Most - Often - Needed

1951

VOLUME ELEVEN

RADIO DIAGRAMS

and Servicing Information

THEORY
PRACTICE EXPERIENCE

Compiled by

M. N. BEITMAN

VOLUME 11
$2.50

SUPREME PUBLICATIONS

Most - Often - Needed

1951 RADIO DIAGRAMS

and Complete INDEX

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THEORY
PRACTICE EXPERIENCE

SUPREME PUBLICATIONS

CHICAGO

Introduction

In this new Supreme Publications eleventh volume, you will find helpful service material on all popular 1951 radios including AM and FM types, portables, auto sets, combinations, and record changers. Again you benefit with SUPREME tremendous volume-sales by being able to purchase this complete manual — a year's supply of diagrams and service data — at a real bargain price. It is our privilege and pleasure to continue to aid radio servicemen with service manuals and books as we cross into the nineteenth year of our company's existence.

The separate index to this Volume 11, 1951 Radio manual, begins on page 3, directly opposite this page, and continues on pages 4 and 5. This index catalogs all models covered in this manual and refers to pages in this manual where such material is described. Use this index to find the 1951 radio material you need.

The majority of service facts presented in this volume have been supplied by the manufacturers of the radios described. Our sincere thanks is given to these manufacturers for their fine cooperation and help.

M. N. Beitman

July 2, 1951
Chicago

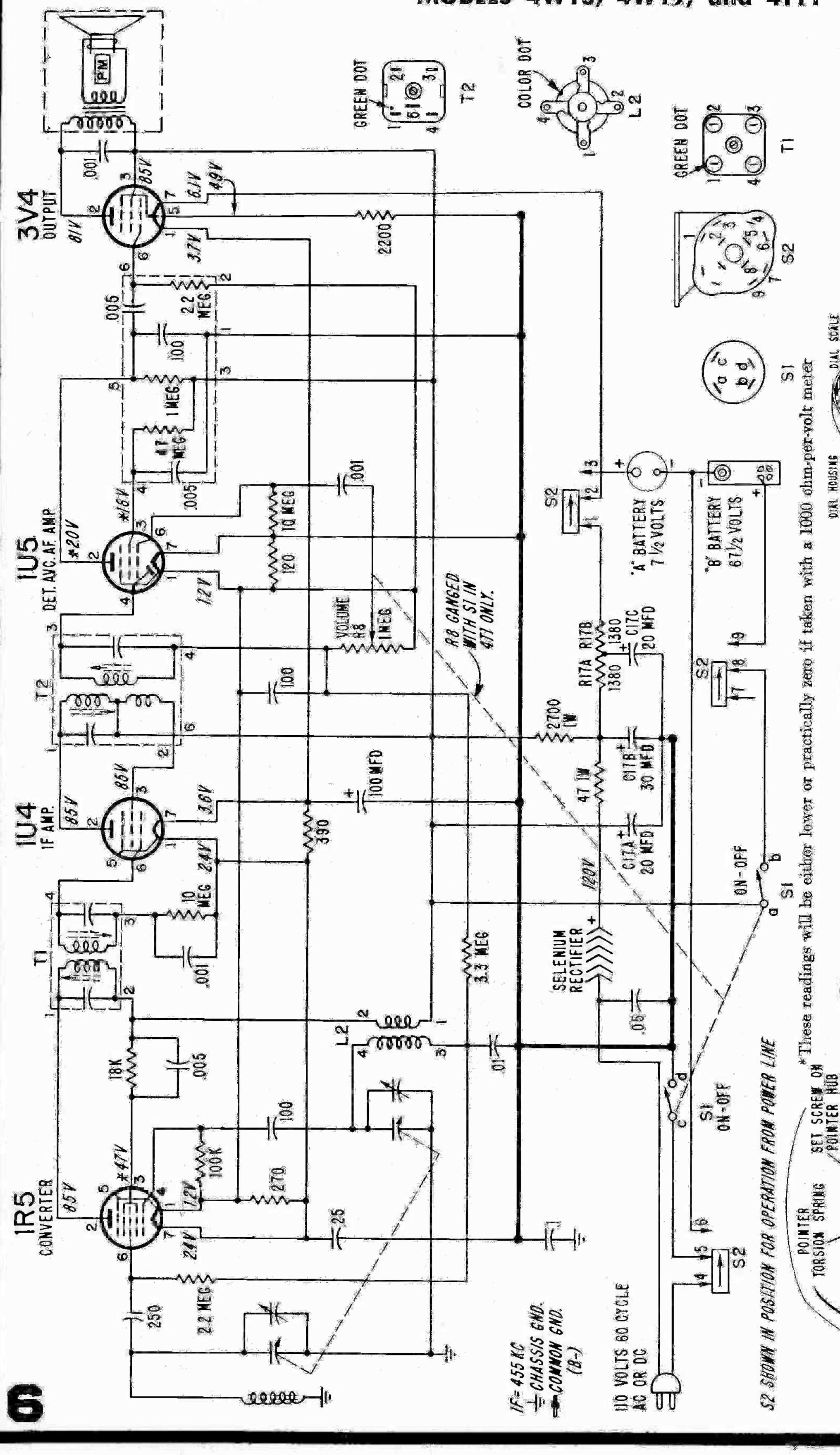
Index

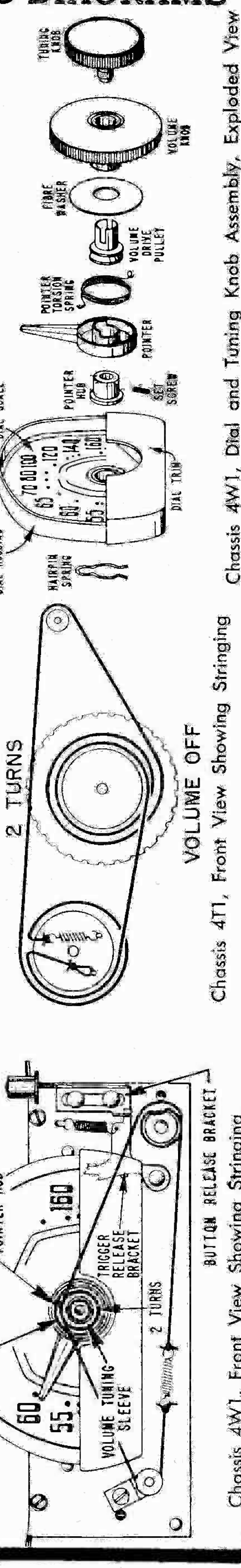
Always use this Index to find needed material in this Volume 11, 1951 RADIO Diagram manual. You will find the various makes of radios listed in alphabetical order by manufacturer's name. Under each make, models or chassis are listed in numerical order at the left of the column while the corresponding page numbers are given to the right.

MANUAL OF 1951 MOST-OFTEN-NEEDED RADIO DIAGRAMS

Admiral

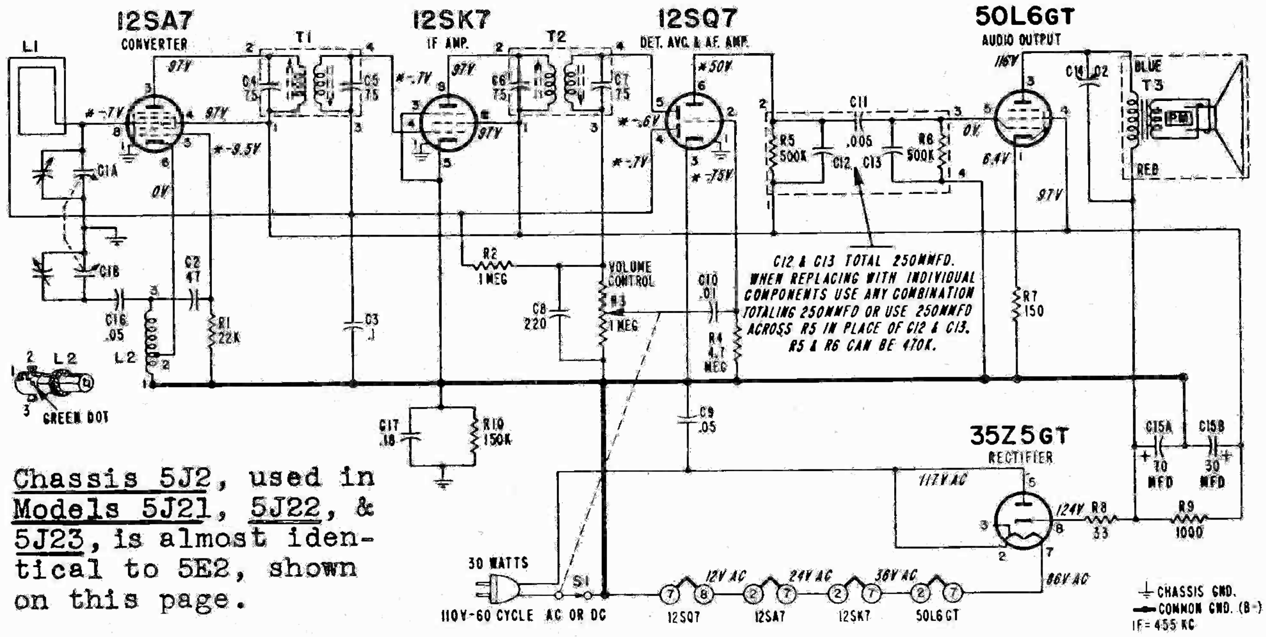
CHASSIS 4W1 and 4T1
MODELS 4W18, 4W19, and 4T11





Admiral

CHASSIS 5E2
MODELS 5E21, 5E22, 5E23



Chassis 5J2, used in Models 5J21, 5J22, & 5J23, is almost identical to 5E2, shown on this page.

*These readings will be either lower or practically zero if taken with a 1000 ohm-per-volt meter.

VOLTAGE DATA

All readings made between tube socket terminals and B minus (terminal of On-Off switch).

Dial turned to low frequency end; volume control at minimum.

Measured on 117 Volts AC line.

Voltages measured with Vacuum Tube Voltmeter.

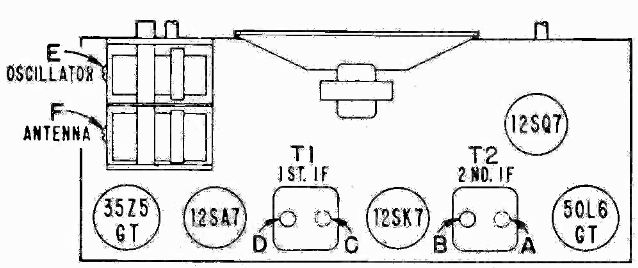
ALIGNMENT PROCEDURE

- Connect output meter across speaker voice coil.
- Turn receiver volume control full on.
- Use an isolation transformer if available, otherwise connect a .1 mfd. condenser in series with low side of signal generator and connect to chassis.

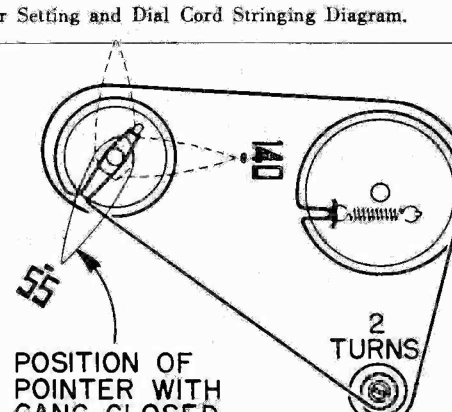
Step	Dummy Antenna in Series with Signal Generator	Connection of Signal Generator (High Side)	Signal Generator Frequency	Receiver Gang Setting	Trimmer Description	Trimmer Designation	Type of Adjustment
1	250 mmfd. condenser	Antenna stator of tuning condenser	455 KC	Gang fully open	2nd IF 1st IF	*A, B *C, D	Maximum Output
2	250 mmfd. condenser	Antenna stator of tuning condenser	1620 KC	Gang fully open	Oscillator (on gang)	E	Maximum Output
3	Loop of several turns of wire or place generator lead close to receiver loop for adequate signal pickup.	No actual connection (signal by radiation)	1400 KC	Tune in generator signal	Antenna (on gang)	F	Maximum Output
4	Mount and set dial pointer as shown in Pointer Setting and Dial Cord Stringing Diagram.						

*Adjustments A and C made from the underside of the chassis.

TUBE AND TRIMMER LOCATION

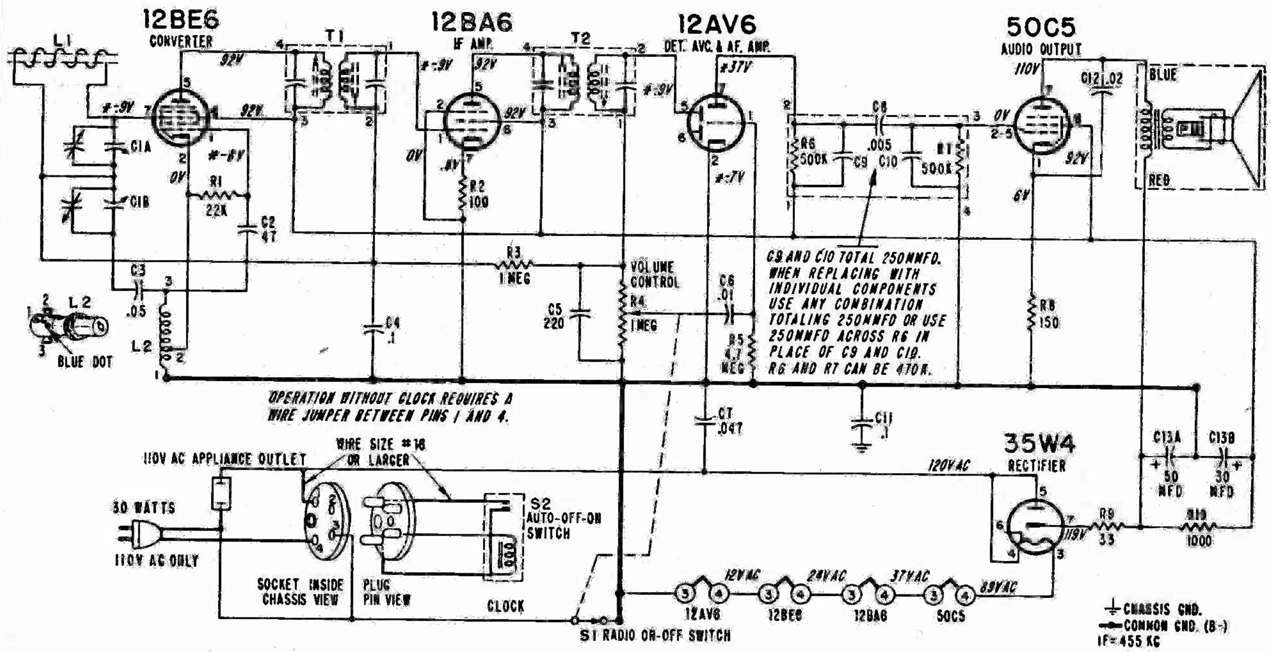


Adjustments A and C are made from underside of chassis.



Admiral

CHASSIS 5G2
MODELS 5G21, 5G22, 5G23, 5G21/15, 5G22/15, 5G23/15



*These readings will be either lower or practically zero if taken with a 1000 ohm-per-volt meter.

OPERATING RADIO MANUALLY

To operate the radio manually, the "Auto-Off-On" switch must be in the "On" position or the radio will not operate.

The radio on-off switch will turn the radio on or off, but will have no control over the appliance or the clock.

TO REMOVE CLOCK from CABINET

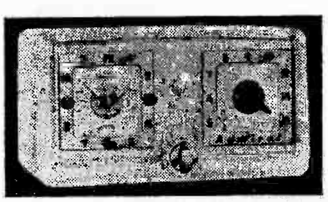
(Radio chassis need not be removed when removing clock)

1. Remove the back from radio cabinet.
2. Remove the clock plug from the socket on top of the radio chassis, by removing screw from top of plug and gently prying plug out from socket.
3. Turn the slumber switch to the "60" position.
4. Remove the 3 nuts which hold the clock back cover to the clock.
5. Carefully pull the clock through the front of the cabinet while twisting it slightly to eliminate binding.

TO REMOVE FIELD and COIL ASSEMBLY or TO REMOVE ROTOR

The field and coil assembly and the rotor can be easily removed after the two screws which mount the nameplate are removed.

Note that when the rotor is replaced, the gear on the rotor must drop into the hole in the center of the gear plate and mesh with the clock gear.

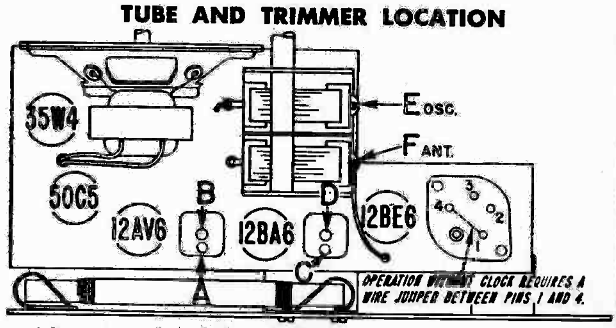


VOLTAGE DATA

Voltages shown on schematic diagram

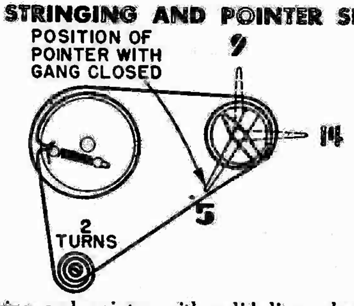
- All readings made between tube socket terminals and B minus (terminal of On-Off switch).
- Measured on 117 Volt AC line.
- Volume control minimum; dial turned to low frequency end.
- Voltages measured with Vacuum Tube Voltmeter.

TUBE AND TRIMMER LOCATION



Adjustments A and C made from underside of chassis.

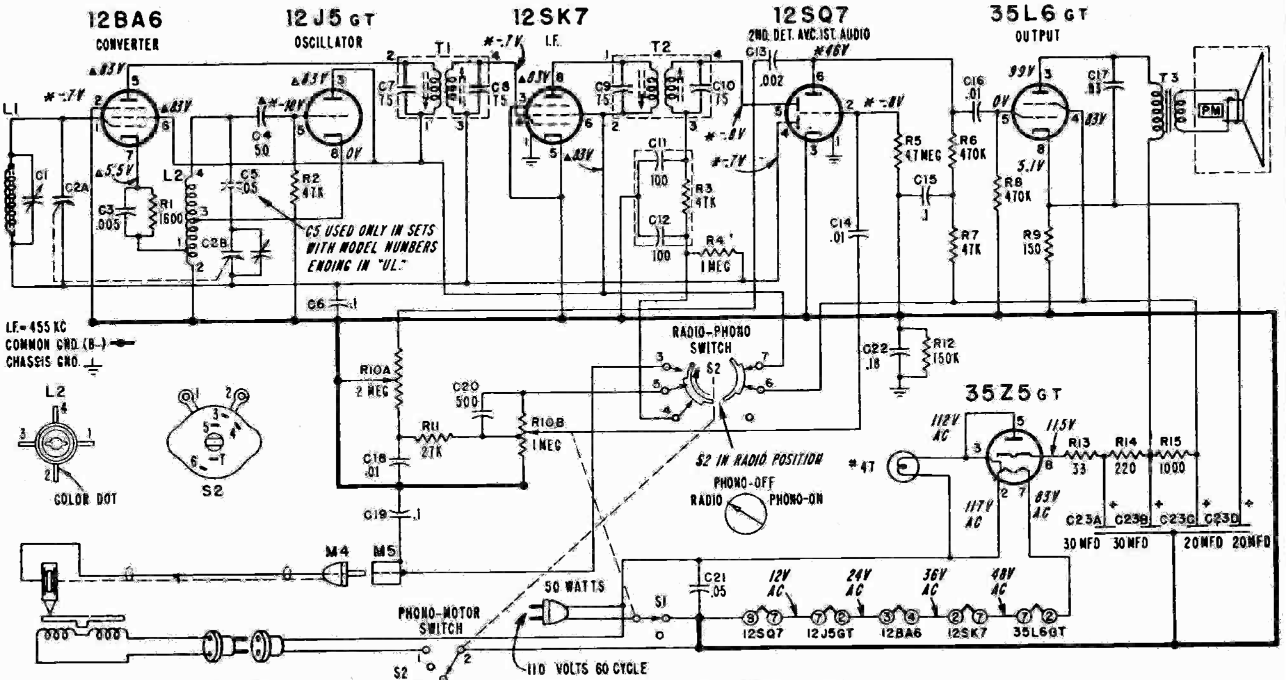
DIAL STRINGING AND POINTER SETTING



Dial stringing and pointer with solid lines shown with gang closed. Dashed line pointer positions (1400 KC and 900 KC) shown when tuning condenser is tuned to generator signal.

Admiral

CHASSIS 6J2
MODELS 6J21, 6J22



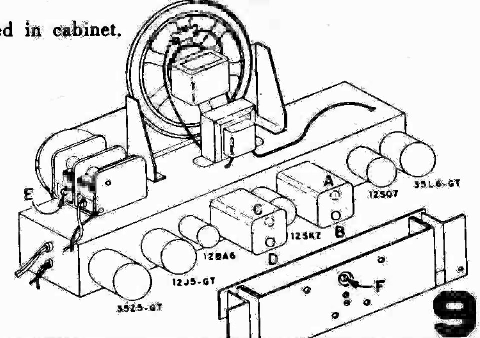
*These readings will be either lower or practically zero if taken with a 1000 ohm-per-volt meter.
▲ These readings will be zero on "Phono"; all other DC readings may be slightly higher.

Step	Dummy Antenna in Series with Signal Generator	Connection of Signal Generator (High Side)	Signal Generator Frequency	Receiver Gang Setting	Trimmer Description	Trimmer Designation	Type of Adjustment
1	250 mmfd. condenser	Tuning condenser, antenna stator	455 KC	Gang fully open	2nd IF 1st IF	*A, B *C, D	Maximum output
2	250 mmfd. condenser	Tuning condenser, antenna stator	1620 KC	Gang fully open	Oscillator	F	Maximum output

Mount dial pointer. Set pointer to horizontal position with tuning condenser tuned to 1400 KC generator signal (see illustration below). Rotate the tuning condenser until the pointer is in a vertical position (900 KC), then slip chassis in cabinet, carefully guiding the pointer so that it locates between the dial escutcheon and the cabinet. Install antenna and chassis mounting bolts. The pointer and escutcheon may be mounted after installing the chassis in cabinet as follows: Set pointer to horizontal position with gang tuned to 1400 KC signal. Place escutcheon on cabinet. With long nose pliers slip the hairpin ends of the escutcheon mounting springs in holes of escutcheon tabs.

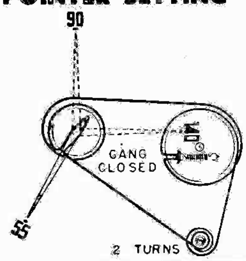
Step	Dummy Antenna in Series with Signal Generator	Connection of Signal Generator (High Side)	Signal Generator Frequency	Receiver Gang Setting	Trimmer Description	Trimmer Designation	Type of Adjustment
3	Loop of several turns of wire, or place generator lead close to receiver antenna for adequate signal pickup.	No actual connection (signal by radiation)	1400 KC	Tune in generator signal	Antenna	†F	Maximum output

*Adjustments A and C made from the underside of the chassis. If IF transformers have hollow core slugs, these adjustments may all be made from the top of chassis, if you use alignment tool #98A30-7 obtainable from your Admiral distributor. The bottom IF slug adjustment may be reached through the hollow core in the upper slug.
† Antenna Trimmer "F" should be aligned after chassis and antenna are mounted in cabinet.



DIAL STRINGING AND POINTER SETTING

Dial stringing and pointer with solid lines shown with gang closed. Dashed line pointer positions (1400 KC and 900 KC) shown when tuning condenser is tuned to generator signal.

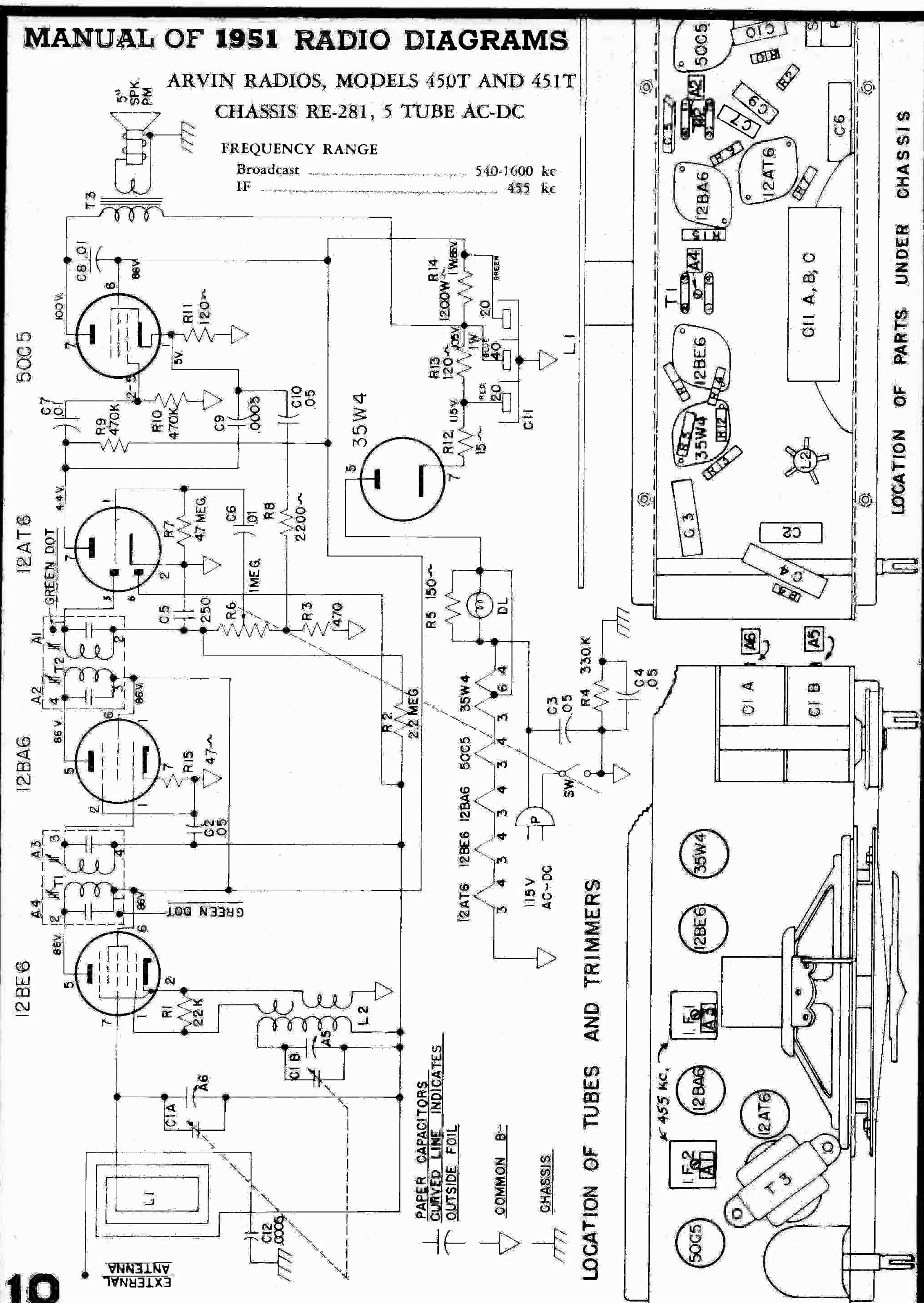


MANUAL OF 1951 RADIO DIAGRAMS

ARVIN RADIOS, MODELS 450T AND 451T
CHASSIS RE-281, 5 TUBE AC-DC

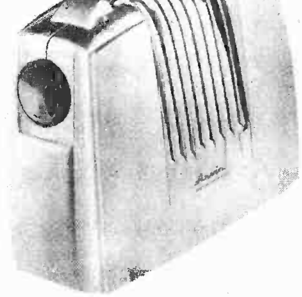
FREQUENCY RANGE

Broadcast	540-1600 kc
IF	455 kc



ARVIN RADIO

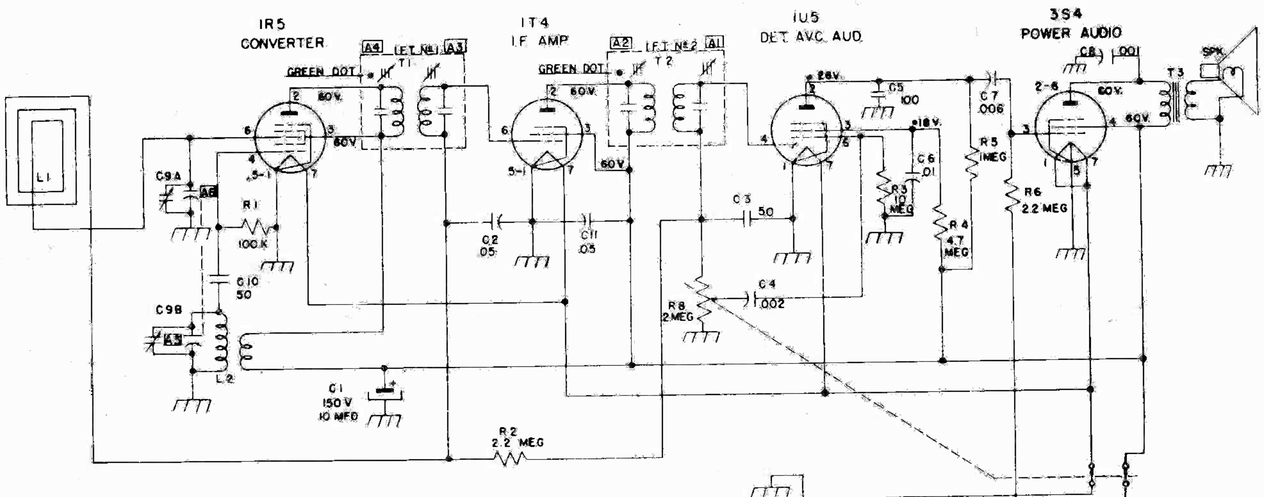
ARVIN RADIO, MODEL 446P; CHASSIS-RE-280
4 TUBE BATTERY PORTABLE

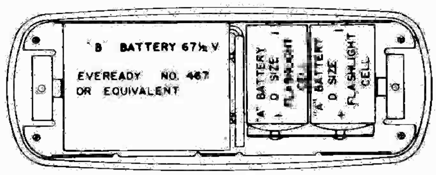


FREQUENCY RANGE
- Broadcast .... 540-1600 kc
- IF .... 455 kc

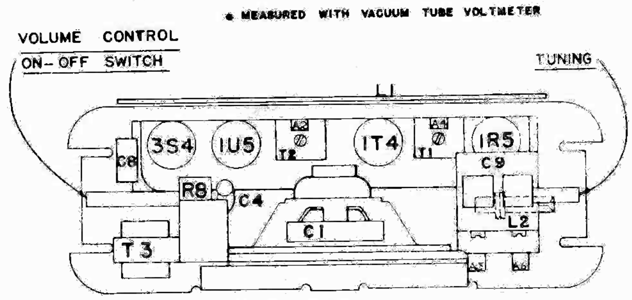
POWER SUPPLY
- 1 $67\frac{1}{2}$ V. B. Battery, Eveready Minimax, No. 467 or Equal.
- 2 $1\frac{1}{2}$ V. D. Size Flashlight Cells, Connected in Parallel.

POWER OUTPUT
- Undistorted .... .06 Watts
- Maximum .... .15 Watts
- Plate Load .... 10,000 Ohms

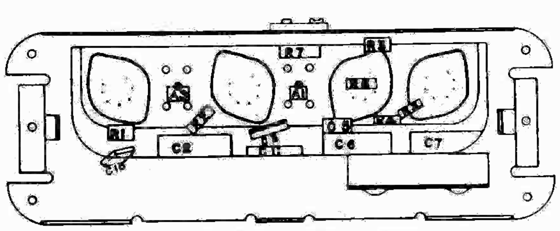




BATTERY INSTALLATION



TUBE LAYOUT



LOCATIONS OF PARTS UNDER CHASSIS

ALIGNMENT DATA

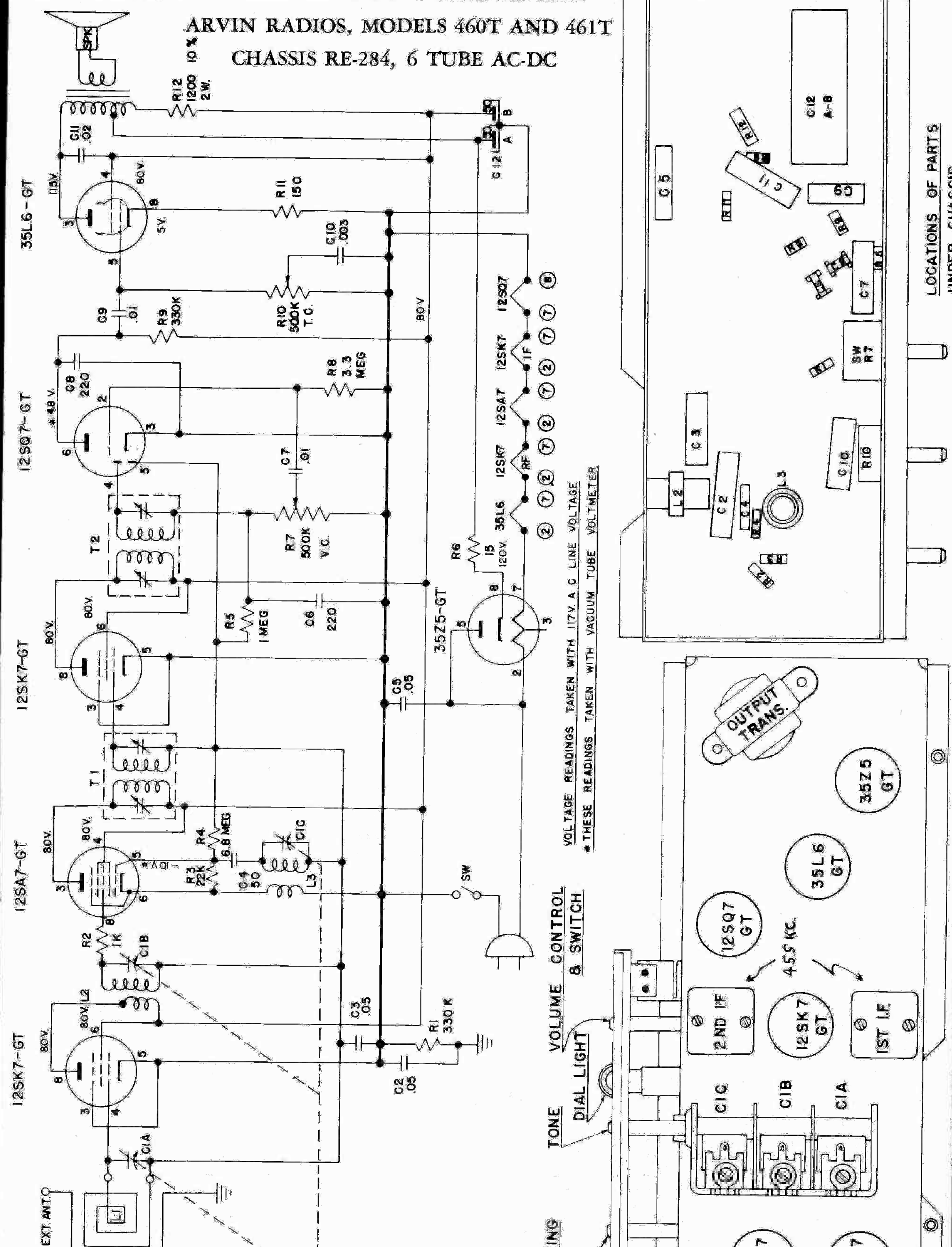
Preliminary

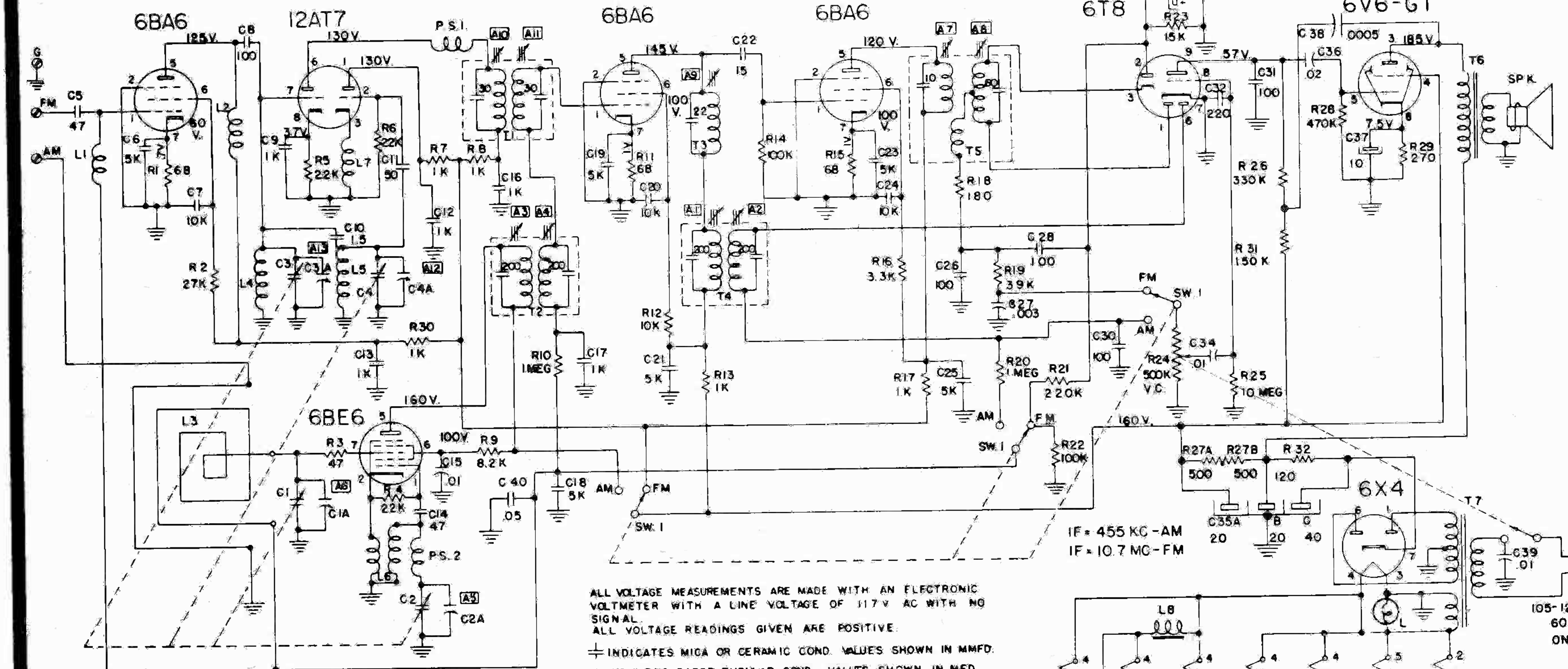
Output meter reading to indicate .05 watt across voice coil .... 0.4 V.
Generator ground lead connected .... to metal chassis.
Generator modulation .... 30%, 400 cycles.
Position of Volume control .... fully on.

Position of Variable	Generator Frequency	Dummy Antenna	Generator Connections	Adjust Trimmers (In order shown)	Trimmer Function
Open	455 KC	.05 MFD	Mixer Grid	A1, A2, A3, A4	I.F.
Open	1650 KC		Test Loop	A5	Osc.
1400 KC	1400 KC		Test Loop	A6	Ant.
600 KC	600 KC		Test Loop	Check Point	

MANUAL OF 1951 RADIO DIAGRAMS

ARVIN RADIOS, MODELS 460T AND 461T
CHASSIS RE-284, 6 TUBE AC-DC





ALL VOLTAGE MEASUREMENTS ARE MADE WITH AN ELECTRONIC VOLTMETER WITH A LINE VOLTAGE OF 117 V AC WITH NO SIGNAL.
ALL VOLTAGE READINGS GIVEN ARE POSITIVE.

INDICATES MICA OR CERAMIC COND. VALUES SHOWN IN MMFD.

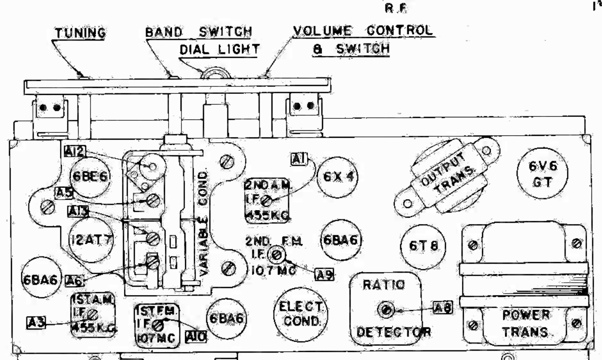
INDICATES PAPER TUBULAR COND. VALUES SHOWN IN MFD.

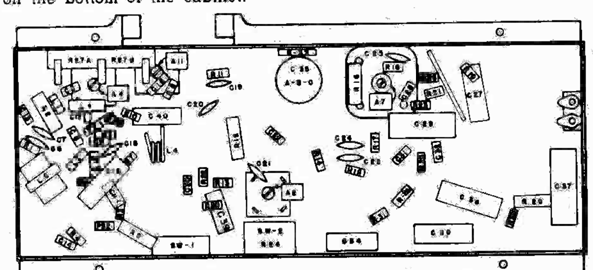
INDICATES ELECTROLYTIC COND. VALUES SHOWN IN MFD.

NOTE:
The Schematic Diagram printed in this bulletin is for Chassis RE-277-1 which includes a bass boost & hum reduction circuit. Chassis RE-277 differs from Chassis RE-277-1 in the following respects.

1. C38 was .02 uf. 400 V., and was connected from plate to screen of the 6V6GT tube.
2. R31, 150 K ohm 1/4 watt Resistor, was not included in the circuit and R26 connected directly to B+ 140 V.
3. R32, 120 ohm 1 wat tresistor, was not included in the circuit and C35B electrolytic condenser section connected to the center tap of R27.

The two chassis are identified by the proper RE numbers on the Model Number label on the bottom of the cabinet.



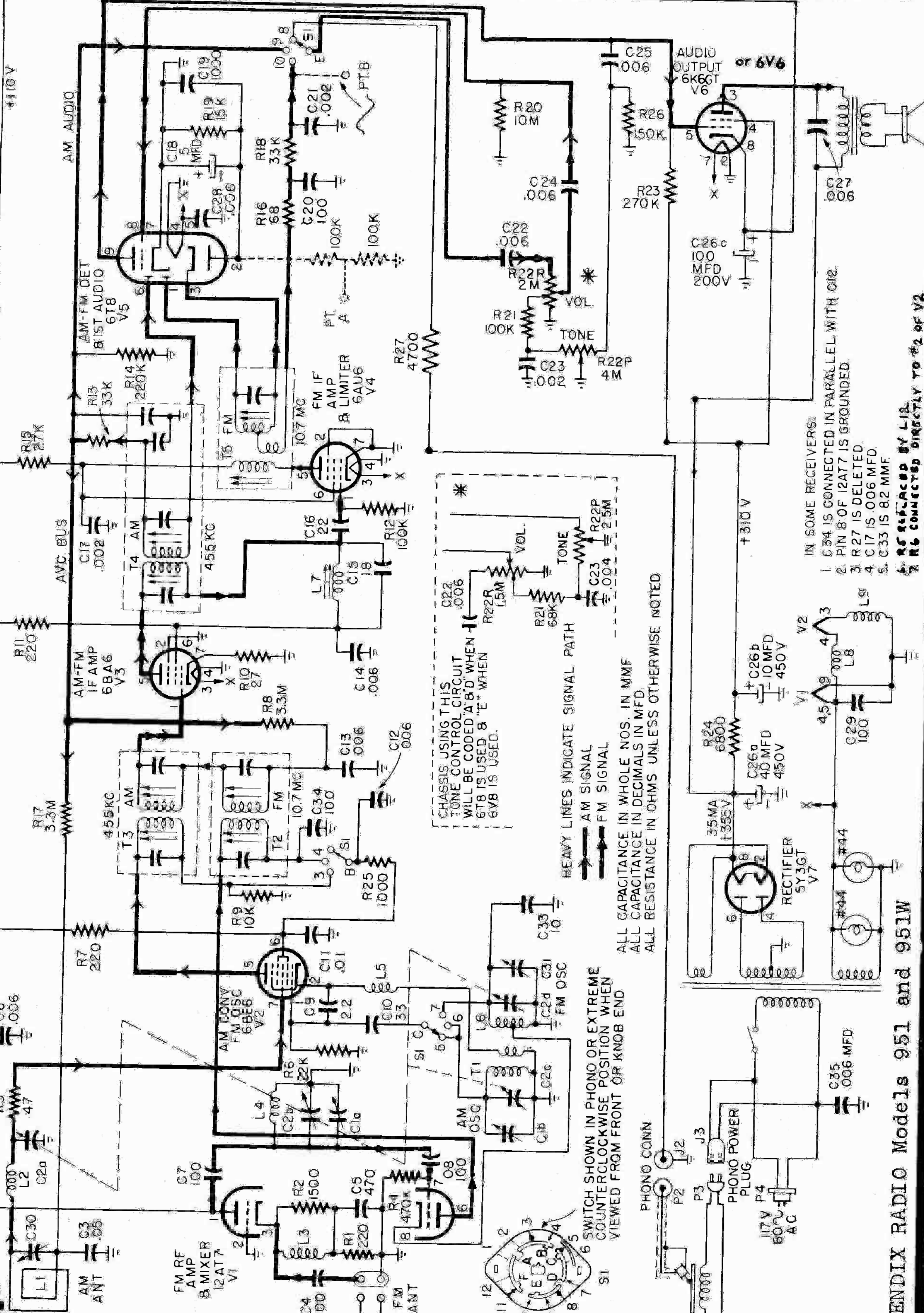


LOCATIONS OF PARTS AND TRIMERS UNDER CHASSIS

ARVIN RADIO

ARVIN RADIOS, MODELS 480TFM AND 481TFM

CHASSIS RE-277 & RE-277-1, 8 TUBE AC, AM-FM

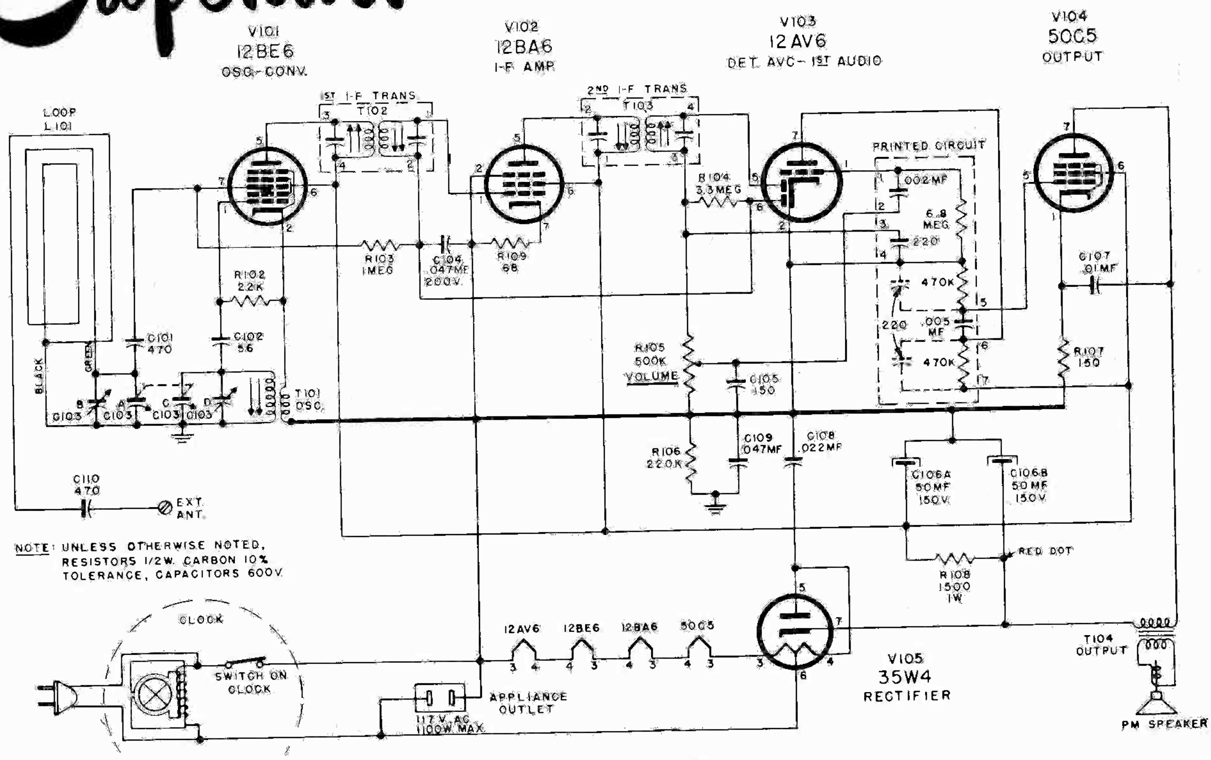

BENDIX RADIO MODELS 951 and 951W
IN SOME RECEIVERS:
1. C34 IS CONNECTED IN PARALLEL WITH C12.
2. PIN 8 OF 12AT7 IS GROUNDED
3. R27 IS DELETED.
4. C17 IS .006 MFD.
5. C33 IS 8.2 MMF.
6. R6 REPLACED BY L12.
7. R6 CONNECTED DIRECTLY TO #2 OF V2
CHASSIS USING THIS TONE CONTROL CIRCUIT WILL BE CODED "A" & "D" WHEN 6T8 IS USED & "E" WHEN 6V8 IS USED.
HEAVY LINES INDICATE SIGNAL PATH
AM SIGNAL
FM SIGNAL
ALL CAPACITANCE IN WHOLE NOS. IN MMF
ALL CAPACITANCE IN DECIMALS IN MFD.
ALL RESISTANCE IN OHMS UNLESS OTHERWISE NOTED
SWITCH SHOWN IN PHONO OR EXTREME COUNTERCLOCKWISE POSITION WHEN VIEWED FROM FRONT OR KNOB END
AUDIO OUTPUT 6K6GT V6 or 6V6
AM-FM DET & 1ST AUDIO 6T8 V5
FM IF AMP & LIMITER 6AU6 V4
AM-FM IF AMP 6BA6 V3
AM CONV FM OSC 6BE6 V2
FM RF AMP & MIXER 12AT7 V1
RECTIFIER 5Y3GT V7
PHONO CONN
PHONO POWER PLUG
117 V 60 ~ AC
AM ANT
FM ANT
AVC BUS
BENDIX RADIO Models 951 and 951W

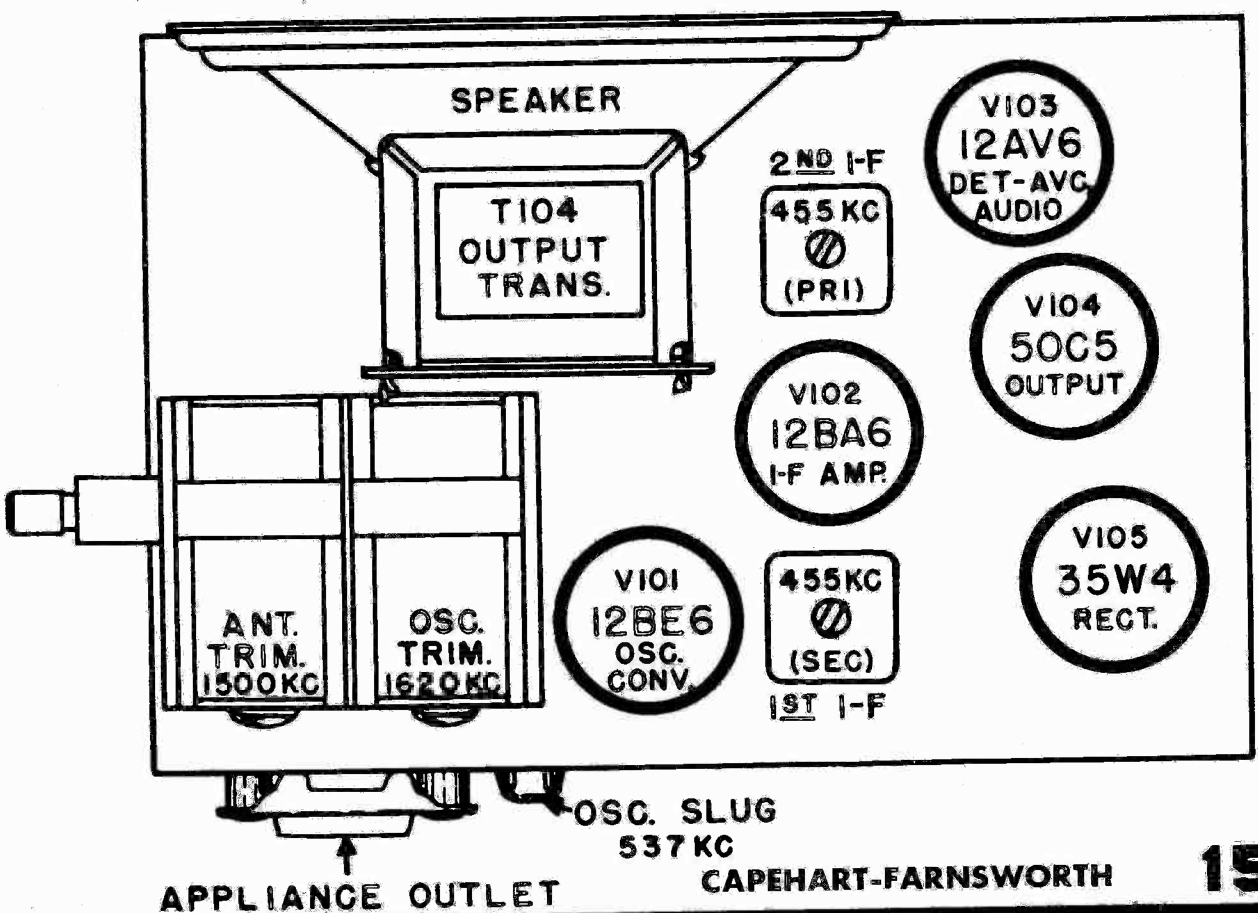
Capehart

CLOCK - RADIO

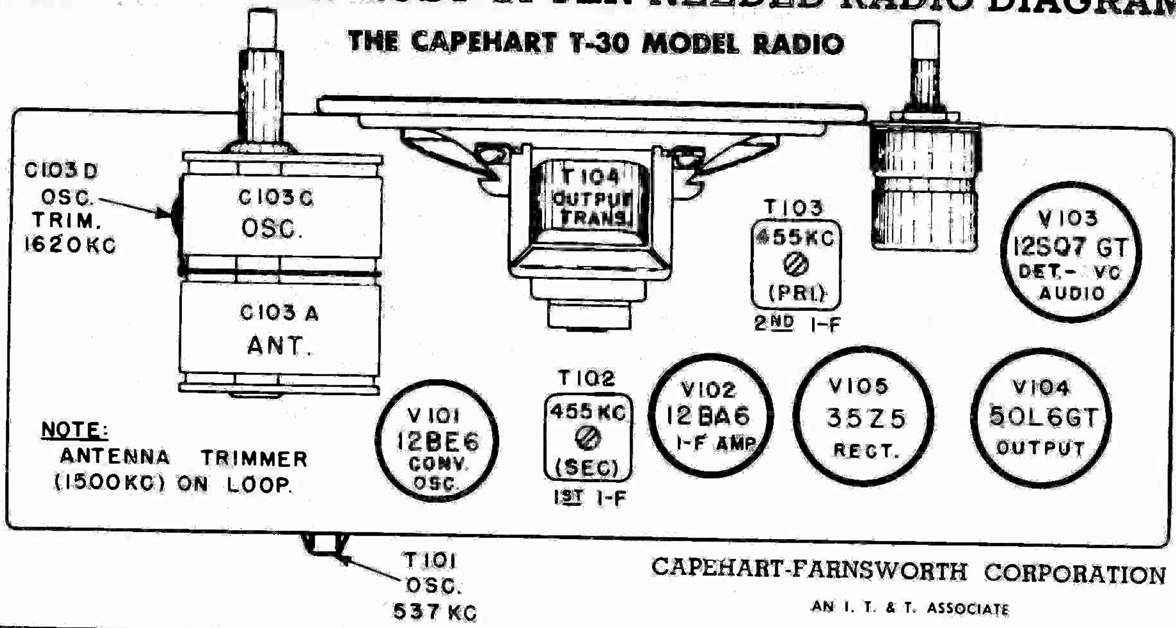
MODEL TC-20

RADIO CHASSIS C-297





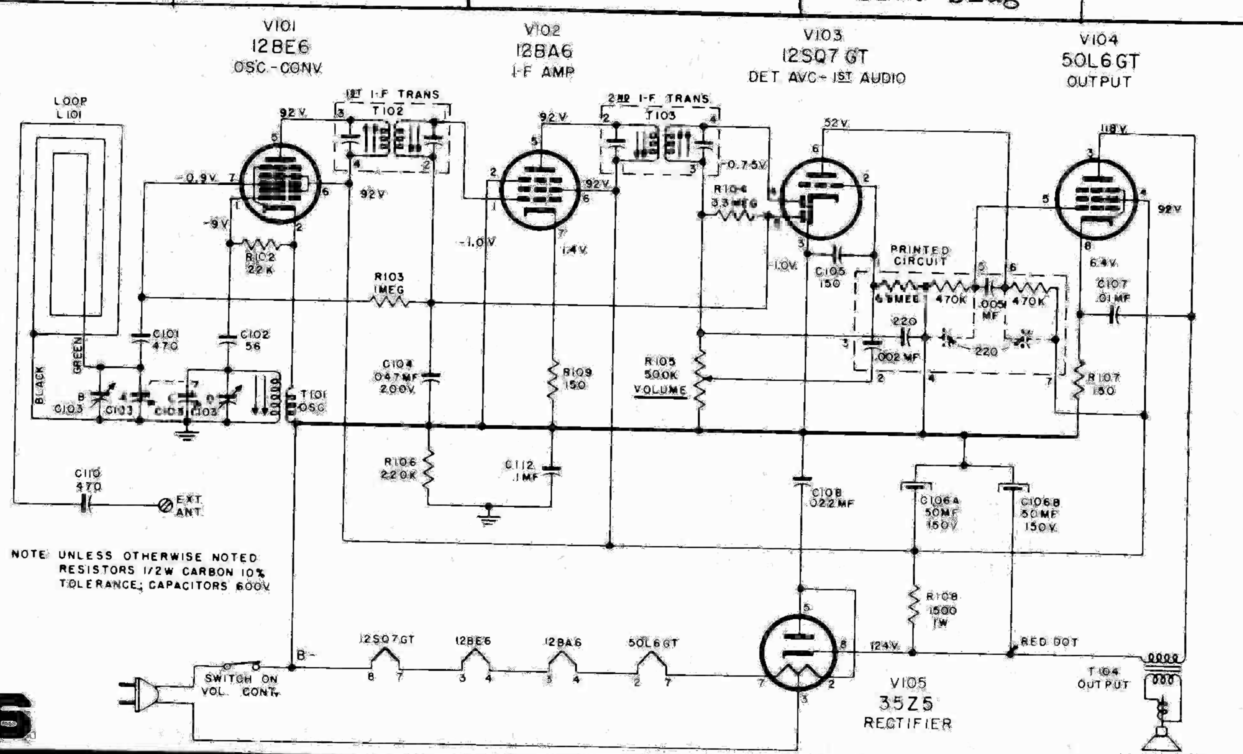
THE CAPEHART T-30 MODEL RADIO



CAPEHART-FARNSWORTH CORPORATION

AN I. T. & T. ASSOCIATE

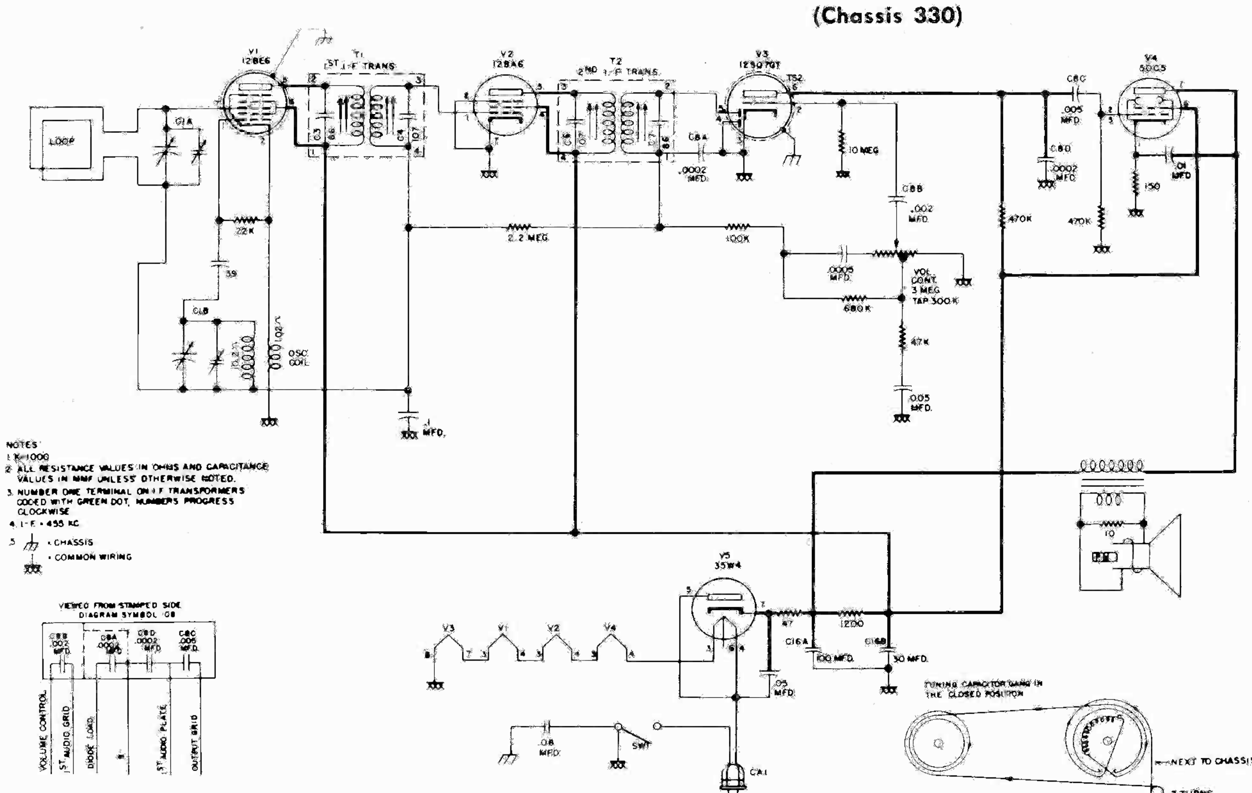
Step	Set RF Generator at	Set Condenser gang at	Adjust	To Obtain
1	455KC	Fully Open at some quiet point	IF Slugs T103 T102	Maximum Output
2	1620KC	1620KC	Osc. Trimmer C103D	Same
3	1500	1500	Ant. Trimmer C103B (on Loop)	Same
4	537KC	537KC	T101 Osc. Slug	Same



CROSLEY

REVISED MODELS: 11-100U, 11-101U, 11-102U, 11-103U 11-104U, 11-105U

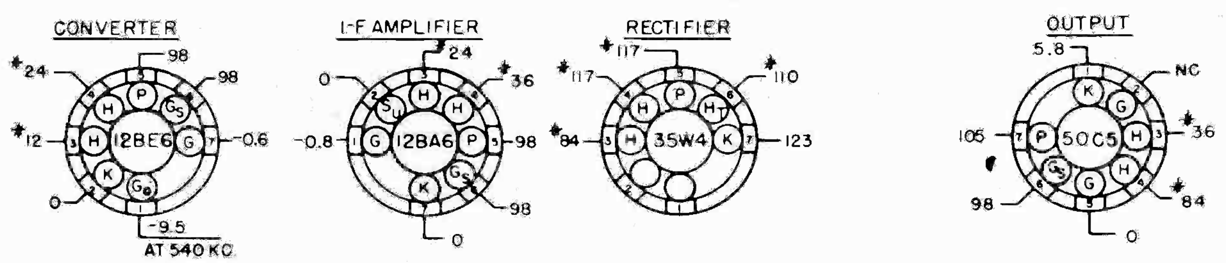
(Chassis 330)



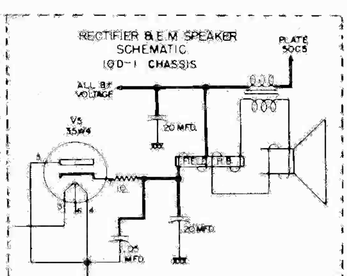
INTERMEDIATE FREQUENCY: 455 kc.

Models D10BE, D10CE, D10GN, D10RD, D10TN, and D10WE, using Chassis 10D, are very similar in circuit to the description on this page. Some of these models used Chassis 10D-1 also where an electromagnetic speaker is employed -- see insert schematic at bottom of page.

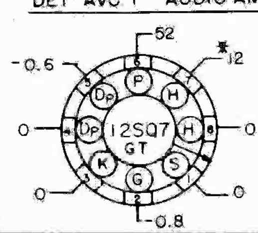
The above listed models also used Chassis 301 which is similar to Chassis 330, but uses 12AV6 instead of 12SQ7 as V3. In some sets R2 is a 3.3 megohms and C5 is .05 mfd.



NOTES.
1. BOTTOM VIEW OF TUBE SOCKETS.
2. MEASURE VOLTAGE WITH AN ELECTRONIC VOLTMETER FROM SOCKET LUG TO B- PIN 2 ON THE 12BA6.
3. LINE VOLTAGE 117 V. 60~.
4. NC = NO CONNECTION.
5. * = AC VOLTAGE.
6. SOCKET VOLTAGE TOLERANCE ± 10%.

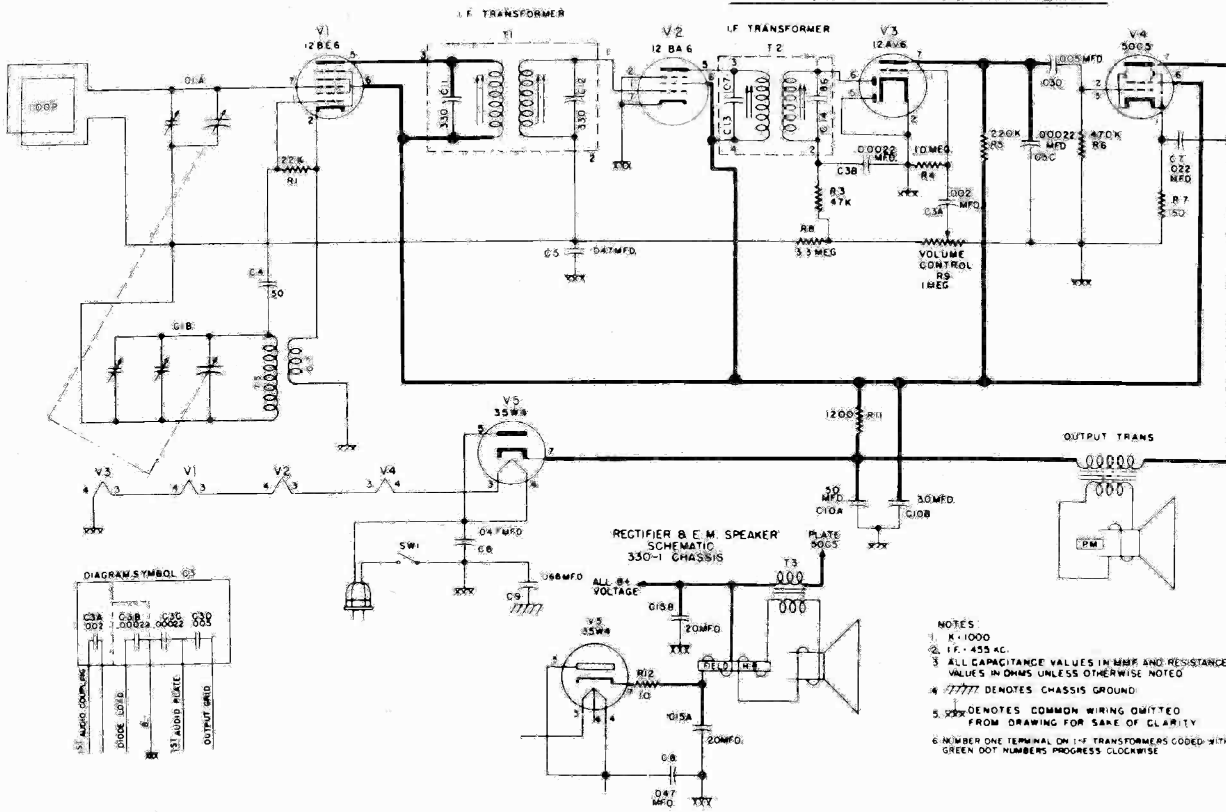


DET-AVC-1ST AUDIO AMPL.



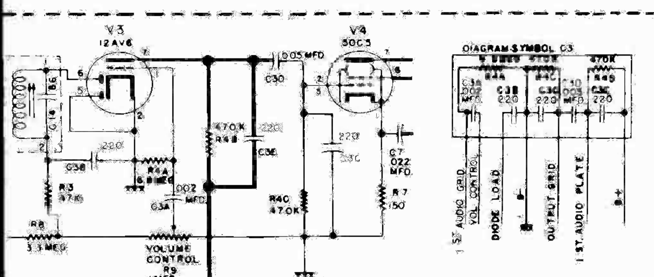
CROSLEY

MODELS 11-114U, 11-115U, 11-116U, 11-117U, 11-118U, 11-119U
** (Chassis 330, 330-1)



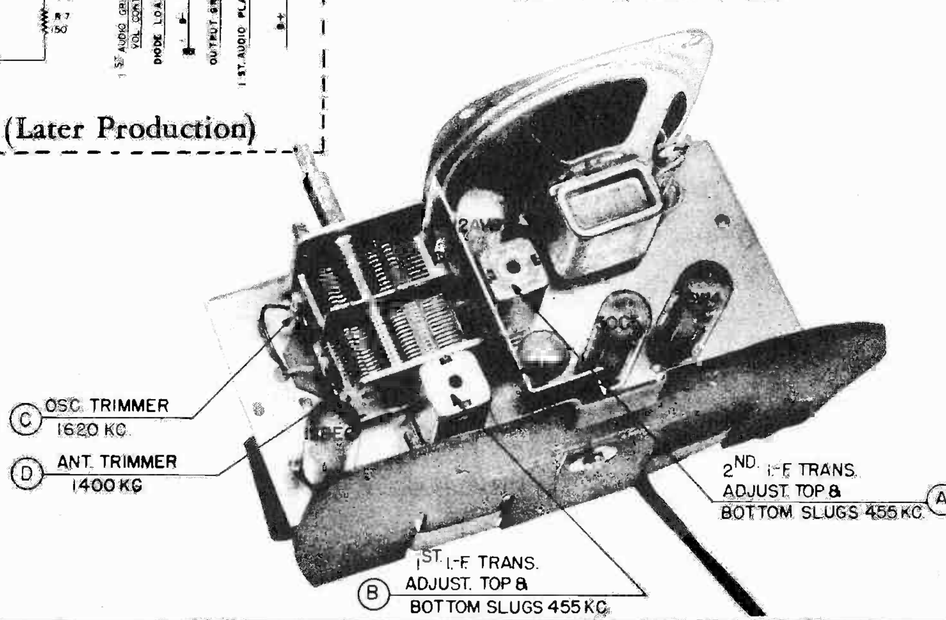
SCHEMATIC DIAGRAM: CHASSIS 330, 330-1 (Early Production Sets)

** Chassis 330 is equipped with a P. M. Speaker   Chassis 330-1 is equipped with an E. M. Speaker



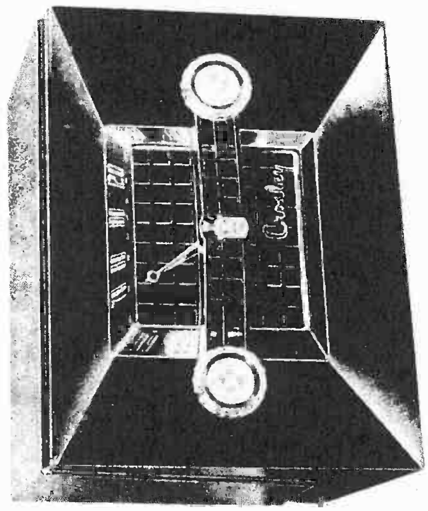
CHASSIS 330, 330-1 (Later Production)

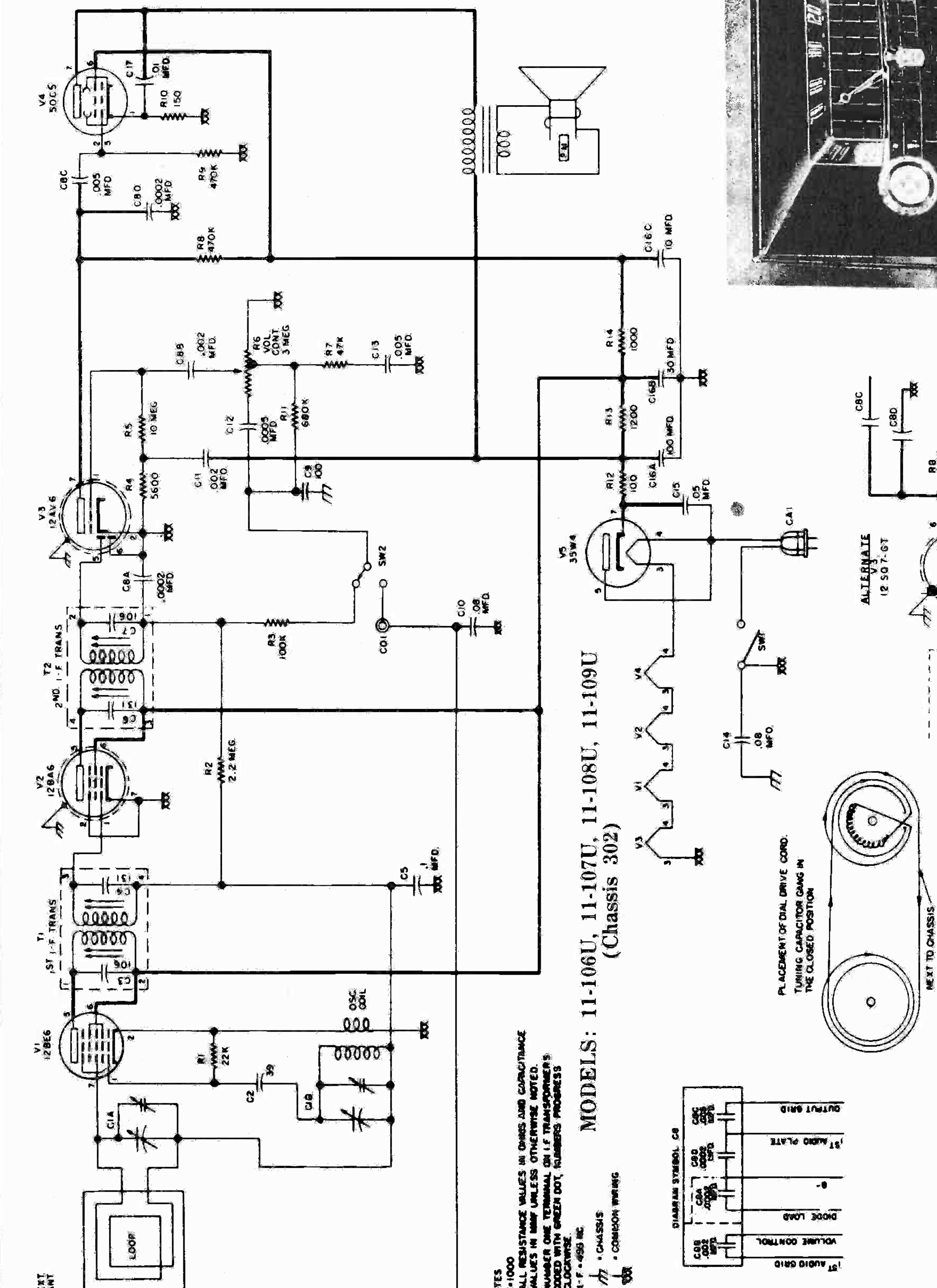
CHASSIS, TOP VIEW

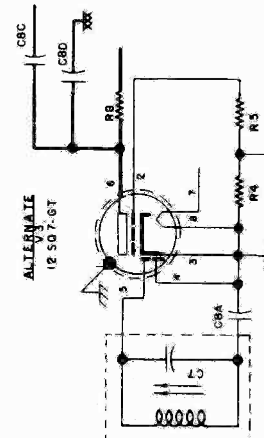


CROSLEY

MODELS: 11-106U, 11-107U, 11-108U, 11-109U
(Chassis 302)



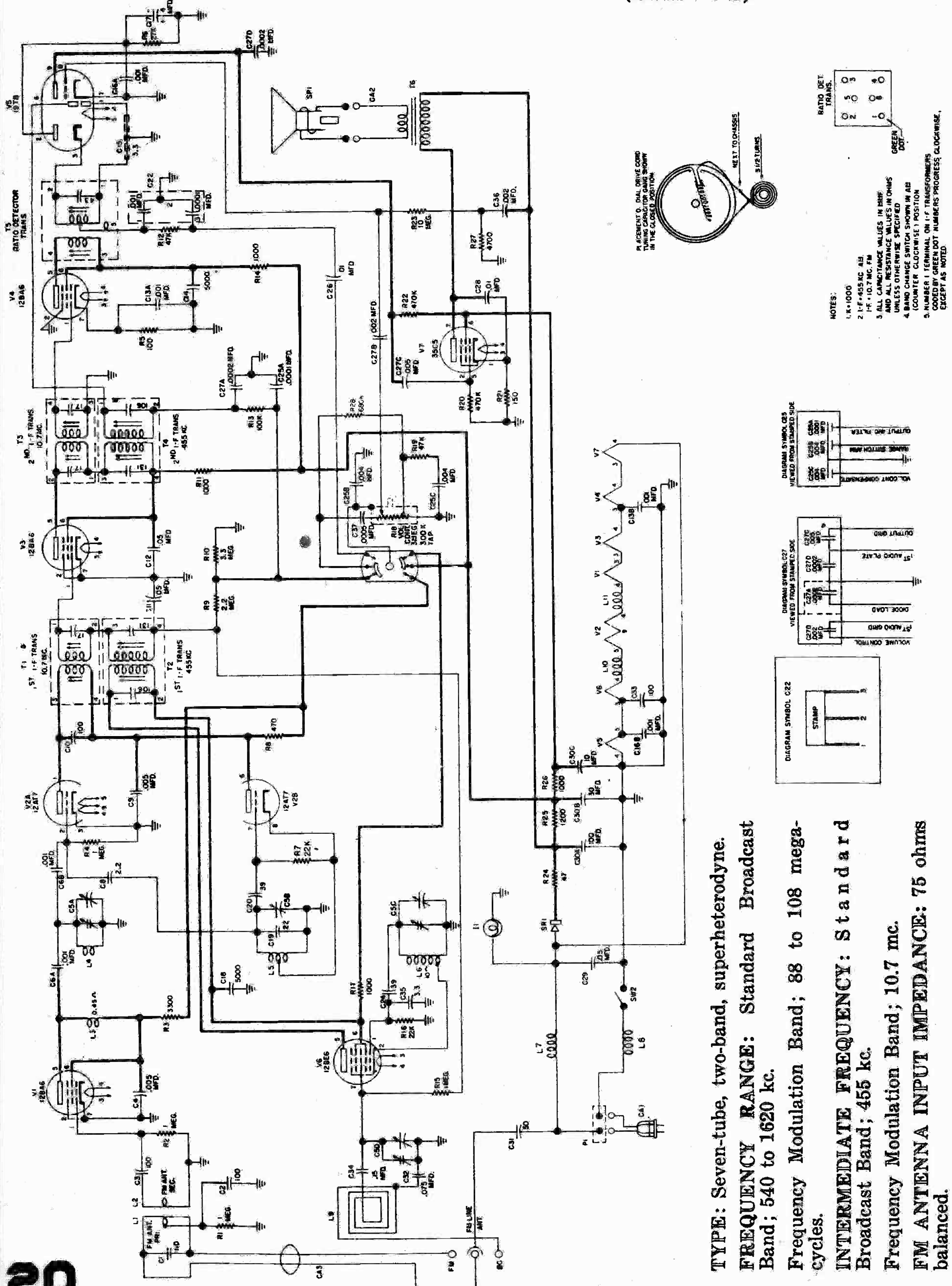




Crosley Chassis 299, used in Models 11-110U, 11-111U, 11-112U, 11-113U, 11-130U, and 11-132U, electrically is almost identical to Chassis 302, described on this page.

CROSLEY

MODELS: 11-126U, 11-127U, 11-128U, 11-129U
(Chassis 312)



TYPE: Seven-tube, two-band, superheterodyne.

FREQUENCY RANGE: Standard Broadcast Band; 540 to 1620 kc.
Frequency Modulation Band; 88 to 108 megacycles.

INTERMEDIATE FREQUENCY: Standard Broadcast Band; 455 kc.
Frequency Modulation Band; 10.7 mc.

FM ANTENNA INPUT IMPEDANCE: 75 ohms balanced.

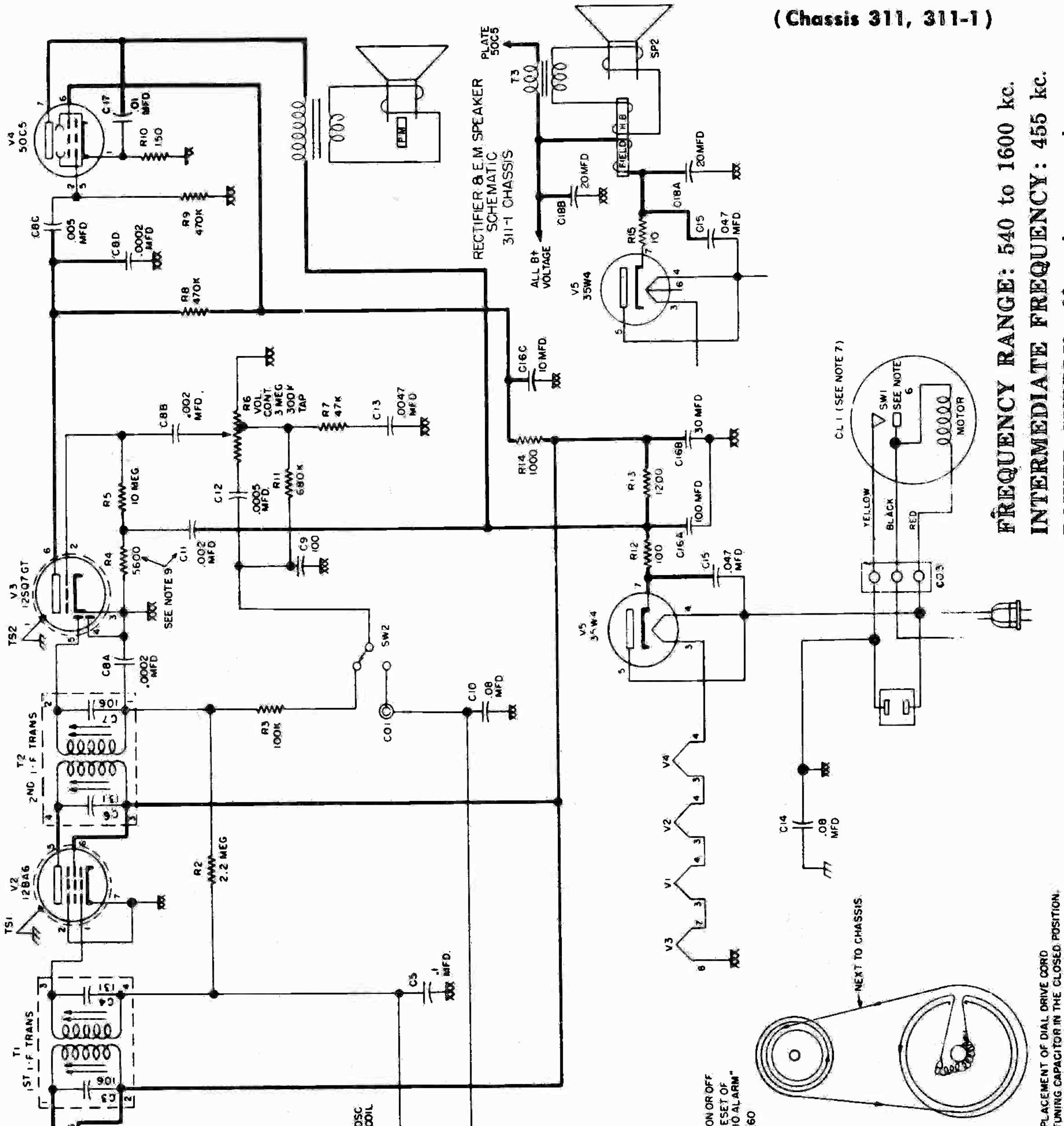
POWER SUPPLY: a.c.—d.c.

CROSLEY

MODELS: 11-120U, 11-121U, 11-122U, 11-123U, 11-124U, 11-125U

Models: D-25 WE, D-25 TN, D-25 CE, D-25 MN, D-25 BE, D-25 GN

(Chassis 311, 311-1)

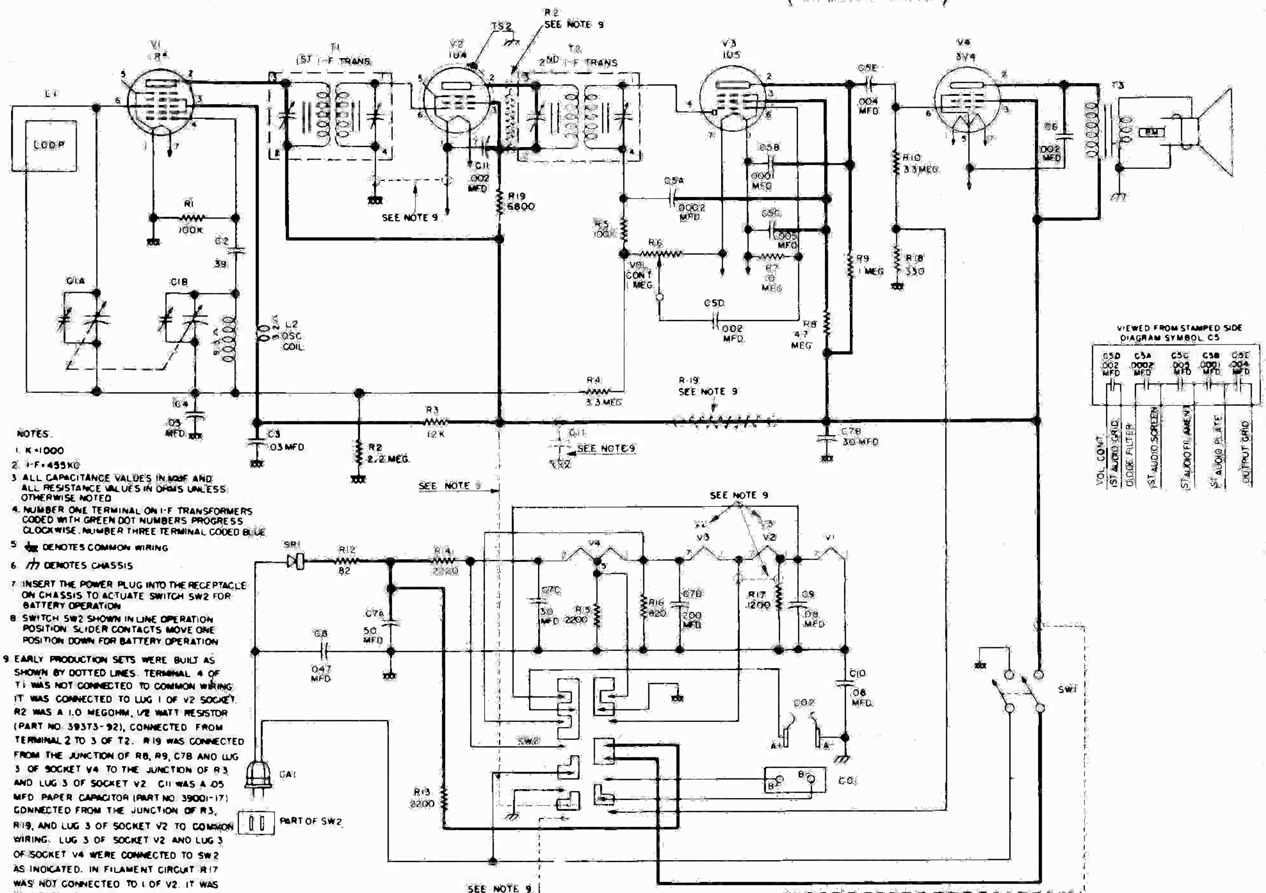


NOTES
1 K=1000
2 ALL RESISTANCE VALUES IN OHMS AND CAPACITANCE VALUES IN MMF UNLESS OTHERWISE NOTED.
3 NUMBER ONE TERMINAL ON I F TRANSFORMERS CODED WITH GREEN DOT, NUMBERS PROGRESS CLOCKWISE
4 I-F = 455 KC
5 = CHASSIS
= COMMON WIRING
6 SWITCH SW1 IS USED TO CONTROL OPERATION OF THE RADIO AND OUTLET AS FOLLOWS.
A MANUALLY BY SETTING THE OPERATION KNOB AT "RADIO" ON OR OFF
B AUTOMATIC ALARM AND RADIO START (POWER ON) BY PRESET OF ALARM CONTROLS WITH THE OPERATION KNOB SET AT "RADIO ALARM"
C AUTOMATIC STOP (POWER OFF) AFTER NOT MORE THAN A 60 MINUTE INTERVAL BY SETTING THE SLEEP CONTROL WITH THE OPERATION KNOB AT OFF.
7 CL1 IS CONNECTED BY PIN CONTACTORS AT CO3.
8 SW2 IS SHOWN IN RADIO POSITION
9 R4 AND C11 ARE USED WITH P.M. SPEAKERS ONLY

FREQUENCY RANGE: 540 to 1600 kc.
INTERMEDIATE FREQUENCY: 455 kc.
POWER SUPPLY: 60 cycle, a.c. only.
VOLTAGE RATING: 105-125 volts.

CROSLEY

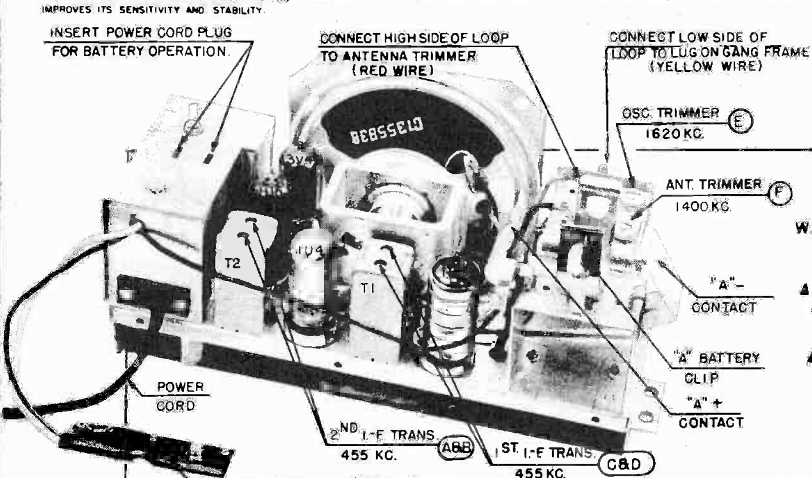
MODELS 11-301U, 11-302U, 11-303U, 11-304U, 11-305U
(Chassis 303)



NOTES.

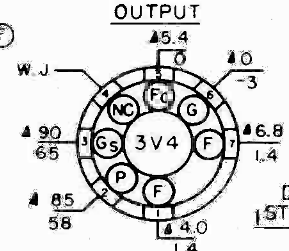
1. K=1000
2. I-F=455KC
3. ALL CAPACITANCE VALUES IN MMF AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE NOTED
4. NUMBER ONE TERMINAL ON I-F TRANSFORMERS CODED WITH GREEN DOT NUMBERS PROGRESS CLOCKWISE. NUMBER THREE TERMINAL CODED BLUE
5. DENOTES COMMON WIRING
6. DENOTES CHASSIS
7. INSERT THE POWER PLUG INTO THE RECEPTACLE ON CHASSIS TO ACTUATE SWITCH SW2 FOR BATTERY OPERATION
8. SWITCH SW2 SHOWN IN LINE OPERATION POSITION. SLIDER CONTACTS MOVE ONE POSITION DOWN FOR BATTERY OPERATION
9. EARLY PRODUCTION SETS WERE BUILT AS SHOWN BY DOTTED LINES. TERMINAL 4 OF T1 WAS NOT CONNECTED TO COMMON WIRING IT WAS CONNECTED TO LUG 1 OF V2 SOCKET. R2 WAS A 1.0 MEGOHM, 1/2 WATT RESISTOR (PART NO. 39373-92), CONNECTED FROM TERMINAL 2 TO 3 OF T2. R19 WAS CONNECTED FROM THE JUNCTION OF R8, R9, C7B AND LUG 3 OF SOCKET V4 TO THE JUNCTION OF R3 AND LUG 3 OF SOCKET V2. C11 WAS A .05 MFD PAPER CAPACITOR (PART NO. 39001-17) CONNECTED FROM THE JUNCTION OF R3, R19, AND LUG 3 OF SOCKET V2 TO COMMON WIRING. LUG 3 OF SOCKET V2 AND LUG 3 OF SOCKET V4 WERE CONNECTED TO SW2 AS INDICATED. IN FILAMENT CIRCUIT R17 WAS NOT CONNECTED TO 1 OF V2. IT WAS CONNECTED TO 7. V2 WAS V3 AND V3 WAS V2. V1 ALSO HAD A SHIELD (PART NO W-144784), THE SAME AS V2. REVISING AN EARLY PRODUCTION SET TO A LATER PRODUCTION SET, AS SHOWN BY THE SOLID LINES IN SCHEMATIC WIRING DIAGRAM, IMPROVES ITS SENSITIVITY AND STABILITY.

INTERMEDIATE FREQUENCY: 455 kc.

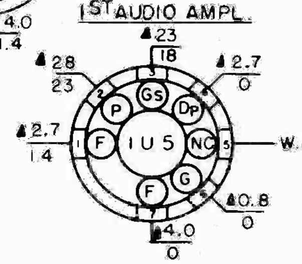


BOTTOM VIEW OF TUBE SOCKETS.
VOLTAGES MEASURED WITH AN ELECTRONIC VOLTMETER FROM SOCKET LUG TO (B-)
W.J.= WIRING JUNCTION.
N.C.= NO CONNECTION.
▲ = VOLTAGES MEASURED WITH RADIO PLUGED INTO 117 V. 60 CYCLE LINE.
ALL OTHER VOLTAGES MEASURED IN BATTERY POSITION WITH "A"=1.45 VOLTS, "B"=67 1/2 VOLTS.

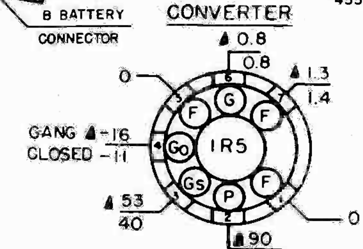
OUTPUT



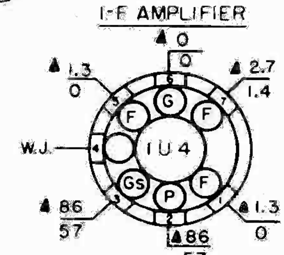
DET. AVC. 1ST AUDIO AMPL.



CONVERTER

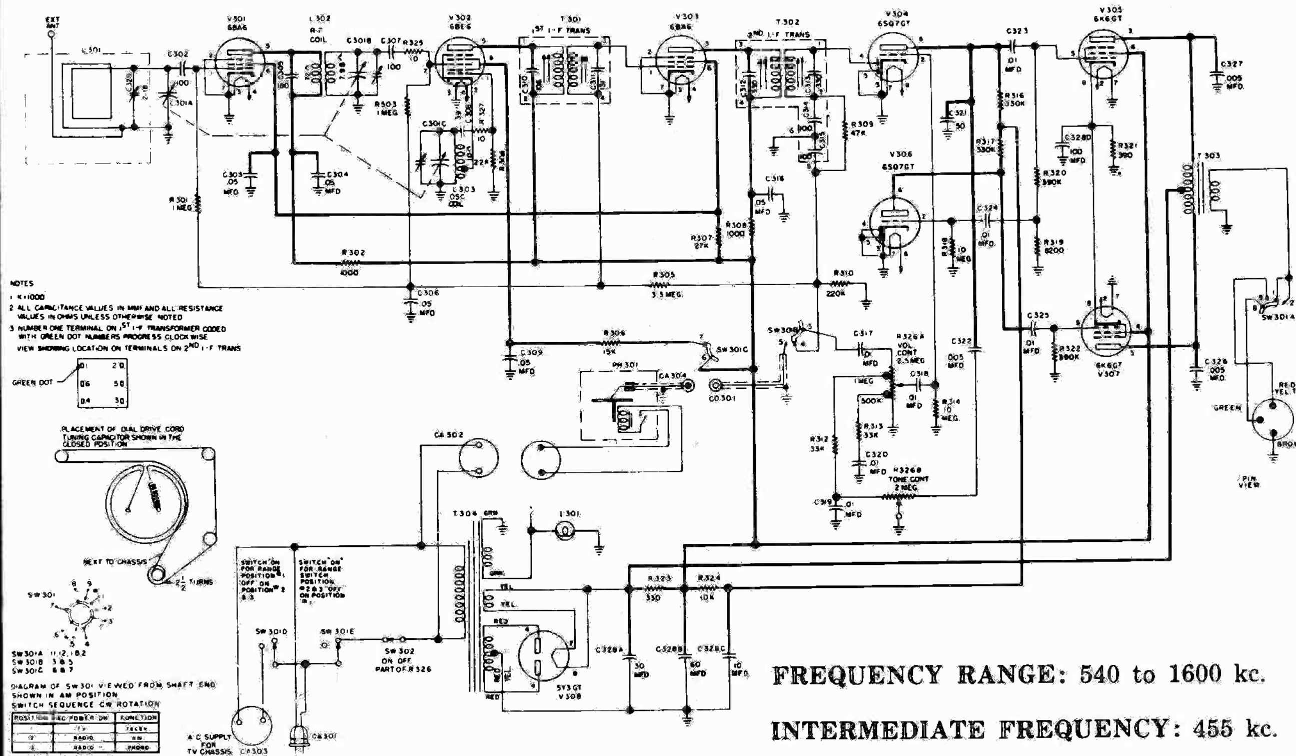


I-F AMPLIFIER



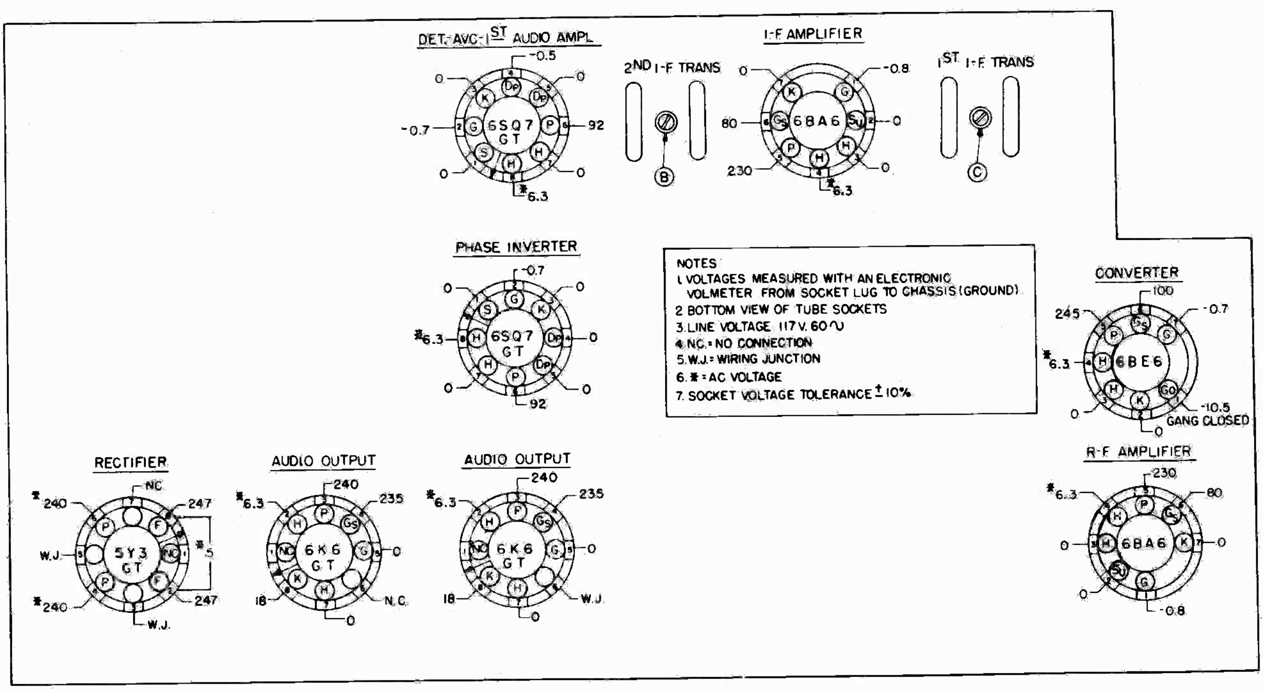
CROSLEY

RADIO CHASSIS 332—PHONO UNIT V-950
USED IN MODELS 11-444MU, 11-474BU

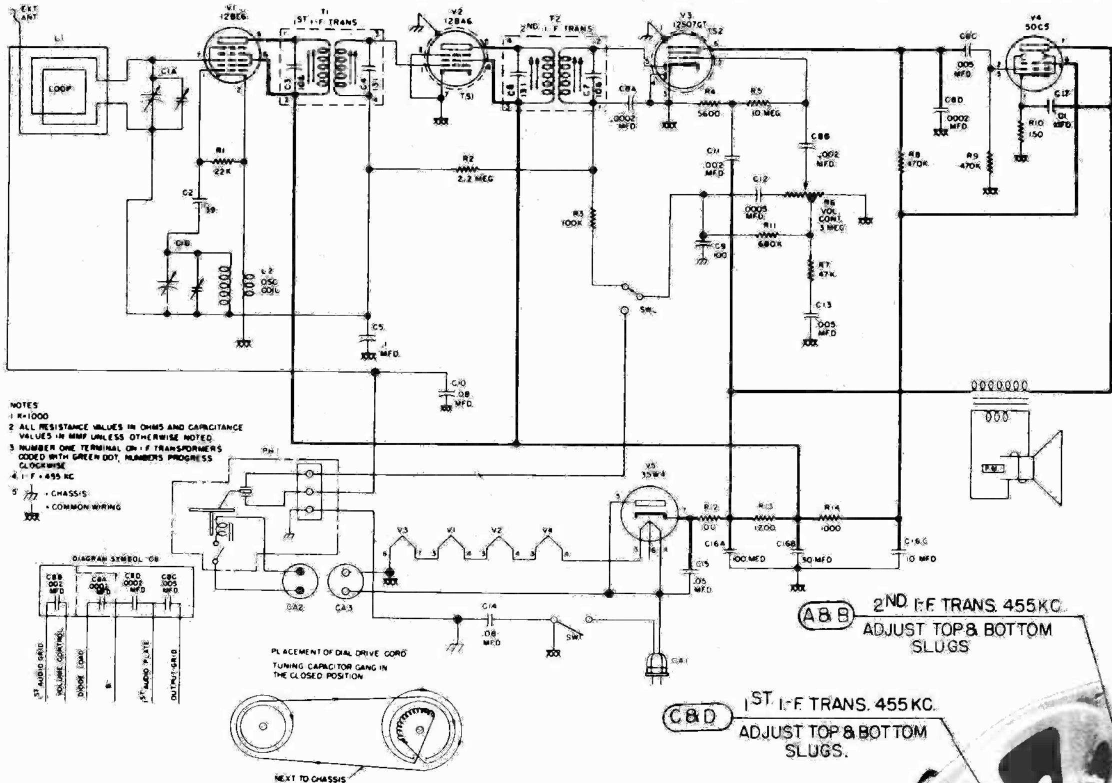


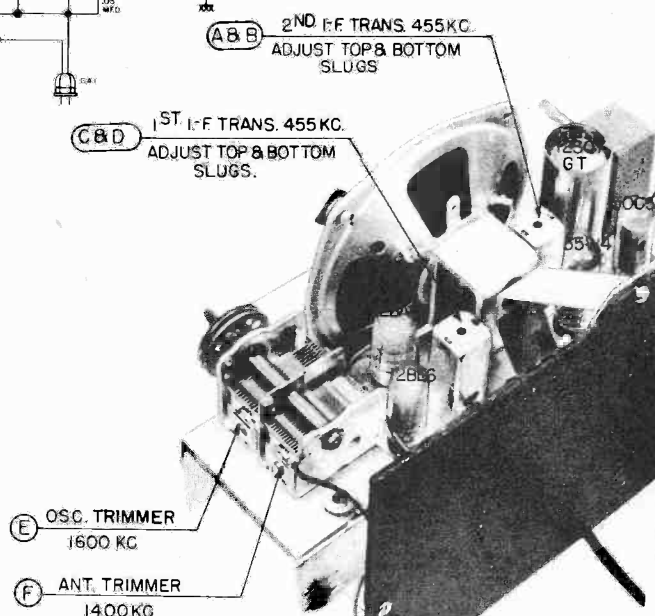
FREQUENCY RANGE: 540 to 1600 kc.

INTERMEDIATE FREQUENCY: 455 kc.



SOCKET VOLTAGE CHART

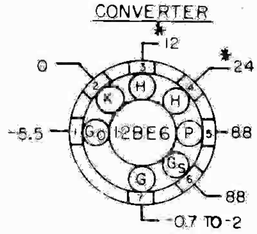


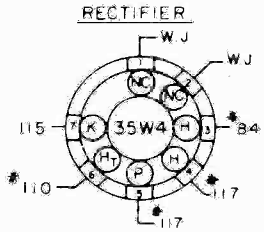


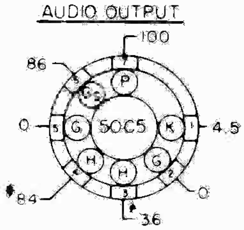
— CROSLEY —

MODELS: 11-550MU, 11-560BU

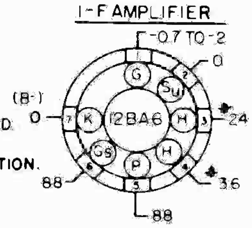
(Chassis 337)

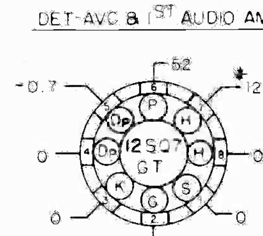






NOTES:
1. BOTTOM VIEW OF TUBE SOCKETS.
2. VOLTAGES MEASURED WITH AN ELECTRONIC VOLTMETER FROM SOCKET LUG TO B- (PIN 7 OF 12BA6)
3. MEASURED WITH THE VOLUME CONTROL AT MINIMUM & NO SIGNAL INTO THE LOOP, TUNING GANG CLOSED.
4. W J = WIRING JUNCTION.
   * = AC VOLTAGES NC = NO CONNECTION.
5. LINE VOLTAGE = 117 V., 60~AC.
6. SOCKET VOLTAGE TOLERANCE ± 10%.

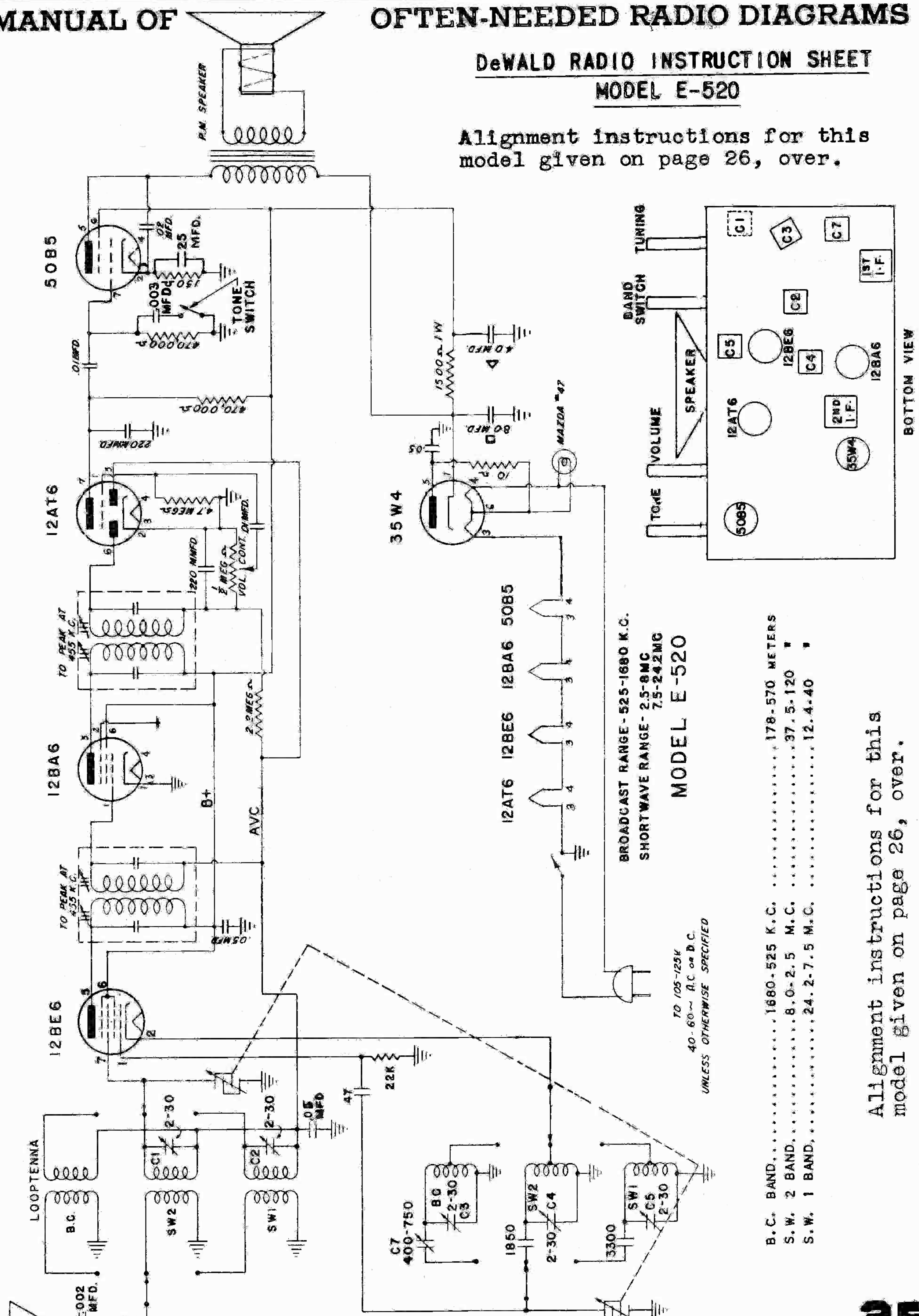




SOCKET VOLTAGE CHART

DeWALD RADIO INSTRUCTION SHEET
MODEL E-520

Alignment instructions for this model given on page 26, over.

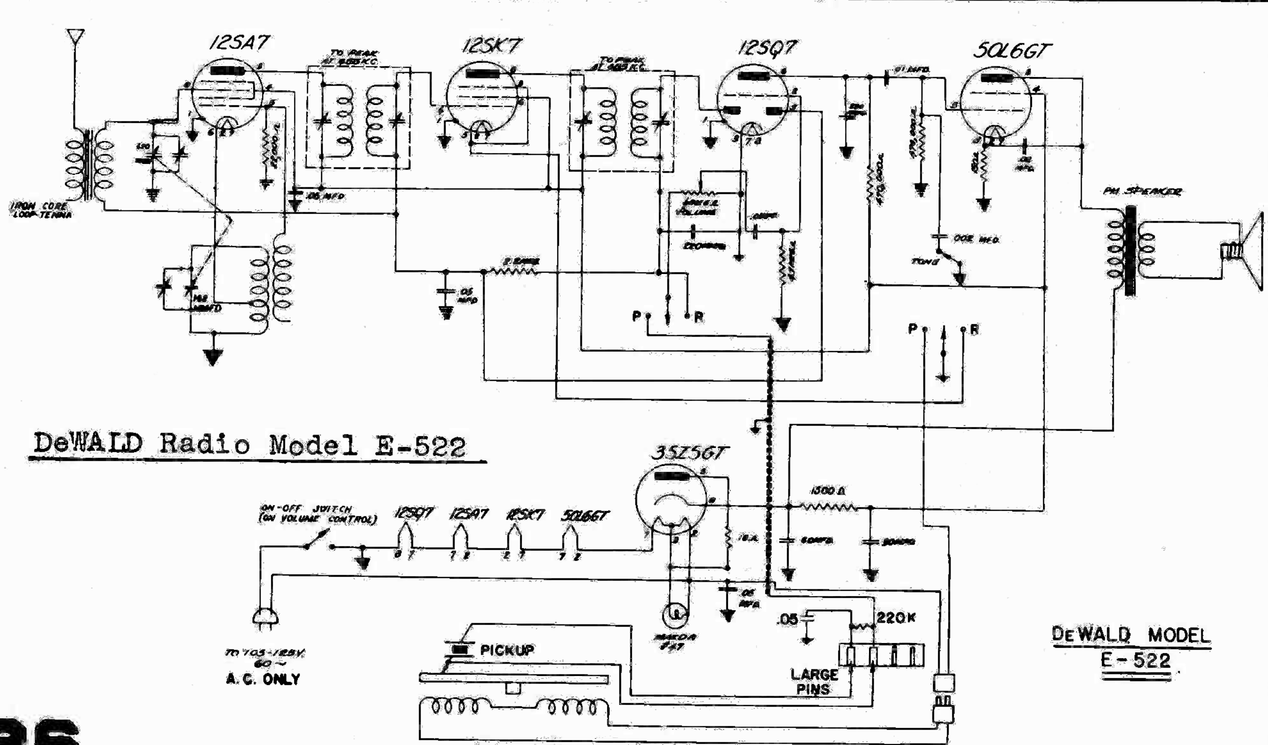


Alignment instructions for this model given on page 26, over.

Alignment Instructions for DeWald Radio Model E-520

(Circuit Diagram on page 25)

To calibrate Model E-520 receiver, connect the output of a signal generator in series with a 200 mmfd. fixed condenser to the flexible antenna lead attached to the loop. Connect the low side of the generator through a 0.1 mfd. condenser to the receiver chassis. The wave band switch should be in the broadcast position. Adjust the generator to 455 KC. and adjust both I.F. transformers (both top and bottom) for maximum signal output. Open the variable condenser for minimum capacity. Turn the wave band switch to short wave #1 position. Set generator at 24.2 MC. Peak the short wave #1 oscillator trimmer screw (C5) for maximum signal. Next set the generator at 23 MC. and tune in this signal on receiver. Adjust short wave #1 R.F. trimmer screw (C2) for maximum signal. The low frequency end of the dial is automatically adjusted by a fixed padder condenser. Next turn band switch to short wave #2 position. Rotate drive shaft until variable condenser of the receiver is open all the way. Adjust generator to 8 MC. Adjust the short wave #2 oscillator trimmer screw (C4) until maximum signal is secured. Next set generator at 7 MC. Tune in this signal on receiver, and adjust short wave #2 R.F. trimmer screw (C1) for maximum signal strength. The low frequency end of the dial is automatically adjusted by a fixed padder condenser. Next turn band switch to broadcast position. Adjust generator to produce 1500 KC. and tune in this signal on receiver. Adjust the broadcast oscillator trimmer screw (C3) for maximum signal. To adjust the low end of the dial, set the generator and receiver at 600 KC. Peak the broadcast padder (C7) for maximum output. The variable condenser should be rocked slightly during this operation. Keep the signal generator output as low as possible when making all these adjustments.



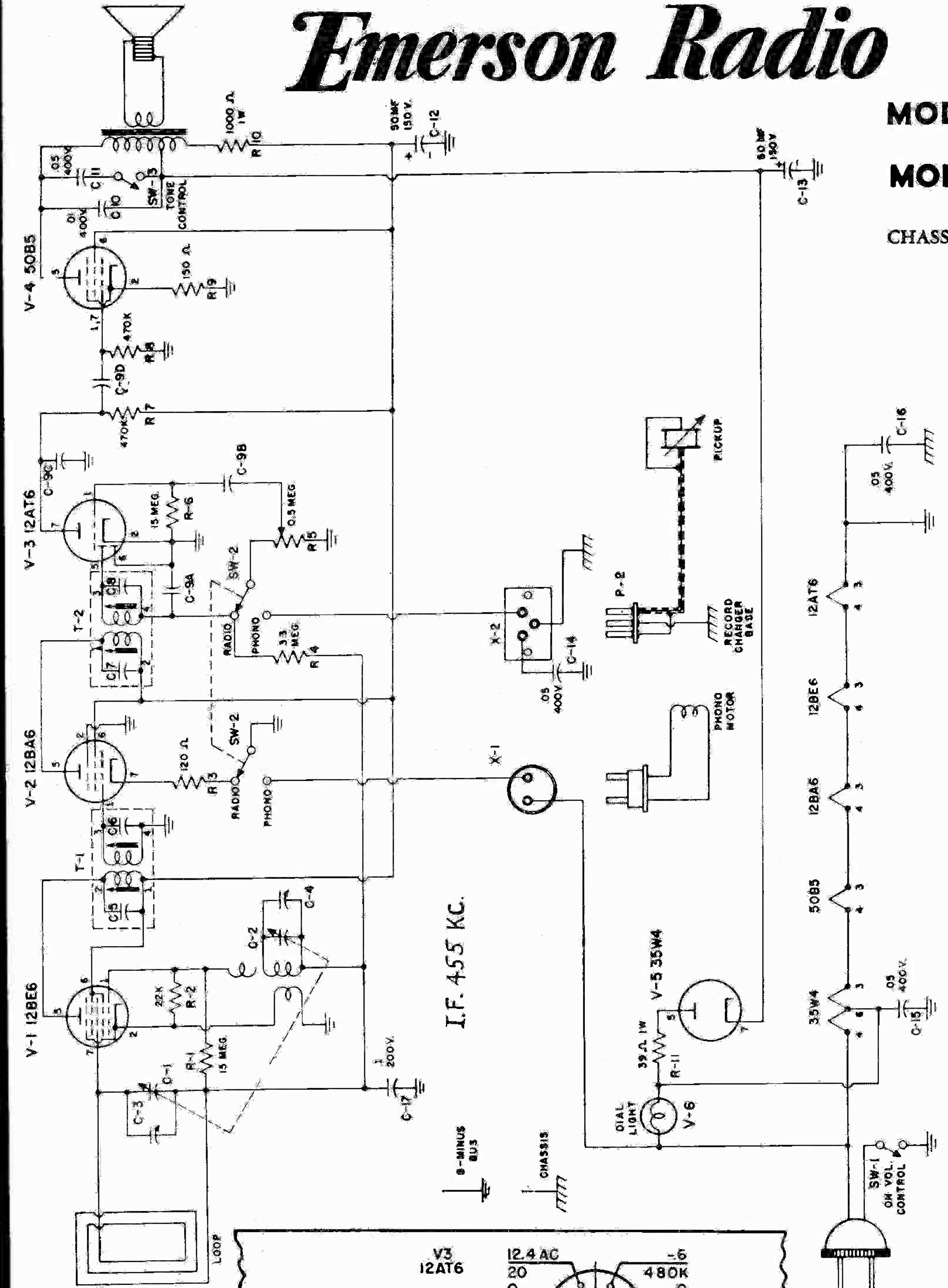
DeWALD Radio Model E-522

Emerson Radio

MODEL 634B

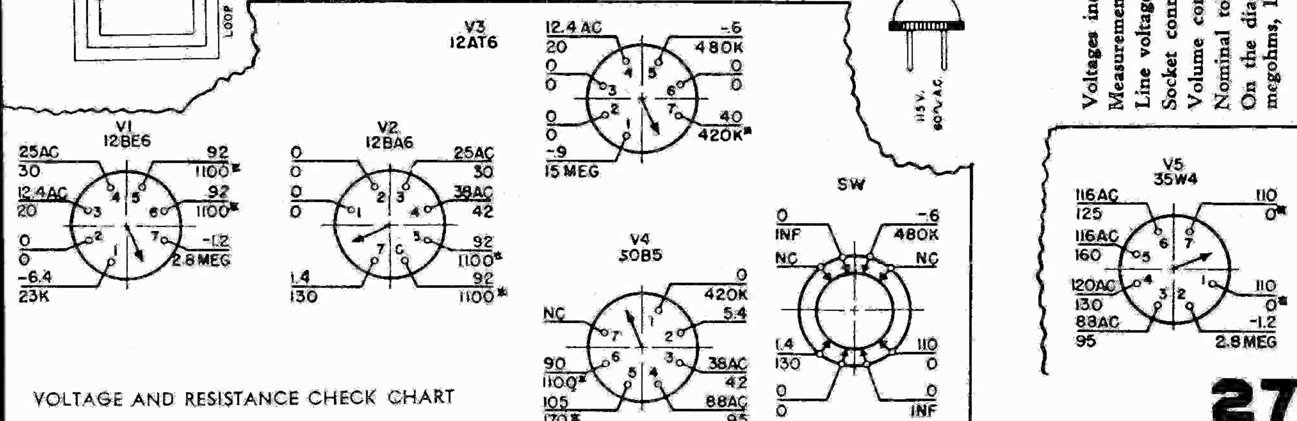
MODEL 672B

CHASSIS MODEL 120097-B



CONDITIONS FOR VOLTAGE AND RESISTANCE READINGS

Voltages indicated are positive d.c., resistances are in ohms, unless otherwise indicated.
Measurements made with voltohmyst or equivalent.
Line voltage maintained at 120 volts a.c. for voltage measurements.
Socket connections are shown as bottom views, with measurements from pin to common negative.
Volume control at maximum; radio-phono switch in radio position; no signal applied for Model 634B measurements.
Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
On the diagrams, upper values are voltage; lower values are resistance. NC denotes no connection, K is kilohms, MEG megohms, INF. is infinity. Resistances marked * are measured to pin 7 of rectifier (B+).



VOLTAGE AND RESISTANCE CHECK CHART

EMERSON RADIO & PHONOGRAPH CORPORATION

MODEL: 625

CHASSIS MODEL: 120105B

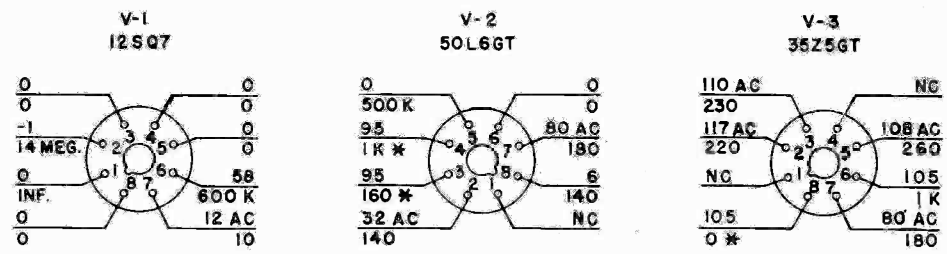
TYPE: Automatic record-changer phonograph
TYPE OF TUBES:
1—12SQ7 audio amplifier
1—50L6GT power output
1—35Z5GT rectifier
POWER SUPPLY: 60 cycle a.c. only
VOLTAGE RATING: 105-125 volts
POWER CONSUMPTION: 30 watts
CURRENT DRAIN: 0.25 amp. at 117 volts a.c.

DISASSEMBLY INSTRUCTIONS

1. Remove two push-on knobs at front of cabinet.
2. Disconnect phono-motor leads by unscrewing wirenuts.
3. Remove phono pickup plug.
4. Unscrew two front cabinet feet and two chassis bolts at sides of cabinet. Lift out chassis.
5. Remove two base plate screws at center of chassis.

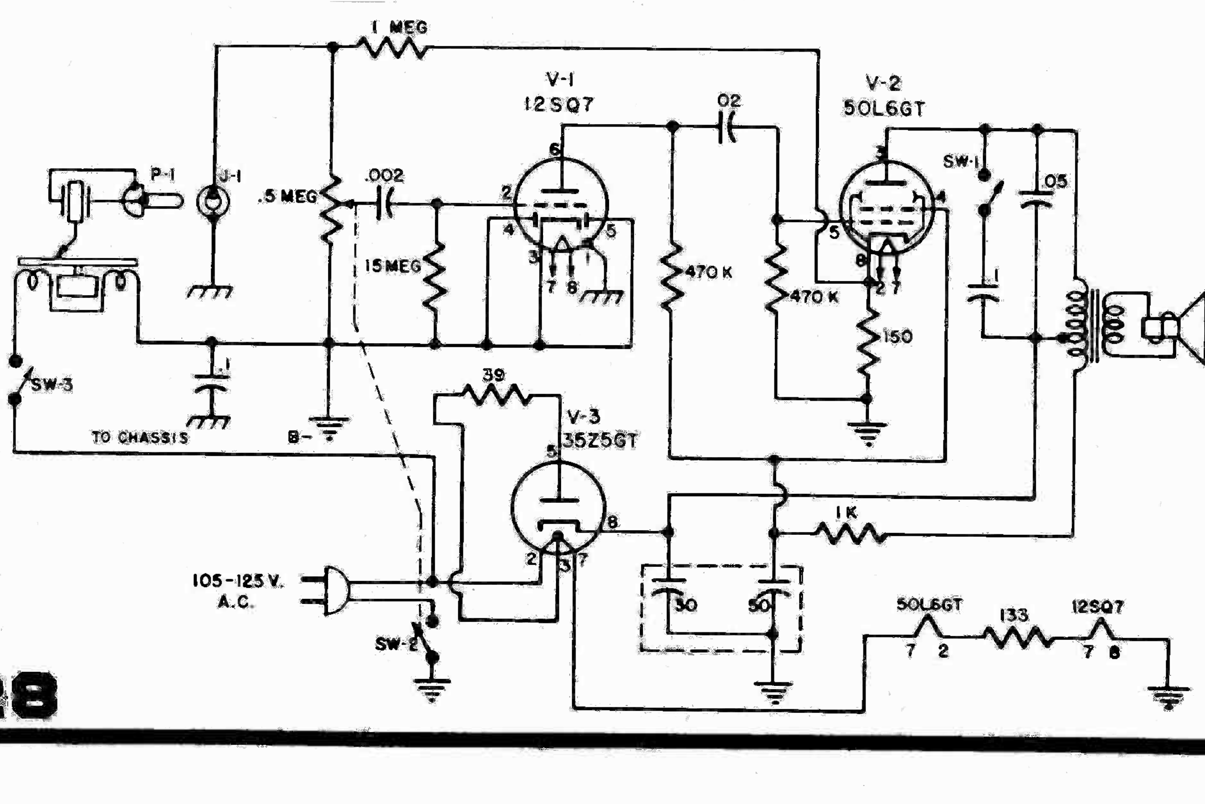
CONDITIONS FOR VOLTAGE AND RESISTANCE READINGS

1. Voltages indicated are positive d.c., resistances are in ohms, unless otherwise indicated.
2. Measurements made with voltohmyst or equivalent.
3. Line voltage maintained at 117 volts a.c. for voltage measurements.
4. Socket connections are shown as bottom views, with measurements from pin to common negative.
5. Volume control at maximum, for voltage measurements.
6. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
7. On the diagram, upper values are voltage and lower values are resistance. NC denotes no connection, K is kilohms, MEG is megohms, INF is infinity. Resistances marked * are measured to pin 8 of rectifier (B+).



NOTE - RES. MARKED * MEASURED TO PIN 8 OF V-3

BOTTOM VIEW - CHASSIS 120105B



Emerson Radio

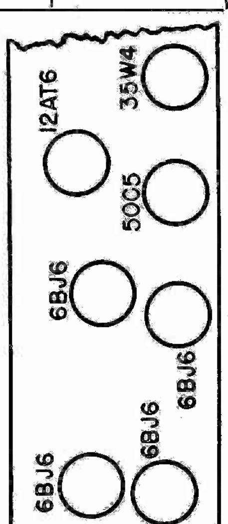
MODEL: 641B

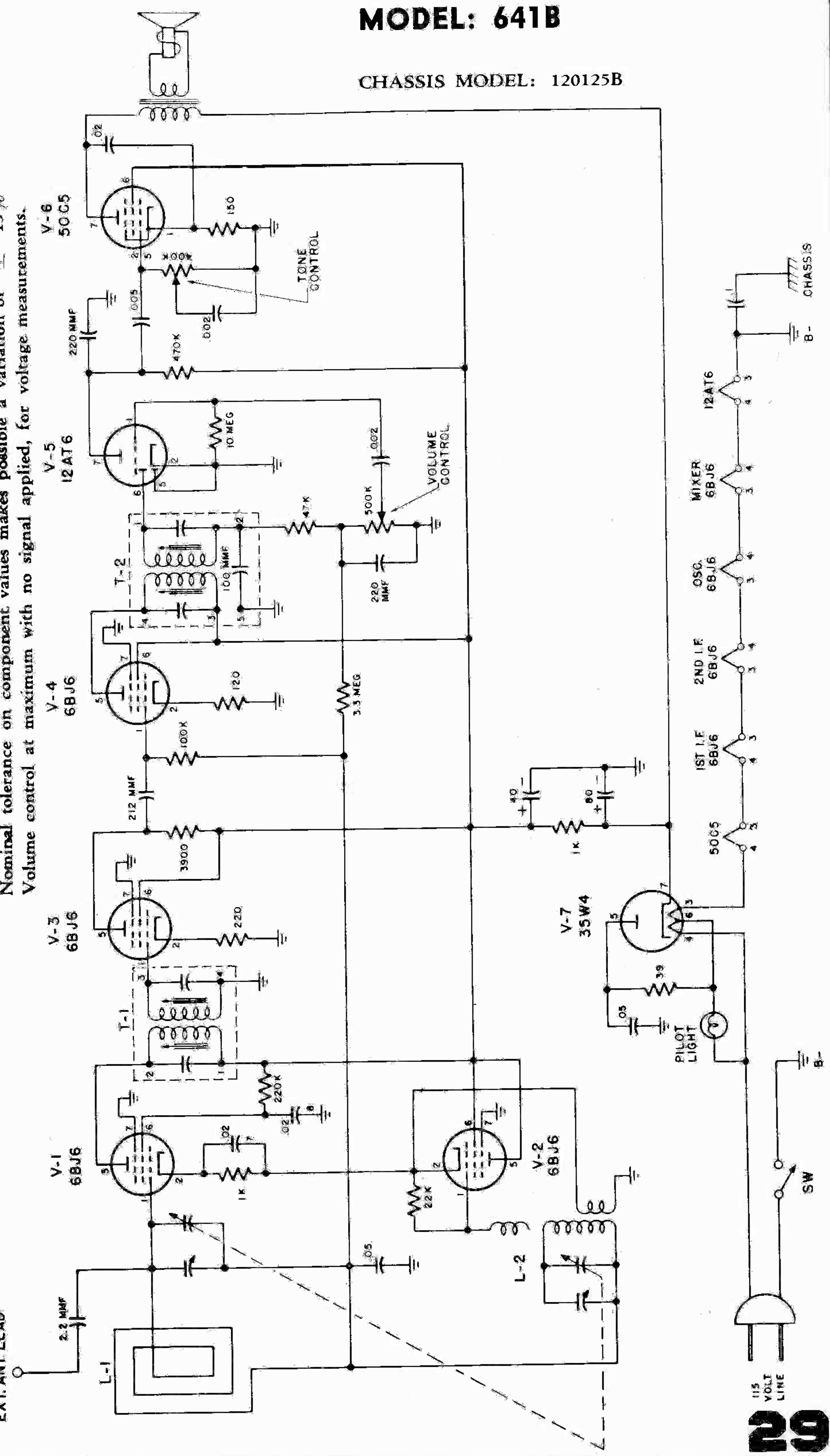
CHASSIS MODEL: 120125B

VOLTAGE READINGS FOR CHASSIS 120125-B

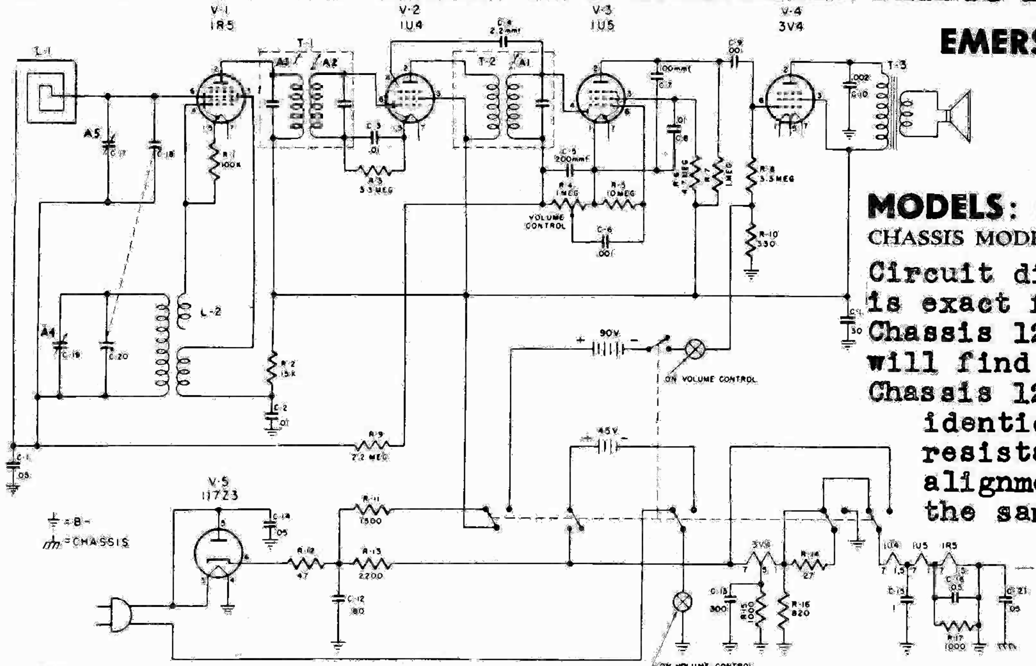
SYMBOL	TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7
V-1	6BJ6	-1.2 DC	1 DC	18 AC	12 AC	85 DC	35 DC	0
V-2	6BJ6	-9.2 DC	0	24 AC	18 AC	85 DC	85 DC	0
V-3	6BJ6	0	1.4 DC	30 AC	36 AC	68 DC	85 DC	0
V-4	6BJ6	-1.3 DC	.65 DC	30 AC	24 AC	85 DC	85 DC	0
V-5	12AT6	-.8 DC	0	0	12 AC	0	-.65 DC	42 DC
V-6	50C5	5.4 DC	0	36 AC	80 AC	0	85 DC	100 DC
V-7	35W4	85 DC	NC	80 AC	115 AC	110 AC	110 AC	110 DC

A.C. and D.C. measurements are taken with a V.T.V.M.
Measured values are from socket pin to common negative (B—).
Line voltage maintained at 115V A.C. for voltage readings.
Nominal tolerance on component values makes possible a variation of ± 15%
Volume control at maximum with no signal applied, for voltage measurements.





EMERSON RADIO



MODELS: 646A, 646B

CHASSIS MODELS: 120121A, 120121B

Circuit diagram shown is exact for Model 646B Chassis 120121B. You will find Model 646A, Chassis 120121A almost identical. Voltage, resistance, and alignment data is the same for both.

Voltage and resistance measurements taken from socket pin to chassis. VTVM used. V.C. at maximum, no signal. Line voltage: 117 volts A.C.

VOLTAGE READINGS

CHASSIS	SYMBOL	TUBE TYPE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7
120121A 120121B	V1	1R5	0	95	60	−6.2	0	0	1.3
	V2	1U4	2.8	95	95	0	2.8	.05	4.0
	V3	1U5	1.3	16	15	.05	.01	.01	2.5
	V4	3V4	4	95	95	0	5.2	0	6.5
	V5	117Z3	N.C.	115	115 AC	0	115 AC	116	115

RESISTANCE READINGS

CHASSIS	SYMBOL	TUBE TYPE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7
120121A 120121B	V1	1R5	0	3800	20K	100K	0	3 Meg.	17
	V2	1U4	30	3800	3800	Inf.	34	3.3 Meg.	38
	V3	1U5	17	1 Meg.	3 Meg.	1 Meg.	3 Meg.	10 Meg.	30
	V4	3V4	38	4000	3800	330	42	3.3 Meg.	54
	V5	117Z3	N.C.	2000	480	0	480	2000	2000

NC=no connection; Inf.=infinity; K=kilohms; Meg.=megohms

ALIGNMENT PROCEDURE

1. Use battery power when available. When a.c. power is used, connect the line cord through an isolation transformer if available. Otherwise connect a 0.1 mfd. condenser in series with the low side of the signal generator and B—.
2. Set the volume control at maximum. The output of the signal generator should be no higher than that necessary to obtain an output reading. Attenuate the signal input as alignment proceeds. Use an insulated alignment tool.
3. Maintain the loop in the same position relative to the chassis as when the receiver is in the cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST*	REMARKS
1	0.1 mfd.	High side to pin 6 (grid) of V1 (1R5). Low side to chassis	455 kc	Variable condenser fully open.	Across voice coil.	A1, (2nd i-f trans), A2, A3 (1st i-f trans.)	Adjust for maximum output. If a.c. is used without an isolation transformer, reduce dummy antenna to 200 mmf. to reduce hum modulation.
2	200 mmf.	High side to external ant. lead. Low side to chassis	1620 kc	Variable condenser fully open.	Across voice coil.	A4 (trimmer cond. C4.)	Adjust for maximum output.
3	200 mmf.	"	1400 kc	Tune for maximum output.	Across voice coil.	A5 (trimmer cond. C2.)	Adjust for maximum output.

Emerson Radio

MODEL: 659B

CHASSIS MODEL: 120126-B

INSTRUCTIONS FOR VOLTAGE AND RESISTANCE READINGS

1. Voltages readings are in d.c. volts and resistance reading in ohms, unless otherwise specified.
2. D.c. voltage measurements are made at 20,000 ohms-per-volt and a.c. voltages are measured at 1000 ohms-per-volt.
3. Socket connections are shown as bottom views. Values are measured from socket pin to common negative.
4. Line voltage maintained at 115 volts a.c. for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in readings.
6. Volume control at maximum, with no signal applied and bandswitch in broadcast position (unless otherwise noted), for voltage measurements.

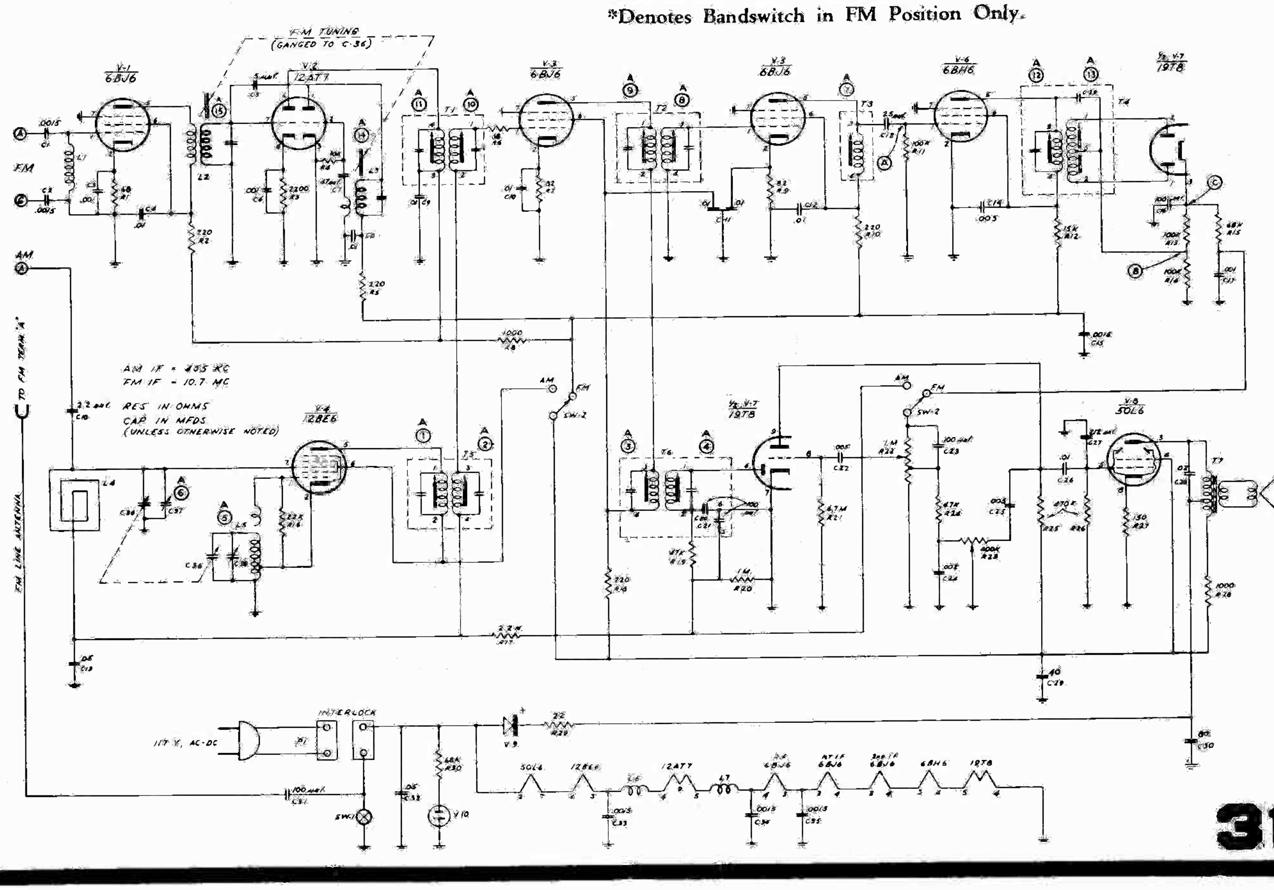
VOLTAGE READINGS (CHASSIS 120126-B)

SYMBOL	TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V-1	6BJ6	0	.6*	35 AC	41 AC	78*	78*	0	—	—
V-2	12AT7	86*	-2.8*	0	53 AC	41 AC	80*	0	1.7*	NC
V-3	6BJ6	-.4	.8	35 AC	30 AC	100	100	0	—	—
V-4	12BE6	-7.6	0	53 AC	.64 AC	100	100	-.4	—	—
V-5	6BJ6	0	.7*	30 AC	24 AC	86*	86*	0	—	—
V-6	6BH6	-.3	0	24 AC	18 AC	50*	50*	0	—	—
V-7	19T8	-.5*	-.6*	-.1*	0	18 AC	-.5	0	-.5	40
V-8	50L6	NC	115 AC	110	105	0	NC	64 AC	7.2	—

RESISTANCE READINGS (CHASSIS 120126-B)

SYMBOL	TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V-1	6BJ6	0	68	42	50	200K*	200K*	0	—	—
V-2	12AT7	200K*	10K	0	62	50	200K*	0	2200	NC
V-3	6BJ6	3.2 meg.	82	42	35	200K*	200K*	0	—	—
V-4	12BE6	22K	.5	62	75	200K	200K	2.7 meg.	—	—
V-5	6BJ6	.6	82	35	28	200K*	200K*	0	—	—
V-6	6BH6	100K	0	28	20	200K*	200K*	0	—	—
V-7	19T8	100K	100K	175K*	0	20	500K	0	4.7 meg.	500K
V-8	50L6	NC	130	200K	200K	470K	NC	75	150	—

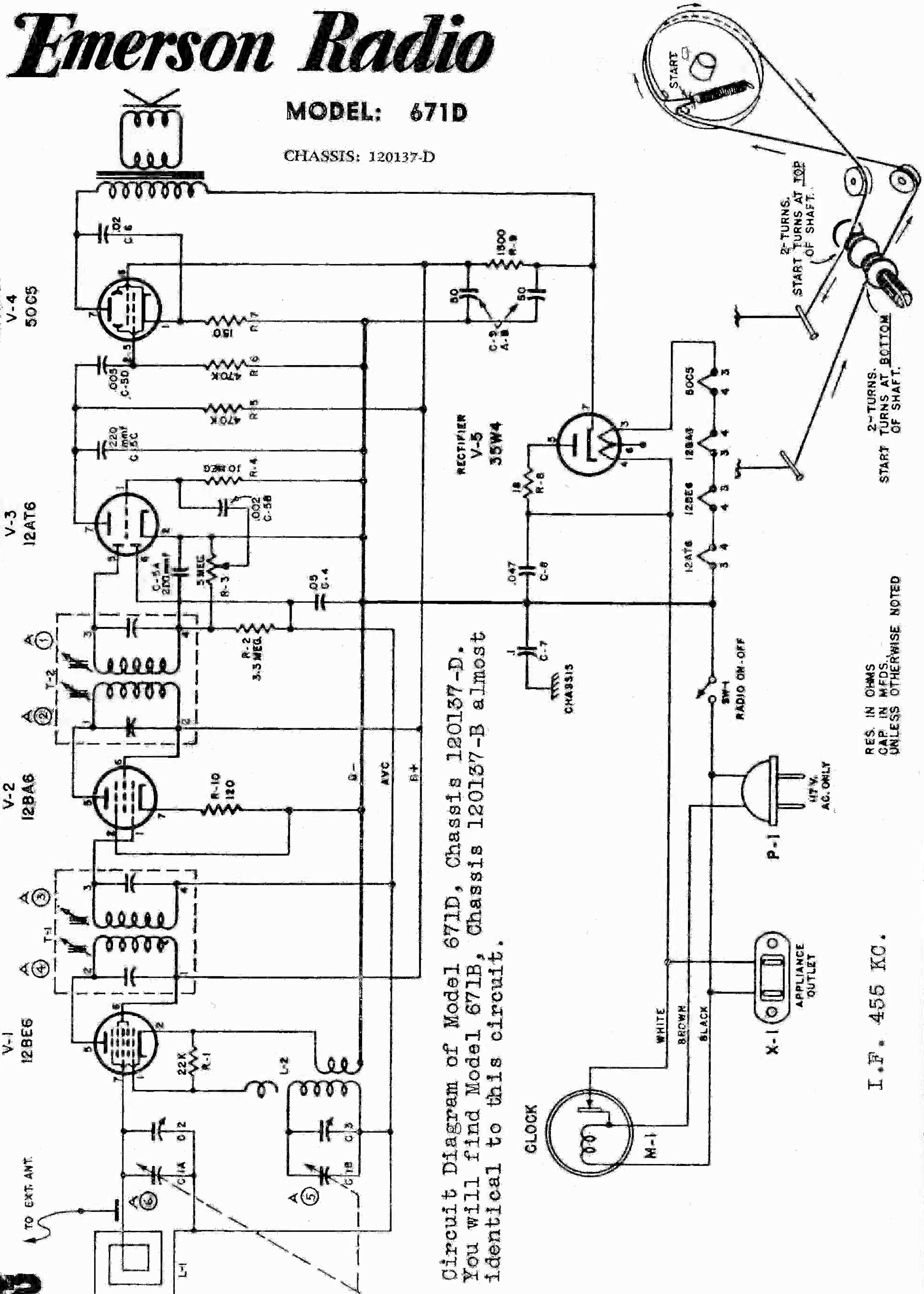
N.C. Denotes "No Connection."
*Denotes Bandswitch in FM Position Only.



Emerson Radio

MODEL: 671D

CHASSIS: 120137-D



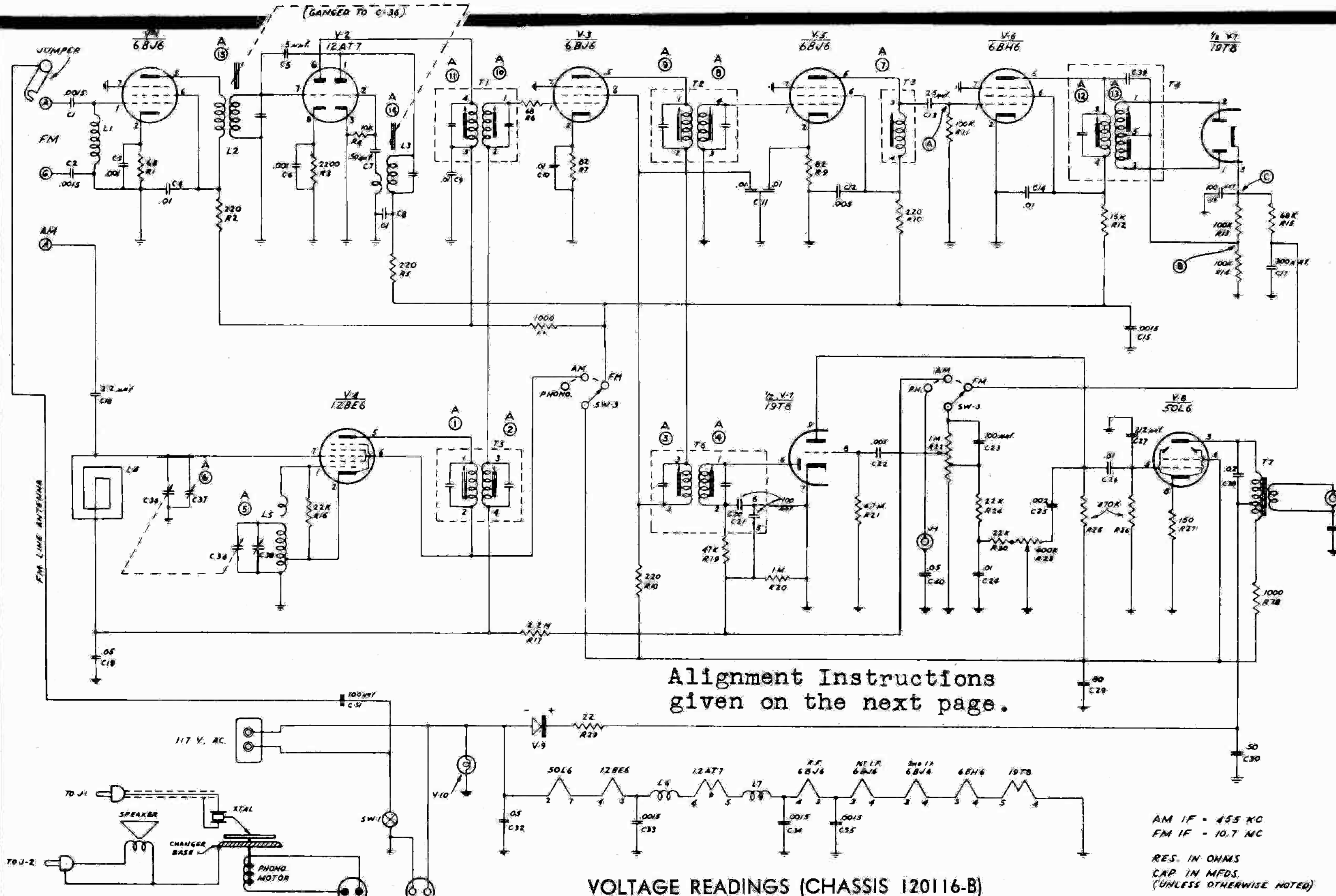
Circuit Diagram of Model 671D, Chassis 120137-D. You will find Model 671B, Chassis 120137-B almost identical to this circuit.

I.F. 455 KC.

Emerson Radio

MODEL: 679B

CHASSIS MODEL: 120116-B



Alignment Instructions given on the next page.

VOLTAGE READINGS (CHASSIS 120116-B)

SYMBOL	TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V-1	6BJ6	0	.6 V.*	35 V.AC	41 V.AC	78 V.*	78 V.*	0	—	—
V-2	12AT7	86 V.*	-2.8 V.*	0	53 V.AC	41 V.AC	80 V.*	0	1.7 V.*	N.C.
V-3	6BJ6	-.4 V	.8 V.	35 V.AC	30 V.AC	100 V.	100 V.	0	—	—
V-4	12BE6	-7.6 V	0	53 V.AC	64 V.AC	100 V.	100 V.	-.4 V	—	—
V-5	6BJ6	0	.7 V.*	30 V.AC	24 V.AC	86 V.*	86 V.*	0	—	—
V-6	6BH6	-.3 V.	0	24 V.AC	18 V.AC	50 V.*	50 V.*	0	—	—
V-7	19T8	-.5 V.*	-.6 V.*	-.1 V.*	O	18 V.AC	-.5 V.	0	-.5 V.	40 V.
V-8	50L6	N.C.	115V.AC	110 V.	105 V.	0	N.C.	64 V.AC	7.2 V.	—

N.C. Denotes "No Connection."

*Bandswitch in F.M. Position Only.

MANUAL OF 1951 MOST-OFTEN-NEEDED RADIO DIAGRAMS

EMERSON RADIO ** ALIGNMENT INSTRUCTIONS, MODEL 679B, continued.

To position pointer, turn variable condenser fully closed and set pointer to reference mark on dial backplate at the low frequency end of the dial.
Volume control should be set at maximum position. The output of the signal generator should be no higher than necessary to obtain an output reading. Attenuate the signal input as alignment proceeds. Use an insulated alignment tool for all adjustments.
Use isolation transformer if available; otherwise connect a .1 mfd. condenser in series with low side of signal generator to chassis.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1 mfd.	High side to Pin 7 (grid) of 12BE6. Low side to chasis.	455 KC.	Broadcast	Tuning condenser fully open.	Across voice coil.	A1, A2, (Trans. T4). A3, A4, (Trans. T2).	Adjust for maximum output. Reduce dummy antenna to .001 mfd. if isolation trans. is not used.
2		Loop	1620 KC.	Broadcast	Tuning condenser fully open.	Across voice coil.	A5, (Trimmer cond. C6).	Form loop of several turns of wire. Radiate signal into receiver loop. Adjust for maximum output.
3		Loop	1400 KC.	Broadcast	Tune for max. outpt.	Across voice coil.	A6, (Trimmer cond. C5).	Adjust for maximum output.

FM I-F and Disc. Alignment Using AM Signal Generator and VTVM

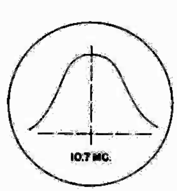
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1	.01 mfd.	High side to Pin 1 (grid) of 6BJ6 2nd i-f (V5). Low side to chassis.	10.7 mc. (Unmodulated)	Frequency modulation	Tuning condenser fully open.	Connect d.c. probe to point "A". Common to chassis.	A7, (Trans. T5).	Adjust for maximum output.
2	.01 mfd.	High side to Pin 1 (grid) of 6BJ6 1st i-f (V3). Low side to chassis.	10.7 mc. (Unmodulated)	Frequency modulation	Tuning condenser fully open.	Connect d.c. probe to point "A". Common to chassis.	A8, A9, (Trans. T3).	Adjust for maximum output.
3	.01 mfd.	High side to Pin 7 of 12AT7 conv. (V2). Low side to chassis.	10.7 mc. (Unmodulated)	Frequency modulation	Tuning condenser fully open.	Connect d.c. probe to point "A". Common to chassis.	A10, A11, (Trans. T1).	Adjust for maximum output.
4	.01 mfd.	High side to Pin 1 (grid) of 6BJ6 2nd i-f (V5). Low side to chassis.	10.7 mc. (Unmodulated)	Frequency modulation	Tuning condenser fully open.	Connect d.c. probe to point "B". Common to chassis.	A12, (Trans. T6).	Adjust for maximum output.
5	.01 mfd.	"	10.7 mc. (Unmodulated)	Frequency modulation	Tuning condenser fully open.	Connect d.c. probe to point "C". Common to chassis.	A13, (Trans. T6).	Adjust for zero output, Continue with FM r-f alignment.

FM I-F AND DISC. ALIGNMENT USING SWEEP SIGNAL GENERATOR AND OSCILLOSCOPE. Use frequency modulated signal, with 60 cycle modulation and 450 kc sweep. Use 120 cycle sawtooth sweep voltage in oscilloscope for horizontal deflection.

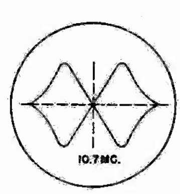
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RADIO DIAL SETTING	CONNECT OSCILLOSCOPE	ADJUST	REMARKS
1	.01 mfd.	High side to Pin 1 (grid) of 6BJ6 1st i-f (V3). Low side of chassis.	10.7 mc. (Unmodulated).	Frequency modulation	Tuning condenser fully open.	Vertical input to Point "A". Ground to chassis.	A7, A8, A9, (Trans. T5 and T3).	Adjust for maximum output (height) and symmetry as per i-f alignment curve shown.
2	.01 mfd.	High side to Pin 7 of 12AT7 of conv. (V2). Low side to chassis.	10.7 mc. (Unmodulated).	Frequency modulation	Tuning condenser fully open.	Vertical input to Point "A". Ground to chassis.	A10, A11, (Trans. T1)	Adjust for maximum output (height) and symmetry as per i-f alignment curve shown.
3	.01 mfd.	High side to Pin 1 (grid) of 6BJ6 2nd i-f (V5). Low side to chassis.	10.7 mc. (Unmodulated).	Frequency modulation	Tuning condenser fully open.	Vertical input to Point "C". Ground to chassis.	A12, A13, (Trans. T6).	Alternately adjust A12 for maximum amplitude and A13 for maximum straightness of cross-over lines, with cross-over occurring at center of pattern as per discriminator alignment curve. Continue with FM r-f alignment.

FM R-F ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1	300 ohm resistor in series with gen. lead.	High side to FM ant. term. Low side to chassis.	109.0 mc. (Unmodulated).	Frequency modulation	Tuning condenser fully open	Connect d.c. probe to point "A". Common to chassis	A14 (Iron Core)	Adjust for maximum output.
2	"	"	106.0 mc.	Frequency modulation	Tune for maximum output.	"	A15 (Iron Core)	Adjust for maximum output.

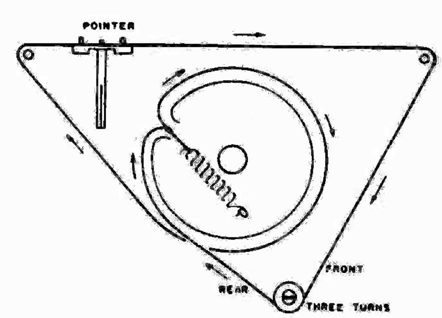


I.F. AND LIMITER



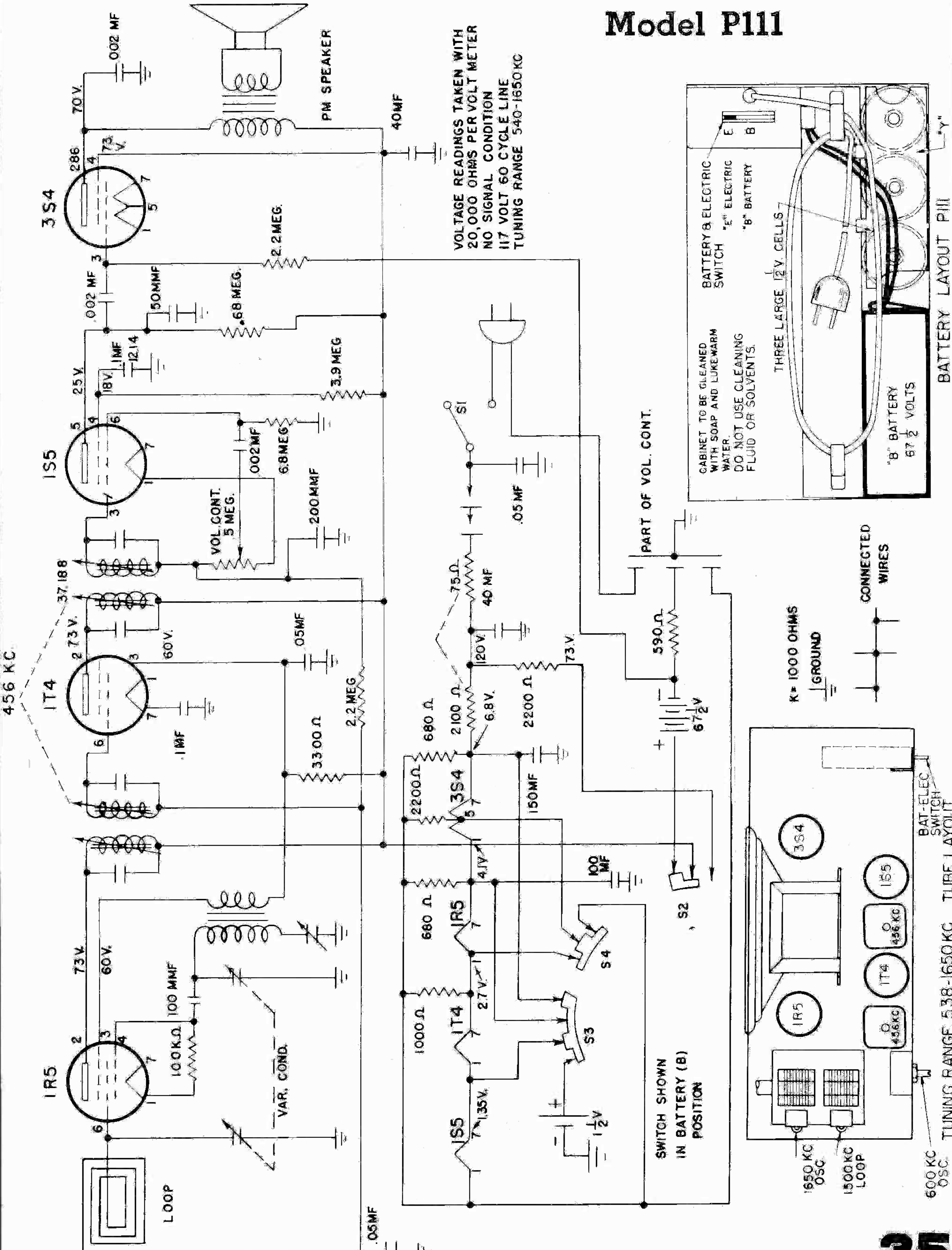
DISCRIMINATOR

ALIGNMENT CURVES (FM)



FADA RADIO & ELECTRIC CO., Inc.

Model P111



FADA RADIO & ELECTRIC CO., Inc.

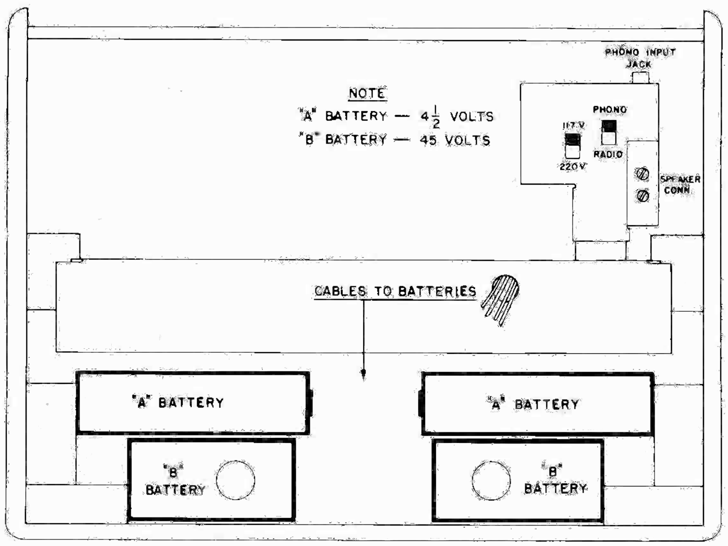
Model P-130

Portable Receiver designed for operation from 105-125 volts, 40-60 cycles A.C. or the same voltage D.C., or 180-220 volts, 40-60 cycles A.C., or from batteries.

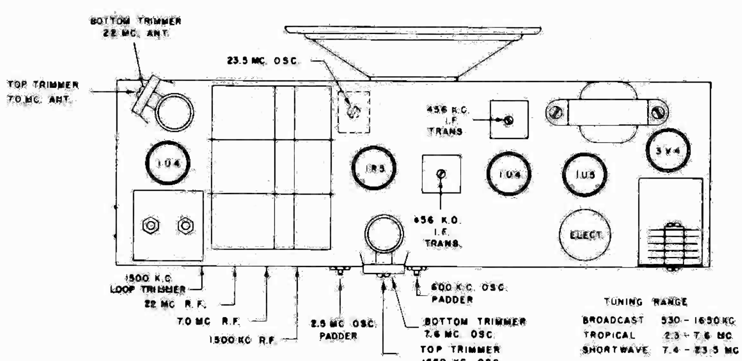
Frequency ranges are:
530 KC to 1650 KC,
2.3 MC to 7.6 MC, and
7.4 MC to 23.5 MC.

I.F. 456 KC.

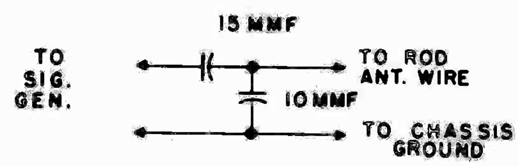
Speaker: 5" P.M., 1.47 oz.
Alnico V Magnet.
Voice coil: 3.2 ohms.



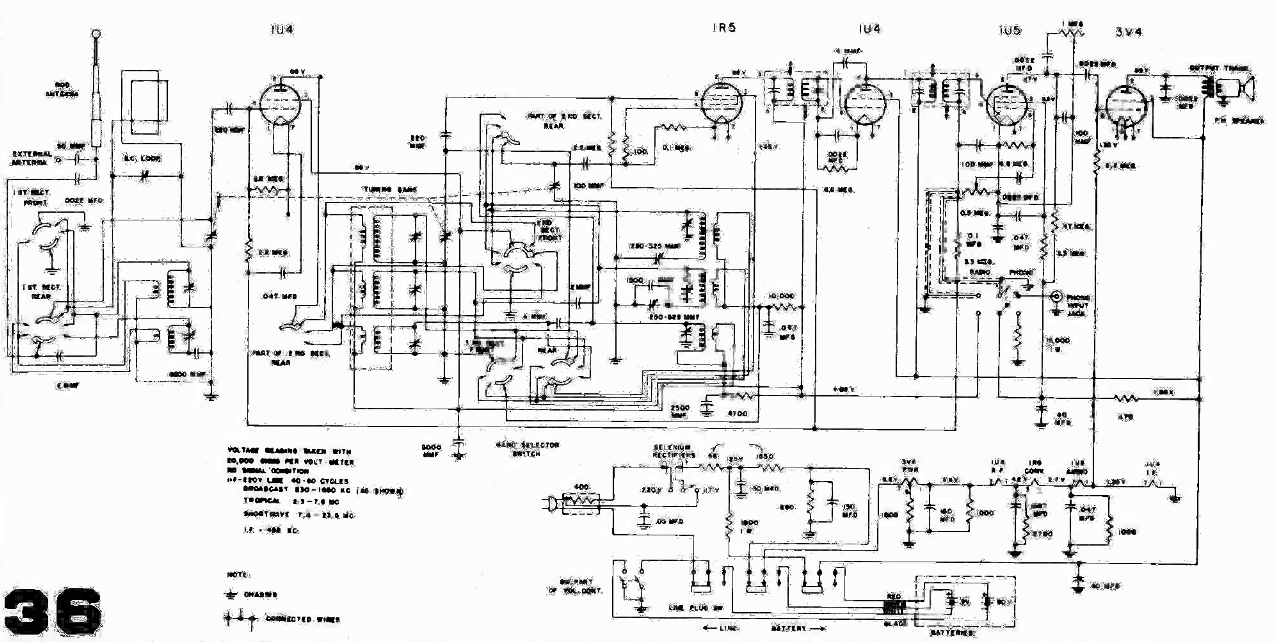
BATTERY LAYOUT P130



TUBE LAYOUT P130

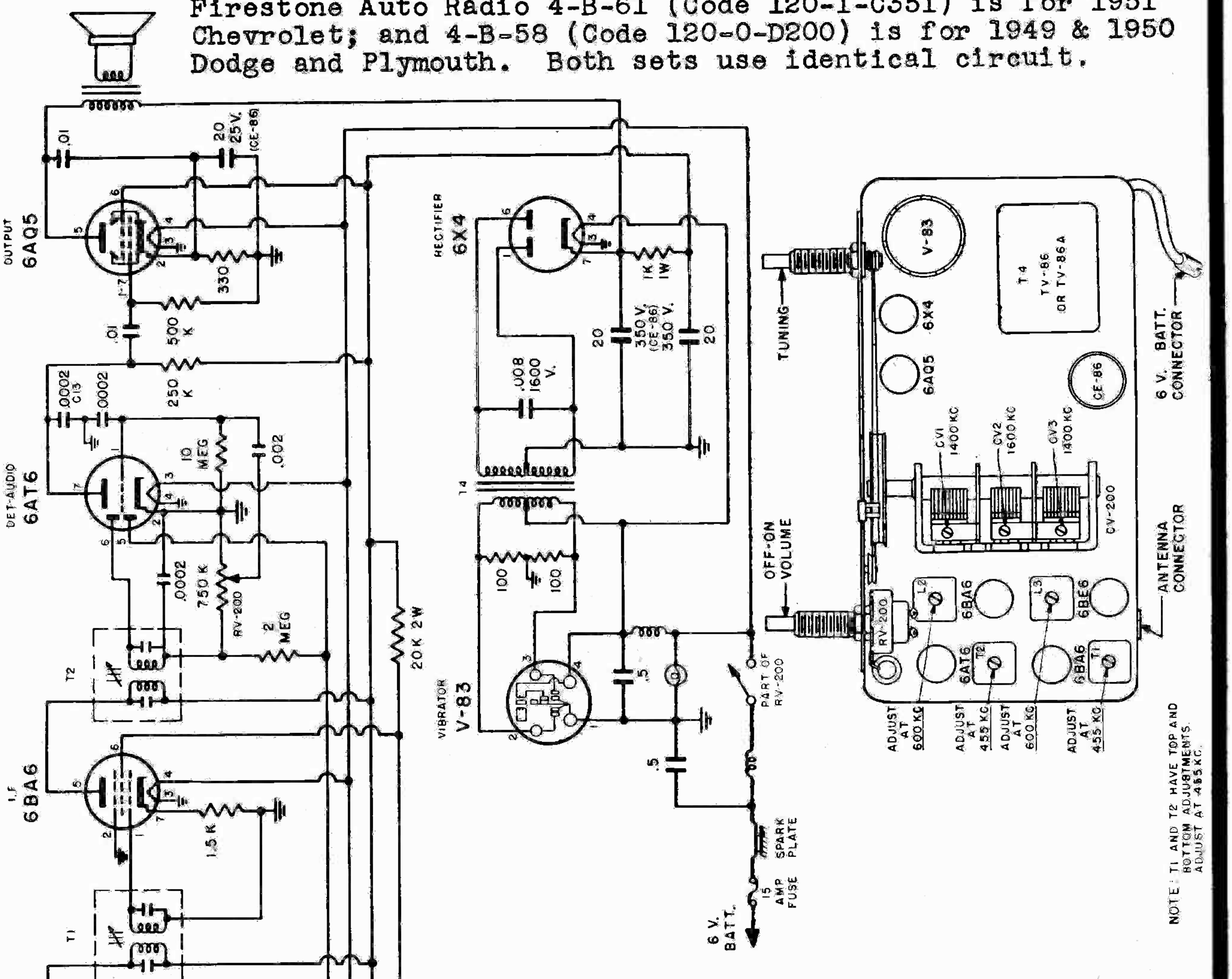


ROD DUMMY ANTENNA

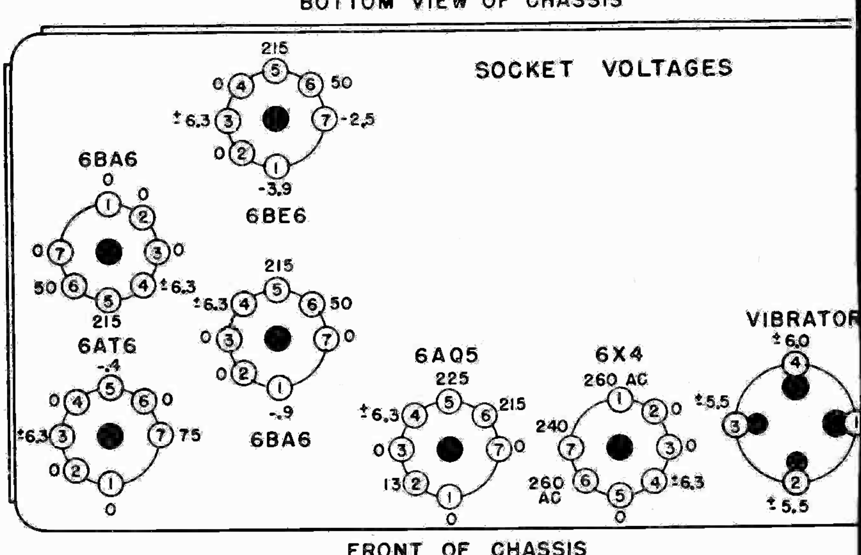


THE FIRESTONE TIRE & RUBBER CO. 4-B-58 and 4-B-61

Firestone Auto Radio 4-B-61 (Code 120-1-C351) is for 1951 Chevrolet; and 4-B-58 (Code 120-0-D200) is for 1949 & 1950 Dodge and Plymouth. Both sets use identical circuit.

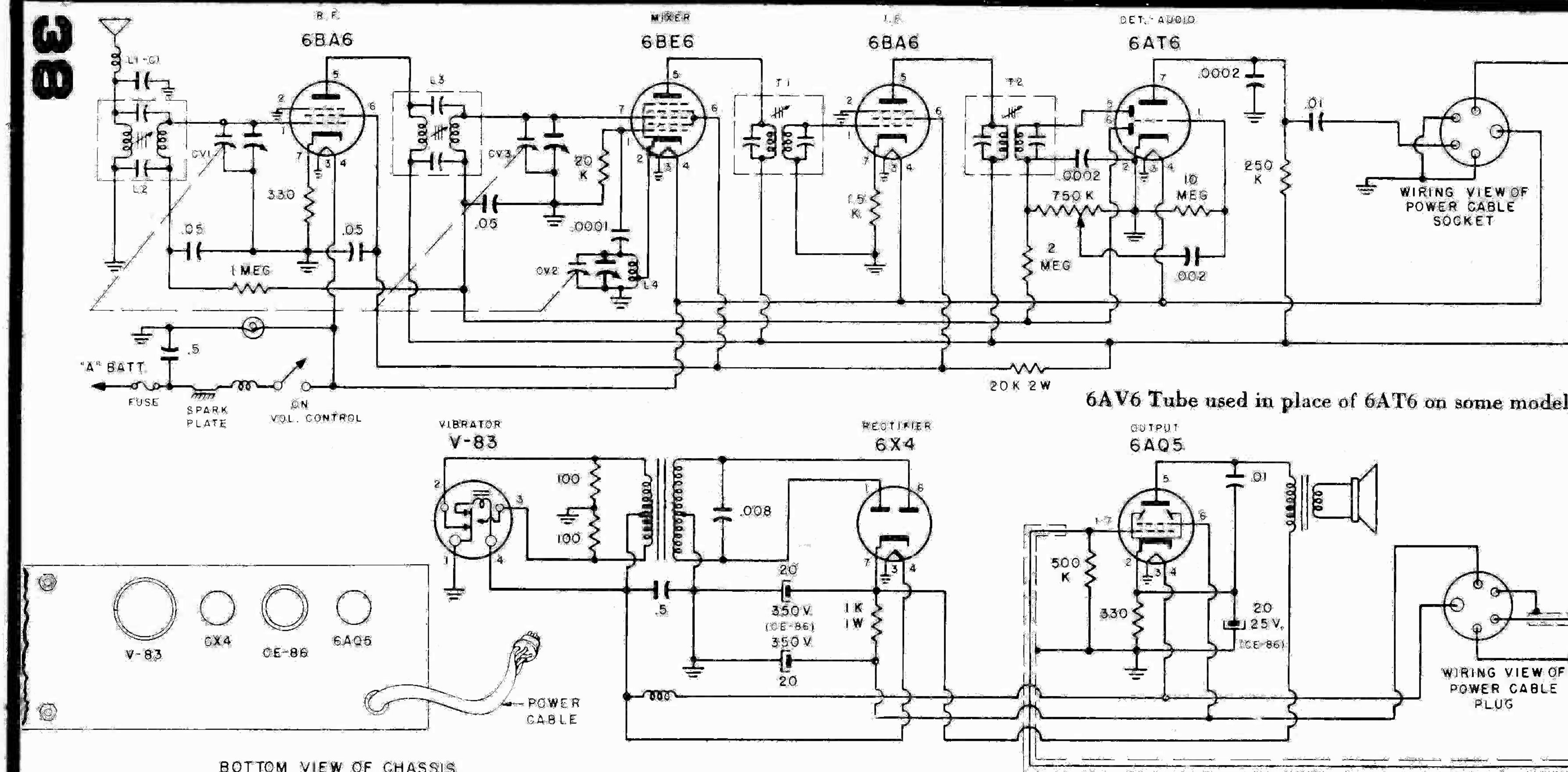


BOTTOM VIEW OF CHASSIS

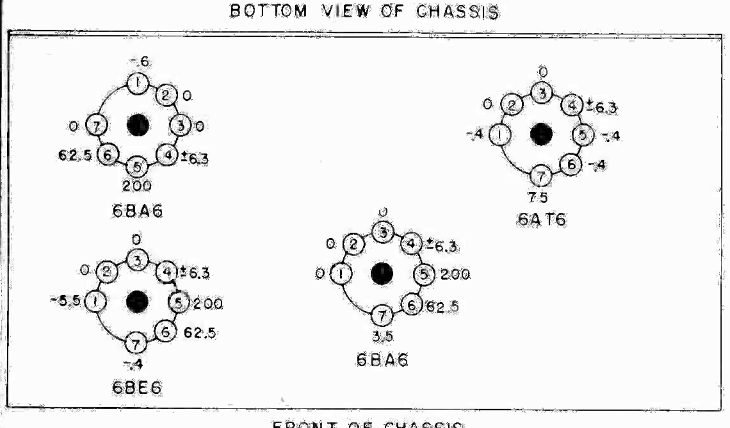


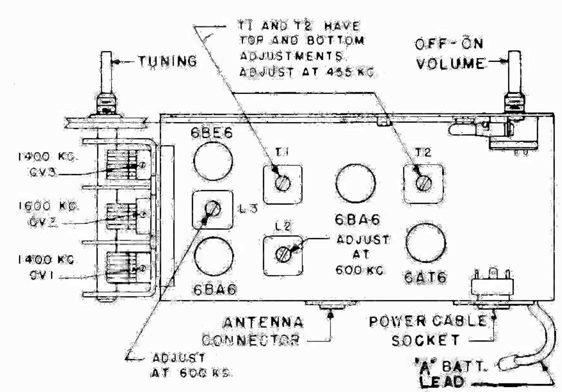
FRONT OF CHASSIS

Note: 6AV6 used in place of 6AT6 on some models.



6AV6 Tube used in place of 6AT6 on some models.



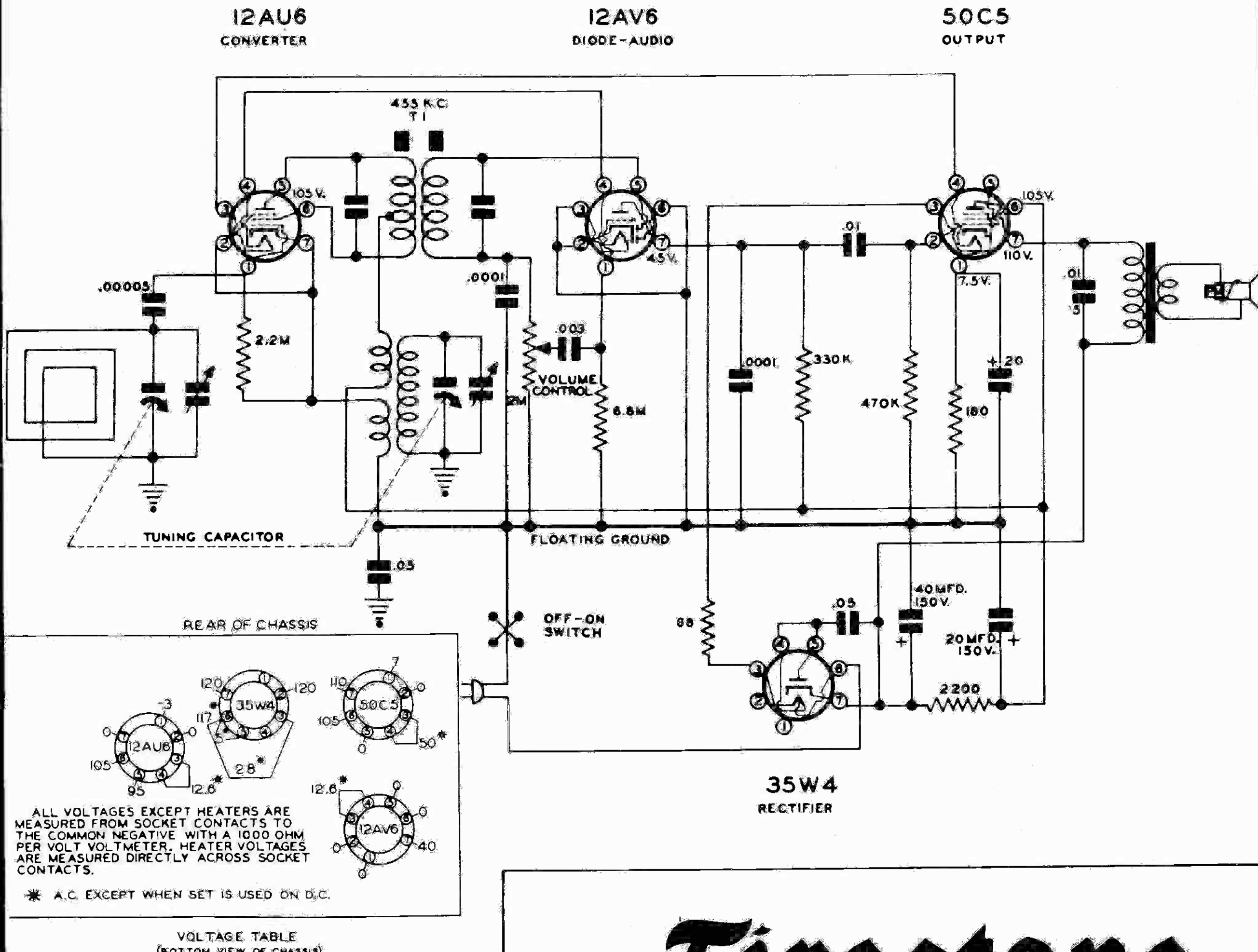


FIRESTONE TIRE & RUBBER

Custom Auto Radios for 1951 Ford, No. 4-B-60; 1949-1950 Ford, 4-B-56; 1950-1951 Studebaker, No. 4-B-62; and 1949-1950 Chevrolet, 4-B-57. The same electrical circuit is used in all these models, but location of parts may differ.

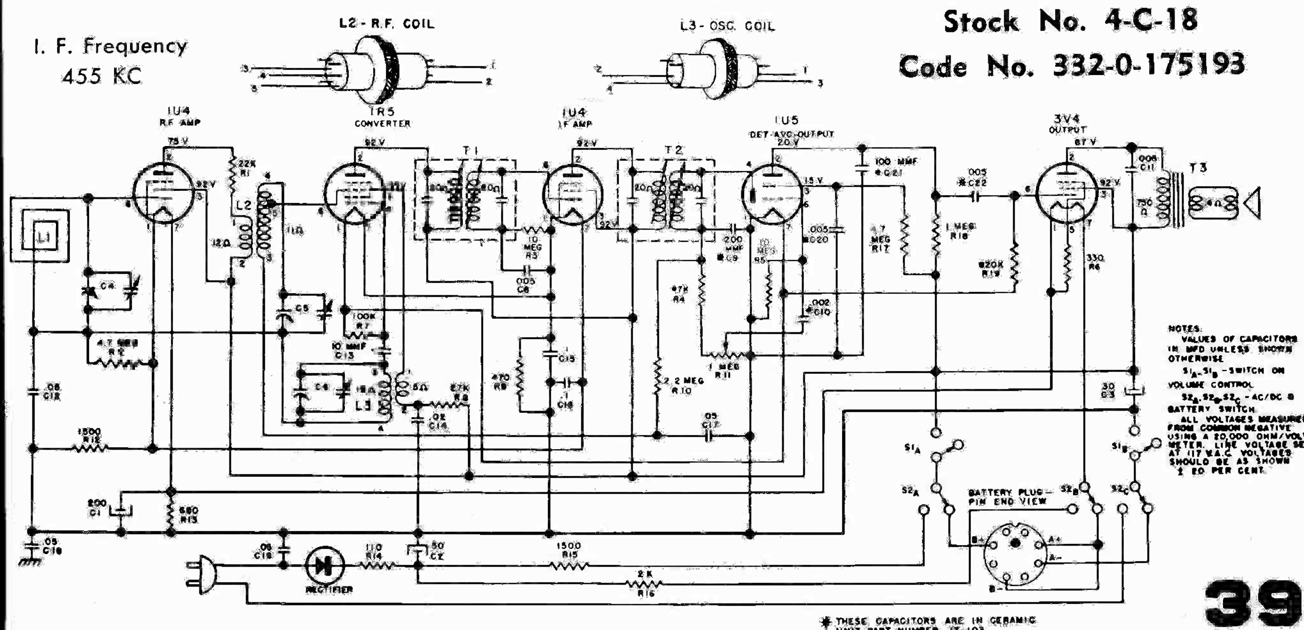
THE FIRESTONE TIRE & RUBBER CO.

Stock No. 4-A-70
Code No. 297-0-299



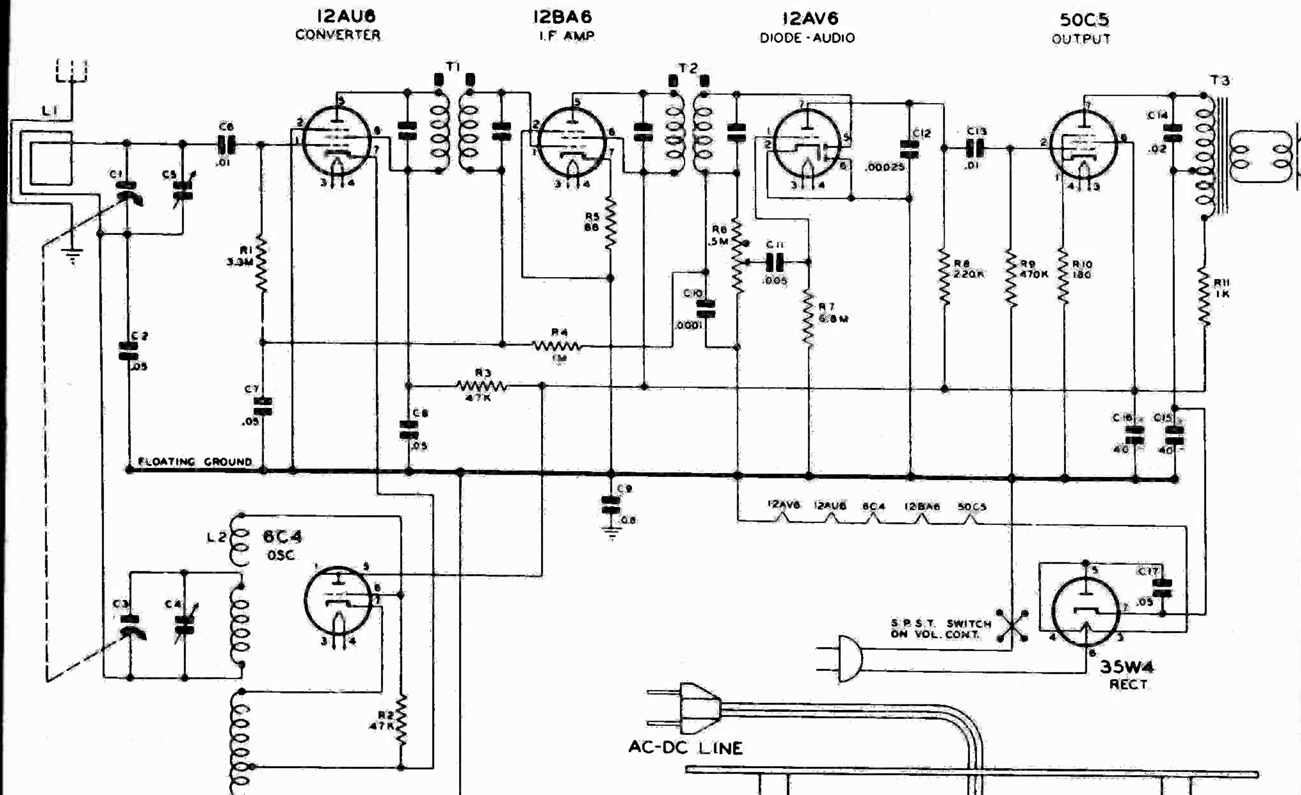
Firestone

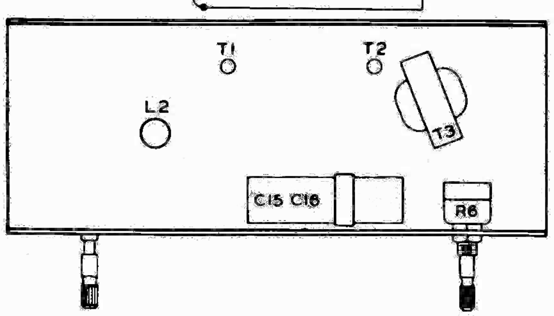
Stock No. 4-C-18
Code No. 332-0-175193

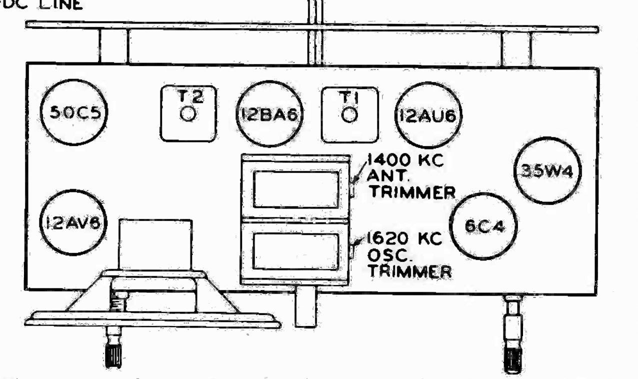


Firestone

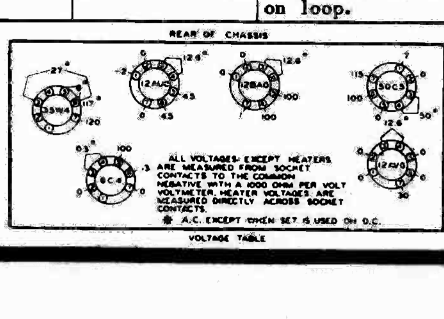
CODE NO. 297-0-3123
STOCK NO. 4-A-85 Walnut
STOCK NO. 4-A-89 White

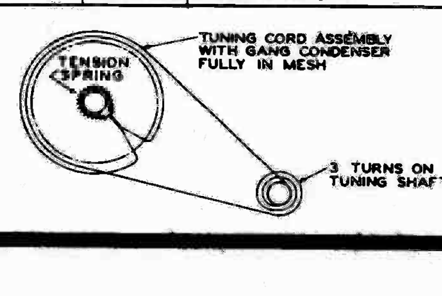




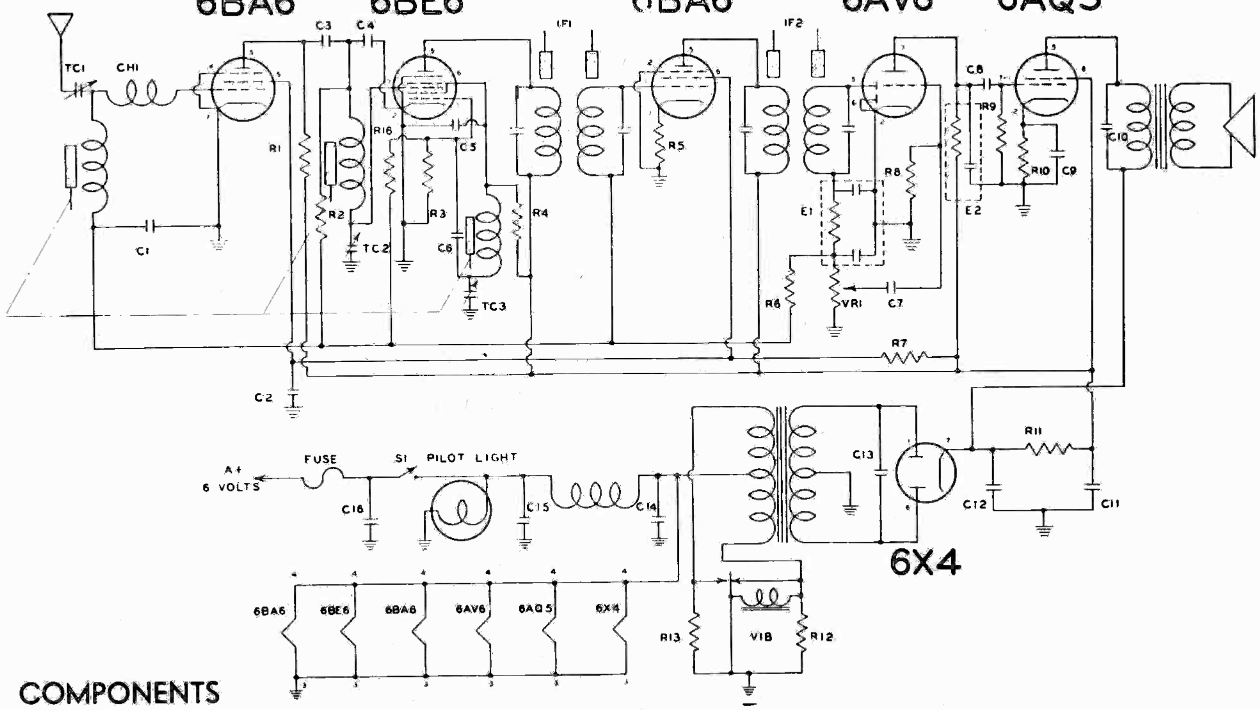


Steps	Set Receiver dial to:	TEST OSCILLATOR		DUMMY ANTENNA	Refer to parts layout diagram for location of trimmers mentioned below:
		Adjust test oscillator frequency to:	Attach output of test oscillator to:		
1	Any point where no interfering signal is received.	EXACTLY 455 KC	High side to grid of 12AU6 Tube. Low side to common negative.	.05 MFD. CONDENSER.	Adjust slugs at top and bottom of 2nd I.F. (T2) and then each of the slugs of the 1st I.F. (T1) for max. output.
2	Exactly 1620 KC	Exactly 1620 KC	External Antenna blue lead on loop.	100 MMFD CONDENSR	Adjust 1620 KC oscillator trimmer for maximum output.
3	Approx. 1400 KC	Approx. 1400 KC	External Antenna blue lead on loop.	100 MMFD CONDENSR	Adjust 1400 KC antenna trimmer for maximum output.



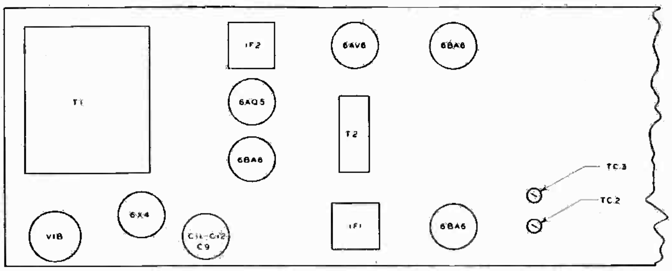


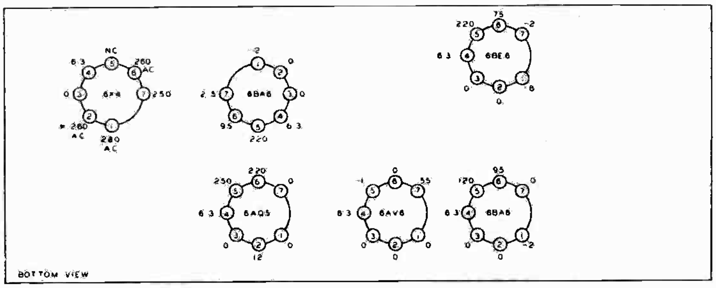
CORONADO RADIO MODEL 05RA33-43-5016A



COMPONENTS

SYMBOL	DESCRIPTION	VALUE	RATING
TC2-TC3	Dual Trimmer		
TC1	Trimmer		
C9, C11, C12	Electrolytic	15-15-25 MFD	350-350-25 volts
	Generator, capacitor	.5 MFD	
C14, C15	Capacitor, paper	.5 MFD	200 volts
C1	Capacitor, paper	.047 MFD	200 volts
C2	Capacitor, paper	.047 MFD	400 volts
C8	Capacitor, paper	.015 MFD	600 volts
C7, C10	Capacitor, paper	.01 MFD	600 volts
C13	Capacitor, buffer	.0056 MFD	1600 volts
C5	Capacitor, mica	1420 MMFD	500 volts
C4	Capacitor, mica	300 MMFD	500 volts
C6	Capacitor, mica	50 MMFD	500 volts
C3	Capacitor, mica	10 MMFD	500 volts
C16	Capacitor, spark	200 MMFD	2000 volts
R12, R13	Resistor	68 ohms	½ watt
R5	Resistor	1200 ohms	½ watt
R1, R3	Resistor	22K ohms	½ watt
R4	Resistor	33K ohms	½ watt
R9	Resistor	470K ohms	½ watt
R2	Resistor	1.8 megohm	½ watt
R6	Resistor	2.2 megohm	½ watt
R8	Resistor	10 megohm	½ watt
R10	Resistor	450 ohms	1 watt
R11	Resistor	1000 ohms	1 watt
R7	Resistor	27K ohms	1 watt
	Resistor, suppressor	10K ohms	
VR1	Volume control	1 megohm	
S1	Switch SP.S.T.		
E2	Capristor	270K ohm/100 MMFD	
E1	Diode filter unit	100-100 MFD/47K ohm	





* TIE POINT FOR C13

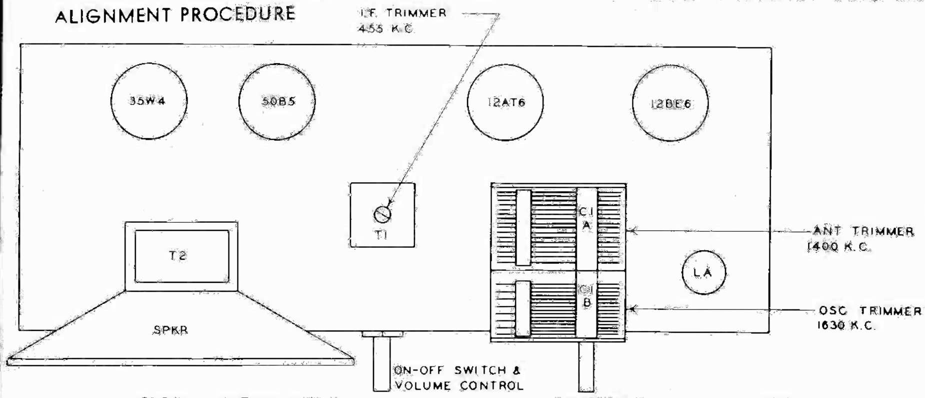
VOLTAGE CHART

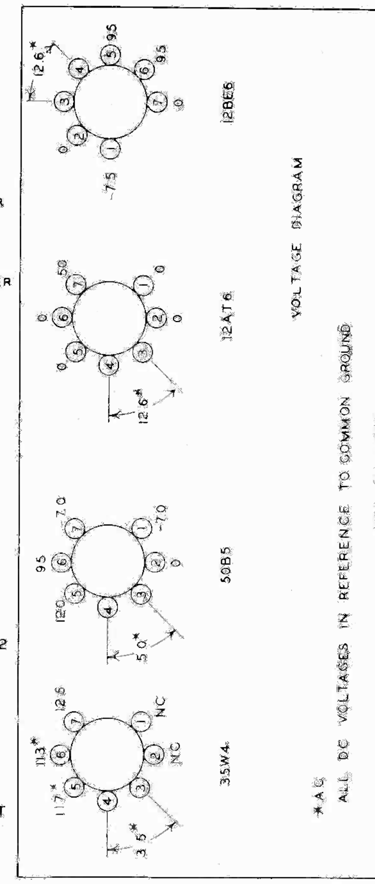
ALIGNMENT PROCEDURE

Frequency	Dummy Antenna	Connection To Radio	Position Of Tuner	Adjust for Max. Output
257.5 KC	100 MMFD	6BE6 Grid Pin No. 7	Slugs Out	IF1 & IF2
1610 KC	100 MMFD	Ant. Jack	Slugs Out	TC3
1610 KC	100 MMFD	Ant. Jack	Slugs Out	TC2
1610 KC	100 MMFD	Ant. Jack	Slugs Out	TC1
1400 KC	100 MMFD	Ant. Jack	Tune in Signal Gen.	LA Slug & LR Slug

CORONADO "BANTAM" RADIO MODEL 05RA33-43-8120A

ALIGNMENT PROCEDURE



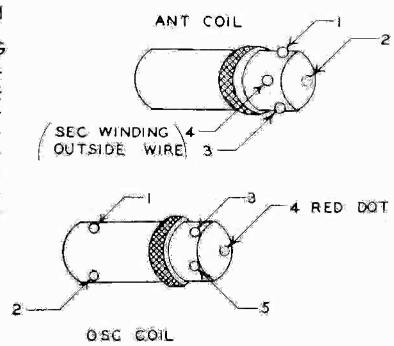


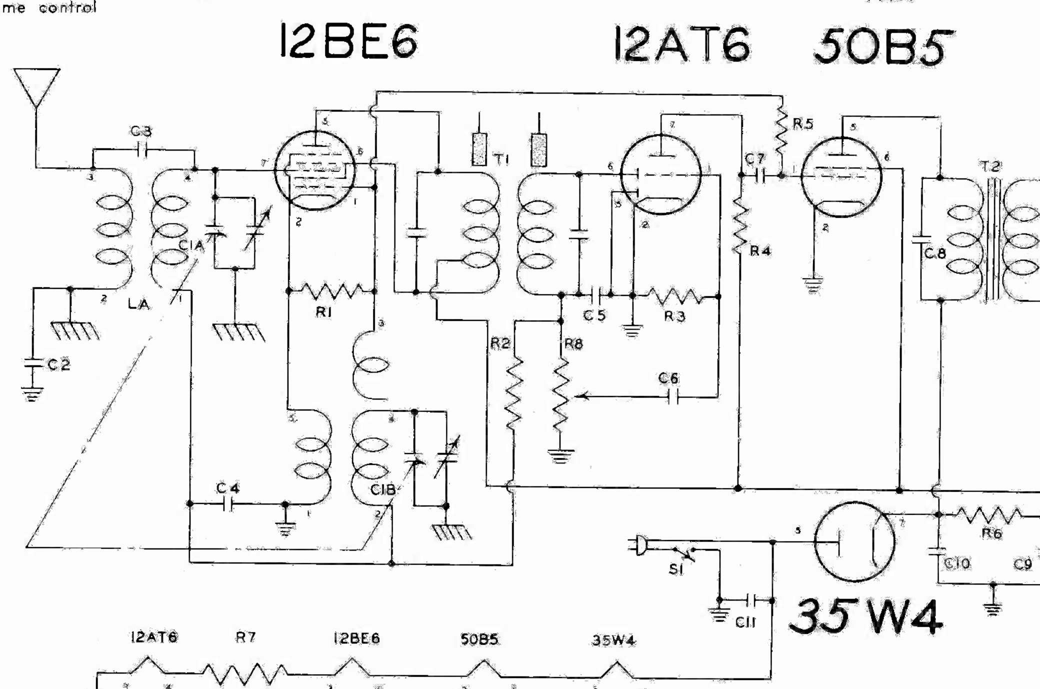
SIGNAL GENERATOR Frequency	Dummy Antenna	Connection to Radio	POSITION OF VARIABLE	ADJUST FOR MAXIMUM OUTPUT
455 KC	100 MMFD	12BE6 Grid Stator C1A	Fully Open	T1
1630 KC	100 MMFD	12BE6 Grid Stator C1A	Fully Open	C1B Oscillator
1400 KC	100 MMFD	Coupled to Antenna Lead	Tune in Signal Generator	C1A Antenna

Connect low side of signal generator to chassis.

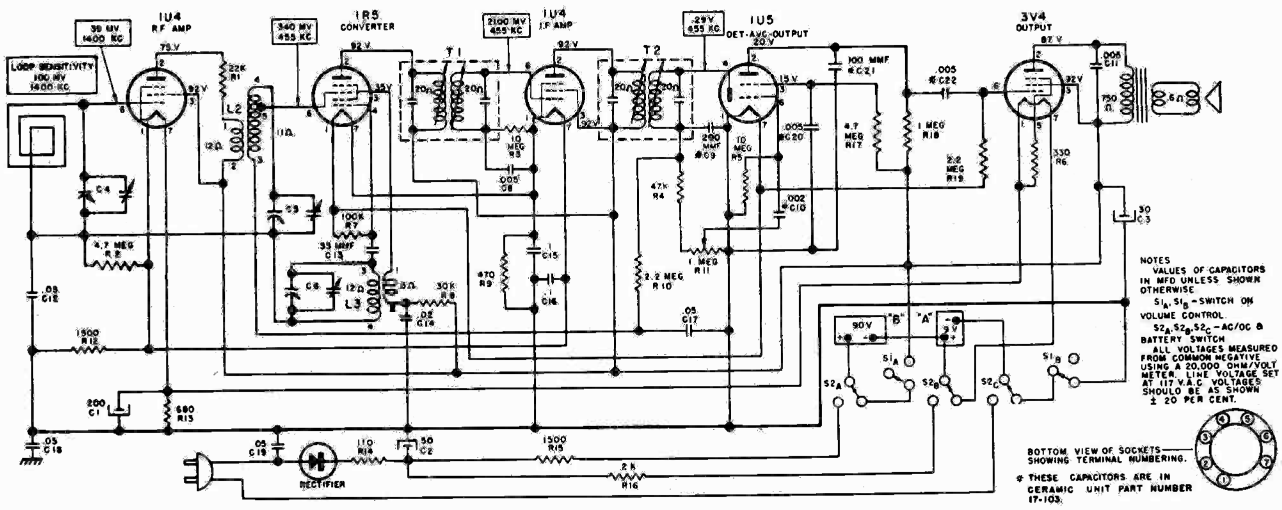
PARTS VALUES FOR T-64 GAMBLE'S AC-DC BANTAM

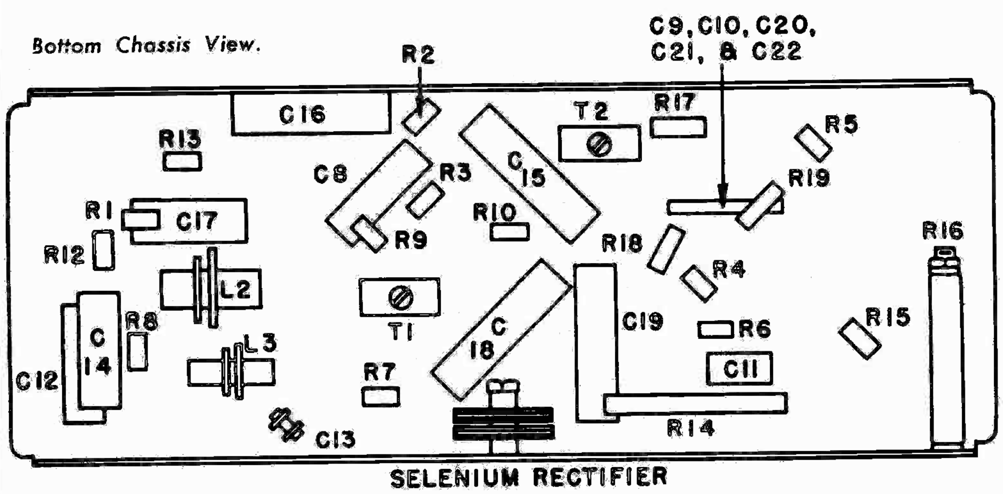
SYMBOL	DESCRIPTION	VALUE	RATING
C1A-C1B	Condenser, 2 gang	.05 MFD	200 volt
C2, C4	Condenser, paper	5 MMFD	500 volt
C3	Condenser, ceramic	100 MMFD	500 volt
C5	Condenser, mica	.002 MFD	600 volt
C6	Condenser, paper	.005 MFD	600 volt
C7, C8	Condenser, paper	20 MFD	150 volt
C9	Electrolytic	40 MFD	150 volt
C10	Electrolytic	.05 MFD	400 volt
C11	Condenser, paper	22K ohm	½ watt
R1	Resistor	2.2 megohm	½ watt
R2	Resistor	10 megohm	½ watt
R3	Resistor	220K ohm	½ watt
R4	Resistor	330K ohm	½ watt
R5	Resistor	2200 ohm	½ watt
R6	Resistor	68 ohm	2 watt
R7	Resistor	1 megohm	
R8	Volume control		



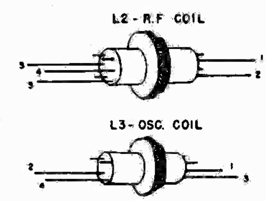


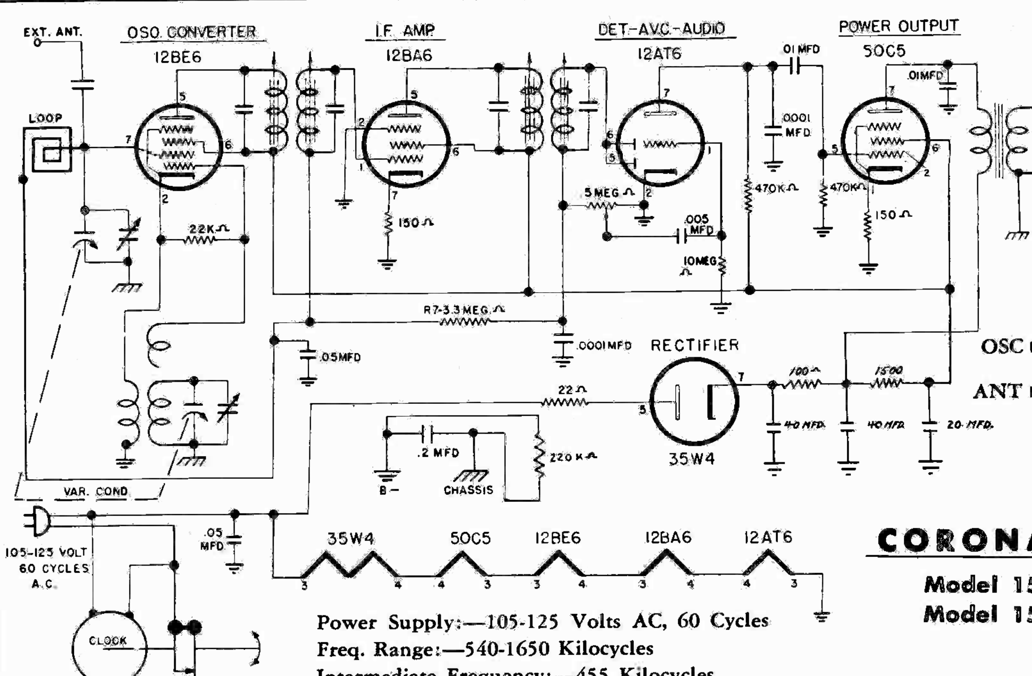
CORONADO RADIO MODEL 05RA4-43-9876A

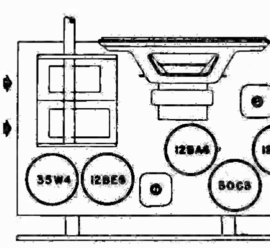




Sets with the suffix "B" instead of "A", use 1L4 tubes instead of 1U4, and a switch operated by power plug and chassis socket.







Power Supply:—105-125 Volts AC, 60 Cycles
Freq. Range:—540-1650 Kilocycles
Intermediate Frequency:—455 Kilocycles

CORONADO RADIO

Model 15RA38-43-8235A
Model 15RA38-43-8236A

MANUAL OF 1951 MOST-OFTEN-NEEDED RADIO DIAGRAMS

CORONADO RADIO MODELS 05RA33-43-8136A, 05RA33-43-8137A

HALLICRAFTER RADIO MODELS 5R11, 5R12, 5R13, 5R14

ALIGNMENT PROCEDURE

The alignment should be made with volume control fully on, and the output from the signal generator as low as possible, to prevent AVC action from interfering with proper alignment.

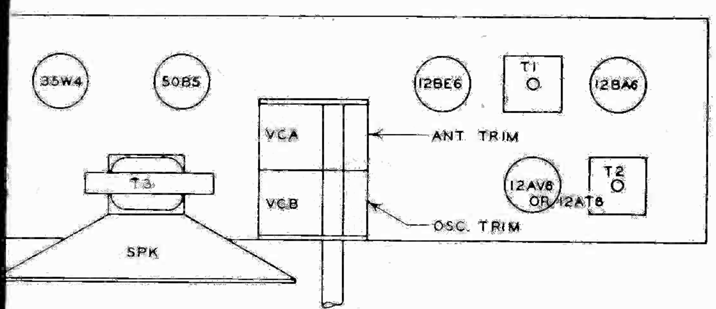
With the output meter connected across the voice coil of the speaker, the output meter reading for 50 milliwatts is 0.4 volts, using a signal which is modulated 400 c.p.s.

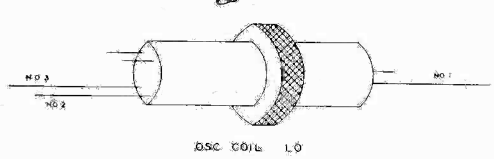
Adjust all trimmers for maximum output. Repeat the alignment procedure given below as a final check.

CAUTION: This is an AC/DC receiver, and when aligning the set it is necessary to isolate the signal generator or the receiver from the line by use of a transformer, or to place a .2 MFD condenser in each test lead of the signal generator.

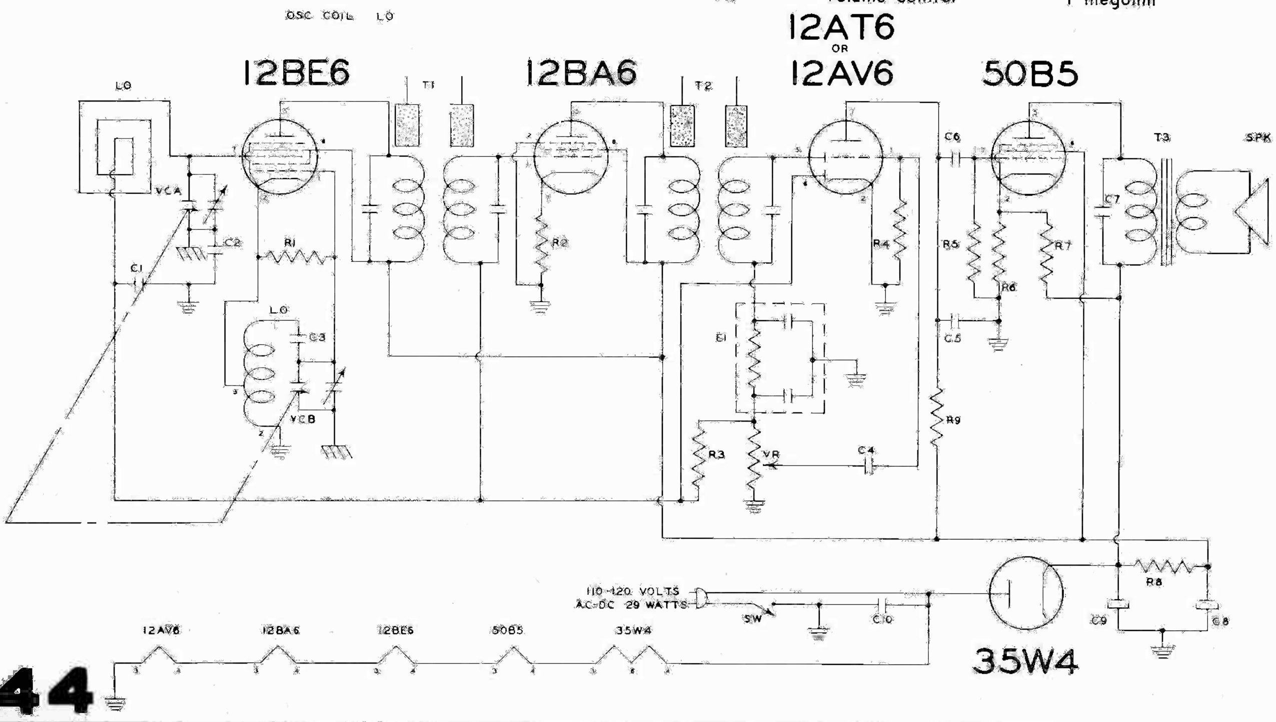
SIGNAL GENERATOR Frequency	Dummy Antenna	Connection to Radio	POSITION OF VARIABLE	ADJUST FOR MAXIMUM OUTPUT
455 KC	.1 MFD	12BE6 Grid Stator VCA	Fully Open	T1 & T2
1625 KC		12BE6 Grid Stator VCA	Fully Open	VCB Oscillator
1400 KC	.1 MFD	Loosely Coupled to Loop	Tune in Signal Generator	VCA Antenna

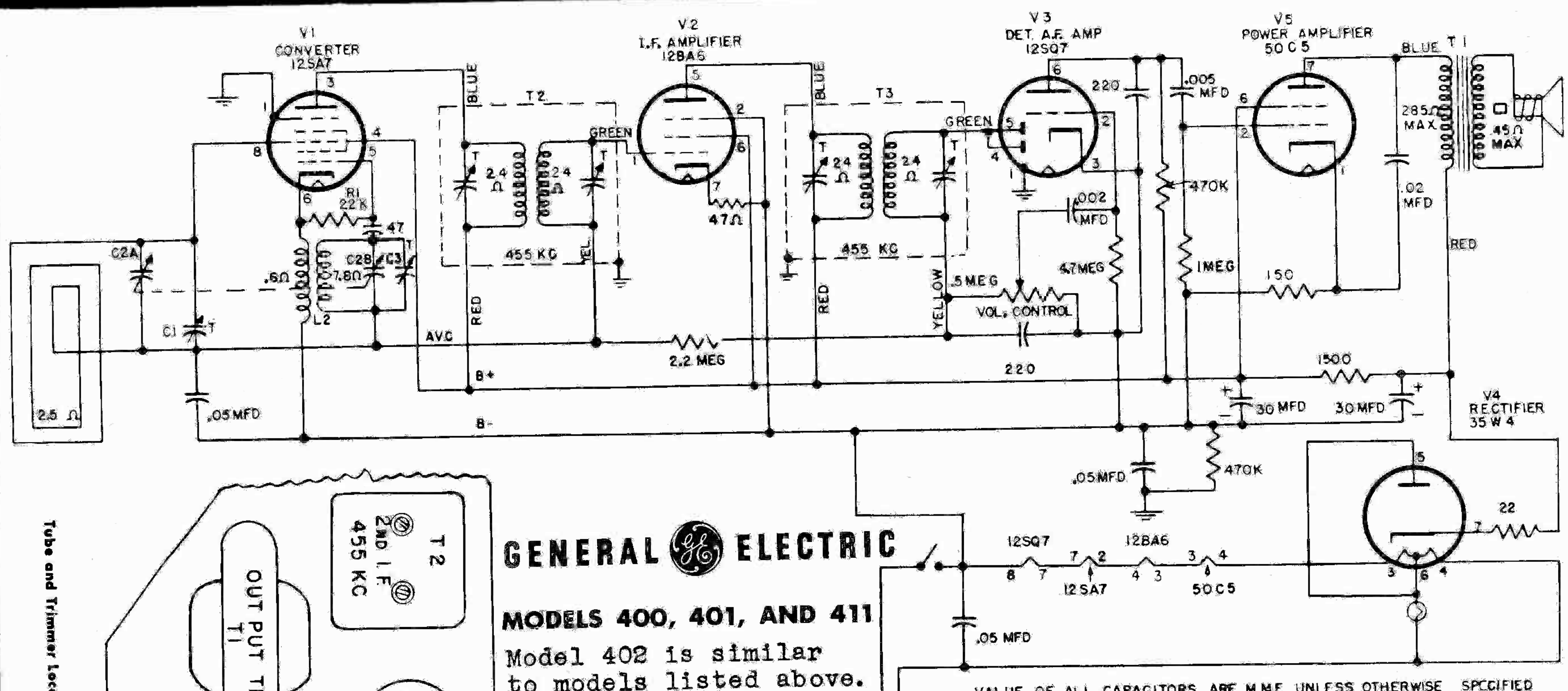
Connect low side of signal generator to common negative.





SYMBOL	DESCRIPTION	VALUE	RATING
VCA-VCB	Condenser, 2 gang		
C1	Condenser, paper	.05 MFD	200 volts
C2	Condenser, paper	.1 MFD	200 volts
C3	Condenser, paper	.02 MFD	600 volts
C4-C6-C7	Condenser, paper	.005 MFD	600 volts
C5	Condenser, mica	250 MMFD	500 volts
C8	Condenser, electrolytic	20 MFD	150 volts
C9	Condenser, electrolytic	40 MFD	150 volts
C10	Condenser, paper	.05 MFD	400 volts
R1	Resistor	22K ohm	1/2 watt
R2	Resistor	390 ohm	1/2 watt
R3	Resistor	1 megohm	1/2 watt
R4	Resistor	10 megohm	1/2 watt
R5-R9	Resistor	470K ohm	1/2 watt
R6	Resistor	120 ohm	1/2 watt
R7	Resistor	10K ohm	1 watt
R8	Resistor	1000 ohm	1 watt
E1	Diode filter unit	2X100 MMFD-47K ohm	
VR	Volume control	1 megohm	

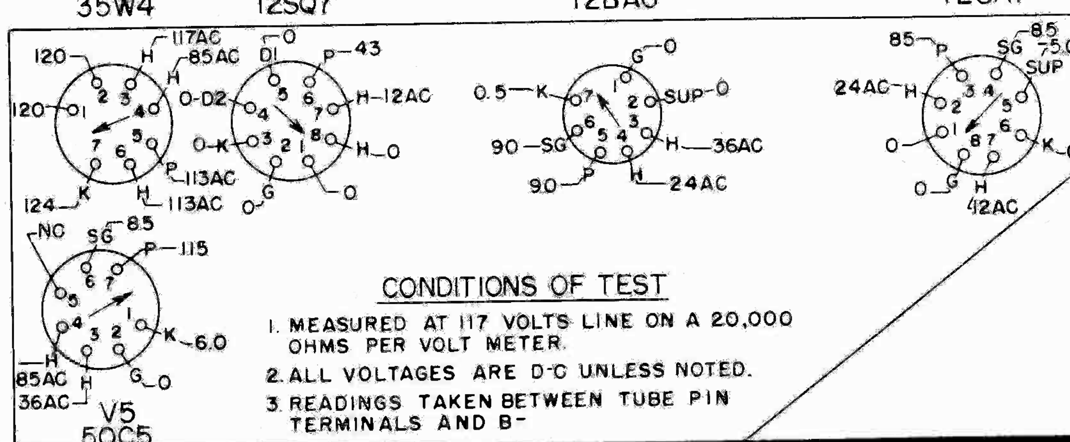




GENERAL ELECTRIC

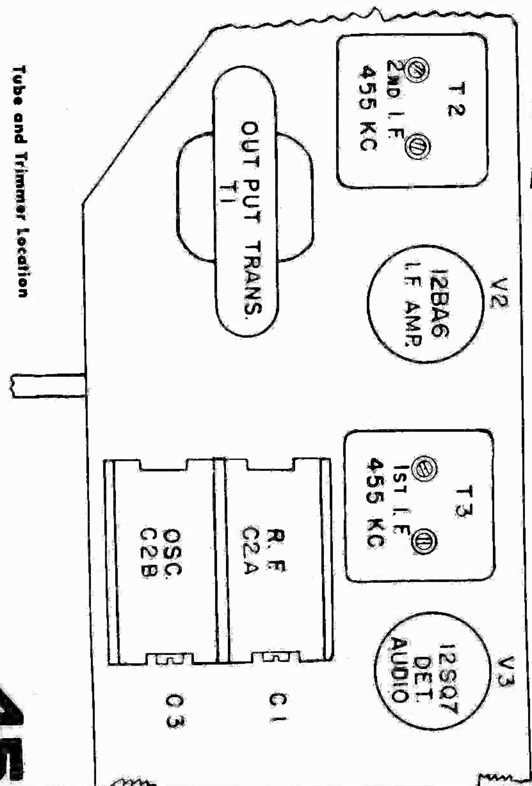
MODELS 400, 401, AND 411

Model 402 is similar to models listed above.



CONDITIONS OF TEST

1. MEASURED AT 117 VOLTS LINE ON A 20,000 OHMS PER VOLT METER.
2. ALL VOLTAGES ARE D-C UNLESS NOTED.
3. READINGS TAKEN BETWEEN TUBE PIN TERMINALS AND B-



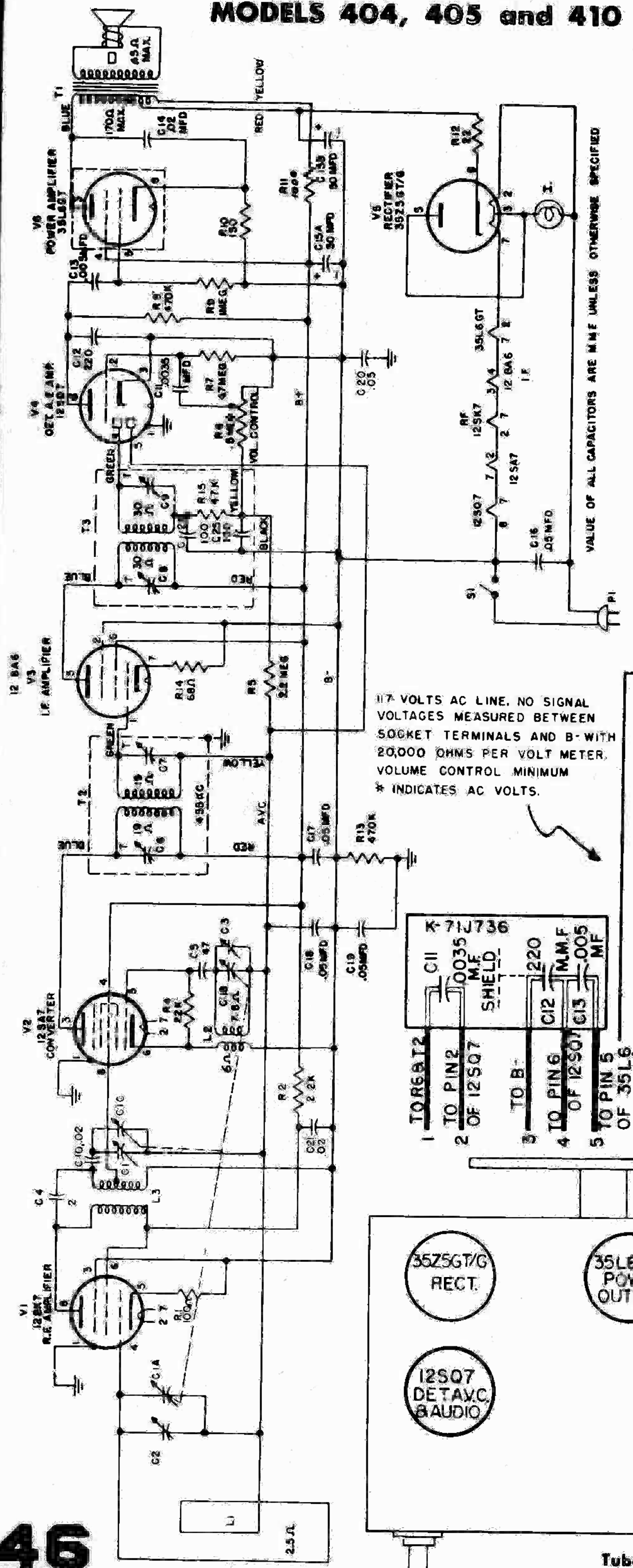
Tube and Trimmer Location

GENERAL ELECTRIC

RADIO

SERVICE DATA

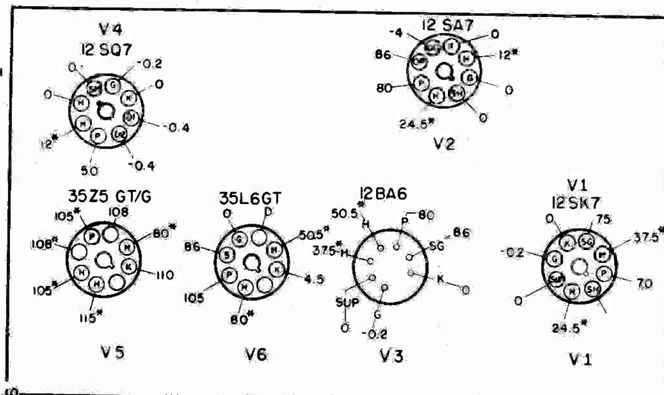
MODELS 404, 405 and 410



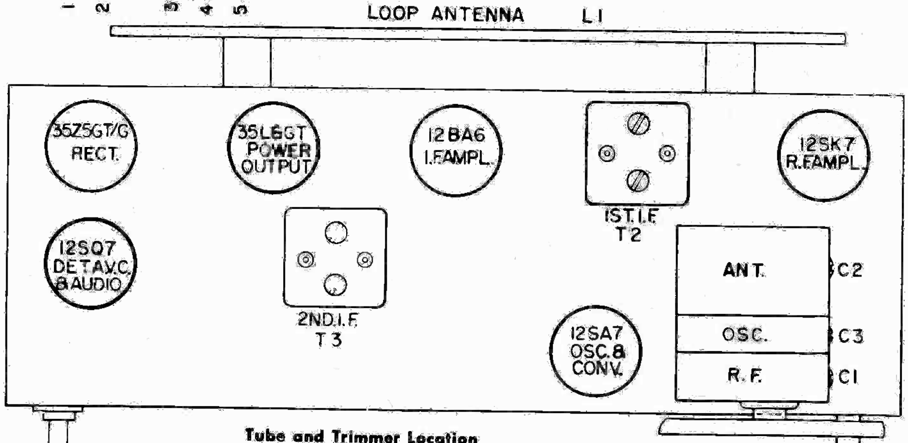
ALIGNMENT CHART

Step	Connect Test Oscillator to:	Test Osc. Setting	Radio Dial Setting	Adjust Trimmers for Maximum
I-F ALIGNMENT				
1	V3, 12BA6 grid (Pin 1), in series with 0.5 mfd.		......	C9 and C8 of second i-f transformer T3.
2	V2, 12SA7 grid (Pin 8), in series with .05 mfd.	455 KC	......	C7 and C6 of first i-f transformer, T2
3			......	Recheck adjustment of C9, C8, C7, C6, for maximum
R-F ALIGNMENT				
4	Inductively coupled to radio loop.	1620 KC	Minimum capacity C1A, C1B	C3, oscillator trimmer
5		1500 KC	Tune for Maximum	C1, r-f trimmer C2, ant. trimmer

FRONT OF CHASSIS



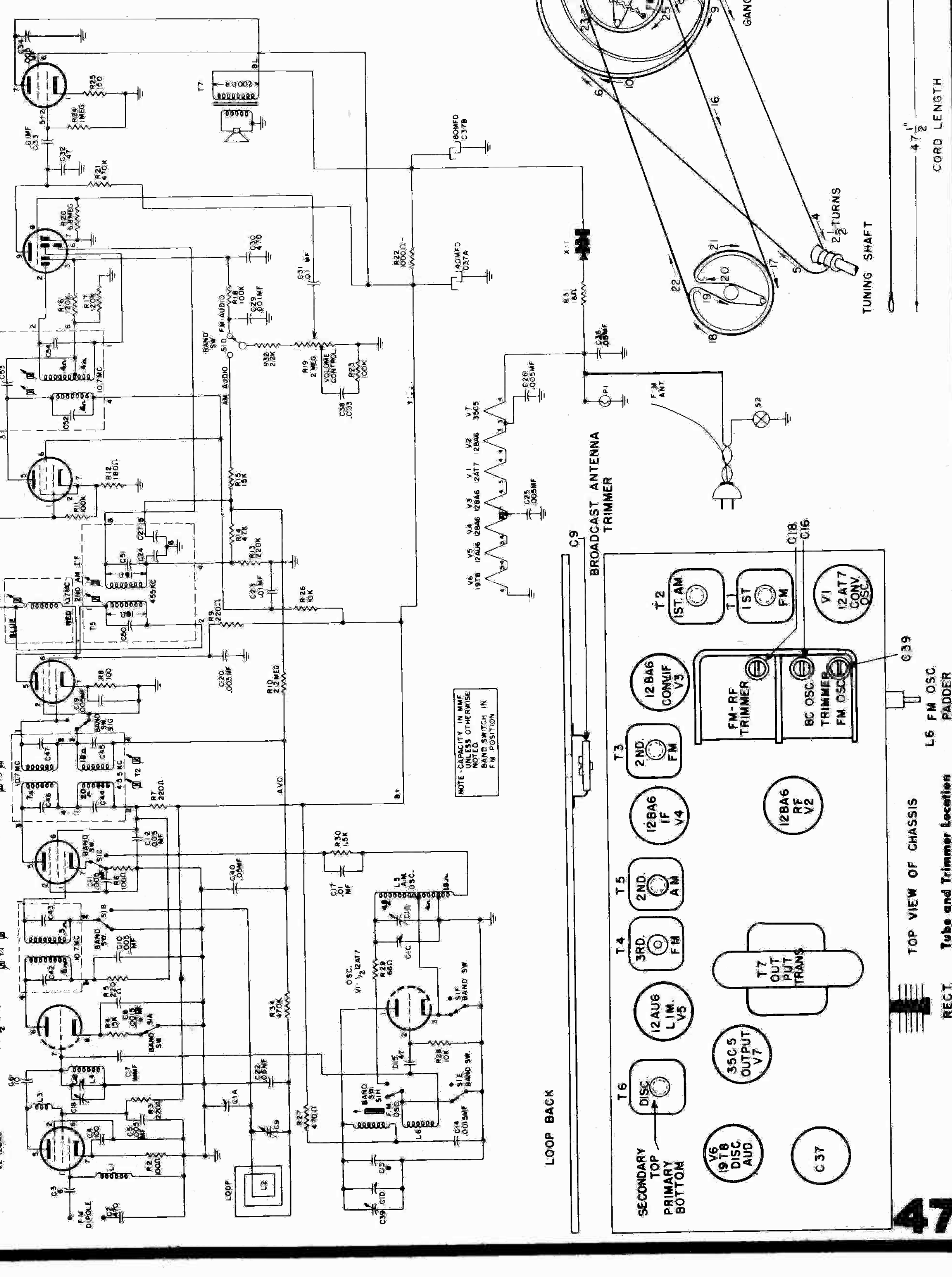
BOTTOM VIEW OF CHASSIS



Tube and Trimmer Location

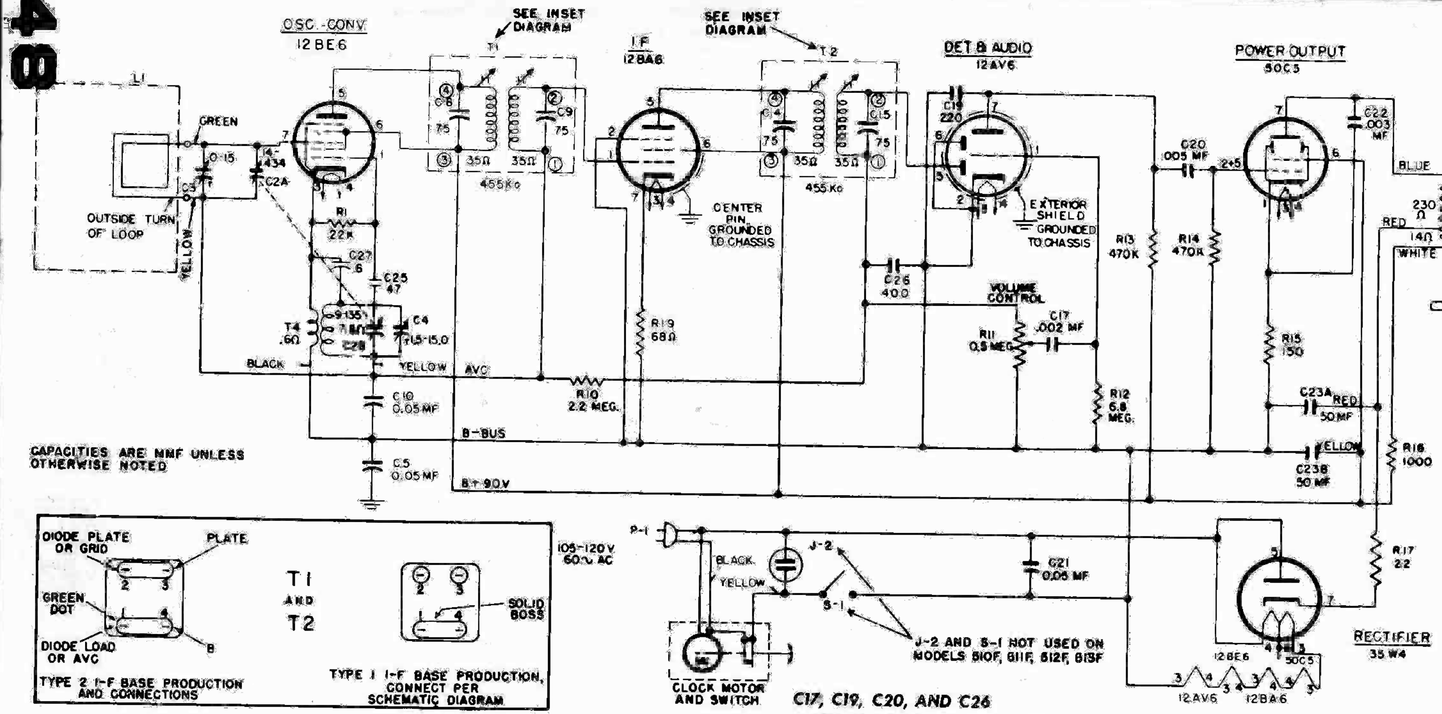
GENERAL ELECTRIC

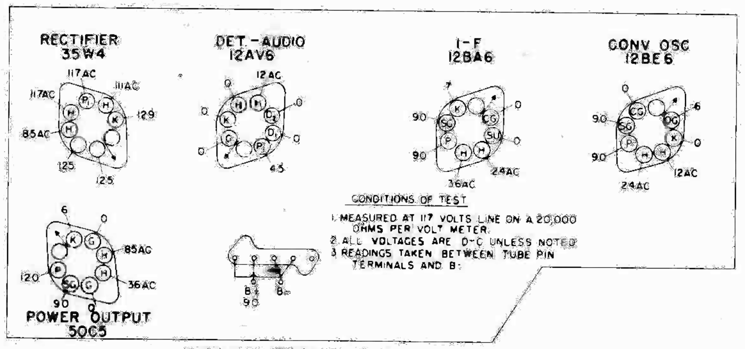
MODEL 408



GENERAL ELECTRIC

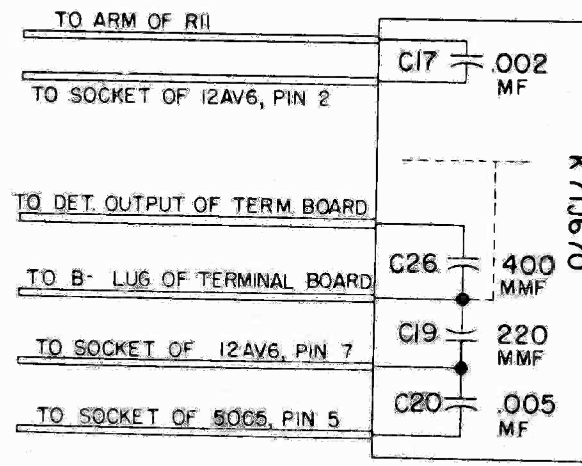
MODELS 510F, 511F, 512F, 513F, 515F, 516F, 517F, 518F, 521F, AND 522F



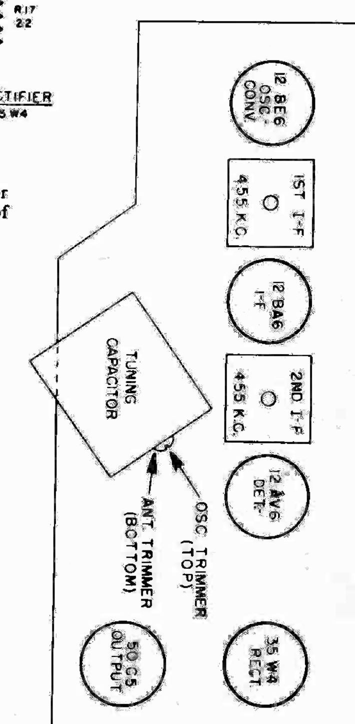


C17, C19, C20, AND C26

The lead identification for the four-section ceramic capacitor RCW-3048 (K71J670) can be observed from the illustration of Figure 2.



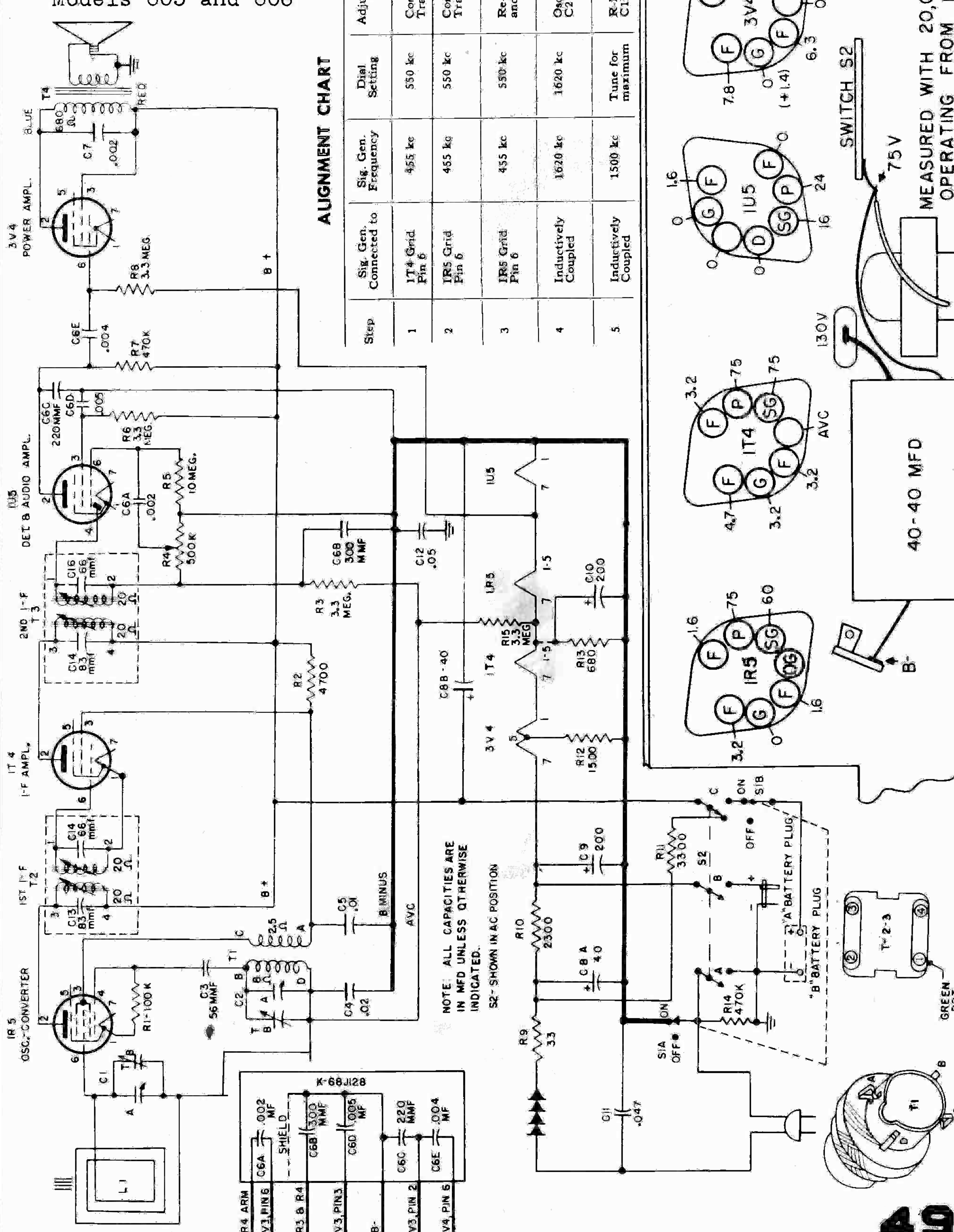
Capacitor RCW-3013



General Electric models as listed in the upper left hand corner, but without the suffix "F", use an identical circuit but employ 12SA7 instead of 12BE6, and 12SQ7 for 12AV6, and differ in physical assembly.

GENERAL ELECTRIC

Models 605 and 606

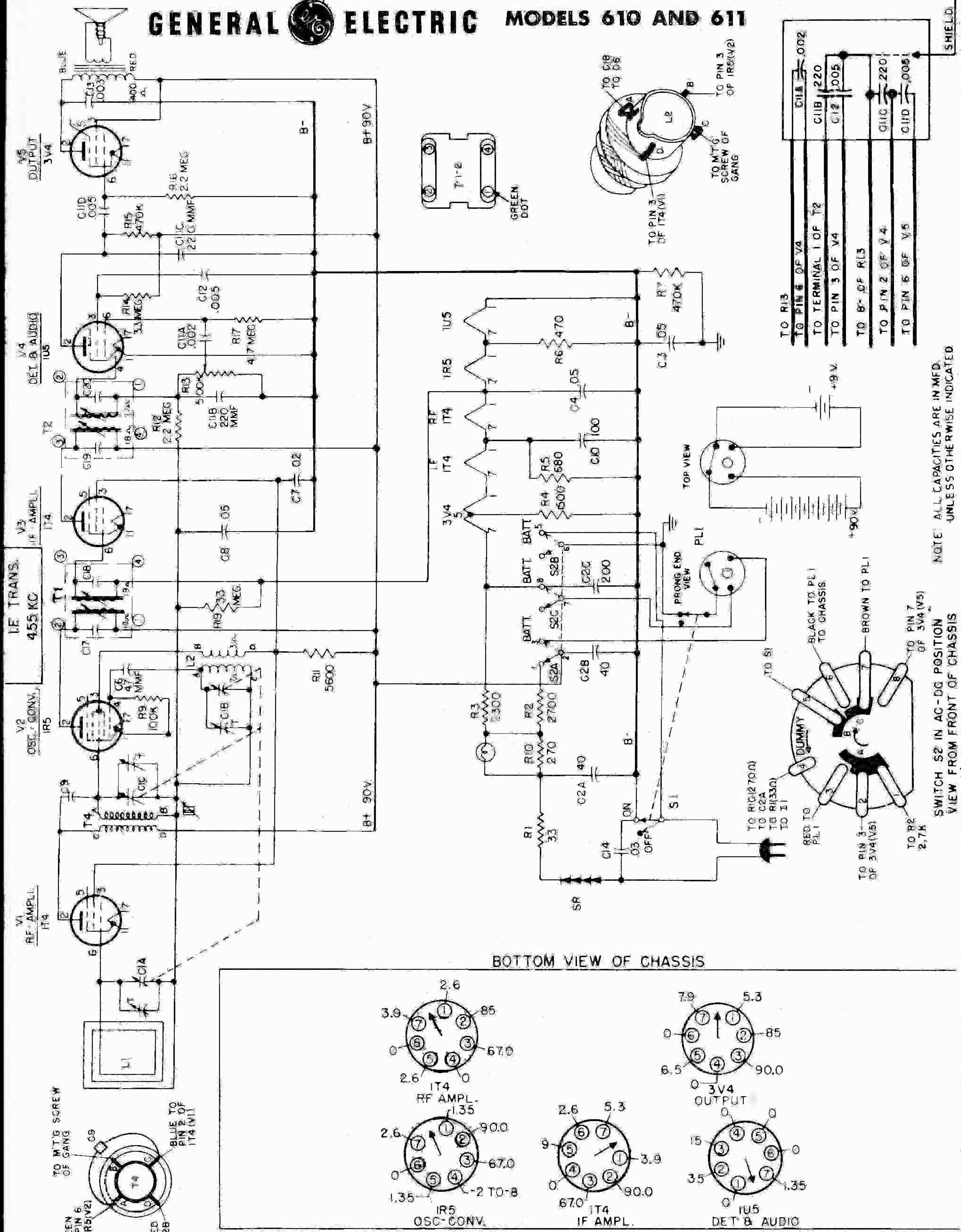


ALIGNMENT CHART

Step	Sig. Gen. Connected to	Sig. Gen. Frequency	Dial Setting	Adjust For Max. Output
1	1T4 Grid Pin 6	455 kc	550 kc	Cores of I-F Trans. T3
2	1R5 Grid Pin 6	455 kc	550 kc	Cores of I-F Trans. T2
3	1R5 Grid Pin 6	455 kc	550 kc	Re-adjust T2 and T3
4	Inductively Coupled	1620 kc	1620 kc	Osc. trimmer C2B
5	Inductively Coupled	1500 kc	Tune for maximum	R-F trimmer C1B

MANUAL OF 1951 MOST-OFTEN-NEEDED RADIO DIAGRAMS

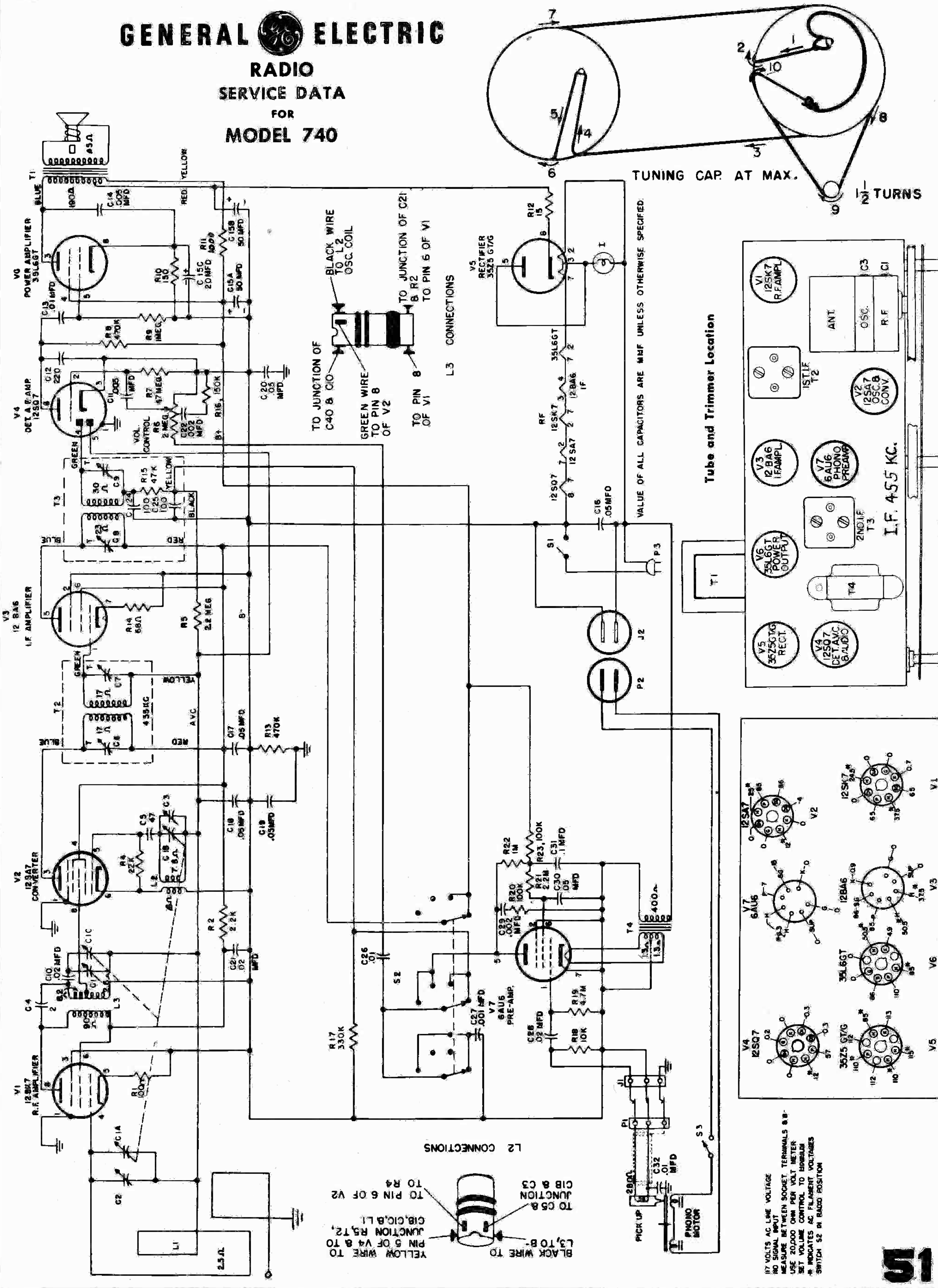
GENERAL ELECTRIC MODELS 610 AND 611



DC VOLTAGES TO B- UNLESS OTHERWISE SPECIFIED. ALL
ALL RATINGS ARE A.C. OPERATION MEASURED WITH REFERENCE TO B-.
RATINGS FOR BATTERY ARE SIMILAR TO AC RATINGS.
VOLTAGE IS MEASURED WITH 20,000 OHMS PER VOLT METER.

GENERAL ELECTRIC

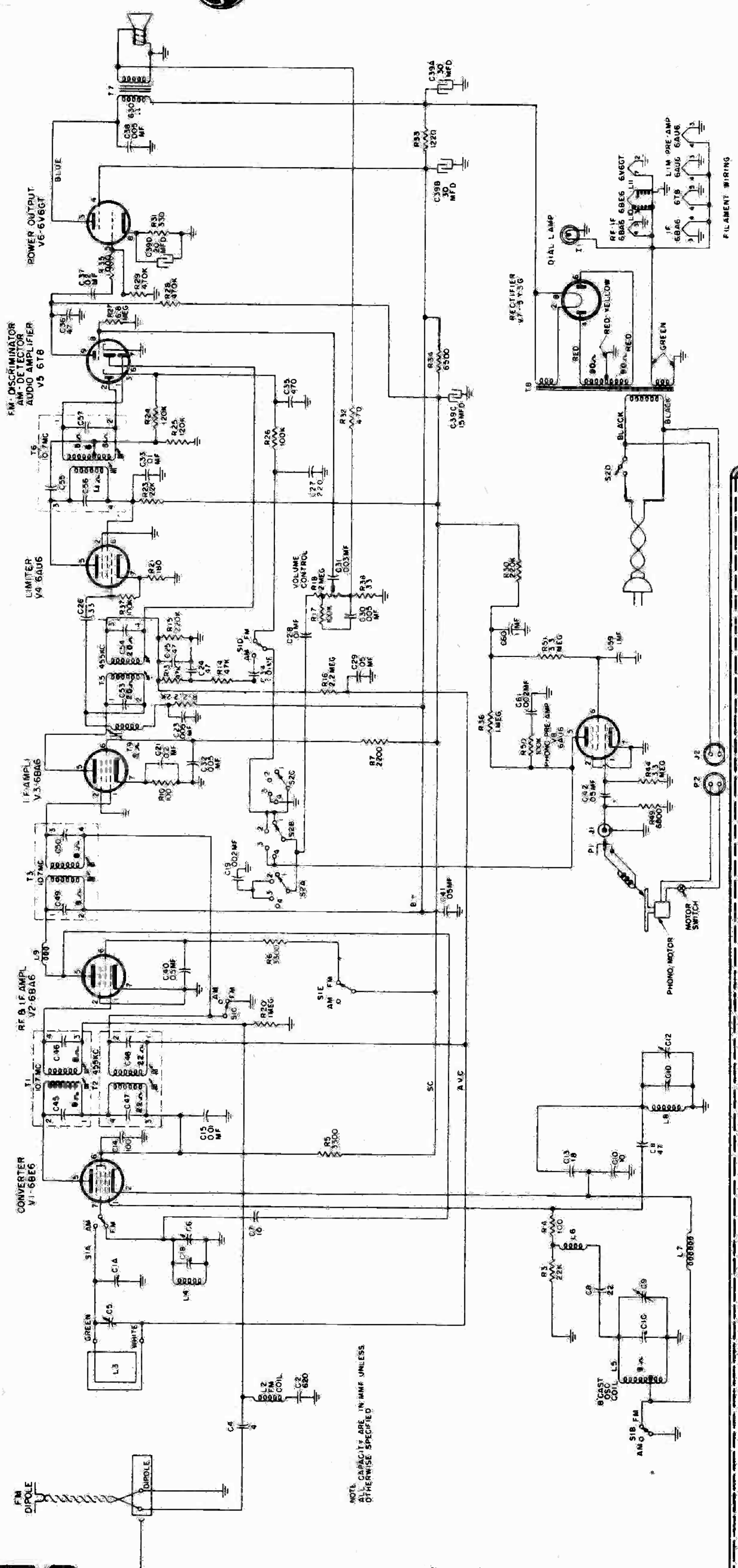
RADIO SERVICE DATA FOR MODEL 740

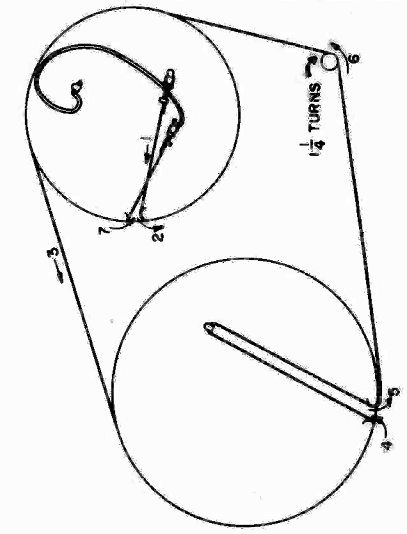


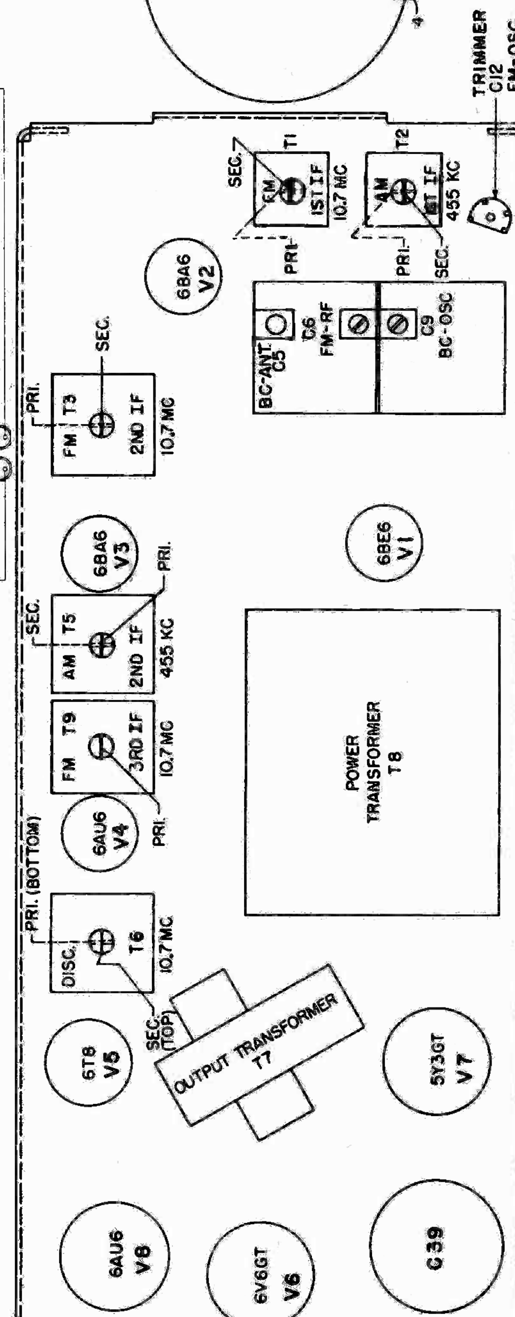
Schematic Change. On later production receivers, the pilot lamp is connected across the secondary of T4 — instead of pins 2-3 of the Type 35Z5 tube (V5). Pin 5 of this tube should be connected to pin 2 instead of pin 3.

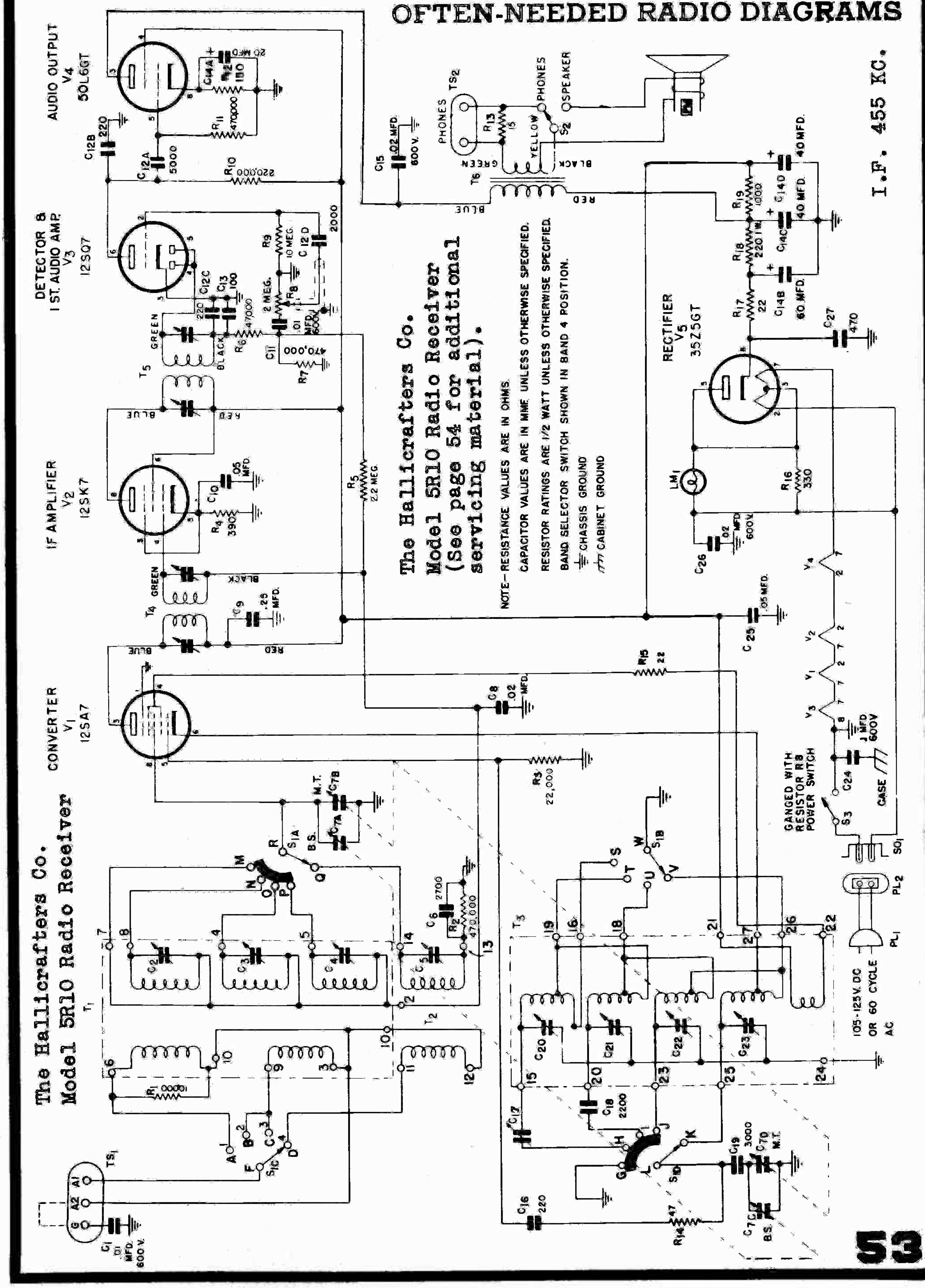
MANUAL OF 1951 MOST-OFTEN-NEEDED RADIO DIAGRAMS

GENERAL ELECTRIC MODELS 752-753

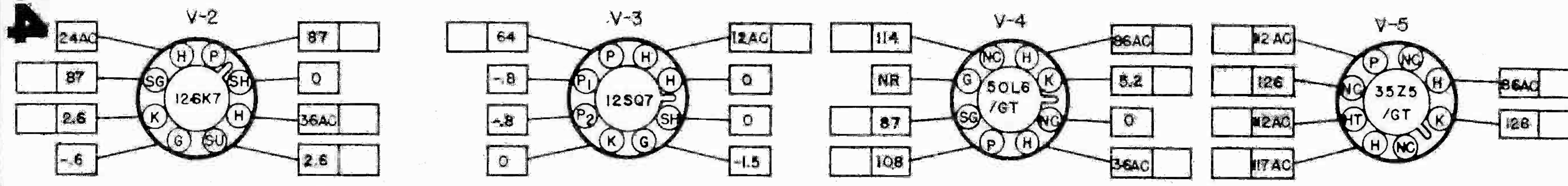


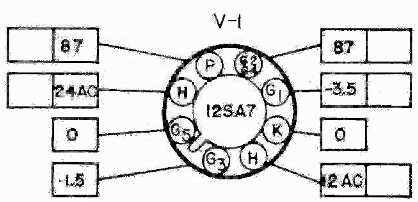





The Hallicrafters Co.
Model 5R10 Radio Receiver
(See page 54 for additional servicing material).
NOTE—RESISTANCE VALUES ARE IN OHMS.
CAPACITOR VALUES ARE IN MMF. UNLESS OTHERWISE SPECIFIED.
RESISTOR RATINGS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED.
BAND SELECTOR SWITCH SHOWN IN BAND 4 POSITION.
CHASSIS GROUND
CABINET GROUND
CONVERTER V1 12SA7
IF AMPLIFIER V2 12SK7
DETECTOR & 1 ST. AUDIO AMP. V3 12SQ7
AUDIO OUTPUT V4 50L6GT
RECTIFIER V5 35Z5GT
PHONES
SPEAKER
GANGED WITH RESISTOR R8 POWER SWITCH
105-125 V. DC OR 60 CYCLE AC
I.F. 455 KC.

the hallicrafters co.





1. SOCKET VIEWS ARE BOTTOM VIEWS.
2. ALL VOLTAGES ARE MEASURED BETWEEN TUBE SOCKET TERMINALS & CHASSIS, WITH ZERO SIGNAL INPUT.
3. LINE VOLTAGE—117 V. AC. AC VOLTAGES WILL BE DC VOLTAGES WHEN OPERATING FROM A DC SOURCE.
4. ALL VOLTAGES SHOWN ARE DC UNLESS OTHERWISE SPECIFIED.
5. DC VOLTAGES SHOWN WERE MEASURED WITH A VACUUM TUBE VOLTMETER.
6. "NC" NO CONNECTION. (VOLTAGES SHOWN FOR THIS TERMINAL ONLY WHEN TERMINALS ARE USED AS A TIE LUG.)
7. "NR" NOT READABLE. (READING GENERALLY MEANINGLESS)
8. ☐ SPACE PROVIDED FOR SERVICE METER READINGS.
9. BAND SELECTOR SWITCH AT BAND "4" POSITION.

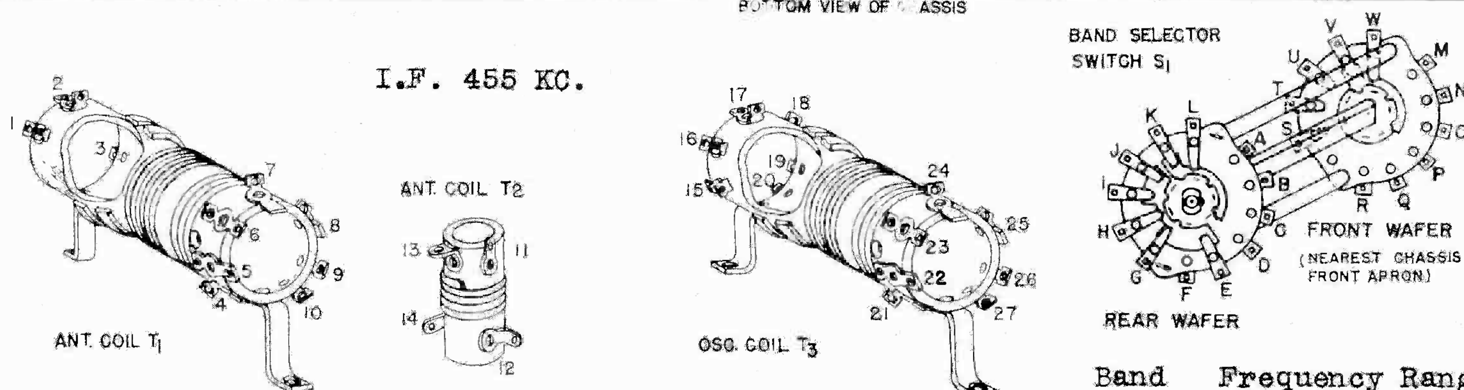
FRONT APRON

BOTTOM VIEW OF CHASSIS

The Hallicrafters Co.
Model 5R10

(Circuit on page 53)

I.F. 455 KC.



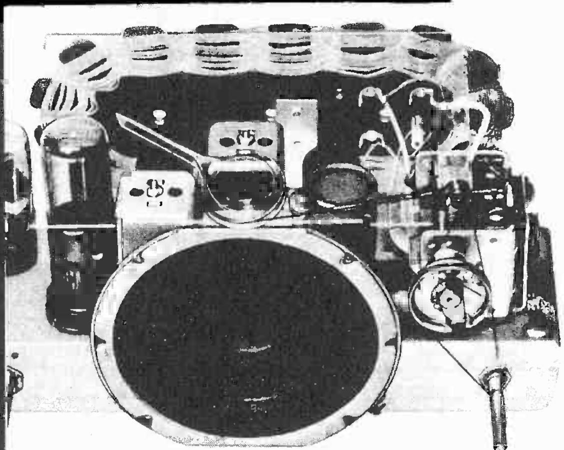
Band	Frequency Range
1	540 KC to 1650 KC
2	1.65 MC to 5.1 MC
3	5 MC to 14.5 MC
4	13 MC to 31 MC

NOTE: DIMENSIONS & PROPORTIONS SHOWN IN PICTORIAL VIEWS HAVE BEEN EXAGGERATED FOR CLARITY OF TERMINAL LUG LOCATION.

Hoffman
SERVICE DATA

RADIO CHASSIS 165

MODELS 204, 205



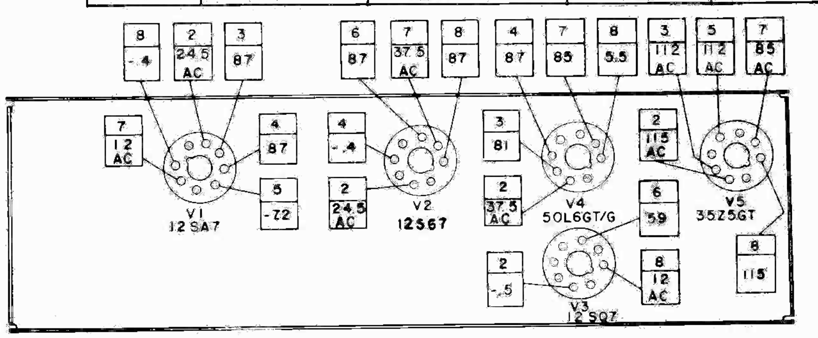
PARTS LIST

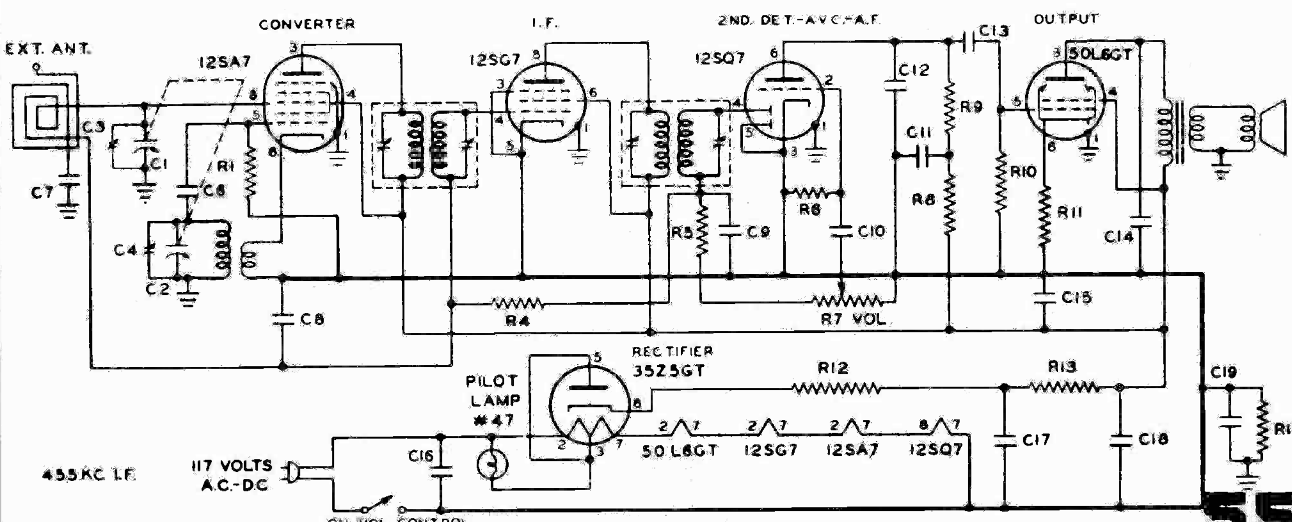
All values of capacity are microfarads unless otherwise noted.
All resistors are 1/2 watt composition type with values given in ohms unless otherwise specified.

Symbol	Part No.	Value	Tolerance	Watts or Volts
C1 } C2 }	4401	{ 0 - 388 mmf 0 - 180 mmf		
C3 } C4 }	Part of 2 Gang Variable			
C5	Not used			
C6	4000	100 mmf	20%	
C7	4102	.005		600
C8	4100	.05		200
C9	4001	270 mmf	20%	
C10	4102	.005		600
C11	4100	.05		200
C12	4001	270 mmf	20%	
C13	4102	.005		600
C14	4106	.02		400
C15	4100	.05		200
C16	4101	.05		400
C17	4201	50		150
C18		30		150
C19	4121	.1	20 %	400
R1	4501	22K	20%	
R2	Not used			
R3	Not used			
R4	4502	2.2 meg	20%	
R5	4504	47K	20%	
R6	4505	10 meg	20%	
R7	4836	500K		
R8	4511	100K	20%	
R9	4500	220K	20%	
R10	4506	470K	20%	
R11	4510	150	20%	
R12	4508	47	20%	
R13	4700	500	10%	5 W
R14	4506	470K	20%	

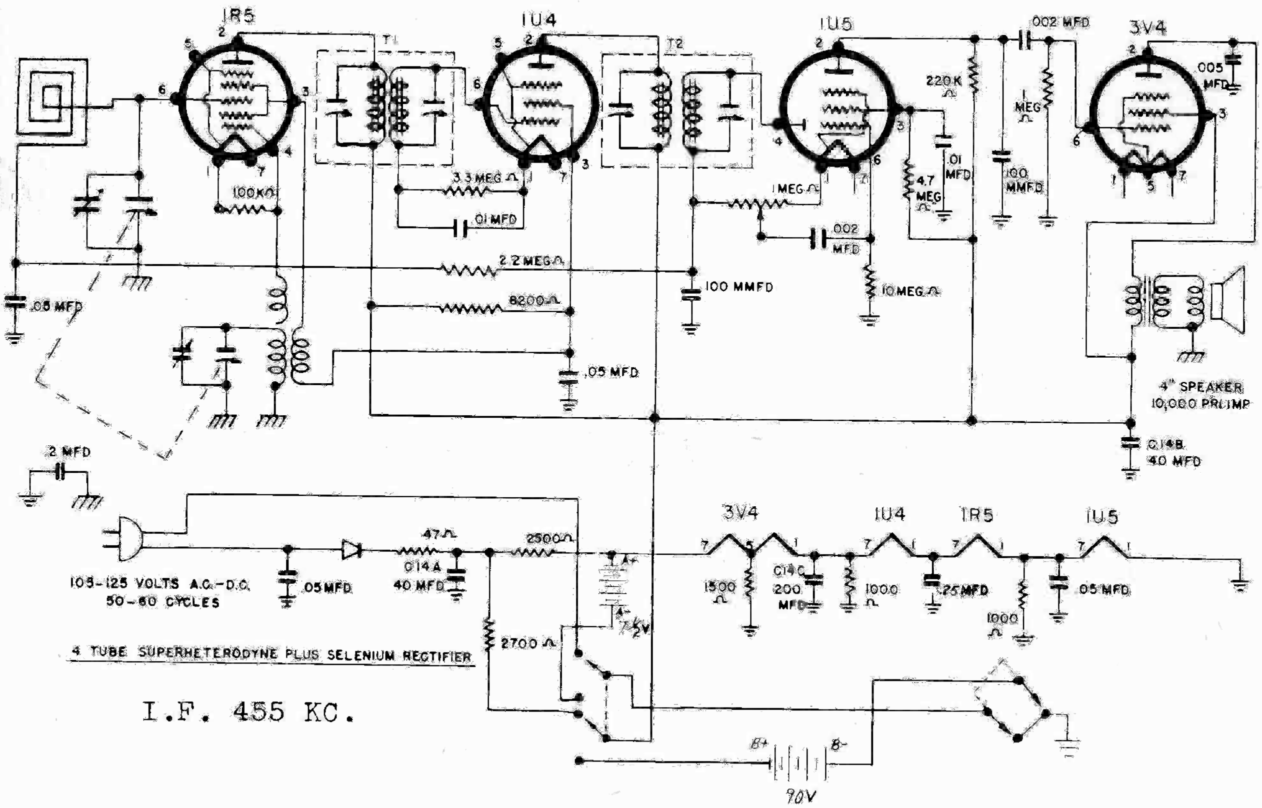
NOTES:
The pin voltage readings are obtained with no signal input to receiver.
D.C. voltages measured with 20,000 ohm/volt meter.
A.C. voltages measured with 1,000 ohm/volt meter.
All voltages measured with reference to B-.
Live voltage 115V A.C.

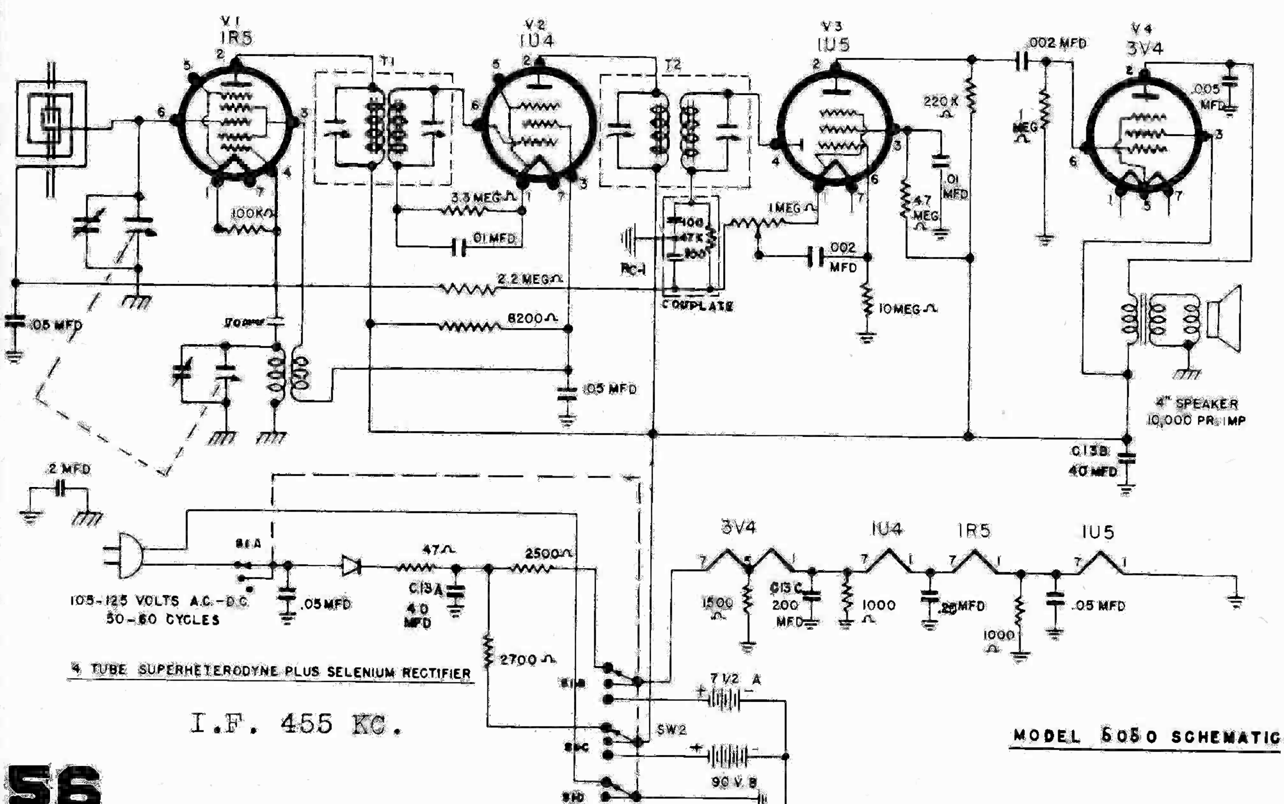
Pin Voltage Diagram



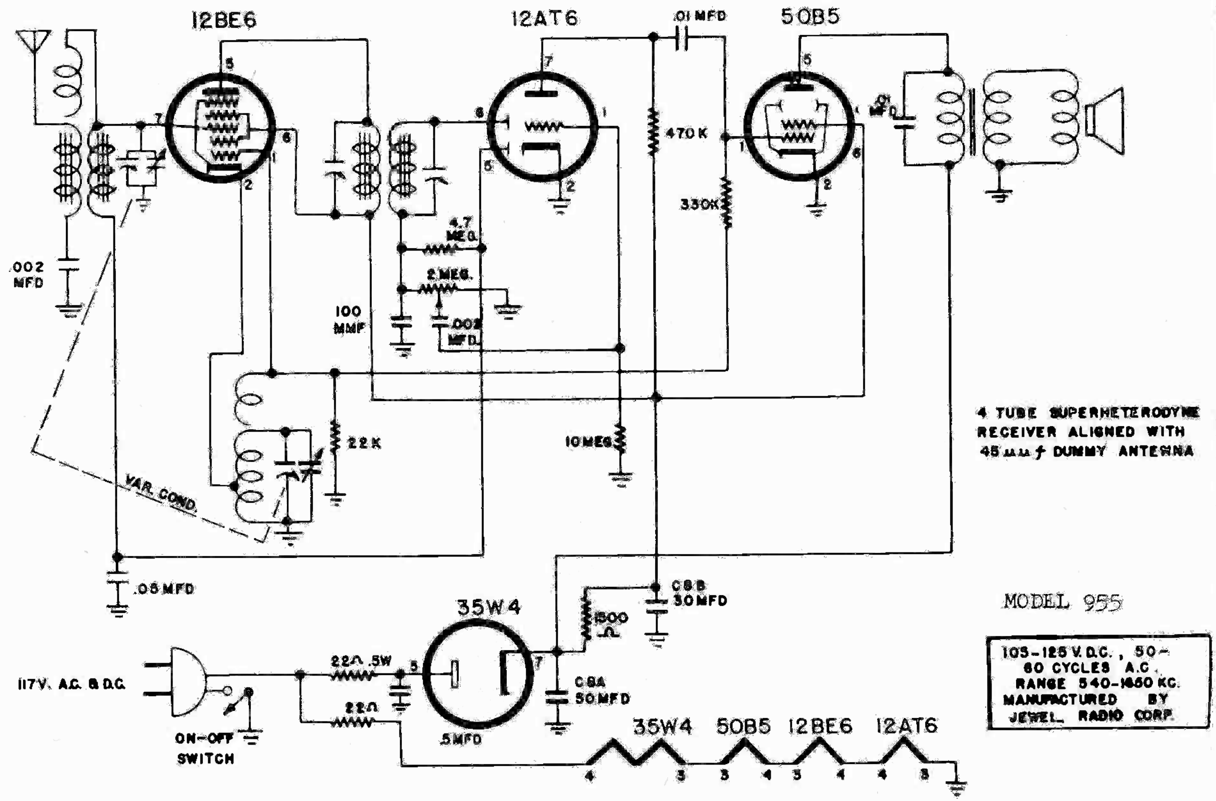


Jewel Radio Corp. Model 5010U

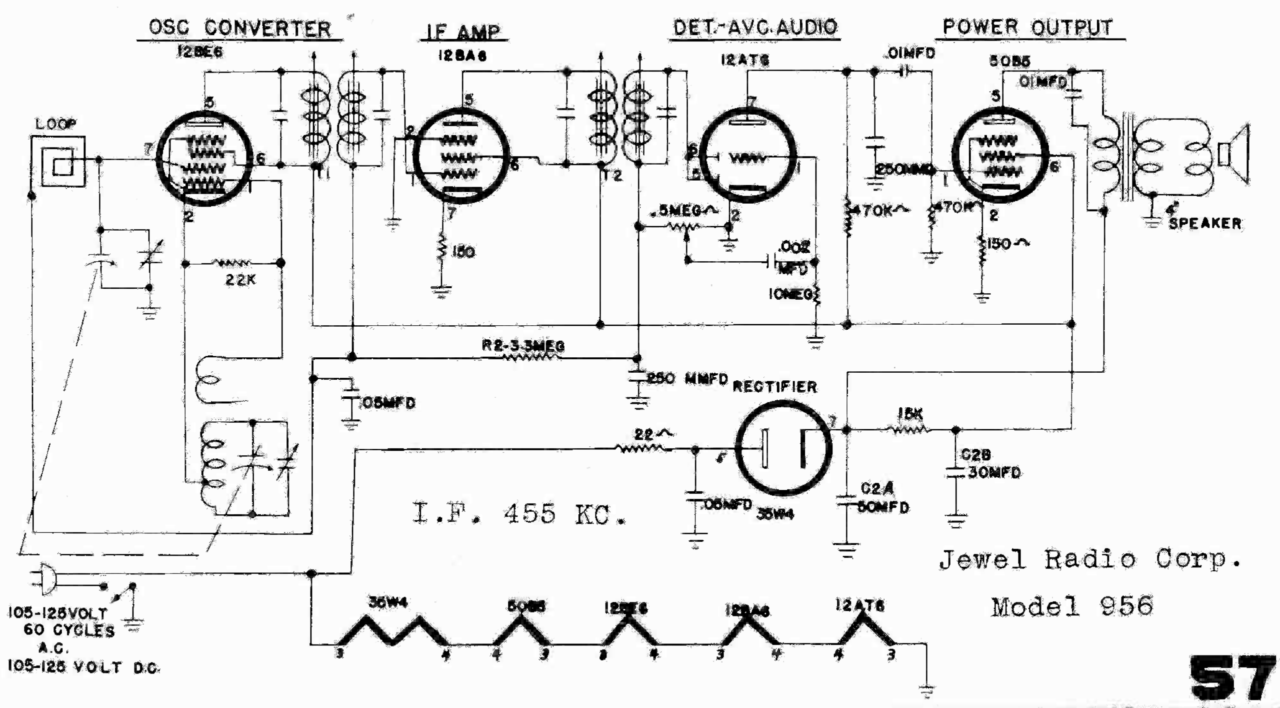




Jewel Radio Corp.



I.F. 455 KC.

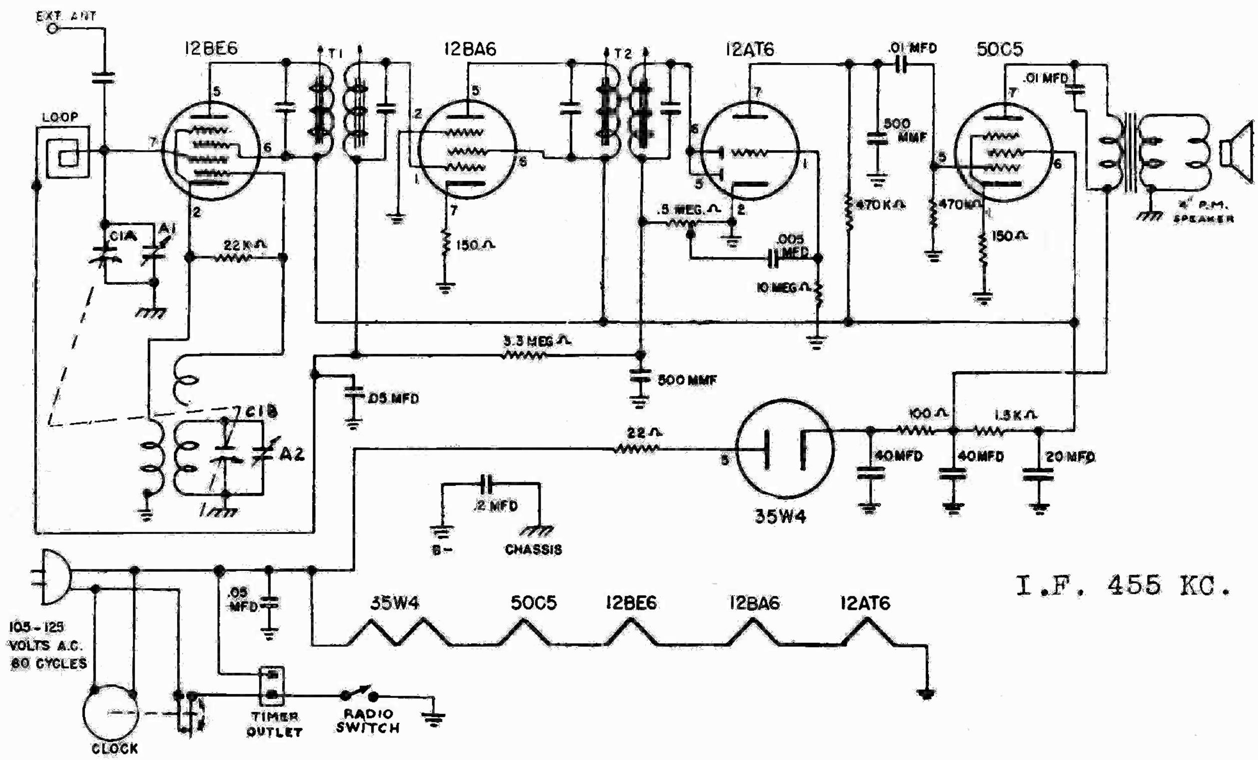


I.F. 455 KC.

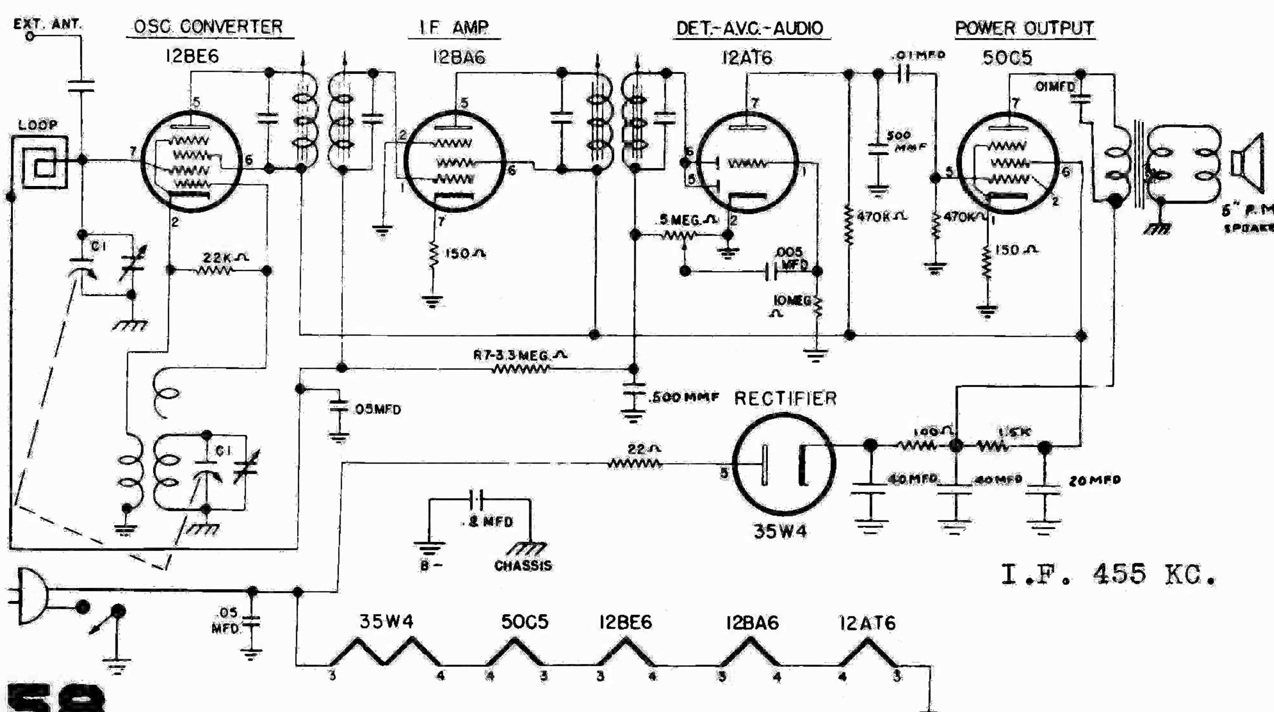
Jewel Radio Corp.

Model 956

Jewel Radio Corp. Model 5057U

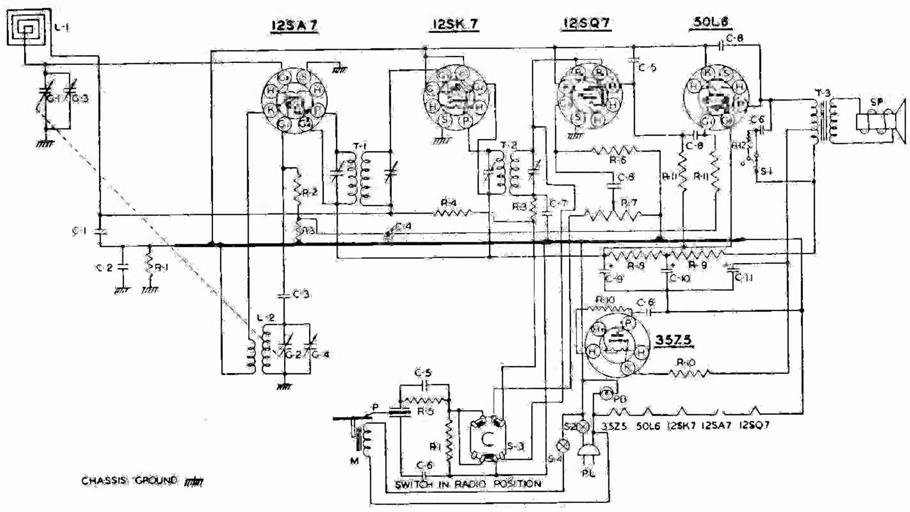


Jewel Radio Corp. Models 960, 960U, 961



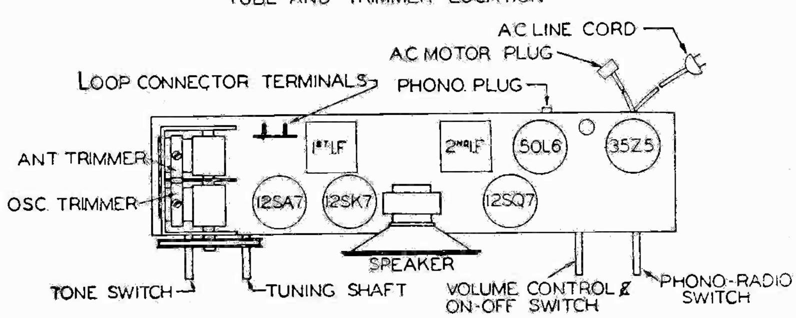
KNIGHT MODEL 5G563

ALLIED RADIO CORPORATION



PART NO.		DESCRIPTION
PC-2	C-1	.05MFD. CONDENSER 200 V.
PC-8	C-2	.1MFD CONDENSER 400 V.
MC-4	C-3	.00005MFD MICA.
PC-4	C-4	.25MFD CONDENSER 200V.
MC-5	C-5	.0005MFD MICA
PC-5	C-6	.05MFD CONDENSER 400V.
MC-2	C-7	.0001MFD MICA
PC-7	C-8	.01MFD CONDENSER 400V.
EC-14	C-9	20MFD } 150WV ELECTROLYTIC
	C-10	40MFD
	C-11	40MFD
IR-20	R-1	220M Ω RESISTOR 1/2W. 20%
IR-9	R-2	22 M Ω RESISTOR 1/2 W. 20%
IR-10	R-3	47 M Ω RESISTOR 1/2W. 20%
IR-23	R-4	3.3MEG Ω RESISTOR 1/2 W. 20%
IR-12	R-5	1MEG Ω RESISTOR 1/2 W. 20%
IR-13	R-6	2.2MEG Ω RESISTOR 1/2W. 20%
VC-4	R-7	1MEG. VOLUME CONTROL
IR-1	R-8	470 Ω RESISTOR 1/2W. 20 %
IR-42	R-9	1000 Ω RESISTOR 1 W. 10 %
IR-17	R-10	33 Ω RESISTOR 1/2W. 20 %
IR-11	R-11	470M Ω RESISTOR 1/2 W. 20%
IR-15	R-12	2200 Ω RESISTOR 1/2 W. 30%
GC-5	G-1	GANG CONDENSER
	G-2	
	G-3	ANT. TRIMMER
	G-4	OSC. TRIMMER
L1-6	T-1	INPUT I.F. TRANFORMER
L1-7	T-2	OUTPUT I.F. TRANSFORMER
	T-3	OUTPUT TRANSFORMER
LL-17	L-1	LOOP ANT.
LO-14	L-2	OSC. COIL
SPK-12	SP	5" P.M. SPEAKER
SW-2	S-1	TONE SWITCH
	S-2	SWITCH ON VOLUME CONTROL
SW-1	S-3	PHONO-RADIO SWITCH
	S-4	SWITCH ON RECORD CHANGER
AC-M-7	M	RECORD CHANGER MOTOR
AC-PU-7	P	CRYSTAL PICKUP ARM CARTRIDGE
PB-2	PB	110 V. 7 1/2 W. PILOT BULB
CO-2	PL	LINE CORD

TUBE AND TRIMMER LOCATION



ALIGNMENT AND SERVICE DATA

Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

The receiver volume control should be turned to maximum during the I.F. and all subsequent alignments to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the floating ground buss under the chassis. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis. Adjust this trimmer until the 1720 KC signal is tuned in.

THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the primary of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on top of the ANT. section of the gang condenser.

Adjust this trimmer until a maximum reading is noted on the output meter.

Montgomery Ward Models 05WG-2751A, 05WG-2752B, etc. Continued on page 61

ALIGNMENT PROCEDURES

AM STAGES

The following 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, and 50 mmf.

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						
FREQUENCY SETTING	CONNECT GENERATOR OUTPUT TO	THROUGH DUMMY ANTENNA	CONNECT GROUND TO	GANG CONDENSER SETTING	ADJUST	ADJUST FOR
455 KC	Control Grid 1st 6BA6 Pin No. 1	.1 mf	Chassis Base	Rotor Fully Open	2nd I.F. Pri. (1) and Sec. (2)	Maximum Output
455 KC	Control Grid 6BE6 Pin No. 7 1st Det.	.1 mf	Chassis Base	Rotor Fully Open	1st I.F. Pri. (3) and Sec. (4)	Maximum Output
455 KC	Control Grid 6BE6 Pin No. 7	.1 mf	Chassis Base	Rotor Fully Open	2nd I-F Pri. (1) and Sec. (2)	Maximum Output
1620 KC	Control Grid 6BE6 Pin No. 7	.1 mf	Chassis Base	Rotor Fully Open	Oscillator C-41	Maximum Output
1400 KC	External Antenna Terminal	50 mmf	Chassis Base	Turn Rotor to Max. Output. Set Pointer to 1400 KC See Note A	Antenna C-2	Maximum Output

NOTE A—If the pointer is not at 1400 KC on the dial, reset pointer to the 1400 KC mark on the dial scale.

FM STAGES

The following is required for aligning:
An accurately calibrated signal generator providing unmodulated signals at the test frequencies listed below.
Non-metallic screwdriver.
Dummy Antennas and I-F Loading Resistor—2500 mmf, 300 ohms

Zero center scale DC vacuum tube voltmeter having a range of approximately 3 volts.
(If a zero center scale meter is not available, a standard scale vacuum tube voltmeter may be used by reversing the meter connections for negative readings).
Allow chassis and signal generator to "Heat Up" for several minutes.

SIGNAL GENERATOR							
	FREQUENCY SETTING	CONNECT GENERATOR OUTPUT TO	THROUGH DUMMY ANTENNA	BAND SWITCH SETTING	GANG CONDENSER SETTING	ADJUST	ADJUST FOR
Discriminator	10.7 MC	6BA6 2nd I-F Pin 1 and Chassis	2500 mmf	FM	Rotor Fully Open	Disc. Pri. (5) Note A	Maximum Deflection
	10.7 MC	6BA6 2nd I-F Pin 1 and Chassis	2500 mmf	FM	Rotor Fully Open	Disc. Sec. (6) Note B	
I-F	10.7 MC Note C	6BA6 1st I-F Pin 1 and Chassis	2500 mmf	FM	Rotor Fully Open	2nd I-F Pri. (7) Sec. (8) Note D	Maximum Deflection
Discriminator	10.7 MC	6BA6 1st I-F Pin 1 and Chassis	2500 mmf	FM	Rotor Fully Open	Disc. Pri. (5) Note D	Maximum Deflection
I-F	10.7 MC	Junction C-32A & B (Dual 100 mmf cond.) And chassis	2500 mmf	FM	Rotor Fully Open	1st I-F Pri. (9) & Sec. (10) 2nd I-F Pri. (7) & Sec. (8) Disc. Pri. (5) In Order Shown Note D	Maximum Deflection
	10.7 MC	Same as above	2500 mmf	FM	Rotor Fully Open	Disc. Sec. (6) Note B	
RECHECK I-F ADJUSTMENTS IN ORDER GIVEN							
Oscillator	108.5	Disconnect built-in dipole antenna and connect generator to dipole terminals with resistor in series.	300 ohms	FM	Rotor Fully Open	Osc. C-25	Deflection Maximum
Antenna	104.5	Same as above	300 ohms	FM	Tune rotor for max. AVC voltage	Ant. C-39	Maximum Deflection

RECHECK ANTENNA & OSC. ADJUSTMENTS IN ORDER GIVEN

FM ALIGNMENT NOTES

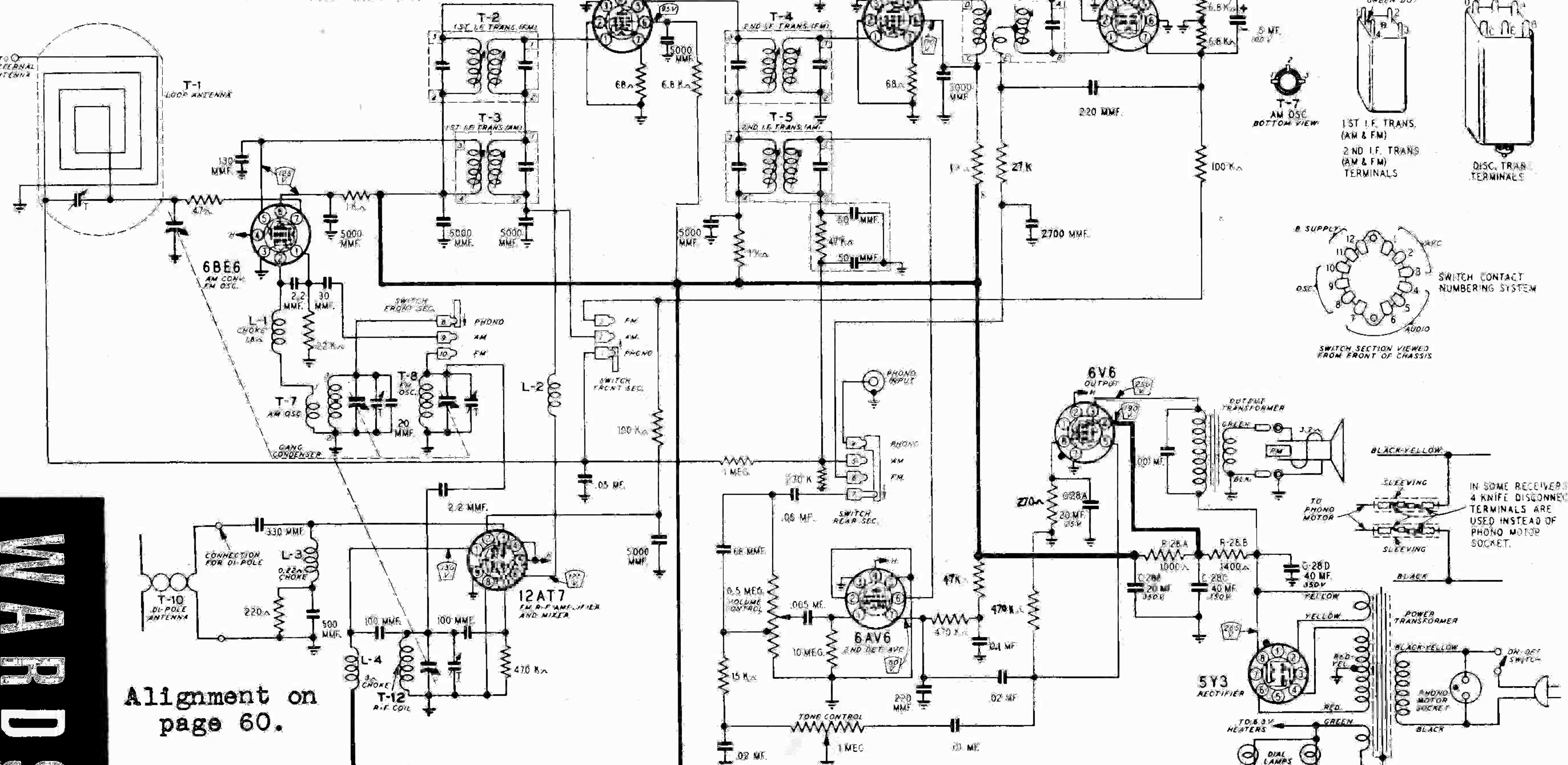
NOTE A—The zero center scale DC vacuum tube voltmeter is to be connected between chassis ground and the AVC line. A signal of .1 volt must be fed into the receiver for this adjustment.
Note output voltage on the zero center DC vacuum tube voltmeter.

B—Disconnect zero center DC vacuum tube voltmeter from AVC and connect it at the audio takeoff point at the 27 K ohm resistor (R-10) and its junction with the terminal strip. Adjust for zero voltage indication.

NOTE C—AM I-F coils must be aligned before attempting to align the FM I-F coils.

NOTE D—Connect zero center DC vacuum tube voltmeter as in Note A. Adjust input to give same output on the zero center DC vacuum tube voltmeter as in Note A.

Intermediate Frequency... AM—455 KC
FM—10.7 MC



Alignment on page 60.

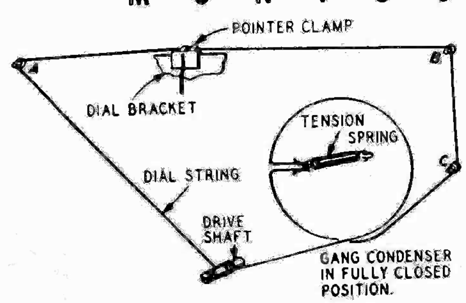
TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground. Plate, screen and cathode voltages were taken with a 1000 ohm-per-volt meter with a 300 volt scale used for plate and screen voltages. Audio grid voltages were read with a vacuum tube volt-meter.

Conditions of measurement are:

Line voltage ....117 Volts AC
Signal Input ....None

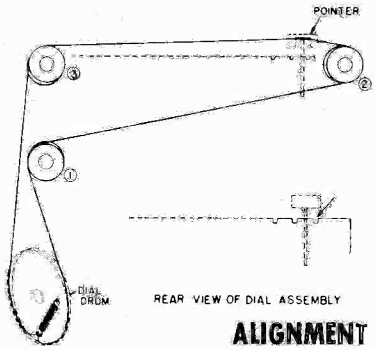
M O N T G O M E R Y   W A R D



MODELS 05WG-2751A & 05WG-2752B

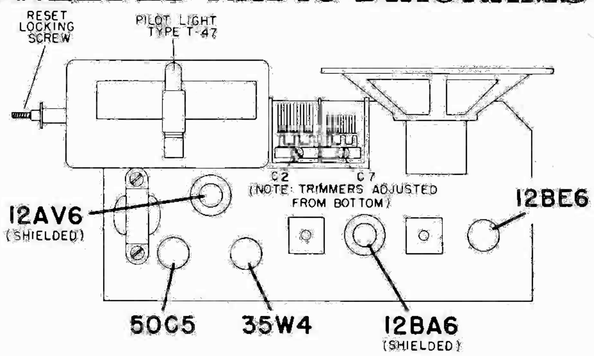
Models 05WG-2752, 05WG-2752C, and 15WG-2752D differ from models listed above and presented on this page in cabinet or record changer. Model 15WG-2752E also uses an AF coupling pack.

Montgomery Ward
MODELS 05BR-1536A, 1537A



REAR VIEW OF DIAL ASSEMBLY

Models with suffix "B" use 35Z5 in place of 35W4



CHASSIS VIEW, SHOWING TUBE LOCATIONS

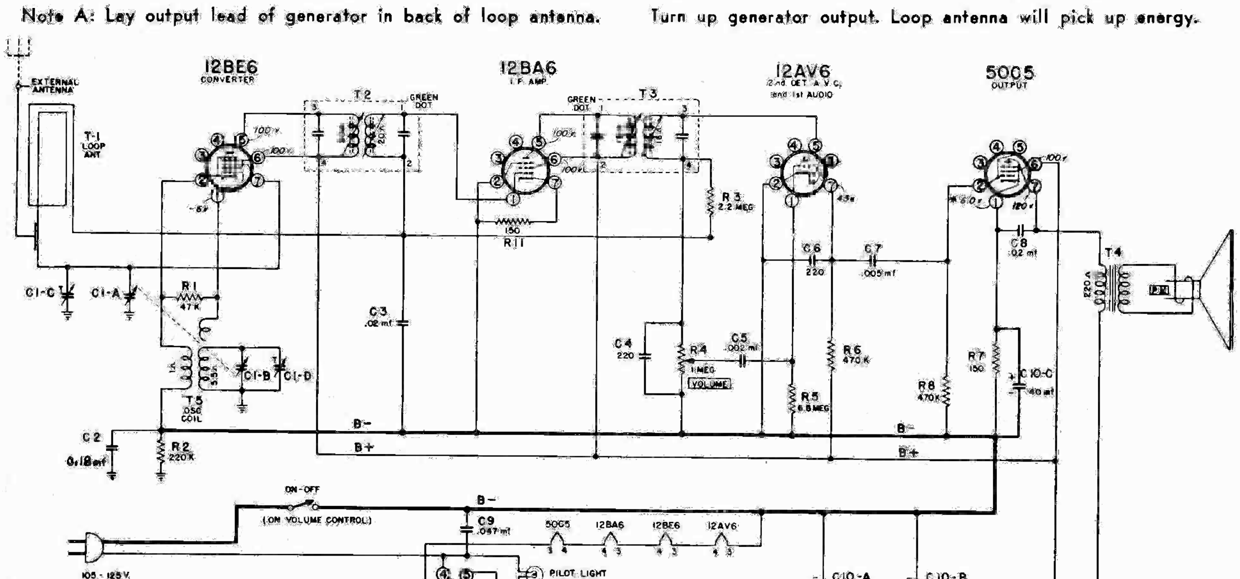
ALIGNMENT PROCEDURE AND RECEIVER STAGE SENSITIVITIES

The signal source must be an accurately calibrated signal generator capable of supplying R. F. signals modulated 30% with a 400-cycle audio signal. A 400-cycle source is necessary for the audio measurement.

The table below lists the sensitivity at various points. All measurements are based on an output of 50-milliwatts. This may be measured by disconnecting the speaker voice coil and substituting a 3.2-ohm, 5-watt resistor across the secondary winding of the output transformer. A reading of .4 volts AC across this resistor will be equivalent to a 50-milliwatt output with the speaker connected. Variations of plus or minus 25% are usually permissable. Volume control at maximum for all adjustments.

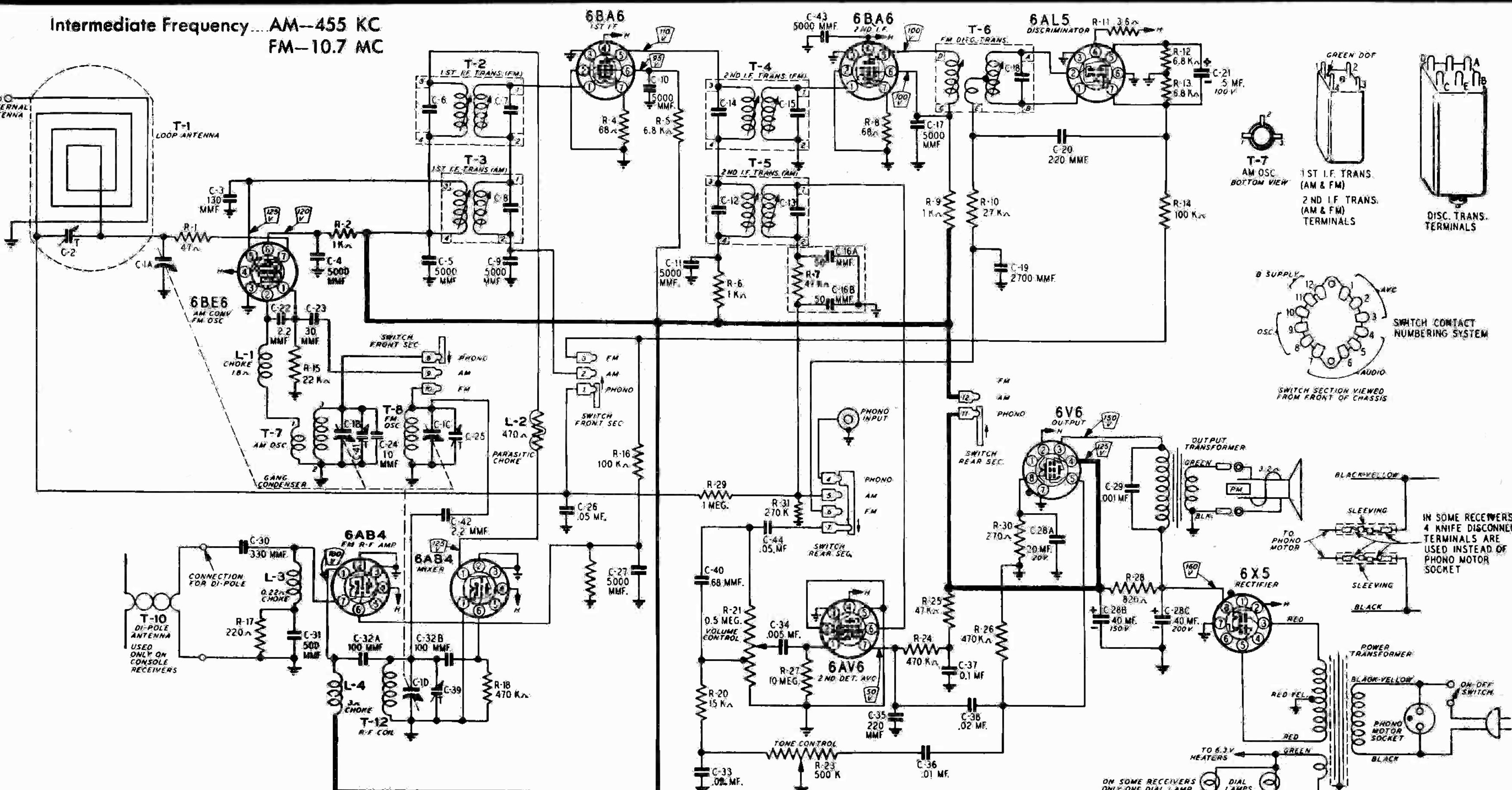
SIGNAL GENERATOR				TUNER SETTING	ADJUST FOR MAXIMUM OUTPUT	INPUT FOR 50-MILLIWATT OUTPUT
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection			
455 kc.	.1 mf.	Pin No. 7 of 12BE6	Buss wire	Rotor full open	Trimmers on output and input I.F. cans	50 microvolts
1700 kc.	.1 mf.	Pin No. 7 of 12BE6	Buss wire	Rotor full open	Oscillator trimmer C7 (on top)	————
1400 kc.	none	See note A	none	Set dial at 1400	Antenna trimmer C2 (on top)	————
1400 kc.	.1 mf.	External antenna clip	Buss wire	1400 kc.	————	50 microvolts
400 cycles	.1 mf.	12AV6, Pin 1	Buss wire	————	————	.03 volts

Note A: Lay output lead of generator in back of loop antenna. Turn up generator output. Loop antenna will pick up energy.



NOTES:
VOLTAGE READINGS TAKEN WITH A 1000-OHM-PER-VOLT VOLTMETER ON THE 250 VOLT SCALE BETWEEN POINTS SHOWN AND CHASSIS.
* READ ON THE 10 VOLT SCALE OF THE VOLTMETER.

NOTE: Schematic Correction.
C8 should be connected between Pin 7 of the 50C5 tube to B-



TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground. Plate, screen and cathode voltages were taken with a 1000 ohm-per-volt meter with a 300 volt scale used for plate and screen voltages. Audio grid voltages were read with a vacuum tube volt-meter. Conditions of measurement are:

Line voltage ....117 Volts AC
Signal Input ....None

A variation of ±10% is usually permissible.

M O N T G O M E R Y W A R D

AM-FM MANTEL RADIO

MODEL
05WG-1813A

Model 15WG-1813B is similar, but uses 12AT7 tube instead of two 6AB4 tubes.

MODEL
05WG-2748F

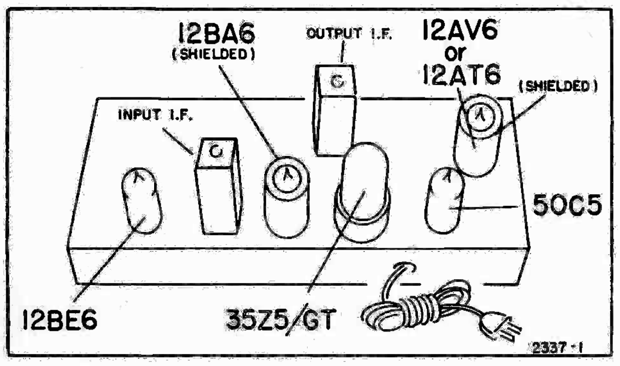
AM-FM CONSOLE

Models of the above number, but with suffix C, D, or E, or Models 94WG-2748B and 94WG-2748C are the same as model here described but use a different record changer. Model 94WG2748A has minor circuit differences from these models.

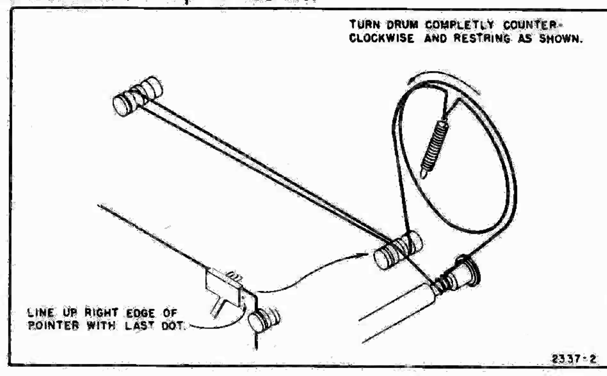
MONTGOMERY WARD

MODEL NO.
15BR-1543A
15BR-1544A

Power Supply .... 115 volts, DC or 50-60 cycle AC, 24 watts.
Frequency Range .... 540 to 1600 Kc.
Intermediate Freq. .... 455 Kc.



Top Chassis View

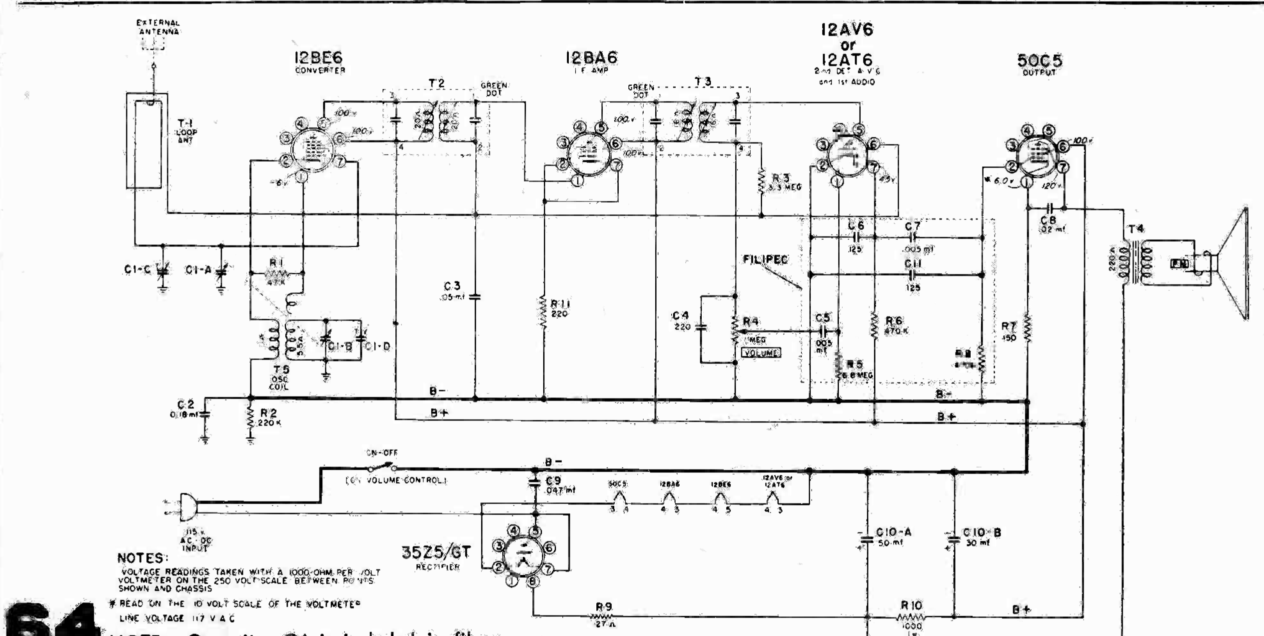


Dial Stringing Diagram

ALIGNMENT PROCEDURE

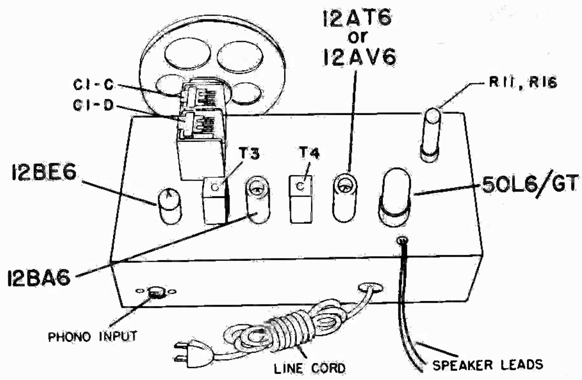
- Loop must be connected and set volume to maximum.

SIGNAL GENERATOR						
Frequency	**Coupling Capacitor**	**Connection to Radio**	**Ground Connection**	**TUNER SETTING**	**ADJUST FOR MAXIMUM OUTPUT**	**INPUT FOR 50-MILLIWATT OUTPUT**
455 kc.	.1 mf	12BE6, Pin 7	HEAVY BUSS LEAD ACROSS CENTER OF CHASSIS	Capacitor fully open (plates out of mesh)	Top and bottom Cores in output and input I.F. cans	65 microvolts
1620 kc.	.1 mf	12BE6, Pin 7		Capacitor fully open (plates out of mesh)	Oscillator trimmer C1-D on gang	70 microvolts
535 kc.	.1 mf.	12BE6, Pin 7		Capacitor fully closed	Check for adequate range	70 microvolts
1400 kc.	————	Lay generator lead near back of cabinet		Tune in 1400 kc. signal	Antenna trimmer C-1C on gang	200 to 400 microvolts
400 cycles	.1 mf	12AT6, Pin 1		————	————	.06 volts



NOTES:
VOLTAGE READINGS TAKEN WITH A 1000-OHM PER VOLT VOLTMETER ON THE 250 VOLT SCALE BETWEEN POINTS SHOWN AND CHASSIS
\# READ ON THE 10 VOLT SCALE OF THE VOLTMETER
LINE VOLTAGE 117 V A C

NOTE: Capacitor C4 is included in filpec.



MONTGOMERY WARD

TABLE RADIO

MODEL NO.
15BR-1547A

ALIGNMENT PROCEDURE AND RECEIVER STAGE SENSITIVITIES

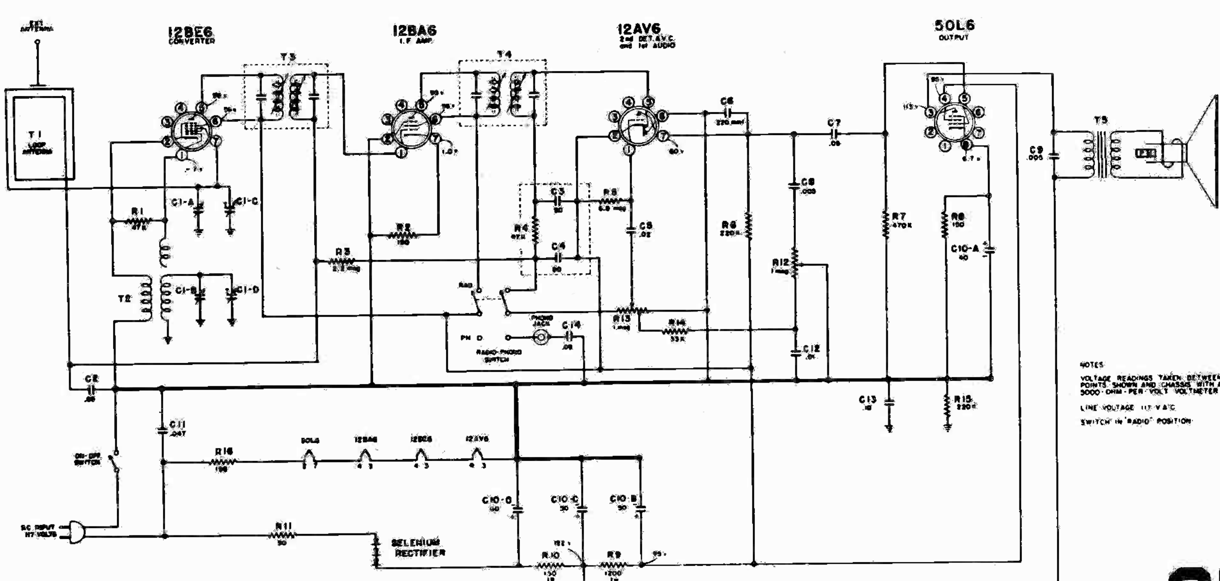
Alignment must be done in the cabinet.

The signal source must be an accurately calibrated signal generator capable of supplying 455 Kc and up to 1620 Kc signals modulated 30% with a 400-cycle audio signal.

To connect the output meter, disconnect the speaker and substitute a 3.2 ohm, 5 watt resistor across the secondary winding of the output transformer. Connect output meter across 3.2 ohm resistor.

- Volume control at maximum for all adjustments.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.
- Loop antenna should be connected to receiver and in its proper position when making adjustments.

SIGNAL GENERATOR				TUNER SETTING	ADJUST FOR MAXIMUM OUTPUT
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection		
455 kc.	.1 mf.	12BE6, Pin 7	B MINUS POINT BUSS LEAD	Capacitor fully open (plates out of mesh)	Top and bottom Cores in output and input I.F. cans
1620 kc.	.1 mf.	12BE6, Pin 7		Capacitor fully open (plates out of mesh)	Oscillator trimmer C1-D on gang
535 kc.	.1 mf.	12BE6, Pin 7		Capacitor fully closed	Check for adequate range
1400 kc.	———	Lay Generator lead near back of cabinet.		Set dial pointer at 1400 kc.	Antenna trimmer C1-C on gang



NOTE: Either a 12AT6 or a 12AV6 tube may be used.

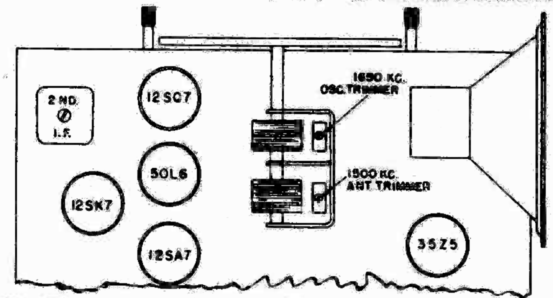
MONTGOMERY WARD

RADIO

Model Nos.

15GCB-1583

15GCB-1584

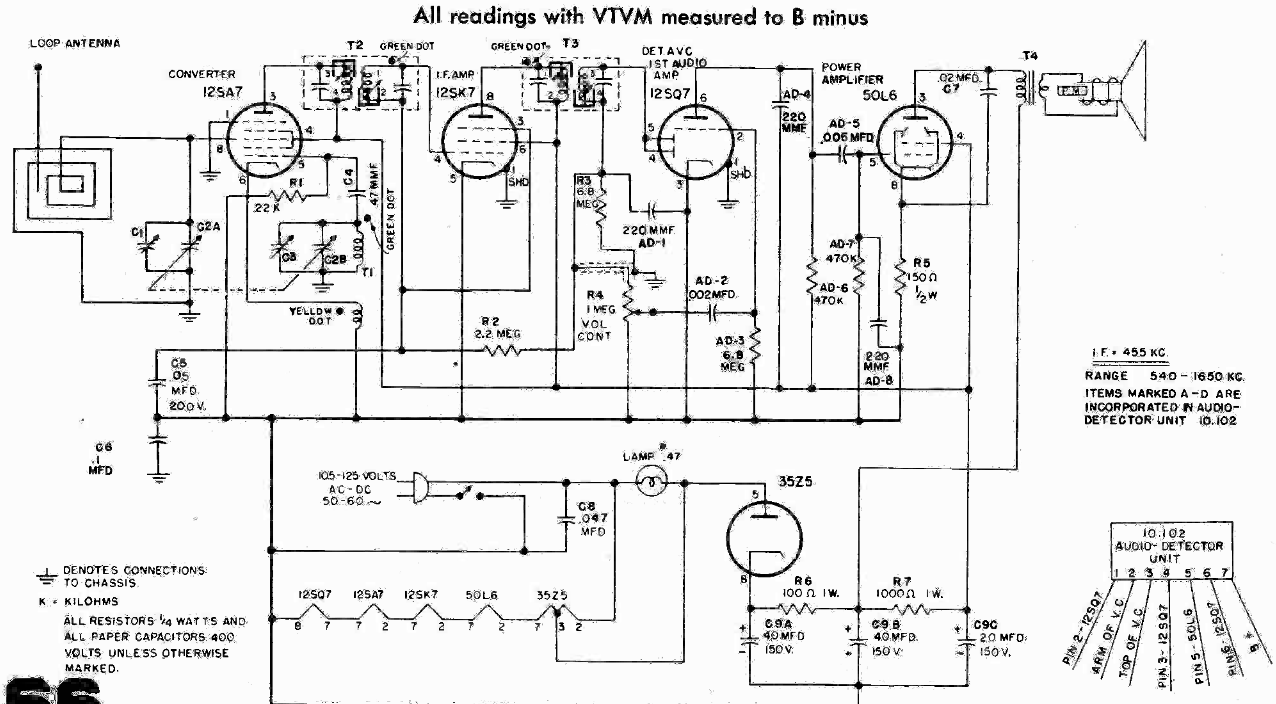


SIGNAL GENERATOR				DIAL SETTING	ADJUST FOR MAXIMUM OUTPUT
Frequency	Coupling	Connection to Radio	Ground Connection		
455 KC	.1 mfd condenser	Stator lug Var. Capacitor (front section)	Lug on Power Switch	Variable Condenser fully open	Trimmers 1st and 2nd I.F. transformer
1650 KC	Coupling loop	None	None	Variable Condenser fully open	Oscillator Trimmer (front section)
1500 KC	Coupling loop	None	None	1500 KC	Ant. Trimmer (rear section)

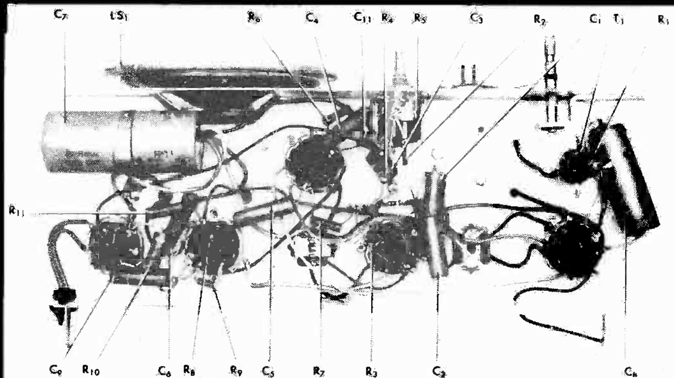
TUBE COMPLEMENT AND VOLTAGE CHART

TUBE TYPE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8
12SA7 Converter	–.8	25 A.C.	85	85	–.8	0	12 A.C.	–.8
12SK7 IF Amplifier	–.8	37 A.C.	–.8	–.8	0	85	25 A.C.	85
12SQ7 Det., AVC, Aud. Amp.	–.8	–.8	0	–.8	–.8	45	12.6 A.C.	0
50L6 Beam Power Amp.	—	84 A.C.	104	85	0	—	37 A.C.	5
35Z5 Rectifier	—	117 A.C.	112 A.C.	85	117 A.C.	110	84A.C.	116

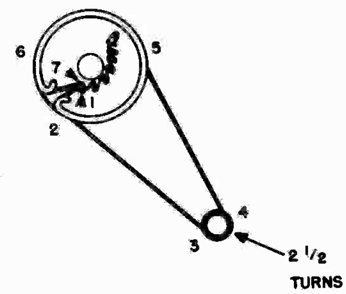
All readings with VTVM measured to B minus



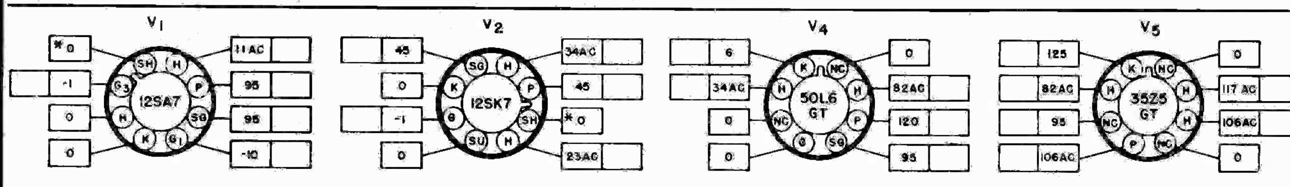
MONTGOMERY WARD



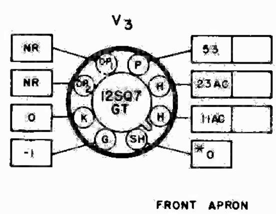
DIAL CORD STRINGING



RADIO TABLE MODELS
15HA-1553A
15HA-1554A



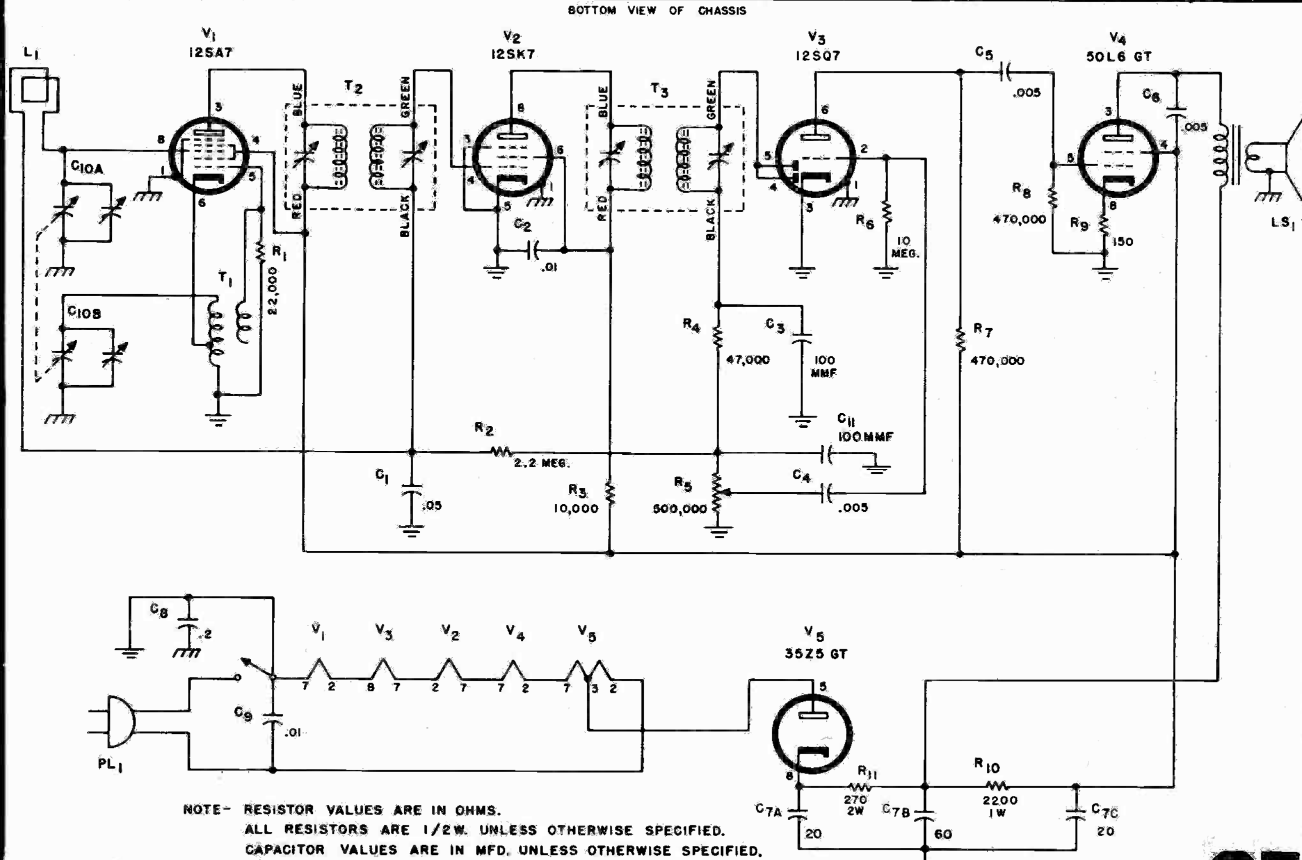
*CAUTION— SEE NOTE 9.



1. SOCKET VIEWS ARE BOTTOM VIEWS.
2. ALL VOLTAGES ARE MEASURED BETWEEN TUBE SOCKET TERMINALS AND ELECTRICAL GROUND (NOT CHASSIS) WITH ZERO SIGNAL INPUT.
3. LINE VOLTAGE — 117 V. AC.
4. ALL VOLTAGES SHOWN ARE DC UNLESS OTHERWISE SPECIFIED. AC VOLTAGES SHOWN BECOME DC WHEN OPERATING FROM A DC LINE.
5. DC VOLTAGES SHOWN WERE MEASURED WITH AN ELECTRONIC VOLTMETER.
6. "NC"— NO CONNECTION. (VOLTAGE SHOWN FOR THIS TERMINAL ONLY WHEN TERMINAL IS USED AS A TIE LUG).
7. "NR"— NOT READABLE. (READING GENERALLY MEANINGLESS).
8. ☐ SPACE PROVIDED FOR SERVICE METER READINGS.
9. ALL READINGS TAKEN WITH LINE PLUG POLARIZED SO THAT GROUND BUSS AND CHASSIS ARE AT THE SAME POTENTIAL WITH THE CHASSIS GROUNDED.

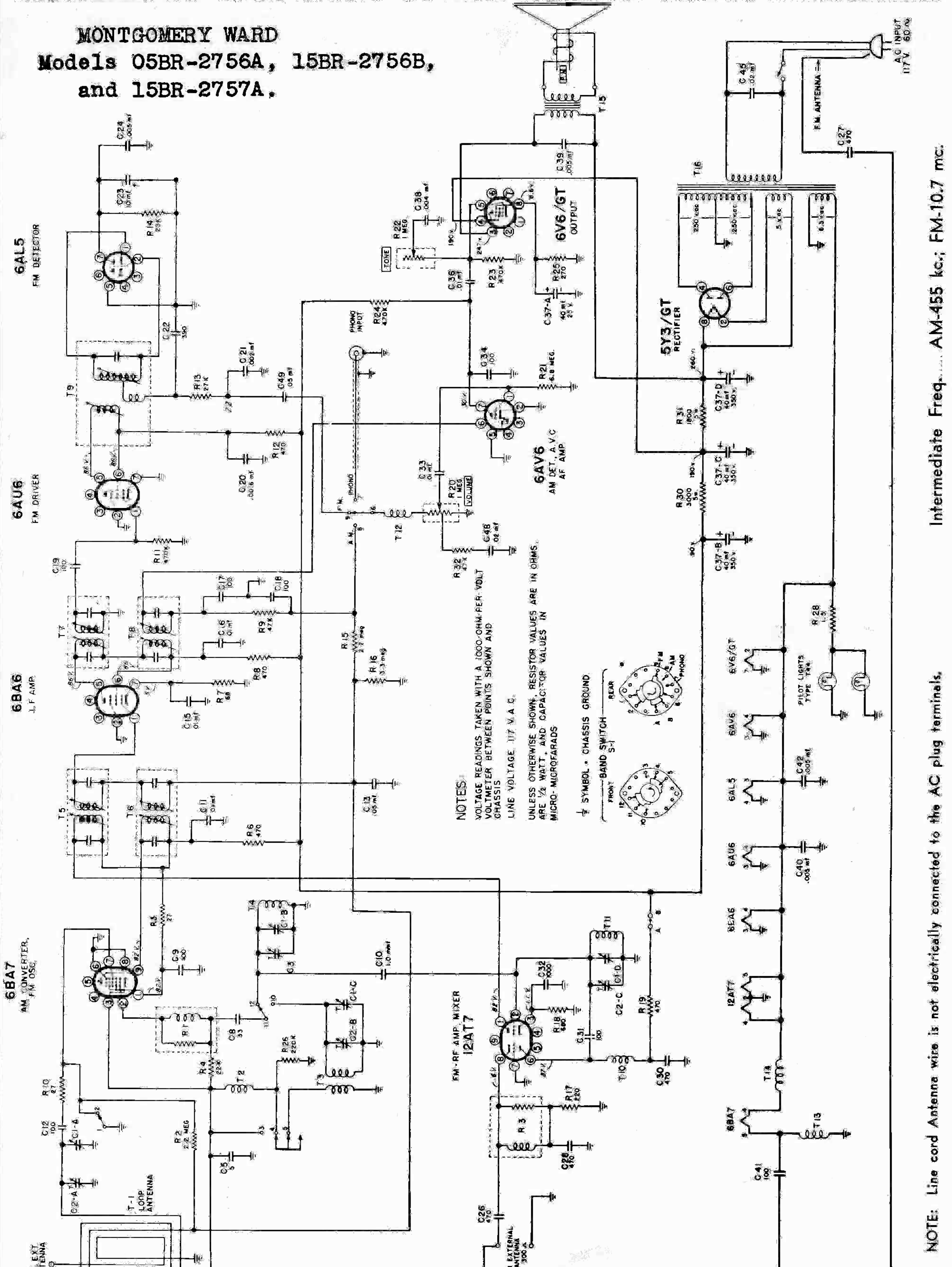
Intermediate Frequency. . . . . . 455 KC

BOTTOM VIEW OF CHASSIS



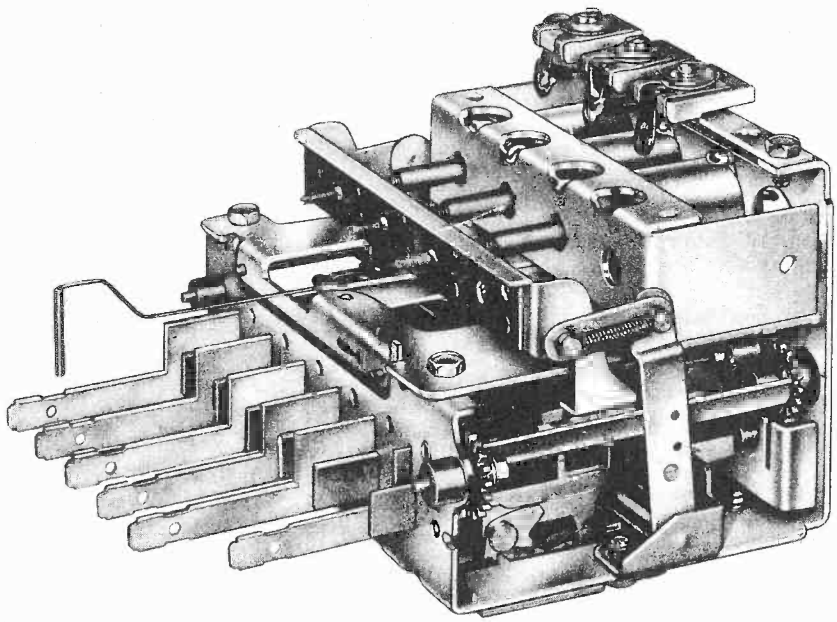
NOTE- RESISTOR VALUES ARE IN OHMS.
ALL RESISTORS ARE 1/2W. UNLESS OTHERWISE SPECIFIED.
CAPACITOR VALUES ARE IN MFD. UNLESS OTHERWISE SPECIFIED.
⏚ INDICATES ELECTRICAL GROUND
⏚ INDICATES CHASSIS GROUND

MONTGOMERY WARD
Models 05BR-2756A, 15BR-2756B, and 15BR-2757A.



Motorola AUTO Radio

AUTOMATIC TUNER AT-58



GENERAL INFORMATION

DESCRIPTION

Automatic Tuner AT-58 is used in Motorola specific auto receivers.

This is a 3-gang permeability type tuner, mechanically operated by movement of its push buttons. Five pre-set and one manual tuning positions are provided. The frequency range is 535 to 1600 Kc. The pre-set positions can be set in any sequence to any frequency within this range.

SERVICE TOOLS

The simplicity of the tuner allows easy servicing with:

1. 1/4" open end and 1/4" box end wrench.

2. A stiff steel hook 1/16" diameter made of 1/8" rod, ground down and shaped like a #5 to #10 size crochet hook, to hook and unhook the springs.

3. Slab head wrench for coil adjustment: #2/56 head.

TO REMOVE TOP DECK

Unscrew two #8 sheet metal screws (45) on the back of the tuner and two #8 sheet metal screws (45) on the top front of the tuner. (Do not unscrew screws (45) at trimmer bracket). Before removing top deck, unhook springs (53) and links (25). Grasp top deck and lift up and tip back. This leaves both decks open for servicing. See Figures 1 and 2.

SERVICING LOWER DECK

Looking at the top of the lower deck (with front to you), on the right we have the manual drive lead screw assembly (42). The other 5 assemblies (43) are the station set-up screw assemblies.

Note that all assemblies can be easily lifted out after springs (50) are unhooked.

Note also that unless a push button arm (1) is pushed in, all assemblies lay flat. When a push button arm (1) is pushed in, the assembly is tilted about 30°.

Visual inspection will show correct location of all springs in the assemblies and those which hold down the assemblies.

(Service material on Tuner AT-58 is continued on the next three pages.)

Motorola Automatic Tuner AT-58, continued from previous page,

Note action of gear train as manual knob is turned and push button arm is pushed in so gears mesh. Automatic tuning buttons can be checked for any binding by trying each button.

DRIVE ARM ADJUSTMENT

It is very important that the carriage drive assembly (12) be correctly adjusted in its bearings so as not to bind or be too loose and allow it to twist and force the tuner out of alignment.

On the left side of the lower deck, you will find a set screw (47) and lock nut (30) for assembly adjustment. Note that the assembly is floated in the base bracket (7) between two ball bearings (4), one on each end. Adjust by loosening lock nut (30) and then turn set screw (47) so that all bearing play is eliminated but yet carriage drive assembly (12) moves freely. Tighten lock nut (30) after adjustment. Before hooking spring (54), tip the tuner several times to make sure carriage drive assembly (12) is free enough to swing up or down by its own weight.

POINTER REPLACEMENT

The pointer is easily removed by downward and outward pressure to unhook it from the pointer arm (2). Pointer is replaced by reversing procedure.

ANT., RF OR OSC. CORE REPLACEMENT

The tuner cores (18) are easily unscrewed from clip (14) and pulled out when carriage assembly (13) is extended. Note that the cores are coded with a paint dot on the screw portion; always use replacement cores bearing the same color coding. When ordering replacement cores, always specify color coding together with part number.

TO SET THE PUSH BUTTONS

1. Turn receiver "on" and allow it to warm up for a few minutes.

2. Push the first automatic tuning button in as far as it will go and HOLD IT THAT WAY.

3. With the tuning knob, tune in the station you desire to set up. Tune carefully until you are exactly on the station; tuning to either side of it will result in poor tone quality. The pointer will indicate station being set up. Release button and knob after tuning in station.

4. Follow above steps 2 and 3 for the remaining four buttons.

SERVICE INFORMATION

The entire top deck of this tuner may be removed, while tuner is mounted in receiver chassis, allowing complete accessibility to all mechanical parts.

TO REPLACE PARTS ON LOWER DECK

Remove top deck of tuner (follow previous instructions). This exposes the 5-station set up screw assemblies (43) and manual lead screw assembly (42). These may be removed by unhooking springs (50) and lifting them out.

If push button arms or slider arms are to be replaced, it will be necessary to remove spring (54); then take out screws (48) from bottom of tuner to allow bracket (7) to move back and permit push button arm assemblies (1) or slider arms (3) to be removed after springs (53) have been removed.

Patience is required to assemble push button arm assemblies (1) and slider arms (3) back into bracket (7). Reassemble tuner by working in reverse order.

Test all parts of lower deck for free operation before assembling to upper deck.

TO REPLACE TOP DECK

Make sure that carriage drive assembly (12) is tipped back (spring (54) unhooked) and carriage assembly (13) carrying the tuning cores is out. Slip in the top deck, making sure the spring washer (70) on the manual drive assembly (42) is between the drive assembly gear and the back of the base before putting in screws and locking the two decks together.

SERVICE HINTS

1. STATION DRIFT (Push Buttons). Check the flat friction spring (56) for breaks or permanent set.

2. TUNER STICKING. Check collars on manual drive assembly (42). If they are cocked or stuck, replace with new assembly.

3. HARD TUNING FOR PRE-SETTING. Check lubricant on the gear train. It should be Stayput #512 or equal.

4. TWISTING CARRIAGE PLATE. Due to poor setting of carriage drive assembly (12). See "Drive Arm Adjustment".

5. ROUGH DRIVE - Check die cast gears (19,20 & 21). Check for lubrication (Stayput #512). Check manual drive bushings.

6. LATCH BAR JAMMING OUT. Check the latch bar spring (51) on the back. If it is bent out of shape, turn it 180° and reshape. If it is weak-replace.

7. STICKING POINTERS. Check the pointer bearing (6) and make sure the linkage of the assembly is free.

8. POINTER NOT RE-POSITIONING OR SLOPPY ACTION. Be sure to check the torsion spring (58) (on the under side of the top deck) for breakage or slipping from the notches on the base and the pointer link plate (34).

Motorola Automatic Tuner AT-58, continued

(Service instructions given on the previous two pages; Figure 2, showing location of additional parts is on the next page, over).

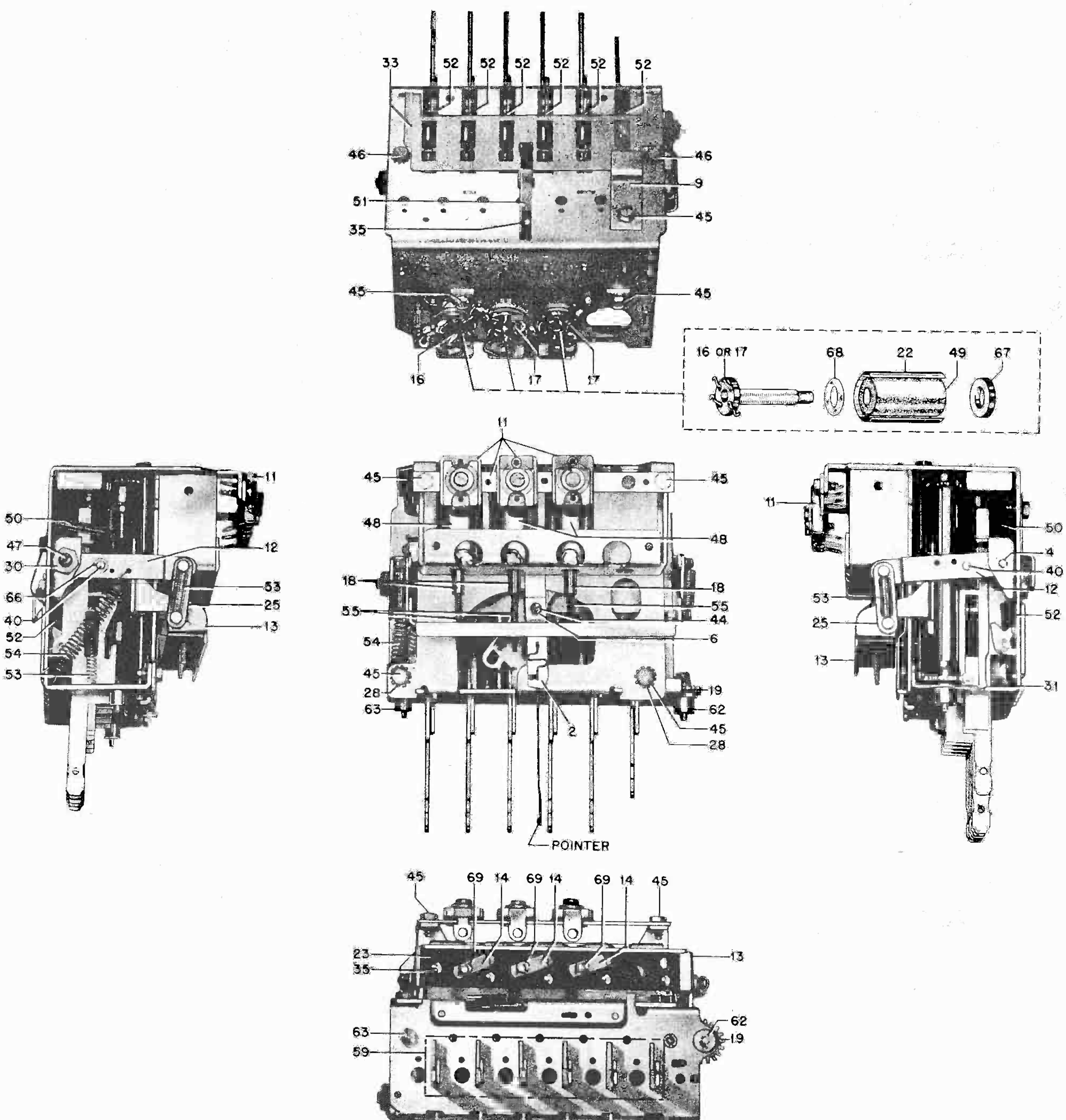


FIGURE I. AUTOMATIC TUNER AT-58 PARTS LOCATIONS

Motorola Automatic Tuner AT-58, continued

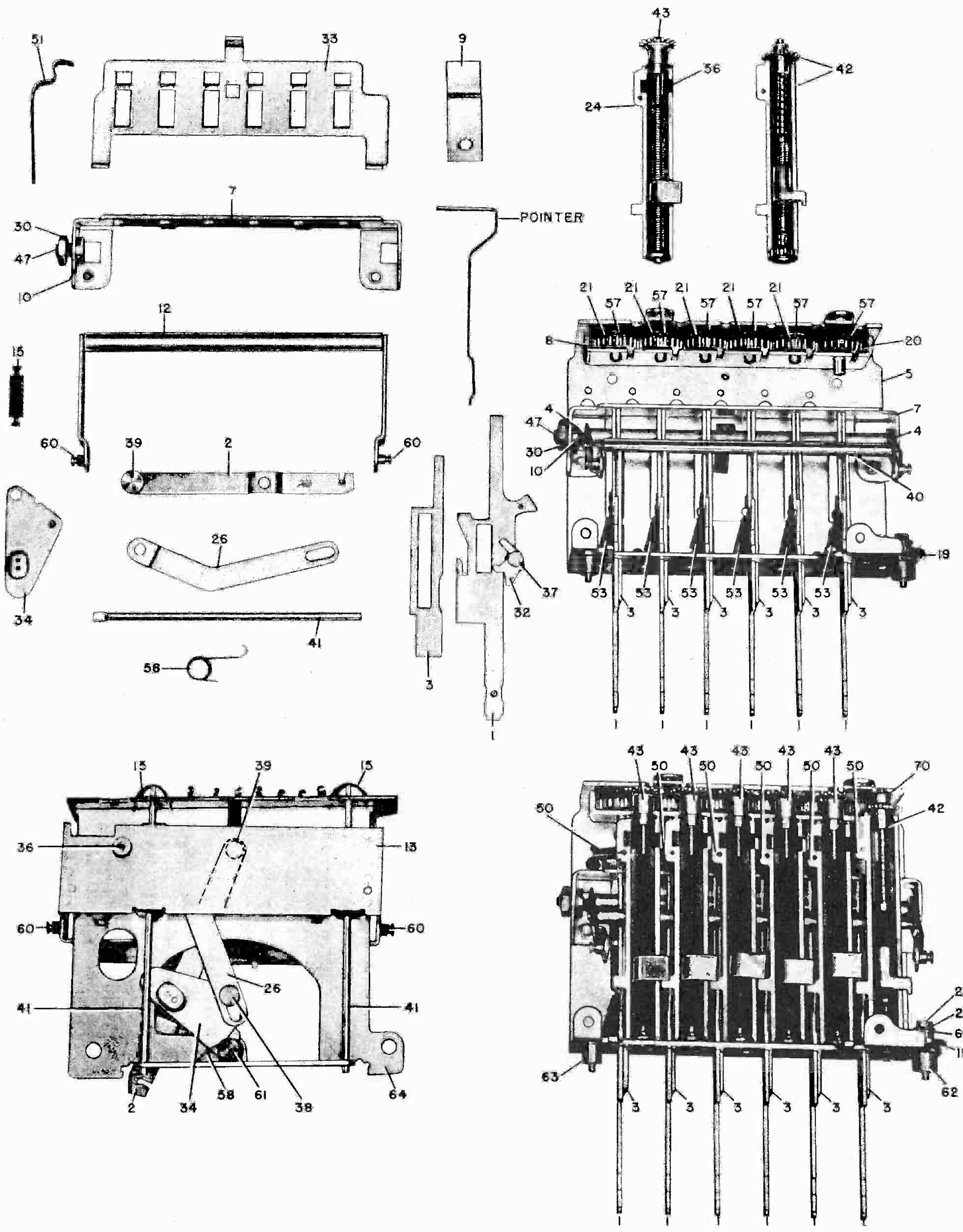
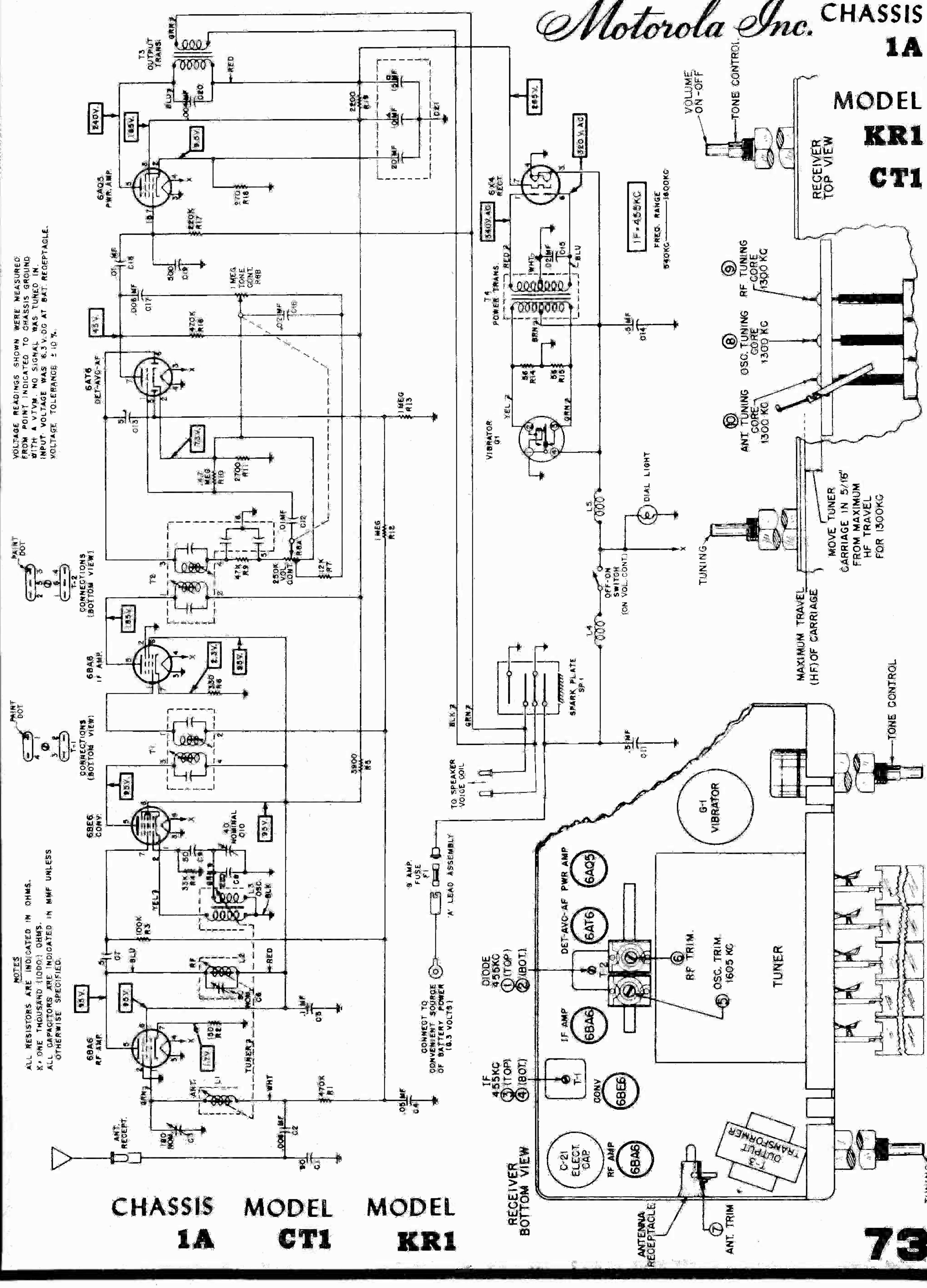


FIGURE 2. AUTOMATIC TUNER AT-58 PARTS LOCATION

Motorola Inc.

CHASSIS 1A

MODEL KR1 CT1



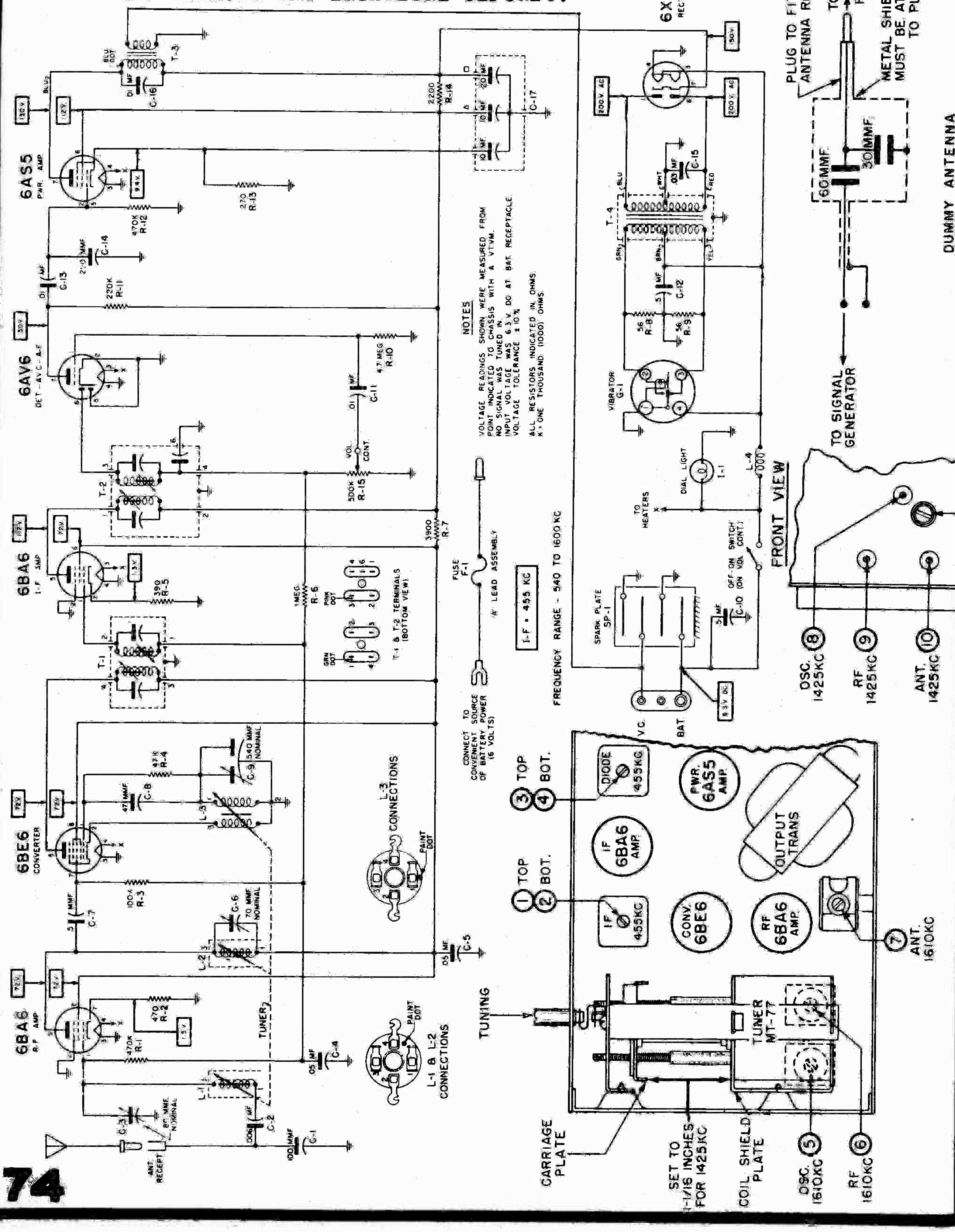
CHASSIS 1A MODEL CT1 MODEL KR1

Motorola Inc.

CHASSIS 1B

MODEL SR1B

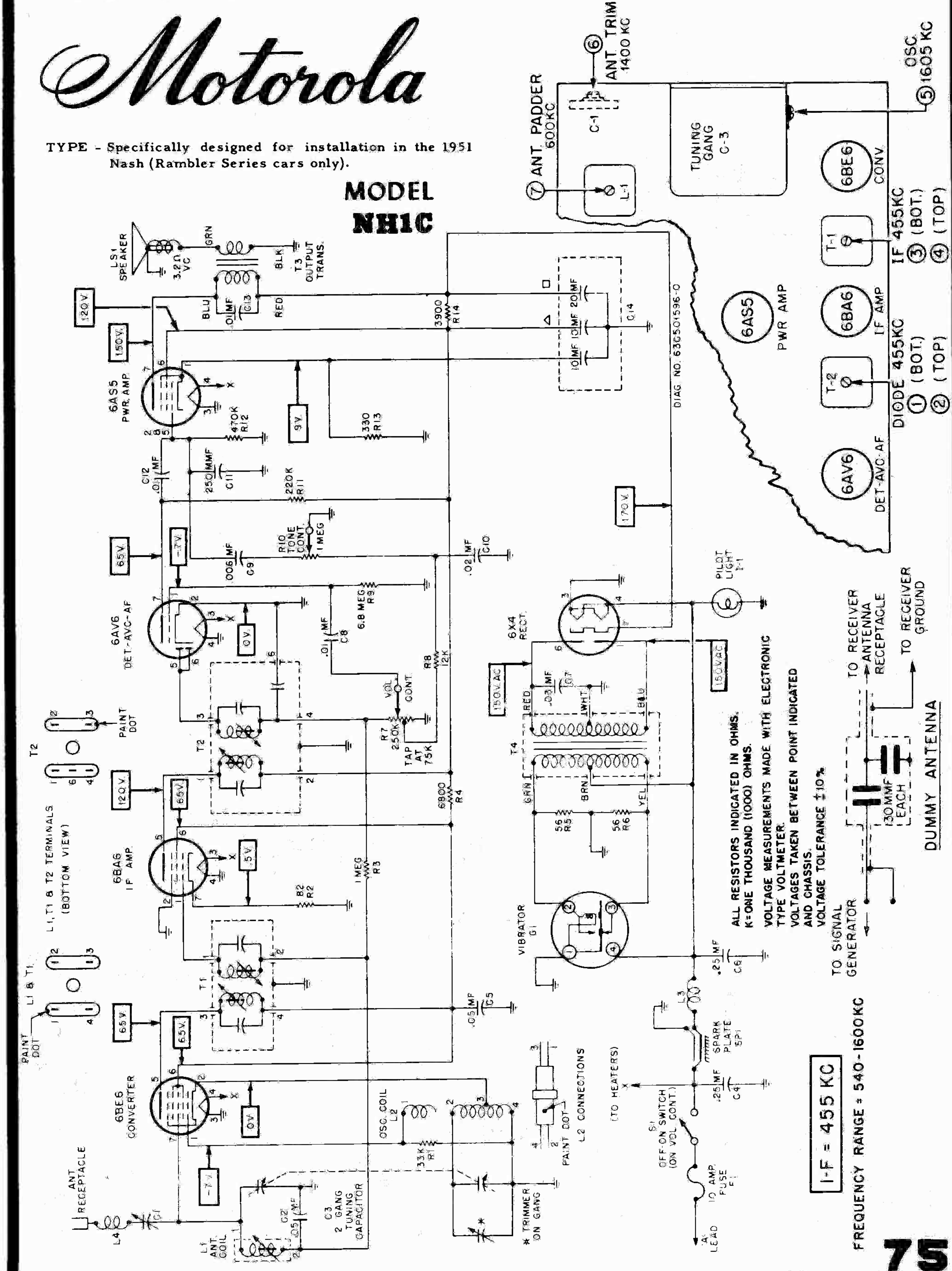
Model GT1M designed for 1951 Chevrolet uses almost the identical circuit.

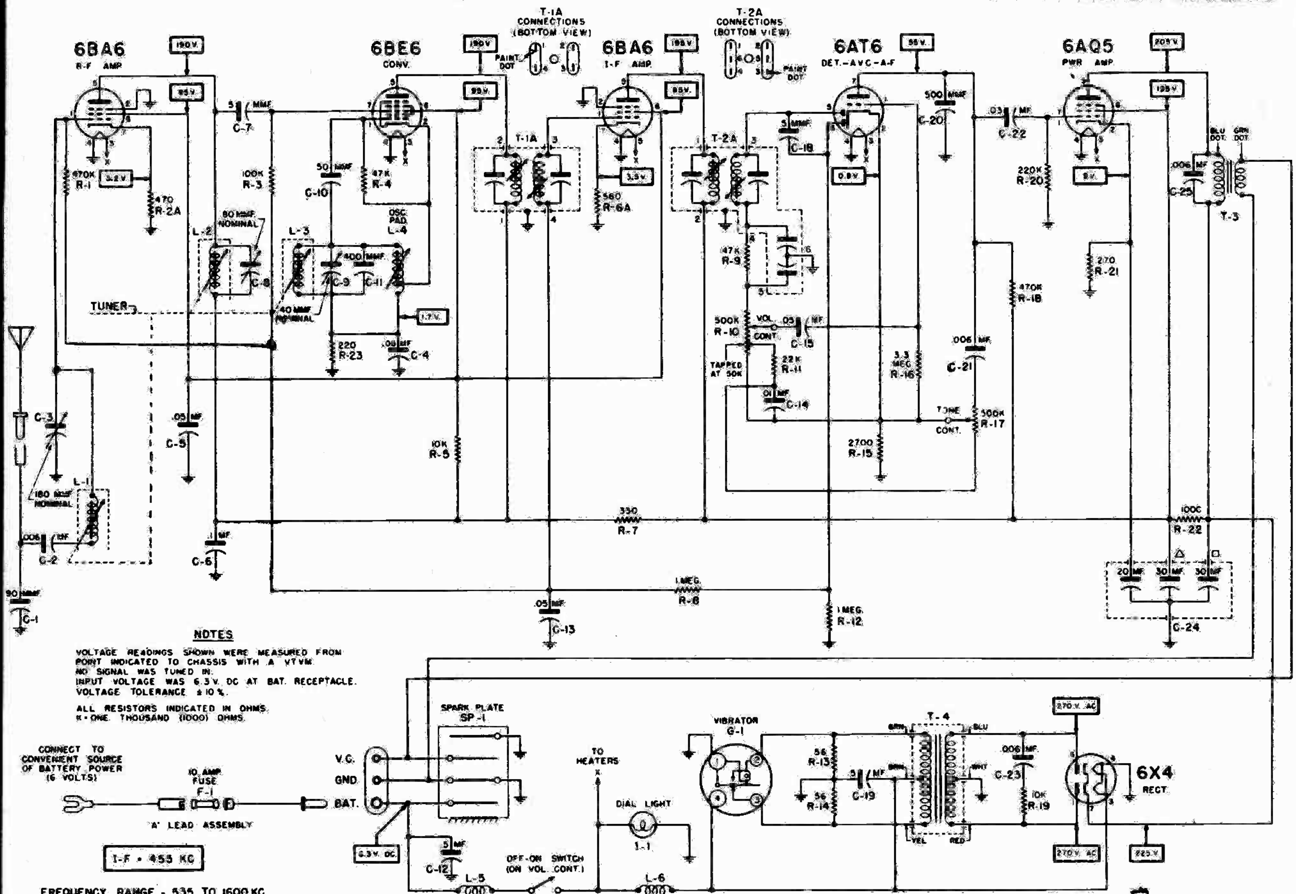


Motorola

TYPE - Specifically designed for installation in the 1951 Nash (Rambler Series cars only).

MODEL NH1C





NOTES

VOLTAGE READINGS SHOWN WERE MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM.
NO SIGNAL WAS TUNED IN.
INPUT VOLTAGE WAS 6.3V. DC AT BAT. RECEPTACLE.
VOLTAGE TOLERANCE ±10%.

ALL RESISTORS INDICATED IN OHMS.
K=ONE THOUSAND (1000) OHMS.

CONNECT TO CONVENIENT SOURCE OF BATTERY POWER (6 VOLTS)

10 AMP FUSE F-1

'A' LEAD ASSEMBLY

I-F = 455 KC

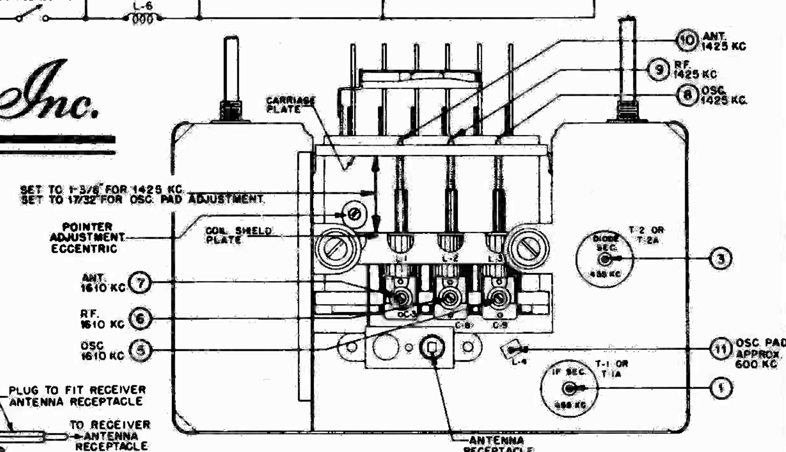
FREQUENCY RANGE - 535 TO 1600 KC

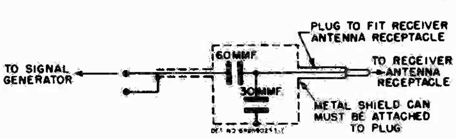
MODELS

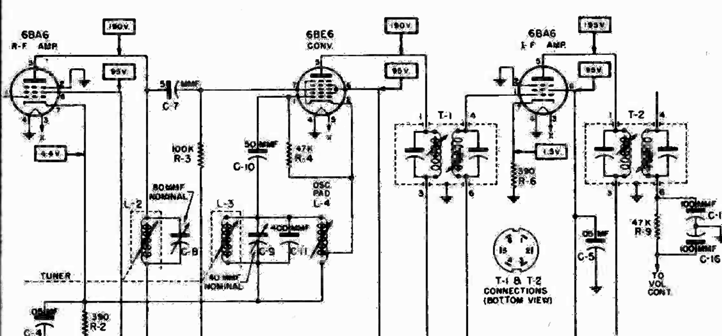
BKOA
CT8A
GM9TA
GMOT
HNO
ILOTC
KR9A
OEO
PCO
PC9A
SR9A

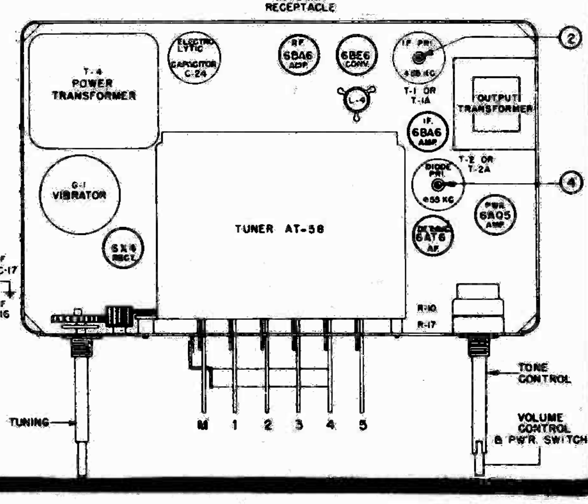
Motorola Inc.

CHASSIS 10A







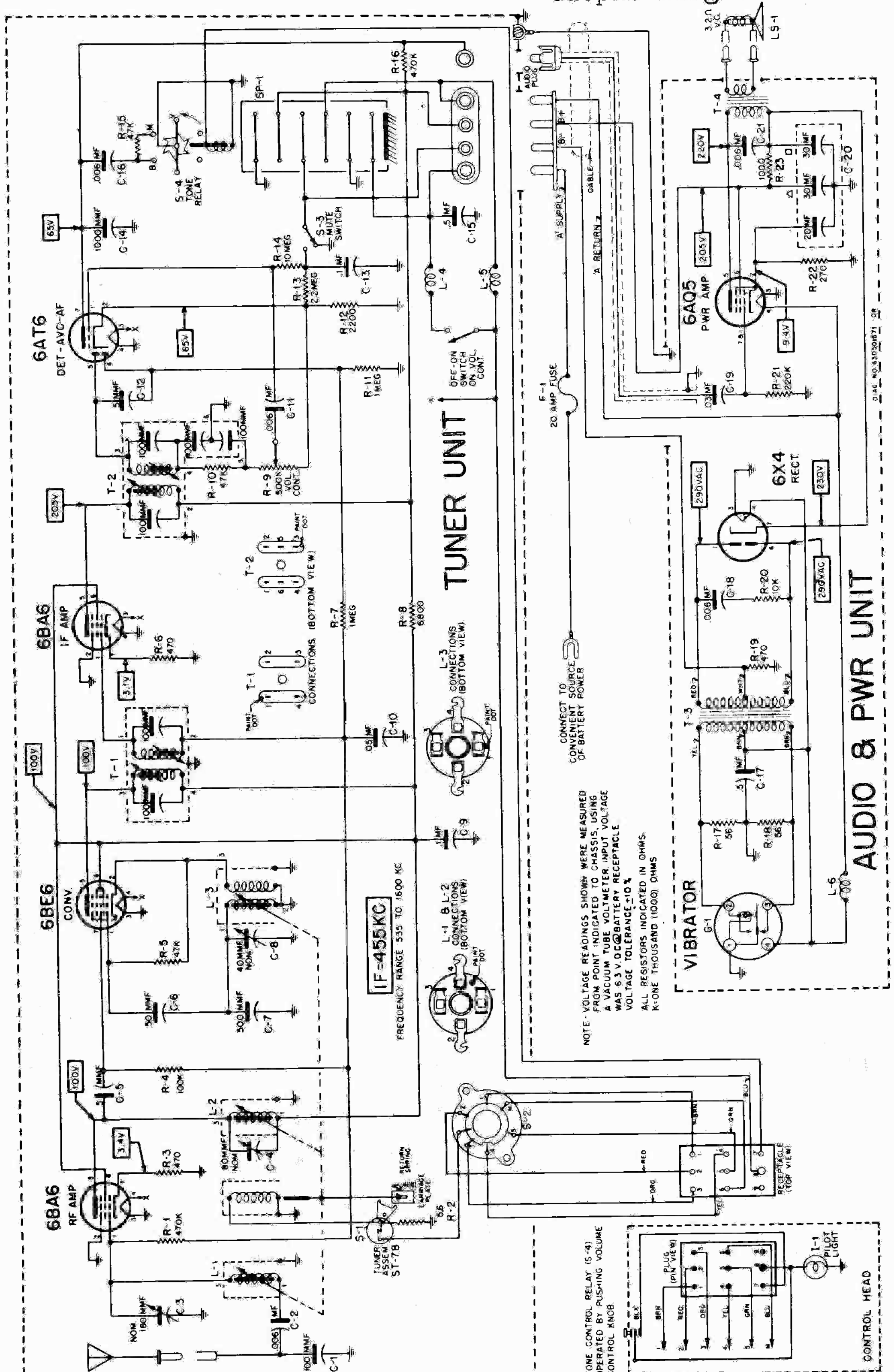


OLD IF CIRCUIT

Motorola

Model 701 circuit is shown on this page.

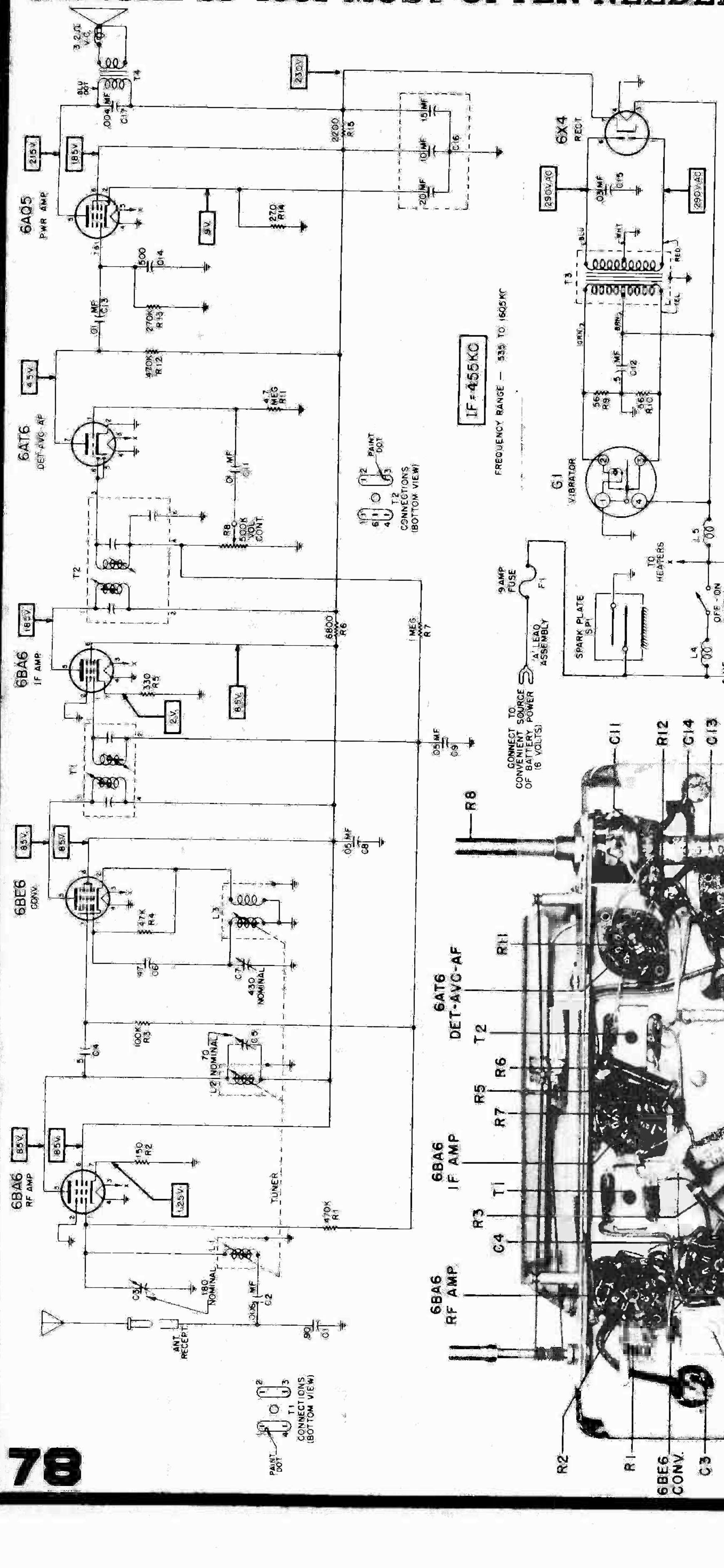
Model 801 tuner unit is as shown, while the audio unit differs mainly in using two 6AQ5 tubes in the output stage.



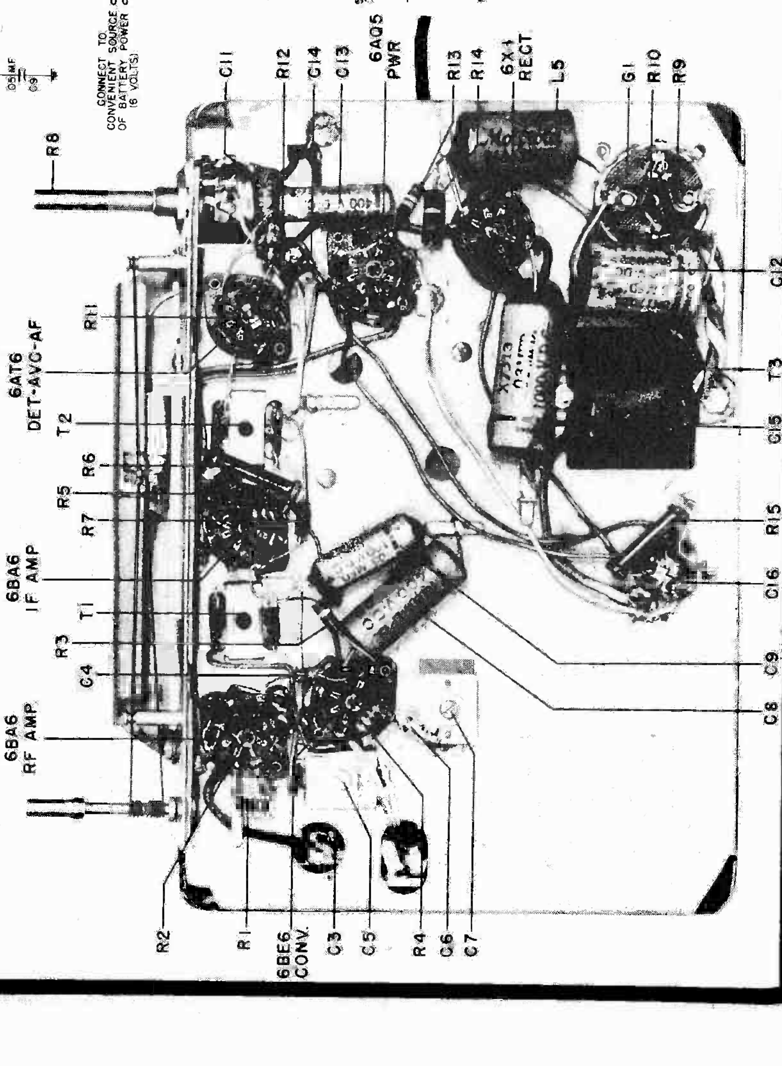
Motorola Inc.

Models 401 and 451

Model 401 uses a self-contained speaker and its circuit is exactly as shown on this page. Model 451 employs an external speaker, but is the same as the 401 in all other respects.



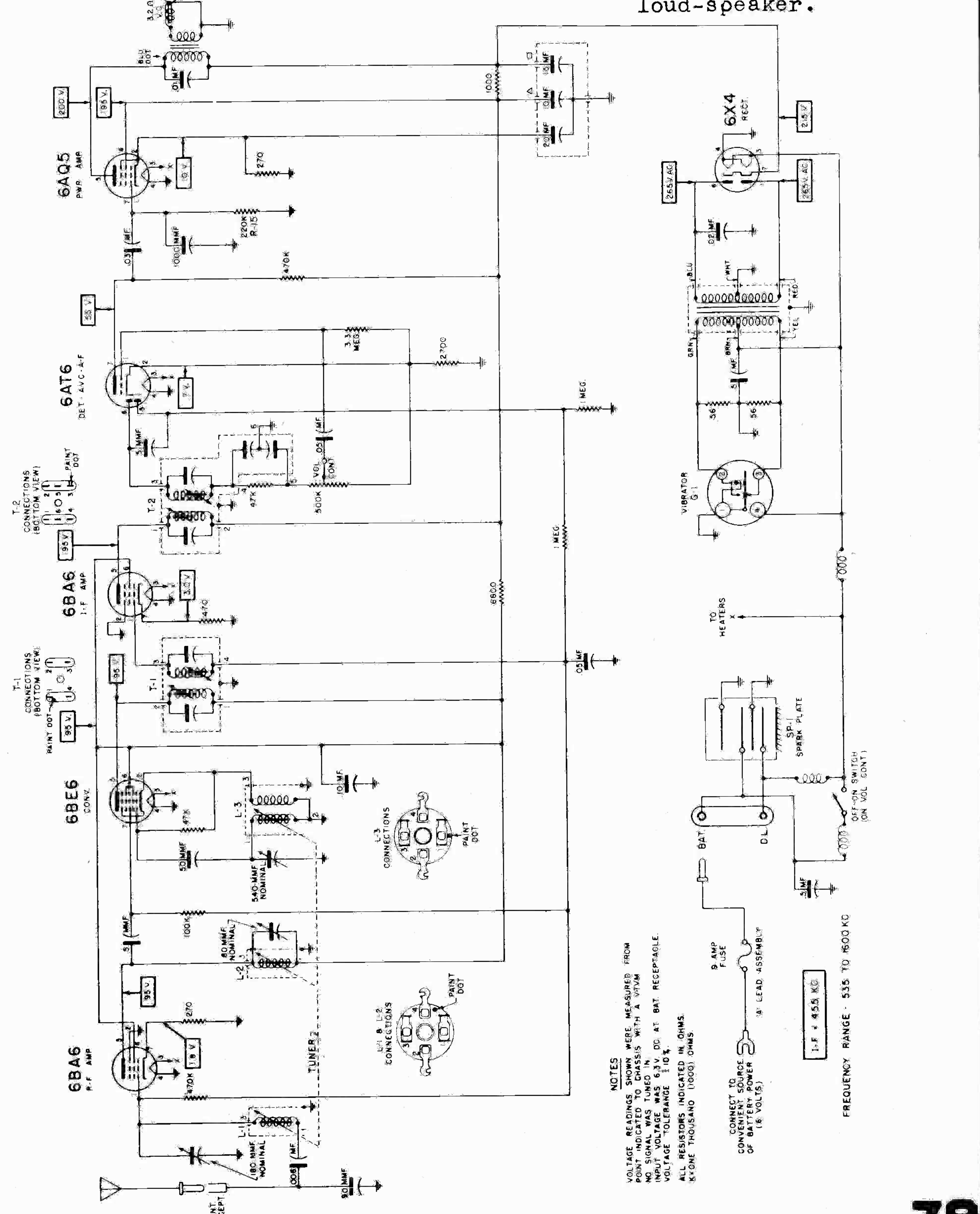
NOTE:- CAPACITORS INDICATED IN MMF UNLESS OTHERWISE SPECIFIED.
ALL RESISTOR INDICATED IN OHMS. K= ONE THOUSAND (1000) OHMS.
VOLTAGE MEASUREMENTS MADE WITH ELECTRONIC TYPE VOLTMETER.
VOLTAGES TAKEN BETWEEN POINT INDICATED AND GROUND.
VOLTAGE TOLERANCE ±10%.
INPUT VOLTAGE 7V. DC. NO SIGNAL INPUT.



Motorola

Model 501, with self-contained speaker, is exactly as per diagram.

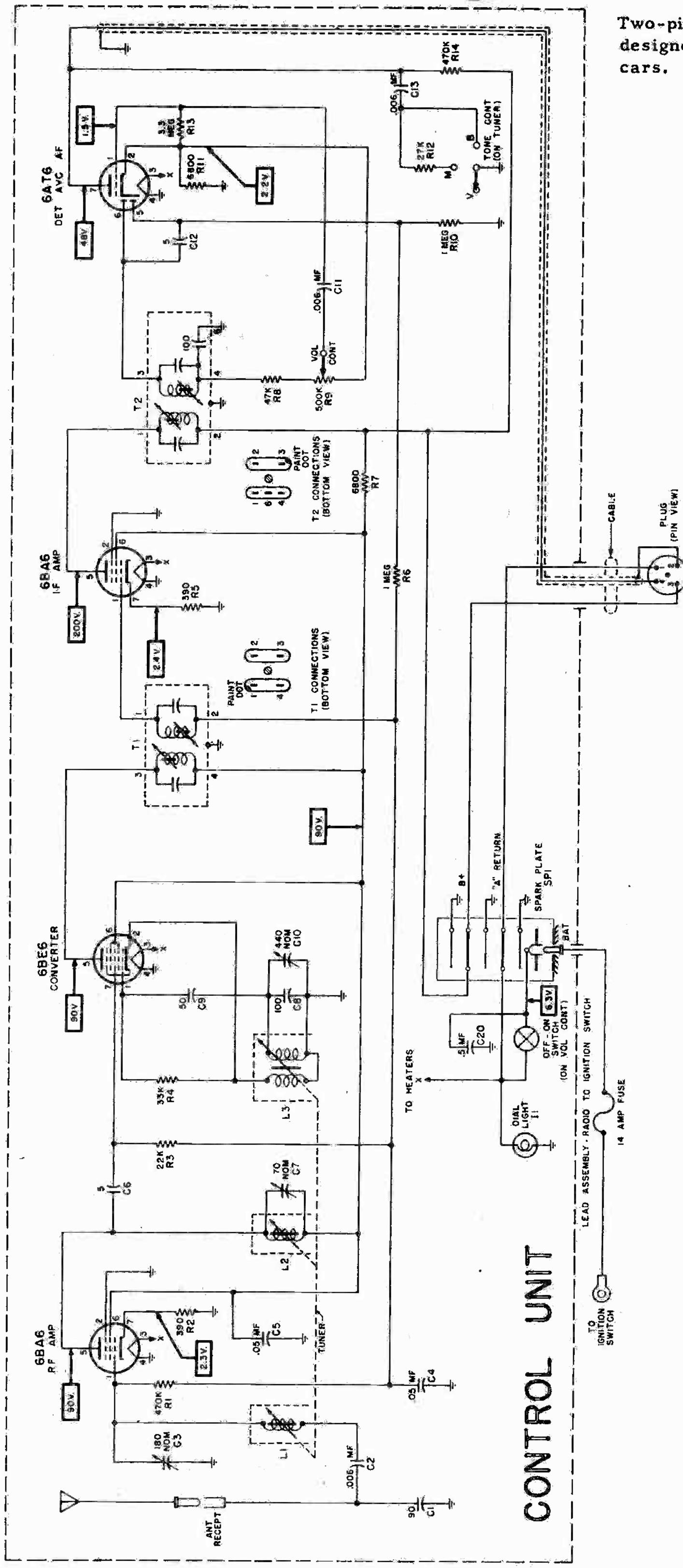
Model 601, differs only in the use of an external loud-speaker.

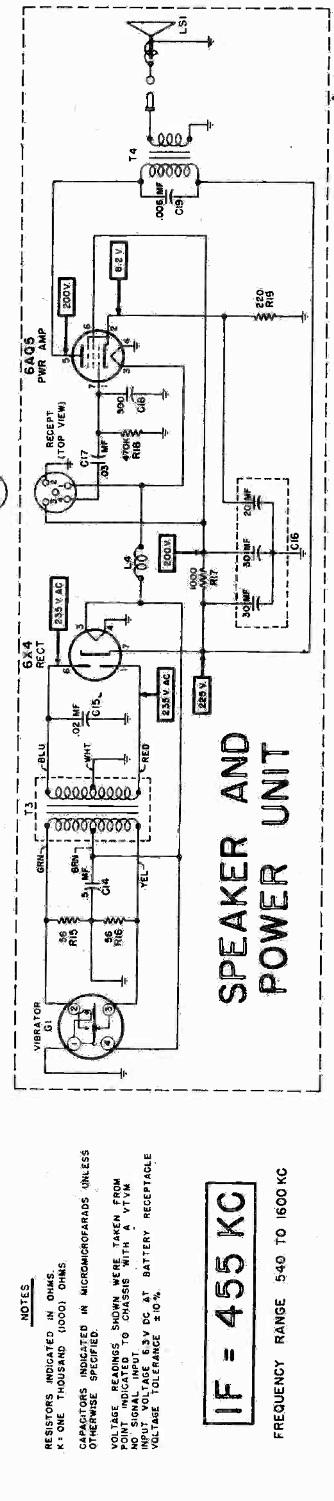


Motorola AUTO Radio

MODEL 606

Two-piece automotive type receiver, specifically designed for installation in Plymouth P-22 and P-23 cars.

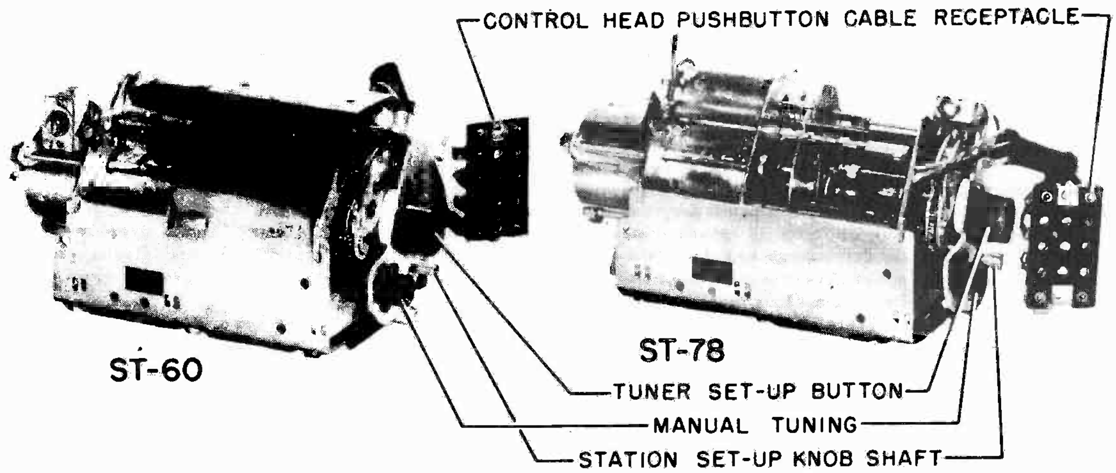




Motorola AUTO Radio SERVICE MANUAL

SOLENOID TUNER

MODELS ST-60 ST-78



GENERAL

Solenoid Tuners ST-60 and ST-78 are used in Motorola electric push-button standard auto receivers.

Fundamentally ST-60 and ST-78 tuners are the same. The two tuners differ in push-button switch lead lengths, oscillator coil, sleeve and shield, tuning cores, antenna trimmer and cover over ST-60 carriage. These tuners are similiar to the original Motorola ST-54 solenoid tuner.

This is a 3 gang permeability type tuner operated by a solenoid. Five pre-set and one manual tuning positions are provided. The frequency range is 535 to 1600 kc. The pre-set positions can be set to any frequency within this range.

The tuner is designed to operate satisfactorily with 4.5 to 7.3 volts input. Before attempting any service work on a tuner that operates too slowly or one that doesn't operate at all, check the battery voltage directly at the receiver spark plate. Normally, this voltage is 6.3 volts. At the moment any push-button is pressed, the voltage at the spark plate should not drop to less than 4.5 volts. If the voltage is less than 4.5, it is an indication of poor wiring between the car battery and receiver or a defective car battery.

This tuner depends on "dash-pot" action between the plunger and the solenoid for proper operation. When the fit between the plunger and solenoid is too tight, the air can't get out fast enough. The result is a slow or sluggish operating tuner. All ST-60 and ST-78 tuners have an adjustable air release in the solenoid end plate. See Figures 1 & 3.

The tuner solenoid coil must be in a horizontal or near horizontal position or the tuner will not operate properly. If it is operated with the coil in a vertical position, the solenoid and carriage return spring may not be strong enough to operate the tuner.

TO SET UP AUTOMATIC TUNER

a. Turn receiver on and allow it to warm up for a few minutes.
b. Collapse antenna until signal is weak.
c. Press Manual "M" button on control head.
d. Turn tuning knob until desired station is tuned in. (Make a mental note of the program). For best results choose only local stations.
e. Press desired button and wait until tuning mechanism completes its operation.
f. Press automatic tuner set-up button until "click" is heard. (See detail above.)
g. Turn automatic tuner set-up knob until previously noted program is heard. NOTE: Check the setting of the automatic button just set up by pressing the "M" button and manually tune in the station. There should be no difference in volume or clarify when the station is tuned in either manually or automatically. If a difference is noted, reset the automatic tuner push button more accurately by repeating above procedure. Also make sure the push button is set to same station that was selected manually and not to a weak distant station carrying the same network program.
h. Repeat steps c, d, e, f and g for balance of buttons.

(This material is continued on the following pages through page 86.)

MOTOROLA Auto Radio Solenoid Tuner, Models ST-60 and ST-78, continued.

THEORY OF OPERATION

NOTE: Throughout these paragraphs, it is suggested that constant reference be made to Figure 1.

When any push-button is pressed, current flows through the solenoid coil, causing the plunger to pull into the coil. Near the end of the plunger travel, through a ratchet mechanism inside the plunger, the selector switch shaft is rotated 60°, moving the selector switch and stop plate to their new position.

An instant later, the solenoid switch is opened breaking solenoid current and the carriage return spring then pulls the plunger out, closing the solenoid switch again. If the selector switch is now resting at the position selected by the push-button (cut away section of selector switch resting in front of contact selected by push-button), the solenoid plunger will continue to be pulled out until the stop plate is resting on the selected lead screw stop. In the event the selector switch is not resting in the position selected by the push-button when the solenoid plunger is on its return trip, the moment the plunger moves out far enough to actuate the solenoid switch, current will again flow through solenoid causing the plunger to be pulled in again. The plungers inward motion again rotates the stop plate and selector switch through another 60°. This last operation is repeated automatically until the selector switch comes to rest at the position selected by the push-button, at which time the solenoid circuit is opened and the plunger moves out until the stop plate is resting on the selected lead screw stop. The stops are adjusted to the desired positions during the station setting up procedure, through the set-up gear train assembly.

Refer to Figure 2 for mechanics behind station setting-up mechanism detail.

When the button on which a station is to be set up is first pressed, the tuner operates and the stop plate comes to rest against the selected lead screw stop. The pressure of the stop plate against the lead screw stop moves the lead screw forward until its shoulder rests against the tuner end plate. The square end of the lead screw does not engage in the square hole of the set-up gear until the set-up button is pushed in and the station set-up knob is turned. A latch on one end of the detent lever engages the gear lever, holding the set-up gear train in contact with the selected lead screw. Now the selected lead screw stop can be moved on its lead screw by turning the station set-up knob. None of the other lead screws turn because the stop plate is not resting against them. After the button is set up, pressing any other button will unlatch the gear lever and disengage the lead screw from the set-up gear. See Figure 2.

Since the coil tuning iron cores are attached to the carriage plate and move in unison with the plunger, the point at which they are brought to a stop (by means of the lead screw stop) determines the frequency to which the coils are tuned.

TO REMOVE TUNER FROM CHASSIS

Should it become necessary to remove the solenoid tuner from the receiver chassis, proceed as follows:

1. Remove the covers from the set, completely exposing the chassis.

2. Mark all leads connecting tuner to receiver.

3. Disconnect all leads connecting tuner to receiver. The control head connecting receptacle is to be removed by unscrewing the two self-tapping screws. Do not unsolder leads from the tuner selector switch.

4. The tuner is held to the chassis by self-tapping screws driven into the sides of the tuner. Do not remove any other screws.

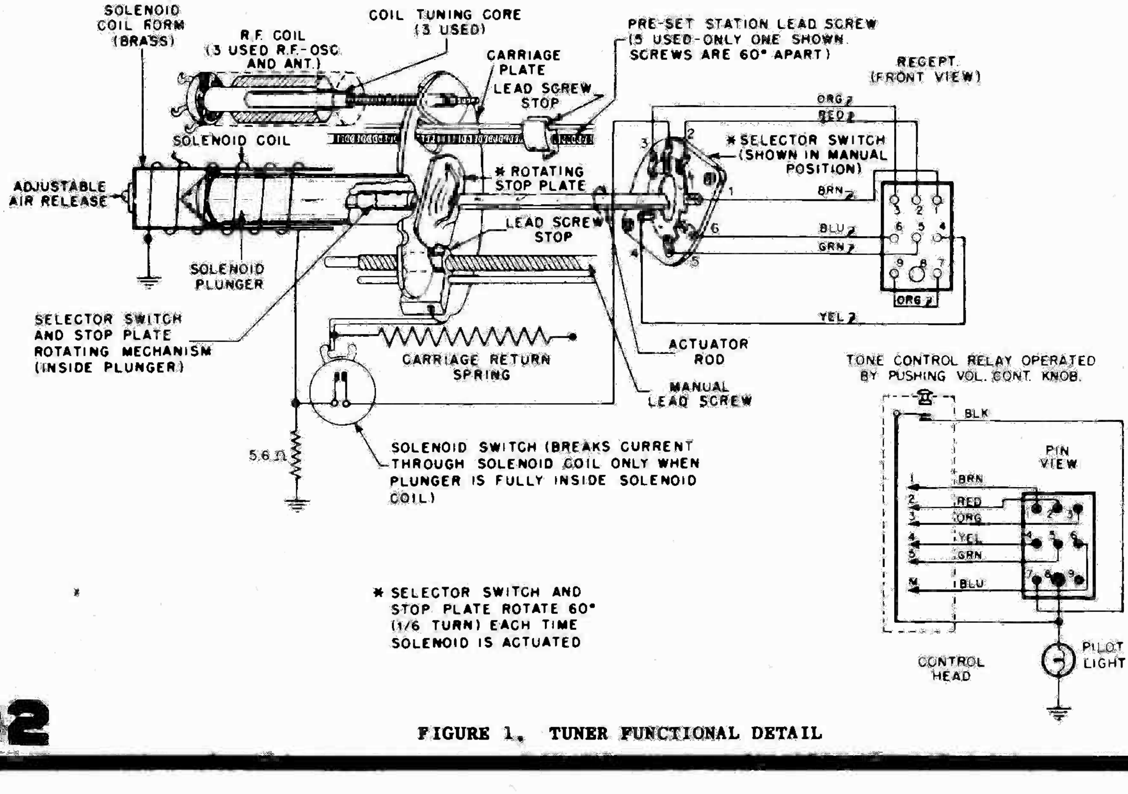


FIGURE 1. TUNER FUNCTIONAL DETAIL

MOTOROLA Solenoid Tuner, Models ST-60 and ST-78, continued.

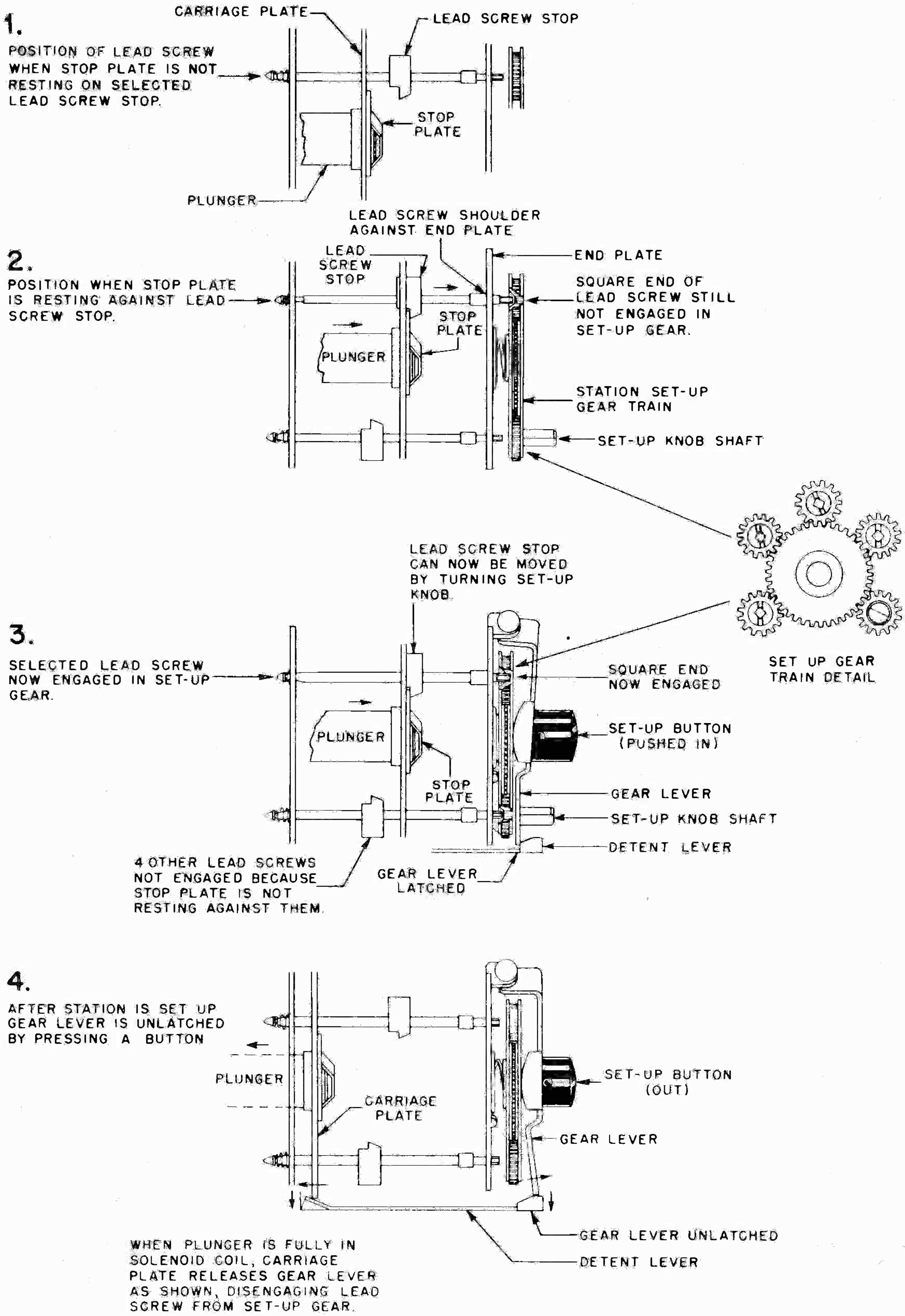


FIGURE 2. STATION SET-UP MECHANISM

MOTOROLA Auto Radio Solenoid Tuner Models ST-60 and ST-78, continued.

ADJUSTMENTS

AIR RELEASE ADJUSTMENT

The speed at which the tuner operates is governed by dash-pot action of the solenoid plunger within the closed solenoid coil form. The rate at which air is allowed to enter or escape determines the speed of the plunger.

An adjustable air release is provided on all ST-60 and ST-78 tuners. See Fig. 3. To adjust, loosen the screw and move the eccentric washer which covers the air release hole to expose or cover more of the air release hole as required.

1. If tuner operates too slowly, open the air release hole. Open it only far enough to secure reliable operation. Too little "dash-pot" action (air release open too much) may cause the plunger to hammer and sometimes even to make the tuner operate continuously due to the selector switch rotor being turned so rapidly as to overshoot its contacts.

2. If the tuner operates too rapidly increase dash-pot action by closing the air release hole slightly. Close it only enough to eliminate hammering.

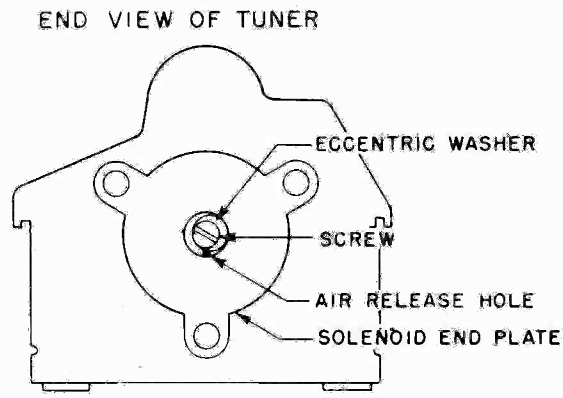


FIGURE 3. AIR RELEASE ADJUSTMENT

PLUNGER RATCHET ADJUSTMENT

The plunger ratchet mechanism is shown in Figure 4. This mechanism rotates the actuator rod which, in turn, rotates the carriage stop plate and the selector switch 60° for each inward motion of the plunger.

If this adjustment is incorrect, tuner may operate continuously once current is applied.

Correct ratchet adjustment is indicated when 1/64" to 1/32" clearance is observed between selector switch contacts and the selector switch rotor as shown in Figure 5. Slowly work the plunger by hand and observe clearance at each contact position. If the average clearance is not 1/64" to 1/32", correction can be made by loosening ratchet adjustment setscrew and turning actuator rod by hand until correct clearance is observed.

Before ratchet adjustment setscrew is finally tightened, push fixed ratchet 1/32" back into plunger. This increases spring tension against rotating ratchet, thus insuring more positive operation.

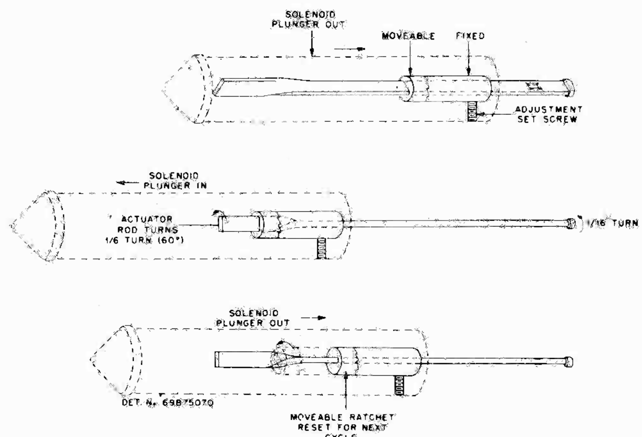


FIGURE 4. PLUNGER RATCHET MECHANISM

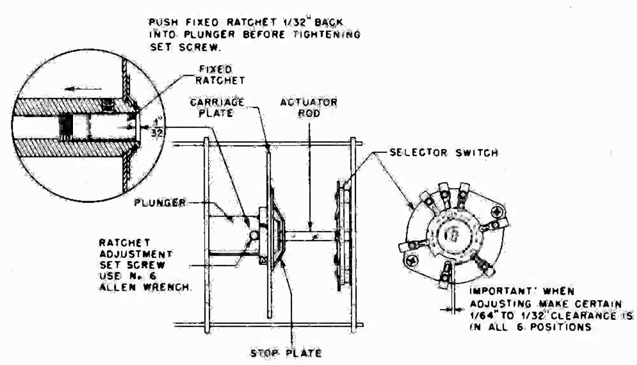


FIGURE 5. PLUNGER RATCHET ADJUSTMENT

SOLENOID SWITCH TRIP ADJUSTMENT

The solenoid switch tripping mechanism should be adjusted as shown in Figure 6.

If the solenoid switch is tripped too early, the ratchet mechanism may fail to operate; if it trips too late, the plunger may hammer violently or should the solenoid switch fail to trip, the plunger would be held within the solenoid.

SERVICE NOTES

FAILURE OF SOME LEAD SCREW TO ENGAGE IN SET-UP GEARS

If some of the lead screws fail to engage in the set-up gears during station setting up procedure, check the gear lever to see if it is bent. When the set-up button is pushed in and the gear lever latches on the detent lever, the set-up gear train should be parallel with the tuner end plate and the bottom of the gear train should be resting on the raised portions of the tuner end plate.

LUBRICATION

Should lubrication ever be required, it is recommended that a very fine grease, commercially called DOW-CORNING Silicone (DC 44 Medium Grade), or its equivalent be used.

Remove all old and sticky lubricant with a solvent such as carbon tetrachloride and then, very sparingly, lubricate only the following points:

1. Carriage guide rods.
2. Actuator rod.
3. Manual lead screw.

Do not lubricate or permit lubricant to get on Selector Switch contacts.

MOTOROLA Tuner ST-60, ST-78, continued.

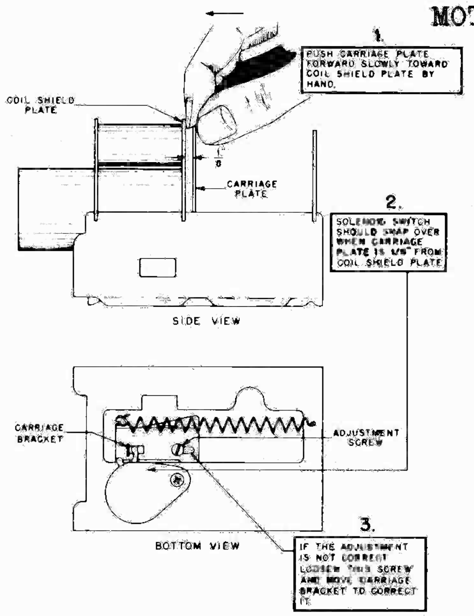


FIGURE 6. SOLENOID SWITCH ADJUSTMENT

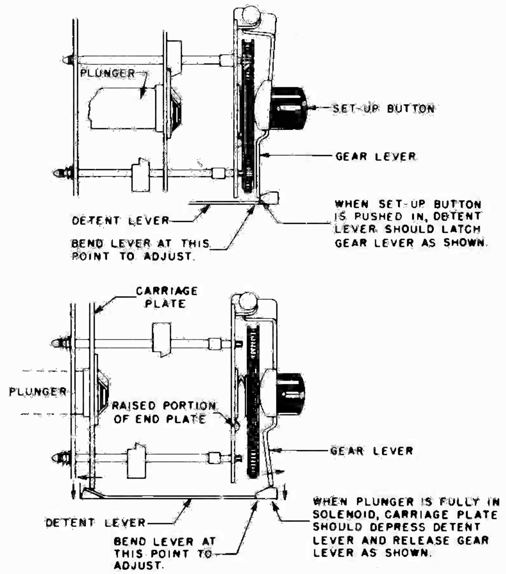


FIGURE 7. GEAR LEVER LATCH ADJUSTMENT

LEAD DRESSING

Make sure that the selector switch and solenoid coil leads are dressed so that carriage plate does not rub against them. Leads rubbing against the carriage plate may cause the tuner to stick, especially at the high frequency end.

REPLACEMENT OF SOLENOID COIL OR SOLENOID PLUNGER

Should replacement of the solenoid coil or solenoid plunger be required, it will be necessary to replace the entire tuner. A close fit between solenoid plunger and solenoid coil form is required; a proper match can only be secured at the factory. When service of this kind is required, return the tuner to the factory for exchange.

ALIGNMENT

In the event that some part of the R.F. circuit has been changed or the adjustments shifted by mishandling, it is suggested that the receiver be realigned. Follow the alignment instructions found in the receiver service manual.

The tuner must be in good working order and assembled onto the chassis before attempting alignment of its tuned circuits.

TO REPLACE ANT. R.F., OR OSC. COILS

1. Unsolder the two lugs holding the coil to the tuner plate.
2. Carefully remove the old coil. Save the thin paper washer that is found at the base of the coil.
3. Slip the paper washer over the replacement coil and slip coil into shield can.
4. Orient coil so its lugs are in same position as before and resolder to tuner plate.
5. Reassemble tuner and install in receiver.
6. Realign ANT., R.F. and OSC. stages per instructions found in the receiver service manual.

ADJUSTMENT OF GEAR LEVER LATCH

The gear lever latch holds the station set-up gear train in position while setting up stations. Failure of the latch to engage properly when the set-up button is pushed in will result in the inability to set up pre-set stations. Failure of the latch to disengage after station is set-up will result in faulty automatic tuning because the lead screws might not seat themselves properly against the tuner end plate. Figure 7 shows the latch detail and adjustment.

TO REPLACE ANT. R.F. OR OSC. COIL TUNING CORES

1. Remove the carriage return spring.
2. Move the carriage plate back as far as it can go. The tuning cores can now be screwed "out" or "in" by grasping the portion that sticks out the back of the coil. When installing a new core, make sure that the insulating washer and adjustment clip are replaced properly. The insulating washer goes on the core side; the core adjustment clip has an ear on it and this ear must fit into a hole in the bakelite insulator on the carriage plate. Refer to Figure 8.
3. Replace the carriage return spring.
4. Install tuner in receiver.
5. Realign ANT., R.F. and OSC. stages following the instructions found in the receiver service manual.

PLUNGER RATCHET REMOVAL

To remove ratchets, proceed as follows:
(Refer to Figure 8 for parts identification).

1. Remove gear plate mounting screw (55).
2. Pull out actuator rod (46). Don't lose washers (83), (88) and (89).
3. Remove stop plate bracket (4) by sliding it out of the retaining slots.
4. Loosen setscrew (50).
5. The large fixed ratchet (34), small floating ratchet (35) and ratchet spring (70) can now be removed.
6. Reassemble in reverse order.

TUNER HANGS UP

The beginning of this trouble is usually a condition where the tuner "runs wild" (fails to stop at a station). Eventually, the stop plate gets "hung up" by getting on the wrong side of the station stops (56). The cause of the trouble is that the selector switch (74) does not turn the correct amount with each dash of the plunger.

Since the actuator rod (46) determines the rotation of the selector switch, it is usually at fault. Check the twist in the actuator rod. It should be 82 degrees. Also check the fit between the "head" end of the actuator rod (46) and the rotary section of the selector switch (77). We have found that some sloppiness sometimes occurs at this point. If the fit is loose, replace the actuator rod (46). This can be easily done by removing gear plate mounting screw (55).

MOTOROLA Solenoid Tuner Models ST-60 and ST-78, continued.

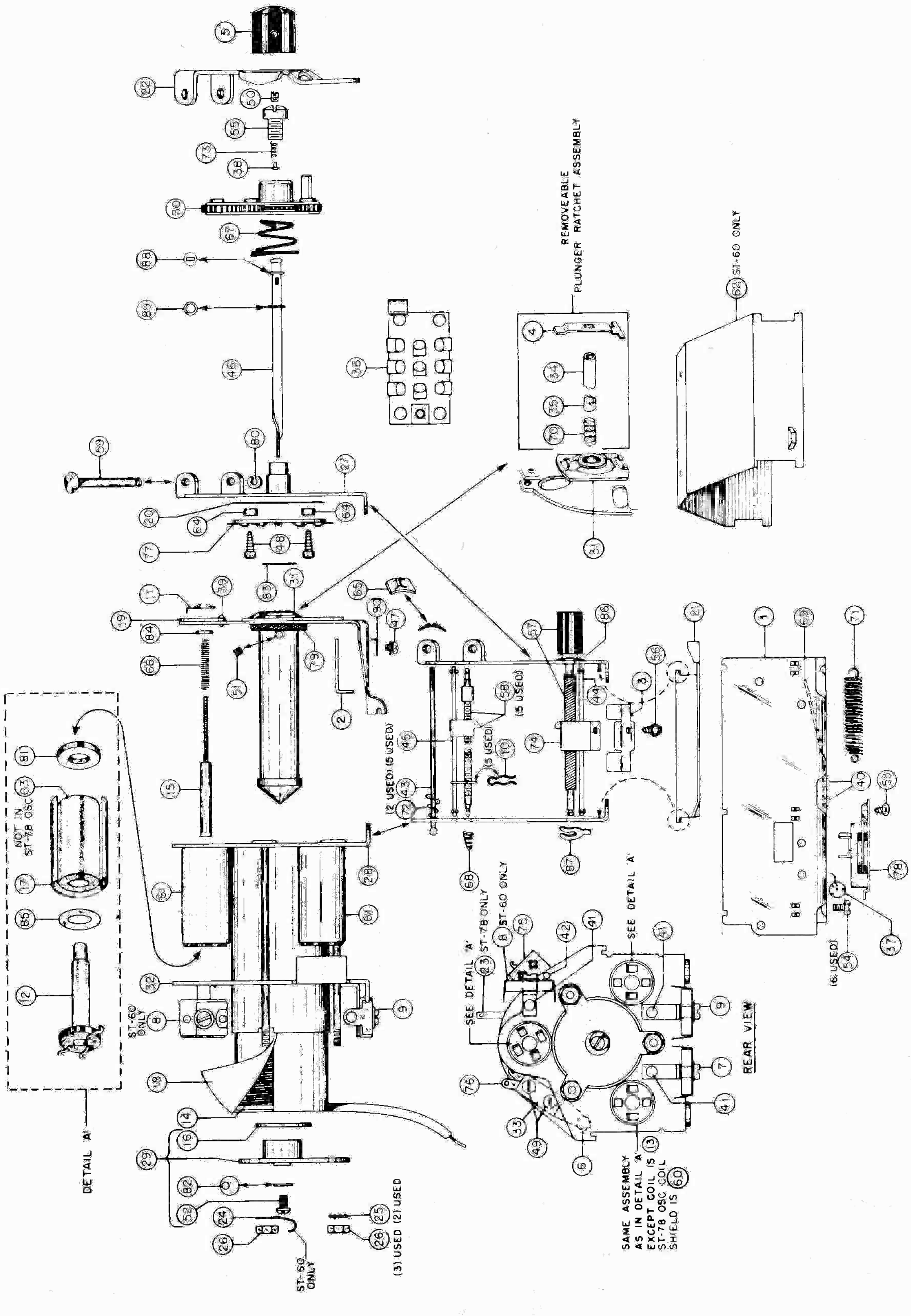


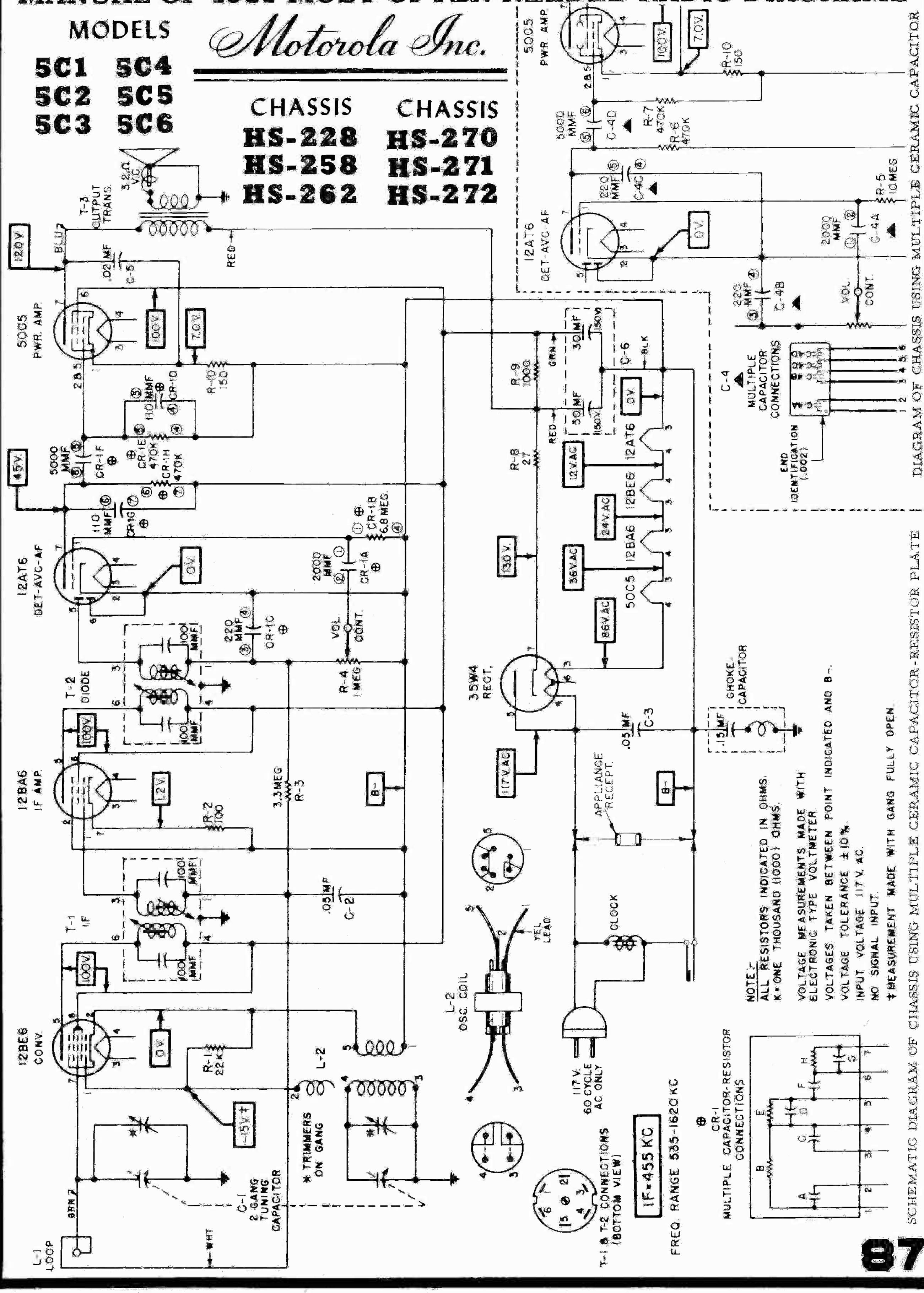
FIGURE 8. PARTS LOCATION

Motorola Inc.

MODELS

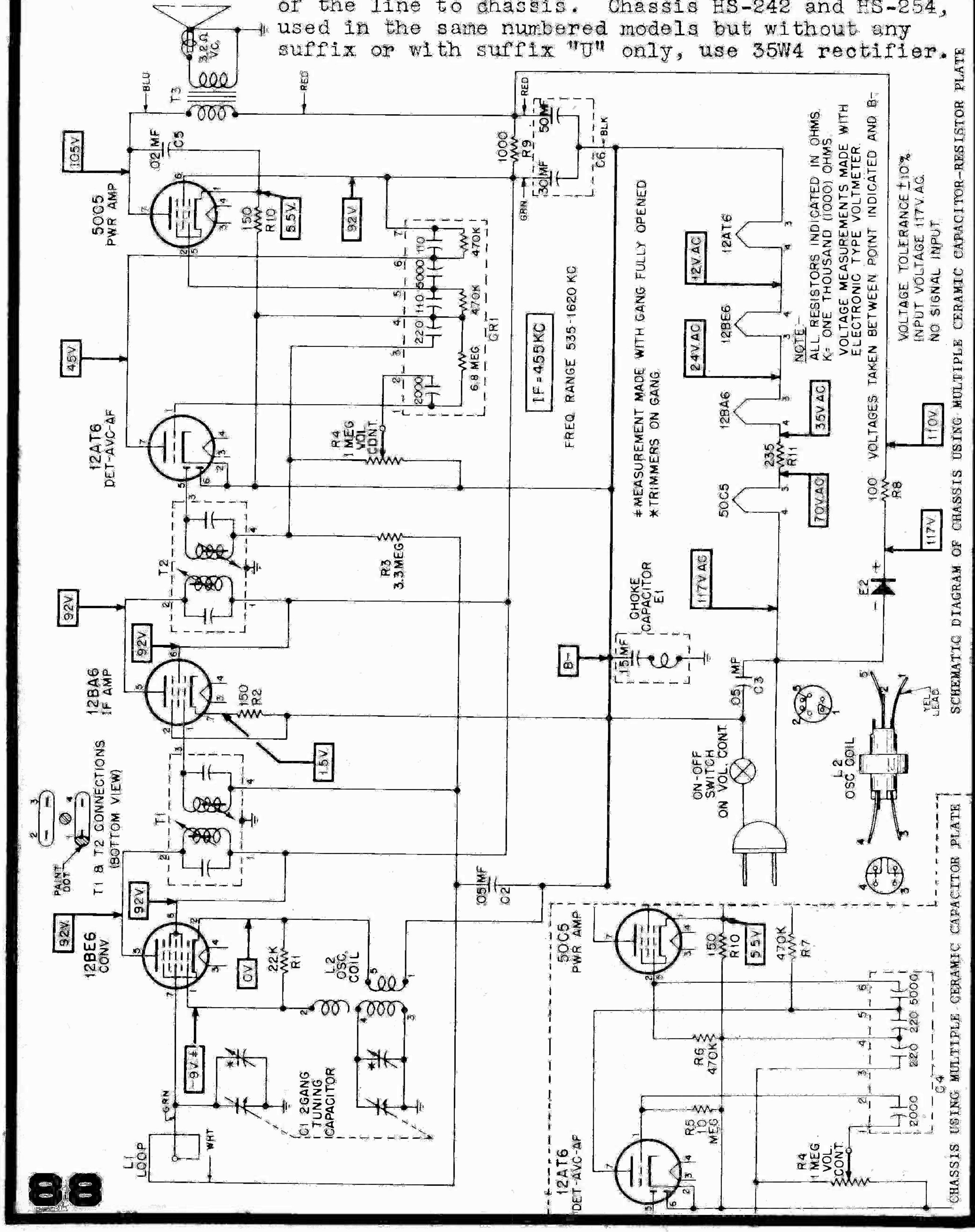
5C1 5C4
5C2 5C5
5C3 5C6

CHASSIS	CHASSIS
HS-228	HS-270
HS-258	HS-271
HS-262	HS-272



MANUAL OF 1951 MOST-OFTEN-NEEDED RADIO DIAGRAMS

MOTOROLA, INC. Circuit diagrams of Models 5R11AU, 5R12AU, 5R13AU, 5R14AU, 5R15AU, 5R16AU, all using Chassis HS-281, are shown on this page. Chassis HS-280, used in the same numbered models but with a suffix "A" (not "AU"), omits choke-capacitor E1 and connects one side of the line to chassis. Chassis HS-242 and HS-254, used in the same numbered models but without any suffix or with suffix "U" only, use 35W4 rectifier.



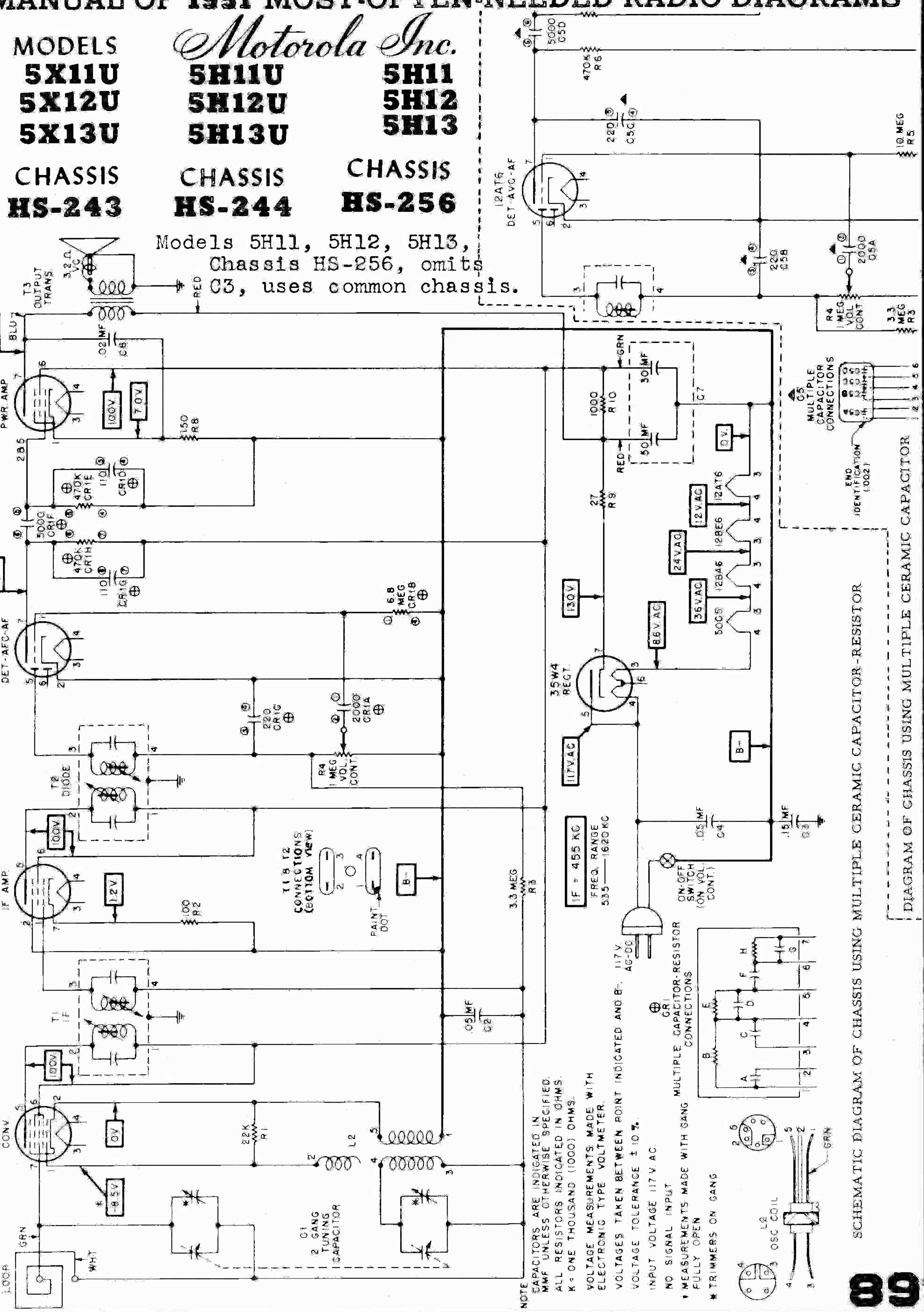
SCHEMATIC DIAGRAM OF CHASSIS USING MULTIPLE CERAMIC CAPACITOR-RESISTOR PLATE

CHASSIS USING MULTIPLE CERAMIC CAPACITOR PLATE

Motorola Inc.

MODELS		
5X11U	5H11U	5H11
5X12U	5H12U	5H12
5X13U	5H13U	5H13
CHASSIS HS-243	CHASSIS HS-244	CHASSIS HS-256

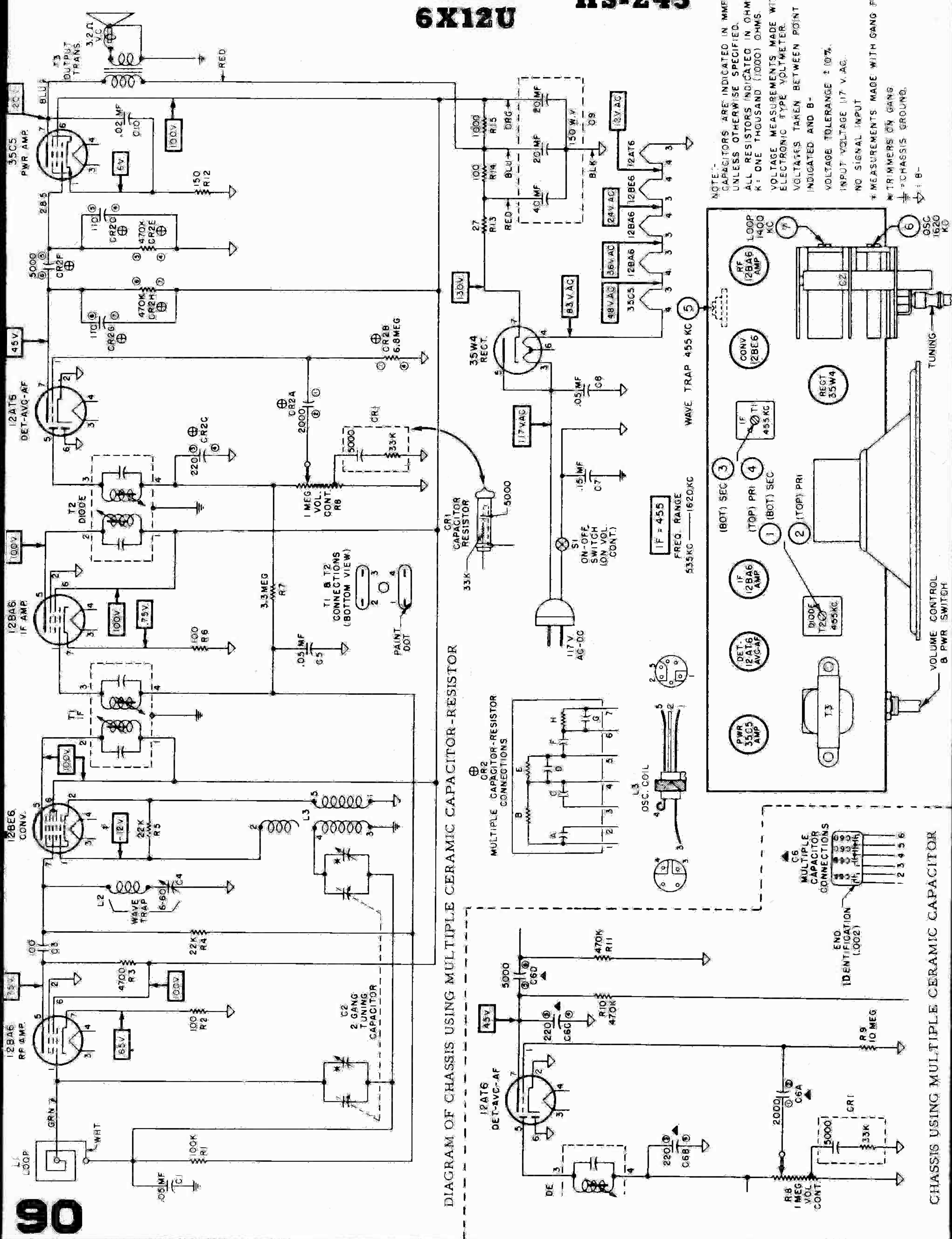
Models 5H11, 5H12, 5H13, Chassis HS-256, omits C3, uses common chassis.



Motorola Inc.

MODELS
6X11U
6X12U

CHASSIS
HS-245



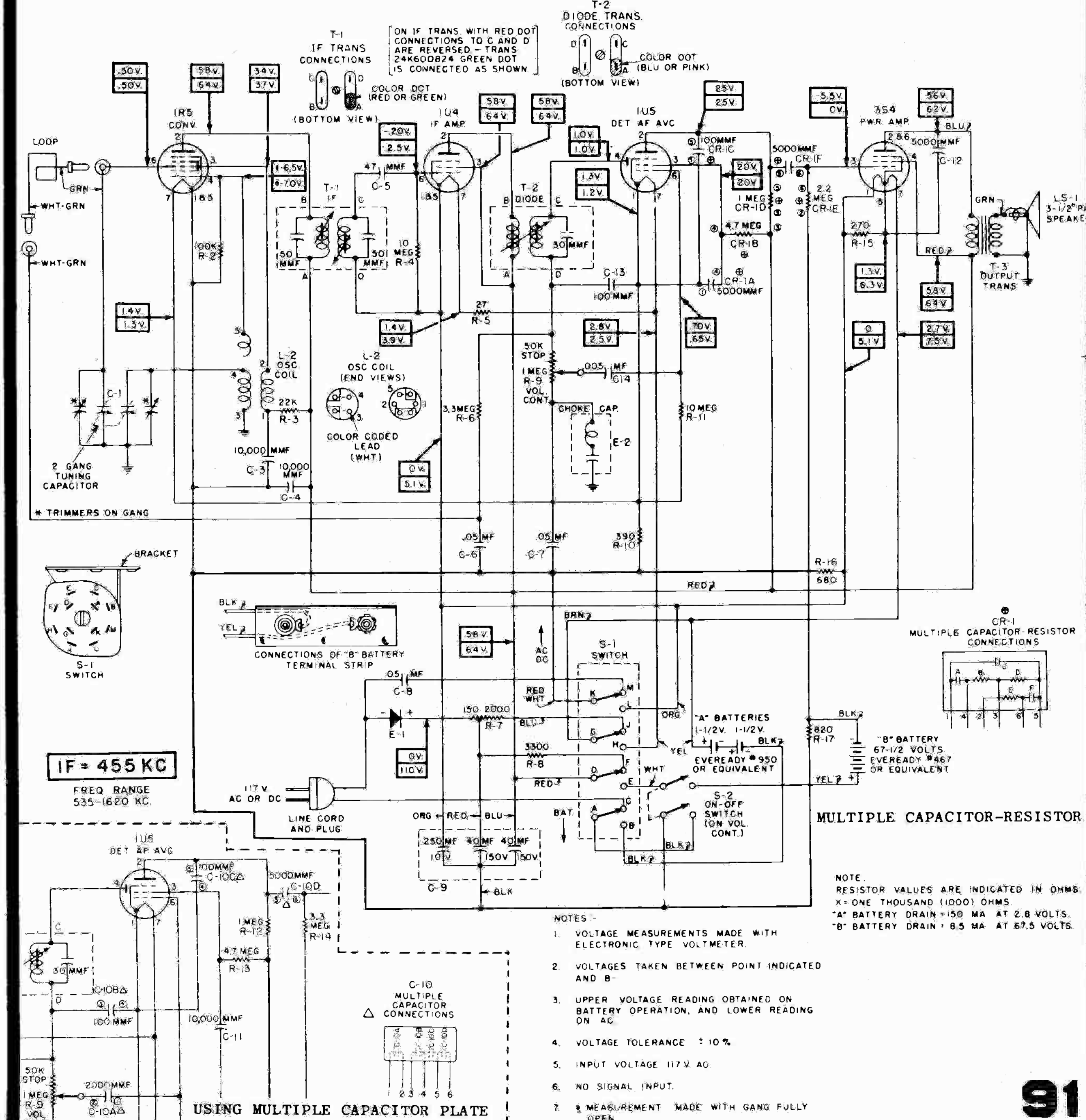
Motorola HOME Radio

MODELS

5L1 5L1U
5L2 5L2U
51L1U 51L2U
5J1 5J1U
5J2 5J2U

CHASSIS
HS-224
HS-250

The models listed at right with the suffix "U" use Chassis HS-224, the other models use Chassis HS-250. The circuit shown is exact for HS-250 using multiple capacitor-resistor plate. The insert diagram in the lower left hand corner shows differences in the HS-250 for a multiple capacitor plate. Chassis HS-224 uses both types of plates and differs from HS-250 in physical assembly and some circuit elements.



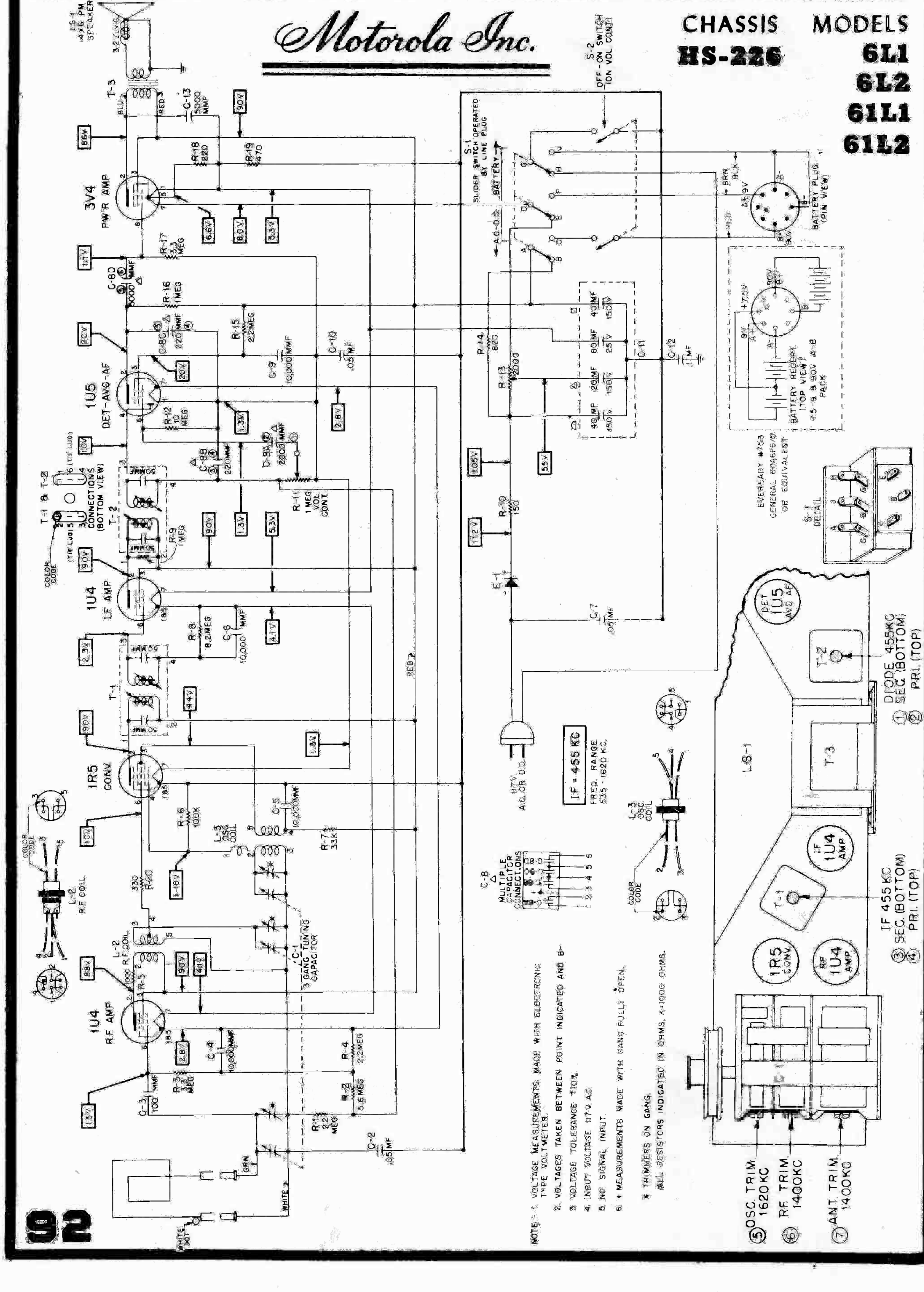
NOTES:-
1. VOLTAGE MEASUREMENTS MADE WITH ELECTRONIC TYPE VOLTMETER.
2. VOLTAGES TAKEN BETWEEN POINT INDICATED AND B-
3. UPPER VOLTAGE READING OBTAINED ON BATTERY OPERATION, AND LOWER READING ON AC.
4. VOLTAGE TOLERANCE ± 10%
5. INPUT VOLTAGE 117 V. AC
6. NO SIGNAL INPUT.
7. * MEASUREMENT MADE WITH GANG FULLY OPEN

NOTE.
RESISTOR VALUES ARE INDICATED IN OHMS.
K = ONE THOUSAND (1000) OHMS
"A" BATTERY DRAIN = 150 MA AT 2.8 VOLTS.
"B" BATTERY DRAIN = 8.5 MA AT 67.5 VOLTS.

Motorola Inc.

CHASSIS HS-226

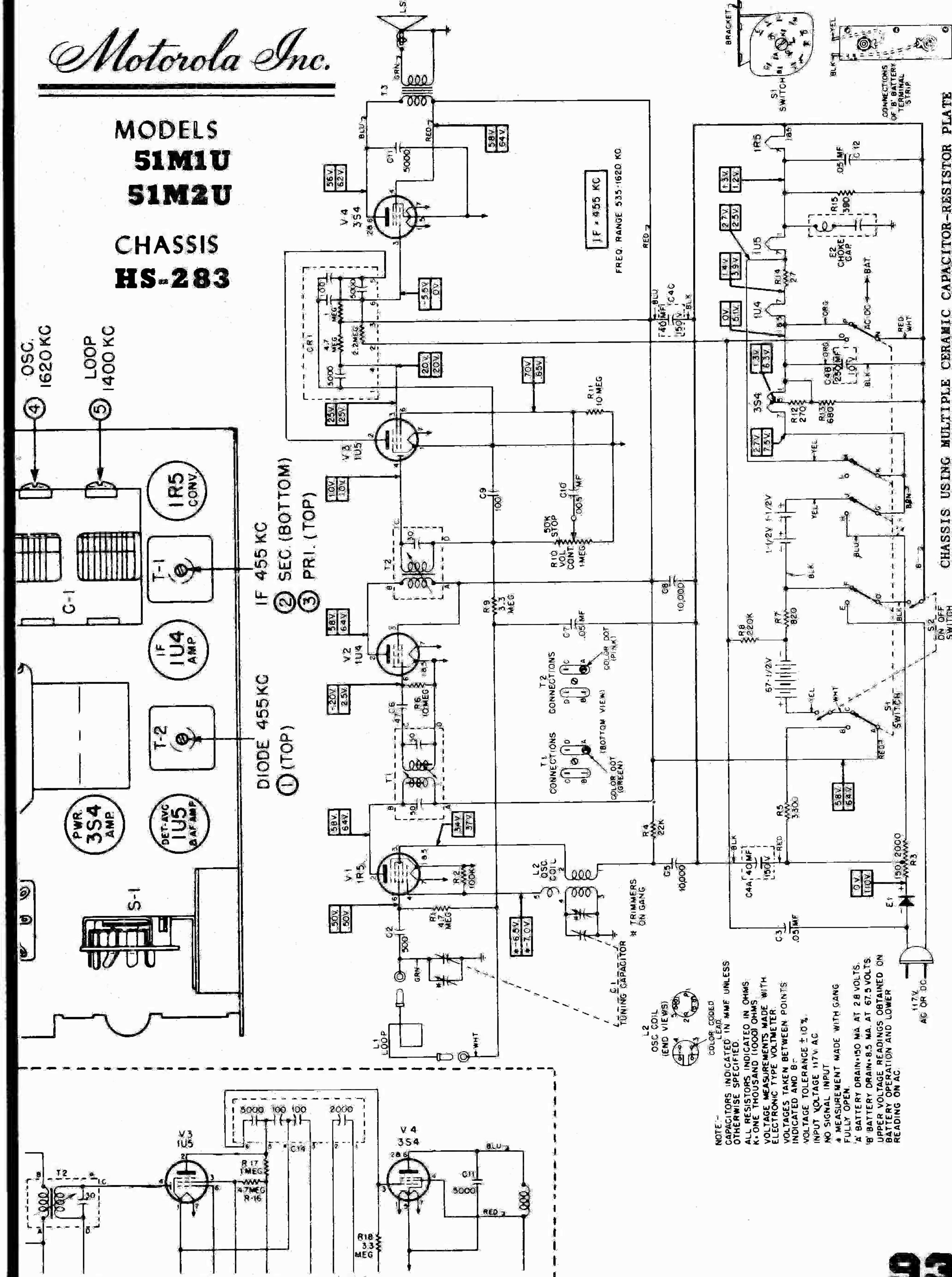
MODELS 6L1, 6L2, 61L1, 61L2



Motorola Inc.

MODELS
51M1U
51M2U

CHASSIS
HS-283

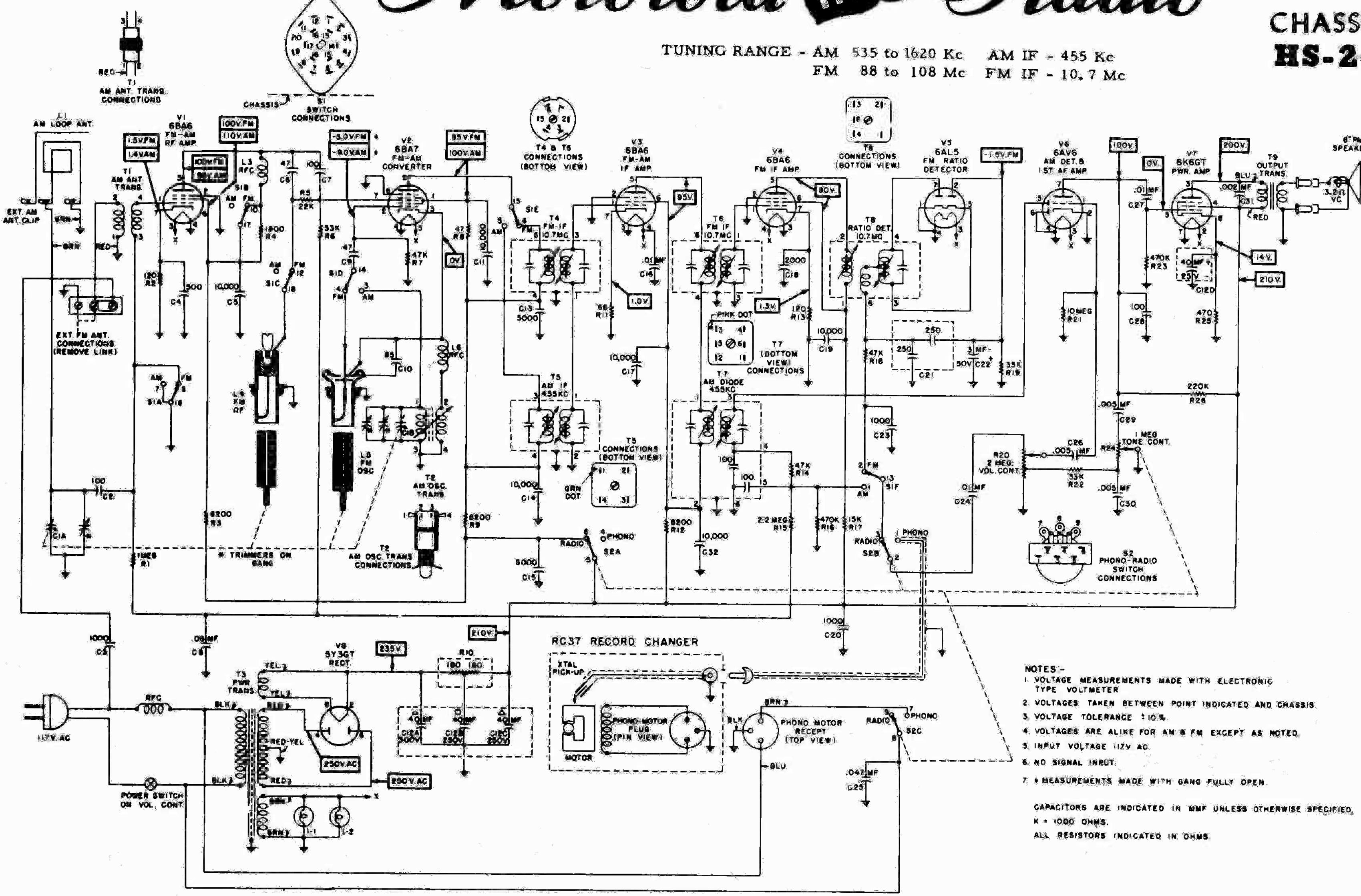


Motorola HOME Radio

MODELS 8FM21 8FM21B

CHASSIS HS-247

TUNING RANGE - AM 535 to 1620 Kc AM IF - 455 Kc
FM 88 to 108 Mc FM IF - 10.7 Mc



NOTES:-
1. VOLTAGE MEASUREMENTS MADE WITH ELECTRONIC TYPE VOLTMETER
2. VOLTAGES TAKEN BETWEEN POINT INDICATED AND CHASSIS.
3. VOLTAGE TOLERANCE ±10%.
4. VOLTAGES ARE ALIKE FOR AM & FM EXCEPT AS NOTED.
5. INPUT VOLTAGE 117V AC.
6. NO SIGNAL INPUT.
7. * MEASUREMENTS MADE WITH GANG FULLY OPEN.

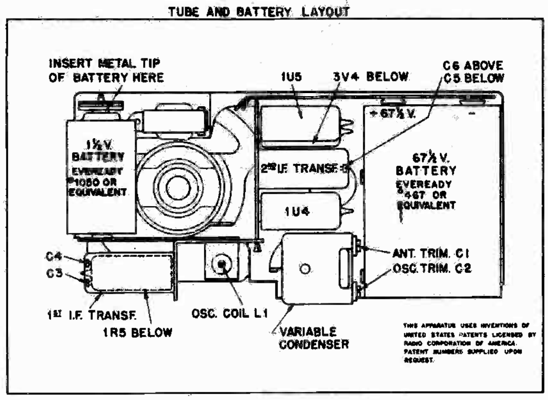
CAPACITORS ARE INDICATED IN MMF UNLESS OTHERWISE SPECIFIED.
K = 1000 OHMS.
ALL RESISTORS INDICATED IN OHMS.

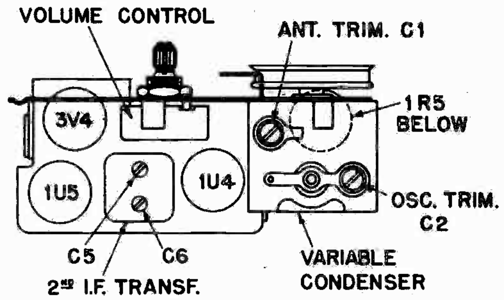
MANUAL OF 1951 MOST-OFTEN-NEEDED RADIO DIAGRAMS

OLYMPIC RADIO & TELEVISION INC.

MODEL 489

TUBE AND BATTERY LAYOUT



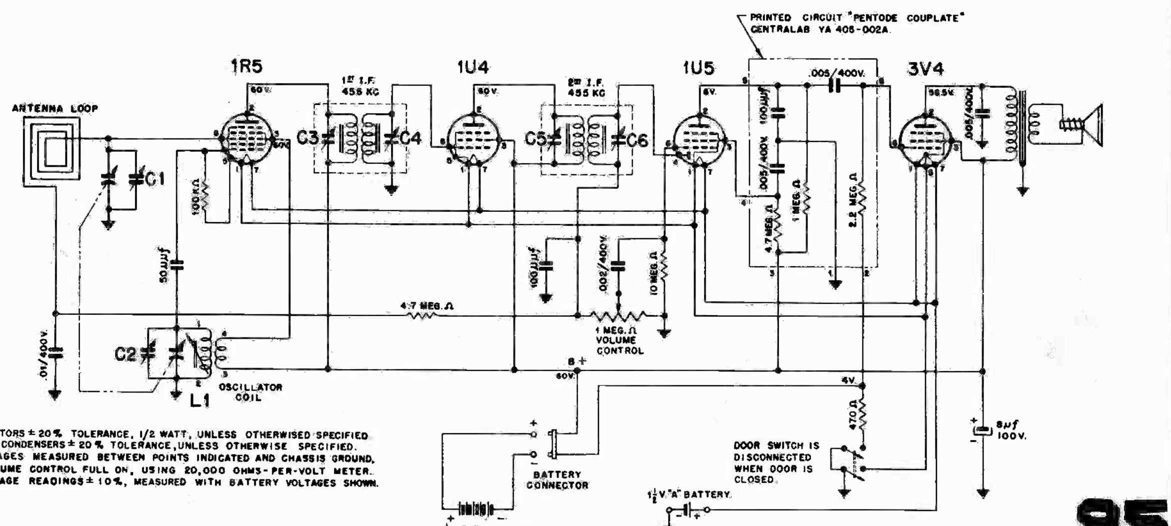


For alignment, the following equipment is required: A.M. modulated R.F. signal generator, VTVM or output meter, insulated screw driver, radiation loop (one turn of about 6" or 8" of #12 or #14 wire connected across the output of the signal generator and placed parallel to receiver loop about 8" away), one 0.1 mfd. 400 v. condenser.

Before aligning, close the variable condenser fully counterclockwise (plates fully closed) and check pointer position. Follow sequence in alignment procedure chart below.

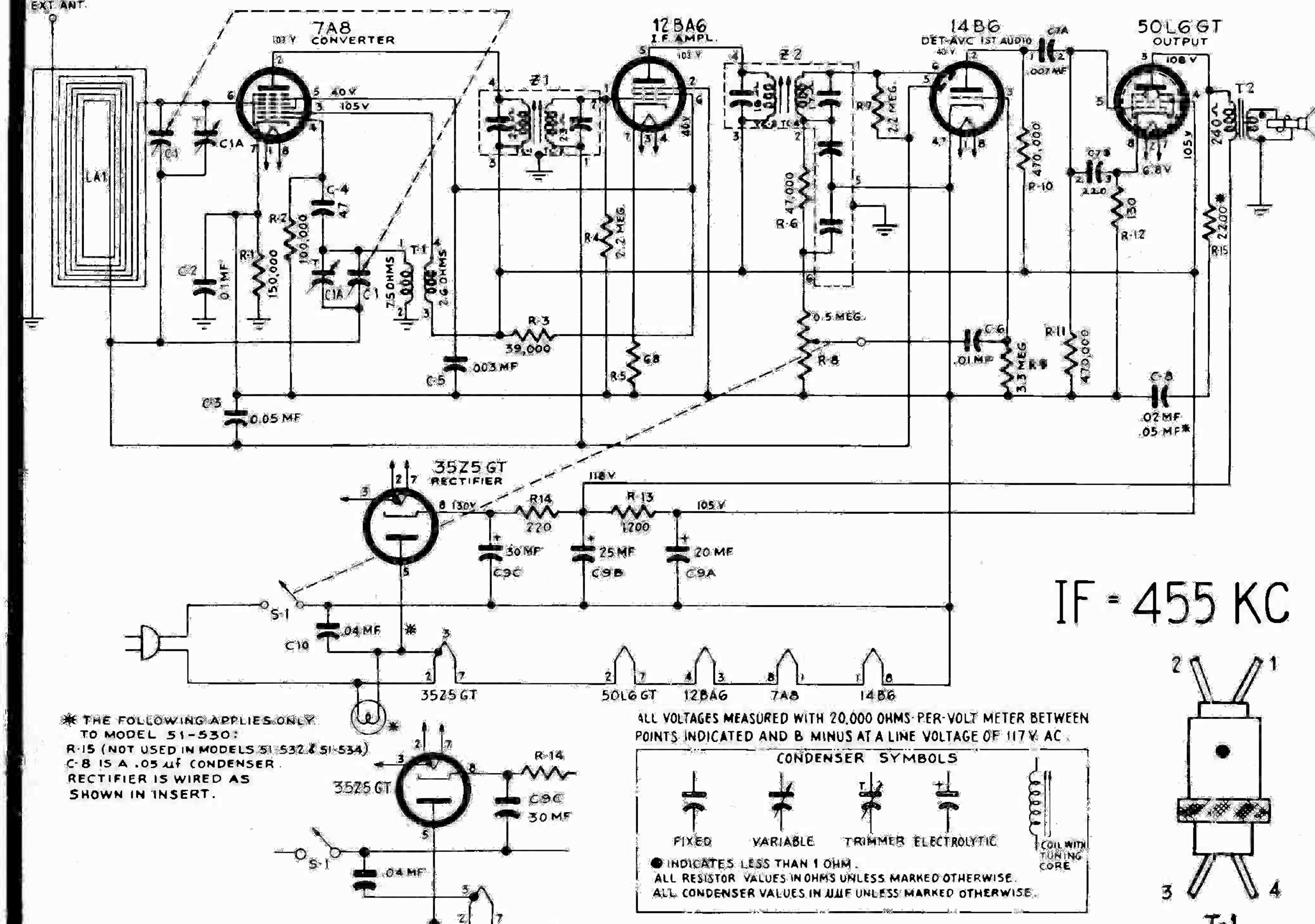
ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO-	SET SIGNAL GENERATOR TO-	SET POINTER TO-	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT. (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	R. F. SECTION OF VARIABLE CONDENSER IN SERIES WITH A .1 MFD. 400 VOLT CONDENSER.	455 KC.	EXTREME RIGHT HAND POSITION (CONDENSER PLATES FULLY OPEN.)	C6, C5, C4, C3 AND REPEAT IN SAME ORDER (1ST. AND 2ND. I.F. TRANFORMERS.)
2	USE RADIATED SIGNAL. (CONNECT BOTH SIDES OF SIGNAL GENERATOR TO RADIATION LOOP.)	1600 KC.	1600 KC. (160 ON DIAL)	C2 (OSCILLATOR TRIMMER)
3		1400 KC.	MAXIMUM SIGNAL (APPROX. 140 ON DIAL)	C1 (ANTENNA TRIMMER)
4		600 KC.	MAXIMUM SIGNAL (APPROX 60 ON DIAL)	ADJUST L1 ROCK VARIABLE FOR MAXIMUM SIGNAL.
5	REPEAT STEPS 2, 3 & 4 AT LEAST TWICE TO INSURE MAXIMUM SENSITIVITY & PROPER DIAL TRACKING.			



NOTES:
1. ALL RESISTORS ± 20% TOLERANCE, 1/2 WATT, UNLESS OTHERWISED SPECIFIED
2. ALL MICA CONDENSERS ± 20% TOLERANCE, UNLESS OTHERWISE SPECIFIED.
3. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND CHASSIS GROUND, WITH VOLUME CONTROL FULL ON, USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS ± 10%, MEASURED WITH BATTERY VOLTAGES SHOWN.

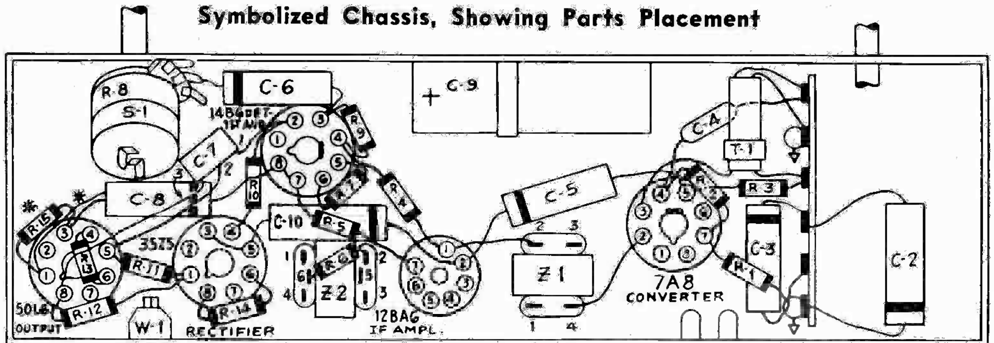
PHILCO RADIO MODELS 51-530, 51-532 and 51-534



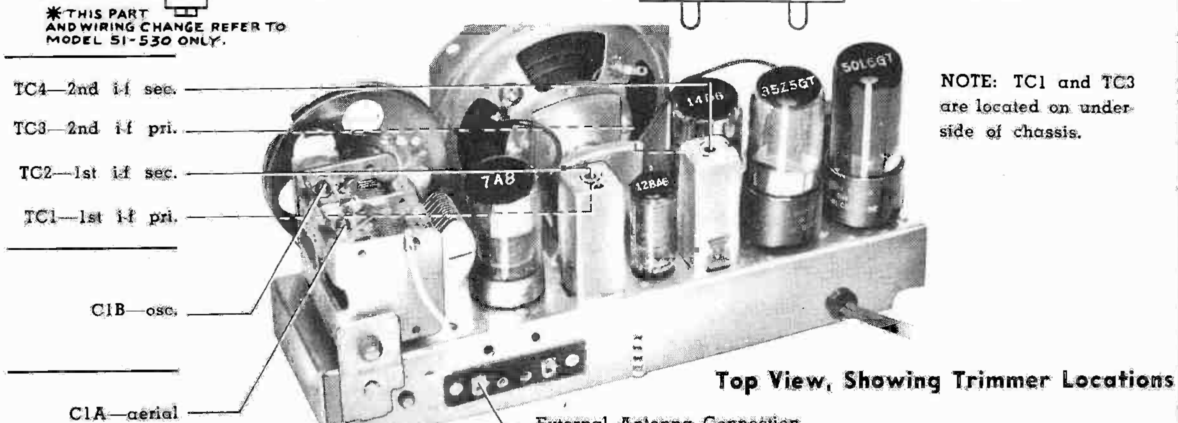
✱ THE FOLLOWING APPLIES ONLY TO MODEL 51-530:
R-15 (NOT USED IN MODELS 51-532 & 51-534)
C-8 IS A .05 μf CONDENSER.
RECTIFIER IS WIRED AS SHOWN IN INSERT.

ALL VOLTAGES MEASURED WITH 20,000 OHMS-PER-VOLT METER BETWEEN POINTS INDICATED AND B MINUS AT A LINE VOLTAGE OF 117V. AC.

Symbolized Chassis, Showing Parts Placement



✱THIS PART AND WIRING CHANGE REFER TO MODEL 51-530 ONLY.

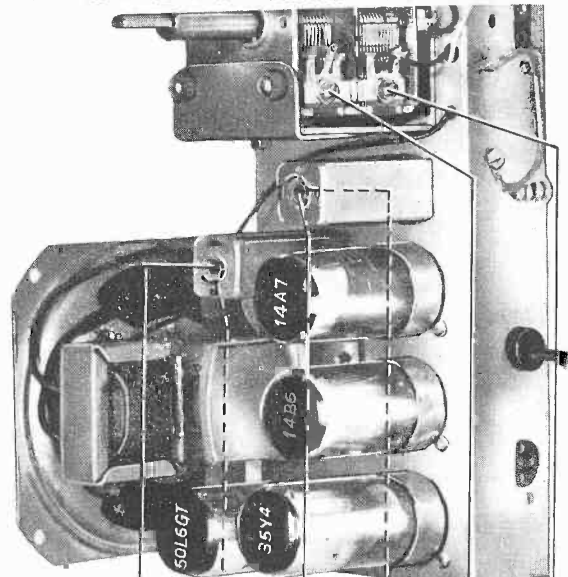


NOTE: TC1 and TC3 are located on underside of chassis.

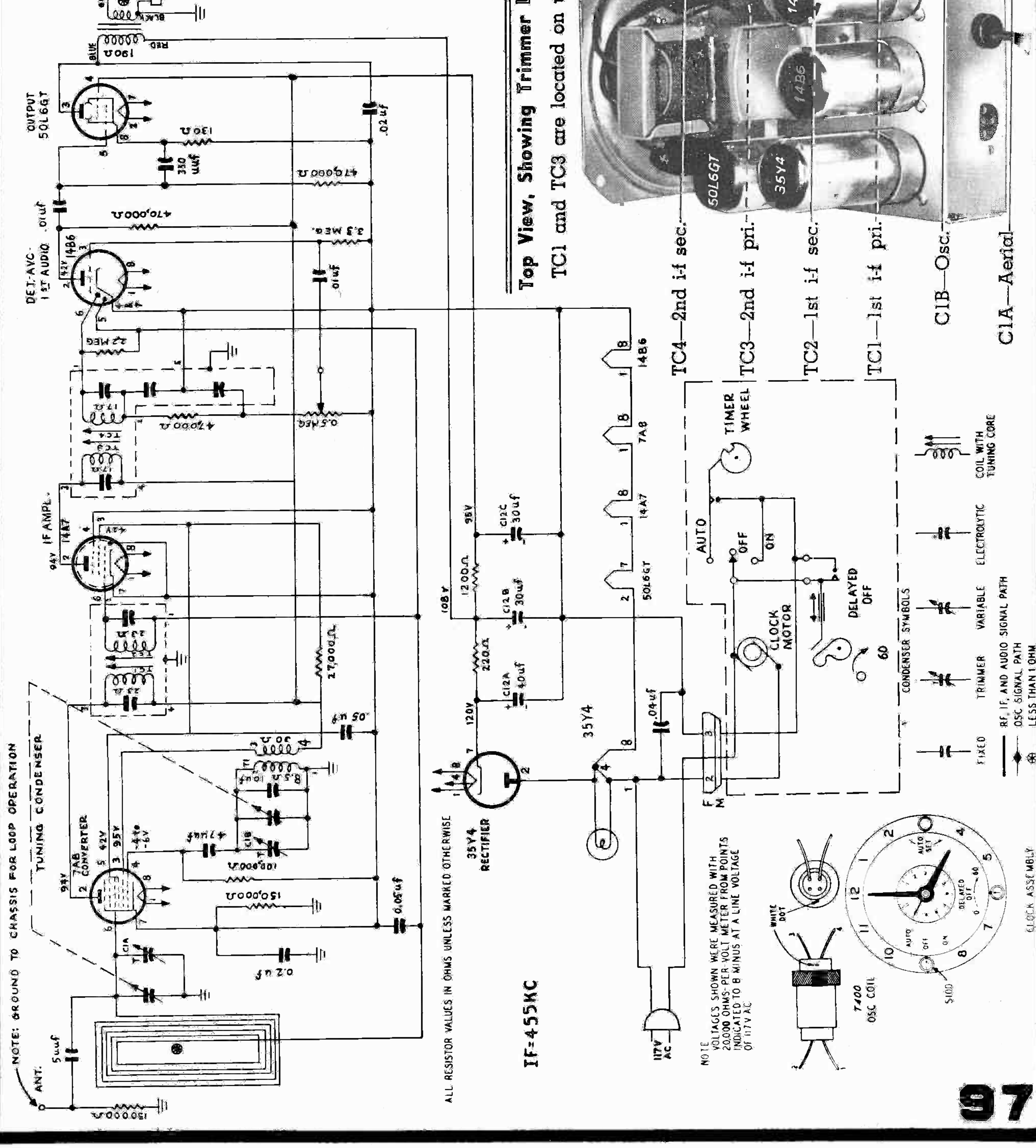
Top View, Showing Trimmer Locations

PHILCO RADIO-CLOCK, MODELS 51-537 and 51-537-I

Model 51-538 is identical in circuit to 51-537 here described. In some Model 51-538 sets (Code 122) a 12BA6 is used instead of 14A7. The Philco material in this manual is reprinted through the courtesy of Philco Corp.

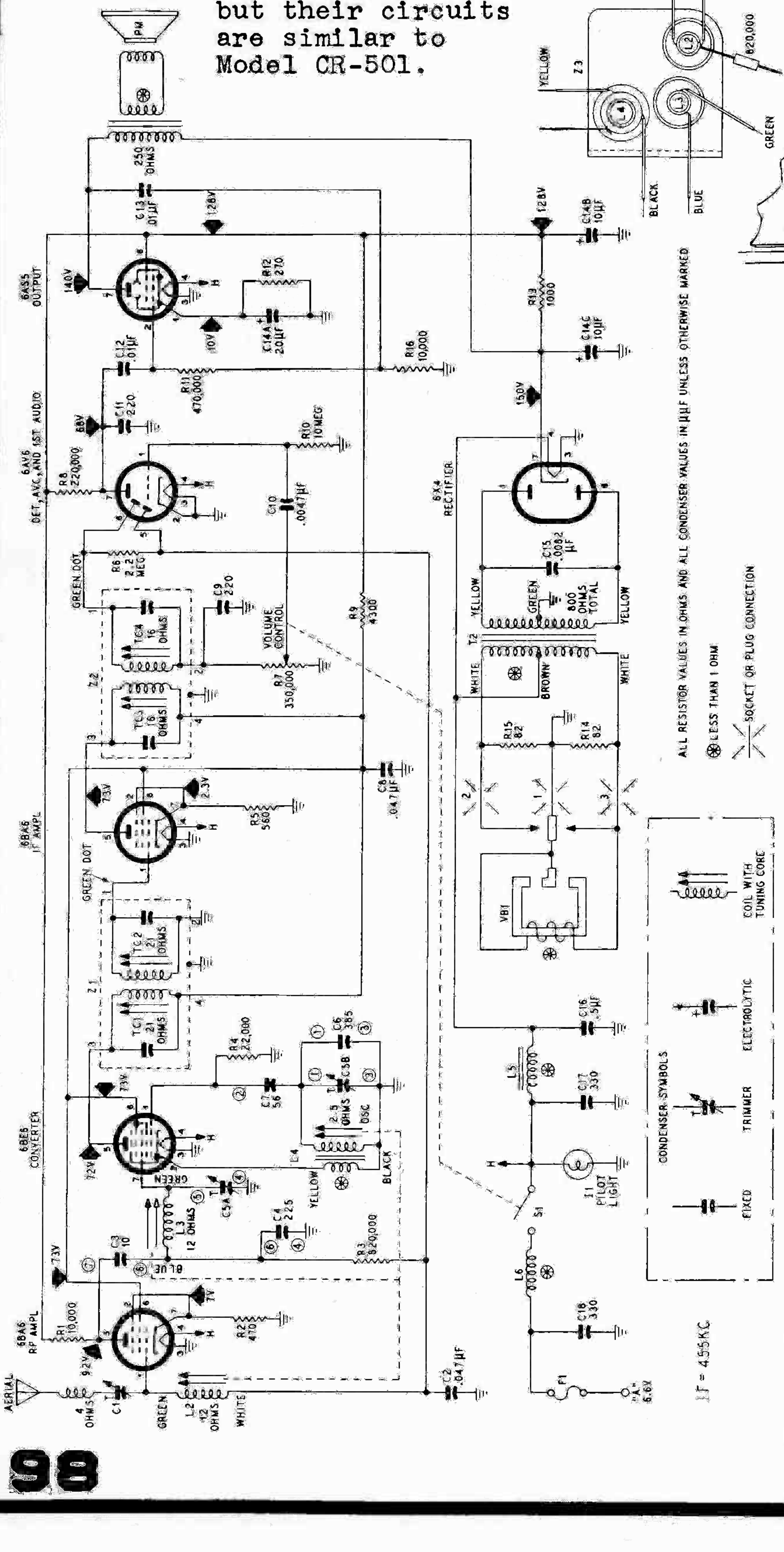


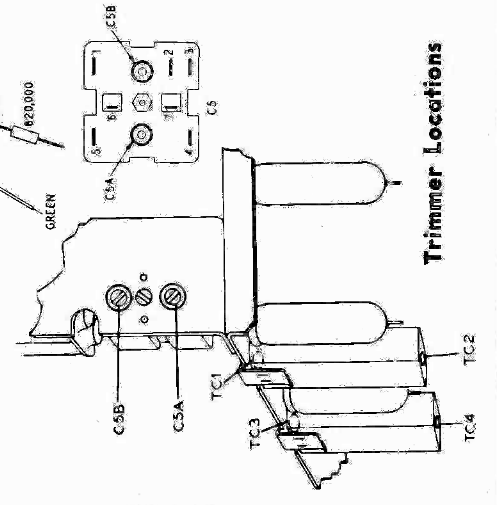
Top View, Showing Trimmer Location
TC1 and TC3 are located on underside of chassis.



PHILCO AUTO RADIO MODEL CR-501

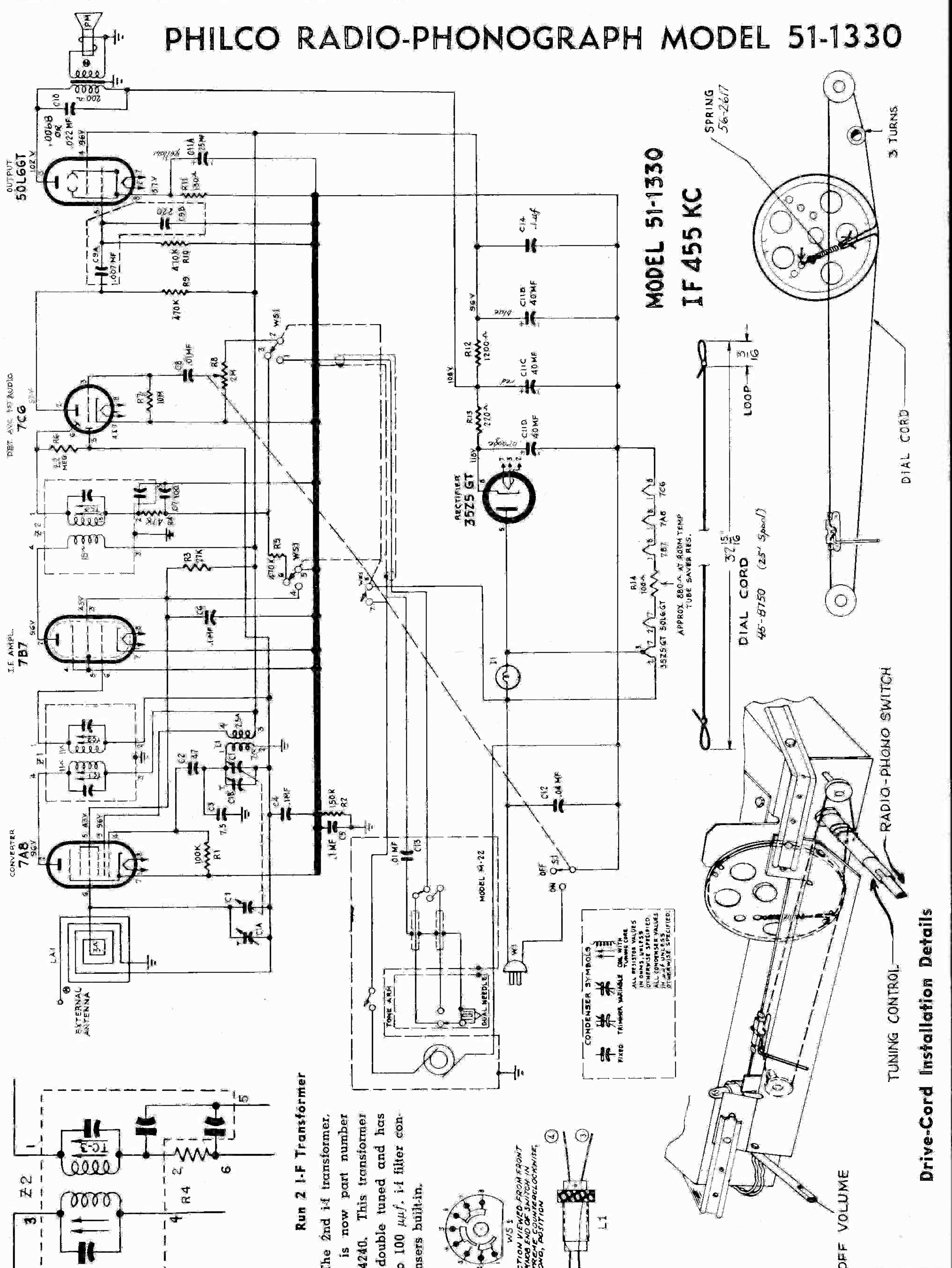
Models CR-503 and CR-505 have external speakers, and CR-505 uses push-buttons, but their circuits are similar to Model CR-501.





STEP	SIGNAL GENERATOR: CONNECTION TO RADIO	SIGNAL GENERATOR: DIAL SETTING	RADIO: DIAL SETTING	RADIO: SPECIAL INSTRUCTIONS	RADIO: ADJUST TRIMMER
1	Through .05-μf. condenser to converter grid (pin 7 of 6BE6).	455 kc.	Maximum counterclockwise	Adjust cores, in order given, for maximum output. TC1 and TC3 are reached through holes in bottom of i-f transformers.	TC4—2nd i-f sec. TC3—2nd i-f pri. TC2—1st i-f sec. TC1—1st i-f pri.
2	Through dummy aerial.	1605 kc.	1605 kc.	Adjust for maximum output.	C5B—osc. trimmer C5A—r-f trimmer C1—aerial trimmer
3			Tune to weak station near 1600 kc.	Readjust trimmer C1, with radio installed in car and aerial fully extended.	C1—aerial trimmer

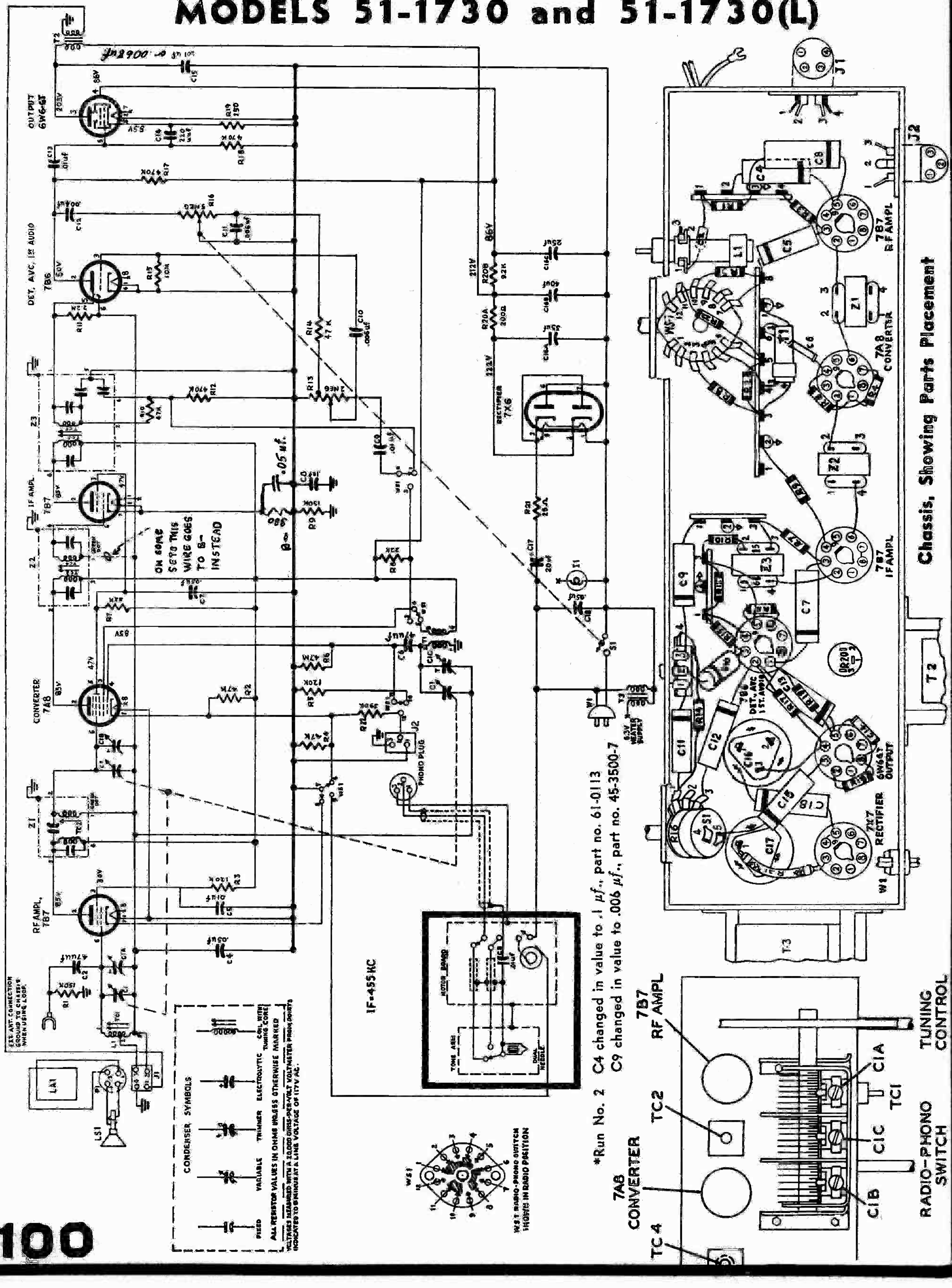
PHILCO RADIO-PHONOGRAPH MODEL 51-1330



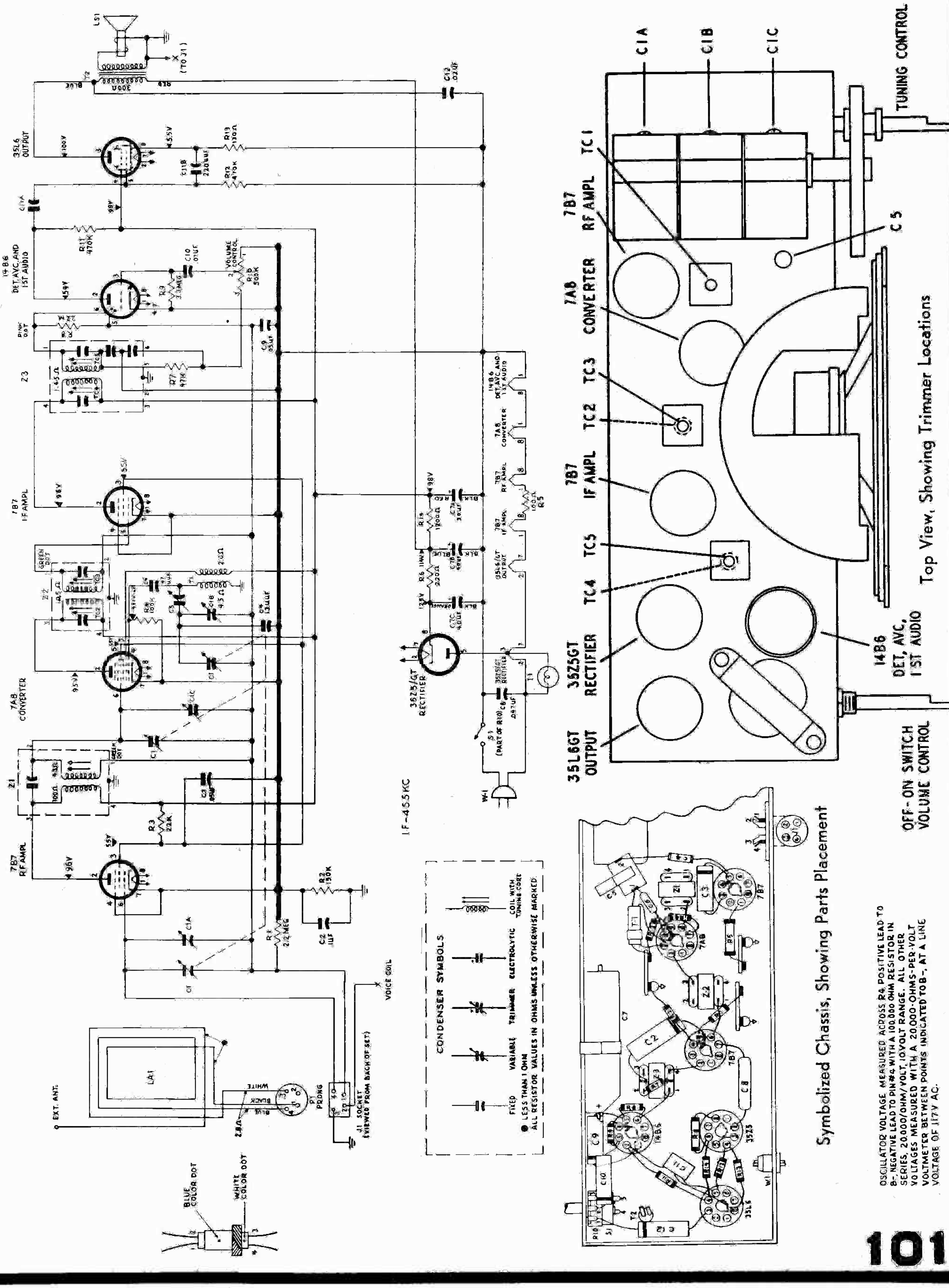
Run 2 I-F Transformer

The 2nd i-f transformer, Z2, is now part number 32-4240. This transformer is double tuned and has two 100 $\mu\mu f$. i-f filter condensers built-in.

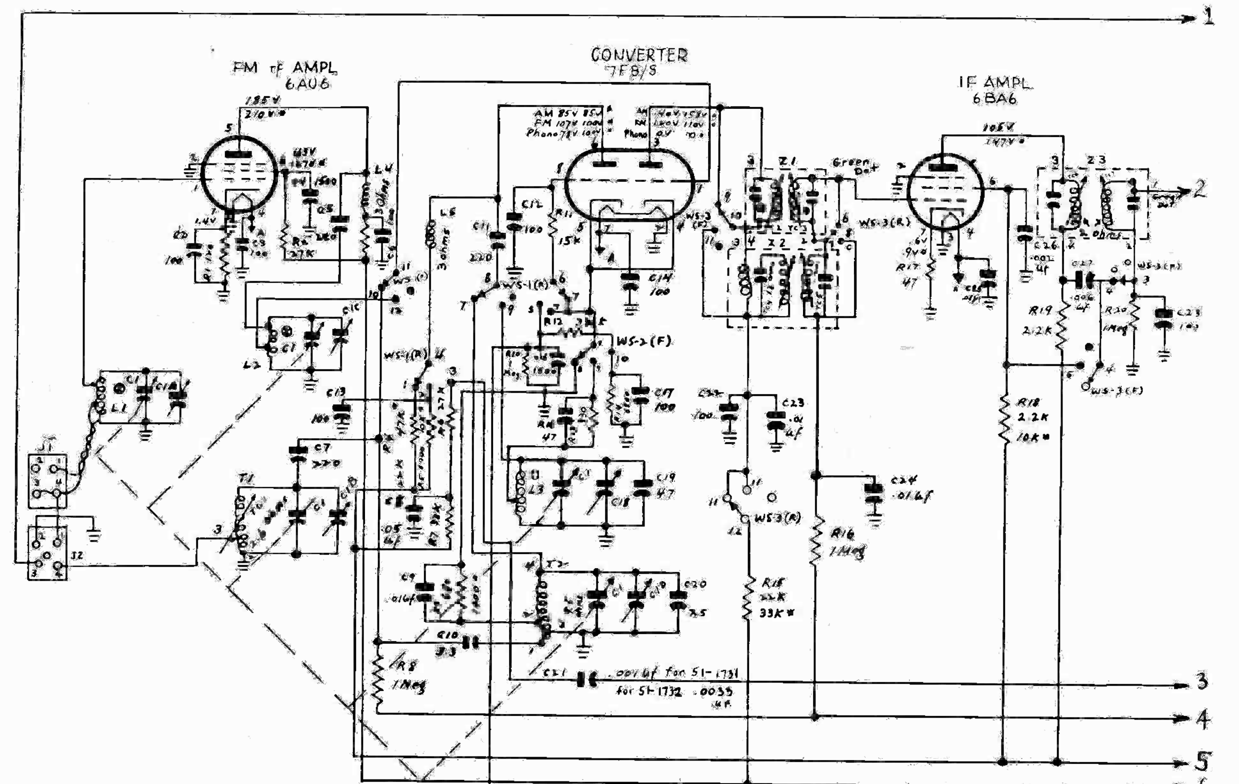
PHILCO RADIO-PHONOGRAPH
MODELS 51-1730 and 51-1730(L)

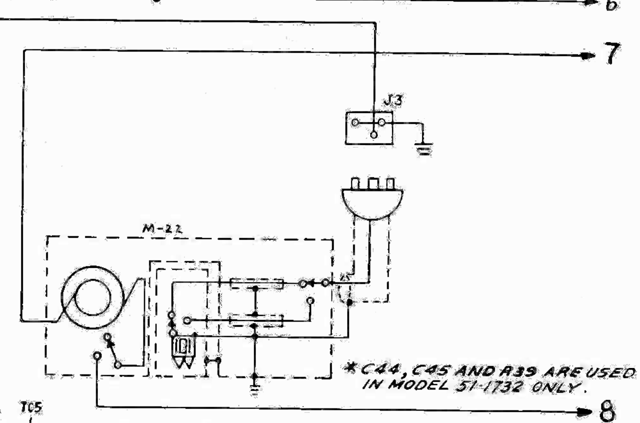


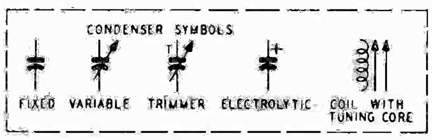
PHILCO RADIO MODELS 51-930, 51-931 AND 51-932



PHILCO RADIO-PHONOGRAPH MODELS 51-1731 and 51-1732







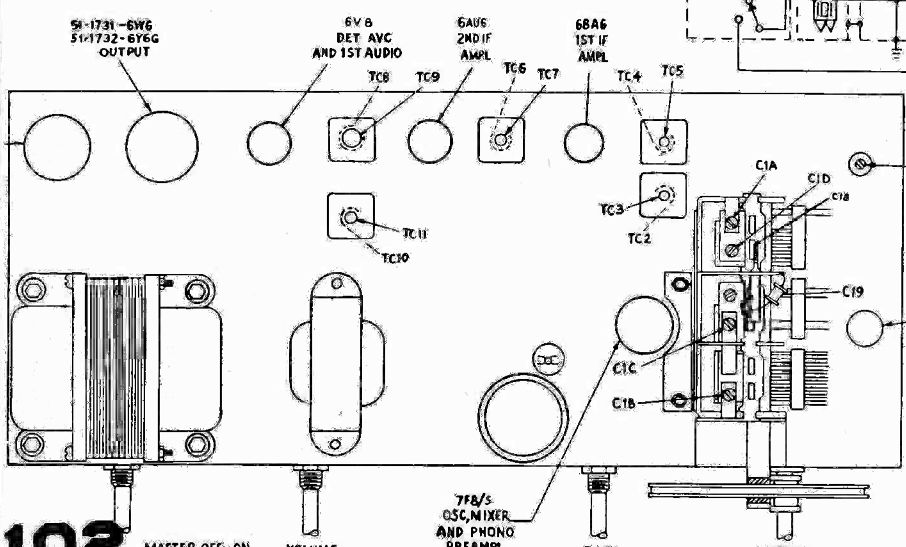
ALL RESISTOR VALUES IN OHMS AND ALL CONDENSER VALUES IN µµF UNLESS MARKED OTHERWISE

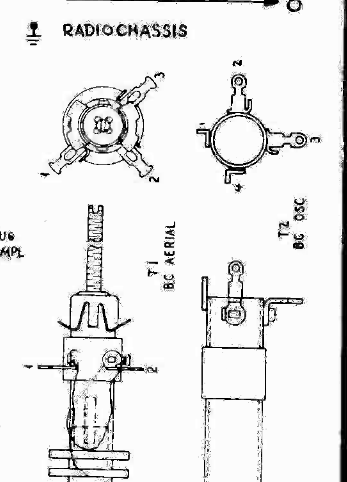
VOLTAGES WERE MEASURED FROM POINTS INDICATED TO GROUND WITH A 20,000-OHMS-PER-VOLT METER AT A LINE VOLTAGE OF 117VAC

⊕ INDICATES LESS THAN 1 OHM

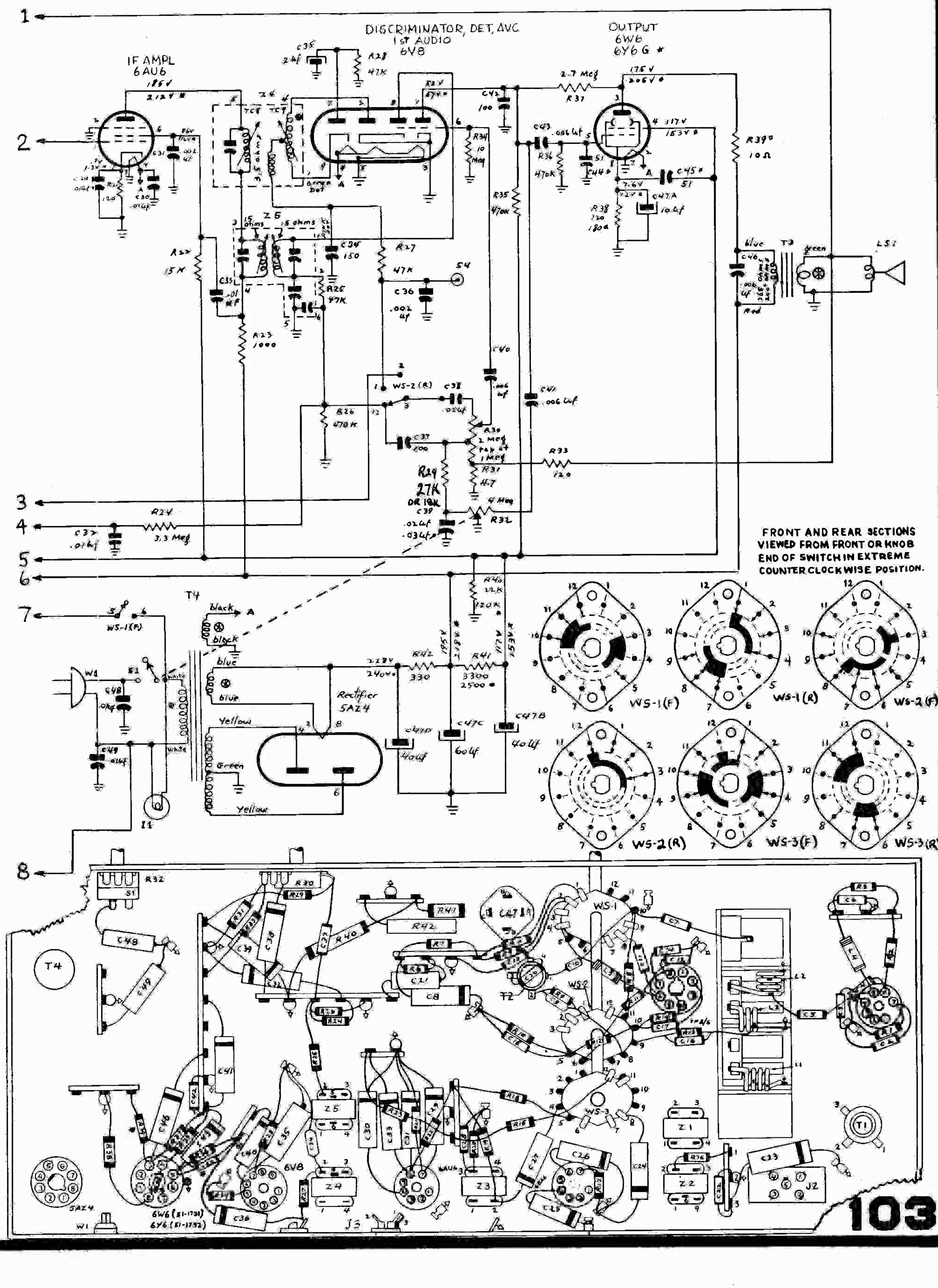
* THE PARTS VALUES AND VOLTAGES MARKED WITH AN ASTERISK APPLY TO MODEL 51-1732

Top View, Showing Trimmer Locations





Philco Radio-Phonograph Models 51-1731 and 51-1732, continued,
(Alignment Information on the next page).



Philco Models 51-1731 and 51-1732 Alignment Information (continued)

AM ALIGNMENT PROCEDURE

Make alignment with loop aerial connected to radio. The AM alignment should be made before the FM alignment.

DIAL POINTER: Calibration and pointer-index measurements are shown in figure 3. With tuning gang fully meshed, set pointer to index mark.

OUTPUT METER: Connect across speaker voice-coil terminals.

SIGNAL GENERATOR: Connect AM r-f signal generator as indicated in chart. Generator ground lead to chassis. Use modulated output.

RADIO CONTROLS: Set volume control to maximum, tone control counterclockwise, and band switch to broadcast position.

OUTPUT LEVEL: During alignment, adjust signal-generator output to hold output meter indication below 1.25 volts.

STEP	SIGNAL GENERATOR		RADIO		ADJUST TRIMMER
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .01-μf. condenser to mixer grid, pin 1, of 7F8/S.	455 kc.	Gang fully meshed.	Adjust, in order given, for maximum output.	TC11—2nd AM i-f sec. TC10—2nd AM i-f pri. TC5—1st AM i-f sec. TC4—1st AM i-f pri.
2	Radiating loop. (See Note below.)	1600 kc.	1600 kc.	Adjust for maximum output.	C1D—AM osc. shunt
3	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum output.	C1B—AM ant. shunt
4	Same as step 2.	580 kc.	580 kc.	Adjust for maximum output. This should not be necessary unless T1 (aerial transformer) has been replaced.	TC1—AM ant. tuning core

RADIATING LOOP: Make up a 6-to-8 turn, 6-inch-diameter loop, using insulated wire; connect to signal generator leads and place near radio loop aerial.

FM ALIGNMENT PROCEDURE

Make the AM alignment first.

RADIO CONTROLS: Set volume control to maximum, tone control counterclockwise, and band switch to FM position. Allow radio and signal generator to warm up for at least 15 minutes before making alignment.

SIGNAL GENERATOR: Use a signal generator capable of delivering a 9.1-mc. FM signal with a deviation of ±80 kc., and modulated AM signals of 92 mc., 105 mc., and 108 mc. Philco Model 7008 Precision Visual Alignment Generator fulfills these requirements. NOTE: The signal generator must be well bonded to radio chassis.

OSCILLOSCOPE: Connect to FM Test jack. Model 7008 is suggested.

OUTPUT METER: Connect across speaker voice-coil terminals.

R-F COIL NOTE: Check resonance of circuits containing coils L1, L2, and L3 by inserting each end of a tuning wand, such as Philco Part No. 45-8885, into coil. If signal strength increases when powdered-iron end is inserted, compress turns slightly. If signal strength increases when brass end is inserted, spread turns slightly. If signal strength decreases when each end is inserted, no adjustment is necessary. Do no spread or compress turns excessively; only a small change is required at these high frequencies.

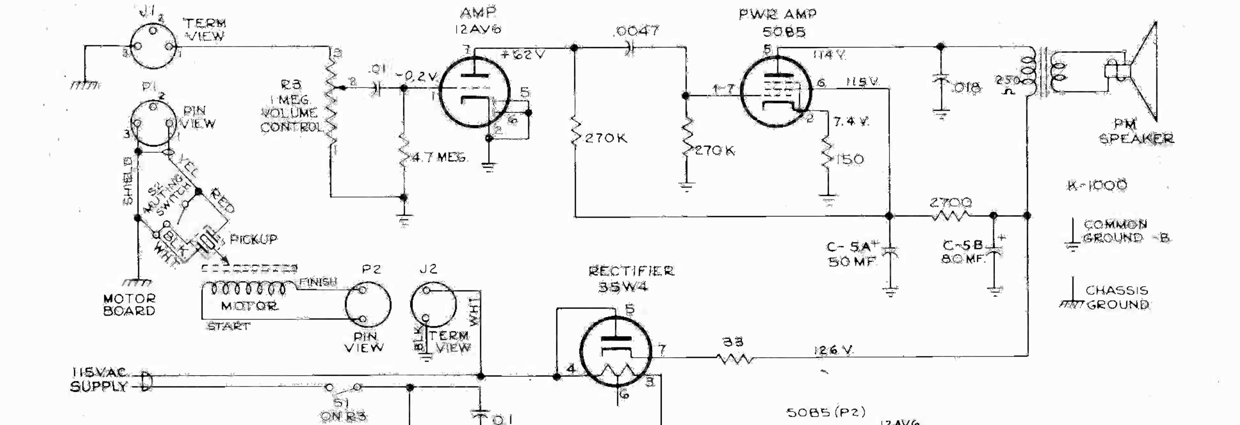
STEP	SIGNAL GENERATOR		RADIO		ADJUST TRIMMER
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through a .01-μf. condenser to pin 1 of 6AU6 I-F amplifier.*	9.1 mc. ± 80 kc. deviation.	Gang fully meshed.	Adjust TC9 for correct crossover. Adjust TC8 for maximum and equal peaks. Repeat.	TC9—FM det. sec. TC8—FM det. pri.
2	.01-μf. condenser to pin 1 of 6BA6.*	9.1 mc. ± 80 kc. deviation.	Gang fully meshed.	Adjust, in order given, for maximum and equal peaks. Repeat.	TC7—FM 2nd i-f sec. TC6—FM 2nd i-f pri.
3	.01-μf. condenser to pin 1 of 7F8/S.*	9.1 mc. ± 80 kc. deviation.	Gang fully meshed.	Adjust, in order given, for maximum and equal peaks. Repeat.	TC3—FM 1st i-f sec. TC2—FM 1st i-f pri.
4	Through a 300 ohm dummy aerial to FM aerial socket, J1.	108 mc.	108 mc.	Adjust trimmer for maximum reading on output meter.	C18—FM osc.
5	Same as step 4.	105 mc.	105 mc.	Adjust for maximum output while rocking gang.	C1C—FM r-f C1A—FM aerial
6	Same as step 4.	92 mc.	92 mc.	Adjust coils, in order given, for proper resonance	L3—FM osc. coil L2—FM r-f coil L1—FM aerial coil

*CAUTION: Do not overload! When aligning the i-f stages, the curve will be distorted or destroyed if too great a signal is used. To check, attenuate the signal input. If the curve changes in form, rather than merely decreasing in amplitude, the stage is overloaded.

RCA VICTOR

MODELS 45-EY-1, 45-EY-15

Chassis Nos. RS-132F, RS-132H

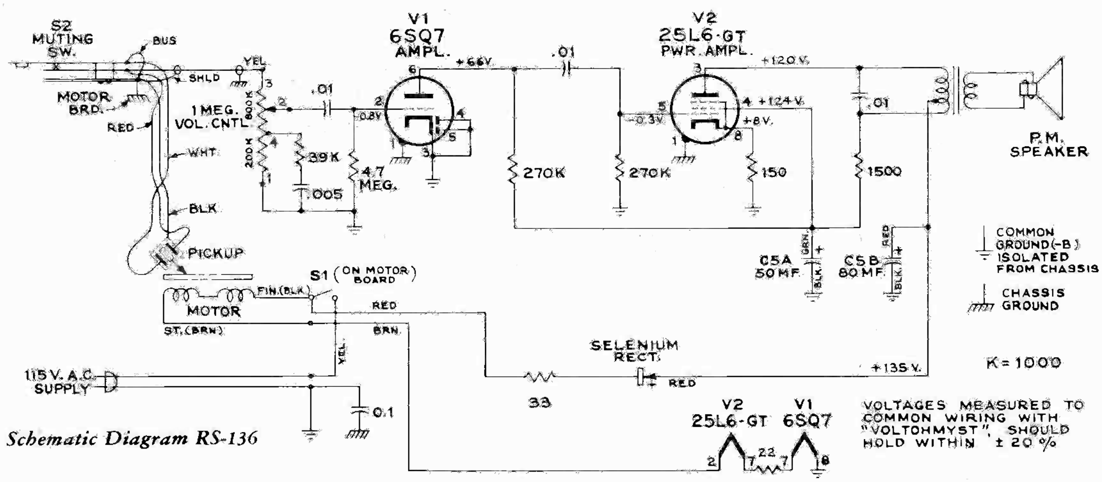


VOLTAGES MEASURED TO COMMON WIRING WITH "VOLTOHMYST", SHOULD HOLD WITHIN ±20 %

RCA VICTOR

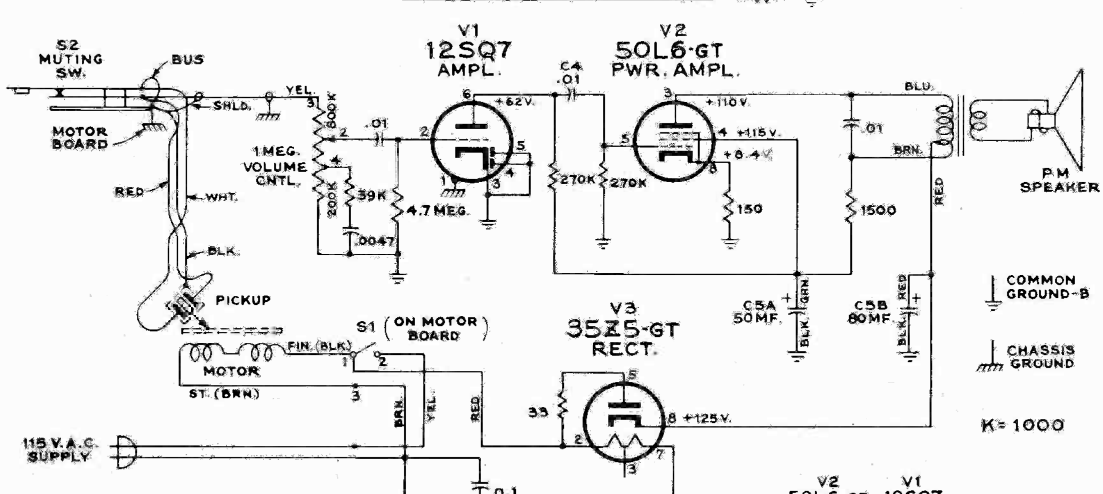
MODEL 45-EY-3

Chassis No. RS-136, RS-136A

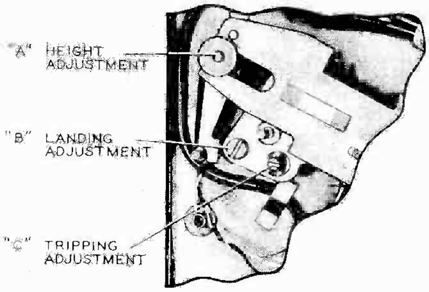


VOLTAGES MEASURED TO COMMON WIRING WITH "VOLTOHMYST", SHOULD HOLD WITHIN ±20 %

Schematic Diagram RS-136



Schematic Diagram RS-136A



RCA VICTOR

Automatic Record Player

MODEL 45-EY-2

Chassis No. RS-138, RS-138A

Critical Lead Dress

1. Dress all leads away from R6 and R9
2. Dress electrolytic capacitor away from R6 and R9
3. Dress filament leads down to chassis
4. Solder braid of W-1 such that it acts as a strain relief

Pickup Height Adjustment

Adjust knurled nut (A) until the distance (during change cycle) between the top of the turntable and the stylus point is approximately 1⅛"

Pickup Landing Adjustment

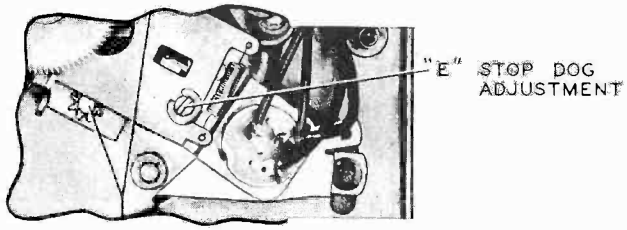
Adjust the screw driver landing adjustment stud "B" so the stylus lands 2⅝" ± 1/64" from the side of the center post.

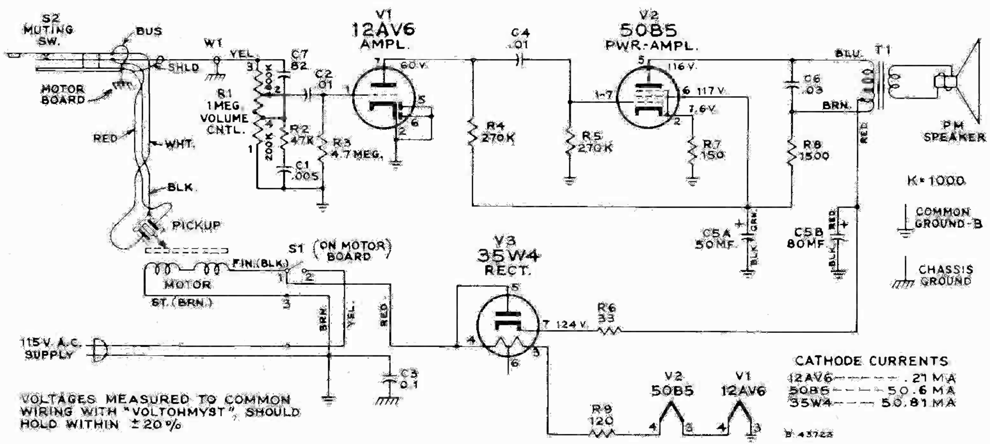
Tripping Adjustment

Adjust the eccentric tripping stud (C) until the mechanism trips when the stylus is 1 19/32" from the side of the center post.

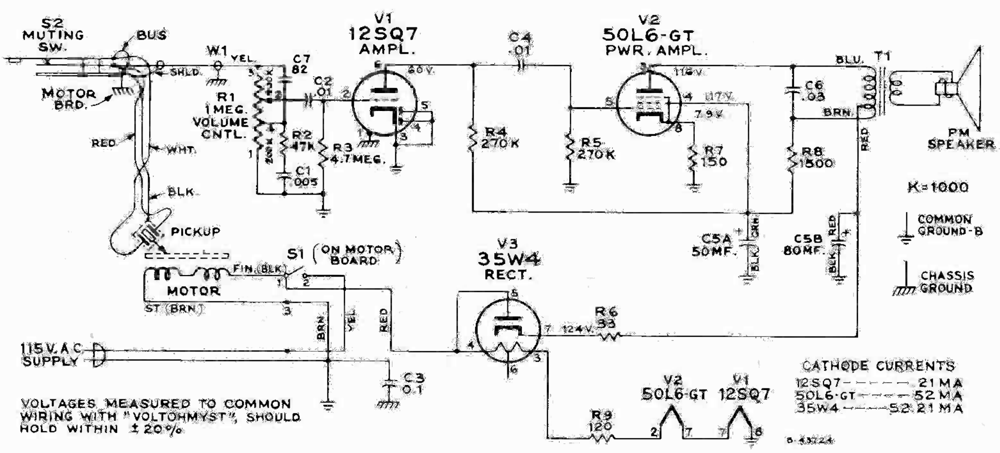
Stop Dog Adjustment

Turn the eccentric screw (E) until the record drops to the turntable without striking the pickup arm.





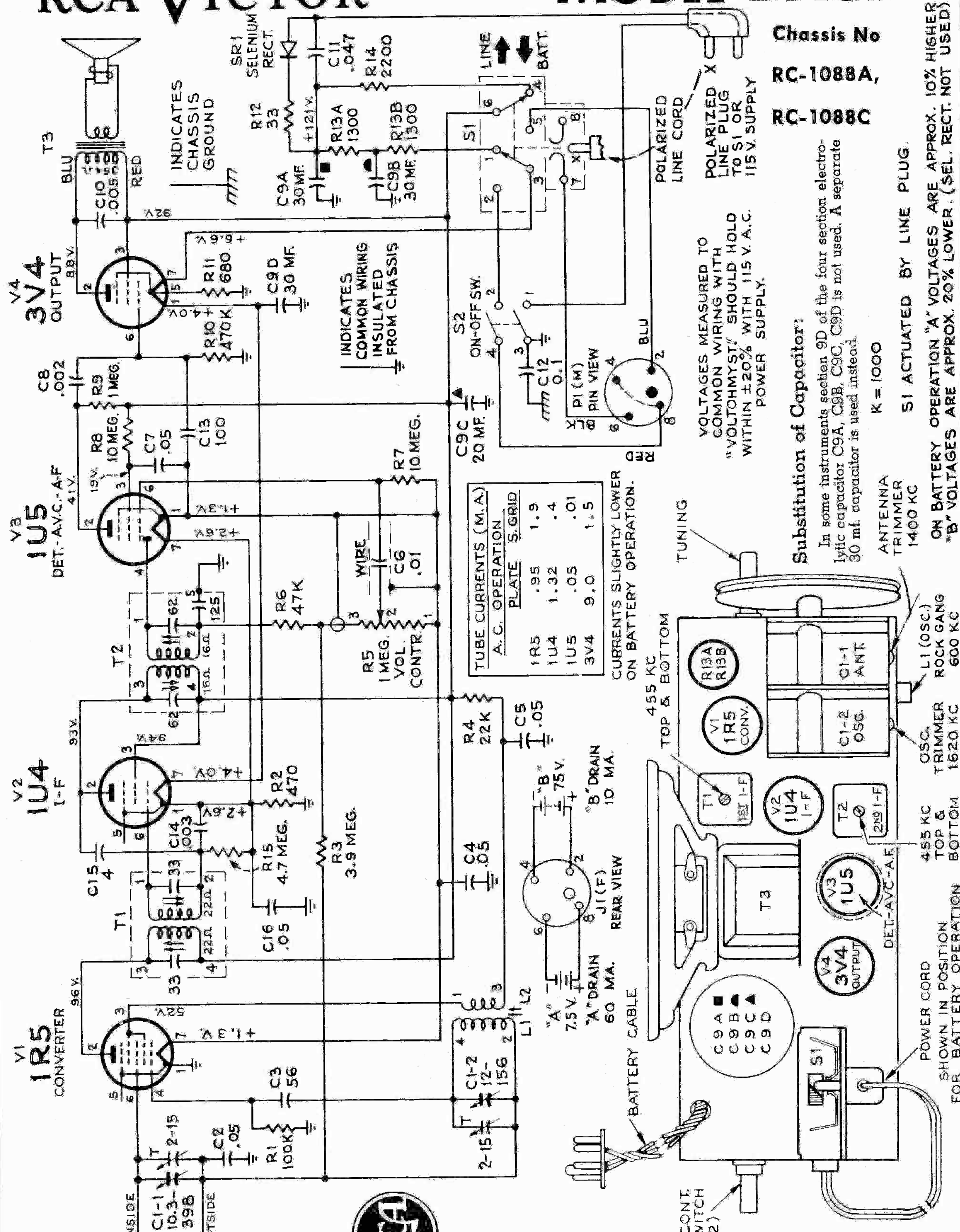
Schematic Diagram RS138



Schematic Diagram RS138A

RCA VICTOR — MODEL BX57

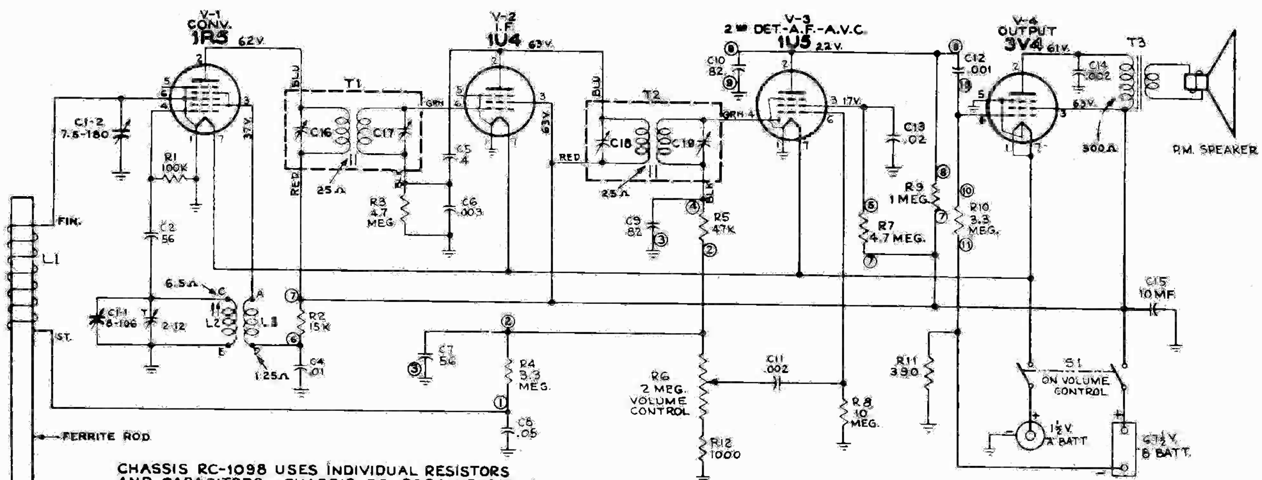
Chassis No RC-1088A, RC-1088C



RCA VICTOR

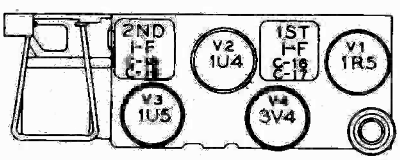
MODEL B-411

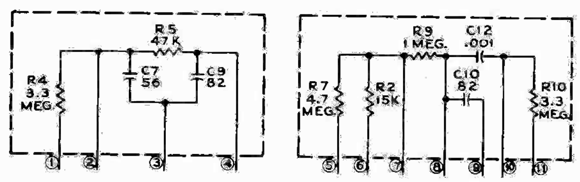
Chassis No. RC-1098 or RC-1098A



CHASSIS RC-1098 USES INDIVIDUAL RESISTORS AND CAPACITORS. CHASSIS RC-1098A USES TWO "PRINTED CIRCUIT" ELEMENTS (B-942660-1 & B-942659-1). CONNECTION POINT NOS. ① TO ⑪ REFER TO PRINTED CIRCUIT ELEMENTS.

ALL RESISTANCE VALUES IN OHMS. K = 1000. ALL CAPACITANCE VALUES LESS THAN 1.0 IN MF. AND ABOVE 1.0 IN MMF. UNLESS OTHERWISE INDICATED.





DIODE FILTER UNIT
B 942660-1

AUDIO COUPLING UNIT
B 942659-1

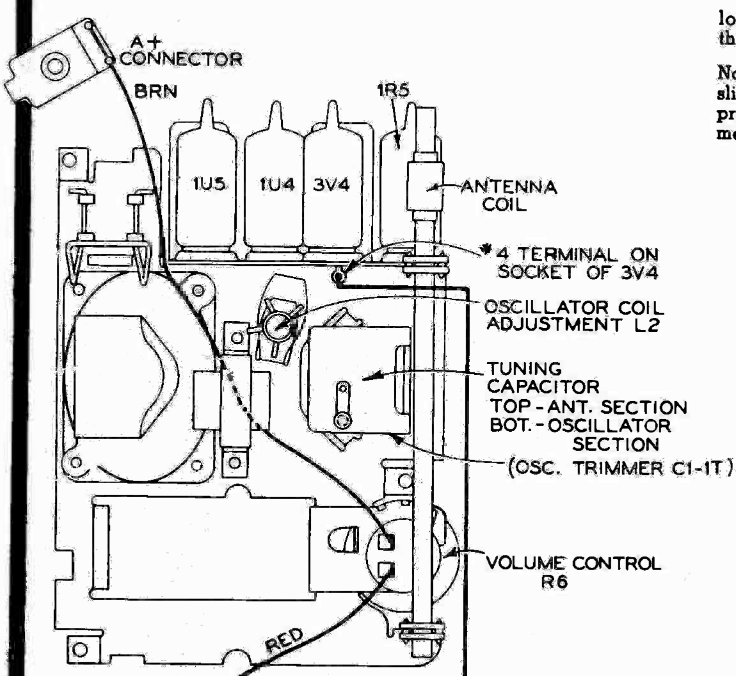
Output Meter.—Connect meter from No. 2 terminal of V4 (plate of 3V4) to ground. Turn volume control to maximum position.

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

Note:—The inductance of the antenna coil is adjusted by sliding the coil along the Ferrite rod. This ant. coil is supplied pre-adjusted and cemented to rod. This makes further adjustment unnecessary.

Steps	Connect the high side of test osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Connection lug of C1-2 located on rear of gang in series with .01 mf.	455 kc	Quiet point near 1600 kc	C18, C19 2nd I-F trans.
2				C16, C17 1st I-F trans.
3		Repeat steps 1 and 2		
4	*Antenna coupling loop (Chassis in case)	1400 kc	14 Rock gang	C1-1T (osc.)
5		600 kc	60 Rock gang	L2 (osc.)
6		Repeat steps 4 and 5		

*Steps 4 and 5 require a coupling loop from the signal generator to feed a signal into the receiver ant. coil. This loop should be loosely coupled to the receiver antenna coil so as not to disturb the receiver ant. coil inductance.



Tube and Trimmer Locations

MODEL A-108

Chassis No. RC 1096

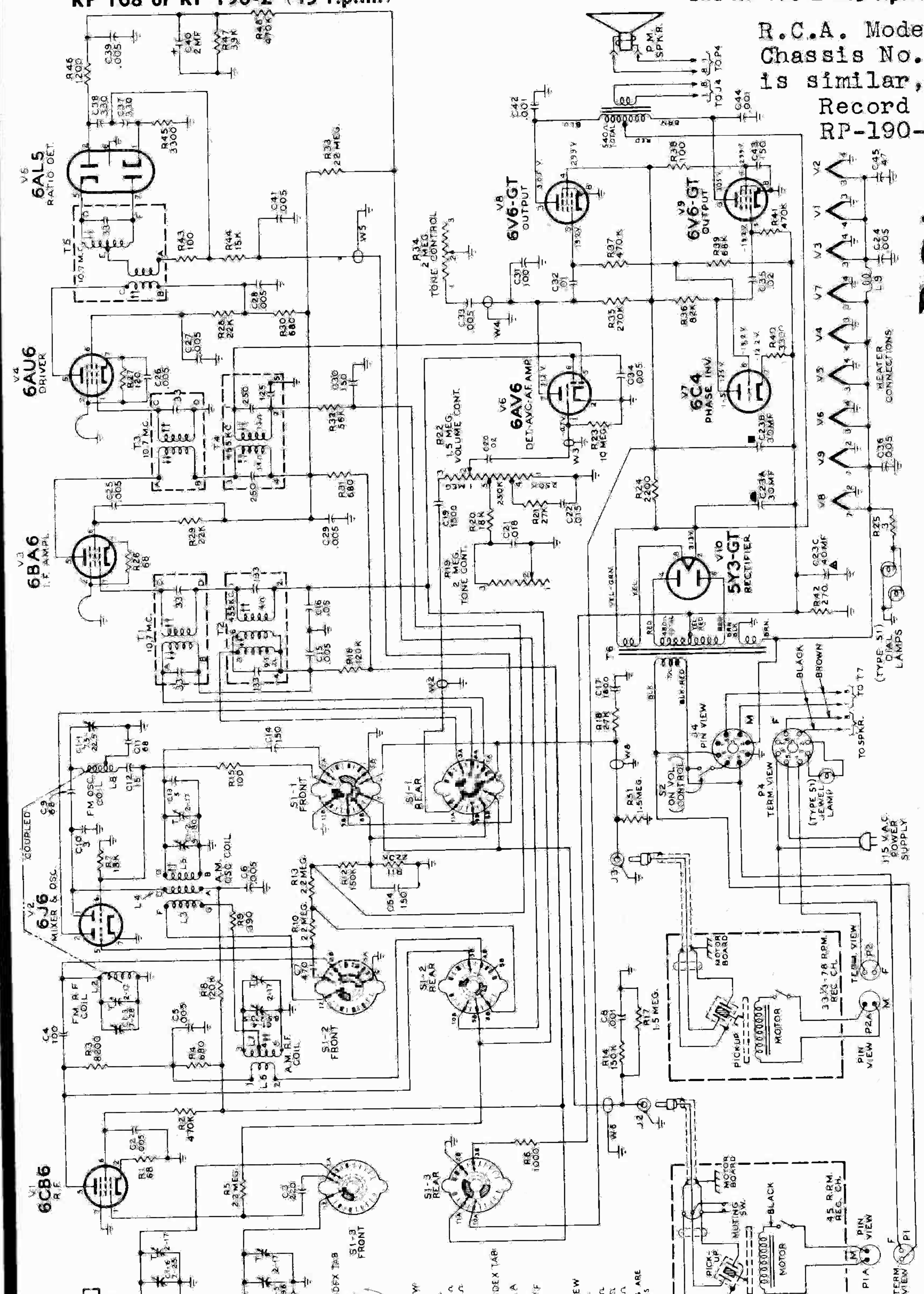
Record Changers 960284 (78/33 1/3 r.p.m.)
RP 168 or RP 190-2 (45 r.p.m.)

MODEL A-101

Chassis No. RC 1096

Record Changers 960282-4 or 5 (78/33 1/3 r. p. m.)
and RP 190-2 (45 r.p.m.)

R.C.A. Model 45-W-10, Chassis No. RC-1096A, is similar, but uses Record Changer RP-190-2 (45 rpm) only.



Function switch viewed from front and shown in "Phono 78/33" position (max. c/clockwise).

CAPACITOR VALUES LESS THAN 1 ARE IN MF., VALUES GREATER THAN 1 ARE IN MMF. UNLESS OTHERWISE SPECIFIED.

RESISTANCE VALUES IN OHMS. K = 1000.

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST WITH NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 117-VOLT

Standard Broadcast (AM) .... 540-1,600 kc.

Frequency Modulation (FM) .... 88-108 mc.

Intermediate Frequencies .... AM—455 kc., FM—10.7 mc.

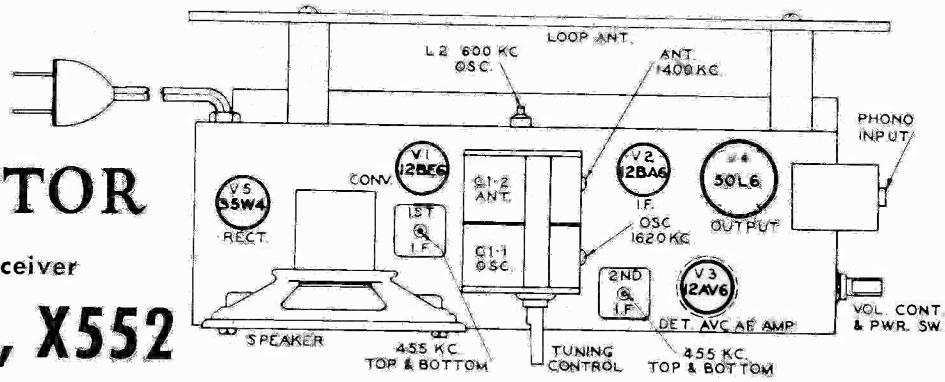
The cathode neutralizing loops of V3 (6BA6) and V4 (6AU6) are insulated wires approx. 2 in. long. Do not alter length.

RCA VICTOR

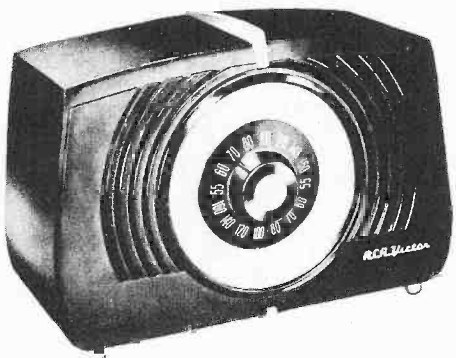
AC-DC Radio Receiver

MODELS X551, X552

Chassis No. RC-1089B RC-1089C



Tube and Trimmer Locations



X551 Maroon *X552 Ivory*

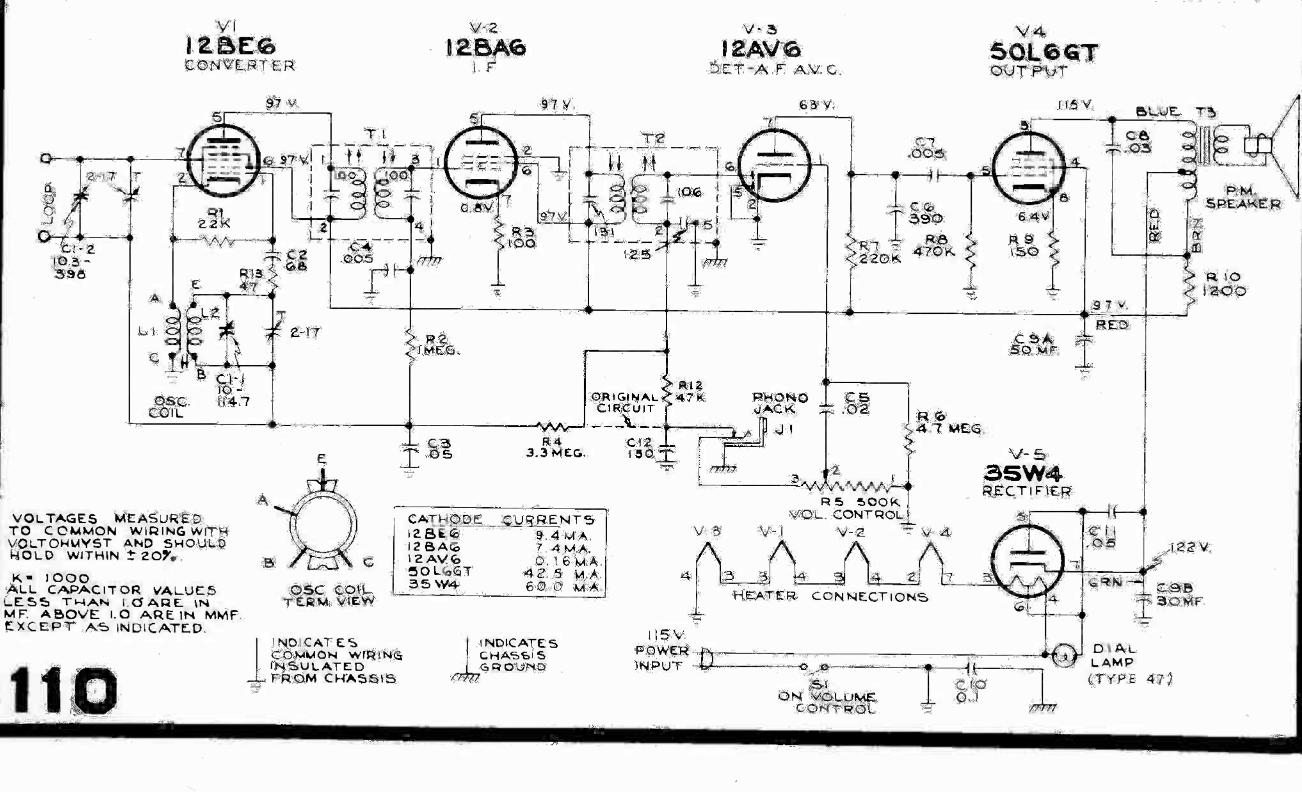
Alignment Procedure

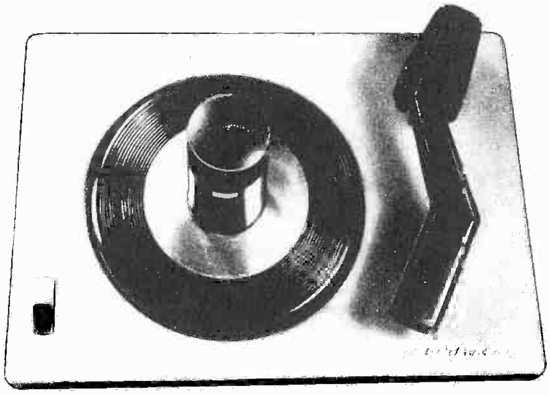
Test-Oscillator—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action. On a.c. operation an isolation transformer (115 v./115 v.) may be necessary for the receiver if the test oscillator is also a.c. operated.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	12BA6 I-F grid through .01 mfd. capacitor	455 kc	Quiet-point 1600 kc end of dial	T2 (top and bottom) 2nd I-F trans.
2	Stator of C1-2 through .01 mfd.			T1 (top and bottom) 1st I-F trans.
3	Short wire placed near loop to radiate signal	1620 kc	Min. cap.	osc. trimmer
4		1400 kc	1400 kc signal	ant. trimmer
5		600 kc	600 kc signal	L2 (osc.) Rock gang
6		Repeat steps 3, 4 and 5.		

Change in Schematic Diagram:

Resistor R4 (3.3 meg. a.v.c. filter), previously connected to the junction of R12 (47K) and the phono jack (J1), is now connected to the junction of R12 and terminal #2 of the 2nd I-F transformer. The revised connection is illustrated below.





RCA VICTOR

RP-190 Series

45 R.P.M. Automatic Record Changer

CAUTION

1. Avoid handling the pickup arm when the mechanism is in cycle.
2. Do not use force to release a jam.
3. Do not try to remove the records on the turntable if the turntable is stopped in cycle.
4. If the separator knives protrude from the center post when the mechanism is out of cycle, push the "start-reject" knob to reject and the condition should be corrected automatically.

MODEL IDENTIFICATION

RP190-1 Uses pickup Stock No. 75476.

RP190-2 Same as RP190-1, except use pickup Stock No. 75575.

RP190-3 Same as RP190-1, except use 85 volt motor Stock No. 75937.

RP190-4 Same as RP190-1, except "ON-OFF" switch; however, they are physically interchangeable.

LUBRICATION

A light machine oil (SAE No. 10) should be used to oil the bearings of the drive motor.

On all bearing surfaces, excepting the motor bearings, Houghton STA-PUT No. 320, or equivalent, should be used. On all other sliding surfaces, STA-PUT No. 512, or equivalent, is recommended.

(Do not oil or grease record separator shelves.)

It is important that the drive motor spindle and the rubber tire on the idler wheel be kept clean and free from oil or grease, dirt, or any foreign material at all times. Carbon tetrachloride or naphtha is satisfactory for cleaning these parts.

AUTOMATIC OPERATION

1. Place a stack of records over the center post, with the desired selections upward, the last record to be played on top.
2. Push the "start-reject" knob to "start" (forward) and release. The mechanism will automatically play in sequence one side of each record stacked on the separator shelves.
3. To reject a record being played, push the "start-reject" knob.
4. At conclusion of playing and as the last record is being repeated, lift the pickup arm and place on its rest. Turn off the power to the drive motor by pushing back on control knob.
5. Remove the stack of records by lifting them straight up.

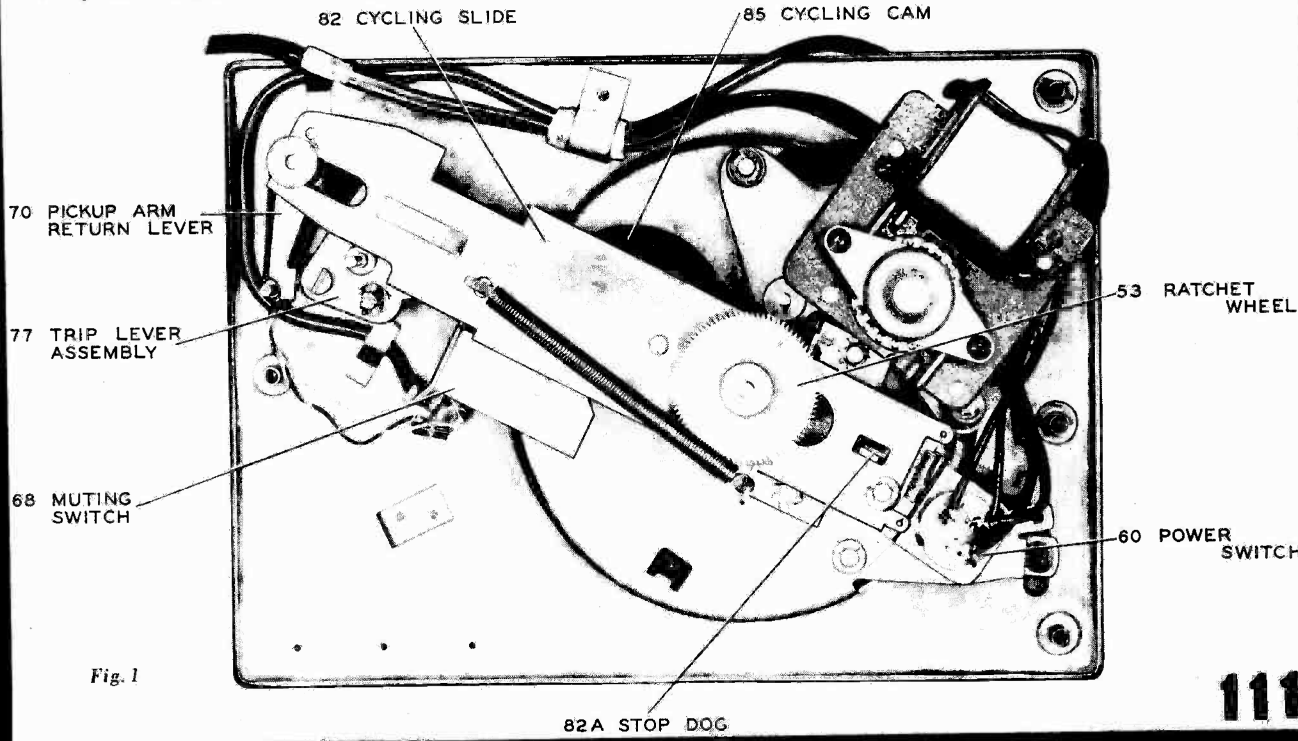


Fig. 1

Function of Principal Parts

Trip Lever (77)

The trip lever is mounted on the bottom end of the pickup arm vertical pivot shaft. The function is to transfer the movement of the pickup arm to parts of the operating mechanism below the motor board. The end of the trip lever contacts stud on cycling cam thereby starts tripping action.

Pickup Arm Return Lever (70)

The function of the pickup arm return lever is to provide a force necessary to push the pickup into landing position. The end of the pickup arm return lever is curved so as to provide a stop for trip lever. This stop determines landing position of the pickup.

Reject Lever (22)

The function of the reject lever is to transfer the action of the control knob to the cycling cam thereby starting a change cycle.

Muting Switch (68)

The function of the muting switch is to short the pickup leads to prevent amplifying of mechanical noise, of the merchanism during change cycle.

Cycling Cam (85)

The cycling cam is mounted on the cycling slide. The function of the cam is to transfer the rotary motion of the turntable shaft into sliding motion of the cycling slide.

Stop Dog (82A)

The stop dog is mounted on the end of cycling slide. The function of the stop dog is to engage the ratchet wheel on the separator shaft and prevent it from rotating, at the exact moment during change cycle.

Ratchet Wheel (53)

The function of the ratchet wheel located on the end of the separator shaft is to keep the separator shaft stationary at the proper time, so as to actuate the separator mechanism inside the centerpost.

Cycling Slide (82)

The cycling slide is the main connecting medium between the various moving parts.

Cycle of Operation

FUNCTION	EXPLANATION
Place a stack of records over centerpost.	1. Records rest on separator shelves protruding from either side of the centerpost.
Push control knob to reject.	1. The control first actuates the power switch applying power to the drive motor. This starts the turntable rotating. 2. Further movement of the control knob actuates the reject lever assembly (8) which contacts the stud mounted on the eccentric cycling cam and moves it slightly.
Cycling starts.	1. The slight movement of the eccentric cycling cam (85) is sufficient for engagement with the rotating knurled roller (62) mounted on turntable shaft. 2. The eccentric cycling cam which is mounted on the cycling slide (82) pushes the slide in the direction of the pickup arm pivot. In so doing tension is increased on the slide return spring (89). 3. The tab on the cycling slide moves back permitting muting switch to close.

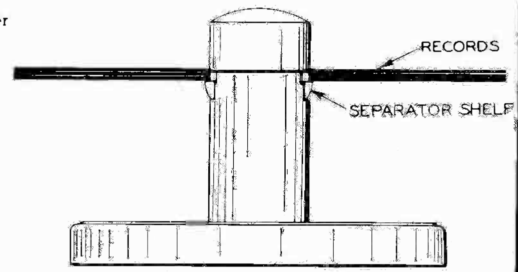


Fig. 3

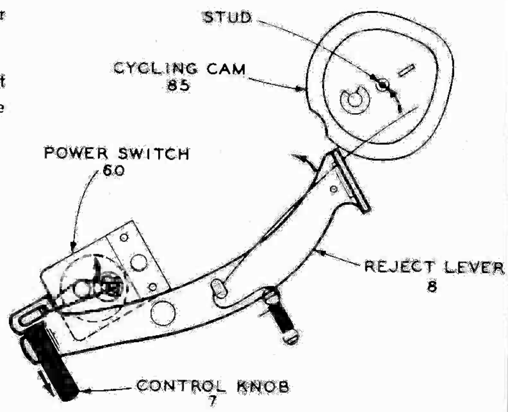


Fig. 4

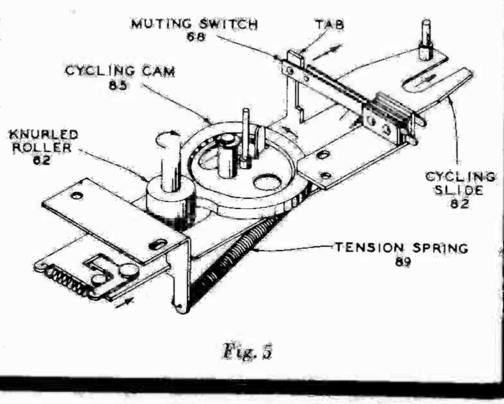


Fig. 5

Cycle of Operation—Continued

Pickup raises from the rest.

1. As the cycling slide continues to move in the direction of the pickup arm pivot the small incline pressed in the slide causes the elevating rod (74) to lift the pickup arm from the rest.
2. The raised pickup arm moves inward slightly from the inward force of the pickup arm return lever (70), until the stud on the trip lever (77) assembly comes against edge of the cycling slide.
3. The cycling slide continues to move further, which pushes the trip lever back. The eccentric landing adjustment stud (79) contacts and pushes the pickup arm return lever (70) against the tension of the return spring (69).

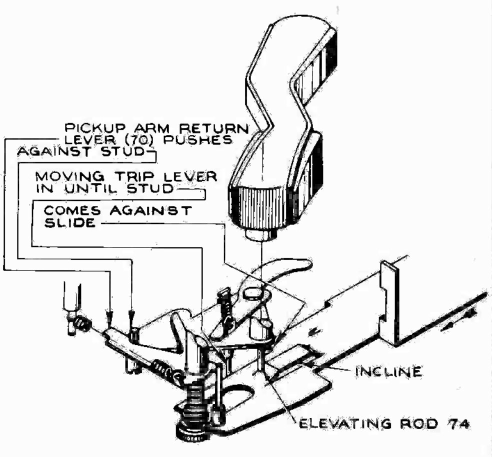


Fig. 7

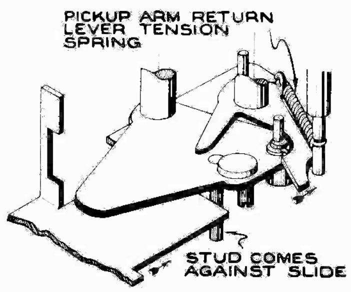


Fig. 6

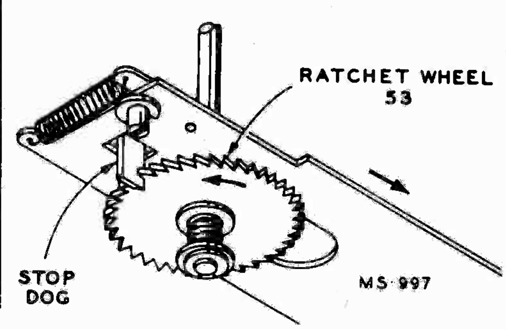


Fig. 8

Separator knives separate the lower record from the stack and the lower record drops to the turntable.

1. As the cycling slide reaches the limit in its movement in the direction of the pickup arm pivot, the stop dog mounted on the slide engages the rotating ratchet wheel (53).
2. The ratchet wheel and separator shaft (6) then remains stationary and the turntable continues to rotate.
3. The separator shelves and knives are coupled together in such a manner that the flattened end of the separator shaft pushes the knives out, which in turn pulls the opposite shelves in.
4. As the shelves recede, the separator knives mounted above the shelves move out and separate the lower record of the stack and support the remaining records while the lower record drops to the turntable.

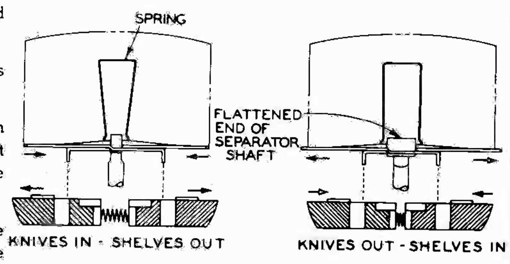


Fig. 9

Pickup moves in for landing.

1. The cycling slide moves away from the pickup arm pivot, due to the force produced by the tension spring (89) keeping the eccentric cycling cam against the rotating knurled roller (62). The knurled roller at this time is returning to the smaller diameter of the cam.
2. The stud on trip lever assembly follows the slide due to the force produced by the action of the pickup arm return lever.
3. After the slide has moved back a short distance the stud on the trip lever assembly no longer follows the slide since the landing adjustment stud comes against the curved stop on the end of the pickup arm return lever. At this moment the pickup is directly above the point of landing.
4. As the cycling slide completes the return movement the elevating rod slides down the incline which lowers the stylus on the record.

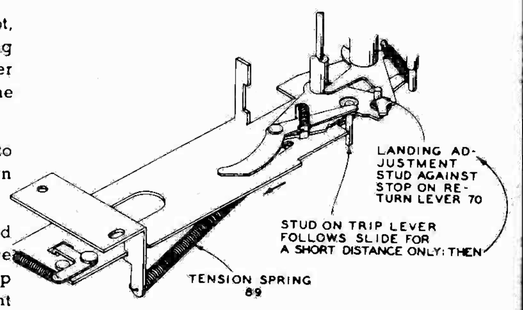


Fig. 10

RP-190 Series

Cycle of Operation—Continued

Cycle completed and the record plays.

1. The tab on the cycling slide contacts and opens the muting switch.
2. The stud on the cycling slide pushes pickup arm return lever back to permit free motion of the pickup arm.
3. The change cycle is completed as the cycling slide comes against the stop bracket, at which time the knurled roller rotates in the cut away section of the cam.
4. As the record plays and the pickup arm moves inward.
5. When the stylus reaches the end of the selection the end of the trip lever contacts the stud on the cycling cam, and pushes it slightly.
6. The slight movement of the cycling cam causes engagement with the rotating knurled roller, thereby starting a change cycle.
7. The mechanism repeats the preceding sequence of operations until the last record of the stack has dropped and has been played. This selection will be repeated until the pickup is lifted and placed on the rest.

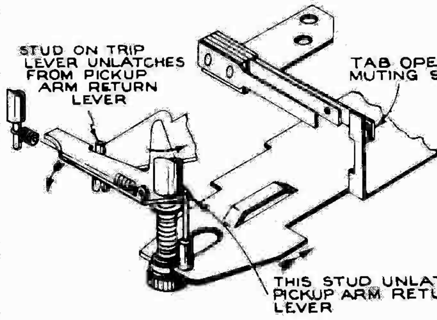


Fig. 11

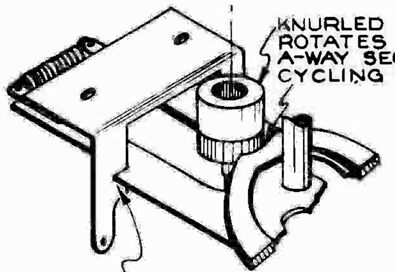


Fig. 12

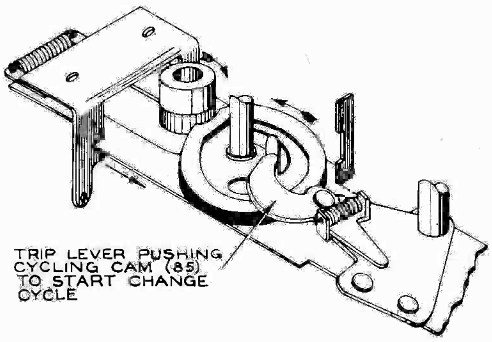


Fig. 13

DO YOU KNOW?

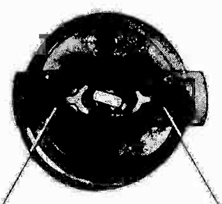


Fig. 16

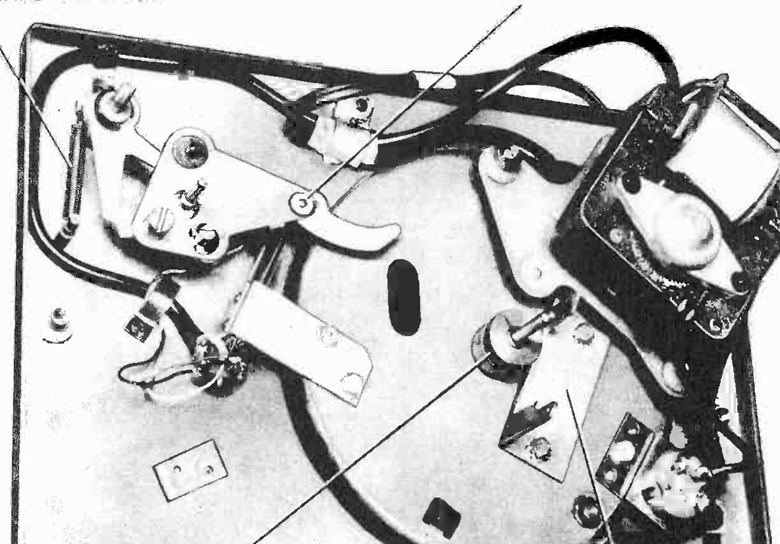


Fig. 14

REJECT CONTROL FAILS TO OPERATE

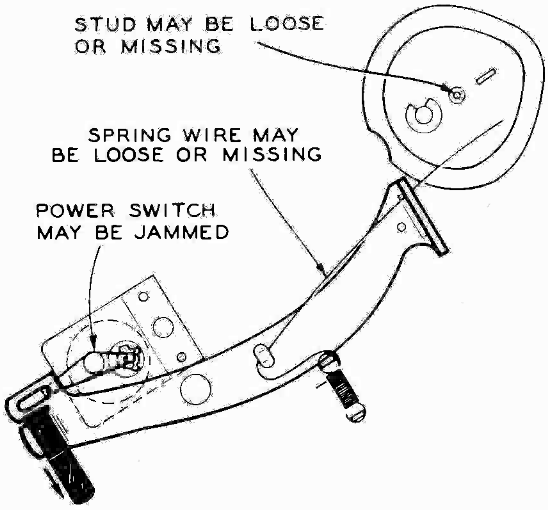


Fig. 17

MECHANISM FAILS TO SEPARATE RECORDS PROPERLY

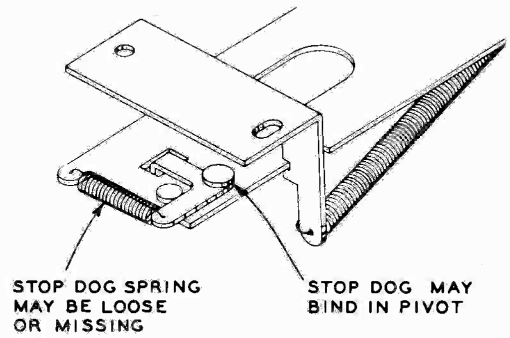


Fig. 18

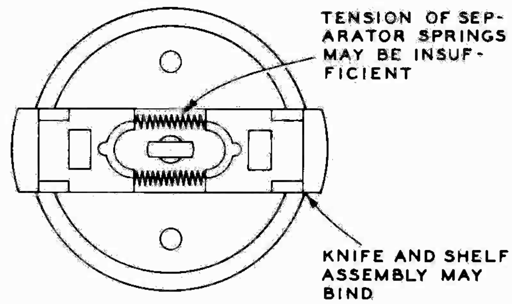


Fig. 19

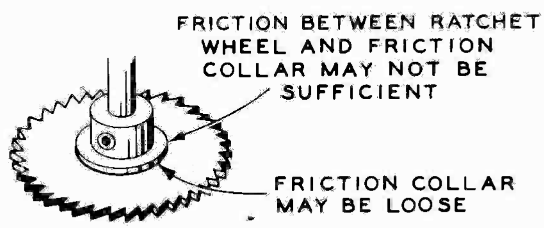
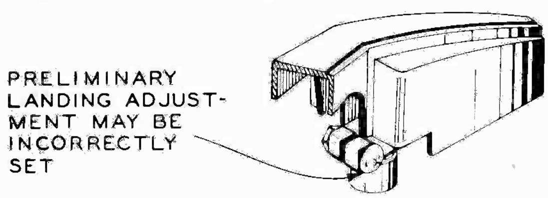


Fig. 20

RECORD STRIKES PICKUP ARM WHEN DROPPING



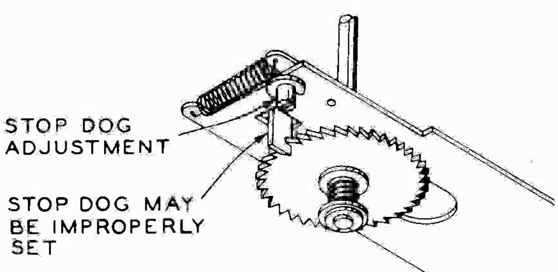


Fig. 21

PREMATURE TRIPPING

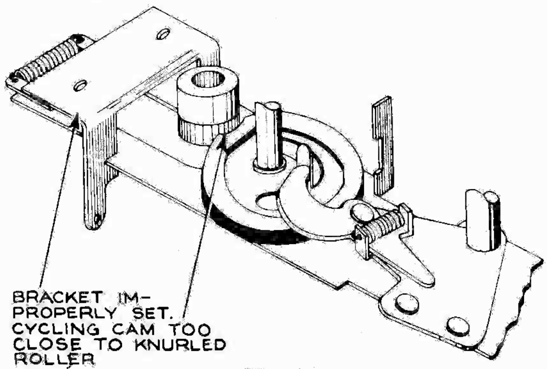


Fig. 30

PICKUP SKIPS GROOVES

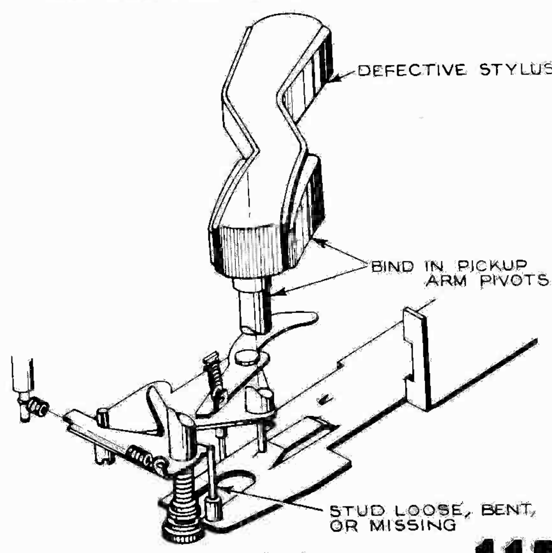


Fig. 25

RP-190 Series

PICKUP FAILS TO LAND PROPERLY

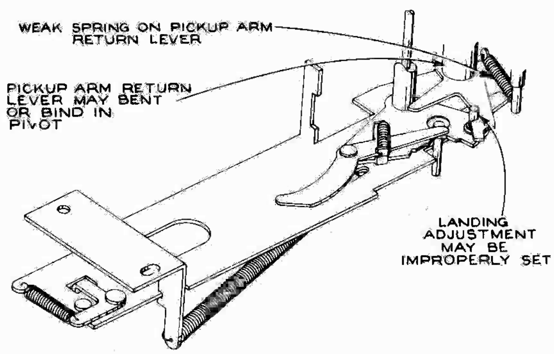


Fig. 22

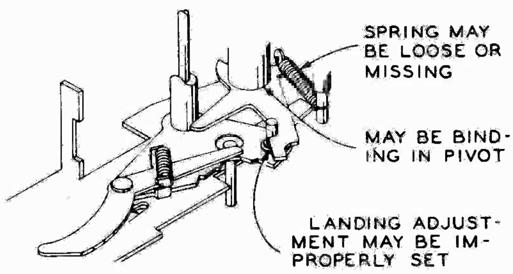


Fig. 23

CONTINUOUS TRIPPING

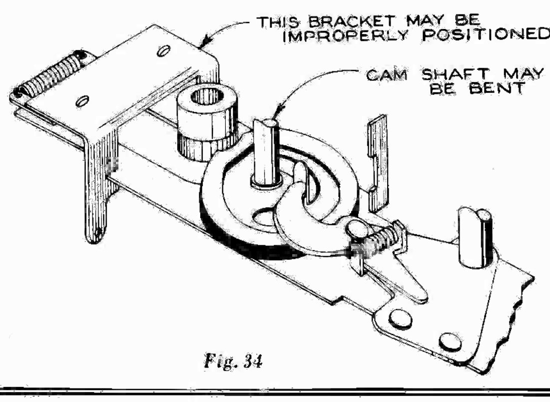


Fig. 34

MECHANISM FAILS TO TRIP

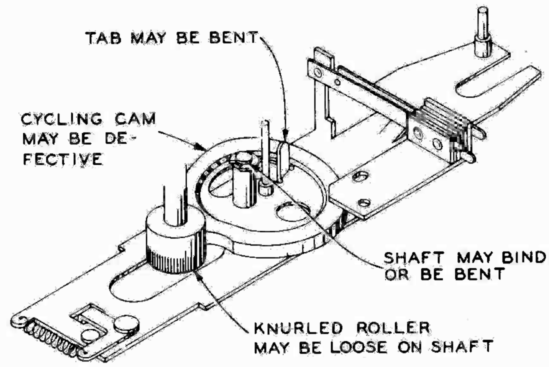


Fig. 26

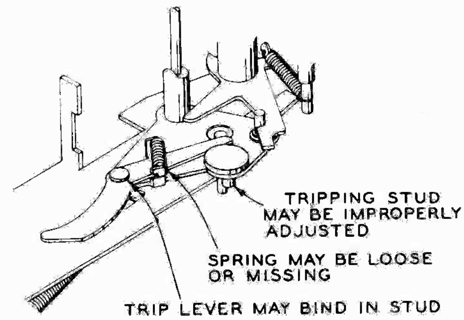


Fig. 27

MECHANISM FAILS TO COMPLETE CYCLE

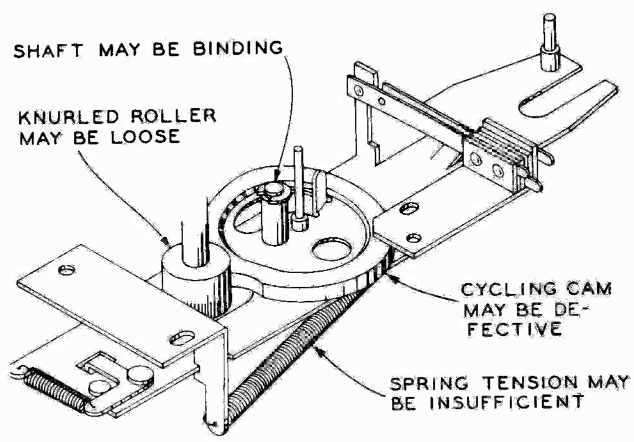


Fig. 35

ADJUSTMENTS

LANDING

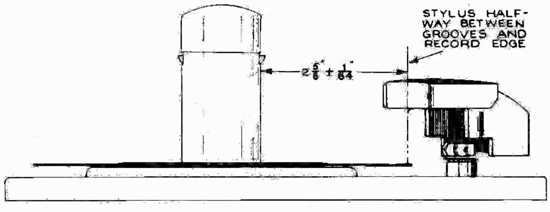


Fig. 36

TRIPPING

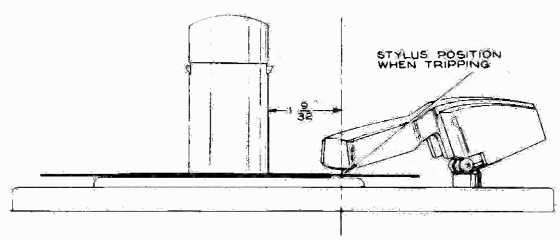


Fig. 37

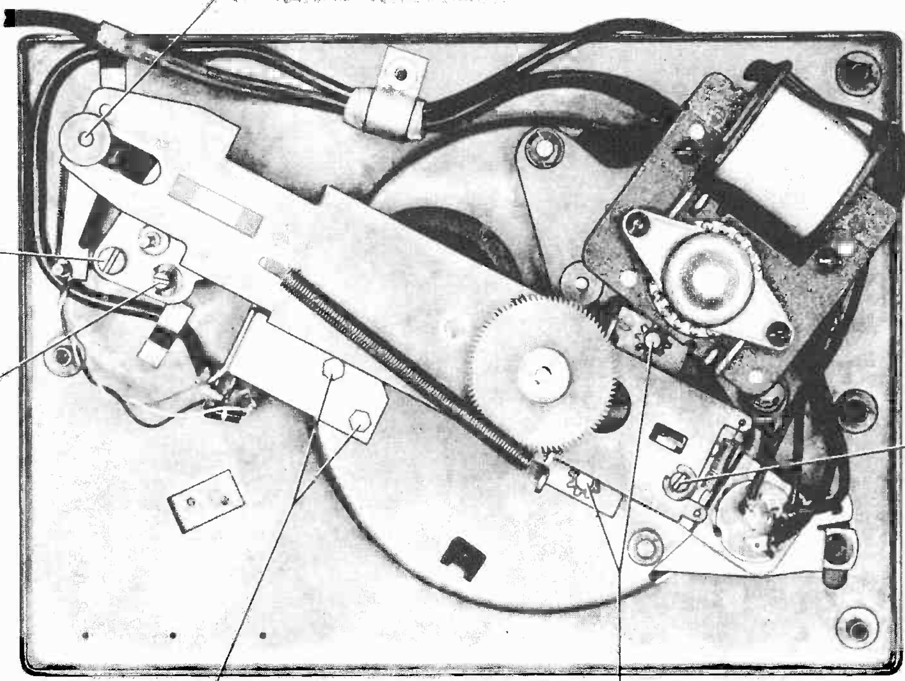


Fig. 38

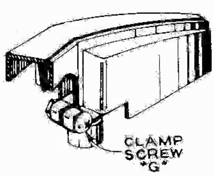


Fig. 39

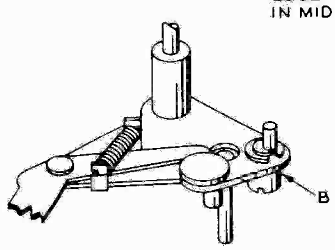


Fig. 40

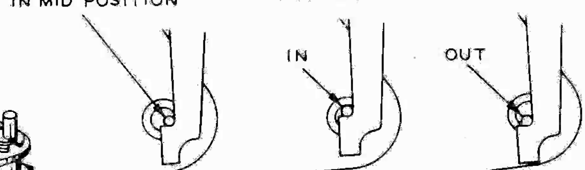


Fig. 41

Adjustments

Pickup Landing Adjustment:

Under ordinary conditions the landing adjustment is a screw-driver adjustment as shown. The adjustment of eccentric landing adjustment stud (B) gives approximately a ¼" movement. (See Figs. 38, 40.)

If, however, the pickup arm has been removed it is first necessary to make an approximate landing adjustment as follows:

1. With the mechanism out of cycle and the clamp screw (G) (Fig. 39) loose, place pickup arm on the rest and tighten clamp screw enough to prevent the clamp from slipping on the shaft.
2. Set the landing adjustment stud (B) as shown (mid-adjustment). (See Figs. 40, 41.)
3. With the power removed, push reject control to reject. Rotate turntable by hand in the correct direction until the pickup is about ready to land.
4. Loosen clamp screw (G) and move pickup arm so the stylus is approximately 2⅝" from side of centerpost. Tighten clamp screw. (See Figs. 36, 39.)
5. Exact landing adjustment can now be made by a screw-driver on stud (B). (See Fig. 38.)

Pickup Height Adjustment (See Fig. 38):

Adjust knurled nut (A) until the distance (during change cycle) between the top of the turntable and the stylus point is approximately 1⅛".

NOTE: If unable to adjust for sufficient height, it may be necessary to cut a few turns from the compression spring to allow more space on the shaft.

Tripping Adjustment (See Figs. 37, 38):

Adjust the eccentric tripping stud (C) until the mechanism trips when the stylus is 1 9/32" from the side of the centerpost.

Mounting Bracket Adjustment (See Fig. 38):

Loosen the two screws (F) and move the bracket so it is as near perpendicular to the slide as possible. Move back or forward until the cut away section of the cycling cam clears the knurled roller approximately 1/16". Tighten screws.

Muting Switch Adjustment (See Fig. 38):

Loosen the two screws (D) and adjust the position of the switch so the contacts are approximately 1/32 to 1/16 inches apart when the mechanism is out of cycle. If the mounting screws do not give sufficient adjustment, bend tab on slide slightly.

Stop Dog Adjustment (See Fig. 38):

Turn the eccentric screw (E) until the record drops turntable without striking the pickup arm.

RP-190 Series

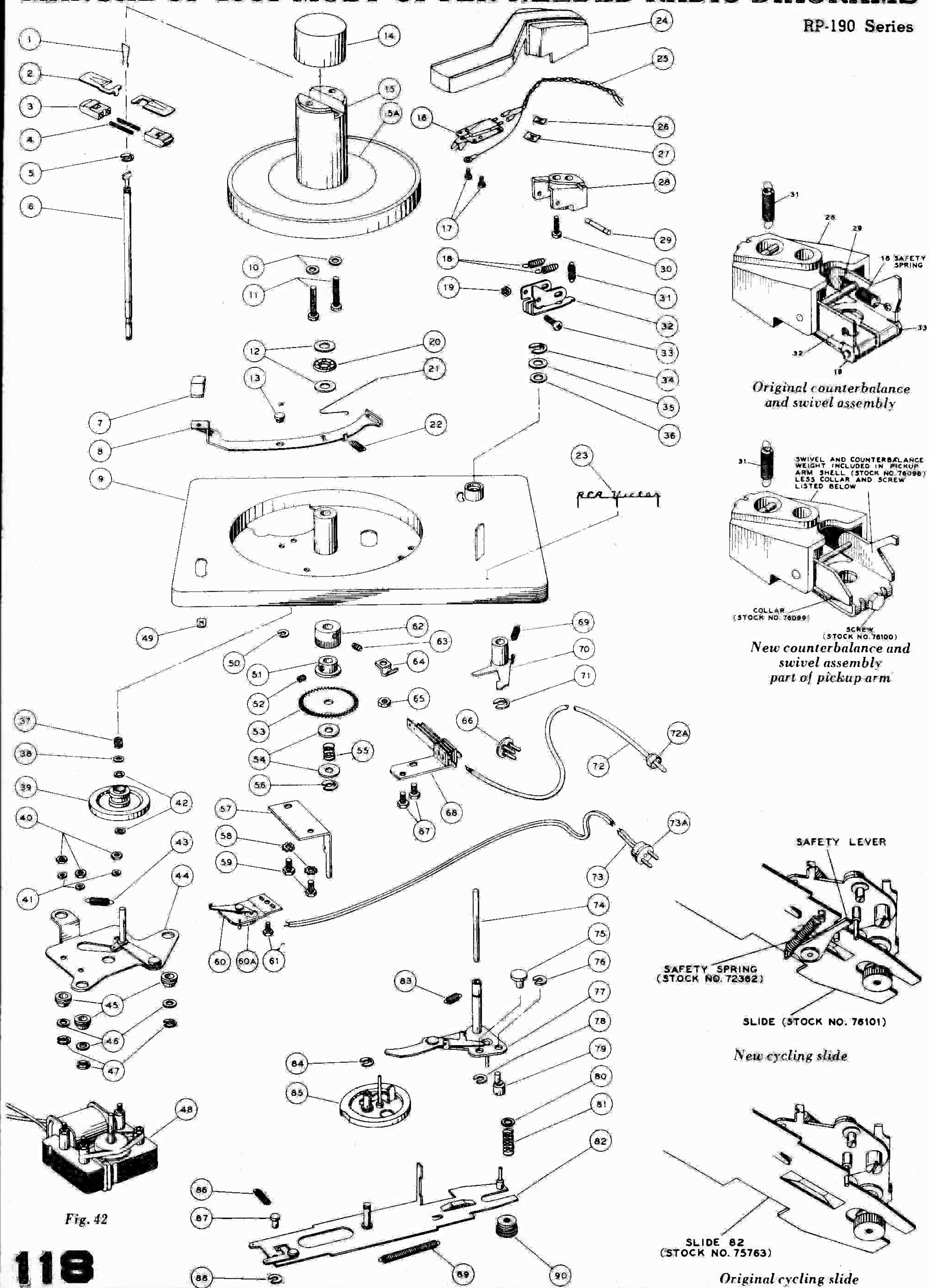
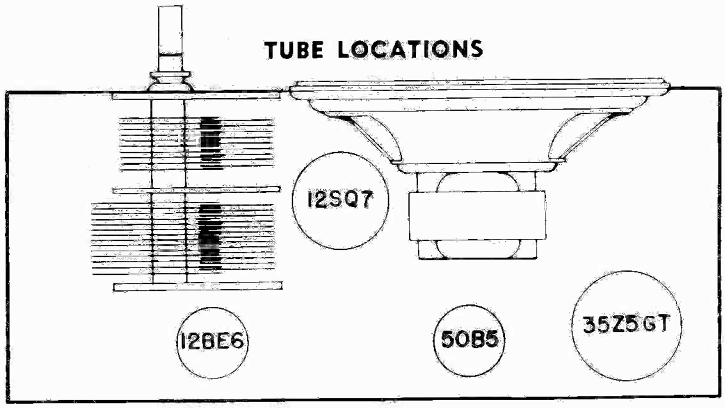


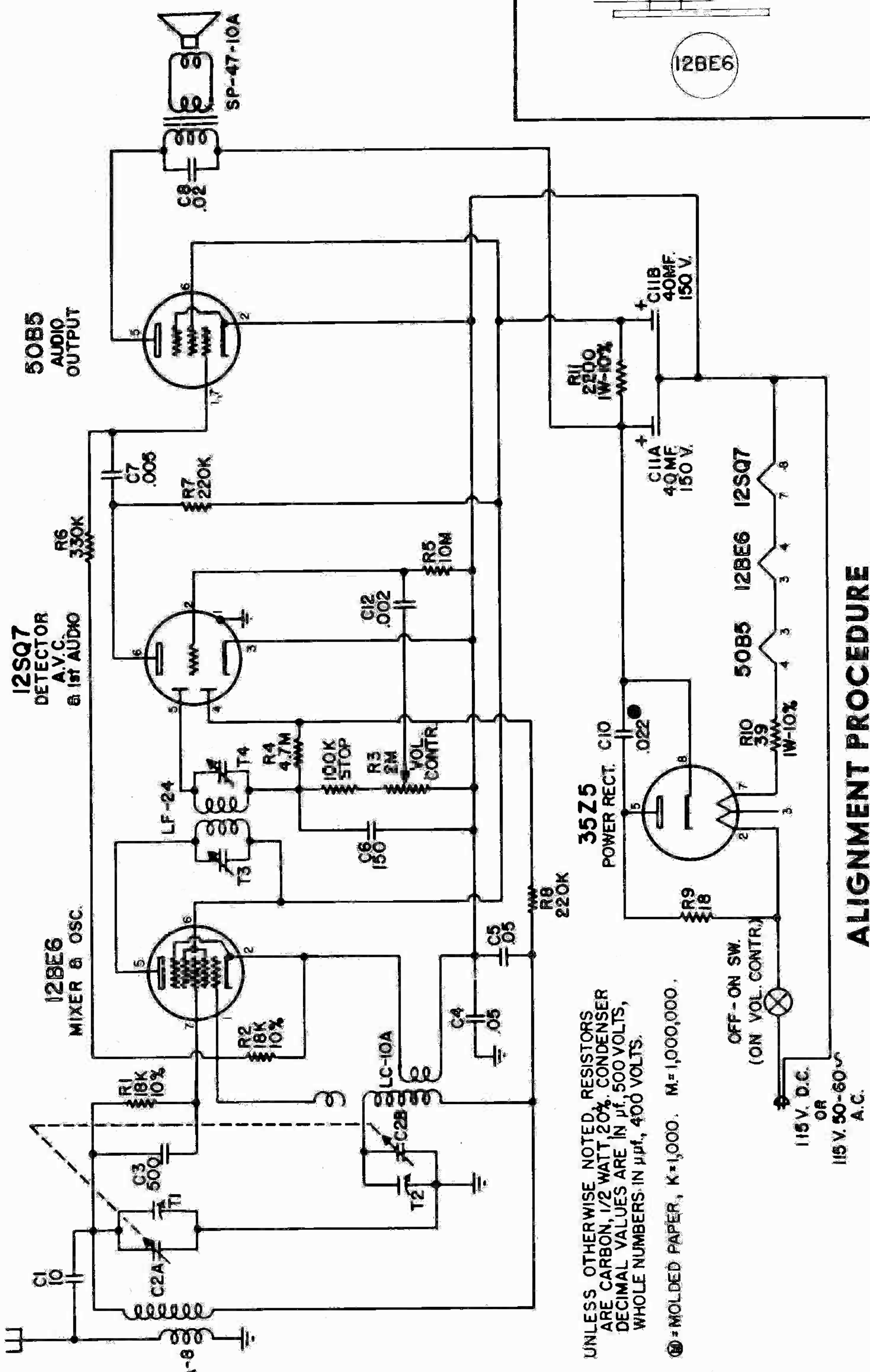
Fig. 42

Silvertone

Sears, Roebuck & Co.
Set Catalog No. 4,
Chassis 478.233

TUBE LOCATIONS





ALIGNMENT PROCEDURE

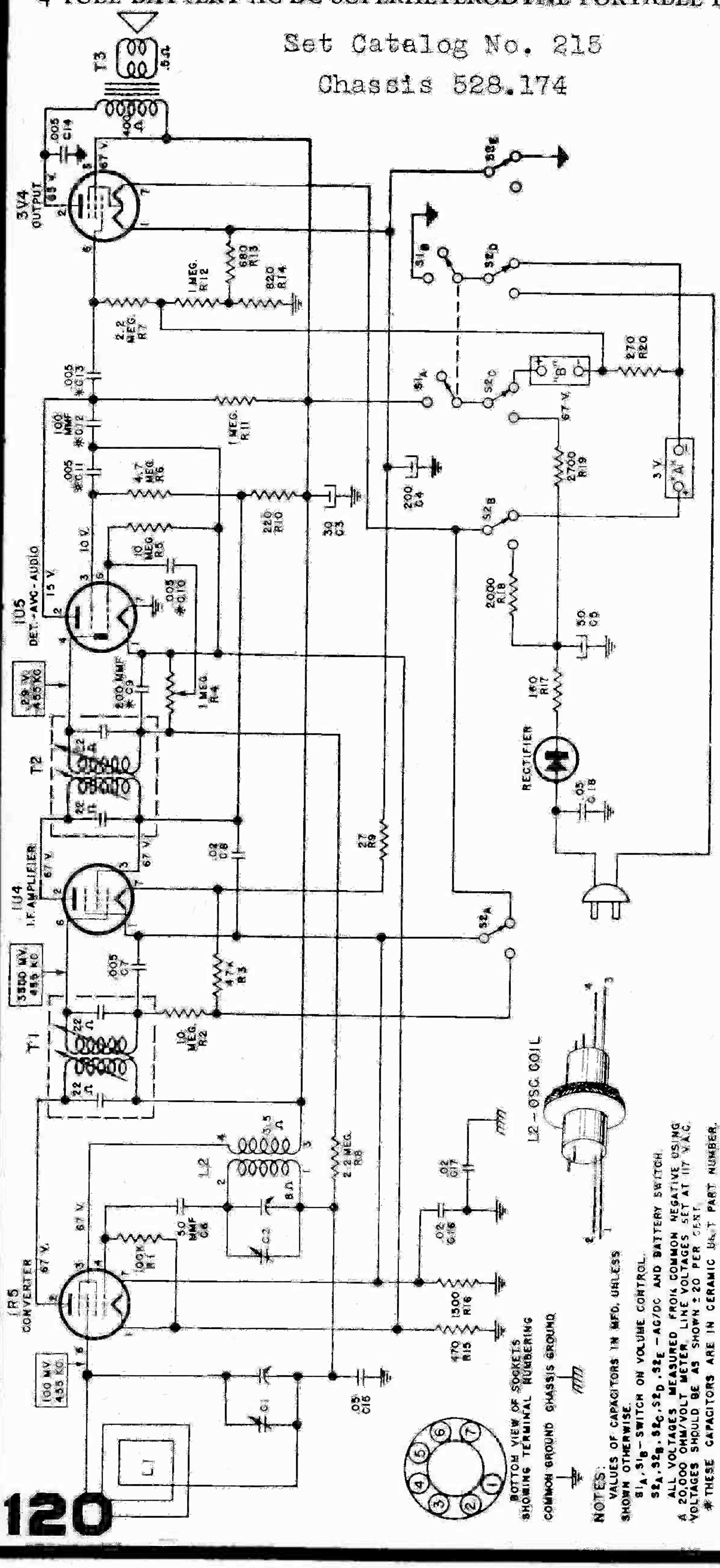
Position of Tuner	Frequency	Signal Generator: Coupling Factor	Signal Generator: Connection to Receiver	Signal Generator: Ground Connection	Trimmer Adjustments (In order shown)
Rotor Full Open (Plates out of mesh)	455 kc.	.1 mfd	Grid of 12BE6 (Pin 7)	Chassis	Input and Output Trimmers on I.F. Can T3 and T4
Rotor Full Open (Plates out of mesh)	1620 kc.	.1 mfd	Grid of 12BE6 (Pin 7)	Chassis	Oscillator Trimmer T2
1400 kc.	1400 kc.	75 mmf	Antenna Hank	Chassis	Antenna Trimmer T1
600 kc.	600	75 mmf	Antenna Hank	Chassis	(Check Point)*

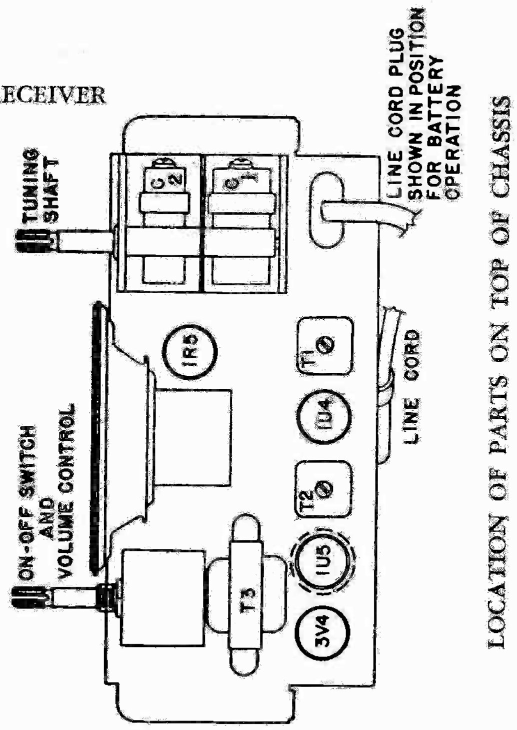
Silvertone

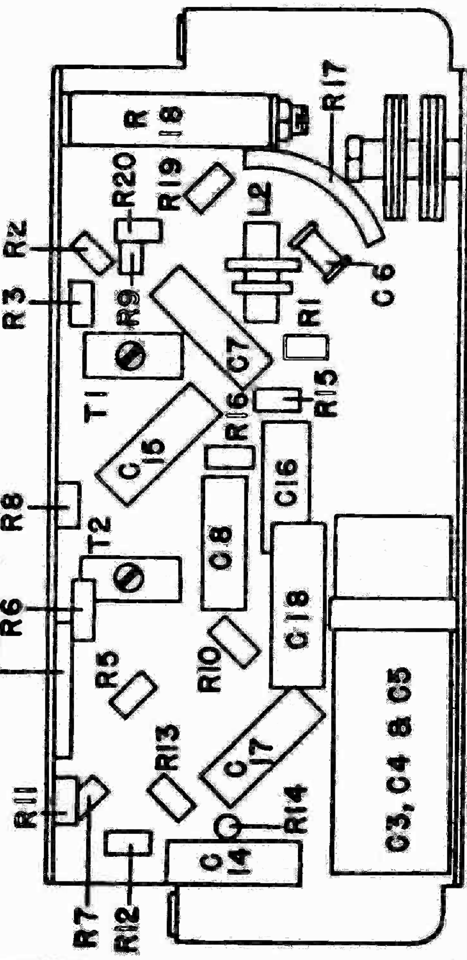
4 TUBE BATTERY-AC-DC SUPERHETERODYNE PORTABLE RECEIVER

Set Catalog No. 215

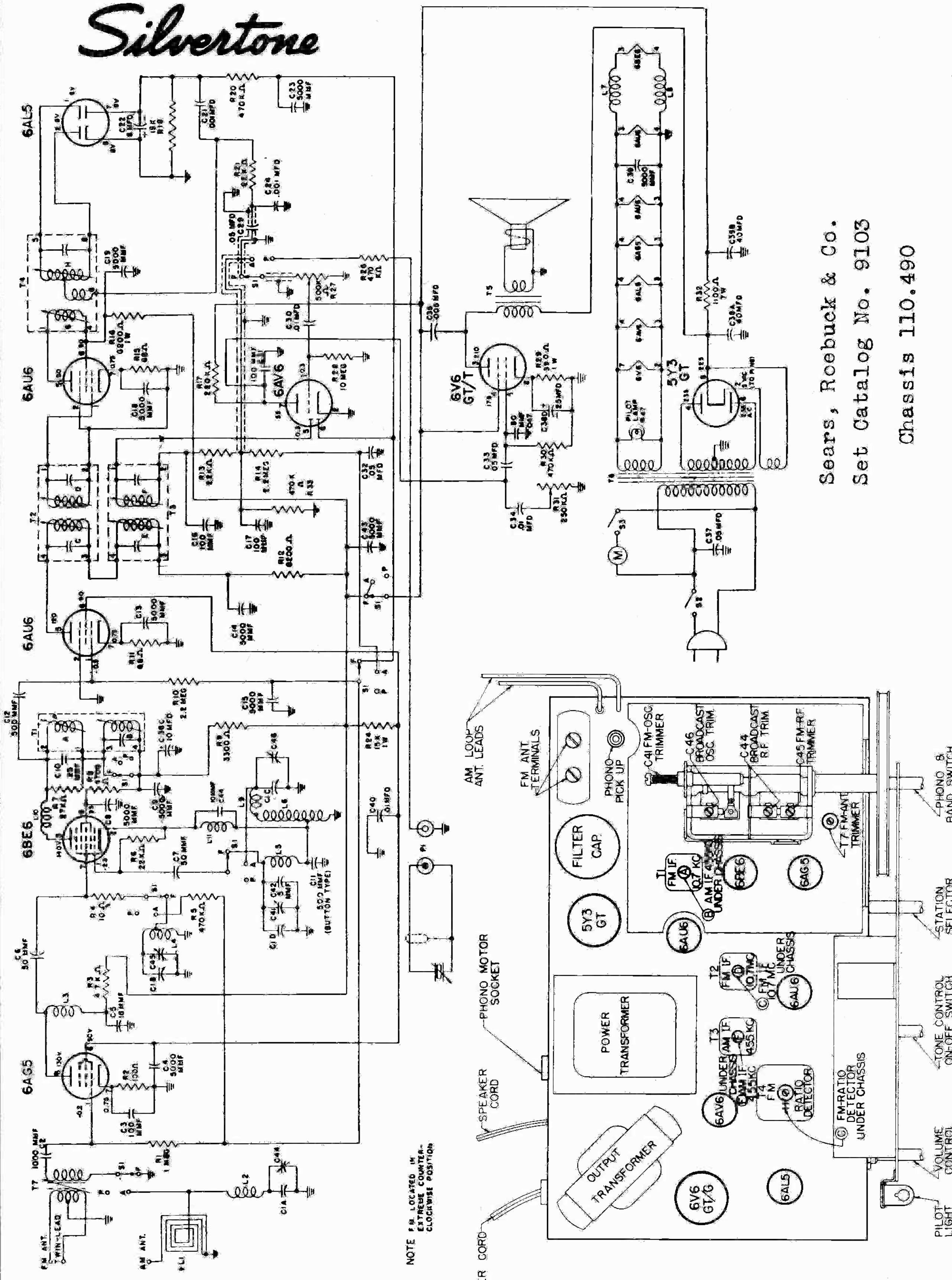
Chassis 528.174







Silvertone



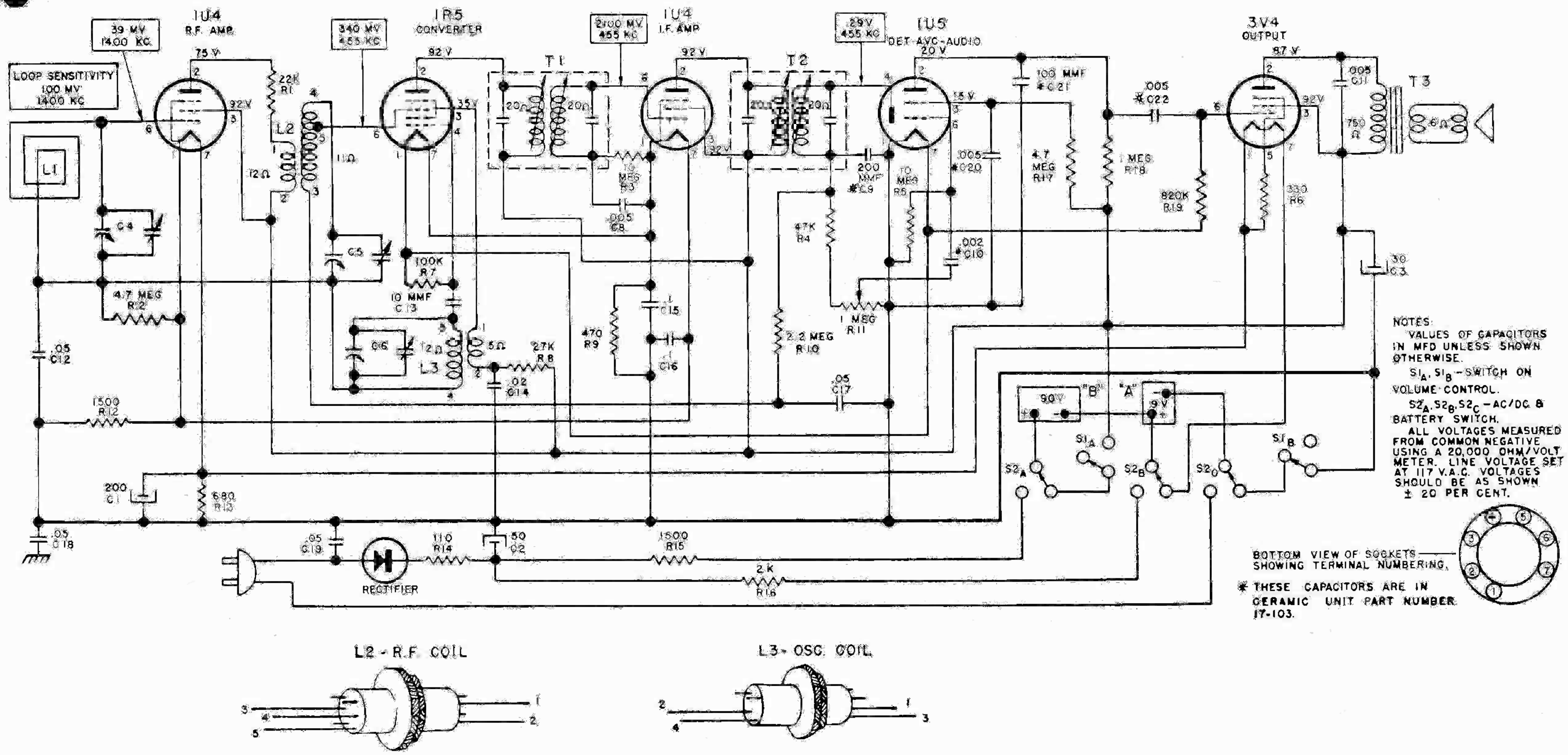
Sears, Roebuck & Co.
Set Catalog No. 9103
Chassis 110.490

Silvertone

Set Catalog No. 225
Chassis 528.171 and 528.171-1

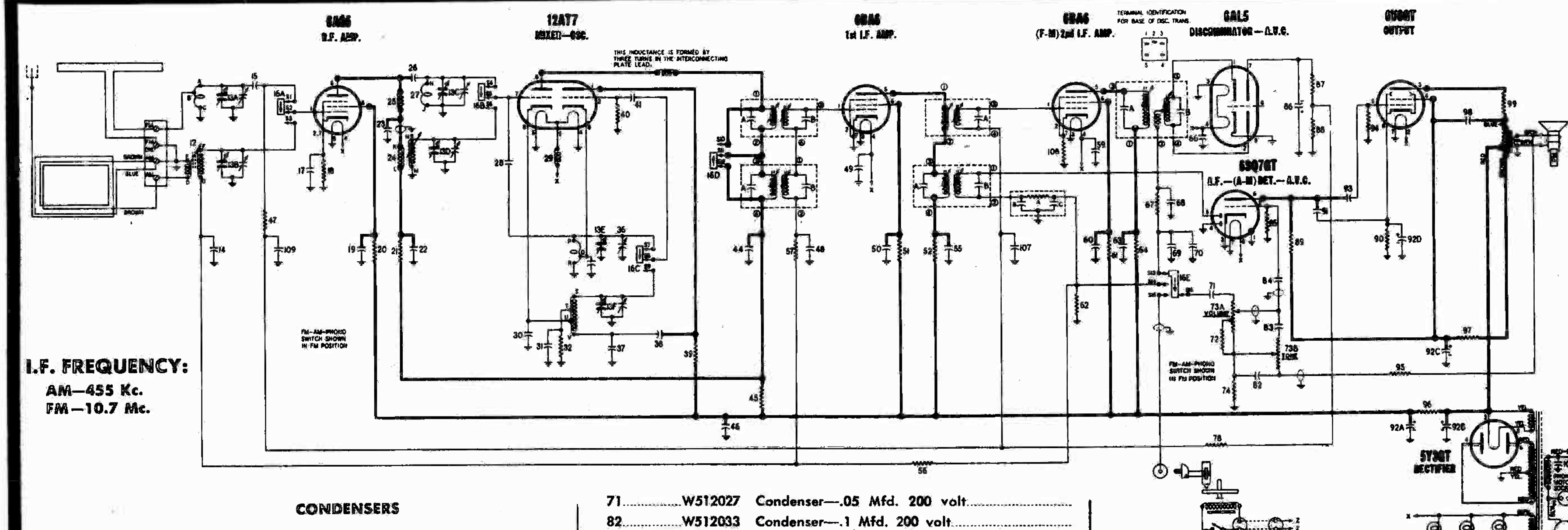
5 TUBE BATTERY-AC-DC SUPERHETERODYNE PORTABLE RECEIVER

CATALOG No. 225



SCHEMATIC DIAGRAM FOR SILVERTONE CHASSIS 528.171-1

Chassis 528.171-1 is the same as 528.171 except for the Battery/AC/DC changeover system. The hand-operated switch is replaced by a type which is operated by plugging the power cord into a chassis socket. The socket is near the back edge of the chassis. There is a slot for only one prong of the power cord plug; the other prong hangs over the back apron. The detachable power cord and the socket for it on the chassis are replaced by a conventional power cord.



I.F. FREQUENCY:
AM—455 Kc.
FM—10.7 Mc.

CONDENSERS

13-A to F	W506348	Condenser—variable gang (with drum)
14	W512027	Condenser—.05 Mfd. 200 volt
15	W513406	Condenser—ceramic 22 Mmfd. 500 volt (Temperature compensating)
17	W513002	Condenser—ceramic 47 Mmfd. 500 volt
19	W513013	Condenser—ceramic 5000 Mmfd. 450 volt
22	W513013	Condenser—ceramic 5000 Mmfd. 450 volt
23	W513002	Condenser—ceramic 47 Mmfd. 500 volt
26	W513401	Condenser—ceramic 5 Mmfd. ± 10% 500 volt (Temperature compensating)
28	W513000	Condenser—ceramic 1.0 Mmfd. 500 volt
30	W513007	Condenser—ceramic 330 Mmfd. 500 volt
31	W512009	Condenser—.01 Mfd. 200 volt
35	W513429	Condenser—ceramic 10 Mmfd. ± 10% 500 volt (Temperature compensating)
36	W506336	Condenser—trimmer; 3 to 30 Mmfd.
37	W513442	Condenser—ceramic 10 Mmfd. ± 10% 500 volt (Temperature compensating)
38	W513013	Condenser—ceramic 5000 Mmfd. 450 volt
41	W513409	Condenser—ceramic 39 Mmfd. ± 5% 500 volt (Temperature compensating)
44	W513013	Condenser—ceramic 5000 Mmfd. 450 volt
46	W513013	Condenser—ceramic 5000 Mmfd. 450 volt
48, 49, 50	W513013	Condenser—ceramic 5000 Mmfd. 450 volt
55	W513013	Condenser—ceramic 5000 Mmfd. 450 volt
59, 60	W513013	Condenser—ceramic 5000 Mmfd. 450 volt
63	W513013	Condenser—ceramic 5000 Mmfd. 450 volt
66	W513013	Condenser—ceramic 5000 Mmfd. 450 volt
68	W513007	Condenser—ceramic 330 Mmfd. 500 volt
69	W512005	Condenser—.003 Mfd. 600 volt
70	W513003	Condenser—ceramic 100 Mmfd. 500 volt
71	W512027	Condenser—.05 Mfd. 200 volt
82	W512033	Condenser—.1 Mfd. 200 volt
83	W512001	Condenser—.001 Mfd. 600 volt
84	W512009	Condenser—.01 Mfd. 200 volt
86	W504937	Condenser—electrolytic 5 Mfd. 50 volt
91	W513008	Condenser—ceramic 470 Mmfd. 350 volt
92-A,B,C,D	W505908	Condenser—electrolytic A—30 Mfd. 450 volt, B—40 Mfd. 450 volt, C—10 Mfd. 450 volt, D—20 Mfd. 25 volt
93	W512009	Condenser—.01 Mfd. 200 volt
98	W512001	Condenser—.001 Mfd. 600 volt
106	W512256	Condenser—.01 Mfd. 600 volt
107	W513013	Condenser—ceramic 5000 Mmfd. 450 volt
109	W513013	Condenser—ceramic 5000 Mmfd. 450 volt

RESISTORS

18	W510117	Resistor—carbon 82 Ohms ± 10% ½ watt
20	W510164	Resistor—carbon 33,000 Ohms ½ watt
21	W510237	Resistor—carbon 1000 Ohms 1 watt
32	W510141	Resistor—carbon 1800 Ohms ± 10% ½ watt
39	W510249	Resistor—carbon 4700 Ohms 1 watt
40	W510155	Resistor—carbon 10,000 Ohms ½ watt
45	W510237	Resistor—carbon 1000 Ohms 1 watt
47	W510167	Resistor—carbon 47,000 Ohms ½ watt
51	W510165	Resistor—carbon 39,000 Ohms ± 10% ½ w.
52	W510237	Resistor—carbon 1000 Ohms 1 watt
56	W510193	Resistor—carbon 2.2 Meg. ½ watt
57	W510173	Resistor—carbon 100,000 Ohms ½ watt
61	W510165	Resistor—carbon 39,000 Ohms ± 10% ½ w.
62	W510185	Resistor—carbon 470,000 Ohms ½ watt
64	W510237	Resistor—carbon 1000 Ohms 1 watt
67	W510159	Resistor—carbon 18,000 Ohms ± 10% ½ w.
72	W510170	Resistor—carbon 68,000 Ohms ½ watt
73-A,B,C	W508483	Volume and tone control A—2 Meg., B—2 Meg., C—"ON-OFF" switch
74	W510128	Resistor—carbon 330 Ohms ½ watt
78	W510193	Resistor—carbon 2.2 Meg. ½ watt
85	W510195	Resistor—carbon 4.7 Meg. ½ watt
87, 88	W510153	Resistor—carbon 8200 Ohms ± 10% ½ watt
89	W510179	Resistor—carbon 220,000 Ohms ½ watt
90	W510128	Resistor—carbon 330 Ohms ½ watt
94	W510185	Resistor—carbon 470,000 Ohms ½ watt
95	W510148	Resistor—carbon 4700 Ohms ± 10% ½ watt
96	W510732	Resistor—wire wound 2000 Ohms ± 10% 10 watts
97	W510261	Resistor—carbon 22,000 Ohms 1 watt
99	W510113	Resistor—carbon 47 Ohms ½ watt
108	W510115	Resistor—carbon 68 Ohms ± 10% ½ watt

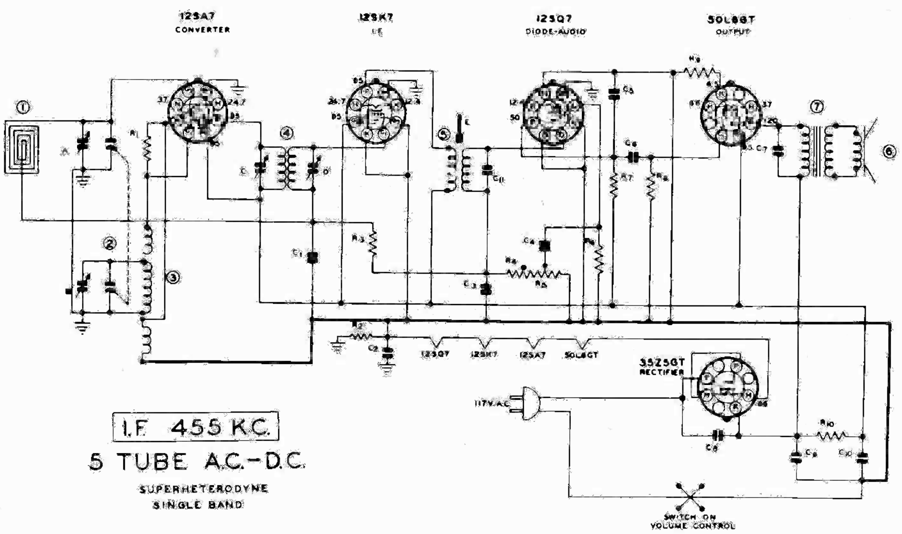
WIRING DIAGRAM

FOR SILVERTONE

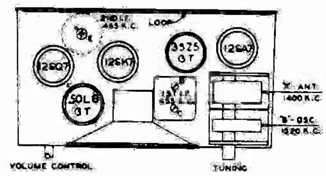
CHASSIS 100.201

Catalog No. 69

Sonora Radio & Television Corp. Model 105



DIA. NO.	PART NO.	DESCRIPTION
R1	[illegible]	72,000 OHM [illegible] 20%
R2	[illegible]	[illegible]
R3	[illegible]	1 MEGOHM [illegible] 20%
R4		IN VOLUME CONTROL
R5	[illegible]	.5 MEGOHM VOL. CONT.
R6	[illegible]	[illegible] MEGOHM [illegible] 20%
R7	[illegible]	[illegible]
R8	[illegible]	470,000 OHM [illegible] 20%
R9	[illegible]	[illegible] OHM [illegible] 10%
R10	[illegible]	1200 OHM [illegible] 10%
C1	[illegible]	.05 MFD 200V
C2	[illegible]	.2 MFD 200V
C3	[illegible]	250 MMFD 500V
C4	[illegible]	.005 MFD 400V
C5	[illegible]	.0005 MFD [illegible]
C6	N-1344	.01 MFD 400V
C7	N-1344	.01 MFD 400V
C8	[illegible]	[illegible] MFD 400V
C9 C10	[illegible]	50 MFD 150V / 30 MFD 150V ELECTROLYTIC
C11	[illegible]	100 MMFD 10% 500V
1	[illegible]	ANTENNA COIL LOOP
2	[illegible]	2 GANG CONDENSER
3	[illegible]	OSCILLATOR COIL
4	[illegible]	1ST I.F. TRANSFORMER
5	[illegible]	2ND I.F. TRANSFORMER
6	[illegible]	4" P.M. SPEAKER
7	[illegible]	OUTPUT TRANSFORMER



Sonora Radio & Television Corp. Models 314 and 315

ALIGNMENT PROCEDURE

STEPS	SET RECEIVER DIAL TO	TEST OSCILLATOR: ADJUST TEST OSCILLATOR FREQUENCY TO	TEST OSCILLATOR: ATTACH OUTPUT OF TEST OSCILLATOR TO	DUMMY ANTENNA	ADJUSTMENTS
1	Any point where no interfering signal is received.	EXACTLY 455 KC	High side to grid of 12AU6 Tube. Low side to common negative.	.05 MFD CONDENSER	Adjust slugs at top and bottom of 2nd I.F. (T2) and then each of the slugs of the 1st. I.F. for maximum output.
2	Exactly 1620 KC	Exactly 1620 KC.	External Antenna blue lead on loop.	100 MMFD Condenser.	Adjust 1620 KC oscillator trimmer (C4) for maximum output.
3	Approx. 1400 KC	Approx. 1400 KC	External Antenna blue lead on loop.	100 MMFD Condenser.	Adjust 1400 KC antenna trimmer for maximum output.

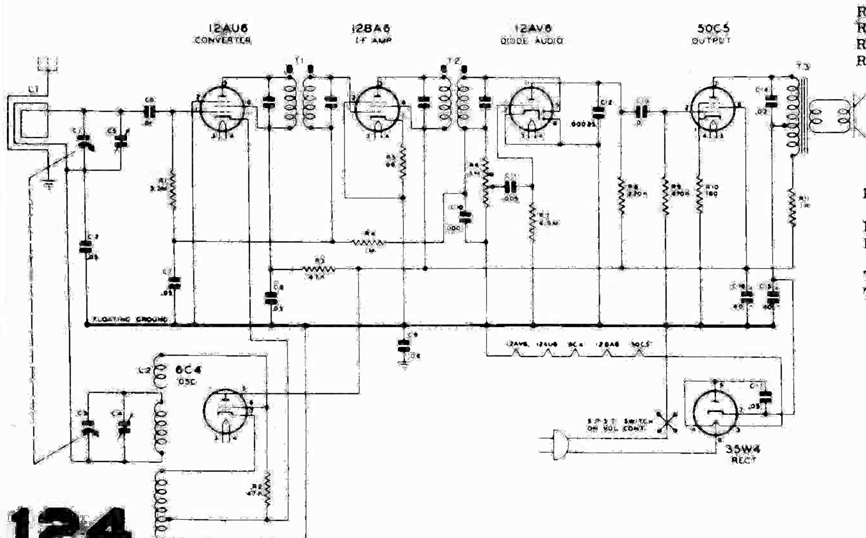
C2,C7,C8 N-1345 Condenser, Paper .05 MFD. 200 V
C6, C13 N-1344 Condenser, Paper .01 MFD. 400 V
C9 N-8092 Condenser, Paper .08 MFD. 400 V
C10 N-6015 Condenser, Ceramic 100 MMFD. 500 V. 20%
C11 N-4894 Condenser, Paper .005 MFD. 600V
C12 N-6488 Condenser, Ceramic 250 MMFD. 500 V. 20%
C14 N-1376 Condenser, Paper .02 MFD. 400 V

C15) C16) N-5051 Condenser, Dry Electrolytic (40 MFD. 150 V.) (40 MFD. 150 V.)

C17 N-1346 Condenser, Paper .05 MFD. 400 V.

R1 N-4062 Resistor, Carbon 3.3 Megohm 1/2W. 20%
R2, R3 N-4063 Resistor, Carbon 47,000 Ohm 1/2W. 20%
R4 N-1262 Resistor, Carbon 1.0 Megohm 1/2W. 20%
R5 N-6485 Resistor, Carbon 68 Ohm 1/2W. 10%
R6 N-7984 Wolume Control 500,000 Ohm with Switch

R7 N-4028 Resistor, Carbon 6.8 Megohm 1/2W. 20%
R8 N-4026 Resistor, Carbon 220,000 Ohm 1/2W. 20%
R9 N-4027 Resistor, Carbon 470,000 Ohm 1/2W. 20%
R10 N-4067 Resistor, Carbon 180 Ohm 1/2W. 10%



R11 N-3341 Resistor, Carbon 1,000 Ohm 1/2W. 10%

L1 N-8002 Coil, Loop Antenna and Cabinet Back
L2 N-7982 Coil, Oscillator

T1, T2 N-7981 Coil, 1st. and 2nd. I.F. Transformer
T3 N-8001 Transformer, Output

N-7981 Speaker, 5 Inch P.M.
N-8045 Assembly, Variable Gang Condenser & Pulley
N-8005 Screen, Flocked Dial

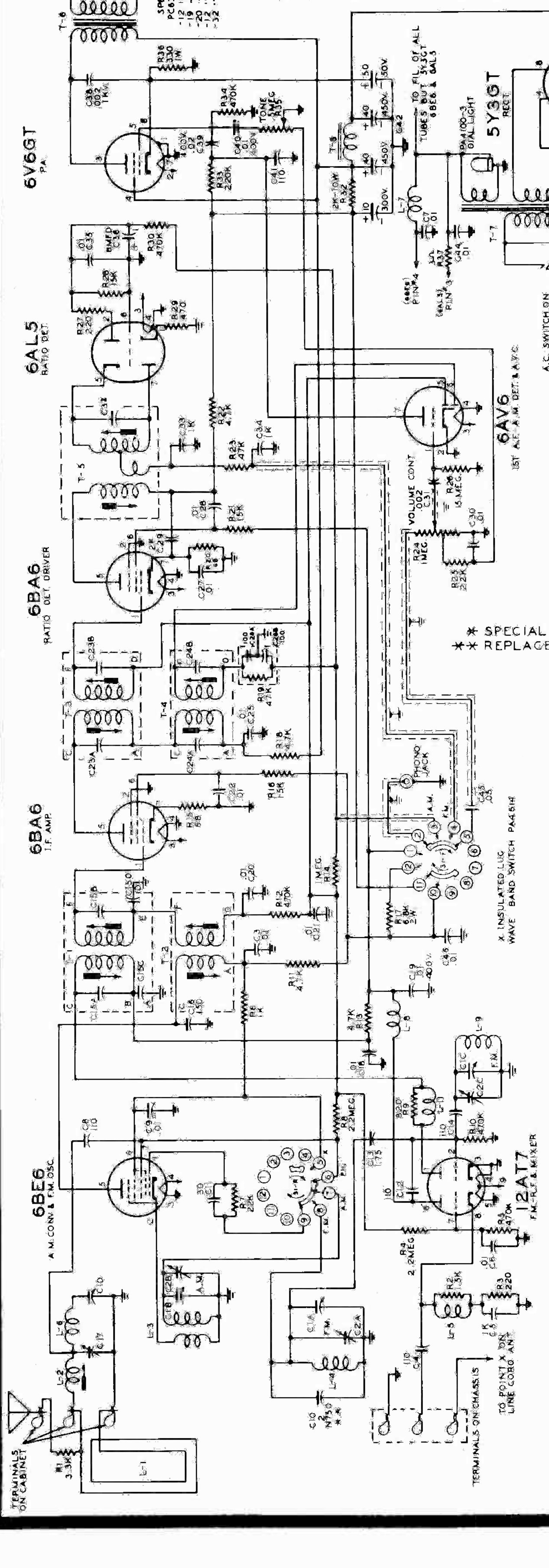
N-8004 Knobs, Walnut Plastic) For Model No.
#315 Cabinet, Walnut Plastic) 607-315 Only

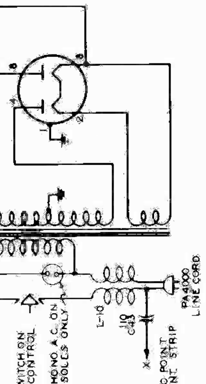
N-8003 Knobs, Ivory Plastic) For Model No.
#314 Cabinet, Ivory Plastic) 607-314 only

N-7994 Pointer, Dial Indicator
N-1090 Line Cord, 6 Foot Rubber
N-8007

1951 MOST-OFTEN-NEEDED RADIO DIAGRAMS

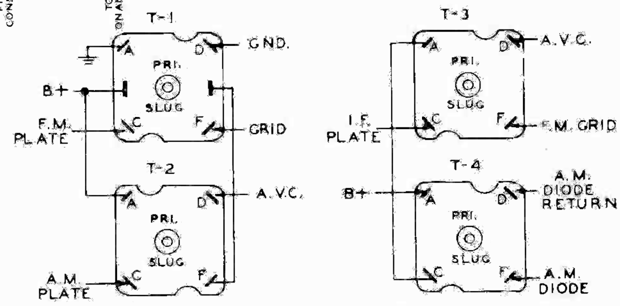
SPARTON SUPERHETERODYNE CHASSIS TYPE 8M10





MODELS 141X, 142X, 1040X, 1041X

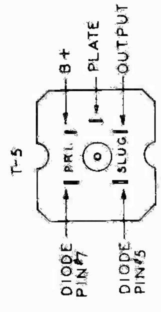
Sparton Chassis 8W10, used in Models 141XX, 142XX, 1040XX, 1041XX, 1085, 1086, 1090, and 1091, electrically is almost identical to the chassis described on this page and on the next page (over).

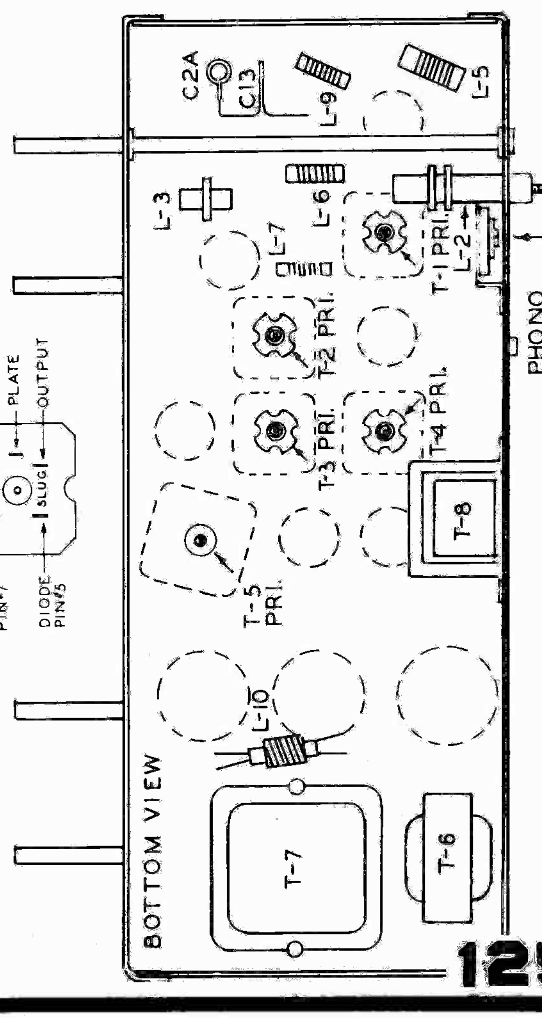


BOTTOM VIEW, TERMINAL HOOKUP FOR T-1, T-2, T-3, T-4 & T-5

* SPECIAL NOTE: THESE TRANSFORMERS SUPPLIED IN COMPLETE ASSEMBLIES

** REPLACE ONLY WITH TEMPERATURE COEFFICIENT AS INDICATED



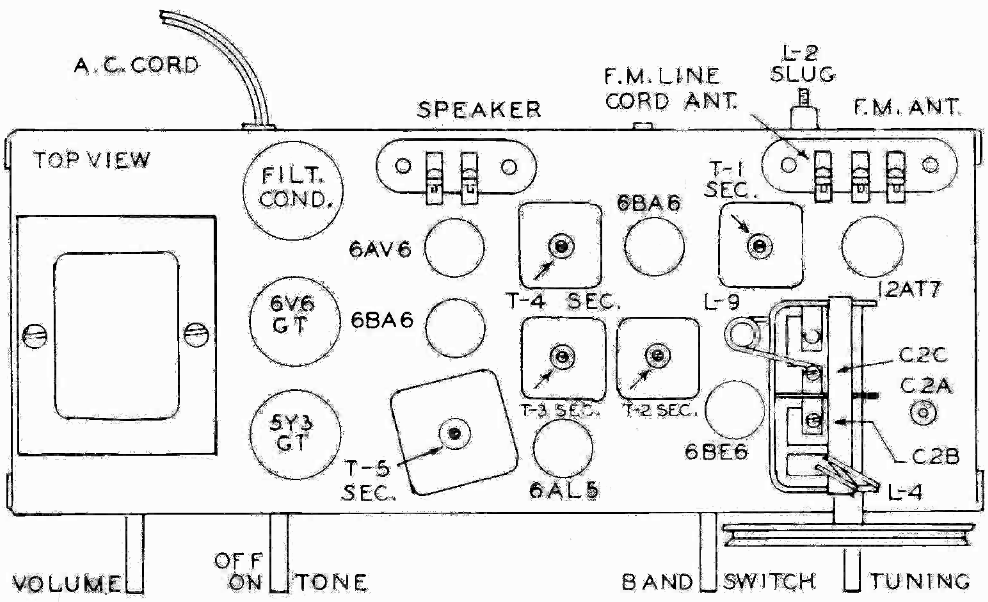


SPARTON SUPERHETERODYNE RADIO RECEIVER

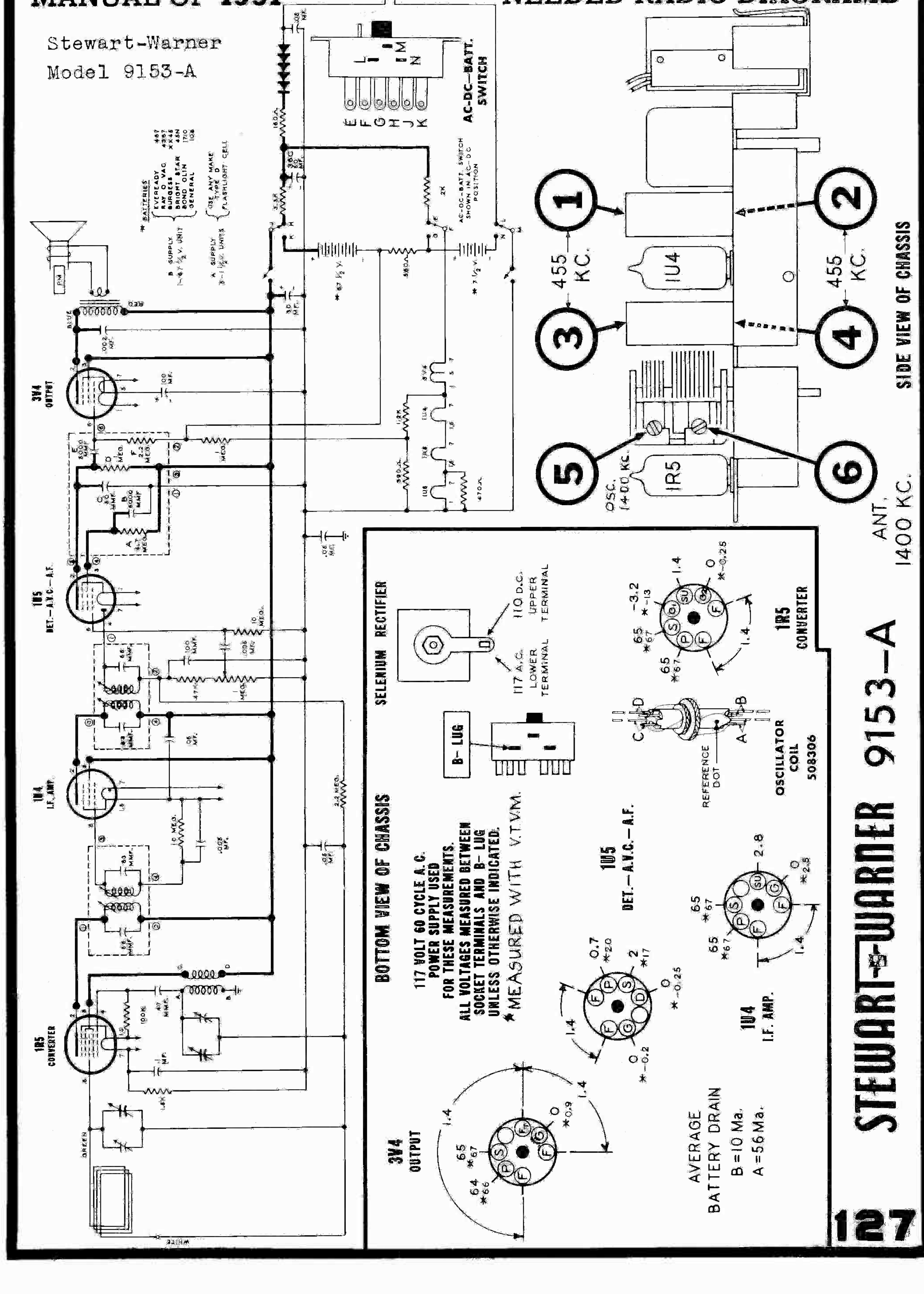
CHASSIS TYPE 8M10 **MODELS 141X, 142X 1040X, 1041X**

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANT.	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND SETTING	TRIMMER OR SLUG	REMARKS
1.	Set Dial pointer even with left-hand stop line with condenser gang closed.							
2.	Connect output meter across speaker terminals.							
3.	A.M.-I.F.	Pin #7 of 6BE6 Conv. Tube	.02 MFD Cond.	456 KC.	A.M.	Open	T4 Sec. Slug	Max. Reading
							T4 Pri. Slug	Max. Reading
							T2 Sec.Slug	Max. Reading
							T2 Pri. Slug	Max. Reading
4.	Repeat operation #3.							
5.		A.M. Ant.		1500 KC.		1500 KC.	C2B Osc. Tri.	Peak Accurately
6.	A.M.-R.F.	On Cabinet	*	1500 KC.	A.M.	1500 KC.	C17 Ant.Tri.	Peak Accurately
7.	A.M.-R.F.	On Cabinet	*	600 KC.	A.M.	600 KC.	L-2 Slug	Max.Reading
8.	Repeat operations #5,#6 and #7.							
9.	Check Calibrations at 600,1000 and 1500 KC.							
10.	SPECIAL NOTE: For complete F.M.- I.F. Visual Alignment instructions please refer to pages 9.10.11.12.13 and 14 of Bulletin 11,Manual 6.							
11.	F.M.-I.F. Alignment using an A.M. Generator and Output Meter.							
12.	T5 F.M. Ratio Det.	Pin #1 of 2nd 6BA6 Tube	.02 MFD. Cond.	10.7 MC.	F.M.	Open	T5 Sec. Slug	Max.Reading
							T5 Pri. Slug	Max.Reading
13.	NOTE: Operations 11,12,14,15,18 and 19 must be made with generator output as low as possible,consistent with usable output meter reading.							
14.	T3 2nd. F.M.-I.F.	Pin #1 1st 6BA6 Tube	.02 MFD. COND.	10.7 MC.	F.M.	Open	T3 Sec. Slug	Max.Reading
							T3 Pri. Slug	Max.Reading
15.	T1 1st F.M.-I.F.	Pin #8 on 12AT7 Mixer Tube	.02 MFD. COND.	10.7 MC.	F.M.	Open	T1 Sec. Slug	Max.Reading
							T1 Pri. Slug	Max.Reading
16.	Adjust secondary slug on T5 ratio detector transformer to minimum deflection or dip on output meter. Under certain conditions it is possible to adjust T5 sec.slug to minimum noise with the receiver tuned to a weak station. This operation is very critical and the receiver must be tuned to the center response only.							
17.	F.M-R.F. alignment using an A.M. Generator with frequencies of 88 to 108 MC.and a vacuum tube voltmeter.or D. C. voltmeter. (20,000 Ohms per volt).							
18.	Place meter across C36 elect. condenser. (Meter reading approximately 1 volt)							
19.	F.M.-R.F.	F.M. Ant.	Match Gen. To 300 Ohms	106 MC	F.M.	106 MC.	C2A Osc. Tri.	Max.Reading
							C2D Ant. Tri.	Peak Accurately
20.	Check Calibration at 88 MC.							

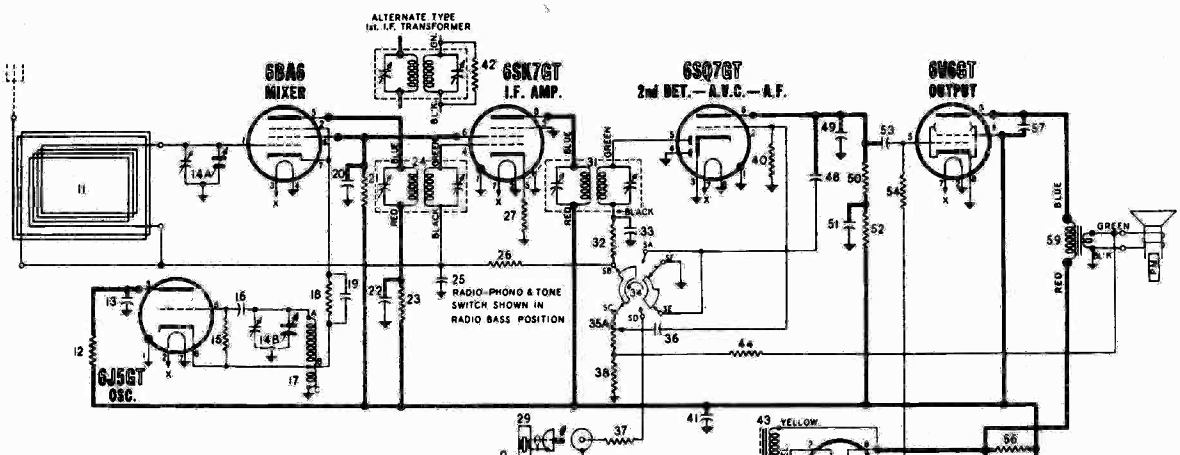
*Use standard dummy antenna

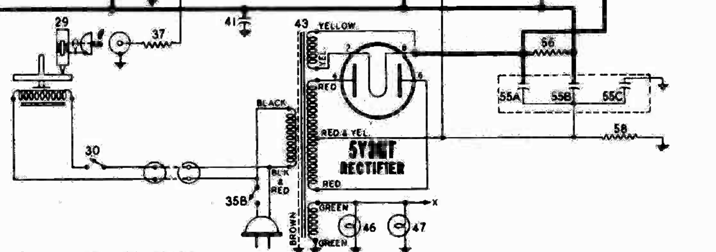


Stewart-Warner
Model 9153-A



STEWART-WARNER MODELS 9154-C & 9154-CZ



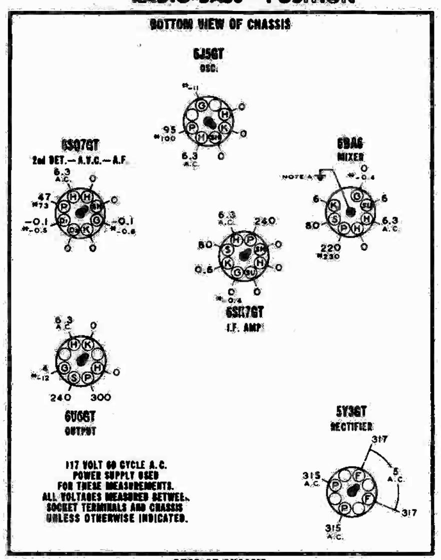


SOCKET VOLTAGES

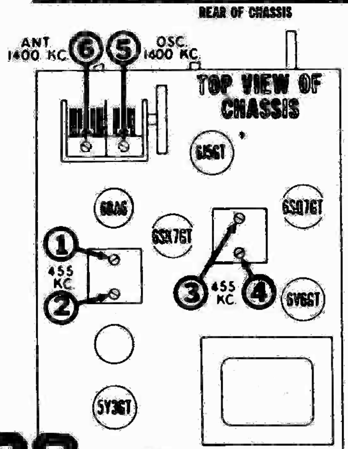
All measurements made with a voltmeter having a sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.

DIAL TUNED TO 540 KC.
VOLUME ON FULL WITH NO SIGNAL
RADIO-PHONO & TONE SWITCH IN "RADIO-BASS" POSITION

I.F. 455 KC.

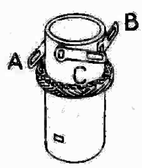


REAR OF CHASSIS

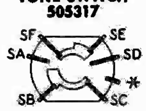


TRIMMER LOCATIONS

OSCILLATOR COIL 505326

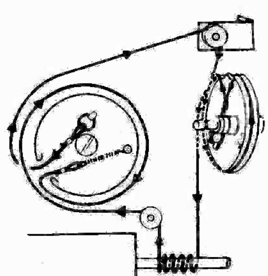


RADIO-PHONO & TONE SWITCH 505317



REAR VIEW
*Not used; may serve as wiring junction point.

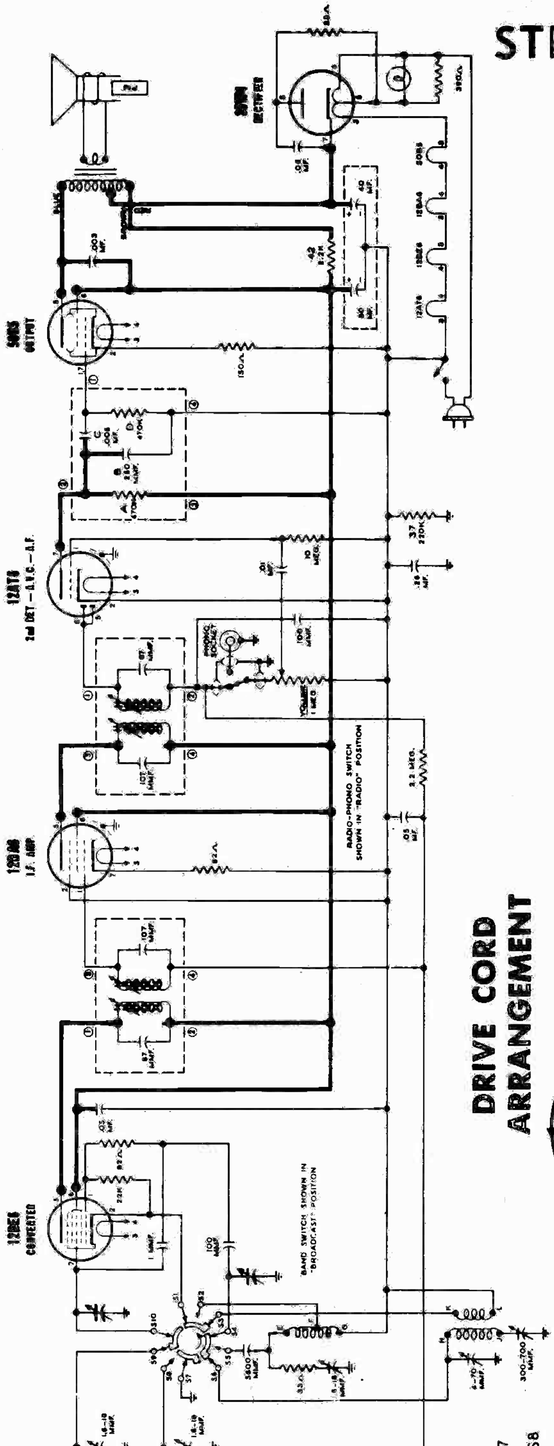
Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

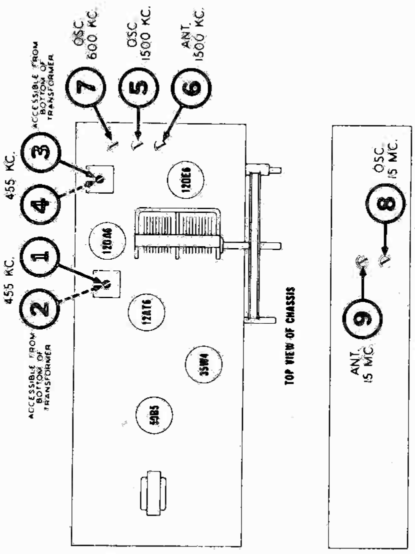


PARTS LIST

DIAGRAM NO.	PART NO.	DESCRIPTION
		CONDENSERS
13	512010	Condenser—.01 Mfd. 400 volt
14-A,B,	505315	Condenser—variable gang (with drum)
16	512503	Condenser—mica 100 Mmfd. 500 volt
19	512026	Condenser—.05 Mfd. 200 volt
20	512028	Condenser—.05 Mfd. 400 volt
22	512016	Condenser—.02 Mfd. 400 volt
25	512026	Condenser—.05 Mfd. 200 volt
33	512503	Condenser—mica 100 Mmfd. 500 volt
36	512006	Condenser—.005 Mfd. 600 volt
41	512028	Condenser—.05 Mfd. 400 volt
48	512006	Condenser—.005 Mfd. 600 volt
49	512509	Condenser—mica 260 Mmfd. 500 volt
51	512034	Condenser—.1 Mfd. 400 volt
53	512016	Condenser—.02 Mfd. 400 volt
55-A, B, C,	502207	Condenser—electrolytic A—20 Mfd.—400 volt; B—10 Mfd.—400 volt; C—20 Mds.— 25 volt
57	512006	Condenser—.005 Mfd. 600 volt
		RESISTORS
12	510263	Resistor—carbon 33,000 Ohms ± 10% 1 watt
15	510167	Resistor—carbon 47,000 Ohms ½ watt
18	510143	Resistor—carbon 2,200 Ohms ½ watt
21	510267	Resistor—carbon 47,000 Ohms 1 watt
23	510152	Resistor—carbon 6,800 Ohms ½ watt
26	510194	Resistor—carbon 3.3 Meg. ½ watt
27	510112	Resistor—carbon 47 Ohms ± 10% ½ watt
32	510167	Resistor—carbon 47,000 Ohms ½ watt
35-A,B,	505318	Volume Control 1 Meg. (with switch)
37	510185	Resistor—carbon 470,000 Ohms ½ watt
38	510122	Resistor—carbon 150 Ohms ½ watt
40	510195	Resistor—carbon 4.7 Meg. ½ watt
42	510191	Resistor—carbon 1 Meg. ½ watt
44	510146	Resistor—carbon 3,300 Ohms ½ watt
50, 52	510179	Resistor—carbon 220,000 Ohms ½ watt
54	510185	Resistor—carbon 470,000 Ohms ½ watt
56	510346	Resistor—carbon 3,300 Ohms 2 watt
58	510707	Resistor—wire wound 200 Ohms ± 5% 2 watt
		COILS AND TRANSFORMERS
11	505306	Loop antenna
17	505326	Coil-oscillator
24	502657	Transformer—1st I.F.
31	502658	Transformer—2nd I.F.
43	502174	Transformer—power
59	505305	Transformer—output
		OTHER ELECTRICAL PARTS
29	509160	Pick-up cartridge
30	509205	Switch—"OFF-ON" for type VM-509032 record changer; used on Model 9154-C.
30	520037	Switch—"OFF-ON" for type GI-509522 record changer; used on Model 9154-CZ
34	505317	Switch—radio-phono-tone
46, 47	110629	Lamp—dial (Mazda #44) 6.3 v. 0.25 A

STEWART-WARNER MODEL 9156-A





I.F. 455 KC.

SOCKET VOLTAGES

Measured with voltmeter having sensitivity of 20,000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.

BAND SWITCH SET TO "SW" POSITION

DIAL TUNED TO MAXIMUM COUNTER-CLOCKWISE POSITION

DRIVE CORD ARRANGEMENT

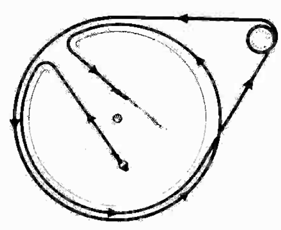
To string dial cord, turn the main drive drum to maximum counter-clockwise position and use following parts:

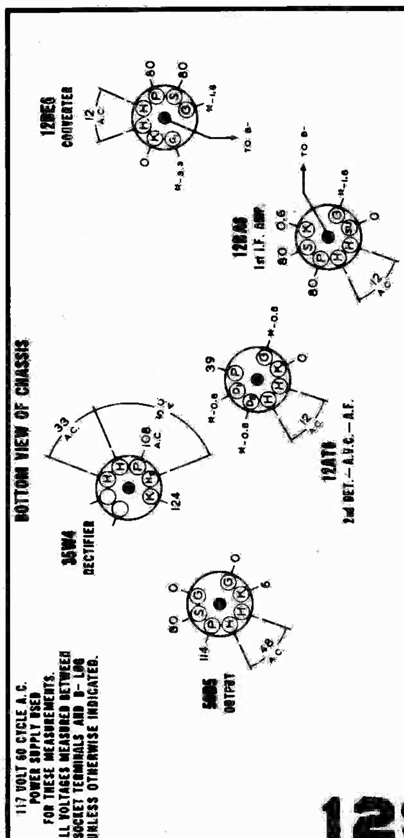
114955 Clip on end of cord

502773 Cord (3½ feet)

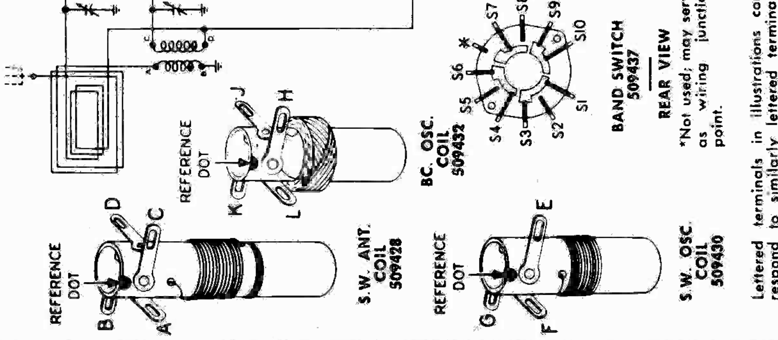
119087 Ring

161384 Tension Spring





117 VOLT 60 CYCLE A.C. POWER SUPPLY USED FOR THESE MEASUREMENTS. ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND B- LUG UNLESS OTHERWISE INDICATED.

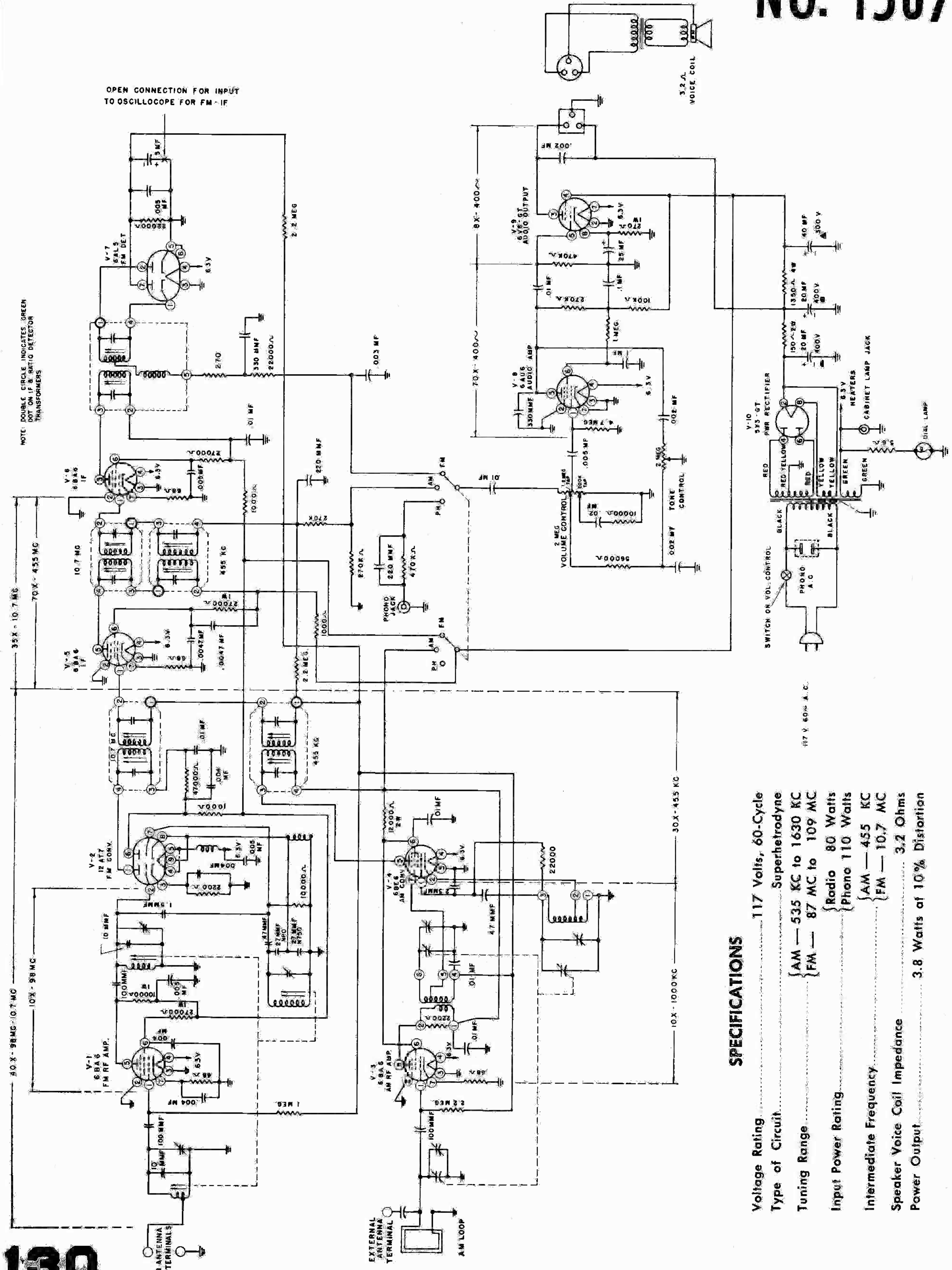


*Not used; may serve as wiring junction point.

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

STROMBERG-CARLSON RADIO

NO. 1507



SPECIFICATIONS

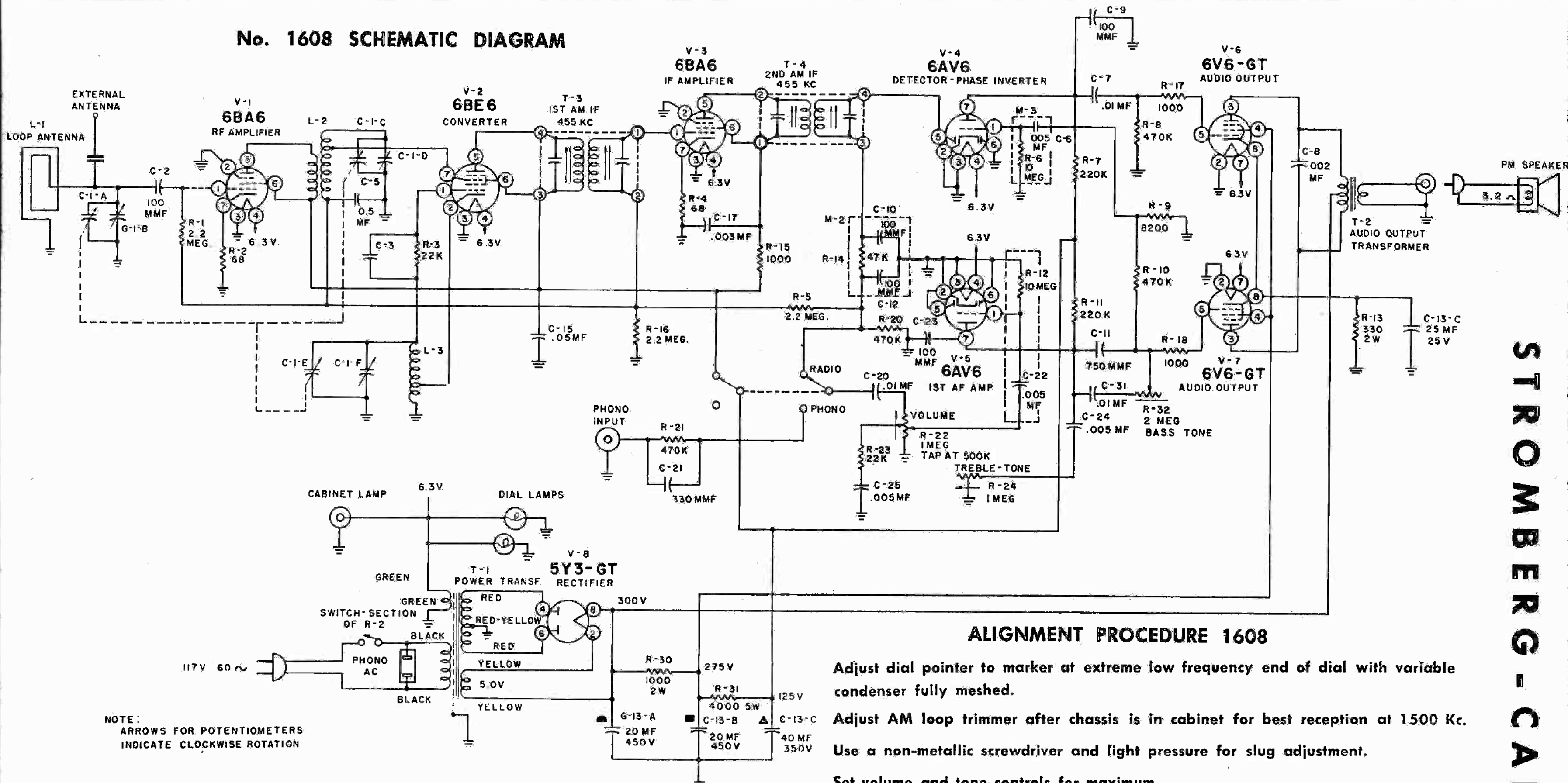
Voltage Rating	117 Volts, 60-Cycle
Type of Circuit	Superhetrodyne
Tuning Range	AM — 535 KC to 1630 KC FM — 87 MC to 109 MC
Input Power Rating	Radio 80 Watts Phono 110 Watts
Intermediate Frequency	AM — 455 KC FM — 10.7 MC
Speaker Voice Coil Impedance	3.2 Ohms
Power Output	3.8 Watts at 10% Distortion

STROMBERG-CARLSON

RADIO RECEIVER NO. 1608

See next page, over, for additional service material.

No. 1608 SCHEMATIC DIAGRAM



ALIGNMENT PROCEDURE 1608

Adjust dial pointer to marker at extreme low frequency end of dial with variable condenser fully meshed.

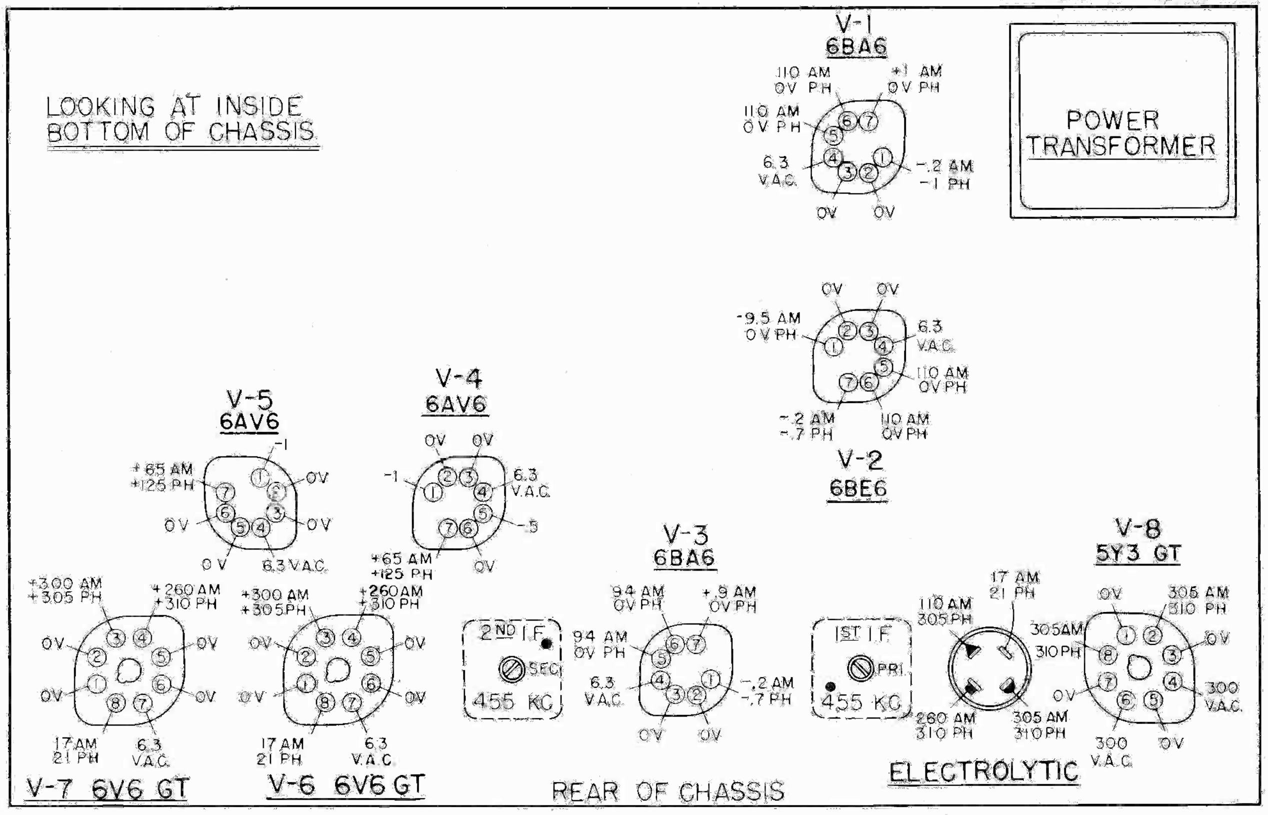
Adjust AM loop trimmer after chassis is in cabinet for best reception at 1500 Kc.

Use a non-metallic screwdriver and light pressure for slug adjustment.

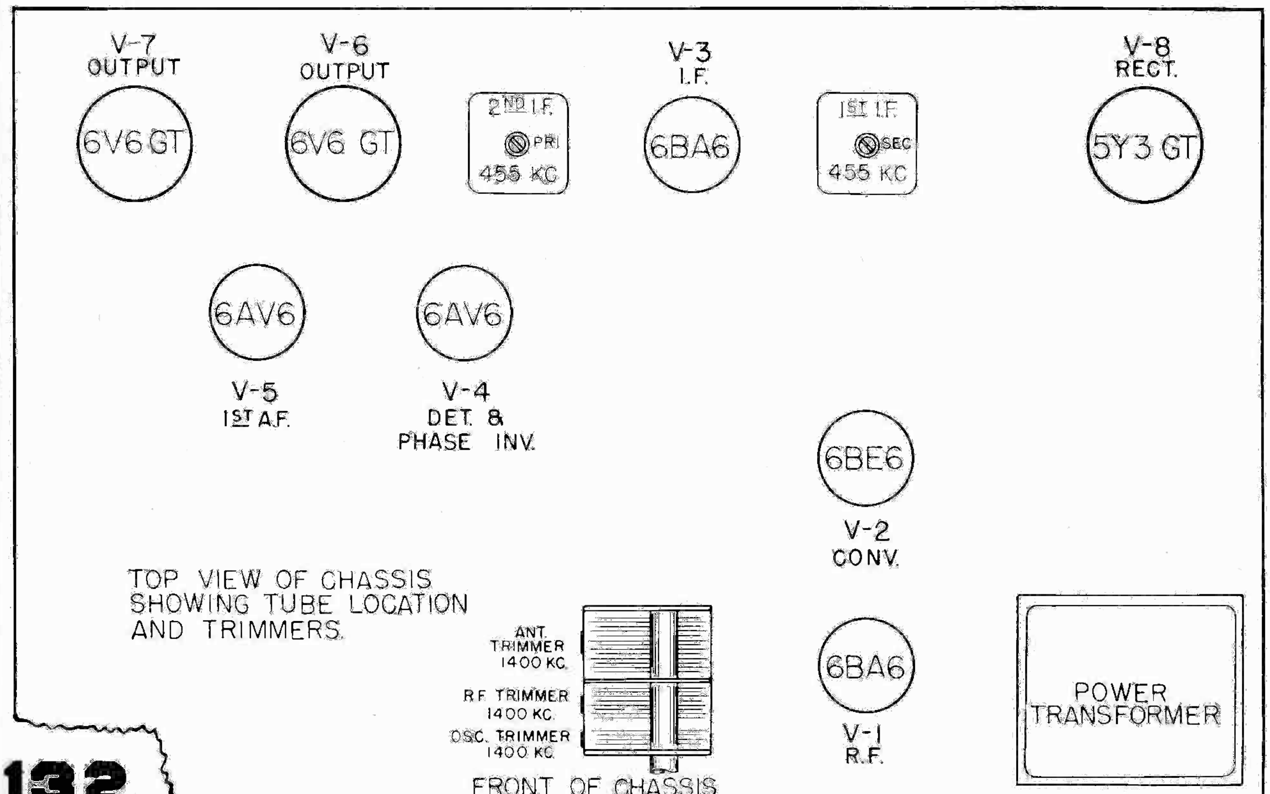
Set volume and tone controls for maximum.

Pointer	Signal Generator	VTVM Connection	Adjustment and Notes
1. Pointer at 1000 Kc. approx.	455 Kc.-400 cy. modulation to grid of converter (pin 7 of V-2, 6BE6).	Terminal 2 of T-3.	Adjust top and bottom slugs of T-3 and T-4 for maximum output on VTVM.
2. Pointer at 1400 Kc.	1400 Kc.-400 cy. modulation to stator terminal of C-1-A.	Same as 1.	Adjust C-1-F and C-1-D for maximum output on VTVM.
3. Pointer at 1400 Kc.	1400 Kc.-400 cy. coupled through radiating loop.	Same as 1.	Readjust C-1-F, C-1-D, and C-1-B for maximum output on VTVM.

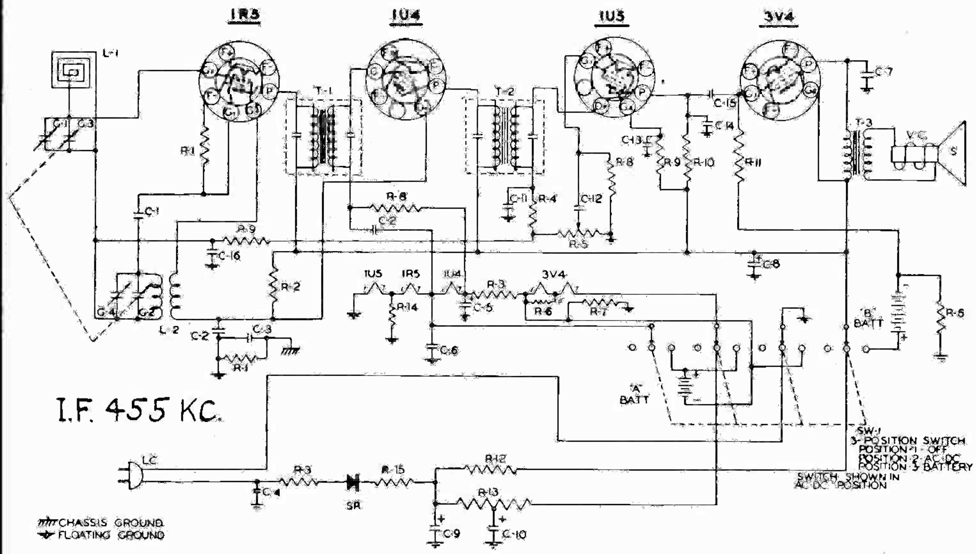
STROMBERG-CARLSON RADIO NO. 1608



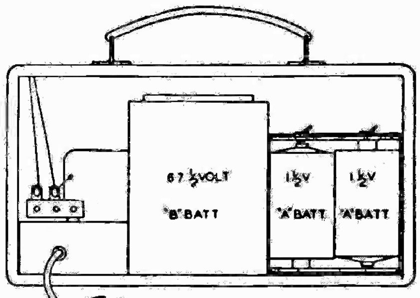
VOLTAGES MEASURED TO CHASSIS GROUND WITH VTVM TYPE METER.
DOTS ON I.F. TRANSFORMERS INDICATE THE POSITION OF COLOR CODED TERMINAL.



TRAV-LER RADIO CORP. MODEL 5022

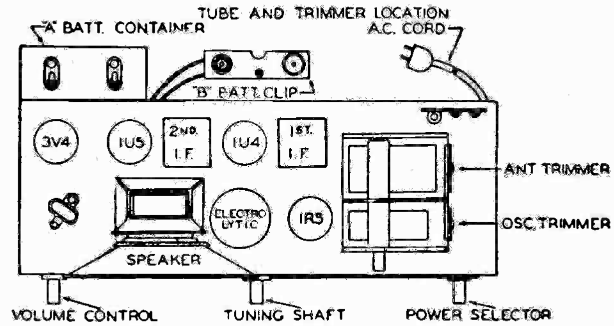


PART NO.		DESCRIPTION
IR-20	R-1	220M ~ RESISTOR 1/2W 20 %
IR-37	R-2	10M ~ RESISTOR 1/2W 20 %
IR-17	R-3	33 ~ RESISTOR 1/2W 20 %
IR-31	R-4	82M ~ RESISTOR 1/2W 10 %
VC-11	R-5	1MEG VOLUME CONTROL
IR-33	R-6	270 ~ RESISTOR 1/2W 10 %
IR-39	R-7	620 ~ RESISTOR 1/2W 5 %
IR-3	R-8	10MEG RESISTOR 1/2W 20 %
IR-23	R-9	3.3MEG RESISTOR 1/2W 20 %
IR-12	R-10	1MEG RESISTOR 1/2W 20 %
IR-13	R-11	2.2MEG RESISTOR 1/2W 20 %
IR-40	R-12	3900 ~ RESISTOR 1W 10 %
WR-7	R-13	1050-1050 CANDOHM RESISTOR 5W 5 %
IR-1	R-14	470 ~ RESISTOR 1/2W 20 %
IR-41	R-15	47 ~ RESISTOR 1W 10 %
MC-2	C-1	100MMFD. MICA CONDENSER
PC-7	C-2	.01MFD. CONDENSER 400 W.V.
PC-8	C-3	.1 MFD. CONDENSER 400 W.V.
PC-5	C-4	.05 MFD. CONDENSER 400 W.V.
EC-6	C-5	70MFD 10WV ELECTROLYTIC
PC-3	C-6	.1 MFD. CONDENSER 200 W.V.
PC-6	C-7	.005MFD. CONDENSER 600 W.V.
EC-14	C-8	40 MFD. 150 W.V. ELECTROLYTIC
	C-9	40 MFD.
	C-10	20 MFD.
MC-7	C-11	150MMFD.
	C-12	.002MFD.
	C-13	.005MFD.
	C-14	100 MFD.
	C-15	.005MFD.
PC-2	C-16	.05MFD. CONDENSER 200 W.V.
	G-1	ANT TRIMMER
GC-6	G-2, G-3	GANG CONDENSER
LL-23	L-1	LOOP ANTENNA
LO-8	L-2	OSC COIL
SR-2	SR	SELENIUM RECTIFIER
CO-1	LC	LINE CORD
SW-8	SW-1	4 POLE 3 POSITION SWITCH
	"A" BATT	2 "D" SIZE FLASHLITE CELLS 1½ VOLTS
	"B" BATT	1 - 67½ VOLT BATTERY
LI-5	T-1	INPUT IF TRANSFORMER
LI-5	T-2	OUTPUT IF TRANSFORMER
SPK-16	T-3	SPEAKER OUTPUT TRANSFORMER
	V.C.	VOICE COIL
	S	3½ PM SPEAKER
	G-4	OSC TRIMMER
TU-39	—	1R5-1U4-1U5-3V4

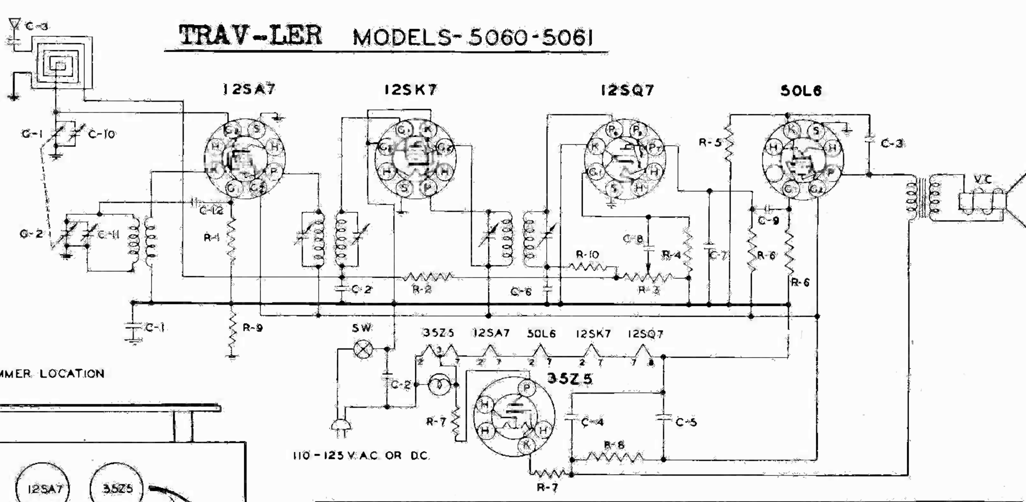


BATTERY LOCATION

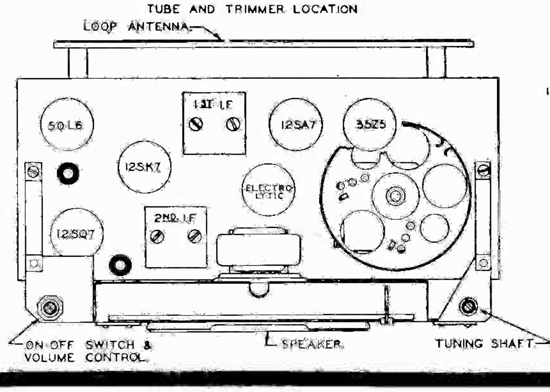
TUBE AND TRIMMER LOCATION



TRAV-LER MODELS-5060-5061

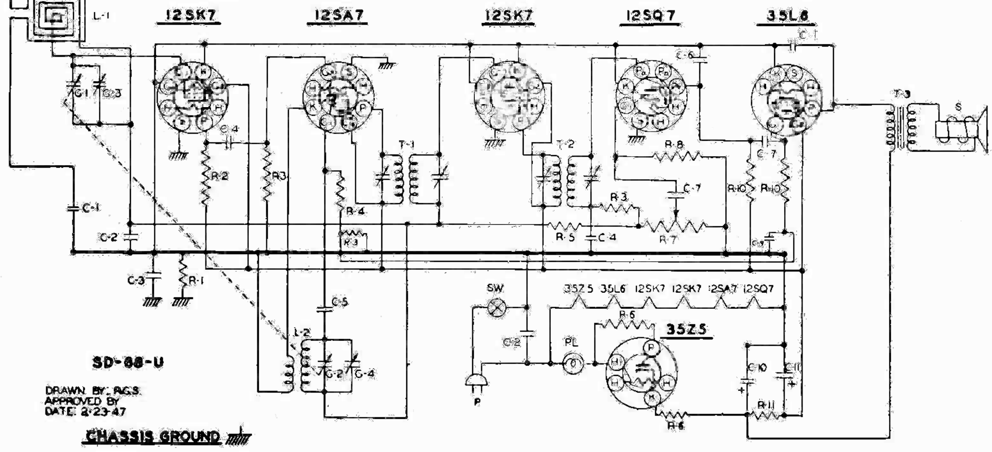


TUBE AND TRIMMER LOCATION

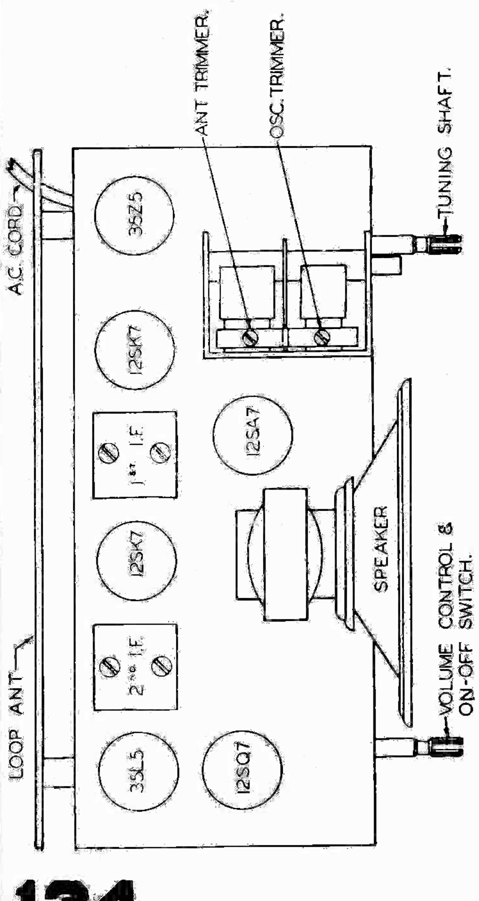


PART NO.		DESCRIPTION	PART NO.		DESCRIPTION
IR-9	R-1	22,000 ~ RESISTOR 1/2W 20 %	EC-12	C-4	40MFD. 150V. ELECTROLYTIC
IR-23	R-2	3.3MEG. RESISTOR 1/2W 20 %		C-5	20MFD.
VC-3	R-3	1MEG. VOLUME CONTROL	MC-8	C-6	220MMFD.
IR-13	R-4	2.2MEG. RESISTOR 1/2W 20 %		C-7	220MMFD.
IR-14	R-5	150 ~ RESISTOR 1/2W 20 %		C-8	.002MFD.
IR-11	R-6	470M ~ RESISTOR 1/2W 20 %		C-9	.005MFD.
IR-17	R-7	33 ~ RESISTOR 1/2W 20 %		C-10	ANT. TRIMMER
IR-25	R-8	2200 ~ RESISTOR 1 W 10 %		C-11	OSC. TRIMMER
IR-20	R-9	220M ~ RESISTOR 1/2W 20 %	MC-4	C-12	50MMFD. MICA CONDENSER
IR-10	R-10	47,000 ~ RESISTOR 1/2W 20 %	GC-6A	G-1, G-2	GANG CONDENSER
PC-8	C-1	.1MFD. CONDENSER 400 V.			
PC-5	C-2	.05MFD. CONDENSER 400 V.			
PC-7	C-3	.01 MFD. CONDENSER 400 V.			

TRAV-LER RADIO CORP. MODEL 5066



PART NO.		DESCRIPTION	PART NO.		DESCRIPTION	PART NO.		DESCRIPTION
PC-7	C-1	.01MFD. CONDENSER 400 V.	IR-9	R-4	22M Ω RESISTOR 1/2W 20 %	LI-6	T-1	INPUT I.F. TRANSFORMER
PC-5	C-2	.05MFD. CONDENSER 400 V.	IR-23	R-5	3.3MEG. Ω RESISTOR 1/2W 20 %	LI-7	T-2	OUTPUT I.F. TRANSFORMER
PC-8	C-3	.1MFD. CONDENSER 400 V.	IR-17	R-6	33 Ω RESISTOR 1/2W 20%		SW	SWITCH ON VOLUME CONTROL
MC-2	C-4	.0001 MICA CONDENSER	VC-13	R-7	1 MEG. VOLUME CONTROL			
MC-4	C-5	.00005 MICA CONDENSER	IR-13	R-8	2.2MEG. Ω RESISTOR 1/2W 20%	SPK-	T-3	OUTPUT TRANSFORMER
MC-5	C-6	.0005 MICA CONDENSER					S	5" P.M. SPEAKER
PC-6	C-7	.005MFD. CONDENSER 600 V.	IR-11	R-10	470M Ω RESISTOR 1/2W 20%			
			IR-25	R-11	2200 Ω RESISTOR 1 W 10%	PB-1	PL	#47 PILOT BULB
PC-4	C-9	25MFD. COND. 200 V				CO-1	P	LINE CORD
EC-12	C-10	40MFD. ELECTROLYTIC. 150 W.V.	GC-5	G-1	GANG CONDENSER			
	C-11	20MFD.		G-2				
				G-3	ANT. TRIMMER			
IR-20	R-1	220M Ω RESISTOR 1/2W 20 %		G-4	OSC TRIMMER			
IR-22	R-2	3900 Ω RESISTOR 1/2W. 10%	LL-16	L-1	LOOP ANT.			
IR-10	R-3	47M Ω RESISTOR 1/2W 20%	LO-10	L-2	OSC. COIL			



ALIGNMENT

Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

The receiver volume control should be turned to maximum during the I.F. and all subsequent alignments to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the floating ground buss under the chassis. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis. Adjust this trimmer until the 1720 KC signal is tuned in.

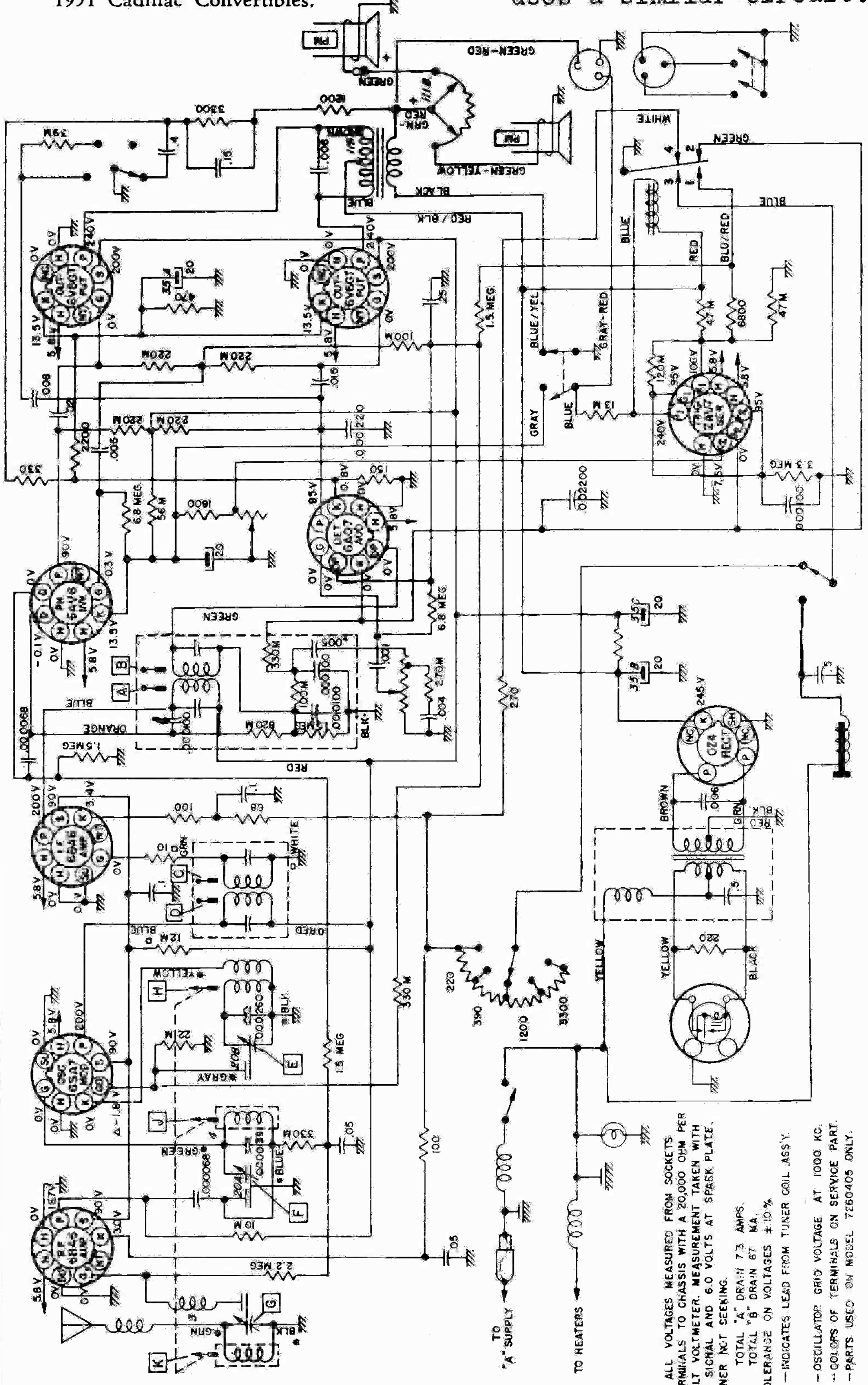
THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the primary of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the back of the loop antenna. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

UNITED MOTORS

Cadillac 7260405 7260905

MOUNTING—Model 7260405 - All 1951 Cadillac Sedans. Model 7260905 - All 1951 Cadillac Convertibles.

Packard Model 416394 uses a similar circuit.



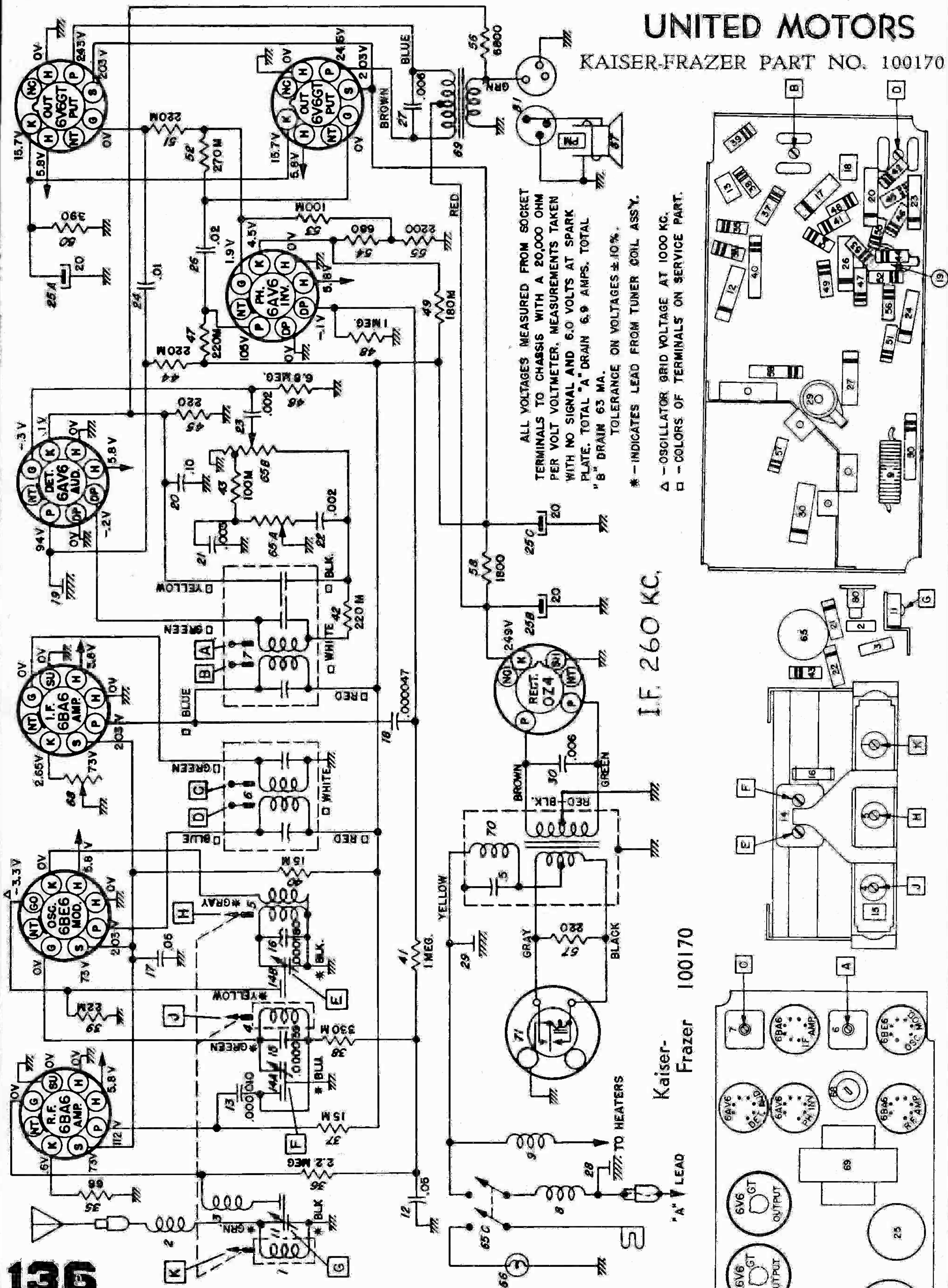
Output Meter VTVM From [2] To Chassis
Generator Return .... Receiver Chassis
Dummy Antenna In Series With Generator
Volume Control .... Maximum Volume
Sensitivity Control .... Maximum Sensitivity
Tone Control .... Treble
Generator Output ... Not To Exceed 2 Volts

Step	Dummy Antenna	Connect To	Signal Generator Frequency	Tune Receiver To	Adjust in Sequence for Max. Output
1	0.1 mfd	6SA7 Grid (Pin 8)	260 KC	*High Frequency Stop	A, B, C, D
2	0.000068 mfd	Antenna Connector	1615 KC	High Frequency Stop	E, F, G
3	0.000068 mfd	Antenna Connector	600 KC	Signal Gen. Signal	J, K
4	0.000068 mfd	Antenna Connector	1615 KC	Signal Gen. Signal	F, G
5	0.000068 mfd	Antenna Connector	1000 KC	Signal Gen. Signal	L

*To tune to high frequency, put a 0.070" feeler gauge (or bare #13 wire) in slot against the high frequency stop.

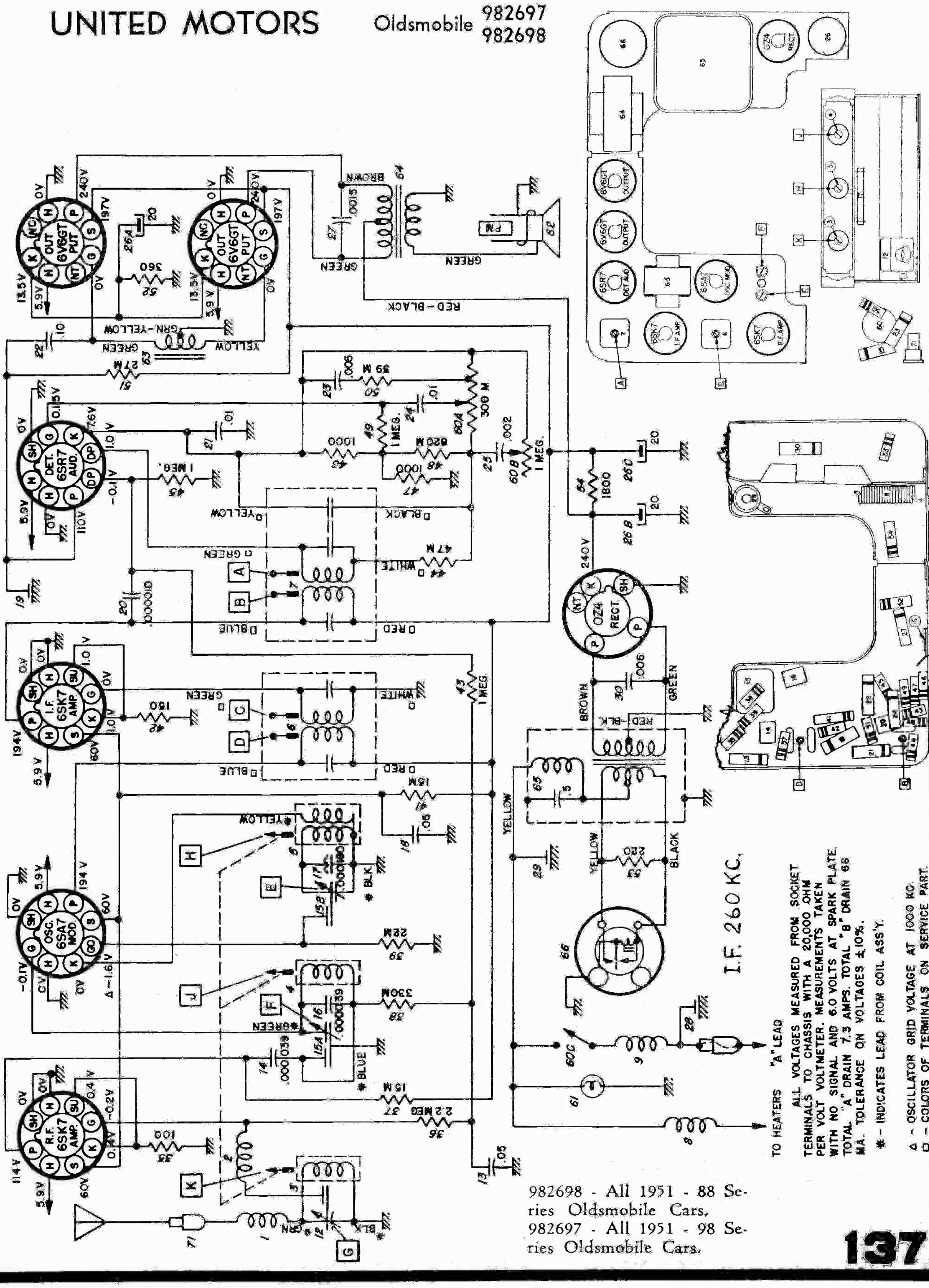
UNITED MOTORS

KAISER-FRAZER PART NO. 100170



UNITED MOTORS

Oldsmobile 982697 982698

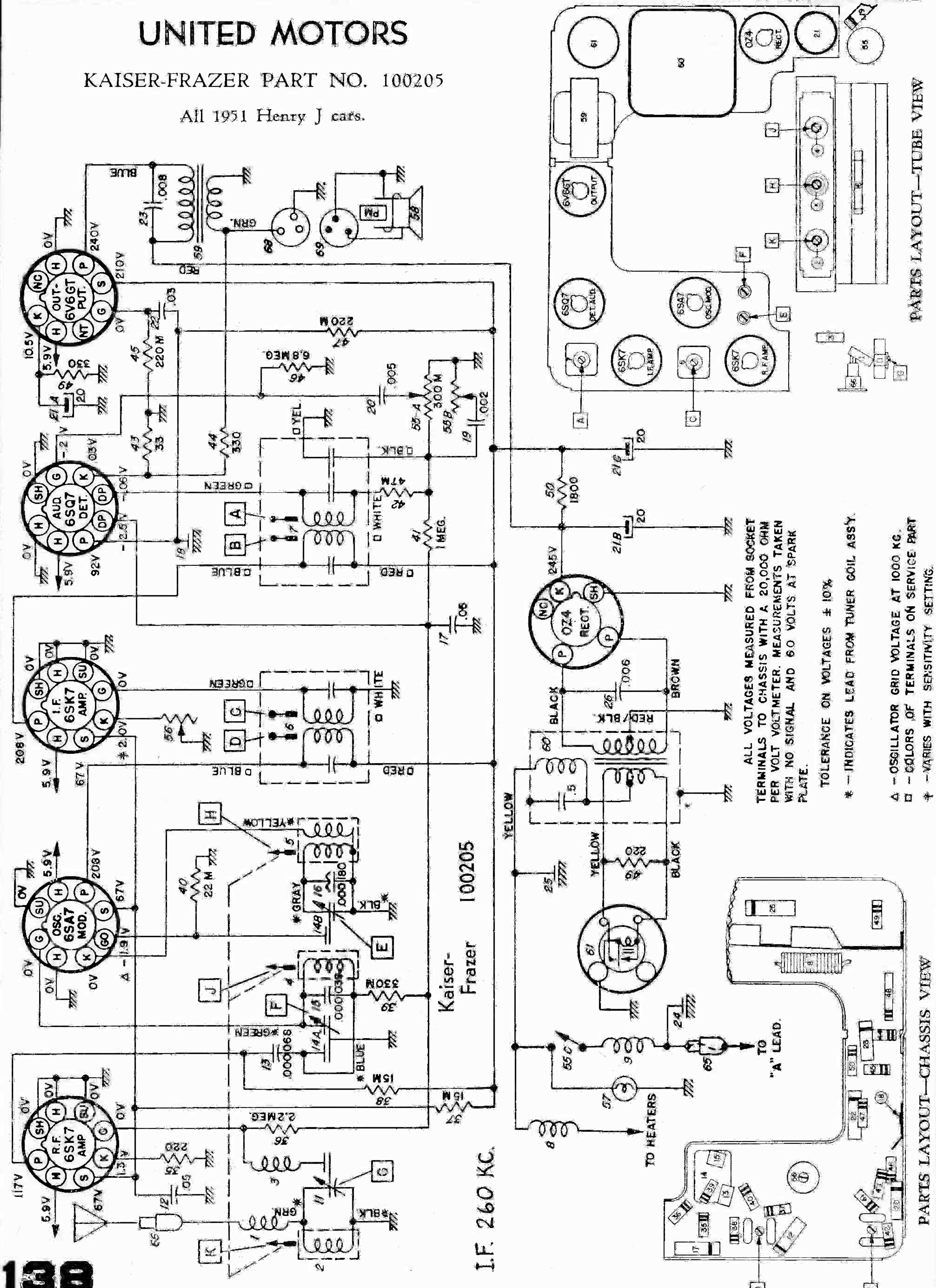


982698 - All 1951 - 88 Series Oldsmobile Cars.
982697 - All 1951 - 98 Series Oldsmobile Cars.

UNITED MOTORS

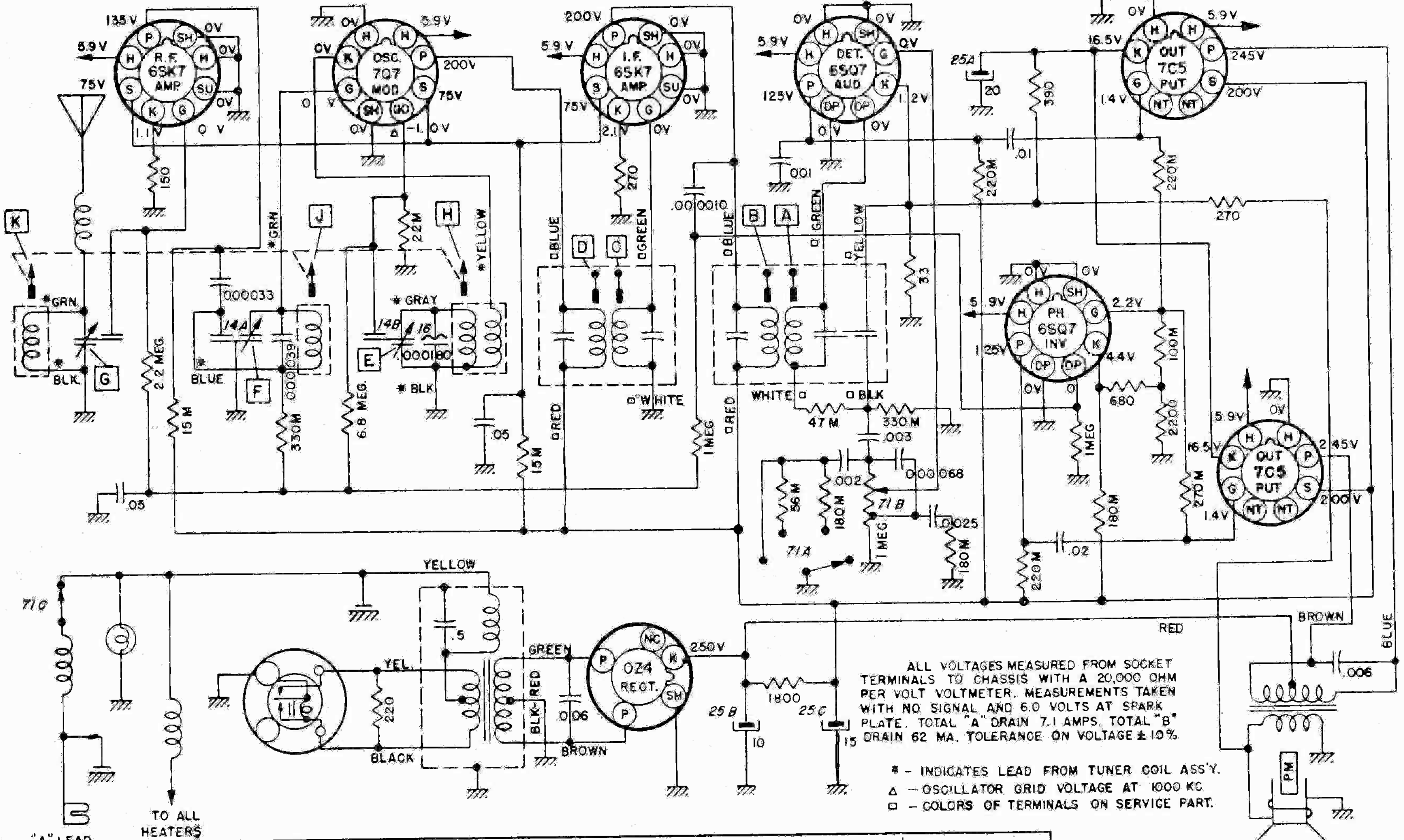
KAISER-FRAZER PART NO. 100205

All 1951 Henry J cars.



UNITED MOTORS

PONTIAC CHIEFTAIN MODEL 984592



ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENTS TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE. TOTAL "A" DRAIN 7.1 AMPS. TOTAL "B" DRAIN 62 MA. TOLERANCE ON VOLTAGE ± 10%

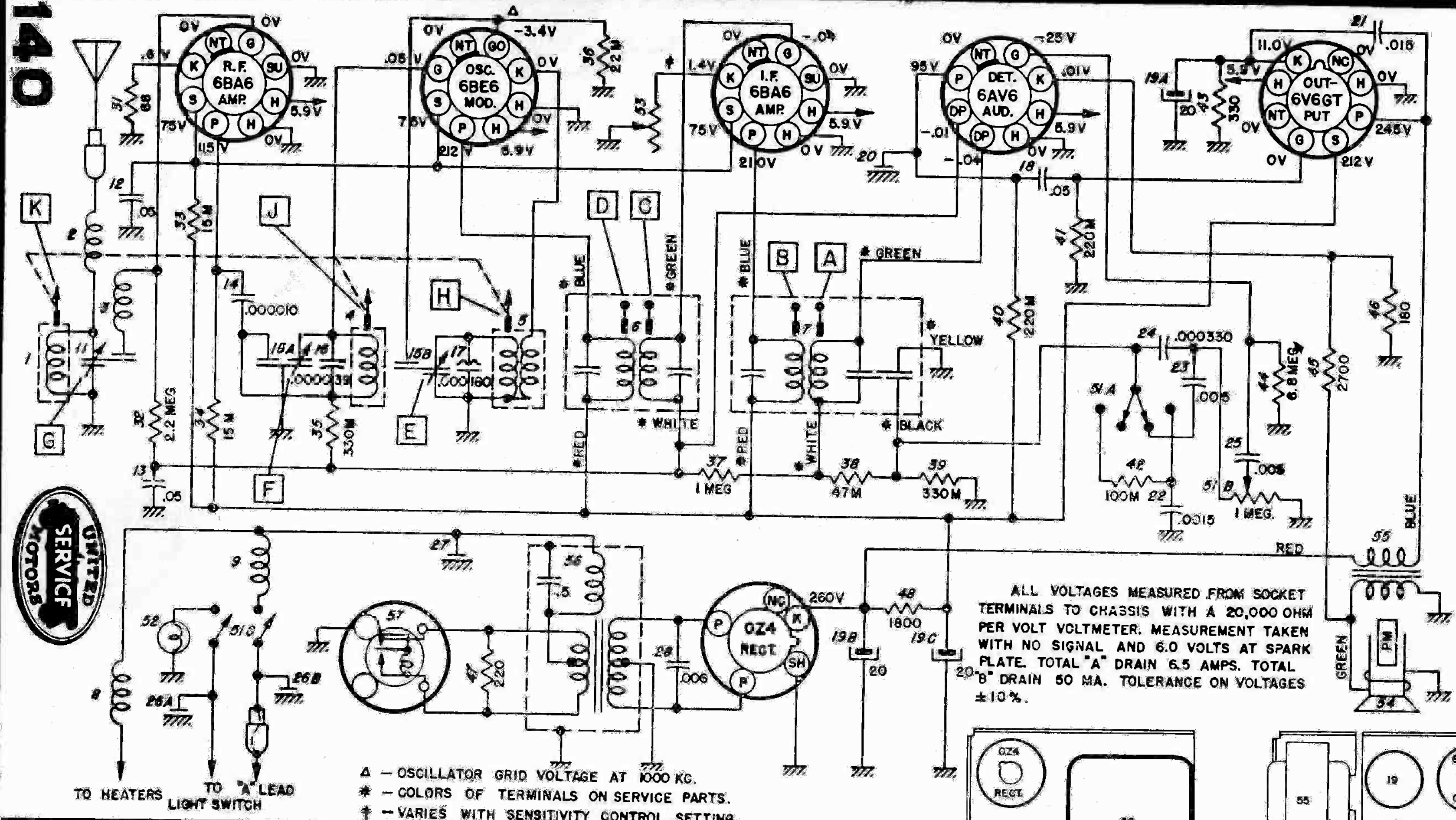
* – INDICATES LEAD FROM TUNER COIL ASS'Y.
△ – OSCILLATOR GRID VOLTAGE AT 1000 KC
□ – COLORS OF TERMINALS ON SERVICE PART.

Steps	Series Condenser or Dummy Antenna	Connect to	Signal Generator Frequency	Tune Receiver To	Adjust in Sequence for Max. Output
1	0.1 Mfd.	6SA7 Grid (Pin #8) or 7Q7 Grid (Pin #6)	260 KC	High Freq. Stop	A, B, C, D
2	0.000068 Mfd.	Antenna Connector	1615 KC	High Freq. Stop	E, F, G
3	0.000068 Mfd.	Antenna Connector	1000 KC	Signal Gen. Signal	J, K
4	0.000068 Mfd.	Antenna Connector	1615 KC	High Freq. Stop	F, G
5	0.000068 Mfd.	Antenna Connector	1100 KC	Signal Gen. Signal	L

Pontiac Model 984592. In some sets type 6SA7 tube was used instead of 7Q7; and 6V6GT instead of 7C5, with corresponding minor circuit changes.

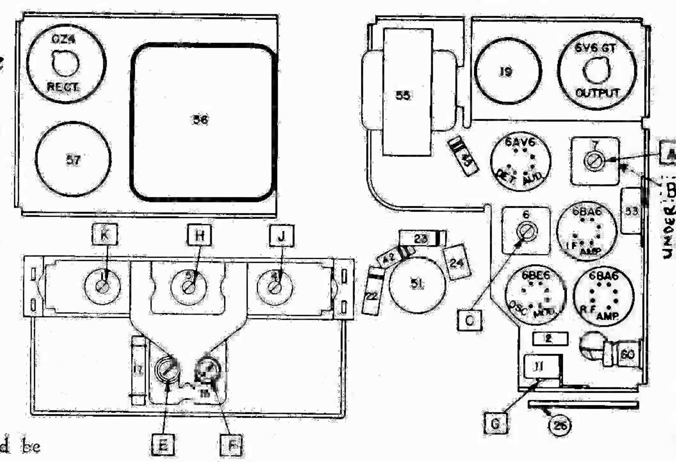
UNITED MOTORS

Chevrolet 986515



ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENT TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE. TOTAL "A" DRAIN 6.5 AMPS. TOTAL "B" DRAIN 50 MA. TOLERANCE ON VOLTAGES ±10%.

Δ – OSCILLATOR GRID VOLTAGE AT 1000 KC.
* – COLORS OF TERMINALS ON SERVICE PARTS.
† – VARIES WITH SENSITIVITY CONTROL SETTING.



Steps	Series Condenser or Dummy Antenna	Connect Signal Generator to	Signal Generator Frequency	Tune Receiver to	Adjust in Sequence For Max. Output
1	0.1 Mfd.	6BE6 Grid (Pin #7)	260 KC	High Frequency Stop	A, B, C, D
2	0.000068 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	*E, F, G
3	0.000068 Mfd.	Antenna Connector	1400 KC	Signal Generator Signal	J, K
4	0.000068 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	F, G
5	0.000068 Mfd.	Antenna Connector	1000 KC	Signal Generator Signal	L

*Before making this adjustment check mechanical setting of oscillator core "H." The rear of the core should be 1 25/32" from the mounting end of the coil form.

Western Auto Supply Co.

truetone

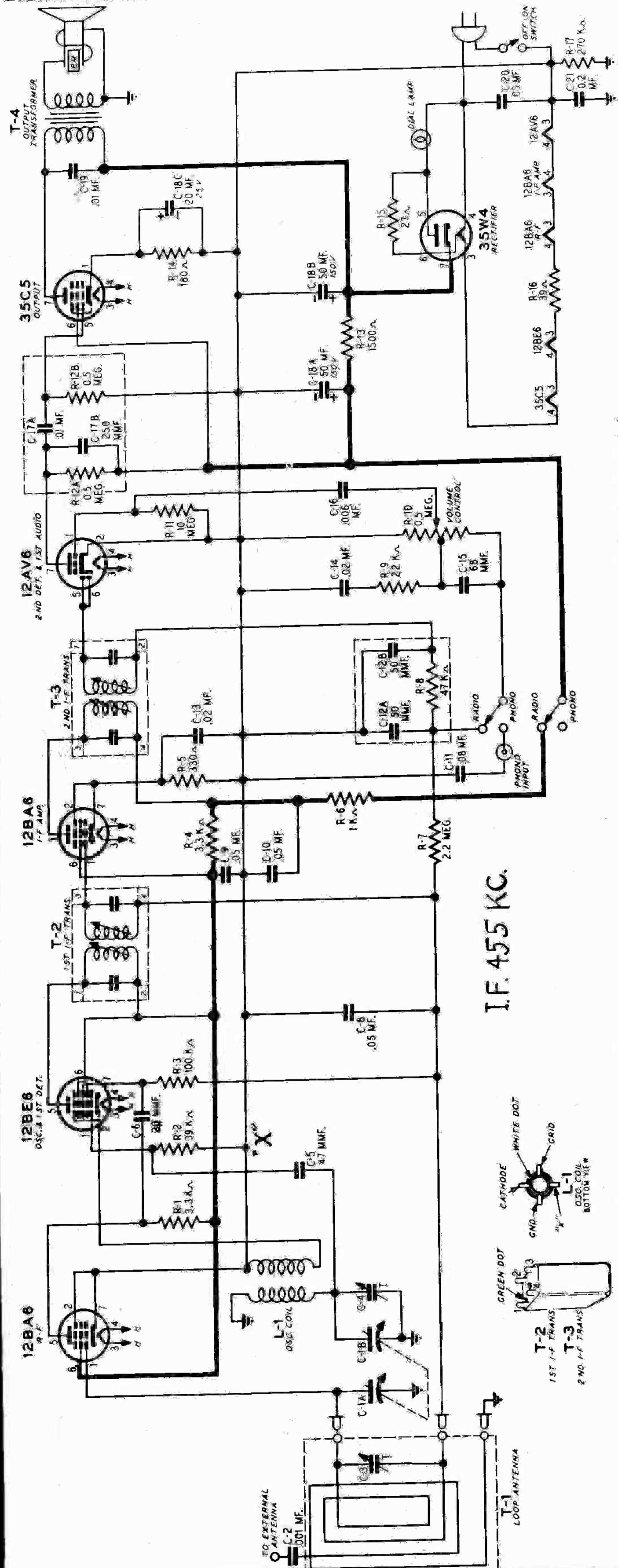
REG. U. S. PAT. OFF.

MODEL D2017 (WALNUT)

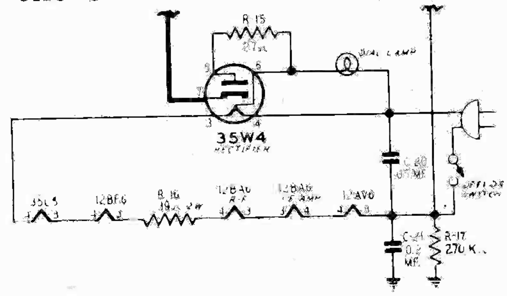
FACTORY MODEL 25D26-006

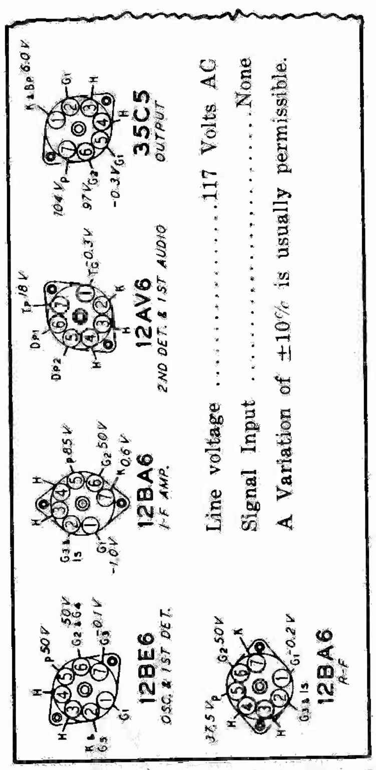
MODEL D2018 (IVORY)

FACTORY MODEL 225D26-002



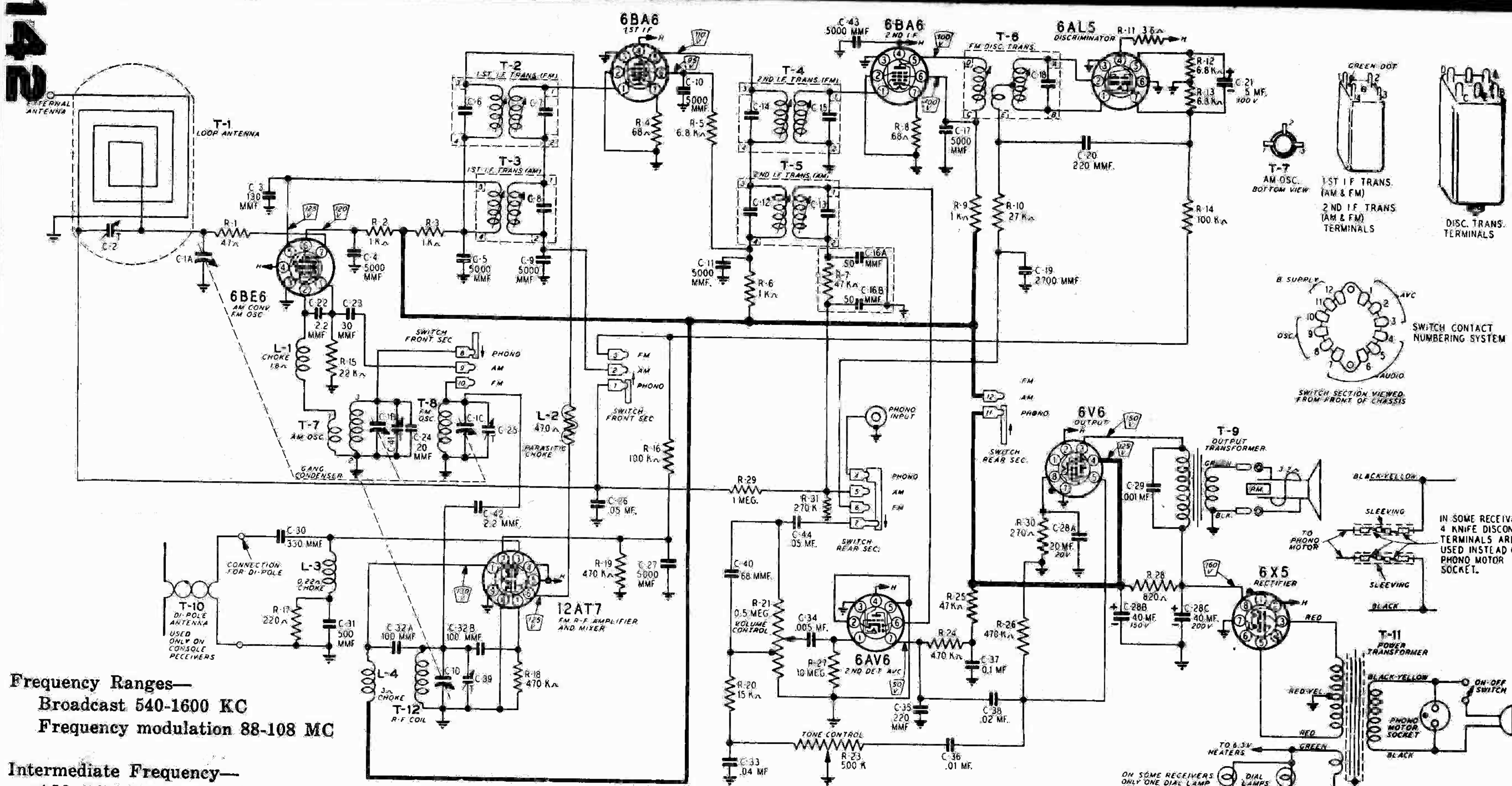
These models with a suffix "A" had another 1500-ohm resistor wired in parallel with R-13, and had the rectifier tube 35W4 wired as shown in the partial schematic, below. In models with a suffix "B" a single 750-ohm resistor was used for R-13, and the 35W4 was wired as shown.





TUBE SOCKET VOLTAGES

Socket voltages are shown on the Bottom Socket diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground. Plate, screen and cathode voltages were taken with a 1000 ohm-per-volt meter with a 300 volt scale used for plate and screen voltages. Audio grid voltages were read with a vacuum tube volt-meter.



Frequency Ranges—
Broadcast 540-1600 KC
Frequency modulation 88-108 MC

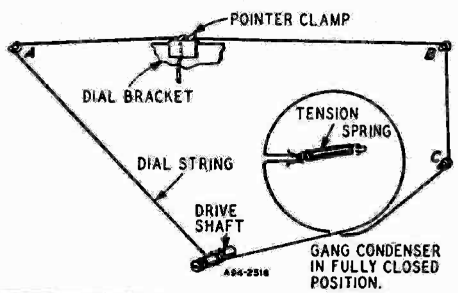
Intermediate Frequency—
AM 455 KC — FM 10.7 MC

NOTE — In later production C-33 is .01 mf.

TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagram. All voltages are between the socket terminal and chassis ground. Plate, screen and cathode voltages were taken with a 1000 ohm-per-volt meter with a 300 volt scale used for plate and screen voltages. Audio grid voltages were read with a vacuum tube volt-meter. Conditions of measurement are:

Line voltage ....117 Volts AC
Signal Input ....None
A Variation of ±10% is usually permissible.



WESTERN AUTO SUPPLY COMPANY

MODEL D1046D

Factory Model 27A96-952

Models D1046 with suffix A, B, and C, and Models D1034A, -B, and -C, are very similar to Model D1046D described on this page.

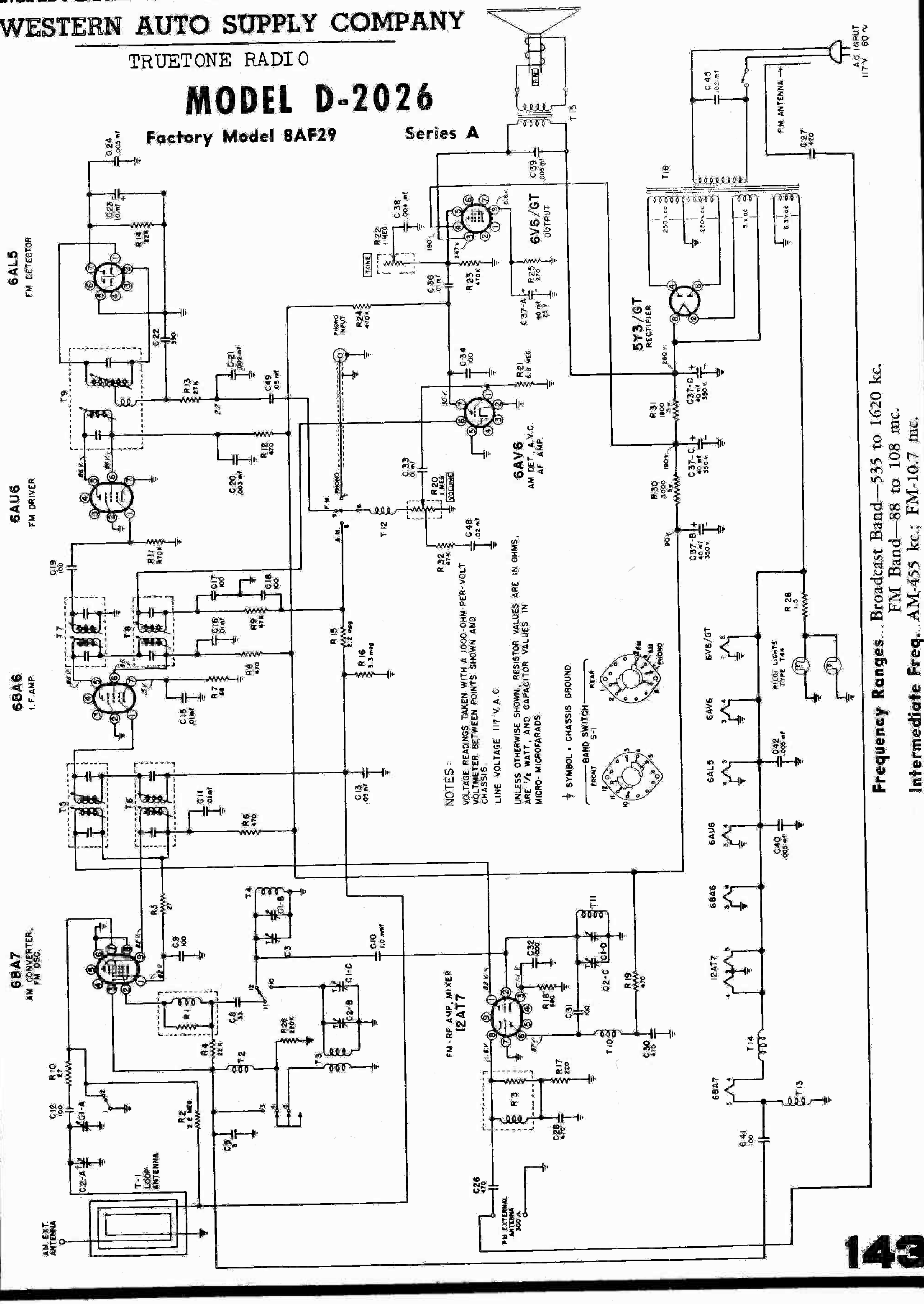
MANUAL OF 1951 MOST-OFTEN-NEEDED RADIO DIAGRAMS

WESTERN AUTO SUPPLY COMPANY

TRUETONE RADIO

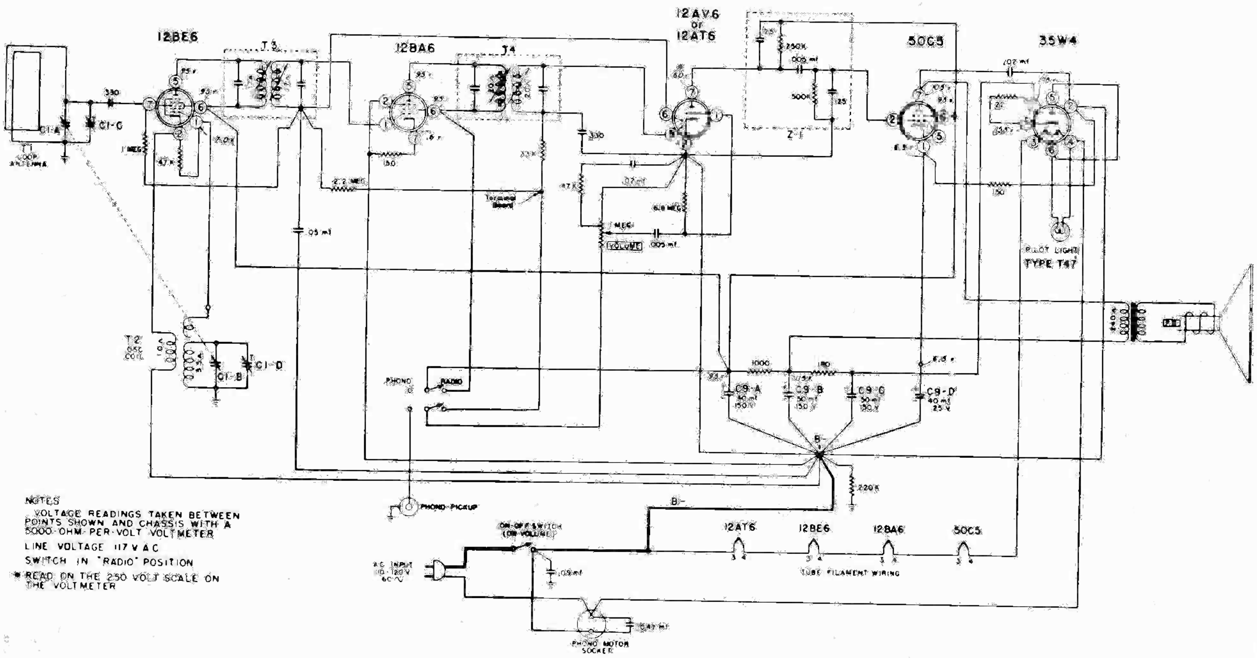
MODEL D-2026

Factory Model 8AF29 **Series A**



Truetone MODEL D-2042

Factory Model 5D162 Series A



ALIGNMENT PROCEDURE AND RECEIVER STAGE SENSITIVITIES

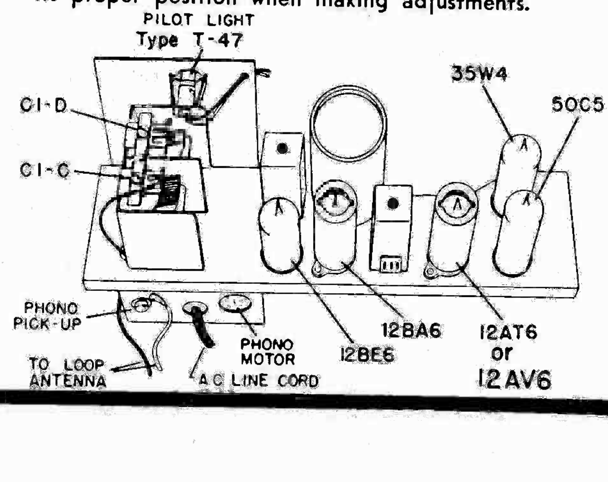
Alignment must be done in the cabinet.

SIGNAL GENERATOR						
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection	TUNER SETTING	ADJUST FOR MAXIMUM OUTPUT	INPUT FOR 50 MILLIWATT OUTPUT
455 kc.	.1 mf.	12BE6, Pin 7	B MINUS POINT AT ELECTROLYTIC	Capacitor full open (plates out of mesh)	Top and bottom Cores in output and input I.F. cans	60 microvolts
1620 kc.	.1 mf.	12BE6, Pin 7		Capacitor full open (plates out of mesh)	Oscillator trimmer C1-D on gang	67 microvolts
535 kc.	.1 mf.	12BE6, Pin 7		Capacitor fully closed	Check for adequate range	61 microvolts
1400 kc.	———	Lay Generator lead near back of cabinet.		Set dial pointed at 1400 kc.	Antenna trimmer C1-C on gang	200 to 400 microvolts
400 cycles	.1 mf.	12AT6, Pin 1 or 12AV6		———	———	.03 volts

The signal source must be an accurately calibrated signal generator capable of supplying both 1000 kc and 455 kc signals modulated 30% with a 400-cycle audio signal. Variations in sensitivity of plus or minus 25% are usually permissible.

The table below lists the sensitivity at the input of each stage. All measurements are based on an output of 50 milliwatts. This may be measured by disconnecting the speaker voice coil and substituting a 3.2-ohm, 5-watt resistor across the secondary winding of the output transformer. A reading of 0.4 volts AC across this resistor will be equivalent to a 50-milliwatt output with the speaker connected.

* Loop antenna should be connected to receiver and in its proper position when making adjustments.

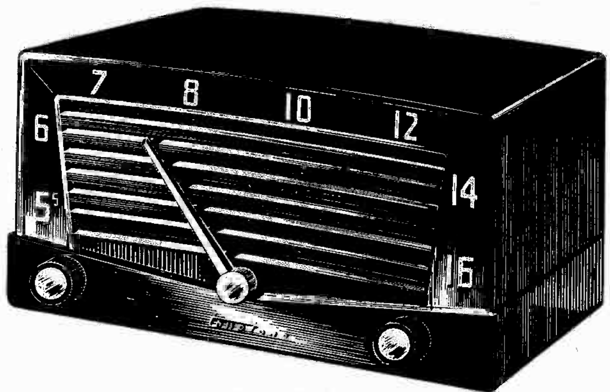


MANUAL OF 1951 MOST-OFTEN-NEEDED RADIO DIAGRAMS

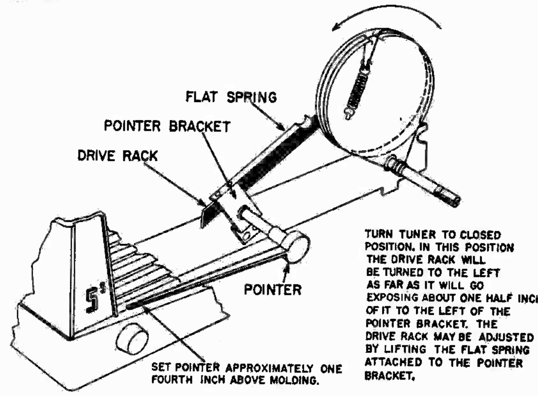
truetone RADIO

MODEL D-2102A AND D-2103A

Factory Model 5D165



Front Cabinet View

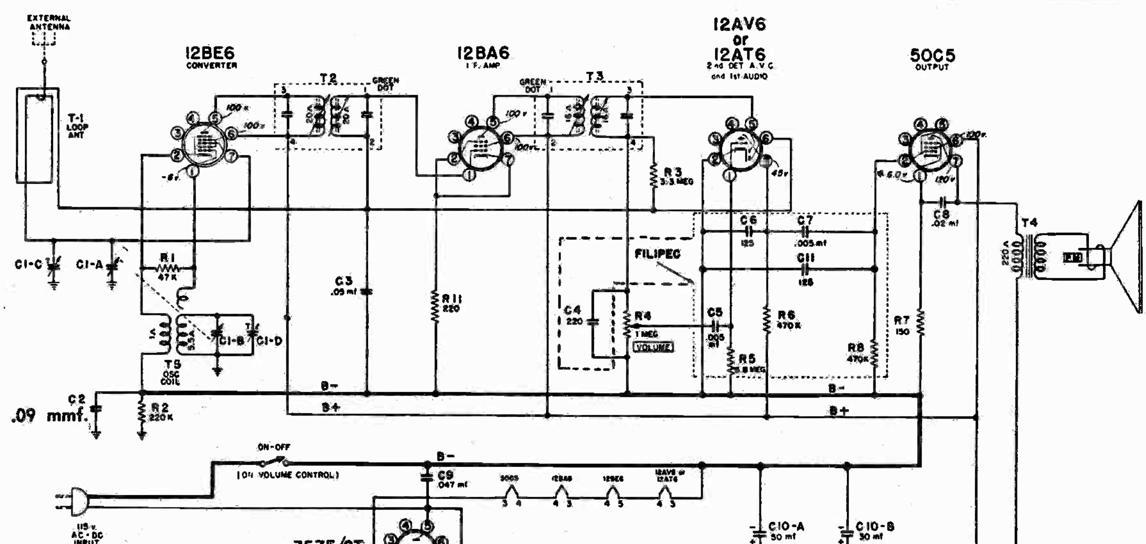


Dial Stringing Diagram

ALIGNMENT PROCEDURE

- Loop must be connected and set volume to maximum.

SIGNAL GENERATOR						
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection	TUNER SETTING	ADJUST FOR MAXIMUM OUTPUT	INPUT FOR 50-MILLIWATT OUTPUT
455 kc.	.1 mf	12BE6, Pin 7	HEAVY BUSS LEAD ACROSS CENTER OF CHASSIS	Capacitor fully open (plates out of mesh)	Top and bottom Cores in output and input I.F. cans	65 microvolts
1620 kc.	.1 mf	12BE6, Pin 7		Capacitor fully open (plates out of mesh)	Oscillator trimmer C1-D on gang	70 microvolts
535 kc.	.1 mf.	12BE6, Pin 7		Capacitor fully closed	Check for adequate range	70 microvolts
1400 kc.	————	Lay generator lead near back of cabinet		Tune in 1400 kc. signal	Antenna trimmer C-1C on gang	200 to 400 microvolts
400 cycles	.1 mf	12AT6, Pin 1		————	————	.06 volts



NOTES:
VOLTAGE READINGS TAKEN WITH A 1000-OHM-PER-VOLT VOLTMETER ON THE 250 VOLT SCALE BETWEEN POINTS SHOWN AND CHASSIS.
* READ ON THE 10 VOLT SCALE OF THE VOLTMETER
LINE VOLTAGE 117 V.A.C.

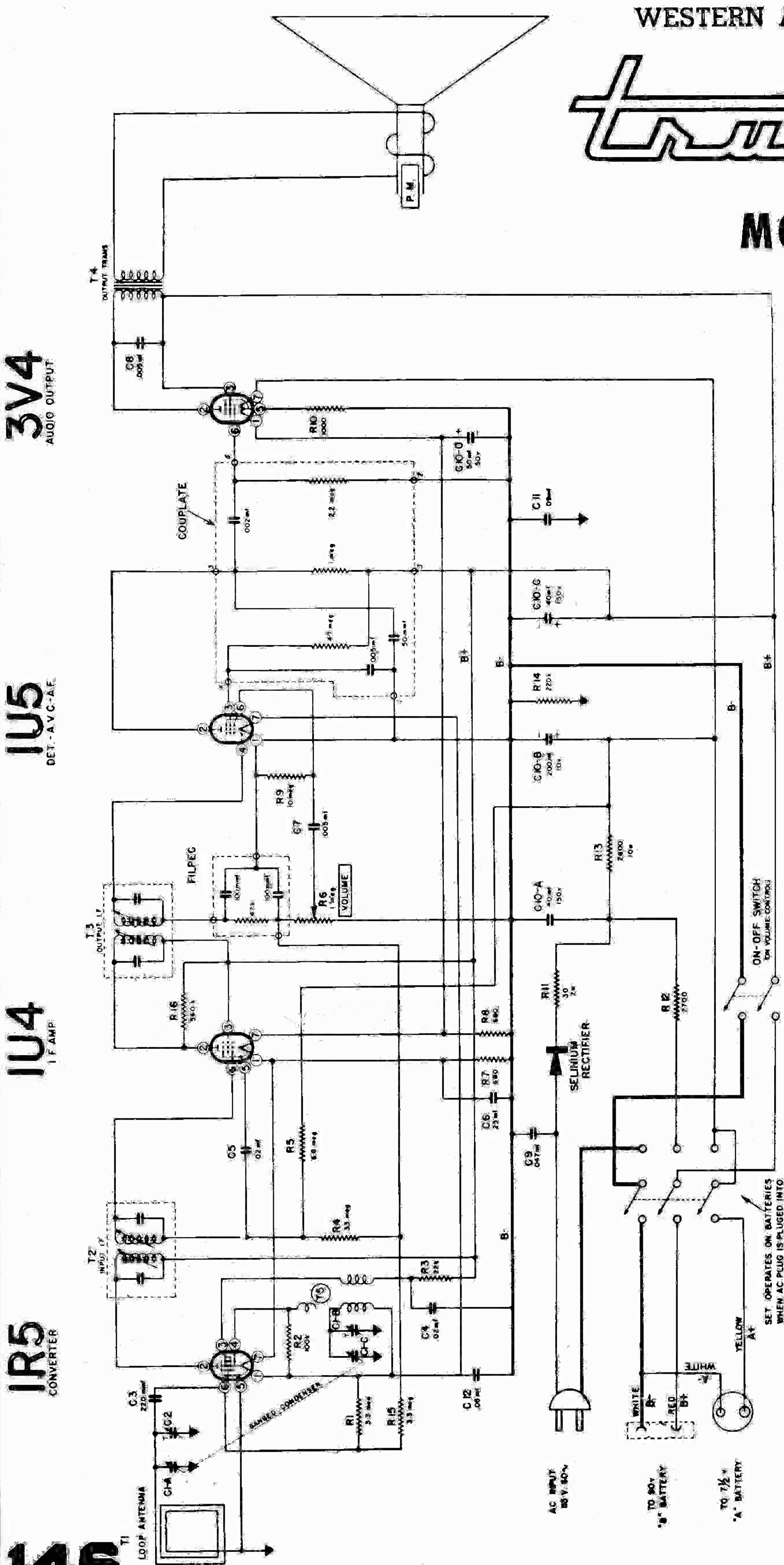
WESTERN AUTO SUPPLY COMPANY

truetone

MODEL D-3120A

Factory Model 4P11

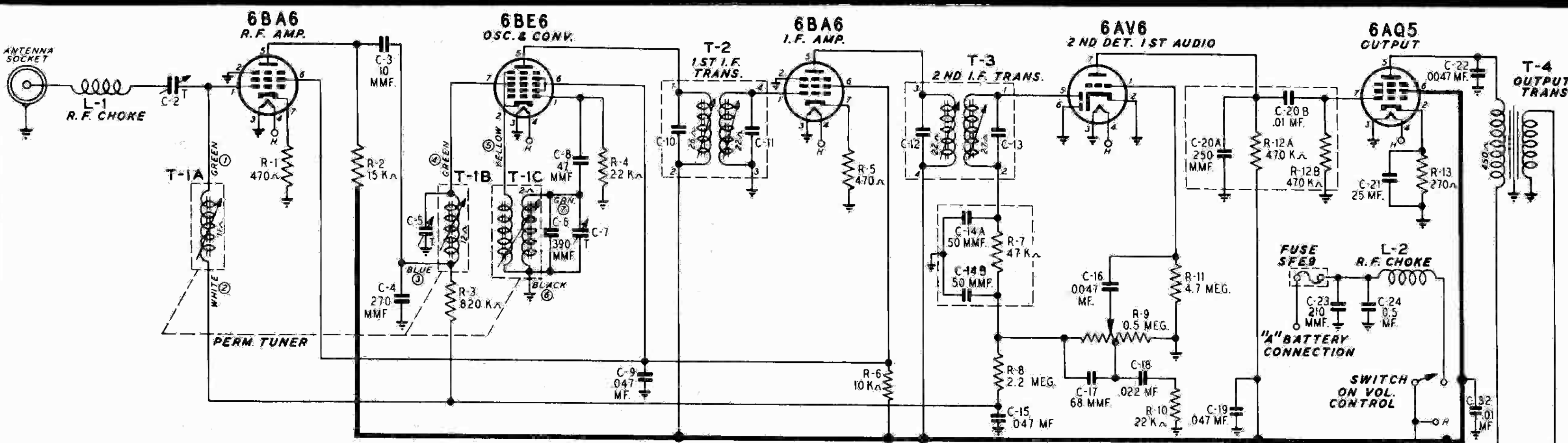
4 Tube A.C.-D.C.-
Battery Portable
Built-In Antenna
Selenium Rectifier

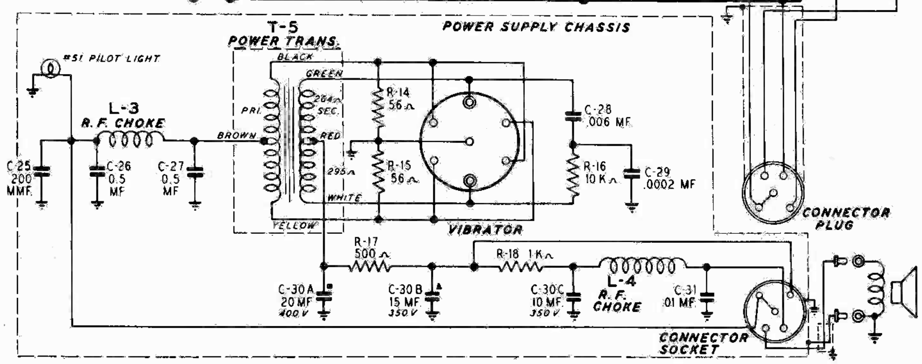


FREQUENCY	COUPLING CAPACITOR	DIAL SETTING	CONNECTION TO RADIO	GROUND CONNECTION	ADJUST	INPUT FOR 50 MILLIWATTS OUTPUT
455 kc.	.1 mfd.	1000 kc.	Pin No. 6 of 1R5	B— (shell of lytic)	I.F. slugs	100 microvolts
1620 kc.	.1 mfd.	1600 kc.	Pin No. 6 of 1R5	B— (shell of lytic)	C1-B Osc. Trim. on gang	—
1400 kc.	Radiation Loop	1400 kc.	Radiation loop	None	C-2 Antenna Trim. on gang	250 microvolts
400 cycles	.05 mfd.	—	Pin No. 6 of 1U5	B— (shell of lytic)	—	.040 volts
400 cycles	.05 mfd.	—	Pin No. 6 of 3V4	B— (shell of lytic)	—	3 volts

Western Auto Supply Co.

Truetone Model D4142A





ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

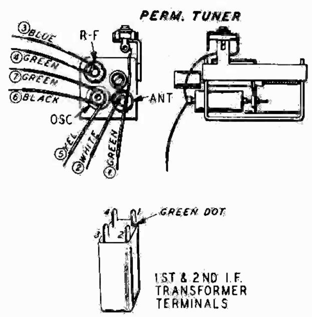
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:

A Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antenna—.05 mf., See Note A.



SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	IRON CORE SETTING	ADJUST TUNING SLUGS (IF) AND TRIMMERS TO MAXIMUM (See Fig. 4)
I.F. 455 KC	Control Grid (prong No. 7) 6BE6 Mixer Tube	.05 mf.	Extreme Position out of Coil	1st I.F. Pri. (1) & Sec. (2) 2nd I.F. Pri. (3) & Sec. (4)
1605 KC	Antenna Cable See Note A	See Note A	Extreme Position out of Coil	Oscillator (C-7)
1605 KC	Antenna Cable	See Note A	Extreme Position out of Coil	R.F. (C-5) Ant. (C-2)
Reassemble Radio—Install in Car—Connect Car Antenna to Radio.				
Car Antenna Readjustment—Tune in weak signal near 1600 KC—Readjust Antenna Trimmer C-2 for maximum output.				

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

NOTE A—Insert the antenna cable plug in the antenna socket on the chassis. The total capacity of the antenna cable and dummy antenna should be 60 mmf. If the cable, for example, has a capacity of 30 mmf., use a 30 mmf. condenser for a dummy antenna. Connect the other end of the antenna cable through the dummy antenna capacity to the output of the signal generator.

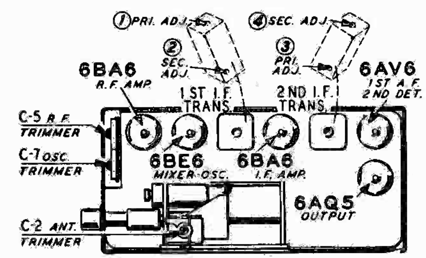


Fig. 4 — Tube Layout

Western Auto Supply Co.

MODEL D4142A

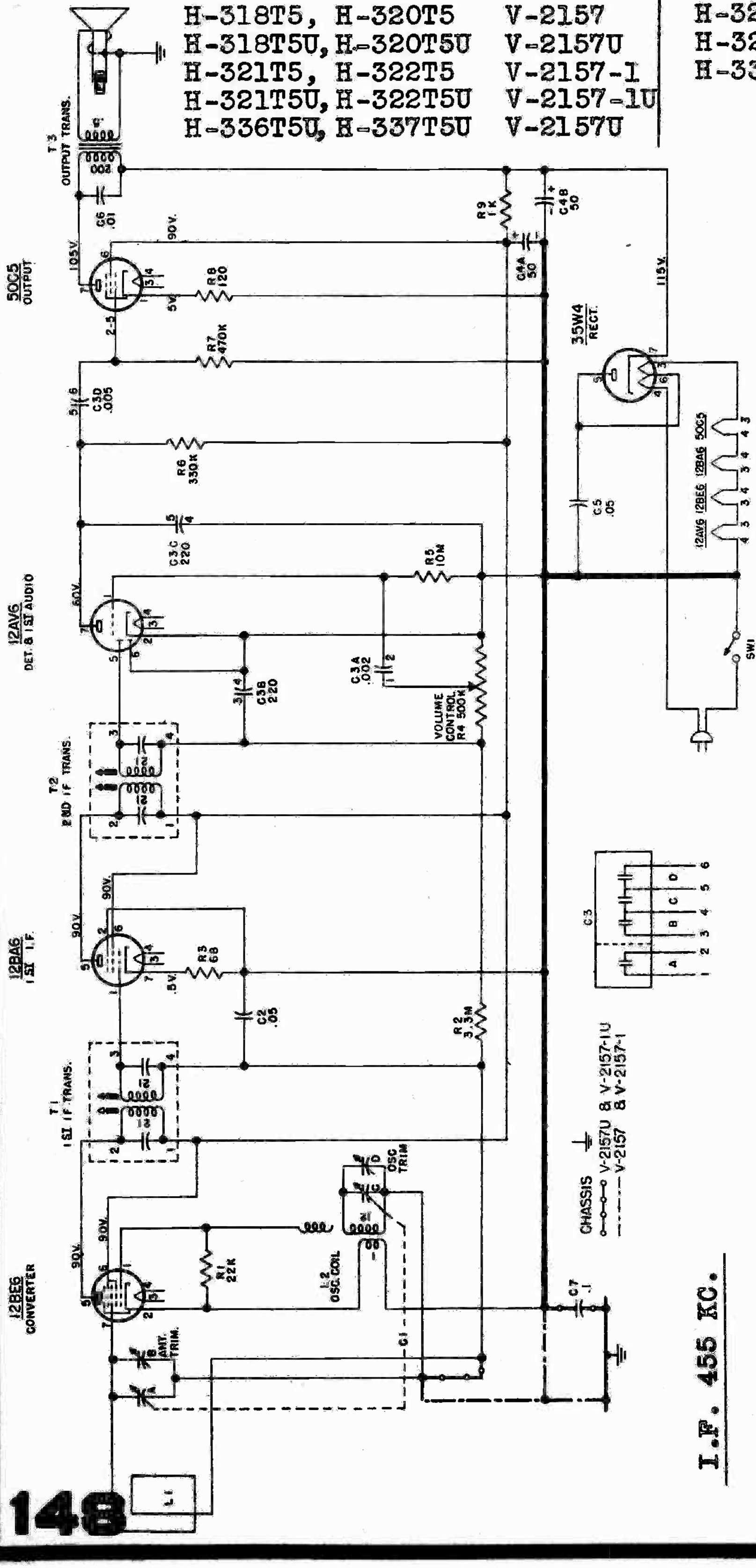
Factory Model 25C23-11

Westinghouse

Models listed at left below correspond exactly to the circuit on this page.

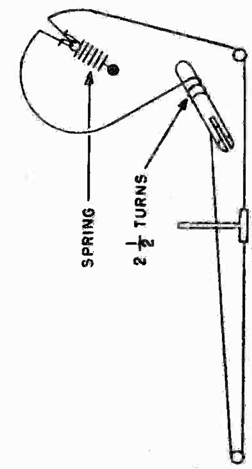
Models	Chassis
H-318T5, H-320T5	V-2157
H-318T5U, H-320T5U	V-2157U
H-321T5, H-322T5	V-2157-1
H-321T5U, H-322T5U	V-2157-1U
H-336T5U, H-337T5U	V-2157U

Similar models are listed below:
H-323T5, Chassis V-2157-2,
H-323T5U, Chassis V-2157-2U,
H-338T5U, H-341T5U, V-2157-4U.

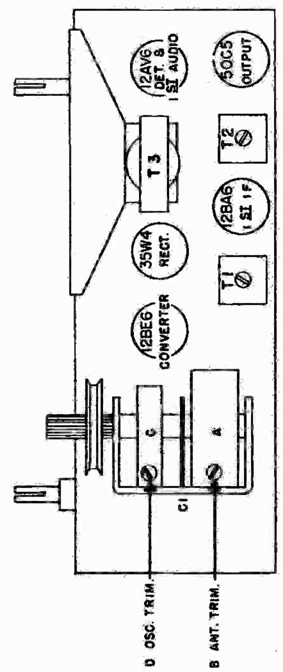


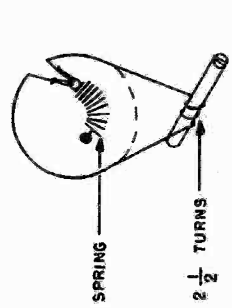
I.F. 455 KC.

NOTE:
1. ALL VOLTAGES MEASURED FROM CHASSIS GROUND (V-2157 & V-2157-1 ONLY) OR COMMON NEGATIVE (V-2157U & V-2157-1U ONLY) USING A 20,000 OHM/VOLT METER. LINE VOLTAGE SET AT 117 V.A.C. READINGS SHOULD BE AS SHOWN ± 20 PER CENT.



DIAL DRIVE FOR V-2157-1 AND V-2157-1U CHASSIS

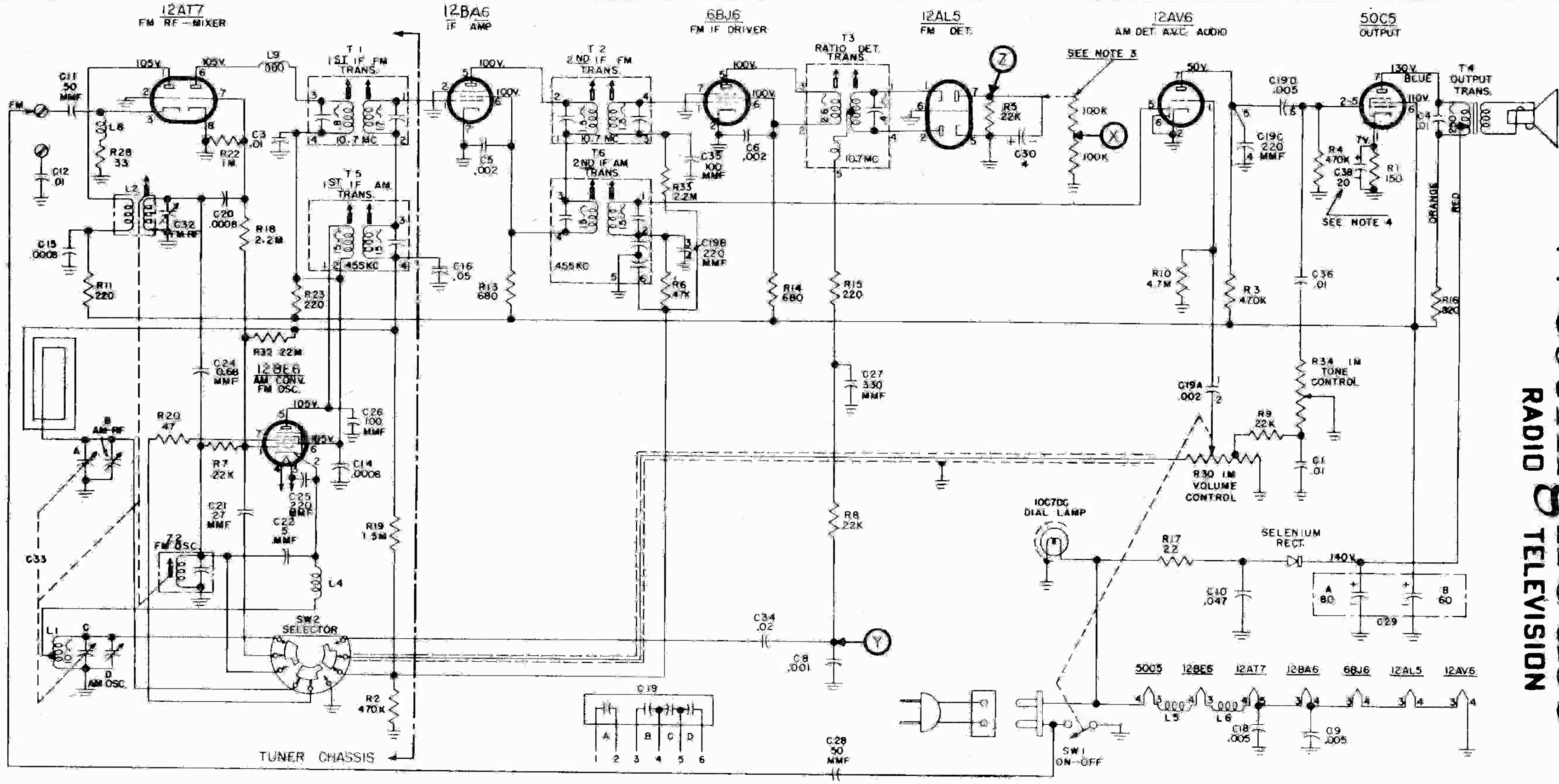




DIAL DRIVE AND CHASSIS LAYOUT FOR V-2157 AND V-2157U CHASSIS

Westinghouse

RADIO TELEVISION



NOTES :

1. SELECTOR SWITCH SW2 IS SHOWN IN EXTREME CLOCKWISE POSITION OR AM BAND. EXTREME COUNTER CLOCKWISE POSITION IS FM BAND.
2. ALL VOLTAGES MEASURED FROM CHASSIS (GROUND) USING A 20,000 OHM/VOLT METER. LINE VOLTAGE SET AT 117V. A.C. VOLTAGES SHOULD BE AS SHOWN ± 20 PER CENT.
3. TO BE INSTALLED FOR ALIGNMENT ONLY.
4. C38 MAY OR MAY NOT BE PART OF C29.
5. ALL CAPACITANCE VALUES IN MFD AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.

MODELS H-334T7U AND H-335T7U CHASSIS V-2136-5U

Alignment information for this chassis is given on the reverse side of this page.

There are a number of other Westinghouse receivers designed for AM and FM reception which use the same type of tubes and utilize circuits very similar to V-2136-5U here described. These models are tabulated at right:

Chassis	Models	Type	Changer
V-2136	H-307T7, H-308T7, H-324T7U, H-325T7U	Table Table	
V-2136-1	H-316C7, H-317C7, H-326C7	Comb. Comb.	V-9481 V-9840
V-2136-2	H-324T7, H-325T7	Table	
V-2136-4	H-328C7	Comb.	V-9481

Westinghouse Models H-334T7U and H-335T7U, Chassis V-2136-5U, continued

ALIGNMENT

BROADCAST BAND

Connect an output meter across the speaker voice coil.

While making the following adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.

Check the dial pointer position by meshing the tuning capacitor plates completely and seeing that the dial pointer is set on the end mark of the dial scale.

Step	*Connect Signal Generator to —*	*Signal Generator Frequency*	*Radio Dial Setting*	*Adjust*
1	Set the band switch to AM			
2	Stator of tuning capacitor (A) through a 0.1 mfd capacitor	455 kc.	minimum capacity	Pri. and sec. of T6 and T5 for max. output in order given

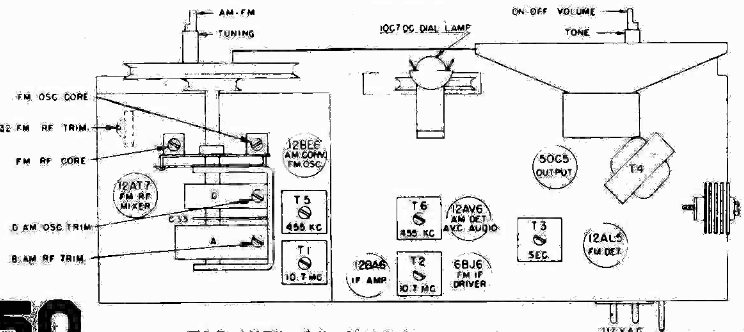
NOTE: If the I-F transformers are badly mis-aligned, it may be impossible to obtain sufficient output using the above system. In this event, it will be necessary to align each transformer separately. Start with the last I-F transformer and work forward, connecting the signal generator to the control grid of the tube preceding the transformer under alignment.

Step	*Connect Signal Generator to —*	*Signal Generator Frequency*	*Radio Dial Setting*	*Adjust*
3	Radiated signal (no actual connection)	1615 kc.	minimum capacity	AM osc. trimmer (D) for max. output
4	Radiated signal (no actual connection)	1400 kc.	tune to signal	AM R-F trimmer (B) for max. output (rock-in) adjustment)

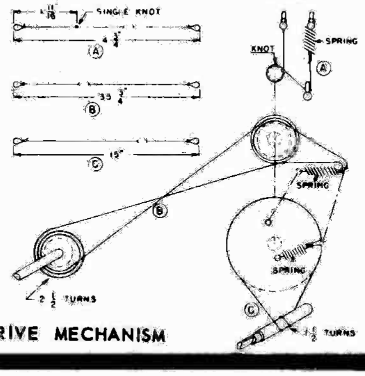
FM BAND

Do not align the FM circuits until all AM adjustments have been completed.

Step	*Connect Signal Generator to —*	*Signal Generator Frequency*	*Radio Dial Setting*	*Adjust*
1	Set the band switch to FM			
2	Connect two 100,000 ohm resistors (the resistances must be equal within 5 per cent) between pin No. 7 of the 12AL5 tube and ground as shown on the schematic diagram.			
3	Connect a V.T.V.M. between points "X" and "Y" (see schematic diagram).			
4	Pin No. 7 of 12AT7 through a .01 mfd mica capacitor	10.7 mc.	minimum capacity	Sec. of T3 for *zero* (use medium strength signal)
5	Connect the V.T.V.M. between point "Z" and ground.			
6	Same as step 4	10.7 mc.	minimum capacity	Pri. of T3 and pri. and sec. of T1 and T2 for maximum voltage
7	Reconnect the V.T.V.M. between points "X" and "Y" and increase the signal strength 10 times.			
8	Same as step 4	10.7 mc.	minimum capacity	Recheck sec. of T3 for *zero* voltage
9	Reconnect the V.T.V.M. between point "Z" and ground.			
10	Same as step 4	10.7 mc.	min. cap.	Pri. of T3 for maximum voltage
11	Remove the two 100,000 ohm resistors that were inserted in step 2.			
12	FM ant. terminal through a 300 ohm non-inductive resistor	98 mc.	98 mc.	FM osc. core for maximum voltage
13	Same as step 12	98 mc.	98 mc.	FM R-F trimmer (C32) for maximum voltage
14	Same as step 12	105 mc.	tune to signal	FM R-F core for maximum voltage
15	Same as step 12	90 mc.	tune to signal	FM R-F trimmer (C32) for maximum voltage (rock-in)
16	Recheck steps 14 and 15 for tracking.			



TOP VIEW OF CHASSIS

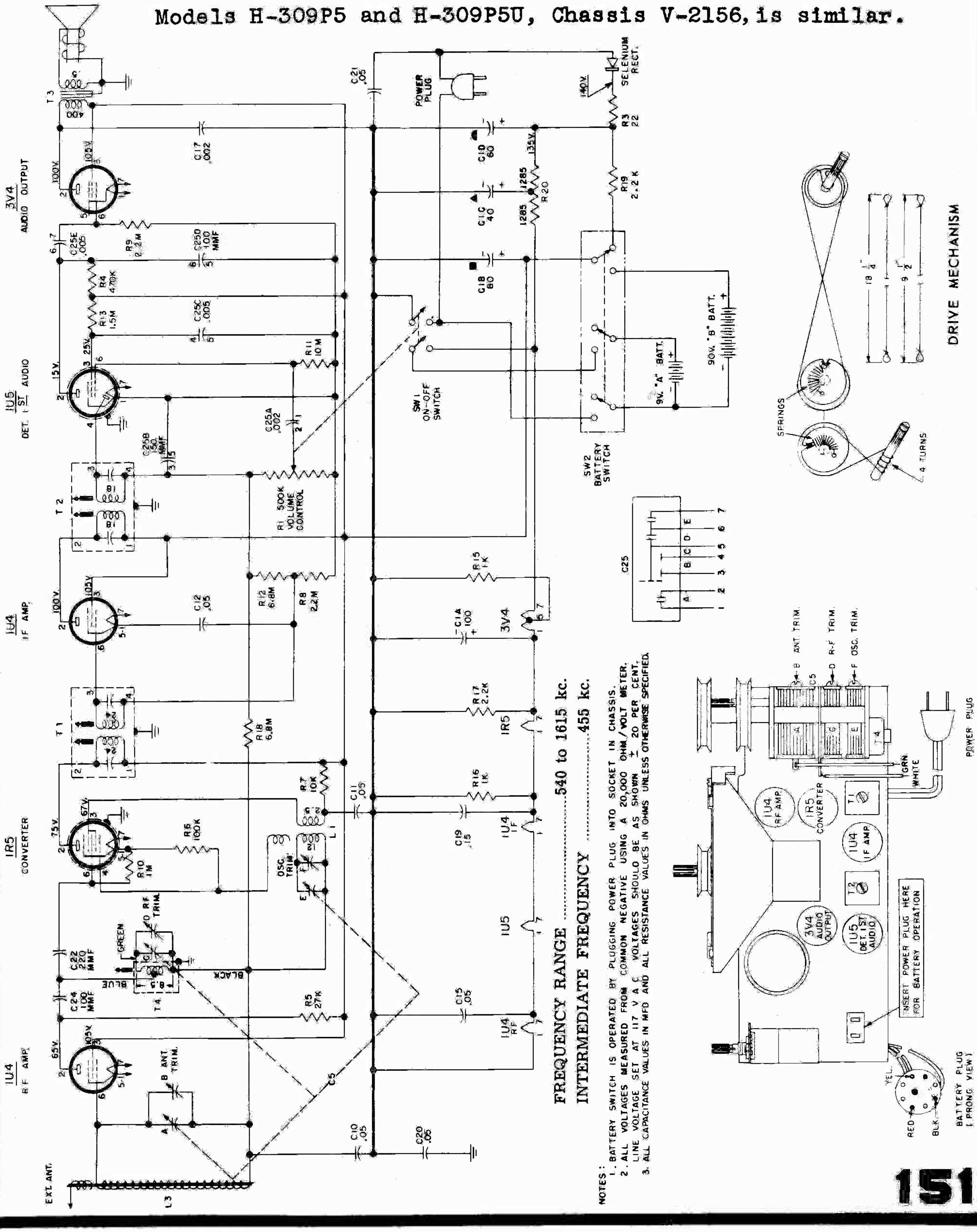


DRIVE MECHANISM

Westinghouse CHASSIS V-2156-1U

MODELS H-342P5U AND H-343P5U

Models H-309P5 and H-309P5U, Chassis V-2156, is similar.

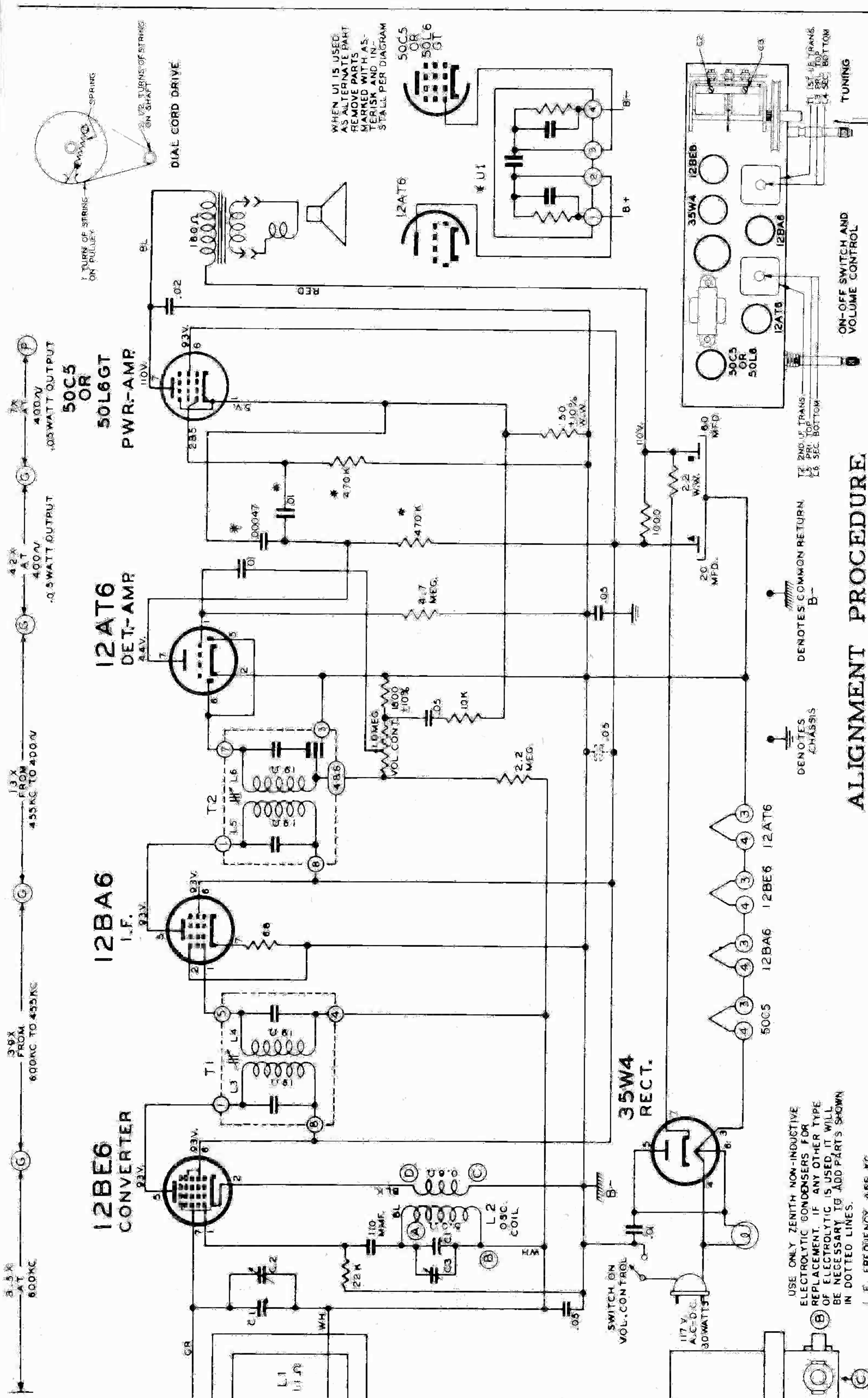


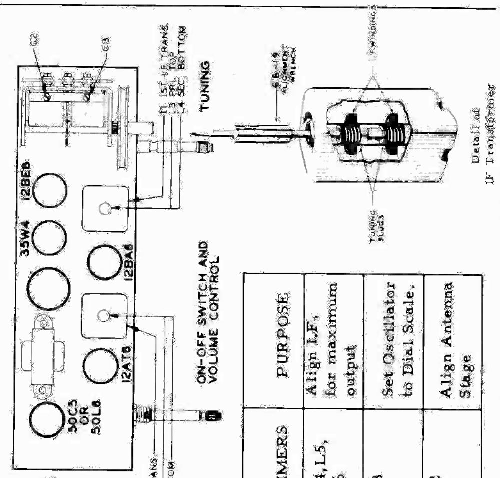
FREQUENCY RANGE ....540 to 1615 kc.

INTERMEDIATE FREQUENCY ....455 kc.

NOTES:
1. BATTERY SWITCH IS OPERATED BY PLUGGING POWER PLUG INTO SOCKET IN CHASSIS.
2. ALL VOLTAGES MEASURED FROM COMMON NEGATIVE USING A 20,000 OHM/VOLT METER. LINE VOLTAGE SET AT 117 V A C. VOLTAGES SHOULD BE AS SHOWN ± 20 PER CENT.
3. ALL CAPACITANCE VALUES IN MFD AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.

ZENITH MODELS H511, H511Y, H511W, CHASSIS 5H01





USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSERS FOR REPLACEMENT. IF ANY OTHER TYPE OF ELECTROLYTIC IS USED, IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.

I. F. FREQUENCY 455 KC.

TUNING RANGE 535 — 1620KC.

I. F. TRANSFORMER NUMBERING STARTS WITH #1 TERMINAL AS FIRST TERMINAL CLOCKWISE AND ADJACENT TO MARKER AS VIEWED FROM BOTTOM OF CHASSIS.

ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.

ALL RESISTORS ± 20% TOLERANCE UNLESS OTHERWISE SPECIFIED.

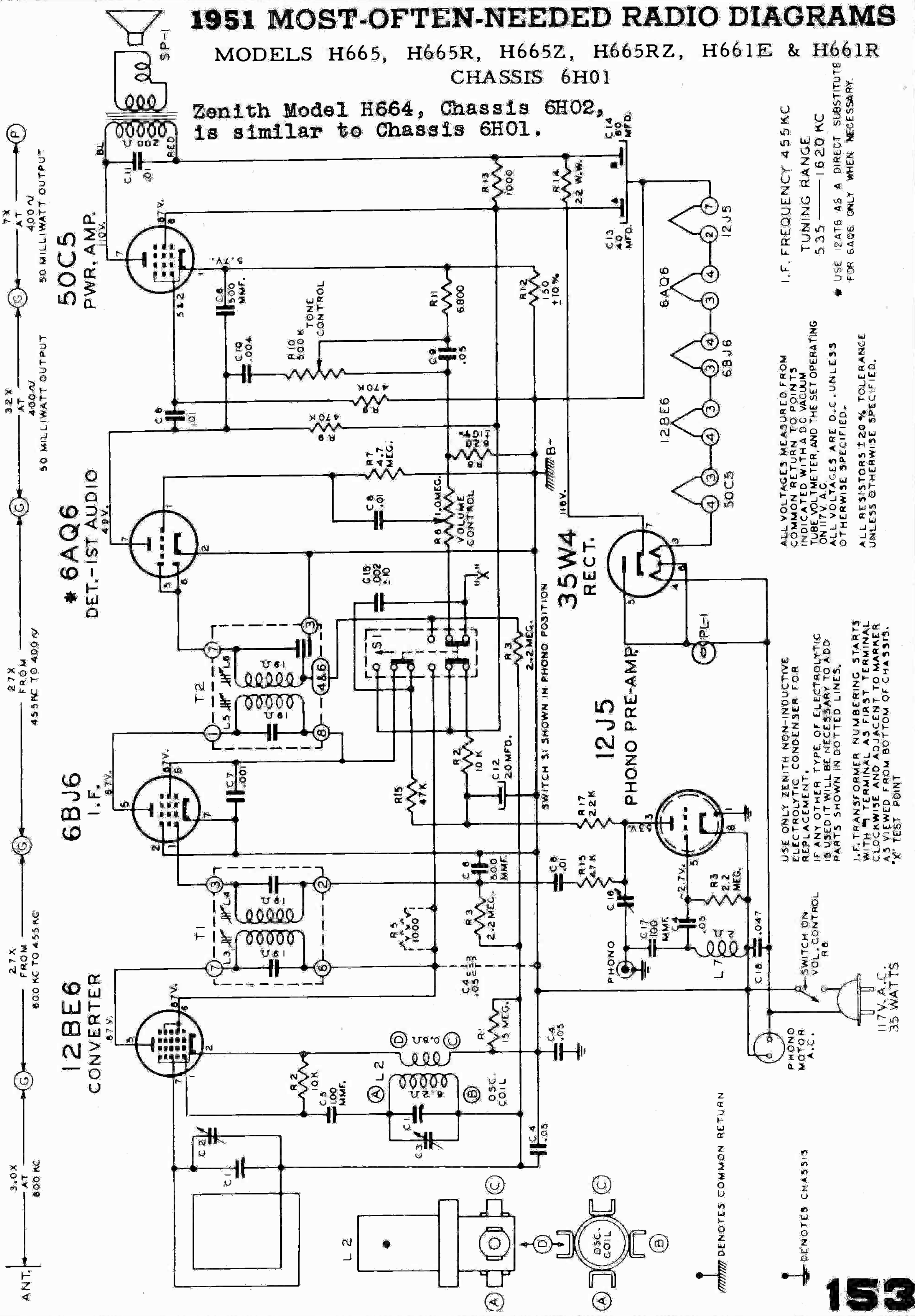
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3, L4, L5, L6	Align I.F. for maximum output
2	One Turn Loop Coupled Loosely to Wave Magnet	---	1600 Kc.	1600 Kc.	C3	Set Oscillator to Dial Scale.
3		---	1400 Kc.	1400 Kc.	C2	Align Antenna Stage

MODELS H665, H665R, H665Z, H665RZ, H661E & H661R

CHASSIS 6H01

Zenith Model H664, Chassis 6H02, is similar to Chassis 6H01.



Zenith Radio Corp. Model H724Z, Chassis 7H02Z

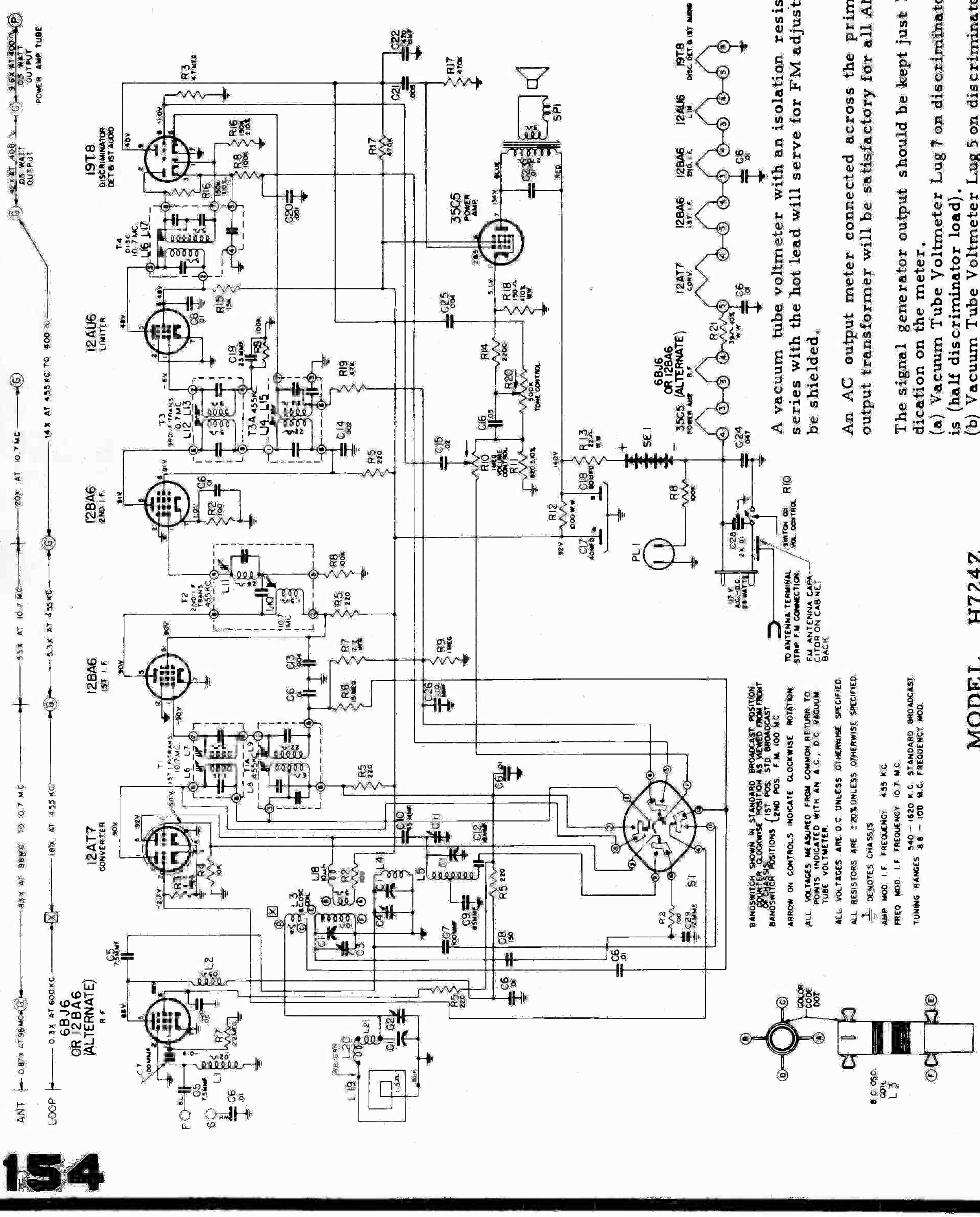
Zenith Model H724, Chassis 7H02, is identical to the "Z" version covered on this page, except for radiation proofing (use of chokes, shielding, etc.).

For alignment, the procedure outlined at the bottom of the schematic on this page should be used with the alignment table on page 155.

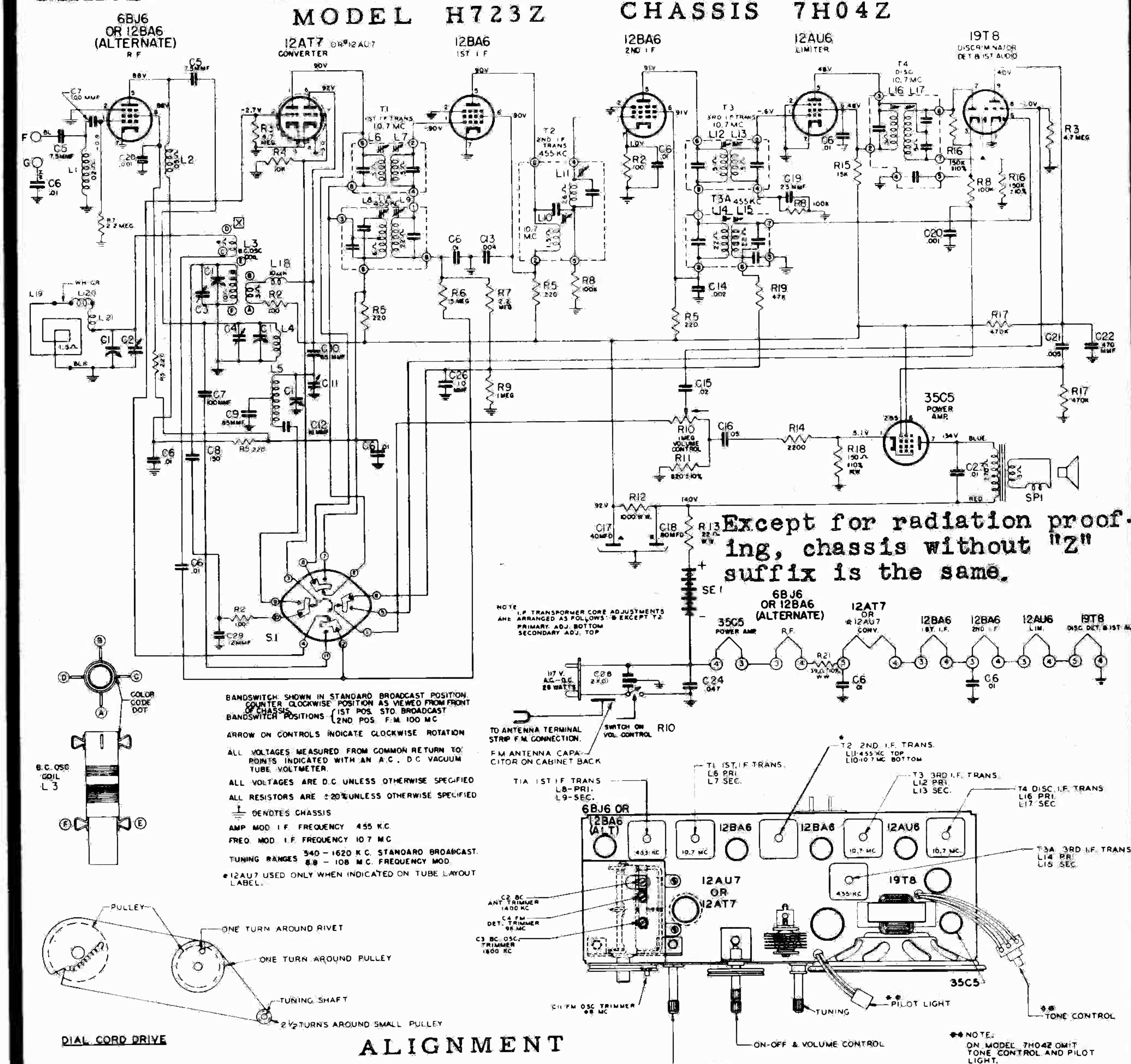
A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.
(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).
(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
(d) Loosen Slugs by applying a hot iron to the cement.



MODEL H723Z CHASSIS 7H04Z



ALIGNMENT

	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Dial	Adj. Trimmers	Purpose
1	Pin 2-12AT7 or 12AU7 Converter	.05 Mfd.	455 KC. Modulated	BC	600 Kc.	L8, 9, 11, 14, 15	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C3	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L12 and 13 Prim and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 Prim. of 2nd IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 or 12AU7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer.	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (Re-	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C11 Osc. Coil.	Set Oscillator to dial scale.
10 (c) (d)	move line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	C4 Det. Coil.	Align det. stage to max. reading.

ZENITH RADIO CORP.

* ALIGNMENT PROCEDURE * MODEL H880RZ, CHASSIS 8H20

(See page 157 for schematic diagram).

	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L9, 10, 13, 14	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L15 Prim. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L11 and L12 Prim. and Sec. of 2nd. IF transformer.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L7 and L8 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Remove line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L5 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

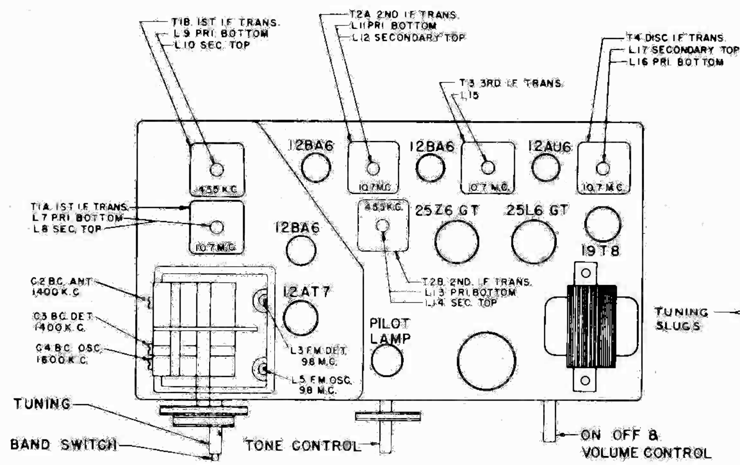
The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

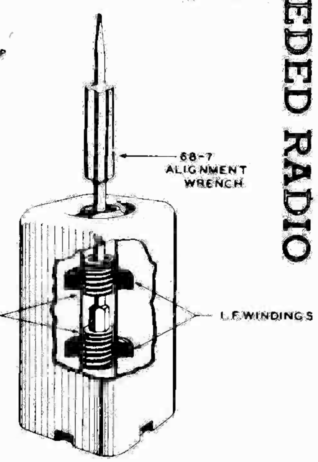
(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

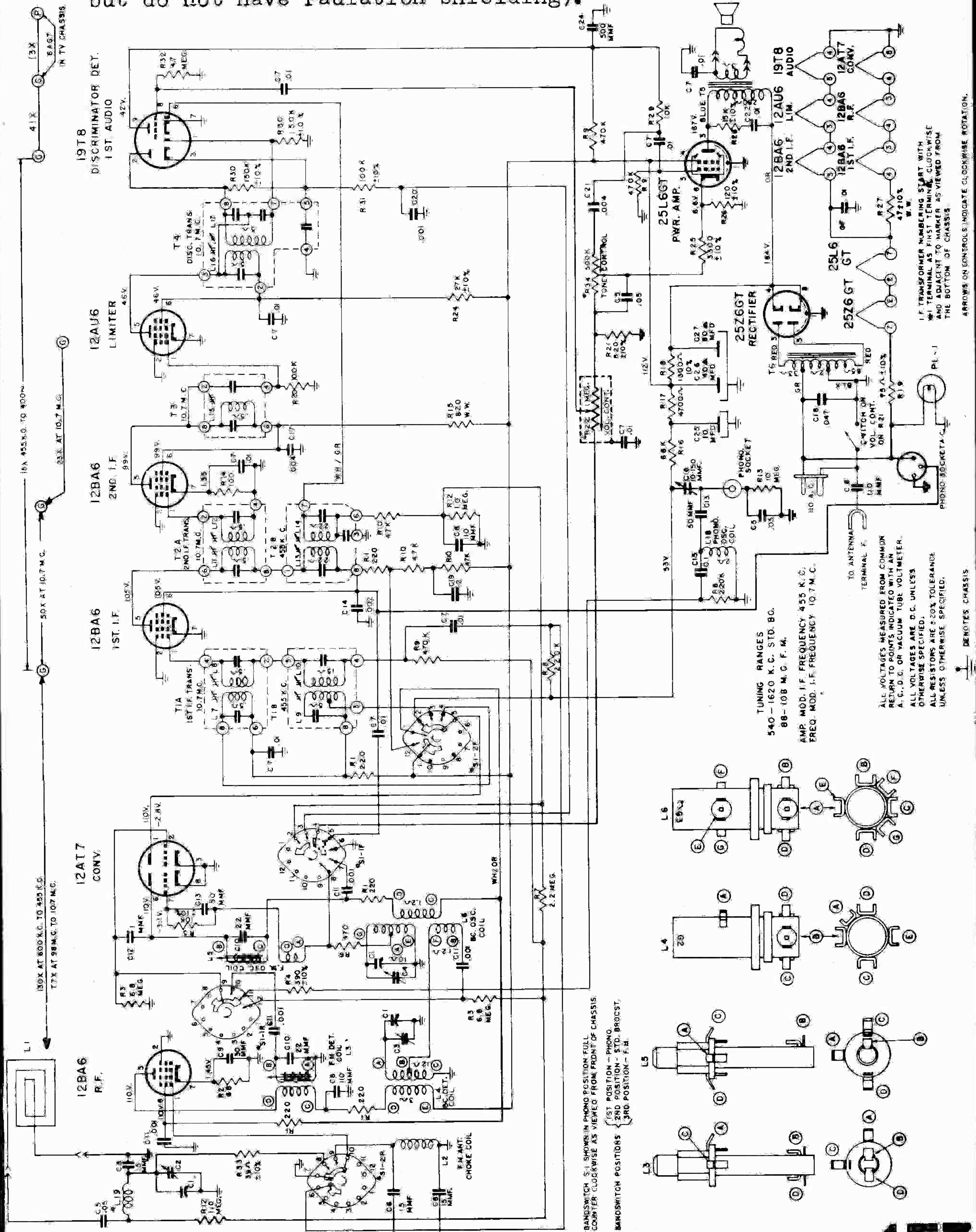


TUBE AND TRIMMER LOCATION

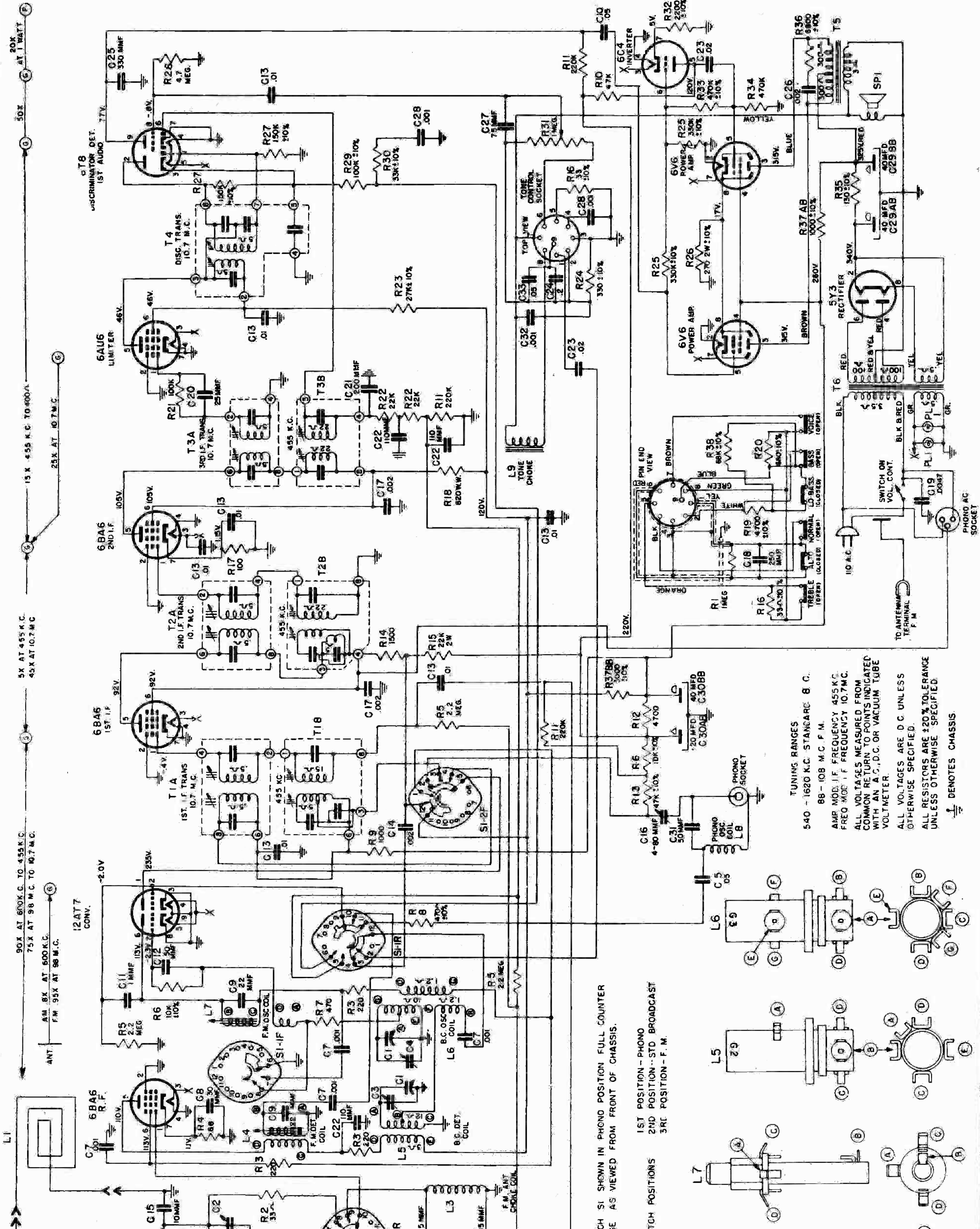


Detail of IF Transformer

ZENITH RADIO CORP. MODEL H880RZ, CHASSIS 8H20
(Models H880R and H880R-revised are similar to Model H880RZ, but do not have radiation shielding).



ZENITH RADIO CORP. MODELS H1083E, H1086R, H1087R, CHASSIS 10H20



ZENITH RADIO CORP.

COBRA-MATIC RECORD CHANGERS

MODELS S14028, S14029, S14030, S14031 and S14036

The Zenith Models S-14028, S-14029, S-14030, S-14031 and S-14036 Record Changers are designed to play standard 78, 45 and 33 1/3 RPM records of standard commercial dimensions. With few minor exceptions these five changers are alike electrically.

Features of these changers include playing and automatically changing as many as ten 12" or ten 10" records. Ten inch and twelve inch records of the same type cannot be intermixed.

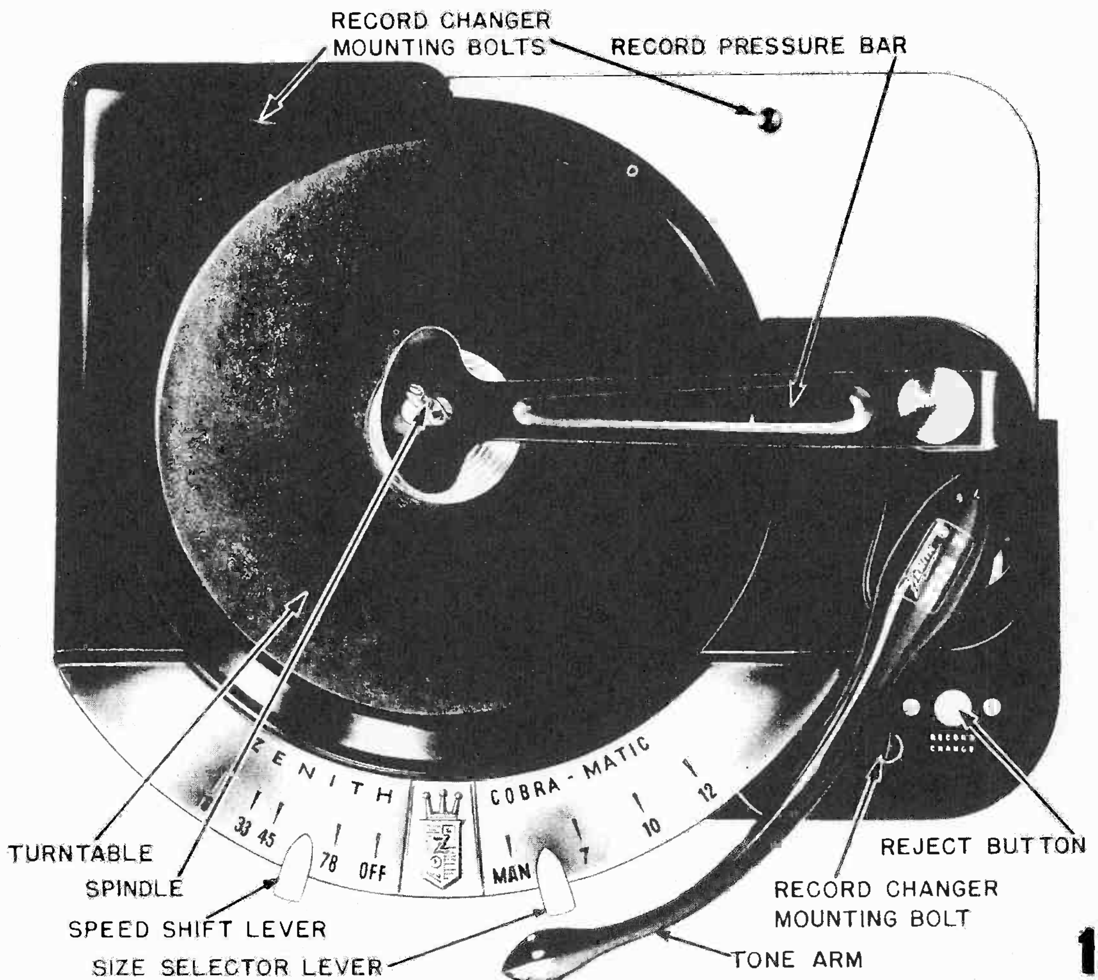
A full stack of 7" 33 1/3 RPM, or a full stack of 7" 45 RPM records (with adapter inserted in the records) can also be played on this changer. This changer does not shut off after the last record, however, all that is required to turn the changer off is to move the speed change lever (18) to OFF position.

LOADING THE RECORD CHANGER

1. Pull straight up on the record pressure arm knob (12) until the record pressure arm clears the spindle. Swing the record pressure arm to the right until pins in pressure arm shaft (14) drop into locating slot on record pressure arm housing (1).

2. Changer will automatically play ten 12" either standard or Long Play, ten 10" either standard or Long Play or ten 7" Long Play or Fine Groove records.

NOTE: Standard, Fine Groove and Long Play records cannot be played in the same stack of records. Speed change lever (18) must be re-set for each type of recording. (Continued on page 160).



ZENITH Record Changer, continued

3. Place records on spindle and lower them to offset shelf. Level records and replace record pressure arm (14) over spindle and lower this until it rests on the top of the record stack.

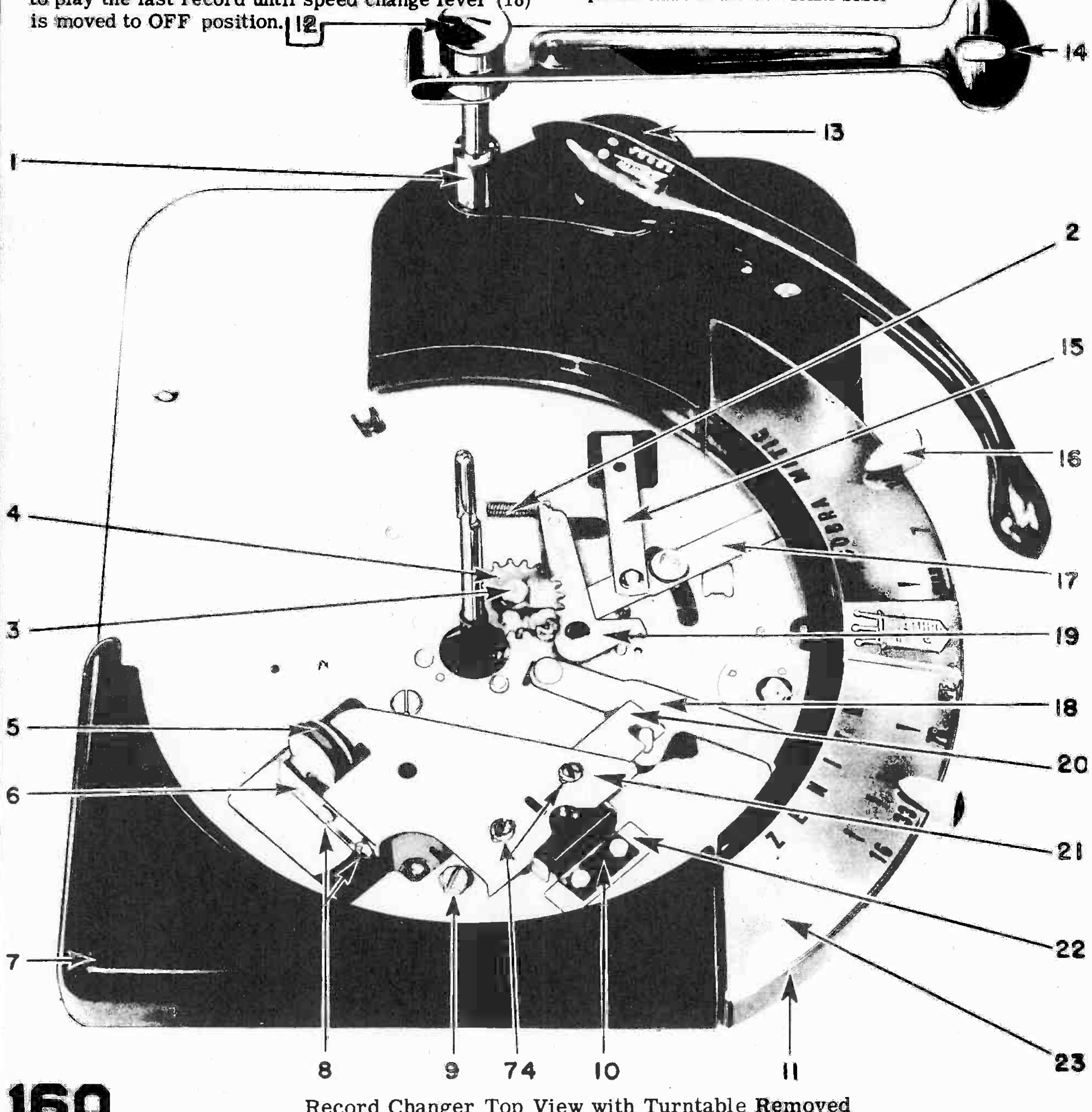
To play standard 78 RPM recordings:
1. Motor speed control lever (18) must be set to 78 position. This will set the record changer to proper speed position and cause the turntable to rotate.
2. Set-up lever (17) must be moved to the size records being played.
3. Place the changer in cycle by depressing reject switch knob (73). The changer will play the remaining records automatically. The changer will continue to play the last record until speed change lever (18) is moved to OFF position.

To play 33 1/3 RPM records:

1. Motor speed change lever (18) must be in 33 1/3 position.

2. Set-up lever (17) should then be moved to either 12", 10" or 7" position depending on the size record being played.

To play Fine Groove (45 RPM) records:
1. Speed change lever (18) should be moved to 45 position and set-up lever (17) should be in 7" position. It must be remembered that these records are manufactured with a 1 1/2" spindle hole so it is essential that a record adapter be inserted into each 45 RPM record to be played. This is necessary to reduce the spindle hole to conventional size.



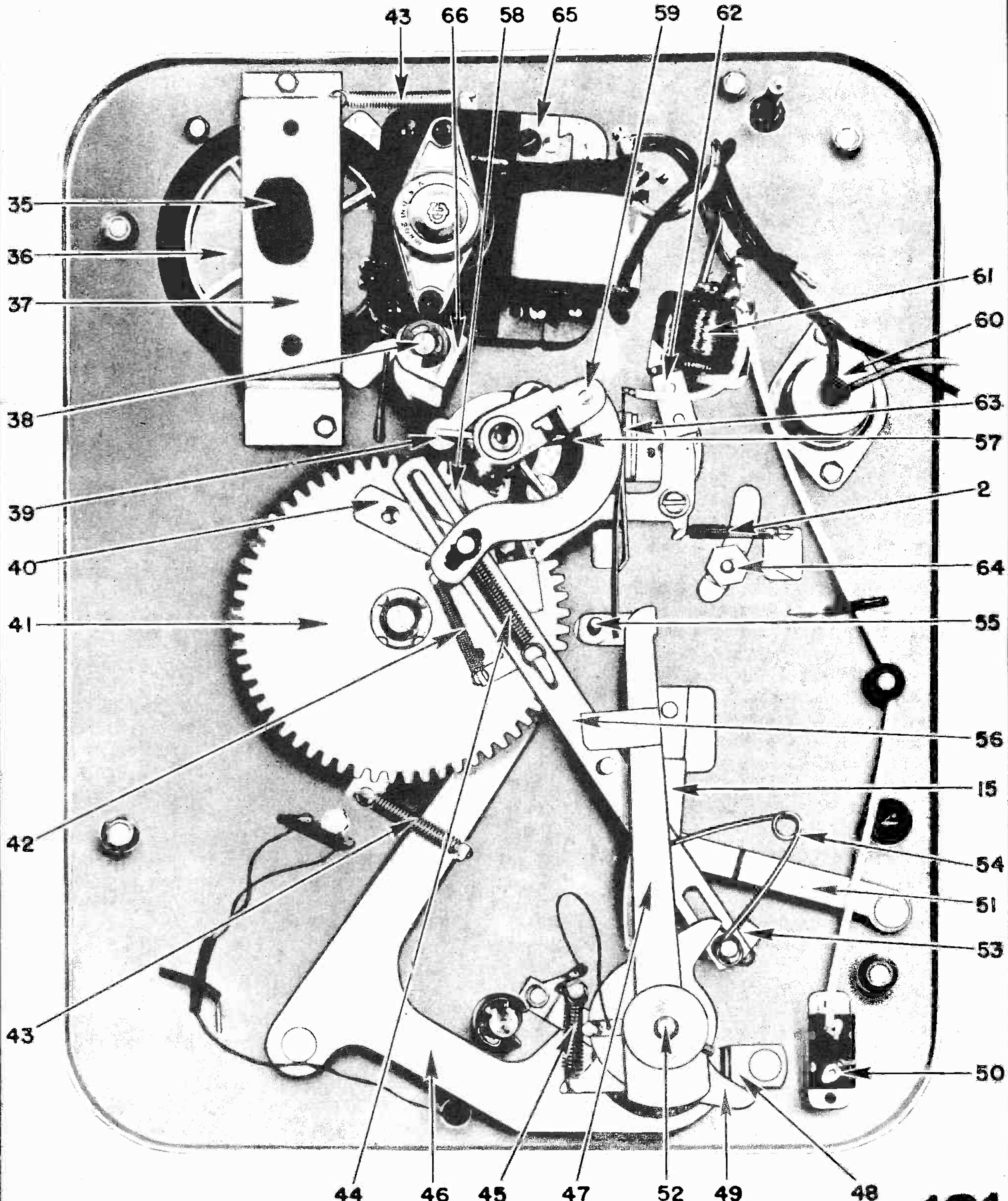
Record Changer Top View with Turntable Removed

REJECTING

To reject a record anytime, while the changer is operating, depress reject switch button (73) and release. This will automatically cause the record changer to go through cycle and begin playing the next record.

STOPPING

To turn off the record changer all that is required is to move the speed shift lever (18) to OFF position.



Record Changer Bottom View

ZENITH Record Changer, continued

UNLOADING

Lift the record pressure arm (14) and swing it to the right until the pin on the shaft drops into the locating groove on record pressure arm shaft housing (1). Lift stack of records straight up on spindle.

MANUAL OPERATION

To play single records or home recordings, lift up the record pressure arm and turn it to the right. Place record on spindle and lower to the spindle shelf. Gently push record towards record pressure arm shaft and lower to turntable. Move speed change lever (18) to proper speed for type of record being played and move set-up lever (17) to manual position. Pick up tone arm and place the needle on the lead-in groove of the record.

DESCRIPTION OF CYCLING

The motor shaft contacts drive wheel assembly (36) and causes it to rotate by friction contact with its rubber surface. Drive wheel assembly (36) drives idler wheel (5). The underside of the turntable is in contact with idler wheel (5) and is driven in this manner. Speed of the turntable is controlled by changing the position of the idler wheel (5) on drive wheel (36). When idler wheel is moved to the center of drive wheel (36) it will rotate more slowly than when moved to the outer edge of this drive wheel (36). In this manner the turntable can be driven at any speed from 10 to 85 RPM. Minor adjustments for proper tonal pitch can be made by simply moving speed change lever (18) back and forth to compensate for turntable speed which may vary due to line voltage changes. When reject button (73) is depressed it energizes solenoid (61) which then attracts trip pawl assembly (62). The same thing occurs when the forward movement of the tone arm causes friction lever and weight assembly (47) to contact the copper bronze contact on trip switch assembly (63). When gear segment (58) is released, gear pawl spring (42) causes the gear segment (58) to engage the rotating pinion gear (25) under the turntable thus causing clutch assembly (41) to rotate.

As clutch assembly (41) rotates, tone arm lift lever (46) swings in such a manner that it contacts tone arm lift pin and raises the tone arm. Simultaneously, tone arm link and stud assembly (56) slides towards, and contacts one finger of tone arm lever assembly (49) forcing the tone arm towards the outer edge of the turntable and then on its return swing contacts the other finger of tone arm lever assembly (49) swinging the tone arm back over the records. The position to which it swings the tone arm over the records is determined by the position of record size discriminator (51). There are three steps on the record size discriminator (51) which determines set-down position for 7", 10" and 12" records. The tone arm lift lever (46) returns and releases brake lever assembly (48) which keeps the tone arm from moving erratically during cycle. Simultaneously, ejector lever and link assembly (59) rotates and this in turn causes spindle shaft (30) to rotate and ejector cam (29) to push the record off the spindle shelf. Operation of the tone arm set-down adjustment can be observed by raising the tone arm so the adjustment mechanism can be viewed.

VELOCITY TRIP

This changer is provided with what is commonly known as a velocity trip rather than a ratchet and positive trip mechanism. A velocity trip depends for the tripping action on the rate of forward motion of the pickup arm with respect to the turntable rotation. The changer will trip only when the tone arm advances more in one revolution of the turntable than the distance between normal grooves in a record. Only records having fast finishing grooves will operate the velocity trip. During the normal playing cycle, friction lever and weight assembly (47) continually moves forward toward the copper bronze contact on trip switch assembly (63).

On normal forward advance, the friction lever and weight assembly (47) is kept from contacting the copper bronze contact by a wiping action from oscillating lever stud assembly (55). The oscillation of oscillating lever and stud assembly is produced by eccentric motion of oscillating gear (4) which is driven by the pinion gear (25) on the lower portion of the turntable. Oscillating gear (4) is mounted off-center so it will describe an eccentric action as it is being driven by the turntable gear. The tone arm moves in towards the center of the record and the repeated action of oscillating lever (55) keeps friction lever and weight assembly (47) from coming in contact with the copper bronze strip on trip switch assembly (63) as the pickup arm moves slowly towards the spindle and lead-in grooves. During the first revolution of the turntable, in the eccentric cycling grooves, the pickup arm advances rapidly and friction lever and weight assembly (47) is moved forward fast enough so that oscillating lever (55) does not halt its progress, therefore, friction lever and weight assembly (47) contacts the copper bronze trip contact on trip switch assembly (63) grounding it and making a complete circuit. This actuates solenoid (61) causing the changer to cycle.

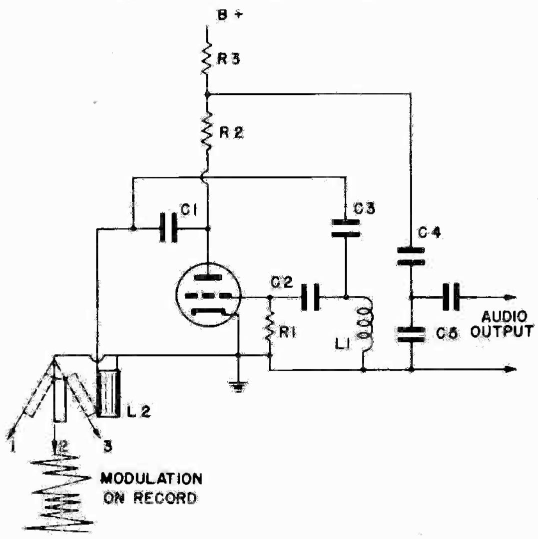
THEORY OF THE COBRA RADIONIC PICKUP

The operation of the Cobra pickup is considerably different from Crystal and Dynamic pickups. These pickups generate audio power, while the Cobra controls power generated by a radio frequency oscillator, detector and audio amplifier. The oscillator operates at a frequency of 2.5 Mc. Modulation is accomplished by changing the energy losses in a tuned circuit. These losses may be represented by an equivalent resistance in series with the reactance of the coil. The ratio of the resistance to the reactance determines the effi-

ciency or Q of the coil. The amplitude of the RF voltage developed across this coil by an oscillator will vary with changes in Q.

The grid coil L1 and other components of the oscillator are mounted in the oscillator pre-amp chassis, while the plate coil L2 is in the needle cartridge with vane and needle assembly. The coil is fixed and has 40 turns of No. 40 wire (approximate DC resistance 2 1/2 ohms). The stainless steel vane, which is in the field of the coil, is spot welded to the osmium-iridium tipped stylus.

Any movement of the stylus will cause a corresponding movement of the vane. As the stylus and vane follow the modulations in the record, changes in the mutual inductance between the vane and coil occur. In position 2 the vane is at rest, and a constant RF voltage appears across the plate coil. As the vane is set in motion and reaches position 1, it is at its greatest outward swing from the coil, resulting in low mutual inductance, low reflected resistance, higher Q, and a higher RF voltage across the coil. In position 3 it is at its greatest inward swing, resulting in a high mutual inductance, high reflected resistance, lower Q and a



Simplified Circuit of Oscillator

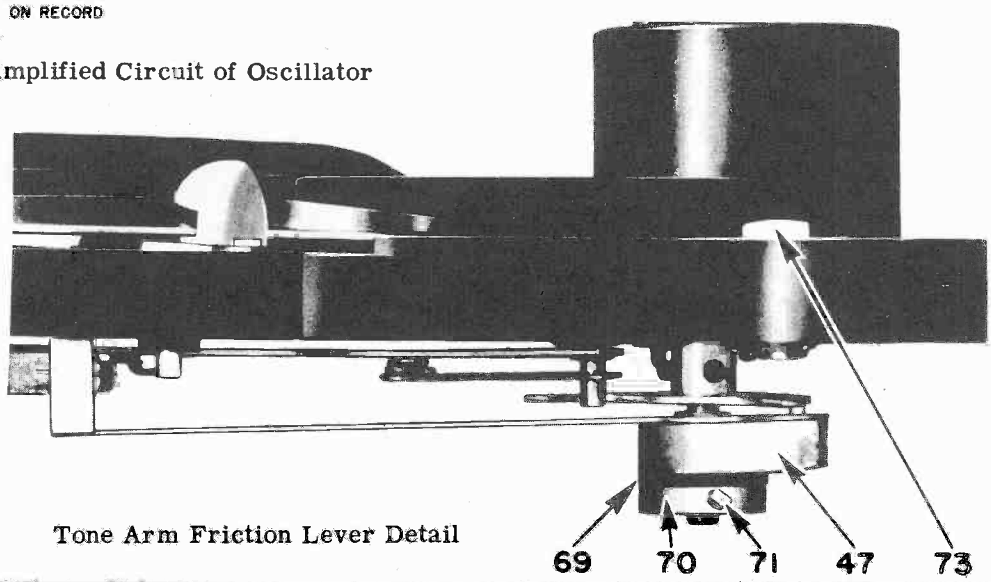
ZENITH Record Changer, continued

lower RF voltage. It can be seen that the amplitude of the RF voltage which appears across the coil will vary with changes in Q, satisfying the condition for amplitude modulation. The position of the vane changes both the Q and L of the coil. Changes in L shift the frequency slightly, and a certain amount of frequency modulation is present, but since there is no frequency discrimination it remains undetected. Since the grid and plate coils are part of a single tuned circuit, any variations of amplitude of the RF voltage brought about by the changes in Q across the plate coil will also appear across the grid of coil L1, causing a shift in the average plate current through the plate load resistor across which the audio output voltage is developed. Plate bend detection takes place since only the positive half of the grid swing causes an increase in the average plate current. These changes in the average plate current appear as audio voltage across the plate load resistor.

The 2.5 Mc RF voltage and the audio voltage both appear at the plate (pin 6) of the oscillator triode. R2, C4 and C5 filter out the RF voltage allowing only the audio component to the grid (pin 4) of the amplifier triode where it is amplified, fed through a shielded lead to the audio amplifier of the receiver and reproduced by the loud speaker.

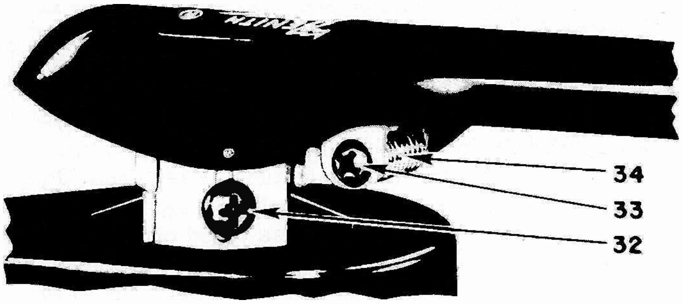
SET DOWN ADJUSTMENT

When adjusting the tone arm for proper set-down on the edge of the record, move set-up change lever to 7" position, place a 7" record on the turntable, turn the record changer through cycle by rotating the turntable by hand. Watch closely where the needle point of the Cobra cartridge lands on the record and adjust tone arm set-down adjustment screw (33) until proper landing position is obtained.



Tone Arm Friction Lever Detail

ZENITH Record Changer, continued



Tone Arm Set-Down & Height Adjustments

TONE ARM HEIGHT ADJUSTMENT

The tone arm height adjustment determines vertical rise of the tone arm. If the tone arm does not rise sufficiently it will not play a full stack of twelve records. On the other hand, if the tone arm raises too high it may hit the records resting on the record shelf. Set the tone arm height adjustment screw (32) so that the needle clears twelve unwarped records on the turntable. The tone arm housing must not hit the under side of the records on the record shelf when the changer is cycled after adjustment.

SLAB HEAD SCREWS

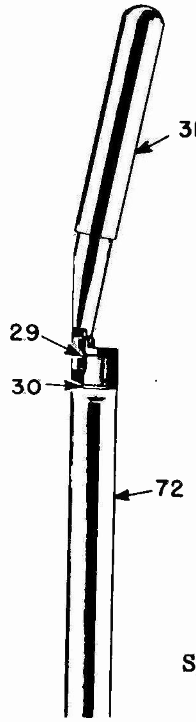
For maximum rigidity many components are locked into position with slab head screws. This type set screw provides a more positive grip. The slab head set screw wrench is available as part number 68-8.

SPEED INDICATOR ADJUSTMENT

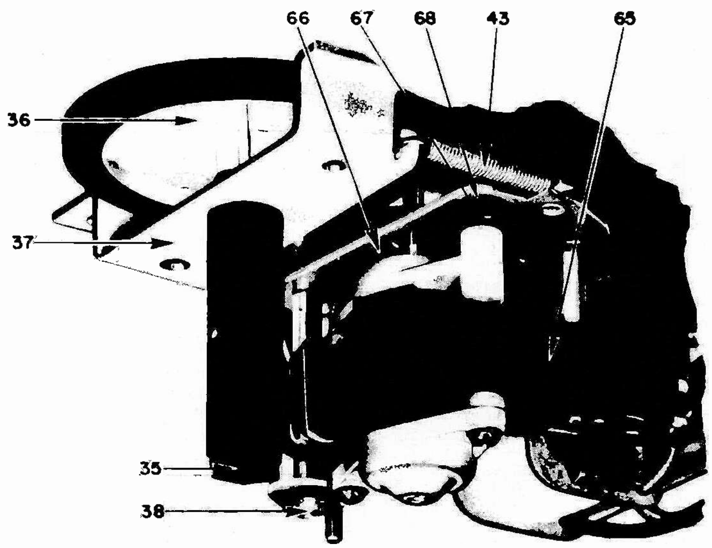
It is possible that the speed of the record changer may not conform to the speed stop on escutcheon (23). Proper adjustments can be made in the following manner. Put a stroboscopic disc on the turntable, adjust speed change lever (18) until the turntable is turning at exactly 78 RPM. Stop the record changer by pulling the AC plug, remove the turntable, loosen the two adjusting screws (74) and move speed change lever (18) so that the point on the control knob indexes exactly at the 78 mark on the escutcheon (23). Then re-tighten adjusting screws (74) and replace the turntable. The turntable should now rotate at exactly 78 RPM, however, as a precaution, again check with the stroboscopic disc.

SPINDLE

The spindle on this record changer is composed of five separate parts. Spindle shaft (30) and ejector cam (29) are pressure-fit together and if either breaks, they cannot be replaced since the assembly operation is a machine operation. The spindle housing is composed of two separate portions which once again are pressure-fit together and require a machine operation for assembly. It is possible that spindle cap (31) may be pulled off spindle assembly (72) and if this does occur, it can easily be replaced by sliding a new spindle cap down over the spindle and then pressing in on the detent portion, which acts as a stop to keep the spindle cap from sliding off spindle (72). If breakage occurs other than loss of the spindle cap (31), the entire spindle assembly (72) must be replaced.



Spindle S-17424



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This INDEX lists every radio and television set included in the presently available Supreme Publications "Most-Often-Needed Servicing" manuals. This includes thirteen radio manuals and seven television (TV) manuals. To find the volume and page where the material you need is listed, first look up the make of set. The names of manufacturers are listed alphabetically from Admiral to Zenith. Under each manufacturer, the models of that make are listed numerically in the left column. Corresponding to each model there is an entry in the right column. In this right column, words such as: One, Two, Three, and up to Twelve, refer to the volume number of RADIO Diagram manuals; this number tells what volume is needed in each case. Volume 13, is listed as 1953. Reference to Television Servicing Information and UHF volumes is made by volume numbers TV1, TV2, through TV7, and UHF1. In each case, the figures following the volume number (-after the dash) tells you on what pages in the volume stated, the material you need will be found. You will find the year and volume number on the cover of every Supreme manual. Just to make sure that this explanation is clear to you, let us try one example. Look up Admiral model 6A1. Here you are referred to Six-12. This means Radio Volume 6 (or 1946 radio diagram manual), page 12. The Introduction, on the page to the left, gives more details.

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