 | SCREW—Motor power switch set screw (Pkg. 10)..... | .25 |
| RS-876 | SCREW—Needle clamping screw..... | .25 |
| RS-1810 | SHIELD—Phono motor power switch shield..... | .15 |
| RS-3051 | SWITCH—Motor power switch and set screw assembly..... | .60 |
| RS-3052 | SWITCH—Phono switch, mounting plate and bushing assembly..... | 2.15 |
| RT-917 | TONE ARM—Tone arm and pivot assembly..... | 3.75 |

(continued)



HJ-624
Fig. 3. Phono-Radio Switch Assembly



HJ-618AC, HJ-618DC
Fig. 3. Phono-Radio Switch Assembly

MODELS HJ618AC, HJ618DC

MODELS HJ624, HJ628

MODELS H639AC, H639DC

Turntable Parts

GENERAL ELECTRIC CO.

INVERTER ASSEMBLY
(Except Model HJ-624)

(continued)

(Used only on special installations)

| | | |
|----------|---|------|
| *RB-008 | BOARD—Terminal board (2 lug) | .10 |
| *RB-013 | BOARD—Terminal board (2 lug) | .10 |
| *RC-039 | CAPACITOR—.01 mfd. 600 V. paper (C-27) | .25 |
| *RC-123 | CAPACITOR—.01 mfd. 400 V. paper (C-25, 29) | .35 |
| RC-159 | CAPACITOR—.05 mfd. 200 V. paper (C-26) | .40 |
| RC-5147 | CAPACITOR—.05 mfd. 200 V. line capacitor (C-28) | .45 |
| RL-347 | CHOKE—4 uh vibrator choke (L-6) | .30 |
| *RQ-1243 | RESISTOR—220 ohms $\frac{1}{2}$ W. carbon (R-22) (Pkg. 5) | .70 |
| RQ-1468 | RESISTOR—2200 ohms 1 W. carbon (R-20) | .20 |
| RR-781 | RESISTOR—25 ohms 7.4 W. wire wound (R-21) | .20 |
| RS-215 | SOCKET—Vibrator socket (Pkg. 5) | .60 |
| RV-203 | VIBRATOR—Inverter unit vibrator (T-2) | 5.50 |

| | | |
|--------|---|------|
| RS-943 | SPINDLE—Turntable spindle and cotter | .20 |
| RS-953 | SPACERS—Rotor spacers between bearings (Pkg. 5) | .15 |
| RT-924 | TURNTABLE—8-inch brown flocked turntable | 1.60 |
| RW-912 | WHEEL—Rubber-edged wheel washer, oil felt and cotter | 1.00 |
| RX-073 | ASSEMBLY—Rotor bearing brackets, felts, bearing assembly | .35 |
| RX-074 | ASSEMBLY—Motor mounting bushing, washers and screws | .15 |
| RX-075 | ASSEMBLY—Motor field and winding assembly | 2.00 |
| RX-076 | ASSEMBLY—Movable-plate-guide spacer, washer screw assembly (Pkg. 5) | .10 |
| RX-077 | ASSEMBLY—Propeller, cotter, washer assembly | .15 |
| RX-078 | ASSEMBLY—Rotor assembly | 1.35 |

MOTOR TURNTABLE
ASSEMBLY

Model No. 1

(MODEL HJ-628)

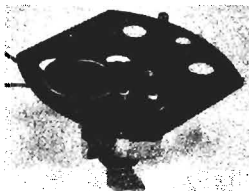
MODELS HJ-618 AC, HJ-618 DC;
H-639 AC AND H-639 DC

| | | |
|---------|---|--------|
| RB-187 | BRACKET—Rubber-edged drive wheel bracket assembly | \$0.20 |
| RB-188 | BRACKET—Rubber-edged idler wheel bracket assembly | .20 |
| RB-627 | BUSHING—Motor mounting rubber bushing (Pkg. 5) | .20 |
| RC-5146 | CAPACITOR—Pyranol capacitor Cat. 25F140 | 1.00 |
| RH-112 | HAIRPIN COTTER—Rubber-edged wheel locating hairpin cotter (Pkg. 10) | .10 |
| RM-129 | MOTOR—60-cycle phono motor only | 4.50 |
| RP-157 | PLATE—Motor mounting plate and spindle bearing assembly | .90 |
| RS-471 | SPRING—Idler wheel bracket tension spring (Pkg. 5) | .30 |
| RS-934 | SPINDLE—Turntable spindle and snap ring | .30 |
| RT-916 | TURNTABLE—8-inch brown flocked turntable | 1.60 |
| RW-910 | WHEEL—Rubber-edged wheel | .35 |

MOTOR TURNTABLE
ASSEMBLY

Model No. 2

(MODEL HJ-628)

MODELS HJ-618 AC, HJ-618 DC
H-639 AC AND H-639 DC

| | | |
|--------|---|------|
| RM-133 | MOTOR—60-cycle motor assembly complete | 6.25 |
| RP-165 | PLATE—Main plate and turntable shaft bearing assembly | .90 |
| RP-166 | PLATE—Motor mounting plate | .30 |
| RP-167 | PLATE—Rubber-edged wheel movable plate and bearing assembly | .70 |
| RP-316 | PULLEY—60-cycle drive pulley and oil throw washer (Pkg. 2) | .25 |
| RS-493 | SPRING—Movable plate tension spring (Pkg. 2) | .10 |

| | | |
|--------|---|------|
| RB-184 | BRACKET—Turntable drive wheel bracket assembly | .15 |
| RB-185 | BRACKET—Lower motor bearing bracket assembly complete | .40 |
| RF-502 | FIELD—60-cycle field stator assembly complete | 3.60 |
| RF-503 | FIELD—50-cycle field stator assembly complete | 3.60 |
| RF-504 | FRAME—Upper motor frame assembly | .60 |
| RM-127 | MOTOR—60-cycle motor assembly complete less turntable | 5.85 |
| RM-128 | MOTOR—50-cycle motor assembly complete less turntable | 6.40 |
| RP-164 | PLATE—Motor mounting plate and bearing assembly | .90 |
| RP-311 | PULLEY—60-cycle motor pulley and set-screw | .20 |
| RP-312 | PULLEY—50-cycle motor pulley and set-screw | .25 |
| RR-406 | ROTOR—Rotor complete | 1.55 |
| RS-467 | SPRING—Turntable drive tension spring | .10 |
| RS-875 | SETSCREW—Motor pulley setscrew (Pkg. 12) | .25 |
| RS-932 | SPINDLE—Turntable spindle and cotter | .30 |
| RT-923 | TURNTABLE—8-inch brown flocked turntable | 1.60 |
| RW-909 | WHEEL—Rubber-edged drive wheel | .50 |
| RX-065 | ASSEMBLY—Turntable drive wheel bracket mounting washer, screw and nut assembly (Pkg. 5) | .20 |
| RX-066 | ASSEMBLY—Lower bearing bracket screw and nut assembly (Pkg. 3) | .05 |
| RX-067 | ASSEMBLY—Motor mounting screw, washer and grommet assembly (Pkg. 3) | .25 |
| RX-068 | ASSEMBLY—Drive wheel oil retainer, cotter and thrust washer assembly (Pkg. 5) | .10 |

*Used on previous receivers.

(Prices subject to change without notice)

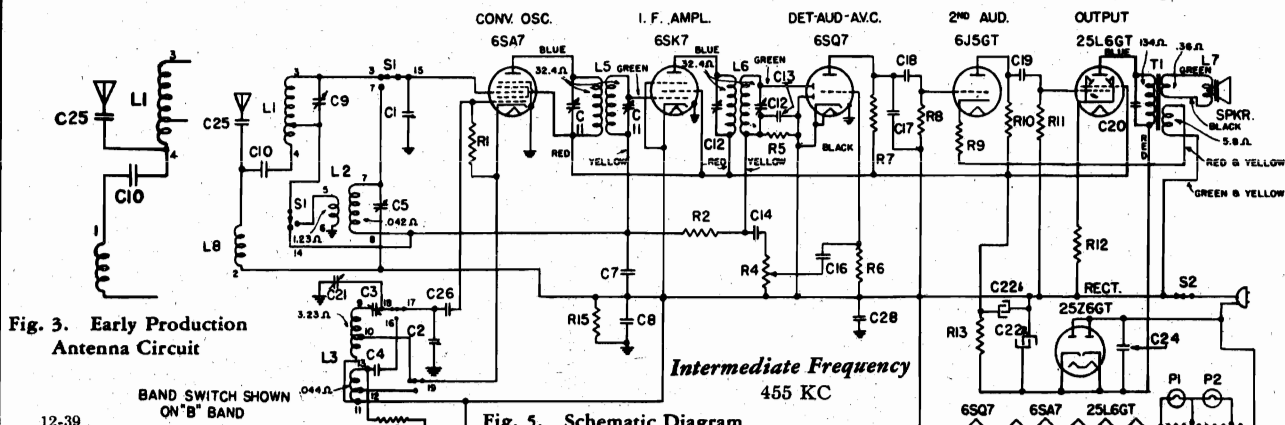
NOTE:

When ordering motor-turntable assembly parts, refer to correct model list.

Alignment, Trimmers, Gain Chassis Wiring, Changes

GENERAL ELECTRIC CO.

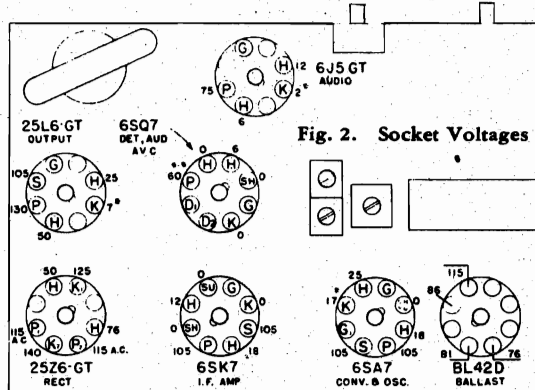
MODELS H622, H623 Schematic, Voltage, Socket



12-39

PRODUCTION CHANGES

Several hundred early production Model H-622 receivers were built with the antenna terminal connected as shown in Fig. 3. The remainder of these receivers were connected as shown in the schematic diagram, Fig. 5. The only difference between the two circuits is in the connection between the lower side of C-25 capacitor and the antenna circuit. Early production circuits had C-25 connected between L-1 and C-10. If hum is experienced when an outside antenna is used on these early production models with Fig. 3 antenna circuit, reverse the power plug in the power supply outlet. Should this procedure fail to attain the required results rewire C-25 into the circuit as shown in the schematic diagram, Fig. 5.



*Measured on 10 volt scale of 20,000 ohms per volt meter.
**Measured on 250 volt scale of 20,000 ohms per volt meter.
Line Volts—115.—No signal input.
Volume at maximum.
When operated on DC power supply, voltages are about 15 per cent lower.
All heater and ballast voltages are AC.

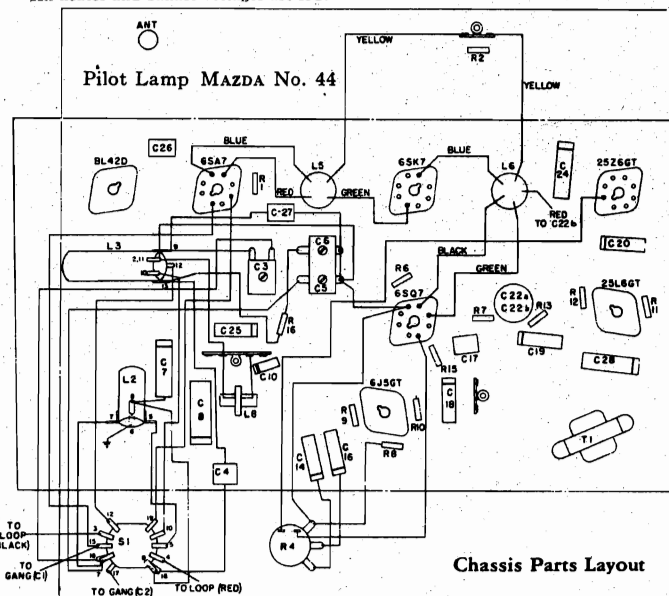


Fig. 2. Socket Voltages

25L6-GT OUTPUT
6SQ7 DET. AUD. AVC
6J5GT AUDIO
6SK7 I.F. AMP
6SA7 CONV. & OSC.
BL42D BALLAST
25Z6-GT RECT.

(REAR OF CHASSIS)

*Measured on 10 volt scale of 20,000 ohms per volt meter.
**Measured on 250 volt scale of 20,000 ohms per volt meter.
Line Volts—115.—No signal input.
Volume at maximum.
When operated on DC power supply, voltages are about 15 per cent lower.
All heater and ballast voltages are AC.

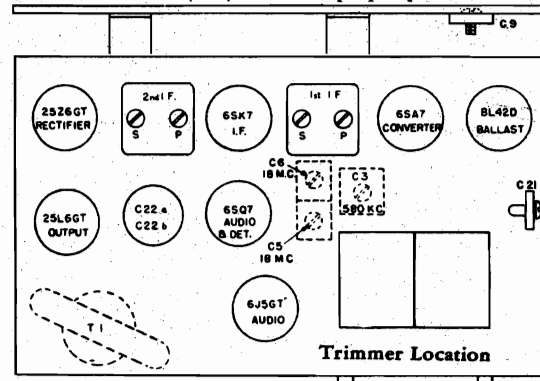
ALIGNMENT PROCEDURE

I.F. Connect an output meter across the voice coil. Rotate the volume control to maximum. Completely close the gang condenser plates and set the dial pointer to the first dial mark at the low end of the scale. Turn the band switch to "B" band (counterclockwise).

Set test oscillator to 455 KC and apply signal to the control grid of the 6SA7 tube through a .05 mfd. capacitor. Do not remove the 6SA7 grid lead. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers for maximum meter reading.

R.F. Apply a 1500 KC signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the signal generator output which can be magnetically coupled to the receiver Beam-a-Scope. Align (C-21) at 1500 KC and peak (C-9) for maximum output. Change signal to 580 KC and tune receiver to signal. Peak (C-3) on the 580 KC signal by rocking the gang condenser. Retrim at 1500 KC.

Turn the band switch to "D" band. Align (C-6) at 18 MC using an 18 MC signal. Peak (C-5) while rocking the gang condenser. The image of the 18 MC signal should be heard at 17.09 MC when (C-6) is on the proper peak.



MODELS HJ624, HJ628

Schematic, Voltage, Gain
Trimmers, Socket,
Changes

GENERAL ELECTRIC CO.

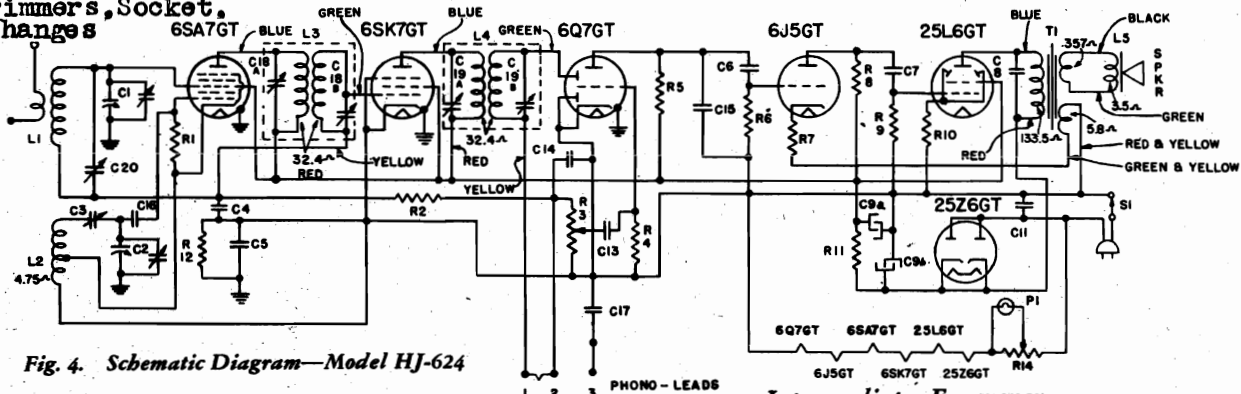
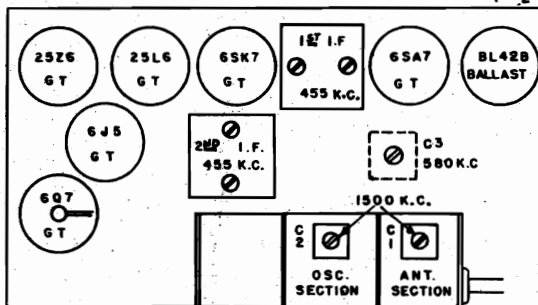


Fig. 4. Schematic Diagram—Model HJ-624



NOTE: On Model HJ-624 the antenna trimmer (C-1) on top the gang condenser is replaced with (C-20) located on the cabinet back cover.

Fig. 1. Trimmer Location

Special Service Information

The following data will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

(1) Stage Gains

Antenna Post to Converter Grid—4 at 1000 KC†
Converter Grid to 6SK7GT Grid—30 at 455 KC†
6SK7GT Grid to 6Q7GT Det. Plate—100 at 455 KC†

(2) Audio Gains

.06 volts, 400 cycles signal across volume control with control set to maximum will give approximately ½ watt speaker output.

(3) DC voltage developed across oscillator grid resistor (R-1) averages 12 volts.

† Variations of +10%, -20% permissible

Loud-speaker—"Alnico" Magnetic Dynamic

Model..... HJ-624 HJ-628
Speaker Diameter..... 6.5 inches 14 inches
Voice Coil Impedance (400 cycles) 3.5 ohms

Tubes

Converter-Oscillator..... GE-6SA7GT
I.F. Amplifier..... GE-6SK7GT
Det., Aud., AVC..... GE-6Q7GT
2nd Audio Amplifier..... GE-6J5GT
Power Output..... GE-25L6GT
Rectifier..... GE-25Z6GT
Dial Lamp..... MAZDA No. 44

FRONT OF CHASSIS

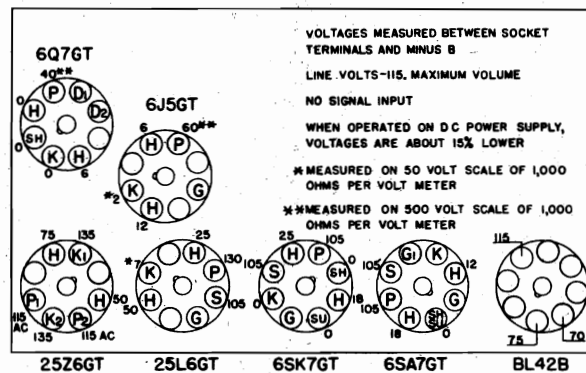


Fig. 2. Socket Voltages

BOTTOM VIEW OF CHASSIS

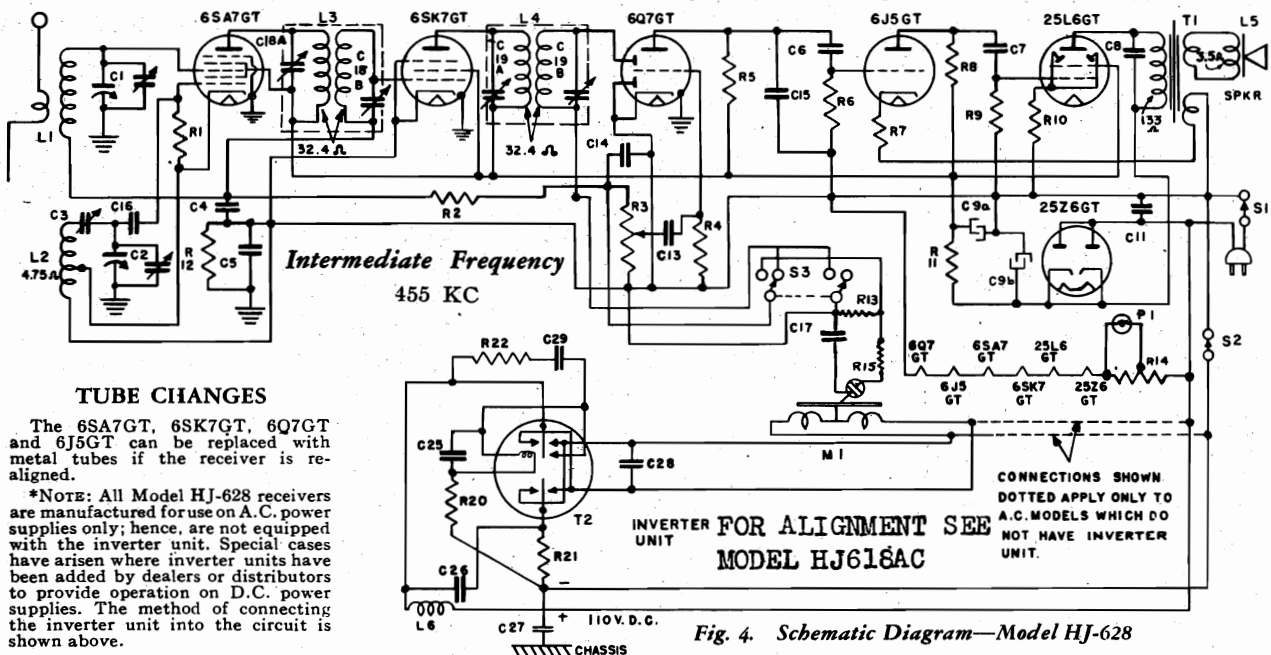


Fig. 4. Schematic Diagram—Model HJ-628

H630U, H632U (Early)
Schematics, Gain

MODEL H625 (Final)
GENERAL ELECTRIC CO. MODELS H630 to H633 (Final)

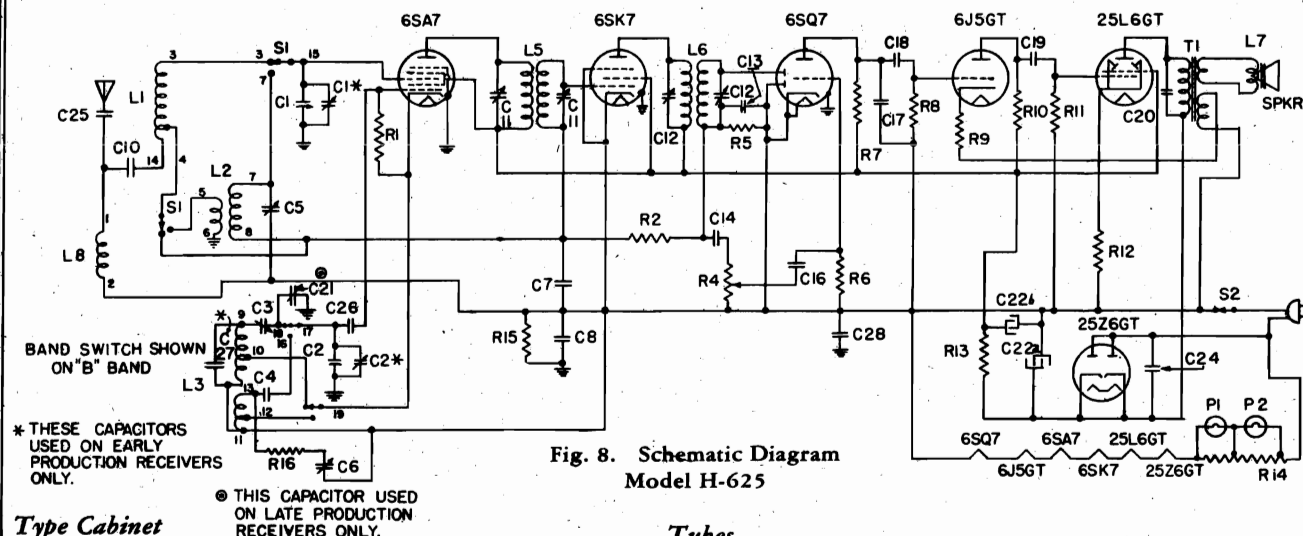


Fig. 8. Schematic Diagram
Model H-625

Type Cabinet

Model H-625..... Console
Models H-630, -631, -632, -633..... Table Model

Tuning Control Drive Ratio..... 4:1

Electrical Specifications

| Power Supply Volts | Frequency (Cycles on AC) | Power Consumption (Watts) |
|-----------------------|-----------------------------|------------------------------|
| 115 AC or DC | 25-60 | 50 |

Tubes

Converter and Oscillator..... GE-6SA7
I.F. Amplifier..... GE-6SK7
Det., Aud., AVC..... GE-6SQ7
2nd Audio Amplifier..... GE-6J5GT
Power Output..... GE-25L6GT
Rectifier..... GE-25Z6GT
Pilot Lamp..... MAZDA No. 44

Electrical Power Output (117 Line Volts)

Undistorted..... 1.4 watts
Maximum..... 2.5 watts*

*Tests made on Model H-625 indicate that the sound output from this receiver is approximately equal to that of an AC receiver using a conventional wound-field loud-speaker rated at 5 watts.

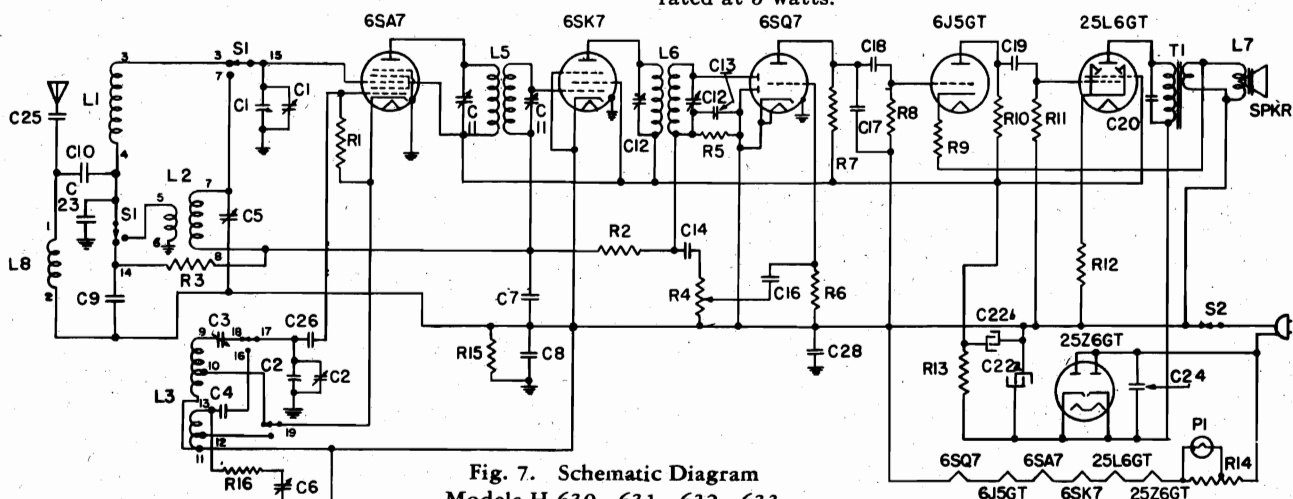


Fig. 7. Schematic Diagram
Models H-630, -631, -632, -633
Models H-630U, 632U (EARLY)

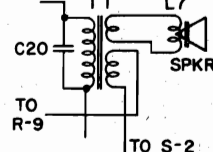
Special Service Information

The following data will be very useful to servicemen equipped with vacuum-tube voltmeters or similar voltage-measuring instruments.

- Stage Gains
Antenna Post to Converter Grid..... 2.7 at 1000 KC
Converter Grid to 6SK7 Grid..... 28 at 455 KC
6SK7 Grid to 6SQ7 Diode Plate..... 87 at 455 KC
- Audio Gain
A 400 cycle signal of .05 volts across volume control will give approximately 1/2 watt speaker output. (Volume control turned to maximum.)
- DC voltage developed across oscillator grid resistor (R-1) averages 13 volts at 1000 KC.

†Variations of +10%, -20% permissible.

ON H-631 & H-633
RECEIVERS SUBSTITUTE
THIS TRANSFORMER (T-1)
FOR ONE SHOWN ABOVE



Loud-speaker—"Alnico" Magnet Dynamic

Model..... H-625..... H-630, -631, -632, -633
Outside Cone Diameter—12 in..... 5 in.
Voice Coil Impedance (400 cycles)..... 3 1/2 ohms

Tuning Frequency Range

Band "B"..... 550-1600 KC
Band "D"..... 5800-18,000 KC

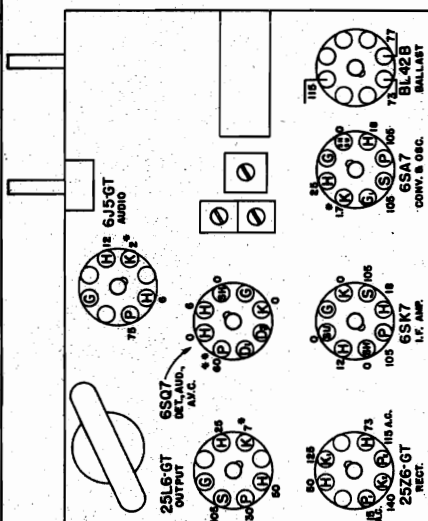
Intermediate Frequency..... 455 KC

GENERAL INFORMATION

The Models H-625, H-630, H-631, H-632, and H-633 are compact six-tube AC-DC superheterodyne receivers employing General Electric Pre-tested Tubes. Features of design include built-in Beam-a-Scope, airplane-type dial, four Feathertouch Tuning keys, broadcast and short-wave coverage, and automatic volume control.

Models H-625, H-631, and H-633 are fully approved by Underwriters' Laboratories.

When operating from a DC source of power it is necessary to insert the power plug with the proper polarity; otherwise, the receiver will fail to function. If excessive hum is noticed when the receiver is used on AC, reverse the power plug in the receptacle.



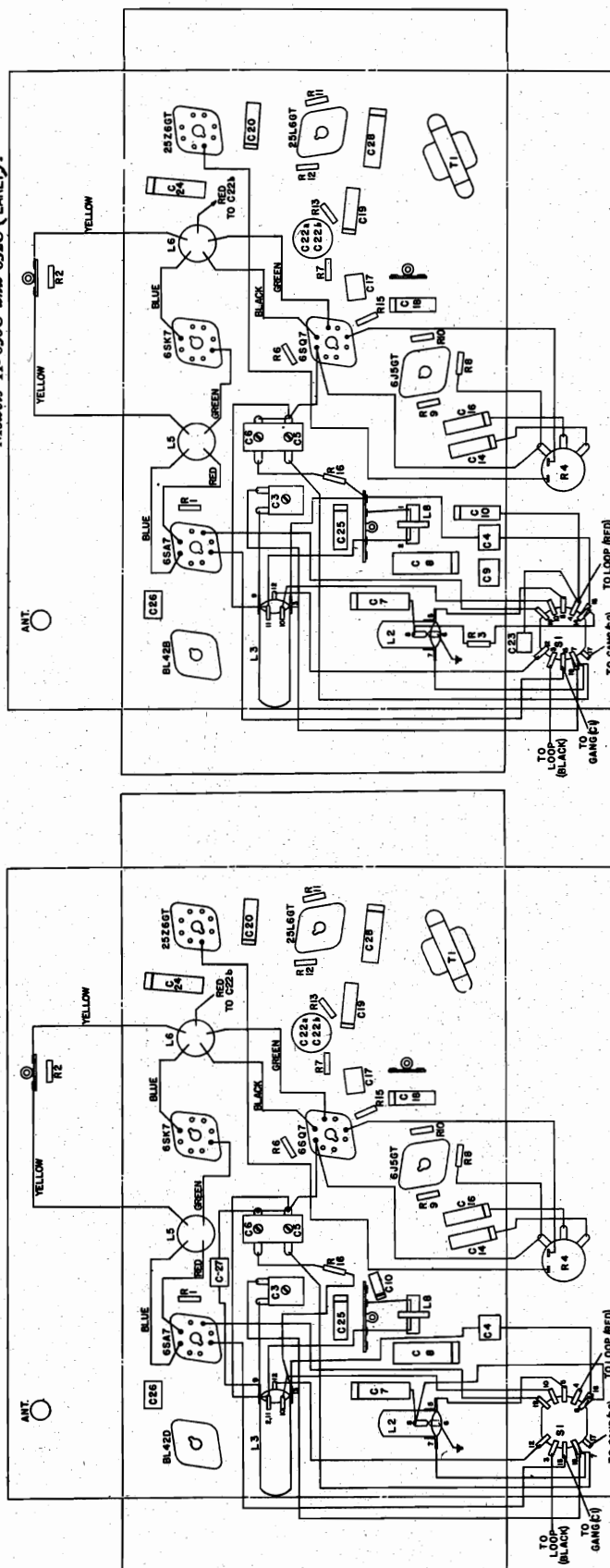
BOTTOM VIEW OF CHASSIS

*Measured on 10 volt scale of 20,000 ohms per volt meter.
 **Measured on 250 volt scale of 20,000 ohms per volt meter.

Line Volts—115.—No signal input.
Volume at maximum.

When operated on DC power supply, voltages are about 15 per cent lower. All heater and ballast voltages are A-C.

Fig. 3. Socket Voltages
Models H-630, -631, -632, -633
Models H-630U and 632U (EARLY).



**Fig. 6. Chassis Parts Layout
Model H-625**

Fig. 5. Chassis Parts Layout
Models H-630, -631, -632, -633; H-630U, H-632U (Early).

GENERAL ELECTRIC CO.

MODELS H625

MODELS H630 to H633

H630U, H632U

Alignment, Changes, Trimmers
Dial Drive Data, Parts

ALIGNMENT PROCEDURE

Alignment Frequencies

| | |
|----------|-----------------|
| I.F. | 455 KC |
| Band "B" | 1500 and 580 KC |
| Band "D" | 18,000 KC |

The location of trimmers for the above models are shown in their respective diagrams, Figs. 1 and 2.

I.F. Alignment

Connect an output meter across the voice coil. Rotate the volume control to maximum. Completely close the gang condenser plates and set the dial pointer to the first dial mark at the low end of the scale. Turn the band switch to "B" band (counterclockwise).

Set test oscillator to 455 KC and apply signal to the control grid of the 6SA7 tube through a .05 mfd. capacitor. Do not remove the 6SA7 grid lead. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers for maximum meter reading.

R.F. Alignment

- (1) Models H-630, -631, -632, -633 Apply a 1500 KC signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the signal generator output which can be magnetically coupled to the receiver Beam-a-Scope. Align (C-2) at 1500 KC and peak (C-1) for maximum output. Change signal to 580 KC and tune receiver to signal. Peak (C-3) on the 580 KC signal by rocking the gang condenser. Retrim at 1500 KC.

Turn the band switch to "D" band. Align (C-6) at 18 MC using an 18 MC signal. Peak (C-5) while rocking the gang condenser. The image of the 18 MC signal should be heard at 17.09 MC when (C-6) is on the proper peak.

- (2) Model H-625 The same alignment procedure as above may be followed for this model excepting that final R.F. alignment on "B" band should be made after the chassis and Beam-a-Scope are properly mounted in the cabinet and interconnected. The location of the Beam-a-Scope with respect to the chassis materially affects alignment.

NOTE.—A change exists in the "B" band trimmer arrangement on late production models. "B" band antenna trimmer (C-1) is eliminated. "B" band oscillator trimmer (C-2) is moved from the top of the gang condenser to the chassis deck and renumbered (C-21) (see Fig. 2). In aligning the late production Model H-625 apply 1500 KC signal as described for H-630. Set dial pointer to 1500 KC and align (C-21) for maximum output by rocking the gang condenser. Retune to 580 KC and peak (C-3) on 580 KC signal by rocking gang condenser. Repeat at 1500 KC.

Alignment on "D" band is the same as described for Model H-630.

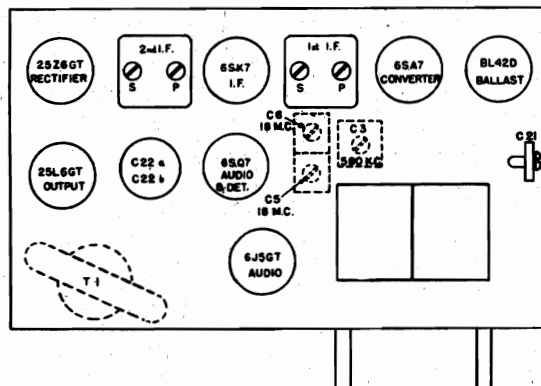
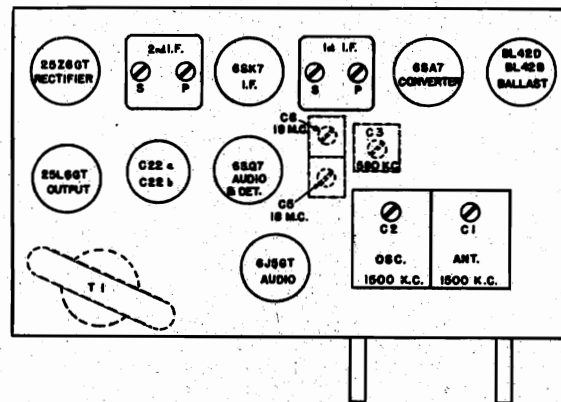


Fig. 2. Trimmer Location
(Late Production Model H-625)

PRODUCTION CHANGES

Late production models of the H-625 have certain trimmer and coil changes incorporated which should be noted when ordering replacement parts.

1. "B" band trimmers (C-1) and (C-2) on top of gang condenser are removed. (C-1) antenna trimmer is completely eliminated. (C-2) oscillator trimmer is renumbered (C-21) and mounted on chassis deck (see Fig. 2).
2. "D" band antenna coil changed from Stock No. RL-088 (Code—Red) to RL-098 (Code—Orange).



NOTE.—Models H-630, -631, -632, -633 use BL42B Ballast.
Model H-625 uses BL42D Ballast.

Fig. 1. Trimmer Location
Models H-625 (Early), -630, -631, -632, -633

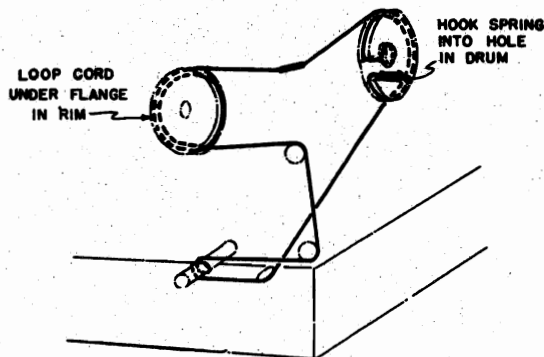


Fig. 9. Dial Drive Stringing Diagram

REPLACEMENT PARTS LIST

| Stock No. | Description | List Price |
|-------------------------|---|------------|
| CHASSIS ASSEMBLY | | |
| RA-314 | CONDENSER ASSEMBLY—Tuning condenser and drive unit complete with pointer (Models H-630, -631, -632, -633) | \$5.70 |
| RA-315 | CONDENSER ASSEMBLY—Tuning condenser and drive unit complete (Model H-625) | 5.75 |
| *RB-023 | BOARD—Terminal board (4 lugs) | .10 |
| RB-041 | BOARD—Terminal board (2 lugs) | .10 |
| RB-182 | BRACKET—Beam-a-Scope bracket (Models H-630, -631, -632, -633) | .10 |
| RB-921 | BACK COVER—Cardboard cabinet back (Models H-630, -631) | .15 |
| RB-922 | BACK COVER—Cardboard cabinet back (Models H-632, -633) | .15 |
| RB-924 | BACK COVER—Cardboard cabinet back (Model H-625) | .30 |

MODEL H625

MODELS H630 to H633

H630U, H632U

Parts List

GENERAL ELECTRIC CO.

| Stock No. | Description | List Price | Stock No. | Description | List Price |
|-----------|---|------------|-----------|--|------------|
| RB-1018 | BOARD—Antenna terminal board..... | .10 | *RQ-1235 | RESISTOR—100 ohms, ½ W. carbon (R-16) (Pkg. 5)..... | .70 |
| RB-1020 | BOARD—Beam-a-Scope terminal board (Model H-625)..... | .10 | *RQ-1239 | RESISTOR—150 ohms, ½ W. carbon (R-12) (Pkg. 5)..... | .70 |
| *RC-011 | CAPACITOR—.002 mfd. 600 V. paper (C-14)..... | .25 | *RQ-1259 | RESISTOR—1000 ohms, ½ W. carbon R-13) (Pkg. 5)..... | \$0.70 |
| *RC-023 | CAPACITOR—.005 mfd. 600 V. paper (C-18, 19)..... | .25 | *RQ-1271 | RESISTOR—3300 ohms, ½ W. carbon (R-9) (Pkg. 5)..... | .70 |
| *RC-039 | CAPACITOR—.01 mfd. 600 V. paper (C-10, 20, 25)..... | .25 | *RQ-1295 | RESISTOR—33,000 ohms, ½ W. carbon (R-1) (Pkg. 5)..... | .70 |
| *RC-048 | CAPACITOR—.02 mfd. 600 V. paper (C-16)..... | .30 | *RQ-1297 | RESISTOR—39,000 ohms, ½ W. carbon (R-10) (Pkg. 5)..... | .70 |
| *RC-092 | CAPACITOR—.05 mfd. 600 V. paper (C-7, 24)..... | .30 | *RQ-1323 | RESISTOR—470,000 ohms, ½ W. carbon (R-3, 5, 7, 11, 15) (Pkg. 5)..... | .70 |
| *RC-123 | CAPACITOR—.01 mfd. 400 V. paper (C-8, 28)..... | .35 | *RQ-1331 | RESISTOR—1.0 megohm, ½ W. carbon (R-8) (Pkg. 5)..... | .70 |
| *RC-216 | CAPACITOR—47 mmf. mica (C-26)..... | .25 | *RQ-1339 | RESISTOR—2.2 megohms, ½ W. carbon (R-2) (Pkg. 5)..... | .70 |
| *RC-220 | CAPACITOR—6 mmf. mica (C-27 on Model H-625) (C-23 on remainder of Models)..... | .25 | *RQ-1365 | RESISTOR—15 megohms, ¼ W. carbon (R-6) (Pkg. 5)..... | .70 |
| *RC-250 | CAPACITOR—220 mmf. mica (C-17 on Model H-625)..... | .25 | RR-772 | RESISTOR—BL42D ballast resistor (R-14) (Model H-625)..... | .45 |
| *RC-293 | CAPACITOR—470 mmf. mica (C-13) (also C-17 on Models H-630, -631, -632, -633)..... | .30 | RR-773 | RESISTOR—BL42B ballast resistor (R-14) (Models H-630, -631, -632, -633)..... | .40 |
| *RC-390 | CAPACITOR—3900 mmf. mica (C-4) (also C-9 on Models H-630, -631, -632, -633)..... | .35 | RR-930 | REFLECTOR—Dial scale reflector (Models H-630, -631, -632, -633)..... | .30 |
| *RC-645 | CAPACITOR—"B" band osc. trimmer (C-21 on late Model H-625)..... | .15 | RR-941 | REFLECTOR—Dial scale reflector (Model H-625)..... | .30 |
| *RC-676 | CAPACITOR—"B" band padder (C-3 on Models H-630, -631, -632, and -633)..... | .35 | *RS-200 | SOCKET—Octal tube socket (Pkg. 5)..... | .75 |
| RC-749 | CONDENSER—Tuning condenser (C-1, 2)..... | 4.15 | RS-256 | SOCKET—Electrolytic mounting socket (Pkg. 5)..... | .25 |
| *RC-863 | CORD—Power cord..... | .65 | RS-261 | SOCKET—Pilot lamp socket..... | .20 |
| RC-1995 | CLAMP—Oscillator coil clamp (Pkg. 5)..... | .10 | *RS-426 | SPRING—Condenser drive cord spring (Pkg. 5)..... | .10 |
| RC-5136 | CAPACITOR—50 mfd. 150 V.; 30 mfd. 150 V.; dry electrolytic (C-22a, 22b)..... | 1.15 | RS-510 | SPACER—Station key spacer (Pkg. 10)..... | .10 |
| RC-6516 | CAPACITOR—"B" band padder (C-3 on Model H-625)..... | .30 | RS-511 | SLEEVE—Condenser bracket spacer sleeve (Pkg. 10)..... | .15 |
| RC-6517 | CAPACITOR—"D" band ant. and osc. trimmers (C-5, 6)..... | \$0.30 | RS-929 | SHAFT—Tuning shaft..... | .10 |
| RC-8130 | CABLE—Tuning drive cable assembly..... | .15 | RS-3036 | SWITCH—Band change switch..... | .60 |
| RC-8508 | CARD—Station letter card (1 set)..... | .30 | RT-328 | TRANSFORMER—1st I.F. transformer (L-5)..... | \$1.00 |
| RD-115 | DIAL—Dial scale (Models H-630, -631, -632, -633)..... | .20 | RT-329 | TRANSFORMER—2nd I.F. transformer (L-6)..... | 1.20 |
| RD-116 | DIAL—Dial scale (Model H-625)..... | 1.00 | RT-468 | TRANSFORMER—Output transformer (T-1) (Models H-630, -632)..... | .95 |
| RG-302 | GROMMET—Tuning shaft drive cord grommet (Pkg. 10)..... | .10 | RT-469 | TRANSFORMER—Output transformer (T-1) (Models H-625, -631, -633)..... | 1.25 |
| RK-055 | KNOB—Light oak control knob (Pkg. 5)..... | .50 | *RT-952 | TERMINAL—Loop lead contact terminal (Pkg. 10)..... | .05 |
| RK-074 | KNOB—Light tan control knob (Model H-625) (Pkg. 5)..... | .50 | RT-954 | TERMINAL—Speaker lead terminal (Pkg. 10)..... | .10 |
| RK-209 | KEY—Light oak station selector key (Models H-630, -631, -632, -633)..... | .15 | RV-072 | VOLUME CONTROL—2.0 megohm volume control (R-4)..... | .80 |
| RK-210 | KEY—Light oak station selector key (Model H-625)..... | .15 | RW-039 | WINDOW—Celluloid station letter window (Pkg. 25)..... | .10 |
| RK-215 | KEY—Light tan station selector key (Model H-625)..... | .15 | *RW-101 | WASHER—Control shaft felt washer (Pkg. 10)..... | .05 |
| RL-088 | COIL—"D" band antenna coil (Code—Red) (L-2)..... | .65 | *RX-035 | ASSEMBLY—Condenser mounting foot assembly..... | .15 |
| RL-098 | COIL—"D" band antenna coil (Code—Orange) (L-2)..... | .65 | RX-061 | ASSEMBLY—Chassis mounting assembly..... | .10 |
| RL-295 | COIL—Oscillator coil (L-3 on Models H-630, -631, -632, -633)..... | .70 | | | |
| RL-296 | COIL—Oscillator coil (L-3 on Model H-625)..... | .70 | | | |
| RL-346 | CHOKE—Antenna choke (L-8)..... | .30 | | | |
| RL-511 | BEAM-A-SCOPE—Beam-a-Scope antenna (L-1 on Models H-630, -631, -632, -633)..... | .70 | | | |
| RL-512 | BEAM-A-SCOPE—Beam-a-Scope antenna (L-1 on Model H-625)..... | 2.95 | | | |
| RL-937 | LUG—Key pin binding lug (Pkg. 10)..... | .10 | | | |
| RM-503 | MASK—Dial scale mask (Model H-625) (Pkg. 10)..... | .10 | | | |
| RN-200 | NAMEPLATE—Dial scale metal nameplate (Model H-625)..... | .20 | | | |
| RP-134 | PIN—Station selector key pin (Pkg. 10)..... | .05 | | | |
| RP-143 | POINTER—Dial scale pointer (Models H-630, -631, -632, -633)..... | .60 | | | |
| RP-144 | POINTER—Dial scale pointer (Model H-625) (Pkg. 5)..... | .25 | | | |
| RP-307 | PULLEY—Condenser drive cord pulley (Pkg. 5)..... | .25 | | | |
| RP-308 | PULLEY—½ inch drive cord idler pulley (Pkg. 5)..... | .10 | | | |
| RP-309 | PULLEY—⅜ inch drive cord idler pulley (Pkg. 5)..... | .10 | | | |

*Used on previous receivers.

MODELS H634, H638, H640 GENERAL ELECTRIC CO. Schematic, Socket, Trimmers

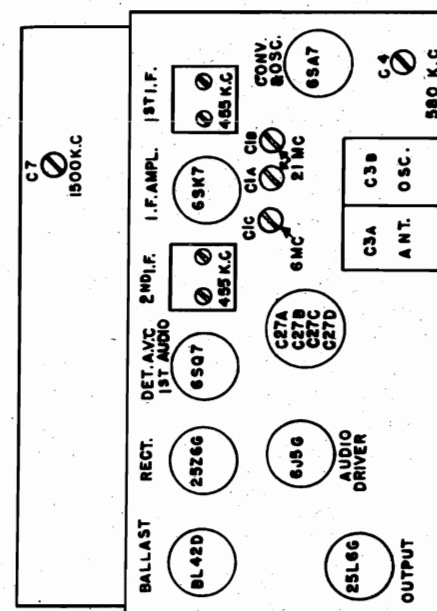
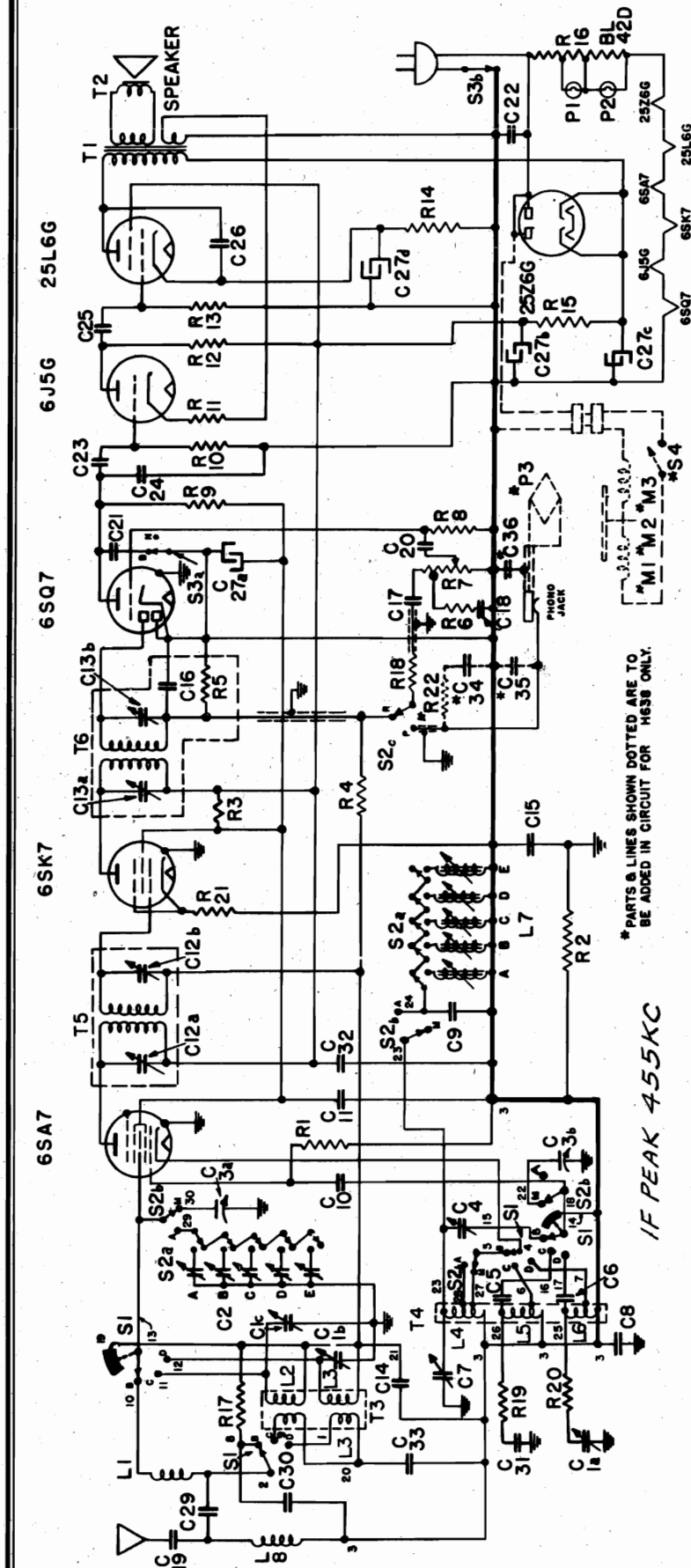


Fig. 2. Trimmer Location

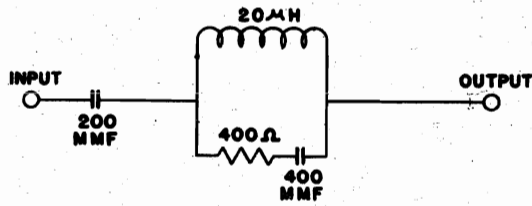
| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|--------|--------------------------------|--------|-------------------------------|
| C-1a | "D" band oscillator trimmer | M-1 | 60 cycle phono motor |
| C-1b | "D" band antenna trimmer | M-2 | 50 cycle phono motor |
| C-1c | "C" band antenna trimmer | M-3 | 25 cycle phono motor |
| C-2a | 7-65 mmf. station trimmer | R-1 | 22,000 ohms, carbon resistor |
| C-2b | 20-180 mmf. station trimmer | R-2 | 470,000 ohms, carbon resistor |
| C-2c | 20-180 mmf. station trimmer | R-3 | 220,000 ohms, carbon resistor |
| C-2d | 100-480 mmf. station trimmer | R-4 | 2.2 megohms, carbon resistor |
| C-2e | 100-480 mmf. station trimmer | R-5 | 2.2 megohms, carbon resistor |
| C-3 | Tuning condenser | R-6 | 56,000 ohms, carbon resistor |
| C-4 | "B" band oscillator padder | R-7 | 56,000 ohms, carbon resistor |
| C-5 | 2000 mmf. mica capacitor #5% | R-8 | 2 megohm volume control |
| C-6 | 5600 mmf. mica capacitor #5% | R-9 | 15 megohms, carbon resistor |
| C-7 | "B" band oscillator trimmer | R-10 | 220,000 ohms, carbon resistor |
| C-8 | 0.1 mfd. paper capacitor | R-11 | 1 megohm, carbon resistor |
| C-9 | 750 mmf. silvered mica cap #5% | R-12 | 3300 ohms, carbon resistor |
| C-10 | 47 mmf. mica capacitor | R-13 | 220,000 ohms, carbon resistor |
| C-11 | .05 mfd. paper capacitor | R-14 | 470,000 ohms, carbon resistor |
| C-12 | .05 mfd. paper capacitor | R-15 | 150 ohms, carbon resistor |
| C-13 | 100 mmf. mica capacitor | R-16 | 560 ohms, carbon resistor |
| C-14 | 100 mmf. mica capacitor | R-17 | Ballast tube BL42D |
| C-15 | .005 mfd. paper capacitor | R-18 | 47,000 ohms, carbon resistor |
| C-16 | .0072 mfd. paper capacitor | R-19 | 150 ohms, carbon resistor |
| C-17 | .005 mfd. paper capacitor | R-20 | 68 ohms, carbon resistor |
| C-18 | .01 mfd. paper capacitor | R-21 | 390 ohms, carbon resistor |
| C-19 | .01 mfd. paper capacitor | R-22 | 100,000 ohms, carbon resistor |
| C-20 | .0015 mfd. paper capacitor | P-1, 2 | Dial lamp, Mazda No. 44. |
| C-21 | | | |

Fig. 3. Schematic Diagram

MODELS H634, H638, H640
Chassis Wiring, Voltage

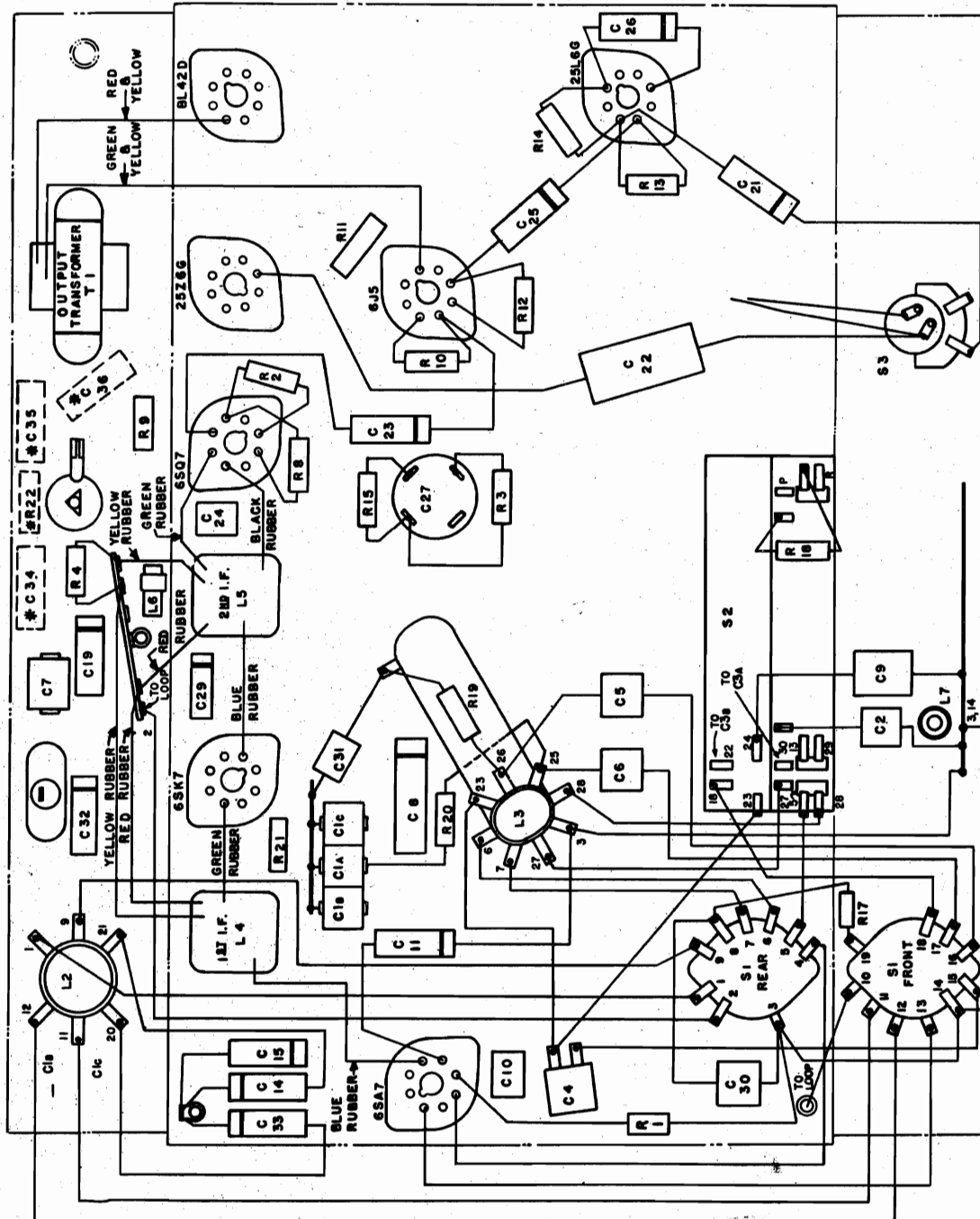
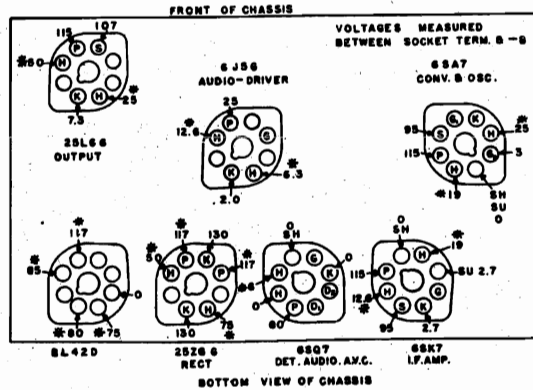
GENERAL ELECTRIC CO.

Fig. 7. I.R.E. Dummy Antenna



* Volts A.c.
Line Volts-117. No signal input. Max. volume. Gang closed. "B" band.
Volts measured on 20,000 ohms per volt-voltmeter.

Fig. 5. Socket Voltage



* C34-C35-C36-R22 TO BE ADDED FOR
H-638 PHONO-COMBINATION ONLY

Fig. 4. Chassis Parts Layout

GENERAL ELECTRIC CO.

MODELS H634, H638, H640
Gain, Coils, Notes

SPECIFICATIONS

Physical Specifications

| | | | |
|--------------------|-------------|-------------|-------------|
| Model..... | H-634..... | H-638..... | H-640..... |
| Height..... | 10½ in..... | 12½ in..... | 10½ in..... |
| Width..... | 18 in..... | 19½ in..... | 19½ in..... |
| Depth..... | 9½ in..... | 13½ in..... | 9½ in..... |
| Weight packed..... | 22 lbs..... | 37 lbs..... | 22 lbs..... |

Tuning Control Drive Ratio.....10:1

Electrical Specifications

| MODEL | RATING | POWER SUPPLY (VOLTS) | FREQUENCY (CYCLES ON AC) | POWER CONSUMPTION (WATTS) |
|----------------|----------------|--|--------------------------|---------------------------|
| H-634 H-640 | | 110-120 AC or DC | 25-60 | 55 |
| H-638 | A6 A5 C2 | 115-125 AC 115-125 AC 115-125 AC | 60 50 25 | 75 75 75 |

Tuning Frequency Range

| | |
|---------------|-----------------|
| Band "B"..... | 550-1600 K.C. |
| Band "C"..... | 2200-6500 K.C. |
| Band "D"..... | 6500-22000 K.C. |

Intermediate Frequency.....455 K.C.

GENERAL INFORMATION

Models H-634, H-638 and H-640 employ three-band AC-DC receivers of the superheterodyne type using six General Electric Pre-tested Tubes. Features of design include the built-in "Beam-a-Scope," the new "Alnico" dynapower speaker, seven "Feathertouch Tuning" keys, a Visualux dial, iron core oscillator trimmer coils for station keys and automatic volume control.

In addition to the above features, the Model H-638 incorporates a phonograph mechanism for reproducing recordings. The phonograph plays 10-inch or 12-inch records and is manually operated. A constant speed, self-starting, silent electric motor and high-quality crystal pick-up insure realistic reproductions.

Coil System

L-1 is the Beam-a-Scope. On "B" band, L-1 operates as a loop antenna. On "C" and "D" bands, the grid end of L-1 is effectively grounded preventing absorption spots due to loop resonance. T-3 is the "C" and "D" antenna transformer while T-4 is the oscillator transformer for all bands. All band switch and coil terminals are numbered in Fig. 3 and Fig. 4 to facilitate in locating common points.

The following table shows the coils in use for various positions of the band and manual-automatic switch:

| Band-switch Position | Antenna Primary | Antenna Secondary | Oscillator Grid | Oscillator Cathode | Remarks |
|---------------------------|-----------------|-------------------|-----------------|------------------------|--|
| Manual Tuning Band "B" | | L-1 | L-4 | Section 3 to 27 of L-4 | C-3a and C-3b tuning condenser in circuit |
| Automatic Tuning Band "B" | | L-1 | L-4 | Section 3 to 28 of L-4 | C-2 and L-7 trimmers and coils in circuit |
| Band "C" | L-2 | L-2 | L-5 | Section 3 to 6 of L-5 | L-1 and L-4 effectively grounded through C-14 and C-4 respectively |
| Band "D" | L-3 | L-3 | L-6 | Section 3 to 7 of L-6 | L-1, L-2 secondary grounded through C-14, L-4, L-5 grounded through C-4 and C-5 respectively |

Electrical Power Output

| | |
|------------------|------------|
| Undistorted..... | 1.75 watts |
| Maximum..... | 2.7 watts |

Tone Control.....2-position

Loud-speaker—"Alnico" Magnet Dynamic

| | | | |
|----------------------------|------------------------|------------|------------|
| Model..... | H-634..... | H-638..... | H-640..... |
| Outside Cone Diameter..... | 5-in..... | 6½ in..... | 6½ in..... |
| Voice Coil Impedance..... | 3.5 ohms at 400 cycles | | |

Phonograph

| | |
|----------------------|---------|
| Model..... | H-638 |
| Type Pick-up..... | Crystal |
| Turntable Speed..... | 78 rpm. |

Tubes

| | |
|-------------------------------|------------------|
| Converter and Oscillator..... | GE-6SA7 |
| I.F. Amplifier..... | GE-6SK7 |
| Det., Aud., AVC..... | GE-6SQ7 |
| Audio Driver..... | GE-6J5G |
| Output..... | GE-25L8G |
| Rectifier..... | GE-25Z6G |
| Pilot Lamp..... | (2) MAZDA No. 44 |

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly.

Note—In no case should the magnet be removed from the assembled position without remagnetizing before replacing it.

Phonograph or Television Audio Connections

These receivers are equipped with a phono-terminal (pin jack) to allow the convenient connection of record players or television audio channels. General Electric plug, Stock No. RP-145, fits the pin jack. The Model H-638 uses the plug connection from phonograph to radio and this plug may be readily removed to allow use of other record players, sound equipment or television sound converters.

Note—A suitable load consisting of a 100,000-ohm resistor and a .01 mfd. capacitor should be connected across the pick-up leads when using a crystal-type unit.

Alignment Procedure

The alignment procedure is given in table form. Use a standard I.R.E. "dummy" antenna, Fig. 7, in making all R.F. alignments. The relative position of the Beam-a-Scope with respect to the chassis materially affects R.F. alignment on "B" band; therefore, final R.F. alignment on "B" band should be made after the chassis and Beam-a-Scope are mounted in the cabinet.

Special Service Information

The following information will be found very useful in servicing receivers if a vacuum-tube voltmeter or similar voltage-measuring instrument is available.

- (1) Stage Gains
 - (a) Antenna Post to Converter Grid

| | |
|---------------|------------|
| Band "B"..... | 3.5 to 4.0 |
| Band "C"..... | 3.0 to 3.5 |
| Band "D"..... | 1.3 to 3.0 |
 - (b) Converter Grid to 6SK7 Grid....60 at 455 K.C.†
 - (c) 6SK7 Grid to 6SQ7 Det. Plate....35 at 455 K.C.†
- (2) A 400-cycle signal of .05 volts across the volume control will give ½ watt speaker output.† (Volume control turned to maximum.)
- (3) Average DC voltage developed across oscillator grid resistor (R1).

| | |
|---------------|---------------|
| Band "B"..... | 6 to 8 volts |
| Band "C"..... | 5 to 10 volts |
| Band "D"..... | 2 to 5 volts |

† Variations of +10%, -20% permissible.

MODELS H634, H638, H640
Alignment, Phono, Data
Dial Drive

GENERAL ELECTRIC CO.

ALIGNMENT PROCEDURE

I.F. Alignment with Oscilloscope

| Band Switch Setting | Input Freq. | Point of Input | Dummy Antenna | Timmer | Comments |
|---------------------|----------------|----------------------------|--------------------|--|---|
| 1. Band "B" | 455 K.C. Sweep | I.F. Grid and Minus B | .05 mfd. or Larger | 2nd I.F. Sec. (C-13b) 2nd I.F. Pri. (C-13a) | Gang condenser plates closed—"manual" key depressed—connect audio input of oscilloscope to minus B and to the junction of R-4 and R-18. Adjust trimmers in order mentioned for a single symmetrical curve of maximum amplitude. The resultant curve is shown in Fig. 1. |
| 2. Band "B" | 455 K.C. Sweep | Converter Grid and Minus B | .05 mfd. or Larger | 1st I.F. Sec. (C-12b) 1st I.F. Pri. (C-12a) | |

I.F. Alignment with Output Meter

| | | | | | |
|-------------|--------------------------|----------------------------|--------------------|--|---|
| 1. Band "B" | 455 K.C. with Modulation | I.F. Grid and Minus B | .05 mfd. or Larger | 2nd I.F. Sec. (C-13b) 2nd I.F. Pri. (C-13a) | Gang condenser plates closed—connect output meter across voice coil—keep input signal low and volume control on as far as possible. Adjust all trimmers for maximum output. |
| 2. Band "B" | 455 K.C. with Modulation | Converter Grid and Minus B | .05 mfd. or Larger | 1st I.F. Sec. (C-12b) 1st I.F. Pri. (C-12a) | |

R. F. Alignment

| | | | | | |
|-------------|---------------------------|--------------|--------|----------------------------|--|
| 1. Band "B" | | | | | Close gang plates adjust pointer to first line at left end of tuning scale. Connect output meter across voice coil—tone control on "Bass" position |
| 2. Band "B" | 580 K.C. with Modulation | Antenna Post | I.R.E. | Osc. Padder (C-4) | Set dial pointer to 580 K.C. and tune in signal with (C-4) |
| 3. Band "B" | 1500 K.C. with Modulation | Antenna Post | I.R.E. | Osc. (C-7) | Peak trimmer for maximum output while rocking the gang condenser |
| 4. Band "B" | 580 K.C. with Modulation | Antenna Post | I.R.E. | Osc. Padder (C-4) | Retrim for maximum output with a low input signal rocking gang condenser |
| 5. Band "C" | 6 M.C. with Modulation | Antenna Post | I.R.E. | Ant. (C-1c) | Peak for maximum output with a low input signal |
| 6. Band "D" | 21 M.C. with Modulation | Antenna Post | I.R.E. | Osc. (C-1a) Ant. (C-1b) | The image of any "D" band signal should be heard 910 K.C. below signal input when (C-1a) is on proper peak. Example: 15 M.C. image—14.09 M.C. Peak (C-1b) while rocking the gang condenser |

PHONOGRAPH MECHANISM (H-638)

The phonograph mechanism used in this receiver has been designed to be as simple as possible and give long and trouble-free performance. Under normal operating conditions service difficulties should be negligible. Occasionally, however, certain adjustments may be required.

Trip Mechanism

The trip mechanism is of simple design and consists of a latch bar connected to the motor switch and a trip lever. The latch is held closed by means of a spring between the latch bar and the trip lever. The motor switch is mechanically connected to the latch bar so that when the trip mechanism is released, the motor switch is in the "Off" position. Be sure this latch bar mechanism works freely without binding.

The trip is actuated by an adjustable arm on the trip lever. When the eccentric groove in the record swings the tone arm back and forth, it pushes the latch out of engagement.

Crystal Pick-up

The crystal pick-up employs a crystal element which is coupled to a light needle chuck. The needle movement bends the crystal element thus generating voltage by the piezo-electric effect. The voltage developed is dependent upon the needle movement amplitude and the load resistance.

The crystal cartridge is a factory-sealed unit and no adjustments are provided. The cartridge is held in the tone arm by means of two screws. The pick-up and tone-arm assembly should require very little servicing and if treated with reasonable care should perform its function without attention for long periods of time.

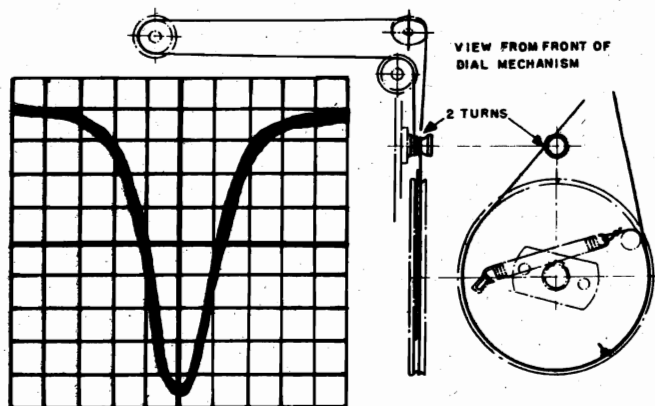


Fig. 1. Over-all I.F. Curve
Taken on G-E Oscilloscope OFM-1

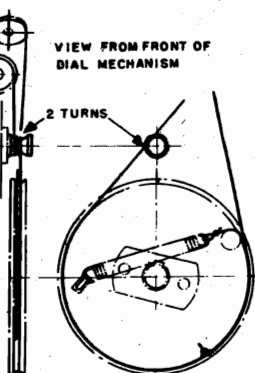


Fig. 6. Dial Drive

Stringing Diagram

GENERAL ELECTRIC CO.

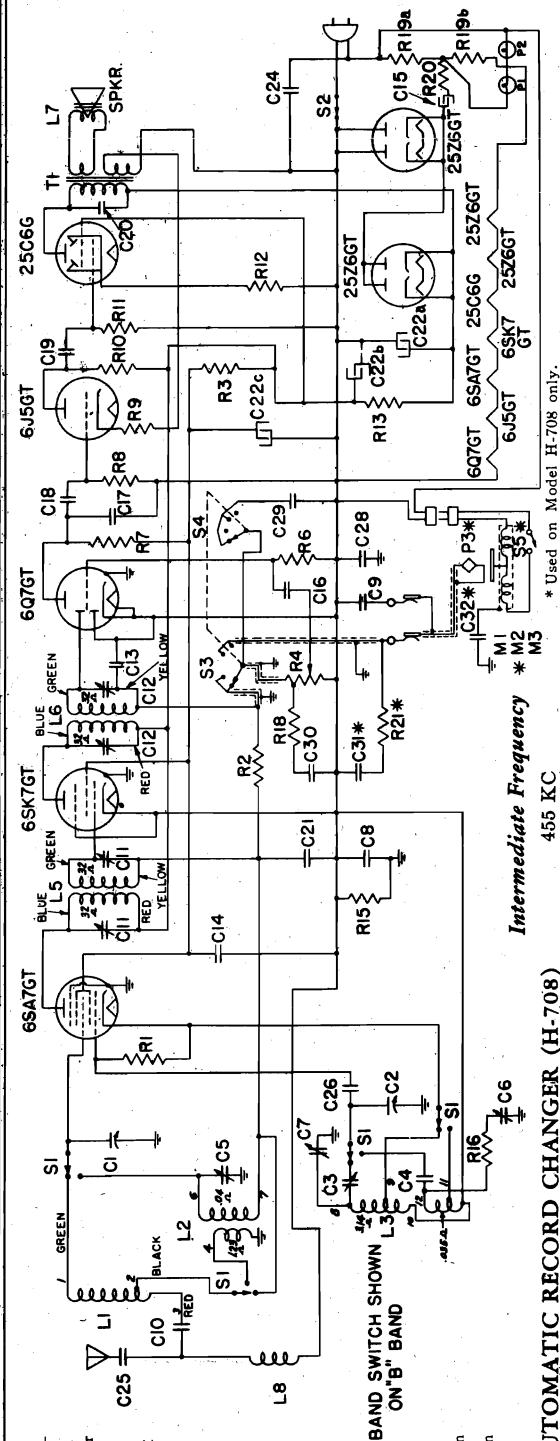
MODELS H708, H736, HJ737
Schematic, Chassis Wiring
Voltage, Socket

Fig. 5. Schematic Diagram

Electrical Specifications

| Model | Rating | Power Supply (Volts) | Frequency (Cycles per second) | Power Consumption (Watts) |
|-------|----------|----------------------|-------------------------------|---------------------------|
| H-736 | | 115 | 25-60 | 65 |
| H-708 | A6 C2 | 115 115 | 60 25 | 90 90 |

Electrical Power Output

Undistorted..... 3.5 watts
Maximum..... 4.5 watts

FRONT OF CHASSIS

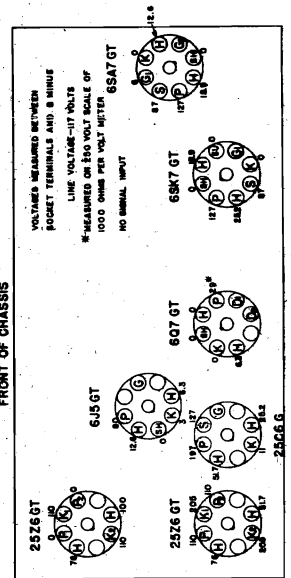


Fig. 2. Socket Voltages

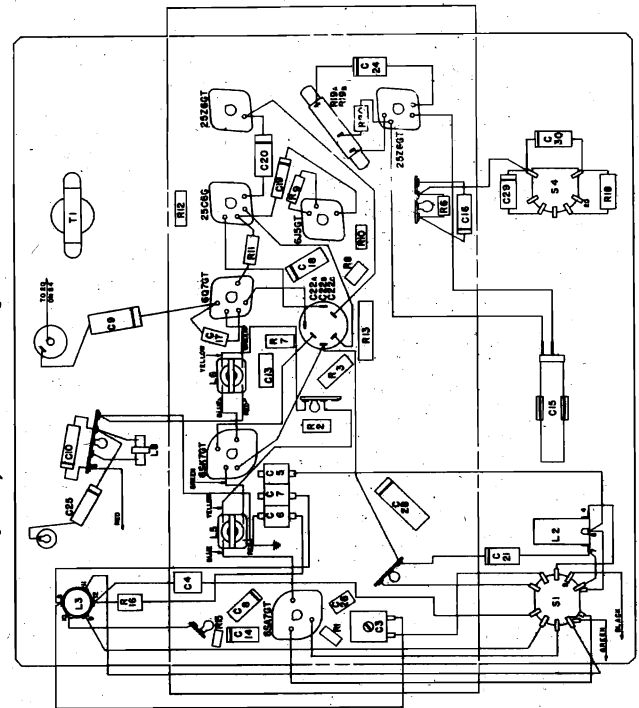


Fig. 4. Chassis Parts Layout

| Symbol | Description |
|--------|--|
| C-1 | Antenna section tuning condenser |
| C-2 | Oscillator section tuning condenser |
| C-3 | "B" band padding capacitor |
| C-4 | 3900 mmf. mica capacitor = 5% |
| C-5 | 3-30 mmf. "D" antenna trimmer |
| C-6 | 3-20 mmf. "D" oscillator trimmer |
| C-7 | 3-20 mmf. "B" oscillator trimmer |
| C-8 | 0.1 mfd. paper capacitor |
| C-9 | 0.1 mfd. paper capacitor |
| C-10 | 0.1 mfd. paper capacitor |
| C-11 | 220 mmf. mica capacitor |
| C-12 | 0.05 mfd. paper capacitor |
| C-13 | 30 mfd. 250 V. dry electrolytic |
| C-14 | 0.02 mfd. paper capacitor |
| C-15 | 220 mmf. mica capacitor |
| C-16 | 0.05 mfd. paper capacitor |
| C-17 | 0.05 mfd. paper capacitor |
| C-18 | 0.05 mfd. paper capacitor |
| C-19 | 0.05 mfd. paper capacitor |
| C-20 | 0.05 mfd. paper capacitor |
| C-21 | 0.05 mfd. paper capacitor |
| C-22a | 40 mfd. 250 V. electrolytic |
| C-22b | 20 mfd. 250 V. electrolytic |
| C-22c | 20 mfd. 250 V. electrolytic |
| C-23 | 0.05 mfd. paper capacitor |
| C-24 | 0.05 mfd. paper capacitor |
| C-25 | 0.05 mfd. paper capacitor |
| C-26 | 0.05 mfd. paper capacitor |
| C-27 | 0.05 mfd. paper capacitor |
| C-28 | 0.05 mfd. paper capacitor |
| C-29 | 0.05 mfd. paper capacitor (used on H-708 only) |
| C-30 | 0.05 mfd. paper capacitor |
| C-31 | 0.05 mfd. paper capacitor |
| C-32 | 0.05 mfd. paper capacitor |
| C-33 | 0.05 mfd. paper capacitor |
| L-1 | Beam-a-Scope |
| L-2 | "D" antenna coil |
| L-3 | "B-D" oscillator coil |
| L-4 | 1st I.F. transformer |
| L-5 | 1st I.F. transformer |
| L-6 | 1st I.F. transformer |
| L-7 | 1st I.F. transformer |
| L-8 | 1st I.F. transformer |
| M-1 | 60-cycle phono motor |
| M-2 | 50-cycle phono motor |
| M-3 | 25-cycle phono motor |
| P-1 | Dial lamps, Mazda No. 44 |
| P-2 | Crystal pick-up |
| R-1 | 33,000 ohms carbon resistor |
| R-2 | 33,000 ohms carbon resistor |
| R-3 | 33,000 ohms carbon resistor |
| R-4 | 33,000 ohms carbon resistor |
| R-5 | 33,000 ohms carbon resistor |
| R-6 | 33,000 ohms carbon resistor |
| R-7 | 33,000 ohms carbon resistor |
| R-8 | 33,000 ohms carbon resistor |
| R-9 | 33,000 ohms carbon resistor |
| R-10 | 33,000 ohms carbon resistor |
| R-11 | 33,000 ohms carbon resistor |
| R-12 | 33,000 ohms carbon resistor |
| R-13 | 33,000 ohms carbon resistor |
| R-14 | 33,000 ohms carbon resistor |
| R-15 | 33,000 ohms carbon resistor |
| R-16 | 33,000 ohms carbon resistor |
| R-17 | 33,000 ohms carbon resistor |
| R-18 | 33,000 ohms carbon resistor |
| R-19a | 33 ohms, 3.5 W. wire wound |
| R-19b | 33 ohms, 3.5 W. wire wound |
| R-20 | 22 ohms, 2 W. carbon resistor |
| R-21 | 100,000 ohms carbon resistor |
| S-1 | Band switch |
| S-2 | Power switch on volume control |
| S-3 | Radio-Phono switch |
| S-4 | Volume control switch |
| T-1 | Output transformer |

Phonograph

| | |
|----------------------|--------------------------|
| Model..... | H-708 |
| Type..... | Automatic Record Changer |
| Record Capacity..... | 8 |
| 10-inch..... | 7 |
| 12-inch..... | Crystal |
| Type Pick-up..... | 78 R.P.M. |
| Turntable Speed..... | |

MODELS H708, H736, HJ737**Alignment, Trimmers, Gain
Circuit Data, Notes****GENERAL ELECTRIC CO.****GENERAL INFORMATION**

Models H-736 and H-708 employ two-band AC receivers of the superheterodyne type using seven General Electric Pre-tested Tubes. Features of design include the voltage doubler rectifier circuit, 12-inch Dynapower speaker, built-in Beam-a-Scope, "plug-in" type terminal for connecting a record player or television sound channel, six mechanical type "Feather-touch Tuning" keys and beam power output.

Model H-708 also contains an automatic-record-changing phonograph mechanism. High-quality reproduction is assured with a crystal pick-up and constant-speed, self-starting, silent electric motor.

Voltage Doubler

The voltage doubler circuit used in Models H-736 and H-708 operates in the following manner; refer to Schematic Diagram Fig. 5. When the B minus side of the power line is positive the right-hand 25Z6GT rectifier will conduct charging up electrolytic capacitor (C-15) to near line voltage. On the reverse cycle when the B minus side of the power line is negative, the line voltage will add to the charge on (C-15) and will charge up electrolytic capacitor (C-22a) through the left-hand 25Z6GT rectifier to nearly twice line voltage. The series resistor (R-20) is inserted as a protective device for both rectifier tubes.

Phonograph or Television Sound Connections

These receivers are equipped with a phono-terminal (pin jack) to allow the convenient connection of a record player or television sound channel. General Electric plug, Stock No. RP-145, fits the pin jack. The Model H-708 uses the plug connection from pick-up to radio and this plug may be readily removed to allow use of another record player or a television sound converter.

NOTE: When using a crystal pick-up other than the one supplied with the Model H-708, a suitable load consisting of a 47,000-ohm resistor in series with a .0072-mfd. capacitor should be connected across the pick-up leads.

ALIGNMENT PROCEDURE**Alignment Frequencies**

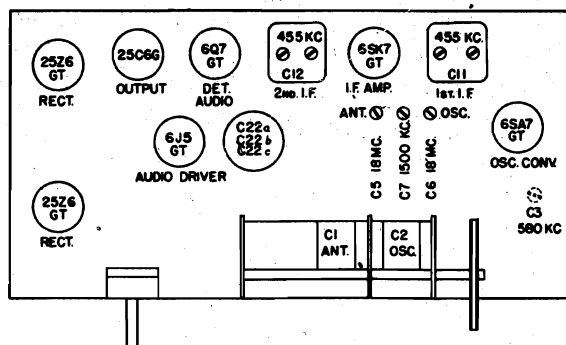
| | |
|----------|-----------------|
| I.F. | 455 KC |
| "B" Band | 1500 and 580 KC |
| "D" Band | 18,000 KC |

The location of trimmers for the above models is shown in Fig. 1.

I.F. Alignment

Connect an output meter across the voice coil. Rotate the volume control to maximum. Completely close the gang condenser plates and set the dial pointer to the first dial mark on the left-hand end of the broadcast scale. Turn the band switch to "B" band (counterclockwise) and the tone control to "Radio-Bass" (extreme counterclockwise).

Set test oscillator to 455 KC and apply signal to the control grid of the 6SA7GT tube through a .05 mfd. capacitor. Do not remove the 6SA7GT grid lead. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers (C-11 and C-12) for maximum meter reading.

**Fig. 1. Trimmer Location****R.F. Alignment**

Apply R.F. signals through a standard I.R.E. dummy antenna to the antenna post on the rear apron of the chassis. The Beam-a-Scope must be connected for R.F. alignment and since its relative position with respect to the chassis materially affects the alignment on "B" band, it is advisable to perform the alignment when the chassis and Beam-a-Scope are properly mounted in the cabinet.

Align (C-3) on 580 KC when gang condenser is turned to the 580 KC dial mark. Peak (C-7) on 1500 KC while rocking gang condenser. Repeak (C-3) on 580 KC while rocking gang condenser.

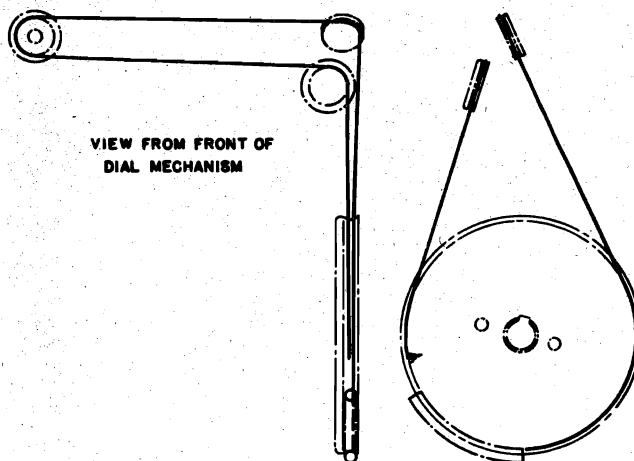
Turn band switch to "D" band and turn gang condenser to 18 MC dial mark. Align (C-6) on 18 MC and peak (C-5) while rocking the gang condenser. The image of any "D" band signal should be heard 910 KC below the input signal when (C-6) is on the proper peak. Example: 18 MC image—17.09 MC.

Special Service Information

The following information will be found very useful in servicing receivers if a vacuum-tube voltmeter or similar voltage-measuring instrument is available:

- (1) Stage Gains
 - (a) Antenna Post to Converter Grid—10 at 1000 KC†
 - (b) Converter Grid to 6SK7 Grid—30 at 455 KC†
 - (c) 6SK7 Grid to 6Q7 Det. Plate—77 at 455 KC†
- (2) A 400-cycle signal of .06 volts across the volume control will give ½ watt speaker output.† (Volume turned to maximum.)
- (3) Average DC voltage developed across oscillator grid resistor (R-1)—6 volts.

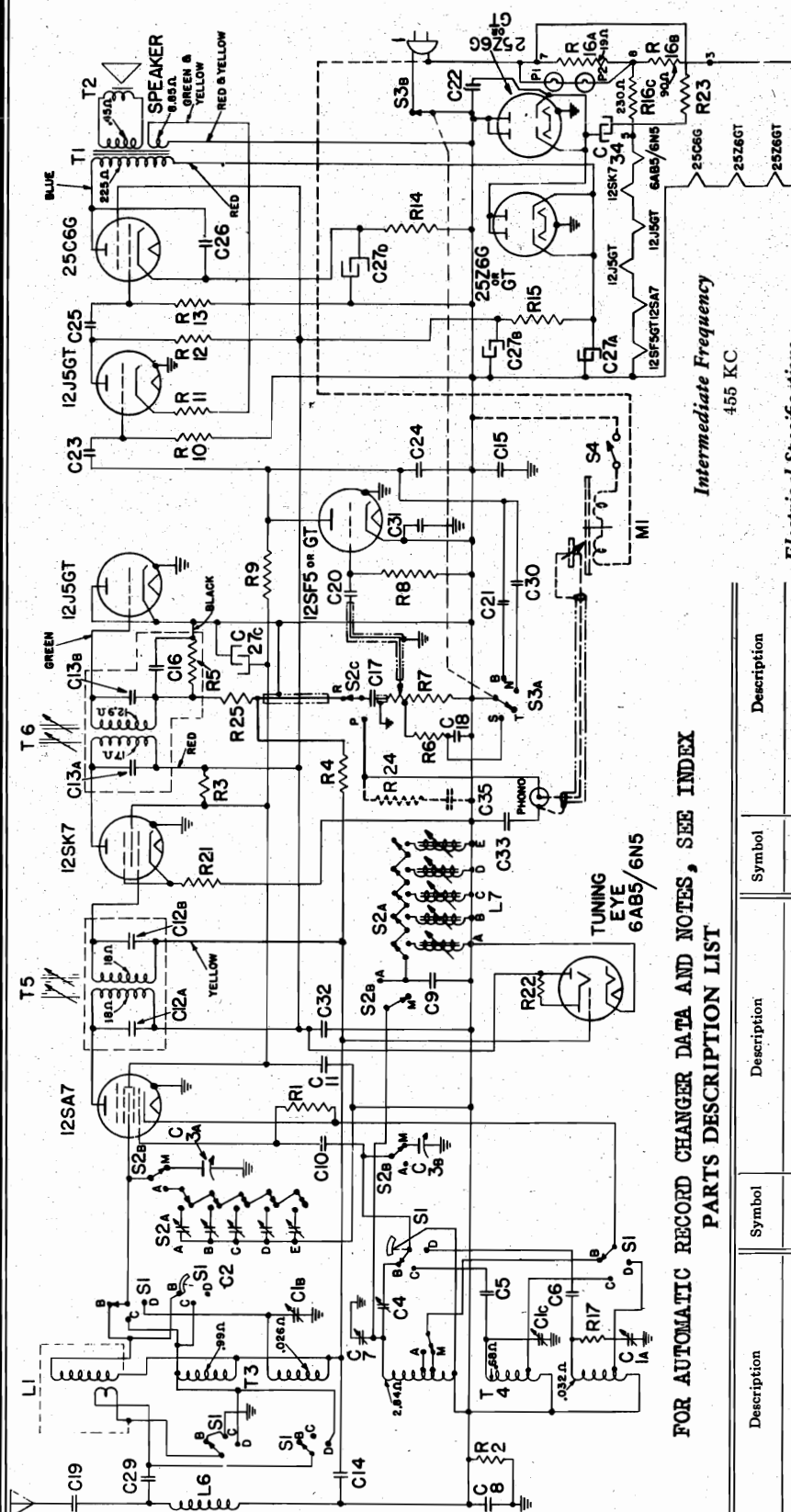
† Variations of +10%, -20% permissible.

**Fig. 3. Drive Cord Arrangement****Loud-speaker—"Alnico" Magnetic Dynamic**

Outside Cone Diameter..... 12 inches
Voice Coil Impedance (400 cycles)..... 3.5 ohms

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly.

NOTE: In no case should the magnet be removed from the assembled position without remagnetizing after replacing it.



Electrical Specifications

| Model | Rating | Power Supply (Volts) | Frequency (Cycles per Second) | Power Consumption (Watts) |
|--------|--------|----------------------|-------------------------------|---------------------------|
| HJ-905 | | 115 | 25-60 | 85 |
| | | | | |
| HJ-908 | A6 | 110-125 | 60 | 95 |
| | A5 | 110-125 | 50 | 95 |
| | C2 | 110-125 | 25 | 110 |
| | | | | |

Electrical Power Output

| | |
|------------------|-----------|
| Undistorted..... | 4.5 watts |
| Maximum..... | .6 watts |

4-speaker—"Alnico" Magnetic Dynamic

| | |
|--|-----------|
| Outside Cone Diameter..... | 12 inches |
| Voice Coil Impedance (400 cycles)..... | 3.5 ohms |

FOR AUTOMATIC RECORD CHANGER DATA AND NOTES, SEE INDEX
PARTS DESCRIPTION LIST

| Symbol | Description | Symbol | Description | Symbol | Description |
|--------|---------------------------------------|--------|-----------------------------------|--------|-------------------------------|
| C-1A | "D" band oscillator trimmer | C-22 | .05 mfd. paper capacitor | R-8 | 4.7 megohms carbon resistor |
| C-1B | "D" band oscillator trimmer | C-23 | .05 mfd. paper capacitor | R-9 | 220,000 ohms carbon resistor |
| C-1C | "C" band oscillator trimmer | C-24 | 100 mfd. paper capacitor | R-10 | 220,000 ohms carbon resistor |
| C-2A | 7-65 mmf. station selector trimmer | C-25 | .02 mfd. paper capacitor | R-11 | 330,000 ohms carbon resistor |
| C-2B | 20-180 mmf. station selector trimmer | C-26 | .01 mfd. paper capacitor | R-12 | 330,000 ohms carbon resistor |
| C-2C | 20-180 mmf. station selector trimmer | C-27A | 40 mfd. 250 V. dry electrolytic | R-13 | 220 ohms 1 W. carbon resistor |
| C-2D | 100-490 mmf. station selector trimmer | C-27B | 20 mfd. 250 V. dry electrolytic | R-14 | 220 ohms 1 W. carbon resistor |
| C-2E | 100-490 mmf. station selector trimmer | C-27C | 20 mfd. 250 V. dry electrolytic | R-15 | 330 ohms 3 W. carbon resistor |
| C-3A | Antenna section tuning condenser | C-27D | 20 mfd. 25 V. dry electrolytic | R-16A | 19 ohms ballast resistor |
| C-3B | Oscillator section tuning condenser | C-29 | .001 mfd. paper capacitor | R-16B | 90 ohms ballast resistor |
| C-4 | 300-675 mmf. "B" band padder | C-30 | .001 mfd. 1000 V. paper capacitor | R-17 | 33 ohms carbon resistor |
| C-5 | 2400 mmf. mica capacitor =5% | C-31 | .01 mfd. paper capacitor | R-18 | 230 ohms carbon resistor |
| C-6 | 2400 mmf. mica capacitor =5% | C-32 | .05 mfd. paper capacitor | R-19C | 33 ohms carbon resistor |
| C-7 | "B" band oscillator trimmer | C-33 | .01 mfd. paper capacitor | R-21 | 47 ohms carbon resistor |
| C-8 | 750 mfd. paper capacitor | C-34 | 20 mfd. 250 V. dry electrolytic | R-22 | 1.0 megohm carbon resistor |
| C-9 | 47 mfd. paper capacitor | C-35 | .02 mfd. paper capacitor | R-23 | 330,000 ohms carbon resistor |
| C-10 | 47 mfd. mica capacitor | L-1 | Beesley type | R-24 | 47,000 ohms carbon resistor |
| C-11 | .05 mfd. paper capacitor | L-6 | Antenna Coupler | S-1 | 300 ohm switch |
| C-12 | 0.1 mfd. paper capacitor | P-1, 2 | Dial lamp, Mazda No. 44 | S-2A | Station selector switch |
| C-13 | 0.1 mfd. paper capacitor | R-1 | 33,000 ohms carbon resistor | S-2B | Manual switch |
| C-14 | 0.1 mfd. paper capacitor | R-2 | 470,000 ohms carbon resistor | S-2C | Phone switch |
| C-15 | 100 mmf. mica capacitor | R-3 | 3300 ohms 1 W. carbon resistor | S-3A | Tone switch |
| C-16 | .005 mfd. paper capacitor | R-4 | 2.2 megohms carbon resistor | S-3B | Power switch |
| C-17 | .0072 mfd. paper capacitor | R-5 | 470,000 ohms carbon resistor | S-4 | Phone motor switch |
| C-18 | .005 mfd. paper capacitor | R-6 | 2.2 megohms carbon resistor | | |
| C-19 | .005 mfd. paper capacitor | R-7 | 56,000 ohms carbon resistor | | |
| C-20 | .01 mfd. paper capacitor | | 2.0 megohms volume control | | |
| C-21 | .0032 mfd. paper capacitor | | | | |

I.F. Alignment

Set test oscillator to 455 KC and apply signal to the control grid of the 12SA7 tube through a .05 mfd. capacitor. Do not remove the 12SA7 grid lead. Keep the test oscillator output as low as a readable meter reading will permit. Adjust all I.F. trimmers (C-12 and C-13) for maximum meter reading.

Apply R.F. signals through a standard I.R.E. dummy antenna to the antenna post on the rear apron of the chassis. The Beam-a-Scope must be connected for R.F. alignment and since its relative position with respect to the chassis materially affects the alignment on "B" band, it is advisable to perform the alignment when the chassis and Beam-a-Scope are properly mounted in the cabinet.

Turn band switch to "D" band and turn gang condenser to 21 MC dial mark. Align (C-1A) on 21 MC and peak (C-1B) while rocking the gang condenser. The image of any "D" band signal should be heard 910 KC below the input signal when (C-1A) is on the proper peak. Example: 21 MC image —20.09 MC.

Special Service Information

FRONT-OF CHASSIS

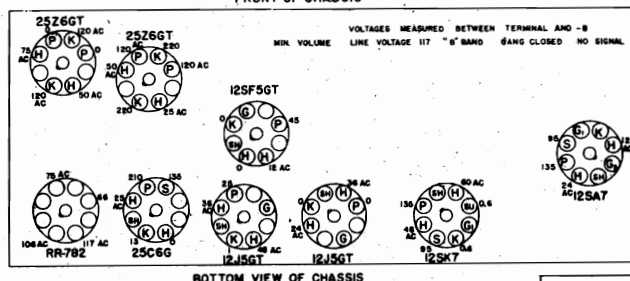


Fig. 2. Socket Voltages

Tuning Frequency Range

| | |
|-----------------|----------------|
| Broadcast..... | 550-1600 KC |
| Short-wave..... | 2300-22,000 KC |

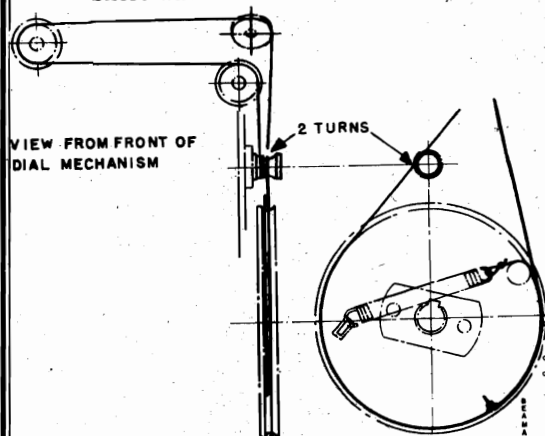


Fig. 3. Drive Cord Arrangement

- (a) Antenna Post to Converter Grid—12 at 1000 KC†
- (b) Converter Grid to 12SK7 Grid—60 at 455 KC†
- (c) 12SK7 Grid to 12J5GT Det. Grid—85 at 455 KC†

- (2) A 400-cycle signal of .04 volts across the volume control will give $\frac{1}{2}$ watt speaker output.† (Volume turned to maximum.)

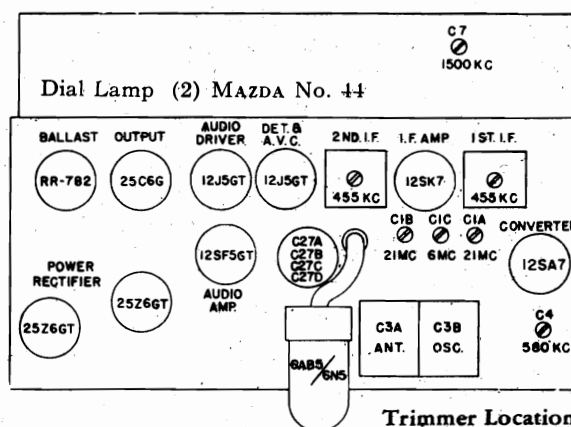
- (3) DC voltage developed across oscillator grid resistor (R-1)—11 volts at 1000 KC.

† Variations of $\pm 10\%$, -20% permissible.

Loud-speaker

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering, it will be necessary to replace the entire cone and voice coil assembly.

NOTE: In no case should the magnet be removed from the assembled position without remagnetizing after replacing it.



Trimmer Location

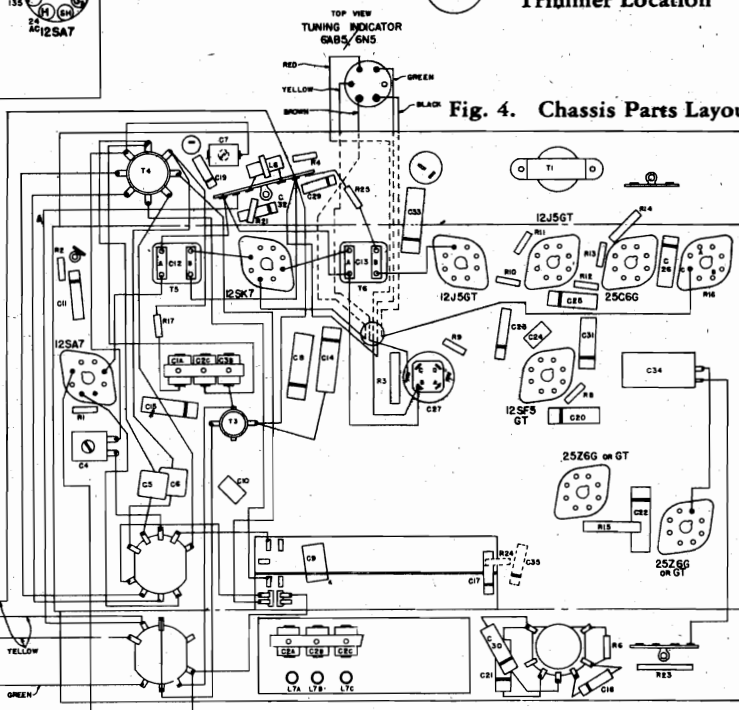


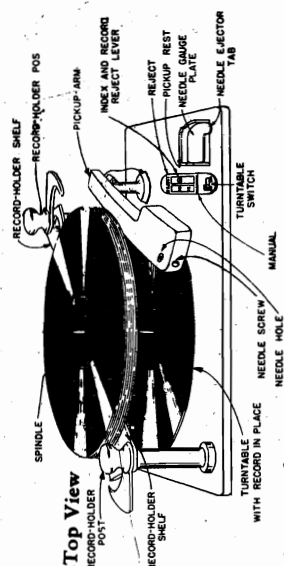
Fig. 4. Chassis Parts Layout

MODEL HM21 Wireless Record Player Schematic, Adjustments

GENERAL ELECTRIC CO.

 MODELS HJ905, HJ908, HJ908B
Circuit Data, Record Changer

AUTOMATIC RECORD CHANGER (HJ-908)



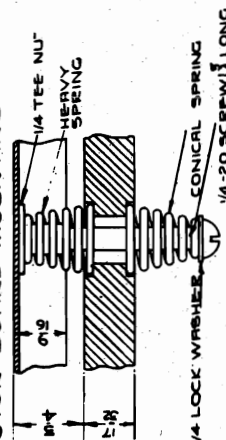
Phonograph

| | |
|----------------------|--------------------------|
| Model..... | HJ-908 |
| Type..... | Automatic Record Changer |
| Record Capacity | 10-inch.....8 |
| | 12-inch.....7 |
| Type Pick-up..... | Crystal |
| Turntable Speed..... | 78 R.P.M. |

General Information

Model HJ-908 radio-phonograph combination is equipped with an automatic record changer. The turntable is driven through a friction drive wheel mounted on the turntable spindle. It is important that the drive motor spindle and rubber tires on the main driving wheel and idler pulley be kept clean and free from oil, grease, dirt or any foreign matter. Any quick-drying naphtha is satisfactory for cleaning these parts. The drive motor bearing is lubricated from an oil well filled and sealed at the factory. It should not require lubrication in the field. The turntable is not removable from the spindle without removing the tapered pin "24" which fastens the rubber-tired driving wheel to the spindle. Once the pin is removed, the driving wheel can be slipped off the spindle and the turntable and spindle assembly lifted upward from the motor board. Caution should be exercised not to bend the spindle. The spindle bearing should be oiled and the cup and ball thrust bearing oiled and checked for proper position.

MOTOR BOARD MOUNTING


 Mounting Details
of Automatic Record Changer

FREQUENCY ADJUSTMENT

To adjust the frequency of the oscillator turn the tuning trimmer which is accessible through a hole in the bottom cover near the power control knob. This is a screwdriver control. Clockwise rotation of the trimmer raises the frequency while counterclockwise rotation lowers the frequency. Since the electrical capacity of the hand may detune the transmitter somewhat if rested on the record player during adjustment, it is best to rest the record player on the edge of a table or bench with the tuning trimmer side of the record player just far enough out from the edge to allow screwdriver adjustment of the tuning trimmer.

MODELS HJ-905, HJ-908. GENERAL INFORMATION

Models HJ-905 and HJ-908 employ three-band AC receivers of the superheterodyne type using nine General Electric Pre-tested Tubes. Features of design include the voltage doubler rectifier circuit, 14-inch Dynapower speaker, built-in Super Beam-a-scope, "plug-in" type terminal for connecting a record player or television sound channel, seven "Feathertouch Tuning" keys and beam power output.

Model HJ-908 also contains an automatic-record-changing phonograph mechanism. High-quality reproduction is assured with a crystal pick-up and constant-speed, self-starting, silent electric motor.

Model HJ-908B is the same as Model HJ-908 except in bleached mahogany cabinet.

Voltage Doubler

The voltage doubler circuit used in Models HJ-905 and HJ-908 operates in the following manner: refer to Schematic Diagram Fig. 5. When the B minus side of the power line is positive the right-hand 25Z6G1 rectifier will conduct charging up electrolytic capacitor (C-34) to near line voltage. On the reverse cycle when the B minus side of the power line is negative the line voltage will add to the charge on (C-34) and will charge up electrolytic capacitor (C-27A) through the left-hand 25Z6G1 rectifier to nearly twice line voltage. The series resistor (R-23) is inserted as a protective device for both rectifier tubes.

Phonograph or Television Sound Connections

These receivers are equipped with a phono-terminal (pin jack) to allow the convenient connections of a record player or television sound channel. General Electric plug, Stock No. RP-145, fits the pin jack. The Model HJ-908 uses the plug connection from pick-up to radio and this plug may be readily removed to allow use of another record player or a television sound converter.

FEATHERTOUCH TUNING ADJUSTMENTS

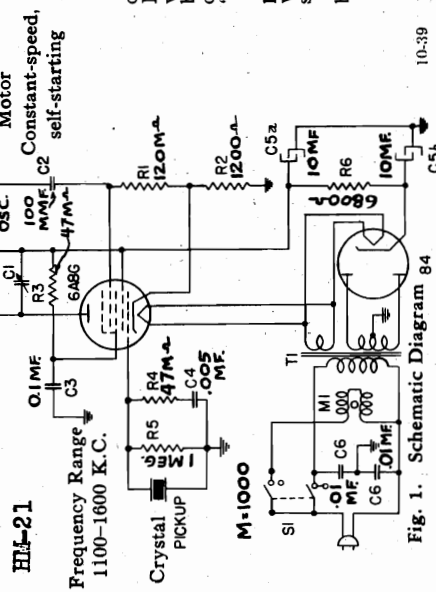
When peaking the antenna trimmer of either of the first two left-hand station keys care must be exercised not to open the trimmer so far that tuning to the oscillator frequency results. If this occurs the tuning indicator shadow sector will vanish and a false indication will be given of tuning.

 FOR OTHER AUTOMATIC
RECORD CHANGER DATA
SEE G69 VOL. X PAGE 9.

Electrical Specifications HM-21 Record Player Oscillator

| Rating | Power Supply (Volts) | Frequency (Cycles per Second) | Power Consumption (Watts) |
|--------|----------------------|-------------------------------|---------------------------|
| A6 | 115-125 | 60 | 30 |
| A5 | 115-125 | 50 | 30 |

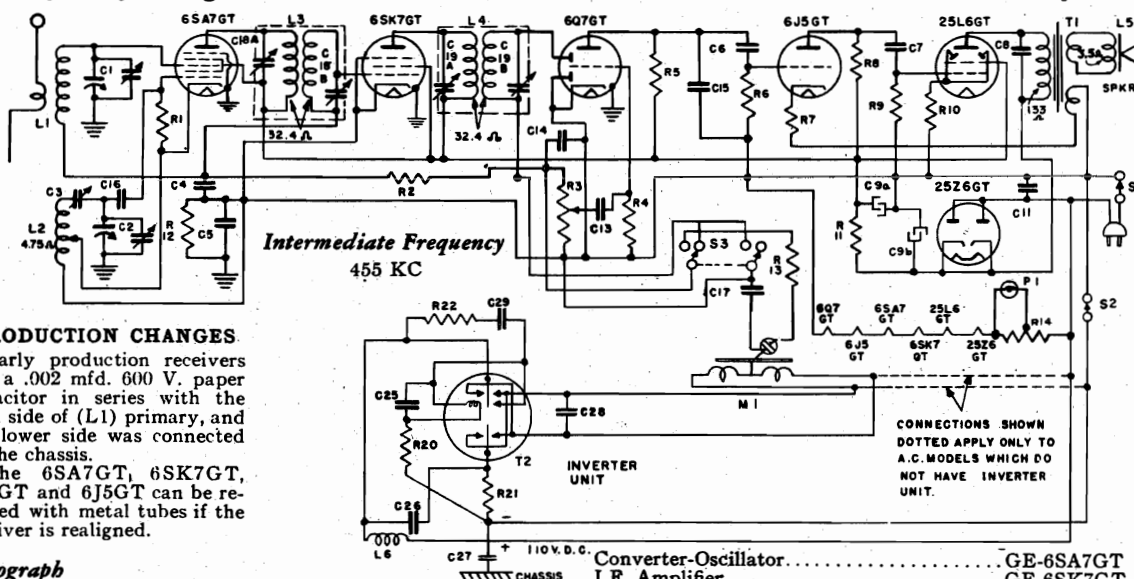
HM-21



MODELS H639AC, H639DC
Schematic, Gain, Voltage

GENERAL ELECTRIC CO.

Socket, Alignment, Trimmers
Phono Sw. Assembly



PRODUCTION CHANGES

Early production receivers had a .002 mfd. 600 V. paper capacitor in series with the high side of (L1) primary, and the lower side was connected to the chassis.

The 6SA7GT, 6SK7GT, 6Q7GT and 6J5GT can be replaced with metal tubes if the receiver is realigned.

Phonograph

Models..... H-639 AC and H-639 DC
Type Pick-up..... Crystal
Turntable Speed..... 78 R.P.M.

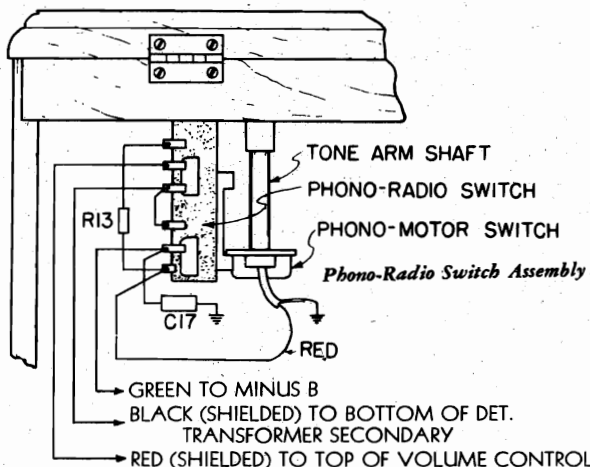
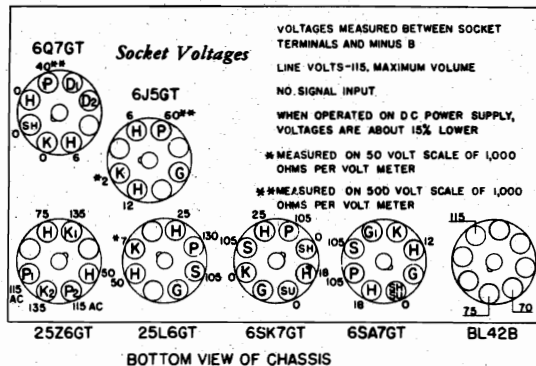
Special Service Information

The following data will be very useful to servicemen equipped with vacuum tube voltmeters or similar voltage measuring instruments.

- (1) Stage Gains
Antenna Post to Converter Grid—4 at 1000 KC†
Converter Grid to 6SK7GT Grid—30 at 455 KC†
6SK7GT Grid to 6Q7GT Det. Plate—100 at 455 KC†
- (2) Audio Gains
.06 volts, 400 cycles signal across volume control with control set to maximum will give approximately 1/2 watt speaker output.
- (3) DC voltage developed across oscillator grid resistor (R-1) averages 12 volts.

† Variations of +10%, -20% permissible.

FRONT OF CHASSIS



| | |
|---------------------------|--------------|
| Converter-Oscillator..... | GE-6SA7GT |
| I.F. Amplifier..... | GE-6SK7GT |
| Det., Aud., AVC..... | GE-6Q7GT |
| 2nd Audio Amplifier..... | GE-6J5GT |
| Power Output..... | GE-25L6GT |
| Rectifier..... | GE-25Z6GT |
| Dial Lamp..... | MAZDA No. 44 |

| Model | Power Supply (Volts) | Frequency (Cycles on AC) | Power Consumption (Watts) |
|----------|----------------------|--------------------------|---------------------------|
| H-639 AC | 115 AC | 60 | 75 |
| H-639 DC | 115 DC | | 85 |

Electrical Power Output

Undistorted..... 2.0 watts
Maximum..... 2.5 watts

Loudspeaker—"Alnico" Magnetic Dynamic

Outside Cone Diameter..... 6.5 inches
Voice Coil Impedance (400 cycles)..... 3.5 ohms

The voice coil is accurately and permanently centered at the factory and should seldom give trouble. In case a voice cone and voice coil assembly.

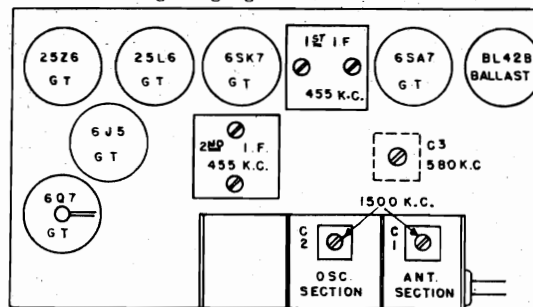
NOTE—In no case should the magnet be removed from the assembled position without remagnetizing after replacing it.

ALIGNMENT PROCEDURE

I.F. Connect an output meter across the voice coil. Turn the volume control to maximum. Set test oscillator to 455 KC and keep the oscillator output as low as a readable meter reading will permit.

Apply signal to the grid of the 6SK7GT through a .05 mfd. capacitor and align the 2nd I.F. transformer. Repeat the procedure, applying the 455 KC signal to the control grid of the 6SA7GT and aligning the 1st I.F. transformer. Finish by over-all adjustments.

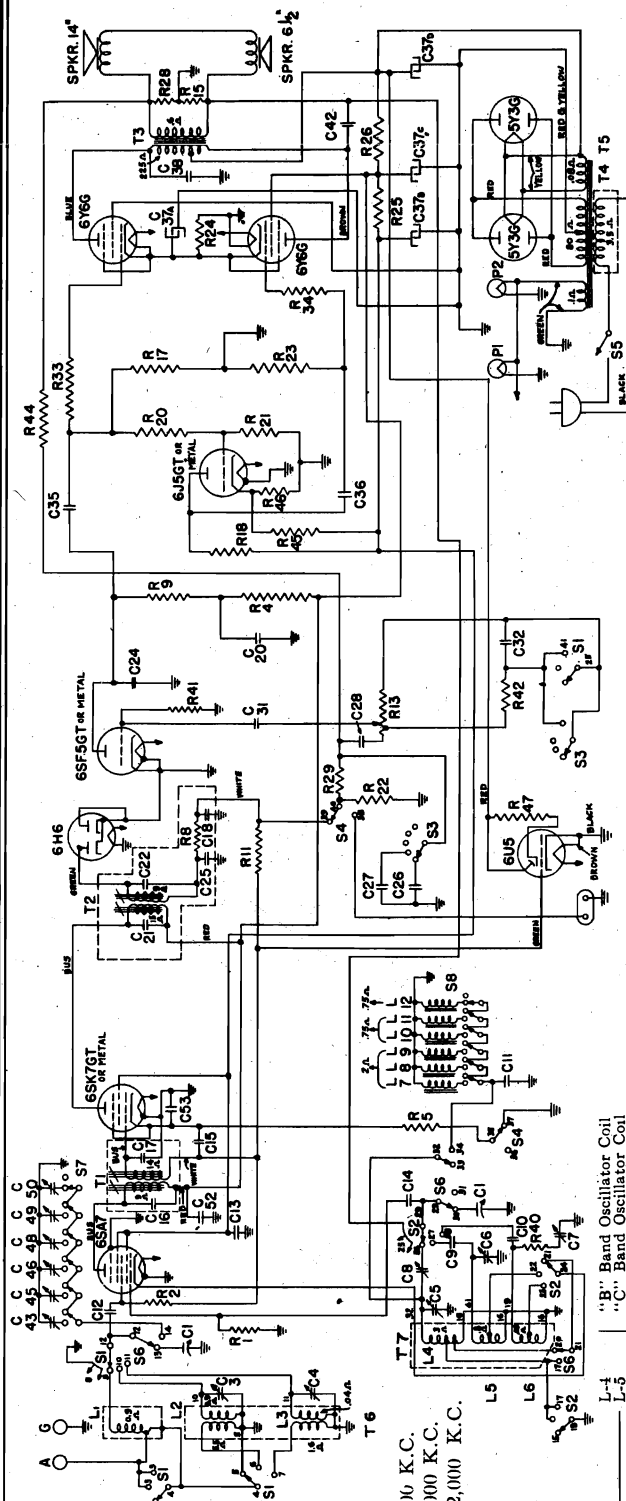
R.F. With gang condenser plates completely closed, set dial pointer to the first mark at the left end of the scale. Apply a 1500 KC signal either through a standard I.R.E. dummy to the antenna terminal or through an additional loop connected to the generator output which can be magnetically coupled to the receiver Beam-a-Scope. Align (C-2) at 1500 KC and peak (C-1) for maximum output. Peak (C-3) on 580 KC while rocking the gang condenser. Retrim at 1500 KC.



GENERAL ELECTRIC CO.

MODEL HJ1005

Schematic, Trimmers, Notes



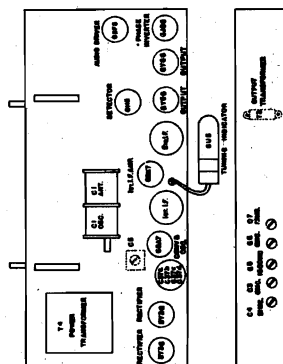
Tuning Frequency Range

Band "B" 540-1600 K.C.
 Band "C" 2300-7000 K.C.
 Band "D" 7000-22,000 K.C.

Description

| Symbol | Description |
|--------|--------------------------------------|
| C-1 | Tuning Condenser |
| C-2 | 3-30 mmf. "C" Antenna Trimmer |
| C-3 | 3-30 mmf. "D" Antenna Trimmer |
| C-4 | 5-40 mmf. "B" Oscillator Trimmer |
| C-5 | 3-30 mmf. "D" Oscillator Trimmer |
| C-6 | 3-30 mmf. "D" Oscillator Trimmer |
| C-7 | 3-30 mmf. "D" Oscillator Trimmer |
| C-8 | 3-30 mmf. "D" Oscillator Trimmer |
| C-9 | 1600 mmf. Mica Capacitor |
| C-10 | 4300 mmf. Mica Capacitor |
| C-11 | 750 mmf. Mica Capacitor |
| C-12 | 150 mmf. Mica Capacitor |
| C-13 | 0.1 mfd. Paper Capacitor |
| C-14 | 0.1 mfd. Paper Capacitor |
| C-15 | 0.1 mfd. Paper Capacitor |
| C-16 | 0.1 mfd. Paper Capacitor |
| C-17 | 85 mmf. I.F. Capacitor |
| C-18 | 85 mmf. I.F. Capacitor |
| C-19 | 85 mmf. I.F. Capacitor |
| C-20 | 85 mmf. I.F. Capacitor |
| C-21 | 85 mmf. I.F. Capacitor |
| C-22 | 175 mmf. I.F. Capacitor |
| C-23 | 100 mmf. Mica Capacitor |
| C-24 | 100 mmf. Mica Capacitor |
| C-25 | 100 mmf. Mica Capacitor |
| C-26 | 100 mmf. Mica Capacitor |
| C-27 | 470 mmf. Paper Capacitor |
| C-28 | 0.1 mfd. Paper Capacitor |
| C-29 | 0.1 mfd. Paper Capacitor |
| C-30 | 0.1 mfd. Paper Capacitor |
| C-31 | 0.1 mfd. Paper Capacitor |
| C-32 | 0.1 mfd. Paper Capacitor |
| C-33 | 0.1 mfd. Paper Capacitor |
| C-34 | 0.1 mfd. Paper Capacitor |
| C-35 | 0.1 mfd. Paper Capacitor |
| C-36 | 0.1 mfd. Paper Capacitor |
| C-37A | 20 mfd. 250 V. Dry Electrolytic |
| C-37B | 20 mfd. 250 V. Dry Electrolytic |
| C-37C | 20 mfd. 250 V. Dry Electrolytic |
| C-37D | 20 mfd. 250 V. Dry Electrolytic |
| C-38 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-39 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-40 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-41 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-42 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-43 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-44 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-45 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-46 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-47 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-48 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-49 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-50 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-51 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-52 | 0.02 mfd. 1000 V. Paper Capacitor |
| C-53 | 0.02 mfd. 1000 V. Paper Capacitor |
| L-1 | Beam-a-Scope |
| L-2 | "C" Band Antenna Coil |
| L-3 | "D" Band Antenna Coil |
| L-4 | "B" Band Oscillator Coil |
| L-5 | "C" Band Oscillator Coil |
| L-6 | "D" Band Oscillator Coil |
| L-7 | Station Oscillator Coils (Code Blue) |
| L-8 | Station Oscillator Coils (Code Red) |
| L-9 | Station Oscillator Coils (Code None) |
| L-10 | Dial Lamp, Mazda No. 44 |
| L-11 | 22,000 ohms Carbon Resistor |
| L-12 | 1.0 megohm Carbon Resistor |
| L-13 | 47,000 ohms Carbon Resistor |
| L-14 | 47,000 ohms Carbon Resistor |
| L-15 | 47,000 ohms Carbon Resistor |
| L-16 | 220,000 ohms Carbon Resistor |
| L-17 | 220,000 ohms Carbon Resistor |
| L-18 | 220,000 ohms Carbon Resistor |
| L-19 | 220,000 ohms Carbon Resistor |
| L-20 | 220,000 ohms Carbon Resistor |
| L-21 | 220,000 ohms Carbon Resistor |
| L-22 | 220,000 ohms Carbon Resistor |
| L-23 | 220,000 ohms Carbon Resistor |
| L-24 | 220,000 ohms Carbon Resistor |
| L-25 | 220,000 ohms Carbon Resistor |
| L-26 | 220,000 ohms Carbon Resistor |
| L-27 | 220,000 ohms Carbon Resistor |
| L-28 | 220,000 ohms Carbon Resistor |
| L-29 | 220,000 ohms Carbon Resistor |
| L-30 | 220,000 ohms Carbon Resistor |
| L-31 | 220,000 ohms Carbon Resistor |
| L-32 | 220,000 ohms Carbon Resistor |
| L-33 | 220,000 ohms Carbon Resistor |
| L-34 | 220,000 ohms Carbon Resistor |
| L-35 | 220,000 ohms Carbon Resistor |
| L-36 | 220,000 ohms Carbon Resistor |
| L-37 | 220,000 ohms Carbon Resistor |
| L-38 | 220,000 ohms Carbon Resistor |
| L-39 | 220,000 ohms Carbon Resistor |
| L-40 | 220,000 ohms Carbon Resistor |
| L-41 | 220,000 ohms Carbon Resistor |
| L-42 | 220,000 ohms Carbon Resistor |
| L-43 | 220,000 ohms Carbon Resistor |
| L-44 | 220,000 ohms Carbon Resistor |
| L-45 | 220,000 ohms Carbon Resistor |
| L-46 | 220,000 ohms Carbon Resistor |
| L-47 | 220,000 ohms Carbon Resistor |
| L-48 | 220,000 ohms Carbon Resistor |
| L-49 | 220,000 ohms Carbon Resistor |
| L-50 | 220,000 ohms Carbon Resistor |
| L-51 | 220,000 ohms Carbon Resistor |
| L-52 | 220,000 ohms Carbon Resistor |
| L-53 | 220,000 ohms Carbon Resistor |
| L-54 | 220,000 ohms Carbon Resistor |
| L-55 | 220,000 ohms Carbon Resistor |
| L-56 | 220,000 ohms Carbon Resistor |
| L-57 | 220,000 ohms Carbon Resistor |
| L-58 | 220,000 ohms Carbon Resistor |
| L-59 | 220,000 ohms Carbon Resistor |
| L-60 | 220,000 ohms Carbon Resistor |
| L-61 | 220,000 ohms Carbon Resistor |
| L-62 | 220,000 ohms Carbon Resistor |
| L-63 | 220,000 ohms Carbon Resistor |
| L-64 | 220,000 ohms Carbon Resistor |
| L-65 | 220,000 ohms Carbon Resistor |
| L-66 | 220,000 ohms Carbon Resistor |
| L-67 | 220,000 ohms Carbon Resistor |
| L-68 | 220,000 ohms Carbon Resistor |
| L-69 | 220,000 ohms Carbon Resistor |
| L-70 | 220,000 ohms Carbon Resistor |
| L-71 | 220,000 ohms Carbon Resistor |
| L-72 | 220,000 ohms Carbon Resistor |
| L-73 | 220,000 ohms Carbon Resistor |
| L-74 | 220,000 ohms Carbon Resistor |
| L-75 | 220,000 ohms Carbon Resistor |
| L-76 | 220,000 ohms Carbon Resistor |
| L-77 | 220,000 ohms Carbon Resistor |
| L-78 | 220,000 ohms Carbon Resistor |
| L-79 | 220,000 ohms Carbon Resistor |
| L-80 | 220,000 ohms Carbon Resistor |
| L-81 | 220,000 ohms Carbon Resistor |
| L-82 | 220,000 ohms Carbon Resistor |
| L-83 | 220,000 ohms Carbon Resistor |
| L-84 | 220,000 ohms Carbon Resistor |
| L-85 | 220,000 ohms Carbon Resistor |
| L-86 | 220,000 ohms Carbon Resistor |
| L-87 | 220,000 ohms Carbon Resistor |
| L-88 | 220,000 ohms Carbon Resistor |
| L-89 | 220,000 ohms Carbon Resistor |
| L-90 | 220,000 ohms Carbon Resistor |
| L-91 | 220,000 ohms Carbon Resistor |
| L-92 | 220,000 ohms Carbon Resistor |
| L-93 | 220,000 ohms Carbon Resistor |
| L-94 | 220,000 ohms Carbon Resistor |
| L-95 | 220,000 ohms Carbon Resistor |
| L-96 | 220,000 ohms Carbon Resistor |
| L-97 | 220,000 ohms Carbon Resistor |
| L-98 | 220,000 ohms Carbon Resistor |
| L-99 | 220,000 ohms Carbon Resistor |
| L-100 | 220,000 ohms Carbon Resistor |

Intermediate Frequency..... 455 K.C.



GENERAL INFORMATION

The Model HJ-1005 is a three-band a-c operated receiver employing ten General Electric Pre-tested Tubes in a super-heterodyne circuit. This receiver is equipped with nine "Feathertouch" Tuning Keys, six of which may be set up for favorite stations. The three remaining keys allow power control manual tuning and phonograph or television audio reception. The new Super Beam-a-scope, which is a highly efficient self-contained antenna circuit, is standard equipment on this model. Other features of design include: Dual Dynapower speakers, floodlighted station key finder, visualux dial, iron core I.F. transformers, automatic tone compensation, automatic volume control and push-pull output.

Electrical Specifications

Rating "A"—110-125 volts, 50-60 cycles, 125 watts
 Rating "C"—110-125 volts, 25-60 cycles, 125 watts

Electrical Power Output

Undistorted..... 8.5 watts
 Maximum..... 10 watts

Loud-speakers—"Alnico" Magnetic Dynamic

Outside Cone Diameters..... 12-in. and 6½-in.
 Voice Coil Impedances..... 3.5 ohms

Tubes

Converter and Oscillator GE-6SA7
 I.F. Amplifier..... GE-6SK7/6SK7GT
 Detector and AVC..... GE-6H6
 Audio Driver..... GE-6SF5/6SF5GT
 Phase Inverter..... GE-6J5G/6J5GT/
 6J5
 Power Output..... (2) GE-6Y6G
 Rectifier..... (2) GE-5Y3G
 Tuning Indicator..... GE-6U5
 Dial Lamp..... (2) Mazda No. 44

MODEL HJ1005

Chassis Wiring, Voltage
Socket

GENERAL ELECTRIC CO.

FRONT OF CHASSIS

D₁—Diode Plate No. 1
D₂—Diode Plate No. 2
F—Filament
G—Control Grid
G₁—Oscillator Grid
G₂—Converter Grid
H—Heater

K—Cathode
P—Plate
P₁, P₂—Rectifier Plates
S—Screen
SH—Shell
SU—Suppressor

VOLTAGES MEASURED BETWEEN
SOCKET TERMINALS AND CHASSIS

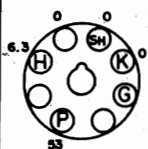
VOLTAGES MEASURED WITH 20,000 OHMS
PER VOLT-VOLTMETER

LINE VOLTS - 117. NO SIGNAL INPUT
MAX. VOLUME SETTING

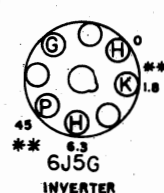
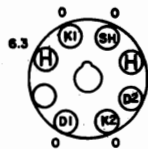
* VOLTS - A.C.

** MEASURED ON 50 VOLT SCALE

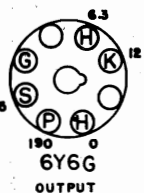
6SF5
AUDIO - AMP.



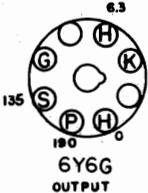
6H6
DET. - AVG.



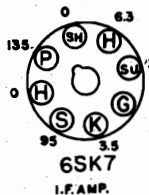
6J5G
INVERTER



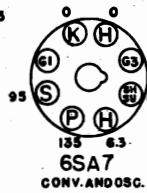
6Y6G
OUTPUT



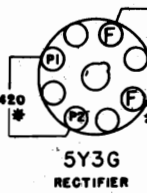
6Y6G
OUTPUT



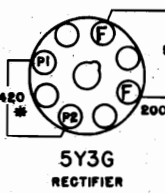
6SK7
I.F. AMP.



6SA7
CONV. AND OSC.

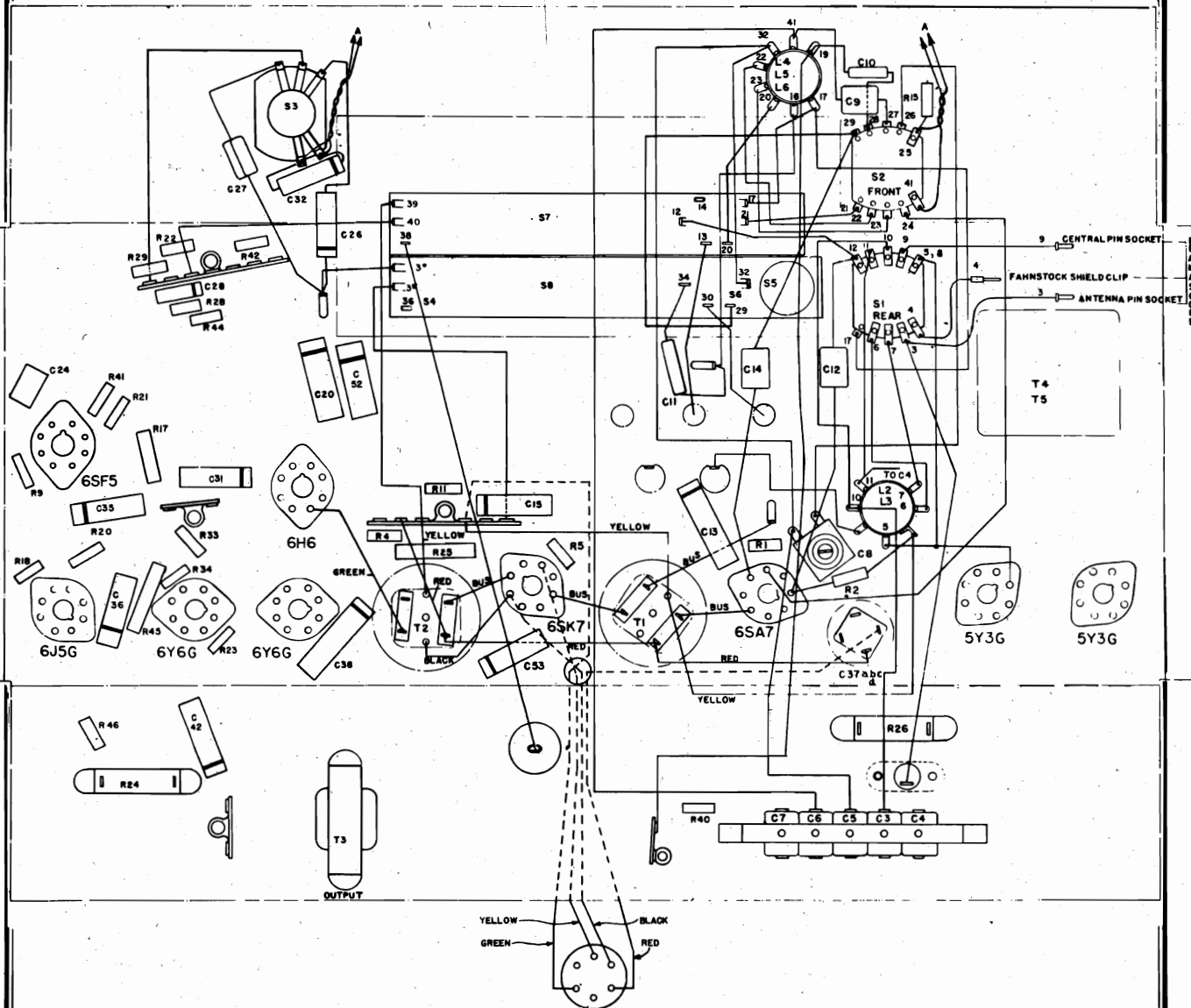


5Y3G
RECTIFIER

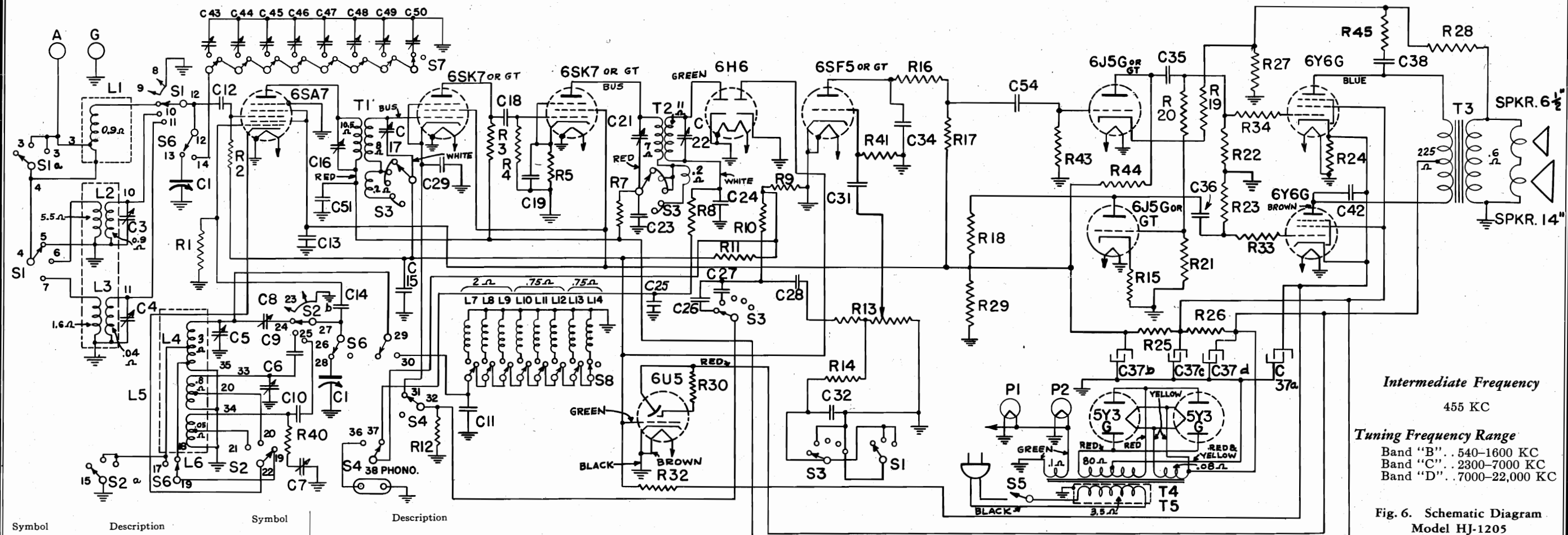


5Y3G
RECTIFIER

BOTTOM VIEW OF CHASSIS



GENERAL ELECTRIC CO.

MODEL HJ1205
Schematic, Voltage, Socket, Coils

| Symbol | Description | Symbol | Description |
|--------|--|----------------|--|
| C-1 | Tuning Capacitor | L-7, -8 | Tuning Coils (No code) |
| C-3 | "C" Band Antenna Trimmer | L-9, -10, -11 | Tuning Coils (Code-Red) |
| C-4 | "D" Band Antenna Trimmer | L-12, -13, -14 | Tuning Coils (Code-Blue) |
| C-5 | "B" Band Oscillator Trimmer | R-1 | 22,000 ohms, Carbon Resistor |
| C-6 | "C" Band Oscillator Trimmer | R-2 | 1.0 megohm, Carbon Resistor |
| C-7 | "D" Band Oscillator Trimmer | R-3 | 6800 ohms, Carbon Resistor |
| C-8 | "B" Band Padder | R-4 | 47,000 ohms, Carbon Resistor |
| C-9 | 1600 mmf. Mica Capacitor $\pm 5\%$ | R-5 | 330 ohms, Carbon Resistor |
| C-10 | 4300 mmf. Mica Capacitor $\pm 5\%$ | R-7 | 1000 ohms, Carbon Resistor |
| C-11 | 750 mmf. Silvered Mica Capacitor $\pm 5\%$ | R-8 | 47,000 ohms, Carbon Resistor |
| C-12 | 150 mmf. Mica Capacitor | R-9 | 220,000 ohms, Carbon Resistor |
| C-13 | 0.1 mfd. Paper Capacitor | R-10 | 47,000 ohms, Carbon Resistor |
| C-14 | 47 mmf. Mica Capacitor | R-11 | 470 ohms, Carbon Resistor |
| C-15 | 0.1 mfd. Paper Capacitor | R-12 | 2 megohm Volume Control |
| C-18 | 47 mmf. Mica Capacitor | R-13 | 150,000 ohms, Carbon Resistor |
| C-19 | .05 mfd. Paper Capacitor | R-14 | 3300 ohms, Carbon Resistor |
| C-23 | .05 mfd. Paper Capacitor | R-15 | 47,000 ohms, Carbon Resistor |
| C-24 | 100 mmf. Mica Capacitor | R-16 | 150,000 ohms, Carbon Resistor |
| C-25 | 47 mmf. Mica Capacitor | R-17 | 47,000 ohms, Carbon Resistor |
| C-26 | .001 mfd. Paper Capacitor | R-18 | 3300 ohms, Carbon Resistor |
| C-27 | 470 mmf. Mica Capacitor | R-19 | 1.5 megohms, Carbon Resistor |
| C-28 | .01 mfd. Paper Capacitor | R-20 | 270,000 ohms, Carbon Resistor |
| C-29 | .05 mfd. Paper Capacitor | R-21 | 220,000 ohms, Carbon Resistor |
| C-31 | .01 mfd. Paper Capacitor | R-22 | 220,000 ohms, Carbon Resistor |
| C-32 | .003 mfd. Paper Capacitor | R-23 | 100 ohms, 3.4 W. Wire Wound |
| C-34 | 47 mmf. Mica Capacitor | R-24 | 2400 ohms, Carbon Resistor |
| C-35 | .05 mfd. Paper Capacitor | R-25 | 2200 ohms, 2.6 W. Wire Wound |
| C-36 | .05 mfd. Paper Capacitor | R-26 | 56 ohms, Carbon Resistor |
| C-37a | 20 mfd. 25 V. Dry Electrolytic | R-27 | 100 ohms, Carbon Resistor |
| C-37b | 20 mfd. 300 V. Dry Electrolytic | R-28 | 47,000 ohms, Carbon Resistor |
| C-37c | 20 mfd. 300 V. Dry Electrolytic | R-29 | 1.0 megohm, Carbon Resistor |
| C-37d | 40 mfd. 350 V. Dry Electrolytic | R-30 | 5.6 megohms, Carbon Resistor |
| C-38 | .01 mfd. 1000 V. Paper Capacitor | R-31 | 1000 ohms, Carbon Resistor |
| C-42 | .01 mfd. 1000 V. Paper Capacitor | R-32 | 1000 ohms, Carbon Resistor |
| C-43 | 7-65 mmf. Antenna Trimmer | R-33 | 33 ohms, Carbon Resistor |
| C-44 | 7-65 mmf. Antenna Trimmer | R-34 | 4.7 megohms, Carbon Resistor |
| C-45 | 20-180 mmf. Antenna Trimmer | R-40 | 220,000 ohms, Carbon Resistor |
| C-46 | 20-180 mmf. Antenna Trimmer | R-41 | 150,000 ohms, Carbon Resistor |
| C-47 | 20-180 mmf. Antenna Trimmer | R-43 | 2200 ohms Carbon Resistor |
| C-48 | 100-490 mmf. Antenna Trimmer | R-44 | Pilot Lights, MAZDA No. 44 |
| C-49 | 100-490 mmf. Antenna Trimmer | R-45 | Antenna Band Switch |
| C-50 | 100-490 mmf. Antenna Trimmer | S-1 | Oscillator Band Switch |
| C-51 | 0.1 mfd. Paper Capacitor | S-2 | Tone Switch |
| C-54 | .05 mfd. Paper Capacitor | S-3 | Phono Switch |
| L-1 | Beam-a-Scope | S-4 | Power Switch |
| L-2 | "C" Band Antenna Coil | S-5 | Manual Switch |
| L-3 | "D" Band Antenna Coil | S-6 | Antenna Section Touch Tuning Switch |
| L-4 | "B" Band Oscillator Coil | S-7 | Oscillator Section Touch Tuning Switch |
| L-5 | "C" Band Oscillator Coil | S-8 | |
| L-6 | "D" Band Oscillator Coil | | |

Electrical Specifications

Rating "A"—110-125 volts, 50-60 cycles, 130 watts
 Rating "C"—110-125 volts, 25-60 cycles, 130 watts

Electrical Power Output

Undistorted 8.5 watts
 Maximum 10 watts

Tubes

Converter and Oscillator GE-6SA7
 1st I.F. Amplifier GE-6SK7/6SK7GT

2nd I.F. Amplifier GE-6SK7/6SK7GT
 Detector and A.V.C. GE-6H6
 Audio Amplifier GE-6SF5/6SF5GT
 Audio Driver GE-6J5G/6J5GT
 Audio Inverter GE-6J5G/6J5GT
 Audio Power Amplifier (2)GE-6Y6G
 Tuning Indicator GE-6U5
 Rectifier (2)GE-5Y3G
 Dial Lamp (4)MAZDA No. 44

Loud-speakers—"Alnico" Magnetic Dynamic

Outside Cone Diameters 12 in. and 6½ in.

Voice Coil Impedances 3.5 ohms

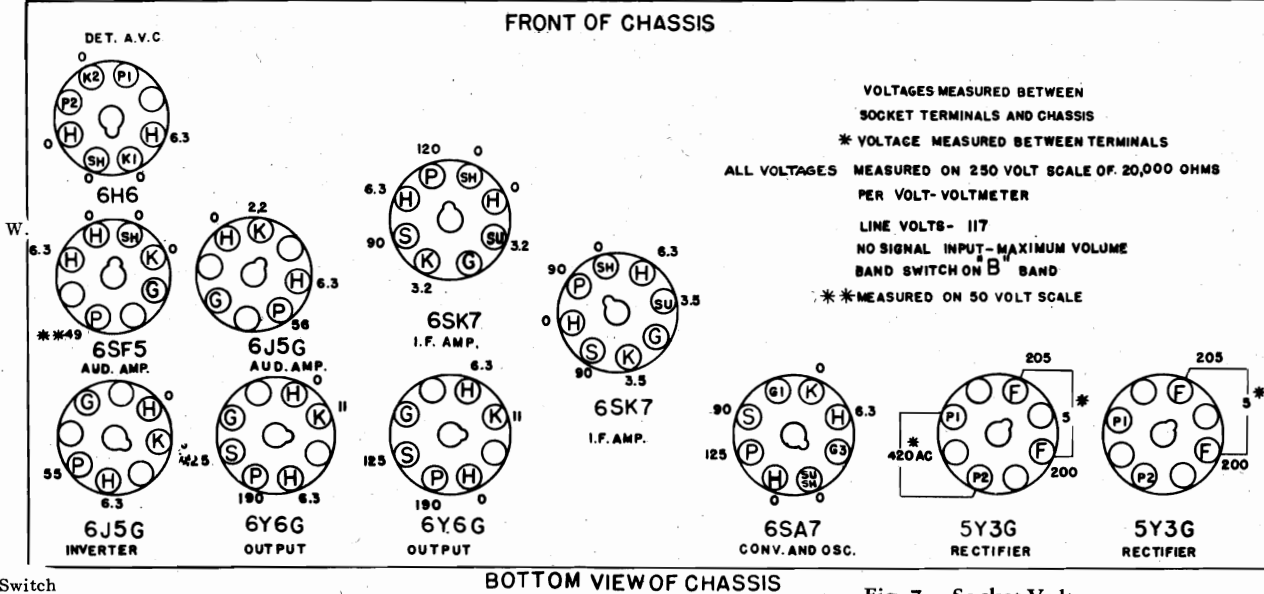
The voice coils are accurately and permanently centered at the factory and should seldom give trouble. In case a voice coil needs recentering it will be necessary to replace the entire cone and voice coil assembly.

Coil System

The "C" and "D" band antenna coils, L-2 and L-3 are wound on a single coil form as shown in Fig. 6. L-4, L-5 and L-6 compose the oscillator transformer for the "B" "C" and "D" bands. All switch points are numbered in Fig. 6 to facilitate in locating these switch points on the pictorial wiring diagram, Fig. 5.

The table opposite gives the coils in use for the various positions of the band switch.

| Band-switch Position | Antenna Primary | Antenna Secondary | Oscillator Primary | Oscillator Secondary |
|----------------------|---------------------------------|---|---------------------|---|
| Band "B" | Lower portion of L1 | Upper portion of L1 | Lower portion of L4 | Upper portion of L4 |
| Band "C" | L2 Primary (L1 Primary shorted) | L2 Secondary (Grid end of L1 to ground) | Lower portion of L5 | Upper portion of L5 (High side of L4 to ground through R15, Mid tap of L4 to ground) |
| Band "D" | L3 Primary (L1 Primary shorted) | L3 Secondary (Grid end of L1 to ground, L2 secondary to ground) | Lower portion of L6 | Upper portion of L6 (High side of L4 and L5 to ground through R15, Mid tap of L4 to ground) |



GENERAL ELECTRIC CO. SPECIAL SERVICE INFORMATION

MODEL HJ1205 Chassis Wiring, Gain

The following information will be found very useful in servicing receivers if a vacuum tube voltmeter or similar voltage measuring instrument is available.

(1) Stage Gains †

- (a) Antenna Post to Converter Grid
Band "B" (Beam-a-Scope connected)*—3 at 1000 KC
Band "C" (Beam-a-Scope disconnected)**—3 at 4 MC
Band "D" (Beam-a-Scope disconnected)**—3 at 18 MC

† Variations of +10%, -20% permissible.

* Use I.R.E. dummy antenna.

** Use 70 mmf. capacitor between signal generator and antenna post.

- (b) Converter Grid to 1st 6SK7 Grid .30 at 455 KC
(c) 1st 6SK7 Grid to 2nd 6SK7 Grid .6 at 455 KC
(d) 2nd 6SK7 Grid to 6H6 Det. Plate .70 at 455 KC
- (2) A 400-cycle signal of .04 volts across volume control will give 1/2-watt speaker output.† (Volume Control turned to maximum.)
(3) Average DC voltage developed across oscillator grid resistor (R1) with gang closed.
Band "B" 6.5 volt
Band "C" 7 volts
Band "D" 2.8 volt

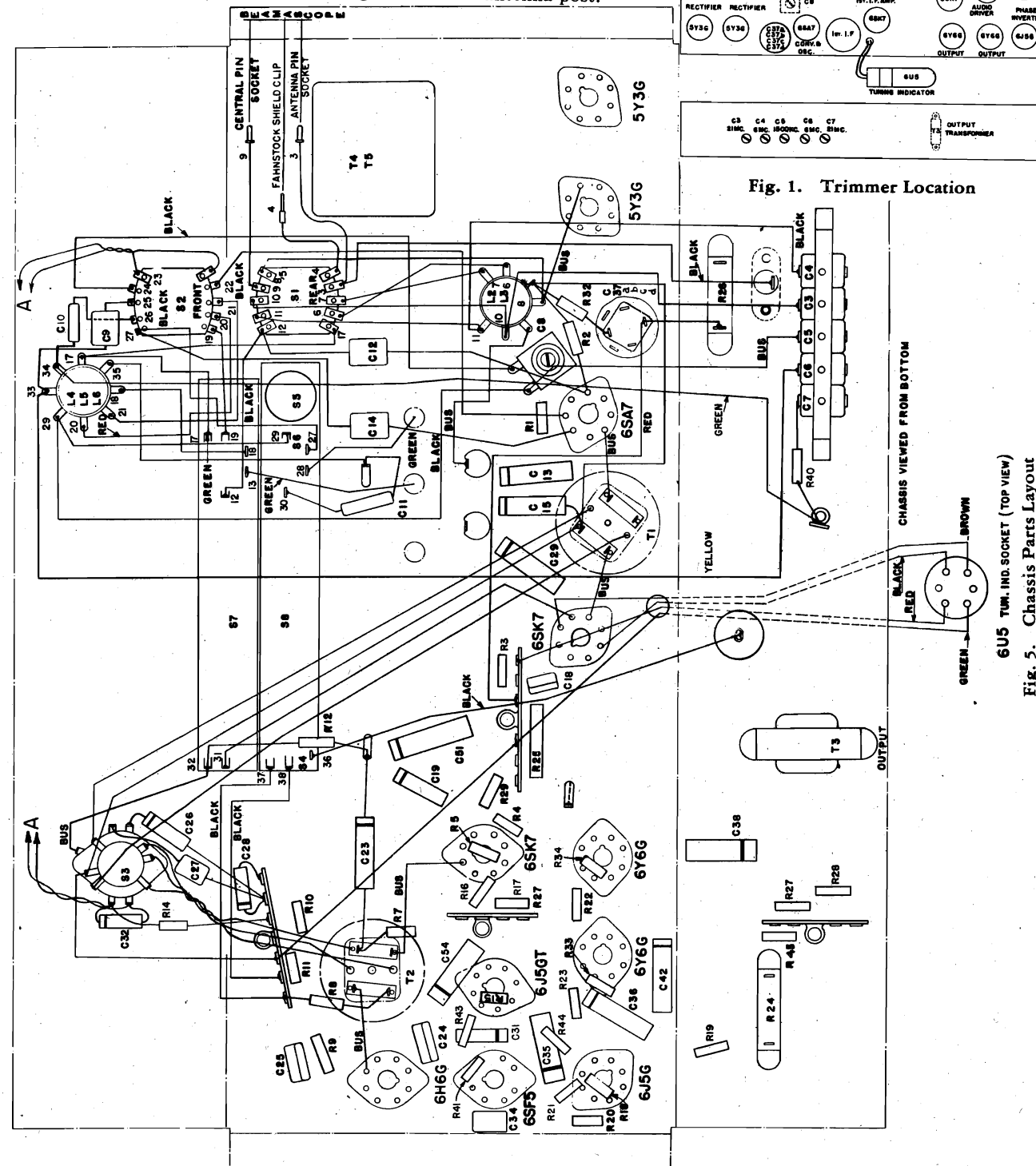


Fig. 1. Trimmer Location

Fig. 5. Chassis Parts Layout

MODEL HJ1205 Alignment, Drive Cord

GENERAL ELECTRIC CO.

| Band-switch Setting | Input Frequency | Tone Control Position | Point of Input | Trimmer | Comments |
|---------------------|------------------------|-----------------------|---------------------|-----------------------------|--|
| 1. Band B | 455 KC and 30 KC Sweep | Bass | 1st I.F. 6SK7 Grid | 2nd I.F. Sec. 2nd I.F. Pri. | Condenser gang at minimum capacity—vertical input to ground and junction at R-8, R-9, and R-10. Adjust trimmers in order mentioned for a single curve of maximum amplitude. The resulting curve on the "Bass" position is shown in Fig. 2a. |
| 2. Band B | 455 KC and 30 KC Sweep | Bass | Converter 6SA7 Grid | 1st I.F. Sec. 1st I.F. Pri. | The expanded curve taken with tone control at "Treble I" is shown in Fig. 2b. Excess sensitivity over "Bass" tone position indicates regeneration. |
| 3. Band B | 455 KC and 30 KC Sweep | Bass | Converter 6SA7 Grid | All I.F. Trimmers | Condenser gang at minimum capacity—manual key depressed—output meter connected across voice coil—volume control at maximum—input as low as practical. Adjust all trimmers in order listed for maximum output. NOTE—Do not attempt alignment in the expanded position. |
| 4. Band B | 455 KC and 30 KC Sweep | Treble I | Converter 6SA7 Grid | All I.F. Trimmers | |

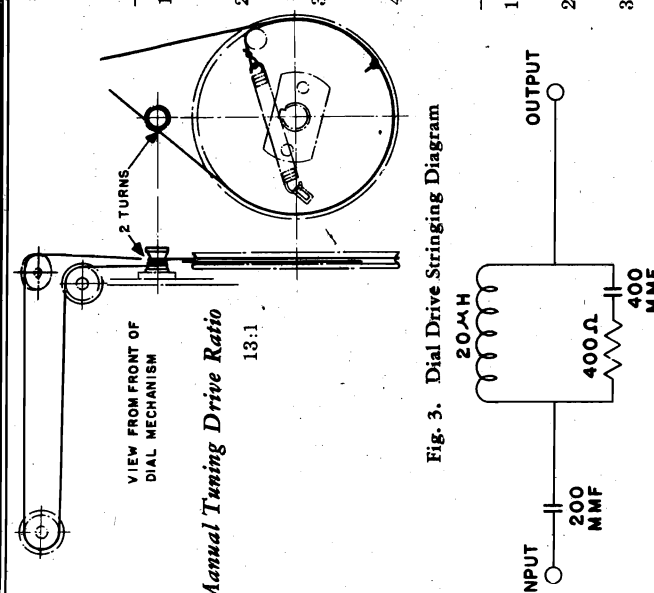
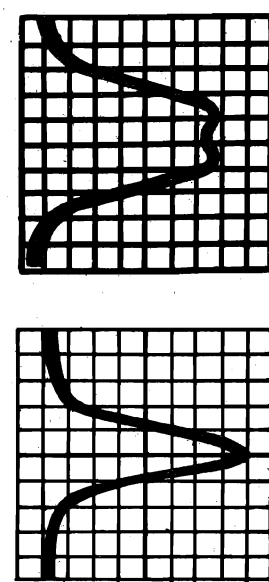


Fig. 3. Dial Drive Stringing Diagram

Fig. 4. I.R.E. Dummy Antenna Alignment Procedure

The alignment procedure is given in table form on this and opposite pages. Use the designated "dummy" antenna in making each individual alignment. I.F. alignment may be performed with the chassis removed from the cabinet and the Beam-a-Scope disconnected. R.F. alignment on "C" and "D" bands should be performed with the Beam-a-Scope disconnected and a 70 mmf. mica capacitor between the signal generator and the point of input. R.F. alignment on "B" band should be performed with the chassis and Beam-a-Scope mounted in the cabinet and properly connected.



(a) Sharp Position
Fig. 2. I.F. Curves Taken on G-E Oscilloscope OFM-1

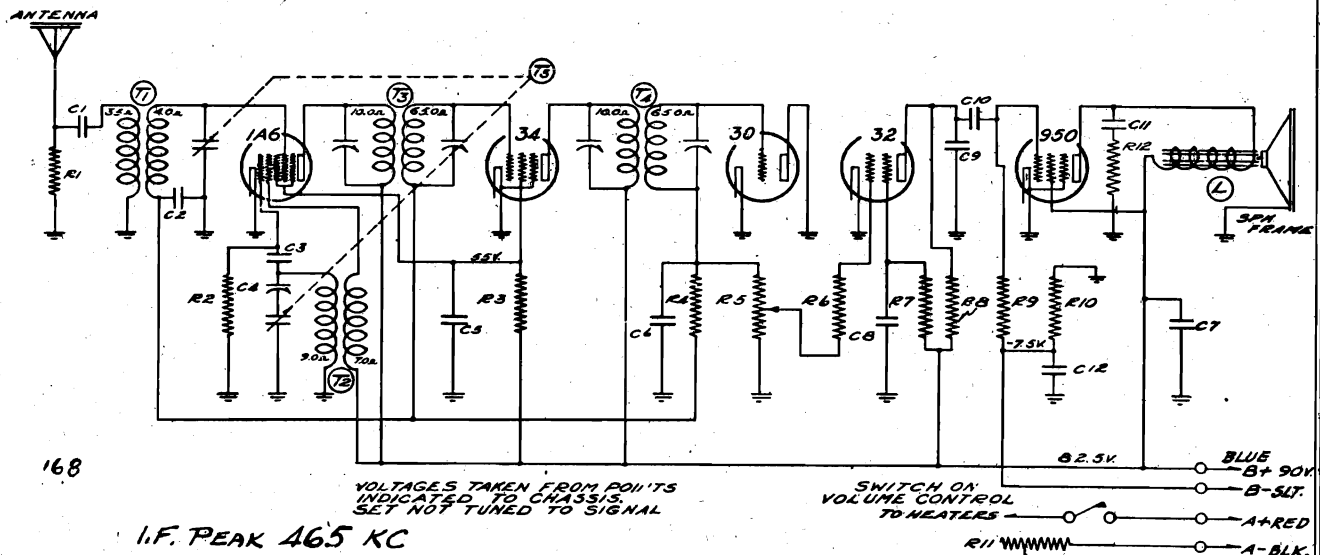
* Use "dummy" antenna consisting of .05-mfd. capacitor between signal generator and point of input.

R.F. ALIGNMENT

| Band | Input Frequency | Tone Control Position | Point of Input | Trimmer | Comments |
|-----------|-------------------|-----------------------|-----------------|-----------------------|---|
| 1. Band B | 455 KC Modulated | Bass | Antenna Post** | Osc. (C-6) Ant. (C-3) | Mechanically adjust dial pointer to first line at left-hand end of dial scale with condenser gang fully meshed. Connect output meter across voice coil. |
| 2. Band C | 6 MC Modulated | Bass | Antenna Post** | Osc. (C-7) Ant. (C-4) | Set pointer to 6 MC mark and align (C-6). Peak (C-3) for maximum output. |
| 3. Band D | 21 MC Modulated | Bass | Antenna Post** | Osc. (C-7) Ant. (C-4) | Set pointer to 21 MC mark and align (C-7). Peak C-4 while rocking gang condenser. The image of any signal on the "D" band should be 910 KC below input signal. Example: 15 MC image 14.09 MC. |
| 4. Band B | 580 KC Modulated | Bass | Antenna Post*** | Osc. Padder (C-8) | Set dial pointer to 580 MC mark and tune in signal with (C-8). |
| 5. Band B | 1500 KC Modulated | Bass | Antenna Post*** | Osc. (C-5) | Adjust (C-5) for maximum output in vicinity of 1500 KC while rocking gang condenser. |
| 6. Band B | 580 KC Modulated | Bass | Antenna Post*** | Osc. Padder (C-8) | Retrim (C-8). |
| 7. Band B | 1500 KC Modulated | Bass | Antenna Post*** | Osc. (C-5) | Repeak (C-5). |

** Use a "dummy" antenna consisting of 70-mmfd. capacitor between signal generator and point of input with "Beam-a-Scope" disconnected.
*** Use an I.R.E. "dummy" antenna as shown in Fig. 7 between signal generator and the point of input.

GOODYEAR TIRE & RUBBER CO., INC. MODEL 522 Schematic, Voltage Socket, Trimmers Alignment



I.F. PEAK 465 KC

No. Part No. Description

RESISTORS

| | | |
|----|--------|--|
| R1 | 130-17 | 10M Ohm - 1/4 Watt - 20% - 20 |
| R2 | 130-52 | 50M Ohm - 1/4 Watt - 20% - 10 |
| R3 | 130-17 | 10M Ohm - 1/4 Watt - 20% - 20 |
| R4 | 130-38 | 2 Meg Ohm - 1/4 Watt - 20% - 100 Volt - Carbon |
| R5 | 101-43 | 1 Meg Ohm Volume Control and Switch |
| R6 | 130-52 | 50M Ohm - 1/4 Watt - 20% - 10 Volt - Carbon |
| R7 | 130-19 | 1 Meg Ohm - 1/4 Watt - 20% - 100 Volt - Carbon |

| | | |
|-----|--------|--|
| R8 | 130-9 | 200M Ohm - 1/4 Watt - 20% - 20 Volt - Carbon |
| R9 | 130-19 | 1 Meg Ohm - 1/4 Watt - 20% - 100 Volt - Carbon |
| R10 | 130-93 | 450 Ohm - 1/4 Watt - 10% - 10 Volt - Carbon |
| R11 | 101-44 | 4.75 Ohms - Rheostat |
| R12 | 130-52 | 50M Ohm - 1/4 Watt - 20% - 10 Volt - Carbon |

CONDENSERS

| | | |
|----|--------|------------------------|
| C1 | 100-11 | .01 x 400 Volt - 25% |
| C2 | 100-22 | .05 x 200 Volt - 25% |
| C3 | 129-12 | .00025 Mica - MT - 20% |
| C4 | 124-14 | Series Pad |
| C5 | 100-9 | .05 x 200 Volt - 25% |

| | | |
|-----|--------|--|
| C6 | 129-5 | .0001 Mica - MT - 20% |
| C7 | 100-6 | .25 x 200 Volt |
| C8 | 100-9 | .05 x 200 Volt - 25% |
| C9 | 129-2 | .0005 Mica - MT - 20% |
| C10 | 100-11 | .01 x 400 Volt - 25% |
| C11 | 100-11 | .01 x 400 Volt - 25% |
| C12 | 119-22 | 10.0 Mfd. x 25 Volts - Working Voltage |

PARTS

| | | |
|----|--------|---------------------------|
| T1 | 111-46 | Antenna Coil |
| T2 | 110-36 | Oscillator Coil |
| T3 | 108-67 | Input I.F. Coil 465 K.C. |
| T4 | 108-68 | Output I.F. Coil 465 K.C. |
| T5 | 102-29 | Two Gang Condenser |
| L | 114-19 | Six Inch Magnetic Speaker |

ALIGNING I.F. TRANSFORMERS: (465 K.C.)

1. With volume control full on and with variable condenser at its minimum capacity position, plates entirely out of mesh, and with external oscillator set at 465 K.C. connected in series with a .1 mfd. condenser, to the grid of the 1A6 tube (cap at top of tube), adjust I.F. transformers, parts number 108-67 and 108-68, to resonance. Both of these transformers have two (2) adjustments each, they are accessible from the tops of the cans (for location see top view).

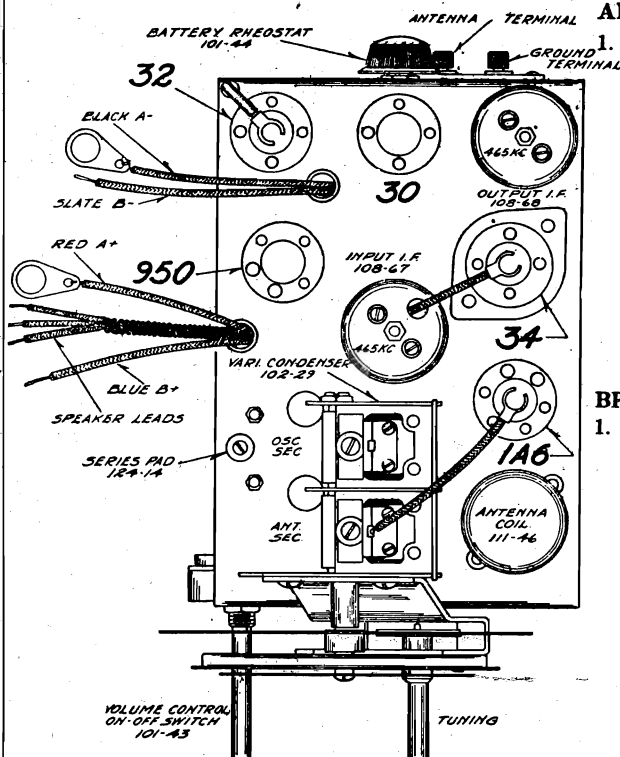
Use as a resonance indicator an output meter connected across the outside terminals of the speaker or by means of an adapter to the plate and screen of the type 950 output tube. Maximum deflection of the volt meter indicates resonance.

Use only enough signal to get a readily readable output.

A low range output meter or the low scale of a multi-range meter should be used.

BROADCAST BAND ALIGNMENT:

- Set external oscillator to 1720 K.C. and connect it in series with a 200 mmfd. condenser to the antenna and ground posts.
 - With variable condenser in its minimum capacity position, plates entirely out of mesh, adjust oscillator trimmer (rear section of variable condenser) to resonance.
 - Re-set external oscillator to 1400 K.C. Rotate variable condenser, pick up signal and adjust antenna trimmer (front section of variable condenser) to resonance.
 - Re-set external oscillator to 600 K.C., move dial pointer to 600 K.C., and adjust series pad, part number 124-14 (see top view), to resonance. While making this adjustment, slowly rock variable condenser to and fro until maximum output is obtained.
 - Check for sensitivity at 1400, 1000, 600 K.C. DO NOT BEND PLATES.



MODEL 525

Schematic, Voltage Socket, Trimmers Alignment

GOODYEAR TIRE & RUBBER CO., INC.

MODELS 685, 686

Alignment

MODELS 685, 686 Runs 1 and 2.

TUBE COMPLEMENT

consists of the latest "Metal-Glass" tubes which are interchangeable with metal tubes. They are as follows:

- 1-Type 6L7 Pentagrid Mixer, First Detector.
- 1-Type 6C5 Oscillator.
- 1-Type 6K7 Remote Cut-off Pentode, I.F. Amplifier (465 K.C.).
- 1-Type 6Q7 Duplex Diode Triode Second Detector, A.V.C. and First Audio.
- 1-Type 6F6 Pentode Output Amplifier.
- 1-Type 5Y3 or 5W4 High Vacuum Rectifier.
- 1-Type 6G5 Cathode-Ray Tuning Indicator. (Note: 6G5 available in "Metal-Glass" only.)
- 1-Type 6L7 Pentagrid Mixer, First Detector.
- 1-Type 6C5 Oscillator.
- 1-Type 6K7 Remote Cut-off Pentode, I.F. Amplifier (465 K.C.).
- 1-Type 6Q7 Duplex Diode Triode Second Detector, A.V.C. and First Audio.
- 1-Type 6F6 Pentode Output Amplifier.
- 1-Type 5Y3 High Vacuum Rectifier.

The tube complement of the model 685 is as follows:

- 1-Type 6L7 Pentagrid Mixer, First Detector.
- 1-Type 6C5 Oscillator.
- 1-Type 6K7 Remote Cut-off Pentode, I.F. Amplifier (465 K.C.).
- 1-Type 6Q7 Duplex Diode Triode Second Detector, A.V.C. and First Audio.
- 1-Type 6F6 Pentode Output Amplifier.
- 1-Type 5Y3 High Vacuum Rectifier.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with 119 volts on the primary of the power transformer.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, short each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Excessive hum, stuttering, low volume and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser; open by-pass condensers frequently cause oscillation and distorted tone.

ALIGNING INSTRUCTIONS:

CAUTION: No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. Remove the knobs and the four bolts which are used to fasten the chassis.

All adjustments should be made with a non-metallic screw driver.

DUMMY ANTENNAS:

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1," "Dummy 2," and "Dummy 3."

Dummy 1: (I.F.)—Consists of a 1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser with a 20 ohm resistor connected in series with the external oscillator.

Dummy 3: (Middle and Short Wave)—Consists of a 1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

Part No. 108-74 Output I.F. Transformer.

Part No. 108-74 Input I.F. Transformer.

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

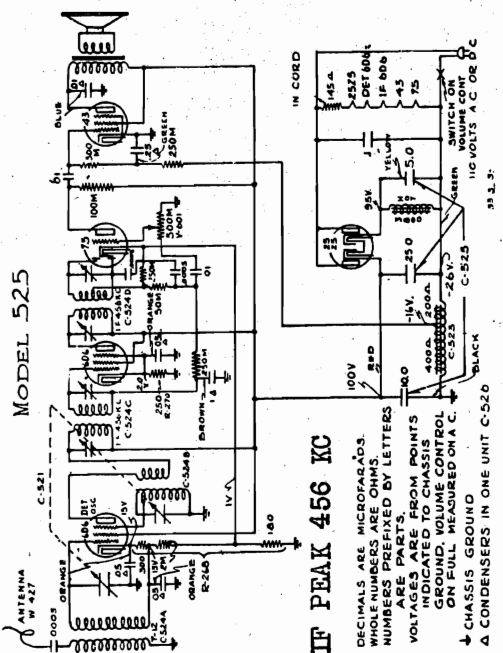
1. With volume control full on (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:

Part No. 108-74 Output I.F. Transformer.

Part No. 108-74 Input I.F. Transformer.

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see top view).

1. With volume control full on (the extreme right of its rotation), the band changing switch in the broadcast position, (extreme left of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:



GOODYEAR TIRE & RUBBER CO., INC

MODEL 566

Schematic, Socket, Alignment, Trimmers Voltage, Notes

CONNECTIONS TO BATTERY:

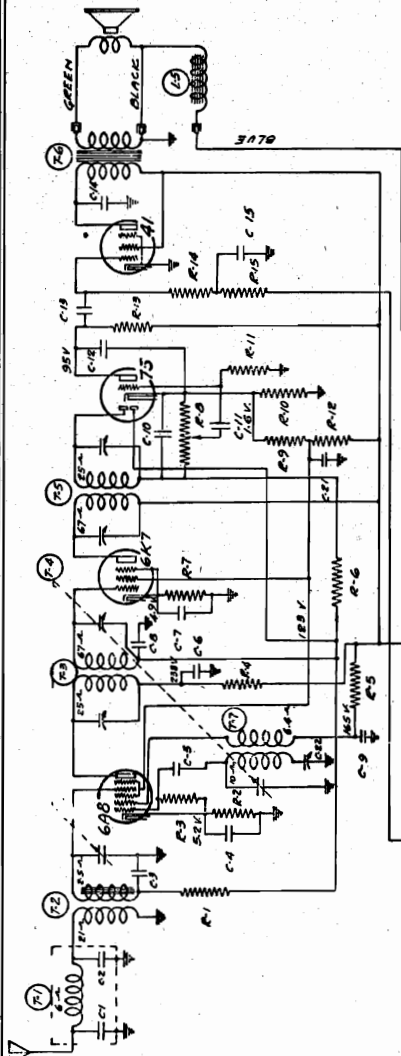
The battery cable, number 152-2, (red wire with fuse receptacle at one end and terminal lug at other end) must be connected to battery terminal of ammeter. At the same time connect ammeter capacitor, number 148-3, to battery terminal of ammeter, other end of condenser to any convenient grounded screw on back of instrument panel. Make certain that insulating sleeve is slipped over fuse when fuse is placed in receptacle, before connecting to short battery cable from receiver.

ANTENNA CONNECTION:

The antenna is connected to the receiver by means of the antenna cable. The antenna wire is the single black wire projecting from the end of the cable. Splice this wire to the roof antenna lead and ground the pig-tail shielding as close to the corner post of the car as possible.

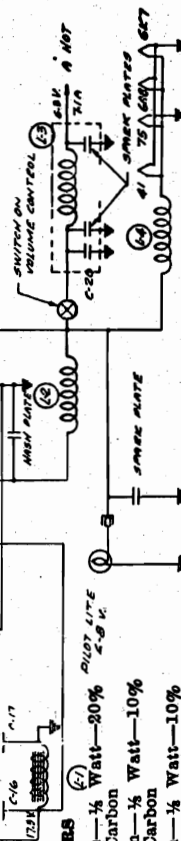
GENERATOR INTERFERENCE:

Remove the generator cutout mounting screw and fasten the condenser (148-1) bracket on the generator cutout mounting lug. Replace the cutout mounting screw and tighten down securely. Connect the condenser lead to the battery terminal of the cutout. The generator condenser is absolutely necessary as it is used to eliminate a high pitched whining noise which would otherwise be heard as the motor is accelerated.



10-35

IF PEAK 465 KC



RESISTORS

| | | | |
|---|---------|---|--|
| R1 | 130-20 | 100M Ohm—1/2 Watt—20% | |
| R2 | 130-79 | 50 Volt—Carbon | |
| R3 | 130-94 | 400 Ohm—1/2 Watt—10% | |
| R4 | 130-23 | 10 Volt—Carbon | |
| R5 | 130-42 | 50M Ohm—1/2 Watt—10% | |
| R6 | 130-68 | 2M Ohm—1/2 Watt—20% | |
| R7 | 130-79 | 20M Ohm—1/2 Watt—20% | |
| R8 | 101-41 | 100 Volt—Carbon—Ins. | |
| R9 | 130-106 | 1 Meg Ohm—1/2 Watt—10% | |
| R10 | 130-101 | 20 Volt—Carbon | |
| R11 | 130-68 | 10 Volt—Carbon | |
| R12 | 130-95 | 100M Ohm—1/2 Watt—10% | |
| R13 | 130-3 | 500M Ohm—1/2 Watt—20% | |
| R14 | 130-5 | 300M Ohm—1/2 Watt—20% | |
| R15 | 130-45 | 250M Ohm—1/2 Watt—20% | |
| R16 | 130-84 | 200 Ohm—1/2 Watt—20% | |
| C1 | 129-3 | .00002 Mica—"0"—20% | |
| C2 | 129-49 | .00009 Mica—"0"—5% | |
| C3 | 100-9 | .05x200 Volt | |
| C4 | 100-6 | .25x200 Volt | |
| C5 | 129-21 | .00025 Mica—"MT"—"0"—20% | |
| C6 | 100-1 | .1 x400 Volt 50%—10% | |
| C7 | 100-33 | .1 x200 Volt 50%—10% | |
| C8 | 100-9 | .05x200 Volt 25%—25% | |
| C9 | 100-1-B | .1 x400 Volt 50%—10% | |
| C10 | 129-12 | .00025 Mica—"MT"—"0"—20% | |
| C11 | 100-9 | .05 x200 Volt 25%—25% | |
| C12 | 129-5 | .0001 Mica—"MT"—"0"—20% | |
| C13 | 116-15 | .05 x400 Volt | |
| C14 | 116-15 | .007x800 Volt | |
| C15 | 100-33 | .1x200 Volt 50%—10% | |
| C16 | 119-20 | 8.0 Mfd. Electrolytic Condenser—350 Working Volts | |
| C17 | 119-20 | 4.0 Mfd. Electrolytic Condenser—350 Working Volts | |
| C18 | 100-36 | .01x1400 Volt—10% | |
| C19 | 100-35 | .5 x 200 Volt 50%—10% | |
| C20 | 100-35 | .5 x 200 Volt 50%—10% | |
| C21 | 100-33 | .1 x 200 Volt 50%—10% | |
| C22 | 124-17 | Single Paddder J-4-S | |
| NOTE: C-13 and C-14 in one unit—part number 116-15. | | | |
| CONDENSERS | | | |
| T1 | 111-48 | Antenna Filter Coil Assembly | |
| T2 | 111-47 | Antenna Coil Assembly | |
| T3 | 108-69 | Input I.F. Coil—465 K.C. | |
| T4 | 102-27 | Two Gang Variable Condenser | |
| T5 | 108-70 | Output I.F. Coil—465 K.C. | |
| T6 | 105-22 | Oscillator Transformer | |
| T7 | 110-37 | Power Transformer | |
| T8 | 104-51 | Filter Choke | |
| L1 | 105-23 | "A" Choke | |
| L2 | 105-19 | "A" Filter Assembly | |
| L3 | 105-25 | "A" Choke | |
| L4 | 105-24 | 5 1/4" Speaker (Field resist.) | |
| L5 | 114-34 | 5 1/4" Speaker (Field resist.) | |
| V | | Vibrator | |

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

PARTS

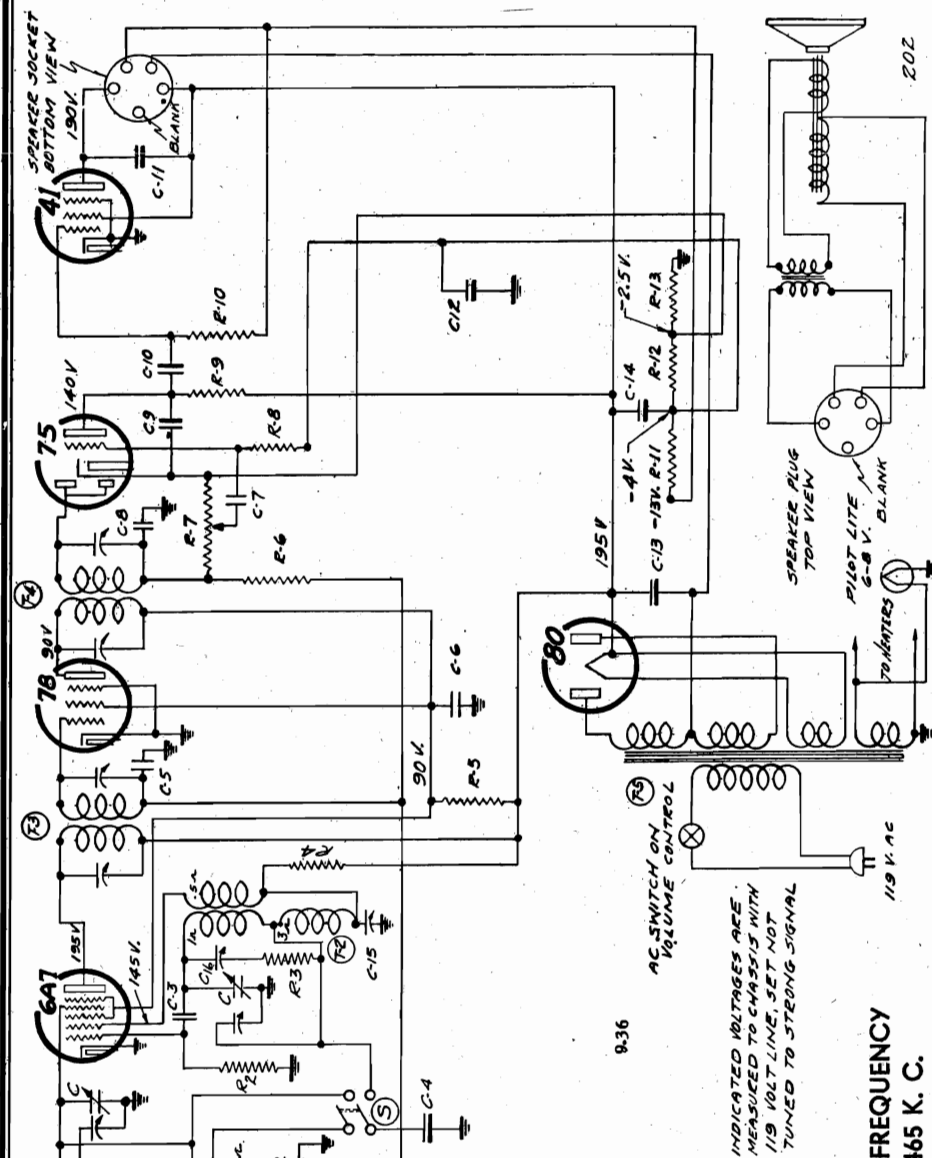
| | | |
|----|--------|--------------------------------|
| T1 | 111-48 | Antenna Filter Coil Assembly |
| T2 | 111-47 | Antenna Coil Assembly |
| T3 | 108-69 | Input I.F. Coil—465 K.C. |
| T4 | 102-27 | Two Gang Variable Condenser |
| T5 | 108-70 | Output I.F. Coil—465 K.C. |
| T6 | 105-22 | Oscillator Transformer |
| T7 | 110-37 | Power Transformer |
| T8 | 104-51 | Filter Choke |
| L1 | 105-23 | "A" Choke |
| L2 | 105-19 | "A" Filter Assembly |
| L3 | 105-25 | "A" Choke |
| L4 | 105-24 | 5 1/4" Speaker (Field resist.) |
| L5 | 114-34 | 5 1/4" Speaker (Field resist.) |
| V | | Vibrator |

MODEL 586

Schematic, Voltage

GOODYEAR TIRE & RUBBER CO., INC.

Socket, Trimmers
Alignment, Notes



DUMMY ANTENNAS:

(I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

(Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

(Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

(On rear section of variable).

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL.VIII.

ALIGNMENT FREQUENCIES

IF :- 465 KC (I.F.) Dummy Adjust IF Trimmers.
S.W. Osc :- 6.6 MC (I.F.) Dummy Adjust S.W. Osc.
B.C. Osc :- 1720 KC (B.C.) Dummy .. B.C. Osc.
B.C. Ant. :- 1550 KC (B.C.) Dummy .. B.C. Ant.
S.W. Ant :- 6 MC (S.W.) Dummy .. Series Pad.
S.W. Ant :- 6 MC (S.W.) Dummy .. S.W. Ant (On rear section of variable).

I. F. FREQUENCY
465 K. C.

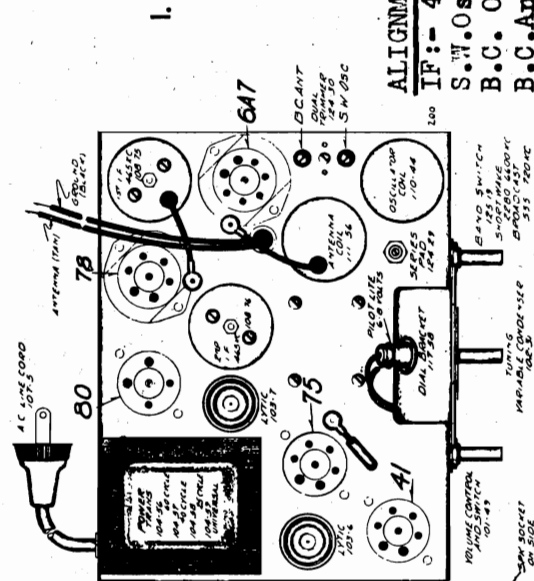
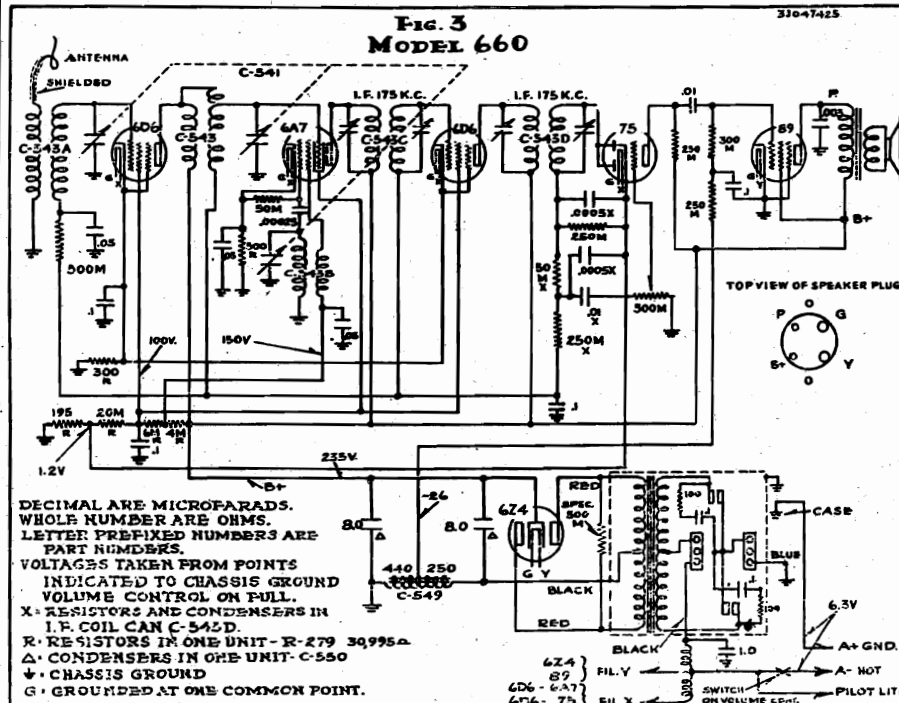


FIG. 1—TOP VIEW

LIST OF REPAIR PARTS
(Serial No. 6E248475 and up)

| Part No. | Reference | Description |
|----------|------------|--|
| 100-6 | C-12: C-6 | CONDENSERS |
| 100-9 | C-5 | .25 x200 Volt Tubular—Without Bracket |
| 100-11 | C-10: C-7 | .05 x200 Volt Tubular |
| 100-19 | C-11 | .01 x400 Volt Tubular |
| 100-26 | C-2 | .006x600 Volt Tubular |
| 103-6 | C-13 | .02 x400 Volt |
| 103-7 | C-14 | 8 Mfd. x 350 Volt Electrolytic |
| 129-5 | C-9 | .00025 Mica—Type O—20% |
| 129-12 | C-8 | .00025 Mica—Type O—20% |
| 129-61 | C-4 | .0017 Mica—Type W—20% |
| 129-62 | C-3 | .00003 Mica—Type W—10% |
| 129-63 | C-1 | .00004 Mica—Type W—10% |
| 106-26 | R-12: R-13 | RESISTORS |
| 130-12 | R-2 | 220 Ohm (R-12), 52 Ohm (R-13), Metal Clad Resistor |
| 130-20 | R-9 | 50M Ohm-1/3 Watt-20%- 20 V.-Carbon |
| 130-22 | R-4 | 100M Ohm-1/3 Watt-20%- 50 V.-Carbon |
| 130-77 | R-5 | 5M Ohm-1/3 Watt-20%- 10 V.-Carbon |
| 130-100 | R-10 | 10M Ohm-1/3 Watt-20%-100 V.-Carbon |
| 130-110 | R-6 | 150M Ohm-1/3 Watt-20%- 50 V.-Carbon |
| 130-111 | R-1 | 1 Meg Ohm-1/10 Wt.-10%-100 V.-Carbon |
| 130-112 | R-3 | 100M Ohm-1/10 Wt.-20%- 50 V.-Carbon |
| 130-113 | R-8 | 100 Ohm-1/10 Wt.-20%- 10 V.-Carbon |
| 130-113 | R-8 | 2 Meg Ohm-1/10 Wt.-20%-100 V.-Carbon |

GOODYEAR TIRE & RUBBER CO., INC.

MODEL 660
Schematic, Socket
Trimmers

SCHEMATIC CIRCUIT DIAGRAM MODEL 660 AUTORADIO

PARTS LIST

| Part No. | Description | List Price Each |
|----------|---|--------------------|
| A 660 | Battery Cable—Plug Type | 1.75 |
| B 104 | Cable Shaft Brackets | .35 |
| B 660 | Antenna Cable—Plug Type | .80 |
| C 106 | Shaft Couplings | .35 |
| C 117 | "A" Choke—Small | .25 |
| C 118 | "A" Choke—Large | .35 |
| C 144 | Dual .1-200 Volt Con- denser | .35 |
| C 152 | .00025 Mica Condenser | .20 |
| C 155 | .0005 Mica Condenser | .20 |
| C 522 | .01-400 Volt Condenser | .25 |
| C 531A | Dual .05 Condenser | .30 |
| C 535 | Dual .1-200 Volt Con- denser | .35 |
| C 541B | 3 Gang Condenser | 3.75 |
| C 543 | R.F. Coil | .80 |
| C 543A | Antenna Coil | .80 |
| C 543B | Oscillator Coil | .70 |
| C 543C | Input I.F. Transformer | 1.25 |
| C 543D | Output I.F. Transformer with Parts | 2.50 |
| C 547 | .1-200 Volt Condenser | .30 |
| C 549 | 690 Ohm Choke | 1.40 |
| C 550 | 8-8 Mfd. Electrolytic Condenser | 2.25 |
| C 551 | 1 Mfd.—120 Volt Con- denser | .35 |
| C 553 | .05-200 Volt Condenser | .25 |
| C 554 | .5 Mfd. Generator Con- denser | .50 |
| R 232A | Special 500M Ohm Resistor Identified with 2 Yellow Dots | .35 |
| R 279 | 30,995 Ohm Resistor | .60 |
| R 281 | 100 Ohm Resistor | .20 |
| S 338 | 18" Volume Control Shaft | 1.25 |
| S 339 | 18" Selector Control Shaft | 1.25 |
| S 338S | Special 24" Volume Con- trol Shaft | 1.50 |
| S 339S | Special 24" Selector Con- trol Shaft | 1.50 |
| V 660 | Complete "B" Unit—OAK | 8.00 |
| V 603 | Volume Control | 1.50 |
| 660 | Remote Control Head Com- plete Less Shafts | 5.00 |
| | 20 Ampere Fuses | .10 |
| | Mounting Bolts | .10 |
| | All carbon resistors | .20 |
| | All sockets | .20 |
| | Dynamic speakers | 5.00 |

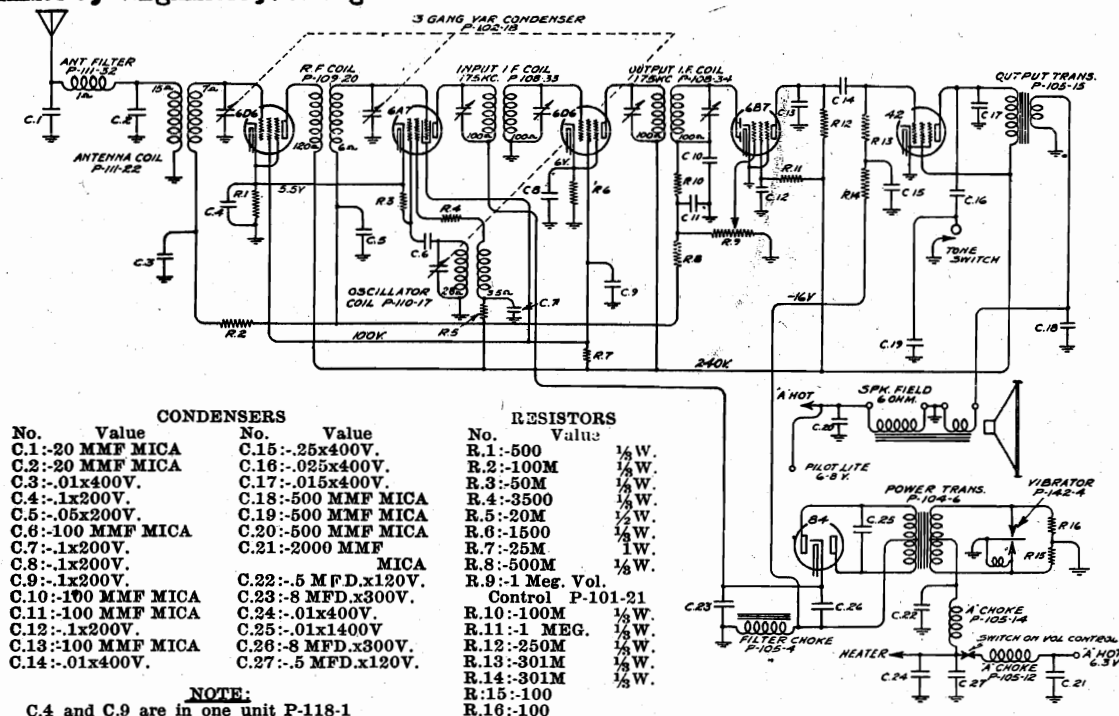
prices subject to
change without notice

First Series Model 660 - Serial Numbers 3F04051 - 23J047424.
Vibrator Heads Only \$4.00

MODEL 680

Schematic, Socket GOODYEAR TIRE & RUBBER CO., INC.
Trimmers, Alignment, Voltage

MODEL 680



| CONDENSERS | | RESISTORS | |
|--------------------|---------------------|------------------|--------|
| No. | Value | No. | Value |
| C.1:-20 MMF MICA | C.15:-.25x400V. | R.1:-500 | 1/4 W. |
| C.2:-20 MMF MICA | C.16:-.025x400V. | R.2:-100M | 1/4 W. |
| C.3:-.01x400V. | C.17:-.015x400V. | R.3:-50M | 1/4 W. |
| C.4:-.1x200V. | C.18:-500 MMF MICA | R.4:-3500 | 1/4 W. |
| C.5:-.05x200V. | C.19:-500 MMF MICA | R.5:-20M | 1/4 W. |
| C.6:-100 MMF MICA | C.20:-500 MMF MICA | R.6:-1500 | 1/4 W. |
| C.7:-.1x200V. | C.21:-2000 MMF | R.7:-25M | 1 W. |
| C.8:-.1x200V. | C.22:-.5 MFD.x120V. | R.8:-500M | 1/4 W. |
| C.9:-.1x200V. | C.23:-8 MFD.x300V. | R.9:-1 Meg. Vol. | |
| C.10:-100 MMF MICA | C.24:-.01x400V. | Control P-101-21 | |
| C.11:-100 MMF MICA | C.25:-.01x1400V. | R.10:-100M | 1/4 W. |
| C.12:-.1x200V. | C.26:-8 MFD.x300V. | R.11:-1 MEG. | 1/4 W. |
| C.13:-100 MMF MICA | C.27:-.5 MFD.x120V. | R.12:-250M | 1/4 W. |
| C.14:-.01x400V. | | R.13:-301M | 1/4 W. |
| | | R.14:-301M | 1/4 W. |
| | | R.15:-100 | |
| | | R.16:-100 | |

NOTE:

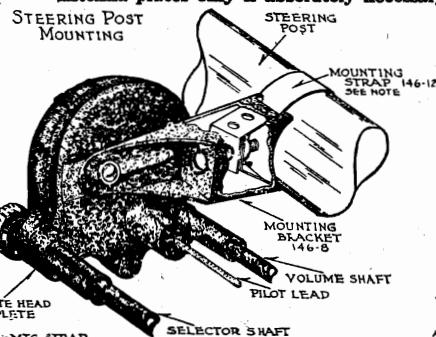
C.4 and C.9 are in one unit P-118-1
C.7 and C.8 are in one unit P-118-1
C.26 and C.23 are in one unit P-119-17
R.16 and R.15 are in one unit P-106-6
Numbers prefixed by letter "P" are part numbers.
Voltages taken from points indicated to chassis ground. Vol. control on full, no signal.

I.F. ALIGNMENT:

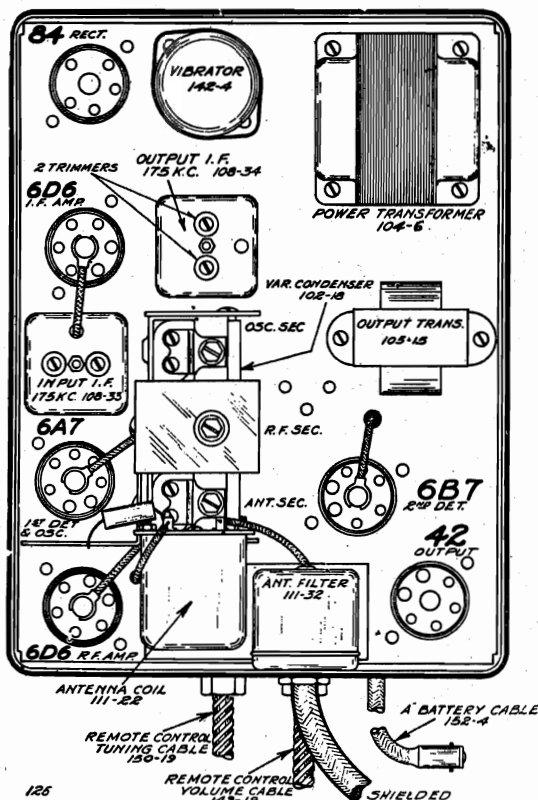
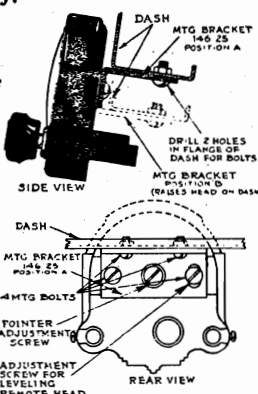
1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 175 K.C., in series with I.F. dummy antenna, to the grid cap of the type 6A7 tube.
2. Adjust trimmer condensers of both input (108-33) and output (108-34) I.F. transformers to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT:

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. and in series with broadcast dummy, to the antenna lead of receiver.
 2. Adjust oscillator trimmer of variable condenser to resonance (this adjustment is on the end section of the three gang condenser—see top view).
 3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. (center) and antenna (front) trimmers to resonance, see top view.
- (a) Check for sensitivity at 1000, 800 and 600 K.C. by setting test oscillator to these frequencies and picking up the signal by rotating variable condenser. Under no circumstances bend plates of oscillator section, bend R.F. and antenna plates only if absolutely necessary.



NOTE—MTG. STRAP HAS 4 HOLES, EACH HAVING A DIMENSION CORRESPONDING TO DIAMETER OF STEERING POST.

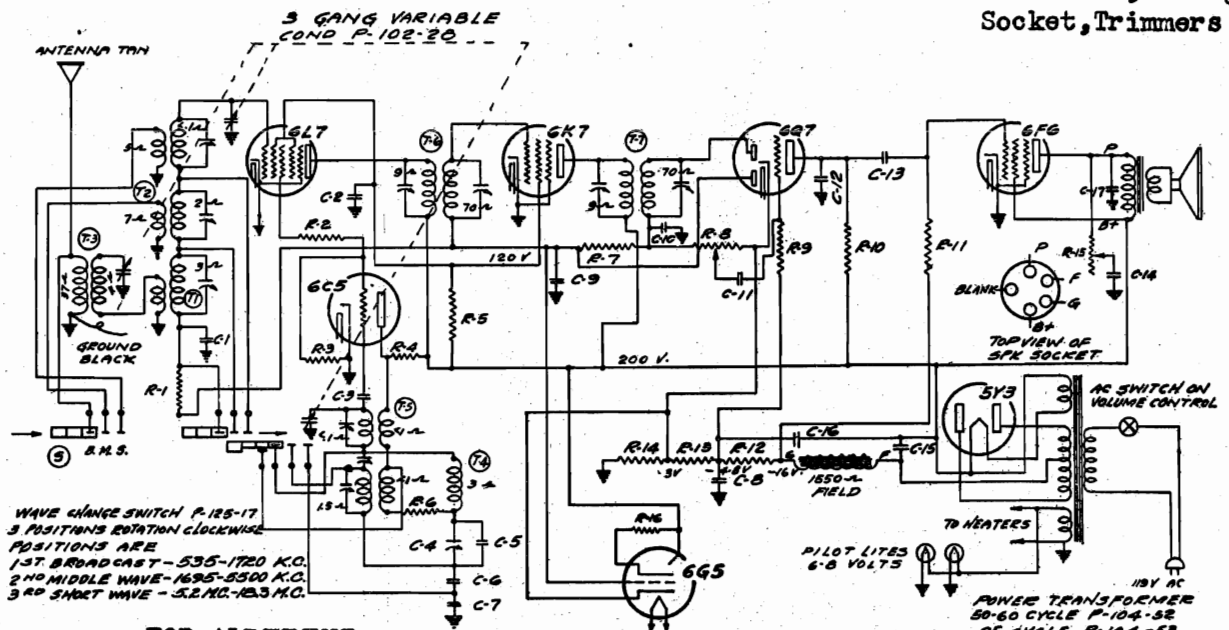


IF PEAK 175 KC.

DUMMY ANTENNAS:

The dummy antennas referred to in the following instructions are:
"I.F. Dummy"—A .1 mfd. condenser connected in series with the test oscillator output lead.
"Broadcast Dummy"—A 200 mmfd. condenser connected in series with the output lead of the test oscillator.

GOODYEAR TIRE & RUBBER CO., INC.

MODELS 685, 686,
Runs 1, 2Schematic, Voltage
Socket, Trimmers

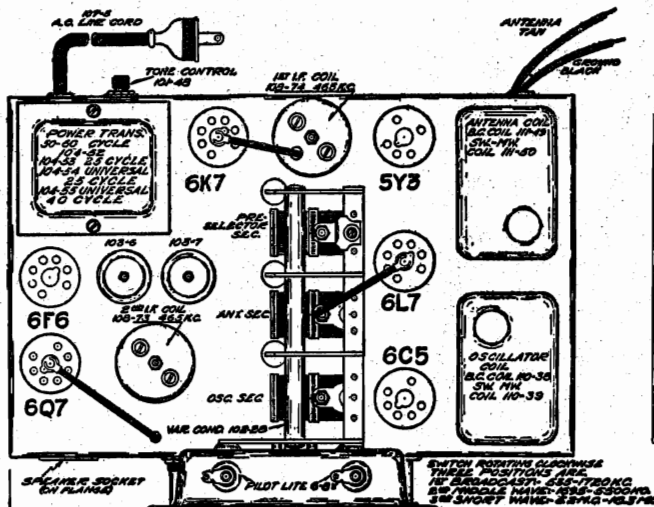
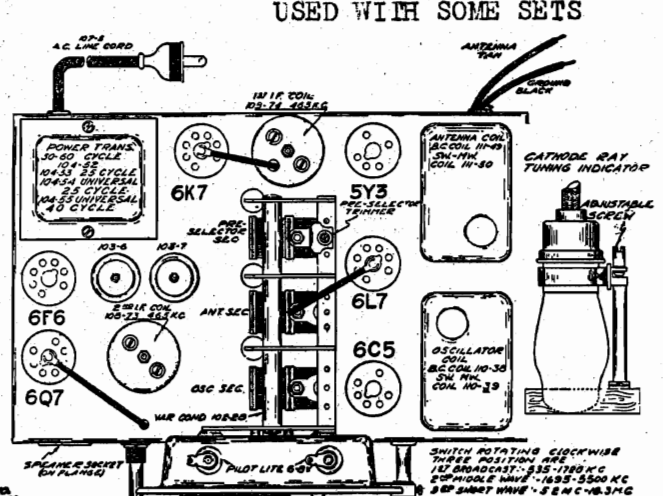
| No. | Part No. | Description |
|------------------|----------|-----------------------------------|
| RESISTORS | | |
| R1 | 130-20 | 100M Ohm— $\frac{1}{4}$ Watt—20% |
| R2 | 130-105 | 150 Ohm— $\frac{1}{4}$ Watt—20% |
| R3 | 130-12 | 50M Ohm— $\frac{1}{4}$ Watt—20% |
| R4 | 130-104 | 9M Ohm—1 Watt—20% |
| R5 | 130-104 | 9M Ohm—1 Watt—20% |
| R6 | 130-27 | 50 Ohm— $\frac{1}{4}$ Watt—20% |
| R7 | 130-19 | 1 Meg Ohm— $\frac{1}{4}$ Watt—20% |
| R8 | 101-46 | 1 Meg Ohm—Volume Control |
| R9 | 130-4 | 3 Meg Ohm— $\frac{1}{4}$ Watt—20% |
| R10 | 130-103 | 100M Ohm— $\frac{1}{4}$ Watt—20% |

| | | |
|-----|---------|----------------------------------|
| R11 | 130-102 | 500M Ohm— $\frac{1}{4}$ Watt—10% |
| R12 | 100-1 | 50 Volt—Carbon |
| R13 | 106-26 | 220 Ohm |
| R14 | 106-26 | 32 Ohm |
| R15 | 101-58 | 50M Ohm—Tone Control |
| R16 | 130-110 | 1 Meg Ohm—1/10 Watt—10% |

| | | |
|-------------------|--------|--------------------------|
| CONDENSERS | | |
| C1 | 100-22 | .05 x 200 Volt—25% |
| C2 | 100-1 | .1 x 400 Volt—25% |
| C3 | 129-39 | .00005 Mica (MT-0)—20% |
| C4 | 124-28 | Series Pad (80-225) |
| C5 | 129-58 | .00055 Mica (MT-0)—10% |
| C6 | 129-55 | .0034 Mica (MW-W)—2 1/2% |
| C7 | 129-54 | .003 Mica (MW-W)—2 1/2% |
| C8 | 100-20 | .1 x 200 Volt—25% |
| C9 | 100-22 | .05 x 200 Volt—25% |
| C10 | 129-12 | .00025 Mica (MT-0)—20% |

| | | |
|-----|--------|--------------------------------|
| C11 | 100-11 | .01 x 400 Volt—25% |
| C12 | 129-2 | .0005 Mica (MT-0)—20% |
| C13 | 100-11 | .01 x 400 Volt—25% |
| C14 | 100-27 | .025 x 600 Volt—25% |
| C15 | 103-6 | 8 Mfd. x 350 Volt Electrolytic |
| C16 | 103-7 | 8 Mfd. x 300 Volt Electrolytic |
| C17 | 100-25 | .002 x 600 Volt—20% |

| | | |
|--------------|--------|---------------------------|
| PARTS | | |
| T1 | 111-49 | Broadcast Antenna Coil |
| T2 | 111-50 | S.W.—M.W. Antenna Coil |
| T3 | 111-51 | B.C.—Pre-Selector Coil |
| T4 | 110-38 | B.C. Oscillator Coil |
| T5 | 110-39 | S.W.—M.W. Oscillator Coil |
| T6 | 108-74 | Input I.F.—465 K.C. |
| T7 | 108-73 | Output I.F.—465 K.C. |
| S | 125-17 | Band Switch |

TUNING INDICATOR. NOT
USED WITH SOME SETSCHASSIS LAYOUT
MODEL 686 Run 1.CHASSIS LAYOUT
MODEL 686 Run 2.

NOTE:—

Model 685 does not have tone control or tuning indicator and uses 2 metal and four glass tubes.

ALIGNMENT FREQUENCIES

- 465 KC Four trimmers.

- BC Series Pad at 600 KC

Osc.(3), RF (2), Ant.(1)

at 1400 KC

-Osc.(8), RF(7), Ant.(6) at

17 MC.

•-MW Series Pad at 1800 KC

$$\text{RF}(5), \text{Ant.}(4), \text{osc.}(9) \text{ at}$$

SMC.

Re-check broadcast alignment and if it is found necessary to re-adjust either R.F. or antenna trimmers, repeat the 17 M.C. short wave and 5 M.C. intermediate wave adjustments.

Dummy Antennas

(I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

(Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

(Intermediate and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

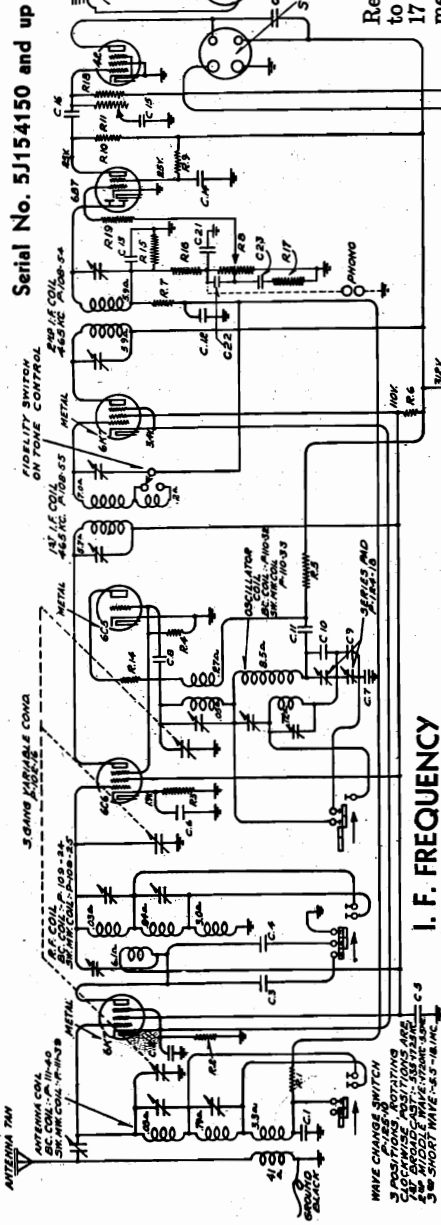
CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOL. VII

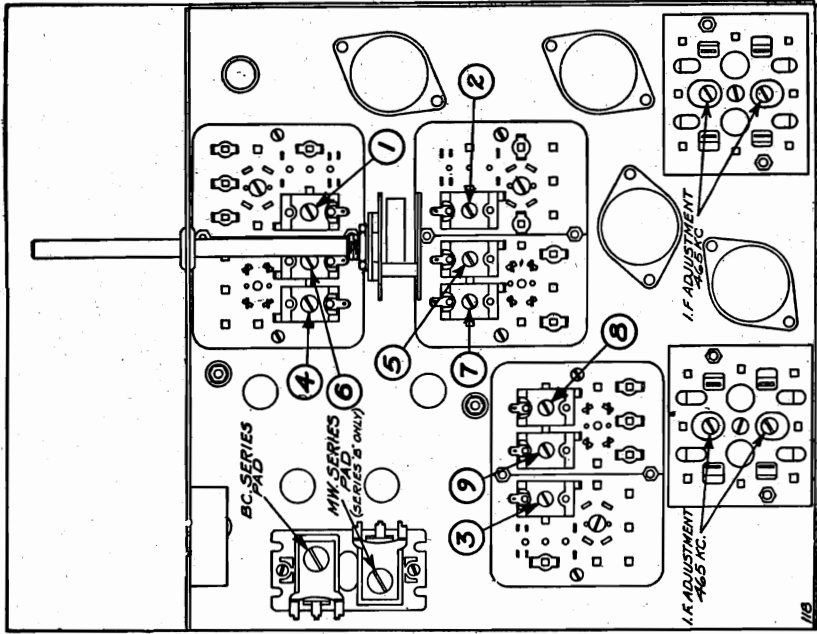
CONDENSERS

RESISTORS

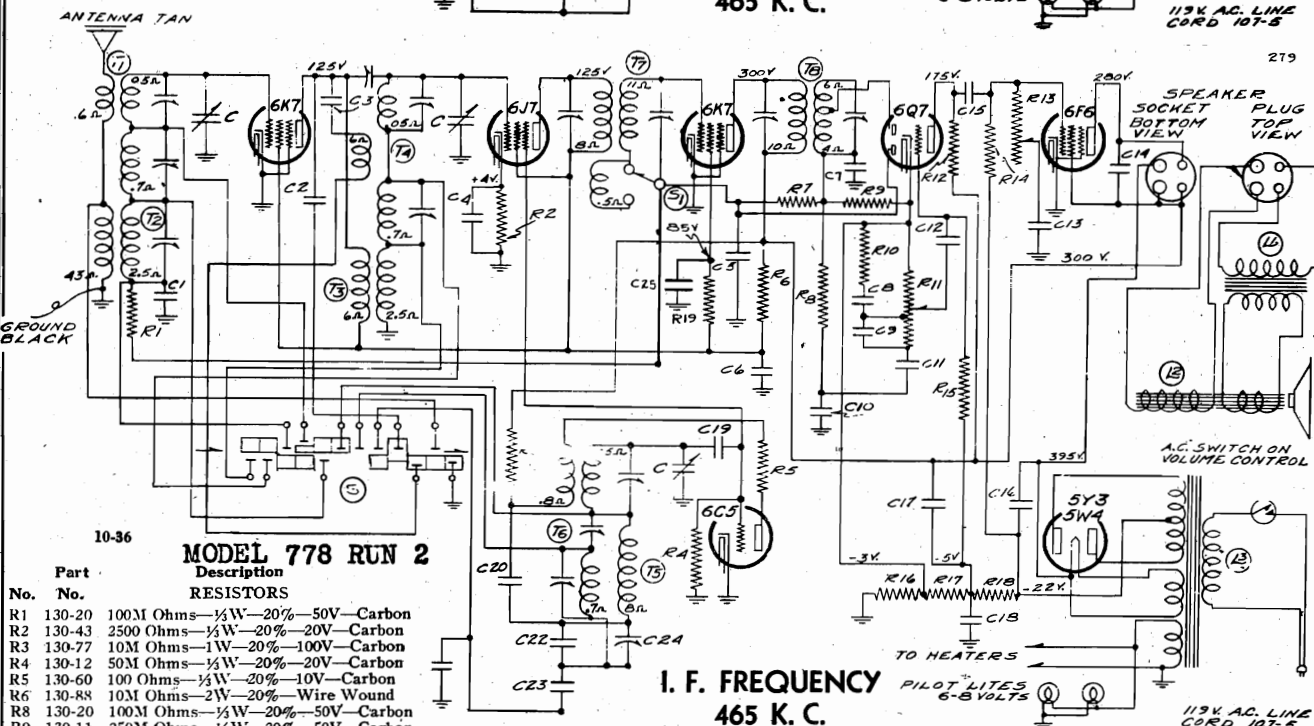
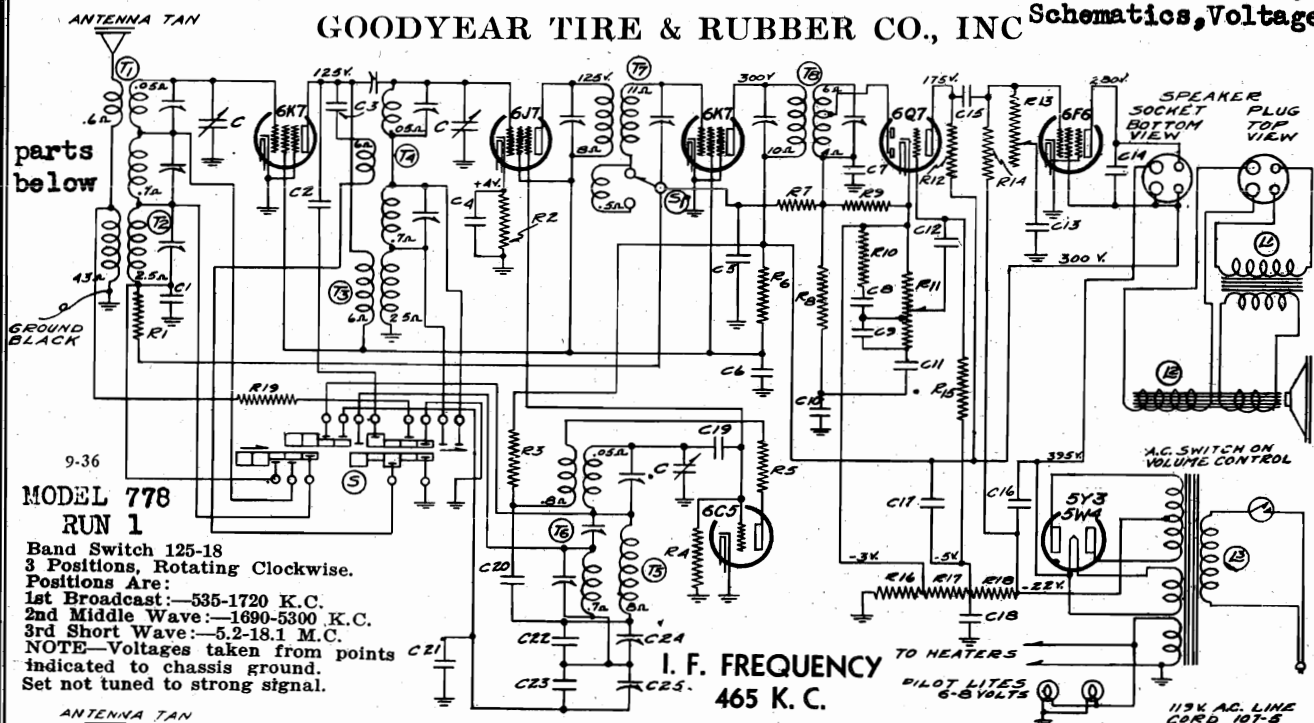
| No. | Part | No. | Value | No. | Value |
|-------------|------------|------------|--------------|-----|-------|
| C.1-100-9 | .05x200 V. | R.1-100M | 1/3 W. | | |
| C.2-100-6 | .25x200 V. | R.2-180 | 1/3 W. | | |
| C.3-129-22 | .0014 Mica | R.3-500 | 1/3 W. | | |
| C.4-129-21 | .0002 Mica | R.4-50M | 1/3 W. | | |
| C.5-100-24 | .25x400 V. | R.12-250M | 1/3 W. | | |
| C.6-100-20 | .1x200 V. | R.13-750M | 1/5 W. | | |
| C.7-129-29 | .0038 Mica | R.14-100 | 1/3 W. | | |
| C.8-129-31 | .00025 M. | R.15-250M | 1/3 W. | | |
| C.9-129-30 | .0014 Mica | R.16-100M | 1/3 W. | | |
| C.10-129-28 | .0064 M. | R.17-5000 | 1/3 W. | | |
| C.11-100-13 | .05x400 V. | R.18-250M | 1/3 W. | | |
| C.12-100-9 | .05x200 V. | R.19-50M | 1/3 W. | | |
| C.13-129-47 | .00004 M. | R.5-12M | 1.0 W. | | |
| C.14-100-20 | .1x200 V. | R.6-15M | 2.0 W. | | |
| C.15-100-11 | .01x400 V. | | W W. | | |
| C.16-100-13 | .05x400 V. | R.7-500M | 1/5 W. | | |
| C.17-103-4 | 16 mfd. | R.8-1 meg. | Vol. Control | | |
| | x350 V. | | P-101-37 | | |
| C.18-100-6 | .25x200 V. | R.9-1 meg. | 1/2 W. | | |
| C.19-103-8 | 14 mfd. | R.10-250M | 1/5 W. | | |
| | x400 V. | R.11-300M | Tone | | |
| C.20-129-2 | .0005 Mica | | control | | |
| C.21-129-47 | .00004 M. | | P-101-38 | | |
| C.22-129-21 | .0002 Mica | | | | |
| C.23-100-9 | .05x200 V. | | | | |



**I. F. FREQUENCY
465 K. C.**



GOODYEAR TIRE & RUBBER CO., INC

MODEL 778, Runs 1, 2
Schematics, Voltage

| Part No. | Description |
|--|--|
| RESISTORS | |
| R1 130-20 | 100M Ohms— $\frac{1}{2}$ W—20%—50V—Carbon |
| R2 130-43 | 2500 Ohms— $\frac{1}{2}$ W—20%—20V—Carbon |
| R3 130-77 | 10M Ohms—1W—20%—100V—Carbon |
| R4 130-12 | 50M Ohms— $\frac{1}{2}$ W—20%—20V—Carbon |
| R5 130-60 | 100 Ohms— $\frac{1}{2}$ W—20%—10V—Carbon |
| R6 130-88 | 10M Ohms—2W—20%—Wire Wound |
| R8 130-20 | 100M Ohms— $\frac{1}{2}$ W—20%—50V—Carbon |
| R9 130-11 | 250M Ohms— $\frac{1}{2}$ W—20%—50V—Carbon |
| R10 130-22 | 5000 Ohms— $\frac{1}{2}$ W—20%—10V—Carbon |
| R11 101-47 | 1 megOhms—Vol. Con. with AC Switch |
| R12 130-20 | 100M Ohms— $\frac{1}{2}$ W—20%—50V—Carbon |
| R13 101-38 | 100M Ohms—Tone Con. with Fid. Sw. |
| R14 130-3 | 506M Ohms— $\frac{1}{2}$ W—20%—100V—Carbon |
| R15 130-38 | 2 megOhms— $\frac{1}{2}$ W—20%—100V—Carbon |
| R16 106-27 | 38 Ohms—10% Muter Resistor |
| R17 106-27 | 28 Ohms—10% Muter Resistor |
| R18 106-27 | 220 Ohms—10% Muter Resistor |
| NOTE: R16, R17, R18 in one unit—part 106-27. | |
| CONDENSERS | |
| C 102-30 | One section of three gang var. cond. |
| C1 100-9 | .05—200 Volt—25% |
| C2 129-59 | .0003 Mica—MT—0—5% |
| C3 129-39 | .00005 Mica—MT—0—20% |
| C4 100-9 | .05—200 Volt—25% |
| C5 100-9 | .05—200 Volt—25% |
| C7 129-5 | .0001 Mica—MT—0—20% |
| C8 100-9 | .05—200 Volt—25% |
| C9 129-2 | .0005 Mica—MT—0—20% |
| C10 129-60 | .00015 Mica—MT—0—20% |
| C12 100-11 | .01—400 Volt—25% |
| C13 100-26 | .02—400 Volt—25% |
| C14 100-32 | .0005—1000 Volt—20% |
| C15 100-11 | .01—400 Volt—25% |

| | |
|------------|-------------------------------|
| C16 103-8 | 14 mfd.—400 Volt Electrolytic |
| C17 103-6 | 8 mfd.—350 Volt Electrolytic |
| C19 129-31 | .000025 Mica—MT—0—15% |
| C20 100-13 | .05—400 Volt—25% |
| C22 129-57 | .0005 Mica—MT—0—5% |

PARTS

| | |
|-------------------------|---|
| T1 111-54 | M.W. and S.W. Antenna Coil Assem. |
| T2 111-55 | Broadcast Antenna Coil Assem. |
| T3 109-30 | Broadcast R.F. Coil Assem. |
| T4 109-29 | M.W. and S.W. R.F. Coil Assem. |
| T5 110-43 | Broadcast Osc. Coil Assem. |
| T6 110-42 | M.W. and S.W. Osc. Coil Assem. |
| T7 108-64 | Input I.F. Coil—465 Kc. |
| T8 108-63 | Output I.F. Coil—465 Kc. |
| L1 | Output Transformer (on speaker) |
| L2 114-36 | 8" Speaker (Field Resis. 1250 Ohms) |
| L3 104-27 | Power Transformer (50-60 Cycle) |
| S 125-18 | Band Switch |
| S1 101-38 | Fidelity Switch on Tone Control |
| PARTS RUN 1 ONLY | |
| R7 130-3 | 500M ohms— $\frac{1}{3}$ Watt—20%—100 Volt—Carbon |
| R19 130-27 | 50 ohms— $\frac{1}{3}$ Watt—20%—Carbon |

| | |
|---|------------------------------------|
| C6 100-24B | .25—400 Volt—20% |
| C11 100-9 | .05—200 Volt—25% |
| C18 100-6B | .25—200 Volt—20% |
| C21 129-54 | .003 Mica—MW—W—2 $\frac{1}{2}$ % |
| C22 129-57 | .0005 Mica—MT—0—5% |
| C23 129-58 | .0021 Mica—MW—W—5% |
| C24 124-18 | Padder, 175 mmf. working capacity. |
| C25 124-18 | Padder, 300 mmf. working capacity. |
| Note: C24, C25 in one unit—part No. 124-18. | |

PARTS RUN 2 ONLY

| | |
|------------|--|
| R7 130-38 | 2 megOhms— $\frac{1}{2}$ W—20%—100V—Carbon |
| R19 130-76 | 30M Ohms— $\frac{1}{2}$ W—20%—10V—Carbon |
| C6 100-41 | .25—400 Volt—20% |
| C11 100-22 | .05—200 Volt—25% |
| C18 100-46 | .25—200 Volt—20% |
| C21 129-69 | .0023 Mica—MW—W—2 $\frac{1}{2}$ % |
| C23 129-55 | .0034 Mica—MW—W—2 $\frac{1}{2}$ % |
| C24 124-34 | Padder, 200 mmf. working capacity |
| C25 100-11 | .01 x 400 Volt—25% |

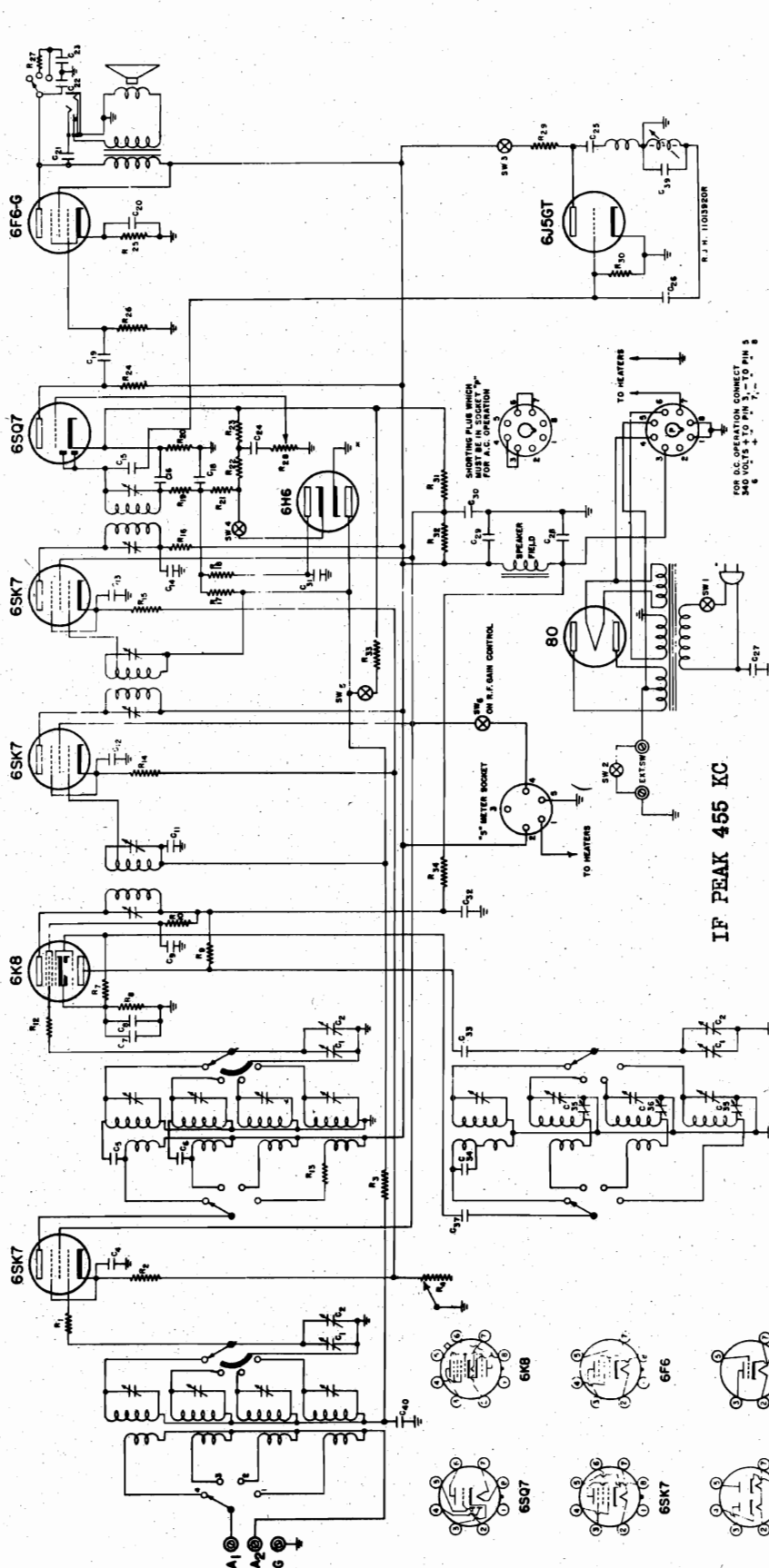
1. Vol. Control A.C. Switch 101-47
2. Tone Control Fidelity SW 101-38
3. Tuning
4. Band switch 125-18

SEE SPECIAL SECTION VOL. VIII
Dummy Antennas

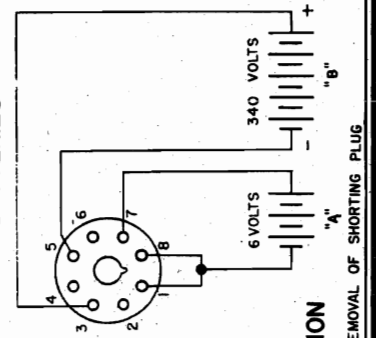
RF (10), Ant.(5), Osc.(2) at 5 MC.

THE HALLICRAFTERS INC.

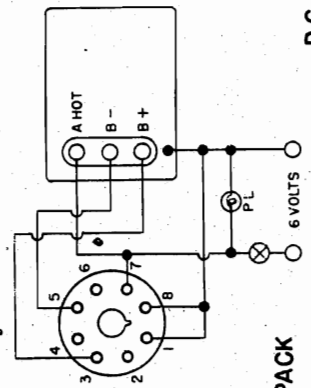
MODEL S20-R
Schematic Notes



BATTERIES



D C OPERATION



VIBRAPACK

SKY-CHAMPION MODEL - S20-R

TUBE LINE-UP

- 6SK7 R. F. Amplifier
- 6K8 1st Detector-Mixer H.F. Oscillator
- 6SK7 1st I.F. Amplifier
- 6SK7 2nd I.F. Amplifier
- 6SK7 2nd Detector, A.V.C. 1st stage of audio
- 6F6G 2nd audio output stage
- 6H6 Automatic Noise Limiter
- 6J5GT Beat Frequency Oscillator
- 80 Rectifier

Unless otherwise specified the S20R Receiver operates on 100-125 volt 50-60 cycle current. A universal model is available on special order for operation on 110-250 volt, 25-60 cycle current.

The Model S20R Receiver draws 65 watts at 115 volts 60 cycle alternating current.

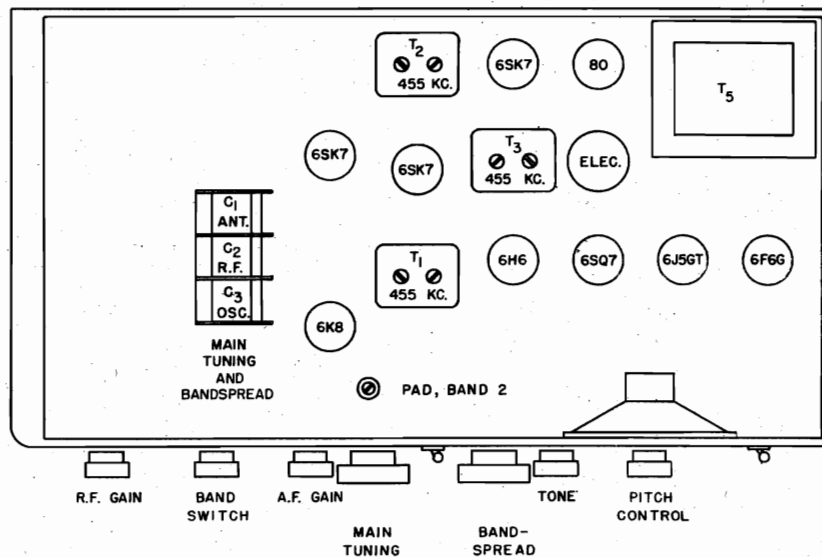
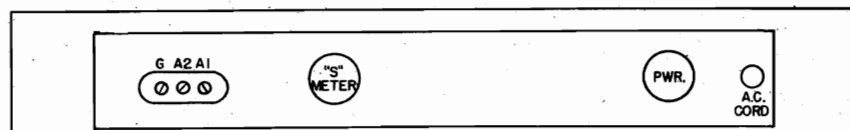
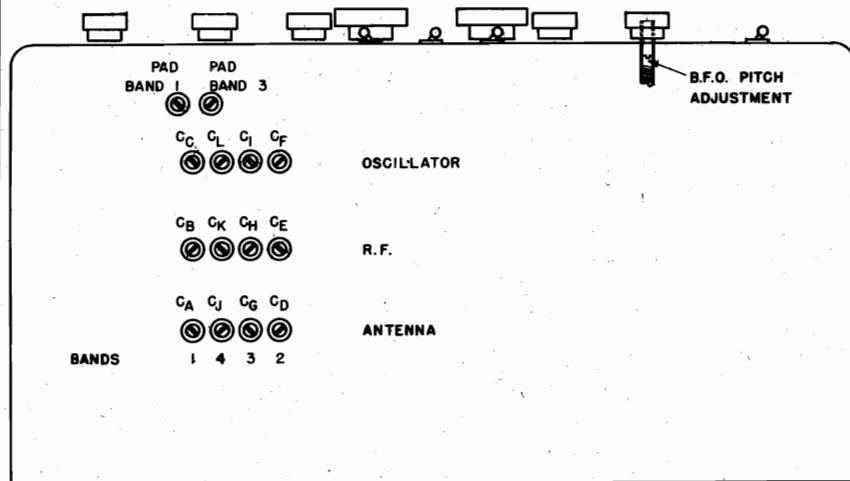
MODEL S20-R

Socket, Trimmers
Parts

THE HALLICRAFTERS INC.

FREQUENCY RANGE

| Band | Coverage |
|------|--------------------|
| 1 | 540 KC to 1,770 KC |
| 2 | 1.72 MC to 5.4 MC |
| 3 | 5.3 MC to 15.7 MC |
| 4 | 15.2 MC to 44. MC |



SWITCHES

- SW1 - AC On-Off On Tone Control Switch
- SW2 - Send Receive Switch
- SW3 - BFO On-Off
- SW4 - ANL On-Off
- SW5 - AVC On-Off
- SW6 - "S" Meter On R.F. Gain Control

RESISTORS

| NO. | OHMS | WATTAGE |
|-----|-----------|-----------|
| 1 | 30 | 1/3 |
| 2 | 200 | " |
| 3 | 100,000 | " |
| 4 | 10,000 | R.F. Gain |
| 7 | 50,000 | 1/3 |
| 8 | 200 | " |
| 9 | 20,000 | 1 |
| 10 | 30,000 | 1 |
| 12 | 3C | 1/3 |
| 13 | 500 | " |
| 14 | 1,000 | " |
| 15 | 300 | " |
| 16 | 1,000 | " |
| 17 | 2,000,000 | " |
| 18 | 1,000,000 | " |
| 19 | 50,000 | " |
| 20 | 100 | 1/3 |
| 21 | 100,000 | " |
| 22 | 250,000 | " |
| 23 | 250,000 | " |
| 24 | 250,000 | " |
| 25 | 500 | 1 |
| 26 | 500,000 | 1/3 |
| 27 | 5,000 | 1 |
| 28 | 500,000 | A.F. Gain |
| 29 | 15,000 | 1-1/2 |
| 30 | 50,000 | 1/3 |
| 31 | 13,000 | 1-1/2 |
| 32 | 10,000 | 3 |
| 33 | 150 | 1/3 |
| 34 | 10,000 | 1-1/2 |

CONDENSERS

| NO. | CAPACITY | VOLTAGE | TYPE |
|-----|----------------|-------------|--------------|
| 1 | 400 mmf | Main tuning | |
| 2 | 27 " | Band Spread | |
| 4 | .05 mfd | 200 | |
| 5 | 25 mmf | | Ceramic |
| 6 | 5 " | | " |
| 7 | .002 mfd | | Mica |
| 8 | .05 " | 200 | |
| 9 | .02 " | 400 | |
| 11 | .02 " | 400 | |
| 12 | .05 " | 200 | |
| 13 | .05 " | 200 | |
| 14 | .02 " | 400 | |
| 15 | 2 mmf | | Twisted Pair |
| 16 | 50 " | | Mica |
| 18 | 50 " | | " |
| 19 | .02 mfd | 400 | |
| 20 | 10 " | 25 | Electrolytic |
| 21 | .01 " | 400 | |
| 22 | .01 " | 800 | |
| 23 | .02 mfd | 600 | |
| 24 | .02 " | 400 | |
| 25 | .01 " | 400 | |
| 26 | 100 mmf | | Mica |
| 27 | .01 mfd | 800 | |
| 28 | 30 " | 450 | Electrolytic |
| 29 | 10 " | 400 | " |
| 30 | .1 " | 200 | |
| 31 | .05 " | 200 | |
| 32 | 10 " | 450 | Electrolytic |
| 33 | 100 mmf | | Ceramic |
| 34 | 105 " | | " |
| 35 | 2400 and 450 " | | Pad |
| 36 | 1400 " | | " |
| 37 | .002 mfd | | Mica |
| 39 | .0005 " | | " |
| 40 | .05 " | 200 | |

THE HALLICRAFTERS INC.

ANTENNA

MODEL S20-R
Alignment, Antenna Notes
MODEL SX-25
Antenna Notes

The Sky Champion has an antenna input circuit which will allow the use of either a doublet or Marconi (inverted "L") antenna. The approximate antenna input impedance of the S20R is 400 ohms.

A very serviceable antenna will be the inverted "L", or Marconi type. This antenna should be approximately 75 feet long overall, including the lead-in to the set. Satisfactory operation of the Sky Champion is obtained throughout its tuning range with this type of antenna and because of that fact as well as its ease of construction it is highly recommended.

With the inverted "L" type of antenna A_2 must remain connected to G for best operation. While a ground connection is usually not necessary it might prove to be helpful in reducing noise. A cold water pipe or 6' foot rod driven in moist soil will be a very satisfactory ground when connected to the G terminal on the receiver. Connections to a radiator or gas piping are not recommended.

Should a doublet antenna be used it is suggested that a transmission line of 400 ohms value of impedance be constructed so that a most efficient transfer of energy is obtained. The commercially available all wave doublet antennas are usually provided with a coupling transformer which matches the transmission line to the receiver. This transformer connects to the A_1 and A_2 terminals on the antenna strip. The half-wave length-doublet antenna cut for a particular frequency can be computed by the following formula.

$$\text{Length in feet} = \frac{463}{\text{Frequency in megacycles}}$$

or for example, a half wave 20 meter or 14 megacycle antenna would be

$$\frac{463}{14} \text{ or } 33.7 \text{ feet long overall}$$

This type of antenna is broken in the center with an insulator and has the transmission line connected to each resulting quarter wave section at that point. This antenna is a very good performer, in a direction broadside to its length, only on the relatively narrow group of frequencies for which it was cut. It does not function well on harmonic frequencies.

When using either type of doublet antennas the transmission line should be connected to A_1 and A_2 binding posts. The wire connecting the A_2 to ground or G can be left connected if the performance of the receiver is improved.

ALIGNMENT PROCEDURE

455 KC, Intermediate-Frequency Alignment. B.F.O. switch in the "OFF" position.
Have the controls set as follows: Set band switch to #2 band.
AF and RF gain controls for maximum volume. Set main dial to 2 megacycles, band spread to zero.

Remove 6K8 grid cap and connect the hot side of your 455 KC generator to this tube. Connect the ground terminal of the signal generator to the chassis of the receiver. Now feed a 455 KC signal into the receiver. Adjust all I.F. transformer trimmers on T1, T2, T3, for maximum gain.

R. F. ALIGNMENT

Re-connect the grid cap to the 6K8 tube. Connect the hot side of the generator to the A_1 antenna terminal on the rear of the chassis through a 400 ohm resistor. Be sure a jumper is connected to A_2 and G. Leave signal generator ground connected to the chassis of the receiver.

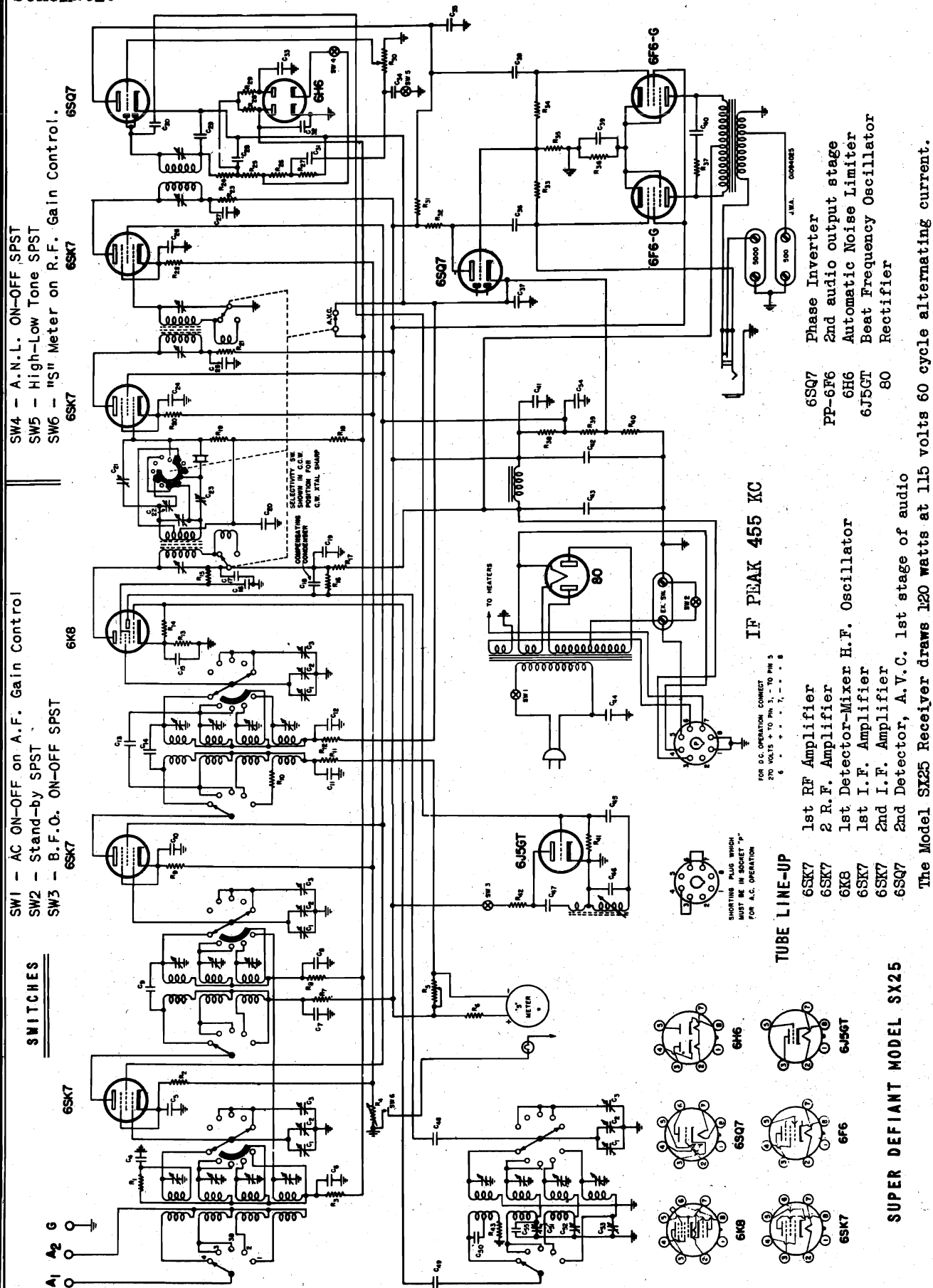
The location of the following trimmers and padders can be determined by referring to the top and bottom chassis views. All pad adjustments are for the low frequency end of each band while the trimmers are for the high-frequency ends.

In order to get at the RF trimmers the guarantee card can be removed by placing a knife under the small snap fasteners holding it in place. So that most satisfactory adjustment of the trimmers and padders can be made, it is advisable to "Rock" the condenser gang across the signal being delivered by the generator until that particular circuit has been accurately peaked at all frequencies except 1400 KC and 4 MC.

| Bands | Trim at | Pad at |
|-------|-------------------------------------|---|
| 1 | 1400 KC Adjust C_A C_B C_C | 600 KC Adjust Pad Band 1 |
| 2 | 4 MC Adjust C_D C_E C_F | 2 MC Adjust Pad Band 2 (Top Chassis) |
| 3 | 14 MC Adjust C_G C_H C_I | 7 MC Adjust Pad Band 3 |
| 4 | 34 MC Adjust C_J C_K C_L | 17 MC No pad on this Band |

MODEL SX-25, Super Defiant
Schematic

THE HALLICRAFTERS INC.



THE HALLICRAFTERS INC.

FREQUENCY METER TUNING

MODEL SX-25, Super Defiant
Alignment, Trimmers, Parts
Frequency Meter Tuning

Around the outer edge of the main tuning dial the amateur bands for which "Frequency Meter Tuning" is available are marked with the red numerals; 10 - 20 - 40 and 80. Set the red line beneath these numerals directly opposite the hair-line on the window and switch to the correct band. The band spread scale will indicate correct frequency within the limits of the accuracy of the setting and calibration.

The band spread dial of the SX25 Model is calibrated so that the operator may determine quite closely the frequency of the signal to which he is listening on the 10 to 80 meter amateur bands inclusive. The outer edge of this dial is marked off in 100 divisions for additional ease in logging and locating stations.

BAND 3B -- Special reference is called to this position of the Band Switch so that no confusion will be experienced. Band 3B is the same as Band 3 and is used in order to have the band spreading of the 40 meter band accomplished through approximately the same number of degrees on the Band Spread Scale as occupied by the other amateur bands for which calibration appears. When the Band Switch is placed in position 3B another section of the band spread condenser is paralleled in the circuit. Band 3 main scale calibration will read somewhat high when the Band Switch is set on 3B.

Note: The accuracy of the main dial calibration will hold only if the BAND SPREAD condenser is set at minimum capacity, or the position indicated by 100 on the Band Spread dial which has been approached by turning the Band Spread Knob in a clockwise direction, or to the right, as far as it will go.

| CONDENSERS | | | | RESISTORS | | | | | | | | | | | | |
|------------|---------------------|---------|--------------|-----------|-----------|---------|----|-------------------|-----|----|---------|-----|--|--|--|--|
| NO. | CAPACITY | VOLTAGE | TYPE | NO. | OHMS | WATTAGE | | | | | | | | | | |
| C1 | Main Tuning Gang | | | R1 | 100,000 | 1/3 | 20 | 800 | 1/3 | 32 | 250,000 | 1/3 | | | | |
| 2 | 2 PL. Bd. Spr. Sec. | | | 2 | 400 | " | 21 | 3,000 | " | 33 | 250,000 | " | | | | |
| 3 | 5 " " " " | | | 3 | 100,000 | " | 22 | 1,000 | " | 34 | 250,000 | " | | | | |
| 4 | .01 mfd | 200 | Paper | 4 | 10,000 R. | F. Gain | 23 | 3,000 | 1/3 | 35 | 200,000 | " | | | | |
| 5 | .05 mfd | 200 | Paper | 5 | 500 | S Meter | 24 | 50,000 | " | 36 | 250 | 1 | | | | |
| 6 | .05 mfd | 200 | Paper | 6 | 100 | 1/3 | 25 | 250,000 | " | 37 | 20,000 | 1 | | | | |
| 7 | .02 mfd | 400 | Paper | 7 | 3,000 | " | 26 | 100,000 | " | 38 | 15,000 | 1 | | | | |
| 8 | .05 mfd | 200 | Paper | 8 | 100,000 | " | 27 | 250,000 | " | 39 | 15,000 | 1 | | | | |
| 9 | 35 mmfd | | Ceramicon | 9 | 400 | " | 28 | 2,000,000 | " | 40 | 150 | 1/3 | | | | |
| 10 | .05 mfd | 200 | Paper | 10 | 500 | " | 29 | 1,000,000 | " | 41 | 50,000 | " | | | | |
| 11 | .02 mfd | 400 | Paper | 11 | 3,000 | " | 30 | 500,000 A.F. Gain | " | 42 | 20,000 | 1 | | | | |
| 12 | .05 mfd | 200 | Paper | 12 | 100,000 | " | 31 | 250,000 | 1/3 | 43 | 8 | 1/3 | | | | |
| 13 | 5 mmfd | | Ceramicon | 13 | 400 | " | | | | | | | | | | |
| 14 | 35 mmfd | | Ceramicon | 14 | 50,000 | " | | | | | | | | | | |
| 15 | .05 mfd | 200 | Paper | 15 | 30,000 | " | | | | | | | | | | |
| 16 | .05 mfd | 400 | Paper | 16 | 15,000 | " | | | | | | | | | | |
| 17 | .02 mfd | 400 | Paper | 17 | 4,000 | " | | | | | | | | | | |
| 18 | 4.5 mmfd | | Compensating | 18 | 100,000 | 1/3 | | | | | | | | | | |
| 19 | 10 mfd | 350 | Electrolytic | 19 | 500,000 | " | | | | | | | | | | |
| 20 | .05 mfd | 200 | Paper | | | | | | | | | | | | | |
| 21 | 25 mmfd | | Phasing | | | | | | | | | | | | | |
| 22 | 1.5 to 18 mmfd | "TXS" | Trimmer | | | | | | | | | | | | | |
| 23 | 1.5 to 18 mmfd | | Trimmer | | | | | | | | | | | | | |
| 24 | .05 mfd | 200 | Paper | | | | | | | | | | | | | |
| 25 | .02 mfd | 400 | Paper | | | | | | | | | | | | | |
| 26 | .05 mfd | 200 | Paper | | | | | | | | | | | | | |
| 27 | .02 mfd | 400 | Paper | | | | | | | | | | | | | |
| 28 | 50 mmfd | | Mica | | | | | | | | | | | | | |
| 29 | 100 mmfd | | Mica | | | | | | | | | | | | | |
| 30 | 3 mmfd | | Twisted Pair | | | | | | | | | | | | | |
| 31 | .02 mfd | 400 | Paper | | | | | | | | | | | | | |
| 32 | .02 mfd | 400 | Paper | | | | | | | | | | | | | |
| 33 | .05 mfd | 200 | Paper | | | | | | | | | | | | | |
| 34 | .002 mfd | 1,600 | Tubular Oil | | | | | | | | | | | | | |
| 35 | 250 mfd | | Mica | | | | | | | | | | | | | |
| 36 | .05 mfd | 400 | Paper | | | | | | | | | | | | | |
| 37 | 10 mfd | 25 | Electrolytic | | | | | | | | | | | | | |
| 38 | .05 mfd | 400 | Paper | | | | | | | | | | | | | |
| 39 | 10 mfd | 25 | Electrolytic | | | | | | | | | | | | | |
| 40 | .002 mfd | 1,600 | Tubular Oil | | | | | | | | | | | | | |
| 41 | .1 mfd | 400 | Paper | | | | | | | | | | | | | |
| 42 | 10 mfd | 350 | Electrolytic | | | | | | | | | | | | | |
| 43 | 30 mfd | 350 | Electrolytic | | | | | | | | | | | | | |
| 44 | .01 mfd | 600 | Paper | | | | | | | | | | | | | |
| 45 | 100 mmfd | | Mica | | | | | | | | | | | | | |
| 46 | 500 mmfd | | Mica | | | | | | | | | | | | | |
| 47 | .02 mfd | 400 | Paper | | | | | | | | | | | | | |
| 48 | 105 mmfd | | Ceramicon | | | | | | | | | | | | | |
| 49 | .002 mfd | | Mica | | | | | | | | | | | | | |
| 50 | 105 mmfd | | Ceramicon | | | | | | | | | | | | | |
| 51 | 2300 mmfd | | Dual Pad | | | | | | | | | | | | | |
| 52 | 1400 mmfd | | Single Pad | | | | | | | | | | | | | |
| 53 | 450 mmfd | | Dual Pad | | | | | | | | | | | | | |
| 54 | .1 mfd | 200 | Paper | | | | | | | | | | | | | |
| 55 | 700 mmfd | | Mica | | | | | | | | | | | | | |

ANTENNA

SEE ANTENNA DATA
FOR MODEL S20-R

R.F. GAIN

BAND SWITCH

SELECTIVITY

MAIN TUNING

XTAL PHASING

BAND SPREAD

A.F. GAIN

PITCH CONTROL

PAD BAND 1

PAD BAND 3

TXS

C_C C_D C_K C_B

OSCILLATOR

C_B C_N C_J C_F

2ND R.F.

C_H C_I C_E

1ST R.F.

C_A C_L C_H C_D

ANTENNA

BANDS

1 4 3 2

FREQUENCY RANGE

| Band | Coverage |
|------|--------------------|
| 1 | 540 KC to 1,700 KC |
| 2 | 1.7 MC to 5.1 MC |
| 3 | 5.0 MC to 15.7 MC |
| 4 | 15.2 MC to 42 MC |

| Set Band | Switch at |
|--------------|-----------|
| Amateur Band | |
| 80 Meter | Band 2 |
| 40 Meter | Band 3B |
| 20 Meter | Band 3 |
| 10 Meter | Band 4 |

G A₂ A₁

500 OHMS EXT. SW.

S METER ADJUSTMENT

PWR

5000 OHMS

AC CORD

Bands

Trim at

Pad at

1

1500 KC

Adjust C_A C_B C_C

600 KC

Adjust Pad Band 1

2

14 MC

Adjust C_H C_I C_J C_K

6 MC

Adjust Pad Band 3

3

4 MC

Adjust C_D C_E C_F C_G

1.8 MC

Adjust Pad Band 2 (Top Chassis)

4

30 MC

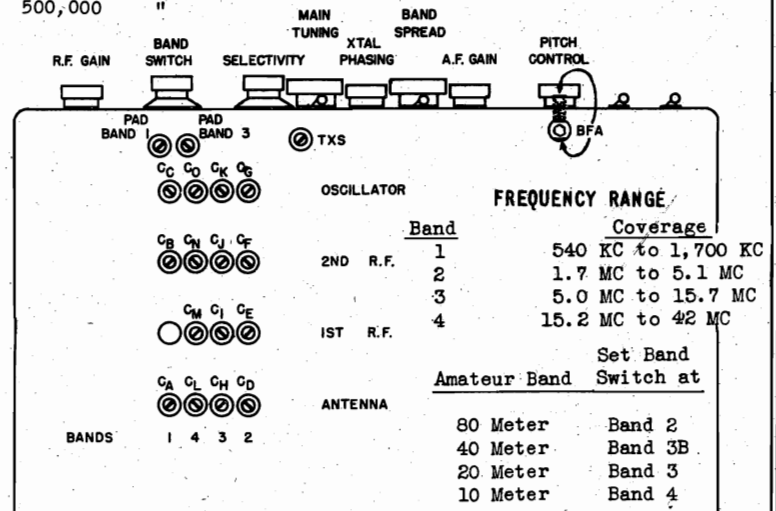
Adjust C_L C_M C_N C_O

1B MC

No pad on this Band

ANTENNA

SEE ANTENNA DATA
FOR MODEL S20-R



| | | | |
|--------------------|--|-------------------|--|
| | | 500 OHMS EXT. SW. | |
| | | | |
| S METER ADJUSTMENT | | PWR | |
| | | 5000 OHMS | |

| Bands | Trim at | Pad at |
|-------|---|---|
| 1 | 1500 KC Adjust C _A C _B C _C | 600 KC Adjust Pad Band 1 |
| 2 | 14 MC Adjust C _H C _I C _J C _K | 6 MC Adjust Pad Band 3 |
| 3 | 4 MC Adjust C _D C _E C _F C _G | 1.8 MC Adjust Pad Band 2 (Top Chassis) |
| 4 | 30 MC Adjust C _L C _M C _N C _O | 1B MC No pad on this Band |

MODEL SX-25 Super Defiant
Alignment Procedure, NotesTHE HALLICRAFTERS INC.
"S" METER

When the R.F. gain control is advanced until a switch is heard to operate, a light will appear behind the translucent scale of the meter itself. Only when this light is on will the meter indicate in "S" units. When so adjusted the meter can be used as a resonance indicator. With the R.F. gain control backed off from maximum the meter is still in the circuit but will not indicate carrier level accurately. On the rear apron of the chassis is the "S" meter adjustment screw. To set the "S" meter, disconnect the antenna and have the R.F. Gain Control on full and the selectivity switch in the "I.F. SHARP A.V.C. ON" position. Now, adjust this knurled knob until the meter reads zero. Reconnecting the antenna and tuning in a station will show its relative carrier intensity.

The 500 and 5000 ohm terminals are for connections to a loud speaker or other load of those impedance values. The matching SX25 speaker should be connected to the 5000 ohm strip. When headphones are plugged into the phone jack the 5000 ohm speaker connection is automatically disconnected.

The "EXT. SWITCH" terminal strip is for external switch provisions should the receiver be controlled by a remote switch or relay. The SEND-REC switch on the panel must be in the Send Position when an external relay is used for stand-by operation.

Unless otherwise specified the SX25 Receiver operates on 100-125 volt 50-60 cycle current. A universal model is available on special order for operation on 110-250 volt, 25-60 cycle current.

ALIGNMENT PROCEDURE

455 KC, Intermediate-Frequency Alignment.

Have the controls set as follows:

AF and RF gain controls for maximum volume.

B.F.O. switch in the "ON" position.

Set band switch to #2 band.

Set main dial to 2 megacycles, band spread to 100.

Selectivity switch in "AVC OFF" xtal phone position.

Remove the 6K8 tube grid cap. Connect a 1 megohm resistor between grid cap and grid of 6K8 tube. Now connect the hot side of the signal generator to the grid of the 6K8 tube through a .1 MFD condenser. Connect the ground terminal of the signal generator to the chassis of the receiver. Remove modulation from generator and feed a 455 KC signal into the receiver and set the pitch control to give a beat note of approximately 1000 cycles. Adjust all I.F. transformer trimmers for maximum gain with the exception of the secondary trimmer on transformer T1. Identified on top chassis view as T1S. In adjusting this trimmer it will be noted that the output reaches a maximum goes through a dip and then back to maximum again. Wobulate the IF frequency and align to the dip between the two maximum points. A distinct change in the crystal note sounding like an apparent broadening of the crystal action will be noted when the correct adjustment has been reached. At this point in the alignment it is necessary to make an adjustment on the phasing control as follows: Tune the signal generator so that its signal will go through zero beat and then to the other side of zero beat until a signal of approximately 5000 cycles is heard in the speaker or headphones. Now carefully adjust the "PHASING CONTROL" until this signal is reduced in volume to a minimum. Reset the signal generator to its original frequency and recheck the adjustment of T1S. Now repeak carefully the other trimmers on I.F. transformers for maximum gain. Place the selectivity switch in the "CW. XTAL" position leaving all controls on the receiver as previously adjusted. Again wobulate the frequency of the signal generator carefully through the very narrow range of the crystal peak. Adjust small trimmer through hole in the bottom plate marked "TXS" until the sharp crystal peak reaches maximum output. At this point the crystal is extremely sharp and maximum output is possible. If this setting gives too sharp crystal filter action this "TXS" trimmer can be adjusted counter-clockwise for broader crystal response to suit the operator.

B.F.O. ADJUSTMENT

In the center of the "PITCH CONTROL" shaft, after the knob has been removed, you will find a recessed screw for adjustment of the Beat Frequency Oscillator.

Before rotating this screw with a suitable screw-driver loosen the set screw on this shaft. This set screw can be reached through a hole in the bottom plate directly under the B.F.O. Assembly marked "BFA".

Now tune in a signal on the receiver with the BFO off. Exact resonance can be determined with the controls so adjusted that the "S" meter will indicate. After you have assured yourself that you have the signal properly tuned in place the selectivity switch in anyone of the three "AVC OFF" positions. Turn the BFO switch to the "ON" position. You now can adjust the screw in the center of the pitch control shaft until a beat note is heard. Tighten the set screw through the bottom plate, replace the knob and the BFO adjustment is completed.

R. F. ALIGNMENT

Re-connect the grid cap to the 6K8 tube. Connect the hot side of the generator to the A₁ antenna terminal on the rear of the chassis. Be sure a jumper is connected to A₂ and G. Leave signal generator ground connected to the chassis of the receiver.

The location of the following trimmers and padders can be determined by referring to the top and bottom chassis views. All pad adjustments are for the low frequency end of each band while the trimmers are for the high frequency ends.

In order to get at the RF trimmers the guarantee card can be removed by placing a knife under the small snap fasteners holding it in place. So that most satisfactory adjustment of the trimmers and padders can be made, it is advisable to "Rock" the condenser gang across the signal being delivered by the generator until that particular circuit has been accurately peaked.

HALSON RADIO & TELEVISION INC. MODEL 6-Button Automatic Tuner-Data

SIX BUTTON AUTOMATIC TUNER

NOTE:--THE ADJUSTMENT SWITCH AND I.F. CONNECTIONS WERE ELIMINATED FROM THIS CIRCUIT, THEREFORE, OMIT ANYTHING PERTAINING TO THEM.

This push button assembly is for convenience and rapidity in the selection of favorite stations. Use preferably on strong local stations of good quality or the major networks. It in no way affects the operation of the normal manual tuning control, located below the dial which is used as heretofore, but is rather an adjunct for convenience.

CHOOSING THE STATIONS FOR AUTOMATIC TUNING Before any adjustment, select the six stations desired. Check their frequency and choose them so that two are from the low frequency end of the broadcast band, two are from the middle frequency and two are of the higher frequencies. Note that all trimmers in the back are marked with the range they cover. Be sure that each set of trimmers is used for only a station within its range.

In most cases this should accommodate the six most popular stations. Occasionally three stations might be desired in one frequency group. Since there are only two buttons available, the least important station will have to be tuned in by the manual control. The chosen stations should be lined up on the buttons in the order of their frequency with the lowest frequency on the left hand side, the next higher frequency to the right of it and so on until the highest frequency station is on the farthest right hand button.

Passing the two small wood screws and take off the front escutcheon. Insert desired behind the little celluloid windows, the station call letters

ADJUSTMENT FOR A PARTICULAR BUTTON Each button is wired up to a particular trimmer set in the back. The back adjustment is approximately directly behind its button. For example, the last button nearest one end of the cabinet is adjusted by the last trimmer nearest that same end of the cabinet. Again, the third button from one end of the cabinet is adjusted by the third set of trimmer screws from the same end.

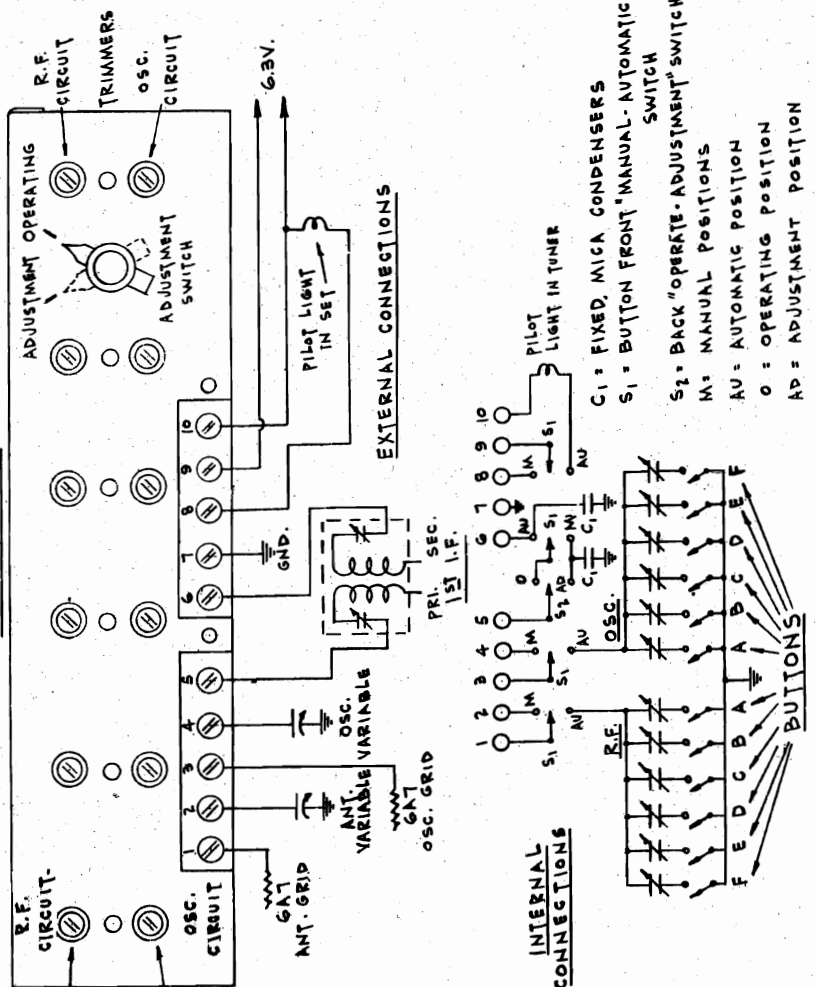
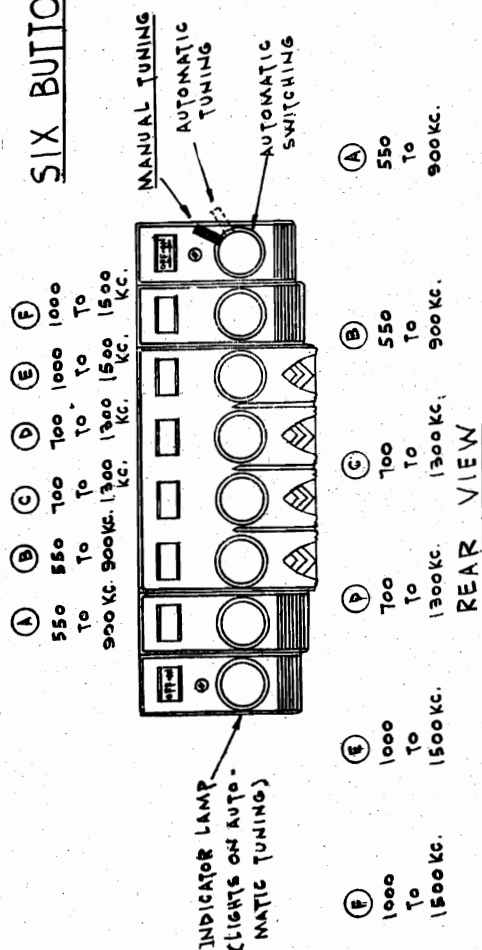
METHOD OF STATION ADJUSTMENT Having picked the station desired, the button for it and the trimmer screws behind the button, the next step is adjustment of the trimmers to actually receive the desired station. Turn back the switch to ADJUSTMENT position. Tune in manually the desired station and leave there. Turn the front automatic button switch to right or automatic position (left button will light up). Turn bottom screw of trimmer (oscillator) until desired station is heard. Switch back and forth between manual and automatic positions for easy identification of the desired station. Turn volume control up.

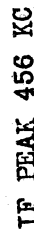
CUTION - It is usually necessary at the beginning to arbitrarily screw top or RF trimmer in fairly tight to right. Sometimes a loud "puttering" or oscillation will be heard as lower, oscillator, screw is turned. When this occurs, tighten up (turn right, clockwise) the upper RF trimmer and then continue adjusting the oscillator until desired station is heard. The actual receiving of the station will always first have to be accomplished by the oscillator trimmer.

After the station is heard, tune upper trimmer for maximum response. Repeat both trimmer adjustments for greater accuracy.

Continue to the next button and adjust its bottom and top trimmers behind it.

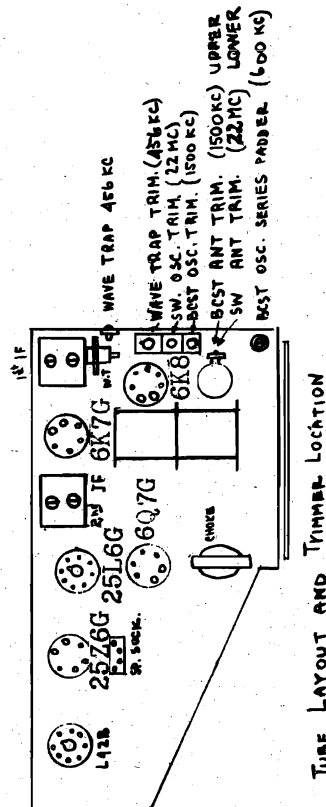
After all trimmers have been adjusted, turn back switch to OPERATION position and leave there in that position henceforth. The receiver is now ready for use. The front button switch will instantly permit use of either automatic or manual tuning without any interaction or dependence of one upon the other.





FOR 135, 150, 220 & 250 VOLTS OPERATION
USE L42BX BALLAST TUBE

12-2612 ELECTROLYTIC COND - 150 W.V.
13-2622 TONE CONTROL SWITCH



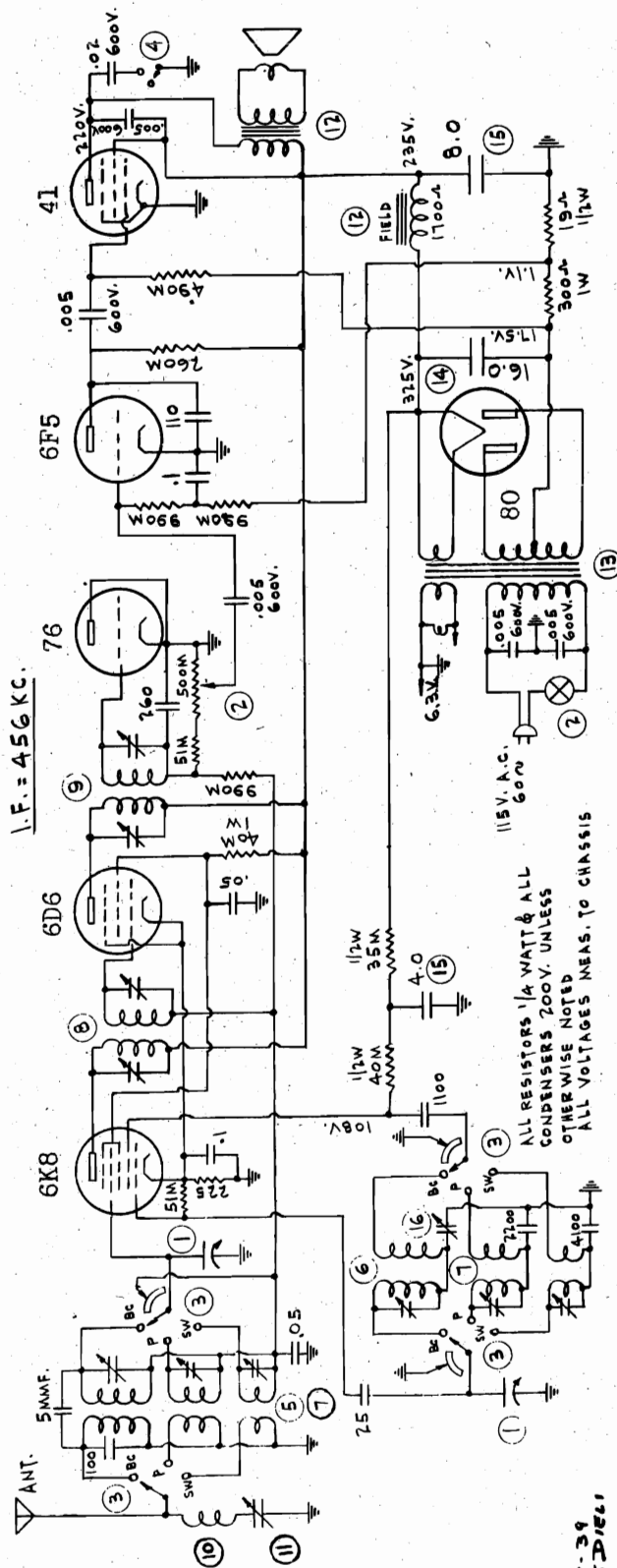
TUBE LAYOUT AND TRIMMER LOCATION

MINOR REASONS FOR FAILURE TO FUNCTION - Defective tubes, grid caps off, volume control not fully turned on, line plug reversed on DC, tubes not in their proper sockets, shorted aerial defective plug or wiring loose in socket.

- (1) Set service oscillator to 456 KC and connect the output lead to the top grid of 6A7. Adjust the I.F. trimmers for maximum response.
- (2) Connect oscillator set at 456 KC to the antenna lead through a .0008 MFD condenser band switch in the broadcast position, and adjust the wave trap for minimum response.
- (3) Set oscillator for 25 MC, band switch in the short wave position, dial pointer set for 25 MC calibration, and adjust the short wave oscillator trimmer until the signal is heard.
- (4) Turn the band switch to the broadcast position, set dial to 1500 KC calibration and feed a 1500 KC signal from the oscillator through the antenna. Adjust the broadcast oscillator trimmer until the signal is heard, then adjust the broadcast antenna trimmer for maximum response.
- (5) Set the test oscillator to 600 KC and adjust the broadcast osc. series padder for maximum response by simultaneously adjusting the padder and rooking the tuning dial.
- (6) Repeat procedure numbers 4 and 5 for greater accuracy.
- (7) Turn the set to the S.W. Band, set the test oscillator to 22 MC, tune in signal with the set and adjust the S.W. antenna trimmer for maximum response. Use 400 KC dummy antenna.

HALSON RADIO & TELEVISION INC.

MODEL 40B2X
Schematic, Socket
Alignment, Trimmers

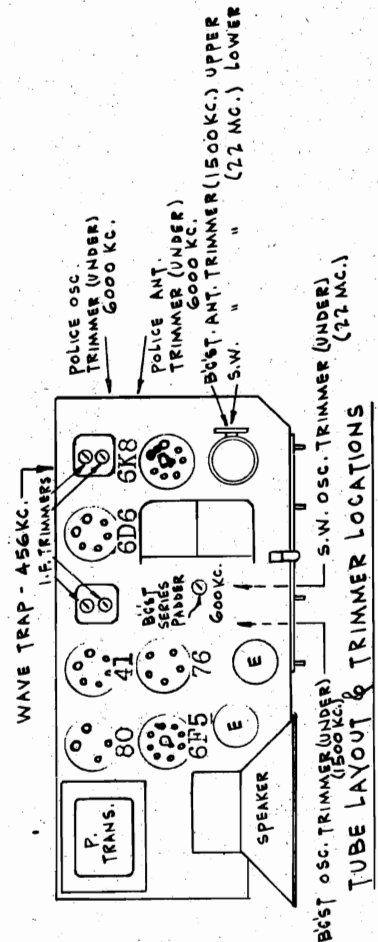


10-31-39
App. - F. Diehl

- 6 = 2425 - OSCILLATOR " " (POLICE BAND)
7 = 2430 - ANT. OSC. "
8 = 1900L - I.F. TRANSFORMER - 1ST - 456 K.C.
9 = 184EP - " " - 2ND. "
10 = 234EP - RANGE SWITCH
11 = 2337-1 - WAVE TRAP COIL - 456 KC. TRIMMER
12 = 2468 - VARIABLE CONDENSER 495 MMFD.
13 = 150EE - VOLUME CONTROL & SWITCH
14 = 234EP - RANGE SWITCH
15 = 1439C - TONE CONTROL SWITCH
16 = 2468 - ANTENNA COIL ASSEMBLY
17 = 2272-1 - SPEAKER ASSEMBLY
18 = 2311 - POWER TRANSFORMER - 115V. - 60N
19 = 2353 - ELECT. COND. (WET) 1CMFD. 450V.
20 = 2308-2 - " " 8-4 MPD. 350V.
21 = 1521-1 - PADDER COND. 200-685 MMFD.

ALIGNMENT PROCEDURES

- (1) Set service oscillator to 456 kc and connect the output lead to the top grid of 6A7. Adjust trimmers for maximum response.
- (2) Connect oscillator set at 456 kc to the antenna lead through a .0002 mfd. condenser; variable condenser closed, and adjust wave trap trimmer for minimum response. Band switch to be in broadcast position.
- (3) Turn band selector to the short wave band, set the test oscillator to 22 mc and connect to antenna lead through 400 ohm dummy antenna. Set dial pointer to 22 mc and adjust short wave oscillator trimmer until signal is heard. Then adjust short wave antenna trimmer for maximum response.
- (4) Turn band selector to police band, set test oscillator to 6000 kc, connect to antenna lead through 400 ohm dummy antenna. Set dial pointer to 6000 kc and adjust police oscillator trimmer until signal is heard. Then adjust broadcast antenna trimmer for maximum response.
- (5) Turn band selector to broadcast band, set test oscillator to 1500 kc, connect to antenna lead through a .0002 mfd. condenser. Set dial at 1500 kc and adjust broadcast oscillator trimmer until signal is heard. Then adjust broadcast antenna trimmer for maximum response.
- (6) With band selector in broadcast position, set test oscillator to 600 kc and adjust broadcast oscillator series padder for maximum response by simultaneously adjusting the padder and rocking the tuning dial.
- (7) Repeat procedures 5 and 6 for greater accuracy.

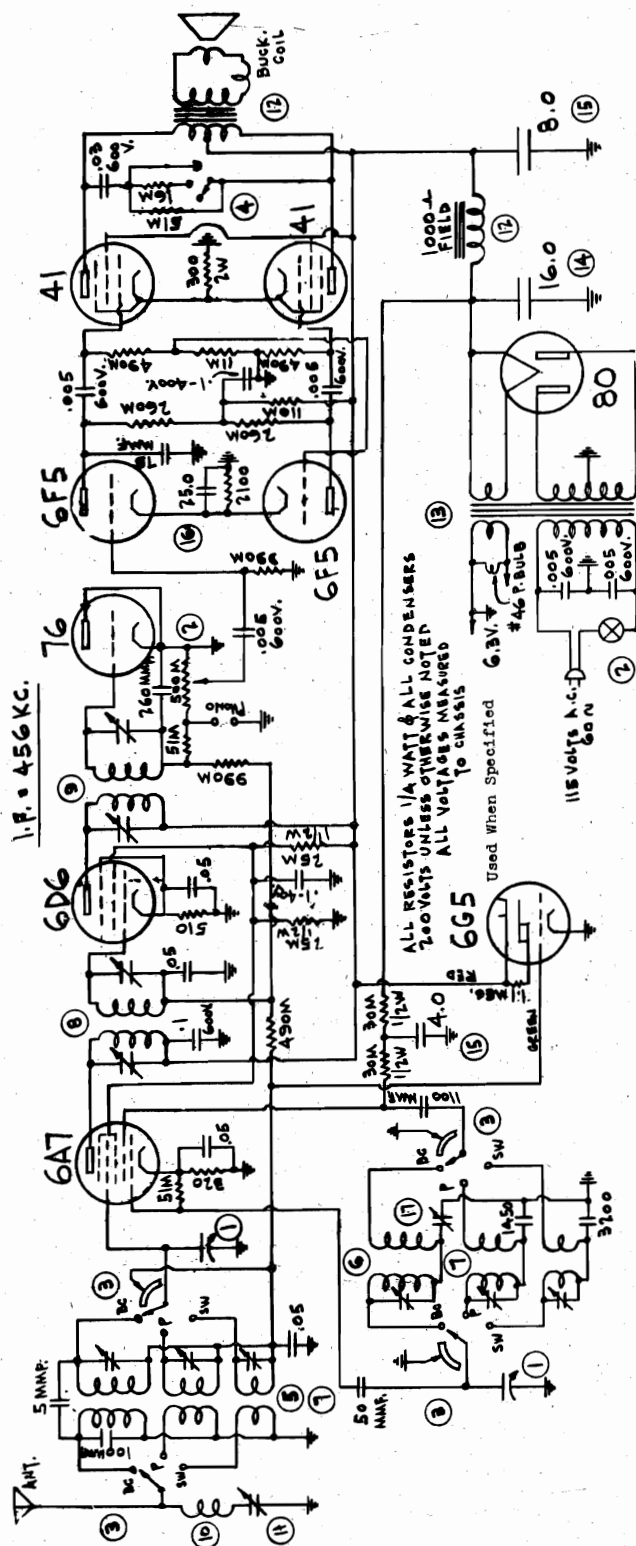


MINOR REASONS FOR FAILURE TO FUNCTION - Defective tubes, grid caps off, volume control not fully turned on, tubes not in their proper sockets, shorted antenna, defective plug or wiring loose in socket.

MODEL 40C3X

Schematic, Socket
Alignment, Trimmers

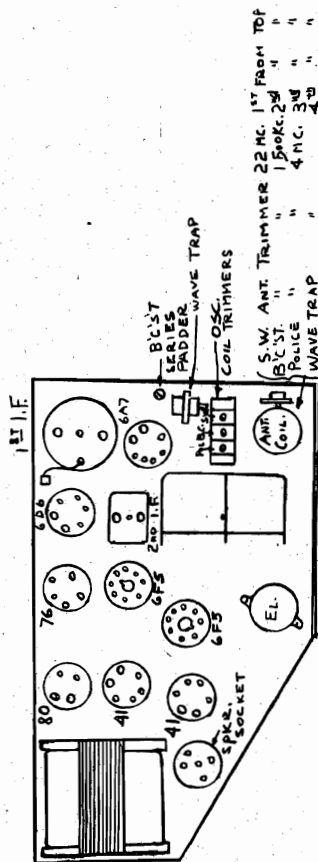
HALSON RADIO & TELEVISION INC.



- 1 = 2290-3 - VARIABLE CONDENSER - 495 MMFD.
2 = 1908D-3 - VOLUME CONTROL & SWITCH
3 = 2345 - RANGE SWITCH
4 = 2346 - TONE CONTROL SWITCH
5 = 2347 - ANTENNA COIL ASSEMBLY
6 = 2348 - OSCILLATOR
- 7 = 2349 - ANT.-OSC. " (POLICE BAND)
8 = 2350-1 - I.F. TRANSFORMER - 1st - 456 KC.
9 = 19481 - " - 2nd - " "
10 = 2351-1 - WAVE TRAP COIL - 456 KC.
11 = 2352-1 - " TRIMMER
12 = 2356-2 - SPEAKER ASSEMBLY
- 13 = 2357-1 - POWER TRANSFORMER - 115V.-60V.
14 = 2358 - ELECT. COND. (WET) 16MFD.-450V.
15 = 2308-2 - " " 8-A MFD.-350V.
16 = 2369 - " " 25 MFD.-15V.
17 = 1621-1 - PADDER COND. 200-685 MMFD.

ALIGNMENT PROCEDURE

- (1) Set service oscillator to 456 kc and connect the output lead to the top grid of 6A7. Adjust trimmers for maximum response.
- (2) Connect oscillator set at 456 kc to the antenna lead through a .0002 mfd. condenser; variable condenser closed, and adjust wave trap trimmer for minimum response. Band switch to be in broadcast position.
- (3) Turn band selector to the short wave band, set the test oscillator to 22 mc and connect to antenna lead through 400 ohm dummy antenna. Set dial pointer to 22 mc and adjust short wave oscillator trimmer until signal is heard. Then adjust short wave antenna trimmer for maximum response.
- (4) Turn band selector to police band, set test oscillator to 6000 kc, connect to antenna lead through 400 ohm dummy antenna. Set dial pointer to 6000 kc and adjust police oscillator trimmer until signal is heard. Then adjust police antenna trimmer for maximum response.
- (5) Turn band selector to broadcast band, set test oscillator to 1500 kc, connect to antenna lead through a .0002 mfd. condenser. Set dial at 1500 kc and adjust broadcast oscillator trimmer until signal is heard. Then adjust broadcast antenna trimmer for maximum response.
- (6) With band selector in broadcast position, set test oscillator to 600 kc and adjust broadcast oscillator series padder for maximum response by simultaneously adjusting the padder and rocking the tuning dial.
- (7) Repeat procedures 5 and 6 for greater accuracy.



TUBE LAYOUT & TRIMMER LOCATION

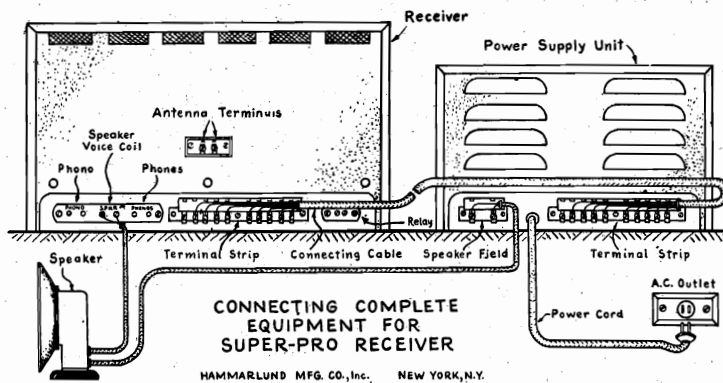
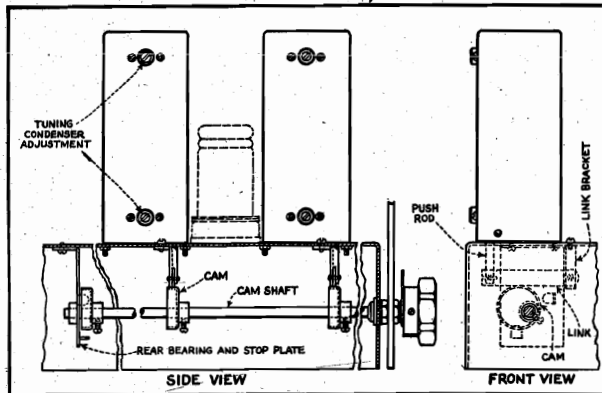
MINOR REASONS FOR FAILURE TO FUNCTION - Defective tubes, grid caps off, volume control not fully turned on, tubes not in their proper sockets, shorted antenna, defective plug or wiring loose in socket.

F-3D 9-7-39

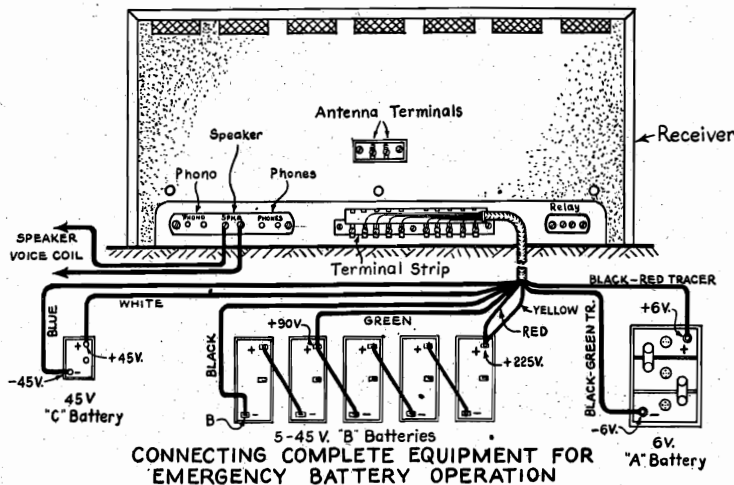
HAMMARLUND MFG. CO., INC.

MODEL 200 Series
Assembly, Selectivity Curves

FIG. 1—Band width control which varies selectivity and permits the operator to adjust the receiver for best quality obtainable with minimum interference.



The two drawings on this page show the proper method of connecting the receiver, power supply, and speaker together. The drawing above shows a standard installation, while the diagram below indicates receiver connections when batteries furnish the power. Protective covers are furnished for all important terminal strips and they should always be in place.



Drawing below provides voltage readings at the various terminals on either the receiver or power supply when the two are connected together.

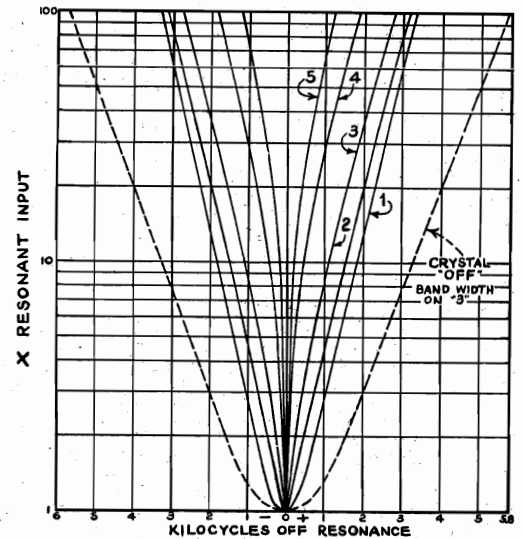
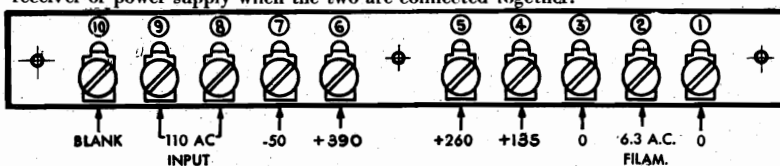


FIG. 6—Variable crystal filter selectivity curves showing five positions of the control switch. Positions 1, 2 and 3 are intended for voice reception. Position 1 is broad enough to permit reception of music. Positions 4 and 5 are for single signal code reception.

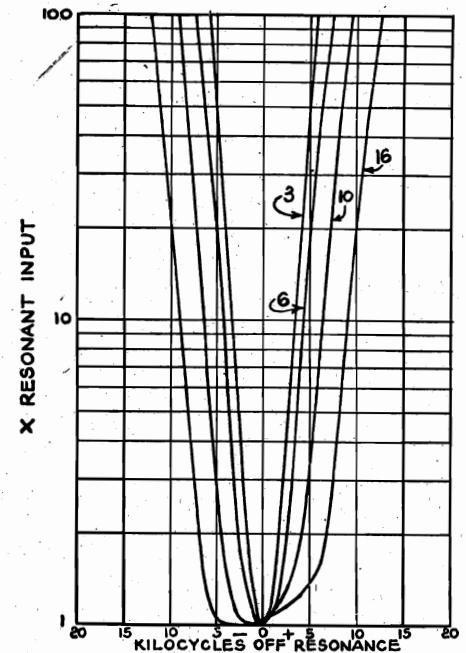


FIG. 5—I.F. curves taken at four positions of the band width control. The actual selectivity of the I.F. amplifier is continuously variable between curves 3 and 16. Particular attention should be paid to the sharp cut-off which greatly reduces back-ground interference.

MODEL 200 Series

Notes, Parts

HAMMARLUND MFG. CO., INC.

ANTENNA REQUIREMENTS

The input of the Series 200 "Super-Pro" is approximately 112 ohms. This means that for best results, the antenna should be coupled to the receiver by means of a low impedance transmission line. The doublet type antenna produces best results. Any well-known low impedance lead-in cable can be used with satisfaction. The use of low impedance lead-ins provides less chance for the lead-in itself to pick up extraneous noises. The low impedance lead-in, together with the electrostatic shield built into the antenna coil of the receiver, reduces noise to a minimum. It must be remembered that every antenna has a period of resonance and works best at that frequency. When erecting a doublet antenna, it is advisable to arrange its physical dimensions so that it will resonate in the band of frequencies where most sensitivity is desired. Care taken in designing and erecting an antenna will pay for itself many times in superior results.

DESIGN

The general design of the new "Super-Pro" embraces over five years of extensive research and experimentation. Individual components in the majority of cases have been specially designed for this receiver. The tuning inductors contained in the tuning unit are individually wound on low-loss forms. There are 20 in this group. Each coil has its own form and is mounted on an Isolantite base. This base also accommodates the variable trimming capacitor. All oscillator trimmers are of the air dielectric type and add considerably to the overall stability of the receiver. High stability mica trimmers are employed in the R.F. circuits.

The band change switch is especially designed for the "Super-Pro" and is unlike any other switch used for this purpose. The cam-operated knives contact stationary fingers and complete the circuit. Thus, no moving part carries current to cause noise or stray coupling. All contacts are silver-plated and will provide years of reliable service. The contacts are designed and placed so that the capacity between them is reduced to a negligible amount. This eliminates frequency drift due to change in dielectric constant during temperature rise. The I.F. transformers in the "Super-Pro" are designed particularly for this receiver. Each coil is wound on an Isolantite form and the coupling between them is mechanically variable to provide control of selectivity. Air dielectric trimmers are employed for maximum stability. Each grid coil in the I.F. unit is tapped near the low potential end so that changes in tubes will not affect the alignment of the receiver. This method also permits the use of a large number of stages operating at relatively low gain in order to obtain a maximum degree of selectivity without instability that might exist with a small number of stages operating at maximum gain.

SUPER-PRO MODELS AND PRICES

| Code | Type | Tuning Range | Speaker | List Price |
|------------|--|-----------------|--------------------------|------------|
| SP-210-X | Crystal | 15-560 Meters | Jensen 10" Dynamic | \$465.00 |
| SPR-210-X | Crystal Rack | 15-560 Meters | Jensen 10" Dynamic | 482.50 |
| SP-220-X | Crystal | 15-560 Meters | Jensen 12" High Fidelity | 490.00 |
| SPR-220-X | Crystal Rack | 15-560 Meters | Jensen 12" High Fidelity | 507.50 |
| SP-210-SX | Crystal | 7½-240 Meters | Jensen 10" Dynamic | 465.00 |
| SPR-210-SX | Crystal Rack | 7½-240 Meters | Jensen 10" Dynamic | 482.50 |
| SP-220-SX | Crystal | 7½-240 Meters | Jensen 12" High Fidelity | 490.00 |
| SPR-220-SX | Crystal Rack | 7½-240 Meters | Jensen 12" High Fidelity | 507.50 |
| SP-210-LX | Crystal | *15-2000 Meters | Jensen 10" Dynamic | 465.00 |
| SPR-210-LX | Crystal Rack | *15-2000 Meters | Jensen 10" Dynamic | 482.50 |
| SP-220-LX | Crystal | *15-2000 Meters | Jensen 12" High Fidelity | 490.00 |
| SPR-220-LX | Crystal Rack | *15-2000 Meters | Jensen 12" High Fidelity | 507.50 |
| PSC-10 | Speaker cabinet finished to match receiver | | | 8.50 |

Above prices cover 110-115-125 volt, 50 to 60 cycle models with tubes, crystal, and speaker. Receiver and power supply enclosed in wrinkle finished table type metal cabinets. Special models for 50-60 cycles with universal type power supply tapped for 115, 125, 140, 230, and 250 volts, also available at no increase in price. Twenty-five cycle models, \$20.00 additional.

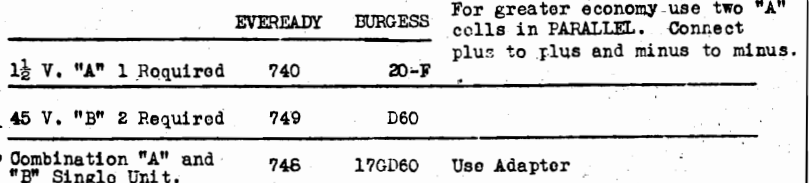
* In this model, the 1000 to 2000 meter band is substituted for the 60 to 120 meter band.

Receiver in cabinet measures 21½" wide, 15¼" deep, and 12½" high. Power supply in cabinet measures 13" wide, 7½" deep, and 8½" high. Rack models fit standard 19" relay racks. Shipping weight approximately 110 pounds.

(Prices subject to change without notice)

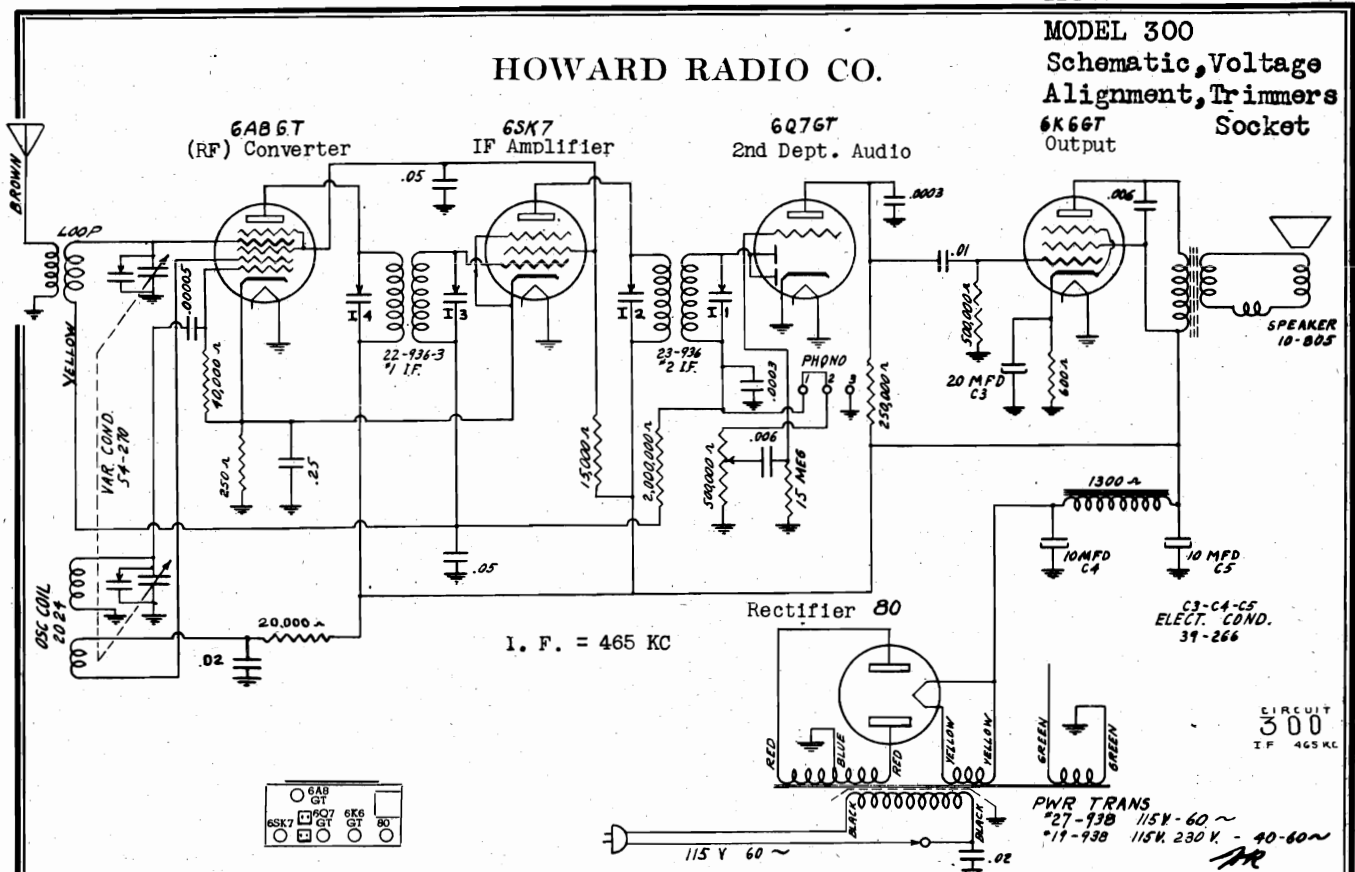
"SUPER-PRO" MODEL SP-200-SX PARTS LIST
(This parts list should be used to identify parts shown in the illustrations)

| Schematic Designation | DESCRIPTION—RECEIVER PARTS | Part No. |
|-----------------------|---|----------|
| A1 | Antenna Input Coil Assembly 10.0 to 20.0 m.c. | SA-46 |
| A2 | Antenna Output Coil Assembly 10.0 to 20.0 m.c. | SA-110 |
| B1 | Antenna Input Coil Assembly 5.0 to 10.0 m.c. | SA-47 |
| B2 | Antenna Output Coil Assembly 5.0 to 10.0 m.c. | SA-113 |
| C1 | Antenna Input Coil Assembly 20.0 to 40.0 m.c. | SA-46 |
| C2 | Antenna Output Coil Assembly 20.0 to 40.0 m.c. | SA-130 |
| D1 | Antenna Input Coil Assembly 2.5 to 5.0 m.c. | SA-48 |
| D2 | Antenna Output Coil Assembly 2.5 to 5.0 m.c. | SA-116 |
| E1 | Antenna Input Coil Assembly 1250 to 2500 k.c. | SA-49 |
| E2 | Antenna Output Coil Assembly 1250 to 2500 k.c. | SA-136 |
| F | 1st R.F. Coil Assembly 10.0 to 20.0 m.c. | SA-111 |
| G | 1st R.F. Coil Assembly 5.0 to 10.0 m.c. | SA-114 |
| H | 1st R.F. Coil Assembly 20.0 to 40.0 m.c. | SA-131 |
| J | 1st R.F. Coil Assembly 2.5 to 5.0 m.c. | SA-117 |
| K | 1st R.F. Coil Assembly 1250 to 1160 k.c. | SA-137 |
| L | 2nd R.F. Coil Assembly 10.0 to 20.0 m.c. | SA-111 |
| M | 2nd R.F. Coil Assembly 5.0 to 10.0 m.c. | SA-114 |
| N | 2nd R.F. Coil Assembly 20.0 to 40.0 m.c. | SA-131 |
| P | 2nd R.F. Coil Assembly 2.5 to 5.0 m.c. | SA-117 |
| R | 2nd R.F. Coil Assembly 1250 to 2500 k.c. | SA-137 |
| S | High Frequency Osc. Coil Assembly 10.0 to 20.0 m.c. | SA-112 |
| T | High Frequency Osc. Coil Assembly 5.0 to 10.0 m.c. | SA-115 |
| W | High Frequency Osc. Coil Assembly 20.0 to 40.0 m.c. | SA-132 |
| X | High Frequency Osc. Coil Assembly 2.5 to 5.0 m.c. | SA-118 |
| Y | High Frequency Osc. Coil Assembly 1250 to 2500 k.c. | SA-138 |
| T-1 | Crystal filter assembly (465 kc.) | SA-178 |
| T-2, T-3 | 1st and 2nd, I.F. Transformer Coil Assembly | SA-166 |
| T-4 | Detector plate coil assembly | SA-167 |
| T-5 | Beat oscillator coil assembly | SA-169 |
| T-6 | A.V.C. Plate coil assembly | SA-168 |
| T-7 | Push-Pull Input Transformer | 4827 |
| T-8 | Push-Pull Output Transformer | 4828 |
| 2-12-22-106 | Antenna terminal strip | 3842 |
| 28 | Capacitor Fixed Mica type 600 mmf. | 6073 |
| 34 | Capacitor Fixed Silver type 95 mmf. | 6195 |
| 77 | Capacitor Fixed Silver type 50 mmf. | 6074 |
| 9-19-69 | Capacitor Fixed Mica type 50 mmf. | 6199 |
| 4-14-24 | Capacitor Fixed Tubular type .02 mf. 500 V. | 6176 |
| 7-17-30-36 | Capacitor Fixed Tubular type .01 mf. 500 V. | 6175 |
| 43-46-48-51 | Capacitor Fixed Tubular type .05 mf. 500 V. | 6174 |
| 56-58-61-63 | Capacitor Fixed Tubular type .25 mf. 400 V. | 3820 |
| 73-85-92 | Capacitor Dry Electrolytic 40 mf. 150 V. | 6171 |
| 40-101-102 | Resistor 4 ohms wire wound 5 watt | 4921 |
| 88 | Resistor 750 ohms wire wound 10 watt | 3836 |
| 89 | Resistor 300 ohms metallized ½ watt | 6169 |
| 96 | Resistor 1,700 ohms metallized ½ watt | 4947 |
| 98 | Resistor 2,000 ohms metallized ½ watt | 6160 |
| 10-20-44 | Resistor 3,000 ohms metallized 1 watt | 3809 |
| 6-47-49 | Resistor 5,000 ohms metallized ½ watt | 4814 |
| 57-59-16 | Resistor 10,000 ohms metallized ½ watt | 6165 |
| 86 | Resistor 12,000 ohms metallized 2 watt | 4840 |
| 5-15-25 | Resistor 25,000 ohms metallized 2 watt | 3999 |
| 50-60 | Resistor 50,000 ohms metallized ½ watt | 6075 |
| 37 | Resistor 50,000 ohms metallized 1 watt | 6166 |
| 29 | Resistor 75,000 ohms metallized ½ watt | 4914 |
| 35-26 | Resistor 250,000 ohms metallized ½ watt | 4912 |
| 66-84 | Resistor 500,000 ohms metallized ½ watt | 6076 |
| 64-72-93 | Resistor 2,000,000 ohms metallized ½ watt | 4920 |
| 65 | Tube socket 6K7 | 4922 |
| 3-13-23 | Tube socket 6SK7 | 4923 |
| 70-74-83 | Tube socket 6H6 | 6111 |
| 53 | Tube socket 6N7 | 4924 |
| 8-18-45 | Tube socket 6SJ7 | 4925 |
| 55-62-91 | Tube socket 6CS | 4926 |
| 76-95 | Tube socket 6F6 | 6108 |
| 79 | Tube socket 6L7 | 4927 |
| 81 | Tube socket 6J7 | 4928 |
| 75-87-90 | Dial lamps 6.3 volt .15 amp. | 3920 |
| 27 | Meter lamp 6.3 volt .15 amp. Bayonet type | 6036 |
| 42 | Tuning meter | 4903 |
| 32-33 | Off-on Switch | 2983 |
| 38 | A.V.C.-MANUAL and SPEAKER-PHONES Switch | 2990 |
| 94 | C.W.-MOD Switch | 4915 |
| 100 | Send-Receive Switch | 4917 |
| 52-103 | Limiter switch | 4916 |
| 41 | Sensitivity control 50,000 ohm | 4918 |
| 67 | Audio Gain Control 250,000 ohm | 4919 |
| 54 | Relay terminal strip | 4904 |
| 68 | Phono-Speaker-Phones terminal strip | 3838 |
| 39 | Connecting terminal strip | 4932 |
| 104 | Meter adjusting potentiometer 1,000 W wire wound | 4801 |
| 105 | Power transformer 110 volts 60 cycle A.C. | 2981 |
| 110 | Filter choke | 3900 |
| 1 | A.C. input Cord and Plug | 3859 |
| 2 | Fuse Block for 2A. fuse | 3858 |
| 3 | Line Voltage Adjusting Strip | 3840 |
| 4 | Speaker Field Terminal Strip | 3838 |
| 5 | Connecting Terminal Strip | 3832 |
| 6 | Filter Condenser 16 mfd. electrolytic 450 volts | 3834 |
| 7 | Filter Condenser 8-8.8 mfd. electrolytic 450 volts | 3997 |
| 8-9-10 | Resistor 18,000 ohms (2 taps) | 4946 |
| 11 | Resistor 18,000 ohms (1 tap) | 4837 |
| 12 | Tube socket 80 | 3828 |
| 13 | Tube socket 5Z3 | 4945 |
| 14 | 1 mf. paper filter condenser | |



HOWARD RADIO CO.

MODEL 300
Schematic, Voltage
Alignment, Trimmers
6K6GT Socket
Output



POWER SUPPLY - (Standard Models) = AC 105-120 V. 60 Cycles

CONSUMPTION 50 WATTS

POWER OUTPUT - (MAX.) = 2.7 W.

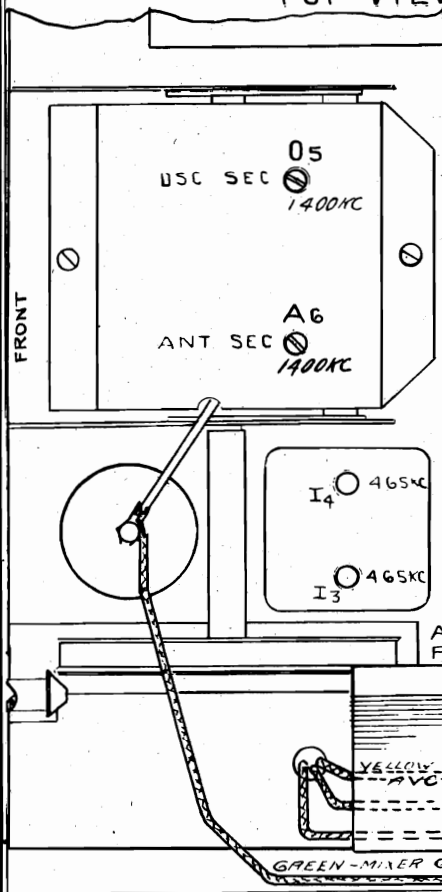
$$u_{po} = 1.5 \text{ W.}$$

SPEAKER = Electrodynamic SIZE = 5"

$$V.C.I.M.P. (400CPS) = 4 \text{ Ohms}$$

FIELD = 1300 Ohms

TOP VIEW



ALIGNMENT PROCEDURE

| Wave-Band Switch Position | Position of Dial Pointer | Generator Frequency | Generator Connection | See Note | Trimmers Adjusted (In order shown) | Trimmer Function |
|---------------------------------|-----------------------------|------------------------|-------------------------|-------------|---|---------------------|
| X | Min. Cap. | 465 KC | 6AS Grid | A, E | I ₁ I ₂ I ₃ I ₄ | IF |
| X | 1400 KC | 1400 KC | Brown lead | D | O ₅ A ₆ | Osc. & Ant. |
| X | 600 KC | 600 KC | Brown lead | | OUT PLATE | OSC. SECTION |

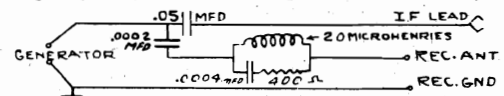
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.



SOCKET VOLTAGE READINGS

Voltage taken from ground with line voltage at - 117 AC.

High voltage reading off rectifier = 275 V.

Drop across speaker field = 75 V.

Voltage taken with 1,000 Ohm per volt meter -

| TUBE | FUNCTION | CATH. ODE. | SCR. GRID | PLATE |
|------|----------|------------|-----------|-------|
| 6AB6 | Mixer | 4.5 | 105 | 195 |
| 6SK7 | IF | 4.5 | 105 | 195 |
| 6Q7 | Det. | x | x | 60 |
| 6X6 | Output | 16 | 195 | 185 |

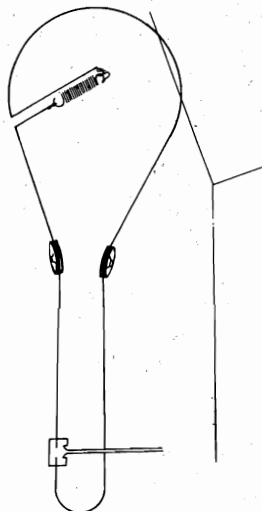
HOWARD RADIO CO.

MODEL 300 Series
MODEL 500 Series
Dial and Tuner Data

Dial Mechanism 300 Series

THE TUNING CONTROL

To provide smooth push button tuning with a minimum amount of effort the tuning shaft has a spring return which disengages the rubber friction drive from the large drive pulley after the tuning knob has been held down while tuning the set manually. There is no adjustment required on this mechanism.



THE ABOVE DIAGRAM SHOWS THE EXACT DRIVE CORD ARRANGEMENT IN CASE A REPLACEMENT IS REQUIRED. THE LAYOUT IS SHOWN WITH THE VARIABLE CONDENSER ALL THE WAY IN AT MAXIMUM CAPACITY AND THE TUNING HAND AT THE LAST LINE ABOVE 550.

The drive string running from one pulley across the dial plate to the other pulley may be slightly higher at its point of mounting to the tuning hand, this will maintain a slight downward pull on the hand to avoid wobble. Another cause of wobble would be caused by crimping the lugs of hand around the string in such a manner that the string would be out of line.

A slight amount of petroleum jelly along the top edge of the dial will provide a smoother travel of the hand. Arrange the long section of the hand straight and with sufficient clearance from the dial plate face to avoid scratching the numerals.

THE STRING TENSION of the drive string is maintained by the coil spring mounted on the large drive pulley. Too much tension will cause an extra load in tuning. Lack of tension will naturally cause backlash.

See that dial light sockets do not touch top edge of tuning hand as it moves across dial plate. Since the pull against the large pulley is quite great, see that the set screws in the pulley hub to the condenser shaft are tight to avoid slipping.

THE PUSH BUTTONS must extend straight outward. If a chassis is removed, see that the push-button screw shanks are not bent so as to bind against the openings in the cabinet panel.

500 Series Dial Mechanism

FIG. 1. SHOWS THE DIAL DRIVE MECHANISM IN ITS NORMAL STATIONARY POSITION ENGAGED FOR MANUAL TUNING. THE CORK ASSEMBLY C IS FRICITIONED AGAINST THE FACE OF STRING PULLEY P, DUE TO PRESSURE OF COIL SPRING S. THE PUSH BUTTON IS NOT PRESSED IN, LEAVING A SMALL GAP BETWEEN THE BRASS EYELET AND THE FLIP BAR.

FIG. 2. SHOWS THE RELEASE MECHANISM AT THE VERY START OF WHICH THE EYELET OVERCAME THE FLIP BAR, CAUSING THE RELEASE ARM TO FORCE THE COIL SPRING TENSION AND PULLEY P TO POINT CLUTCH AWAY FROM THE STRING PULLEY FACE. POINT CLUTCH ACTION TAKES PLACE BEFORE THE VARIABLE CONDENSER.

THE OBJECT OF THE ABOVE MECHANISM OF COURSE IS TO ELIMINATE THE PRESSURE THAT OTHERWISE WOULD BE REQUIRED IF THE MANUAL TUNING CONTROL HAD TO BE SPUN AROUND WHEN USING THE PUSH BUTTONS. THE SCREW ADJUSTMENT R, FIG. 1, WILL PROVIDE THE PROPER AMOUNT OF CLUTCH RELEASE CLEARANCE AT G, FIG. 2.

THE STRING TENSION of the drive cord is maintained by the coil spring on the large drive pulley FIG. 4.

THE PUSH BUTTONS must extend straight outward, before a chassis is mounted in the cabinet, see that the push-button screw shanks are not bent so as to bind against the escutcheon holes.

THE DRIVE BELT tension is very easily obtained between the tuning shaft and the pulley by raising or lowering the frame when the two screws B, B (FIG. 3) are loosened. Do not get the belt too tight. The belt runs directly on the tuning shaft, the rubber grommet on the shaft is merely acting as a guide.

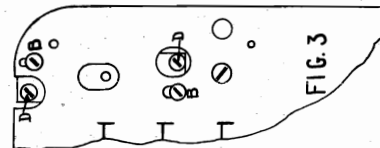
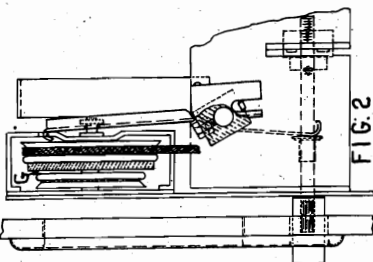
TO REPLACE THE DRIVE BELT (1) remove screws B, B and D from frame, permitting it to be disassembled (2) loosen set screws holding leading wire on tuning set. This will allow the belt to be pulled out to loop the belt in the replacement of the cork clutch is also accomplished by removing screws B, B and D. THE TUNING HAND should be set to the end calibration line above 550 KC when the condenser is at maximum capacity.

The drive string running from one pulley across the dial plate to the other pulley will be higher at the point of mounting on the tuning hand, this will maintain a slight downward pull on the tuning hand which will prevent wobble. Another cause of wobble would be in crimping the lugs around the string causing the string to be out of line.

A slight amount of petroleum jelly along the top edge of the dial plate is beneficial. Arrange the long section of the hand so it will not scratch the dial numbers.

See that dial light sockets do not touch top edge of tuning hand as it moves across dial plate. Since the pull against the large pulley is quite great, see that the set screws in the pulley hub to the condenser shaft are tight to avoid slipping.

THE PUSH BUTTONS must extend straight outward. If a chassis is removed, see that the push-button screw shanks are not bent so as to bind against the openings in the cabinet panel.



(Four stations for Series 300)

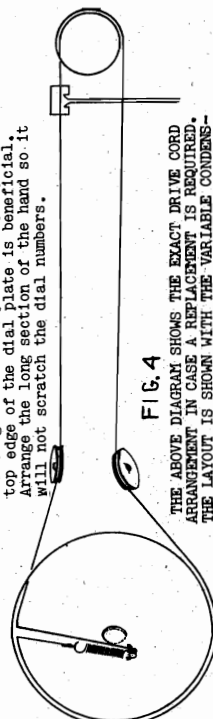


FIG. 4

THE ABOVE DIAGRAM SHOWS THE EXACT DRIVE CORD ARRANGEMENT IN CASE A REPLACEMENT IS REQUIRED. THE LAYOUT IS SHOWN WITH THE VARIABLE CONDENSER ALL THE WAY IN AT MAXIMUM CAPACITY AND THE TUNING HAND AT THE LAST LINE ABOVE 550.

(Four stations for 300 Series)

SETTING-UP THE PUSH BUTTONS

300 Series 500 Series

at least 15 minutes before making settings.

2. Decide upon the six stations that you want to tune in automatically.

It is preferable to set the lower frequency stations, starting with the button on the right.

3. Tune the station with the regular tuning knob, making certain the station is EXACTLY IN TUNE, then with the fingers loosen the push button with a twist to the left of about one-half turn, now push the button ALL THE WAY IN.

4. Carefully release button and tighten it with a twist to the right.

5. Repeat above procedure for the other five buttons for five other stations and insert station letter tab in position for each button.

THE PUSH BUTTONS WILL ONLY OPERATE CORRECTLY WHEN THEY ARE OPERATED WITH A FIRM, QUICK THRUST, KEEPING FINGER ON BUTTON UNTIL DIAL POINTER COMES TO A STOP.

MODEL 301APC MODEL 518APC
 MODEL 302APC MODEL 520APC
 MODEL 308APC MODEL 580APC

HOWARD RADIO CO.

Automatic Phono.Data

INSTALLATION AND OPERATING INSTRUCTIONS AUTOMATIC PHONOGRAPH COMBINATION

INSTALLATION

PREPARING FOR OPERATION - Remove the bracket "A" securing the pickup and needle mechanism. This bracket is shown in place in Figure 1. It is held to the motorboard by means of a screw "B". Remove the screw, lift off the bracket and replace screw in motorboard to cover hole. Then remove red bolts "C" and "D" which hold the motorboard secure during shipment. These are also shown in Figure 1. When these bolts are removed it will allow the wood strips to be taken out. "E" and "F".

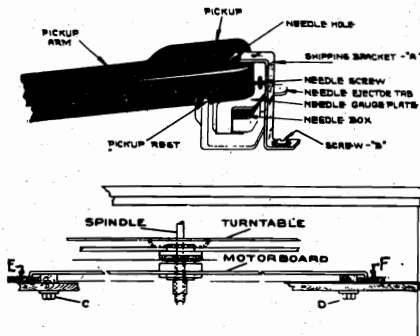


Figure 1 - Unpacking

The two record holder posts (See Figure 6) are covered with paper held in place by rubber bands as is also the pickup. Remove these paper coverings.

THE SCREWS THAT HOLD THE RADIO CHASSIS ARE LOOSENEED JUST ENOUGH TO ALLOW THE WOOD STRIPS (USED IN SHIPMENT) TO BE REMOVED. CAUTION: ONLY A SMALL AMOUNT OF TURNING OF THE WING SCREWS IS NECESSARY. IF THEY ARE TOO LOOSE THE CHASSIS WILL DROP OUT OF POSITION AND THE PUSH BUTTONS WILL NOT OPERATE PROPERLY.

LOCATION: The instrument should be located near an electric outlet and on a level surface. The cabinet should not be located near a source of heat such as a radiator or register. If the cabinet is placed parallel to a wall, at least an inch space should exist between the back of the cabinet and the wall, for best tone quality. The instrument must be installed in a level position for proper operation of the phonograph.

POWER SUPPLY: Unless otherwise specified on the chassis and on the power transformer, the standard receiver is to be operated from an alternating current only - (105 to 120 Volts, 60 cycle).

SPEED REGULATION: There are no adjustments on the Phonograph Motor for speed regulation since the design of the motor is for a constant speed, similar to an electric clock. Be certain that the power line frequency is the same as specified on the motor frame, the standard models being 60 cycle.

PHONOGRAPH INSTRUCTIONS

CAUTIONS - 1. NEVER USE FORCE TO START OR STOP THE MOTION OF ANY PART OF THE RECORD-CHANGING MECHANISM OR PICKUP ARM.
 2. THE USE OF RECORDS WHICH HAVE BECOME WARPED OR DAMAGED THROUGH IMPROPER CARE MAY CAUSE THE MECHANISM TO JAM AND DAMAGE THE INSTRUMENT. IN ADDITION, RECORDS WHICH HAVE BECOME WARPED WILL SLIDE ON ONE ANOTHER WHEN PLAYING, RESULTING IN UNSATISFACTORY REPRODUCTION.

3. THIS INSTRUMENT IS NOT RECOMMENDED FOR PLAYING 10-INCH AND 12-INCH RECORDS IN MIXED SEQUENCE. IF THE USER DESIRES THIS SERVICE HE MUST BE POSITIVE THAT ALL RECORDS ARE PERFECTLY FLAT AND FREE FROM WARP. THE INDEX AND RECORD REJECT LEVER MUST BE SET AT "10" AND AFTER PLAYING THE LAST SELECTION THE PICKUP WILL COME DOWN IN POSITION FOR A 10-INCH RECORD AND REPEAT THE PLAYING OF THIS LAST RECORD ON A 10-INCH DIAMETER UNLESS THE TURNABLE SWITCH IS TURNED OFF. ANY JAMMING OF THE MECHANISM UNDER THESE CONDITIONS INDICATES THAT THE RECORDS USED ARE NOT PERFECTLY FLAT OR THAT THEIR EDGES ARE NOT SUFFICIENTLY SMOOTH TO PERMIT NORMAL OPERATION OF THE SEPARATORS IN DROPPING EACH RECORD IN SEQUENCE ONTO THE TURNABLE.

4. DO NOT LEAVE RECORDS ON THE RECORD HOLDER POSTS, AS THEY ARE LIABLE TO WARP. KEEP YOUR RECORDS IN A RECORD FILE (ALBUM OF CABINET) WHEN NOT IN USE. IF ANY RECORDS SHOULD BECOME WARPED, PLACE THEM ON A FLAT SURFACE WITH A FLAT HEAVY ARTICLE, SUCH AS A LARGE BOOK, ON TOP AND LEAVE THEM IN THIS POSITION FOR A FEW DAYS.

ONLY LOAD YOUR RECORDS ON THE RECORD HOLDER SHELVES AFTER THE PICKUP IS IN ITS REST POSITION AND THE TURNABLE STOPPED WITH TURNABLE SWITCH AT "OFF".

TURNABLE SWITCH: The Turntable Switch is a toggle type located in the front of the index plate on the motorboard (See Figure 6). It is used to start and stop the motor.

INDEX LEVER: The Index Lever moves in a small arc in the slot in the index plate. (See Figure 6). The plate is labeled for four positions of the lever - "Manual", "12", "10" and "Reject". If a single record is to be played the automatic record-changing feature will not be used and the Index Lever should be set to the "Manual" position.

If either 10 or 12-inch records are to be played automatically the index lever must be moved to the position indicating the size records that are to be played. If 10-inch records are to be played, or 10 and 12 inch mixed, the Index Lever must be set at "10" and if 12-inch records are to be played, the lever must be set at "12". To reject a record being played, or to start the record-changing cycle in case the record just played does not have the standard eccentric or spiral changing groove simply push the lever to the "REJECT" position and let go. The pickup will raise up and swing outwards and the next record will drop down. Upon releasing the lever, it will automatically return to the "10" position. If you are playing a series of 12-inch records, the lever should be returned to the "12" position after rejecting a record. Keep the lever in its "MANUAL" position when not actually playing records automatically.

Before operating the phonograph, either automatically or manually, be sure that the Pickup Arm is down at playing level and can be easily moved by hand. If not, the Index Lever will be in "10" or "12" and an "eject cycle" must be completed to bring the arm down. To do this, turn the Power switch on the radio panel to "ON" position, then throw the turntable switch "ON". The turntable will start to revolve and the cycle of motion of the pickup arm will be resumed. When the Pickup Arm comes down, turn off the turntable switch.

TO OPERATE THE PHONOGRAPH: To play records, set the radio Power switch to the "ON" position. With the Index Lever at Manual and the pickup resting on the support over the needle gauge plate, arm in groove, loosen the needle screw and drop a needle, point first, through the needle hole in the pickup. (See Figures 1 and 6). The needle will be stopped in the right position by the needle gauge plate. Press gently on top of pickup to seat it squarely on the gauge plate. Then tighten the needle screw with your fingers.

Lift the Record Holder shelves, Figure 6, with the fingers underneath and revolve to clear the record circle, also push back the lever sticking up adjacent to the rear record holder post. You now have clear access to the turntable. Place the first record upon the turntable with the spindle protruding through the center of the record.

Swing the shelves back into position down in place and load up. For automatic operation seven 10-inch records or six 12-inch records may be stacked on the record holder shelves.

It is not recommended to mix 10 and 12 inch records for automatic operation. Records should never be stacked higher than the spindle.

STEP BY STEP PROCEDURE FOR OPERATING PHONOGRAPH

A. TO PLAY 10" OR 12" RECORDS INDIVIDUALLY:

1. Move Index Lever to "Manual" position. See Figure 6.
2. Make sure the pickup arm is resting in its groove with pickup over used needle box. See Figures 1 and 6.
3. Lift the record holder shelves and swing outwards. See Figure 6.
4. Push back the vertical lever near the rear record holder post.
5. Place single record on turntable.
6. Turn power on at receiver, and switch to "Phono" position.
7. Turn on turntable switch. See Figure 6. The turntable will start revolving. Wait till it has reached its normal speed.
8. Lift pickup arm and carefully place needle in first groove of record.
9. Adjust "Volume" and "Tone" as for radio. The same controls are used.

The phonograph will not shut off until the turntable switch (Figure 6) or the Receiver switch is turned off.

To repeat the selection on records with the center changing groove, set index lever to the "10" or "12" position depending upon which size record is being played.

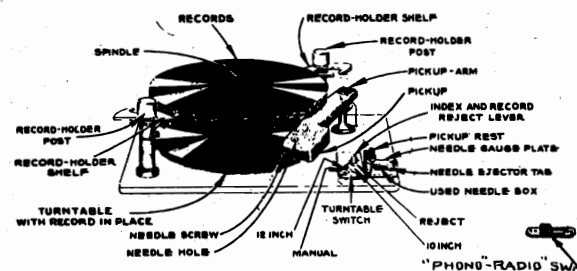


Figure 6

MODEL 210A
Push-Button Adapter
Schematic

HOWARD RADIO CO.

MODEL 301APC MODEL 518APC
MODEL 302APC MODEL 520APC
MODEL 308APC MODEL 580APC

Automatic Phono Data

B. TO PLAY 10" OR 12" RECORDS SO THAT RECORDS WILL CHANGE AUTOMATICALLY AFTER EACH SELECTION.

1. Move index lever to "Manual" position. Fig. 6.
2. Make sure the pickup arm is resting in groove with pickup over reject needle cup. Figs. 1 and 6.
3. Place first record on turntable as for individual playing.
4. Swing the record holder shelves inward into place down on their posts and extending over the turntable. Fig. 6.
5. Stack any amount up to seven 10-inch records on the record holder shelves.
6. Turn power on at receiver, and switch to "Phono" position.
7. Turn on turntable switch. Fig. 6.
8. With index lever still in the "Manual" position lift pickup arm and lower to first groove of record.
9. Move index lever to 10 or 12 inch position depending on the size records being played.
10. Adjust volume and tone as for radio.

Records with the center changing groove will change automatically at the end of each selection until the end of the last record is reached. The last record will repeat itself until the Turntable Switch or Power-Tone control is turned off. To bring down another record at any time during playing of series, push the index lever, (Fig. 6) to "Reject" and let go. Bring back to "12" if you are playing 12-inch records.

CAUTION: DO NOT STOP THE TURNTABLE WITH TURNTABLE SWITCH OR POWER-TONE KNOB UNTIL THE PICKUP IS DOWN AT THE END OF A CYCLE. TO CHANGE NEEDLE: To change needle, place the pickup over the Needle Gauge Plate, with the pickup arm resting in the support groove, loosen the Needle Screw, press down the Needle Ejector Tab to drop the needle into the Used Needle Box (Figs. 1 and 6). Allow the gauge plate to return to its normal position. Drop a new needle point first, into the needle hole, press gently on pickup to seat it squarely on gauge plate and tighten the needle screw with your fingers.

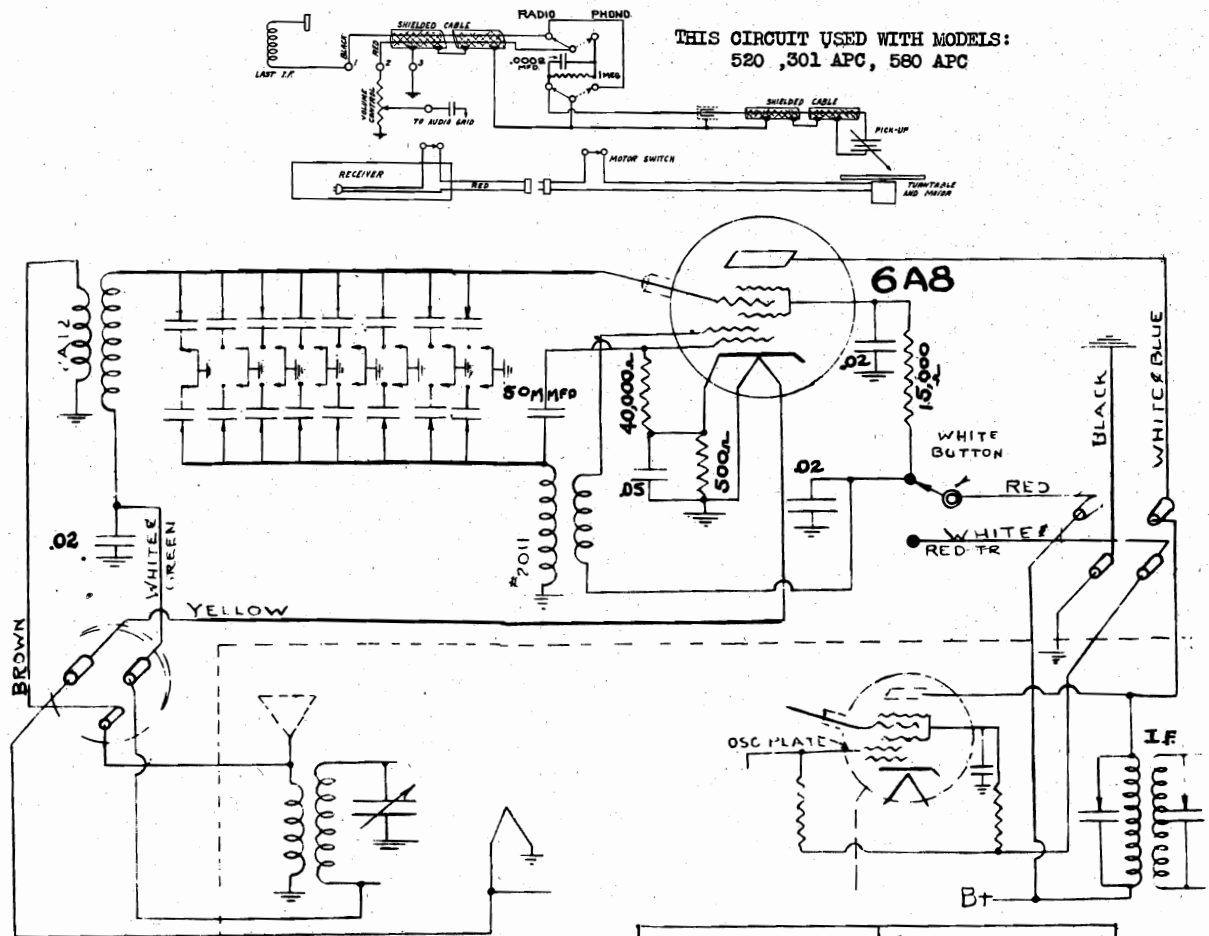
NEEDLES: Good needles are essential to best reproduction. It is advisable to use medium-tone needles and these may be purchased from your Retail Store. Do not reinsert a used needle in the pickup. Change your needles frequently, worn needles distort reproduction and may damage the records. A rack for holding needle books will be found at the back of the compartment under the lid. To empty used needles from the needle box, lift the pickup and move to left out of the way, then tilt up used needle box at front and lift out of its hole in the motorboard. Press the ejector tab to open the lid; to replace, slide the lug on the back into its groove in the motor board and press the box into plate.

RECORDS: Handle your phonograph records carefully. It is advisable to purchase your records from The Retail Store where you may have them played over on an instrument of this type. Keep your records in a record album or lay them flat when not in use. Never leave them on the Record-Holder shelves. Electrically transcribed records are best. Worn or poorly transcribed records result in distortion. Records with the eccentric or spiral center groove are necessary for automatic operation, either change or repeat.

LUBRICATION: Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gear of record posts. Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers on underside of motorboard.

Apply a few drops of light machine oil to the motor spindle bearing. The oil hole has a screw plug. Do not allow oil or grease to come in contact with rubber mounting of tone arm base, rubber bumper, or rubber spindle cap.

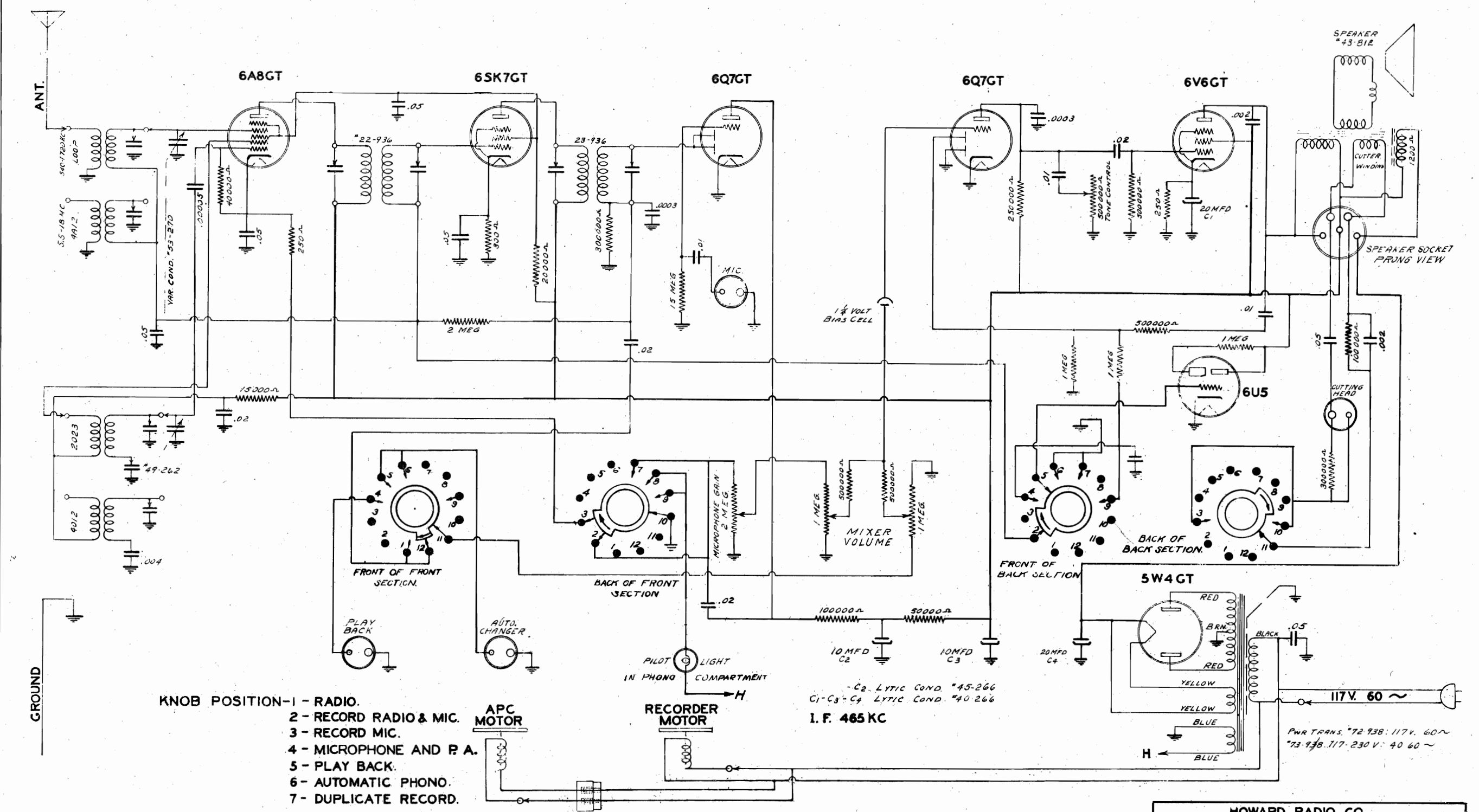
FOR SERVICE REFERENCE THE FUNDAMENTAL RADIO-PHONOGRAPH ELECTRICAL CIRCUIT IS SHOWN BELOW.



| | | |
|-----------|----------|----------------------------|
| DRWG. NO. | D41-715 | ADAPTER |
| MODEL | 210A | WITH SWITCH IN SG. CIRCUIT |
| DATE | 11-21-37 | |

HOWARD RADIO CO.

MODELS 302R(RA), 302RT
Schematic

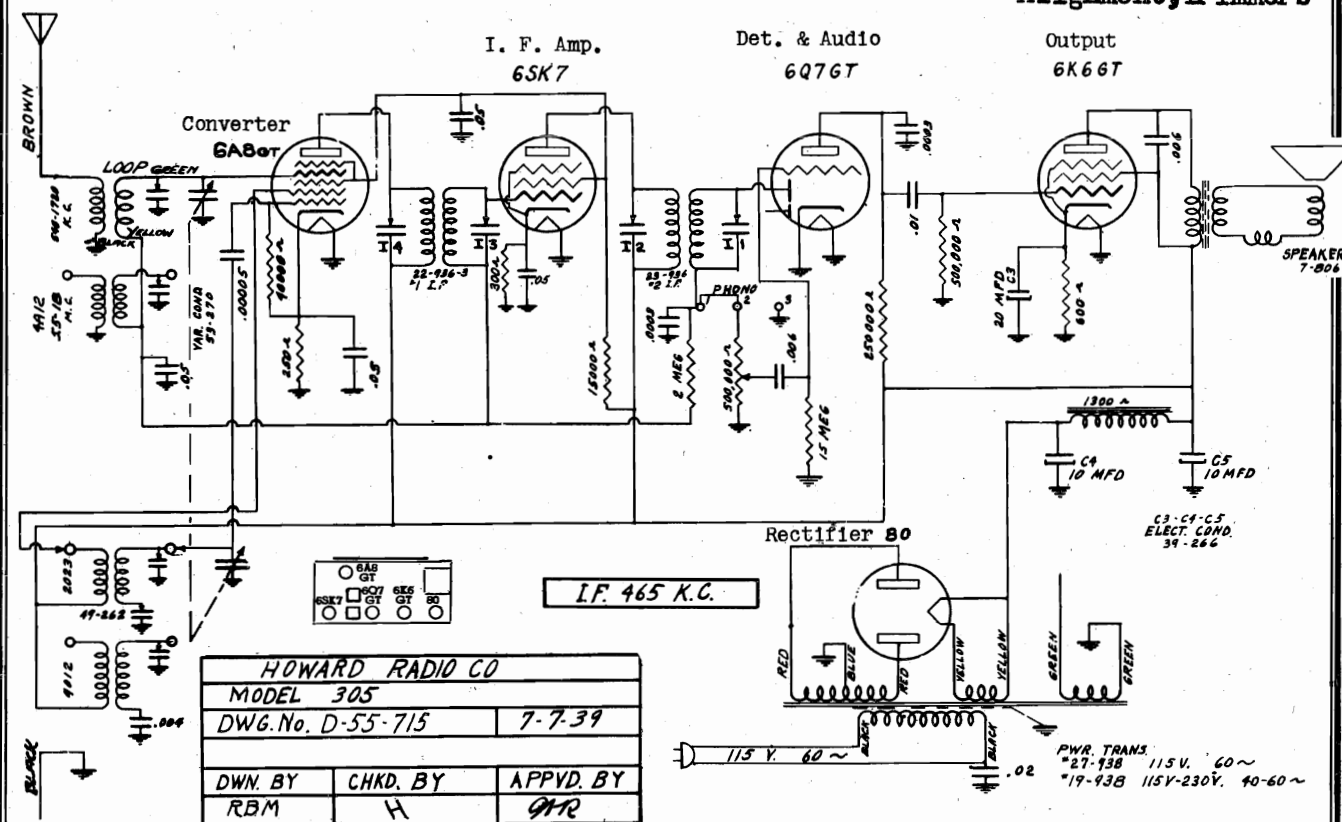


- KNOB POSITION-1 - RADIO.
2 - RECORD RADIO & MIC.
3 - RECORD MIC.
4 - MICROPHONE AND P. A.
5 - PLAY BACK.
6 - AUTOMATIC PHONO.
7 - DUPLICATE RECORD.

| | |
|---------------------------|---------|
| HOWARD RADIO CO. | |
| MODEL 302 R. (RA), 302 RT | |
| DWG. NO. C71-715 | 2-21-40 |

HOWARD RADIO CO.

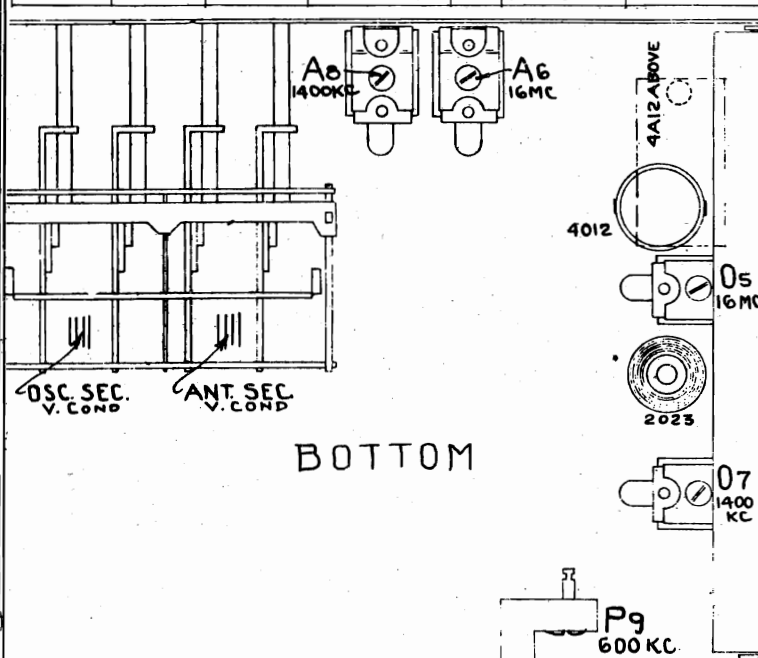
MODEL 305 Schematic, Voltage Alignment, Trimmers



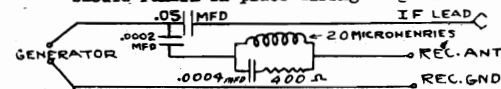
SPEAKER = Electro-dynamic SIZE = 6" V.C.I.M.P. (400 CPS) = 4 Ohms
POWER SUPPLY - (Standard Models) = 105-120 V. 60 Cycle CONSUMPTION 50 WATTS
POWER OUTPUT - (MAX.) = 2.7 W. up to 1.5W

ALIGNMENT PROCEDURE

| Wave-Band Switch Position | Position of Dial Pointer | Generator Frequency | Generator Connection | See Note | Trimmers Adjusted (In order shown) | Trimmer Function |
|---------------------------|--------------------------|---------------------|----------------------|-------------------------------|---|------------------|
| BC | Min. Cap. | 465 KC | 6A8 Grid | A, E | I ₁ I ₂ I ₃ I ₄ | IF |
| SW | 16 MC | 16 MC | Brown lead | B, D | O ₅ A ₆ | Osc. Ant. |
| BC | 1400 KC | 1400 KC | Brown lead | O ₇ A ₈ | | Osc. Ant. |
| BC | 600 KC | 600 KC | Brown lead | C | P ₉ | Osc. Pad. |



NOTES
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.
B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.
C- When adjusting this pad, move the tuning hand back and forth and adjust pad until the peak of greatest intensity is obtained.
D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.
E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.

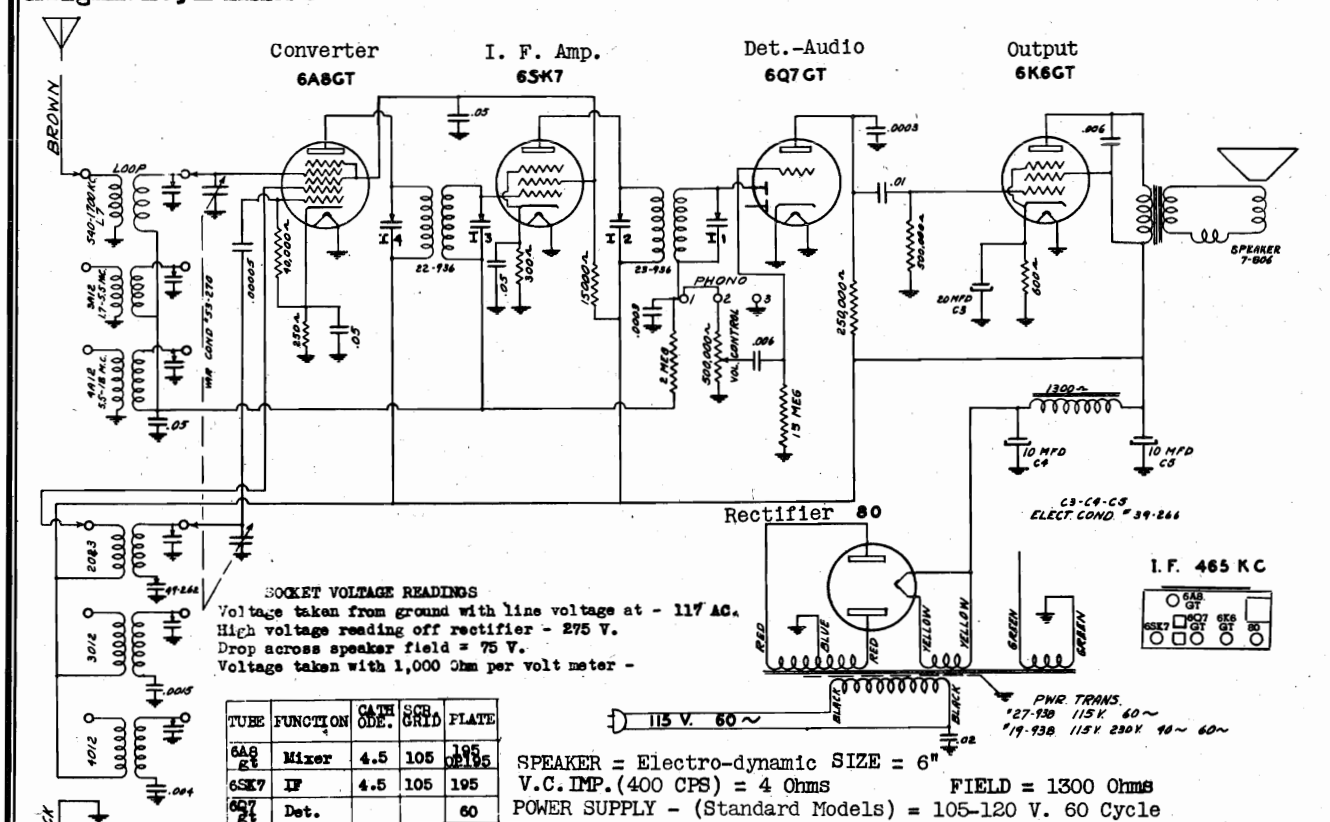


SOCKET VOLTAGE READINGS
Voltage taken from ground with line voltage at - 117 AC
High voltage reading off rectifier - 275 V.
Drop across speaker field = 75 V.
Voltage taken with 1,000 Ohm per volt meter -

| TUBE | FUNCTION | CATH. ODE. | GRD. | PLATE |
|---------|----------|------------|------|-------|
| 6A8 GT | Mixer | 4.5 | 105 | 195 |
| 6SK7 GT | IF | 4.5 | 105 | 195 |
| 6Q7 GT | Det. | | | 60 |
| 6K6 GT | Output | 16 | 195 | 185 |

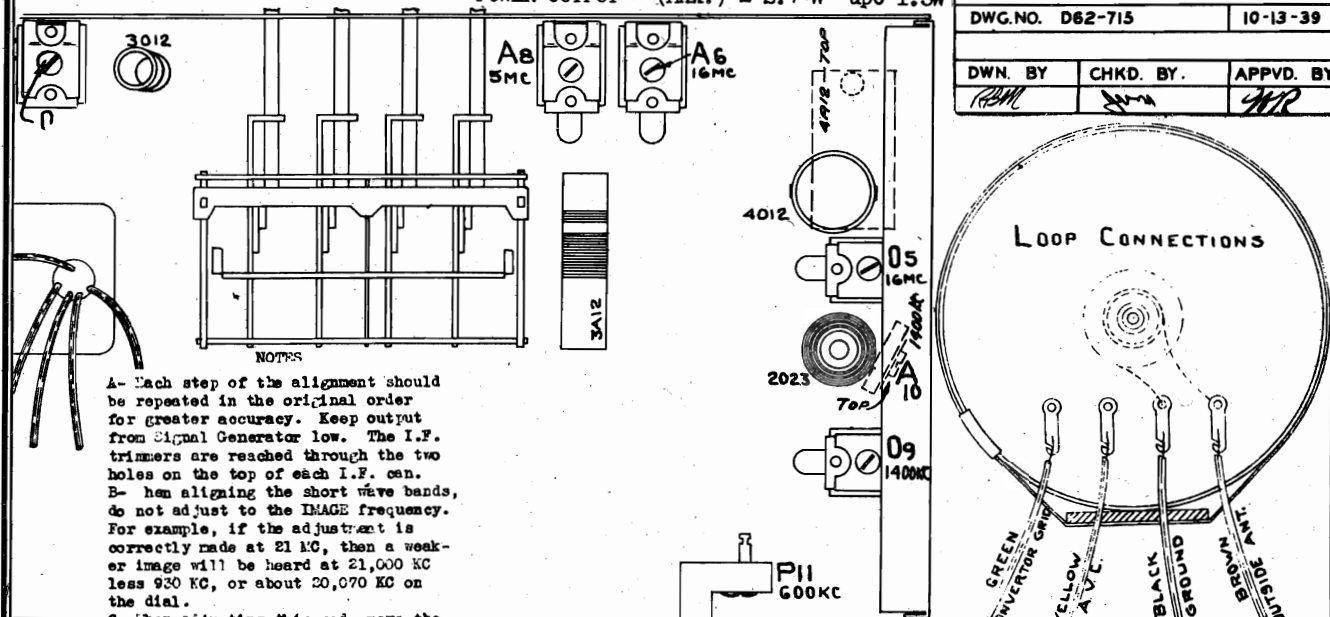
MODEL 306 Schematic, Voltage Alignment, Trimmers

HOWARD RADIO CO.

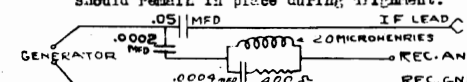


SOCKET VOLTAGE READINGS
Voltage taken from ground with line voltage at - 117 AC.
High voltage reading off rectifier - 275 V.
Drop across speaker field = 75 V.
Voltage taken with 1,000 Ohm per volt meter -

| TUBE | FUNCTION | CATH. ODE. | GRD. | PLATE |
|---------|----------|------------|------|-------|
| 6A8 GT | Mixer | 4.5 | 105 | 195 |
| 6SK7 GT | IF | 4.5 | 105 | 195 |
| 6Q7 GT | Det. | | | 60 |
| 6K6 GT | Output | 16 | 195 | 185 |



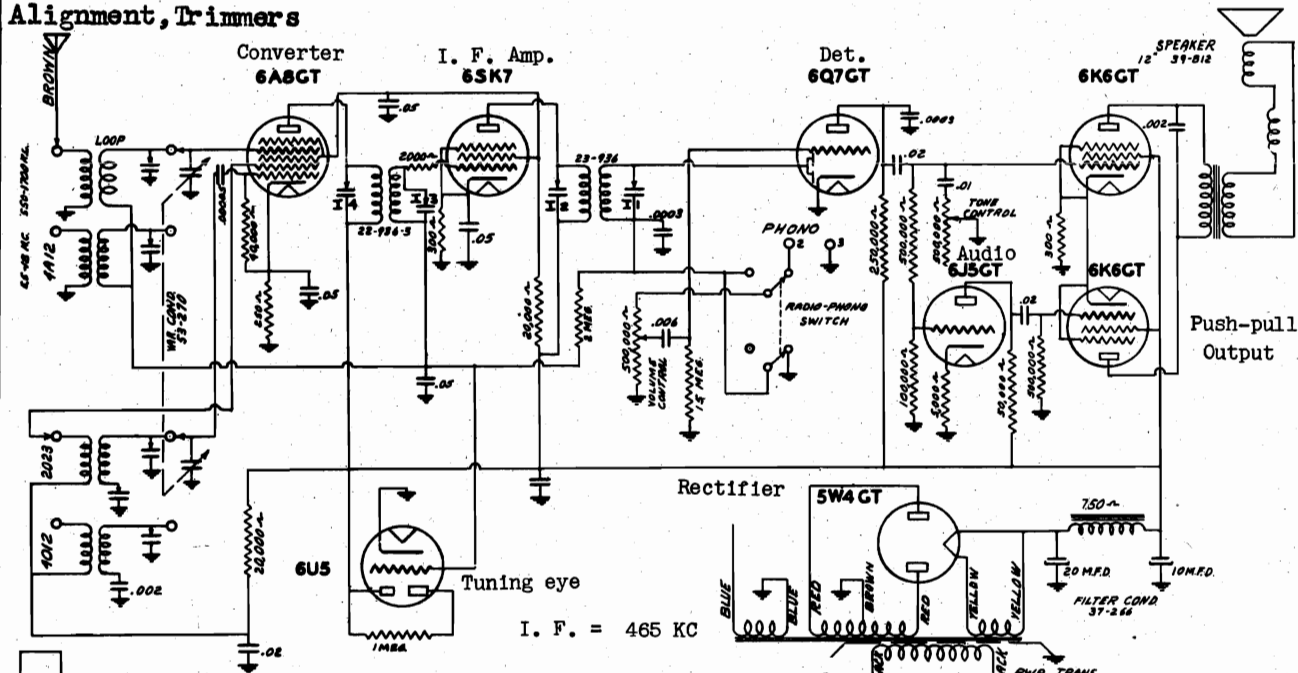
NOTES
A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.
B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.
C- When adjusting this pad, move the tuning hand back and forth and adjust pad until the peak of greatest intensity is obtained.
D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.
E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.



| Wave-Band Switch Position | Position of Dial Pointer | Generator Frequency | Generator Connection | See Note | Trimmers Adjusted (In order shown) | Trimmer Function |
|---------------------------|--------------------------|---------------------|----------------------|--------------------------------|---|------------------|
| BC | Min. Cap. | 465 KC | 6A8 Grid | A, E | I ₁ I ₂ I ₃ I ₄ | IF |
| SW | 16 MC | 16 MC | Brown lead | B, D | O ₅ A ₆ | Osc. Ant. |
| PB | 5 MC | 5 MC | Brown lead | O ₇ A ₈ | | Osc. Ant. |
| BC | 1400 KC | 1400 KC | Brown lead | O ₉ A ₁₀ | | Osc. Ant. |
| BC | 600 KC | 600 KC | Brown lead | C | P ₁₁ | Osc. Pad. |

MODELS 308APC, 308C, 308TT
Schematic, Voltage
Alignment, Trimmers

HOWARD RADIO CO.

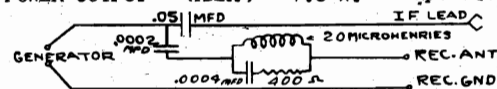


ALIGNMENT PROCEDURE

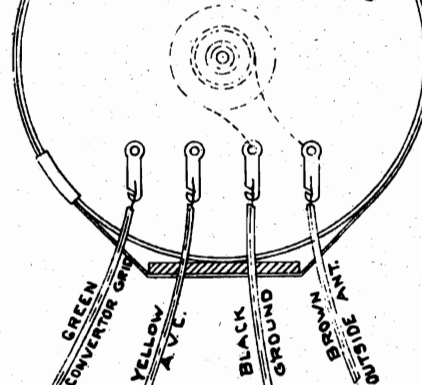
| Wave-Band Switch Position | Position of Dial Pointer | Generator Frequency | Generator Connection | See Note | Trimmers Adjusted (In order shown) | Trimmer Function |
|---------------------------|--------------------------|---------------------|----------------------|----------|---|------------------|
| BC | Min. Cap. | 465 KC | 6AS Grid | A, E | I ₁ I ₂ I ₃ I ₄ | IF |
| SW | 16 MC | 16 MC | Brown lead | B, D | O ₅ A ₆ | Osc. Ant. |
| BC | 1400 KC | 1400 KC | Brown lead | | O ₇ A ₈ | Osc. Ant. |
| BC | 600 KC | 600 KC | Brown lead | C | P ₉ | Osc. Pad. |

A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.
B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.
C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.
D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.
E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.

POWER SUPPLY - (Standard Models) = 105-120 V. 60 Cycle
CONSUMPTION 70 WATTS + 30APC
POWER OUTPUT - (MAX.) = 7.5 W. up to 4.5W.



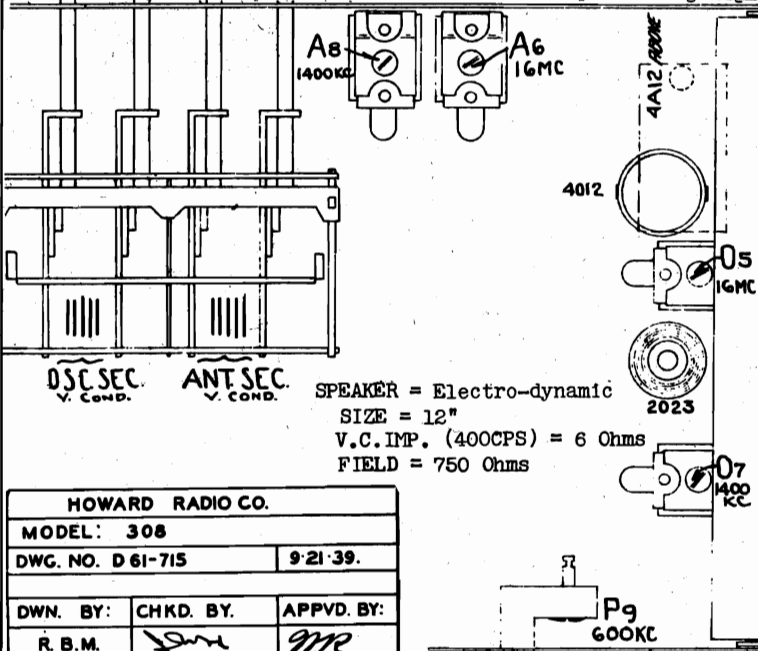
LOOP CONNECTIONS



SOCKET VOLTAGE READINGS

Voltage taken from ground with line voltage at - 117 AC
High voltage reading off rectifier = 315 V.
Drop across speaker field = 75 V.
Voltage taken with 1,000 Ohm per volt meter -

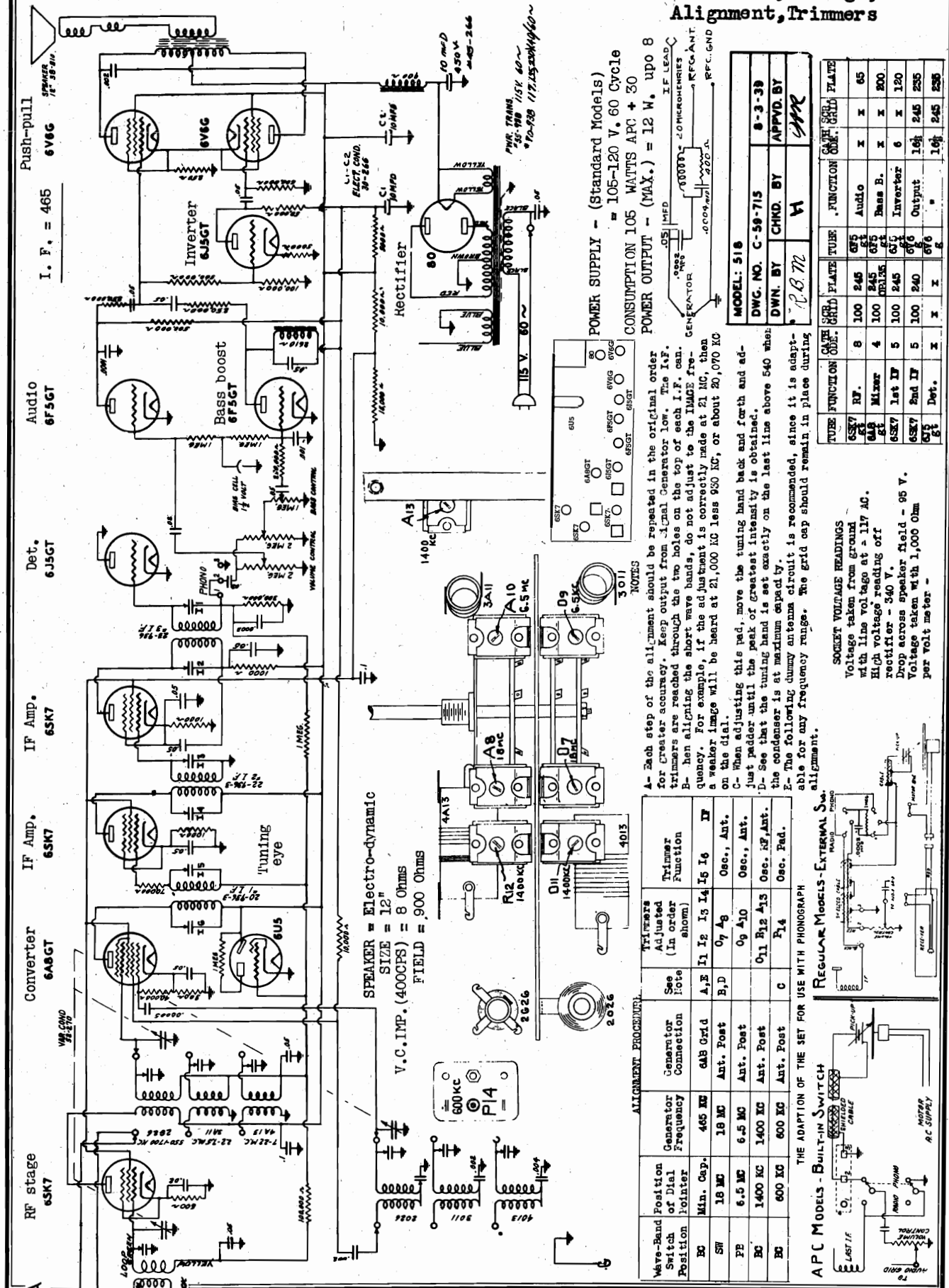
| TUBE | FUNCTION | CATH. ODE. | SCR. GRID | PLATE |
|--------|----------|------------|-----------|-------|
| 6AS GT | Mixer | 4 | 105 | 250 |
| 6SK7 | IF | 3 | 105 | 235 |
| 6Q7 GT | Det. | x | x | 70 |
| 6J5 GT | Inverter | 7 | x | 150 |
| 6K6 GT | Output | 18 | 240 | 230 |
| 6K6 GT | " | 18 | 240 | 230 |

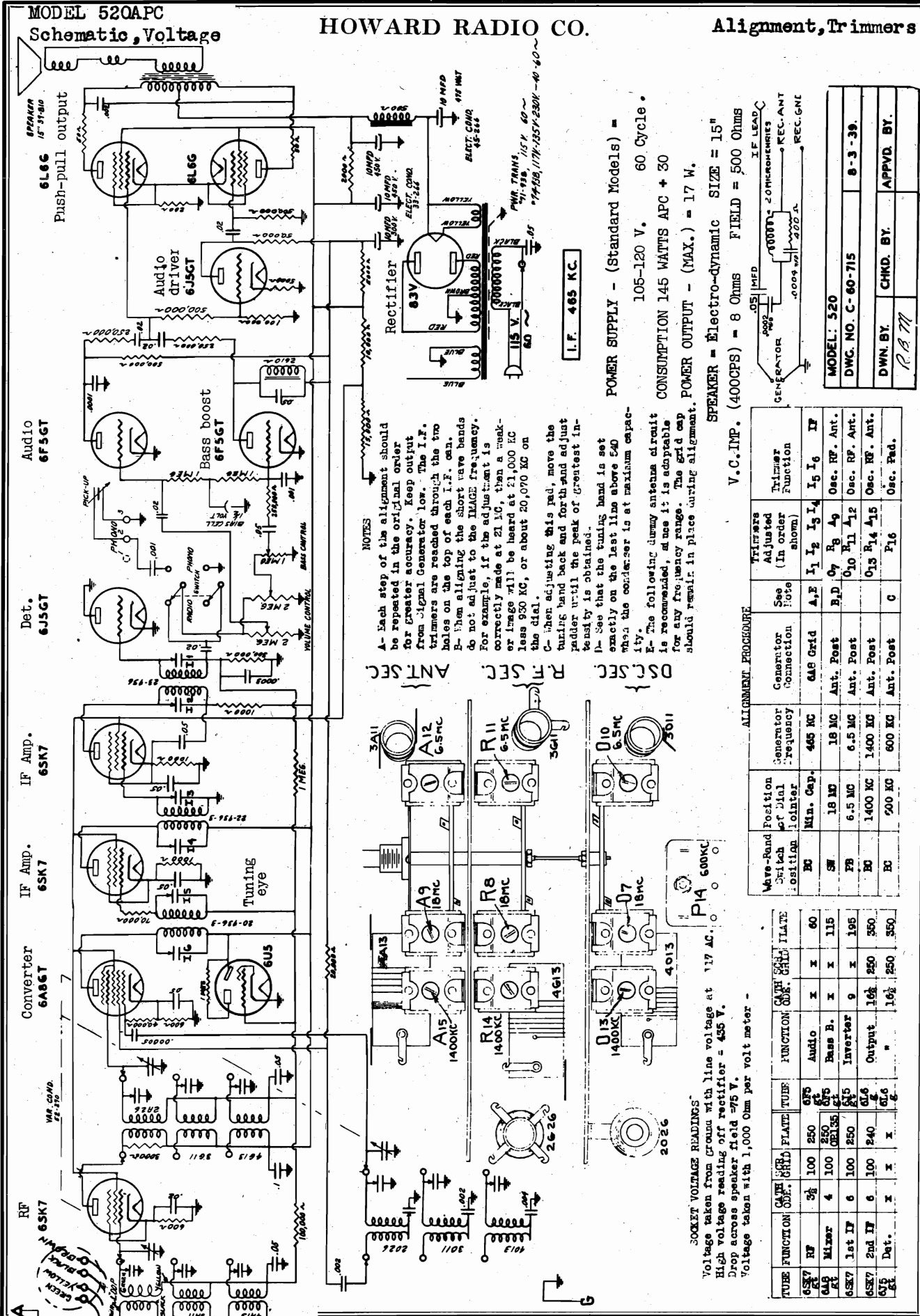


HOWARD RADIO CO.
MODEL: 308
DWG. NO. D 61-715 9-21-39.
DWN. BY: R.B.M. CHKD. BY: APPVD. BY: JMR

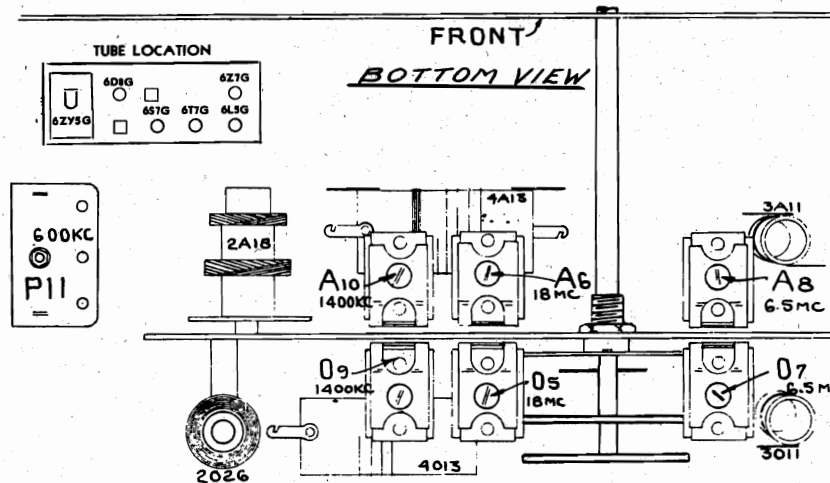
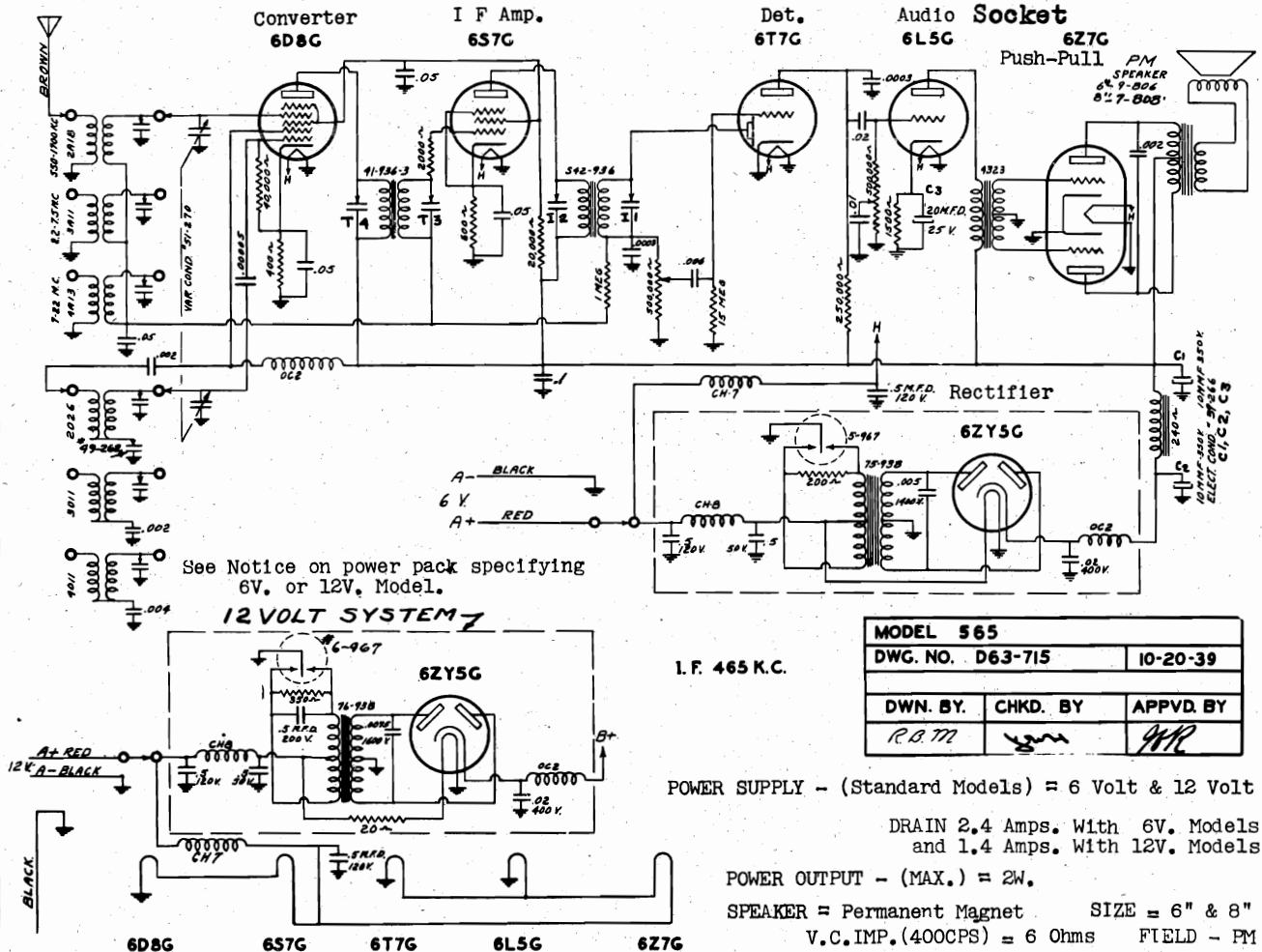
HOWARD RADIO CO.

MODELS 518, 518S, 518APC
Schematic, Voltage, Socket
Alignment, Trimmers



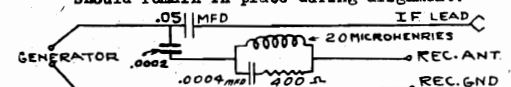


HOWARD RADIO CO.

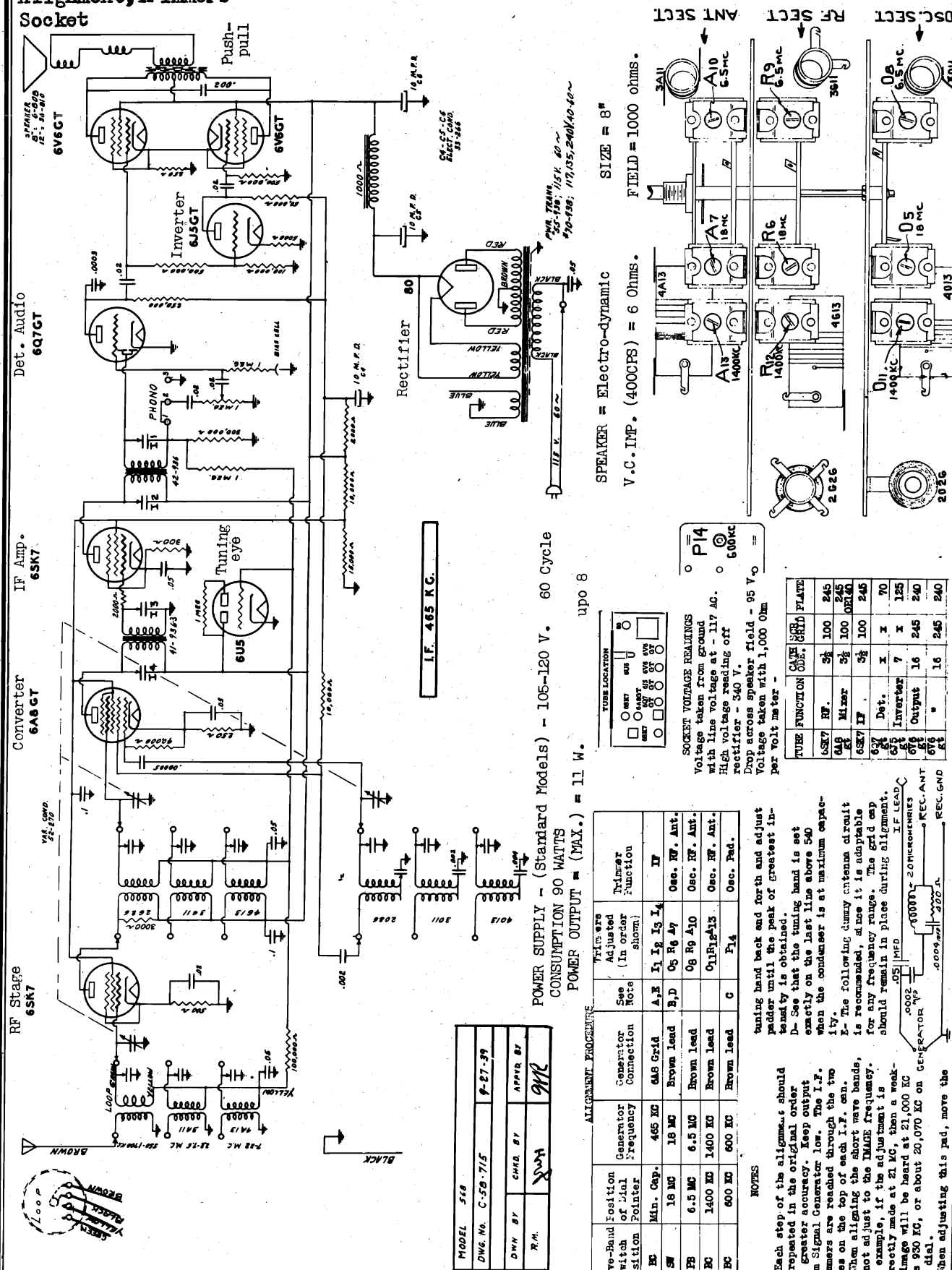
MODEL 565(6v.,12v)
Schematics, Voltage
Alignment, Trimmers
Socket

ALIGNMENT PROCEDURE

| Wave-Band Switch Position | Position of Dial Pointer | Generator Frequency | Generator Connection | See Note | Trimmers Adjusted (In order shown) | Trimmer Function |
|---------------------------|--------------------------|---------------------|----------------------|----------|---|------------------|
| BC | Min. Cap. | 465 KC | 6D8 Grid | A, E | I ₁ I ₂ I ₃ I ₄ | IF |
| SW | 18 MC | 18 MC | Brown lead | B, D | O ₅ A ₆ | Osc., Ant. |
| FB | 6.5 MC | 6.5 MC | Brown lead | | O ₇ A ₈ | Osc., Ant. |
| BC | 1400 KC | 1400 KC | Brown lead | | O ₉ A ₁₀ | Osc., Ant. |
| BC | 600 KC | 600 KC | Brown lead | C | P11 | Osc. Pad. |

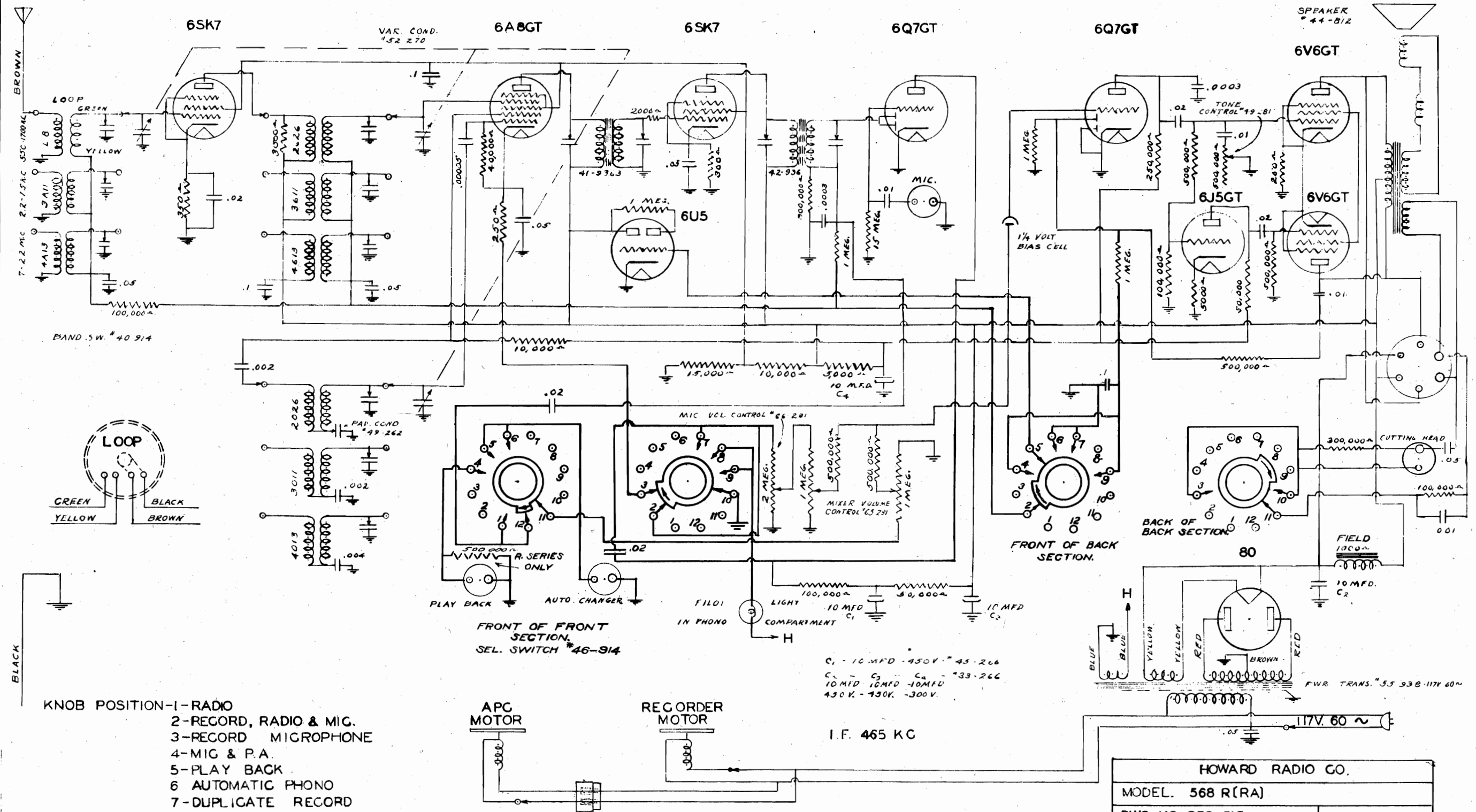


| TUBE | FUNCTION | CATH. ODE. | SCR. GRID | PLATE |
|------|-----------|------------|-----------|-------|
| 6D8G | Mixer | 3 | 70 | 145 |
| 6S7G | IF | 3 | 70 | 145 |
| 6T7G | Det. | x | x | 50 |
| 6L5G | Audio | 6 V. Bias | x | 145 |
| 6Z7G | PP Output | x | x | 140 |



MODEL 568R(RA)
Schematic

HOWARD RADIO CO.



Alignment, Trimmers

HOWARD RADIO CO.

MODEL 575 Schematic, Voltage

TUBE LOCATION

| | | | | | |
|-------|------|-------|-------|-----|----|
| 6A8GT | 6SK7 | 6Q7GT | 6V6GT | 6U5 | 80 |
|-------|------|-------|-------|-----|----|

ALIGNMENT PROCEDURE

| Wave-Band Switch Position | Position of Dial Pointer | Generator Frequency | Generator Connection | See Note | Trimmers Adjusted (In order shown) | Trimmer Function |
|---------------------------|--------------------------|---------------------|----------------------|----------|---|------------------|
| BC | Min. Cap. | 465 KC | 6A8 Grid | A, E | I ₁ I ₂ I ₃ I ₄ | IF |
| SW | 18 MC | 18 MC | Brown lead | B, D | O ₅ A ₆ | Osc., Ant. |
| PB | 6.5 MC | 6.5 MC | Brown lead | | O ₇ A ₈ | Osc., Ant. |
| BC | 1400 KC | 1400 KC | Brown lead | | O ₉ A ₁₀ | Osc., Ant. |
| BC | 600 KC | 600 KC | Brown lead | C | P11 | Osc., Pad. |

NOTES

A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.

SOCKET VOLTAGE READINGS

Voltage taken from ground with line voltage at -117 AC

High voltage reading off rectifier = 305 V.

Drop across speaker field = 70 V.

Voltage taken with 1,000 Ohm per volt meter -

| TUBE | FUNCTION | CATH. ODE. | GRID | PLATE |
|--------|----------|-----------------|------|-------|
| 6A8 GT | Mixer | 3 $\frac{1}{2}$ | 107 | 235 |
| 6SK7 | IF | 4 | 107 | 235 |
| 6Q7 GT | Det. | x | x | 70 |
| 6V6 GT | Output | 11 | 240 | 225 |

LOOP CONNECTIONS

POWER SUPPLY - (Standard Models) = 105-120V. 60 Cycle

CONSUMPTION 50 WATTS

POWER OUTPUT - (MAX.) = 6W. up to 4W.

MODEL 575

DWG. NO. D-59-715 7-25-39

DWN. BY RM CHKD. BY H APPVD. BY JFR

MODELS 580, 580C, 580APC Schematic, Voltage, Socket

HOWARD RADIO CO.

Alignment, Trimmers

TUBE LOCATION

| | | | | | |
|-------|------|-------|-------|-----|----|
| 6A8GT | 6SK7 | 6Q7GT | 6K6GT | 6U5 | 80 |
|-------|------|-------|-------|-----|----|

ALIGNMENT PROCEDURE

| Wave-Band Switch Position | Position of Dial Pointer | Generator Frequency | Generator Connection | See Note | Trimmers Adjusted (In order shown) | Trimmer Function |
|---------------------------|--------------------------|---------------------|----------------------|----------|---|------------------|
| BC | Min. Cap. | 465 KC | 6A8 Grid | A, E | I ₁ I ₂ I ₃ I ₄ | IF |
| SW | 18 MC | 18 MC | Brown lead | B, D | O ₅ A ₆ | Osc., Ant. |
| PB | 6.5 MC | 6.5 MC | Brown lead | | O ₇ A ₈ | Osc., Ant. |
| BC | 1400 KC | 1400 KC | Brown lead | | O ₉ A ₁₀ | Osc., Ant. |
| BC | 600 KC | 600 KC | Brown lead | C | P11 | Osc., Pad. |

NOTES

A- Each step of the alignment should be repeated in the original order for greater accuracy. Keep output from Signal Generator low. The I.F. trimmers are reached through the two holes on the top of each I.F. can.

B- When aligning the short wave bands, do not adjust to the IMAGE frequency. For example, if the adjustment is correctly made at 21 MC, then a weaker image will be heard at 21,000 KC less 930 KC, or about 20,070 KC on the dial.

C- When adjusting this pad, move the tuning hand back and forth and adjust padder until the peak of greatest intensity is obtained.

D- See that the tuning hand is set exactly on the last line above 540 when the condenser is at maximum capacity.

E- The following dummy antenna circuit is recommended, since it is adaptable for any frequency range. The grid cap should remain in place during alignment.

SOCKET VOLTAGE READINGS

Voltage taken from ground with line voltage at -117 AC.

High voltage reading off rectifier = 305 V.

Drop across speaker field = 70 V.

Voltage taken with 1,000 Ohm per volt meter -

| TUBE | FUNCTION | CATH. ODE. | GRID | PLATE |
|--------|-----------|-----------------|------|-------|
| 6A8 GT | Converter | 4 | 110 | 235 |
| 6SK7 | IF | 3 $\frac{1}{2}$ | 110 | 235 |
| 6Q7 GT | Det. | x | x | 70 |
| 6K6 GT | Invert | 8 | x | 140 |
| 6K6 GT | Output | 18 | 235 | 225 |
| 6K6 GT | " | 18 | 235 | 225 |

LOOP CONNECTIONS

POWER SUPPLY - (Standard Models) = 105-120 V. 60 Cycle

CONSUMPTION 75 WATTS APC + 30

POWER OUTPUT - (MAX.) = 7.5W up to 5

MODEL 580

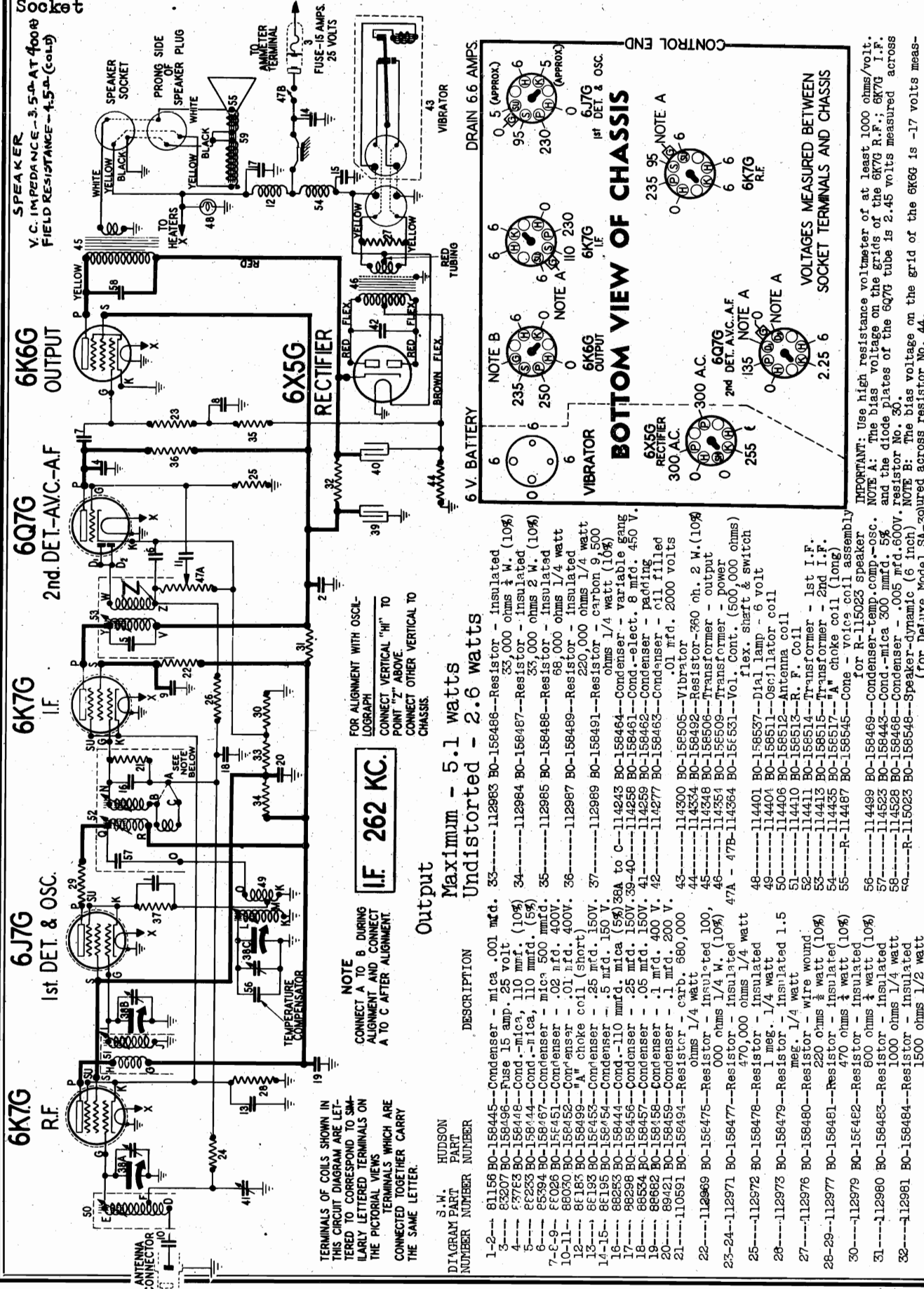
DWG. NO. D-59-715 7-25-39

DWN. BY RM CHKD. BY H APPVD. BY JFR

MODEL SA39

Schematic, Voltage
Socket

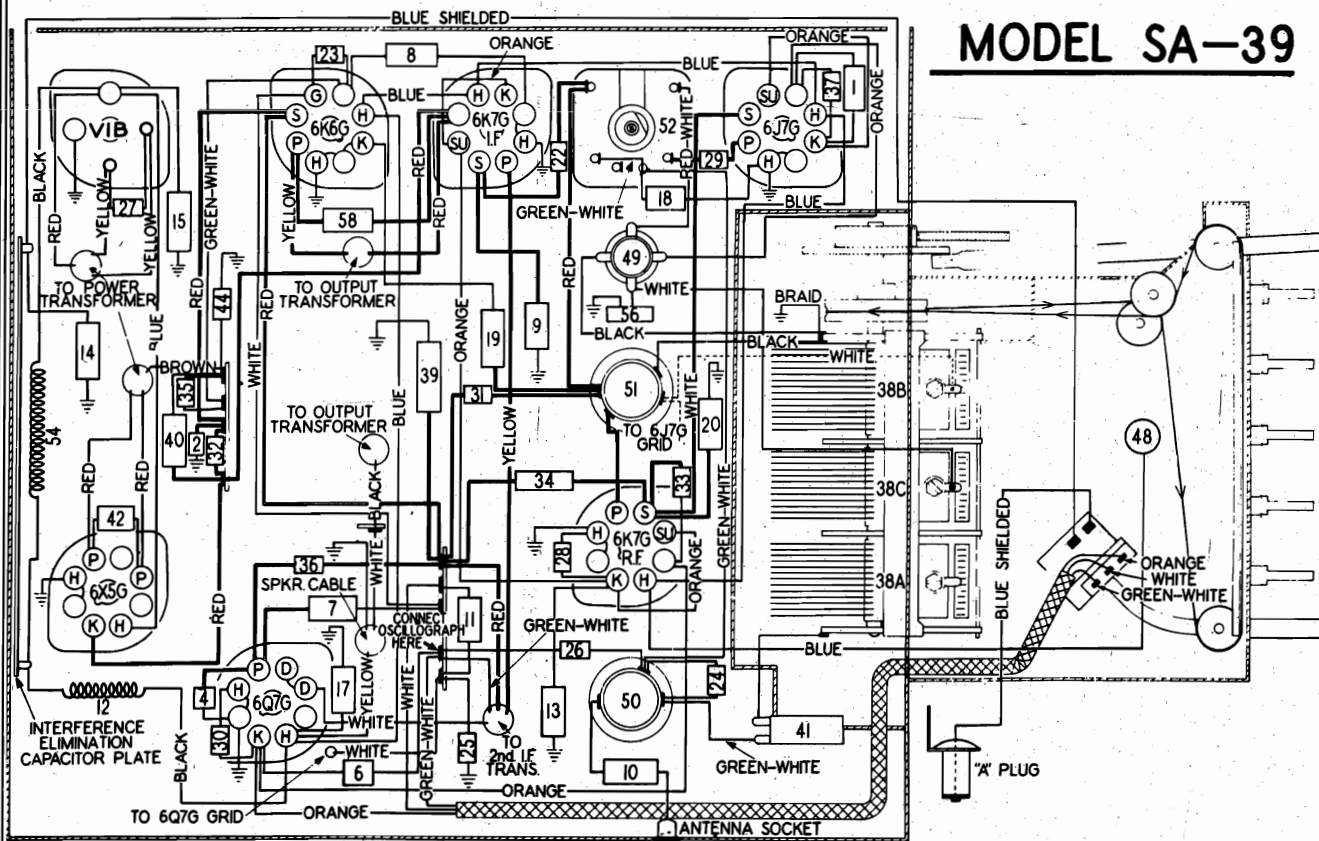
HUDSON MOTOR CAR CO.



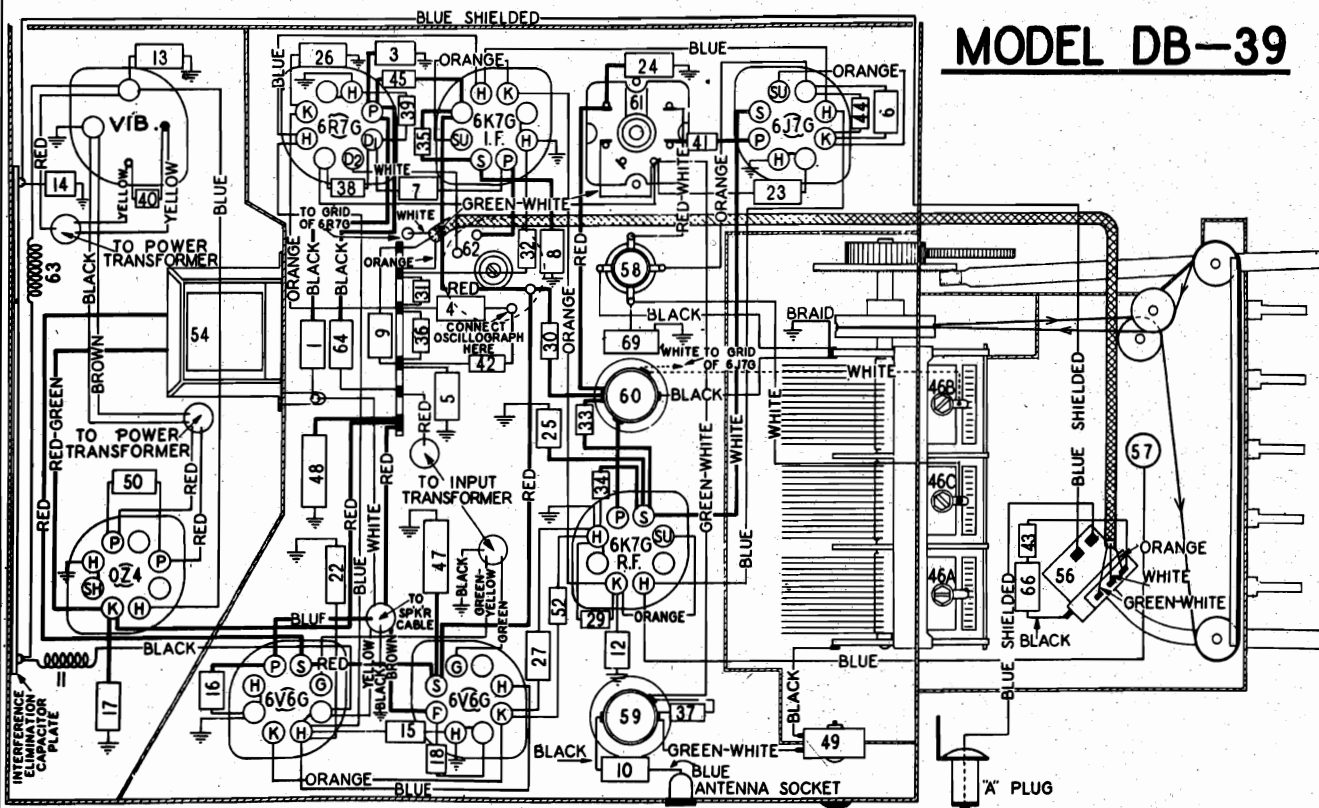
MODEL DB39
MODEL SA39
Chassis Wiring

HUDSON MOTOR CAR CO.

MODEL SA-39

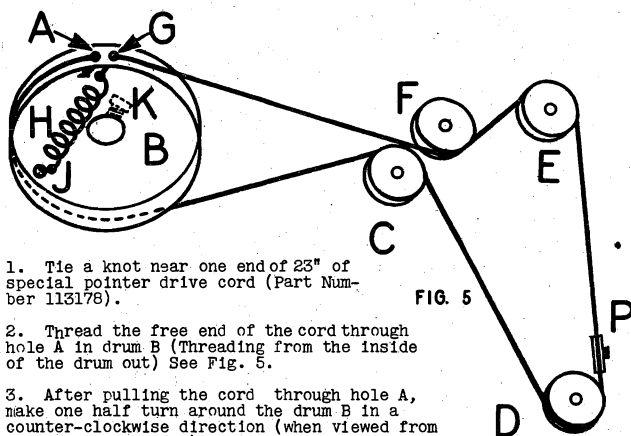


MODEL DB-39



HUDSON MOTOR CAR CO.

MODEL DB39
MODEL SA39
Dial and Tuner
Data, Notes

ADDITIONAL SERVICE DATA**HOW TO REPLACE THE DIAL POINTER DRIVE CORD**

1. Tie a knot near one end of 23" of special pointer drive cord (Part Number 113178).
2. Thread the free end of the cord through hole A in drum B (Threading from the inside of the drum out) See Fig. 5.
3. After pulling the cord through hole A, make one half turn around the drum B in a counter-clockwise direction (when viewed from flange side of drum).
4. Continuing, draw the cord over to the back of pulley C and around to pulley D. From this point continue across to pulley E and around to pulley F.
5. Go around pulley F and up to the top of drum B to hole G.
6. Draw the cord through hole G and tie it to the end of tension spring H in such a manner that when the spring is clipped to lug J, the spring will be extended to approximately 7/8 inch.

HOW TO SET UP THE PUSH BUTTONS.

To set up the push buttons, proceed as follows:

1. Turn on the set and allow it to operate for at least one-quarter hour before attempting to set up the push buttons.
2. Select the five stations to which the buttons are to be set. Be sure to select nearby, powerful stations, since weak signals will generally give better results when tuned in manually. Any button may be set to any desired station.
3. Grasp the tuning knob and pull it out, (outward movement is slight, about 1/8 inch) so that the drive pinion engages the condenser drive gear and the set may be tuned manually.
4. Tune in the station to which you wish to set the particular button. Be sure to tune in the station correctly by TUNING TO THE POINT WHERE THE PROGRAM IS HEARD WITH THE LEAST HISS OR DISTORTION, AND NOT TO THE POINT OF GREATEST VOLUME.
5. Grasp the push button being set up, and turn it to the left (counter-clockwise) about one whole turn.
6. Push this button all the way in, and keeping it pushed in, turn right (clockwise) until reasonably tight.
7. Set up the remaining four buttons in a similar manner.
8. Label each button with the call letters of the stations you have selected, using the call letter tabs and celluloid covers packed with your receiver. Insert the call letter tab in the recess in the push button, and cover it with the celluloid tab.
9. To use your push button tuner, first push in the tuning knob. Then push in the button labelled with the call letters of the desired station. Be sure to push the button all the way in.

AUDIO OSCILLATION IN MODEL DB-39 RECEIVER.

Occasionally audio oscillation or howl may be encountered in this model. This is caused by an audio voltage being fed back to the audio section of receiver from the speaker cord. The remedy is to locate the speaker cord away from the 6R7-G and 6V6-G tubes, holding it in place with a rubber band if necessary.

INCORRECT TUNING OF PUSH BUTTONS

Occasionally a receiver may be found which will not tune-in stations accurately when push button tuning is used. The causes and remedies for this are as follows:

1. Push buttons incorrectly set-up. Remedy: Reset the button to the desired station being sure to tune in the station carefully.
2. Extreme sharpness of tuning of the receiver. Remedy: The green-white jumper wire on the bottom of the 1st I. F. transformer may be improperly connected. The correct connection for normal operation of the receiver is shown in Fig. 1 (Terminals A and C should be connected together).

LOW SENSITIVITY

Low sensitivity may be due to improper adjustment of the antenna compensator, trimmer #8 (see alignment procedure page). This trimmer is accessible without removing the set from the car. When the readjustment of the compensator is necessary, care should be taken that the antenna, if of the under-car type, is clean and free of accumulation of mud or slush which would alter its capacity and lower its resistance. In such cases, the antenna and its insulators should be washed, and preferably, allowed to dry before making adjustment. Doing this sharpens the tuning of the compensator and makes possible an accurate setting.

FAILURE OF RECEIVER TO OPERATE

Failure of the receiver to operate may be due to one or more causes. When a receiver is found in such condition, its parts should be checked as follows:

1-FUSE

The fuse may be burned out or making poor contact. In cases of burnout, replace with another 15 Ampere fuse. If second fuse fails, remove receiver from car and investigate condition of vibrator and receiver circuits. DO NOT USE A HIGHER RATING FUSE.

2-TUBES

Unfasten the trunk clamps holding the speaker case cover. This will enable you to reach the tubes. Check to see that all tubes are in their proper sockets. One or more tubes may be defective. To determine their condition, remove them from the receiver and test with a tube tester, or if a tube tester is not available, replace the tubes, one at a time, with tubes known to be good, until the defective tube is located.

3-VIBRATOR

Improper operation of the vibrator is usually evidenced by one of the following symptoms: Receiver blows fuses, receiver is dead or weak, reception is intermittent, reception is noisy and unsteady. To check the vibrator, replace the suspected unit with a new vibrator. Do not attempt to adjust the defective unit.

4-CIRCUIT

Failures within the basic circuits of the receiver may be isolated by a systematic test procedure. The receiver should be removed from the car and placed where it will be readily accessible. The top cover and speaker case cover should be removed from the case. The defect in the receiver can then be located by means of continuity, voltage, or stage analysis, using a signal generator.

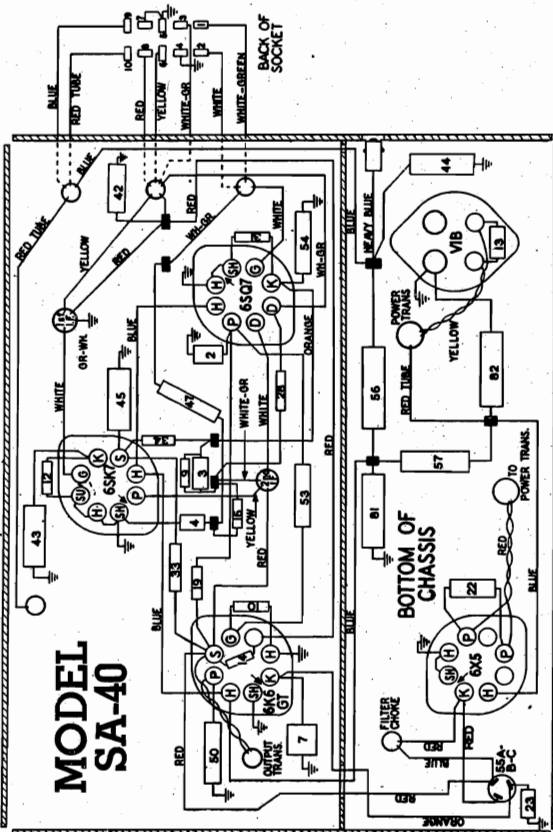
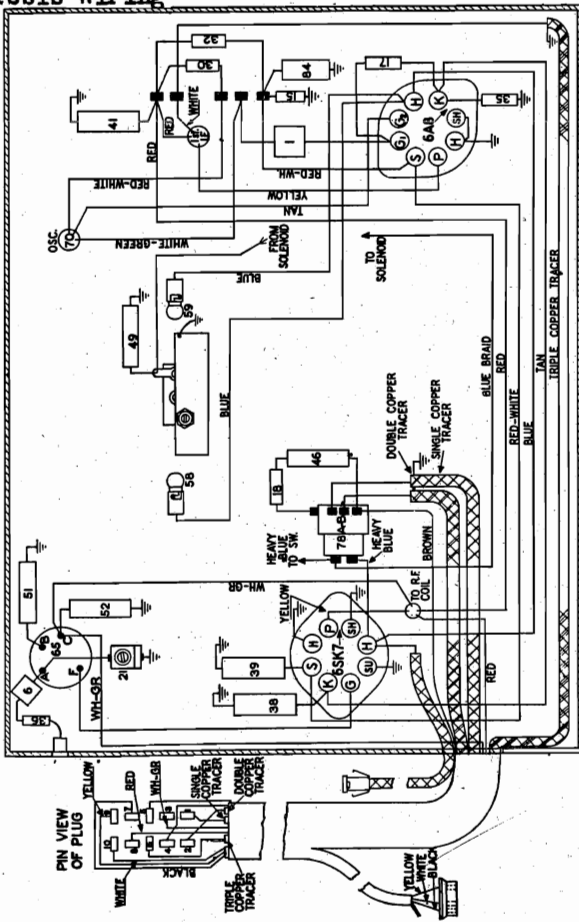
When checking the receiver, using a signal generator, a signal is fed progressively into the I. F. and R. F. stages of the receiver, until the defective stage is located, and a continuity or voltage check may then be given that stage to isolate the defective unit or circuit.

ADJUSTMENT OF IRON CORES IN COILS.

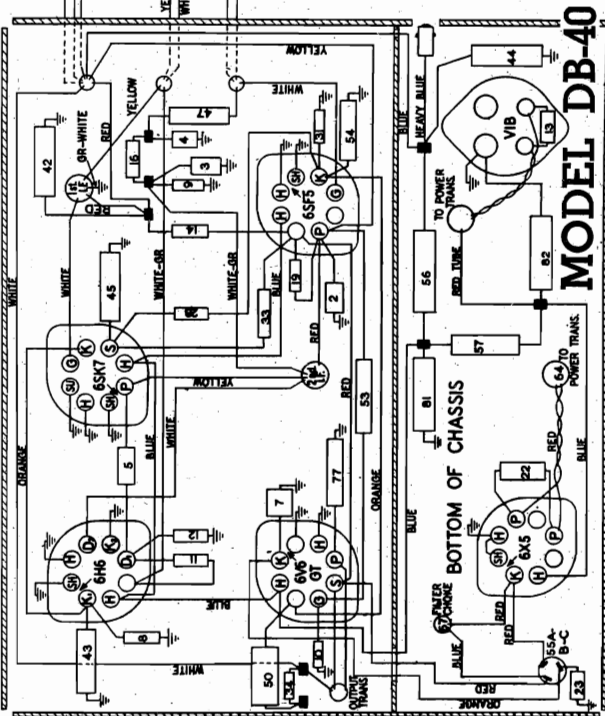
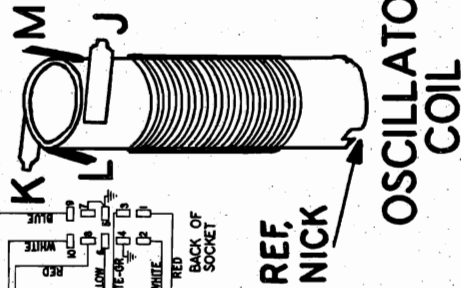
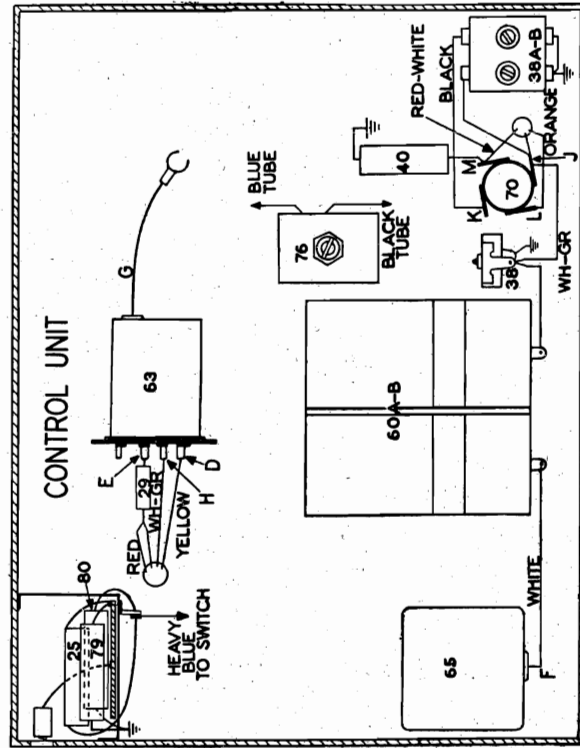
The Antenna, R. F., and Oscillator coils have adjustable iron cores. Any adjustment of these cores will necessarily change the inductance of the coils and therefore extreme caution must be exercised where adjustment becomes necessary. THE CORE OF THE OSCILLATOR COIL MUST NOT BE ADJUSTED AT ANY TIME. The correct method of adjusting the R. F. and antenna coil cores is adequately covered under "Alignment Instructions".

MODEL DB40
MODEL SA40
Control Unit
Chassis Wiring

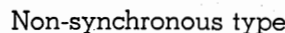
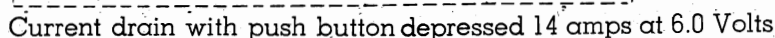
HUDSON MOTOR CAR CO.



Models SA-40 and DB-40



MODEL DB40
Schematic, Voltage



Compliments of www.nucow.com

HUDSON MOTOR CAR CO.

MODEL DB40
MODEL SA40
Alignment, Trimmers
Changes, Notes
ALIGNMENT PROCEDURE

- For alignment an output meter and accurately calibrated signal generator are required.
1. Connect the output meter across the voice coil or between the plate of the output tube and chassis in series with a .1 mfd. condenser. The more sensitive type of meter should be connected across the voice coil.
 2. Remove only the top cover of the lower unit and the bottom cover of the control unit.
 3. Connect the ground lead of the signal generator to the receiver chassis and leave it connected in this manner through the entire alignment procedure.
 4. Turn the volume control to maximum volume position and leave it throughout the entire alignment procedure.

| DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR | CONNECTION OF SIGNAL GENERATOR OUTPUT TO RECEIVER | SIGNAL GENERATOR FREQUENCY | RECEIVER DIAL SETTING | TRIMMER DESCRIPTION | TYPE OF ADJUSTMENT |
|--|---|----------------------------|--|---|---|
| 1 MFD. CONDENSER | CONTROL GRID OF 6A8 | 455 KC. | ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL | 1-2 2nd I.F. LOWER UNIT 3 1st I.F. LOWER UNIT 4 1st I.F. CONT. UNIT | ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT. |
| 80 MMFD. CONDENSER | ANTENNA CONNECTION ON SET | 1580 KC. | SET SO THAT SIGNAL INDICATOR IS ENTIRELY OUT OF MESH | 5 OSCILLATOR CONDENSER | CAREFULLY ADJUST FOR MAXIMUM OUTPUT. |
| 80 MMFD. MICA CONDENSER | ANTENNA CONNECTION ON SET | 1400 KC. | ACCURATELY TUNE TO 1400 KC. GENERATOR SIGNAL | 6 ANTENNA CONDENSER (SERIES) BUTTON ON END OF CONTROL UNIT | ADJUST FOR MAXIMUM OUTPUT. |
| 80 MMFD. CONDENSER | ANTENNA CONNECTION ON SET | 600 KC. | TUNE TO 600 KC. GENERATOR SIGNAL | 7 OSCILLATOR (SERIES) CONDENSER | ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL. |

Now repeat adjustments made on trimmer numbers 5, 6 and 7.

After the set has been installed in the car, tune in a fairly weak station near 1400 KC, and adjust trimmer No. 6 under the plug button on the end of the control unit. Maximum volume is obtained.

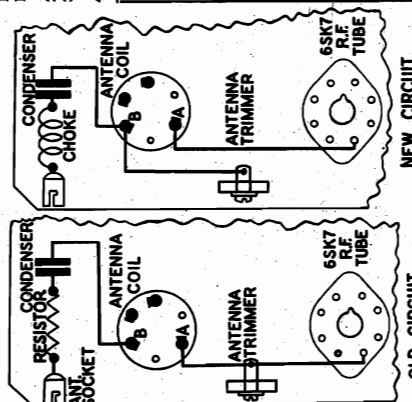
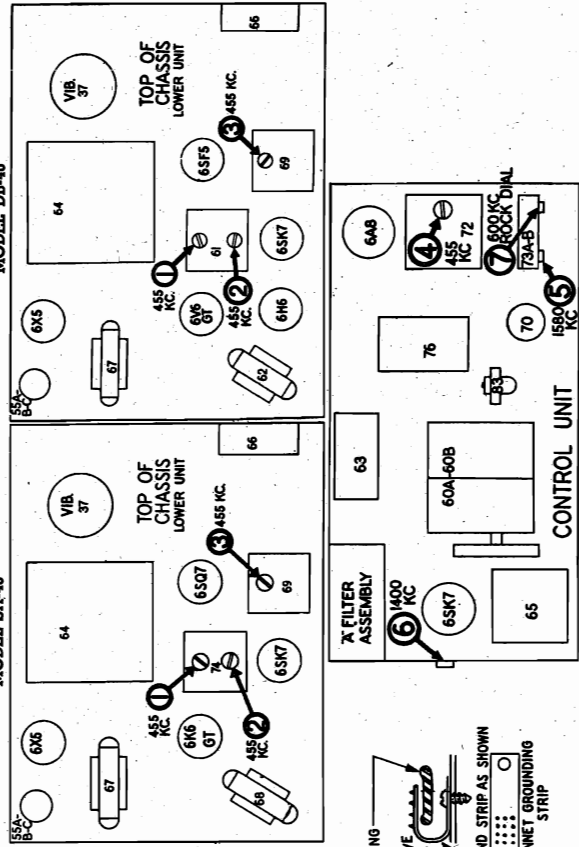
MODEL SA-40**MODEL DB-40**

FIG. 1. Diagram Illustrating Recommended Antenna Circuit Changes

Disconnect this wire from the antenna coil terminal and from the trimmer terminal. Slip a piece of spaghetti tubing over this wire and re-connect it to the same lug on the antenna coil. (Marked A in Figure 1.)

Connect the trimmer condenser to the antenna coil terminal nearest the corner of the chassis. (Marked B in Figure 1.) This is the terminal to which the antenna series mica condenser connects.

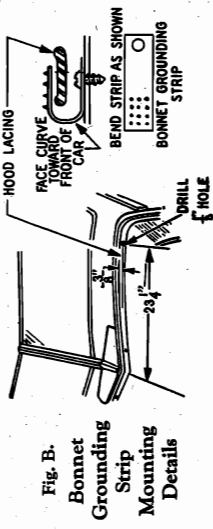
Replace the antenna socket using the two mounting screws.

Solder the choke to the terminals from which you removed the resistor (see Fig. 1).

Check to see that the wiring of the unit has not been pushed over so as to interfere with the dial drive cord.

After this change is made, it is absolutely essential to realign the antenna trimmer. This must be done with a signal generator and an 80 mfd. condenser in series with the antenna lead and the signal generator. If any other capacity is used, adjustment will be incorrect.

The antenna trimmer can and should be aligned to the regular car aerial. To do this we suggest connecting the trimmer to the antenna lead and without mounting the antenna lead in the car. Tune in a fairly weak station near 1400 kc. on the dial and adjust the antenna trimmer for maximum volume.

**LOW SENSITIVITY**

In cases of low sensitivity not traceable to weak tubes or defective parts, check the setting of the antenna trimmer. If the set has been aligned using any dummy antenna other than the 80 mfd. condenser recommended, the setting of this condenser will be off considerably. In all cases, the antenna should be adjusted to the regular car aerial. Do not mount the control unit and place it in some accessible place. Tune in a weak station, near 1400 KC, remove the plug button covering the antenna trimmer from the case, and adjust this trimmer for maximum volume.

Another possible cause of low sensitivity is misalignment of the transistors caused by the upper and lower units of the chassis being out of alignment. To correct this, realign both units of the receiver as described under "Alignment Procedure".

REPLACING TUBES IN CONTROL HEAD

1. Remove the two Phillips screws at the bottom of the instrument panel grill. Lift out the grill.
2. Remove the four machine screws holding the speaker plate.
3. Insert a screwdriver blade in the slot in the front of the control unit and pry off the lower cover. This will give access to the 6A8 and 6SK7 tubes.

HUM

A possible source of hum difficult to trace, is caused when the lower end of the volume control accidentally becomes grounded in the control unit. In addition to the ground which is made in the lower radio unit. Removing the accidental ground in the control head will clear up this difficulty.

IGNITION NOISE

If ignition noise is excessive, first make sure the installation man has performed all the operations described in paragraphs 20 and 21.

Additional bonnet grounding strips (Stewart-Warner Part No. 118718, Hudson Part No. BO-181417) may be helpful in further reducing ignition interference. The best location for these can be determined by grounding the hood to the body at various points with a knife. If the grounding strip is located at a point 10 1/4 inches from the center of the car, install an additional strip at a point 23 1/4 inches from the center as shown in Fig. B.

A change has been incorporated in the radios now being built to reduce ignition noise. This change can be made in the field by a radio service man if excessive noise is still encountered after following all previous instructions.

Remove the resistor noise chokes (Stewart-Warner Part No. BO-181580, Stewart-Warner Part No. 118728) and install the full instructions to make this change are given here.

INSTALLATION OF ANTENNA CHOKE

The antenna noise choke (Stewart-Warner Part No. 118728, Hudson Part No. BO-181580) is a single layer choke coil wound on a ceramic body which looks like an insulated resistor. It is to be installed inside the control unit in place of the resistor connected in series with the antenna lead on early sets. Later sets already have the choke.

Remove the top cover of the control unit. Check whether the antenna lead is connected to a resistor body. (See Fig. 1.) If it is a choke wound on a resistor body, the change has already been made. If you find a plain, insulated resistor connected to a terminal lug to which the blue wire from the antenna socket is connected, proceed with the change. This resistor has a value of 88 ohms and can be identified by its blue body grey end and black dot.

Remove the resistor.

Remove the two screws holding the antenna socket to the case.

The antenna trimmer must now be connected to a different terminal on the antenna coil. The trimmer is in the case and the antenna coil is in the car. The antenna lead wire runs from the antenna coil terminal A, through the top trimmer lug to the control grid of the 6SK7 tube.

MODEL DB40

MODEL SA40

Dial Drive Data

HUDSON MOTOR CAR CO.

REMOVING TUNING UNIT CHASSIS FROM CASE

1. Pry off bottom cover, utilizing screwdriver slot at front of case.
2. Remove four self-tapping screws holding down top cover and pry cover off.
3. Unsolder the blue wire extending from the on-off switch to the "A" choke assembly.
4. Remove two screws holding antenna receptacle to case. Also remove the screw holding down the cable grounding plate. Then remove four screws holding chassis assembly to case.
5. The entire tuning unit chassis can now be lifted from the case.

REMOVING TUNING MECHANISM FROM CHASSIS

1. Unsolder the green-white and the white wire from the gang condenser.
2. Unsolder brown cable wire from low end of volume control.
3. Unsolder gray rubber covered shielded wire (2 copper tracers) from center terminal of volume control.
4. Unsolder gray rubber covered shielded wire (1 copper tracer) from high end of volume control.
5. Unsolder blue wire from on-off switch on volume control. Also unsolder shielding from volume control bracket.
6. Unsolder 2 blue pilot light wires at 6A8 socket.
7. Unsolder ground of .05 mfd. condenser from frame of tuning mechanism. Mechanism can now be lifted out.

HOW TO REPLACE THE DIAL DRIVE CORD

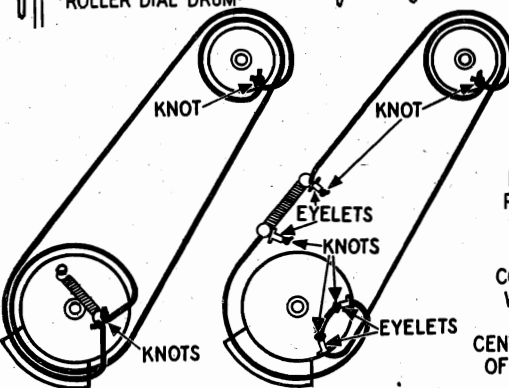
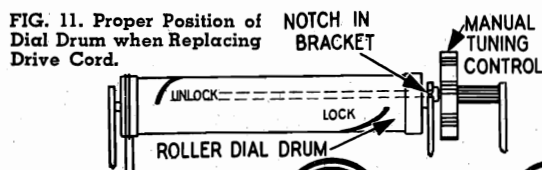


FIG. 12
Early Type
Dial Drive System

FIG. 13
Second Type
Dial Drive System

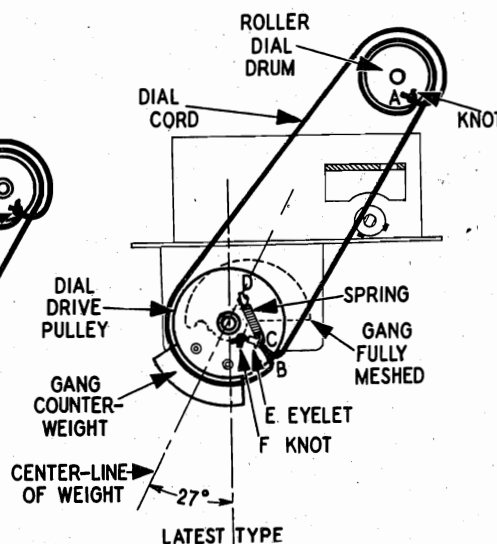


FIG. 14
Details of Latest Type
Dial Drive Systems

Three dial drive systems are illustrated here. The method marked "Second Type" (Fig. 13) can be used in sets originally using the "Early Type" (Fig. 12). The second type is preferable to the early type.

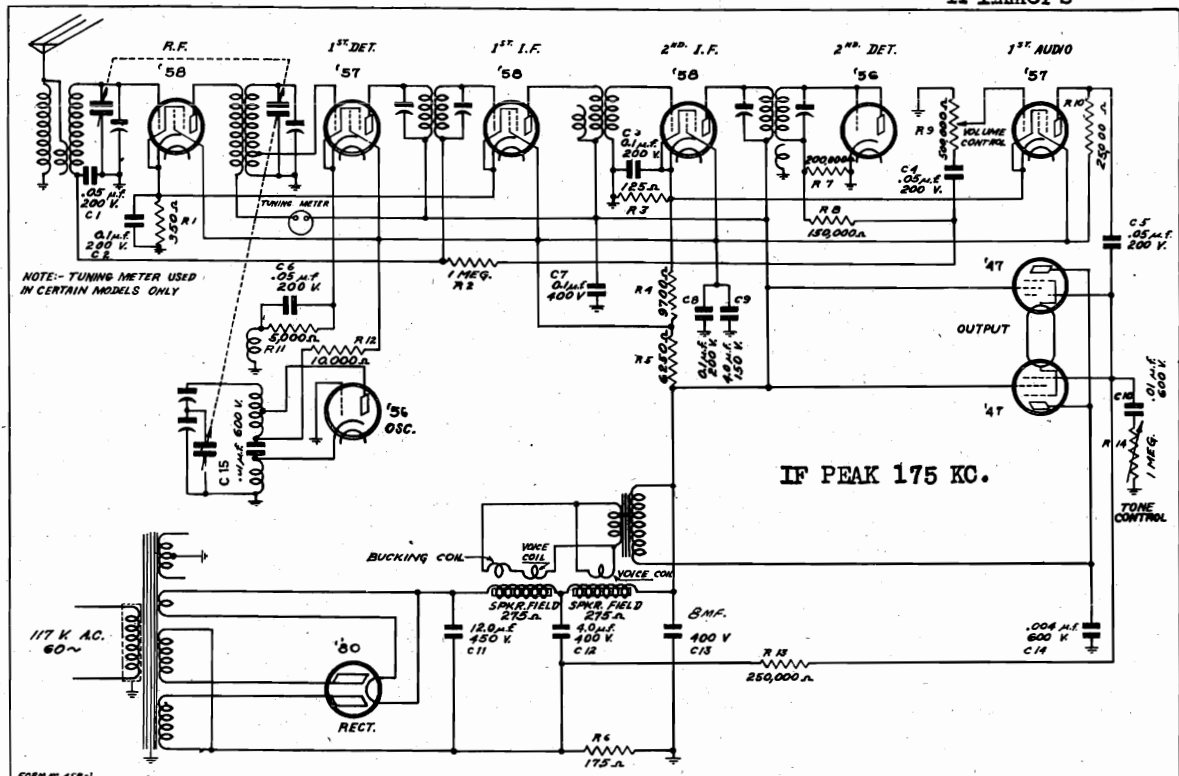
The method marked "Latest Type" (Fig. 14) is the best but uses a different Dial Drive Pulley. Therefore early type or second type drives **cannot** be restrung as shown for latest type unless a new Dial Drive Pulley (Stewart-Warner Part No. 118176, Hudson Part No. BO-161539) is installed.

The dial cord in the latest type dial drive can be replaced as follows:

1. Remove chassis from case as described on this page.
2. Remove the antenna coil shield can by removing the two nuts holding it to the chassis. This will give access to the dial drive drum.
3. Refer to Fig. 11. Rotate the dial so the word "UNLOCK" is directly in line with the reference notch in the right hand dial support bracket. Block the dial in this position, using a small block of rubber or other soft material which will not mar or damage the dial.
4. Rotate the gang condenser so its plates are fully meshed. (See Fig. 14.) Keep the gang in this position until the dial cord has been replaced.
5. About 26 inches of dial drive cord (Stewart-Warner Part No. 113178, Hudson Part No. BO-158521) are required. Tie a large knot in the center of this dial cord.
6. Pass both ends of the cord outward through hole A in the roller dial drum. (Fig. 14.)
7. Pass one end of the dial drive cord clockwise around the roller dial drum, through the hole in the support bracket and through hole B in the dial drive pulley.
8. Pass the other end of the cord counter-clockwise around the roller dial drum, counter-clockwise around the dial drive pulley and inward through hole B in the dial drive pulley.
9. At this point, make sure that the gang is fully meshed, that the counter-weight is in the proper position, and the dial is in the position shown in Fig. 11. Otherwise calibration will be incorrect.
10. Tie a spring to the ends of the dial drive cord inside the dial drive pulley so that the cord extends about $\frac{3}{8}$ inch inside the pulley when the cord is pulled taut. See Fig. 14. This illustration shows the recommended method of fastening the spring using an eyelet. Fasten the other end of the spring to the tab D on the pulley. The spring should be stretched only very slightly when in place. Too much spring tension may cause binding.
11. Remove the material used to hold the dial in position as described in Step 2. If the above procedure has been followed, the calibration of the dial will be correct when the unit is replaced in the case.

LAFAYETTE RADIO MFG. CO.

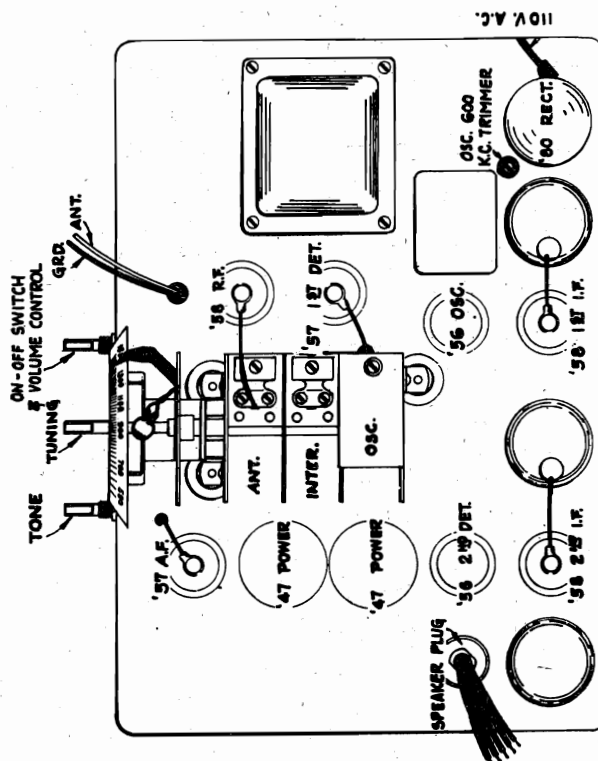
MODEL C-10 Late
Schematic, Voltage
Alignment, Socket
Trimmers



Set the signal generator for 175 K.C. Connect the signal lead from the signal generator to the grid of the 1st detector tube through a .05 mfd. condenser. Turn the tuning condenser rotor until the plates are completely out. The ground lead from the signal generator goes to the ground lead of the receiver. Then adjust the four intermediate frequency condensers for maximum output. The adjusting screws for these condensers are reached from the bottom of the chassis.

Next set the signal generator for a signal of exactly 1400 K.C. The antenna lead from the signal generator is, in this instance, connected to the antenna lead of the receiver. Set the dial pointer on the 1400 K.C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

Next set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. The adjusting screw for this condenser is reached from the top of the chassis and is between the I.F. and oscillator coil cans.



Voltages at Sockets

LINE VOLTAGE, 115 — ANTENNA LEAD SHORTED TO GROUND

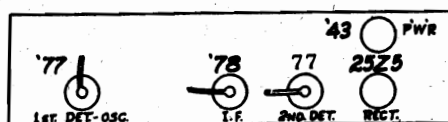
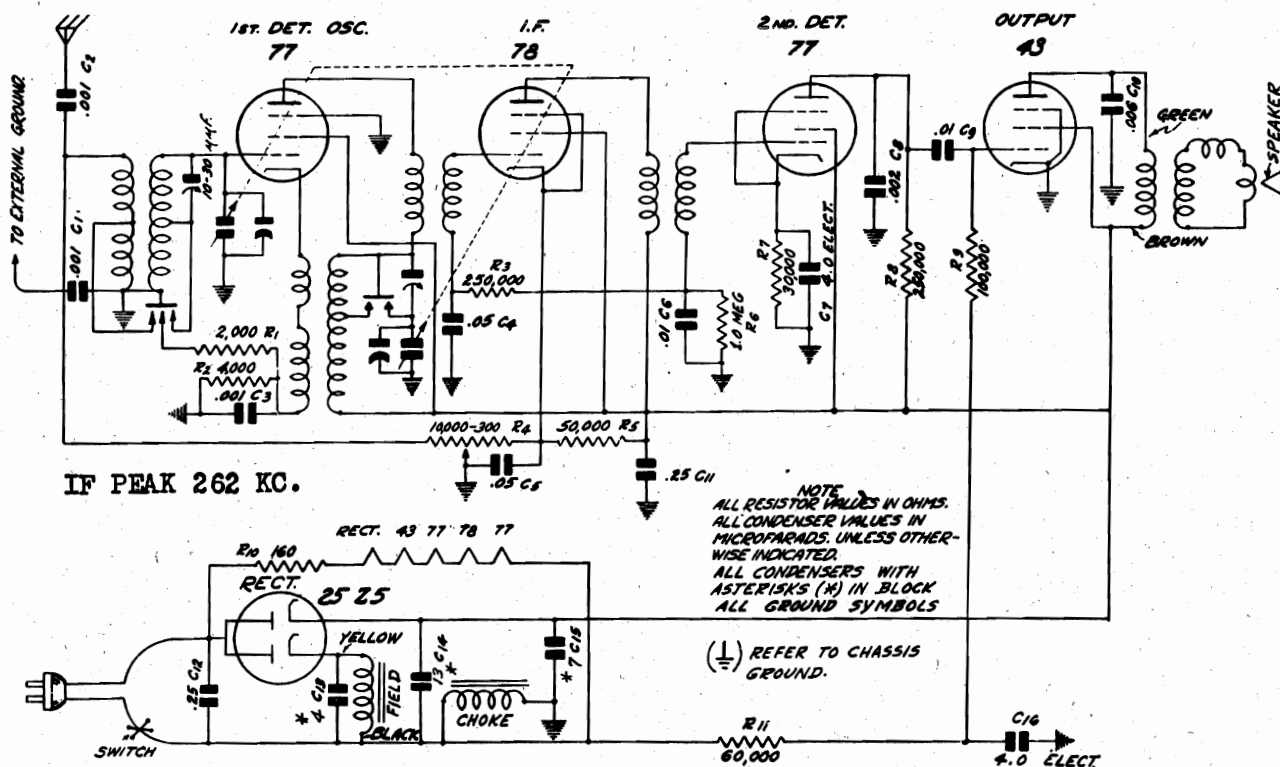
| Type of Tube | Function | Across Filament or Heater | Plate to Cathode | Screen to Cathode | Grid to Cathode | Normal Plate M.A. |
|--------------|-----------|---------------------------|------------------|-------------------|---------------------|-------------------|
| 58 | R.F. | 2.4 | 275 | 100 | 4.2 ⁽¹⁾ | 5.2 |
| 57 | 1st Det. | 2.4 | 265 | 99 | 5.4 | .9 |
| 56 | Osc. | 2.4 | 28 | | 0 | 8.6 |
| 58 | 1st I.F. | 2.4 | 275 | 100 | 4.2 ⁽¹⁾ | 5.2 |
| 58 | 2nd I.F. | 2.4 | 275 | 102 | 3.0 | 8.5 |
| 56 | 2nd Det. | 2.4 | 0 | | 0 | 0 |
| 57 | 1st Audio | 2.4 | 12 | 102 | 3.0 ⁽¹⁾ | 1.8 |
| 47 | Output | 2.4 | 265 | 280 | 18.5 ⁽²⁾ | 30.0 |
| 80 | Rect. | 4.9 | | | | 55.0 per plate |

(1) Measured from cathode to ground.

(2) Measured across Resistor R6.

MODEL L-20, Nomad
Schematic, Voltage
Socket

LAFAYETTE RADIO MFG. CO.



Voltages at Sockets

Antenna lead connected to ground lead (not external ground).—Volume Control at Maximum.

CAUTION—Do not put chassis on any grounded surface or let chassis touch any ground.

| | | A.C. Line Voltage—115 Use High Resistance A.C. Meter, Rectifier Type, for Heater Voltage Measurements | | | | | D.C. Line Voltage—110 Use High Resistance D.C. Meter for Heater Voltage Measurements | | | | |
|--------------|---------------|--|------------------|-------------------|-----------------|--------------------|---|------------------|-------------------|-----------------|--------------------|
| Type of Tube | Function | Across Heater | Plate to Cathode | Screen to Cathode | Grid to Cathode | Normal Plate M. A. | Across Heater | Plate to Cathode | Screen to Cathode | Grid to Cathode | Normal Plate M. A. |
| 77 | 1st Det. Osc. | 5.8 | 106 | 106 | 5.2 | .8 | 5.6 | 87 | 87 | 4.3 | .6 |
| 78 | I.F. | 5.8 | 108 | 108 | 3.0(1) | 7.4 | 5.6 | 88 | 88 | 2.4(1) | 6.0 |
| 77 | 2nd Det. | 5.8 | 65(2) | 104 | 6.0(3) | .14 | 5.6 | 58(2) | 82 | 5.0(3) | .11 |
| 43 | Output | 24. | 95 | 110 | 18.0(4) | 22.0 | 23.0 | 80 | 90 | 15.0(4) | 17.0 |
| 25Z5 | Rect. | 24. | 110(5) 155 | | | 84.0 Total | 23.0 | 5.0(5) 6.0 | | | 74.0 Total |

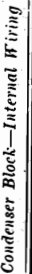
(1) Cathode to Ground.

(2) With 1,000,000 ohm meter—reading will be lower with lower resistance meter.

(3) Cathode to ground—read with 100,000 ohm meter.

(4) Read across filter choke.

(5) Readings from plate to two cathodes with 250,000 ohm meter



IF PEAK 262 KC

| Type of Tube | Function | Across Heater | Plate to Cathode | Screen to Cathode | Grid to Cathode | Normal Plate MA |
|--------------|--------------------|---------------|-------------------|-------------------|---------------------|--------------------|
| 78 | R. F. | 6.1 | 182 | 80 | 3. ⁽¹⁾ | 7.0 |
| 77 | 1st Det. and Osc. | 6.1 | 178 | 77 | 5. ⁽²⁾ | 1.3 ⁽²⁾ |
| 78 | I. F. | 6.1 | 182 | 80 | 3. ⁽¹⁾ | 7.0 |
| 75 | 2nd Det. 1st Audio | 6.1 | 70 ⁽³⁾ | | 1.4 ⁽¹⁾ | .35 |
| 41 | Output | 6.1 | 172.5 | 176.5 | 12.5 ⁽⁴⁾ | 16.0 |
| 84 | Rect. | 6.1 | 205 | | | 17.5 per plate |

-

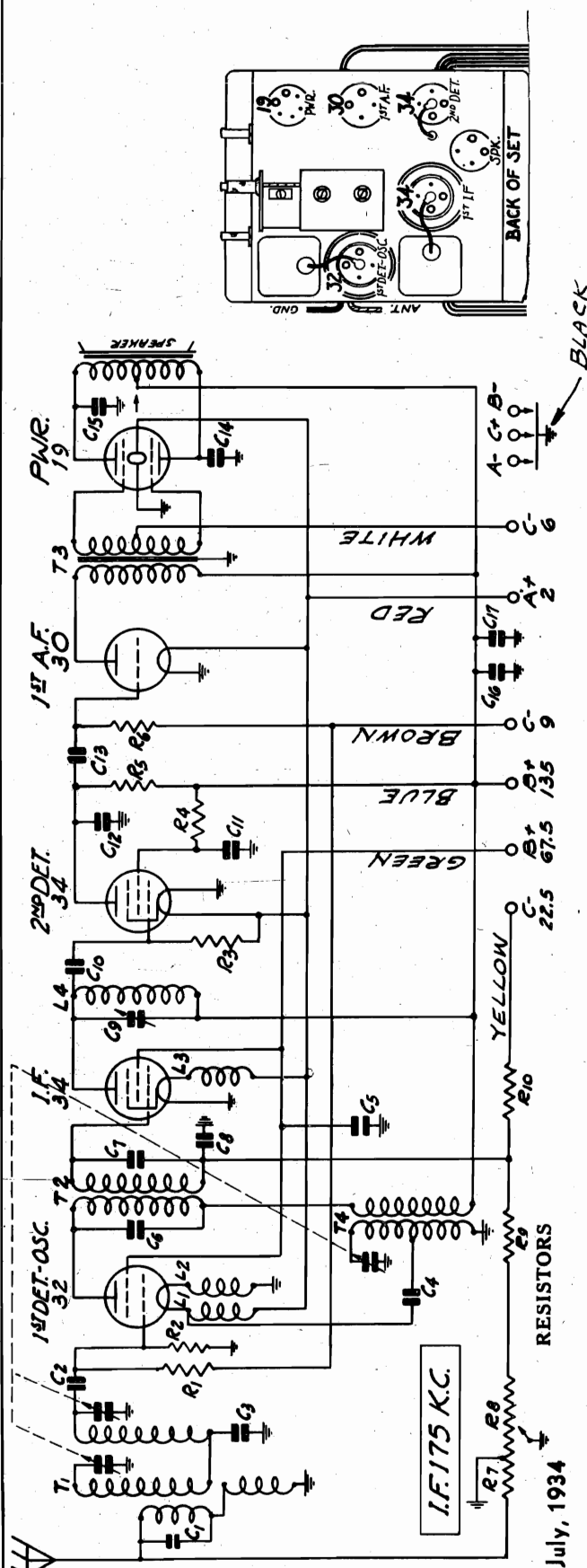
Fig. 8—Location of Tubes

After the wiring has all been completed and before the chassis is permanently installed, try out the set and adjust the antenna trimmer. The location of the tubes is shown in Fig. 8. To adjust the antenna trimmer, tune in a weak signal between 1200 and 1400 K.C. with the volume control about three-fourths on. On one end of the chassis box are two small metal plates. Remove the smaller of these two plates. Directly under the hole in the chassis box is the antenna trimmer condenser screw. Turn this

MODEL B-61

Schematic, Voltage
Socket, Resistance

LAFAYETTE RADIO MFG. CO.



July, 1934

| Part No. | Code | Resistance | Wattage | Type |
|-----------|-------|-------------|---------|----------------|
| P-A94505 | R1 | 5 Megohm | 0.2 | Carbon |
| P-A94105 | R2 | 1 Megohm | 0.2 | Carbon |
| P-A94205 | R3 | 2 Megohm | 0.2 | Carbon |
| P-B94104 | R4 | 100,000 Ohm | 0.5 | Carbon |
| P-B94403 | R5 | 40,000 Ohm | 0.5 | Carbon |
| P-A95105 | R6 | 1 Megohm | 0.2 | Carbon |
| P-96001 | {R7 | 3,000 Ohm | | Volume Control |
| | {R8 | 60,000 Ohm | | |
| P-A94901 | ww R9 | 900 Ohm | 0.2 | Wire Wound |
| P-A94652 | R10 | 6,500 Ohm | 0.2 | Carbon |
| *P-A94105 | R1 | 10 Megohm | 0.2 | Carbon |
| *P-A94205 | R2 | 2 Megohm | 0.2 | Carbon |

*These resistors were used on first models.

CONDENSERS

| Part No. | Code | Capacity | Voltage | Type |
|----------|------|-------------|---------|--------------------------|
| P-81812 | C1 | 200 mmf | | Wire—Part of Ant. Assem. |
| P-81801 | C2 | 35 mmf | | Wire—Part of Ant. Assem. |
| P-80862 | C3 | 0.05 mf | 200V | Tubular |
| P-80862 | C4 | 0.05 mf | 200V | Tubular |
| P-80862 | C5 | 0.05 mf | 200V | Tubular |
| P-81806 | C6 | 70 mmf | | Wire |
| P-81804 | C7 | 45 mmf | | Wire |
| P-80862 | C8 | 0.05 mf | 200V | Tubular |
| P-1685 | C9 | 70 ± 30 mmf | | I. F. Trimmer |
| P-81800 | C10 | 50 mmf | | Wire |
| P-81045 | C11 | 0.25 mf | 200V | Tubular |
| P-80863 | C12 | 0.004 mf | 600V | Tubular |
| P-80898 | C13 | 0.006 mf | 600V | Tubular |
| P-80969 | {C14 | 0.01 mf | 400V | Dual Tubular |
| | {C15 | 0.01 mf | 400V | |
| P-80864 | C16 | 0.1 mf | 200V | Tubular |
| P-80968 | C17 | 4.0 mf | 150V | Electrolytic |
| P-81035 | | | | 3 Gang Condenser |

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis.

| Item | Code | D. C. Resistance in Ohms |
|--|------|--------------------------|
| Double Tuned Ant. Coil Pri. | T1 | 19.2 |
| Double Tuned Ant. Coil Sec. (Pres selector) | T1 | 3.2 |
| Double Tuned Ant. Coil Sec. (1st Det.) | T1 | 3.2 |
| 1st I.F. Coil Pri. | T2 | 90.0 |
| 1st I.F. Coil Sec. | T2 | 116.0 |
| D Audio Input Trans. Pri. | T3 | 1010. |
| Audio Input Trans. Sec. Cent. Tap to outside end | T3 | 648. |
| Audio Input Trans. Sec. Cent. Tap to inside end | T3 | 588. |
| Oscillator Coil, Grid Winding | T4 | 4.1 |
| Oscillator Coil, Plate Winding | T4 | 10.4 |
| Double Filament Reactor Assem. | L1 | .61 |
| Single Filament Reactor Assem. | L2 | .61 |
| 2nd I.F. Reactor Coil | L3 | .61 |
| 6" Magnetic Speaker, Center Tap to outside end | L4 | 52.1 |
| 6" Magnetic Speaker, Center Tap to inside end | | 272. |
| 8" Magnetic Speaker (same as P-2124) | | 225. |

VOLTAGES AT SOCKETS
Volume Control at Maximum—Antenna Shorted to Ground
B + 135 Volts
Voltages to Chassis

| Voltages to Chassis | | | | | | |
|---------------------|--|-----------------|----------------|-----------------|---------------|--------------------|
| Type of Tube | Function | Across Filament | Plate to Cath. | Screen to Cath. | Grid to Cath. | Normal Plate M. A. |
| 32 | 1st Det. & Osc. | 2.0 | 135 | 67.5 | 7.5(1)(2) | 2.5 |
| 34 | I. F. | 2.0 | 135 | 67.5 | 2.5(3) | 2.8 |
| 34 | 2nd Det. | 2.0 | 50 | 40(1) | 0 | 1.8 |
| 30 | 1st Audio | 2.0 | 135 | | 9(4) | 3.0 |
| 19 | Output | 2.0 | 135 | | 6 | 1.8 |
| (1) | With 250,000 ohm meter. | | | | | |
| (2) | Subject to variation due to oscillatory current. | | | | | |
| (3) | With 25,000 ohm meter. | | | | | |
| (4) | As read at "C" battery. | | | | | |
| | | | | | | Total |

LAFAYETTE RADIO MFG. CO.

MODEL B-64
Schematic, Voltage
Socket

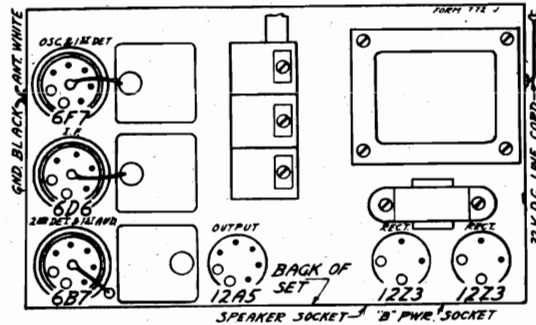


Fig. 2—Arrangement of Tubes

VOLTAGES AT SOCKETS

Input 32 Volts—Antenna Shorted to Ground

| Type of Tube | Function | Across Filament | Plate to Cathode | Screen to Cathode | Grid to Cathode | Normal Plate M.A. |
|--------------|-----------------|-----------------|--------------------|-------------------|-----------------|--------------------|
| 6F7 | 1st Det. & Osc. | 6.3 | 167 ⁽¹⁾ | 90 | 2.6 | 7.0 ⁽¹⁾ |
| | | | 117 ⁽²⁾ | | 0 | 2.8 ⁽²⁾ |
| 6D6 | I. F. | 6.3 | 172 | 120 | 3.2 | 8.2 |
| 6B7 | 2nd Det. | 6.3 | 25 | 25 | 7.25 | 2.0 |
| 12A5 | Output | 12.6 | 180 | 180 | 25 | 32 |
| 12Z3 | Rectifier | 12.6 | 225 | | | 25 |

(1) Pentode Section of Tube

(2) Triode Section of Tube

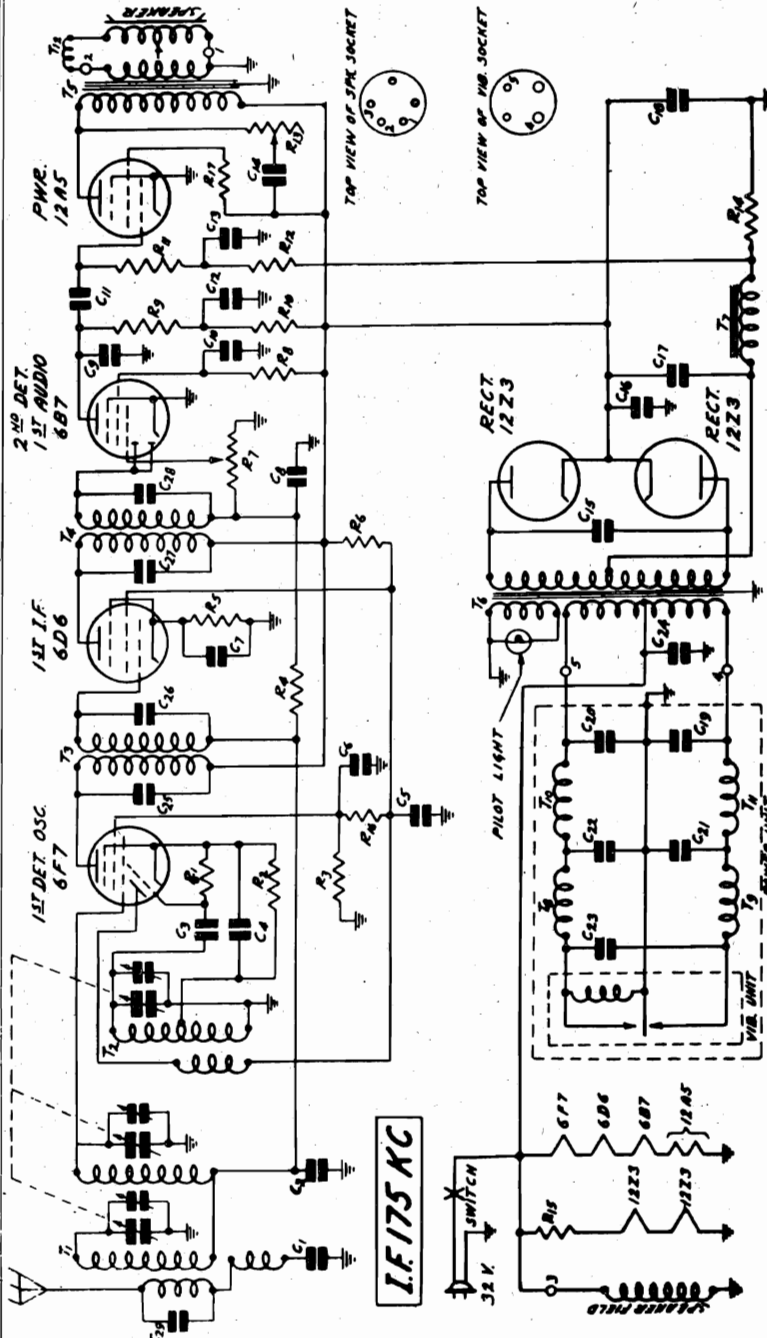


Fig. 1—Schematic Circuit Diagram

The numbers on the 2 sockets shown at the right above, correspond with the numbers as shown in the circuit.

CONDENSERS

| Part No. | Code | Capacity | Voltage | Type |
|----------|------|----------|---------|-------------------------------------|
| P-80862 | C1 | .05 Mf. | 200V | Tubular |
| P-80862 | C2 | .05 Mf. | 200V | " |
| P-81801 | C3 | .35 Mmf. | 200V | Wire Capacitor Part of Osc. Assem. |
| P-80862 | C4 | .05 Mf. | 200V | Tubular |
| P-80888 | C5 | .25 Mf. | 200V | " |
| P-81049 | C6 | .05 Mf. | 200V | " |
| P-81811 | C7 | .05 Mf. | 200V | Wire Capacitor |
| P-81051 | C8 | .02 Mf. | 600V | Tubular |
| P-80888 | C9 | .25 Mf. | 200V | " |
| P-80888 | C10 | .01 Mf. | 600V | " |
| P-80888 | C11 | .25 Mf. | 200V | " |
| P-81062 | C12 | .01 Mf. | 140V | " |
| P-81055 | C13 | .01 Mf. | 140V | " |
| P-81052 | C14 | .05 Mf. | 400V | " |
| P-80887 | C15 | .015 Mf. | 1600V | " |
| P-81016 | C16 | .10 Mf. | 400V | " |
| P-81016 | C17 | 8.0 Mf. | 300V | Electrolytic Block |
| P-80993 | C18 | 5 Mf. | 140V | Tubular |
| P-81806 | C19 | 70 Mmf. | 140V | Wire Capac. Part of 1st I.F. Assem. |
| P-81804 | C20 | 45 Mmf. | 140V | Wire Capac. Part of 1st I.F. Assem. |
| P-81803 | C21 | 90 Mmf. | 140V | Wire Capac. Part of 2nd I.F. Assem. |
| P-81810 | C22 | 100 Mmf. | 140V | Wire Capac. Part of 2nd I.F. Assem. |
| P-81812 | C23 | 200 Mmf. | 140V | Wire Capac. Part of Ant. Assem. |
| P-81015 | C24 | | | Three Gang Condenser |

| Part No. | Code | Resistance | Wattage | Type |
|----------|------|-------------|---------|----------------|
| P-A95104 | R1 | 100,000 Ohm | .2 | Carbon |
| P-A95152 | R2 | 1,500 Ohm | .2 | Carbon |
| P-B94303 | R3 | 30,000 Ohm | .2 | Carbon |
| P-A98233 | R4 | 2 Megohm | .2 | Carbon |
| P-98021 | R5 | 400 Ohm | .2 | Wire Wound |
| P-C93702 | R6 | 7,000 Ohm | 1.0 | Carbon |
| P-96014 | R7 | 500,000 Ohm | .5 | Volume Control |
| P-B94204 | R8 | 200,000 Ohm | .5 | Carbon |
| P-B94603 | R9 | 60,000 Ohm | .5 | Carbon |
| P-A95203 | R10 | 20,000 Ohm | .2 | Carbon |
| P-A95504 | R11 | 500,000 Ohm | .2 | Carbon |
| P-A94104 | R12 | 100,000 Ohm | .2 | Carbon |
| P-97011 | R13 | 150,000 Ohm | .2 | Tone Control |
| P-98035 | R14 | 450 Ohm | 2.0 | Wire Wound |
| P-98034 | R15 | 25 Ohm | 3.0 | Wire Wound |
| P-B95602 | R16 | 6,000 Ohm | .5 | Carbon |

Oct, 1934

MODEL B-65

Schematic, Voltage
Socket

LAFAYETTE RADIO MFG. CO.

RESISTORS

| Part No. | Code | Resistance | Wattage | Type |
|----------|------|-------------|---------|----------------|
| P-A95104 | R1 | 100,000 Ohm | .2 | Carbon |
| P-A98803 | R2 | 30,000 Ohm | .2 | Carbon |
| P-A95104 | R3 | 100,000 Ohm | .2 | Carbon |
| P-A98602 | R4 | 6,000 Ohm | .2 | Carbon |
| P-B93902 | R5 | 9,000 Ohm | .5 | Carbon |
| P-A95505 | R6 | 5 Megohm | .2 | Carbon |
| P-96012 | R7 | 1 Megohm | .2 | Volume Control |
| P-A95505 | R8 | 5 Megohm | .2 | Carbon |
| P-A94603 | R9 | 60,000 Ohm | .2 | Carbon |
| P-A95104 | R10 | 100,000 Ohm | .2 | Carbon |
| P-A95104 | R11 | 100,000 Ohm | .2 | Carbon |

Voltages at Sockets
ANTENNA SHORTED TO GROUND

| Type of Tube | Function | Fila-ment Volt. | Plate to Neg. Filament | Screen to Neg. Filament | Grid to Neg. Filament | Normal Plate M. A. |
|--------------|--------------|-----------------|------------------------|-------------------------|-----------------------|--------------------|
| 34 | 1st Detector | 2.0 | 135 | 55 | 3.0 av. | 1.90 |
| 30 | Oscillator | 2.0 | 75 | 70 | 0.0 | 3.70 |
| 34 | I. F. | 2.0 | 135 | 70 | 3.0 av. | 8.00 |
| 30 | 2nd Detector | 2.0 | 2 | 65 | 4.0 | 2.30 |
| 34 | 1st A. F. | 2.0 | 140 | 135 | 8.0 | 3.10 |
| 30 | 2nd A. F. | 2.0 | 137 | 137 | 6.0 | 1.00 per plate |

CONDENSERS

| Part No. | Code | Capacity | Voltage | Type |
|----------|------|-------------|--------------------------------|---------|
| P-80862 | C1 | 0.050 Mf. | 200V | Tubular |
| P-80862 | C2 | 0.050 Mf. | 200V | Tubular |
| P-80862 | C3 | 0.050 Mf. | 200V | Tubular |
| P-80864 | C4 | 0.100 Mf. | 200V | Tubular |
| P-81501 | C5 | 35 Mmf. | Cap. Part of Osc. Coil Assem. | |
| P-80888 | C6 | 0.250 Mf. | 200V | Tubular |
| P-80862 | C7 | 0.050 Mf. | 200V | Tubular |
| P-80888 | C8 | 1.500 Mf. | 140V | Tubular |
| P-1955 | C9 | 70-140 Mmf. | Trimmer | |
| P-81800 | C10 | 50 Mmf. | Cap. Part of 2nd I.F. Coil As. | |
| P-80981 | C11 | 0.010 Mf. | 400V | Tubular |
| P-80888 | C12 | 0.250 Mf. | 200V | Tubular |
| P-80945 | C13 | 500 Mmf. | Moulded | |
| P-80862 | C14 | 0.050 Mf. | 200V | Tubular |
| P-80888 | C15 | 0.250 Mf. | 200V | Tubular |
| P-81014 | C16 | 16.00 Mf. | Electrolytic Block | |
| P-80914 | C22 | 0.002 Mf. | 600V | Tubular |
| P-80914 | C23 | 0.002 Mf. | 600V | Tubular |
| P-81812 | C24 | 200 Mmf. | Cap. Part of Ant. Assem. | |
| P-81807 | C25 | 70 Mmf. | Cap. Part of 1st I.F. Coil As. | |
| P-81805 | C26 | 45 Mmf. | Cap. Part of 1st I.F. Coil As. | |

Three Gang Condensers

Fig. 1. Schematic Circuit Diagram

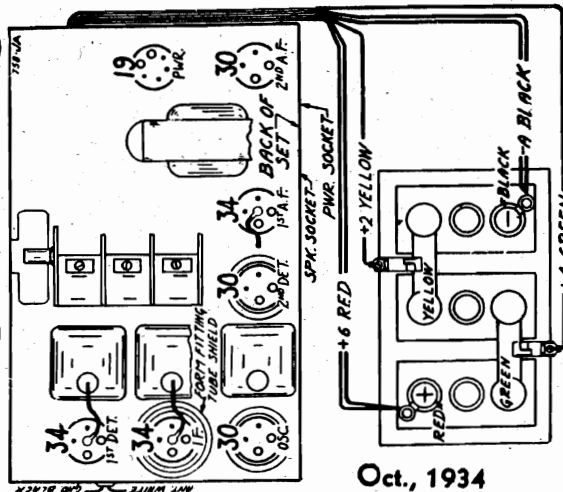
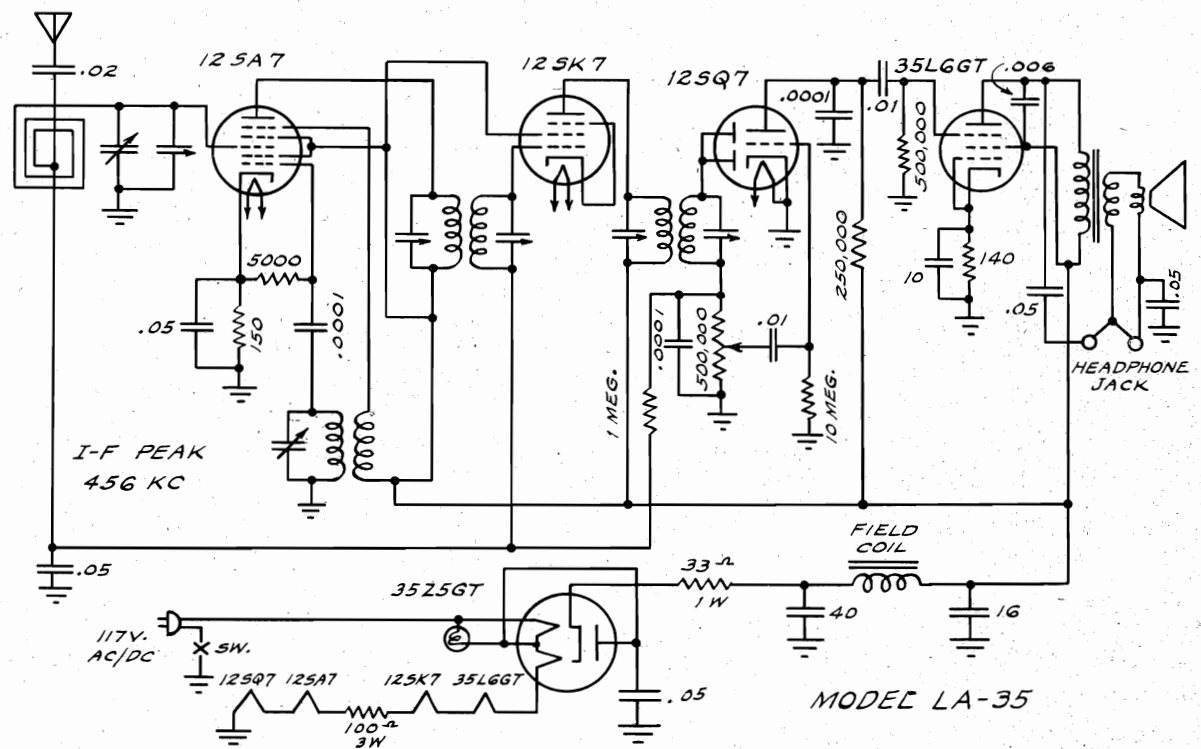
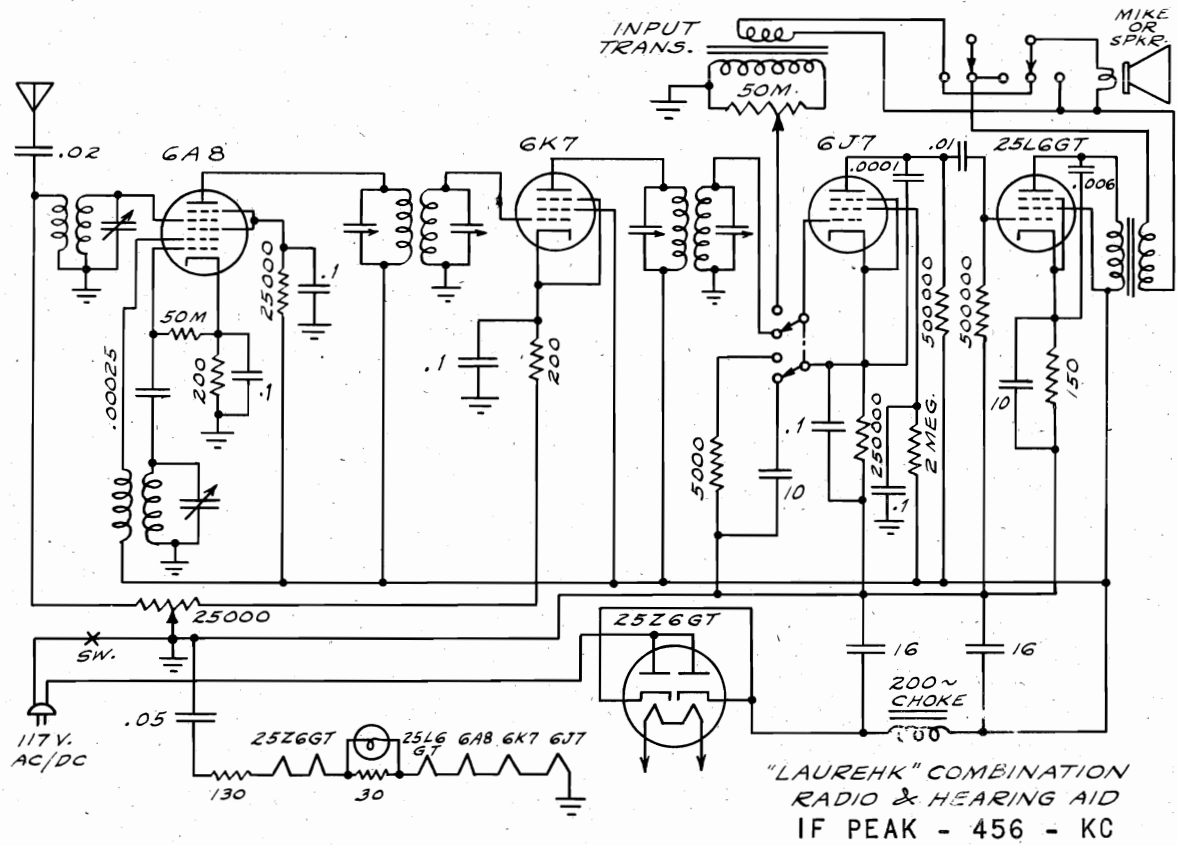


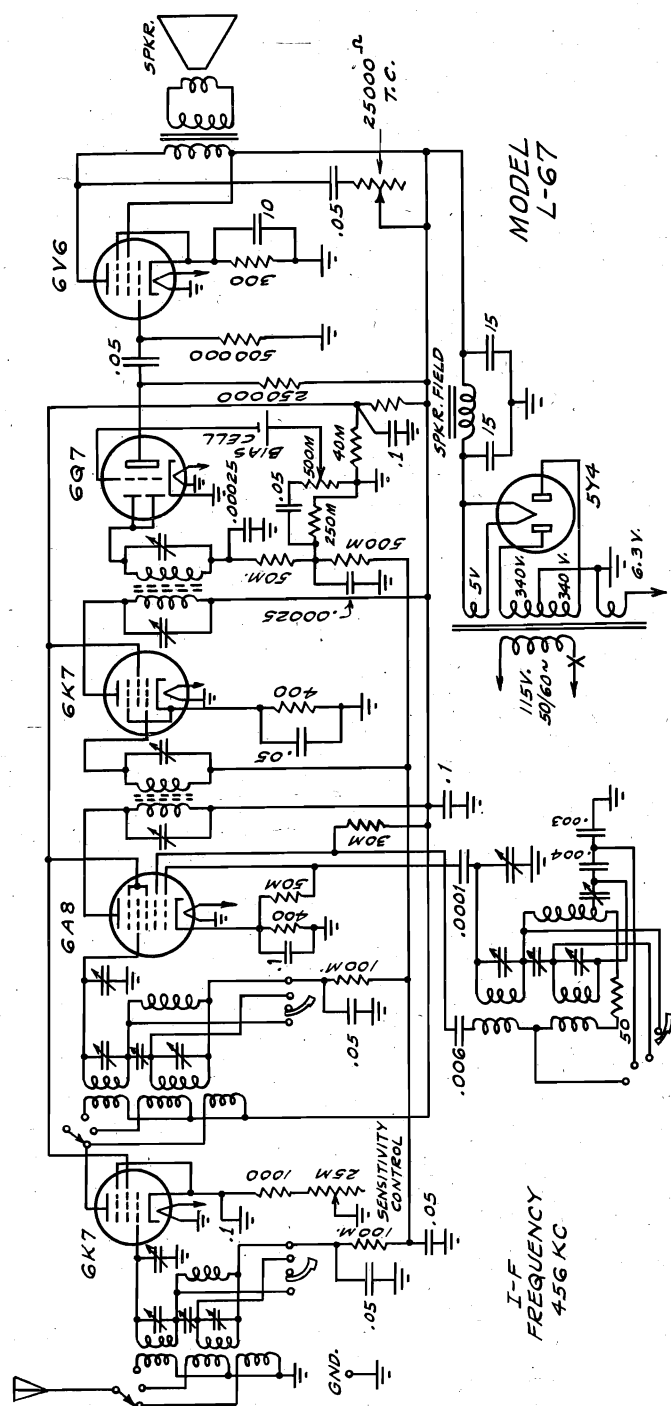
Fig. 2. Location of Tubes and Battery Connections

MODEL IA35
LAUREHK RADIO MFG. CO. MODEL Radio-Hearing Aid
Schematics



MODEL L67
Schematic, Alignment

LAUREHK RADIO MFG. CO.



The I. F. Amplifier is aligned in the usual manner. Connect a service oscillator between the chassis and the grid of the 6A8 tube, using a condenser .0005 mfd. to .25 mfd. between the grid and the high side of the generator output. Do not remove the grid clip for this operation. The Range Switch should be turned to the Broadcast band and the dial set near 600 Kc; then proceed with alignment at 456 Kc.

Turn the audio Volume Control and Sensitivity Controls on full. Increase the output of the service oscillator until a signal is just audible. Adjust each I. F. Trimmer so that maximum volume is obtained. It is best to repeat this procedure two or three times on each trimmer to obtain the most accurate adjustment. These trimmers are adjusted with a small screw driver through the openings in the top of the shield on each I. F. transformer.

The service oscillator should now be connected to the antenna and ground terminals of the receiver, through the proper dummy antenna.

Close the gang condenser and see that the dial pointer position coincides with the last line at the low-frequency end of the dial. If this condition does not obtain, loosen the set-screw on the dial drum, make the necessary correction, and firmly tighten the screw.

Turn the range switch to the Short-Wave (extreme clockwise) position, set the dial and the service oscillator to 17 Mc, connect a 400 ohm resistor between the service oscillator and the antenna binding post as a dummy antenna, turn the output of the service oscillator up to maximum, tighten the top trimmer in the oscillator coil until just snug, then loosen it four turns and then as the trimmer is tightened, set it to the position of maximum response, reducing the output of the service oscillator as alignment proceeds. (If two responses are found of nearly equal intensity, adjust for the one with the trimmer farthest open). Align the

top trimmers in the RF coil, but since the RF adjustment has some effect on the oscillator frequency it will be necessary to rock the dial slightly to keep the signal tuned in. Having aligned the oscillator and RF circuits adjust the top trimmer in the Antenna coil for maximum sensitivity, reducing the output of the service oscillator as the receiver becomes progressively more sensitive. If the receiver tends to "motor-boat", turn down the service oscillator output until the trouble stops. Some service oscillators, however, leak through enough signal that even with the output control set at zero, the receiver is still overloaded, in which case it is necessary to turn down the Sensitivity and Audio Controls until the receiver behaves properly.

Turn the Range Switch to the "Police" or middle range and set the service oscillator and dial at 4.8 Mc. Align first the oscillator, then the RF and Antenna coils on this band - lower trimmer on all three coils, in a manner similar to that used on the Short Wave band. Both the Short Wave and Police band ranges have fixed padding condensers.

Turn the Range Switch to the Broadcast position, substitute a 200 mfd. condenser for the 400 ohm resistor as a dummy antenna, set the dial and the service oscillator to 1400 Kc. and align the circuits again (middle trimmer) in the same manner as described above. Having done this, set the service oscillator to 600 Kc. and tune the receiver dial for maximum response in the neighborhood of 600 Kc. Next, rock the dial back and forth across the signal, at the same time adjusting the padding condenser, turning continuously in one direction until the output of the receiver, as it is rocked across the signal, becomes maximum. If the padding is turned too far, the output will drop off again. A few minutes experiment with this operation will show more than a lengthy description. Having completed the padding operation, return the receiver and the generator to 1400 Kc. and realign as before. This completes the alignment of the Broadcast band and of the receiver.

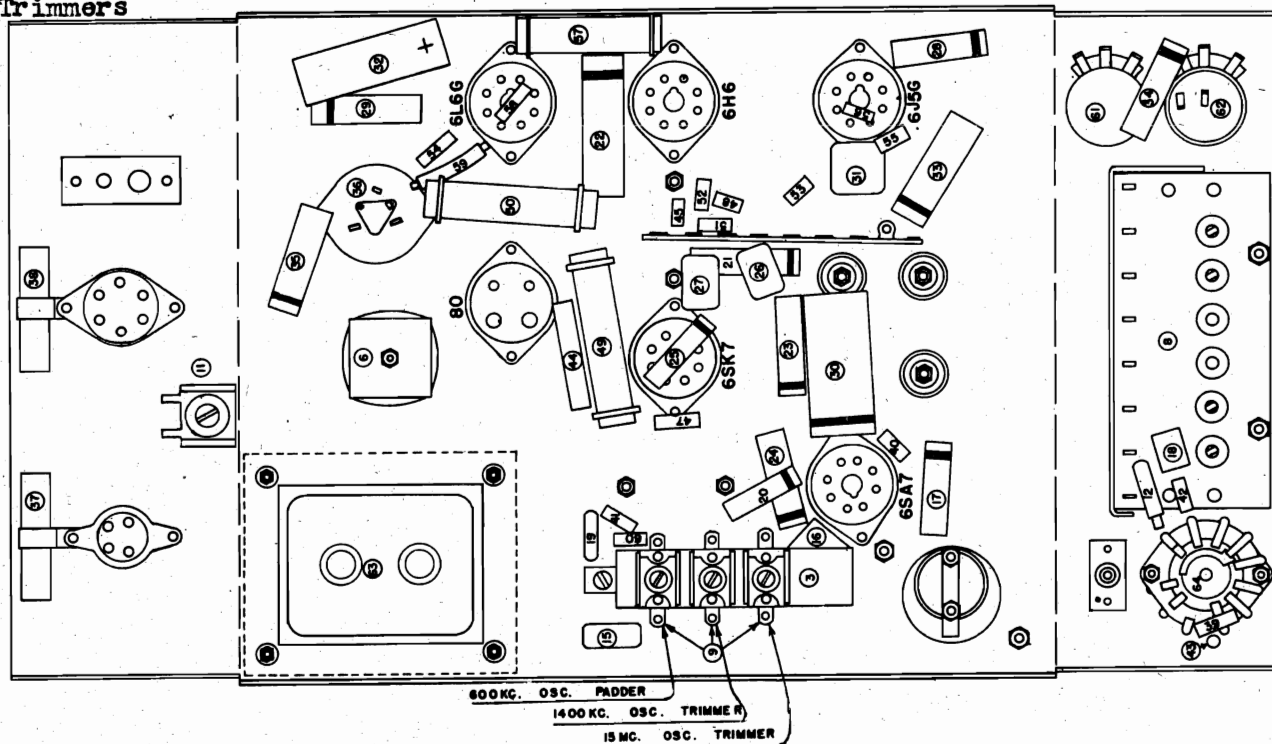


CHASSIS CR134, CR137

CR144

THE MAGNAVOX CO., INC.

Chassis, Alignment
Trimmers



SPECIFICATIONS

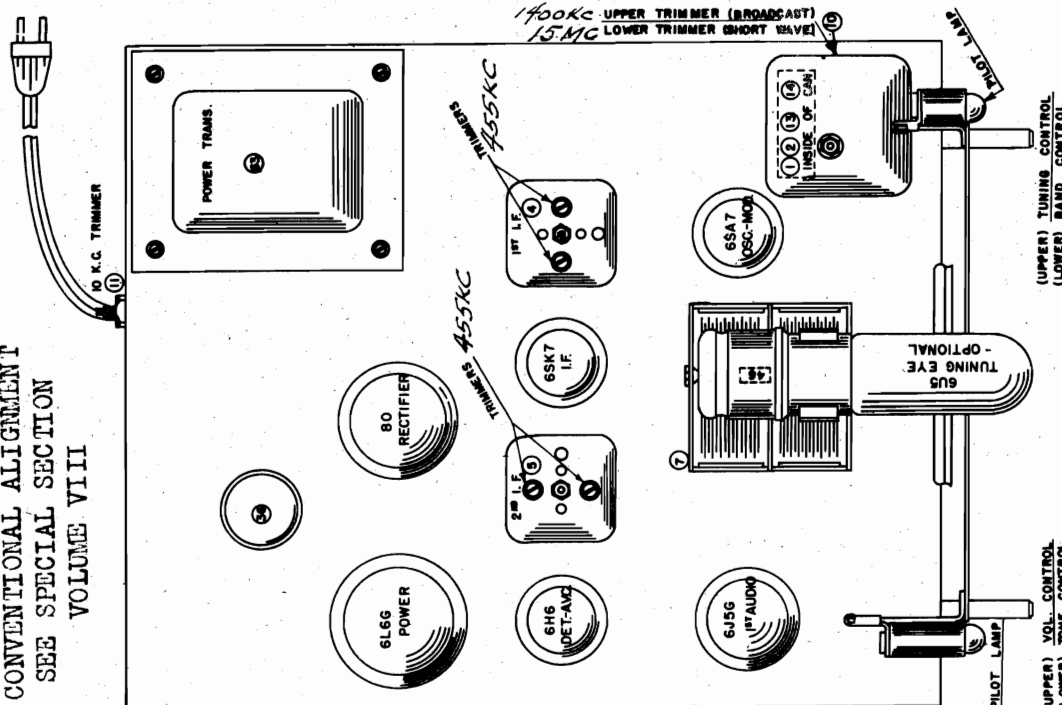
Primary voltage.....117 V. AC; Intermediate frequency.....455 KC;
Power consumption..... 90 watts; Tuning frequency range: 535 - 1730 KC;
Power output..... 6 watts; 5.7 - 18.1 MC;

Circuit: Superheterodyne with two tuning ranges, treble control, A.V.C.; bass compensation in volume control for phonograph
Speaker:
Field coil..... 750 ohms; pickup; push-button condenser-type tuner.
Transformer.....3500 ohms;

CR-134 --- Used in Concerto Combination.

CR-144 --- Used in Chairside and Modern American Combinations, same as CR-134 with addition of tuning eye.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



CHASSIS CR134, CR136, CR140

CR142, CR143 to CR153 incl. THE MAGNAVOX CO., INC.

10-kc Filter Adjustment

CHASSIS CR141, CR142

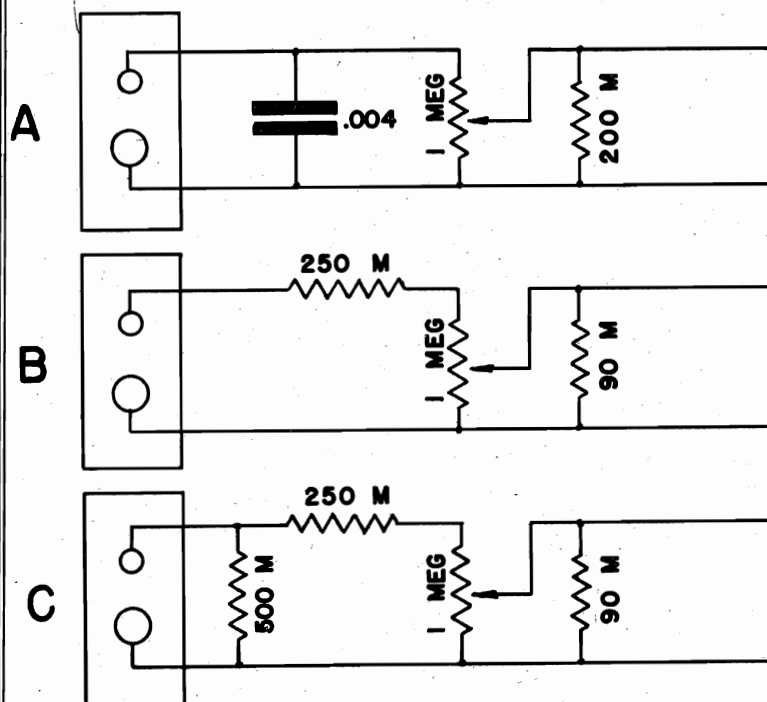
MODEL CR-141 and CR-142.

Changes

Since the first production of this model was released, several circuit changes have been made to improve the fidelity and volume of phonograph reproduction. These changes were made at two different times and are shown in Figures B and C.

Figure A shows the original circuit. It is possible to check the phonograph input circuit on this radio without removing the chassis from the cabinet by the use of an ohmmeter, according to instructions shown.

TURN WAVE SWITCH TO PHONO POSITION, REMOVE PICKUP PLUG AND CONNECT OHMMETER TO PICKUP SOCKET—MEASURE RESISTANCE WITH VOLUME CONTROL OFF AND FULL ON.



VOLUME CONTROL
OFF ON
1 MEG 157,000~

VOLUME CONTROL
OFF ON
1,250,000~ 332,500~

VOLUME CONTROL
OFF ON
356,000~ 200,000~

IF IT IS FOUND THAT CIRCUIT "A" OR "B" IS USED, CHANGE TO CIRCUIT "C".

10 K.C. FILTER ADJUSTMENT

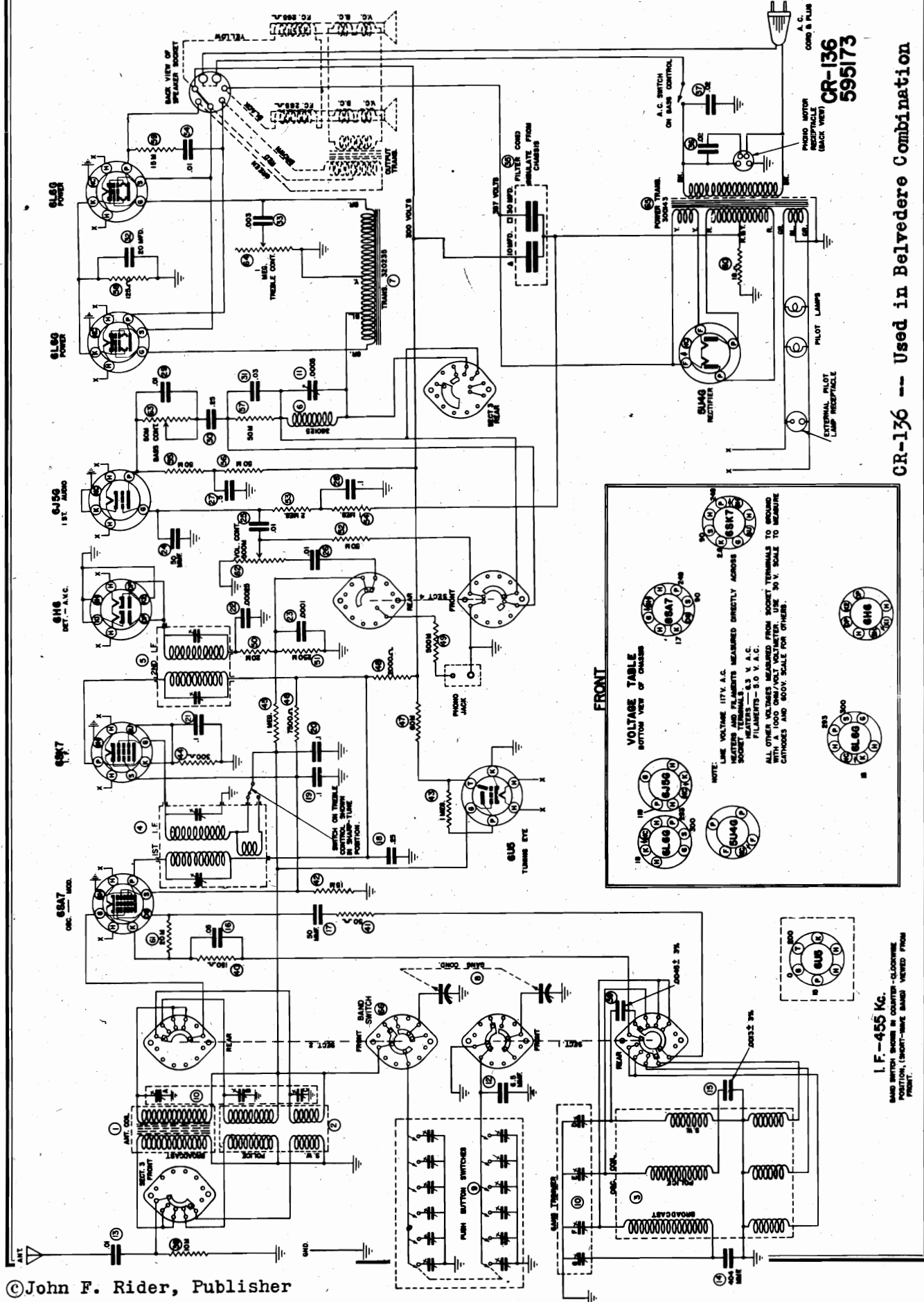
MODELS CR-136, CR-146, CR-147, CR-148, CR-149, CR-152, CR-153.

With the tone control set for maximum treble response and the Band Expander set in the High Fidelity position (accomplished by rotating the treble control to the right as far as possible), tune the receiver to a point between two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by retuning the 10 KC output filter by means of the 10 KC trimmer condenser at the rear center of the chassis. In the absence of such a signal source in the daytime, an ACCURATE audio oscillator may be used to feed a 10 KC into the volume control.

MODELS CR-134, CR-140, CR-142, CR-144, CR-143, CR-145, CR-150, CR-151.

With the tone control set for maximum treble response, tune the receiver to a point between two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by retuning the 10 KC output filter by means of the 10 KC trimmer condenser at the rear center of the chassis.

CR-136 -- Used in Belvedere Combination



CHASSIS CR136
Chassis, Alignment
Socket, Trimmers

THE MAGNAVOX CO., INC.

Circuit: Superheterodyne with three tuning ranges, treble and bass controls, I.F. band expansion, A.V.C., bass compensation control for phonograph pickup.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII
SPECIFICATIONS

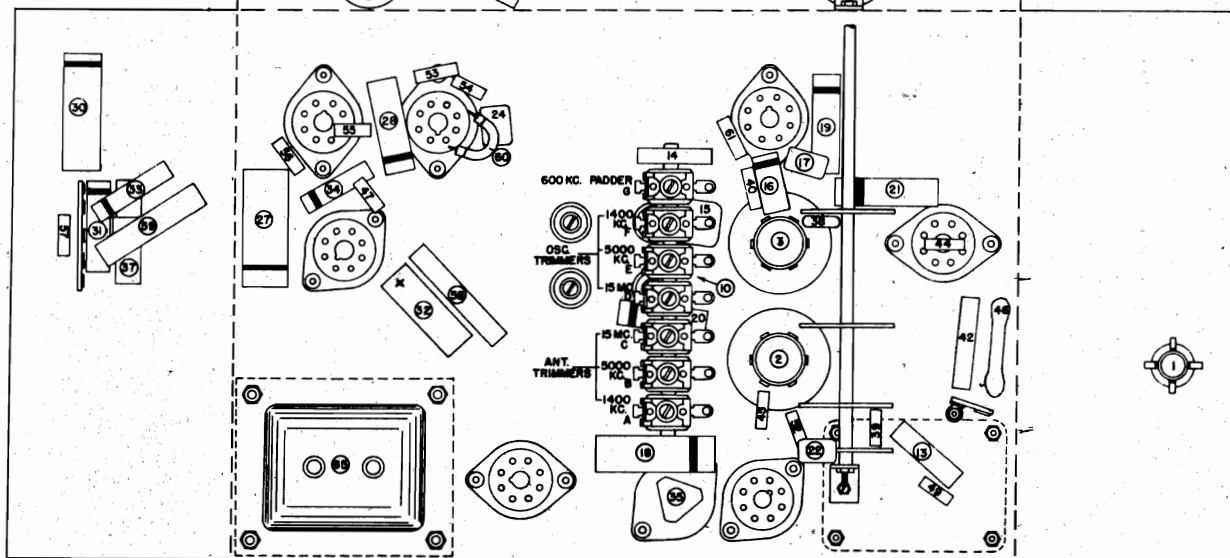
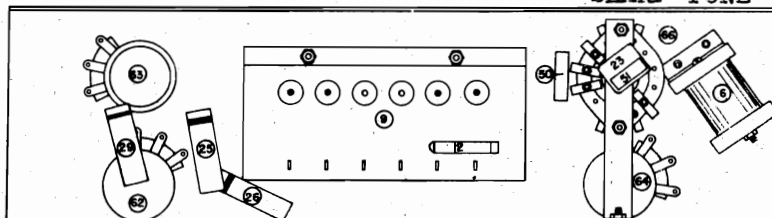
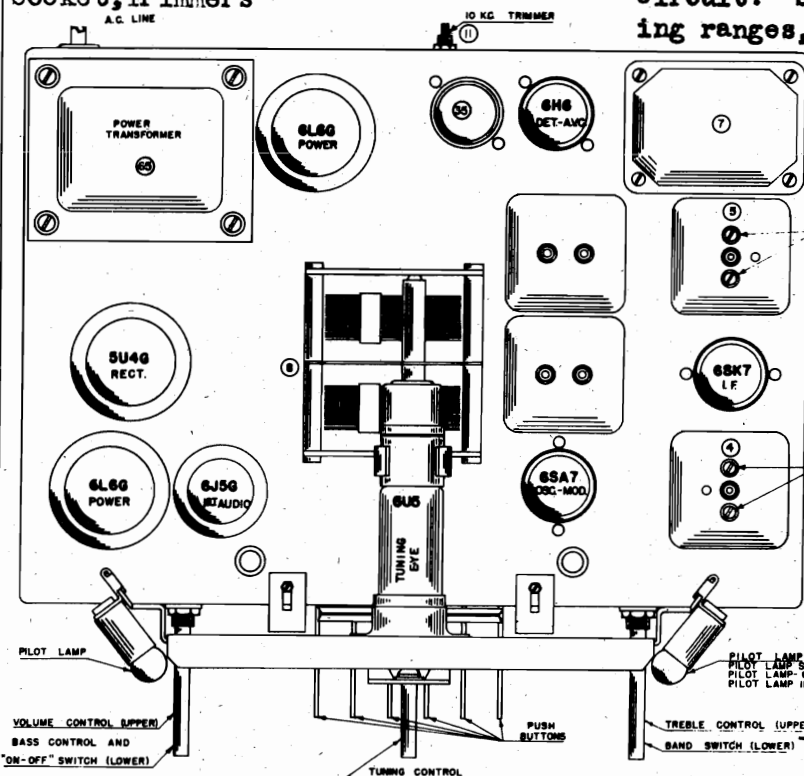
Primary voltage...117 V. AC;
Power consumption...134 watts;
Power output..... 20 watts;
Speaker (12C131):

455KC Field Coil... 250 ohms;
Transformer.. NONE

Speaker (302):
Field Coil... 250 ohms;
Transformer.. 5M ohms ;
(for dual speakers)

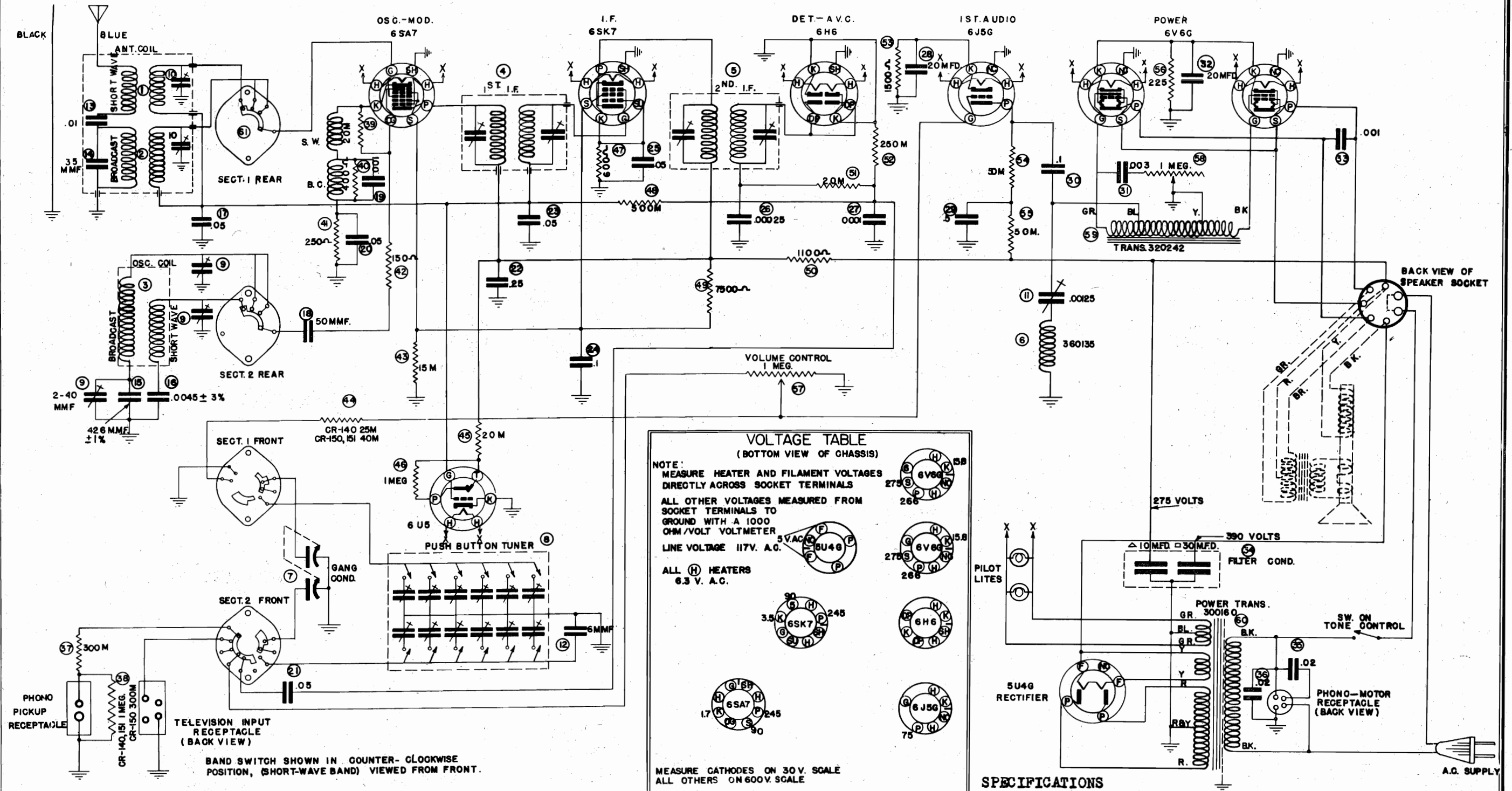
Intermediate frequency 455 KC;
Tuning range: 535 - 1730 KC;
1.65 - 5.8 MC;
5.6 - 18.2 MC;

ALIGNMENT NOTE:
KEEP BAND EXPANDER SWITCH IN
"SHARP TONE" POSITION DURING
ALL ADJUSTMENTS.

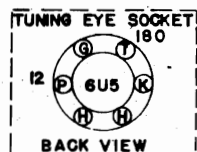


CR-136
595173

THE MAGNAVOX CO., INC.

CHASSIS CR140, CR150, CR151
Schematic, Voltage


I.F. 455 K.C.

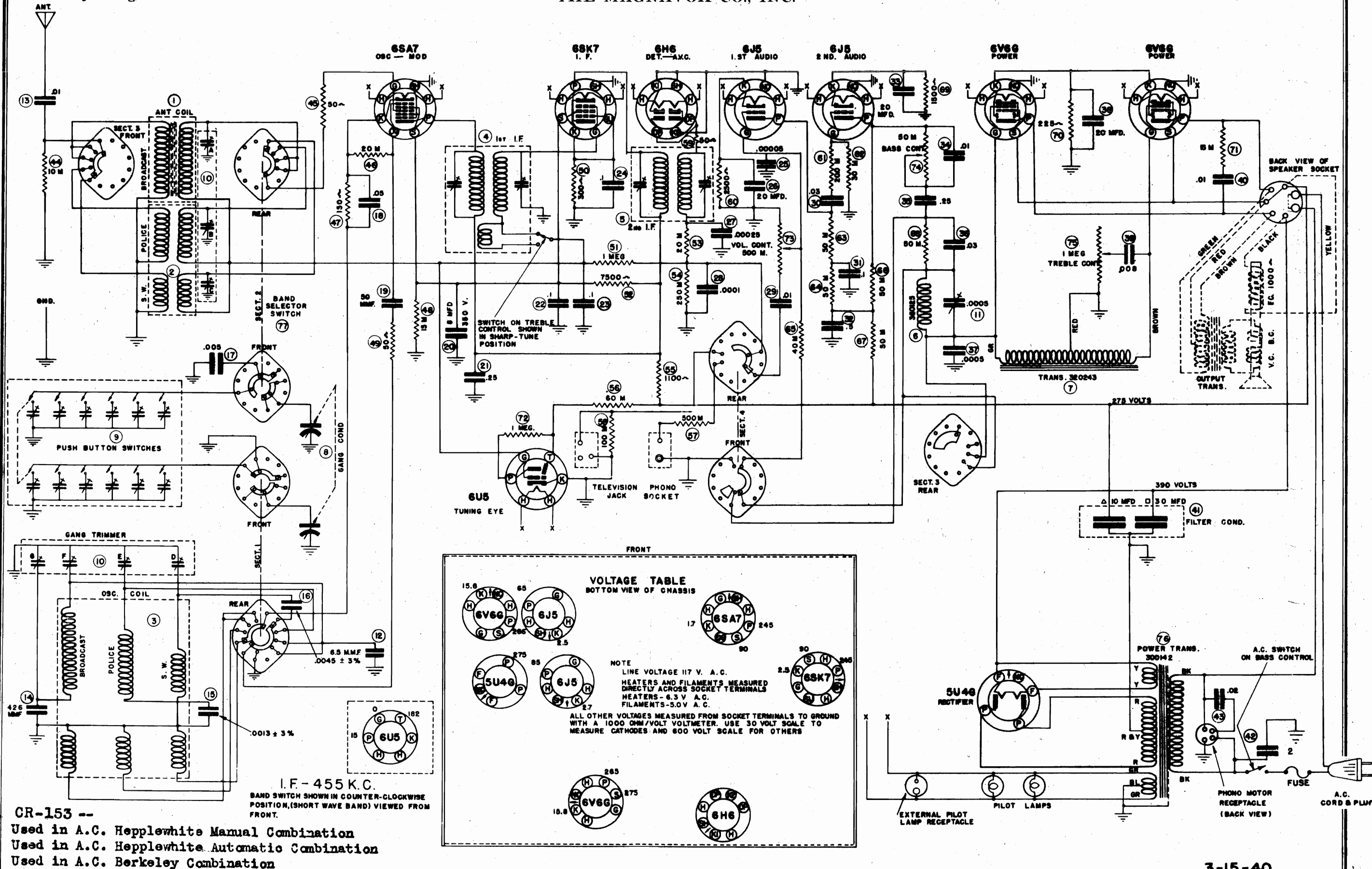

CR-140
CR-150-595184-CR-151
CR-140 Used in American Modern Combination
Used in Chairside Combination
Used in Sheraton Combination

CR-150 Used in Grinnell Model 60 Combination
Used in Chippendale Combination

CR-151 Used in Sheraton Combination

CHASSIS CR153
Schematic, Voltage

THE MAGNAVOX CO., INC.

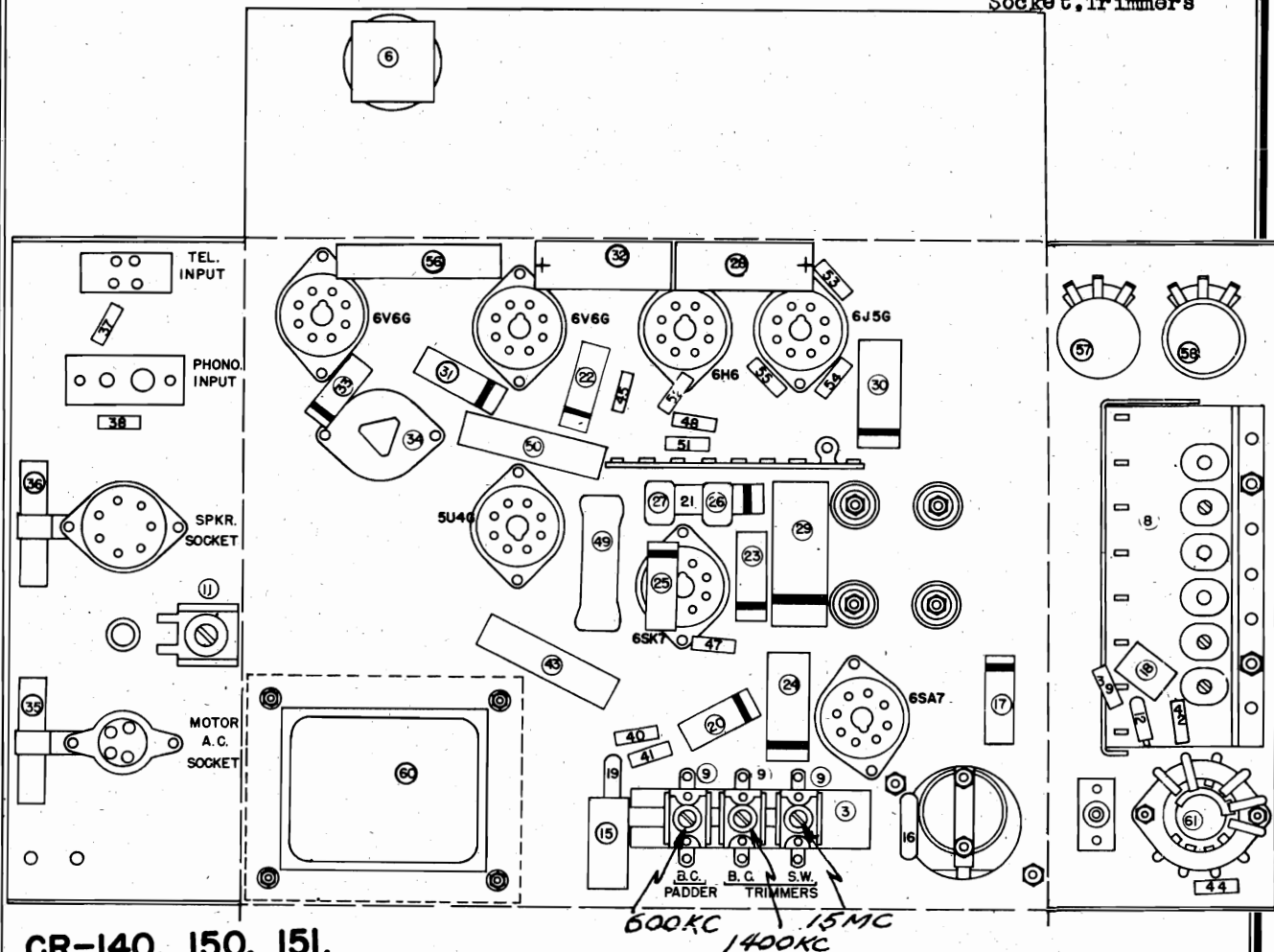
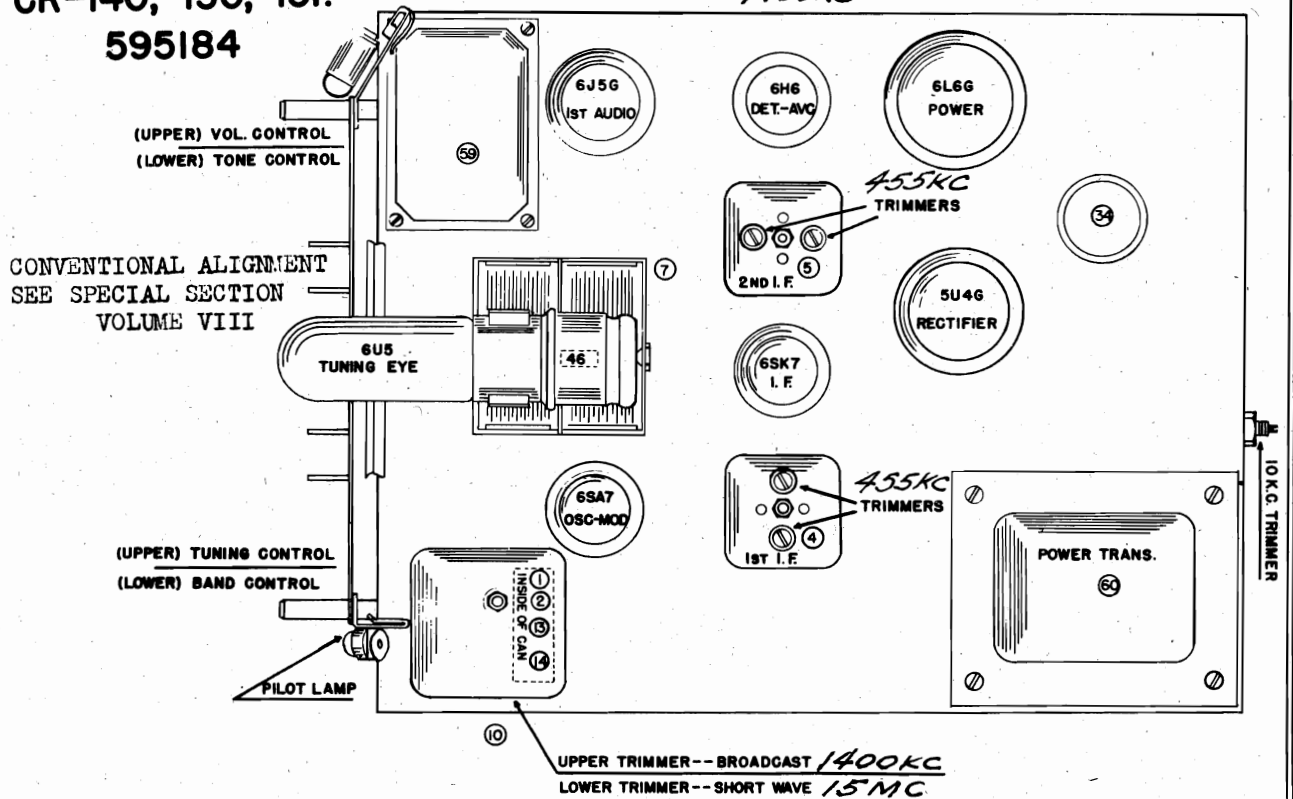


3-15-40

THE MAGNAVOX CO., INC.

CHASSIS CR140, CR150

CR151

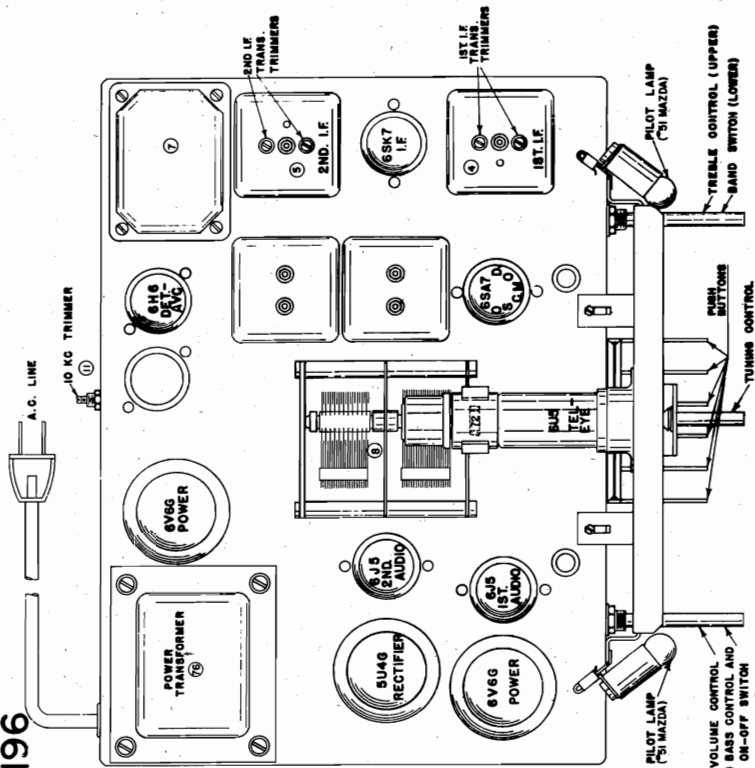
Chassis, Alignment
Socket, TrimmersCR-140, 150, 151.
595184

TO REMOVE THE CHASSIS FROM THE CABINET:

BERKELEY AND HEPPLEWHITE UNITS

1. Remove the four plugs from the lower side of the chassis and remove the antenna-ground terminal board from the side of the cabinet.
2. Pull the control knobs and the push button knobs from their shafts.
3. Remove the stay-hinge from the lid of the cabinet by removing the two upper wood screws holding it in place. Tilt the cabinet lid back and rest it on a support.
4. Remove the stay-hinge plate from the radio panel.
5. Remove the Phillips-head wood screws, securing the radio panel, and lift the panel from the cabinet.
6. Loosen the four screws securing the chassis to the cabinet cleats, and lift the chassis from the cabinet.

CAUTION: Do not remove the mounting brackets from the chassis at any time.



CAUTION:
CR153-595196

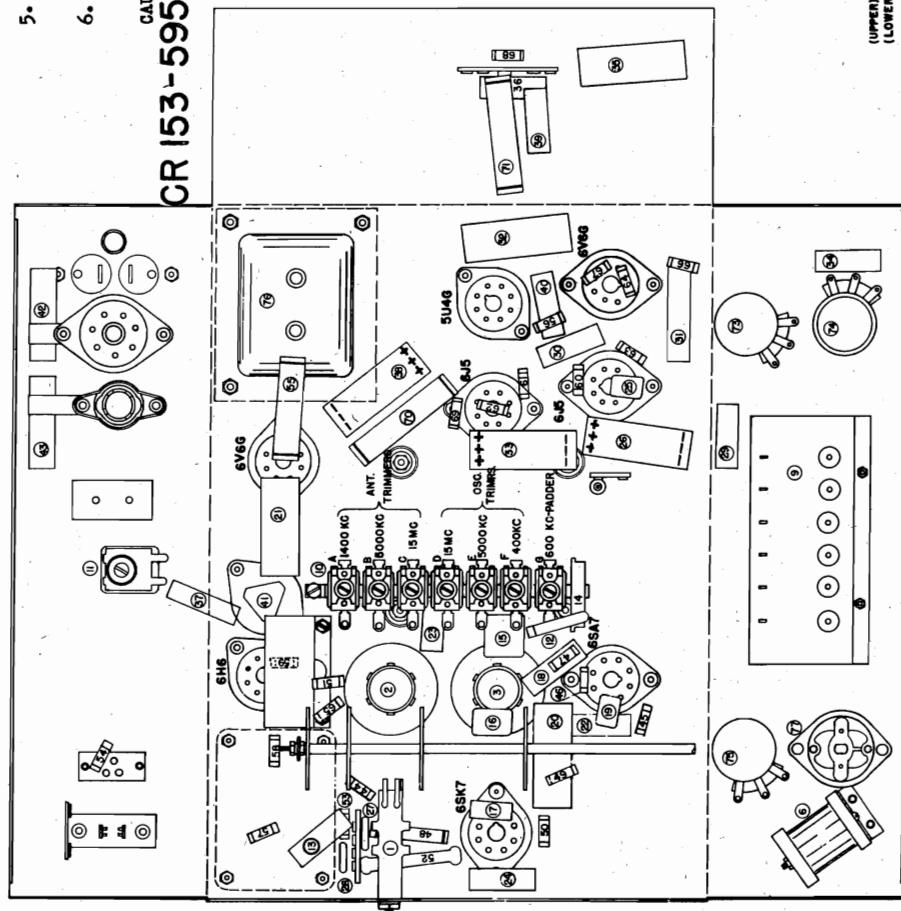
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

SPECIFICATIONS

| | | | |
|------------------------|------------|-----------------------------|----------------|
| Primary voltage..... | 117 V. AC; | Intermediate frequency..... | 155 KC; |
| Power consumption..... | 103 watts; | Tuning frequency range | 535 - 1730 KC; |
| Power output..... | 12 watts; | | 1.65 - 5.8 MC; |

Speaker:

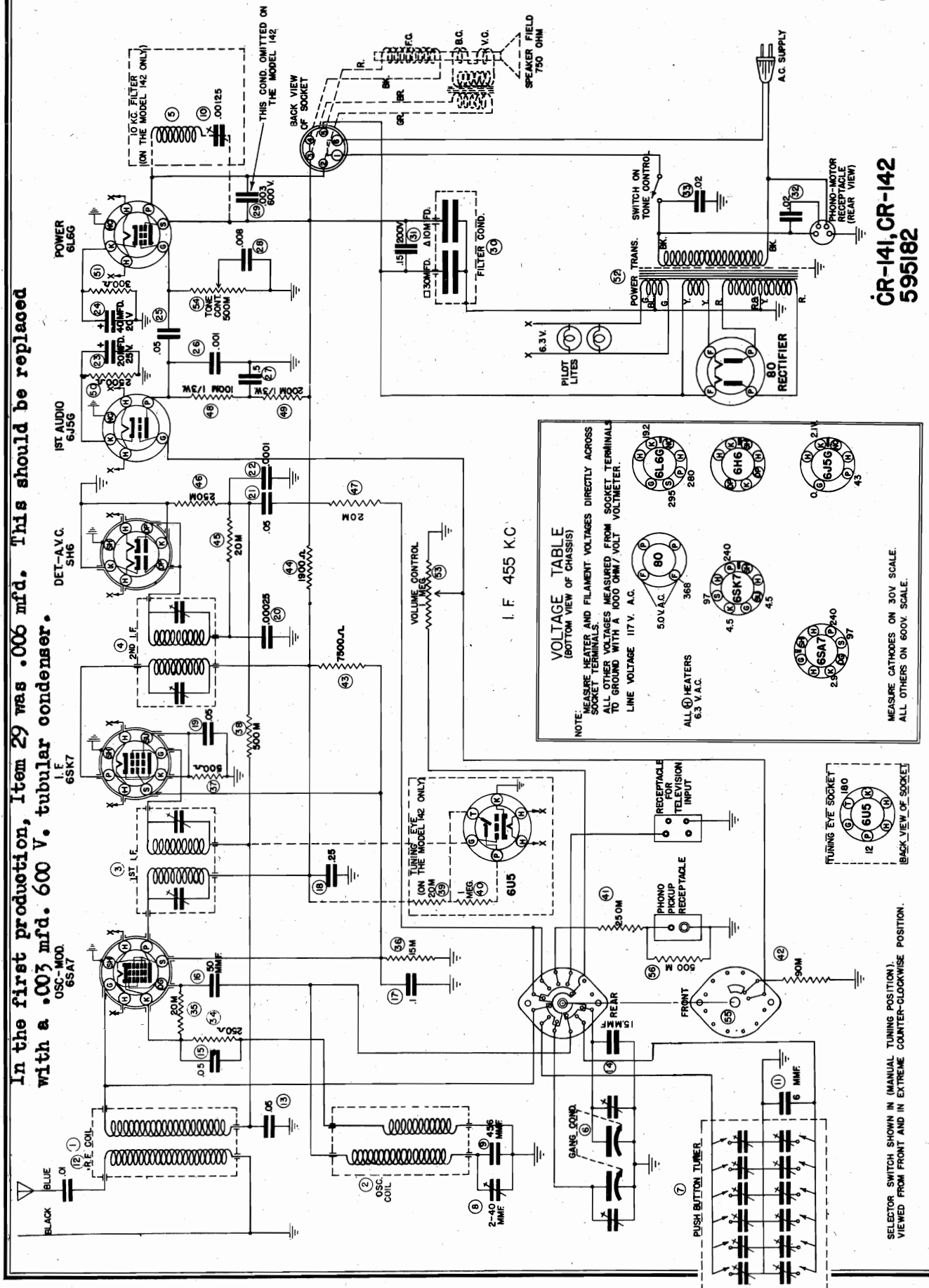
Circuit: Superheterodyne with three tuning ranges, treble and bass controls, bass compensation in volume control for phono-graph pickup, A.V.C., condenser type push-button tuner, variable selectivity.



THE MAGNAVOX CO., INC.

CHASSIS CR141, CR142
Schematic, Voltage

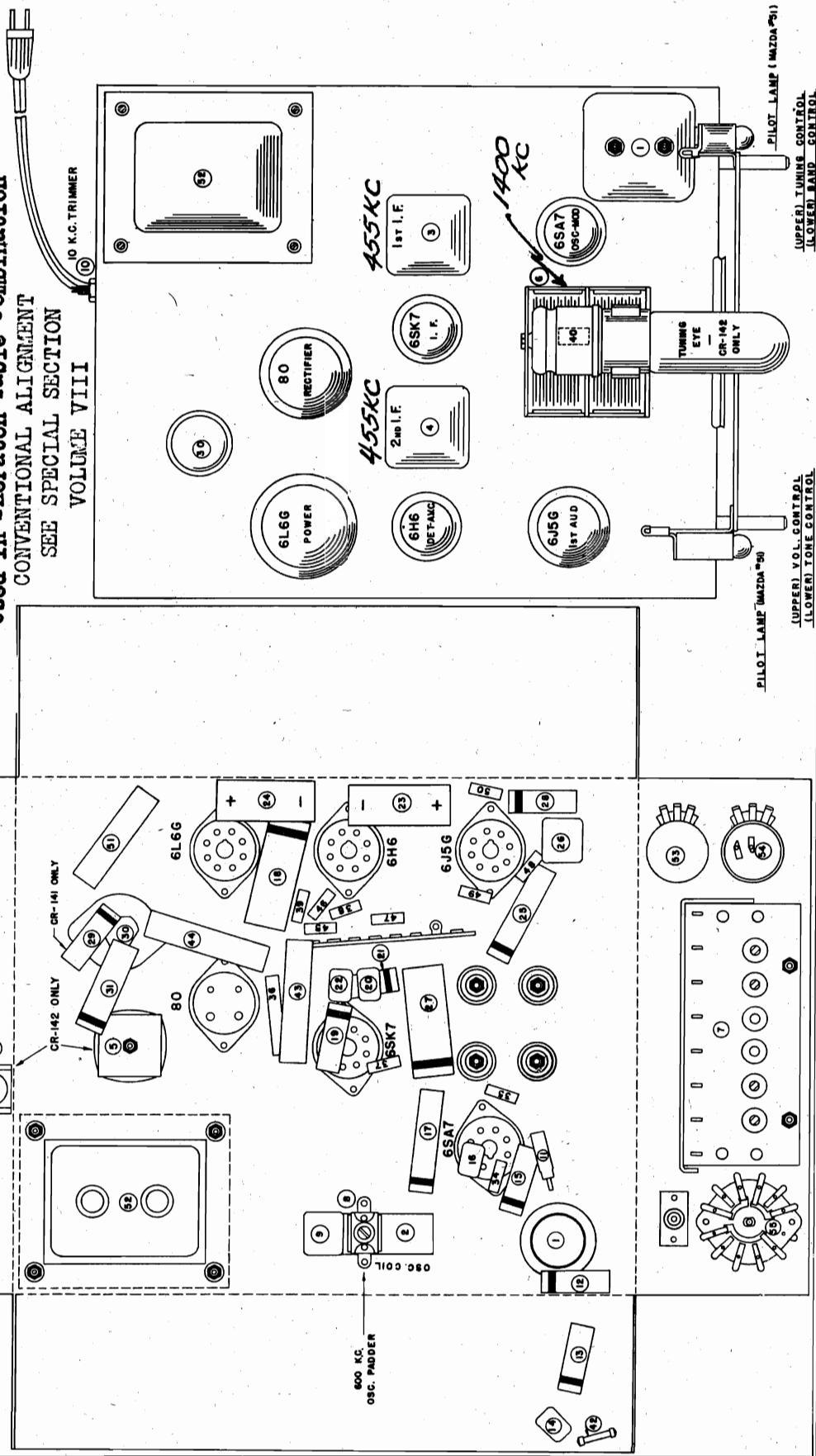
In the first production, Item 29 was .006 mfd. This should be replaced with a .003 mfd. 600 V. tubular condenser.



Intermediate frequency.....455 KC;
Tuning frequency range... 535-1730 KC;
Circuit: Superheterodyne with treble
control; push-button condenser type
tuner; A.V.C.; bass compensation in
volume control for phonograph pickup;
television input receptacle.

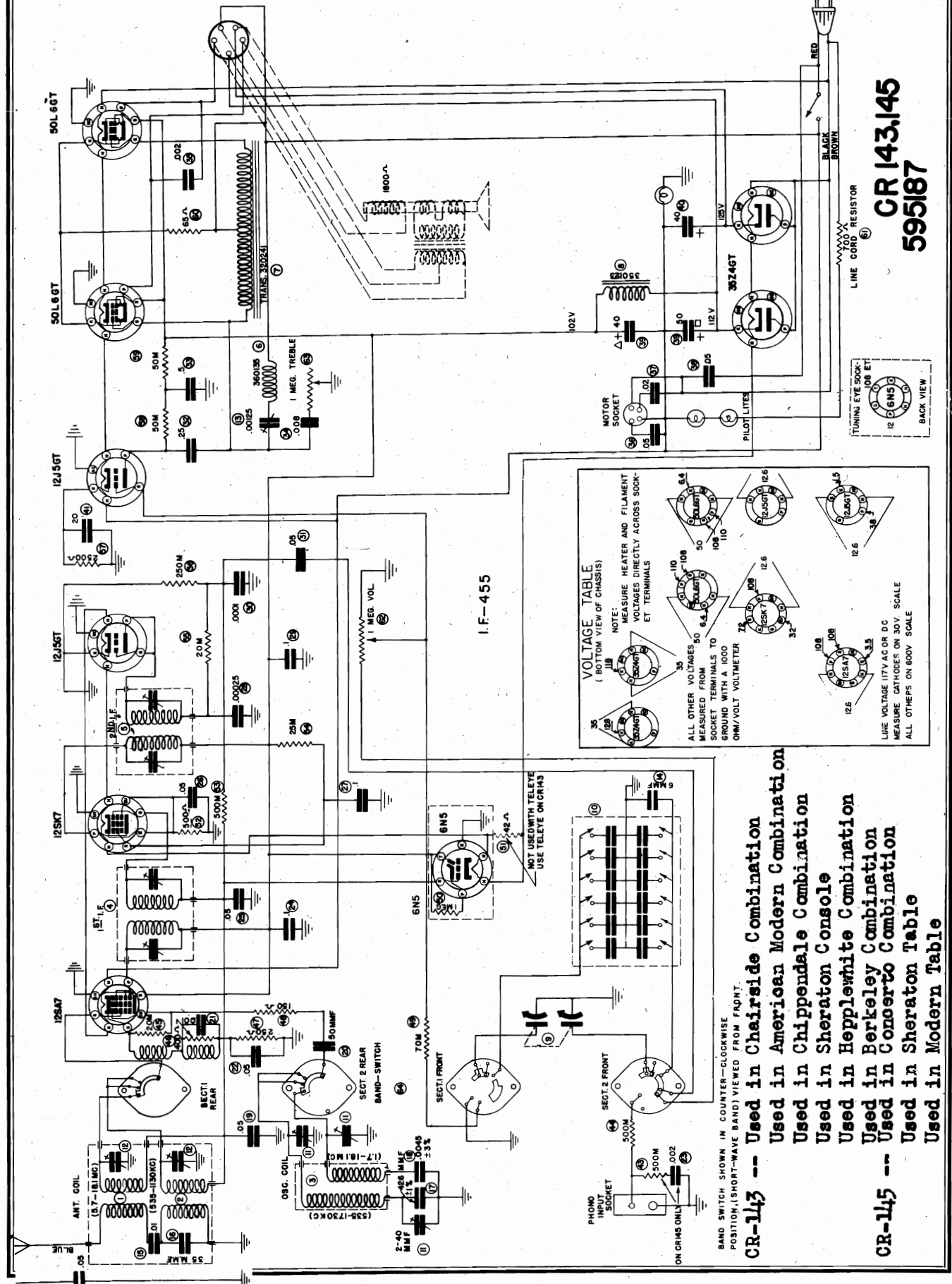
CR-141 -- Used in Concerto Combination
Used in Modern Table Combination
Used in Sheraton Table Combination

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



THE MAGNAVOX CO., INC.

CHASSIS CR143, CR145
Schematic, Voltage



THE MAGNAVOX CO., INC.

SPECIFICATIONS

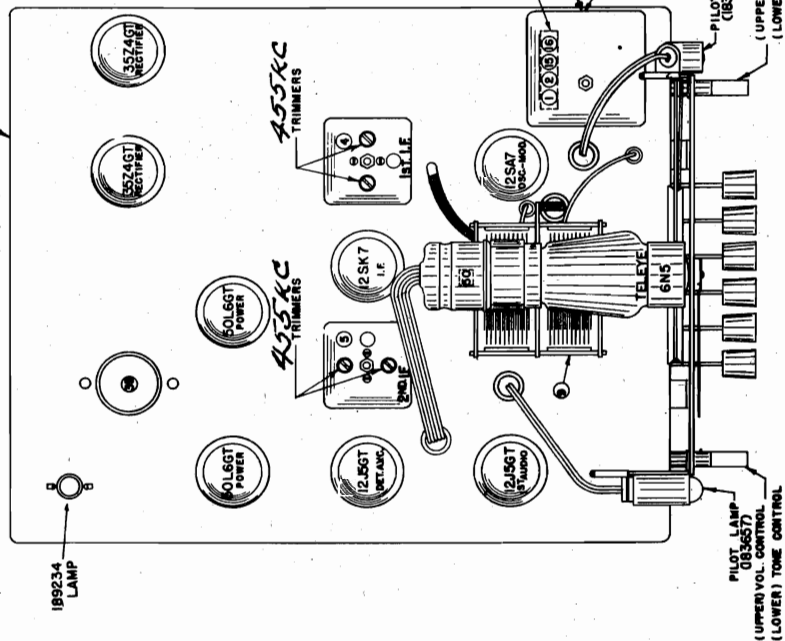
Primary voltage.....117 V. AC-DC;
Power consumption..... 85 watts;

Speaker:

Field Coil.....1800 ohms;
Transformer.....3000 ohms;

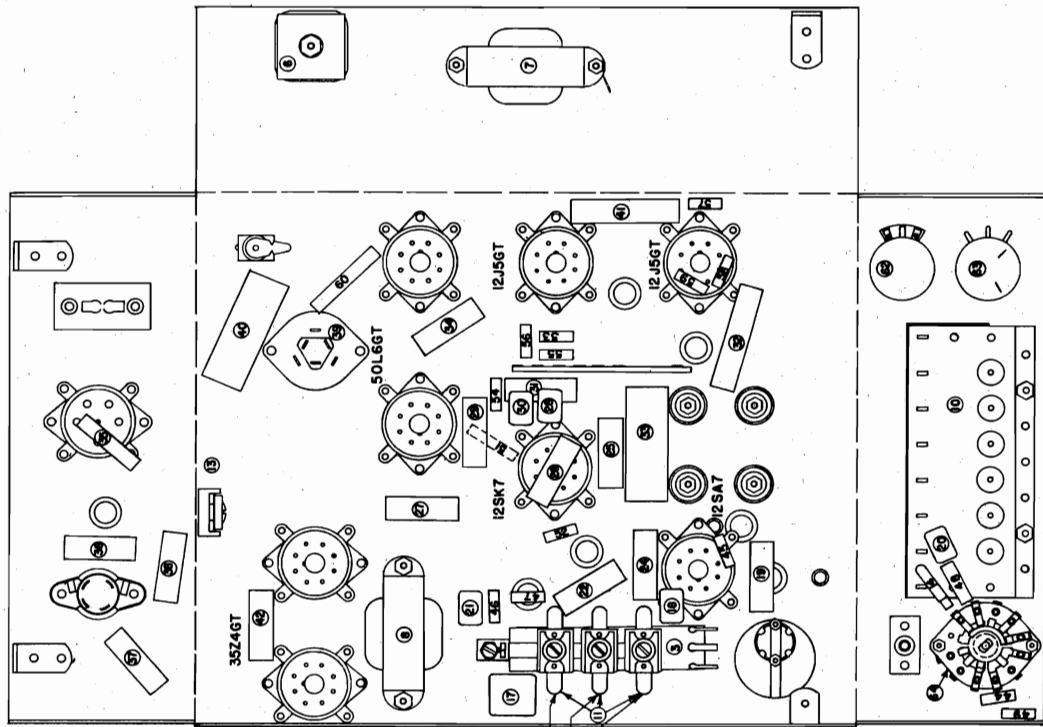
Intermediate frequency.....455 KC;
Tuning frequency range: 535 - 1730 KC;
5.7 - 18.1 MC;

10 K.C. TRIMMER—



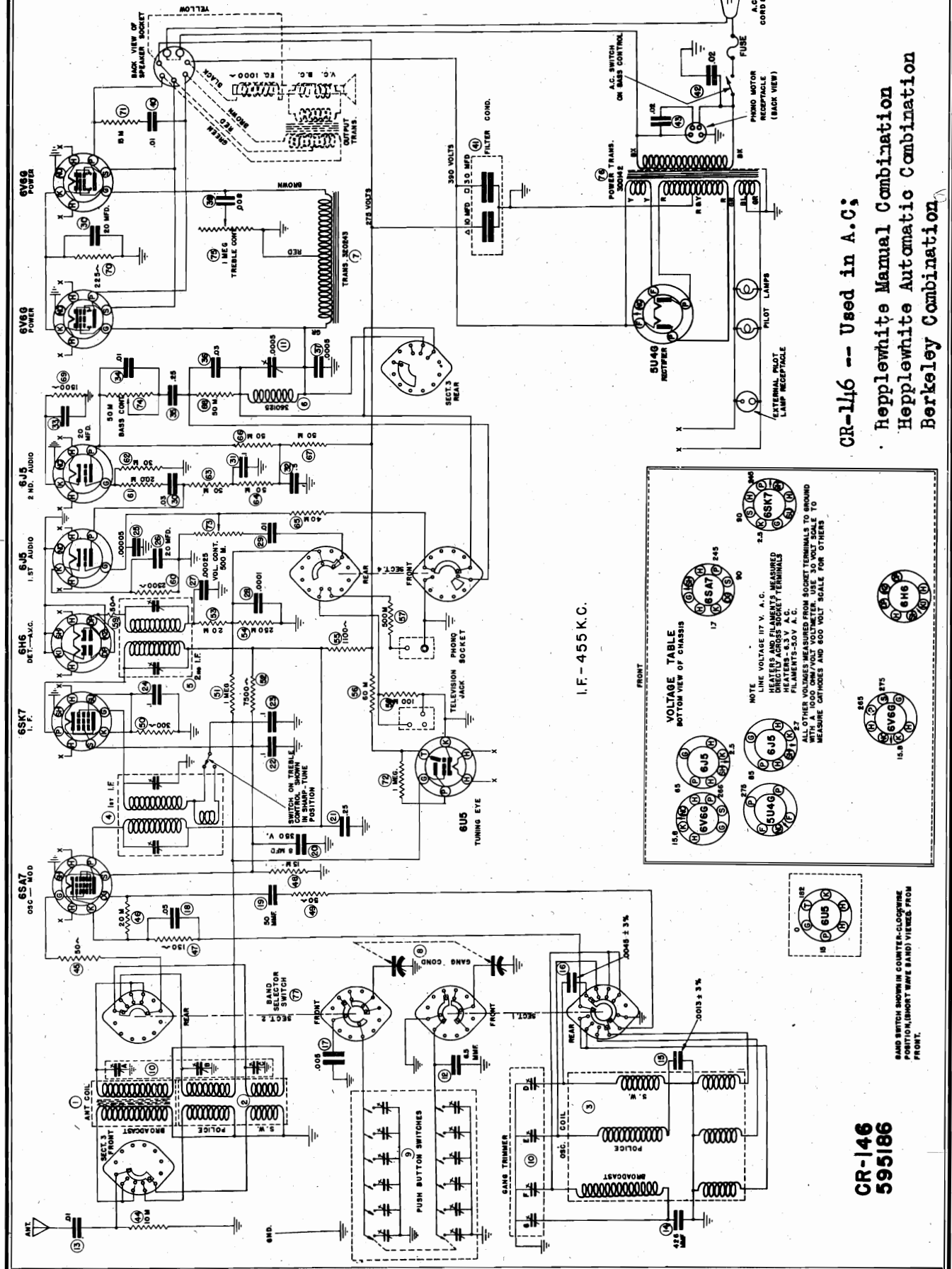
CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

CR-143,145.
595187



Circuit: Superheterodyne with two tuning ranges, treble control; A.V.C.; bass compensation in volume control for phonograph pickup; push-button condenser-type tuner.

THE MAGNAVOX CO., INC.

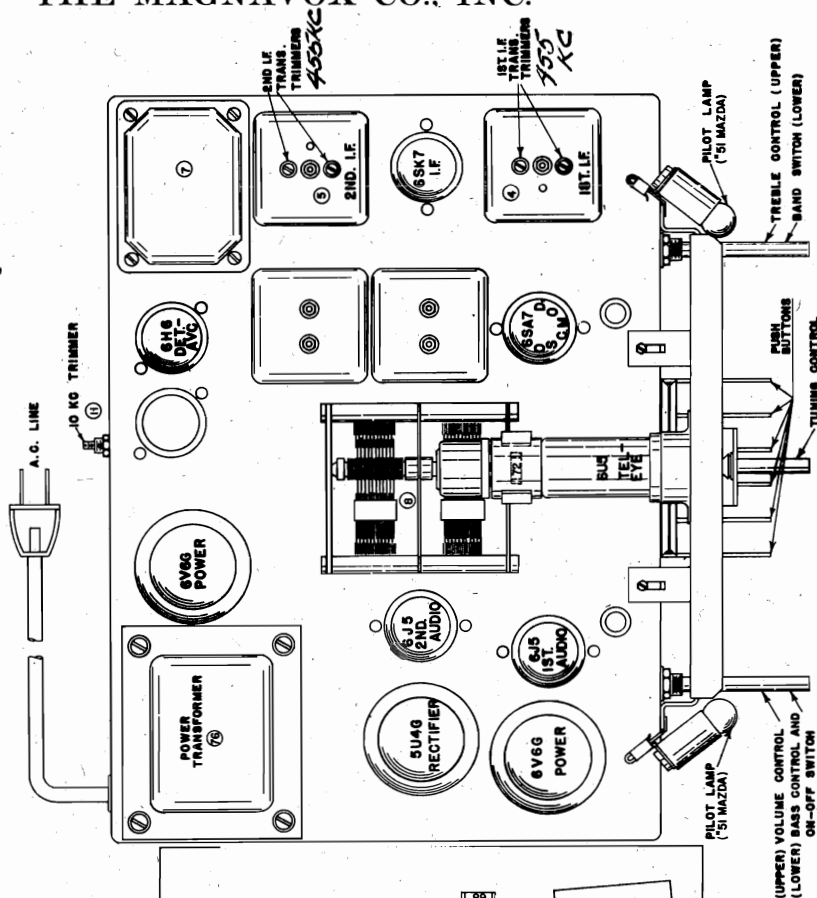
CHASSIS CR146
Schematic, Voltage

Intermediate frequency.....155 KC;
Tuning frequency range 535 - 1730 KC;
 1.65 - 5.8 MC;
 5.60 - 18.2 MC;

Circuit: Superheterodyne with three tuning ranges, treble and bass controls, bass compensation in volume control for phonograph pickup, A.V.C., condenser type pushbutton tuner, variable selectivity.

| | | |
|----------------------|------------|---------------------------|
| Primary voltage..... | 117 V. AC; | Speaker: |
| Power consumption.. | 103 watts; | |
| Power output..... | 12 watts; | Field Coil..... |
| | | Transformer... 8000 ohms; |
| | | 3000 ohms; |

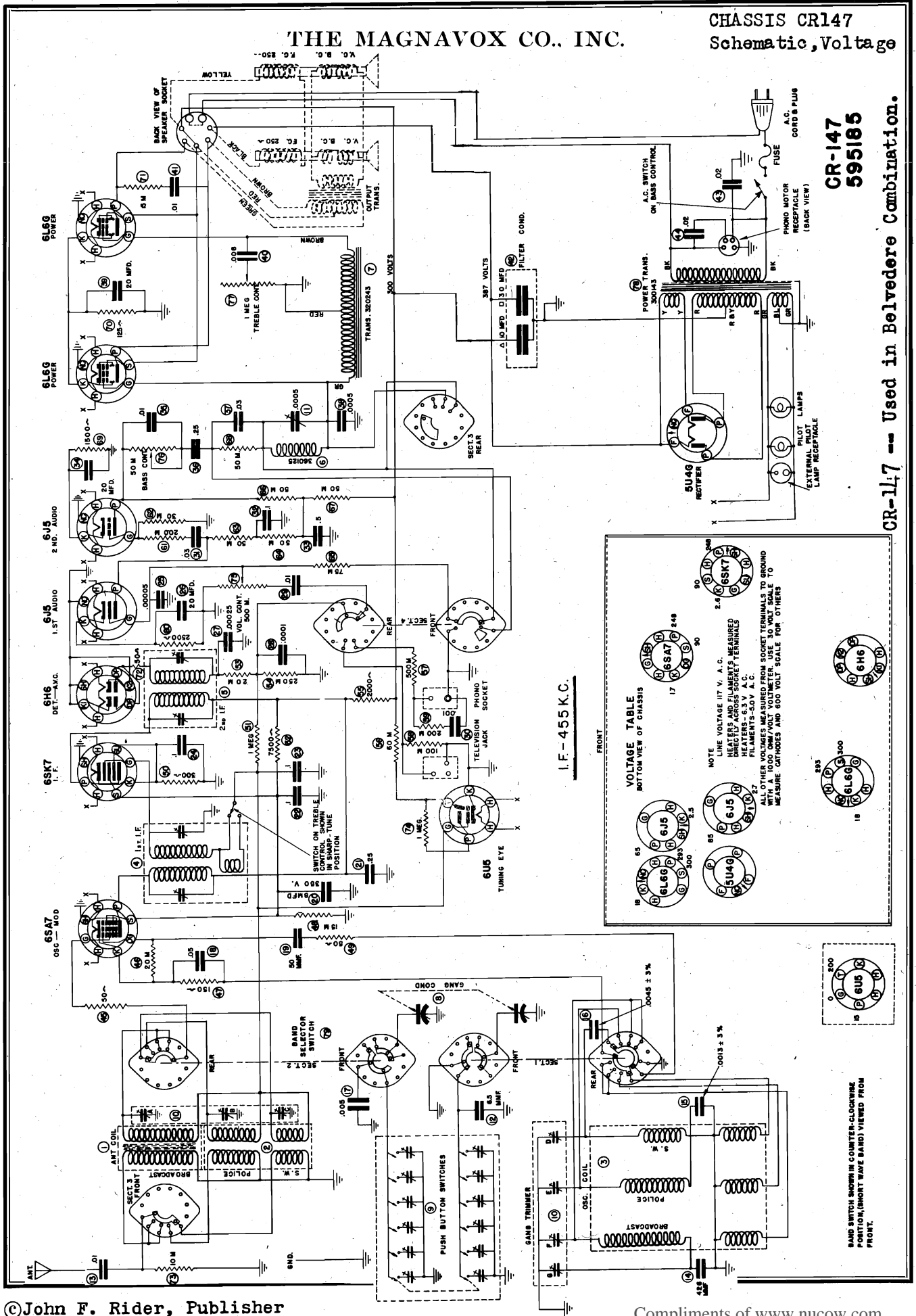
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII



CRI46 595186

CR-147
595185

CR-147 -- Used in Belvedere Combination.



CHASSIS CR147
Chassis, Alignment
Socket, Trimmers

THE MAGNAVOX CO., INC.

SPECIFICATIONS

Speaker (120131):

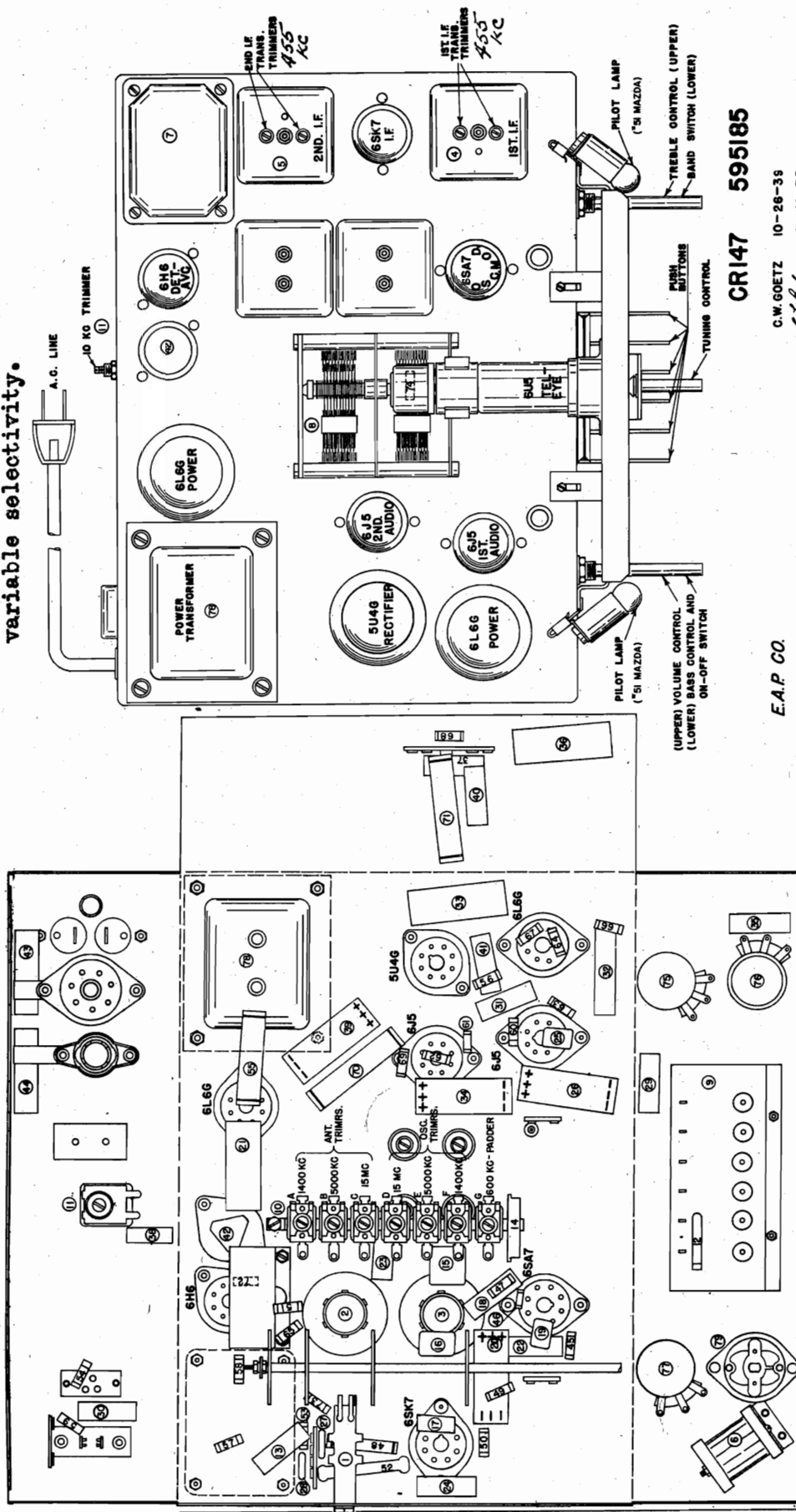
Field Coil..... 250 ohms;
Transformer..... NONE

Speaker (302):

Field Coil..... 250 ohms;
Transformer..... 5M ohms;

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

Intermediate frequency.....455 KC;
Tuning frequency range: 535 - 1730 KC;
1.65 - 5.8 MC;
5.6 - 18.2 MC;
Circuit: Superheterodyne with three tuning ranges, treble and bass controls, I.F. band expansion, A.V.C., bass compensation in volume control for phonograph pickup, variable selectivity.

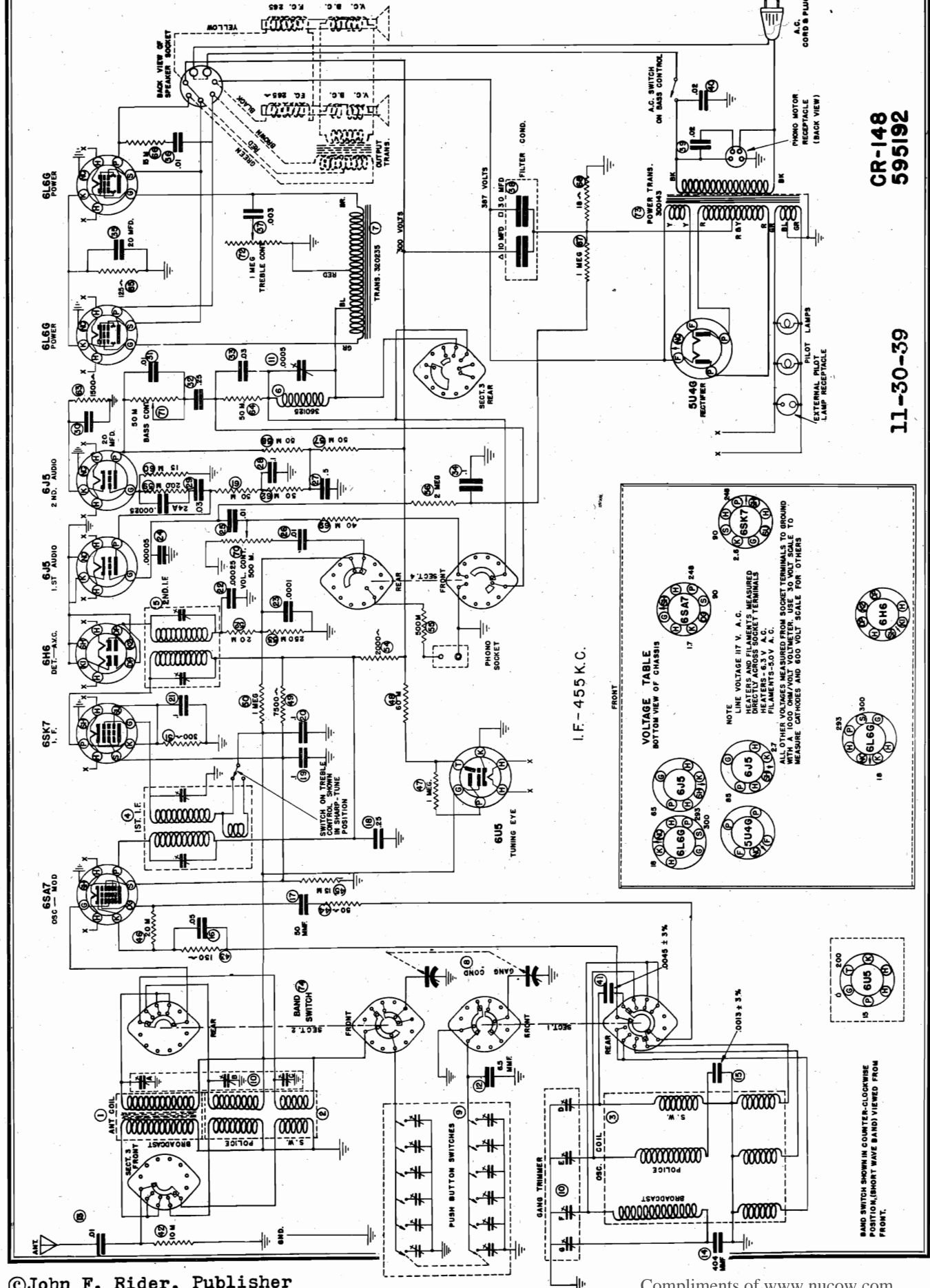


E.A.P. CO.

CR147 595185

C.W. GOETZ 10-26-35
C.L.B. 10-14-37

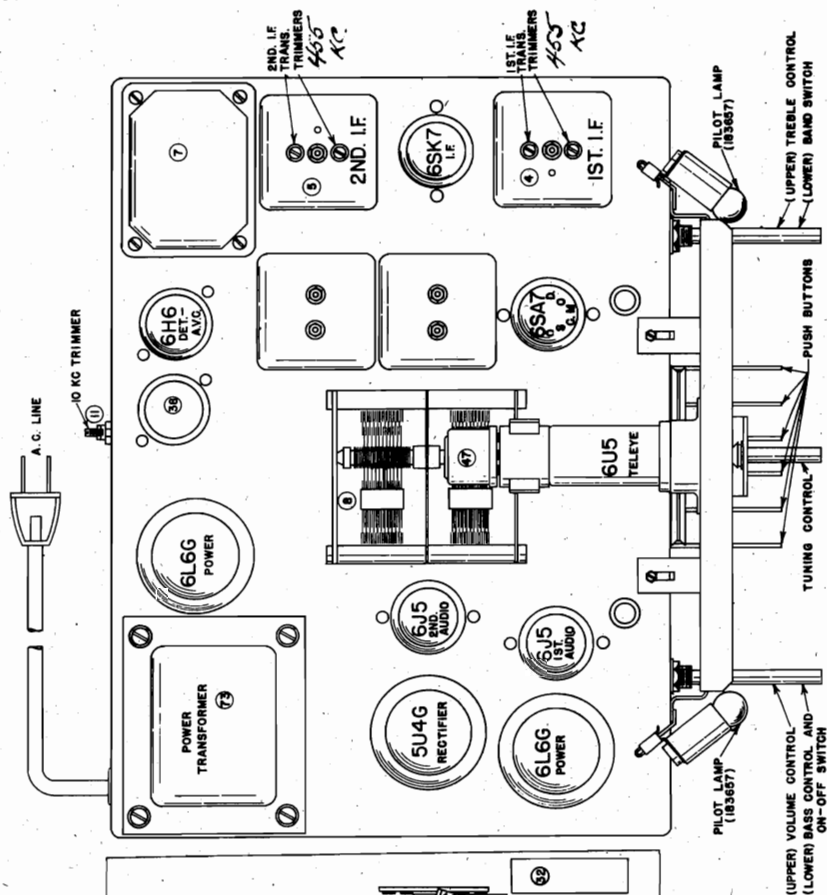
THE MAGNAVOX CO., INC.

CHASSIS CR148
Schematic, Voltage

Intermediate frequency.....455 KC;
Tuning frequency range: 535 - 1730 KC;
1.65 - 5.8 MC;
5.6 - 18.2 MC:

Circuit: Superheterodyne with three tuning ranges, treble and bass controls, I.F. band expansion, A.V. C., bass compensation in volume control for phonograph pickup, variably selectivity.

CR148 595192



CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII

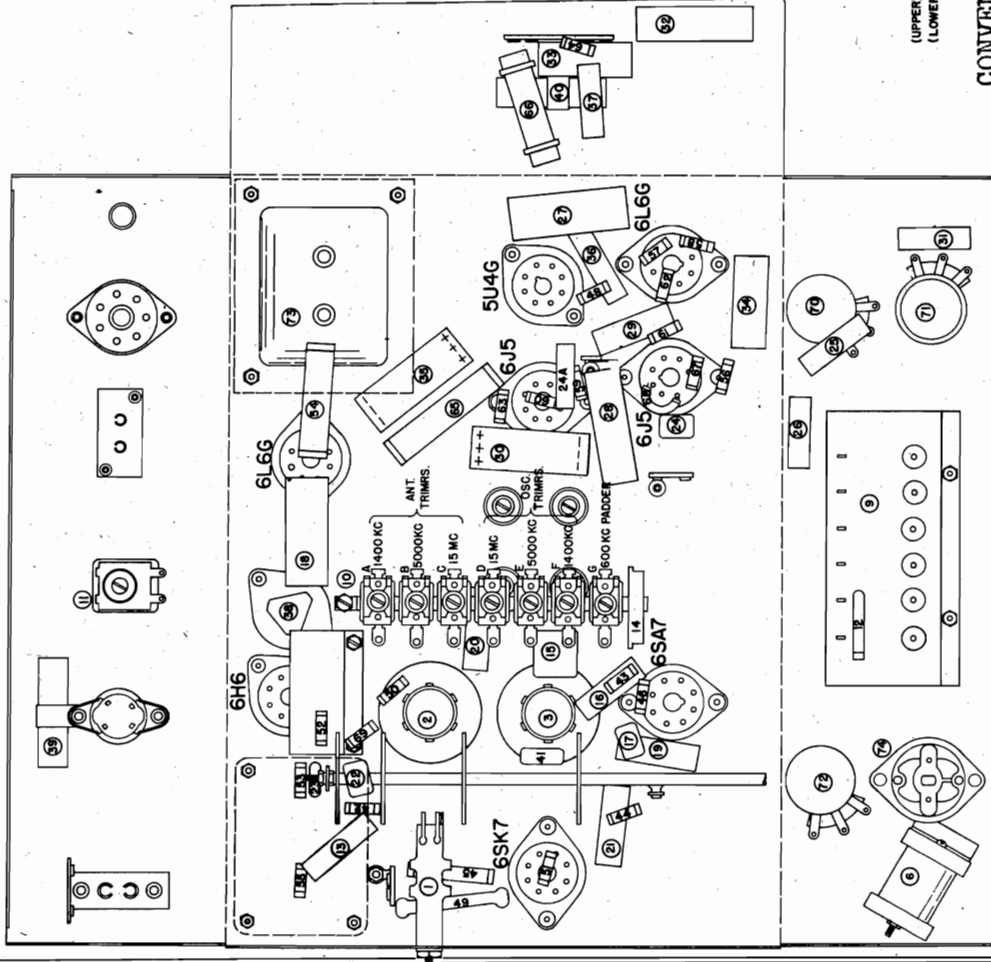
CR-1/E -- Used in Belvedere Combination

Speaker (12C131):

Primary voltage...117 V. AC;
Power consumption...160 watts;
Power output..... 20 watts;

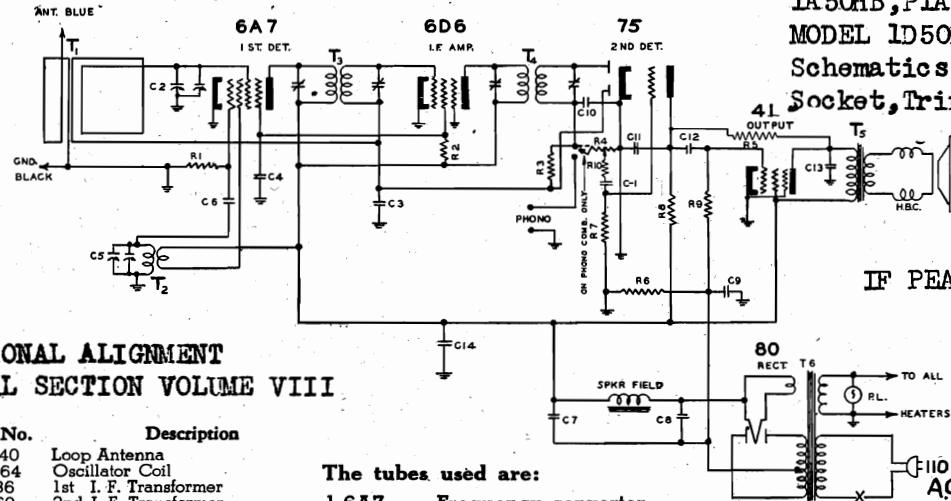
Speaker (302):

Field Coil.....250 Ohms;
Transformer..... 5M Ohms;



MAJESTIC RADIO & TELEV. CORP

MODELS 1A50A, 1A50F
1A50H, 1A50AB, 1A50FB
1A50HB, 1A50, 1A50B
MODEL 1D50MB
Schematics, Alignment
Socket, Trimmers, Tuner



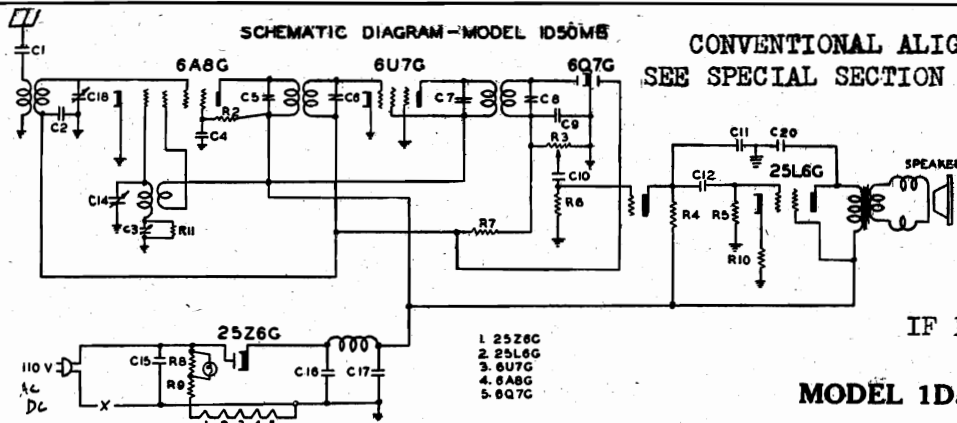
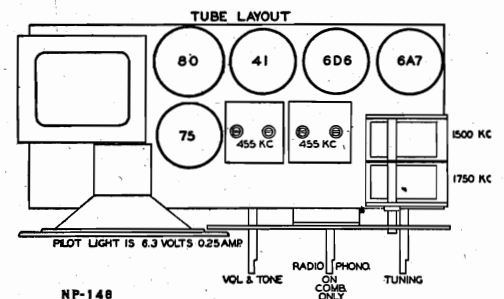
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

| Schematic Location | Part No. | Description |
|--------------------|----------|---|
| T1 | Y-CR-40 | Loop Antenna |
| T2 | Y-CS-64 | Oscillator Coil |
| T3 | Y-CI-36 | 1st I. F. Transformer |
| T4 | Y-CI-60 | 2nd I. F. Transformer |
| T5 | | Speaker Output Transformer |
| T6 | Y-TP-30 | Power Transformer |
| C1, C12 | C-15754 | Tubular cond. .01 mfd. 400V |
| C2, C5 | Y-CV-37 | Variable Condenser |
| C3 | C-15752 | Tubular cond. .05 mfd. 200V |
| C4 | C-15756 | Tubular cond. .05 mfd. 400V |
| C6 | CM-29 | Mica cond. 50 mmf. 30% |
| C10, C11 | CM-30 | Mica cond. 250 mmf. 30% |
| C7, C8, C9 | Y-CE-43 | Electrolytic Condenser |
| C13 | C-25 | Tubular cond. .006 mfd. 400V |
| C14 | C-15757 | Tubular cond. .1 mfd. 400V |
| R1 | R-15511 | Carbon res. 50Kohm $\frac{1}{4}$ W20% |
| R2 | R-83 | Carbon res. 35K ohm $\frac{1}{4}$ W20% |
| R3 | R-15500 | Carbon resistor 2meg $\frac{1}{4}$ W20% |
| R4 | Y-VC-30 | Volume Control |
| R5 | R-15559 | Carbon resistor 3meg $\frac{1}{4}$ W20% |
| R6 | R-117 | Carbon res. 275 ohm $\frac{1}{4}$ W20% |
| R7 | R-109 | Carbon resistor 5meg $\frac{1}{4}$ W20% |
| R8, R9 | R-15520 | Carbon res. 500Kohm $\frac{1}{4}$ W20% |
| R10 | R-15515 | Carbon res. 100Kohm $\frac{1}{4}$ W20% |
| P.L. | LB-44 | Pilot Light Mazda #44 |

The tubes used are:

1-6A7 Frequency converter
1-6D6 Intermediate frequency amplifier
1-75 2nd Detector, AVC, and audio driver
1-41 Power output
1-80 Rectifier

Model 1A50-A
Model 1A50-F
Model 1A50-H
Model P-1A50
Model 1A50-A-B
Model 1A50-F-B
Model 1A50-H-B
Model P-1A50-B



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

IF PEAK 455 KC

MODEL 1D50-MB

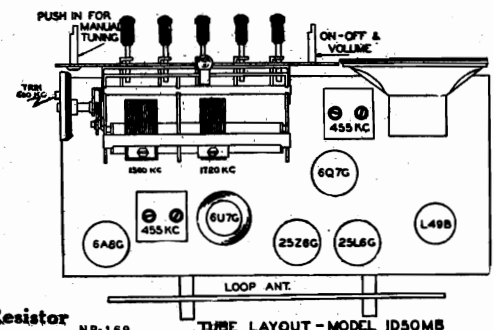
PUSH-BUTTONS: Unscrew the push-button on which you desire to receive a certain station. Tune in this station manually. Push in the push button and screw it tightly while holding it in. Repeat for other stations.

Insert station tabs in the escutcheon by snapping them in place. Pushing in any button will cause the desired station to be heard.

| Schematic Location | Part No. | Description |
|--------------------|----------|--|
| C1, C12 | C-15754 | Tubular cond. .01 mfd. 400V |
| C2, C4 | C-15752 | Tubular cond. .05 mfd. 200V |
| C15 | C-15756 | Tubular cond. .05 mfd. 400V |
| C10 | C-15753 | Tubular cond. .002 mfd. 600V |
| C16, C17, C13 | Y-CE-46 | Electrolytic |
| C9 | CM-30 | Mica cond. 250 mmf. 30% |
| C11 | CM-31 | Mica cond. 100 mmf. 30% |
| C3 | Y-CP-8 | Padding Condenser |
| R11 | R-15511 | Carbon res. 50Kohm $\frac{1}{4}$ W20% |
| R5 | R-15520 | Carbon res. 500Kohm $\frac{1}{4}$ W20% |
| R4 | R-15512 | Carbon res. 250Kohm $\frac{1}{4}$ W20% |
| R6 | R-79 | Carbon resistor 15meg $\frac{1}{4}$ W20% |
| R10 | R-46 | Carbon res. 110 ohm $\frac{1}{4}$ W20% |
| R7 | R-15500 | Carbon resistor 2meg $\frac{1}{4}$ W20% |
| R3 | Y-CV-25 | Volume Control |
| R8, R9 | L-49-B | Plug in Ballast Resistor |

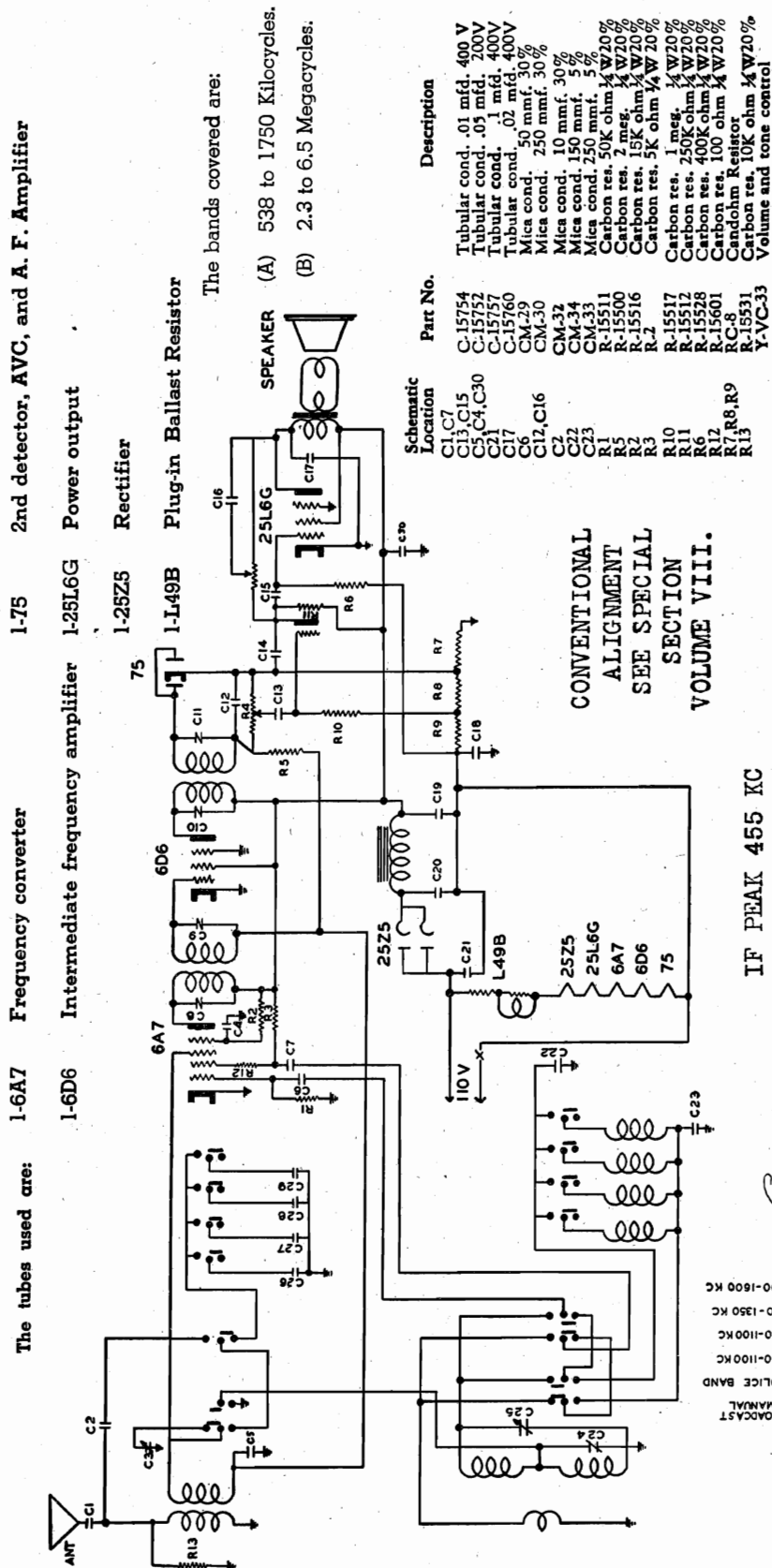
The tubes used are:

1-6A8G Converter
1-6U7G I. F. Amplifier
1-6Q7G 2nd Detector
1-25L6G Beam Output
1-25Z6G Rectifier
1-L49B Plug-in Ballast Resistor



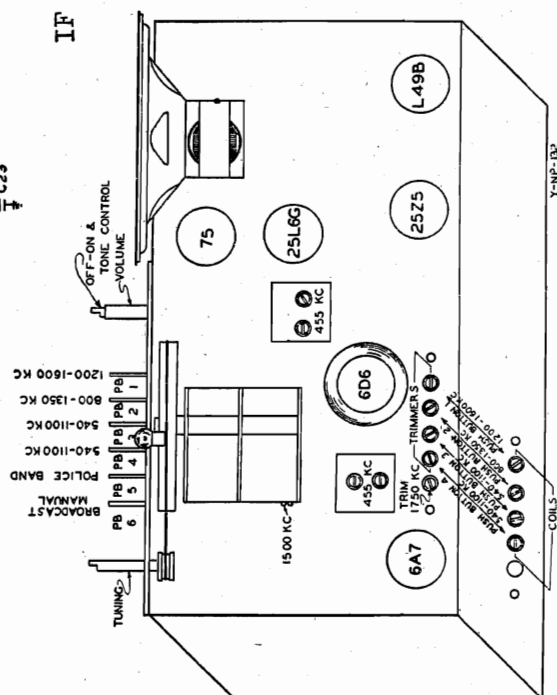
MODEL 1D59-EB-PL
Schematic, Socket
Alignment, Trimmers
Tuner

MAJESTIC RADIO & TELEV. CORP.

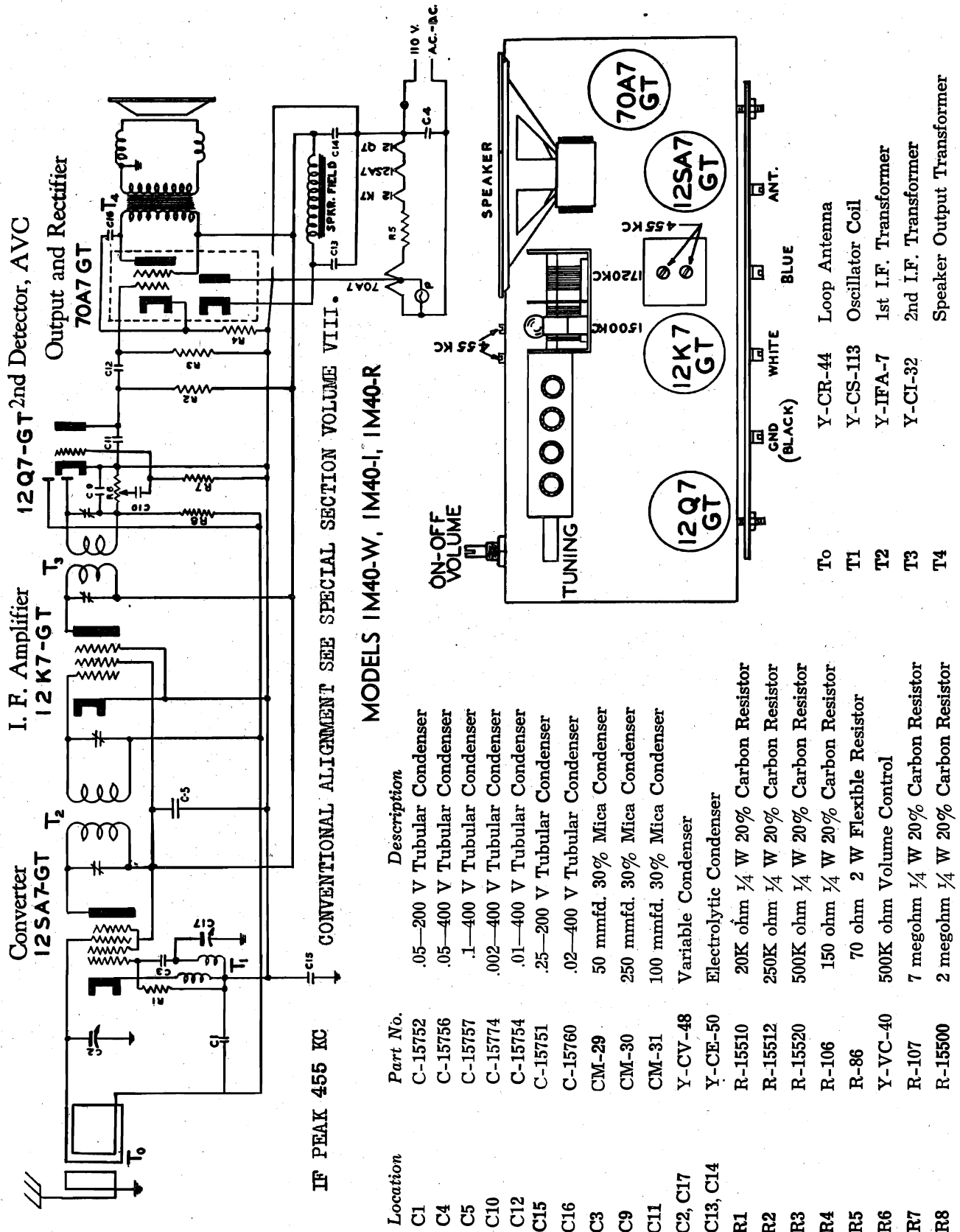


ADJUSTMENTS OF PUSH BUTTONS

These push-buttons are adjusted so as to come within three (3) frequency ranges. The first button from the left is for stations lying between 1200 and 1600 kilocycles. The second (2) button is for stations lying between 800 and 1350 kilocycles. The third (3) and fourth (4) buttons are for stations lying between 540 and 1100 kilocycles. To set up these buttons, determine which four (4) stations you wish to receive most frequently. Ascertain their frequencies and determine on which button they should be set up. Push in the button on which a particular station is to be set up and, with a screw driver, turn the screw at the rear of the chassis corresponding to this push-button, until the station you desire to hear is received with best quality and tone. Go to the top rear of the chassis and adjust the corresponding trimmer condenser until that station is heard with maximum volume. Repeat for the other push-buttons. The location of these adjustment points is shown in figure 1.



MAJESTIC RADIO & TELEV. CORP.

MODELS 1M40I, 1M40R
1M40WSchematic, Socket
Alignment, Trimmers

MODELS 1M40 Series
MODELS 380 Series
MODELS 390 Series
Tuner Data

MAJESTIC RADIO & TELEV. CORP

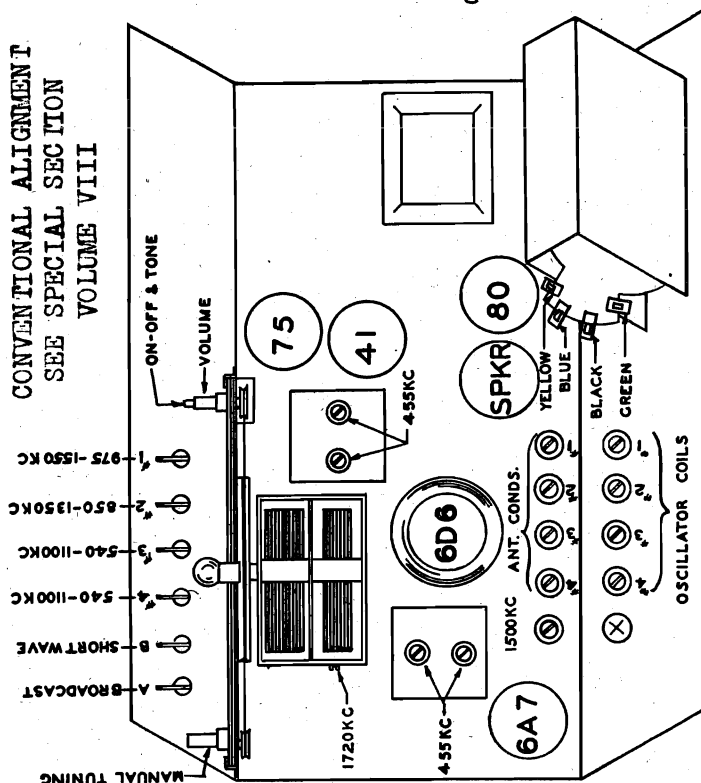
MODELS 5BDA, 5BEA
Tuner, Socket, Trimmers
Alignment

MODEL 1M40.

ADJUSTMENT OF PUSH BUTTONS

Determine on which push button you wish to set a particular station. Pull off that button. Using a screw driver, loosen the screw covered by the button. Tune the set manually by means of the station dial drum until the desired station is heard with best tone and volume. Push the push button shaft as far as it will go, tighten the screw, insert the proper station tab in the slot of the push button, and replace the push button on the push button shaft. Repeat for other stations.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



MODELS 5BDA, 5BEA

MODELS 3C80, 3C80P, 380; 3C80, 3C80B; 3C90, 390; 3C90.

PUSH BUTTON TUNING

Six buttons on this set are provided to allow you to select your favorite station in the broadcast band instantaneously without any operation except that of pushing a button. These buttons start from the fourth from the left to the fourth from the right, inclusive, and numbering them from the left to the right, as 1, 2, 3, 4, 5, and 6. The buttons numbered 1, 2, and 3 are designed to cover the frequency range from 1700 to 800 Kc. Buttons number 4, 5, and 6 are designed to cover the range from 1200 to 540 Kc. To set up these buttons it is only necessary to select one of the buttons which includes the frequency of the station which you wish to receive, and depress that button. Select the corresponding screw in the back of the receiver and with a small screw driver adjust it by turning the screw in or out until the station is being received as well as possible. Then, using the same screw driver, adjust the corresponding trimmer from the top of the chassis until maximum volume is obtained on that station. The other buttons may be adjusted in exactly the same fashion to different stations. Every time a button is adjusted for a certain station, remove the call letter tab from the sheet of call letters furnished with the receiver, and insert it through the small slit in the side of the knob so that the call letters show through the top of the knob. After the buttons have been once adjusted in this fashion, it is only necessary to press the button marked with the call letters of the station you wish to receive, whereupon it will be heard instantaneously.

MODELS 5BDA, 5BEA

PUSH BUTTONS: Looking at the front of the set counting from left to right, the first four push buttons are for setting up stations.

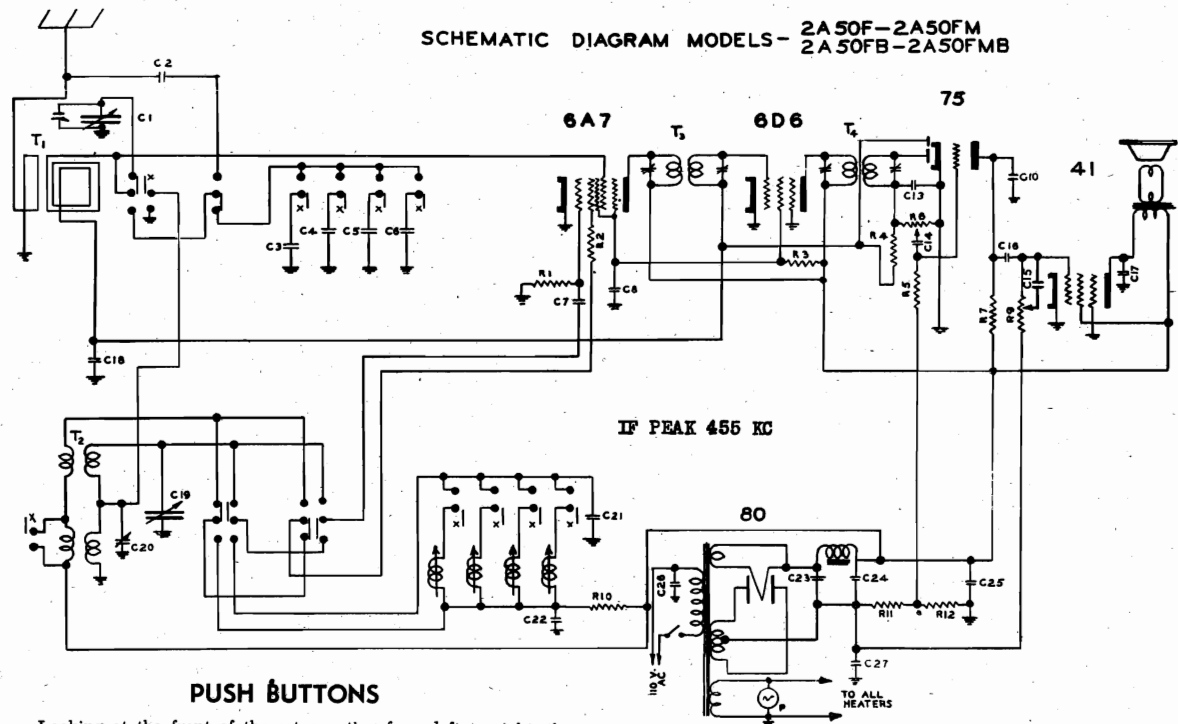
- Button number 1 is for stations lying between 975 and 1550 Kilocycles
- Button number 2 is for stations lying between 850 and 1350 Kilocycles
- Button number 3 is for stations lying between 540 and 1100 Kilocycles
- Button number 4 is for stations lying between 540 and 1100 Kilocycles
- Button number A is for Broadcast Band.
- Button number B is for Short Wave Band

Determine on which button a desired station is to be set up. Push that button in. Going to the rear of the receiver, adjust the coil corresponding to the chosen push button until the desired station is heard with maximum volume and best tone. Adjust the trimmer corresponding to the chosen button until that station is heard with maximum volume. Repeat for other push buttons.

Socket Trimmers Tuner

MAJESTIC RADIO & TELEV. CORP.

MODELS 2A50F, 2A50FB
2A50FM, 2A50FMB
Schematic, Alignment



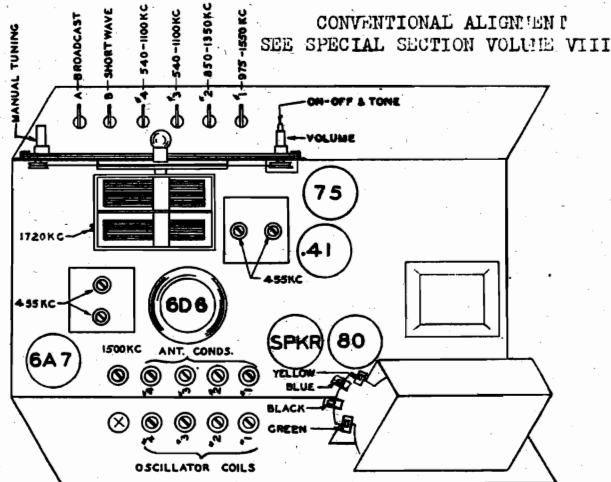
Looking at the front of the set counting from left to right, the first four push buttons are for setting up stations. Button number 1 is for stations lying between 975 and 1550 Kilocycles. Button number 2 is for stations lying between 850 and 1350 Kilocycles. Button number 3 is for stations lying between 540 and 1100 Kilocycles. Button number 4 is for stations lying between 540 and 1100 Kilocycles. Button number A is for Broadcast Band. Button number B is for Short Wave Band.

Determine on which button a desired station is to be set up. Push that button in. Going to the rear of the receiver, adjust the coil corresponding to the chosen push button until the desired station is heard with maximum volume and best tone. Adjust the trimmer corresponding to the chosen button until that station is heard with maximum volume. Repeat for other push buttons.

Plug in the line cord to an AC power line of 105-130 Volts of 60 Cycles for Models 2A50-F and 2A50-F-M, and 50 or 60 Cycles for Models 2A50-F-B and 2A50-F-M-B.

The tubes used are:

| | |
|-------|---|
| 1-6A7 | Frequency converter |
| 1-6D6 | Intermediate frequency amplifier |
| 1-75 | Second detector, AVC, and Audio frequency amplifier |
| 1-41 | Output |
| 1-80 | Rectifier |



REPLACEMENT PARTS LIST FOR MODELS 2A50-F, 2A50-F-B, 2A50-F-M, 2A50-F-M-B

| Schematic Location | Part Number | Description |
|--------------------|-------------|-----------------------------------|
| R1 | R-15511 | 50K ohm 1/4 W 20% Carbon Resistor |
| R2 | R-15601 | 100 ohm 1/4 W 20% Carbon Resistor |

Schematic Location

| Schematic Location | Part Number | Description |
|--------------------|-------------|------------------------------------|
| R3 | R-15544 | 15K ohm 1 W 20% Carbon Resistor |
| R4 | R-15500 | 2 megohm 1/4 W 20% Carbon Resistor |
| R5 | R-15517 | 1 megohm 1/4 W 20% Carbon Resistor |
| R6, R9 | Y-VC-33 | Volume and Tone Control |
| R7 | R-15512 | 250K ohm 1/4 W 20% Carbon Resistor |
| R10 | R-2 | 5000 ohm 1/4 W 20% Carbon Resistor |
| R11 | R-82 | 35 ohm 1/4 W 20% Carbon Resistor |
| R12 | R-98 | 150 ohm 1/2 W 10% Carbon Resistor |
| T1 | Y-CS-100 | Loop Antenna |
| T2 | Y-CS-102 | Oscillator Coil |
| T3 | Y-CI-40 | 1st I.F. Transformer |
| T4 | Y-CI-42 | 2nd I.F. Transformer |
| C2, C14 | C-15754 | .01 mfd. 400 V Tubular Condenser |
| C8, C25 | C-15756 | .05 mfd. 400 V Tubular Condenser |
| C15 | C-30 | .001 mfd. 400 V Tubular Condenser |
| C16, C17 | C-25 | .006 mfd. 400 V Tubular Condenser |
| C18 | C-15752 | .05 mfd. 200 V Tubular Condenser |
| C26 | C-18 | .01 mfd. 400 V 20% Tubular Ceramic |
| C7 | CM-29 | 50 mmf. 30% Mica Condenser |
| C10 | CM-31 | 100 mmf. 30% Mica Condenser |
| C22 | CM-33 | 250 mmf. 5% Mica Condenser |
| C21 | CM-34 | 150 mmf. 5% Mica Condenser |
| C3, C4, C5, C6 | Y-CT-30B | Trimmer Strip |
| C23, C24, C27 | Y-CE-43 | Electrolytic Condenser |

MODELS 3C70,360

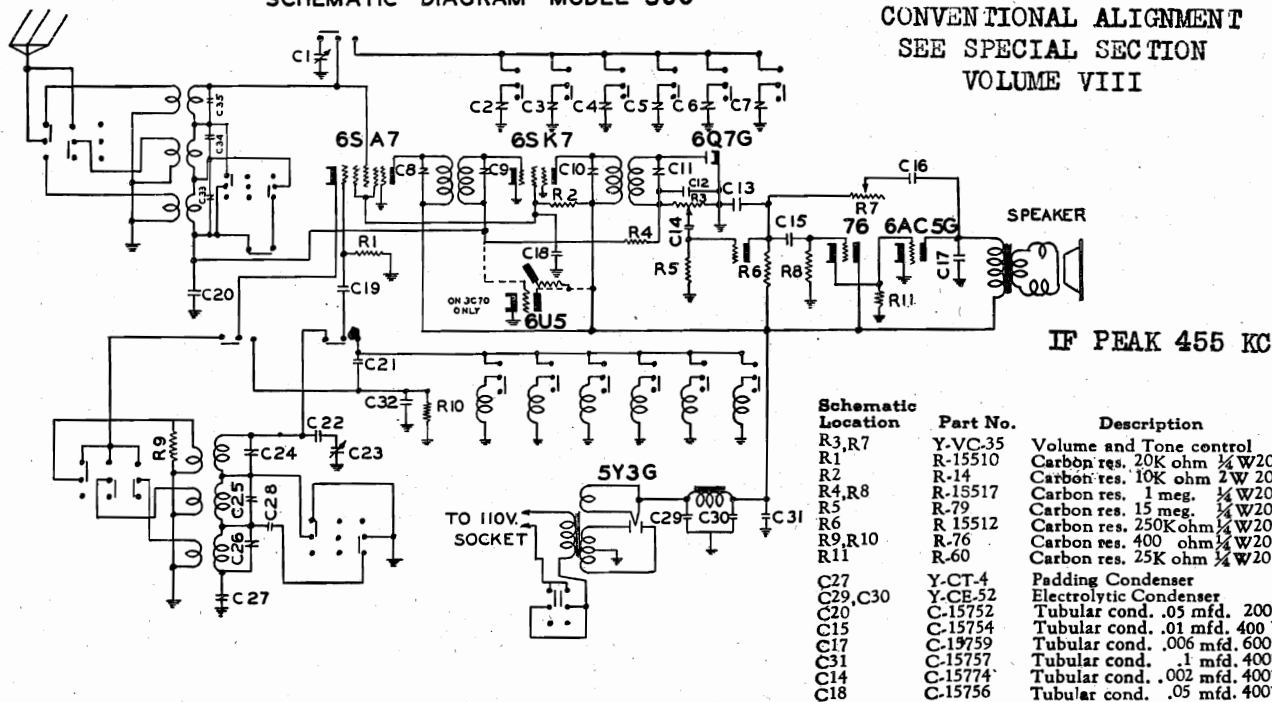
Schematic, Alignment MAJESTIC RADIO & TELEV. CORP.

Socket, Trimmers

Tuner

SCHEMATIC DIAGRAM—MODEL 3C70
360

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



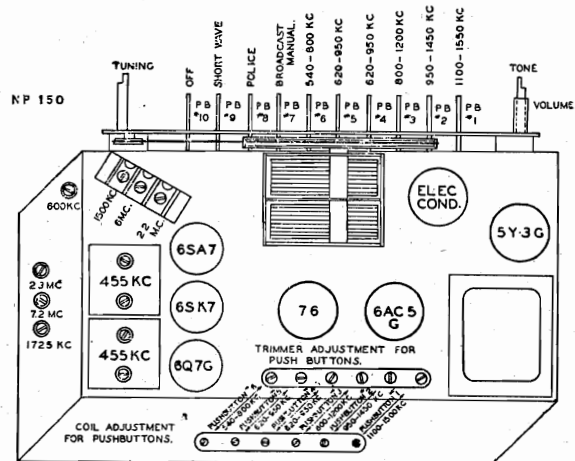
The receiver operates with the following tubes:

- 1-6SA7 Single ended frequency converter
- 1-6SK7 Single ended intermediate frequency amplifier
- 1-6Q7G 2nd detector, A. V. C. and A. F. driver
- 1-76 Output tube driver
- 1-6AC5G Dynamically coupled output stage
- 1-5Y3G Rectifier
- 1-6U5 Tuning indicator (Model 3C70 only)

| Schematic Location | Part No. | Description |
|--------------------|----------|-----------------------------------|
| R3,R7 | Y-VC-35 | Volume and Tone control |
| R1 | R-15510 | Carbon res. 20K ohm 1/4 W 20% |
| R2 | R-14 | Carbon res. 10K ohm 2 W 20% |
| R4,R8 | R-15517 | Carbon res. 1 meg. 1/4 W 20% |
| R5 | R-79 | Carbon res. 15 meg. 1/4 W 20% |
| R6 | R-15512 | Carbon res. 250K ohm 1/4 W 20% |
| R9,R10 | R-76 | Carbon res. 400 ohm 1/4 W 20% |
| R11 | R-60 | Carbon res. 25K ohm 1/4 W 20% |
| C27 | Y-CT-4 | Padding Condenser |
| C29,C30 | Y-CE-52 | Electrolytic Condenser |
| C20 | C-15752 | Tubular cond. .05 mfd. 200V |
| C15 | C-15754 | Tubular cond. .01 mfd. 400 V |
| C17 | C-15759 | Tubular cond. .006 mfd. 600V |
| C31 | C-15757 | Tubular cond. .1 mfd. 400V |
| C14 | C-15774 | Tubular cond. .002 mfd. 400V |
| C18 | C-15756 | Tubular cond. .05 mfd. 400V |
| C12,C13,C19 | CM-31 | Mica cond. 100 mmfd. 30% |
| C16 | CM-30 | Mica cond. 250 mmfd. 30% |
| C22 | CM-2 | Mica cond. 4330 mmfd. 5% |
| C28 | CM-36 | Mica cond. 2770 mmfd. 5% |
| C21 | CM-13 | Mica cond. 100 mmfd. 5% |
| C32 | CM-27 | Mica cond. 2000 mmfd. 3% |
| C2,C3,C4,C5,C6,C7 | GT-28 | Trim. capacities for P. B. tuning |

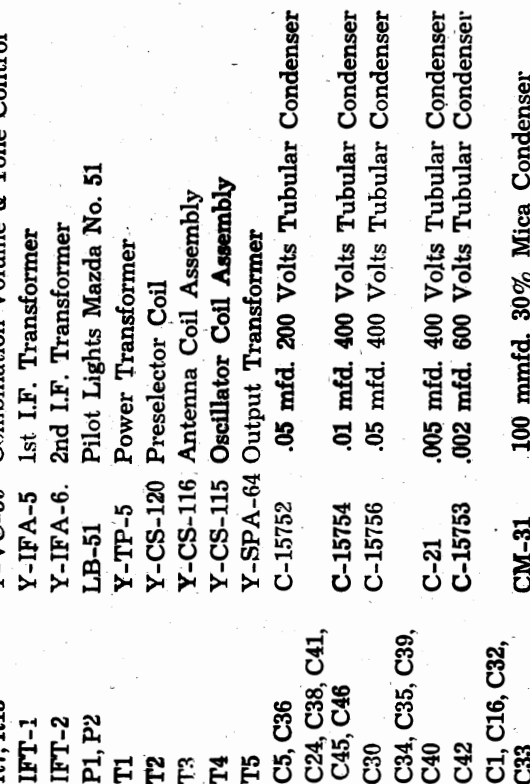
SETTING UP OF PUSH-BUTTONS

- Button No. 1 is for stations lying between 1100 and 1550 KC's.
- " No. 2 is for stations lying between 950 and 1450 KC's.
- " No. 3 is for stations lying between 800 and 1200 KC's.
- " No. 4 is for stations lying between 620 and 950 KC's.
- " No. 5 is for stations lying between 620 and 950 KC's.
- " No. 6 is for stations lying between 540 and 800 KC's.



1. Select the stations that you wish to set up on the push-buttons.
2. Determine on which push-buttons these stations should be set up, according to above table.
3. Push the button on which you should set up a particular station.
4. Using a screw driver, adjust the coil corresponding to the proper push-button until the desired station is heard with maximum volume and best tone.
5. Adjust the trimmer condenser corresponding to the proper push-button until the desired station is heard with maximum volume.
6. Repeat for other push-buttons.

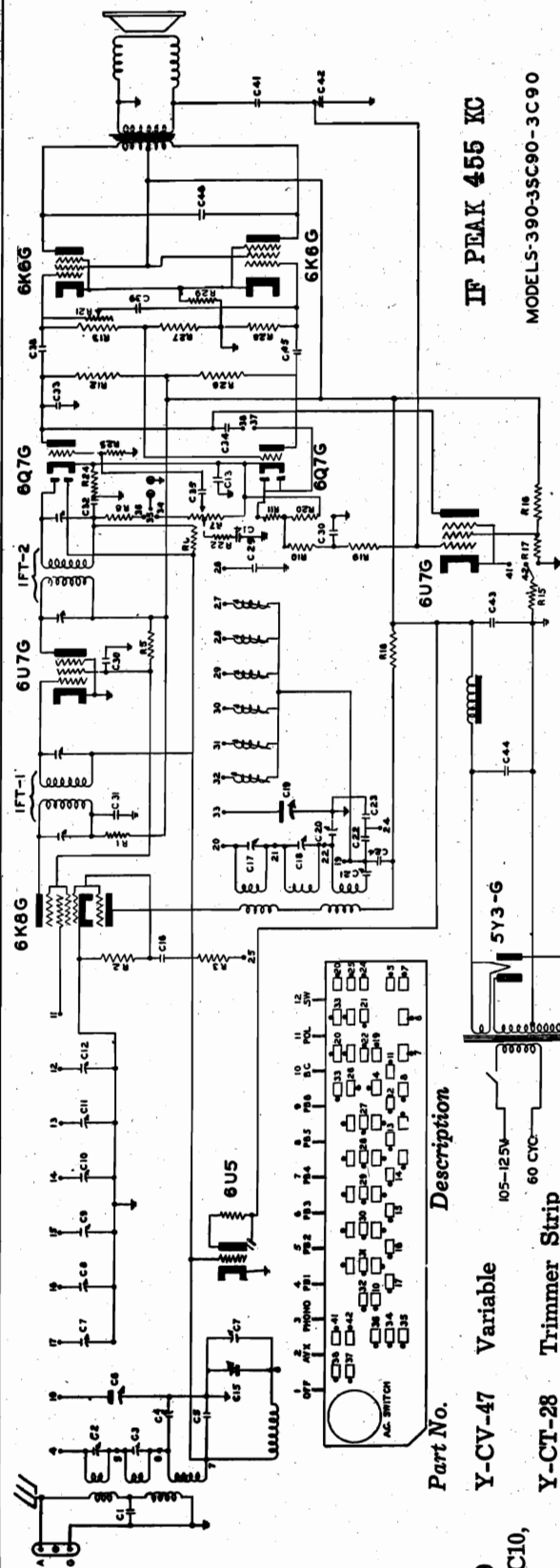
Compliments of www.nucow.com



MAJESTIC RADIO & TELEV. CORP.

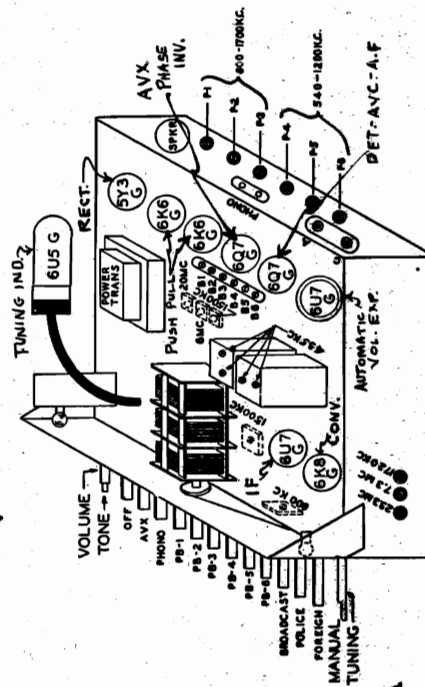
MODELS 3C90, 3SC90
390

Schematic, Alignment
Socket, Trimmers
Tuner Layout



IF PEAK 455 KC

MODELS-390-3SC90-3C90



CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII.

FOR TUNER DATA
SEE INDEX

These models are three band superheterodyne receivers and differ only in the provision for record changer.

| | |
|------|------------------------------------|
| R-15 | 8K ohm 1/4 W 20% Carbon Resistor |
| R-16 | 50K ohm 1 W 20% Carbon Resistor |
| R-17 | 5000 ohm 1/4 W 10% Carbon Resistor |
| R-18 | 30K ohm 1/2 W 20% Carbon Resistor |
| R-20 | 250K ohm 1/4 W 20% Carbon Resistor |
| R-27 | 10K ohm 1/4 W 20% Carbon Resistor |
| R-29 | 200 ohm 1 W 20% Carbon Resistor |

Schematic
Location

Description

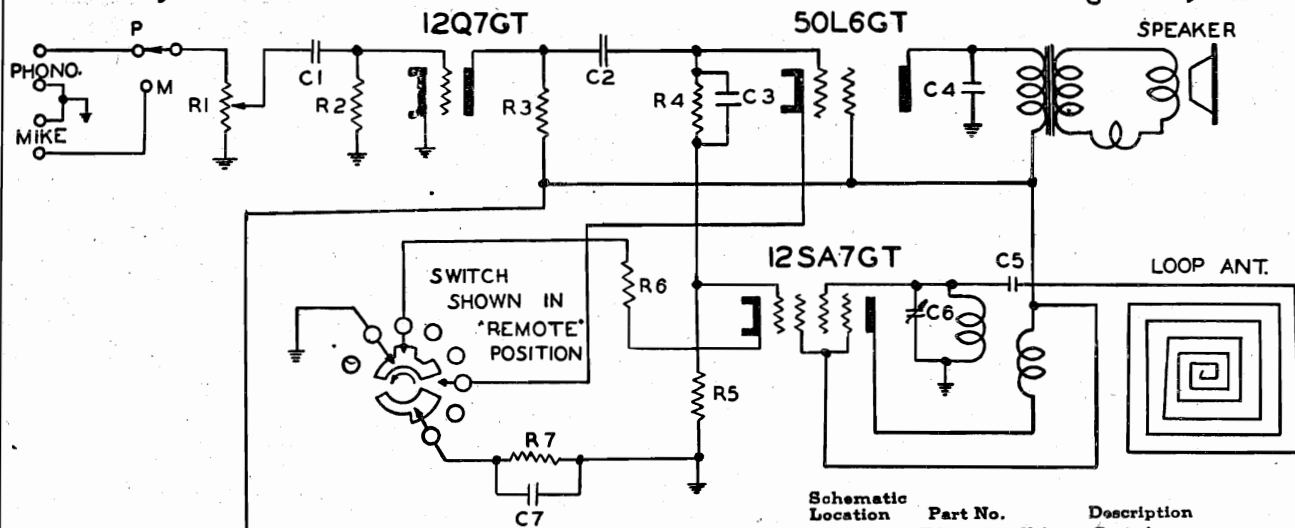
Part No.

| | | |
|------------------------------|------------------------------------|----------|
| C6, C15, C19 | Variable | Y-CV-47 |
| C7, C8, C9, C10, C11, C12 | Trimmer Strip | Y-CT-28 |
| C21 | Padder Condenser | Y-CP-8 |
| C43, C44 | Electrolytic Condenser | Y-CE-52 |
| C1, C16, C32, C33 | 100 mmfd. 30% Mica Condenser | CM-31 |
| C23 | 4900 mmfd. 5% Mica Condenser | CM-38 |
| C22 | 2300 mmfd. 5% Mica Condenser | CM-39 |
| C29 | 100 mmfd. 5% Mica Condenser | CM-13 |
| C35 | 500 mmfd. 20% Mica Condenser | CM-15909 |
| C5, C30 | .05 mfd. 200 V Tubular Condenser | C-15752 |
| C13, C14, C24, C38, C41, C45 | .01 mfd. 400 V Tubular Condenser | C-15754 |
| C30, C31 | .05 mfd. 400 V Tubular Condenser | C-15756 |
| C34, C48 | .005 mfd. 400 V Tubular Condenser | C-21 |
| C39, C42 | .002 mfd. 600 V Tubular Condenser | C-15753 |
| R1, R24 | 1000 ohm 1/4 W 20% Carbon Resistor | R-15542 |
| R2, R8, R22 | 50K ohm 1/4 W 20% Carbon Resistor | R-15511 |
| R3 | 100 ohm 1/4 W 20% Carbon Resistor | R-15601 |
| R5 | 25K ohm 1 W 20% Carbon Resistor | R-15501 |
| R6 | 2 megohm 1/4 W 20% Carbon Resistor | R-15500 |
| R7, R21 | Volume and Tone Control | Y-VC-39 |
| R10, R11, R25 | 1 megohm 1/4 W 20% Carbon Resistor | R-15517 |
| R12, R26 | 100K ohm 1/4 W 20% Carbon Resistor | R-15515 |
| R13, R19, R28 | 500K ohm 1/4 W 20% Carbon Resistor | R-15520 |

MODEL 4-PWO
Wireless Record Player
Schematic, Socket

MAJESTIC RADIO & TELEV. CORP

MODEL 6UL51
Schematic, Socket
Alignment, Trimmers

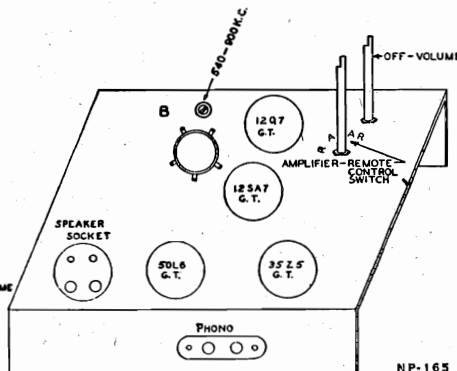
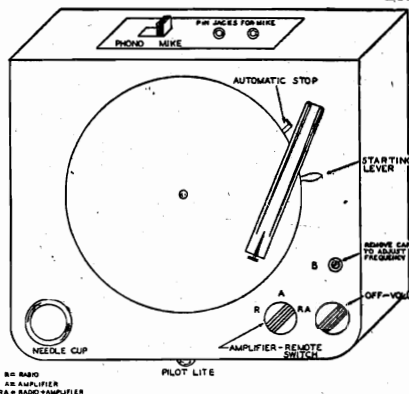


MODEL 4-PWO

| Schematic Location | Part No. | Description |
|--------------------|----------|------------------------------------|
| R1 | Y-VC-36 | Volume Control |
| R2 | R-79 | Carbon resistor 15meg 1/4W20% |
| R3 | R-15512 | Carbon res. 250Kohm 1/4W20% |
| R4 | R-15517 | Carbon res. 400Kohm 1/4W20% |
| R5 | R-15511 | Carbon res. 50Kohm 1/4W20% |
| R6 | R-15542 | Carbon res. 1Kohm 1/4W20% |
| R7 | R-15508 | Carbon res. 150ohm 1/4W10% |
| R8 | R-104 | Carbon res. 50ohm 2W flexible res. |
| C1 | C-15774 | Tubular cond. .002 mfd. 400V |
| C2, C4 | C-15760 | Tubular cond. .02 mfd. 400V |
| C10 | C-15757 | Tubular cond. .1 mfd. 400V |
| C3 | CM-37 | Mica cond. 500 mmf. 30% |
| C5 | CM-10 | Mica cond. 10 mmf. 10% |
| C7, C8, C9 | Y-CE-54 | Electrolytic |

The tubes used are

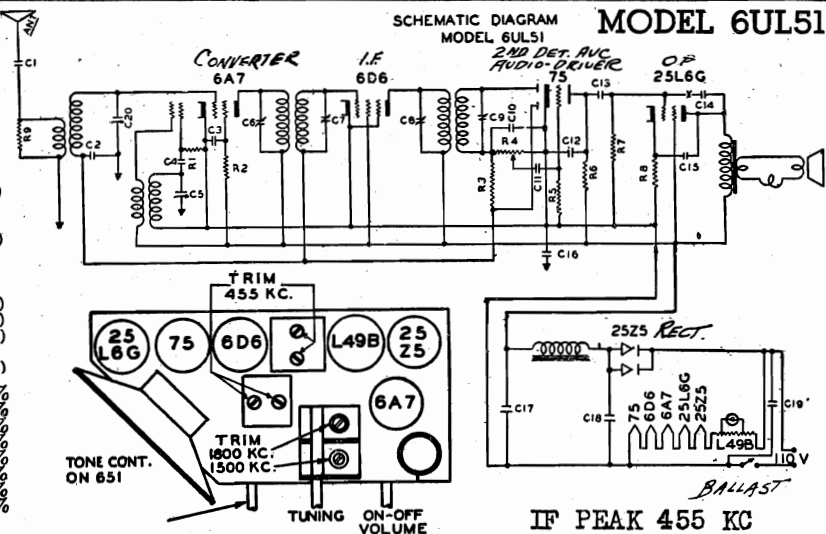
- 1-12Q7GT Pre Amplifier
- 1-50L6GT Beam power output
- 1-12SA7GT Modulator oscillator
- 1-35Z5GT Rectifier



Model 4PWO operates on 105-130 volts, 60 cycles, AC. It can be made to operate on 50-cycles AC by changing a bushing on the motor shaft.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

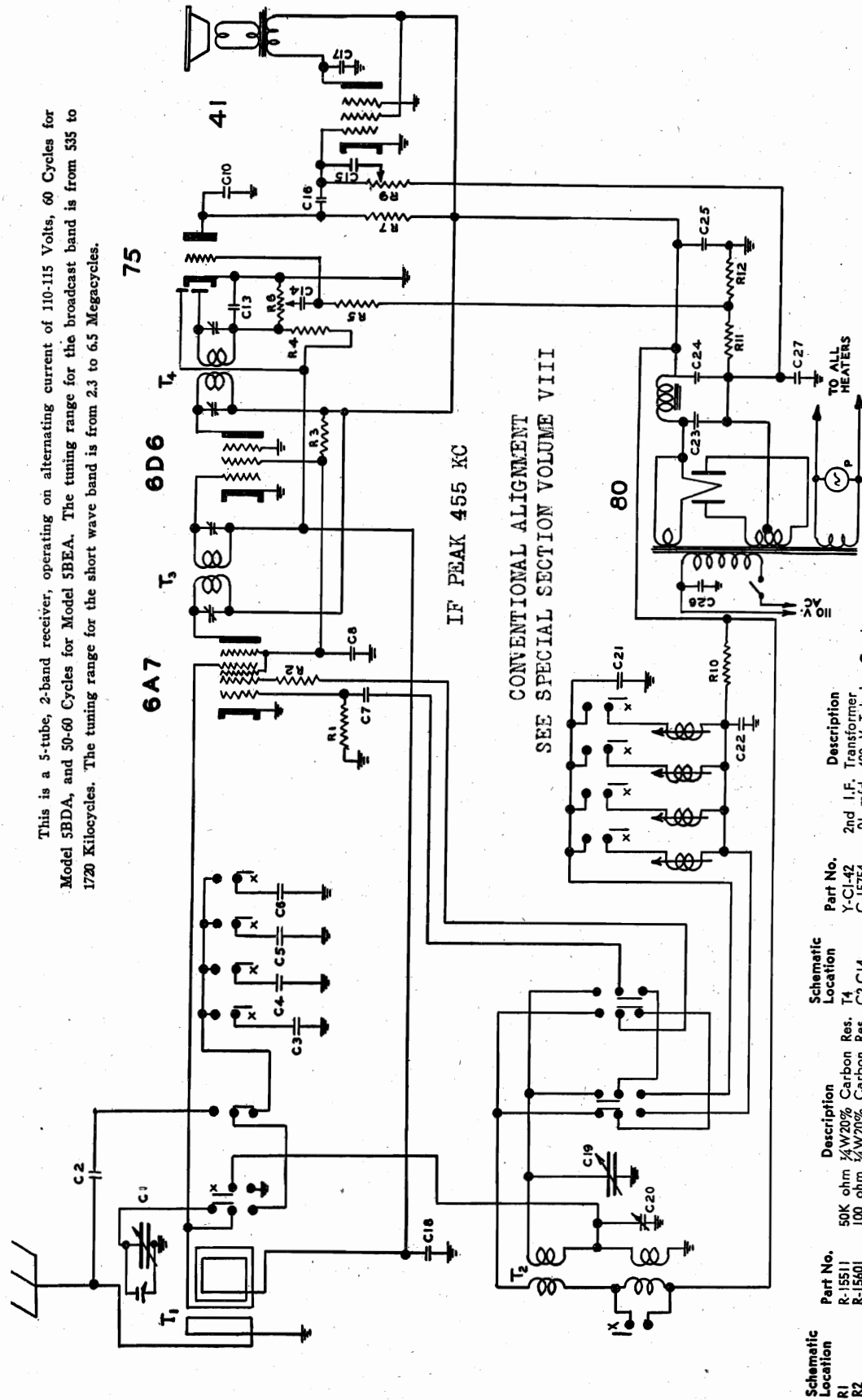
| Schematic Location | Part No. | Description |
|--------------------|----------|------------------------------------|
| C1, C13 | C-15754 | Tubular cond. .01 mfd. 400V |
| C2 | C-15752 | Tubular cond. .05 mfd. 200V |
| C5 | Y-CV-22 | Variable cond. (Osc. Section) |
| C20 | Y-CT-1 | Variable cond. (Signal Section) |
| C6, C7 | Y-CT-1 | Trimmer cond. 1st I.F. Trans. |
| C8, C9 | Y-CT-1 | Trimmer cond. 2nd I.F. Trans. |
| C16 | C-20 | Paper cond. .25 mfd. 200V (Mol.) |
| C15 | C-15760 | Tubular cond. .02 mfd. 400V |
| C4 | CM-29 | Mica cond. 50 mmf. |
| C10, C12, C14 | CM-31 | Mica cond. 100 mmf. |
| C17 | Y-CE-40 | Electr. cond. 16 mfd. 150V (Met.) |
| C18 | Y-CE-39 | Electr. cond. 40 mfd. 200V (Clad.) |
| C19 | C-24 | Paper cond. .1 mfd. 300V (Mol.) |
| C11 | C-15774 | Tubular cond. .002 mfd. 400V |
| C3 | C-28 | Paper cond. .05 mfd. 200V (Mol.) |
| R1 | R-15511 | Carbon res. 50Kohm 1/4W20% |
| R2 | R-15516 | Carbon res. 15Kohm 1/4W20% |
| R3 | R-15500 | Carbon resistor 2meg 1/4W20% |
| R5 | R-79 | Carbon resistor 15meg 1/4W20% |
| R6 | R-15512 | Carbon res. 250Kohm 1/4W20% |
| R7 | R-15520 | Carbon res. 500Kohm 1/4W20% |
| R9 | R-15531 | Carbon resistor 10K 1/4W20% |
| R8 | R-56 | Carbon res. 100ohm 1/4W10% |
| R4 | Y-VC-21 | Volume Control |



MAJESTIC RADIO & TELEV. CORP.

MODELS 5BDA, 5BEA
Schematic

This is a 5-tube, 2-band receiver, operating on alternating current of 110-115 Volts, 60 Cycles for Model 5BDA, and 50-60 Cycles for Model 5BEA. The tuning range for the broadcast band is from 535 to 1720 Kilocycles. The tuning range for the short wave band is from 2.3 to 6.5 Megacycles.



FOR TUNER AND LAYOUT
SEE INDEX

The tubes used are:

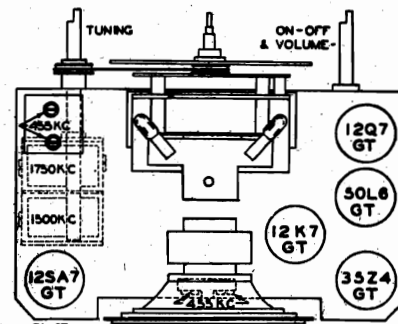
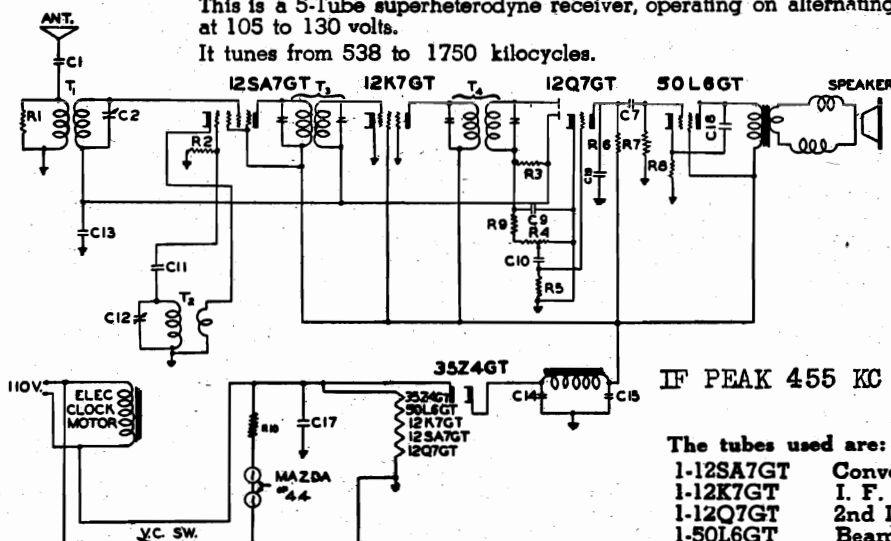
| | |
|-------|---|
| 1-6A7 | Frequency converter |
| 1-6D6 | Intermediate frequency amplifier |
| 1-75 | Second detector, AVC, and Audio frequency amplifier |
| 1-41 | Output |
| 1-80 | Rectifier |

| Part No. | Description | Schematic Location | Part No. | Description | Schematic Location |
|----------|------------------------------|--------------------|----------|-------------------------------|--------------------|
| R-15511 | 50K ohm 1/4W20% Carbon Res. | T4 | Y-CI-42 | 2nd I.F. Transformer | |
| R-15601 | 100 ohm 1/4W20% Carbon Res. | C2, C14 | C-15754 | .01 mfd. 400 V Tubular Cond. | |
| R-15544 | 15K ohm 1W20% Carbon Res. | C8, C25 | C-15756 | .05 mfd. 400 V Tubular Cond. | |
| R-15500 | 2 meg. 1/4W20% Carbon Res. | C15 | C-30 | .100 mfd. 400 V Tubular Cond. | |
| R-15517 | 1 meg. 1/4W20% Carbon Res. | C16, C17 | C-25 | .005 mfd. 400 V Tubular Cond. | |
| Y-VC-33 | Volume and Tone Control | C18 | C-15752 | .05 mfd. 200 V Tubular Cond. | |
| R-15512 | 250K ohm 1/4W20% Carbon Res. | C26 | C-18 | 50 mfd. 400 V Ceramic | |
| R-2 | 5000 ohm 1/4W20% Carbon Res. | C7 | CM-29 | 100 mfd. Mica Condenser | |
| R-82 | 35 ohm 1/4W20% Carbon Res. | C10 | CM-31 | 250 mfd. 5% Mica Condenser | |
| R-98 | 150 ohm 1/4W10% Carbon Res. | C22 | CM-33 | 150 mfd. 5% Mica Condenser | |
| Y-CS-100 | Loop Antenna | C21 | Y-CT-308 | Trimmer Strip | |
| Y-CS-102 | Oscillator Coil | C20 | Y-CE-43 | Electrolytic Condenser | |
| Y-CI-40 | 1st I.F. Transformer | C23, C24, C27 | | | |

MODELS 5T, 5TO
MODELS 140, 148
Schematics, Socket
Trimmers, Alignment

MAJESTIC RADIO & TELEV. CORP.

This is a 5-Tube superheterodyne receiver, operating on alternating current of 60 cycles only, at 105 to 130 volts.
It tunes from 538 to 1750 kilocycles.



IF PEAK 455 KC

The tubes used are:
1-12SA7GT Converter
1-12K7GT I. F. Amplifier
1-12Q7GT 2nd Detector, A.V.C., Driver
1-50L6GT Beam Power Output
1-35Z4GT Rectifier

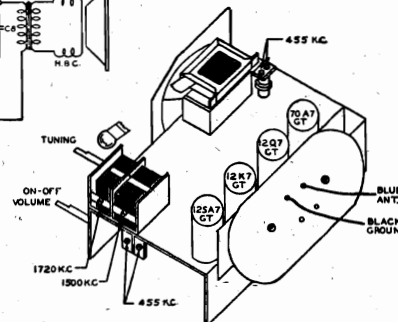
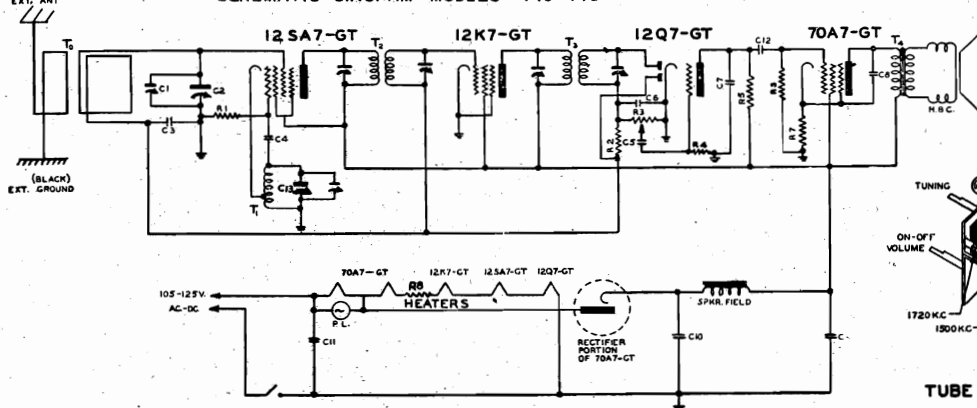
MODELS 5T-5TO

| Schematic Location | Part No. | Description |
|--------------------|----------|------------------------------|
| R1 | R-15531 | Carbon res. 10K ohm 1/4W20% |
| R2 | R-15510 | Carbon res. 20K ohm 1/4W20% |
| R3 | R-15500 | Carbon resistor 2meg 1/4W20% |
| R4 | Y-VC-21 | Volume Control |
| R5 | R-50 | Carbon resistor 5meg 1/4W20% |
| R6 | R-15512 | Carbon res. 250K ohm 1/4W20% |
| R7 | R-15520 | Carbon res. 500K ohm 1/4W20% |
| R8 | R-80 | Carbon res. 110 ohm 1/4W20% |
| R9 | R-15515 | Carbon res. 100K ohm 1/4W20% |
| R10 | LC-14 | Line Cord |

| Schematic Location | Part No. | Description |
|--------------------|----------|------------------------------|
| C1, C7 | C-15754 | Tubular cond. .01 mfd. 400V |
| C13 | C-15752 | Tubular cond. .05 mfd. 200V |
| C10 | C-15774 | Tubular cond. .002 mfd. 400V |
| C17, C18 | C-15760 | Tubular cond. .02 mfd. 400V |
| C11 | CM-29 | Mica cond. 50 mmfd. 30% |
| C9, C19 | CM-30 | Mica cond. 250 mmfd. 30% |
| C14, C15 | Y-CE-55 | 40 16 mfd. 150 V |
| T-1 | Y-CS-111 | Antenna Coil |
| T-3 | CI-69 | 1st I. F. Transformer |
| T-4 | Y-CI-32 | 2nd I. F. Transformer |
| | Y-M-26 | Electric Clock |
| T-2 | CS-112 | Osc. Coil |

CONVENTIONAL ALIGNMENT FOR ALL MODELS SEE SPECIAL SECTION VOLUME VIII

SCHEMATIC DIAGRAM MODELS 140-148



IF PEAK 455 KC

MODELS 140, 148

This set is a one band, 4-tube superheterodyne receiver equipped with a Majestic High Q loop.
This set will operate on 105-125 volts AC or DC current, and will receive stations lying between 540 and 1720 Kc. This includes standard broadcast and most police stations.

The tubes used are:

1-12SA7GT Frequency Converter and Osc.
1-12K7GT I. F. Amplifier

1-12Q7GT 2nd Detector, AVC, First Audio
1-70A7GT Output and Rectifier

| Schematic Location | Part No. | Description |
|--------------------|----------|------------------------------|
| C3 | C-15752 | Tubular cond. .05 mfd. 200V |
| C5 | C-15753 | Tubular cond. .002 mfd. 600V |
| C8 | C-15760 | Tubular cond. .02 mfd. 400V |
| C11 | C-15756 | Tubular cond. .05 mfd. 400V |
| C12 | C-15754 | Tubular cond. .01 mfd. 400V |
| C2, C13 | Y-CV-15 | Variable Condenser |
| C9, C10 | Y-CE-56 | Electrolytic Condenser |
| C4 | CM-29 | Mica cond. 50 mmfd. |
| C6, C7 | CM-30 | Mica cond. 250 mmfd. |

| Schematic Location | Part No. | Description |
|--------------------|----------|------------------------------|
| R1 | R-15510 | Carbon res. 20K ohm 1/4W20% |
| R2 | R-15500 | Carbon resistor 2meg 1/4W20% |
| R3 | Y-VC-15 | Volume Control |
| R4 | R-15559 | Carbon resistor 3meg 1/4W20% |
| R5 | R-15512 | Carbon res 250K ohm 1/4W20% |
| R6 | R-15520 | Carbon res. 500K ohm 1/4W20% |
| R7 | R-106 | Carbon res. 150 ohm 1/4W20% |
| R8 | R-86 | Flexible res. 70 ohm 2W |
| T0 | Y-CS-131 | Loop Assembly |
| T1 | Y-CS-105 | Oscillator Coil |
| T2 | Y-CS-106 | 1st I. F. Transformer |
| T3 | Y-CS-107 | 2nd I. F. Transformer |
| P.L. | LB-47 | Pilot Light Mazda #47 |

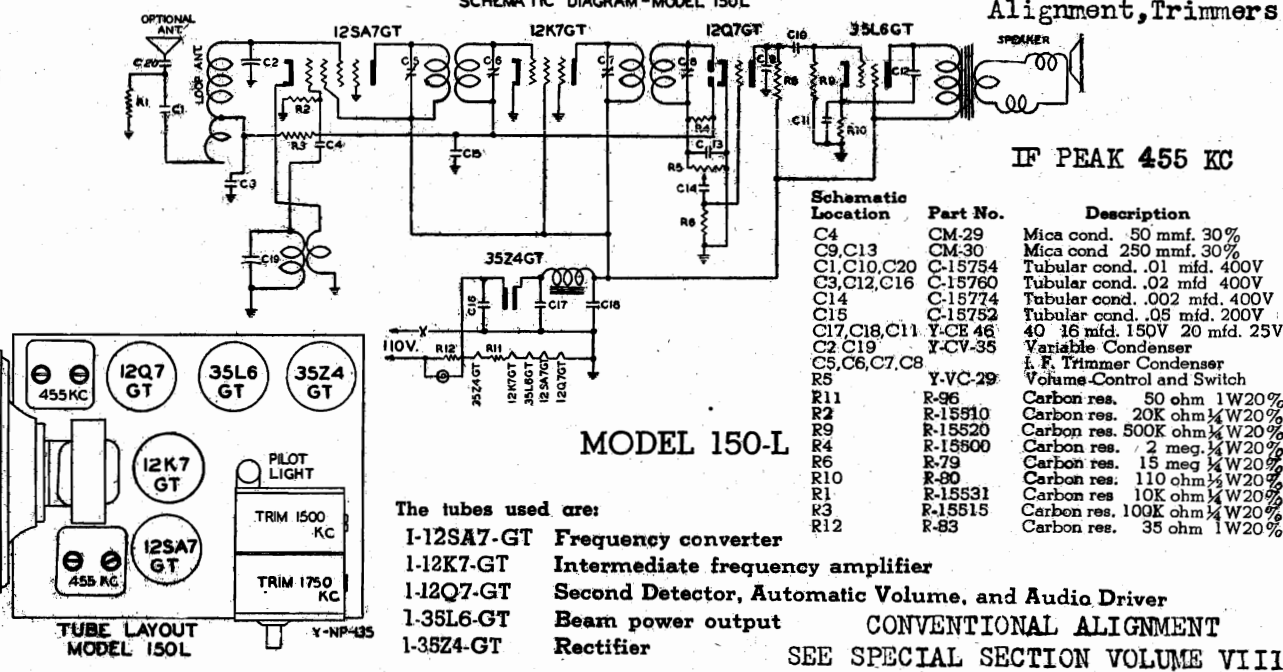
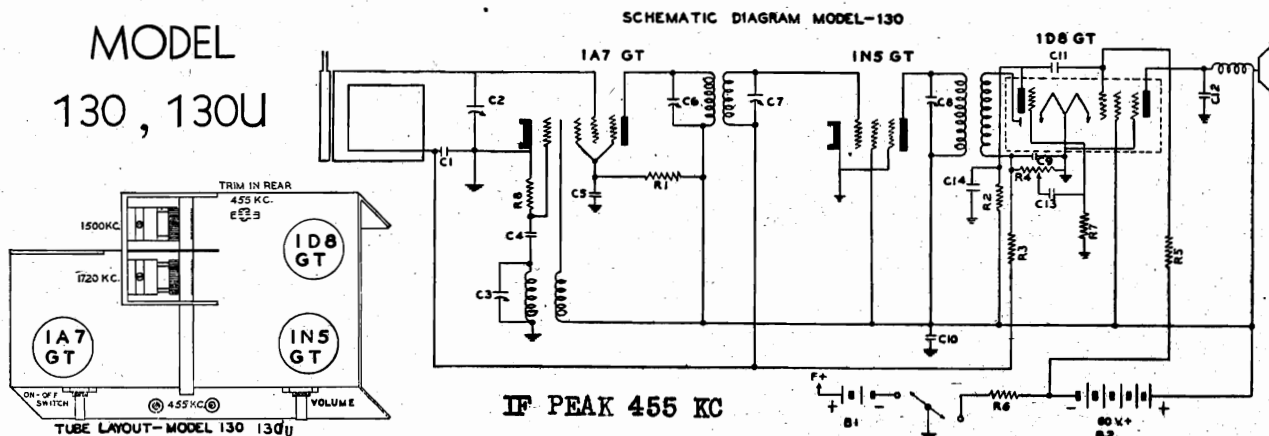
MAJESTIC RADIO & TELEV. CORP.

MODELS 130, 130U

MODEL 150L

Schematics, Socket
Alignment, Trimmers

SCHEMATIC DIAGRAM - MODEL 150L

MODEL
130, 130U

To change the "A" battery, remove the old one from its bracket. Remove the wrapping or tube from the new battery and snap it in position as shown in Figure 1, making certain that the small center contact of the battery makes a good connection to the spring contact as shown in Figure 1.

To change the "B" battery, slide the old one from underneath the chassis. Remove the plug from this battery. Insert the plug into the new battery and replace the new battery.

The tuning range is from 540 to 1750 kilocycles.

The tubes used are:

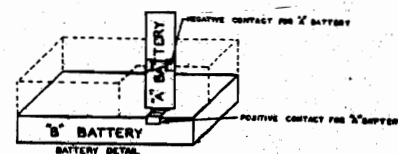
- 1—1A7GT Combined oscillator and 1st detector.
- 1—1N5GT Intermediate frequency amplifier.
- 1—1D8GT Combined second detector, Audio driver, and Power output.

MODEL 130

B1 No. 9 Majestic Battery No. 9 1.5V
B2 No. 3A40P Majestic Battery No. 3A40P 60V

MODEL 130U

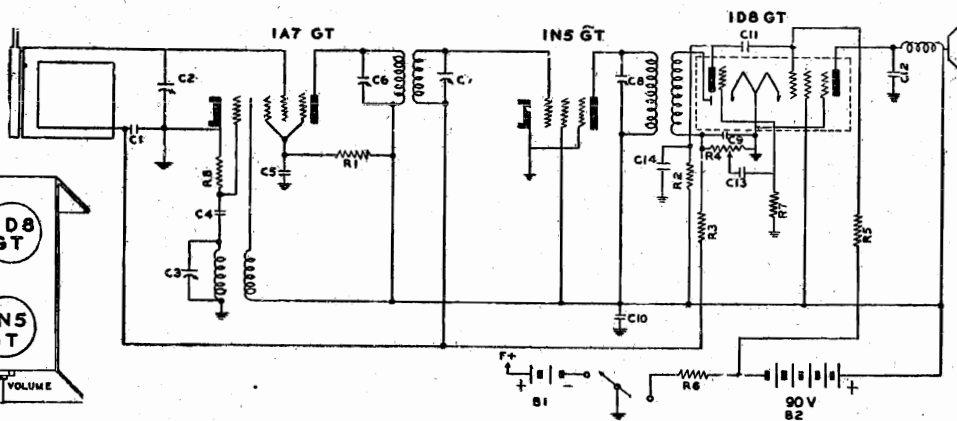
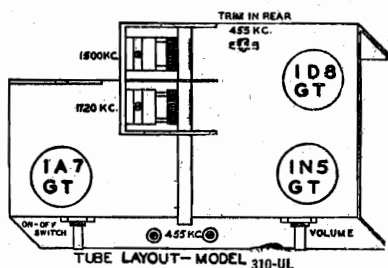
1—P-94A Majestic Battery No. P-94A 1.5V
2—P-5303 Majestic Battery No. P-5303 45V



MODEL 310UL
MODELS 419B, 420
420PL, 421, 421PL
Schematics, Socket
Trimmers, Alignment

MAJESTIC RADIO & TELEV. CORP.

MODEL 310UL
IF PEAK 455 KC

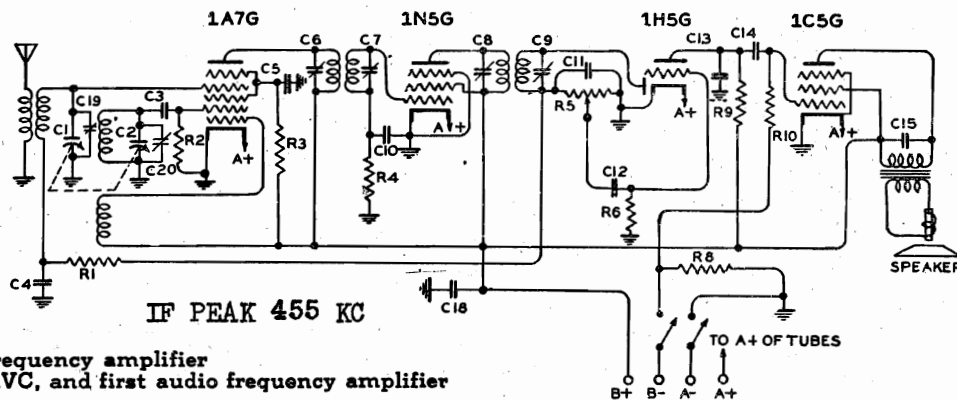


The tubes used are: 1—1A7GT Combined oscillator and 1st detector.
 1—1N5GT Intermediate frequency amplifier.
 1—1D8GT Combined second detector, Audio driver, and Power output.

| Schematic Location | Part No. | Description |
|--------------------|----------|--------------------------------|
| C1 | C-45 | Tubular cond. .05 mfd. 200V |
| C2, C3 | Y-CV-46 | Variable Condenser |
| C4 | CM-31 | Mica cond. 100 mmfd. |
| C5, C11 | C-48 | Tubular cond. .01 mfd. 400V |
| C6, C7 | CT-1 | Trimmer condenser |
| C8 | CT-32 | Trimmer condenser |
| C9, C14 | CM-30 | Mica cond. 250 mmfd. |
| C10 | CE-58 | 4 mfd. 100V Electrolytic |
| C12, C13 | C-47 | Tubular cond. .004 mfd. 400V |
| R1 | R-105 | Carbon res. 5K ohm |
| R2 | R-102 | Carbon res. 1 meg. |
| R3, R5, R7 | R-101 | Carbon res. 2 meg. |
| R8 | R-15515 | Carbon res. 100K ohm |
| R6 | R-103 | Carbon res. 600 ohm |
| B1 | 1—P-94A | Majestic Battery No. P-94 1.5V |
| B2 | 2—P-5303 | Majestic Battery No. P-530 45V |

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII.

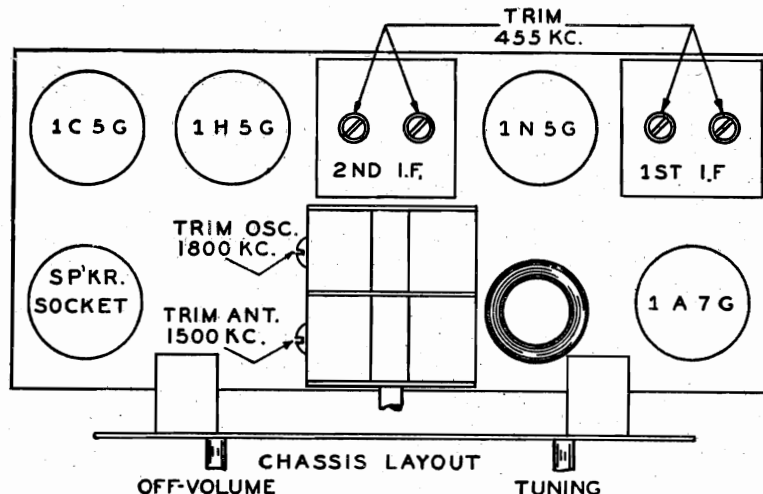
Model 419-B
 Model 420
 Model 420-PL
 Model 421
 Model 421-PL



The tubes used are:
 1-1A7G Converter
 1-1N5G Intermediate frequency amplifier
 1-1H5G 2nd detector, AVC, and first audio frequency amplifier
 1-1C5G Output tube

| Schematic Location | Part No. | Description |
|--------------------|----------|--------------------------|
| C4, C5 | C-15752 | .05 mfd. 200V |
| C10, C12, C14 | C-15763 | .01 mfd. 200V |
| C15 | C-25 | .006 mfd. 400V |
| C3, C11, C13 | CM-15918 | 100 mmf Type "O" Mica |
| C1, C2 | Y-CV-26 | Variable Condenser |
| C6, C7, C8, C9 | Y-CT-2 | 1. F. Trimmer Condenser |
| C18 | CE-35 | 8 mfd. 150V Electrolytic |
| R9 | R-15520 | 500K 1/4W 20% |
| R10 | R-15517 | 1 meg. 1/4W 20% |
| R8 | R-72 | 600 ohms 1/4W 20% |
| R2 | R-15523 | 200K 1/4W 20% |
| R6 | R-15559 | 3 meg. 1/4W 20% |
| R3 | R-44 | 70K 1/4W 10% |
| R1, R4 | R-15500 | 2 meg. 1/4W 20% |
| R5 | Y-VC-26 | Volume Control |

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII



This receiver is designed to operate on the following dry batteries.

- 1 1/2 volt A-battery — Eveready 742A — RAY-O-VAC P-94A or the equivalent.
- 45 volt B-batteries — Eveready 762 — RAY-O-VAC P-5303 or the equivalent.

**Schematic, Socket
Trimmers, Alignment
MODEL 699P
Schematic**

MAJESTIC RADIO & TELEV. CORP.

**MODELS 511, 511A
519P, 519PA Late**

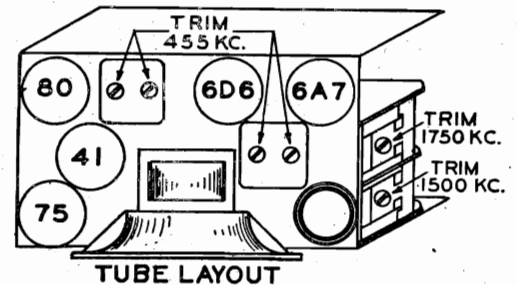
Model 511
Model 511A
Model 519P
Model 519PA

| Schematic Location | Part No. | Description |
|--------------------|----------|--------------------------|
| R1 | R-15511 | 50K ohms 20% 1/4W |
| R2 | R-15544 | 15K ohms 20% 1W |
| R3 | Y-VC-17 | 500K ohms Volume control |
| R4 | R-15500 | 2 meg ohms 20% 1/4W |
| R5 | R-15517 | 1 meg ohm 20% 1/4W |
| R6 | R-15520 | 500K 20% 1/4W |
| R7 | R-15528 | 400K 20% 1/4W |
| R10, R9, R8 | RC-7 | Candohm resistor |
| R11 | R-50 | 5 meg 20% 1/4W |
| C2 | C-15752 | .05 mfd. 200V |
| C7, C15 | C-15756 | .05 mfd. 400V |
| C11, C16 | C-15754 | .01 mfd. 400V |
| C | Y-CV-17 | Variable gang condenser |
| C4, C5, C8, C9 | Y-CT-1 | I. F. Trimmers |
| C10, C12 | CM-15918 | 100 mmfd. 20% |
| C3 | CM-15929 | 50 mmfd. 20% |
| C13, C14, C18 | Y-CE-43 | Electrolytic condenser |
| | | 12 8 mfd. 300 V |
| | | 20 mfd. 25 V |
| C19 | CM-16 | 150 mmfd. 20% |
| C17 | C-15759 | .006 mfd. 600V |

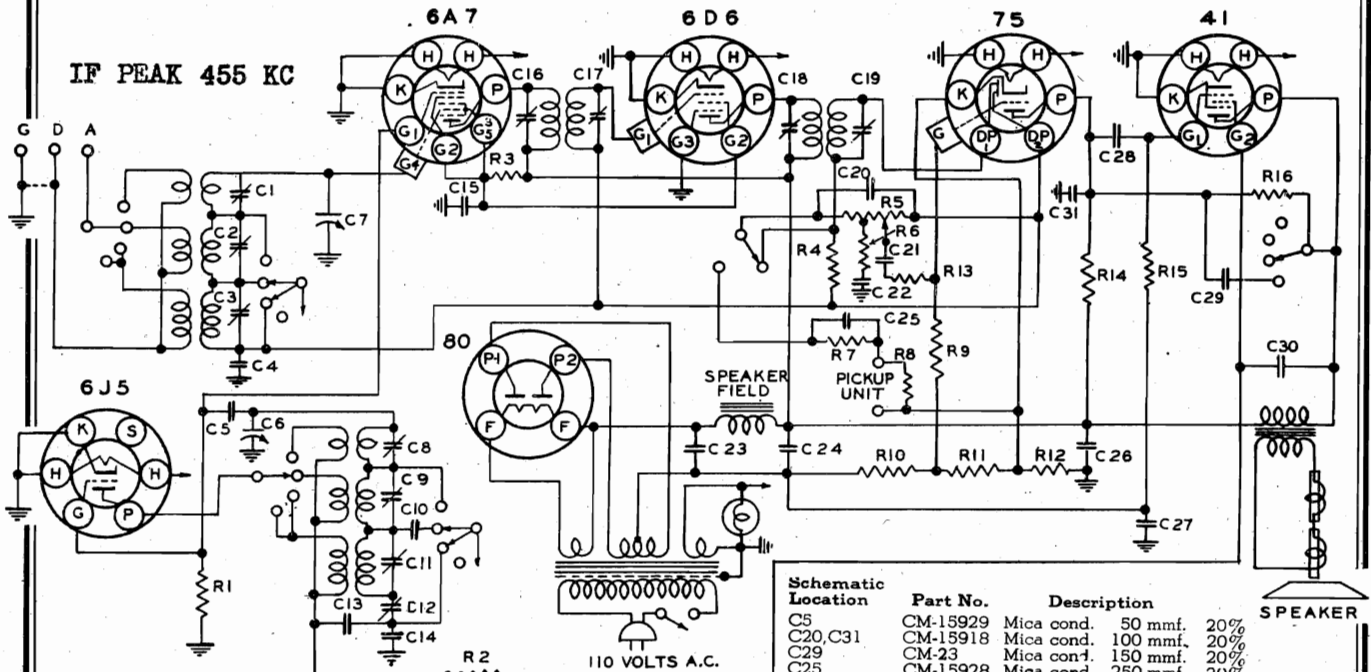
The tubes used are:

- 1-6A7 Converter tube
1-6D6 I. F. Amplifier
1-75 Second detector, automatic volume control and audio amplifier
1-41 Power output
1-80 Rectifier

IF PEAK 455 KC



CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.



MODEL 699-P

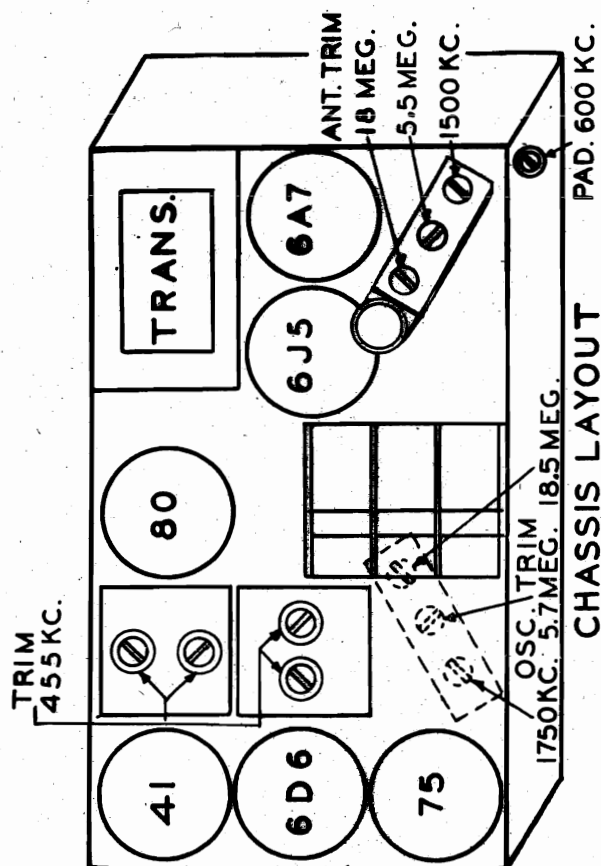
| Schematic Location | Part No. | Description |
|--------------------|----------|--------------------------------|
| R1, R6 | R-15511 | Carbon resistor 50K 1/4W 20% |
| R4, R7, R16 | R-15500 | Carbon resistor 2 Meg 1/4W 20% |
| R13, R8, R14 | R-15512 | Carbon resistor 250K 1/4W 20% |
| R5 | R-2 | Carbon resistor 5K 1/4W 20% |
| R9 | R-15517 | Carbon resistor 1 Meg 1/4W 20% |
| R15 | R-15520 | Carbon resistor 5 Meg 1/4W 20% |
| R3 | R-15535 | Carbon resistor 13K 2W 20% |
| R10, R11, R12 | RC-6 | Candohm resistor |
| R5 | Y-VC-22 | Volume control |

| Schematic Location | Part No. | Description |
|-----------------------|------------|--|
| C5 | CM-15929 | Mica cond. 50 mmfd. 20% |
| C20, C31 | CM-15918 | Mica cond. 100 mmfd. 20% |
| C29 | CM-23 | Mica cond. 150 mmfd. 20% |
| C25 | CM-15928 | Mica cond. 250 mmfd. 20% |
| C10 | CM-1 | Mica cond. 2550 mmfd 5% |
| C14 | CM-17 | Mica cond. pre. 4330 mmfd. 3% |
| C15, C26 | C-15756 | Tubular cond. .05 mfd. 400 V |
| C13, C21 | C-15754 | Tubular cond. .01 mfd. 400 V |
| C22, C28 | C-15759 | Tubular cond. .006 mfd. 400 V |
| C30 | C-15752 | Tubular cond. .05 mfd. 200 V |
| C4 | Y-CP-1 | Trimmer cond. ant. |
| C1, C2, C3 | Y-CP-1 | Trimmer cond. ant. |
| C8, C9, C11 | Y-CP-1 | Trimmer cond. ant. |
| C12 | Y-CP-16472 | Osc. Padder condenser |
| C16, C17 | Y-CT-1 | Trimmer cond. 1st I. F. |
| C18, C19 | Y-CT-1 | Trimmer cond. 2nd I. F. |
| C23, C24, C27, Y-CE-7 | | Elect. cond. 16.16 mfd. 400 V, 12 mfd. 25V |
| C6, C7 | Y-CV-19 | 2 gang variable cond. |

MODEL 699-P

Socket, Trimmer's
Alignment, Tuner

MAJESTIC RADIO & TELEV. CORP.



- (3) Tune in your desired station manually until it is heard with best quality.
 - (4) Push in the button while holding the manual tuning knob fixed on the station.
 - (5) Tighten the button by turning it to the right while the button is pushed all the way in, as tightly as possible. Allow the button to come out and tighten still more. It is of the utmost importance that the buttons be logged as tightly as possible.
 - (6) Repeat this procedure to set up the other buttons.
- IT IS IMPORTANT THAT ALL THE BUTTONS BE LOGGED ON STATIONS LYING BETWEEN 550 AND 1700 KILOCYCLES AND THAT THESE BUTTONS BE SCREWED TIGHTLY. IF THIS IS NOT DONE THE CAMS OPERATING THE PUSH BUTTON UNIT MAY WANDER AND JAM THE WHOLE UNIT.

If there are not enough stations in your locality to log all six buttons, the unused buttons should be logged somewhere between 550 and 1700 kilocycles.

To change any one setting at any time repeat the above procedure. After that, to get this station, push the desired button with an even firm push until it has reached the end of its travel. After the push buttons are adjusted to your desired station, cut out the proper station call letters from the enclosed station call letter sheet, and snap this tab into the rectangular opening above the push buttons. Cover them with the small transparent celluloid tabs supplied with the call letters. These openings are shown in Fig. 1 as No. 1, No. 2, No. 3, No. 4, No. 5 and No. 6.

MODEL 699-P

Model 699-P is a six tube radio phonograph combination operating on a 110 volts 50-60 cycles. The receiver tunes to three bands, these are:

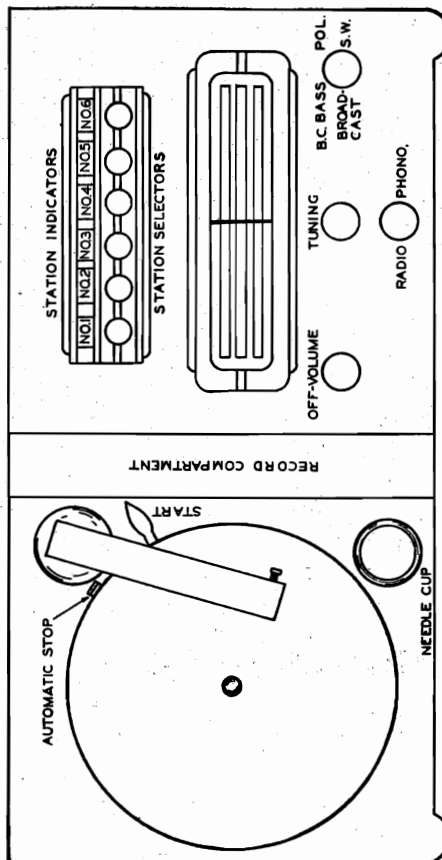
- A—Broadcast band 538 to 1750 kilocycles.
- B—Police and airplane 1.75 to 5.8 M.C.
- C—American and foreign short wave receptions 5.8 to 18.6 M.C.

The receiver is equipped with automatic volume control, inverse feedback, inverse feedback tone control, base compensation, and mechanical push button tuning.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII.

The tubes used are:

- 1—6A7 First detector
- 1—6J5 Oscillator
- 1—6D6 I. F. Amplifier
- 1—75 Second detector, automatic volume control and first audio amplifier
- 1—41 Power output
- 1—80 Rectifier



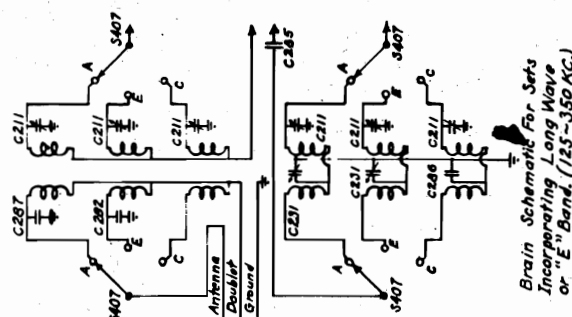
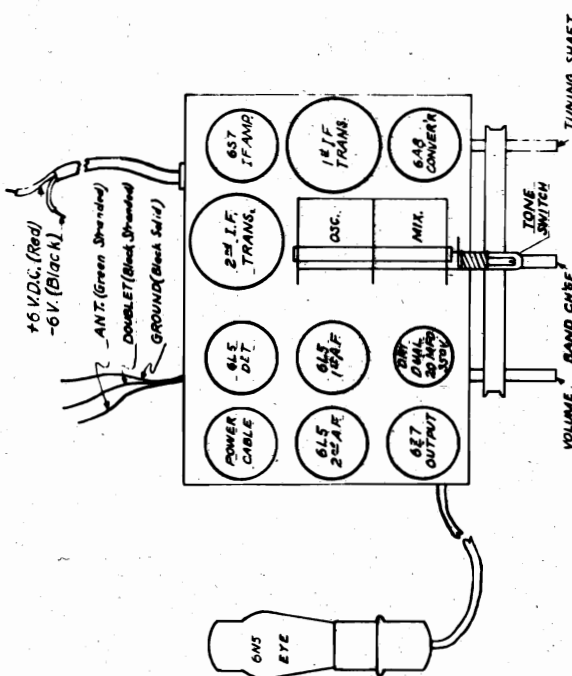
Operations For Setting Up Of Buttons

- (1) Decide which station you desire to hear on any one button.
- (2) Loosen this button by turning it to the left.

| | |
|------|--------------------------|
| E34 | Eye Clamp |
| K56 | Eye Socket/Cable |
| K65 | P Button Key |
| K240 | 1 Inch Knob |
| K40 | Pilot Light 6-3 |
| R12 | 500 Ohm $\frac{1}{4}$ W. |
| R17 | 25M. " |
| R19 | 100M. " |
| R21 | 1Meg. " |
| R23 | 3 " " |
| R72 | 15M. " 1W. |
| R73 | 25M. " |
| S304 | 6" x M. Split |
| S319 | Spring, Belt |
| S333 | Pointer Assembly |
| S407 | Band Switch |
| S445 | Tone Switch |
| T71 | Power Trans. |
| T79 | Audio Transf. |
| T164 | 15T.E |
| T165 | 25T.E |
| V33 | Vibrator |
| V231 | Osc. Pak., E Band |
| J7 | Conn. Outlet |

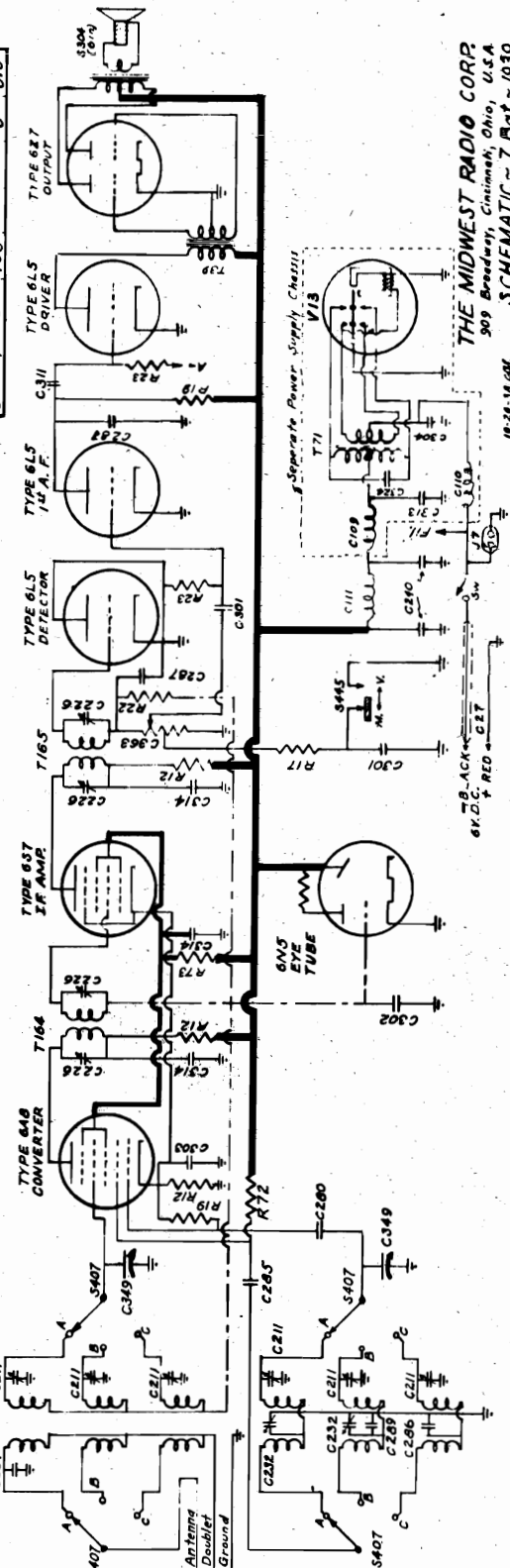
| | | | |
|------|-----------------|--|--|
| C27 | Battery Cable | | |
| C109 | Choke, R.F. | | |
| C110 | Choke, R.F. | | |
| C111 | Choke, Filter | | |
| C211 | Trimmer, 3 gang | | |
| C226 | I.F. Padder | | |
| C232 | Osc. Padder | | |
| C240 | Dual Dry | | |
| C250 | 100 mfd. Mica | | |
| C255 | 2000 | | |
| C256 | 3000 | | |
| C257 | 200 | | |
| C259 | 1200 | | |
| C301 | 0.1 mfd. 200 V. | | |
| C302 | 0.5 | | |
| C303 | 2.5 | | |
| C304 | 5 | | |
| C311 | 0.1 400 V. | | |
| C313 | 2.5 | | |
| C314 | 0.5 | | |
| C324 | 0.5 | | |
| C349 | 2 gang Variable | | |
| C363 | Vol. Cont. W.S. | | |
| C375 | Eye Escutcheon | | |
| E33 | Eye Bracket | | |

| TUBE | PLATE | SCREEN | SUPPL. | CATH. | HEAT |
|---------------|-------|--------|--------|-------|------|
| 6A0 Converter | 135 | 80 | 90 | 4 | 6.0 |
| 6BT 1F Ampl. | 135 | 80 | 4 | 6.0 | 4 |
| 6BS Defector | 0 | 0 | 0 | 6.0 | 0 |
| 6BS 1st A.F. | 25 | 0 | 0 | 6.0 | 0 |
| 6BS Driver | 130 | 0 | 0 | 6.0 | 0 |
| 6ZT Output | 135 | 0 | 0 | 6.0 | 0 |
| 6NSEye Tube | 135 | 0 | 0 | 6.0 | 0 |

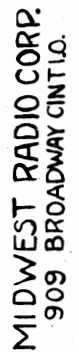


Brain Schematic For Sets
Incorporating Long Wave
or "E" Band. (125-350 KC.)

Standard Brain Below
Incorporates Police Band,
1.7~5.5 MC.



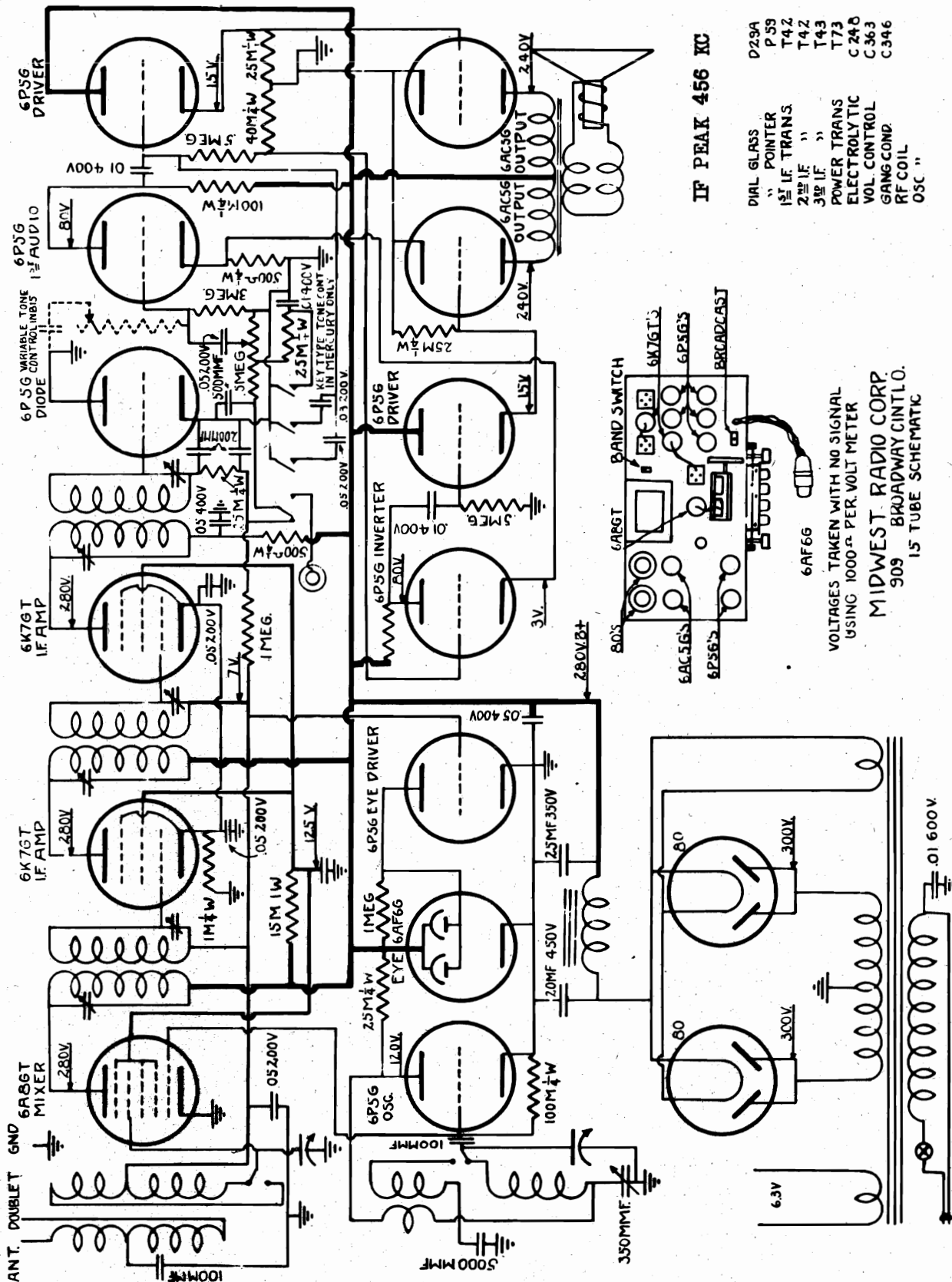
THE MIDWEST RADIO CORP.
909 Broadway, Cincinnati, Ohio, U.S.A.
SCHEMATIC ~ 7 Bat. ~ 1939



IF PEAK 456 KC

| | |
|---------------|------|
| DIAL GLASS | D23A |
| " POINTER | P59 |
| 1ST LF TRANS. | T42 |
| 2ND LF " | T42 |
| 3RD LF " | T43 |
| POWER TRANS | T73 |
| ELECTROLYTIC | C248 |
| VOL. CONTROL | C363 |
| GANG COND. | C346 |
| RF COIL | |
| OSC " | |

RDG



VOLTAGES TAKEN WITH NO SIGNAL
USING 1000 Ω PER VOLT METER

MIDWEST RADIO CORP.
909 BROADWAY CINTLO.
15 TUBE SCHEMATIC

MIDWEST RADIO CORP.
909 BROADWAY CINTLO.

MODEL 170

Schematic, Voltage
Socket

MIDWEST RADIO CORP.

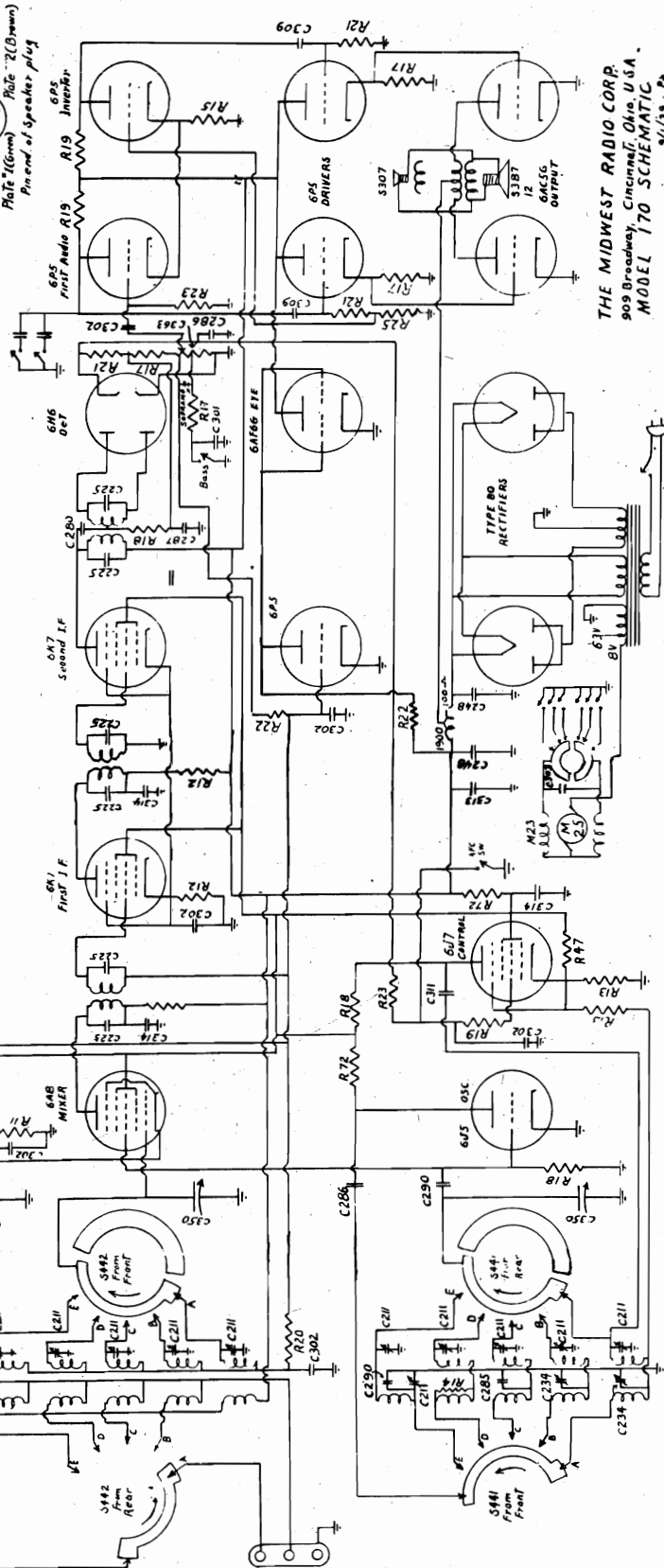
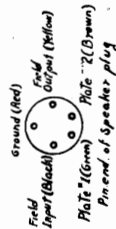
| | | |
|-------------------------|----------------------|-----------------------|
| R25 40K Ohms | C313 .25 MFD | A10 Ant Binding post |
| R47 25K " | C314 .05 | B26 Brush Holder |
| R48 50K " | C330 36gang Var Cond | B27 Brush Clip |
| R72 15K " | C383 Control Volume | C20 Cable-Plug |
| S307 Speaker 3 1/2" 12" | D3 Dial Background | C245 Commutator Disk |
| S442 | D41 Dial Glass | C400 " Segment |
| S441 Band Sw. 01c RF | A24 Knob (Brown-1") | C225 36gang Trimmer |
| S442 | M23 Meter | C234 Osc. Aud. (Gang) |
| 773 Per. Trans. | P10 Panel | C248 Filter Cond. |
| | P46 Pilot Light-8V | |
| | P59 Pointer Slide | |
| | R11 200 Ohm | |
| | R12 500 " | |
| | R13 1000 " | |
| | R14 2000 " | |
| | R15 5000 " | |
| | R17 25K " | |
| | R19 100K " | |
| | R20 200K " | |
| | R21 500K " | |
| | R22 1Meg " | |
| | R23 3 " | |

| | | |
|---------------------|--------------------|----------------------|
| C313 .25 MFD | C314 .05 | C330 36gang Var Cond |
| C383 Control Volume | D3 Dial Background | D41 Dial Glass |
| A24 Knob (Brown-1") | M23 Meter | P10 Panel |
| P46 Pilot Light-8V | P59 Pointer Slide | R11 200 Ohm |
| R12 500 " | R13 1000 " | R14 2000 " |
| R15 5000 " | R17 25K " | R19 100K " |
| R20 200K " | R21 500K " | R22 1Meg " |
| R23 3 " | | |

| | | |
|----------------------|-----------------------|----------------------|
| A10 Ant Binding post | B26 Brush Holder | B27 Brush Clip |
| C20 Cable-Plug | C245 Commutator Disk | C400 " Segment |
| C225 36gang Trimmer | C234 Osc. Aud. (Gang) | C248 Filter Cond. |
| C270 10 MFD. | C271 25 " | C280 100 " |
| C285 2000 " | C286 3000 " | C287 200 " |
| C290 60 " | C301 01 MFD paper | C302 .05 " |
| C303 .25 " | C309 .02 " | C311 .01 " |
| C313 .25 MFD | C314 .05 | C330 36gang Var Cond |

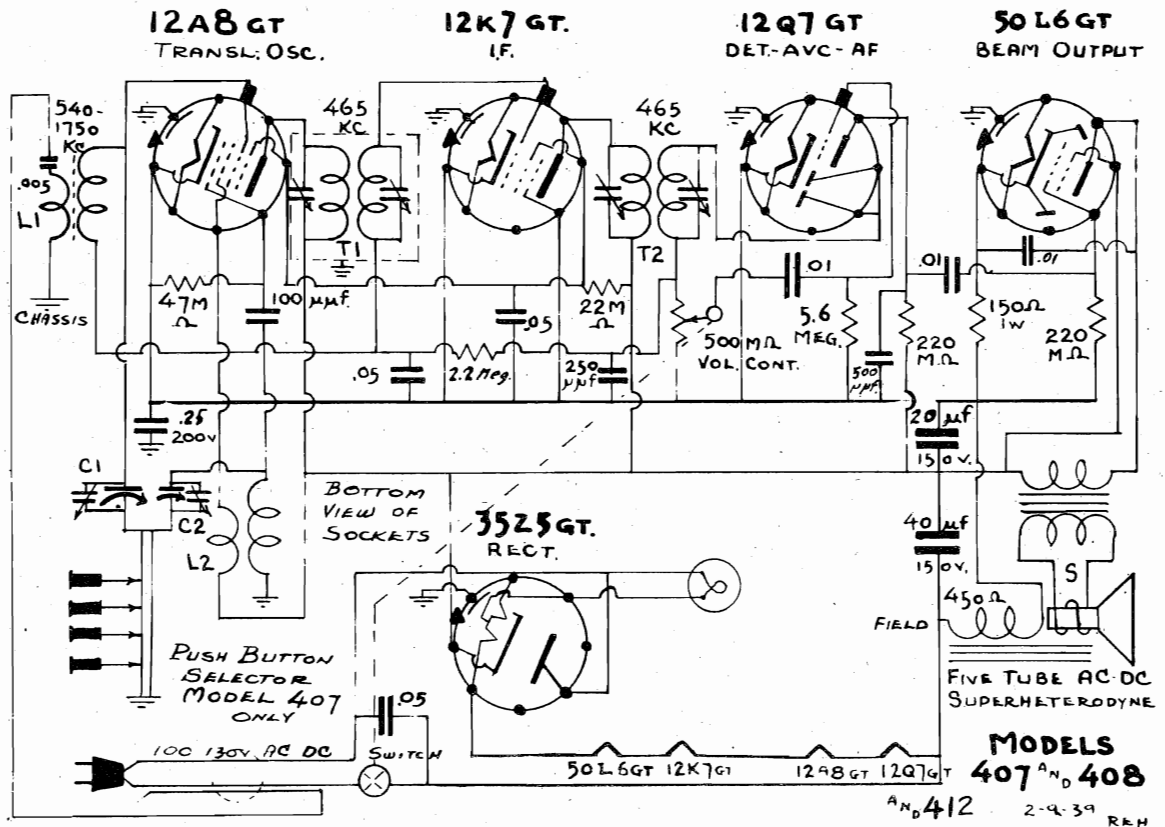
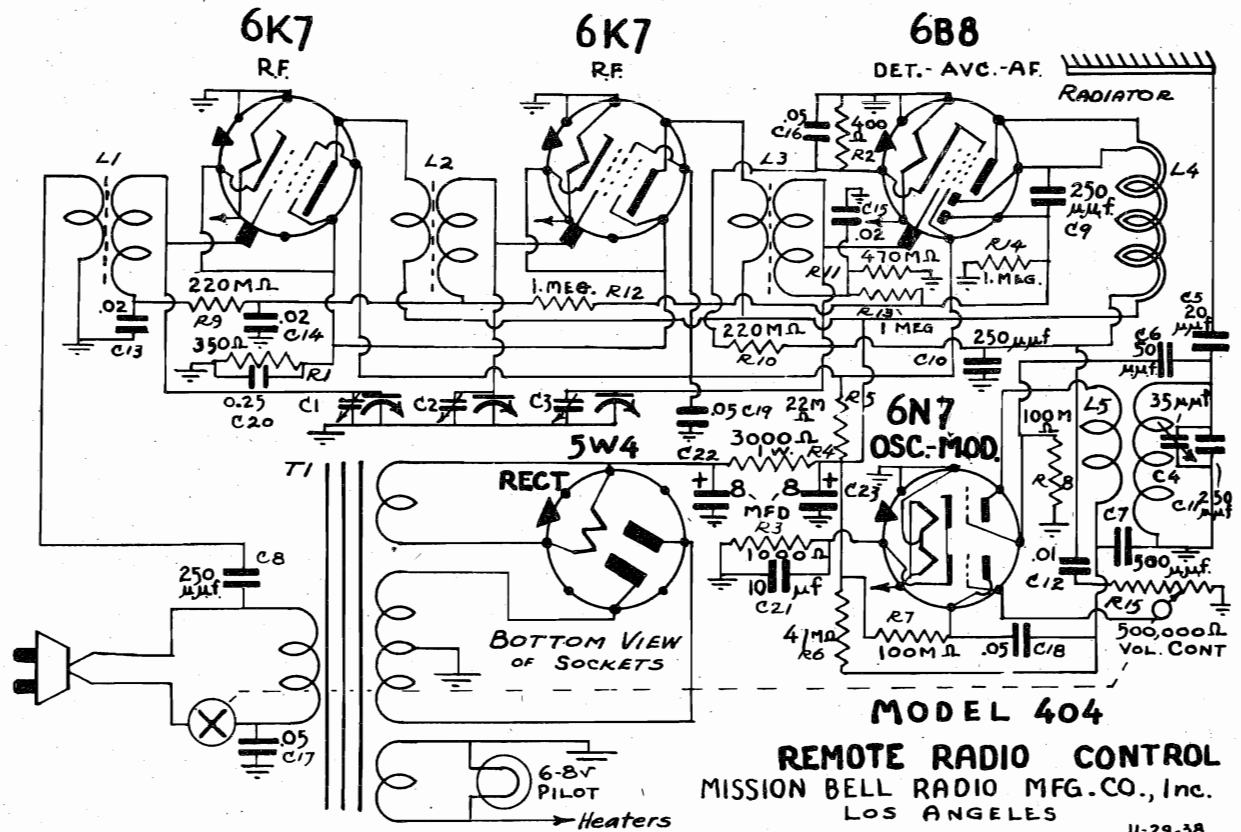
| TUBE | PLATE | SCREEN | GRID | HEATER |
|----------------|-------|--------|------|--------|
| 6K7 R.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 A.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 D.C. AMP. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 2ND I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 1ST I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 3RD I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 4TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 5TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 6TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 7TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 8TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 9TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 10TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 11TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 12TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 13TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 14TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 15TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 16TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 17TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 18TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 19TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 20TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 21TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 22TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 23TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 24TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 25TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 26TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 27TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 28TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 29TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 30TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 31TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 32TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 33TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 34TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 35TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 36TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 37TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 38TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 39TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 40TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 41TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 42TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 43TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 44TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 45TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 46TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 47TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 48TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 49TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 50TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 51TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 52TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 53TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 54TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 55TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 56TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 57TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 58TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 59TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 60TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 61TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 62TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 63TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 64TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 65TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 66TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 67TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 68TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 69TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 70TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 71TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 72TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 73TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 74TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 75TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 76TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 77TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 78TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 79TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 80TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 81TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 82TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 83TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 84TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 85TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 86TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 87TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 88TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 89TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 90TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 91TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 92TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 93TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 94TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 95TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 96TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 97TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 98TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 99TH I.F. | 245 | 6.5 | 2.4 | 6.0 |
| 6K7 100TH I.F. | 245 | 6.5 | 2.4 | 6.0 |

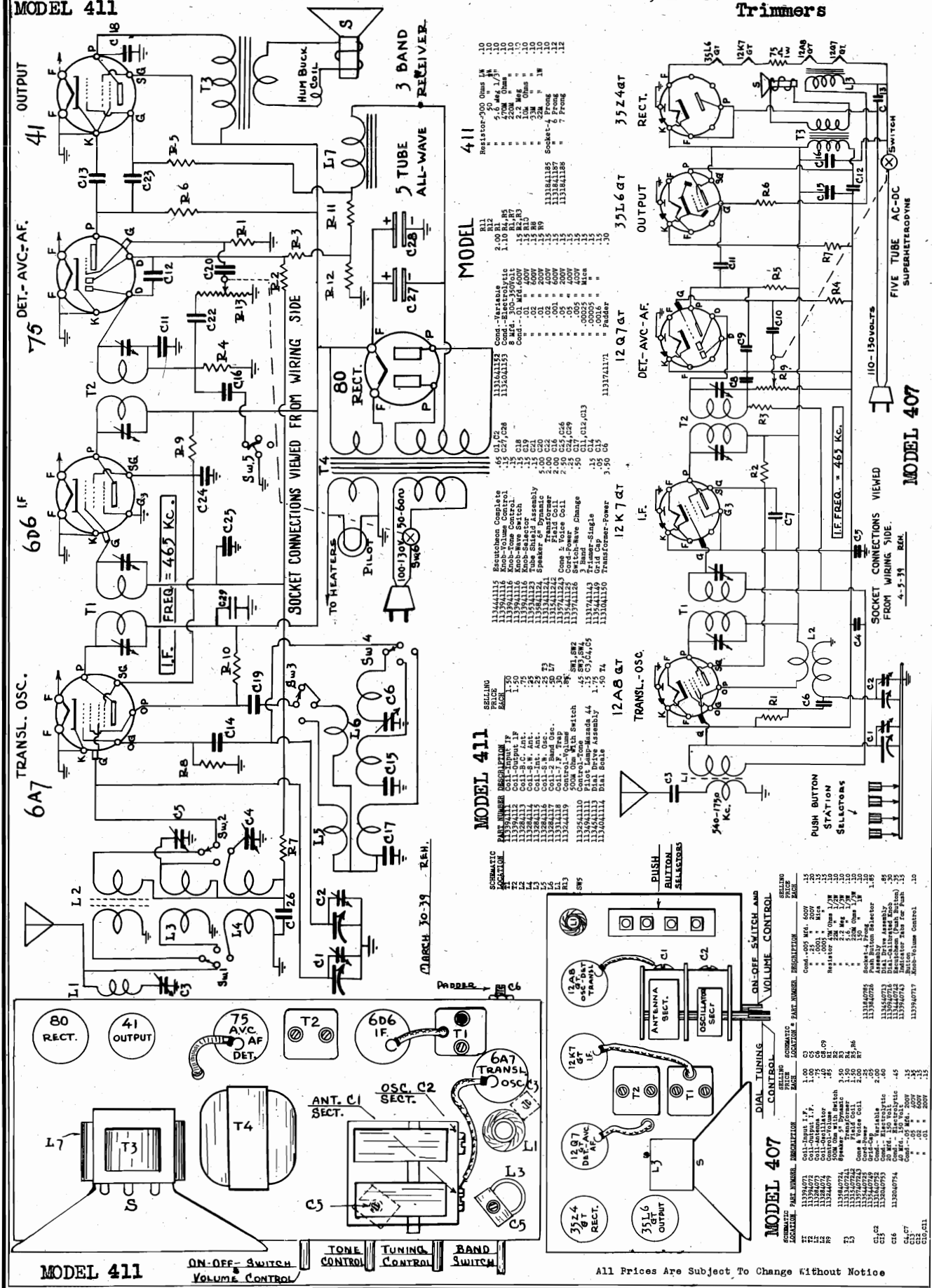
IF PEAK 456 KC



THE MIDWEST RADIO CORP.
909 Broadway, Cincinnati, Ohio, U.S.A.
MODEL 170 SCHEMATIC
9/1/39 - P4

MISSION BELL RADIO MFG. CO., INC. MODELS 407, 408, 412
Schematics





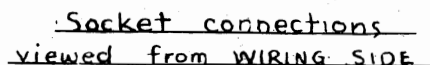
MODEL 410

**MODEL 498 Record
Player**



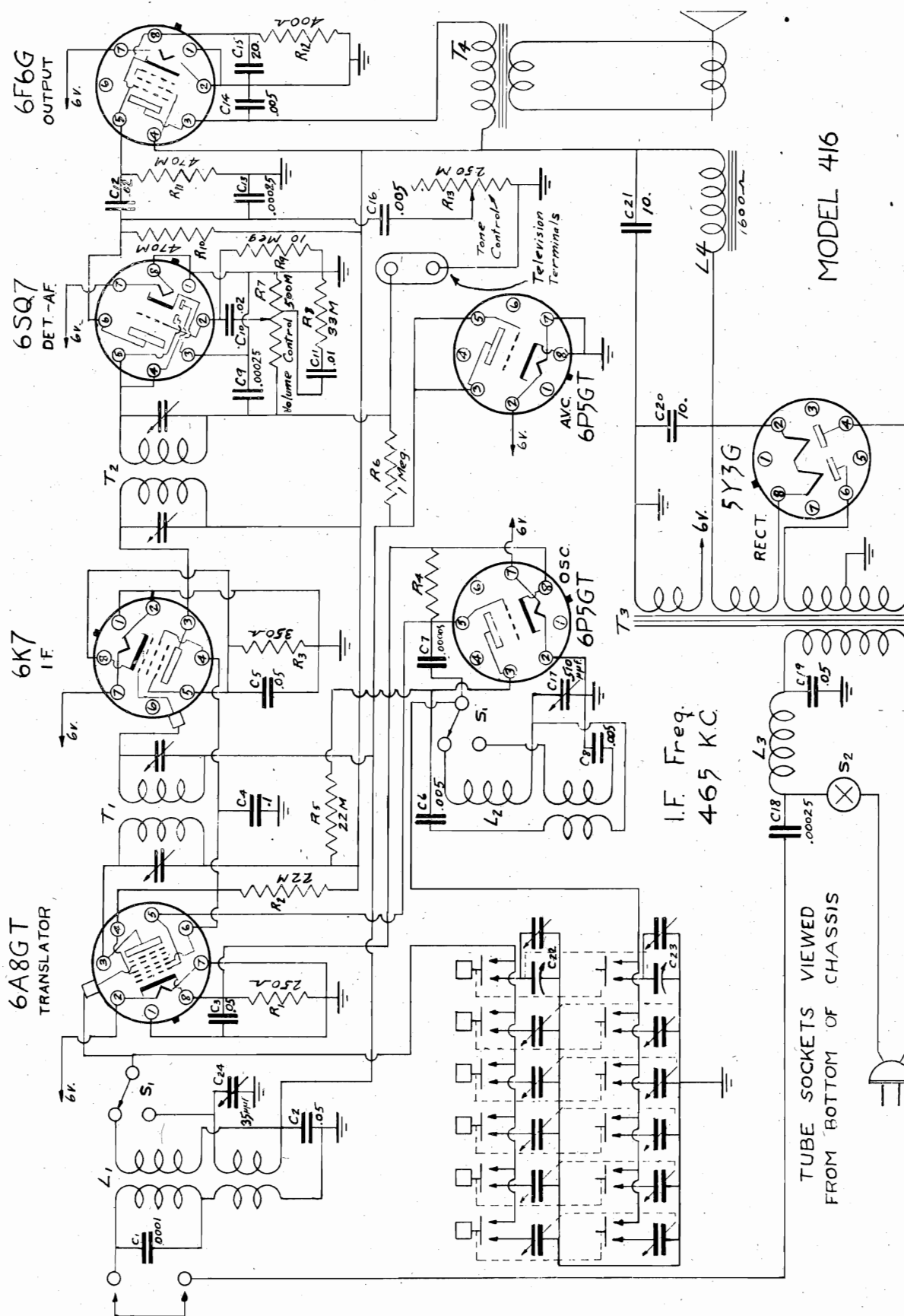
MODEL 410

2 2 39



MISSION BELL RADIO
MFG. CO., INC.
LOS ANGELES
6-19-39 REH

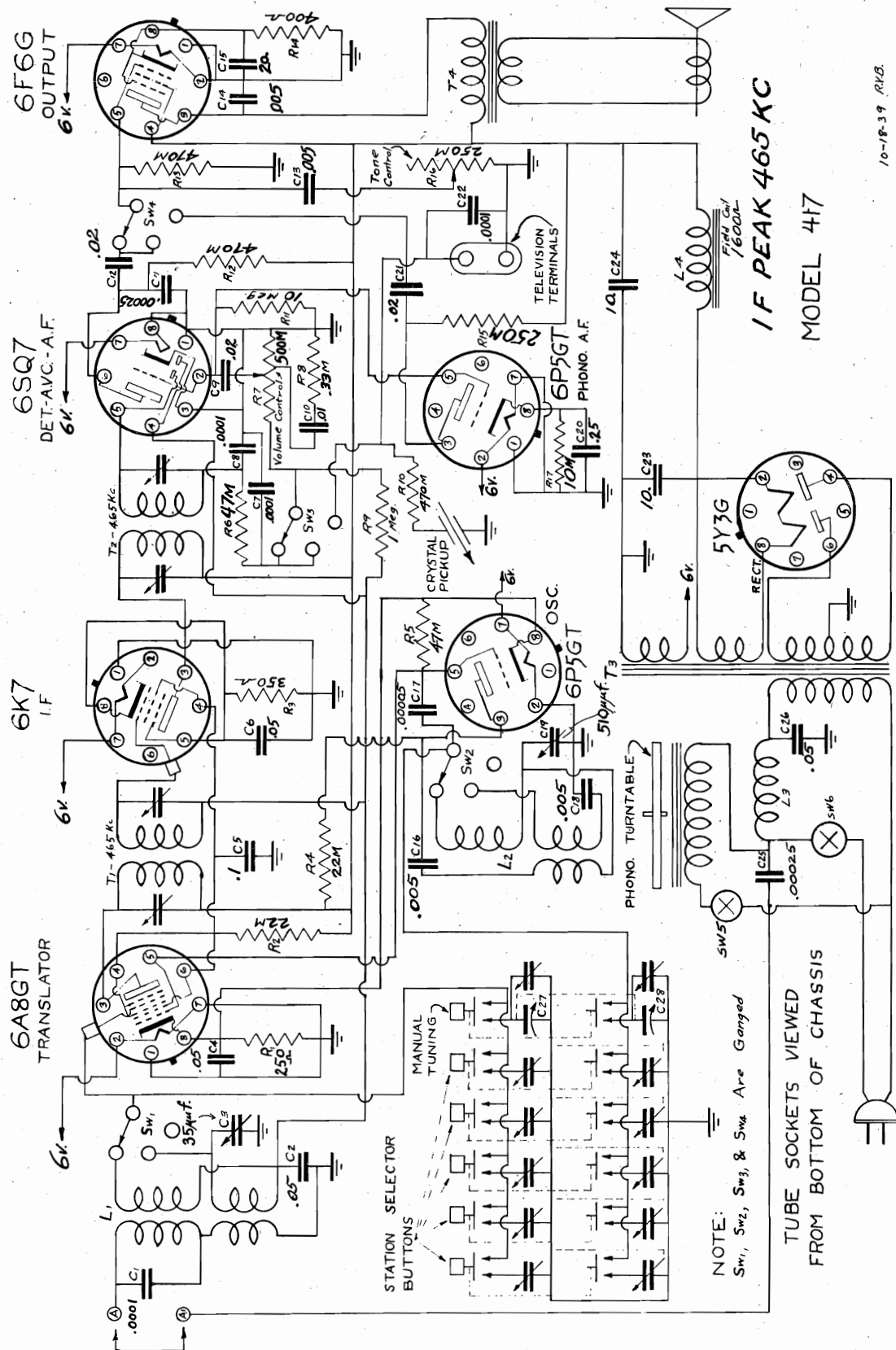
MISSION BELL RADIO MFG. CO., INC.



9-12-39.

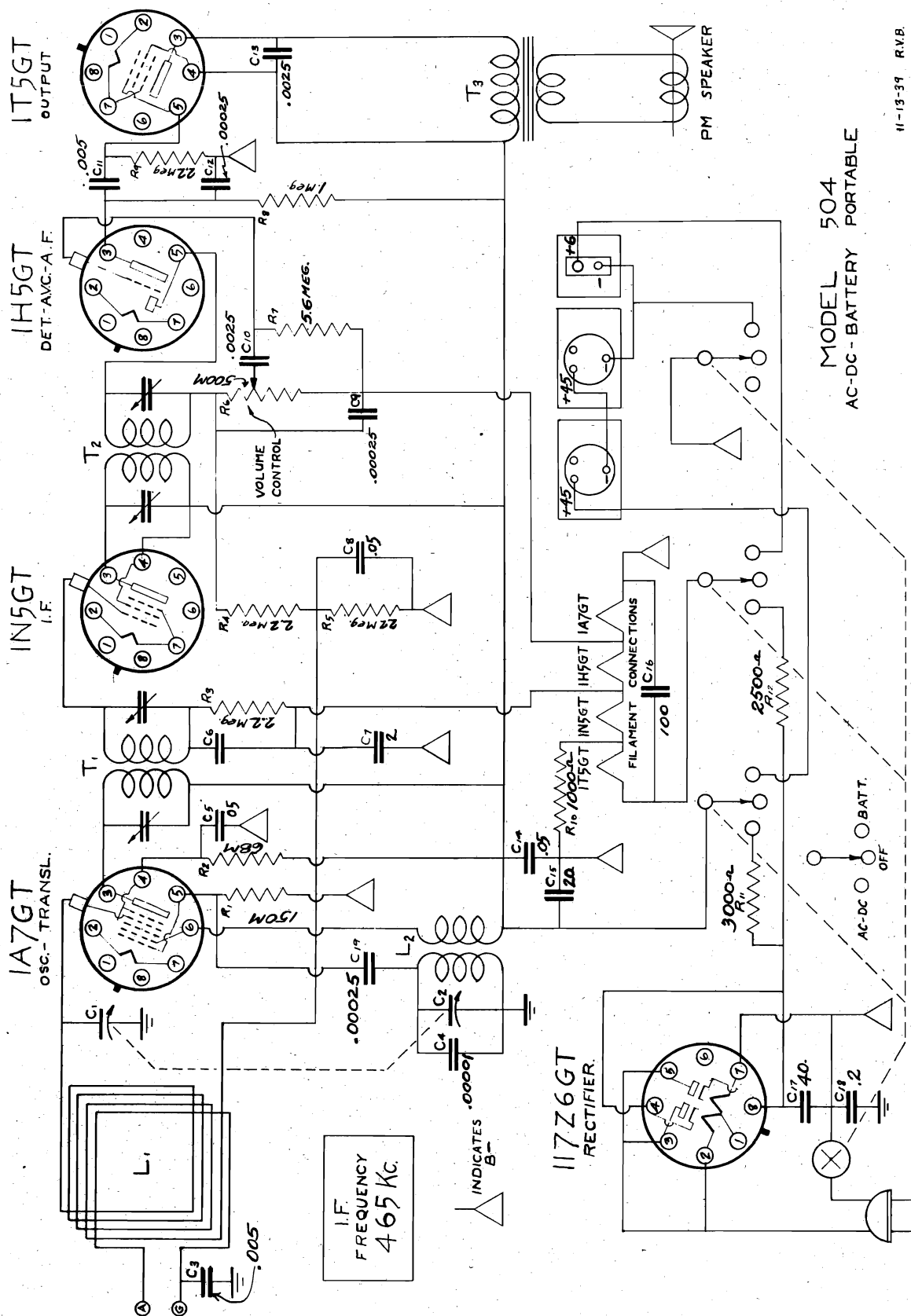
MODEL 416

MISSION BELL RADIO MFG. CO., INC.

MODEL 417
Schematic

MODEL 504
Schematic

MISSION BELL RADIO MFG. CO., INC.



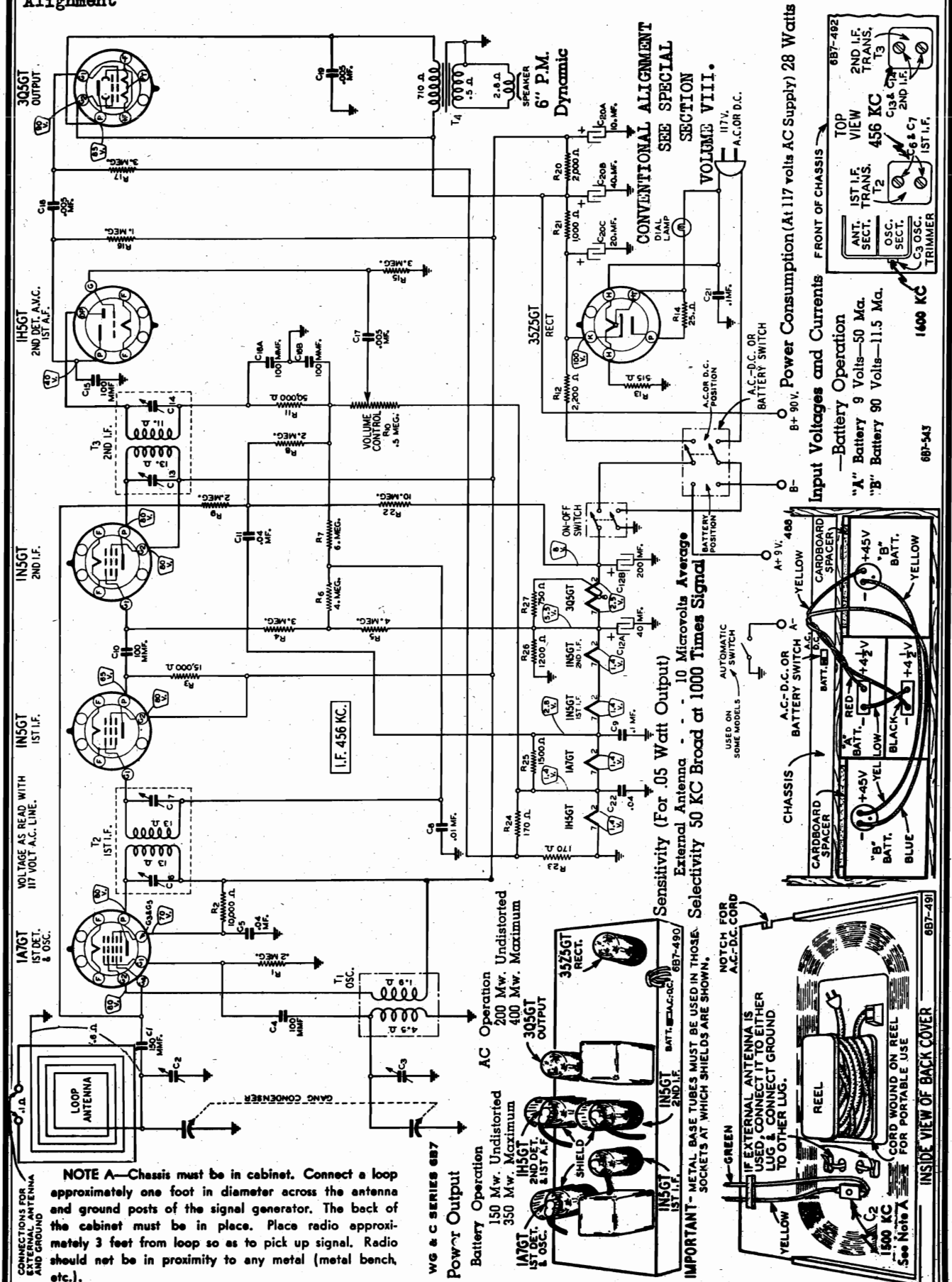
MODEL 504
AC-DC-BATTERY PORTABLE

11-13-39 R.V.B.

Trimmers, Sensitivity
Batt. Conn., Loop Data
Alignment

MONTGOMERY WARD & CO.

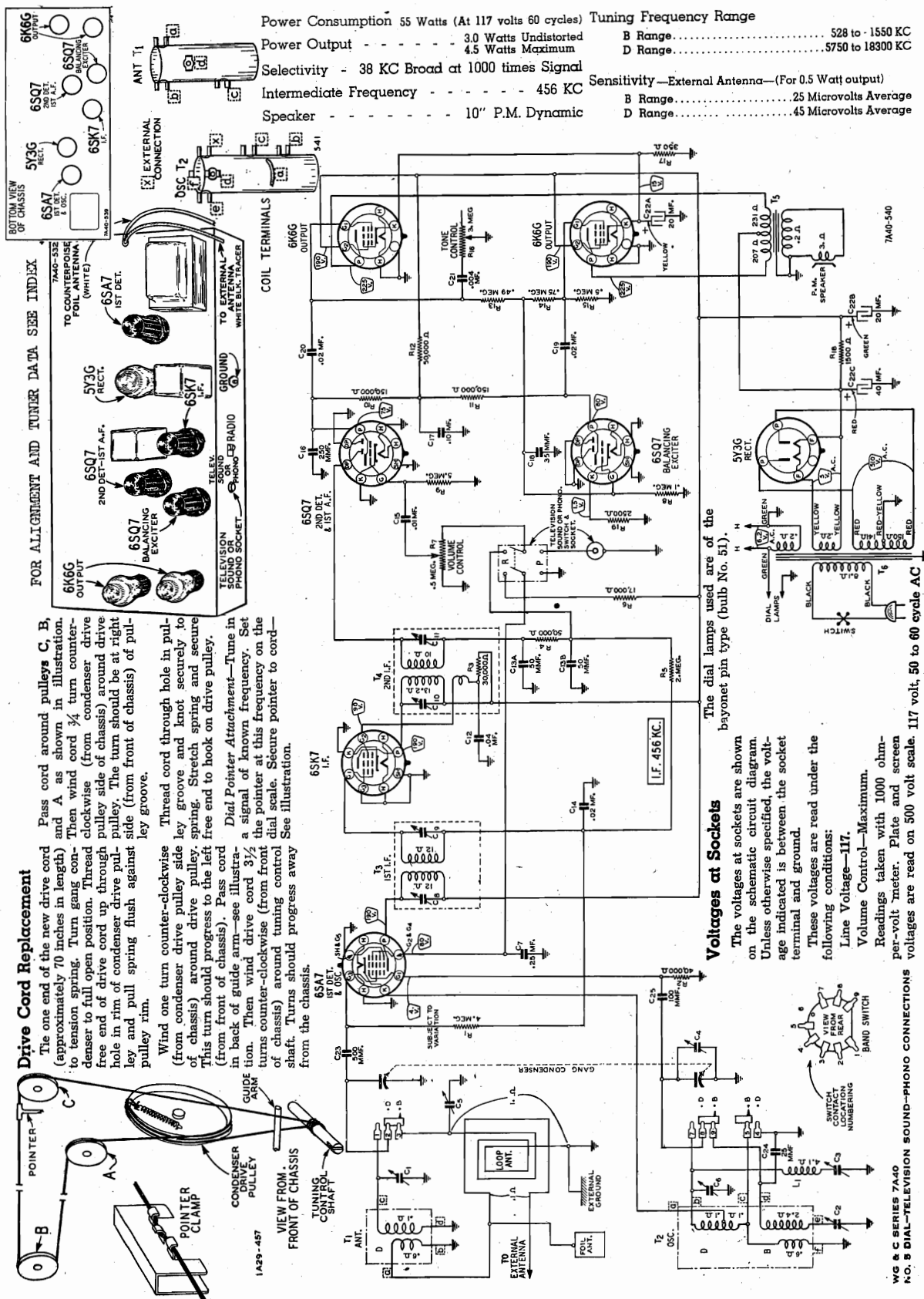
MODELS 04WG-663, 04WG-668
Schematic, Voltage, Socket



MODEL O4WG-725
Schematic, Voltage
Socket, Trimmers
Sensitivity

MONTGOMERY WARD & CO.

Power Consumption 55 Watts (At 117 volts 60 cycles) Tuning Frequency Range
Power Output - - - - - 3.0 Watts Undistorted
4.5 Watts Maximum
Selectivity - 38 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - 456 KC
Speaker - - - - - 10" P.M. Dynamic
Sensitivity—External Antenna—(For 0.5 Watt output)
B Range.....25 Microvolts Average
D Range.....45 Microvolts Average



Drive Cord Replacement

The one end of the new drive cord (approximately 70 inches in length) and A as shown in illustration. Then wind cord 3/4 turn counter-clockwise (from condenser drive pulley side of chassis) around drive pulley. Thread pulley side of chassis) around drive pulley. The turn should be at right angle and pull spring flush against pulley rim.

Wind one turn counter-clockwise (from condenser drive pulley side of chassis) around drive pulley. Stretch spring and secure this turn should progress to the left (from front of chassis). Pass cord in back of guide arm—see illustration. Then wind drive cord 3 1/2 turns counter-clockwise (from front of chassis) around tuning control shaft. Turns should progress away from the chassis.

Dial Pointer Attachment—Tune in a signal of known frequency. Set the pointer at this frequency on the dial scale. Secure pointer to cord—See illustration.

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram. Unless otherwise specified, the voltage indicated is between the socket terminal and ground.

These voltages are read under the following conditions:

Line Voltage—117.

Volume Control—Maximum.

Readings taken with 1000 ohm-per-volt meter. Plate and screen voltages are read on 500 volt scale. 117 volt, 50 to 60 cycle AC

WG & C SERIES 7A40

NO. 5 DIAL-TELEVISION SOUND-PHONO CONNECTIONS

VIEW FROM FRONT OF CHASSIS

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

1A29-457

VIEW FROM FRONT OF CHASSIS

TUNING COIL SHAFT

CONDENSER DRIVE PULLEY

POINTER CLAMP

POINTER

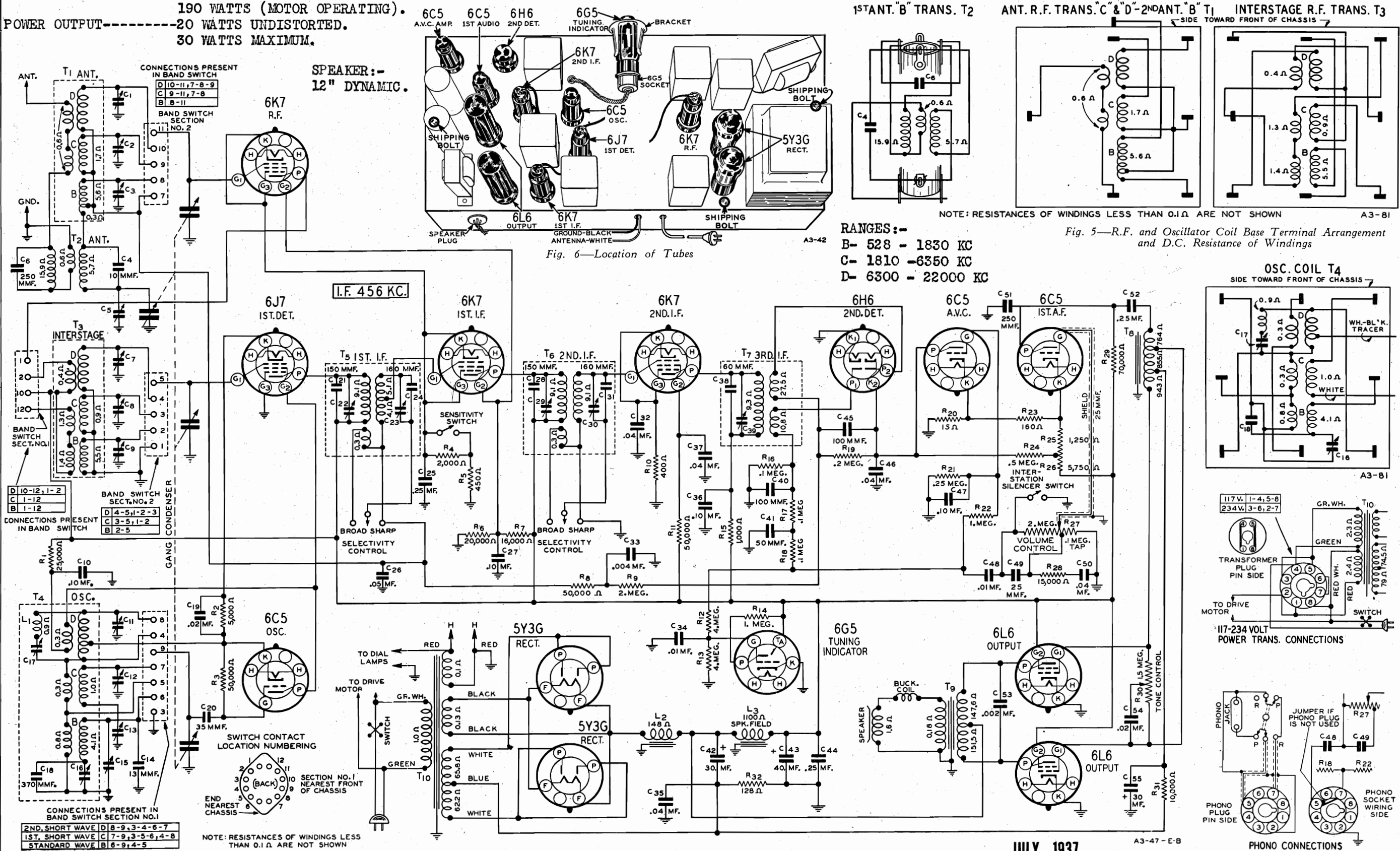
1A29-457

MONTGOMERY WARD & CO.

MODELS 62-303, 62-433
Schematic, Socket, Coils
Transformer, Phono, Conn.

POWER CONSUMPTION---160 WATTS AT 117 V. 60 CYCLES.
190 WATTS (MOTOR OPERATING).
POWER OUTPUT-----20 WATTS UNDISTORTED.
30 WATTS MAXIMUM.

SPEAKER:-
12" DYNAMIC.



MONTGOMERY WARD & CO.

MODELS 62-303, 62-309, 62-321
62-347, 62-417, 62-433, 62-447
62-449, 62-451
Drive Panel Adjustments
Compound Gear Notes

Adjusting or Replacing the Motor On-Off Switch

ADJUSTING SWITCH

The motor On-Off switch is at the upper right side of the panel (from back of radio). If this switch is not properly adjusted, the motor may not start when the touch tuning button is depressed or the motor may stop when the touch tuning button is released. The switch is tuned in by means of the electric mechanism.

To check this switch, remove the fibre cover by taking out the screw which holds the bracket over this fibre cover. When the switch operating lever (or reset metal piece across back of assembly which interacts with the 8 setting discs - see Fig. 6) is in its lowest position, the switch will close and at the same position of the lever the switch will again open.

Replacing Compound Gear

Remove belt and idler pulley - See Fig. 6.

Refer to turnbuckle take-up on steel drive cable - See Fig. 6. Observe position of hex nut on the stud of this cable. It is important to see how many threads this nut is from the end of the stud.

Loosen the main drive cable by loosening the hex nut on the stud and backing off the round knurled nut about 5 half turns.

Remove horseshoe washer from gears 1 and 2, spreading the washers by means of long nose pliers and screwdriver.

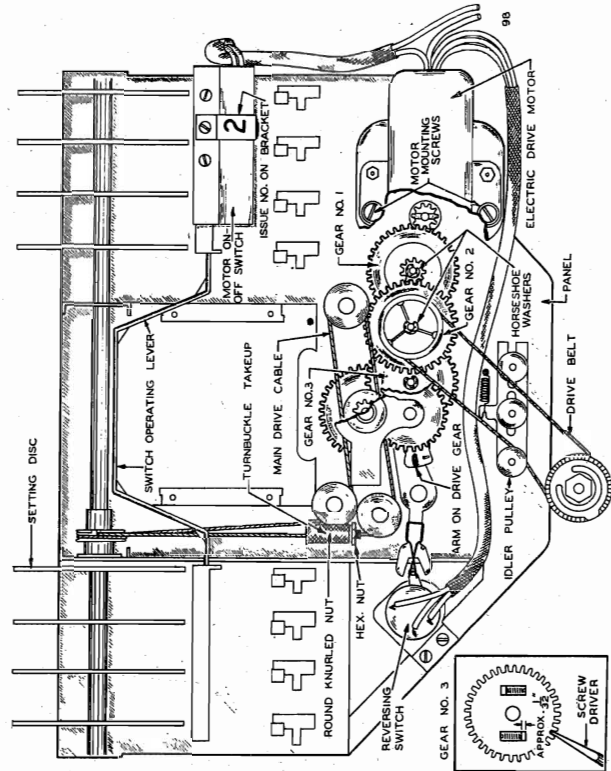


Fig. 6 - Rear View of Electric Drive Panel Showing Gear Assembly

General Adjustments

IF, WHEN A TOUCH TUNING BUTTON IS PUSHED IN, THE MOTOR DOES NOT TURN

Push the button which has previously been depressed or release it. Then again push the button in the way in which it was pushed. The motor should start when the button is pushed and stop when it is released.

The motor On-Off switch may be out of adjustment - See article on that subject in this manual.

JUMPY ACTION WHEN TUNING

Put gear drive in motor - Return electric drive panel to factory to have this done.

EXCESSIVE BACKLASH

IN MANUAL TUNING

If there is too much backlash when tuning the radio manually, free the film drum cable. To do this, stretch the film drum cable. Also stretch the phosphor bronze film drum cable and oil the pulleys on which this cable runs. Check the tightness of the set screws holding the drive drum to the tuning condenser shaft.

MOTOR ROTATES BUT DIAL FIGURES DO NOT MOVE

Correct this condition in the same manner as described above under "Backlash in Manual Tuning" (early models only).

Occasionally this condition can be remedied by turning the tuning knob. Turn the tuning knob with the other hand a slight amount in the direction in which it turns most easily. Then turn the electric-motor lever back to the electric position.

The friction disc in the motor may slip. Change to the gear drive in the motor - Return electric drive panel to factory to have this done.

The fibre gear No. 1 (see Fig. 6) may be slipping on its hub. Replace this gear - See article on that subject in this manual.

IF THE DIAL DOES NOT STOP AT THE SAME POINT EACH TIME THE BUTTON IS DEPRESS

IF THIS OCCURS ON ONE BUTTON ONLY - It will be necessary to replace the defective setting disc at the top of the dial. Turn the dial to the position of the defective button. Return the electric drive panel to the factory to have this done.

IF THIS OCCURS ON ALL BUTTONS - Tighten the main drive cable by means of the turnbuckle.

See if set screws on top pulley of main drive cable are tight.

Check spring clip on drive drum of tuning condenser which holds drive arm to see whether or not it is gripping this arm tightly.

The silencer switch spring assembly at the front of the electric drive panel may not have sufficient spring tension. This assembly has two parts. First, it silences the radio while the motor is in operation. Its second function is to exert a slight springing action on the end of the armature shaft which extends from the motor.

Inside of the motor is a small pinion gear which rotates on two pins. The entire armature shaft assembly slides back and forth in its bearings.

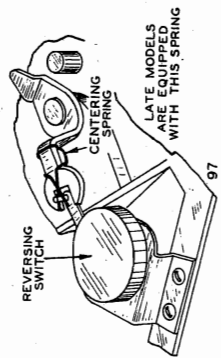


Fig. 5 - Use of Centering Spring on Early Models

Replacing Main Drive Cable

From the front of the panel, turn manual tuning knob to the right (clockwise) as far as it will go. This will bring the arm on the drive gear to the left (from back of panel) - See Fig. 6.

Now support the panel in such a manner that it is held firmly in an upright position, the back of the panel toward the operator. The bottom of the casting can be supported by a screwdriver. Care must be taken that the setting discs are not distorted.

Referring to the new drive cable, it will be noted that one end has a screw fitting, and the other end has a round knurled nut fitting. These two fittings together with the hex nut and lock washer comprise the turnbuckle take-up.

With screw end F (Fig. 7) hanging down, place the cable into the vertical slot at the back of pulley B with the knot inside of the opening at point G.

Then wind the screw end of the cable on pulley B in a clockwise direction to turn, passing over the portion of this cable which is in slot H.

Bring the screw end of the cable over to pulley A and hold it in this position. This can be done by fastening a D knot stout cord to the end of the cable. Attach the cord to the top of the panel as shown in Fig. 7. Instead of a stout cord, the round knurled nut and old cable can be secured to the screw end of the new cable.

Now refer to the portion of the cable that is in the slot at point H pulley B. Using a screwdriver, push the cable down into the slot. It is important that the cable at groove J. CAUTION: Do not use a metal prod as this may damage the cable. It is important that the cable at groove J be kept close to the front flange of pulley B (flange nearest panel), while the portion of the cable between the front flange of pulley B and the back flange of pulley A will ride freely in the center of pulley B - as shown in Fig. 11.

Then from groove J bring the cable in a counterclockwise direction 1/2 turn around pulley B, over to pulley C, 1/2 turn around pulley D, and then up to the shaft at the right of pulley E. Be sure the cable is well down in slot H, pulley B.

Wind the cable LOOSELY one and one-half turns around this shaft, progressing toward the left as shown in Fig. 6.

Rotate the setting discs until pulley E is approximately in the position shown in Fig. 9. Using a thin wooden prod, place cable in slot L with knot in hole at point K of pulley E. Rotate the setting discs a slight amount to the right until the cable is well down in slot L. Then push the cable well down into slot L - See Fig. 9.

Rotate the setting discs 3/4 of a complete revolution in such a direction that the top of the discs move toward the front of the panel. Bring the round knurled nut under the loop of the cable as shown in Fig. 10.

Check for take-up on gear 3. Approximately 1/32 inch of the fixed gear (bottom) will show through slot in top gear - See Fig. 6.

Reassemble motor to frame, pushing tension spring under motor shaft. Be sure to use the same screws to mount the motor to the frame that were taken off. Care must be taken that the pinion gear in the motor meshes properly with gear 3. The motor must be properly aligned, pull the motor away from gear No. 1 before tightening the mounting screws.

Replace belt and idler pulley.

Retighten turnbuckle on main drive cable bringing hex nut to its former position and round knurled nut down tight against hex nut washer.

Reassemble electric drive panel to chassis.

Replacing Main Drive Cable (No. 2 and Later Issue Panels)

The main drive cable is the steel cable which has the turnbuckle take-up. A change was made in this cable and the method of stringing it early in production.

Later models with the new cable can be identified by the numeral 2 stamped on the bracket from the motor. On the earlier models, the numeral 1 is stamped on the bracket. On older models, the numeral 1 is stamped on the top pulley of this cable in place.

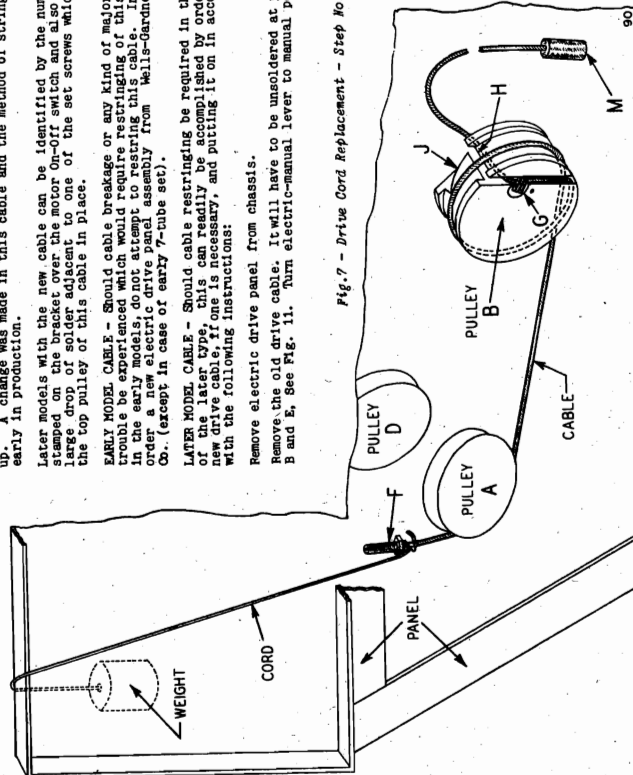
EARLY MODEL CABLE - Should cable breakage or any kind of major cable trouble be experienced which would require restringing of this cable in the early models, do not use the turnbuckle take-up. Instead, use a screwdriver to adjust the drive panel assembly from Wells-Gardner and Co. (except in case of early 7-tube set).

LATER MODEL CABLE - Should cable restringing be required in the case of the later type, this can readily be accomplished by using the new drive cable and turnbuckle take-up, and putting it on in accordance with the following instructions:

Remove electric drive panel from chassis.

Remove the old drive cable. It will have to be unsoldered at pulleys B and E. See Fig. 11. Turn electric-manual lever to manual position.

Fig. 7 - Drive Cord Replacement - Step No. 1



90

Take out the 2 motor mounting screws and lift the motor out of place - See Fig. 6.

Lift up the main drive gear to clear the teeth at the top of gear 2 - take care not to nick the cable.

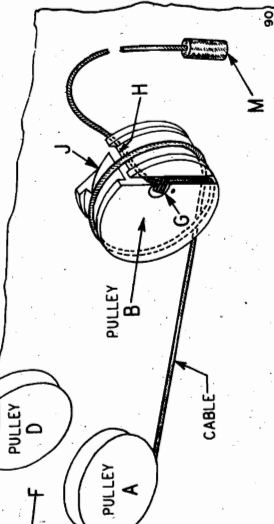
Remove gears 2 and 1.

Put the new fibre tooth gear on the shaft and replace horseshoe washer.

Now refer to gear assembly 3 - See Fig. 6. The top gear of this assembly is movable and the bottom gear is fixed. Rotate the top gear one tooth clockwise relative to the bottom gear and hold the two in this position with a screwdriver - See Fig. 6.

Slide gear 2 on its shaft, pulling the main drive cable over the top of the teeth - again care must be taken not to nick the cable.

Push gear 2 all the way on its shaft, engaging gears 1 and 3. Replace the horseshoe washers.



92

Fig. 9 - Drive Cord Replacement - Step No. 3

MONTGOMERY WARD & CO.

MODELS 62-303, 62-309, 62-321
62-347, 62-417, 62-433, 62-447
62-449, 62-451
Drive Cord Data, Movie Dial

40 Cycle Power Supply

An electric drive chassis equipped with a 117-234 volt 40 to 60 cycle power transformer can be used on a 60 cycle power supply only, unless changed as mentioned below. The electric drive panels of these sets are equipped with 60 cycle motors and these will function satisfactorily only at that frequency.

If one of these radios is to be used on a 40 cycle power supply, it will be necessary to change the motor. The motor regularly supplied with the 25 cycle model is used for this purpose.

Movie Dial Adjustments and Replacements

Replacing and Positioning the Dial Lamp

Caution—If a new lamp is required, use only a No. 81 lamp, Wards catalogue No. 61-8204.

Turn the radio off and turn the band switch to the standard wave position.

Remove the lamp housing by unscrewing and removing the two screws which hold this housing in place—See Fig. 1.

Remove the old lamp from the housing. It will be necessary to depress the contact plug retaining spring which will be seen in the narrow slot near the upper end of the housing and pull the plug out a slight amount from the housing, in order to remove the lamp. Replace the lamp and push the plug down until the locking spring snaps into place.

Replace the lamp housing by means of the two screws, but do not tighten these screws yet.

Turn the radio on.

Then grasp the top of the lamp housing assembly and move it up or down until the image on the screen is clearest and the lines are horizontal. The effect of having the lamp assembly too high or low is shown in the illustration in the instruction book. Tighten the two screws.

Replacing Film

Turn the band switch to the standard wave position. Then remove the lamp housing (See article "Replacing and Positioning the Dial Lamp").

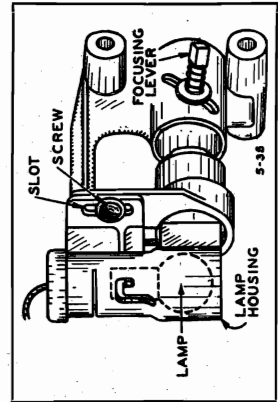


Fig. 1—Adjusting Lamp Height

25 Cycle Electric Drive Panel

The 25 cycle electric drive panel assembly is identical to the 60 cycle assembly except that a 25 cycle motor and a different gear No. 1 (see Fig. 6) are used.

The pinion gear in the 25 and 60 cycle motors are not the same. If, therefore, one of these pinions is ordered, the type of motor must be specified. (Both 25 and 60 cycle motors are furnished with pinion included.)

Remove weight and cord (or round nut) from screw and F on this cable. Screw round knurled nut onto end of cable. While this is being done, the setting discs

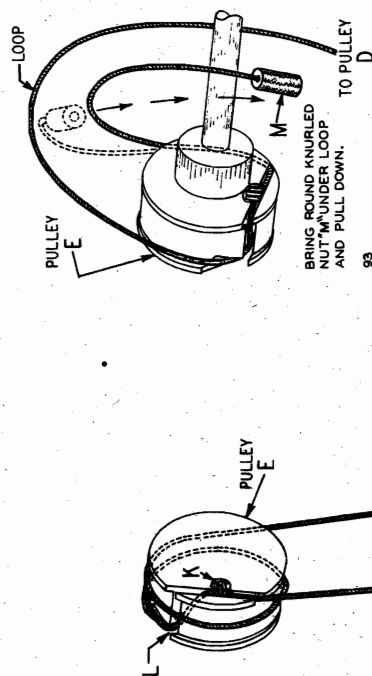


Fig. 10 - Drive Cord Replacement - Step No. 4

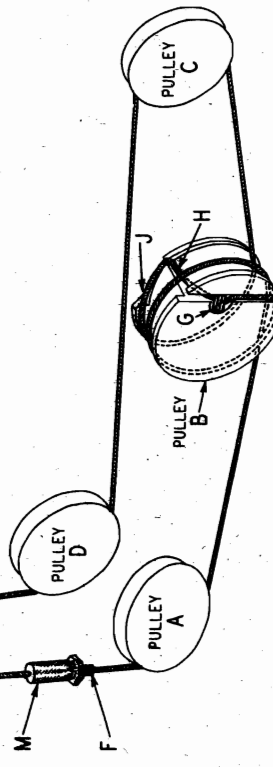


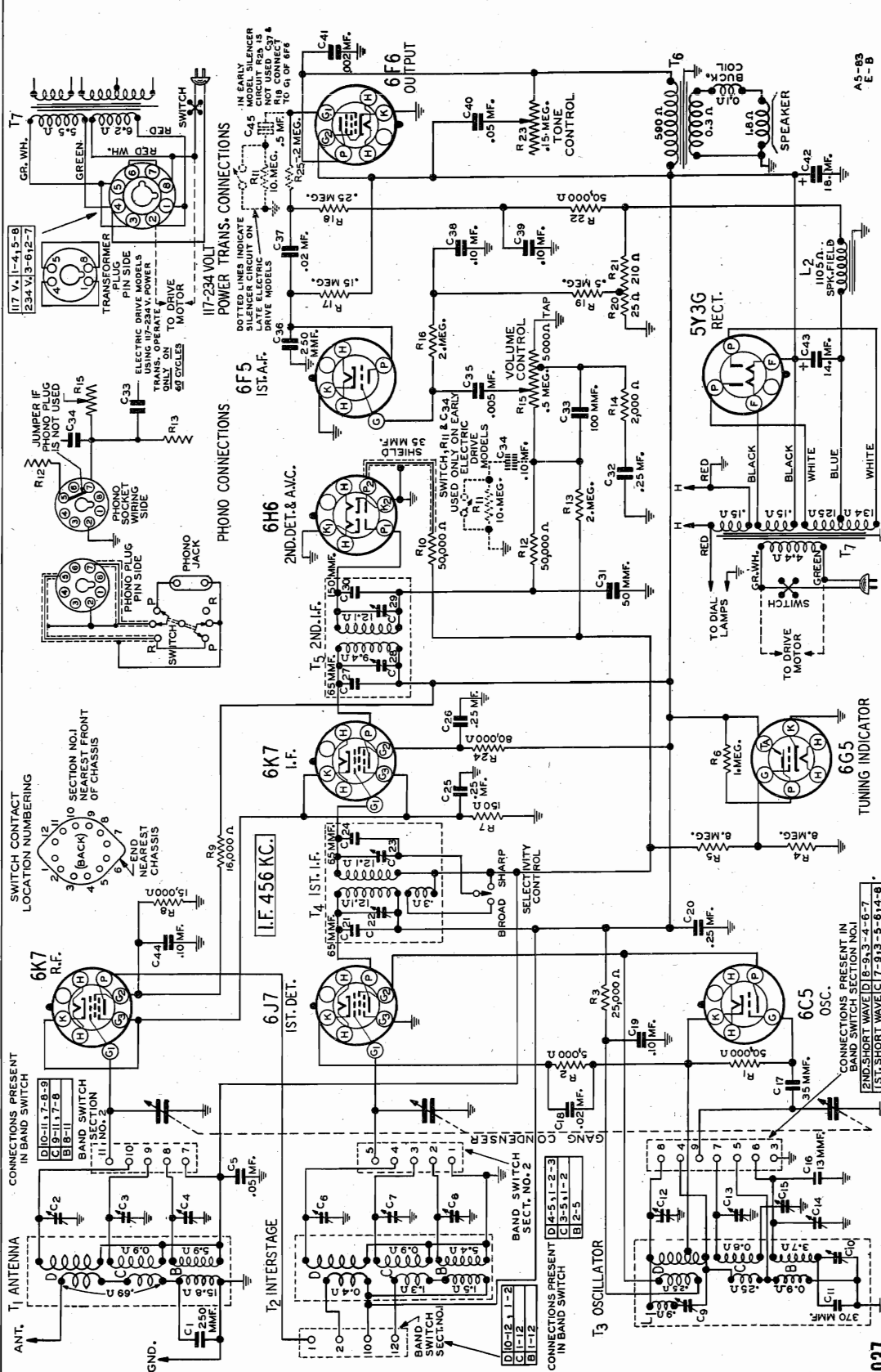
Fig. 11 - Drive Cord Replacement - Complete Assembly

should be grasped by another person and rotated as far as they will go in such a direction that the top of the discs moves away from the front of the panel. The purpose of this is to take up all slack in the cable and to enable the two ends of the turnbuckle to be secured together. The cable must be firm and with all slack out. It is set in position by the setting discs. The setting discs and pulleys do not turn freely. The position of the cable is regulated by the position of the hex nut. The round knurled nut must be screwed tightly against the lock washer next to the hex nut. Solder knots at points G and K on pulleys B and E respectively. Reassemble the electric drive panel to chassis.

Place cable from pulley D on pulley E at left flange (from back of panel) from band cable from pulley B. The discs move away from the front of the panel. Rotate the discs approximately 3/4 of a turn or until the slack in the cable from pulley D is all taken up. Pulley E and the cable will then be in the position shown in Fig. 11 and the knurled nut and it of the cable will be hanging down from pulley E and must be held in tension.

The next step is to connect the two portions of the turnbuckle together. Before doing this, see that the cable is on all of the pulleys as shown in Fig. 11. Tension should still be applied to both ends of the cable.

MONTGOMERY WARD & CO.



Tuning Frequency Range

Fig. 2—Schematic Circuit Diagram

Selectivity - 27 KC Broad at 1000 times Signal
(Shorn)

| | |
|-------------------------------|-------------------|
| (Source F) | |
| Intermediate Frequency | - - - - - 456 KC. |

Speakers - - - - 8" or 10" Dynamic

| | | |
|-------------------|---|-----------------------------------|
| Power Consumption | - | 75 Watts (At 117 volts 60 cycles) |
| | | 113 Watts (Motor Operating) |
| Power Output | - | - |
| | - | 3.0 Watts Undistorted |
| | - | 5.0 Watts Maximum |

JULY, 1937

NOTE: RESISTANCES OF WINDINGS LESS THAN 0.1 Ω ARE NOT SHOWN

SPECIFICATIONS

| | | |
|-------------------|---|-----------------------------------|
| Power Consumption | - | 75 Watts (At 117 volts 60 cycles) |
| | | 113 Watts (Motor Operating) |
| Power Output | - | 3.0 Watts Undistorted |
| | | 5.0 Watts Maximum |

Sensitivity

| | | |
|--------------|----------------|---------|
| B Range..... | 1.0 Microvolts | Average |
| C Range..... | 1.0 Microvolts | Average |
| D Range..... | 2.0 Microvolts | Average |

| | |
|-------------------------------|-------------------|
| Tuning Frequency Range | |
| B Range..... | 528 to 1830 KC. |
| C Range..... | 1810 to 6350 KC. |
| D Range..... | 6300 to 22000 KC. |

MODELS 62-309, 62-449
Circuit Data, Voltage
Socket, Coils, Notes

MONTGOMERY WARD & CO.

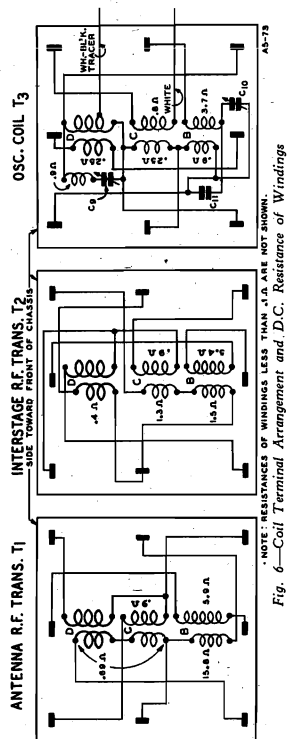


Fig. 6—Coil Terminal Arrangement and D.C. Resistance of Windings

Phonograph Connections

Phonograph connections are made as shown in Fig. 2. On the front panel of the chassis base is a round knockout 1 1/2 inch in diameter. An octal base socket is mounted in this knockout opening and wired as illustrated.

A phono cable assembly may then be purchased (see parts list). On one end of this cable is an octal plug and on the other end is a phonograph radio switch and double tip jack.

Dial and Drive Assembly
SEE INDEX.

In the electric drive panel of this model will not operate satisfactorily at any frequency other than 60 cycles. Consequently, if one of these radios is to be used on a 40 cycle power supply, it will be necessary to change the motor. The motor regularly supplied with the 25 cycle model is used for this purpose.

Connections for the 117-234 volt transformer are shown in Fig. 2. There is a 1 1/2 inch round knockout on the back panel of the chassis which may be removed to permit installation of a special octal socket. A plug which goes with this socket may then be inserted for either the 117 volt or 234 volt connection.

VOLTAGES AT SOCKETS

| TUBE | FUNCTION | VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated) | | | | | | Antenna Shorted to Ground | |
|------|------------------|--|-------------|------------------|-------------|-------------------|-------------|---------------------------|-------------|
| | | Prong No. 1 | Prong No. 2 | Prong No. 3 | Prong No. 4 | Prong No. 5 | Prong No. 6 | Prong No. 7 | Prong No. 8 |
| 6K7 | R.F. | 0 | 6.2(1) | 245 | 118 | 2.5 | 6.2(1) | 2.5 | 6.2 |
| 6J7 | 1st Det. | 0 | 6.2(1) | 245 | 114 | 0 | 6.2(1) | 6.2 | 0 |
| 6C5 | Oct. | 0 | 6.2(1) | 114 | 118 | 2.5 | 6.2(1) | 2.5 | 0 |
| 6K7 | I.F. | 0 | 6.2(1) | 245 | 118 | 0 | 6.2(1) | 6.2 | 0 |
| 6H6 | 2nd Det. | 0 | 6.2(1) | 155 | 230 | 245 | 6.2(1) | 6.2 | 0 |
| 6F5 | 1st A.F. | 0 | 6.2(1) | 230 | 245 | 16(3) | 6.2(1) | 6.2 | 0 |
| 6F6 | Power | 0 | 5.0(4) | 230 | 245 | 16(3) | 6.2(1) | 6.2 | 0 |
| 5Y3G | Rectifier | 0 | 5.0(4) | 230 | 245 | 16(3) | 6.2(1) | 6.2 | 0 |
| 6G5 | Tuning Indicator | 0 | 5.0(4) | 230 | 245 | 16(3) | 6.2(1) | 6.2 | 0 |
| | | Plate to Ground | 20 | Target to Ground | 245 | Cathode to Ground | 0 | Across Heater | 6.2 |

- (1) A.C. voltage as read across heater terminals 2 and 7.
(2) Bias (1.5 volts) as read across resistor R20.
(3) Bias (16 volts) as read across resistors R20 and 21.
(4) A.C. voltage as read across filament terminals 2 and 8.
(5) A.C. voltage as read across terminals 4 and 6.

Circuit

This model is a three band AC operated radio with a tuning range as shown in the specifications above.

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna and interstage R.F. transformer assemblies and T3 is the oscillator coil assembly. The standard wave, 1st and 2nd short wave coils in each assembly are indicated by the letters B, C and D respectively.

The band switch completes connections to the coils in use. The band switch sections are designed in the schematic as section 1 and section 2.

The antenna transformer with tuned secondary feeds into a type 6K7 R.F. amplifier tube. The output of this tube is fed through the interstage R.F. transformer with tuned secondary into a 6J7 tube which functions as the 1st detector.

A separate type 6C5 tube is employed in the oscillator circuit. The oscillating circuit is always resonant at 436 KC above the frequency to which the R.F. amplifier is tuned.

One stage of I.F. amplification is employed using a 6K7 tube. The primaries and secondaries of the 1st and 2nd I.F. transformers are tuned by small trimmer capacitors.

Referring to Fig. 2, it will be noted that there is a coupling winding connected in series with the

secondary of I.F. transformer T4. When the selectivity control is in the sharp position, the coupling winding is open circuited and the loose coupling which exists between the primary and secondary of this transformer results in high selectivity.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary is connected in series with the secondary. This provides overcoupling which results in a greatly widened resonance curve. Passage of a wide range of audio frequencies is thus obtained.

A 6H6 tube functions as a diode 2nd detector. AVC voltage is applied to the control grid circuits of the R.F. and I.F. tubes.

Across the volume control resistor R15 is a filter composed of capacitors C32 and C33 and resistor R14. At high volume settings, the filter is not effective. At low volume settings, the action of this filter results in an increase of high and low frequency amplitudes relative to the other frequency amplitudes.

A 6F5 triode tube functions as the first audio amplifier while the output stage uses a 6F6 output pentode tube. A dynamic reproducer is employed.

The power unit uses a 5Y3G full wave rectifier. A 6G5 tuning indicator tube is employed.

Ordinarily, a twenty-five cycle receiver may be operated from a sixty cycle power supply. However, the electric drive models cannot be operated in this manner because the twenty-five cycle motor will not operate properly on a sixty cycle power supply.

The sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

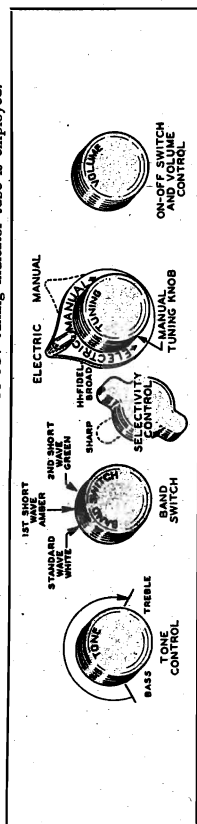


Fig. 5—Octal Tube Terminal Numbering (bottom of socket).

General Service Data

Twenty-five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer and electric drive motor are used.

Ordinarily, a twenty-five cycle receiver may be operated from a sixty cycle power supply. However, the electric drive models cannot be operated in this manner because the twenty-five cycle motor will not operate properly on a sixty cycle power supply.

The sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

117-234 Volt Power Transformer

A 117-234 volt 60 cycle power transformer is also available for this model. It is important that these sets be operated on a 60 cycle power supply only.

Ordinarily, radios equipped with a 117-234 volt universal transformer may be operated on a 40 to 60 cycle power supply. However, the 60 cycle motor

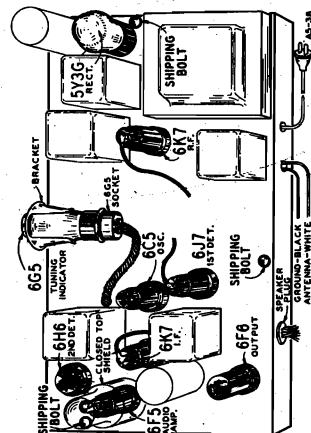


Fig. 4—Location of Tubes

MONTGOMERY WARD & CO.

MODELS 62-309, 62-449
MODELS 62-321, 62-451
MODELS 62-347, 62-417
62-447
Alignment, Trimmers

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Selectivity Control—Sharp Position All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

| STEP (Follow Order as Given) | | SIGNAL GENERATOR | | TRIMMERS ADJUSTED | | INITIAL STEPS | | ADJUSTMENT | |
|---------------------------------|--|-----------------------------------|--|-------------------|--|-------------------|--|--------------------------|--|
| BAND SWITCH SETTING | | DUMMY ANTENNA CONNECTION AT RADIO | | See Illustration | | See Illustration | | See Illustration | |
| I.F. | | 2nd I.F. Adj. | | 450 KC | | Grid of I.F. Tube | | 2nd I.F. (C28) & (C29) | |
| RANGE B | | 1st I.F. Adj. | | 450 KC | | Grid of 1st Det. | | 1st I.F. (C22) & (C23) | |
| 1830 KC | | Range B | | 200 mmf. | | Antenna Lead | | Oscillator Range B (C13) | |
| 1500 KC | | Range B | | 200 mmf. | | Antenna Lead | | Ant. Range B (C4) | |
| 600 KC | | Range B | | 200 mmf. | | Antenna Lead | | 600 KC (C15) | |
| RANGE C | | Range C | | 400 Ohm | | Antenna Lead | | Oscillator Range C (C13) | |
| 6000 KC | | Range C | | 400 Ohm | | Antenna Lead | | Antenna Range C (C3) | |
| 2000 KC | | Range C | | 400 Ohm | | Antenna Lead | | Int. Range C (C7) | |
| RANGE D | | Range D | | 400 Ohm | | Antenna Lead | | 2000 KC (C14) | |
| 22,000 KC | | Range D | | 400 Ohm | | Antenna Lead | | Oscillator Range D (C12) | |
| 20,000 KC | | Range D | | 400 Ohm | | Antenna Lead | | Ant. Range D (C2) | |
| 7000 KC | | Range D | | 400 Ohm | | Antenna Lead | | Int. Range D (C6) | |
| 62-347, 62-417, 62-447 | | Range D | | 400 Ohm | | Antenna Lead | | 7000 KC (C18) | |
| STEP (Follow Order as Given) | | SIGNAL GENERATOR | | TRIMMERS ADJUSTED | | INITIAL STEPS | | ADJUSTMENT | |
| BAND SWITCH SETTING | | DUMMY ANTENNA CONNECTION AT RADIO | | See Illustration | | See Illustration | | See Illustration | |
| I.F. | | 2nd I.F. Adj. | | 450 KC | | Grid of I.F. Tube | | 2nd I.F. (C28) & (C29) | |
| Range B | | 1st I.F. Adj. | | 450 KC | | Grid of 1st Det. | | 1st I.F. (C22) & (C23) | |
| 1830 KC | | Range B | | 200 mmf. | | Antenna Lead | | Oscillator Range B (C12) | |
| 1500 KC | | Range B | | 200 mmf. | | Antenna Lead | | 1st Ant. Range B (C2) | |
| 600 KC | | Range B | | 200 mmf. | | Antenna Lead | | 2nd Ant. Range B (C4) | |
| Range D | | Range D | | 400 Ohm | | Antenna Lead | | Oscillator Range D (C11) | |
| 19800 KC | | Range D | | 400 Ohm | | Antenna Lead | | Ant. Range D (C3) | |
| 16000 KC | | Range D | | 400 Ohm | | Antenna Lead | | Ant. Range D (C3) | |
| 6000 KC | | Range D | | 400 Ohm | | Antenna Lead | | 6000 KC (C4) | |

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.
After each range is completed, repeat the procedure as a final check.

NOTE A—In set using the electric drive, loosen the two set screws in the hub of the film drum assembly. Turn the film drum until the 1500 KC mark on the dial and then tighten the two set screws. (On later models, the film drum can be turned without loosening the set screws.)

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

Special Note on Calibration—Movie Dial Set. If the following does not intersect the proper call letters when a station is tuned in, proceed as follows:

(1) Tune in any station between 530 KC and approximately 900 KC. The signal will then be heard on the radio. (2) Adjust the station selector dial, explained above under Note A, until the line on the dial crosses the call letters of the station tuned in.

Modify this adjustment if necessary until all stations between 530 KC and approximately 900 KC are tuned in with some part of their call letters touching the vertical line on the screen.

(2) Set the signal generator for exactly 1500 KC. Turn the rotor until the signal is heard in the maximum output.

(3) Adjust the 1st and 2nd antenna Range B trimmers to maximum output at 1500 KC.

(4) Check the 600 KC adjustment for maximum output.

Calibration should now be substantially correct over the entire dial. If it is not, repeat the above procedure.

CAUTION—When aligning the short wave band, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 1500 KC. The signal will then be heard on the radio. The image signal, which is 2100 KC, will also be heard. The image signal, which is 2100 KC, will also be heard. The image signal, which is 2100 KC, will also be heard.

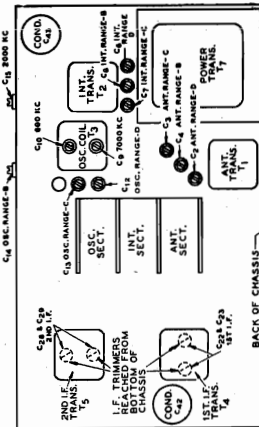


Fig. 3—Location of Trimmers Models 62-309, 62-449

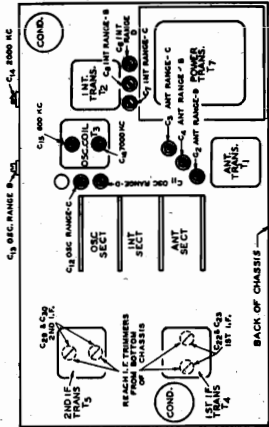
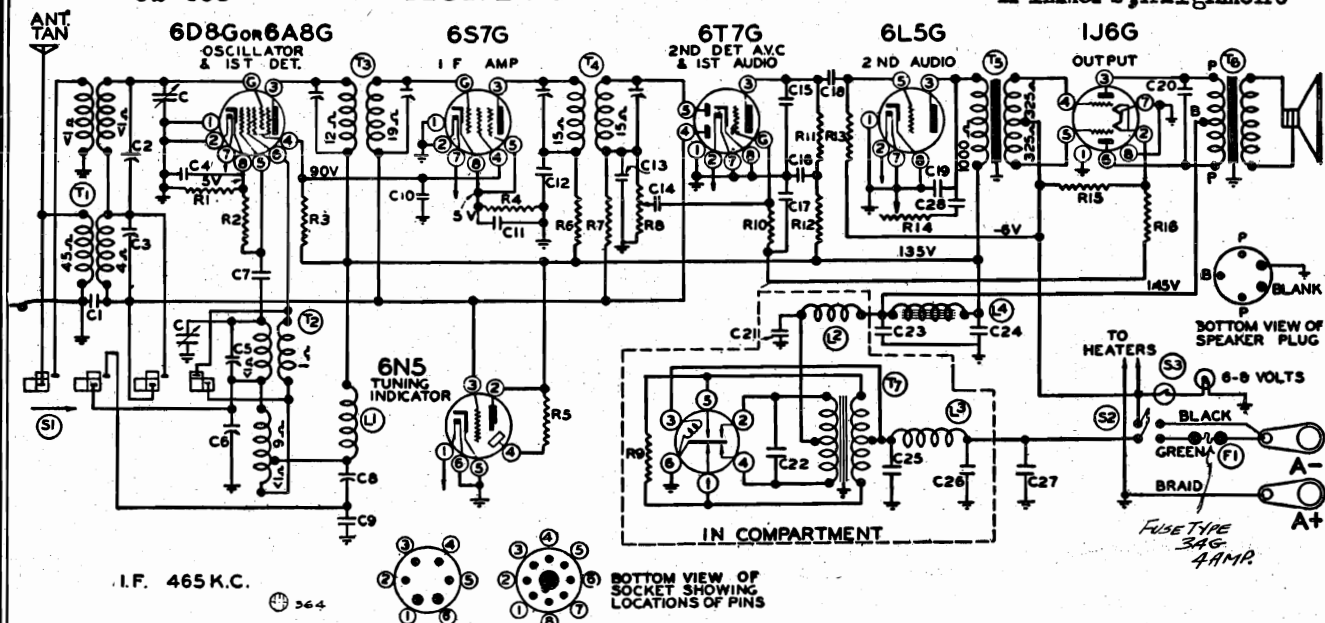


Fig. 3—Location of Trimmers Models 62-347, 62-417, 62-447

MODELS 62-376, 62-425
62-486

MONTGOMERY WARD & CO.

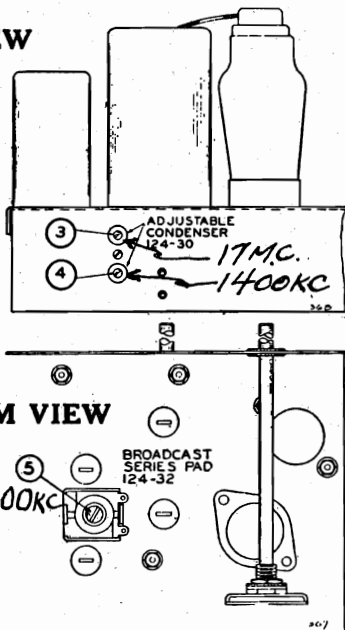
Schematic, Socket
Trimmers, Alignment



LIST OF REPAIR PARTS (Serial No. 7E607720 and up)

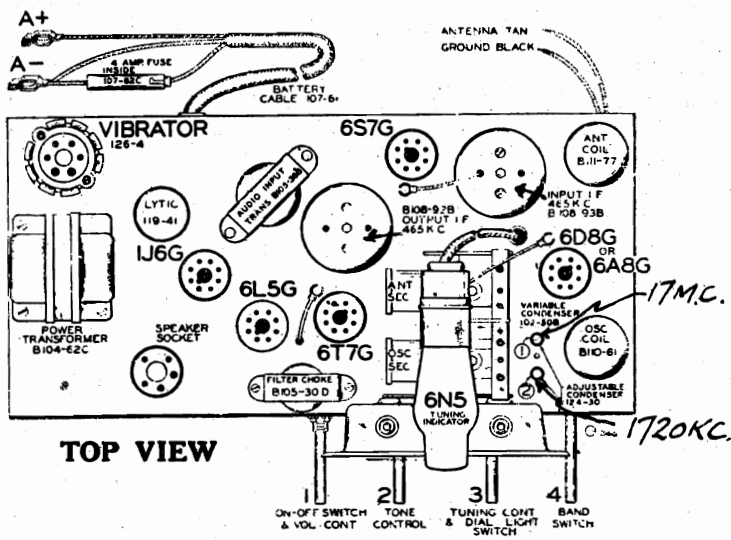
| Schematic Part No. | Reference | Description | No. Used in Set |
|----------------------|------------------|---|-----------------|
| CONDENSERS | | | |
| BE100-11 | C14, C17 | .01 x 400 Volt Tubular | 2 |
| BE100-14 | C21 | .1 x 200 Volt Tubular | 1 |
| | C1, C4, C10, C27 | | |
| BE100-20 | C11, C12, C16 | .1 x 200 Volt Tubular | 7 |
| BE100-25 | C19, C20 | .002 x 600 Volt Tubular | 2 |
| BE100-26 | C18, C28 | .02 x 400 Volt Tubular | 2 |
| BE100-34 | C22 | .005 x 1200 Volt Tubular | 1 |
| BE100-35 | C25, C26 | .5 x 200 Volt (Oval Type) | 2 |
| BE119-41 | C23, C24 | 8-4 MFD. 200 W. V. Lytic Filter | 1 |
| BE124-32 | C8 | Series Padder Condenser | 1 |
| | C5, C6 | | |
| BE124-30 | C2, C3 | Dual Ceramic Padder Condenser | 2 |
| BE129-5 | C13 | .0001 Mica - Type MT - 20% | 1 |
| BE129-12 | C15 | .00025 Mica - Type MT - 20% | 1 |
| BE129-39 | C7 | .00005 Mica - Type MT - 20% | 1 |
| BE129-54 | C9 | .003 Mica - Type MT - 2 1/2 % | 1 |
| RESISTORS | | | |
| BE130-12 | R2 | 50M Ohm-1/3 Watt-20%-Carbon 1 | |
| BE130-19 | R10, R16 | 1 Meg Ohm-1/3 Watt-20%-Carbon 2 | |
| BE130-20 | R11, R12 | 100M Ohm-1/3 Watt-20%-Carbon 2 | |
| BE130-31 | R4, R6 | 1500 Ohm-1/3 Watt-20%-Carbon 2 | |
| BE130-38 | R7, R13 | 2 Megohm-1/3 Watt-20%-Carbon 2 | |
| BE130-54 | R1 | 500 Ohm-1/3 Watt-20%-Carbon 1 | |
| BE130-84 | R9 | 200 Ohm-1/3 Watt-20%-Carbon 1 | |
| BE130-149 | R3 | 15M Ohm-1/3 Watt-20%-Carbon 1 | |
| BE130-158 | R15 | 16 Ohm-1 Watt-5% Wire Wound 1 | |
| COILS | | | |
| BE B-108-92B | T4 | Output I. F. Coil Assembly complete with can 1 | |
| BE B-108-93B | T3 | Input I. F. Coil Assembly complete with can 1 | |
| BE B-110-61 | T2 | Broadcast and Short-wave Oscillator Coil Assembly complete with can 1 | |
| BE B-111-77 | T1 | Broadcast and Short-wave Antenna Coil Assembly complete with can 1 | |
| CHOKE COILS | | | |
| BE105-19 | L3 | "A" Choke Coil 1 | |
| BE B-105-30D | L4 | Filter Choke (400 Ohms) 1 | |
| BE105-35 | L1, L2 | R. F. "B" Choke Coil 2 | |
| TRANSFORMERS | | | |
| BE B-104-62C | T7 | Power Transformer for Vibrator 1 | |
| BE B-105-36B | T5 | Input Audio Transformer 1 | |
| SPEAKER | | | |
| BE114-58 | T6 | Six inch P. M. Dynamic Speaker 1 | |
| MISCELLANEOUS | | | |
| BE101-81 | R8, S2 | Volume Control and Switch (500M Ohm) 1 | |
| BE101-82 | R14 | Tone Control (100M Ohm) 1 | |
| BE107-105 (R5) | | Cable and Socket Assembly complete with 250M Ohm Resistor 1 | |

REAR VIEW



BOTTOM VIEW

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



MONTGOMERY WARD & CO

Phone. Conn. je je je

JULY, 1937

Fig. 2—Schematic Circuit Diagram

Selectivity - - 27 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - 456 KC.

[illegible]

Tuning Frequency Range

Sensitivity

B Range

C: Range

U range

....1.0 Microvolts Average

.....1.0 Microvolts Average

7.0 Microvolts Average

SPECIFICATIONS

100 Watts (At 117 volts 60 cycles)

100 Watts (At 117 volts 60 cycles)

100 Watts (At 117 volts 60 cycles)

9.8 Watts, Undistorted
12 Watts, Maximum

UNIVERSITY OF CALIFORNIA

Compliments of www.nucow.com

MODELS 62-321, 62-451

Circuit Data, Voltage

Socket, Coils, Notes

MONTGOMERY WARD & CO.

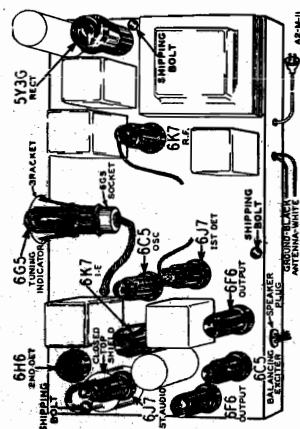


Fig. 5—Location of Tubes

Twenty-five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer and electric drive motor are used. Ordinarily, a twenty-five cycle receiver may be operated from a sixty cycle power supply. However, the electric drive models cannot be operated in this manner because the twenty-five cycle motor will not operate properly on a sixty cycle power supply. This sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

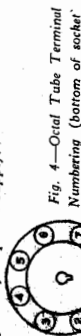


Fig. 4—Octal Tube Terminal Numbering (bottom of socket)

117-234 Volt Power Transformer

A 117-234 volt 60 cycle power transformer is also available for this model. It is important that these sets be operated on a 60 cycle power supply only.

Ordinarily, radios equipped with a 117-234 volt universal transformer may be operated on a 40 to 60 cycle power supply. However, the 60 cycle motor in the electric drive panel of this model will not operate satisfactorily at any frequency other than 60 cycles. Consequently, if one of these radios is to be used on a 40 cycle power supply, it will be necessary to change the motor. The motor regularly supplied with the 25 cycle model is used for this purpose.

Connections for the 117-234 volt transformer are shown in Fig. 2. There is a 1½ inch round knockout on the back panel of the chassis which may be removed to permit installation of a special socket.

Circuit

This model is a three band AC operated radio with a tuning range as shown in the specifications above.

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna and interstage R.F. transformer assemblies and T3 is the oscillator coil assembly. The standard wave, 1st and 2nd short wave coils in each assembly are indicated by the letters B, C, and D respectively.

The band switch completes connections to the coils in use. The band switch sections are designated in the schematic as section 1 and section 2.

The antenna transformer with tuned secondary feeds into a type 6K7 R.F. amplifier tube. The output of this tube is fed through the interstage R.F. transformer with tuned secondary into a 6J7 tube which functions as the 1st detector.

A separate type 6C5 tube is employed in the oscillator circuit. The oscillating circuit is always resonant at 456 KC above the frequency to which the R.F. amplifier is tuned.

One stage of I.F. amplification is employed using a 6K7 tube. The primaries and secondaries of the 1st and 2nd I.F. transformers are tuned by small trimmer condensers.

Referring to the 1st and 2nd I.F. transformers T4 and T5 in Fig. 2, it will be noted that there is a coupling winding shown below the primary of T4 and below the secondary of T5.

When the selectivity control is in the sharp position, the coupling windings are open circuited and the loose coupling which exists between the primary and secondary of these transformers results in high selectivity.

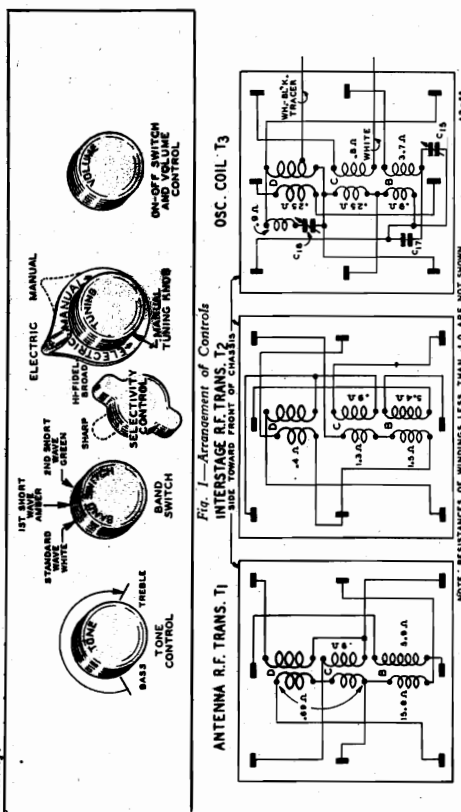


Fig. 1—Arrangement of Controls

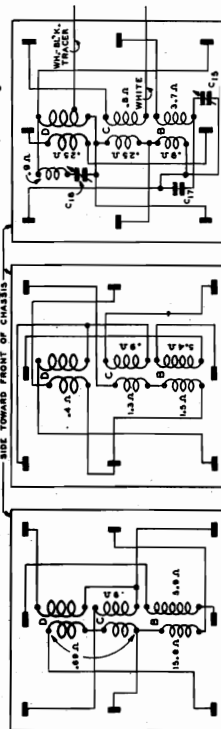


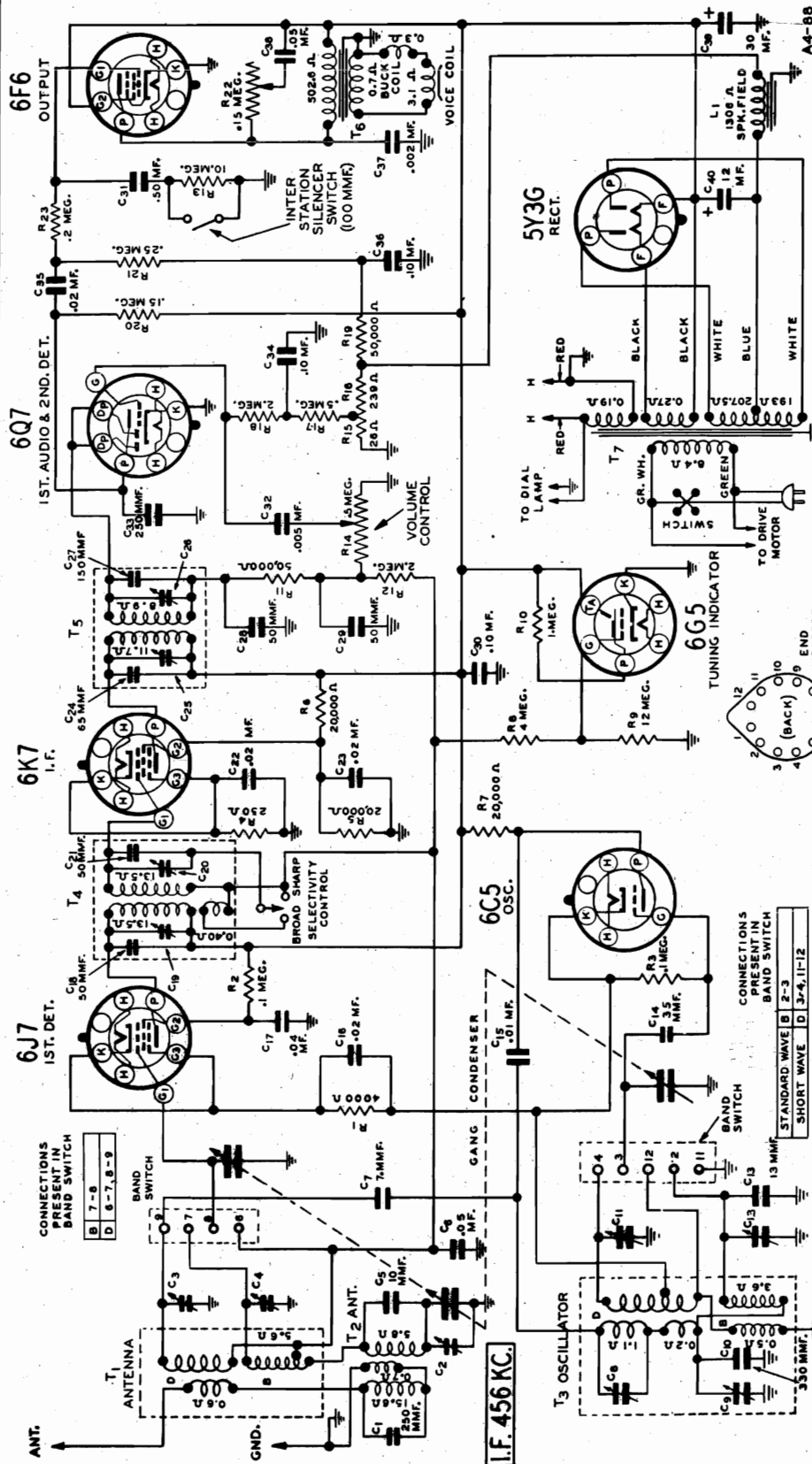
Fig. 6—Coil Terminal Arrangement and DC Resistance of Windings

| VOLTAGES AT SOCKETS | | | | | | | | | |
|--|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Line Voltage: 117—Volume Control: Maximum | | | | | | | | | |
| Readings taken with 1000 Ohm-per-volt meter. | | | | | | | | | |
| TUBE | FUNCTION | Prong No. 1 | Prong No. 2 | Prong No. 3 | Prong No. 4 | Prong No. 5 | Prong No. 6 | Prong No. 7 | Prong No. 8 |
| 6K7 | R.F. | 0 | 6.1(1) | 280 | 108 | 2.5 | 6.1(1) | 2.5 | 6.1(1) |
| 6J7 | 1st Det. | 0 | 6.1(1) | 280 | 125 | 0 | 6.1(1) | 8.9 | 6.1(1) |
| 6C5 | Osc. | 0 | 6.1(1) | 128(2) | 100 | 2.5 | 6.1(1) | 0 | 6.1(1) |
| 6H6 | 2nd Det.—A.V.C. | 0 | 6.1(1) | 250 | 110 | 0(3) | 6.1(1) | 0 | 6.1(1) |
| 6J7 | 1st A.F. | 0 | 6.1(1) | 100 | 120 | 0(3) | 6.1(1) | 18.5 | 6.1(1) |
| 6C8 | Balancing Exciter | 0 | 6.1(1) | 330 | 280 | 0 | 6.1(1) | 0(4) | 6.1(1) |
| 6F6 | Output | 0 | 6.1(1) | 730(6) | 730(6) | 0 | 6.1(1) | 4.8(5) | 6.1(1) |
| 5Y3G | Rectifier | 0 | 4.8(5) | 250 | 250 | 0 | 6.1 A.C. | 6.1 A.C. | 6.1 A.C. |
| 665 | Tuning Indicator | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) A.C. voltage as read across heater terminals 2 and 7.
(3) A.C. voltage as read across filament terminal 2 and 8.
(4) Bias (24 volts) as read across resistors R22, R23, & R24.
(5) A.C. voltage as read across filament terminal 2 and 8.
(6) A.C. voltage as read across filament 4 and 6.

MONTGOMERY WARD & CO.

MODELS 62-347, 62-417, 62-447
Schematic, Sensitivity
Transformer Data



JULY, 1937

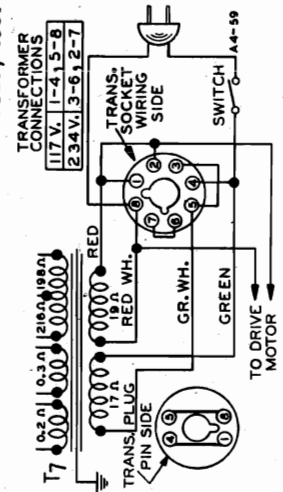


Fig. 2—Schematic Circuit Diagram

SPECIFICATIONS

Power Consumption - 67 Watts (At 117 volts 60 cycles)
105 Watts (Motor Operating)

Power Output - 2.5 Watts Undistorted
4.5 Watts Maximum

Selectivity - 28 KC Broad at 1000 times Signal
(Sharp)

Speaker - 8" Dynamic

Tuning Frequency Range

B Range..... 528 to 1830 KC.
D Range..... 5750 to 19800 KC

Sensitivity

B Range..... 7 Microvolts Average
D Range..... 9 Microvolts Average

MODELS 62-347, 62-417
62-447

Circuit Data, Voltage
Socket, Coils, Phono.

MONTGOMERY WARD & CO.

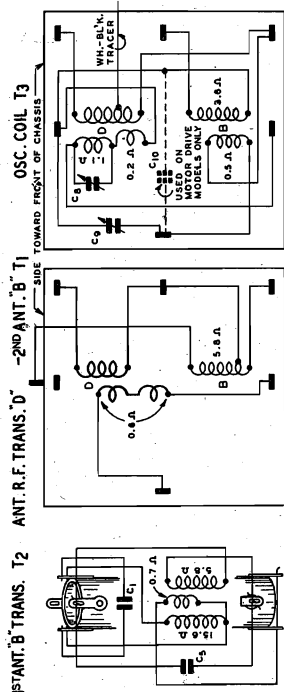


Fig. 4—Coil Terminal Arrangement and D.C. Resistance of Windings

A phono cable assembly may then be purchased. On one end of this cable is an octal plug and on the other end is a phonograph-radio switch and double tip jack.

Ordinarily, radios equipped with a 117-234 volt universal transformer may be operated on a 40 to 60 cycle power supply. However, the 60 cycle motor in the electric drive panel of this model will not operate satisfactorily at any frequency other than 60 cycles. Consequently, if one of these radios is to be used on a 40 cycle power supply, it will be necessary to change the motor. The motor regularly supplied with the 25 cycle model is used for this purpose.

Connections for the 117-234 volt transformer are shown in Fig. 2. There is a $1\frac{1}{8}$ inch round knockout on the back panel of the chassis which may be removed to permit installation of a special octal socket. A plug which goes with this socket may then be inserted for either the 117 volt or 234 volt connection.

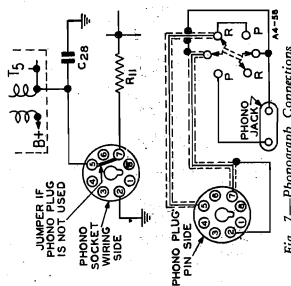


Fig. 7—Phonograph Connections

Phonograph Connections

Phonograph connections are made as shown in Fig. 7. On the side panel of the chassis base is a round knockout $1\frac{1}{8}$ inch in diameter. An octal base socket is mounted in this knockout opening and wired as illustrated.

VOLTAGES AT SOCKETS

Line Voltage: 117—Volume Control: Maximum
Readings taken with 1000 Ohm-per-volt meter

| TUBE | FUNCTION | VOLTAGE BETWEEN SOCKET PRONG AND GROUND (Unless otherwise indicated) | | | | | | | |
|------|-----------------------|--|-----------------|------------------|-------------------|-------------|-------------|---------------|-------------|
| | | Prong No. 1 | Prong No. 2 | Prong No. 3 | Prong No. 4 | Prong No. 5 | Prong No. 6 | Prong No. 7 | Prong No. 8 |
| 6J7 | 1st Det..... | 0 | 6.2(1) | 230 | 145 | | 9.5 | 6.2(1) | 9.5 |
| 6K7 | I.F..... | 0 | 6.2(1) | 230 | 100 | | 2.0 | 6.2(1) | 2.0 |
| 6CS | Oct..... | 0 | 6.2(1) | 140 | | | | 6.2(1) | 0 |
| 6Q7 | 1st Audio & 2nd Det.. | 0 | 6.2(1) | 100 | | | | 6.2(1) | 0(2) |
| 6F5 | Power Amp..... | 0 | 6.2(1) | 210 | 230 | | | 6.2(1) | 0(3) |
| 5Y3G | Rectifier..... | 0 | 5.0(4) | | 630(5) | | | 630(5) | 5.0(4) |
| 6G5 | Tuning Indicator..... | | Plate to Ground | Target to Ground | Cathode to Ground | | | Across Heater | |

| | 20 | 230 | 0.2 A.C. |
|---|----|-----|---|
| (1) A.C. voltage as read across heater terminals 2 and 7. | | | (4) A.C. voltage as read across heater terminals 2 and 8. |
| (2) Bias (1.5 volts) as read across resistor R15. | | | (5) A.C. voltage as read across terminals 4 and 6. |
| (3) Bias (14 volts) as read across resistors R15 and R16. | | | |

Circuit

This model is a two band AC operated radio with a tuning range as shown in the specifications above.

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna coil assemblies and T3 is the oscillator coil assembly. The standard wave and short wave coils in each assembly are indicated by the letters B and D respectively.

The band switch completes connections to the coils in use. When it is in the Range B position, a double tuned antenna R.F. stage is used while in the D Range, a single tuned secondary is used.

A type 6J7 tube functions as the 1st detector.

A separate type 6C5 tube is employed in the oscillator circuit. The oscillating circuit is always resonant at 456 KC above the frequency to which the R.F. amplifier is tuned.

One stage of I.F. amplification is employed using a 6K7 tube. The primaries and secondaries of the 1st and 2nd I.F. transformers are tuned by small trimmer condensers.

Referring to Fig. 2, it will be noted that there is

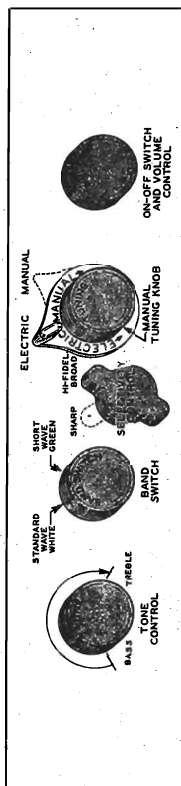


Fig. 1—Arrangement of Controls

General Service Data

Twenty-Five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer and electric drive motor are used. Ordinarily, a twenty-five cycle receiver may be

Ordinarily, a twenty-five cycle receiver may be operated from a sixty cycle power supply. However, the electric drive models cannot be operated in this manner because the twenty-five cycle motor will not operate properly on a sixty cycle power supply.

The sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

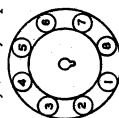


Fig. 6—Octal Tube Terminal Numbering (bottom of socket).

A17-234 Volt Power Transformer

A 117-234 volt 60 cycle power transformer is also available for this model. *It is important that these sets be operated on a 60 cycle power supply only.*

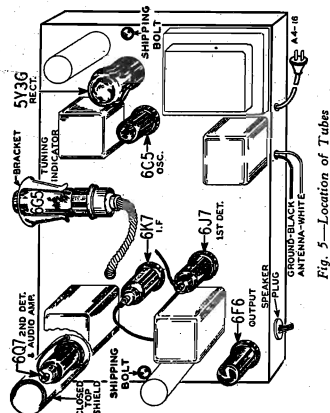
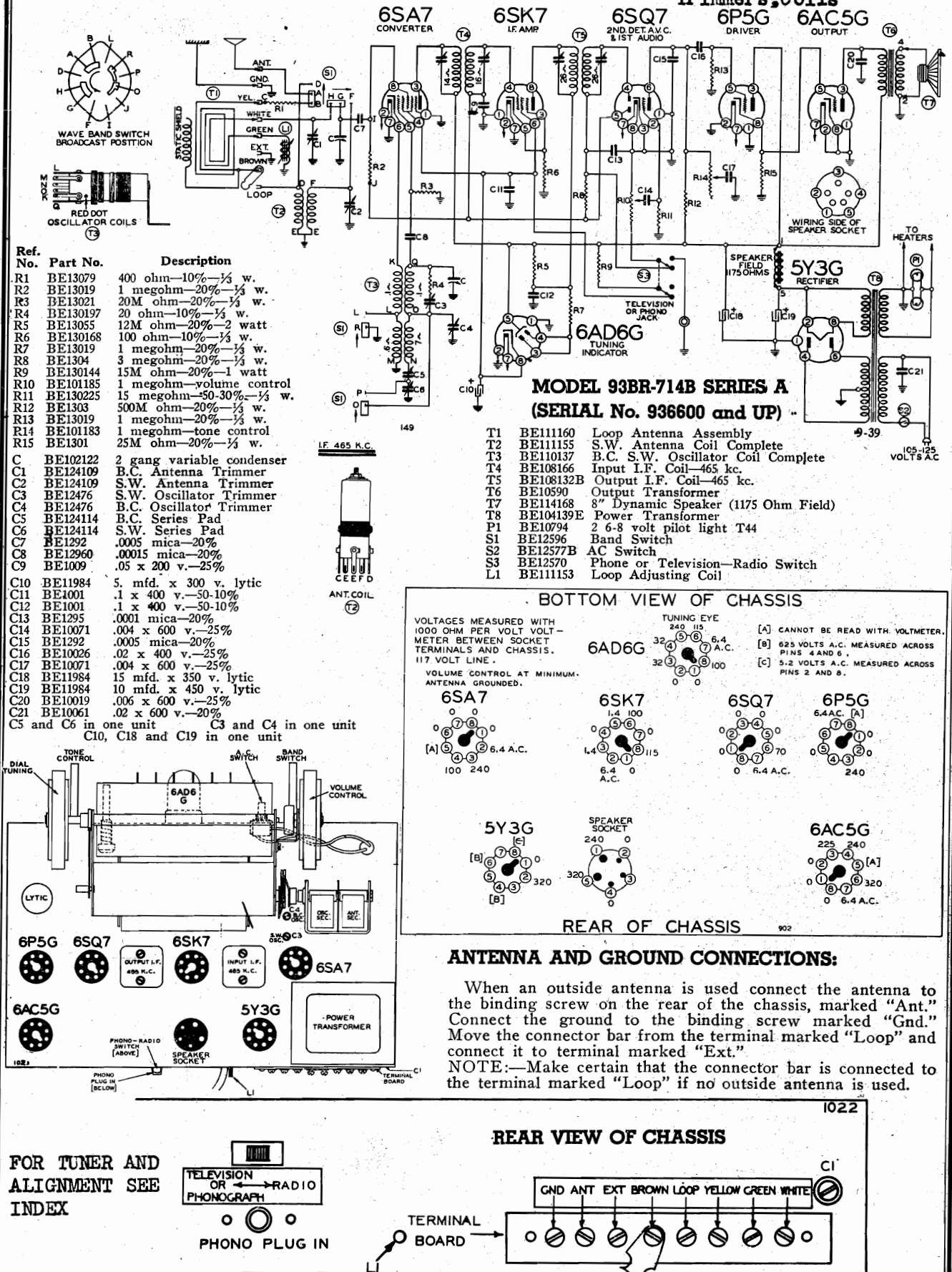


Fig. 5—Location of Tubes

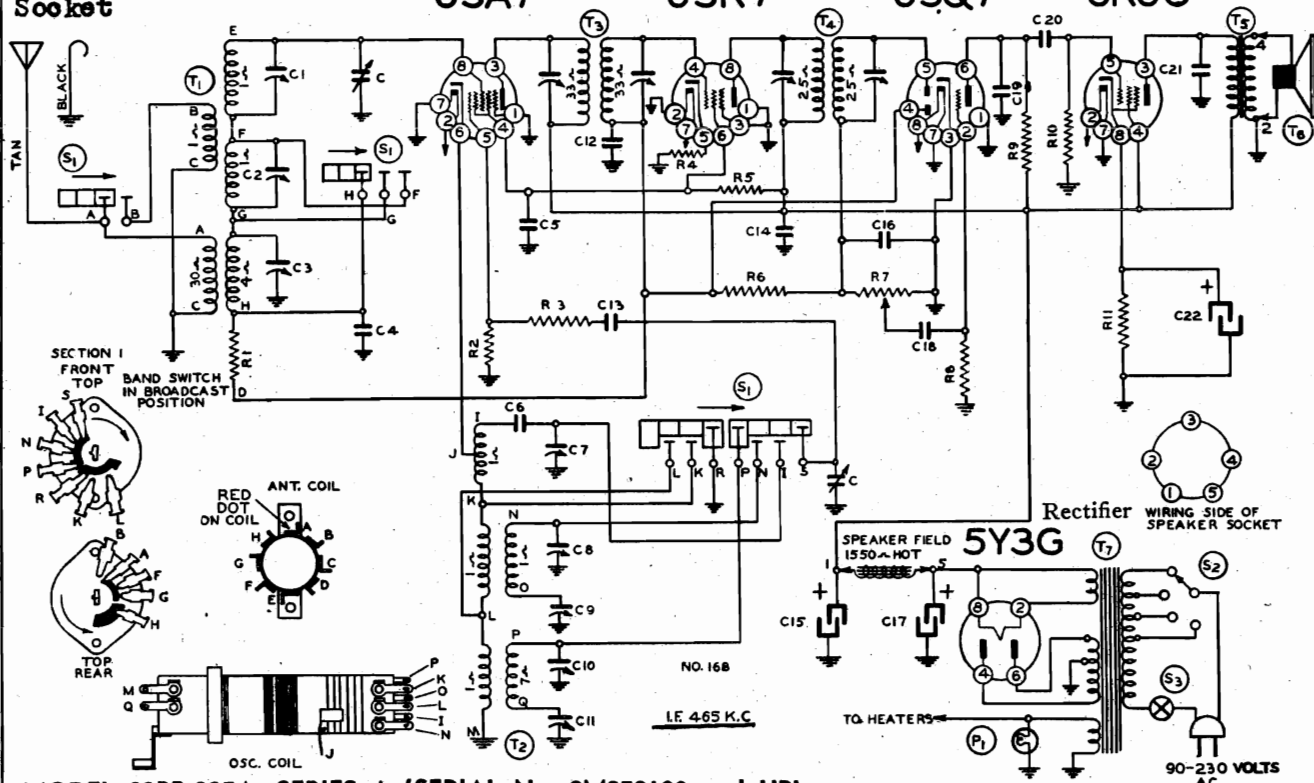
Dial and Drive Assembly

INDEX

MONTGOMERY WARD & CO.

MODEL 93BR-714B, Series A
Schematic, Voltage, Socket
Trimmers, Coils

MODEL 93BR-335A, Ser. A **MONTGOMERY WARD & CO.**
Schematic, Voltage **Second Detector, A.V.C.**
Alignment, Trimmers **First Detector-Oscillator. I. F. Amplifier. First Audio. Output Amplifier.**
Socket **6SA7 6SK7 6SQ7 6K6G**



MODEL 93BR-335A, SERIES A (SERIAL No. 9M259100 and UP)

| Ref. No. | Part No. | Description |
|------------------|----------|-------------------------|
| RESISTORS | | |
| R1 | BE13011 | 250M ohm—1/2 w. |
| R2 | BE130194 | 35M ohm—1/2 w. |
| R3 | BE130299 | 10 ohm—1/2 w. |
| R4 | BE130239 | 250 ohm—1/2 w. |
| R5 | BE130242 | 12M ohm—1 watt |
| R6 | BE1304 | 3 megohm—1/2 w. |
| R7 | BE101208 | 1 megohm volume control |
| R8 | BE130223 | 10 megohm—1/2 w. |
| R9 | BE13011 | 250M ohm—1/2 w. |
| R10 | BE13019 | 1 megohm—1/2 w. |
| R11 | BE13070 | 500 ohm—1/2 w. |

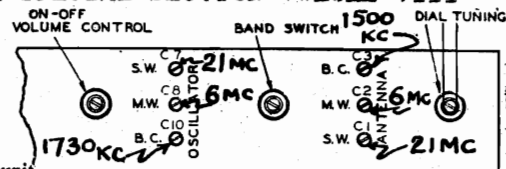
| Ref. No. | Part No. | Description |
|-------------------|----------|------------------------------------|
| CONDENSERS | | |
| C | BE102124 | Two Gang Variable Cond |
| C1 | BE124124 | S. W. Antenna Trimmer |
| C2 | BE124124 | M. W. Antenna Trimmer |
| C3 | BE124124 | B. C. Antenna Trimmer |
| C4 | BE1009 | .05 x 200 v. |
| C5 | BE1001 | .1 x 400 v. |
| C6 | BE129153 | .006—S. W. Padder (Set at Factory) |
| C7 | BE124123 | S. W. Oscillator Trimmer |
| C8 | BE124123 | M. W. Oscillator Trimmer |
| C9 | BE129154 | .0025 M. W. Padder |
| C10 | BE124123 | B. C. Oscillator Trimmer |
| C11 | BE129155 | B. C. Padder |

| | | |
|-----|----------|--------------------------|
| C12 | BE10026 | .02 x 400 v. |
| C13 | BE1295 | .0001 Mica |
| C14 | BE1001 | .1 x 400 v. |
| C15 | BE119103 | 40 mfd. lytic |
| C16 | BE1295 | .0001 Mica |
| C17 | BE119103 | 10 mfd. lytic |
| C18 | BE10025 | .002 x 600 v |
| C19 | BE1292 | .0005 Mica |
| C20 | BE10026 | .02 x 400 v. |
| C21 | BE10071 | .004 x 600 v. |
| C22 | BE119103 | 20 mfd. lytic x 25 w. v. |

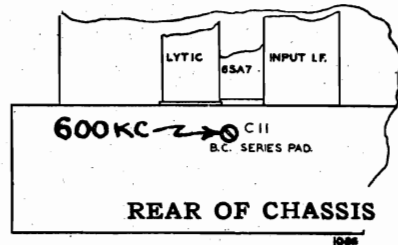
PARTS

| | | |
|----|-----------|--|
| T1 | BE111169 | Antenna Coil |
| T2 | BE10143 | Oscillator Coil |
| T3 | BE108169B | Input I. F. |
| T4 | BE108170 | Output I. F. |
| T5 | BE10575 | Output Transformer |
| T6 | BE114176 | 6" Dynamic Speaker (1550 ohm field) |
| T7 | BE104193 | Power Transformer 40-60 cycles .. 90-230 volts |
| S1 | BE125105 | Band Switch |
| S2 | | Voltage Switch on Power Transformer |
| S3 | BE10794 | Volume Control—On-Off switch |
| P1 | | Pilot Light Bulb T-44 |

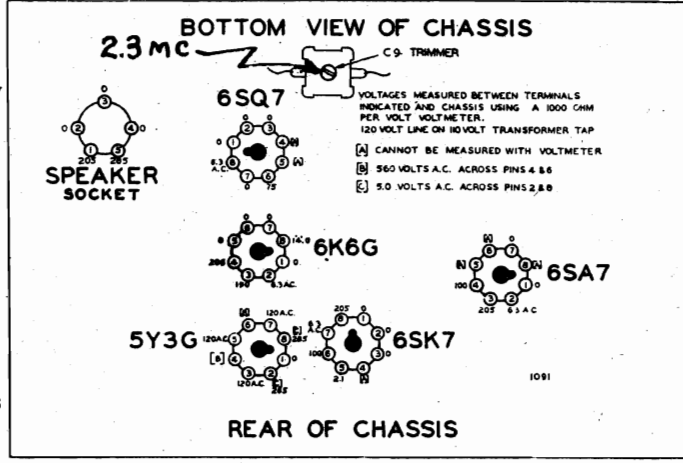
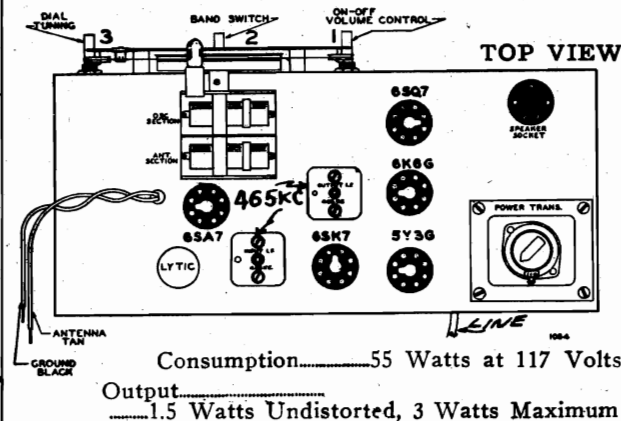
CONVENTIONAL ALIGNMENT 12-39
SEE SPECIAL SECTION VOLUME VIII



FRONT OF CHASSIS 1083



REAR OF CHASSIS



Alignment, Socket Trimmers

MONTGOMERY WARD & CO.

MODEL 93BR-391A, Ser. A

Schematic, Voltage

Second Detector, A.V.C.

First Audio.

Output

R. F. Amplifier. First Detector-Oscillator. I. F. Amplifier.

6SK7

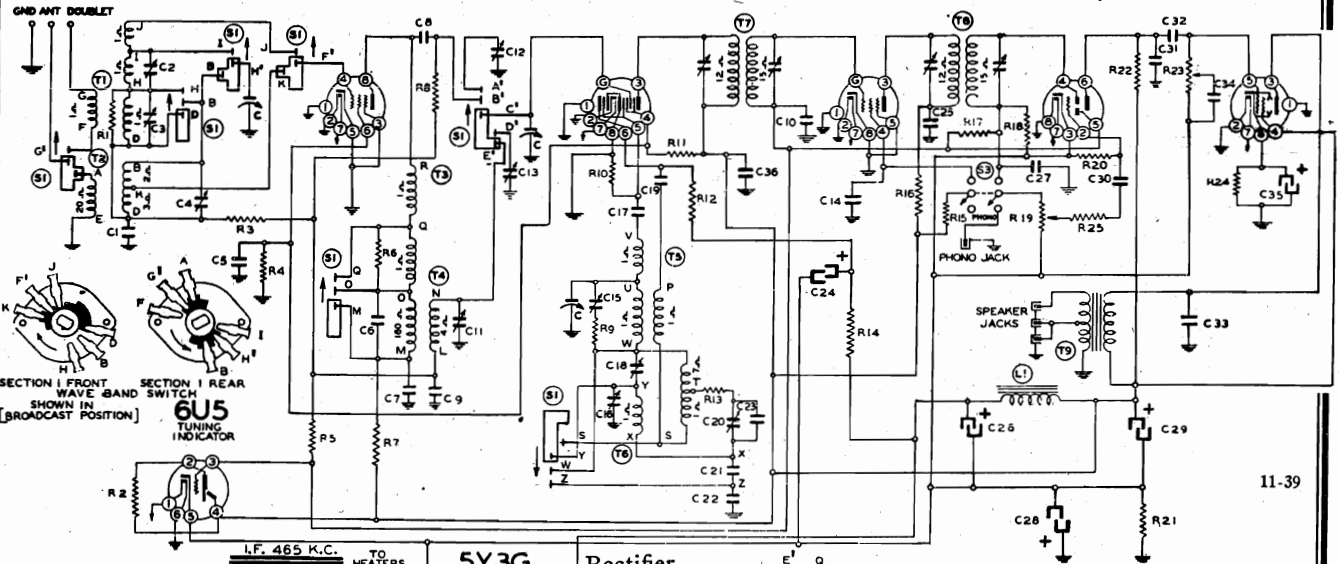
6K8

6K7

6SQ7

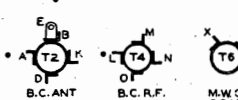
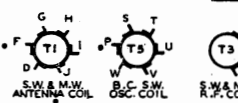
6V6G

NOTE: WHEN USING SINGLE WIRE ANT. CONNECT DOUBLET TO GROUND



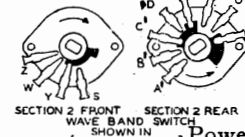
SECTION 1 FRONT WAVE BAND SWITCH SHOWN IN [BROADCAST POSITION]

SECTION 1 REAR TUNING INDICATOR



5Y3G

Rectifier



MODEL 93BR-391A SERIES A CONVENTIONAL ALIGNMENT

VOLUME VIII

Power Consumption.....65 Watts at 117 Volts

Power Output -4 Watts Undistorted, 6.5 Watt Maximum

(SERIAL No. 9K188300 and UP)

| Ref. No. | Part No. | Description |
|----------|----------|-------------------------|
| R1 | BE13094 | 50M ohm-1/2 w.-10% |
| R2 | BE1303 | 500M ohm-1/2 w. |
| R3 | BE13020 | 100M ohm |
| R4 | BE13012 | 50M ohm-1/2 w. |
| R5 | BE13026 | 1000 ohm-1/2 w. |
| R6 | BE130232 | 25M ohm-1/2 w. |
| R7 | BE13026 | 1000 ohm-1/2 w. |
| R8 | BE13019 | 1 megohm-1/2 w. |
| R9 | BE13097 | 200 ohm-1/2 w. |
| R10 | BE13012 | 50M ohm-1/2 w. |
| R11 | BE130304 | 12M ohm-2 watt |
| R12 | BE13017 | 10M ohm-1/2 w. |
| R13 | BE130299 | 10 ohm-1/2 w. |
| R14 | BE13017 | 10M ohm-1/2 w. |
| R15 | BE13020 | 100M ohm-1/2 w. |
| R16 | BE13023 | 2M ohm-1/2 w. |
| R17 | BE1304 | 3 megohm-1/2 w. |
| R18 | BE1304 | 3 megohm-1/2 w. |
| R19 | BE101184 | 1 megohm volume control |
| R20 | BE130225 | 15 megohm-1/2 w. |
| R21 | BE130303 | 35 ohm-1/2 w. |
| R22 | BE1309 | 200M ohm-1/2 w. |
| R23 | BE101206 | 150M ohm tone control |
| R24 | BE130227 | 250 ohm-1 watt |
| R25 | BE13020 | 100M ohm-1/2 w. |

FOR TUNER SEE INDEX

| | | |
|-----|----------|----------------------------|
| C | BE102121 | 3 gang variable condenser |
| C1 | BE10090 | .02 x 400 v. |
| C2 | BE124118 | S.W. Antenna Trimmer |
| C3 | BE124118 | M.W. Antenna Trimmer |
| C4 | BE124118 | B.C. Antenna Trimmer |
| C5 | BE10013 | .05 x 400 v. |
| C6 | BE12938 | .00005 mica |
| C7 | BE10090 | .02 x 400 v. |
| C8 | BE10090 | .02 x 400 v. |
| C9 | BE10090 | .02 x 400 v. |
| C10 | BE1009 | .05 x 200 v. |
| C11 | BE124119 | B.C. R.F. Trimmer |
| C12 | BE124119 | S.W. R.F. Trimmer |
| C13 | BE124119 | M.W. R.F. Trimmer |
| C14 | BE10013 | .05 x 400 v. |
| C15 | BE124119 | S.W. Oscillator Trimmer |
| C16 | BE124119 | M.W. Oscillator Trimmer |
| C17 | BE12962 | .00003 Mica |
| C18 | BE124119 | B.C. Oscillator Trimmer |
| C19 | BE10025 | .002 x 600 v. |
| C20 | BE124119 | B.C. Padding Condenser |
| C21 | BE129149 | .0028 Compression M.W. Pad |
| C22 | BE129105 | .0035 Compression S.W. Pad |
| C23 | BE12959 | .0003 mica |
| C24 | BE11981 | 16 uf. lytic x 400 w. v. |
| C25 | BE1001 | 1 x 400 v. |
| C26 | BE119100 | 30 uf. lytic x 450 w. v. |
| C27 | BE1295 | .0001 mica |
| C28 | BE11991 | 40 uf. lytic x 25 w. v. |

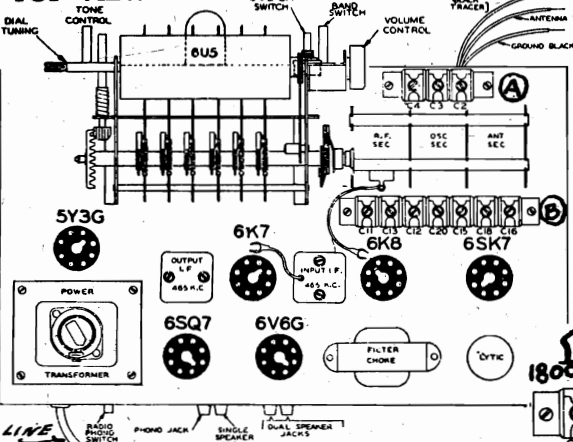
(SERIAL No. 9K188300 and UP)

| | | |
|-----|----------|--------------------------|
| C29 | BE119100 | 30 uf. lytic x 450 w. v. |
| C30 | BE10025 | .002 x 600 v. |
| C31 | BE12912 | .00025 mica |
| C32 | BE10013 | .05 x 400 v. |
| C33 | BE10097 | .02 x 600 v. |
| C34 | BE10078 | .01 x 200 v. |
| C35 | BE119100 | 40 uf. lytic-25 w. v. |
| C36 | BE10013 | .05 x 400 v. |

C26, C29, and C35 in same unit

| | | |
|-----|----------|------------------------|
| T1 | BE111156 | S.W. M.W. Ant. Coil |
| T2 | BE111158 | B.C. Antenna Coil |
| T3 | BE10955 | S.W. M.W. R.F. Coil |
| T4 | BE10956 | B.C. R.F. Coil |
| T5 | BE110140 | B.C. S.W. Osc. Coil |
| T6 | BE110138 | M.W. Oscillator Coil |
| T7 | BE108165 | 1st I.F. Input Coil |
| T8 | BE108119 | 2nd I.F. Output Coil |
| T9 | BE10598 | Output Transformer |
| T10 | BE104181 | Universal Transformer |
| | BE114179 | 8" P. M. Speaker |
| L1 | BE10597B | "B" Filter Choke |
| S1 | BE12595 | Wave Band Switch |
| S2 | BE12581 | On & Off Switch |
| S3 | BE12570 | Radio Phono Switch |
| P1 | BE10794 | (2) Pilot Lights - T44 |

TOP VIEW



BOTTOM VIEW OF CHASSIS

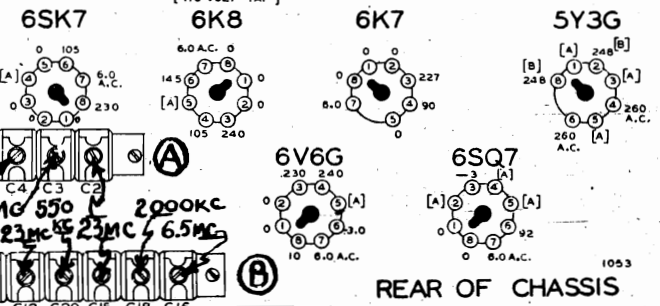
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLT-METER BETWEEN SOCKET TERMINALS AND CHASSIS.

[A] CANNOT BE READ WITH VOLT-METER.

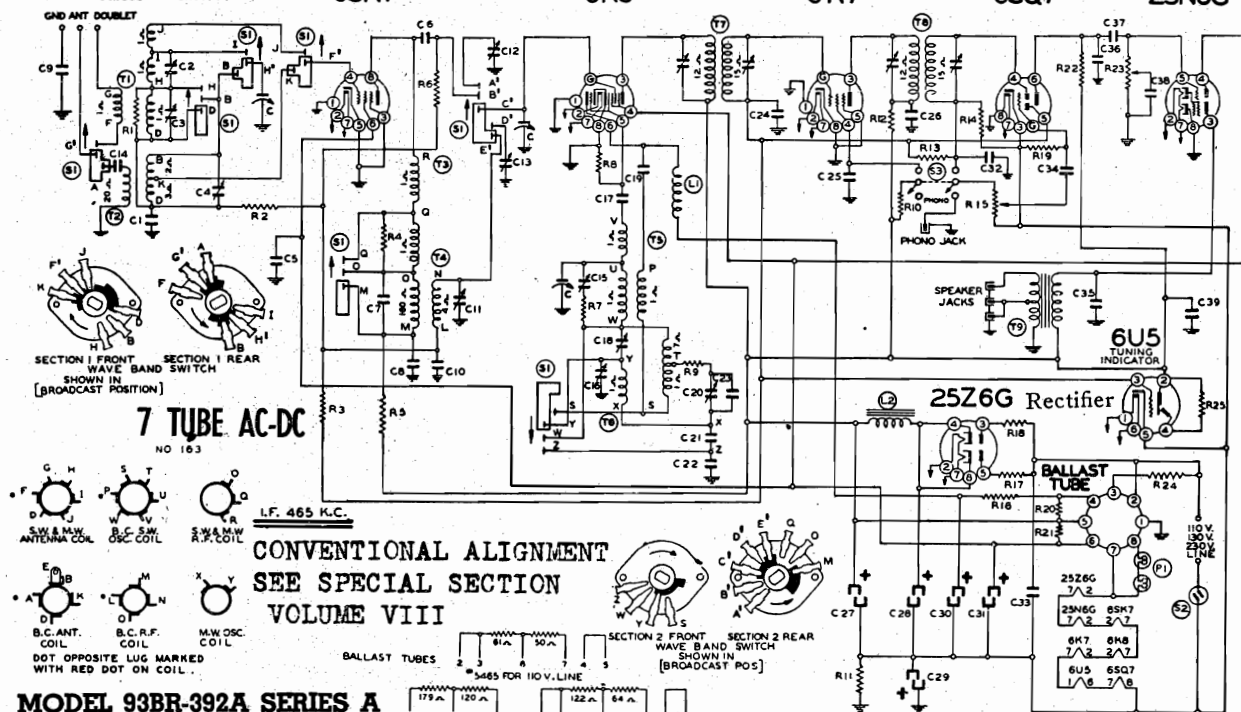
[B] 5 VOLTS A.C. BETWEEN PINS 2 & 8

[C] USING 250 VOLT SCALE ON VOLT-METER

NOTE: MEASURED AT LINE 117 V. A.C. 60 CYCLES. [110 VOLT TAP]



MODEL 93BR-392A, Ser. A
Schematic, Voltage
MONTGOMERY WARD & CO.
Alignment, Socket
Trimmers
Second Detector, A.V.C.
R. F. Amplifier. First Detector-Oscillator. I. F. Amplifier. First Audio. Output
6SK7 6K8 6K7 6SQ7 25N6G

 NOTE: WHEN USING SINGLE
 WIRE ANT. CONNECT
 DOUBLET TO GROUND.

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII
MODEL 93BR-392A SERIES A
(SERIAL No. 9K167300 and UP)

| Ref. No. | Part No. | Description | 11-39 |
|----------|-----------|-------------------------------|-------|
| R1 | BE13094 | 50M ohm— $\frac{1}{2}$ w. | |
| R2 | BE13020 | 100M ohm— $\frac{1}{2}$ w. | |
| R3 | BE13026 | 1000 ohm— $\frac{1}{2}$ w. | |
| R4 | BE130232 | 25M ohm— $\frac{1}{2}$ w.—10% | |
| R5 | BE13026 | 1000 ohm— $\frac{1}{2}$ w. | |
| R6 | BE13019 | 1 megohm— $\frac{1}{2}$ w. | |
| R7 | BE13097 | 200 ohm— $\frac{1}{2}$ w.—10% | |
| R8 | BE13012 | 50M ohm— $\frac{1}{2}$ w. | |
| R9 | BE130299 | 10 ohm— $\frac{1}{2}$ w.—10% | |
| R10 | BE13020 | 100M ohm— $\frac{1}{2}$ w. | |
| R11 | BE130197 | 20 ohm— $\frac{1}{2}$ w.—10% | |
| R12 | BE13023 | 2000 ohm— $\frac{1}{2}$ w. | |
| R13 | BE1304 | 3 megohm— $\frac{1}{2}$ w. | |
| R14 | BE1304 | 3 megohm— $\frac{1}{2}$ w. | |
| R15 | BE101184 | 1 megohm volume control | |
| R16 | BE13022 | 5000 ohm— $\frac{1}{2}$ w. | |
| R17 | BE130168 | 100 ohm— $\frac{1}{2}$ w. | |
| R18 | BE130168 | 100 ohm— $\frac{1}{2}$ w.—10% | |
| R19 | BE130225 | 15 megohm— $\frac{1}{2}$ w. | |
| R20 | BE130176 | 20M ohm— $\frac{1}{2}$ w.—10% | |
| R21 | BE130302 | 9M ohm—1.5 watt—10% | |
| R22 | BE1309 | 200M ohm— $\frac{1}{2}$ w. | |
| R23 | BE101207 | 1 megohm tone control | |
| R24 | BE10658 | 300 ohm—10%—50 watt | |
| R25 | BE13019 | 1 megohm— $\frac{1}{2}$ w. | |
| C | BE102121 | Three gang variable condenser | |
| C1 | BE10090-B | .02 x 400 v. | |
| C2 | BE124118 | S.W. Antenna Trimmer | |
| C3 | BE124118 | M.W. Antenna Trimmer | |
| C4 | BE124118 | B.C. Antenna Trimmer | |

| | | |
|-----|----------|----------------------------|
| C5 | BE10013 | .05 x 400 v. |
| C6 | BE10090 | .02 x 400 v. |
| C7 | BE12938 | .00005 mica |
| C8 | BE10090 | .02 x 400 v. |
| C9 | BE10026 | .02 x 400 v. |
| C10 | BE10090 | .02 x 400 v. |
| C11 | BE124119 | B.C. R.R. Trimmer |
| C12 | BE124119 | S.W. R.F. Trimmer |
| C13 | BE124119 | M.W. R.F. Trimmer |
| C14 | BE10026 | .02 x 400 v. |
| C15 | BE124119 | S.W. Oscillator Trimmer |
| C16 | BE124119 | M.W. Oscillator Trimmer |
| C17 | BE12962 | .0003 mica |
| C18 | BE124119 | B.C. Oscillator Trimmer |
| C19 | BE10025 | .002 x 600 v. |
| C20 | BE124119 | B.C. Padding Condenser |
| C21 | BE129149 | .0028 Compression M.W. Pad |
| C22 | BE129105 | .0035 Compression S.W. Pad |
| C23 | BE12959 | .0003 mica |
| C24 | BE1009 | .05 x 200 v. |
| C25 | BE10013 | .05 x 400 v. |
| C26 | BE1001 | .1 x 400 v. |
| C27 | BE11998 | 30 uf. lytic—300 w.v. |
| C28 | BE11998 | 30 uf. lytic—300 w.v. |
| C29 | BE11998 | 40 uf. lytic—25 w.v. |
| C30 | BE11964 | 15 uf. lytic—400 w.v. |
| C31 | BE11964 | 10 uf. lytic—350 w.v. |
| C32 | BE1295 | .0001 mica |
| C33 | BE10013 | .05 x 400 v. |
| C34 | BE10025 | .002 x 600 v. |
| C35 | BE10026 | .02 x 400 v. |

Consumption.....110 Watts at 230 Volts

 Output.....4 Watts Undistorted, 5 Watt Maximum
 (Measured with 230 Volt Line Voltage)

| | | |
|-----|---------|--------------|
| C36 | BE12912 | .00025 mica |
| C37 | BE10013 | .05 x 400 v. |
| C38 | BE10078 | .01 x 200 v. |
| C39 | BE10013 | .05 x 400 v. |

 C2, C3 and C4 are in same unit.
 C11, C12, C13, C15, C16, C18 and C20
 in same unit.

 C27, C28 and C29 in same unit.
 C30 and C31 in same unit.

| | | |
|----|----------|---------------------------|
| T1 | BE111156 | S.W. M.W. Antenna Coil |
| T2 | BE111158 | B.C. Antenna Coil |
| T3 | BE10955 | S.W. M.W. R.F. Coil |
| T4 | BE10956 | B.C. R.F. Coil |
| T5 | BE110140 | B.C. S.W. Oscillator Coil |
| T6 | BE110138 | M.W. Oscillator Coil |
| T7 | BE108165 | 1st I. F. Input Coil |
| T8 | BE108119 | 2nd I. F. Output Coil |
| T9 | BE10598 | Output Transformer |
| | BE114179 | 8" P.M. Speaker |
| L1 | BE1234 | R.F. Choke |
| L2 | BE10597B | "B" Filter Choke |
| S1 | BE12595 | Wave Band Switch |
| S2 | BE12581 | On and Off Switch |
| S3 | BE12570 | Radio-Phono Switch |
| P1 | BE10794 | (2) Pilot Lights T-44 |

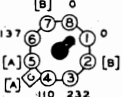
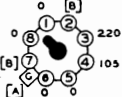
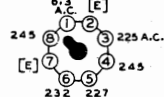
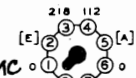
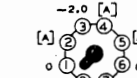
BOTTOM VIEW OF CHASSIS

 VOLTAGES MEASURED WITH 1000 OHM PER VOLT
 VOLTMETER BETWEEN SOCKET TERMINALS
 AND CHASSIS.

NOTE: MEASURED AT LINE 230 V.A.C. 60 CYCLES

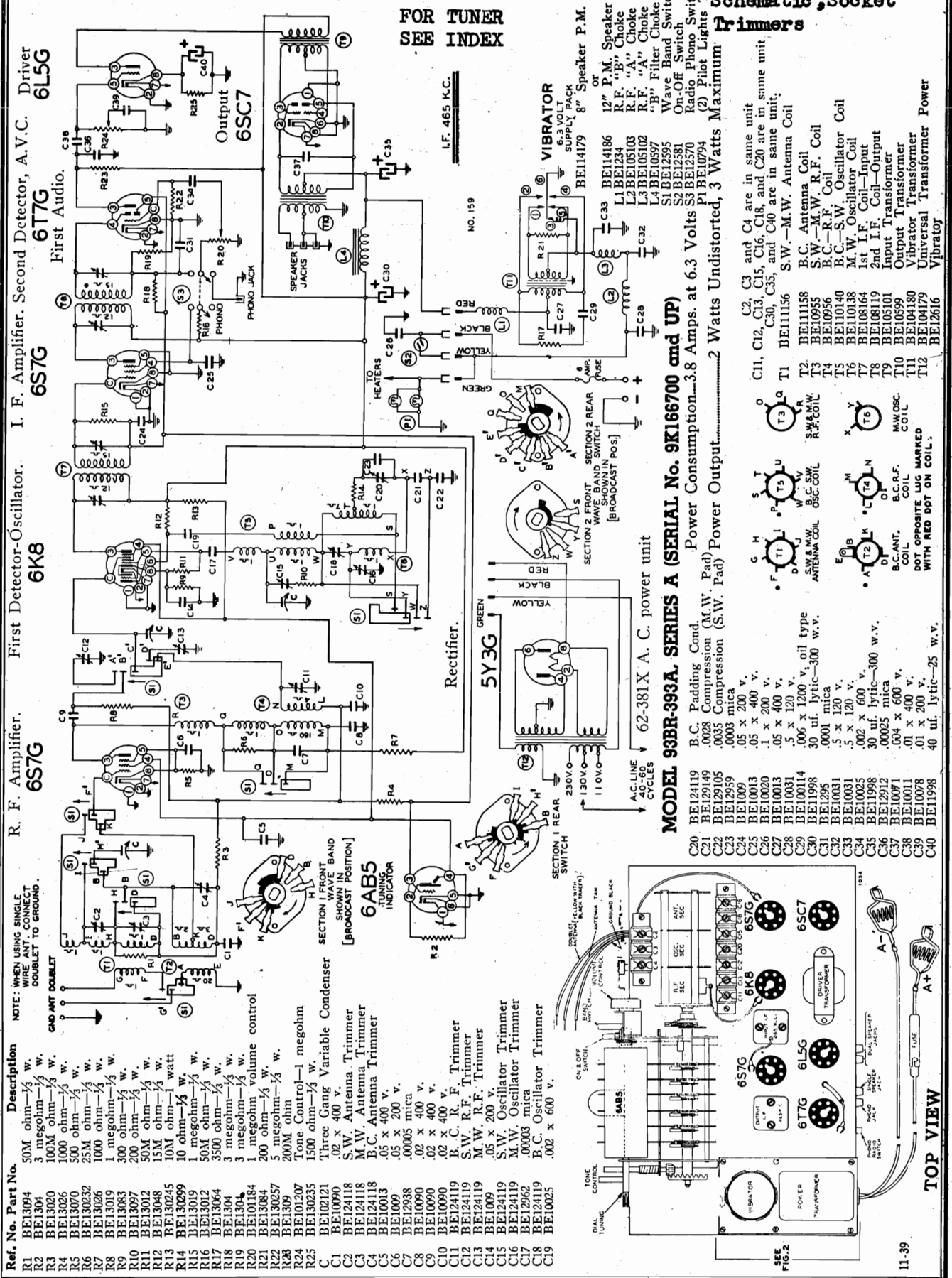
[A] CANNOT BE READ WITH VOLTMETER.

6SK7

6K8

6K7

25Z6G

25N6G

6SQ7

BALLAST TUBE

REAR OF CHASSIS

MONTGOMERY WARD & CO.



MODEL 93BR-393A, Ser. A
Voltage, Alignment
Trimmers
S.P.U. Notes

MONTGOMERY WARD & CO.

ALIGNMENT FREQUENCIES

IF 465 KC

SHORT WAVE BAND 23 MC

Align S.W. Oso. (C15), Ant. (C2), RF (C12)

MEDIUM WAVE BAND 6.5 MC

Align M Oso. (C16), Ant. (C3), RF (C13)

BROADCAST BAND

Align Oso. (C18) at 2000 KC.

Align Ant. (C4), RF (C11) at 1800 KC.

Align Oso. Series Pad (C20) at 550 KC.

THE ALIGNMENT IS CONVENTIONAL
SEE SPECIAL SECTION VOLUME VIII.

BATTERY AND POWER SUPPLY:

This radio obtains its power entirely from a six volt storage battery—no other batteries are required.

- For 6 volt storage battery operation:
 - Connect the lead (containing the fuse receptacle) marked A positive (+) to the positive (+) post of the storage battery.
 - Connect the lead marked A negative (—) to the negative (—) post of the storage battery.
- For 100-250 volts, 40/60 cycle operation; see Fig. 2.

Installing the Model 62-381X Power Unit

(For 100-250 Volt 40/60 Cycle A. C. Operation)

To install the Model 62-381X A.C. power unit proceed as follows:—

- Remove the chassis from the cabinet, by removing the four chassis mounting bolts from the bottom of the cabinet.
- Referring to Fig. 1, note that the 6-volt power unit is fastened to the top of the radio chassis with eight copper head screws, (six on top of chassis, and two on rear flange of chassis).
- Remove the eight copper head screws.
- Disconnect the four flexible leads of the power unit from the chassis connector strip. These leads clip into pin jacks. Note that the color of each flexible lead matches the color dot on the chassis pin jack connector strip.
- Place the model 62-381X A.C. power unit (see Fig. 2) on the top of the radio chassis and plug the four flexible leads into the pin jacks on the chassis connector strip.
 - The red lead should be plugged into the pin jack which is marked with a red dot.
 - The green lead connects to the pin jack which is marked with a green dot.
 - The yellow lead connects to the pin jack which is marked with a yellow dot.
 - The black lead connects to the pin jack which is marked with a black dot.
- Mount the power unit to the chassis using the eight copper head screws.

IMPORTANT:

After the A.C. power unit has been installed check the connections again to make sure you have followed the instructions correctly. Set the switch on the top of the power transformer to the proper voltage.

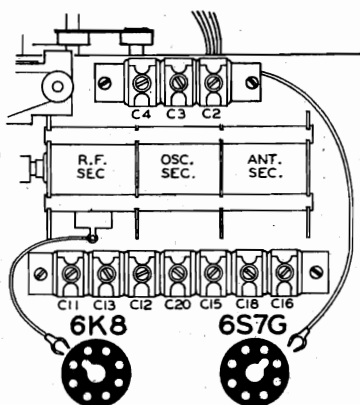
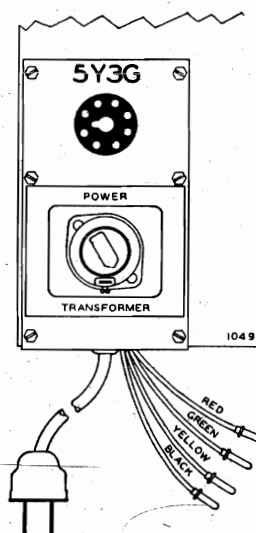


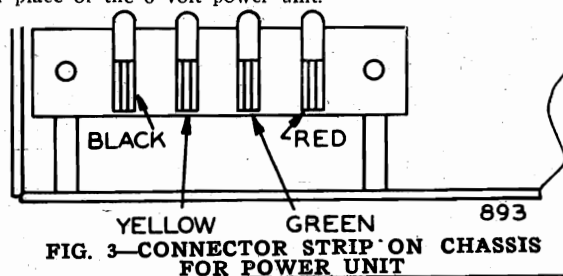
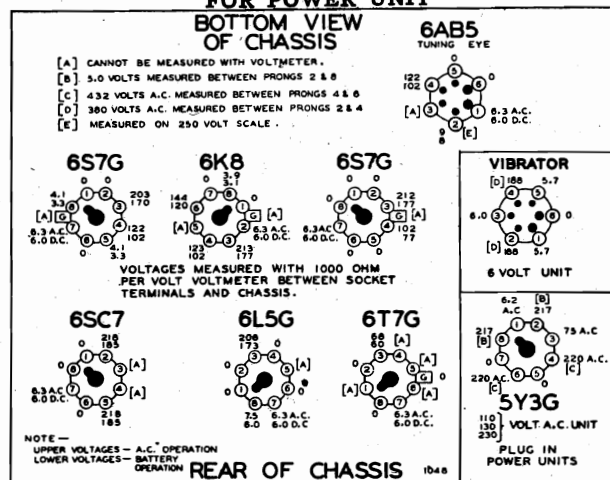
FIG. 5—TOP OF CHASSIS

FIG. 2—MODEL 62-381X
A. C. POWER UNIT**SERVICE NOTES:**

Voltage taken from different points of circuit to chassis are measured with volume control at minimum, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

IN ORDER TO PREVENT SIGNAL FROM ACTING UPON AVC AND AFFECTING ACCURACY OF VOLTAGE MEASUREMENTS, AERIAL AND GROUND LEADS SHOULD BE SHORT CIRCUITED WHILE MAKING MEASUREMENTS.

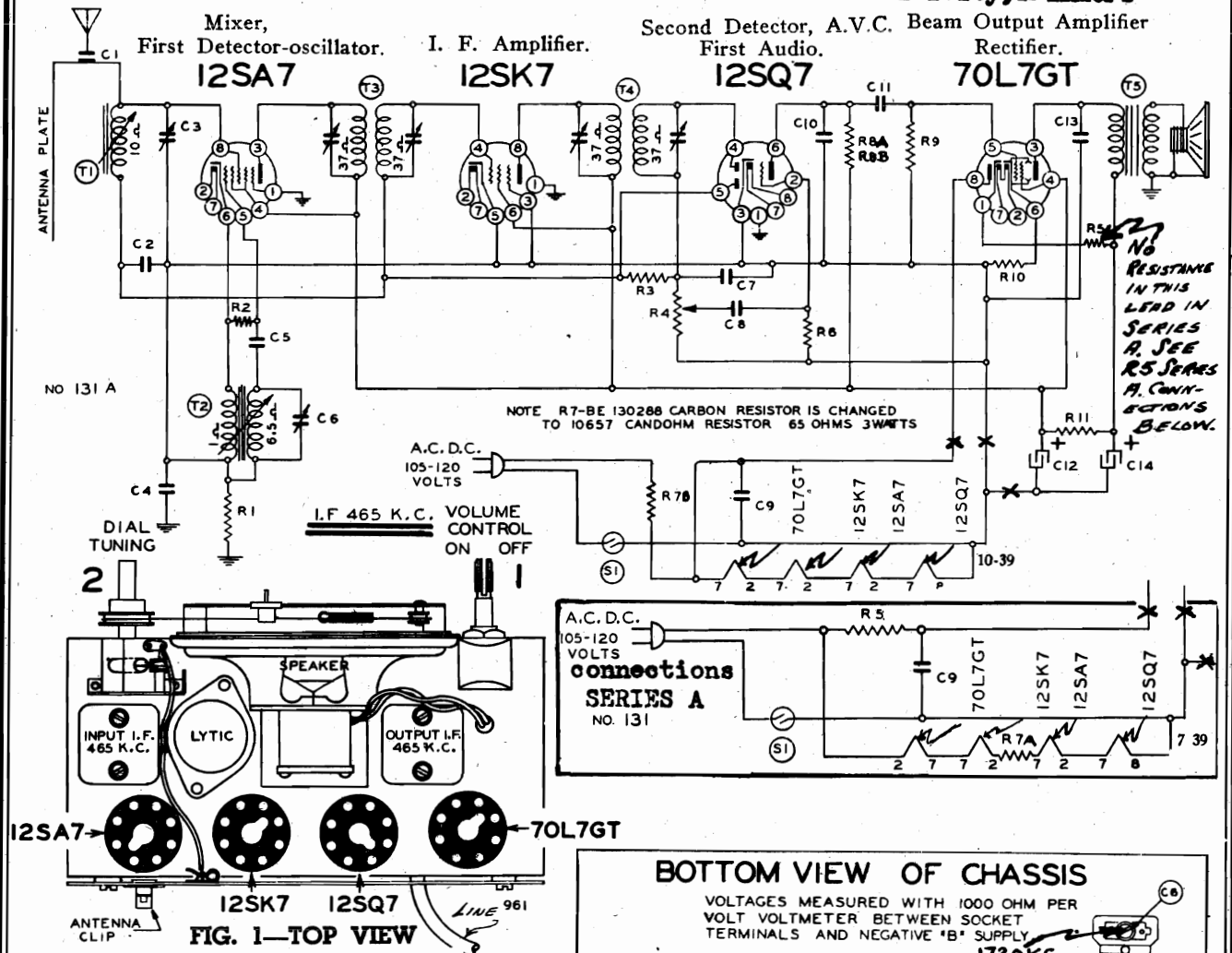
All voltages as indicated on the voltage chart are measured with a fully charged 6 volt storage battery or from 117 volt A. C. line if the Model 62-381X A. C. power unit is installed in place of the 6 volt power unit.

FIG. 3—CONNECTOR STRIP ON CHASSIS
FOR POWER UNIT

MONTGOMERY WARD & CO.

MODELS 93BR-420A, 93BR-421A
 Series A; 93BR-420B, 93BR-421B, 93BR-423B, 93BR-424B
 93BR-431B, Series B
 Serial 813000 up, Ser. B
 Schematic, Voltage, Socket
 Sensitivity, Trimmers

FOR ALIGNMENT
 SEE INDEX



| Ref. | No. | Description |
|------------------|----------|----------------------------|
| RESISTORS | | |
| R1 | BE130100 | 150M ohm— $\frac{1}{2}$ w. |
| R2 | BE130176 | 20M ohm— $\frac{1}{2}$ w. |
| R3 | BE1304 | 3 megohm— $\frac{1}{2}$ w. |
| R4 | BE101188 | Volume control (500M ohm) |
| R5 | BE130293 | 30 ohm—1 watt |
| R6 | BE130257 | 5 megohm— $\frac{1}{2}$ w. |
| R7A | BE130288 | 50 ohm— $\frac{1}{2}$ watt |
| R8A | BE1302 | 75M ohm— $\frac{1}{2}$ w. |
| R7B | BE10657 | 65 ohm—3 watt |
| R8B | BE13011 | 250M ohm— $\frac{1}{2}$ w. |
| R9 | BE13011 | 250M ohm— $\frac{1}{2}$ w. |
| R10 | BE130166 | 150 ohm— $\frac{1}{2}$ w. |
| R11 | BE130279 | 1M ohm—1 watt |

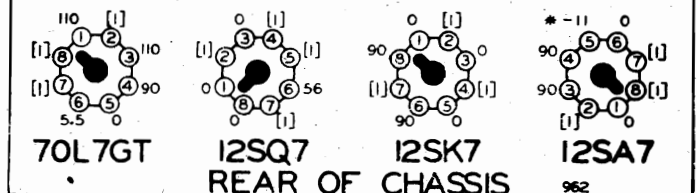
| Ref. | No. | Description |
|-------------------------|----------|---|
| CONDENSERS | | |
| C1 | BE131262 | .00001 washer condenser (Ant. Clip on Back Plate) |
| C2 | BE1009 | .05 x 200 v. |
| C3 | BE124100 | Antenna Trimmer |
| C4 | BE10091 | .15 x 400 v. |
| C5 | BE12939 | .00005 mica |
| C6 | BE124100 | Osc. Trimmer |
| C7 | BE12912 | .00025 mica |
| C8 | BE10025 | .002 x 600 v. |
| C9 | BE10013 | .05 x 400 v. |
| C10 | BE1292 | .0005 mica |
| C11 | BE10011 | .01 x 400 v. |
| C12 | BE11992 | 20 ufd. x 150 w. v. lytic |
| C13 | BE10011 | .01 x 400 v. |
| C14 | BE11992 | 40 ufd. x 150 w. v. lytic |
| C3 and C6 in one unit | | |
| C12 and C14 in one unit | | |

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLT METER BETWEEN SOCKET TERMINALS AND NEGATIVE 'B' SUPPLY

[1] CANNOT BE MEASURED WITH VOLT METER.

* OSCILLATOR VOLTAGE MEASURED WITH R.F. CHOKE IN SERIES WITH LEAD.



BOTTOM VIEW

Power Consumption - - - - - 35 Watts

Power Output - - - - - 800 Milliwatts Undistorted

Sensitivity (for .05 Watts Output) - 60 Microvolts Average

Selectivity - 75 KC Broad at 1000 Times Signal at 1000 KC

Tuning Frequency Range - - - - - 540 to 1720 KC

Intermediate Frequency - - - - - 465 KC

Speaker - - - - - 4 in. P. M. Dynamic

MODEL 62-381 SPU

Installation Notes

MODELS 93BR420A, 93BR421A

93BR420B, 93BR421B,

93BR423B, 93BR424B

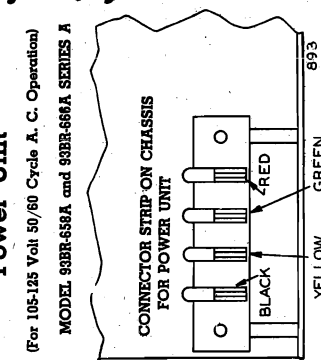
93BR431B, Ser. A, B

Installing the Model 62-381

Power Unit

(For 105-125 Volt 50/60 Cycle A. C. Operation)

MODEL 93BR-688A and 93BR-688A SERIES A



To install the Model 62-381 A.C. power unit proceed as follows:-

1. Remove the chassis from the cabinet, by removing the four chassis mounting bolts from the bottom of the cabinet.
2. Referring to Fig. 1, page 1, note that the 6-volt power unit is fastened to the top of the radio chassis with eight copper head screws, (six on top of chassis, and two on rear flange of chassis).
3. Remove the eight copper head screws.
4. Disconnect the four flexible leads of the power unit from the chassis connector strip. These leads clip into pin jacks. Note that the color of each flexible lead matches the color dot on the chassis pin jack connector strip.
5. Place the model 62-381 A.C. power unit on the top of the radio chassis and plug the four flexible leads into the pin jacks on the chassis connector strip.
 - (a) The red lead should be plugged into the pin jack which is marked with a red dot.
 - (b) The green lead connects to the pin jack which is marked with a green dot.
 - (c) The yellow lead connects to the pin jack which is marked with a yellow dot.
 - (d) The black lead connects to the pin jack which is marked with a black dot.
6. Mount the power unit to the chassis using the eight copper head screws.

MODELS 93BR461A, 93BR462A

MODEL 93BR714B

Alignment, Trimmers

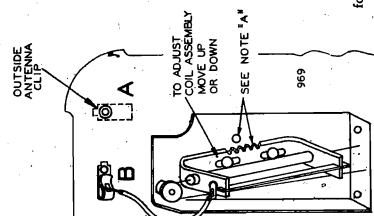


FIG. 4

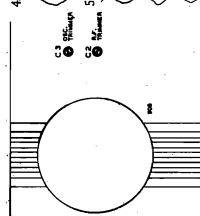


FIG. 4

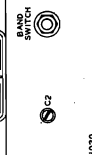
MODELS 93BR-461A, -462A.

IMPORTANT:

After the A.C. power unit has been installed check the connections again to make sure you have followed the instructions correctly.

Specifications

Model No. 93BR-714B



Power Consumption - - - - - 65 Watts

Power Output - - - - - 2.5 Watts Undistorted

Sensitivity (for 5 Watts Output) - - - - -

Broadcast Band - 30 Microvolts Average

Shortwave Band - 50 Microvolts Average

Selectivity - 45 KC Broad at 1000

Times Signal at 1000 KC

ALIGNMENT PROCEDURE

Models No. 93BR-420B, 93BR-421B, 93BR-423B, 93BR-424B and 93BR-420A and 93BR-421A

- Volume control-Maximum all adjustments.
- Connect dummy antenna in series with generator output lead.
- Connect dummy antenna value in series with generator output lead.

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connections to Radio | Position of Iron Cores (Dial Setting) | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|-----------------|------------------------------------|---------------|---------------------------|---------------------------------------|------------------------------------|------------------|--------------------------|
| I. F. | 465 Kc. | .1 MFD. | Terminal "3" (See Fig. 4) | Iron Cores All the way out | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| I. F. | 465 Kc. | .1 MFD. | Terminal "3" (See Fig. 4) | Iron Cores All the way out | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| BROAD-CAST BAND | 1720 Kc. | .1 MFD. | Terminal "3" (See Fig. 4) | Iron Cores All the way out | Trimmer C3 (See Fig. 3) | Oscillator | Adjust to maximum output |
| BROAD-CAST BAND | 1720 Kc. | 200 MMF. | Terminal "3" (See Fig. 4) | Iron Cores All the way out | Trimmer C3 (See Fig. 3) | Oscillator | Adjust to maximum output |
| BROAD-CAST BAND | 1720 Kc. | 200 MMF. | Terminal "3" (See Fig. 4) | Iron Cores All the way out | Trimmer C3 (See Fig. 3) | Oscillator | Adjust to maximum output |
| BROAD-CAST BAND | 1720 Kc. | 200 MMF. | Terminal "3" (See Fig. 4) | Iron Cores All the way out | Trimmer C3 (See Fig. 3) | Oscillator | Adjust to maximum output |
| BROAD-CAST BAND | 1720 Kc. | 200 MMF. | Terminal "3" (See Fig. 4) | Iron Cores All the way out | Trimmer C3 (See Fig. 3) | Oscillator | Adjust to maximum output |

NOTE "A"-The antenna coil assembly is made up of the antenna coil and the antenna trimmer (C3) adjustment screw. It is necessary to check the antenna trimmer (C3) adjustment screw at 1720 Kc. to see if there is any appreciable change in trimmer adjustment. If there is, it is in track. If the trimmer adjustment is not in track, it is necessary to adjust the trimmer. The position of the antenna coil at 1600 Kc. These two adjustments should be made several times until no change of trimmer adjustment is required at 1720 Kc.

MODELS 93BR-461A, -462A.

- Volume control-Maximum all adjustments.
- Connect radio chassis to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connections to Radio | Variable Condenser Setting | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|----------------------|------------------------------------|---------------|----------------------|--|------------------------------------|------------------|--------------------------|
| I. F. 93BR-461A ONLY | 465 Kc. | .1 MFD. | Grid of 1A7G Tube | Rotor (full open) (Plates out of mesh) | Four trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| I. F. 93BR-462A ONLY | 465 Kc. | .1 MFD. | Grid of 1A7G Tube | Rotor (full open) (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| I. F. 93BR-462A ONLY | 465 Kc. | .1 MFD. | Grid of 1A7G Tube | Rotor (full open) (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| BROAD-CAST BAND | 1600 Kc. | .1 MFD. | Grid of 1A7G Tube | Rotor (full open) (Plates out of mesh) | Trimmer C3 (front sec. of Fig. 4) | Oscillator | Adjust to maximum output |
| BROAD-CAST BAND | 1600 Kc. | .1 MFD. | Grid of 1A7G Tube | Rotor (full open) (Plates out of mesh) | Trimmer C3 (front sec. of Fig. 4) | Oscillator | Adjust to maximum output |

MODEL 93BR-714B (CAT. NO. 62-721)

- Volume control-Maximum all adjustments.
- Connect radio ground to ground post of signal generator with a short heavy lead.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.
- Allow chassis and signal generator to "heat up" for several minutes.

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connections to Radio | Variable Condenser Setting | Trimmers Adjusted (in Order Shown) | Trimmer Function | Adjustment |
|------------------------------|------------------------------------|---------------|----------------------|--|------------------------------------|---------------------------------|--------------------------|
| I. F. | 465 Kc. | .1 MFD. | Grid of 6X4 Tube | Rotor (full open) (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| I. F. | 465 Kc. | .1 MFD. | Grid of 6X4 Tube | Rotor (full open) (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Output I. F. | Adjust to maximum output |
| SHORT WAVE BAND (See Note A) | 18 Mc. | 400 Ohms | Antenna and Ground | Set Dial at 18 Mc. | Trimmer C3 (See Fig. 3) | Short Wave oscillator | Adjust to maximum output |
| SHORT WAVE BAND (See Note A) | 18 Mc. | 400 Ohms | Antenna and Ground | Set Dial at 18 Mc. | Trimmer C3 (See Fig. 3) | Short Wave oscillator | Adjust to maximum output |
| SHORT WAVE BAND (See Note A) | 18 Mc. | 400 Ohms | Antenna and Ground | Set Dial at 18 Mc. | Trimmer C3 (See Fig. 3) | Short Wave oscillator | Adjust to maximum output |
| BROAD-CAST BAND (See Note A) | 1600 Kc. | 200 mmf. | Grid of 6X4 Tube | Rotor (full open) (Plates out of mesh) | Trimmer C4 (See Fig. 4) | Broadcast oscillator series pad | Adjust to maximum output |
| BROAD-CAST BAND (See Note A) | 1600 Kc. | 200 mmf. | Grid of 6X4 Tube | Rotor (full open) (Plates out of mesh) | Trimmer C4 (See Fig. 4) | Broadcast oscillator series pad | Adjust to maximum output |
| LOOP ALIGNMENT (See Note B) | 1500 Kc. | 200 mmf. | Antenna and Ground | Set Dial at 1500 Kc. | Trimmer C1 (See Fig. 4) | Broadcast antenna | Adjust to maximum output |
| LOOP ALIGNMENT (See Note B) | 1500 Kc. | 200 mmf. | Antenna and Ground | Set Dial at 1500 Kc. | Trimmer C1 (See Fig. 4) | Broadcast antenna | Adjust to maximum output |
| LOOP ALIGNMENT (See Note B) | 1500 Kc. | 200 mmf. | Antenna and Ground | Set Dial at 1500 Kc. | Trimmer C1 (See Fig. 4) | Broadcast antenna | Adjust to maximum output |

NOTE "A"-The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the Short Wave Band and to the grid of the 6X4 tube when aligning the Broadcast Band oscillator and the 1600 Kc. oscillator. The loop antenna need not be connected to the radio when making these adjustments.

NOTE "B"-Loop alignment is made with the chassis mounted in the cabinet and the "ANT." and "GND." terminals and the jumper on the terminal board connected to the "EXT." terminal (See Fig. 1).

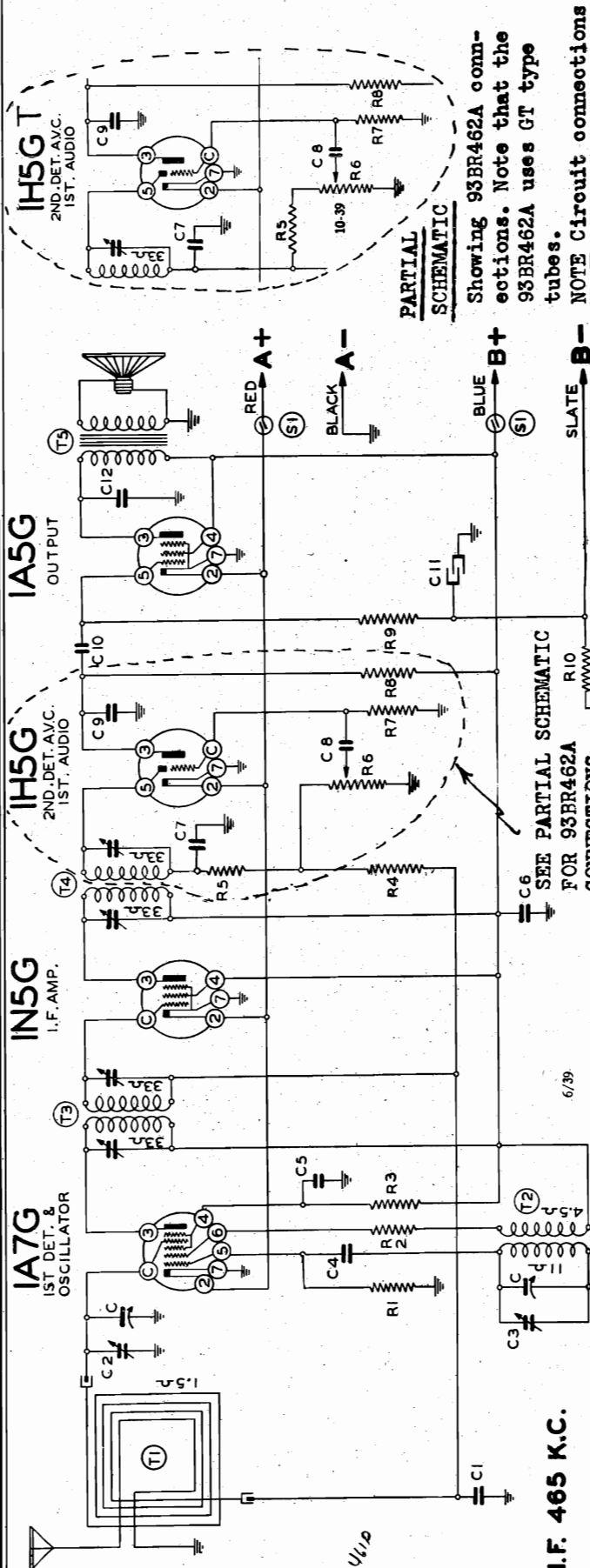
NOTE "C"-Turn the dial back and forth rapidly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

After each band is completed, repeat the procedure as a final check.

FIG. 4

MONTGOMERY WARD & CO.

MODELS 93BR-461A,
Serial 759400 up
93BR-462A, Ser. 939800 up
Schematics, Sensitivity



PARTIAL SCHEMATIC

Showing 93BR462A connections. Note that the 93BR462A uses GT type tubes.

NOTE Circuit connections are the same in both sets except for differences above.

R. F. Trimmer on Gang
Oscillator Trimmer on Gang

BE12012
BE1009
BE1006
BE12012
BE10025
BE10025
BE10078
BE10078
BE10078
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025
BE10025

I.F. 465 K.C.

FOR ALIGNMENT AND TUNER
SEE INDEX

BE SURE TO REFER TO PROPER LIST FOR CORRECT PARTS

MODEL 93BR-462A (SERIAL No. 939800 and UP)

Ref. No. Part No. Description

C5 BE1009 .05 x 200 v. - 25%

C6 BE1009 .25 x 200 v. - 20%

C7 BE1295 .0001 mica - 20%

C8 BE10012 .003 x 600 v. - 25%

C9 BE12912 .00025 mica - 20%

C10 BE10078 .01 x 200 v. - 25%

C11 BE11975 10 mfd. x 25 v. - 25%

C12 BE10012 .003 x 600 v. - 25%

T1 BE11159 Loop Antenna Complete

T2 BE110139 Oscillator Coil

T3 BE108167 Input I. F. Coil

T4 BE108168 Output I. F. Coil

T5 BE105100 Output Transformer

T6 BE114183 4" P. M. Speaker

S1 BE12597 On-Off Switch

No. 153

PARTS

Loop Antenna Complete

Oscillator Coil

Input I. F. Coil

Output I. F. Coil

Output Transformer

4" P. M. Speaker

On-Off Switch

MODEL 93BR-461A (SERIAL No. 759400 and UP)

Ref. No. Part No. Description

C2 BE12012 200M ohm - 1/4 w. - 20%

C3 BE1009 4M ohm - 1/4 w. - 20%

C4 BE1006 50M ohm - 1/4 w. - 20%

C5 BE12012 3 megohm - 1/4 w. - 20%

C6 BE10025 100M ohm - 1/4 w. - 20%

C7 BE10025 100M ohm - 1/4 w. - 20%

C8 BE10078 1 megohm - 1/4 w. - 25%

C9 BE10078 1 megohm - 1/4 w. - 25%

C10 BE10078 1 megohm - 1/4 w. - 25%

C11 BE10078 1 megohm - 1/4 w. - 25%

C12 BE10025 2 megohm - 1/4 w. - 10%

T1 BE11131 Loop Antenna Complete

T2 BE110121 Oscillator Coil

T3 BE108151 Input I. F. Coil

T4 BE108152 Output I. F. Coil

T5 BE114165 5" Speaker with output transformer

S1 D.P.S.T. On-off switch on volume control

Catalog No. 5022.

PARTS

Loop Antenna Complete

Oscillator Coil

Input I. F. Coil

Output I. F. Coil

5" Speaker with output transformer

D.P.S.T. On-off switch on volume control

Specifications Model No. 93BR-461A Model No. 93BR-462A

Power Consumption - "A" Battery 200 MA; "B" Battery 8.15 MA. "A" Battery 200 MA; "B" Battery 8 MA.

Power Output - 100 Milliwatts, Undistorted

Sensitivity (for .05 Watts) - 60 Microvolts Average

Selectivity - 52 Kc. Broad at 1000 Times Signal at 1000 Kc. 50 Kc. Broad at 1000 Times Signal at 1000 Kc.

"B" Batteries

2-45 volt "B" Batteries;

Article No. 62-4951.

"A" Battery

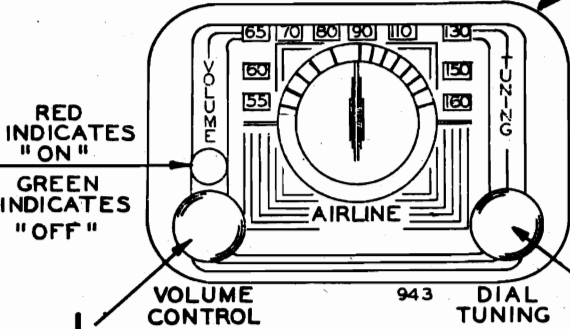
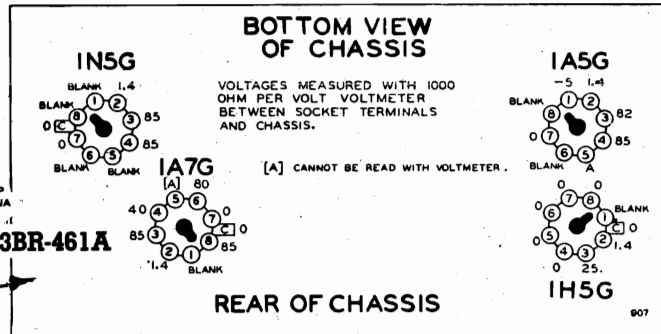
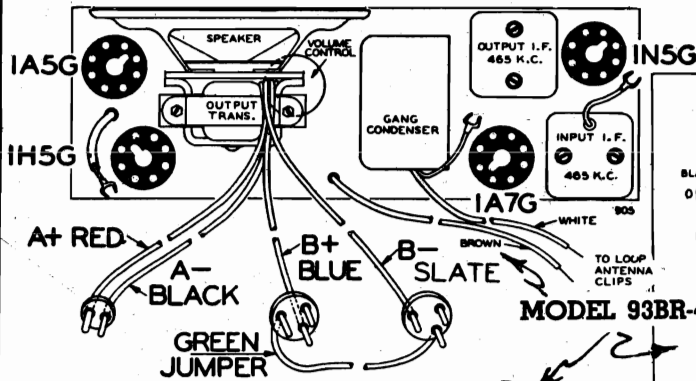
1-1 1/2 volt "A" Battery;

Article No. 62-5021.

MODEL 93BR-461A
Voltage, Trimmers
Battery Conn. Socket

MONTGOMERY WARD & CO.

MODEL 93BR-462A
Voltage, Trimmers
Notes, Batt. Conn.



ADJUSTING THE ANTENNA:

IMPORTANT: MODEL 93BR-462A

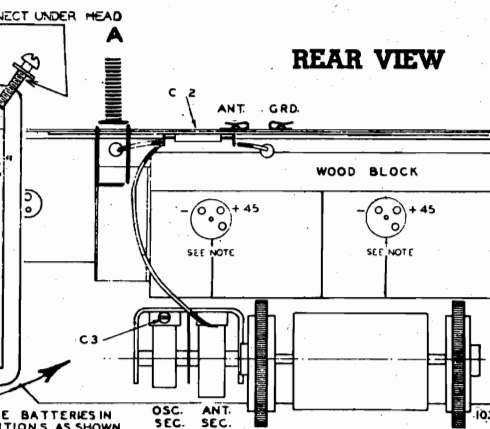
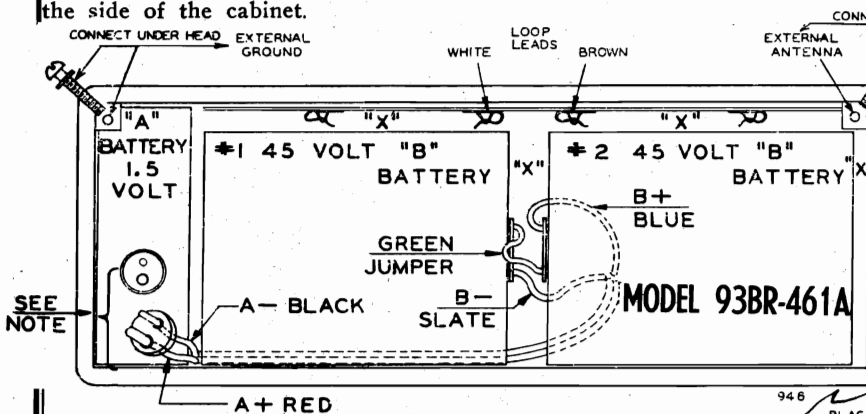
After the batteries have been installed and the radio placed in operation, tune in a weak station around 1400 Kc. on the dial.

On the back of the cabinet a small adjustment screw is provided, (see C2, Fig. 2).

Very carefully turn this adjustment screw in or out until the station is as clear and loud as it can be made.

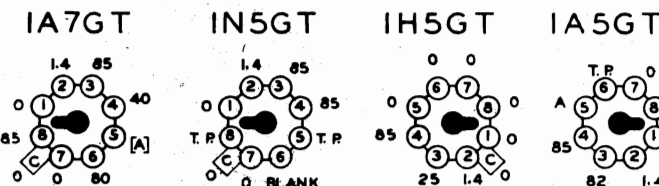
NOTE: The "A" battery should be placed in the cabinet so that the plug-in socket on the top of the battery is nearer to the side of the cabinet which is faced down than to the side of the cabinet which is facing up. Also, the "A" battery should be pushed all the way into the cabinet so that it fits between the left end of the radio chassis and the side of the cabinet.

NEXT:—Tune in a station around 600 Kc. on the dial and adjust adjustment screw (See A, Fig. 2). Both these adjustments are very important for best reception.

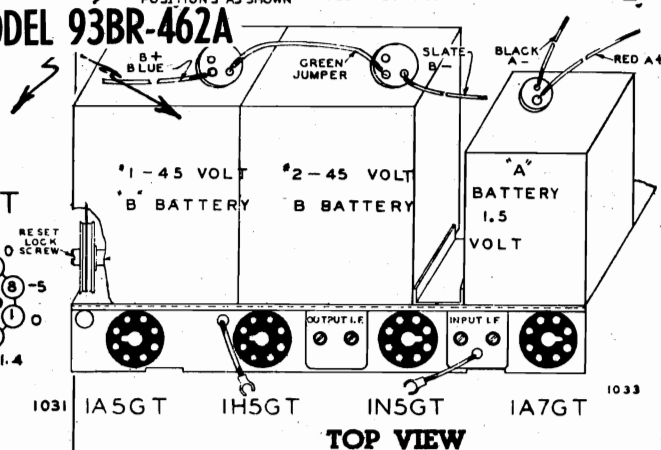


PRONG VIEW

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS.
[A] CANNOT BE READ WITH VOLTMETER
T.P.—TIE POINT



MODEL 93BR-462A



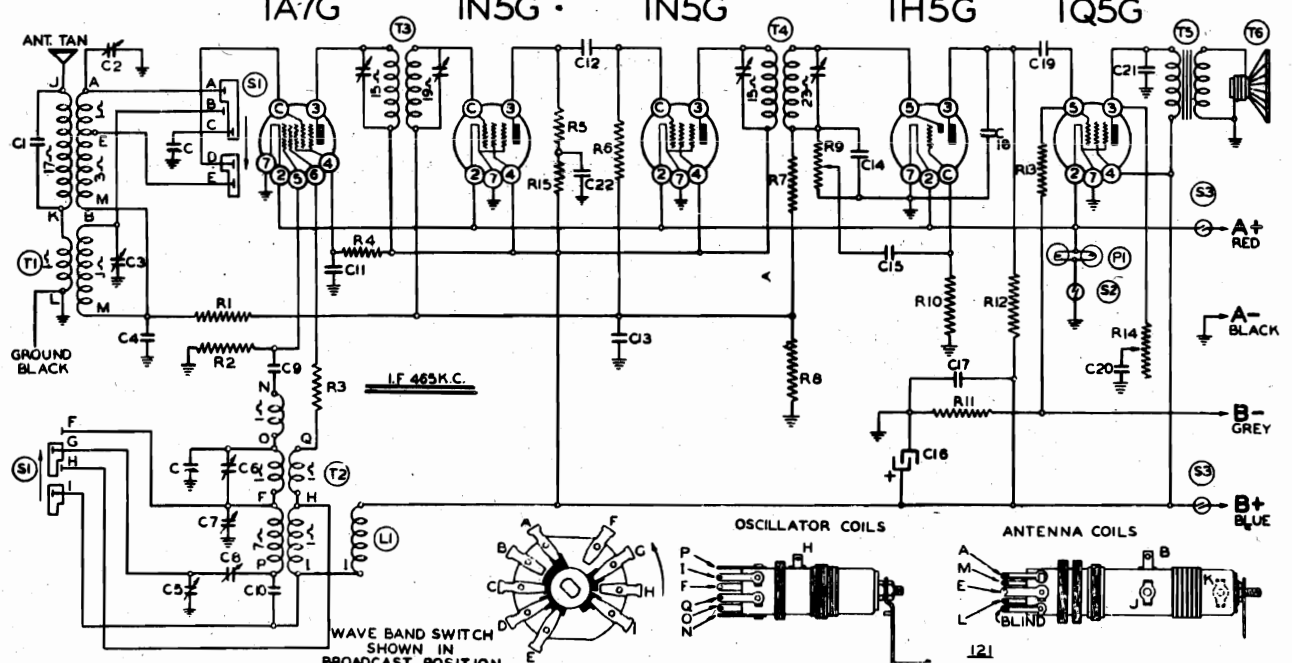
MODELS 93BR-561A, 93BR-563A

Serial 783300 up

MONTGOMERY WARD

Schematic, Socket, Voltage
Alignment, Trimmers, Coils

Mixer, 1st I. F. Amplifier & CO. Second Detector,
First Detector-oscillator 2nd I. F. Amplifier A.V.C., 1st Audio Output



1—1½ volt "A" Battery.
2—45 volt "B" Batteries.

MODELS 93BR-561A and 93BR-563A (SERIAL No. 783300 and UP)

Selectivity - .35 Kc. Broad at 1000 Times Signal at 1000 Kc.

Sensitivity (for .05 Watts) Broadcast—10 Microvolts Average

Short Wave—20 Microvolts Average

CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOLUME VIII

Consumption - - -

"A" Battery 300 MA; "B" Battery 11 MA.

Output - - - -

190 Milliwatts, Undistorted

| Ref. No. | Part No. | Description |
|------------------|----------|-------------------------|
| RESISTORS | | |
| R1 | BE13020 | 100M ohm—½ w. |
| R2 | BE1309 | 200M ohm—½ w. |
| R3 | BE13056 | 100 ohm—½ w. |
| R4 | BE13012 | 50M ohm—½ w. |
| R5 | BE13022 | 5M ohm—½ w. |
| R6 | BE13020 | 100M ohm—½ w. |
| R7 | BE1304 | 3 megohm—½ w. |
| R8 | BE1304 | 3 megohm—½ w. |
| R9 | BE101184 | 1 megohm—volume control |
| R10 | BE130225 | 15 megohm—½ w. |
| R11 | BE130101 | 600 ohm—½ w. |
| R12 | BE1303 | 500M ohm—½ w. |
| R13 | BE13019 | 1 megohm—½ w. |
| R14 | BE101179 | Tone Control |
| R15 | BE13017 | 10M ohm—½ w. |

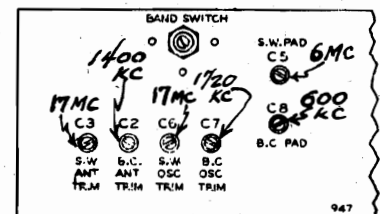
| Ref. No. | Part No. | Description |
|-------------------|----------|---------------------------|
| CONDENSERS | | |
| C1 | BE129132 | 2 gang variable condenser |
| C2 | BE12485 | .000125 mica |
| C3 | BE12485 | B. C. Trimmer |
| C4 | BE12485 | S. W. Trimmer |
| C5 | BE1009 | .05 x 200 v. |
| C6 | BE12486 | S. W. Pad |
| C7 | BE12484 | S. W. Trimmer |
| C8 | BE12484 | B. C. Trimmer |
| C9 | BE12486 | B. C. Pad |
| C10 | BE12939 | .00005 mica |
| C11 | BE1009 | .05 x 200 v. |

| Ref. No. | Part No. | Description |
|----------|----------|---------------|
| C11 | BE1009 | .05 x 200 v. |
| C12 | BE1292 | .0005 mica |
| C13 | BE1009 | .05 x 200 v. |
| C14 | BE12960 | .00015 mica |
| C15 | BE10012 | .003 x 600 v. |
| C16 | BE11986 | 8 mid. lytic |
| C17 | BE1006 | .25 x 200 v. |
| C18 | BE12921 | .0002 mica |
| C19 | BE10011 | .01 x 400 v. |
| C20 | BE10026 | .02 x 400 v. |
| C21 | BE10071 | .004 x 600 v. |
| C22 | BE10020 | .1 x 200 v. |

C2 and C3 in one unit. C6 and C7 in same unit.
C5 and C8 in one unit.

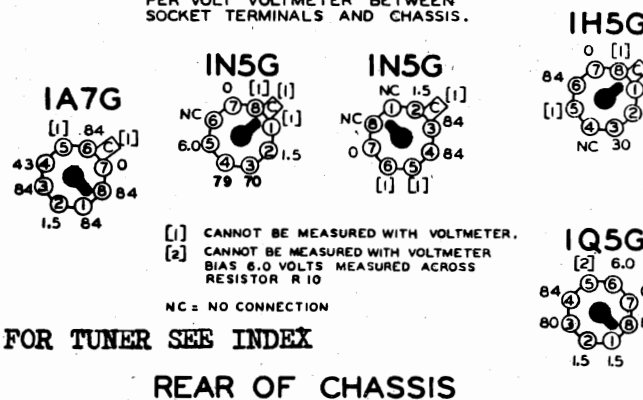
PARTS

| | | |
|----|-----------|-------------------------------|
| T1 | BE111120 | B. C.—S. W. Antenna Coil |
| T2 | BE110118 | B. C.—S. W. Osc. Coil |
| T3 | BE108111G | Input I. F. Coil |
| T4 | BE108112 | Output I. F. Coil |
| T5 | BE10569 | Output Transformer |
| T6 | BE114162R | 6" P. M. Speaker (for 62-563) |
| T7 | BE114169 | 8" P. M. (for 62-561) |
| S1 | BE12579 | Band Switch |
| S2 | BE12581 | Pushbutton Switch—Pilot |
| S3 | | Off-on switch on tone control |
| P1 | BE107243 | (2) 1.5 v. Pilot Lights |
| L1 | BE1233 | R. F. Choke Coil |

TRIMMERS ON
FRONT OF CHASSIS

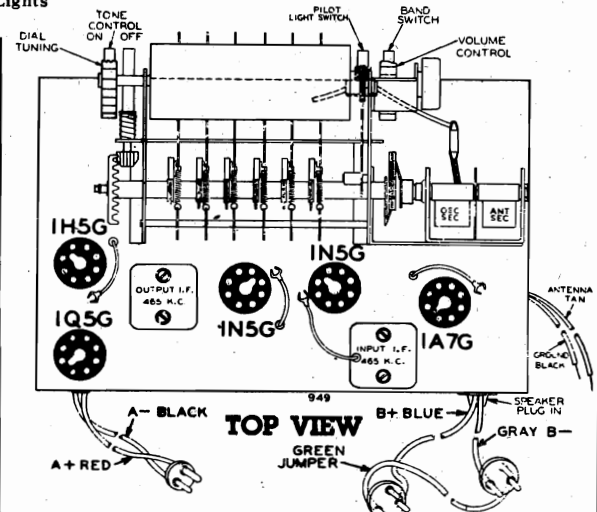
BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM
PER VOLT VOLT METER BETWEEN
SOCKET TERMINALS AND CHASSIS.



FOR TUNER SEE INDEX

REAR OF CHASSIS



TOP VIEW

MODELS 93BR-658A, 93BR-666A

Series A, Serial 9F824600 up

MONTGOMERY WARD & CO.

First Detector-oscillator
6D8G

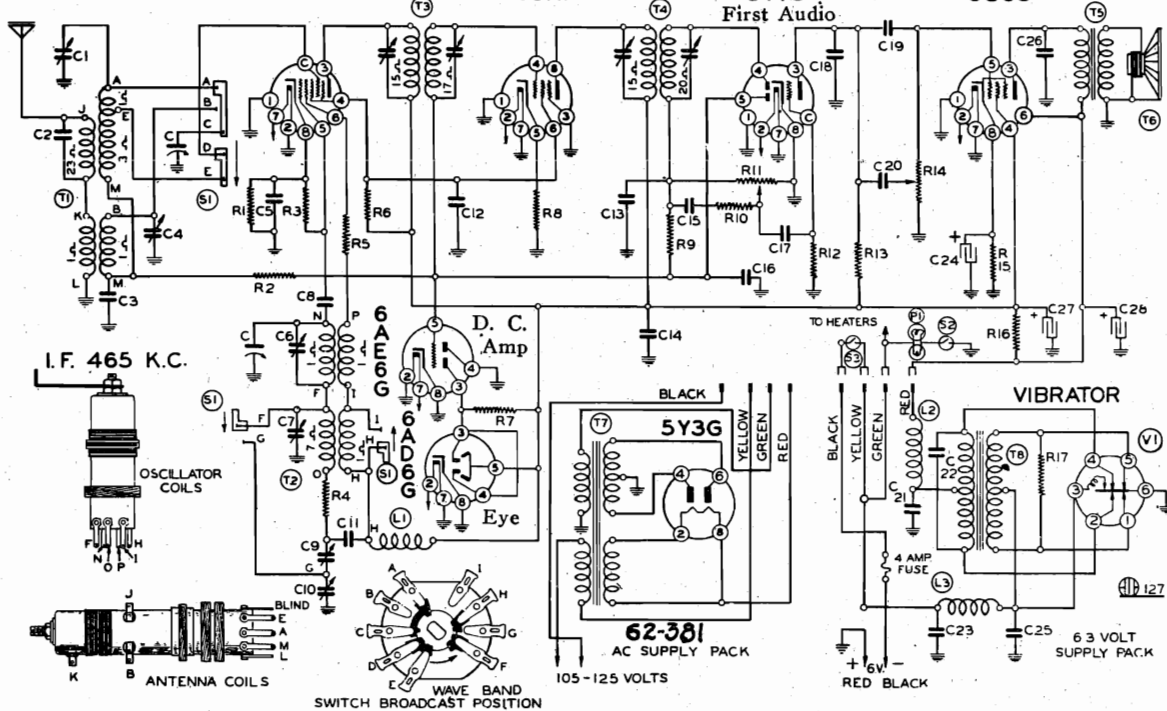
I. F. Amplifier
6SK7

Second Detector, A.V.C.
6T7G

Schematic, Voltage, Socket

Alignment, Trimmers

Output
6G6G



Ref. No. Part No.

MODEL 93BR-658A and 93BR-666A SERIES A (SERIAL No. 9F824600 and UP)

| RESISTORS | | |
|-----------|----------|-----------------------------|
| R1 | BE13083 | 300 ohm— $\frac{1}{2}$ w. |
| R2 | BE13020 | 100M ohm— $\frac{1}{2}$ w. |
| R3 | BE13012 | 50M ohm— $\frac{1}{2}$ w. |
| R4 | BE130286 | 20 ohm— $\frac{1}{2}$ w. |
| R5 | BE130168 | 100 ohm— $\frac{1}{2}$ w. |
| R6 | BE13048 | 15M ohm— $\frac{1}{2}$ w. |
| R7 | BE13019 | 1 megohm— $\frac{1}{2}$ w. |
| R8 | BE13097 | 200 ohm— $\frac{1}{2}$ w. |
| R9 | BE1304 | 3 megohm— $\frac{1}{2}$ w. |
| R10 | BE13012 | 50M ohm— $\frac{1}{2}$ w. |
| R11 | BE101184 | 1 Megohm volume control |
| R12 | BE130225 | 15 megohm— $\frac{1}{2}$ w. |
| R13 | BE1305 | 300M ohm— $\frac{1}{2}$ w. |
| R14 | BE101177 | 500M ohm tone control |
| R15 | BE13070 | 500 ohm— $\frac{1}{2}$ w. |
| R16 | BE130199 | 1500 ohm—1 watt |
| R17 | BE130285 | 200 ohm— $\frac{1}{2}$ w. |

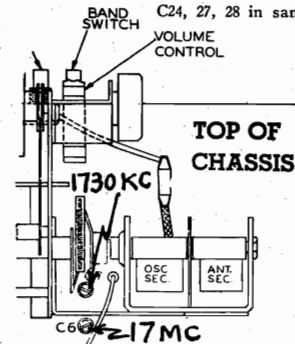
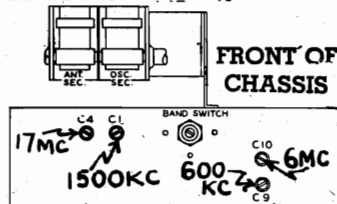
| CONDENSERS | | |
|------------|-----------|---------------------------|
| C | BE102106B | 2 gang variable condenser |
| C1 | BE12475 | BC Antenna Trimmer |
| C2 | BE129132 | .000125 mica |
| C3 | BE1009 | .05 x 200 |
| C4 | BE12475 | S. W. Antenna Trimmer |
| C5 | BE10020 | .1 x 200 v. |
| C6 | BE12476 | S. W. Oscillator Trimmer |
| C7 | BE12476 | B. C. Oscillator Trimmer |
| C8 | BE12938 | .00005 Mica |

| | | |
|-----|---------|-------------------------|
| C9 | BE12488 | B. C. Series Pad |
| C10 | BE12488 | S. W. Series Pad |
| C11 | BE10020 | .1 x 200 v. |
| C12 | BE10020 | .1 x 200 v. |
| C13 | BE1295 | .0001 Mica |
| C14 | BE10020 | .1 x 200 v. |
| C15 | BE1295 | .0001 mica |
| C16 | BE10026 | .02 x 400 v. |
| C17 | BE10019 | .006 x 600 v. |
| C18 | BE1292 | .0005 mica |
| C19 | BE10026 | .02 x 400 v. |
| C20 | BE10019 | .006 x 600 v. |
| C21 | BE10020 | .1 x 200 v. |
| C22 | BE10068 | .003 x 1400 v. |
| C23 | BE10040 | .5 x 120 v. |
| C24 | BE11985 | 20 mfd.—25 w. v. lytic |
| C25 | BE10040 | .5 x 120 v. |
| C26 | BE10019 | .006 x 600 v. |
| C27 | BE11985 | 30 mfd.—200 w. v. lytic |
| C28 | BE11985 | 30 mfd.—200 w. v. lytic |

| | | |
|----|------------|--|
| T1 | BE111121 | Antenna Coil |
| T2 | BE110117 | Oscillator Coil |
| T3 | BE108111-I | Input I. F. |
| T4 | BE108112E | Output I. F. |
| T5 | BE10569C | Output Transformer |
| T6 | BE11462J | 6 in. P.M. speaker—for model 91BR-666A |
| T7 | BE114169 | 8 in. P.M. speaker—for model 93BR-658A |
| T8 | BE104165 | AC Power Transformer |
| T9 | BE104164 | Vibrator Transformer |
| V1 | BE12616 | Vibrator |
| L1 | BE1233 | R. F. Choke |
| L2 | BE1233 | R. F. Choke |
| L3 | BE10568 | "A" Choke |
| S1 | BE12579 | Wave Band Switch |
| S2 | BE12581 | Pilot Light Switch |
| S3 | | Off-on switch on tone control |
| P1 | BE10789 | Pilot light 6.3 v.—150 ma.—T-40 |

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

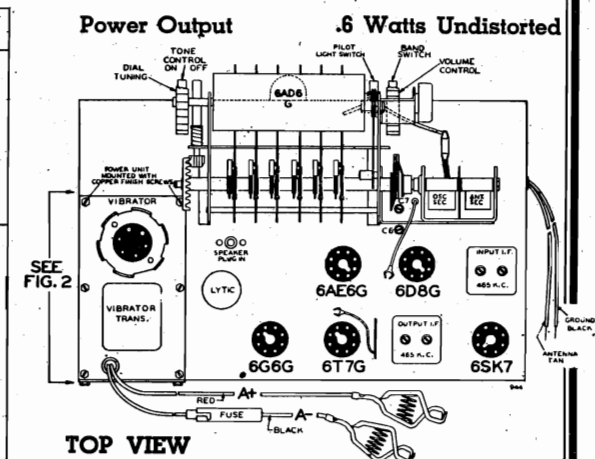
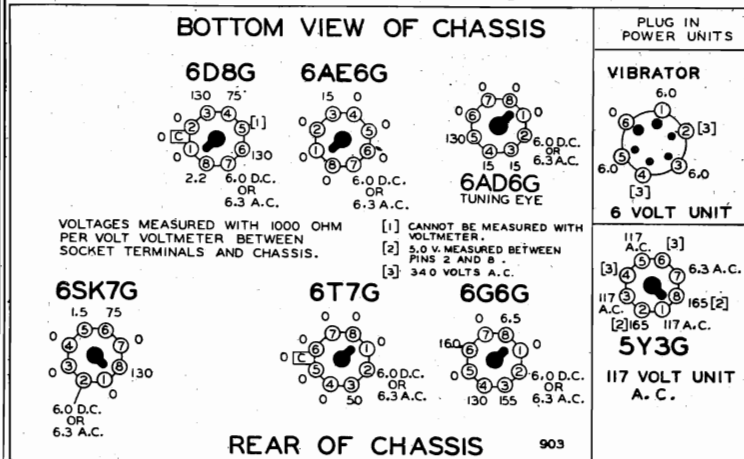
FOR TUNER
SEE INDEX



Sensitivity (for .05 Watts Output) - Broadcast 15 Microvolts Average
Shortwave 30 Microvolts Average
Selectivity - 35 KC Broad at 1000 Times Signal at 1000 KC

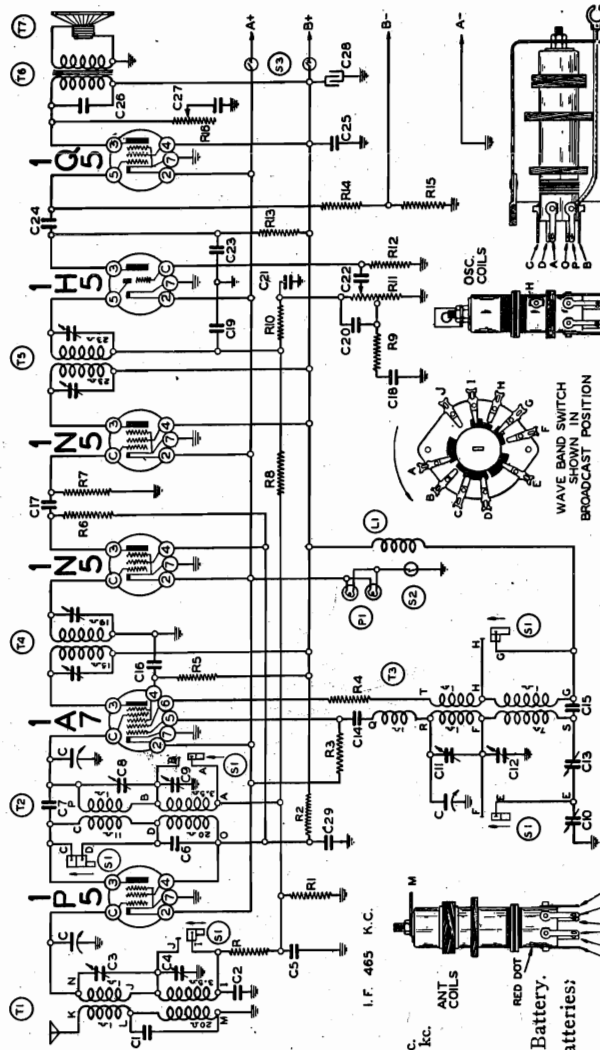
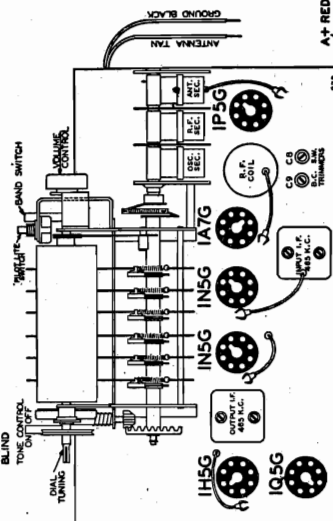
Power Consumption 2.5 Amp. at 6.3 Volts

Power Output .6 Watts Undistorted

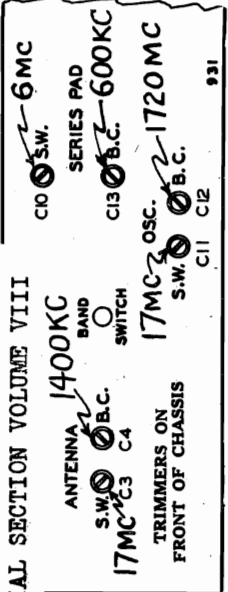


Alignment, Trimmers,
Sensitivity, Coils

MONTGOMERY WARD & CO.

MODELS 93BR-659A, 93BR-660A
Serial 9F806900 up
Schematic, Voltage, SocketMODELS 93BR-659A and 93BR-660A
(SERIAL No. 9F806900 and UP)

TOP VIEW

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

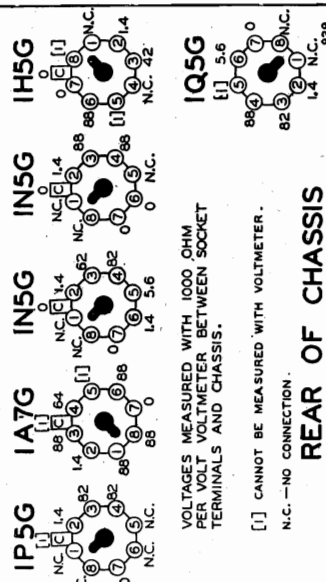
931

| Ref. No. | Part No. | Description |
|-------------------|----------|---------------------------|
| RESISTORS | | |
| R1 | BE130100 | 150M ohm-1/4 w. |
| R2 | BE130103 | 3 megohm-1/4 w. |
| R3 | BE130109 | 2M ohm-1/4 w. |
| R4 | BE130109 | 200M ohm-1/4 w. |
| R5 | BE130109 | 100 ohm-1/4 w. |
| R6 | BE130102 | 50M ohm-1/4 w. |
| R7 | BE130102 | 15M ohm-1/4 w. |
| R8 | BE130104 | 3 megohm-1/4 w. |
| R9 | BE130104 | 15M ohm-1/4 w. |
| R10 | BE130102 | 50M ohm-1/4 w. |
| R11 | BE130102 | 15M ohm-1/4 w. |
| R12 | BE130102 | 50M ohm-1/4 w. |
| R13 | BE130102 | 15M ohm-1/4 w. |
| R14 | BE130102 | 50M ohm-1/4 w. |
| R15 | BE130102 | 15M ohm-1/4 w. |
| R16 | BE101179 | 1 megohm tone control |
| CONDENSERS | | |
| C1 | BE102112 | 3 gang variable condenser |
| C2 | BE102112 | .001 mica condenser |
| C3 | BE102112 | .02 x 400 v. |
| C4 | BE12496 | Dual Trimmer (S.W. Ant.) |
| C5 | BE12496 | Dual Trimmer (B.C. Ant.) |
| C6 | BE12496 | .05 x 200 v. |
| C7 | BE12496 | .001 mica |
| C8 | BE12496 | .001 mica |
| C9 | BE12496 | .001 mica |
| C10 | BE12496 | .001 mica |
| C11 | BE12496 | .001 mica |
| C12 | BE12496 | .001 mica |
| C13 | BE12496 | .001 mica |
| C14 | BE12496 | .001 mica |
| C15 | BE12496 | .001 mica |
| C16 | BE12496 | .001 mica |
| C17 | BE12496 | .001 mica |
| C18 | BE12496 | .001 mica |
| C19 | BE12496 | .001 mica |
| C20 | BE12496 | .001 mica |
| C21 | BE12496 | .001 mica |
| C22 | BE12496 | .001 mica |
| C23 | BE12496 | .001 mica |
| C24 | BE12496 | .001 mica |
| C25 | BE12496 | .001 mica |
| C26 | BE12496 | .001 mica |
| C27 | BE12496 | .001 mica |
| C28 | BE12496 | .001 mica |
| C29 | BE12496 | .001 mica |
| C30 | BE12496 | .001 mica |
| C31 | BE12496 | .001 mica |
| C32 | BE12496 | .001 mica |
| C33 | BE12496 | .001 mica |
| C34 | BE12496 | .001 mica |
| C35 | BE12496 | .001 mica |
| C36 | BE12496 | .001 mica |
| C37 | BE12496 | .001 mica |
| C38 | BE12496 | .001 mica |
| C39 | BE12496 | .001 mica |
| C40 | BE12496 | .001 mica |
| C41 | BE12496 | .001 mica |
| C42 | BE12496 | .001 mica |
| C43 | BE12496 | .001 mica |
| C44 | BE12496 | .001 mica |
| C45 | BE12496 | .001 mica |
| C46 | BE12496 | .001 mica |
| C47 | BE12496 | .001 mica |
| C48 | BE12496 | .001 mica |
| C49 | BE12496 | .001 mica |
| C50 | BE12496 | .001 mica |
| C51 | BE12496 | .001 mica |
| C52 | BE12496 | .001 mica |
| C53 | BE12496 | .001 mica |
| C54 | BE12496 | .001 mica |
| C55 | BE12496 | .001 mica |
| C56 | BE12496 | .001 mica |
| C57 | BE12496 | .001 mica |
| C58 | BE12496 | .001 mica |
| C59 | BE12496 | .001 mica |
| C60 | BE12496 | .001 mica |
| C61 | BE12496 | .001 mica |
| C62 | BE12496 | .001 mica |
| C63 | BE12496 | .001 mica |
| C64 | BE12496 | .001 mica |
| C65 | BE12496 | .001 mica |
| C66 | BE12496 | .001 mica |
| C67 | BE12496 | .001 mica |
| C68 | BE12496 | .001 mica |
| C69 | BE12496 | .001 mica |
| C70 | BE12496 | .001 mica |
| C71 | BE12496 | .001 mica |
| C72 | BE12496 | .001 mica |
| C73 | BE12496 | .001 mica |
| C74 | BE12496 | .001 mica |
| C75 | BE12496 | .001 mica |
| C76 | BE12496 | .001 mica |
| C77 | BE12496 | .001 mica |
| C78 | BE12496 | .001 mica |
| C79 | BE12496 | .001 mica |
| C80 | BE12496 | .001 mica |
| C81 | BE12496 | .001 mica |
| C82 | BE12496 | .001 mica |
| C83 | BE12496 | .001 mica |
| C84 | BE12496 | .001 mica |
| C85 | BE12496 | .001 mica |
| C86 | BE12496 | .001 mica |
| C87 | BE12496 | .001 mica |
| C88 | BE12496 | .001 mica |
| C89 | BE12496 | .001 mica |
| C90 | BE12496 | .001 mica |
| C91 | BE12496 | .001 mica |
| C92 | BE12496 | .001 mica |
| C93 | BE12496 | .001 mica |
| C94 | BE12496 | .001 mica |
| C95 | BE12496 | .001 mica |
| C96 | BE12496 | .001 mica |
| C97 | BE12496 | .001 mica |
| C98 | BE12496 | .001 mica |
| C99 | BE12496 | .001 mica |
| C100 | BE12496 | .001 mica |

The type and function of each tube is as follows.

- 1-Type 1P5G R. F. Amplifier.
- 1-Type 1A7G Mixer, First Detector-oscillator.
- 1-Type 1N5G Remote Cut-Off Pentode, 1st I. F. Amplifier (465 K.C.).
- 1-Type 1N5G Remote Cut-Off Pentode, 2nd I. F. Amplifier (465 K.C.).
- 1-Type 1H5G Second Detector, A.V.C., 1st Audio.
- 1-Type 1Q5G Output Amplifier.

BOTTOM VIEW OF CHASSIS



REAR OF CHASSIS

Power Consumption - - - "A" Battery 350 MA; "B" Battery 15 MA.
Power Output - - - - - 190 Milliwatts, Undistorted
Sensitivity (for .05 Watts) - Broadcast Band-6 Microvolts Average
Short Wave Band-15 Microvolts Average
Selectivity - - - 35 Kc. Broad at 1000 Times Signal at 1000 Kc.

MODELS 93BR-714A, 93BR-716A

Serial 939200 and up

93BR-715A, Ser. A

Serial 786400 and up

Schematic, Voltage, Socket

MODEL 93BR-714A, 93BR-716A

SERIES A

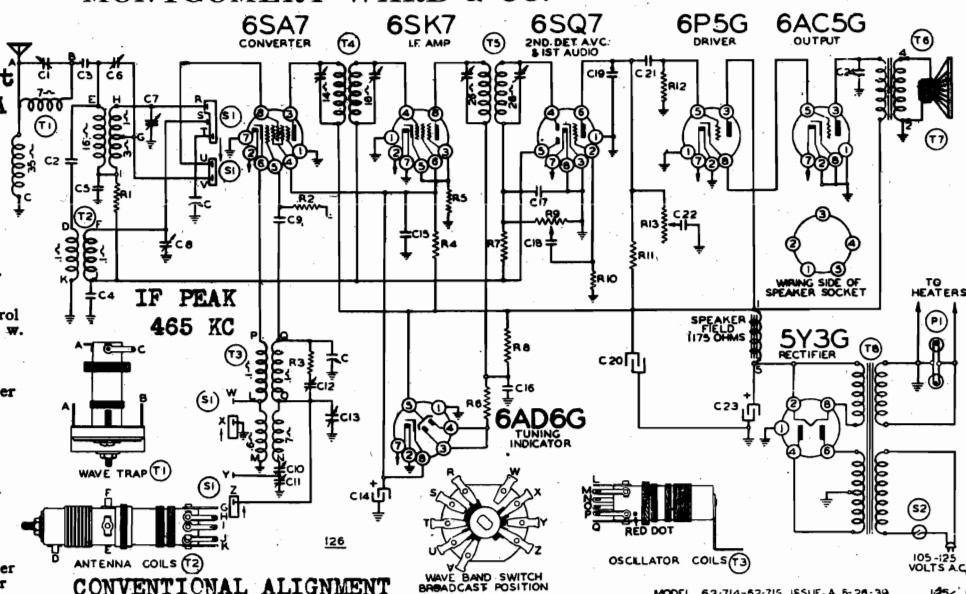
(SERIAL No. 939200 and UP)

| No. | Part No. | Description |
|-------------|---|------------------------------------|
| R1 | BE13011 | 250M ohm— $\frac{1}{4}$ w. |
| R2 | BE13021 | 20M ohm—20%— $\frac{1}{4}$ w. |
| R3 | BE130197 | 20 ohm—10%— $\frac{1}{4}$ w. |
| R4 | BE130144 | 15M ohm—20%—1 watt |
| R5 | BE130168 | 100 ohm—10%— $\frac{1}{4}$ w. |
| R6 | BE130110 | 1 megohm—10%— $\frac{1}{10}$ w. |
| R7 | BE1304 | 3 megohm—20%— $\frac{1}{4}$ w. |
| R8 | BE13055 | 12M ohm—20%—2 watt |
| R9 | BE101185 | 1 megohm—volume control |
| R10 | BE130225 | 15 megohm—50—30%— $\frac{1}{4}$ w. |
| R11 | BE1303 | 500M ohm—20%— $\frac{1}{4}$ w. |
| R12 | BE13019 | 1 megohm—20%— $\frac{1}{4}$ w. |
| R13 | BE101183 | 1 megohm—tone control |
| C | BE102114 | 2 gang variable condenser |
| C1 | BE12467 | Wave Trap Trimmer |
| C2 | BE129140 | .00016 mica—5% |
| C3 | BE10011 | .01 x 400 volt—25% |
| C4 | BE1009 | .05 x 200 volt—25% |
| C5 | BE129131 | .002775 mica—3% |
| C6 | BE12468 | Image Trimmer |
| C7 | BE12475 | B. C. Antenna Trimmer |
| C8 | BE12475 | S. W. Antenna Trimmer |
| C9 | BE12960 | .00015 Mica—20% |
| C10 | BE12487 | B. C. Series Pad |
| C11 | BE12487 | S. W. Series Pad |
| C12 | BE12476 | B. C. Oscillator Trimmer |
| C13 | BE11984 | 5. mfd. x 300 v. lytic |
| C14 | BE1001 | .1 x 400 v. 50—10% |
| C15 | BE1001 | .1 x 400 v. 50—10% |
| C16 | BE1295 | .0001 mica—20% |
| C17 | BE10071 | .004 x 600 v.—25% |
| C18 | BE10071 | .004 x 600 v.—25% |
| C19 | BE1292 | .0005 mica—20% |
| C20 | BE11984 | 15 mfd. x 350 v. lytic |
| C21 | BE10026 | .02 x 400 v.—25% |
| C22 | BE10071 | .004 x 600 v.—25% |
| C23 | BE11984 | 10 mfd. x 450 v. lytic |
| C24 | BE10019 | .006 x 600 v.—25% |
| C7 and C8 | in one unit. C10 and C11 in one unit. | |
| C12 and C13 | in one unit. C14, C20, and C23 in one unit. | |

FOR TUNER
SEE INDEX

MONTGOMERY WARD & CO.

Trimmers, Alignment, Coils



CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOLUME VIII

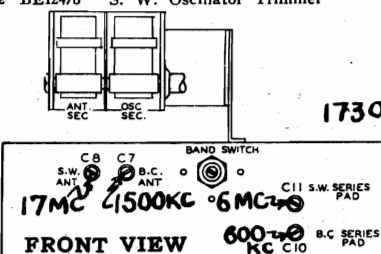
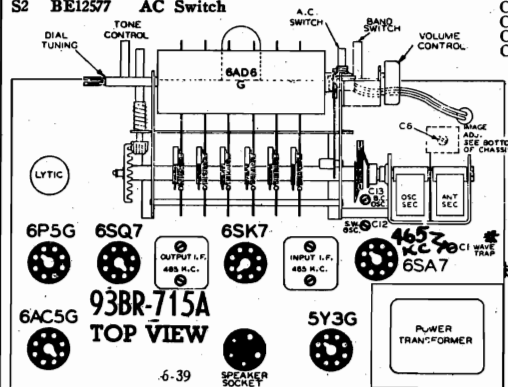
NOTE:—Refer to proper parts list
for correct parts.

MODEL 93BR-715A SERIES A (SERIAL No. 786400 and UP)

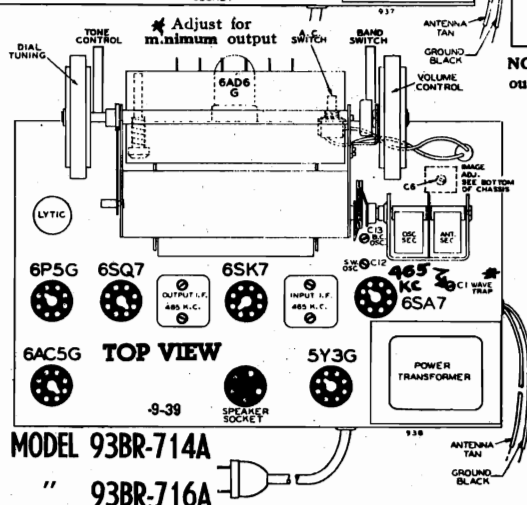
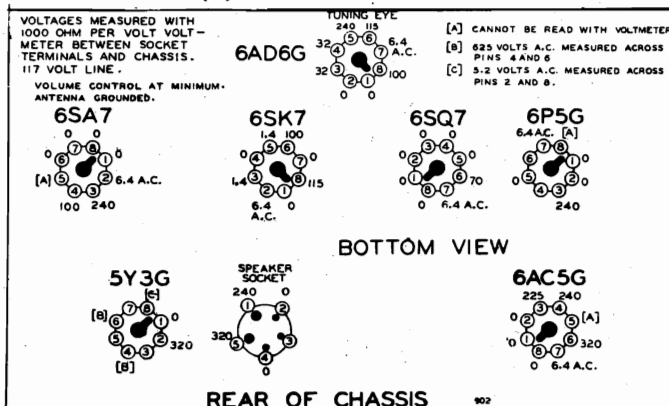
Power Consumption 65 Watts

Output 2.5 Watts Undistorted

| Ref. No. | Part No. | Description | C13 | BE12476 | B. C. Oscillator Trimmer |
|----------|-----------|------------------------------------|-------------|---|-------------------------------------|
| R1 | BE13011 | 250M ohm—20%— $\frac{1}{4}$ w. | C14 | BE11984 | 5. mfd. x 300 v. lytic |
| R2 | BE13021 | 20M ohm—20%— $\frac{1}{4}$ w. | C15 | BE1001 | .1 x 400 v. 50—10% |
| R3 | BE130197 | 20 ohm—10%— $\frac{1}{4}$ w. | C16 | BE1001 | .1 x 400 v. 50—10% |
| R4 | BE130144 | 15M ohm—20%—1 watt | C17 | BE1295 | .0001 mica—20% |
| R5 | BE130168 | 100 ohm—10%— $\frac{1}{4}$ w. | C18 | BE10071 | .004 x 600 v.—25% |
| R6 | BE130110 | 1 megohm—10%— $\frac{1}{10}$ w. | C19 | BE1292 | .0005 mica—20% |
| R7 | BE1304 | 3 megohm—20%— $\frac{1}{4}$ w. | C20 | BE11984 | 15 mfd. x 350 v. lytic |
| R8 | BE13055 | 12M ohm—20%—2 watt | C21 | BE10026 | .02 x 400 v.—25% |
| R9 | BE101184 | 1 megohm—volume control | C22 | BE10071 | .004 x 600 v.—25% |
| R10 | BE130225 | 15 megohm—50—30%— $\frac{1}{4}$ w. | C23 | BE11984 | 10 mfd. x 450 v. lytic |
| R11 | BE1303 | 500M ohm—20%— $\frac{1}{4}$ w. | C24 | BE10019 | .006 x 600 v.—25% |
| R12 | BE13019 | 1 megohm—20%— $\frac{1}{4}$ w. | C7 and C8 | in one unit. C10 and C11 in one unit. | |
| R13 | BE101176 | 1 megohm—tone control | C12 and C13 | in one unit. C14, C20, and C23 in one unit. | |
| C | BE102106B | 2 gang variable condenser | T1 | BE108146 | Wave Trap |
| C1 | BE12467 | Wave Trap Trimmer | T2 | BE111122 | Antenna Coil Complete |
| C2 | BE129140 | .00016 mica—5% | T3 | BE110115 | Oscillator Coil Complete |
| C3 | BE10011 | .01 x 400 volt—25% | T4 | BE108111H | Input I. F. Coil—465 kc. |
| C4 | BE1009 | .05 x 200 volt—25% | T5 | BE108132B | Output I. F. Coil—465 kc. |
| C5 | BE129131 | .002775 mica—3% | T6 | BE10590 | Output Transformer |
| C6 | BE12468 | Image Trimmer | T7 | BE114161 | 6" Dynamic Speaker (1175 Ohm Field) |
| C7 | BE12475 | B. C. Antenna Trimmer | T8 | BE104139D | Power Transformer |
| C8 | BE12475 | S. W. Antenna Trimmer | P1 | BE10794 | 6-8 volt pilot light T44 |
| C9 | BE12960 | .00015 Mica—20% | S1 | BE12579 | Band Switch |
| C10 | BE12487 | B. C. Series Pad | S2 | BE12581 | AC Switch |
| C11 | BE12487 | S. W. Series Pad | | | |
| C12 | BE12476 | S. W. Oscillator Trimmer | | | |



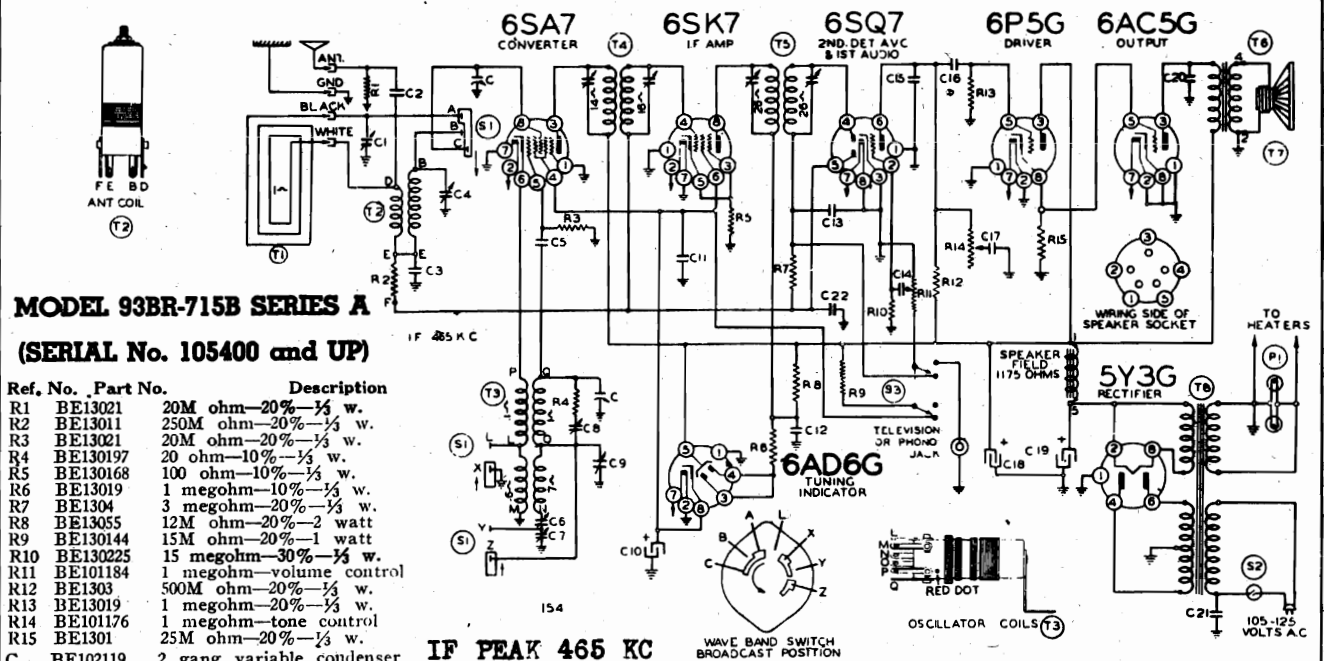
NOTE "B" 1500 KC. is the image frequency of 2430 KC. Adjust Trimmer (C6) until a minimum output is obtained. Trimmer (C6) is mounted on the bottom of the chassis.



MODEL 93BR-715B, Series A
Serial 105400 up
Schematic, Voltage, Socket

MONTGOMERY WARD & CO.

Trimmers, Alignment
Sensitivity, Coils



MODEL 93BR-715B SERIES A
(SERIAL No. 105400 and UP)

| Ref. No. | Part No. | Description |
|------------------------------|-----------|----------------------------------|
| R1 | BE13021 | 20M ohm—20%— $\frac{1}{2}$ w. |
| R2 | BE13011 | 250M ohm—20%— $\frac{1}{2}$ w. |
| R3 | BE13021 | 20M ohm—20%— $\frac{1}{2}$ w. |
| R4 | BE130197 | 20 ohm—10%— $\frac{1}{2}$ w. |
| R5 | BE130168 | 100 ohm—10%— $\frac{1}{2}$ w. |
| R6 | BE13019 | 1 megohm—10%— $\frac{1}{2}$ w. |
| R7 | BE1304 | 3 megohm—20%— $\frac{1}{2}$ w. |
| R8 | BE13055 | 12M ohm—20%—2 watt |
| R9 | BE130144 | 15M ohm—20%—1 watt |
| R10 | BE130225 | 15 megohm—30%— $\frac{1}{2}$ w. |
| R11 | BE101184 | 1 megohm—volume control |
| R12 | BE1303 | 500M ohm—20%— $\frac{1}{2}$ w. |
| R13 | BE13019 | 1 megohm—20%— $\frac{1}{2}$ w. |
| R14 | BE101176 | 1 megohm—tone control |
| R15 | BE1301 | 25M ohm—20%— $\frac{1}{2}$ w. |
| C | BE102119 | 2 gang variable condenser |
| C1 | BE124109 | B.C. Antenna Trimmer |
| C2 | BE10025 | .002 x 600 v.—25% |
| C3 | BE12954 | .003 mica—3% |
| C4 | BE124109 | S.W. Antenna Trimmer |
| C5 | BE12960 | .00015 mica—20% |
| C6 | BE124120 | B.C. Series Pad |
| C7 | BE129150 | S.W. Series Pad |
| C8 | BE12476 | S.W. Oscillator Trimmer |
| C9 | BE12476 | B.C. Oscillator Trimmer |
| C10 | BE11984 | 5. mfd. x 300 v. lytic |
| C11 | BE1001 | .1 x 400 v.—10% |
| C12 | BE1001 | .1 x 400 v.—10% |
| C13 | BE1295 | .0001 mica—20% |
| C14 | BE10071 | .004 x 600 v.—25% |
| C15 | BE1292 | .0005 mica—20% |
| C16 | BE10026 | .02 x 400 v.—25% |
| C17 | BE10071 | .004 x 600 v.—25% |
| C18 | BE11984 | 15 mfd. x 350 v. lytic |
| C19 | BE11984 | 10 mfd. x 450 v. lytic |
| C20 | BE10019 | .006 x 600 v.—25% |
| C21 | BE10061 | .02 x 600 v.—Bakelite |
| C22 | BE1009 | .05 x 200 v.—25% |
| C8 and C9 in one unit | | |
| C10, C18 and C19 in one unit | | |
| T1 | BE111166 | B.C. Loop Assembly |
| T2 | BE111167 | S.W. Antenna Coil Complete |
| T3 | BE110141 | Oscillator Coil Complete |
| T4 | BE108166 | Input I.F. Coil—465 kc. |
| T5 | BE108132B | Output I.F. Coil—465 kc. |
| T6 | BE10590 | Output Transformer |
| T7 | BE14161 | 6" Dynamic Speaker |
| T8 | BE104139E | Power Transformer |
| P1 | BE10794 | 2 6-8 volt pilot light T44 |
| S1 | BE125102 | Band Switch |
| S2 | BE12581 | AC Switch |
| S3 | BE12570 | Phono or Television-Radio Switch |

IF PEAK 465 KC

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII

SEE ALSO NOTES

ALIGNMENT PROCEDURE MODEL 93BR-714B.

Power Consumption - - - 65 Watts

Power Output - 2.5 Watts Undistorted

Sensitivity (for .5 Watts Output)

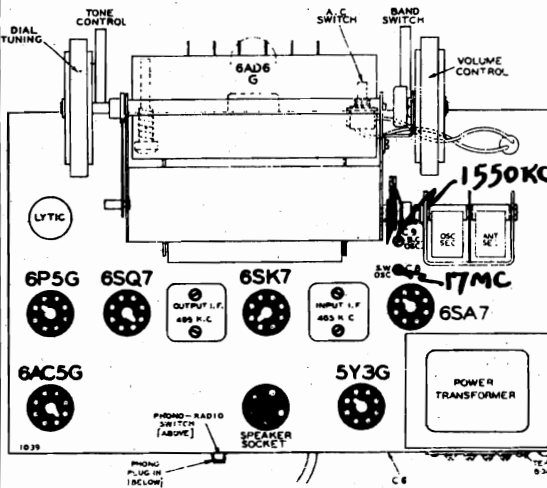
Broadcast Band—30 Microvolts Average

Shortwave Band—50 Microvolts Average

Selectivity - 45 KC Broad at 1000 Times Signal at 1000 KC

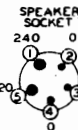
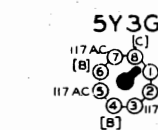
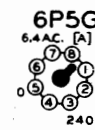
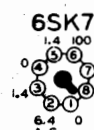
FOR TUNER
SEE INDEX

When an outside antenna is used connect the antenna to the binding screw on the rear of the chassis, marked "Ant." Connect the ground to the binding screw marked "Gnd." Do not disconnect the loop antenna when an outside antenna and ground are used.



BOTTOM VIEW OF CHASSIS

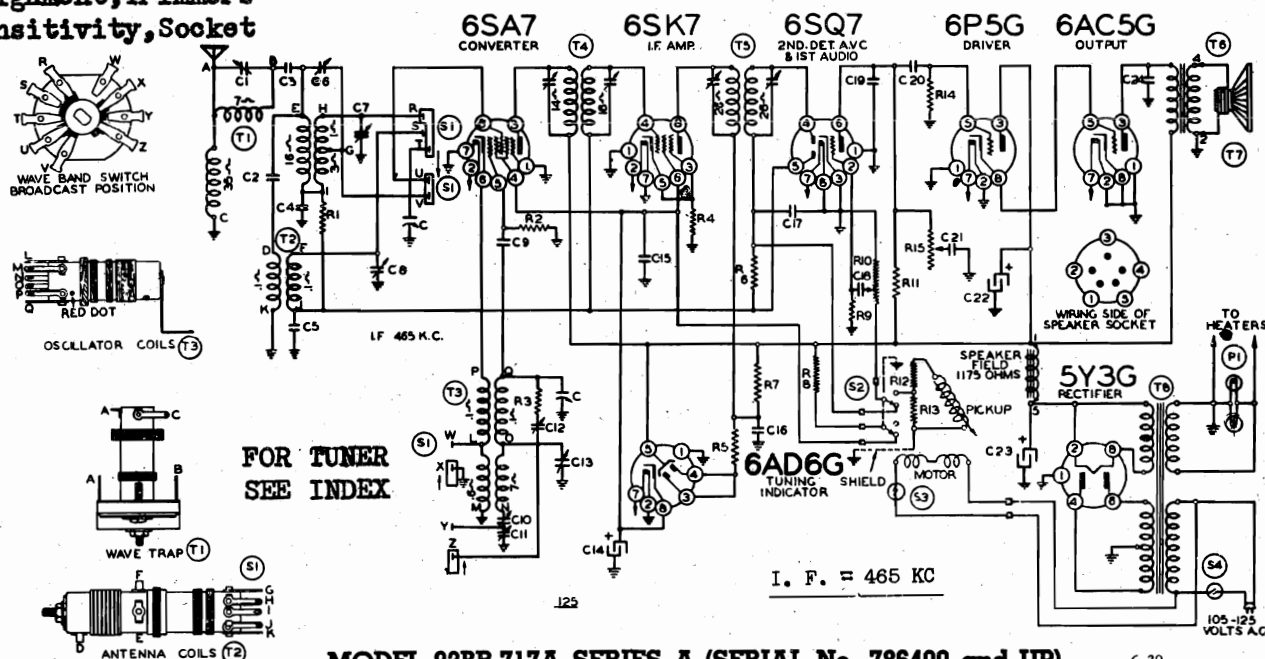
VOLTAGES MEASURED WITH 1000 OHM PER VOLT WETTER OHMMETER SOCKET TERMINALS AND CHASSIS 117 VOLT LINE VOLUME CONTROL AT MINIMUM. ANTENNA GROUND.



REAR OF CHASSIS

MODEL 93BR-717A, Series A
Serial 786400 up
Schematic, Voltage, Coils
Alignment, Trimmers
Sensitivity, Socket

MONTGOMERY WARD & CO.



MODEL 93BR-717A SERIES A (SERIAL No. 786400 and UP)

6-39

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

Power Consumption

115 Watts Sensitivity (for .5 Watts Output)

Power Output

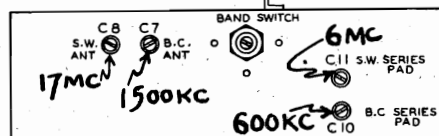
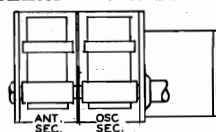
2.5 Watts Undistorted

Broadcast Band—30 Microvolts Average
Shortwave Band—50 Microvolts Average

| Ref. No. | Part No. | Description |
|----------|-----------|-------------------------------------|
| R1 | BE13011 | 250M ohm—20%— $\frac{1}{2}$ w. |
| R2 | BE13021 | 20M ohm—20%— $\frac{1}{2}$ w. |
| R3 | BE130197 | 20 ohm—10%— $\frac{1}{2}$ w. |
| R4 | BE130168 | 100 ohm—10%— $\frac{1}{2}$ w. |
| R5 | BE130110 | 1 megohm—10%— $\frac{1}{10}$ w. |
| R6 | BE1304 | 3 megohm—20%— $\frac{1}{2}$ w. |
| R7 | BE13055 | 12M ohm—20%—2 watt |
| R8 | BE130144 | 15M ohm—20%—1 watt |
| R9 | BE130225 | 15 megohm—50—30%— $\frac{1}{2}$ w. |
| R10 | BE101184 | 1 megohm—volume control |
| R11 | BE1303 | 500M ohm—20%— $\frac{1}{2}$ w. |
| R12 | BE130268 | 350M ohm—20%— $\frac{1}{2}$ w. |
| R13 | BE130100 | 150M ohm—20%— $\frac{1}{2}$ w. |
| R14 | BE13019 | 1 megohm—20%— $\frac{1}{2}$ w. |
| R15 | BE101176 | 1 megohm—Tone control |
| C | BE102106B | 2 gang variable condenser |
| C1 | BE12467 | Wave Trap Trimmer |
| C2 | BE129140 | .00016 mica—5% |
| C3 | BE10011 | .01 x 400 volt—25% |
| C4 | BE129131 | .002775 mica—3% |
| C5 | BE1009 | .05 x 200 volt—25% |
| C6 | BE12468 | Image Trimmer |
| C7 | BE12475 | B. C. Antenna Trimmer |
| C8 | BE12475 | S. W. Antenna Trimmer |
| C9 | BE12960 | .00015 Mica—20% |
| C10 | BE12487 | B. C. Series Pad |
| C11 | BE12487 | S. W. Series Pad |
| C12 | BE12476 | S. W. Oscillator Trimmer |
| C13 | BE12476 | B. C. Oscillator Trimmer |
| C14 | BE11984 | 5 mfd. x 300 v. lytic. |
| C15 | BE1001 | .1 x 400 v. 50—10% |
| C16 | BE1001 | .1 x 400 v. 50—10% |
| C17 | BE12939 | .00005 Mica—20% |
| C18 | BE10071 | .004 x 600 v.—25% |
| C19 | BE1292 | .0005 mica—20% |
| C20 | BE10026 | .02 x 400 v.—25% |
| C21 | BE10071 | .004 x 600 v.—25% |
| C22 | BE11984 | 15 mfd. x 350 v. lytic. |
| C23 | BE11984 | 10 mfd. x 450 v. lytic. |
| C24 | BE10019 | .006 x 600 v.—25% |
| T1 | BE108146 | Wave Trap |
| T2 | BE111122 | Antenna Coil Complete |
| T3 | BE110115 | Oscillator Coil Complete |
| T4 | BE108111H | Input I. F. Coil—465 kc. |
| T5 | BE108132B | Output I. F. Coil—465 kc. |
| T6 | BE10590 | Output Transformer |
| T7 | BE114161 | 6" Dynamic Speaker (1175 Ohm Field) |

Selectivity - 45 KC Broad at 1000 Times Signal at 1000 KC

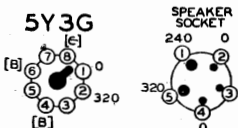
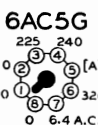
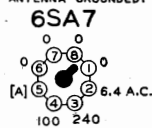
| | | |
|----|-----------|--------------------------|
| T8 | BE104139D | Power Transformer |
| P1 | BE10794 | 6-8 volt pilot light T44 |
| S1 | BE12579 | Band Switch |
| S2 | BE12570B | Phono-Radio Switch |
| S3 | BE12588 | Motor switch |
| S4 | BE12581 | A. C. Switch |



BOTTOM VIEW OF CHASSIS

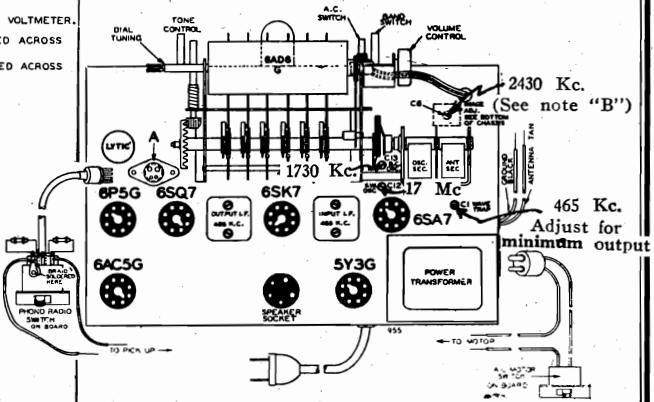
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLT-METER BETWEEN SOCKET TERMINALS AND CHASSIS. 117 VOLT LINE.

VOLUME CONTROL AT MINIMUM. ANTENNA GROUNDED.



REAR OF CHASSIS

FRONT VIEW

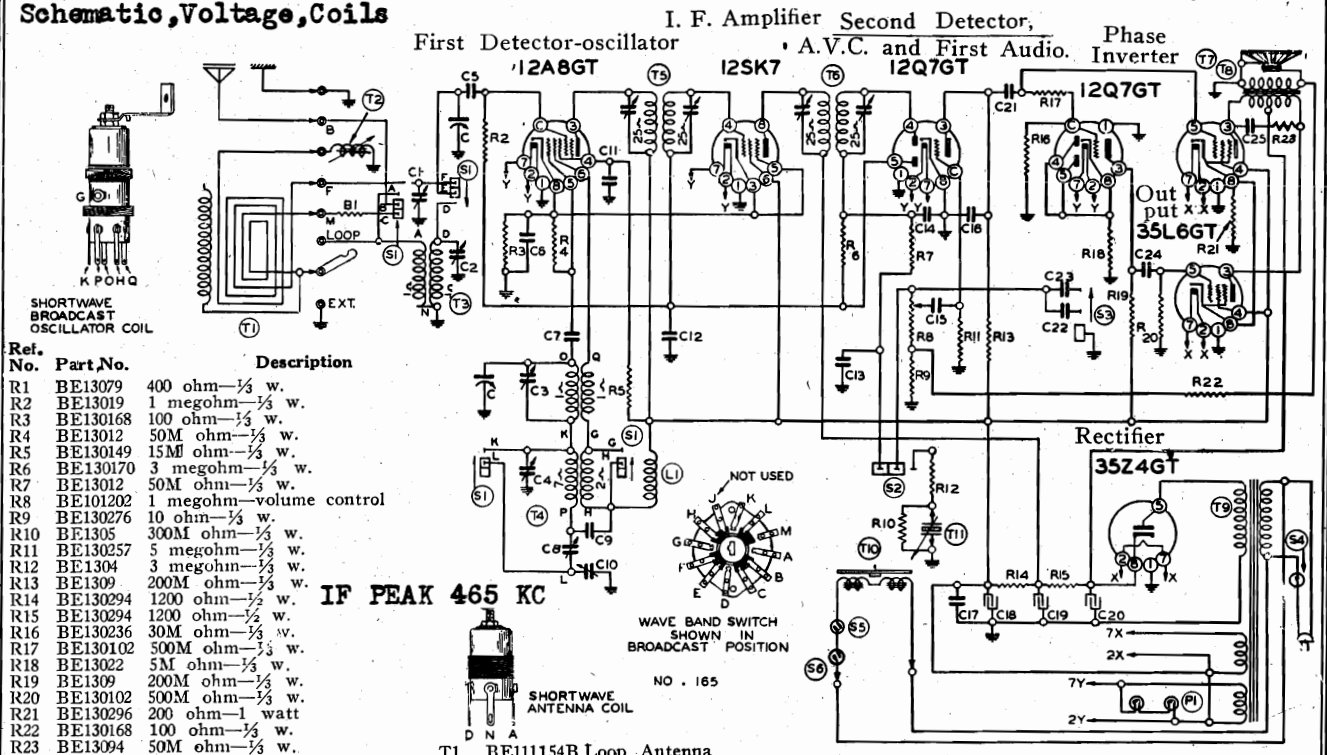


NOTE "B" 1500 KC. is the image frequency of 2430 KC. Adjust Trimmer (C6) until a minimum output is obtained. Trimmer (C6) is mounted on the bottom of the chassis.

MODEL 93BR-719A, Series A
Serial 9L228300 up
Schematic, Voltage, Coils

MONTGOMERY WARD & CO.

Alignment, Trimmers
Sensitivity, Socket



| Ref. No. | Part No. | Description |
|----------|----------|----------------------------|
| R1 | BE13079 | 400 ohm— $\frac{1}{2}$ w. |
| R2 | BE13019 | 1 megohm— $\frac{1}{2}$ w. |
| R3 | BE130168 | 100 ohm— $\frac{1}{2}$ w. |
| R4 | BE13012 | 50M ohm— $\frac{1}{2}$ w. |
| R5 | BE130149 | 15M ohm— $\frac{1}{2}$ w. |
| R6 | BE130170 | 3 megohm— $\frac{1}{2}$ w. |
| R7 | BE13012 | 50M ohm— $\frac{1}{2}$ w. |
| R8 | BE101202 | 1 megohm—volume control |
| R9 | BE130276 | 10 ohm— $\frac{1}{2}$ w. |
| R10 | BE1305 | 300M ohm— $\frac{1}{2}$ w. |
| R11 | BE130257 | 5 megohm— $\frac{1}{2}$ w. |
| R12 | BE1304 | 3 megohm— $\frac{1}{2}$ w. |
| R13 | BE1309 | 200M ohm— $\frac{1}{2}$ w. |
| R14 | BE130294 | 1200 ohm— $\frac{1}{2}$ w. |
| R15 | BE130294 | 1200 ohm— $\frac{1}{2}$ w. |
| R16 | BE130236 | 30M ohm— $\frac{1}{2}$ w. |
| R17 | BE130102 | 500M ohm— $\frac{1}{2}$ w. |
| R18 | BE13022 | 5M ohm— $\frac{1}{2}$ w. |
| R19 | BE1309 | 200M ohm— $\frac{1}{2}$ w. |
| R20 | BE130102 | 500M ohm— $\frac{1}{2}$ w. |
| R21 | BE130296 | 200 ohm—1 watt |
| R22 | BE130168 | 100 ohm— $\frac{1}{2}$ w. |
| R23 | BE13094 | 50M ohm— $\frac{1}{2}$ w. |

| | | |
|-----|----------|--------------------------------|
| C | BE102119 | 2 gang variable condenser |
| C1 | BE124111 | B.C. Adj. Trimmer (Antenna) |
| C2 | BE124111 | S.W. Adj. Trimmer (Antenna) |
| C3 | BE124112 | S.W. Adj. Trimmer (Oscillator) |
| C4 | BE124112 | B.C. Adj. Trimmer (Oscillator) |
| C5 | BE1292 | .0005 mica |
| C6 | BE100104 | .5 x 100 v. |
| C7 | BE12939 | .00005 mica |
| C8 | BE124113 | B.C. Series Pad |
| C9 | BE1009 | .05 x 200 v. |
| C10 | BE124113 | S.W. Series Pad |
| C11 | BE10020 | .1 x 200 v. |
| C12 | BE1009 | .05 x 200 v. |
| C13 | BE1295 | .0001 mica |
| C14 | BE1295 | .0001 mica |
| C15 | BE10025 | .002 x 600 v. |
| C16 | BE1292 | .0005 mica |
| C17 | BE10020 | .1 x 200 v. |
| C18 | BE119101 | 20 mfd. lytic |
| C19 | BE119101 | 20 mfd. lytic |
| C20 | BE119101 | 40 mfd. lytic |
| C21 | BE10026 | .02 x 400 v. |
| C22 | BE1298 | .0006 mica |
| C23 | BE100112 | .001 x 200 v. |
| C24 | BE10026 | .02 x 400 v. |
| C25 | BE1001 | .1 x 400 v. |

FOR TUNER
SEE INDEX

C1 and C2 in same unit
 C8 and C10 in same unit
 C18, C19 and C20 in same unit
 C3 and C4 in same unit

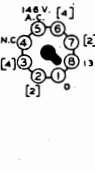
REAR VIEW



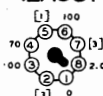
ALIGNMENT NOTE

S.W.—Signal to ANT&GND.
 B.C.— 12A8GT Grid.
 LOOP—(C1, T2) with chassis mounted, loop connected signal to ANT & GND. Jumper connected to EXT.

35Z4GT



12A8GT



12Q7GT



35L6GT



BOTTOM VIEW

12SK7



12Q7GT



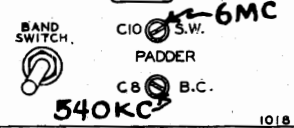
35L6GT



REAR OF CHASSIS

MODEL 93BR-719A SERIES A
(SERIAL No. 9L228300 and UP)

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION VOL.VIII



Selectivity - 50 KC Broad at 1000 Times
Signal at 1000 KC
Sensitivity (for .5 Watts Output)
 Broadcast Band—45 Microvolts Average
 Shortwave Band—50 Microvolts Average
Power Consumption

(Radio Chassis Only) 55 Watts
 (Radio Chassis and Phono Motor) 80 Watts
Power Output
 3 Watts Undistorted

ON & OFF SWITCH VOLUME DIAL RESET CONTROL TUNING BUTTON

PHONO RADIO TONE BAND SWITCH CONTROL SWITCH

1400 KC

17MC

35L6GT 12Q7GT

1550 KC 12A8GT 17MC

35L6GT 12Q7GT

12Q7GT

35L6GT

12SK7

600 KC

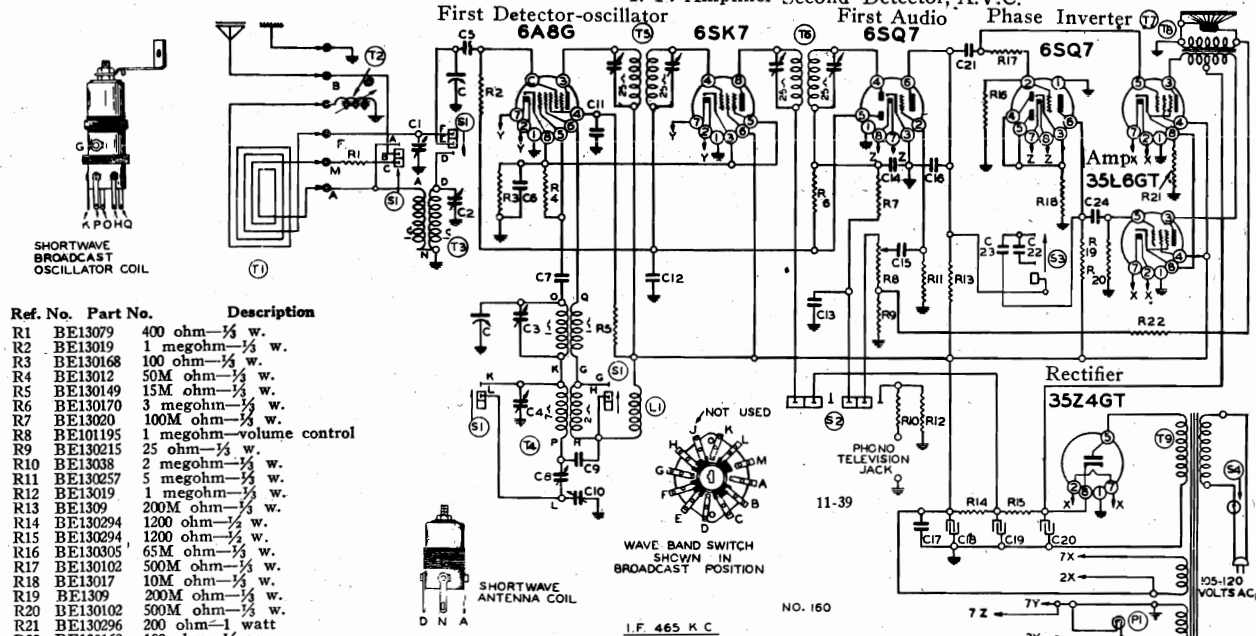
1028

MODEL 93BR-720A, Series A
Serial 9L221400 up
Schematic, Voltage, Coils

MONTGOMERY WARD & CO.

Alignment, Trimmers
Sensitivity, Socket

I. F. Amplifier Second Detector, A.V.C.



| Ref. No. | Part No. | Description |
|----------|----------|---------------------------------|
| R1 | BE13079 | 400 ohm— $\frac{1}{2}$ w. |
| R2 | BE13019 | 1 megohm— $\frac{1}{2}$ w. |
| R3 | BE13018 | 100 ohm— $\frac{1}{2}$ w. |
| R4 | BE13012 | 50M ohm— $\frac{1}{2}$ w. |
| R5 | BE13019 | 15M ohm— $\frac{1}{2}$ w. |
| R6 | BE130170 | 3 megohm— $\frac{1}{2}$ w. |
| R7 | BE13020 | 100M ohm— $\frac{1}{2}$ w. |
| R8 | BE101195 | 1 megohm—volume control |
| R9 | BE130215 | 25 ohm— $\frac{1}{2}$ w. |
| R10 | BE13038 | 2 megohm— $\frac{1}{2}$ w. |
| R11 | BE130257 | 5 megohm— $\frac{1}{2}$ w. |
| R12 | BE13019 | 1 megohm— $\frac{1}{2}$ w. |
| R13 | BE1309 | 200M ohm— $\frac{1}{2}$ w. |
| R14 | BE130294 | 1200 ohm— $\frac{1}{2}$ w. |
| R15 | BE130294 | 1200 ohm— $\frac{1}{2}$ w. |
| R16 | BE13035 | 65M ohm— $\frac{1}{2}$ w. |
| R17 | BE130102 | 500M ohm— $\frac{1}{2}$ w. |
| R18 | BE13017 | 10M ohm— $\frac{1}{2}$ w. |
| R19 | BE1309 | 200M ohm— $\frac{1}{2}$ w. |
| R20 | BE130102 | 500M ohm— $\frac{1}{2}$ w. |
| R21 | BE130296 | 200 ohm—1 watt |
| R22 | BE130168 | 100 ohm— $\frac{1}{2}$ w. |
| C | BE102123 | 2 gang variable condenser |
| C1 | BE124117 | B. C. Adj. Trimmer (Antenna) |
| C2 | BE124116 | S. W. Adj. Trimmer (Antenna) |
| C3 | BE124112 | S. W. Adj. Trimmer (Oscillator) |
| C4 | BE124112 | B. C. Adj. Trimmer (Oscillator) |
| C5 | BE1292 | .0005 mica |
| C6 | BE100104 | .5 x 100 v. |
| C7 | BE12939 | .00005 mica |
| C8 | BE124113 | B. C. Series Pad |
| C9 | BE1009 | .05 x 200 v. |
| C10 | BE124113 | S. W. Series Pad |
| C11 | BE10020 | .1 x 200 v. |
| C12 | BE1009 | .05 x 200 v. |
| C13 | BE12939 | .00005 Mica |
| C14 | BE12939 | .00005 Mica |
| C15 | BE10025 | .002 x 600 v. |
| C16 | BE1292 | .0005 Mica |
| C17 | BE10020 | .1 x 200 v. |
| C18 | BE119101 | 20 mid. lytic x 200 v. |
| C19 | BE119101 | 20 mid. lytic x 200 v. |
| C20 | BE119101 | 40 mid. lytic x 200 v. |
| C21 | BE10026 | .02 x 400 v. |

| | | |
|-----|-----------|----------------------------------|
| C22 | BE10071 | .004 x 600 v. |
| C23 | BE10071 | .004 x 600 v. |
| C24 | BE10026 | .02 x 400 v. |
| | | C3 and C10 in same unit. |
| | | C3 and C4 in same unit. |
| | | C18, C19 and C20 in same unit. |
| T1 | BE111157 | Loop Antenna |
| T2 | BE111153 | Loop Adjusting Coil |
| T3 | BE111163 | S.W. Antenna Coil |
| T4 | BE110135 | B.C. S.W. Oscillator Coil |
| T5 | BE108163C | Input I.F. - 465 kc. |
| T6 | BE108163D | Output I.F. - 465 kc. |
| T7 | BE114182 | 6" P.M. Speaker |
| T8 | BE10596 | Output Transformer |
| T9 | BE104184 | Power Transformer |
| S1 | BE125100 | Band Switch |
| S2 | BE12570 | Phono Radio Switch |
| S3 | BE12599 | Tone Switch |
| S4 | BE | Off-on switch on volume control. |
| L1 | BE1233 | R.F. Choke |
| P1 | BE10794 | 6-8 v. pilot light T-44 |

MODEL 93BR-720A SERIES A
(SERIAL No. 9L221400 and UP)

C 10 S.W. 6MC
 Padder
 C 8 B.C. 540KC S.W. 17MC
 1025

FRONT OF CHASSIS

FOR TUNER
SEE INDEX

Power Consumption 55 Watts
Power Output 3 Watts Undistorted
Sensitivity (for .5 Watts Output)
Broadcast Band—35 Microvolts Average
Shortwave Band—52 Microvolts Average
Selectivity - 46 KC Broad at 1000 Times Signal at 1000 KC

CONVENTIONAL ALIGNMENT

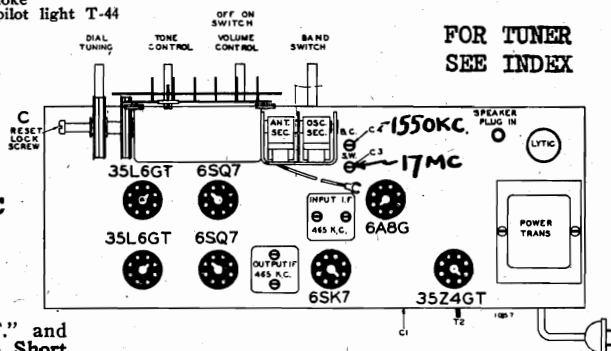
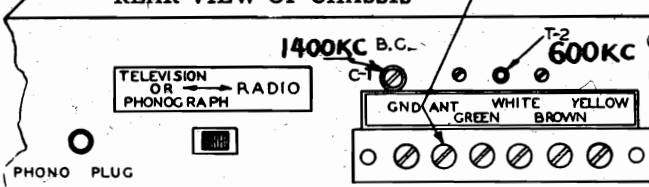
SEE SPECIAL SECTION VOLUME VIII

ALIGNMENT NOTES:-

NOTE "A"—The signal generator is connected to the "ANT." and "GND." terminals on the rear of the chassis when aligning the **Short Wave Band** and to the grid of the 6A8G tube and ground terminal when setting the **Broadcast Band** oscillator end frequencies, (1550 and 540 K.C.). The loop antenna need not be connected to the radio when making these adjustments.

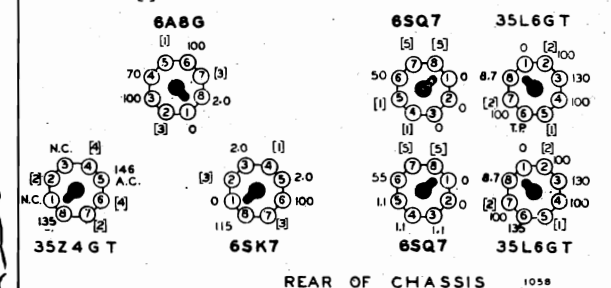
NOTE "B"—Loop alignment is made with the chassis mounted in the cabinet and the loop antenna connected to the terminal board. The signal generator is connected to the "ANT." and "GND." terminals.

When an outside antenna is used connect the antenna to the binding screw on the rear of the chassis, marked "Ant." Connect the ground to the binding screw marked "Gnd." Do not disconnect the loop antenna when an outside antenna and ground are used.

REAR VIEW OF CHASSIS**BOTTOM VIEW OF CHASSIS**

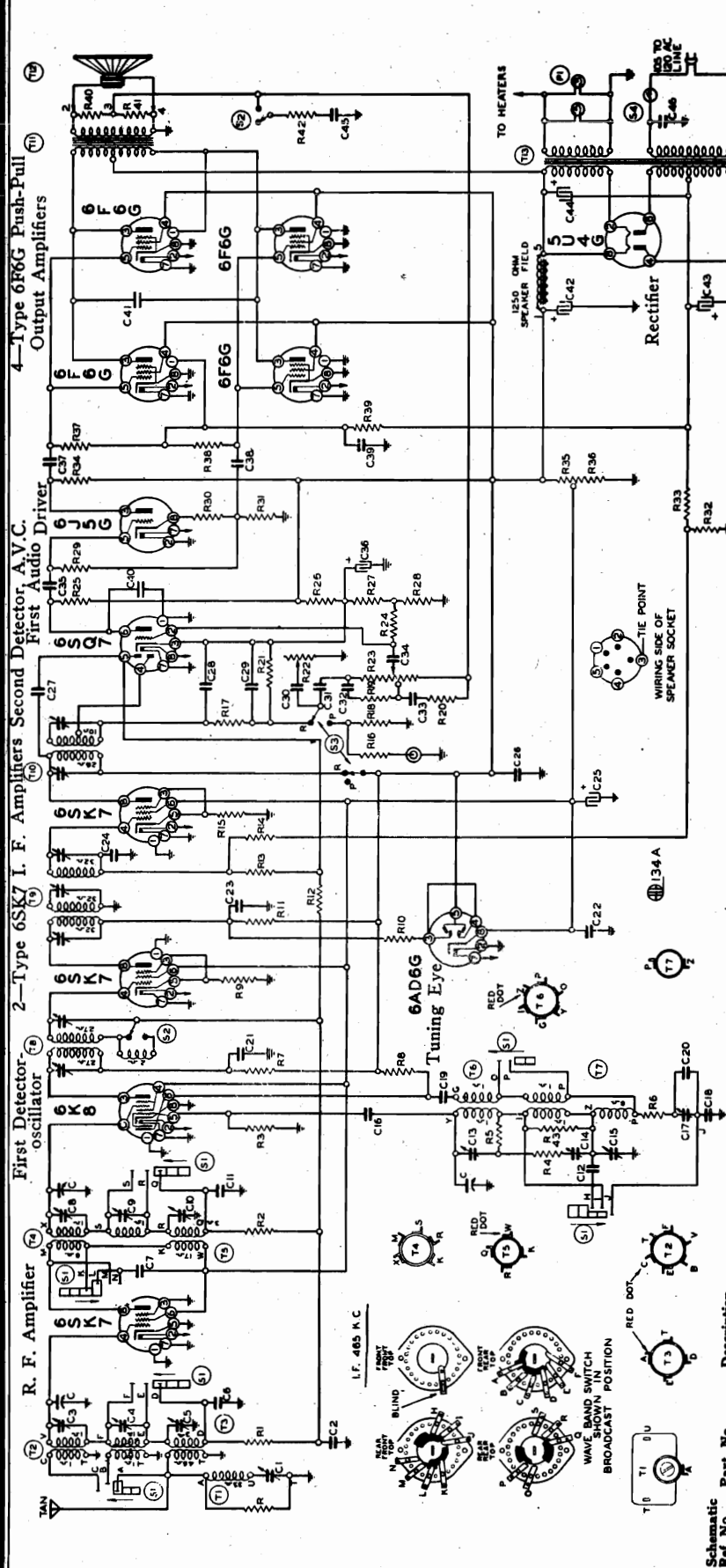
VOLTAGES MEASURED WITH 1000 OHM
 PER VOLT VOLTMETER BETWEEN
 SOCKET TERMINALS AND CHASSIS

- [1] CANNOT BE MEASURED WITH VOLTMETER
- [2] 30 VOLTS A.C. READ ACROSS PINS 2 & 7
- [3] 5.9 VOLTS A.C. READ ACROSS PINS 2 & 7
- [4] 15 VOLTS A.C. LINE VOLTAGE READ BETWEEN PINS 4 & 6
- [5] 5.9 VOLTS A.C. READ ACROSS PINS 7 & 8



REAR OF CHASSIS 1058

MONTGOMERY WARD & CO.

MODEL 93BR-1201A, Series A
Serial 9F826400 up
Schematic,

MODEL 93BR-1201A SERIES A
(SERIAL NO. 9F826400 and UP)

PARTS

| Schematic Ref. No. | Part No. | Description |
|--------------------|----------|------------------------------|
| R | BE13082 | 10M ohm- $\frac{1}{2}$ w. |
| R1 | BE13020 | 100M ohm- $\frac{1}{2}$ w. |
| R2 | BE13011 | 250M ohm- $\frac{1}{2}$ w. |
| R3 | BE13012 | 50M ohm- $\frac{1}{2}$ w. |
| R4 | BE130240 | 30 ohm- $\frac{1}{2}$ w. |
| R5 | BE130174 | 50 ohm- $\frac{1}{2}$ w. |
| R6 | BE130197 | 20 ohm- $\frac{1}{2}$ w. |
| R7 | BE13043 | 2500 ohm- $\frac{1}{2}$ w. |
| R8 | BE130196 | 30M ohm-1 watt |
| R9 | BE13097 | 200 ohm- $\frac{1}{2}$ watt |
| R10 | BE13019 | 1 megohm- $\frac{1}{2}$ w. |
| R11 | BE130219 | 20M ohm-1 watt |
| R12 | BE13019 | 1 megohm- $\frac{1}{2}$ w. |
| R13 | BE1303 | 500M ohm- $\frac{1}{2}$ w. |
| R14 | BE1303 | 500M ohm- $\frac{1}{2}$ w. |
| R15 | BE130294 | 1200 ohm- $\frac{1}{2}$ w. |
| R16 | BE13011 | 250M ohm- $\frac{1}{2}$ w. |
| R17 | BE13066 | 75M ohm- $\frac{1}{2}$ w. |
| R18 | BE13011 | 250M ohm- $\frac{1}{2}$ w. |
| R19 | BE13013 | 100M ohm- $\frac{1}{2}$ w. |
| R20 | BE13076 | 30M ohm- $\frac{1}{2}$ w. |
| R21 | BE130292 | 125M ohm- $\frac{1}{2}$ w. |
| R22 | BE10182 | 50M ohm tone control |
| R23 | BE10181 | 1 megohm volume control |
| C2 | BE1009 | .05 x 200 v. |
| C3 | BE12497 | SW Antenna Trimmer |
| C4 | BE12497 | MW Antenna Trimmer |
| C5 | BE12497 | BC Antenna Trimmer |
| C6 | BE10096 | .02 x 200 v. |
| C7 | BE12498 | MW-R.F. Trimmer |
| C8 | BE12498 | MW-R.F. Trimmer |
| C9 | BE12498 | B.C.-R.F. Trimmer |
| C10 | BE12498 | .05 x 200 v. |
| C11 | BE129144 | .00395 mica comp. type |
| C12 | BE129144 | SW, Oscillator trimmer |
| C13 | BE12498 | M.W. Oscillator trimmer |
| C14 | BE12498 | B.C. Oscillator trimmer |
| C15 | BE12498 | .0005 mica |
| C16 | BE12498 | B.C. Series Pad adjustable |
| C17 | BE129129 | .0025 mica |
| C18 | BE10025 | .0045 x 600 v. |
| C19 | BE10025 | .0045 x 600 v. |
| C20 | BE129104 | 50 ohm- $\frac{1}{2}$ w. |
| C21 | BE1001 | .1 x 400 v. |
| C22 | BE1001 | .1 x 400 v. |
| C23 | BE1001 | .1 x 400 v. |
| C24 | BE10026 | 3 gang variable condenser |
| C25 | BE10026 | Wave trap-adj. condenser |
| C26 | BE1001 | .1 x 400 v. |
| C27 | BE129145 | .00001 ceramicon |
| C28 | BE1295 | .0001 mica |
| C29 | BE1295 | .0001 mica |
| C30 | BE10019 | .006 x 600 v. |
| C31 | BE10022 | .05 x 200 v. |
| C32 | BE1295 | .0001 mica |
| C33 | BE10011 | .01 x 400 v. |
| C34 | BE10022 | .05 x 200 v. |
| C35 | BE10019 | .05 mid.-25 w.v. lytic |
| C36 | BE10019 | .05 mid.-25 w.v. lytic |
| C37 | BE1001 | .1 x 400 v. |
| C38 | BE1001 | .1 x 400 v. |
| C39 | BE10048 | .25 x 200 v. |
| C40 | BE1295 | .0001 mica |
| C41 | BE10073 | .008 x 1200 v. |
| C42 | BE10103 | 30 mid.-450 w.v. lytic |
| C43 | BE11991 | 30 mid.-25 w.v. lytic |
| C44 | BE10103 | 30 mid.-450 w.v. lytic |
| C45 | BE10018 | .5 x 100 v. |
| C46 | BE10061 | .02 x 600 v.-Bakelite |
| C25 and C36 | | in same unit |
| S1 | BE12570 | Hi-Fi Switch on tone control |
| S2 | BE12577B | Radio-Phono Switch |
| S3 | BE12577B | Off-on AC Switch |
| P1 | BE10794 | 2-6-8 v. pilot lights T44 |

MODEL 93BR-1201A
Alignment, Trimmers

MONTGOMERY WARD & CO.

Voltage, Socket
Sensitivity

| BAND | SIGNAL GENERATOR Frequency Setting | Dummy Antenna | Connection to Radio | Position of Band Switch | Variable Condenser Setting | Trimmers Adjusted (In Order Shown) | Trimmer Function | Adjustment |
|---------------------------|--|------------------|-------------------------|----------------------------|---|--|---|--|
| I. F. | 465 Kc. | .1 MFD. | Grid of 6SK7 (2nd I.F.) | Broadcast | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Output I. F. | (See Note "A") Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Grid of 6SK7 (1st I.F.) | Broadcast | Rotor full open (Plates out of mesh) | Three trimmers on top (See Fig. 1) | Interstage I. F. | Adjust to maximum output |
| | 465 Kc. | .1 MFD. | Grid of 6K8 | Broadcast | Rotor full open (Plates out of mesh) | Two trimmers on top (See Fig. 1) | Input I. F. | Adjust to maximum output |
| SHORT WAVE BAND | 21 Mc. | 400 ohms | Antenna lead | Short Wave | Set Dial at 21 Mc. | Trimmer (C13) (See Fig. 3) | Short Wave oscillator | (See Note "B") Adjust to maximum output |
| | 21 Mc. | 400 ohms | Antenna lead | Short Wave | Dial Set at 21 Mc. | Trimmers (C3 & C8) (See Fig. 3) | Short Wave antenna & R. F. | Adjust to maximum output |
| MIDDLE WAVE BAND | 6 Mc. | 400 ohms | Antenna lead | Middle Wave | Set Dial at 6 Mc. | Trimmer (C14) (See Fig. 3) | Middle Wave oscillator | Adjust to maximum output |
| | 6 Mc. | 400 ohms | Antenna lead | Middle Wave | Dial Set at 6 Mc. | Trimmers (C4) (C9) (See Fig. 3) | Middle Wave antenna and R. F. | Adjust to maximum output |
| | 2.3 Mc. | 400 ohms | Antenna lead | Middle Wave | Set Dial at 2.3 Mc. | Trimmer (C12) (See Bottom of Chassis) | Middle Wave oscillator series pad | Adjust to maximum rock dial. (See note "C") |
| BROADCAST CAST BAND | 1730 Kc. | 200 mmf. | Antenna lead | Broadcast | Rotor full open (Plates out of mesh) | Trimmer (C15) (See Fig. 3) | Broadcast oscillator | Adjust to maximum output |
| | 1500 Kc. | 200 mmf. | Antenna lead | Broadcast | Set Dial at 1500 Kc. | Trimmers (C5) (C10) (See Fig. 3) | Broadcast antenna and R. F. | Adjust to maximum output |
| | 600 Kc. | 200 mmf. | Antenna lead | Broadcast | Set Dial at 600 Kc. | Trimmer (C17) (See Fig. 3) | Broadcast oscillator series pad | Adjust to maximum rock dial. (See note "D") |
| | 465 Kc. | 200 mmf. | Antenna lead | Broadcast | Set Dial at 465 Kc. | Trimmer (C1) (See Fig. 3) | I. F. Wave Trap | Adjust for minimum output (See Note "E") |
| | | | | | | | | |

NOTE "A" I.F. Alignment as given is for use with output meter. For oscilloscope alignment; connect oscilloscope between ground and high side of 125M ohm diode load resistor on output I.F. Make same adjustments as above except readjust input I.F. trimmers in broad position for uniform expansion.

NOTE "B" Make certain that the 21MC signal and not the image has been tuned in by noting that the image falls near 20MC. on the dial scale.

NOTE "C" The middle wave oscillator series padder condenser is mounted on the bottom of the chassis at the rear of the bandswitch. When adjusting this trimmer turn the dial back and forth slightly (rock) and adjust until the peak of greatest intensity is obtained.

NOTE "D" Turn the dial back and forth slightly (rock) and adjust trimmer until the peak of greatest intensity is obtained.

NOTE "E" After adjusting wavetrap trimmer (C1), go over 1730 Kc, 1500 Kc and 600 Kc adjustments again.

Power Consumption - - - 165 Watts
Power Output - - 21 Watts Undistorted
Sensitivity (for .5 Watts Output) - -
Broadcast Band—4 Microvolts Average
Middle Band—6 Microvolts Average
Shortwave Band—10 Microvolts Average

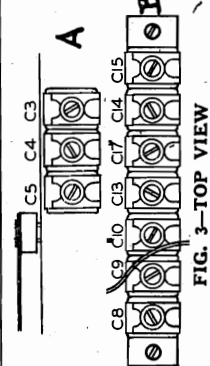


FIG. 3-TOP VIEW

FOR TUNER
SEE INDEX

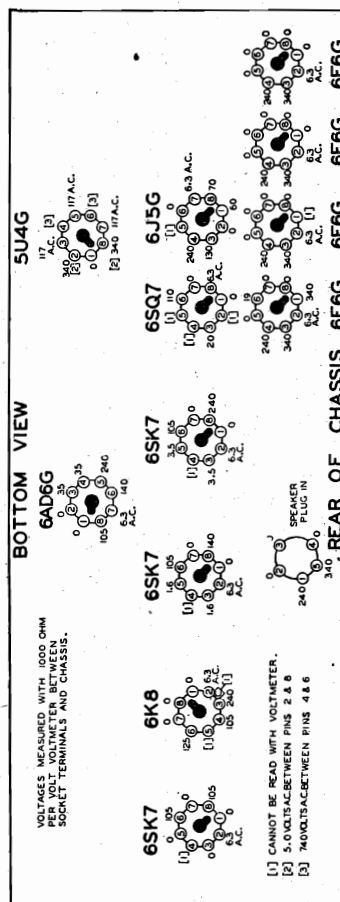
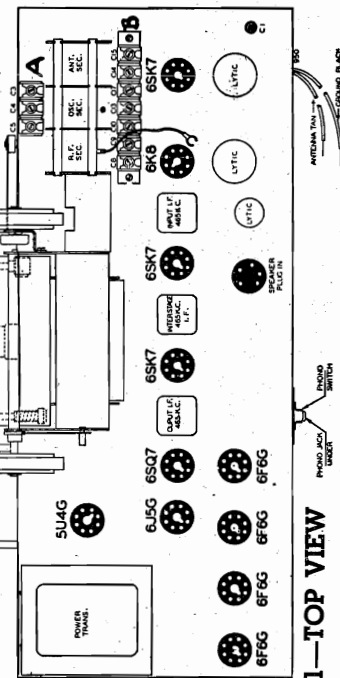


FIG. 1-TOP VIEW



MONTGOMERY WARD & CO.

MODELS 93BR-391A, 93BR-392A,
93BR-393A, 93BR-462A, 93BR-561A
93BR-658A, 93BR-659A, 93BR-714A, B
93BR-715B, 93BR-717A, 93BR-719A
93BR-720A, 93BR-1201A
Tuner Data

MODELS -93BR-391A, -392A, -393A, -462A, -561A, -658A, -659A, -714A, -715A, -716A, -717A, -718A, -719A, -720A, -1201A
93BR-734B (CAT. NO. 62-721), 93BR-715A, -715B (CAT. NO. 62-722), -717A, -720A, -1201A
Procedure for Setting the Automatic Push Buttons

IMPORTANT—Read carefully before setting the automatic push buttons:

There are six push buttons by means of which six stations may be selected (See "A," Fig. 2). Make a list of local stations or stations you tune in regularly, any number up to and including six.

On the front of each automatic push button an opening is provided for inserting the call letter tabs. (See "B," Fig. 2). Insert the call letter tabs in the rectangular openings of each of the automatic push buttons. One of the small circular tabs supplied should be inserted into place over each of the station call letter tabs.

NOW, PROCEED AS FOLLOWS:

Unlock the Tuner Mechanism.

(NOTE:—The automatic tuner mechanism is locked tight when radio is shipped from the factory.)

1. Remove the snap-in button from the dial escutcheon plate (See "A," Fig. 2). If the snap-in button will not come out easily, using your fingers, pry it off with a screwdriver or a knife, being careful not to mar the finish on the escutcheon plate.

2. Unlock the tuner mechanism by inserting a screwdriver through the hole in the panel. Press in and loosen the locking screw by turning it to the left as far as it will turn without forcing.

You will note that as the locking screw is turned it will turn easily until the dial reaches a point where it starts to turn more difficult. At this point, actually start unlatching the tuner mechanism. Beyond this point, the locking screw will turn quite easily again until the tuner mechanism is completely unlocked. At this point do not force the locking screw any further. The tuner mechanism is now unlocked.

1. Make a list of six stations you tune in regularly. There are six push buttons on the front of the radio by means of which six stations may be tuned automatically (See "B," Fig. 3).

2. Punch out the call letters of the stations you have selected from the set of station call letter tabs supplied.

On the front of each automatic push button an opening is provided for inserting the call letter tabs, (see "A," Fig. 3). Insert the call letter tabs in the rectangular openings in each of the automatic tuner push buttons. One of the small circular tabs supplied should be snapped into place over each of the station call letter tabs.

3. Stations may be set up in any sequence desired.

NOW, PROCEED AS FOLLOWS:

1. Pull the "Reset" button all the way out (see control No. 6, Fig. 3), and rotate the button to the left (counter-clockwise) until it cannot be turned any further.

You will note that as the button is rotated it will turn easily until the pointer reaches the end of the dial scale and then a slight amount of force will be required to actually start unlatching the tuner mechanism. Beyond this point, the button will turn quite easily again until the tuner mechanism is completely unlocked. At this point do not force the button any further. The tuner mechanism is now unlocked.

(NOTE:—Automatic tuner mechanism is locked tight when radio is shipped from the factory.)

2. Push in all the way any one of the push buttons and at the same time push the dial tuning knob. The tuning knob, both the dial tuning knob and the push button, should be pushed hard enough to make them stay latched in.

You may find it necessary to rotate the dial tuning knob slightly when pushing it in to make certain that the gears mesh properly.

3. Both the pushbutton and the Dial Tuning Knob are now

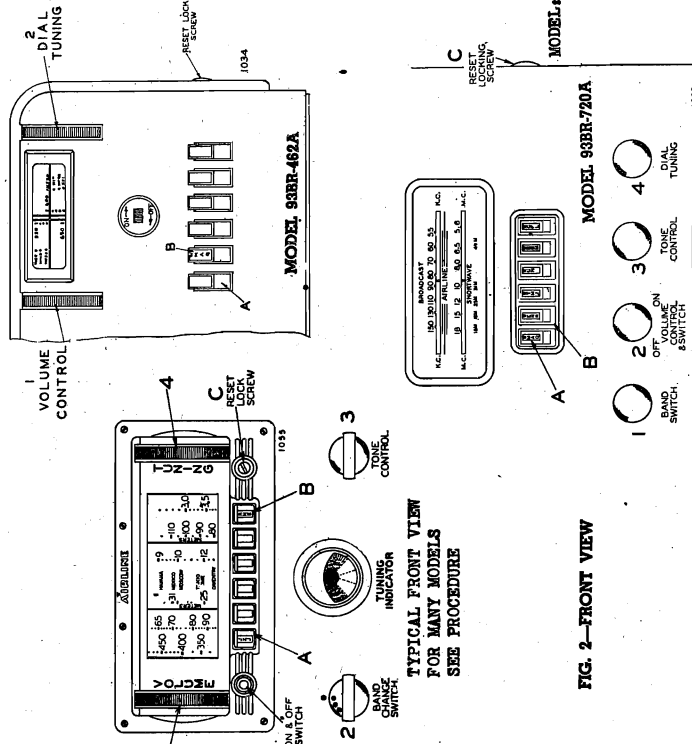


FIG. 2—FRONT VIEW

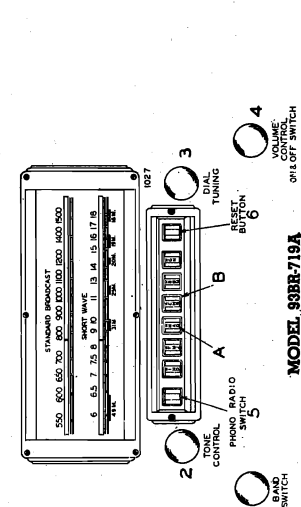


FIG. 3.

SETTING PUSH BUTTONS

1. Press in all the way any one of the automatic tuner push buttons. Holding it in firmly, tune in by means of the Dial Tuning Knob. Control the station selected on the station call letter tab on this push button. Move the Dial Tuning Knob very slowly up and down (while still holding the automatic tuner push button in firmly), noting the width of the shadow on the screen of the cathode-ray tuning eye. Minimum width on the tuning eye indicates the ideal tuning position (resonance). The station will then be clearest and accurately tuned in.

2. Press in another tuner push button. Holding it in firmly, carefully tune in the station indicated on the call letter tab on this push button.

3. Follow this procedure until you have selected all of your favorite stations.

(NOTE:—If the dial mechanism works hard or has a tendency to slip when setting up a station for one of the push buttons, it is due to the tuner mechanism not being unlocked all the way. Loosen the reset locking screw. The Dial Tuning Control should turn the dial drum freely with a push button pushed in.)

LOCKING THE TUNER MECHANISM

1. To lock the tuner mechanism insert a screwdriver through the hole in the panel and press in and turn the reset locking screw to the right until it cannot be turned any further without forcing it.

2. This will lock the tuner mechanism and all the stations which are set up on the push buttons will be locked in place for automatic tuning.

Press in any one of the push buttons and—YOUR FAVORITE STATION IS SELECTED.

MODEL -93BR-719A Procedure for Setting the Automatic Pushbuttons

latched in. Do not hold the pushbutton in by hand while tuning in a station. Tune in by means of the dial tuning knob which is latched in. Turn the dial tuning knob very slowly back and forth until the station is clearest. The station will then be accurately tuned in.

4. Push in all the way another pushbutton, at the same time push the dial tuning knob in so that both the pushbutton and the dial tuning knob are latched in together. Tune in the station indicated on the call letter tab on this pushbutton.

5. Follow this procedure until you have tuned in all of your favorite stations.

6. Pull the "Reset" button all the way out and rotate the button to the right (clockwise) until it cannot be turned any further. This will lock the automatic tuner mechanism and the stations you have set up for automatic tuning will be locked in place.

CHANGING STATIONS:

If you should desire to change any station you selected to another, pull the "Reset" button all the way out and rotate the button to the left (counter-clockwise) and unlock the tuner mechanism. Select the new station as explained.

(NOTE:—If the dial mechanism works hard when setting up a new station for one of the automatic tuner pushbuttons, it is due to the tuner mechanism not being unlocked all the way. Loosen the reset button out all the way and rotate the button to the left (counter-clockwise) until it cannot be turned any further. The dial mechanism should work freely with a turn push-button latched-in.

After you have selected the new station, pull the "Reset" button all the way out and rotate the button to the right (clockwise) to lock the tuner mechanism. Be sure the button is turned until it will turn no further.

The automatic tuner buttons are now set up for quick tuning.

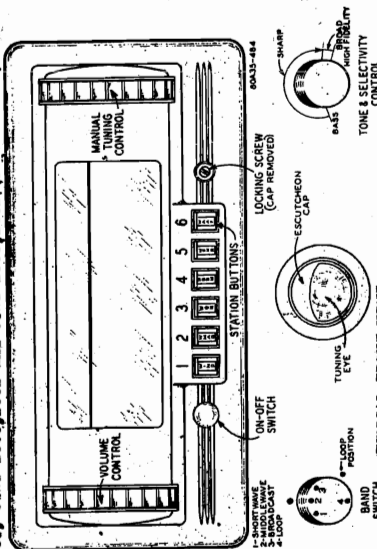
MODEL 93WG-510
Drive Cord Data
MODELS 93WG1103, 93WG1104
Alignment, Trimmers

MONTGOMERY WARD & CO

MODELS 04WG-725, 93WG382,
93WG754, 93WG800, 93WG801
93WG1000
Tuner Data

Procedure for Setting the Station Buttons

FOR MODELS 93WG-382, 04WG-725, 93WG-800, 801, 806 (LOOP MODELS)
 93WG-801, 802, 806, 93WG-1000, 1001 and 93WG-1000, 1001 (LOOP MODELS)



Selecting the Stations to Be Set

There are 6 buttons on the automatic tuning dial by means of which 6 stations may be set for quick tuning.

Make a list of your favorite stations, those which you tune in regularly. There may be any number up to and including 6 in this list.

It is better to list the station with the lowest kilocycle number first, the station with the next higher kilocycle number next, and so on.

Any button may be used for any station you can receive, although it will be more convenient to set the stations so that the kilocycle numbers increase from left to right.

Setting a Station Button

Turn the manual tuning control so that the dial moves toward 1700 KC until the stop is reached.

At the right side of the escutcheon (from the front) will be seen a cap which covers a hole in the escutcheon.—See illustration. Pull off this cap.

At the end of the tube in back of the hole in the escutcheon is the locking screw. Using a small handled screwdriver, unlock the mechanism by turning this screw in a counter-clockwise direction several turns.

TO SET STATIONS ACCURATELY, DO NOT JAR THE RADIO OR BUTTONS WHILE THE MECHANISM IS UNLOCKED.

Select the first station from the list you have prepared, and carefully tune in this station by means of the manual tuning control using the tuning eye as a guide.

TYPICAL FRONT VIEW

With one hand, hold the manual tuning control to prevent it from turning and with the other hand, push one of the station buttons shown in the illustration all the way in. It is better to start with button No. 1.

Hold this button all the way in. With the other hand, see whether or not this station is still accurately tuned in by moving the tuning control a slight amount back and forth while observing the tuning eye. Be sure to hold the button all the way in. Release the button slowly after the station is tuned in.

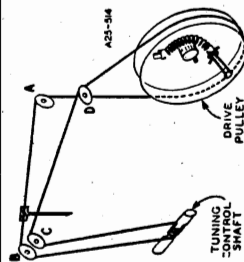
CAUTION—Do not touch this button again while the mechanism is unlocked as the setting may be altered. Carefully tune in the second station on your list. Then hold the tuning control and push the second button slowly and firmly all the way in. Check for accurate tuning.

Proceed in the same manner to set any additional stations on your list on the remaining station buttons.

Caution

The metal chassis is connected to one side of the line through a .25 mfd. condenser. Both AC and DC power lines are grounded on one side. If the side of the line not connected to the metal chassis through the condenser is grounded, the condenser will be connected across the line and there will be an increase in hum.

Therefore, in any service work on the chassis, keep it on an other insulated surface to avoid contact with ground. The person working on the set should avoid getting in contact with any ground.



MODEL 93WG-510

Dial Pointer Attachment—Tune in a station of known frequency. Set the pointer at this frequency on the dial scale and secure pointer to cord and pulley D. Pull remaining portion of cord over pulleys A and B as shown in illustration.

MODELS 93WG-1103 and 93WG-1104 ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
 Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
 Allow Chassis and Signal Generator to "Heat Up" for several minutes.
 IMPORTANT—Follow procedure in the order shown.

Output Indicating Meter—Non-Metallic Screwdriver.
 Dummy Antennas—1 mf., 200 mmf., and 400 ohms.

| SIGNAL GENERATOR FREQUENCY SETTING | DUMMY ANTENNA CONNECTION AT RADIO | BAND SWITCH SETTING | CONDENSER SETTING | ADJUST TRIMMERS TO MAXIMUM |
|------------------------------------|-----------------------------------|---------------------|-------------------|----------------------------|
| I. F. | 45 KC | Grid of 1st Det. | .1 mf. | Turn Rotor to Full Open |
| RANGE D | 18,300 KC | Antenna Lead | 400 Ohm | Turn Rotor to Full Open |
| | 15,000 KC | Antenna Lead | 400 Ohm | Turn Rotor to Max. Output |
| RANGE C | 5400 KC | Antenna Lead | 400 Ohm | Turn Rotor to Full Open |
| | 5000 KC | Antenna Lead | 400 Ohm | Turn Rotor to Max. Output |
| RANGE B | 1600 KC | Antenna Lead | 200 mmf. | Turn Rotor to Full Open |
| | 1400 KC | Antenna Lead | 200 mmf. | Turn Rotor to Max. Output |
| | 600 KC | Antenna Lead | 200 mmf. | Turn Rotor to Max. Output |

At 5000 use 1712 KC, or 4088 KC on the dial. If it is not possible to increase the input signal to hear the image.

After each range is completed, repeat the procedure as a final check.

NOTE A—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE B—If the pointer is not at 1400 KC on the dial, loosen the 2 clamps which hold the pointer assembly on the cord, move the pointer to the 1400 KC mark, and tighten the clamps.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Set the signal generator to 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 1400 KC.

Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram. Unless otherwise specified, the voltages are read under the following conditions:
 Antenna Shorted to Ground.
 Readings taken with 1000 ohm-per-volt meter. Plate and screen voltages are read on 500 volt scale.

Drive Cord Replacement

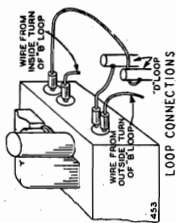
Secure other end of spring to hook on pulley. Thread looped end of cord, starting from inside of drive pulley, through hole in rim of drive pulley.
 Turn gang condenser to completely closed position. Remove any twists in doubled cord. Pass one portion of cord over pulleys A and B as shown in illustration. Then wind 3 1/2 turns counter-clockwise (from rear of chassis) around tuning control shaft.—See illustration.

Loop 1/2 turn around bottom half of drive pulley. Continue cord over pulley D. Pull remaining portion of cord and pull over pulley C.



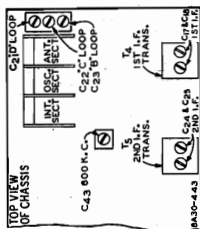
MONTGOMERY WARD & CO.

MODEL 04WG-725
MODEL 93WG-382
MODELS 93WG754, 93WG755
Alignment, Trimmers

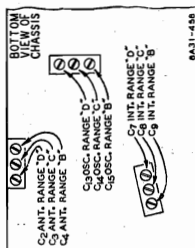


NOTE E-Console models only—Turn knob of loop until output is maximum.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 9500 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 9500 KC on the dial, or 4088 KC on the dial, it may be necessary to increase the input signal to hear the image.



NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.



Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

After each range is completed, repeat the procedure as a final check.

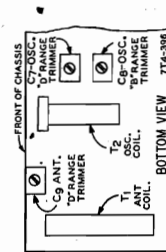
NOTE A—For all adjustments, with the exception of the 3 loop range adjustments, the pin tip should be in the external antenna hole of the Antenna Selection Socket—See illustration on page one.

NOTE B—If the indicator is not at 1500 KC, it will be necessary to re-calibrate. Loosen the set screw on the dial hub near the vol-

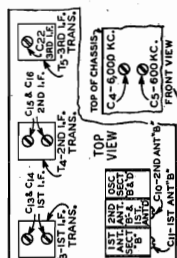


NOTE A—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

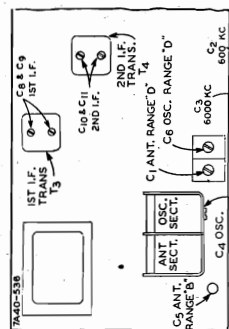
CALIBRATION—Chassis should be in cab position. If it is necessary to realibrate the radio, loosen the set screw on the dial hub near the volume control drum. Tune in a signal of known frequency. Hold the tuning control drum stationary and at the same time turn the dial drum the necessary amount in the required direction. If the radio detunes as the dial drum is turned, loosen the set screw a slight additional amount and recalibrate. Retighten the set screw.



5,000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.



CAUTION—When aligning the short wave band, be sure **NOT** to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at



NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Tune in a 1400 KC signal. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

Volume Control—Maximum All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator.

| SIGNAL GENERATOR | | DUMMY ANTENNA | | CONDENSER SETTING | | ADJUST TRIMMERS TO MAXIMUM | |
|------------------|------------------|---------------|---------|---|---|----------------------------|--|
| MODEL 139E-382 | | AT RADIO | | | | | |
| 1. F. | | | | | | | |
| 465 KC | Grid of 1st Det. | .1 mf. | B Range | Turn Rotor to Full Open | 1st I.F. (C17) & (C18) | 2nd I.F. (C24) & (C25) | |
| RANGE B | | | | | | | |
| 1730 KC | Antenna Lead | 200 mmf. | B Range | Turn Rotor to Full Open | Oscillator Range B (C15) | | |
| 1500 KC | Antenna Lead | 200 mmf. | B Range | Turn Rotor to Max. Output Set Indicator to 1500 KC See Note B | Ant. Range B (C4) Int. Range B (C9) | | |
| 600 KC | Antenna Lead | 200 mmf. | B Range | Turn Rotor to Max. Output | 400 KC (C43) Rod Rotor—See Note C | | |
| RANGE C | | | | | | | |
| 7000 KC | Antenna Lead | 400 Ohm | C Range | Turn Rotor to Full Open | Oscillator Range C (C14) | | |
| 6000 KC | Antenna Lead | 400 Ohm | C Range | Turn Rotor to Max. Output | Antenna Range C (C3) | | |
| RANGE D | | | | | | | |
| 22,000 KC | Antenna Lead | 400 Ohm | D Range | Turn Rotor to Full Open | Oscillator Range D (C13) | | |
| 21,000 KC | Antenna Lead | 400 Ohm | D Range | Turn Rotor to Max. Output | Ant. Range D (C23) Int. Range D (C7) Rod Rotor—See Note C | | |
| LOOP RANGE B | | | | | | | |
| 1500 KC | None—See Note D | | B Range | Turn Rotor to Max. Output | Loop Trimmer (C21) | | |
| LOOP RANGE C | | | | | | | |
| 6000 KC | None—See Note D | | C Range | Turn Rotor to Max. Output | Loop Trimmer (C22) | | |
| LOOP RANGE D | | | | | | | |
| 21,000 KC | None—See Note D | | D Range | Turn Rotor to Max. Output | Loop Trimmer (C21) | | |
| See Note D | | | | | Rod Rotor—See Note C | | |

MODEL 93WG-754 93WG-755

| I. F. | | Grid of 1st Det. | 1 mf. | B Range | Turn Rotor to Full Open | 1st I.F. (C13) & (C14) 2nd I.F. (C15) & (C16) 3rd I.F. (C22) |
|----------------|--------------|------------------|---------|---------------------------|--|--|
| RANGE B | | | | | | |
| 455 KC | Antenna Lead | 200 mmf. | B Range | Turn Rotor to Full Open | Oscillator Range 8 (C9) | |
| 1750 KC | Antenna Lead | 200 mmf. | B Range | Turn Rotor to Max. Output | 1st Ant. Range 8 (C11) 2nd Ant. Range 8 (C16) 600 KC (C3) Rock Rotor—See Note A | |
| 600 KC | Antenna Lead | 200 mmf. | B Range | Turn Rotor to Max. Output | Oscillator Range D (C7) | |
| RANGE D | | | | | | |
| 13,500 KC | Antenna Lead | 400 Ohm | D Range | Turn Rotor to Full Open | Ant. Range D (C3) Rock Rotor—See Note A | |
| 16,000 KC | Antenna Lead | 400 Ohm | D Range | Turn Rotor to Max. Output | 6000 KC (C4) Rock Rotor—See Note A | |
| 6000 KC | Antenna Lead | 400 Ohm | D Range | Turn Rotor to Max. Output | | |

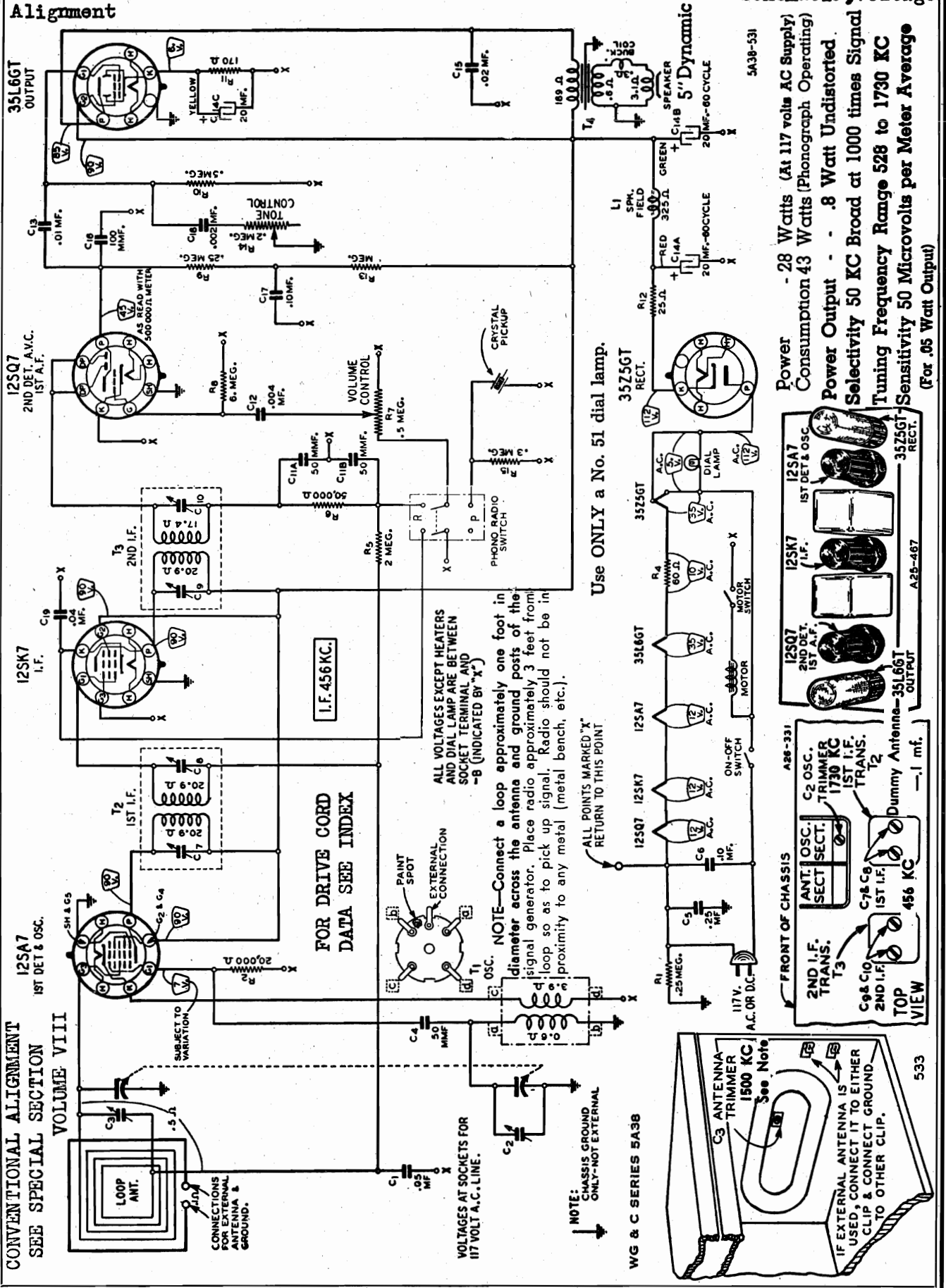
MODEL 04WG-725

| F. | Grid of 1st Det. | .1 mf. | S Range | Turn Rotor to Full Open | 1st I.F. (C8) & (C9) 2nd I.F. (C10) & (C11) |
|---------------------|------------------|--------------|----------|--|--|
| RANGE B | | | | | |
| | 45K KC | Antenna Lead | 200 mmf. | Turn Rotor to Full Open | Oscillator Range B (C4) |
| | 1550 KC | Antenna Lead | 200 mmf. | Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note A | Ant. Range B (C5) |
| | 1400 KC | Antenna Lead | 200 mmf. | Turn Rotor to Max. Output | 500 KC (C2) Rock Rotor—See Note B |
| RANGE D | | | | | |
| | 600 KC | Antenna Lead | 400 Ohm | Turn Rotor to Full Open | Oscillator Range D (C6) |
| | 18,300 KC | Antenna Lead | 400 Ohm | Turn Rotor to Max. Output | Ant. Range D (C1) Rock Rotor—See Note B |
| | 17,000 KC | Antenna Lead | 400 Ohm | Turn Rotor to Max. Output | 5000 KC (C3) Rock Rotor—See Note B |
| | 6000 KC | Antenna Lead | 400 Ohm | Turn Rotor to Max. Output | Ant. Range B (C5) |
| LOOP RANGE B | | | | | |
| | 1400 KC | Antenna Lead | 400 Ohm | Turn Rotor to Max. Output | Ant. Range B (C5) |

Trimmers, Socket Sensitivity Alignment

MONTGOMERY WARD & CO.

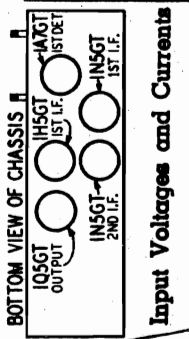
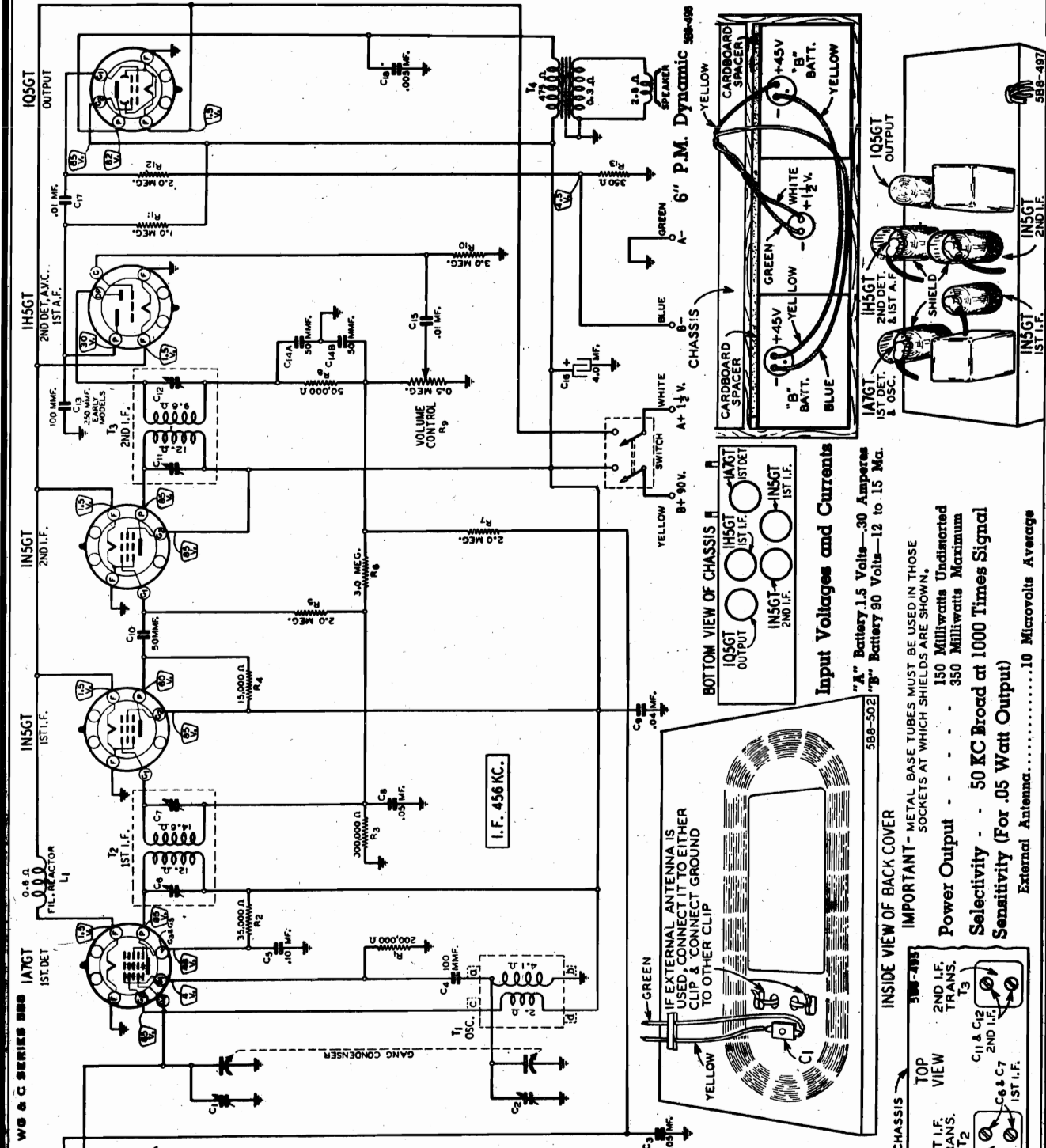
MODEL 93WG-510
Schematic, Voltage



MODEL 93WG-565A
Schematic, Voltage

MONTGOMERY WARD & CO.

Socket, Trimmers
Alignment, Sensitivity

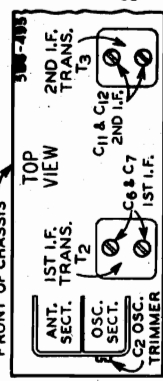


Input Voltages and Currents
"A" Battery 1.5 Volts—30 Amperes
"B" Battery 90 Volts—12 to 15 Ma.

IMPORTANT—METAL BASE TUBES MUST BE USED IN THOSE SOCKETS AT WHICH SHIELDS ARE SHOWN.

Power Output - - - 150 Milliwatts Undistorted
Selectivity - - - 350 Milliwatts Maximum
Sensitivity (For .05 Watt Output)
50 KC Broad at 1000 Times Signal
External Antenna.....10 Microvolts Average

INSIDE VIEW OF BACK COVER



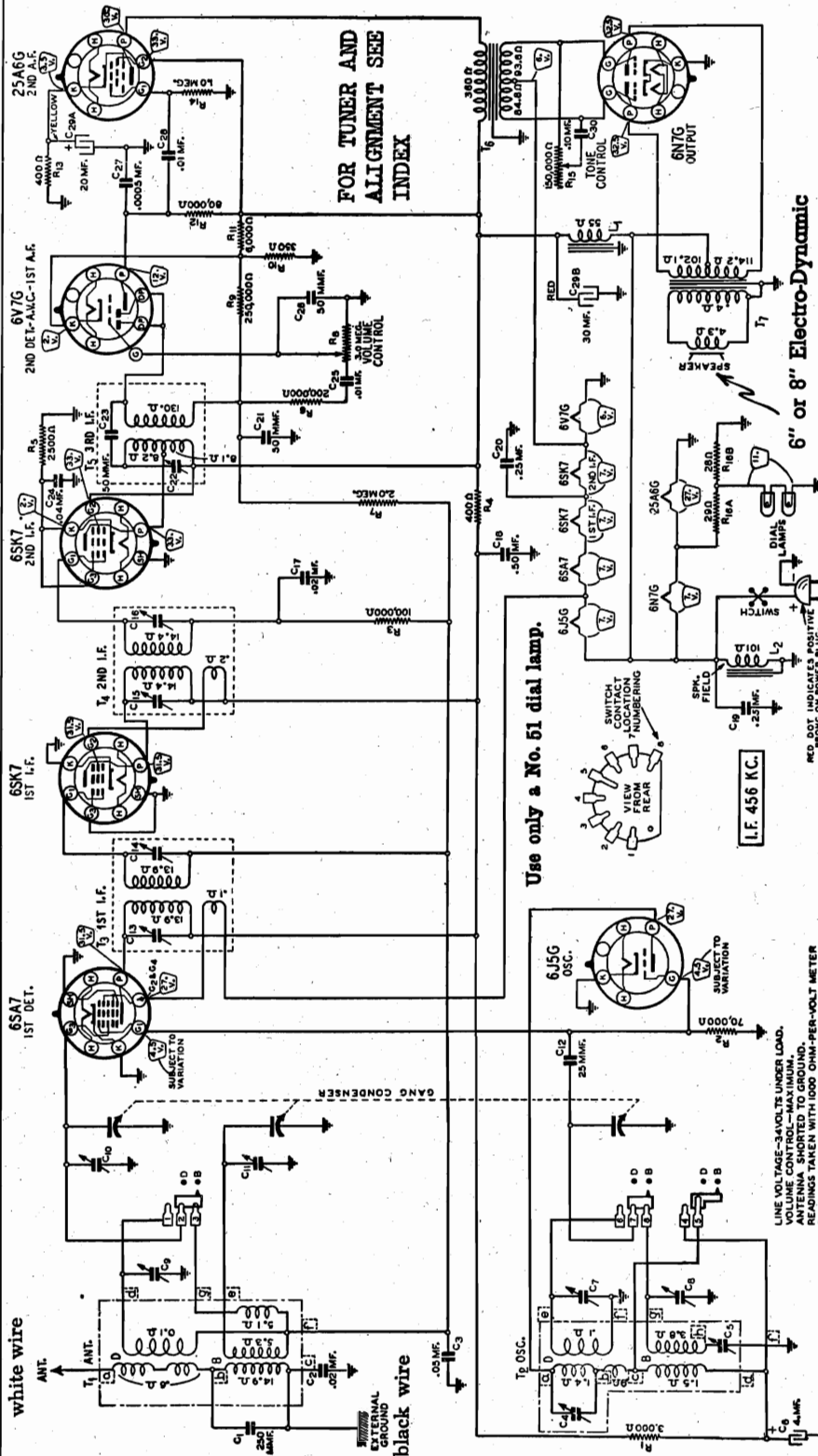
FRONT OF CHASSIS

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

| SIGNAL GENERATOR | CONNECTION | DUMMY | CONDENSER | ADJUST TRIMMERS |
|-------------------|-----------------------------------|---------|--|--|
| FREQUENCY SETTING | AT RADIO ANTENNA | ANTENNA | SETTING | TO MAXIMUM |
| 456 KC | Signal Grid of 1st Det. (Top Cap) | .1 mf. | Turn rotor to full open | 1st I.F. (C6) & (C7) 2nd I.F. (C11) & (C12) |
| 1600 KC | Signal Grid of 1st Det. | .1 mf. | Turn rotor to full open | Oscillator (C2) |
| 1500 KC | None—See Note A | | Turn rotor to max. output Antenna (C1) | |

NOTE A—Chassis must be in cabinet. Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. The back of the cabinet must be in place. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).
CALIBRATION (For models with pointer in front of dial scale)—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, hold the pulley at the back of the dial, loosen the pointer screw, set the pointer at the 800 KC mark, and retighten the pointer screw.



Power Consumption - 1.60 Amperes at 36 Volts DC

| | | |
|--------------|-----------|----------------------|
| Power Output | - - - - - | .17 Watt Undistorted |
|--------------|-----------|----------------------|

Selectivity - - 30 KC Broad at 1000 times Signal

Sensitivity (For .05 watt output)

B Range 528 to 1730 KC ...6.0 Microvolts Average

D Range5750 to 18300 KC...8.0 Microvolts Average

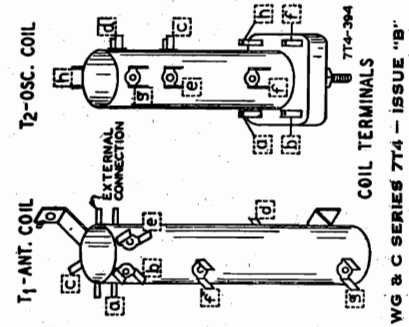
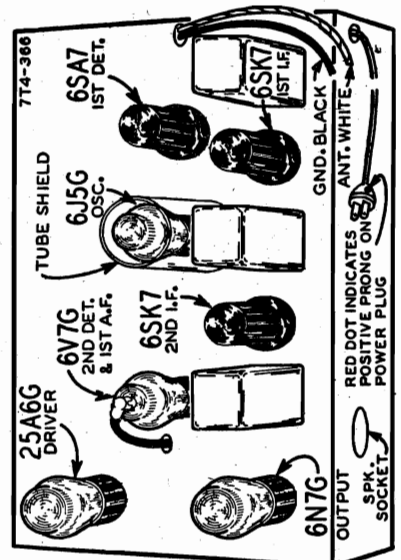
Line Voltage Range

The radio will operate satisfactorily within a line voltage range of 25 to 42 volts. If the line voltage is higher than 42, it will be necessary to use a series resistor to cut it down. If the voltage varies, a variable resistor may be required.

32 Volt Power Supply

This radio is designed for use on farms and in those places where the power supply consists of a 32 volt direct current generating plant. The radio may not be satisfactory on plants which do not use storage batteries.

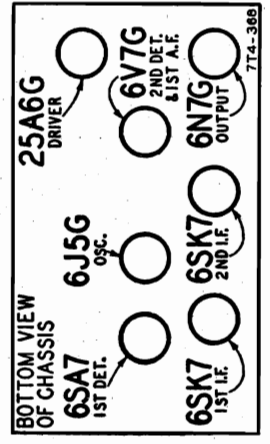
The power consumption of this radio is 57.6 watts. When first turned on, the power consumption is higher for a few seconds until the tubes heat.



WG & C SERIES 7T4 - ISSUE "B"

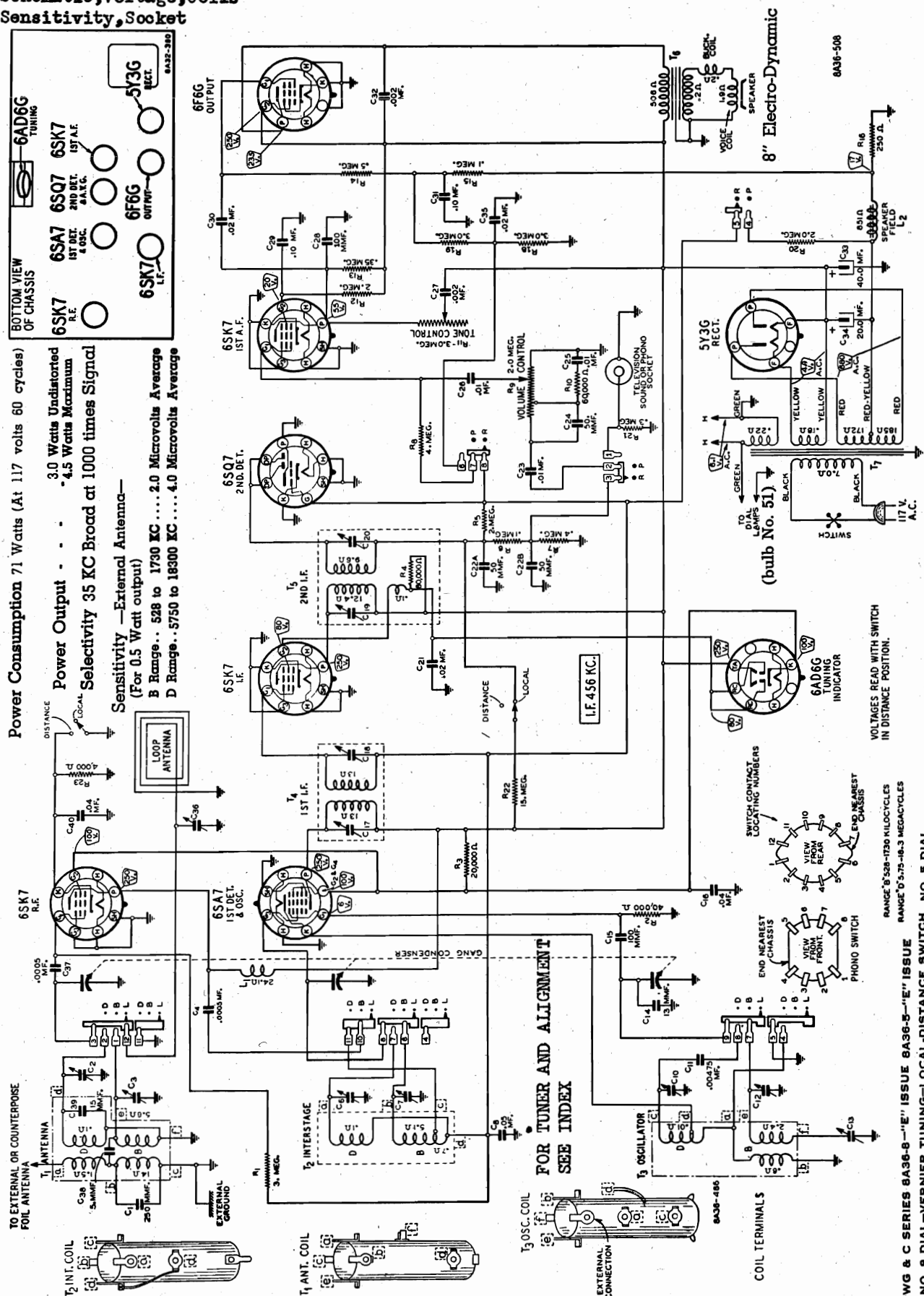
CAUTION

The metal chassis is connected to one side of the line—See Schematic Circuit Diagram.



MODELS 93WG-800, 93WG-801
(With Loop)
Schematic, Voltage, Coils
Sensitivity, Socket

MONTGOMERY WARD & CO.

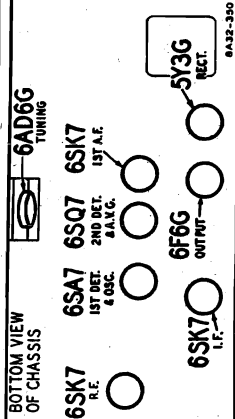




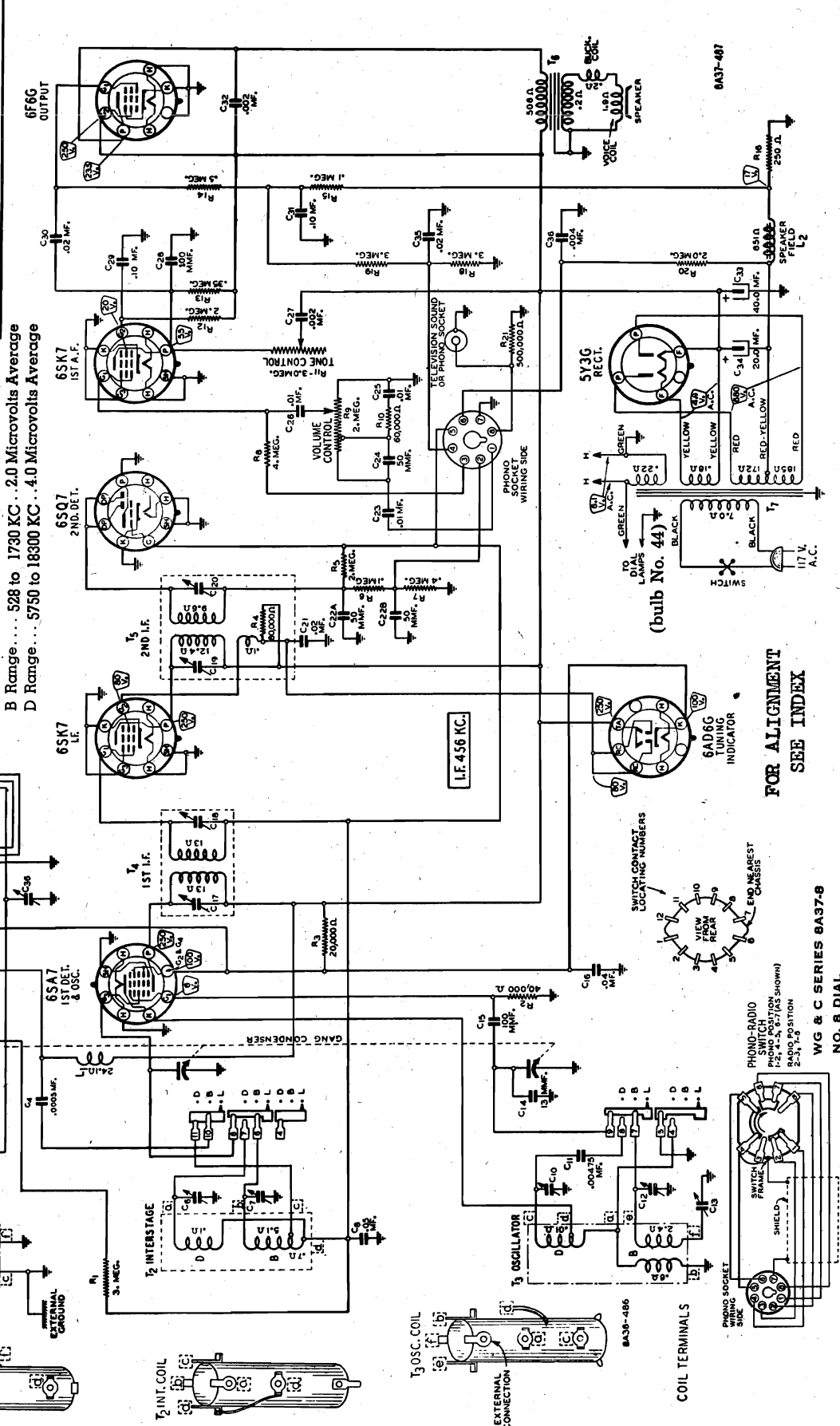
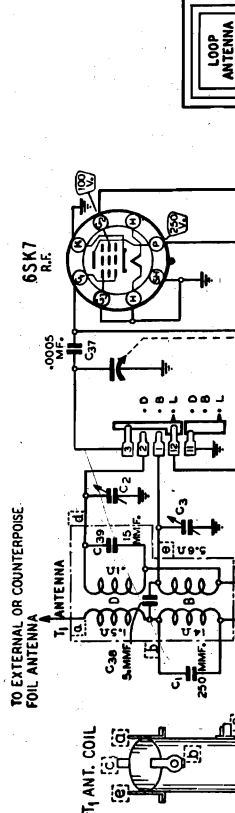


MODEL 93WG-805(With Loop)
Schematic, Voltage, Coils
Sensitivity, Socket

MONTGOMERY WARD & CO.



Power Consumption 71 Watts (At 117 volts 60 cycles)
 88 Watts (Phonograph Operating)
 Power Output - - - - - 30 Watts Undistorted
 4.5 Watts Maximum
 Selectivity - - - 35 KC Broad at 1000 times Signal
 Intermediate Frequency - - - - - 456 KC
 Speaker - - - - - 10" Electro-Dynamic
 Sensitivity—External Antenna—(For 0.5 Watt Output)
 B Range... 528 to 1730 KC... 2.0 Microvolts Average
 D Range... 5750 to 18300 KC... 4.0 Microvolts Average



**FOR ALIGNMENT
 SEE INDEX**

**WG & C SERIES 8A37-8
 NO. 8 DIAL**

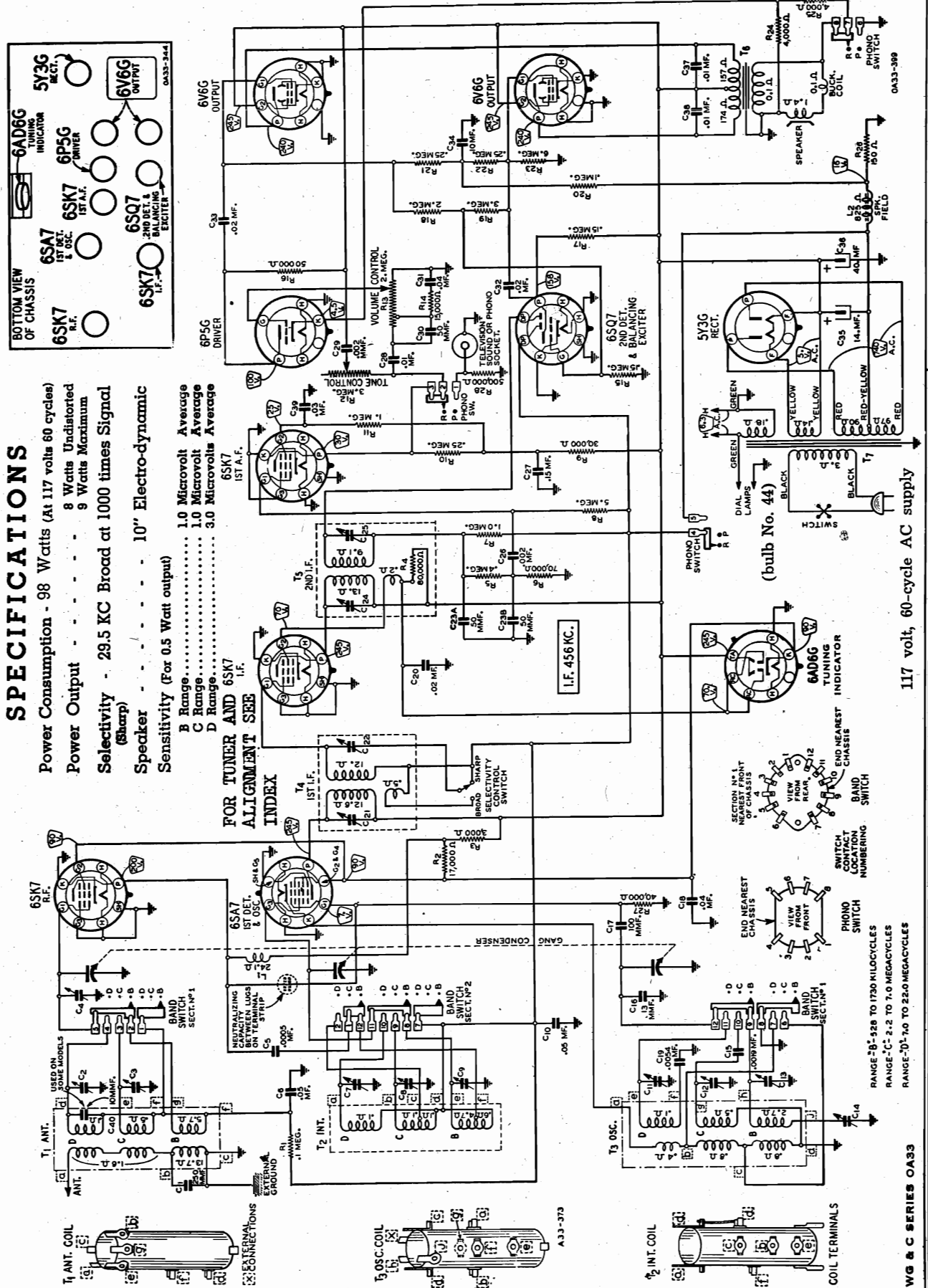
MONTGOMERY WARD & CO.

MODELS 93WG-1000, 93WG-1001
Schematic, Voltage, Coils
Sensitivity, Socket

SPECIFICATIONS

Power Consumption - 98 Watts (At 117 volts 60 cycles)
Power Output - - - - - 8 Watts Undistorted
 - - - - - 9 Watts Maximum
Selectivity - 29.5 KC Broad at 1000 times Signal
 (Sharp)
Speaker - - - - - 10" Electro-dynamic
Sensitivity (For 0.5 Watt output)
B Range..... 1.0 Microvolt Average
C Range..... 1.0 Microvolt Average
D Range..... 3.0 Microvolts Average

FOR TUNER AND 6SK7
ALIGNMENT SEE
INDEX



117 volt, 60-cycle AC supply

WG & C SERIES OA33

MODELS 93WG-1000, 93WG-1001
(With Loop)

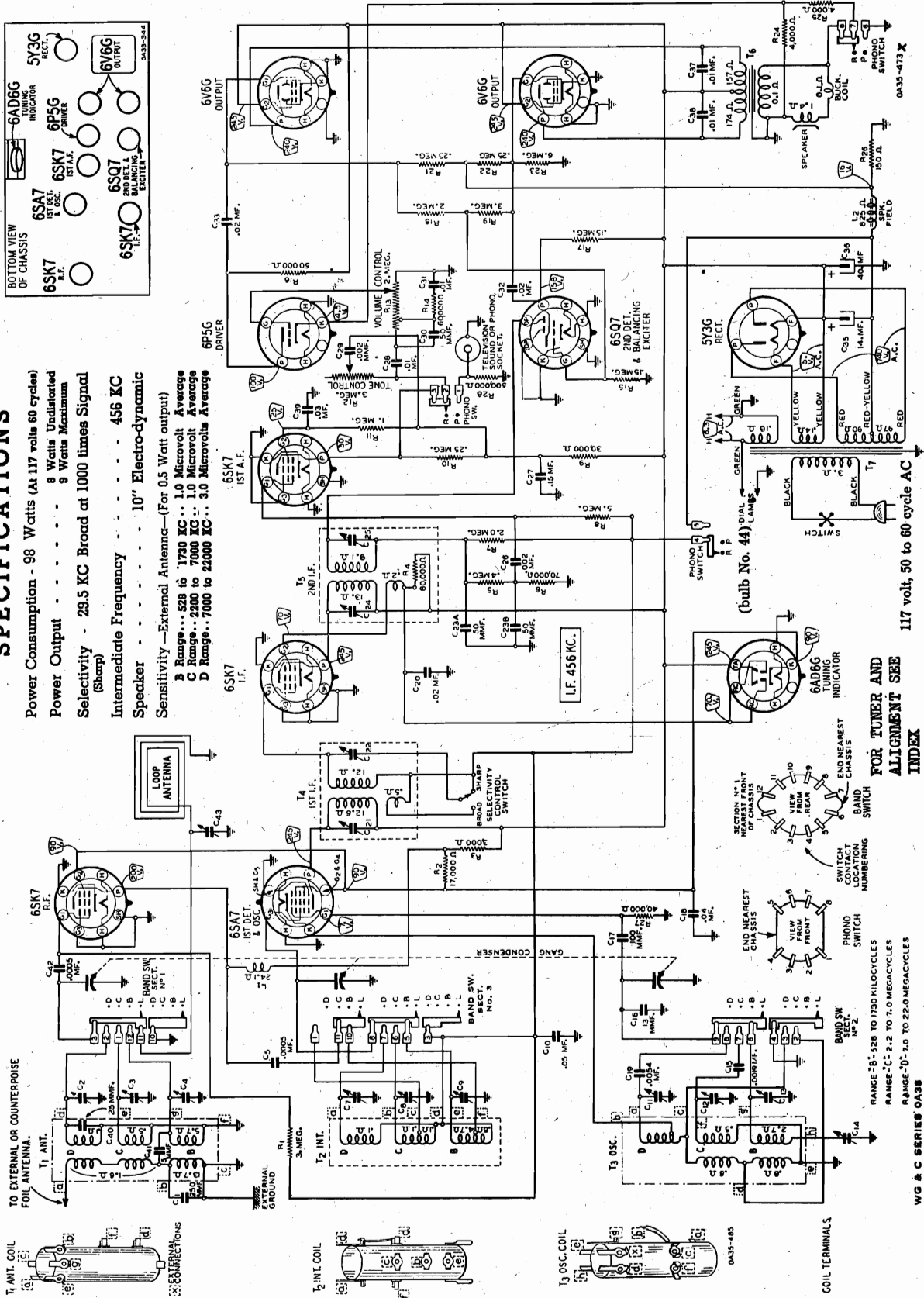
Schematic, Voltage, Coils
Sensitivity, Socket

MONTGOMERY WARD & CO.

SPECIFICATIONS

| | | |
|------------------------|----------|--|
| Power Consumption - | 98 Watts | (At 117 volts 60 cycles) |
| Power Output | - - - - | 8 Watts Undistorted 9 Watts Maximum |
| Selectivity - | 29.5 KC | Broad at 1000 times Signal (Sharp) |
| Intermediate Frequency | - - - - | 456 KC |
| Speaker | - - - - | 10" Electro-dynamic |

Sensitivity—External Antenna—(For 0.5 Watt output)



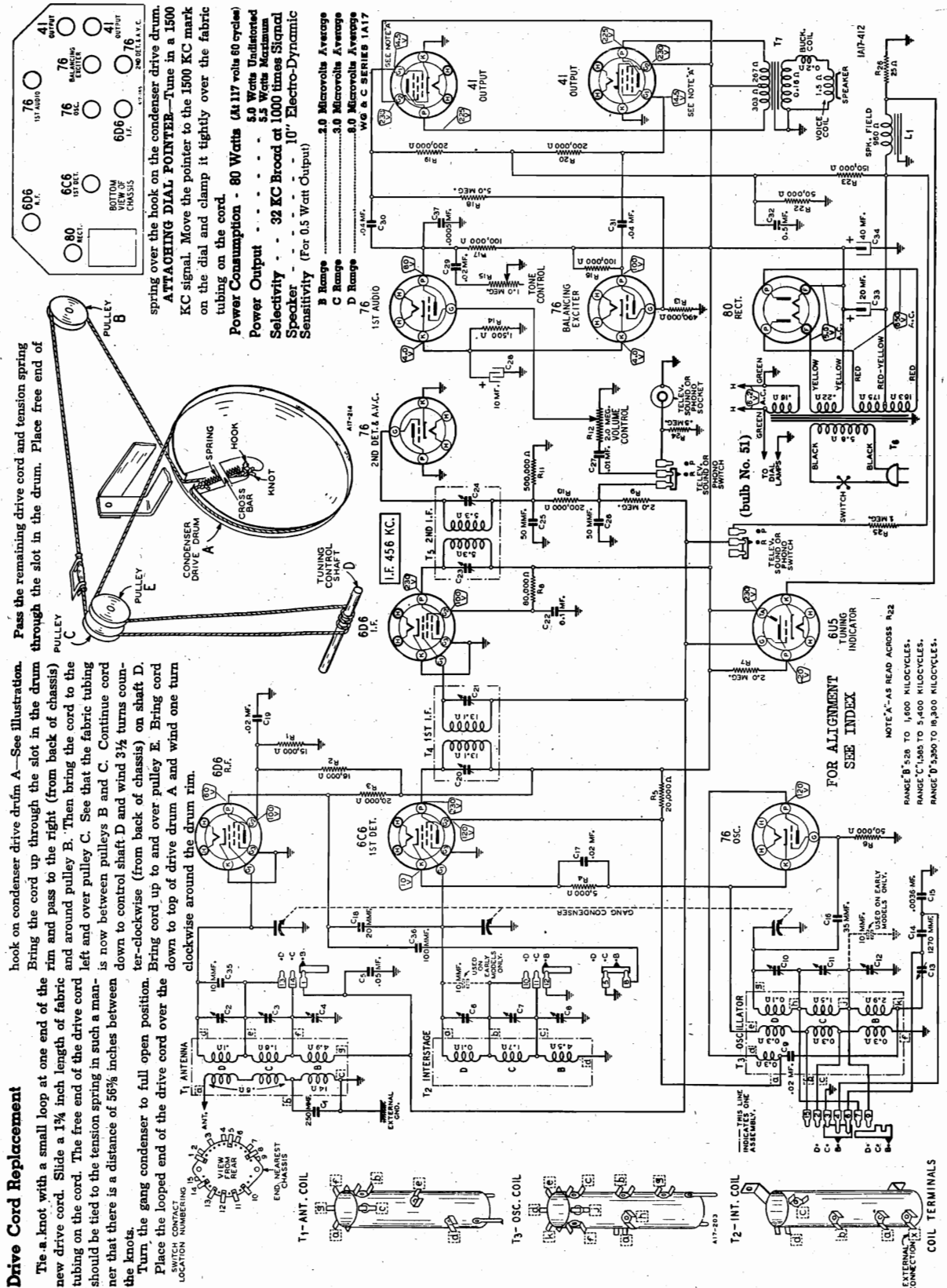
**FOR TUNER AND
ALIGNMENT SEE
INDEX**

117 volt, 50 to 60 cycle AC

WG & C SERIES' OA38

MONTGOMERY WARD & CO.

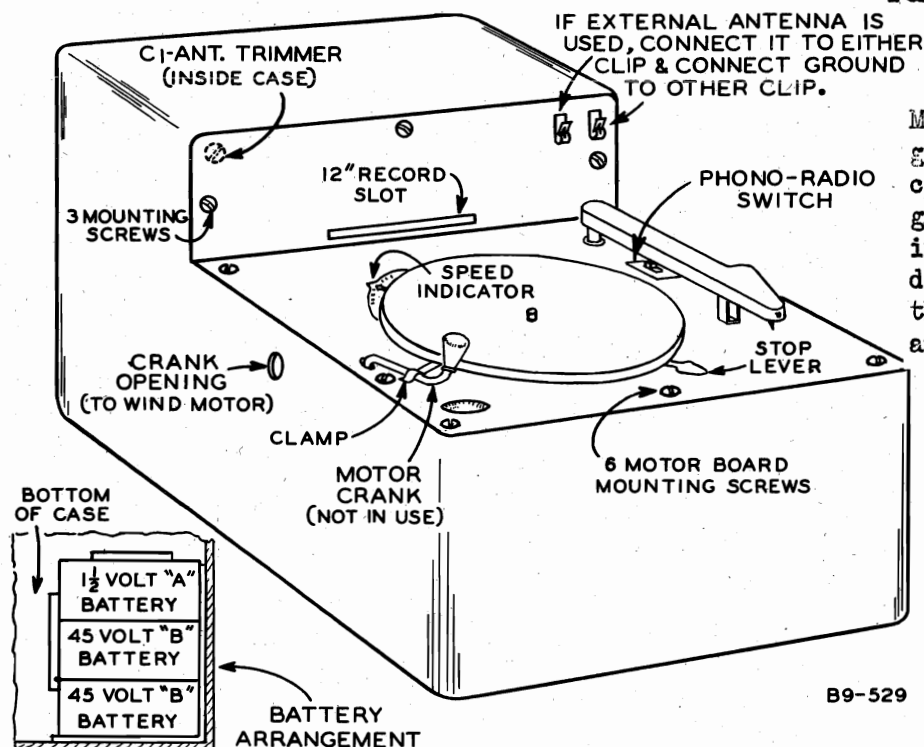
MODELS 93WG-1103, 93WG-1104
Schematic, Voltage, Coils
Socket, Sensitivity
Drive Cord Replacement



MODEL 93WG-2208
Schematic, Chassis
Parts

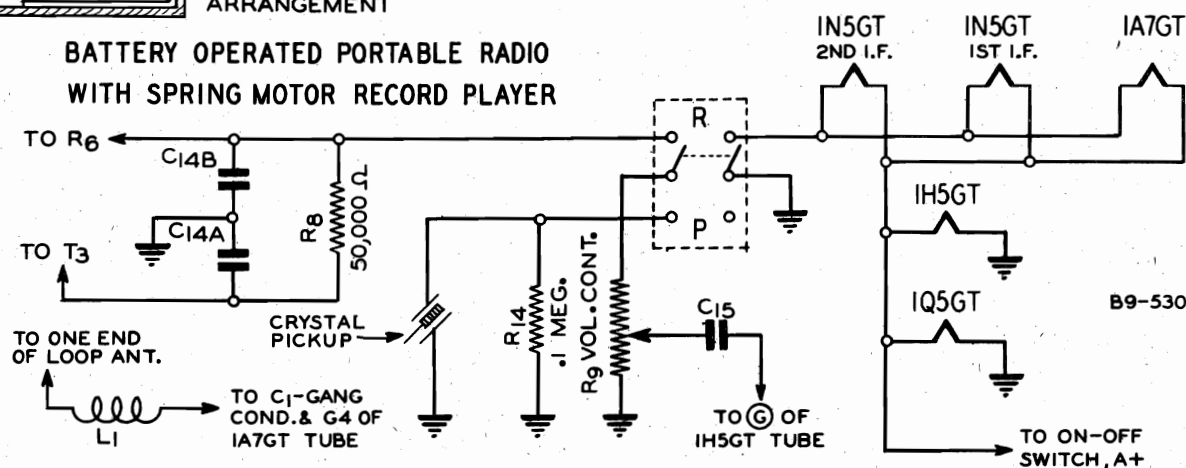
MONTGOMERY WARD & CO.

MODEL 93WG-2208 consists of receiver Model 93WG-565A and the record player shown here. See Index for data on receiver.



Most of the information given for 93WG-565A is correct for this phono-graph combination. The information that is different is given on this page with changes and additions.

B9-529

BATTERY OPERATED PORTABLE RADIO
WITH SPRING MOTOR RECORD PLAYER


B9-530

PARTS USED ON MODEL 93WG-565A ARE USED ON THIS MODEL EXCEPT AS FOLLOWS:-

The following NEW PARTS not shown on MODEL 93WG-565A ARE USED

| Bin No. | Part No. | Code | Description | Selling Price |
|---------|----------|------|--|---------------|
| | 2A161 | | Radio-Phono Switch..... | \$0.16 |
| | 4X351 | | Escutcheon for Phono-Radio Switch..... | .12 |
| | 17A131 | C1 | 1-12 mmf. Trimmer Condenser..... | .10 |
| | 14A115 | | 2 Section Gang Condenser complete with Tuning Control Shaft..... | 2.05 |
| | A85104 | R14 | 100,000 Ohm 0.2 Watt Carbon Resistor..... | .06 |
| | 28A3 | | Needle Cup..... | .06 |
| | 28A7 | | Cover for Needle Cup..... | .06 |
| | 9A1218 | | Loading Coil for Loop Antenna..... | .18 |

The following parts shown on MODEL 93WG-565A ARE NOT USED

| Bin No. | Part No. | Code | Description | Selling Price |
|---------|----------|------|--|---------------|
| | 9A1191 | | Loop Antenna Assembly..... | \$0.54 |
| | 4A139 | | Fibre Strip (Loop Antenna Leads)..... | .04 |
| | 17A110 | C1 | 2.5-35 mmf. Loop Antenna Trimmer Condenser..... | .06 |
| | 14A114 | | 2 Section Gang Condenser complete with Tuning Control Shaft..... | 1.20 |

W G & C Series 5B9

Prices Subject to Change Without Notice.

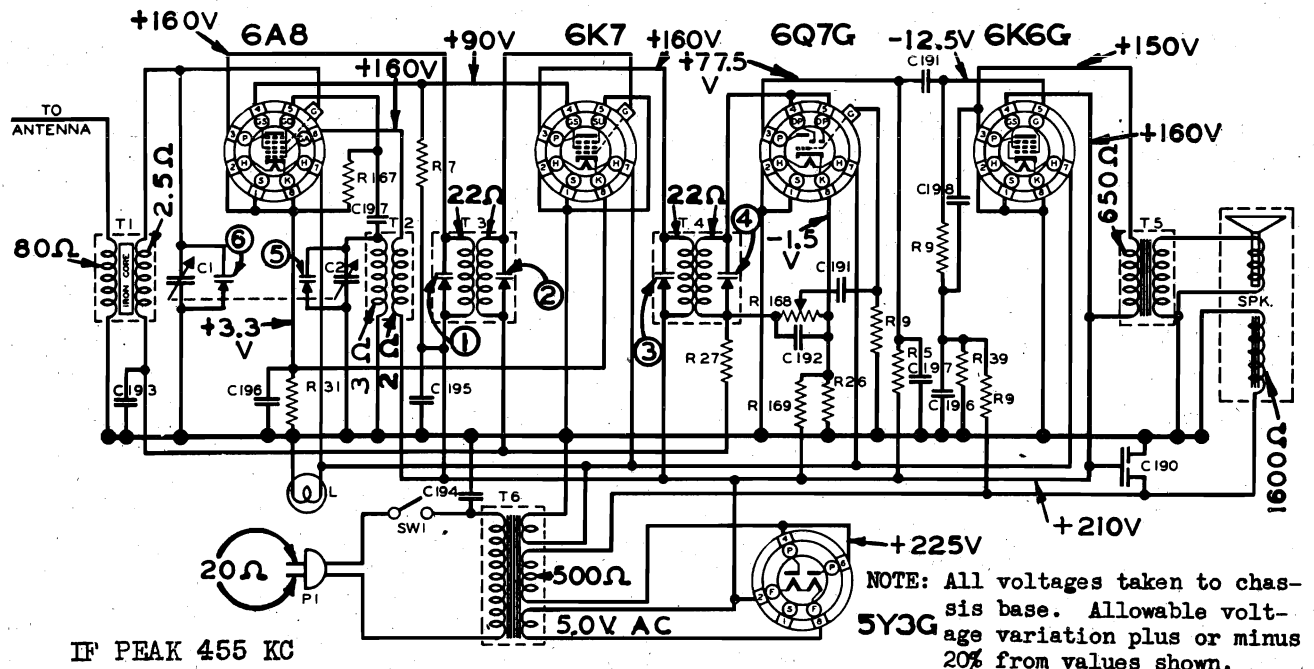
NOBLITT-SPARKS INDUSTRIES, INC.

MODEL 71

Chassis RE-43

Schematic, Voltage

Alignment, Sensitivity



IF PEAK 455 KC

BALANCING INSTRUCTIONS

| Operation No. | Connect Bal. Oscillator to | Bal. Oscillator Frequency | Adj. Padder No. | Dial Setting | Sens. |
|---------------|----------------------------|---------------------------|-----------------|--------------|--------|
| 1. | * 6A8 Grid | 455 | 1, 2, 3 & 4 | 550 kc | 75 mv. |
| 2. | Ant. Lead Through 200 uuf. | 1720 | 5 | 1720 kc | |
| 3. | Ant. Lead Through 200 uuf. | 1400 | 6 | 1400 kc | 30 mv. |

* I.F. Sensitivity should be 150 microvolts minimum for 200 milliwatts output

RESISTORS

| Ref. No. | Part No. | Description | Price |
|----------|----------|-----------------------------|-------|
| R5 | 17-2070 | 500,000 ohms 1/4 watt | .20 |
| R7 | 17-2072 | 20,000 ohms 1/2 watt | .20 |
| R9 | 17-2080 | 1,000,000 ohms 1/4 watt | .20 |
| R27 | 17-4788 | 2,000,000 ohms 1/4 watt | .20 |
| R31 | 17-2066 | 260 ohms 1/2 watt | .20 |
| R39 | 17-14051 | 300,000 ohms 1/4 watt | .20 |
| R167 | 17-14281 | 60,000 ohms 1/4 watt | .20 |
| R168 | 17-16166 | 500,000 ohms volume control | .75 |
| R169 | 17-14282 | 150,000 ohms 1/4 watt | .20 |
| R26 | 17-4781 | 600 ohms 1/4 watt | .20 |

CONDENSERS

| Ref. No. | Part No. | Description | Price |
|----------|----------|------------------------|-------|
| C1 & 2 | 17-16147 | Tuning condenser | 3.00 |
| C190 | 17-14271 | 10-10 mfd. 300 v.d.c. | 1.50 |
| C191 | 17-14272 | .01 mfd. 400 v.d.c. | .35 |
| C192 | 17-14273 | .00025 mfd. 600 v.d.c. | .25 |
| C193 | 17-14274 | .05 mfd. 200 v.d.c. | .30 |
| C194 | 17-14275 | .01 mfd. 400 v.d.c. | .40 |
| C195 | 17-14276 | .05 mfd. 400 v.d.c. | .35 |
| C196 | 17-14277 | .1 mfd. 200 v.d.w. | .35 |
| C197 | 17-14278 | .0001 mfd. 600 v.d.c. | .25 |
| C198 | 17-14279 | .005 mfd. 400 v.d.c. | .30 |

MISCELLANEOUS

| Part No. | Description | Price |
|-----------|-----------------------------|-------|
| 17-13905 | Dial light bulb (Mazda #44) | .15 |
| 17-15791E | Line cord and plug assembly | .40 |
| 17-16133 | Speaker Assembly | 4.00 |
| 17-15926A | Volume control and switch | 1.00 |

COILS AND TRANSFORMERS

| Ref. No. | Part No. | Description | Price |
|----------|----------|-------------------------|-------|
| T1 | 00-16141 | Antenna Coil | .75 |
| T2 | 00-16142 | Oscillator coil | .50 |
| T3 | 00-16161 | First I.F. Transformer | 1.50 |
| T4 | 00-16162 | Second I.F. Transformer | 1.50 |
| T5 | 00-16160 | Output transformer | 1.50 |
| T6 | 00-16140 | Power transformer | 3.00 |

ELECTRICAL and MECHANICAL SPECIFICATIONS

TUBES: 6A8--1st Detector Oscillator
 6K7--L.F. Amplifier
 6Q7G--2nd Detector, A.V.C. Audio Amplifier
 6K6G--Power output Amplifier
 5Y3G--Rectifier

Dial Light: Mazda #44

Frequency Range: 1725 to 540 K.C.

Power Output: 1.8 watts

Speaker: 5" Electro Dynamic, 3 ohm voice coil
1600 ohms field.

Voltage & Frequency: 117 V. 60 cycles AC only

Watts Power Consumption: 45 Watts

Sensitivity: 50 microvolts for 200 milliwatts output

Approved by: Underwriters

Licensed under: R.C.A. and Hazeltine patents

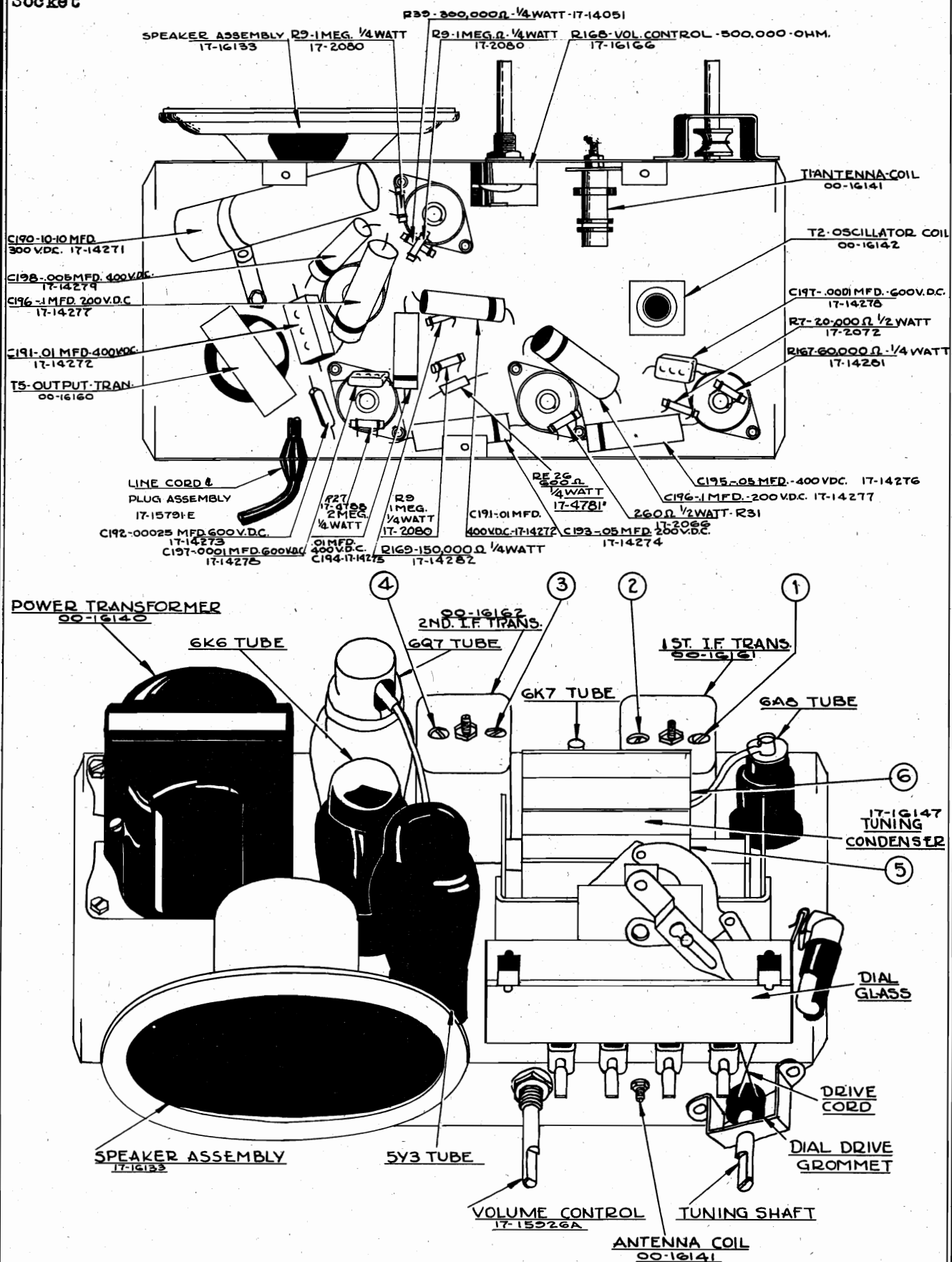
Chassis Dimensions: Width 10 3/4"; height 6 3/4"; depth 6 3/4"

Cabinet dimensions: Width 11 1/2"; height 8"; depth 6 1/4"

Mechanical Push-button Tuning: 4 push-buttons

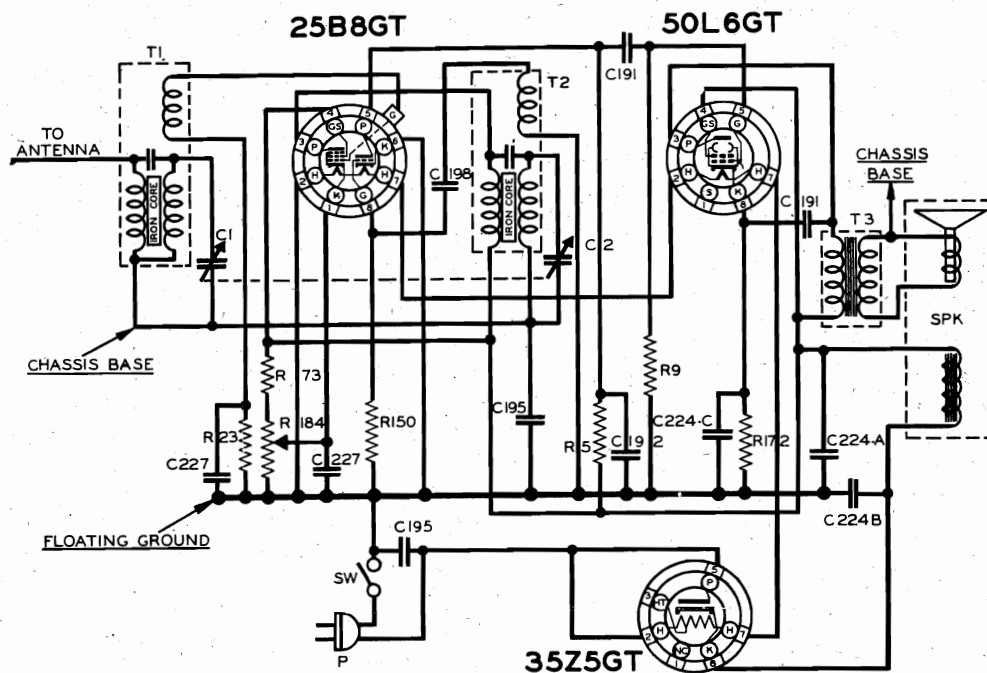
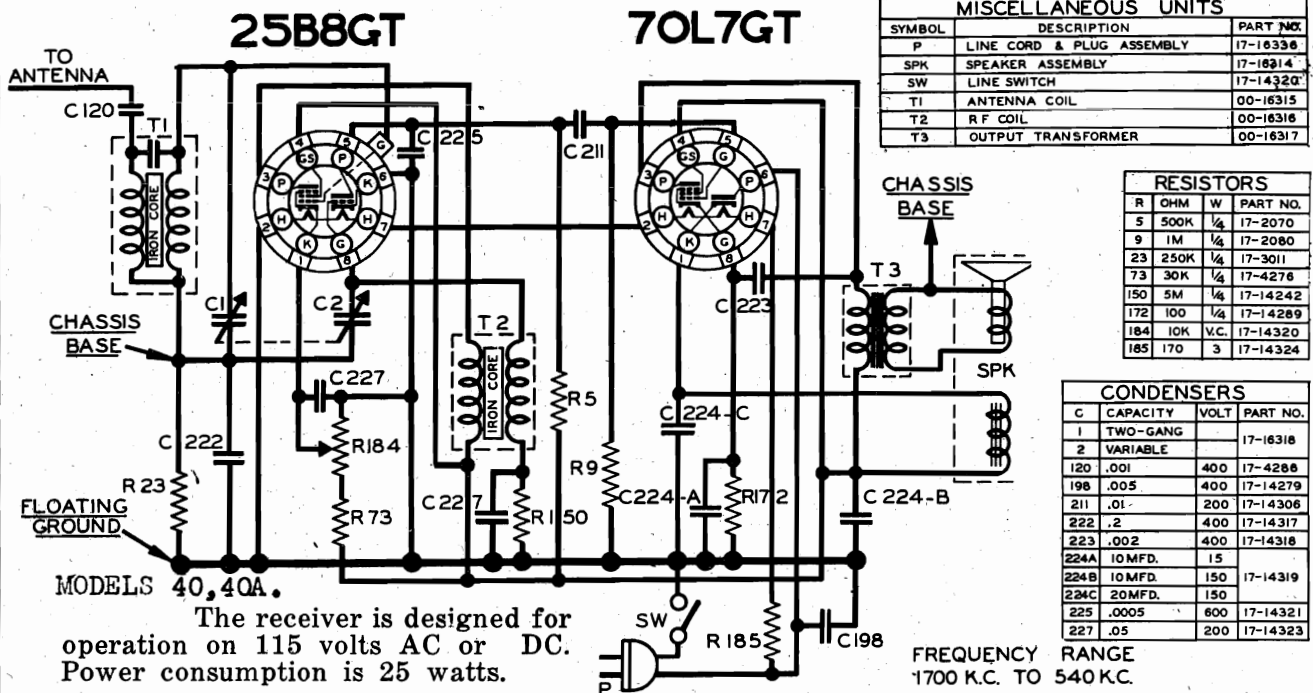
MODEL 71
Chassis RE-43
Chassis, Trimmers
Socket

NOBLITT-SPARKS INDUSTRIES, INC.



NOBLITT-SPARKS INDUSTRIES, INC.

MODELS 40,40A
MODELS 402,402A
Ch.RE-55
Schematics



Model 610
Tuner Data

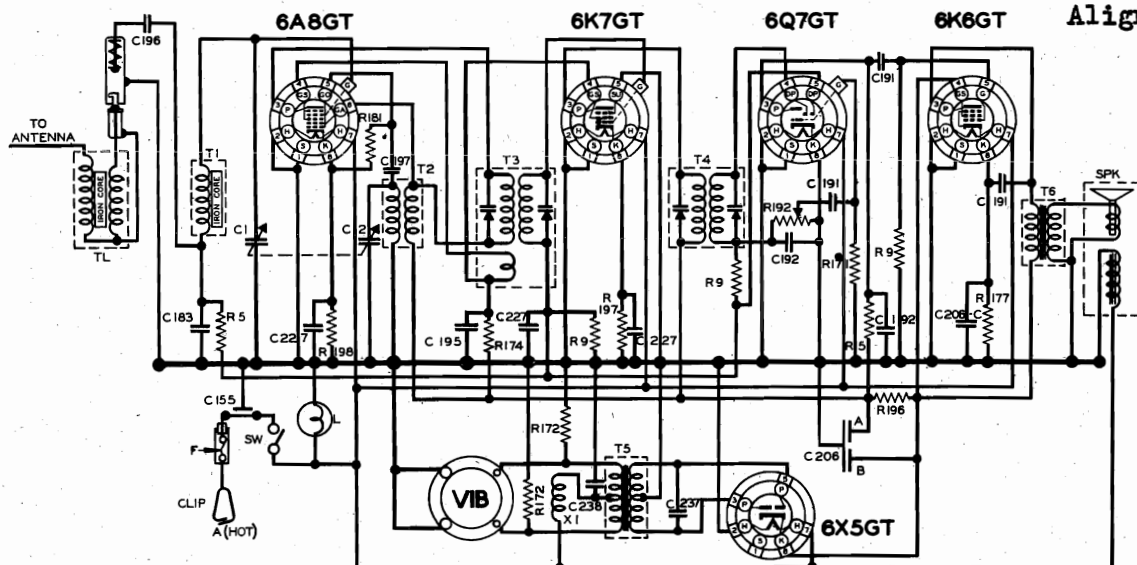
NOBLITT-SPARKS INDUSTRIES, INC.

MODELS 510, Chassis RE-54

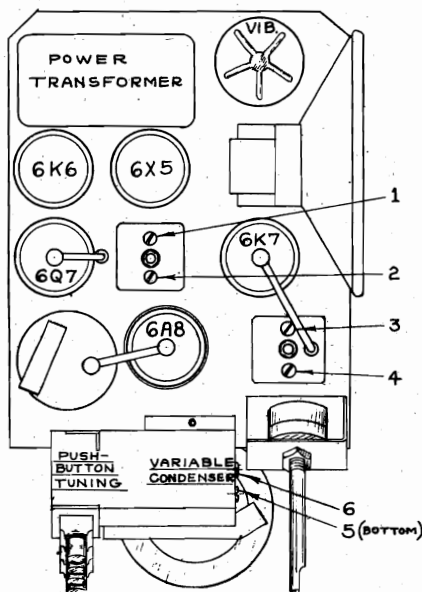
610, Chassis RE-58

Schematic, Socket, Trimmers

Alignment

**IF PEAK 455 KC**

FREQUENCY RANGE 1575 TO 540 K.C.

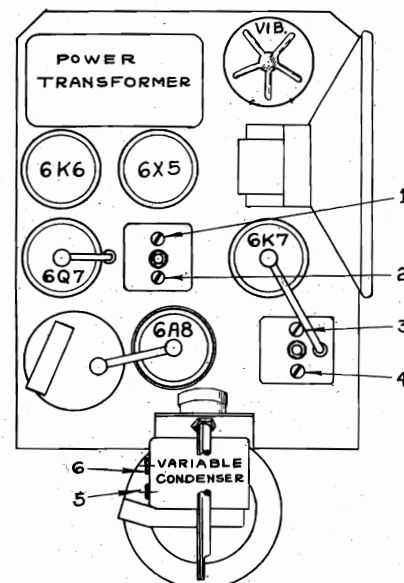
NOBLITT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA.**MODEL 610****Model 610 PUSH BUTTON ADJUSTMENT:**

Any button may be set to any station desired. First, tune in the desired station by means of the thumb wheel. Second, turn the push button counter-clockwise two full turns. Then depress this button the full length of its stroke, and while depressed, tighten the button again by turning it clockwise. The button may now be released. To check the correct setting for this button, turn the thumb wheel to some other point and depress the push button. This will return the tuning mechanism to the station just set up. If it does not, repeat the foregoing sequence of operations more carefully. Each of the remaining buttons may be set to other stations in a like manner.

| RESISTORS | | | CONDENSERS | | |
|-----------|------|-----|------------|----------|---------------|
| R | OHMS | W | C | CAPACITY | VOLT |
| 3 | 500K | 1/4 | 1 | TWO-GANG | 17-16421 |
| 5 | 1M | 1/4 | 2 | 500V | 17-14217 |
| 171 | 15M | 1/4 | 155 | .0002 | 200 17-14217 |
| 172 | 100 | 1/4 | 237 | .005 | 1200 17-14345 |
| 174 | 20K | 1/4 | 204M | 10 MFD. | 350 17-14287 |
| 177 | 850 | 1/4 | 204M | 10 MFD. | 350 17-14287 |
| 181 | 100K | 1/4 | 191 | .01 | 400 17-14272 |
| 182 | 1M | 1/4 | 192 | .00035 | 400 17-14273 |
| 198 | 500 | 1 | 183 | .003 | 400 17-14284 |
| 197 | 800 | 1/4 | 185 | .05 | 400 17-14276 |
| 196 | 400 | 1/4 | 184 | .1 | 200 17-14277 |
| | | | 197 | .0001 | 400 17-14278 |
| | | | 236 | .5 | 150 17-14348 |
| | | | 237 | .05 | 200 17-14323 |

| CHOKES & TRANSFORMERS | | |
|-----------------------|-------------------|----------|
| T-X | TYPE | PART NO. |
| 1 | ANTENNA COIL | 00-18441 |
| 2 | OSCILLATOR COIL | 00-18442 |
| 3 | FIRST I.F. COIL | 00-18443 |
| 4 | SECOND I.F. COIL | 00-18444 |
| 5 | POWER TRANS. | 00-18445 |
| 6 | OUTPUT TRANS. | 00-18446 |
| X | CHOKE | |
| 1 | SUPPRESSION CHOKE | 20-18457 |

| MISCELLANEOUS UNITS | | |
|---------------------|-------------------------------|----------|
| SYMBOL | DESCRIPTION | PART NO. |
| F | FUSE - 20 AMP | 17-2228 |
| L | DIAL LIGHT BULB - MAZDA NO 44 | 17-13905 |
| SPK | SPEAKER ASSEMBLY | 17-16456 |
| SW | POWER SWITCH | 17-16422 |
| TL | TRANSMISSION LINE | 00-18448 |
| VIB | VIBRATOR | 17-14747 |

ARVIN CAR RADIO
CHASSIS RE 54, RE 58.
**MODEL 510****BALANCING INSTRUCTIONS:**

All sensitivities given for 1/2 watt output = 1.4 V. across Voice Coil

| Operation No. | Connect Bal. Oscillator to | Bal. Oscillator Frequency | Adjust Padder No. | Dial Setting | Sensitivity |
|---------------|-----------------------------|---------------------------|-------------------|--------------|-------------|
| 1 | 6A8 Grid | 455 | 1, 2, 3 & 4 | 550 KC | 50 uv |
| 2 | Ant. Coupler Through 20 uuf | 1400 | 5 | 1400 | |
| 3 | " | 1400 | 6 | 1:00 | 10 uv |

(See Fig. 5 & 6)

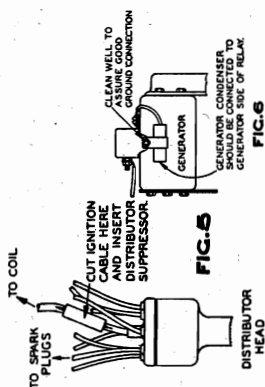
If after following the installation instructions in detail objectionable motor noise is encountered the following interference elimination procedure should be followed.

A standard distributor suppressor must be installed in series with the center high tension coil lead as close to the distributor as possible. This suppressor is not used with Ford V8 automobiles.

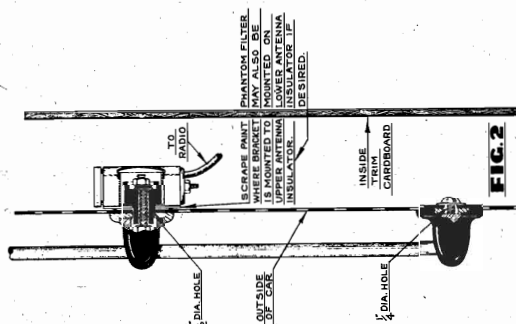
The generator condenser should be installed on the car generator as illustrated and the ammeter condenser should be connected between the ammeter or ignition switch terminal and the grounded metal instrument panel.

The "A" lead from the receiver should be connected to the ammeter terminal of the car or to some other convenient point such as the ignition switch terminal in the Ford V8.

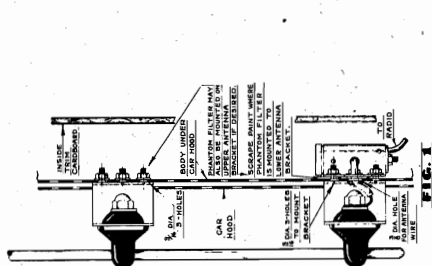
The two front mounting bolts are $1\frac{1}{4}$ inches long to permit the Ford V8 installation shown in Figure 4. For other installations such as shown in Figure 3 these bolts may be cut down to $\frac{5}{8}$ inches if desired to facilitate installation.



ation is included in the packing list. In installations other than the Ford V8 this spacer may be found useful in spacing away from the lip of the instrument panel one side of the radio (where the



lip of the instrument panel is not horizontal). In this case the spacer may be cut to the proper length with a hack saw. The spacer may also be cut into two equal lengths and used to space the entire front portion of the radio down from the lip of the instrument panel in order to avoid a projection of some sort such as a toggle switch.



Car Radio. If either the A25 or A26 antenna is selected the installation of the Phantom Filter to the antenna should be made as illustrated in Figure 1. If a side cowl type (A27 or A28) is selected the installation should be made as shown in Figure 2. Each antenna package has included in it detailed information as to the size and location of mounting holes.

INSTALLATION:

This receiver may be installed by securing it to the instrument panel of the car with the screws supplied in the hardware package. The rear end of the radio is supported by a perforated mounting bracket which may be bent to fit any installation requirement.

Illustrations in Figure 8 are representative of an average installation. Precaution should be taken, however, that the radio, when installed, does not interfere with the operation of the brake, clutch, cowl vent or emergency brake lever, and ample room for future installation for an Arvin Hot Water Heater should be allowed.

Ford V8 automobiles built in 1938 and 1939 require a special installation which is illustrated in Figure 4. The necessary spacer for this instal-

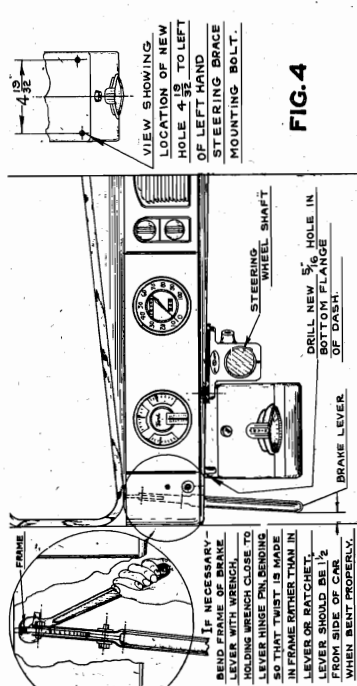


FIG. 4

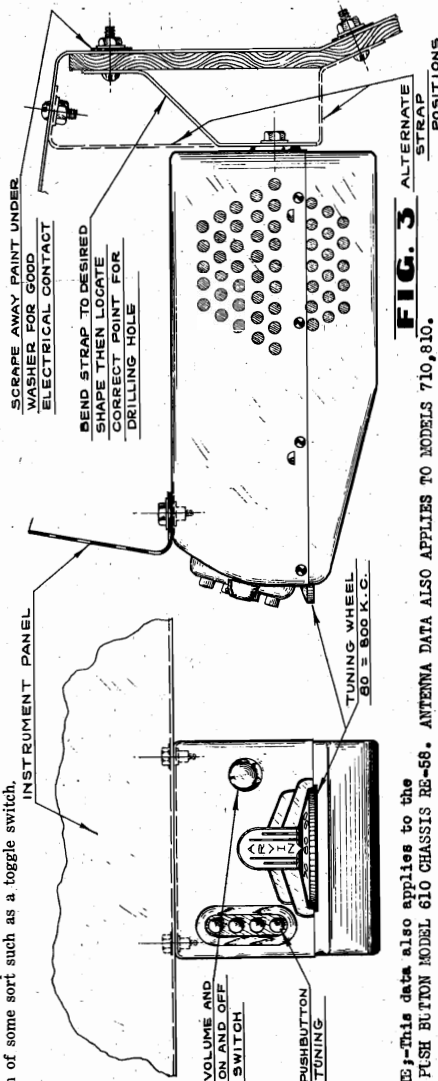


FIG. 3 **ALTERNATE**

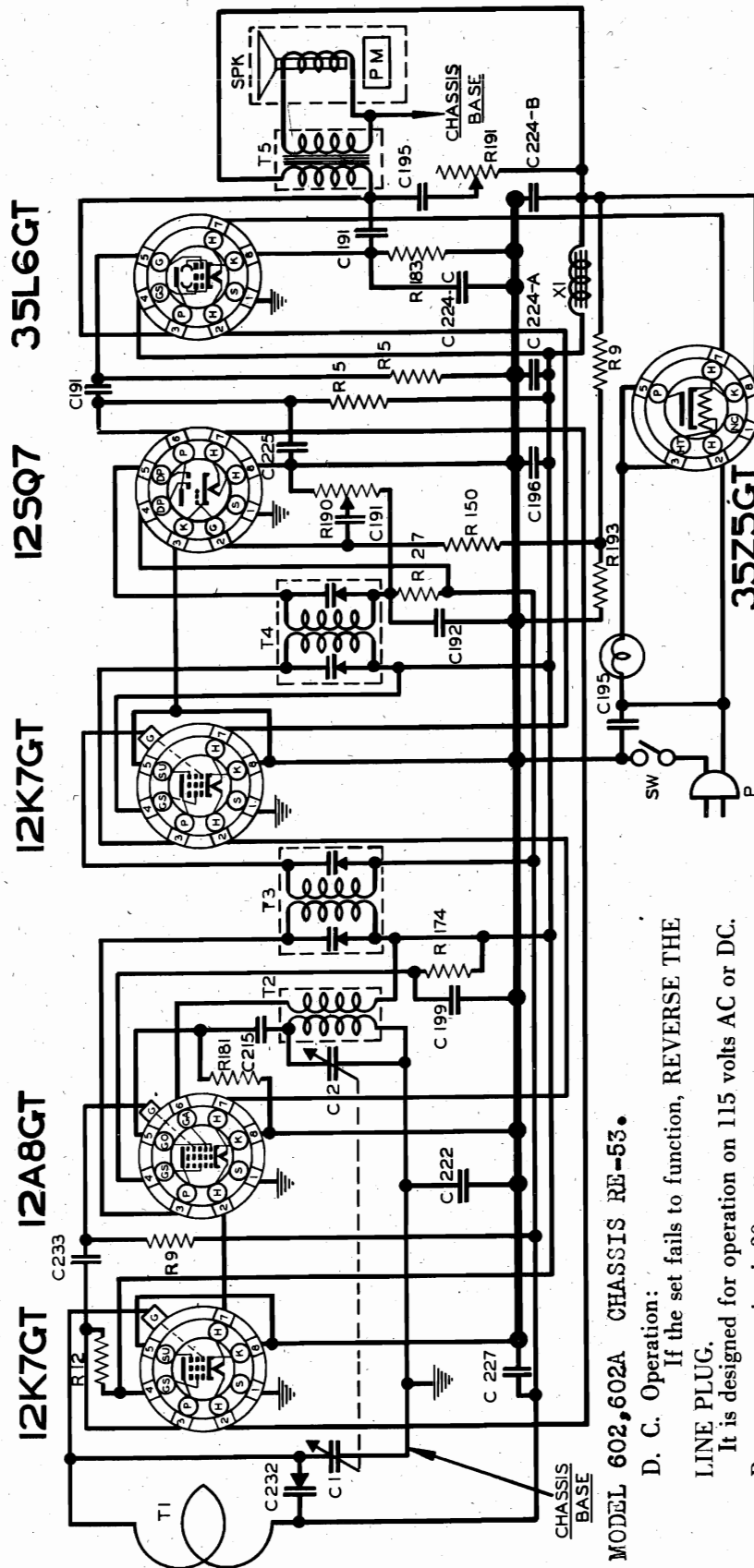
NOTE;-This data also applies to the
PUSH BUTTON MODEL 610 CHASSIS RE-58. ANTENNA DATA ALSO APPLIES TO MODELS 710-810.

NOBLITT-SPARKS INDUSTRIES, INC

MODELS 602, 602A

Chassis RE-53

Schematic, Alignment



MODEL 602, 602A CHASSIS RE-53.

D. C. Operation:
If the set fails to function, REVERSE THE
LINE PLUG.
It is designed for operation on 115 volts AC or DC.
Power consumption is 30 watts.

| RESISTORS | | | CONDENSERS | | TRANSFORMERS & CHOKES | | MISCELLANEOUS UNITS | |
|-----------|------|-----|------------|----------|-----------------------|---|---------------------|----------|
| R | OHM | W | C | CAPACITY | VOLT | T | SYMBOL | PART NO. |
| 1 | 500K | 1/4 | 1 | TWO-GANG | | 1 | L | 17-16376 |
| 2 | 1M | 1/4 | 2 | VARIABLE | | 2 | P | 17-16336 |
| 3 | 10K | 1/4 | 191 | .01 | 400 | 3 | SPK | 17-16403 |
| 4 | 100K | 1/4 | 192 | .00025 | 600 | 4 | SW | 17-14333 |
| 5 | 10K | 1/4 | 193 | .05 | 400 | 5 | | |
| 6 | 100K | 1/4 | 194 | .01 | 200 | | | |
| 7 | 100K | 1/4 | 195 | .02 | 200 | | | |
| 8 | 100K | 1/4 | 215 | .0001 | 600 | | | |
| 9 | 100K | 1/4 | 222 | .2 | 400 | | | |
| 10 | 100K | 1/4 | 224A | 10 MFD. | 150 | | | |
| 11 | 100K | 1/4 | 224B | 20 MFD. | 150 | | | |
| 12 | 100K | 1/4 | 224C | 10 MFD. | 15 | | | |
| 13 | 100K | 1/4 | 225 | .0005 | 600 | | | |
| 14 | 100K | 1/4 | 227 | .05 | 200 | | | |
| 15 | 100K | 1/4 | 232 | 2-20 UUF | PAID | | | |
| 16 | 100K | 1/4 | 233 | .000035 | 600 | | | |

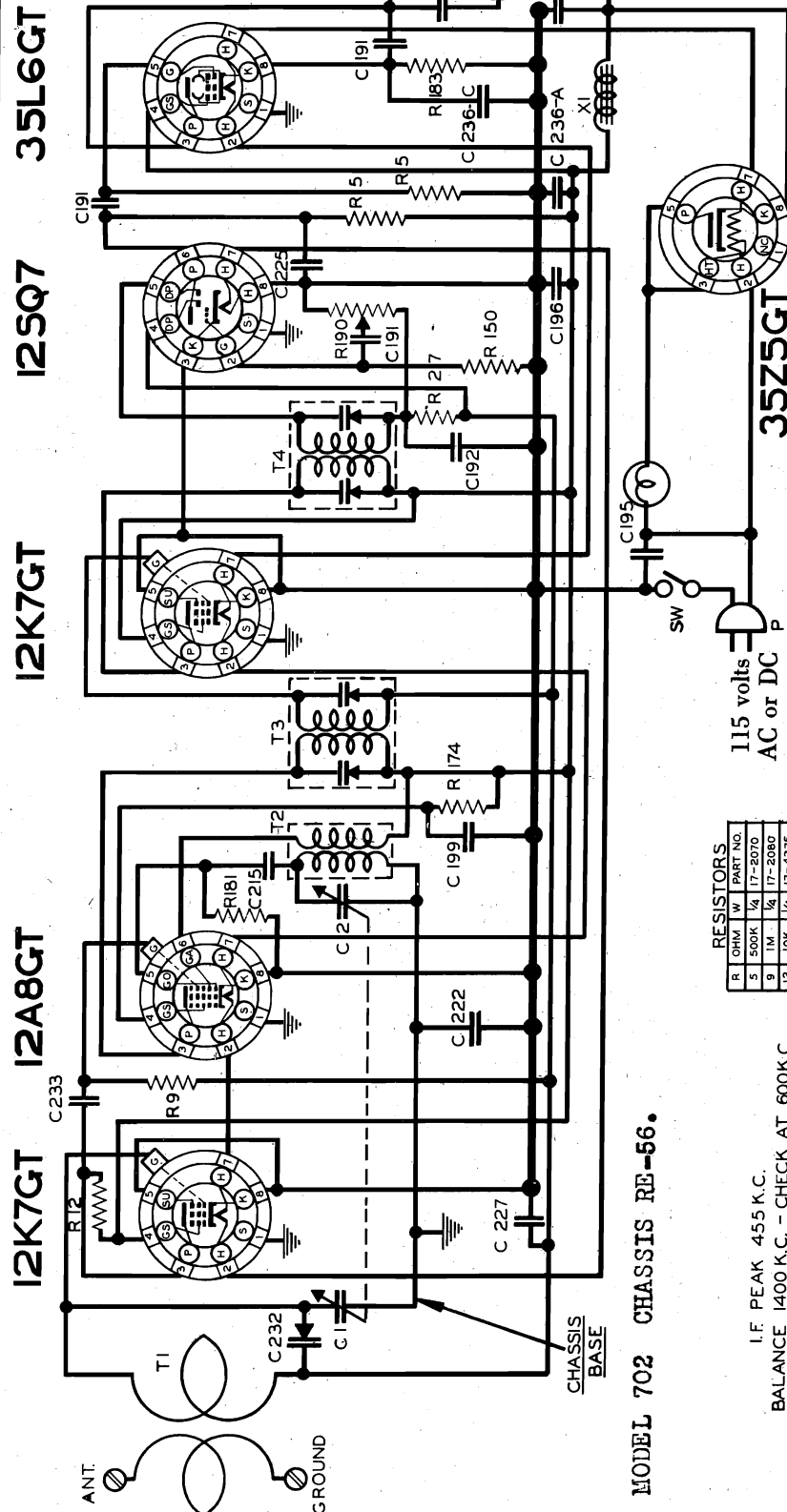
I.F. PEAK 455 K.C.
BALANCE 1400 K.C. - CHECK AT 600 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA

MODEL 702

Chassis RE-56

Schematic, Tuner
Alignment

NOBLITT-SPARKS INDUSTRIES, INC.



MODEL 702 CHASSIS RE-56.

I.F. PEAK 455 K.C.

BALANCE 1400 K.C. - CHECK AT 600K.C.

Power consumption is 30 watts.

RESISTORS

| R | OHMS | W | PART NO. |
|----|------|-----|----------|
| 1 | 500K | 1/4 | 17-2070 |
| 2 | 1M | 1/4 | 17-2080 |
| 3 | 10K | 1/4 | 17-4275 |
| 4 | 2M | 1/4 | 17-4788 |
| 5 | 5M | 1/4 | 17-4242 |
| 6 | 20K | 1/4 | 17-4291 |
| 7 | 100K | 1/4 | 17-4303 |
| 8 | 150 | 1/4 | 17-4316 |
| 9 | 1M | 1/4 | 17-16521 |
| 10 | 100K | 1/4 | 17-16520 |

MISCELLANEOUS UNITS

| SYMBOL | MISCELLANEOUS UNITS | PART NO. |
|--------|----------------------------------|----------|
| L | DIAL LIGHT BULB - MAZDA 47 | 17-16376 |
| P | LINE CORD & PLUG ASSEMBLY | 17-16336 |
| SPK | PERMANENT MAGNET SPEAKER | 17-16316 |
| SW | LINE SWITCH (SEE VOLUME CONTROL) | 17-16321 |

CONDENSERS

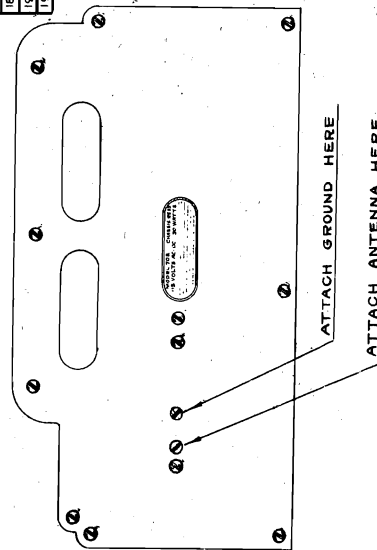
| C | CAPACITY | VOLT | PART NO. |
|----|-----------|------|----------|
| 1 | 2-20 GANG | | 17-16513 |
| 2 | VARIABLE | | 17-16513 |
| 3 | 0.01 | 400 | 17-14272 |
| 4 | 0.0025 | 600 | 17-14273 |
| 5 | 0.05 | 400 | 17-14278 |
| 6 | 0.01 | 200 | 17-14277 |
| 7 | 0.001 | 500 | 17-14283 |
| 8 | 0.001 | 500 | 17-14310 |
| 9 | 0.001 | 400 | 17-14317 |
| 10 | 0.001 | 400 | 17-14344 |
| 11 | 0.001 | 150 | 17-14344 |
| 12 | 0.001 | 25 | 17-14321 |
| 13 | 0.001 | 200 | 17-14323 |
| 14 | 0.001 | 200 | 17-14335 |
| 15 | 0.001 | 200 | 17-14336 |

TRANSFORMERS & CHOKES

| T | TRANSFORMER | PART NO. |
|---|------------------|----------|
| 1 | ANTENNA LOOP | 00-16530 |
| 2 | OSCILLATOR COIL | 00-16404 |
| 3 | FIRST I.F. COIL | 00-16531 |
| 4 | SECOND I.F. COIL | 00-16532 |
| 5 | OUTPUT TRANS. | 00-16533 |
| 6 | CHOKES | 00-16534 |
| 7 | IRON CORE CHOKES | 00-16534 |

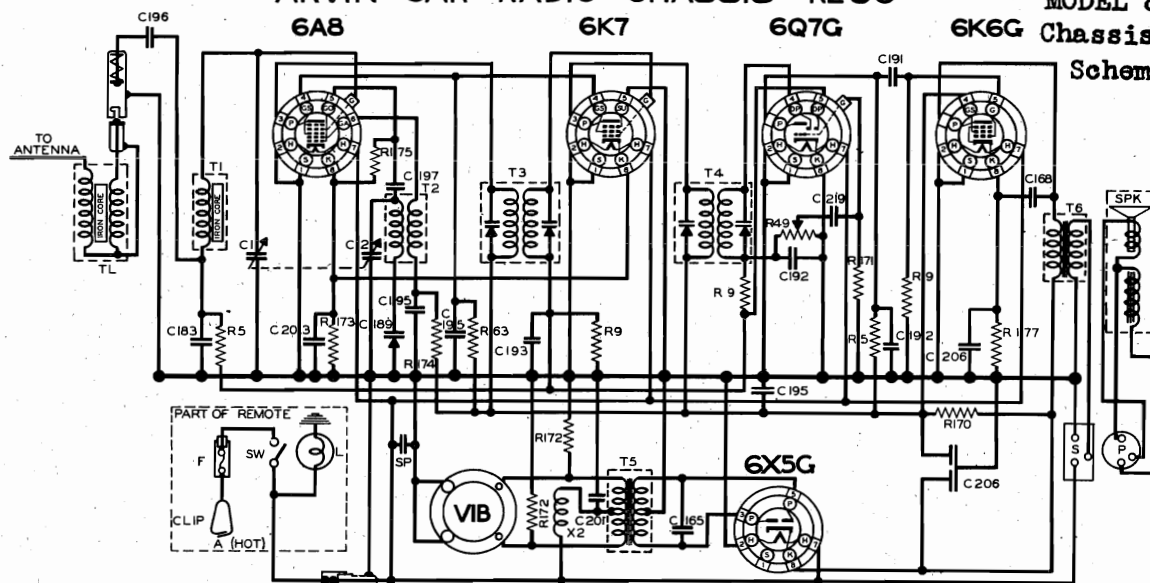
Push Button Adjustment:

Any button may be set up for any station desired. First, tune in the desired station by means of the manual tuning control. Second, turn the push button counter-clockwise two full turns. Then depress this button the full length of its stroke, and while depressed, tighten the button again by turning it clockwise. The button may now be released. To check the correct setting for this button, turn the manual control to some other point and depress the push button. This will return the tuning mechanism to the station just set up. If it does not, repeat the foregoing sequence of operations more carefully. Each of the remaining buttons may be set to other stations in a like manner.



NOBLITT-SPARKS INDUSTRIES, INC.
ARVIN CAR RADIO CHASSIS RE59

MODEL 710,
Chassis RE-59
MODEL 810,
Chassis RE-60
Schematics

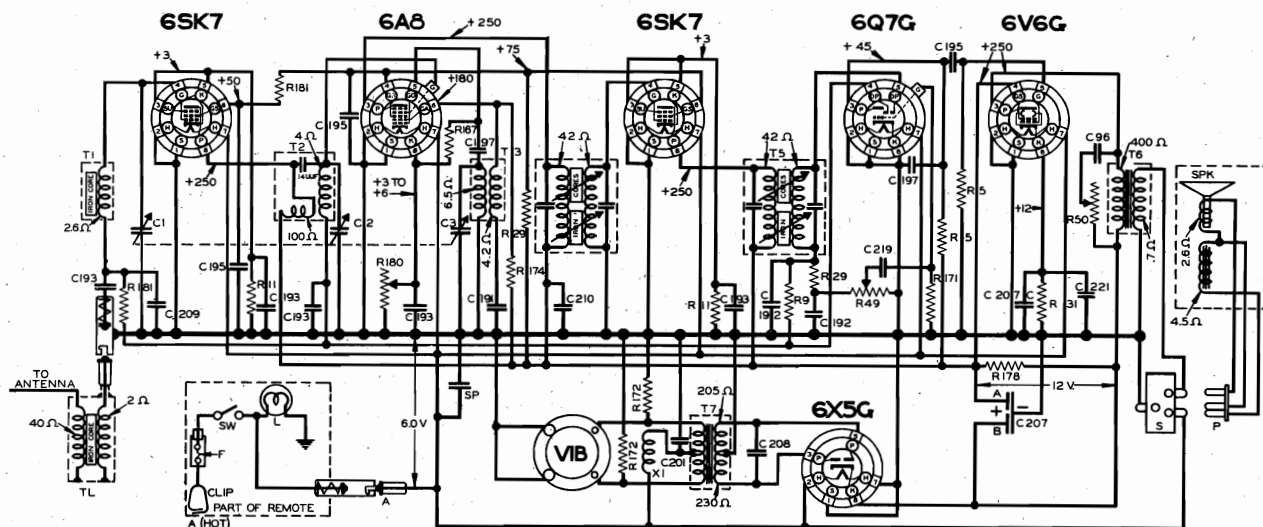


ARVIN MODEL 710 CAR RADIO

| RESISTORS | | | CAPACITORS | | CHOKE & TRANSFORMERS | | | MISCELLANEOUS: UNITS | | | | |
|-----------|-----------|----------|------------|----------|----------------------|----------|-----------------|----------------------|-------------------|-------------------------------|--------------|---|
| PN | QWKS | PART NO | C | CAPACITY | PN | T44 | TYPE | PART NO | SYMBOL | DESCRIPTION | PART NO | |
| 3 | 500K | 14 | 17 | TWO-GANG | 2 | 823F | 1 | ANTENNA COIL | F | FUSE - 20 AMP | 17-2228 | |
| 9 | IM | 14 | 17-2080 | 2 | VARIABLE | 2 | OSCILLATOR COIL | 10-16230 | L | DL LIGHT / BULB - MAZDA NO 51 | 17-1900A | |
| 49 | 500K V.C. | 17-14356 | 183 | .005 | 130 | 17-14230 | 3 | FIRST I.F. COIL | P | SPK PLUG | 17-4746 | |
| 63 | 15K | 16 | 17-1401 | 820 | .005 | 17-14230 | 4 | SECOND I.F. COIL | P | SPK PLUG | 17-1581 | |
| 170 | R20 | 17-14267 | 189 | .0005 | 130 | 17-14249 | 5 | POWER TRANS. | SPK | SPK ASSEMBLY | 17-6517 | |
| 171 | 15M | 16 | 17-14268 | 191 | .01 | 400 | 17-14272 | 6 | OUTPUT TRANS. | SW | POWER SWITCH | — |
| 192 | 10K | 16 | 17-14269 | 192 | .0005 | 400 | 17-14273 | | TL | TRANSMISSION LINE | 10-16233 | |
| 193 | 20K | 16 | 17-14270 | 193 | .01 | 200 | 17-14274 | | SPK | SPK PLATE | — | |
| 194 | 20K | 16 | 17-14271 | 195 | .05 | 400 | 17-14275 | | VIB | VIBRATOR | 17-14747 | |
| 195 | 40K | 16 | 17-14292 | 196 | 1 | 200 | 17-14277 | X | CHOKE | | | |
| 197 | 55K | 16 | 17-14298 | 197 | .0001 | 650 | 17-14278 | 2 | SUPPRESSION CHORE | 25-13459 | | |
| | | | | 216 | .003 | 200 | 17-14279 | | | | | |
| | | | | 201 | .5 | 150 | 17-14285 | | | | | |
| | | | | 203 | 2 | 200 | 17-14284 | | | | | |
| | | | | 208 | 10-10MFD | 300 | 17-14297 | | | | | |
| | | | | 208 | 20MFD | 15 | | | | | | |
| | | | | 168 | .002 | 400 | 17-14234 | | | | | |

IF PEAK 455 K.C.
FREQUENCY RANGE 1575 TO 540 K.C.
NOBILT-SPARKS INDUSTRIES, INC.,
COLUMBUS, INDIANA.

ARVIN CAR RADIO CHASSIS RE-60



ARVIN MODEL 810 CAR RADIO

NOTE - ALL VOLTAGES GIVEN
FOR "A" INPUT OF 6 VOLTS.
ALLOW $\pm 10\%$ ON ALL
VOLTAGES & RESISTANCES
OF WINDING.

[illegible]

INTERMEDIATE FREQUENCY 170 K.C.
FREQUENCY RANGE 1570 TO 540 K.C.
NOBLITT-SPARKS INDUSTRIES, INC.
COLUMBUS, INDIANA.

MODEL 710
MODEL 810
Socket, Trimmers
Alignment

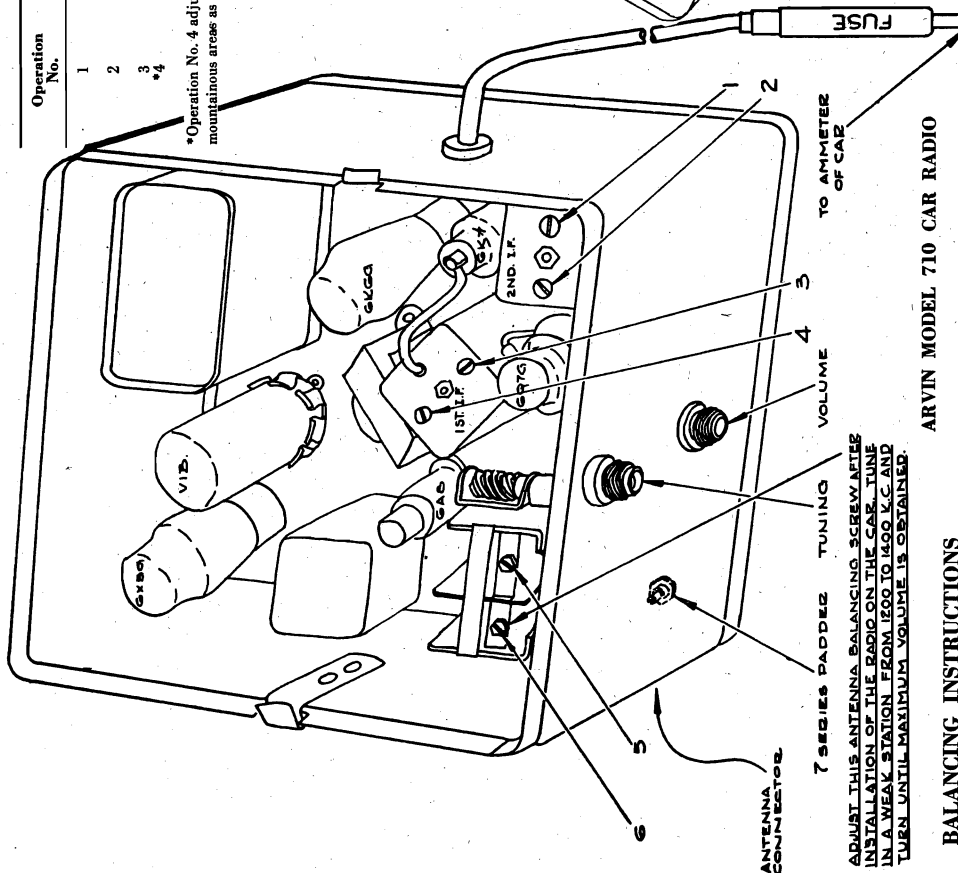
NOBLITT-SPARKS INDUSTRIES, INC.

ARVIN MODEL 810 CAR RADIO

All sensitivities given for 1 watt output equals 1.73 V. across speaker Voice Coil

| Operation No. | Connect Bal. Oscillator to | Bal. Oscillator Frequency | Adjust Padder No. | Dial Setting | Sensitivity |
|---------------|-----------------------------|---------------------------|-------------------|------------------|-------------|
| 1 | 6A8 Grid | 170 kc | 1, 2, 3 & 4 | Condenser Closed | 700 uv |
| 2 | Ant. Coupler Through 20 uuf | 1570 kc | 5 | Condenser Open | |
| 3 | Through 20 uuf | 1400 kc | 6 & 7 | 1400 kc | 5 uv |
| *4 | Through 20 uuf | 600 kc | 8 | 600 kc | 3.5 uv |

*Operation No. 4 adjusts bias on 6A8 to obtain 5 uv sensitivity; for metropolitan areas this sensitivity may be set as low as 10 uv. and in mountainous areas as high as 1 uv. to secure the most satisfactory reception.

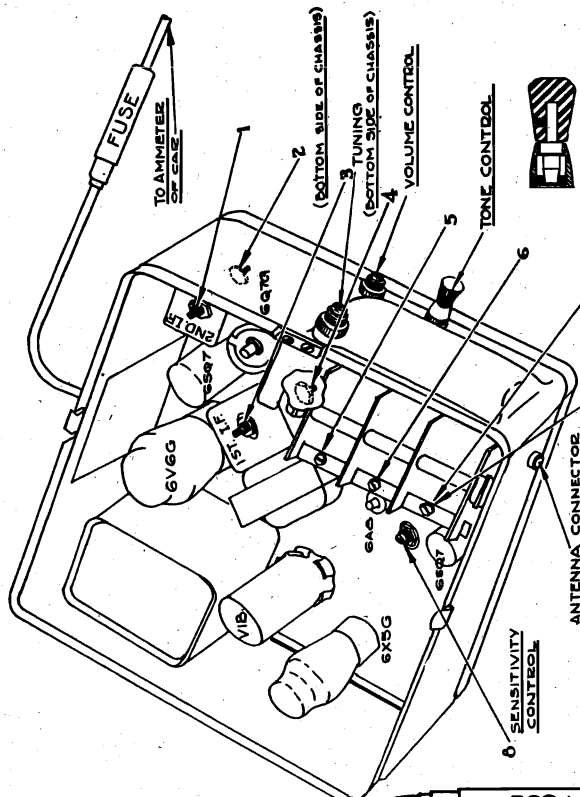


ARVIN MODEL 710 CAR RADIO

BALANCING INSTRUCTIONS

All sensitivities given for 1/2 watt output equals 1.4 V. across Voice Coil

| Operation No. | Connect Bal. Oscillator to | Bal. Oscillator Frequency | Adjust Padder No. | Dial Setting | Sensitivity |
|---------------|-----------------------------|---------------------------|-------------------|--------------|-------------|
| 1 | 6A8 Grid | 455 kc | 1, 2, 3 & 4 | 550 kc | 50 uv |
| 2 | Ant. Coupler Through 20 uuf | 1400 kc | 5 | 1400 kc | 10 uv |
| 3 | Through 20 uuf | 1400 kc | 6 | 1400 kc | 10 uv |
| 4 | Through 20 uuf | 600 kc | 7 | 600 kc | 10 uv |

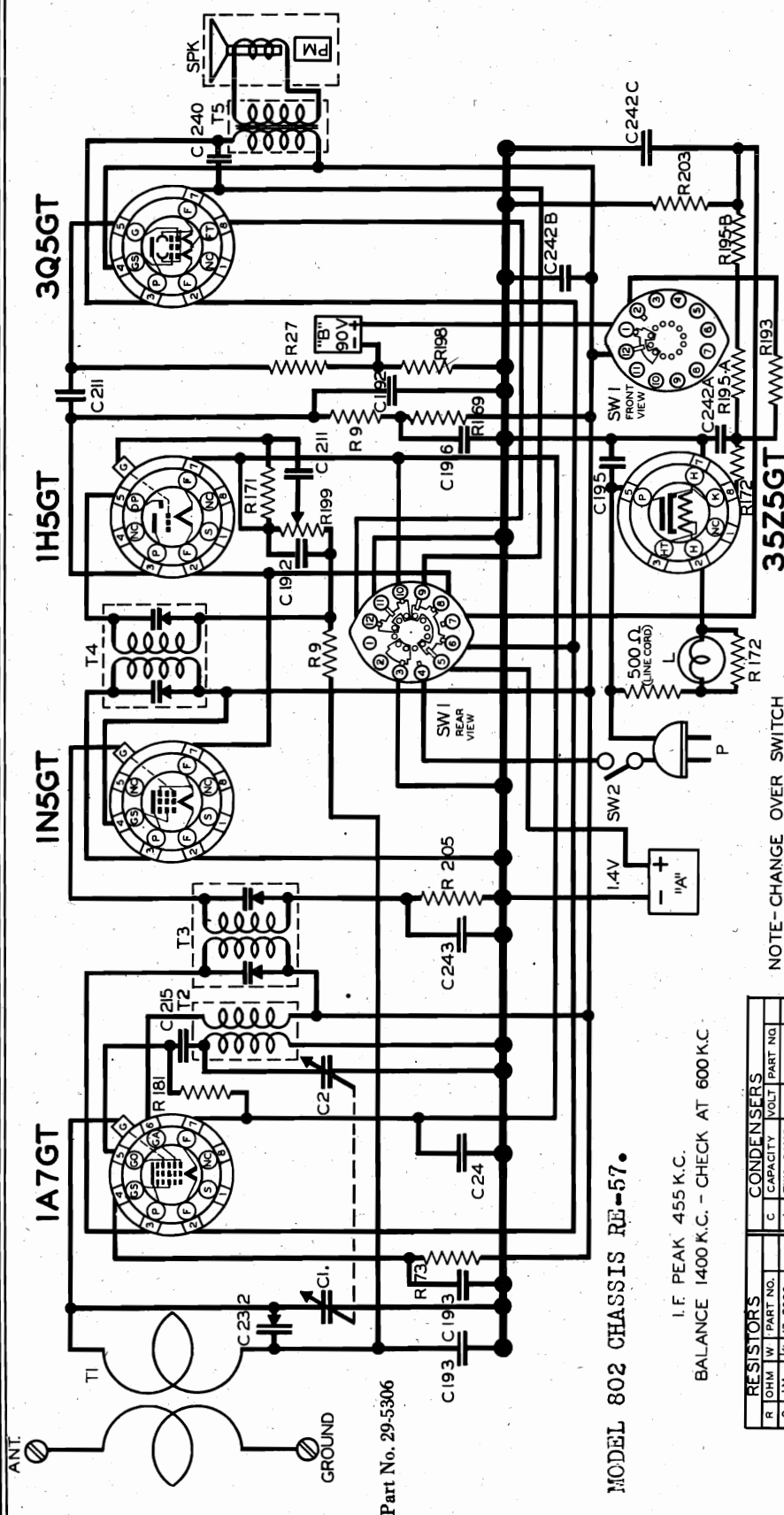


FOR ANTENNA DATA
SEE INDEX

Alignment

NOBLITT-SPARKS INDUSTRIES, INC.

MODEL 802
Chassis RE-57
Schematic,



The Arvin Model 802 is a five-tube Portable Radio Receiver designed to receive its operating power from either the self contained batteries in the receiver or a 115 volt AC or DC circuit.

All sensitivities given for 50 milliwatts output = .4 volts across Voice Coil.

BALANCING INSTRUCTIONS

NOTE- CHANGE OVER SWITCH SHOWN IN BATTERY OPERATION POSITION.

| RESISTORS | | CONDENSERS | |
|-----------|---------------------|------------|------------------------|
| R | OHM W PART NO. | C | CAPACITY VOLT PART NO. |
| 9 | 1M 1/4 17-2080 | 1 | TWO-GANG 17-16411 |
| 27 | 2M 1/4 17-4768 | 2 | VARIABLE 600 17-14273 |
| 73 | 30K 1/4 17-4278 | 192 | .00025 200 17-14273 |
| 169 | 150K 1/4 17-14282 | 193 | .05 200 17-14274 |
| 171 | 15M 1/4 17-14288 | 195 | .05 400 17-14276 |
| 172 | 100 1/4 17-14289 | 196 | .1 200 17-14277 |
| 181 | 100K 1/4 17-14303 | 211 | .01 200 17-14306 |
| 194 | 460 2 1/4 17-14351 | 215 | .0001 200 17-14310 |
| 195 | 1500 5 1/4 17-14343 | 241 | .5 200 17-14340A |
| 199 | 1M 1/4 17-14350 | 232 | 2-20 UF PAD 17-14335 |
| 203 | 450 1/4 17-14354 | 240 | .003 400 17-14348 |
| 193 | 2K 1/4 17-14337 | 242A | .40 150 17-14348 |
| 205 | 3M 1/4 17-14356 | 242B | .20 150 17-14353 |
| | | 242C | .100 25 17-14354 |
| | | 243 | .002 200 17-14357 |

TRANSFORMERS

| T | TYPE | SYMBOL | DESCRIPTION | PART NO. |
|---|------------------|--------|--|----------|
| 1 | ANTENNA LOOP | A | 1.5 VOLT "A" BATTERY | 17-16551 |
| 2 | OSCILLATOR COIL | B | TWO 45 VOLT "B" BATTERIES | 17-16563 |
| 3 | FIRST I.F. | L | DIAL LIGHT BULB - MAZDA 47 | 17-16578 |
| 4 | SECOND I.F. COIL | P | LINE CORD & PLUG ASSEMBLY | 17-16579 |
| 5 | OUTPUT TRANS. | SPK | SPEAKER ASSEMBLY - 5" PERMANENT MAGNET | 17-16582 |
| | | SW1 | AC DC - BATTERY SWITCH | 17-16584 |
| | | SW2 | VOLUME CONTROL & LINE SWITCH | 17-14350 |

| Operation No. | Connect Bal. Oscillator to | Balance Oscillator Frequency | Adjust | Dial Setting |
|---------------|----------------------------|------------------------------|--------------------------|--------------|
| 1 | 1A7 Grid | 455 kc | 1st & 2nd I. F. Trimmers | 550 kc |
| 2 | Ant Post Through 20 uuf | 1400 kc | Osc. Trimmer | 1400 kc |
| 3 | Ant Post Through 20 uuf | 1400 kc | Ant Trimmer | 1400 kc |

MODEL 802 CHASSIS RE-57.

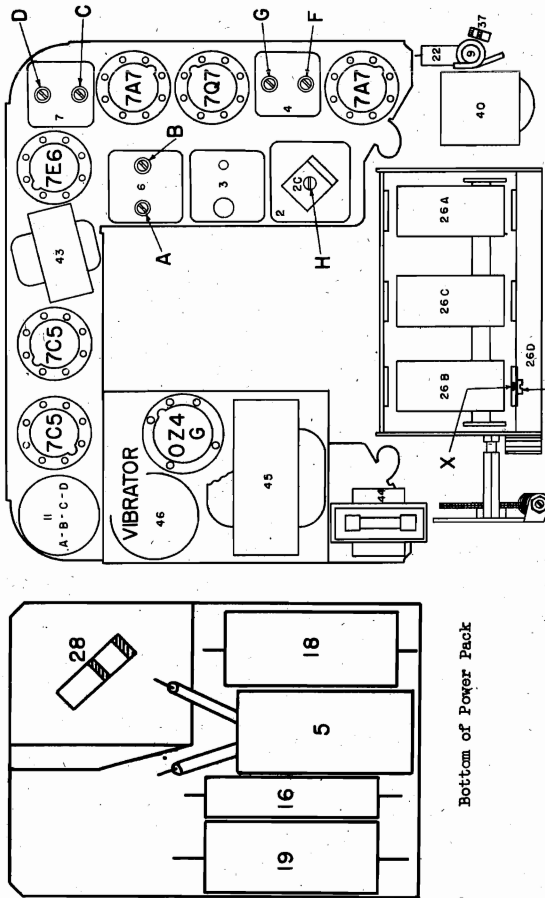
I.F. PEAK 455 K.C.
BALANCE 1400 K.C. - CHECK AT 600 K.C.

Part No. 29-5306

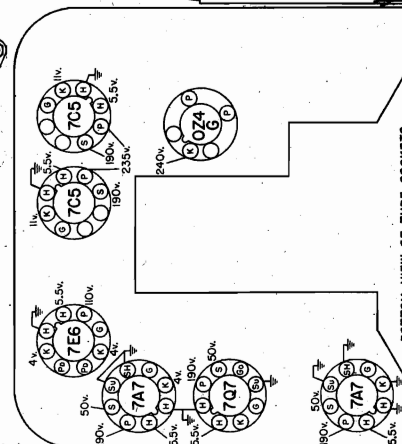
MODEL 982160
Alignment, Trimmers
Chassis, Voltage

OLDSMOBILE DIV—GEN. MOTORS

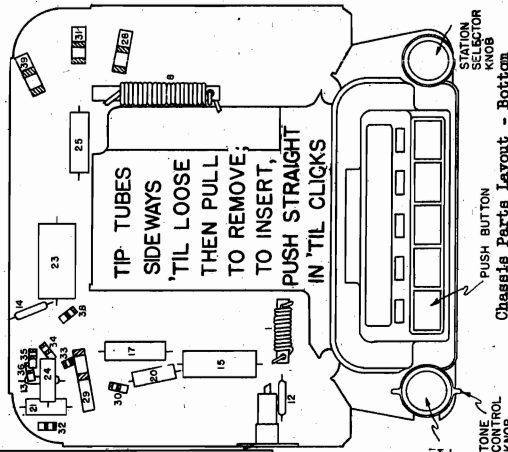
Olds Model 982160
 Date: 1-12-40



Chassis Parts Layout - Top



Bottom of Power Pack



Chassis Parts Layout - Bottom

BOTTOM VIEW OF TUBE SOCKETS
 READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT; "A" BATTERY 6.0 VOLTS, CURRENT DRAIN 6.5 AMPERES, "B" SUPPLY DRAIN APPROXIMATELY 50 M.A.

| RADIO DATA | |
|-----------------------|------------------------------------|
| MODEL NUMBER | 982160 |
| SERIAL NUMBER | 580 C001 & UP |
| TUBE COMPLEMENT | 7A7, 7C7, 7A7, 7E6, 7C5, 7C6, 024G |
| BATTERY CURRENT | 6.5 AMPERES |
| VIBRATOR TYPE | NON SYNCHRONOUS |
| VOLUME CONTROL KNOB | |
| TONE CONTROL KNOB | |
| PUSH BUTTON | |
| STATION SELECTOR KNOB | |

8+ VOLTS - 240
 I.F. K.C. - 260
 R.F. K.C. - 1520 - 540

- CIRCUIT ALIGNMENT**
1. **1520 Kc.**
 - (a) Turn volume control to the maximum position.
 - (b) Connect the signal lead of the test oscillator to terminal X which is the grid prong of the 7Q7 tube through a .1 mfd. condenser.
 - (c) Connect the ground lead of the test oscillator to the chassis frame.
 - (d) Connect the output meter across the speaker voice coil at the terminal board mounted on the speaker.
 - (e) Set the test oscillator to exactly 260 kilocycles.
 - (f) Adjust trimmers "A", "B", "C" and "D" on the I-F transformers for maximum output.
 2. **1520 Kc.**
 - (a) Leave the test oscillator leads connected as for aligning the I-F circuits.
 - (b) Turn the rotor plates of the gang condenser all the way out and align the high frequency stop.
 - (c) Set the test oscillator to 1520 kilocycles.
 - (d) Adjust the condenser "F" (Fig. 2) for maximum output. (It is very important that this frequency be set accurately as a slightly improper setting will cause the receiver to be out of track over the high frequency end of the dial).
 3. **1400 Kc.**
 - (a) Leave the test oscillator leads connected the same as before.
 - (b) Turn the rotor plates of the gang condenser all the way into mesh so that they rest against the low frequency stop.
 - (c) Set the test oscillator to 540 kilocycles.
 - (d) Adjust the oscillator padding condenser "G" (Fig. 2) for maximum output. (This adjustment sets the low frequency tuning range of the receiver to 540 K.C.).
 4. **1400 Kc.**
 - (a) Remove the signal lead of the test oscillator from the grid terminal of the 7Q7 tube (Terminal marked X, Fig. 2) and connect to the antenna receptacle of the receiver THROUGH a .00007 mfd. MICA CONDENSER connected in place of the .1 mfd. condenser previously used. (It is very important that a .00007 mfd. mica condenser be used when aligning the antenna stage of this receiver in order that the circuit can be made to track properly.)
 - (b) Set the test oscillator to 1400 kilocycles.
 - (c) Turn the condenser rotor plates until this frequency is tuned in with maximum output.
 - (d) Adjust the R-F parallel trimmer "E" (Fig. 2) on the gang condenser and the antenna compensating condenser "H".
 5. **500 Kc.**
 - (a) Set the test oscillator at 600 K.C.
 - (b) Adjust the condenser rotor plates until the signal from the test oscillator or is tuned in with maximum output.
 - (c) Maintain a low output signal from the test oscillator and readjust the oscillator tracking condenser "G" (Fig. 2) while rocking the variable condenser gang tuning shaft back and forth through the signal.
 - (d) This operation should be continued until no further increase in output can be obtained.
 6. **Adjusting Receiver to Car Antenna.**

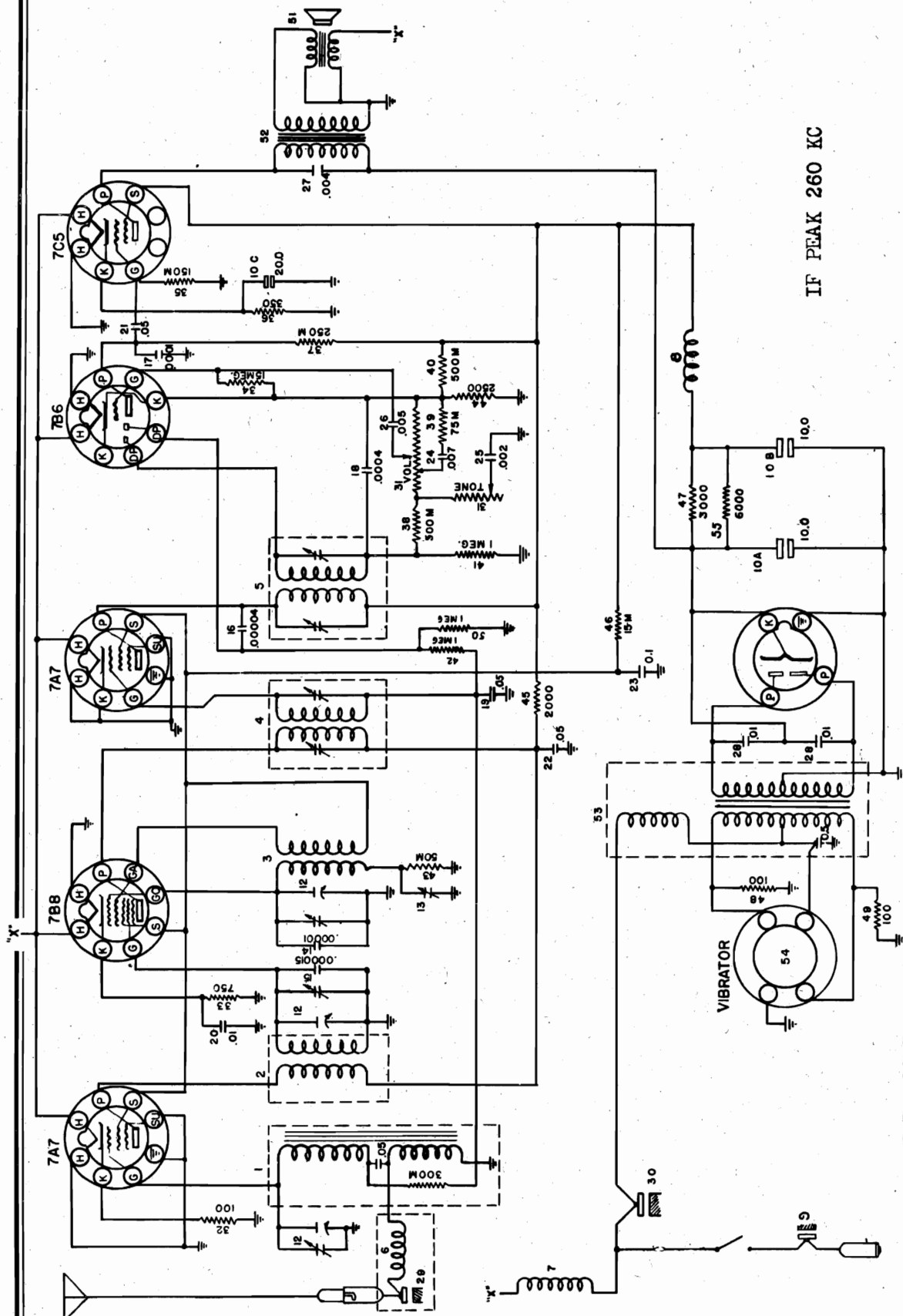
When the receiver leaves the factory the antenna circuit is closely aligned to match the capacity of the car antenna. However, due to variations in antenna capacity, it will be necessary with set installed in car, to adjust the antenna trimmer to match the car antenna. This should be done as follows:

 - (a) Make sure antenna lead is connected properly.
 - (b) Be sure the antenna is fully extended (all the way out).
 - (c) Turn set on and tune in a very weak station between 120 and 150 (near 150). Adjust the antenna trimmer "F" for maximum volume. Do not disturb the oscillator or the R-F trimmers in making this adjustment.

NOTE: If the entire alignment procedure has been accomplished accurately, the receiver should be very nearly uniformly sensitive over the entire frequency range.

OLDSMOBILE DIV.—GEN. MOTORS

MODEL 982161
Schematic



IF PEAK 260 KC

TUBE COMPLEMENT

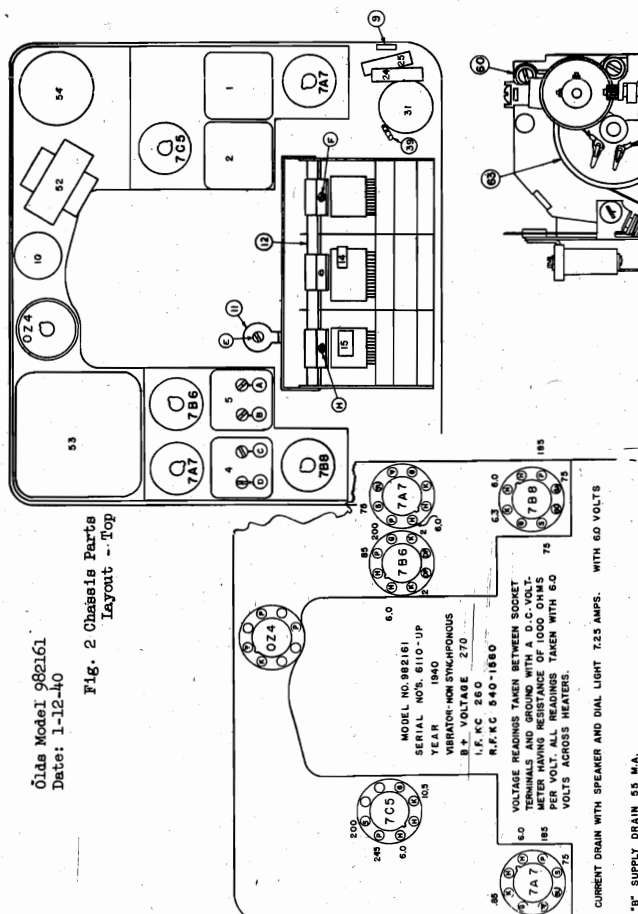
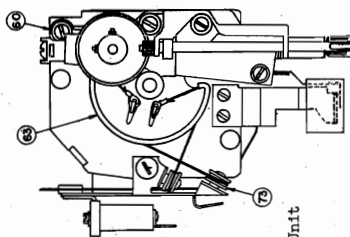
| Type | Function | Type | Function |
|------|----------------------|------|------------------------|
| 7A7 | R-F Amplifier | 7B6 | Detector AVC 1st Audio |
| 7B7 | Oscillator Modulator | 7C5 | Audio Power Output |
| 7A7 | I-F Amplifier | OZ4 | Rectifier |

Olds Model 982161
Date: 1-12-40

MODEL 982161

Alignment, Trimmers
Chassis, Voltage

OLDSMOBILE DIV.—GEN. MOTORS

Fig. 2 Chassis Parts
Layout - Top

Tuning Control Unit

Fig. 4 Chassis Tube Voltage Chart

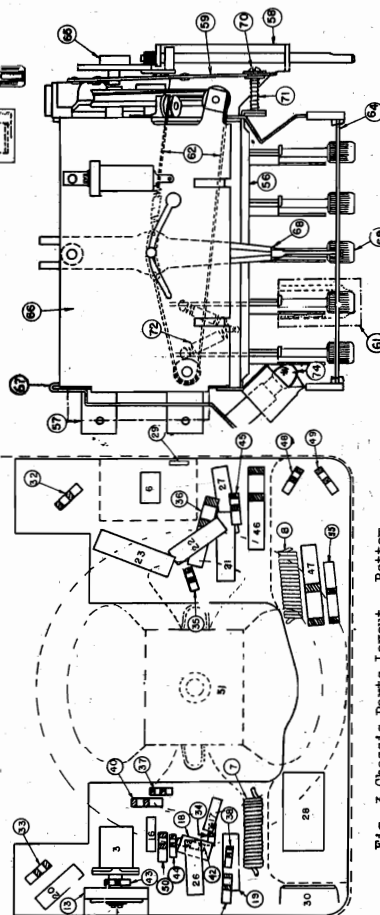


Fig. 3 Chassis Parts Layout - Bottom

CIRCUIT ALIGNMENT

An accurately calibrated test oscillator or signal generator and an output meter must be used to align the receiver circuits correctly. To make all alignment adjustments, the back cover must be removed. All trimmers except the oscillator series trimmer are readily accessible (See "A", "B", "C", "D", "E", "F", "G", "H", "I", "J", "K", "L", "M", "N", "O", "P", "Q", "R", "S", "T", "U", "V", "W", "X", "Y", "Z", Fig. 2). The oscillator series trimmer ("J2" Fig. 3) is adjusted through a hole in the side of the case.

1. I-F Alignment at 260 Kilocycles.

- Connect an output meter across the speaker field coil, leaving speaker connected.
- Connect the signal lead of the test oscillator to the gang condenser terminal to which condenser No. 15 is connected (Fig. 2).
- With the test oscillator set at exactly 260 K.C. adjust the I-F trimmers "A", "B", "C", and "D" until a maximum output is obtained. Re-check alignment several times with oscillator output signal low as possible for suitable output readings.

2. Alignment at 1560 Kilocycles.

- Connect the test lead of the test oscillator to the receiver antenna connection through a .00005 mfd. condenser.
- Turn the rotor plates of the gang condenser all the way out against the high frequency stop.
- Set the test oscillator to 1560 K.C.
- Adjust the oscillator trimmer "E" (Fig. 2) until a maximum output is obtained.

3. Alignment at 1400 Kilocycles.

- Leave the test oscillator leads connected the same as for alignment at 1560 Kilocycles. Set the test oscillator frequency at 1400 Kilocycles.
- Tune the set to this signal.
- Adjust the R-F trimmer "F" and the antenna trimmer "J" (Fig. 2) for maximum output.

4. Alignment at 600 Kilocycles.

- Leave the test oscillator leads connected the same as for alignment at 1400 K.C. Set the test oscillator frequency at 600 K.C.
- Tune set to this signal.
- Adjust the oscillator series trimmer "J" (Fig. 3) through the side of the case for maximum output, while rocking the tuning dial back and forth through the signal.

5. Realignment at 1560 and 1400 Kilocycles.

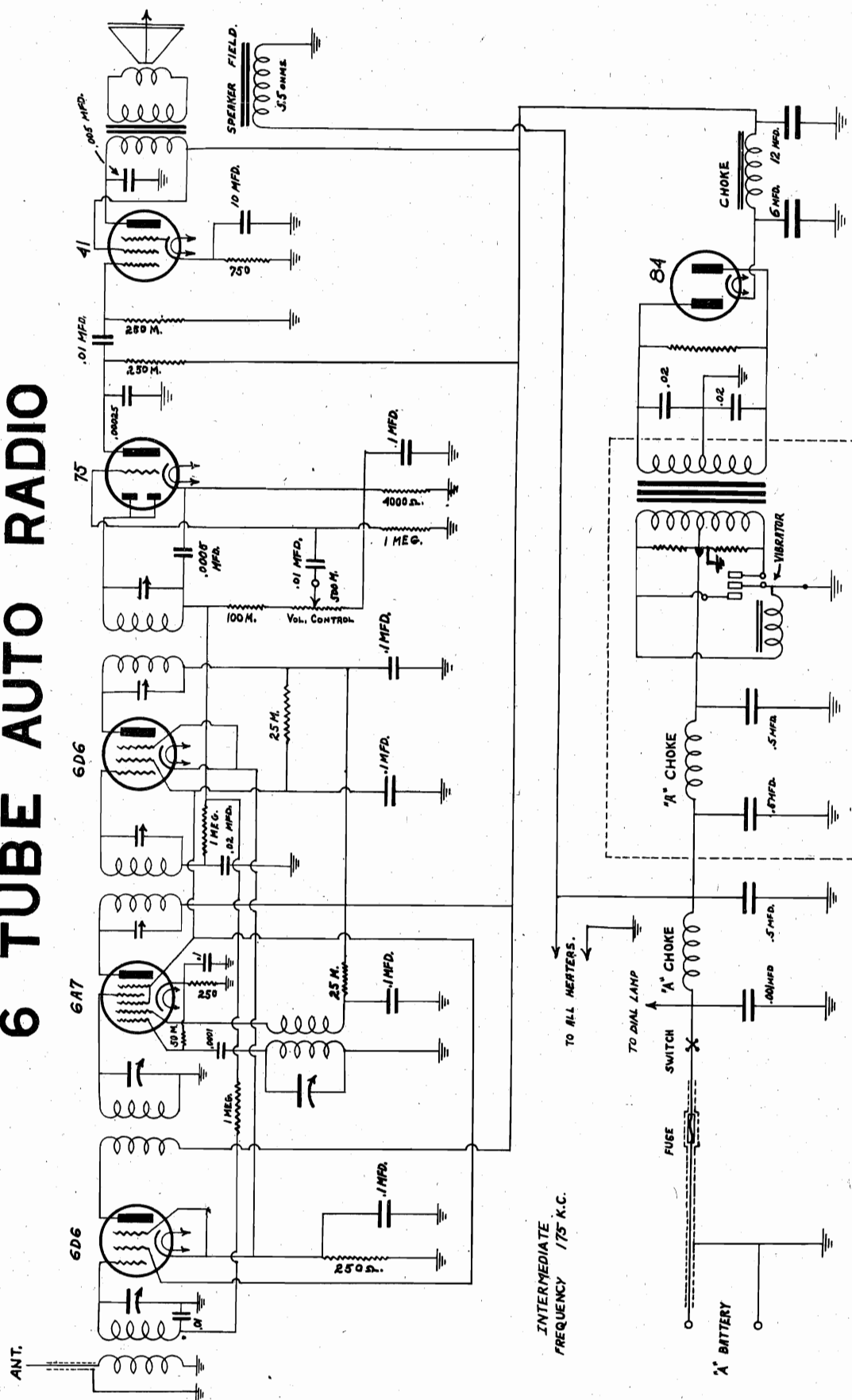
Repeat alignment of R-F and antenna sections of the gang condenser as outlined under paragraphs 2 and 3.

6. Adjusting Receiver to Car Antenna.

When the receiver leaves the factory the antenna circuit is closely aligned to match the capacity of the car antenna. However, due to variations in antenna capacity, it will be necessary with set installed in car, to adjust the antenna trimmer to match the car antenna. This should be done as follows:

- Make sure antenna lead is connected properly.
- Be sure the antenna is fully extended (all the way out).
- Turn set on and tune in a very weak station between 120 and 150 (near 150). Adjust the antenna trimmer "J" for maximum volume. Do not disturb the oscillator or the R-F trimmers in making this adjustment.

6 TUBE AUTO RADIO



| | | |
|---------------------|---------------------|---------------|
| APP. BY <i>Long</i> | DR. BY W | APRIL 1, 1935 |
| ENGINEERING | | DEPARTMENT |

IF PEAK 465 KC

5-6V.

DATE 8-3-55-57
DRAWN BY H.H.
CHECKED BY
APPROVED BY

The diagram illustrates the internal layout of a radio chassis. Key components and their connections are as follows:

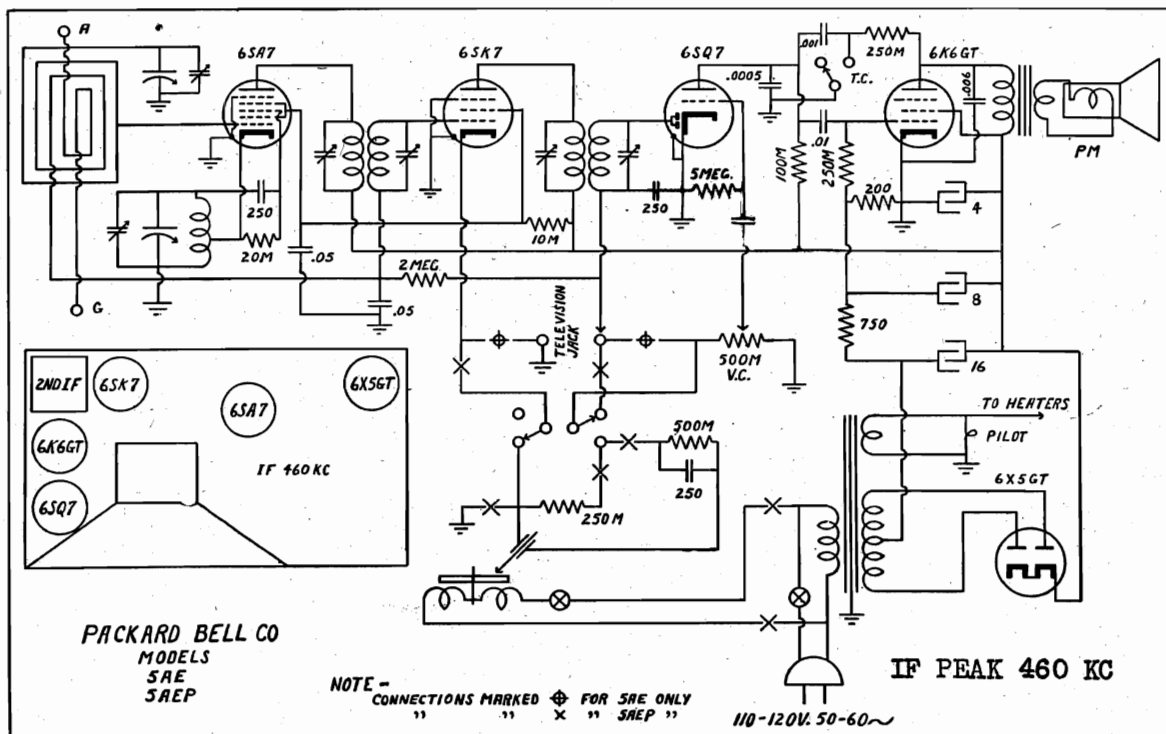
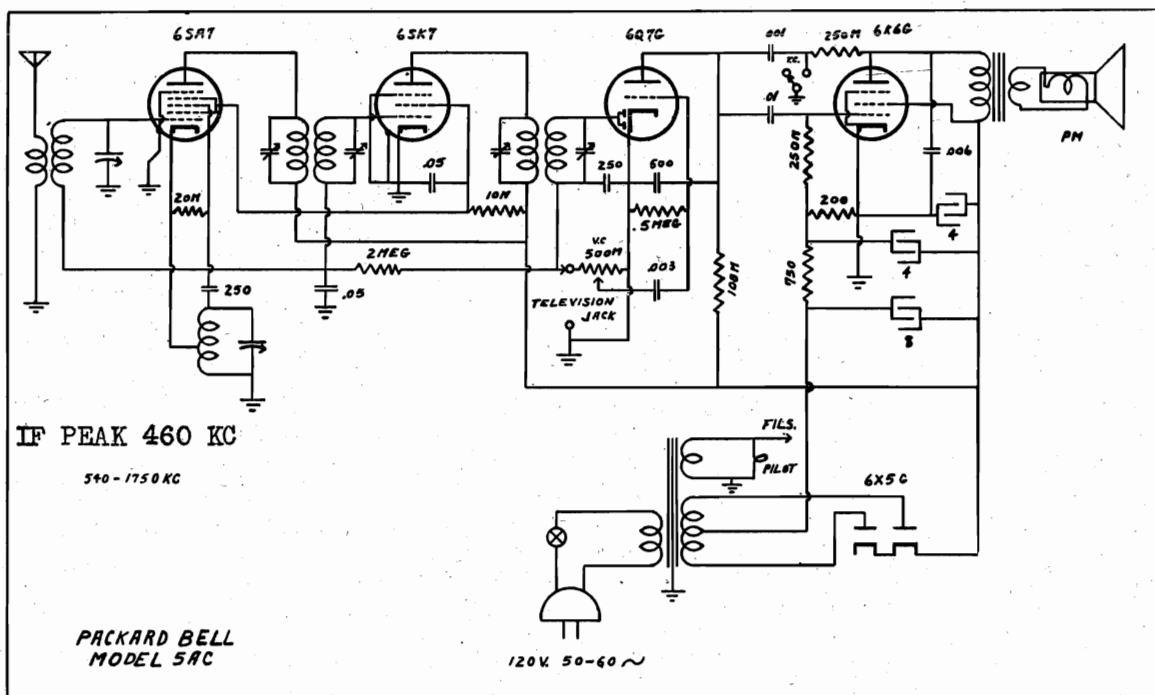
- Vacuum Tubes:**
 - 6Z5:** Located at the top left, connected to the **RED A+** and **BLACK A-** power supply rails.
 - 677:** Positioned below the 6Z5, connected to the **RED ANT.** and **BLACK GROUND** lines.
 - 6AB:** Located in the center, connected to the **ANT. TRIMMER** and **OSC. TRIMMER**.
 - 657:** Positioned at the top right, connected to the **ANT. COIL**.
- Power Supply:**
 - TRANSFORMER:** A large rectangular component at the bottom left.
 - FILTER CHOKE:** A cylindrical component connected to the transformer.
 - 62Y5:** A small tube at the bottom left, connected to the filter choke.
- Other Components:**
 - VIBRATOR:** A circular component connected to the 6Z5.
 - 41:** A circular component connected to the 677.
 - 225 IF TRANS:** A component connected to the 677.
 - TUNING COND.:** A variable capacitor connected to the 6AB.
 - ANT. TRIMMER:** A trimmer connected to the 6AB.
 - OSC. TRIMMER:** A trimmer connected to the 6AB.
 - ANT. COIL:** A coil connected to the 657.
- Connections:**
 - RED A+ / BLACK A-:** Power supply rails at the bottom.
 - RED ANT. / BLACK GROUND:** Antenna connections at the top.
 - BROADCAST PRODDER:** A connection point at the top.
 - ELECTROSTATIC COND.:** A connection point between the 677 and 6AB.

INTERMEDIATE FREQUENCY: Set oscillator to 465 KC. Feed this to the grid of the pentagrid (6A7) converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

BROADCAST BAND: Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Reset the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the *broadcast padding* condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

PACKARD BELL CO.

MODEL 5AC
Schematic
MODELS 5AE, 5AEP
Schematic, Socket

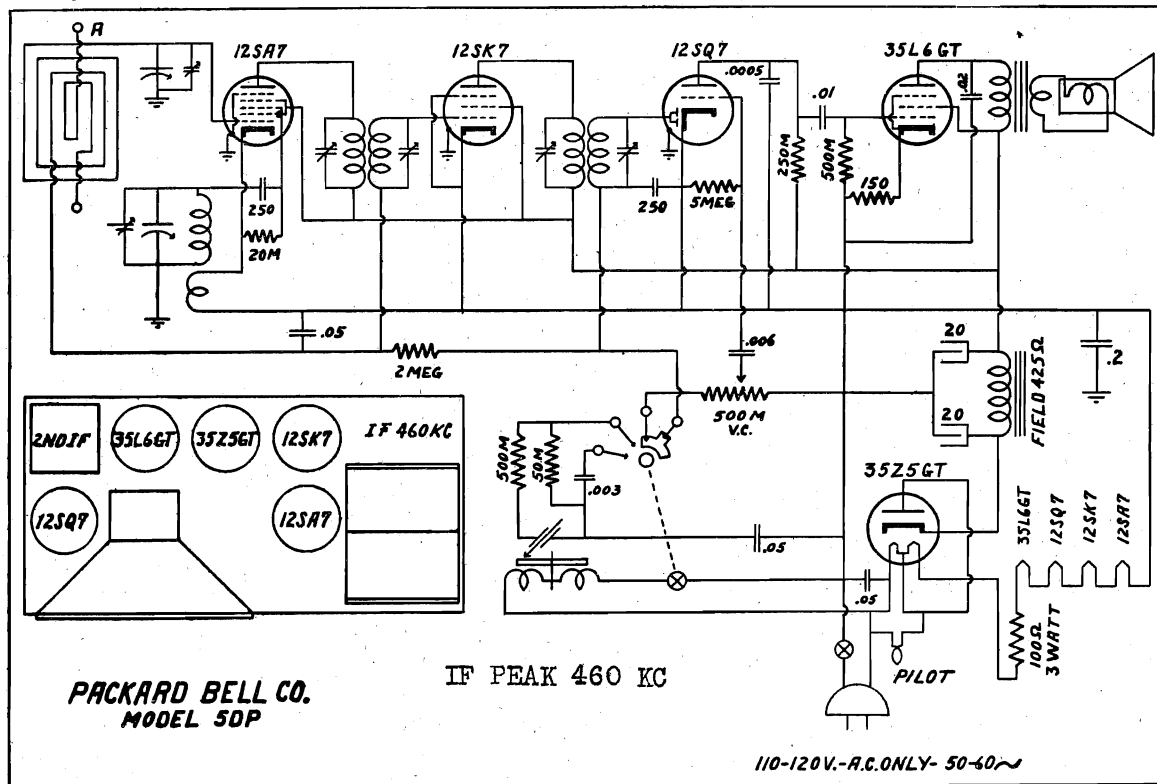
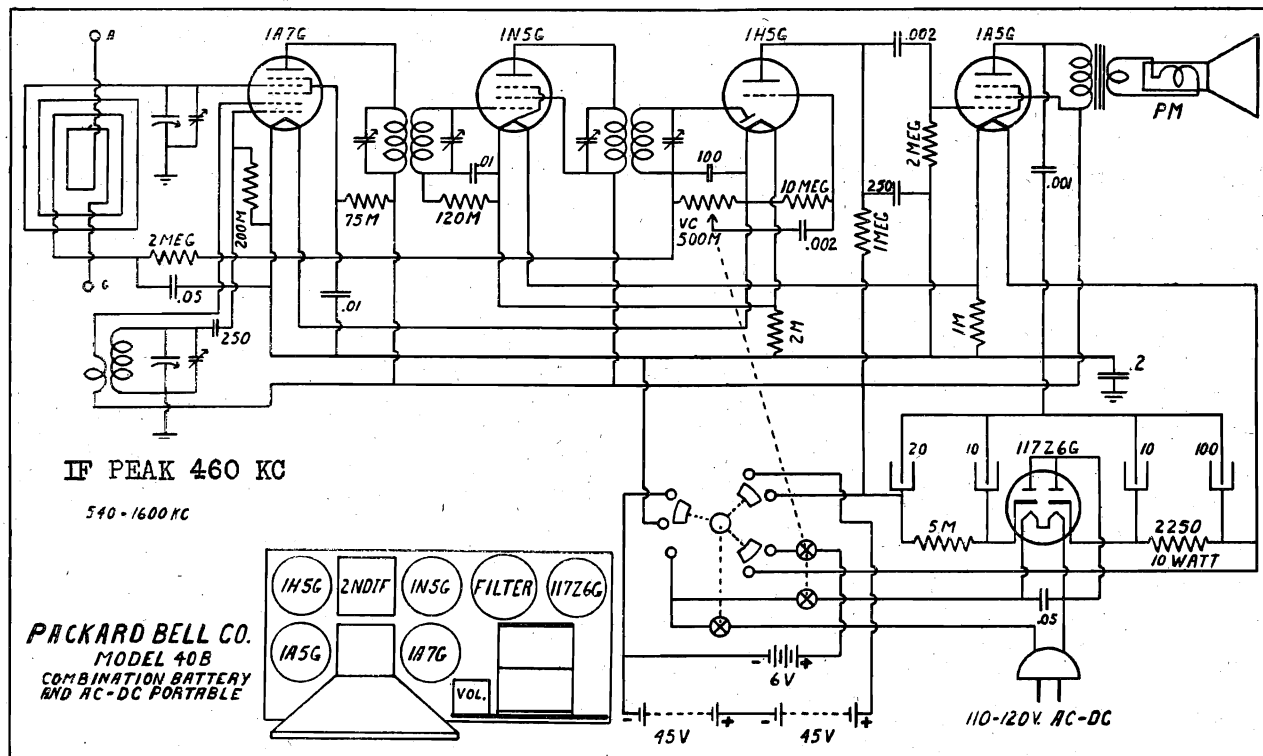


MODEL 40B

MODEL 50P

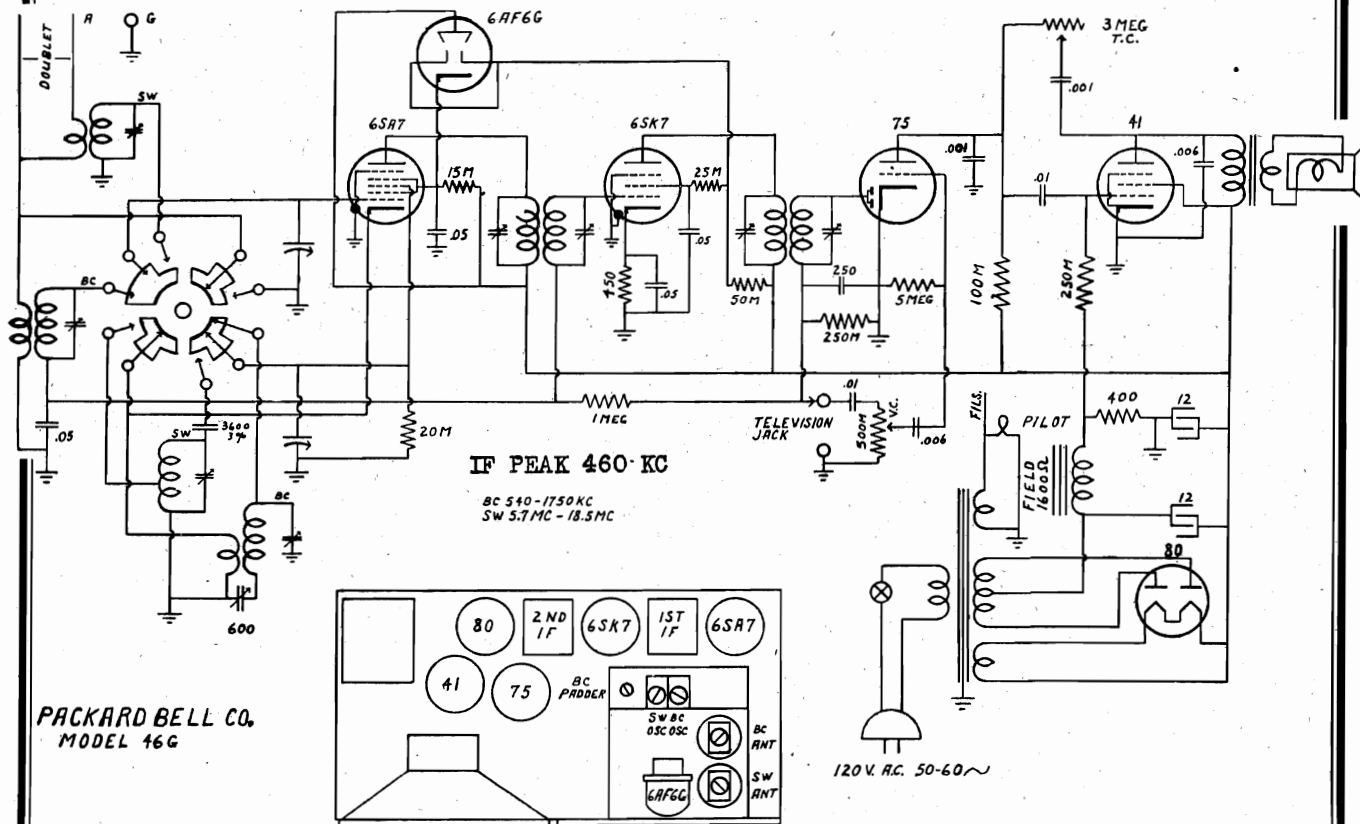
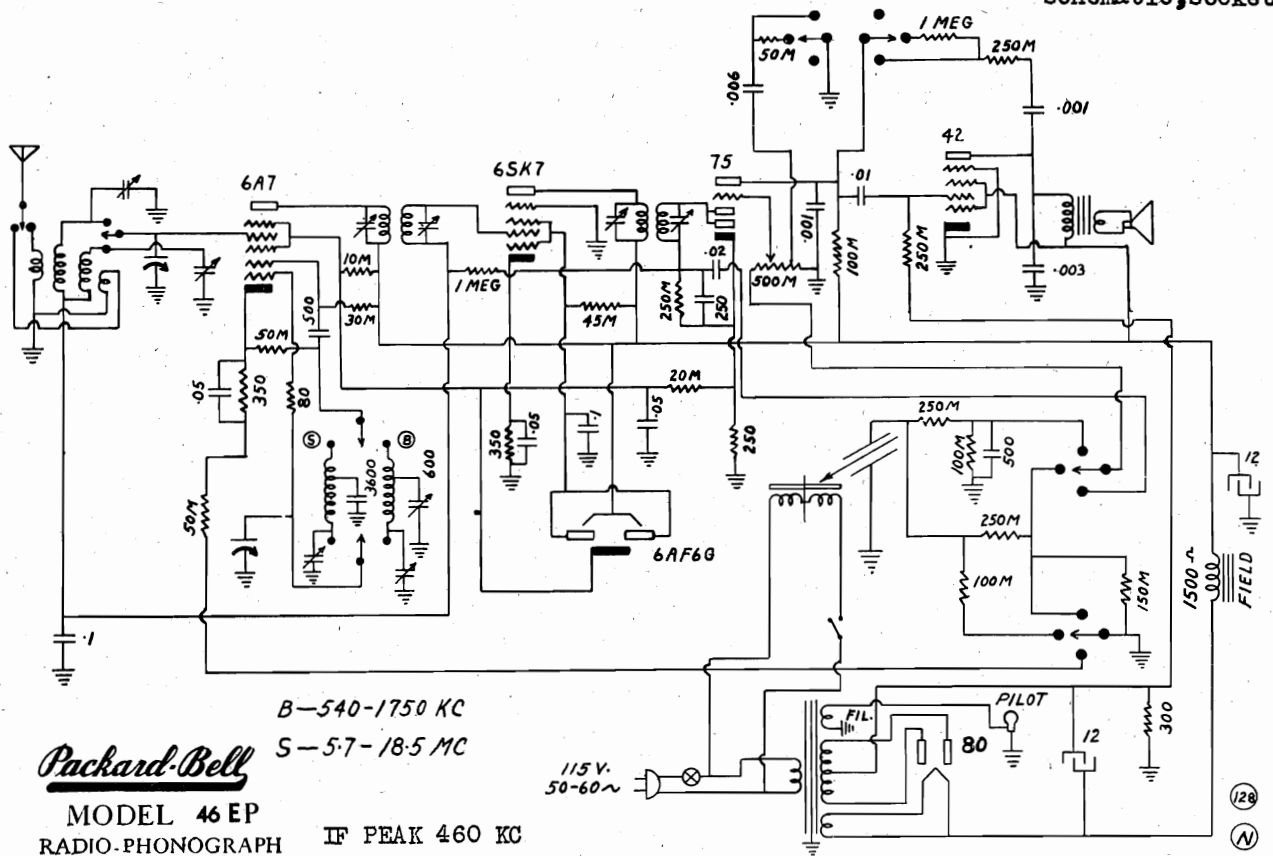
Schematics, Socket

PACKARD BELL CO.



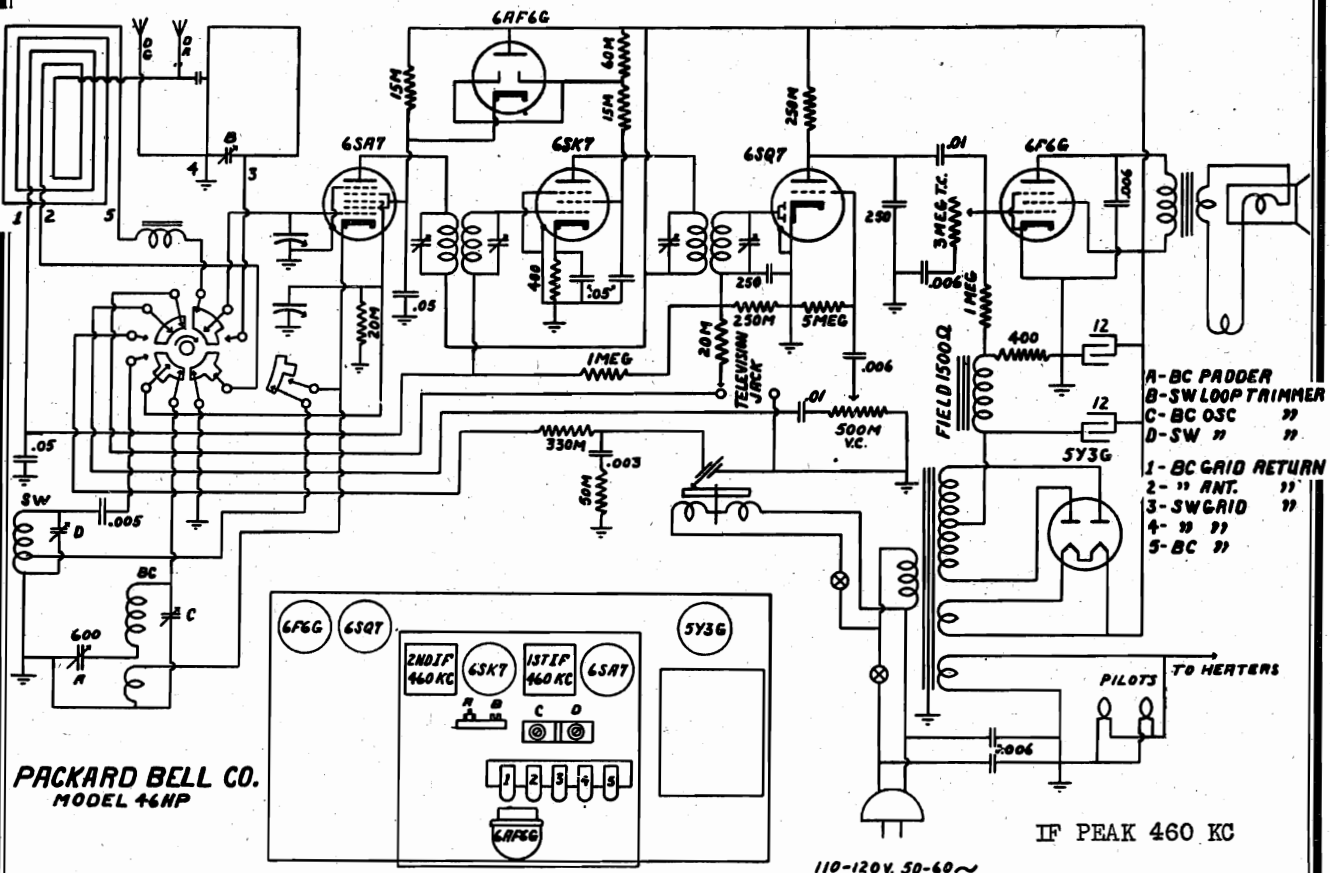
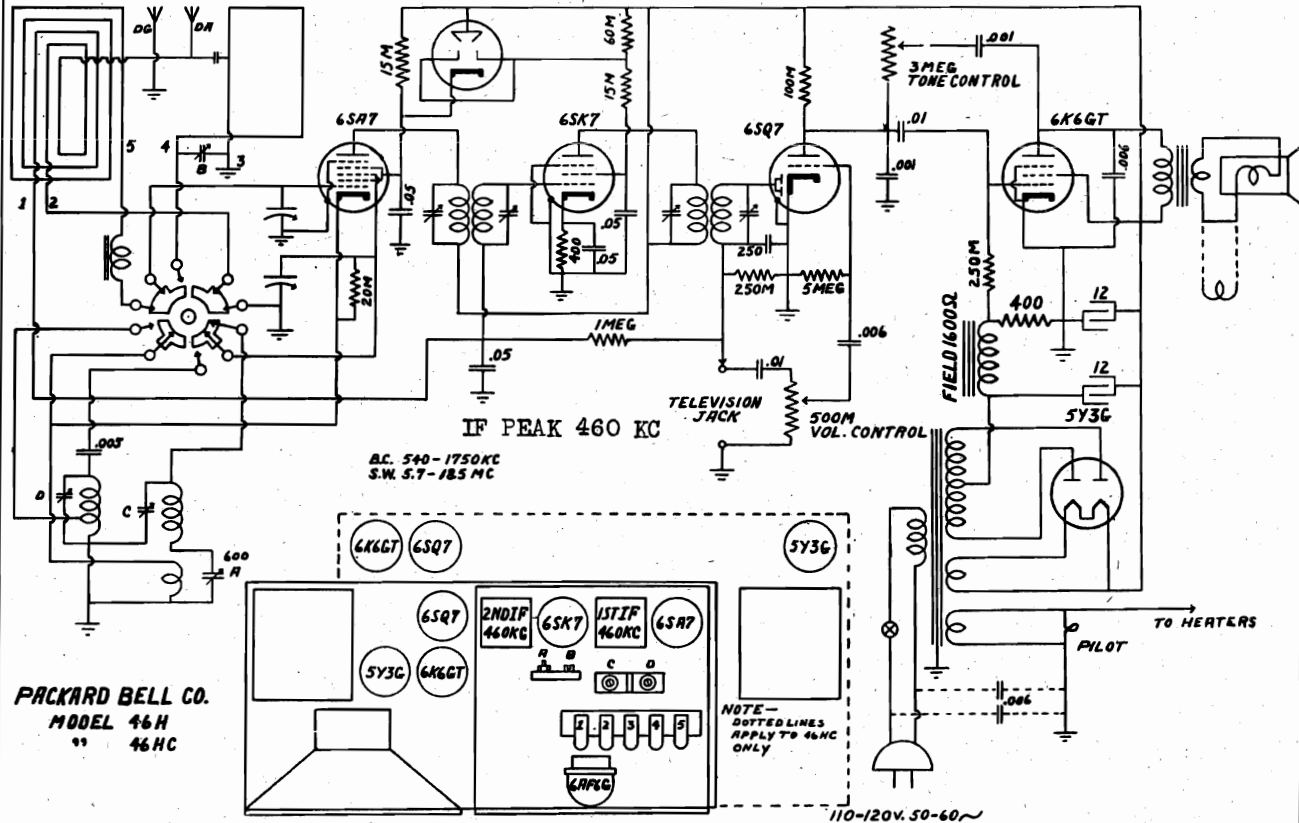
PACKARD BELL CO.

MODEL 46EP
Schematic
MODEL 46G
Schematic, Socket



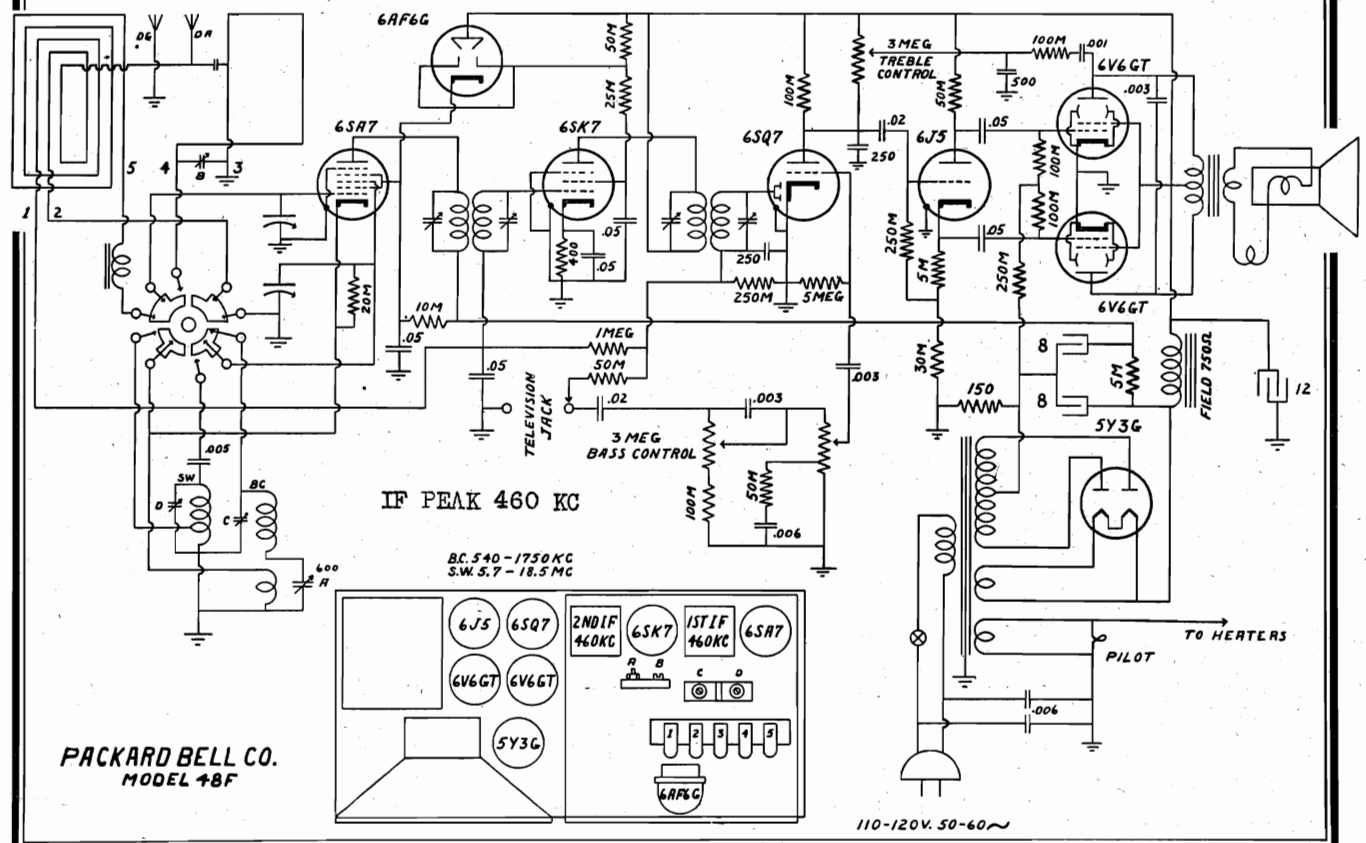
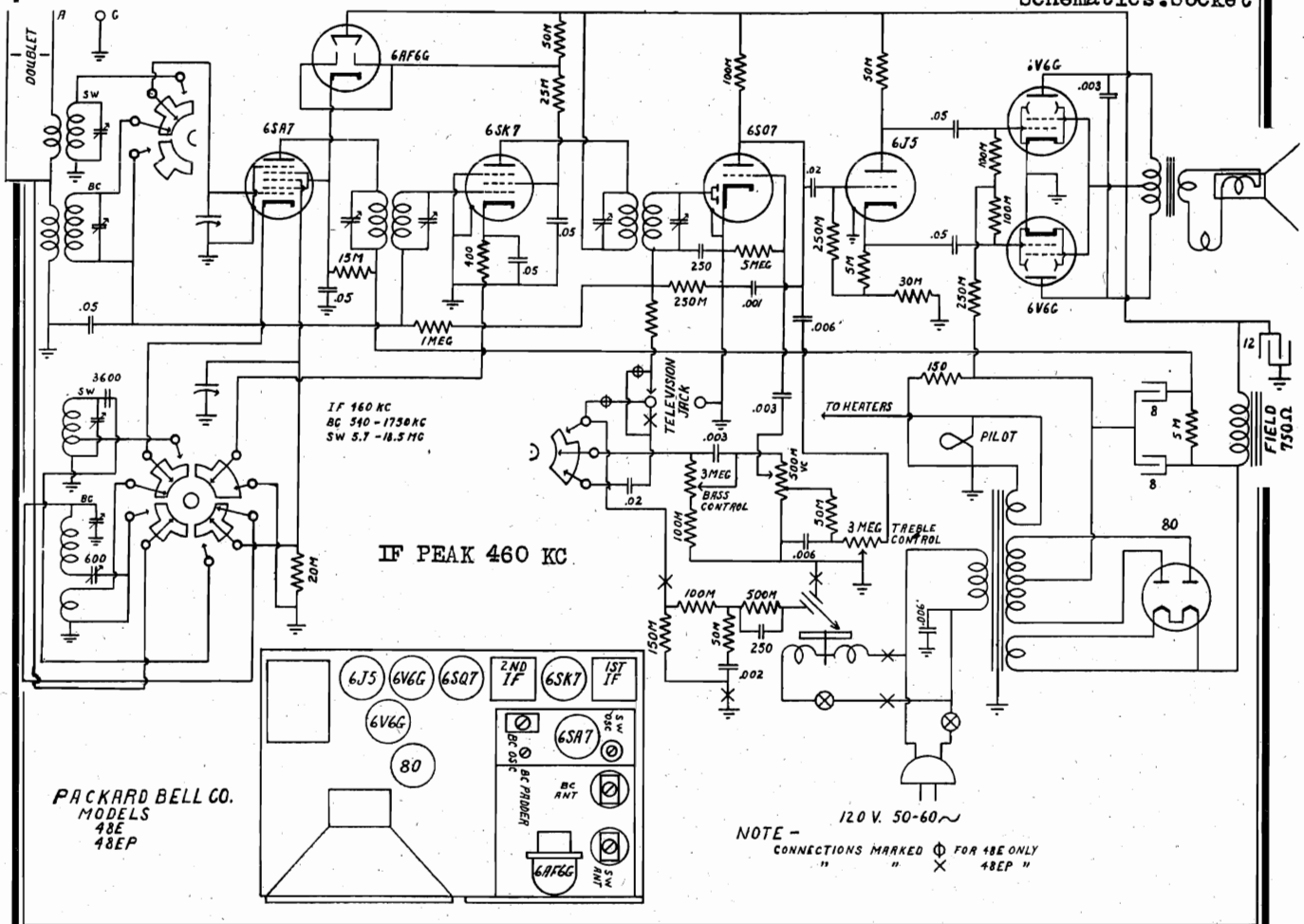
MODELS 46H, 46HC
MODEL 46HP
Schematics, Socket

PACKARD BELL CO.



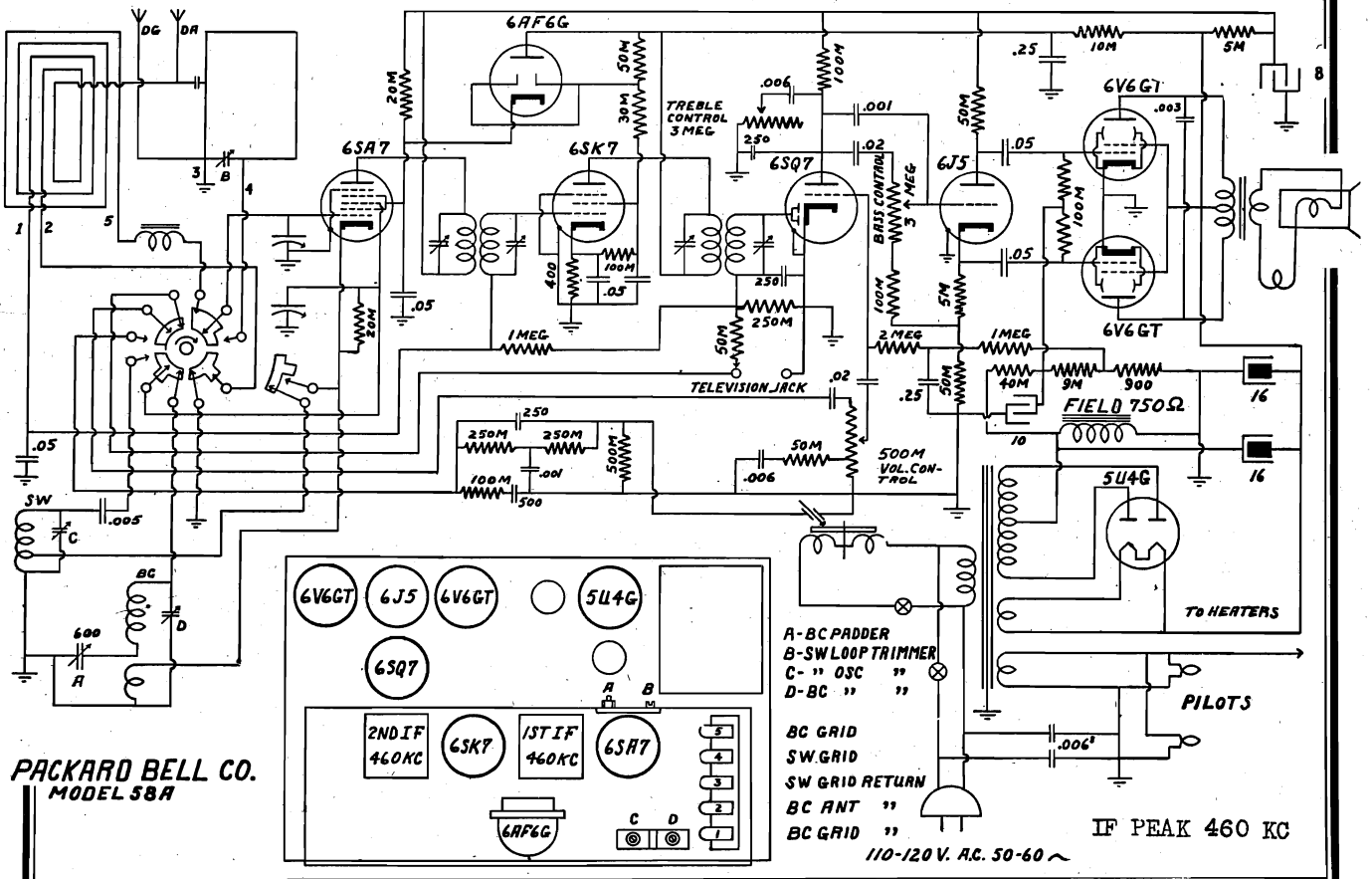
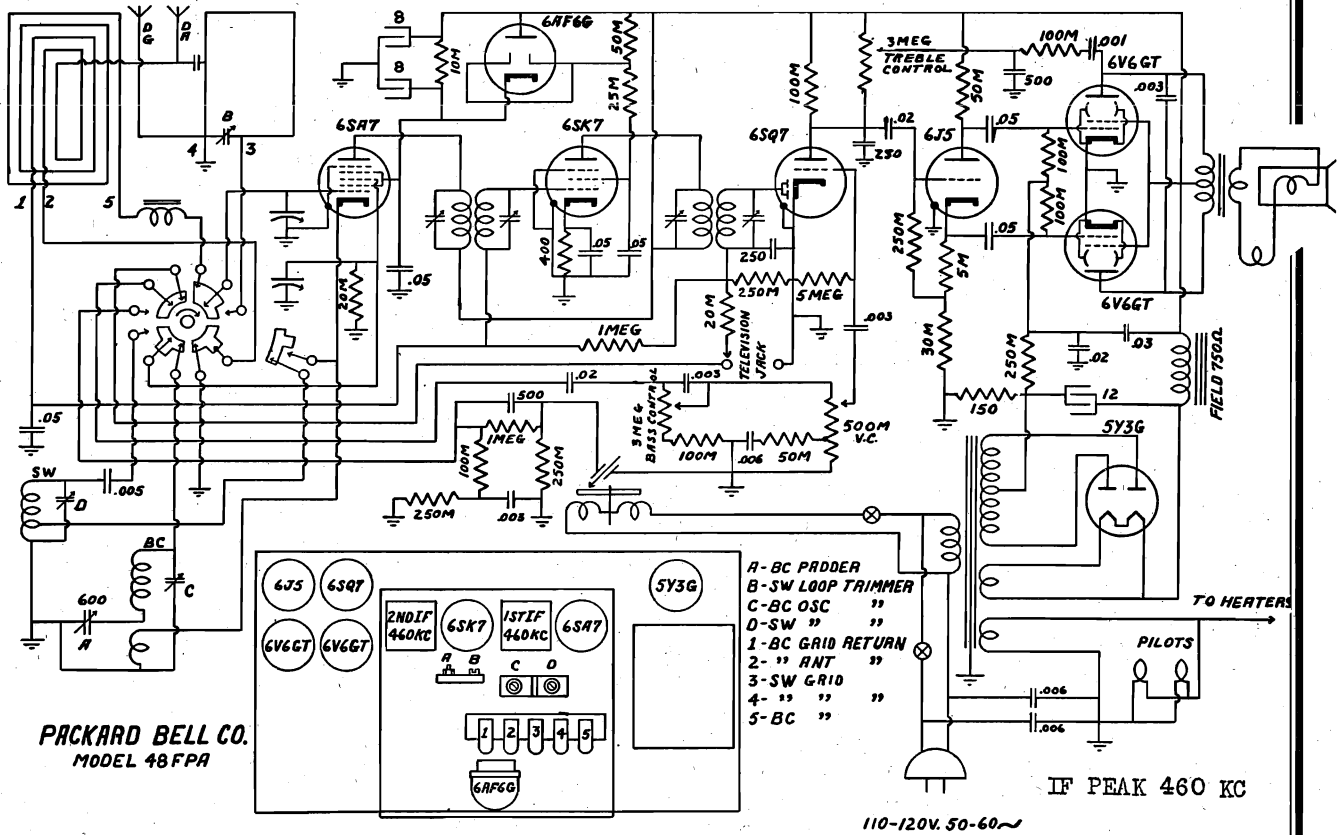
PACKARD BELL CO.

MODELS 48E, 48EP
MODEL 48F
Schematics. Socket



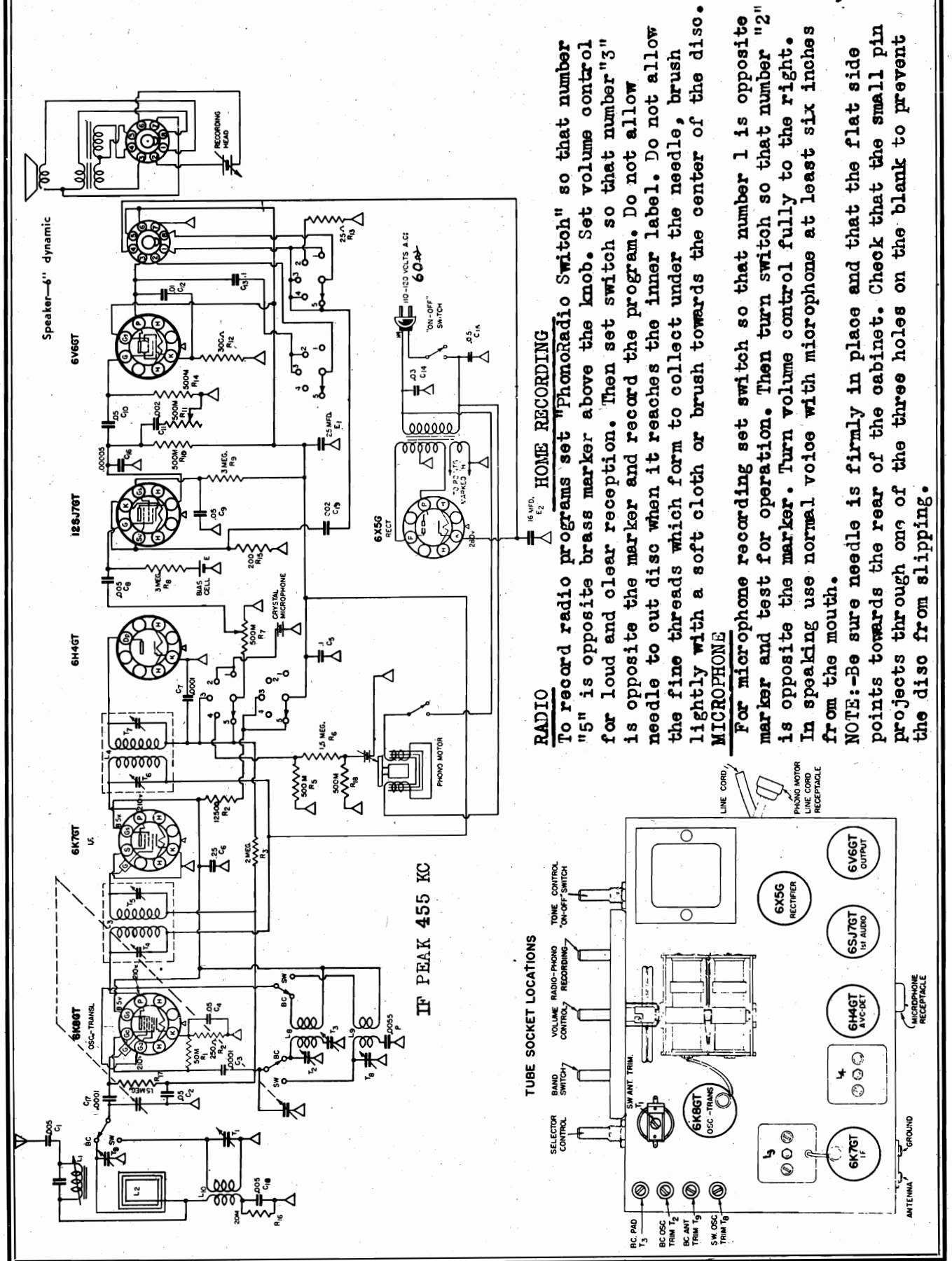
MODEL 48FPA
MODEL 58A
Schematics, Socket

PACKARD BELL CO.



MODELS P5, 500P
Schematic, Socket
Trimmers, Notes

PATHE



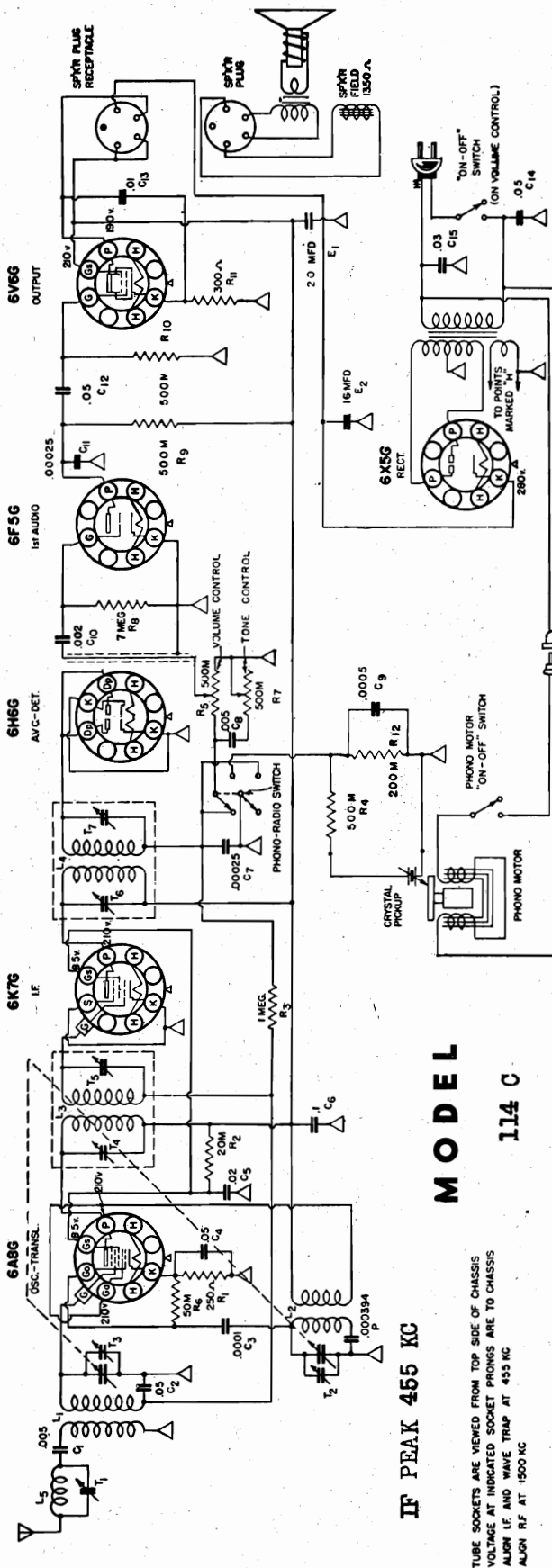
RADIO
To record radio programs set "PhonoRadio Switch" so that number "5" is opposite brass marker above the knob. Set volume control for loud and clear reception. Then set switch so that number "3" is opposite the marker and record the program. Do not allow needle to cut disc when it reaches the inner label. Do not allow the fine threads which form to collect under the needle, brush lightly with a soft cloth or brush towards the center of the disc.

MICROPHONE
For microphone recording set switch so that number 1 is opposite marker and test for operation. Then turn switch so that number "2" is opposite the marker. Turn volume control fully to the right. In speaking use normal voice with microphone at least six inches from the mouth.

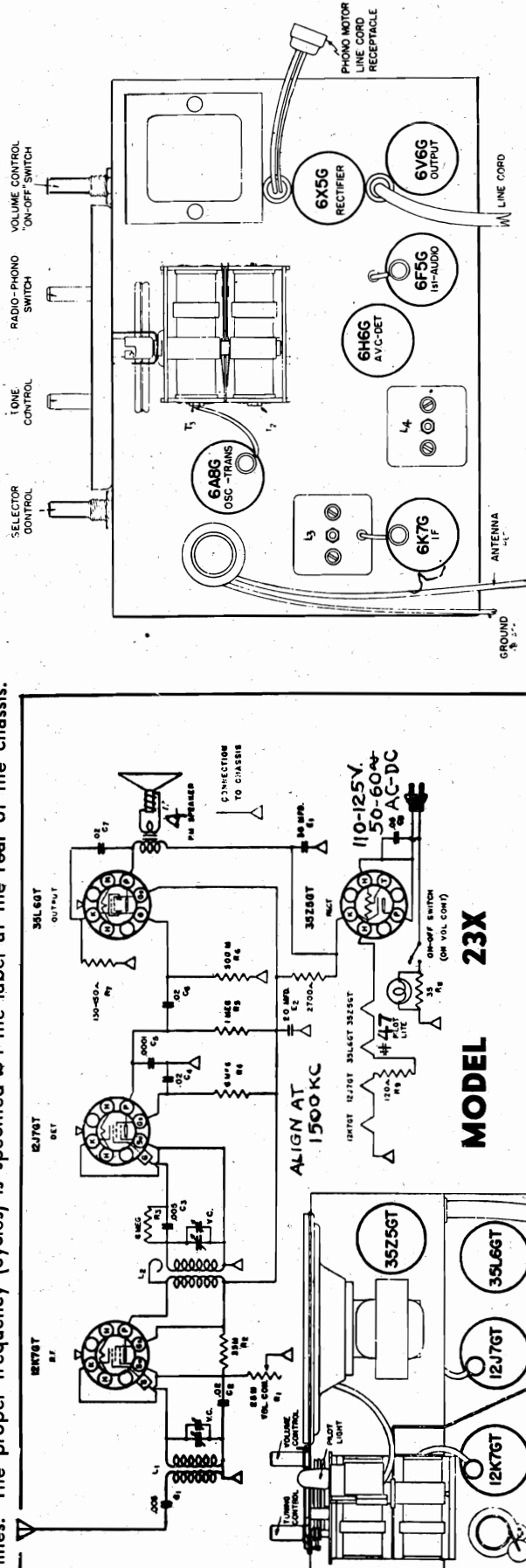
NOTE:-Be sure needle is firmly in place and that the flat side points towards the rear of the cabinet. Check that the small pin projects through one of the three holes on the blank to prevent the disc from slipping.

MODEL 23X
MODEL 114C
Schematics, Socket

PATHE



The receiver is designed for operation from 115 volt alternating current, 25-60 cycle (AC) supply lines. The proper frequency (cycles) is specified on the label at the rear of the chassis.

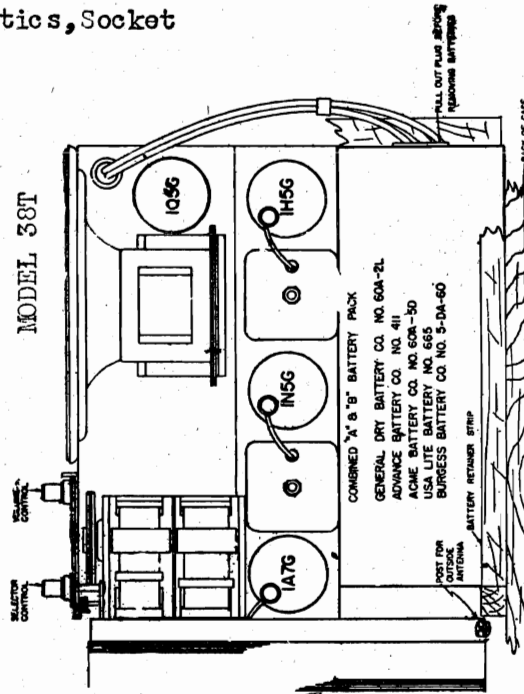


MODEL 38T
MODEL 52
Schematics, Socket

PATHE

MODEL 40T
Schematic

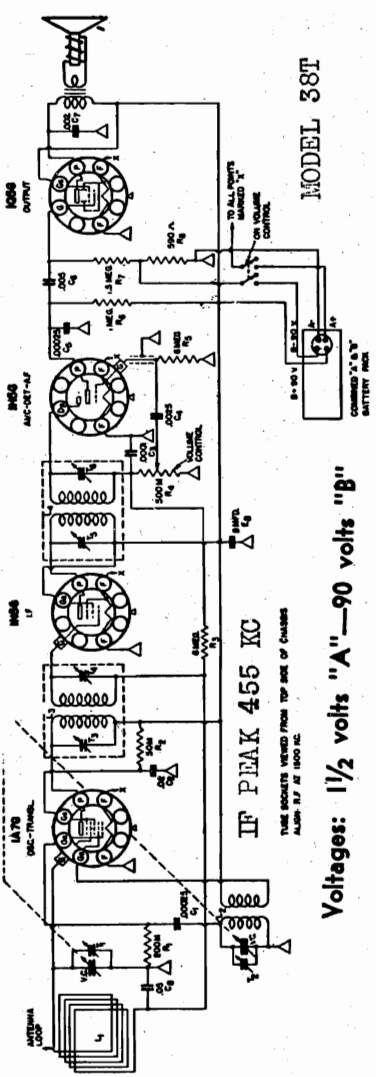
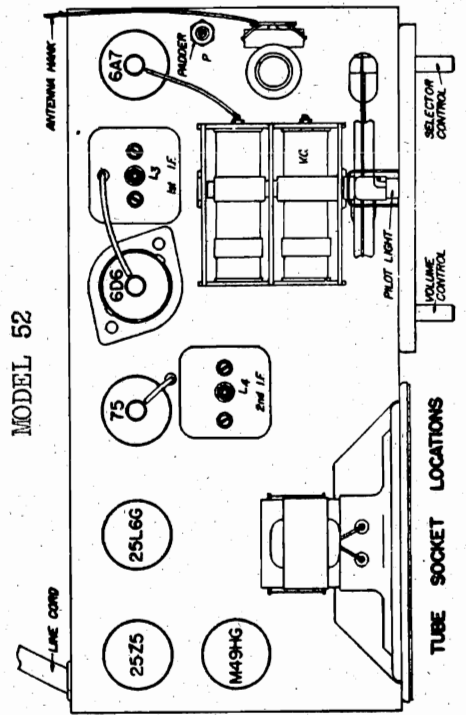
LOCATION OF TUBES & BATTERIES
MODEL 38T



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

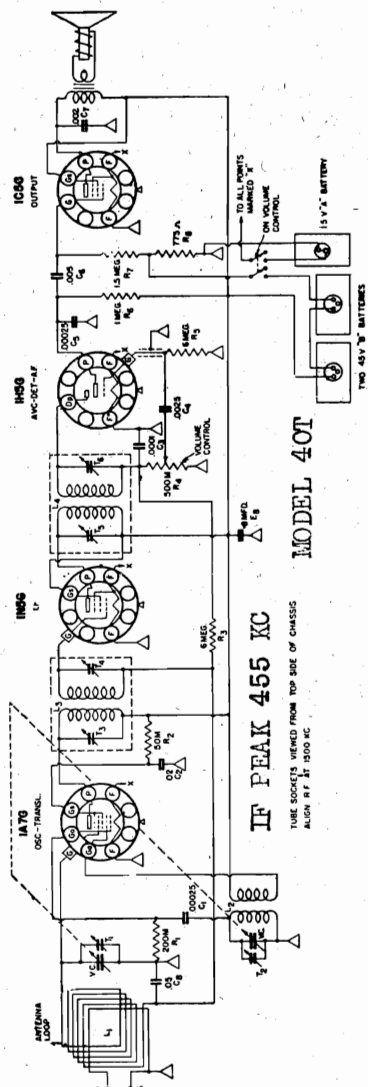
110 to 125 volts 50-60 cycles AC or DC

MODEL 52

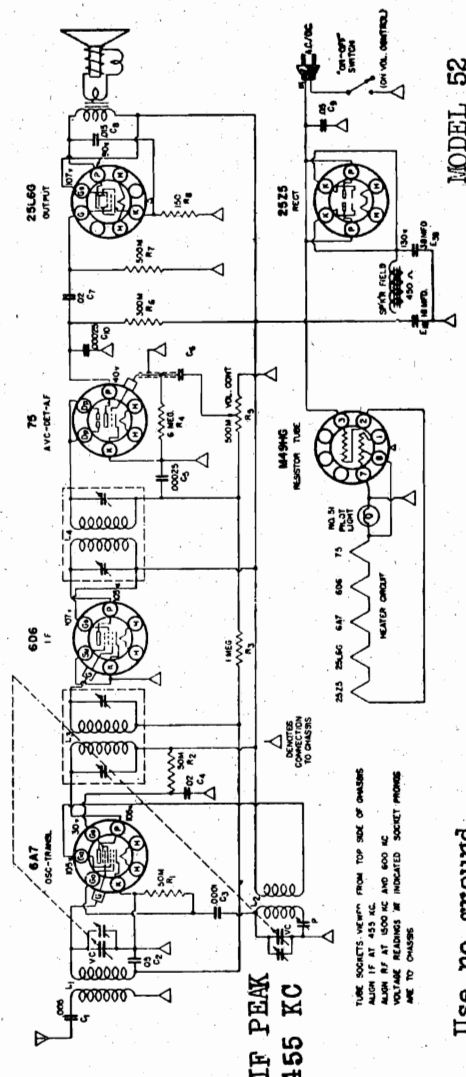


Voltagess: 1 1/2 volts "A"—90 volts "B"

MODEL 38T



MODEL 40T



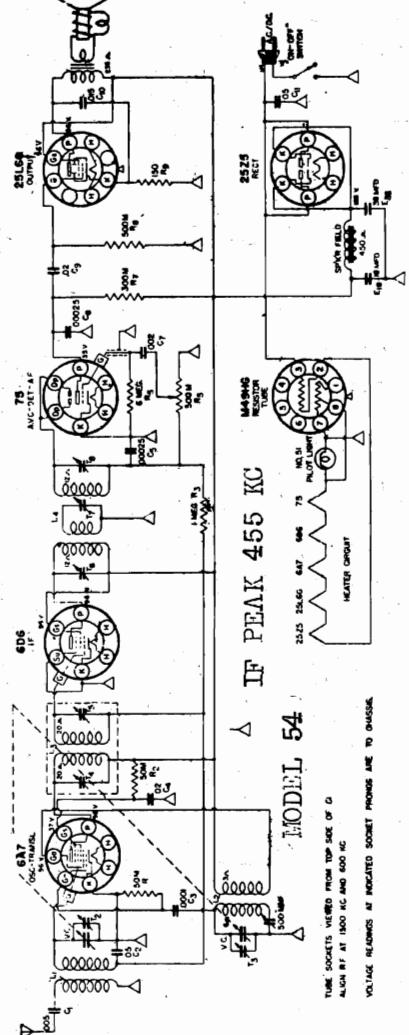
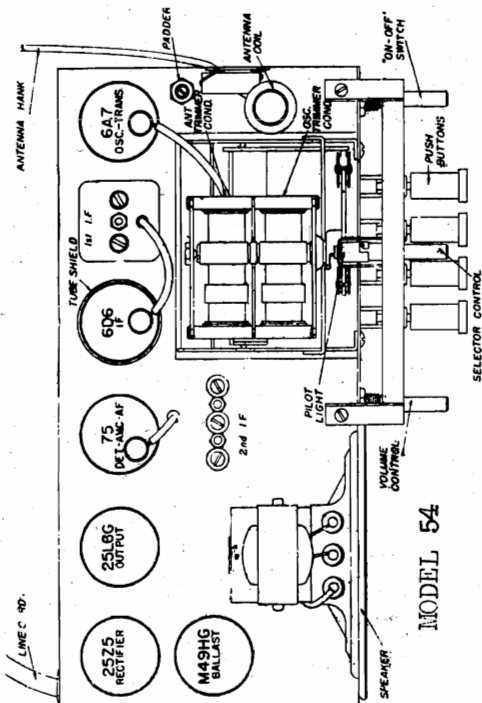
MODEL 52

Use no ground.

MODEL 54
Schematic, Socket
Alignment, Trimmers
Tuner

PATHE

MODEL 40T
Socket, Trimmers



MODEL 54

CONVENTIONAL ALIGNMENT

SEE SPECIAL SECTION VOLUME VIII

AUTOMATIC TUNING: There are four push buttons on the front panel which can be set so that by simply pushing the button marked with a station's call letters, any of four different stations may be received.

Allow the receiver to warm up for 20 minutes before making the station adjustments. Decide on the station you wish to receive.

Tune to this station as accurately as possible with the selector knob.

Next, push in this button as far as possible, being careful not to disturb the station setting on the dial.

Turn this push button knob about one turn to the left, or until it starts to unscrew easily.

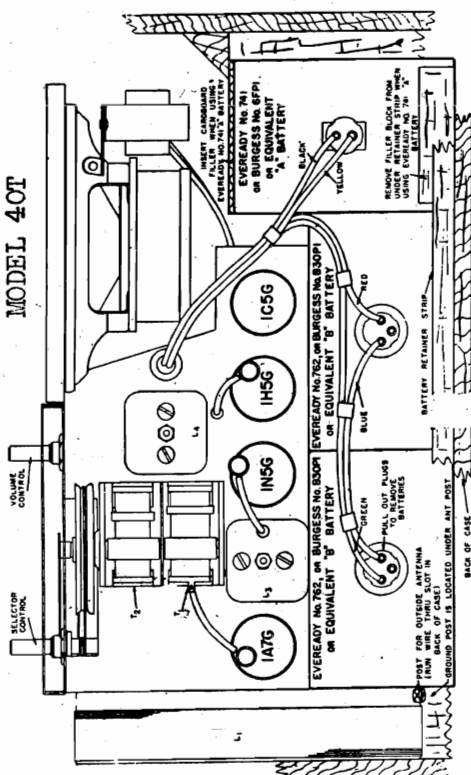
Holding the button at the "IN" position, screw the push button knob to the right until it is tight.

Cut out name of station from list supplied and insert in face of button.

Insert celluloid disk.

This completes the adjustments for one station. The three other buttons may be set in a similar manner.

LOCATION OF TUBES & BATTERIES
MODEL 40T



PHILCO RADIO & TELEV. CORP.

MODEL L Record Changer Instructions

PHILCO Model 'L' RECORD CHANGER

OPERATING INSTRUCTIONS

The Model "L" Record Changer plays seven 12" or eight 10" records automatically. The last record remains on the turntable and repeats as long as the Record Changer is in operation.

Records may be repeated as often as desired by raising the record removing arm at A Fig. 1 to the upright position. To reject a record and play the next record below it, pull the latch lever at L Fig. 1 forward.

To adjust the record removing arm to handle 10" records set the record removing arm change lever at D Fig. 1 opposite the number 10 stamped on the base plate. For 12" records set the lever opposite the number 12.

To adjust the pickup to play 10" records, push the pickup stop at K Fig. 1 back. (Away from the pickup needle). For 12" records pull the stop forward (toward the needle) as far as it will go.

Some units are equipped with two speed motors, and others with 78 RPM motors. When the two speed motor is used change from one speed to the other by simply moving lever at F Fig. 1 to position desired.

To start motor, throw switch at N Fig. 1 on the "on" position.

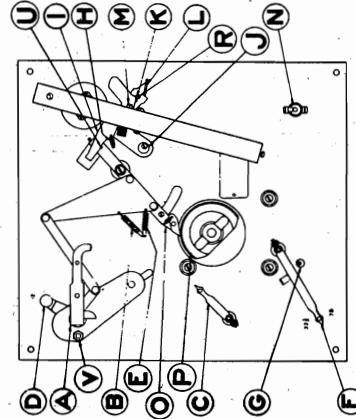


FIG. 1.

MOTOR SPEED

The motor speed is adjusted by means of a lever at C Fig. 1 which is mounted under the turntable. The direction of swing to fast or slow is indicated by the legends F and S on the base plate.

33-1/3 RPM — 78 RPM SHIFT (Two-speed motors only)

Move the speed change lever at F Fig. 1 as far as it will go in the direction of swing indicated by the legends 33-1/3 and 78 on the base plate.

If adjustment of the speed change lever is required for any reason, proceed as follows: First loosen the screw which

clamps the lever to the motor shaft. This shaft is provided with a screw-driver slot in the end. Next, using a screw driver, turn this shaft in a clockwise direction until you feel it strike the stop. The motor is now in the 33-1/3 RPM position. Now set the lever against the lug provided in the base plate and opposite the legend 33-1/3 and tighten the clamp screw. This places the lever in the correct position on the motor shaft. The final step is the adjustment of the eccentric bushing at G Fig. 1 which limits the throw of the lever. First loosen the screw which holds the eccentric bushing. Next, throw the speed change lever to its farthest 78 RPM position, (using care that the lever does not slip on the motor shaft). Then turn the eccentric bushing around until it touches the side of the lever, and tighten it in place with the screw provided.

TRIP MECHANISM

The trip mechanism is the trigger that sets the Record Changer in motion. This is done by allowing the latch bar at O Fig. 1 to drop in front of, and be actuated by the cam at P Fig. 1. This cam is driven by the motor and is in motion as long as the motor is running. If this mechanism does not operate smoothly, the precautions outlined in succeeding paragraphs should be observed.

First of all, make sure that the square pin in the latch lever at U Fig. 1 latches properly in the notch in the lift lever at I Fig. 1. When latched, the notch should be engaged approximately one-half of its depth. The depth of engagement is adjusted by means of the eccentric washer and locking screw at J Fig. 1. Now run the Record Changer through its cycle. If the square pin fails to engage the notch in the lift lever, first check the tension of the latch spring at H Fig. 1 to insure that the notch can engage the pin. Next check the tension of the reset spring at E Fig. 1. This reset spring should not be under tension when the latch bar is latched but should have enough tension when the latch bar drops back off of the cam to cause the square pin to over travel the notch in the lift lever.

IMPORTANT—Before attempting to change the tension of any spring, be sure that the parts involved work freely without any tendency to bind, as of course any binding condition would preclude proper operation.

The Record Changer is adjusted at the factory to trip on a spiral trip groove record when the phonograph needle is 1 1/4" from the edge of the hole in the center of the record.

MOTOR LUBRICATION

The motor installed in the Record Changer is governor controlled, with all gearing enclosed, and leaves the factory lubricated for proper operation. For maximum satisfaction, lubricate the motor at regular intervals with SAE No. 10 oil. Please do not use any other grade of oil.

The governor disc engages with a ring of hard felt. This felt is impregnated with a lubricating solution sufficient for proper operation for approximately a year under normal conditions. It may be necessary, however, if the motor shows a tendency to chatter or waiver, to apply a drop or two of oil to this felt ring.

When eccentric or oscillating trip groove records are used, tripping is effected by means of the hardened steel pin in the end of tone arm lift crank at S Fig. 2, engaging the serrated block on the play between the end of the pin and the block, when, with a short needle, (3/8" Minimum Length) the pickup is resting on one record on the turntable. If the pressure of the pin on the block is not sufficient to insure operation, then check the pressure spring which is located up under the pickup.

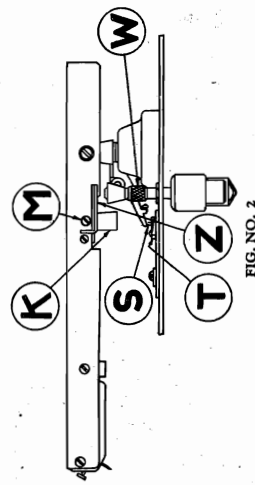


FIG. NO. 2

The oval head pivot screw at R Fig. 1 serves as a pivot for the lift lever at I Fig. 1. This screw should allow the lift lever to be raised by the latch bar to its maximum height without binding but also without any additional play.

If the Record Changer fails to trip, see if the phonograph needle is jumping out of a worn record trip groove. Next make certain that all parts of the mechanism work freely and smoothly. If it is found that the latch bar at O Fig. 1 is not dropping in far enough to engage the cam at P Fig. 1, then check the tension of the trip spring at B Fig. 1.

RECORD REMOVING MECHANISM

The Record Changer is adjusted so that it will always leave one record on the turntable. This is done to prevent the phonograph needle from damaging the covering on the turntable.

In case the Record Removing Mechanism fails to operate smoothly, proceed as follows: First make certain that all parts work freely with no binding in pivots or bearings, and that the record removing arm assembly rests on the stop screw at Q Fig. 3.

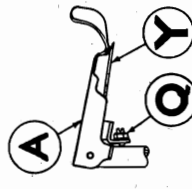


FIG. NO. 3

Next stop the motor in such a position that the latch bar at O Fig. 1 can swing by and clear the cam at P Fig. 1. Place just one record on the turntable and measure from the top of this record down to the base plate. This distance should be one inch. Now by pulling the reject lever at L Fig. 1 first, it will be found possible to swing the record removing finger at Y Fig. 3 over to where it just touches the edge of the record. If the adjustment is correct, the record removing finger should just barely rise over the edge of the first record. If adjustment is required it can be made by means of the stop screw at Q Fig. 3. In the event the record removing arm raises the record from the turntable and drops it back in place without removing it, check the lift adjustment at V Fig. 1. This adjustment consists of an eccentric stud which is provided with a lock nut, and is made by loosening the lock nut and turning the eccentric stud. The lift adjustment should be set so that the hole in the center of the record just clears turntable spindle when the Record Changer is in operation.

PICKUP LOWERING MECHANISM

The pickup lowering mechanism has two functions. First, it lowers the phonograph needle gently to the surface of the record. Second, it feeds the needle toward the center of the record so that it will enter the playing groove.

If the pickup descends too fast or too slow, adjust the speed of descent by turning the knurled thumb nut on the dashpot sleeve at W Fig. 2.

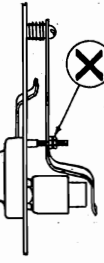
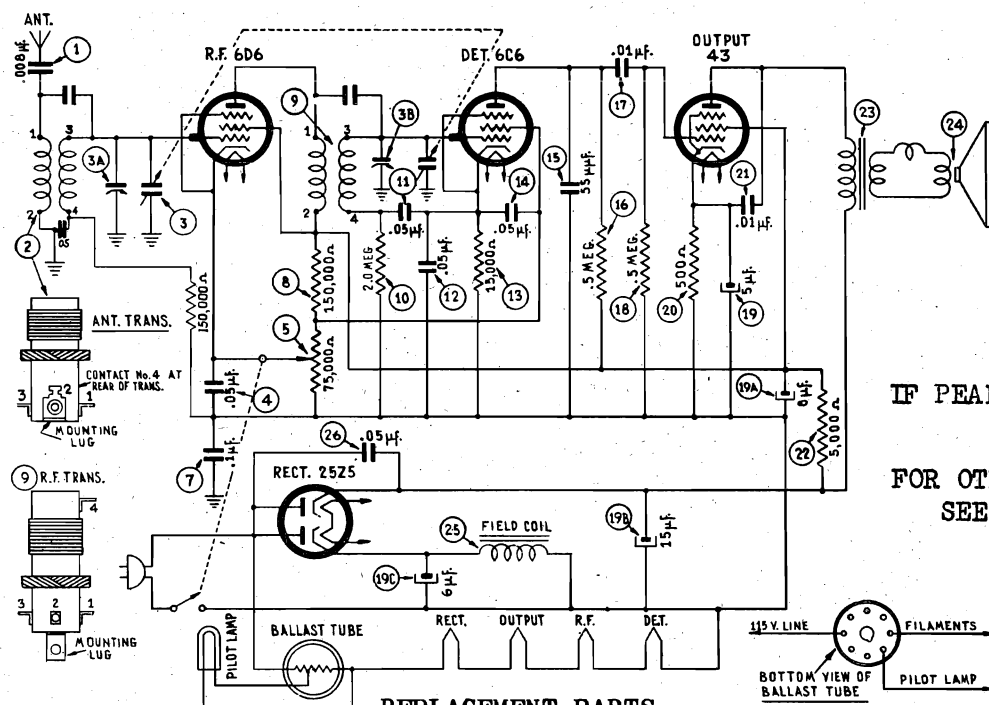


FIG. NO. 4

The unit is adjusted at the factory so that the needle will be set down approximately 3/32" in from the edge of the record. An adjusting screw is provided on the side of the pickup at M Fig. 2. If the needle is being lowered onto the playing surface of the record, and the adjusting screw at M Fig. 2 fails to correct the condition proceed as follows: First stop the record changer, with the pickup in the maximum raised position and check the clearance between the underside of the pickup shelf at Z Fig. 2 and the tip of the pickup in the underside of the record. This clearance should be very small as otherwise the pickup shelf will tend to bounce as it is lowered. There must be sufficient clearance however to prevent the pickup from rubbing on the tip of the dash pot, or the pickup will not swing out far enough to allow the adjustable stop at K Fig. 2 to come to rest against the dashpot. Check this clearance in both 10" and 12" record positions. If adjustment is required, the height of the dashpot may be regulated by loosening the nuts on the bottom of the lift lever stud at X Fig. 4 and changing their position on the stud. To raise the dashpot turn the nuts clockwise, to lower the dashpot turn the nuts counter-clockwise. Be sure to lock the nuts tightly together after the adjustment is made.

MODEL TH-1
Schematic
Alignment
PHILCO RADIO & TELEV. CORP.


IF PEAK 470 KC

FOR OTHER DATA
SEE INDEX
REPLACEMENT PARTS
TRANSITONE HOME RADIO MODEL TH-1

| Schem. No. | Description | Philco Part No. | Schem. No. | Description | Philco Part No. |
|------------|----------------------------------|-----------------|------------|-----------------------------------|-----------------|
| 1 | Condenser (.006 mfd. 200 V)..... | 32104 | 23 | Output Transformer..... | 43118 |
| 2 | Ant. Transformer..... | 40168 | 24 | Speaker..... | 60110 |
| 3 | Tuning Condenser..... | 33110 | 25 | Field Coil.....Part of Spkr. Unit | 32101 |
| 4 | Condenser .05 mfd. 200 V)..... | 32100 | 26 | Condenser .05 mfd. 400 V..... | 32101 |
| 5 | Volume Control..... | 49115 | | Clip (Drive Cord)..... | 20156 |
| 6 | Resistor 150,000 ohms..... | 47100 | | Dial (Scale)..... | 16200T |
| 7 | Condenser .1 mfd. 200V..... | 32117 | | Dial Window..... | 14100 |
| 8 | Resistor 150,000 ohms..... | 47100 | | Drive Cord Assembly..... | 90232 |
| 9 | R.F. Transformer..... | 40169 | | Drive Pulley & Screw..... | 21102 |
| 10 | Resistor 150,000 ohms..... | 47100 | | Knob Assembly..... | 13100 |
| 11 | Condenser .05 mfd. 200 V..... | 32100 | | Pointer..... | 20237 |
| 12 | Condenser .05 mfd. 200 V..... | 32100 | | Socket 25Z5..... | 15103 |
| 13 | Resistor 15,000 ohms..... | 47154 | | Socket 6D6..... | 15100 |
| 14 | Condenser .05 mfd. 200 V..... | 32100 | | Socket 6C6..... | 15101 |
| 15 | Condenser 55 mmfd..... | 30115 | | Socket 43..... | 15102 |
| 16 | Resistor .5 megohm..... | 47101 | | Socket K55B..... | 15104 |
| 17 | Condenser .01 mfd. 200 V..... | 32102 | | Socket Assembly (Pilot Lamp).... | 90100 |
| 18 | Resistor .5 megohm..... | 47101 | | Shaft (Tuning Drive)..... | 21101 |
| 19 | Electrolytic Condenser..... | 31116 | | Spring (Drive Cord)..... | 23103 |
| 20 | Resistor 500 ohms..... | 47155 | | Speaker Cone..... | |
| 21 | Condenser .01 mfd. 400 V..... | 32103 | | Washer "C" Type Drive Shaft..... | 23102 |
| 22 | Resistor 5000 ohms..... | 47105 | | | |

ALIGNMENT OF THE COMPENSATORS

In order to align the R.F. circuit of the receiver, an output meter, and signal generator will be required. With these instruments, the compensators should be adjusted as given below.

1. Connect an output meter to the plate and cathode terminals of the 43 tube.

2. The signal generator output lead is now connected to the aerial wire of the receiver through a 100 mmfd. condenser and the generator ground to a good ground connection. Then, turn the volume control to a full volume position.

3. Adjust the dial pointer as follows: Turn the tuning con-

denser to maximum capacity position. With the condenser in this position, the dial pointer should be $\frac{1}{2}$ inch below the 550 K.C. mark of the dial and horizontal with the chassis.

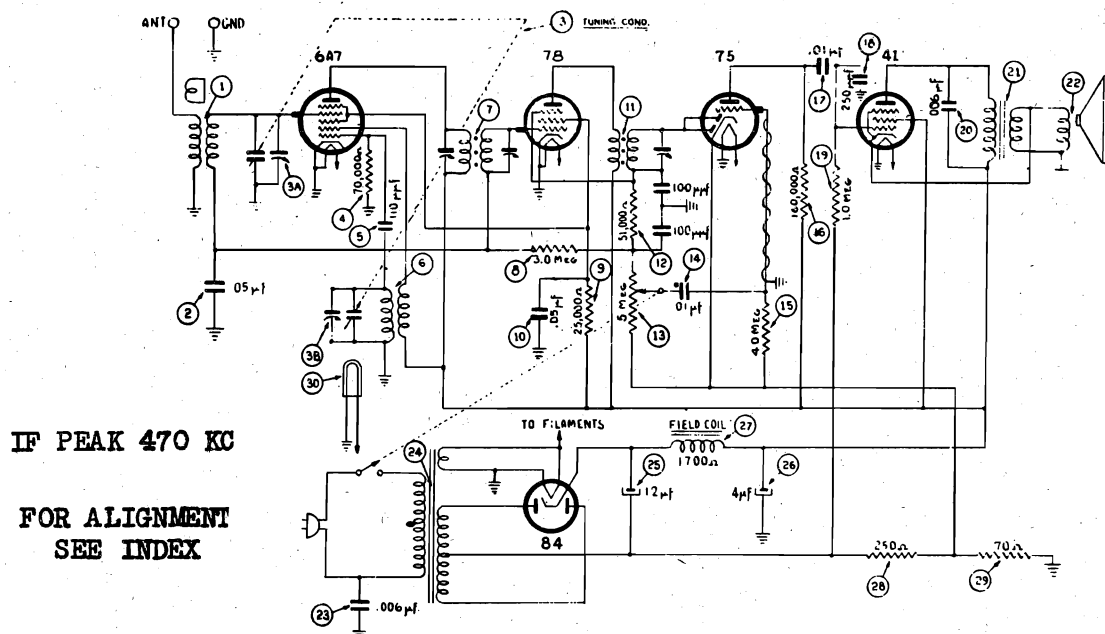
4. Set the signal generator and receiver dial for 1500 K.C. and adjust padders 3A and 3B for maximum reading on the output meter.

MODEL TH-1 is a 5 tube receiver designed for operation on alternating current (A.C.) or direct current (D.C.) 115 volts and covers a frequency range of 540 to 1720 kilocycles.

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions. In remote localities where signal strength is weak, a regular outdoor aerial is recommended, such as Philco aerial Part No. 40-6383. For hotels and apartment house installations, Philco Utility Aerial Part No. 40-6384 should be used.

PHILCO RADIO & TELEV. CORP.

MODEL TH-3
Schematic



MODEL TH-3 is a 5 tube superheterodyne receiver covering a frequency range from 540 to 1720 kilocycles and designed for operation on 115 volts alternating current (A.C.). The tubes used in this model are indicated on the schematic diagram shown below.

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TH-3

| Schem. No. | Description | Philco Part No. | Schem. No. | Description | Philco Part No. |
|------------|---|-----------------|------------|---------------------------------------|-----------------|
| 1 | Antenna Transformer..... | 32-2583 | 23 | Condenser (.006 mf. molded)..... | 30-4423 |
| 2 | Condenser (.05 mf. tubular)..... | 30-4519 | 24 | Power Transformer..... | 32-7979 |
| 3 | Tuning Condenser..... | 31-2335 | 25 | Electrolytic Condenser (12 mf.).... | 30-2327 |
| 4 | Resistor (70,000 ohms, ½ watt)... | 33-370339 | 26 | Electrolytic Condenser (4 mf.).... | 30-2328 |
| 5 | Condenser (110 mmf. mica)..... | 30-1031 | 27 | Field Coil.....Part of Speaker | 36-1461 |
| 6 | Oscillator Transformer..... | 32-3021 | 28 | Resistor (250 ohms, ½ watt)..... | 33-125339 |
| 7 | 1st I.F. Transformer..... | 32-3120 | 29 | Resistor (70 ohms, ½ watt)..... | 33-070339 |
| 8 | Resistor (3.0 meg., ½ watt)..... | 33-530339 | 30 | Pilot Lamp..... | 34-2064 |
| 9 | Resistor (25,000 ohms, ½ watt)... | 33-325339 | | Baffle & Silk Assembly..... | 40-6430 |
| 10 | Condenser (.05 mf. tubular)..... | 30-4444 | | Bezel Throat..... | 28-5474 |
| 11 | 2nd I.F. Transformer..... | 32-2674 | | Bezel Window..... | 27-5409 |
| 12 | Resistor (51,000 ohms, ½ watt)... | 33-351339 | | Cone Assembly (For Speaker 36-1461-1) | 36-4114 |
| 13 | Volume Control..... | 33-5254 | | Cone Assembly (For Speaker 36-1461-2) | 36-4095 |
| 14 | Condenser (.01 mf. tubular)..... | 30-4479 | | Dial & Scale Assembly..... | 31-2351 |
| 15 | Resistor (4.0 meg., ½ watt)..... | 33-540339 | | Drive Cord 10 9/16"..... | 27-8411 |
| 16 | Resistor (160,000 ohms, ½ watt).. | 33-416339 | | Drive Drum..... | 28-6662 |
| 17 | Condenser (.01 mf. tubular)..... | 30-4169 | | Drive Shaft..... | 56-6016 |
| 18 | Condenser (250 mmf. mica)..... | 30-1032 | | Knob Assembly..... | 27-4632 |
| 19 | Resistor (1.0 meg., ½ watt)..... | 33-510339 | | Pointer..... | 28-5408 |
| 20 | Condenser (.006 mf. tubular)..... | 30-4467 | | Power Cord..... | L-2778 |
| 21 | Output Transformer..... | | | Socket (5 prong)..... | 27-6035 |
| | For Speaker 36-1461-1..... | 32-8046 | | Socket (6 prong)..... | 27-6036 |
| | For Speaker 36-1461-2..... | 32-8040 | | Socket (7 prong)..... | 27-6037 |
| 22 | Speaker Cone and Voice Coil See next column | | | Speaker..... | 36-1461 |
| | Assembly.....Part of Speaker 36-1461 | | | | |

MODELS TH-3, TH-4, TP-4,
TH-5, TP-5, TP-10, TP-11
TP-12
Alignment Instructions

PHILCO RADIO & TELEV. CORP.

GENERAL ALIGNING INSTRUCTIONS

Models TH-3, TH-4, TP-4, TH-5, TP-5, TP-10, TP-11, TP-12

The same general procedure is followed in aligning the compensating condensers in any of the above listed models.

EQUIPMENT REQUIRED

Signal Generator Philco Model 077 or 177 should be used.

Aligning Indicator Philco Model 027 and Model 028 circuit testers which contain an audio output meter and vacuum tube voltmeter. Either of the vacuum tube voltmeter or the audio

output meters may be used as an aligning indicator and are connected as given under "Connecting Aligning Instruments".

Tools: Fibre handle aligning screw driver, Philco Part No. 45-2610.

CONNECTING ALIGNING INSTRUMENTS

Audio Output Meter: If an aligning indicator of this type is used, connect it to the plate and screen terminals of the output tube.

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator, make the following connections:

Attach the negative terminal of the voltmeter to any point in the circuit where the A.V.C. voltage can be obtained. Connect the positive terminal to the ground connection of the receiver. In AC-DC sets the positive (+) terminal of the vacuum tube voltmeter should be connected to (B-) of the receiver. (Cathode 7C6.)

For aligning receivers with loktal type tubes, an aligning adaptor, Philco Part No. 45-2767 may be used with the vacuum tube voltmeter. To use the adaptor, remove the second detector tube from its socket and insert the aligning adaptor in the socket, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor.

Attach the positive terminal of the vacuum tube voltmeter to the black wire of the adaptor.

Signal Generator: When adjusting the I.F. padders, the high side of the signal generator is connected through a .004 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis. It may be necessary when adjusting AC-DC models to reverse the power plug to eliminate hum.

The R.F. and oscillator padders are aligned with the high side of the signal generator connected to the antenna of the receiver through a 100 mmfd. condenser.

After connecting the aligning instruments, adjust the compensators on all models in the order as shown in the tabulation below. The first and second I.F. transformers in all models are located on the top and bottom sections of the chassis respectively. The antenna and oscillator padders are located on the tuning condenser.

| Operations in Order | SIGNAL GENERATOR | | RECEIVER | | | SPECIAL INSTRUCTIONS |
|---------------------|--------------------------------|--------------|-------------------------------|-----------------|------------------------------|---|
| | Output Connections to Receiver | Dial Setting | Dial Setting | Control Setting | Adjust Compensators in Order | |
| 1 | Ant. Section of Tuning Cond. | 470 K. C. | 540 K. C. Tuning Cond. closed | Vol. Max. | 1st & 2nd I.F. | Push in manual button on push button models |
| 2 | Ant. Ter. | 1700 K. C. | 1700 K. C. | Vol. Max. | "Osc" | Note A and B |
| 3 | Ant. Ter. | 1500 K. C. | 1500 K. C. | Vol. Max. | "Ant" | Note B |

NOTE A — DIAL CALIBRATION: With the exception of Models TP-10 and TP-11 the dial pointers are adjusted by closing the tuning condenser (plates fully meshed) and setting the pointers on the dot below 55 on the dial.

NOTE B—The alignment procedure for the I.F. padders in Models TP-10 and TP-11 is the same as that given above. The antenna and oscillator padders of these models, however, are adjusted as follows:

1. Turn the tuning condenser to the extreme high frequency position (all plates out of mesh).
2. Insert a .004" gauge between the stationary and rotor plates of the oscillator condenser. If the gauge is not handy, a piece of bond writing paper can be used. After inserting gauge, turn rotor toward the low frequency end so that the gauge will be held in position.
3. Set signal generator at 1720 K.C. and tune oscillator padder for maximum reading on the output meter.

4. Remove gauge and set signal generator to 1500 K.C. and tune tuning condenser for maximum reading on this signal, then adjust the antenna padder for maximum output.
5. Place set in cabinet so that the tuning arm on the tuning condenser engages the dial on the cabinet. After placing receiver in the cabinet and it is found that the dial does not track properly with station signals, the dial can be calibrated as follows: Set the signal generator to a low frequency signal (600 K.C.) and tune receiver until signal shows maximum reading on the output meter. The dial is then set to this signal by inserting a 6-32 Phillips screw driver to the adjustment screw on the tuning condenser pulley. Loosen screw and slightly turn dial so that it reads 600 K.C. then retighten screw. When doing this, however, precaution should be taken so that the tuning condenser is not disturbed while dial is being adjusted and screw is being tightened or loosened.

PHILCO RADIO & TELEV. CORP.

MODEL RP-3, Wireless Record Player Schematic, Data

WIRELESS RECORD PLAYER.....MODEL RP-3

Model RP-3 is a Wireless Record Player, designed to operate through the entire R.F. and audio system of a Radio Receiver. No connections are required between the Wireless Record Player and the Radio. The sound from the record is converted into a radio signal (540 K.C.) and broadcasted to the aerial of the radio set.

This model is equipped with a semi-automatic crystal pickup mechanism which will play either ten inch or twelve inch records. The pickup mechanism automatically places the pickup on the record when the lid of the cabinet is closed. Records can also be repeated by simply opening and closing the lid.

The player is operated from a 115 Volt, 60 cycle A.C. power supply. A volume control is also provided for adjusting the output of the player.

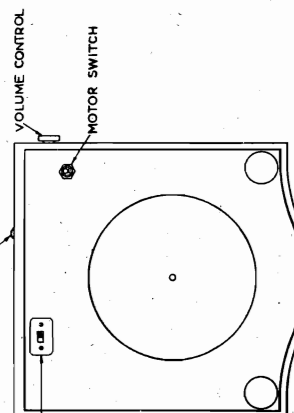
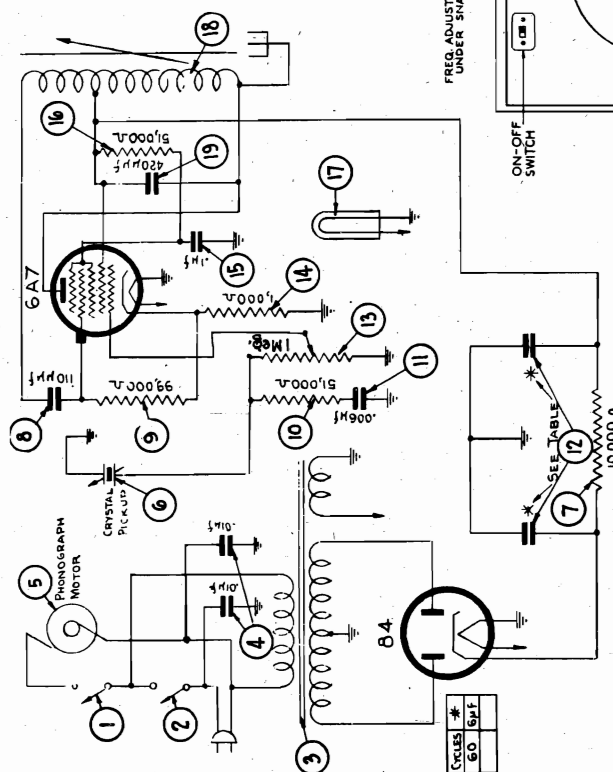
CHANGING OPERATING FREQUENCY

When the Record Player leaves the factory it is adjusted to operate at approximately 540 K.C. If interference from broadcasting stations is encountered, the frequency of the unit can be changed to any other frequency between 530 K.C. and 580 K.C. by removing snap button and adjusting small screw indicated in diagram. Turning screw clockwise lowers the frequency, counter-clockwise raises the frequency. *This adjustment is best made while the unit is in operation.*

No definite rule can be established for the relative location of the record player to a radio; individual trial will establish the best location. However, in general, satisfactory operation may be obtained up to a distance of fifty (50) feet, provided local noise conditions are not too severe.

If hum is experienced it may be necessary to reverse the power plug of the record player, the radio, or both. In some cases it may be advisable to use the same receptacle for record player and radio.

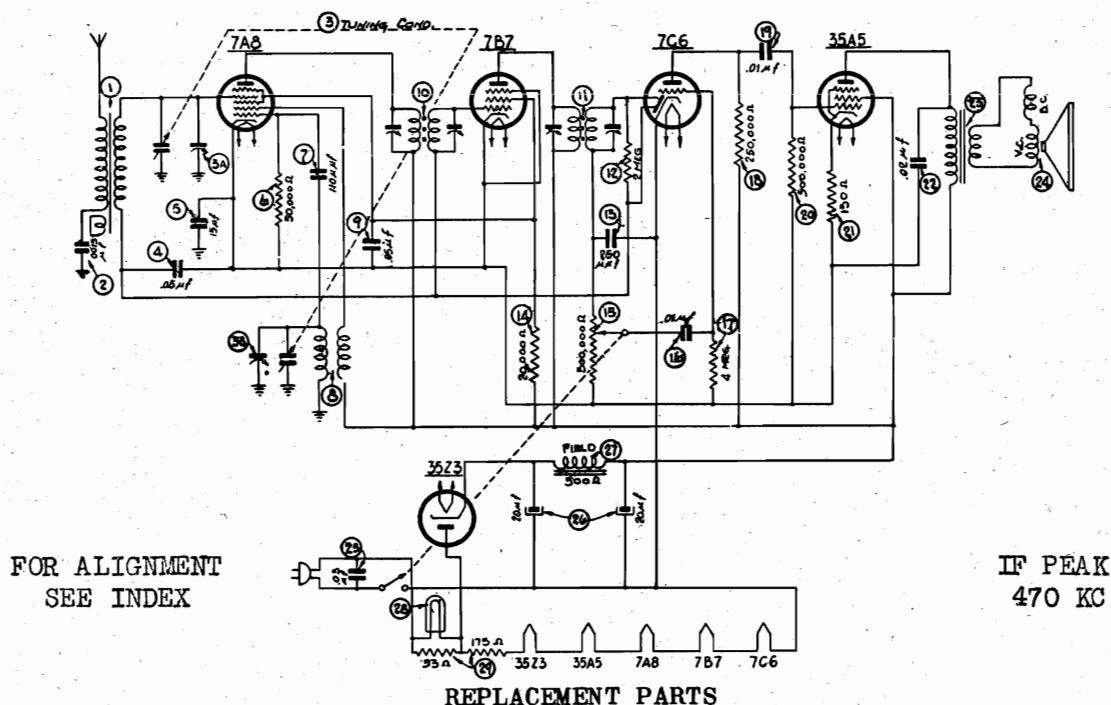
MODEL RP-3 WIRELESS RECORD PLAYER



| Schem. No. | Description | Philco Part No. |
|------------|---|-----------------|
| 1 | Motor Switch | 42-1503 |
| 2 | Master Switch | 42-1406-2 |
| 3 | Power Transformer | 32-8043 |
| 4 | Line Condenser (.01 mf.-.01 mf., 600 v.) | 3903-DC |
| 5 | Motor | 35-2021 |
| 6 | Crystal Pickup | 35-2028 |
| 7 | Crystal Cartridge | 415-1027 |
| 8 | Filter Resistor (10,000 ohms., 1/2 watt) | 33-310344 |
| 9 | Oscillator Grid Cond. (110 mmf.) | 30-1031 |
| 10 | Oscillator Grid Resistor (99,000 ohms., 1/2 watt) | 33-399344 |
| 11 | Comp. Resistor (51,000 ohms., 1/2 watt) | 33-351344 |
| 12 | Comp. Condenser (.006 mf., 200 v.) | 30-4467 |
| 13 | Electrolytic Condenser (6 mf.-6 mf., 150 v.) | 30-2388 |
| 14 | Volume Control | 33-5322 |
| 15 | Cathode Bias Resistor (1,000 ohms., 1/2 watt) | 33-210344 |
| 16 | Screen By-Pass (.1 mf., 200 v.) | 30-4499-S |
| 17 | Screen Resistor (51,000 ohms., 1/2 watt) | 33-351344 |
| 18 | Pilot Light (6-8 v., .250 amp.) | 34-2210 |
| 19 | Oscillator Coil | 32-3232 |
| | Oscillator Condenser (420 mmf.) | 30-1116 |

MODELS TH-4, TH-4T
Schematic, Notes

PHILCO RADIO & TELEV. CORP.



TRANSITONE HOME RADIO MODEL TH-4

| Schem. No. | Description | Philco Part No. | Schem. No. | Description | Philco Part No. |
|------------|--------------------------------------|-----------------|------------|--|-----------------|
| 1 | Antenna Transformer..... | 32-3151 | 22 | Tubular Condenser (.02 mf., 400v.) | 30-45168 |
| 2 | Tubular Condenser (.0015 mf., 200v.) | 30-45558 | 23 | Output Transformer | |
| 3 | Tuning Condenser..... | 31-2354 | | For Speaker 36-1469-1..... | 32-8047 |
| 4 | Tubular Condenser (.05 mf., 400v.) | 30-45198 | | For Speaker 36-1469-9..... | 32-8044 |
| 5 | Tubular Condenser (.15 mf., 400v.) | 30-45058 | 24 | Speaker..... | 36-1469 |
| 6 | Resistor (50,000 ohms, 1/3 watt)... | 33-350244 | 25 | Tubular Condenser (.03 mf., 400v.) | 30-44498 |
| 7 | Mica Condenser (110 mmf.)..... | 30-1031 | 26 | Electrolytic Condenser (20-20mf, 150v) | 30-2382 |
| 8 | Oscillator Transformer..... | 32-3152 | 27 | Field Coil -- Part of Speaker No.. | 36-1469 |
| 9 | Tubular Condenser (.05 mf., 400v.) | 30-45198 | 28 | Pilot Lamp..... | 34-2068 |
| 10 | 1st I.F. Transformer..... | 32-3149 | 29 | Line Resistor..... | 33-3367 |
| 11 | 2nd I.F. Transformer..... | 32-3150 | | Cone Assembly (for Speaker 36-1469-1) | 36-4115 |
| 12 | Resistor (2 meg., 1/3 watt)..... | 33-520244 | | Cone Assembly (for Speaker 36-1469-9) | 36-4113 |
| 13 | Mica Condenser (250 mmf.)..... | 30-1032 | | Drive Cord Assy..... | 31-2358 |
| 14 | Resistor (20,000 ohms, 1/3 watt)... | 33-320244 | | Drive Shaft Assy..... | 31-2355 |
| 15 | Volume Control 500,000 ohms)..... | 33-5306 | | Pilot Lamp Socket..... | 38-9825 |
| 16 | Tubular Condenser (.01 mf., 200v.) | 30-44798 | | Pointer..... | 27-4891 |
| 17 | Resistor (4 meg., 1/3 watt)..... | 33-540244 | | Power Cord..... | L-3199 |
| 18 | Resistor (250,000 ohms, 1/3 watt)... | 33-425244 | | Scale..... | 27-5553 |
| 19 | Tubular Condenser (.01 mf., 400v.) | 30-45728 | | Socket..... | 27-6130 |
| 20 | Resistor (500,000 ohms, 1/3 watt)... | 33-450244 | | Spring (Drive Cord)..... | 28-8954 |
| 21 | Resistor (130 ohms, 1/2 watt)..... | 33-113336 | | Speaker Assy..... | 36-1469 |

MODEL TH-4T

MODEL TH-4T IVORY

Cardboard Back.....27-9511
Dial Window.....27-5472
Grille Cloth.....44-1287
Knob Assy.....27-4809

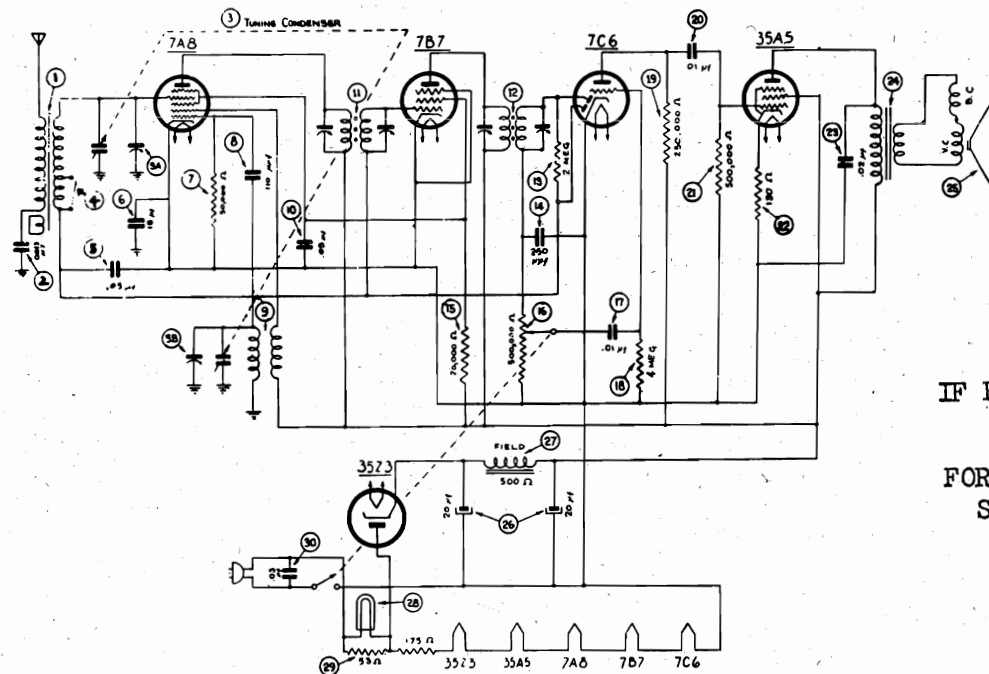
Cardboard Back.....27-9545
Knob Assembly.....27-4810

MODEL TH-4 is a 5 tube superheterodyne receiver covering a frequency range of 540 to 1720 kilocycles and designed for operation on either alternating current (A.C.) or direct current (D.C.) 115 volts.

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels, or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

PHILCO RADIO & TELEV. CORP.

MODELS TP-4, TP4-I
Schematic, Notes

IF PEAK 470 KC

FOR OTHER DATA
SEE INDEX

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TP-4

| Schem. No. | Description | Philco Part No. | Schem. No. | Description | Philco Part No. |
|------------|--------------------------------------|-----------------|------------|--|-----------------|
| 1 | Antenna Transformer..... | 32-3164 | | | |
| 2 | Tubular Condenser (.0015 mf., 200V) | 30-45558 | 25 | Cone Assembly | 32-8044 |
| 3 | Tuning Condenser..... | 31-2354 | | | |
| 4 | Switch..... | 42-1406 | | | |
| 5 | Tubular Condenser (.05 mf., 200V.) | 30-45198 | | | |
| 6 | Tubular Condenser (.15 mf., 400V.) | 30-45058 | | | |
| 7 | Resistor (50,000 ohms, 1/3 watt)... | 33-350244 | 26 | Tubular Condenser (.03 mf., 400V.) | 30-44498 |
| 8 | Mica Condenser (110 mmf.)..... | 30-1031 | 27 | Electrolytic Condenser | |
| 9 | Oscillator Transformer..... | 32-3152 | | (20-20 mf., 150V.)..... | 30-2382 |
| 10 | Tubular Condenser (.05 mf., 200V.) | 30-45198 | 28 | Field Coil | |
| 11 | 1st I.F. Transformer..... | 32-3149 | | Part of Speaker, Part No 36-1469 | |
| 12 | 2nd I.F. Transformer..... | 32-3150 | 29 | Pilot Lamp..... | 34-2068 |
| 13 | Resistor (2 meg., 1/3 watt)..... | 33-520244 | 30 | Line Resistor..... | 33-3367 |
| 14 | Mica Condenser (250 mmf.)..... | 30-1032 | | Cardboard Back..... | 27-9511 |
| 15 | Resistor (20,000 ohms, 1/3 watt)... | 33-320244 | | Dial Window..... | 27-5472 |
| 16 | Volume Control (500,000 ohms)..... | 33-5306 | | Drive Cord Assembly..... | 31-2358 |
| 17 | Tubular Condenser (.01 mf., 200V.) | 30-44798 | | Drive Shaft Assembly..... | 31-2355 |
| 18 | Resistor (4 meg., 1/3 watt)..... | 33-540244 | | Drive Drum..... | 28-6662 |
| 19 | Resistor (250,000 ohms, 1/3 watt)... | 33-425244 | | Grille Cloth..... | 44-1287 |
| 20 | Tubular Condenser (.01 mf., 400V.) | 30-45728 | | Knob Assembly..... | 27-4809 |
| 21 | Resistor (500,000 ohms, 1/3 watt)... | 33-450244 | | Pointer..... | 27-4891 |
| 22 | Resistor (130 ohms, 1/2 watt)..... | 33-113338 | | Scale..... | 27-5556 |
| 23 | Tubular Condenser (.02 mf., 400V.) | 30-45188 | | Sockets..... | 27-6130 |
| 24 | Output Transformer | | | Speaker..... | 36-1469 |
| | For Speaker 36-1469-1..... | 32-8047 | | Spring (Drive Cord)..... | 28-8954 |

TP-4 IVORY

Cardboard Back..... 27-9545

Knob Assembly..... 27-4810

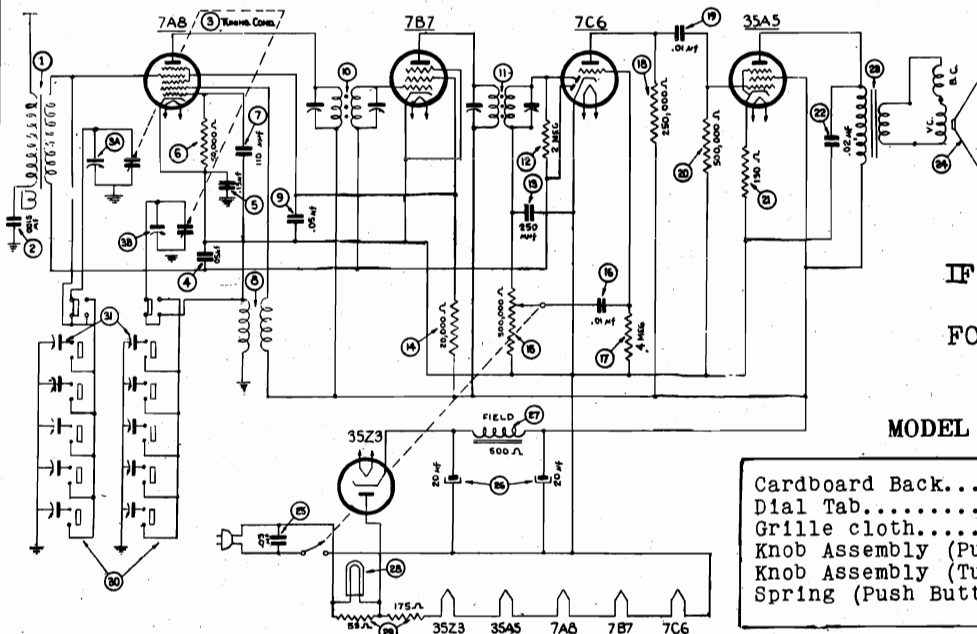
MODELS TP-4 and TP4-I are 5 tube superheterodyne receivers having 2 tuning ranges covering from 540 to 1720 kilocycles on the broadcast band and a frequency range from 2.3 to 2.5 megacycles (M.C.) on the police band. This model is designed to operate on either alternating (A.C.) or direct current (D.C.) 115 volts. These models are identical with the exception of cabinets.

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

MODELS TH-5, TH-5T
Schematic, Tuner

PHILCO RADIO & TELEV. CORP.



IF PEAK 470 KC

FOR OTHER DATA
SEE INDEX

MODEL TH-5T IVORY

Cardboard Back..... 27-9328
 Dial Tab..... 27-5528
 Grille cloth..... 44-1288
 Knob Assembly (Push Button).... 27-4830
 Knob Assembly (Tuning & Volume) 27-4810
 Spring (Push Button Knobs)..... 28-5686

REPLACEMENT PARTS

Schem.
No. DescriptionPhilco
Part No.

| | | |
|----|-------------------------------------|-----------|
| 1 | Antenna Transformer..... | 32-3186 |
| 2 | Tubular Condenser (.0015 mf., 200v) | 30-45558 |
| 3 | Tuning Condenser..... | 31-2365 |
| 4 | Tubular Condenser (.05 mf., 200v.) | 30-45198 |
| 5 | Tubular Condenser (.15 mf., 400v.) | 30-45058 |
| 6 | Resistor (50,000 ohms, 1/3 watt) | 33-350244 |
| 7 | Mica Condenser (110 mmf.)..... | 30-1031 |
| 8 | Oscillator Transformer..... | 32-3167 |
| 9 | Tubular Condenser (.05 mf., 200v) | 30-45198 |
| 10 | 1st I.F. Transformer..... | 32-3149 |
| 11 | 2nd I.F. Transformer..... | 32-3150 |
| 12 | Resistor (2 meg., 1/3 watt)..... | 33-520244 |
| 13 | Mica Condenser (250 mmf.)..... | 30-1032 |
| 14 | Resistor (20,000 ohms, 1/3 watt) | 33-320244 |
| 15 | Volume Control (500,000 ohms)... | 33-5306 |
| 16 | Tubular Condenser (.01 mf., 200v) | 30-44798 |
| 17 | Resistor (4 meg. 1/3 watt)..... | 33-540244 |
| 18 | Resistor (250,000 ohms, 1/3 watt) | 33-425244 |
| 19 | Tubular Condenser (.01 mf., 400v) | 30-45728 |
| 20 | Resistor (500,000 ohms, 1/3 watt) | 33-450244 |
| 21 | Resistor (130 ohms, 1/2 watt)... | 33-113336 |

| | | |
|----|--------------------------------------|----------|
| 22 | Tubular Condenser (.02 mf., 400v) | 30-45168 |
| 23 | Output Transformer | |
| | For Speaker 36-1469-1..... | 32-8047 |
| | For Speaker 36-1469-9..... | 32-8044 |
| 24 | Speaker..... | 36-1469 |
| 25 | Tubular Condenser (.03 mf., 400v.) | 30-44498 |
| 26 | Electrolytic Condenser | |
| | (20-20 mf., 150 v)..... | 30-2382 |
| 27 | Field Coil-Part of Speaker, PartNo.. | 36-1469 |
| 28 | Pilot Lamp..... | 34-2068 |
| 29 | Line Resistor..... | 33-3367 |
| 30 | Push-Button Switch..... | 42-1485 |
| 31 | Padding Condenser Strip..... | 31-6293 |
| | Cone Assembly (for Speaker 36-1469-1 | 36-4115 |
| | Cone Assembly (for Speaker 36-1469-9 | 36-4113 |
| | Cardboard Back..... | 27-9314 |
| | Dial Window..... | 27-5472 |
| | Drive Cord Assy..... | 31-2358 |
| | Drive Shaft Assy..... | 31-2355 |
| | Grille cloth..... | 44-1288 |
| | Knob Assembly (Push Button)..... | 27-4823 |
| | Knob Assembly (Tuning, Volume).... | 27-4809 |
| | Padding Strip (Tuning Unit)..... | 31-6293 |
| | Pilot Lamp socket assembly..... | 36-9825 |
| | Pointer..... | 27-4891 |
| | Power Cord..... | L-3199 |
| | Push Button Switch..... | 42-1485 |
| | Scale..... | 27-5553 |
| | Sockets..... | 27-6130 |
| | Spring (Drive Cord)..... | 28-8954 |

MODEL TH-5 is a 5 tube superheterodyne receiver covering a frequency range of 540 to 1720 kilocycles and designed for operation on either alternating current (A.C.) or direct current (D.C.) 115 volts.

This model is equipped with 6 electric push-buttons for automatically selecting stations in addition to dial tuning. Five push-buttons are used for the stations and one push button for selecting dial tuning. The push-buttons cover a frequency range as follows:

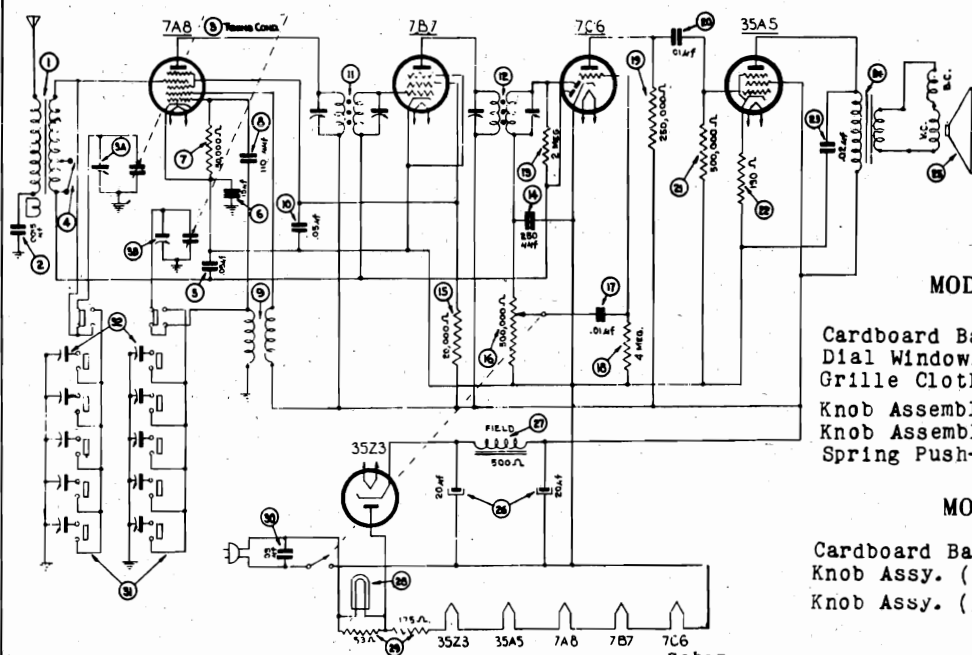
| Padders (right to left from rear) | Circuit | Buttons (left to right from front) | Frequency Range | Padders (right to left from rear) | Circuit | Buttons (left to right from front) | Frequency Range |
|---|------------------|--|------------------------|---|------------------|--|-------------------------|
| 1 | Ant. } Osc. } | 1 | 540 to 1030 kilocycles | 7 | Ant. } Osc. } | 4 | 900 to 1470 kilocycles |
| 2 | | | | 8 | | | |
| 3 | Ant. } Osc. } | 2 | 650 to 1100 kilocycles | 9 | Ant. } Osc. } | 5 | 1160 to 1600 kilocycles |
| 4 | | | | 10 | | | |
| 5 | Ant. } Osc. } | 3 | 740 to 1240 kilocycles | | | 6 | Manual |
| 6 | | | | | | | |

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

PHILCO RADIO & TELEV. CORP.

MODELS TP-5, TP-5-I
TP-5T
Schematic, Tuner



IF PEAK 470 KC
FOR OTHER DATA
SEE INDEX

MODEL TP-5T WALNUT

| | |
|----------------------------------|---------|
| Cardboard Back..... | 27-9314 |
| Dial Window..... | 27-5472 |
| Grille Cloth..... | 44-1288 |
| Knob Assembly..... | 27-4809 |
| Knob Assembly (Push Button)..... | 27-4823 |
| Spring Push-Button Knob..... | 28-5686 |

MODEL TP-5T IVORY

| | |
|----------------------------------|---------|
| Cardboard Back..... | 27-9328 |
| Knob Assy. (Push Button).... | 27-4830 |
| Knob Assy. (Tuning, Volume)..... | 27-4810 |

MODEL TP-5

REPLACEMENT PARTS

| Schem. No. | Description | Philco Part No. | Schem. No. | Description | Philco Part No. |
|------------|-------------------------------------|-----------------|------------|------------------------------------|-----------------|
| 1 | Antenna Transformer..... | 32-3188 | 23 | Tubular Condenser (.02 mf., 400V) | 30-4516S |
| 2 | Tubular Condenser (.0015 mf., 200V) | 30-4555S | 24 | Output Transformer | |
| 3 | Tuning Condenser..... | 31-2365 | | For Speaker 36-1469-1..... | 32-8047 |
| 4 | Switch..... | 42-1406 | | For Speaker 36-1469-9..... | 32-8044 |
| 5 | Tubular Condenser (.05 mf., 200V) | 30-4519S | 25 | Cone Assembly | |
| 6 | Tubular Condenser (.15 mf., 400V) | 30-4505S | | For Speaker 36-1469-1..... | 36-4115 |
| 7 | Resistor (50,000 ohms, 1/3 watt). | 33-350244 | | For Speaker 36-1469-9..... | 36-4113 |
| 8 | Mica Condenser (110 mmf.)..... | 30-1031 | 26 | Electrolytic Condenser | |
| 9 | Oscillator Transformer..... | 32-3167 | | (20-20 mf., 150V.)..... | 30-2382 |
| 10 | Tubular Condenser (.05 mf., 200V) | 30-4519S | 27 | Field Coil -- Part of Speaker No.. | 36-1469 |
| 11 | 1st I.F. Transformer..... | 32-3149 | 28 | Pilot Lamp..... | 34-2088 |
| 12 | 2nd I.F. Transformer..... | 32-3150 | 29 | Line Resistor..... | 33-3387 |
| 13 | Resistor (2 meg. 1/3 watt)..... | 33-520244 | 30 | Tubular Condenser (.03 mfd. 400V.) | 30-4449S |
| 14 | Mica Condenser (250 mmf.)..... | 30-1032 | 31 | Push-Button Switch..... | 42-1485 |
| 15 | Resistor (20,000 ohms, 1/3 watt). | 33-320244 | 32 | Padding Condenser Strip..... | 31-6293 |
| 16 | Volume Control (500,000 ohms).... | 33-5303 | | Drive Cord Assembly..... | 31-2358 |
| 17 | Tubular Condenser (.01 mf., 200V) | 30-4479S | | Drive Shaft Assembly..... | 31-2355 |
| 18 | Resistor (4 meg., 1/3 watt)..... | 33-540244 | | Drive Drum..... | 28-6682 |
| 19 | Resistor (250,000 ohms, 1/3 watt) | 33-425244 | | Padding Strip..... | 31-6293 |
| 20 | Tubular Condenser (.01 mf., 400V). | 30-4572S | | Pointer..... | 27-4891 |
| 21 | Resistor (500,000 ohms, 1/3 watt) | 33-450244 | | Power Cord..... | L-3199 |
| 22 | Resistor (130 ohms, 1/2 watt).... | 33-113336 | | Push-Button Switch..... | 42-1485 |
| | | | | Scale..... | 27-5553 |
| | | | | Sockets..... | 27-6130 |
| | | | | Spring (Drive Cord)..... | 28-8954 |
| | | | | Speaker..... | 36-1469 |

MODELS TP-5 and TP-5-I are 5 tube superheterodyne receivers having 2 tuning ranges covering from 540 to 1720 kilocycles on the broadcast band and from 2.3 to 2.5 megacycles (M.C.) on the police band. This model is designed for operation on alternating current (A.C.) or direct current (D.C.) 115 volts. These models are identical with the exception of cabinets.

The set is equipped with 6 electric push-buttons for automatically selecting stations in addition to dial tuning. Five push-buttons are used for the stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows:

| Padders (right to left from rear) | Circuit | Buttons (left to right from front) | Frequency Range | Padders (right to left from rear) | Circuit | Buttons (left to right from front) | Frequency Range |
|-----------------------------------|---------|------------------------------------|------------------------|-----------------------------------|---------|------------------------------------|-------------------------|
| 1 | Ant. | 1 | 540 to 1030 kilocycles | 7 | Osc. | 4 | 900 to 1470 kilocycles |
| 2 | Osc. | | | 8 | Ant. | | |
| 3 | Ant. | 2 | 650 to 1100 kilocycles | 9 | Osc. | 5 | 1160 to 1600 kilocycles |
| 4 | Osc. | | | 10 | Ant. | | |
| 5 | Ant. | 3 | 740 to 1240 kilocycles | | Osc. | 6 | Manual |
| 6 | Osc. | | | | | | |

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-8384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

MODELS TP-5, TP-11, TH-5

Tuner Data

MODEL 39-8

Alignment

PHILCO RADIO & TELEV. CORP.

SETTING AND OPERATING ELECTRIC PUSH BUTTON TUNING

Models TP-5, TP-11, TH-5

Select five of your favorite nearby broadcast stations and remove their call letters from the station call letter tab sheets supplied. Place the call letters in the windows above the buttons, making sure that each respective button covers the frequency of the station for which it is to be used. The frequency of the popular stations in your vicinity may be found by consulting any station list. The frequency range of the buttons is as follows:—

| Paddlers (right to left from rear) | Circuit | Buttons (left to right from front) | Frequency Range |
|--|---------|--|-------------------------|
| 1 | Ant } | 1 | 540 to 1030 kilocycles |
| 2 | Osc } | | |
| 3 | Ant } | 2 | 650 to 1100 kilocycles |
| 4 | Osc } | | |
| 5 | Ant } | 3 | 740 to 1240 kilocycles |
| 6 | Osc } | | |
| 7 | Ant } | 4 | 900 to 1470 kilocycles |
| 8 | Osc } | | |
| 9 | Ant } | 5 | 1160 to 1600 kilocycles |
| 10 | Osc } | | |
| | | 6 | Dial |

The left-hand button looking at the front of the cabinet corresponds to the two right-hand screws looking at the rear and covers the lowest frequency range.

With the "Manual" button depressed, tune in the station whose call letters appear above the left-hand button. Then depressing the left-hand button, tune in this station by rotating

the "OSC" screw of No. 1 pair (at the right end of the unit looking at the rear of the chassis). Turn the screw slowly and listen carefully or the station may be passed without noticing it. After the "OSC" screw has been adjusted for maximum volume, the corresponding "ANT" screw should be adjusted for maximum. For some stations, it may be necessary to re-adjust the "OSC" screw after the "ANT" screw has been set. Switching from the "Manual" to the automatic push button will enable you to make sure you have the correct station tuned in. When the first station has been set, the same procedure should be followed for the remaining buttons, first tuning in the desired station by means of the "Manual" control.

To tune the receiver with the "Push-Buttons," simply press in the button which is under the call letters of the desired station. Your station will be received instantly. The volume of the program may be controlled with the manual volume control.

While the above procedure is satisfactory in setting up push buttons for stations, a very accurate adjustment can be obtained with a vacuum tube voltmeter.

Model 39-8

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED:

- (1) Signal Generator; Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K.C. is the correct instrument for this purpose.
- (2) Output Meter, Philco Model 027 Circuit Tester, incorporates a sensitive output meter and is recommended.
- (3) Philco Fiber Handle Screw Driver, Part No. 45-2610 and Fiber Wrench, Part No. 3164.

OUTPUT METER:

The Philco 027 Output Meter is connected to the plate and screen terminals of the type 43 tube and adjusted for the 0 to 30 A.V.C. scale. After connecting the output meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown on Fig. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Signal Generator

Receiver

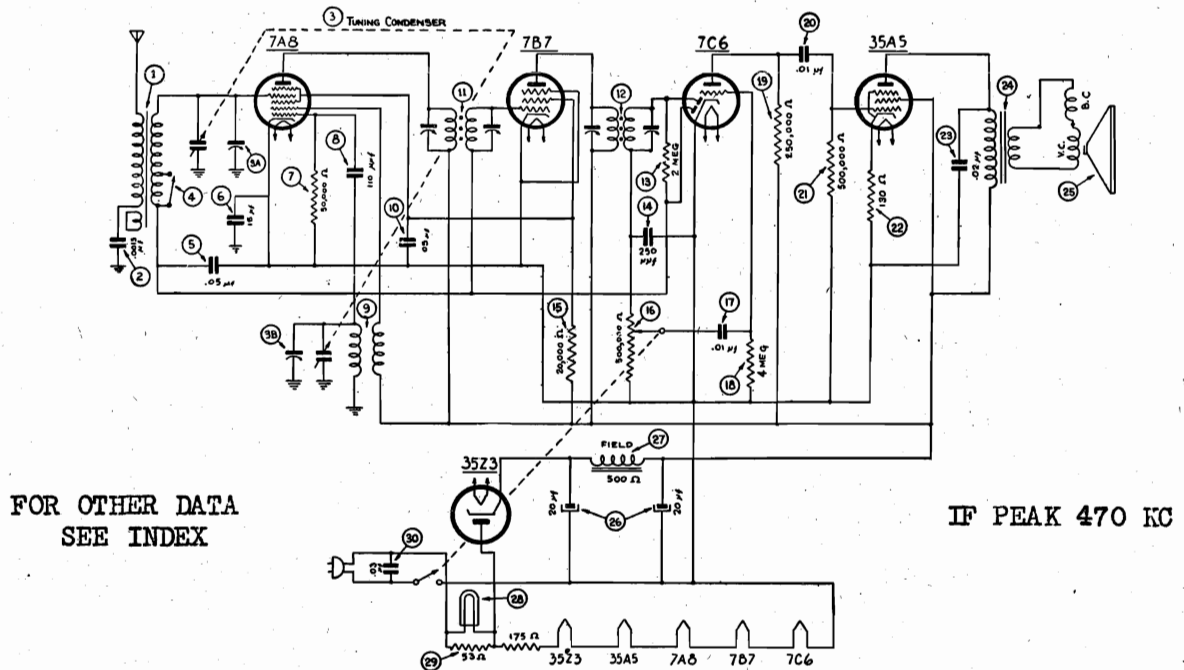
| Operation In Order | Output Connections to Receiver | Dummy Antenna (Note A) | Dial Setting | Dial Setting | Control Setting | Adjust Compensators in order | Special Instructions |
|--------------------------|--------------------------------------|------------------------------|-----------------|-----------------|--------------------|------------------------------------|--|
| 1 | 6A7 Grid Cap | .1 mf. | 470 K.C. | 580 K.C. | Vol.Cont. Max. | I2A, 10B, 10A | Adjust for max. output |
| 2 | Ant. Lead | 100 mf. | 1550 K.C. | 1550 K.C. | Vol.Cont. Max. | 2B, 2A | Adjust for max. output Note A, B. |

NOTE A--The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

NOTE B--DIAL CALIBRATION: With the tuning condenser in "maximum capacity" position (plates fully meshed), set the dial pointer between the two horizontal lines at the low frequency end of the scale (550 K.C.).

PHILCO RADIO & TELEV. CORP.

MODEL TP-10
Schematic
Notes



REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TP-10

| Schem. No. | Description | Philco Part No. | Schem. No. | Description | Philco Part No. |
|------------|-------------------------------------|-----------------|------------|-----------------------------------|-----------------|
| 1 | Antenna Transformer..... | 32-3184 | 25 | For Speaker 36-1469-9..... | 32-8044 |
| 2 | Tubular Condenser (.0015 mf., 200V) | 30-45558 | 26 | Cone Assembly | |
| 3 | Tuning Condenser..... | 31-2354 | | For Speaker 36-1469-1..... | 36-4115 |
| 4 | Switch..... | 42-1406 | | For Speaker 36-1469-9..... | 36-4113 |
| 5 | Tubular Condenser (.05 mf., 200V) | 30-45198 | 26 | Electrolytic Condenser | |
| 6 | Tubular Condenser (.15 mf., 400V) | 30-45058 | | (20-20 mf., 150 V.)..... | 30-2382 |
| 7 | Resistor (50,000 ohms, 1/3 watt). | 33-350244 | 27 | Field Coil....Part of Speaker No. | 36-1469 |
| 8 | Mica Condenser (110 mmf.)..... | 30-1031 | 28 | Pilot Lamp..... | 34-2068 |
| 9 | Oscillator Transformer..... | 32-3152 | 29 | Line Resistor..... | 33-3387 |
| 10 | Tubular Condenser (.05 mf., 200V) | 30-45198 | 30 | Tubular Condenser (.03 mf., 400V) | 30-44498 |
| 11 | 1st I.F. Transformer..... | 32-3149 | | Cabinet..... | 10367-A |
| 12 | 2nd I.F. Transformer..... | 32-3150 | | Cardboard Back..... | 27-9320 |
| 13 | Resistor (2 meg., 1/3 watt)..... | 33-520244 | | Disc Feet..... | 27-9337 |
| 14 | Mica Condenser (250 mmf.)..... | 30-1032 | | Drive Cord Assembly..... | 31-2358 |
| 15 | Resistor (20,000 ohms, 1/3 watt). | 33-320244 | | Drive Drum..... | 56-6033 |
| 16 | Volume Control (500,000 ohms).... | 33-5306 | | Driving Arm (Pointer Drive)..... | 56-1376 |
| 17 | Tubular Condenser (.01 mf., 200V). | 30-44798 | | Drive Shaft Assy..... | 31-2355 |
| 18 | Resistor (4 meg., 1/3 watt)..... | 33-540244 | | Grille Silk & Gasket..... | 40-6452 |
| 19 | Resistor (250,000 ohms, 1/3 watt) | 33-425244 | | Knob Assembly..... | 27-4815 |
| 20 | Tubular Condenser (.01 mf., 400V) | 30-45728 | | Pilot Lamp Socket Assembly..... | 38-9828 |
| 21 | Resistor (500,000 ohms, 1/3 watt) | 33-450244 | | Power Cord..... | L-3199 |
| 22 | Resistor (130 ohms, 1/2 watt).... | 33-113336 | | Rubber Tubing (Driving Arm)..... | 27-9334 |
| 23 | Tubular Condenser (.02 mf., 400V) | 30-45168 | | Sockets..... | 27-6130 |
| 24 | Output Transformer | | | Speaker Assembly..... | 36-1469 |
| | For Speaker 36-1469-1..... | 32-8047 | | Spring..... | 28-8751 |

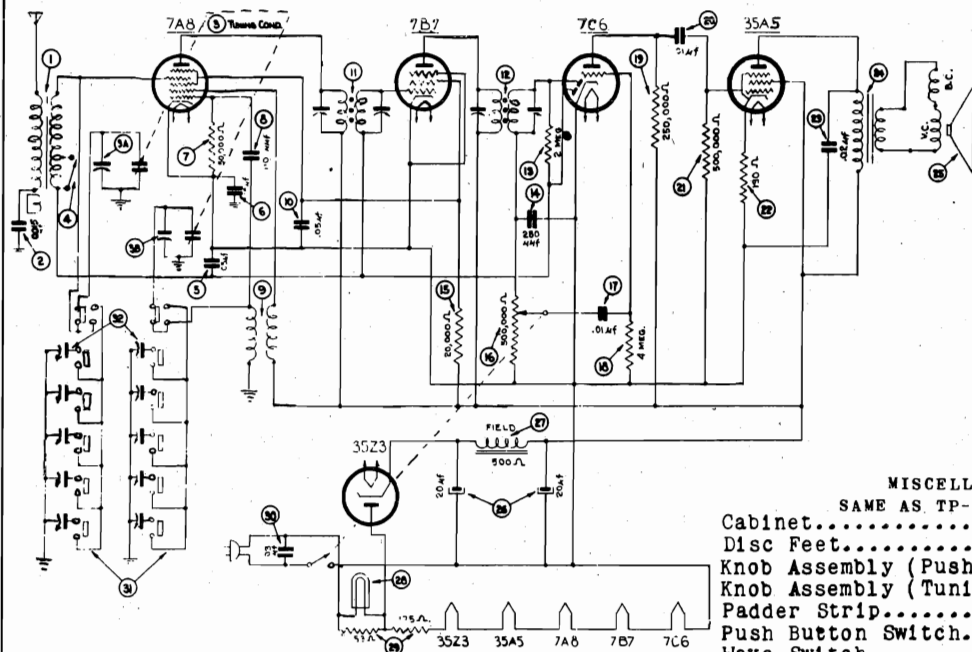
MODEL TP-10 is a 5 tube superheterodyne receiver having 2 tuning ranges covering from 540 to 1720 kilocycles (K.C.) on the broadcast band and 2.3 to 2.5 megacycles (M.C.) on the police band. This model is designed for operation on either alternating current (A.C.) or direct current (D.C.) 115 volts. The receiver is assembled in a streamlined, 2 toned plastic cabinet.

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-8384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

MODEL TP-11
Schematic, Tuner

PHILCO RADIO & TELEV. CORP.



IF PEAK 470 KC

FOR OTHER DATA
SEE INDEX

MISCELLANEOUS PARTS

SAME AS TP-10 WITH EXCEPTION

| | |
|---------------------------------|---------|
| Cabinet..... | 10368-A |
| Disc Feet..... | 27-9337 |
| Knob Assembly (Pushbutton)..... | 27-4824 |
| Knob Assembly (Tuning)..... | 27-4815 |
| Padder Strip..... | 31-6293 |
| Push Button Switch..... | 42-1485 |
| Wave Switch..... | 42-1408 |

REPLACEMENT PARTS

| Schem. No. | Description | Philco Part No. |
|------------|---|-----------------|
| 1 | Antenna Transformer..... | 32-3168 |
| 2 | Tubular Condenser (.0015 mf., 200V) | 30-45558 |
| 3 | Tuning Condenser..... | 31-2365 |
| 4 | Switch..... | 42-1406 |
| 5 | Tubular Condenser (.05 mf., 200V) | 30-45198 |
| 6 | Tubular Condenser (.15 mf., 400V) | 30-45058 |
| 7 | Resistor (50,000 ohms, 1/3 watt)..... | 33-350244 |
| 8 | Mica Condenser (110 mmf.)..... | 30-1031 |
| 9 | Oscillator Transformer..... | 32-3167 |
| 10 | Tubular Condenser (.05 mf., 200V) | 30-45198 |
| 11 | 1st I.F. Transformer..... | 32-3149 |
| 12 | 2nd I.F. Transformer..... | 32-3150 |
| 13 | Resistor (2 meg., 1/3 watt)..... | 33-520244 |
| 14 | Mica Condenser (250 mmf.)..... | 30-1032 |
| 15 | Resistor (20,000 ohms, 1/3 watt)..... | 33-320244 |
| 16 | Volume Control (500,000 ohms)..... | 33-5306 |
| 17 | Tubular Condenser (.01 mf., 200V)..... | 30-44798 |
| 18 | Resistor (4 meg., 1/3 watt)..... | 33-540244 |
| 19 | Resistor (250,000 ohms, 1/3 watt)..... | 33-425244 |
| 20 | Tubular Condenser (.01 mf., 400V)..... | 30-45728 |
| 21 | Resistor (500,000 ohms, 1/3 watt)..... | 33-450244 |
| 22 | Resistor (130 ohms, 1/2 watt)..... | 33-113336 |
| 23 | Tubular Condenser (.02 mf., 400V)..... | 30-45168 |
| 24 | Output Transformer | |
| | For Speaker 36-1469-1..... | 32-8047 |
| | For Speaker 36-1469-9..... | 32-8044 |
| 25 | Cone Assembly | |
| | For Speaker 36-1469-1..... | 36-4115 |
| | For Speaker 36-1469-9..... | 36-4113 |
| 26 | Electrolytic Condenser (20-20 mf., 150 V.)..... | 30-2382 |
| 27 | Field Coil.....Part of Speaker No 36-1469 | |
| 28 | Pilot Lamp..... | 34-2068 |
| 29 | Line Resistor..... | 33-3367 |
| 30 | Tubular Condenser (.03 mf., 400 V.)..... | 30-44498 |
| 31 | Push-Button Switch..... | 42-1485 |
| 32 | Padding Condenser Strip..... | 31-6293 |

MODEL TP-11 is a 5 tube superheterodyne receiver having 2 tuning ranges covering from 540 to 1720 kilocycles (K.C.) on the broadcast band and from 2.3 to 2.5 megacycles (M.C.) on the police band. This model is assembled in a 2 toned, streamlined plastic cabinet.

This model is equipped with 6 electric push-buttons for automatically selecting stations in addition to dial tuning. Five push-buttons are used for the stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows:

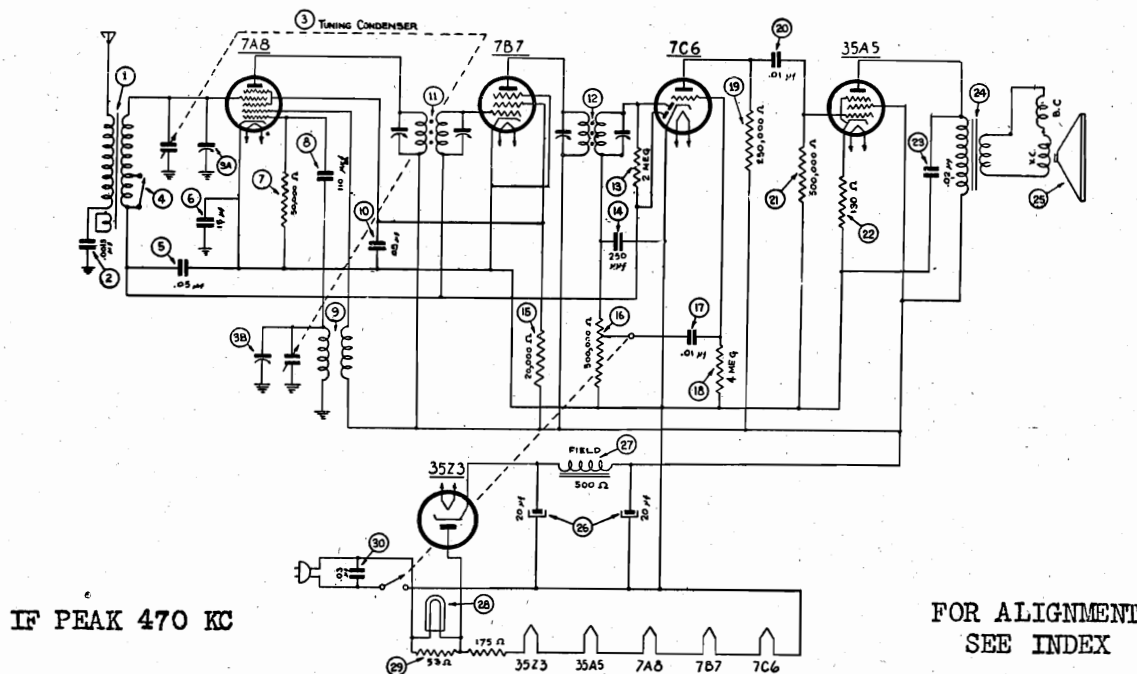
| Padders (right to left from rear) | Circuit | Buttons (left to right from front) | Frequency Range | Padders (right to left from rear) | Circuit | Buttons (left to right from front) | Frequency Range |
|-----------------------------------|-----------|------------------------------------|------------------------|-----------------------------------|-----------|------------------------------------|-------------------------|
| 1 | Ant. Osc. | 1 | 540 to 1030 kilocycles | 7 | Ant. Osc. | 4 | 900 to 1470 kilocycles |
| 2 | Ant. Osc. | 2 | 650 to 1100 kilocycles | 8 | Ant. Osc. | 5 | 1160 to 1600 kilocycles |
| 3 | Ant. Osc. | 3 | 740 to 1240 kilocycles | 9 | Ant. Osc. | | |
| 4 | Ant. Osc. | | | 10 | Ant. Osc. | 6 | Manual |
| 5 | Ant. Osc. | | | | | | |
| 6 | Ant. Osc. | | | | | | |

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

PHILCO RADIO & TELEV. CORP.

MODEL TP-12
Schematic Notes



REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TP-12

| Schem. No. | Description | Philco Part No. | Schem. No. | Description | Philco Part No. |
|------------|-------------------------------------|-----------------|------------|-----------------------------------|-----------------|
| 1 | Antenna Transformer..... | 32-3164 | 25 | Cone Assembly | 32-8044 |
| 2 | Tubular Condenser (.0015 mf., 200V) | 30-45558 | 26 | Electrolytic Condenser | 32-8044 |
| 3 | Tuning Condenser..... | 31-2354 | 27 | Field Coil.....Part of Speaker No | 36-1469 |
| 4 | Switch..... | 42-1406 | 28 | Pilot Lamp..... | 34-2068 |
| 5 | Tubular Condenser (.05 mf., 200V). | 30-45198 | 29 | Line Resistor..... | 33-3367 |
| 6 | Tubular Condenser (.15 mf., 400V). | 30-45058 | 30 | Tubular Condenser (.03 mf., 400V) | 30-44498 |
| 7 | Resistor (50,000 ohms, 1/3 watt). | 33-350244 | | Cardboard..... | 27-9299 |
| 8 | Mica Condenser (110 mmf.)..... | 30-1031 | | Cabinet..... | 10374 |
| 9 | Oscillator Transformer..... | 32-3152 | | Cable (Power)..... | L-3183 |
| 10 | Tubular Condenser (.05 mf., 200V). | 30-45198 | | Dial Scale..... | 27-5498 |
| 11 | 1st I.F. Transformer..... | 32-3149 | | Drive Drum..... | 28-6662 |
| 12 | 2nd I.F. Transformer..... | 32-3150 | | Drive Shaft Assembly..... | 31-2355 |
| 13 | Resistor (2 meg., 1/3 watt)..... | 33-520244 | | Drive Cord Assembly..... | 31-2358 |
| 14 | Mica Condenser (250 mmf.)..... | 30-1032 | | Knob Assembly..... | 27-4820 |
| 15 | Resistor (20,000 ohms, 1/3 watt)... | 33-320244 | | Pointer Dial..... | 56-1326 |
| 16 | Volume Control (500,000 ohms)..... | 33-5306 | | Spring (Drive Cord)..... | 28-8751 |
| 17 | Tubular Condenser (.01 mf., 200V). | 30-44798 | | Speaker..... | 36-1469 |
| 18 | Resistor (4 meg., 1/3 watt)..... | 33-540244 | | Socket Assembly (Pilot Lamp)..... | 38-9825 |
| 19 | Resistor (250,000 ohms, 1/3 watt). | 33-425244 | | Sockets..... | 27-6128 |
| 20 | Tubular Condenser (.01 mf., 400V). | 30-45728 | | | |
| 21 | Resistor (500,000 ohms, 1/3 watt). | 33-450244 | | | |
| 22 | Resistor (130 ohms, 1/2 watt)..... | 33-113336 | | | |
| 23 | Tubular Condenser (.02 mf., 400V). | 30-45168 | | | |
| 24 | Output Transformer | | | | |
| | For Speaker 36-1469-1..... | 32-8047 | | | |

MODEL TP-12 is a 5 tube superheterodyne receiver having 2 tuning ranges covering from 540 to 1720 kilocycles (K.C.) on the broadcast band and from 2.3 to 2.5 megacycles (M.C.) on the police band. This model is designed to operate on either alternating (A.C.) or direct current (D.C.) 115 volts. This model is assembled in a walnut cabinet with contrasting maple inlays.

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-6384 is recommended.

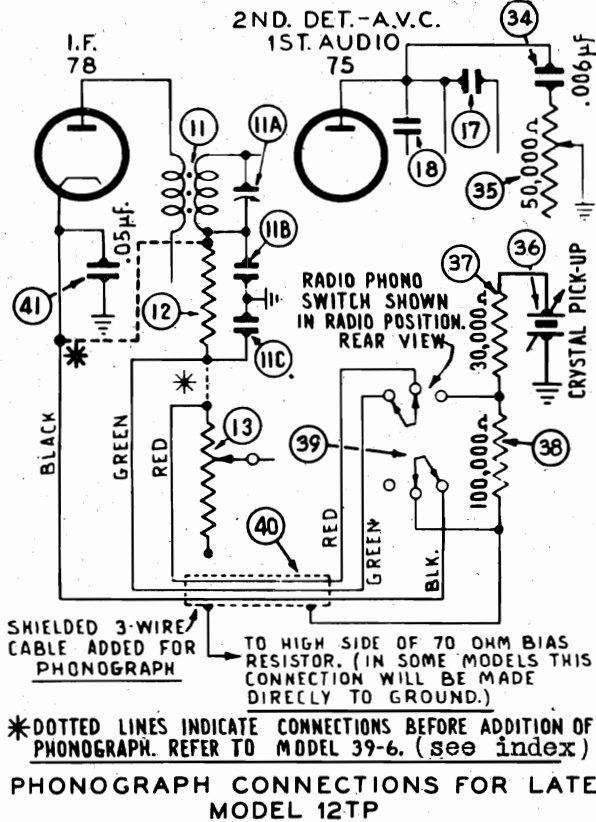
NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

[illegible]

The Phonograph connections as used with Model 39-6 is shown below. Refer to **index** for Model 39-6.

| Schem. No. | Description | Part No. |
|---------------|------------------------------------|-----------|
| 31 | Motor (115 Volts)..... | 35-1174 |
| 32 | Condenser (.05 mfd., 200 V.)..... | 30-4519 |
| 33 | Cable..... | |
| 34 | Resistor (32,000 ohms)..... | 33-332339 |
| 35 | Condenser (.006 mfd., 400 V.)..... | 30-4591 |
| 36 | Crystal Cartridge..... | 415-1087 |
| 37 | Resistor (32,000 ohms)..... | 33-332339 |
| 38 | Resistor (32,000 ohms)..... | 33-332339 |
| 39 | Switch (Radio-Phono)..... | 42-1522 |
| 40 | Motor (Power Switch)..... | 42-1498 |
| 41 | Condenser (.006 mfd., 400 V.)..... | 30-4591 |
| 42 | Tone Control..... | 33-5330 |
| | Pickup Complete..... | 35-2027 |

| Schem. No. | Description | Part No. |
|---------------|-------------------------------------|-----------|
| 34 | Condenser (.006 mfd., 400 V.)..... | 30-4591 |
| 35 | Tone Control..... | 33-5330 |
| 36 | Crystal Cartridge (Pickup)..... | 415-1027 |
| 37 | Resistor (30,000 ohms)..... | 33-330339 |
| 38 | Resistor (100,000 ohms)..... | 33-410339 |
| 39 | Switch (Radio-Phono)..... | 42-1522 |
| 40 | Cable..... | |
| 41 | Condenser (.05 mfd., 200 V.)..... | 30-4519 |
| | Pickup Complete..... | 35-2027 |
| | Motor (115 Volt A.C. 60 cycle)..... | 35-1174 |
| | Power Switch (Motor)..... | 42-1498 |



PHILCO RADIO & TELEV. CORP.

MODELS 12TP, 39-12
39-12TP, Early, Late
Alignment, Trimmers
Socket, Parts

PHILCO RADIO PHONOGRAPH.....MODEL 12-TP

SPECIFICATIONS

TYPE OF CIRCUIT: Model 39-12 TP is a table model combination semi-automatic phonograph and superheterodyne radio receiver. The phonograph mechanism automatically places the pickup on the record when the lid is closed and will play 10 or 12 inch records.

A.C. operated, superheterodyne with automatic volume control, pentode audio output, and covers the standard broadcast and state police frequencies.

POWER SUPPLY:

| | |
|---------|-----------|
| Voltage | Frequency |
| 115 | Cycles |
| | 50 To 60 |

INTERMEDIATE FREQUENCY: 470 K.C.

R.F. TUNING RANGE: 540 to 1720 K.C.

AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED: Five: One 6A7, Det. Osc.; One 78, I.F.; One 75, 2nd Det., 1st Audio; One 41, Output, and One 84, Rectifier.

TUNING MECHANISM: 8 to 1 Ratio using Pulley and Cord.

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED:

- (1) Signal Generator
- (2) Output Meter
- (3) Philco Fibre Handle Screw Driver, Part No. 45-2810 and Fibre Wrench, Part No. 3164.

OUTPUT METER:

The 027 Output Meter is connected to the plate and cathode terminals of the 41 tube. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable

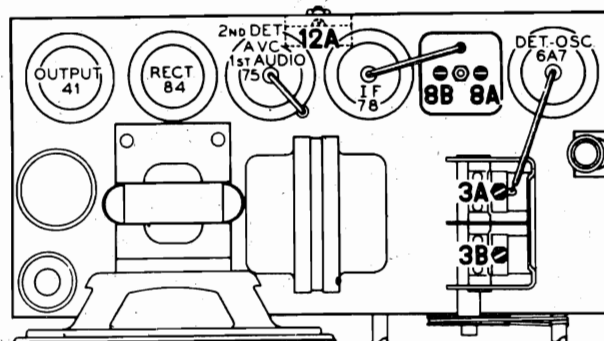


FIG. 2.—Locations of Compensators.

indication is noted on the output meter after signal is applied.

DIAL CALIBRATION:

- 1 Turn the tuning condenser to maximum capacity position (plates fully meshed).
- 2 Holding the tuning condenser in this position, turn the pointer until it is 1/16 of an inch below the three lines of the scale at the 550 K.C. end. This is the correct position of pointer at maximum capacity of tuning condenser.

| OPERATIONS IN ORDER | SIGNAL GENERATOR | | | RECEIVER | | | NOTES |
|---------------------------|--------------------------------------|------------------|-----------------|-----------------|---------------------|------------------------|--------------------|
| | Output Connections to Receiver | Dummy Antenna | Dial Setting | Dial Setting | Control Settings | Adjust Compensators | |
| 1 | 6A7 Grid | .1 mfd | 470 KC | 580 KC | Vol (Max) | (12A), (8B) (8A) | Adjust for Max. |
| 2 | Aerial (White Wire) | 100 mmfd | 1500 KC | 1500 KC | Vol (Max) | (3B), (3A) | Adjust for Max. |

REPLACEMENT PARTS

MODEL 39-12 TP

| Schem. No. | Description | Part No. | Schem. No. | Description | Part No. |
|---------------|---|-----------|---------------|---|----------|
| 1 | Antenna Transformer..... | 32-2583 | *27 | Field coil assembly (not supplied; see Note) | |
| 2 | Condenser (0.05 mfd. tubular)..... | 30-4444 | 28 | Condenser (Electrolytic 12 mfd.)..... | 30-2235 |
| 3 | Tuning Condenser Assembly..... | 31-2258 | 29 | Power Transformer (115V, 50 to 60 cycle)..... | 32-7993 |
| 4 | Compensator (Part of tuning condenser 3)..... | | 30 | Condenser (0.01 mfd., .01 mfd.)..... | 3903-DG |
| 5 | Resistor (51,000 ohms, 1/2 watt)..... | 33-351339 | | Pilot Lamp..... | 34-2068 |
| 6 | 110 mmfd. mica..... | 30-1031 | | Bezel and Glass Assembly..... | 40-6158 |
| 7 | Oscillator Transformer..... | 32-3019 | | Bezel Clamp..... | 28-5153 |
| 8 | First I.F. Transformer..... | 32-3018 | | Cable (Power)..... | L-2778 |
| 9 | Resistor (2 megohms)..... | 33-520339 | | Clip (R.F. Trans. small)..... | 28-5002 |
| 10 | Condenser (0.03 mfd. tubular)..... | 30-4449 | | Clip (R.F. Trans. large)..... | 28-5003 |
| 11 | Resistor (40,000 ohms, 1/2 watt)..... | 33-340339 | | Clip (Tuning Shaft)..... | 28-8610 |
| 12 | Second I.F. Transformer..... | 32-2944 | | Dial Assembly..... | 31-2097 |
| 13 | Resistor (51,000 ohms, 1/2 watt)..... | 33-351339 | | Dial Pointer..... | 28-5185 |
| 14 | Volume Control..... | 33-5230 | | Dial Drive Cord Assembly..... | 31-2082 |
| 15 | Condenser (0.01 mfd. tubular)..... | 30-4479 | | Dial Drive Drum..... | 28-6662 |
| 16 | Resistor (4 megohms, 1/2 watt)..... | 33-540339 | | Dial Drive Spring..... | 28-8751 |
| 17 | Condenser (250 mmfd. mica)..... | 30-1032 | | Knob (Tuning and Volume)..... | 27-4604 |
| 18 | Resistor (160,000 ohms, 1/2 watt)..... | 33-416339 | | Shaft Assembly (Tuning)..... | 31-2179 |
| 19 | Condenser (0.01 mfd. tubular)..... | 30-4169 | | Shield (Tube)..... | 28-5059 |
| 20 | Resistor (2 megohm, 1/2 watt)..... | 33-510339 | | Socket (6 prong)..... | 27-6036 |
| 21 | Condenser (0.01 mfd. tubular)..... | 30-4169 | | Socket (7 prong)..... | 27-6037 |
| 22 | Output Transformer..... | 32-7861 | | Socket (5 prong)..... | 27-6035 |
| 23 | Cone and Voice Coil Assembly..... | 36-4084 | | Stop--Rubber..... | 27-4540 |
| 24 | Resistor (70 ohms, 1/2 watt)..... | 33-070339 | | Speaker Model B0-1..... | 36-1418 |
| 25 | Resistor (250 ohms, 1/2 watt)..... | 33-125431 | | Pilot Lamp Assembly..... | 31-2179 |
| 26 | Condenser (Electrolytic 4 mfd.)..... | 30-2236 | | | |

* Entire Speaker must be replaced when field coil is open or damaged.

**MODEL 35-1169, Automatic
Record Changer**
PHILCO RADIO & TELEV. CORP.
Notes

Automatic record changer Part No. 35-1169 plays eight 10" records automatically or eight 12" records manually. The last record remains on the turntable and repeats as long as the record changer is in operation either in the manual or automatic position.

OPERATION
AUTOMATIC POSITION:

To load the mechanism lift the record removing arm at (A) Fig. 1 to the upright position. To adjust the pickup to play 10" records, automatically, push the pickup stop at (K) Fig. 1 back away from the pickup. To play 12" records manually, pull the stop forward toward the needle as far as it will go. Place records on turntable. Throw switch at (N) Fig. 1 to the "On" position. Mechanism will now operate and reject each record after it has been played through. To reject a record and play the next record below it, pull the latch lever at (L) Fig. 1 forward.

MANUAL POSITION:

To operate the mechanism in the manual position, lift the record removing arm at (A) Fig. 1 to the upright position. 10 or 12" records can then be played by the position of the pickup stop at (K) Fig. 1. To play 10" records manually, push the pickup stop at (K) Fig. 1 back away from the pickup needle. For 12" records, pull the stop forward toward the needle as far as it will go.

MOTOR LUBRICATION

The motor installed in this Record Changer is governor controlled, with all gearing enclosed and leaves the factory lubricated for proper operation. For best results, lubricate the motor at regular intervals with a pure mineral oil as light as obtainable. Under no circumstances use any oil heavier than an SAE #10 nor any oil containing mixtures of animal or vegetable oils.

The governor disc engages with a felt brake. This felt is impregnated with a lubricating solution sufficient for proper operation for approximately six months under normal conditions. An oil hole is provided in the top of the governor housing for re-lubricating the brake felt.

MOTOR SPEED

The motor speed is adjusted by means of a slotted post (C) 3 Fig. 1 which is located under the turntable. To change motor speed rotate this post slightly by means of a screw driver.

TRIP MECHANISM

The trip mechanism is the trigger that sets the Record Changer in motion. This is done by allowing the latch bar at (O) Fig. 1 to drop in front of, and be actuated by the cam at (P) Fig. 1. This cam is driven by the motor and is in motion as long as the motor is running. If this mechanism does not operate smoothly, the precautions outlined in succeeding paragraphs should be observed.

First of all, make sure that the square pin in the latch lever at (U) Fig. 1 latches properly in the notch in the lift lever at (1) Fig. 1. When latched, the notch should be engaged approximately one-half of its depth. The depth of engagement is adjusted by means of the eccentric washer and locking screw at (J) Fig. 1. Now run the record changer through its cycle. If the square pin fails to engage the notch in the lift lever, first check the tension of the latch spring at (H) Fig. 1 to insure that the notch can engage the pin. Next check the tension of the reset spring at (E) Fig. 1. This reset spring should not be under tension when the latch bar is latched but should have enough tension when the latch bar drops back off of the cam to cause the square pin to over travel the notch in the lift lever.

IMPORTANT --- Before attempting to change the tension of any spring, be sure that the parts involved work freely without any tendency to bind, as of course any binding condition would preclude proper operation.

The Record Changer is adjusted at the factory to trip on a spiral trip groove record when the phonograph needle is 1-3/4" from the edge of the hole in the center of the record.

When eccentric or oscillating trip groove records are used, tripping is effected by means of the

hardened steel pin in the end of tone arm lift crank at (S) Fig. 2 engaging the serrated block on the trip lever at (T) Fig. 2. There must be a minimum of 1/32" play between the end of the pin and the block, when, with a short needle, (5/8" Minimum Length) the pickup is resting on one record on the turntable. If the pressure of the pin on the block is not sufficient to insure operation, then check the pressure spring which is located up under the pickup.

The oval head pivot screw at (R) Fig. 1 serves as a pivot for the lift lever at (1) Fig. 1. This screw should allow the lift lever to be raised by the latch bar to its maximum height without binding but also without any additional play.

If the Record Changer fails to trip, see if the phonograph needle is jumping out of a worn record trip groove. Next make certain that all parts of the mechanism work freely and smoothly. If it is found that the latch bar at (O) Fig. 1 is not dropping in far enough to engage the cam at (P) Fig. 1 then check the tension of the trip spring at (B) Fig. 1.

RECORD REMOVING MECHANISM

The record Changer is adjusted so that it will always leave one record on the turntable. This is done to prevent the phonograph needle from damaging the covering on the turntable.

In case the Record Removing Mechanism fails to operate smoothly, proceed as follows: First make certain that all parts work freely with no binding in pivots or bearings, and that the record removing arm assembly rests on the stop screw at (Q) Fig. 3. Next stop the motor in such a position that the latch bar at (O) Fig. 1 can swing by and clear the cam at (P) Fig. 1. Place just one record on the turntable and measure from the top of this record down to the base plate. This distance should be one inch. Now by pulling the reject lever at (L) Fig. 1 first, it will be found possible to swing the record removing finger at (Y) Fig. 3 over to where it just touches the edge of the record. If the adjustment is correct, the record removing finger should just barely rise over the edge of the first record. If adjustment is required it can be made by means of the stop screw at (Q) Fig. 3. In the event the record removing arm raises the record from the turntable and drops it back in place without removing it, check the lift adjustment at (V) Fig. 1. This adjustment consists of an eccentric stud which is provided with a lock nut, and is made by loosening the lock nut and turning the eccentric stud. The lift adjustment should be set so that the hole in the center of the record just clears turntable spindle when the Record Changer is in operation.

PICKUP LOWERING MECHANISM

The pickup lowering mechanism has two functions. First, it lowers the phonograph needle gently to the surface of the record. Second, it feeds the needle toward the center of the record so that it will enter the playing groove.

If the pickup descends too fast or too slow, adjust the speed of descent by turning the knurled thumb nut on the dashpot sleeve at (W) Fig. 2.

The unit is adjusted at the factory so that the needle will be set down approximately 3/32" in from the edge of the record. An adjusting screw is provided on the side of the pickup at (M) Fig. 2. If the needle is being lowered onto the playing surface of the record, and the adjusting screw at (M) Fig. 2 fails to correct the condition proceed as follows: First stop the record changer, with the pickup in the maximum raised position and check the clearance between the underside of the pickup shelf at (Z) Fig. 2 and the tip of the dashpot. This clearance should be very small as otherwise the pickup will tend to bounce as it is lowered. There must be sufficient clearance however to prevent the pickup shelf from rubbing on the tip of the dash pot, or the pickup will not swing out far enough to allow the adjustable stop at (K) Fig. 2 to come to rest against the dashpot. Check this clearance in both 10" and 12" record positions. If adjustment is required, the height of the dashpot may be regulated by loosening the nuts on the bottom of the lift lever stud at (X) Fig. 4 and changing their position on the stud. To raise the dashpot turn the nuts clockwise, to lower the dashpot turn the nuts counter-clockwise. Be sure to lock the nuts tightly together after the adjustment is made.

PHILCO RADIO & TELEV. CORP.

MODEL 35-1169
Assembly, Parts

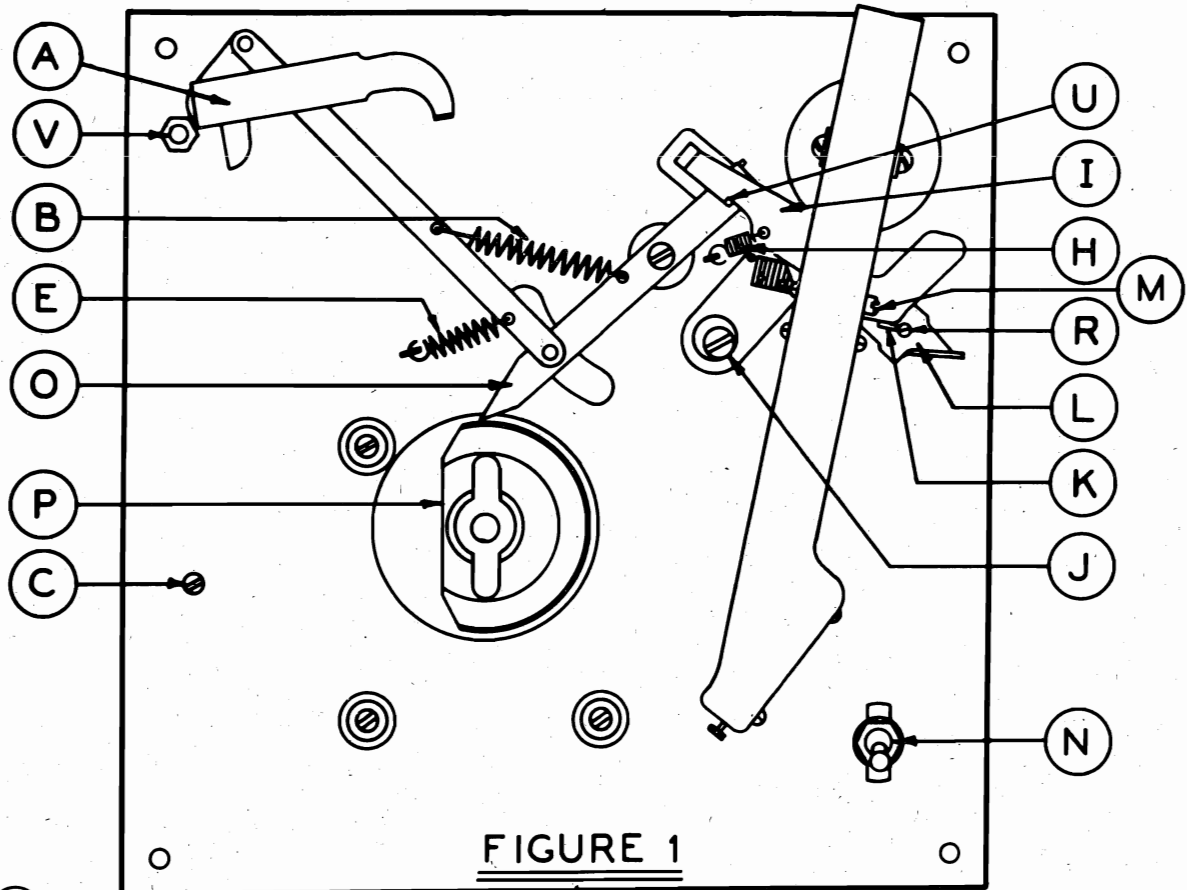


FIGURE 1

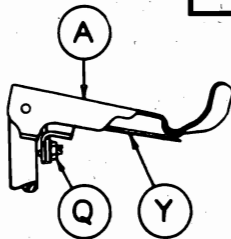


FIGURE 3

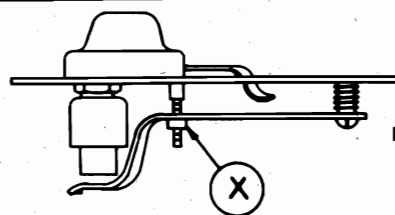


FIGURE 4

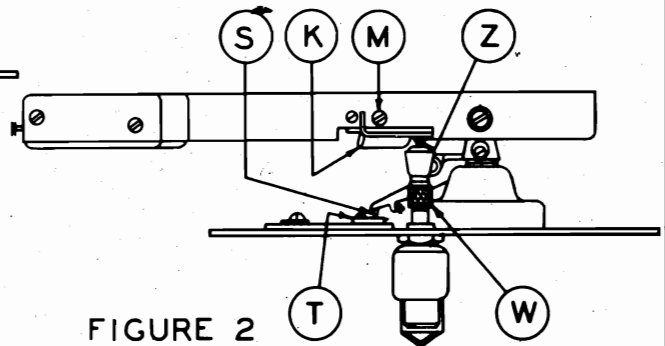


FIGURE 2

A. Record Removing Mechanism Assy. Complete
Parts of Above Assembly

- Record Removing Arm Assembly
- Record Removing Sleeve & Link Assy.
- Record Removing Sleeve Link Mtg. Stud
- Record Removing Sleeve Screw
- Record Removing Link Spring
- Record Removing Finger Pin
- Record Removing Finger
- Record Removing Finger Spring
- Record Removing Arm Adjusting Nut
- Record Removing Arm Adjusting Screw
- Record Removing Arm Pin (Arm to Sleeve & Link Assy.)
- B. Trip Spring
- C. Motor Speed Adjusting Post
- E. Record Removing Link Spring
- H. Latch Spring
- I. Lift Lever Assembly
 - Lift Spring
 - Lift Crank Washer
 - Lift Lever Screw
- J. Eccentric Washer & Locking Screw
- K. Adjustable Stop

- L. Reject Lever
- M. Pickup Positioning Adjusting Screw
- N. Power Switch
- O. Latch Bar Assembly Complete
 - Screw (Latch Bar Mtg.)
 - Stud Nut (Latch Bar & Bumper)
 - Stop (Latch Bar)
- P. Cam (Latch Bar Stop)
- Q. Record Removing Arm Adjusting Screw
 - Nut (Record Removing Arm)
- R. Lift Lever Pivot Screw
- S. Tone Arm Lift Crank
- T. Trip Lever Serrated Block (Part of L)
- U. Pin (Part of Latch Bar (O))
- V. Record Removing Arm Adjusting Stud
- W. Dash Pot Complete.
- X. Dash Pot Lift Lever
- Y. Record Removing Finger
- Z. Pickup Lift Shelf

- Washer (Latch Bar Mtg. Screw)
- Mounting Screw (Latch Bar Stop)
- Screw (Latch Bar & Pickup Lift Stop)
- Dash Pot
- Nut (Dash Pot)
- Adjusting Cap (Dash Pot)
- Gland (Dash Pot)
- Plunger Assembly (Dash Pot)
- Lever Spring (Dash Pot)
- Weight (Dash Pot)
- Lever Spacer (Dash Pot)
- Felt Washer (Dash Pot)
- Leather (Dash Pot)
- Washer Large (Dash Pot)
- Washer Small (Dash Pot)

MODEL 35-1176, Intermix
Auto Record Changer
Assembly Motor Notes

PHILCO RADIO & TELEV. CORP.

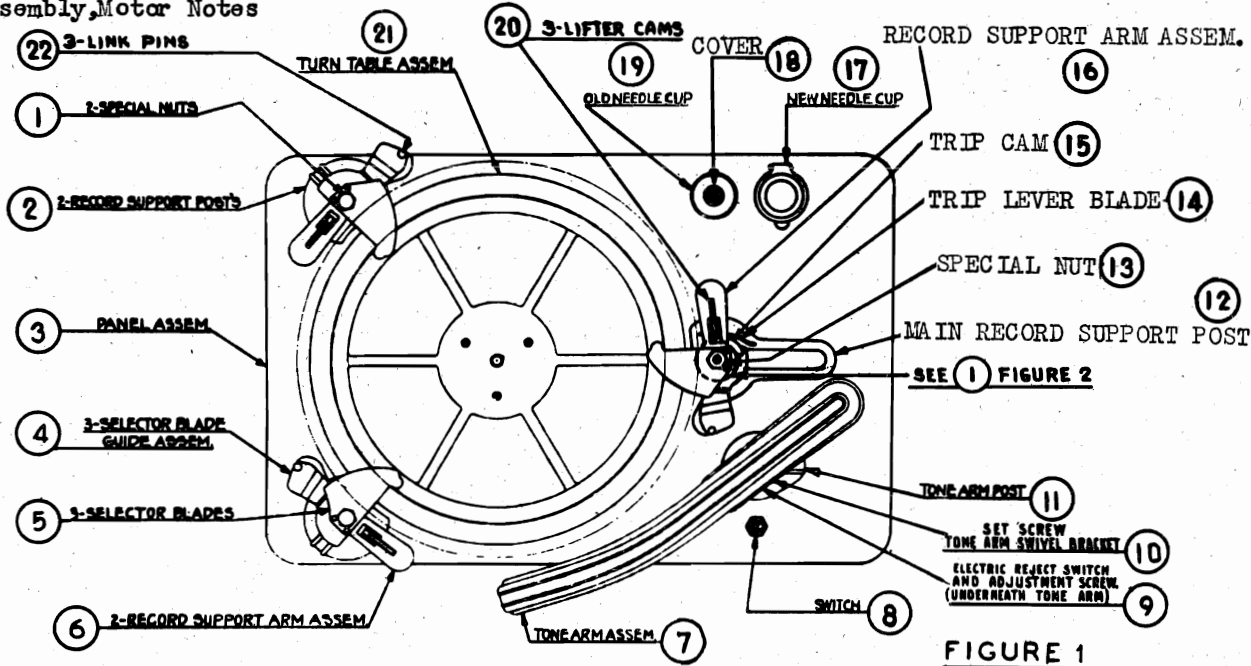


FIGURE 1

TOP VIEW OF RECORD CHANGER PART No. 35-1176

REMOVING MOTOR TRANSMISSION

In removing the motor transmission, the following parts should be disassembled first:

1. Remove turntable shaft. (See paragraph — Removing Turntable Shaft Assembly.)
2. Unsolder pick-up wires.
3. Loosen the two set screws which hold the tone arm lever and the tone arm shaft and remove tone arm and shaft.
4. Remove the mounting screws which hold the tone arm post to the panel. Unsolder electric tone arm reject switch wire from the terminal strip and remove tone arm post.
5. Remove "C" washer from the drive link pin — this will allow the drive link to be removed from the transmission and then remove the six mounting screws holding the transmission to the panel and take out the transmission.

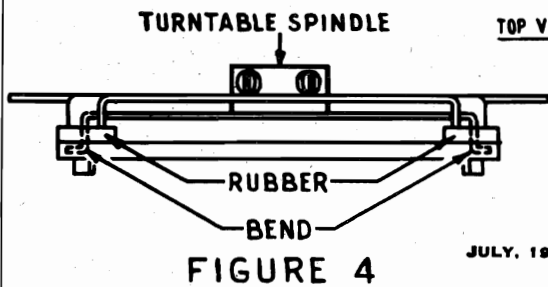


FIGURE 4

JULY, 1939.

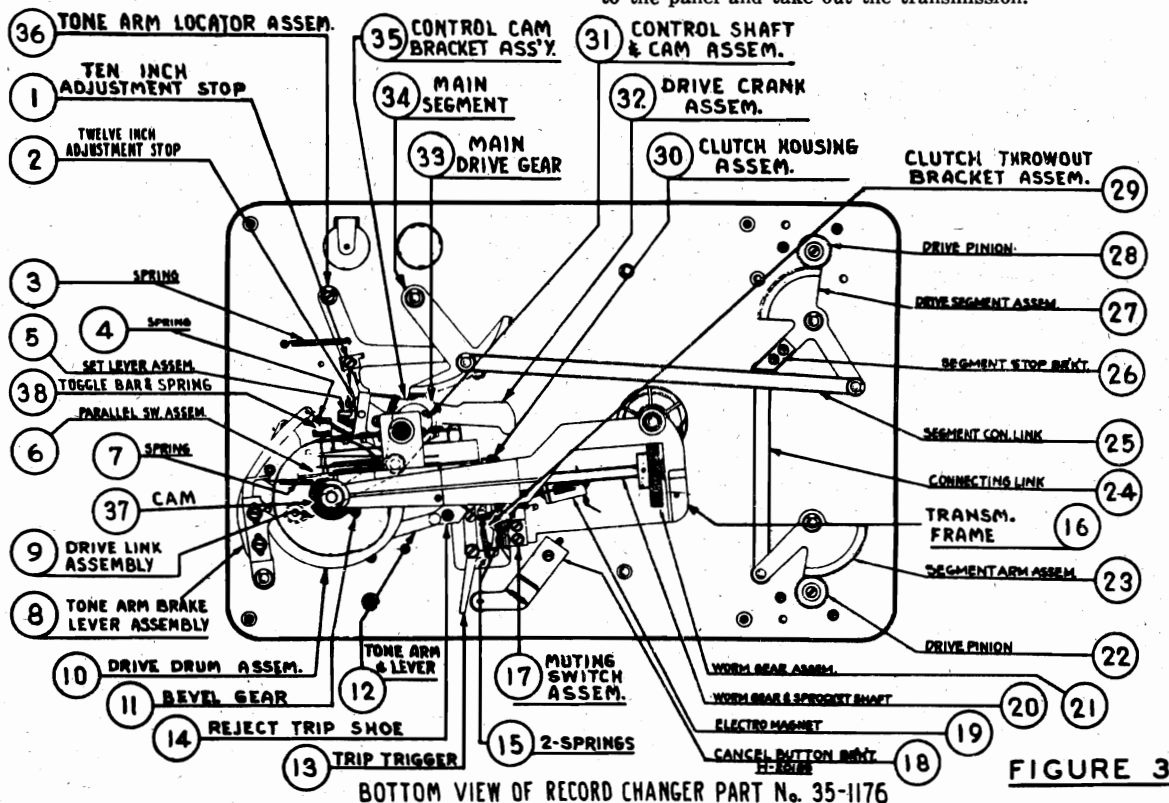


FIGURE 3

BOTTOM VIEW OF RECORD CHANGER PART No. 35-1176

PHILCO RADIO & TELEV. CORP.

TONE ARM ELECTRIC REJECT SWITCH WILL NOT OPERATE

(When no record is on turntable)

The tone arm electric reject switch operates when the mechanism is first loaded and no records are on the turntable or no records are on the record support arms. This switch closes when the pick-up needle drops into a groove provided in the turntable; allowing the tone arm to go to a lower level and causing switch contact to close. Adjustment of this switch is as follows:

1. Adjust screw (9) Fig. 1 located in the tone arm directly above the end of the tone arm shaft. Turn this screw in the direction necessary to obtain a clearance of $\frac{1}{16}$ " between the bottom of the groove in the turntable and the bottom end of the needle.
2. With a record on the turntable and the needle resting on the record, a clearance of $\frac{1}{16}$ " between the top and bottom contacts of the tone arm electric reject switch should be obtained. Bend the moving contacts spring upward or downward to obtain the necessary clearance.
3. Also check the electric magnet (19) Fig. 3 and associated wiring for open circuits.
4. Check the small metal rod connecting the trip trigger (13) Fig. 3 and lever of electric magnet.

MECHANISM WILL NOT REJECT AT THE END OF RECORDS

The tone arm is designed to reject records with an oscillating or spiral reject groove. To make the adjustments for either type of records, proceed as follows:

1. See that the screw (10) Fig. 1 which clamps the tone arm swivel bracket is tight. Make sure that the set screws holding the tone arm lever (12) Fig. 3 to the tone arm shaft are tight.

2. Oscillating Groove Records

Records with an oscillating reject groove are rejected by the trip dog located on the end of the tone arm lever (12) Fig. 3 engaging the saw teeth of the trip trigger (13) Fig. 3. When the mechanism will not reject an oscillating groove record, either the screws mentioned in paragraph 1 are loose or the trip dog trip trigger (13) Fig. 3 or springs (15) Fig. 3 are at fault. When it is found that these parts have become worn or weak, they should be replaced.

3. Spiral Groove Records

Records with spiral reject grooves are rejected by the trip shoe (14) Fig. 3 located on the end of the tone arm lever (12) Fig. 3. This trip shoe (14) Fig. 3 hits the pin on the trip trigger (13) Fig. 3 releasing the clutch throwout bracket (29) Fig. 3. This should occur when the pick-up needle has traveled to within a distance of $1\frac{1}{8}$ " from the center of the turntable spindle. Adjust the mechanism to properly reject this type of record as follows: If the pick-up does not reject the mechanism after traveling to within $1\frac{1}{8}$ " from the center of the turntable spindle (or $1\frac{1}{4}$ " from the edge of spindle), loosen the knurled nut holding trip shoe (14) Fig. 3 to the tone arm lever (12) Fig. 3. Move trip shoe toward or away from the pin on the trip trigger (13) Fig. 3 until the trip shoe operates the mechanism properly. When this point is found, the knurled nut should be well tightened.

TEN AND TWELVE INCH RECORDS DO NOT SEPARATE PROPERLY IN A MIXED LOADING

Ten and twelve inch records in a mixed loading are separated by lifter cams (20) Fig. 1 located on the record support arms (6) (16) Fig. 1. These cams operate when the next record to be selected by the mechanism is 10" and are designed to lift a 12" record when one is located directly above the 10" record. This allows the selector blades (5) Fig. 1 and guide arms (4) Fig. 1 to slide under the 12" record so that a 10" record can be placed on the turntable. The lifter cams (20) Fig. 1 are caused to operate by the 10" record hitting the end of the cam. Check the following parts when mechanism does not separate records properly:

1. The lifter cam link (20) Fig. 1 should be approximately $\frac{3}{32}$ " above the surface of the record support arms (6) (16) Fig. 1 when no records are on support arms (6) (16) Fig. 1. This link is held in this position by the small return spring found under (20) Fig. 1 underneath the support arms (6) (16) Fig. 1. If link is not above the surface of support arms (6) (16) Fig. 1, check for loose spring; replace spring if necessary.
2. The selector blades (5) Fig. 1 should have a slight downward pressure on the top surface of the guide arms (4) Fig. 1 when in their return position ready for next selection.
3. In their full return position after a record has been placed on the turntable the selector blades should also pass the guide arm link pin (22) Fig. 1 so that the selector blades will carry the guide arm toward the edge of a record when making the next selection. If any one of the blades do not return enough to clear the guide arm link pin (22) Fig. 1, the blade should be adjusted as given in paragraph "RECORD SELECTORS DO NOT OPERATE IN SYNCHRONISM".

PHILCO INTER-MIX RECORD CHANGER, Part No. 35-1176 plays and automatically changes with one loading—14 ten-inch and twelve-inch records mixed together in any order. This record changer will also separately play 15 ten-inch records or 13-twelve inch records. In addition, the mechanism is designed to operate with slightly warped records.

Service information contained in this bulletin covers operation, care, and adjustments that may be necessary if the mechanism ceases to function properly.

When ordering parts, refer to the part number of the entire mechanism in addition to the number and name of parts shown in the figures of this bulletin.

PHILCO RECORD PLAYER NEEDLES

To obtain brilliant life-like tone quality, PHILCO Record Player Needles are recommended. These needles are especially designed to give high fidelity tone reproduction—less record wear and less surface noise. One needle plays 15 to 20 records. The use of inferior needles in the pick-up of this mechanism will greatly affect the tone reproduction performance.

AUTOMATIC AND MANUAL POSITIONS

A control knob (1) Fig. 2 is provided for placing the mechanism in the automatic or manual operating position.

When changing from manual to automatic or automatic to manual positions, the mechanism should be turned off and allowed to complete its cycle. The knob can then be set for the position desired as follows:

To operate the mechanism manually, press knob (1) Fig. 2 marked "Press-Turn" down and turn to the right (clockwise) until record support arm assembly (16) Fig. 1 is in the extreme clockwise position.

For the automatic operating position, control knob (1) Fig. 2 is turned to the left (counter-clockwise) until knob snaps up.

PICK-UP DOES NOT INDEX PROPERLY ON OUTER EDGE OF 10" AND 12" RECORDS

The pick-up is set for 12" records by the trip cam (15) Fig. 1 that is pivotally mounted under the selector blade on main record support post (12) Fig. 1. This trip cam is operated by the edge of a 12" record compressing the cam when the record support arm moves in a clockwise direction. This cam moves trip lever blade (14) Fig. 1 and toggle bar and spring (38) Fig. 3 which pushes set lever blade (5) Fig. 3 into position to hold the tone arm locator (36) Fig. 3 in the 12" position.

After playing a record or the mechanism has been rejected, the set lever (5) Fig. 3 is reset for the 10" position by the control cam bracket lever (35) Fig. 3 mounted on the set lever shaft. The control cam bracket (35) Fig. 3 engages the control shaft cam pin (31) Fig. 3 at the start of rotation.

Adjustment of the tone arm when placing the needle in the first groove of 10" and 12" records is controlled by tone arm locator (36) Fig. 3. When 10" or 12" adjustments are made, the 12" adjustment should be made first. If 10" adjustment alone is necessary, the 12" adjustment should be re-checked. Adjustment of the locator lever is as follows:

12-inch Record Adjustment

1. Turn control knob (1) Fig. 2 to "manual" position.
2. Place a 12" record on the turntable.
3. Start mechanism and allow pick-up to position itself on the outer edge of the record. If the needle has not been placed in the center of the smooth outer rim of the record, adjust stop (2) Fig. 3 by loosening set screw. Move the stop in the direction necessary to center the needle on the smooth outer rim of the record.

10-inch Record Adjustment

1. Set control knob (1) Fig. 2 to "automatic" position.
2. Load the mechanism with several 10" records.
3. Allow mechanism to set a record on turntable and place the pick-up on the smooth outer rim of the record.
4. If the pick-up does not come down in the center of the smooth outer edge of the record, adjust the following:
5. Loosen 10" record stop (1) Fig. 3.
6. Move the stop slightly toward or away from the stop pin as the case may be to center the pick-up needle on the outer edge of the record.

If, after making the above adjustments, it is found that the pick-up will not move into the first groove after the needle is centered on the outer edge of the record, examine the following parts:

1. Spring (2) Fig. 3 on 12" adjustment stop may be weak.
2. Tone arm lever or swivel shaft may be binding; examine and lubricate.

MODEL 35-1176

Notes

PHILCO RADIO & TELEV. CORP.

4. There should also be sufficient tension between the guide arm link pin (22) Fig. 1 and the end of the selector blade (5) Fig. 1 so that the guide arms (4) Fig. 1 will be pulled forward against the record when the selector blade (5) Fig. 1 moves to select the next record. Tension between guide arms and selector blades should be sufficient so that sloop on guide should lift a full load of records to proper height for selector blades to select bottom record. If guide arm pin (22) Fig. 1 does not have enough tension against end of selector blades (5) Fig. 1, check the springs holding the pin in position, also, for worn surface on side of pin.

5. Action of the selector guide arm (4) Fig. 1. The guide arm is designed to guide the selector blade (5) Fig. 1 and lift the record to the proper height necessary to separate the records. The top of the guide arm (4) Fig. 1 has two inclined surfaces. The outer surface for 10" records and the inner surface for 12" records. After the selector blades (5) Fig. 1 have entered between the records, the guide arm (4) Fig. 1 is released and returned to its normal position. If it does not return to its normal position, check for a weak spring on the guide arms (4) Fig. 1 or binding between guide arm and record support post (2) Fig. 1. These springs are attached to record support posts (2) (12) Fig. 1 and a pin at the swivel of the guide arm.

6. In case of a warped 10" record with its concave face down, resting on a warped 12" record with the concave face upward, there is a tendency for the selector blades to jam against the edge of the 10" record instead of going in under it. In order to prevent this condition the blades must be bent down sufficiently to slide along the top surface of the 12" record.

SELECTOR BLADE (5) FIG. 1 FAILS TO SEPARATE BOTTOM RECORD FROM STACK

This is due either to a badly warped condition of the record, or to its being of a thickness considerably different from those now in standard use. The design of both selector blade and record support arms is such as to accommodate a maximum variation in thickness and flatness of records, but certain records may be found which are so far out as to be unfit for use in the automatic changer.

RECORD SELECTORS DO NOT OPERATE IN SYNCHRONISM

If the record selector blades (5) Fig. 1 do not operate in synchronism proceed as follows:

1. Set the control knob (1) Fig. 2 to "automatic" position. See page 1 "Automatic and Manual Positions". (Turn knob to the left until it snaps up). Place one 10" record on selector blades. After record has been dropped to record supports, pull lower plug and rotate turntable by hand until the selector blades are close to the edge of record. At this point all selector blades should be as nearly as possible the same distance from spindle. If the selector blades are not the same distance from the spindle due to replacement of gears, etc., the blades are resynchronized as follows:

2. With the mechanism in the same condition as outlined in paragraph 1, remove the "C" washer from segment arms (23) or (27) Fig. 3 depending on which of these selector blades are out of time. Pull segment arm down so that gears are disengaged, then move selector blade (5) Fig. 1 in direction necessary to align it with other blades. When this position is found, mesh gears and replace "C" washer.

MECHANISM DOES NOT RETURN SELECTOR BLADES TO LOADING POSITION

If the selector blades will not return to the loading position (pointed toward spindle) after a record has been placed on the turntable:

1. Look for trouble in the parallel cam switch (6) Fig. 3. The contact of this switch should be in a closed position, at the time a record is being played.

2. When the selector blades are in the proper loading position cam (37) Fig. 3 should open parallel switch (6) Fig. 3. To place the mechanism in the loading position, turn changer switch (8) Fig. 1 off. After the switch is off the changer should continue to operate until the next record is selected and dropped on the turntable. When the record is dropped on the turntable, cam (37) Fig. 3 should open parallel switch (6) Fig. 3. When the turntable stops rotating the selector blades should be pointed toward spindle.

3. To adjust cam (37) Fig. 3 loosen the two set screws and rotate cam on the shaft until proper position is obtained. Retighten set screws.

TOP RECORD SLIPS WHEN PICK-UP IS IN THE PLAYING POSITION

If the top record slips in the playing position, check the following parts:

1. Check for excessively warped records. Records warped too badly should be replaced and not used in the changes.

2. Check for worn grooves in record, particularly old records. After the grooves of the records lose their gloss, the pick-up does not glide through the groove. This condition has a tendency to cause pick-up needle to drag resulting in the top record slipping.

3. Check record friction spring (16) Fig. 2 for tension. This spring should protrude far enough from the shaft to hold the top record from slipping when in the playing position. This spring when adjusted properly to hold a record, should also allow a 10" record to fall freely onto the turntable.

If the spring is in need of adjustment, see heading "Removing Turntable Shaft Assembly", Paragraph 4.

OILING AND GREASING MOTOR AND MECHANISM

The motor and mechanism should be oiled and greased every six months with a good grade of S. A. E. 10 oil.

Parts to Lubricate:

1. All bearings of the mechanism.
2. All sliding surfaces such as, cams, etc., should be lubricated with a very light grease.
3. Motor bearings and governor felt.

TURNTABLE SPEED ADJUSTMENT

If motor runs too fast or slow, the governor adjustment screw (27) Fig. 2 on the top side of the governor should be screwed in or out slightly as required. To do this, loosen the lock nut and turn screw, then retighten lock nut.

REMOVING TURNTABLE SHAFT ASSEMBLY

To remove the turntable shaft assembly, proceed as follows:

1. Loosen the two set screws holding the motor coupling (21) Fig. 2 to the turntable shaft.
2. Loosen the two screws holding the turntable drive worm (23) Fig. 2 to the turntable shaft, then lift out turntable and shaft.
3. To remove the turntable from the shaft, remove the three screws and nuts which hold it to the hub.
4. The record friction spring (16) Fig. 2 on the turntable shaft can be removed by pushing the hub downward toward the heavy end of the shaft — the spring can then be removed. If it is desired to increase the record friction on spring, bend upward the lower section of the spring which contacts with the bottom surface of the hub. To decrease the record friction against the spring, bend the spring downward.

The motor is removed as follows:

1. Remove the three $\frac{1}{8}$ " machine screws which hold the motor to the motor mounting bracket. Three $\frac{1}{2}$ " spacers will also be found which space the motor from the mounting plate.
2. There are two motor bracket locating pins on the underside of the changer base panel which pass through rubber grommets located in the motor mounting bracket. These are provided to keep the mounting panel and motor bracket in proper alignment.

MECHANISM AND CHASSIS MOUNTING

The mechanism is mounted in the cabinet as follows: 4 mounting studs are located in the bottom surface of the panel each threaded to take $\frac{1}{4}$ " No. 20 machine screws. The mounting panel rests on four tapered coil springs. The small end of each spring is pressed over a mounting stud and the large end of each spring fits into a screw in the top surface of the mounting shaft in the cabinet. Four spacing blocks $\frac{1}{4}$ " thick and with a $\frac{3}{16}$ " hole are fastened to the lower side of the cabinet motor board. The $\frac{3}{16}$ " hole in each block is centered with the $\frac{1}{16}$ " screw clearance hole. These are provided and located on the lower side of the cabinet motor board into which each of the lower mounting springs are to fit. The $\frac{1}{4}$ " No. 20 machine screws are turned through the four wing nuts until the head of each screw is against the head of the bottom side of each wing nut. The four lower springs are of smaller diameter than the upper springs. These lower springs are slipped over the nuts to each of the $\frac{1}{4}$ " No. 20 machine screws with the smaller end toward the head and resting on the wing nuts.

The $\frac{1}{4}$ " No. 20 machine screws are pushed through the $\frac{1}{16}$ " clearance hole and tightly screwed into the mounting studs. Wing nuts should be backed down on head of $\frac{1}{4}$ " No. 20 bolt to place changer in operation.

MODEL 35-1180
Auto. Record Changer
Operating Notes

PHILCO RADIO & TELEV. CORP.

MODEL 35-1176
Assembly Notes

NO REPRODUCTION WHEN NEEDLE IS OPERATING ON RECORD

A muting switch (177 Fig. 3, the purpose of which is to short the pick-up during the change cycle. This switch is mounted on the transmission frame, and is operated from the clutch throw-out (29) Fig. 3. When a record is on the turntable and the needle is in playing position, the contact of this switch should be in the open position.

AUTOMATIC CLUTCH DOES NOT COMPLETELY DISENGAGE AT THE END OF THE CYCLE

This trouble is identified by a steady thumping or clicking sound when the pick-up is in the playing position and is caused by the clutch not properly disengaging at the end of the automatic cycle. In most cases, this trouble is due to the clutch clearance adjusting plate not being in the proper position on the tone arm brake (8) Fig. 3. To eliminate this trouble, make the following adjustments:

1. Loosen the two screws that hold the clutch clearance adjusting plate to the tone arm brake lever (8) Fig. 3. Advance the adjusting plate until the clutch pawl [found in clutch housing (30) Fig. 3] clears the clutch sprocket.

2. If the clutch disengages before the pin on the drive drum (10) Fig. 3 reaches the inclined surface of the adjusting plate, the plate should then be retarded until the drive drum pin passes over the humps and slides down inclined surface.

FAILURE OF UNIVERSAL DRIVE COUPLING

The Universal drive coupling consists of four strips of rubber held together by a frame having ears projecting into slots in the rubber.

If excessive strain is placed on the coupling, the projecting ears may slip out of the slots in the rubber, thus disconnecting the drive. In order to hold the coupling together more firmly, the outer end of these ears projecting through the rubber may be bent outward at right angles to form a hook which will hold the rubber firmly in place. Do not make bend any more than $\frac{1}{8}$ " from end of ear. See Fig. 4.

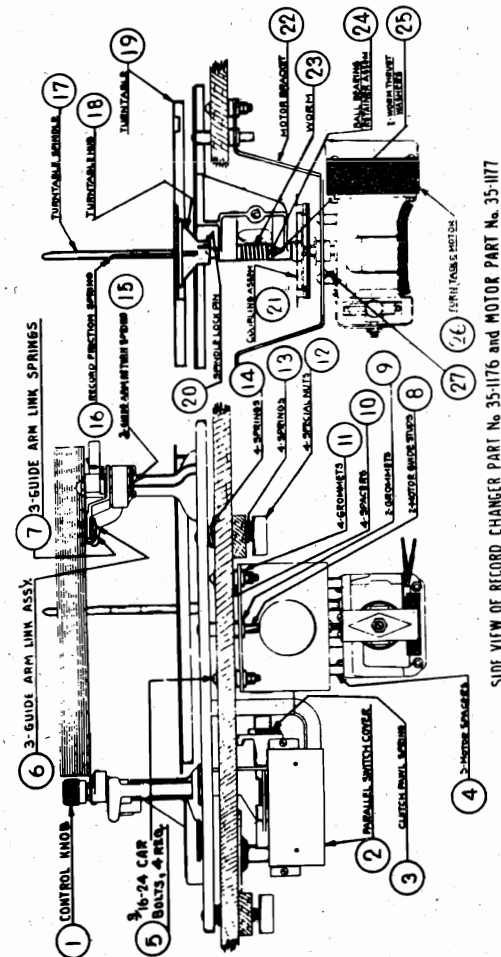


FIGURE 2

Automatic Record Changer Part No. 35-1180

PHILCO AUTOMATIC RECORD CHANGER Part No. 35-1180 automatically changes either twelve 10" or ten 12" records. The service information contained in this bulletin covers the operation, care, and adjustments that may be necessary if the mechanism ceases to function properly.

When ordering parts for this mechanism, refer to the part number of the entire mechanism in addition to the number and names of the parts shown in the figures of this bulletin.

CHANGER OPERATION

Setting for Record Size

This changer plays up to twelve 10-inch records or ten 12-inch records at one loading.

On each post you will see two plates. The lower one, on which the records rest, is the shelf plate. The upper one is the selector blade which selects the next record to be played from the bottom of the stack.

To set for record size. (1) Clasp one of the posts just underneath the shelf plate, with thumb and finger of left hand. With right hand, lift knob and turn selector plate until the figure 10 or 12 (whichever size you want to play) is opposite the pointer. Do the same with the other post. Both selector plates must be in 10 or 12 position. (2) Push button marked 10 or 12, as required (see Figure 1).

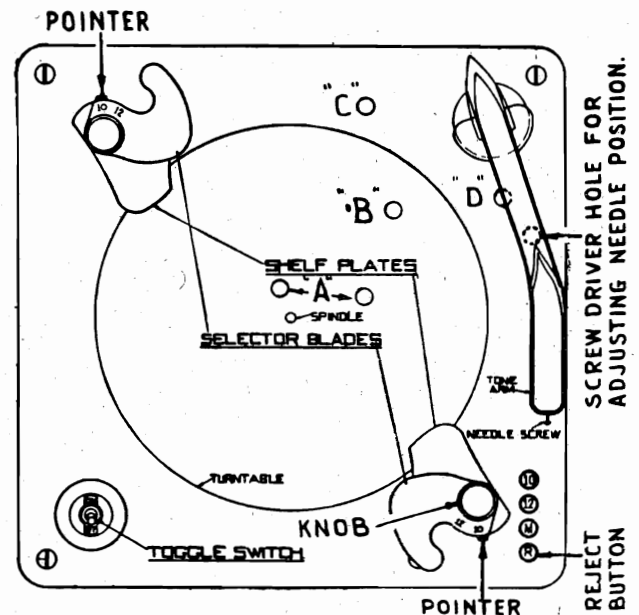


FIG. 1 SHOWS SELECTOR BLADES IN POSITION FOR 10-INCH RECORDS.

MODEL 35-1180

Adjustments, Notes

PHILCO RADIO & TELEV. CORP.

Loading

See that both shelf plates are turned toward center of turntable. As shelf plates near correct position you will feel the shelf plates drop into their indexing slots. Make sure both posts have dropped into their slots, if one is not in the slot, records may be damaged. Place the stack of records over center pin so they will rest on the two shelf plates.

Starting the Mechanism

To start motor and turntable (1) turn the switch to "ON" position. (2) Then push button "R". This will release the first record and start the record-changing mechanism.

Rejecting a Record

To reject a record press the "R" button. This can be done any time after the needle has come into contact with that record.

Turning Off

Turn changer switch to "OFF" position. Lift pickup arm, place it on the pickup rest. (If you happen to turn off the changer switch while the mechanism is going through a "change cycle", you will notice that it does not stop until the cycle has been completed, and pickup is again in playing position, ready to be lifted over onto the pickup rest.)

To avoid warping of records, never leave records resting on the shelf plates.

Removing Played Records

To remove records make sure motor switch is off, then take hold of both posts, just below the shelf plates, and turn them out of the way. Lift the played records from the turntable. Taking hold of posts as before (below shelf plate) move plates until post again falls into indexed position as outlined under loading. The changer may then be loaded with a new stack of records.

Manual Operation

To play records one at a time as in an ordinary phonograph: (1) Remove any records remaining on the turntable, leave plates turned outward as for removing played records. Do not turn them back toward center of turntable. (2) Press button marked "M". Then place a record on the turntable, switch on motor and lift pickup into position.

LUBRICATION

The record changer will not need lubrication more than once a year and should be lubricated with a good light machine oil such as S.A.E. 10. There are 6 locations that will need oiling. These are shown in Figure 1. These lubricating holes can be reached from the top of the mechanism and are as follows:

1. The motor gear housing contains 3 lubricating wicks. These wicks are shown at "A" in Figure 1. Two of these wicks are reached through the hole directly in back of the turntable spindle and the other wick to the right of the turntable spindle.
2. A small quantity of oil should be dropped through hole marked "B" in Figure 1. Lubricating this point distributes oil to the various moving surfaces of the mechanism.
3. A felt wick directly below the hole marked "C" in Figure 1 should also be oiled.
4. Another felt wick marked "D" in Figure 1 should also be well oiled.

After long periods of use the oil becomes gummed in the above mentioned wicks. The wicks should be removed and cleaned with kerosene or carbon tetrachloride.

NEEDLE FAILS TO MOVE INTO RECORD GROOVE AFTER LANDING ON RECORD

Generally when the needle will not pull into the groove after landing on the record, trouble may be found due to lead spring (97) being weak. Increasing the tension of this spring or replacing spring will generally eliminate the trouble.

If after adjusting the lead spring (97) it is found that the needle jumps across the record, it may be necessary to adjust the angle of the pickup in relation to the turntable spindle. This procedure is covered under paragraph "Mechanism Will Not Reject at the End of Records".

TONE ARM SLIDES INWARD ACROSS RECORD

This is caused by the guide arms stud (12) not releasing from the grooves in the upper side of the large cam gear (11). This may be due to friction at the shoulder screw (26) or the coil spring lifting the arm may be weak.

If the coil spring appears to be weak, it may be strengthened by shortening. If there is binding at the bearing, a little oil will help; also, a few movements by hand under considerable pressure will relieve the binding. If the binding is caused by the arm being twisted out of line, the trouble can be sure by straightening up the parts.

ADJUSTING THE RISING HEIGHT OF PICK-UP ARM

The pick-up arm should rise high enough during the change cycle so that the top of the tone arm clears the record resting on the support arms by $\frac{1}{8}$ ". When the maximum load of records are on the turntable, the needle should clear the top record, if not adjust as follows:

Loosen the lock nut in pick-up sleeve (22). Turn the sleeve in the direction necessary to lengthen or shorten the pick-up plunger (21). After correct adjustment is found, tighten lock nut.

ADJUSTING DISTANCE FROM TURNTABLE SPINDLE AT WHICH REJECT WILL OPERATE AND CYCLE WILL BEGIN

The mechanism is designed to reject records of all types whether they are provided with special grooves or not. The mechanism is adjusted to operate $1\frac{1}{8}$ " from the center of the record spindle; this distance has been found to be the most satisfactory point for all modern records so that they will be rejected after they have been played through. To adjust the reject mechanism for this distance or any distance that may be desired, a trip adjusting screw (18) is provided. By turning this screw toward the trip trigger (16), the mechanism is caused to operate at a closer distance from the spindle. Turning the adjusting screw (18) away from the trip trigger, operates the reject closer to the turntable spindle.

It may be found on some records of very early manufacture that it will not be possible to obtain a satisfactory adjustment that will always operate the changer mechanism.

REJECT BUTTON "R" WILL NOT OPERATE MECHANISM

If the "R" button does not cause the mechanism to go through a change cycle check the following parts:

- a. Examine key control unit (75) for parts that have become out of shape or any obstruction that will prevent the "R" button from moving to its maximum length of travel.
- b. Inspect reject rod (78). If this rod does not trip the mechanism even when properly revolved by complete depressing of "R" button, the rod has probably been bent out of shape. Replace the rod or reshape it to its former position.
- c. If trigger (16) is properly actuated but without starting a change cycle see instructions as given under "Mechanism Will Not Reject at End of Records" paragraph 3.

PRESSING "M" BUTTON DOES NOT CHANGE MECHANISM FROM AUTOMATIC TO MANUAL POSITIONS

Observe action of "M" button. Button should travel far enough down when depressed to cause the manual rod (77) to actuate the key control unit. The key control unit (75) should also be checked for parts which have become out of shape or any foreign obstruction.

MOTOR STOPS IMMEDIATELY WHEN CHANGER SWITCH IS TURNED OFF DURING A CHANGE CYCLE

The normal action of the mechanism when the changer switch is turned off during a change cycle is to continue to operate until the needle is again on the record. The mechanism should then stop. This action is caused by the cycling switch (85) short circuiting the manual changer switch during a change cycle. The switch should be changed when the above mentioned trouble develops.

PHILCO RADIO & TELEV. CORP.

MODEL 35-1180

Service Notes

MECHANISM DOES NOT REPEAT THE LAST RECORD

If the mechanism does not repeat the last record, any one of the parts listed under "Mechanism Will Not Repeat at End of Records" may be causing the trouble.

RECORDS FALL UNEVENLY ON THE TURNTABLE

Records falling unevenly on the turntable is generally due to the turntable spindle not being correctly centered between the record loading posts. To correct this trouble, see "Replacing Motor."

LAST RECORD DROPS ON ONE SIDE

This trouble is due in most cases to the loading posts being bent out of perpendicular to the main plate. To check for this trouble, test the posts with a steel square as directed under "Replacing Motor". Replace or adjust post so that it will be perpendicular to the main plate.

CHANGER CONTINUES CYCLING

If the mechanism continues to change records constantly, it indicates trouble in the lift (37). Failure of this lift to disengage with the cam gear (11), Fig. 2, will cause the trouble. Check the various rivets at which motion occurs to find a point where friction or binding is interfering with freedom of motion. The cam lever (39), Fig. 2, should also be checked for too much friction. Oil this part if necessary.

SELECTOR BLADE FAILS TO SEPARATE BOTTOM RECORD FROM STACK

This is due either to a badly warped record or to its being of a thickness considerably different from records now in standard use. The selector blade and shelf blades are designed to accommodate a maximum variation in thickness and flatness of records now in standard use. There are certain records, however, that may be found which vary in thickness so much as to be impracticable for use in the automatic changers.

SELECTOR BLADES JAM INTO EDGE OF RECORD

This is generally caused by too small a spacing between the selector plate and the spacing between the selector plate and the shelf plate. This space should never be less than .050 inch when selector plate is in 10" position. Another cause of jamming is too sharp an edge on the selector plate.

To eliminate this trouble, check spacing of plates. Bend the selector plate slightly, if necessary. Smooth up the edge of the selector plate by means of a piece of fine emery cloth.

MECHANISM SLOW IN STARTING OR STALLS DURING A CHANGE OF CYCLE

Trouble is probably due to:

- Motor mechanism is not thoroughly lubricated. See heading "Lubrication".
- Check for loose set screws.
- Line voltage may be abnormally low or motor windings damaged. If the windings of the motor are damaged, replace motor. To remove motor, see heading "Replacing Motor".

REPLACING MOTOR

Replacing the motor necessitates extreme care in aligning and correctly mounting the new motor. The procedure listed below should be followed closely. When replacing a new motor or ordering a new one from your distributor, specify the power supply from which the motor is to be operated. The motor electrical wiring is shown in Fig. 4.

When mounting replacement motor, it is most important to see that record pin is centered between the two posts of the changer, that it stands perpendicular to main plate (53), and that it has not become bent so as to wobble. Even though

the posts are stout and not easy to bend, it is well to check them also, with a 12" combination square laid clear across the concave upper surface of main plate. When the new motor has been attached, with three screws through grommet sleeves (51) (spacers) into its frame, and record pin is seen to revolve without appreciable wobble, the correct position of the record pin between the record-mounting posts can be accurately checked as follows: Place a single 12" record on the shelf plates, press "R" button, and turn turntable forward by hand. Immediately after the shelf plates open and allows the record to fall, turn turntable slightly backward, and with other hand support the record between the shelf plates; it can then be readily seen whether record pin is off center. If the record pin is found to be off center, remove the record and turntable, and loosen slightly the motor mounting screw or screws nearest the shelf plate to which record appeared closest. This should improve evenness of operation. However, unless the unevenness was very slight, it will be necessary for a permanent repair to insert a shim or two on one or more of the three screws (or change shims from one screw to another). The shims used are shaped like an ordinary washer, cut out at one side (see cut-away view at 52 on photo, showing a shim in place upon one of the grommet sleeves). Shims can readily be cut out with shears and punch from thin metal or cardboard—or an assortment of shims of different thicknesses can be had from your distributor. (Order "Assortment of Part No. 45-2785"). They should be inserted; around proper screws (when screws have been sufficiently loosened) between motor frame and the metal grommet sleeve. Do not insert shims next to rubber grommet.

TURNING CHANGER SWITCH OFF FAILS TO STOP MECHANISM

If after turning the changer switch off the mechanism continues to operate it indicates trouble in the cycling switch (85). Replace the switch when this trouble develops.

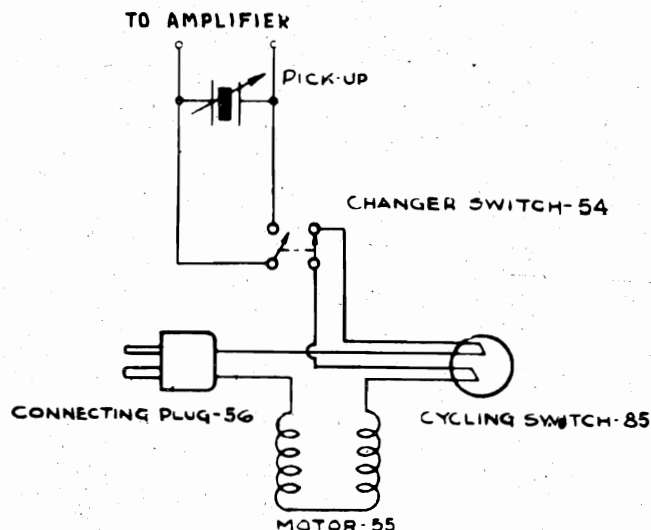


FIG. 4. MOTOR ELECTRICAL CONNECTIONS
DISASSEMBLING THE CHANGER

Before attempting to remove sub-plate assembly (83) detach key control unit (75) from main plate. To do this, start with control unit truss bar (80). Then take out the screw which holds left end of adjusting rod lever (94). Next remove adjusting rod (92) and adjusting rod extension (79). Take out the screw holding spring (73); then the screws holding key control unit (75) to main plate. Rods (77) and (78) can then, with due care, be extracted without bending. Free the cam connecting rod (58) by loosening setscrew holding spreader and hub assembly (59). Sub-plate assembly can then be detached without bending parts. In reassembling, reverse the procedure.

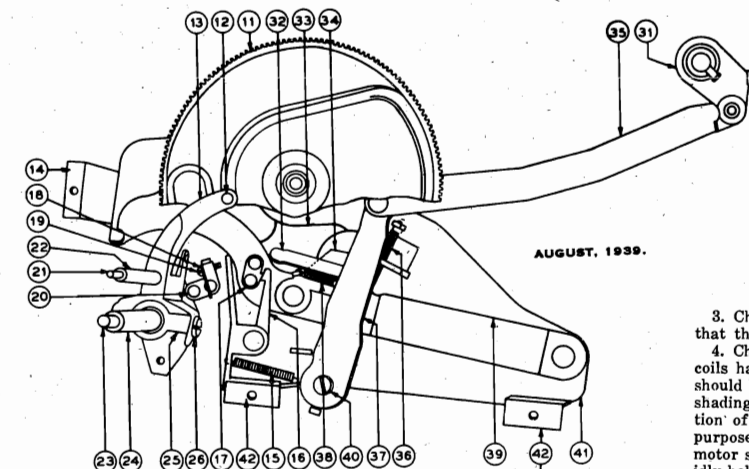
MODEL 35-1180
Assembly Notes
PHILCO RADIO & TELEV. CORP.


FIG. 2. CUTAWAY VIEW SHOWING PARTS UNDER SUB-PLATE ASSEMBLY (83)

| Numbers on Figs. 2 and 3 | PART DESCRIPTION | Numbers on Figs. 2 and 3 | PART DESCRIPTION | Numbers on Figs. 2 and 3 | PART DESCRIPTION |
|--------------------------|---------------------|--------------------------|----------------------|--------------------------|------------------|
| 11 | Cam Gear | 38 | Spring | 77 | Manual Rod |
| 12 | Stud | 39 | Cam Lever | 78 | Reject Rod |
| 13 | Guide Arm | 40 | Shoulder Screw | 79 | Extension Rod |
| 14 | Bracket | 41 | Sub-Plate | 80 | Truss Bar |
| 15 | Trigger Spring | 42 | Bracket | 81 | Adjusting Cam |
| 16 | Trigger | 51 | Grommet Sleeve | 82 | Cam Gear |
| 17 | Trigger Catch | 52 | Shim | 83 | Sub-Plate Assem. |
| 18 | Trip Adj. Screw | 53 | Main Plate | 84 | Spring |
| 19 | Lock Spring | 54 | Changer Switch | 85 | Cycling Switch |
| 20 | Release Lever | 55 | Motor | 86 | Bracket |
| 21 | Pickup Plunger | 56 | Connecting Plug | 87 | Spring |
| 22 | Pickup Sleeve | 57 | Changer Connect. Rod | 88 | Link |
| 23 | Swivel Shaft | 58 | Cam Connecting Rod | 89 | Release Lever |
| 24 | Swivel Tube | 59 | Spreader-Hub Assem. | 90 | Upper Spreader |
| 25 | Swivel Trunnion | 60 | Shaft | 91 | Lower Spreader |
| 26 | Shoulder Screw | 61 | Spring Roller | 92 | Rod |
| 31 | Spreader-Hub Assem. | 62 | Spreader Spring | 93 | Lever-Hub Assem. |
| 32 | Bridge | 71 | Post Nut | 94 | Lever |
| 33 | Lifter Cam | 72 | Lever-Hub Assem. | 95 | Swivel Spring |
| 34 | Pawl | 73 | Flat Spring | 96 | Lever Spring |
| 35 | Cam Connecting Rod | 74 | Shaft | 97 | Lead Spring |
| 36 | Spring | 75 | Key Unit | | |
| 37 | Lift | 76 | Key Bracket | | |

FIG. 3

SQUEAKS OR OTHER NOISES DURING PLAYING OF RECORDS

If squeaks or various noises are heard from the mechanism during the playing of records or changing of records, the following items should be checked:

1. In the majority of the cases, these squeaks will be usually found to come from the friction between the stacked records and the turntable spindle. To check for this trouble, operate the mechanism with and without a load of records. To eliminate this condition, apply a very thin coat of light motor grease or vaseline to the turntable spindle.

2. Check the 5 wicks given under the paragraph on "Lubrication." Each wick should be thoroughly saturated with oil. All 3 motor wicks should be removed from the retaining holes with tweezers and examined to see if the oil has become gummy. In this case, the wicks should be thoroughly cleaned and relubricated with oil and replaced in their sockets.

3. Check all set screws to see that they are in place and tight.

4. Check motor windings. If coils have been jarred loose they should be tightened in place. The shading coils which encircle a portion of each laminated pole, the purpose of which is to make the motor self-starting, should be rigidly held in place by the retaining tape.

ADJUSTING LANDING POSITION OF NEEDLE ON RECORD

Adjustment of the landing position of the needle on records is controlled by the adjusting screw located in the hole shown in Figure 1. This adjustment is made with a screw driver from the top of the mechanism and does not require the removal of the changer from the cabinet. If the needle comes down too far from the edge of the record, playing of records will not start at their beginning. In this case, turn the needle positioning adjustment screw very slightly counter-clockwise. If the needle comes down too close to the edge of the record, the pickup may slip off the record. To adjust this condition turn the adjusting screw clockwise. If adjustment screw is too far to rear and cannot be adjusted through hole in base plate, depress "Manual" push button, and push bracket—Forward.

TURNTABLE SPEED VARIES

The turntable speed should be 78 R.P.M. + or - 2 R.P.M. when a record is being played, and the mechanism will operate satisfactorily. If the speed is below or above these limits, it indicates either trouble in the motor windings or bearings of the motor. Sometimes a few drops of oil on the bearings will increase the speed to normal. If upon investigation the normal speed cannot be obtained, replace the motor.

MECHANISM WILL NOT REJECT AT THE END OF RECORDS

There are several parts that will cause the mechanism to fail in the operation of rejecting of records. These items are listed as follows:

1. Examine swivel spring (95) for stretching. This spring is attached to the lugs at the end of the swivel spreaders (90) (91). The purpose of this spring is to keep the swivel spreaders (90) (91) closed, so that the trip trigger can be actuated. Increasing the tension of the spring (95) will prevent the swivel spreads from opening allow the trip trigger to actuate properly.

If after increasing the tension of the spring (95) it is found that the needle jumps across the record, it may be necessary to adjust the horizontal level of the pickup. Sometimes the pickup leans towards the center of the record. To remedy this condition, the pickup mounting post should be examined for proper mounting position or the pickup arm may be twisted out of shape. In either of these cases the pickup arm should be replaced or adjusted to its original position. When the pickup arm is properly adjusted, it should lean slightly in an outward direction (toward the edge of the record).

2. After it is found that the trip trigger (16) is operating properly, trouble may be found due to the cam lever (39) binding against sub-Plate (41). In this case, look for some obstruction or foreign material on these two parts. Also see that the rivets are operating freely. If lever (39) engages cam lever pawl (34) so that lift (37) forces its rollers up into the groove on cam gear (82) and if the set screws are tight, the change cycle should go into motion as the cam gear (82) turns.

3. Sometimes friction between the trigger (16) and trigger catch (17) due to burrs or rough surfaces may also prevent the reject from operating. If the trigger unlatches but the cam lever (39) does not move, it indicates binding between sliding surfaces. This may be caused by above mentioned burrs or by the cam lever being slightly warped.

To eliminate this condition, locate the position where there is excessive friction. If it is found that the parts are out of shape due to being bent, new parts should be added or the old ones straightened. When it is found that trouble is due to a burr on the edge of the metal parts, burrs should be removed with a very fine file or scraper. After eliminating this trouble, a small amount of oil should be applied to the sliding surfaces.

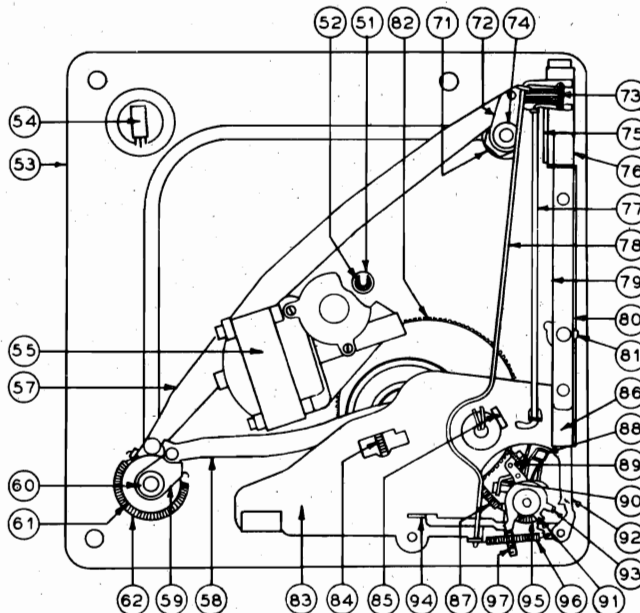


FIG. 3

PHILCO RADIO & TELEV. CORP.

MODELS 39-31, 39-31XF
39-31XK, Code 121
MODELS 39-3-31PA,
39-40PCX, 39-2-40PC
Schematics, Notes

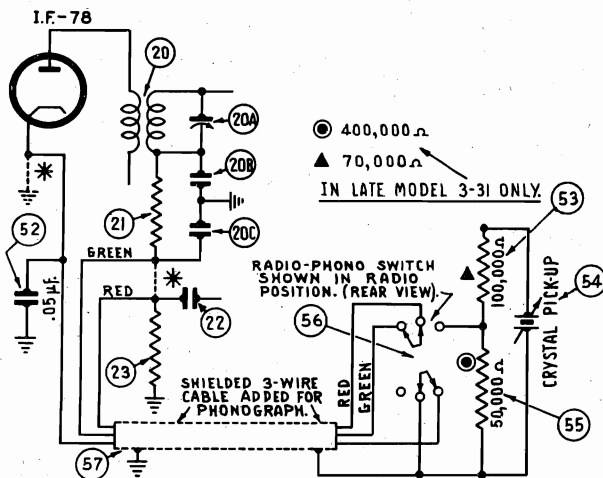
PHILCO Model 39-3-31 PA

Model 3-31 PA is a combination automatic record changer, phonograph and electric push-button tuning superheterodyne radio. This model is identical to the Model 39-31 Code 121 with the exception of the automatic record changer.

The automatic record changer plays seven 12" or eight 10" records automatically. The last record remains on the turntable and repeats as long as the record changer is in operation. The electric pick-up is a crystal type.

The specifications for the radio receiver, alignment of compensators and adjustments of push-buttons for reception of stations is covered under the Model 39-31 Code 121. Connections for the phonograph pick-up as connected to the Model 39-31 Code 121 receiver are shown below. The circle numbers of this diagram correspond to the circle numbers of the Model 39-31 Schematic.

For automatic record changer Model "L" used with this set, see index.



* DOTTED LINES INDICATE CONNECTIONS BEFORE ADDITION OF PHONOGRAPH. (REFER TO MODEL 39-35.)
PHONOGRAPH CONNECTIONS FOR MODEL 3-31.

Replacement Parts — Model 39-3-31 PA

| SCHE. No. | DESCRIPTION | PART No. |
|-----------|------------------------------|-----------|
| 52 | Condenser (.05 mfd., 200 V.) | 30-4519 |
| 53 | Resistor (100,000 ohms) | 33-410339 |
| 54 | Crystal Cartridge | 35-2030 |
| 55 | Resistor (50,000 ohms) | 33-350339 |
| 56 | Switch (Radio-Phono) | 42-1053 |
| 57 | Cable | |

MISCELLANEOUS PARTS

| | |
|--------------------------------|---------|
| Motor (115 V., 60 cycle A. C.) | |
| Motor Switch | |
| Tone Arm Complete | 35-2055 |
| Turntable | 35-3041 |

NOTE:-

Models 39-30 and 39-35 code 121 are similar with the exception of the type of Cabinets, Speakers and Power Transformers. These differences are shown on the Replacement Parts list and circuit diagram.

Models 39-31XF and 39-31XK are identical to Model 39-35, Code 121 with the exception of cabinets.

The Model 39-35, code 121 specifications, diagram and replacement parts apply to Models 39-31XF and XK.

See Philco pages 10-13 through 10-16.

PHILCO Models 39-40 PCX and 2-40 PC

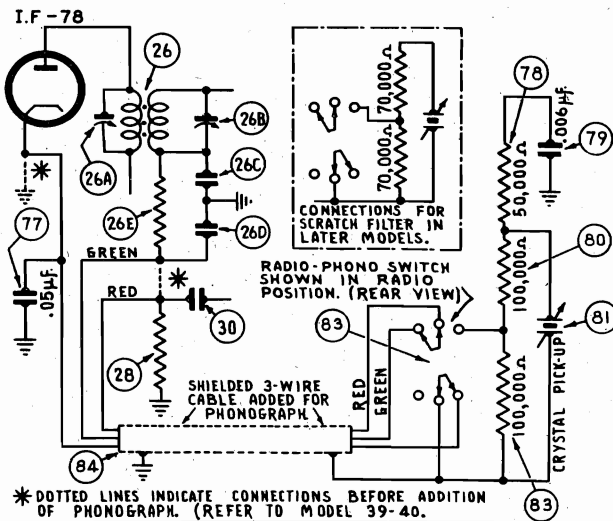
Models 39-40 PCX and 2-40 PC are combination automatic record changer phonograph and electric push-button tuning superheterodyne radio receivers. These models are identical to the Model 39-40 Code 121 with the exception of the phonograph mechanism. The phonograph contains an automatic record changer which plays ten records either 10 or 12 inches repeating the last selection until the records are re-stacked or the set is turned off.

The radio receiver specifications, aligning instructions and adjustments for electric push-button tuning are covered under Model 39-40 Code 121. The cabinet size and power consumption, however, differ on the Models 39-40 PCX and 2-40 PC and are listed below.

The phonograph connections diagram shown below indicates the connections to the radio receiver of the Model 39-40 Code 121. The circle numbers of the diagram correspond to the circle numbers of the Model 39-40 Code 121 diagram.

CABINET DIMENSIONS:

Height, 37 1/2". Width, 39 1/16". Depth, 17 1/2".



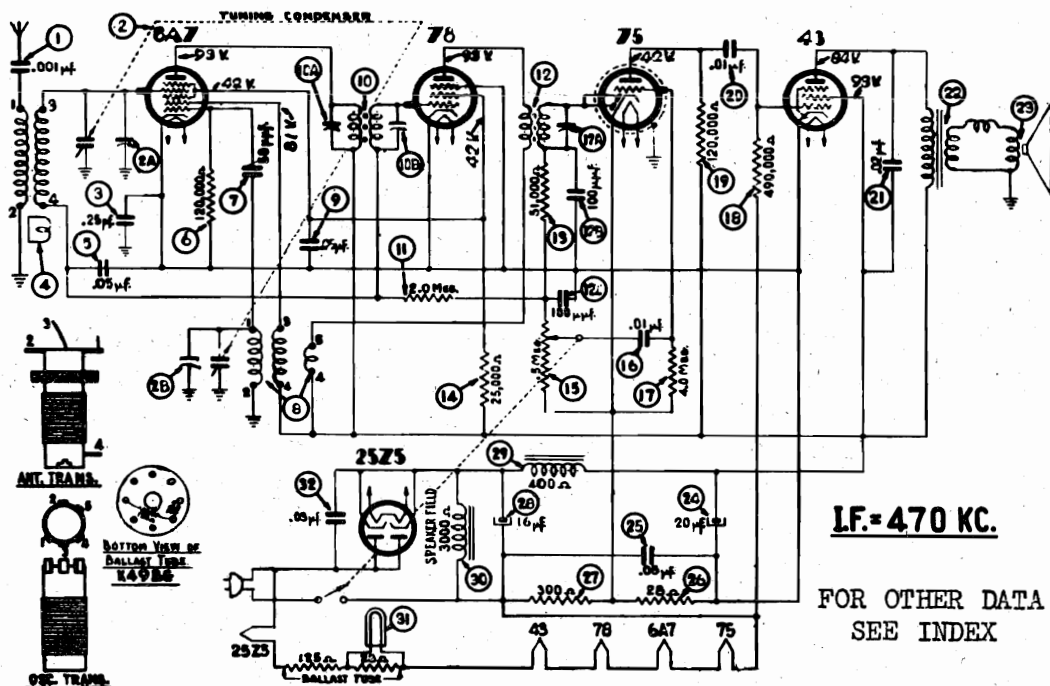
* DOTTED LINES INDICATE CONNECTIONS BEFORE ADDITION OF PHONOGRAPH. (REFER TO MODEL 39-40.)
PHONOGRAPH CONNECTIONS FOR MODELS 39-40PCX, 2-40PC

Replacement Parts — Models 39-40 PCX and 2-40 PC

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|-----------|-------------------------------|-----------|-----------|-------------------------|-----------|-----------|-------------|----------|
| 77 | Condenser (.05 mfd., 200 V.) | 30-4519 | 81 | Crystal Cartridge | 35-2030 | | | |
| 78 | Resistor (50,000 ohms) | 33-350339 | 82 | Resistor (100,000 ohms) | 33-410339 | | | |
| 79 | Condenser (.006 mfd., 200 V.) | 30-4583 | 83 | Switch (Radio-Phono) | 42-1053 | | | |
| 80 | Resistor (100,000 ohms) | 33-410339 | 84 | Cable | | | | |

| MISCELLANEOUS PARTS | |
|-------------------------------|---------|
| Motor 110 volt, 60 cycle | 35-1187 |
| Motor 110 volt, 50 cycle | 35-1186 |
| Automatic Record Chgr. (Com.) | 35-1178 |
| Governor (motor) | 35-1165 |

Voltage

[illegible]

| | |
|-----------------------------|-----------|
| Bezel & Glass Assembly..... | 13105 |
| Bezel Clamp..... | 20162 |
| Dial Scale..... | 16104P |
| Drive Drum & Set Screw..... | 31-1283 |
| Drive Shaft Assembly..... | 31-2140 |
| Drive Cord Assembly..... | 90325 |
| Output Transformer..... | 32-7874 |
| Pointer (Dial)..... | 28-5468 |
| Spring Drive Cord..... | 28-8751 |
| Speaker..... | 36-1362-1 |
| Socket (7 prong)..... | 27-6037 |
| Socket (6 prong)..... | 27-6036 |
| Socket (8 prong)..... | 27-6058 |

PHILCO RADIO & TELEV. CORP.

MODELS 39-17, 39-18, 39-19
39-19PA, 39-19PF, 39-19PCS
39-19PT, 39-75
Tuner Data
MODEL 39-85
Alignment, Trimmers

Alignment of Compensators

EQUIPMENT REQUIRED:

(1) Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 KC is the correct instrument for this purpose.

(2) Output Meter, Philco Model 027 Circuit Tester, incorporates a sensitive output meter and is recommended.

(3) Philco Fiber Handle Screw Driver, part No. 45-2810 and Fiber Wrench, part No. 3164.

OUTPUT METER: The Philco 027 Output Meter is connected to the plate and screen terminals of the 1A5G tube. Set the meter to use the 0-30 volt scale.

| Operations in Order | Signal Generator | | | Receiver | | | Special Instructions |
|---------------------|--------------------------------|------------------------|--------------|--------------|------------------|------------------------------|----------------------|
| | Output Connections to Receiver | Dummy Antenna (Note A) | Dial Setting | Dial Setting | Control Settings | Adjust Compensators in Order | |
| 1 | 1A7G Grid | .1 mf | 470 KC | 580 KC | Vol. Cont. max. | (20A) (19B) (19A) | |
| 2 | Ant. Lead (white) | 400 ohms | 18.0 MC | 18.0 MC | Vol. Cont. max. | (6B) | See Note B |
| 3 | Ant. Lead (white) | 225 mmf | 1550 KC | 1550 KC | Vol. Cont. max. | (9) (6A) | |
| 4 | Ant. Lead (white) | 225 mmf | 580 KC | 580 KC | Vol. Cont. max. | (9A) | Roll gang |
| 5 | Ant. Lead (white) | 225 mmf | 1550 KC | 1550 KC | Vol. Cont. max. | (9) | |

NOTE A—The "Dummy Antenna" consists of a condenser or resistor connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

Specifications

TYPE OF CIRCUIT: Four tube, battery operated superhetrodyne circuit, two tuning ranges, Automatic Volume Control, and Pentode Output.

TUNING RANGES: Range 1, 540 to 1720 KC.; Range 2, 5.6 to 18.0 MC.

INTERMEDIATE FREQUENCY: 470 KC.

PHILCO TUBES USED: 1-1A7G, 1st Detector and Oscillator; 1-1N5G, I. F. Amplifier; 1-1H5G, 2nd Detector, 1st Audio, and Automatic Volume Control; and 1-1A5G, Output.

AERIAL AND GROUND: Philco "Farm Radio Aerial," part No. 40-6383, is required for maximum performance. A good ground is very essential.

CABINETS: Types "B" and "XF."

BATTERIES REQUIRED: One Philco "A" Pack, part No. 41-8014, and one Philco "B" Pack, part No. 41-8015.

BATTERY DRAIN: 6.5 Ma. "B" and 200 Ma. "A." Total with no signal.

TUNING MECHANISM: Pulley and cable drive for Manual tuning. Electric Push-Button for Automatic Tuning.

SETTING AND OPERATING AUTOMATIC TUNING

Models 39-17, 39-18, 39-19, 39-19PA, 39-19PF, 39-19PCS, 39-19PT, and 39-75.

For best results follow these instructions carefully.

Select six of your favorite nearby broadcast stations and remove their call letters from the station call letter tab sheets supplied. Insert these call letters in the escutcheon directly in front of the buttons at the top of the cabinet.

Hold the "Station Selector" knob to prevent it from rotating while you insert a large coin in the screw head at the center of the knob, (see figure) and loosen by turning counter-clockwise about one turn. Press down any one of the six buttons. Holding it down, tune in with the "Station Selector" the station corresponding to the call letters in front of the button. With the volume low, turn the "Station Selector" knob slowly back and forth until the signal is clearest. The station is then tuned in correctly.

Release the button and press another button all the way down. Follow the above instructions, tuning in the station accurately with the button held down. In the same way continue to set all the buttons.

After all buttons are set, and the last one is released, hold the "Station Selector" knob to prevent it from turning while you tighten the screw at the center of the knob. When the screw is tightened the unit is ready to operate.

If it is ever desired to substitute a station received well in your locality for a station already set, follow the same procedure, setting up only the desired station.

To tune your receiver automatically simply press down the button in the rear of the desired station call letters. Be sure that you press the button all the way down until a distinct stop is noted.

MODEL 39-85.

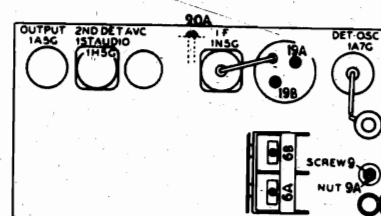


Fig. 1. Locations of Compensators

NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: Turn the tuning condenser to maximum capacity (plates fully meshed). With tuning condenser in this position set the pointer horizontally across the dial.

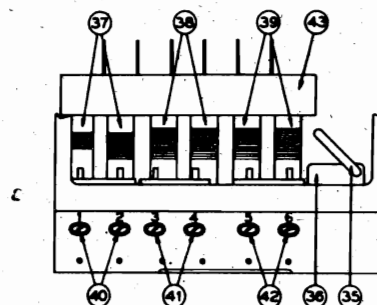


Fig. 4. Automatic Tuning Unit

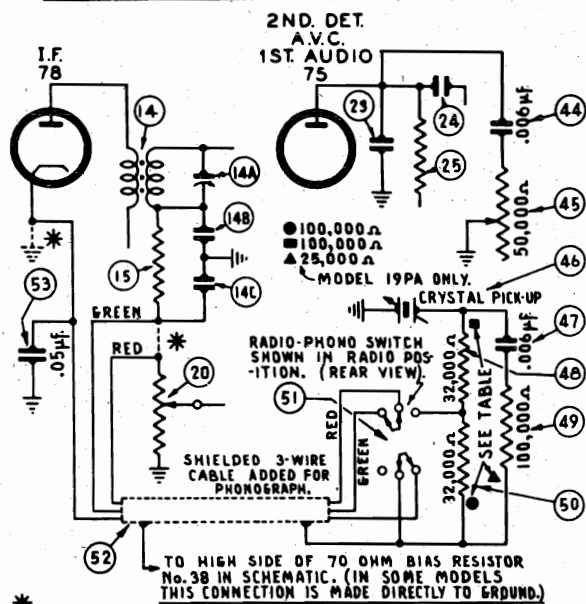
Instructions for setting up and operating the electric push-button tuning will be found on Philco Page 10-16.

MODELS 39-19PA,
39-19PF, 39-19PCS
39-19PT

PHILCO RADIO & TELEV. CORP.

MODEL 39-30PCX
Phono. Connections
Notes, Parts

Models 39-19 PA, 39-19 PF, 39-19 PCS, 39-19 PT



* DOTTED LINES INDICATE CONNECTIONS BEFORE ADDITION OF PHONOGRAPH. (REFER TO MODEL 39-19, see index).

PHONOGRAPH CONNECTIONS
MODELS 19PA, 19PF, 19PCS, 19PT.

Model 39-19 PA is a combination automatic record changer phonograph and automatic push-button tuning superheterodyne radio receiver. The radio receiver of this model is identical to the Model 39-19 Code 122 with the exception of the automatic phonograph connections. The automatic record changer plays eight 10-inch records automatically or 12-inch records manually.

The specifications of this model with the exception of the cabinet dimensions and power consumption and automatic record changer are the same as Model 39-19 Code 122. The connections for the phonograph pick-up as connected in the Model 39-19 Code 122 are shown below. The circle numbers of this diagram correspond to the circle numbers of the Model 39-19 Code 122.

The alignment of compensators will also be found under Model 39-19 Code 122 (see index)

For record changer 35-1169 see index.

Models 39-19 PF, 39-19 PCS and 39-19 PT, are combination phonograph and automatic tuning superheterodyne radio receivers. The radio receivers of Models 39-19 PF and PCS are identical to Model 39-19 Code 122 with the exception of the phonograph connections. The radio receiver of Model 39-19 PT is identical to Model 39-19 Code 121 with the addition of the phonograph connections. The phonograph section of these models consists of a semi-automatic pick-up that places itself automatically on the turntable when the lid is closed and plays either 10- or 12-inch records.

The specifications of this model with the exception of cabinet dimensions, power consumption and semi-automatic pick-up are the same as Model 39-19 Codes 121, 122. The connections for the phonograph pick-up as connected to Model 39-19, Codes 121 and 122 are shown below. The circle numbers of this diagram correspond to the circle numbers of the Model 39-19 Codes 121, 122.

The alignment of the compensators will also be found under Model 39-19 Codes 121, 122 (see index)

Replacement Parts — Model 39-19 PA

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|-----------|-------------------------------|-----------|-----------|----------------------------|----------|-----------|---|----------|
| 44 | Condenser (.006 mfd., 400 V.) | 30-4591 | 52 | Cable (Radio-Phono Switch) | 30-4519 | | Tone Arm Complete with Crystal and Base | 35-2048 |
| 45 | Tone Control | 33-5327 | 53 | Condenser | 30-4519 | | Turntable (10") | 35-3032 |
| 46 | Crystal Cartridge | 35-2044 | | | | | Tuning Shaft | 35-6015 |
| 47 | Condenser (.006 mfd., 400 V.) | 30-4591 | | | | | Motor (110 V., 60 cycle) | 35-1163 |
| 48 | Resistor (32,000 ohms) | 33-332339 | | | | | Shaft (Wave Switch and Volume Control) | 38-9640 |
| 49 | Resistor (100,000 ohms) | 33-410339 | | | | | Tuning Shaft Tube | 35-6004 |
| 50 | Resistor (32,000 ohms) | 33-332339 | | | | | Dashpot Assy. (Automatic Record Chgr.) | 315-1001 |
| 51 | Switch (Radio-Phono) | 42-1053 | | | | | Handles (For Lid of 19PA Cabinet) | 27-4597 |
| | | | | | | | Springs (Governor Ball of Record Chgr.) | 35-1179 |

MISCELLANEOUS PARTS

Replacement Parts — Models 39-19 PF, 39-19 PCS, 39-19 PT

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|-----------|-------------------------------|-----------|-----------|------------------------------|-----------|-----------|--|----------|
| 44 | Condenser (.006 mfd., 400 V.) | 30-4591 | 50 | Resistor (32,000 ohms) | 33-332339 | | Sleeve for Tuning Shaft | 28-6935 |
| 45 | Tone Control | 33-5327 | 51 | Switch (Radio-Phono) | 42-1053 | | Shaft (Wave Change and Volume Control) | 38-9748 |
| 46 | Crystal Cartridge | 415-1027 | 52 | Cable (Radio-Phono Switch) | 30-4519 | | Tuning Shaft Tube | 28-6935 |
| 47 | Condenser (.006 mfd., 400 V.) | 30-4591 | 53 | Condenser (.05 mfd., 200 V.) | 30-4519 | | Tone Arm and Pick-up Complete | 35-2027 |
| 48 | Resistor (32,000 ohms) | 33-332339 | | | 35-2057 | | Turntable (9") | 35-3035 |
| 49 | Resistor (100,000 ohms) | 33-410339 | | | 28-6922 | | | |

PHILCO Model 39-30 PCX

Model 39-30 PCX is a combination automatic record changer phonograph and electric push-button tuning superheterodyne radio receiver. This model is identical to the Model 39-30 Code 121 with the exception of the automatic record changer. The automatic record changer plays ten records either 10 or 12 inches repeating the last selection until the records are restacked or the set is turned off. The electric pick-up is a crystal type.

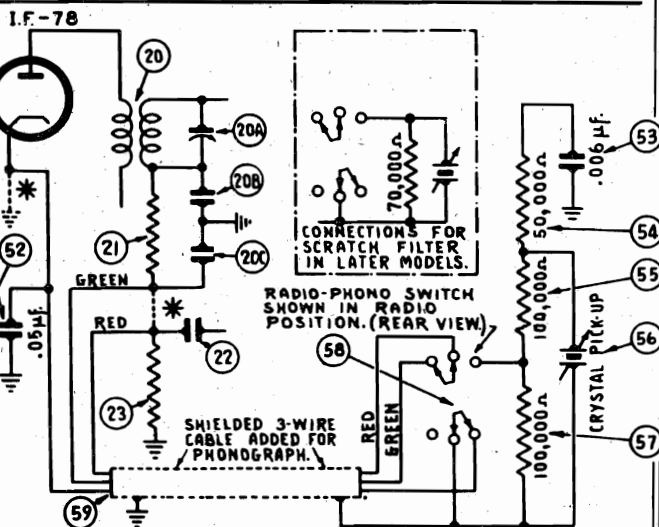
The specifications for the radio receiver, alignment of compensators and adjustment of push-buttons for reception of stations is covered under Model 39-30 Code 121. The connections for the phonograph pick-up as connected in the Model 39-30 Code 121 receiver are shown below. The circle numbers of this diagram correspond to the circle numbers of the Model 39-30 Code 121 schematic.

Replacement Parts — Model 39-30 PCX

| SCHE. No. | DESCRIPTION | PART No. |
|-----------|-------------------------------|-----------|
| 52 | Condenser (.05 mfd., 200 V.) | 30-4519 |
| 53 | Condenser (.006 mfd., 200 V.) | 30-4583 |
| 54 | Resistor (50,000 ohms) | 33-350339 |
| 55 | Resistor (100,000 ohms) | 33-410339 |
| 56 | Crystal Cartridge | 35-2030 |
| 57 | Resistor (100,000 ohms) | 33-410339 |
| 58 | Switch (Radio-Phono) | 42-1522 |
| 59 | Cable | |

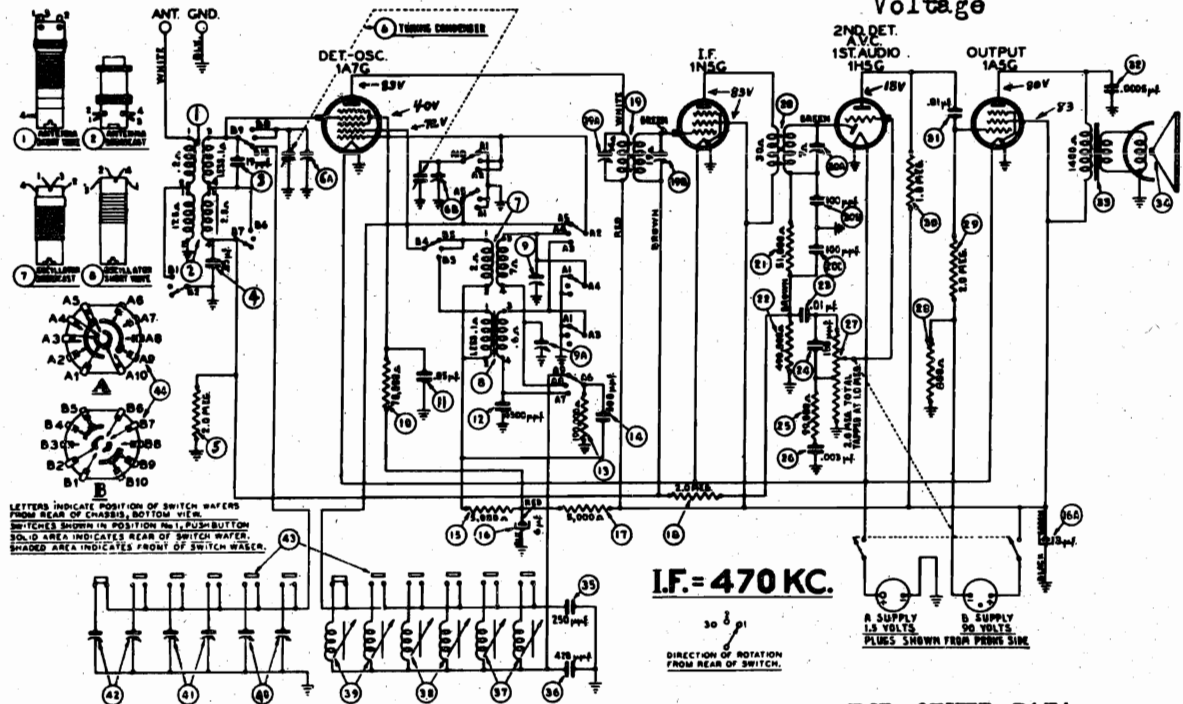
MISCELLANEOUS PART

| | |
|----------------------------------|---------|
| Tone Arm and Pick-up (Less Base) | 35-2059 |
|----------------------------------|---------|



* DOTTED LINES INDICATE CONNECTIONS BEFORE ADDITION OF PHONOGRAPH. (REFER TO MODEL 39-30, (see index)).
PHONOGRAPH CONNECTIONS FOR MODEL 39-30PCX

MODEL 39-85, Code 121
PHILCO RADIO & TELEV. CORP Schematic, Chassis
Voltage

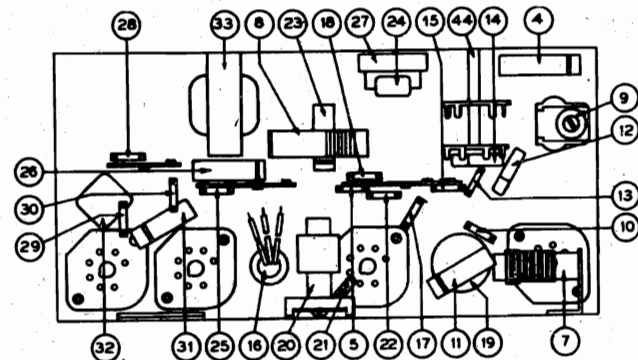


Replacement Parts
Model 39-85, Code 121

| Schem. No. | Description | Part No. |
|------------|--|-----------|
| 1 | Antenna Transformer, Range 2 (Incls. No. 3)..... | 32-3092 |
| 2 | Antenna Transformer, Range 1..... | 32-3084 |
| 3 | Condenser (19 mmf) (part of No. 1)..... | 30-1090 |
| 4 | Condenser (.05 mf tubular)..... | 30-4519 |
| 5 | Resistor (2.0 megohms, ½ watt)..... | 33-520339 |
| 6 | Tuning Condenser Assembly..... | 31-2300 |
| 7 | Oscillator Transformer, Range 1..... | 32-3082 |
| 8 | Oscillator Transformer, Range 2..... | 32-3085 |
| 9 | Compensator (two sections)..... | 31-6100 |
| 10 | Resistor (70,000 ohms, ½ watt)..... | 33-370339 |
| 11 | Condenser (.05 mf tubular)..... | 30-4444 |
| 12 | Condenser (4500 mmf mica)..... | 30-1109 |
| 13 | Resistor (190,000 ohms, ½ watt)..... | 33-419339 |
| 14 | Condenser (500 mmf mica)..... | 30-1114 |
| 15 | Resistor (5000 ohms, ½ watt)..... | 33-250339 |
| 16 | Electrolytic Condenser (6 mf—3 mf)..... | 30-2348 |
| 17 | Resistor (5000 ohms, ½ watt)..... | 33-250339 |
| 18 | Resistor (2.0 megohms)..... | 33-520339 |
| 19 | 1st I. F. Transformer Assembly..... | 32-2841 |
| 20 | 2nd I. F. Transformer Assembly..... | 32-3081 |
| 21 | Resistor (51,000 ohms, ½ watt)..... | 33-351339 |
| 22 | Resistor (490,000 ohms, ½ watt)..... | 33-449339 |
| 23 | Condenser (.01 mf tubular)..... | 30-4572 |
| 24 | Condenser (150 mmf mica)..... | 30-1033 |
| 25 | Resistor (99,000 ohms, ½ watt)..... | 33-399339 |
| 26 | Condenser (.003 mf tubular)..... | 30-4580 |
| 27 | Volume Control and On-Off Switch..... | 33-5288 |
| 28 | Resistor (800 ohms, ½ watt)..... | 33-180339 |
| 29 | Resistor (2.0 megohms, ½ watt)..... | 33-520339 |
| 30 | Resistor (1.0 megohm, ½ watt)..... | 33-510339 |
| 31 | Condenser (.01 mf tubular)..... | 30-4572 |
| 32 | Condenser (.0005 mf mica)..... | 30-1114 |
| 33 | Output Transformer..... | 32-7984 |
| 34 | Cone & Voice Coil Assembly for Speaker (Part No. 36-1410)..... | 36-4093 |
| | Cone & Voice Coil Assembly for Speaker (Part No. 36-1436)..... | 36-4094 |
| 35 | Condenser (250 mmf, silver plated mica)..... | 30-1104 |
| 36 | Condenser (420 mmf, silver plated mica)..... | 30-1116 |

Fig. 2. Schematic Diagram

FOR OTHER DATA
SEE INDEX



Replacement Parts

CONTINUED

| Schem. No. | Description | Part No. | Description | Part No. |
|------------|--|----------|--------------------------------|----------|
| 37 | Oscillator Coil Assem. (High freq. No. 1 and 2)..... | 32-2941 | Bezel Assy. (Dial)..... | 40-6374 |
| 38 | Oscillator Coil Assem. (Medium frequency No. 3 and 4)..... | 32-2942 | Cable (Battery)..... | 41-3437 |
| 39 | Oscillator Coil Assem. (Low frequency No. 5 and 6)..... | 32-2943 | Dial Assy. | 31-2307 |
| 40 | Compensator (two sections) (Nos. 1 and 2)..... | 31-6244 | Dial Pointer..... | 56-1091 |
| 41 | Compensator (two sections) (Nos. 3 and 4)..... | 31-6245 | Dial Drive Cord..... | 31-2318 |
| 42 | Compensator (two sections) (Nos. 5 and 6)..... | 31-6246 | Dial Drive Spring..... | 28-8751 |
| 43 | Push-Button Switch..... | 42-1471 | Dial Tuning Shaft..... | 31-2290 |
| 44 | Wave Switch..... | 42-1466 | Escutcheon (Push-Button)..... | 28-5561 |
| | | | Knob (Push-Button)..... | 27-4702 |
| | | | Knob (Range Switch)..... | 27-4321 |
| | | | Knob (Volume & Tuning)..... | 27-4332 |
| | | | Pulley (Tuning Condenser)..... | 28-6662 |
| | | | Speaker (B Cabinet)..... | 36-1410 |
| | | | Speaker (XF Cabinet)..... | 36-1436 |
| | | | Socket (6 prong)..... | 27-6086 |
| | | | Socket (7 prong)..... | 27-6099 |
| | | | Socket (Speaker)..... | 27-6115 |
| | | | Tab Kit..... | 40-6408 |

MODEL 39-116PCX
Phono. Connections
Notes

PHILCO RADIO & TELEV. CORP.

PHILCO Model 39-116 PCX

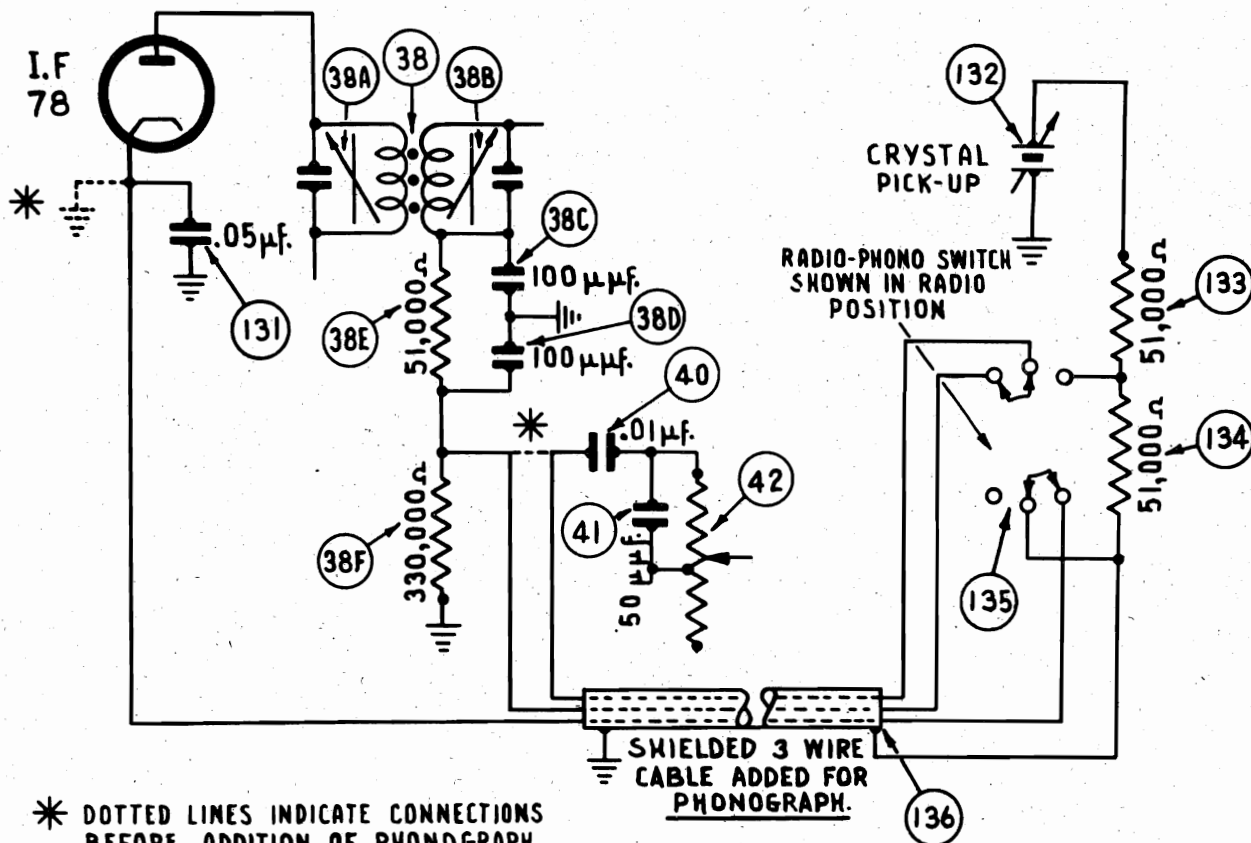
Model 39-116 PCX is a combination phonograph and 14 tube radio receiver employing a superheterodyne circuit with three tuning ranges for reception of standard and short-wave broadcast stations. Incorporated in this receiver is Philco mystery control for electric automatic tuning of eight standard broadcast stations from a remote point. The phonograph section contains an automatic record changer which plays ten records either 10- or 12-inch size automatically repeating the last record until the records are restacked or the switch turned off.

This model with the exception of the phonograph mechanism is identical to the Model 39-116 RX. The same specifications for the Model 39-116 RX apply to this model except the cabinet size and power consumption which are listed below.

CABINET DIMENSIONS:

Height, 37 $\frac{1}{2}$ ".Width, 44 $\frac{1}{2}$ ".Depth, 17 $\frac{1}{2}$ ".

The adjustment of the mystery control circuit for reception of stations and alignment of compensators is also covered under Model 39-116 RX. The phonograph connections are shown below as connected in the Model 39-116 RX circuit diagram. The circle numbers of this phonograph diagram correspond to the circle numbers of the Model 39-116 RX diagram.



* DOTTED LINES INDICATE CONNECTIONS
BEFORE ADDITION OF PHONOGRAPH.
REFER TO SERVICE BULLETIN No. 310.

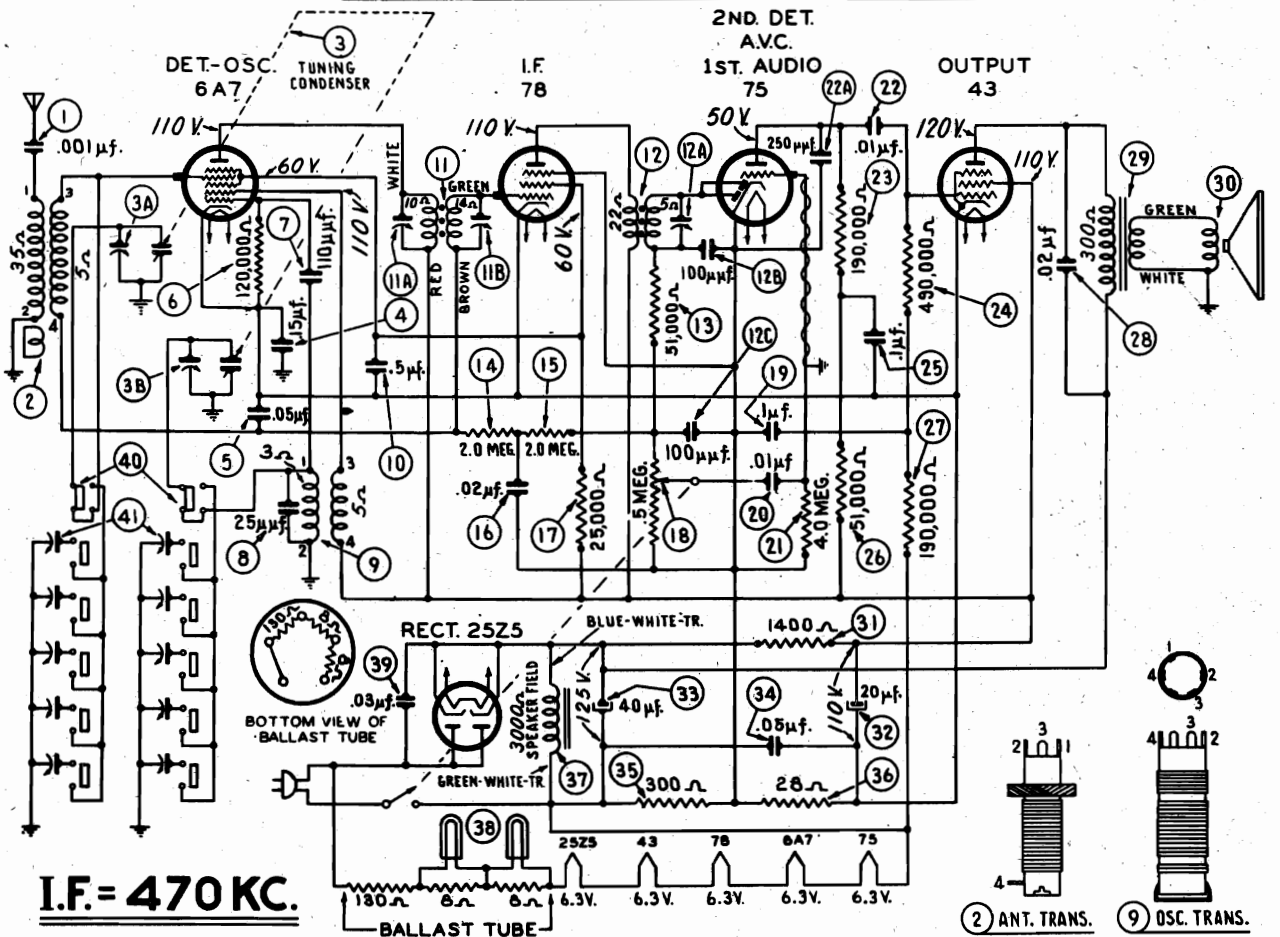
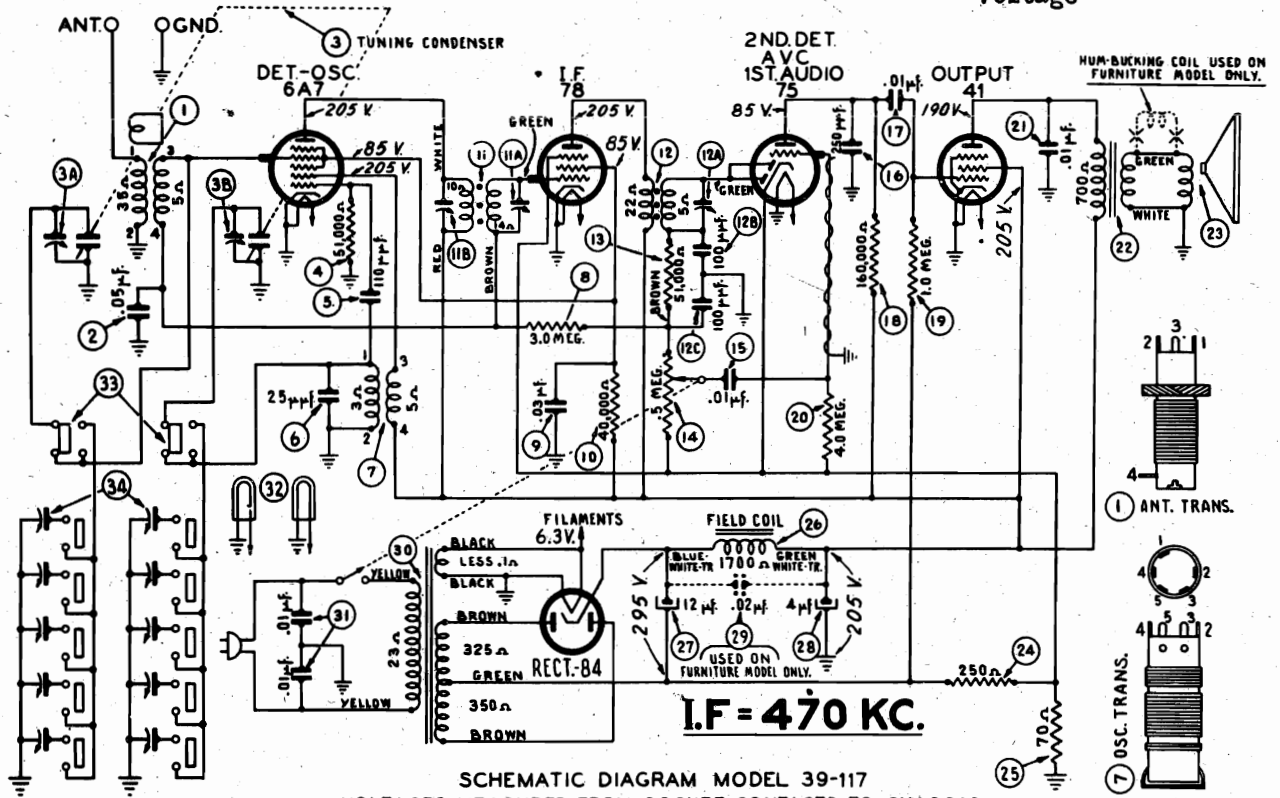
PHONOGRAPH CONNECTIONS FOR MODEL 39-116 PCX

Replacement Parts — Model 39-116 PCX

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|--------------|------------------------------|-------------|-------------------------------------|-------------|-------------|
| 131 | Condenser (.05 mfd., 200 V.) | 30-4519 | MISCELLANEOUS PARTS | | |
| 132 | Crystal Cartridge (Pick-up) | 35-2030 | Automatic Record Changer (Complete) | | 35-1178 |
| 133 | Resistor (51,000 ohms) | 33-351339 | Motor 110 volts, 60 cycles | | 35-1187 |
| 134 | Resistor (51,000 ohms) | 33-351339 | Motor 110 volts, 50 cycles | | 35-1186 |
| 135 | Switch (Radio-Phono) | 42-1053 | Governor (motor) | | 35-1165 |
| 136 | Cable | | | | |

PHILCO RADIO & TELEV. CORP.

MODEL 39-117(121,122)
MODEL 39-118(121,122)
Schematics
Voltage



MODEL 39-117(121,122)
MODEL 39-118(121,122)
Alignment

PHILCO RADIO & TELEV. CORP
MODEL 39-119(121,122)
Alignment, Trimmers
Chassis, Parts

Alignment of Compensators

EQUIPMENT REQUIRED:

(1) Signal Generator: Philco Model 077 Signal Generator, which has a fundamental frequency range from 115 to 36,000 K.C., is the correct instrument for this purpose.

(2) Output Meter: Philco Model 027 Vacuum Tube voltmeter and Circuit Tester incorporates a sensitive output meter and is recommended.

(3) Philco Fiber Handle Screw Driver, Part No. 27-7059, and Fiber Wrench, Part No. 3164.

(4) Philco Set Transformer, Part No. 32-2763

OUTPUT METER:

Two indicating devices for aligning of the receiver can be used; either an audio output meter or a vacuum tube voltmeter. The method of connecting the audio output meter is given in the next paragraph. The procedure for connecting the vacuum tube voltmeter as an aligning indicator will be found on Page 5. Where greater accuracy of the various tuned circuits is desired, the vacuum tube voltmeter is recommended as an aligning device.

The Philco 027 Output Meter is connected to the plate and cathode terminals of the type 41 tube in Model 39-117 and 119 and type 43 tube in Model 39-118. Set the meter to use the 0-30 volt scale.

Procedure—Model 39-117

| Operations in Order | SIGNAL GENERATOR | | | RECEIVER | | | Special Instructions |
|---------------------|--------------------------------|------------------------|--------------|--------------|-------------------|------------------------------|-------------------------|
| | Output Connections to Receiver | Dummy Antenna (Note A) | Dial Setting | Dial Setting | Control Settings | Adjust Compensators in Order | |
| 1 | 6A7 Grid | .1 mf. | 470 K.C. | 580 K.C. | Vol. Cont. (Max.) | 12A, 11A, 11B | Push "In" Manual Button |
| 2 | Ant. Ter. | 200 mmf. | 1550 K.C. | 1550 K.C. | Vol. Cont. (Max.) | 3B, 3A | See Note B |

Procedure—Model 39-118

| | | | | | | | |
|---|---------------|----------|-----------|-----------|-------------------|---------------|--------------------------|
| 1 | 6A7 Grid | .1 mfd. | 470 K.C. | 580 K.C. | Vol. Cont. (Max.) | 12A, 11A, 11B | See Note C |
| 2 | Ant. and Gnd. | 200 mmf. | 1550 K.C. | 1550 K.C. | Vol. Cont. (Max.) | 3B, 3A | See Note B See Note D |

Procedure—Model 39-119

| | | | | | | | |
|---|---------------|----------|-----------|-----------|-----------|---------------|-----------------------|
| 1 | 6A7 Grid | .1 mfd. | 470 K.C. | 580 K.C. | Vol. Max. | 14A, 13B, 13A | Note B |
| 2 | Ant. and Gnd. | 200 mmf. | 18 M.C. | 18 M.C. | Vol. Max. | 4B | |
| 3 | Ant. and Gnd. | 200 mmf. | 1550 K.C. | 1550 K.C. | Vol. Max. | 8, 4A | Roll Tuning Condenser |
| 4 | Ant. and Gnd. | 200 mmf. | 580 K.C. | 580 K.C. | Vol. Max. | 8A | |
| 5 | Ant. and Gnd. | 200 mmf. | 1550 K.C. | 1550 K.C. | Vol. Max. | 8, 4A | |

A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

B—Dial Calibration: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, the tuning pointer is set on the first index line at the low frequency end of the scale (540 K.C.).

* Several speakers on these models have the same part number with the exception of a -1, -2, etc., following the part number. These speakers are interchangeable. The cone assembly, however, cannot be interchanged. When ordering cones, be sure to order correct cone part number as indicated in each parts list.

C—Insert the signal generator output lead into the "Med" jack and the ground lead into the "Gnd" jack of the signal generator. Connect the other end of the output lead to terminal No. 1 on the Set Transformer Part No. 32-2763, and the cable ground to terminal No. 2. Nos. 3 and 4 terminals of Set Transformer are then connected to the chassis and 6A7 grid respectively of the receiver with short pieces of wire. Insert the 0.1 mf. in series with the No. 4 lead which connects to the grid.

D—Insert the signal generator output lead into the "Med" jack and the ground lead into the "Gnd" jack of the signal generator. Connect the other end of the output lead to terminal No. 1 of the Set Transformer, Part No. 32-2763, and the cable ground to terminal No. 2. Nos. 3 and 4 terminals of Set Transformer are then connected to the chassis and antenna lead respectively of the receiver with short pieces of wire. Insert the 100 mmf. in series with the No. 4 lead which connects to the antenna lead.

MODEL 39-119, CODE 121-122

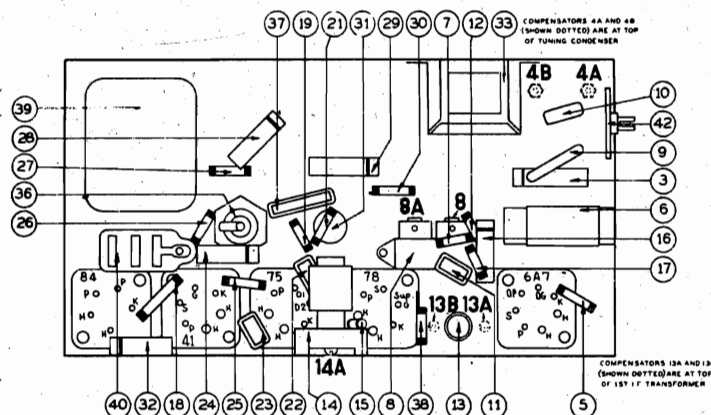


Fig. 3—Part Locations, Model 39-119

| Description | Part No. |
|---|------------|
| Bezel Assembly (Dial) | 40-6364 |
| Bezel Gasket (Dial) | 27-9174 |
| Bezel (Push Button) | 56-1364 |
| Bezel Gasket (Push Button) | 27-9218 |
| Bezel (Clamp Push Button) | 28-3153 |
| Cable & Plug (Power Supply) | L-2278 |
| Dial | 27-5480 |
| Dial Tuning Drum Assy. | 31-2281 |
| Drive Cord Assy. (Pointer operation) | 31-2275 |
| Drive Cord Assy. (Tuning Cond.) | 31-2343 |
| Clip (Mtr. Ant. Coils) | 28-5002 |
| Clip (Mtr. Osc. Coil) | 28-5003 |
| Escutcheon Plate (extension shafts F cabinet) | 56-1051 |
| Escutcheon Pin | W-950 |
| Knobs (Volume & Tuning) | 27-4753 |
| Knob (Wave Switch) | 27-4754 |
| Pilot Lamp Socket Assembly | 38-9612 |
| Pointer (Dial) | 28-5334 |
| Push Button | 27-4814 |
| Screws (Bezel Mtg.) | W-1834 FGA |
| Shaft Extensions (Volume, Tuning and Wave Switch) | 38-9640 |
| Spring (Tuning Cond. Cord) | 28-8751 |
| Spring (Pointer Cord) | 28-8946 |
| Speaker (T cabinet, code 121—optional) | *36-1426-3 |
| Speaker (F cabinet—code 122) | *36-1426-1 |
| Spring, Retaining (Volume Shaft) | *36-1449-3 |
| Socket (5 prong, Rect. tube) | 28-8915 |
| Socket (6 prong, type 78, 75 and 41 tubes) | 27-6035 |
| Socket (7 prong, type 6A7 tube) | 27-6036 |
| Tab (Manual) | 27-6107 |
| Tab Kit | 27-5486 |
| † Replace speaker. | 40-6391 |

PHILCO RADIO & TELEVISION CORP. MODEL 39-117(121,122)

MODEL 39-117(121,122)

MODEL 39-118(121,122)

Chassis, Trimmers

Parts

Model 39-117, Codes 121-122

TYPE OF CIRCUIT: A.C. operated; super-heterodyne circuit, covering standard broadcast and police stations (540 K.C. to 1720 K.C.). In addition other features of design are: Electric Push-Button Tuning; Automatic Volume Control; and pentode audio output.

Codes 121 and 122 chassis of this model are similar with the exception of Speaker and Cabinet.

This receiver is designed to operate from a "Philco Utility Aerial," Part No. 45-2450. This aerial system should be used to obtain maximum performance from the receiver.

POWER SUPPLY: Voltage—115 volts. Frequency—50-60 cycles. Power Consumption—40 watts.

INTERMEDIATE FREQUENCY: 470 K.C.

TUNING RANGE: 540 to 1720 K.C.

AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED: Five tubes: 1-6A7, 1st detector and oscillator; 1-78, I.F.; 1-75, 2nd detector, Automatic Volume Control, and 1st audio; 1-41, Output; and 1-84, Rectifier.

TUNING MECHANISM: Pulley and cable drive for Manual tuning. Six Electric Push-Buttons for Automatic Tuning. Five push-buttons are used for stations and one for manual tuning. The procedure for adjusting and operating the Electric Push-Buttons will be found in the instructions supplied with each set.

CABINETS: Code 121 chassis in type "T" cabinet. Code 122 chassis in type "F" cabinet.

| Schem. No. | Description | Part No. |
|------------|---------------------------------|-----------|
| 1 | Ant. Trans. | 32-3039 |
| 2 | Tubular Cond. (.05 mfd.) | 30-4519 |
| 3 | Tuning Cond. Assy. | 31-2362 |
| 4 | Resistor (51,000 ohms, 1 watt) | 33-351439 |
| 5 | Mica Cond. (.110 mmfd.) | 30-1031 |
| 6 | Silver Mica Cond. (.25 mmfd.) | 30-1112 |
| 7 | Osc. Trans. | 32-3040 |
| 8 | Resistor (3.0 meg., 1 watt) | 33-530439 |
| 9 | Tubular Cond. (.03 mfd.) | 30-4449 |
| 10 | Resistor (40,000 ohms, 1 watt) | 33-340439 |
| 11 | 1st I. F. Trans. Assy. | 32-3075 |
| 12 | 2nd I. F. Trans. Assy. | 32-2944 |
| 13 | Resistor (51,000 ohms, 1 watt) | 33-351439 |
| 14 | Volume Control & On-Off switch. | 33-5276 |

Model 39-118, Codes 121-122

TYPE OF CIRCUIT: A.C. D.C. operated; super-heterodyne circuit, covering standard broadcast and police stations (540 K.C. to 1720 K.C.). In addition other features of design are: Electric Push-Button Tuning; Automatic Volume Control; and pentode audio output.

Codes 121 and 122 chassis of this model are similar with the exception of Speaker and Cabinet.

The receiver is designed to operate from a "Philco Utility Aerial," Part No. 45-2450. This aerial system should be used to obtain maximum performance from the receiver.

POWER SUPPLY: Voltage—115 volts. A.C. or D.C. Power Consumption—55 watts.

INTERMEDIATE FREQUENCY: 470 K.C.

TUNING RANGE: 540 to 1720 K.C.

PHILCO TUBES USED: 1-6A7, 1st detector and oscillator; 1-78, I.F.; 1-75, 2nd detector, Automatic Volume Control and 1st audio; 1-43, Output; 1-25Z5, Rectifier; and 1-BKV51DJ, ballast tube.

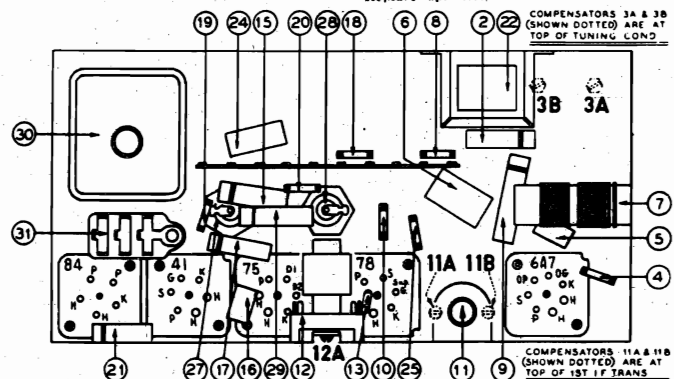
TUNING MECHANISM: Pulley and cable drive for Manual tuning. Six Electric Push-Buttons for Automatic Tuning. Five push-buttons are used for stations and one for manual tuning. The procedure for adjusting and operating the Electric Push-Buttons will be found in the instructions supplied with each set.

CABINETS: Code 121 chassis in type "T" cabinet. Code 122 chassis in type "F" cabinet.

| Schem. No. | Description | Part No. |
|------------|---------------------------------|-----------|
| 1 | Ant. Trans. | 32-3039 |
| 2 | Tubular Cond. (.001 mfd.) | 30-4453 |
| 3 | Tuning cond. Assy. | 31-2362 |
| 4 | Tubular Cond. (.15 mfd.) | 30-4505 |
| 5 | Tubular Cond. (.05 mfd.) | 30-4519 |
| 6 | Resistor (120,000 ohms, 1 watt) | 33-412439 |
| 7 | Mica Cond. (.110 mmfd.) | 30-1031 |
| 8 | Silver Mica Cond. (.25 mmfd.) | 30-1112 |
| 9 | Osc. Trans. | 32-3040 |
| 10 | Tubular Cond. (.5 mfd.) | 30-4551 |
| 11 | 1st I. F. Trans. Assy. | 32-3075 |
| 12 | 2nd I. F. Trans. Assy. | 32-2944 |
| 13 | Resistor (51,000 ohms, 1 watt) | 33-351439 |
| 14 | Resistor (2.0 megohms, 1 watt) | 33-520439 |

| | | |
|----|---|-----------|
| 15 | Tubular Cond. (.01 mfd.) | 30-4479 |
| 16 | Mica Cond. (.250 mmfd.) | 30-1032 |
| 17 | Tubular Cond. (.01 mfd.) | 30-4572 |
| 18 | Resistor (160,000 ohms, 1 watt) | 33-416439 |
| 19 | Resistor (1.0 meg., 1 watt) | 33-510439 |
| 20 | Resistor (4.0 meg., 1 watt) | 33-540439 |
| 21 | Tubular Cond. (.01 mfd.) | 30-4572 |
| 22 | Output Trans. | 32-7980 |
| 23 | Cone & Voice Coil Assy. For Speaker (Pt. No. 36-1426-1) | 36-4083 |
| | (Pt. No. 36-1426-3) | 36-4085 |
| | Cone & Voice Coil Assy. for Speaker (Pt. No. 36-1440-3) | 36-4086 |
| 24 | Resistor (250 ohms wirewound) | 33-125431 |
| 25 | Resistor (70 ohms, 1 watt) | 33-070439 |
| 26 | Field Coil for Speaker (Pt. No. 36-1426) | |
| 27 | Field Coil for Speaker (Pt. No. 36-1440) | |
| 28 | Electro. Cond. (.12 mfd.) | 30-2319 |
| 29 | Electro. Cond. (.4 mfd.) | 30-2236 |
| 30 | Tubular Cond. (.02 mfd.) | 30-4215 |
| 31 | Power Trans. (115 volts, 50-60 cycles) | 32-7974 |
| 32 | Bakelite Cond. (.01 mfd.—.01 mfd.) | 3903 DG |
| 33 | Pilot Lamps | 34-2064 |
| 34 | Push button switch | 42-1484 |
| 35 | Padder strip | 31-6292 |

| | |
|--|------------|
| Bezel Assy. (Dial) | 40-6364 |
| Bezel Gasket (Dial) | 27-9174 |
| Bezel (Push buttons) | 56-1364 |
| Bezel Gasket (push buttons) | 27-9218 |
| Bezel Clamp (Dial) | 28-5153 |
| Cable & Plug (Power Supply) | L-2778 |
| Dial | 27-5406 |
| Dial Tuning Drum Assy. | 31-2281 |
| Drive Cord Assy. (Pointer) | 31-2275 |
| Drive Cord Assy. (Tuning cond.) | 31-2243 |
| Clip (Mtg. Ant. Coll.) | 28-5002 |
| Clip (Mtg. Osc. Coll.) | 28-5003 |
| Escutcheon Plate (extension shafts F Cabinet) | 56-1051 |
| Escutcheon Pin | W-950 |
| Knobs (Volume & Tuning) | 27-4753 |
| Pilot Lamp Socket Assy. | 38-9612 |
| Pointer (Dial) | 28-5934 |
| Push buttons (6 used) | 27-4814 |
| Screws (bezel mtg.) | W-1834 FGA |
| Shaft Extensions (2 used) F cabinet only | 38-9640 |
| Spring (retaining, volume and tuning) F cabinet only | 28-8915 |
| Spring (Tuning cond. cord) | 28-8751 |
| Spring (Pointer Cord) | 28-8946 |
| Socket (5 prong, Rect. tube) | 27-6035 |
| Socket (6 prong, type 78 75 & 41 tubes) | 27-6036 |
| Socket (7 prong, type 6A7 tube) | 27-6107 |
| *Speaker (F cabinet) | 36-1440 |
| *Speaker (T cabinet) | 36-1426-1 |
| Tab Kit | 40-6391 |
| † Replace speaker. | |



| | | |
|----|--|-----------|
| 15 | Resistor (2.0 megohms, 1 watt) | 33-520439 |
| 16 | Tubular Cond. (.02 mfd.) | 30-4215 |
| 17 | Resistor (25,000 ohms, 1 watt) | 33-325439 |
| 18 | Volume Control & On-Off Switch | 33-5276 |
| 19 | Tubular Cond. (.1 mfd.) | 30-4499 |
| 20 | Tubular Cond. (.01 mfd.) | 30-4572 |
| 21 | Resistor (4.0 megohms, 1 watt) | 33-540439 |
| 22 | Tubular Cond. (.01 mfd.) | 30-4572 |
| 23 | Resistor (190,000 ohms, 1 watt) | 33-419439 |
| 24 | Resistor (400,000 ohms, 1 watt) | 33-449439 |
| 25 | Tubular Cond. (.1 mfd.) | 30-4499 |
| 26 | Resistor (51,000 ohms, 1 watt) | 33-351439 |
| 27 | Resistor (190,000 ohms, 1 watt) | 33-419439 |
| 28 | Tubular Cond. (.02 mfd.) | 30-4516 |
| 29 | Output Trans. | 32-7986 |
| 30 | Cone & Voice Coil Assy. Speaker Part No. 36-1444-1 | *36-4083 |
| | Speaker Part No. 36-1444-3 | *36-4085 |
| | Cone & Voice Coil Assy. Speaker Part No. 36-1445 | *36-4086 |
| 31 | Resistor (1400 ohms, 1 watt) | 33-214439 |
| 32 | Electro. Cond. (.20 mfd.) | 30-2245 |
| 33 | Electro. Cond. (.40 mfd.) | 30-2332 |
| 34 | Tubular Cond. (.05 mfd.) | 30-4444 |
| 35 | Resistor (300 ohms) (wirewound) | 33-130431 |
| 36 | Resistor (28 ohms, 1 watt) | 33-028439 |
| 37 | Field Coil for Speaker, Part No. 36-1444 | |
| 38 | Pilot Lamps | 34-2068 |
| 39 | Tubular Cond. (.03 mfd.) | 30-4449 |
| 40 | Push button switch | 42-1484 |
| 41 | Padder strip | 31-6292 |

| | |
|---|------------|
| Bezel Assy. (Dial) | 40-6364 |
| Bezel Gasket (Dial) | 27-9174 |
| Bezel (Push Buttons) | 56-1364 |
| Bezel Gasket (Push Buttons) | 27-9218 |
| Bezel Clamp (Dial) | 28-5153 |
| Cable & Plug (Power Supply) | L-2778 |
| Dial | 27-5406 |
| Dial Tuning Drum Assy. | 31-2281 |
| Drive Cord Assy. (Pointer) | 31-2275 |
| Drive Cord Assy. (Tuning Cond.) | 31-2243 |
| Clip (Mtg. Ant. Coll.) | 28-5002 |
| Clip (Mtg. Osc. Coll.) | 28-5003 |
| Escutcheon Plate (extension shafts F cabinet) | 56-1051 |
| Escutcheon Pin | W-950 |
| Knobs (Volume & Tuning) | 27-4753 |
| Pilot Lamp Socket Assy. | 38-9612 |
| Pointer | 28-5934 |
| Push Buttons (6 used) | 27-4814 |
| Screws (Bezel Mtg.) | W-1834 FGA |
| Shaft Extensions (2 used F cabinet only) | 38-9640 |
| Spring (retaining) Volume & Tuning F Cabinet only | 28-8915 |
| Spring (Tuning Cond. Cord) | 28-8751 |
| Spring (Pointer Cord) | 28-8946 |
| Socket (5 prong, Ballast tube) | 27-6035 |
| Socket (6 prong, type 25Z5, 43, 75 & 78 tubes) | 27-6036 |
| Socket (7 prong, type 6A7 Tube) | 27-6107 |
| *Speaker (F cabinet) | 36-1445 |
| *Speaker (T cabinet, optional) | 36-1444-1 |
| Tab Kit | 40-6391 |
| † Replace speaker. | |

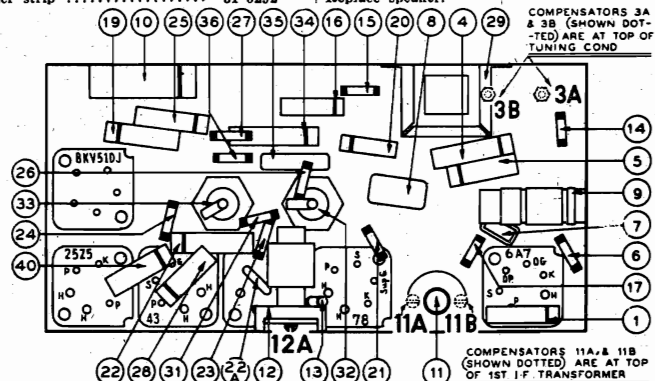


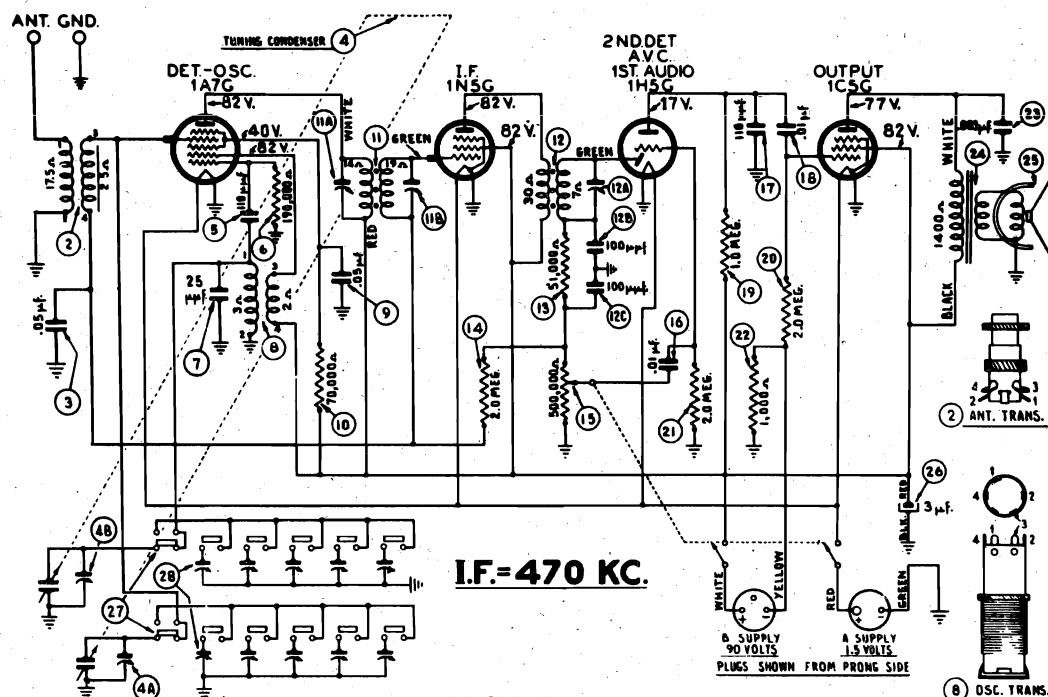


Diagram showing three types of antenna coils:

- 1. ANT. TRANS. SHORT WAVE: A vertical coil with a central tap (3) and two outer terminals (1 and 2).
- 2. ANT. TRANS. BROADCAST: A vertical coil with a central tap (3) and two outer terminals (4 and 1).
- 6. OSC. TRANS.: A vertical coil with a central tap (3) and two outer terminals (4 and 6).

| No. | Description | Part No. |
|-----|--|-----------|
| 25 | Resistor (.9,000 ohms, 1 watt) | 33-39943S |
| 26 | Resistor (400,000 ohms, 1 watt) | 33-14943S |
| 27 | Resistor (400,000 ohms, 1 watt) | 33-14943S |
| 28 | Tubular Cond. (1 mfd.) | 30-4499 |
| 29 | Tubular Cond. (.01 mfd.) | 30-4479 |
| 30 | Resistor (4.0 meg., 1 watt) | 33-54043S |
| 31 | Electrolytic Cond. (4-8 mfd.) | 30-2523 |
| 32 | Tubular Cond. (.01 mfd.) | 30-4499 |
| 33 | Output Trans. | 32-7980 |
| *34 | Cone & Voice Coil Assy. | |
| | Speaker Part No. 36-1426-1 | *36-4083 |
| | Speaker Part No. 36-1426-3 | *36-4085 |
| | Cone & Voice Coil Assy. | |
| | Speaker Part No. 36-1449 | *36-4086 |
| 35 | *Field Coil (Speaker Part No. 36-1426) | |
| | *Field Coil (Speaker Part No. 36-1449) | |
| 36 | Electrolytic Cond. (8 mfd.) | 30-2319 |
| 37 | Resistor (250 ohms, with ground) | 33-15431 |
| 38 | Resistor (70 ohms, with ground) | 33-07133 |
| 39 | Power Trans. (115 volts, 50-60 cycles) | 32-7974 |
| 40 | Bakelite Cond. (.01—.01 mfd.) | 3903 DG |
| 41 | Pilot Lamps | 34-2064 |
| 42 | Wave Switch | 42-1495 |
| 43 | Push Button Switch | 42-1484 |
| 44 | Padder Strip | 31-6293 |

MODEL 39-175(121,122) PHILCO RADIO & TELEVISION CORP. Schematic, Voltage



SPECIFICATIONS

RANGE: 530 to 1720 K.C.

Model 39-175 is a 4 tube battery operated superheterodyne receiver covering standard broadcast and state police stations. The receiver is equipped with electric push-button tuning in addition to manual tuning, low current battery tubes and extremely sensitive speaker.

The electric push-button tuning contains 6 push buttons for selecting any of 5 stations in the standard broadcast band and one button for dial tuning. The procedure for adjusting and operating the push-buttons will be found in the instructions on page 3.

Code 121 is assembled in a type T cabinet and has the speaker mounted on the chassis. Code 122 is assembled in a console cabinet with the speaker detached from the chassis.

Alignment of the R.F. and I.F. compensating condensers of this model is the same as that given for the Model 39-75 code 121 and 122.

| | | |
|----|--|-----------|
| 2 | Antenna Transformer..... | 32-3169 |
| 3 | Tubular Condenser (.05 mfd.)..... | 30-4519 |
| 4 | Tuning Condenser Assembly..... | 31-2362 |
| 5 | Condenser (110 mfd., mica)..... | 30-1031 |
| 6 | Resistor (190,000 ohms, 1 watt)..... | 33-419439 |
| 7 | Condenser (25 mfd., silver plated mica)..... | 30-1112 |
| 8 | Oscillator Transformer..... | 32-3083 |
| 9 | Tubular Cond. (.05 mfd.)..... | 30-4444 |
| 10 | Resistor (70,000 ohms, 1 watt)..... | 33-370439 |
| 11 | 1st I.F. Transformer Assembly..... | 32-3078 |
| 12 | 2nd I.F. Transformer Assembly..... | 32-3081 |
| 13 | Resistor (51,000 ohms, 1 watt)..... | 33-351439 |
| 14 | Resistor (2.0 megohms, 1 watt)..... | 33-520439 |
| 15 | Volume Control..... | 33-5291 |
| 16 | Tubular Condenser (.01 mfd.)..... | 30-4572 |
| 17 | Condenser (110 mfd., mica)..... | 30-1031 |
| 18 | Tubular Condenser (.01 mfd.)..... | 30-4572 |
| 19 | Resistor (1.0 megohm, 1 watt)..... | 33-510439 |
| 20 | Resistor (2.0 megohms, 1 watt)..... | 33-520439 |
| 21 | Resistor (2.0 megohms, 1 watt)..... | 33-520439 |
| 22 | Resistor (1000 ohms, 1 watt)..... | 33-210439 |
| 23 | Tubular Condenser (.003 mfd.)..... | 30-4469 |
| 24 | Output Transformer..... | 32-7995 |
| 25 | Cone & Voice Coil Assemblies | |
| | Speaker Part No. 36-1442-3..... | 36-4090 |
| | Speaker Part No. 36-1447-3..... | 36-4092 |
| 26 | Electrolytic Condenser (3 mfd.)..... | 30-2346 |
| 27 | Push-Button Switch..... | 42-1484 |
| 28 | Padder Strip..... | 31-6292 |

INTERMEDIATE FREQUENCY: 470 K.C.

PHILCO TUBES: One 1A7G, First Detector and Oscillator; one 1N5G, I.F. Amplifier; one 1H5G, Second Detector; First Audio and Automatic Volume Control, and one 1C5G pentode Output.

BATTERIES REQUIRED: One (1) Philco "A" Pack, Part No. 41-8014; one (1) Philco "B" Pack, Part No. 41-8015.

BATTERY DRAIN:

"A" - (250 M.A.) "B" - (8½ M.A.)

AERIAL AND GROUND: In order to obtain the highest amount of sensitivity from these receivers the Philco Farm Radio Aerial, Part No. 40-6383, should be used. This aerial is accurately designed to match the tuned antenna circuit in the receiver so that maximum performance will be obtained.

A good ground connection to the nearest water pipe or any other good ground source is also required.

| | |
|---|---------|
| Spring (On-Off Indicator)..... | 28-8927 |
| Snap Fastener (On-Off Indicator)..... | 28-4342 |
| Speaker (T Cabinet)..... | 36-1442 |
| (F Cabinet)..... | 36-1447 |
| Socket (6 prong)..... | 27-6086 |
| Socket (7 prong)..... | 27-6099 |
| Socket (Speaker)..... | 27-6115 |
| Wire Link (On-Off Indicator)..... | 28-8922 |
| Tab (Manual)..... | 27-5487 |
| Tab Kit..... | 40-6408 |
| Shaft Extension (Tuning, Volume)..... | 38-9640 |
| Spring (Shaft Retaining)..... | 28-8915 |
| Bezel (Push Button)..... | 56-1364 |
| Bezel Assembly (Dial)..... | 40-6364 |
| Bezel Gasket (Dial)..... | 27-9174 |
| Bezel Gasket (Push Button)..... | 27-9218 |
| Cable Battery..... | 41-3429 |
| Dial..... | 27-5420 |
| Drive Drum Assembly..... | 31-2281 |
| Drive Pulley..... | 28-6662 |
| Drive Cord (Pointer)..... | 31-2275 |
| Drive Cord (Cord Drive)..... | 31-2343 |
| Knob (Push Button)..... | 27-4814 |
| Knob (Tuning, Volume)..... | 27-4753 |
| Pointer..... | 28-5934 |
| Shaft (Tuning)..... | 56-6032 |
| Spring (Drive Cord Tuning Condenser)..... | 28-8751 |
| Spring (Drive Cord Pointer)..... | 28-8946 |

MODEL 39-711(121)

MODEL 39-751(121)

PHILCO RADIO & TELEV. CORP.

Chassis, Trimmers

Parts

Replacement Parts Model 39-711

| Schem. No. | Description | Part No. |
|------------|-----------------------------------|-----------|
| 1 | Tubular Cond. (.001 mfd. 1000 V.) | 30-4601 |
| 2 | Tubular Cond. (.01 mfd. 400 V.) | 30-4572 |
| 3 | Tubular Cond. (.25 mfd. 400 V.) | 30-4589 |
| 4 | Ant. Trans. (B.C. & Police) | 32-3141 |
| 5 | Ant. Trans. (S.W.) | 32-3143 |
| 6 | Compensator (2 section) | 31-6287 |
| 7 | Tubular Cond. (.1 mfd. 200 V.) | 30-4586 |
| 8 | Tubular Cond. (.25 mfd. 400 V.) | 30-4589 |
| 9 | Resistor (51,000 ohms, 1 watt) | 33-351439 |
| 10 | Resistor (120,000 ohms, 1 watt) | 33-412439 |
| 11 | Tuning Cond. | 31-2357 |
| 12 | Osc. Trans. (B.C. & Police) | 32-3142 |
| 13 | Osc. Trans. (S.W.) | 32-3144 |
| 14 | Compensator (2 section) | 31-6287 |
| 15 | Compensator | 31-6289 |
| 16 | Mica Cond. (1650 mmfd.) | 30-4587 |
| 17 | Mica Cond. (3500 mmfd.) | 30-4588 |
| 18 | Resistor (3300 ohms, 1 watt) | 33-233439 |
| 19 | Mica Cond. (250 mmfd.) | 30-1119 |
| 20 | Resistor (5000 ohms, 1 watt) | 33-250439 |
| 21 | 1st I.F. Trans. Assy. | 32-3139 |
| 22 | 2nd I.F. Trans. Assy. | 32-3140 |
| 23 | Tubular Cond. (.1 mfd. 200 V.) | 30-4586 |
| 24 | Tubular Cond. (.01 mfd. 600 V.) | 30-4581 |
| 25 | Resistor (20,000 ohms, 1 watt) | 33-320439 |
| 26 | Resistor (2.0 meg., 1 watt) | 33-520139 |
| 27 | Tubular Cond. (.05 mfd. 200 V.) | 30-4519 |
| 28 | Volume Control (5 meg.) | 33-5305 |
| 29 | Tubular Cond. (.001 mfd. 200 V.) | 30-4582 |
| 30 | Resistor (10,000 ohms, 1 watt) | 33-101039 |
| 31 | Resistor (330,000 ohms, 1 watt) | 33-390439 |
| 32 | Resistor (330,000 ohms, 1 watt) | 33-433439 |
| 33 | Mica Cond. (250 mmfd.) | 30-1119 |
| 34 | Tubular Cond. (.02 mfd. 200 V.) | 30-4584 |
| 35 | Resistor (330,000 ohms, 1 watt) | 33-433439 |
| 36 | Resistor (150 ohms, 1 watt) | 33-115439 |

Replacement Parts Model 39-751

| Schem. No. | Description | Part No. |
|------------|-----------------------------------|-----------|
| 1 | Tubular Cond. (.25 mfd.) | 30-4589 |
| 2 | Tubular Cond. (.01 mfd.) | 30-4572 |
| 3 | Ant. Trans. (B.C.) | 32-2588 |
| 4 | Ant. Trans. (S.W. 1) | 32-3093 |
| 5 | Ant. Trans. (S.W. 2) | 32-2885 |
| 6 | Compensator | 31-6288 |
| 7 | Tubular Cond. (.01 mfd.) | 30-4572 |
| 8 | Tubular Cond. (.15 mfd.) | 30-4600 |
| 9 | Tubular Cond. (.05 mfd.) | 30-4519 |
| 10 | Tubular Cond. (.05 mfd.) | 30-4519 |
| 11 | Resistor (100 ohms, 1 watt) | 33-110439 |
| 12 | Tubular Cond. (.1 mfd.) | 30-4586 |
| 13 | Tubular Cond. (.1 mfd.) | 30-4586 |
| 14 | Resistor (1.5 megohm) | 33-515439 |
| 15 | R.F. Trans. (Brdest.) | 32-2379 |
| 16 | R.F. Trans. (S.W. 1) | 32-3099 |
| 17 | R.F. Trans. (S.W. 2) | 32-3165 |
| 18 | Mica Cond. (5 mmfd.) | 30-1120 |
| 19 | Compensator | 31-6288 |
| 20 | Tubular Cond. (.05 mfd.) | 30-4519 |
| 21 | Tubular Cond. (.05 mfd.) | 30-4519 |
| 22 | Resistor (51,000 ohms, 1 watt) | 33-351439 |
| 23 | Resistor (100 ohms, 1 watt) | 33-110439 |
| 24 | Resistor (24,000 ohms, 1 watt) | 33-320439 |
| 25 | Mica Cond. (250 mmfd.) | 30-1119 |
| 26 | Tuning Cond. | 31-2325 |
| 27 | Osc. Trans. (Brdest.) | 32-2120 |
| 28 | Osc. Trans. (S.W. 1) | 32-3094 |
| 29 | Osc. Trans. (S.W. 2) | 32-3102 |
| 30 | 2 Section Compensator | 31-6287 |
| 31 | Compensator | 31-6289 |
| 32 | Semi-Fixed Condenser (1605 mmfd.) | 31-6282 |
| 33 | Compensator | 31-6288 |
| 34 | Semi-Fixed Condenser (3300 mmfd.) | 31-6283 |
| 35 | Mica Cond. (250 mmfd.) | 30-1119 |
| 36 | Resistor (5,000 ohms, 1 watt) | 33-250439 |
| 37 | Resistor (2,000 ohms, 1 watt) | 33-320439 |
| 38 | Tubular Cond. (.05 mfd.) | 30-4519 |
| 39 | Resistor (600 ohms, 1 watt) | 33-160439 |
| 40 | Tubular Cond. (.05 mfd.) | 30-4519 |
| 41 | Tubular Cond. (.001 mfd.) | 30-4592 |
| 42 | Resistor (20,000 ohms, 1 watt) | 33-320439 |
| 43 | 1st I.F. Trans. Assy. | 32-3116 |
| 44 | 2nd I.F. Trans. Assy. | 32-3133 |
| 45 | Resistor (10,000 ohms, 1 watt) | 33-101039 |
| 46 | Mica Cond. (250 mmfd.) | 30-1119 |
| 47 | Tubular Cond. (.1 mfd.) | 30-4586 |
| 48 | Resistor (120,000 ohms, 1 watt) | 33-412439 |
| 49 | Resistor (99,000 ohms, 1 watt) | 33-399439 |
| 50 | Resistor (240,000 ohms, 1 watt) | 33-424439 |
| 51 | Resistor (120,000 ohms, 1 watt) | 33-412439 |
| 52 | Resistor (1.0 meg., 1 watt) | 33-510439 |
| 53 | Resistor (10.0 meg., 1 watt) | 33-610439 |
| 54 | Tubular Cond. (.006 mfd.) | 30-4583 |
| 55 | Tubular Cond. (.01 mfd.) | 30-4581 |
| 56 | Tone Control (4.0 meg.) | 33-5299 |
| 57 | Tubular Cond. (.02 mfd.) | 30-4584 |
| 58 | Mica Cond. (110 mmfd.) | 30-1118 |
| 59 | Volume Control | 33-5304 |
| 60 | Resistor (70,000 ohms, 1 watt) | 33-370439 |
| 61 | Tubular Cond. (.006 mfd.) | 30-4583 |
| 62 | Tubular Cond. (.25 mfd.) | 30-4589 |
| 63 | Resistor (32,000 ohms, 1 watt) | 33-332439 |
| 64 | Resistor (32,000 ohms, 1 watt) | 33-332439 |
| 65 | Resistor (25,000 ohms, 1 watt) | 33-325439 |
| 66 | Resistor (5,000 ohms, 1 watt) | 33-250439 |
| 67 | Tubular Cond. (.02 mfd.) | 30-4584 |
| 68 | Resistor (490,000 ohms, 1 watt) | 33-449439 |
| 69 | Tubular Cond. (.01 mfd.) | 30-4581 |

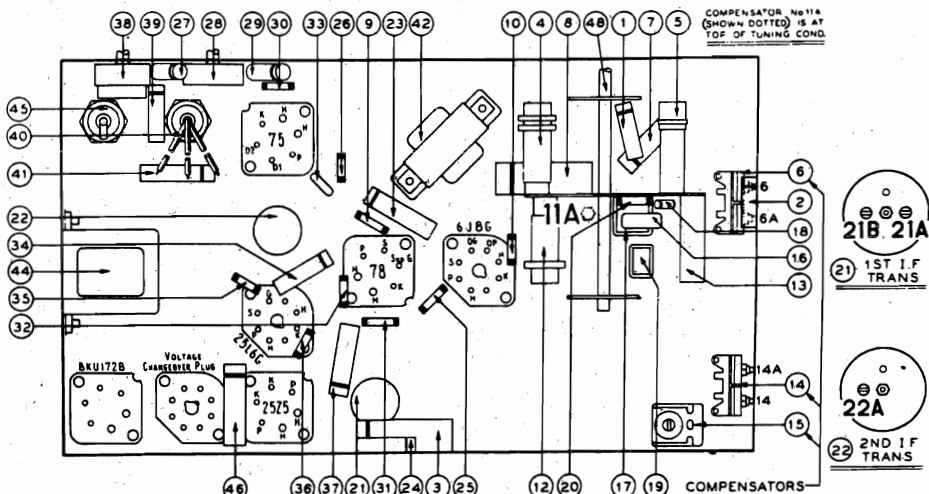


Fig. 3—Part Locations, Model 39-711, Underside of Chassis

| Schem. No. | Description | Part No. |
|------------|--------------------------------------|----------|
| 37 | Tubular Cond. (.1 mfd., 200 V.) | 30-4586 |
| 38 | Tone Control Switch | 42-1481 |
| 39 | Tubular Cond. (.05 mfd., 400 V.) | 40-4518 |
| 40 | Electrolytic Cond. (6 mfd., 25 V.) | 30-2380 |
| | (20 mfd., 150 V.) | 30-2380 |
| 41 | Tubular Cond. (.015 mfd., 400 V.) | 30-4515 |
| 42 | Output Trans. | 32-8033 |
| 43 | Cone & Voice Coil Assy. | 36-4170 |
| 44 | Filter Choke | 32-8029 |
| 45 | Electrolytic Cond. (20 mfd., 150 V.) | 30-2245 |
| 46 | Tubular Cond. (.05 mfd., 600 V.) | 30-4602 |
| 47 | Pilot Lamp | 34-2068 |
| 48 | Wave Switch | 42-1480 |

Miscellaneous Parts

| Description | Part No. |
|--|----------|
| Cord (Wave Band Indicator) | 27-9294 |
| Cord (Pointer Operation) | 31-2359 |
| Dial | 27-5499 |
| Indicator (Wave Band) | 56-1269 |
| Knobs (4 used) | 27-4332 |
| Pointer (Dial) | 56-1276 |
| Socket (Pilot Lamp) | 38-9127 |
| Socket (6 prong, type 25Z5 & Ballast tube) | 27-6036 |
| Socket (6 prong, type 78 & 75 tubes) | 27-6122 |
| Socket (8 prong, type 6J8G & 25L6G tubes) | 27-6120 |
| Socket (8 prong, voltage changeover plug) | 27-6127 |
| Spring (Tuning Indicator Cord) | 28-8913 |
| Spring (Wave Band Indicator Mounting) | 28-8943 |
| Spring (Wave Band Indicator Cord) | 28-8945 |

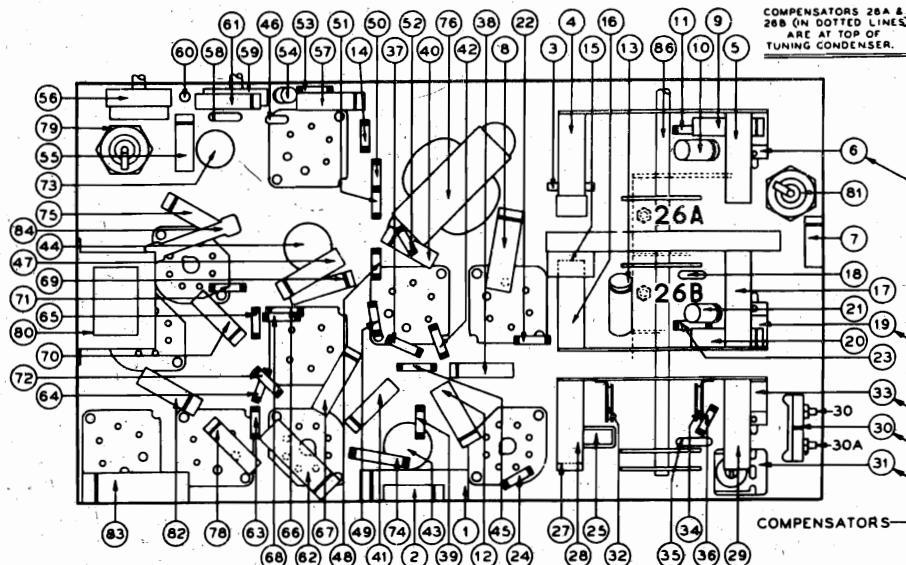


Fig. 4—Part Locations, Model 39-751, Underside of Chassis

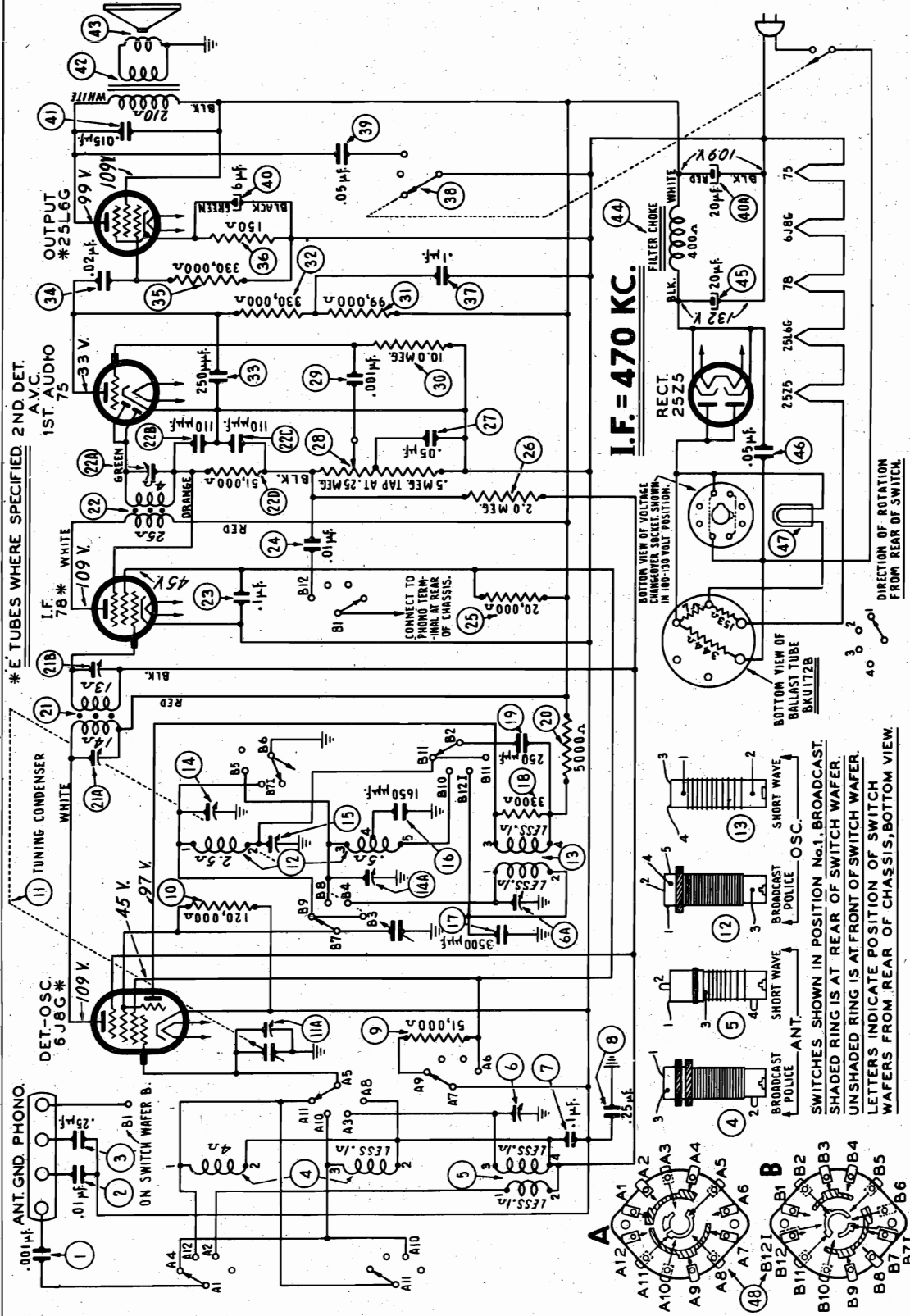
| Schem. No. | Description | Part No. |
|------------|--|-----------|
| 70 | Tubular Cond. (.02 mfd.) | 30-4584 |
| 71 | Resistor (240,000 ohms, 1 watt) | 33-424439 |
| 72 | Resistor (240,000 ohms, 1 watt) | 33-424439 |
| 73 | Electrolytic Cond. (16 mfd., 300 V., 10 mfd., 25 V.) | 30-2372 |
| 74 | Resistor (150 ohms, 1 watt) | 33-115439 |
| 75 | Tubular Cond. (.01 mfd.) | 30-4581 |
| 76 | Output Trans. | 32-8028 |
| 77 | Cone & Voice Coil Assy. (For Speaker 36-1455-3) | 36-4108 |
| | Cone & Voice Coil Assy. (For Speaker 36-1455-3) | 36-4107 |
| 78 | Tubular Cond. (.01 mfd.) | 30-4581 |
| 79 | Electrolytic Cond. (40 mfd., 300 V.) | 30-2373 |
| 80 | Filter Choke | 32-8029 |
| 81 | Electrolytic Cond. (20 mfd., 150 V.) | 30-2245 |
| 82 | Tubular Cond. (.02 mfd.) | 30-4590 |
| 83 | Tubular Cond. (.5 mfd.) | 30-4599 |
| 84 | Resistor (10,000 ohms, 3 watt) | 33-3366 |
| 85 | Pilot Lamps | 34-2068 |
| 86 | Wave Switch | 42-1454 |

Miscellaneous Parts

| Description | Part No. |
|---|--------------|
| Bezel (39-751T) | 56-1246 |
| Bezel (39-751XX) | 56-1222 |
| Cord (Wave Band Indicator) | 27-9294 |
| Cord (Pointer Operation) | 31-2359 |
| Cord (Tone Control Indicator) | 31-2351 |
| Indicator (Wave Band & Tone Control) | 56-1269 |
| Knob (Tuning) | 27-4330 |
| Knob (Vernier) | 27-4331 |
| Knob (Tone Control & Vol. Cont.) | 27-4332 |
| Pointer (Dial) | 56-1276 |
| Screws (Bezel) | W-1834 (A-D) |
| Socket (Pilot Lamp) | 38-9118 |
| Socket (5 prong, type 78 tube) | 27-6124 |
| Socket (6 prong, type 78 & 75 tubes) | 27-6123 |
| Socket (6 prong, type 25Z5 & Ballast Tubes) | 27-6036 |
| Socket (8 prong, type 6J8G & 25L6G tubes) | 27-6120 |
| Socket (8 prong, voltage changeover plug) | 27-6127 |
| Spring (Tuning Indicator Cord) | 28-8913 |
| Spring (Indicator Operation) | 28-8931 |
| Spring (Indicator Mounting) | 28-8943 |
| Vernier Drive | 31-2329 |
| Speaker | 36-1456-31 |
| Speaker | 36-1455-3 |

PHILCO RADIO & TELEV. CORP.

MODEL 39-711(121)
Schematic, Voltage
Changes



SCHEMATIC DIAGRAM MODEL 39-711

TYPE CIRCUIT: Model 39-711, code 121, is a six (6) tube A.C. or D.C. operated receiver employing a superheterodyne circuit with three tuning ranges for reception of Standard, Police and Shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. In addition, other features of design are: Automatic Volume Control; Tone Control; and special compensation for reducing frequency drift to a minimum.

POWER SUPPLY: 100-130 or 200-240 volts A.C. or D.C. The voltage ranges are selected by inserting the changeover plug as indicated on top of the chassis.

PRODUCTION CHANGES
Condenser Part No. 30-1119, 250 mard. added from suppressor grid of the 6J8G tube to ground to prevent regeneration at 15 to 22 M.C.

AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Plug No. 40-6870 should be used and a good ground connection to the nearest water pipe or any other good source.

CABINET DIMENSIONS: T 12% Height 16% Width 9% Depth 9%

POWER CONSUMPTION: 85 watts at 240 V.
43 watts at 120 V.

TUNING RANGES: 550 to 1720 K.C.;
2.3 to 7.4 M.C.; 7.3 to 22 M.C.

NOTE 1
AT 240 VOLTS LINE VOLTAGE
THE VOLTAGES NOTED WILL
BE APPROXIMATELY DOUBLED

E TUBES WHERE SPECIFIED.

10,000 Ω

2ND DET.
AFC
1ST AUDIO
75

PHASE
INVERTER
76

OUTPUT
#25L6G
117V

OUTPUT
#25L6G
117V

SEE NOTE A

44B \oplus @ 44A

44 2ND I.F. TRANS.

43B

43A

43 1ST I.F. TRANS.

100 Ω

85

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

166

167

168

169

170

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

187

188

189

190

191

192

193

194

195

196

197

198

199

200

201

202

203

204

205

206

207

208

209

210

211

212

213

214

215

216

217

218

219

220

221

222

223

224

225

226

227

228

229

230

231

232

233

234

235

236

237

238

239

240

241

242

243

244

245

246

247

248

249

250

251

252

253

254

255

256

257

258

259

260

261

262

263

264

265

266

267

268

269

270

271

272

273

274

275

276

277

278

279

280

281

282

283

284

285

286

287

288

289

290

291

292

293

294

295

296

297

298

299

300

301

302

303

304

305

306

307

308

309

310

311

312

313

314

315

316

317

318

319

320

321

322

323

324

325

326

327

328

329

330

331

332

333

334

335

336

337

338

339

340

341

342

343

344

345

346

347

348

349

350

351

352

353

354

355

356

357

358

359

360

361

362

363

364

365

366

367

368

369

370

371

372

373

374

375

376

377

378

379

380

381

382

383

384

385

386

387

388

389

390

391

392

393

394

395

396

397

398

399

400

401

402

403

404

405

406

407

408

409

410

411

412

413

414

415

416

417

418

419

420

421

422

423

424

425

426

427

428

429

430

431

432

433

434

435

436

437

438

439

440

441

442

443

444

445

446

447

448

449

450

451

452

453

454

455

456

457

458

459

460

461

462

463

464

465

466

467

468

469

470

471

472

473

474

475

476

477

478

479

480

481

482

483

484

485

486

487

488

489

490

491

492

493

494

495

496

497

498

499

500

501

502

503

504

505

506

507

508

509

510

511

512

513

514

515

516

517

518

519

520

521

522

523

524

525

526

527

528

529

530

531

532

533

534

535

536

537

538

539

540

541

542

543

544

545

546

547

548

549

550

551

552

553

554

555

556

557

558

559

560

POWER CONSUMPTION: 50 watts at 120 volts.
100 watts at 240 volts.

100 watts at 240 volts.
TUNING RANGES: 530 to 1720 K.C.; 2.3 to 7.4 M.C.; 7.3 to 22 M.C.

LETTERS INDICATE POSITION OF SWITCH WAFERS FROM REAR OF CHASSIS, (BOTTOM VIEW.)

PE CIRCUIT: Model 39-751, code 121, is an eight (8) tube A.C. or

PE CIRCUIT: Model 39-751, code 121, is an eight (8) tube A.C. or

D.C. operated receiver employing a superheterodyne circuit with three tuning ranges for reception of Standard, Police and Shortwave Broad-

cast Stations. Connections are also provided for attaching a high

Automatic Volume Control; Continuously Variable Tone Control; Bass Impedance Electric Phonograph pick-up. Other features of design are:

1. *Chlorophyll a* (Chl *a*)

[illegible]

—

DIMENSIONS:

DIMENSIONS:

To prevent in-

resistor, Par

parallel with

100

1

Depth

Width

Width
Depth

20 9½
27½ 11

30 K.C. & 700

9 was connected

F. transforme

PHILCO RADIO & TELEV. CORP.

MODEL 39-711(121)

MODEL 39-751(121)

Alignment

Alignment of Compensators**EQUIPMENT REQUIRED:**

- (1) Signal Generator; Philco Model 077.
- (2) Output Meter, Philco Model 027 Circuit Tester.
- (3) Philco Fiber Handle Screw Driver, Part No. 27-7059 and Fiber Wrench, Part No. 3164.

OUTPUT METER:

Two indicating devices for aligning of the receiver can be used; either an audio output meter or a vacuum tube voltmeter. The method of connecting the audio output meter is given in the next paragraph. The procedure for connecting the vacuum tube voltmeter as an aligning indicator will be found on page 5. Where greater accuracy

of the various tuned circuits is desired, the vacuum tube voltmeter is recommended as an aligning device.

The Philco 027 Output Meter is connected to the plate and cathode terminals of the type 25L6G tube (use one tube in Model 39-751) and adjusted for the 0 to 30 V.A.C. scale. After connecting the output meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 3, Model 39-711, and Fig. 4, Model 39-751. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

MODEL 39-711

| Operations in Order | SIGNAL GENERATOR | | | RECEIVER | | | Special Instructions |
|---------------------|--------------------------------|----------------------|--------------|--------------|--|---------------------|--------------------------|
| | Output Connections to Receiver | Dummy Antenna Note A | Dial Setting | Dial Setting | Control Settings | Adjust Compensators | |
| 1 | 6J8EG | .1 mfd. | 470 K.C. | 580 K.C. | Vol. Max. Tone treble Range Sw. Brdcast. | 22A, 21B, 21A | |
| 2 | Ant. & Grnd. | 200 mmfd. | 1500 K.C. | 1500 K.C. | Vol. Max. Tone treble Range Sw. Brdcast. | 14, 11A | Note B |
| 3 | Ant. & Grnd. | 200 mmfd. | 580 K.C. | 580 K.C. | Vol. Max. Tone treble Range Sw. Brdcast. | 15 | Roll gang Repeat Oper. 2 |
| 4 | Ant. & Grnd. | 400 ohms | 7.0 M.C. | 7.0 M.C. | Range Sw. Police | 14A | Roll Gang |
| 5 | Ant. & Grnd. | 400 ohms | 20 M.C. | 20 M.C. | Range Sw. S. W. | 6A, 6 | Note C |

MODEL 39-751

| Operations in Order | SIGNAL GENERATOR | | | RECEIVER | | | Special Instructions |
|---------------------|--------------------------------|----------------------|--------------|--------------|--|---------------------|------------------------------|
| | Output Connections to Receiver | Dummy Antenna Note A | Dial Setting | Dial Setting | Control Settings | Adjust Compensators | |
| 1 | 6J8G Grid and Ground | .1 mfd. | 470 K.C. | 580 K.C. | Vol. Max. Tone-Treble | 44B, 44A, 43B, 43A | |
| 2 | Ant. and Grd. | 200 mmfd. | 1500 K.C. | 1500 K.C. | Vol. Max. Range Sw. Brdcast. | 30, 26B, 26A | Note B |
| 3 | Ant. and Grd. | 200 mmfd. | 580 K.C. | 580 K.C. | Vol. Max. | 31 | Roll gang Repeat Operation 2 |
| 4 | Ant. and Grd. | 400 ohms | 6.0 M.C. | 6.0 M.C. | Vol. Max. Tone-Treble Range Sw. Police | 30A | Roll gang |
| 5 | Ant. and Grd. | 400 ohms | 20 M.C. | 20 M.C. | Vol. Max. Tone-Treble Range Sw. S. W. | 33, 19, 6 | Note C |

NOTE A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B—Dial Calibration: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C—When adjusting compensator (33) model 39-751 and (6A)—model 39-711 be sure to tune in the fundamental signal (20 M.C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 940 K.C. below the fundamental signal, which will be 19.060 M.C.

The Philco-Tropic radio is particularly recommended for locations where super reception of short wave is necessary and where the radio and the cabinet are exposed to extreme conditions. The receiver is especially constructed to withstand decay, spoilage and deterioration caused by extreme conditions of humidity, heat, salt air and cold; and to stand up under the most severe tropic weather conditions.

The chassis is heavily plated, making it impervious to salt air, rust and corrosion.

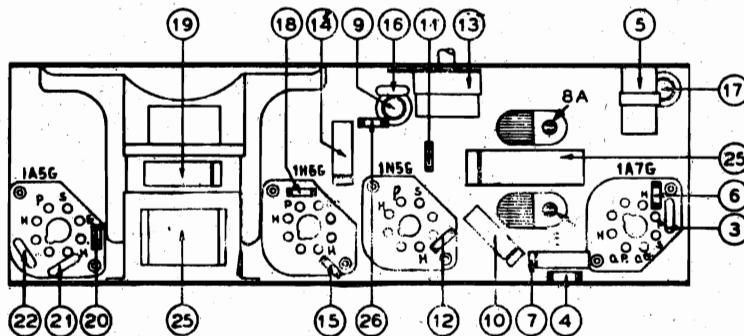
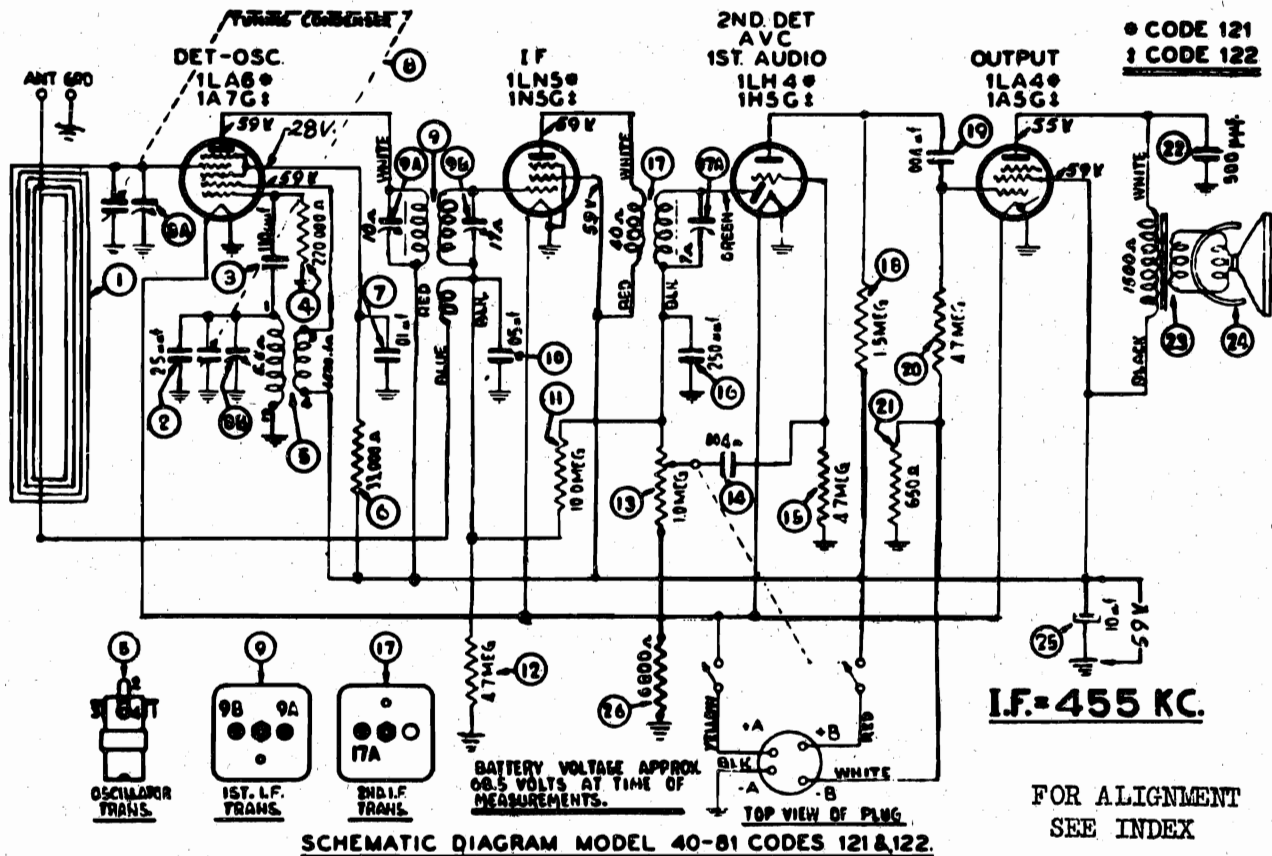
The various parts, such as coils, condensers, chokes and transformers, are treated with special wax that will withstand very high temperatures. In addition the wax is treated with chemicals which repel rodents and insects.

The cabinet is treated with a special sealing compound which protects it against moisture and heat.

MODEL 40-81(121,122)

Schematic, Voltage
Chassis

PHILCO RADIO & TELEV. CORP.



AUGUST, 1939.

Replacement Parts — Models 40-81, Codes 121, 122

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|-----------|--|-----------|-----------|---|-----------|
| 1 | Loop Assembly (Part of Cabinet)..... | 10413A | 23 | Output Transformer | 32-8062 |
| 2 | Mica Condenser (15 mmfd.)..... | 61-0038 | 24 | Cone and Voice Coil Assembly (Speaker Part No. 36-1481-3)..... | 36-4121 |
| 3 | Mica Condenser (110 mmfd.)..... | 30-1031 | 25 | Electrolytic Condenser (10 mfd., 150 V.)..... | 30-2396 |
| 4 | Resistor (220,000 ohms, 1/2 watt)..... | 33-422339 | 26 | Resistor (6800 ohms, 1/2 watt)..... | 33-268339 |
| 5 | Oscillator Transformer | 32-3277 | | | |
| 6 | Resistor (33,000 ohms, 1/2 watt)..... | 33-333339 | | | |
| 7 | Tubular Condenser (.01 mfd.)..... | 30-4572 | | | |
| 8 | Tuning Condenser Assembly..... | 31-2432 | | | |
| 9 | 1st I. F. Transformer Assembly..... | 32-3266 | | | |
| 10 | Tubular Condenser (.05 mfd.)..... | 30-4519 | | | |
| 11 | Resistor (10.0 meg., 1/2 watt)..... | 33-610339 | | | |
| 12 | Resistor (4.7 meg., 1/2 watt)..... | 33-547339 | | | |
| 13 | Volume Control and On-Off Switch..... | 33-5331 | | | |
| 14 | Tubular Condenser (.004 mfd.)..... | 30-4578 | | | |
| 15 | Resistor (4.7 meg., 1/2 watt)..... | 33-547339 | | | |
| 16 | Mica Condenser (250 mmfd.)..... | 61-0033 | | | |
| 17 | 2nd I. F. Transformer Assembly..... | 32-3266 | | | |
| 18 | Resistor (1.5 meg., 1/2 watt)..... | 33-515339 | | | |
| 19 | Tubular Condenser (.004 mfd.)..... | 30-4578 | | | |
| 20 | Resistor (4.7 meg., 1/2 watt)..... | 33-547339 | | | |
| 21 | Resistor (650 ohms, 1/2 watt)..... | 33-165326 | | | |
| 22 | Mica Condenser (500 mmfd.)..... | 30-1114 | | | |

MISCELLANEOUS PARTS

| | |
|---------------------------------|---------|
| Acetate Window | 27-5541 |
| Cabinet | 10431A |
| Clip (Coil Mounting)..... | 28-5002 |
| Drive Cord Assembly..... | 31-2411 |
| Dial | 27-5561 |
| Grille Screen | 56-1539 |
| Knobs (Volume and Tuning)..... | 27-4876 |
| Pointer | 27-4891 |
| Speaker | 36-1481 |
| Shield (Tube, Code 122)..... | 56-1566 |
| Sockets (Loktal, Code 121)..... | 55-0875 |
| Sockets (Octal, Code 122)..... | 27-6133 |
| Spring (Drive Cord)..... | 28-5751 |
| Tuning Shaft Assembly..... | 38-9878 |



MODEL 39-744(121)

Runs 1,2,3

Alignment, Chassis

Trimmers, Parts

Replacement Parts

Model 39-744

| Schem. No. | Description | Part No. |
|------------|-------------------------------------|-----------|
| 1 | Ant. Trans. (Brdst.) | 32-2588 |
| 2 | Ant. Trans. (S.W. 1) | 32-3093 |
| 3 | Ant. Trans. (S.W. 2) | 32-2885 |
| 4 | Compensator | 31-6288 |
| 5 | Tubular Cond. (.05 mfd.) | 30-4519 |
| 6 | Resistor (51,000 ohms, 1 watt) | 33-351439 |
| 7 | Tuning Cond. | 31-2325 |
| 8 | R.F. Trans. (Brdst.) | 32-2379 |
| 9 | R.F. Trans. (S.W. 1) | 32-3099 |
| 10 | R.F. Trans. (S.W. 2) | 32-3165 |
| 11 | Mica Cond. (5 mmfd.) | 30-1120 |
| 12 | Compensator | 31-6288 |
| 13 | Tubular Cond. (.05 mfd.) | 30-4519 |
| 14 | Tubular Cond. (.1 mfd.) | 30-4586 |
| 15 | Resistor (51,000 ohms, 1 watt) | 33-351439 |
| 16 | Osc. Trans. (Brdst.) | 32-2120 |
| 17 | Osc. Trans. (S.W. 1) | 32-3094 |
| 18 | Osc. Trans. (S.W. 2) | 32-3102 |
| 19 | 2 Section Compensator | 31-6287 |
| 20 | Compensator | 31-6289 |
| 21 | Semi-fixed Cond. (1605 mmfd.) | 31-6282 |
| 22 | Semi-fixed Cond. (3300 mmfd.) | 31-6283 |
| 23 | Compensator | 31-6288 |
| 24 | Mica Cond. (250 mmfd.) | 30-1119 |
| 25 | Resistor (10,000 ohms, 1 watt) | 33-310439 |
| 26 | Resistor (10,000 ohms, 1 watt) | 33-310439 |
| 27 | Electrolytic Cond. (5 mfd., 150 V.) | 30-2374 |
| 27A | Electrolytic Cond. (5 mfd., 150 V.) | |
| 27B | Elect. Cond. (10 mfd., 150 V.) | |
| 27C | Elect. Cond. (20 mfd., 150 V.) | |
| 28 | 1st I.F. Trans. Assy. | 32-3127 |
| 29 | 2nd I.F. Trans. Assy. | 32-3117 |
| 30 | Tubular Cond. (.01 mfd.) | 30-4581 |
| 31 | Resistor (330,000 ohms, 1 watt) | 33-433439 |
| 32 | Volume Control (2.0 meg.) | 33-5298 |
| 33 | Resistor (70,000 ohms, 1 watt) | 33-370439 |
| 34 | Tubular Cond. (.006 mfd.) | 30-4583 |
| 35 | Tone Control (10.0 meg.) | 33-5303 |
| 36 | Tubular Cond. (.01 mfd.) | 30-4581 |
| 37 | Tubular Cond. (.05 mfd.) | 30-4519 |
| 38 | Resistor (1.0 megohm, 1 watt) | 33-510439 |
| 39 | Resistor (1.0 megohm, 1 watt) | 33-510439 |
| 40 | Resistor (490,000 ohms, 1 watt) | 33-449439 |
| 41 | Resistor (1.0 megohm, 1 watt) | 33-510439 |
| 42 | Resistor (10.0 megohm, 1 watt) | 33-610439 |
| 43 | Tubular Cond. (.01 mfd.) | 30-4581 |
| 44 | Mica Cond. (110 mmfd.) | 30-1118 |
| 45 | Mica Cond. (110 mmfd.) | 30-1118 |
| 46 | Resistor (1.0 megohm, 1 watt) | 33-510439 |
| 47 | Tubular Cond. (.006 mfd.) | 30-4583 |
| 48 | Resistor (1.0 megohm, 1 watt) | 33-510439 |
| 49 | Resistor (99,000 ohms, 1 watt) | 33-399439 |
| 50 | Resistor (99,000 ohms, 1 watt) | 33-399439 |

PHILCO RADIO & TELEV. CORP.

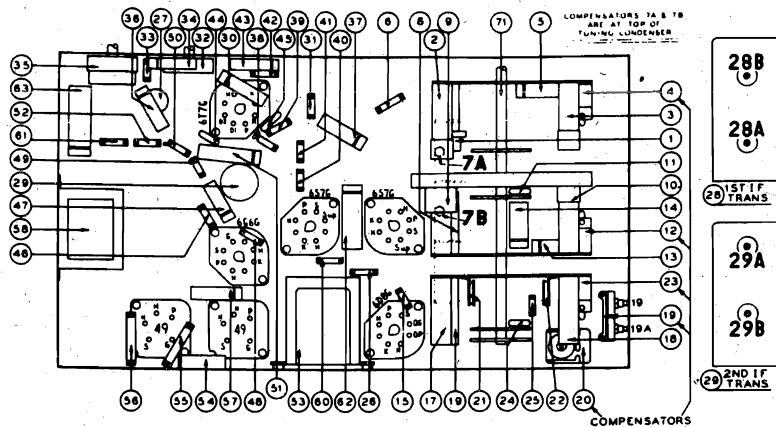


Fig. 1—Part Locations—Underside of Chassis

| | | | | | |
|----|---|-----------|----|------------------------------------|-----------|
| 51 | Tubular Cond. (.1 mfd.) | 30-4586 | 41 | Cable (Battery) | 41-3472 |
| 52 | Resistor (1,000 ohms, 1 watt) | 33-210439 | | Cord (Wave Switch) | 27-9294 |
| 53 | Driver Trans. | 33-8027 | | Cord (Tuning Drive) | 31-2330 |
| 54 | Tubular Cond. (.01 mfd.) | 30-4581 | | Cord (Tone Control) | 31-2331 |
| 55 | Resistor (33 ohms, 1 watt, wire-wound) | 33-033421 | | Dial | 27-5438 |
| 56 | Resistor (33 ohms, 1 watt, wire-wound) | 33-033421 | | Drum (Tone Control) | 28-6996 |
| 57 | Tubular Cond. (.004 mfd.) | 30-4578 | | Drum (Wave Switch) | 28-7315 |
| 58 | Output Trans. | 32-8026 | | Drum and Coupling (Tuning Drive) | 31-2327 |
| 59 | Cone & Voice Coil Assy. (Spkr. 36-1455-3) | 36-4107 | | Gasket (Dial Mtg.) | 27-9256 |
| | Cone & Voice Coil Assy. (Spkr. 36-1456-3) | 36-4108 | | Indicator (Tone & Range) | 56-1269 |
| 60 | Resistor (15,000 ohms, 1 watt) | 33-315439 | | Knob (Tuning) | 27-4330 |
| 61 | Resistor (1,000 ohms, 1 watt) | 33-210439 | | Knob (Vernier) | 27-4331 |
| 62 | Tubular Cond. (.25 mfd.) | 30-4588 | | Knob (Tone, Volume) | 27-4332 |
| 63 | Tubular Cond. (.25 mfd.) | 30-4588 | | Pointer | 56-1276 |
| 64 | "A" Choke | 32-1954 | | Speaker (T Cabinet) | 36-1455-3 |
| 65 | Tubular Cond. (.5 mfd., metal case) | 30-4296 | | Speaker (XX Cabinet) | 36-1456-3 |
| 66 | Vibrator | 41-3222 | | Spring (Tone and Range Indicators) | 28-8945 |
| 67 | Power Trans. | 32-7682 | | Spring (Indicator Mtg.) | 28-8943 |
| 68 | Tubular Cond. (.01 mfd.) | 30-4588 | | Socket (5 prong) | 27-8035 |
| 69 | "B" Choke | 32-2925 | | Socket (6 prong) Vibrator Unit | 27-8036 |
| 70 | Tubular Cond. (.5 mfd., metal case) | 30-4296 | | Socket (8 prong) | 27-6120 |
| 71 | Wave Switch | 42-1474 | | Socket Assy. (Pilot Lamp) | 38-9796 |
| 72 | Pilot Lamp Bulbs | 34-2068 | | Shield (Square) | 28-2726 |
| | Bezel (T Cabinet) | 56-1246 | | Shield Cap (Square Shield) | 28-2727 |
| | Bezel (XX Cabinet) | 56-1222 | | Shield—Round (two required) | 56-1074 |
| | | | | Shield Cap (Round Shield) | 56-1073 |
| | | | | Station Card | 27-5436 |
| | | | | Station Card Shield | 27-5437 |
| | | | | Station Card Holder | 56-1273 |
| | | | | Vernier Drive | 31-2329 |

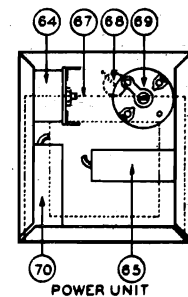


Fig. 2
—Part Locations—
Power Unit

Alignment of Compensators

EQUIPMENT REQUIRED:

- (1) Signal Generator; Philco Model 077 A.C. operated or Model 177 Battery operated.
- (2) Output Meter, Philco Model 027 Circuit Tester.
- (3) Philco Fiber Handle Screw Driver, Part No. 27-7059, and Fiber Wrench, Part No. 3164.

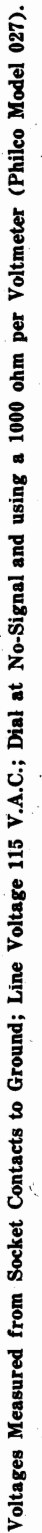
OUTPUT METER: The Philco 027 Output Meter is connected to the plate and cathode terminals of one of the type 49 tubes and adjusted for the 0 to 30 V.A.C. scale. After connecting the output meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 1. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

| Order | SIGNAL GENERATOR | | | RECEIVER | | | Special Instructions |
|-------|--------------------------------|----------------------|--------------|--------------|---|---------------------|-------------------------|
| | Output Connections to Receiver | Dummy Antenna Note A | Dial Setting | Dial Setting | Control Settings | Adjust Compensators | |
| 1 | 6D8EG Grid and Ground | .1 mfd. | 470 K.C. | 580 K.C. | Vol. Max. Tone-Treble | 29B, 29A, 28B, 28A | |
| 2 | Ant. and Grd. | 200 mmfd. | 1500 K.C. | 1500 K.C. | Vol. Max. Range Switch Brdst. | 19, 7B, 7A | Note B |
| 3 | Ant. and Grd. | 200 mmfd. | 580 K.C. | 580 K.C. | Vol. Max. | 20 | Roll Gang Repeat Oper-2 |
| 4 | Ant. and Grd. | 400 ohms | 6.0 M.C. | 6.0 M.C. | Vol. Max. Tone-Treble Range Switch Police | 19A | Roll Gang |
| 5 | Ant. and Grd. | 400 ohms | 20 M.C. | 20 M.C. | Vol. Max. Tone-Treble Range Switch S. W. | 23, 12, 4 | Note C |

A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

B—Dial Calibration: In order to adjust the receiver correctly the dial must be aligned sure to tune in the fundamental signal (20 to track properly with the tuning condenser. To M.C.—second signal from tight position of adjust the dial, proceed as follows: With the paddler instead of the image signal. If the tuning condenser closed (maximum capacity), compensator is correctly adjusted, the image set the dial pointer on the first mark on the signal will be found by turning the receiver left edge (low frequency end) of the broad-dial 940 K.C. below the fundamental signal. cast scale.

C—When adjusting compensator (23) be sure to tune in the fundamental signal (20 to track properly with the tuning condenser. To M.C.—second signal from tight position of adjust the dial, proceed as follows: With the paddler instead of the image signal. If the tuning condenser closed (maximum capacity), compensator is correctly adjusted, the image set the dial pointer on the first mark on the signal will be found by turning the receiver left edge (low frequency end) of the broad-dial 940 K.C. below the fundamental signal. cast scale.



MODEL 39-770(121)
Chassis, Trimmers
Drive Cord Data

PHILCO RADIO & TELEV. CORP.

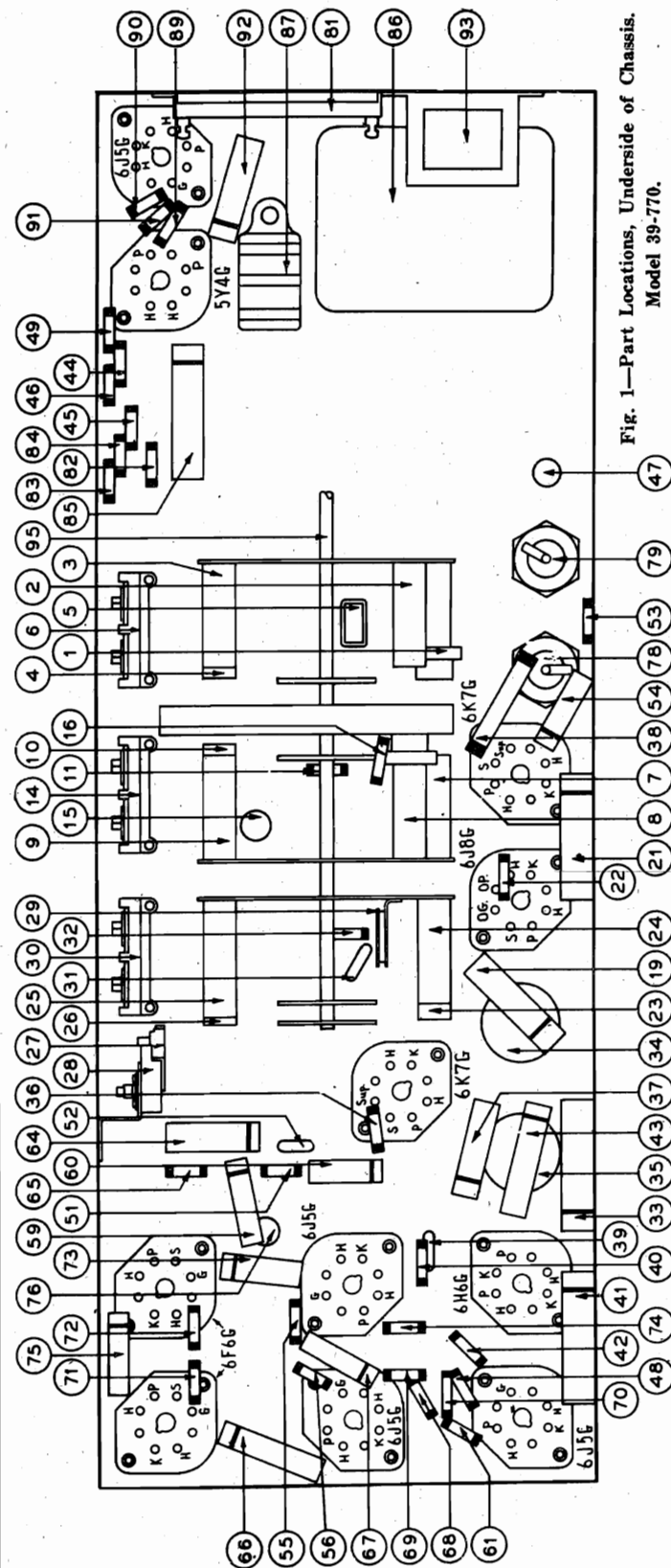


Fig. 1—Part Locations, Underside of Chassis, Model 39-770.

TYPE CIRCUIT: Model 39-770 is an eleven (11) tube A.C. operated superheterodyne circuit with four (4) tuning ranges covering the frequencies listed below. Provisions are also provided for connecting a high impedance phonograph pick-up. In addition other features of design are: Tuning Light Indicator; Continuously Variable Tone Control with Variable Bass Compensation; Amplified Automatic Volume Control; Push-Pull Pentode Audio Output; and Special Compensation in all circuits to prevent frequency drift.

POWER SUPPLY: 115 or 220 V. 50 to 60 Cycle A.C. 115 Watts. To operate the receiver on either of the above voltages, insert the plug on top of power transformer as indicated on the transformer. Special Power Transformers for operation on 25 cycle current are available.

TUNING RANGES: 530 to 1720 K.C.; 17 M.C. to 5.6 M.C. 5.5 M.C. to 11.6 M.C.; 11.6 M.C. to 22.0 M.C.

AUDIO OUTPUT: 7.5 Watts.

AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Aerial, Part No. 40-6370, should be used together with a good ground connection to the nearest water pipe or any other good ground source.

CABINET DIMENSIONS:

| Type | Height | Width | Depth |
|---------|---------|---------|---------|
| Type T | 18 1/2" | 23 1/2" | 12 3/4" |
| Type XX | 36 1/2" | 34 1/2" | 14 3/4" |

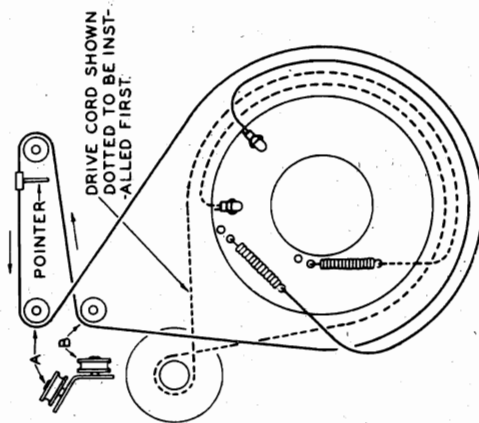


Fig. 3—Installing Drive Cords.

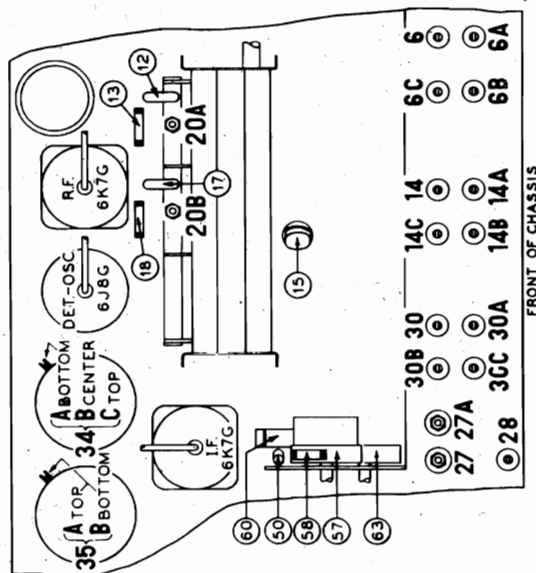


Fig. 2—Compensator Locations: Top, Front View of Chassis.

PHILCO RADIO & TELEV. CORP.

MODEL 39-770(121)
Alignment, Parts

Alignment of Compensators

| Operations | SIGNAL GENERATOR | | | RECEIVER | | | Special Instructions |
|------------|--------------------------------|----------------------|--------------|--------------|--|---------------------|--|
| | Output Connections to Receiver | Dummy Antenna Note A | Dial Setting | Dial Setting | Control Setting | Adjust Compensators | |
| 1 | 6J8G Grid | .1 mfd. | 470 K.C. | 580 K.C. | Tone-Treble Vol.—Max. Range Switch "Brdest." | 35B, 35A, 34C, 34A | Turn 34B "IN" full |
| 2 | 6J8G Grid | .1 mfd. | 470 K.C. | 580 K.C. | Tone-Treble Vol.—Max. Range Switch "Brdest." | 34B | TO MAX. OUTPUT |
| 3 | Ant. & Gnd. Panel | 200 mmfd. | 1500 K.C. | 1500 K.C. | Tone-Treble Vol.—Max. Range Switch "Brdest." | 27, 20B, 20A | Note B |
| 4 | Ant. & Gnd. Panel | 200 mmfd. | 580 K.C. | 580 K.C. | Tone-Treble Vol.—Max. Range Switch "Brdest." | 28 | Roll Gang |
| 5 | Ant. & Gnd. Panel | 200 mmfd. | 5.0 M.C. | 5.0 M.C. | Tone-Treble Vol.—Max. Range Switch "SWC" | 27A | Roll Gang Note C |
| 6 | Ant. & Gnd. Panel | 400 ohms | 11 M.C. | 11 M.C. | Tone-Treble Vol.—Max. Range Switch "SWB" | 30, 14, 6 | Note D Roll Gang on 14 and 6 Image above 11.0 M.C. |
| 7 | Ant. & Gnd. Panel | 400 ohms | 6.0 M.C. | 6.0 M.C. | Tone-Treble Vol.—Max. Range Switch "SWB" | 30A, 14A, 6A | Note D Roll Gang on 14A and 6A Image above 6.0 M.C. Repeat Operation 6 |
| 8 | Ant. & Gnd. Panel | 400 ohms | 20.0 M.C. | 20.0 M.C. | Tone-Treble Vol.—Max. Range Switch "SWA" | 30B, 14C, 6C | Note D Roll Gang on 14C and 6C Image above 20.0 M.C. |
| 9 | Ant. & Gnd. Panel | 400 ohms | 12.0 M.C. | 12.0 M.C. | Tone-Treble Vol.—Max. Range Switch "SWA" | 30C, 14B, 6B | Note D Roll Gang on 14B and 6B Image above 12.0 M.C. Repeat Operation 7 |

NOTE A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B—Dial Calibration: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set

the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable with condenser and pointer in this position is shown.

NOTE C—Compensator (27A) should be peaked to the Fundamental signal which is the second (2) signal from the tight (maximum capacity) position. If the compensator is correctly padded, the "Image" signal will be found by turning the receiver dial 940 K.C. below 5.0 M.C.

NOTE D—Compensators of Shortwave Ranges "A" and "B" should be peaked to the first signal from the tight (maximum capacity) position. If the compensators are correctly padded, the "Image" signal will be found by turning the receiver dial 940 K.C. above the frequencies being used. Example: 11.0 M.C. (Image 11.940); 20.0 M.C. (Image 20.940).

| Schem. No. | Description | Part No. | Schem. No. | Description | Part No. | Schem. No. | Description | Part No. |
|------------|---------------------------------|-----------|------------|---|-----------|------------|---|-----------|
| 1 | Ant. Trans. (Brdest.) | 32-2588 | 44 | Resistor (490,000 ohms, 1 watt) | 33-449439 | 82 | Resistor (20,000 ohms, 1 watt) | 33-320439 |
| 2 | Ant. Trans. (S.W. C) | 32-3105 | 45 | Resistor (1.0 megohm, 1 watt) | 33-510439 | 83 | Resistor (99,000 ohms, 1 watt) | 33-399439 |
| 3 | Ant. Trans. (S.W. B) | 32-3108 | 46 | Resistor (51,000 ohms, 1 watt) | 33-351439 | 84 | Resistor (1.0 megohm, 1 watt) | 33-510439 |
| 4 | Ant. Trans. (S.W. A) | 32-3111 | 47 | Electrolytic Cond. (.3 mfd., 150 V.) | 30-2367 | 85 | Tubular Cond. (.05 mfd.) | 30-4588 |
| 5 | Mica Cond. (5 mmfd.) | 30-1120 | 48 | Resistor (70,000 ohms, 1 watt) | 33-370439 | 86 | Power Trans. 100/130 or 200/260 V., 50 to 60 cycles | 32-8008 |
| 6 | Compensators (4 section) | 31-6284 | 49 | Resistor (20,000 ohms, 1 watt) | 33-320439 | 87 | Bakelite Cond. (.015 and .015 mfd.) | 3793-ODG |
| 7 | R.F. Trans. (Brdest.) | 32-2379 | 50 | Resistor (120,000 ohms, 1 watt) | 33-412439 | 88 | Pilot Lamps (Dial) | 34-2064 |
| 8 | R.F. Trans. (S.W. C) | 32-3106 | 51 | Resistor (490,000 ohms, 1 watt) | 33-449439 | 89 | Resistor (1.0 megohm, 1 watt) | 33-510439 |
| 9 | R.F. Trans. (S.W. B) | 32-3109 | 52 | Mica Cond. (250 mmfd.) | 30-1119 | 90 | Resistor (1.0 megohm, 1 watt) | 33-510439 |
| 10 | R.F. Trans. (S.W. A) | 32-3112 | 53 | Resistor (99,000 ohms, 1 watt) | 33-399439 | 91 | Resistor (1.5 megohms, 1 watt) | 33-515439 |
| 11 | Resistor (32,000 ohms, 1 watt) | 33-351439 | 54 | Tubular Cond. (.05 mfd.) | 30-4519 | 92 | Tubular Cond. (.2 mfd.) | 30-4587 |
| 12 | Mica Cond. (250 mmfd.) | 30-1119 | 55 | Resistor (1.5 megohms, 1 watt) | 33-515439 | 93 | Tuning Indicator Trans. | 32-8009 |
| 13 | Resistor (1.0 meg., 1 watt) | 33-510439 | 56 | Resistor (1.5 megohms, 1 watt) | 33-515439 | 94 | Pilot Lamp (Tuning Indicator) | 34-2221 |
| 14 | Compensators (4 section) | 31-6284 | 57 | Volume Control (1.0 megohm) | 33-5302 | 95 | Wave Switch | 42-1476 |
| 15 | Tubular Cond. (.1 mfd.) | 30-4527 | 58 | Resistor (2000 ohms, 1 watt) | 33-220439 | | Bezel | 56-1163 |
| 16 | Resistor (5000 ohms, 1 watt) | 33-250439 | 59 | Tubular Cond. (.03 mfd.) | 30-4585 | | Bezel Gasket | 38-9734 |
| 17 | Mica Cond. (250 mmfd.) | 30-1119 | 60 | Tubular Cond. (.006 mfd.) | 30-4591 | | Cable (Power) | L-3180 |
| 18 | Resistor (1.0 megohm) | 33-510439 | 61 | Resistor (99,000 ohms, 1 watt) | 33-399439 | | Coupling (Tuning Cond. to Drive) | 31-2291 |
| 19 | Tubular Cond. (.25 mfd.) | 30-4588 | 62 | Tubular Cond. (.003 mfd.) | 30-4580 | | Disc (Volume Control) | 27-4765 |
| 20 | Tuning Cond. | 31-2326 | 63 | Tone Control (3.0 megohms) | 33-5287 | | Disc (Range Switch) | 27-4767 |
| 21 | Tubular Cond. (.25 mfd.) | 30-4588 | 64 | Tubular Cond. (.15 mfd.) | 30-4593 | | Disc (Tuning) | 27-4798 |
| 22 | Resistor (32,000 ohms, 1 watt) | 33-332439 | 65 | Resistor (3000 ohms, 1 watt) | 33-230439 | | Disc (Tone Control) | 27-4802 |
| 23 | Osc. Trans. (Brdest.) | 32-2120 | 66 | Tubular Cond. (.03 mfd.) | 30-4517 | | Dial | 27-5448 |
| 24 | Osc. Trans. (S.W. C) | 32-3107 | 67 | Tubular Cond. (.006 mfd.) | 30-4591 | | Dial Pointer | 56-1033 |
| 25 | Osc. Trans. (S.W. B) | 32-3110 | 68 | Resistor (1.0 megohm, 1 watt) | 33-510439 | | Dial Cord Spring | 28-8913 |
| 26 | Osc. Trans. (S.W. A) | 32-3113 | 69 | Resistor (70,000 ohms, 1 watt) | 33-370439 | | Drive Cord (Pointer) | 31-2352 |
| 27 | Compensator | 31-6288 | 70 | Resistor (70,000 ohms, 1 watt) | 33-370439 | | Drive Cord (Tuning Drum) | 31-2350 |
| 28 | Compensator | 31-6289 | 71 | Resistor (330,000 ohms, 1 watt) | 33-433439 | | Drum Assembly (Tuning Cond.) | 38-9716 |
| 29 | Semi-Fixed Cond. (1330 mmfd.) | 31-6286 | 72 | Resistor (330,000 ohms, 1 watt) | 33-433439 | | Range Switch Operating Arm and Link Assembly | 38-9756 |
| 30 | Compensators (4 section) | 31-6285 | 73 | Tubular Cond. (.03 mfd.) | 30-4517 | | Socket (7 prong—6K7G R.F. Tube) | 27-6099 |
| 31 | Mica Cond. (250 mmfd.) | 30-1119 | 74 | Resistor (70,000 ohms, 1 watt) | 33-370439 | | Socket (6 prong) | 27-6121 |
| 32 | Resistor (20,000 ohms, 1 watt) | 33-320439 | 75 | Tubular Cond. (.003 mfd.) | 30-4582 | | Socket (8 prong—6J8G) | 27-6120 |
| 33 | Tubular Cond. (.25 mfd.) | 30-4589 | 76 | Output Trans. | 32-8020 | | Socket Assembly (Dial Lamp) | 38-9694 |
| 34 | 1st I.F. Trans. Assy. | 32-3114 | 77 | Cone and Voice Coil Assy. (Spkr. Pt. No. 36-1460-3) | 36-4105 | | Socket Assembly (Dial Lamp) | 38-9695 |
| 35 | 2nd I.F. Trans. Assy. | 32-3115 | 77A | Cone and Voice Coil Assy. (Spkr. Pt. No. 36-1459-2) | 36-4106 | | Socket Assembly (Bullseye XX Cabinet) | 38-9696 |
| 36 | Resistor (20,000 ohms, 1 watt) | 33-320439 | 78 | Electrolytic Cond. (40 mfd., 300 V.) | 30-2366 | | Station Card | 27-5446 |
| 37 | Tubular Cond. (.05 mfd.) | 30-4519 | 79 | Electrolytic Cond. (18 mfd.) | 30-2368 | | Station Card Shield | 27-5447 |
| 38 | Resistor (15,000 ohms, 2 watt) | 33-315539 | 80 | Field Coil (Replace Spkr. 36-1459-2 in "T" Cabinet and Replace Spkr. 36-1460-3 in "XX" Cabinet) | 33-3365 | | Spring (Retaining Station Card) | 56-1294 |
| 39 | Mica Cond. (110 mmfd.) | 30-1118 | | | | | Speaker (XX Cabinet) | 36-1460-3 |
| 40 | Resistor (490,000 ohms, 1 watt) | 33-449439 | | | | | Speaker (T Cabinet) | 36-1459-2 |
| 41 | Tubular Cond. (.5 mfd.) | 30-4590 | | | | | | |
| 42 | Resistor (99,000 ohms, 1 watt) | 33-399439 | | | | | | |
| 43 | Tubular Cond. (.2 mfd.) | 30-4587 | | | | | | |

MODEL 39-2770(121)
Alignment, Notes

PHILCO RADIO & TELEV. CORP.

SPECIFICATIONS

Model 39-2770 is an eleven (11) tube A. C. operated superheterodyne circuit with four tuning ranges covering—long wave, 140 to 390 K. C.; standard broadcasts, 540 to 1720 K. C.; short wave (A) 5.7 to 11.5 M. C.; short wave (B) 11.5 to 22 M. C. Other than the tuning range coverage Model 39-2770 is similar in design to the Model 39-770.

Service information for Model 39-2770 is the same as that given for Model 39-770 with the exception of "Alignment of Compensator" procedure and some parts in the R. F. section.

These differences are listed below:—

SCHEMATIC NO.

(2)
(8)
(24)

DESCRIPTION

Ant. Trans.
R. F. Trans.
Osc. Trans.

PART NO.

32-3135
32-3136
32-3137

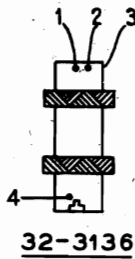
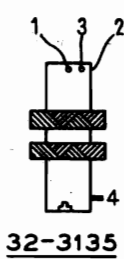
- 1—Add a 2200 mmfd. condenser, Part No. 30-1125, from contact C1 on Range Switch to ground.
- 2—Add a 5 mmfd. condenser, Part No. 30-1120, from contact C2 on Range Switch to ground.
- 3—Add a 110 mmfd. condenser, Part No. 30-1118 in place of the 51,000 ohm resistor, Part No. 33-351439, now used in the Model 39-770.
- 4—Add a 5 mmfd. condenser, Part No. 30-1120 from contact B2 on Range Switch to ground.
- 5—Add a compensator, Part No. 31-6297, from contact A1 on Wave Switch to ground. (The 1330 mmfd. semi-fixed condenser, Part No. 31-6286, used in Model 39-770 is removed from Model 39-2770.)

ALIGNMENT OF COMPENSATORS

| SIGNAL GENERATOR | | | | | RECEIVER | | |
|------------------|--------------------------------|----------------------|--------------|--------------|---|---|--|
| Operations | Output Connections to Receiver | Dummy Antenna Note A | Dial Setting | Dial Setting | Control Setting | Adjust Compensators | Special Instructions |
| 1 | 6J8G Grid | .1 mfd. | 470 K. C. | 580 K. C. | Tone-Treble Vol.-Max. Range Switch Brdcast. | 35B, 35A, 34C, 34A | Turn 34B "in" full |
| 2 | 6J8G Grid | .1 mfd. | 470 K. C. | 580 K. C. | Tone-Treble Vol.-Max. Range Switch Brdcast. | 34B | To Max. Output |
| 3 | Ant. & Gnd. Panel | 200 mmfd. | 1500 K. C. | 1500 K. C. | Tone-Treble Vol.-Max. Range Switch Brdcast. | 27, 20B, 20A | Note B |
| 4 | Ant. & Gnd. Panel | 200 mmfd. | 580 K. C. | 580 K. C. | Tone-Treble Vol.-Max. Range Switch Brdcast. | 28 | Roll gang |
| 5 | Ant. & Gnd. Panel | 200 mmfd. | 350 K. C. | 350 K. C. | Tone-Treble Vol.-Max. Range Switch "LW" | 27A | Note B |
| 6 | Ant. & Gnd. Panel | 200 mmfd. | 160 K. C. | 160 K. C. | Tone-Treble Vol.-Max. Range Switch "LW" | New Compensator contact A1 Range Switch | Roll gang |
| 7 | Ant. & Gnd. Panel | 400 ohms | 11 M. C. | 11 M. C. | Tone-Treble Vol.-Max. Range Switch "SWB" | 30, 14, 6 | Note D Roll gang on 14 and 6 image above 11.0 M. C. |
| 8 | Ant. & Gnd. Panel | 400 ohms | 6.0 M. C. | 6.0 M. C. | Tone-Treble Vol.-Max. Range Switch "SWB" | 30A, 14A, 6A | Note D Roll gang on 14A and 6A image above 6.0 M. C. Repeat operation 6 |
| 9 | Ant. & Gnd. Panel | 400 ohms | 20.0 M. C. | 20.0 M. C. | Tone-Treble Vol.-Max. Range Switch "SWA" | 30B, 14C, 6C | Note D Roll gang on 14C and 6C image above 20.0 M. C. |
| 10 | Ant. & Gnd. Panel | 400 ohms | 12.0 M. C. | 12.0 M. C. | Tone-Treble Vol.-Max. Range Switch "SWA" | 30C, 14B, 6B | Note D Roll gang on 14C and 6B image above 12.0 M. C. Repeat operation 7 |

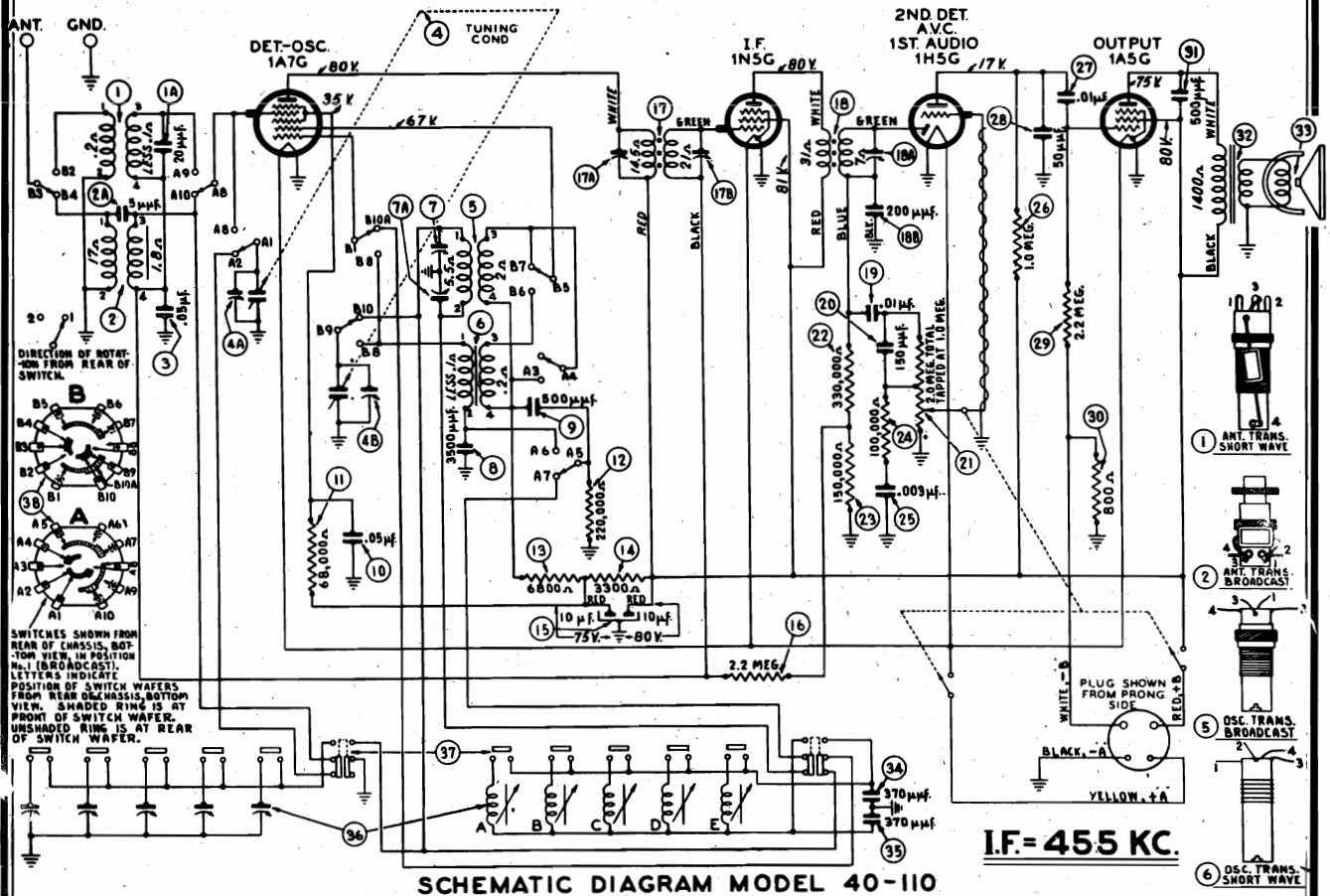
COILS SHOWN BELOW

The numbers on coil connections shown, correspond to same numbers on coil connections for Model 39-770.



PHILCO RADIO & TELEV. CORP.

MODEL 40-110
Schematic, Voltage
Chassis, Trimmers



Replacement Parts — Model 40-110

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|-----------|---|-----------|-----------|--|-----------|
| 1 | Ant. Trans. Ass'y. (Short Wave)..... | 32-3289 | 22 | Resistor (330,000 ohms, 1/2 watt)..... | 33-433339 |
| 1A | Mica Condenser (20 mmfd.)..... | 61-0039 | 23 | Resistor (180,000 ohms, 1/2 watt)..... | 33-415339 |
| 2 | Ant. Trans. Ass'y. (Broadcast)..... | 32-3279 | 24 | Resistor (100,000 ohms, 1/2 watt)..... | 33-410339 |
| 2A | Mica Condenser (5 mmfd.)..... | 30-1097 | 25 | Tubular Condenser (.003 mfd.)..... | 30-4469 |
| 3 | Tubular Condenser (.05 mfd.)..... | 30-4519 | 26 | Resistor (1.0 meg., 1/2 watt)..... | 33-510339 |
| 4 | Tuning Condenser Assembly..... | 31-2404 | 27 | Tubular Condenser (.01 mfd.)..... | 30-4872 |
| 5 | Osc. Transformer (Broadcast)..... | 32-3287 | 28 | Mica Condenser (50 mmfd.)..... | 30-1029 |
| 6 | Osc. Transformer (Short Wave)..... | 32-3288 | 29 | Resistor (2.2 meg., 1/2 watt)..... | 33-522339 |
| 7 | Compensator..... | 31-6321 | 30 | Resistor (800 ohms, 1/2 watt)..... | 33-180326 |
| 8 | Mica Condenser (3500 mmfd.)..... | 30-1094 | 31 | Mica Condenser (500 mmfd.)..... | 30-1114 |
| 9 | Mica Condenser (500 mmfd.)..... | 30-1114 | 32 | Output Transformer..... | 32-8066 |
| 10 | Tubular Condenser (.05 mfd.)..... | 30-4444 | 33 | Cone and Voice Coil Assembly (Speaker Part No. 38-1410-1)..... | 38-4093 |
| 11 | Resistor (68,000 ohms, 1/2 watt)..... | 33-368339 | 34 | Silver Mica Condenser (370 mmfd.)..... | 30-1110 |
| 12 | Resistor (220,000 ohms, 1/2 watt)..... | 33-422339 | 35 | Silver Mica Condenser (370 mmfd.)..... | 30-1110 |
| 13 | Resistor (6800 ohms, 1/2 watt)..... | 32-268339 | 36 | Coils—Padder Strip and Strk. Assembly..... | 30-1110 |
| 14 | Resistor (3300 ohms, 1/2 watt)..... | 32-233339 | 36A | Coil No. 1 (540-1030 K. C.)..... | 32-3042 |
| 15 | Elec. Condenser (10-10 mfd., 150 V.)..... | 30-2408 | 36B | Coil No. 2 (650-1100 K. C.)..... | 32-3042 |
| 16 | Resistor (2.2 meg., 1/2 watt)..... | 33-522339 | 36C | Coil No. 3 (650-1100 K. C.)..... | 32-3042 |
| 17 | 1st I. F. Transformer Assembly..... | 32-3198 | 36D | Coil No. 4 (740-1240 K. C.)..... | 32-3041 |
| 18 | 2nd I. F. Transformer Assembly..... | 32-3259 | 36E | Coil No. 5 (1160-1600 K. C.)..... | 32-3041 |
| 19 | Tubular Condenser (.01 mfd.)..... | 30-4872 | 37 | Push-Button Switch..... | 42-1827 |
| 20 | Mica Condenser (150 mmfd.)..... | 30-1033 | 38 | Wave Switch..... | 42-1816 |
| 21 | Volume Control (2 meg.)..... | 33-5326 | | | |

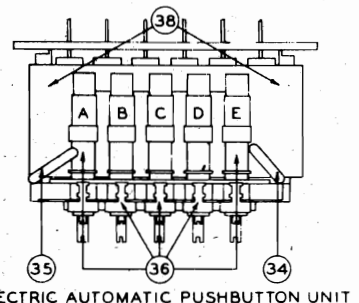


FIG. 2.

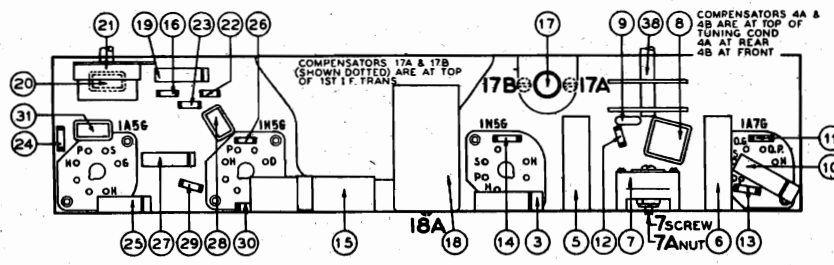


FIG. 3.

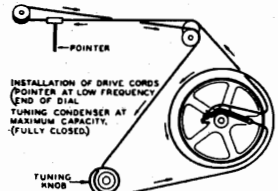


FIG. 1.
INSTALLATION OF
DRIVE CORD.

AUGUST, 1939.

MODEL 40-110
Alignment, Notes
PHILCO RADIO & TELEV. CORP.

SPECIFICATIONS

TYPE OF CIRCUIT: Model 40-110 is a four tube battery operated superheterodyne receiver with electric push-button tuning. In addition other features of design are: Low current drain tubes, new high sound output speaker, specially designed tone chamber, two tuning ranges, automatic volume control, and pentode audio output.

The receiver is equipped with six electric tuning push-buttons for automatically selecting stations. Five of the push-buttons are used for broadcast stations and one for selecting dial tuning. The procedure for adjusting the push-buttons will be found in the instructions supplied with each set.

TUNING RANGES: 540 to 1630 K. C. 5.4 to 18.0 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

PHILCO TUBES USED: One 1A7G, Converter; one 1N5G, I. F. Amplifier; one 1H5G, 2nd Detector, A. V. C. 1st Audio; one 1A5G, Audio Output.

PHILCO BATTERIES: One Type P-60D-11L.

BATTERY DRAIN: "A" 200 M. A. "B" 7.2 M. A.

| CABINET DIMENSIONS: | | Height | Width | Depth |
|---------------------|-------|--------|-------|-------|
| 40-110K | | 37½ | 26¾ | 11½ |
| 40-110B | | 17½ | 17½ | 9½ |

AERIAL AND GROUND: To obtain maximum operating performance with this model, Philco Farm Radio Aerial Part No. 40-6383 is recommended and a good ground source such as a water pipe.

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED

Signal Generator covering a frequency range of 115 K. C. to 36 M. C. such as Philco Model 077.

Aligning Indicator: A vacuum tube voltmeter or audio output meter such as contained in Philco Models 027 and 028 circuit testers. Either of these meters can be used to align the

receiver and are connected as given below.

Tools: Aligning screw driver
Part No. 45-2610.

CONNECTING ALIGNING METERS

Audio Output Meter: The audio output meter is connected to the plate and screen terminals of the 1A5G tube. Adjust the meter for the 0 to 30 volt A. C. scale.

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows: Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to any point in the

A. V. C. circuit where voltage can be obtained. The positive (+) terminal is connected to the receiver chassis.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below.

| Operations in Order | SIGNAL GENERATOR | | | RECEIVER | | | SPECIAL INSTRUCTIONS |
|---------------------|--------------------------------|---------------|--------------|--------------|---------------------------------|----------------|-------------------------|
| | Output Connections to Receiver | Dummy Antenna | Dial Setting | Dial Setting | Control Setting | Adjust Padders | |
| 1 | Aerial | Note A | 455 K. C. | 580 K. C. | Vol. Max. Range Switch "Brdcat" | 18A, 17A, 17B | Manual Push-button "IN" |
| 2 | Aerial | 400 ohms | 18 M. C. | 18 M. C. | Vol. Max. Range Switch "S. W." | 4A | Note B |
| 3 | Aerial | 225 mmfd. | 1500 K. C. | 1500 K. C. | Range Switch "Brdcat" | 7 screw, 4B | Note E |
| 4 | Aerial | 225 mmfd. | 580 K. C. | 580 K. C. | Range Switch "Brdcat" | 7A (nut) | Roll Tuning Condenser |
| 5 | Aerial | 400 ohms | 1500 K. C. | 1500 K. C. | Range Switch "Brdcat" | 7 screw | |

NOTE A — The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (High side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — **DIAL CALIBRATION:** In order to adjust the receiver correctly, the dial must be aligned to track properly

with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, the tuning pointer is set horizontal at the low frequency end of the scale (530 K. C.).

PHILCO RADIO & TELEV. CORP.

MODELS 40-115, 40-124

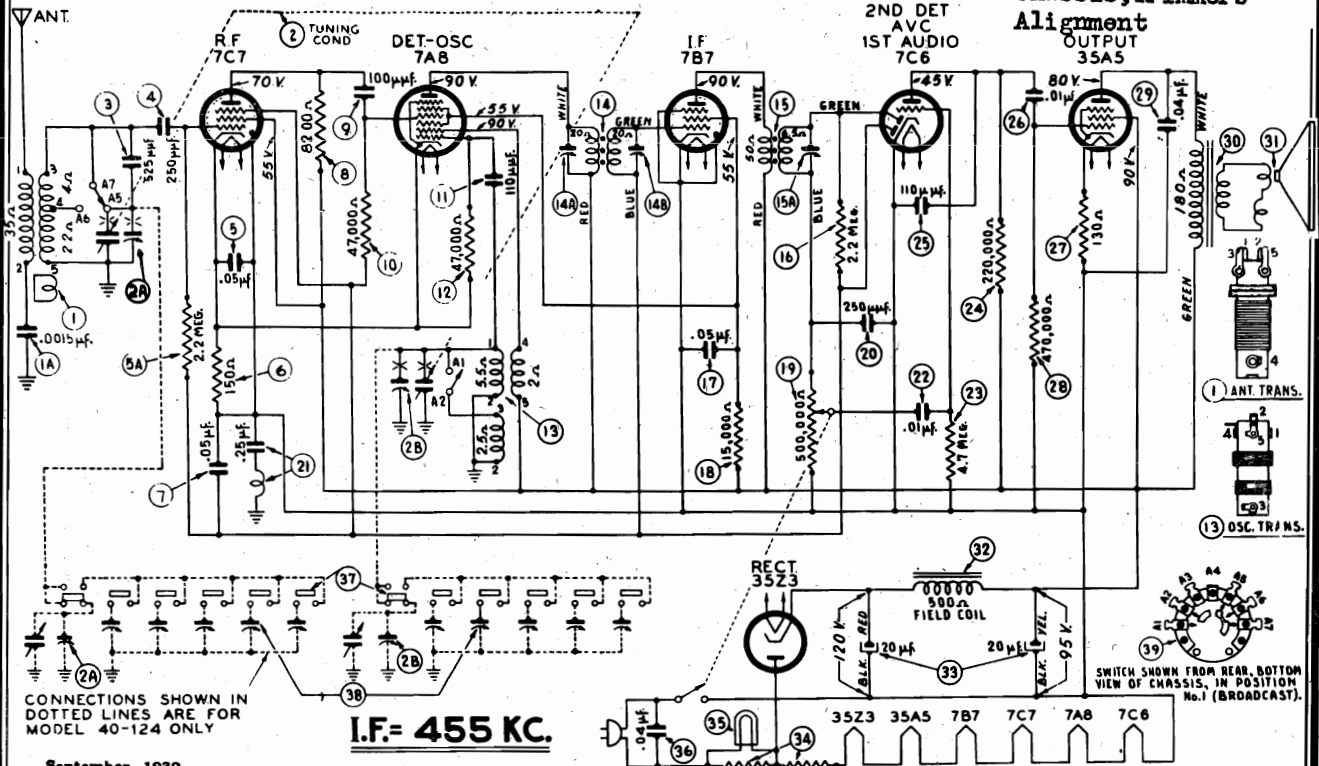
Code 121

Schematic, Voltage

Chassis, Trimmers

Alignment

OUTPUT



September, 1939

| SCHE. No. | DESCRIPTION | PART No. |
|-----------|--|-----------|
| 1 | Antenna Transformer (Model 40-115)... | 32-3303 |
| 1A | Antenna Transformer (Model 40-124)... | 32-3321 |
| 2 | Tubular Condenser (.0015 mfd.)... | 30-4555 |
| 3 | Tuning Condenser (Model 40-115)... | 31-2425 |
| 4 | Tuning Condenser (Model 40-124)... | 31-2426 |
| 5 | Mica Condenser (.525 mmfd.)... | 30-1142 |
| 5A | Mica Condenser (.250 mmfd.)... | 30-4519 |
| 6 | Tubular Condenser (.05 mfd.)... | 33-522339 |
| 7 | Resistor (2.2 meg., 1/2 watt)... | 33-115336 |
| 8 | Resistor (150 ohms, 1/2 watt)... | 30-4519 |
| 9 | Tubular Condenser (.05 mfd.)... | 33-282339 |
| 10 | Resistor (8200 ohms, 1/2 watt)... | 30-1126 |
| 11 | Mica Condenser (.100 mmfd.)... | 33-347339 |
| 12 | Resistor (47,000 ohms, 1/2 watt)... | 30-1130 |
| 13 | Mica Condenser (.110 mmfd.)... | 33-347339 |
| 14 | Oscillator Trans. (Model 40-115)... | 32-3255 |
| 15 | Oscillator Trans. (Model 40-124)... | 32-3256 |
| 16 | 1st I. F. Transformer Assembly... | 32-3237 |
| 17 | 2nd I. F. Transformer Assembly... | 32-3238 |
| 18 | Resistor (2.2 meg., 1/2 watt)... | 33-522339 |
| 19 | Tubular Condenser (.05 mfd.)... | 30-4519 |
| 20 | Resistor (15,000 ohms, 1/2 watt)... | 33-315339 |
| 21 | Volume Control and On-Off Switch... | 33-5306 |
| 22 | Mica Condenser (.250 mmfd.)... | 30-1074 |
| 23 | Choke and Condenser Assembly (.25 mfd.)... | 38-9956 |
| 24 | Tubular Condenser (.01 mfd.)... | 30-4479 |
| 25 | Resistor (4.7 meg., 1/2 watt)... | 33-547339 |
| 26 | Resistor (220,000 ohms, 1/2 watt)... | 33-422339 |
| 27 | Mica Condenser (.110 mmfd.)... | 30-1130 |
| 28 | Tubular Condenser (.01 mfd.)... | 30-4572 |
| 29 | Resistor (130 ohms, 1/2 watt)... | 33-113336 |
| 30 | Resistor (470,000 ohms, 1/2 watt)... | 33-447339 |
| 31 | Tubular Condenser (.04 mfd.)... | 30-4119 |
| 32 | Output Transformer (Speaker Part No. 36-1469-1)... | 32-8047 |
| 33 | Output Transformer (Speaker Part No. 36-1469-9)... | 32-8048 |
| 34 | Cone and Voice Coil Assembly (Speaker Part No. 36-1469-1)... | 36-4115 |
| 35 | Cone and Voice Coil Assembly (Speaker Part No. 36-1469-9)... | 36-4113 |
| 36 | Field Coil (Replace Speaker Part No. 36-1469)... | 30-2403 |
| 37 | Electrolytic Condenser (20-20 mfd.)... | 33-3375 |
| 38 | Pilot Lamp... | 34-2068 |
| 39 | Tubular Condenser (.04 mfd.)... | 30-4119 |

| SCHE. No. | DESCRIPTION | PART No. |
|-----------|-------------------------------------|----------|
| 37 | Pushbutton Switch (Model 40-124)... | 42-1512 |
| 38 | Padder Strip (Model 40-124)... | 31-6312 |
| 39 | Wave Switch... | 42-1505 |

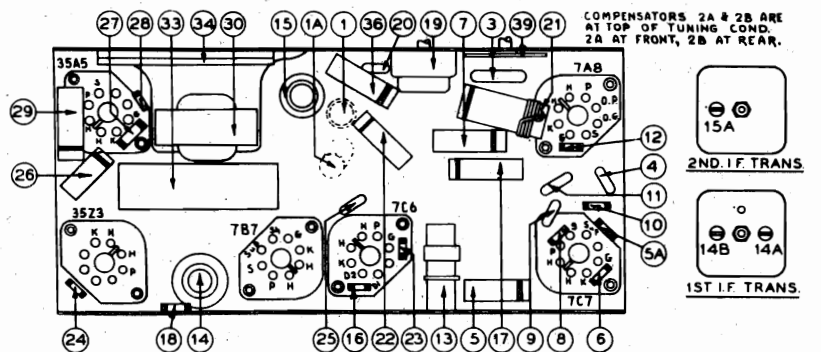
MISCELLANEOUS PARTS

| | |
|--|---------|
| Cable and Plug (Power Supply)... | L-3199 |
| Cabinet (Model 40-115)... | 10432A |
| Clip (Coil Mounting)... | 28-5002 |
| Dial... | 27-5517 |
| Drive Cord Assembly... | 31-2387 |
| Drive Shaft Assembly... | 31-2370 |
| Knobs (Volume, Tuning, Wave Switch)... | 27-4809 |
| Pilot Lamp Socket Assembly... | 38-9825 |
| Pointer (Dial)... | 27-4868 |

MISCELLANEOUS PARTS

MODEL 40-124

| | |
|-----------------------|---------|
| Cabinet... | 10433A |
| Knobs (Pushbutton)... | 27-4824 |
| Tab (Dial)... | 28-8954 |
| Tab (Television)... | 27-5526 |
| Tab Kit... | 27-9450 |
| | 40-6473 |



MODELS 40-115, 40-124 PART LOCATIONS, UNDERSIDE OF CHASSIS.

| Operations in Order | SIGNAL GENERATOR | | | RECEIVER | | | SPECIAL INSTRUCTIONS |
|---------------------------|-----------------------------------|------------------|-----------------|-----------------|------------------------------------|-------------------|--|
| | Output Connections to Receiver | Dummy Antenna | Dial Setting | Dial Setting | Control Settings | Adjust Padders | |
| 1 | 7A8 Grid | .004 | 455 K. C. | 580 K. C. | Vol. Max. Range Switch "Brdcst" | 15A, 14A, 14B | Manual Pushbutton "IN" Model 40-124 |
| 2 | Aerial | 100 mmfd. | 1580 K. C. | 1580 K. C. | Range Switch "Brdcst" | (2B) | Note B, Note C |
| 3 | Aerial | 100 mmfd. | 1500 K. C. | 1500 K. C. | Range Switch "Brdcst" | (2A) | |

NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the

condenser in this position, the tuning pointer is set horizontal at the low frequency end of the scale (530 K. C.).

NOTE C—Compensators 2A and 2B are on top of the Tuning Condenser. 2A at the front, 2B at the rear.

MODEL 40-81(121,122)
MODEL 40-88(121)
MODELS 40-140,40-145,
40-507

PHILCO RADIO & TELEV. CORP.

Alignment

Models 40-140, 40-145, 40-507.

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED

1. **Signal Generator** with a frequency range from 115 to 36,000 K. C., such as Philco Model 077.
2. **Aligning Indicator**, Philco Model 027 or 028, vacuum tube voltmeter and circuit tester incorporates sensitive audio output

meters and vacuum tube voltmeters. Either of these instruments can be used as an aligning indicator.

3. **Fibre Handle Screw Driver**, Philco Part No. 45-2610. When using the vacuum tube voltmeter for aligning the receiver, an aligning adaptor Part No. 45-2767 is required.

CONNECTING ALIGNING METERS

1. **Audio Output Meter:** If the Philco Models 027 and 028 audio output meters are used, they are connected to the speaker voice coil terminals or the plate and screen terminals of the 7B5 tube. Adjust the meter to use the 0 to 10 volt A. C. scale.

2. **Vacuum Tube Voltmeter:** To use the vacuum tube voltmeter as an aligning indicator make the following connections:

Adjusting I. F. Circuit: Remove the 1232 R. F. tube from its socket and insert the aligning adaptor, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the vacuum tube voltmeter to the black wire of the adaptor.

Adjusting R. F. Circuit: To adjust the R. F. circuit, the aligning adaptor is inserted in the 7C6 second detector tube socket. The vacuum tube voltmeter remains connected to the adaptor as given in the paragraph above. With the voltmeter connected in this manner, a very sensitive indication of the A. V. C. voltage is obtained when the padders are adjusted.

After connecting the aligning adaptors, adjust the compensators as shown in the tabulation below. Locations of the compensators are shown in Schematic Diagram. If the aligning meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

| Operations in Order | SIGNAL GENERATOR | | RECEIVER | | | SPECIAL INSTRUCTIONS |
|---------------------|------------------------------------|--------------|--------------|--|---------------------|---|
| | Output Connections | Dial Setting | Dial Setting | Control Settings | Adjust Compensators | |
| 1 | No. 1 Ter. on Loop Panel Note B | 455 K. C. | 580 K. C. | Vol. Cont. Max. Range Switch "Brdest" | 33A, 33B, 28A, 28B | Dial Push-Button "In" Model 40-145 |
| 2 | Use Loop, Note C | 18.0 M. C. | 18.0 M. C. | Vol. Cont. Max. Range Switch "S.W." | 27A, 2A, Note D | Check Image at 17,000 K. C. |
| 3 | Use Loop, Note C | 1500 K. C. | 1500 K. C. | Range Switch "Brdest" | 25A, 1A | Note A |
| 4 | Use Loop, Note C | 580 K. C. | 580 K. C. | Range Switch "Brdest" | 25 | Roll Tuning Condenser |
| 5 | Use Loop, Note C | 1500 K. C. | 1500 K. C. | Range Switch "Brdest" | 25A, 2A | |
| 6 | Use Loop, Note C | 18.0 M. C. | 18.0 M. C. | Range Switch "S.W." | 2A, Note D | Roll Tuning Condenser & Adjust Padder to First Peak from Tight Position |

NOTE A — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE B — When adjusting the I. F. padders the high side of the signal generator output is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the generator is connected to the chassis of the receiver.

NOTE C — When aligning the R. F. Circuits a loop is made from a few turns of wire and connected to the generator output terminals; the signal generator is then placed two or three feet from the loop in the cabinet.

NOTE D — S. W. Oscillator compensator (27A) is located on top of the tuning condenser. Antenna compensators (1A) and (2A) are located on the loop. When adjusting the "Ant" compensators, the receiver loop should be held in place against the back of the cabinet.

Models 40-81, Codes 121, 122

| Operations in Order | SIGNAL GENERATOR | | RECEIVER | | | SPECIAL INSTRUCTIONS |
|---------------------|--|--------------|--------------|-----------------|---------------------|--|
| | Output Connections to Receiver | Dial Setting | Dial Setting | Control Setting | Adjust Compensators | |
| 1 | See Paragraph on Signal Generator above | 455 K. C. | 580 K. C. | Vol. Max. | 17A, 9B, 9A | See Paragraph on Signal Generator above |
| 2 | Use Loop on Generator | 1500 K. C. | 1500 K. C. | Vol. Max. | 8B, 8A | Padder location Fig. 1 Note A |

Model 40-88, Code 121

| | | | | | | |
|---|---|------------|------------|-----------------------------------|---------------|--|
| 1 | See Signal Generator Paragraph above | 455 K. C. | 580 K. C. | Vol. Max. | 21A, 20B, 20A | |
| 2 | Use Loop on Generator | 18 M. C. | 18 M. C. | Vol. Max. Range Switch "S. W." | 8B | Note A |
| 3 | Use Loop | 1400 K. C. | 1400 K. C. | Range Switch "Brdest" | 12, Screw, 8A | |
| 4 | Use Loop | 580 K. C. | 580 K. C. | Range Switch "Brdest" | 12A, Nut | Roll Tuning Condenser |
| 5 | Use Loop | 1400 K. C. | 1400 K. C. | Range Switch "Brdest" | 12, Screw, 8A | |
| 6 | Use Loop | 18 M. C. | 18 M. C. | Range Switch "S. W." | 3 | See Paragraph on Signal Generator above |

NOTE A — DIAL CALIBRATION: Before adjusting the R. F. padders the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the tuning condenser in the closed position (maximum capacity) set the dial pointer on the small dot below 550 K. C.

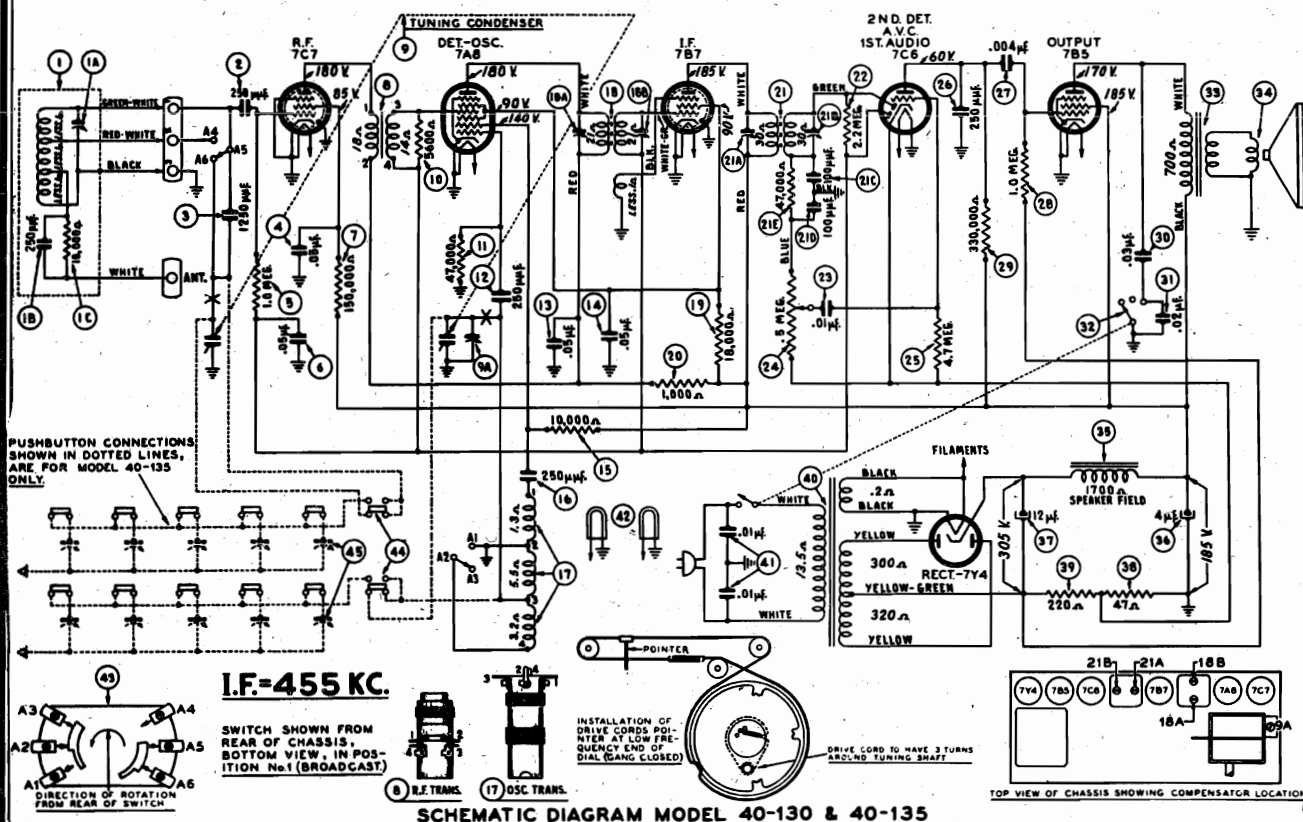
BATTERY CURRENT:
"A" Battery, 200 M. A. Model 40-81 Battery, 5.6 M. A.

BATTERY CURRENT:
"A" Battery, 250 M. A. Model 40-88 "B" Battery, 8 M. A.

MODELS 40-503, 40-506,
MODEL 40-525
Chassis, Tuner

PHILCO RADIO & TELEV. CORP.

MODELS 40-130, 40-135
Schematic, Voltage, Tuner
Chassis, Trimmers



JUNE, 1939.

Replacement Parts — Models 40-130 and 40-135

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|----------------------------|--|-----------|-----------|--|----------|-----------|-------------------------------------|----------|
| 1 | Loop Assembly | 38-9891 | 28 | Clip (R. F. and Osc. Trans. Mts.) | 28-5002 | 27 | Rubber Bushing (Tuning Cond. Drive) | 27-9432 |
| 1A | Compensator | 31-8318 | 29 | Dial | 27-5506 | 28 | Spring (Drive Cord, Tuning Cond.) | 28-8731 |
| 1B | Nica Cond. (250 mmfd.) | 61-0033 | 30 | Drive Cord Assy. (Pointer) | 31-2398 | 29 | Spring (Drive Cord, Pointer) | 28-8953 |
| 2 | Resistor (10,000 ohms, 1/2 watt) | 33-10339 | 31 | Drive Cord Assy. (Tuning Cond.) | 31-2400 | 30 | Spring (Tuning Shaft Assy.) | 28-8955 |
| 3 | Nica Cond. (250 mmfd.) | 61-0033 | 32 | Escutcheon (Pushbutton Model 40-135) | 28-5742 | 31 | Socket (Lokalt, all tubes) | 38-1478 |
| 4 | Nica Cond. (1250 mmfd.) | 30-4513 | 33 | Escutcheon Pin (Model 40-135) | W-1074 | 32 | Socket (Lokalt, all tubes) | 38-0575 |
| 5 | Tubular Cond. (.05 mfd.) | 33-510339 | 34 | Insulating Bushing (Insulate Drive Shaft) | 27-9437 | 33 | Tuning Shaft | 38-9852 |
| 6 | Tubular Cond. (.05 mfd.) | 30-4513 | 35 | Knobs (Tuning, Tone, Volume and Wave Switch) | 27-4332 | 34 | Tuning Drive Drum Assy. | 38-9853 |
| 7 | Resistor (150,000 ohms, 1/2 watt) | 33-415339 | 36 | Knobs (Pushbutton Model 40-135) | 27-4824 | 35 | Tab (Dial, Model 40-135) | 27-8326 |
| 8 | R. F. Transformer | 32-3282 | 37 | Pilot Lamp Socket Assy. | 38-9904 | 36 | Tab (Television, Model 40-135) | 27-9450 |
| 9 | Tuning Condenser | 31-2174 | 38 | Pointer | 38-1532 | 37 | Tab Kit (Model 40-135) | 40-5473 |
| 10 | Resistor (5800 ohms, 1/2 watt) | 33-258339 | | | | 38 | Washer "C" Type, Tuning Shaft | 28-2043 |
| 11 | Resistor (47,000 ohms, 1/2 watt) | 33-347339 | | | | | | |
| 12 | Nica Cond. (250 mmfd.) | 61-0033 | | | | | | |
| 13 | Tubular Cond. (.05 mfd.) | 30-4513 | | | | | | |
| 14 | Tubular Cond. (.05 mfd.) | 30-4513 | | | | | | |
| 15 | Resistor (10,000 ohms, 1/2 watt) | 33-310339 | | | | | | |
| 16 | Nica Cond. (250 mmfd.) | 61-0033 | | | | | | |
| 17 | Oscillator Transformer | 33-3212 | | | | | | |
| 18 | 1st I. F. Trans. Assy. | 33-318439 | | | | | | |
| 19 | Resistor (18,000 ohms, 1/2 watt) | 33-210339 | | | | | | |
| 20 | Resistor (1,000 ohms, 1/2 watt) | 33-3281 | | | | | | |
| 21 | 2nd I. F. Trans. Assy. | 33-3281 | | | | | | |
| 22 | Resistor (2.5 meg., 1/2 watt) | 33-4572 | | | | | | |
| 23 | Tubular Cond. (.01 mfd.) | 33-5235 | | | | | | |
| 24 | Volume Control (.5 meg.) | 33-547339 | | | | | | |
| 25 | Resistor (4.7 meg., 1/2 watt) | 61-0033 | | | | | | |
| 26 | Nica Cond. (250 mmfd.) | 30-4513 | | | | | | |
| 27 | Tubular Cond. (.004 mfd.) | 33-510339 | | | | | | |
| 28 | Resistor (1.0 meg., 1/2 watt) | 33-423339 | | | | | | |
| 29 | Resistor (330,000 ohms, 1/2 watt) | 30-4481 | | | | | | |
| 30 | Tubular Cond. (.03 mfd.) | 33-8063 | | | | | | |
| 31 | Tubular Cond. (.02 mfd.) | 33-8063 | | | | | | |
| 32 | Tone Control and On-Off Switch | 33-8063 | | | | | | |
| 33 | Cone and Voice Coil Assy. (Sptr. Part No. 38-1478-3) | 38-4085 | | | | | | |
| 34 | Field Coil (Replace Sph. Part No. 38-1478) | 30-2401 | | | | | | |
| 35 | Electrolytic Cond. (.2 mfd., 400 V.) | 30-2401 | | | | | | |
| 36 | Resistor (47 ohms, 1/2 watt) | 33-047331 | | | | | | |
| 37 | Resistor (250 ohms, 1/2 watt) | 33-8064 | | | | | | |
| 38 | Power Trans. (115 V., 50-60 cycles) | 33-8064 | | | | | | |
| 39 | Sakelite Cond. (.01-.01 mfd.) | 30-2401 | | | | | | |
| 40 | Pilot Lamp | 42-1494 | | | | | | |
| 41 | Wave Switch | 42-1494 | | | | | | |
| 42 | Pushbutton Switch (Model 40-135 only) | 31-8318 | | | | | | |
| 43 | Padder Strip (Model 40-135 only) | 31-8318 | | | | | | |
| MISCELLANEOUS PARTS | | | | | | | | |
| | Cabinet (Model 40-130) | 10394A | | | | | | |
| | Cabinet (Model 40-135) | 10394B | | | | | | |
| | Cable and Plug (Power Supply) | L-3198 | | | | | | |

FIG. 1. PART LOCATIONS, UNDERSIDE OF CHASSIS.

Model 40-130 is dial tuned and assembled in cabinet type "T"

* Model 40-135 is equipped with six electric push buttons for automatically selecting stations in addition to dial tuning. Five push buttons are used for stations one of which can be used in combination with Special type PHILCO TELEVISION receivers for reception of television sound programs. The sixth push button selects dial tuning. The push buttons in this model cover frequency ranges as follows:

540 to 1030 K. C. 740 to 1300 K. C.
650 to 1100 K. C. 900 to 1470 K. C.
1160 to 1600 K. C.

*NOTE: Push button data and tuning ranges apply for Models 40-503, 40-506 and 40-525 also.

The procedure for adjusting the push buttons for reception of stations is similar to the method described in volume ten the only difference being that the frequency range of each button is different.

Philco television sets and record players contain instructions for setting up and adjusting the push-button in model 40-135.

TUNING RANGES: 540 to 1550 K. C.; 1.5 to 3.3 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

POWER SUPPLY: 115 volts A. C., 60 cycles.

POWER CONSUMPTION: 35 watts.

See Philco
page 10-16.

MODELS 40-130, 40-135

MODEL 40-165

MODELS 40-503, 40-506

MODEL 40-525

PHILCO RADIO & TELEV. CORP.

Alignment

40-503, 40-506, 40-130, 40-135, 40-525

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED

(1) **Signal Generator:** Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K. C. is the correct instrument for this purpose.

(2) **Aligning Indicator:** Philco Models 027 or 028 Vacuum Tube

Voltmeters and Circuit Testers incorporate sensitive vacuum tube voltmeters and audio output meters and are recommended.

(3) Philco Fiber Handle Screw Driver, Part No. 45-2610. Aligning adaptor Part No. 45-2767, when using the vacuum tube voltmeter for alignment.

CONNECTING ALIGNING METERS

Audio Output Meter: Philco Model 027 or 028 Audio Output Meters is connected to the voice coil terminals of the speaker or the plate and screen of the 7B5 tube and adjusted for the 0 to 10 volt A. C. scale.

Vacuum Tube Voltmeter: To use the Vacuum Tube Voltmeter as an alignment indicator make the following connections:

(1) **Adjusting I. F. Circuit:** Remove the 7C7 R. F. tube from its socket and insert the aligning adaptor, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the vacuum tube voltmeter to the black wire of the adaptor.

(2) **Adjusting R. F. Circuit:** To adjust the R. F. circuit, the aligning adaptor is inserted in the 7C6 second detector tube socket. The vacuum tube voltmeter remains connected to the adaptor as given in the paragraph above. With the voltmeter connected in this manner a very sensitive indication of the A. V. C. voltage is obtained when the padders are adjusted.

After connecting the aligning adaptors, adjust the compensators as shown in the tabulation below. Locations of the compensators are shown in Fig. 1. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

| Operations in Order | SIGNAL GENERATOR | | RECEIVER | | | SPECIAL INSTRUCTIONS |
|---------------------|--------------------------------|--------------|--------------|--|------------------------------|---------------------------------------|
| | Output Connections to Receiver | Dial Setting | Dial Setting | Control Settings | Adjust Compensators in Order | |
| 1 | No. 1 Ter. on Panel Note B | 455 K. C. | 580 K. C. | Vol. Cont. Max. Range Switch "Brdcst" | 21B, 21A, 18B, 18A | Dial Push-Button "In" Model 40-125 |
| 2 | Loop Note C | 1500 K. C. | 1500 K. C. | Vol. Cont. Max. Range Switch "Brdcst" | 9A, 1A Note D | Note A |

NOTE A—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE B—When adjusting the I. F. padders the high side of the signal generator output is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis.

The ground or low side of the generator is connected to the chassis of the receiver.

NOTE C—When aligning the R. F. a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed two or three feet from the loop in the cabinet.

NOTE D—Oscillator compensator (9A) is located on top of the tuning condenser. Antenna compensator (1A) is located on the loop. When adjusting the "ANT" compensators the receiver loop should be held in place against the back of the cabinet.

Model 40-165

Signal Generator: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders a loop antenna is made from a few turns of wire and connected to the signal generator output terminals; the generator is then placed two or three feet from the loop in the cabinet. Do not remove the receiver loop from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

| Operations in Order | SIGNAL GENERATOR | | RECEIVER | | | Special Instructions |
|---------------------|------------------------------------|-------------------|------------------------|---|---------------------|--|
| | Output Connections to Receiver | Frequency Setting | Dial Setting | Control Settings | Adjust Compensators | |
| 1 | High Side to No. 1 Ter. Loop Panel | 455 K. C. | 580 K. C. No Signal | Range Switch "Brdcst." Vol. Max. Dial Push-Button "In" | 37A, 37B, 34A, 34B | See paragraph on signal generator above |
| 2 | Use Loop on Generator | 18.0 M. C. | 18.0 M. C. | Range Switch "SW" | 61A | Note A. Image should be 910 K.C. below 18 M.C. |
| 3 | Use Loop on Generator | 1500 K. C. | 1500 K. C. | Range Switch Brdcst. | 26, 25 | |
| 4 | Use Loop on Generator | 580 K. C. | 580 K. C. | Range Switch Brdcst. | 26A | Roll tuning condenser |
| 5 | Use Loop on Generator | 1500 K. C. | 1500 K. C. | Range Switch Brdcst. | 26, 25 | |
| 6 | Use Loop on Generator | 18.0 M. C. | 18.0 M. C. | Range Switch "SW" | 2A | Note B, Note C |

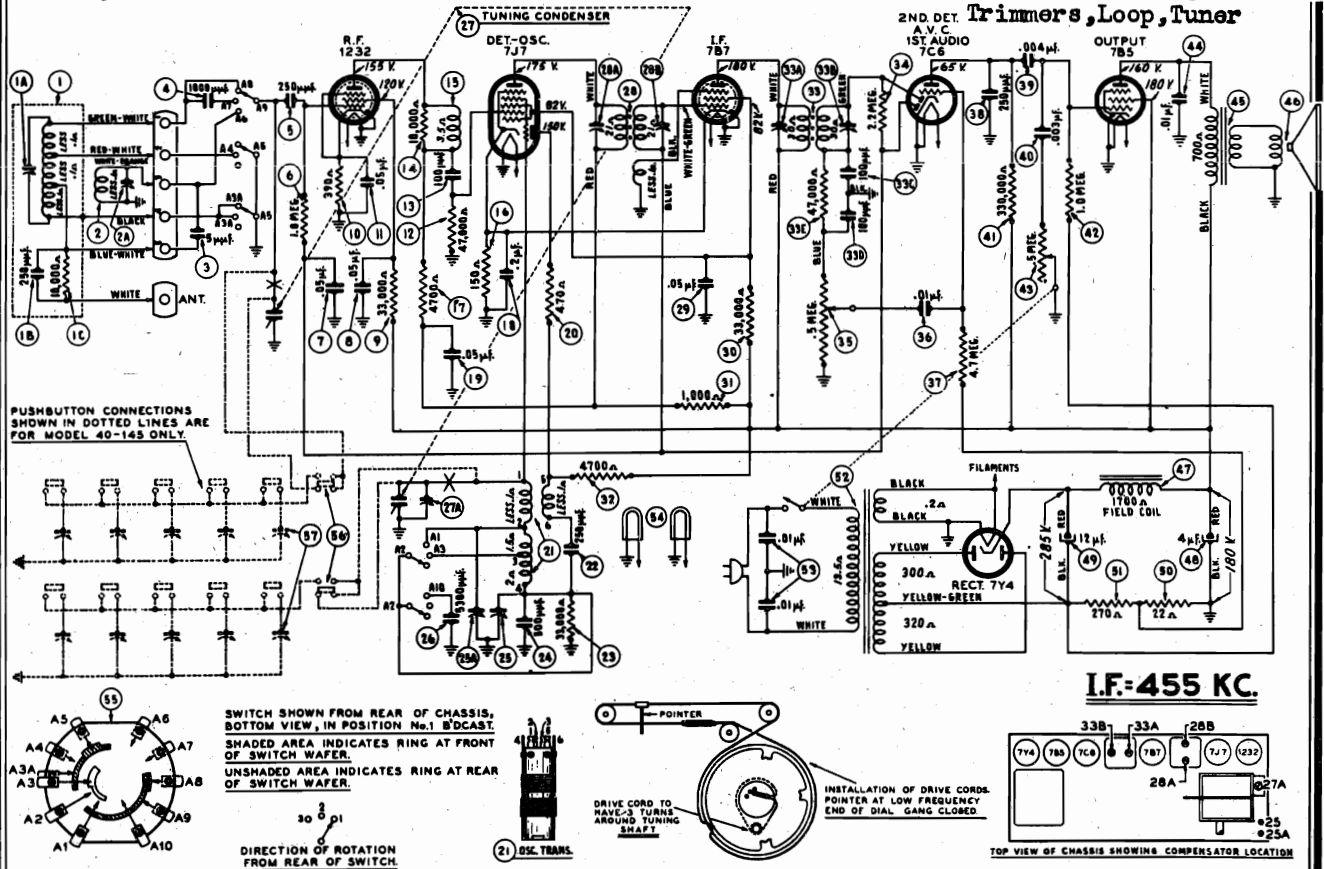
NOTE A—DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in Schematic Diagram.

NOTE B—Turn loop padder to closed position (maximum capacity), then adjust to the first signal peak from this position; at the same time roll the tuning condenser. See Note C.

NOTE C—When adjusting the low frequency compensator of Range One (Broadcast) or the antenna compensators of the high frequency tuning ranges; the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now turn the compensator slightly to the right or left. Continue turning compensator in the direction that gives greatest signal and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

MODEL 40-507
Tuner, Chassis

PHILCO RADIO & TELEV. CORP.

MODELS 40-140, 40-145
Schematic, Voltage, Chassis
Trimmers, Loop, Tuner

Replacement Parts

SCHEMATIC DIAGRAM MODEL 40-140 & 40-145

| SCHE. No. | DESCRIPTION | PART No. |
|-----------|--|-----------|
| 1 | Loop Assembly (Broadcast) | 38-8892 |
| 1A | Compensator | 31-1311 |
| 1B | Mica Cond. (250 mmfd.) | 61-0033 |
| 1C | Resistor (10,000 ohms, 1/2 watt) | 33-10339 |
| 2A | Loop Assembly (Short Wave) | 38-8893 |
| 2B | Compensator | 31-1312 |
| 2C | Mica Cond. (5 mmfd.) | 30-1087 |
| 3 | Mica Cond. (1000 mmfd.) | 31-1083 |
| 4 | Mica Cond. (250 mmfd.) | 61-0033 |
| 5 | Resistor (10 meg., 1/2 watt) | 33-10339 |
| 6 | Tubular Cond. (.05 mfd.) | 30-4518 |
| 7 | Tubular Cond. (.05 mfd.) | 30-4518 |
| 8 | Resistor (33,000 ohms, 1/2 watt) | 33-33339 |
| 9 | Resistor (390 ohms, 1/2 watt) | 33-136331 |
| 10 | Tubular Cond. (.05 mfd.) | 30-4518 |
| 11 | Resistor (47,000 ohms, 1/2 watt) | 33-347339 |
| 12 | Mica Cond. (100 mmfd.) | 30-1121 |
| 13 | Resistor (10,000 ohms, 1/2 watt) | 33-10339 |
| 14 | R. F. Transformer | 32-3194 |
| 15 | Resistor (4700 ohms, 1/2 watt) | 33-247339 |
| 16 | Tubular Cond. (.2 mfd.) | 30-4528 |
| 17 | Resistor (470 ohms, 1/2 watt) | 33-147339 |
| 18 | Oscillator Transformer | 32-3194 |
| 19 | Mica Cond. (250 mmfd.) | 61-0033 |
| 20 | Resistor (33,000 ohms, 1/2 watt) | 33-33339 |
| 21 | Silver Mica Cond. (500 mmfd.) | 31-1311 |
| 22 | Compensator (2 section) | 31-1312 |
| 23 | Mica Cond. (.3300 mmfd.) | 31-1312 |
| 24 | Tuning Condenser | 31-1312 |
| 25 | 1st I. F. Trans. Assy. | 32-3210 |
| 26 | Tubular Cond. (.05 mfd.) | 30-4518 |
| 27 | Resistor (33,000 ohms, 1/2 watt) | 33-33339 |
| 28 | Resistor (1,000 ohms, 1/2 watt) | 33-210339 |
| 29 | Resistor (4700 ohms, 1/2 watt) | 33-247339 |
| 30 | 2nd I. F. Trans. Assy. | 32-3210 |
| 31 | Resistor (2.2 meg., 1/2 watt) | 33-522339 |
| 32 | Volume Control (.2 meg.) | 33-5218 |
| 33 | Tubular Cond. (.01 mfd.) | 30-4572 |
| 34 | Resistor (4.7 meg., 1/2 watt) | 33-547339 |
| 35 | Mica Cond. (250 mmfd.) | 61-0033 |
| 36 | Tubular Cond. (.004 mfd.) | 30-4572 |
| 37 | Resistor (.003 mfd.) | 33-5218 |
| 38 | Resistor (330,000 ohms, 1/2 watt) | 33-433339 |
| 39 | Tubular Cond. (.05 mfd.) | 30-4518 |
| 40 | Resistor (1.0 meg., 1/2 watt) | 33-10339 |
| 41 | Tone Control (.5 meg., & On-Off Switch) | 33-5233 |
| 42 | Tubular Cond. (.01 mfd.) | 30-4572 |
| 43 | Output Transformer | 32-3063 |
| 44 | Cone and Voice Coil Assy. (Sphr. Part No. 36-1478-3) | 36-4088 |
| 45 | Field Coil (Replace Sphr. Part No. 36-1478-3) | 36-4088 |
| 46 | Electrolytic Cond. (4 mfd., 400 V.) | 30-2401 |
| 47 | Electrolytic Cond. (12 mfd., 400 V.) | 30-2409 |
| 48 | Resistor (22 ohms, 1/2 watt) | 33-02531 |
| 49 | Resistor (270 ohms, 1 watt) | 33-127431 |
| 50 | Power Trans. (115 V., 80-60 cycles) | 32-0600 |

PHILCO BUILT-IN SUPER AERIAL SYSTEM:

Included in the built-in super aerial system is a statically shielded loop for broadcast band reception and a short wave receiving loop. A feature of the built-in broadcast band statically shielded loop is that the receiver may be turned to the position in which it picks up a minimum amount of interference, or if interference is not present the receiver may be set in the position where best reception is obtained.

In addition, other features of design are: Three tuning ranges; special high gain R. F. stage; Philco high-efficiency Loktal tubes; automatic volume control, tone control and a Beam power audio output stage. In general, these models are similar but differ in their tuning mechanisms and cabinets.

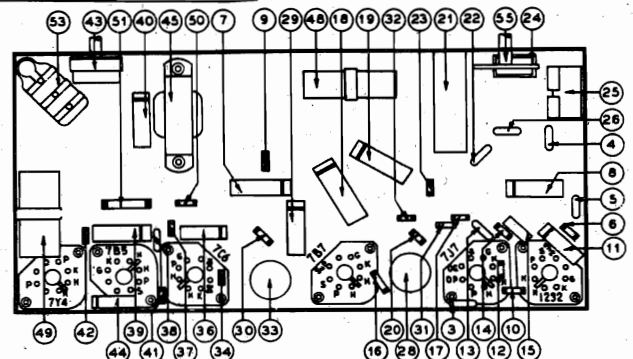
Model 40-140 is dial tuned and assembled in cabinet type "T" (Table model).

Model 40-145 is equipped with six electric push buttons for automatically selecting stations in addition to dial tuning. Five push buttons are used for stations one of which can be

* APPLIES TO MODEL 40-507 ALSO

JUNE, 1939.

FOR OTHER
DATA
SEE INDEX



*FIG. 1. PART LOCATIONS, UNDERSIDE OF CHASSIS.

MISCELLANEOUS PARTS

| DESCRIPTION | PART No. |
|---|----------|
| Line Condenser (.01-.01 mfd.) | 3903-00G |
| Pilot Lamps | 34-308 |
| Wave Switch | 42-1485 |
| Push Button Switch (Model 40-145 only) | 42-1328 |
| Padder Strip (Model 40-145 only) | 31-6318 |
| Cable and Plug Assy. (Power Supply) | L-3199 |
| Cabinet (Model 40-140) | 10-388A |
| Cabinet (Model 40-145) | 10-388B |
| Clip (Mtg. Osc. Coil) | 28-3399 |
| Scutcheon (Pushbuttons, Model 40-145) | 28-5742 |
| Scutcheon Pin (Model 40-145) | W-1074 |
| Insulating Bushing (Drive Shaft) | 27-9437 |
| Knobs (Tuning, Tone, Vol., Wave Switch) | 27-4332 |
| Knobs (Pushbuttons, Model 40-145) | 27-4332 |
| Pilot Lamp Socket Assy. | 38-9804 |
| Pointer | 38-1532 |
| Rubber Bushing (Tuning Cond. Drive) | 27-9432 |
| Spring (Tuning, Drive Cord) | 28-8751 |
| Spring (Pointer, Drive Cord) | 28-8953 |
| Spring (Tuning Shaft Assy.) | 28-8955 |
| Speaker | 36-1478 |
| Socket (Loktal Tube) | 15-0878 |
| Tuning Shaft | 36-6052 |
| Tuning Drive Drum Assy. | 38-8883 |
| Tab (Dial, Model 40-145) | 27-5528 |
| Tab (Television, Model 40-145) | 27-9450 |
| Tab Kit (Model 40-145) | 40-8473 |
| Washer ("C" Type, Tuning Shaft) | 28-2043 |

used in combination with special type PHILCO TELEVISION receivers for reception of television sound programs. The sixth push button selects dial tuning.

The procedure for adjusting the push buttons to broadcast stations is the same as that contained in **VOLUME TEN**.

The frequency coverage of each push button is as follows:

| | |
|-------------------|--------------------|
| 540 to 1030 K. C. | 740 to 1300 K. C. |
| 650 to 1100 K. C. | 900 to 1470 K. C. |
| | 1160 to 1600 K. C. |

Philco television sets and record players contain information for adjusting the push button on the 40-145.

*TUNING RANGES:

540 to 1550 K. C. 1.5 to 3.3 M. C. 5.7 to 18.0 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

POWER SUPPLY: 115 volts A. C., 60 cycle.

POWER CONSUMPTION: 38 watts.

AUDIO OUTPUT: 2 watts.

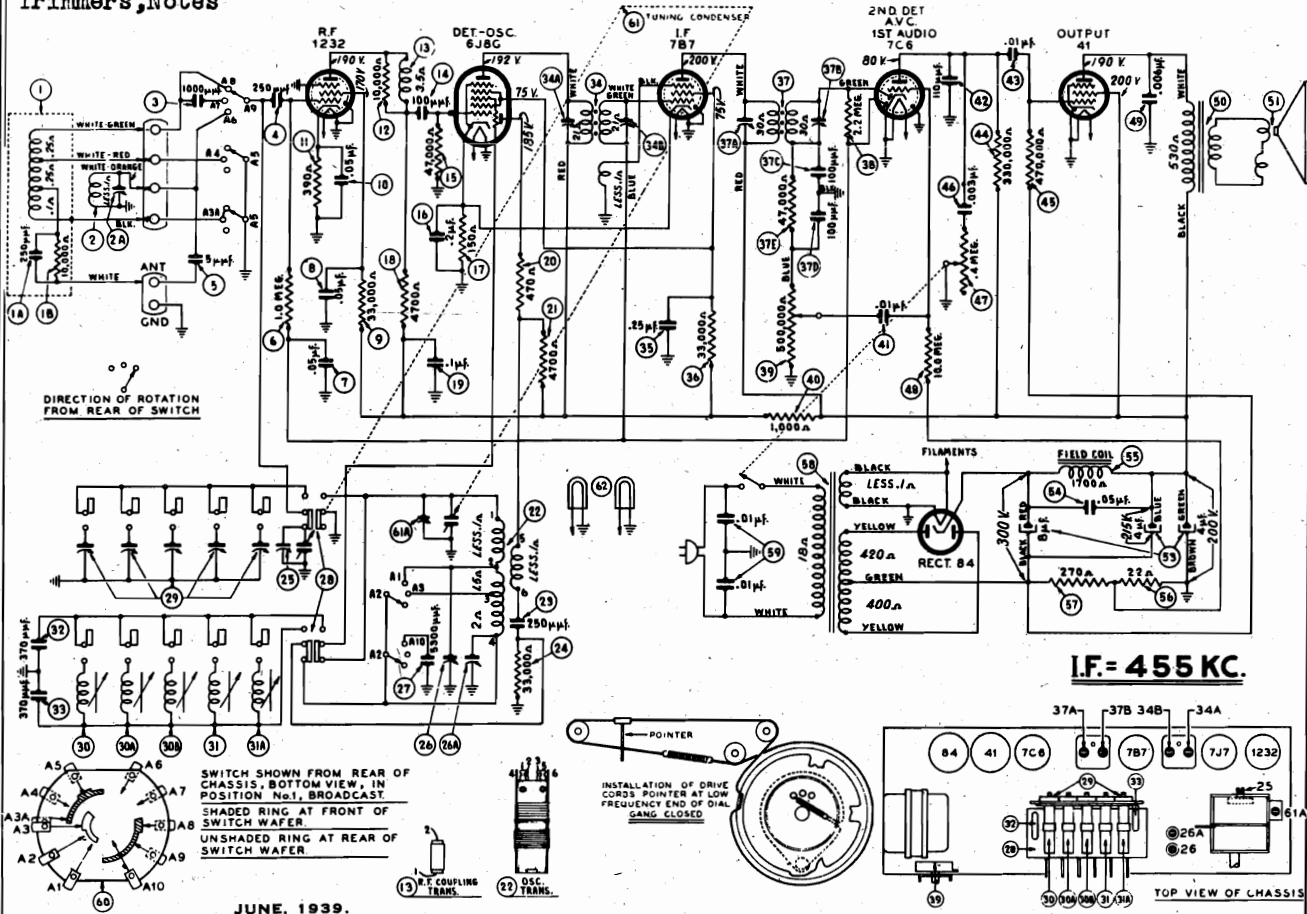
PHILCO TUBES USED: 12Z2, R. F.; 7J7, converter; 7B7, I. F.; 7C6, second detector, AVC and first audio; 7B5, audio output and 7Y4, rectifier.

*See Philco
page 10-16.

MODEL 40-165

Schematic, Voltage, Chassis PHILCO RADIO & TELEV. CORP.

Trimmers, Notes



JUNE, 1939.

Replacement Parts — Model 40-165

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|-----------|---|-----------|-----------|---|-----------|-----------|---|----------|
| 1 | Loop Assy. (Broadcast) | 38-9895 | 54 | Tubular Cond. (.05 mfd.) | 30-4123 | 37A | Knobs (Tuning, Tone, Volume, Wave Switch) | 27-4332 |
| 1A | Mica Cond. (.250 mfd.) | 61-0033 | 55 | Field Coil (Replace Spkr. Part No. 36-1480) | 33-022331 | 37B | Pilot Lamp Socket Assy. | 38-9808 |
| 1B | Resistor (10,000 ohms, 1/2 watt) | 33-103339 | 56 | Resistor (22 ohms, 1/2 watt) | 33-127439 | 37C | Rubber Hose (Tuning Cond. Drive) | 27-9432 |
| 2 | Loop Assy. (Short Wave) | 38-9896 | 57 | Power Trans. (110 volt, 60 cycle) | 33-8055 | 37D | Spring (Tuning, Drive Cord) | 28-8751 |
| 2A | Compensator (Part of S. W. Loop) | 30-1063 | 58 | Line Cond. (.01-.01 mfd.) | 3803-50 | 37E | Spring (Pointer, Drive Cord) | 28-8953 |
| 3 | Mica Cond. (1000 mfd.) | 61-0033 | 59 | Wave Switch | 42-1495 | 37F | Spring Drive Shaft (Grounding) | 28-8955 |
| 3A | Mica Cond. (.250 mfd.) | 61-0033 | 60 | Tuning Cond. | 31-2375 | 37G | Screw (Bezel Mtg.) | W-1834 |
| 4 | Mica Cond. (.5 mfd.) | 33-510339 | 61 | Pilot Lamps | 34-2064 | 37H | Speaker | 36-1480 |
| 5 | Resistor (1.0 meg., 1/2 watt) | 33-4819 | 62 | Bezel | 27-4842 | 37I | Socket (Type 84 Tube) | 27-6035 |
| 6 | Tubular Cond. (.05 mfd.) | 33-333339 | | MISCELLANEOUS PARTS | | 37J | Socket (Type 6J80 Tube) | 27-6131 |
| 7 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 | | Cabinet | 103988 | 37K | Socket (Type 1232, 7B7, 7C6 Tubes) | 27-6120 |
| 8 | Tubular Cond. (.05 mfd.) | 33-333339 | | Cable and Plug (Power Supply) | L-3199 | 37L | Tab (Dial) | 27-9432 |
| 9 | Resistor (390 ohms, 1/2 watt) | 33-139339 | | Clip (Coil Mtg.) | 28-5003 | 37M | Tab (Television) | 27-9451 |
| 10 | Resistor (10,000 ohms, 1/2 watt) | 33-310339 | | Drive Cord Assy. (Pointer) | 31-2382 | 37N | Tab Kit | 40-6474 |
| 11 | R. F. Coupling Trans. | 30-4587 | | Drive Cord Assy. (Tuning Cond.) | 31-2400 | 37O | Tuning Shaft | 28-8952 |
| 12 | Mica Cond. (100 mfd.) | 33-247339 | | Escutcheon (Push Button) | 27-4843 | 37P | Tuning Drive Drum Assy. | 38-9853 |
| 13 | Resistor (47,000 ohms, 1/2 watt) | 33-347339 | | Insulating Bushing (Insulate Drive Shaft) | 27-9437 | 37Q | Washer ("C" Type, Tuning Shaft) | 28-2043 |
| 14 | Tubular Cond. (.2 mfd.) | 33-4587 | | Knobs (Push Buttons) | 27-4824 | | | |
| 15 | Resistor (150 ohms, 1/2 watt) | 33-115339 | | | | | | |
| 16 | Resistor (4700 ohms, 1/2 watt) | 33-247339 | | | | | | |
| 17 | Tubular Cond. (.1 mfd.) | 30-4827 | | | | | | |
| 18 | Resistor (470 ohms, 1/2 watt) | 33-147339 | | | | | | |
| 19 | Resistor (470 ohms, 1/2 watt) | 33-247339 | | | | | | |
| 20 | Mica Cond. (.250 mfd.) | 32-3195 | | | | | | |
| 21 | Osc. Trans. | 61-0033 | | | | | | |
| 22 | Mica Cond. (250 mfd.) | 33-333339 | | | | | | |
| 23 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 | | | | | | |
| 24 | Compensator (2 section) | 31-3038 | | | | | | |
| 25 | Compensator (Single) | 31-3022 | | | | | | |
| 26 | Mica Cond. (5300 mfd.) | 30-1134 | | | | | | |
| 27 | Push Button Switch | 42-1493 | | | | | | |
| 28 | Padder Strip and Bracket Assy. | 31-8285 | | | | | | |
| 29 | Coil No. 1 (540-1000 K.C.) | 32-3042 | | | | | | |
| 30A | Coil No. 2 (650-1100 K.C.) | 32-3042 | | | | | | |
| 30B | Coil No. 3 (740-1300 K.C.) | 32-3042 | | | | | | |
| 31 | Coil No. 4 (900-1500 K.C.) | 32-3041 | | | | | | |
| 31A | Coil No. 5 (1100-1800 K.C.) | 32-3041 | | | | | | |
| 32 | Silver Mica Cond. (370 mfd.) | 30-1110 | | | | | | |
| 33 | Silver Mica Cond. (370 mfd.) | 30-1110 | | | | | | |
| 34 | 1st I. F. Trans. | 32-3210 | | | | | | |
| 35 | Tubular Cond. (.05 mfd.) | 30-4587 | | | | | | |
| 36 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 | | | | | | |
| 37 | 2nd I. F. Trans. | 32-3211 | | | | | | |
| 38 | Resistor (2.2 meg., 1/2 watt) | 33-522339 | | | | | | |
| 39 | Volume Control (500,000 ohms) | 33-5219 | | | | | | |
| 40 | Resistor (1000 ohms, 1/2 watt) | 33-219339 | | | | | | |
| 41 | Tubular Cond. (.01 mfd.) | 30-4572 | | | | | | |
| 42 | Mica Cond. (110 mfd.) | 30-1130 | | | | | | |
| 43 | Tubular Cond. (.05 mfd.) | 33-423339 | | | | | | |
| 44 | Resistor (330,000 ohms, 1/2 watt) | 33-423339 | | | | | | |
| 45 | Resistor (470,000 ohms, 1/2 watt) | 33-443339 | | | | | | |
| 46 | Tubular Cond. (.005 mfd.) | 33-523339 | | | | | | |
| 47 | Tone Control and On-Off Switch (4 meg.) | 33-5233 | | | | | | |
| 48 | Resistor (10.0 ohms, 1/2 watt) | 30-4504 | | | | | | |
| 49 | Tubular Cond. (.006 mfd.) | 32-8056 | | | | | | |
| 50 | Output Trans. | 32-8056 | | | | | | |
| 51 | Cone and Voice Coil Assy. (Skr. Part No. 36-1480-3) | 36-1480 | | | | | | |
| 53 | Electrolytic Cond. (4-4.8 mfd.) | 30-2400 | | | | | | |

FIG. 1. PART LOCATIONS, UNDERSIDE OF CHASSIS.

PHILCO BUILT-IN SUPER AERIAL SYSTEM:

Included in the built-in super aerial system is a statically shielded loop for broadcast band reception and a short wave receiving loop. The feature of the built-in broadcast band statically shielded loop is that it may be turned to the position in which it picks up a minimum amount of interference, or if interference is not present the loop may be set in the position where best reception is obtained.

POWER SUPPLY: 115 Volts, 25 and 60 Cycle A. C.

POWER CONSUMPTION: 45 watts.

FREQUENCY TUNING RANGES: (Three)

540 to 1550 K. C. 1.5 to 3.5 M. C. 6.0 to 18.0 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED: 1232, R. F.; 6J8G, Converter; 7B7, I. F.; 7C6, Second Detector A. V. C. and First Audio; 41, Audio Power Output; 84, Rectifier.

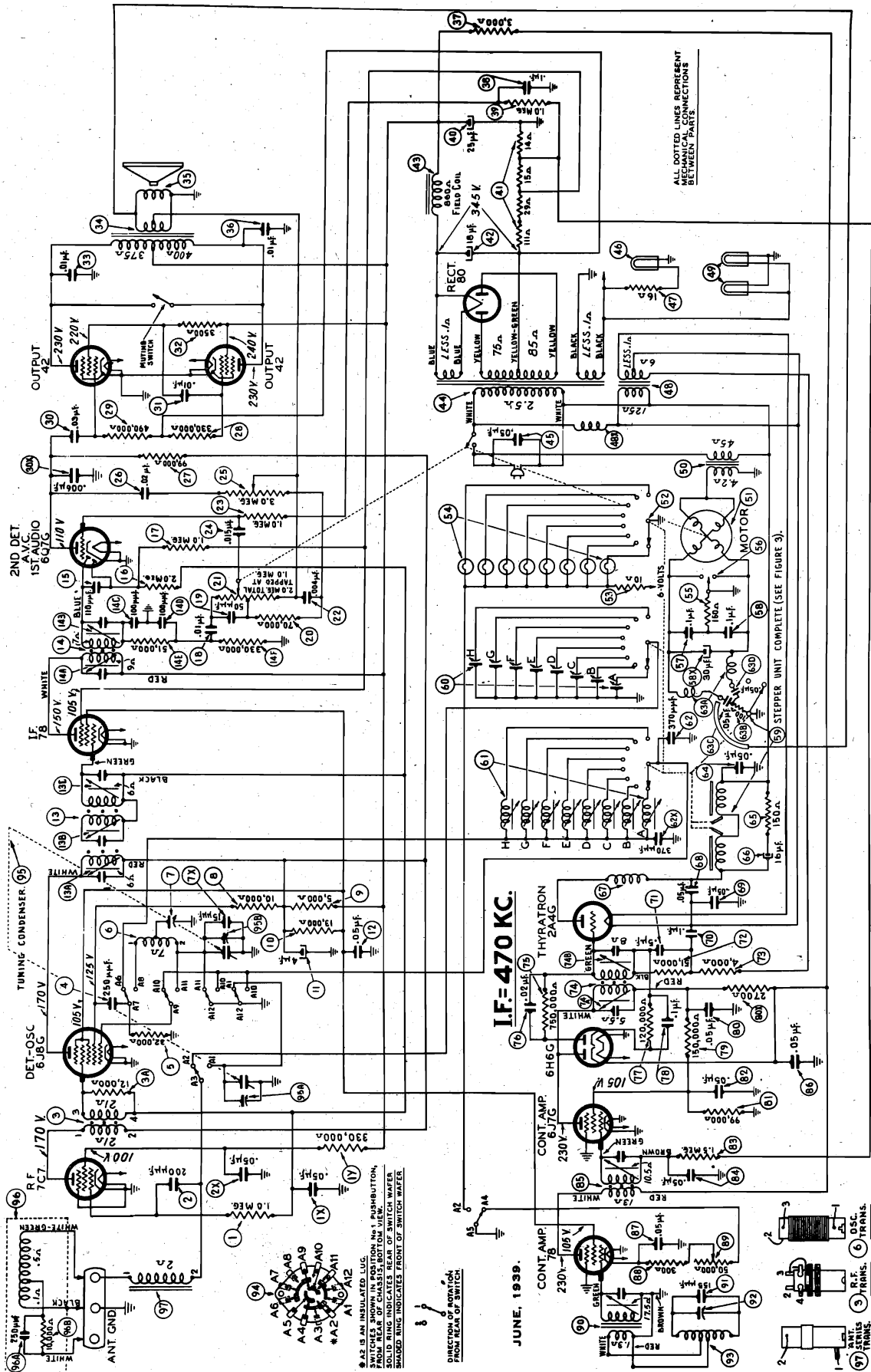
CABINET DIMENSIONS: Type F; Height, 37"; Width, 23 3/4"; Depth, 9 3/4".

ADJUSTING ELECTRIC PUSH-BUTTON TUNING:

The procedure for adjusting the electric tuning push-buttons in this model is covered in vol. X, Philco page 10-16.

PHILCO RADIO & TELEV. CORP.

MODEL 40-205
Schematic, Voltage



SCHEMATIC DIAGRAM MODEL 40-205

FOR ALIGNMENT DATA, SEE INDEX

VOLTAGES MEASURED FOR SOCKET CONTACTS TO CHASSIS. LINE VOLTAGE 115 VOLT A. C. VOLUME MINIMUM. RANGE SELECTOR (BROADCAST). NO STATION BEING RECEIVED.

MODEL 40-205
MODEL 40-216
MODEL 40-510
MODEL 40-516

PHILCO RADIO & TELEV. CORP.

Models 40-205, 40-216

and MODELS 40-510, 40-516.

Wireless Remote Control Adjustments, Notes

② Model 40-205, 510.

TYPE CIRCUIT: Model 40-205, code 121, is a 12-tube wireless remote control and dial tuned receiver employing a super-heterodyne circuit for reception of standard broadcast stations. Eight broadcast stations can be automatically tuned in from the remote control unit. The wireless remote control unit also increases and decreases volume and turns off the set without any connections between the receiver and the control unit. This model is also designed to receive the sound of a television program tuned in by Philco Television sets.

PHILCO BUILT-IN SUPER AERIAL SYSTEM:

A new type aerial system which eliminates an outside aerial is also incorporated in this model. Included in the built-in super aerial system is a statically shielded loop for broadcast band reception. The feature of the built-in broadcast band statically shielded loop is that it may be turned to the position in which it picks up a minimum amount of interference or if interference is not present, the loop may be set in the position where best reception is obtained.

In addition, other features of design are automatic volume control, continuously variable tone control, base compensation, degenerated push pull pentode audio output.

POWER SUPPLY: 115 Volts, 50 to 60 Cycles, A. C.

POWER CONSUMPTION: 180 watts. (Model 40-205 only)

TUNING RANGES: 540 to 1600 K. C.

I. F. FREQUENCY: 470 K. C.

PHILCO TUBES USED: Receiver—7C7, F. R. Amplifier: 6J8G, First Detector Oscillator: 78, I. F. Amplifier: 6Q7G, Second Detector, A. V. C. and First Audio; two (2) 42 Audio Output, and one 80 Rectifier.

Wireless Remote Control Amplifier—78, First Control Amplifier: 6J7G, Second Control Amplifier: A. V. C.: 6ZY5G, A. V. C. and a 2A4G Thyatron Rectifier.

Wireless Remote Control Unit—One type 30.

AUDIO OUTPUT: 10 watts.

CABINET DIMENSIONS:

| | Height | Width | Depth |
|-------------------------|--------|-------|--------|
| Console | 38 | 30 | 15 1/2 |
| Wireless Remote Control | 5 1/2 | 7 1/2 | 9 1/2 |

Model 40-510 is a radio-phonograph combination assembled in a console cabinet consisting of a 12 tube, wireless remote control superheterodyne radio receiver and a Deluxe Inter-Mix Record Changer.

② Model 40-216, 516.

TYPE CIRCUIT: Model 40-216, code 121, is a 14-tube wireless remote control and dial tuned receiver employing a super-heterodyne circuit with three tuning ranges for reception of standard and short wave broadcast stations. Eight broadcast stations can be automatically tuned in from the remote control unit. The wireless remote control unit also increases and decreases volume and turns off the set without any connections between the receiver and the control unit. This model is also designed to receive the sound of a television program tuned in by Philco Television sets. A Philco wireless record player can also be set up for use with this receiver.

PHILCO BUILT-IN SUPER AERIAL SYSTEM:

A new type aerial system which eliminates an outside aerial is also incorporated in this model. Included in the built-in super aerial system is a statically shielded loop for broadcast band reception and a short wave receiving loop. The feature of the built-in broadcast band statically shielded loop is that it may be turned to the position in which it picks up a minimum amount of interference or if interference is not present, the loop may be set in the position where best reception is obtained.

In addition other features of design are automatic volume control, continuously variable tone control, base compensation, degenerated push pull pentode audio output. Outside aerial connections are also provided for remote localities where station signal strength is exceptionally weak.

POWER SUPPLY: 115 Volts, 50 to 60 Cycles, A. C.

POWER CONSUMPTION: 190 watts. (Model 40-216 only)

TUNING RANGES: 540 to 1600 K.C., 1.6 to 4.5 M.C., 6.0 to 18.0 M.C.

I. F. FREQUENCY: 470 K. C.

PHILCO TUBES USED: Receiver—6J7G, R. F. Amplifier: 6A8G, Converter: 78, I. F. Amplifier: 6Q7G, Second Detector, A. V. C. and First Audio: 37, Phase Inverter: two 42 Audio Output, and one 80, Rectifier.

Wireless Remote Control Amplifier—78, First Control Amplifier: 6J7G, Second Control Amplifier: 6J5G, A. V. C.: 6ZY5G and 2A4G, Rectifier.

Wireless Remote Control Unit—1 type 30 tube.

AUDIO OUTPUT: 10 watts.

Model 40-516 is a radio-phonograph combination assembled in a console cabinet consisting of a 14 tube, wireless remote control superheterodyne radio receiver and a Deluxe Inter-Mix Record Changer.

ADJUSTMENT OF WIRELESS REMOTE CONTROL CIRCUITS

Models 40-205, 40-216 and 40-510, 40-516.

ADJUSTING CONTROL FREQUENCY AMPLIFIER

The wireless remote control models are shipped with 5 different control frequencies which range from 350 to 400 K. C. These frequencies are identified by code numbers appearing on the serial number ticket and on the rear of the chassis. The code numbers and frequencies are as follows:

Code 5.....355 K. C. Code 7.....375 K. C.
Code 6.....367 K. C. Code 8.....383 K. C.
Code 9.....395 K. C.

The purpose of the different control frequencies is to prevent interaction between two or more wireless remote control models which are on the same floor or exceptionally close together. When several wireless remote control models are to be located close together, it will be necessary to use different control frequencies. These frequencies should be 20 K. C. apart. For example, if three models are to be operated at the same time and are closely situated, it will be advisable to adjust the control frequency of the first set to 355 K. C., the second set to 375 K. C., and the third set to 395 K. C.

In order to realign or change the control frequency of these models, the following equipment is required:

1. Philco Model 077 signal generator with a loop attached to the output terminal. (A few turns of wire 12 inch in diameter).
2. Philco wireless remote control aligning adapter. Part No. 45-2769.
3. Philco aligning screw driver, Part No. 45-2610.

With this apparatus the control frequency is adjusted as follows:

1. Remove the 2A4G control tube from its socket and replace with the aligning adapter. Connect the red lead of the aligning adapter to the positive terminal of the vacuum tube voltmeter. The black lead of the adapter is connected to the negative terminal of the vacuum tube voltmeter.
2. Remove the 78 control amplifier tube, its shield and the shield of the 6J7G tube. Apply power to the set and turn the range selector disc to "remote".
3. Attach the "high" side of the signal generator output to the grid of the 6J7G tube. Set the generator modulation

control to "mod on" and turn the attenuator control about one-fourth on.

4. The control frequency to which the control amplifier is tuned can now be determined by tuning the signal generator between 350 and 400 K. C. When the signal generator is tuned to the control frequency, the vacuum tube voltmeter will show maximum deflection. If this frequency is to be used, leave the signal generator at this point or turn the indicator to any other frequency desired between 350 and 400 K. C.

5. After the control frequency has been found or changed, compensators (103A), (103B) Model 40-216; and (74A), (74B) Model 40-205 are adjusted for maximum indication on the vacuum tube voltmeter.

6. After adjusting this circuit, replace the 78 tube and shields in their sockets and remove the signal generator lead from the grid of the 6J7G tube.

7. Place the small loop mentioned above into the "high" and "ground" of the signal generator output terminals and place the signal generator near the secondary inductor loop in the bottom of the cabinet. When doing this, do not disturb the setting of the signal generator indicator. Turn the sensitivity control located on the right rear of the chassis toward the position marked "extreme" then adjust compensators (119), (115) Model 40-216; (90), (85) Model 40-205 for maximum reading on the vacuum tube voltmeter.

8. Next adjust the secondary inductor loop compensator (121) in the Model 216 and (92) Model 205 located in the bottom of the cabinet. This compensator is encased in a cardboard container that is attached to one corner of a loop. Extreme care should be used in adjusting the compensator to the exact point of resonance as the secondary inductor is a very sharply tuned circuit.

9. If the vacuum tube voltmeter pointer goes off scale when adjusting the compensators, turn the attenuator control of the signal generator toward the "off" position. After these compensators are adjusted to maximum, the control amplifier is tuned to the frequency selected.

PHILCO RADIO & TELEV. CORP.

ALIGNING OF COMPENSATING CONDENSERS**EQUIPMENT REQUIRED**

(1) **Signal Generator.** In order to properly adjust this receiver a calibrated signal generator such as Philco Model 077 is required. This signal generator covers a frequency range of 540 to 36,000 K. C.

(2) **Indicating Device.** To obtain maximum signal strength and accurate adjustment of the padders a vacuum tube volt-

meter and circuit tester such as Philco Models 027 and 028 is recommended. These testers also contain an audio output meter which may be used as an indicating device.

(3) **Aligning Tools.** Fiber handle screw driver Philco Part No. 45-2610. When using the vacuum tube voltmeter for adjusting the set, an aligning adaptor Part No. 45-2767 is required.

CONNECTING ALIGNING INSTRUMENTS

VACUUM TUBE VOLTMETER: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the converter grid (6J8G) Model 205; (6A8G) Model 216. The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the resistor.

2. Connect the positive (+) terminal to the chassis ground terminal.

AUDIO OUTPUT METER: If this type of meter is used as an aligning indicator, it should be connected to the plate terminals of the 42 tubes. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators

in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 6 and 7, page No. 6. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

SIGNAL GENERATOR: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders a loop antenna is made from a few turns of wire and connected to the signal generator output terminals; the loop is then placed two or three feet from the loop in the cabinet. Do not remove the receiver loop from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

Receiver Circuit Adjustments — Model 40-216 and MODEL 40-516.

| Operation | SIGNAL GENERATOR | | RECEIVER | | | SPECIAL INSTRUCTIONS |
|-----------|--------------------------------|--------------|--------------|-------------------------------------|---------------------|----------------------|
| | Output Connections to Receiver | Dial Setting | Dial Setting | Control Setting | Adjust Compensators | |
| 1 | 78 I. F. Grid | 470 K.C. | 580 K.C. | Vol. Max. Range Switch "Brdest" | 38A, 38B | Turn Out 33B Full |
| 2 | 6A8G Det. Osc. Grid | 470 K.C. | 580 K.C. | Vol. Max. Range Switch "Brdest" | 33C, 33A, 33B | Note A |
| 3 | Use Loop on Generator | 18.0 M.C. | 18.0 M.C. | Vol. Max. Range Switch "Short Wave" | 22B, 124A, 2A | Note C, Note D |
| 4 | Use Loop on Generator | 1500 K.C. | 1500 K.C. | Vol. Max. Range Switch "Brdest" | 22, 13X, 3X | Note A |
| 5 | Use Loop on Generator | 580 K.C. | 580 K.C. | Vol. Max. Range Switch "Brdest" | 23 | Rollgang |
| 6 | Use Loop on Generator | 1550 K.C. | 1550 K.C. | Vol. Max. Range Switch "Brdest" | 22 | |
| 7 | Use Loop on Generator | 3.5 M.C. | 3.5 M.C. | Vol. Max. Range Switch "Police" | 22A | Note B |

Receiver Circuit Adjustments — Model 40-205 and MODEL 40-510.

| Operation | SIGNAL GENERATOR | | RECEIVER | | | SPECIAL INSTRUCTIONS |
|-----------|--------------------------------|--------------|--------------|---------------------------------|---------------------|--------------------------------|
| | Output Connections to Receiver | Dial Setting | Dial Setting | Control Setting | Adjust Compensators | |
| 1 | 78 Grid | 470 K.C. | 580 K.C. | Vol. Max. Range Switch "Brdest" | 14A, 14B | Turn Out 13B Full |
| 2 | 6J8G Grid | 470 K.C. | 580 K.C. | Vol. Max. Range Switch "Brdest" | 13A, 13C, 13B, 14A | |
| 3 | Loop | 1500 K.C. | 1500 K.C. | Vol. Max. Range Switch "Brdest" | 95B, 95A | Note A |
| 4 | Loop | 580 K.C. | 580 K.C. | Vol. Max. Range Switch "Brdest" | 7 | Rollgang when Adjusting Padder |
| 5 | Loop | 1500 K.C. | 1500 K.C. | Vol. Max. Range Switch "Brdest" | 95B, 95A | Note B |

NOTE A — Dial Calibration: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable and dial pointer in shown in Fig. 5.

NOTE C — If two peaks (signals) are observed on the aligning meter when adjusting the oscillator padder No. 22A tune the padder to the second peak from the maximum capacity position (screw all the way in).

NOTE D — If two peaks (signals) are observed on the aligning meter when adjusting the R. F. and loop padders 124A and 2A, tune the padders to the first peak signal from the maximum capacity position (screw all the way in). When adjusting the padders to this first peak roll the tuning condenser (rock) slightly back and forth to obtain the maximum readings on the aligning meter.

NOTE B — See adjustments. Remote Control Amplifier

ADJUSTING WIRELESS REMOTE CONTROL UNIT

The wireless remote control unit is now adjusted to the control frequency of the amplifier as follows:

1. Turn off the signal generator, then dial any one of the stations indicated on the remote control unit by pulling the selector to the stop position; release the selector and at the same time press the stop down and hold it in this position.

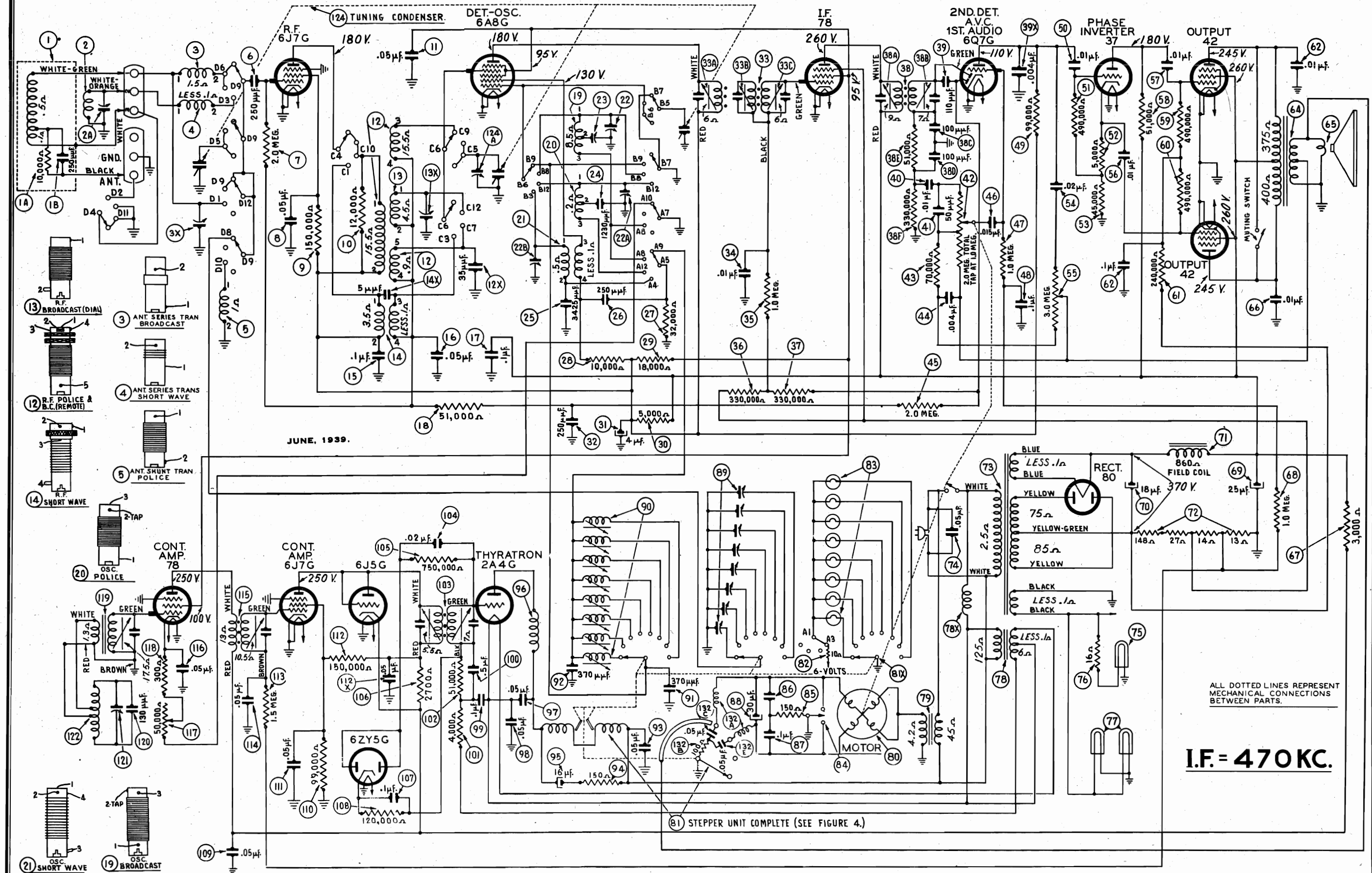
2. Now bring the wireless remote control unit close to the receiver. Using a padding wrench, Philco Part No. 3164, tune the compensator (127) Fig. 3, located on the bottom of the remote control unit until a maximum voltage reading is indicated on the vacuum tube voltmeter. When tuning this compensator, it should be done very slowly so as not to pass over the frequency to which the control amplifier is tuned.

3. After adjusting the compensator with the sensitivity control on the receiver in the "extreme" position, the remote control unit is adjusted for maximum sensitivity by setting the sensitivity control in the "near" position and placing the remote control unit a few feet away from the receiver. The compensator (127) Fig. 3, is then adjusted again for maximum voltage reading of the vacuum tube voltmeter.

4. After making these adjustments, remove the aligning adaptor from the socket and replace the 2A4G tube. The wireless remote control unit should now be adjusted to the same frequency as the control frequency in the receiver.

PHILCO RADIO & TELEV. CORP.

MODEL 40-216
Schematic, Voltage



Chassis, Trimmers
Stepper Unit, Dial

PHILCO RADIO & TELEV. CORP.

MODEL 40-216
MODEL 40-516

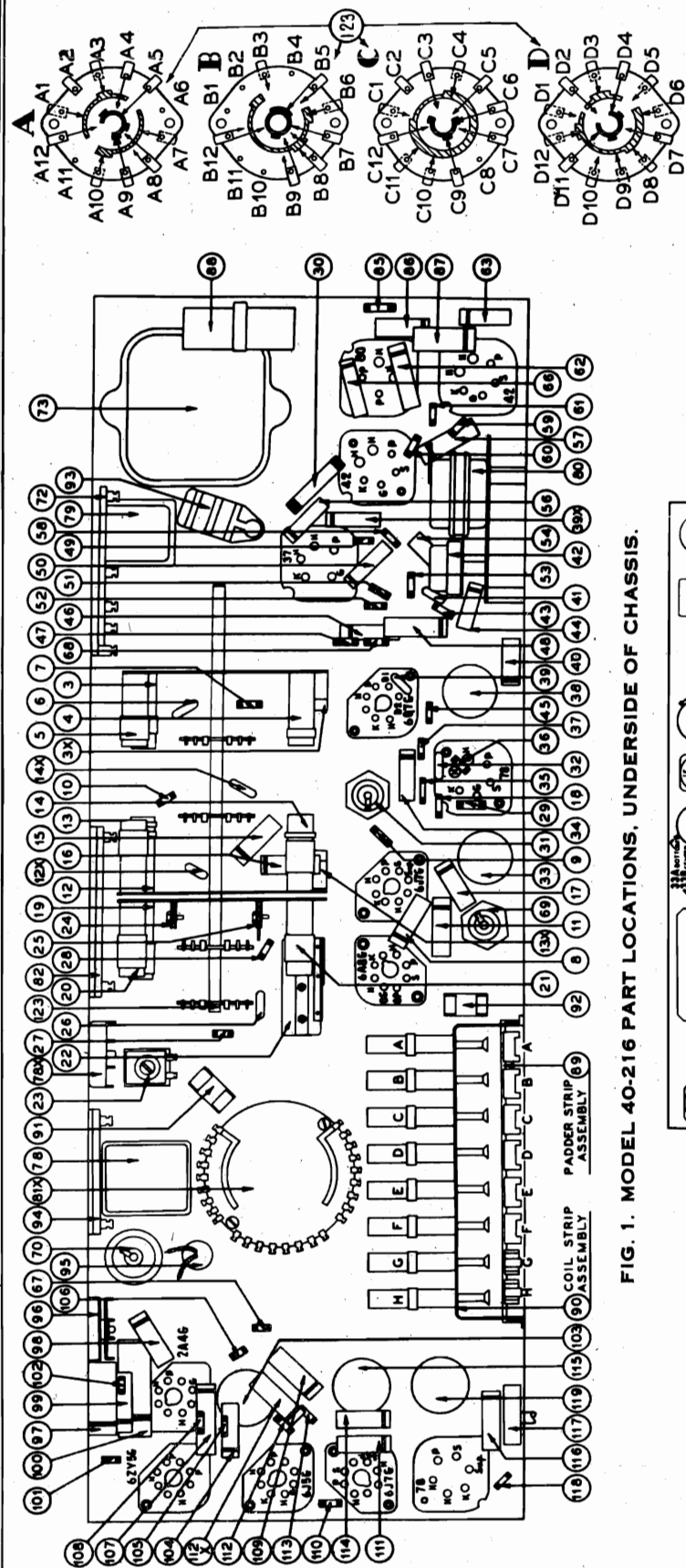


FIG. 1. MODEL 40-216 PART LOCATIONS, UNDERSIDE OF CHASSIS.

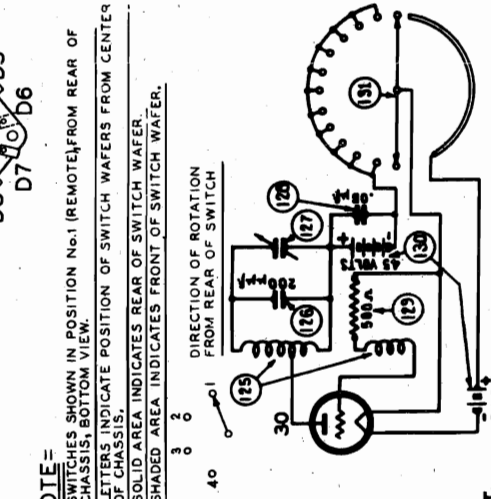


FIG. 3. WIRELESS REMOTE CONTROL UNIT SCHEMATIC DIAGRAM.
* In Model 40-516 No. 8 position is used for photograph. This position is already connected and will not need adjustment.

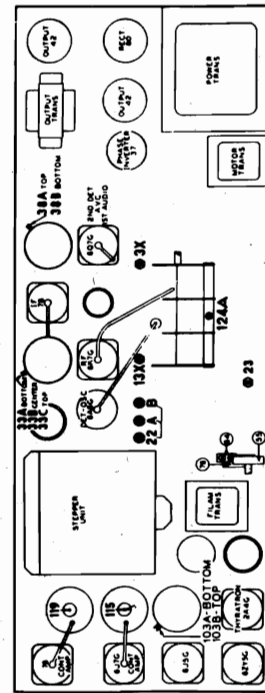


FIG. 5. DIAL POINTER AND CABLE ARRANGEMENT.
MODELS 40-205, 40-216.

FIG. 7. LOCATIONS OF COMPENSATORS, MODEL 40-216.

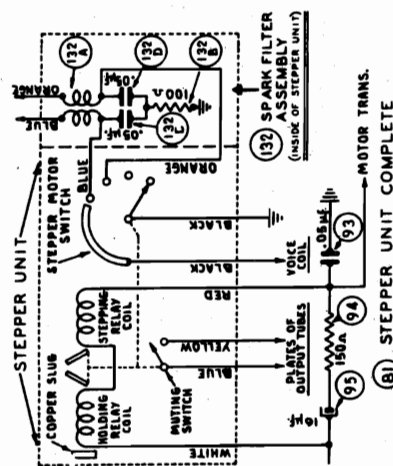


FIG. 2. INTERNAL WIRING OF STEPPER UNIT.
UNIT NUMBERS CORRESPOND TO SCHEMATIC.

MODEL 40-205
MODEL 40-216

Model 40-205

| SCHE. No. | DESCRIPTION | PART No. |
|-----------|---|-----------|
| 1X | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 1Y | Tubular Cond. (.05 mfd.) | 30-4511 |
| 2X | Resistor (330,000 ohms, 1/2 watt) | 33-510339 |
| 2Y | Mica Cond. (.001 mfd.) | 30-4511 |
| 3X | Tubular Cond. (.05 mfd.) | 30-4511 |
| 3Y | Resistor (12,000 ohms, 1/2 watt) | 33-510339 |
| 4X | Mica Cond. (.001 mfd.) | 30-4511 |
| 4Y | Resistor (32,000 ohms, 1/2 watt) | 33-510339 |
| 5X | Compensator | 31-6264 |
| 5Y | Mica Cond. (.001 mfd.) | 30-4511 |
| 6X | Resistor (10,000 ohms, 1/2 watt) | 33-510339 |
| 6Y | Resistor (5,000 ohms, 1/2 watt) | 33-510339 |
| 7X | Resistor (13,000 ohms, 1/2 watt) | 33-510339 |
| 7Y | Electrolytic Cond. (4 mfd., 250 V.) | 30-2334 |
| 8X | Tubular Cond. (.05 mfd.) | 30-4511 |
| 8Y | 1st I. F. Trans. Assy. | 32-2645 |
| 9X | 2nd I. F. Trans. Assy. | 32-2645 |
| 9Y | Mica Cond. (.001 mfd.) | 30-4511 |
| 10X | Resistor (2.0 meg., 1/2 watt) | 33-510339 |
| 10Y | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 11X | Tubular Cond. (.01 mfd.) | 30-4511 |
| 11Y | Mica Cond. (.004 mfd.) | 33-510339 |
| 12X | Resistor (70,000 ohms, 1/2 watt) | 33-510339 |
| 12Y | Volume Control (2.0 meg.) | 33-510339 |
| 13X | Tubular Cond. (.004 mfd.) | 33-510339 |
| 13Y | Resistor (10,000 ohms, 1/2 watt) | 33-510339 |
| 14X | Tubular Cond. (.015 mfd.) | 30-4511 |
| 14Y | Tone Control (3.0 meg.) | 33-510339 |
| 15X | Resistor (99,000 ohms, 1/2 watt) | 33-510339 |
| 15Y | Resistor (330,000 ohms, 1/2 watt) | 33-510339 |
| 16X | Resistor (490,000 ohms, 1/2 watt) | 33-510339 |
| 16Y | Tubular Cond. (.05 mfd.) | 30-4511 |
| 17X | Tubular Cond. (.03 mfd.) | 30-4511 |
| 17Y | Tubular Cond. (.006 mfd.) | 30-4511 |
| 18X | Tubular Cond. (.01 mfd.) | 30-4511 |
| 18Y | Resistor (3300 ohms, 1/2 watt) | 33-510339 |
| 19X | Tubular Cond. (.01 mfd.) | 30-4511 |
| 19Y | Output Trans. (Spkr. Part No. 36-1450-2) | 36-1450-2 |
| 20X | Cone and Voice Coil Assy. | 36-1450-2 |
| 20Y | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 21X | Tubular Cond. (.01 mfd.) | 30-4511 |
| 21Y | Resistor (3000 ohms, 1/2 watt) | 33-510339 |
| 22X | Tubular Cond. (.01 mfd.) | 30-4511 |
| 22Y | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 23X | Electrolytic Cond. (25 mfd., 300 V.) | 30-2360 |
| 23Y | Bias Resistor (Wirewound, 475 V.) | 30-2200 |
| 24X | Field Coil (Replace Spkr. Part No. 36-1450) | 36-1450 |
| 24Y | Power Trans. (115 V., 50-60 cycles) | 32-7999 |
| 25X | Power Trans. (115 V., 25-40 cycles) | 32-8013 |
| 25Y | Condenser (.05 mfd., 115 V. Plug) | 30-4511 |
| 26X | Pilot Lamp (Bulbless) | 32-7999 |
| 26Y | Pilot Lamp (Bulbless) | 32-7999 |
| 27X | Filament Trans. (115 V., 50-60 cycles) | 32-7999 |
| 27Y | Filament Trans. (115 V., 25-40 cycles) | 32-7999 |
| 28X | Choke Coil | 32-1281 |
| 28Y | Pilot Lamps (Dial) | 32-1281 |
| 29X | Motor Trans. (115 V., 50-60 cycles) | 32-7999 |
| 29Y | Motor Trans. (115 V., 25-40 cycles) | 32-7999 |
| 30X | Volume Control Motor Assy. | 35-1151 |
| 30Y | Rotary Switch | 42-1444 |
| 31X | Bias Resistor (Wirewound, 10 ohms) | 33-510339 |
| 31Y | Pilot Lamps (Station Indicator) | 32-7999 |
| 32X | Resistor (150 ohms, 1/2 watt) | 33-510339 |
| 32Y | Volume Control Switch (Motor Control) | 30-4511 |
| 33X | Tubular Cond. (.01 mfd.) | 30-4511 |
| 33Y | Tubular Cond. (.01 mfd.) | 30-4511 |
| 34X | Electrolytic Cond. (30 mfd., 30 V.) | 30-2361 |

PHILCO RADIO & TELEV. CORP.

Parts Lists

Replacement Parts

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|-----------|--------------------------------------|-----------|-----------|----------------------------------|-----------|
| 59 | Stepper Unit Complete | 38-9889 | 90C | MISCELLANEOUS PARTS | |
| 60A | Compensator Strip (Pushbutton) | 31-6264 | 90D | Resistor (10,000 ohms, 1/2 watt) | 33-510339 |
| 60B | Compensator No. 2 | 30-4511 | 90E | Tubular Cond. (.02 mfd.) | 30-4511 |
| 60C | Compensator No. 3 | 30-4511 | 90F | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 60D | Compensator No. 4 | 30-4511 | 90G | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 60E | Compensator No. 5 | 30-4511 | 90H | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 60F | Compensator No. 6 | 30-4511 | 90I | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 60G | Compensator No. 7 | 30-4511 | 90J | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 60H | Compensator No. 8 | 30-4511 | 90K | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 61 | Coil Assy. (Pushbutton) | 30-4511 | 90L | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 61A | Oscillator Coil No. 1 | 32-3042 | 90M | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 61B | Oscillator Coil No. 2 | 32-3042 | 90N | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 61C | Oscillator Coil No. 3 | 32-3042 | 90O | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 61D | Oscillator Coil No. 4 | 32-3042 | 90P | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 61E | Oscillator Coil No. 5 | 32-3042 | 90Q | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 61F | Oscillator Coil No. 6 | 32-3042 | 90R | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 61G | Oscillator Coil No. 7 | 32-3042 | 90S | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 61H | Oscillator Coil No. 8 | 32-3042 | 90T | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 62 | Silver Mica Cond. (370 mfd.) | 30-1110 | 90U | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 62X | Silver Mica Cond. (370 mfd.) | 30-1110 | 90V | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 63A | Spark Filter Choke | 32-3278 | 90W | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 63B | Resistor (100 ohms, 1/2 watt) | 33-110339 | 90X | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 63C | Tubular Cond. (.05 mfd.) | 30-4511 | 90Y | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 63D | Tubular Cond. (.05 mfd.) | 30-4511 | 90Z | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 64 | Bakelite Cond. (.05 mfd.) | 3615-56 | 91 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 65 | Resistor (150 ohms, 1/2 watt) | 30-2387 | 92 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 66 | Electrolytic Cond. (16 mfd., 150 V.) | 30-2387 | 93 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 67 | Tubular Cond. (.05 mfd.) | 30-4511 | 94 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 68 | Tubular Cond. (.05 mfd.) | 30-4511 | 95 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 69 | Tubular Cond. (.05 mfd.) | 30-4511 | 96 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 70 | Tubular Cond. (.05 mfd.) | 30-4511 | 97 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 71 | Tubular Cond. (.05 mfd.) | 30-4511 | 98 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 72 | Resistor (51,000 ohms, 1/2 watt) | 33-510339 | 99 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 73 | Resistor (4,000 ohms, 1/2 watt) | 33-240339 | 100 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 74 | No. 1 Control Amp. Coil | 33-510339 | 101 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 75 | Resistor (750,000 ohms, 1/2 watt) | 33-510339 | 102 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 76 | Tubular Cond. (.02 mfd.) | 30-4511 | 103 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 77 | Resistor (130,000 ohms, 1/2 watt) | 33-510339 | 104 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 78 | Tubular Cond. (.01 mfd.) | 30-4511 | 105 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 79 | Resistor (150,000 ohms, 1/2 watt) | 33-510339 | 106 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 80 | Tubular Cond. (.05 mfd.) | 30-4511 | 107 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 81 | Resistor (99,000 ohms, 1/2 watt) | 33-510339 | 108 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 82 | Tubular Cond. (.05 mfd.) | 30-4511 | 109 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 83 | Tubular Cond. (.05 mfd.) | 30-4511 | 110 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 84 | No. 2 Control Amp. Coil | 32-3087 | 111 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 85 | Tubular Cond. (.05 mfd.) | 30-4511 | 112 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 86 | Tubular Cond. (.05 mfd.) | 30-4511 | 113 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 87 | Resistor (300 ohms, 1/2 watt) | 33-130339 | 114 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 88 | Sensitivity Control (150 ohms) | 33-510339 | 115 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 89 | No. 1 Control Amp. Coil | 32-3087 | 116 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 90 | Silver Mica Cond. (150 mfd.) | 30-1121 | 117 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 91 | Air Padder (Secondary Inductor) | 40-6414 | 118 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 92 | Secondary Inductor | 40-6414 | 119 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 93 | Wave Switch | 42-1444 | 120 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 94 | Wave Switch | 42-1444 | 121 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 95 | Loop Assembly | 38-9882 | 122 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 96A | Mica Cond. (.250 mfd.) | 61-0033 | 123 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 97 | Ant. Series Trans. | 32-3226 | 124 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |

Replacement Parts

Model 40-216

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|-----------|---|-----------|-----------|---|-----------|-----------|--------------------------------------|-----------|
| 1 | Loop Assy. (Broadcast) | 38-9882 | 53 | Resistor (45,000 ohms, 1/2 watt) | 33-345339 | 90C | Osc. Trans. No. 3 | |
| 1A | Resistor (10,000 ohms, 1/2 watt) | 33-103339 | 54 | Tubular Cond. (.02 mfd.) | 30-4481 | 90D | Osc. Trans. No. 4 | 32-3042 |
| 2 | Mica Cond. (250 mmfd.) | 61-0033 | 55 | Tone Control (3.0 meg.) | 33-5287 | | 870-1180 K.C. | |
| 2A | Loop Assy. (Short Wave) | 38-9883 | 56 | Tubular Cond. (.01 mfd.) | 30-4572 | 90E | Osc. Trans. No. 5 | |
| 3 | Compensator | 31-6326 | 57 | Tubular Cond. (.01 mfd.) | 30-4572 | 90F | Osc. Trans. No. 6 | |
| 3X | Ant. Series Trans. (Broadcast) | 32-3291 | 58 | Resistor (51,000 ohms, 1/2 watt) | 33-351339 | | 900-1470 K.C. | 32-3041 |
| 4 | Compensator | 31-6326 | 59 | Resistor (490,000 ohms, 1/2 watt) | 33-449339 | 90G | Osc. Trans. No. 7 | |
| 5 | Series Trans. (Short Wave) | 32-3293 | 60 | Resistor (490,000 ohms, 1/2 watt) | 33-449339 | 90H | Osc. Trans. No. 8 | |
| 5A | Ant. Trans. (Police Shunt) | 32-3292 | 61 | Resistor (240,000 ohms, 1/2 watt) | 33-424339 | | 1100-1600 K.C. | 32-3041 |
| 6 | Mica Cond. (250 mmfd.) | 61-0033 | 62 | Tubular Cond. (.01 mfd.) | 30-4501 | 91 | Silver Mica Cond. (370 mmfd.) | 30-1110 |
| 6A | Resistor (2.0 meg., 1/2 watt) | 33-520339 | 63 | Output Trans. | 30-4499 | 92 | Silver Mica Cond. (370 mmfd.) | 30-1110 |
| 7 | Tubular Cond. (.05 mfd.) | 30-4123 | 64 | Cone and Voice Coil Assy. | 32-7998 | | Bakeplate Cond. (.05 mfd.) | 33-3362 |
| 8 | Resistor (150,000 ohms, 1/2 watt) | 33-115339 | | Spkr. Part No. 36-1450-2 | 36-1450-2 | | Resistor (150 ohms) | 30-2356 |
| 9 | Resistor (13,000 ohms, 1/2 watt) | 33-123339 | 65 | Resistor (1.0 meg., 1/2 watt) | 36-4089 | 95 | Electrolytic Cond. (16 mfd., 200 V.) | 30-1181 |
| 11 | Tubular Cond. (.05 mfd.) | 30-4123 | | Spkr. Part No. 36-1450-4 | 36-4111 | | Choke Coil | 30-4123 |
| 12 | R. F. Trans. (Broadcast, Pushbutton and Pull) | 32-3230 | 66 | Tubular Cond. (.01 mfd.) | 30-4501 | | Tubular Cond. (.05 mfd.) | 30-4123 |
| 12X | Mica Condenser (35 mmfd.) | 30-1141 | 68 | Resistor (1,000 ohms, 1/2 watt) | 33-351339 | 98 | Tubular Cond. (.05 mfd.) | 30-4123 |
| 13 | R. F. Trans. (Broadcast Manual) | 32-3222 | 69 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 99 | Tubular Cond. (.1 mfd.) | 30-4451 |
| 13X | Compensator | 32-3222 | 70 | Electrolytic Cond. (25 mfd., 300 V.) | 30-2360 | 100 | Tubular Cond. (.05 mfd.) | 30-4451 |
| 14 | R. F. Trans. (Short Wave) | 32-3046 | 71 | Field Coil (Replace Spkr. Part No. 36-1450) | 36-1450 | 101 | Resistor (4000 ohms, 1/2 watt) | 30-240339 |
| 14X | Mica Cond. (5 mmfd.) | 30-1097 | 72 | Resistor (Wirewound, Bias) | 33-3364 | 102 | Resistor (51,000 ohms, 1/2 watt) | 32-3275 |
| 15 | Tubular Cond. (.05 mfd.) | 30-4511 | 73 | Power Trans. (115 V., 50-60 cycles) | 32-8001 | 104 | Tubular Cond. (.02 mfd.) | 30-4516 |
| 16 | Tubular Cond. (.05 mfd.) | 30-4511 | 74 | Power Trans. (115 V., 25-40 cycles) | 32-8017 | 105 | Resistor (750,000 ohms, 1/2 watt) | 32-3275 |
| 17 | Tubular Cond. (.1 mfd.) | 30-4435 | 75 | Bypass Cond. (.05 mfd., 110 V. Plug) | 30-4576 | 106 | Resistor (270,000 ohms, 1/2 watt) | 32-3275 |
| 18 | Resistor (51,000 ohms, 1/2 watt) | 33-351339 | 76 | Pilot Lamp Bulb (16 ohms) | 36-4111 | 107 | Tubular Cond. (.1 mfd.) | 30-4455 |
| 19 | Oscillator Trans. (Broadcast) | 32-3231 | 77 | Pilot Lamp Resistor (16 ohms) | 30-016331 | 108 | Resistor (120,000 ohms, 1/2 watt) | 30-412339 |
| 20 | Oscillator Trans. (Police) | 32-3294 | 77 | Pilot Lamp (Dial) | 34-2064 | 109 | Resistor (99,000 ohms, 1/2 watt) | 33-399339 |
| 21 | Oscillator Trans. (Police, Wave) | 32-3294 | 78 | Filament Trans. (115 V., 50-60 cycles) | 32-7999 | 110 | Tubular Cond. (.05 mfd.) | 30-4123 |
| 22 | Compensator (section, oscillator) | 31-6266 | 78 | Filament Trans. (115 V., 25-40 cycles) | 32-8016 | 111 | Tubular Cond. (.05 mfd.) | 30-4123 |
| 23 | Compensator (Broadcast, Low Frequency) | 31-6230 | 79 | Choke Coil | 32-1281 | 112 | Resistor (50,000 ohms, 1/2 watt) | 30-4123 |
| 24 | Tracking Cond. (1230 mmfd.) | 31-6230 | 79X | Motor Trans. (115 V., 50-60 cycles) | 32-8015 | 113 | Tubular Cond. (.05 mfd.) | 33-515339 |
| 25 | Tracking Cond. (1230 mmfd.) | 31-6263 | 80 | Motor Trans. (115 V., 25-40 cycles) | 32-8015 | 114 | Tubular Cond. (.05 mfd.) | 33-515339 |
| 26 | Mica Cond. (250 mmfd.) | 61-0033 | 80 | Motor Assy. (Volume Control) | 35-1151 | 115 | Tubular Cond. (.05 mfd.) | 30-4444 |
| 27 | Resistor (32,000 ohms, 1/2 watt) | 33-115339 | | Stepper Unit (Complete) | 38-9889 | 116 | Tubular Cond. (.05 mfd.) | 30-4444 |
| 28 | Resistor (10,000 ohms, 1/2 watt) | 33-103339 | | Rotary Switch (Stepper Unit) | 42-1448 | 117 | Sensitivity Control | 33-103339 |
| 29 | Resistor (18,000 ohms, 1/2 watt) | 33-183339 | 81X | B. C. Resistor (Wirewound, 10 ohms) | 34-2064 | 118 | Resistor (500 ohms, 1/2 watt) | 32-3086 |
| 30 | Resistor (5,000 ohms, 1/2 watt) | 30-2334 | 82 | Pilot Lamp Assy. (Station Indicator) | 32-7999 | 119 | No. 1 Control Amp. Trans. | 32-3086 |
| 31 | Electrolytic Cond. (25 mfd., 250 V.) | 61-0033 | 84 | Switch (Volume Control-Motor) | 30-4576 | 120 | Silver Mica Cond. (130 mmfd.) | 31-6268 |
| 32 | Mica Cond. (250 mmfd.) | 61-0033 | 85 | Resistor (150 ohms, 1/2 watt) | 33-115339 | 121 | Impedance Matching (Secondary) | 40-6415 |
| 33 | 1st I. F. Trans. Assy. | 30-4572 | 86 | Tubular Cond. (.01 mfd.) | 30-4499 | 122 | Secondary Inductor (Mystery Tuning) | 30-4415 |
| 34 | Tubular Cond. (.01 mfd.) | 33-103339 | 87 | Tubular Cond. (.1 mfd.) | 30-4499 | 123 | Wave Switch | 31-2417 |
| 35 | Resistor (330,000 ohms, 1/2 watt) | 33-333339 | 88 | Electrolytic Cond. (30 mfd., 30 V.) | 31-6264 | 124 | Tuning Cond. | |
| 36 | Resistor (330,000 ohms, 1/2 watt) | 33-333339 | | Compensator No. 1 | | | | |
| 37 | 2nd I. F. Trans. Assy. | 32-2645 | 89A | Compensator No. 2 | | | | |
| 38 | Mira Cond. (110 mmfd.) | 30-4576 | 89B | Compensator No. 3 | | | | |
| 39 | Tubular Cond. (.01 mfd.) | 30-4478 | 89C | Compensator No. 4 | | | | |
| 40 | Tubular Cond. (.01 mfd.) | 30-4478 | 89D | Compensator No. 5 | | | | |
| 41 | Mica Cond. (50 mmfd.) | 33-5300 | | Compensator No. 6 | | | | |
| 42 | Volume Control | 33-703339 | | Compensator No. 7 | | | | |
| 43 | Resistor (70,000 ohms, 1/2 watt) | 30-4576 | 89E | Compensator No. 8 | | | | |
| 44 | Tubular Cond. (.004 mfd.) | 30-4576 | 89F | Compensator No. 9 | | | | |
| 45 | Resistor (2.0 meg., 1/2 watt) | 33-520339 | | Compensator No. 10 | | | | |
| 46 | Tubular Cond. (.015 mfd.) | 30-4529 | 89G | Compensator No. 11 | | | | |
| 47 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 89H | Compensator No. 12 | | | | |
| 48 | Tubular Cond. (.01 mfd.) | 30-4511 | | Compensator No. 13 | | | | |
| 49 | Resistor (99,000 ohms, 1/2 watt) | 33-399339 | 90 | Elect. Pushbutton Trans. Assy. (8 Trans.) | 32-3091 | 132A | Spark Filter Choke | 32-3278 |
| 50 | Tubular Cond. (.01 mfd.) | 30-4169 | 90A | Osc. Trans. No. 1 | | 132B | Resistor (100 ohms, 1/2 watt) | 33-110339 |
| 51 | Resistor (490,000 ohms, 1/2 watt) | 33-449339 | 90B | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 132C | Tubular Cond. (.05 mfd.) | 30-4444 |
| 52 | Resistor (5,000 ohms, 1/2 watt) | 33-250339 | 90C | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 132D | Tubular Cond. (.05 mfd.) | 30-4444 |

| WIRELESS REMOTE CONTROL UNIT | | | |
|------------------------------|--|-----------|---------|
| 125 | Primary Inductor | 32-3097 | |
| 126 | Silver Mica Cond. (200 mmfd.) | 30-1115 | 32-3097 |
| 127 | Tubular Cond. (.05 mfd.) | 30-4511 | |
| 128 | Air Padder | 33-5288 | |
| 129 | Resistor (500 ohms, 1/2 watt) | 33-1503 | 33-5039 |
| 130 | Mystery Pack (Battery) | 41-8023 | |
| 131 | Dial Unit (Pulser) | 31-5704 | |
| 132 | Spark Filter Assy. (Inside of Sepper Unit) | 38-9889 | |
| 132A | Spark Filter Choke | 32-3278 | |
| 132B | Resistor (100 ohms, 1/2 watt) | 33-110339 | |
| 132C | Tubular Cond. (.05 mfd.) | 30-4444 | |
| 132D | Tubular Cond. (.05 mfd.) | 30-4444 | |

SCHEMATIC DIAGRAM MODEL 40-503 & 40-506

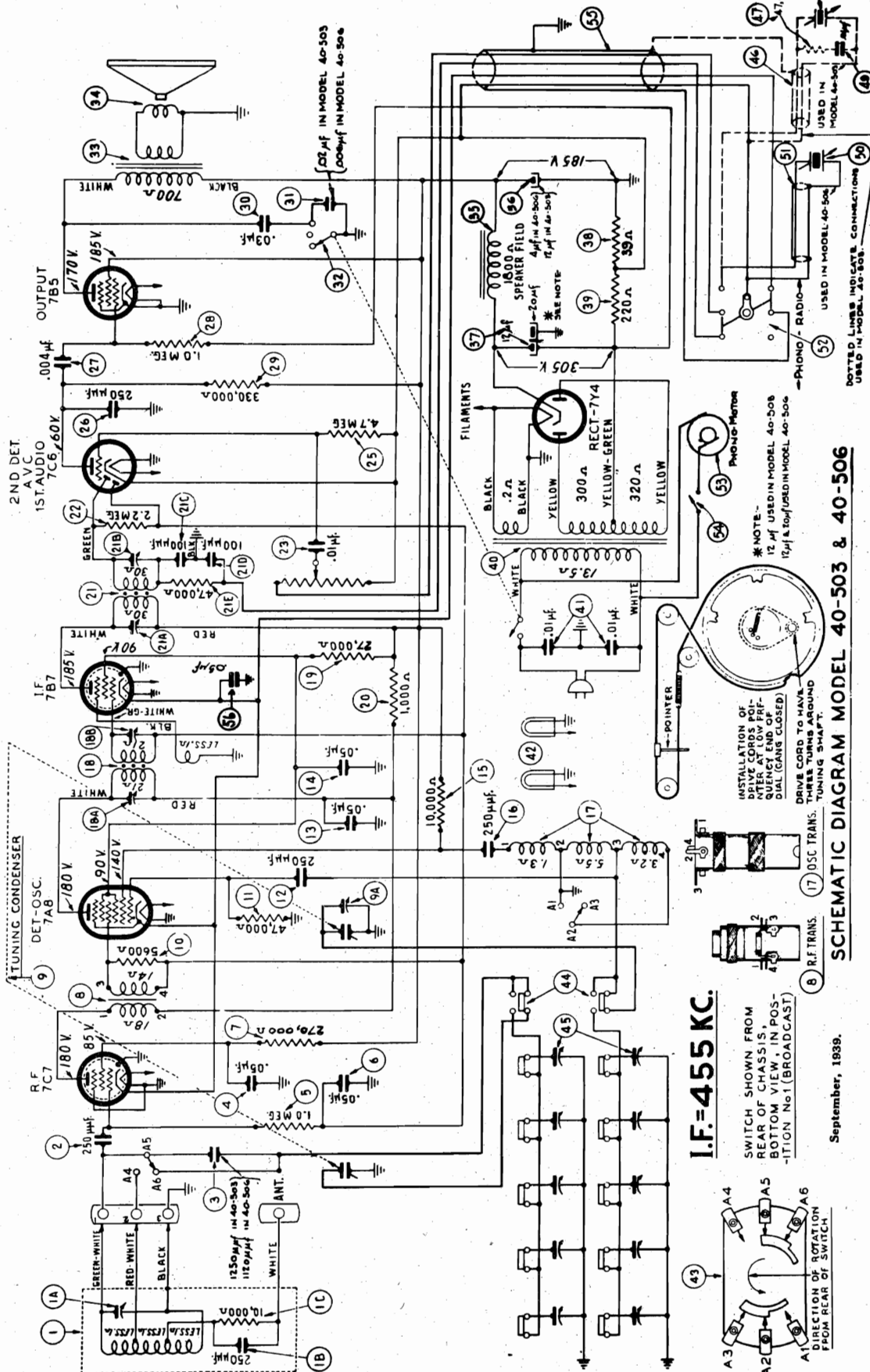
C.. NO SIGNAL BEING RECEIVED.
FOR OTHER DATA, SEE INDEX
POWER CONSUMPTION:
Model 40-503—65 watts,
Model 40-506—65 watts.

Model 40-506 is assembled in a console type cabinet and consists of a manually operated crystal pickup and will play 10" or 12" records. An automatic switch is provided on this model that starts the phonograph motor when the pickup is lifted from the mounting.

Model 40-503 is assembled in a table model cabinet and consists of a semi-automatic crystal pickup mechanism which will play 10" or 12" records.* The pickup is placed on the record automatically when the lid is closed.

THE VOLTAGES INDICATED WERE MEASURED WITH A 1000 OHMS PER VOLTMMETER. PHILCO MODEL 027. LINE VOLTAGE 115 VOLTS A. C.. NO SIGNAL BEING RECEIVED.

September, 1939.



Replacement Parts — Model 40-525

| | | | |
|-----------------------------------|----------|---------------------------------|---------|
| Drive Cord Assy. (Pointer) .. | 31-2399A | Spring (Tuning, Drive Cord) .. | 28-8751 |
| Drive Cord Assy. (Tun. Cord) .. | 31-2400 | Spring (Pointer, Drive Cord) .. | 28-8953 |
| Dial .. | 27-5807 | Spring (Tuning Shaft Assy.) .. | 28-8955 |
| Excutechcon Pin (Push-Buttons) .. | 28-5742 | Sparker .. | 38-1489 |
| Excutechcon Pin (Push-Buttons) .. | W-1074 | Sockets (Loktal Tubes) .. | 55-0375 |
| Ignition Bushing (Drive Shaft) .. | 27-9437 | Tuning Shaft .. | 66-0052 |
| Knobs (Tuning, Tone) .. | 27-4332 | Tuning Drive Drum Assembly .. | 38-9883 |
| Volume, Wave Switch) .. | 27-4824 | Tab (Dial) .. | 27-5826 |
| Knobs (Push-Buttons) .. | 27-4824 | Tab (Television) .. | 27-9450 |
| Pilot Lamp Socket Assembly .. | 38-9904 | Tab Kit .. | 40-6473 |
| Knobs (Push-Buttons) .. | 56-1352 | Washer (C Type, Tun. Shaft) .. | 28-2043 |
| Rubber Bushing .. | 27-9432 | | |

| SCHÉ. | PART. | SCHÉ. | DESCRIPTION | PART. | SCHÉ. | DESCRIPTION | PART. |
|-------|--|-----------|-------------|-------|------------------------------|-------------|-------|
| No. | No. | No. | | No. | No. | | No. |
| 1 | Loop Assembly | 38-9926 | | 34 | Cone & Voice Coil Assembly: | | |
| 1A | Compensator | 31-6318 | | | For Spkr. 36-1484-2, 40-503 | 36-4126 | |
| 1B | Mica Condenser (250 mmfd.) | 61-0033 | | | For Spkr. 36-1487-2, 40-506 | 36-4068 | |
| 1C | Resist. (10,000 ohms, ½ watt) | 33-510339 | | | For Spkr. 36-1487-3, 40-506 | 36-4128 | |
| 2 | Mica Condenser (250 mmfd.) | 61-0033 | | 35 | Field Coil | | |
| 3 | Mica Condenser (1250 mmfd., 40-503) | 5886 | | | (For 40-503, Replace Spkr.) | 36-1484 | |
| 4 | Tubular Condenser (.05 mfd., 1120 mmfd., 40-506) | 30-1140 | | 36 | (For 40-506, Replace Spkr.) | 36-1487 | |
| 4 | Tubular Condenser (.05 mfd., 30-4518) | 30-4518 | | | Drive Cord (Cond. Drive) | 31-2400 | |
| 5 | Resistor (1.0 meg., ½ watt) | 33-510339 | | | Drive Drum (Tuning) | 38-9883 | |
| 6 | Tubular Condenser (.05 mfd., 30-4518) | 30-4518 | | | Excutechson (Stating Tubes) | 28-5742 | |
| | | | | | Knobs (Push, Tone, Wave Sw.) | 27-4332 | |
| | | | | | Knobs (Vibration Switch) | 27-4824 | |

| SCHE. No. | DESCRIPTION | PART No. |
|--------------|---|-------------|
| 47 | Motor (110 volts, 60 cycles) | 35-1204 |
| 48 | Switch (Part of 46) | 35-1204 |
| 49 | Circuit Cartridge (Pickup) | 35-2030 |
| 50 | Pickup Cable Assembly | 35-2030 |
| 51 | Switch Section | 31-3508 |
| 52 | Changer | 318-1775 |
| 53 | Radio-Phono Switch | 42-1551 |
| 54 | Cable (Radio-Phono Switch) | L-3217 |
| 55 | Condenser (.05 mfd.) | 30-4518 |
| 56 | Resistor (500 ohms, 1/2 watt) | 33-250339 |
| 57 | Resistor (500 ohms, 1/2 watt) | 33-250339 |
| 58 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 59 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 60 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 61 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 62 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 63 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 64 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 65 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 66 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 67 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 68 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 69 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 70 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 71 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 72 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 73 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 74 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 75 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 76 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 77 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 78 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 79 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 80 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 81 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 82 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 83 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 84 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 85 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 86 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 87 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 88 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 89 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 90 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 91 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 92 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 93 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 94 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 95 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 96 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 97 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 98 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 99 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |
| 100 | Resistor (1,000 ohms, 1/2 watt) | 33-510339 |

[illegible]

| MISCELLANEOUS PARTS | |
|--|-------------------------------------|
| Resist. (47,000 ohms, 1/2 watt) 33-3472339 | |
| Mica Condenser (250 mfd.) 61-0033 | Automatic Record Changer... 35-1180 |
| Tubular Condenser (.05 mfd.) 30-4518 | Cabinet..... 10462-A |
| Tubular Condenser (.05 mfd.) 30-4518 | Cable (Power)..... L-3199 |
| Resist. (10,000 ohms, 1/2 watt) 33-103339 | Cable (Speaker) 41-3339 |
| Resist. (10,000 ohms, 1/2 watt) 33-10033 | Cable (Radio-Phone)..... L-3217 |
| Oscillator Transformer..... 32-3212 | Dial Scale..... 27-5506 |
| Set of I. F. Trans. Assembly..... 32-3210 | |

| | | |
|----------------------------|--|--------------------|
| 28 | Resis. (330,000 ohms, ½ watt) | 33-443339 |
| 29 | Tube Socket (No. 6) | 30-4449 |
| 30 | Tubular Condenser (.03 mfd.) | 30-4449 |
| 31 | Tubular Condenser (.02 mfd., 400-cycles) (.006 mfd., 40-508) | 30-4481 30-4504 |
| 32 | Tone Control & On-Off Switch | 42-1520 |
| 33 | Output Transformer | 32-8063 |
| MISCELLANEOUS PARTS | | |
| | Cabinet (40-503) | 10406 |
| | "C" Washer (Tuning Shaft) | 28-2043 |
| | "T" Nut (Motor Mtg.) | W-1758 |
| | Washer (Motor Mtg.) | W-1366 |
| | Screw (Chassis Mtg., 40-503) | W-2030 |
| | Screw (Chassis Mtg., 40-506) | W-783 |
| | Screw (Pickup Mtg.) | W-599 |
| | Screw (Motor Mtg.) | W-2027 |
| | Condenser (.05 mfd.) | 30-4518 |
| 54 | Motor Switch (40-506) | 42-1536 |
| | Motor Switch (40-503) | 42-1498 |
| 55 | Cable (Radio-Phono) | L-3217 |

| | |
|--------------------------------------|-----------|
| Drive Card (Pencil Drive)..... | 31-2400 |
| Drive Drum (Timing)..... | 38-9883 |
| Erectochron (Station Table)..... | 98-5742 |
| Knobs (Velo, Tune, Wave Sw.)..... | 37-4332 |
| Knob (Pushbutton Switch)..... | 27-4824 |
| Knob (Phone Off-On)..... | 37-4627 |
| Pilot Light Socket Assy..... | 38-3906 |
| Resistor (2,000 ohms, 1/2 watt)..... | 32-3241 |
| Resistor (1,000 ohms, 1/2 watt)..... | 32-3241 |
| 2nd L.F. Trans. Assembly..... | 33-592339 |
| Resistor (2.2 meg., 1/2 watt)..... | 33-592339 |
| Tubular Condenser (.01 mfd.)..... | 30-4872 |
| Volume Control (.5 meg.)..... | 33-5332 |
| Resistor (4.7 meg., 1/2 watt)..... | 33-547339 |
| Micro Condenser (250 mmfd.)..... | 61-0038 |

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|--------------|------------------------------|-------------|--------------|-------------------------------|-------------|--------------|--------------------------------|-------------|
| 1 | Loop Assembly (Broadcast) .. | 38-5943 | 24 | Silver Mica Cond. (500 mmfd.) | 30-1138 | 48 | Elect. Cond. (12 mid., 400 V.) | 30-2410 |
| 1A | Compensator | 31-0308 | 25 | Compensator (Two Section) .. | 31-0317 | 49 | Elect. Cond. (12 mid., 400 V.) | 30-2410 |

| | |
|-----------------------------|----------|
| Shaft (Tuning) | 318-1506 |
| Spring (Cond. Drive Cord) | 28-8751 |
| Spring (Cond. Drive Cord) | 28-8953 |
| Spring (Painter Drive Cord) | 28-8953 |
| Spring (Tuning Shaft Assy.) | 36-1480 |
| Speaker | 55-0575 |
| Sockets | 27-5526 |
| Tub (Dial) | 27-5526 |
| Tub (Television) | 27-5490 |

| | | |
|-----|--|----------|
| 1C | Resist. (10,000 ohms, 1/2 watt) | 32-10339 |
| 2 | Loop Assembly (Short Wave) | 38-9444 |
| 2A | Compensator | 31-0820 |
| 3 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 4 | Mica Condenser (1,000 mm(d), 1/2 watt) | 30-1063 |
| 5 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 5A | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 6 | Loop Assembly (Long Wave) | 38-9444 |
| 7 | Loop Assembly (Short Wave) | 38-9444 |
| 8 | Compensator | 31-0820 |
| 9 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 10 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 11 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 12 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 13 | Loop Assembly (Long Wave) | 38-9444 |
| 14 | Loop Assembly (Short Wave) | 38-9444 |
| 15 | Compensator | 31-0820 |
| 16 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 17 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 18 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 19 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 20 | Loop Assembly (Long Wave) | 38-9444 |
| 21 | Loop Assembly (Short Wave) | 38-9444 |
| 22 | Compensator | 31-0820 |
| 23 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 24 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 25 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 26 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 27 | Loop Assembly (Long Wave) | 38-9444 |
| 28 | Loop Assembly (Short Wave) | 38-9444 |
| 29 | Compensator | 31-0820 |
| 30 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 31 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 32 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 33 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 34 | Loop Assembly (Long Wave) | 38-9444 |
| 35 | Loop Assembly (Short Wave) | 38-9444 |
| 36 | Compensator | 31-0820 |
| 37 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 38 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 39 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 40 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 41 | Loop Assembly (Long Wave) | 38-9444 |
| 42 | Loop Assembly (Short Wave) | 38-9444 |
| 43 | Compensator | 31-0820 |
| 44 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 45 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 46 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 47 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 48 | Loop Assembly (Long Wave) | 38-9444 |
| 49 | Loop Assembly (Short Wave) | 38-9444 |
| 50 | Compensator | 31-0820 |
| 51 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 52 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 53 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 54 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 55 | Loop Assembly (Long Wave) | 38-9444 |
| 56 | Loop Assembly (Short Wave) | 38-9444 |
| 57 | Compensator | 31-0820 |
| 58 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 59 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 60 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 61 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 62 | Loop Assembly (Long Wave) | 38-9444 |
| 63 | Loop Assembly (Short Wave) | 38-9444 |
| 64 | Compensator | 31-0820 |
| 65 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 66 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 67 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 68 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 69 | Loop Assembly (Long Wave) | 38-9444 |
| 70 | Loop Assembly (Short Wave) | 38-9444 |
| 71 | Compensator | 31-0820 |
| 72 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 73 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 74 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 75 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 76 | Loop Assembly (Long Wave) | 38-9444 |
| 77 | Loop Assembly (Short Wave) | 38-9444 |
| 78 | Compensator | 31-0820 |
| 79 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 80 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 81 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 82 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 83 | Loop Assembly (Long Wave) | 38-9444 |
| 84 | Loop Assembly (Short Wave) | 38-9444 |
| 85 | Compensator | 31-0820 |
| 86 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 87 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 88 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 89 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 90 | Loop Assembly (Long Wave) | 38-9444 |
| 91 | Loop Assembly (Short Wave) | 38-9444 |
| 92 | Compensator | 31-0820 |
| 93 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 94 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 95 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 96 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 97 | Loop Assembly (Long Wave) | 38-9444 |
| 98 | Loop Assembly (Short Wave) | 38-9444 |
| 99 | Compensator | 31-0820 |
| 100 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 101 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 102 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 103 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 104 | Loop Assembly (Long Wave) | 38-9444 |
| 105 | Loop Assembly (Short Wave) | 38-9444 |
| 106 | Compensator | 31-0820 |
| 107 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 108 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 109 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 110 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 111 | Loop Assembly (Long Wave) | 38-9444 |
| 112 | Loop Assembly (Short Wave) | 38-9444 |
| 113 | Compensator | 31-0820 |
| 114 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 115 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 116 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 117 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 118 | Loop Assembly (Long Wave) | 38-9444 |
| 119 | Loop Assembly (Short Wave) | 38-9444 |
| 120 | Compensator | 31-0820 |
| 121 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 122 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 123 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 124 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 125 | Loop Assembly (Long Wave) | 38-9444 |
| 126 | Loop Assembly (Short Wave) | 38-9444 |
| 127 | Compensator | 31-0820 |
| 128 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 129 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 130 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 131 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 132 | Loop Assembly (Long Wave) | 38-9444 |
| 133 | Loop Assembly (Short Wave) | 38-9444 |
| 134 | Compensator | 31-0820 |
| 135 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 136 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 137 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 138 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 139 | Loop Assembly (Long Wave) | 38-9444 |
| 140 | Loop Assembly (Short Wave) | 38-9444 |
| 141 | Compensator | 31-0820 |
| 142 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 143 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 144 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 145 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 146 | Loop Assembly (Long Wave) | 38-9444 |
| 147 | Loop Assembly (Short Wave) | 38-9444 |
| 148 | Compensator | 31-0820 |
| 149 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 150 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 151 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 152 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 153 | Loop Assembly (Long Wave) | 38-9444 |
| 154 | Loop Assembly (Short Wave) | 38-9444 |
| 155 | Compensator | 31-0820 |
| 156 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 157 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 158 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 159 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 160 | Loop Assembly (Long Wave) | 38-9444 |
| 161 | Loop Assembly (Short Wave) | 38-9444 |
| 162 | Compensator | 31-0820 |
| 163 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 164 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 165 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 166 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 167 | Loop Assembly (Long Wave) | 38-9444 |
| 168 | Loop Assembly (Short Wave) | 38-9444 |
| 169 | Compensator | 31-0820 |
| 170 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 171 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 172 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 173 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 174 | Loop Assembly (Long Wave) | 38-9444 |
| 175 | Loop Assembly (Short Wave) | 38-9444 |
| 176 | Compensator | 31-0820 |
| 177 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 178 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 179 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 180 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 181 | Loop Assembly (Long Wave) | 38-9444 |
| 182 | Loop Assembly (Short Wave) | 38-9444 |
| 183 | Compensator | 31-0820 |
| 184 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 185 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 186 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 187 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 188 | Loop Assembly (Long Wave) | 38-9444 |
| 189 | Loop Assembly (Short Wave) | 38-9444 |
| 190 | Compensator | 31-0820 |
| 191 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 192 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 193 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 194 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 195 | Loop Assembly (Long Wave) | 38-9444 |
| 196 | Loop Assembly (Short Wave) | 38-9444 |
| 197 | Compensator | 31-0820 |
| 198 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 199 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 200 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 201 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 202 | Loop Assembly (Long Wave) | 38-9444 |
| 203 | Loop Assembly (Short Wave) | 38-9444 |
| 204 | Compensator | 31-0820 |
| 205 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 206 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 207 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 208 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 209 | Loop Assembly (Long Wave) | 38-9444 |
| 210 | Loop Assembly (Short Wave) | 38-9444 |
| 211 | Compensator | 31-0820 |
| 212 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 213 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 214 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 215 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 216 | Loop Assembly (Long Wave) | 38-9444 |
| 217 | Loop Assembly (Short Wave) | 38-9444 |
| 218 | Compensator | 31-0820 |
| 219 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 220 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 221 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 222 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 223 | Loop Assembly (Long Wave) | 38-9444 |
| 224 | Loop Assembly (Short Wave) | 38-9444 |
| 225 | Compensator | 31-0820 |
| 226 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 227 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 228 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 229 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 230 | Loop Assembly (Long Wave) | 38-9444 |
| 231 | Loop Assembly (Short Wave) | 38-9444 |
| 232 | Compensator | 31-0820 |
| 233 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 234 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 235 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 236 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 237 | Loop Assembly (Long Wave) | 38-9444 |
| 238 | Loop Assembly (Short Wave) | 38-9444 |
| 239 | Compensator | 31-0820 |
| 240 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 241 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 242 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 243 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |
| 244 | Loop Assembly (Long Wave) | 38-9444 |
| 245 | Loop Assembly (Short Wave) | 38-9444 |
| 246 | Compensator | 31-0820 |
| 247 | Mica Condenser (3 mm(d), 1/2 watt) | 30-1097 |
| 248 | Mica Condenser (1,000 ohms, 1/2 watt) | 32-10339 |
| 249 | Mica Condenser (250 mm(d), 1/2 watt) | 61-0033 |
| 250 | Resistor (1.0 meg., 1/2 watt) | 32-51039 |

Field Coil 30-2825
(Replaces Spkr. Part No. 36-1480)

Electrolytic Condenser
 (4 mid., 409 V.) 30-2401
 (12.20 mfd., 475 V.) 30-2437
 (Electrolytic Condens.)

Resistor (39 ohms, ½ watt)..... 30-059839
 (39 ohm, 1 watt) 30-059839
 (39 ohm, 2 watt) 30-059839

MOUNTING PARTS

Tab Kit (Station Call Letters) 40-6473

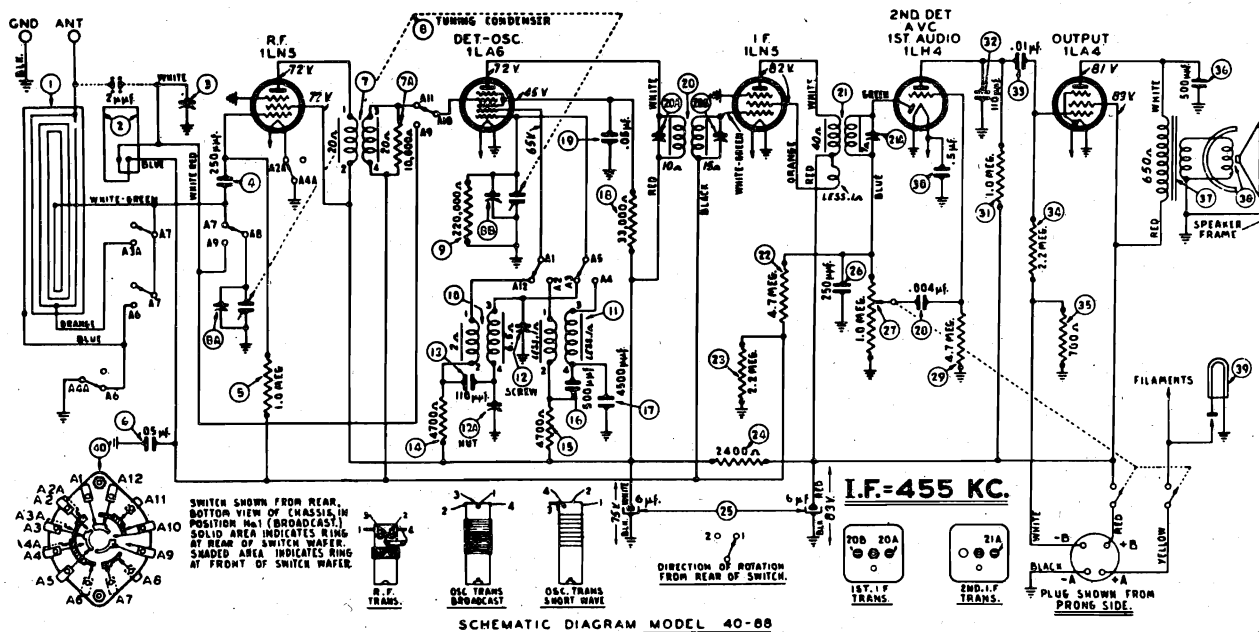
| | | | | | |
|----|---|-----------|-----|--|-----------|
| 8 | Tubular Condenser (.02 mfd.) | 35-4518 | 35 | Volume Control (.5 mfd.) | 35-4529 |
| 9 | Tubular Condenser (.03 mfd.) | 33-333339 | 36 | Tubular Condenser (.01 mfd.) | 35-4572 |
| 10 | Resist. (33,000 ohms, $\frac{1}{2}$ watt) | 33-138331 | 37 | Resistor (4.7 meg. $\frac{1}{2}$ watt) | 35-447339 |
| 11 | Resistor (390 ohms, $\frac{1}{2}$ watt) | 33-138331 | 38 | Resistor (4.7 meg. $\frac{1}{2}$ watt) | 35-447339 |
| 12 | Tubular Condenser (.02 mfd.) | 33-4518 | 39 | Mica Cond. (.250 mfd.) | 61-00323 |
| 13 | Resist. (47,000 ohms, $\frac{1}{2}$ watt) | 33-447339 | 40 | Tubular Cond. (.004 mfd.) | 35-4578 |
| 14 | Mica Condenser (100 mfd.) | 30-1128 | 41 | Resistor (.003 mfd.) | 35-4589 |
| 15 | Resist. (10,000 ohms, $\frac{1}{2}$ watt) | 33-310939 | 42 | Resist. (330,000 ohms, $\frac{1}{2}$ watt) | 33-453539 |
| 16 | R.F. Transformer | 33-3194 | 43 | Crystal Pickups | 33-4030 |
| 17 | | | 44 | Crystal Pickups | 33-4030 |
| 18 | | | 45 | Crystal Pickups | 33-4030 |
| 19 | | | 46 | Crystal Pickups | 33-4030 |
| 20 | | | 47 | Crystal Pickups | 33-4030 |
| 21 | | | 48 | Crystal Pickups | 33-4030 |
| 22 | | | 49 | Crystal Pickups | 33-4030 |
| 23 | | | 50 | Crystal Pickups | 33-4030 |
| 24 | | | 51 | Crystal Pickups | 33-4030 |
| 25 | | | 52 | Crystal Pickups | 33-4030 |
| 26 | | | 53 | Crystal Pickups | 33-4030 |
| 27 | | | 54 | Crystal Pickups | 33-4030 |
| 28 | | | 55 | Crystal Pickups | 33-4030 |
| 29 | | | 56 | Crystal Pickups | 33-4030 |
| 30 | | | 57 | Crystal Pickups | 33-4030 |
| 31 | | | 58 | Crystal Pickups | 33-4030 |
| 32 | | | 59 | Crystal Pickups | 33-4030 |
| 33 | | | 60 | Crystal Pickups | 33-4030 |
| 34 | | | 61 | Crystal Pickups | 33-4030 |
| 35 | | | 62 | Crystal Pickups | 33-4030 |
| 36 | | | 63 | Crystal Pickups | 33-4030 |
| 37 | | | 64 | Crystal Pickups | 33-4030 |
| 38 | | | 65 | Crystal Pickups | 33-4030 |
| 39 | | | 66 | Crystal Pickups | 33-4030 |
| 40 | | | 67 | Crystal Pickups | 33-4030 |
| 41 | | | 68 | Crystal Pickups | 33-4030 |
| 42 | | | 69 | Crystal Pickups | 33-4030 |
| 43 | | | 70 | Crystal Pickups | 33-4030 |
| 44 | | | 71 | Crystal Pickups | 33-4030 |
| 45 | | | 72 | Crystal Pickups | 33-4030 |
| 46 | | | 73 | Crystal Pickups | 33-4030 |
| 47 | | | 74 | Crystal Pickups | 33-4030 |
| 48 | | | 75 | Crystal Pickups | 33-4030 |
| 49 | | | 76 | Crystal Pickups | 33-4030 |
| 50 | | | 77 | Crystal Pickups | 33-4030 |
| 51 | | | 78 | Crystal Pickups | 33-4030 |
| 52 | | | 79 | Crystal Pickups | 33-4030 |
| 53 | | | 80 | Crystal Pickups | 33-4030 |
| 54 | | | 81 | Crystal Pickups | 33-4030 |
| 55 | | | 82 | Crystal Pickups | 33-4030 |
| 56 | | | 83 | Crystal Pickups | 33-4030 |
| 57 | | | 84 | Crystal Pickups | 33-4030 |
| 58 | | | 85 | Crystal Pickups | 33-4030 |
| 59 | | | 86 | Crystal Pickups | 33-4030 |
| 60 | | | 87 | Crystal Pickups | 33-4030 |
| 61 | | | 88 | Crystal Pickups | 33-4030 |
| 62 | | | 89 | Crystal Pickups | 33-4030 |
| 63 | | | 90 | Crystal Pickups | 33-4030 |
| 64 | | | 91 | Crystal Pickups | 33-4030 |
| 65 | | | 92 | Crystal Pickups | 33-4030 |
| 66 | | | 93 | Crystal Pickups | 33-4030 |
| 67 | | | 94 | Crystal Pickups | 33-4030 |
| 68 | | | 95 | Crystal Pickups | 33-4030 |
| 69 | | | 96 | Crystal Pickups | 33-4030 |
| 70 | | | 97 | Crystal Pickups | 33-4030 |
| 71 | | | 98 | Crystal Pickups | 33-4030 |
| 72 | | | 99 | Crystal Pickups | 33-4030 |
| 73 | | | 100 | Crystal Pickups | 33-4030 |

| | | |
|--|----------|--|
| Power Transformer (115 V, 50-60 cycles) | 32-8064 | |
| Bakelite Cond. (01-01 mfd) | 32033-DG | |
| Pilot Lamp | 32064 | |
| Wave Switch | 42-1494 | |
| Pushbutton Switch | 42-1528 | |
| Radio Fader Strip | 31-6315 | |
| Motor Switch | 42-1548 | |
| Nail Escutcheon Mounting | W-1074 | |
| Nut Speaker Mounting | W-1247A3 | |
| Nut Phone Switch Mfg. | W-664F44 | |
| Screw (Chassis Mounting) | W-2068 | |
| Screw (Speaker Plug) | W-1714 | |
| Washer (Chassis Mounting) | W-140F43 | |
| Washer (Speaker Mounting) | 27-7467 | |
| "C" Washer (Tuning Shaft) | 28-2043 | |

| | | |
|-----|--------------------------------------|-----------|
| 66 | Switch (Off-On Motor)..... | 42-1544 |
| 67 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 68 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 69 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 70 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 71 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 72 | Oscillator Transformer..... | 32-31195 |
| 73 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 74 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 75 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 76 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 77 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 78 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 79 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 80 | Oscillator Transformer..... | 32-31195 |
| 81 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 82 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 83 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 84 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 85 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 86 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 87 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 88 | Oscillator Transformer..... | 32-31195 |
| 89 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 90 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 91 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 92 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 93 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 94 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 95 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 96 | Oscillator Transformer..... | 32-31195 |
| 97 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 98 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 99 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 100 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 101 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 102 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 103 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 104 | Oscillator Transformer..... | 32-31195 |
| 105 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 106 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 107 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 108 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 109 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 110 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 111 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 112 | Oscillator Transformer..... | 32-31195 |
| 113 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 114 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 115 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 116 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 117 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 118 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 119 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 120 | Oscillator Transformer..... | 32-31195 |
| 121 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 122 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 123 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 124 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 125 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 126 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 127 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 128 | Oscillator Transformer..... | 32-31195 |
| 129 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 130 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 131 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 132 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 133 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 134 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 135 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 136 | Oscillator Transformer..... | 32-31195 |
| 137 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 138 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 139 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 140 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 141 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 142 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 143 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 144 | Oscillator Transformer..... | 32-31195 |
| 145 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 146 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 147 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 148 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 149 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 150 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 151 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 152 | Oscillator Transformer..... | 32-31195 |
| 153 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 154 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 155 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 156 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 157 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 158 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 159 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 160 | Oscillator Transformer..... | 32-31195 |
| 161 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 162 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 163 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 164 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 165 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 166 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 167 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 168 | Oscillator Transformer..... | 32-31195 |
| 169 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 170 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 171 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 172 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 173 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 174 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 175 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 176 | Oscillator Transformer..... | 32-31195 |
| 177 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 178 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 179 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 180 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 181 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 182 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 183 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 184 | Oscillator Transformer..... | 32-31195 |
| 185 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 186 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 187 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 188 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 189 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 190 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 191 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 192 | Oscillator Transformer..... | 32-31195 |
| 193 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 194 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 195 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 196 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 197 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 198 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 199 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 200 | Oscillator Transformer..... | 32-31195 |
| 201 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 202 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 203 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 204 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 205 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 206 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 207 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 208 | Oscillator Transformer..... | 32-31195 |
| 209 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 210 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 211 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 212 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 213 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 214 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 215 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 216 | Oscillator Transformer..... | 32-31195 |
| 217 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 218 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 219 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 220 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 221 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 222 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 223 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 224 | Oscillator Transformer..... | 32-31195 |
| 225 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 226 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 227 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 228 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 229 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 230 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 231 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 232 | Oscillator Transformer..... | 32-31195 |
| 233 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 234 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 235 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 236 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 237 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 238 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 239 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 240 | Oscillator Transformer..... | 32-31195 |
| 241 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 242 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 243 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 244 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 245 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 246 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 247 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 248 | Oscillator Transformer..... | 32-31195 |
| 249 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 250 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 251 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 252 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 253 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 254 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 255 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 256 | Oscillator Transformer..... | 32-31195 |
| 257 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 258 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 259 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 260 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 261 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 262 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 263 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 264 | Oscillator Transformer..... | 32-31195 |
| 265 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 266 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 267 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 268 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 269 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 270 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 271 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 272 | Oscillator Transformer..... | 32-31195 |
| 273 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 274 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 275 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 276 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 277 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 278 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 279 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 280 | Oscillator Transformer..... | 32-31195 |
| 281 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 282 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 283 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 284 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 285 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 286 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 287 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 288 | Oscillator Transformer..... | 32-31195 |
| 289 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 290 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 291 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 292 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 293 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 294 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 295 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 296 | Oscillator Transformer..... | 32-31195 |
| 297 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 298 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 299 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 300 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 301 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 302 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 303 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 304 | Oscillator Transformer..... | 32-31195 |
| 305 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 306 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 307 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 308 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 309 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 310 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 311 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 312 | Oscillator Transformer..... | 32-31195 |
| 313 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 314 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 315 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 316 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 317 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 318 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 319 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 320 | Oscillator Transformer..... | 32-31195 |
| 321 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 322 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 323 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 324 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 325 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 326 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 327 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 328 | Oscillator Transformer..... | 32-31195 |
| 329 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 330 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 331 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 332 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 333 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 334 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 335 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 336 | Oscillator Transformer..... | 32-31195 |
| 337 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 338 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 339 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 340 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 341 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 342 | Tubular Condenser (.05 mfd.)..... | 30-4518 |
| 343 | Resistor (470 ohms, 1/2 watt)..... | 33-147339 |
| 344 | Oscillator Transformer..... | 32-31195 |
| 345 | Mica Condenser (.250 mfd.)..... | 61-00333 |
| 346 | Resist. (33,000 ohms, 1/2 watt)..... | 33-333339 |
| 347 | Resistor (1500 ohms, 1/2 watt)..... | 33-115331 |
| 348 | Resist. (4700 ohms, 1/2 watt)..... | 33-247339 |
| 349 | Tubular Condenser (.2 mfd.)..... | 30-4536 |
| 350 | Tubular Condenser (.05 mfd.)..... | 3 |

PHILCO RADIO & TELEV. CORP.

MODEL 40-88(121)
Schematic, Voltage
Chassis, Trimmers



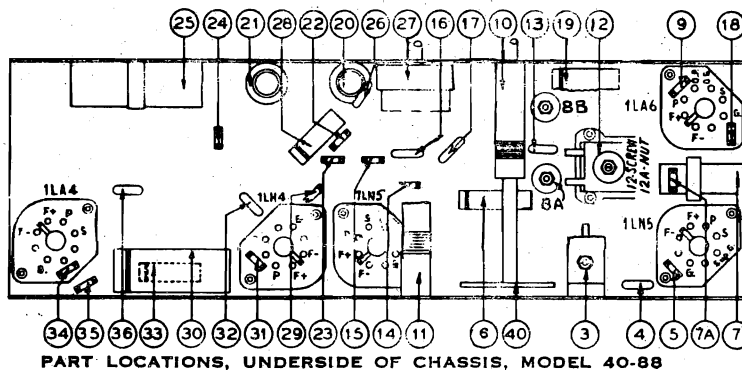
Replacement Parts — Model 40-88, Code 121

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|-----------|--|-----------|-----------|-------------------------------|-----------|
| 1 | Loop Assembly (Broadcast) | 38-8917 | 34 | Resistor (2.2 meg., 1/2 watt) | 33-522339 |
| 2 | Loop Assembly (Short Wave) | 38-8865 | 35 | Resistor (700 ohms, 1/2 watt) | 33-170339 |
| 3 | Compensator | 31-6288 | 36 | Mica Condenser (500 mmfd.) | 30-1114 |
| 4 | Mica Condenser (250 mmfd.) | 61-0033 | 37 | Output Transformer | 32-8096 |
| 5 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 38 | Cone and Voice Coil Assembly | 36-4121 |
| 6 | Tubular Condenser (.05 mfd.) | 30-4519 | 39 | Pilot Lamp | 34-2246 |
| 7 | R. F. Transformer Assembly | 32-3219 | 40 | Wave Switch | 42-1499 |
| 7A | Resistor (10,000 ohms, 1/2 watt) | 33-310339 | | | |
| 8 | Tuning Condenser Assembly | 31-2378 | | | |
| 9 | Resistor (220,000 ohms, 1/2 watt) | 33-422339 | | | |
| 10 | Oscillator Transformer (Broadcast) | 32-3249 | | | |
| 11 | Oscillator Transformer (Short Wave) | 32-3220 | | | |
| 12 | Compensator | 31-6100 | | | |
| 13 | Mica Condenser (110 mmfd.) | 30-1130 | | | |
| 14 | Resistor (4700 ohms, 1/2 watt) | 33-247339 | | | |
| 15 | Resistor (4700 ohms, 1/2 watt) | 33-247339 | | | |
| 16 | Mica Condenser (500 mmfd.) | 30-1114 | | | |
| 17 | Mica Condenser (4500 mmfd.) | 30-1109 | | | |
| 18 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 | | | |
| 19 | Tubular Condenser (.05 mfd.) | 30-4519 | | | |
| 20 | 1st I. F. Transformer Assembly | 32-3222 | | | |
| 21 | 2nd I. F. Transformer Assembly | 33-547339 | | | |
| 22 | Resistor (4.7 meg., 1/2 watt) | 33-522339 | | | |
| 23 | Resistor (2.2 meg., 1/2 watt) | 33-522339 | | | |
| 24 | Resistor (2400 ohms, 1/2 watt) | 33-246339 | | | |
| 25 | Electrolytic Condenser (6-6 mf., 150 V.) | 30-2388 | | | |
| 26 | Mica Condenser (250 mmfd.) | 61-0033 | | | |
| 27 | Volume Control and On-Off Switch | 33-5310 | | | |
| 28 | Tubular Condenser (.004 mfd.) | 30-4578 | | | |
| 29 | Resistor (4.7 meg., 1/2 watt) | 33-547339 | | | |
| 30 | Tubular Condenser (.5 mfd.) | 30-4551 | | | |
| 31 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | | | |
| 32 | Mica Condenser (110 mmfd.) | 30-1130 | | | |
| 33 | Tubular Condenser (.01 mfd.) | 30-4572 | | | |

MISCELLANEOUS PARTS

| | |
|---------|--|
| 27-4855 | Box |
| 104-44A | Cabinet |
| 28-5002 | Clip (Coil Mounting) |
| 31-2380 | Drive Cord Assembly |
| 27-4511 | Dial |
| 56-1418 | Flag (On-Off Indication) |
| 56-6045 | Flag Bearing |
| 28-8947 | Flag Spring |
| 38-9861 | Flag Cam and Hub Assembly |
| 27-9472 | Gasket (Dial Mounting) |
| 27-4862 | Knobs (Tuning, Volume and Wave Switch) |
| 56-1467 | Pilot Lamp Socket Assembly |
| 27-4868 | Pointer |
| 27-4844 | Pushbutton (Pilot Lamp) |
| 28-8952 | Spring (Pilot Lamp) |
| 36-1482 | Speaker |
| 56-1255 | Speaker Grille |
| 28-8952 | Spring (Drive Cord) |
| 28-8665 | Spring (Wave Switch Centering) |
| 28-4342 | Snap Fastener (Dial Mounting) |
| 55-0575 | Socket (Locket) |
| 56-6070 | Tuning Shaft |
| 56-1486 | Tuning Drum |

FOR ALIGNMENT
SEE INDEX

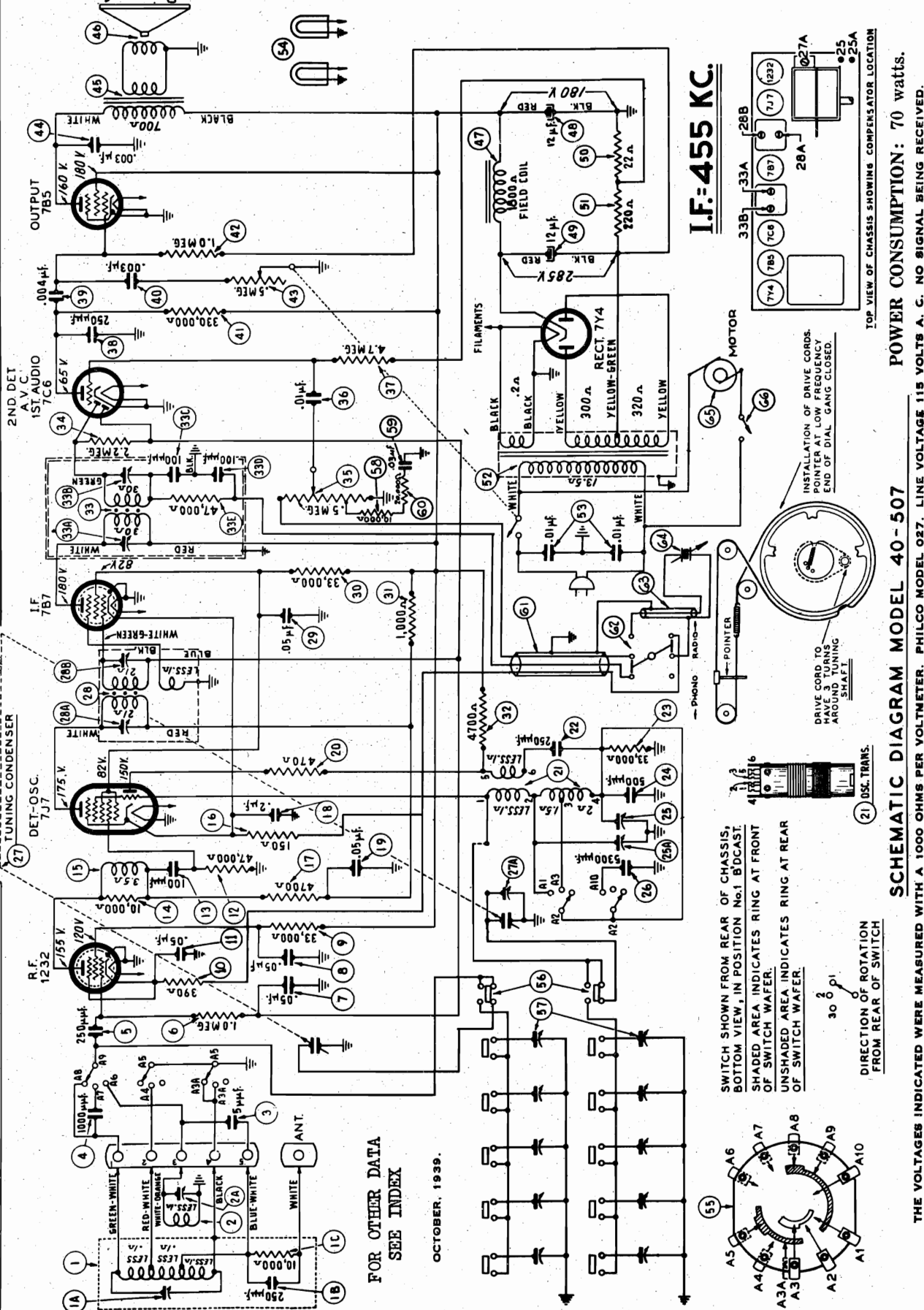


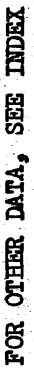
MODEL 40-507

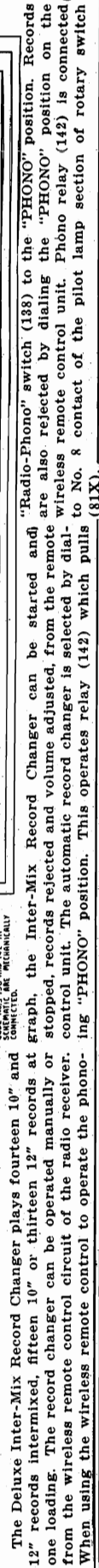
Schematic, Voltage

PHILCO RADIO & TELEV. CORP.

Trimmers



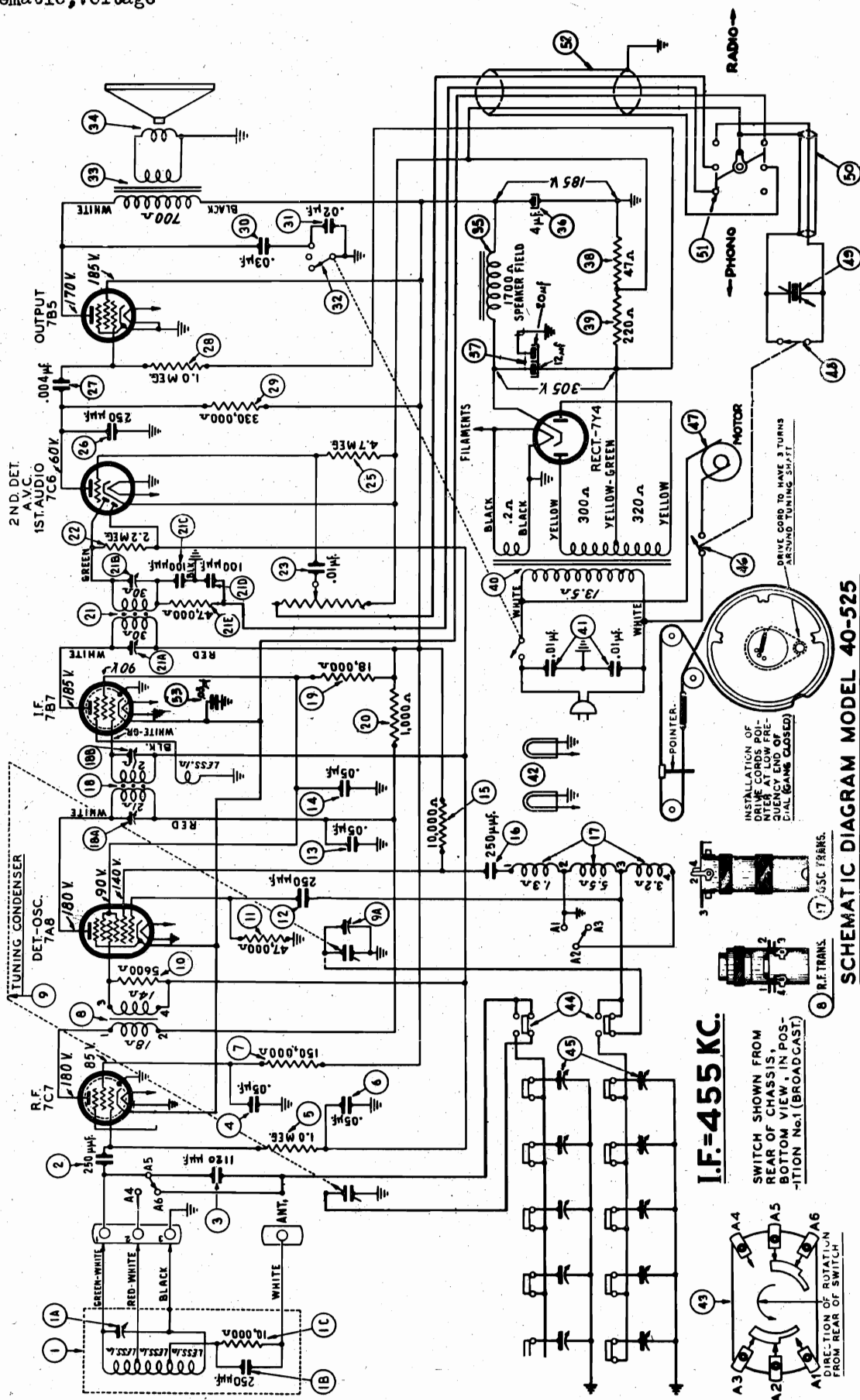




FOR OTHER DATA
SEE INDEX

MODEL 40-525(121)
Schematic, Voltage

PHILCO RADIO & TELEV. CORP.



MODEL 40-710

MODEL 40-715

Alignment

PHILCO RADIO & TELEV. CORP.

ALIGNMENT MODELS 40-710, 40-715

EQUIPMENT REQUIRED

(1) **Signal Generator.** In order to properly adjust this receiver, a calibrated signal generator such as Philco Model 077 A. C. or Model 177 battery operated are required. These signal generators cover a frequency range of 540 to 36,000 K. C.

(2) **Indicating Device.** To obtain maximum signal strength and accurate adjustment of the padders a vacuum tube volt-

meter and circuit tester such as Philco Models 027 and 028 is recommended. These testers also contain an audio output meter which may be used as an indicating device.

(3) **Aligning Tools.** Fiber handle screw driver, Philco Part No. 45-2610.

MODEL 40-710 CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeters: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit with the Philco aligning adaptor, Part No. 45-2767, as follows:

Remove the 7C6 tube from its socket and insert the aligning adaptor in the socket, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the voltmeter to the black wire.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and

screen terminals of the 35A5 tube. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

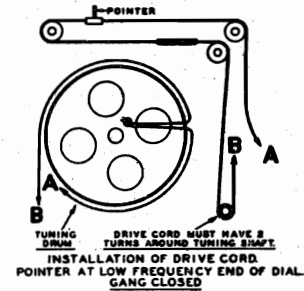


FIG. 1. DIAL CALIBRATION.

| Operations in Order | SIGNAL GENERATOR | | | RECEIVER | | | SPECIAL INSTRUCTIONS |
|---------------------|--------------------------------|----------------------|--------------|--------------|---------------------------------|---------------------|-------------------------|
| | Output Connections to Receiver | Dummy Antenna Note A | Dial Setting | Dial Setting | Control Settings | Adjust Compensators | |
| 1 | 7A8 | .1 mfd. | 455 K. C. | 580 K. C. | Vol. Max. Range Switch "Brdest" | 23A, 19B, 19A | |
| 2 | Ant. & Chassis | 400 ohms | 20 M. C. | 20 M. C. | Range Switch "S. W. 2" | 18B, 18A | Note C |
| 3 | Ant. & Chassis | 400 ohms | 7.0 M. C. | 7.0 M. C. | Range Switch "S. W. 1" | 16A | Rollgang |
| 4 | Ant. & Chassis | 200 mmfd. | 1400 K. C. | 1400 K. C. | Vol. Max. Range Switch "Brdest" | 16 | Note B |
| 5 | Ant. & Chassis | 200 mmfd. | 580 K. C. | 580 K. C. | Vol. Max. Range Switch "Brdest" | 15 | Rollgang Repeat Oper. 4 |

NOTE A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B—**DIAL CALIBRATION:** In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning

condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C—When adjusting compensator (18B) be sure to tune in the fundamental signal (20 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 910 K. C. below the fundamental signal, which will be 19.090 M. C.

MODEL 40-715 CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the converter grid (6J8G). The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the resistor.

2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and

screen terminals of the 41 tube. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 1. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

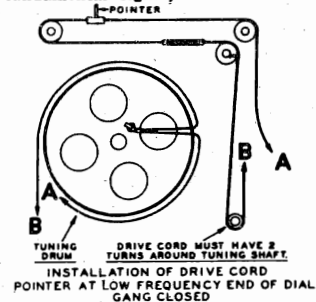


FIG. 1. DIAL CALIBRATION.

| Operations in Order | SIGNAL GENERATOR | | | RECEIVER | | | SPECIAL INSTRUCTIONS |
|---------------------|--------------------------------|----------------------|--------------|--------------|---|---------------------|--------------------------|
| | Output Connections to Receiver | Dummy Antenna Note A | Dial Setting | Dial Setting | Control Settings | Adjust Compensators | |
| 1 | 6J8EG | .1 mfd. | 455 K. C. | 580 K. C. | Vol. Max. Tone Treble Range Switch "Brdest" | 24, 16B, 16A | |
| 2 | Ant. & Grnd. | 200 mmfd. | 1500 K. C. | 1500 K. C. | Vol. Max. Tone Treble Range Switch "Brdest" | 9A, 15A | Note B |
| 3 | Ant. & Grnd. | 200 mmfd. | 580 K. C. | 580 K. C. | Vol. Max. Tone Treble Range Switch "Brdest" | 11 | Roll Gang Repeat Oper. 2 |
| 4 | Ant. & Grnd. | 400 ohms | 7.0 M. C. | 7.0 M. C. | Range Switch "Police" | 9 | Roll Gang |
| 5 | Ant. & Grnd. | 400 ohms | 20 M. C. | 20 M. C. | Range Switch "S.W." | 5A, 5 | Note C |

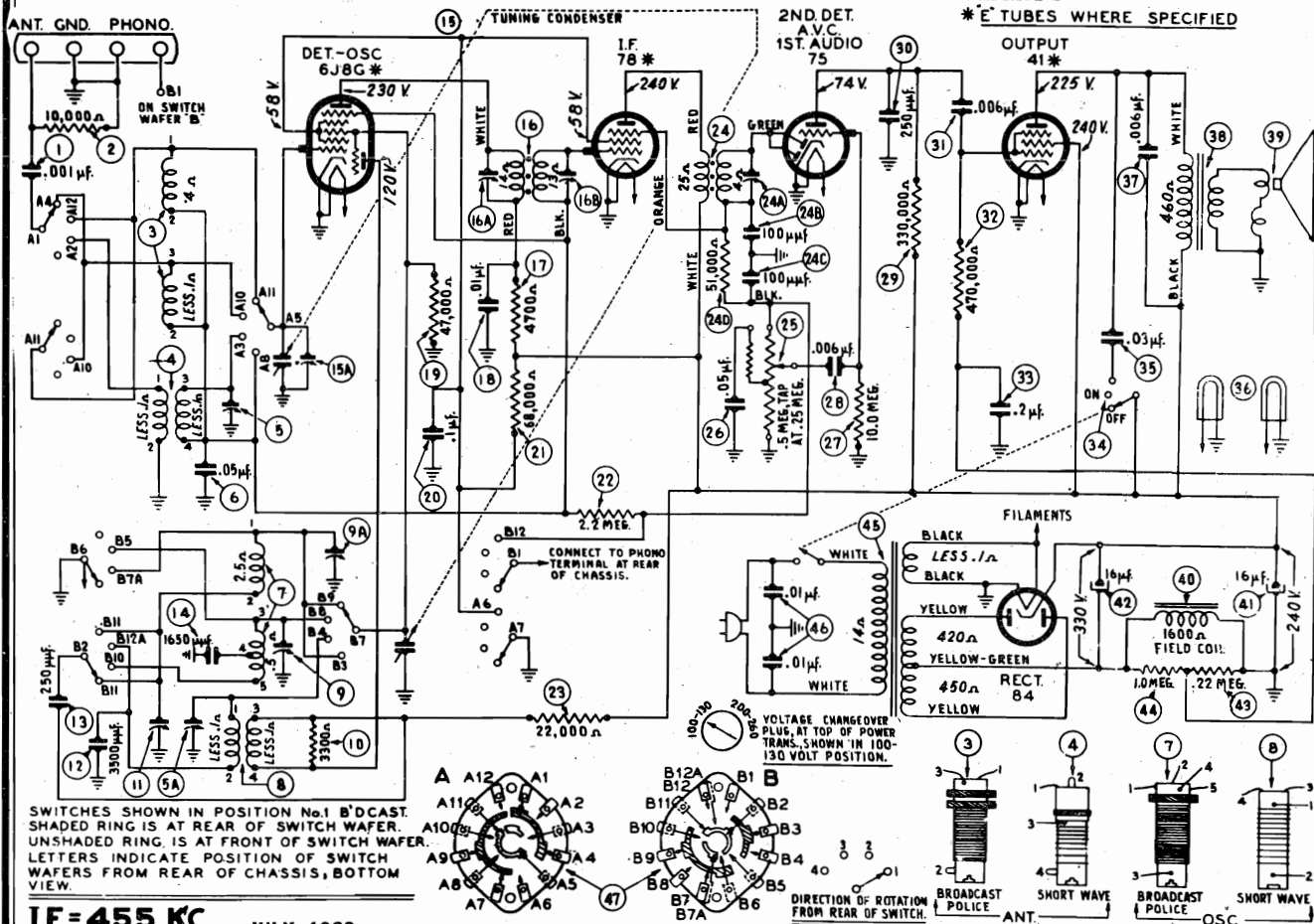
NOTE A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B—**DIAL CALIBRATION:** In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning

condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C—When adjusting compensator (5A) be sure to tune in the fundamental signal (20 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 910 K. C. below the fundamental signal, which will be 19.090 M. C.

PHILCO RADIO & TELEV. CORP. MODEL 40-715(121) Schematic, Voltage, Chassis Trimmers *E TUBES WHERE SPECIFIED



SWITCHES SHOWN IN POSITION No.1 B'DCAST. SHADED RING IS AT REAR OF SWITCH WAFER. UNSHADED RING IS AT FRONT OF SWITCH WAFER. LETTERS INDICATE POSITION OF SWITCH WAFERS FROM REAR OF CHASSIS, BOTTOM VIEW.

IF=455 KC. JULY, 1939.

Replacement Parts — Model 40-715

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|-----------|---|-----------|-----------|---------------------------|----------|-----------|--|----------|
| 1 | Tubular Cond. (.001 mfd.) | 30-4582 | 46 | Line Cond. (.01-.01 mfd.) | 3903-ODG | 3 | Pilot Lamp Socket Assembly | 38-9796 |
| 2 | Resistor (10,000 ohms, 1/2 watt) | 33-310339 | 47 | Wave Switch | 42-1480 | 4 | Speaker | 38-1276 |
| 3 | Antenna Trans. (Broadcast, Police) | 32-3143 | | | | 5 | Socket (5 prong, type 84 tube) | 36-1472 |
| 4 | Antenna Trans. (Short Wave) | 32-3143 | | | | 6 | Socket (6 prong, type 41, 75 & 78 tubes) | 27-6035 |
| 5A | Compensator (2 section) | 31-6287 | | | | 7 | Socket (8 prong, Octal, type 6J8G tube) | 27-6058 |
| 6 | Tubular Cond. (.05 mfd.) | 30-4609 | | | | 8 | Spring Clip (Coil Mounting) | 28-5002 |
| 7 | Oscillator Trans. (Broadcast, Police) | 32-3142 | | | | 9 | Spring (Drive Cord) | 28-8013 |
| 8 | Oscillator Trans. (Short Wave) | 32-3142 | | | | 10 | Station Card Shield | 27-5437 |
| 9 | Compensator (2 section) | 31-6287 | | | | 11 | Station Card Holder | 58-5273 |
| 9A | Resistor (3300 ohms, 1/2 watt) | 33-233339 | | | | 12 | Tuning Condenser Drum | 31-2356 |
| 10 | Compensator (1 section) | 31-6289 | | | | | | |
| 11 | Mica Cond. (3500 mmfd.) | 30-1095 | | | | | | |
| 12 | Mica Cond. (250 mmfd.) | 30-1119 | | | | | | |
| 13 | Mica Cond. (1650 mmfd.) | 58-77 | | | | | | |
| 14 | Tuning Condenser | 31-2357 | | | | | | |
| 15 | 1st I. F. Transformer | 32-3139 | | | | | | |
| 16A | Part of 16 | | | | | | | |
| 16B | Part of 16 | | | | | | | |
| 17 | Resistor (4700 ohms, 1/2 watt) | 33-247339 | | | | | | |
| 18 | Tubular Cond. (.03 mfd.) | 30-4572 | | | | | | |
| 19 | Resistor (47,000 ohms, 1/2 watt) | 33-347339 | | | | | | |
| 20 | Tubular Cond. (.1 mfd.) | 30-4583 | | | | | | |
| 21 | Resistor (68,000 ohms, 1/2 watt) | 33-368439 | | | | | | |
| 22 | Resistor (2.2 meg., 1/2 watt) | 33-522339 | | | | | | |
| 23 | Resistor (22,000 ohms, 1/2 watt) | 33-232339 | | | | | | |
| 24 | 2nd I. F. Transformer | 32-3140 | | | | | | |
| 24A | Part of 24 | | | | | | | |
| 24B | Part of 24 | | | | | | | |
| 24C | Part of 24 | | | | | | | |
| 25 | Volume Control (.5 meg.) | 33-5305 | | | | | | |
| 26 | Tubular Cond. (.05 mfd.) | 30-4519 | | | | | | |
| 27 | Resistor (10.0 meg., 1/2 watt) | 33-610339 | | | | | | |
| 28 | Tubular Cond. (.006 mfd.) | 30-4583 | | | | | | |
| 29 | Resistor (330,000 ohms, 1/2 watt) | 33-433339 | | | | | | |
| 30 | Mica Cond. (250 mmfd.) | 30-1119 | | | | | | |
| 31 | Tubular Cond. (.006 mfd.) | 30-4610 | | | | | | |
| 32 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 | | | | | | |
| 33 | Tubular Cond. (.2 mfd.) | 30-4567 | | | | | | |
| 34 | Tone Control and On-Off Switch | 42-1481 | | | | | | |
| 35 | Tubular Cond. (.03 mfd.) | 30-4517 | | | | | | |
| 36 | Pilot Lamp | 34-2084E | | | | | | |
| 37 | Tubular Cond. (.03 mfd.) | 30-4591 | | | | | | |
| 38 | Output Transformer | 32-6018 | | | | | | |
| 39 | Cone and Voice Coil Assembly (Spkr. Part No. 36-1452-2) | 30-4193 | | | | | | |
| 40 | Field Coil (Replace Spkr. Part No. 36-1452) | 30-2363 | | | | | | |
| 41 | Electrolytic Cond. (16 mfd., 300 V.) | 30-2364 | | | | | | |
| 42 | Electrolytic Cond. (16 mfd., 400 V.) | 30-2364 | | | | | | |
| 43 | Resistor (22 meg., 1/2 watt) | 33-522339 | | | | | | |
| 44 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | | | | | | |
| 45 | Power Transformer (100-130 V. 200-260 V., 50-60 cycles) | 32-8006 | | | | | | |

MISCELLANEOUS PARTS

- Clamp (Dial Mounting) 56-1271
- Cabinet 10365A
- Cable and Plug (Power Supply) L-2289
- A. C. Plug (Special) L-1367
- Dial 27-5469
- Drive Cord Assembly (Pointer Operation) 31-2359
- Gasket (Dial Mounting) 27-9258
- Knobs (Tuning, Tone, Volume, Wave Sw.) 27-4232

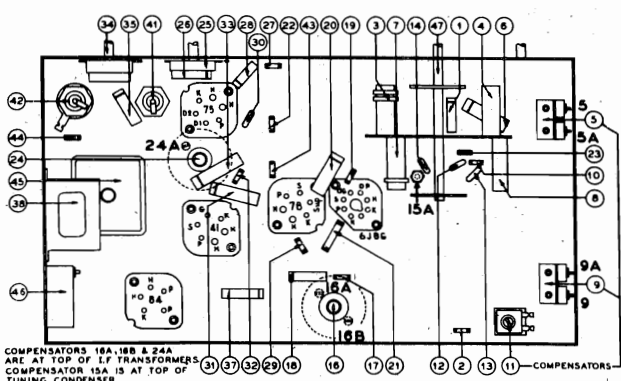


FIG. 2. PART LOCATIONS, UNDERSIDE OF CHASSIS.

SPECIFICATIONS

TYPE CIRCUIT: Model 40-715, code 121, is a five (5) tube A. C. operated radio employing a superheterodyne circuit with three tuning ranges for reception of Standard, Police and Shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. In addition other features of design are: Automatic Volume Control; Three Point Tone Control; Bass Compensation; and special temperature and humidity-proof compensators for reducing frequency drift to a minimum.

FOR ALIGNMENT SEE INDEX

POWER SUPPLY: 100-130 or 200-260 volts A. C. The voltage ranges are selected by inserting the changeover plug as indicated on top of the power transformer.

POWER CONSUMPTION: 40 watts.

TUNING RANGES: 530 to 1720 K. C. 2.3 to 7.4 M. C. 7.3 to 22 M. C.

I. F. FREQUENCY: 455 K. C.

PHILCO TUBES: 6J8EG, Converter-Oscillator; 78E, I. F. Amplifier; 75, Second Detector, First Audio and A. V. C.; 41E, Audio Output; 84, Rectifier.

MANY OF THE PARTS IN THIS PHILCO SUCH AS CONDENSERS AND RESISTORS, ARE HELD TO MUCH CLOSER TOLERANCE THAN STANDARD REPLACEMENT PARTS. GENUINE PHILCO REPLACEMENT PARTS MUST BE USED TO OBTAIN SATISFACTORY PERFORMANCE OF THIS MODEL.

MODEL 40-725(121)
MODEL 40-755(121)
Alignment

PHILCO RADIO & TELEV. CORP.

Philco-Tropic Models

40-725, code 121

40-755, code 121

SPECIFICATIONS

Model 40-725

TYPE CIRCUIT: Model 40-725, code 121, is a six (6) tube A. C. operated receiver employing a superheterodyne circuit with three tuning ranges for reception of Standard, Police and Shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. In addition other features of design are: Automatic Volume Control; Continuously Variable Tone Control; Bass Compensation, and special compensation for reducing frequency drift to a minimum.

POWER SUPPLY: 100-130 or 200-260 volt, 50-60 cycle, 60 watts. The voltage ranges are selected by inserting the plug as indicated on top of the power transformer.

TUNING RANGES:
530 to 1720 K. C. 2.3 to 7.4 M. C. 7.3 to 22 M. C.

I. F. FREQUENCY: 455 K. C.

PHILCO TUBES: 78E, R. F. Amplifier; 6J8EG, Converter-Oscillator; 78E, I. F. Amplifier; 75, Second Detector, First Audio, and A. V. C.; 41E, Pentode Audio Output; 84, Rectifier.

AUDIO OUTPUT: 2.5 watts.

AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Aerial, Part No. 40-6370 should be used and a good ground connection to the nearest water pipe or any other good ground.

CABINET DIMENSIONS:
Height, 14 $\frac{1}{4}$ " Width, 18 $\frac{1}{4}$ " Depth, 10 $\frac{1}{4}$ ".

Model 40-755

TYPE CIRCUIT: Model 40-755, code 121, is an eight (8) tube A. C. operated receiver employing a superheterodyne circuit with three tuning ranges for reception of Standard, Police and Shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. Other features of design are: Automatic Volume Control; Continuously Variable Tone Control; Bass Compensation; Push-Pull Pentode Audio Output; Tuning Resonance Indicator, and special compensation for reducing frequency drift to a minimum.

POWER SUPPLY: 100-130 or 200-260 volt, 50 to 60 cycle, 83 watts. The voltage ranges are selected by inserting the plug as indicated on top of the power transformer.

TUNING RANGES:
530 to 1720 K. C. 2.3 to 7.4 M. C. 7.3 to 22 M. C.

I. F. FREQUENCY: 455 K. C.

PHILCO TUBES: 78E, R. F. Amplifier; 6J8EG, Converter-Oscillator; 78E, I. F. Amplifier; 75, Second Detector, First Audio, and A. V. C.; 76, Inverter; two 42E, Pentode Audio Output; 80, Rectifier.

AUDIO OUTPUT: 6 watts.

AERIAL AND GROUND: Same as Model 40-725.

CABINET DIMENSIONS:
Height, 14 $\frac{1}{4}$ " Width, 20" Depth, 10 $\frac{1}{4}$ ".

ALIGNING COMPENSATING CONDENSERS

EQUIPMENT REQUIRED

(1) **Signal Generator.** In order to properly adjust this receiver a calibrated signal generator such as Philco Model 077 A. C. or Model 177 battery operated are required. These signal generators cover a frequency range of 540 to 36,000 K. C.

(2) **Indicating Device.** To obtain maximum signal strength and accurate adjustment of the padders a vacuum tube volt-

meter and circuit tester such as Philco Models 027 and 028 is recommended. These testers also contain an audio output meter which may be used as an indicating device.

(3) **Aligning Tools.** Fiber handle screw driver, Philco Part No. 45-2610.

CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the converter grid (6J8G). The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the resistor.

2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 41 tube. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 1. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

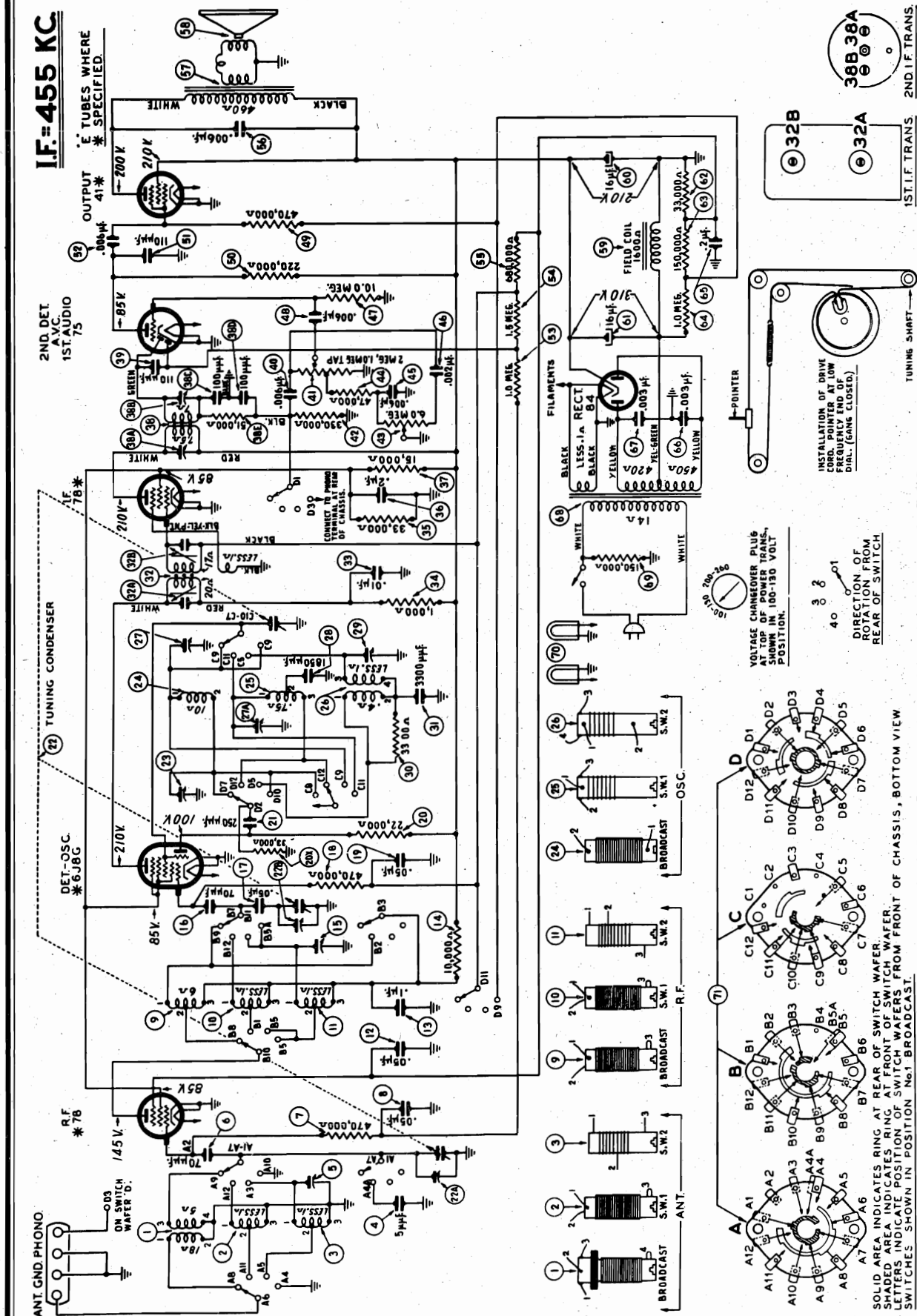
| Opera- tions in Order | SIGNAL GENERATOR | | | RECEIVER | | | | SPECIAL INSTRUCTIONS |
|-----------------------------|-----------------------------------|----------------------------|-----------------|-----------------|---|------------------------|-----------------------|-------------------------|
| | Output Connections to Receiver | Dummy Antenna Note A | Dial Setting | Dial Setting | Control Settings | Adjust Compensators | | |
| | | | | | | Model 40-725 | Model 40-755 | |
| 1 | 6J8G Grid and Ground | .1 mfd. | 455 K. C. | 580 K. C. | Vol. Max. Tone Treble | 38B, 38A, 32B, 32A | 39B, 39A, 33B, 33A | |
| 2 | Ant. & Grnd. | 200 mmfd. | 1500 K. C. | 1500 K. C. | Vol. Max. Range Switch "Brdcst" | 27, 22B, 22A | 27, 32B, 32A | Note B |
| 3 | Ant. & Grnd. | 200 mmfd. | 580 K. C. | 580 K. C. | Vol. Max. | 23 | 23 | Roll Gang |
| 4 | Ant. & Grnd. | 200 mmfd. | 1500 K. C. | 1500 K. C. | Vol. Max. | 27, 22B, 22A | 27, 32B, 32A | |
| 5 | Ant. & Grnd. | 400 ohms | 6.0 M. C. | 6.0 M. C. | Vol. Max. Tone Treble Range Switch "S.W.1" | 27A | 27A | Roll Gang |
| 6 | Ant. & Grnd. | 400 ohms | 20 M. C. | 20 M. C. | Vol. Max. Tone Treble Range Switch "S.W.2" | 29, 15, 5 | 29, 16, 5 | Note C |

NOTE A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B—**DIAL CALIBRATION:** In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning

condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C—When adjusting compensator (29) be sure to tune in the fundamental signal (20 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be 910 K. C. below the fundamental signal, which will be 19.090 M. C.



MODEL 40-725(121)
MODEL 40-755(121)
Chassis, Parts

PHILCO RADIO & TELEV. CORP.

Model 40-725, Code 121
Replacement Parts

| SCHE. No. | DESCRIPTION | PART No. |
|-----------|---|-----------|
| 1 | Antenna Transformer (Broadcast) | 32-2588 |
| 2 | Antenna Transformer (S. W. 1) | 32-3191 |
| 3 | Antenna Transformer (S. W. 2) | 32-3196 |
| 4 | Tubular Condenser (.5 mfd.) | 30-1120 |
| 5 | Compensator (Antenna S. W. 1) | 31-6288 |
| 6 | Mica Condenser (.70 mmfd.) | 30-1117 |
| 7 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 |
| 8 | Tubular Condenser (.05 mfd.) | 30-4609 |
| 9 | R. F. Transformer (Broadcast) | 32-3189 |
| 10 | R. F. Transformer (S. W. 1) | 32-3190 |
| 11 | R. F. Transformer (S. W. 2) | 32-3197 |
| 12 | Tubular Condenser (.05 mfd.) | 30-4519 |
| 13 | Tubular Condenser (.1 mfd.) | 30-4611 |
| 14 | Resistor (10,000 ohms, 1 watt) | 33-310439 |
| 15 | Compensator (R. F. S. W. 2) | 31-6283 |
| 16 | Mica Condenser (.70 mmfd.) | 30-1117 |
| 17 | Tubular Condenser (.05 mfd.) | 30-4519 |
| 18 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 |
| 19 | Tubular Condenser (.05 mfd.) | 30-4609 |
| 20 | Resistor (22,000 ohms, 1/2 watt) | 33-322339 |
| 20X | Resistor (33,000 ohms, 1/2 watt) | 33-333339 |
| 21 | Mica Condenser (.250 mmfd.) | 30-1119 |
| 22 | Tuning Condenser Assembly | 31-2186 |
| 23 | Compensator (Broadcast series) | 31-6287 |
| 24 | Oscillator Transformer (Broadcast) | 32-3254 |
| 25 | Oscillator Transformer (S. W. 1) | 32-3094 |
| 26 | Oscillator Transformer (S. W. 2) | 32-3102 |
| 27 | Compensator (Broadcast shunt) | 31-2687 |
| 27A | Compensator (S. W. 1) | 31-2687 |
| 28 | Tracking Condenser (.1850 mmfd.) | 31-6310 |
| 29 | Compensator (S. W. 2) | 31-6310 |
| 30 | Resistor (3300 ohms, 1/2 watt) | 33-233339 |
| 31 | Tracking Condenser (.3300 mmfd.) | 31-6311 |
| 32 | 1st I. F. Transformer Assembly | 32-3187 |
| 33 | Tubular Condenser (.01 mfd.) | 30-4572 |
| 34 | Resistor (1,000 ohms, 1/2 watt) | 33-210339 |
| 35 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 |
| 36 | Tubular Condenser (.2 mfd.) | 30-4587 |
| 37 | Resistor (15,000 ohms, 1/2 watt) | 33-315439 |
| 38 | 2nd I. F. Transformer Assembly | 32-3133 |
| 39 | Mica Condenser (.110 mmfd.) | 30-1118 |
| 40 | Tubular Condenser (.006 mfd.) | 30-4583 |
| 41 | Volume Control (2 meg.) | 33-5298 |
| 42 | Resistor (330,000 ohms, 1/2 watt) | 33-433339 |
| 43 | Tone Control and On-Off Switch | 33-5299 |
| 44 | Resistor (47,000 ohms, 1/2 watt) | 33-347339 |
| 45 | Tubular Condenser (.006 mfd.) | 30-4579 |
| 46 | Tubular Condenser (.002 mfd.) | 30-4579 |
| 47 | Resistor (10.0 meg., 1/2 watt) | 33-610339 |
| 48 | Tubular Condenser (.006 mfd.) | 30-4583 |
| 49 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 |
| 50 | Resistor (220,000 ohms, 1/2 watt) | 33-423339 |
| 51 | Mica Condenser (.110 mmfd.) | 30-1118 |
| 52 | Tubular Condenser (.006 mfd.) | 33-510339 |
| 53 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 54 | Resistor (1.5 meg., 1/2 watt) | 33-513339 |
| 55 | Resistor (680,000 ohms, 1/2 watt) | 33-610339 |
| 56 | Tubular Condenser (.006 mfd.) | 30-4581 |
| 57 | Output Transformer | 32-6018 |
| 58 | Cone and Voice Coil Assembly (Speaker Part No. 36-1452-2) | 36-4103 |
| 59 | Field Coil (Replace Spkr. Part No. 36-1453) | 36-1453 |
| 60 | Electrolytic Condenser (16 mfd., 300 V.) | 30-2319 |
| 61 | Electrolytic Condenser (16 mfd., 400 V.) | 30-2364 |
| 62 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 |
| 63 | Resistor (150,000 ohms, 1/2 watt) | 33-413339 |
| 64 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 65 | Tubular Condenser (.003 mfd.) | 30-4608 |
| 66 | Tubular Condenser (.003 mfd.) | 30-4608 |

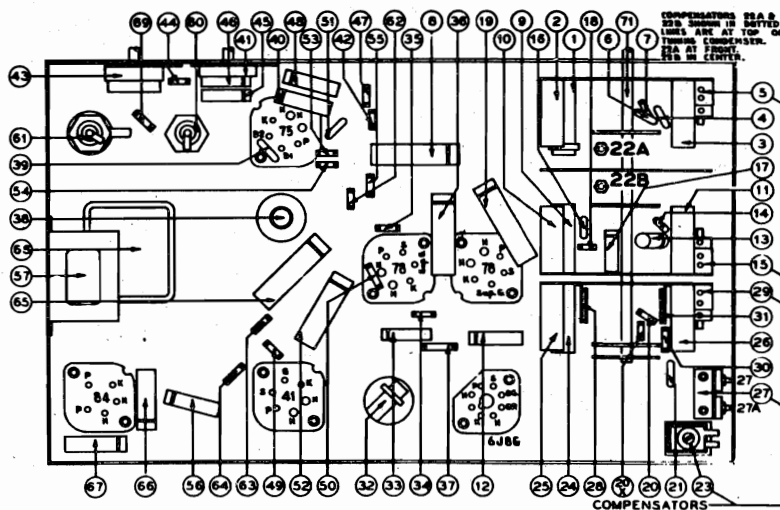


FIG. 1. MODEL 40-725 PART LOCATIONS, UNDERSIDE OF CHASSIS.

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|---------------------|--|-----------|-----------|---|----------|
| 67 | Tubular Condenser (.003 mfd.) | 30-4608 | 67 | Felt Strip (Bezel Mounting) | 27-8225 |
| 68 | Power Transformer (100-130 V., 200-260 V., 50-60 cycles) | 32-8006 | 68 | Knob (Tuning) | 27-4330 |
| 69 | Resistor (180,000 ohms, 1/2 watt) | 33-413339 | 69 | Knob (Tuning) | 27-4862 |
| 70 | Pilot Lamps | 34-2064E | 70 | Knob (Volume and Wave Switch) | 27-4332 |
| 71 | Wave Switch | 42-1504 | 71 | Pilot Lamp Socket Assembly | 38-9798 |
| MISCELLANEOUS PARTS | | | | | |
| | Bezel | 56-1222 | | Pointer | 56-1276 |
| | Cable and Plug (Power Supply) | L-2289 | | Screws (Bezel Mounting) | W-2071 |
| | Special Export Power Plug | L-1367 | | Spring (Drive Cord) | 28-8913 |
| | Cabinet (40-755T) | 10417A | | Spring Clip (Coil Mounting) | 28-8002 |
| | Drive Cord Assembly | 31-2330 | | Socket (5 prong, type 84 tube) | 27-6035 |
| | | | | Socket (6 prong, type 78, 41, 75 tubes) | 27-6036 |
| | | | | Socket (Octal, type 6J80 tube) | 27-6058 |
| | | | | Speaker (Model 40-755X) | 36-1460 |
| | | | | Tuning Drum and Coupling | 31-2327 |
| | | | | Vernier Drive (Tuning) | 31-2329 |

Model 40-755, Code 121
Replacement Parts

| SCHE. No. | DESCRIPTION | PART No. |
|-----------|---|-----------|
| 1 | Antenna Transformer (Broadcast) | 32-2588 |
| 2 | Antenna Transformer (S. W. 1) | 32-3191 |
| 3 | Antenna Transformer (S. W. 2) | 32-3196 |
| 4 | Mica Condenser (.5 mmfd.) | 30-1120 |
| 5 | Compensator | 31-6288 |
| 6 | Mica Condenser (.70 mmfd.) | 30-1117 |
| 7 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 |
| 8 | Tubular Condenser (.05 mfd.) | 30-4609 |
| 9 | R. F. Transformer (Broadcast) | 32-3189 |
| 10 | R. F. Transformer (S. W. 1) | 32-3190 |
| 11 | R. F. Transformer (S. W. 2) | 32-3197 |
| 12 | Tubular Condenser (.05 mfd.) | 30-4519 |
| 13 | Tubular Condenser (.1 mfd.) | 30-4611 |
| 14 | Resistor (10,000 ohms, 1 watt) | 33-310439 |
| 15 | Tubular Condenser (.05 mfd.) | 30-4519 |
| 16 | Compensator | 31-6288 |
| 17 | Tubular Condenser (.05 mfd.) | 30-4519 |
| 18 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 |
| 19 | Resistor (22,000 ohms, 1/2 watt) | 33-322339 |
| 20 | Mica Condenser (.70 mmfd.) | 30-1117 |
| 21 | Mica Condenser (.250 mmfd.) | 30-1119 |
| 22 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 |
| 23 | Compensator | 31-6288 |
| 24 | Oscillator Transformer (Broadcast) | 32-3254 |
| 25 | Oscillator Transformer (S. W. 1) | 32-3094 |
| 26 | Oscillator Transformer (S. W. 2) | 32-3102 |
| 27 | Compensator (2 sections) | 31-6287 |
| 28 | Tracking Condenser (.1850 mmfd.) | 31-6310 |
| 29 | Compensator | 31-6310 |
| 30 | Resistor (3300 ohms, 1/2 watt) | 33-233339 |
| 31 | Tracking Condenser (.3300 mmfd.) | 31-6311 |
| 32 | Tuning Condenser Assembly | 32-3187 |
| 33 | 1st I. F. Transformer Assembly | 32-3187 |
| 34 | Tubular Condenser (.01 mfd.) | 30-4572 |
| 35 | Resistor (1,000 ohms, 1/2 watt) | 33-210339 |
| 36 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 |
| 37 | Tubular Condenser (.2 mfd.) | 30-4587 |
| 38 | Resistor (15,000 ohms, 1/2 watt) | 33-315439 |
| 39 | 2nd I. F. Transformer Assembly | 32-3133 |
| 40 | Mica Condenser (.110 mmfd.) | 30-1118 |
| 41 | Tubular Condenser (.006 mfd.) | 30-4583 |
| 42 | Volume Control (2.0 meg.) | 33-5298 |
| 43 | Resistor (330,000 ohms, 1/2 watt) | 33-433339 |
| 44 | Tone Control and On-Off Switch | 33-5299 |
| 45 | Resistor (47,000 ohms, 1/2 watt) | 33-347339 |
| 46 | Tubular Condenser (.006 mfd.) | 30-4579 |
| 47 | Tubular Condenser (.002 mfd.) | 30-4579 |
| 48 | Resistor (10.0 meg., 1/2 watt) | 33-610339 |
| 49 | Tubular Condenser (.006 mfd.) | 30-4583 |
| 50 | Resistor (100,000 ohms, 1/2 watt) | 33-410339 |
| 51 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 |
| 52 | Mica Condenser (.250 mmfd.) | 30-1119 |
| 53 | Tubular Condenser (.006 mfd.) | 30-4610 |
| 54 | Resistor (47,000 ohms, 1/2 watt) | 33-347339 |
| 55 | Resistor (27,000 ohms, 1/2 watt) | 33-310339 |
| 56 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 |
| 57 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 58 | Resistor (1.5 meg., 1/2 watt) | 33-513339 |
| 59 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 |
| 60 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 |
| 61 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 |
| 62 | Tubular Condenser (.006 mfd.) | 30-4610 |
| 63 | Tubular Condenser (.110 mmfd.) | 30-1118 |
| 64 | Tubular Condenser (.003 mfd.) | 30-4582 |
| 65 | Output Transformer | 32-6058 |
| 66 | Cone and Voice Coil Assembly (Speaker Part No. 36-1453-4) | 36-4105 |
| 67 | Field Coil (Replace Spkr. Part No. 36-1453 (T Cabinet)) | 36-1453 |
| 68 | Electrolytic Condenser (16 mfd., 400 V.) | 30-2364 |

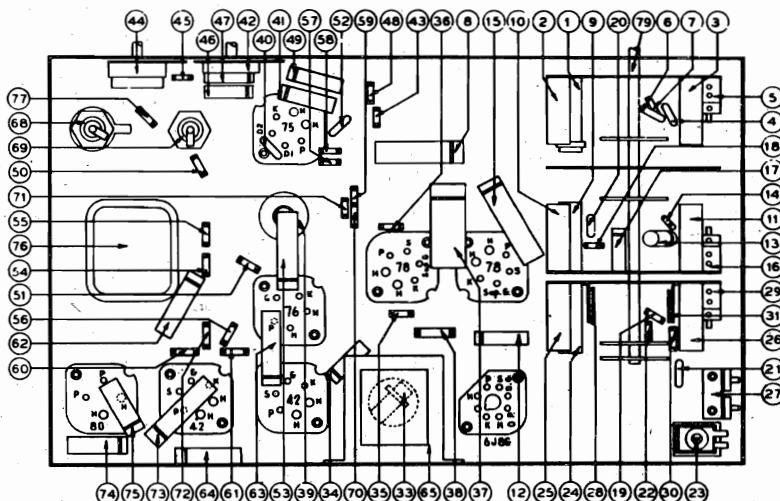


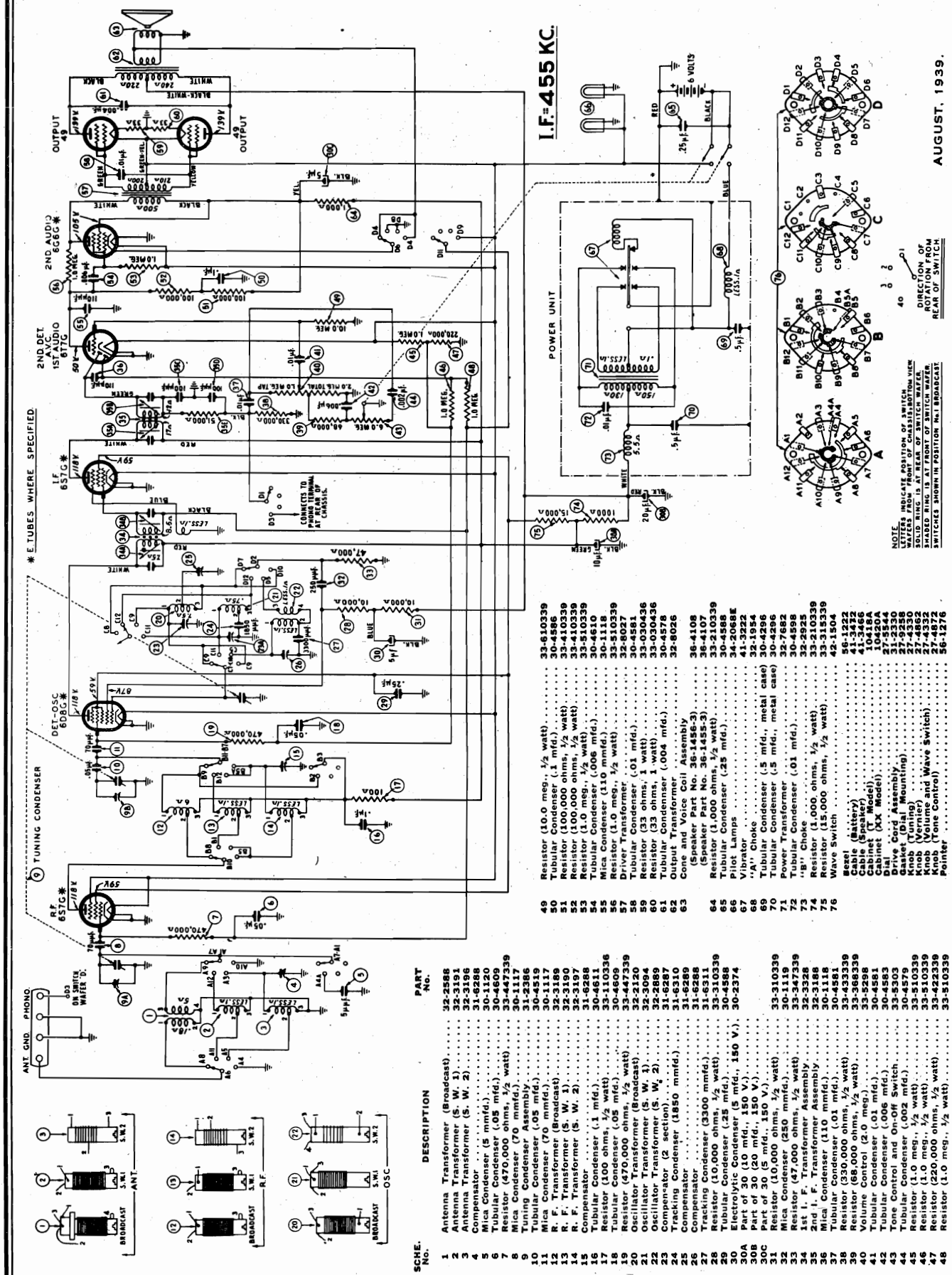
FIG. 2. MODEL 40-755 PART LOCATIONS, UNDERSIDE OF CHASSIS

| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|-----------|--|-----------|-----------|---|----------|
| 69 | Electrolytic Condenser (40 mfd., 300 V.) | 30-2366 | 69 | Dial | 27-5544 |
| 70 | Resistor (180,000 ohms, 1/2 watt) | 33-413339 | 70 | Drive Cord | 31-2330 |
| 71 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 71 | Felt Strip (Bezel Mounting) | 27-8225 |
| 72 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 72 | Knob (Tuning) | 27-4330 |
| 73 | Tubular Condenser (.2 mfd.) | 30-4587 | 73 | Knob (Tuning) | 27-4862 |
| 74 | Tubular Condenser (.003 mfd.) | 30-4608 | 74 | Knob (Volume and Wave Switch) | 27-4332 |
| 75 | Tubular Condenser (.003 mfd.) | 30-4608 | 75 | Pointer | 56-1276 |
| 76 | Power Transformer (100-130 V., 200-260 V., 50-60 cycles) | 32-8007 | 76 | Socket (5 prong, type 78 tube) | 27-6035 |
| 77 | Resistor (150,000 ohms, 1/2 watt) | 33-413339 | 77 | Socket (6 prong, type 78, 42, 75 tubes) | 27-6036 |
| | | | | Socket (Octal, type 6J80 tube) | 27-6058 |
| | | | | Speaker (Model 40-755X) | 36-1460 |
| | | | | Tuning Drum and Coupling | 31-2327 |
| | | | | Vernier Drive (Tuning) | 31-2329 |

PHILCO RADIO & TELEV. CORP.

MODEL 40-748(121)
Schematic, Voltage

AUGUST, 1939.



MODEL 40-748(121)
Chassis, Trimmers
Alignment
MODEL S-1722
Tuner Data

PHILCO RADIO & TELEV. CORP.

PHILCO - TROPIC MODEL 40-748, CODE 121

SPECIFICATIONS

TYPE CIRCUIT: Model 40-748, code 121 is a 7 tube battery operated radio receiver employing a superheterodyne circuit with 3 tuning ranges for reception of standard, police, and shortwave broadcast stations. Connections are also provided for attaching an external high impedance electric phonograph pick-up. In addition other features of design are automatic volume control, continuously variable tone control, BASS compensation, and a push pull pentode audio output circuit. A vibrator is used for supplying the "B" voltage from the 6 volt storage battery.

POWER SUPPLY: 6 volt storage battery.

TUNING RANGES: 530-1720 K. C. 2.3-7.4 M. C. 7.3-22 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

PHILCO TUBES USED: 6S7EG, R. F. Amplifier; 6D8EG, Converter; 6S7EG, I. F. Amplifier; 6T7G, Second Detector A. V. C. and First Audio; 6G6EG, Second Audio; two 49, Output.

AUDIO OUTPUT: 2.5 watts.

AERIAL & GROUND: To obtain maximum performance from this receiver, the Philco Safety aerial, Part No. 40-6370 should be used. A good ground source to the nearest water pipe or any other grounding connection should be used.

CABINET DIMENSIONS: Height, 14½"; Width, 20"; Depth, 10¾".

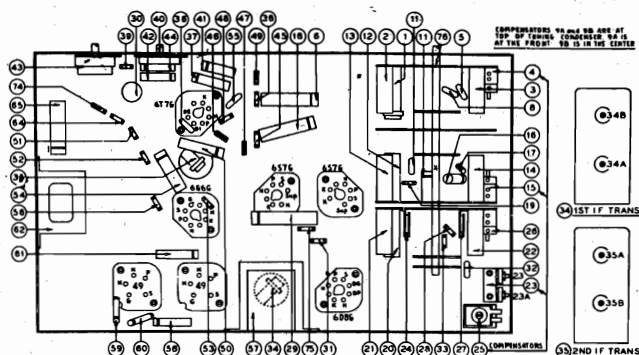


FIG. 1. PART LOCATIONS—UNDERSIDE OF CHASSIS.

MISCELLANEOUS PARTS

| DESCRIPTION | PART NO. |
|---|----------|
| Speaker (T. Cabinet)..... | 36-1455 |
| Speaker (XX Cabinet)..... | 36-1456 |
| Spring Clip (Coil Mounting)..... | 28-5002 |
| Spring (Drive Cord)..... | 28-8913 |
| Station Card Holder..... | 56-1273 |
| Socket (5 prong, type 49 tube)..... | 27-6035 |
| Socket (6 prong, vibrator)..... | 27-6036 |
| Socket (Loktal tubes)..... | 27-6058 |
| Shield (Tube, Half)..... | 56-1072 |
| Shield Cap..... | 56-1073 |
| Shield Base..... | 56-1074 |
| Rubber Cushion (Vibrator Mounting)..... | 27-4287 |
| Rubber Washer (Vibrator Unit Mounting)..... | 27-4307 |
| Rubber Corner (Chassis)..... | 27-4584 |
| Tuning Drum and Coupling Assembly..... | 31-2327 |
| Vernier Drive (Tuning)..... | 31-2329 |

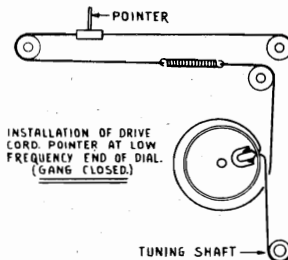


FIG. 2. INSTALLATION OF DRIVE CORD.

ALIGNMENT OF COMPENSATORS

| Operations in Order | SIGNAL GENERATOR | | | RECEIVER | | | SPECIAL INSTRUCTIONS |
|---------------------|--------------------------------|----------------------|--------------|--------------|--|----------------------|----------------------|
| | Output Connections to Receiver | Dummy Antenna Note A | Dial Setting | Dial Setting | Control Settings | Adjust Compensators | |
| 1 | 6D8EG Grid and Ground | .1 mfd. | 455 K. C. | 580 K. C. | Vol. Max. Tone-Treble Range Switch "Brdcst" | 35A, 35B 34A, 34B | |
| 2 | Ant. & Grd. | 200 mmfd. | 1500 K. C. | 1500 K. C. | Vol. Max. Range Switch "Brdcst" | 23, 9B, 9A | Note B |
| 3 | Ant. & Grd. | 200 mmfd. | 580 K. C. | 580 K. C. | Vol. Max. | 25 | Roll Gang |
| 4 | Ant. & Grd. | 200 mmfd. | 1500 K. C. | 1500 K. C. | Vol. Max. Range Switch "Brdcst" | 23, 9B, 9A | Note B |
| 5 | Ant. & Grd. | 400 ohms | 6.0 M. C. | 6.0 M. C. | Vol. Max. Tone-Treble Range Switch "S. W. 1" | 23A | Roll Gang |
| 6 | Ant. & Grd. | 400 ohms | 21 M. C. | 21 M. C. | Vol. Max. Tone-Treble Range Switch "S. W. 2" | 26, 15, 4 | Note C |

NOTE A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B—**DIAL CALIBRATION:** In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning

condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C—When adjusting compensator (26) be sure to tune in the fundamental signal (21 M. C.—second signal from tight position of padder) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning the receiver dial 910 K. C. below the fundamental signal.

MODEL S-1722 SETTING UP THE RECEIVER FOR AUTOMATIC TUNING

1—Turn the Receiver on and allow it to operate for TWENTY minutes. Remove the cover plate over the automatic tuning adjusting screws. This plate is on the front of the Receiver and is removed by removing two screws.

2—Push the Automatic Station Selector button until the word "DIAL" appears in the indicator window. Tune in the station whose call letters are in the first position on the dial (the highest frequency station) and note the program. Push the Automatic Selector button once and this station's call letters will appear at the indicator window.

3—With a small screwdriver, turn the No. 1 adjusting screw (See Fig. 3) in the lower column, to the right or left until this station is tuned in. Now adjust the corresponding screw in the upper column until maximum volume is obtained. Make these adjustments carefully, as it may be easy to pass by, the loudest point on some stations.

When adjusting for Automatic Tuning on strong local stations the antenna rod should be all the way down and the adjustments made

with the car in a shielded area, such as in a steel constructed building or under a viaduct. This is necessary in order to obtain a weak signal so the adjustments can be accurately made.

4—Press the Automatic Station Selector button until "DIAL" appears again in the indicator window and tune in the station whose call letters are in the second position on the automatic dial (the next lower frequency). Press the automatic button two times and adjust the number 2 set of adjusting screws.

Repeat this procedure until each of the five pairs of adjusting screws has been tuned to its respective station.

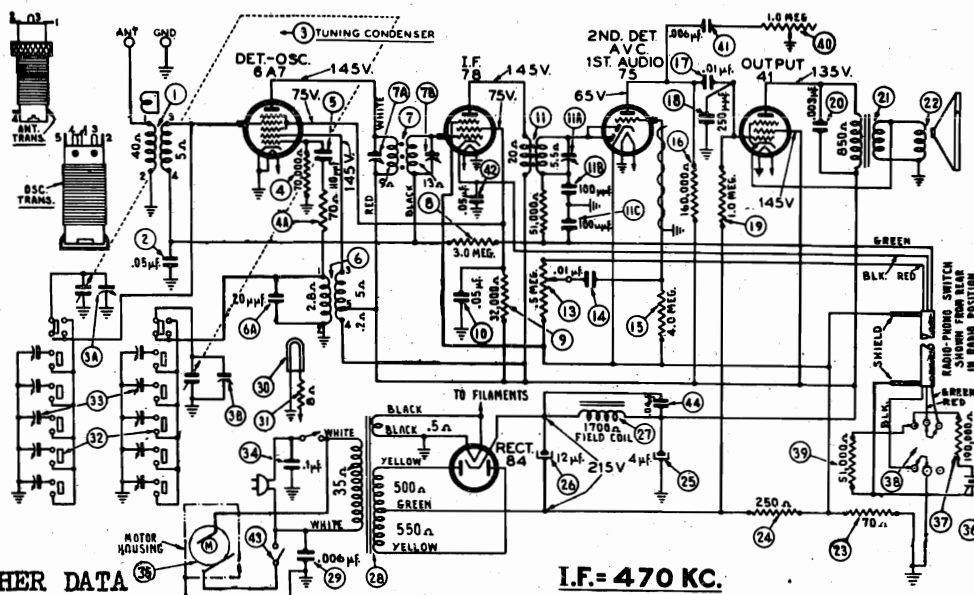
IT IS NECESSARY THAT THE SETTING OF THE ADJUSTING SCREWS BE REPEATED TO BE SURE THEY ARE PROPERLY SET SO THAT MAXIMUM PERFORMANCE MAY BE HAD.

Make all adjustments for maximum reading on the output meter.



MODEL 107(121)
Runs 1,2
Schematic, Voltage
Notes

PHILCO RADIO & TELEV. CORP



FOR OTHER DATA
SEE INDEX

SCHEMATIC DIAGRAM MODEL 107

SPECIFICATIONS

TYPE OF CIRCUIT:

Model 107, code 121 is a combination Automatic Record Changer, Phonograph and Electric push-button tuning radio receiver.

The record Changer plays eight 10" records automatically and 12" records manually and employs a crystal pick-up.

The Radio Receiver employs a five tube A.C. operated superheterodyne circuit, covering standard broadcast frequencies: 530 to 1720 K.C., Automatic Volume Control, and Pentode Audio Output. Six Electric Automatic Push-Buttons are provided; five push-buttons are used for selecting any one of five stations in the standard broadcast range, and one push-button for

changing to manual tuning. The procedure for adjusting the push-buttons for reception of stations will be found in the instructions supplied with each set.

INTERMEDIATE FREQUENCY: 470 K.C.

PHILCO TUBES USED:

6A7 First Detector Oscillator; 78, I.F. Amplifier; 75, Second Detector, A.V.C., First Audio; 41 Audio Output and 84, Rectifier.

POWER SUPPLY: 115 V., 50 to 60 cycle A.C.

Power Transformers are available for operation on 115 V., 25 to 40 cycles A.C.

POWER CONSUMPTION: 57 watts

AUDIO OUTPUT: One (1) watt

Compensating condensers will be found under the

The aligning instructions for the R.F. and I.F. model 39-7, code 121. (See Philco page 10-2)

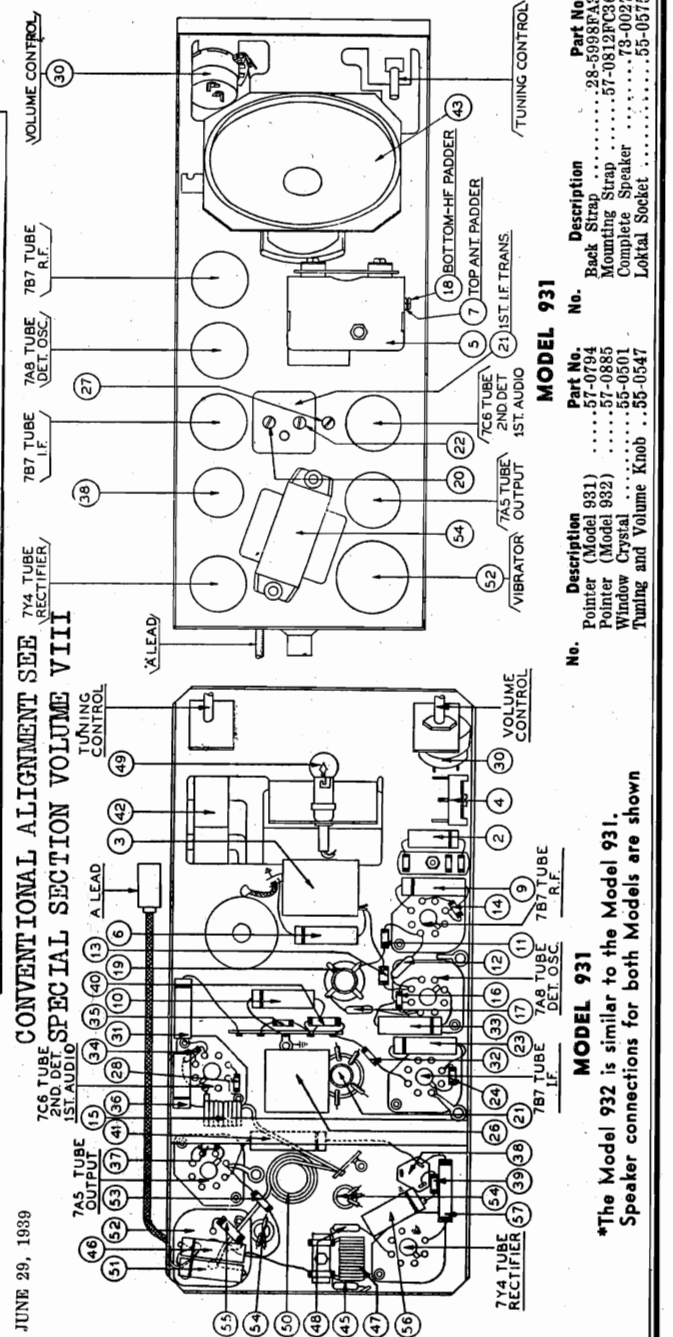
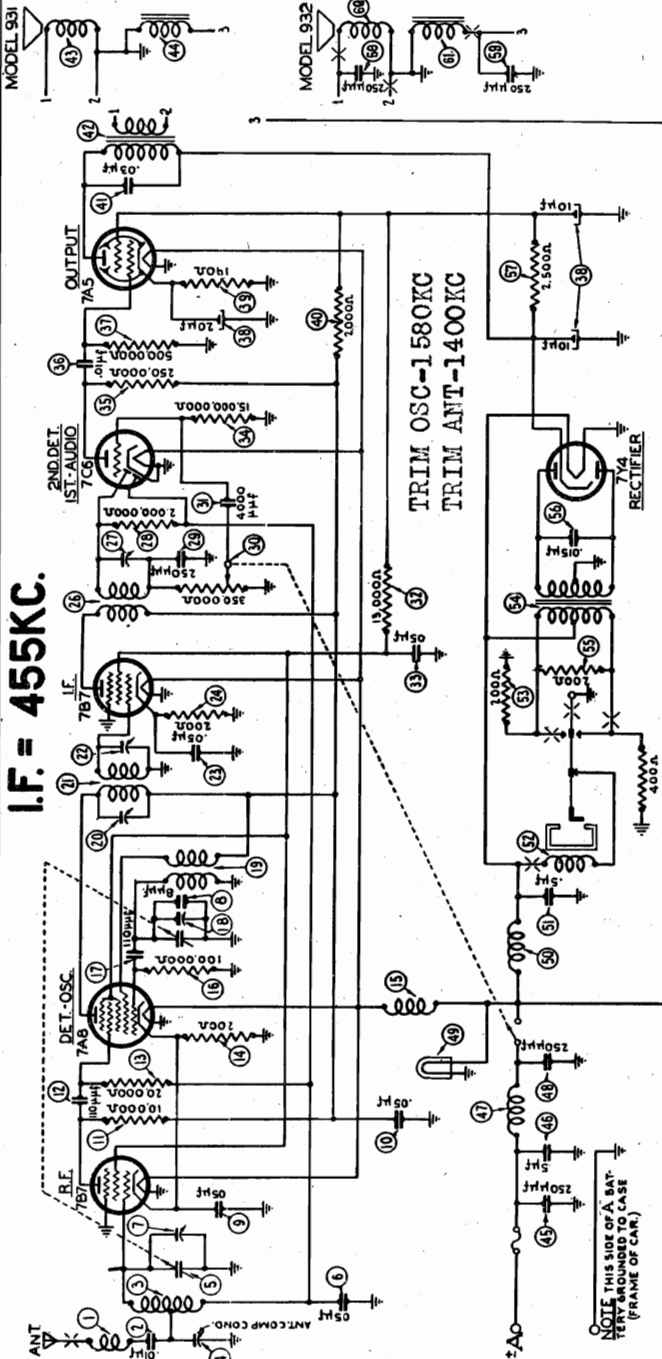
| Schem. No. | Description | Part No. |
|------------|---------------------------------------|-----------|
| 1 | Antenna Transformer..... | 32-3039 |
| 2 | Tubular Condenser (.05 mfd.).... | 30-4519 |
| 3 | Tuning Condenser..... | 31-2338 |
| 4A | Resistor (70,000 ohms, 1/2 watt).... | 33-370339 |
| 5 | Mica Condenser (110 mmfd.)..... | 30-1031 |
| 6 | Oscillator Transformer..... | 32-2122 |
| 6A | Mica Condenser (20 mmfd.)..... | 30-1123 |
| 7 | 1st I.F. Transformer Assy..... | 32-3121 |
| 8 | Resistor (3.0 meg., 1/2 watt).... | 33-530339 |
| 9 | Resistor (32,000 ohms, 1/2 watt).... | 33-332339 |
| 10 | Tubular Cond. (.05 mfd.)..... | 30-4444 |
| 11 | 2nd I.F. Transformer Assy..... | 32-2674 |
| 12 | Resistor (51,000 ohms, 1/2 watt).... | 33-351339 |
| 13 | Volume Control (.5 meg.)..... | 33-5254 |
| 14 | Tubular Condenser (.01 mfd.).... | 30-4479 |
| 15 | Resistor (4.0 meg., 1/2 watt).... | 33-540339 |
| 16 | Resistor (180,000 ohms, 1/2 watt).... | 33-416339 |
| 17 | Tubular Condenser (.01 mfd.).... | 30-4572 |
| 18 | Mica Condenser (250 mmfd.)..... | 30-1032 |
| 19 | Resistor (1.0 meg., 1/2 watt).... | 33-510339 |
| 20 | Tubular Condenser (.003 mfd.).... | 30-4582 |
| 21 | Output Transformer..... | 32-7980 |
| 22 | Cone & Voice Coil Assembly | |
| | Speaker No. 36-1473-3..... | 36-4120 |
| | Speaker No. 36-1440-3..... | 36-4086 |
| 23 | Resistor (50 ohms, 1/2 watt).... | 33-050339 |
| 24 | Resistor (250 ohms, 1/2 watt).... | 33-125339 |
| 25 | Electrolytic Cond. | |
| | (Run 1- 6 mfd., 450 V.)..... | 30-2265 |

| Schem. No. | Description | Part No. |
|------------|--------------------------------------|-----------|
| 26 | Electrolytic Cond. (12 mfd., 300V.) | 30-2404 |
| 27 | Field Coil | |
| | (replace spkr. #36-1473-3) | |
| | (replace spkr. #36-1440-3) | |
| 28 | Power Trans. (115V., 50-60 cycles) | 32-7979 |
| 29 | Condenser (.006 mfd., moulded)... | 30-4423 |
| 30 | Pilot Lamp..... | 34-2064 |
| 31 | Pilot Lamp Resistor (8 ohms, 1/2wt) | 33-980331 |
| 32 | Push Button Switch..... | 42-1477 |
| 33 | Padder Strip Assembly..... | 31-6290 |
| 34 | Tubular Cond. (.1 mfd.)..... | 30-4122 |
| 35 | Phono Motor (110 volt 60 cycle)... | 35-1163 |
| 36 | Crystal Pick-up (metal case).... | 35-2041 |
| | Crystal Pick-up (bakelite case)... | 35-2030 |
| 37 | Resistor (190,000 ohms, 1/2 watt) | 33-419339 |
| 38 | Radio Phono Switch..... | 42-1509 |
| 39 | Resistor (51,000 ohms, 1/2 watt).... | 33-351339 |
| 40 | Tone Control (1.0 meg.)..... | 33-5320 |
| 41 | Tubular Cond. (.006 mfd.)..... | 30-4591 |
| 42 | Tubular Cond. (.05 mfd.)..... | 30-4519 |
| 43 | Motor Switch..... | |
| 44 | Tubular Cond. (.04 mfd.)..... | 30-4119 |
| | Bezel Assembly (Dial)..... | 56-1305 |
| | Bezel Clamp..... | 28-5153 |
| | Knobs..... | 27-4632 |
| | Manual Tab..... | 27-5460 |
| | Push-button..... | 27-4702 |
| | Station tab holder..... | 28-5661 |
| | Visor Screen..... | 27-5468 |
| | Automatic Record Changer | 35-1169 |

PHILCO RADIO & TELEV. CORP. Schematic, Chassis Trimmers, Alignment

MODELS 931, 932

| PARTS LIST | | |
|------------|---|-----------------|
| No. | Description | Part No. |
| 1 | Antenna Choke | 65-0102 |
| 2 | Condenser (.01 mfd.) | 61-0014 |
| 3 | Antenna Transformer | 65-0195 |
| 4 | Antenna Compensator | 63-0030 |
| 5 | Tuning Condenser | 63-0028 |
| 6 | Condenser (.05 mfd.) | 30-4444 |
| 7 | First Padder (on Tun. Cond.) | 30-1106 |
| 8 | Condenser (8 mmfd.) | 30-4569 |
| 9 | Condenser (.05 mfd.) | 30-4569 |
| 10 | Resistor (10,000 ohms) | 33-310247 |
| 11 | Resistor (110,000 ohms) | 33-1031 |
| 12 | Resistor (20,000 ohms) | 33-320247 |
| 13 | Resistor (200 ohms) | 33-120346 |
| 14 | Filament Choke | 65-0158 |
| 15 | Resistor (100,000 ohms) | 33-410247 |
| 16 | Condenser (110 mfd.) | 30-1031 |
| 17 | Second Padder (on Tun. Cond.) | 30-1031 |
| 18 | Oscillator Transformer | 65-0194 |
| 19 | Padder (Pri. 1st I. F. Trans.) | 65-0191 |
| 20 | Padder (Sec. 2nd I. F. Trans.) | 30-4569 |
| 21 | Resistor (200 ohms) | 33-120346 |
| 22 | Second I. F. Transformer | 65-0192 |
| 23 | Padder (Pri. 1st I. F. Trans.) | 65-0191 |
| 24 | Resistor (2,000,000 ohms) | 33-520247 |
| 25 | Condenser (250 mfd.) | 61-0033 |
| 26 | Volume Control (350,000 ohms) and On-Off Switch | 67-0020 |
| 27 | Condenser (4,000 mfd.) | 30-4456 |
| 28 | Resistor (13,000 ohms) | 33-31347 |
| 29 | Condenser (.05 mfd.) | 30-4569 |
| 30 | Resistor (15,000,000 ohms) | 33-615347 |
| 31 | Resistor (250,000 ohms) | 33-424247 |
| 32 | Condenser (.01 mfd.) | 61-0014 |
| 33 | Resistor (500,000 ohms) | 33-449247 |
| 34 | Filter Condenser (10-10-30 mfd.) | 61-0088 |
| 35 | Resistor (190 ohms) | 33-120346 |
| 36 | Resistor (2,000 ohms) | 33-220347 |
| 37 | Condenser (.03 mfd.) | 30-4449 |
| 38 | Output Transformer (Model 931) | 65-0221 |
| 39 | Output Transformer (Model 932) | 65-0221 |
| 40 | Cone Kit (Model 932) | 91-0078 |
| 41 | Field Coil (For 73-0027-1 Speaker) | 91-0078 |
| 42 | Condenser (250 mfd.) | Not Replaceable |
| 43 | Condenser (.5 mfd.) | 61-0033 |
| 44 | "A" Choke | 61-0054 |
| 45 | Condenser (250 mfd.) | 32-1644 |
| 46 | Condenser (250 mfd.) | 61-0033 |
| 47 | Pilot Lamp | 34-2089 |
| 48 | Vibrator Choke | 65-0204 |
| 49 | Condenser (.5 mfd.) | 61-0054 |
| 50 | Vibrator | 83-0017 |
| 51 | Resistor (200 ohms) | 33-120347 |
| 52 | Power Transformer | 65-0185 |
| 53 | Resistor (200 ohms) | 33-120347 |
| 54 | Resistor (.015 mfd.) | 30-4552 |
| 55 | Resistor (2,500 ohms) | 33-225447 |
| 56 | Condenser (250 mfd.) | 61-0033 |
| 57 | Field Coil | Not Replaceable |
| 58 | Cone Kit (Model 932) | 91-0068 |
| 59 | For 73-0024-3 Speaker | 91-0068 |
| 60 | For 73-0024-2 Speaker | 91-0028 |
| 61 | For 73-0025-2 Speaker | 91-0028 |
| 62 | Drive Cord (16 1/2") | 55-0588 |
| 63 | Drive Cord (13 1/4") | 55-0589 |
| 64 | Drive Cord (7 1/4") | 55-0593 |
| 65 | Dial Assembly (Model 931) | 77-0346 |
| 66 | Dial Assembly (Model 932) | 77-0358 |



MODEL 933

Alignment, Trimmers

PHILCO RADIO & TELEV. CORP.

MODEL 933 ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 077 or 177 Philco Signal Generator, 027 Philco vacuum tube voltmeter and circuit tester and a 27-7159 Padding screw driver.

General — The vacuum tube voltmeter can be used as a "wireless" output meter as a convenient method for obtaining maximum output reading. Solder one end of a piece of wire to a strip of phosphor bronze approximately 1" wide, 6" long and .02" thick. Coil this strip so that it can be slipped over the top of the type 7B5 output tube, and make a fairly tight contact. Connect the other end of the wire to the "high" terminal of the vacuum tube voltmeter. Then connect a wire from the radio chassis to the "plus" terminal of the vacuum tube voltmeter.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

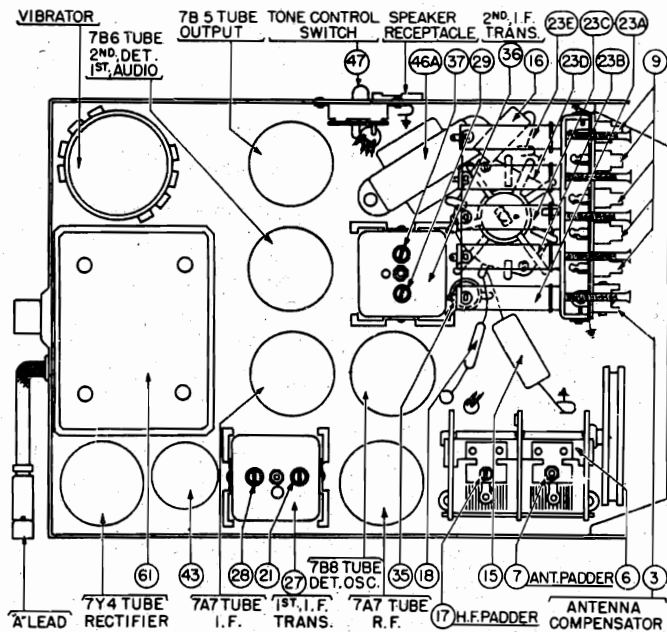


FIGURE 3

| OPERATION | SIGNAL GENERATOR | | DUMMY CAPACITY | SPECIAL INSTRUCTIONS | ADJUST PADDER |
|-----------|---|--------------------------------|------------------------|---|------------------|
| | FREQUENCY | CONNECTION | | | |
| 1 | Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning. | | | | |
| 2 | 470 K.C. | To Antenna Receptacle on Radio | 30 Mmfd. See Note 1 | Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go. | 37 29 28 21 |
| 3 | 1580 K.C. | To Antenna Receptacle on Radio | 30 Mmfd. See Note 1 | Set Tuning Condenser at 1580 K.C. | 17 |
| 4 | 1500 K.C. | To Antenna Receptacle on Radio | 30 Mmfd. See Note 1 | Set Tuning Condenser at 1500 K.C. | 7 Note 2 |

Make all adjustments for maximum reading on the output meter.

NOTE 1 Connect the antenna lead, Part No. 41-3191, to the antenna receptacle in the radio. Connect a 30 Mmfd. Condenser in series between the signal generator and the antenna lead.

NOTE 2 When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it. Also adjust the antenna compensator ② for maximum on a weak signal at approximately 1400 K.C.

PHILCO RADIO & TELEV. CORP.

MODEL 933
Schematic, Chassis

MODEL 933 SCHEMATIC

I.F. = 470KC

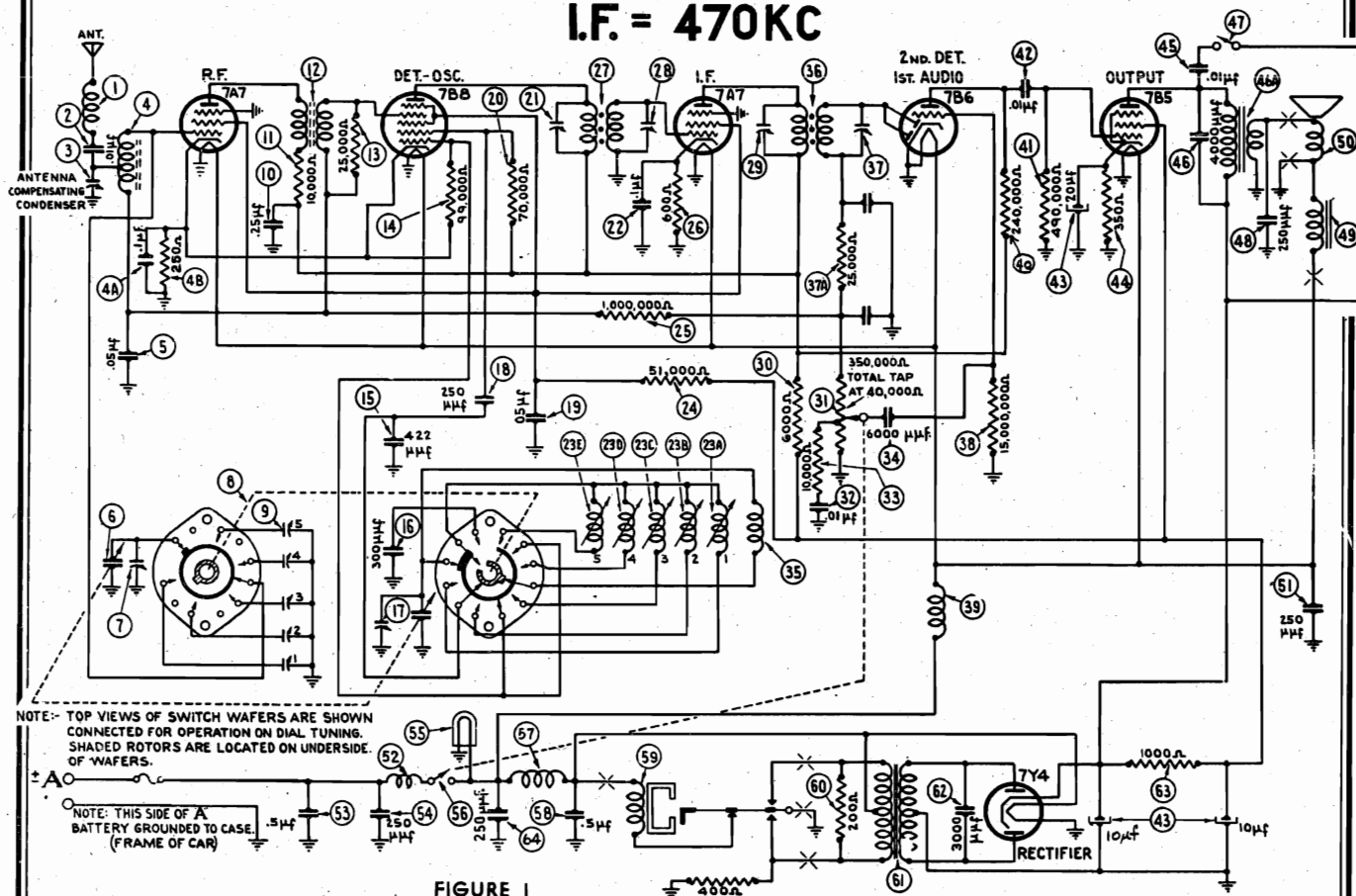


FIGURE 1

PARTS LIST

| No. | Description | Part No. | Description | Part No. | No. | Description | Part No. | Description | Part No. |
|-----|--------------------------------|-----------|--------------------------------|-----------------|-----|--------------------|----------|--------------------|----------|
| 1 | Antenna Choke | 65-0184 | Volume Control (350,000 ohms) | 67-0019 | 53 | 7Y4 TUBE RECTIFIER | 62 | 7Y4 TUBE RECTIFIER | 62 |
| 2 | Condenser (.01 mfd.) | 61-0014 | and On-Off Switch | 67-0019 | 54 | 7A7 TUBE | 27 | 7A7 TUBE | 27 |
| 3 | Antenna Compensator | Part of 6 | Condenser (.01 mfd.) | 61-0014 | 55 | 7A7 TUBE | 4A | 7A7 TUBE | 4A |
| 4 | Antenna Transformer | 65-0182 | Resistor (10,000 ohms) | 33-310237 | 56 | 7B8 TUBE | 19 | 7B8 TUBE | 19 |
| 5 | Condenser (.01 mfd.) | 30-1499 | Condenser (6,000 mmfd.) | 30-4467 | 57 | 7B5 TUBE | 26 | 7B5 TUBE | 26 |
| 6 | Resistor (250 ohms) | 33-125336 | Oscillator Transformer | | 58 | 7B5 TUBE | 48 | 7B5 TUBE | 48 |
| 7 | Condenser (.05 mfd.) | 30-4444 | (Dial) | 65-0165 | 59 | 7B5 TUBE | 49 | 7B5 TUBE | 49 |
| 8 | Tuning Condenser | 63-0024 | Second I. F. Transformer | 65-0161 | 60 | 7B5 TUBE | 50 | 7B5 TUBE | 50 |
| 9 | First Padder (on Tun. Cond.) | | Padder (Sec. 2nd I. F. Trans.) | | 61 | 7B5 TUBE | 51 | 7B5 TUBE | 51 |
| 10 | Wafer Switch | 412-1024 | Resistor (25,000 ohms) | 33-325237 | 62 | 7B5 TUBE | 52 | 7B5 TUBE | 52 |
| 11 | Antenna Padder Assy. | 77-0286 | Resistor (15,000,000 ohms) | 33-615337 | 63 | 7B5 TUBE | 53 | 7B5 TUBE | 53 |
| 12 | Condenser (.25 mfd.) | 30-4446 | Filament Choke | 65-0201 | 64 | 7B5 TUBE | 54 | 7B5 TUBE | 54 |
| 13 | Resistor (10,000 ohms) | 33-310237 | Resistor (240,000 ohms) | 33-424337 | 65 | 7B5 TUBE | 55 | 7B5 TUBE | 55 |
| 14 | R. F. Transformer | 65-0183 | Resistor (490,000 ohms) | 33-449237 | 66 | 7B5 TUBE | 56 | 7B5 TUBE | 56 |
| 15 | Resistor (25,000 ohms) | 33-325337 | Condenser (.01 mfd.) | 30-4124 | 67 | 7B5 TUBE | 57 | 7B5 TUBE | 57 |
| 16 | Resistor (99,000 ohms) | 33-399237 | Filter Condenser | | 68 | 7B5 TUBE | 58 | 7B5 TUBE | 58 |
| 17 | Silver Mica Condenser | | (10-10-20 mfd.) | 61-0028 | 69 | 7B5 TUBE | 59 | 7B5 TUBE | 59 |
| 18 | (422 mmfd.) | 61-0066 | Resistor (350 ohms) | 33-135336 | 70 | 7B5 TUBE | 60 | 7B5 TUBE | 60 |
| 19 | Silver Mica Condenser | | Condenser (.01 mfd.) | 30-4381 | 71 | 7B5 TUBE | 61 | 7B5 TUBE | 61 |
| 20 | (300 mmfd.) | 61-0002 | Condenser (4,000 mmfd.) | 30-4185 | 72 | 7B5 TUBE | 62 | 7B5 TUBE | 62 |
| 21 | Second Padder (on Tun. Cond.) | | Oscillator Transformer | 65-0162 | 73 | 7B5 TUBE | 63 | 7B5 TUBE | 63 |
| 22 | Condenser (250 mmfd.) | 30-1038 | Tone Control Switch | 42-1406 | 74 | 7B5 TUBE | 64 | 7B5 TUBE | 64 |
| 23 | Condenser (.05 mfd.) | 30-4444 | Condenser (250 mmfd.) | 61-0033 | 75 | 7B5 TUBE | 65 | 7B5 TUBE | 65 |
| 24 | Resistor (70,000 ohms) | 33-370337 | Field Coil | Not Replaceable | 76 | 7B5 TUBE | 66 | 7B5 TUBE | 66 |
| 25 | Padder (Pri. 1st I. F. Trans.) | | Cone Kit | | 77 | 7B5 TUBE | 67 | 7B5 TUBE | 67 |
| 26 | Condenser (.1 mfd.) | 30-4499 | For 73-0024-3 Speaker | 91-0068 | 78 | 7B5 TUBE | 68 | 7B5 TUBE | 68 |
| 27 | Oscillator Transformer (1) | 65-0169 | For 73-0024-3 Speaker | 91-0028 | 79 | 7B5 TUBE | 69 | 7B5 TUBE | 69 |
| 28 | Oscillator Transformer (2) | 65-0170 | For 73-0025-2 Speaker | 91-0065 | 80 | 7B5 TUBE | 70 | 7B5 TUBE | 70 |
| 29 | Oscillator Transformer (3) | 65-0171 | Condenser (250 mmfd.) | 61-0033 | 81 | 7B5 TUBE | 71 | 7B5 TUBE | 71 |
| 30 | Oscillator Transformer (4) | 65-0172 | "A" Choke | 65-0037 | 82 | 7B5 TUBE | 72 | 7B5 TUBE | 72 |
| 31 | Oscillator Transformer (5) | 65-0173 | Condenser (.5 mfd.) | 30-4565 | 83 | 7B5 TUBE | 73 | 7B5 TUBE | 73 |
| 32 | Resistor (51,000 ohms) | 33-351237 | Condenser (250 mmfd.) | 61-0033 | 84 | 7B5 TUBE | 74 | 7B5 TUBE | 74 |
| 33 | Resistor | | Pilot Lamp | 34-2040 | 85 | 7B5 TUBE | 75 | 7B5 TUBE | 75 |
| 34 | (1,000,000 ohms) | 33-510237 | On-Off Switch and | | 86 | 7B5 TUBE | 76 | 7B5 TUBE | 76 |
| 35 | Resistor (600 ohms) | 33-160438 | Volume Control | 67-0019 | 87 | 7B5 TUBE | 77 | 7B5 TUBE | 77 |
| 36 | First I. F. Transformer | 65-0160 | Vibrator Choke | 65-0075 | 88 | 7B5 TUBE | 78 | 7B5 TUBE | 78 |
| 37 | Padder (Sec. 1st I. F. Trans.) | | Condenser (.5 mfd.) | 30-4565 | 89 | 7B5 TUBE | 79 | 7B5 TUBE | 79 |
| 38 | Padder (Pri. 2nd I. F. Trans.) | | Vibrator | 83-0017 | 90 | 7B5 TUBE | 80 | 7B5 TUBE | 80 |
| 39 | Resistor (6,000 ohms) | 33-260337 | | | 91 | 7B5 TUBE | 81 | 7B5 TUBE | 81 |

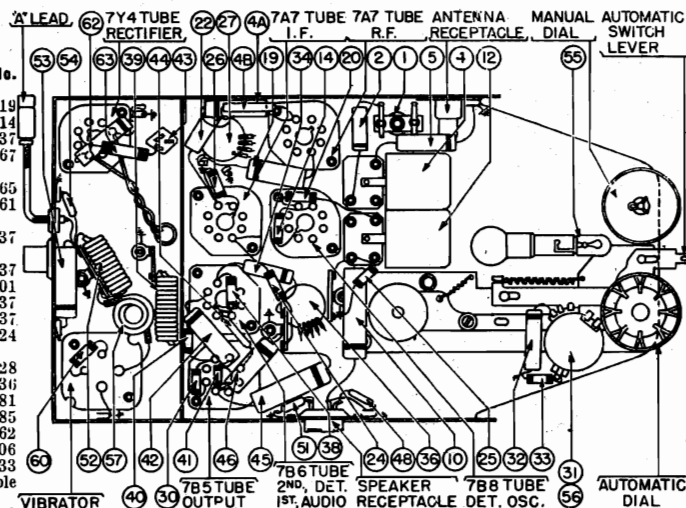


FIGURE 2

MODELS C1708, S1722, S1726
F1740, L1760, L1761
Dial Cord Data

PHILCO RADIO & TELEV. CORP.

PHILCO AUTO RADIO

INSTALLING THE DIAL CORD ON THE
Chrysler Model C-1708 Lincoln Models L-1760, L-1761
Ford Model F-1740 Studebaker Models S-1722, S-1726

When installing new dial cords on the custom built radios, follow the procedure given below:

CHRYSLER MODEL C-1708

1. Remove the top cover, bottom cover and front housing.
2. Turn the radio upside down with the control shafts in front.
3. Turn the tuning control shaft CLOCKWISE to the stop position.
4. Hook the spring on one end of the cord.
5. Hook a paper clip through the eyelet of the cord to which the spring is attached and fasten the clip to the dial mounting bracket.
6. Place the long end of the cord over the rear wooden pulley. Wrap seven turns of cord CLOCKWISE around the back portion of the tuning shaft. Pass the cord through the slot in the collar of the shaft and wrap $\frac{3}{4}$ of a turn CLOCKWISE around the shaft in front of the collar. Run the cord over the front wooden pulley and fasten the other end of the cord to the spring. Then force the cord over the metal pulley at the top of the scale bracket.
7. Place the pointer on the dial cord and slide it to the first line above the 1500 mark.
8. Remove the paper clip and recheck the pointer setting, using a broadcast signal or a Philco Signal Generator. Slide the pointer along the dial cord to the correct frequency.
9. Replace the front housing and the top and bottom covers.

FORD MODEL F-1740 — LINCOLN MODELS L-1760 and L-1761

1. Remove the tuning condenser assembly from the front casting of the radio.
2. Remove the dial and shaft assembly from the tuning condenser bracket.
3. Remove the dial drum from the knob and shaft assembly.
4. Place the tuning condenser unit on the bench with the bracket to the back and the metal pulley facing up. The tuning condenser plates must be in mesh.
5. Connect one end of the cord to the link and hook the link on the right tab on the inside of the pulley. Feed the cord through the slot in the pulley and wrap one turn of cord CLOCKWISE around the pulley, keeping the cord to the right of the guide pin on the tuning condenser.
6. Hold the dial drum with the left hand and wrap two turns of cord COUNTER-CLOCKWISE around the spool, keeping the cord to the left of the pin in the spool. Loop one turn of cord around the pin. Then wrap one turn COUNTER-CLOCKWISE around the spool, keeping the cord to the right of the pin in the spool.
7. Place the knob and shaft on the spool, with the pin on the spool nearest to the knob and with the thin washer on the left side of the knob and the thick washer on the right side. Place the shaft in the grooves on the tuning condenser bracket.
8. Bring the cord COUNTER-CLOCKWISE around the idler pulley on the bracket and wrap five turns of cord CLOCKWISE around the knob shaft. Be sure the washer is against the end of the bracket.
9. Bring the cord CLOCKWISE around the pulley on the tuning condenser and connect the end of the cord to the link on the drum.
10. Hook the closed end of the tension spring to the tab on the left side of the pulley and hook the other end to both ends of the cord where it enters the pulley.
11. Replace the tuning condenser assembly.

STUDEBAKER MODEL S-1722

1. Remove the chassis from the housing.
2. Place the Receiver on the bench, right side up and with the shafts to the front.
3. Turn the tuning condenser plates in mesh.
4. Feed the loop on the short end of the cord through the hole in the back of the tuning shaft and pass the free end of the loop through the loop of the cord. Pull the cord tight.
5. Wrap $1\frac{1}{2}$ turns of cord CLOCKWISE around the end of the tuning shaft and then $\frac{3}{4}$ of a turn CLOCKWISE around the tuning condenser drum.
6. Fasten the center loop of the cord to one end of the spring and fasten the other end of the spring in the hole in the drum.
7. Pass the long end of the cord around the idler pulley and through the hole in the sub-base.
8. Hold the cord and turn the radio over with the wiring side showing.
9. Wrap one turn of cord CLOCKWISE around the tuning dial drum.
10. Holding the cord with one hand, turn the tuning shaft CLOCKWISE until the stop position is reached.
11. Wrap $1\frac{1}{2}$ turns of cord COUNTER-CLOCKWISE around the tuning shaft in back of the front flange.
12. Feed the loop of the cord through the hole in the shaft and pass the free end of cord through the eyelet. The cord must have tension after it is assembled.
13. Assemble the Receiver in the housing.

STUDEBAKER MODEL S-1726

1. Remove the top cover, bottom cover and front housing.
2. Place the Receiver on the bench right side up with the control knobs in front.
3. Turn the tuning shaft clockwise as far as it will go.
4. Loosen the two set screws on the tuning shaft coupling, so that the shaft turns freely.
5. Place the small "J" spring in the slot at the back of the tuning shaft.
6. Hook one of the knotted ends of the cord into one of the hooks on the spring and turn the shaft clockwise until there are eight turns of cord on the shaft between the spring and the front shaft bracket.
7. Hook the remaining end of the cord to the other hook on the spring and turn the shaft counter-clockwise until one turn is wound on the back end of the shaft.
8. Hold the tuning shaft so that it does not turn and place the both cords COUNTER-CLOCKWISE over the two pulleys.
9. Bring the cord under the pointer with the front end of the cord in front of the guide bracket and the back end of the cord in back of the guide bracket.
10. Slide the pointer over to the right end of the guide bracket and place the large "J" spring under the pointer and through the slot, with the hook to the back.
11. With a fine piece of wire as a hook, feed the front end of the cord through the hole in the pointer from the bottom and fasten this loop to the hook on the "J" spring on the pointer.
12. Pull the cord tight and loop it over the pulley on the left end of the pointer guide bracket. Tighten the set screws on the tuning shaft coupling.
13. The pointer can be adjusted to the proper frequency by holding the tuning shaft and sliding the pointer along the guide bracket.
14. Replace the front housing and top and bottom covers.

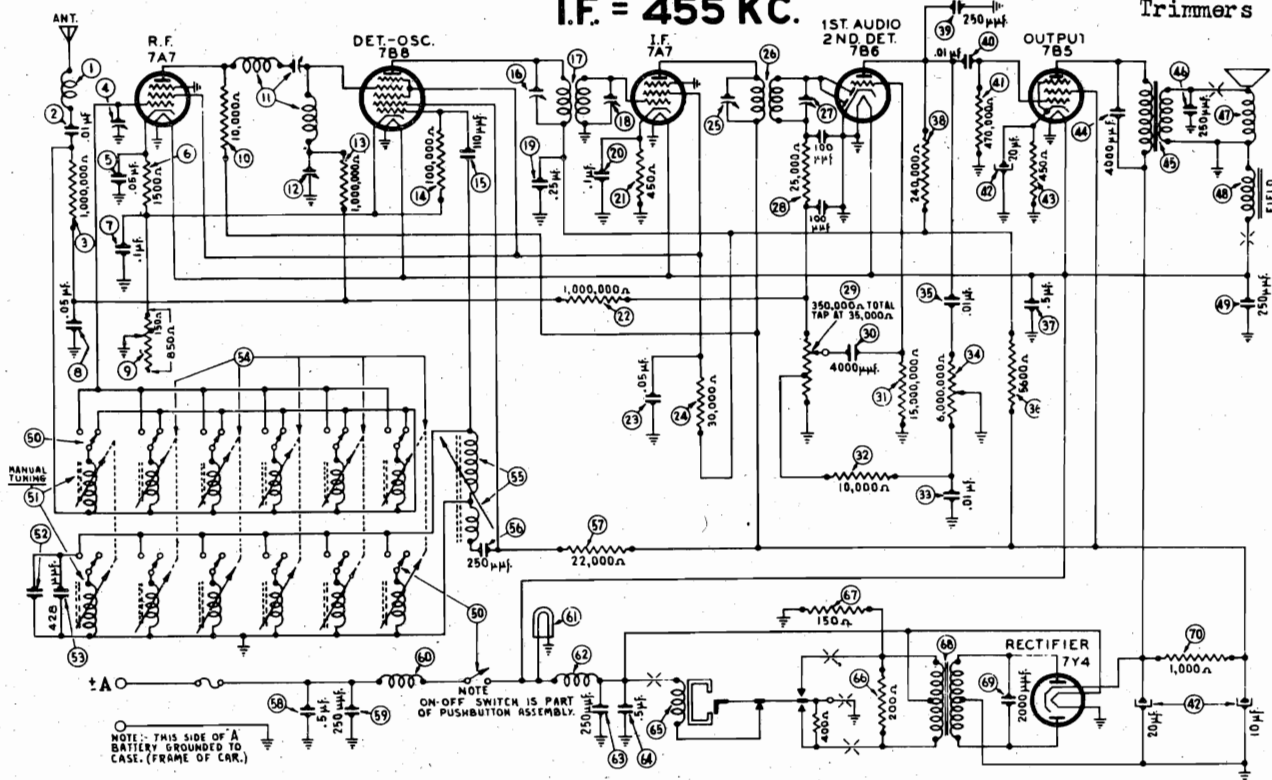
October, 1939.

PHILCO RADIO & TELEV. CORP.

MODEL C-1708 Chrysler
Schematic, Chassis

I.F. = 455 KC.

Trimmers



| SCHE. No. | DESCRIPTION | PART No. |
|-----------|---------------------------------------|-----------------|
| 1 | Antenna Choke | 65-0102 |
| 2 | Condenser (.01 mfd.) | 61-0014 |
| 3 | Resistor (1,000,000 ohms) | 33-510154 |
| 4 | Antenna Padder | 63-0035 |
| 5 | Condenser (.05 mfd.) | 30-4444 |
| 6 | Resistor (1500 ohms) | 33-615334 |
| 7 | Condenser (.1 mfd.) | 30-4499 |
| 8 | Condenser (.05 mfd.) | 30-4444 |
| 9 | Sensitivity Control (1000 ohms) | 67-0025 |
| 10 | Resistor (10,000 ohms) | 33-310454 |
| 11 | Untuned R. F. Assembly | 65-0271 |
| 12 | I. F. Wave Trap Padder | 33-510154 |
| 13 | Resistor (1,000,000 ohms) | 33-615334 |
| 14 | Condenser (.110 mmfd.) | 30-1031 |
| 15 | Padder (Pri. 1st I. F. Trans.) | 65-0236 |
| 16 | First I. F. Transformer | 30-4604 |
| 17 | Padder (Sec. 1st I. F. Trans.) | 30-4499 |
| 18 | Condenser (.25 mfd.) | 33-145438 |
| 19 | Resistor (450 ohms) | 33-510154 |
| 20 | Resistor (1,000,000 ohms) | 30-4444 |
| 21 | Condenser (.05 mfd.) | 33-330434 |
| 22 | Resistor (30,000 ohms) | 65-0237 |
| 23 | Padder (Pri. 2nd I. F. Trans.) | 33-325154 |
| 24 | Second I. F. Transformer | 67-0022 |
| 25 | Padder (Sec. 2nd I. F. Trans.) | 30-4334 |
| 26 | Resistor (25,000 ohms) | 33-615154 |
| 27 | Volume Control (350,000 ohms) | 33-310154 |
| 28 | Condenser (4000 mmfd.) | 30-4479 |
| 29 | Resistor (15,000,000 ohms) | 67-0022 |
| 30 | Resistor (10,000 ohms) | 30-4479 |
| 31 | Condenser (.01 mfd.) | 33-256334 |
| 32 | Tone Control (8,000,000 ohms) | 61-0054 |
| 33 | Condenser (.01 mfd.) | 33-424354 |
| 34 | Resistor (5600 ohms) | 61-0033 |
| 35 | Condenser (.5 mfd.) | 30-4169 |
| 36 | Resistor (240,000 ohms) | 33-447154 |
| 37 | Condenser (250 mmfd.) | 61-0072 |
| 38 | Condenser (.01 mfd.) | 33-145428 |
| 39 | Resistor (470,000 ohms) | 61-0073 |
| 40 | Filter Condenser (10-20-20 mfd.) | 65-0235 |
| 41 | Resistor (450 ohms) | 61-0033 |
| 42 | Condenser (4000 mmfd.) | 91-0086 |
| 43 | Output Transformer | 91-0085 |
| 44 | Condenser (250 mmfd.) | Not Replaceable |
| 45 | Resistor (250 ohms) | 61-0033 |
| 46 | Cone Kit (For 73-0030-2) | 65-0087 |
| 47 | Cone Kit (For 73-0030-3) | 77-0440 |
| 48 | Field Coil | 61-0082 |
| 49 | Condenser (250 mmfd.) | 77-0369 |
| 50 | Push-Button and On-Off Switch | 61-0033 |
| 51 | Inductive Tuning Unit | 33-322454 |
| 52 | Thermol Compensator | 61-0033 |
| 53 | Condenser (428 mmfd.) | 30-4491 |
| 54 | Push-Button Switch and Trans. Assy. | 61-0033 |
| 55 | Oscillator Tracking Coil | 33-22454 |
| 56 | Resistor (23,000 ohms) | 61-0033 |
| 57 | Condenser (250 mmfd.) | 30-4491 |
| 58 | Condenser (.5 mfd.) | 61-0033 |
| 59 | Condenser (250 mmfd.) | 34-2039 |
| 60 | "A" Choke | 65-0222 |
| 61 | Pilot Lamp | 61-0033 |
| 62 | Vibrator Choke | 30-4565 |
| 63 | Condenser (250 mmfd.) | 83-0017 |
| 64 | Condenser (.5 mfd.) | 33-120354 |
| 65 | Vibrator | 33-115354 |
| 66 | Resistor (200 ohms) | 65-0234 |
| 67 | Resistor (150 ohms) | 65-0274 |
| 68 | Power Transformer | 33-210434 |
| 69 | Condenser (2000 mmfd.) | 55-0861 |
| 70 | Resistor (1000 ohms) | 55-0868 |
| | Dial | 57-0894 |
| | Drive Cord | 55-0679 |
| | Pointer | 55-0651 |
| | Window Crystal | 55-0683 |
| | Tuning and Volume Knob (Motor Parts) | 55-0684 |
| | Tuning and Volume Knob (Dodge) | 55-0685 |
| | Tuning and Volume Knob (DeSoto) | 55-0713 |
| | Tuning and Volume Knob (Chrysler) | 55-0731 |
| | Push-Button Knob | 55-0730 |
| | Station Tab | 57-1110FA7 |
| | Tone Control Lever (Ply. Chrys. Dod.) | 57-1110FA7 |
| | Tone Control Lever (DeSoto) | 57-1110FA7 |
| | Speaker Cable | 95-0105 |
| | Antenna Lead | 95-0106 |

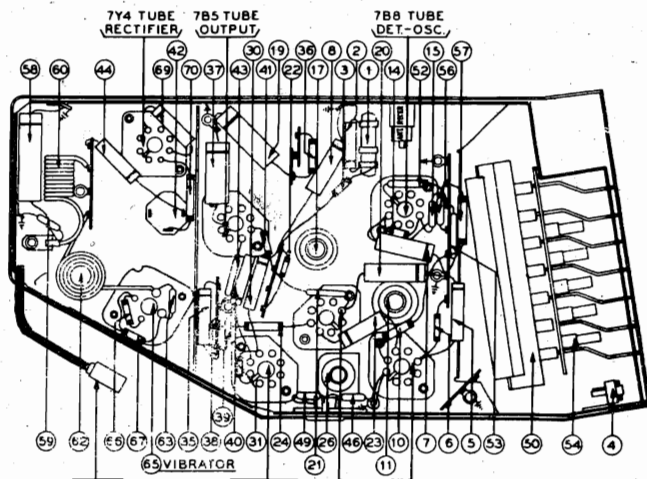
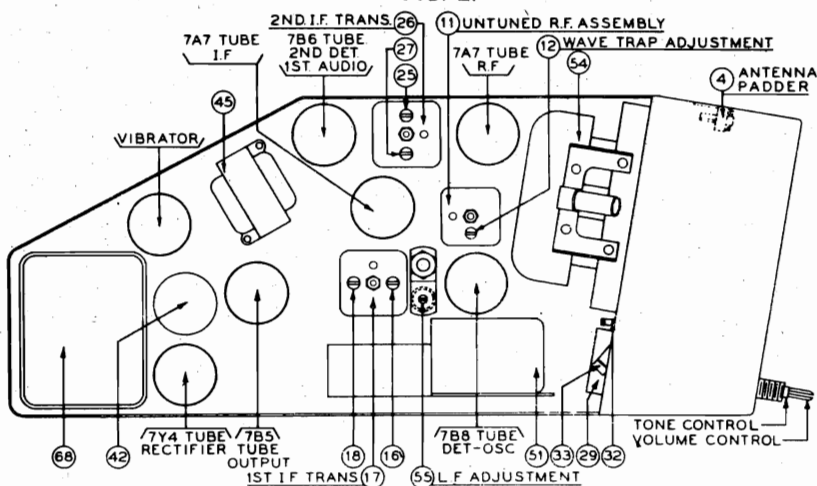


FIG. 2.



FOR ALIGNMENT SEE INDEX

September, 1939

MODEL C-1708
MODEL S-1722
Alignment

PHILCO RADIO & TELEV. CORP.

Model C - 1708 ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment—Fully charged heavy duty storage battery or 6-volt power pack, 077 or 177 Philco Signal Generator, 027 Philco vacuum tube voltmeter and circuit tester and a 27-7159 Padding screw driver

General—The vacuum tube voltmeter can be used as a "wireless" output meter as a convenient method for

obtaining maximum output reading. Solder one end of a piece of wire to a strip of phosphor bronze approximately 1" wide, 6" long and .02" thick.

Coil this strip so that it can be slipped over the top of the type 7B5 output tube, and make a fairly tight contact. Connect the other end of the wire to the "high" terminal of the vacuum tube voltmeter. Then connect a wire from the radio chassis to the "plus" terminal of the vacuum tube voltmeter.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

| OPERATIONS | SIGNAL GENERATOR | | DUMMY CAPACITY | SPECIAL INSTRUCTIONS | ADJUST PADDER |
|------------|---|--------------------------------|--------------------|---------------------------------------|--|
| | FREQUENCY | CONNECTION | | | |
| | Press the "DIAL" button and stations can be tuned in by "DIAL" tuning | | | | |
| 1 | 455 K. C. | To Antenna Receptacle on Radio | .1 mfd. | Note 1 | (27) (25) (18) (16) (27) (25) (18) (16) |
| 2 | 455 K. C. | To Antenna Receptacle on Radio | .1 mfd. | Note 1 | (12) minimum |
| 3 | 1400 K. C. | To Antenna Receptacle on Radio | 20 mmfd. Note 2 | Set tuning condenser at 1400 K. C. | (1) |
| 4 | 580 K. C. | To Antenna Receptacle on Radio | 20 mmfd. Note 2 | Set tuning condenser at 580 K. C. | (55) Note 3 |
| 5 | 1400 K. C. | To Antenna Receptacle on Radio | 20 mmfd. Note 2 | Set tuning condenser at 1400 K. C. | (4) Note 4 |

Make all adjustments for maximum reading on the output meter unless otherwise specified.

NOTE 1—Turn the tuning control knob clockwise as far as it will go.

NOTE 2—Connect the Chrysler Antenna lead, Part No. 95-0106, to the antenna receptacle on the radio. Connect a 20 mmfd. Condenser in series between the signal generator and the antenna lead.

NOTE 3—Rotate the tuning control when adjusting the Low Frequency screw (55). Tune to the signal and adjust

the screw for maximum output. Turn the tuning control knob slightly, first one way then the other, for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4—When the Antenna Stage adjustment is made with the Radio installed in the car, the Radio Antenna lead must be connected to the Cowl Antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna lead but not connected to it and adjust padder (4) for maximum signal at 1400 K. C.

ALIGNMENT FOR MODEL S-1722

| OPERATIONS | SIGNAL GENERATOR | | DUMMY CAPACITY | SPECIAL INSTRUCTIONS | ADJUST PADDER |
|------------|---|--------------------------------|------------------------|---------------------------------------|---------------|
| | FREQUENCY | CONNECTION | | | |
| 1 | Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning. | | | | |
| 2 | 470 K. C. | To Grid of 78 I. F. Tube | .5 mfd. | Note 2 | 25 23 15 13 |
| 3 | 1580 K. C. | To Antenna Receptacle on Radio | 35 mmfd. See Note 1 | Note 2 | 54 |
| 4 | 1360 K. C. | To Antenna Receptacle on Radio | 35 mmfd. See Note 1 | Set tuning condenser at 1360 K. C. | 47 Note 3 |

NOTE 1—Connect the antenna lead, Part No. L-2765, to the antenna receptacle in the radio. Connect a 35 mmfd. Condenser in series between the signal generator and the antenna lead.

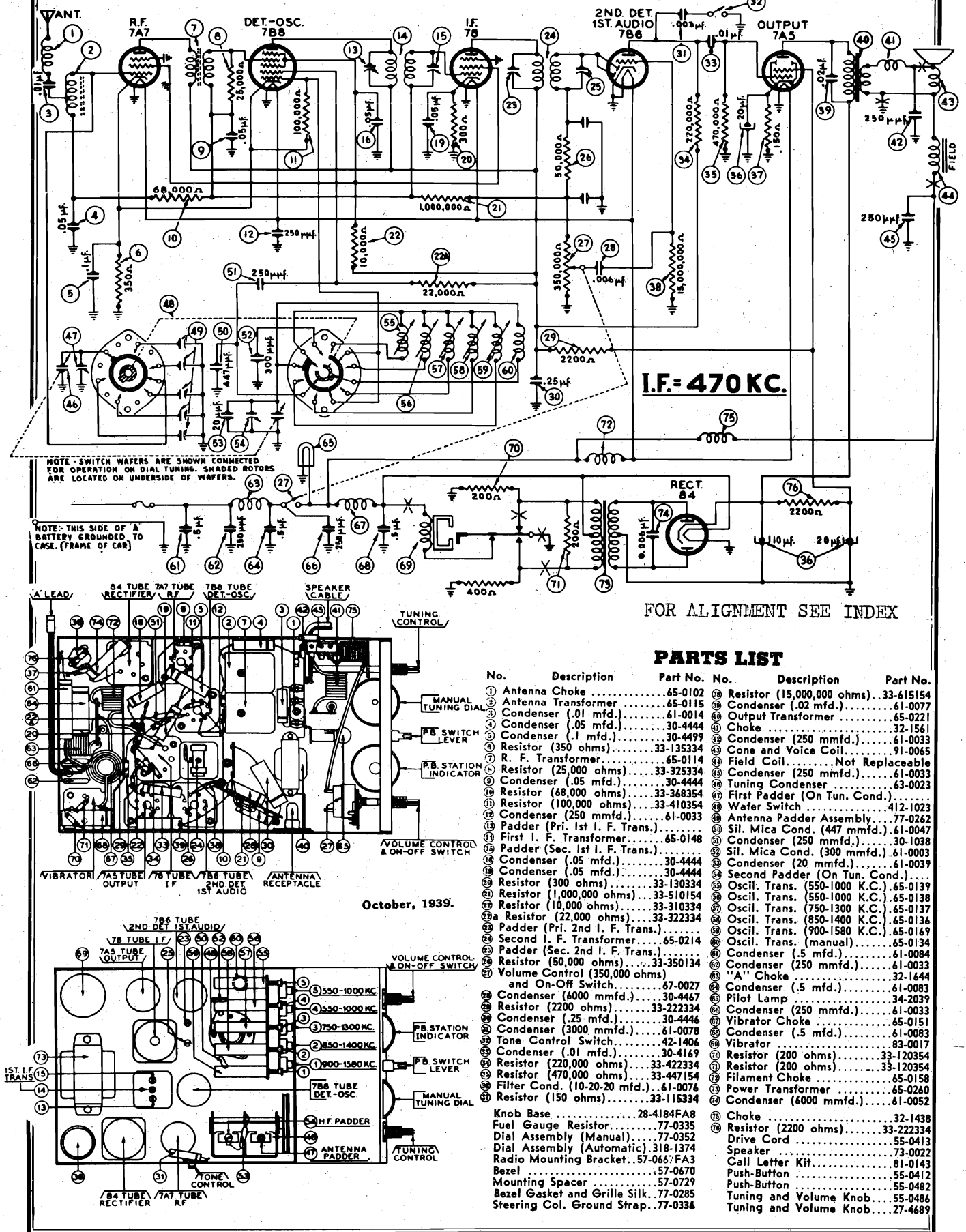
NOTE 2—Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3—When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

Studebaker
Trimmers

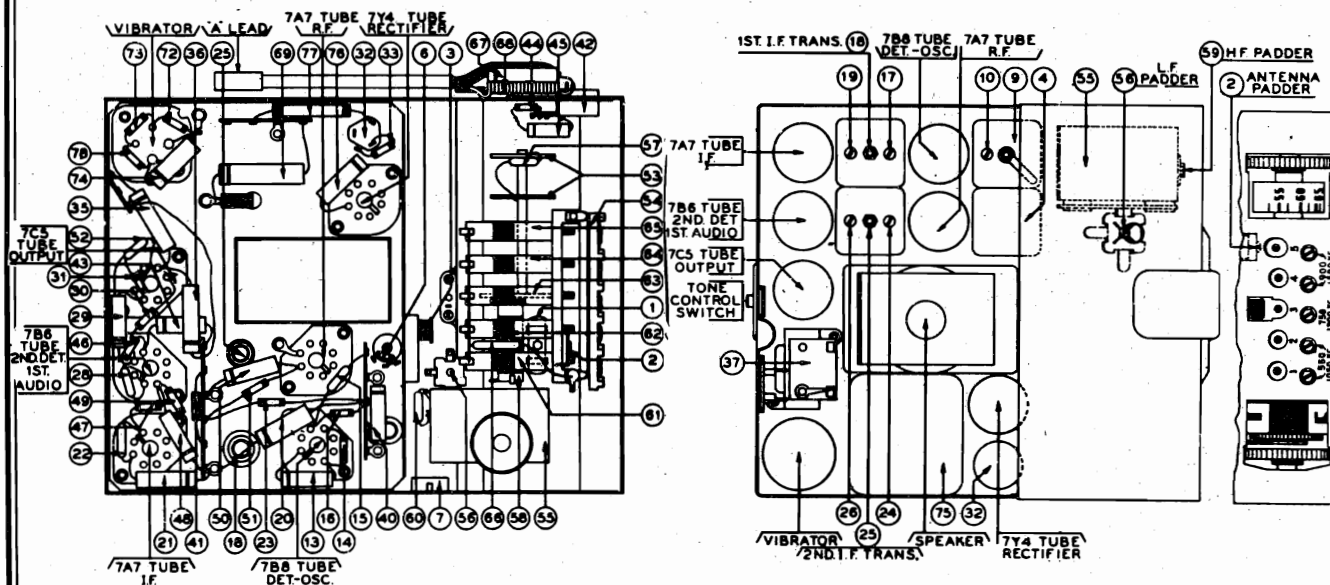
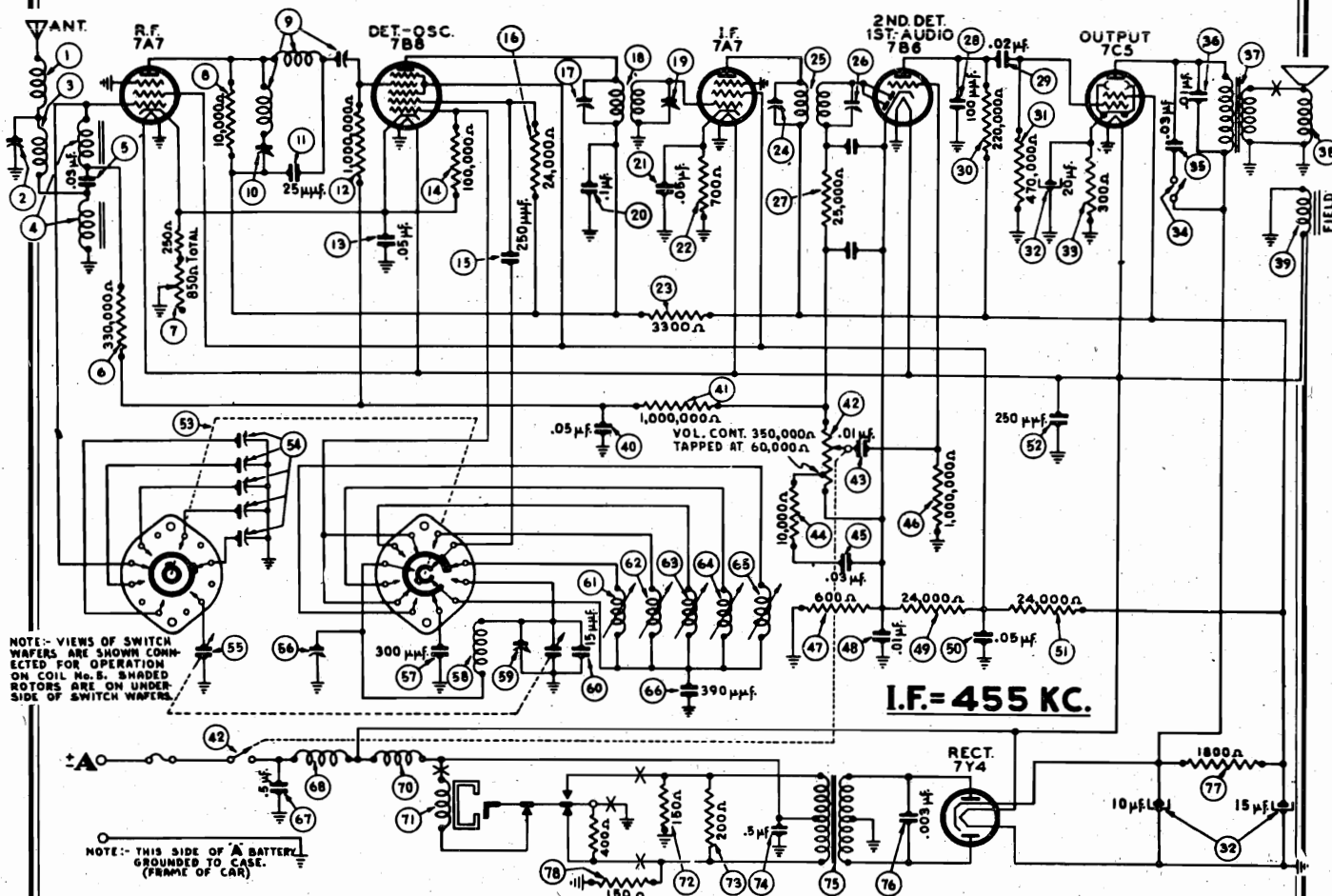
PHILCO RADIO & TELEV. CORP.

MODEL S-1722
Schematic, Chassis



MODEL F-1740 Ford
Schematic, Chassis
Trimms

PHILCO RADIO & TELEV. CORP.



PHILCO RADIO & TELEV. CORP.

MODEL F-1740
Alignment, Tuner
Parts

PARTS LIST

| No. | Description | Part No. | No. | Description | Part No. |
|-----|-------------------------|-----------|-----|--------------------------------|-----------------|
| ① | Antenna Choke | 65-0283 | ② | Sil. Mica Cond. (300 mmfd.) | 61-0003 |
| ② | Antenna Padder | Part of ② | ③ | Oscillator Trans. (Manual) | 65-0252 |
| ③ | Antenna Choke | 65-0282 | ④ | H. F. Padder (on Tuning Cond.) | 61-0038 |
| ④ | Antenna Transformer | 65-0288 | ⑤ | Condenser (15 mmfd.) | 61-0038 |
| ⑤ | Condenser (.03 mfd.) | 61-0064 | ⑥ | Oscil. Trans. (900-1580 K.C.) | 65-0255 |
| ⑥ | Resistor (330,000 ohms) | 33-43234 | ⑦ | Oscil. Trans. (900-1580 K.C.) | 65-0255 |
| ⑦ | Sensitivity Control | 67-0029 | ⑧ | Oscil. Trans. (750-1300 K.C.) | 65-0256 |
| ⑧ | Resistor (10,000 ohms) | 33-310334 | ⑨ | Oscil. Trans. (580-1050 K.C.) | 65-0257 |
| ⑨ | R. F. Transformer | 65-0267 | ⑩ | Sil. Mica Cond. (390 mmfd.) | 61-0031 |
| ⑩ | I. F. Wave Trap Padder | Part of ② | ⑪ | Condenser (.5 mfd.) | 61-0084 |
| ⑪ | Condenser (25 mmfd.) | 30-1108 | ⑫ | "A" Choke | Part of ② |
| | | | ⑬ | Vibrator Choke | Part of ② |
| | | | ⑭ | Vibrator | 83-0017 |
| | | | ⑮ | Resistor (150 ohms) | 33-115334 |
| | | | ⑯ | Resistor (200 ohms) | 33-120334 |
| | | | ⑰ | Condenser (.5 mfd.) | 61-0083 |
| | | | ⑱ | Power Transformer | 65-0278 |
| | | | ⑲ | Condenser (3000 mmfd.) | 61-0059 |
| | | | ⑳ | Resistor (1800 ohms) | 33-218534 |
| | | | ㉑ | Resistor (150 ohms) | 33-115334 |
| | | | ㉒ | Drive Cord | 55-0881 |
| | | | ㉓ | Indicator Scale (P. B.) | 55-0495 |
| | | | ㉔ | Dial Scale (Manual) | 55-0821 |
| | | | ㉕ | Manual Control Knob | 55-0705 |
| | | | ㉖ | Volume Control Knob | 55-0704 |
| | | | ㉗ | Push-Button | 55-0794 |
| | | | ㉘ | Bezel Screws | 55-0754 |
| | | | ㉙ | Bezel Screws | 97-0101 |
| | | | ㉚ | Interference Condenser | 61-0040 |
| | | | ㉛ | Interference Condenser | 61-0092 |
| | | | ㉜ | Interference Condenser | 30-4307 |
| | | | ㉝ | Hook Bolt | 97-0094FA3 |
| | | | ㉞ | Wing Nut | 97-0048FA3 |
| | | | ㉟ | Gland Nut & Sleeve Assy. | 77-0459 |
| | | | ㊱ | Speaker | 73-0036-2 |
| | | | ㊲ | Pilot Lamp | 34-2044 |
| | | | ㊳ | Jumper Plug | 57-1121 |
| | | | ㊴ | Baffle Gasket | 55-0707 |
| | | | ㊵ | Resistor (1,000,000 ohms) | 33-510238 |
| | | | ㊶ | Condenser (.05 mfd.) | 30-4567 |
| | | | ㊷ | Resistor (100,000 ohms) | 33-410154 |
| | | | ㊸ | Condenser (250 mmfd.) | 61-0034 |
| | | | ㊹ | Resistor (24,000 ohms) | 33-324334 |
| | | | ㊺ | Padder (Pri. 1st I. F. Trans.) | 65-0265 |
| | | | ㊻ | First I. F. Transformer | 65-0265 |
| | | | ㊼ | Padder (Sec. 1st I. F. Trans.) | 65-0264 |
| | | | ㊽ | Condenser (.1 mfd.) | 30-4455 |
| | | | ㊾ | Condenser (.05 mfd.) | 30-4567 |
| | | | ㊿ | Resistor (700 ohms) | 33-170438 |
| | | | 1 | Resistor (3300 ohms) | 33-233334 |
| | | | 2 | Padder (Pri. 2nd I. F. Trans.) | 65-0264 |
| | | | 3 | Second I. F. Transformer | 65-0264 |
| | | | 4 | Padder (Sec. 2nd I. F. Trans.) | 33-325234 |
| | | | 5 | Resistor (25,000 ohms) | 30-1031 |
| | | | 6 | Condenser (100 mmfd.) | 30-4481 |
| | | | 7 | Condenser (.02 mfd.) | 33-422334 |
| | | | 8 | Resistor (220,000 ohms) | 33-447154 |
| | | | 9 | Resistor (470,000 ohms) | 33-130438 |
| | | | 10 | Filter Cond. (10-15-20 mfd.) | 42-1406-6 |
| | | | 11 | Resistor (300 ohms) | 30-4447 |
| | | | 12 | Tone Control Switch | 30-4381 |
| | | | 13 | Condenser (.03 mfd.) | 65-0279 |
| | | | 14 | Condenser (.01 mfd.) | 91-0086 |
| | | | 15 | Output Transformer | Not Replaceable |
| | | | 16 | Replacement Cone | 30-4567 |
| | | | 17 | Field Coil | 33-510154 |
| | | | 18 | Condenser (.05 mfd.) | 67-0026 |
| | | | 19 | Resistor (1,000,000 ohms) | 61-0014 |
| | | | 20 | Vol. Cont. & On-Off Switch | 33-310154 |
| | | | 21 | Condenser (.01 mfd.) | 61-0061 |
| | | | 22 | Resistor (10,000 ohms) | 33-510154 |
| | | | 23 | Condenser (.03 mfd.) | 33-160334 |
| | | | 24 | Resistor (1,000,000 ohms) | 30-4479 |
| | | | 25 | Resistor (600 ohms) | 33-324334 |
| | | | 26 | Condenser (.01 mfd.) | 30-4569 |
| | | | 27 | Resistor (24,000 ohms) | 33-324434 |
| | | | 28 | Condenser (.05 mfd.) | 61-0033 |
| | | | 29 | Resistor (24,000 ohms) | 77-0391 |
| | | | 30 | Condenser (250 mmfd.) | 63-0036 |
| | | | 31 | Wafer Switch | 63-0037 |
| | | | 32 | Antenna Padder Assembly | |
| | | | 33 | Tuning Condenser | |
| | | | 34 | Low Frequency Padder | |

Model F-1740 ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment—Fully charged heavy duty storage battery or 6-volt power pack, 077 or 177 Philco Signal Generator, 027 Philco vacuum tube voltmeter and circuit tester and a 27-7059 Padding screw driver.

General—The vacuum tube voltmeter can be used as an output meter, as a convenient method for obtaining maximum output reading. Connect one end of the test lead to the "high" terminal of the vacuum tube voltmeter and the other end to the jumper on the bottom of the radio. Then connect one end of the other test lead, from the "plus" terminal of the vacuum tube voltmeter to the radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

All cover plates must be in place on the radio and screwed to the housing before attempting to adjust the radio.

| OPERATIONS | SIGNAL GENERATOR | | DUMMY CAPACITY | SPECIAL INSTRUCTIONS | ADJUST PADDER |
|---|------------------|--------------------------------|----------------|------------------------------------|----------------------------|
| | FREQUENCY | CONNECTION | | | |
| Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning. | | | | | |
| 1 | 455 K. C. | To Antenna Receptacle on Radio | .1 mfd. | Note 2 | 25 24 19 17 25 24 19 17 |
| 2 | 455 K. C. | To Antenna Receptacle on Radio | .1 mfd. | Note 2 | 10 Minimum |
| 3 | 1580 K. C. | To Antenna Receptacle on Radio | See Note 1 | Note 2 | 55 |
| 4 | 1400 K. C. | To Antenna Receptacle on Radio | See Note 1 | Set Tuning Condenser at 1400 K. C. | 2 |
| 5 | 580 K. C. | To Antenna Receptacle on Radio | See Note 1 | Set Tuning Condenser at 580 K. C. | 55 Note 3 |
| 6 | 1580 K. C. | To Antenna Receptacle on Radio | See Note 1 | Note 2 | 55 |
| 7 | 1400 K. C. | To Antenna Receptacle on Radio | See Note 1 | Set Tuning Condenser at 1400 K. C. | 2 Note 4 |

Make all adjustments for maximum reading on the output meter.

NOTE 1—Connect the antenna lead part number 95-0120 to the antenna receptacle on the radio, in series with a 20 mmfd. condenser between the antenna lead and the signal generator. Ground the shield pigtail on the antenna lead to the signal generator.

NOTE 2—Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3—Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4—When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

SETTING UP THE RADIO FOR AUTOMATIC TUNING

The Antenna and Rotomatic adjustments are easily accessible by removing the plastic bezel on the top of the radio. This bezel is held by two screws.

1—Turn the radio on and allow it to operate for at least twenty minutes before starting any adjustments. All adjustments must be made with the antenna fully extended.

2—Press the Rotomatic button until the word "Dial" appears on the Rotomatic indicator. Tune in a weak station on the manual dial between 1300 and 1400 kilocycles. Adjust the antenna padder ② (Fig. 3) until maximum volume is obtained. NOTE: This adjustment must be made first before any Rotomatic adjustments are made; otherwise, mis-tuning will result.

3—Select five stations within the frequency range shown under each set of adjustment screws in Fig. 3.

4—With "Dial" showing on the Rotomatic indicator, manually tune in the station to be set up on position No. 1 and identify the program.

5—Press the Rotomatic button until No. 1 appears on the Rotomatic indicator. Now adjust the top screw at position No. 1 until the station selected is brought in with loudest volume. Then adjust the slotted hex screw at the bottom until maximum volume is obtained. NOTE: Stations of higher frequencies are tuned in by turning the screws to the left or counter-clockwise. Lower frequency stations are tuned by turning to the right or clockwise.

6—Proceed with setting up the remaining four stations in the same manner as described under Paragraph 4 and 5.

7—Because there is some detuning of the coils due to the movements of the cores in adjacent coils, it is necessary to re-check the adjustments again, going back from Position No. 5 to No. 1 and again re-checking from No. 1 to No. 5. This is important for accurate reception while driving at a distance from the broadcasting stations.

8—This final re-checking of adjustments should be made in an area of low signal strength in your service station or in some known "dead" spot where signals can just barely be heard.

MODELS 91A, 91B, 99A,
99B Ford
Antenna Data

PHILCO RADIO & TELEV. CORP.

FORD ANTENNA PARTS LIST

(FORD 91A CLOSED CAR)*

Philco Part No. 91-0038

| Part No. | Description | Lot Price | Est | Part No. | Description | Lot Price | Est |
|-----------|--------------------|---------------|------|----------|------------------|-----------|--------|
| W-58FA1 | Nut | per 100 | 1.20 | *92-4870 | Gasket | | .03 |
| W-583 | Lockwasher | per 100 | .90 | *28-2860 | Washer | per 100 | .50 |
| W-579FA1 | Lockwasher | per 100 | .45 | *28-4896 | Wrench | | .10 |
| W-1907 | Nut | per 100 | 4.00 | *28-7988 | Escutcheon | | .26 |
| W-1968FA8 | Screw (Escutcheon) | Mag., per 100 | 1.50 | *86-4043 | Tow Strap | | .02 |
| 27-4506 | Antenna Stop | | .06 | *55-0182 | Knob | | .45 |
| 27-4671 | Bushing | | .15 | | Antenna Assembly | | \$3.75 |
| 27-4678 | Gasket | | .10 | 91-0049 | Antenna Lead | | 1.80 |
| | | | | *95-0075 | Antenna Lead | | 1.80 |

*Used on No. 116 car also.

FORD ANTENNA PARTS LIST

(FORD 91B OPEN CAR)

Philco Part No. 91-0051

| Part No. | Description | List Price Each | Part No. | Description | List Price Each |
|----------|--------------|-----------------|----------|---------------------------|-----------------|
| W-55 | Nut | per 100 \$1.20 | 28-4696 | Wrench | .10 |
| W-679FA1 | Lockwasher | per 100 .45 | *55-0182 | Knob | .45 |
| W-177FA8 | Screw | per 100 .10 | 55-0285 | Gasket | .08 |
| 27-4710 | Antenna Stop | .15 | 55-0810 | Threaded Bakelite Bushing | .25 |
| 28-2606 | Washer | per 100 .50 | 91-0044 | Antenna Assembly | 4.35 |
| | | | *95-0075 | Antenna Lead | 1.30 |

*Used on 91A car also.

*Used on 91A car also.

FORD ANTENNA PARTS LIST

FOR 116 CLOSED CAR (MERCURY) (99A)

Philco Part No. 91-0031

| Part No. | Description | List Price Each | Part No. | Description | List Price Each |
|------------|-------------------------|-----------------|----------|------------------|-----------------|
| W-03T A1 | Nut | per 100 .120 | 28-4696 | Wrench | _____ |
| W-53B | Lockwasher | per 100 .90 | 36-4043 | Tow Strap | _____ |
| W-57F A1 | Lockwasher | per 100 .45 | 55-0182 | Knob | _____ |
| W-79T A1 | Nut | per 100 .400 | 55-0240 | Antenna Stop | _____ |
| W-1988T A8 | Screw (Escutcheon Mtg.) | per 100 .150 | 57-0278 | Escutcheon | _____ |
| 27-4671 | Bushing | _____ .15 | 91-0023 | Antenna Assembly | \$3.75 |
| 27-4679 | Gasket | _____ .08 | 95-0075 | Antenna Lead | 1.80 |
| 28-2606 | Washer | per 100 .50 | | | |

FORD ANTENNA PARTS LIST

FOR 116 OPEN CAR (MERCURY) (99B)

Philco Part No. 91-0039

| Part No. | Description | List Price Each | Part No. | Description | List Price Each |
|----------|------------------------|-----------------|----------|---------------------------|-----------------|
| W-55 | Nut | per 100 \$1.20 | 55-0240 | Stop | .10 |
| W-570 | Lockwasher | per 100 .45 | 55-0285 | Gasket | .08 |
| 28-2606 | Washer | per 100 .50 | 55-0810 | Threaded Bakelite Bushing | .25 |
| 28-4696 | Allen Set Screw Wrench | .10 | 91-0046 | Antenna Assembly | 4.25 |
| 55-0182 | Knob | .45 | 95-0075 | Antenna Lead | 1.80 |

Prices subject to change without notice

1939 FORD ADJUSTABLE ANTENNA

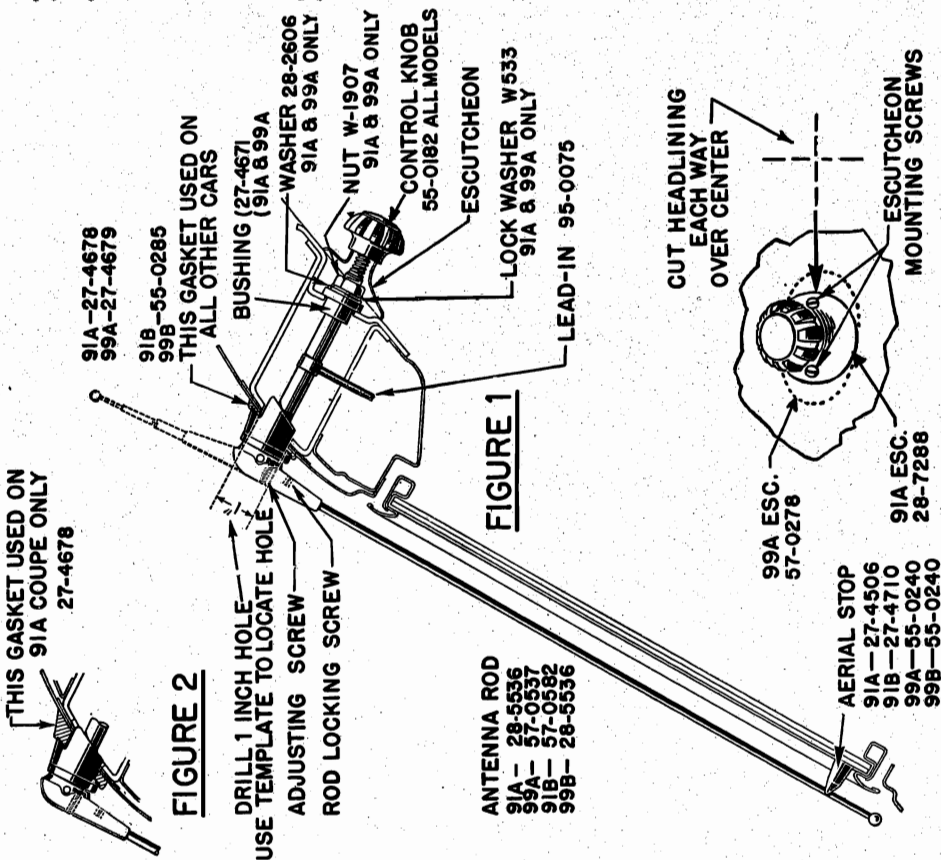


FIGURE 3