

Most - Often - Needed

1962

VOLUME R-22

RADIO DIAGRAMS

and Servicing Information



Compiled by
M. N. BEITMAN

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SUPREME PUBLICATIONS

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1962

Volume R-22

RADIO DIAGRAMS

and Servicing Information



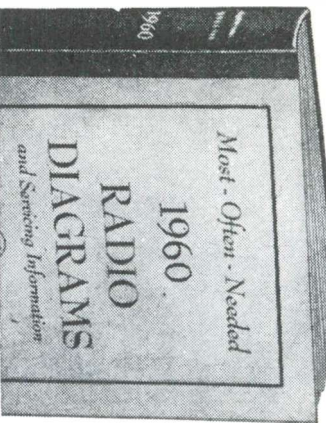
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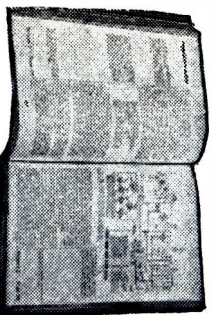
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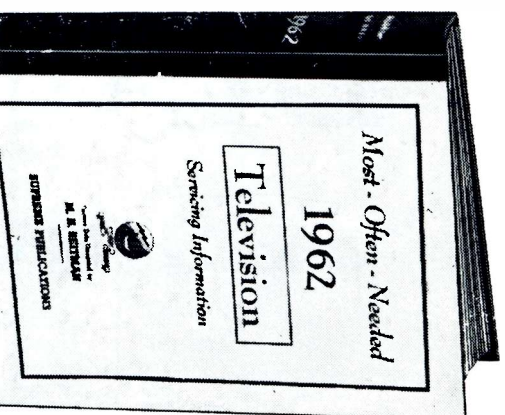
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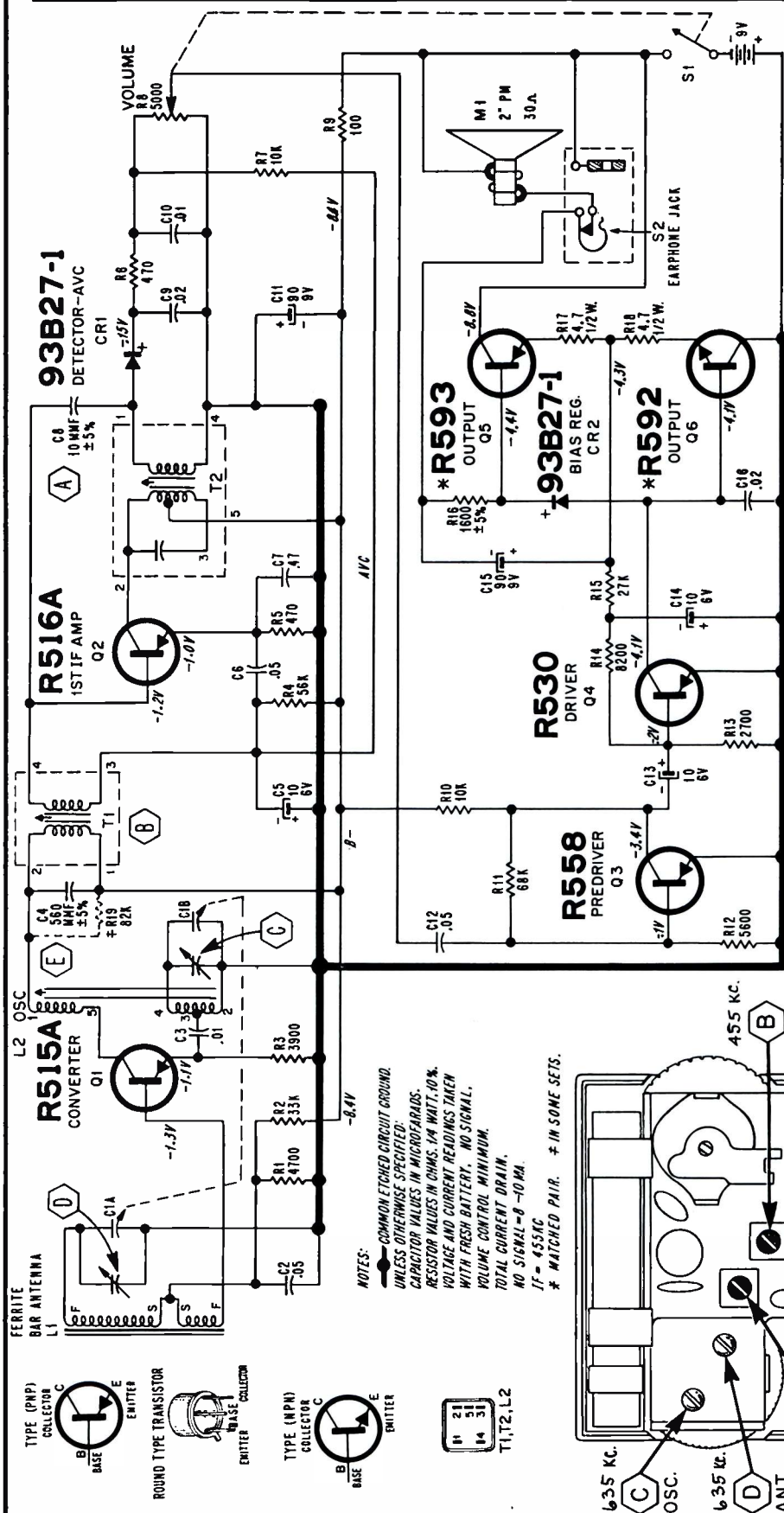
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<input type="checkbox"/> 1961 <input type="checkbox"/> 1960 <input type="checkbox"/> 1959 <input type="checkbox"/> 1958 <input type="checkbox"/> 1957 <input type="checkbox"/> 1956 <input type="checkbox"/> 1955 <input type="checkbox"/> 1954 <input type="checkbox"/> 1953 <input type="checkbox"/> 1952 <input type="checkbox"/> 1951 <input type="checkbox"/> 1950 <input type="checkbox"/> 1949 <input type="checkbox"/> 1948 <input type="checkbox"/> 1947 <input type="checkbox"/> 1946 <input type="checkbox"/> 1945 <input type="checkbox"/> 1944 <input type="checkbox"/> 1943 <input type="checkbox"/> 1942 <input type="checkbox"/> 1941 <input type="checkbox"/> 1940 <input type="checkbox"/> 1939 <input type="checkbox"/> 1938	Popular RADIO Diagram Manuals at only \$2.50 each..... These annual RADIO volumes specially priced at only \$2.50 each..... THIS GROUP ONLY \$2 EACH Manual, \$2.50	<input type="checkbox"/> Rush RADIO and TV manuals checked <input checked="" type="checkbox"/> in coupon. <input type="checkbox"/> New Television Servicing Course, complete... \$3. <input type="checkbox"/> Simplified Radio Servicing by Comparison... \$1.50 <input type="checkbox"/> Practical Radio Course (all 35 lessons)... \$3.95 <input type="checkbox"/> New 1962 Television Servicing Manual, only... \$3. <input type="checkbox"/> 1961 TV Manual, \$3. <input type="checkbox"/> 1960 TV Manual, \$3. <input type="checkbox"/> Additional 1959 TV, \$3. <input type="checkbox"/> Early 1959 TV, \$3. <input type="checkbox"/> 1958 TV Manual, \$3. <input type="checkbox"/> Additional 1957 TV, \$3. <input type="checkbox"/> Early 1957 TV, \$3. <input type="checkbox"/> 1956 TV Manual, \$3. <input type="checkbox"/> Additional 1955 TV, \$3. <input type="checkbox"/> Early 1955 TV, \$3. <input type="checkbox"/> 1954 TV, \$3. <input type="checkbox"/> 1953 TV, \$3. <input type="checkbox"/> 1952 TV, \$3. <input type="checkbox"/> 1951 TV, \$3. <input type="checkbox"/> Master Index to all Manuals, 25c <input type="checkbox"/> I am enclosing \$..... Send postpaid.
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Name:
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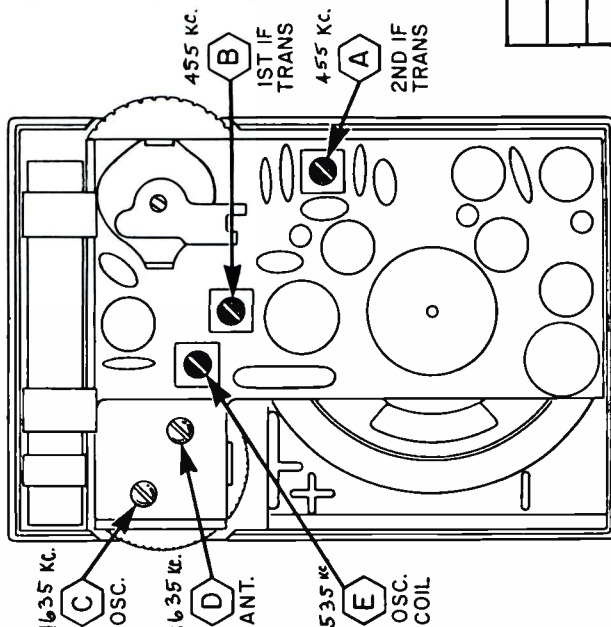




ADMIRAL

MODEL	COLOR	CHASSIS
Y2221	Black	6M3A
Y2223	White	
Y2226	Yellow	
Y2229	Blue	

Eveready	206
Mallory	TRI26
Ray-O-Vac	1611M



VOLUME

1962 RADIO SERVICING INFORMATION

ADMIRAL

Chassis 7B2, Models Y2081, Y2082, Y2083

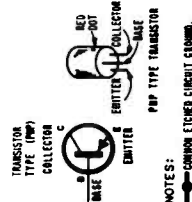
For top view and alignment information refer to such material for 7B2B, on page 6.

2N411
CONVERTER
Q1

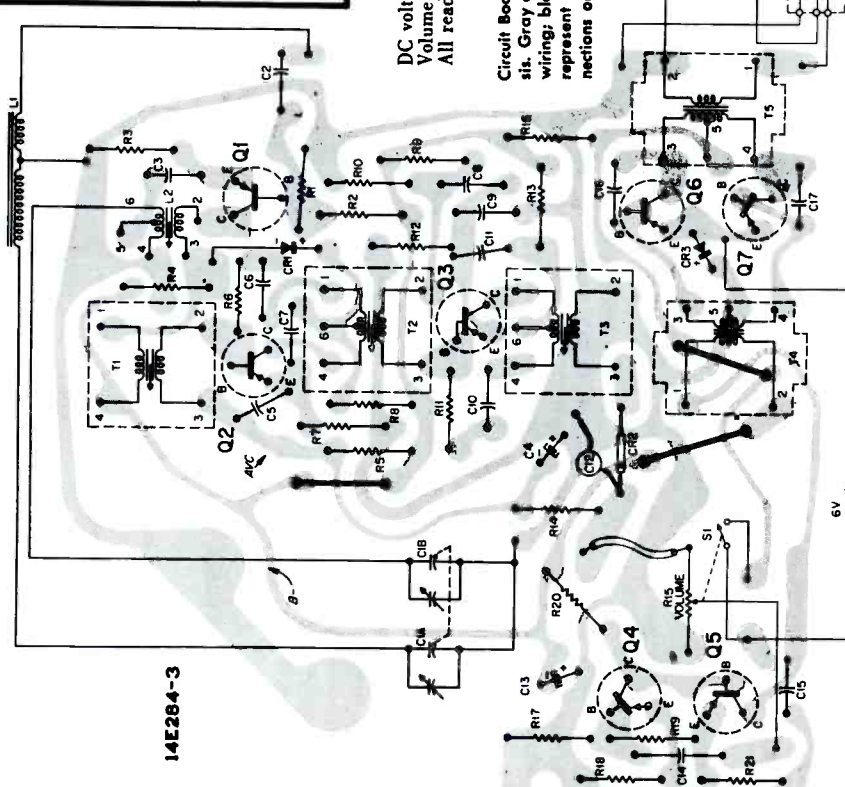
2N410
1ST IFAMP
Q2

2N410
2ND IF
Q3

IN295
DETECTOR-AVC
CR2



NOTES:
1. COMMON ETCHED CIRCUIT SYMBOLS.
2. CAPACITANCE VALUES IN MICROFARADS.
3. RESISTOR VALUES IN OHMS, 1/4 WATT, 10%.
4. VOLTAGE AND CURRENT READINGS TAKEN WITH FRESH BATTERIES.
5. NO SERIAL VOLUME CONTROL. MINIMUM.
6. TOTAL CURRENT DRAIN (NO SIGNAL) = 1-10 MA.
7. IF=455 KC.
8. * NOT CIRCLED
9. * NOTCHED PAD



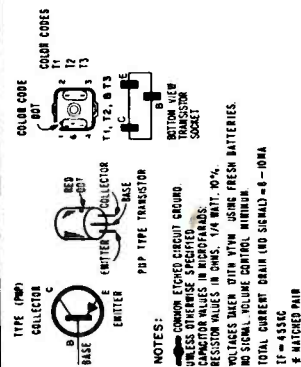
VOLTAGE DATA

DC voltages shown measured with VTVM, no signal, using fresh batteries.
Volume control at minimum; dial set to low frequency end.
All readings made between transistor terminals and etched circuit ground.

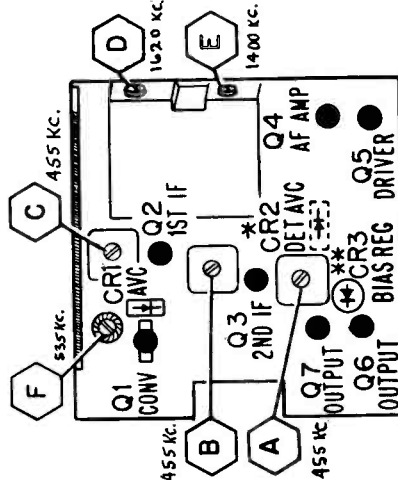
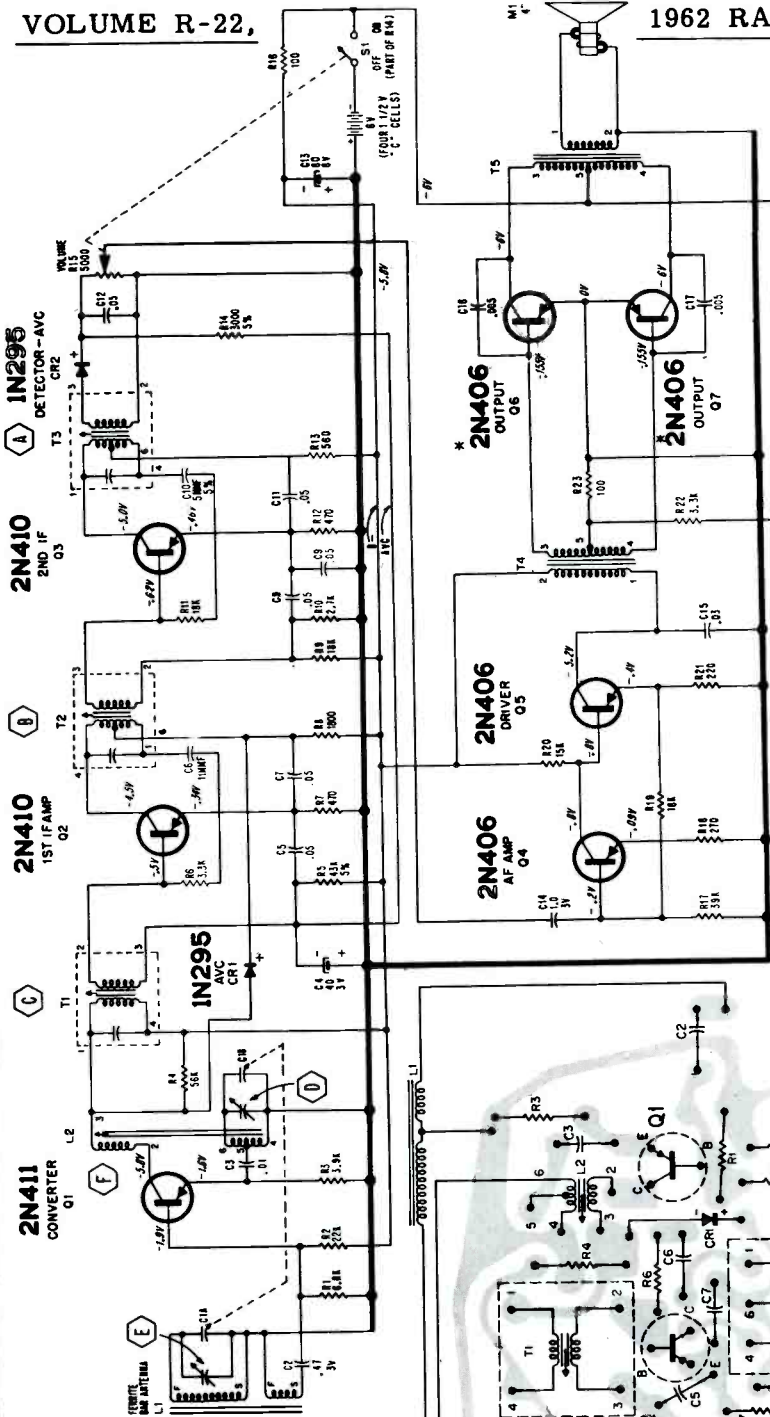
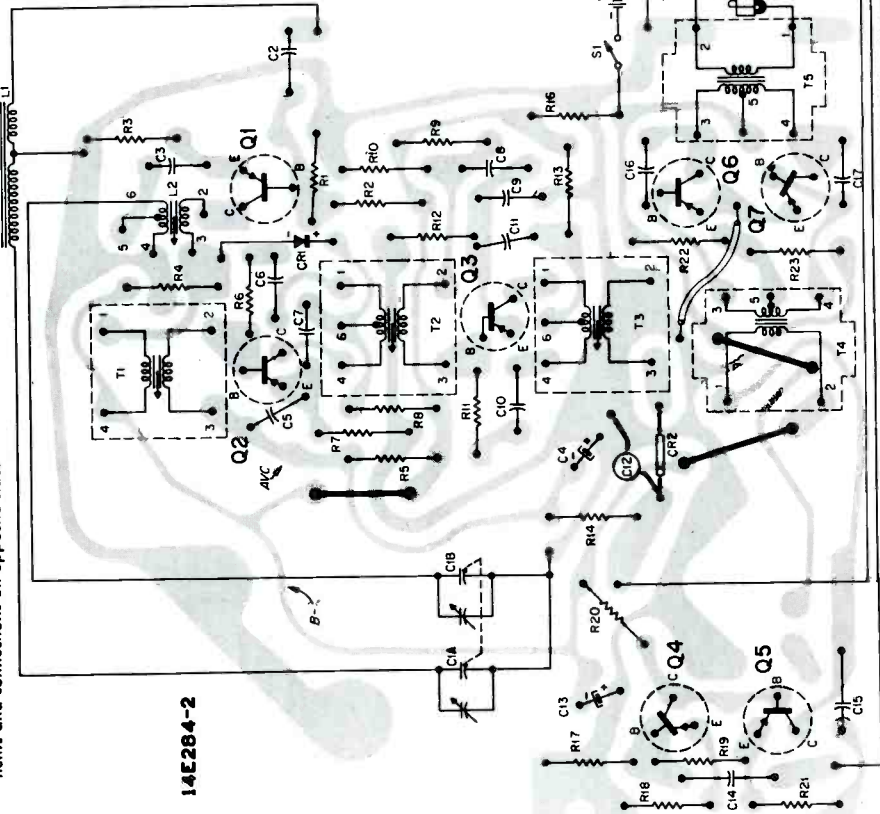
Rear View of Etched
Circuit Board Used in 7B2 Chassis.
Gray area represents etched wiring; black symbols and lines represent components and connections on opposite side.

ADMIRAL Chassis 7B2B Models Y2101, Y2102, and Y2108

For voltage data see
instructions on page 5.



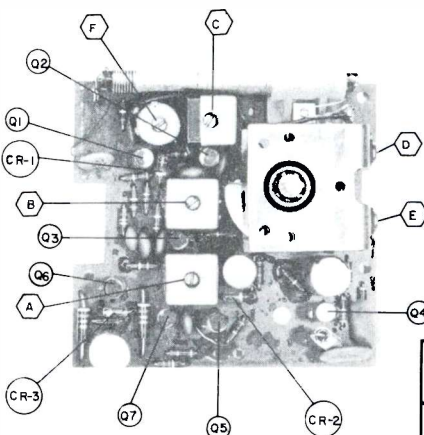
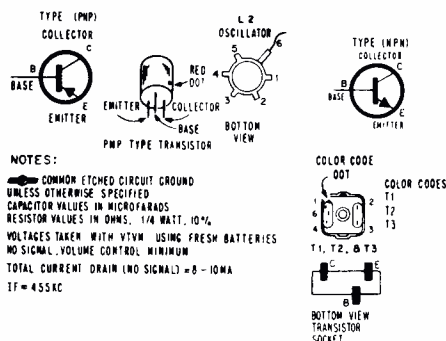
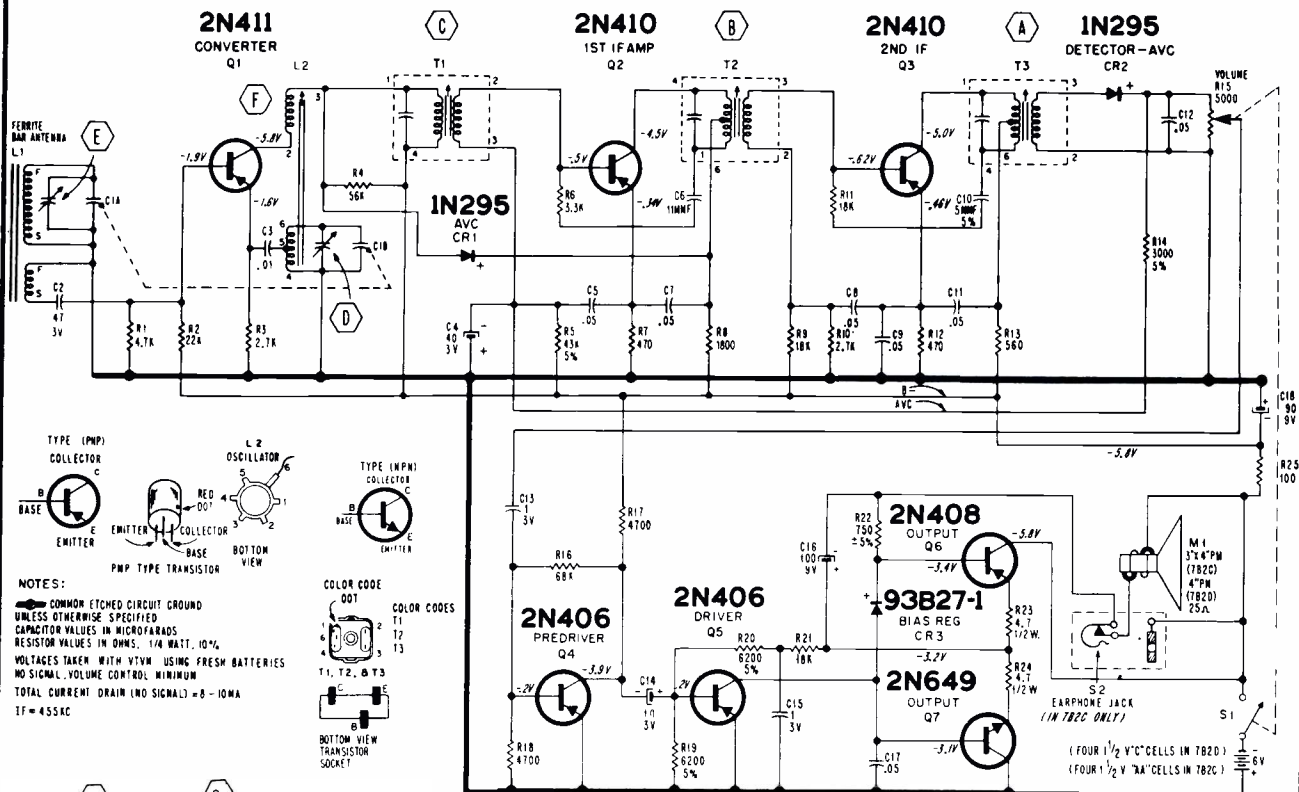
Rear View of Etched Circuit Board Used in 7B2B Chassis. Gray area represents etched wiring; black symbols and lines represent components and connections on opposite side.



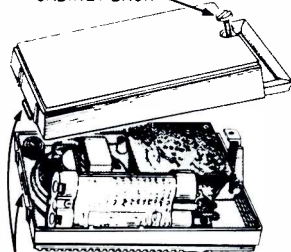
Top View of Chassis Showing Transistor and Alignment Point Locations.

ADMIRAL

Chassis 7B2C, Models Y2081A, Y2082A, Y2083A
Chassis 7B2D, Models Y2252, Y2253, Y2256



1 LOOSEN SCREW ON CABINET BACK



2 UNHOOK TAB FROM SLOT ON FRONT SECTION

Opening the Cabinet for Battery Replacement, in Models Using the 7B2D Chassis

ALIGNMENT PROCEDURE

Alignment of a transistor radio is similar to alignment of an ordinary vacuum-tube radio. However, there is somewhat more interaction between the RF and IF circuits, thus requiring greater care in the setting of the adjustments as well as repetition of some of the steps. Therefore, for best results, follow the alignment procedure exactly as given below.

- Fresh batteries should be used.
- Set Volume control at maximum.
- Connect output meter across speaker voice coil. For best results, connect 25 ohm resistive load through earphone jack, if used.
- Use lowest output of signal generator that will produce adequate indication on lowest scale of output meter. IMPORTANT: Output level should be held at 25 mw. or less. The voltage reading at the 25 mw. level is approximately 0.8 volts across the 25 ohm load.

Step	Connection of Signal Generator	Signal Gen. Frequency	Receiver Gang Setting	Adjustment Description	Adjustment
1	Radiated Signal. † Loop of several turns of wire, or place generator lead close to receiver for adequate signal.	455 KC	Gang fully open	3rd IF 2nd IF 1st IF	* (A) (B) and (C) for maximum output.
2	Same as "Step 1".	1620 KC	Gang fully open	Oscillator Trimmer	(D) for maximum output.
3	Repeat "Step 1" several times until there is no further increase in the output.				
4	Same as "Step 1".	§ 1400 KC	Tune in generator signal	Antenna Trimmer	(E) for maximum output.
NOTE: After completing "Step 4" the tuning range should be 1620 KC to 535 KC; +5 KC. If this range cannot be obtained, continue with Steps 5, 6 and 7.					
5	Same as "Step 1".	535 KC	Gang fully closed	Oscillator Coil Core	(F) for maximum output.
6	Repeat "Step 2", then repeat Steps 5 and 2 several times until oscillator covers required range.				
7	Repeat "Step 4".				

† If signal generator does not produce sufficient output for usable reading, clip hot lead of generator to RF stator plates terminal of gang; clip ground lead to frame of gang. Adjust (A) (B) and (C) for usable output only. Then return to "Step 1".

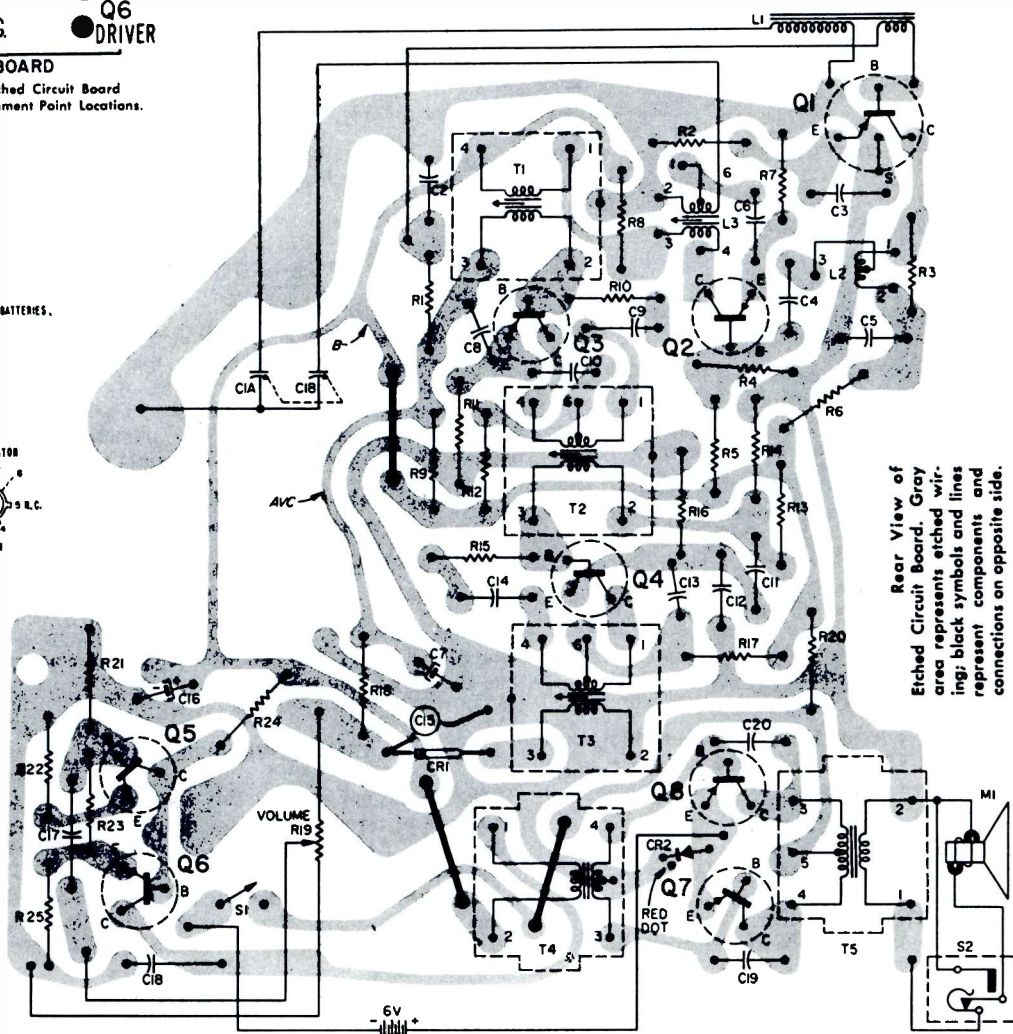
* If difficulty is experienced in obtaining signal output, first rotate IF slugs out several turns, then slowly adjust slugs in until output is obtained. Caution: Rotating slugs too far inward will damage ceramic capacitor contained in IF can.

§ Antenna trimmer (E) should first be adjusted for maximum output with generator tuned to 1400 KC. Then try to increase output by rocking gang or generator slightly while readjusting trimmer.

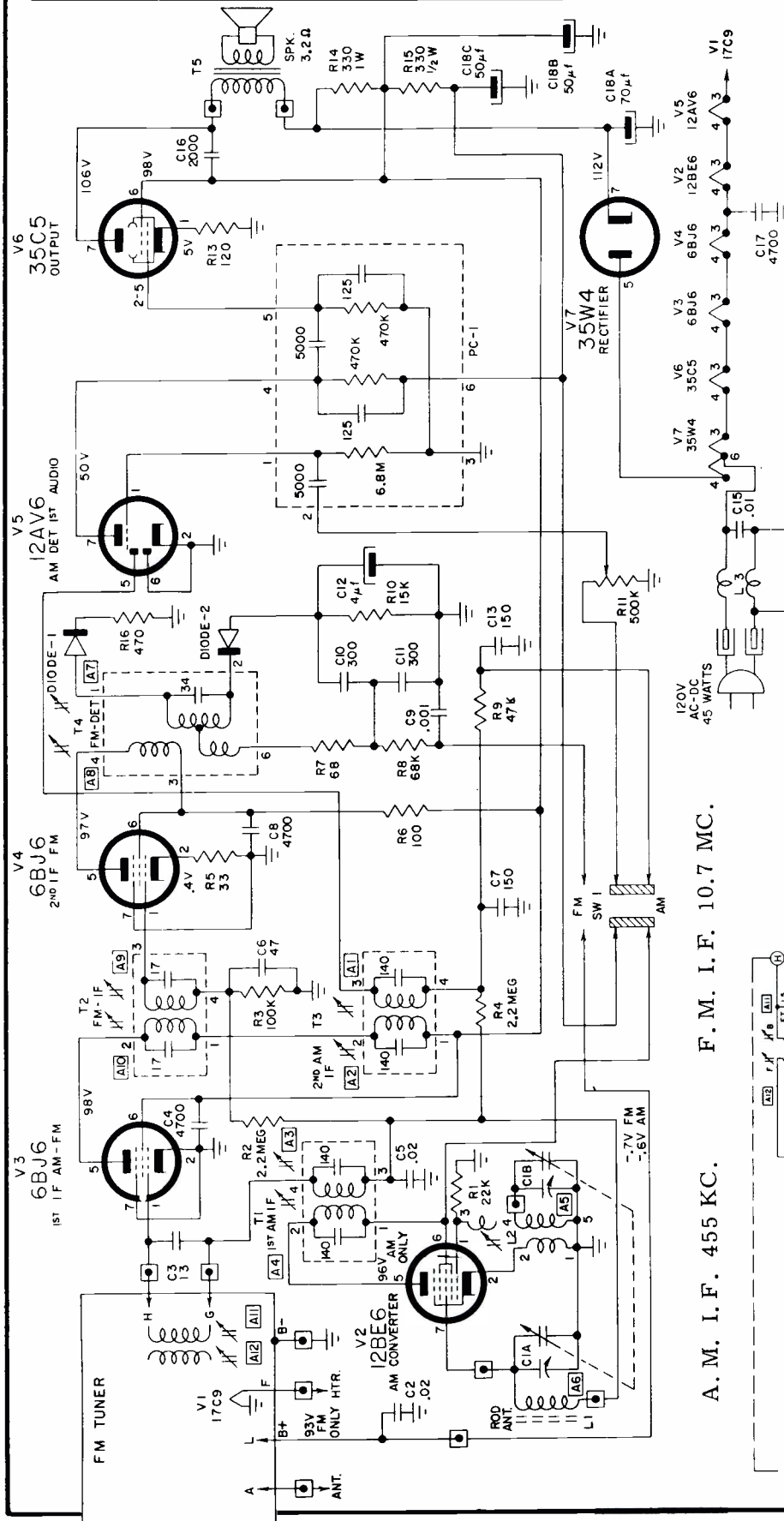
ADMIRAL Chassis 8A2, used in Models Y2091, Y2093, Y2098



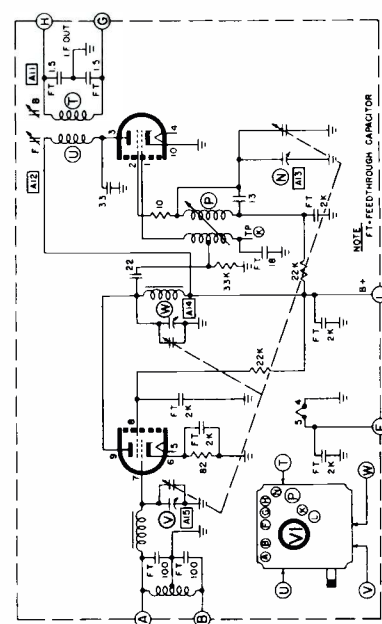
— COMMON ETCHED CIRCUIT GROUND.
 UNLESS OTHERWISE SPECIFIED:
 CAPACITOR VALUES IN MICROFARADS,
 RESISTOR VALUES IN OHMS, 1/4 WATT, 10%.
 VOLTAGE AND CURRENT READINGS TAKEN WITH FRESH BATTERIES,
 NO SIGNAL, VOLUME CONTROL MINIMUM.
 TOTAL CURRENT (DRAIN NO SIGNAL) = 0-10 MA
 0 = NOT GROUNDING
 IF = 455 KC
 * MATCHED PAIR



Rear View of Etched Circuit Board. Gray area represents etched wiring; black symbols and lines represent components and connections on opposite side.



A.M. I.F. 455 KC. F.M. I.F. 10.7 MC.



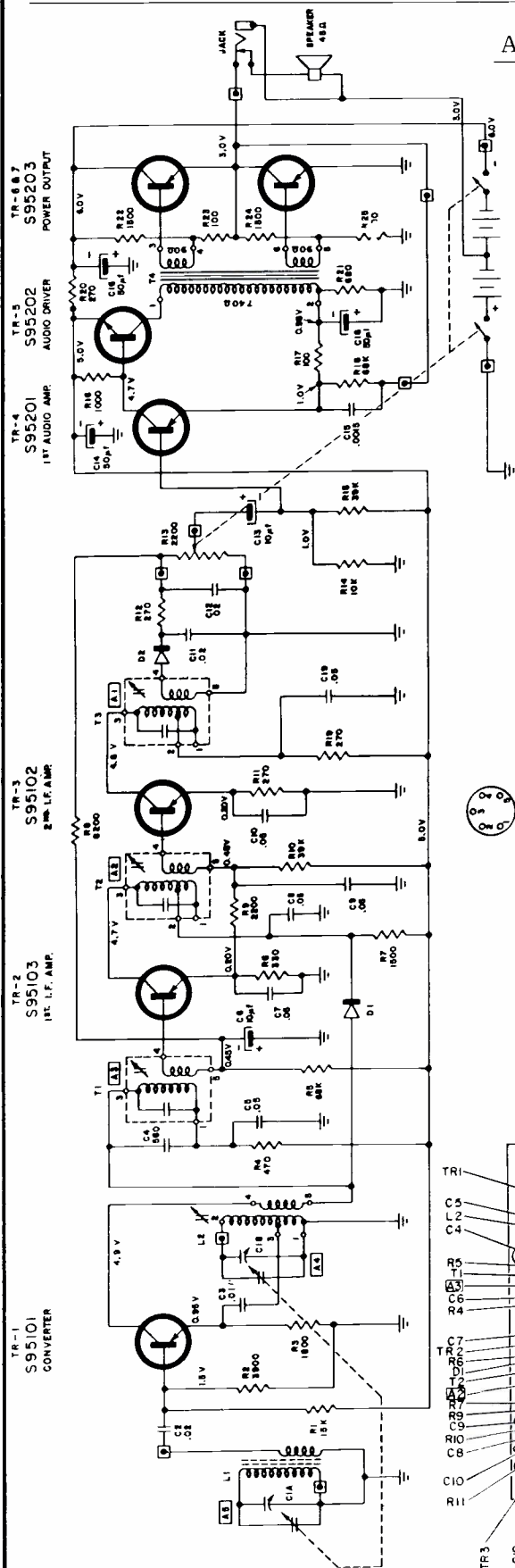
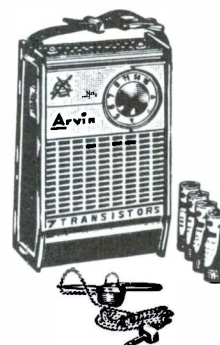
TUNER SCHEMATIC

VOLTAGES MEASURED TO B- WITH A V.T.M. $\pm 20\%$ NO SIGNAL.
FM POSITION UNLESS OTHERWISE NOTED. B+ VOLTAGES SHOULD BE APPROX. 2V HIGHER IN AM POSITION.
RESISTANCE VALUES ARE IN OHMS. K=1,000, MEG=1,000,000
CAPACITANCE VALUES LESS THAN (1) ARE IN MICROFARADS (μf), AND VALUES OF (1) OR GREATER ARE IN MICROMICROFARADS (μf) UNLESS OTHERWISE INDICATED.

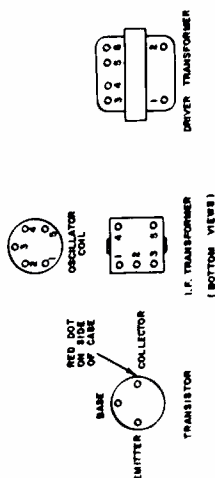


MODELS 31R25 - 31R26
CODE 1.64901

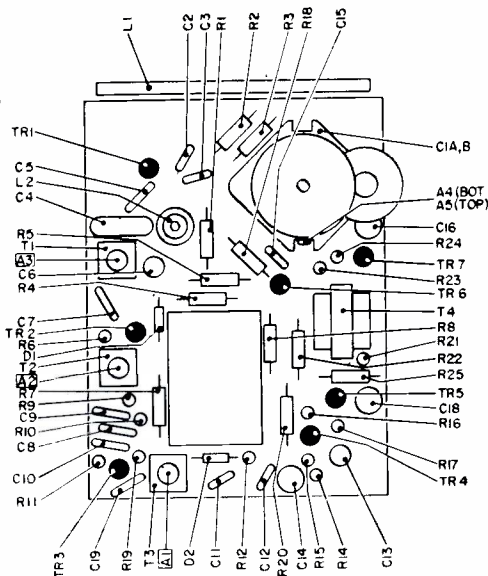
ARVIN Models 61R48, 61R49, Code 1.62201



⊥ - COMMON GROUND.
 □ - EXTERNAL CONNECTOR TO PRINTED CIRCUIT BOARD.
 RESISTANCE VALUES ARE IN OHMS; K = KILLOHMS.
 CAPACITANCE VALUES LESSER THAN 1.0 ARE IN MICROFARADS (μF) AND VALUES GREATER THAN 1.0 ARE IN MICRO-MICROFARADS (μμF) EXCEPT WHERE NOTED.
 VOLTAGE READINGS TO COMMON GROUND (±) ARE MEASURED WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS.
 TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS IS 8 TO 12 MA.



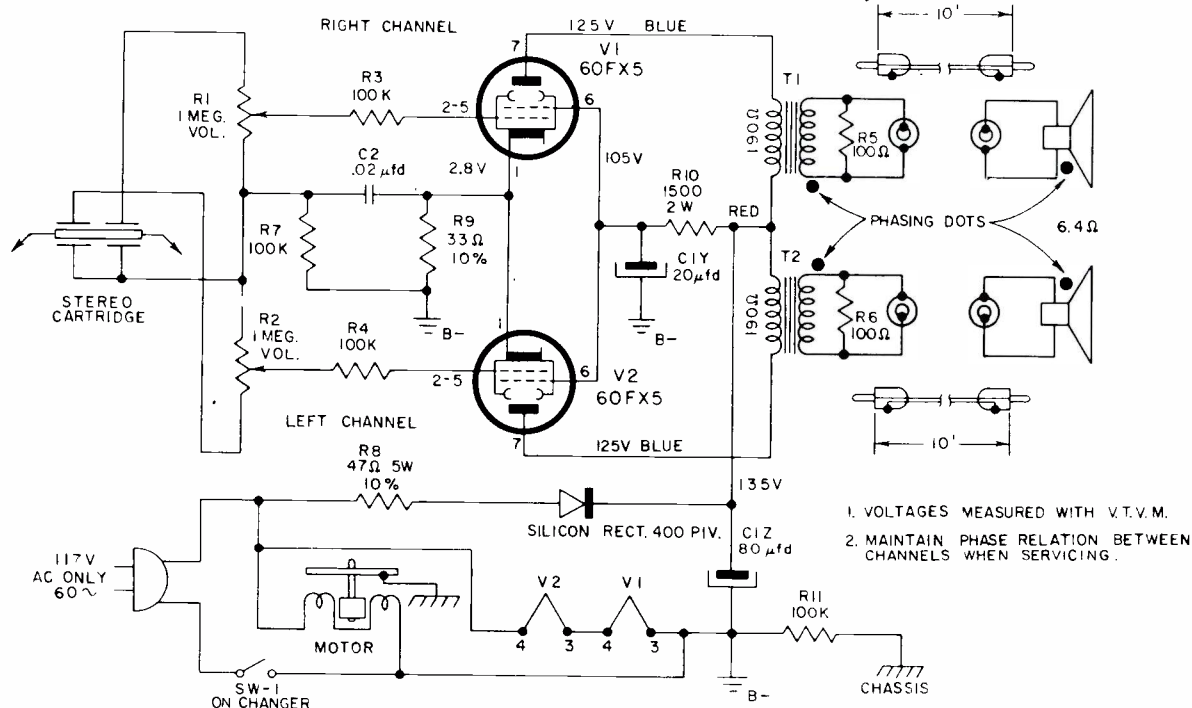
SIGNAL TEST POINTS	TEST FREQUENCY	SERIES CAPACITOR TO GENERATOR (μF)	INPUT FOR GENERATOR (V)
TR-1 BASE	455 KC	.05 μF	820 μV
TR-2 BASE	455 KC	.05 μF	25 μV
TR-3 BASE	455 KC	.05 μF	5 μV
STANDARD LOOP	1000 KC	STANDARD LOOP	200 μV/M



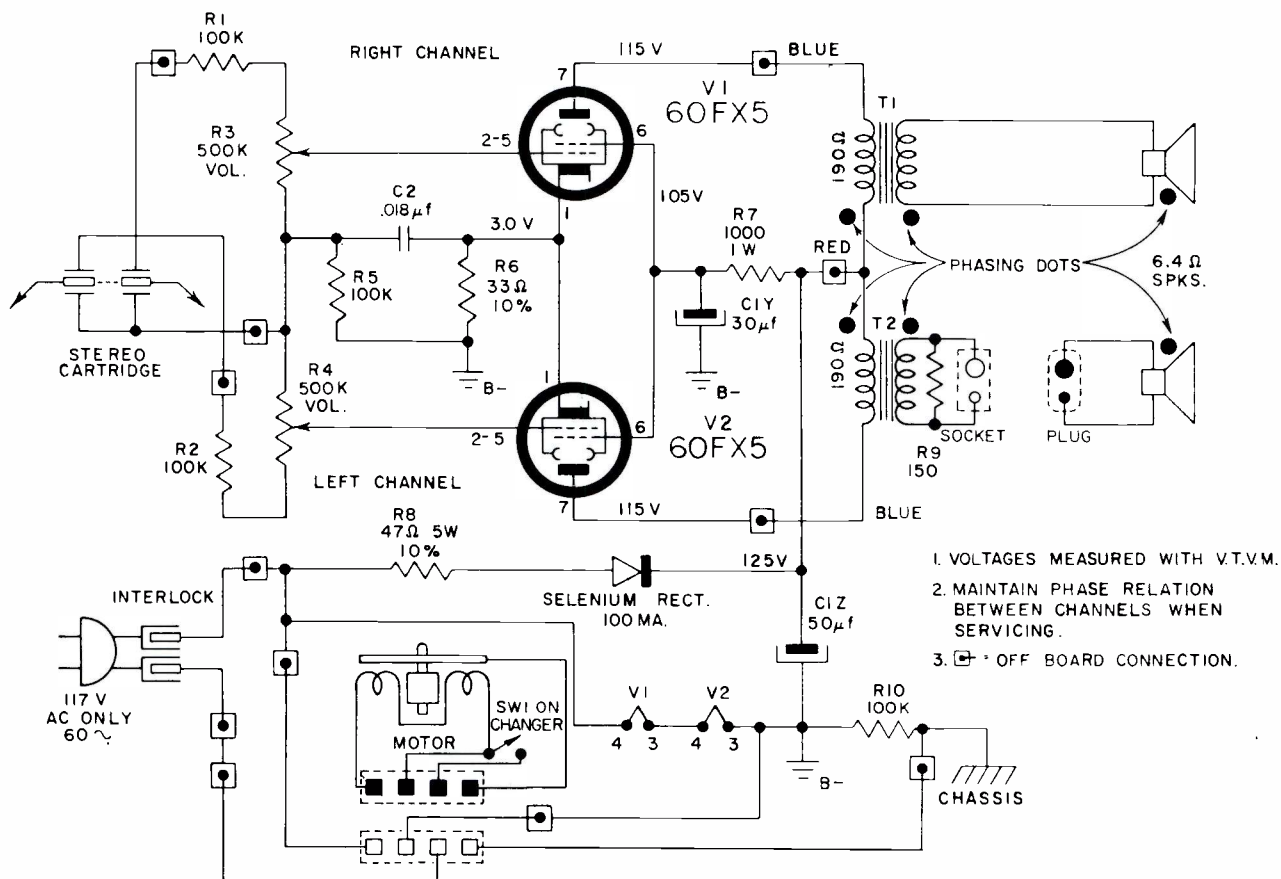
Position of Variable	Generator Frequency	Dummy Antenna	Generator Connections	Trimmers Adj. in order shown for Max. Output	Function of Trimmer
Open	455 Kc	.05 μf	C1A	A1 (Top of T3) A2 (Top of T2) A3 (Top of T1)	I.F. I.F. I.F.
Open 1400 Kc 600 Kc	1670 Kc 1400 Kc 600 Kc		*Test Loop *Test Loop *Test Loop	A4 A5 Check Point	Oscillator Antenna

*Standard Hazeltine Test Loop Model 1150 or 3 turns of wire about 6" in diameter placed about one foot from the set loop.

ARVIN PHONOGRAPH MODEL 80P78, CODE 1. 62001



ARVIN PHONOGRAPH MODEL 81P68, CODE 1. 65301

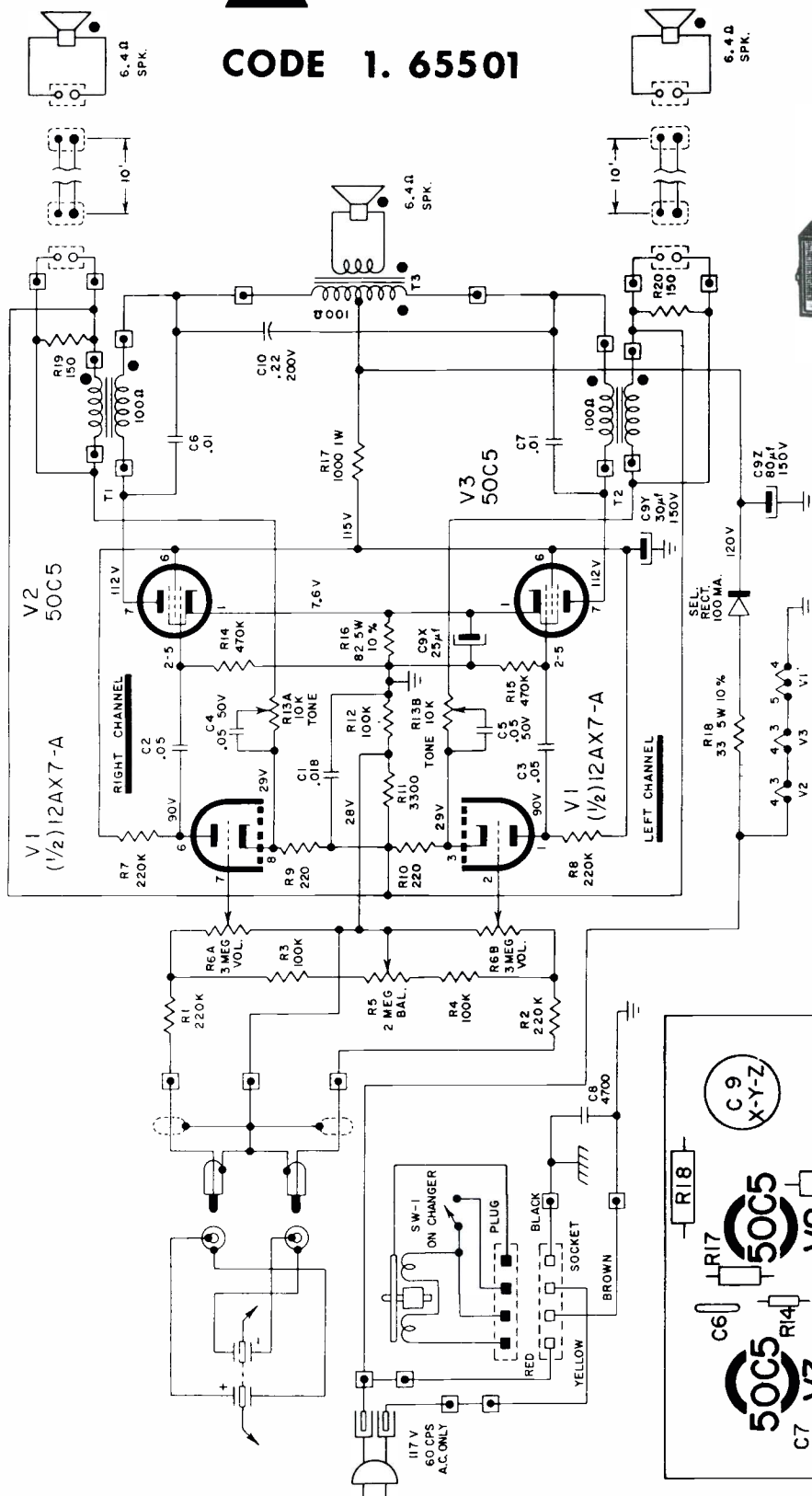
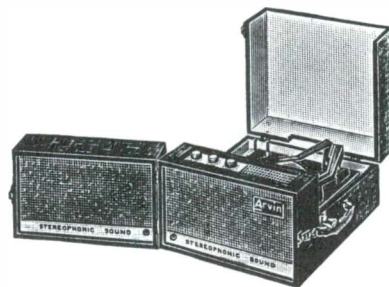


Arvin

CODE 1. 65501

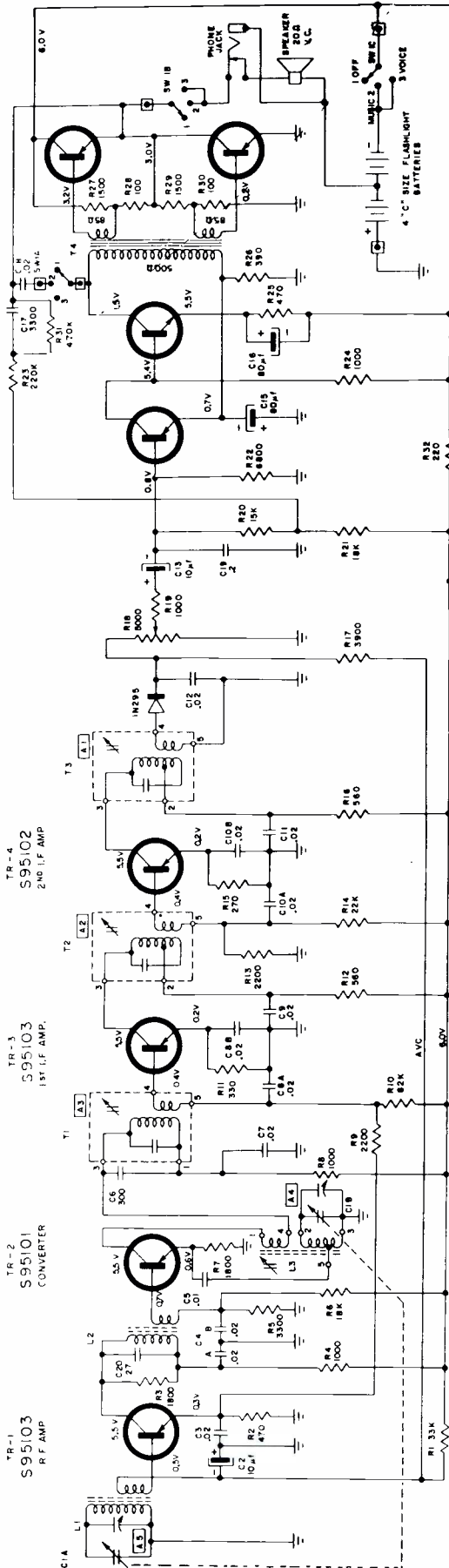
PHONOGRAPH MODELS

81P75 - 81P78



NOTES:

1. $\frac{1}{2}$ = B-
2. $\frac{1}{2}$ = CHASSIS
3. VOLTAGES MEASURED WITH V.T.V.M.
4. \square = EXTERNAL CONNECTIONS TO PRINTED BOARD.
5. RESISTANCE MEASURED IN OHMS; K = 1,000 MEG = 1,000,000.
6. RESISTORS ARE 1/2 WATT WITH A $\pm 20\%$ TOLERANCE UNLESS OTHERWISE INDICATED.
7. CAPACITANCE VALUES LESS THAN ONE (1) ARE IN MICROFARADS (μ F), AND VALUES OF ONE (1) OR GREATER ARE IN MICROFARADS (μ F) UNLESS OTHERWISE INDICATED.
8. COMPONENTS IN THIS AMPLIFIER ARE INTERCONNECTED TO RESULT IN A CONSISTANT PHASE RELATION BETWEEN CHANNELS DO NOT PHASING DOT
9. \bullet = PHASING DOT
10. T1, T2, T3 (IN PHASE TERMINALS. RED DOT IS PRIMARY; GREEN DOT IS SECONDARY).
11. SPEAKER (POSITIVE VOLTAGE MOVES VOICE COIL OUTWARD)

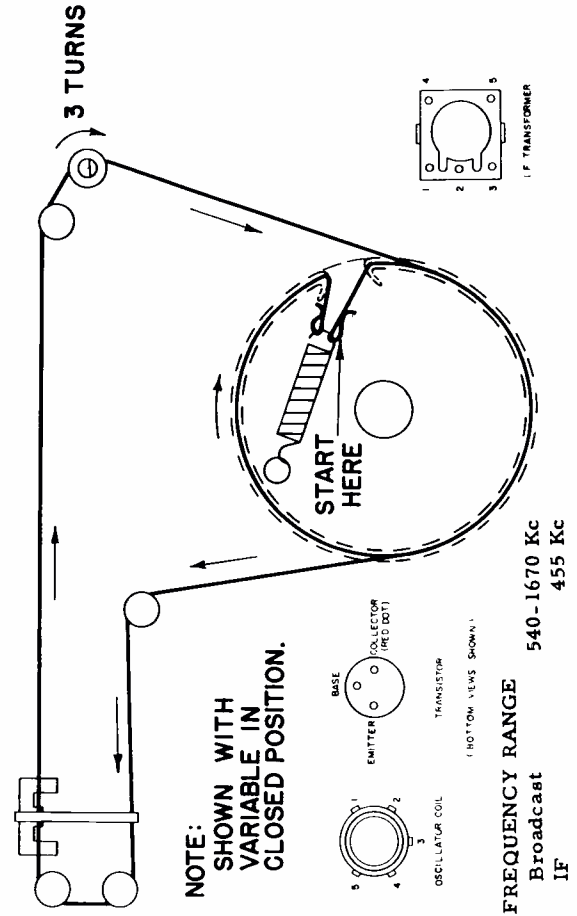


 = COMMON GROUND (+)
 = EXTERNAL CONNECTOR TO PRINTED CIRCUIT

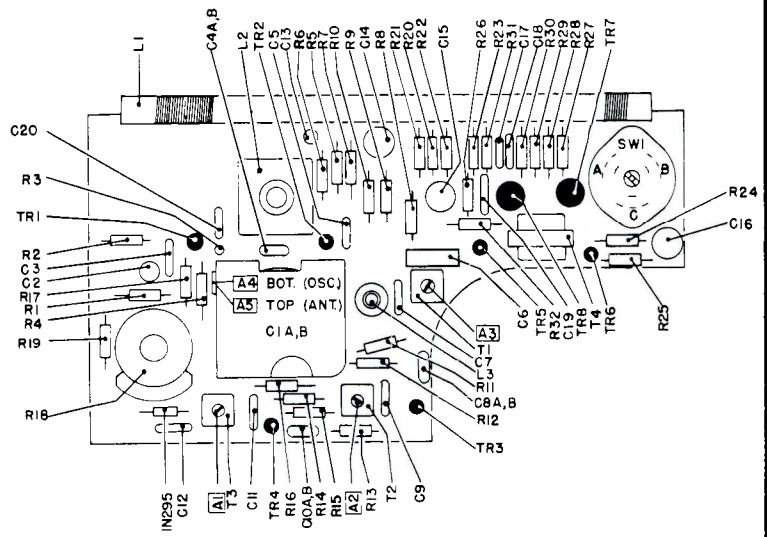
RESISTANCE VALUES ARE IN OHMS $K=1000$
CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (μF) AND
VALUES GREATER THAN 1.0 ARE IN MICRO-MICROFARADS ($\mu\mu F$) EXCEPT
WHERE NOTED.
VOLTAGE READINGS TO COMMON GROUND (+) ARE MADE WITH VACUUM
TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS
TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS = 8 TO 16

TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS • 8 TO 16 MA

SIGNAL TEST POINTS	TEST FREQUENCY	SERIES CAPACITOR TO GENERATOR	INPUT FOR 50W OUTPUT (1.0V ACROSS 20Ω)
TR-4 BASE	455 K.C.	.05μf	100μV
TR-3 BASE	455 K.C.	.05μf	30μV
TR-2 BASE	455 K.C.	.05μf	75μV
ANTENNA ROD	1000 K.C.	STANDARD LOOP	



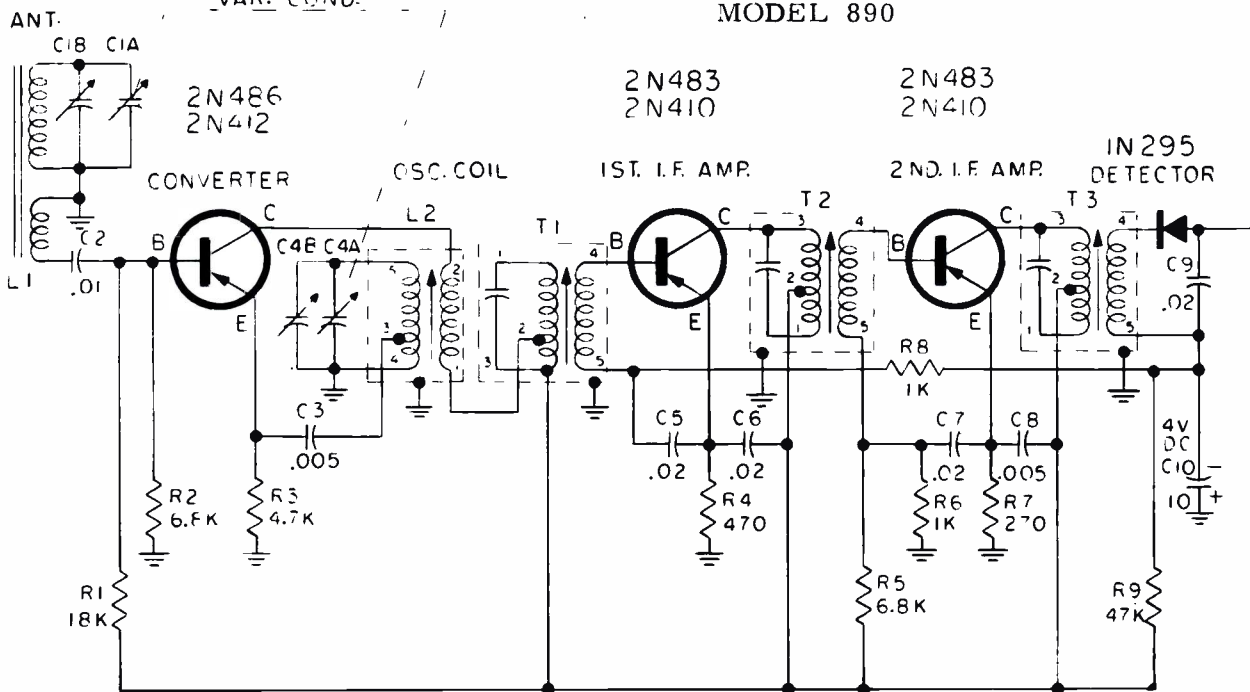
FREQUENCY RANGE
Broadcast 540-1670 Kc
IF 455 Kc



BULOVA WATCH COMPANY, INC.

VAR. COND.

MODEL 890



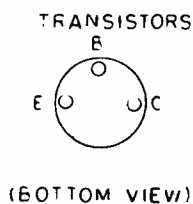
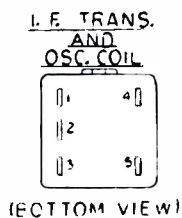
ALL RESISTORS 1/4 WATT $\pm 10\%$ UNLESS OTHERWISE NOTED.

K = 1,000 OHMS.

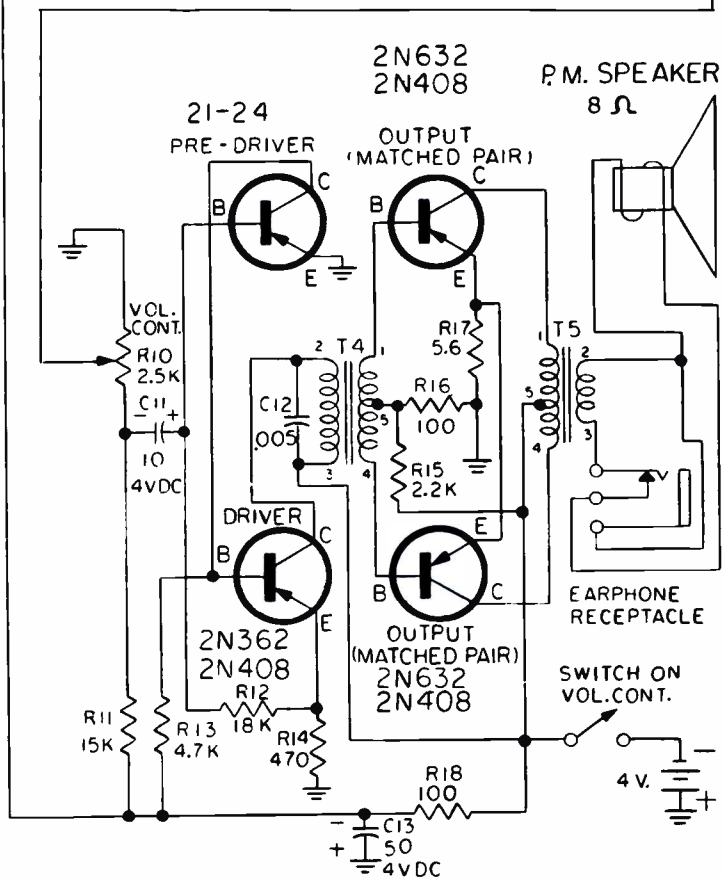
ALL CAPACITORS IN MFD. UNLESS OTHERWISE NOTED.

DC WORKING VOLTAGE IS 25V UNLESS OTHERWISE NOTED.

CHASSIS GROUND.

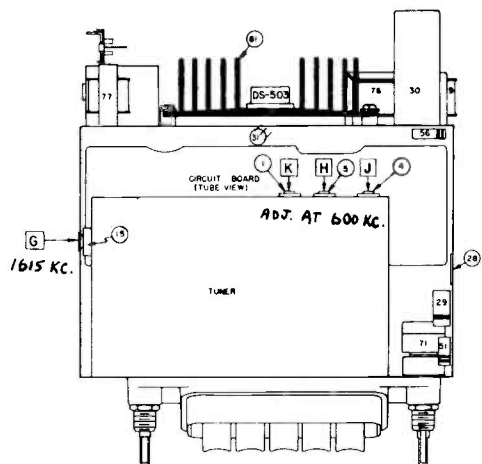


BULOVA
MODEL * 890

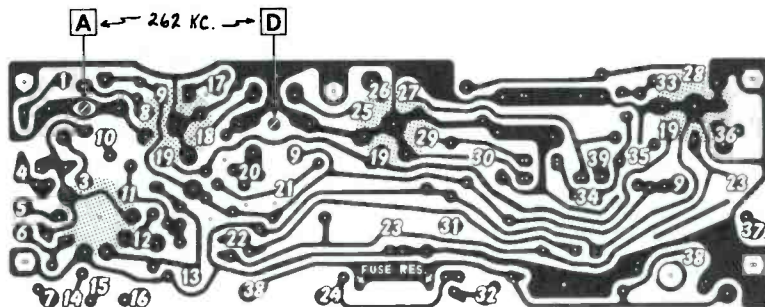


DELCO

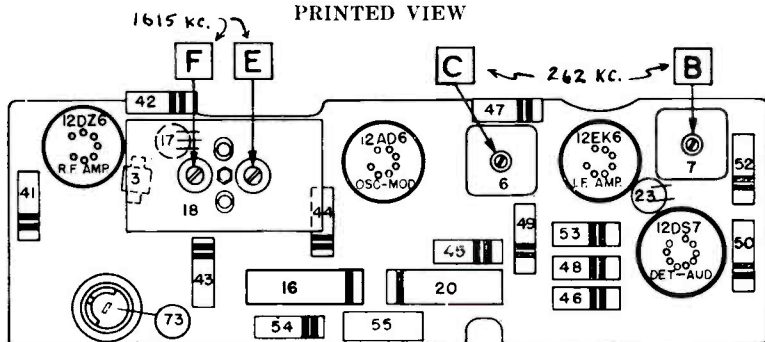
PONTIAC MODEL 989831



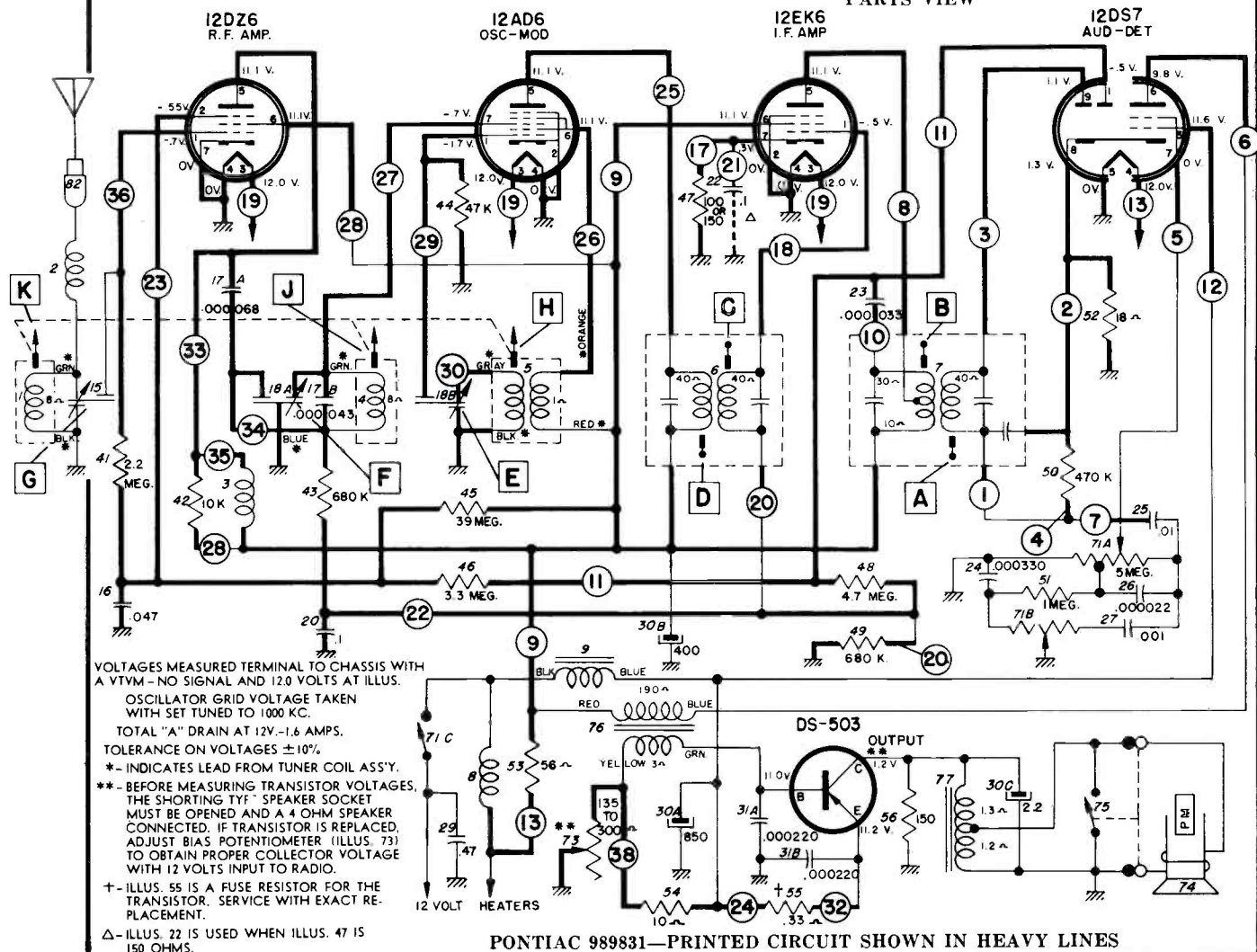
TUBE VIEW



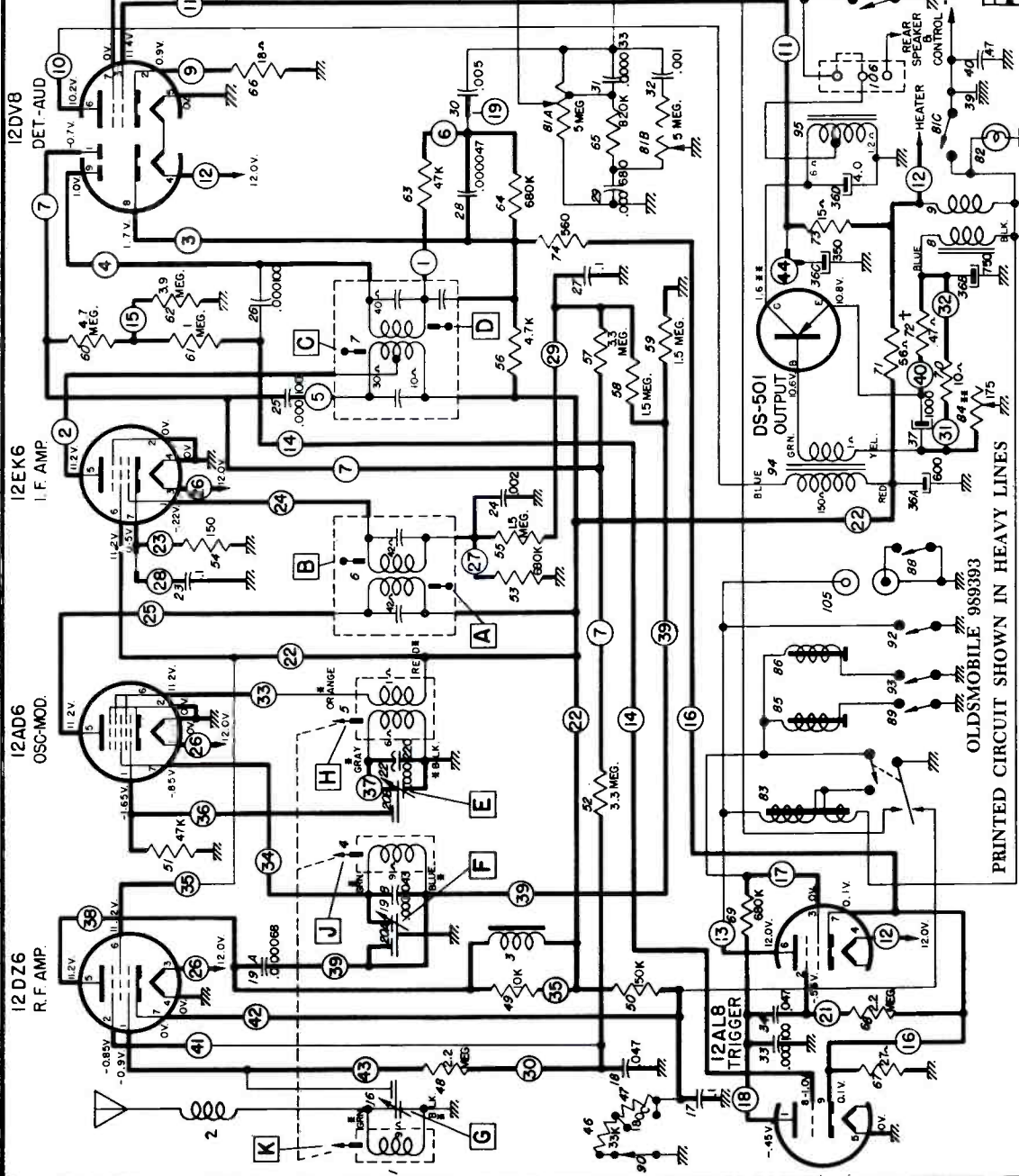
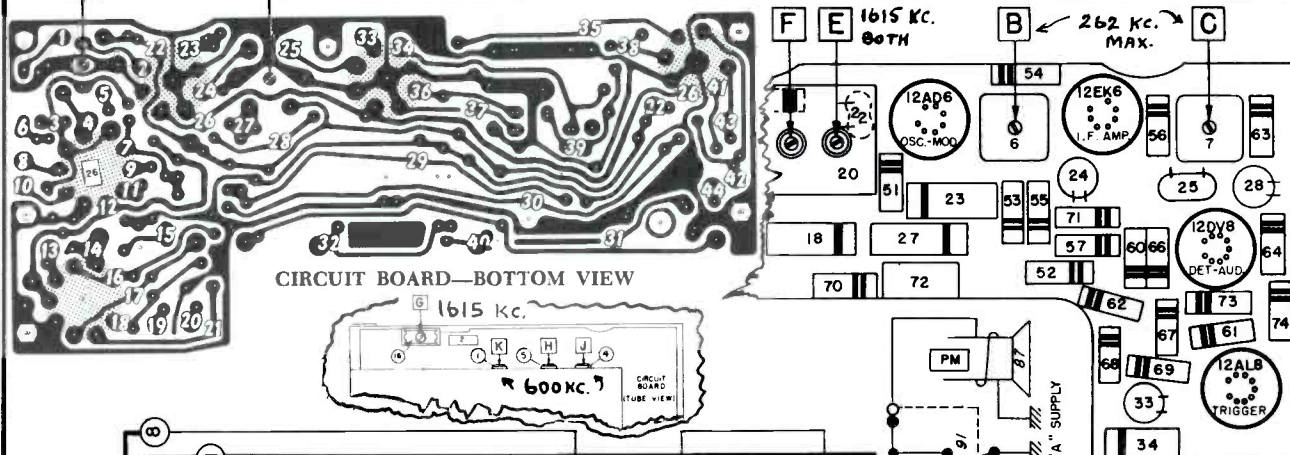
PRINTED VIEW



PARTS VIEW



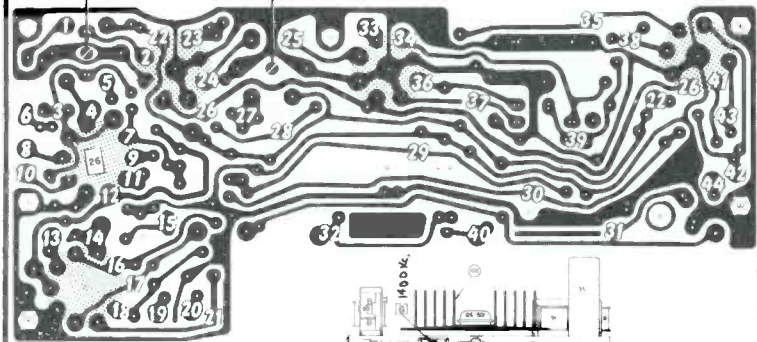
MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION



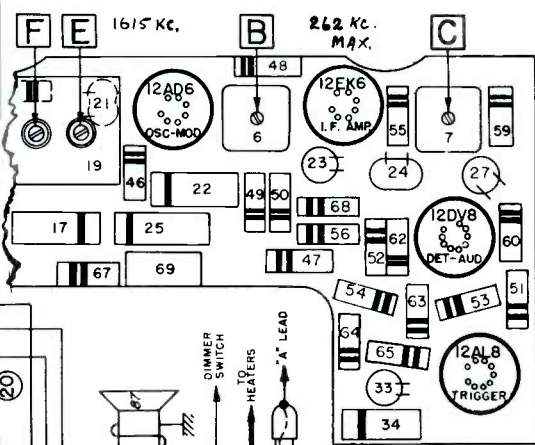
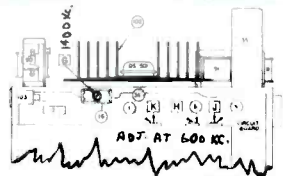
D 262 Kc. MIN. **A** 262 Kc. MAX. **A** MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

DELCO

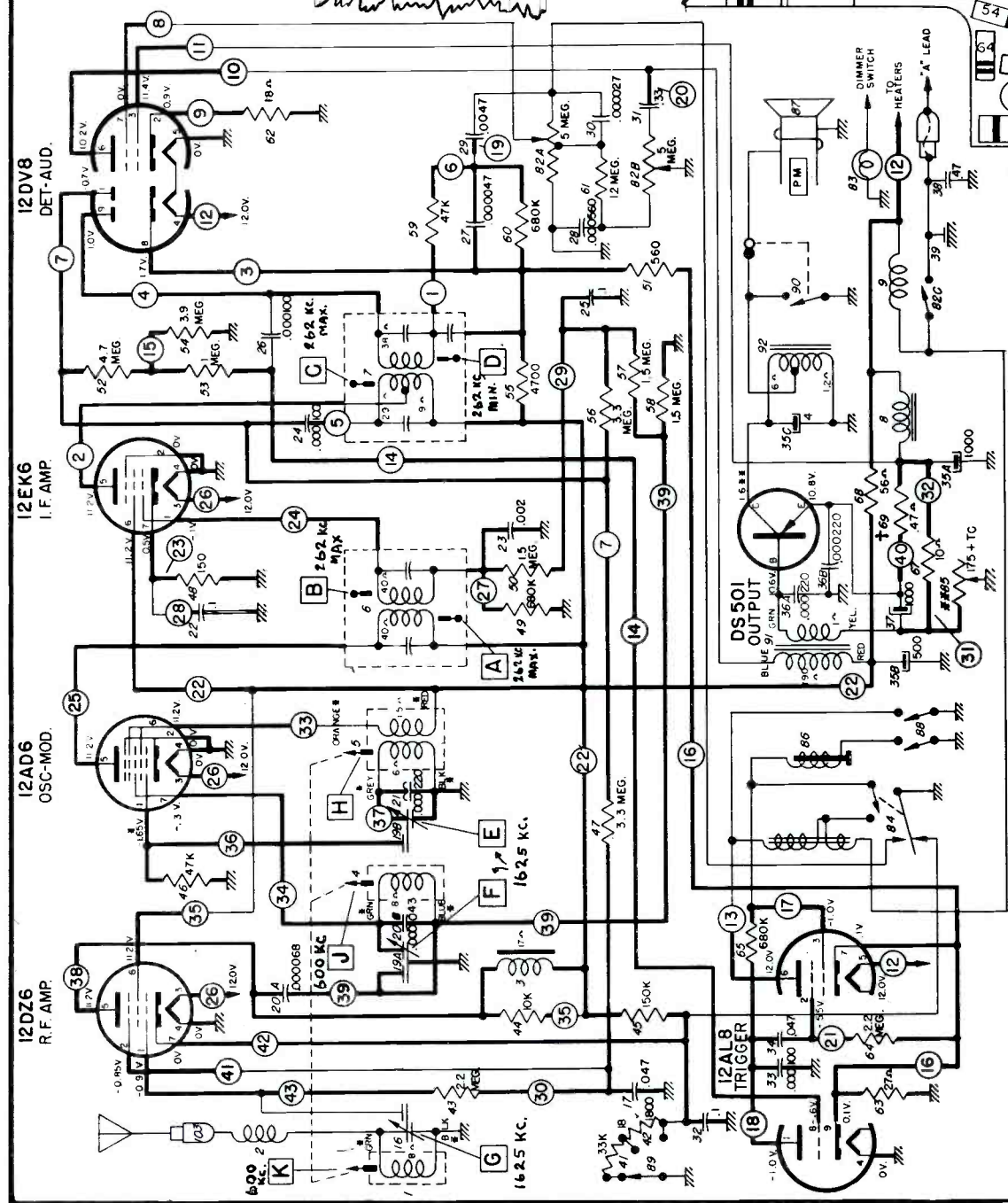
PONTIAC MODEL 989692



PRINTED VIEW



PARTS VIEW



PONTIAC MODEL 989692

PRINTED CIRCUIT SHOWN IN HEAVY LINES
 WHITE NUMBERS ON PRINTED CIRCUIT DRAWING CORRESPOND
 TO THE ENCIRCLED NUMBERS ON SCHEMATIC.
 ILLUSTRATION #69 IS A FUSE RESISTOR. IF THIS IS OPEN, THE
 TRANSISTOR COLLECTOR VOLTAGE WILL BE "O."

MODEL: G-1702
CHASSIS: 120579



- To remove defective components one of several methods may be used. A recommended method is to cut close to the body of the defective component and solder the new part to the remaining leads. Another method is to apply heat at the junction point of the component wire lead and the printed board and lift out the component. If the wire lead is bent over, first heat and pry lead wire up. A defective component with many terminals may be removed by clipping into several parts and removing a small section at a time.



R-5 TONE

C-1

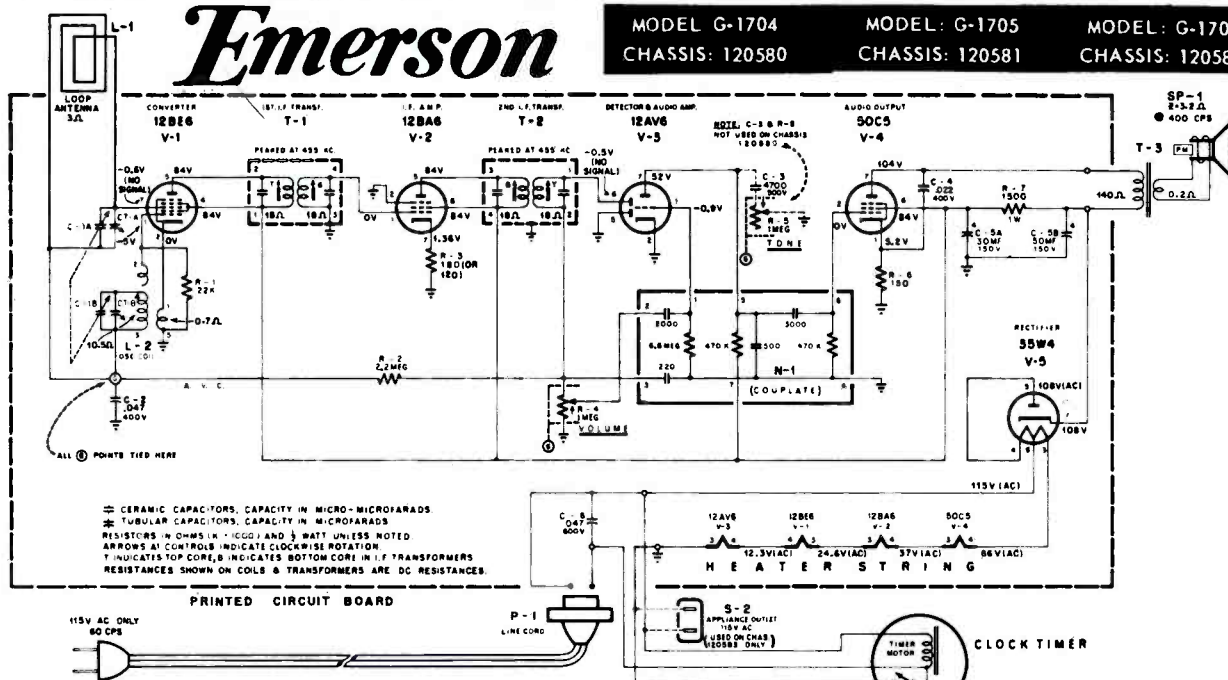
SW-1 ON-OFF, R-4 VOL.

Emerson

MODEL G-1704
CHASSIS: 120580

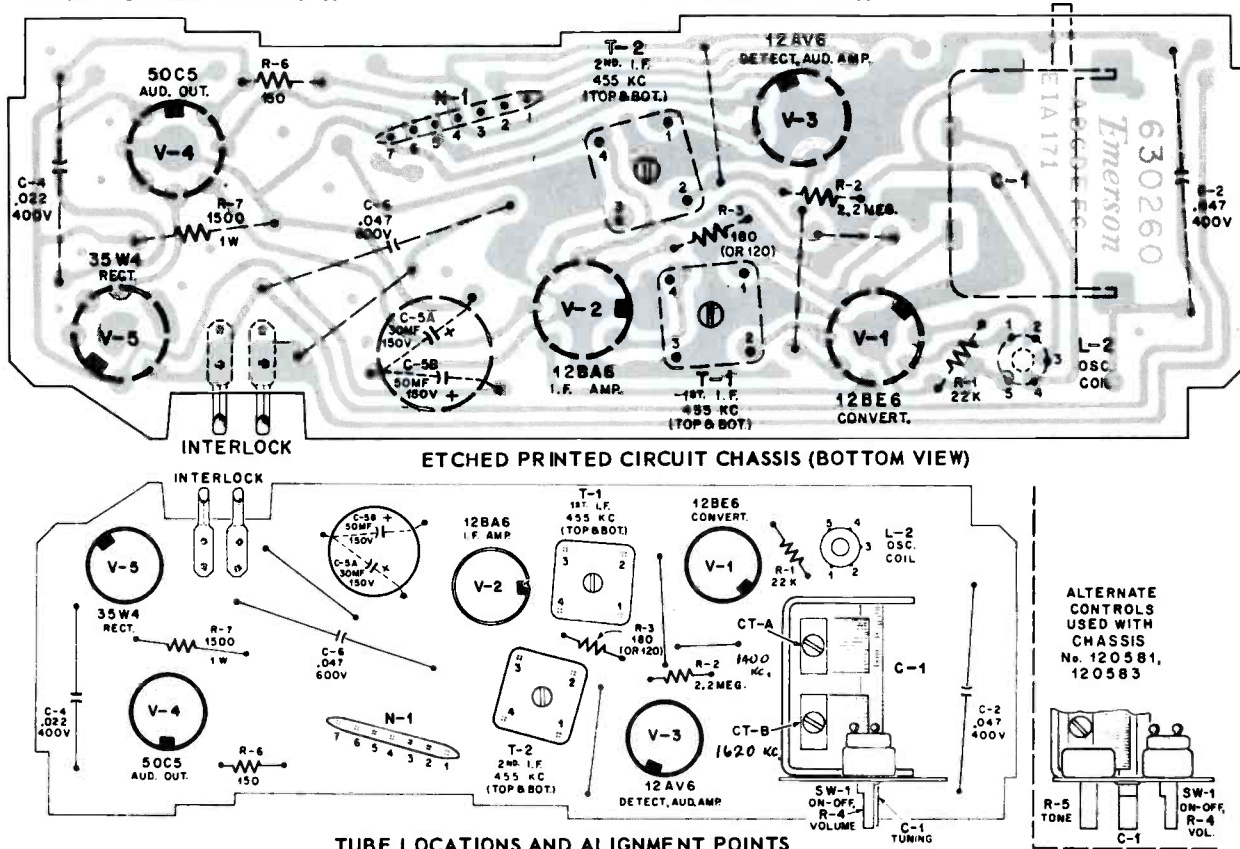
MODEL: G-1705
CHASSIS: 120581

MODEL: G-1706
CHASSIS: 120583



The models described in this Service Note are AC operated superheterodyne clock-radios designed for reception of programs in the AM broadcast band. They are electrically very similar; differing only in use of a tone control circuit (not used in model G-1704), automatically controlled appliance outlet (model G-1706 only) and the use of various clock-timer mechanisms.

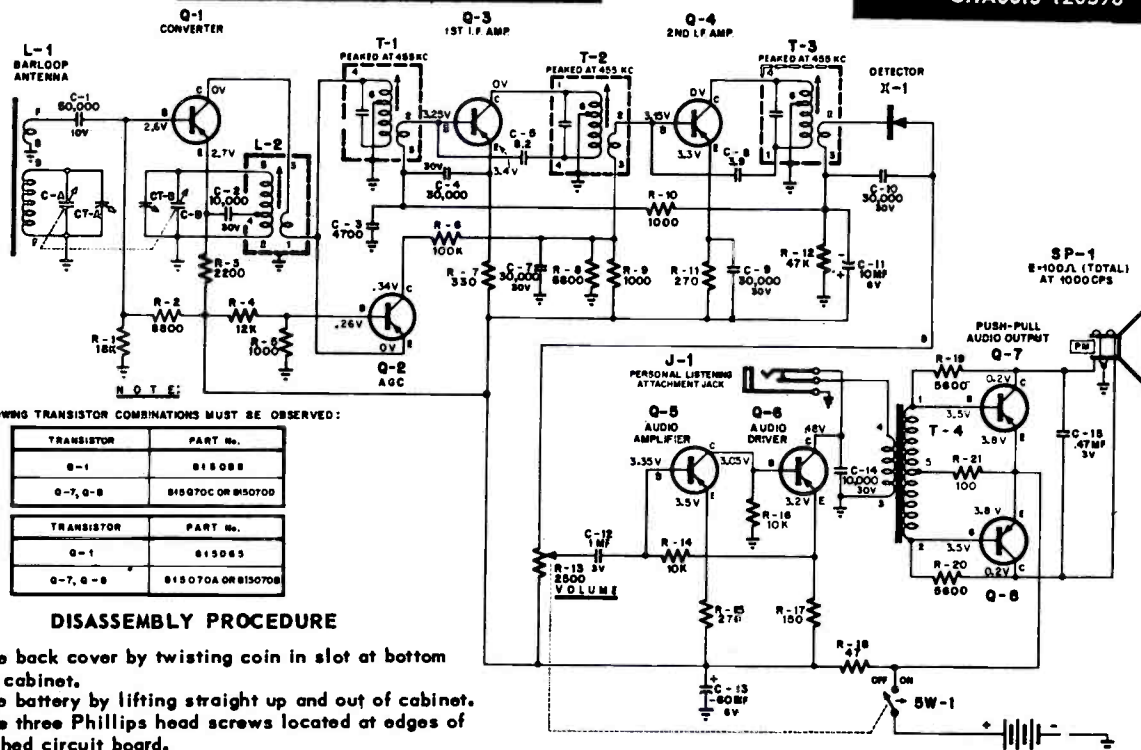
To remove defective components one of several methods may be used. A recommended method is to cut close to the body of the defective component and solder the new part to the remaining leads. Another method is to apply heat at the junction point of the component wire lead and the printed board and lift out the component. If the wire lead is bent over, first heat and pry lead wire up. A defective component with many terminals may be removed by clipping into several parts and removing a small section at a time.



TUBE LOCATIONS AND ALIGNMENT POINTS

Emerson Radio

MODEL 707
CHASSIS 120598



THE FOLLOWING TRANSISTOR COMBINATIONS MUST BE OBSERVED:

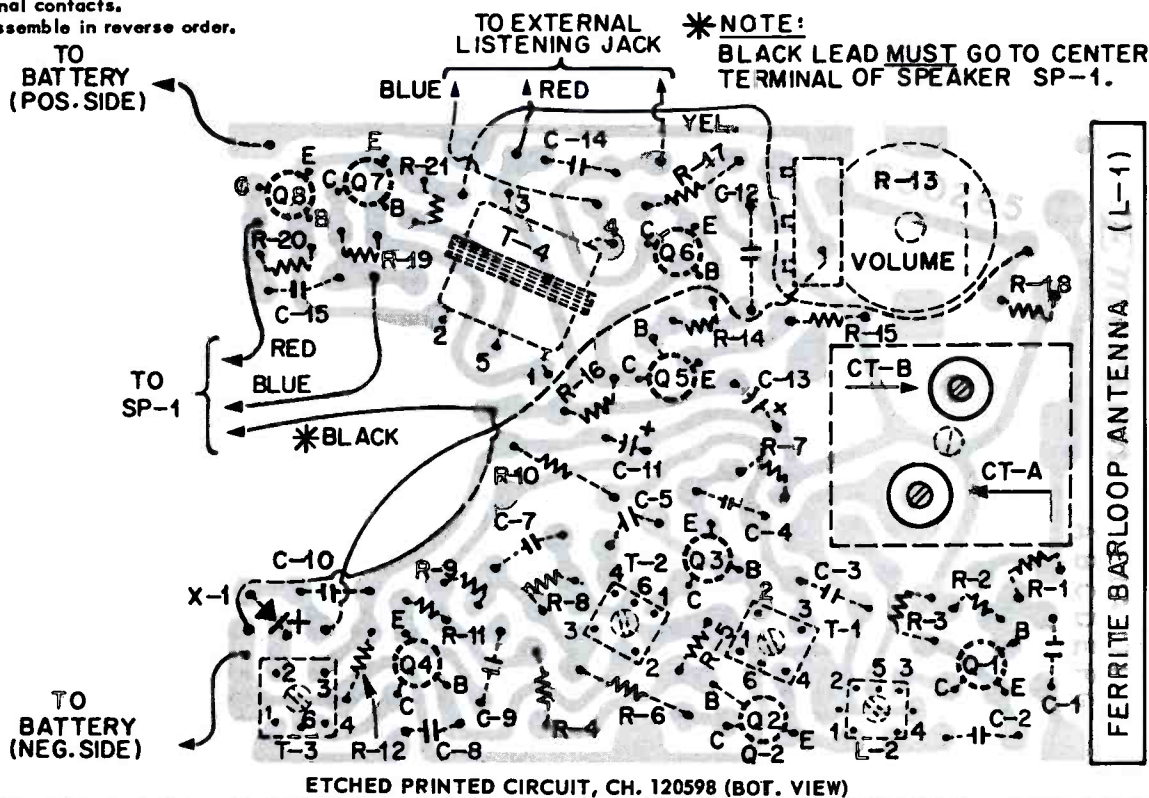
TRANSISTOR	PART No.
Q-1	8150BB
Q-7, Q-8	815070C OR 815070D

TRANSISTOR	PART No.
Q-1	8150B5
Q-7, Q-8	815070A OR 815070B

DISASSEMBLY PROCEDURE

Remove back cover by twisting coin in slot at bottom end of cabinet.
Remove battery by lifting straight up and out of cabinet.
Remove three Phillips head screws located at edges of the etched circuit board.
Remove hex nut and washer used to secure personal listening attachment jack to side of cabinet. Free jack from its mounting hole by pushing inward.
Lift chassis out of cabinet, being careful to avoid placing strain on the wires leading to the speaker and battery terminal contacts.
Re-assemble in reverse order.

⊕ CERAMIC CAPACITORS, CAPACITY IN MICRO-MICROFARADS
⊕ UNLESS NOTED.
⊕ ELECTROLYTIC CAPACITORS, CAPACITY IN MICROFARADS.
RESISTORS IN OHMS (R=1000) AND 1/2 WATT.



ETCHED PRINTED CIRCUIT, CH. 120598 (BOT. VIEW)

MODEL 943-B
CH. 120569-D

[illegible]

CONTROL SHAFTS (REFER TO FIG. 2 FOR FUNCTION)

AM TUNING FM TUNING

AM SECTION

CT-A R.F. TRIMMER 1400KC

CT-B OSC. TRIMMER 1620KC

T-3 455KC (TOP & BOT.)

V-4

V-5 6BA6 1F. AMP

T-4 455KC (TOP & BOT.)

6BE6 CONVERTER

AC (RADIO)

STEREO/MONAUROAL AMP SECTION

12AX7

V-1

25EH5

V-2

6DT8

T-5 10.7MC (TOP & BOT.)

V-6

V-7 12F. AMP

V-8 6BA6 2ND FM. I. AMP

T-6 10.7 MC (TOP & BOT.)

T-7 10.7 MC (TOP & BOT.)

FM SECTION

FM TUNING

LOUDNESS

BASS

SW-2 FUNCTION SWITCH

BALANCE AND A.F.C. (PULL-PUSH)

TREBLE AND ON-OFF (PULL-PUSH)

AM TUNING

V-1 12AK7

V-2 6BE6

V-3 6BE6

V-4 6BD6

V-5 6BD6

C-1 10000

C-2 10000

C-3 10000

C-4 10000

C-5 10000

C-6 10000

C-7 10000

C-8 10000

C-9 10000

C-10 10000

C-11 10000

C-12 10000

C-13 10000

C-14 10000

C-15 10000

C-16 10000

C-17 10000

C-18 10000

C-19 10000

C-20 10000

C-21 10000

C-22 10000

C-23 10000

C-24 10000

C-25 10000

C-26 10000

C-27 10000

C-28 10000

R-1 10000

R-2 10000

R-3 10000

R-4 10000

R-5 10000

R-6 10000

R-7 10000

R-8 10000

R-9 10000

R-10 10000

R-11 10000

R-12 10000

R-13 10000

R-14 10000

R-15 10000

R-16 10000

R-17 10000

R-18 10000

R-19 10000

R-20 10000

R-21 10000

R-22 10000

R-23 10000

R-24 10000

R-25 10000

R-26 10000

R-27 10000

R-28 10000

R-29 10000

R-30 10000

T-1

T-2

T-3

T-4

T-5

T-6

T-7

T-8

T-9

T-10

NOTE: R-25 NOT USED ON MODEL 941-B (CH. 1205B-B)

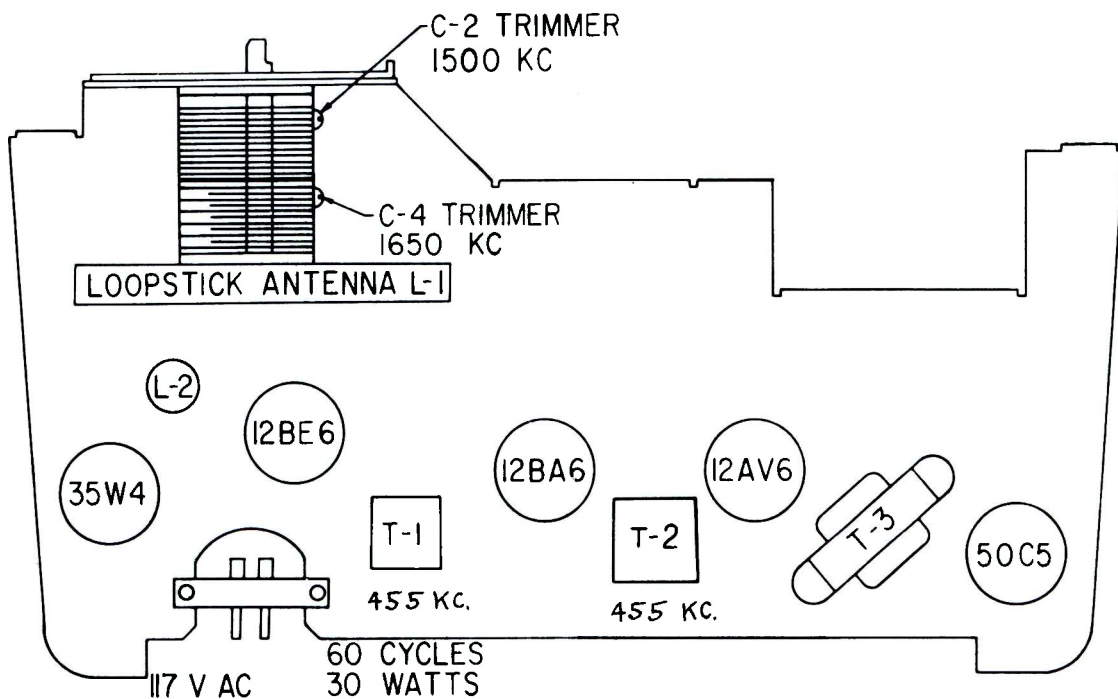
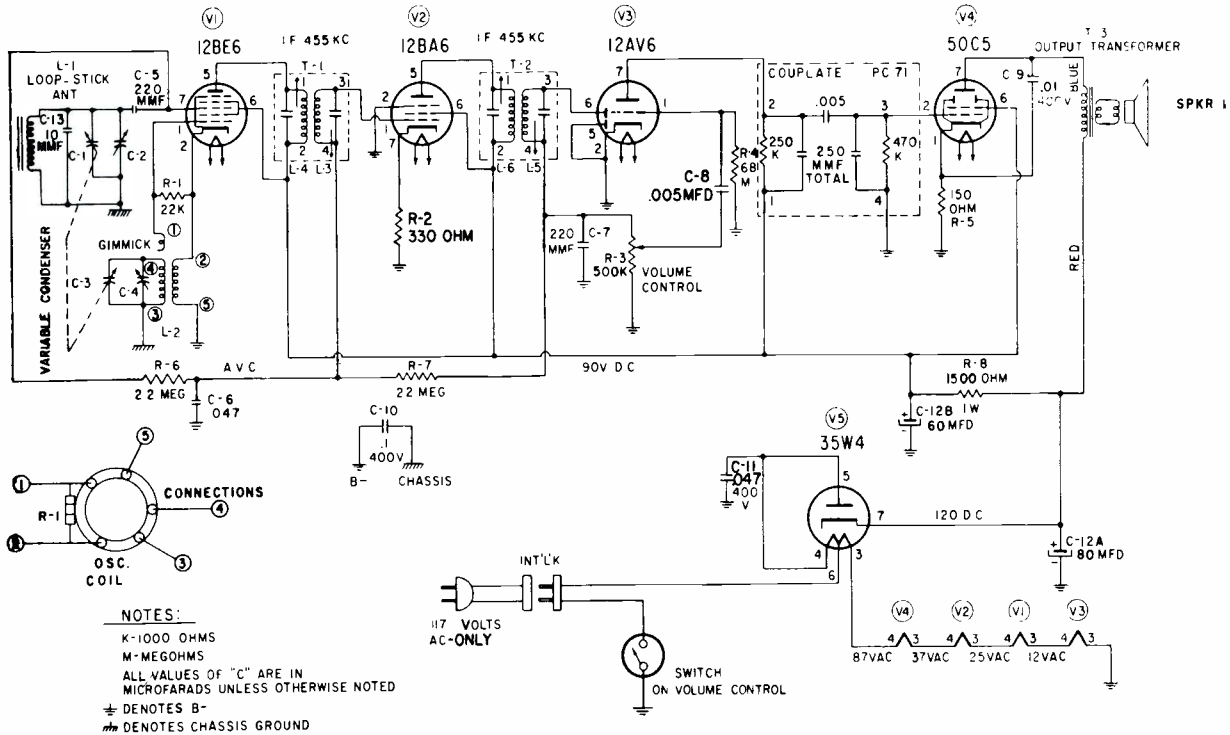
ETCHED PRINTED CIRCUIT BOARD, BOTTOM VIEW

SYM	TUBE	SW-2	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V-1	12AX7	AM FM	*570K *570K	6.8 Meg 6.8 Meg	0 0	0 0	0 0	*570K *570K	6.8 Meg 6.8 Meg	0 0	3 3
V-2	25EH5	AM FM	33 33	470K 470K	23 23	33 33	470K 470K	*970 *970	*360 *360	— —	— —
V-3	25EH5	AM FM	33 33	470K 470K	33 33	43 43	470K 470K	‡ 1 Meg ‡ 1 Meg	*360 *360	— —	— —
V-4	6BE6	AM FM	22K 22K	1 1	20 20	17 17	*970 *INF	*970 *INF	22Meg 22 Meg	— —	— —
V-5	6BA6	AM FM	4 Meg 4 Meg	0 0	20 20	23 23	*970 *INF	*970 *INF	150 150	— —	— —
V-6	6DT8	AM FM	5.5 Meg *2K	0 0	56 56	3 3	INF INF	5.5 Meg *12K	100K 100K	0 0	0 0
V-7	6BA6	AM FM	470K 470K	0 0	8 8	11 11	*INF 1K	*INF 1K	0 0	— —	— —
V-8	63A6	AM FM	1 1	0 0	13 13	15 15	*INF 1K	*INF 1K	100 100	— —	— —

22

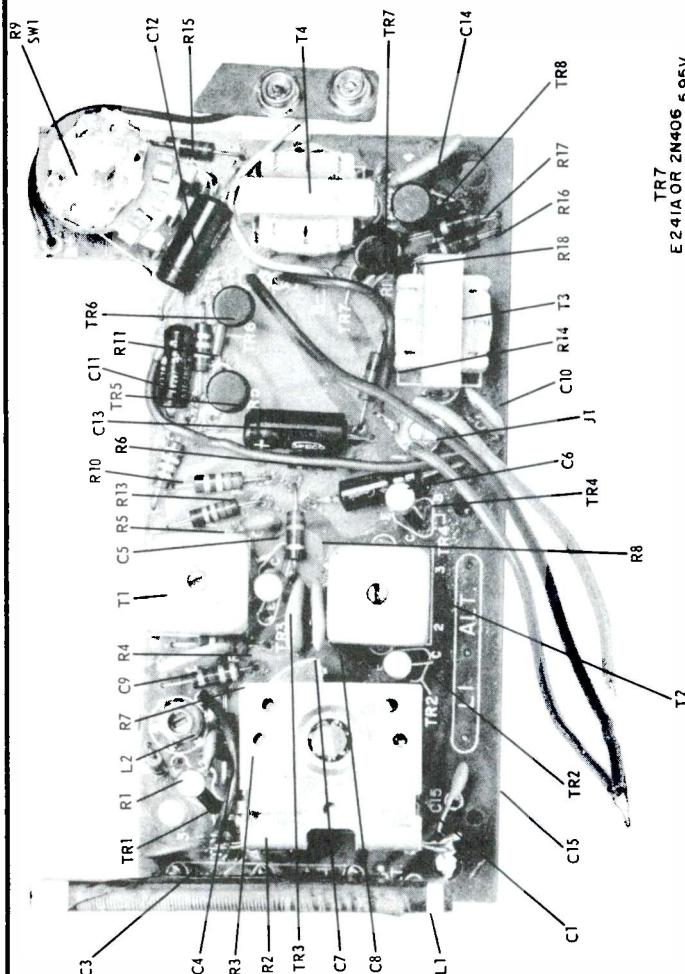
Gamble-Shogmo, Inc.

This is exact service material for Model RA48-8260A. Model RA48-8261A is practically identical. Model RA48-8266A is similar but uses clock with switching network and has somewhat different parts placement.



Gamble-Skogmo, Inc.

MODELS RA50-9908A, RA50-9909A



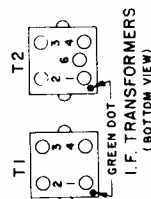
NOTES:

1. ALL CAPACITANCE VALUES ARE IN MICROFARADS UNLESS OTHERWISE INDICATED.
2. ALL RESISTANCE VALUES ARE IN OHMS, $1/2W \pm 10\%$ UNLESS OTHERWISE INDICATED.
3. VOLTAGES SHOWN AT EACH TRANSISTOR ELECTRODE ($\pm 20\%$) MEASURED TO COMMON GROUND WITH A VTVM WITH NO INPUT SIGNAL AND VOLUME CONTROL SET AT MAXIMUM.

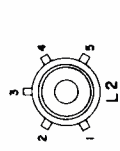
TO SERVICE RADIO

The chassis may be removed for servicing by:

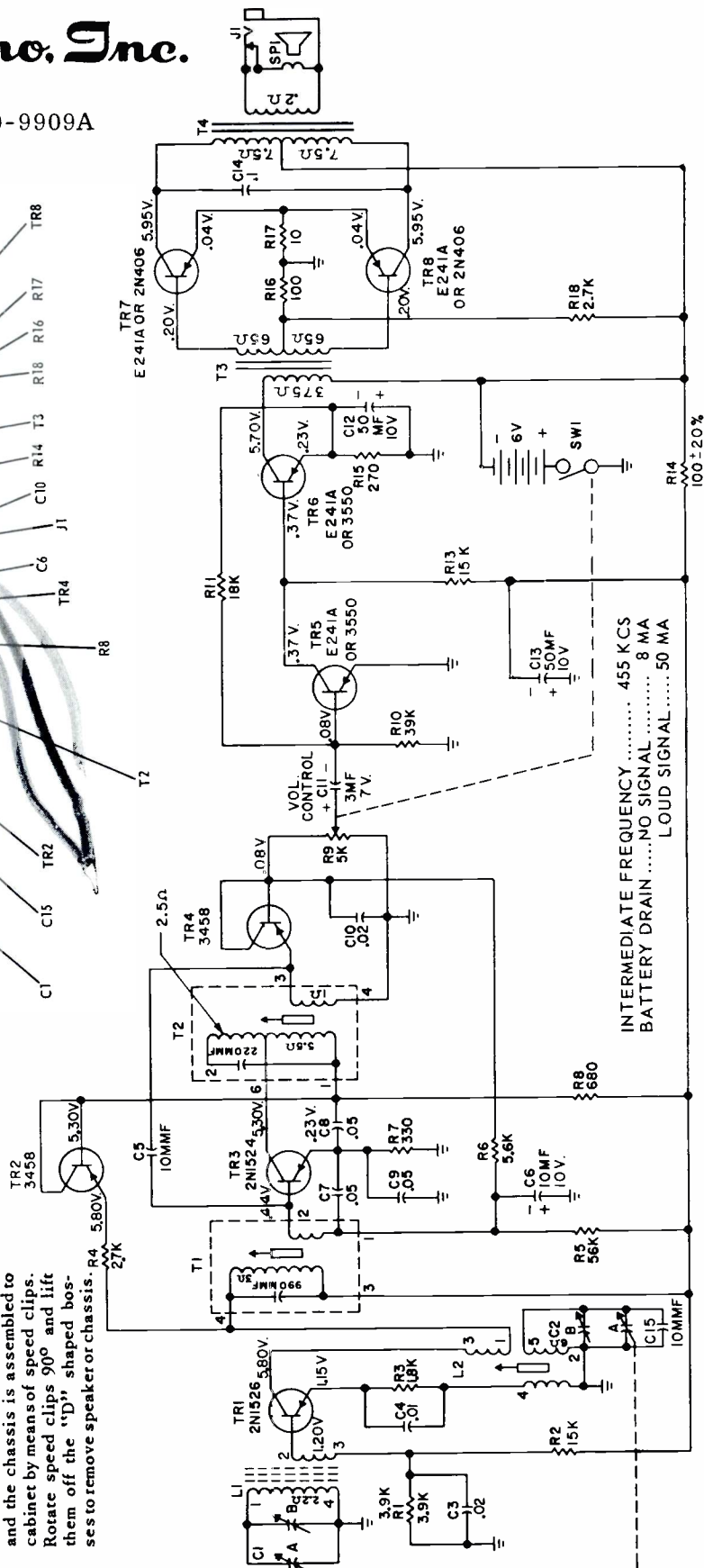
1. Removing volume and tuning knobs.
2. Removing battery compartment cover and battery holder.
3. Removing the two screws in the bottom of the battery compartment and inserting a thin screwdriver into the hole of one of these two screws to push off face of cabinet.
4. Speaker is assembled to face and the chassis is assembled to cabinet by means of speed clips. Rotate speed clips 90° and lift them off the "D" shaped bosses to remove speaker or chassis. R4 580V.



I.F. TRANSFORMERS (BOTTOM VIEW)



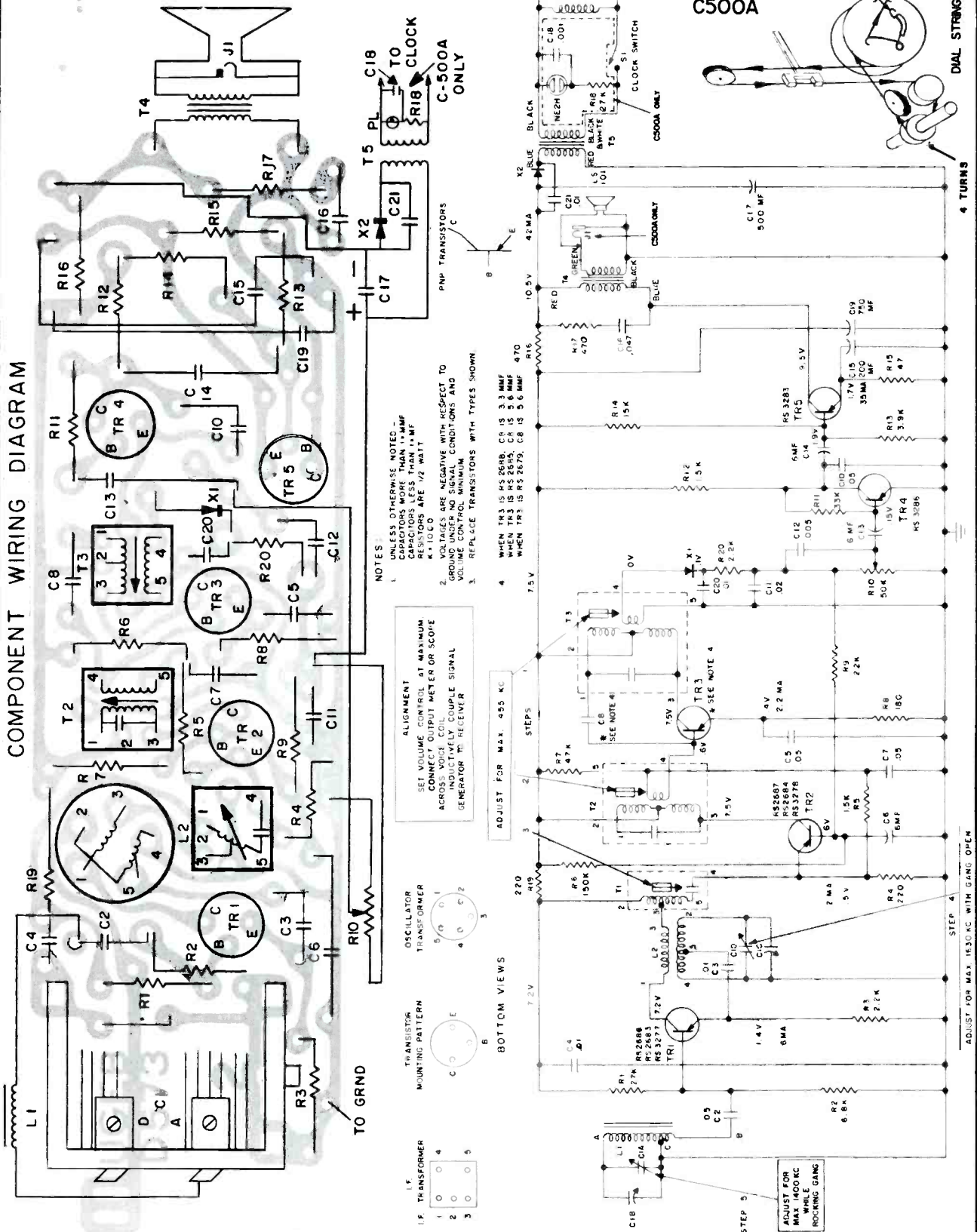
OSCILLATOR COIL (BOTTOM VIEW)



INTERMEDIATE FREQUENCY 455 KCS
BATTERY DRAIN NO SIGNAL 8 MA
LOUD SIGNAL 50 MA

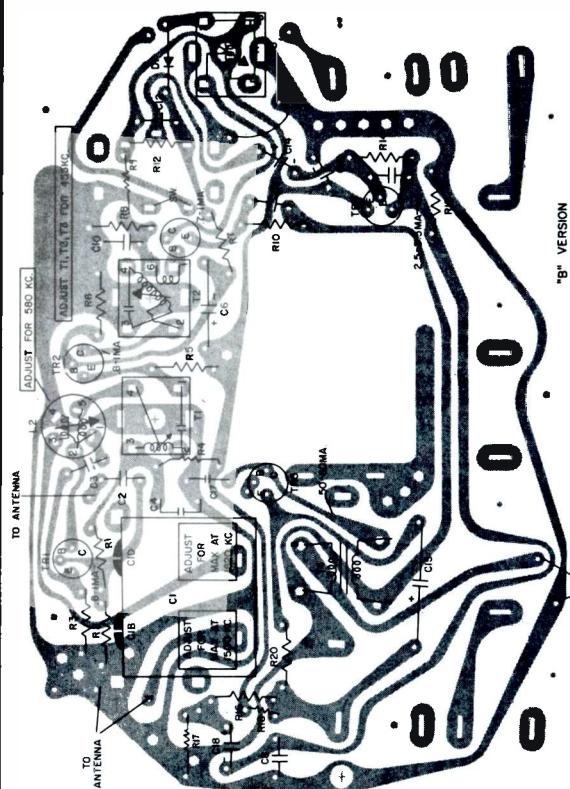
GENERAL ELECTRIC

MODELS
C495A
C496A
C500A

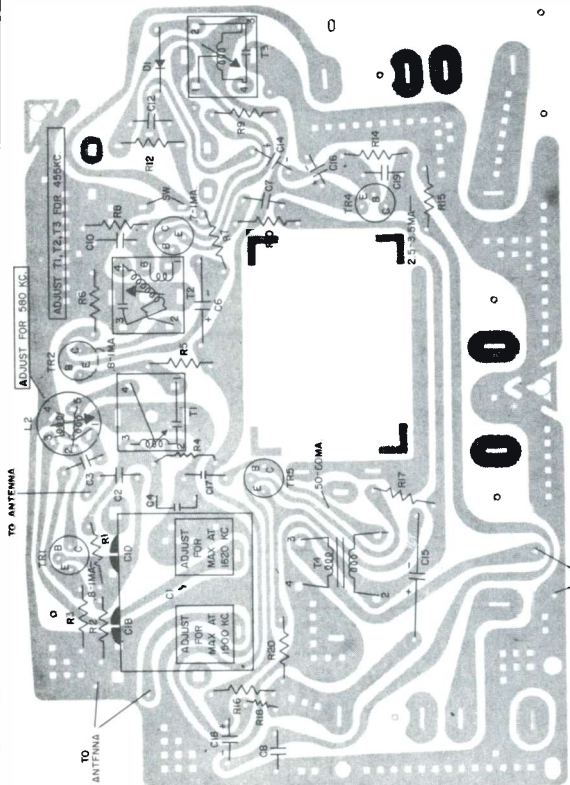


GENERAL ELECTRIC

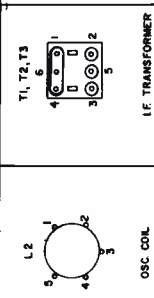
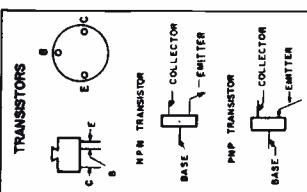
MODELS
P795A,B
P796A,B
P797A,B



"B" VERSION



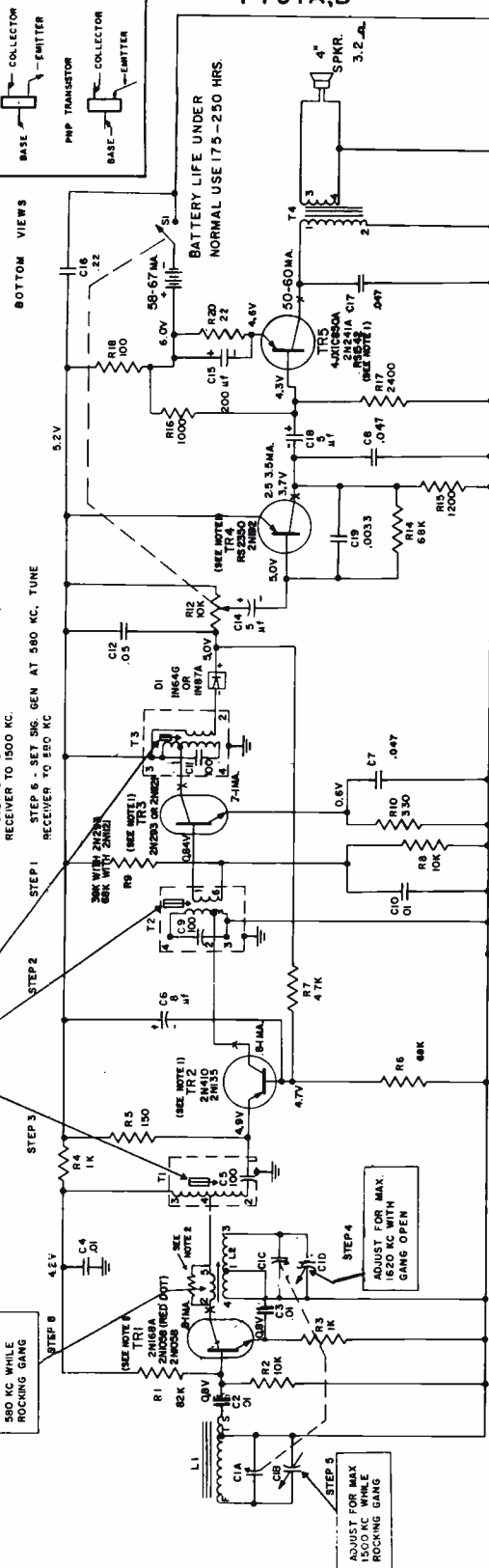
"A" VERSION



ALIGNMENT
SET VOLUME CONTROL AT MAXIMUM.
CHECK OUTPUT METER ON SCOPE ACROSS
VOICE COIL.
INDUCTIVELY COUPLE SIGNAL GENERATOR TO
RECEIVER.
STEP 1 - SET SIG. GEN. AT 455 KC. WITH
RECEIVER TUNING GANG OPEN.
STEP 2 - SET SIG. GEN. AT 1500 KC. WITH
RECEIVER TUNING GANG OPEN.
STEP 3 - SET SIG. GEN. AT 580 KC. TUNE
RECEIVER TO 580 KC.

UNLESS OTHERWISE NOTED
K=1000
CAPACITORS MORE THAN 1.0 MF
CAPACITORS LESS THAN 1.0 MF
RESISTORS 1/2 W CARBON
VOLTAGES ARE POSITIVE WITH
RESPECT TO GROUND

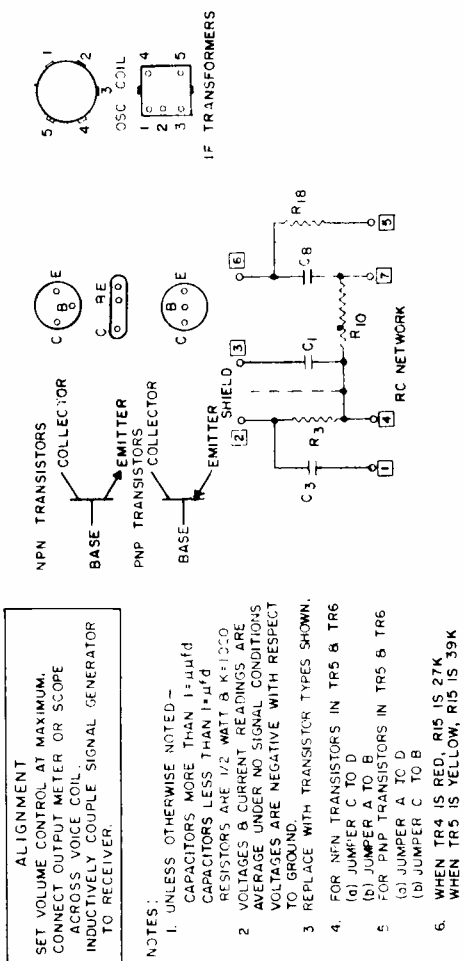
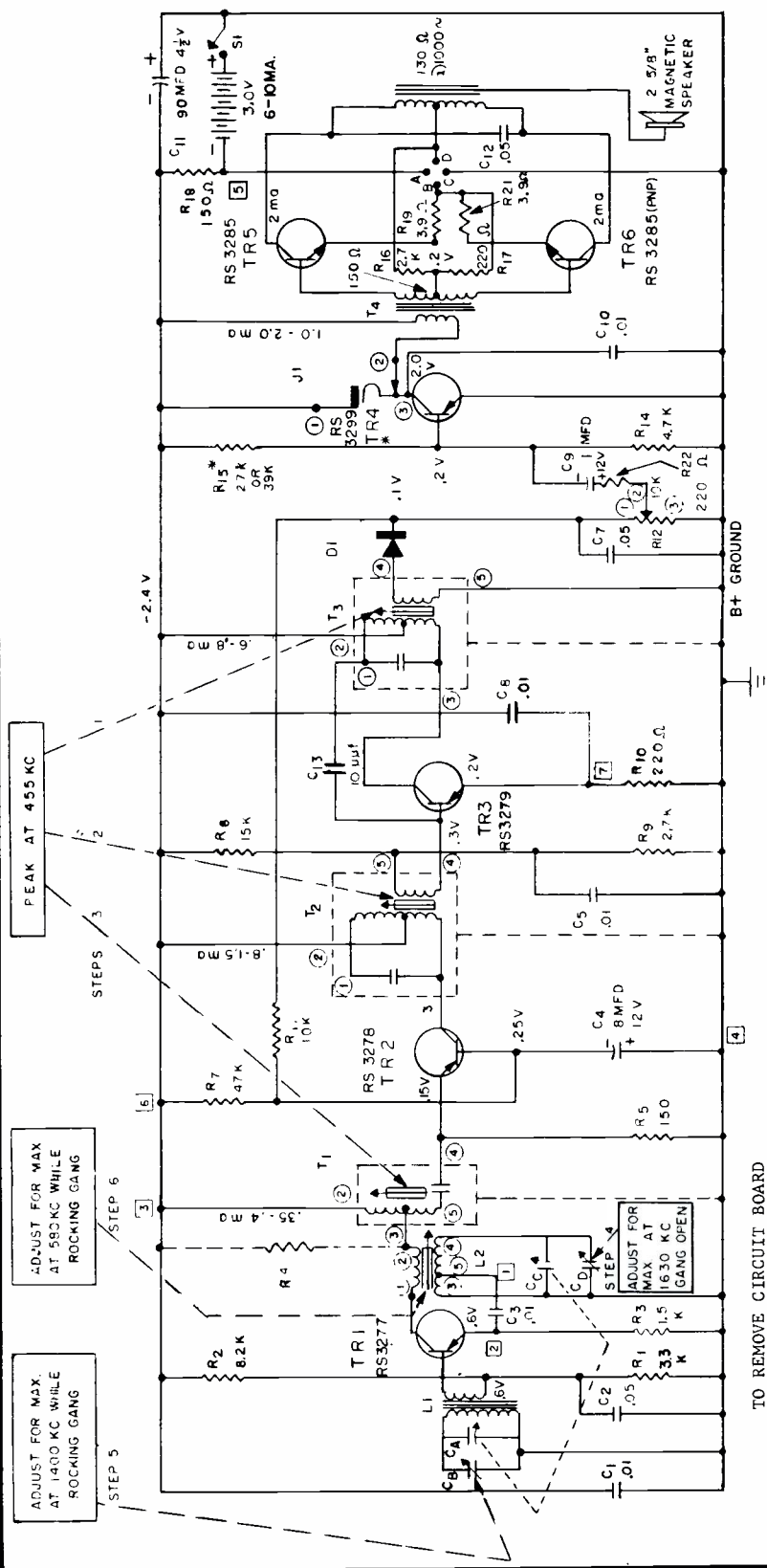
NOTES—
1- REPLACE WITH TRANSISTOR TYPES SHOWN
2- 3900 OHMS, USE ONLY WITH
2N4038 (RED DOT)



"A" & "B" VERSION

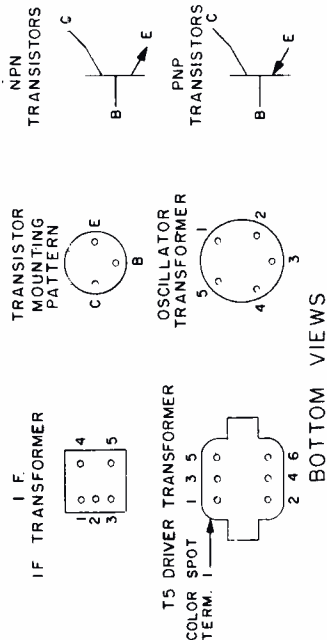
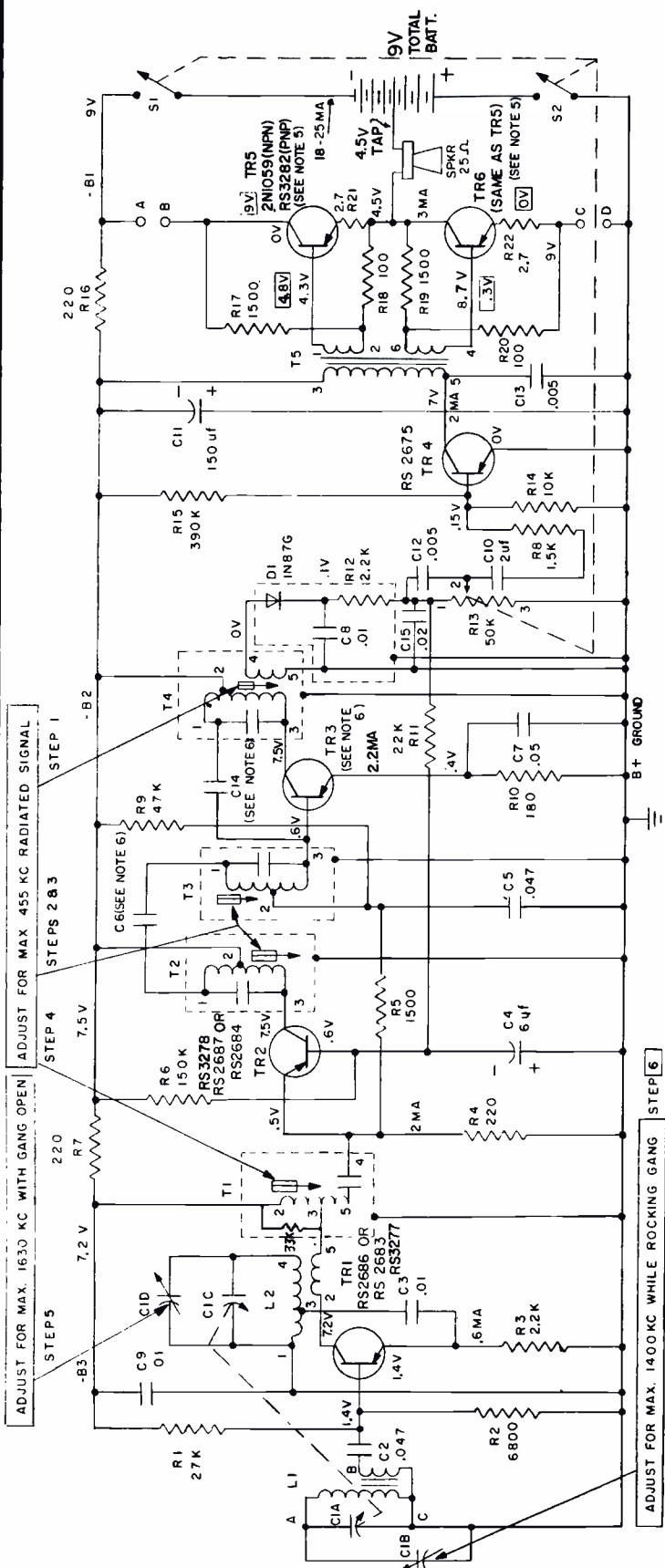
GENERAL ELECTRIC

MODELS
P820A
P821A



GENERAL ELECTRIC

MODEL P835A



- CHASSIS REMOVAL**
1. Remove knobs.
 2. Remove battery compartment.
 3. Remove 4 1/4" hex-head screws from circuit board (with 1/4" spintite).
 4. Remove 1/4" hex-head screws from tuning capacitor and volume control brackets (with 1/4" spintite).
 5. Carefully lift chassis out of cabinet.
- TROUBLESHOOTING**
- A check of battery condition and total current drain of the receiver should be made first. All current measurements are made at quiescence with the receiver turned on, volume control at maximum, tuning gang closed, and with no signal conditions. The total receiver current drain is 18 to 25 mls. This is measured by disconnecting one of the leads to the battery and inserting a milliammeter in series with the lead and battery.
- If an excessive total current drain is recorded, the individual collector currents of each transistor should be checked. An excessive current reading may mean a shorted transistor; no current will indicate that a transistor or associated circuit component is defective.

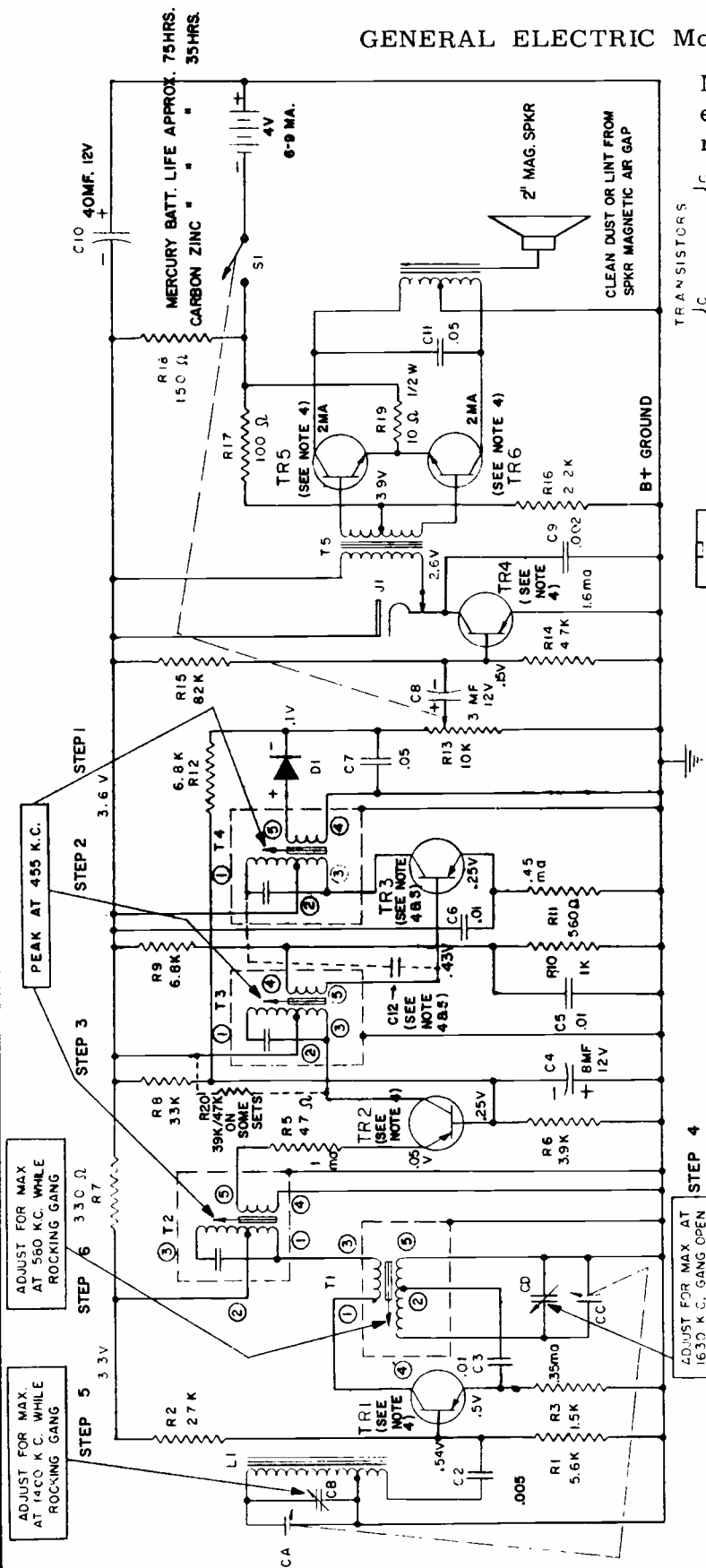
ALIGNMENT

SET VOLUME CONTROL AT MAXIMUM.
CONNECT OUTPUT METER OR SCOPE
ACROSS VOICE COIL.
INDUCTIVELY COUPLE SIGNAL GENERATOR
TO RECEIVER.

- NOTES:**
1. UNLESS OTHERWISE NOTED—CAPACITORS MORE THAN 1 μMF CAPACITORS LESS THAN 1 μMF RESISTORS ARE 1/2 WATT
 2. VOLTAGES ARE NEGATIVE WITH RESPECT TO GROUND UNDER NO SIGNAL CONDITIONS AND VOLUME CONTROL MINIMUM.
 3. REPLACE TRANSISTORS WITH TYPES SHOWN
 4. VOLTAGES SHOWN IN [] ARE WITH TR5
 5. WHEN TR5 & TR6 ARE PNP, JUMPER B TO D & A TO C. WHEN TR5 & TR6 ARE PNP, JUMPER A TO B & C TO D.
 6. WHEN TR3 IS RS 2688, C6 IS 2.0 & C14 IS 3. WHEN TR3 IS RS 2685, C6 IS 1.5 & C14 IS 5.6

GENERAL ELECTRIC Models P850B,C, P851C

Models P825A, P826A, are electrically the same as the models covered on this page.



NOTES:

1. UNLESS OTHERWISE NOTED: CAPACITORS MORE THAN 1 - MMF CAPACITORS LESS THAN 1 - MF RESISTORS ARE 1/4 WATT
2. VOLTAGES UNDER NO SIGNAL CONDITIONS. VOLTAGES ARE NEGATIVE WITH RESPECT TO GROUND.
3. REPLACE WITH TRANSISTOR TYPES SHOWN.

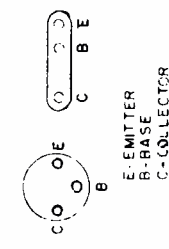
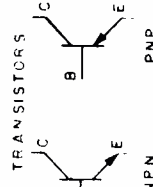
ALIGNMENT

SET VOLUME CONTROL AT MAXIMUM. CONNECT OUTPUT METER OR SCOPE ACROSS VOICE COIL. INDUCTIVELY COUPLE SIGNAL GENERATOR TO RECEIVER.

CHASSIS REMOVAL

1. Remove cabinet back (with 1/8" tip screwdriver).
2. Remove two hex-head screws holding circuit board to cabinet front (with 1/8" Xcelite P4 spintite or equivalent).
3. Remove earphone jack by unscrewing knurled nut counterclockwise on cabinet top (with needle nose pliers).
4. Tilt up volume control side of chassis board and lift out of cabinet front.

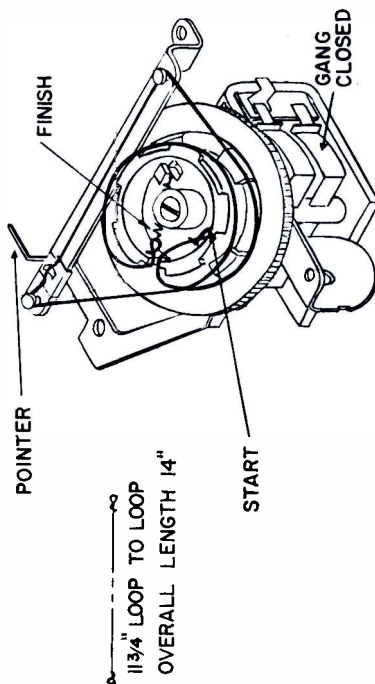
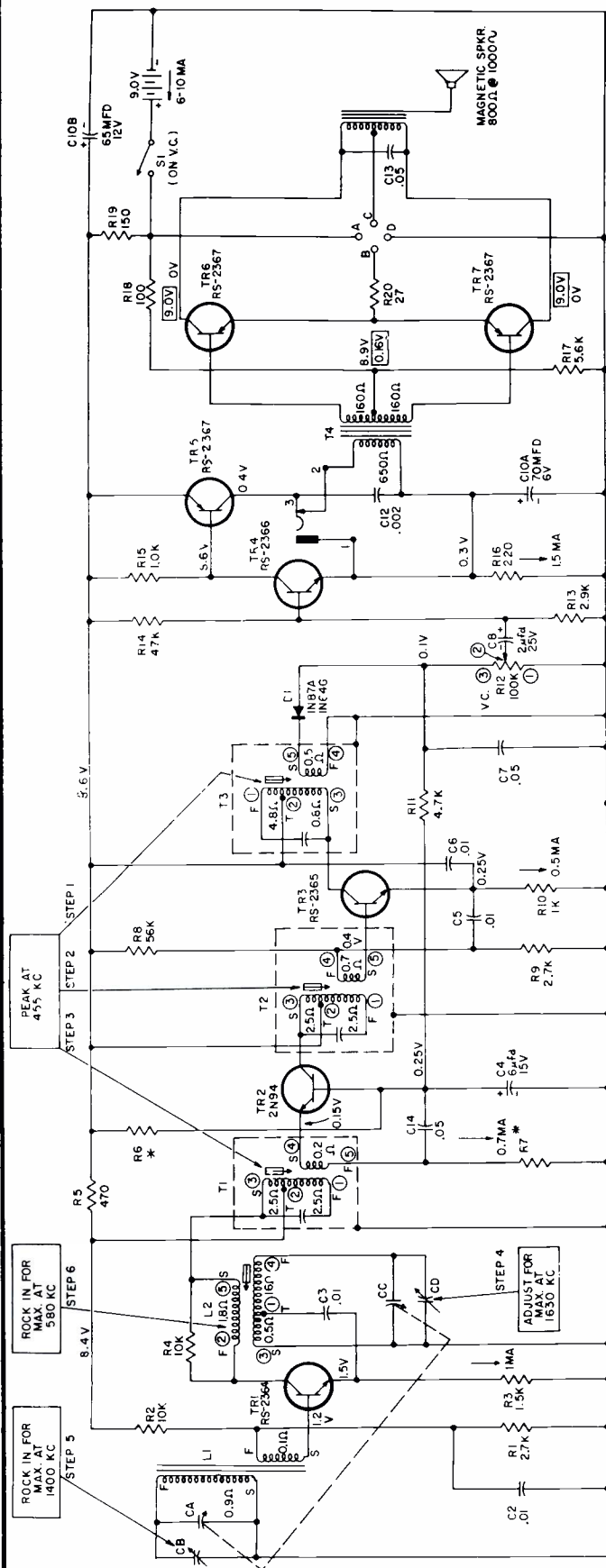
NOTE: Earphone jack must be inserted through fishpaper insulator and bushings before mounting jack to cabinet.



4. TRANSISTOR COMPLEMENT

TRANSISTOR	REPLACEMENT
TR1	RS 2694
TR2	RS 2695
TR3	RS 2696
TR4	RS 2697
TR5, 6	RS 1549

5. C12 IS 6MMF WHEN TR3 IS COLOR CODED. C12 IS 7.5MMF WHEN TR3 IS NOT COLOR CODED.



DIAL STRINGING

GENERAL ELECTRIC

MODELS P900A P901A

OSCILLATOR COIL



FIRST I.F. TRANSFORMER



SECOND I.F. & THIRD I.F. TRANSFORMERS



OSCILLATOR COIL

NPN TRANSISTORS



COLLECTOR

BASE

EMITTER

PNP TRANSISTORS



COLLECTOR

BASE

EMITTER

BOTTOM VIEWS

COILS AND TRANSFORMERS

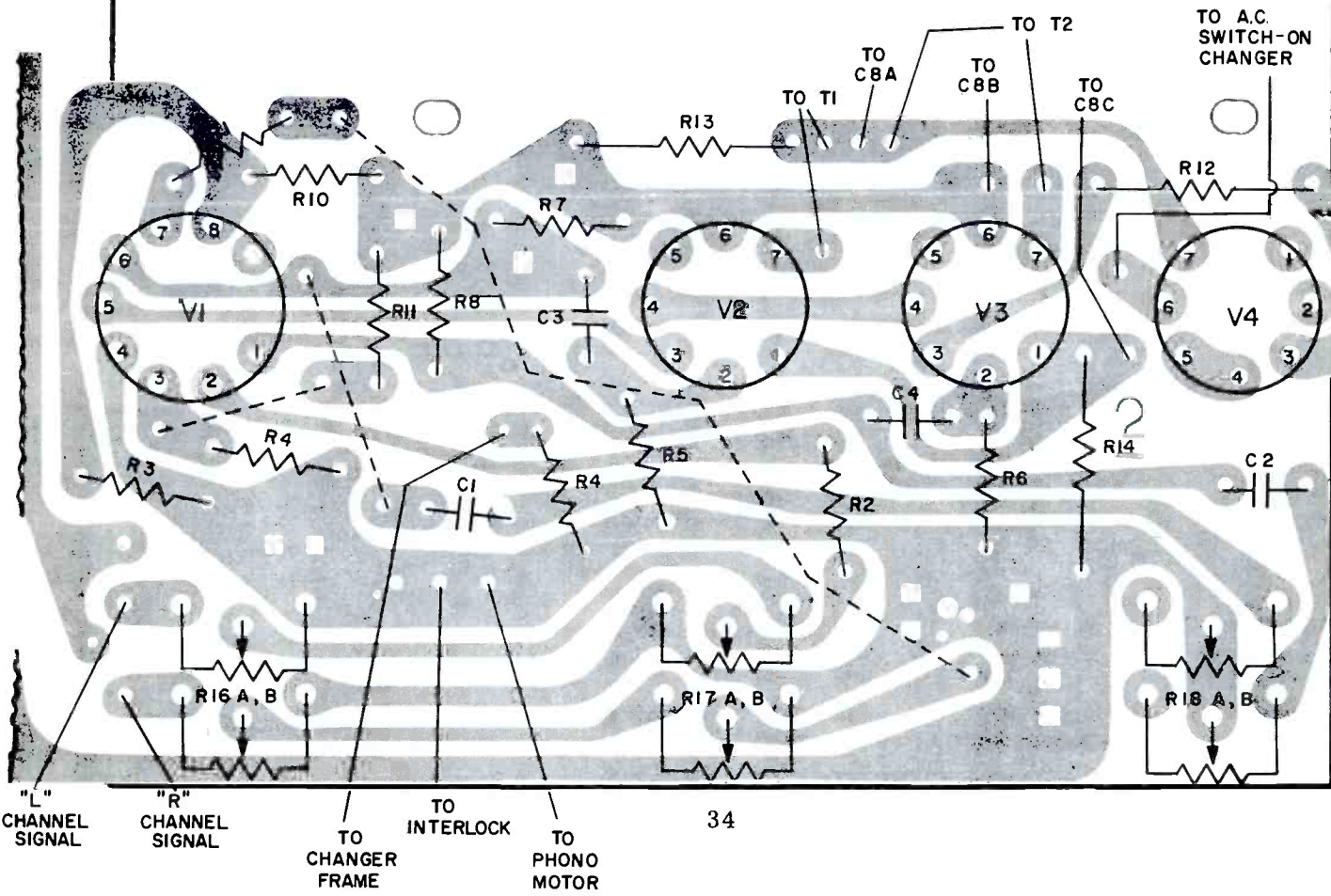
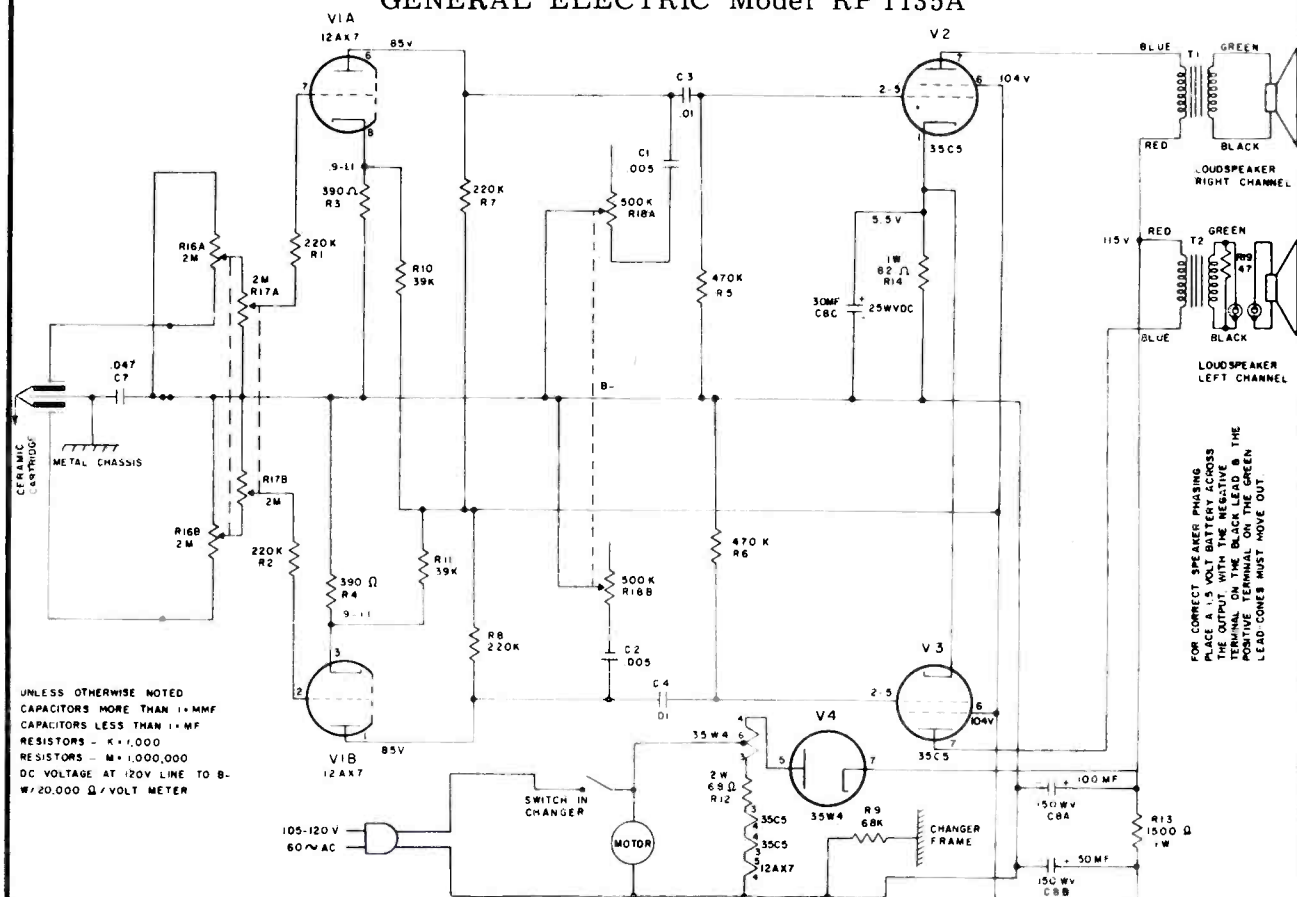
TRANSFORMER	COILS AND TRANSFORMERS
RS-2601	Driver Transformer.....
T4	1st I.F.....
RS-2602	2nd I.F.....
T1	3rd I.F.....
RS-2603	Oscillator Coil.....
T2	Antenna.....
RS-2604	
T3	
RS-2605	
L2	
RS-2607	
L1	

ALIGNMENT
SET VOLUME CONTROL
AT MAXIMUM.
CONNECT OUTPUT METER
OR SCOPE ACROSS VOICE
COIL.
INDUCTIVELY COUPLE
SIGNAL GENERATOR TO
RECEIVER

NOTES:
1- UNLESS OTHERWISE NOTED-
CAPACITORS MORE THAN 10 MMF
CAPACITORS LESS THAN 10 MMF
RESISTORS ARE 1/2 WATT 5% AVERAGE
2- VOLTAGE IS SOURCE VOLTAGE. VOLTAGES ARE
POSITIVE WITH RESPECT TO GROUND
3- SIMILAR APPROVED TRANSISTORS MAY BE USED
4- VOLTAGES SHOWN IN L.I. ARE FOR PNP
TRANSISTORS IN TR6 & TR7
5- FOR PNP TRANSISTORS IN TR6 & TR7
A- JUMPER C TO D
B- JUMPER C TO B
C- R18 = 100Ω
D- R19 = 5.6KΩ
6- FOR PNP TRANSISTORS IN TR6 & TR7
A- JUMPER A TO C
B- JUMPER B TO D
C- R18 = 5.6KΩ
D- R19 = 100Ω
* 7- R6 VALUES - TR2 R6 R7
2N94-132 82K 220
2N94-362 150K 220
RS 3306 180K 470

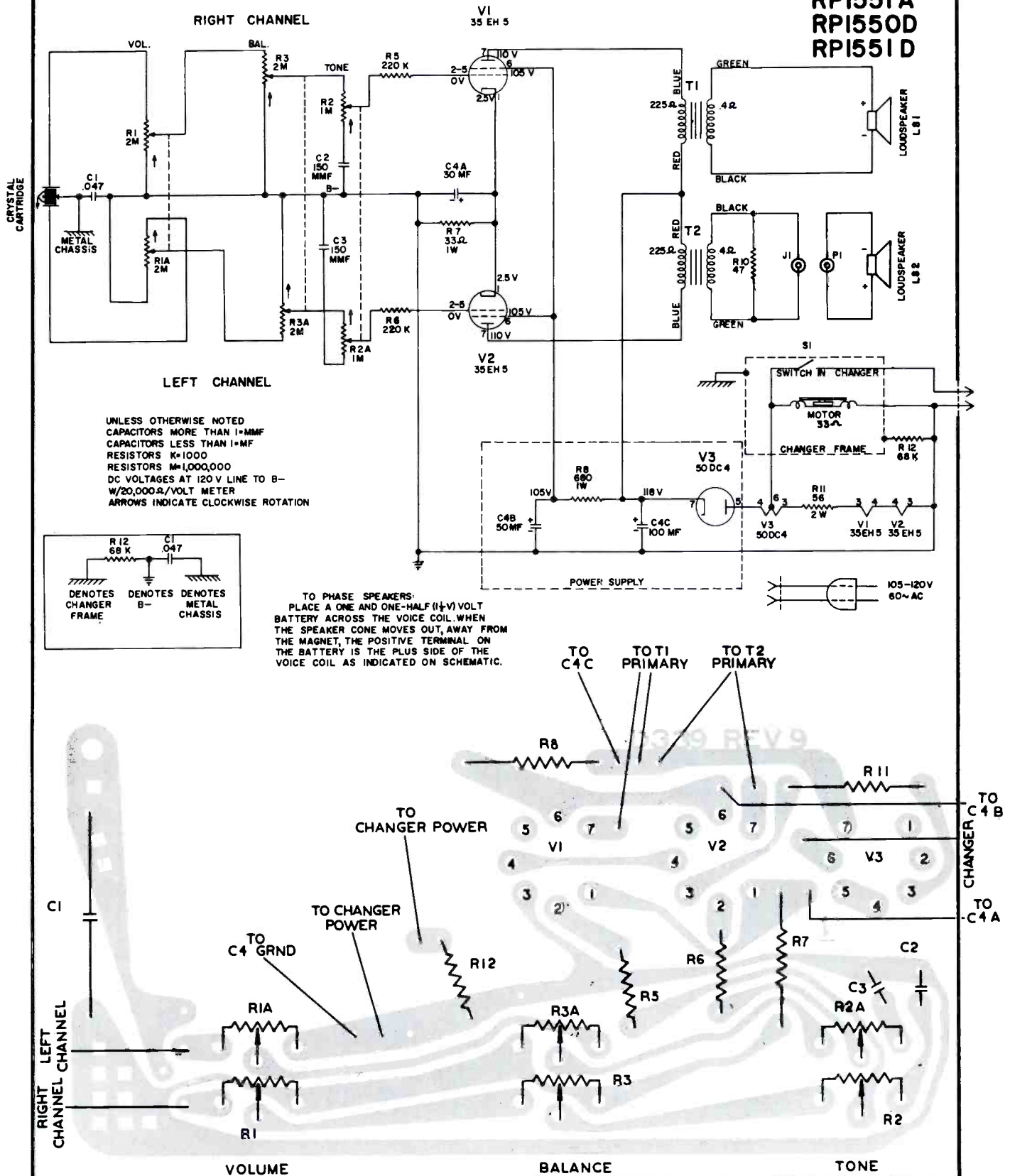
VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

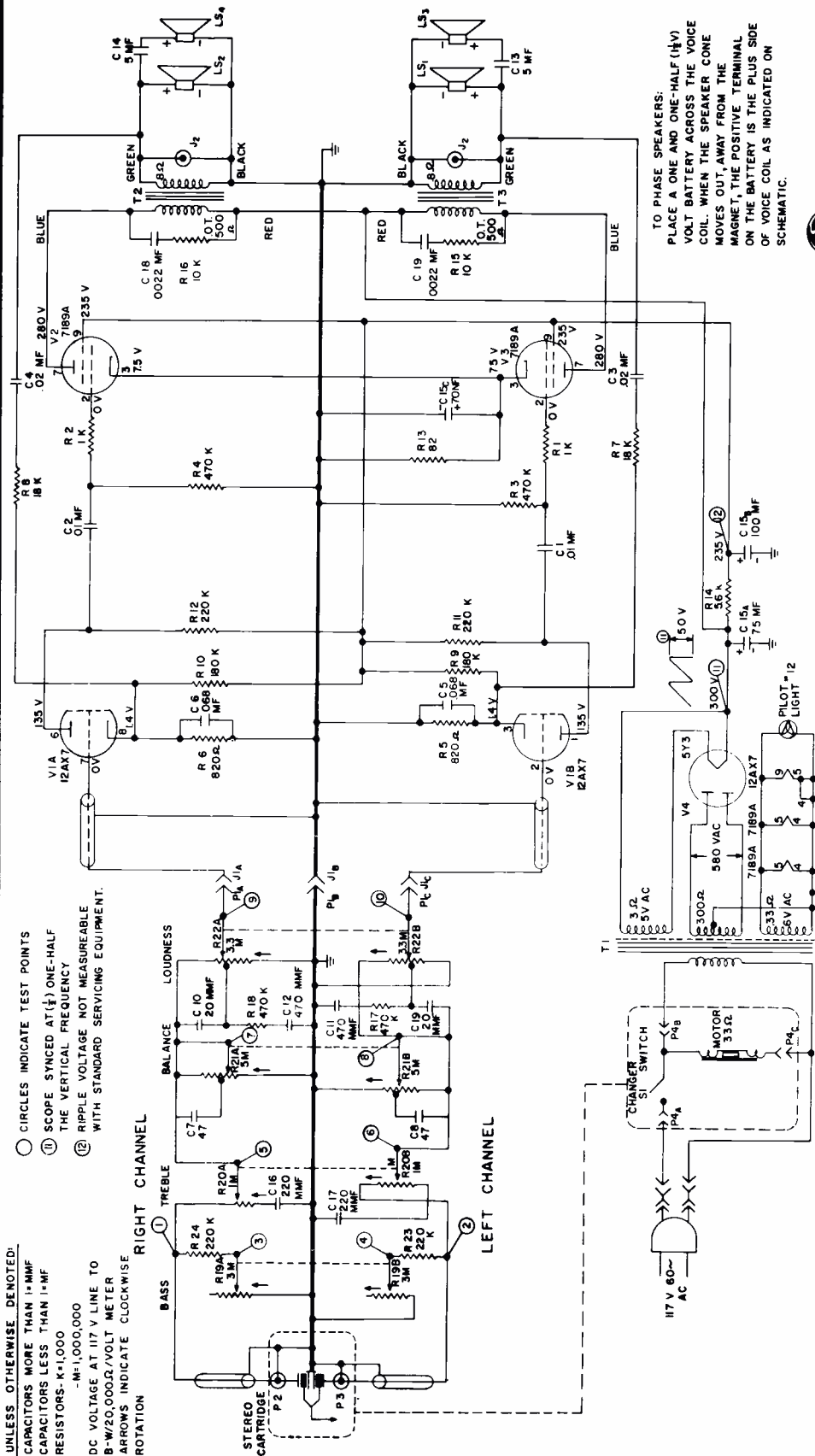
GENERAL ELECTRIC Model RP 1135A



GENERAL  ELECTRIC

MODELS
RPI550A
RPI551A
RPI550D
RPI551D

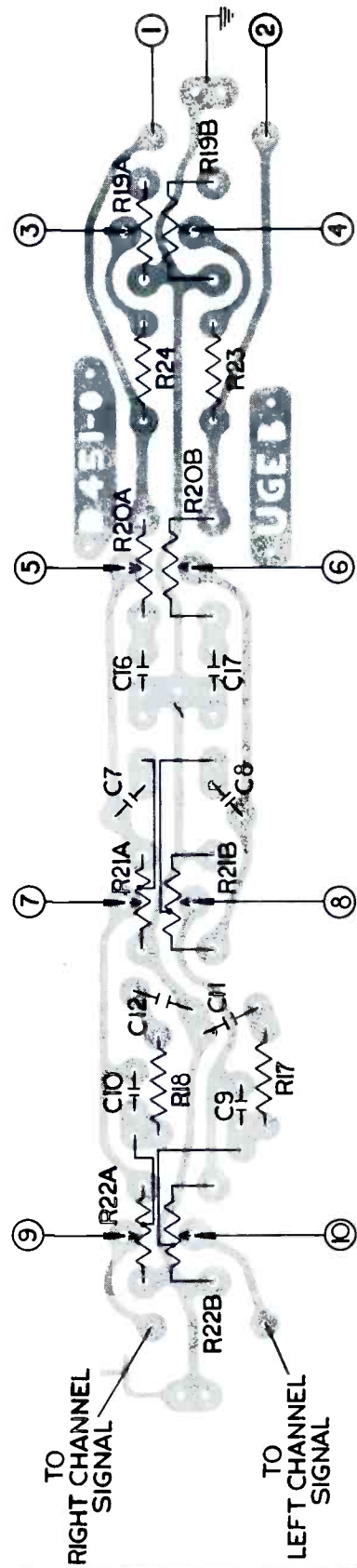




GENERAL ELECTRIC

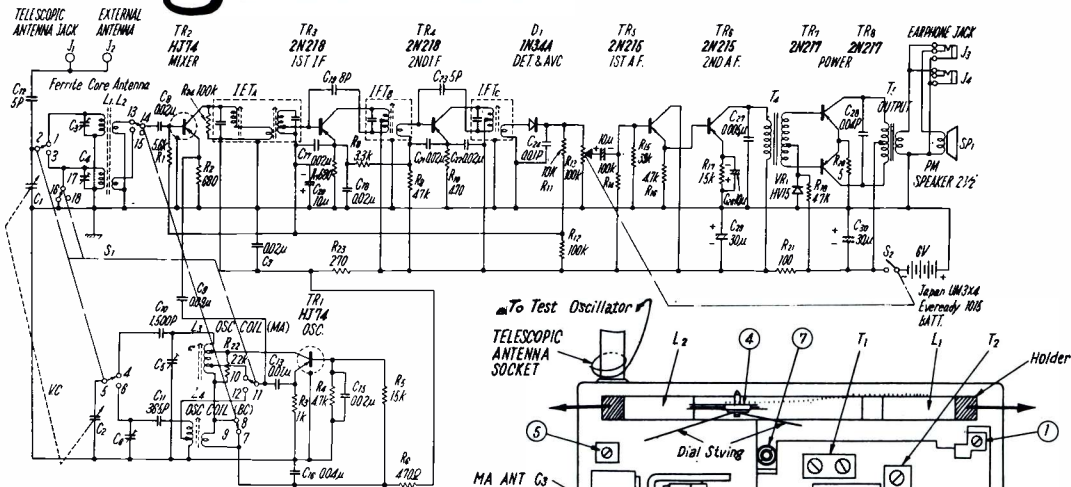
Exact circuit diagram for Models RC1200, RC1201, RC1202, RC1203. Additional Models RP1155A, -C, RP1170, RC1210, RC1211, RC-1212, RC-1213, RP1590A, are almost the same electrically and use identical wiring boards illustrated on the next page adjacent at right.

GENERAL ELECTRIC Boards for Models RP1155A, -C, RP1170, RC1200, RC-1201, RC1202, RC1203, RC1210, RC1211, RC1212, RC1213, RP1590A



GENERAL ELECTRIC Wiring Boards for Models RP1155A, -C, RP1170, RC1200,
RC-1201, RC1202, RC1203, RC1210, RC1211, RC1212, RC1213, RP1590A

Hitachi, Ltd. model WH-822M



ALIGNMENT PROCEDURE

Turn volume control to maximum.

Modulate the test oscillator at 400 c/s or 1,000 c/s. Connect it with the rod antenna through 10 pF and connect oscillator ground wire to radio chassis.

Take out output from earphone jack and measure it using an AC voltmeter of the tester or V.T.V.M. at the range below 3 volts. As the output voltage increases as the adjustment proceeds, restrict the output of the oscillator so that the pointer swing is kept within 0.5 volt.

Adjustment of the intermediate frequency

Preparation	Adjust the band switch at BC.		
Adjustment Order	Division on Dial	Oscillator Frequency	Adjustment Place
1	Max. BC Division	455 kc	T3
2	Max. BC Division	455 kc	T2
3	Max. BC Division	455 kc	T1 (Right)
4	Max. BC Division	455 kc	T1 (Left)
5	Max. BC Division	455 kc	Repeat 1-4

Adjustment of high frequency circuit (BC)

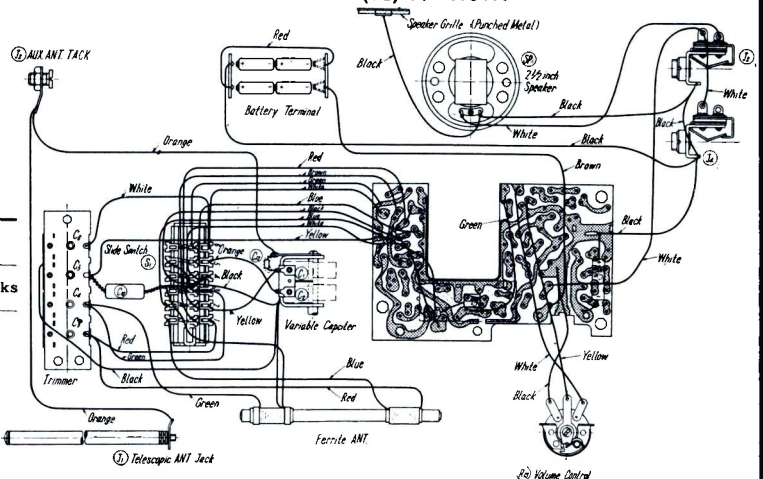
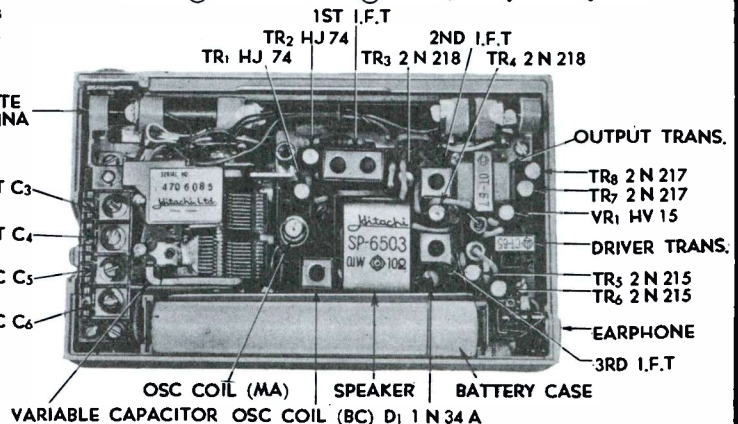
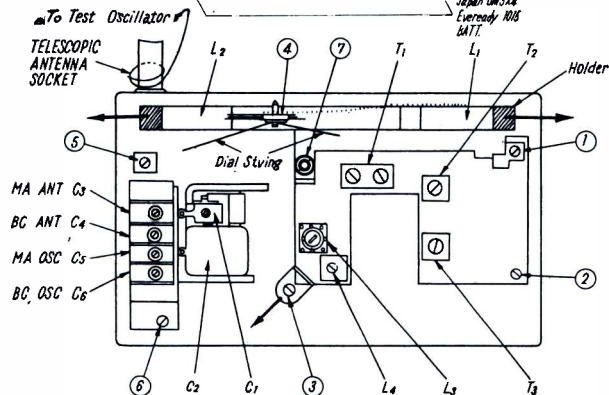
Preparation	Adjust the band switch at BC		
Adjustment Order	Division on Dial	Oscillator Frequency	Adjustment Place
6	Max. BC Division	1,650 kc	C6
7	Min. BC Division	525 kc	L4
8	Repeat 6 & 7		Repeat 6 & 7
9	Receive 600 kc	600 kc	L2
10	Receive 1,400 kc	1,400 kc	C4
11	Repeat 9 & 10		Repeat 9 & 10

Adjustment of high frequency circuit (MA)

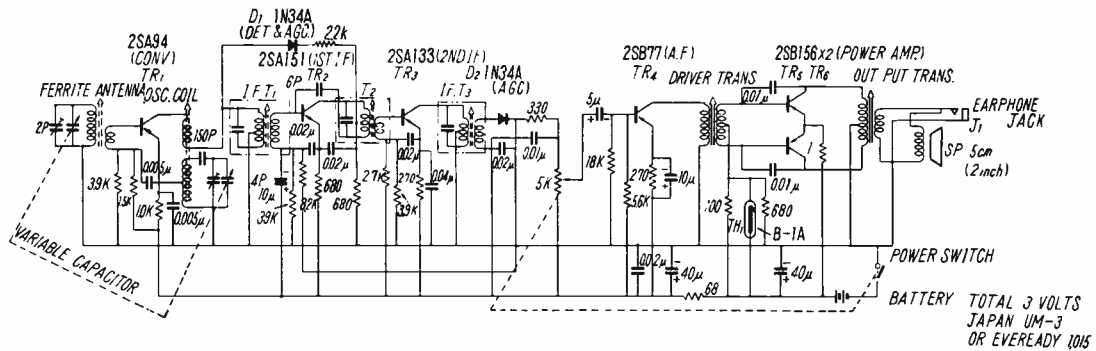
Preparation	Adjust the band switch at MA			
Adjustment Order	Division on Dial	Oscillator Frequency	Adjustment Place	Remarks
12	Max. MA Division	4.7 Mc	C5	*1
13	Min. MA Division	1.55 Mc	L3	
14	Repeat 12 & 13		Repeat 12 & 13	
15	Receive MA 11 Mc	4 Mc	C3	*2
16	Recieve MA 4 Mc	1.65 Mc	L1	
17	Repeat 15 & 16		Repeat 15 & 16	

*1. When you adjust 12 & 15, watch image. When you turn oscillator at 12, it must receive another signal at 5.6 Mc. However, if you receive the signal at 3.8 Mc, you must readjust the oscillator, as it is possible that the signal is tuned with the image. The same applies to 15.

*2. When you adjust 15, the receiving frequency will slip out if you move C3. Move the frequency of the oscillator & try to adjust, keeping it always at the maximum.



Hitachi, Ltd. Model TH-660 Circuit Schematic Diagram

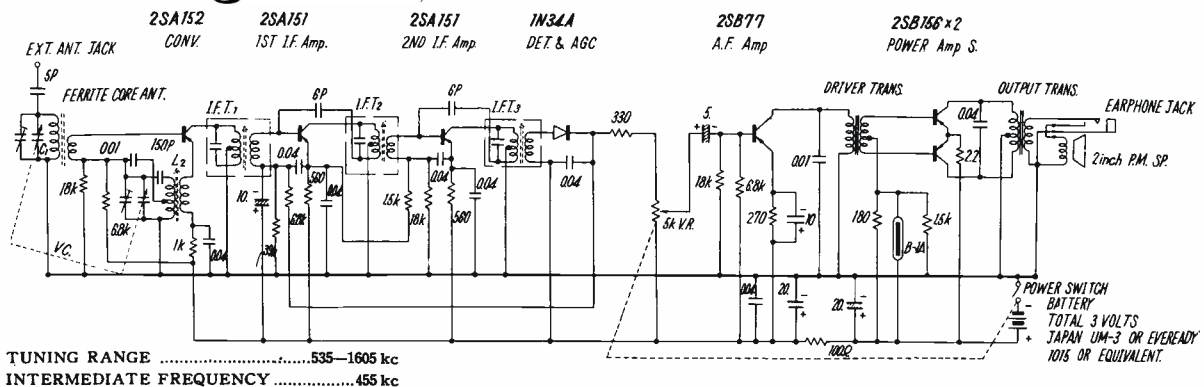


SPECIFICATIONS :

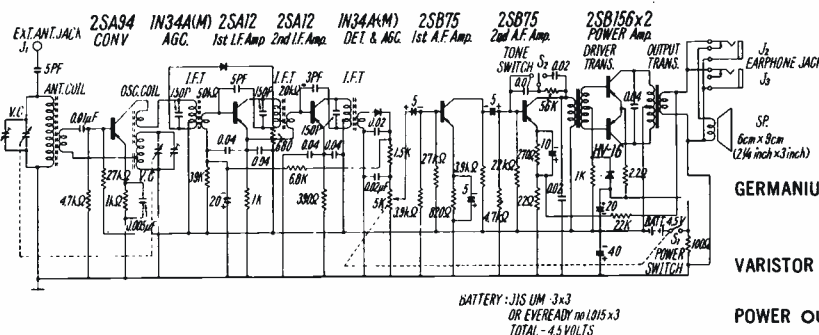
DIMENSIONS 2 1/4" W x 3 1/4" H x 1 1/4" D
 WEIGHT 7 ozs, including batteries
 TUNING RANGE 535-1605 kc
 INTERMEDIATE FREQUENCY 455 kc
 TRANSISTOR COMPONENTS:
 Hitachi Transistor, 2SA94 (Converter)
 Hitachi Transistor, 2SA151 (I. F. Amp., 1st. stages)
 Hitachi Transistor, 2SA133 (2nd stages)
 Hitachi Transistor, 2SB77 (A.F. Amp.)
 Hitachi Transistor, 2SB156x2 (Push-pull Power Amp.)

GERMANIUM DIODE Hitachi Crystal Diode, 1N34A
 (2nd Detector, and Automatic Volume Controller)
 THERMISTOR Hitachi Thermistor, B-1A
 (Temperature Compensator)
 POWER OUTPUT 100 mW (Undistorted)
 150 mW (Maximum)
 LOUD SPEAKER 2 inch P. M. Speaker
 EL-214 can be plugged in.
 RECOMMENDED BATTERIES EVEREADY 1015 or its equivalent

Hitachi, Ltd. Model TH-661 Circuit Schematic Diagram



HITACHI 7-Transistor Portable Radio TH-759



TRANSISTOR COMPONENTS:

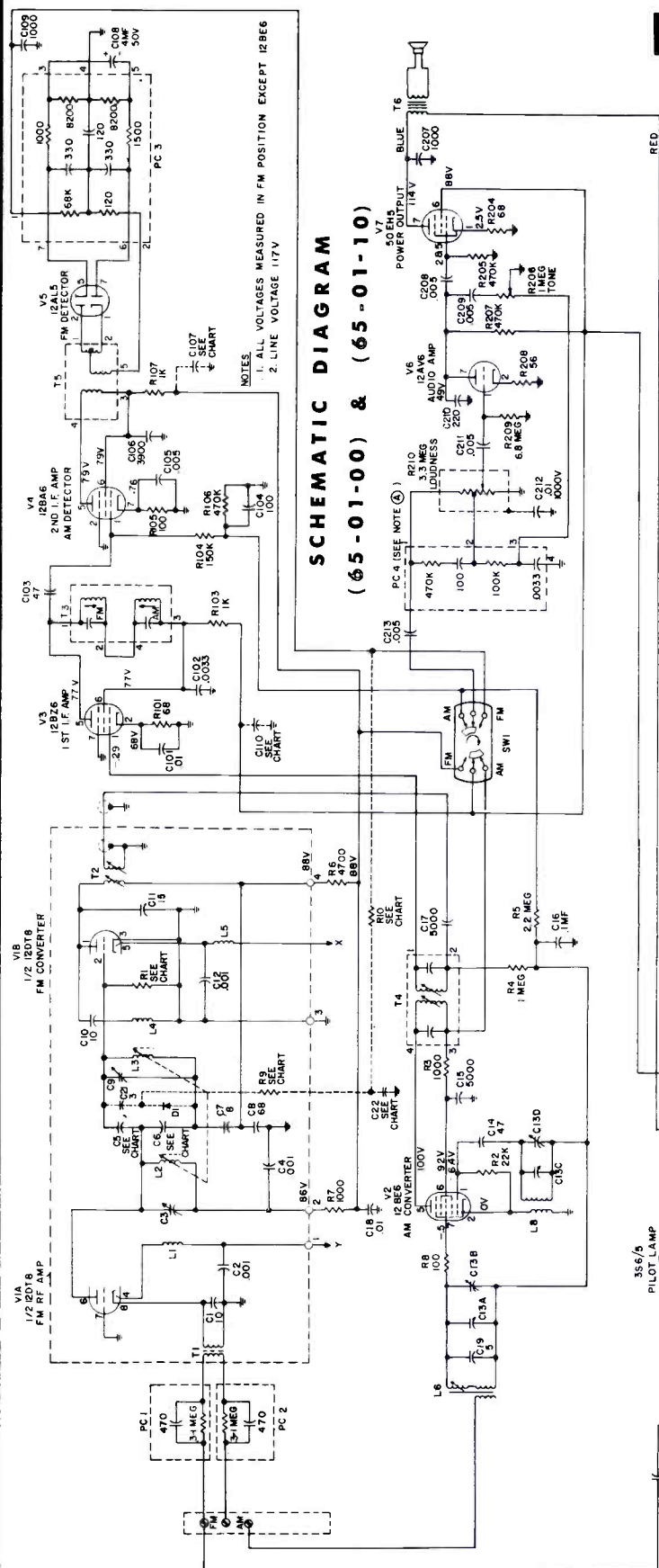
Hitachi Transistor, 2SA 94 (MIX.)
 Hitachi Transistor, 2SA12x2, (I.F. Amp., 2-stage)
 Hitachi Transistor, 2SB75x2, (A.F. Amp., 2-stage)
 Hitachi Transistor, 2SB156x2, (Push-pull Power Amp.)

GERMANIUM DIODE Hitachi Crystal Diode, 1N34A (M) x 2
 (Detector and Automatic Volume Controller)
 VARISTOR Hitachi Varistor, HV 16 (Temperature and Voltage Compensator)
 POWER OUTPUT 150 mW (Undistorted)
 180 mW (Maximum)
 LOUD SPEAKER 3 inch x 2 1/4 inch P.M. Speaker.
 EARPHONE JACK Hitachi Magnetic Earphone, EL-219, can be plugged in.
 RECOMMENDED BATTERY EVEREADY 1015 or its equivalent.

SCHEMATIC DIAGRAM
(65-01-00) & (65-01-10)

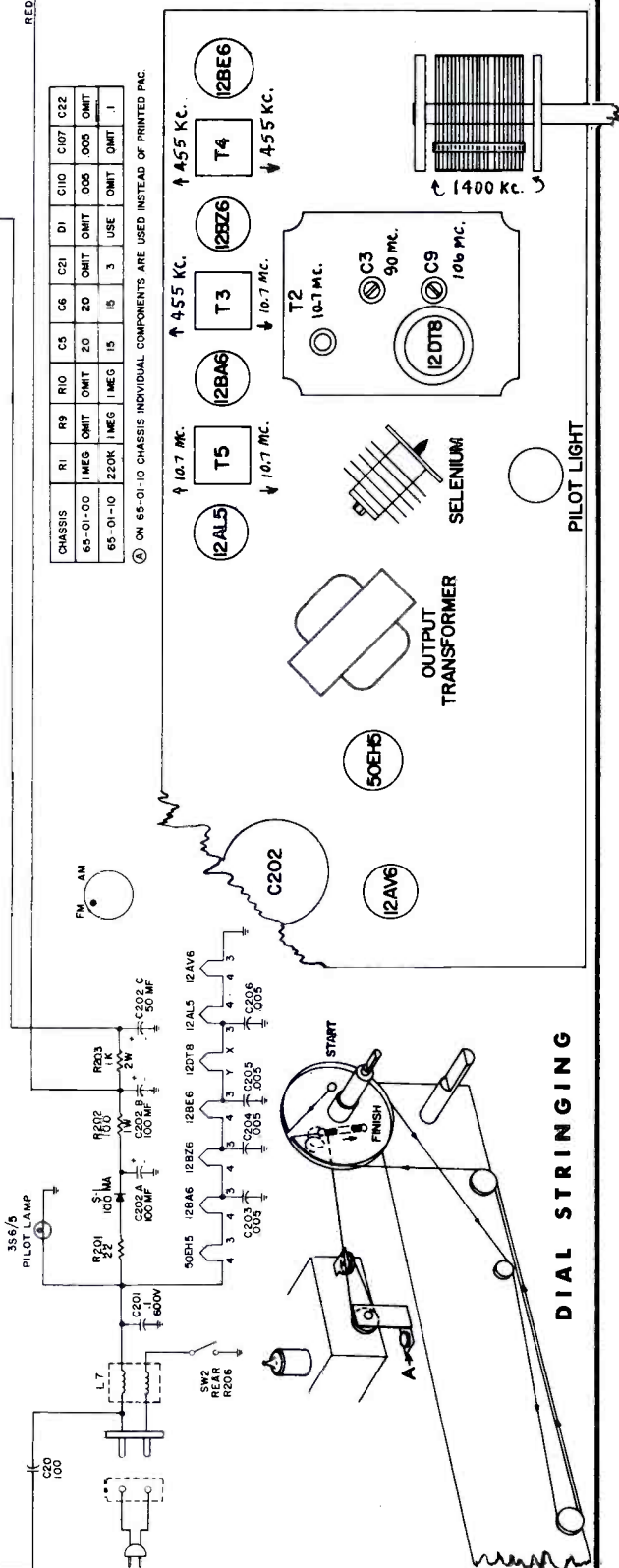
NOTES

1. ALL VOLTAGES MEASURED IN FM POSITION EXCEPT 12BE6



CHASSIS	R1	R9	R10	C5	C6	C21	D1	C110	C107	C22
65-01-00	1MEG	OMIT	OMIT	20	20	OMIT	OMIT	.005	.005	OMIT
65-01-10	220K	1MEG	1MEG	15	15	3	USE	OMIT	OMIT	1

① ON 65-01-10 CHASSIS INDIVIDUAL COMPONENTS ARE USED INSTEAD OF PRINTED PAC.



Magnavox

71 SERIES RADIO CHASSIS

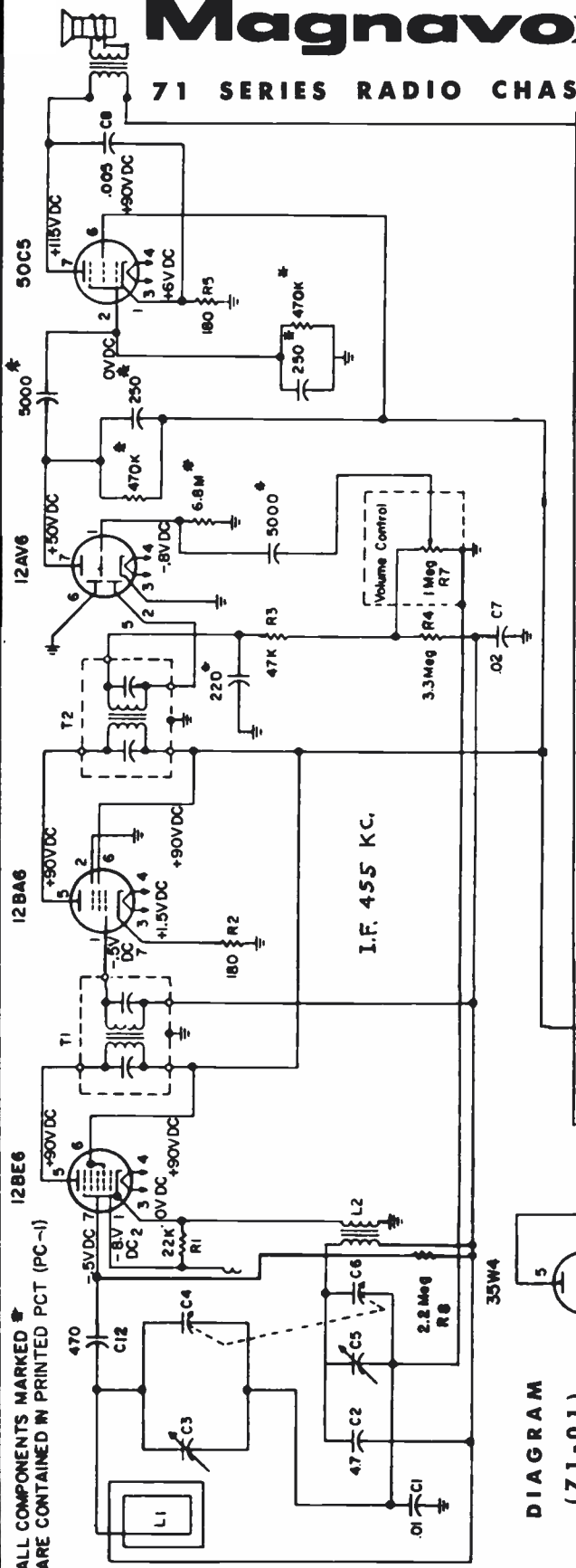


DIAGRAM
(71-01)

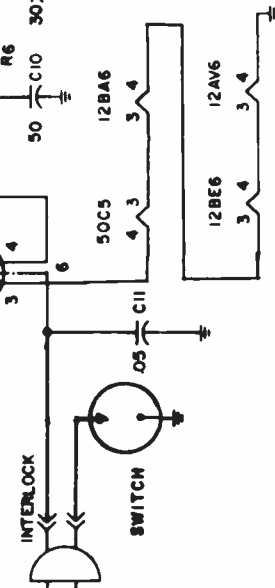
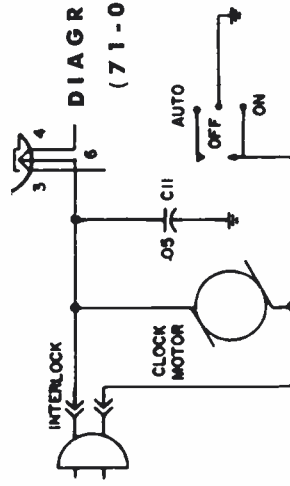
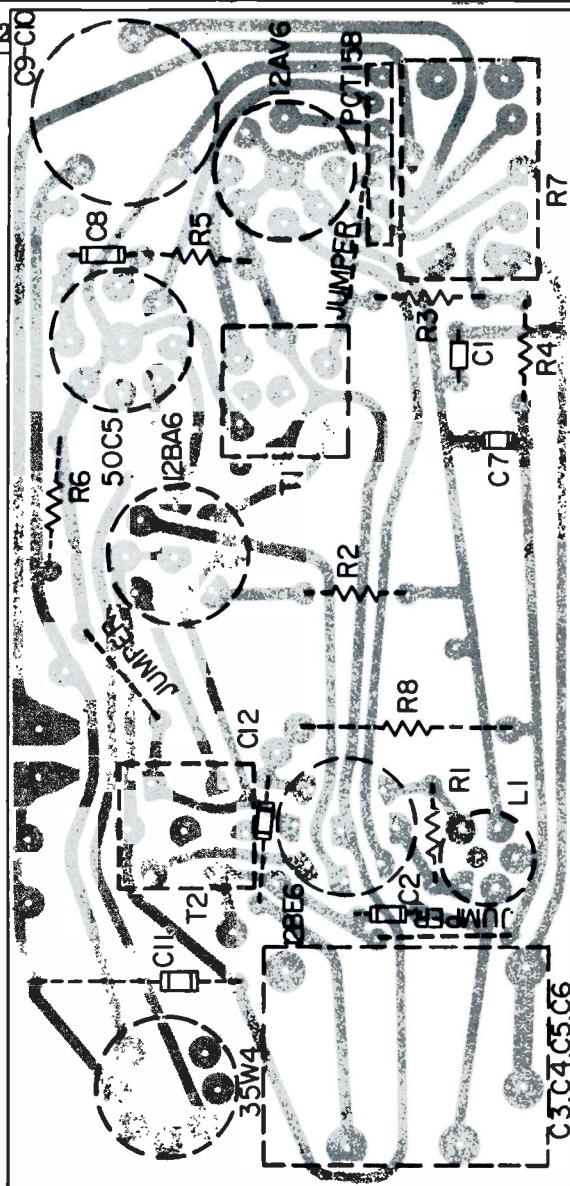


DIAGRAM
(71-02)

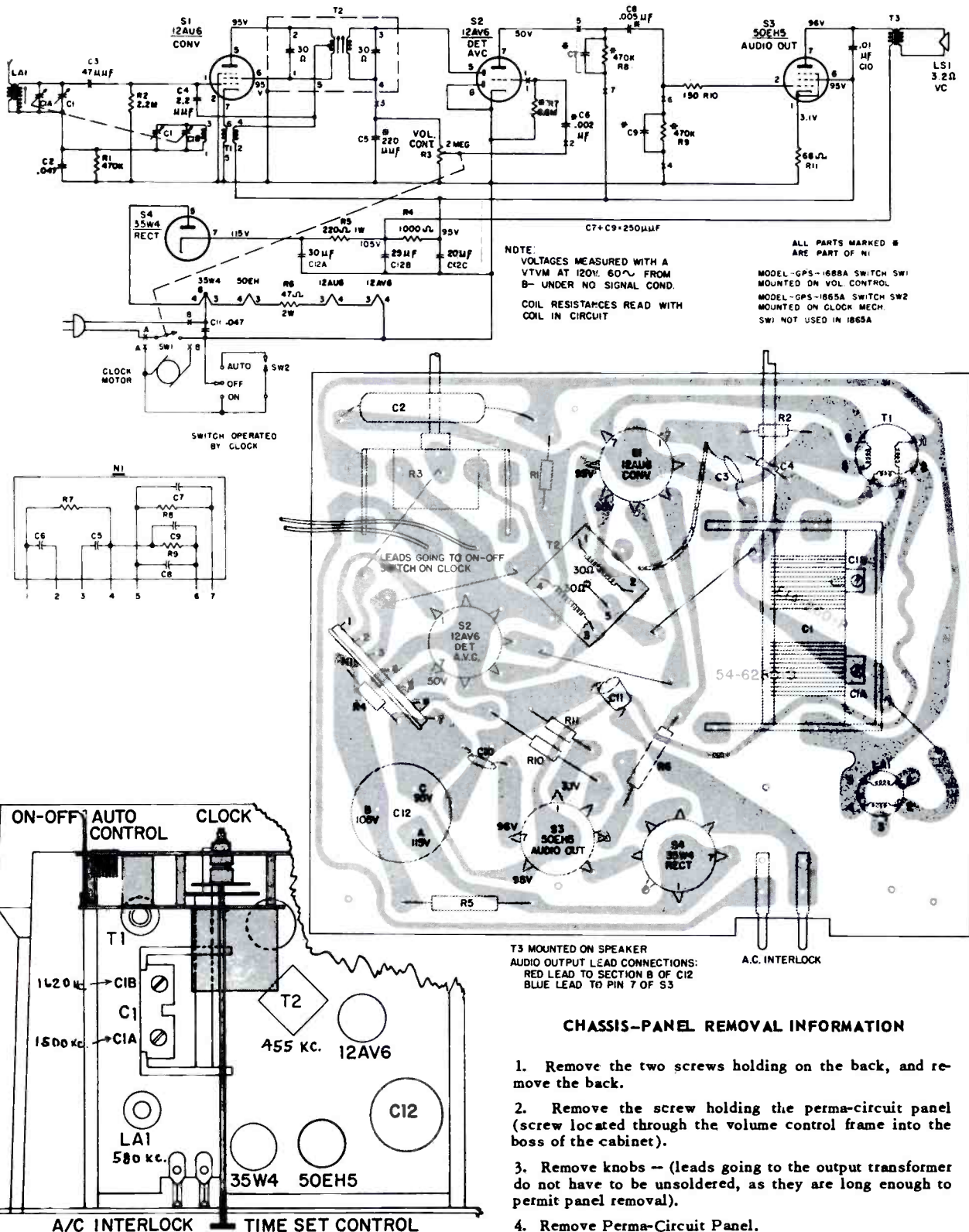


(VIEWED FROM WIRING SIDE OF BOARD)

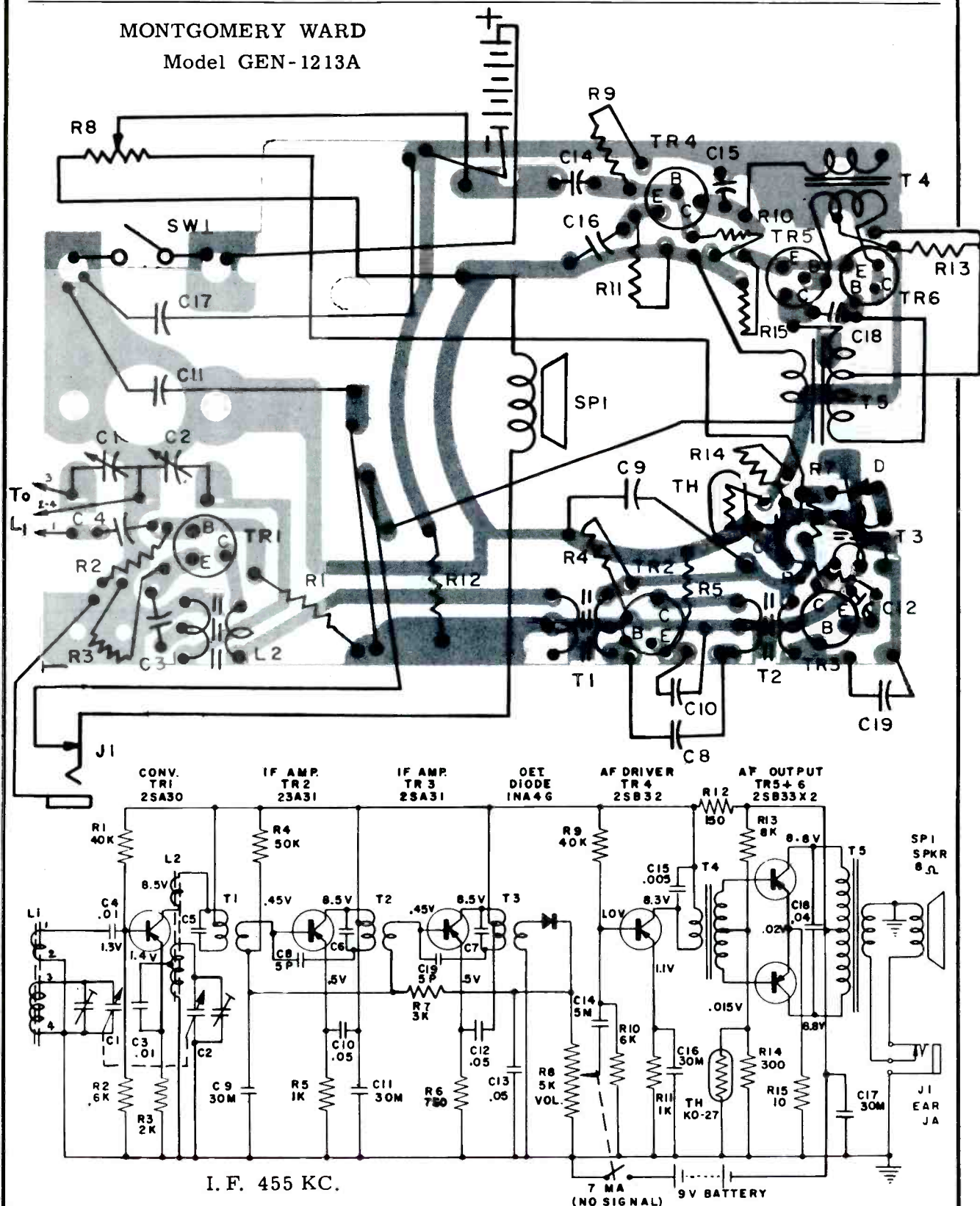


MONTGOMERY WARD

MODELS GPS-1688A AND GPS-1865A

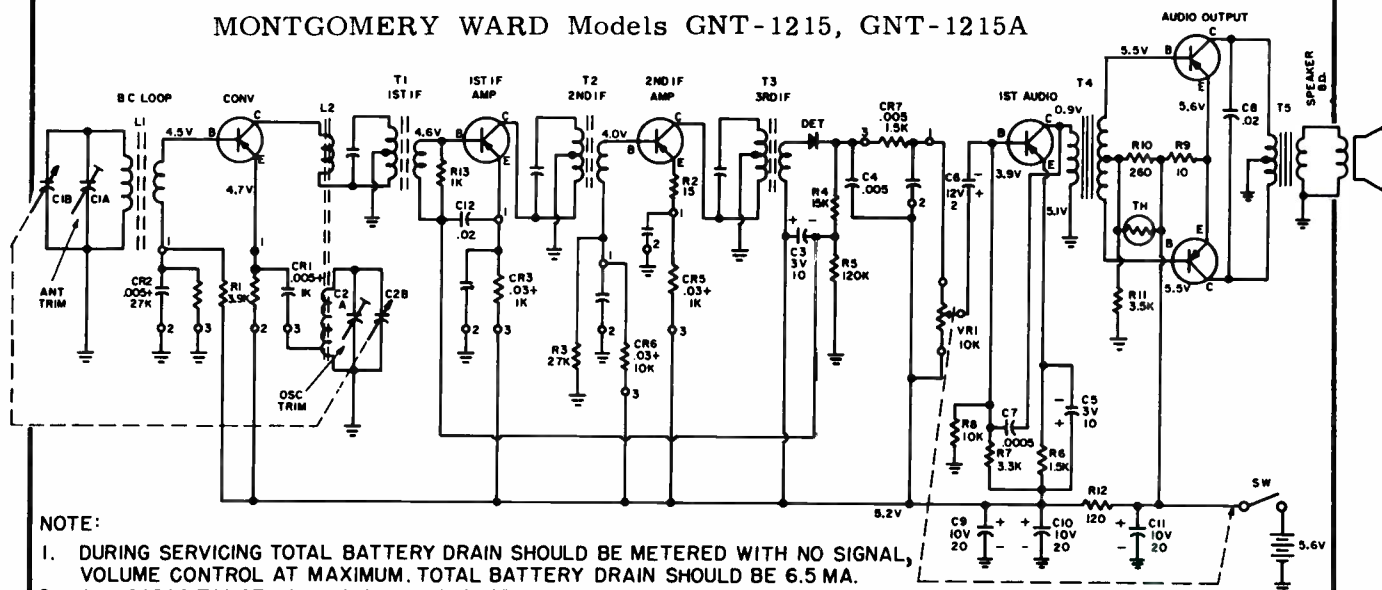


MONTGOMERY WARD
Model GEN-1213A



It is possible to damage a transistor when testing circuit continuity. Since a transistor needs only a low voltage applied to its terminals for conduction, use of an ohmmeter having an internal battery voltage of more than 7.5 volts, will damage the transistor. Testing continuity of a circuit which includes a transistor can result in misleading indications, as the resistance of a transistor in the conduction direction is low in comparison to the resistance in the non-conduction direction. It is more reliable to make voltage measurements and check whether voltages shown on the schematic are present. Reference to the schematic diagram and to the printed circuit board artwork will permit tracing the circuit and locating components on the printed board.

MONTGOMERY WARD Models GNT-1215, GNT-1215A



NOTE:

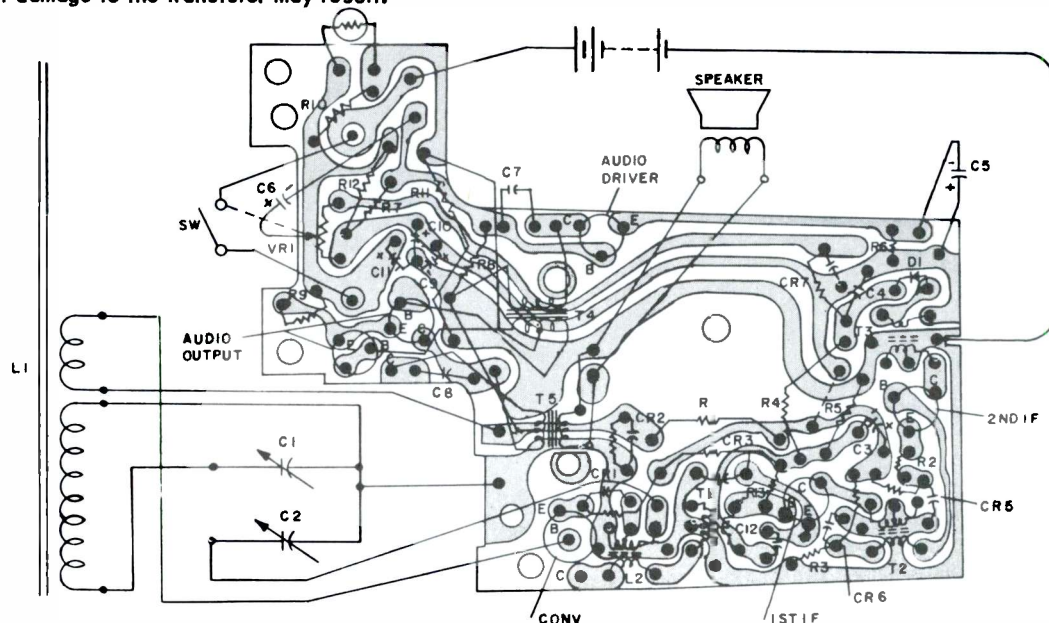
1. DURING SERVICING TOTAL BATTERY DRAIN SHOULD BE METERED WITH NO SIGNAL, VOLUME CONTROL AT MAXIMUM. TOTAL BATTERY DRAIN SHOULD BE 6.5 MA.
2. ALL CAPACITANCE VALUES IN MICROFARADS. ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
3. VOLTAGE MEASUREMENTS MADE WITH A V.T.V.M FROM POINTS INDICATED TO GROUND WITH TUNING CAPACITOR AT MAXIMUM, VOLUME CONTROL AT MAXIMUM, BATTERY SOURCE AT 5.6 VOLTS.

I. F. 455 KC.

To check for a circuit defect which would cause excessive battery drain, an overall current measurement and supplementary voltage measurement should be made.

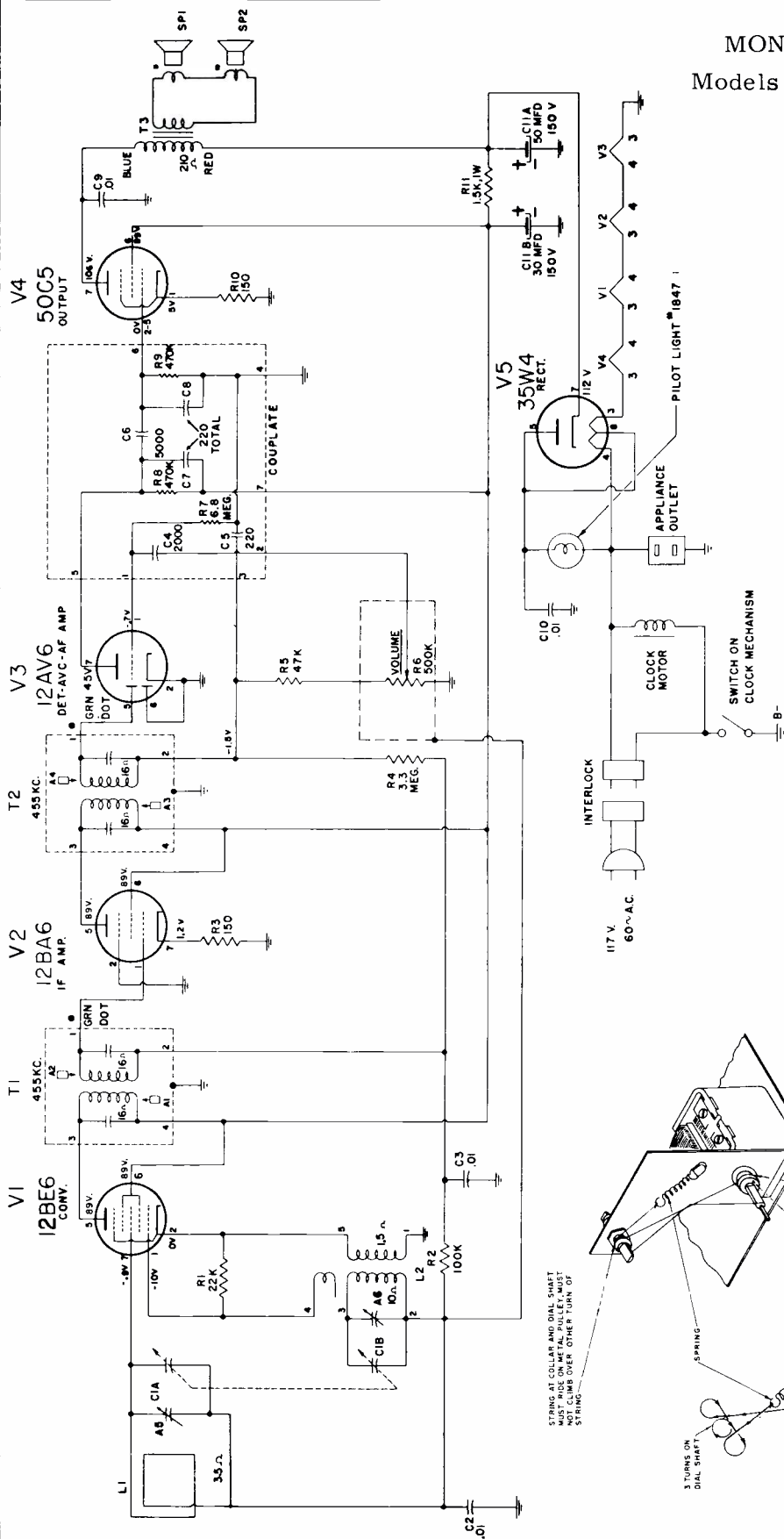
Signal tracing by injection of a signal from a signal generator is done on transistor radios in exactly the same manner as has been done for many years with the conventional vacuum tube radios. The signal generator should be connected in series with a capacitor to avoid shorting out bias voltages. The base of a transistor is the signal input terminal (Corresponding to the signal grid of a tube). The collector is the signal output terminal (Corresponding to the plate of a tube). The emitter is the common terminal (Corresponding to the cathode of a tube). Oscillator performance can not be judged by measurement of a DC voltage developed across a resistor. Measurement of oscillator signal strength with an AC VTVM at the emitter will give an indication of oscillator performance. In class "B" output, used in the receiver, the battery current increases greatly with increased signal input (over 30 MA with volume control set at maximum). If all other circuit components have been checked and a faulty transistor is suspected, replacement of the transistor is the surest check. Transistors should not be soldered or unsoldered in the circuit when voltage is applied to the circuit. In some cases replacement of an IF transistor will affect IF alignment.

Do not short across the base and collector terminals of the transistors while the radio is operating, as permanent damage to the transistor may result.

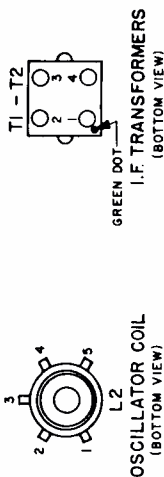


MONTGOMERY WARD

Models GEN-1691A, GEN-1869A

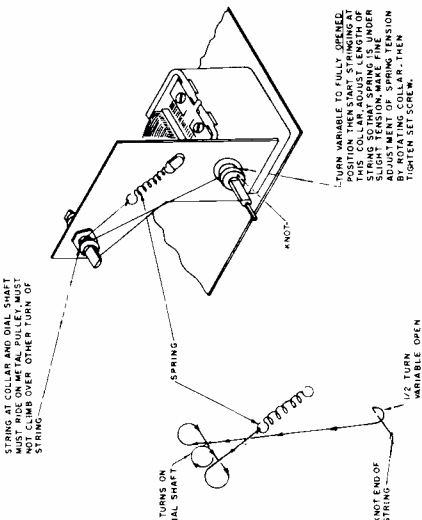


- NOTES:
1. ALL VOLTAGES MEASURED WITH VTVM, REFERENCED TO B-, WITH VOLUME CONTROL AT MAXIMUM, NO SIGNAL APPLIED.
 2. ALL VOLTAGES SHOWN ARE DC UNLESS OTHERWISE INDICATED.
 3. ALL RESISTORS ARE IN OHMS, $\pm 20\%$, 1/2 WATT UNLESS OTHERWISE SPECIFIED.
 4. DC COIL RESISTANCE VALUES UNDER 1 OHM NOT SHOWN.
 5. CAPACITANCE VALUES UNDER 1 ARE IN MICROFARADS, MORE THAN 1 ARE IN MICROMICROFARADS UNLESS OTHERWISE INDICATED.



CHASSIS REMOVAL INFORMATION

1. Remove 4 screws holding the back and front sections of cabinet together, rear section may now be removed.
2. Remove volume and tuning knobs.
3. Remove 2 screws and flat washers at either side of chassis board and 1 screw on dial bracket.
4. Unsolder output transformer leads at speaker terminals.
5. Chassis may now be removed from cabinet.
6. To reassemble the chassis, proceed with the above steps in reverse sequence.



MOTOROLA

MODEL
MOTOROLA
04MI
INTERNATIONAL HARVESTER
244079-R91
244113-R91

POWER TRANSISTOR CURRENT ADJUSTMENT - After replacing a power transistor, measure the collector current of BOTH power transistors and adjust for proper operation.

R18 is used to limit total collector current. In most sets it is a piece of copper wire; in a few sets it is a 1/2 watt carbon resistor, either 27 or 56 ohms.

With 14V input to the radio "A" lead, the total collector current should not exceed 340 ma or be less than 150 ma. When 12.6V is applied to the radio "A" lead, the total collector current must not exceed 260 ma or be less than 120 ma. If the total collector current does not fall within these limits, change the value of R18 as required.

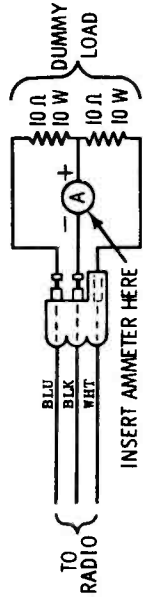
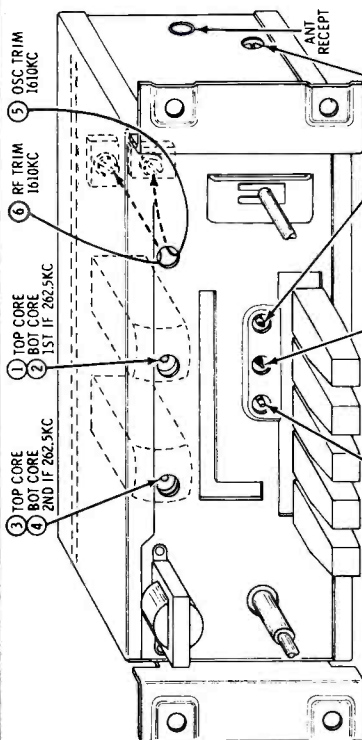
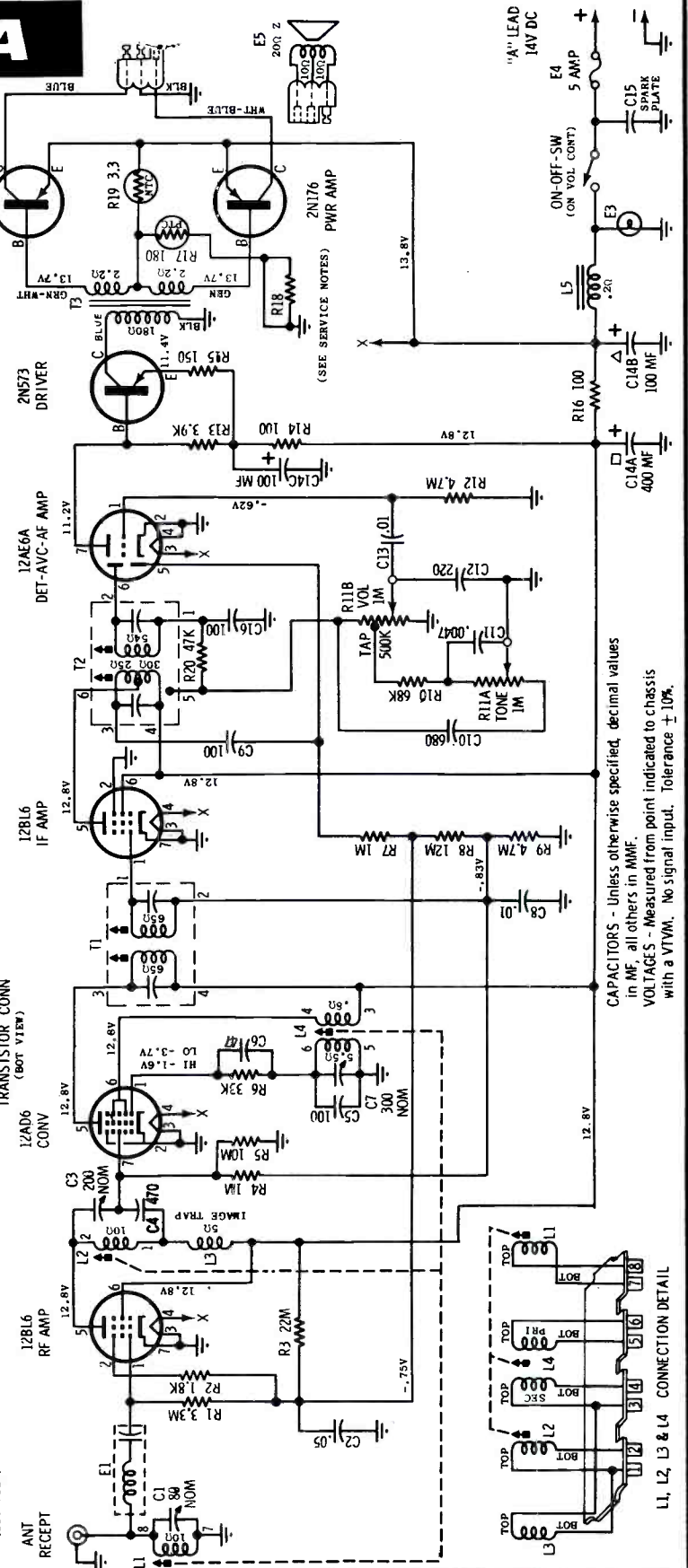
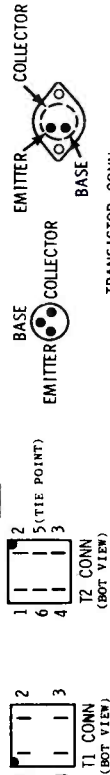


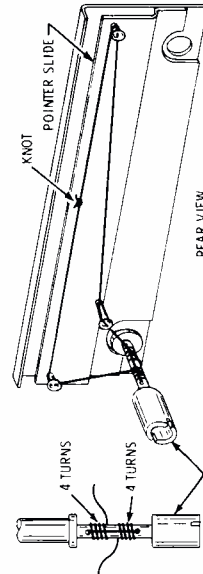
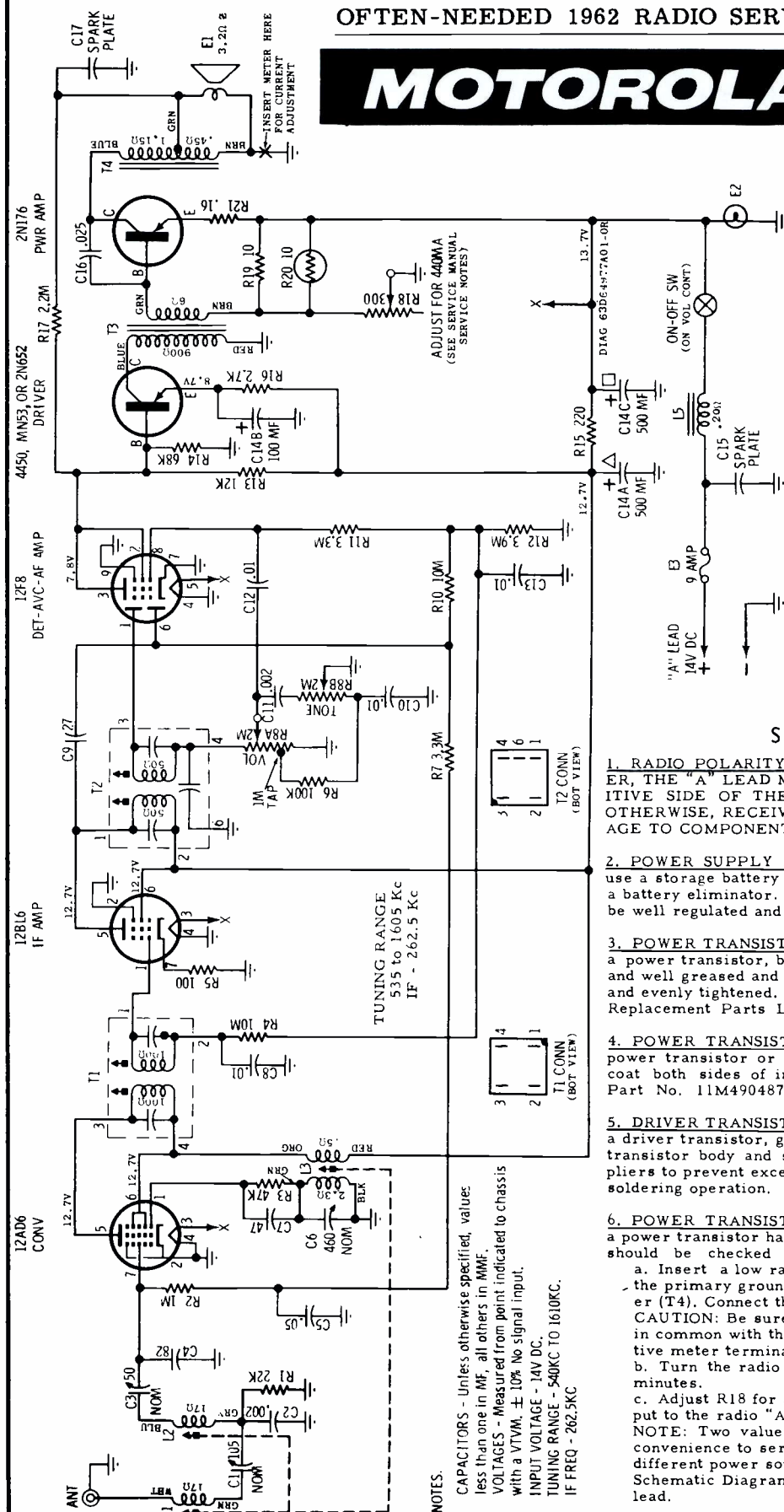
ILLUSTRATION - ADJUSTING TRANSISTOR CURRENT OR OPERATING SET WITHOUT SPEAKER



ALIGNMENT POINT LOCATION DETAIL



MOTOROLA

**MODEL
11MX**


1. Thread a sufficient length of dial cord through two holes in shaft.
2. Wind 4 turns from each hole toward center of shaft as shown in detail.
3. Thread over guides and tie knot as shown

DIAL STRINGING DETAIL

SERVICE NOTES

1. RADIO POLARITY - WHEN SERVICING THIS RECEIVER, THE "A" LEAD MUST BE CONNECTED TO THE POSITIVE SIDE OF THE POWER SOURCE. IF CONNECTED OTHERWISE, RECEIVER WILL NOT OPERATE AND DAMAGE TO COMPONENTS MAY RESULT.

2. POWER SUPPLY REQUIREMENTS - It is preferable to use a storage battery (without a battery charger) in place of a battery eliminator. If a battery eliminator is used, it must be well regulated and filtered.

3. POWER TRANSISTOR REPLACEMENT - When replacing a power transistor, be sure transistor insulator is in place and well greased and that the mounting screws are securely and evenly tightened. Use only the transistor specified in the Replacement Parts List for replacement. See Notes 4 & 6.

4. POWER TRANSISTOR INSULATOR - When replacing a power transistor or power transistor insulator, be sure to coat both sides of insulator with DC-4 grease (Motorola Part No. 11M490487) to insure proper heat dissipation.

5. DRIVER TRANSISTOR REPLACEMENT - When replacing a driver transistor, grasp the transistor leads (between the transistor body and soldering lug) with a pair of long nose pliers to prevent excessive heating of transistor body during soldering operation.

6. POWER TRANSISTOR CURRENT ADJUSTMENT - After a power transistor has been replaced, the collector current should be checked and adjusted for proper operation.

a. Insert a low range (0-1 or 0-2 amp) DC ammeter in the primary ground return lead of the output transformer (T4). Connect the negative post of the meter to ground. CAUTION: Be sure the speaker ground lead is connected in common with the transformer ground lead to the positive meter terminal (see schematic).

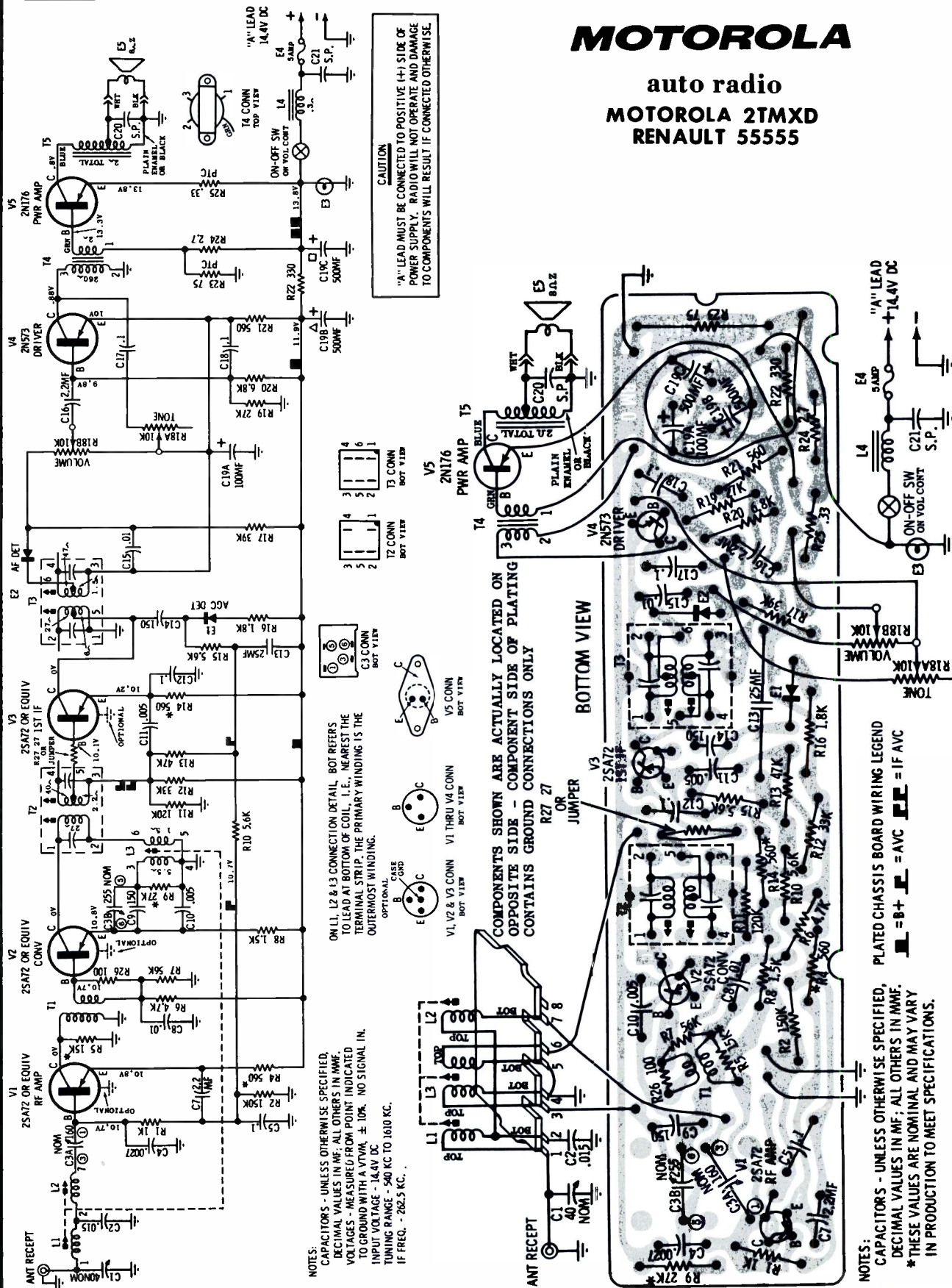
b. Turn the radio on and allow it to heat up for about 15 minutes.

c. Adjust R18 for a reading of 360 ma with 12.6 volts input to the radio "A" lead.

NOTE: Two values of radio input voltage are given as a convenience to service personnel in order to accommodate different power sources. The current value stated on the Schematic Diagram is for 14 volts input to the radio "A" lead.

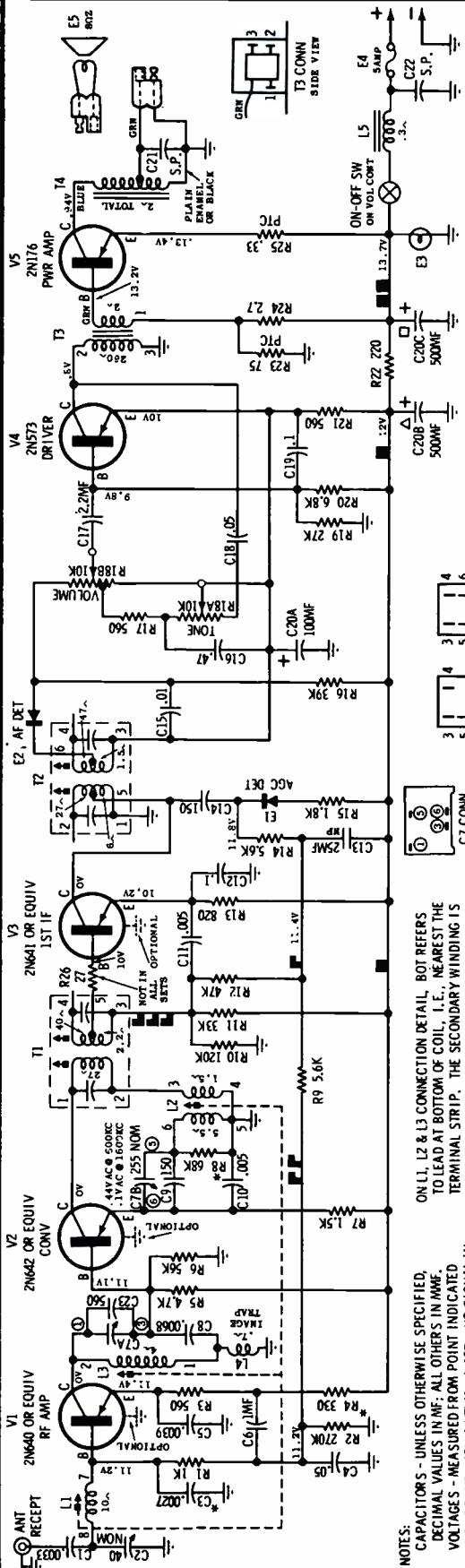
MOTOROLA

auto radio
MOTOROLA 2TMXD
RENAULT 55555

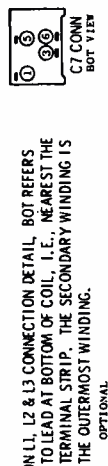


MOTOROLA

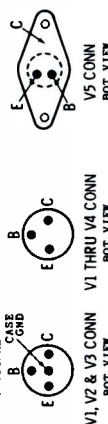
auto radio
MOTOROLA 2TMR
AMERICAN MOTORS 8990981



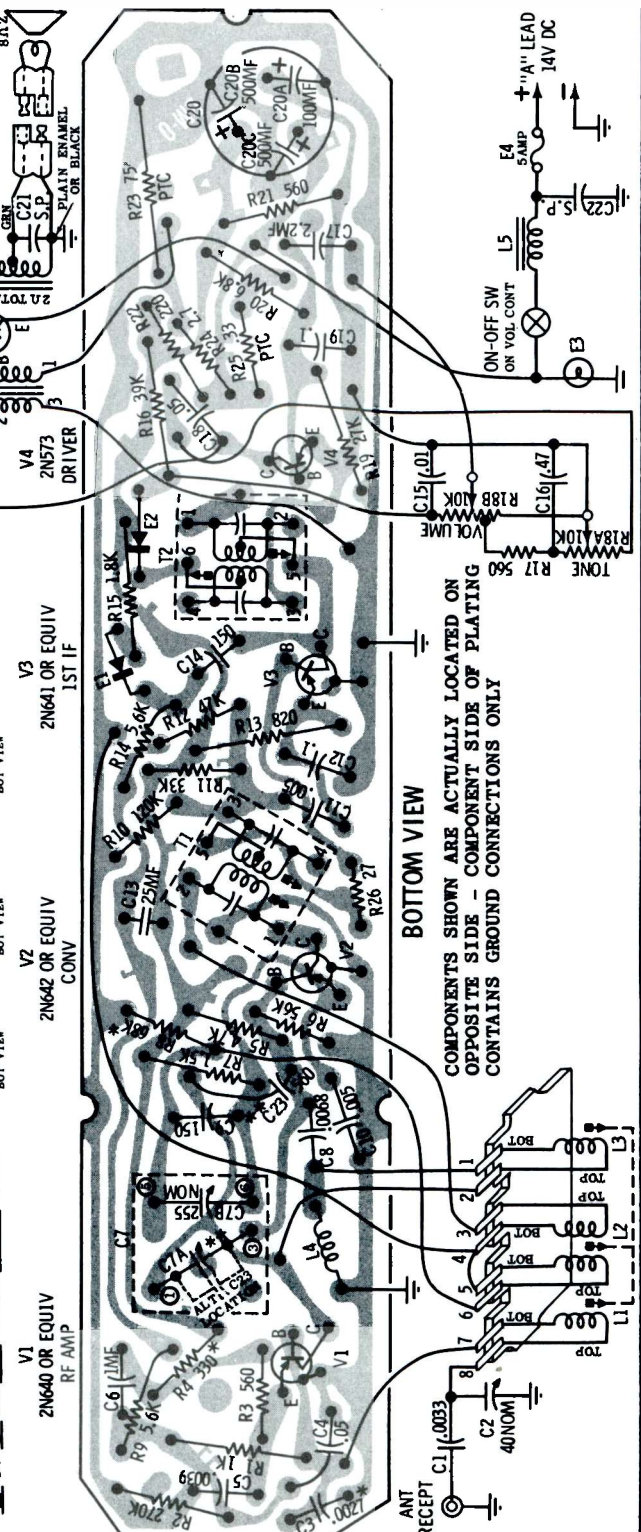
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.



ON L1, L2 & L3 CONNECTION DETAIL, BOT REFERS TO LEAD AT BOTTOM OF COIL, I.E., NEAREST THE TERMINAL STRIP. THE SECONDARY WINDING IS THE OUTERMOST WINDING.

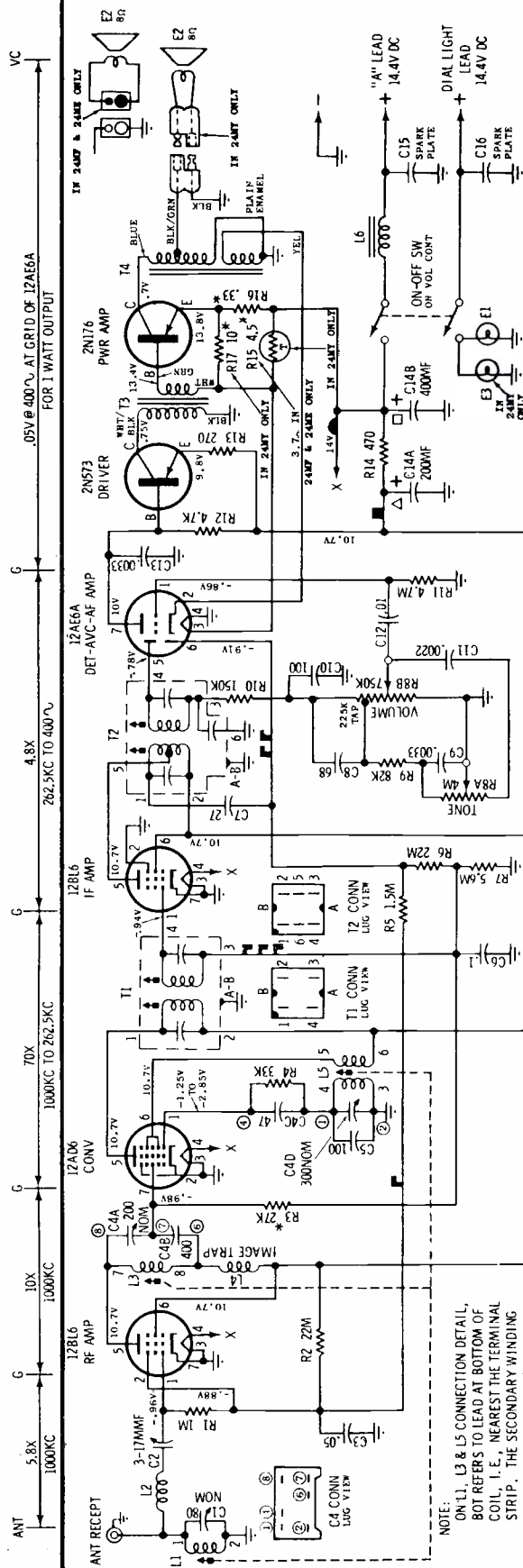


ON L1, L2 & L3 CONNECTION DETAIL, BOT REFERS TO LEAD AT BOTTOM OF COIL, I.E., NEAREST THE TERMINAL STRIP. THE SECONDARY WINDING IS THE OUTERMOST WINDING.



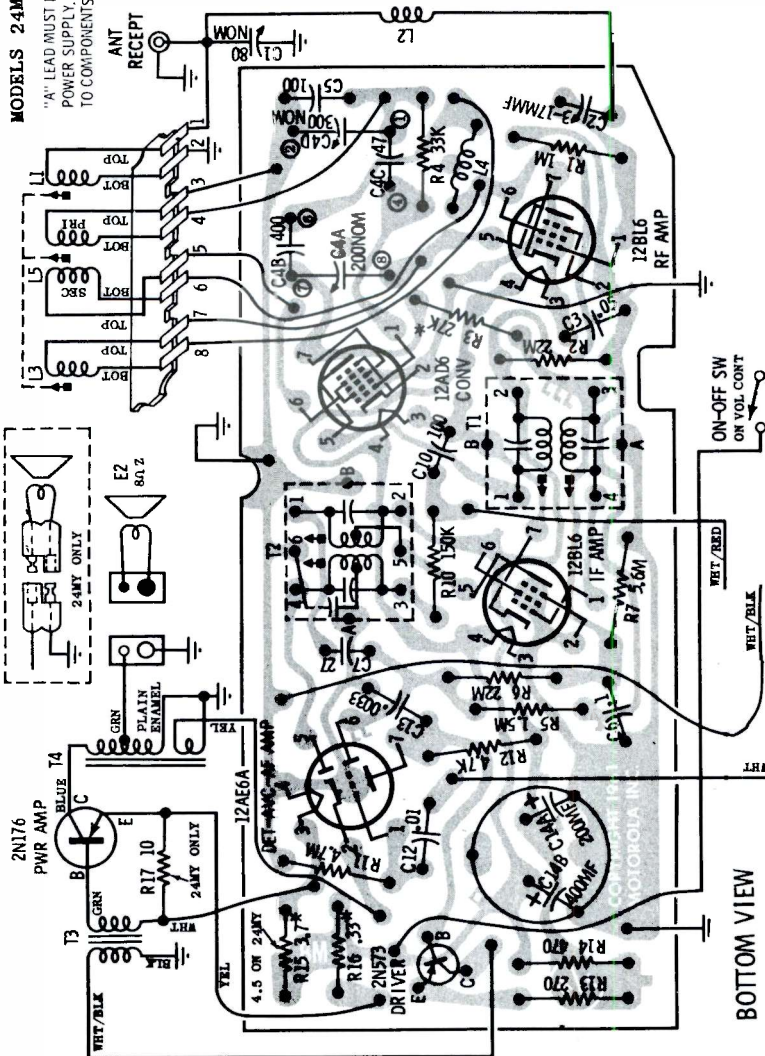
BOTTOM VIEW

COMPONENTS SHOWN ARE ACTUALLY LOCATED ON OPPOSITE SIDE - COMPONENT SIDE OF PLATING CONTAINS GROUND CONNECTIONS ONLY



MODELS 24MB, 24MF & 24MY SCHEMATIC DIAGRAM

NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
 VOLTAGES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM, $\pm 10\%$.
 NO SIGNAL IN.
 INPUT VOLTAGE - 14.4V DC
 TUNING RANGE - 540KC TO 1610KC, IF - 262.5KC
 *THE EXACT VALUE TO BE DETERMINED BY PRODUCTION PROCESS.
 REPLACE WITH THE SAME VALUE OF THE ORIGINAL PART.



MOTOROLA

auto radio

MOTOROLA

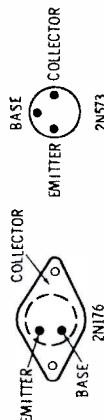
FORD

24ME.....C2GY-18805-A

24MF.....C2AZ-18805-A

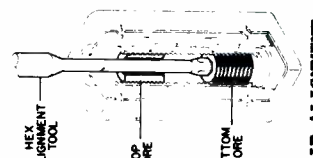
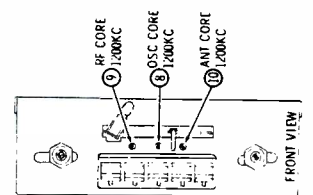
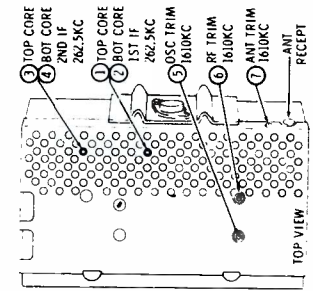
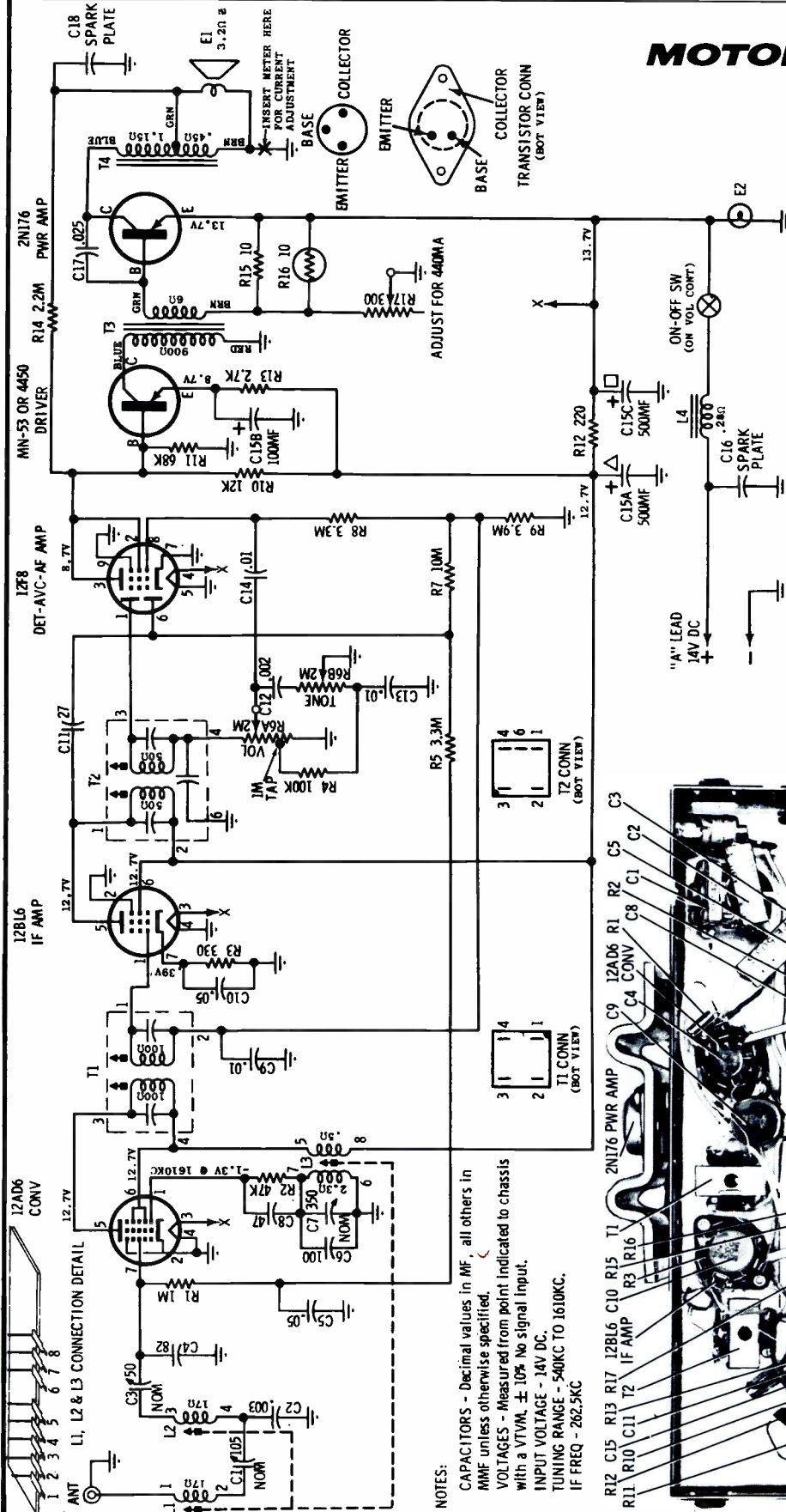
24MY.....C2YY-18805-A2

Model 24ME is for the 1962 Comet.
 Model 24MF is for the 1962 Ford.
 Model 24MY is for the 1962 Meteor.

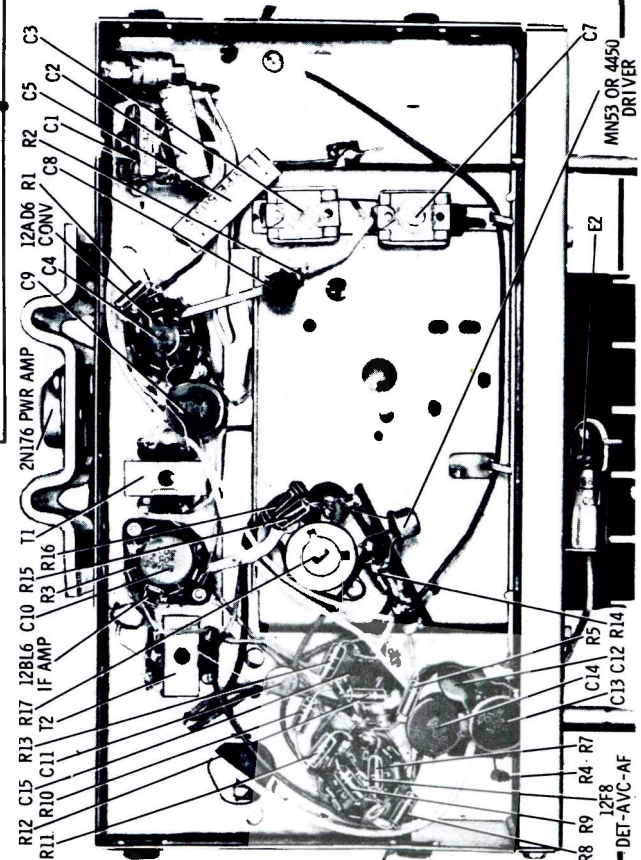


MOTOROLA

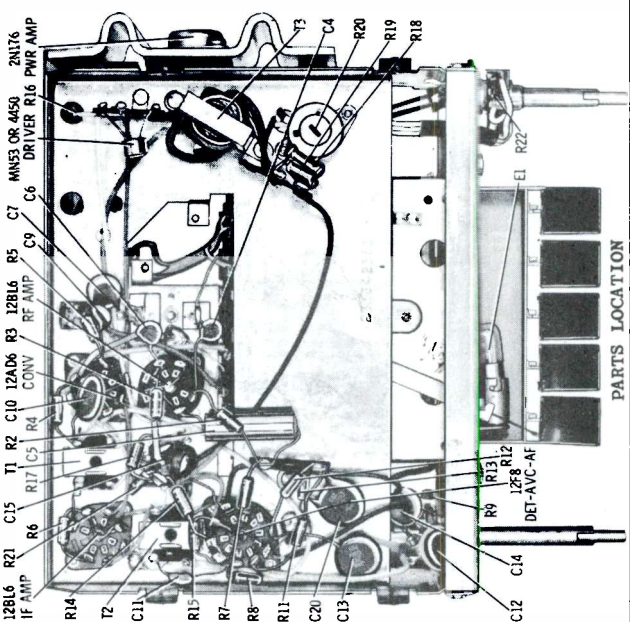
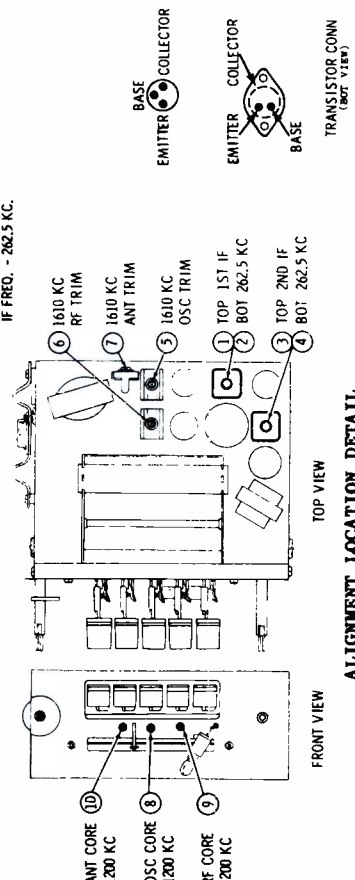
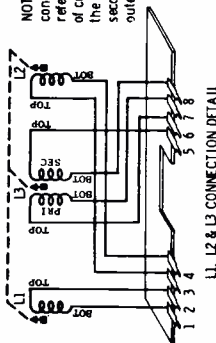
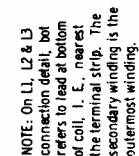
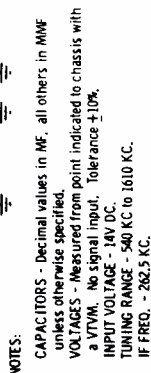
MODEL
CA61X



ALIGNMENT POINTS LOCATION DETAIL



MODEL
OEA61X

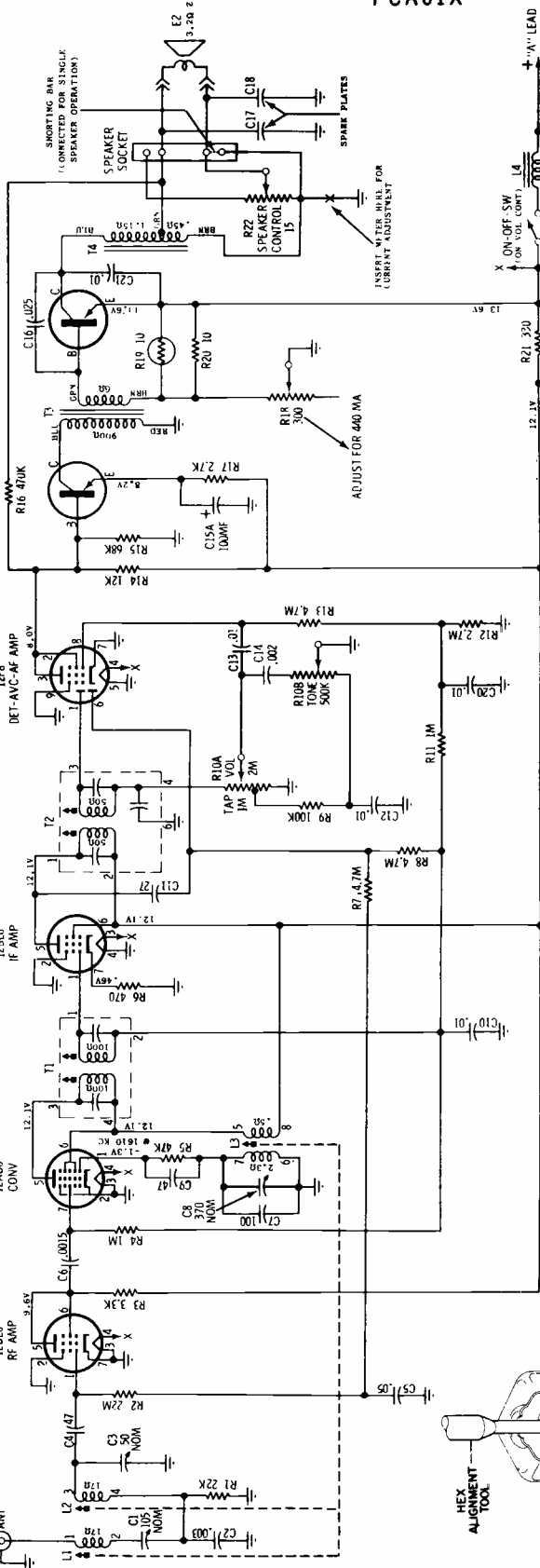


MOTOROLA

MODEL
PCA61X

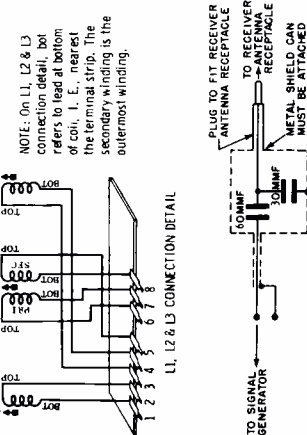
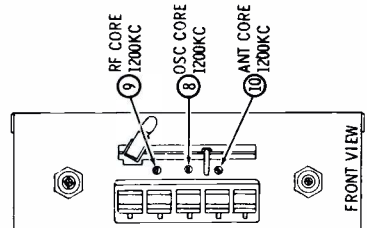
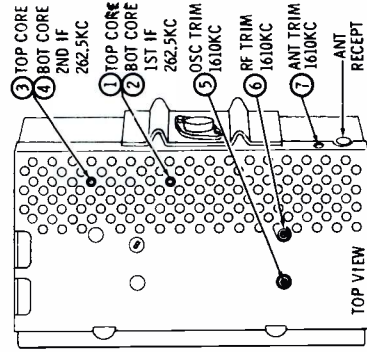
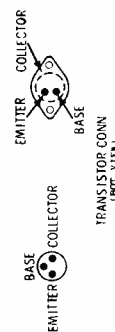
2N176
PWF AMP

MIN-53 OR 4450
DRIVER



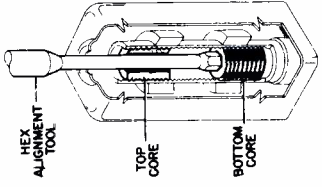
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

NOTES:
CAPACITORS - Decimal values in MF, all others in MMF unless otherwise specified.
VOLTAGES - Measured from point indicated to chassis with a VTVM. No signal input. Tolerance $\pm 10\%$.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540 KC to 1610 KC.
IF FREQ. - 262.5 KC.



NOTE: On L1, L2 & L3 connection detail, bot refers to lead at bottom of coil, i. e., nearest the terminal strip. The secondary winding is the outermost winding.

IF ALIGNMENT
DETAIL



PARTS LOCATION
MOTOROLA Auto Radio Model PCA61X

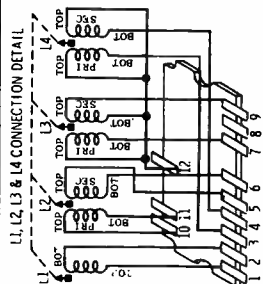
ALIGNMENT LOCATION DETAIL

MOTOROLA

auto radio CTA62 CTM62

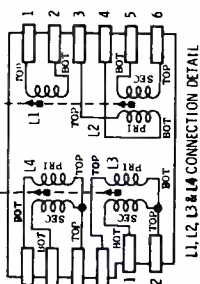
Automotive all transistor super-heterodyne receivers designed for custom installation in all 1962 Chevrolet automobiles except the Chevy II & Corvair series.

INFORMATION

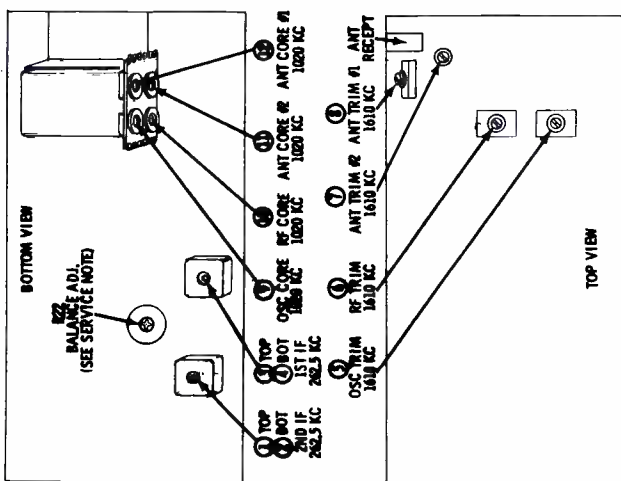


CTA62 DIAGRAM

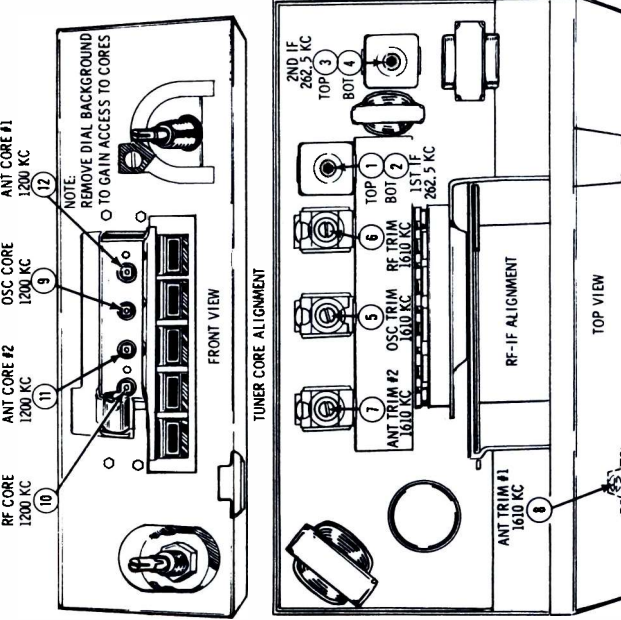
NOTE: ON L1, L2, L3 & L4 CONNECTION DETAIL, BOT REFERS TO LEAD AT BOTTOM OF COIL, I.E., NEAREST THE TERMINAL STRIP. THE SECONDARY WINDING IS THE OUTERMOST WINDING.



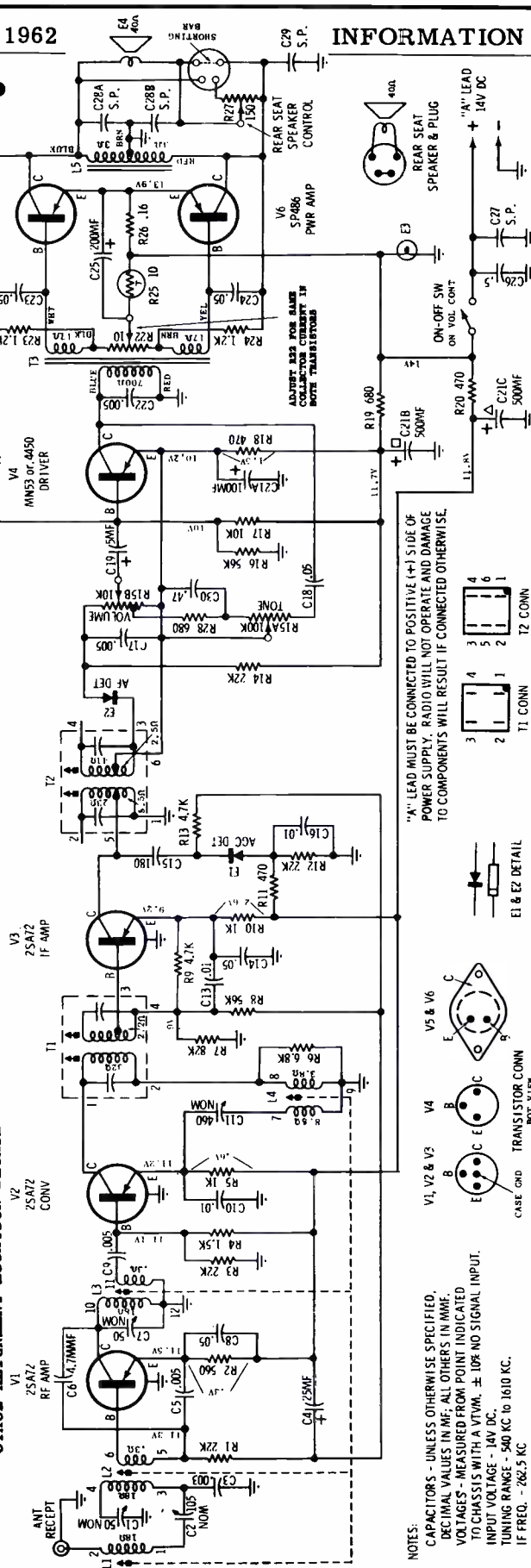
CTM62 DIAGRAM



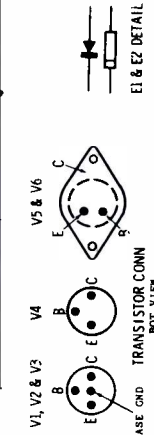
CTM62 ALIGNMENT LOCATION DETAIL



CTA62 ALIGNMENT LOCATION DETAIL



"X" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

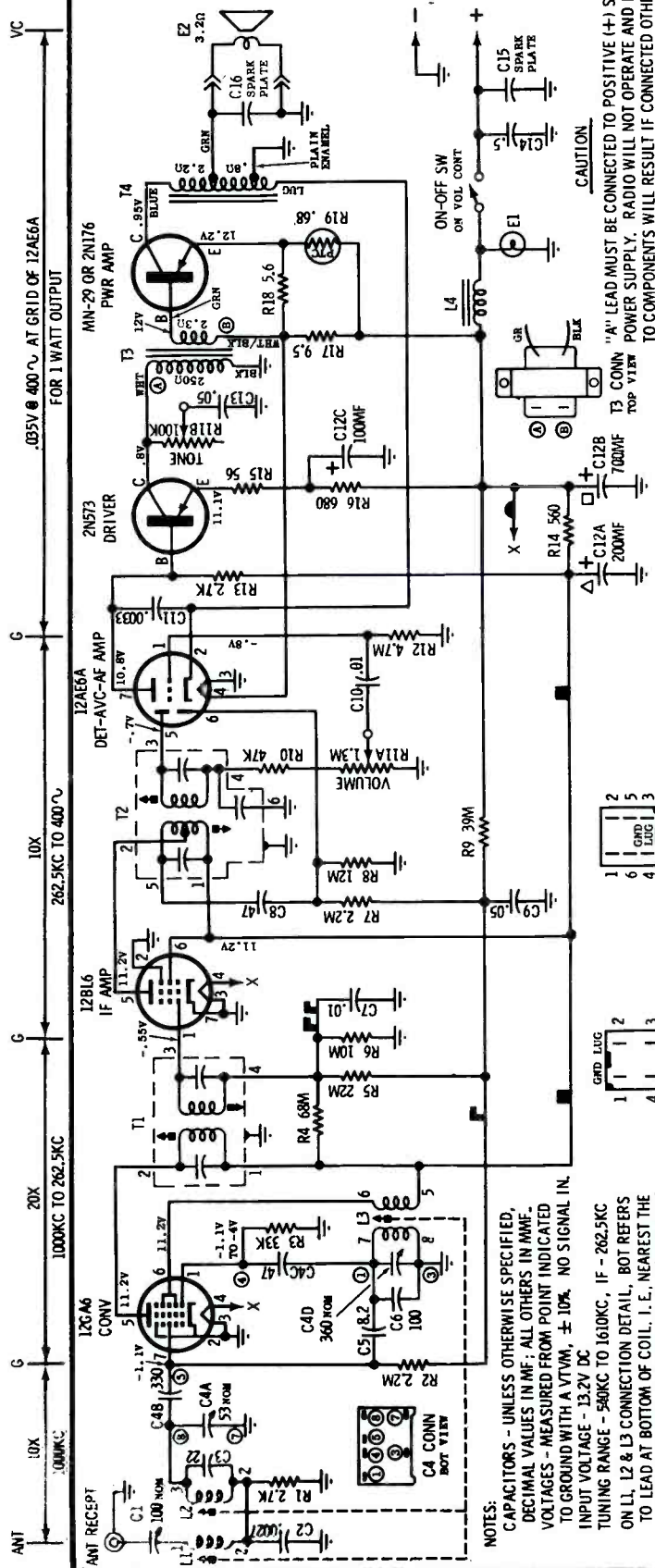


NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM, $\pm 10\%$ NO SIGNAL INPUT.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540 KC TO 1610 KC.
IF FREQ. - 262.5 KC

MOTOROLA

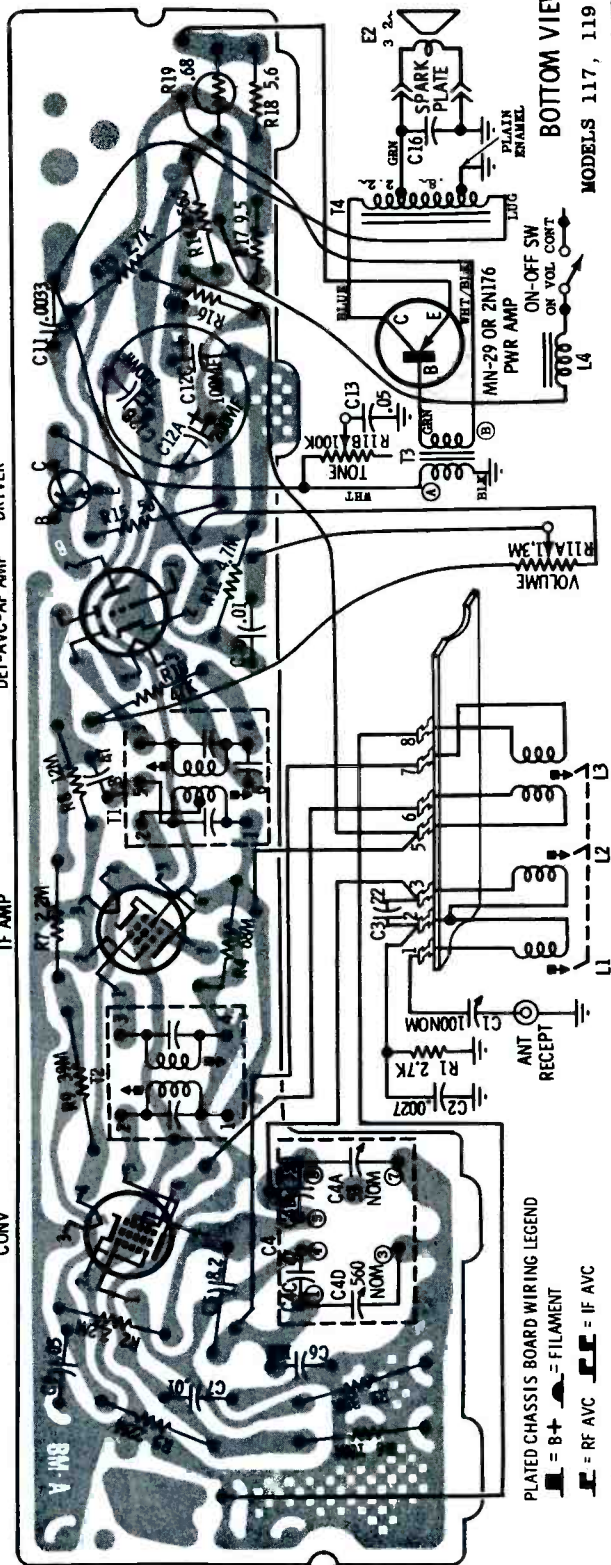
auto radio

MOPAR 117,119,120



CAUTION

"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.



PLATED CHASSIS BOARD WIRING LEGEND

B+ = FILAMENT

 $\mathbf{F} = \mathbf{R} \mathbf{F} \mathbf{A} \mathbf{V} \mathbf{C} \quad \mathbf{F} \mathbf{F} = \mathbf{I} \mathbf{F} \mathbf{A} \mathbf{V} \mathbf{C}$

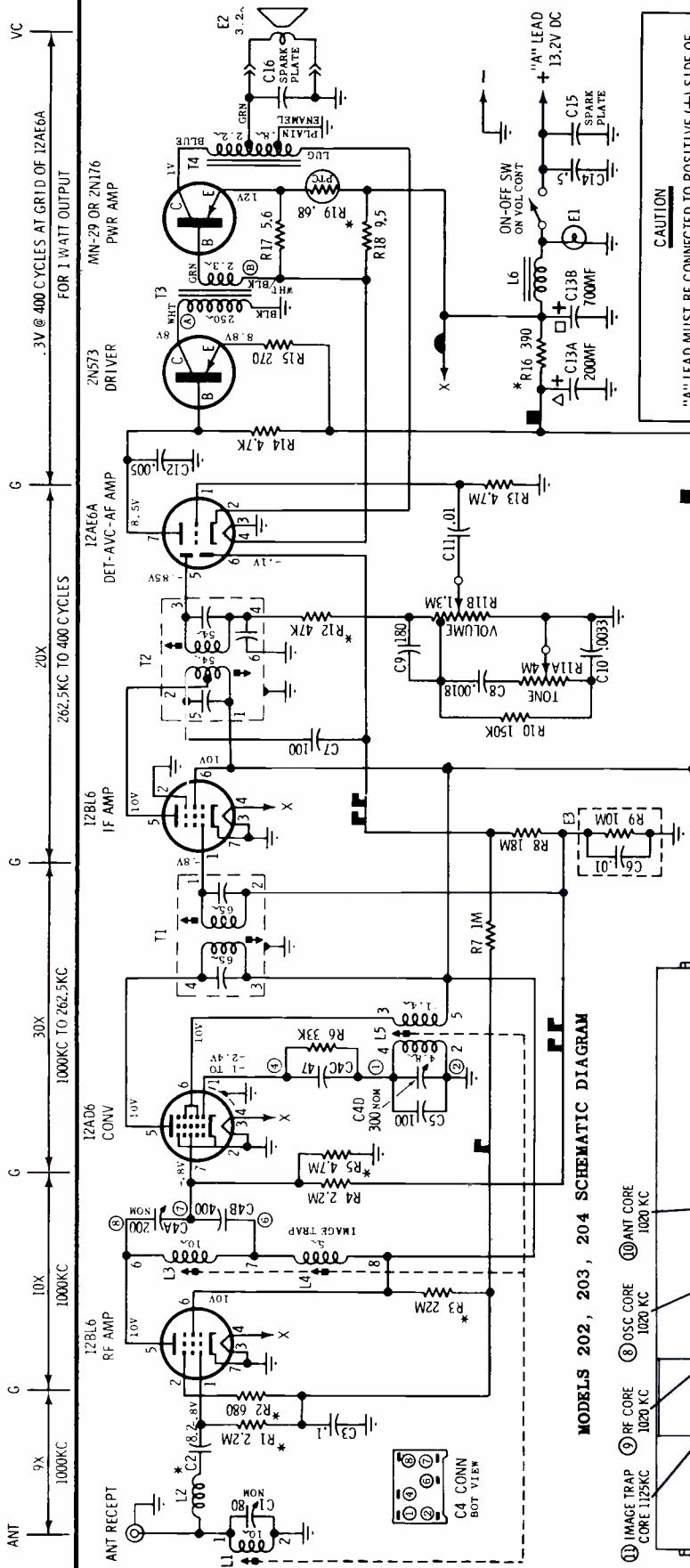
BOTTOM VIEW

MODELS 117, 119, 120

MOTOROLA

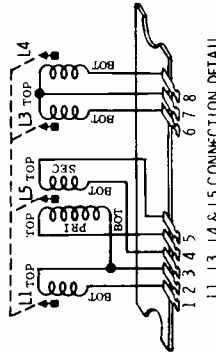
auto radio

MOPAR 202,203,204

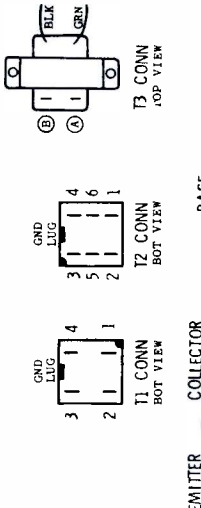


CAUTION
 "A1" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

PLATED CHASSIS BOARD WIRING LEGEND
 ■ = B+ ■ = FIL ■ = RF AVC ■ = IF & CONV AVC



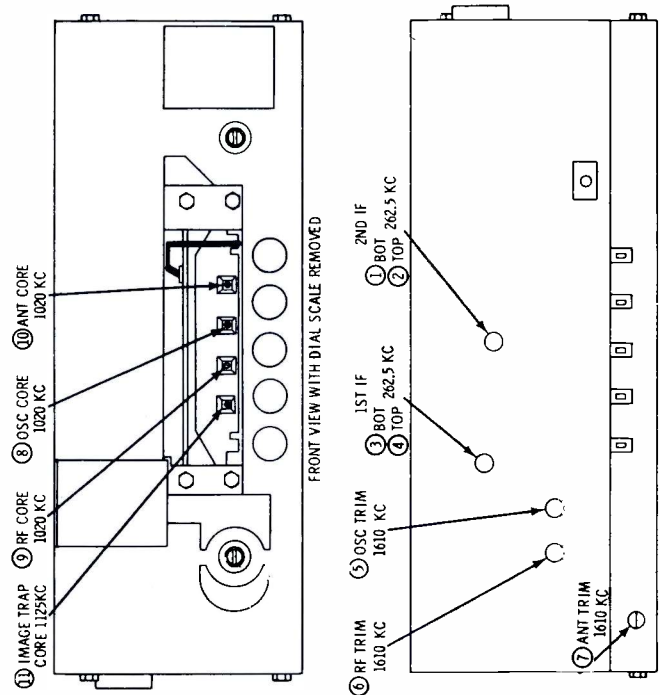
ON L1, L3, L4 & L5 CONNECTION DETAIL, BOT REFERS TO LEAD AT BOTTOM OF COIL, I.E., NEAREST THE TERMINAL STRIP. THE SECONDARY WINDING IS THE OUTERMOST WINDING.



* THESE VALUES ARE NOMINAL. EXACT VALUE DETERMINED BY PRODUCTION REQUIREMENTS. WHEN SERVICING REPLACE WITH VALUE REMOVED.

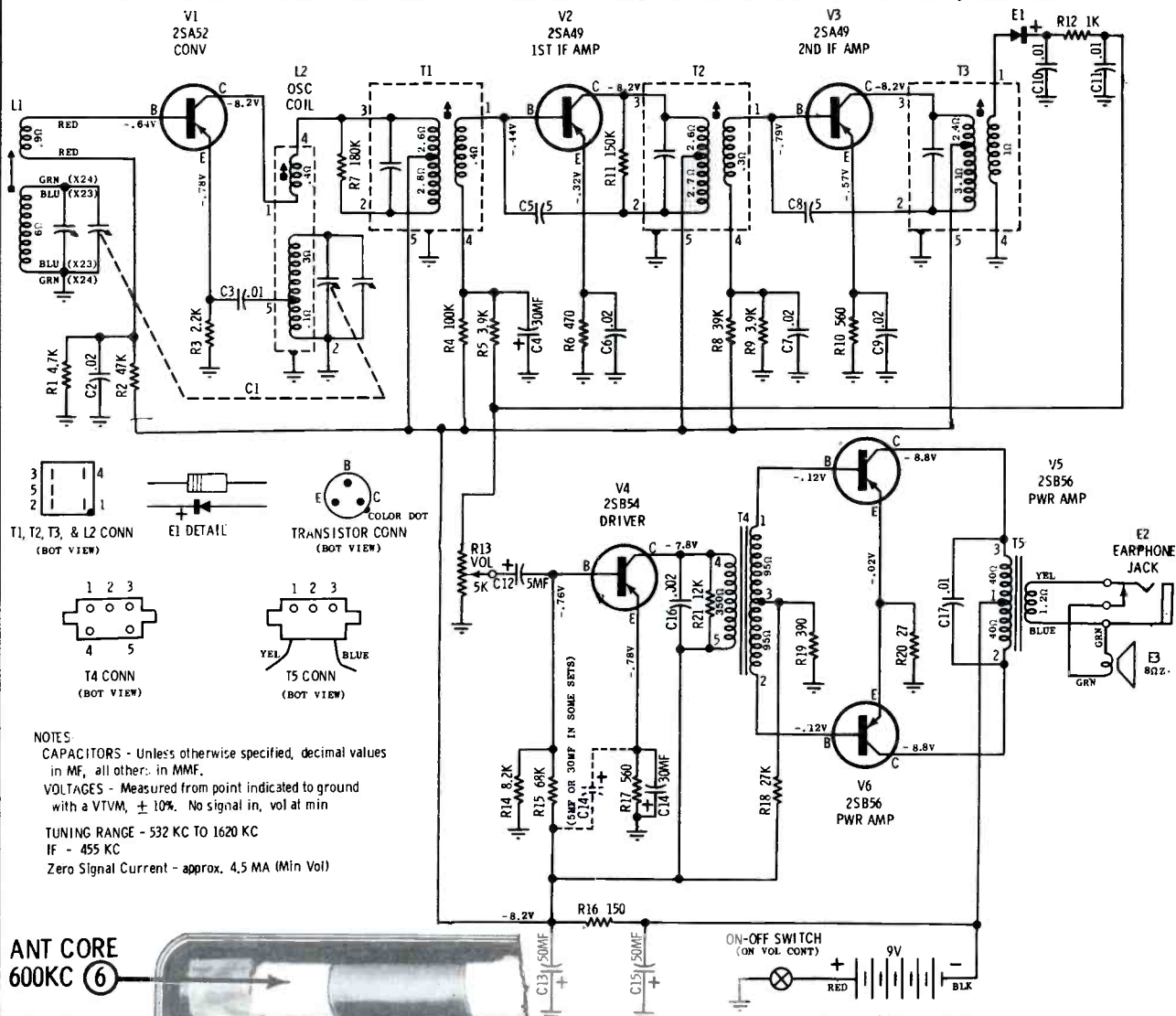
NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF, ALL OTHERS IN MMF.
 VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM. $\pm 10\%$ NO SIGNAL IN.
 INPUT VOLTAGE - 13.2V DC.
 TUNING RANGE - 540 KC TO 1610 KC.
 IF FREQ. - 262.5 KC.

MODELS 202, 203, 204 SCHEMATIC DIAGRAM



MODELS 202, 203, 204 ALIGNMENT LOCATION DETAIL

MOTOROLA Models X 23, X 24, Chassis HS-880, HS-881



ANT CORE
600KC (6)

OSC TRIM
1620KC (4)

ANT TRIM
1400KC (5)

1ST IF
455KC (3)

OSC CORE
532KC (7)

2ND IF
455KC (2)

3RD IF
455KC (1)

CHASSIS REMOVAL

1. Remove tuning knob mounting screw (from front of radio), remove cabinet back & 1 chassis mtg screw located next to tuning gang.
2. Spread cabinet slightly at sides until chassis is free from its 4 chassis retainers (part of cabinet). Lift chassis up until it clears the retainers.
3. If necessary, unsolder all chassis connecting leads. If it becomes necessary to remove the earphone jack, unscrew the earphone jack mtg nut (a special tool is available - order Part No. 66A646211).

POWER SUPPLY

Operates from one 9-volt battery; use Eveready 206 or equivalent. Battery Drain - 3.5 to 5.5 ma with no input signal and volume at minimum level. To measure battery drain, turn radio off & connect a milliammeter across the terminals of the on-off switch; the meter should read 3.5 to 5.5 ma.

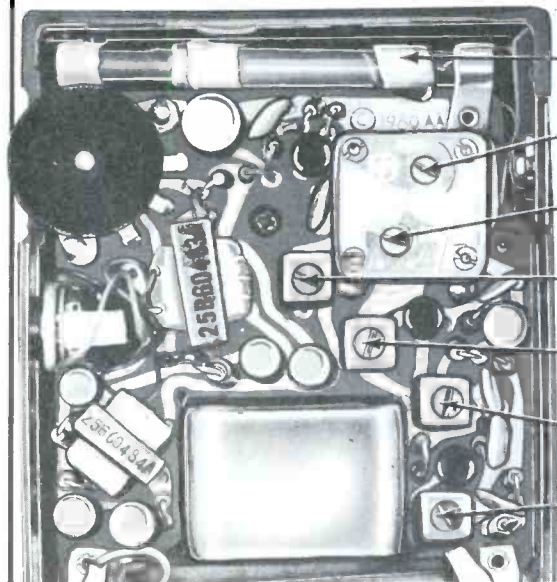
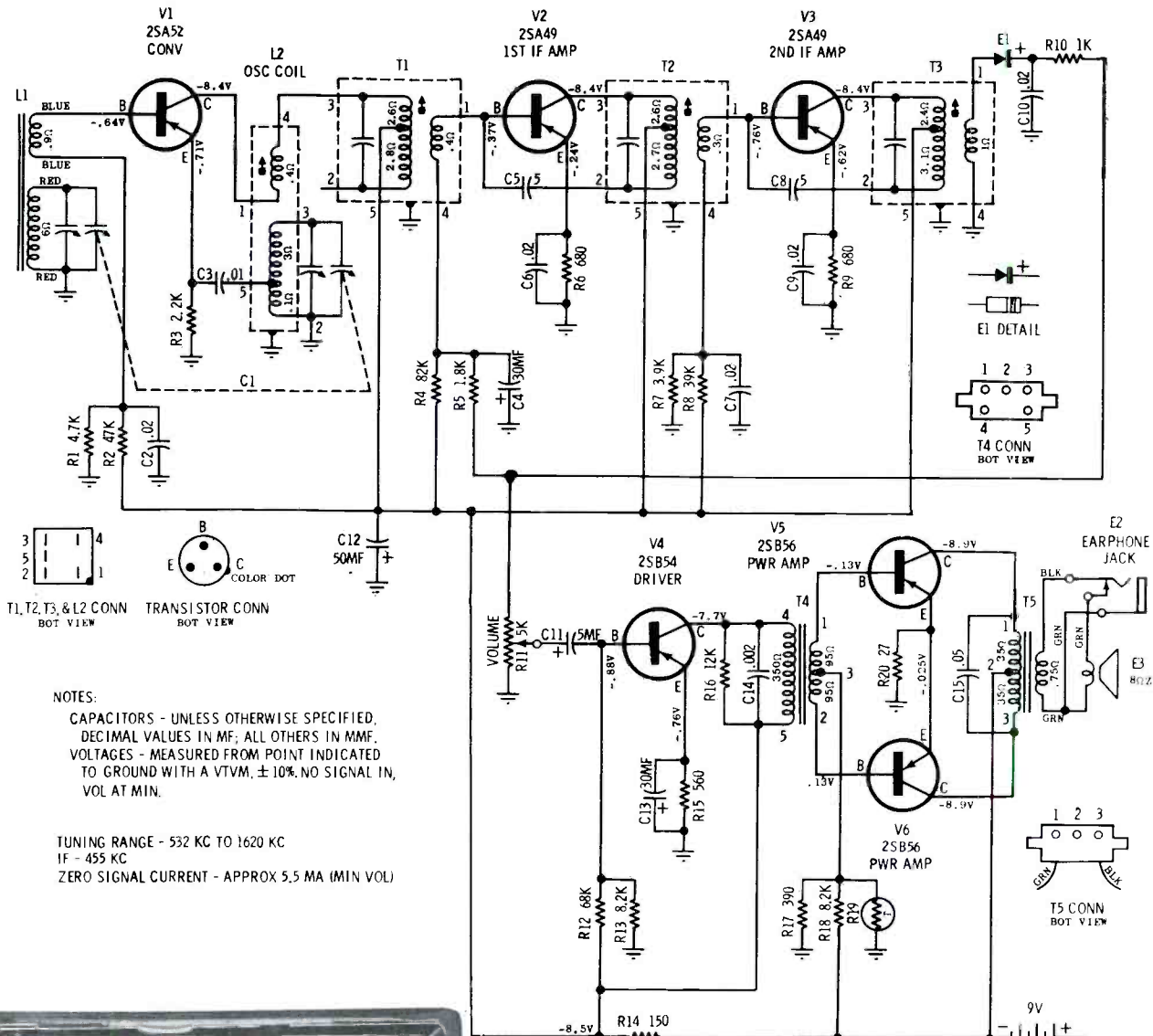
MOTOROLA

MODEL

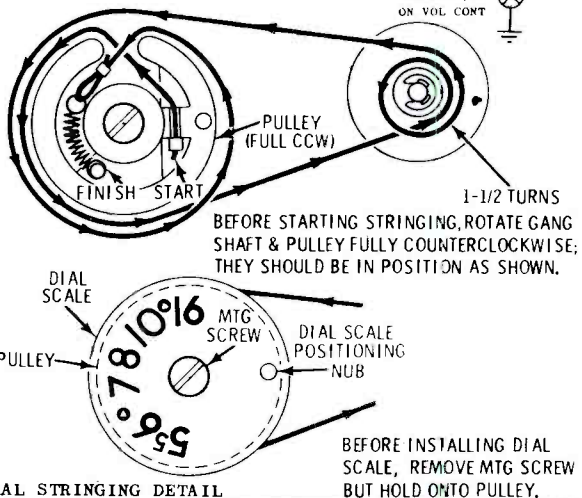
X 25

CHASSIS

HS-882



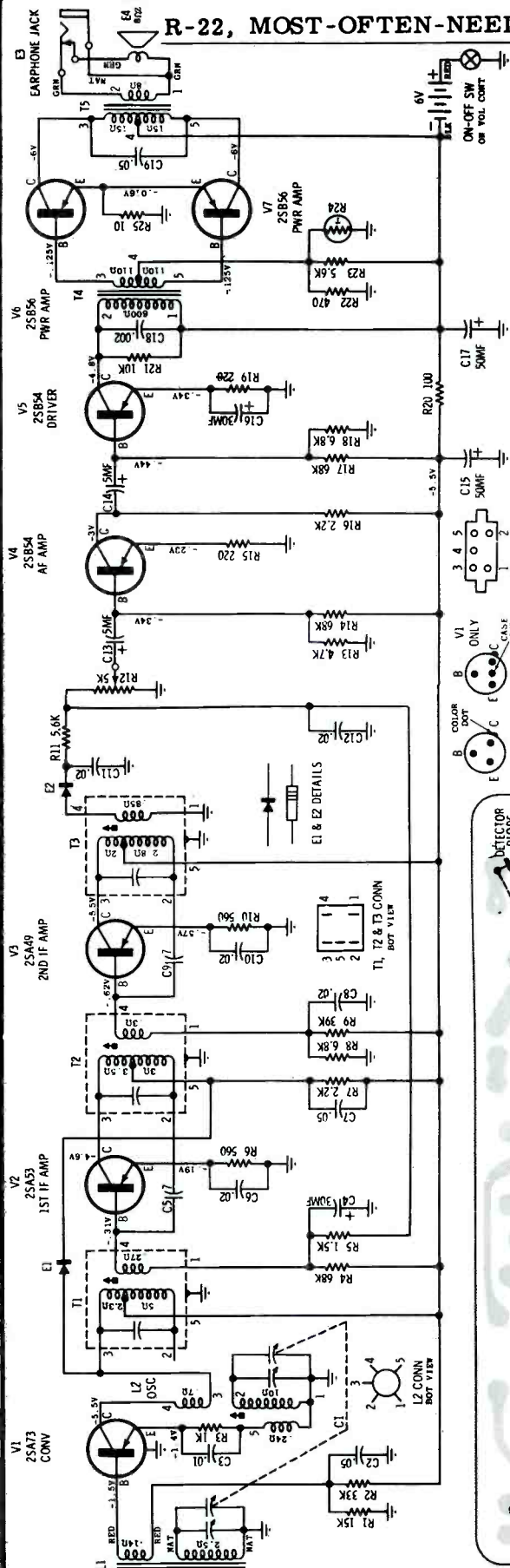
ALIGNMENT POINT LOCATIONS



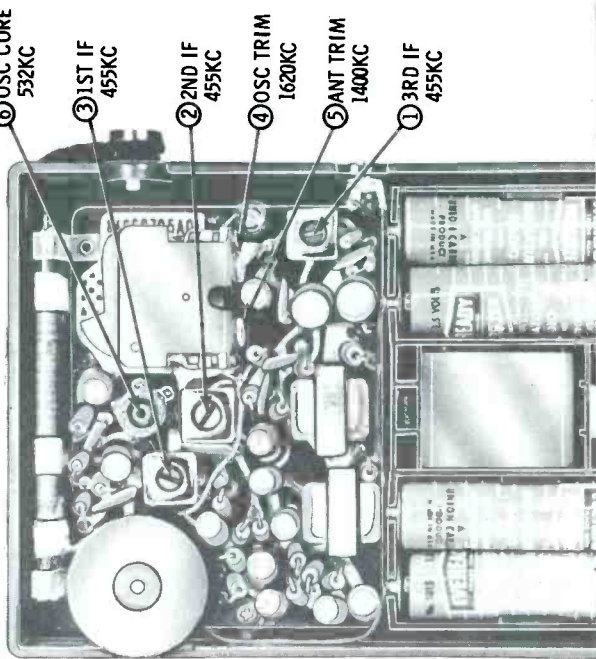
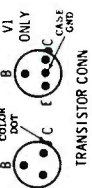
R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

MOTOROLA

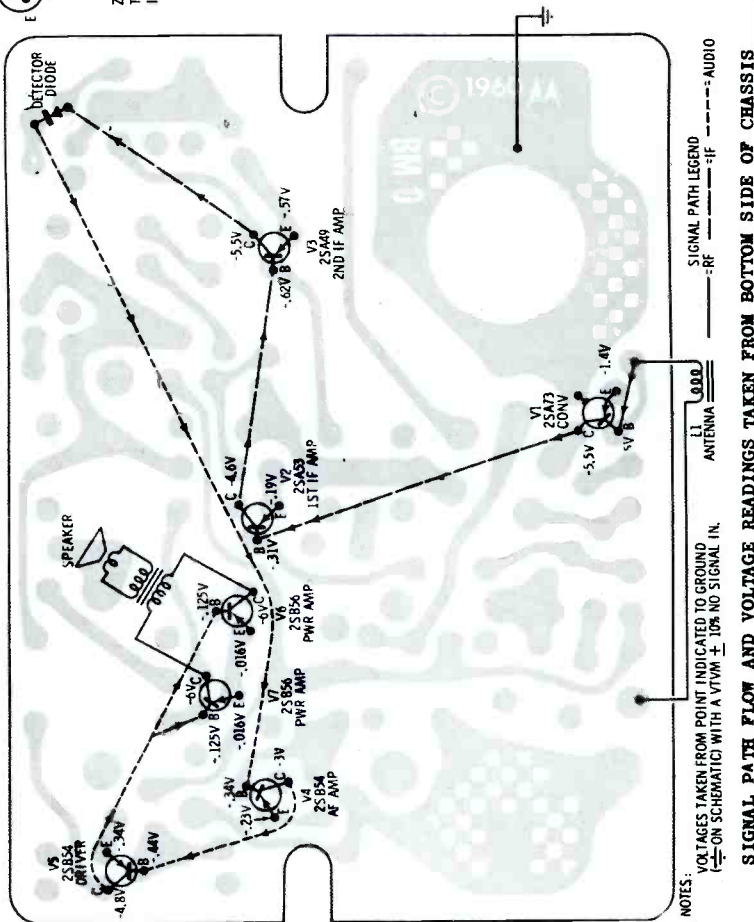
MODEL CHASSIS
X 26 HS-883



NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED,
DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
VOLTAGES - MEASURED FROM POINT INDICATED
TO GROUND WITH A VTVM $\pm 10\%$ NO SIGNAL IN,
VOL. AT MIN.
ZERO SIGNAL CURRENT - APPROX. 8.0 MA (MIN VOL)
TUNING RANGE - 535 TO 1620 KC
IF - 455 KC



ALIGNMENT POINT LOCATIONS

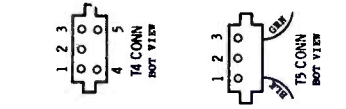
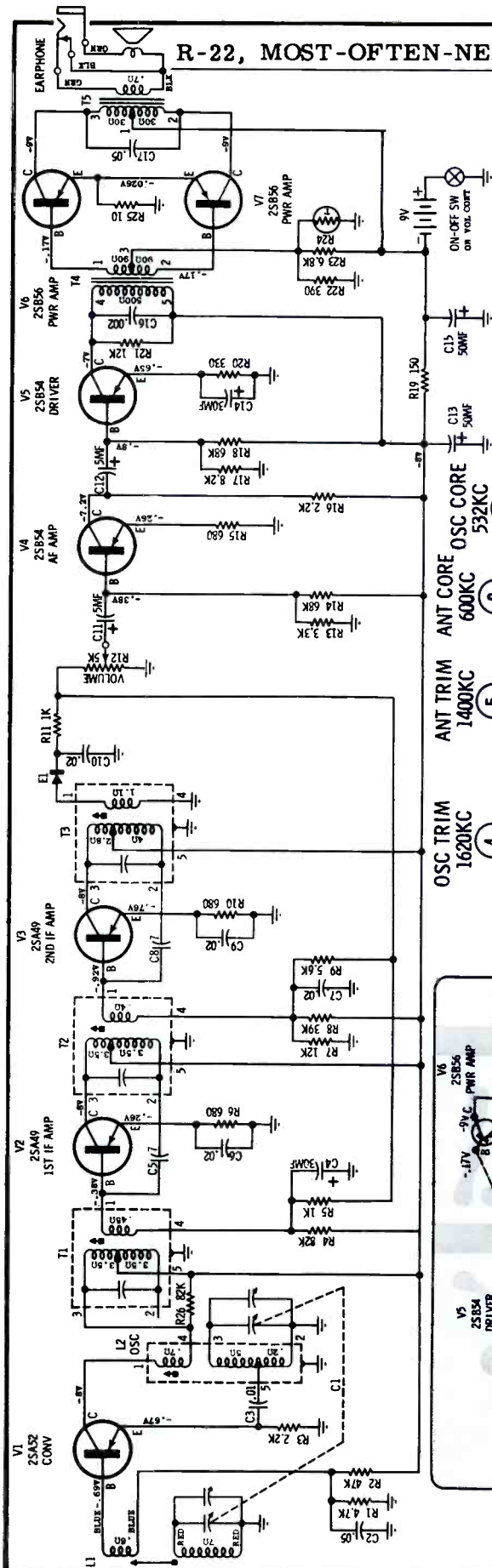


NOTES:
VOLTAGES TAKEN FROM POINT INDICATED TO GROUND
(--- ON SCHEMATIC) WITH A VTVM $\pm 10\%$ NO SIGNAL IN.
SIGNAL PATH LEGEND
--- RF --- IF --- AUDIO
ANTENNA

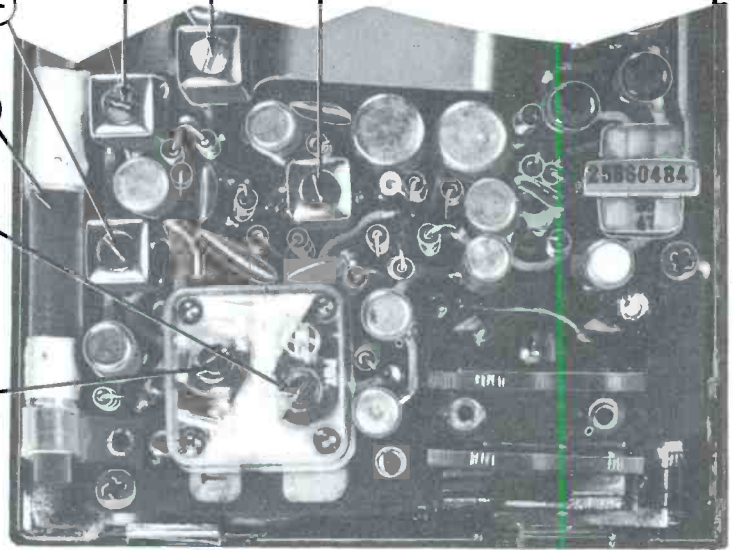
R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

MOTOROLA

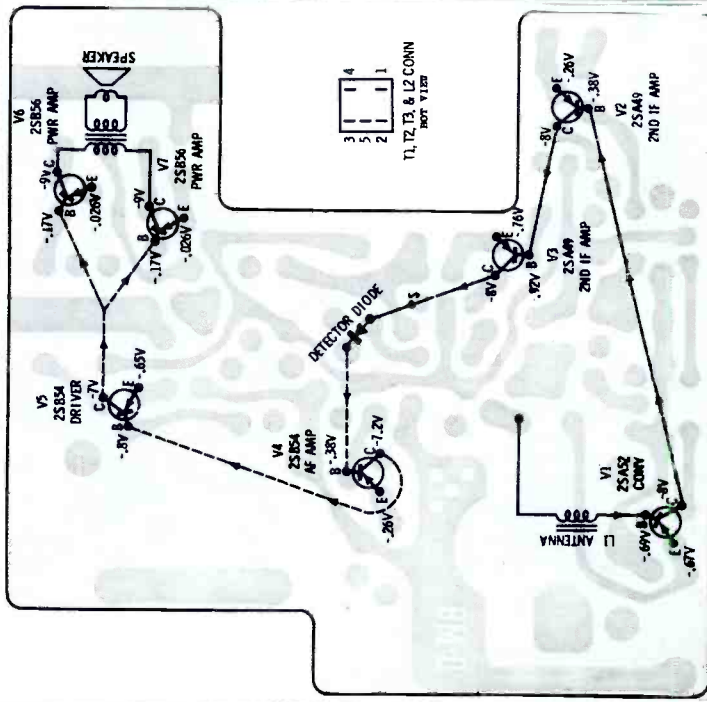
MODEL CHASSIS
X27 HS-915



NOTES:
CAPACITORS - Unless otherwise specified, decimal values in MF, all others in MWF.
VOLTAGES - Measured from point indicated to ground with a VTVM, $\pm 10\%$. No signal in, v_0 at min.
TUNING RANGE - 532 KC TO 1620 KC
IF - 455 KC
Zero Signal Current - approx. 6.5 MA (Min Vol)



ALIGNMENT POINT LOCATIONS



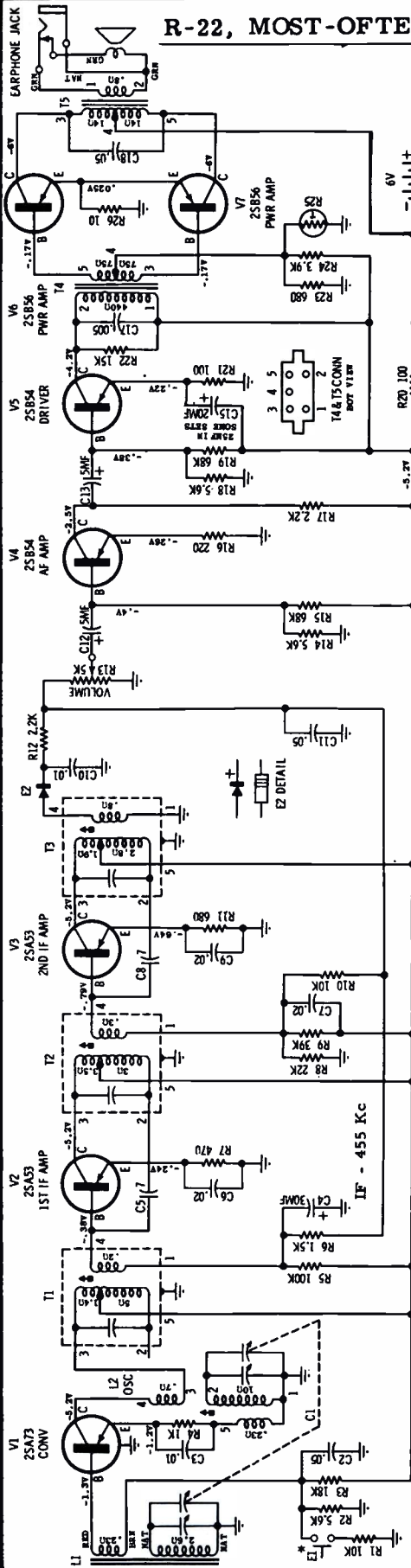
NOTES:
VOLTAGES - TAKEN FROM POINT INDICATED TO GROUND
($\frac{1}{2}$ ON SCHEMATIC) WITH A VTVM, $\pm 10\%$. NO SIGNAL IN.
SIGNAL PATH LEGEND: --- RF --- IF --- AUDIO
SIGNAL PATH FLOW AND VOLTAGE READINGS TAKEN FROM BOTTOM

R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

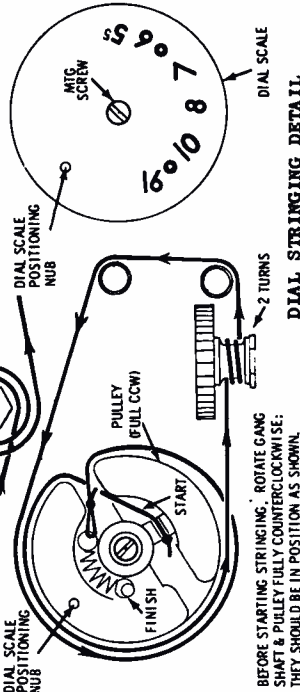
MOTOROLA

MODEL
X28

CHASSIS
HS-884

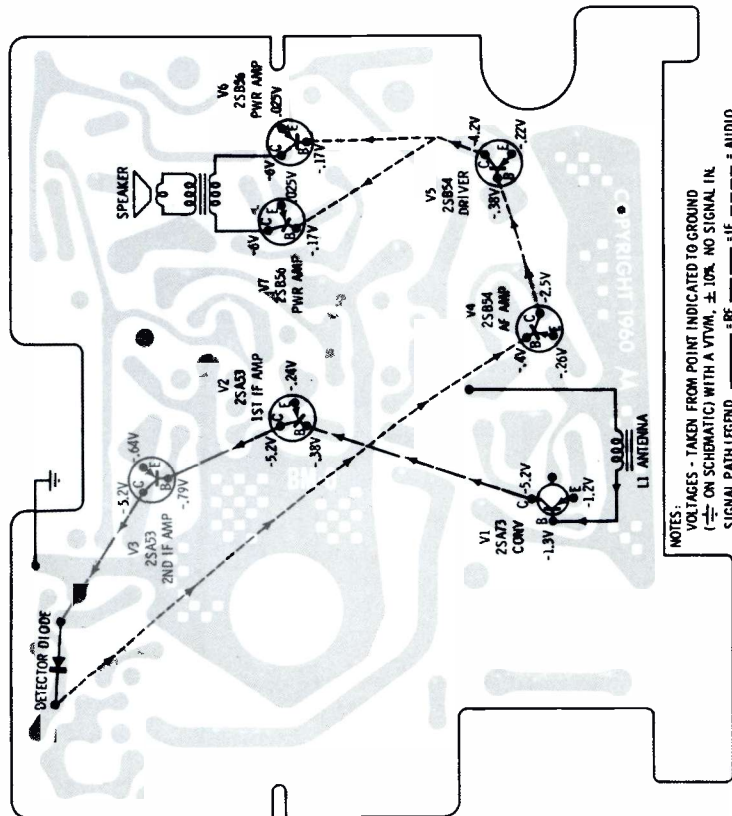


NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
VOLTAGES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM, $\pm 10\%$, NO SIGNAL IN, VOL AT MIN.
* ZERO SIGNAL CURRENT - APPROX 12 MA (MIN VOL)
* PUSHBUTTON SWITCH (BATTERY LIFE INDICATOR) IS LOCATED ON FRONT OF RADIO - PUSH TO CLOSE.
TUNING RANGE - 532 KC TO 1620 KC
IF - 455 KC



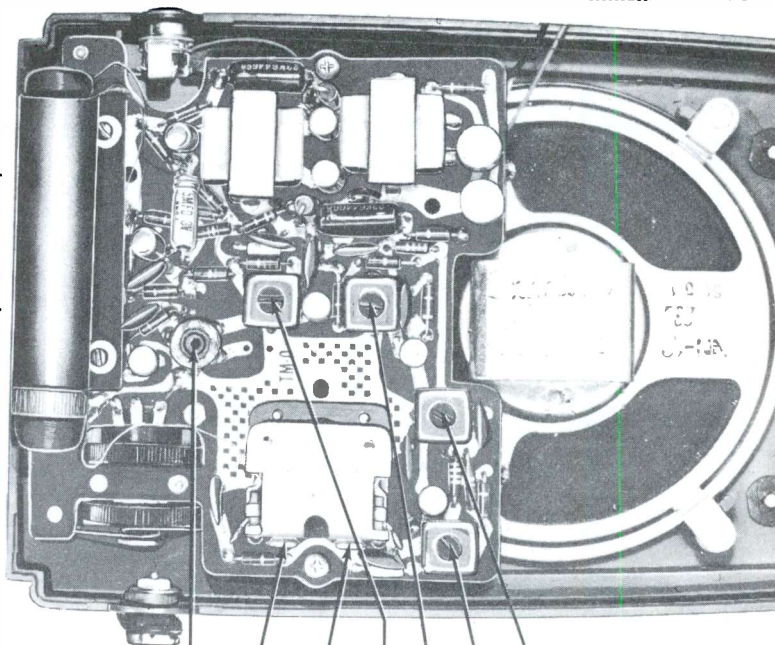
CHASSIS REMOVAL

1. Remove 3 cabinet mounting screws (2 are located under carrying strap; the other on bottom of cabinet).
2. Lift out bezel, escutcheon & chassis as an assembly.
3. Remove 3 chassis mounting screws & lift up chassis.
4. If necessary, unsolder all chassis connecting leads. If it becomes necessary to remove the earphone jack unscrew the earphone jack mtg nut (a special tool is available - order Part No. 66A646211).

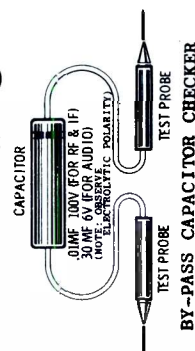


MOTOROLA

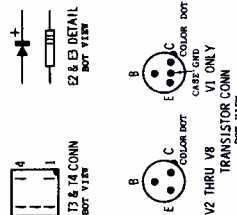
ALIGNMENT POINT LOCATIONS



- OSC CORE 600KC 7
ANT TRIM 1400KC 6
OSC TRIM 1620KC 5
1ST IF 455KC 4
2ND IF 455KC 3
4TH IF 455KC 1
BRD IF 455KC 2

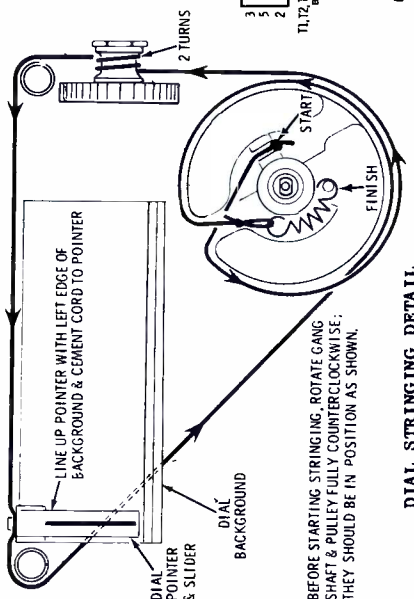


BY-PASS CAPACITOR CHECKER



NOTES:

- CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN M μ ; ALL OTHERS IN MMF.
- VOLTAGES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM, $\pm 10\%$; NO SIGNAL IN, VOL AT MIN.
- ZERO SIGNAL CURRENT - APPROX 0.5MA (MIN VOL)
- PUSHBUTTON SWITCH (BATTERY LIFE INDICATOR) IS LOCATED ON FRONT OF RADIO - PUSH TO CLOSE.
- TUNING RANGE - 532 KC TO 1620 KC



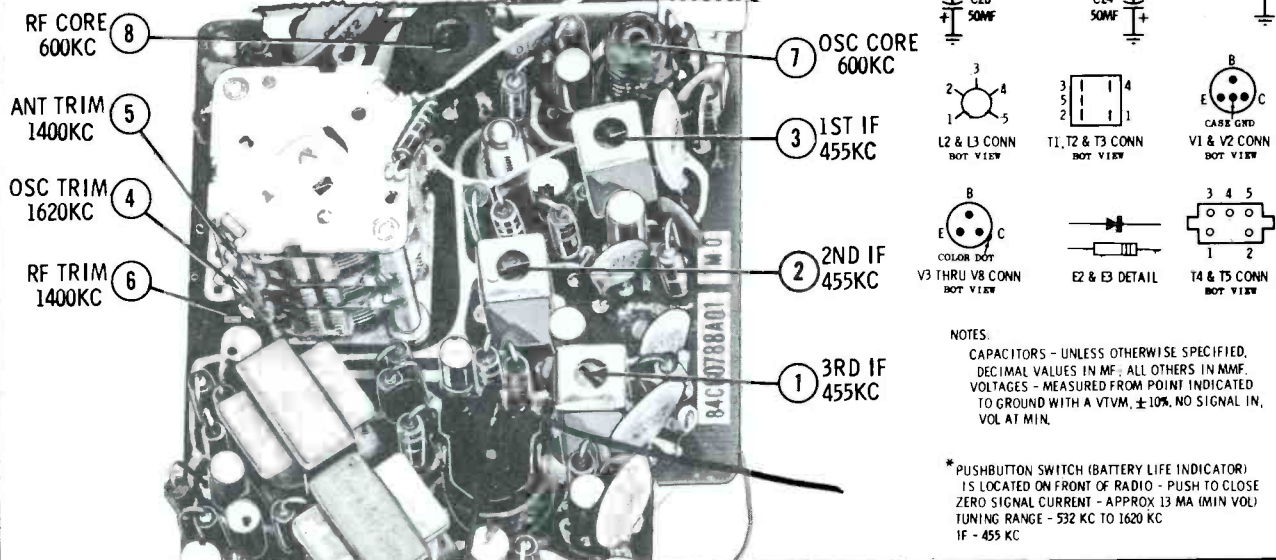
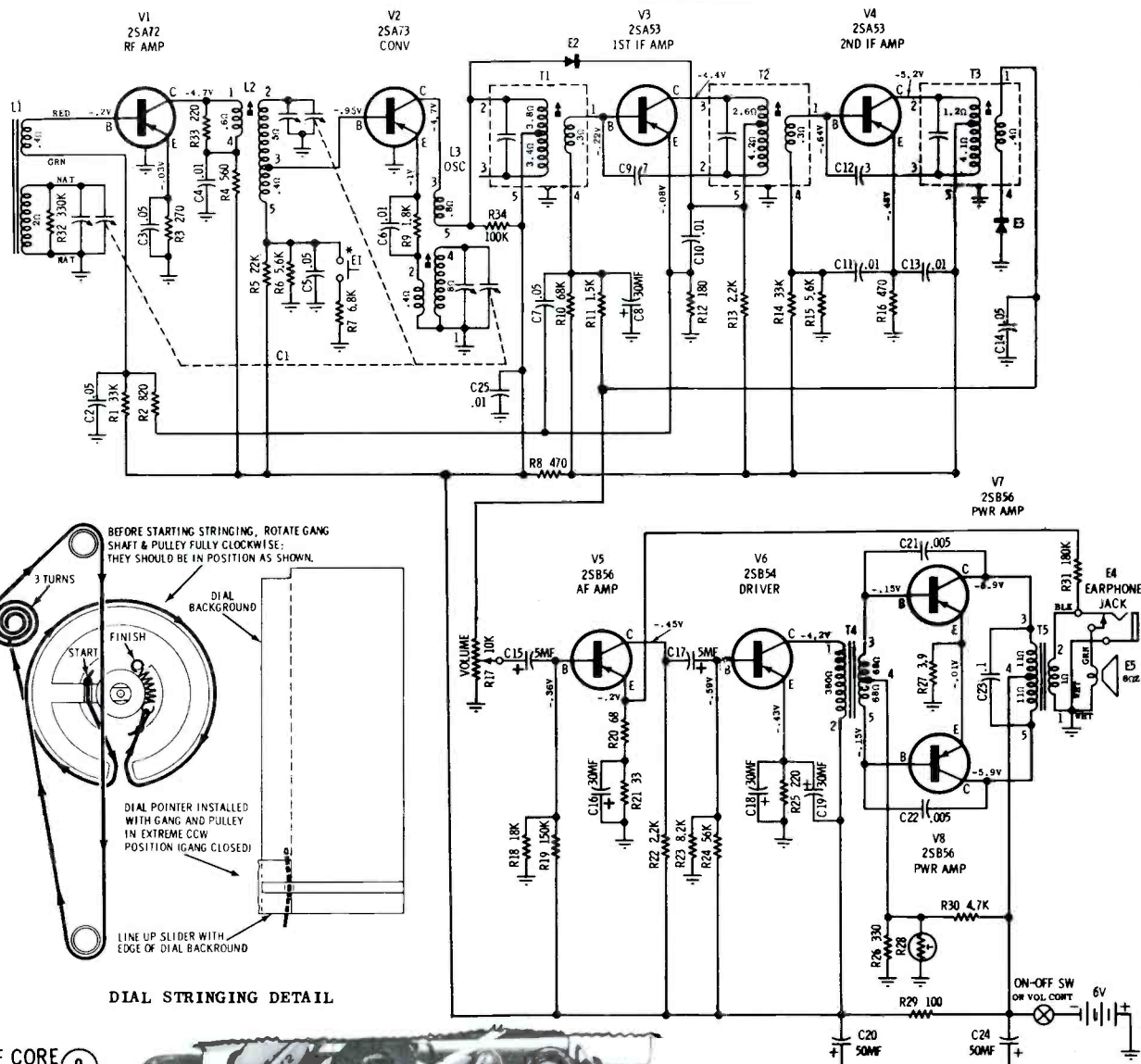
CHASSIS REMOVAL

1. Rotate cabinet stand (on bottom of cabinet) out of way, then insert coin into slot on cabinet bottom & twist in either direction; lift off battery compartment cover.
2. Remove 1 cabinet back mounting screw (at bottom of battery compartment) & lift up cabinet back.
3. Remove 2 chassis mounting screws & lift up chassis.
4. If necessary, unsolder all chassis connecting leads. If it becomes necessary to remove the earphone jack, unscrew the earphone jack mtg nut (a special tool is available - order Part No. 66A645611).

MOTOROLA

MODEL CHASSIS

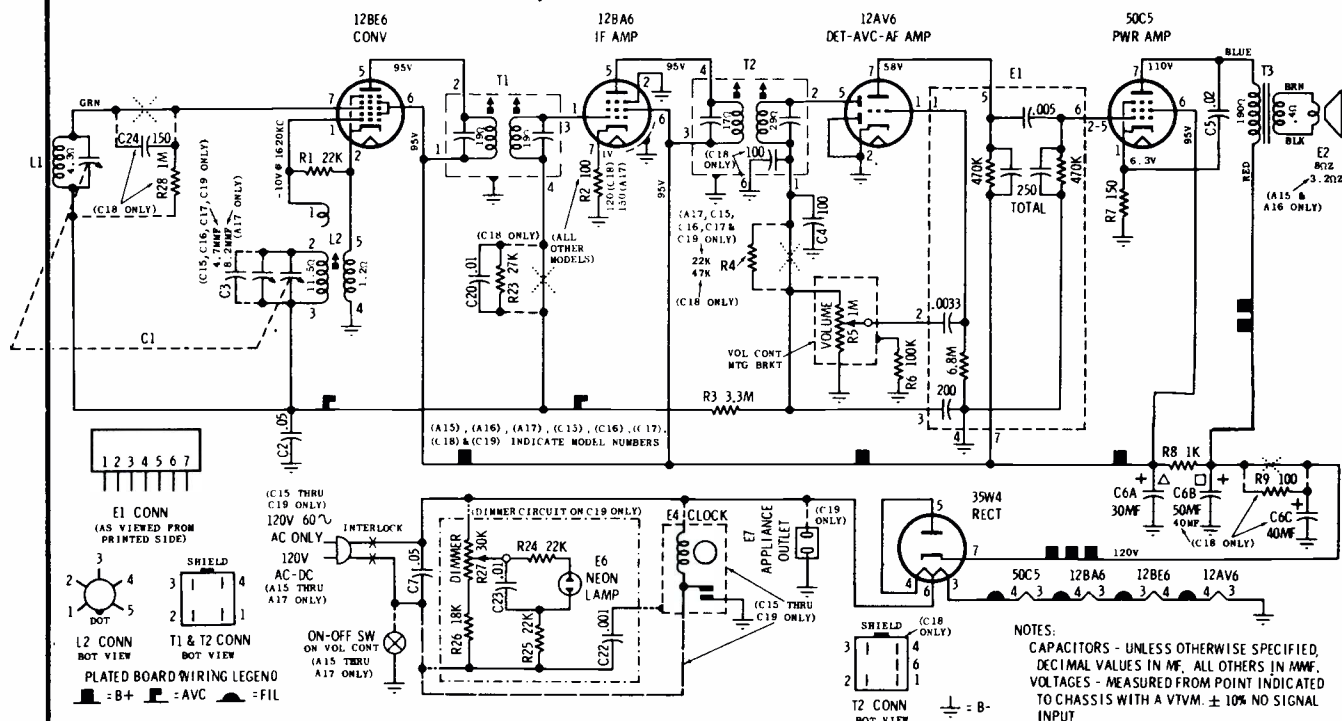
X31 HS-894



VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

MOTOROLA

Models: A15, A16, - A17, - C15, C16, C17, - C18, - C19
Chassis: HS-744, - HS-922, - HS-939, - HS-813, - HS-938



CHASSIS REMOVAL

MODEL A15, A16

1. Remove cabinet back - 2 screws hold it in place.
2. Remove chassis mtg. screw at base of chassis.
3. Pull off volume knob ONLY (Do not pull captivated tuning knob).
4. From front, unscrew palnut under volume control knob.
5. Unsolder appropriate leads to slide chassis out of tuning knob & cabinet.

MODEL A17, C15, C16, C17

1. Remove cabinet back - 2 screws hold it in place.
2. Pull off volume & tuning knobs.
3. From rear, remove chassis mtg. screw located on volume control mounting bracket.
4. Unsolder appropriate leads to slide chassis from cabinet.

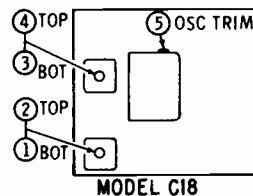
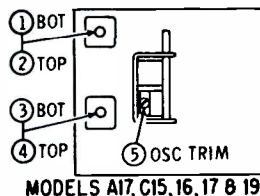
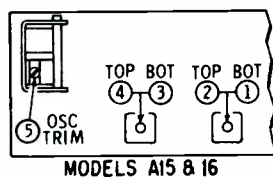
MODEL C18

1. Remove cabinet back - 2 screws hold it in place.
2. Pull off volume & tuning knobs.
3. From front, unscrew palnut under volume control knob.
4. Unsolder antenna leads.
5. Remove 3 chassis mtg. screws.
6. Unsolder appropriate leads to slide chassis from cabinet.

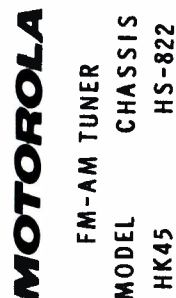
ALIGNMENT

Use an isolation transformer between the power line and the receiver. If not available, connect low side of generator to B- through a .1 mf capacitor. Connect a low range output meter across speaker voice coil and set volume control to max. Attenuate generator output to maintain 50 milliwatts on output meter to prevent overloading. (50 milliwatts is 40 volts across 3.2 ohm output (A15-A16) or .64 volts across 8 ohm output (A17, C15 to C19)).

STEP	GENERATOR CONNECTION	GENERATOR FREQ. (400 cycle mod)	GANG SETTING	ADJUST	REMARKS
A15 to A17 C15 to C19					
IF ALIGNMENT					
1	Grid of conv (Pin 7 12BE6) thru .1 mf & B-	455 Kc	Fully opened	1, 2, 3 & 4	Adjust for max.
RF ALIGNMENT					
2	"	1620 Kc	Fully opened	5	Adjust for max.

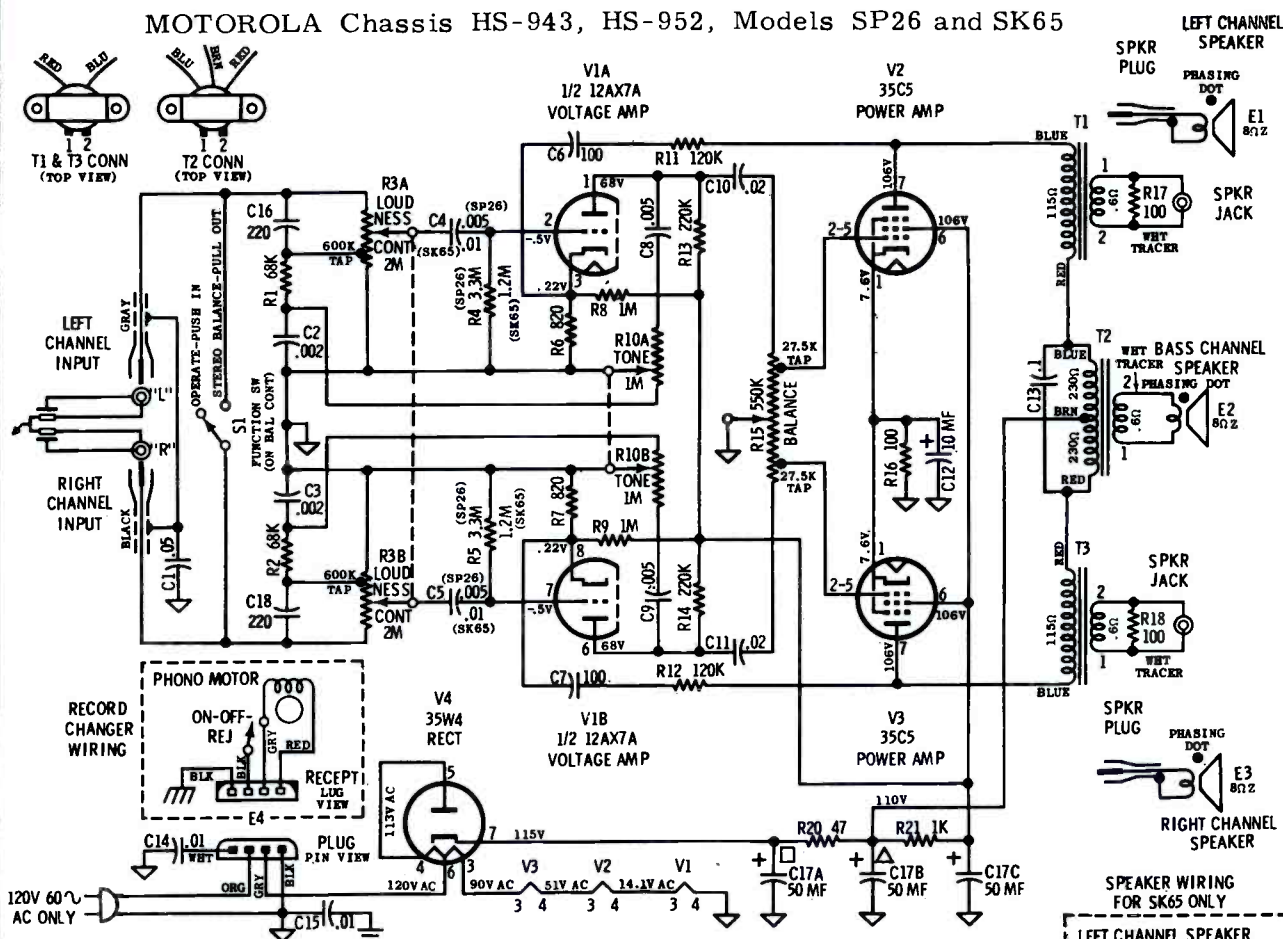


MOTOROLA FM-AM Tuner, Model HK45, Chassis HS-822



VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

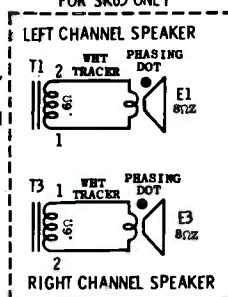
MOTOROLA Chassis HS-943, HS-952, Models SP26 and SK65



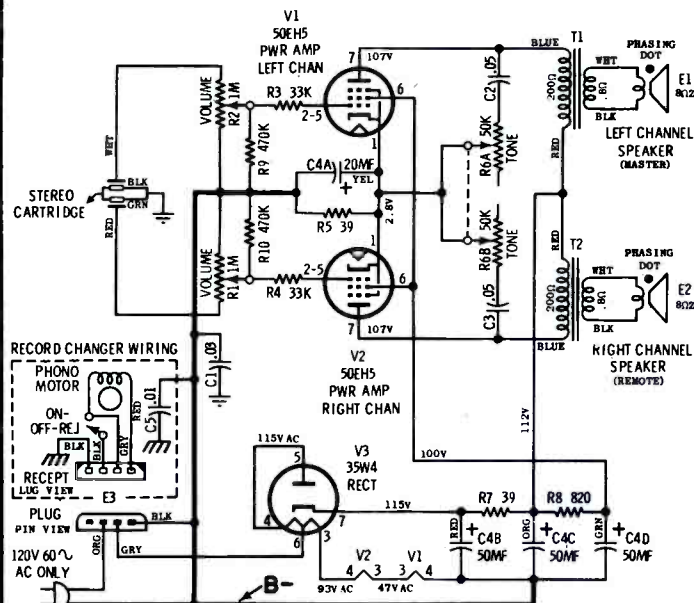
NOTES:

CAPACITORS - Unless otherwise specified, decimal values in MF; all others in MMF.
 VOLTAGES - Measured from point indicated to B- with a VTVM, $\pm 10\%$. No signal in.

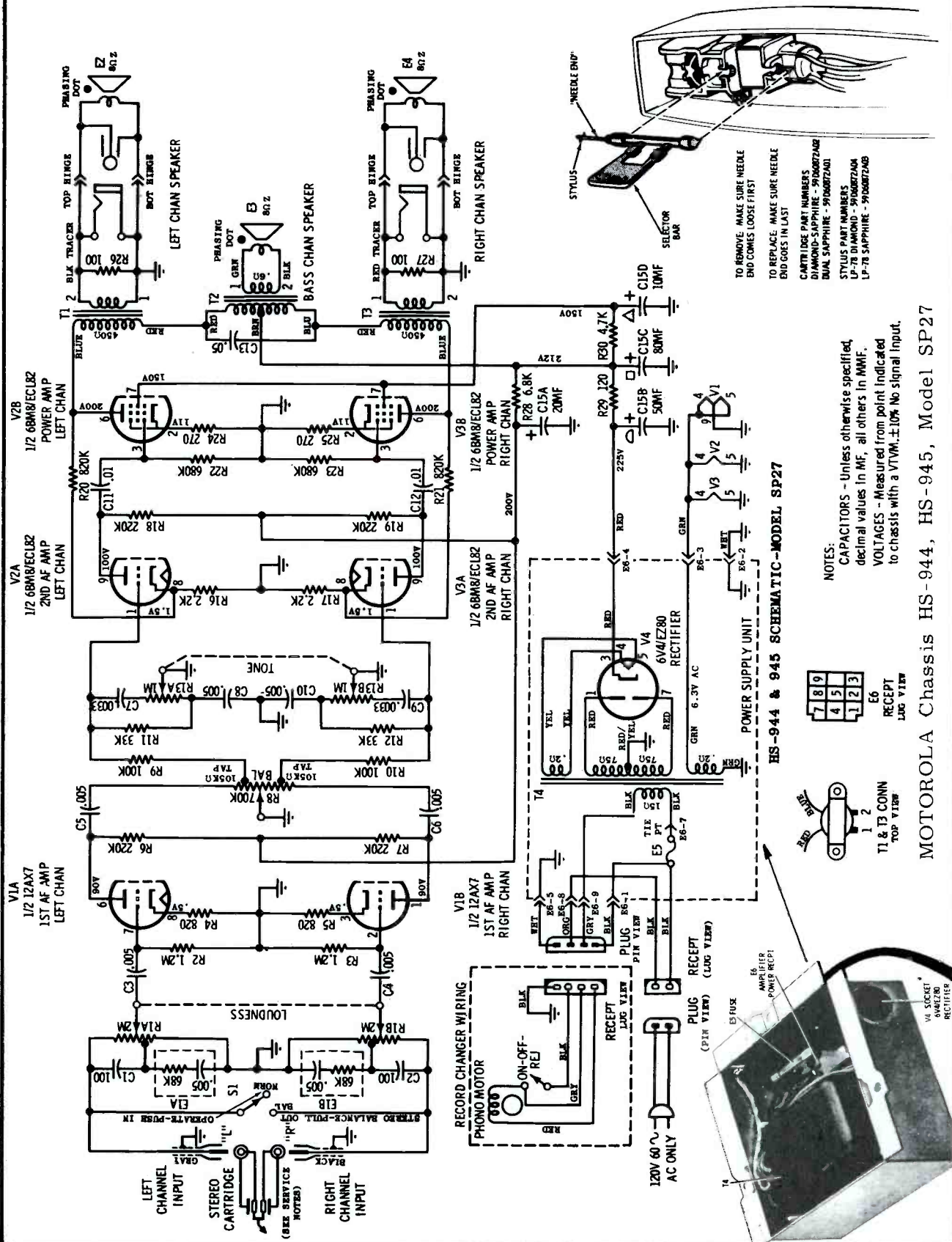
∇ = B- --- = Chassis --- = Record changer frame



MOTOROLA Chassis HS-942, Model SP25



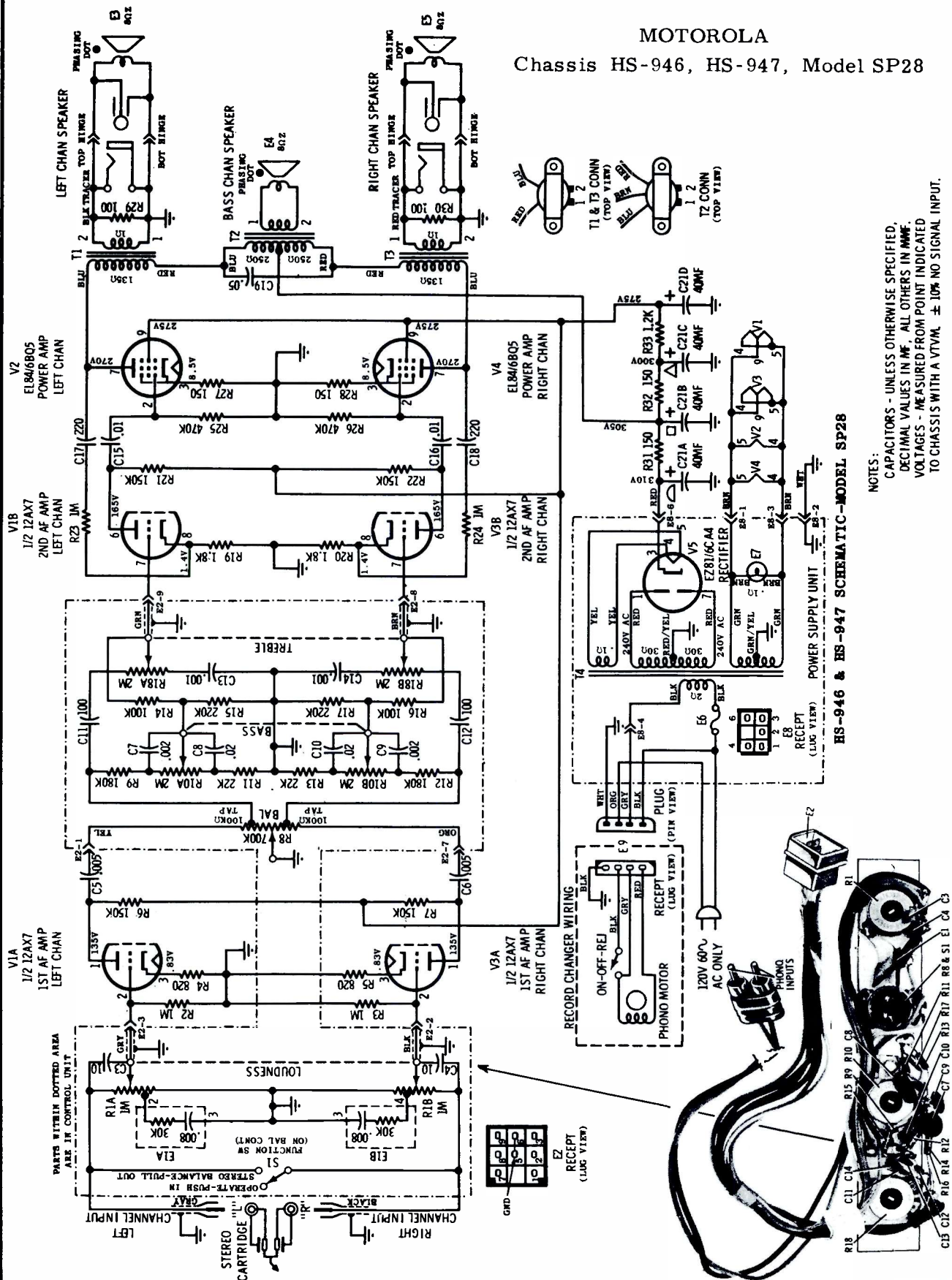
MOTOROLA Chassis HS-944, HS-945, Model SP27



VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

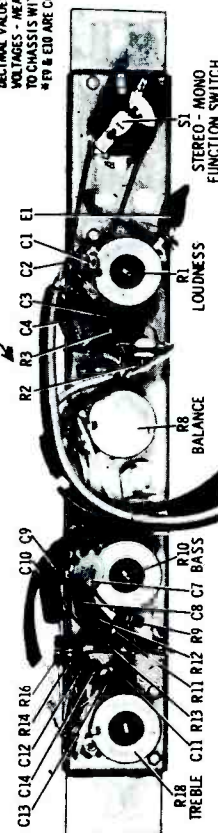
MOTOROLA

Chassis HS-946, HS-947, Model SP28



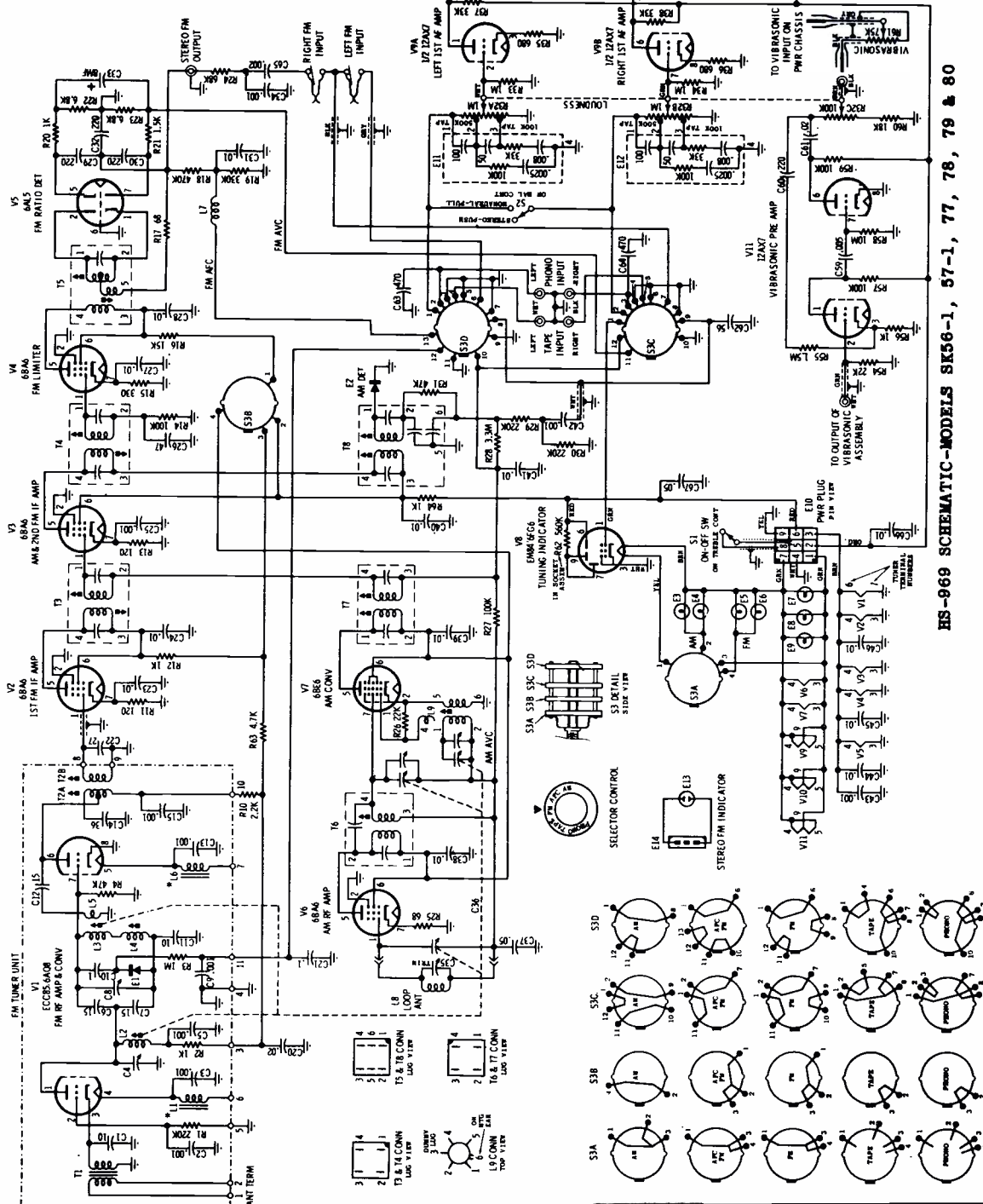


Chassis HS-948, HS-949, HS-950, HS-951,
Models SP29 and SP30



HS-949 PARTS LOCATION

NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED,
DECIMAL VALUES IN μ F; ALL OTHERS IN MMF.
VOLTAGES - MEASURED FROM POINT INDICATED
TO CHASSIS WITH A VTVM $\pm 10\%$ NO SIGNAL INPUT.
TUNING RANGE - AM 535KC TO 1600KC (IF-650KC)
- FM 88MC TO 108MC (IF-14.7MC)

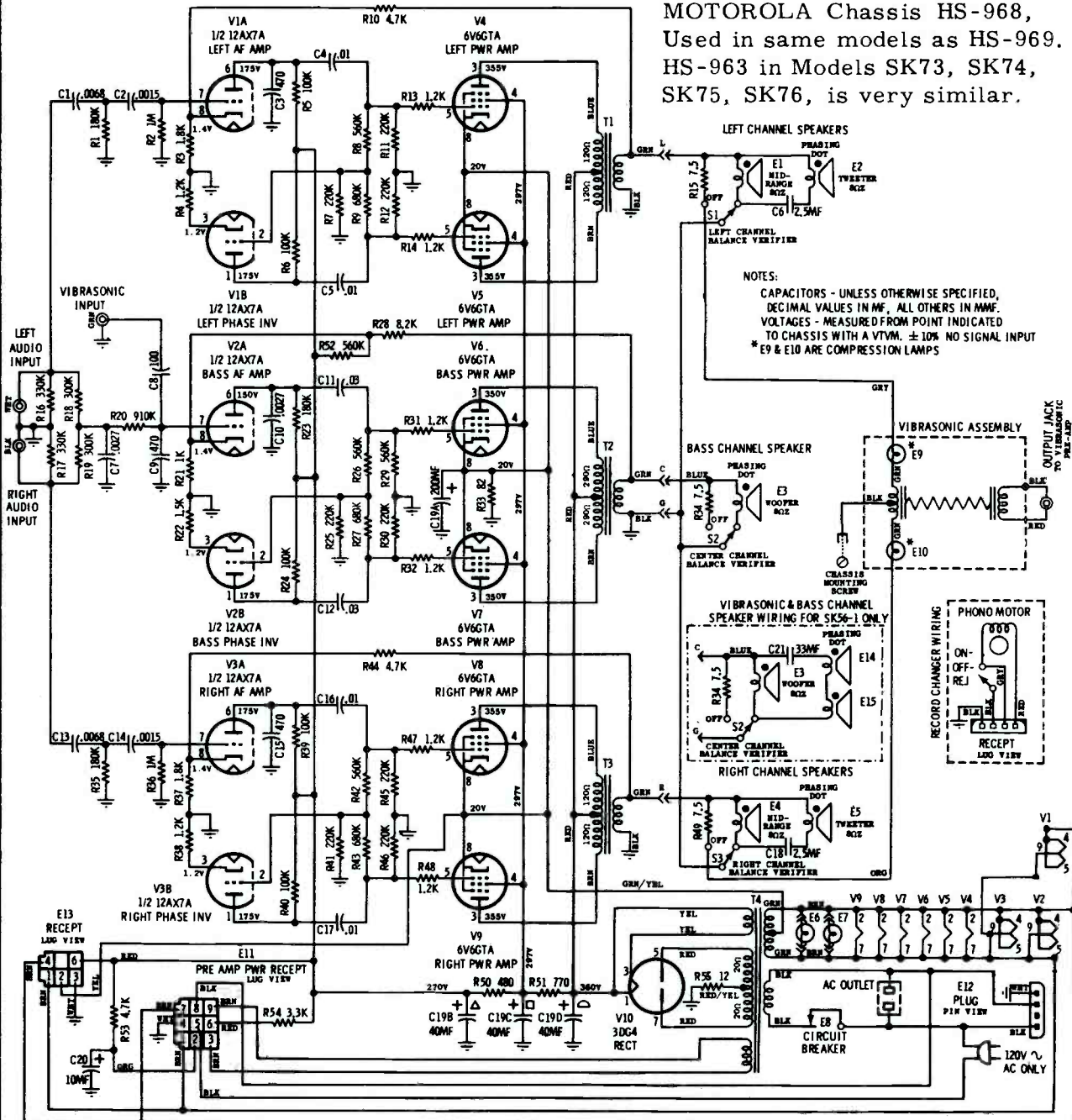


PHS-969 SCHEMATIC-MODELS SK56-1, 57-1, 77, 78, 79 & 80

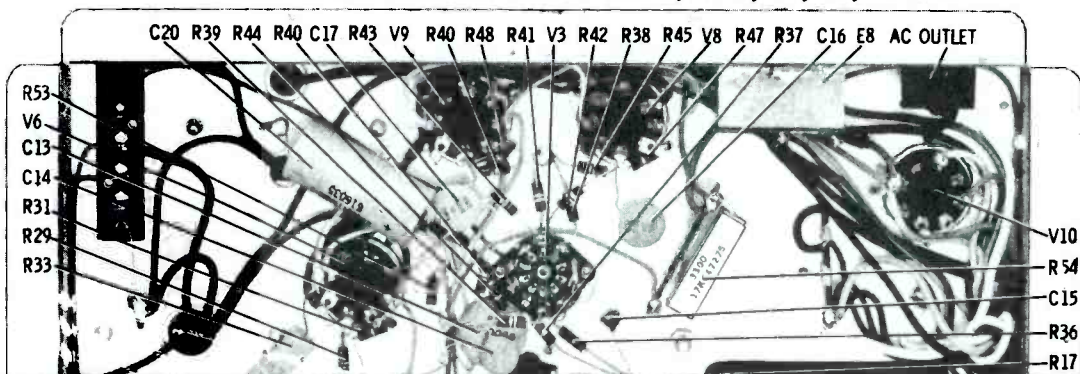
MOTOROLA Chassis HS-969, Models SK56-1, SK57-1, SK77, SK78, SK79, SK80

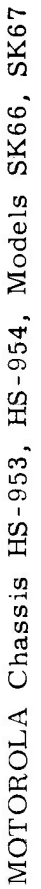
VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

MOTOROLA Chassis HS-968, Used in same models as HS-969. HS-963 in Models SK73, SK74, SK75, SK76, is very similar.



CHASSIS HS-968 SCHEMATIC-MODELS SK56-1, 57-1, 77, 78, 79 & 80





HS-953 & 954 SCHEMATIC--MODELS SK66 & 67

HS-954 PARTS LOCATION

Packard Bell

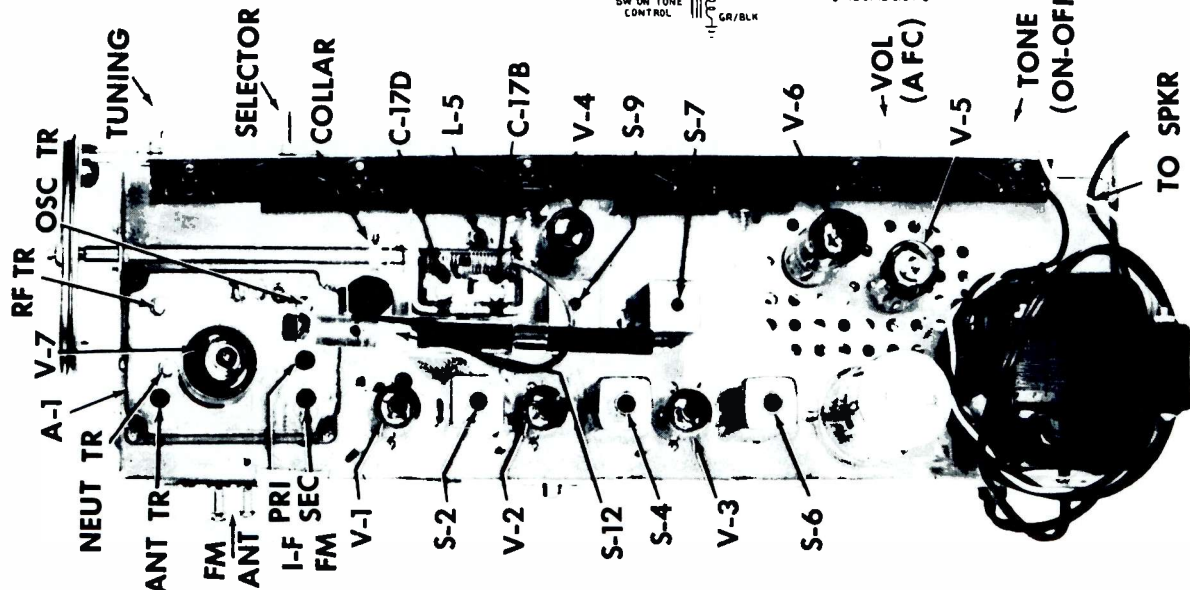
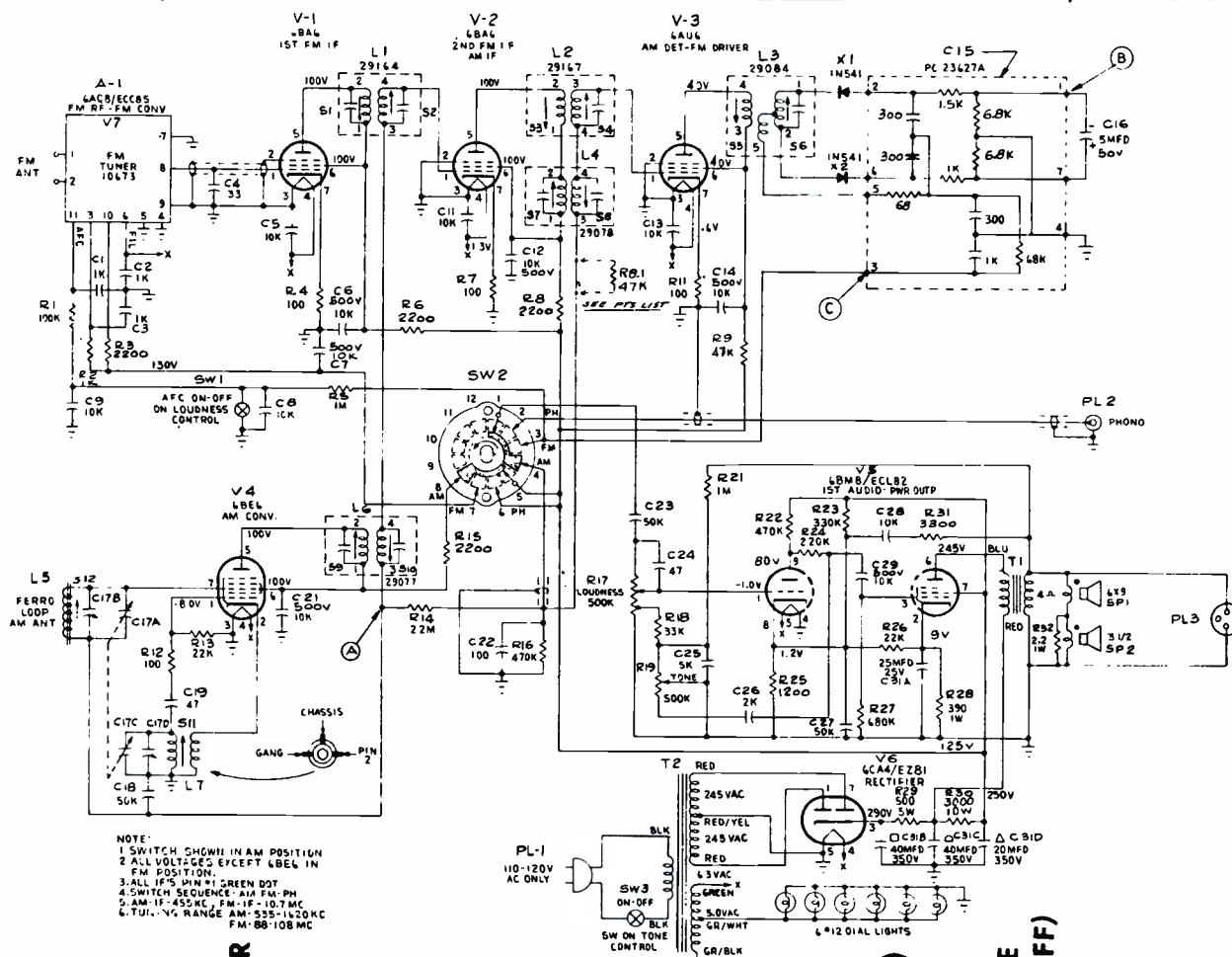
MODEL 7R4 RADIO

Model 7R4 is an AM-FM radio receiver containing seven electron tubes and three crystal diodes. The FM section contains AFC circuitry. A phono input socket is provided at the rear of the set.

Frequencies

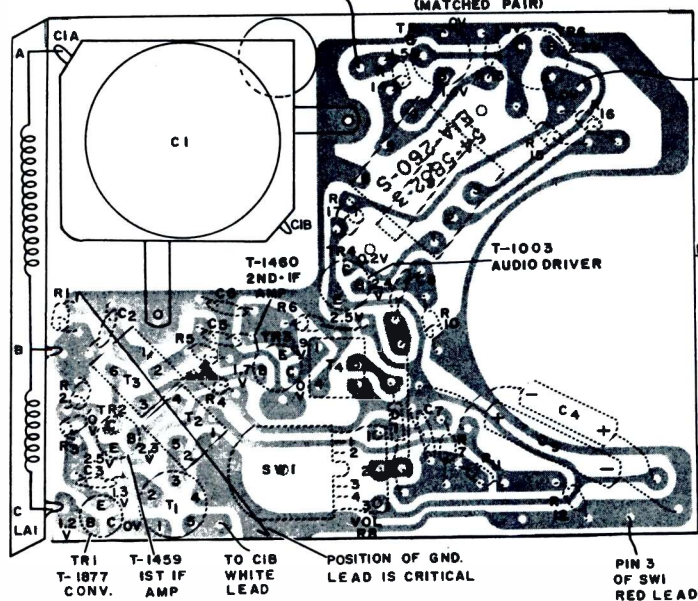
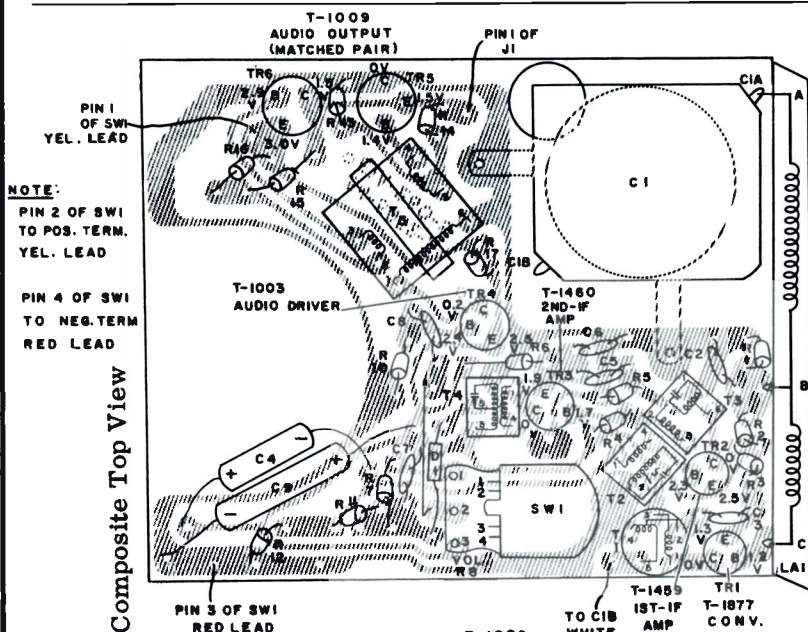
AM radio: 530 kc to 1620 kc; I-F 455 kc

FM radio: 87.5 mc to 108.5 mc; I-F 10.70 mc



PHILCO

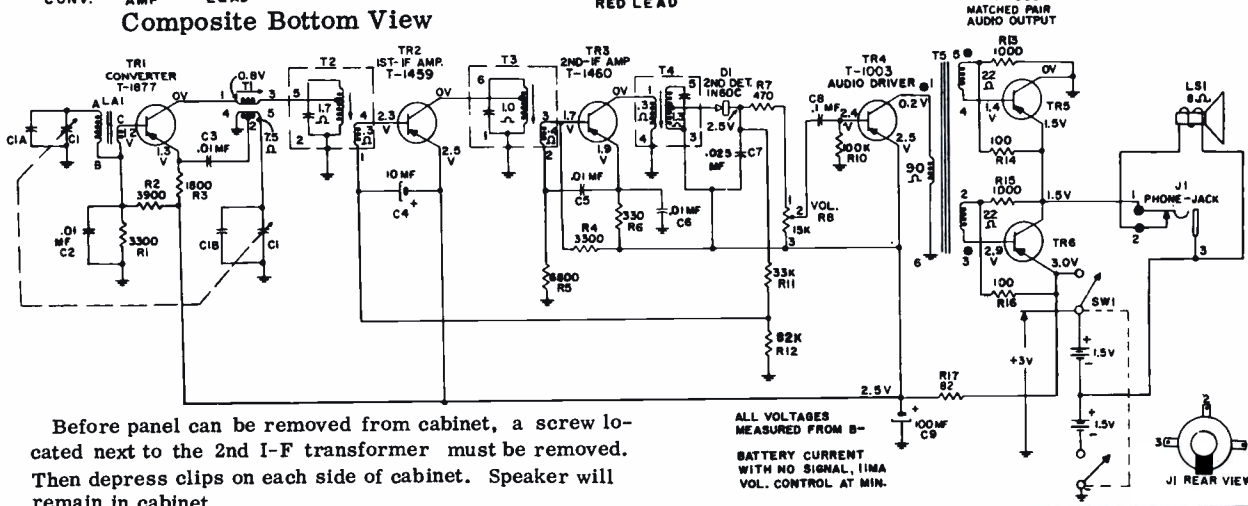
MODEL T-61, CODE 124



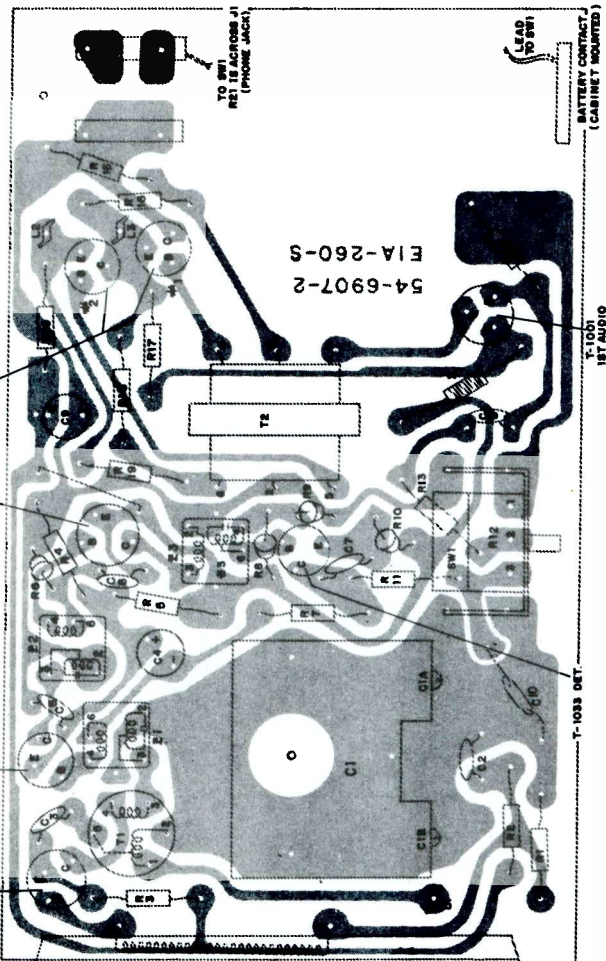
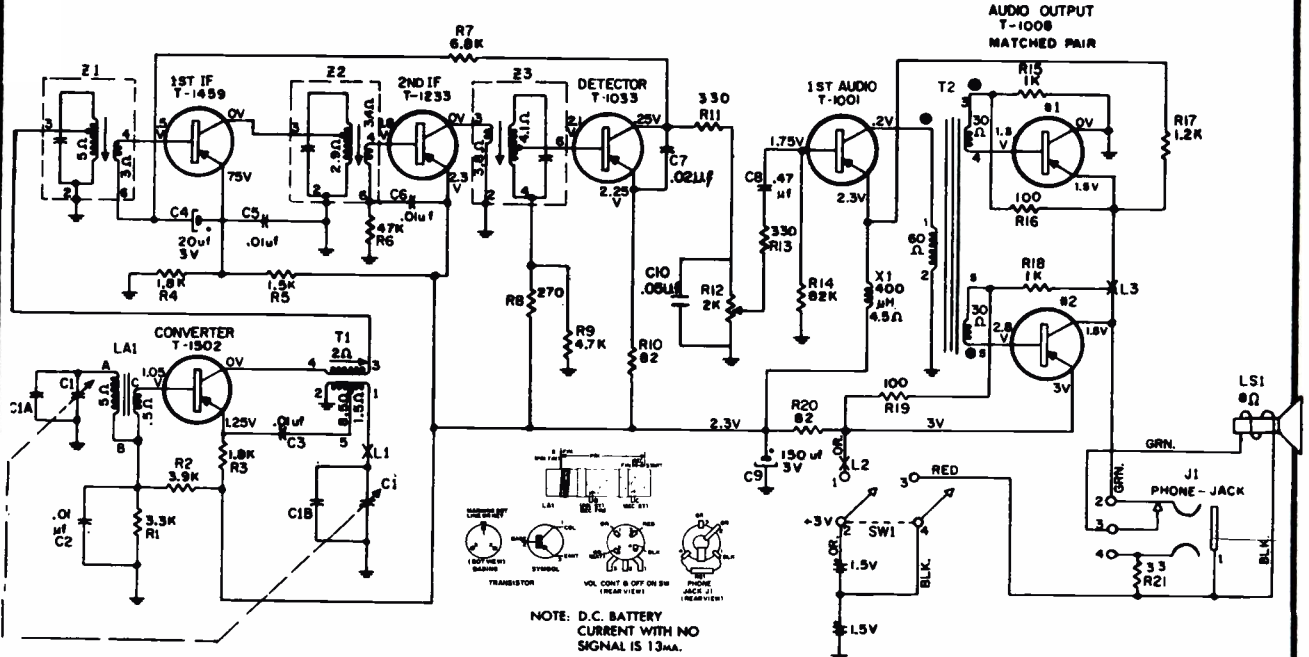
ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Connect signal generator through a .1-uf. condenser to ant. section of gang.	455 kc.	Tuning gang fully open.	Adjust for maximum output in order given.	T4-3rd I-F T3-2nd I-F T2-1st I-F
2	Use radiating loop. (See NOTE 1 below)	600 kc.	600 kc.	Adjust for maximum output. Rock tuning gang while making this adjustment.	T1-osc. core
3	Same as step 2.	1620 kc.	1620 kc. (Tuning gang fully open)	Adjust for maximum output.	C1B-osc. trimmer
4	Same as step 2.	1400 kc.	1400 kc.	Adjust for maximum output.	C1A-antenna trimmer
5	Repeat steps 2, 3 and 4 until no further improvement is obtained. Always stop on step 4.				

NOTE 1. Use a 6-to-8-turn, 6-inch-diameter loop made up of insulated wire. Connect to generator terminals, and place about one foot from radio loop.



PHILCO PORTABLE RADIO TRANSISTOR MODEL T-71, CODE 124



Component Panel Bottom View—Showing Parts Location

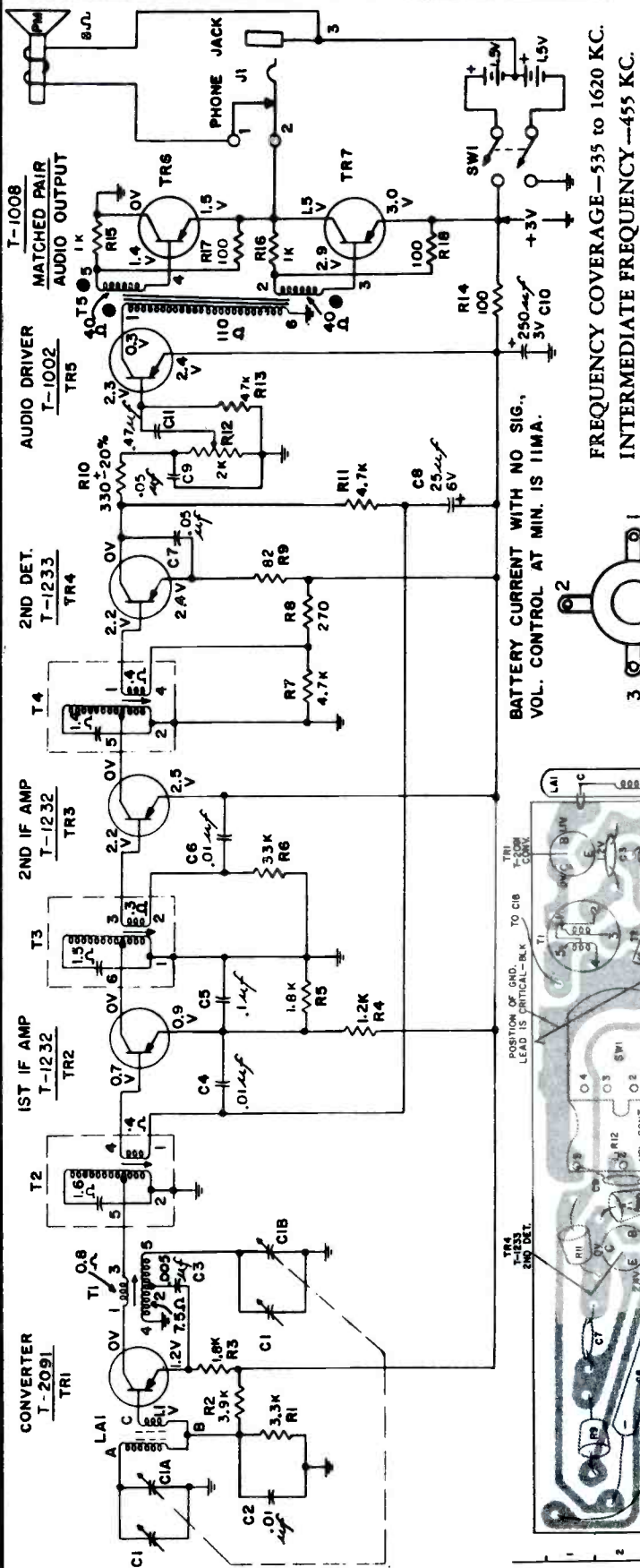
ALIGNMENT CHART

STEP	RADIO			ADJUST
	SIGNAL GENERATOR	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	CONNECTION TO RADIO Connect signal generator through a .1-uF. condenser to ant. section of gang.	455 kc.	Tuning gang fully open.	Z3—3rd i-f Z2—2nd i-f Z1—1st i-f
2	Use radiating loop. (See NOTE 1 below)	600 kc.	Adjust for maximum output. Rock tuning gang while making this adjustment.	T1—osc. core
3	Same as step 2.	1620 kc.	Adjust for maximum output. (Tuning gang fully open)	C1B—osc. trimmer
4	Same as step 2.	1400 kc.	Adjust for maximum output.	C1A—antenna trimmer
5	Repeat steps 2, 3 and 4 until no further improvement is obtained. Always stop on step 4.			

NOTE 1. Use a 6-to-8-turn, 6-inch-diameter loop made up of insulated wire. Connect to generator terminals, place about one foot from radio loop.

PHILCO

MODEL T-77, CODE 124



**FREQUENCY COVERAGE—535 to 1620 KC.
INTERMEDIATE FREQUENCY—455 KC.**

**ALL VOLTAGES MEASURED
FROM B MINUS**

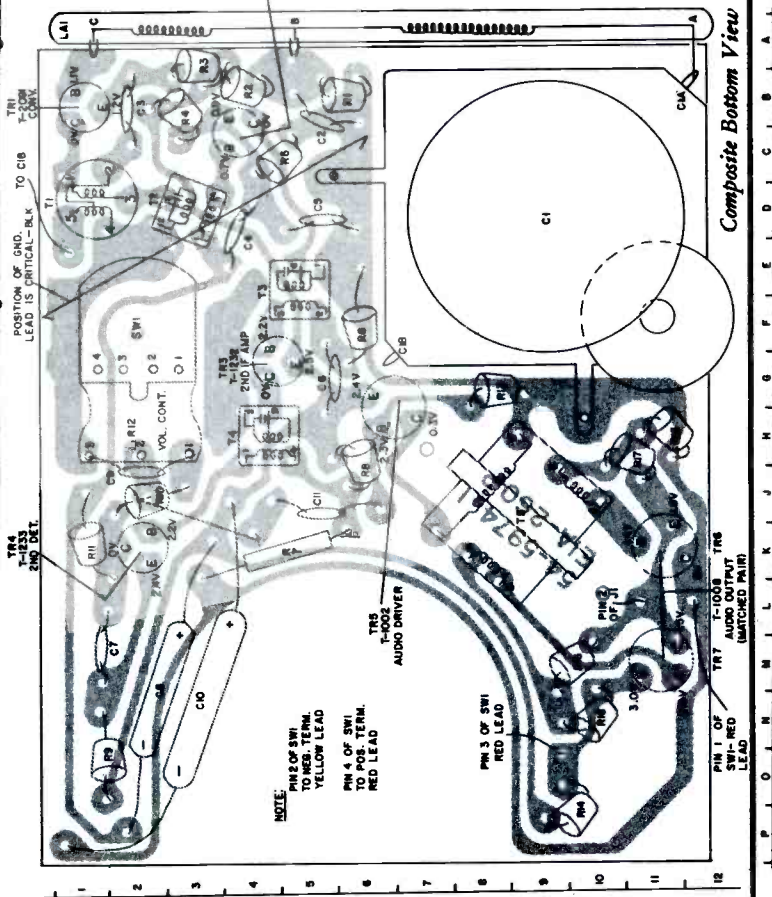
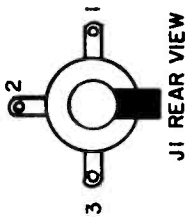
SERVICE NOTES

When signal tracing, inject signal at transistor collector and limit input to keep signal across speaker below .6 volt.

Normally, the transistors should be the last item suspected. If C10 opens serious audio oscillation will result.

NOTE: Panel Removal

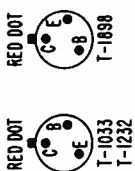
A screw located close to the 2nd i-f transformer (C5 graph location) must be removed. Then spread side of cabinet at volume control and pull panel outward. If volume knob fails to clear cabinet, it may be released from the volume control shaft. To do this, insert a thin blade between the volume control knob and the plastic cabinet and pull the panel out.



MODEL T-88, CODE 124



TRANSISTOR IDENTIFICATION



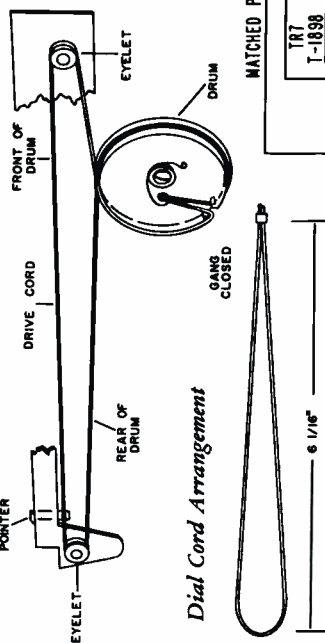
RED DOT
T-1033
T-1232

RED DOT
T-1898

ALL RESISTOR VALUES EXPRESSED IN OHMS AND ALL CAPACITOR VALUES EXPRESSED IN MICROFARADS UNLESS OTHERWISE NOTED.

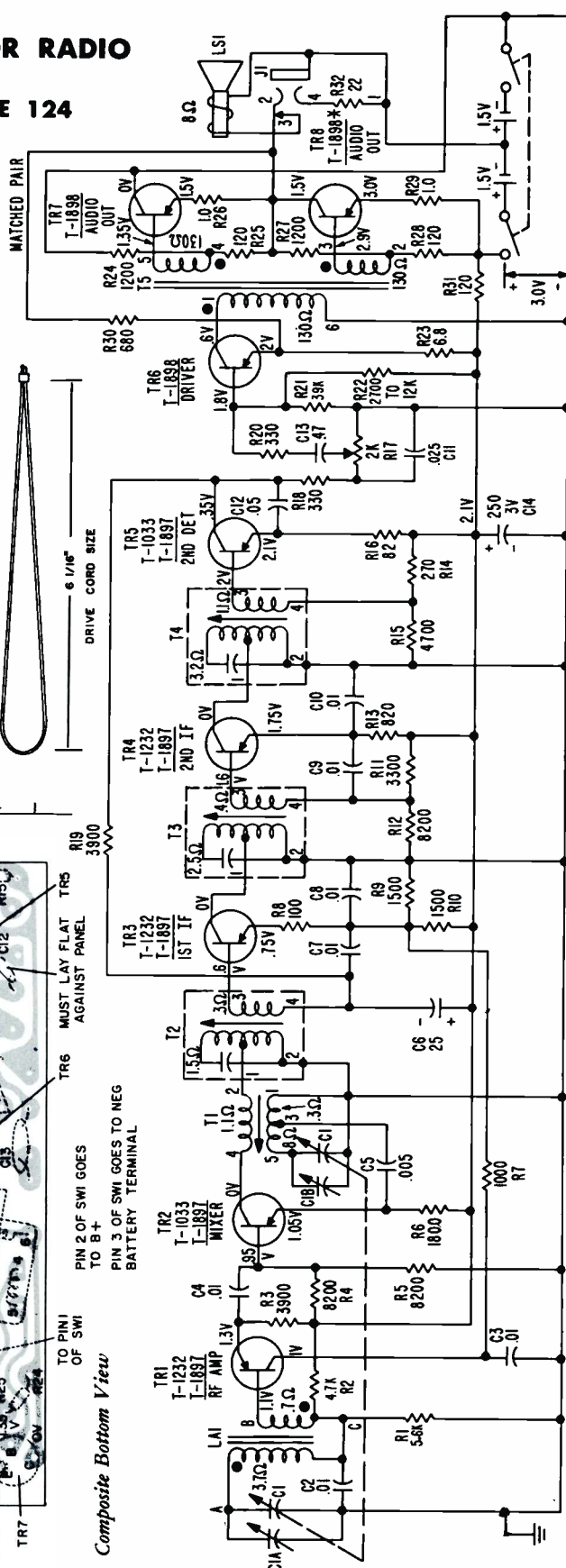
FREQUENCY COVERAGE—535 to 1620 KC.
INTERMEDIATE FREQUENCY—455 KC.

When replacing driver transistor TR6, current limiting resistor R22 must be of proper value to provide 2.1 ma collector current with the transistor employed. Refer to parts list for the replacement transistor which is shipped with the proper resistor.



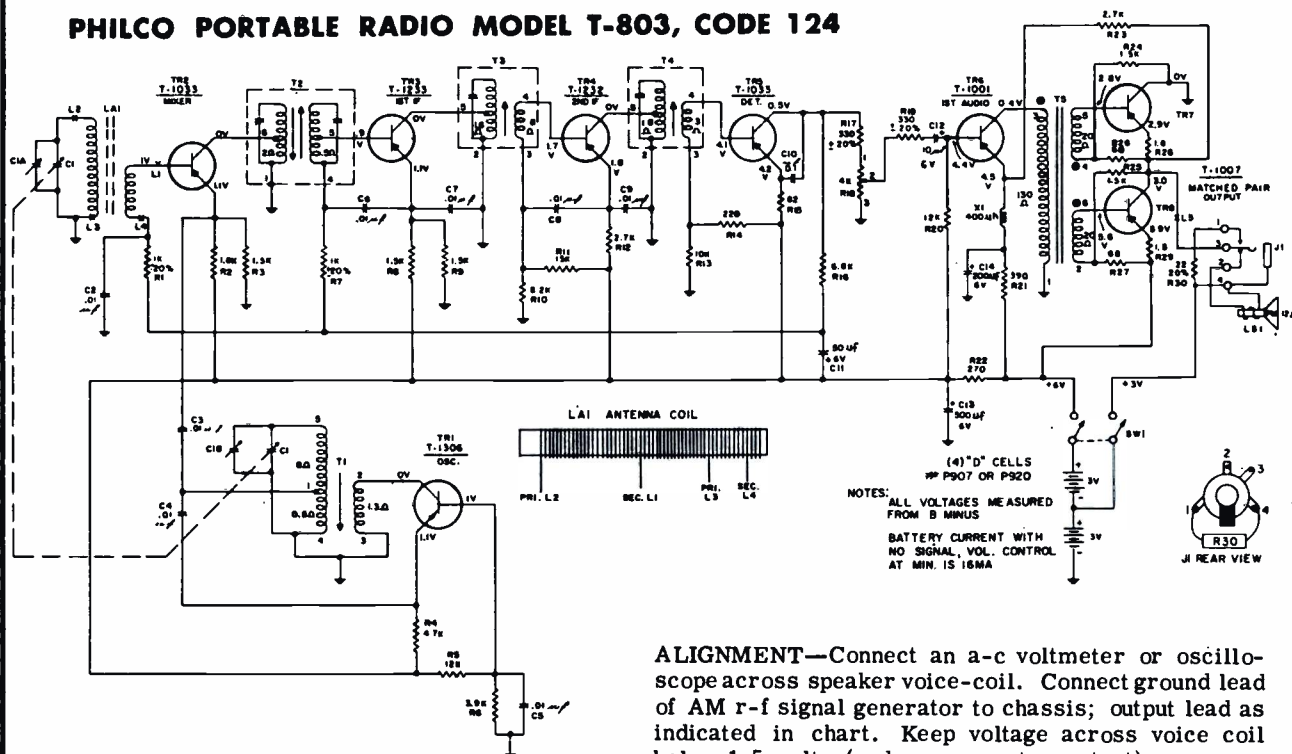
Dial Cord Arrangement

DRIVE CORD SIZE



Composite Bottom View

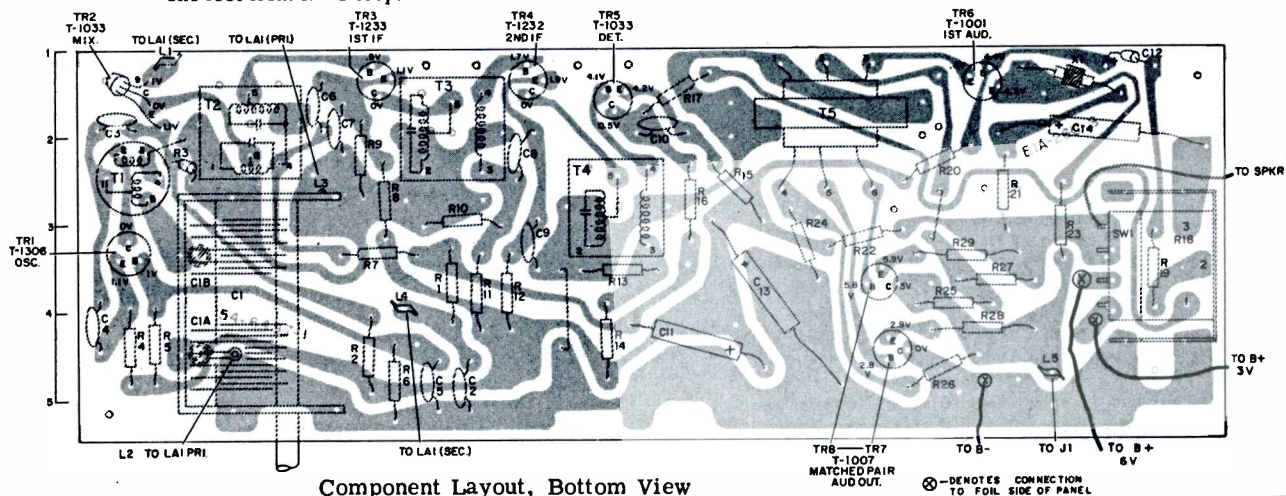
PHILCO PORTABLE RADIO MODEL T-803, CODE 124



ALIGNMENT—Connect an a-c voltmeter or oscilloscope across speaker voice-coil. Connect ground lead of AM r-f signal generator to chassis; output lead as indicated in chart. Keep voltage across voice coil below 1.5 volts (reduce generator output).

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Connect signal generator through a .1-uf. condenser to ant. section of gang.	455 kc.	Tuning gang fully open.	Adjust for maximum output in order given.	T4—3rd i-f pri. T3—2nd i-f pri. T2—bot. core T2—top core
2	Use radiating loop. (See NOTE 1 below).	600 kc.	600 kc.	Adj. for maximum output. Rock tuning gang while making adj.	T1—ocs. core
3	Same as step 2.	1620 kc.	1620 kc. (Tuning gang fully open)	Adjust for maximum output.	C1B—osc. trim.
4	Same as step 2.	1400 kc.	1400 kc.	Adjust for maximum output.	C1A—ant. trim.
5	Repeat steps 2, 3 and 4 until no further improvement is obtained. Always stop on step 4.				

NOTE 1. Use a 6-to-8-turn, 6-inch diameter loop made up of insulated wire. Connect to generator terminals, and place about one foot from radio loop.



PHILCO MODELS K-777, K-778, K-849 AND K-850

(Service material below and on page 81, at right)

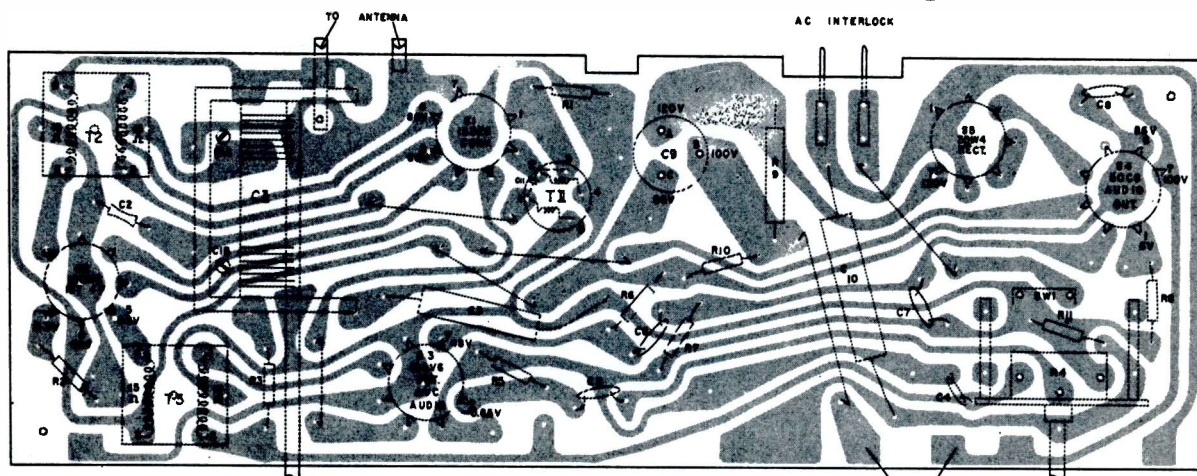


Figure 1. Bottom View of Perma Circuit Panel Component Layout Models K-849, K-850

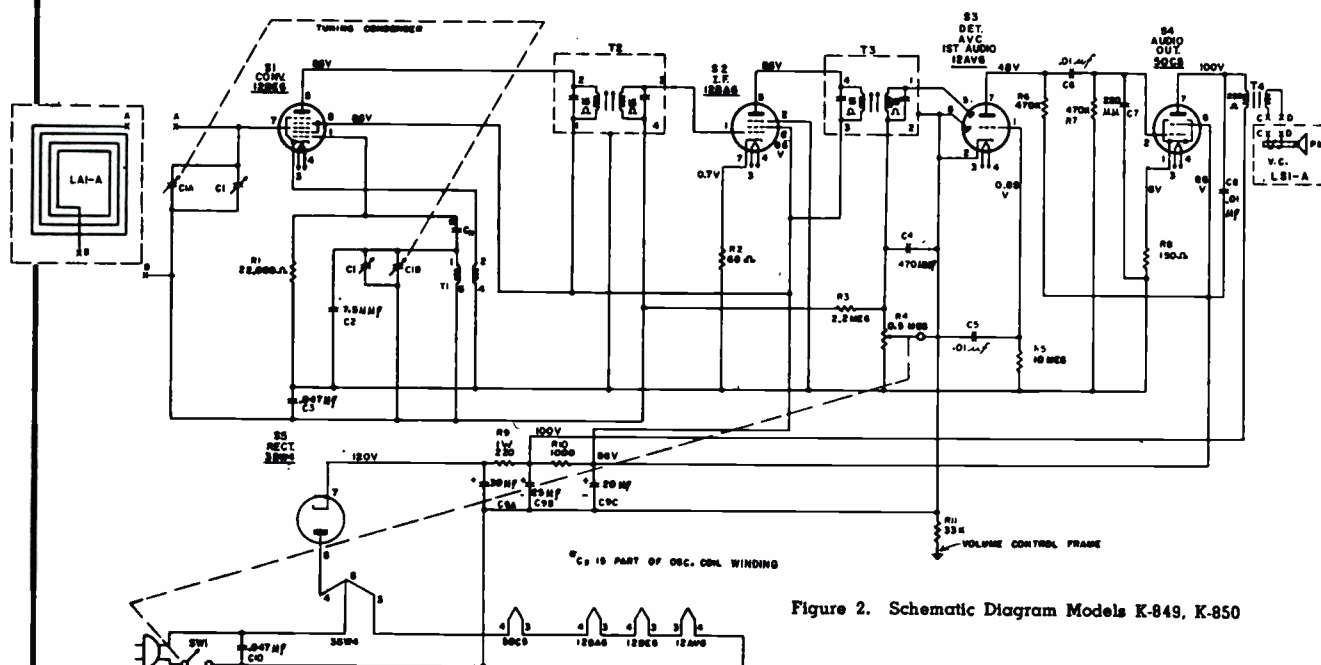


Figure 2. Schematic Diagram Models K-849, K-850

ALIGNMENT CHART

STEP	SIGNAL GENERATOR		RADIO		ADJUST
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	
1.	Ground lead to B—; output lead through a .1 mf condenser to grid (pin 7) of 12BE6 or top of r-f tuning condenser.	455 kc.	Tuning gang fully open.	Adjust tuning cores, in order given, for maximum output.	T3—top T3—bottom T2—bottom T2—top
2.	Radiating loop (See Note below).	1620 kc.	1620 kc.	Adjust for maximum output.	C1-B—osc.
3.	Same as step 2.	1500 kc.	1500 kc.	Adjust for maximum output.	C1-A—aerial

NOTE: Make up a 6-8 turn, 6 inch diameter loop from insulated wire, connect to signal-generator leads, and place near radio loop.

PHILCO HOME RADIO MODELS K-777, K-778, K-849 AND K-850

(For alignment and other service data see page 80, at left)

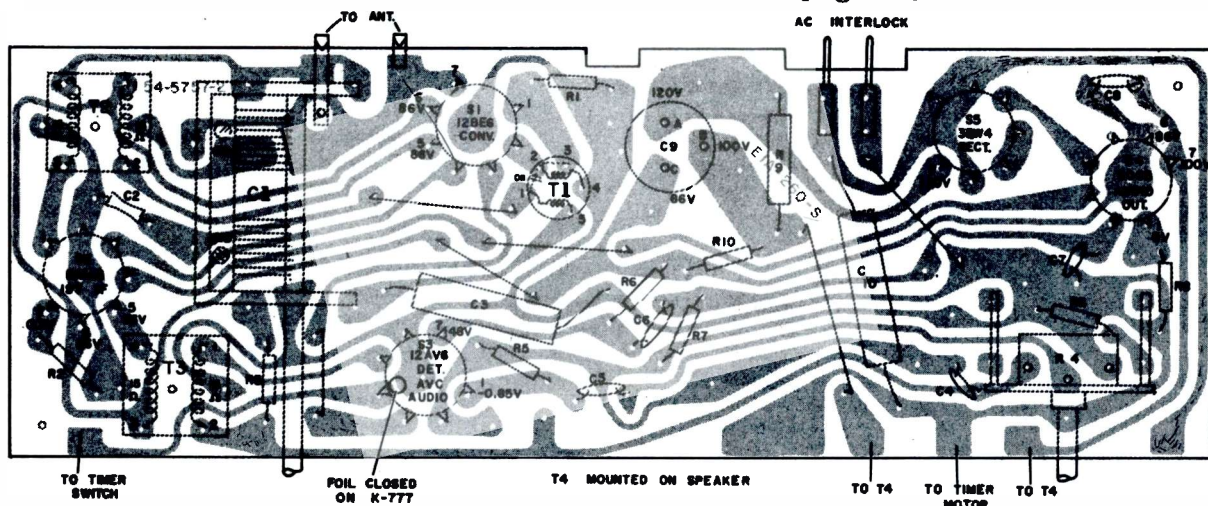


Figure 3. Bottom View of Perma Circuit Panel Component Layout Model K-778

SLEEP SWITCH—Model K-778 employs a "sleep" switch which is set to turn the radio off after a desired length of time (up to 60 minutes).

LULLAWAY—All clock radio models except K-777 have the on-off switch in the filament return line. When the switch is opened, the set fades out rather than cuts off. Model K-777 has a conventional switching arrangement located in the B— line.

MODELS K-777 and K-778 have similar circuitry with slight variations as shown.

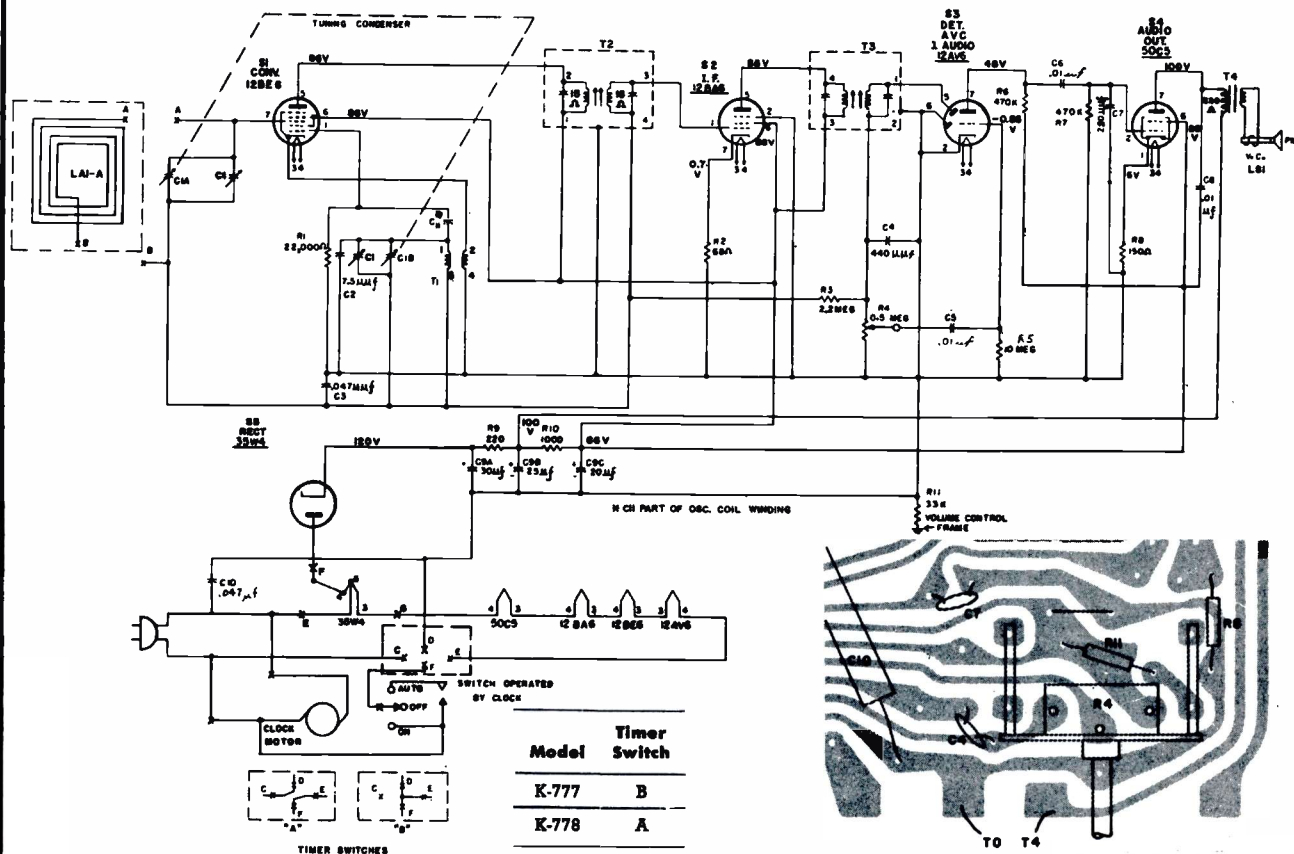
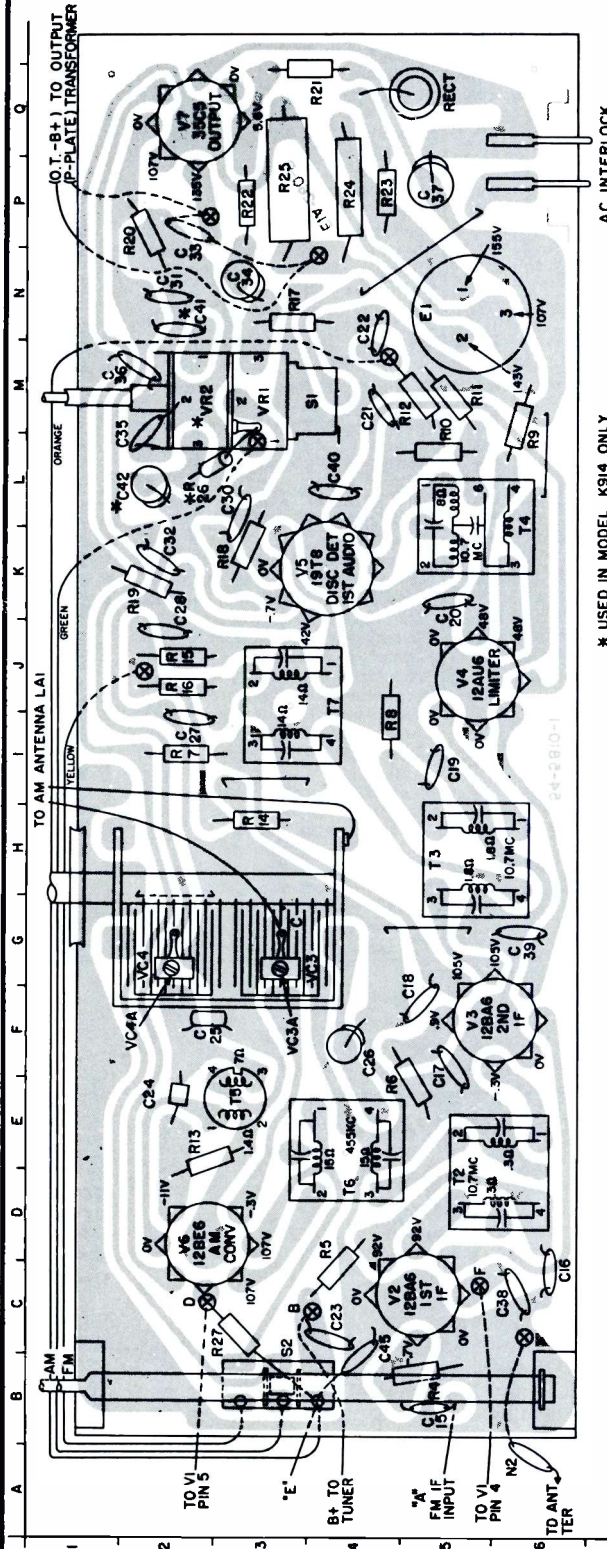


Figure 4. Schematic Diagram Models K-777, K-778

Figure 5. Bottom View, Partial Printed Panel Showing Model K-777, Foil Difference in B-Circuit (Figure 3)

PHILCO AM/FM TABLE RADIOS MODELS K-912, K-914

(Continued from preceding page)



PARTS LIST

Symbol	Location	Description	Service Part No.
C1	A3 ¹	Capacitor, 2.2 mmf, ant. trap	30-1221-6
C2	*	Capacitor, 10 mmf FM Ant. trans. secondary	30-1251-35
C3	A2 ¹	Capacitor, 18 mmf, 5%, FM Oscillator grid circuit	30-1251-48
C4	A3 ¹	Capacitor, 18 mmf, 5%, FM Oscillator grid circuit	30-1251-48
C5	B3 ¹	Capacitor, 10 mmf, 5%, Oscillator tank circuit	30-1251-44
C7	A2 ²	Capacitor, 10 mmf, 10%, Disc., Oscillator feedback	30-1251-35
C8	A2 ¹	Capacitor, 15 mmf, ceramic Disc, Plate by-pass	30-1251-36
C9	B3 ¹	Capacitor, 15 mmf, Ceramic Disc, T1 Secondary	30-1251-36
C10	B3 ¹	Capacitor, 56 mmf, 10%, neutralizing	30-1251-37
C11	A3 ¹	Capacitor, .001 mfd, FM r-f by-pass	30-1238-13
C12	B3 ¹	Capacitor, .001 mfd, 12DT8 Filament by-pass	30-1238-13
C13	B2 ¹	Capacitor, .001 mfd, 12DT8 filament by-pass	30-1238-13
C14	C4 ¹	Capacitor, .01 mfd, B+ by-pass	30-1238-33
C15	B5	Capacitor, 100 mmf, FM i-f coupling	30-1251-38
C16	C6	Capacitor, .0022 mfd, FM i-f screen	30-1262-7
C17	F5	Capacitor, .01 mfd, V3 cathode by-pass	30-1262
C18	F5	Capacitor, .0047 mfd, V3 i-f screen by-pass	30-1262-3
C19	I5	Capacitor, 22 mmf, V4 i-f grid	30-1263-19
C20	K5	Capacitor, .01 mfd, V4 screen by-pass	30-1262
C21	B4	Capacitor, 150 mmf, 19T8 (V5) cathode by-pass	30-1262-28
C22	N4	Capacitor, .001 mfd, 19T8 (V5) cathode by-pass	30-1262-12
C23	C4	Capacitor, .01 mfd, FM B+ by-pass	30-1262
C24	E2	Capacitor, 47 mmf, AM Oscillator grid	30-1230-4
C25	F2	Capacitor, 7.5 mmf, AM Oscillator compensation	30-1224-83
C26	F4	Capacitor, .047 mfd, AVC by-pass	30-4650-45
C27	I2	Capacitor, 220 mmf, AM Diode Det. Output	30-1262-41
C28	J2	Capacitor, 220 mmf, AM Det. Filter	30-1262-41
C30	K3	Capacitor, .0033 mfd, Audio Grid Coupling	30-1262-42
C31	N2	Capacitor, 220 mmf, Output Grid by-pass	30-1262-41
C32	K2	Capacitor, .01 mfd, Output Grid coupling	30-1262

Panel Removal - First remove knobs, and cabinet back (note that three screws must be extracted - one in handle depression and two on set bottom). Next, remove the two panel mounting screws located at the bottom left corner, and 2-1/4" in from bottom right corner. Panel will now slide out of its end holders, (tuning dial will pull free as panel is removed).

(Material continued on the next two pages)

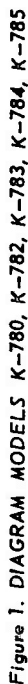


Figure 1. DIAGRAM MODELS K-780, K-782, K-783, K-784, K-785

The K-780, K-782, K-783, K-784 and K-785 are all clock models. The K-780, incorporates a "40 winks" feature which permits the set to be turned off by depressing the button on top. After approximately 7 minutes, the set will turn itself on. This cycle can be repeated up to a maximum of one hour. The "40 winks" circuit is inoperative when the clock switch is in either the "ON" or "OFF" positions.

Models K-782 and K-783 employ the "40 winks" circuit to mute a buzzer by means of a pushbutton located on the cabinet top. These models also include a "sleep" position which turns the set off after a preset time period. The buzzer is inoperative when the lever is in the "Auto Radio" position.

Models K-784 and K-785 both employ four "piano keys" marked "sleep", "radio", "alarm", and "off". If the set is off, and the sleep button is pushed, the set will play for a period of ten minutes. If this button is pushed twice, the set will play for 30 minutes, and so on up to a maximum period of 65 minutes. If the alarm is on, the sleep button will mute it for a period of 10-30 minutes, depending on the number of times the sleep button is depressed.

(Service material continued
on the next two pages.)

PHILCO MODELS K-780, K-782, K-783, K-784, K-785, K-847
K-851, K-852, K-853, K-855, K-856, K-858 (Continued)

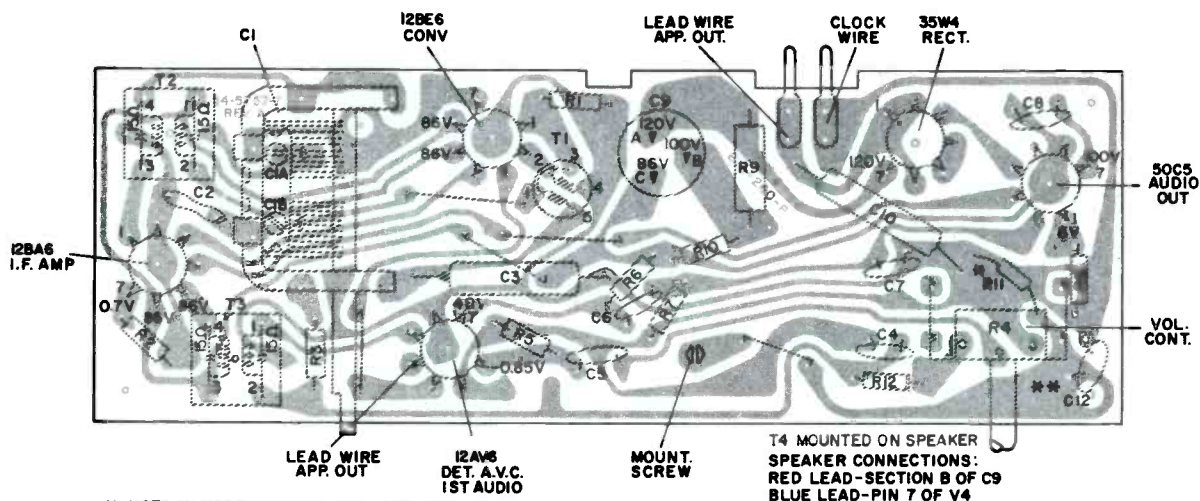


Figure 2. Bottom View of Perma Circuit Panel Component Layout Models K-782, K-783, K-784

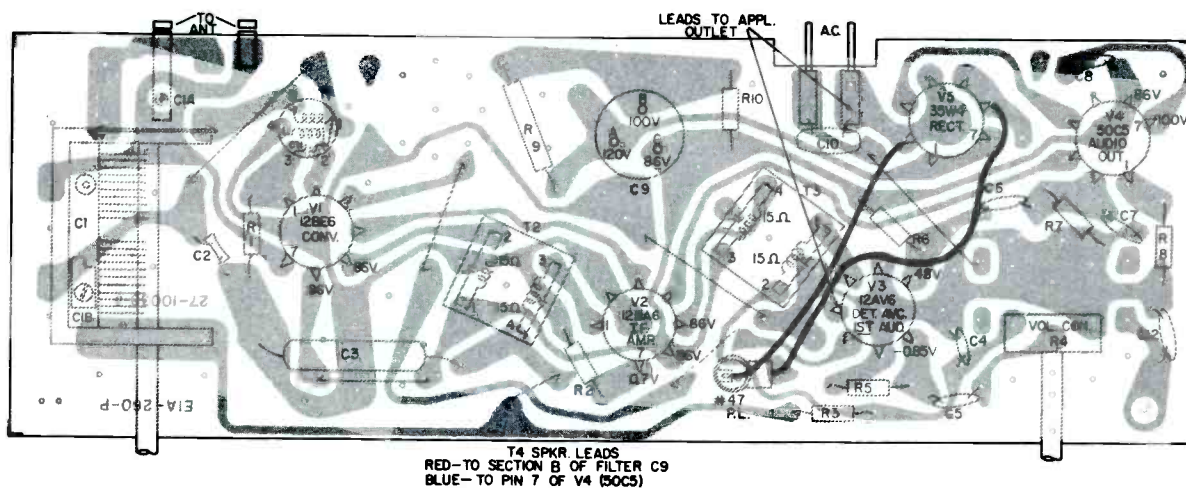


Figure 3. Bottom View of Perma Circuit Component Layout Model K-785 (Layout Model K-858 is similar.)

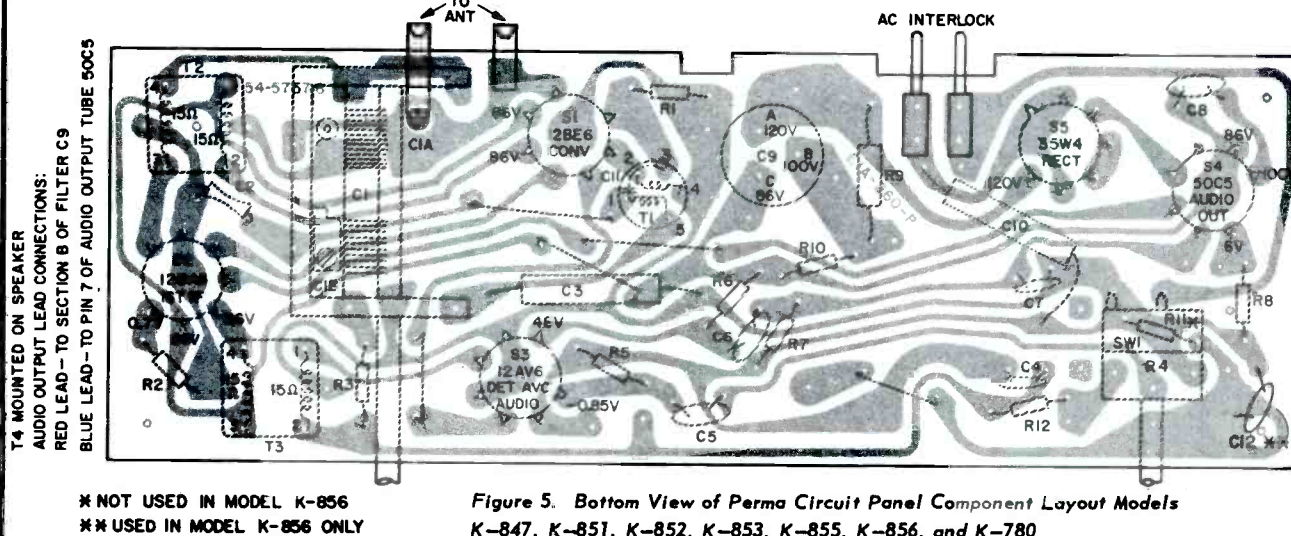
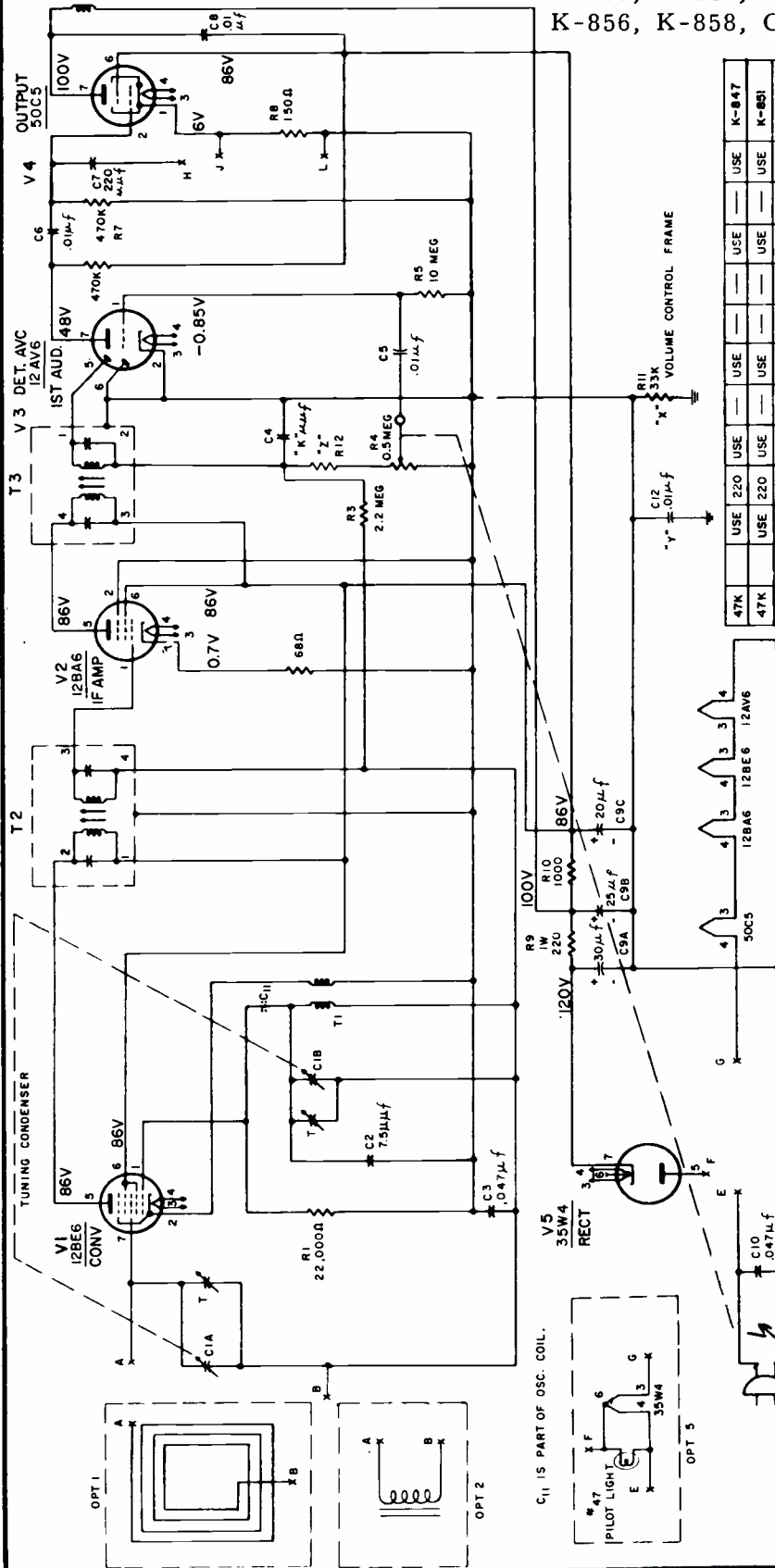


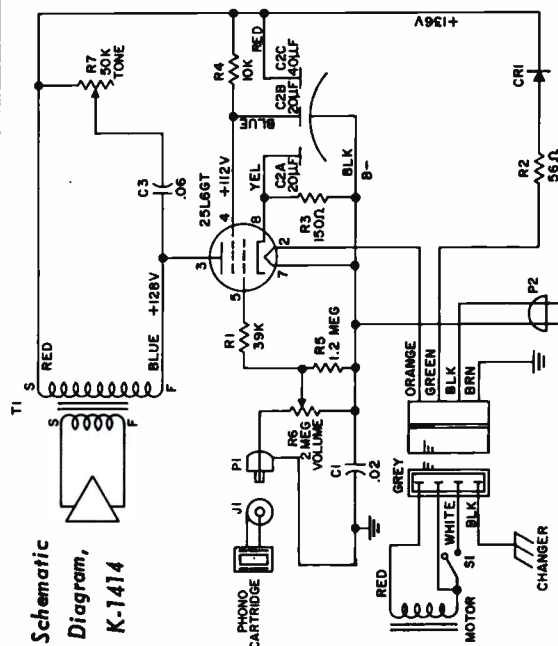
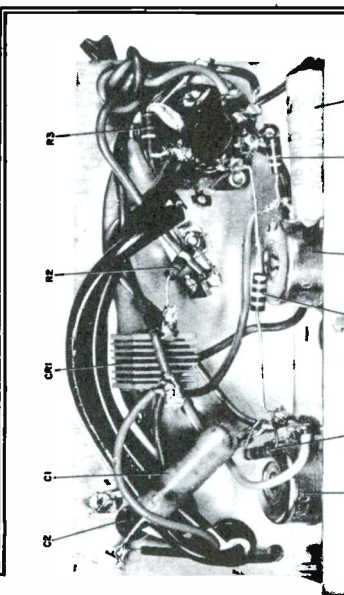
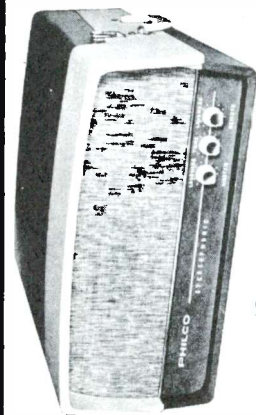
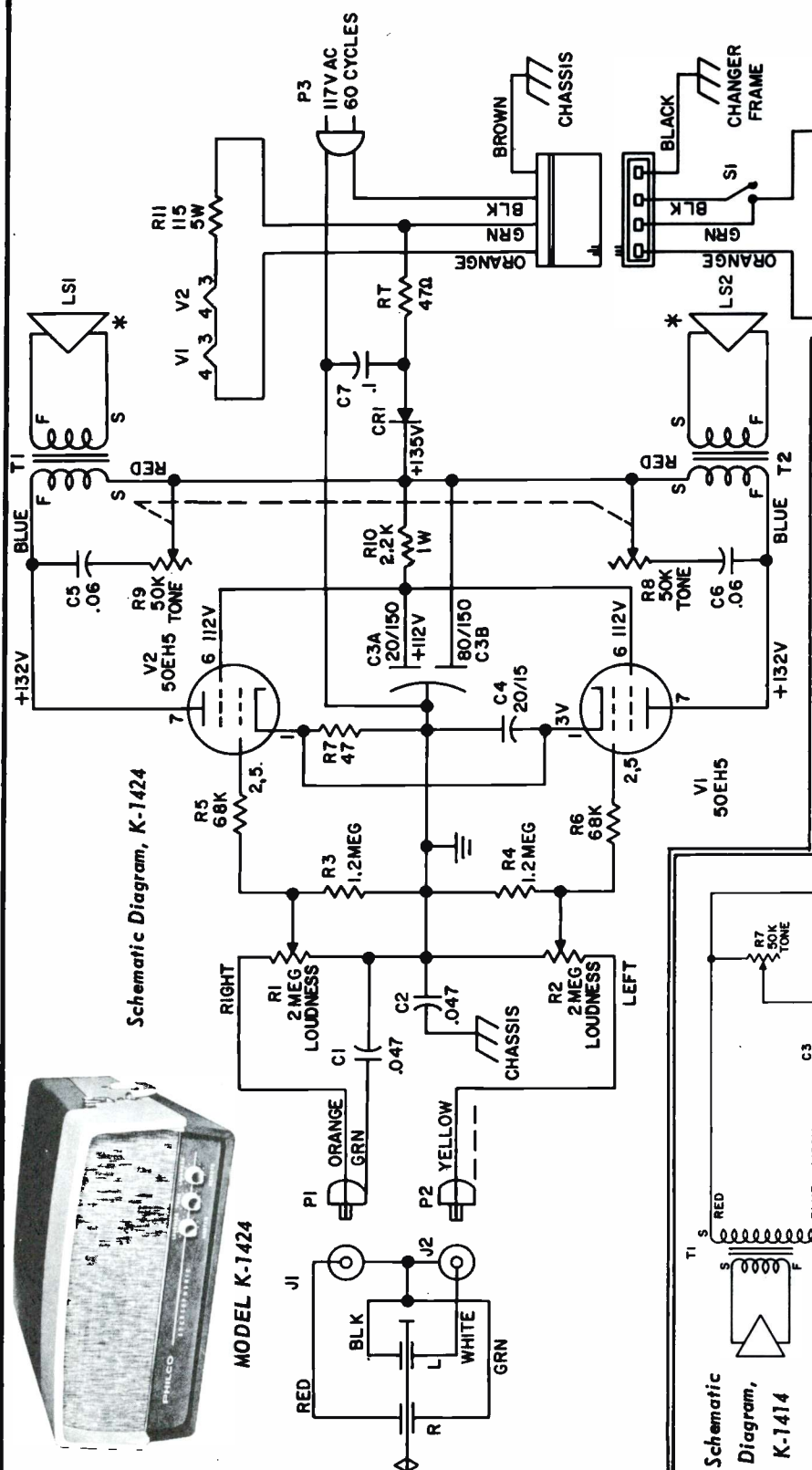
Figure 5. Bottom View of Perma Circuit Panel Component Layout Models K-847, K-851, K-852, K-853, K-855, K-856, and K-780

NEEDED 1962 RADIO SERVICING INFORMATION

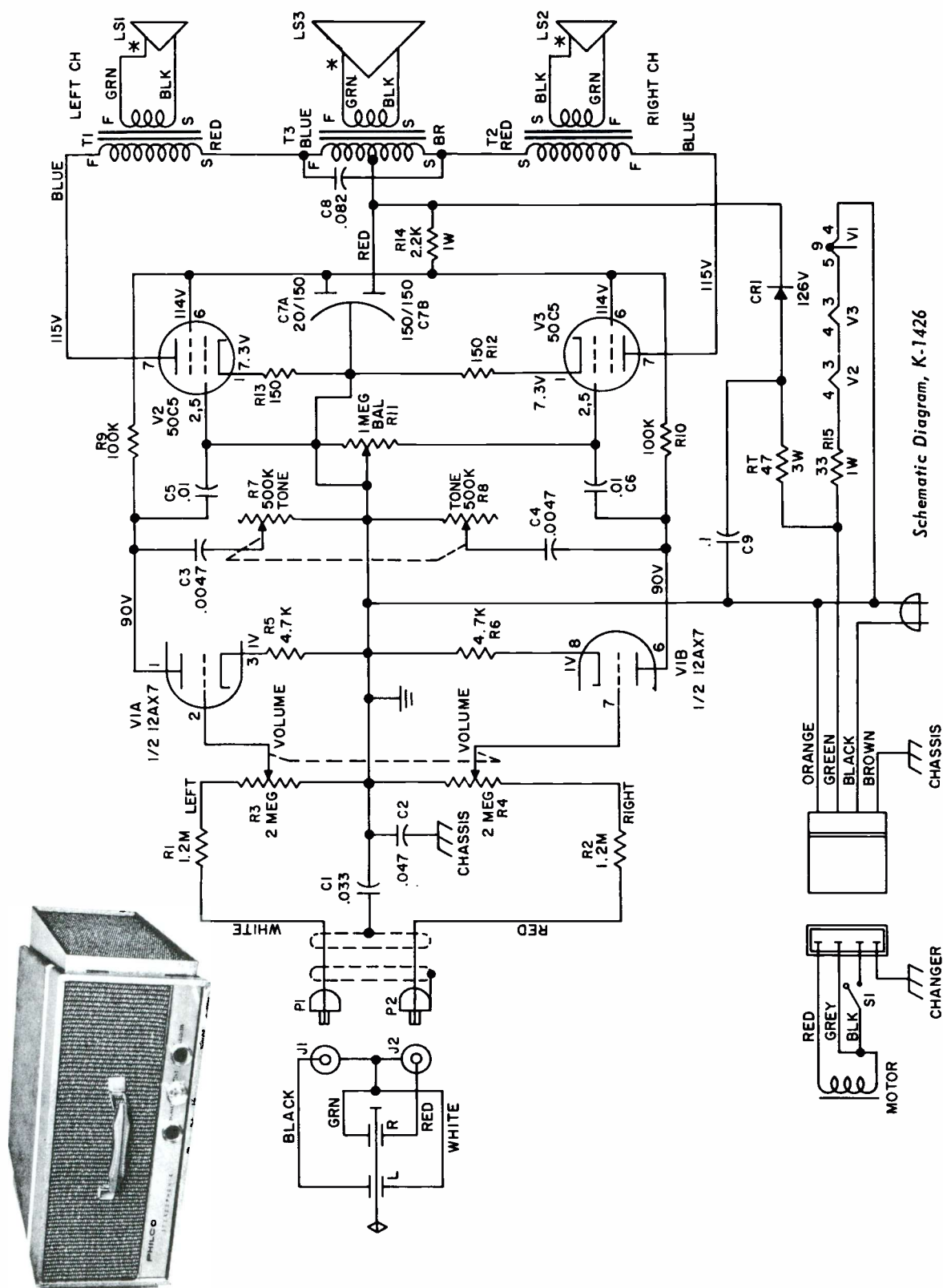
PHILCO Models K-780, K-782, K-783, K-784, K-785, K-847, K-851, K-852, K-853, K-855, K-856, K-858, Continued from preceding pages



PHONO MODELS K-1414, K-1424

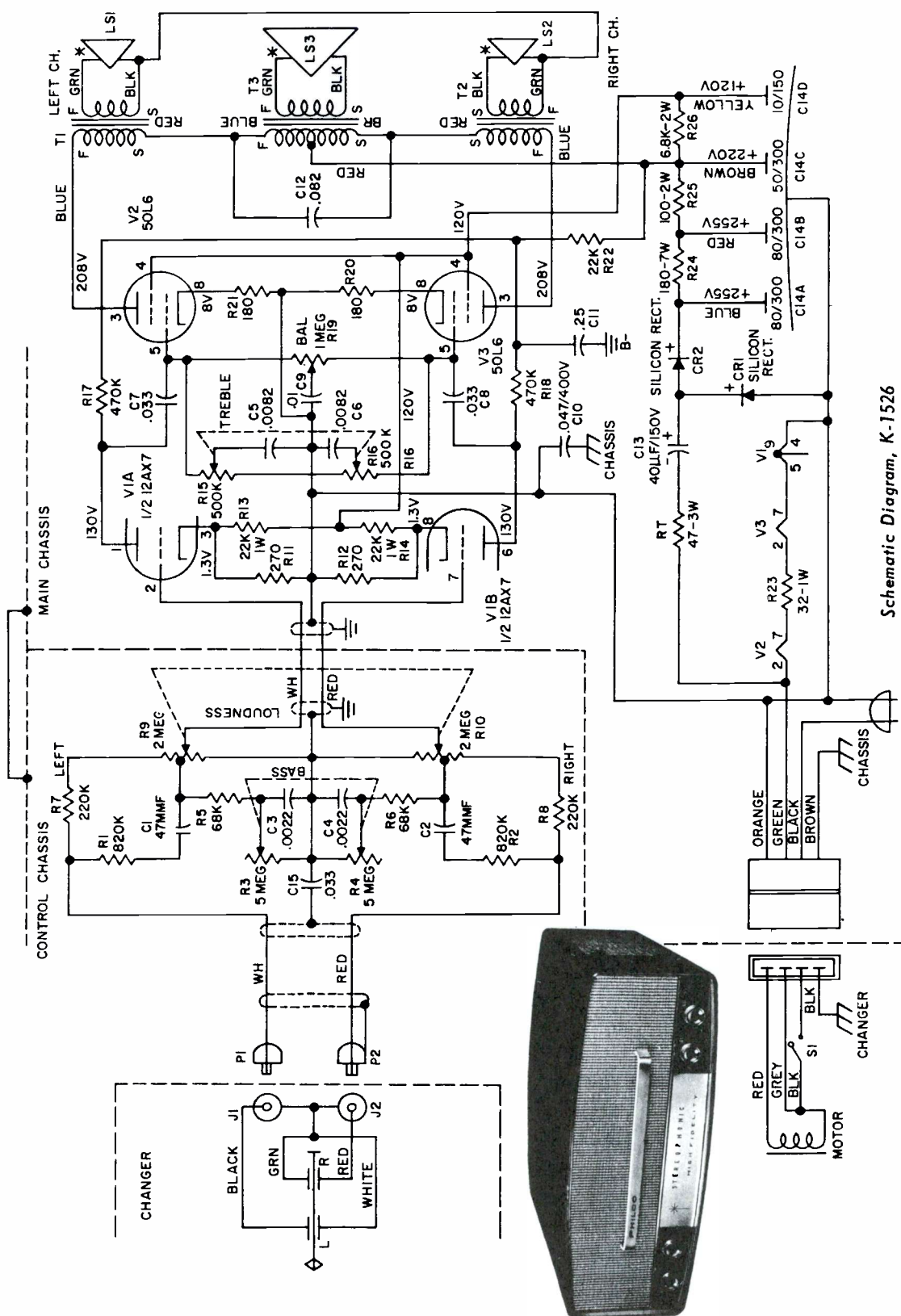


PHILCO PHONOGRAPH MODEL K-1426

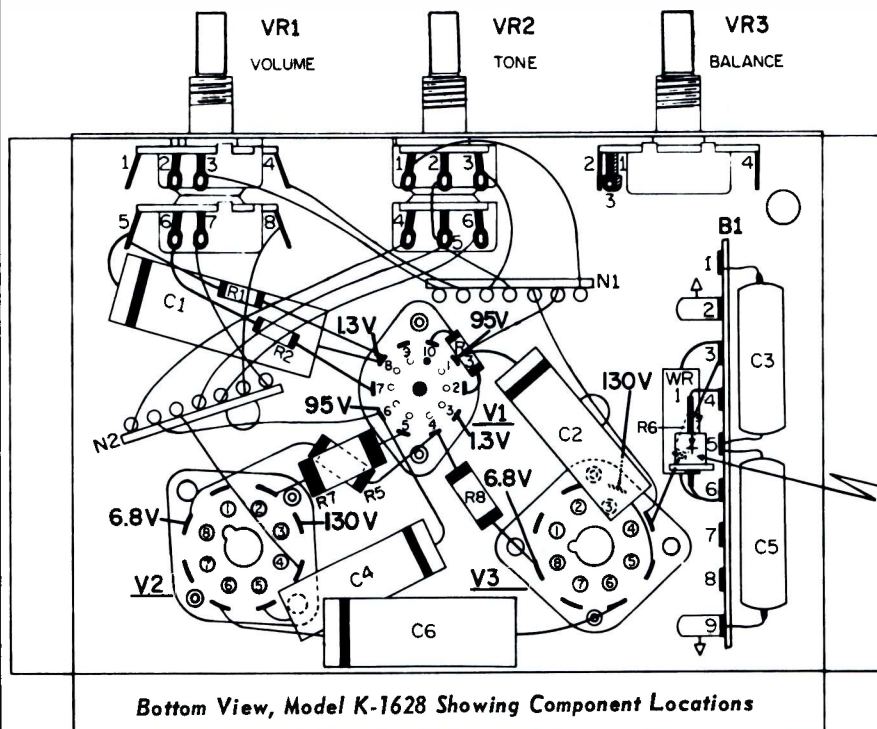
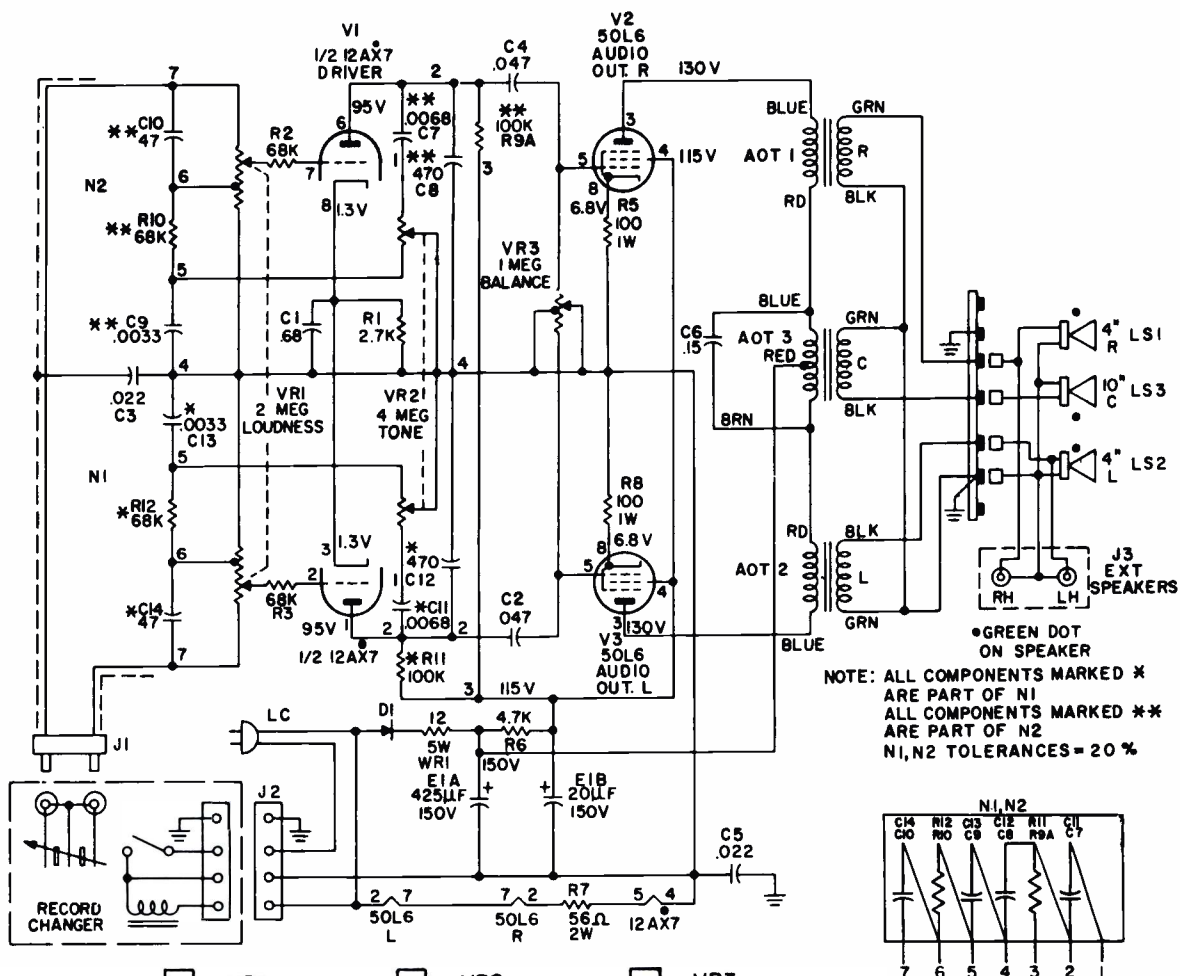


Schematic Diagram, K-1426

PHILCO MODEL K-1526



PHILCO AMPLIFIER—MODEL K-1628



AUDIO OUTPUT: Model K-1628 has a peak power of 8 watts, 2 watts at 10% for each side channel.

POWER CONSUMPTION: Model K-1628 — 55 watts.

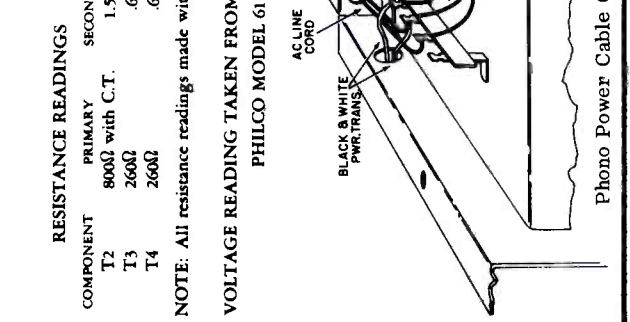
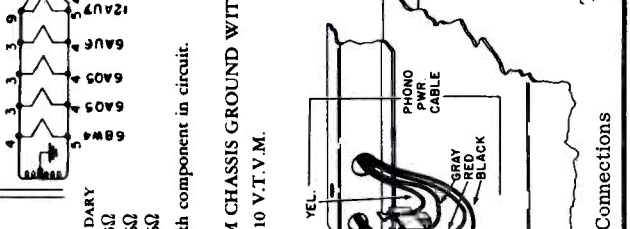
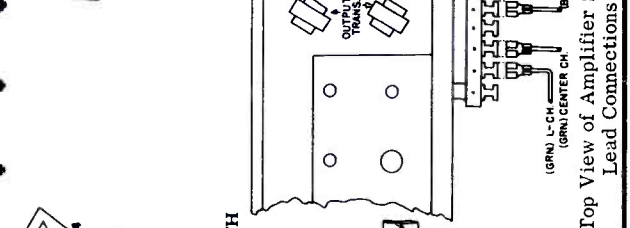
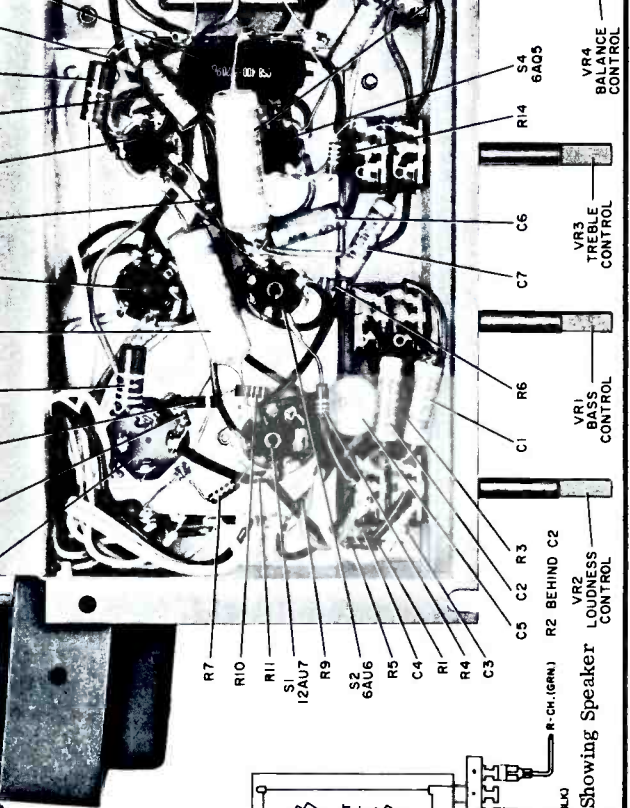
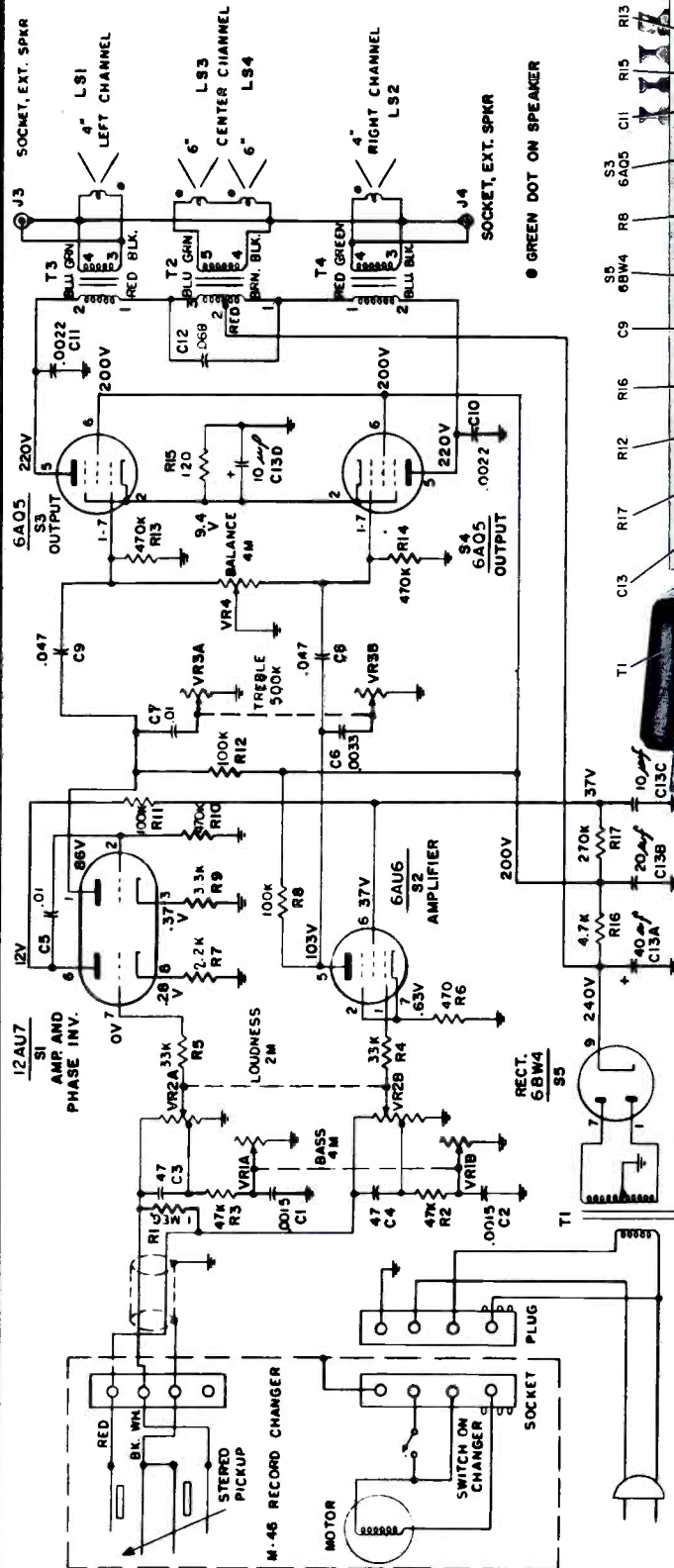
OPERATING VOLTAGE: 105-120 volts, 60 cycles AC.

SPEAKERS: Model K-1628 contains two 4" speakers for left and right channel information. Their impedance is 8 Ω and magnet weight is .68 ounces. This model employs a 10", 16 Ω woofer, for central bass listening.

SS43BE AUXILIARY SPEAKER SYSTEM: Model K-1628 uses, as auxiliary equipment, two 4" external speakers. Voice coil impedance is 8 Ω and magnet weight is 2.15 ounces. The speaker units are available in beige, part number 43-9439.

PHILCO

AMPLIFIER — MODEL K-1632



RESISTANCE READINGS

COMPONENT	PRIMARY	SECONDARY
T2	800Ω with C.T.	1.5Ω
T3	260Ω	.6Ω
T4	260Ω	.6Ω

NOTE: All resistance readings made with component in circuit.

VOLTAGE READING TAKEN FROM CHASSIS GROUND WITH

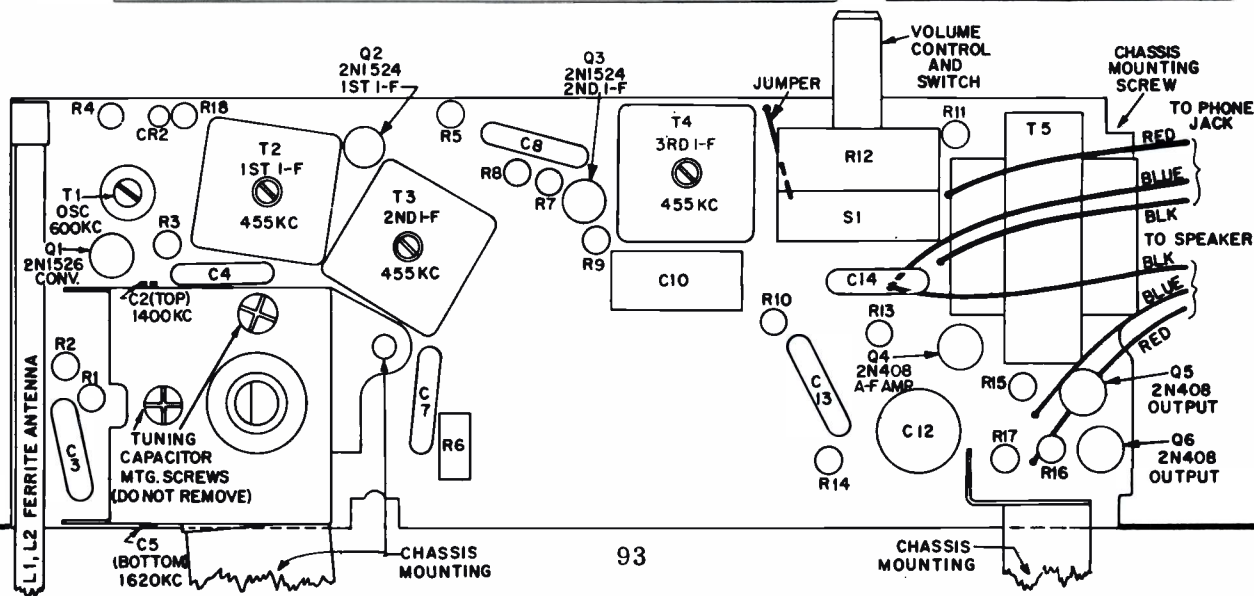
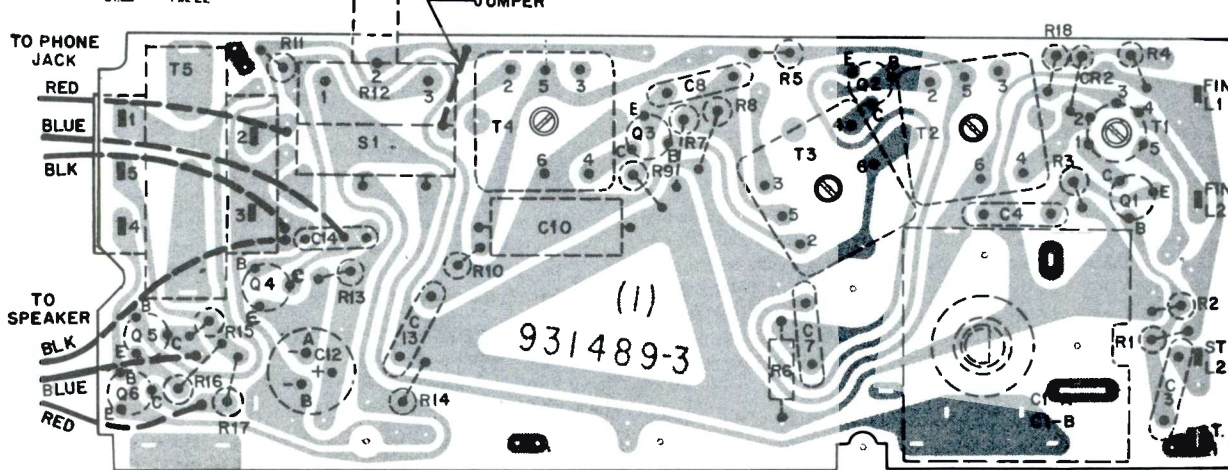
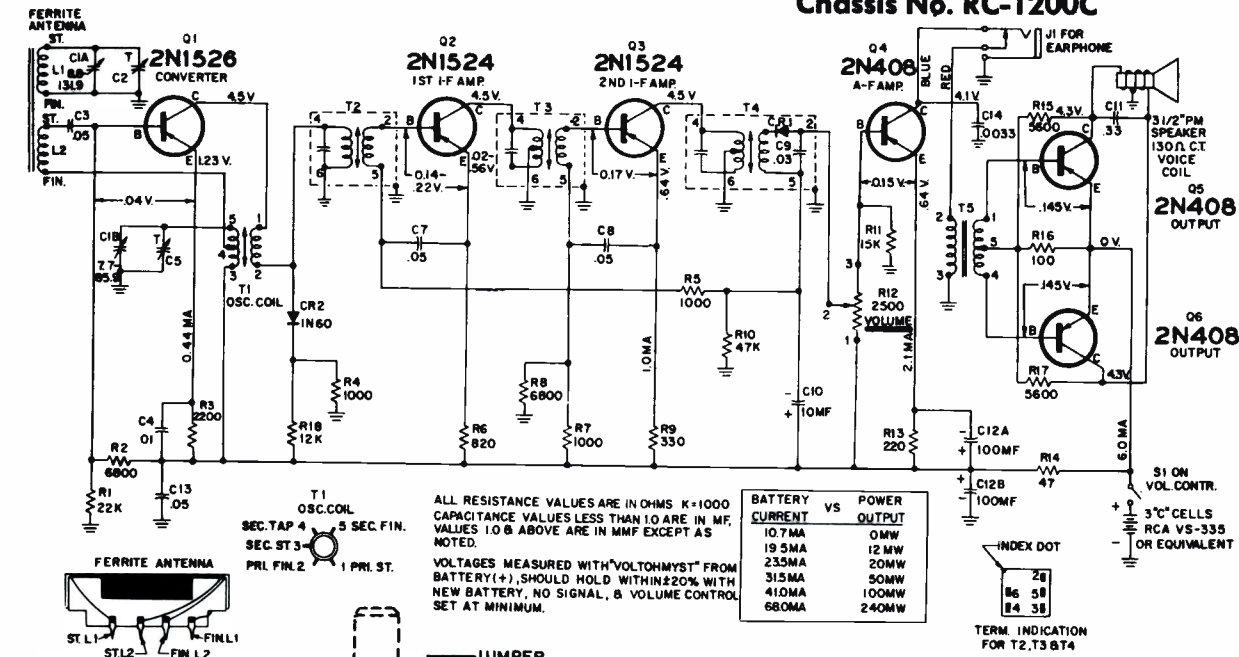
PHILCO MODEL 6110 V.T.V.M.

Top View of Amplifier Showing Speaker Lead Connections

Phono Power Cable Connections

RCA VICTOR Models 1-RG-11, 1-RG-14, 1-RG-15

Chassis No. RC-1200C



Chassis No. RC-1202F

(Circuit variations)

TO LOOP

TO VI PIN7

TO VI PIN2

TO VI PIN1

TO R5

TO V4 PIN4

TO C1B

36A53A

RECT.

C12 .047

120 VOLTS 60 CYCLES POWER SUPPLY

CABINET INTERLOCK

BLK

BRN

WHT.

0.13 MHR

C1-A 132-394.4

2-14

T3 OSC COIL

C1-B 92-116.4

2-14

C4 5.6

C5 .047

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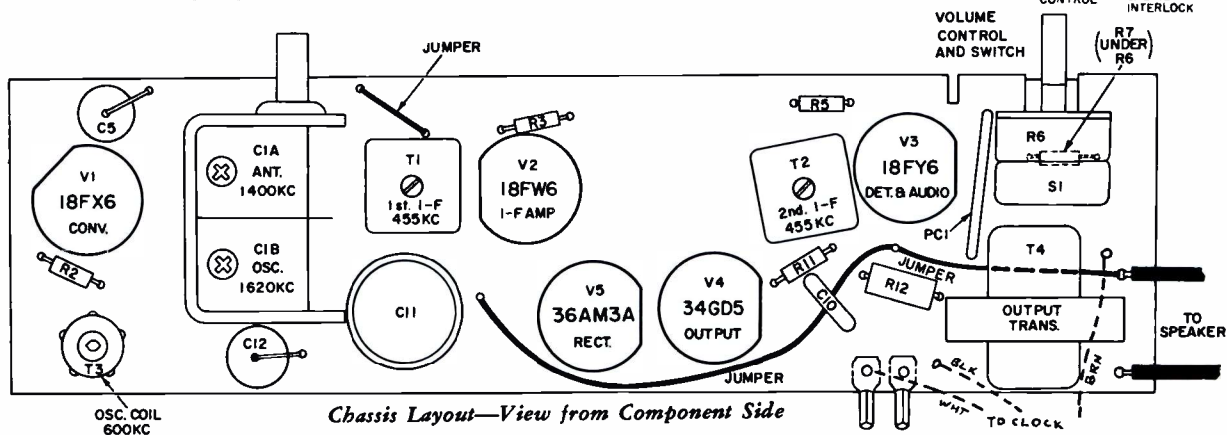
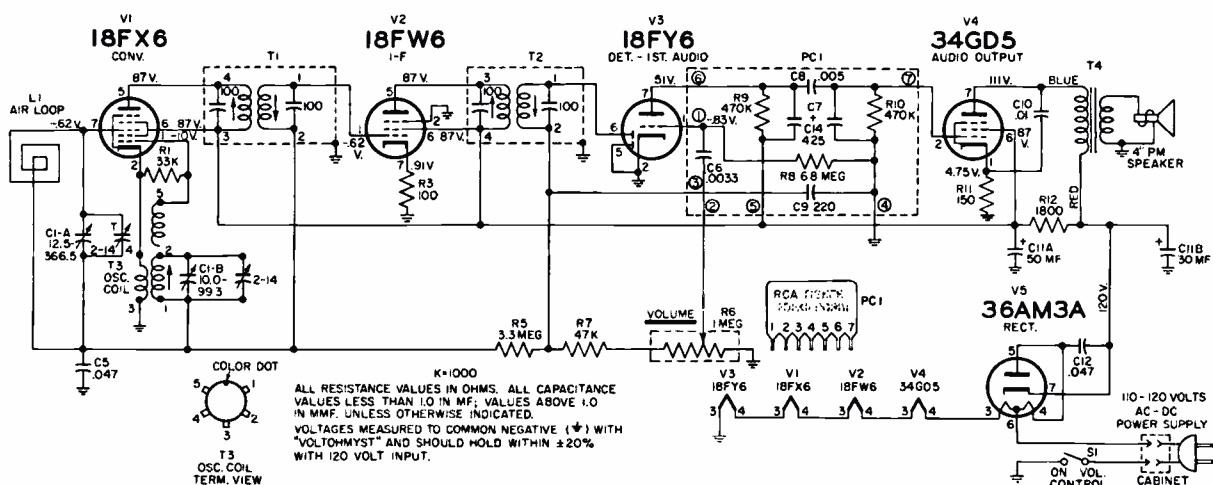
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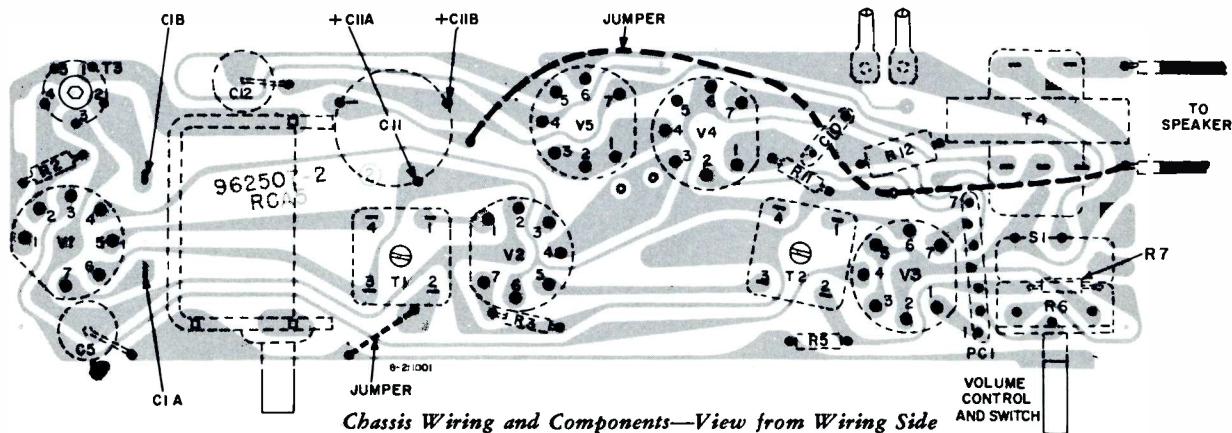
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Chassis Layout—View from Component Side

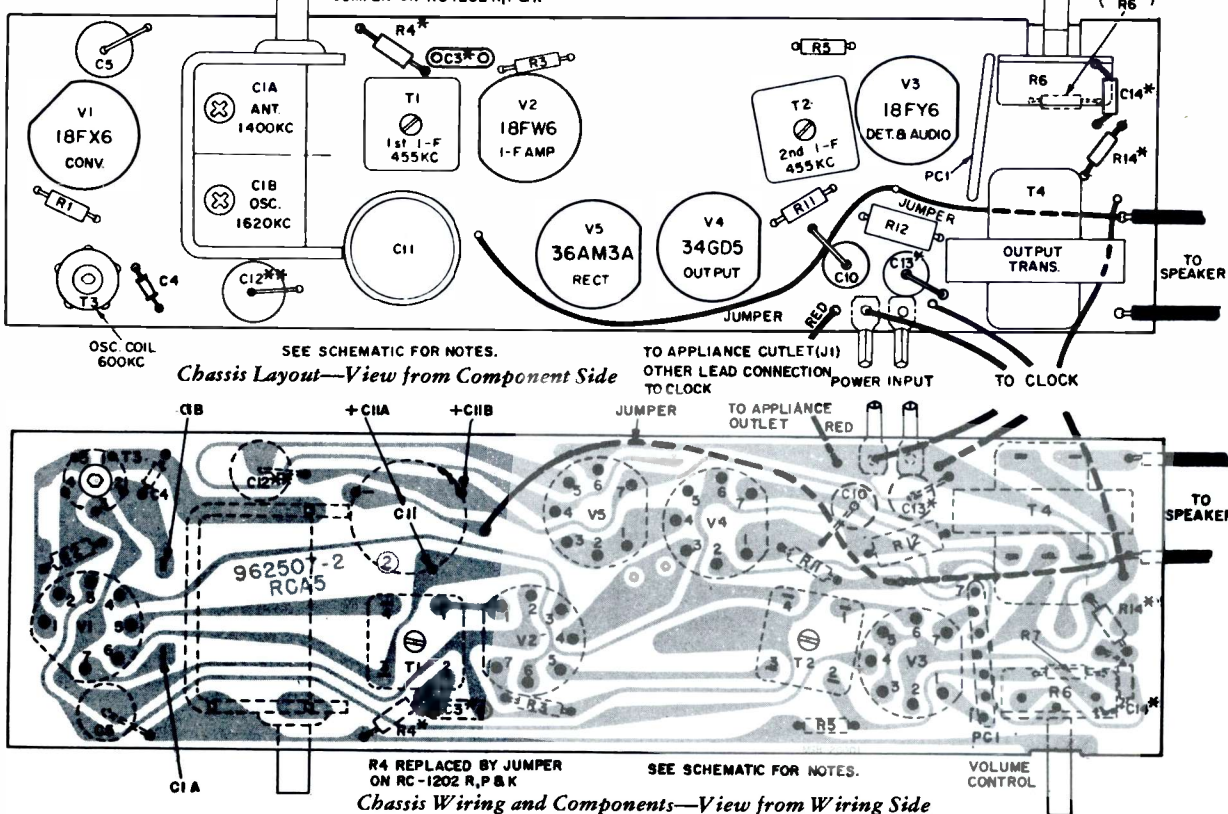
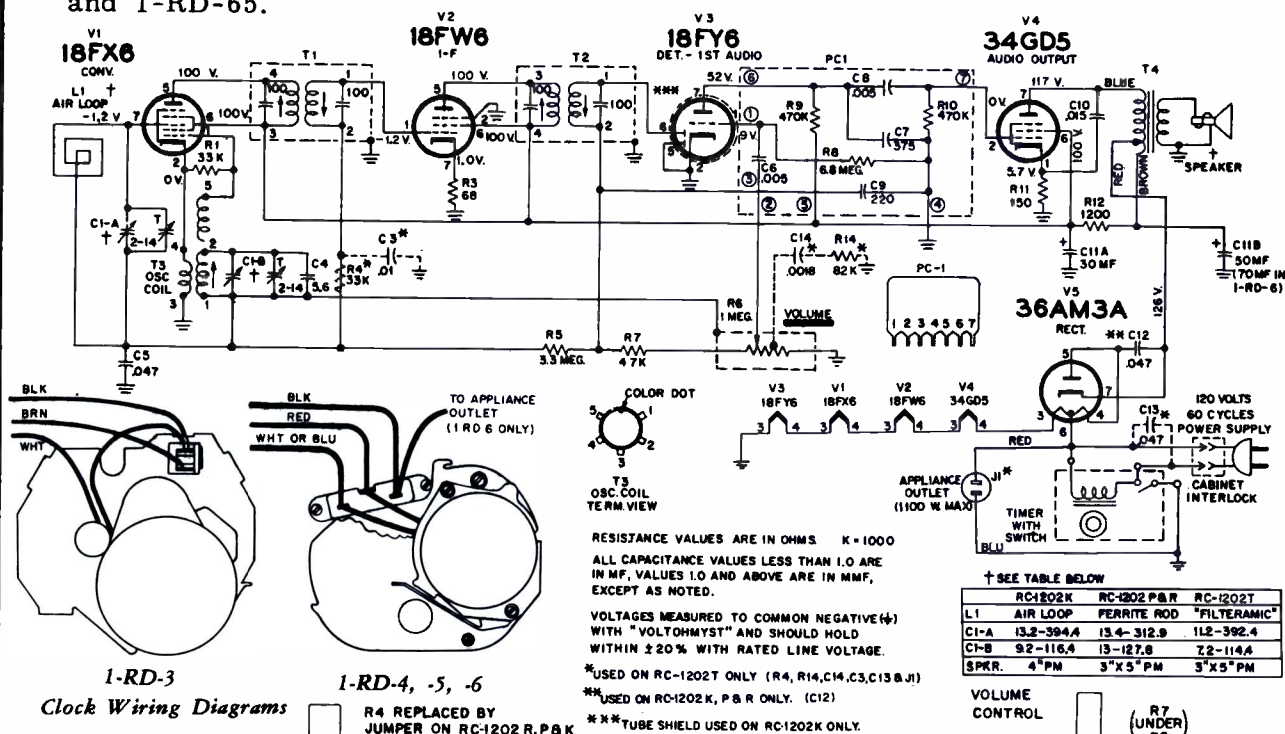


Chassis Wiring and Components—View from Wiring Side

RCA VICTOR

Chassis Nos. RC-1202K, P, R, & T

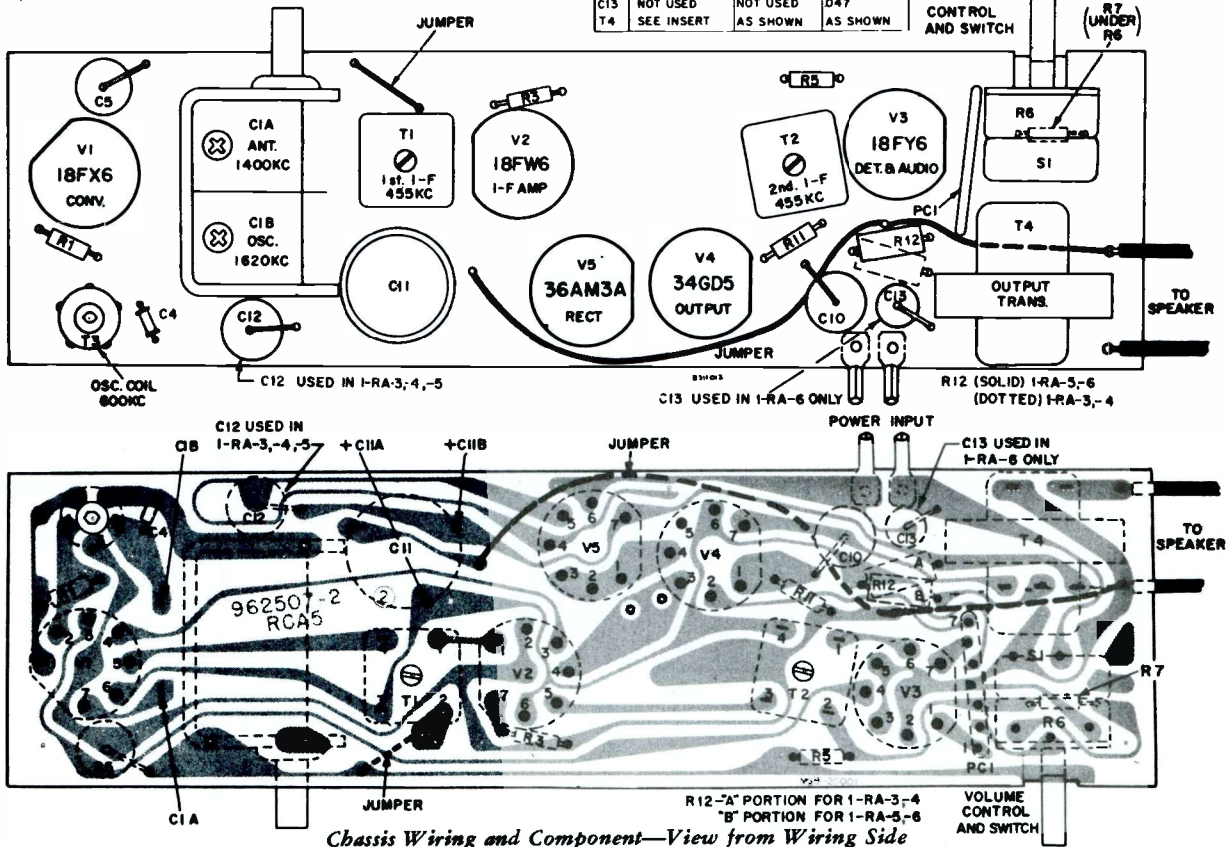
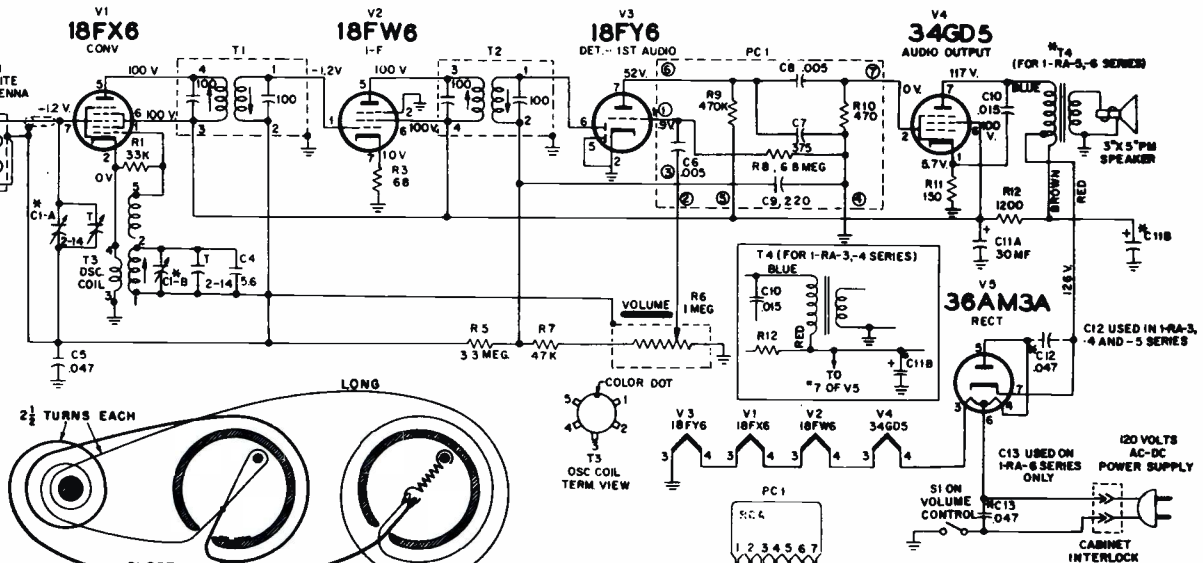
Models 1-RD-30, 1-RD-32, 1-RD-33, 1-RD-37, 1-RD-40, 1-RD-41, 1-RD-44, 1-RD-45, 1-RD-50, 1-RD-52, 1-RD-53, 1-RD-56, 1-RD-60, 1-RD-61, 1-RD-63, and 1-RD-65.



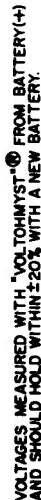
VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

RCA Victor Models 1-RA-30, 1-RA-33, 1-RA-35, 1-RA-36, 1-RA-42, 1-RA-43, 1-RA-44, 1-RA-45, use Chassis RC-1202L; Models 1-RA-50, 1-RA-51, 1-RA-52, 1-RA-55, use Chassis RC-1202M; Models 1-RA-60, 1-RA-61, 1-RA-64, 1-RA-65, Chassis RC-1202N.

Dial Cord Assembly for 1-RA-5 Series and 1-RA-6 Series



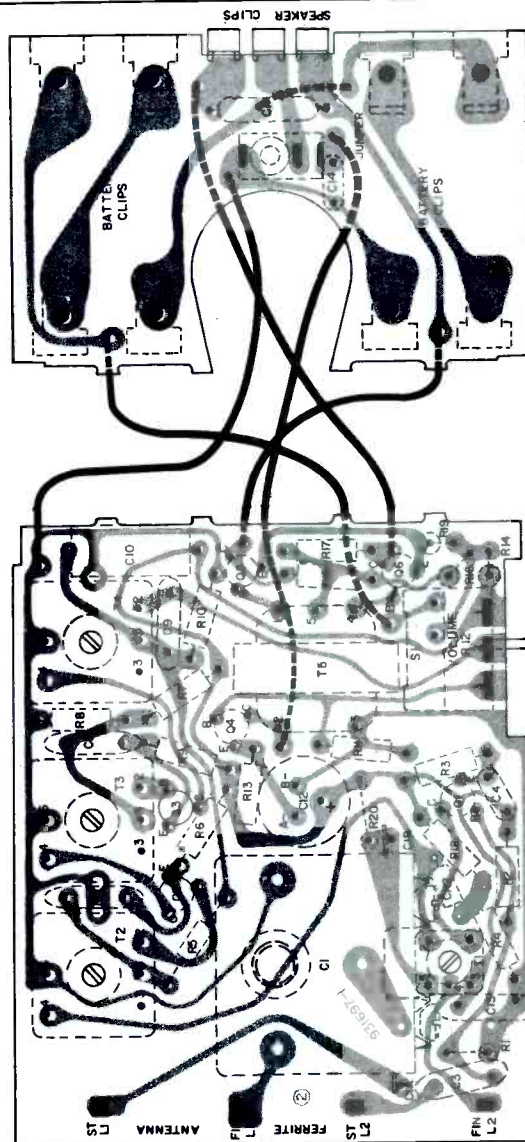
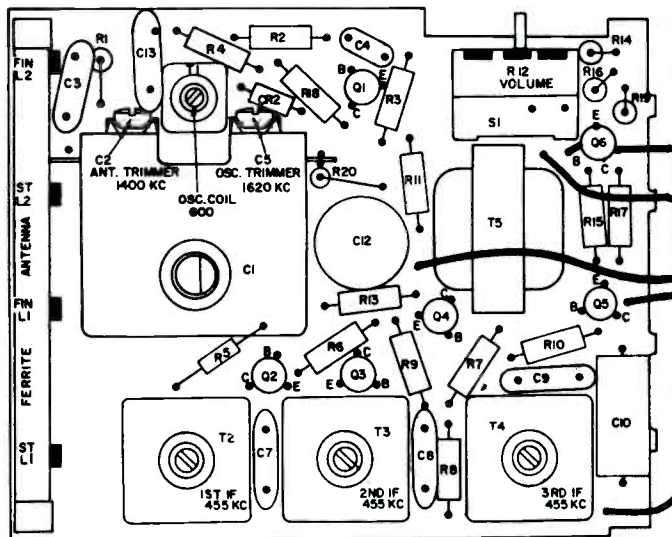
Chassis RC-1208A, RC-1208B



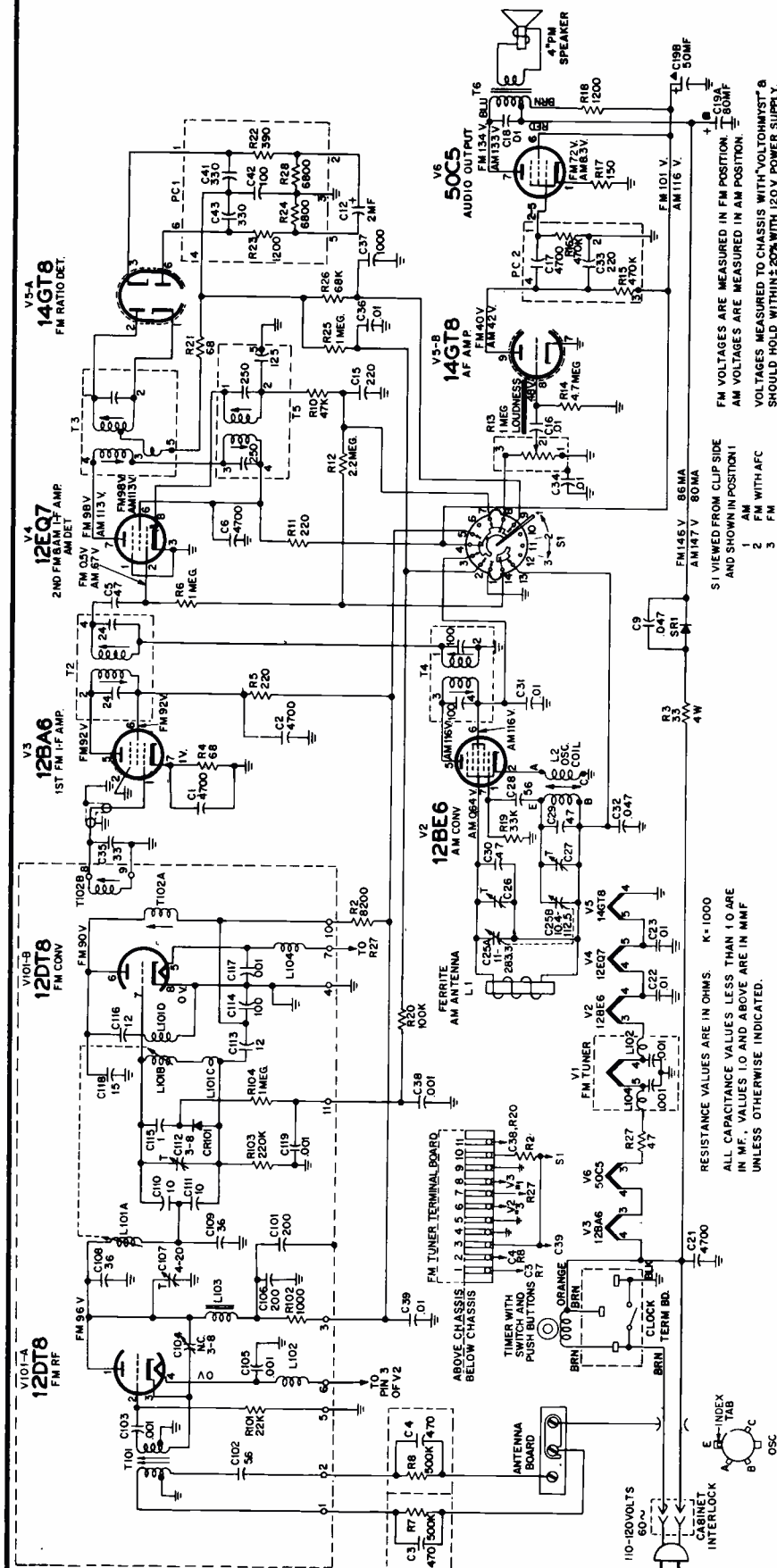
PRODUCTION CHANGES

* In some instruments R1 is 27K and C3 is .03 m μ .

ALL CAPACITANCE VALUES LESS THAN 1.0 ARE IN MF,
THOSE ABOVE 1.0 ARE IN MMF EXCEPT AS NOTED.



Chassis Wiring and Components—View from Wiring Side (Removed from Case)



RCA Victor

Models

1-RC-30, 1-RC-31,

1-RC-34

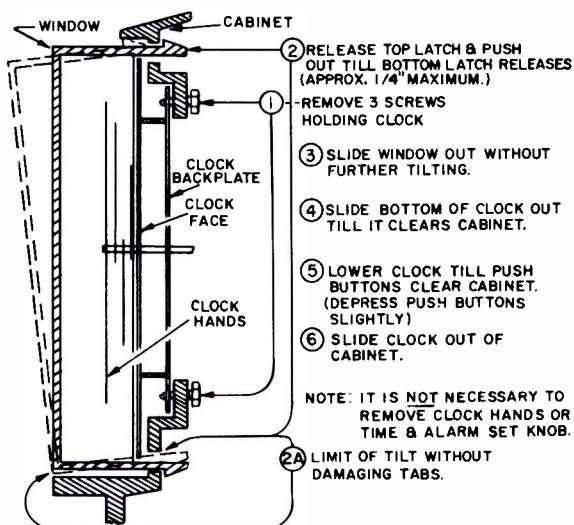
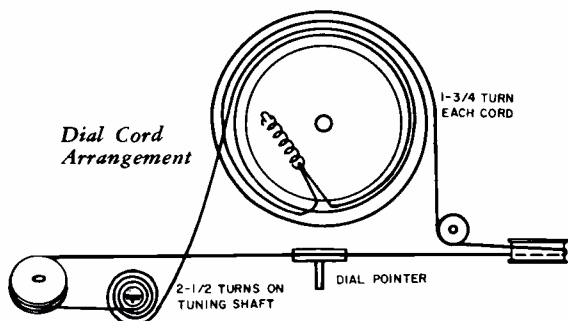
Chassis No. RC-1201D

(Service material continued on the next page at right.)

VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

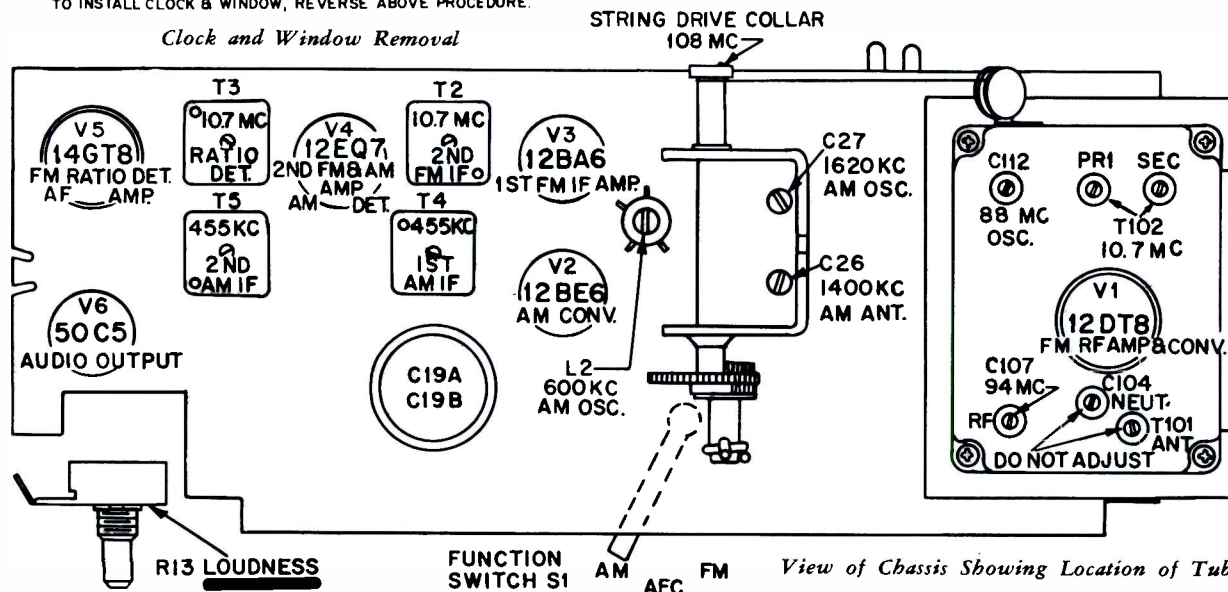
RCA Victor Models 1-RC-30, 1-RC-31, 1-RC-34, Chassis RC-1201D, Continued

Models of the 1-RC-3 Series are 6 tube (plus silicon rectifier) clock radios designed for reception on both the AM and FM bands. These instruments operate only on a 110-120 volt, 60 cycle power supply. The clock timer features five push buttons which select OFF, ON, DROWSE, RADIO alarm, and auto ALARM. A ferrite rod antenna is utilized for AM reception, and a power line antenna for FM reception.



TO INSTALL CLOCK & WINDOW, REVERSE ABOVE PROCEDURE.

Clock and Window Removal



CRITICAL LEAD DRESS

1. Dress all bus leads short and direct as possible.
2. Dress all by-pass capacitors and coupling capacitor leads short and direct as possible.
3. Dress all insulated leads down to chassis and away from any hot resistors.
4. Dress power line antenna away from ferrite rod and secure against front by hold down clips.
5. Dress grid capacitor away from oscillator coil.
6. Dress output transformer leads away from tuning drum.

THE CHASSIS IS CONNECTED DIRECTLY TO ONE SIDE OF THE POWER LINE. AN ISOLATION TRANSFORMER SHOULD BE USED DURING ALIGNMENT OR OTHER SERVICE WORK.

AM ALIGNMENT

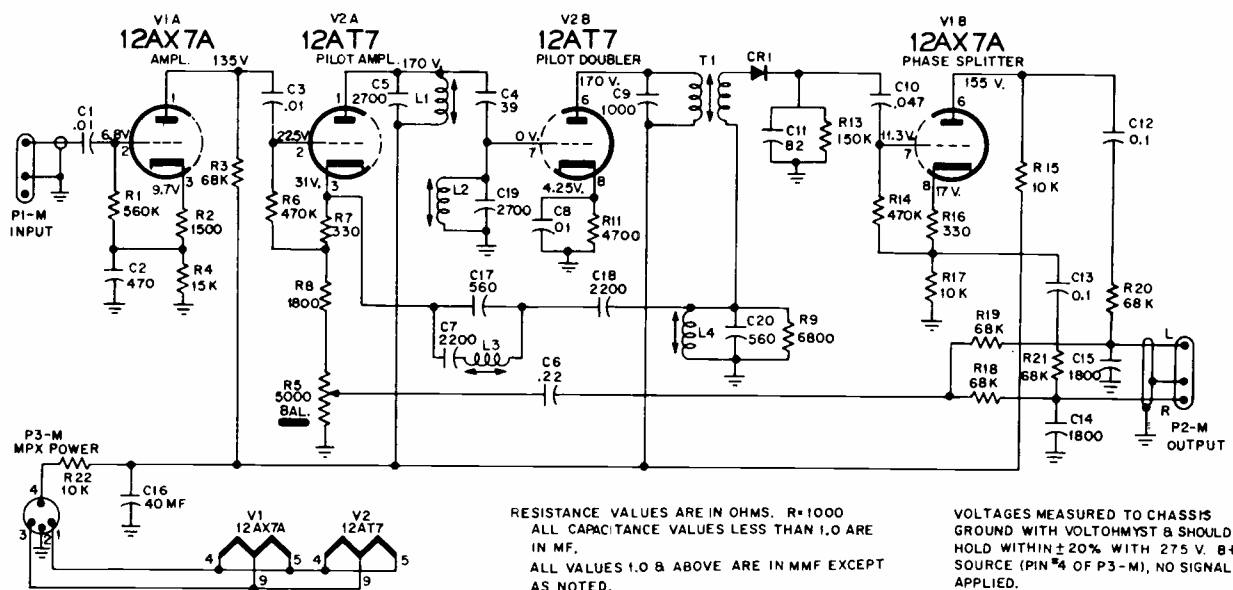
Turn SELECTOR switch to AM position, and turn LOUDNESS control to maximum. Connect output meter across voice coil of speaker. Keep generator output low to avoid AVC action.

Step	Connect high side of signal gen. to—	Set signal gen. to—	Set radio dial to—	Adjust for maximum
1	Antenna gang (C25A) through 0.01 mf capacitor	455 kc (modulated)	Gang fully open	T5 (2nd AM IF) top & bottom
2				T4 (1st AM IF) top and bottom
3	Repeat steps 1 and 2.			
4	Short wire placed near AM antenna to radiate signal	1620 kc (modulated)	1620 kc (gang fully open)	C27 (osc. trimmer)
5		1400 kc (modulated)	1400 kc signal (rock gang)	C26 (ant. trimmer)
6		600 kc (modulated)	600 kc signal (rock gang)	L2 (osc. coil)
7	Repeat steps 4, 5, and 6.			

RCA VICTOR

RK-295

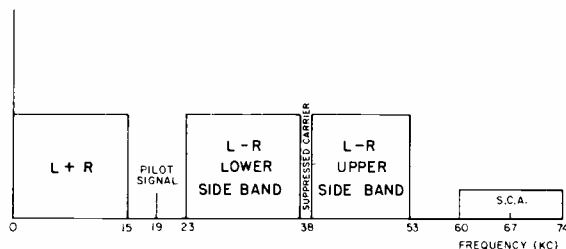
Chassis No. RS-200



FM STEREO (MULTIPLEX) OPERATION

The FM-Stereo (Multiplex) broadcasting system that has been approved by the FCC is compatible. This means that present FM tuners not equipped for the reception of an FM-Stereo signal will be able to receive a complete balanced program rather than only one channel, or an unbalanced program, as in former methods of stereocasting.

The FM-Stereo composite signal is composed of three pieces of information: the L+R signal, the L-R signal, and a 19 KC pilot signal. These are placed in the channel spectrum as shown.



Composite Signal

The L+R signal is the in-phase combination of the left channel and the right channel information and is used to frequency modulate the main carrier. The L-R signal is the out-of-phase combination of the same channels and is used to amplitude modulate a 38 KC carrier signal which is then suppressed leaving only the sidebands. This is the portion of the composite signal that, when matrixed with the L+R signal, separates the two channels. The 19 KC pilot signal is effectively the synchronizing signal and is used to reinsert the carrier in the L-R signal, thus making a local oscillator unnecessary.

Present FM tuners need only the L+R signal to reproduce the full and complete program. As this signal is the combination of the two stereo channels, none of the information is lost or suppressed for monophonic reproduction. In an FM-Stereo system, however, additional circuitry is necessary to separate the combined channels. This is the function of the L-R and 19 KC pilot signals.

After reception through the normal FM channel of the receiver, in a FM-Stereo system, the signal from the FM detector (discriminator or ratio-detector) is fed into two amplifier stages (V1A & V2A). From the cathode of V2A the L+R signal is fed directly to the matrix from the Balance control which is a part of the cathode circuit, and the L-R signal is filtered out and fed to T1—a mixing transformer. The 19 KC pilot signal is taken off at the plate of V2A and fed to a frequency doubler stage V2B. In V2B the grid is tuned to 19 KC and the plate is tuned to 38 KC. From the plate of V2B the 38 KC signal is fed to the mixing transformer, T1, where the 38 KC carrier is reinserted in the L-R signal. This signal is now demodulated in CR1 and passed on to a phase-inverter stage (V1B). In the phase inverter the L-R signal is taken off at the plate and the -L+R signal is taken off at the cathode. These two signals are now fed to the matrix where they combine with the L+R signal. By simple algebra $(L+R) + (L-R) = 2L$, and $(L+R) + (-L+R) = 2R$, thus the left and right channels are recovered and fed to the stereo amplifier.

This system, although similar in some respects to the color TV signal, differs in the fact that a local oscillator is not necessary for reinsertion of the carrier. Instead of sync pulse being supplied, an actual sync frequency is transmitted.

It is also possible for a commercial service keying signal (S. C. A.—such as is presently in use) to be transmitted in the composite signal.

RCA VICTOR

Tuner Chassis RC-1206A Amplifier Chassis Nos. RS-193A, B, D

1-VE-0 Series, Models 1VE075, 1VE086, 1VE094,
1-VE-1 Series, Models 1VE105, 1VE106, 1VE107,
1-VE-2 Series, Models 1VE205, 1VE207, 1VE224, 1VE229, 1VE246,
1-VF-1 Series, Models 1VF105, 1VF106, 1VF107,
1-VF-2 Series, Models 1VF205, 1VF207, 1VF224, 1VF229, 1VF246.

Diagram of Tuner Chassis RC-1206A is on the next page, over; and the diagram of the amplifier is on the page following. Use this related material together.

The 1-VE-2 Series, the 1-VF-1 Series, and the 1-VF-2 Series instruments use a four tube dual-channel audio amplifier (RS-193A) consisting of a preamplifier stage and an output stage in each channel. The phono input and the tuner input are fed to the function switch which selects STEREO phono, MONO phono, or RADIO tuner operation. Dual controls are provided to regulate the BASS, TREBLE, and LOUDNESS in each channel simultaneously, and a BALANCE control is provided to permit adjustment of the relative strength of each channel.

The RS-193A chassis contains output jacks for AC power to the record changer and to the tuner. A multiplex power output jack provides filament and B+ power for a multiplex adapter.

The 1-VE-1 Series instruments use the RS-193B audio amplifier which is similar to the RS-193A except that it does not contain a function switch, a tuner input, a tuner AC power output, or a multiplex power output.

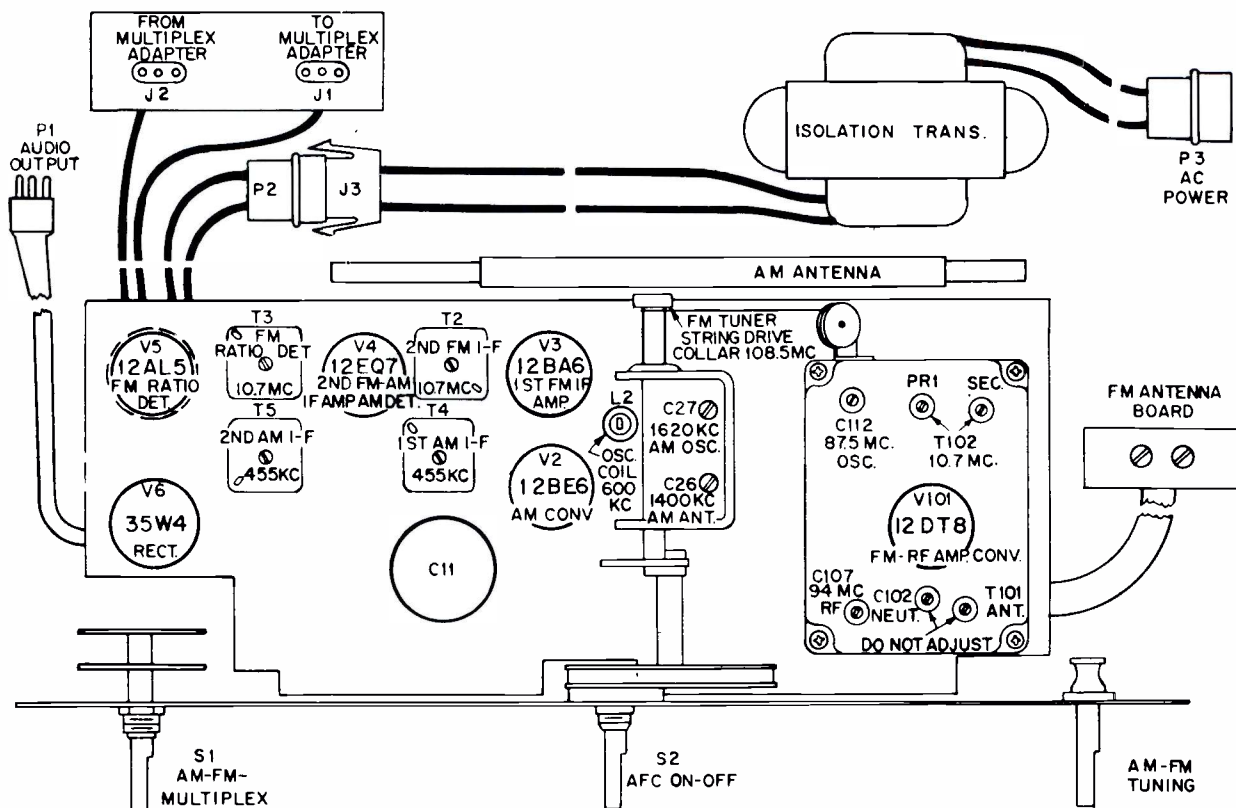
The 1-VE-0 Series instruments use the RS-193D audio amplifier. The RS-193D chassis is similar to the RS-193A except that it does not contain a function switch, a tuner input, a tuner AC power output, a multiplex power output, or a dial light.

MULTIPLEX ADAPTER

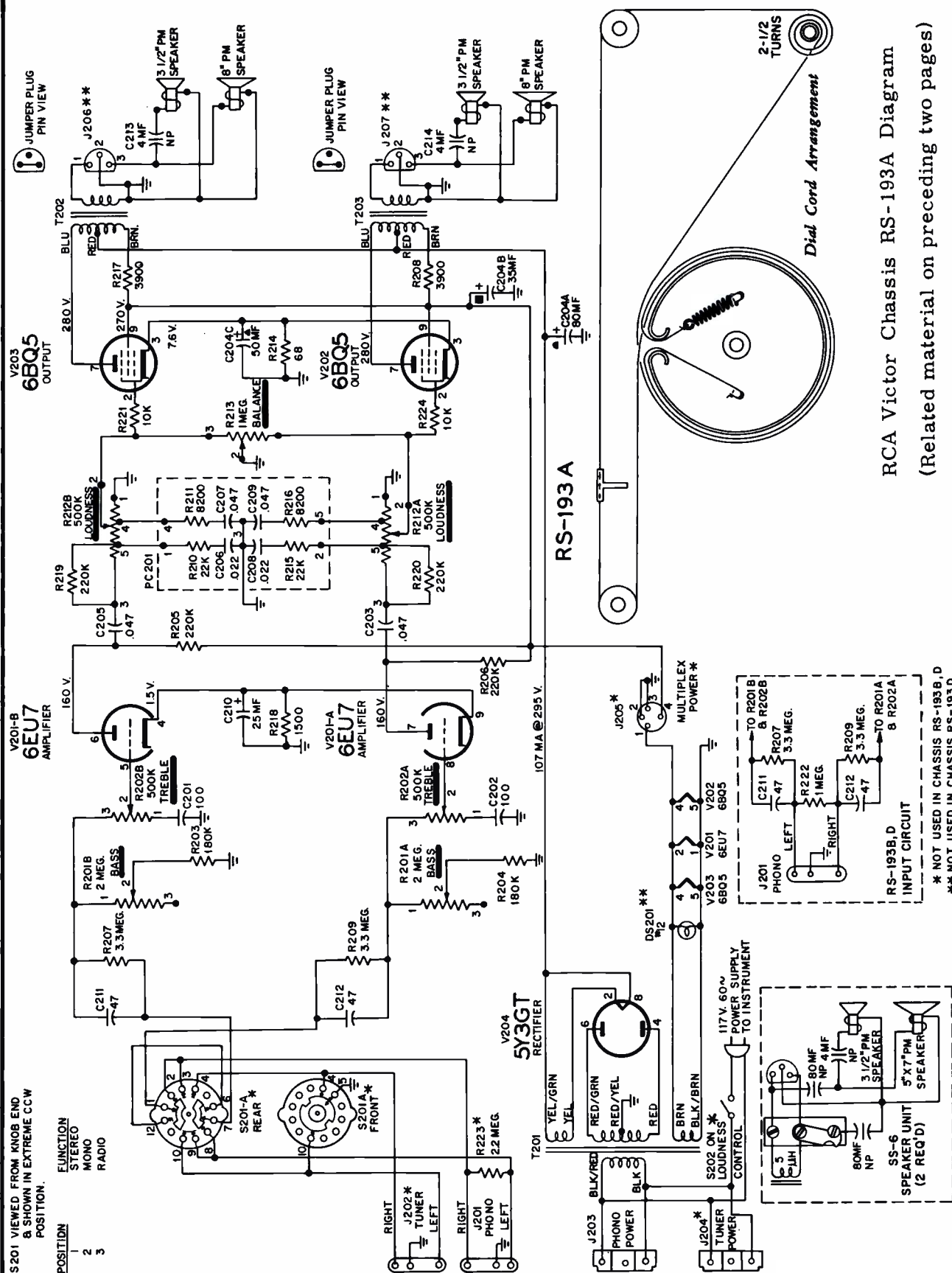
Models of the 1-VF-1 Series and the 1-VF-2 Series have provision for the connection of a multiplex adapter (RCA Model RK-295). Three jacks provide for the input, output, and power connections of the adapter. The signal input jack (J1) and the signal output jack (J2) are mounted on a bracket fastened to the cabinet underneath of the AM/FM tuner (RC-1206A). (These jacks are shown as a part of the tuner circuitry.) The MPX POWER jack is mounted on the amplifier chassis (RS-193A), and provides filament and B+ power for the adapter.

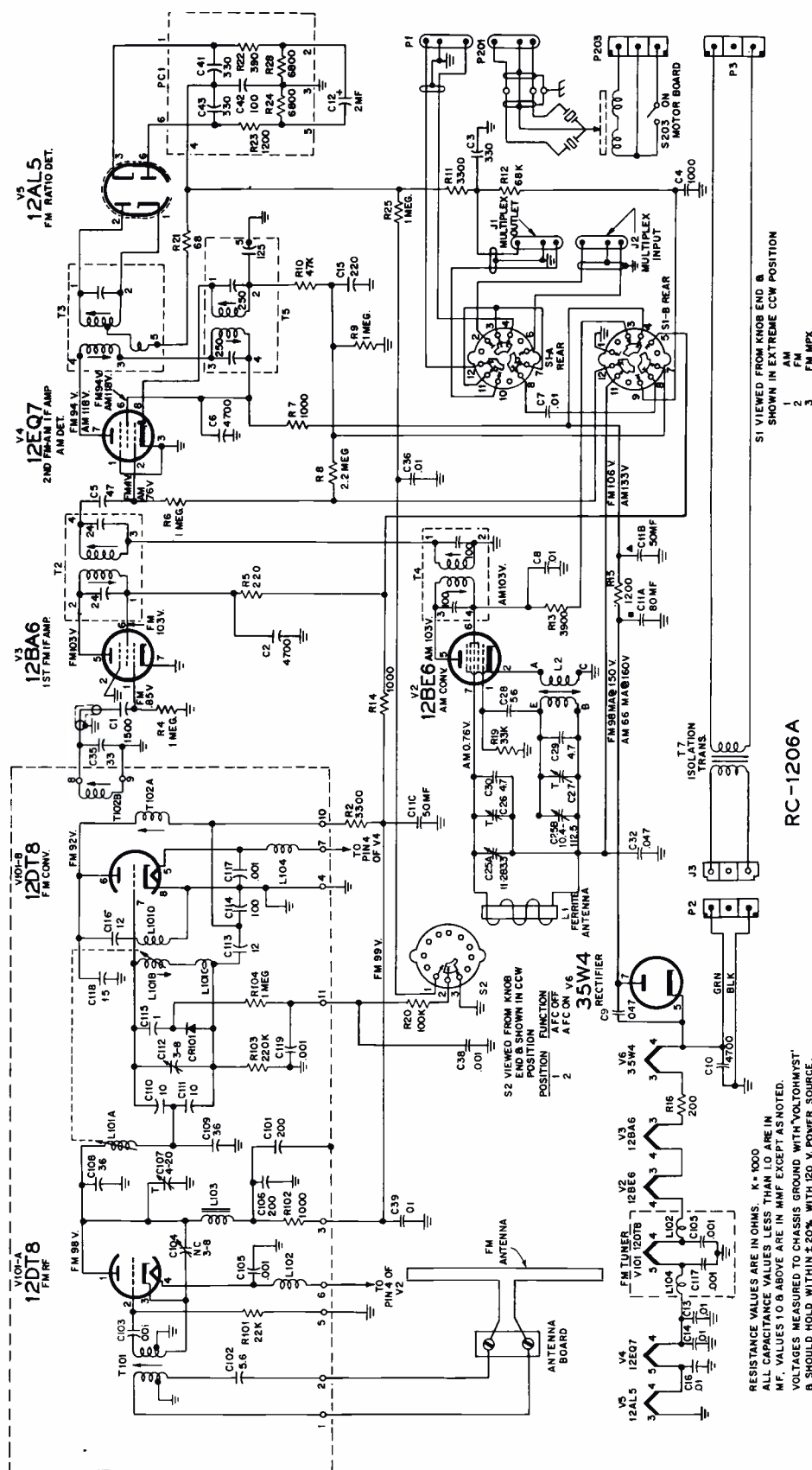
To receive FM multiplex broadcasts:

1. Connect the cables from the multiplex adapter (RK-295) to the MPX INPUT jack (J1) and the MPX OUTPUT jack (J2) on the tuner chassis, and the MPX POWER jack (J205) on the amplifier chassis.
2. Turn the FUNCTION selector switch to FM MPX.
3. Turn the STEREO-MONO-RADIO switch to RADIO.



Chassis RC-1206A—Location of Major Components





CRITICAL LEAD DRESS

Chassis RC-1206A

1. 10.7 mc IF grid and plate wiring must be short and dressed close to chassis.
2. Connect AVC side of AM antenna to top side of tuning gang, and dress clear of 12BE6 and 12BA6 tubes.
3. Dress heater lead which connects to pin 4 of 12BE6 along rear apron and to rear of 12BA6 socket.
4. B+ lead from pin 6 of 12BE6 to T4 must be short and dressed along chassis.
5. All RF bypass capacitor leads must be short and direct.
6. All heater leads must be close to chassis.

Chassis RS-193A, B, D

1. Dress all heater leads close to chassis and away from all grid connections.
2. Dress all green and white leads against front apron.
3. Dress all leads to pins 6 and 8 of V4(5Y3) close to chassis.
4. Dress all leads from T2 and T3 against back apron.
5. Dress R8 and R17 (3900Ω) close to back apron keeping leads as short as possible.
6. Bend terminal 2 away from terminals 1 and 3 of J3 on RS-193B amplifier.

RCA Victor

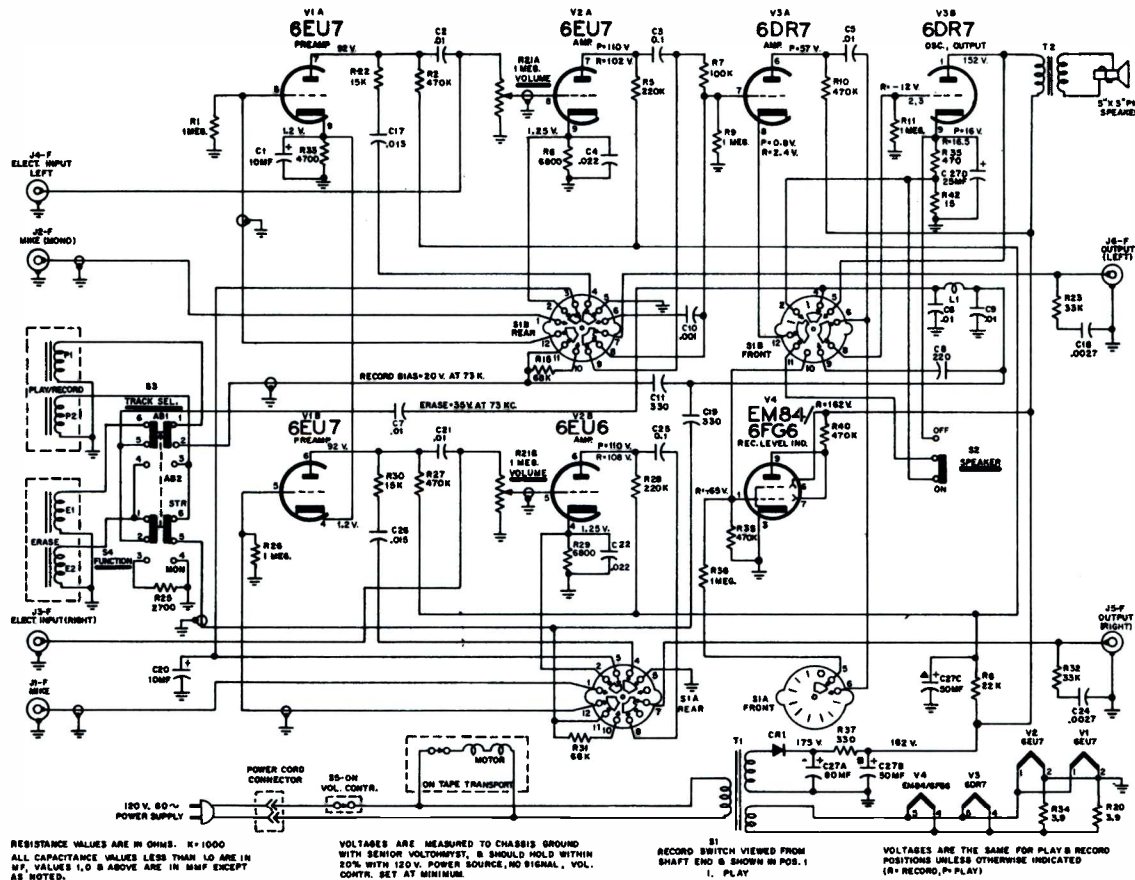
Chassis RC-1206A

(Continued from preceding page; material on related amplifier is on the next page.)

RCA VICTOR

TAPE RECORDER

Model 1-YC-11
Amplifier Chassis No. RS-196
Tape Transport TCT-3A



CHASSIS REMOVAL

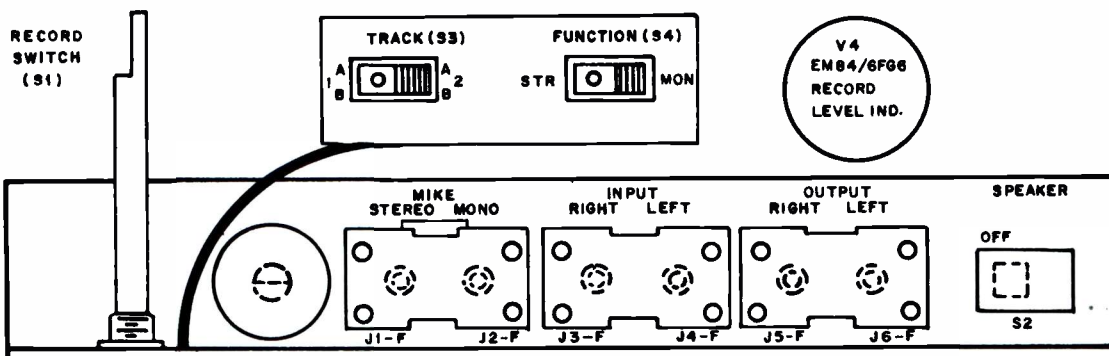
The amplifier chassis is fastened to the tape transport and is removed with it. For normal servicing it will not be necessary to separate the chassis from the transport.

To remove chassis and transport:

1. Turn REWIND-STOP-PLAY knob to rewind position.
2. Pull off RECORD, REWIND-STOP-PLAY, SPEED CONTROL and VOLUME knobs. Note: To remove SPEED control knob, twist while gently pulling the knob. When the knob is replaced, push it on firmly until the knob seats with a click.
3. The control escutcheon is held in place by three spring clips (2 at the front and one at the back), and one screw. Remove

the screw and plastic washer from the center of the escutcheon and lift the escutcheon straight up and off.

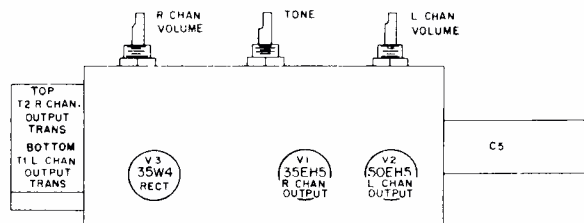
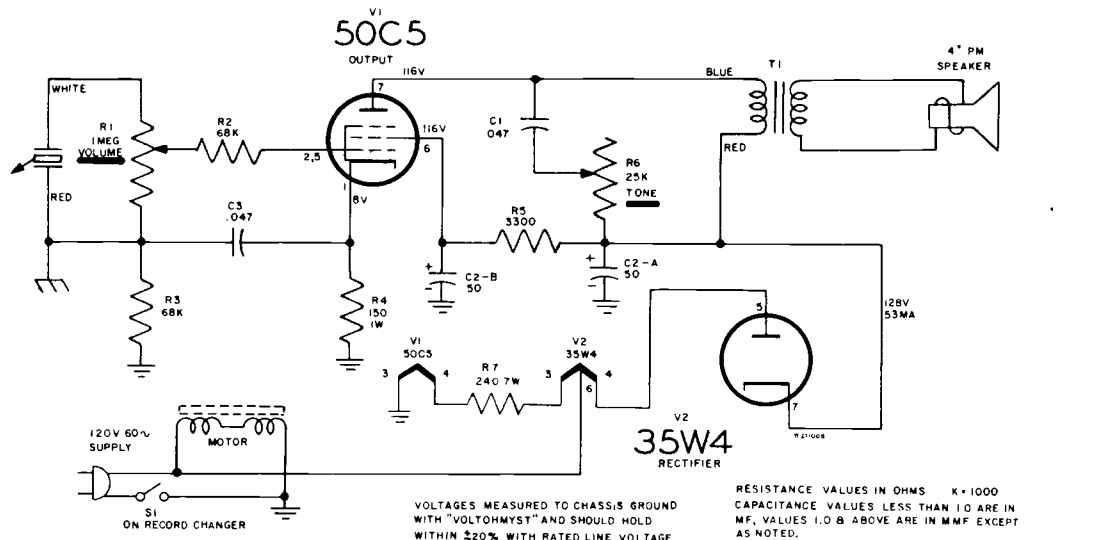
4. Block the carrying handle in its extended position.
 5. Remove the four (4) red screws at the corners of the tape transport.
 6. Lift right side of motor board sufficiently to permit disconnecting the speaker.
 7. Lift out motor board and chassis.
- Note: Support the transport mechanism on blocks or a rack if it is to be operated while outside of the case.
8. To reassemble, reverse the foregoing procedure.



RCA VICTOR

Model 1-VA-14

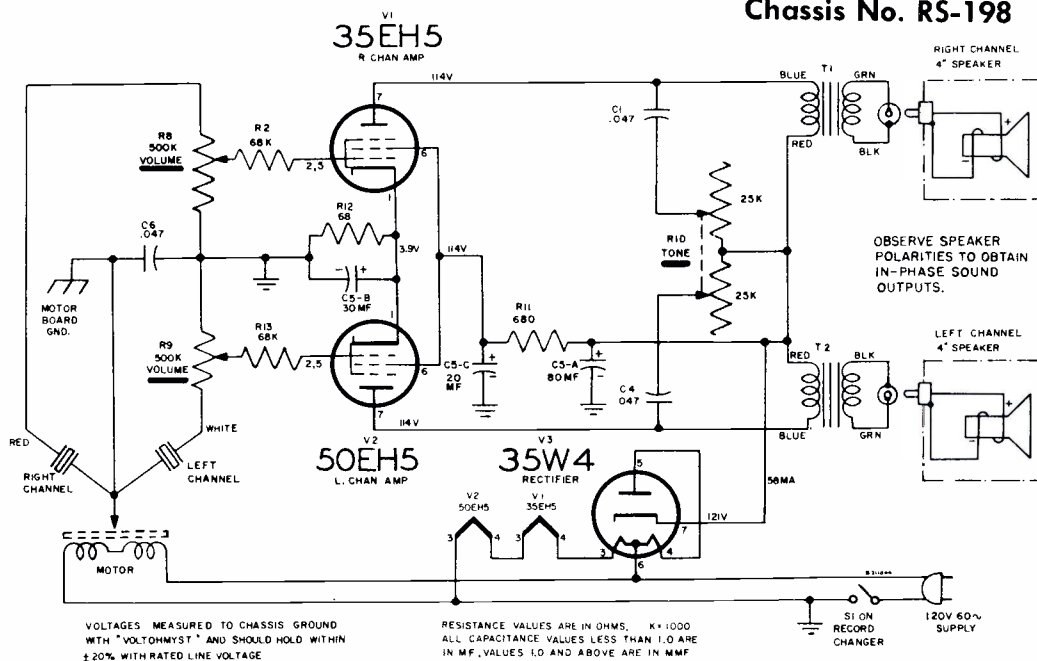
Chassis No. RS-197



RCA VICTOR

Model 1-VC-15

Chassis No. RS-198

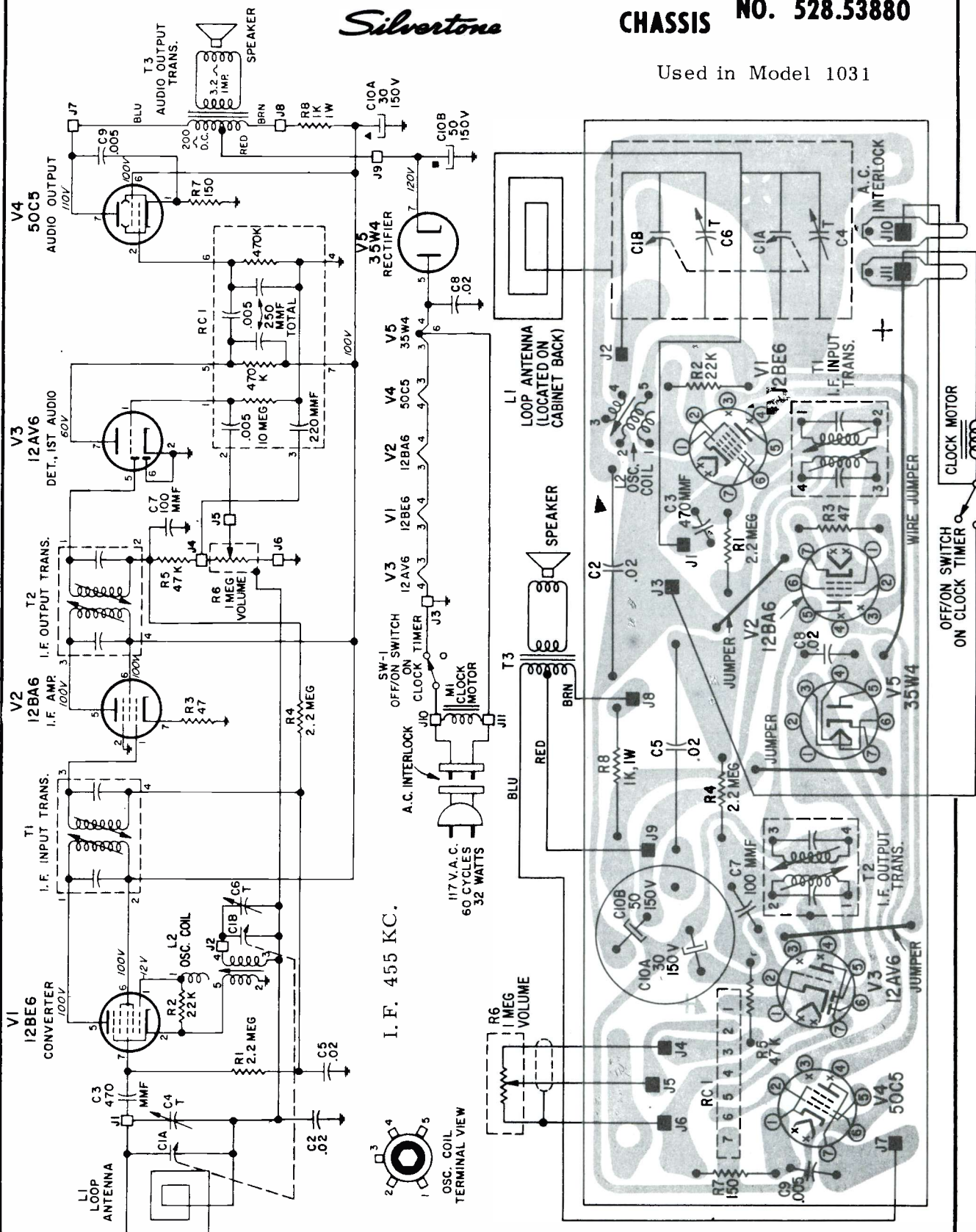


SEARS, ROEBUCK and CO.

Silvertone

**RADIO
CHASSIS NO. 528.53880**

Used in Model 1031

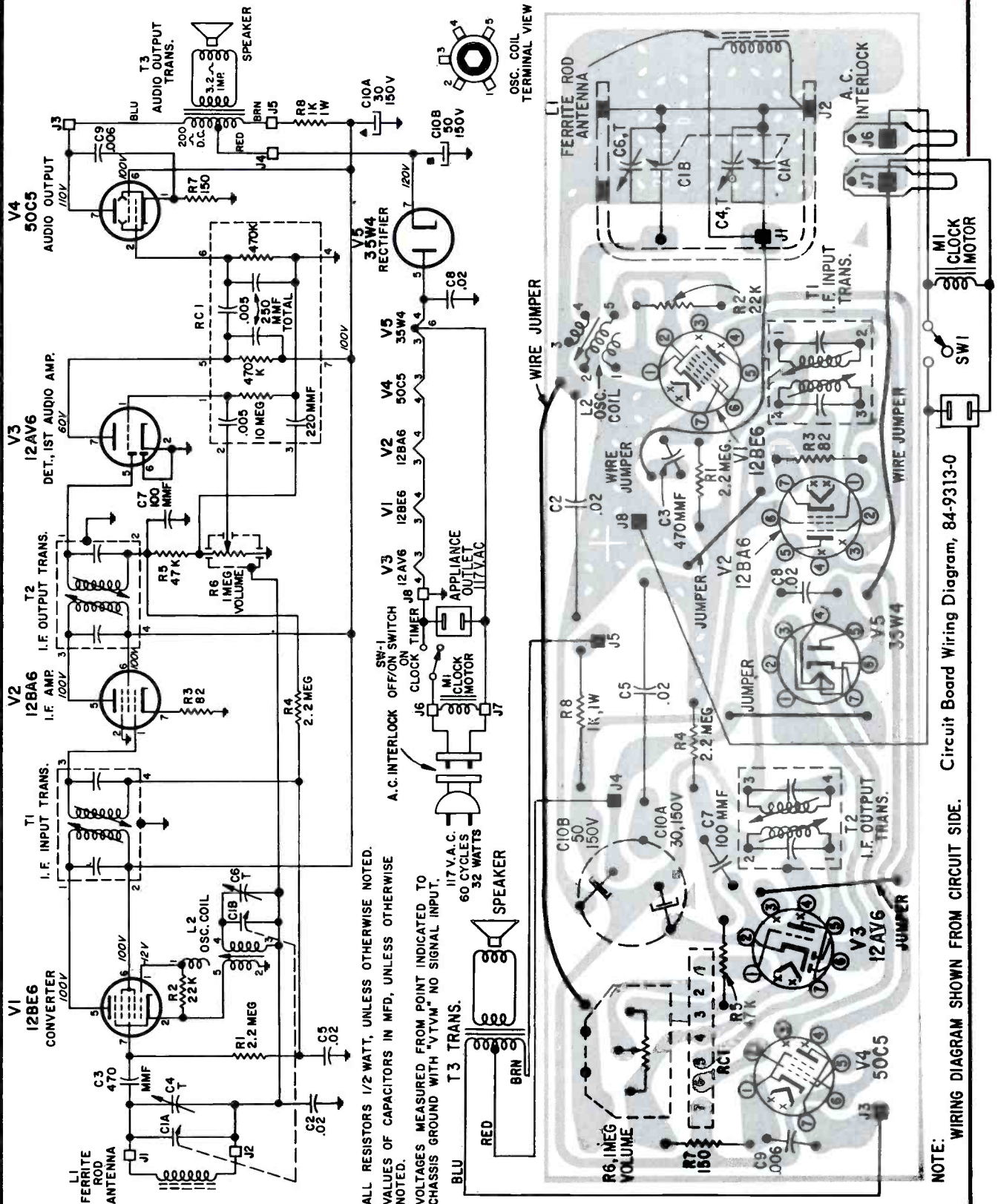


SEARS, ROEBUCK AND CO.

Models 1035, 1036, 1037, 1038

Silvertone

CHASSIS NO. 528.53940

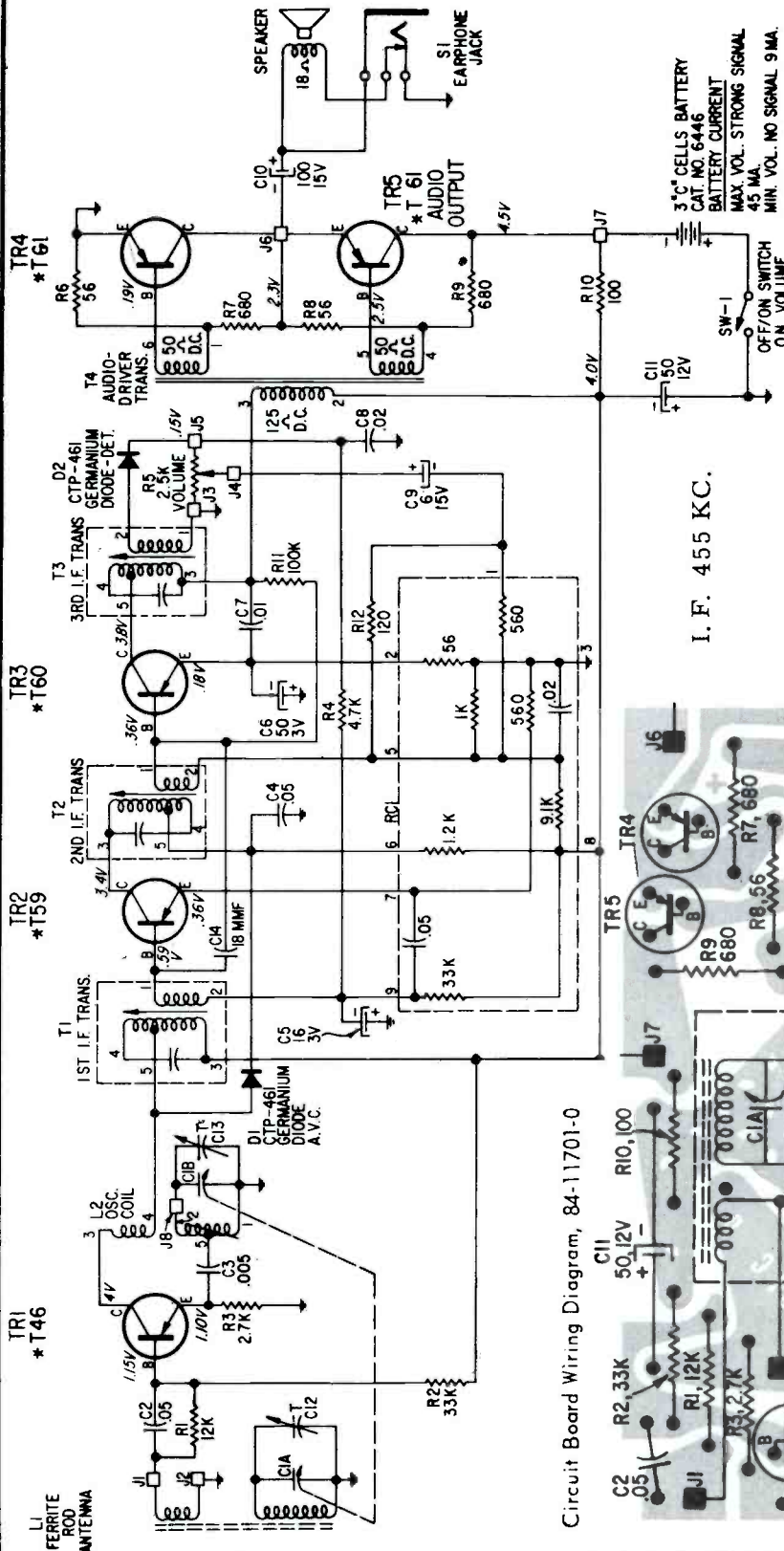


SEARS, ROEBUCK AND CO.

CHASSIS NO. 528.53740

Models 1212, 1213, 1214

Silvertone



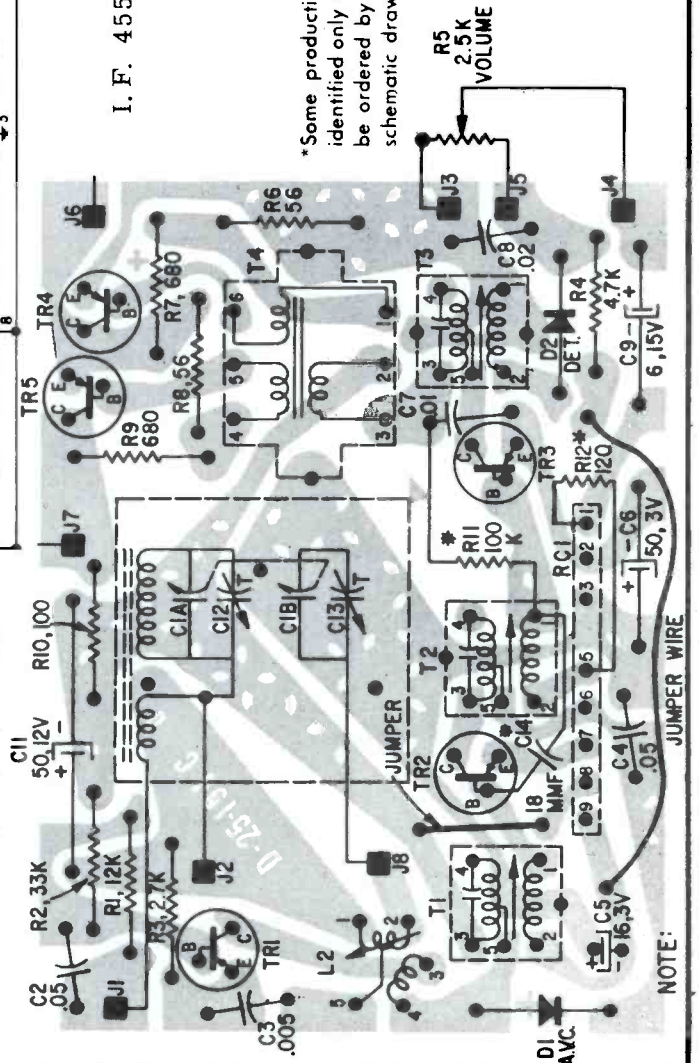
Circuit Board Wiring Diagram, 84-11701-0

I. F. 455 KC.

*Some production Models of this chassis may contain transistors identified only by manufacturers type number. Replacements should be ordered by the type number shown for that transistor on the schematic drawing.

NOTES

1. VALUES OF CAPACITORS IN MFD, UNLESS OTHERWISE NOTED.
2. ALL RESISTORS ARE 1/2 WATT, UNLESS OTHERWISE NOTED.
3. VOLTAGE READINGS ARE TAKEN FROM POINT INDICATED TO CHASSIS GROUND WITH "VTVM" NO SIGNAL INPUT.
4. J1, J2 ETC. INDICATES TERMINAL CONNECTIONS ON CIRCUIT BOARD.



NOTE:

1. WIRING DIAGRAM SHOWN FROM CIRCUIT SIDE.
2. * INDICATES COMPONENTS LOCATED ON CIRCUIT SIDE.

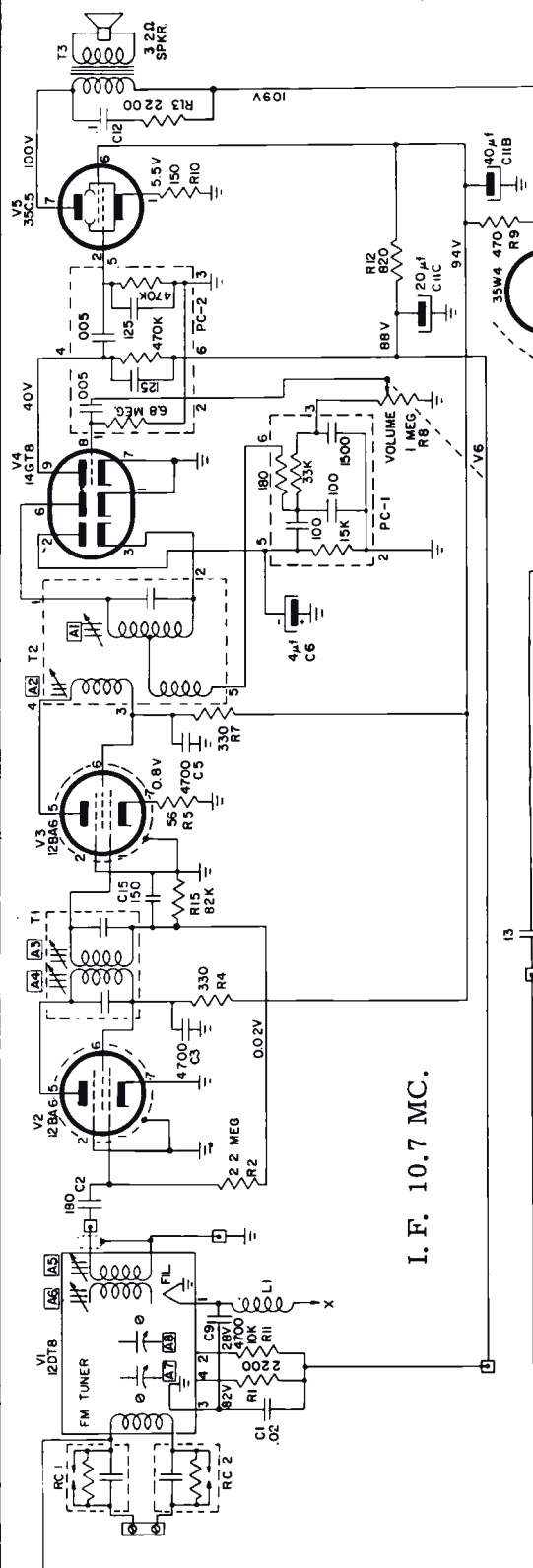


VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO

SEARS, ROEBUCK and CO.

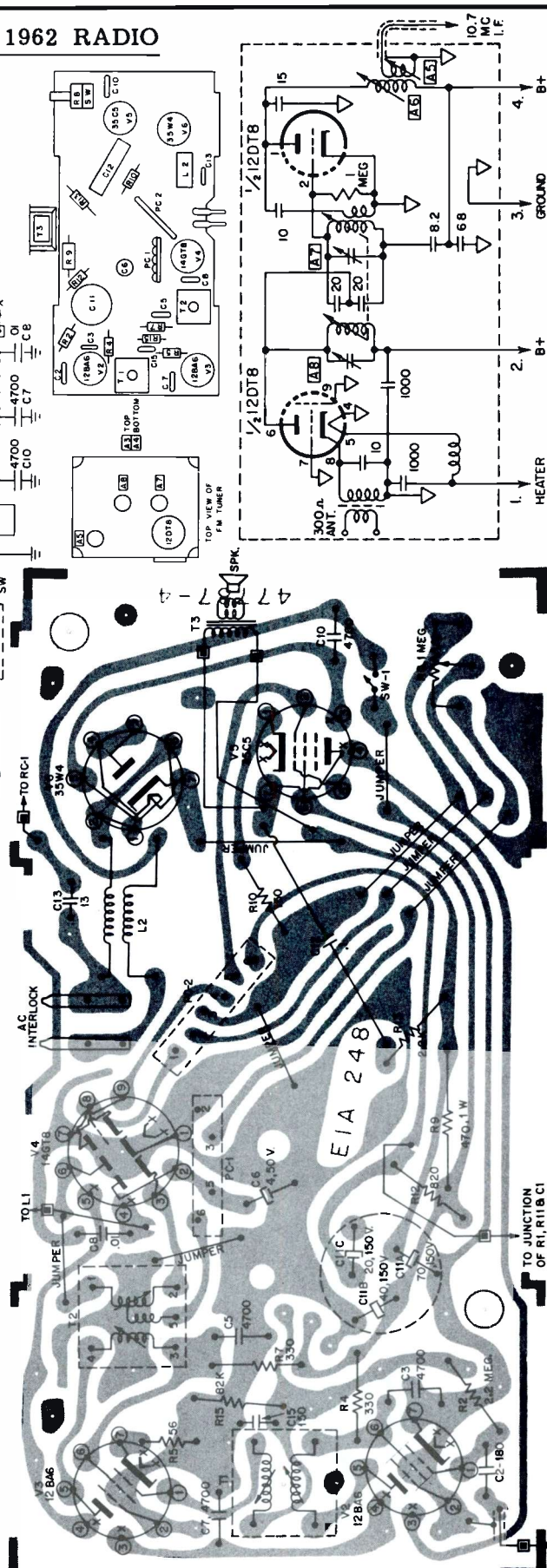
Chassis 132.64402

Models 2018, 2019



I. F. 10.7 MC.

VOLTAGES MEASURED TO B- WITH A VTVM : 20 %, NO SIGNAL
RESISTANCE VALUES ARE IN OHMS K=1,000 MEG 1,000,000
CAPACITANCE VALUES LESS THAN (1) ARE IN MICROFARADS (μf),
AND VALUES OF (1) OR GREATER ARE IN MICROMICROFARADS (μμf),
UNLESS OTHERWISE INDICATED.



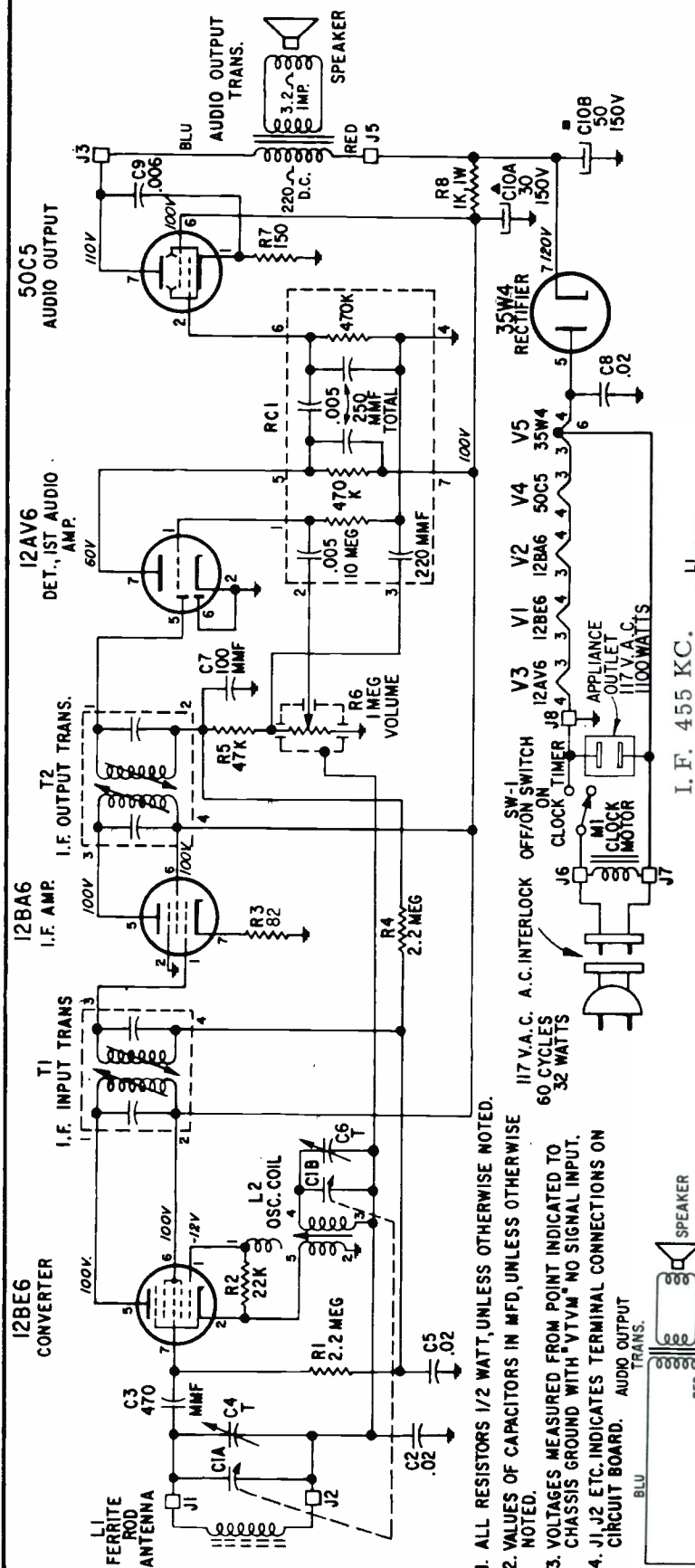
TUNER SCHEMATIC

SEARS, ROEBUCK and Co.

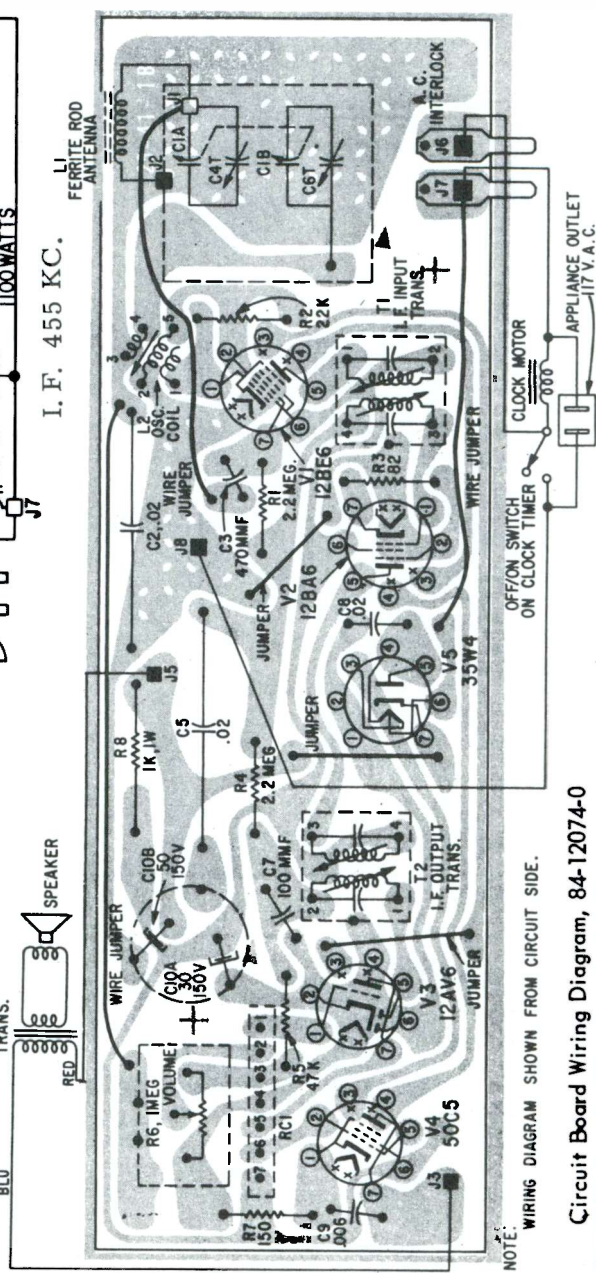
Silvertone
CLOCK-RADIO

CHASSIS No. 528.53760

Models 2035, 2036, 2037, 2038

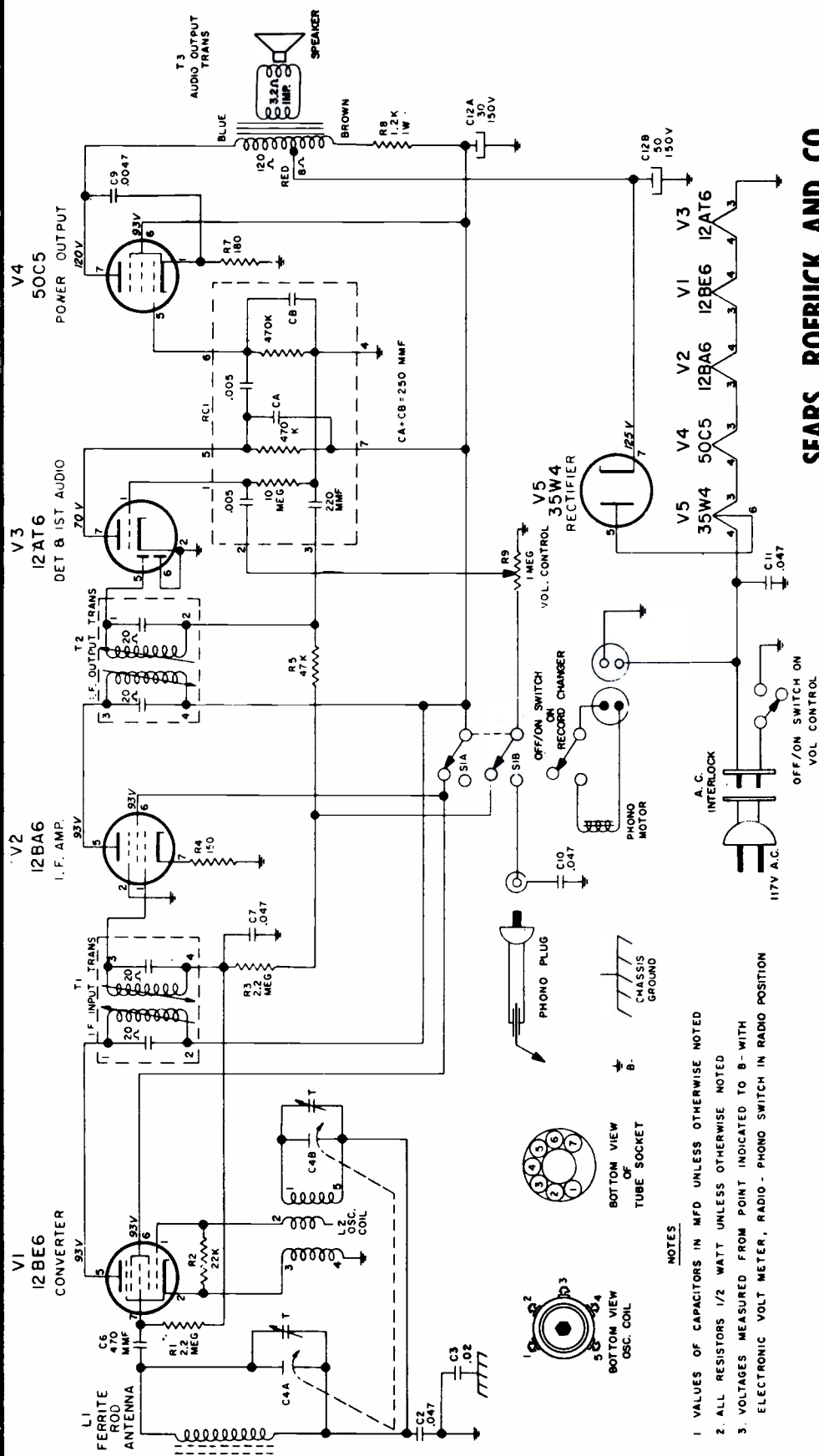


1. ALL RESISTORS 1/2 WATT, UNLESS OTHERWISE NOTED.
2. VALUES OF CAPACITORS IN MFD, UNLESS OTHERWISE NOTED.
3. VOLTAGES MEASURED FROM POINT INDICATED TO CHASSIS GROUND WITH "VTVM" NO SIGNAL INPUT.
4. J1, J2 ETC. INDICATES TERMINAL CONNECTIONS ON CIRCUIT BOARD. AUDIO OUTPUT TRANS.



NOTE: WIRING DIAGRAM SHOWN FROM CIRCUIT SIDE.

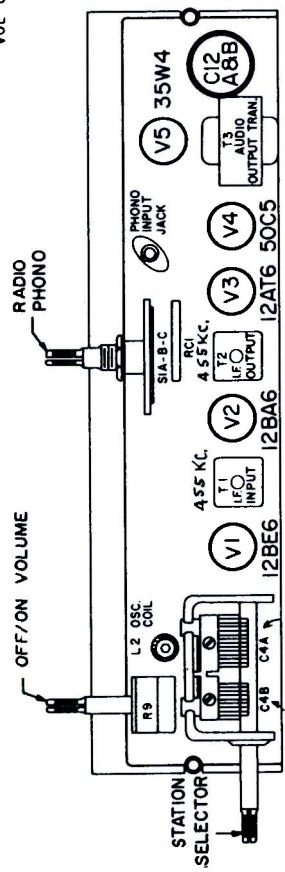
Circuit Board Wiring Diagram, 84-12074-0



SEARS, ROEBUCK AND CO.
 RADIO
 CHASSIS NO. 528.53071

USED IN MODELS:
 8038, 9040*, 9040A*

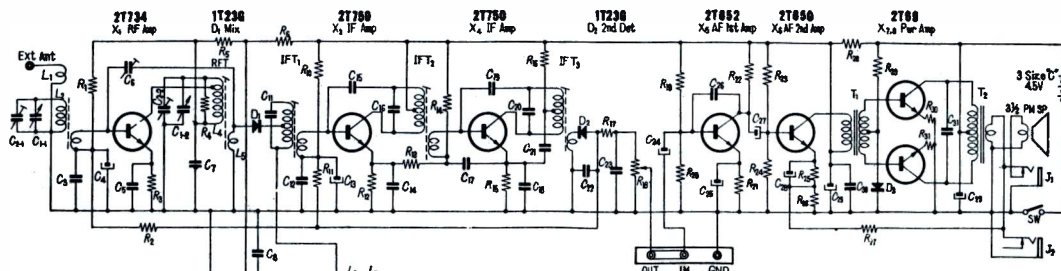
* Models 9040 & 9040A are exactly the same.



Top View - Radio Chassis

SONY

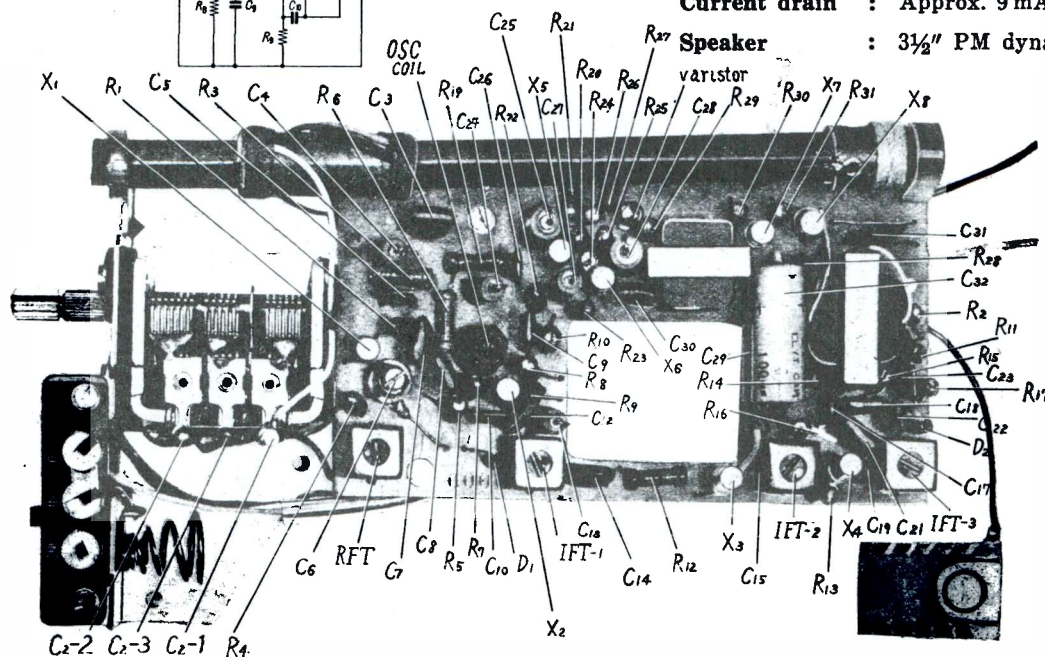
T R - 8 4



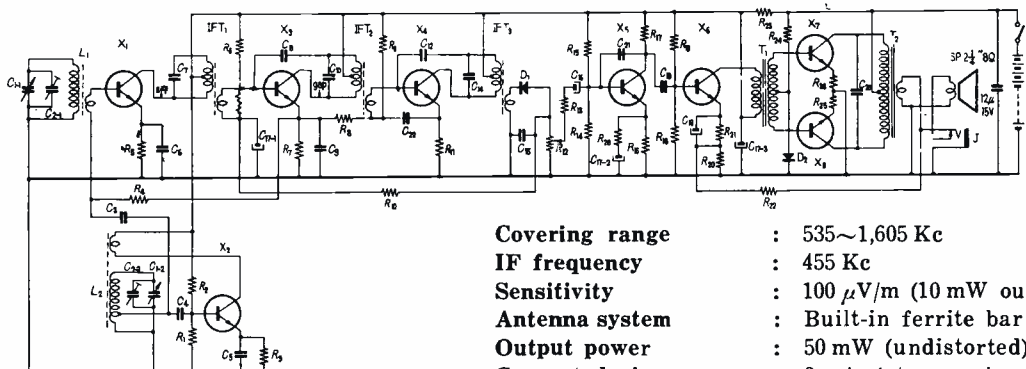
IF frequency : 455 Kc

Current drain : Approx. 9 mA at 0 signal

Speaker : 3 1/2" PM dynamic 8 Ω.



Symbol	Description	Symbol	Description	Symbol	Description	Symbol	Description
C _{1-1,2,3}	3 ganged C max. 200, 165 PF	C ₂₃	0.02 μF " (")	R ₁₄	15 KΩ " "	X ₆	AF ₂ 2T650 (2SD65)
C _{2-1,2,3}	" trimmer	C ₂₄	10 μF 3 V (Electric)	R ₁₅	470 Ω " "	X ₇	PA 2T69 or 2T31 (2SD69 or 2SB31)
C ₃	0.05 μF MXL (Maylor)	C ₂₅	30 μF 3 V (")	R ₁₆	470 Ω " "	X ₈	PA 2T69 or 2T31 (2SD69 or 2SB31)
C ₄	10 μF 3 V (Electrolytic)	C ₂₆	0.05 μF MXL (Maylor)	R ₁₇	3.3 KΩ " "	D ₁	Mix. 1T23G
C ₅	0.005 μF MXL (Maylor)	C ₂₇	10 μF 3 V (Electric)	R ₁₈	5 KΩ Volume control	D ₂	Det. 1T23G
C ₆	2~20 PF Cylindrical trimmer	C ₂₈	30 μF 6 V (")	R ₁₉	15 KΩ RL 1/2W	D ₃	Varistor 1T51
C ₇	0.05 μF MXL (Maylor)	C ₂₉	100 μF 6 V (")	R ₂₀	3.3 KΩ " "	L _{1,2,3}	Ferrite bar antenna 10 1/2 x 160 mm LA-040-1F
C ₈	0.05 μF " (")	C ₃₀	0.05 μF MXL (Maylor)	R ₂₁	470 Ω " "	L _{4,5}	RF Transformer (LH-003)
C ₉	0.02 μF " (")	C ₃₁	0.1 μF PS191 (Maylor)	R ₂₂	1 KΩ " "	L _{6,7,8}	Oscillator coil (LQ-025-Q)
C ₁₀	0.002 μF " (")	C ₃₂	100 μF 6 V (Electrolytic)	R ₂₃	10 KΩ " "	IFT ₁	LI-023AP
C ₁₁ ①	180 PF	R ₁	150 KΩ RL 1/8W	R ₂₄	3.3 KΩ " "	IFT ₂	LI-008BP
C ₁₂	0.02 μF MXL (Maylor)	R ₂	8.7 KΩ " "	R ₂₅	330 Ω " "	IFT ₃	LI-008CP
C ₁₃	10 μF 3 V (Electrolytic)	R ₃	560 Ω " "	R ₂₆	5 Ω " "	T ₁	1.5 KΩ : 2 KΩ (TI-007)
C ₁₄	0.05 μF MXL (Maylor)	R ₄	150 KΩ " "	R ₂₇	220 Ω " "	T ₂	200 Ω : 8 Ω (TX-003)
C ₁₅ ③	2 PF (Styrol)	R ₅	220 Ω " "	R ₂₈	60 Ω " "	SP	3 1/2" 8 Ω DS-008-1
C ₁₆ ①	180 PF	R ₆	220 Ω " "	R ₂₉	2.2 KΩ RL 1/8W	① Built in IFT ② To be adjusted	
C ₁₇	0.02 μF MXL (Maylor)	R ₇	56 KΩ " "	R ₃₀	5 Ω " "		
C ₁₈	0.02 μF " (")	R ₈	12 KΩ " "	R ₃₁	5 Ω " "		
C ₁₉	2 PF (Styrol)	R ₉	1 KΩ " "	X ₁	RF 2T734 (2SC73)		
C ₂₀ ①	180 PF	R ₁₀	56 KΩ " "	X ₂	Osc. 2T732 (2SC73)		
C ₂₁	0.05 μF MXL (Maylor)	R ₁₁	5.6 KΩ " "	X ₃	IF ₁ 2T750 (2SC75)		
C ₂₂	0.02 μF " (")	R ₁₂	470 Ω " "	X ₄	IF ₂ 2T750 (2SC75)		
		R ₁₃	2.2 KΩ " "	X ₅	AF ₁ 2T652 (2SD65)		

SONY**TR-86**

Covering range : 535~1,605 Kc
 IF frequency : 455 Kc
 Sensitivity : 100 μ V/m (10 mW output)
 Antenna system : Built-in ferrite bar antenna
 Output power : 50 mW (undistorted)
 Current drain : 8 mA (at zero signal)
 Speaker : 2 1/4" PM dynamic speaker 8 Ω

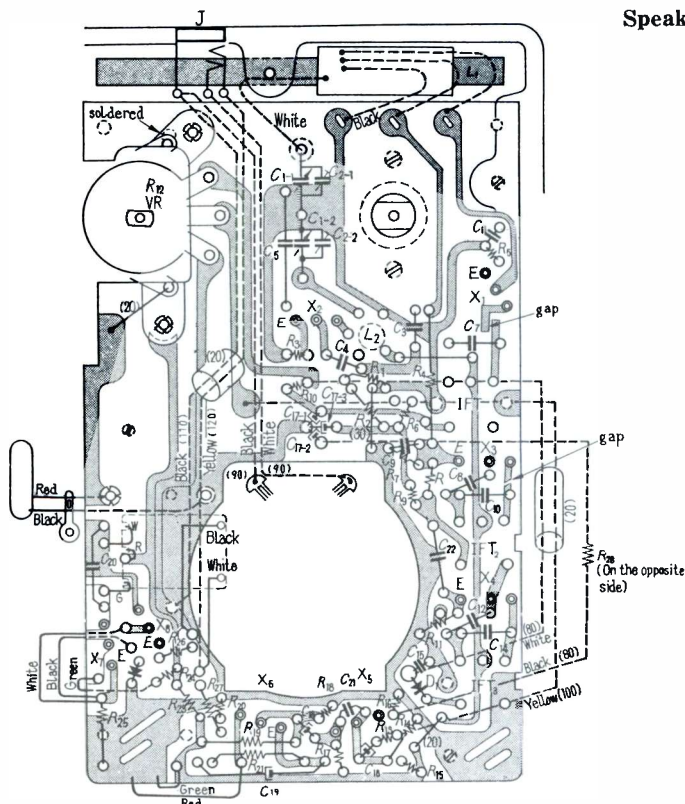
Parts list for TR-86

Symbol	Description	Symbol	Description
L ₁	Antenna coil LA-033-LE	R ₂₆	22 Ω " "
L ₂	Oscillator coil LO-002-Q	R ₂₇ ①	33 K Ω " "
IFT ₁	LI-008-AP	R ₂₈	270 Ω " 20%
IFT ₂	LI-008-BP	C _{1-1, 1-2}	Variable condenser
IFT ₃	LI-008-CP	C _{2-1, 2-2}	CV-007-02
T ₁	TI-002-03	C ₃	0.005 μ F
T ₂	TX-002-03	C ₄	0.01 μ F
SP	2 1/4" 8 Ω DS-004-1	C ₅	0.005 μ F
J	Earphone jack	C ₆	0.01 μ F
R ₁	10 K Ω 1/4 W 20%	C ₇	180 PF
R ₂	56 K Ω " "	C ₈	2 PF
R ₃	2.2 K Ω " "	C ₉ ③	30 μ F 3 V
R ₄	2.2 K Ω " "	C ₁₀	180 μ F
R ₅ ①	820 Ω " 10%	C ₁₂	2 PF
R ₆	82 K Ω " 20%	C ₁₄	180 PF
R ₇	470 Ω " "	C ₁₅	0.02 μ F
R ₈	820 Ω " "	C ₁₆ ③	5 μ F 6 V
R ₉	18 K Ω " "	C ₁₇ ③	20 μ F 10 V 3 in block
R ₁₀	7.5 K Ω " "	C ₁₈ ③	5 μ F 6 V
R ₁₁	470 Ω " "	C ₁₉ ③	30 μ F 3 V
R ₁₂ ②	5 K Ω (RV-234)	C ₂₀	0.05 μ F
R ₁₃	1.5 K Ω 1/4 W 20%	C ₂₁	0.001 μ F
R ₁₄	10 K Ω 1/4 W 20%	C ₂₂	0.01 μ F
R ₁₅	56 K Ω " "	X ₁	Mixer 2 T 7 (2SD76)
R ₁₆	820 Ω " "	X ₂	Oscillator 2 T 7 (2SD73)
R ₁₇	2.2 K Ω " "	X ₃	IF 2 T 7 (2SD76)
R ₁₈	10 K Ω " "	X ₄	IF 2 T 7 (2SD76)
R ₁₉	56 K Ω " "	X ₅	Audio 2 T 6 (2SD66)
R ₂₀	5 Ω " 10%	X ₆	Audio 2 T 6 (2SD66)
R ₂₁	680 Ω " 20%	X _{7, X₈}	Power stage 2 T 6 (2SD65)
R ₂₂	220 Ω " "	D ₁	Detector 1 T 23
R ₂₃	220 Ω " "	D ₂	Varistor 1 T 52
R ₂₄	5.6 k Ω " "		
R ₂₅	22 Ω " 10%		

① To be adjusted.

② With switch.

③ Electrolytic.

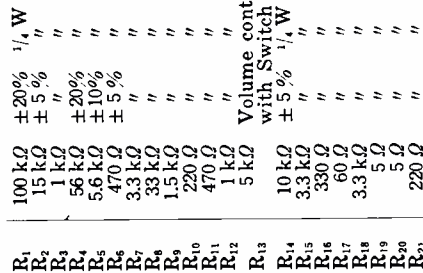
**Circuit board of TR-86 (Printed side)****Audio Transformer**

Input transformer TI-002

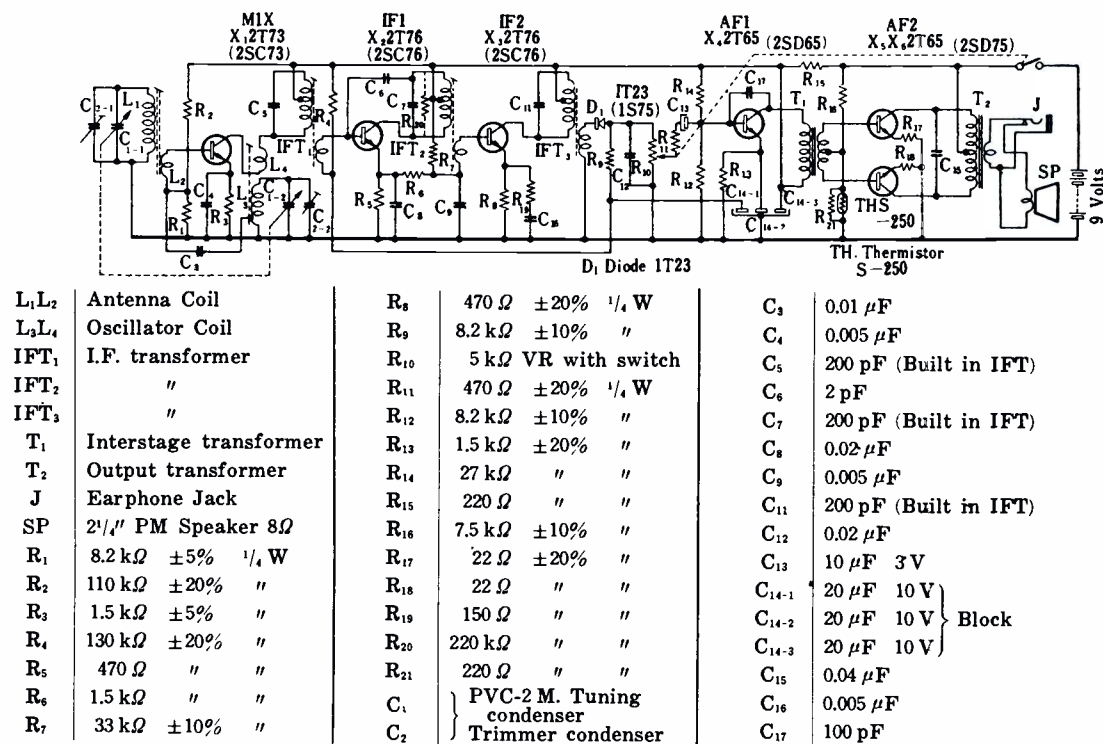
6 K Ω : 3 K Ω DC resistance 500 Ω : 280 Ω

Output transformer TX-002

1.4 K Ω : 8 Ω DC resistance 100 Ω : 0.5 Ω



SONY TR-610

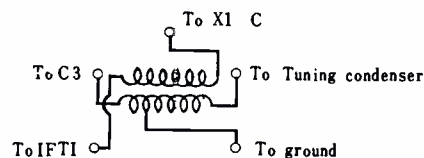


TR-610 Circuit board printed side

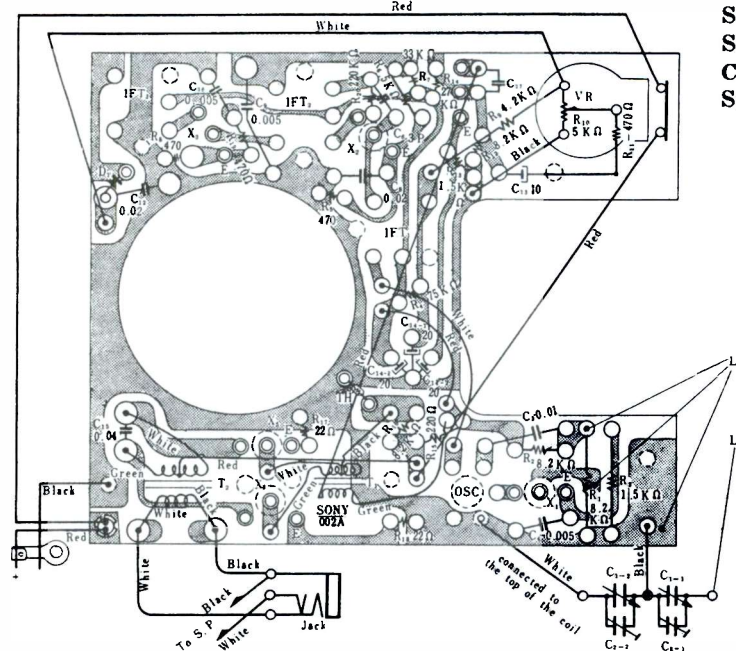
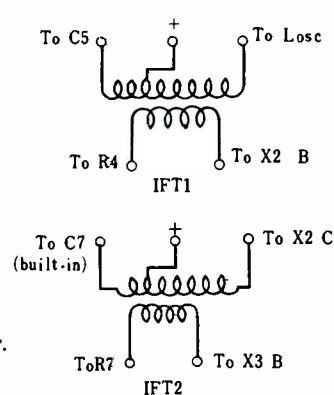
IF frequency : 455 kc
Sensitivity : 400 μV/m at 10 mW output
Selectivity : 18 db at 10 kc off resonance
Current drain : Approx. 5 mA at zero signal
Speaker : 2 1/4" PM dynamic 8Ω

Coils

(a) Oscillator coil (bottom view)

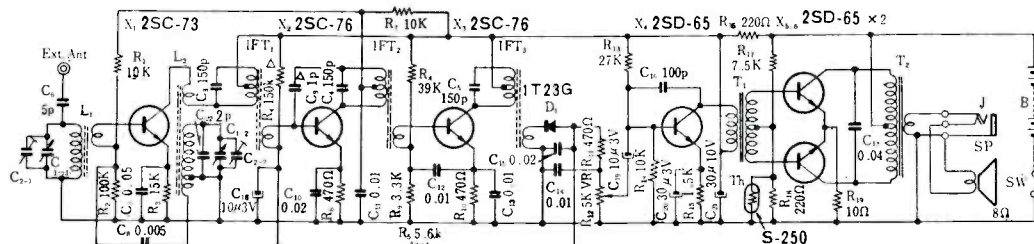


(b) IFT (bottom view)

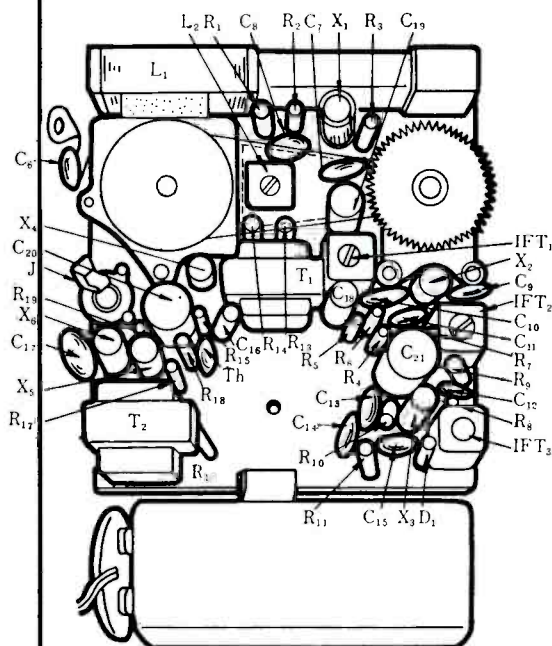


How to remove Cabinet

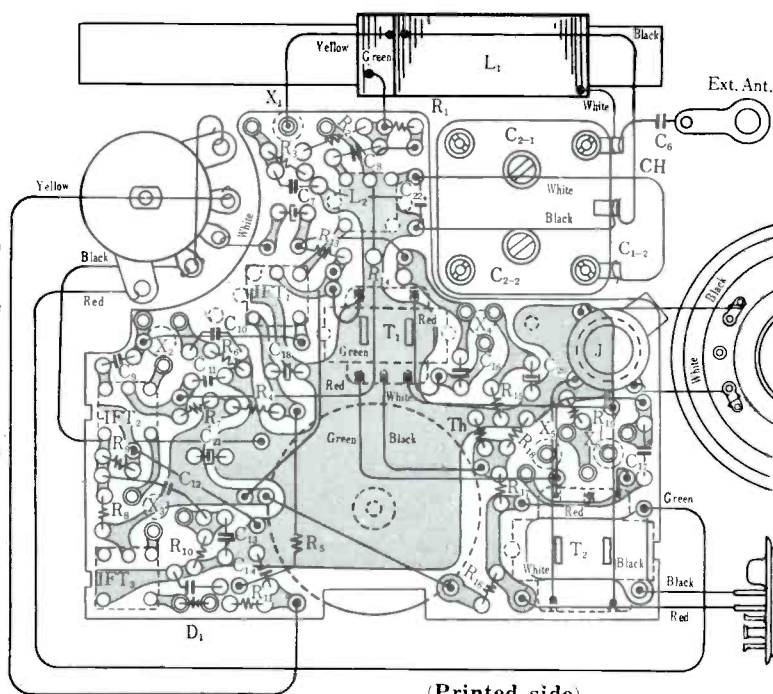
- Remove 2 small Philips screws on both side of the Cabinet.
- Open the Back cover and remove a screw on the back of the speaker. The circuit board can be easily taken out.

SONY**TR - 620**

※ Built in IFT
 △ To be adjusted
 All resistors are 1/10 watt.



Mounting of TR-620



(Printed side)

Adjustment

- 1) Lower limit: 520 kc Adjust L_2
 Upper limit: 1680 kc " C_{2-2}
- 2) Tracking adjustment
 Checking point
 620 kc Adjust L_1
 1400 kc " C_{2-1}

Covering range: 535~1605 kc

IF frequency: 455 kc

Current drain: 6 mA at 0 signal

Speaker: 2 1/4" PM dynamic (8 Ω)**Voltage & current distribution**

	Collector current	Emitter voltage
X_1	190~250 μ A	2.85~3.75 V
X_2	310~390 μ A	0.145~0.18 V
X_3	550~680 μ A	0.26~0.32 V
X_4	1.1~1.4 mA	1.65~2.1 V
X_5	0.8~1.5 mA for 2	0.008~0.015 V
X_6		

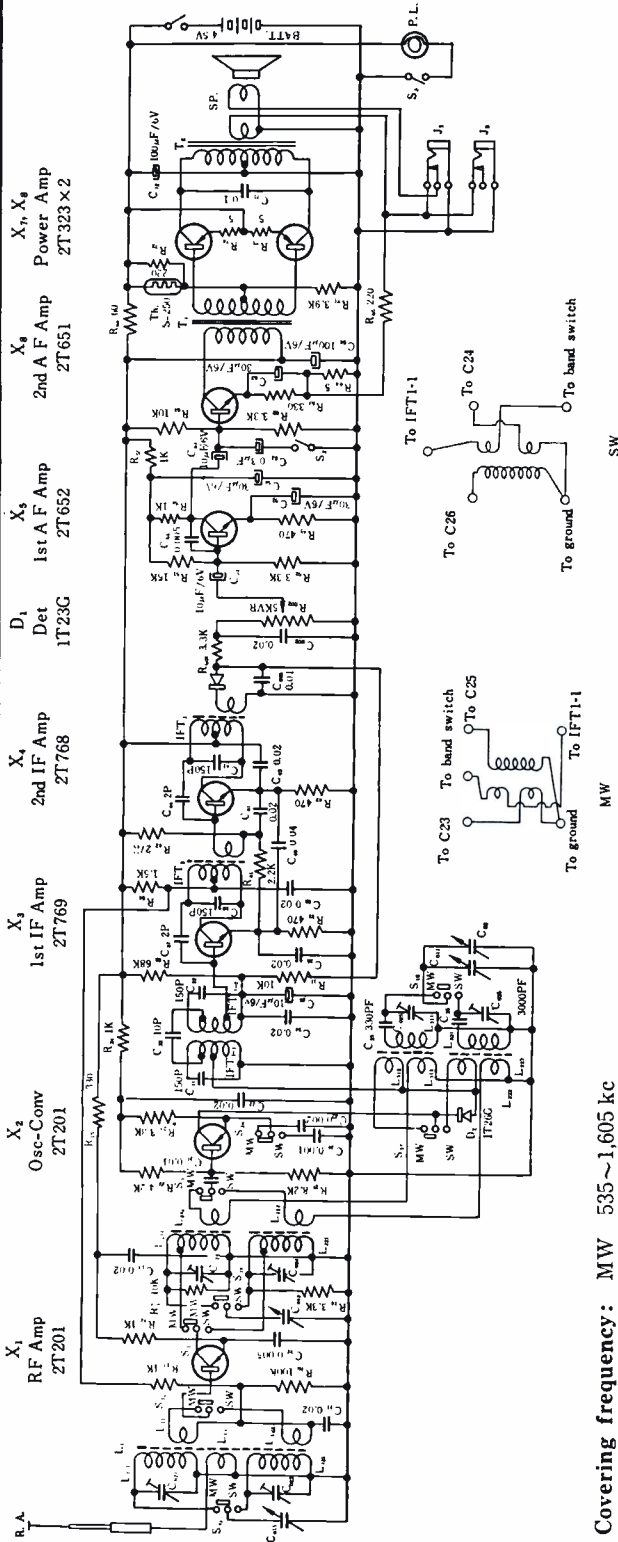
(Current drain at 0 signal: Approx. 6 mA)

How to remove the cabinet

- 1) Loosen and remove Philips screw on the back cover.
- 2) Loosen and remove Philips screw on the right below the tuning condenser.
- 3) Loosen and remove Philips screw on the left below the volume control.
- 4) Dismount external aerial jack.

SONY

TR-815B and TR-815Y



Covering frequency: MW 535~1,605 kc

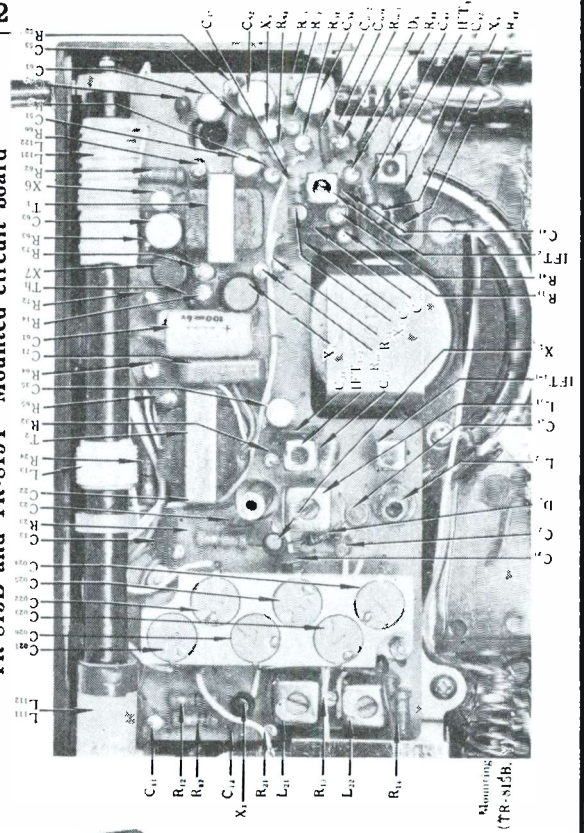
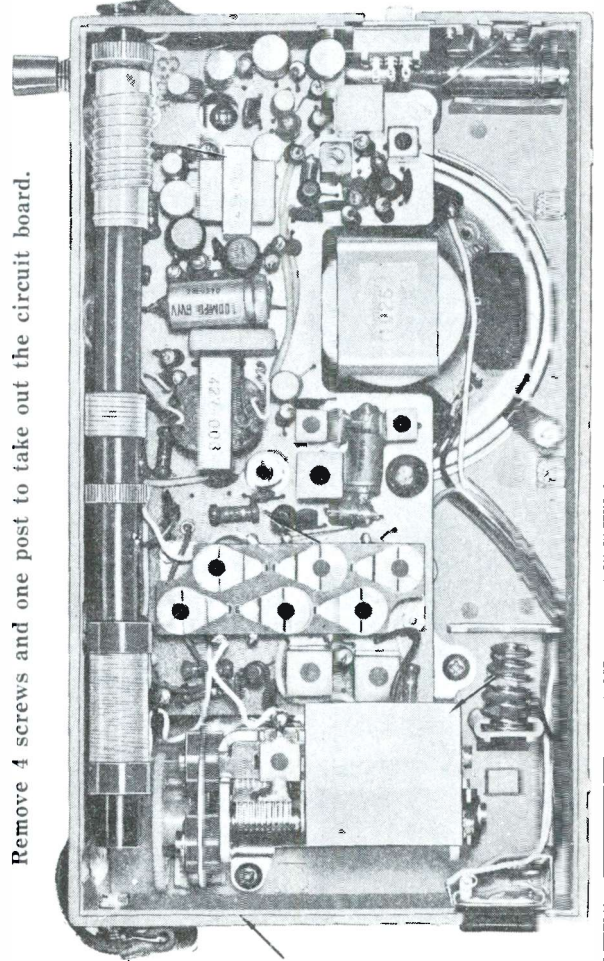
IF frequency : SW 3.9~12 Mc for TR-815B, 6~18 Mc for TR-815Y

455 kc

Current drain : Approx. 8 mA at zero signal
Approx. 55 mA at 150 mW output

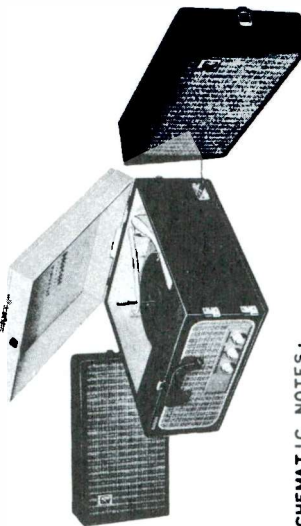
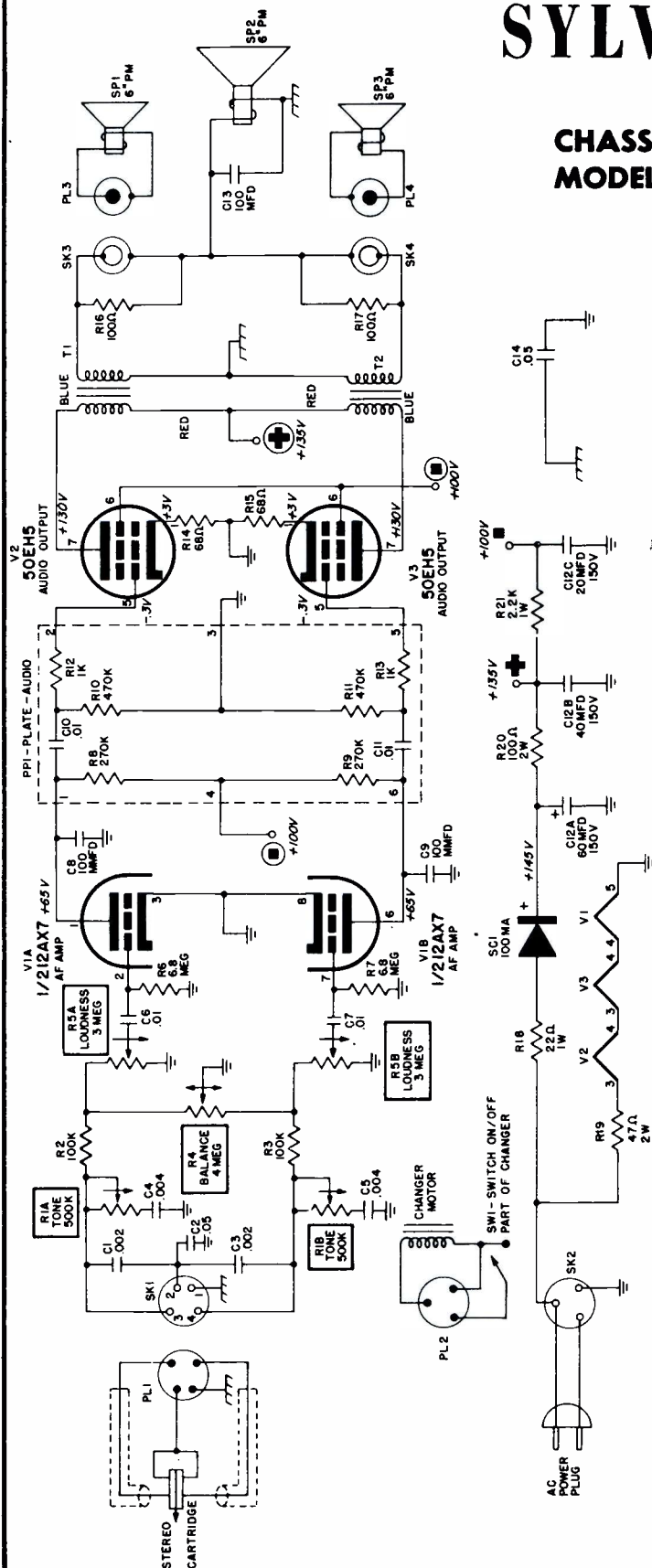
Remove 4 screws and one post to take out the circuit board.

TR-815B and TR-815Y Mounted circuit board



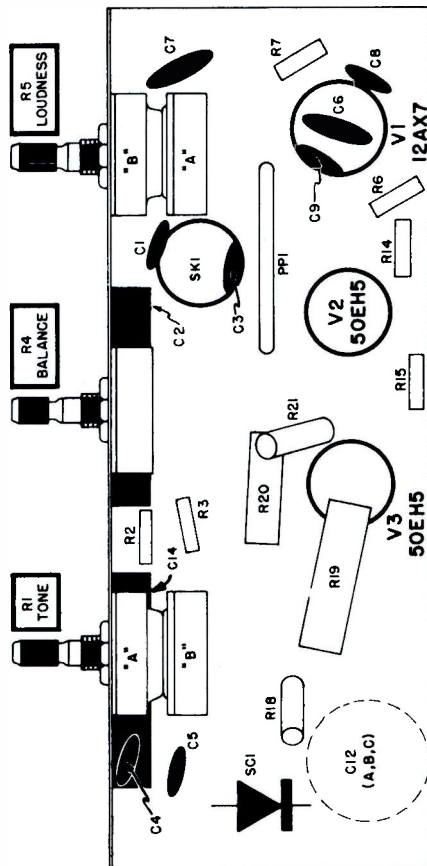
SYLVANIA

CHASSIS: 664-1
MODELS: 45PI8




SCHEMATIC NOTES:

1. VOLTAGES SHOWN ARE AVERAGE READINGS MEASURED TO NEGATIVE "B" WITH NO SIGNAL INPUT. VARIATIONS MAY BE NOTED DUE TO NORMAL PRODUCTION TOLERANCES.
2. AC POWER SOURCE - 117V 60W "VARIAC REGULATED".
3. VOLTAGE SOURCES ARE INDICATED BY SYMBOLS WITHOUT CIRCLES + : ENCIRCLED SYMBOLS ⊕ INDICATE VOLTAGE TIE POINTS.
4. $\text{---} \text{---} \text{---}$ DESIGNATES CHASSIS GROUND.
5. \ominus DESIGNATES NEGATIVE "B".



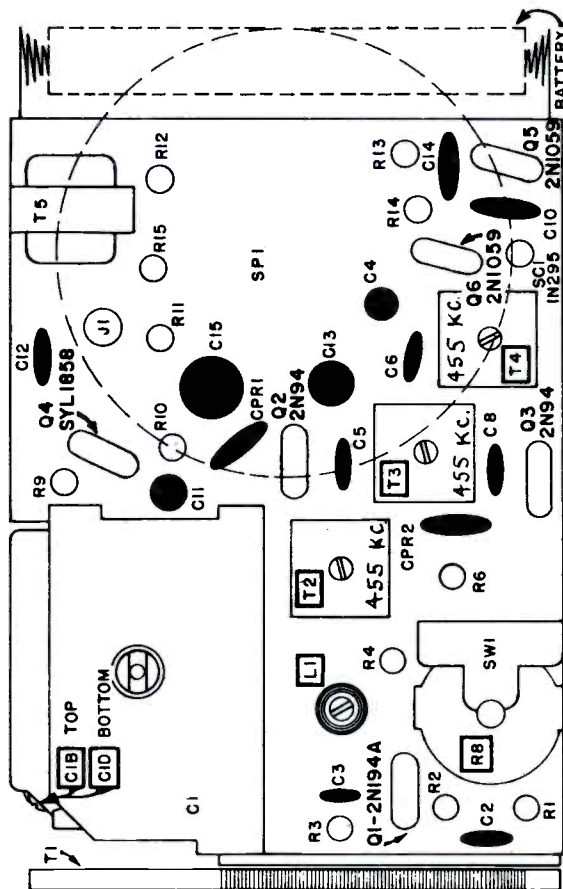
BOTTOM PARTS LAYOUT



1. VOLTAGES MEASURED TO CHASSIS GROUND, WITH RECEIVER NOT TUNED TO ANY SPECIFIC STATION.
2. BATTERY VOLTAGE WITH RECEIVER OPERATING 4 VOLTS.
3. VOLTAGES SHOWN ARE AVERAGE READINGS. VARIATIONS MAY BE NOTED DUE TO NORMAL PRODUCTION TOLERANCE.
4. COIL AND TRANSFORMER RESISTANCE ARE TAKEN WITH COMPONENTS CONNECTED IN THE CIRCUIT.
5. ALL CAPACITORS IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
6. INTERMEDIATE FREQUENCY (IF), 455KC.
7.  DESIGNATES CHASSIS GROUND.

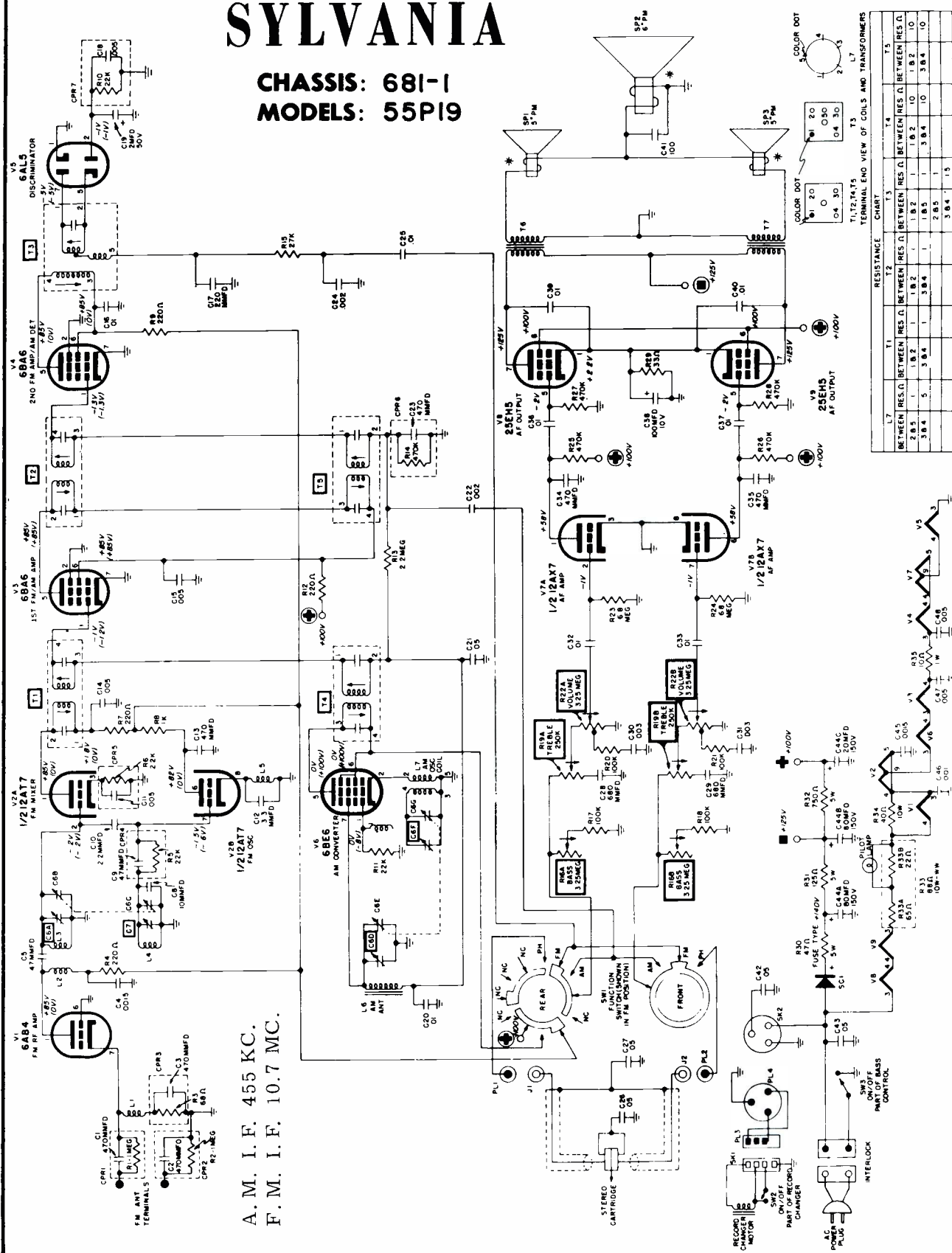
SYLVANIA

CHASSIS: 666-1,-2
MODELS: 6P08, 6P09 SERIES



SYLVANIA

CHASSIS: 68I-1
MODELS: 55P19



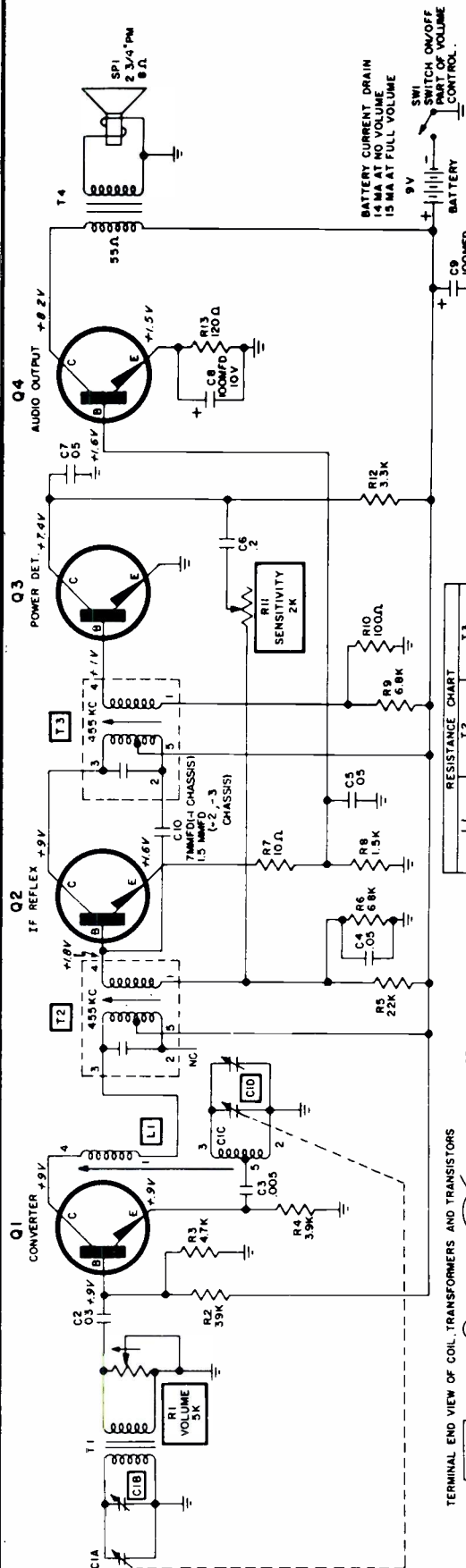
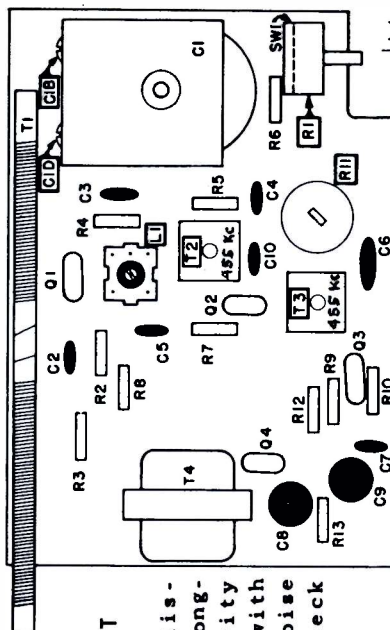
VOLUME R-22, MOST-OFTEN

RADIO INFORMATION

SYLVANIA

CHASSIS: 682-1,-2,-3
MODELS: 4PI9WD (-1CHASSIS)
 4PI9W (-2CHASSIS)
 4PI9WC (-3CHASSIS)

TOP PARTS LAYOUT



RESISTANCE CHART		
L1	T2	T3
BETWEEN RES	BETWEEN RES	BETWEEN RES
1.84	1.50	1.50
2.63	2.63	2.63
2.85	2.85	2.85
3.85	3.85	3.85
4.0	4.0	4.0

SENSITIVITY CONTROL ADJUSTMENT

With volume control set for normal listening level and receiver tuned to strongest local station, adjust sensitivity control **R11** for best audible sound with minimum interference and background noise such as whistles, tweet, etc. Recheck entire band for oscillations.

CHASSIS REMOVAL

Remove back cover by inserting a coin into the cover opening slot (located on bottom of case) and twist until cover is free.

Remove the four (4) screws located in the corners of the chassis. CAUTION: Do not remove the two screws (soldered) securing the variable tuning capacitor to the board.

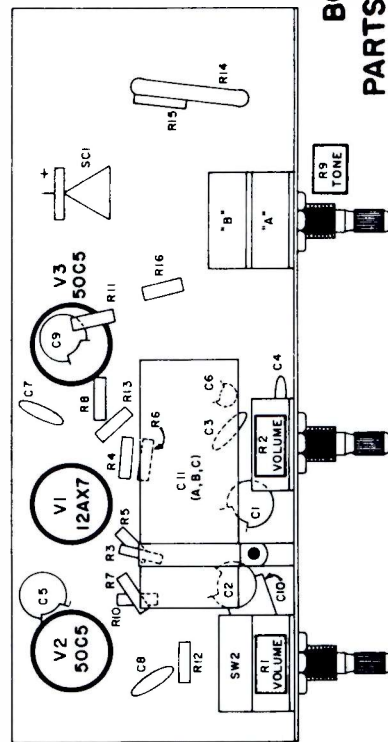
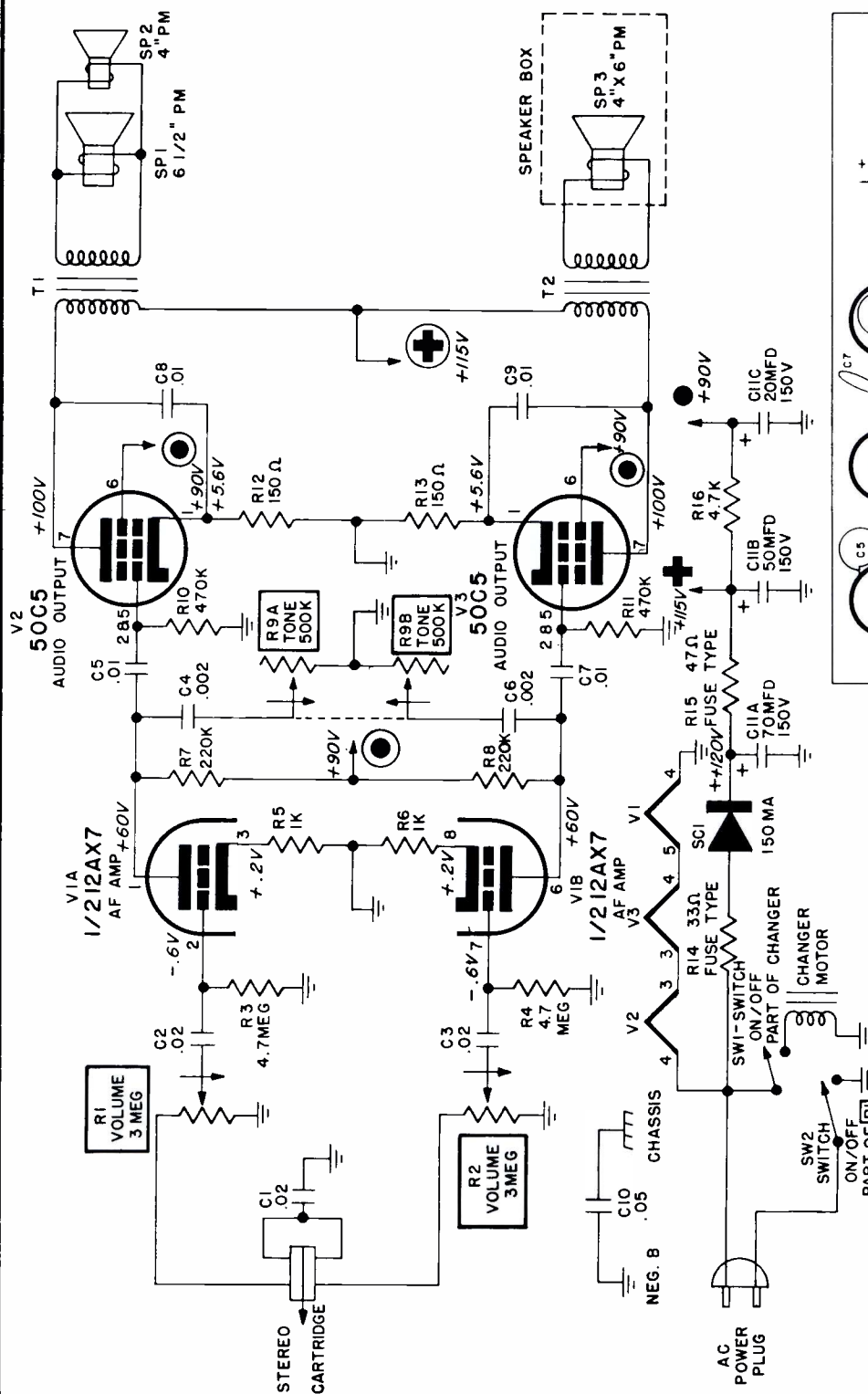
IMPORTANT: Groups of matched transistors are used in this receiver. If replacement is necessary same grouping must be maintained.

GROUP	CONVERTER	IF REFLEX	DETECTOR	OUTPUT
I	2N212 (SYL2133)	SYL2132	SYL2130	SYL2136
II	2N212 (SYL2133)	SYL2132	SYL2131	SYL2134
III	2N212 (SYL2133)	SYL2131	SYL2131	SYL2135
IV	SYL 2133	SYL2132	SYL2131	SYL2136

SYLVANIA

CHASSIS: 691-1
MODELS: 45C20

BOTTOM
PARTS LAYOUT



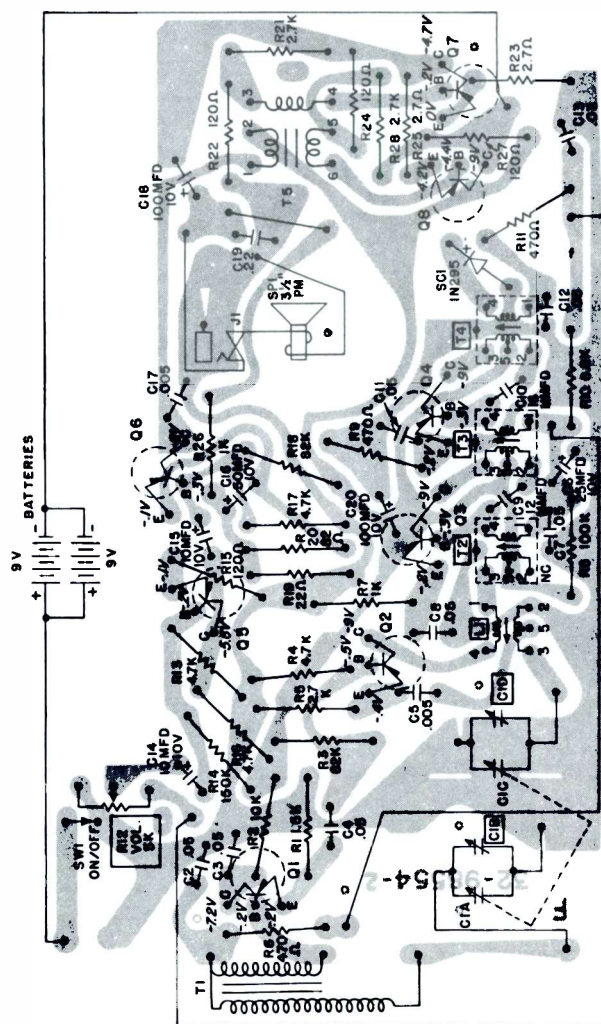
SCHEMATIC NOTES

1. VOLTAGES SHOWN ARE AVERAGE READINGS MEASURED TO NEGATIVE "B" WITH NO SIGNAL INPUT. VARIATIONS MAY BE NOTED DUE TO NORMAL PRODUCTION TOLERANCES.
2. AC POWER SOURCE 117V, 60 CYCLE.
3. VOLTAGE SOURCES ARE INDICATED BY \oplus ; CORRESPONDING VOLTAGE TIE POINTS. \ominus INDICATES NEGATIVE "B"; ∇ DESIGNATES CHASSIS GROUND.
4. ∇ INDICATES NEGATIVE "B"; ∇ DESIGNATES CHASSIS GROUND.

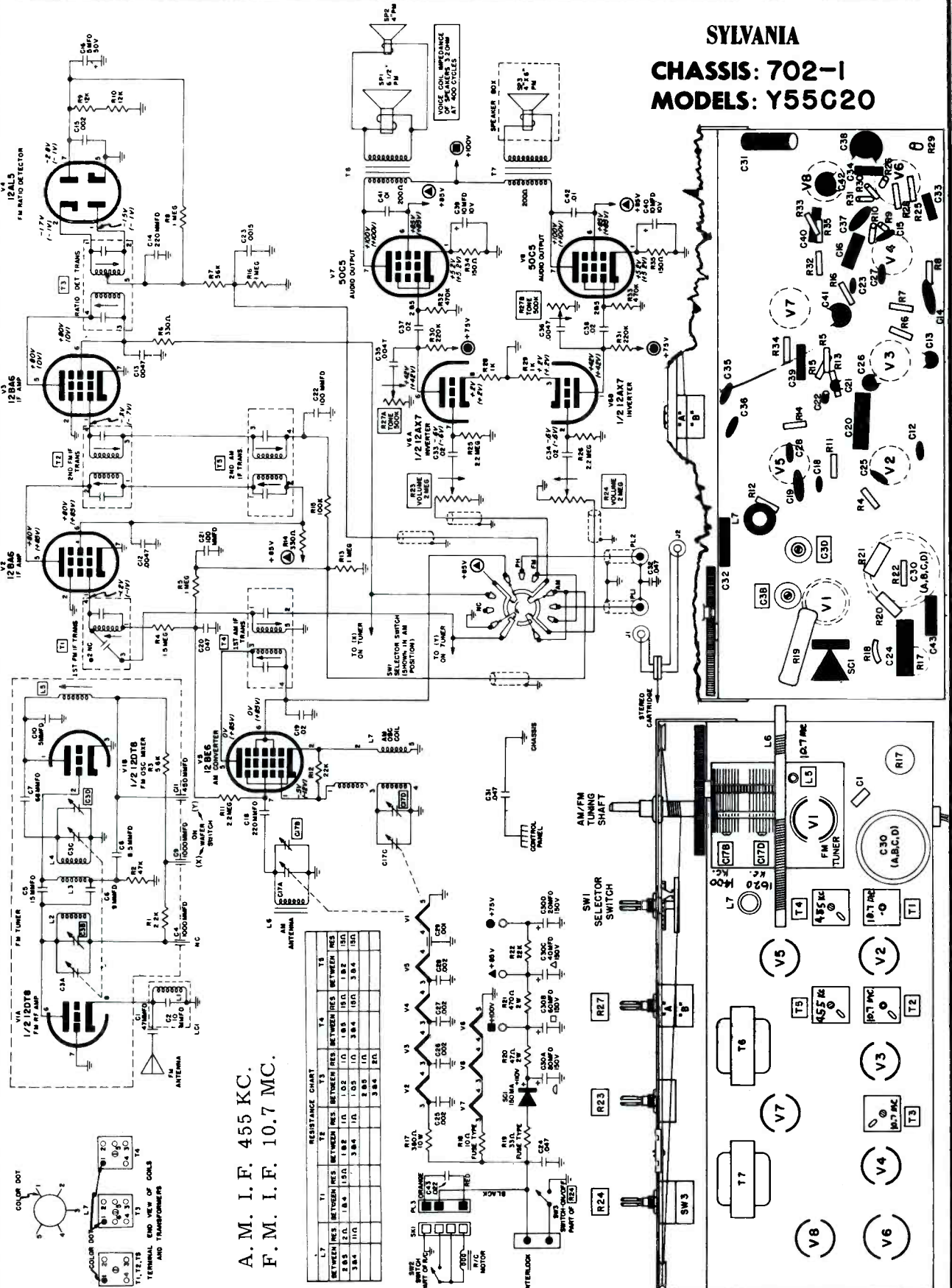


1. VOLTAGES MEASURED TO CHASSIS GROUND, WITH RECEIVER NOT TUNED TO ANY SPECIFIC STATION.
2. BATTERY VOLTAGE WITH RECEIVER OPERATING 9 VOLTS.
3. VOLTAGES SHOWN ARE AVERAGE READINGS. VARIATIONS MAY BE NOTED DUE TO NORMAL PRODUCTION TOLERANCE.
4. COIL AND TRANSFORMER RESISTANCE ARE TAKEN WITH COMPONENTS CONNECTED IN THE CIRCUIT.
5. ALL CAPACITORS IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
6. INTERMEDIATE FREQUENCY (IF), 455KC.
7. \perp DESIGNATES CHASSIS GROUND.

RESISTANCE CHART									
L1	T2		T3		T4		T5		
	BETWEEN	RES	BETWEEN	RES	BETWEEN	RES	BETWEEN	RES	
1.04	1.04	1.04	1.04	1.04	2.50	1.02	4.00		
2.03	1.04	2.03	2.50	2.03	2.03	3.04	450		
2.00	1.04	2.00	1.05	2.00	8.0	0.66	450		
3.00	2.00	3.00	3.00	3.00	15.0	3.05	120		



SYLVANIA
CHASSIS: 702-1
MODELS: Y55C20



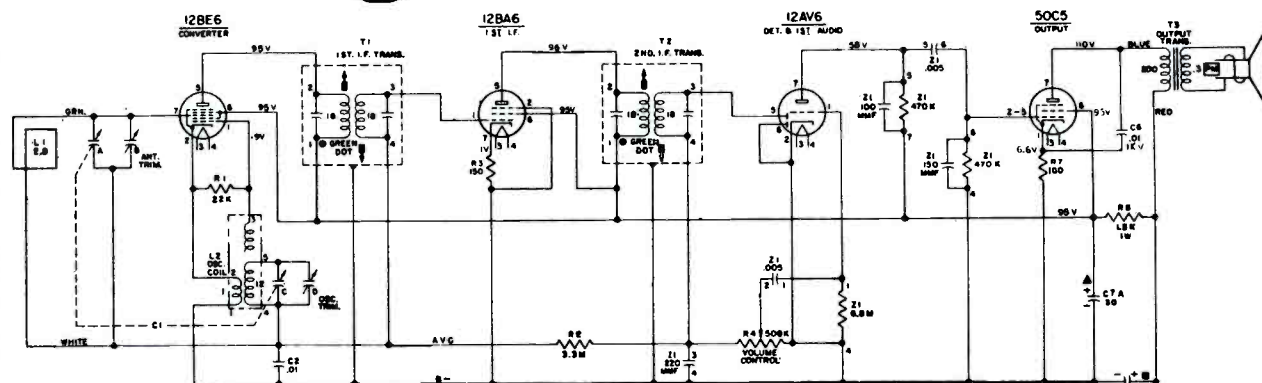
A.M. I.F. 455 KC.
F.M. I.F. 10.7 MC.

Models AK15, AK16, AK17, AK18, AT15,
AT16, 6022, 6025, 6028, & 6029.



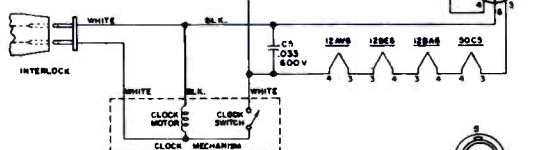
Westinghouse

Model H-816L5, Chassis V-2259-7,
Model H-803T5, Chassis V-2259-8,
is the same except for clock circuit.



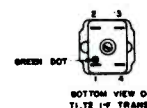
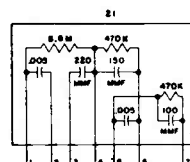
CHASSIS REMOVAL INFORMATION

1. Remove the volume knob from the front of the cabinet. The tuning knob is captivated and cannot be removed from the front by pulling. The chassis must be removed first and then the lock washer taken off the knob shank.
2. Remove the back cover from the cabinet.
3. Remove the self-tapping screw securing the tuning capacitor bracket to the front of the cabinet.
4. Unloosen the chicken bands securing the clock AC and audio output transformer wires and then slide the chassis out from the rear of the cabinet for servicing.
5. Use a conventional radio cord or a TV AC interlock line cord to power the radio while servicing.



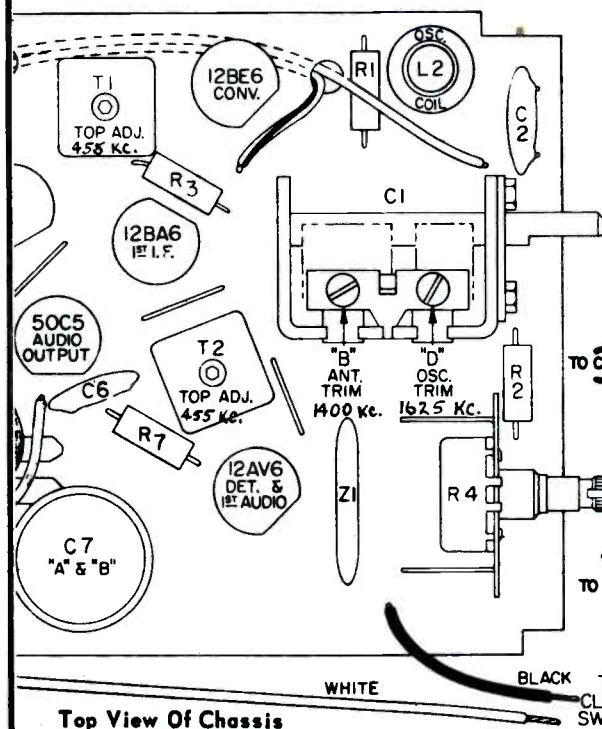
CLOCK REMOVAL

1. Remove the clock control knob from the front of the cabinet.
2. Remove the back cover from the cabinet.
3. Unsolder the leads to the clock.
4. Remove the two screws securing the clock to the cabinet and remove the clock. Use the reverse procedure to install the replacement clock.

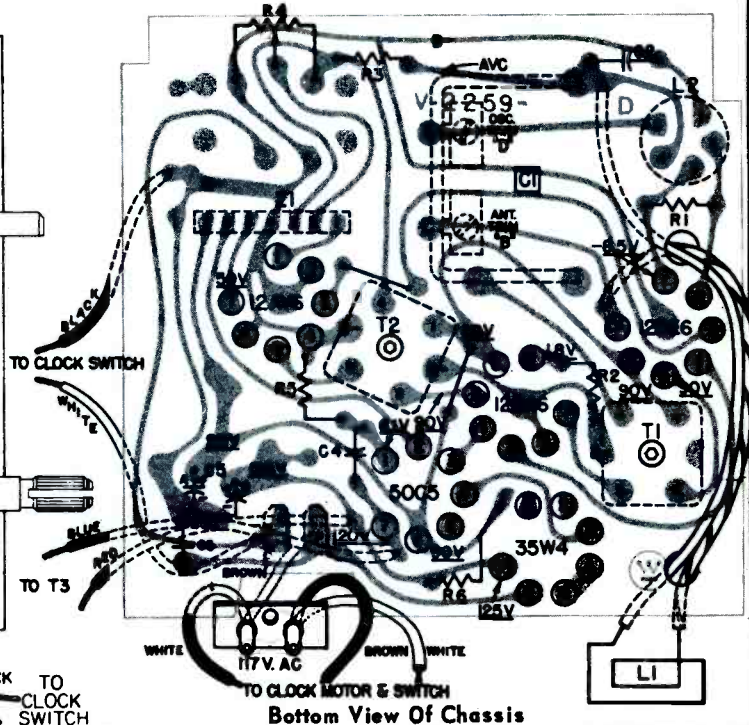


NOTES:

1. ALL VOLTAGES MEASURED FROM COMMON NEGATIVE USING A V.T.V.M. AND NO SIGNAL INPUT LINE VOLTAGE SET AT 117 V A.C. READINGS SHOULD BE AS SHOWN ± 20 PER CENT.
2. ALL CAPACITANCE VALUES IN MFD. AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.



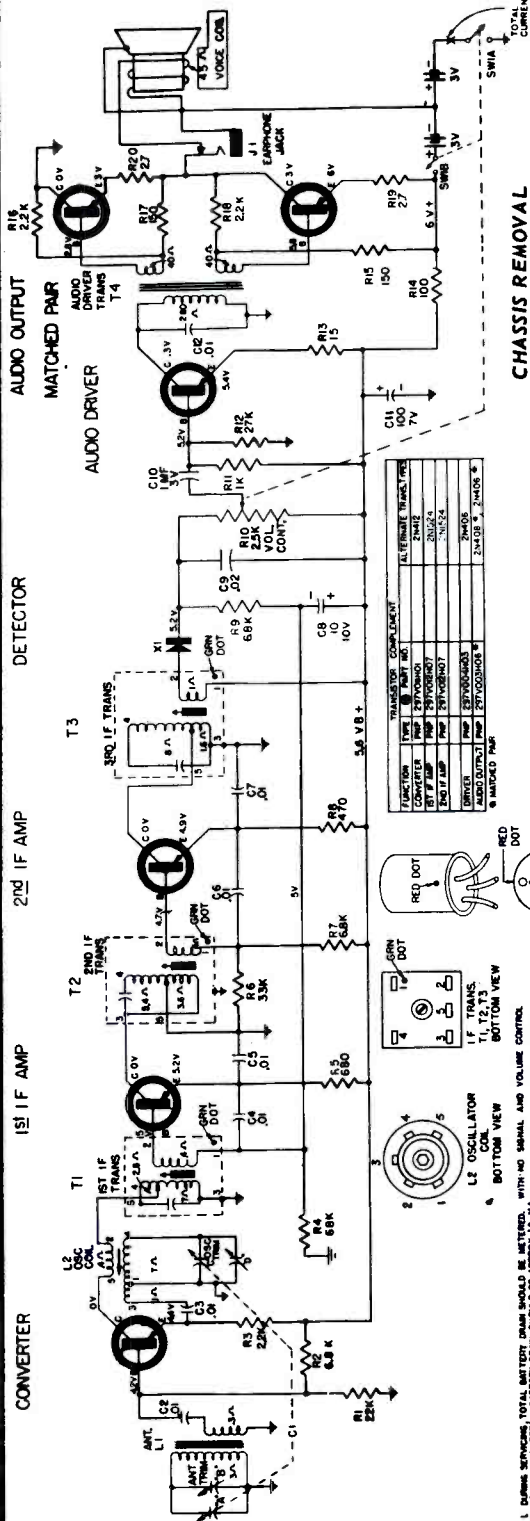
Top View Of Chassis



Bottom View Of Chassis

WESTINGHOUSE

Models H-790P6, -GP, H-791P6, H-791P6GP, Chassis V-2393-4.



CHASSIS REMOVAL

1. Remove the tuning knob as follows. Insert a loop of string (see figure 1) under the tuning knob and pull the knob up and out of the cabinet front. Remove the hex head screw.
2. Remove the back of the cabinet by loosening the two coin-slot screws on the back.
3. Remove the two 1" long hex head screws securing the chassis to the cabinet front.
4. Remove the printed circuit chassis, battery case, speaker spacers, rubber grommet and speaker.
5. To insert the printed circuit chassis back into the cabinet use the reverse procedure.

TUNING KNOB REMOVAL
INSERT STRING UNDER
TUNING KNOB & PULL UP

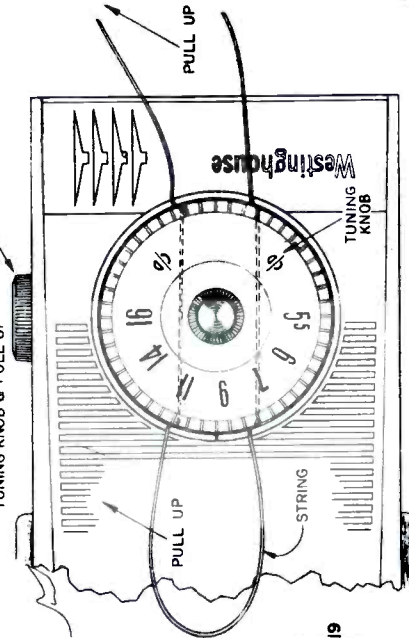
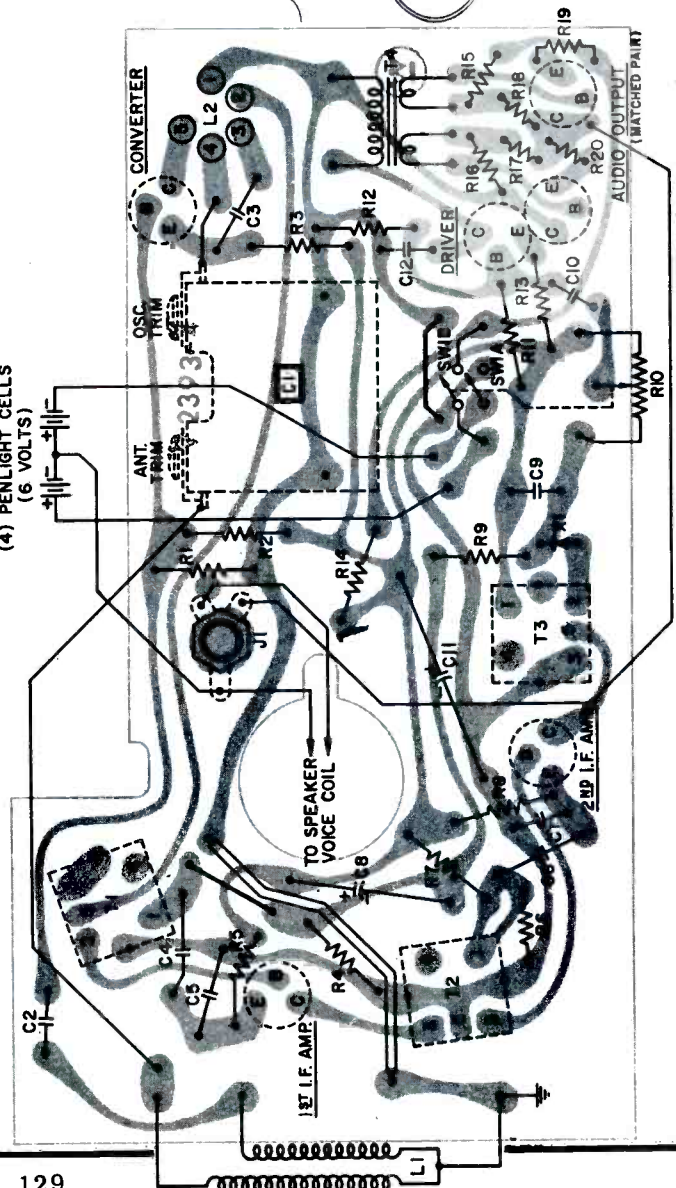


Figure 1 - Tuning Knob Removal

Frequency Range 540 to 1600 KC
Intermediate Frequency 455 KC

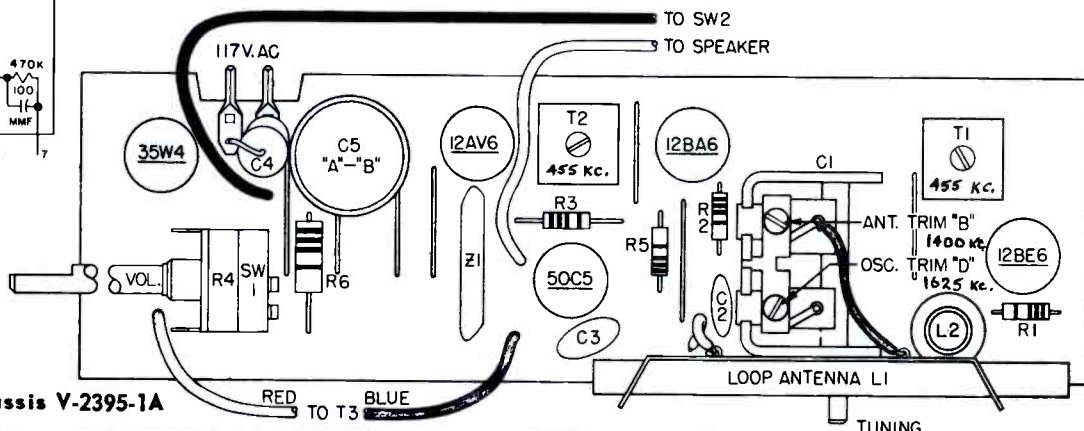
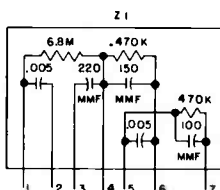
(4) PENLIGHT CELLS (6 VOLTS)



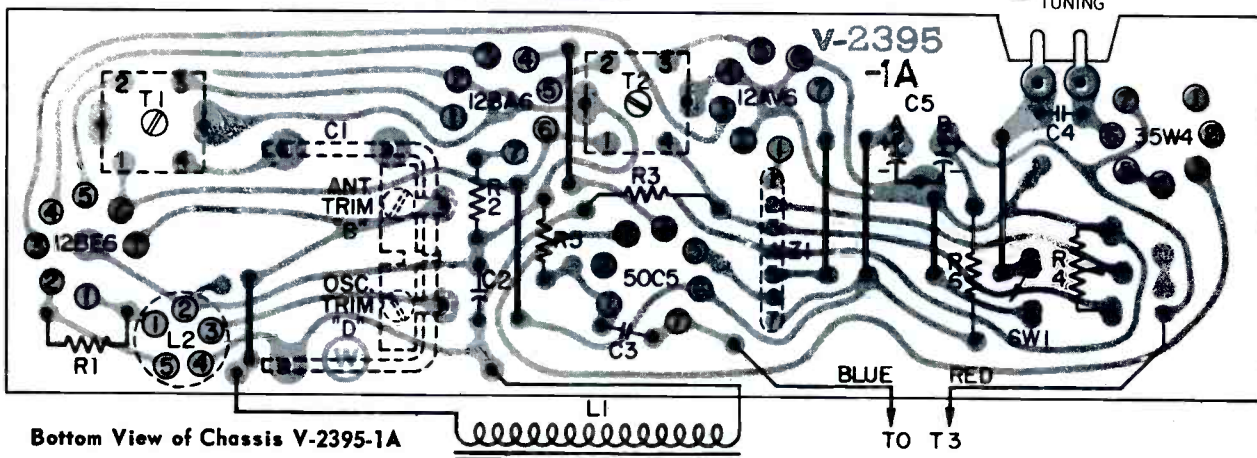
WESTINGHOUSE Models H-746T5A, H-747T5A, Chassis V-2395-1A, and Models H-808L5, H-809L5, Chassis V-2395-7, with clock circuit not shown.



1. ALL VOLTAGES MEASURED FROM COMMON NEGATIVE USING A V.T.V.M., VOLUME CONTROL AT MINIMUM, TUNING CAPACITOR AT MAXIMUM LINE VOLTAGE SET AT 117 V.A.C. READINGS SHOULD BE AS SHOWN $\pm 20\%$.
2. ALL CAPACITANCE VALUES IN MFD. AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED



Top View of Chassis V-2395-1A



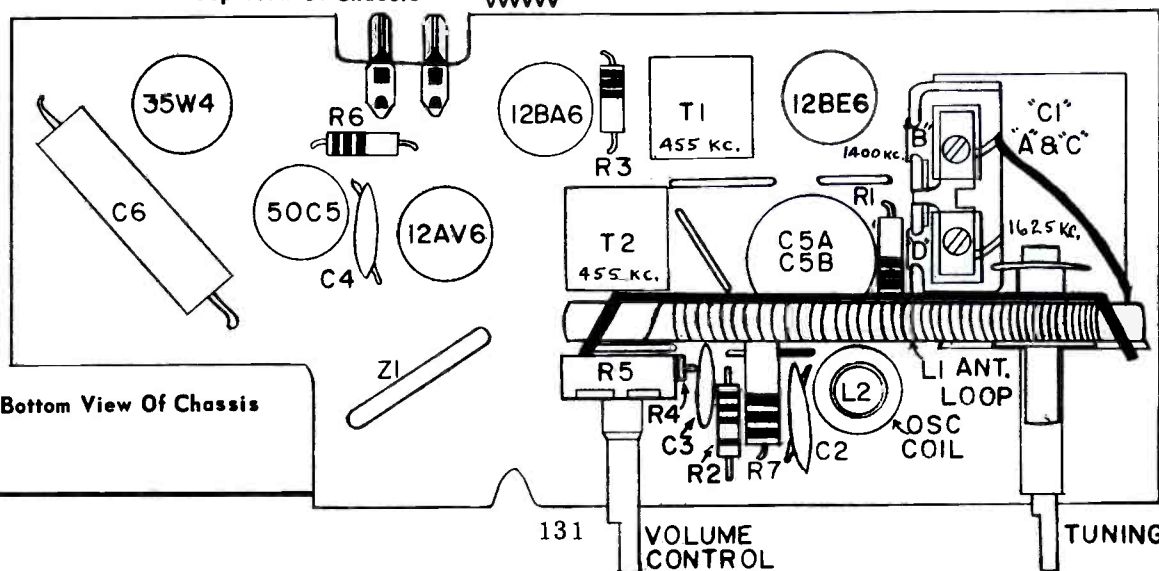
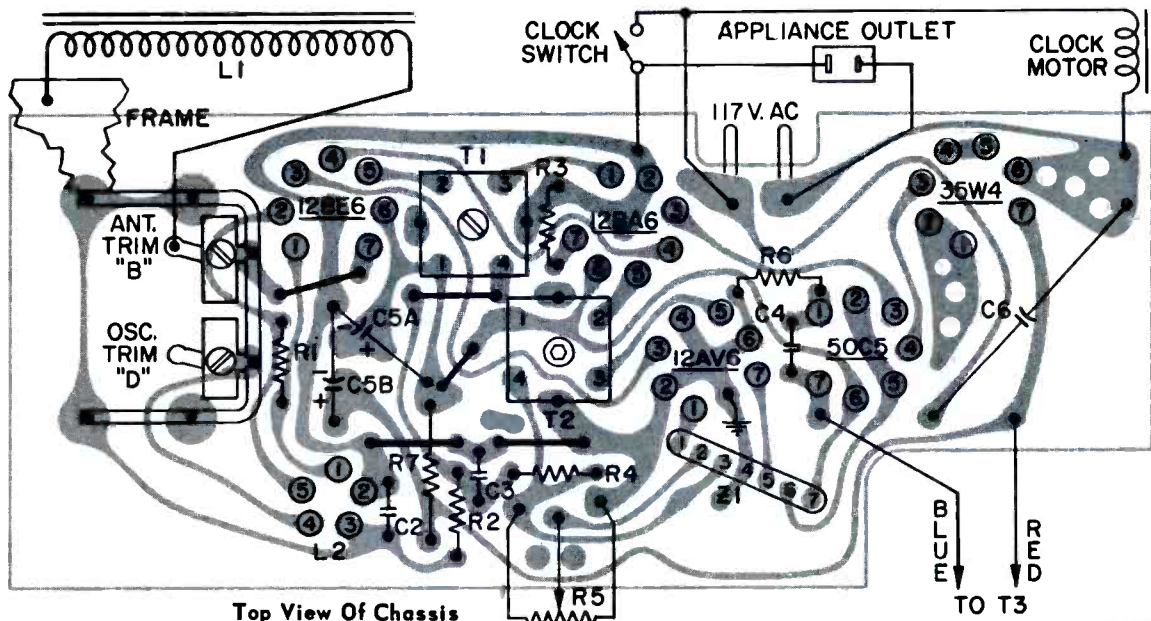
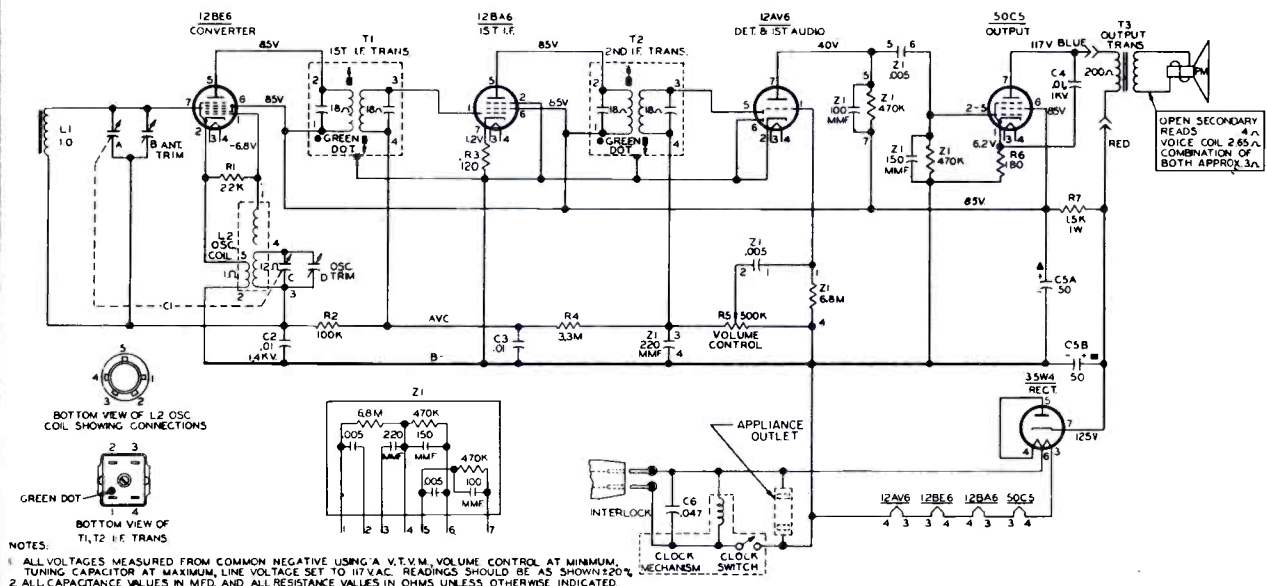
Bottom View of Chassis V-2395-1A

1. Disengage volume control knob (located on side of cabinet) from volume control shaft.
2. Remove two screws from rear of cabinet.

- 130

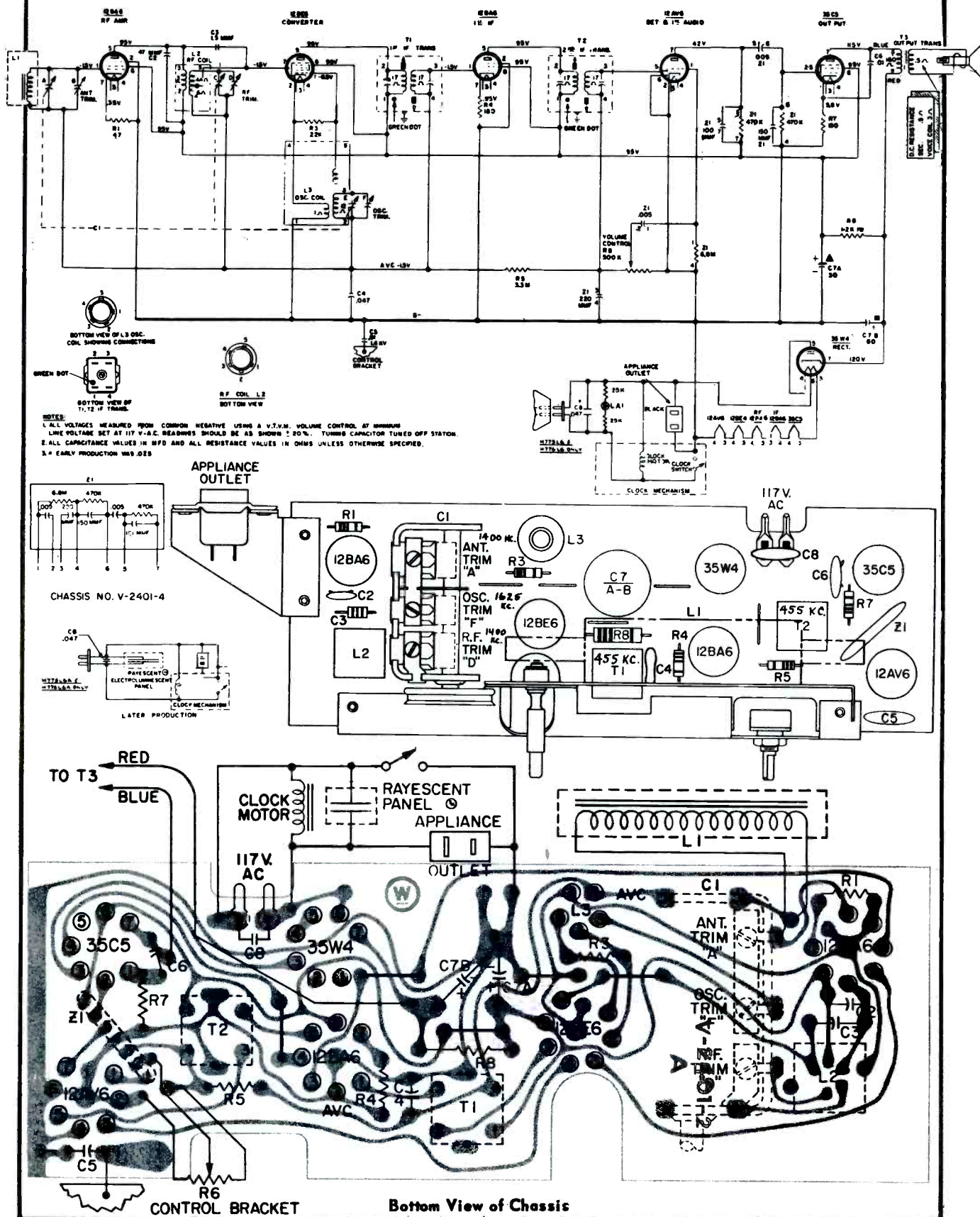
VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

WESTINGHOUSE Models H-804L5, H-805L5, H-806L5, Chassis V-2398-3



VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

WESTINGHOUSE Models H-775L6A, H-776L6A, Chassis V-2401-4



Westinghouse

H-798P7
H-798P7GP

H-799P7
H-799P7GP

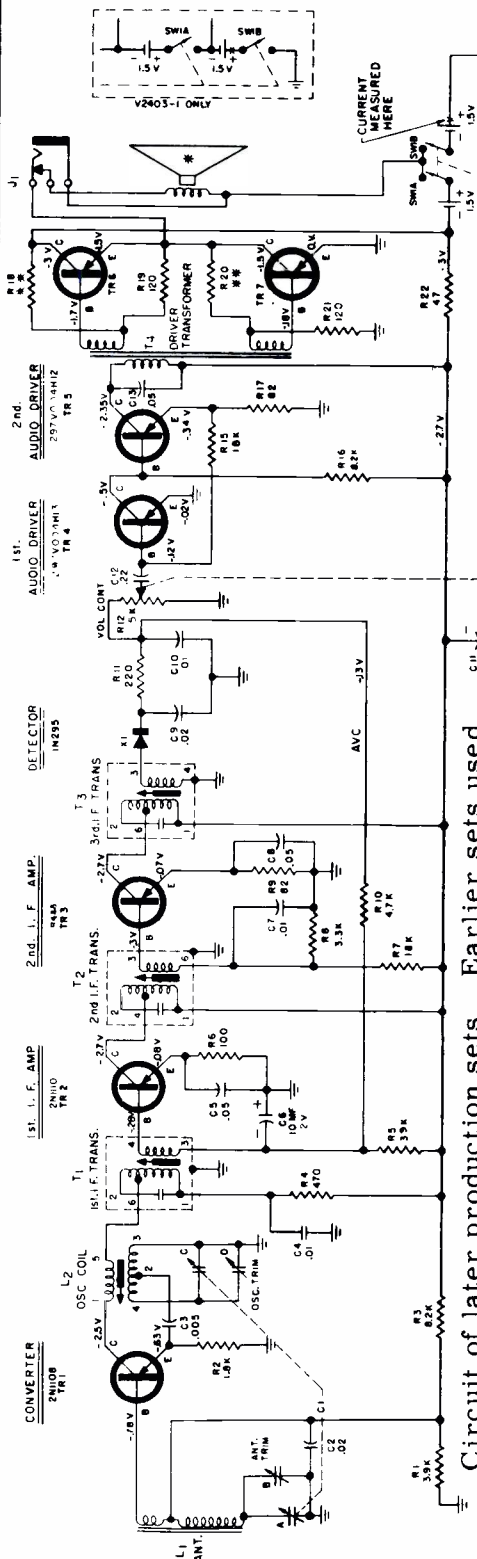
H-732P7
H-733P7
H-798P7A
H-798P7GPA

H-732P7GP
H-733P7GP
H-799P7A
H-799P7GPA

CHASSIS V-2403-4

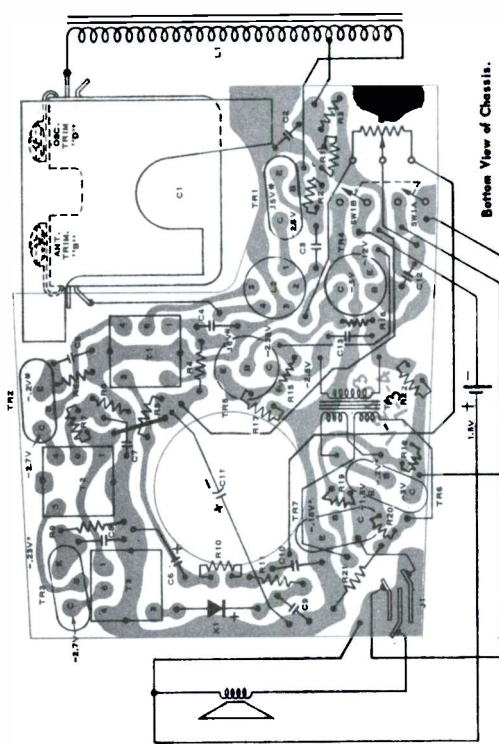
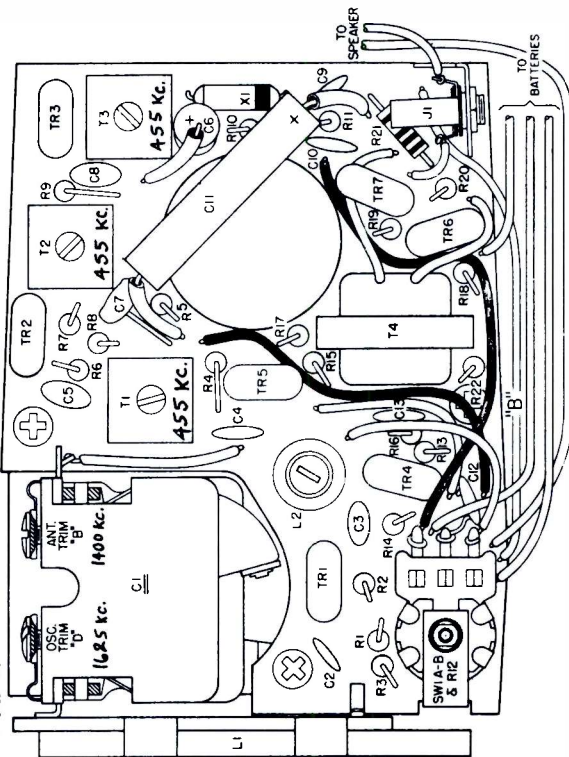
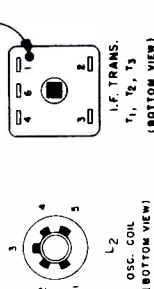
CHASSIS V-2403-1

AUDIO OUTPUT
MATCHED PAIR
R291 OR R356



Circuit of later production sets. Earlier sets used a few different value parts and extra resistors used with another type TR4 transistor.

FUNCTION	TYPE	1st PART NO.	ALTERNATES 1st PART NO.
CONVERTER	2N1006	2N1006	2N1006
1st. I.F. AMP	2N100	2N100	2N100
2nd. I.F. AMP	4N4	4N4	4N4
1st. AUDIO DRIVER	2N1006	2N1006	2N1006
2nd. AUDIO DRIVER	2N1006	2N1006	2N1006
AUDIO OUTPUT	2N1006	2N1006	2N1006

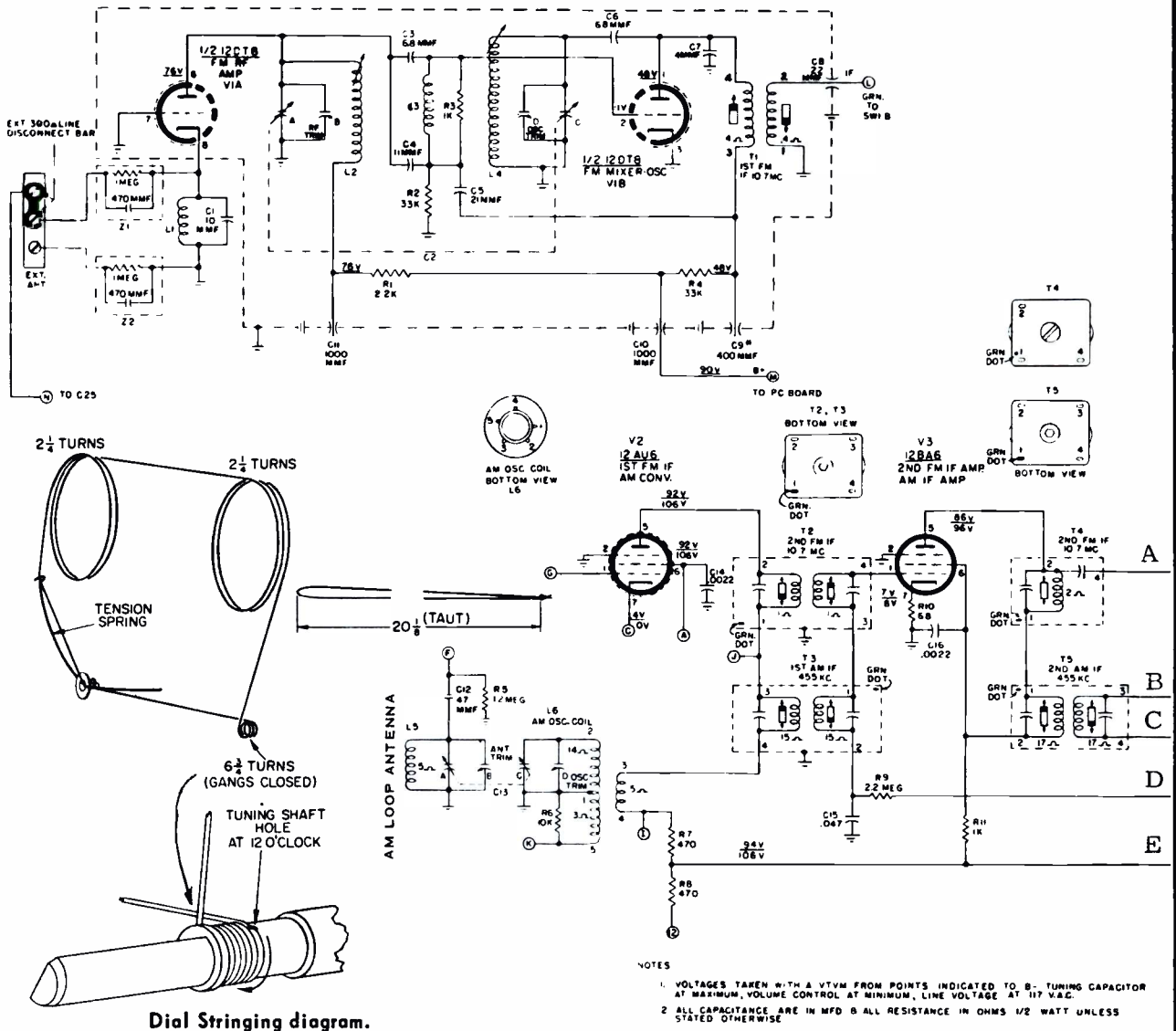


ALL VOLTAGES MEASURED IN RESPECT TO GROUND EXCEPT INDICATED. INDICATED VOLTAGES MEASURED IN RESPECT TO EMITTER. VOLTAGE VARIATION MAY INDICATE A DEFECTIVE STAGE.

Westinghouse

Models H-761N7, H-762N7, Chassis V-2407-1, Models H-764N7, H-765N7, H-777N7, H-778N7, H-779N7, H-780N7, Chassis V-2407-2, are very similar to sets covered on this page and continued on the next page, adjacent at right.




FM TUNER 12DT8



Connect to balance of diagram on next page.

WESTINGHOUSE Models H-761N7, H-762N7, Chassis V-2407-1, Continued

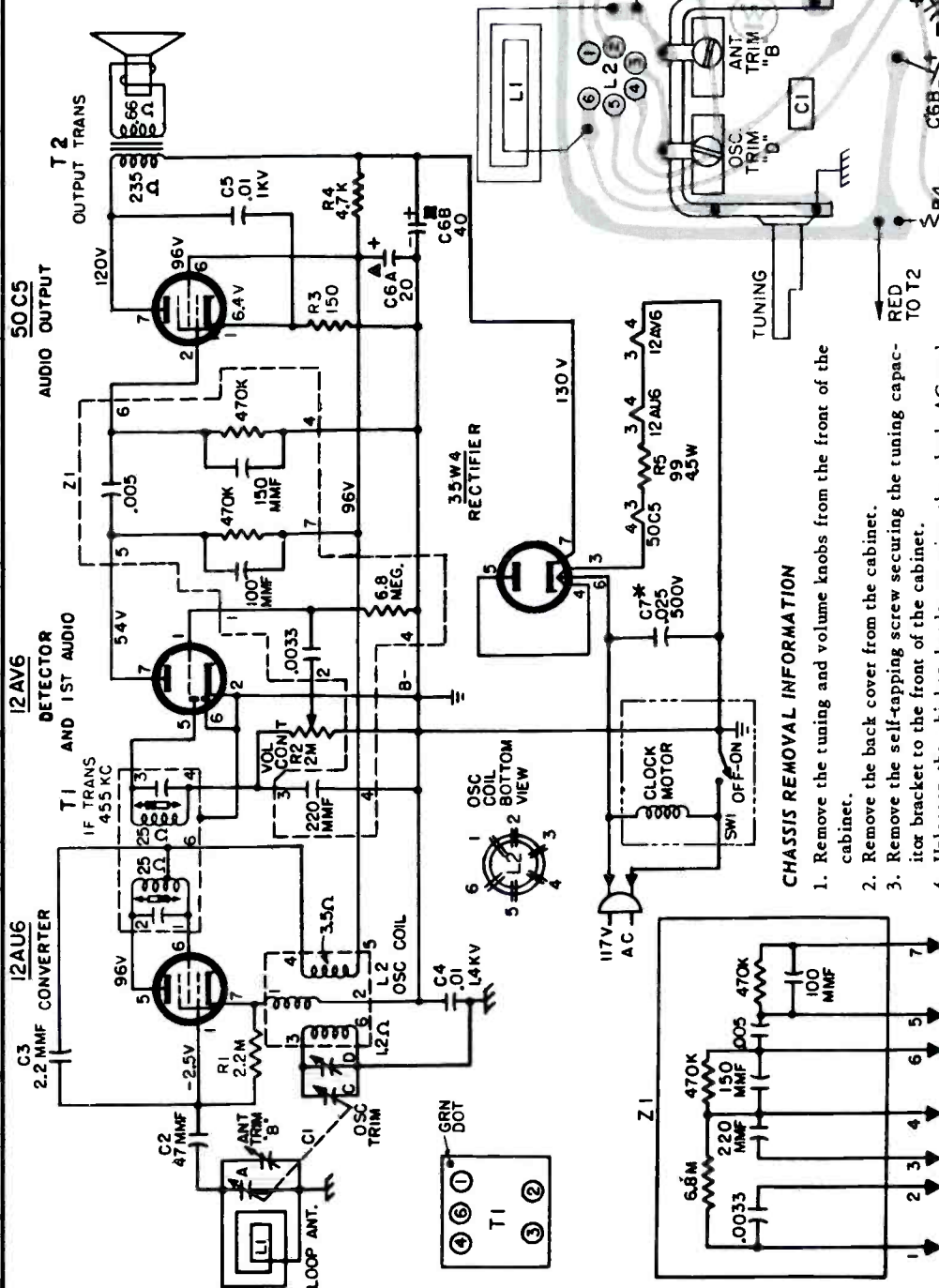


3. An arrow is used to indicate the direction from which the slug can be adjusted (ex.  indicates a bottom slug adjustable from the bottom ---  indicates a bottom slug adjustable from the top ---  indicates a bottom slug adjustable from top or bottom.)

Westinghouse

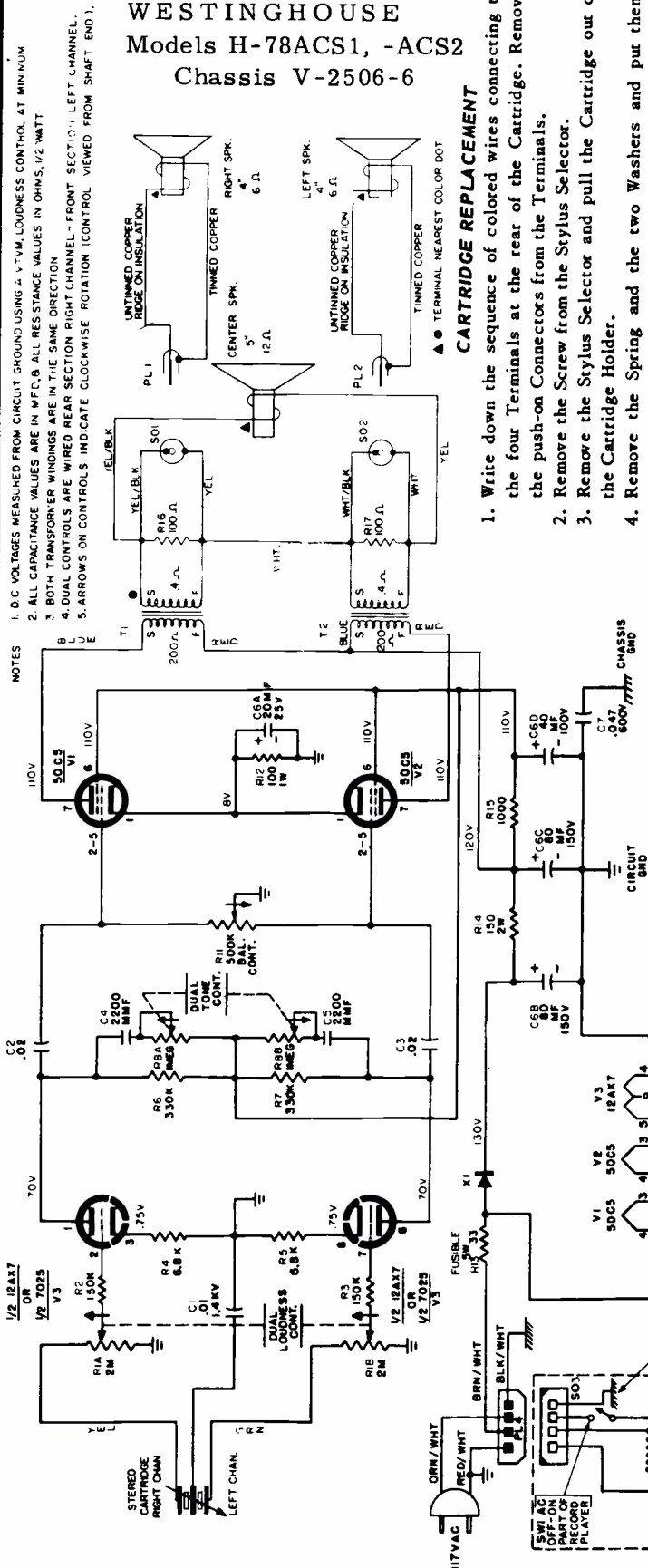
MODEL
H-766L4-A

V-2420-1 CHASSIS



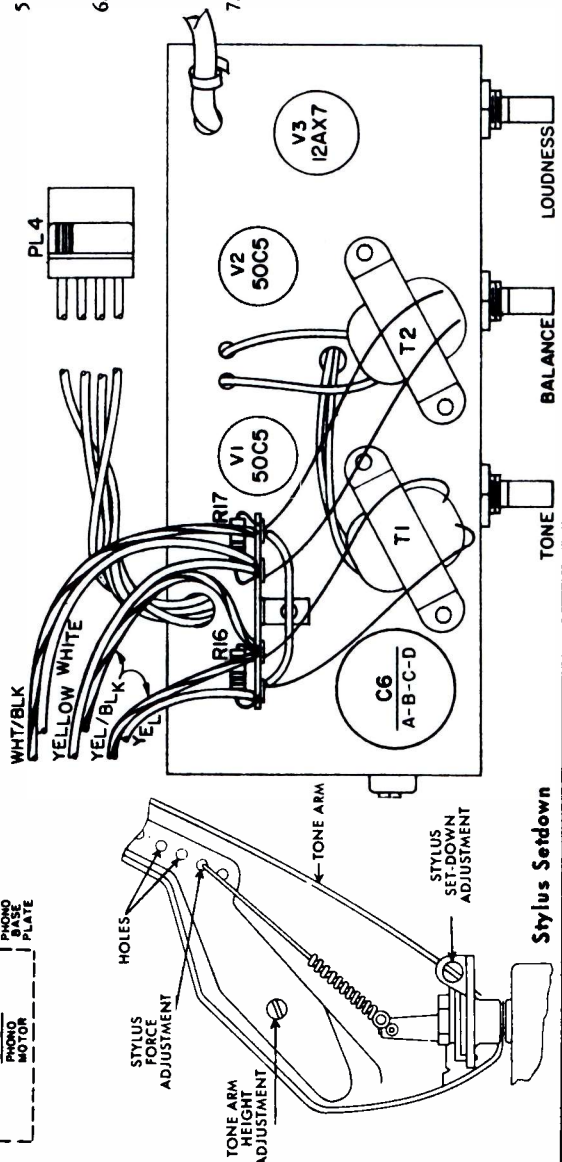
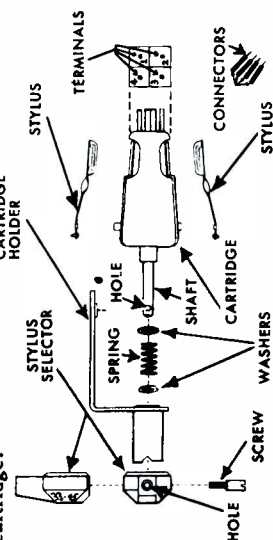
Tube pin numbering is for bottom of socket.

WESTINGHOUSE Models H-78ACS1, -ACS2 Chassis V-2506-6



CARTRIDGE REPLACEMENT

1. Write down the sequence of colored wires connecting to the four Terminals at the rear of the Cartridge. Remove the push-on Connectors from the Stylus Holder.
2. Remove the Screw from the Stylus Selector.
3. Remove the Stylus Selector and pull the Cartridge out of the Cartridge Holder.
4. Remove the Spring and the two Washers and put them onto the replacement Cartridge.
5. Insert the replacement Cartridge into the Cartridge holder; push it as far in toward the front of the Tone Arm as it will go and hold it there.
6. Put the Stylus Selector onto the Carriage Shaft so that the Hole in the Stylus Selector lines up with the Hole in the Carriage Shaft. Secure it in place with the Screw. Be sure that the "33-45" marking on the Stylus Selector faces upward and the Stylus marked SA-075 faces down. Push the Connectors onto the Terminals with the wire colors in the sequence previously noted for the original cartridge.



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MODEL H-69AC51

CHASSIS V-2507-7

PORTABLE - STEREO PHONO

NOTES:
1. ALL CAPACITANCE VALUES IN MFD & ALL RESISTANCE VALUES IN OHMS, 1/2 WATT, UNLESS OTHERWISE STATED.
2. ALL VOLTAGES MEASURED FROM CHASSIS GROUND USING A V.T.V.M. NO SIGNAL INPUT, LINE VOLTAGE SET AT 117 VAC. READINGS SHOULD BE AS SHOWN $\pm 20\%$.
3. REAR SECTIONS OF ALL COMPONENTS MUST BE REMOVED FROM CONTACT END.
4. SW 2 IS NOT INCLUDED IN #1 OR #2.
5. SW 2 IS NOT INCLUDED IN #1 OR #2.
6. VOLTAGES UNDERLINED WITH SW 2 IN MONAURAL POSITION

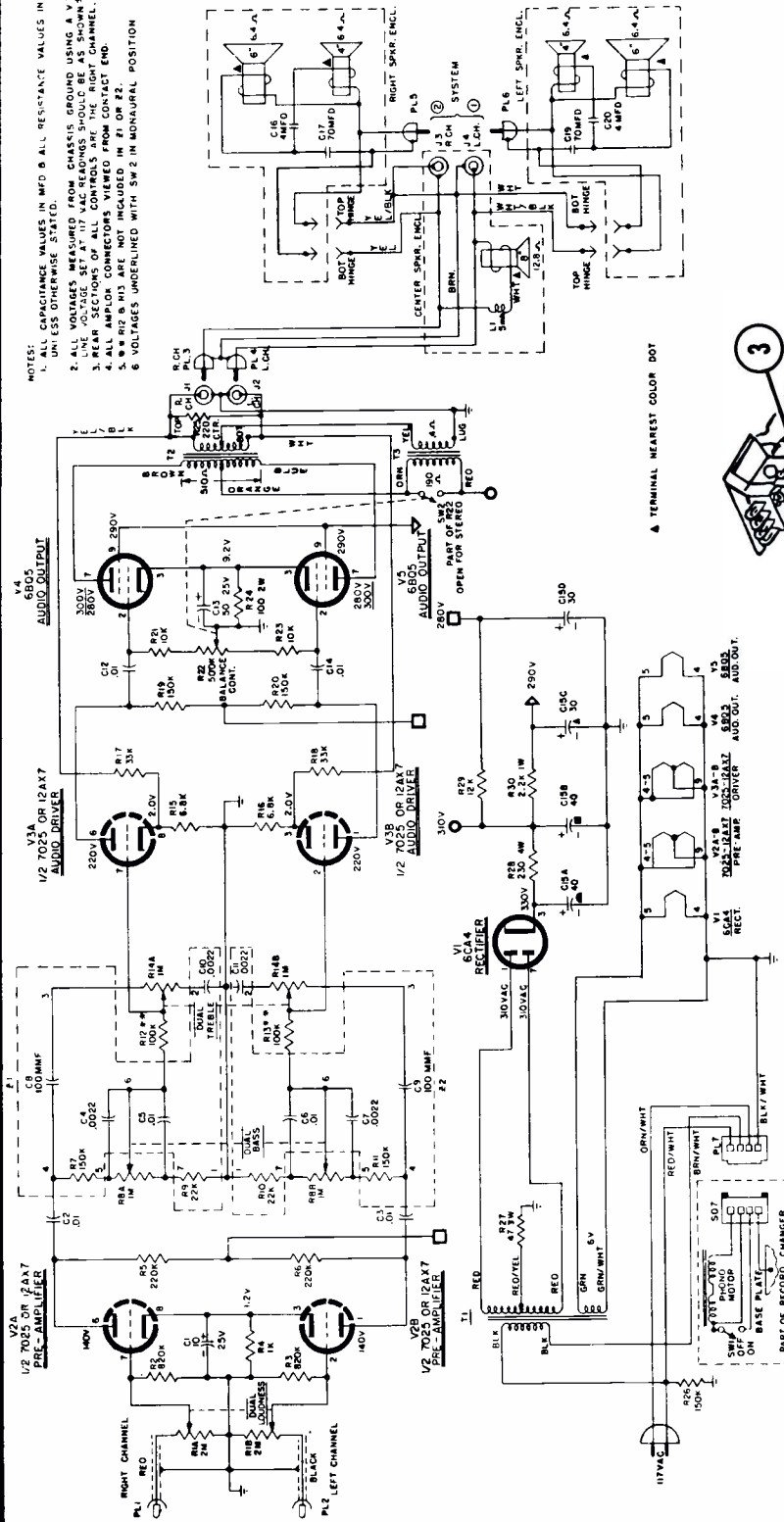
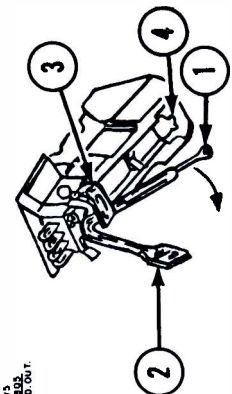


Figure 1
Stylus removal
and replacement.



POWER CORD POLARITY

To remove the possibility of hum due to incorrect power plug polarity, try reversing this plug while the Bass and Loudness controls are set at maximum. Leave the plug in the minimum hum position. Always check the AC power plug polarity first when servicing a hum problem.

PHASING

Each speaker is coded with a dot on one terminal. The striped speaker leads must go to the speaker terminals marked with a color dot.

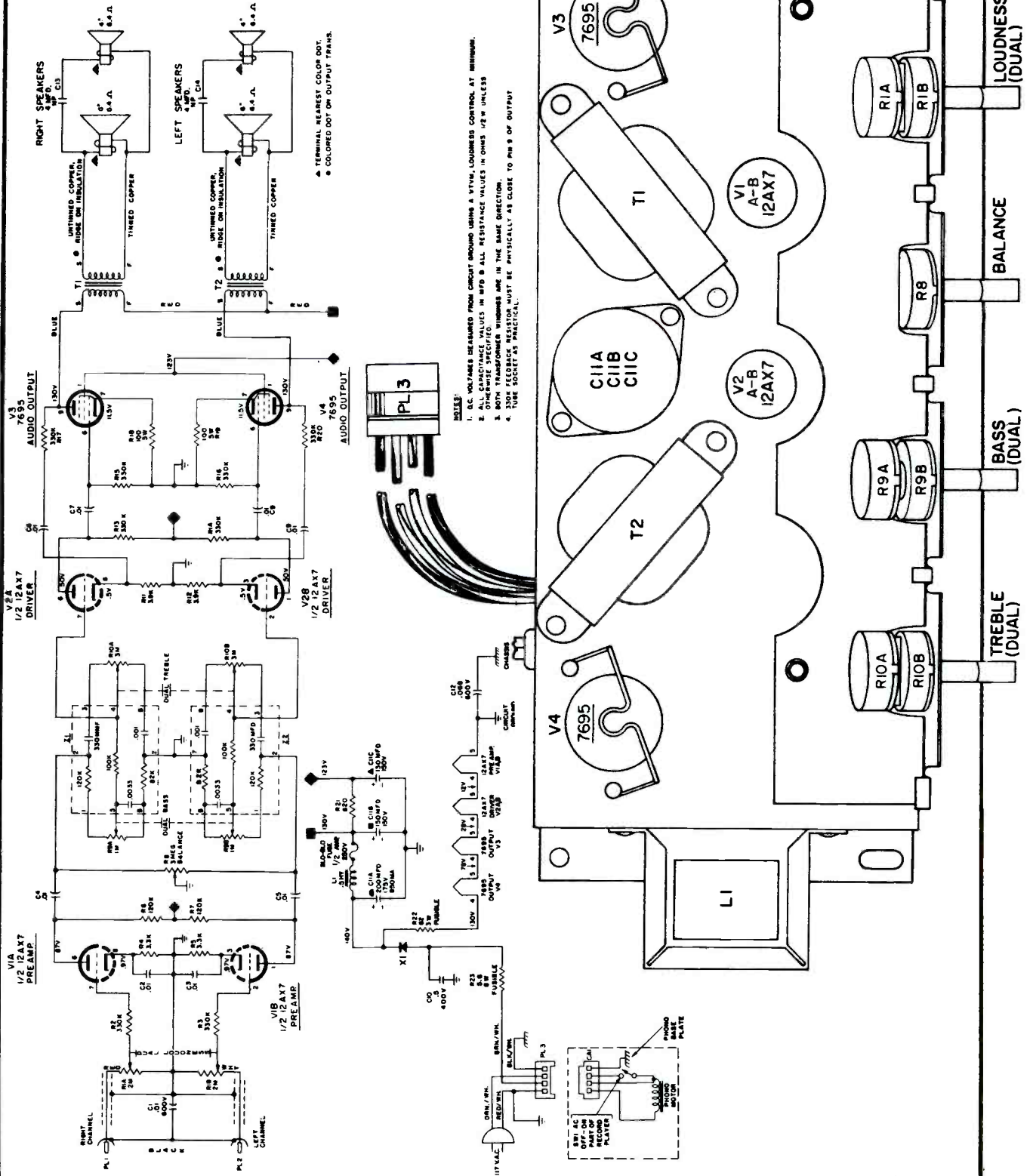
STYLUS REPLACEMENT (See Figure 1)

To remove stylus (item #1), move lever handle (#2) until it is pointing down. Gently pull spring clip (#3) slightly open with finger. Grasp stylus by lever handle and slip it out from under clip. To replace stylus, slip heel of stylus under clip. Gently pull clip slightly open with finger. Slip stylus under clip making certain that stylus shaft rests in center of coupler (#4).

CARTRIDGE REPLACEMENT

Write down the sequence of colored wires connecting to the four terminals at rear of cartridge. Remove the mounting screws securing the cartridge in the tone arm. Remove the push-on connectors from the cartridge terminals. Push the connectors onto the terminals of the replacement cartridge with the wire-colors in the sequence previously noted for the original cartridge.

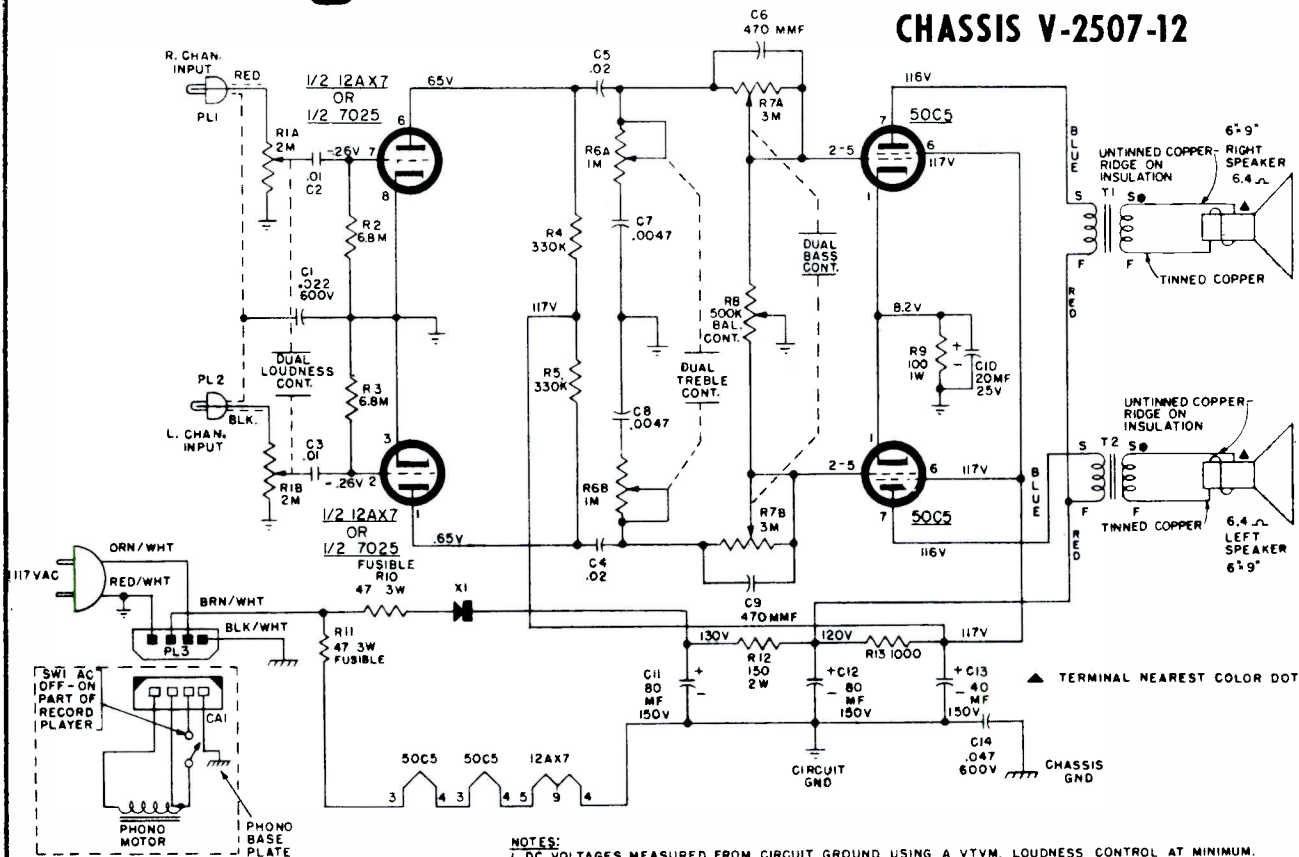
WESTINGHOUSE
Models H-81ACS1, H-81ACS2,
Chassis V-2507-11



Westinghouse

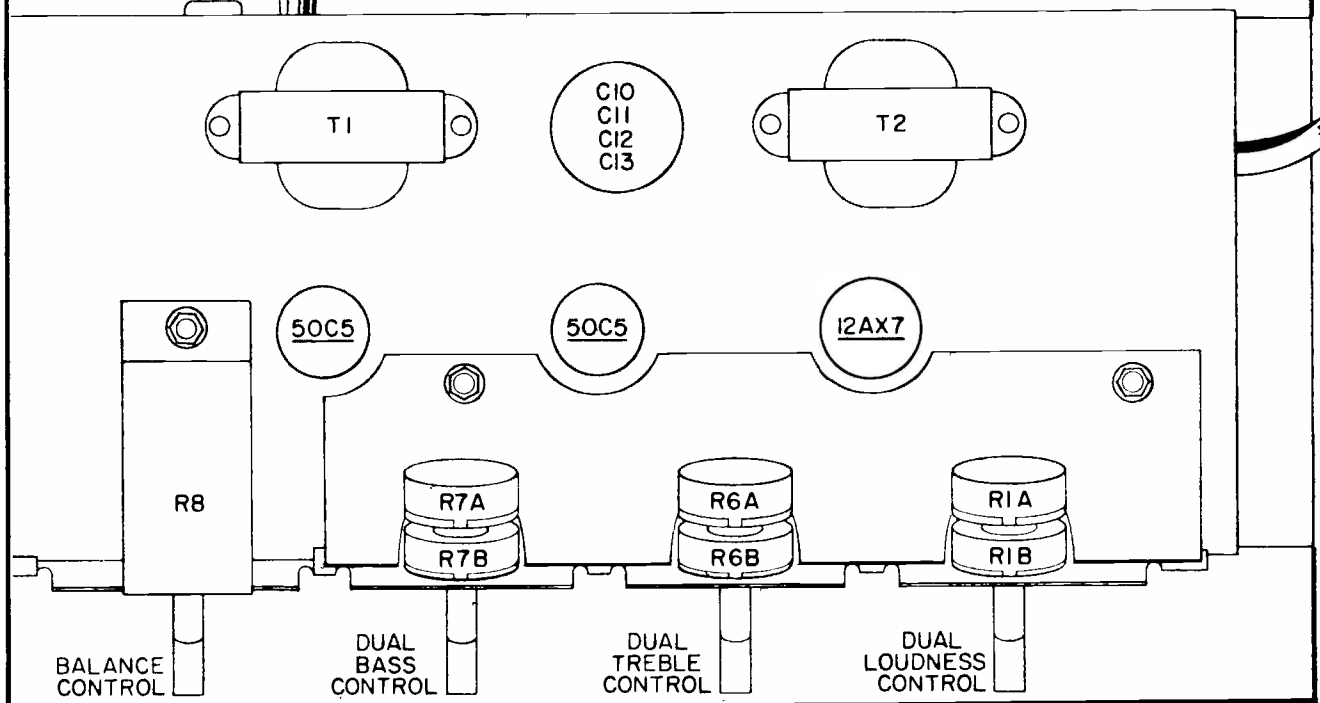
MODELS H-79AC51, H-79AC52

CHASSIS V-2507-12

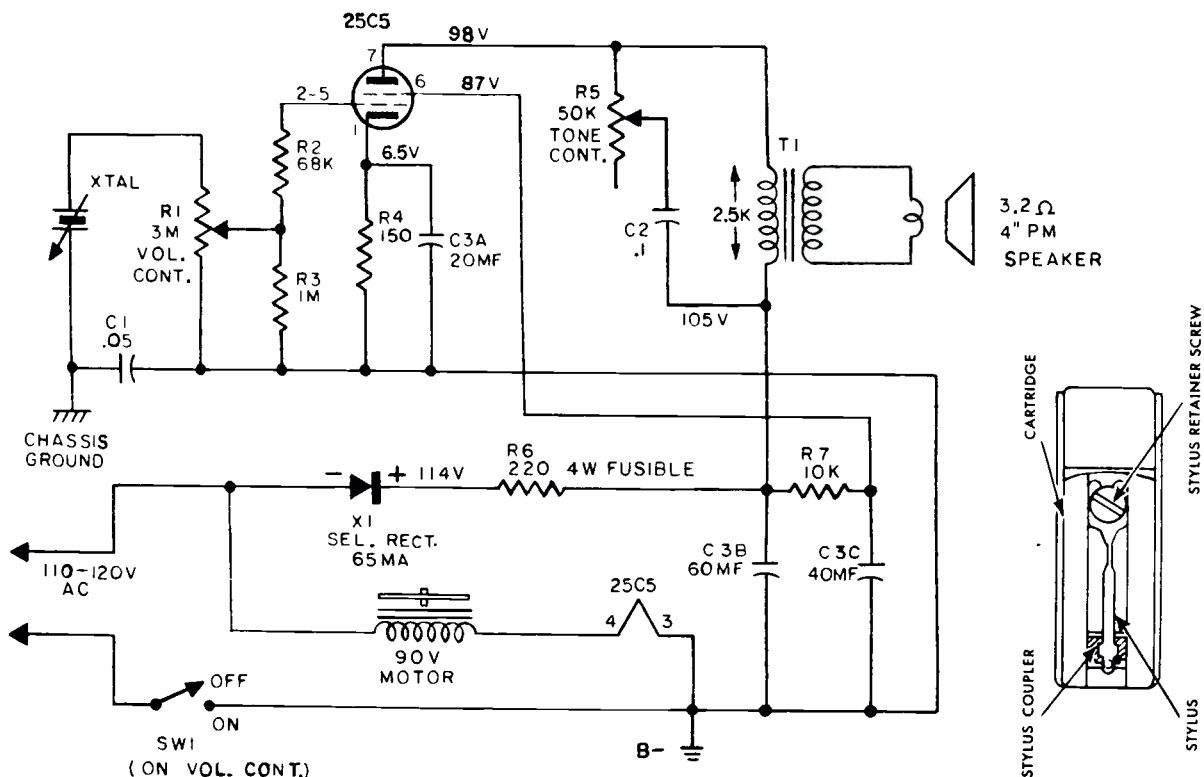


NOTES:

1. DC VOLTAGES MEASURED FROM CIRCUIT GROUND USING A VTVM, LOUDNESS CONTROL AT MINIMUM.
2. ALL CAPACITANCE VALUES ARE IN MFD, & ALL RESISTANCE VALUES IN OHMS, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
3. BOTH TRANSFORMER WINDINGS ARE IN THE SAME DIRECTION.



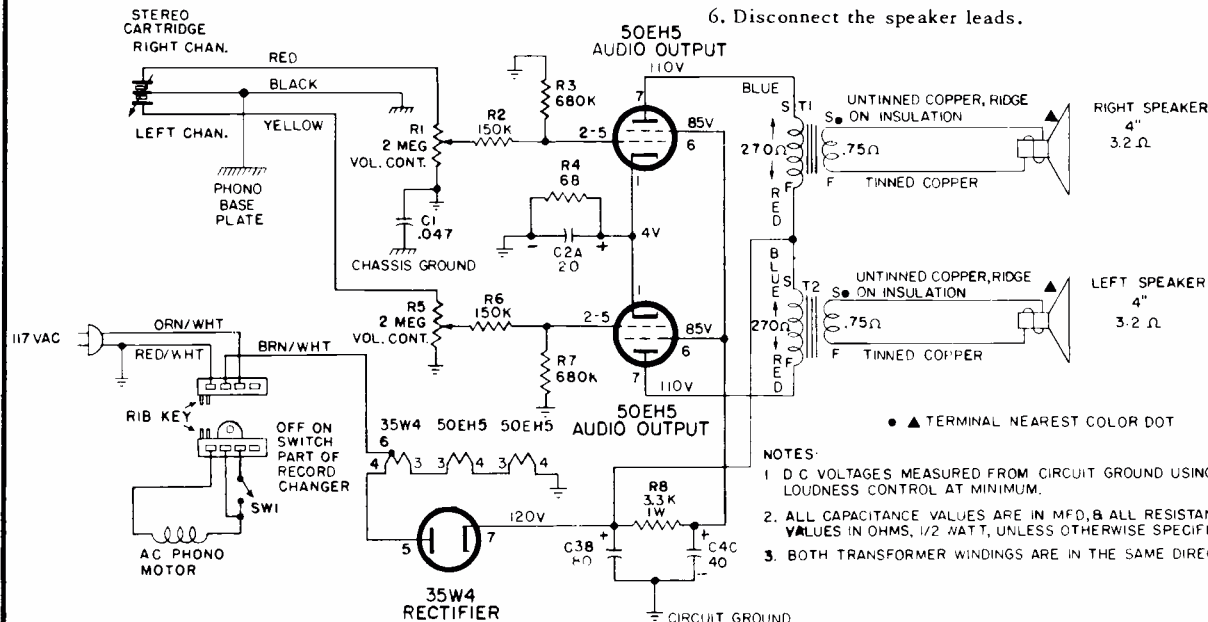
WESTINGHOUSE Models H-72MP1 and H-72MP2



WESTINGHOUSE
Models H-76ACS1, H-76ACS2
Chassis V-2508-11

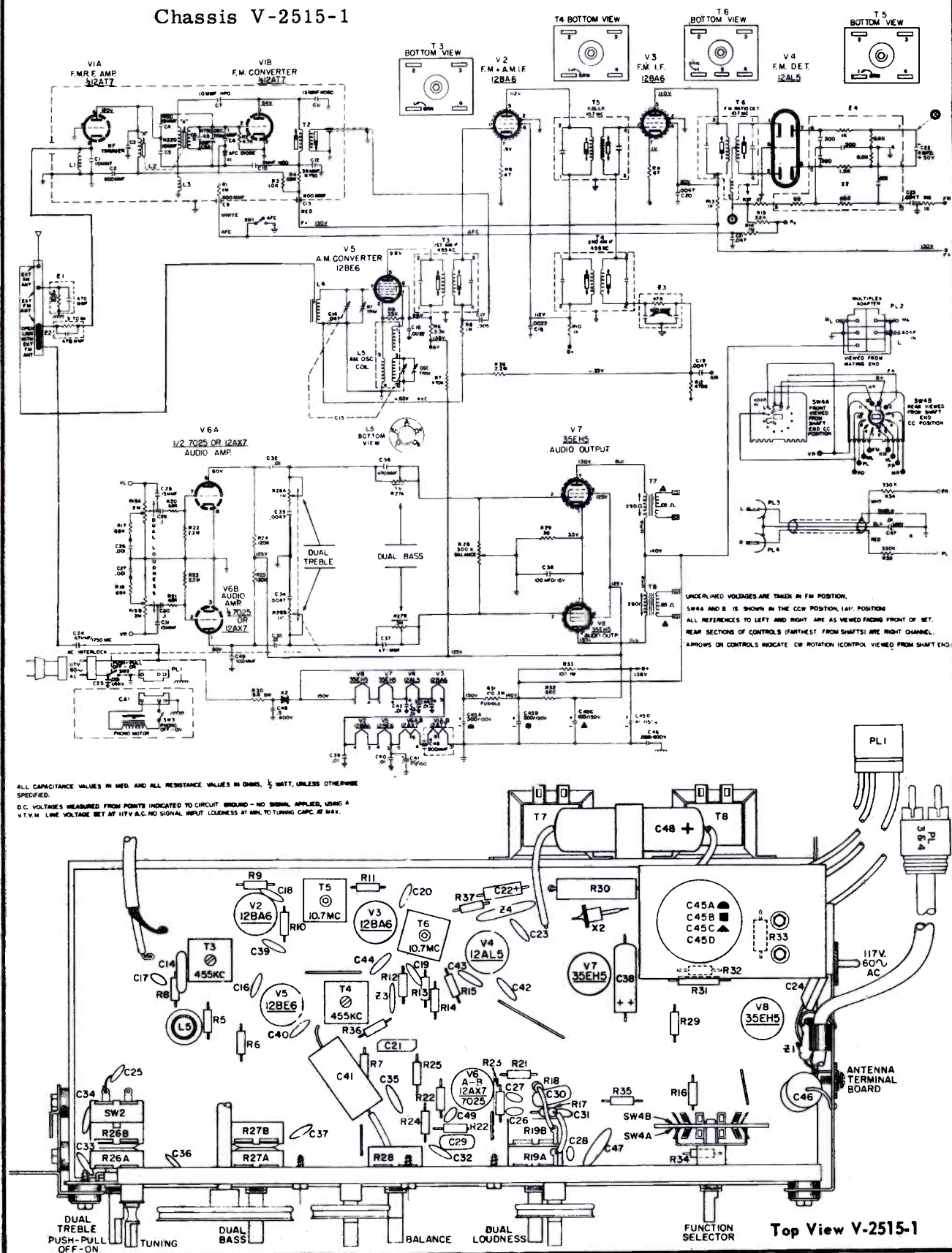
CHASSIS REMOVAL

1. Remove the perforated tube-service cover which is attached by 2 phillips screws.
2. Remove the 4 phillips screws holding the motor board. Lift the motor board.
3. Disengage the amp-loc from the changer and unsolder the leads to the changer terminal board.
4. Remove Volume control knobs.
5. Remove the 2 speed nuts holding the chassis to the cabinet front.
6. Disconnect the speaker leads.



VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

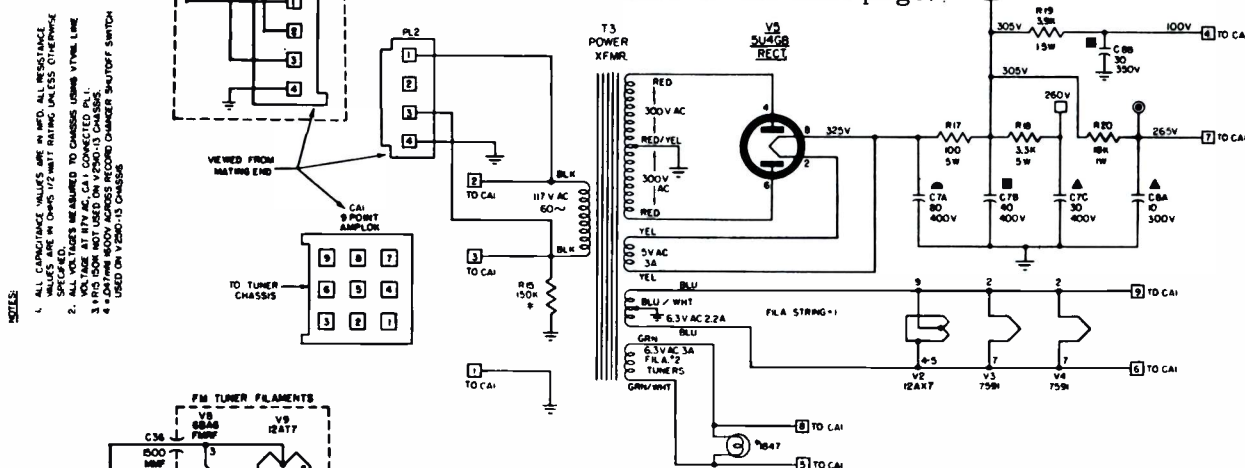
WESTINGHOUSE Models H-M1700, H-M1701, H-M1702, H-M1703, Chassis V-2515-1



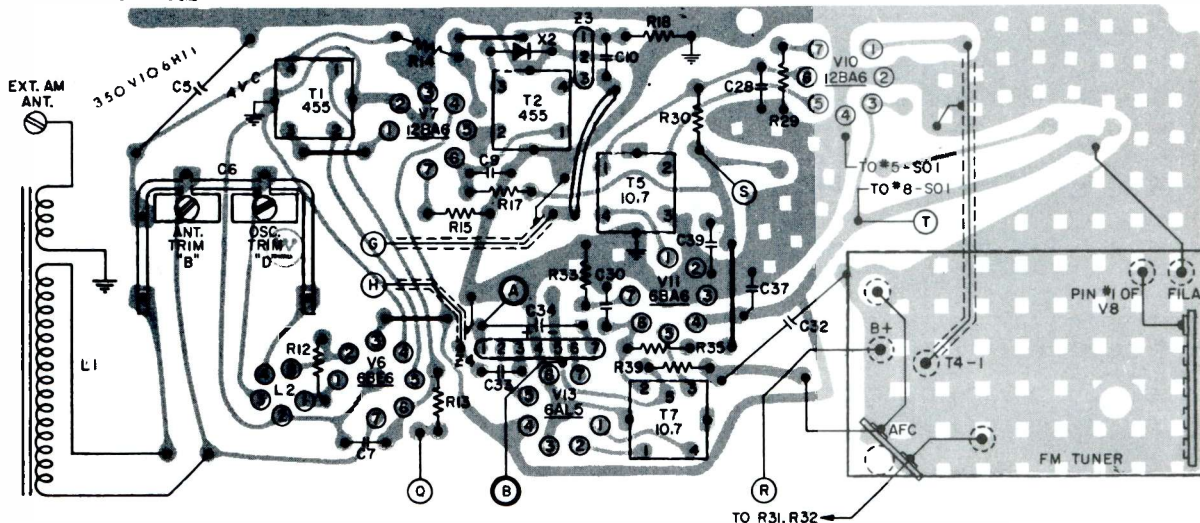
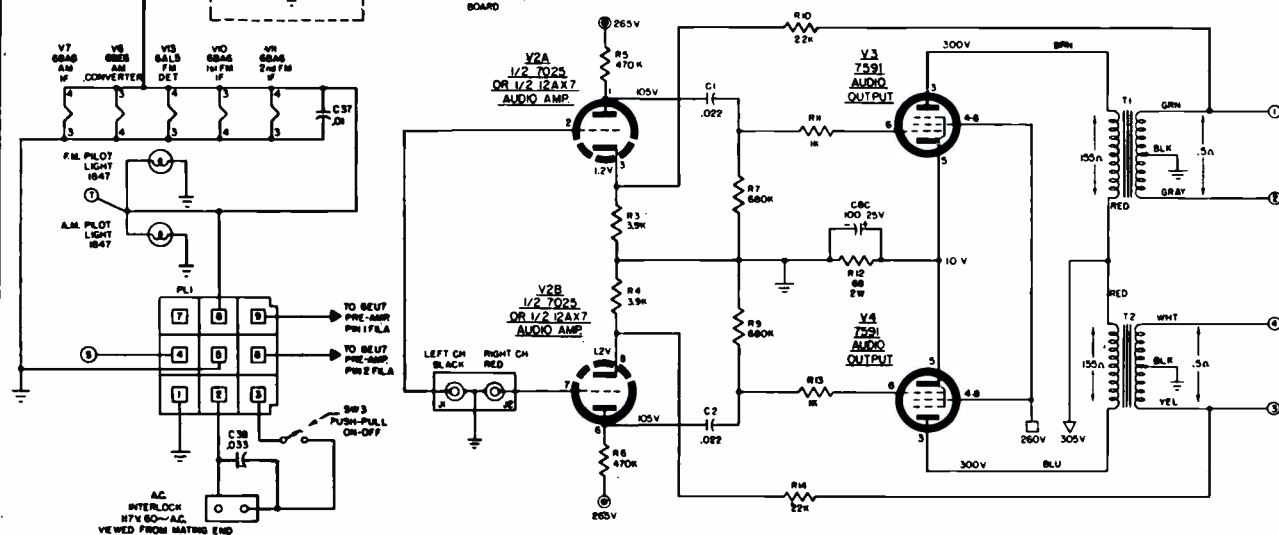
VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

WESTINGHOUSE Chassis V-2510-7 and V-2511-5, Models H-M1310B, H-M1311B, H-M1312B, H-M1313B, H-M1410, H-M1411, H-M1412, H-M1413.

(Continued on the next page)



V-2510-7 Schematic Diagram.

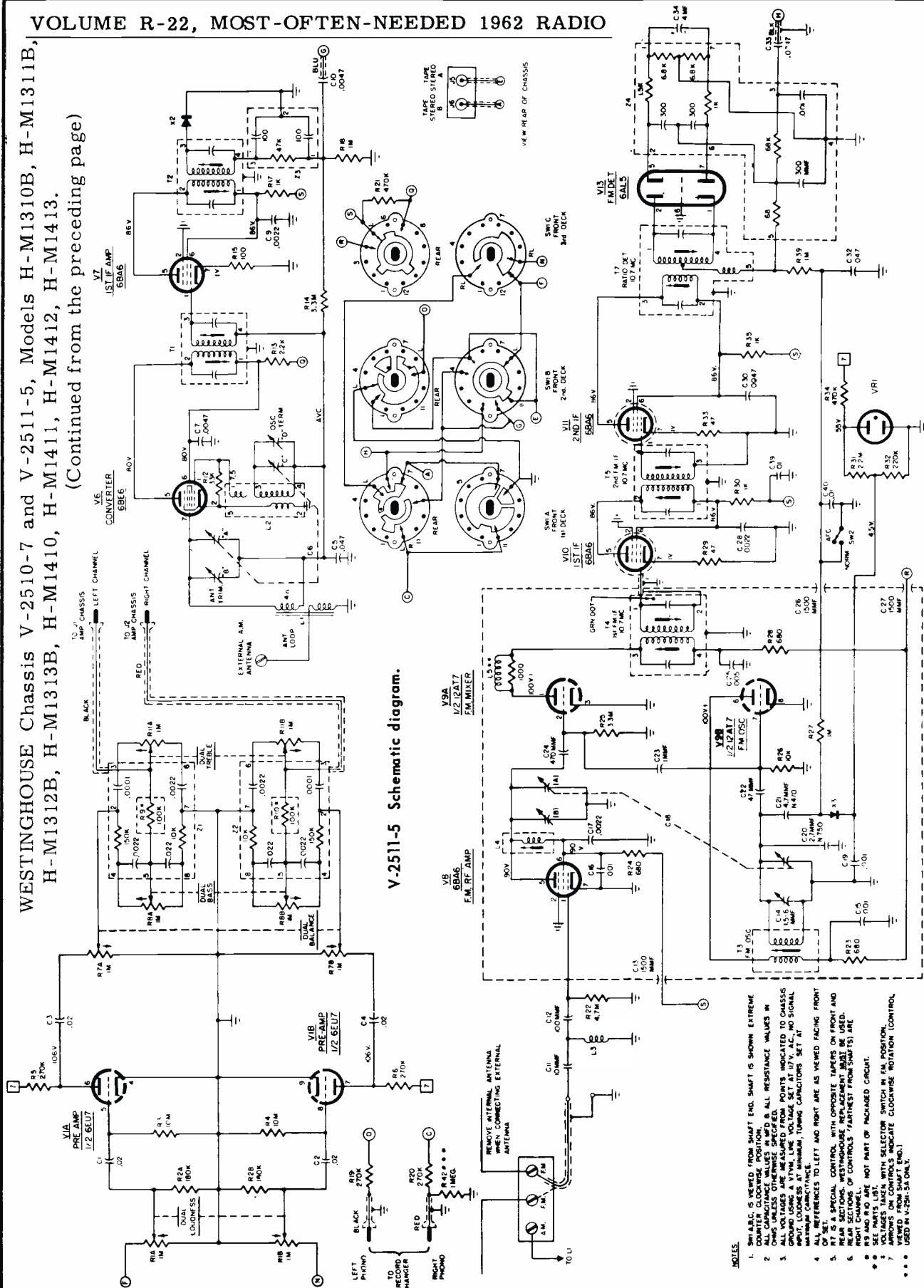


Bottom of PC board showing location of top components in solid outlines. Tube pin numbering is for bottom of socket.

VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO

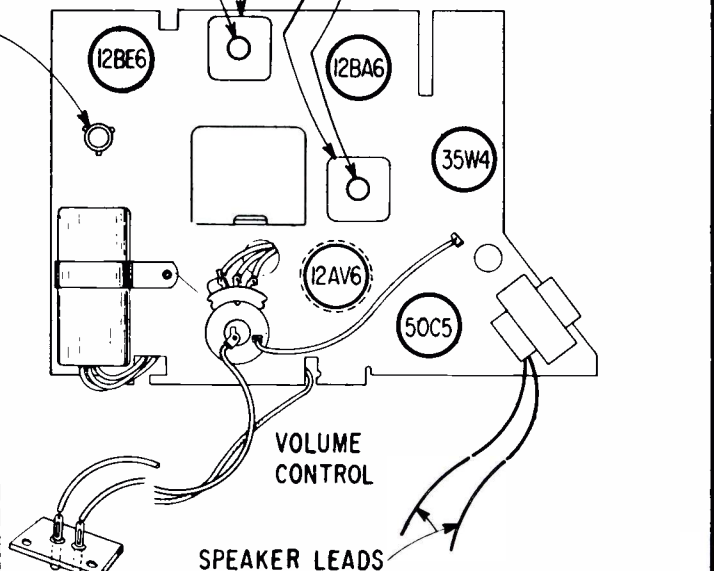
WESTINGHOUSE Chassis V-2510-7 and V-2511-5, Models H-M1310B, H-M1311B, H-M1312B, H-M1313B, H-M1410, H-M1411, H-M1412, H-M1413.

(Continued from the preceding page)



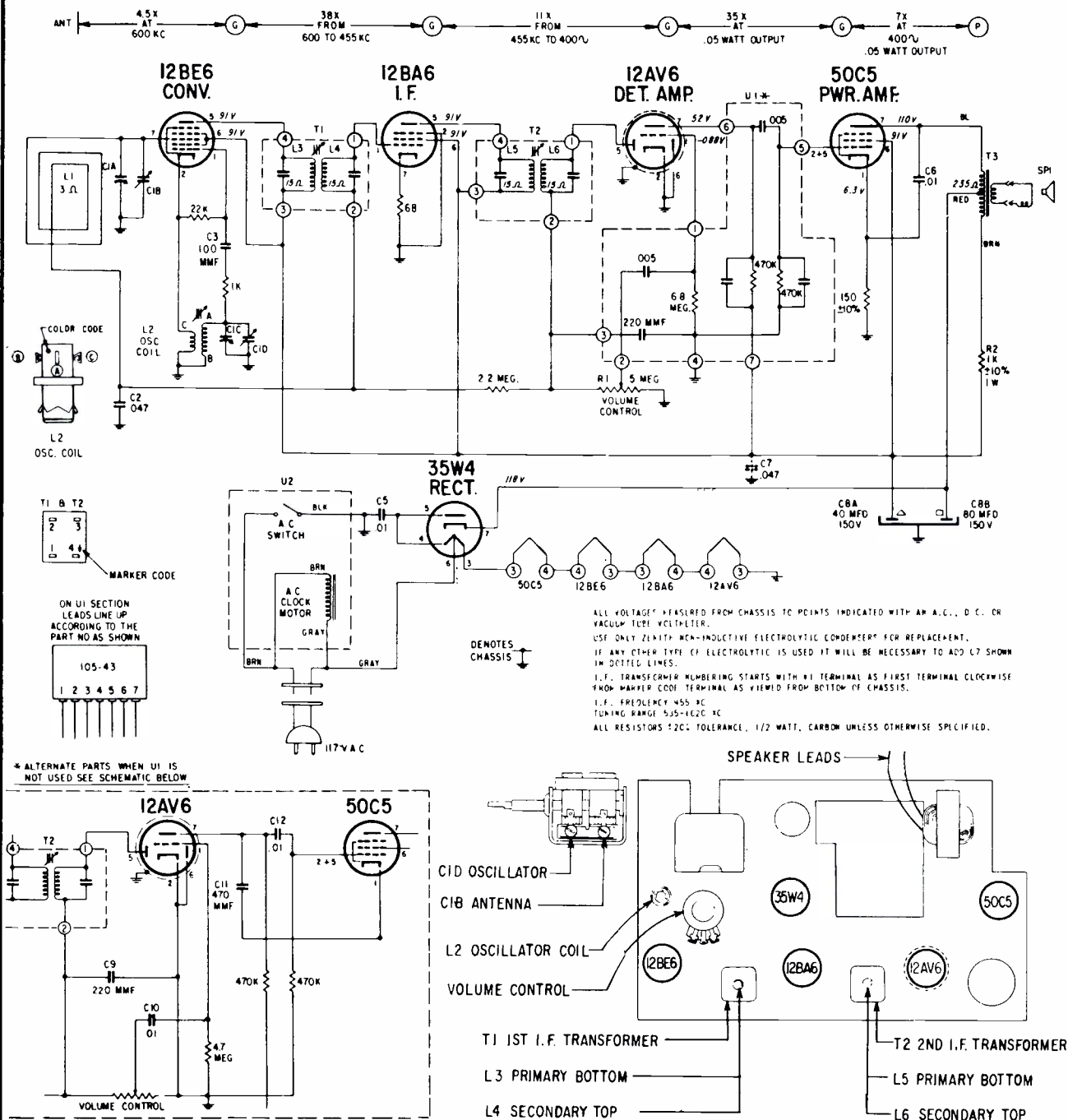
V-2511-5 Schematic diagram.

- NOTES
1. SWA, B, C IS VIEWED FROM SHAFT END. SHAFT IS SHOWN EXTREME LEFT POSITION.
 2. ALL CAPACITANCE VALUES IN μ F & ALL RESISTANCE VALUES IN Ω UNLESS OTHERWISE SPECIFIED. POINTS INDICATED TO CHASSIS GROUND USING A 1/4" WIRE LINE VOLTAGE SET AT 10V. ALL NO SIGNAL MAXIMUM CAPACITANCE.
 3. ALL CAPACITANCE VALUES IN μ F & ALL RESISTANCE VALUES IN Ω UNLESS OTHERWISE SPECIFIED. POINTS INDICATED TO CHASSIS GROUND USING A 1/4" WIRE LINE VOLTAGE SET AT 10V. ALL NO SIGNAL MAXIMUM CAPACITANCE.
 4. ALL CAPACITANCE VALUES IN μ F & ALL RESISTANCE VALUES IN Ω UNLESS OTHERWISE SPECIFIED. POINTS INDICATED TO CHASSIS GROUND USING A 1/4" WIRE LINE VOLTAGE SET AT 10V. ALL NO SIGNAL MAXIMUM CAPACITANCE.
 5. R7 IS A SPECIAL CONTROL WITH OPPOSITE TAPERS ON FRONT AND REAR. SPECIAL WESTINGHOUSE REPLACEMENT MUST BE USED.
 6. REAR SWITCHES OF CONTROLS (FARTHEST FROM SWA) ARE RIGHT CHANNEL.
 7. REAR SWITCHES OF CONTROLS (FARTHEST FROM SWA) ARE LEFT CHANNEL.
 8. R9 AND R10 ARE NOT PART OF PACKAGED CIRCUIT.
 9. SET POINTS LISTED WITH SELECTOR SWITCH IN FN POSITION.
 10. ALL CAPACITANCE VALUES IN μ F & ALL RESISTANCE VALUES IN Ω UNLESS OTHERWISE SPECIFIED. POINTS INDICATED TO CHASSIS GROUND USING A 1/4" WIRE LINE VOLTAGE SET AT 10V. ALL NO SIGNAL MAXIMUM CAPACITANCE.

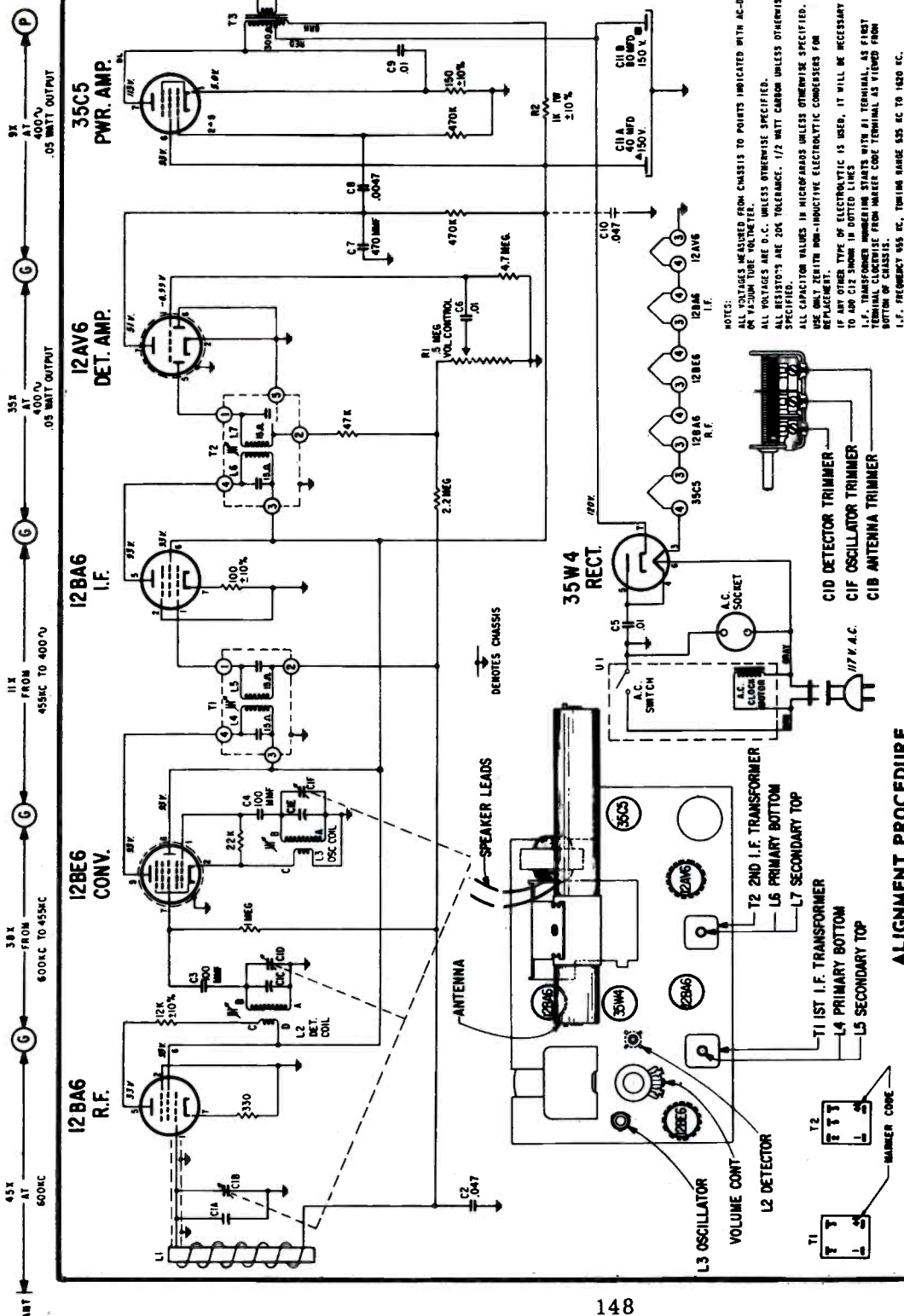


VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

ZENITH Radio Model H519, Chassis 5H07

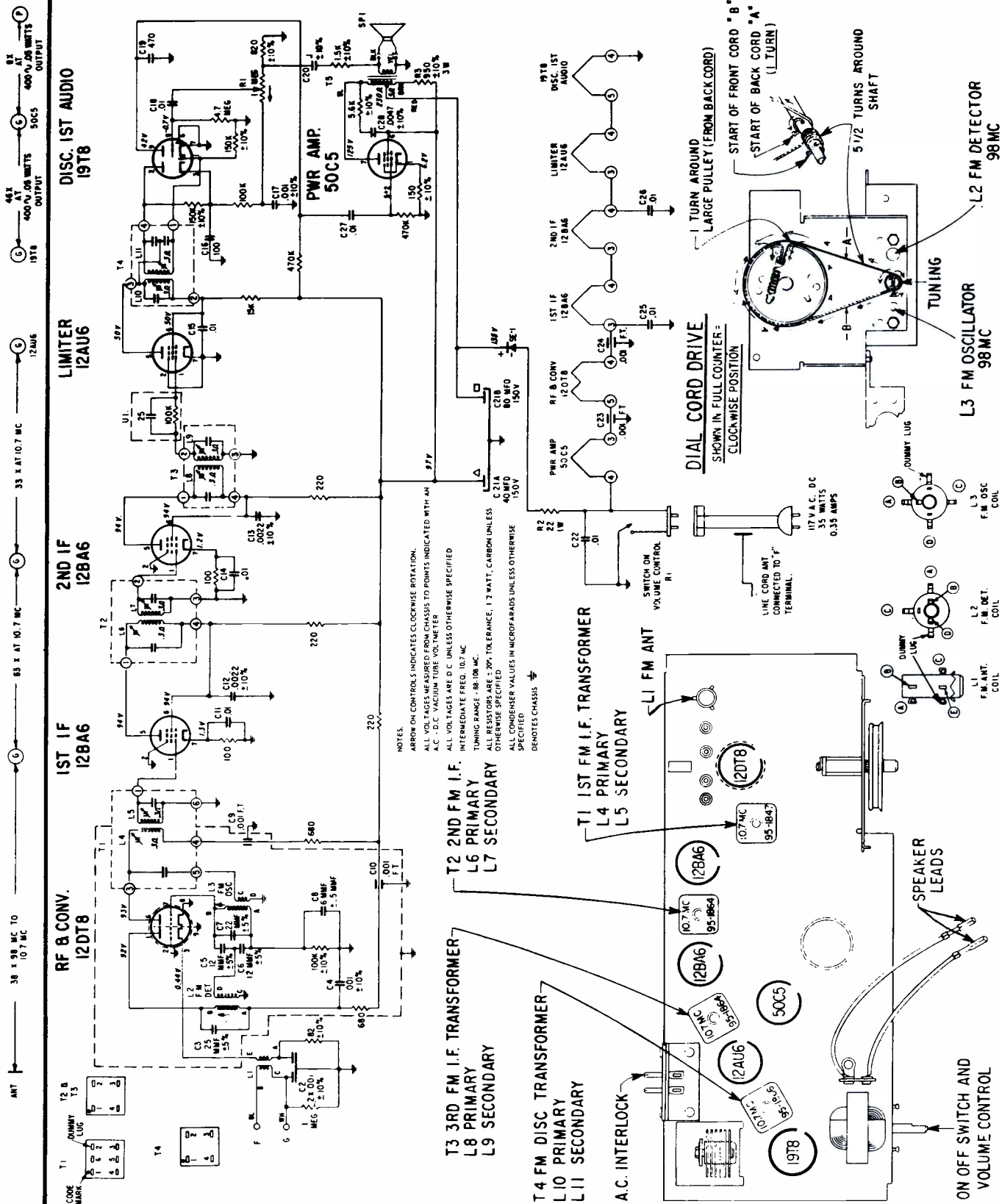


Chassis 6H03



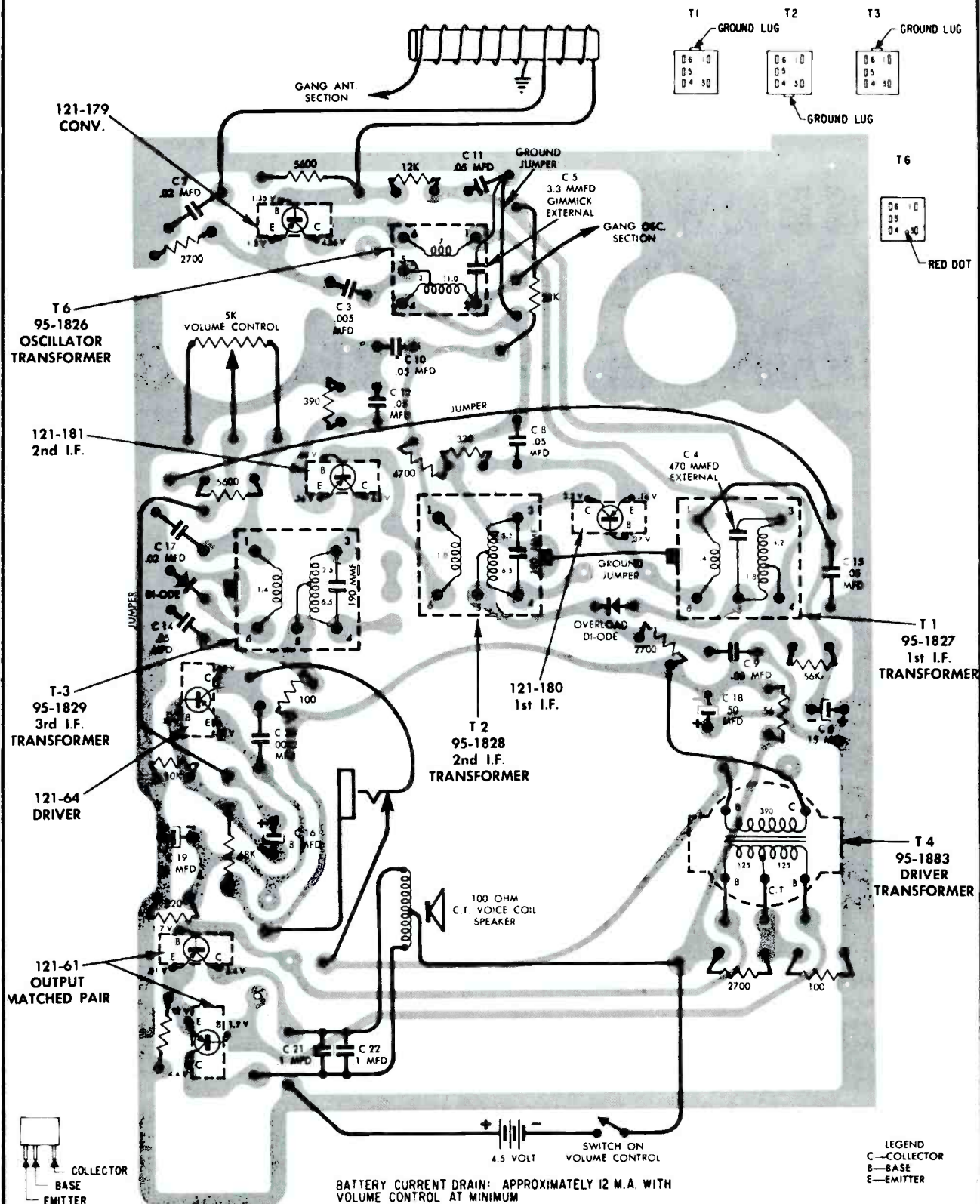
Operation	Connect Oscillator To	Dummy Antenna	Input Sig. Frequency	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L4, L5, L6, L7	For I.F. Alignment.
2	One Turn Loop Coupled Loosely to Wave-magnet	—	1600 Kc.	1600 Kc.	C1F	Set Oscillator to Dial Scale.
3		—	1400 Kc.	1400 Kc.	C1D, C1B	Align Detector and Antenna Stage.

ZENITH RADIO CORPORATION MODEL H722C, G&W CHASSIS 6H06



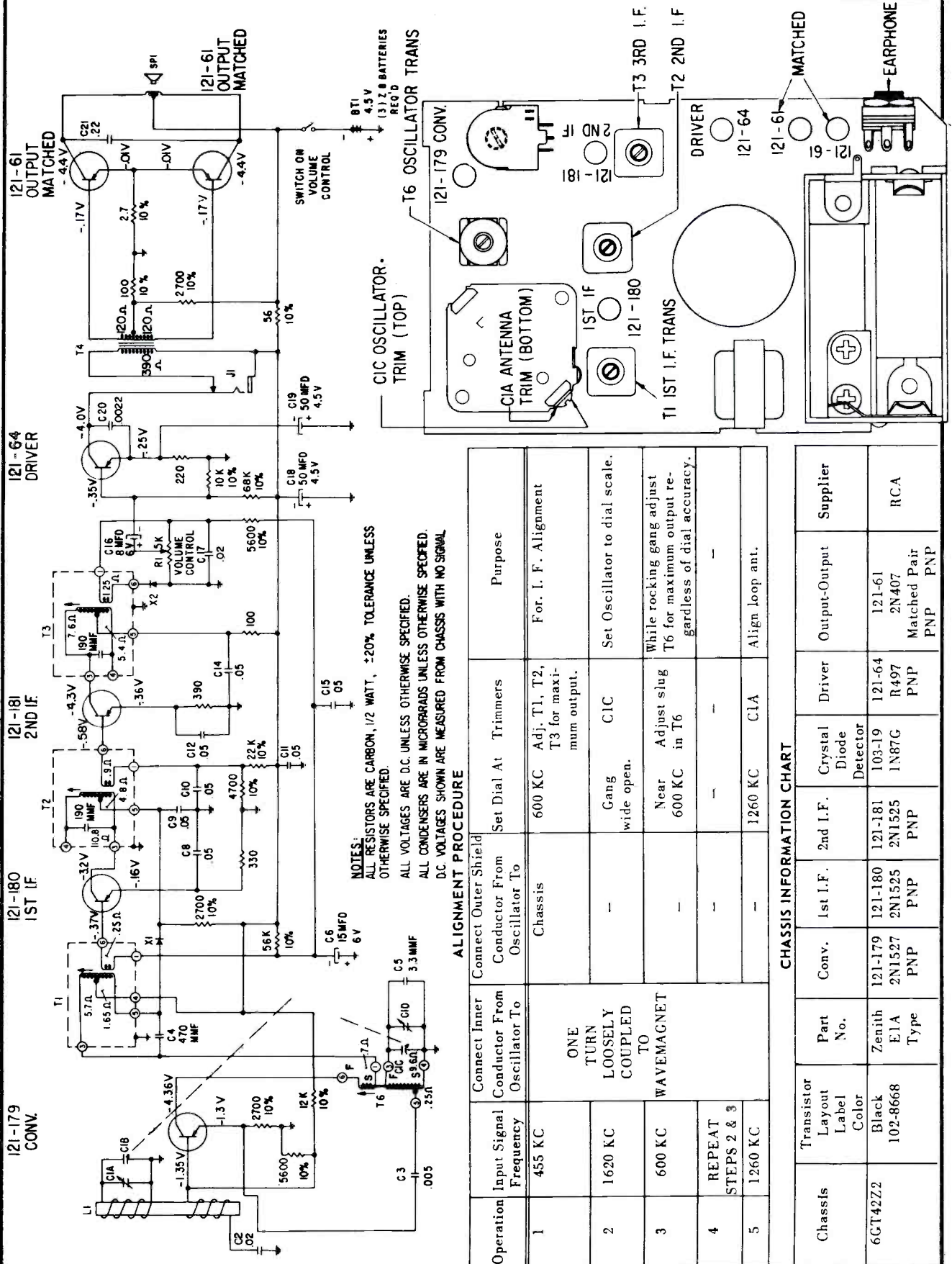
VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

ZENITH RADIO Model Royal 150, Chassis 6GT42Z2
(Circuit diagram and alignment on next page, at right)



CHASSIS, WIRING AND COMPONENTS

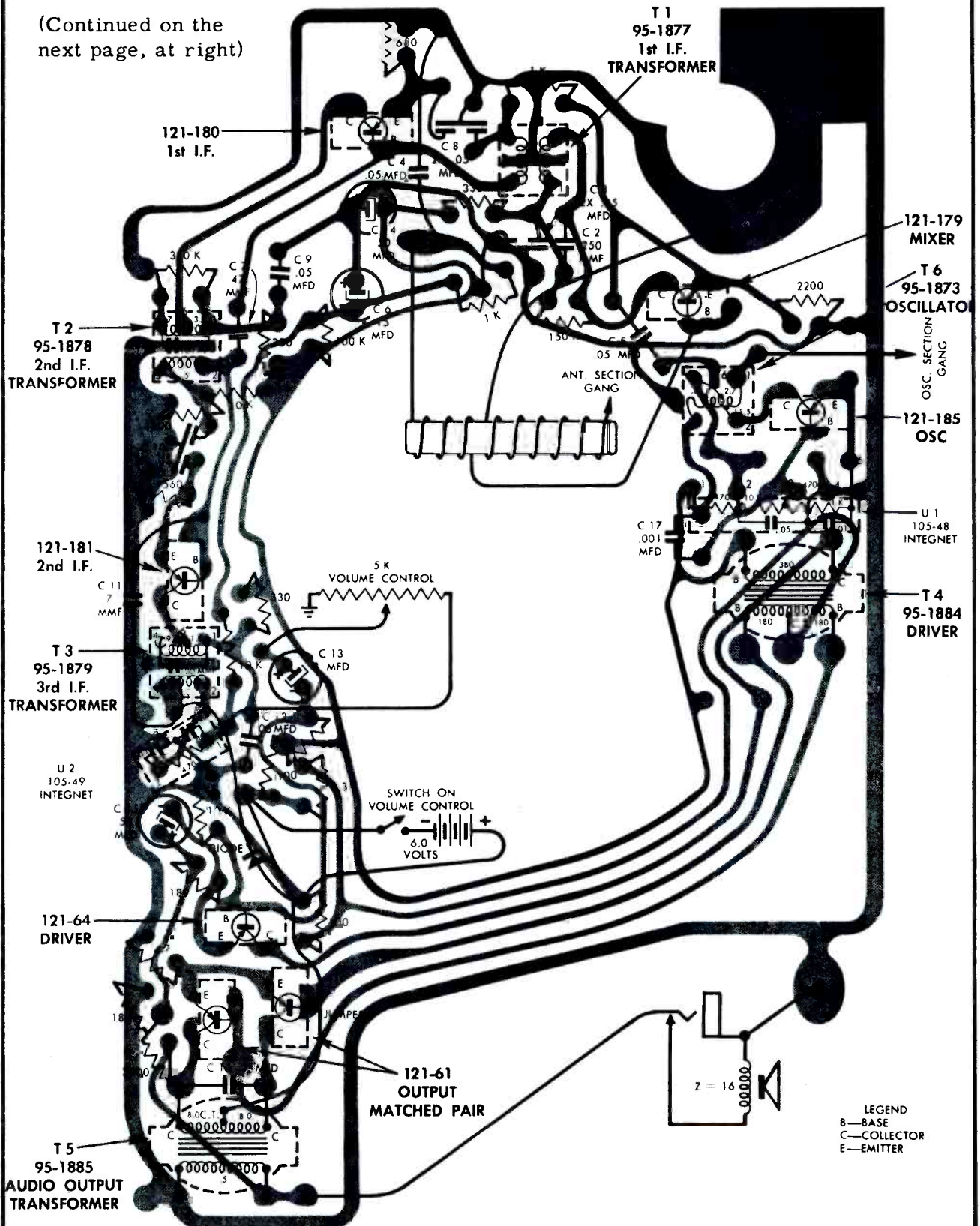
VIEWED FROM WIRING SIDE



VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

ZENITH RADIO Model Royal 400, Chassis 7GT40Z2, Continued

(Continued on the next page, at right)



CHASSIS, WIRING AND COMPONENTS

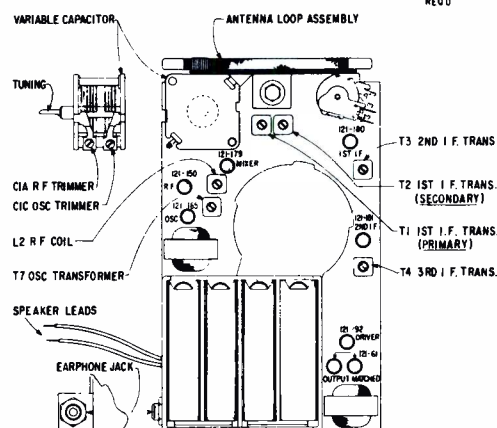
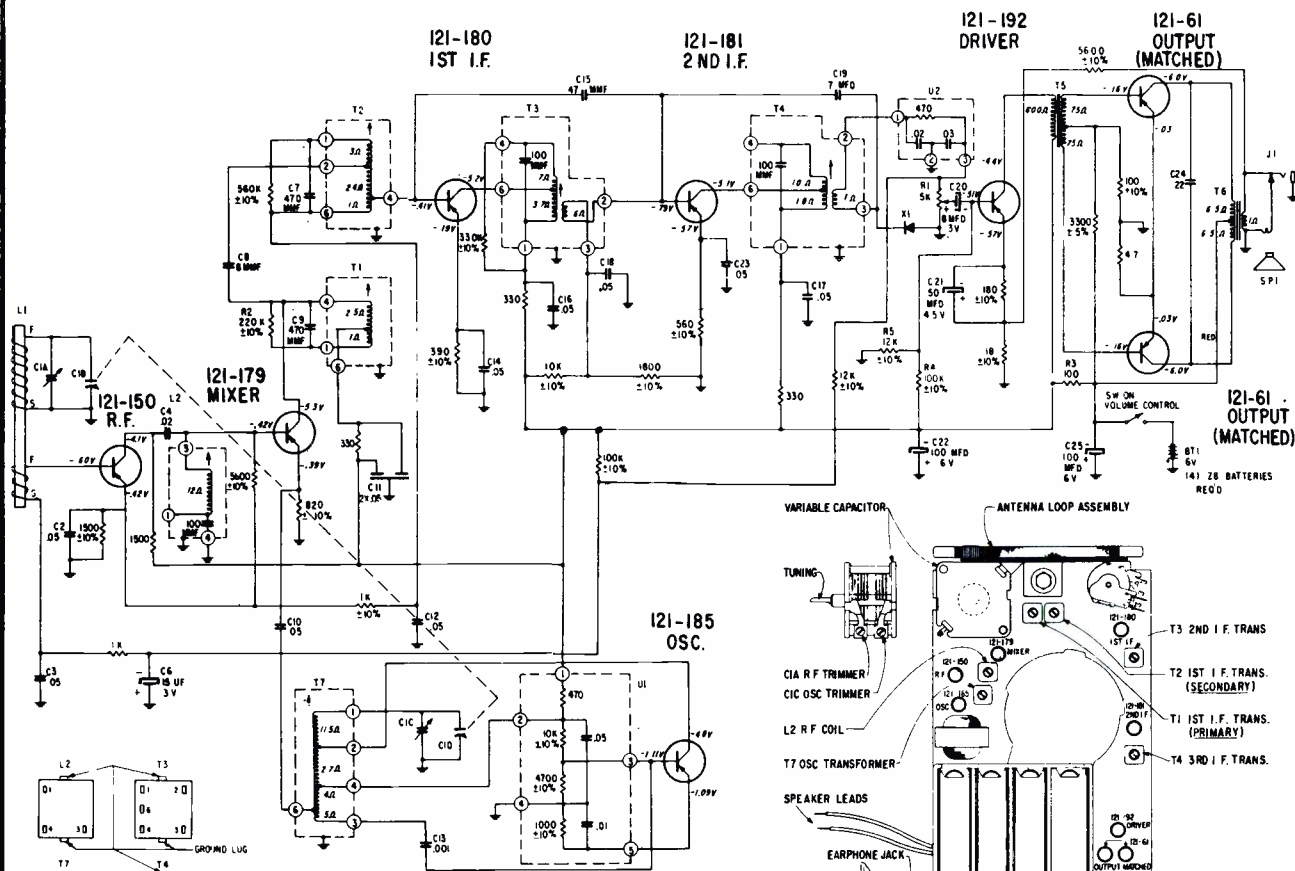
VIEWED FROM WIRING SIDE

ZENITH RADIO Model Royal 500H, Chassis 8HT40Z2
(Circuit diagram and alignment on the next page at right)



VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

ZENITH RADIO Model Royal 500H, Chassis 8HT40Z2, Continued



ALIGNMENT PROCEDURE

Operation	Input Signal Frequency	Connect Inner Conductor From Oscillator To	Set Dial At	Trimmers	Purpose
1	455 KC	ONE TURN LOOSELY COUPLED TO WAVEMAGNET	600 KC	Adj. T1, T2, T3, T4 for Maximum output	For I.F. Alignment
2	455 KC		600 KC	Adj. L2 for Minimum output	Tune Trap to IF Frequency
3	1620 KC		Gang Wideopen	CK	Set Oscillator To Dial Scale
4	600 KC		Near 600	Adjust slug in T7	Adjust T6 for Maximum output while rocking gang. Tune T5 For Maximum output regardless of dial accuracy
5	Repeat Steps 3 & 4				
6	1260 KC		1260 KC	CIA	Align Loop Antenna

CHASSIS INFORMATION CHART

Chassis	Transistor Layout Label Color	Part No.	R.F.	Mixer	Osc.	1st I.F.	2nd I.F.	Xtal diode detector	Driver	Output	Supplier R C A
8HT40Z2	Black 102-8202	Zenith E.I.A. Type	121-150 2N1631 PNP	121-179 2N152T PNP	121-185 2N152S PNP	121-180 2N152S PNP	121-181 2N152S PNP	X03-19 8N87G	121-192 2N407 PNP	121-61 2N407 PNP	

ZENITH RADIO Chassis 4G24 used in Model GV21

The schematic diagram for the 4G24 amplifier consists of the following sections:

- 6CB6 DRIVER:** Features a 6CB6 vacuum tube with a 12AU7 6X4 rectifier. Components include resistors R1 (7.5K, 4W), R2 (33K), R3 (1K), R4 (100K), R5 (220K), R6 (1M), R7 (50K), R8 (68K), and R9 (100K). Capacitors include C1 (.1), C2 (.001), C3 (100P), and C4 (2MFD, 100V). A 15.5V 4A power supply is connected to the heater.
- 12AX7A AMP:** Features a 12AX7 vacuum tube. Components include resistors R1 (47K), R2 (2.2K), R3 (2.2K), R4 (50K), R5 (100K), R6 (10K), R7 (10K), R8 (10K), R9 (10K), R10 (10K), R11 (10K), R12 (10K), R13 (10K), R14 (10K), R15 (10K), R16 (10K), R17 (10K), R18 (10K), R19 (10K), R20 (10K), R21 (10K), R22 (10K), R23 (10K), R24 (10K), R25 (10K), R26 (10K), R27 (10K), R28 (10K), R29 (10K), R30 (10K), R31 (10K), R32 (10K), R33 (10K), R34 (10K), R35 (10K), R36 (10K), R37 (10K), R38 (10K), R39 (10K), R40 (10K), R41 (10K), R42 (10K), R43 (10K), R44 (10K), R45 (10K), R46 (10K), R47 (10K), R48 (10K), R49 (10K), R50 (10K), R51 (10K), R52 (10K), R53 (10K), R54 (10K), R55 (10K), R56 (10K), R57 (10K), R58 (10K), R59 (10K), R60 (10K), R61 (10K), R62 (10K), R63 (10K), R64 (10K), R65 (10K), R66 (10K), R67 (10K), R68 (10K), R69 (10K), R70 (10K), R71 (10K), R72 (10K), R73 (10K), R74 (10K), R75 (10K), R76 (10K), R77 (10K), R78 (10K), R79 (10K), R80 (10K), R81 (10K), R82 (10K), R83 (10K), R84 (10K), R85 (10K), R86 (10K), R87 (10K), R88 (10K), R89 (10K), R90 (10K), R91 (10K), R92 (10K), R93 (10K), R94 (10K), R95 (10K), R96 (10K), R97 (10K), R98 (10K), R99 (10K), R100 (10K). Capacitors include C1 (220MMF), C2 (100P), C3 (100P), C4 (2MFD, 100V), C5 (100P), C6 (100P), C7 (100P), C8 (100P), C9 (100P), C10 (100P), C11 (100P), C12 (100P), C13 (100P), C14 (100P), C15 (100P), C16 (100P), C17 (100P), C18 (100P), C19 (100P), C20 (100P), C21 (100P), C22 (100P), C23 (100P), C24 (100P), C25 (100P), C26 (100P), C27 (100P), C28 (100P), C29 (100P), C30 (100P), C31 (100P), C32 (100P), C33 (100P), C34 (100P), C35 (100P), C36 (100P), C37 (100P), C38 (100P), C39 (100P), C40 (100P), C41 (100P), C42 (100P), C43 (100P), C44 (100P), C45 (100P), C46 (100P), C47 (100P), C48 (100P), C49 (100P), C50 (100P), C51 (100P), C52 (100P), C53 (100P), C54 (100P), C55 (100P), C56 (100P), C57 (100P), C58 (100P), C59 (100P), C60 (100P), C61 (100P), C62 (100P), C63 (100P), C64 (100P), C65 (100P), C66 (100P), C67 (100P), C68 (100P), C69 (100P), C70 (100P), C71 (100P), C72 (100P), C73 (100P), C74 (100P), C75 (100P), C76 (100P), C77 (100P), C78 (100P), C79 (100P), C80 (100P), C81 (100P), C82 (100P), C83 (100P), C84 (100P), C85 (100P), C86 (100P), C87 (100P), C88 (100P), C89 (100P), C90 (100P), C91 (100P), C92 (100P), C93 (100P), C94 (100P), C95 (100P), C96 (100P), C97 (100P), C98 (100P), C99 (100P), C100 (100P).
- 1/2 12AU7 AMP:** Features a 12AU7 vacuum tube. Components include resistors R1 (47K), R2 (2.2K), R3 (2.2K), R4 (50K), R5 (100K), R6 (10K), R7 (10K), R8 (10K), R9 (10K), R10 (10K), R11 (10K), R12 (10K), R13 (10K), R14 (10K), R15 (10K), R16 (10K), R17 (10K), R18 (10K), R19 (10K), R20 (10K), R21 (10K), R22 (10K), R23 (10K), R24 (10K), R25 (10K), R26 (10K), R27 (10K), R28 (10K), R29 (10K), R30 (10K), R31 (10K), R32 (10K), R33 (10K), R34 (10K), R35 (10K), R36 (10K), R37 (10K), R38 (10K), R39 (10K), R40 (10K), R41 (10K), R42 (10K), R43 (10K), R44 (10K), R45 (10K), R46 (10K), R47 (10K), R48 (10K), R49 (10K), R50 (10K), R51 (10K), R52 (10K), R53 (10K), R54 (10K), R55 (10K), R56 (10K), R57 (10K), R58 (10K), R59 (10K), R60 (10K), R61 (10K), R62 (10K), R63 (10K), R64 (10K), R65 (10K), R66 (10K), R67 (10K), R68 (10K), R69 (10K), R70 (10K), R71 (10K), R72 (10K), R73 (10K), R74 (10K), R75 (10K), R76 (10K), R77 (10K), R78 (10K), R79 (10K), R80 (10K), R81 (10K), R82 (10K), R83 (10K), R84 (10K), R85 (10K), R86 (10K), R87 (10K), R88 (10K), R89 (10K), R90 (10K), R91 (10K), R92 (10K), R93 (10K), R94 (10K), R95 (10K), R96 (10K), R97 (10K), R98 (10K), R99 (10K), R100 (10K). Capacitors include C1 (220MMF), C2 (100P), C3 (100P), C4 (2MFD, 100V), C5 (100P), C6 (100P), C7 (100P), C8 (100P), C9 (100P), C10 (100P), C11 (100P), C12 (100P), C13 (100P), C14 (100P), C15 (100P), C16 (100P), C17 (100P), C18 (100P), C19 (100P), C20 (100P), C21 (100P), C22 (100P), C23 (100P), C24 (100P), C25 (100P), C26 (100P), C27 (100P), C28 (100P), C29 (100P), C30 (100P), C31 (100P), C32 (100P), C33 (100P), C34 (100P), C35 (100P), C36 (100P), C37 (100P), C38 (100P), C39 (100P), C40 (100P), C41 (100P), C42 (100P), C43 (100P), C44 (100P), C45 (100P), C46 (100P), C47 (100P), C48 (100P), C49 (100P), C50 (100P), C51 (100P), C52 (100P), C53 (100P), C54 (100P), C55 (100P), C56 (100P), C57 (100P), C58 (100P), C59 (100P), C60 (100P), C61 (100P), C62 (100P), C63 (100P), C64 (100P), C65 (100P), C66 (100P), C67 (100P), C68 (100P), C69 (100P), C70 (100P), C71 (100P), C72 (100P), C73 (100P), C74 (100P), C75 (100P), C76 (100P), C77 (100P), C78 (100P), C79 (100P), C80 (100P), C81 (100P), C82 (100P), C83 (100P), C84 (100P), C85 (100P), C86 (100P), C87 (100P), C88 (100P), C89 (100P), C90 (100P), C91 (100P), C92 (100P), C93 (100P), C94 (100P), C95 (100P), C96 (100P), C97 (100P), C98 (100P), C99 (100P), C100 (100P).
- 1/2 12AU7 PHASE INV.:** Features a 12AU7 vacuum tube. Components include resistors R1 (47K), R2 (2.2K), R3 (2.2K), R4 (50K), R5 (100K), R6 (10K), R7 (10K), R8 (10K), R9 (10K), R10 (10K), R11 (10K), R12 (10K), R13 (10K), R14 (10K), R15 (10K), R16 (10K), R17 (10K), R18 (10K), R19 (10K), R20 (10K), R21 (10K), R22 (10K), R23 (10K), R24 (10K), R25 (10K), R26 (10K), R27 (10K), R28 (10K), R29 (10K), R30 (10K), R31 (10K), R32 (10K), R33 (10K), R34 (10K), R35 (10K), R36 (10K), R37 (10K), R38 (10K), R39 (10K), R40 (10K), R41 (10K), R42 (

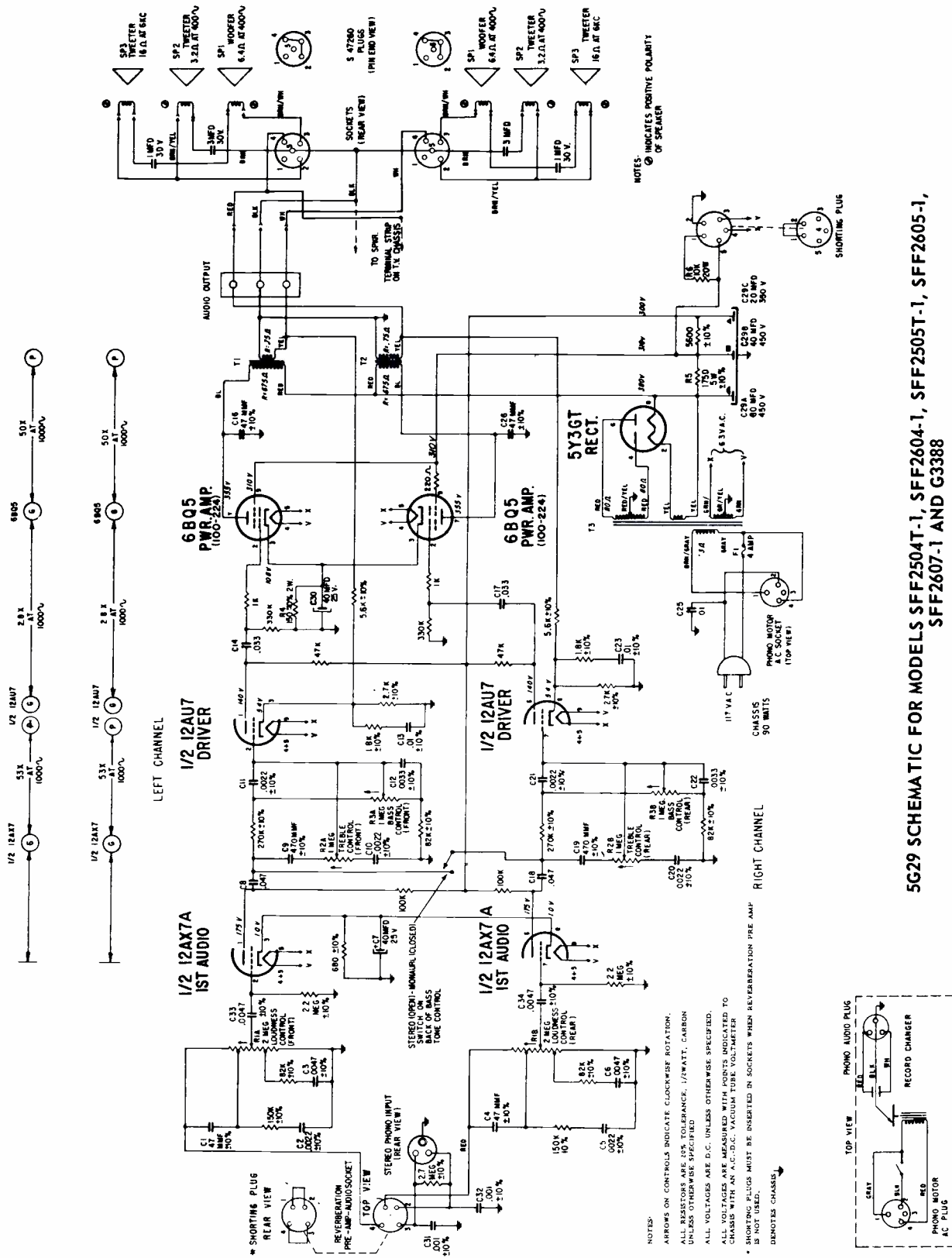
GPS 80 SCHEMATIC

The schematic diagram illustrates the internal wiring of the GPS 80 portable transistor radio. Key components and sections include:

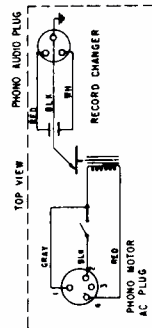
- Power Section:** A 17 V.A.C. 60 ~ 55 W transformer provides power to a 6X4 rectifier tube. The secondary windings are connected to the 1, 2, 3, 4, 5, and 6 pins of the 6X4. The 6A05 audio amplifier tube is connected to the 1, 2, 3, 4, 5, and 6 pins. The 6A05 is powered by a 250 V B+ supply.
- Detector and AF Amplifier:** A 12AX7 twin diode tube is used for both functions. The 12AX7 is connected to the 1, 2, 3, 4, 5, and 6 pins. The 12AX7 is powered by a 125 V B+ supply.
- Controls:** The circuit includes a tuning eye control (5 MEG, 270K, 270K, 270K, 270K, 270K), a volume control (5 MEG, 22 MEG, 22 MEG, 22 MEG, 22 MEG, 22 MEG), and a balance control (1 MEG, 220, 220, 220, 220, 220).
- Speaker and Phasing Dot:** The speaker is connected to the 1, 2, 3, 4, 5, and 6 pins of the 6A05. The phasing dot is connected to the 1, 2, 3, 4, 5, and 6 pins of the 6A05.
- Record Changer:** A separate section for the record changer is shown, including a motor and a terminal view of the cartridge. The record changer is connected to the 1, 2, 3, 4, 5, and 6 pins of the 6A05.

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ZENITH RADIO Chassis 5G29 used in Models SFF2504T-1, SFF2505T-1,
SFF2604-1, SFF2605-1, SFF2607-1, and G3388



5G29 SCHEMATIC FOR MODELS SFF2504T-1, SFF2604-1, SFF2505T-1, SFF2605-1, SFF2607-1 AND G3388



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