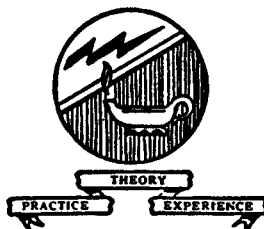


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1962

Volume R-22

RADIO
DIAGRAMS
and Servicing Information



Compiled by

M. N. BEITMAN

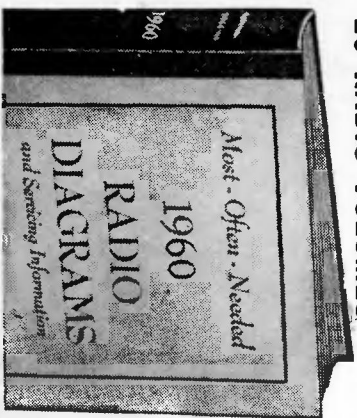
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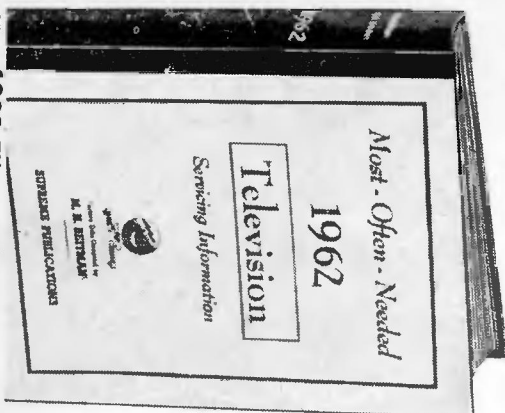
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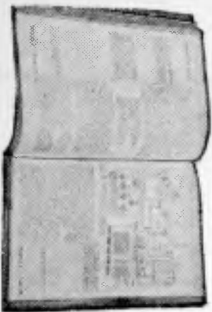
New 1962 Television Servicing Manual, only... **\$3.**
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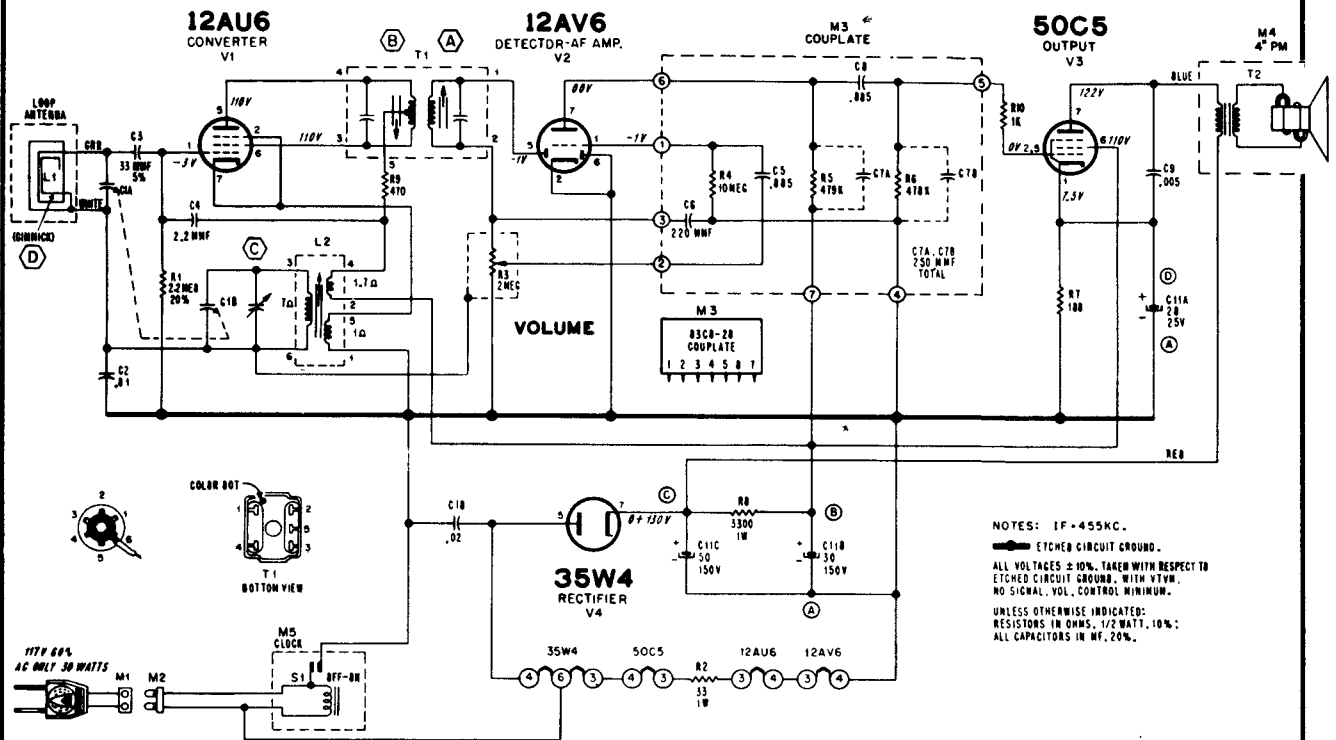
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ADMIRAL

CHASSIS 4R3
MODELS Y3133 • Y3137



VOLTAGE PRECAUTION

The etched circuit common ground of this receiver is connected directly to one side of the power line. To prevent damage to etched wiring, do not place chassis directly on a metal bench, or other metal objects.

When taking voltage or resistance measurements, use test prods with needle points.

REMOVING CHASSIS FROM CABINET

Unplug and remove back. Remove the knobs from the front of the cabinet. Remove the screw outside from under the Tuning knob and the screws inside that hold the Volume control bracket to the cabinet. Remove etched circuit board support at rear of chassis. Chassis will now slide out.

ALIGNMENT PROCEDURE

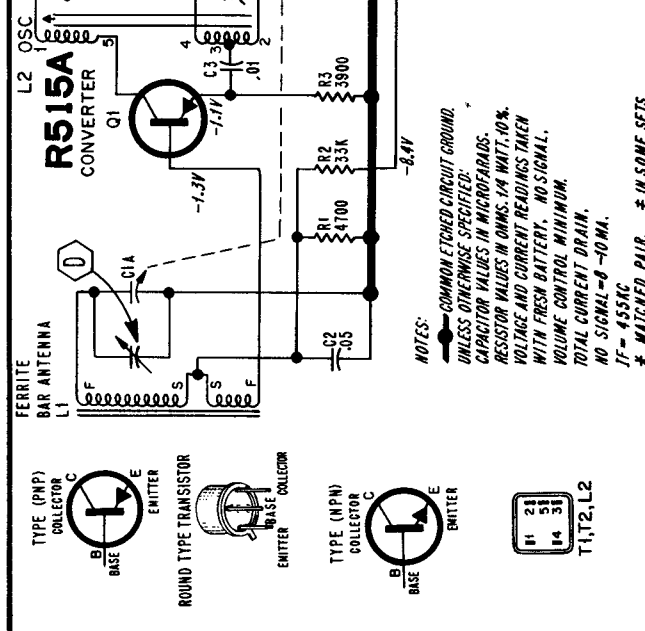
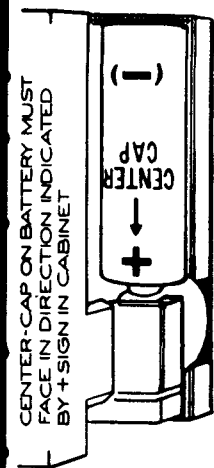
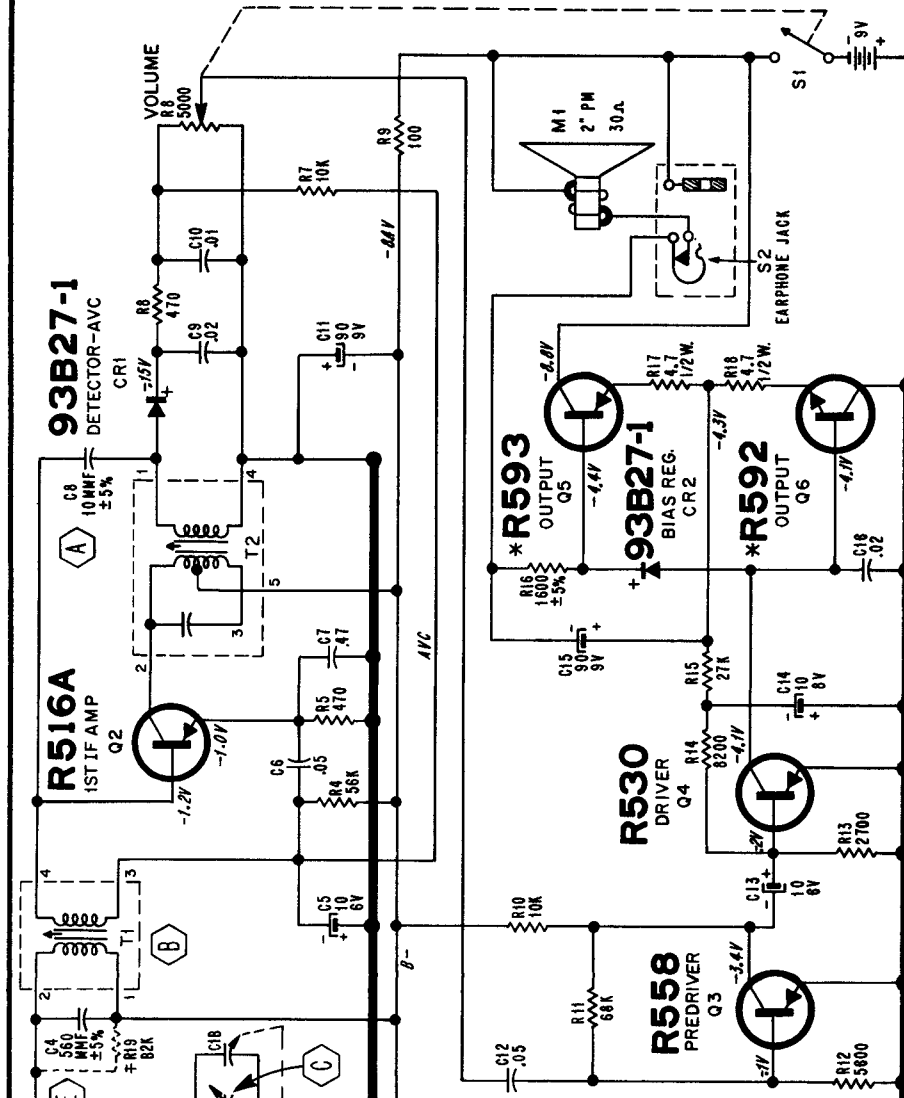
- Use an isolation transformer or connect a .1 mf. capacitor in series with low side of signal generator.
CAUTION: DO NOT CONNECT AN EARTH GROUND WIRE DIRECTLY TO CHASSIS.
- Set Volume control full on.
- Connect output meter across output secondary. Disconnect speaker, use 3.2 ohm load.
- Use lowest setting of signal generator capable of producing adequate indication on lowest scale of output meter.
- By using alignment tool (Part No. 98A30-7) both IF transformer slugs can be aligned
- Repeat adjustments to insure good results.

Step	Connection of Signal Generator	Signal Gen. Frequency	Receiver Gang Setting	Adjustment Description	Adjustment
1.	Through a .1 mf capacitor to pin 1 of the 12AU6 (Converter) tube.	455 KC	Gang fully open	IF Primary IF Secondary	Ⓐ and Ⓑ for maximum output
2	Same as "STEP 1".	1620 KC	Gang fully open	Oscillator Trimmer	Ⓒ for maximum output
3	Radiated Signal. Loop of several turns of wire, or place generator lead close to receiver loop for adequate signal pickup.	1400 KC	Tune in generator signal	Antenna Loop Gimmick	Ⓓ for maximum output (Rock gang for optimum results)

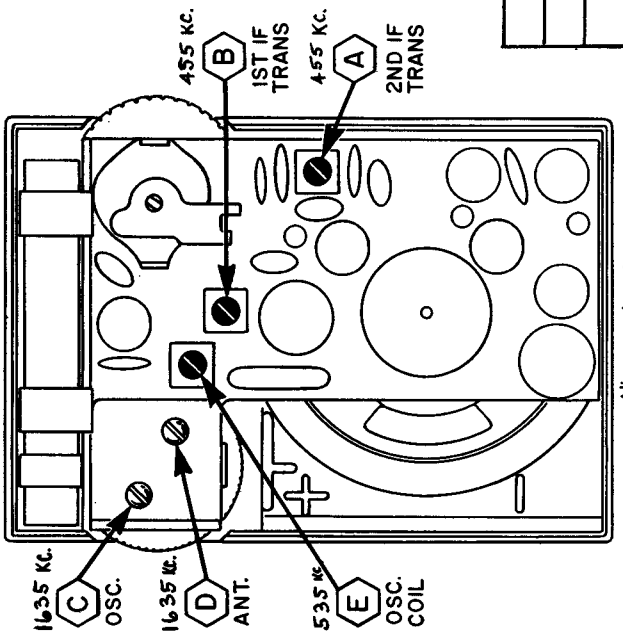
ADMIRAL

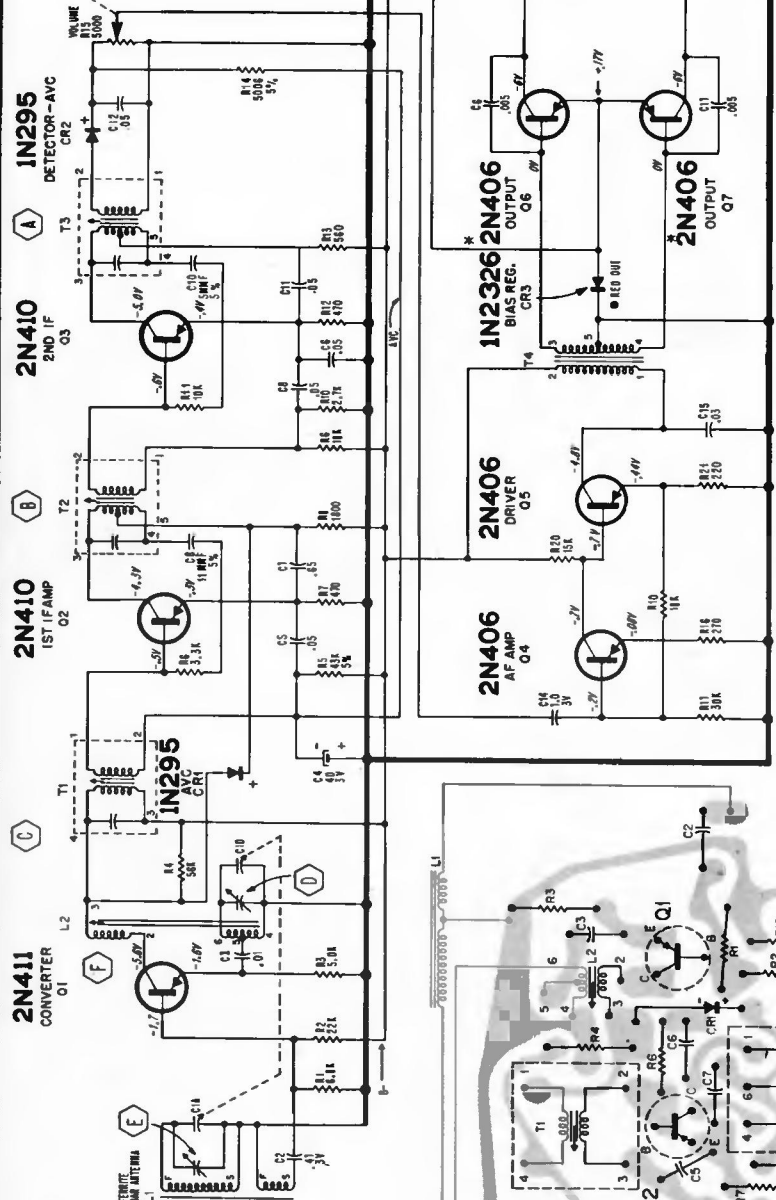
MODEL	COLOR	CHASSIS
Y2221	Black	6M3A
Y2223	White	
Y2226	Yellow	
Y2229	Blue	

BATTERY CHART	
Eveready	206
Mallory	TR126
Ray-O-Vac	1611M



NOTES:
 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 BATTERY, NO SIGNAL,
 VOLUME CONTROL MINIMUM,
 TOTAL CURRENT DRAIN,
 NO SIGNAL—8-10 MA.
 IF = 455 KC
 * MATCHED PAIR. † IN SOME SETS.





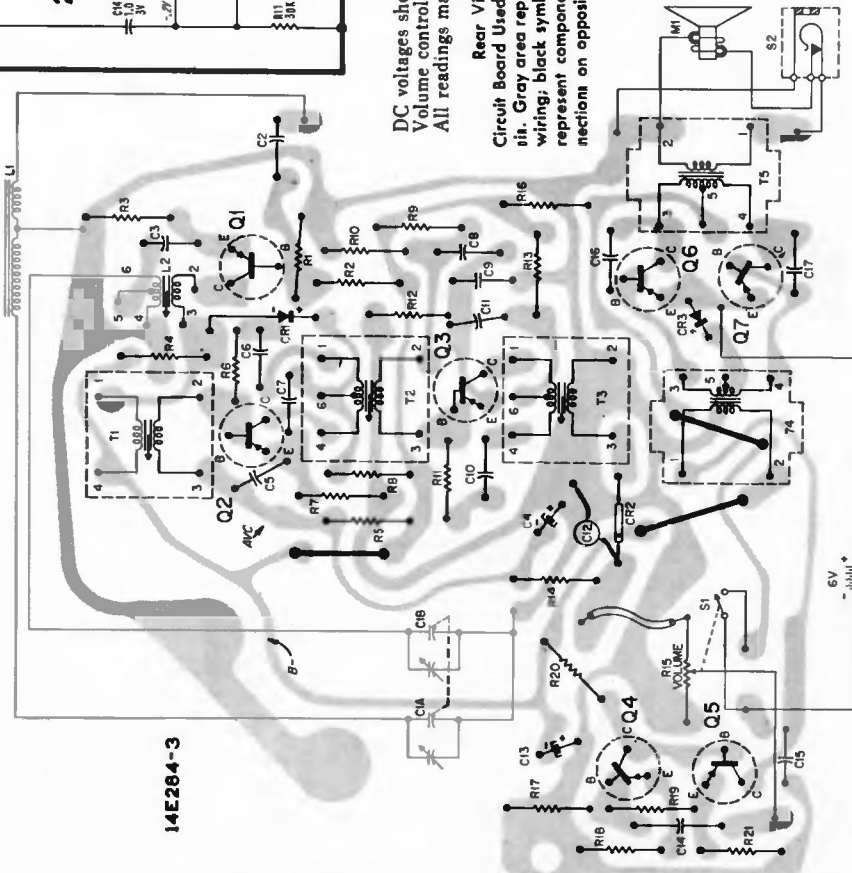
VOLTAGE DATA
 DC voltages shown measured with VTVM, no signal, using fresh batteries.
 Volume control at minimum; dial set to low frequency end.
 All readings made between transistor terminals and etched circuit ground.

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 7B2, Models Y2081, Y2082, Y2083

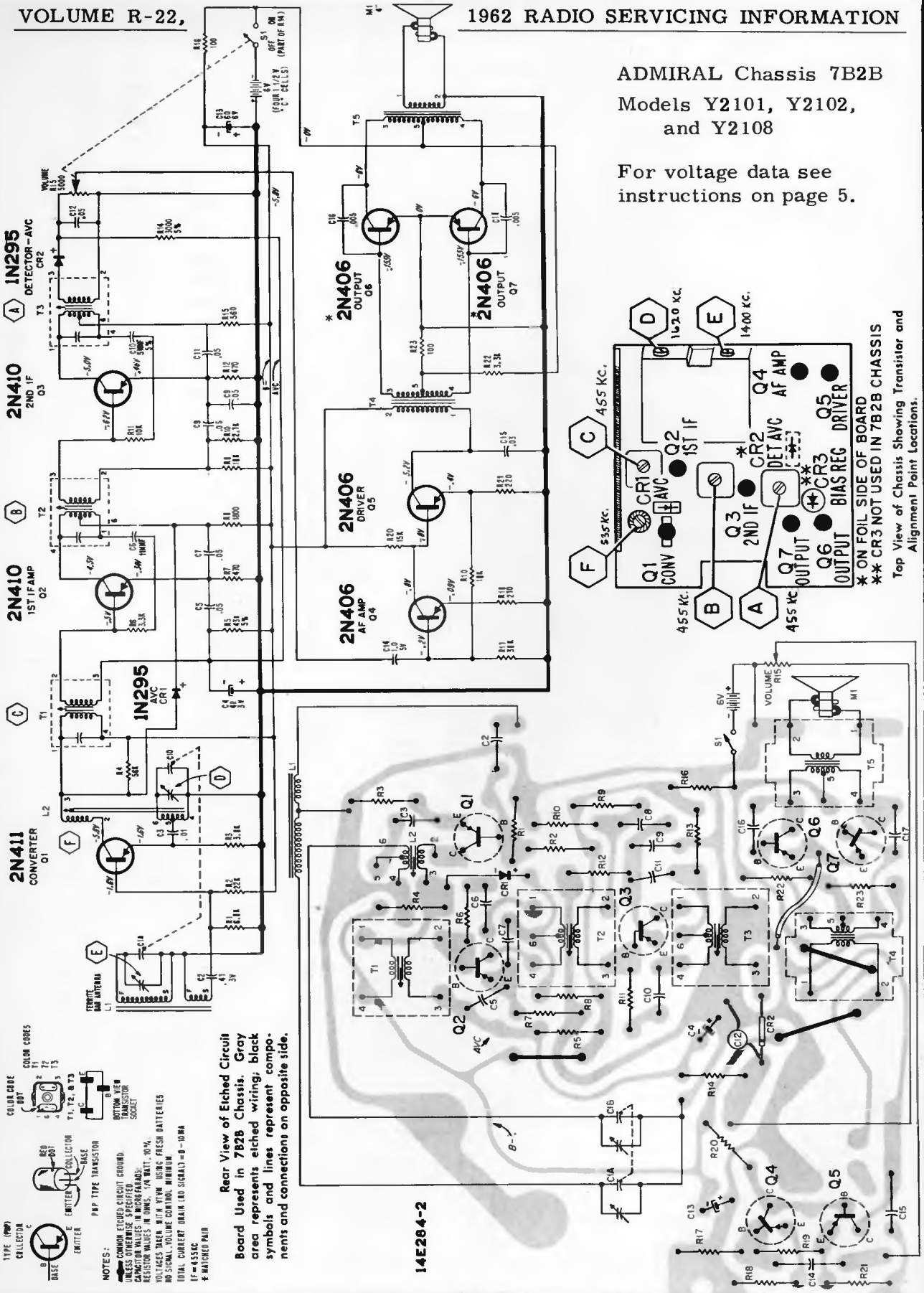
For top view and alignment information refer to such material for 7B2B, on page 6.



- NOTES:**
 * COMMON ETCHED CIRCUIT CHASSIS.
 † UNLESS OTHERWISE SPECIFIED, CAPACITOR VALUES IN MICROFARADS.
 ‡ RESISTOR VALUES IN OHMS; 1/4 WATT, 10%.
 †† UNLESS INDICATED OTHERWISE, ALL RESISTORS ARE COMBINATION TOLERANCE.
 ††† TOTAL CURRENT DRAIN (OO SIGNAL) = 10-15 MA.
 †††† NOT CHANGED.
 ††††† INDICATED PPM.

ADMIRAL Chassis 7B2B
Models Y2101, Y2102,
and Y2108

For voltage data see
instructions on page 5.



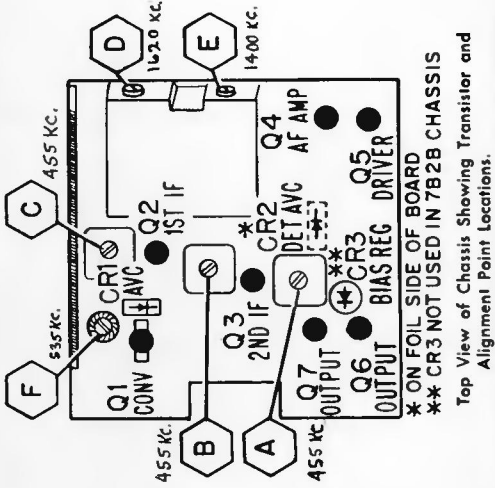
TYPE (TYP)
COLLECTOR C
BASE B
EMITTER E
EMITTER COLLECTOR RED (DOT)
EMITTER BASE C
PAP TYPE TRANSISTOR
T1, T2, B T3
C

COLOR CODE
DOT
1
2
3
4
5
6
7
8
9
0

NOTES:
* COMMON ETCHED CIRCUIT GROUND UNLESS OTHERWISE SPECIFIED.
* CAPACITOR VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
* RESISTOR VALUES IN OHMS, 1/4 WATT, 10% UNLESS OTHERWISE SPECIFIED.
* VOLTAGES TAKEN WITH RTVM USING FRESH BATTERIES.
* NO SIGNAL, VOLUME CONTROL MINIMUM.
* TOTAL CURRENT DRAIN (NO SIGNAL) = 8-10 MA.
* IF = 455 KC.
* MATCHED PAIR

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

14E284-2

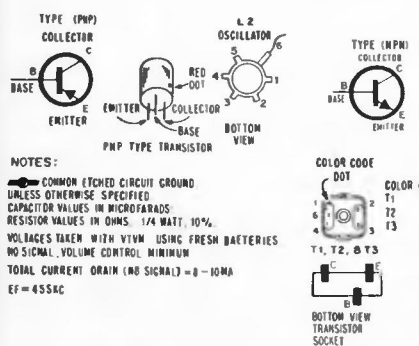
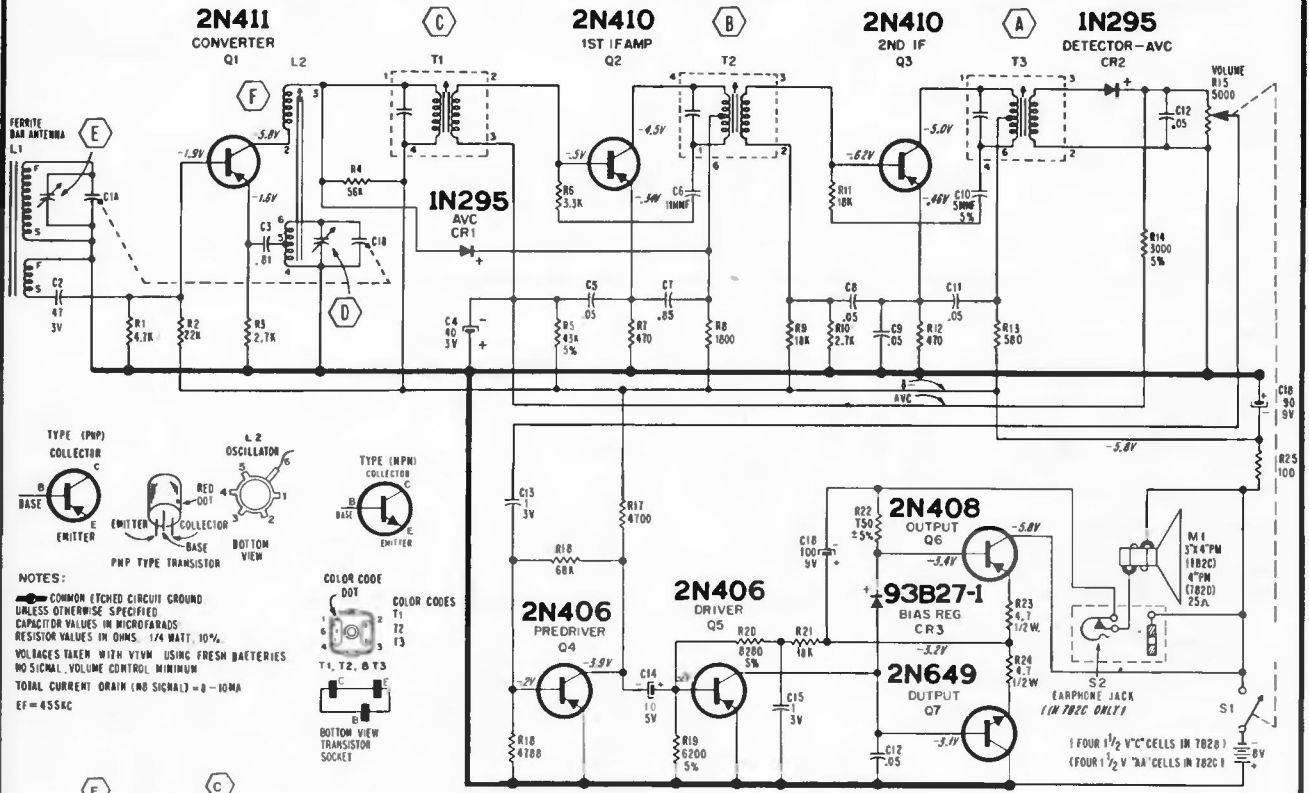


Top View of Chassis Showing Transistor and Alignment Point Locations.
* ON FOIL SIDE OF BOARD
** CR3 NOT USED IN 7B2B CHASSIS

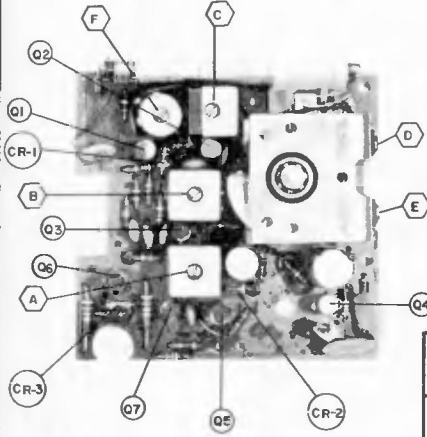
ADMIRAL

Chassis 7B2C, Models Y2081A, Y2082A, Y2083A

Chassis 7B2D, Models Y2252, Y2253, Y2256



NOTES:
 COMMON ETCHED CIRCUIT GROUND UNLESS OTHERWISE SPECIFIED
 CAPACITOR VALUES IN MICROFARADS
 RESISTOR VALUES IN OHMS, 1/4 WATT, 10%
 VOLTAGES TAKEN WITH V1VM USING FRESH BATTERIES
 NO SIGNAL, VOLUME CONTROL MINIMUM
 TOTAL CURRENT DRAIN (NO SIGNAL) = 8-10mA
 EC=455AC

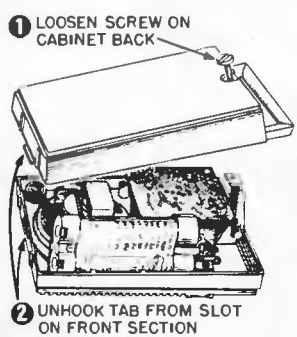


ALIGNMENT PROCEDURE

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.

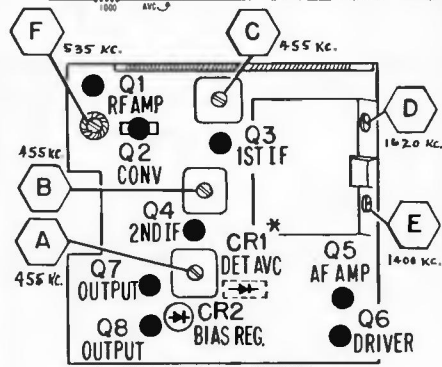
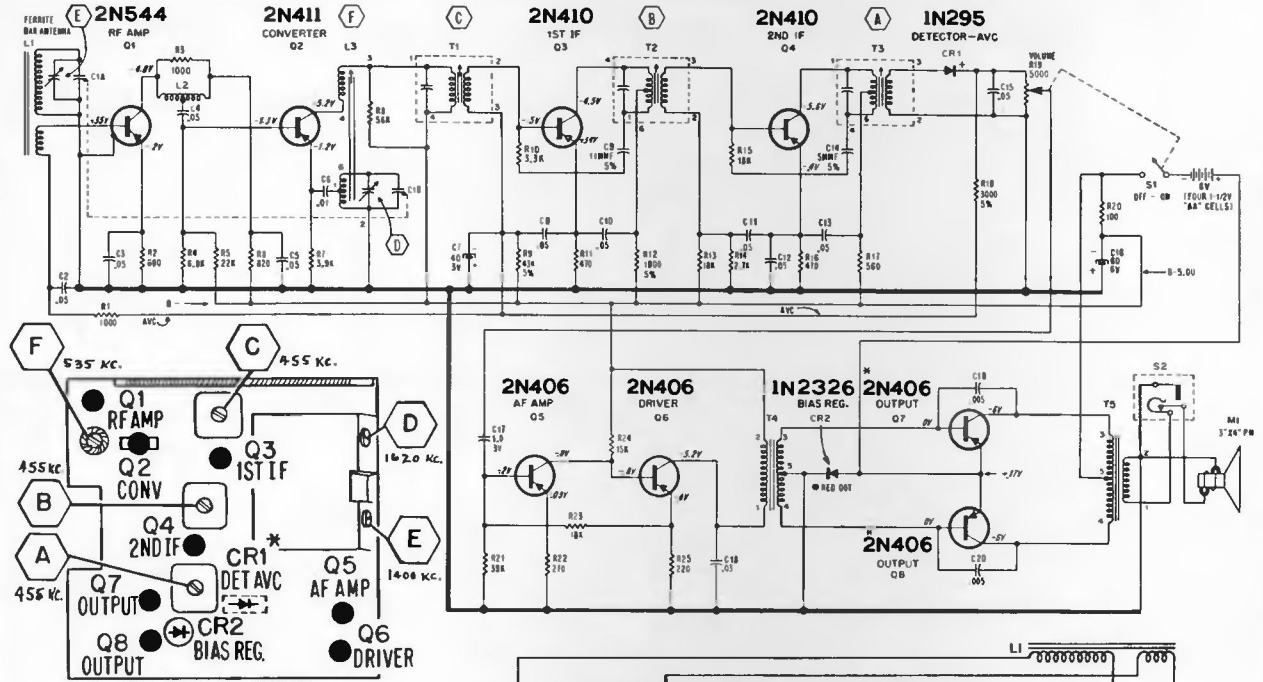
Step	Connection of Signal Generator	Signal Gen. Frequency	Receiver Gang Setting	Adjustment Description	Adjustment
1	Radiated Signal. †Loop of several turns of wire, or place generator lead close to receiver for adequate signal.	455 KC	Gang fully open	3rd IF 2nd IF 1st IF	* (A) (B) and (C) for maximum 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.					



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

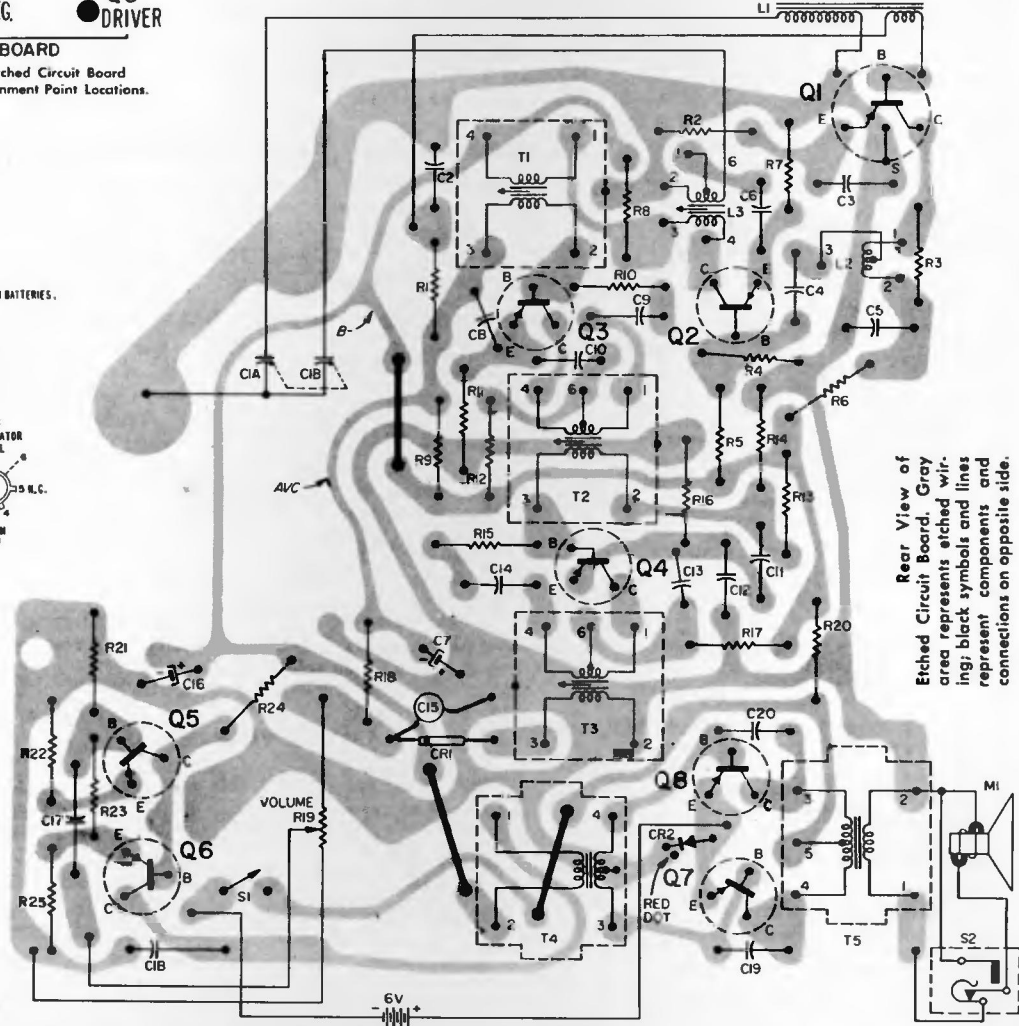
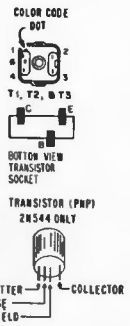
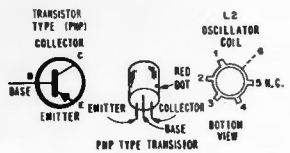
VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

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



* ON FOIL SIDE OF BOARD
 Top View of Etched Circuit Board
 Showing Transistor and Alignment Point Locations.

- NOTES:**
- 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) = 8-10 MA
 - + NOT GROUNDED
 - IF = 455 KC
 - * MATCHED PAIR

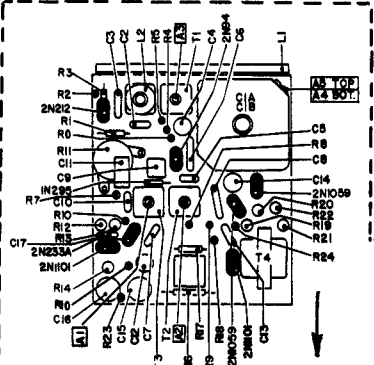
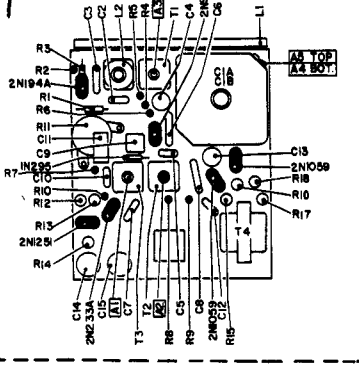
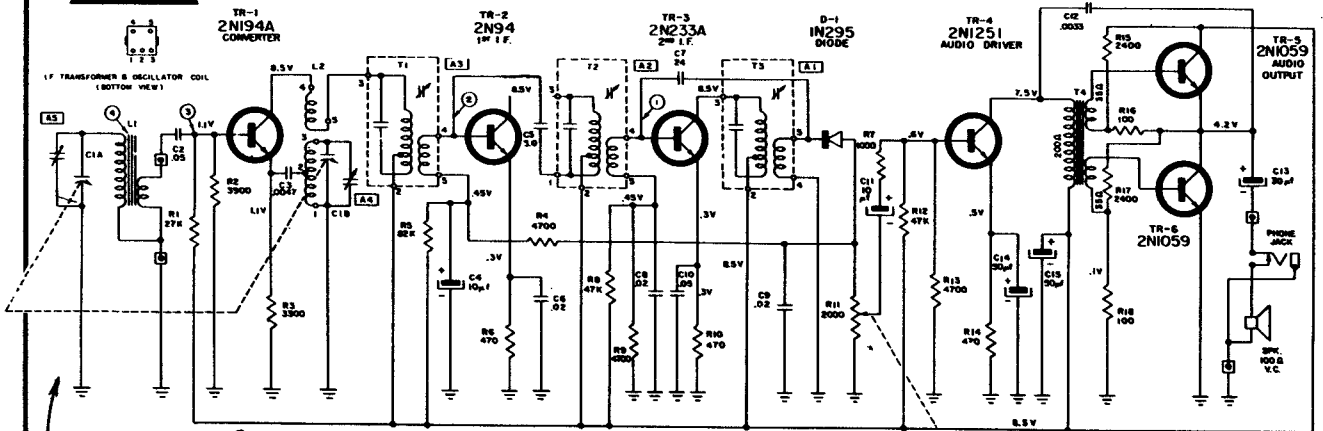


Rear View of Etched Circuit Board. Gray area represents etched wiring; black symbols and lines represent components and connections on opposite side.



**MODELS 61R13, 61R16, 61R19
61R23, 61R26, 61R29**

CODE 1.61701



SIGNAL TEST POINTS	TEST FREQUENCY	SERIES CAPACITOR NO. RESISTOR	INPUT FOR S.W. OUTPUT (7V ACROSS 100Ω)
①	455 KC	.05 μf	500 μV
②	455 KC	.05 μf	50 μV
③	455 KC	.05 μf	2 μV
④	1000 KC	STANDARD LOOP	200 μV/V

CAPACITANCE VALUES LESS 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 HIGH-Z VOLT-METER UNDER NO SIGNAL CONDITIONS WITH TUNING CAPACITOR CLOSED AND VOLUME CONTROL AT MAXIMUM CLOSURE POSITION.

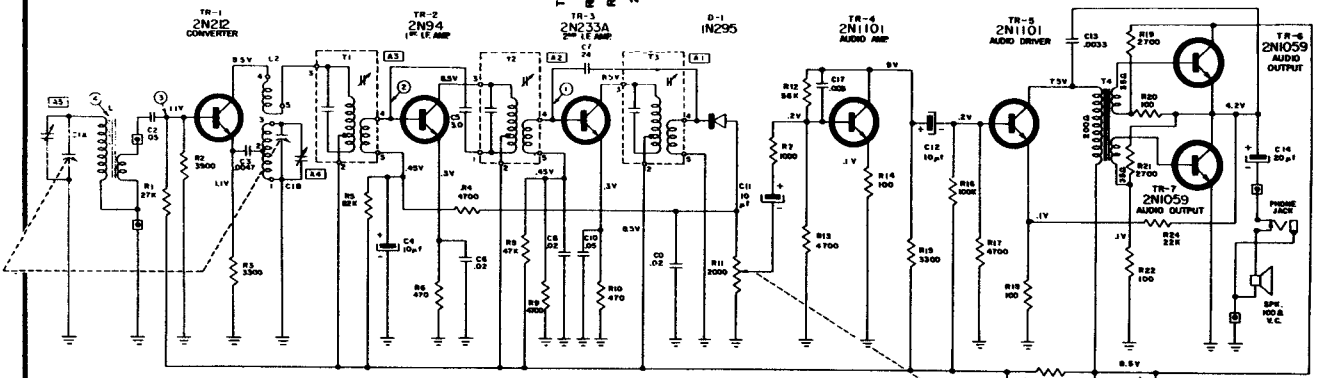
RESISTANCE VALUES ARE IN OHMS: K=1000.

⊖ COMMON GROUND SYMBOL.

⊕ EXTERNAL CONNECTION TO PRINTED CIRCUIT.

TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS: 7 TO 10 MA.

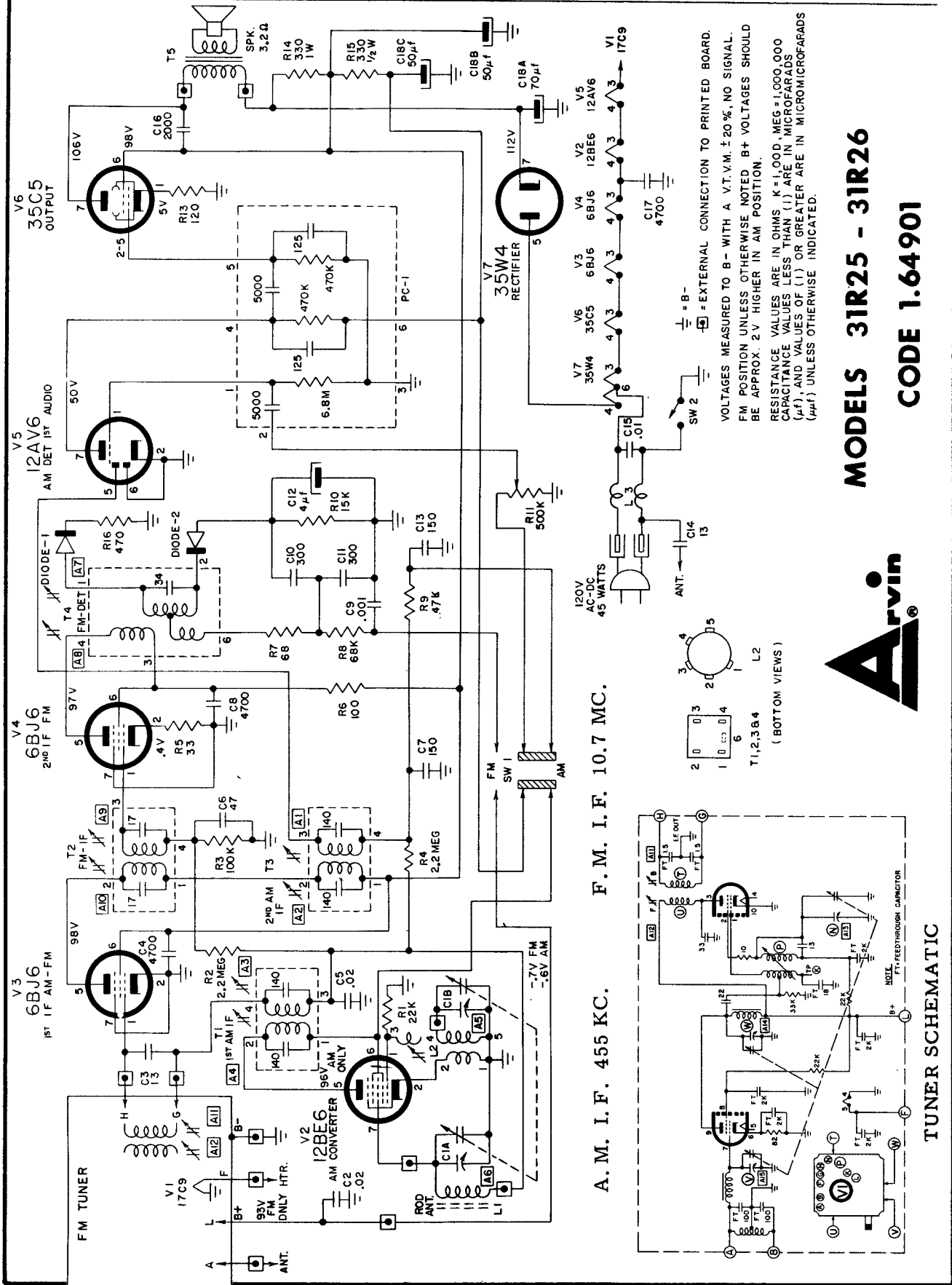
**Arvin CODE 1.61601
MODELS 61R35 & 61R39**



Alignment information and all service notes apply to all models listed on this page.

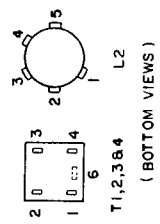
Position of Variable	Generator Frequency	Dummy Antenna	Generator Connections	Trimmers Adj. in order shown for Max. Output	Function of Trimmer
Open	455 Kc	.05 μf	C1A	A1 (Top of T3) A2 (Top of T2) A3 (Top of T1)	I. F. I. F. I. F.
Open	1670 Kc		*Test Loop	A4	Oscillator
1400 Kc	1400 Kc		*Test Loop	A5	Antenna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

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



A. M. I. F. 455 KC.

F. M. I. F. 10.7 MC.



SW 2 = B-
 = EXTERNAL CONNECTION TO PRINTED BOARD.
 VOLTAGES MEASURED TO B- WITH A V.T.V.M. ±20%, NO SIGNAL.
 FM POSITION UNLESS OTHERWISE NOTED BY 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 MICROFARADS
 (μf) UNLESS OTHERWISE INDICATED.

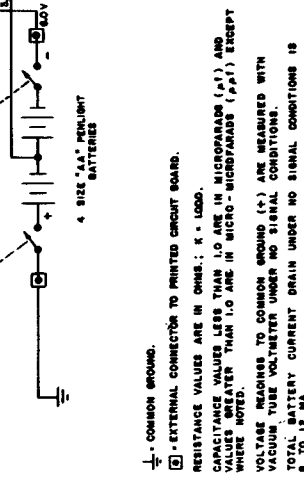
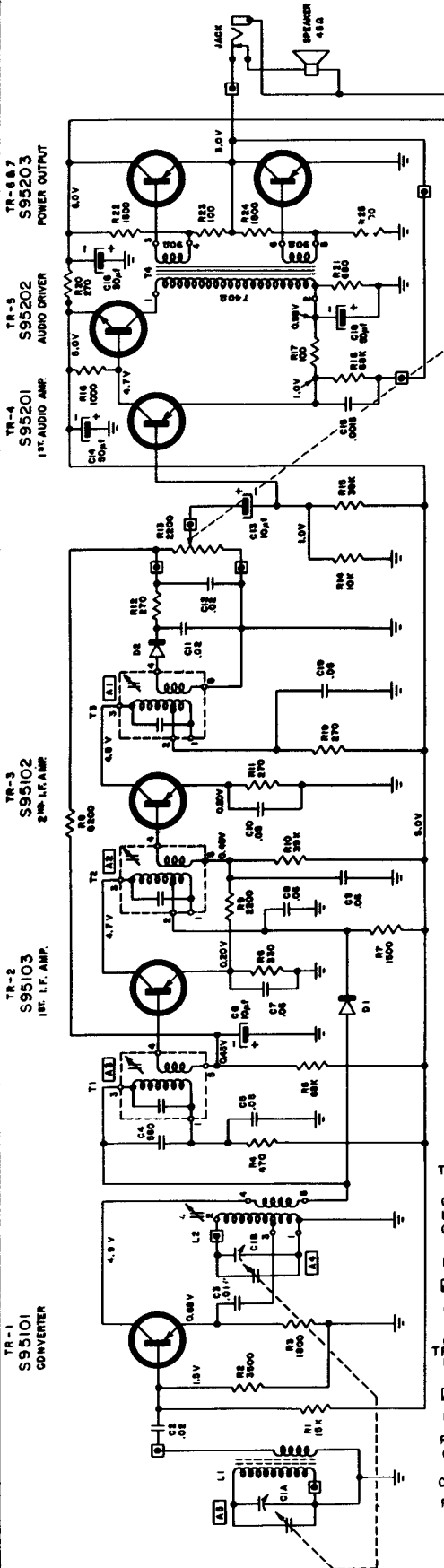
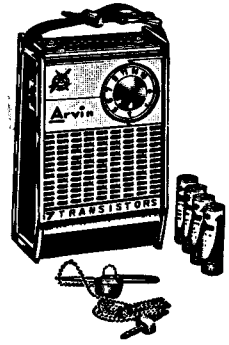


MODELS 31R25 - 31R26
 CODE 1.64901

TUNER SCHEMATIC

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

ARVIN Models 61R48, 61R49, Code 1.62201

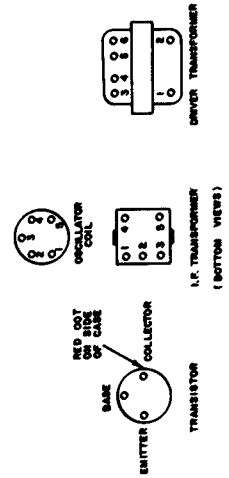


4 - SIZE "AA" FLASHLIGHT BATTERIES

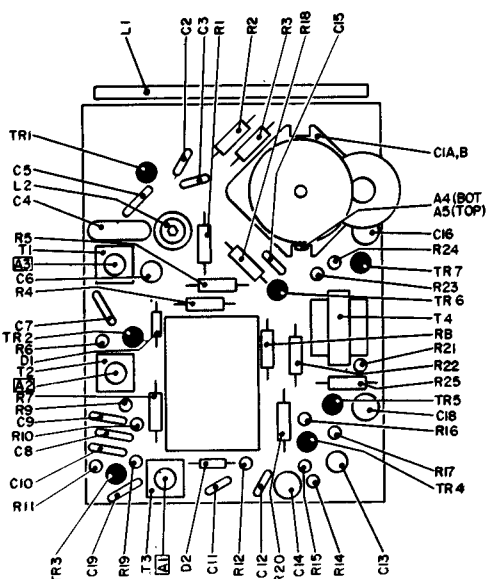
⊥ - COMMON GROUND.
 □ - EXTERNAL CONNECTOR TO PRINTED CIRCUIT BOARD.

CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (μF) AND VALUES GREATER THAN 1.0 ARE IN MICRO-MICROFARADS (μμF) EXCEPT VOLTAGE COILS TO COMMON GROUND (V) ARE MEASURED WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS.

TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS IS 8 TO 12 MA.



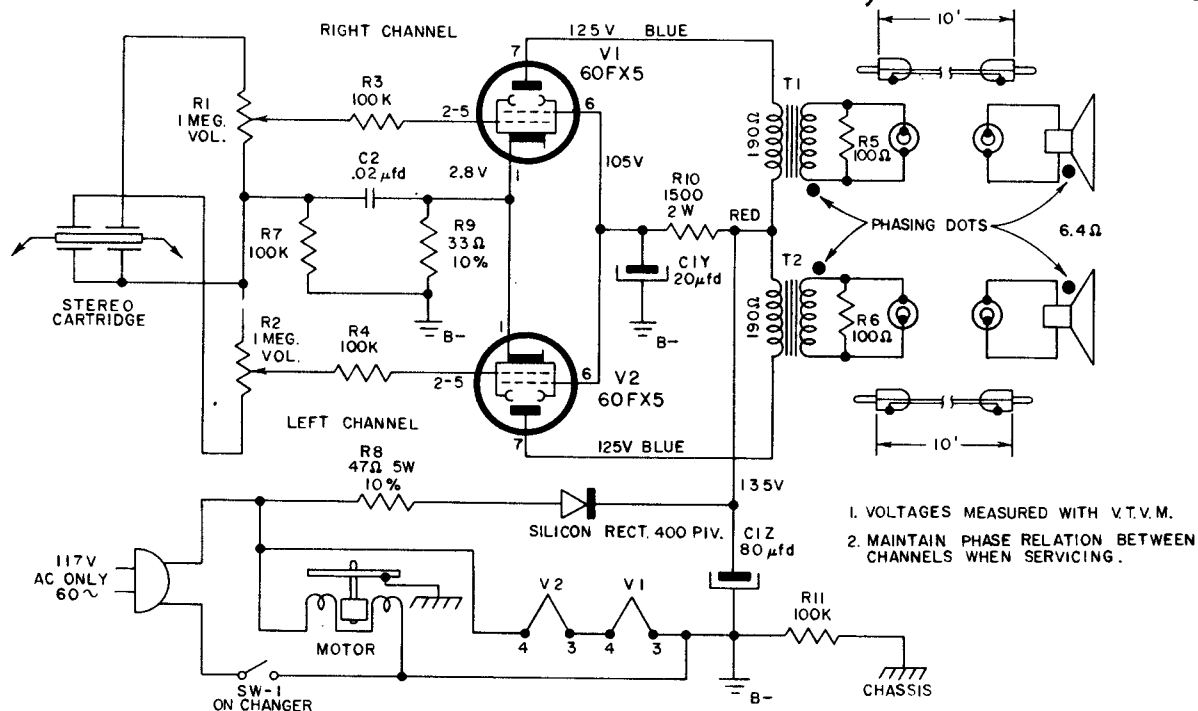
SIGNAL TEST POINTS	TEST FREQUENCY	RESISTOR CAPACITOR TO GENERATOR	IMPEDANCE LIMIT FOR GENERATOR (110V AC @ 60 Hz)
TR-1 BASE	455 KC	.05 μF	820 Ω V
TR-2 BASE	455 KC	.05 μF	25 Ω V
TR-3 BASE	455 KC	.05 μF	9 Ω V
STANDING LOOP	1000 KC	STANDING LOOP	200 Ω V/M



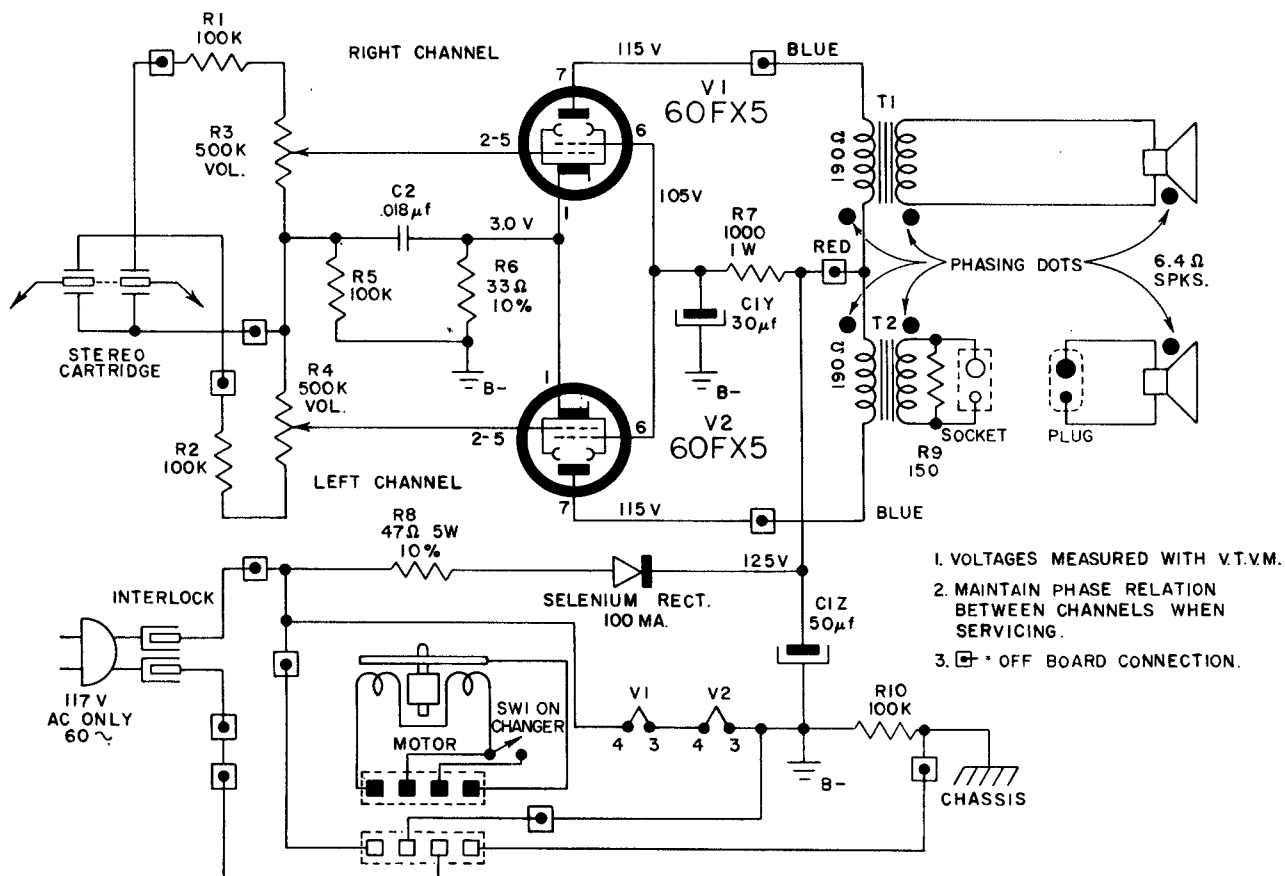
Position of Variable	Generator Frequency	Dummy Antenna	Generator Connections	Trimmers Adj. in order shown for Max. Output	Function of Trimmer
Open	455 Kc	.05 μf	C1A	A1 (Top of T3) A2 (Top of T2) A3 (Top of T1)	I. F. I. F. I. F.
Open 1400 Kc 600 Kc	1670 Kc 1400 Kc 600 Kc		*Test Loop *Test Loop *Test Loop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

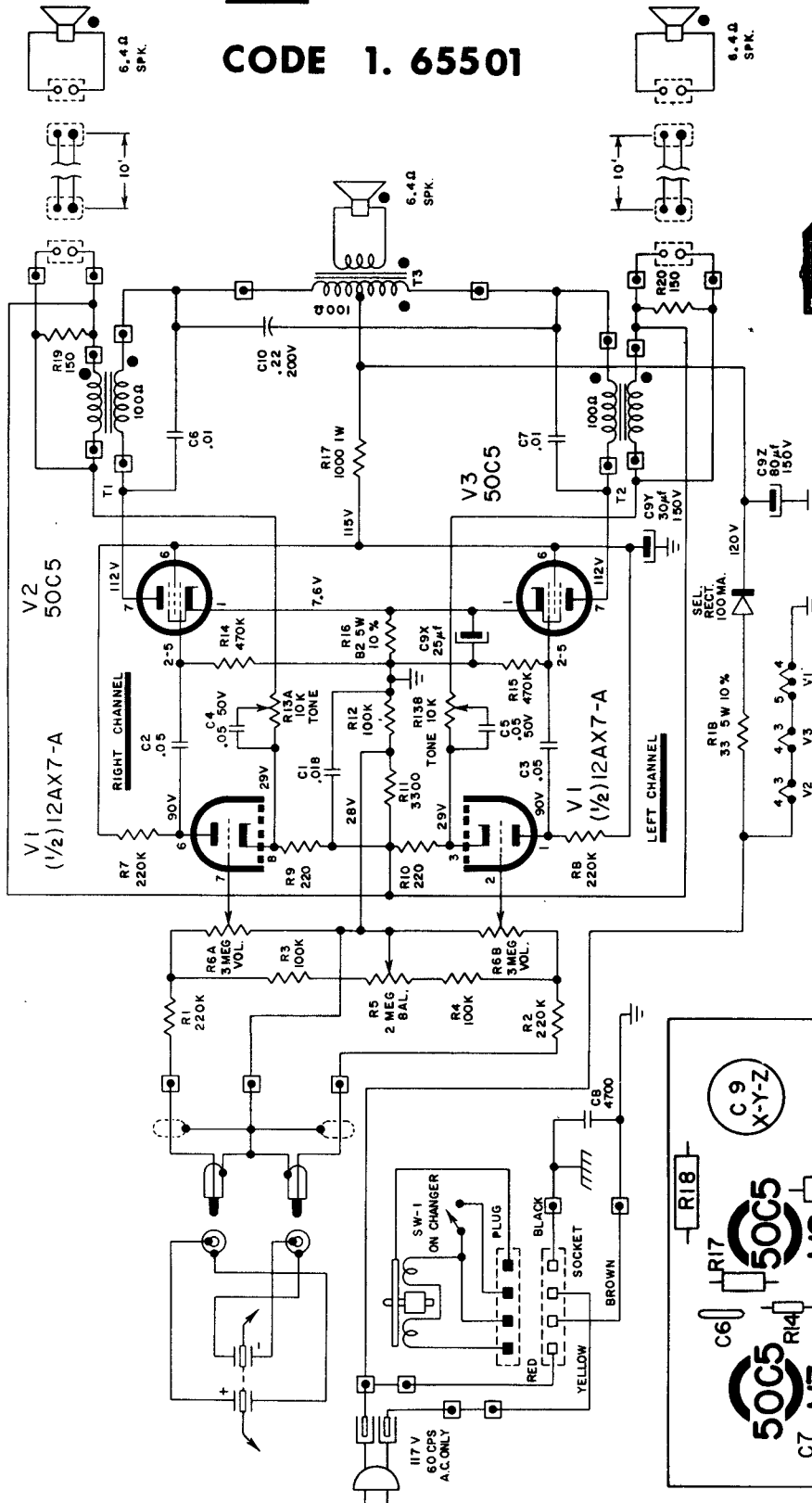
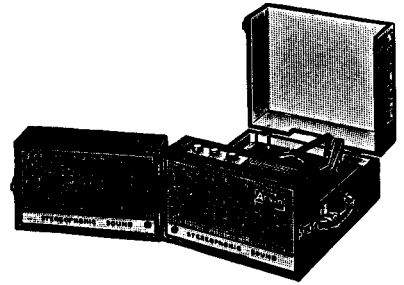


Arvin

CODE 1. 65501

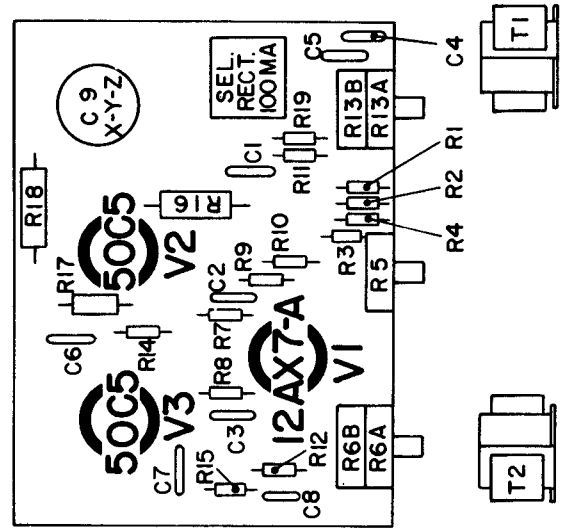
PHONOGRAPH MODELS

81P75 - 81P78



NOTES:

1. $\frac{1}{2}$ = B-
2. --- = 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 + - 20% TOLERANCE UNLESS OTHERWISE INDICATED.
7. CAPACITANCE VALUES LESS THAN ONE (1) ARE IN MICROFARADS (μf), AND VALUES OF ONE (1) OR GREATER ARE IN MICRO-MICROFARADS ($\mu\mu\text{f}$) UNLESS OTHERWISE INDICATED.
8. COMPONENTS IN THIS AMPLIFIER ARE INTERCONNECTED TO RESULT IN A CONSISTANT PHASE RELATIONSHIP BETWEEN CHANNELS. DO NOT DISTURB THIS PHASE RELATIONSHIP DURING SERVICING.
9. \bullet = PHASING DOT
- T1, T2, T3 (IN PHASE TERMINALS. RED DOT IS PRIMARY; GREEN DOT IS SECONDARY)
- SPEAKER (POSITIVE VOLTAGE MOVES VOICE COIL OUTWARD).



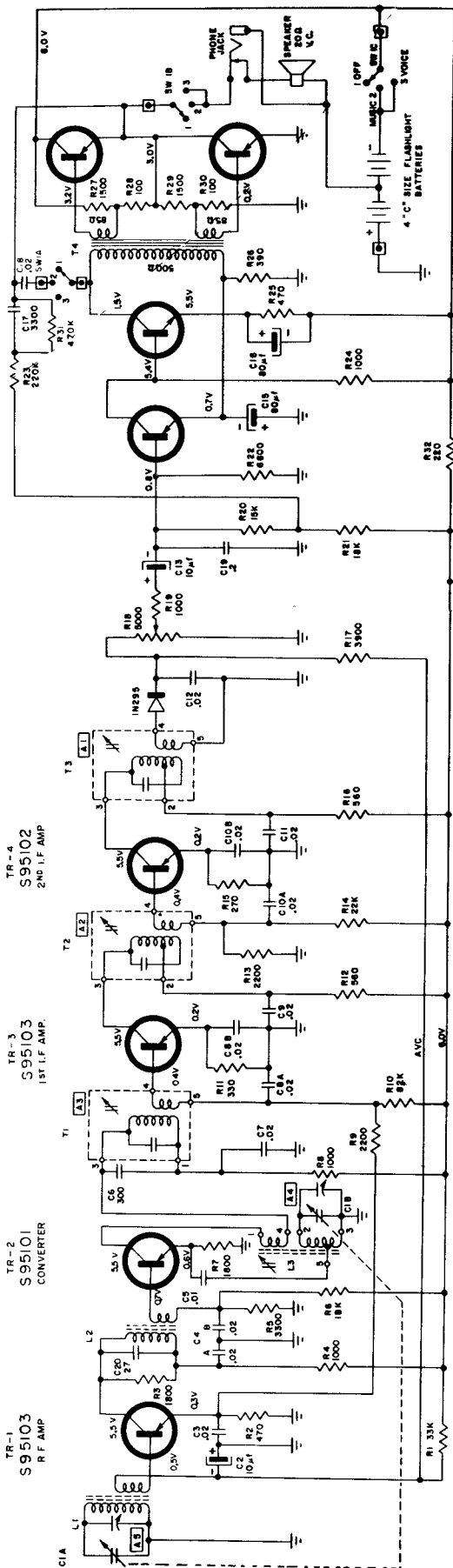


**MODEL 61R58
CODE 1. 62402**

TR-7 & 8
S95204
POWER OUTPUT

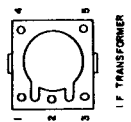
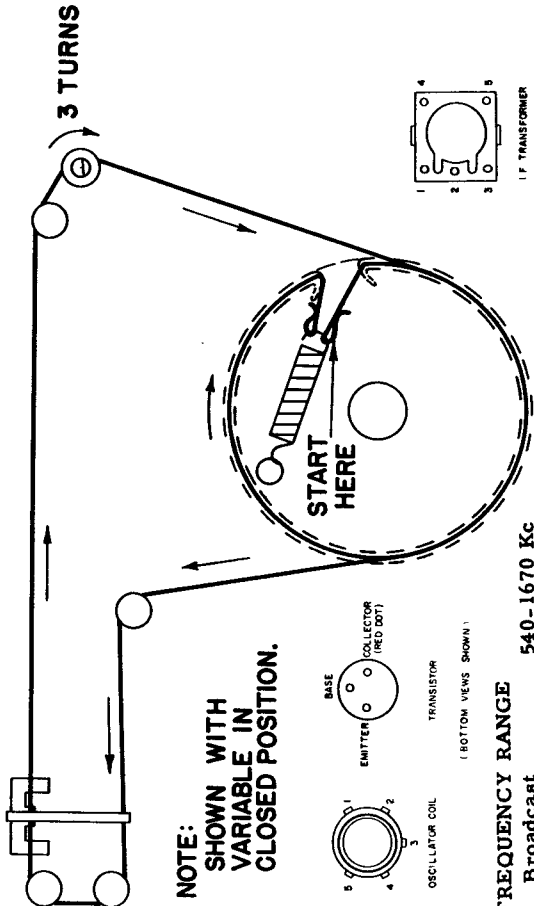
TR-6
S95202
AUDIO DRIVER

TR-5
S95201
1ST AUDIO AMP

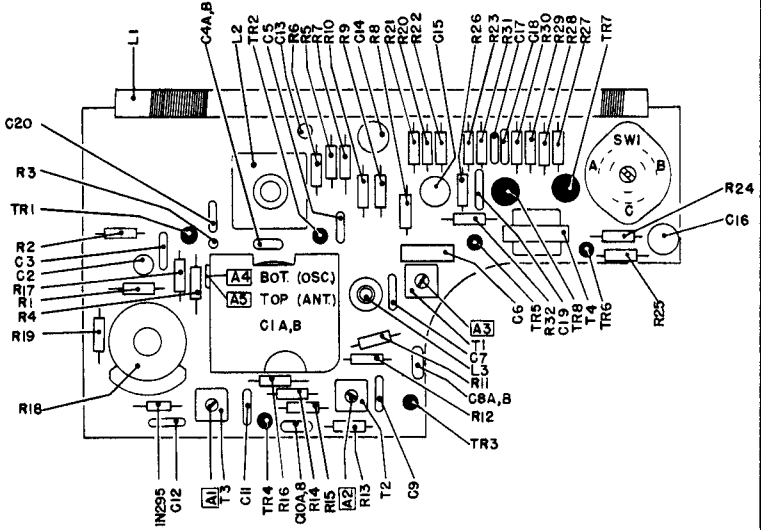


SIGNAL	TEST POINTS	FREQUENCY	SERIES CAPACITOR INPUT TO GENERATOR
TR-4 BASE	455 K.C.	.05μf	100μf V
TR-3 BASE	455 K.C.	.05μf	50μf V
TR-2 BASE	455 K.C.	.05μf	6.7μf V
ANTENNA ROD	1000 K.C.	STANDARD LOOP	75 μf

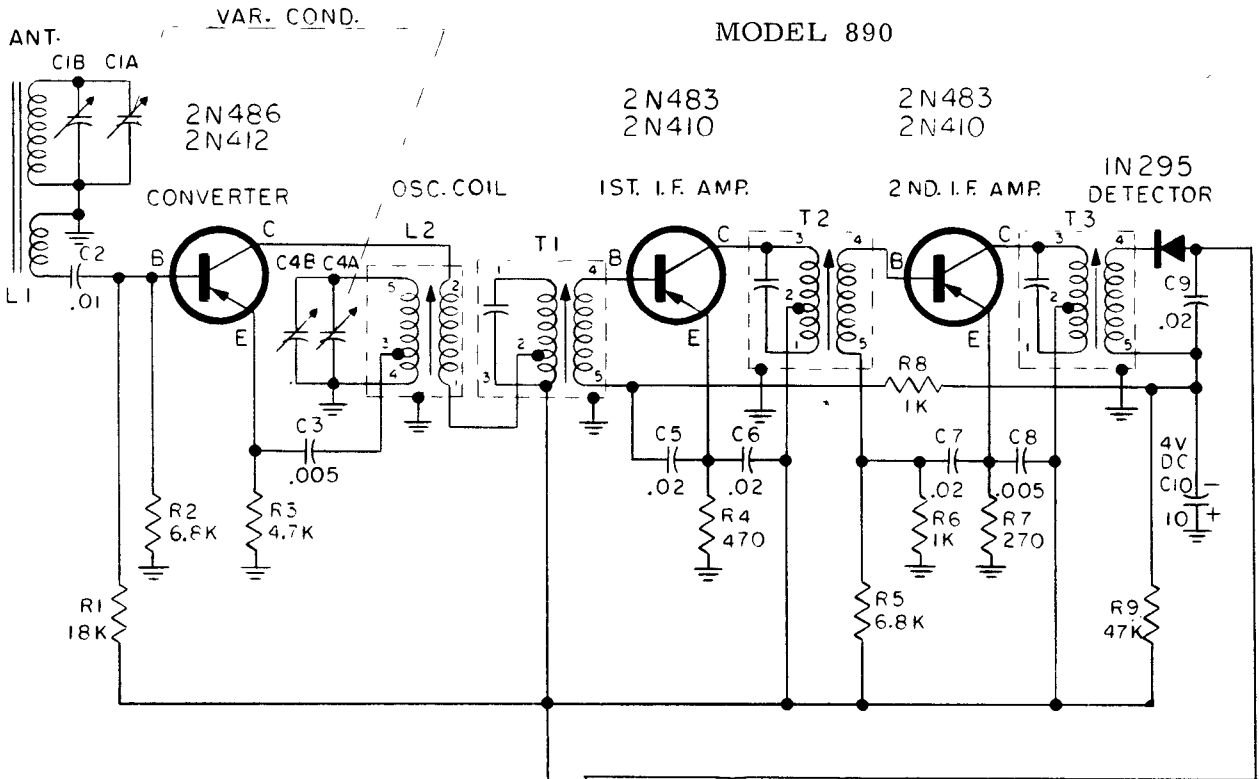
⊕ = COMMON GROUND (+).
 □ = EXTERNAL CONNECTOR TO PRINTED CIRCUIT.
 RESISTANCE VALUES ARE IN OHMS K=1000.
 CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (μf) AND VALUES GREATER THAN 1.0 ARE IN MICRO-MICROFARADS (μμf) EXCEPT WHERE NOTED.
 TUBES ARE THE COMMON TYPES AND ARE MADE WITH VACUUM TIGHTENING INSTRUCTIONS. CHECK MANUFACTURER'S DATA SHEET FOR TUBE IDENTIFICATION AND CONNECTIONS.
 TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS = 8 TO 16 MA.



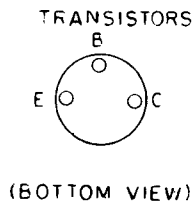
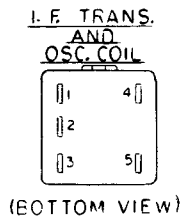
FREQUENCY RANGE
 Broadcast IF
 540-1670 Kc
 455 Kc



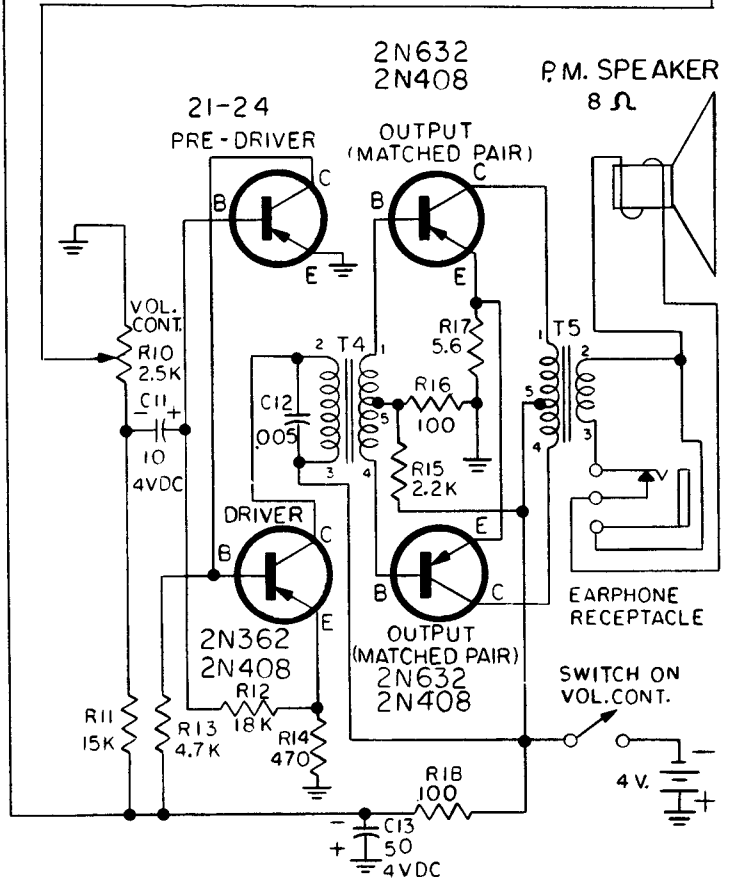
BULOVA WATCH COMPANY, INC.



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.
 \perp = CHASSIS GROUND.

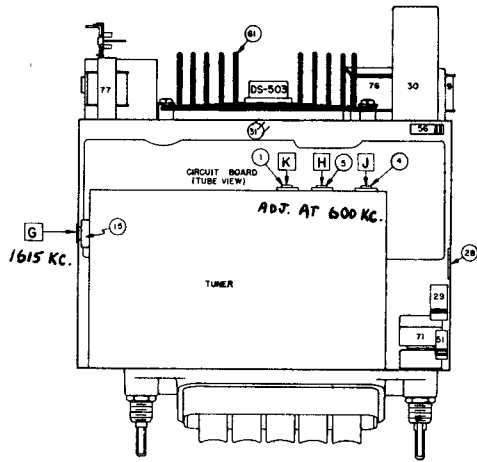


BULOVA
 MODEL # 890

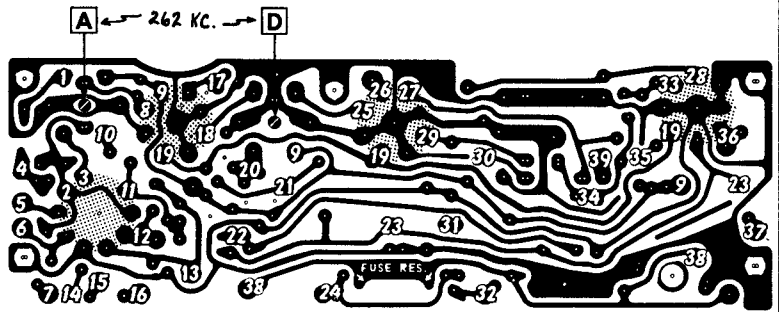


DELCO

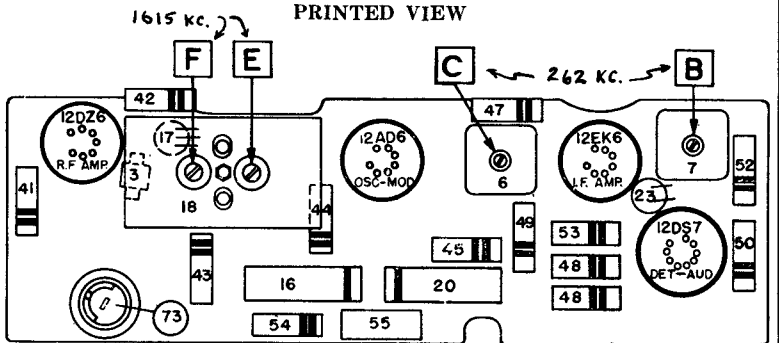
PONTIAC MODEL 989831



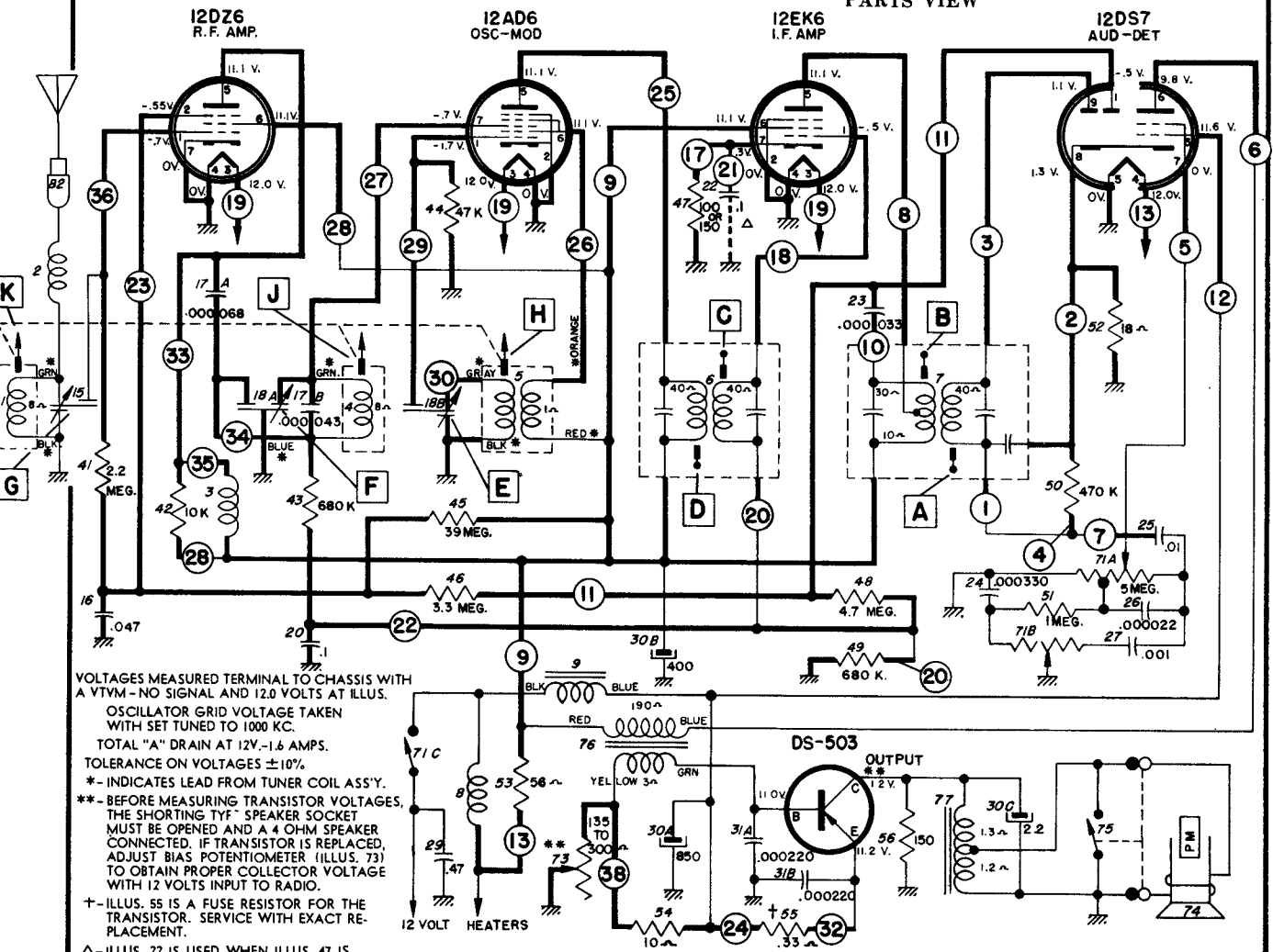
TUBE VIEW



PRINTED VIEW



PARTS VIEW



VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VTVM - NO SIGNAL AND 120 VOLTS AT ILLUS.
 OSCILLATOR GRID VOLTAGE TAKEN WITH SET TUNED TO 1000 KC.
 TOTAL "A" DRAIN AT 12V - 1.6 AMPS.
 TOLERANCE ON VOLTAGES ±10%
 * - INDICATES LEAD FROM TUNER COIL ASS'Y.
 ** - BEFORE MEASURING TRANSISTOR VOLTAGES, THE SHORTING TYP. SPEAKER SOCKET MUST BE OPENED AND A 4 OHM SPEAKER CONNECTED. IF TRANSISTOR IS REPLACED, ADJUST BIAS POTENTIOMETER (ILLUS. 73) TO OBTAIN PROPER COLLECTOR VOLTAGE WITH 12 VOLTS INPUT TO RADIO.
 † - ILLUS. 55 IS A FUSE RESISTOR FOR THE TRANSISTOR. SERVICE WITH EXACT REPLACEMENT.
 Δ - ILLUS. 22 IS USED WHEN ILLUS. 47 IS 150 OHMS.

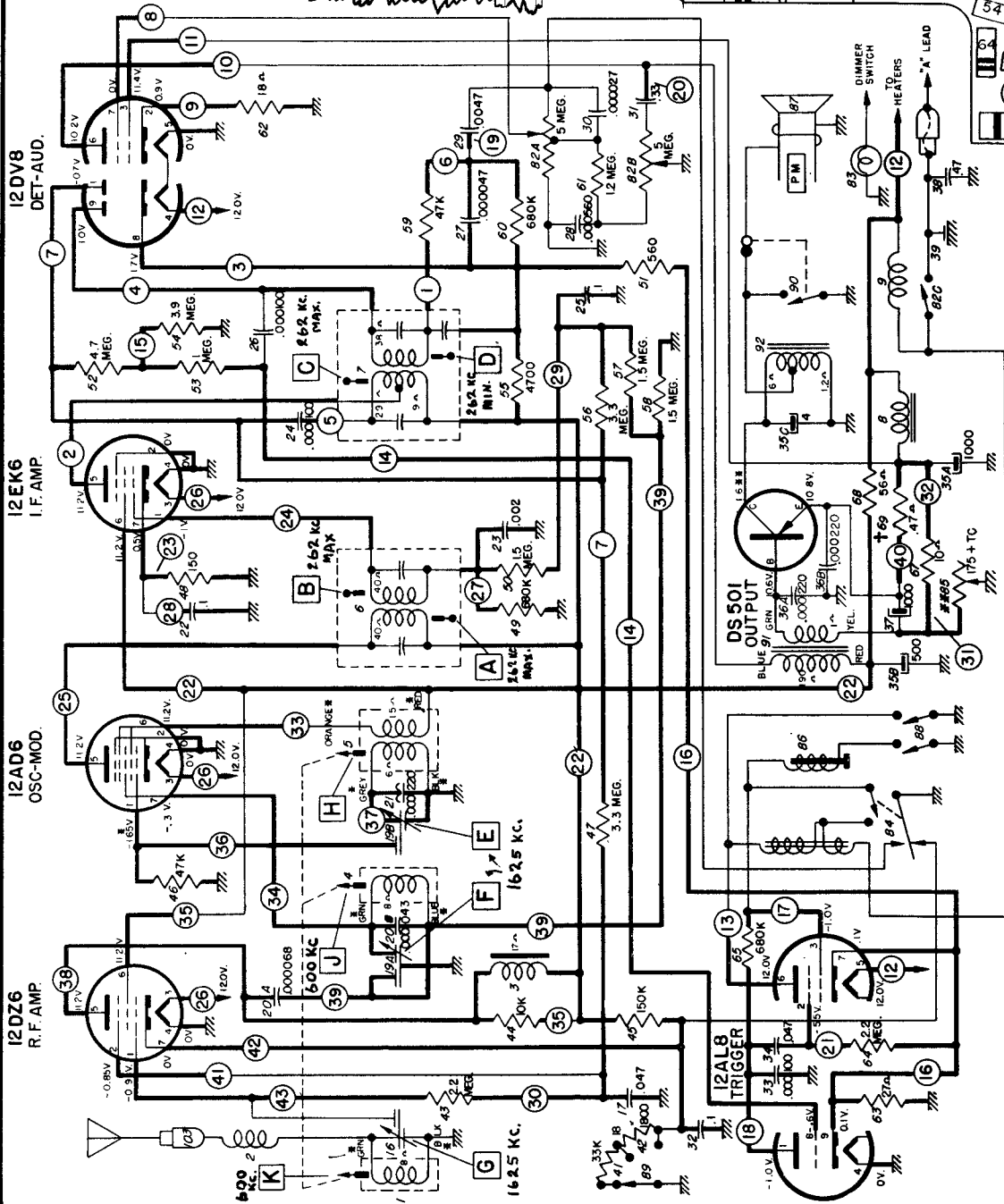
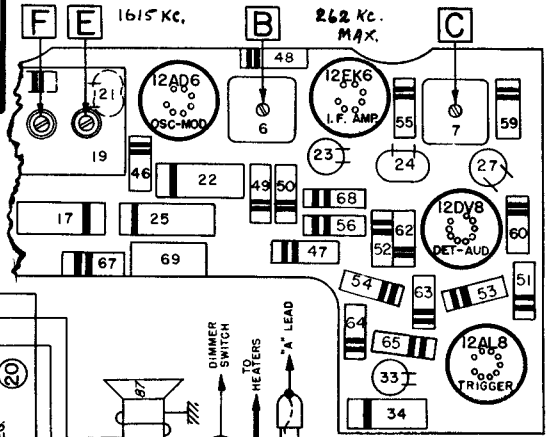
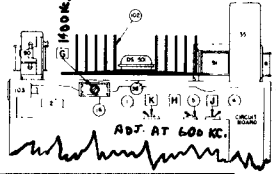
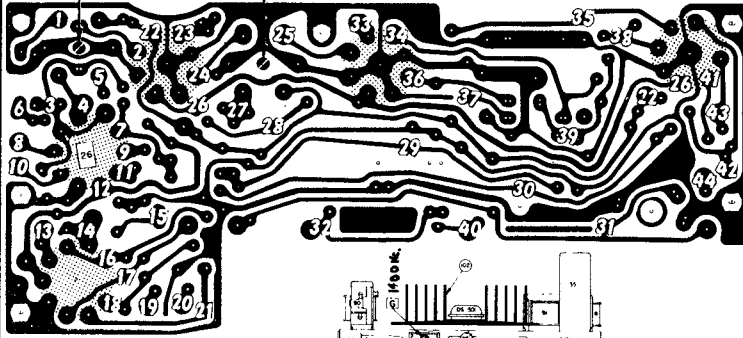
PONTIAC 989831—PRINTED CIRCUIT SHOWN IN HEAVY LINES

D 262 Kc. MIN. 262 Kc. MAX.

A MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

DELCO

PONTIAC MODEL 989692



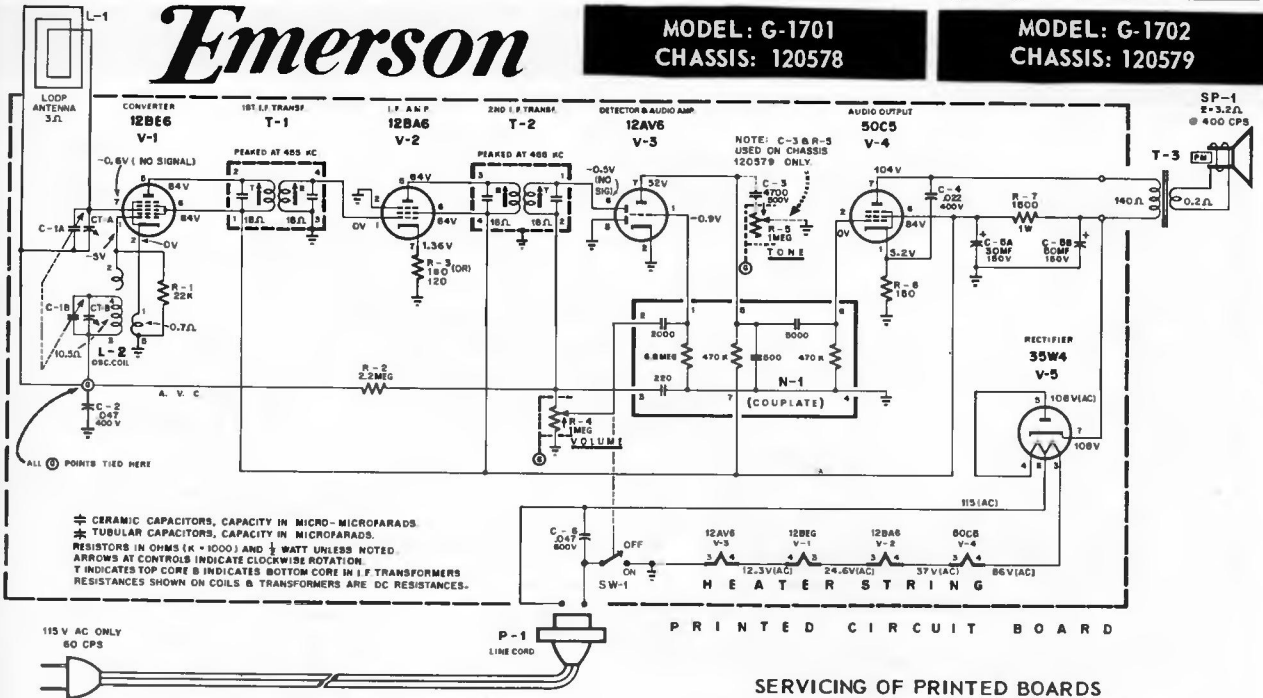
PONTIAC MODEL 989692

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."

Emerson

MODEL: G-1701
CHASSIS: 120578

MODEL: G-1702
CHASSIS: 120579

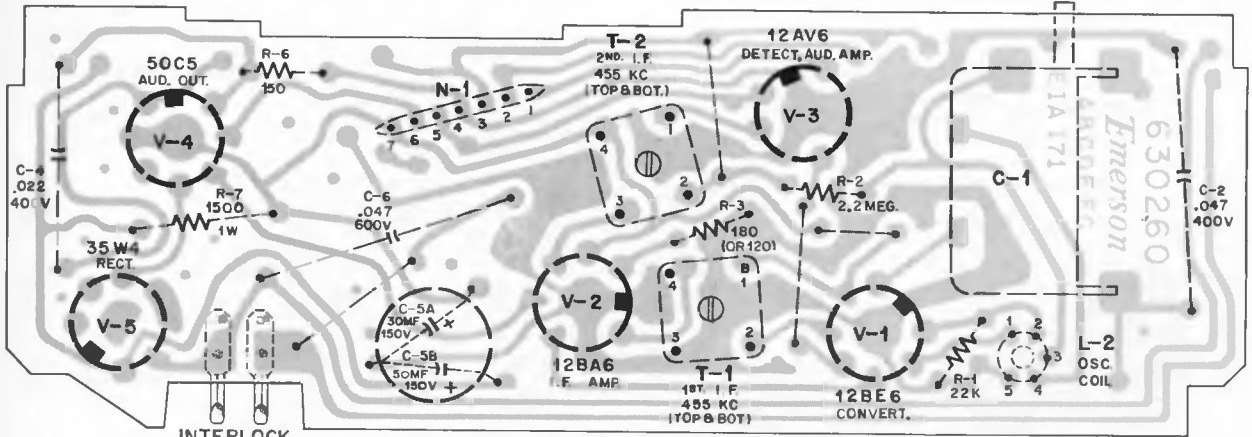


SERVICING OF PRINTED BOARDS

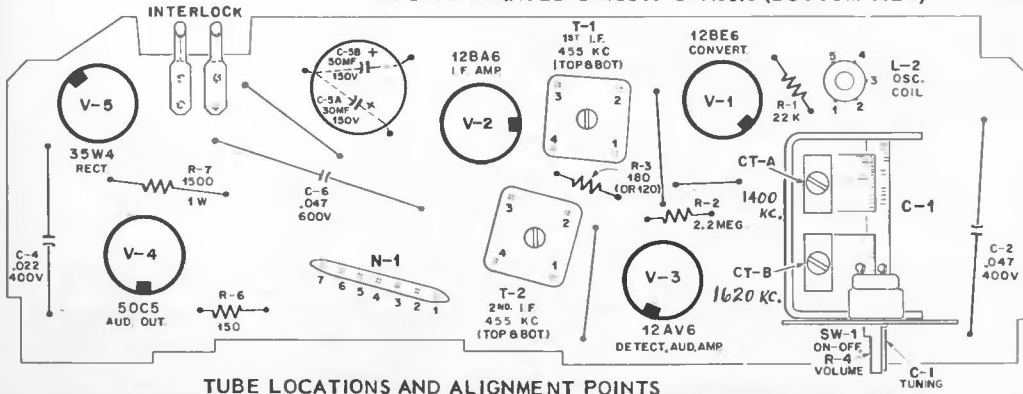
SPEAKER REPLACEMENT

- 1) Remove line cord plug from wall outlet and remove back from cabinet. Remove chassis.
- 2) Apply heat to plastic retaining studs used to secure speaker to cabinet and remove speaker.
- 3) Install new speaker in cabinet. Secure speaker by re-heating original mounting studs and pressing excess plastic down over rear of speaker frame.

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.

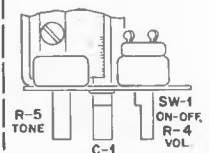


ETCHED PRINTED CIRCUIT CHASSIS (BOTTOM VIEW)



TUBE LOCATIONS AND ALIGNMENT POINTS

ALTERNATE CONTROLS USED WITH CHASSIS No. 120579

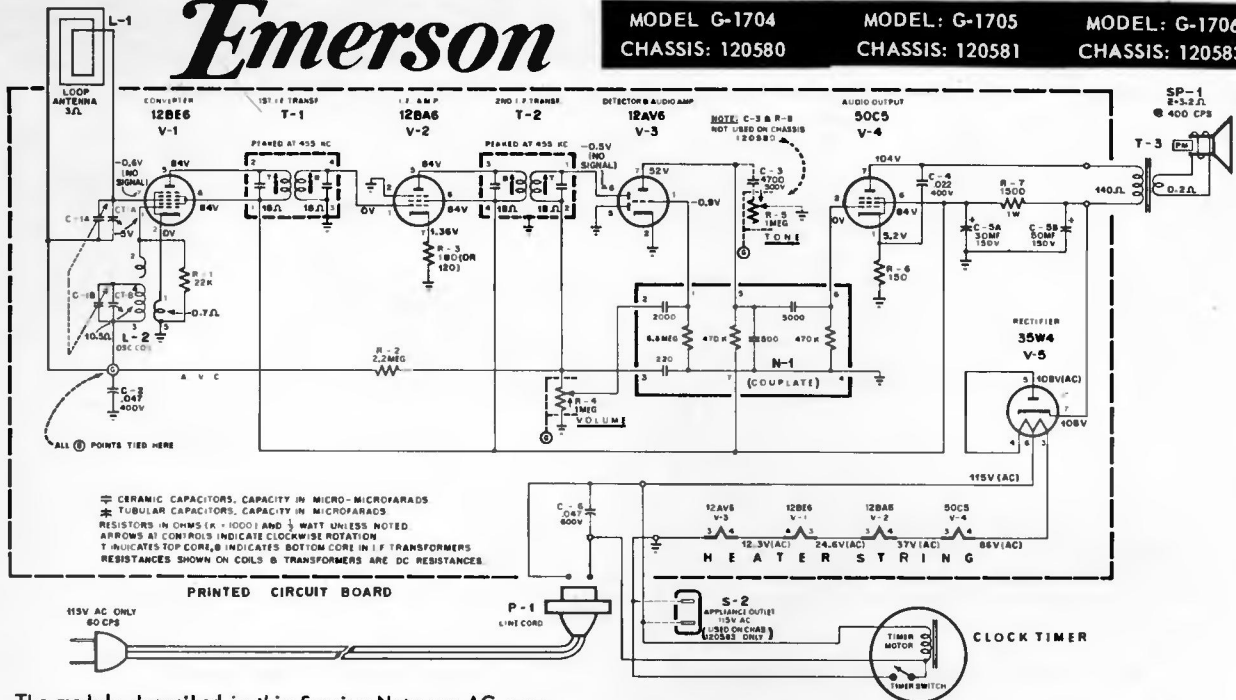


Emerson

MODEL G-1704
CHASSIS: 120580

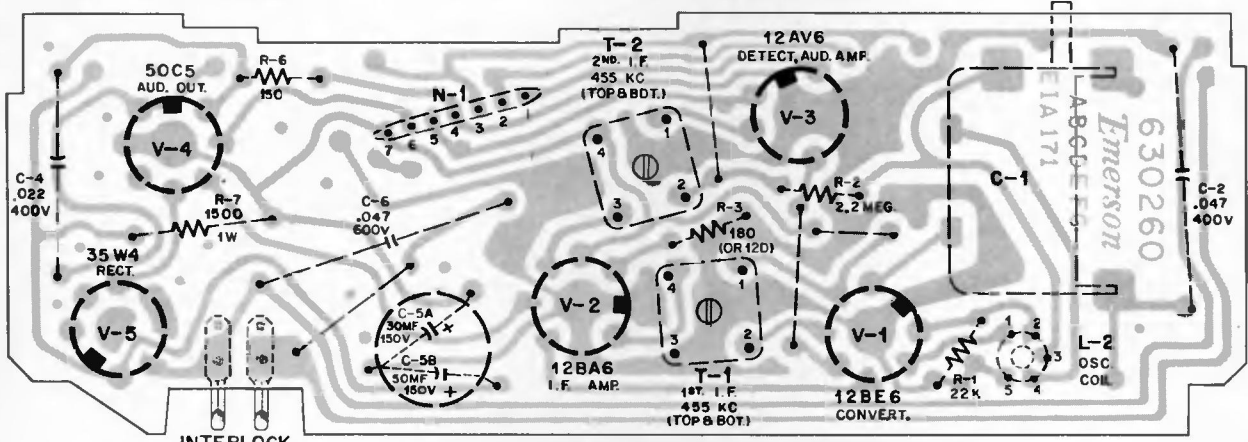
MODEL: G-1705
CHASSIS: 120581

MODEL: G-1706
CHASSIS: 120583

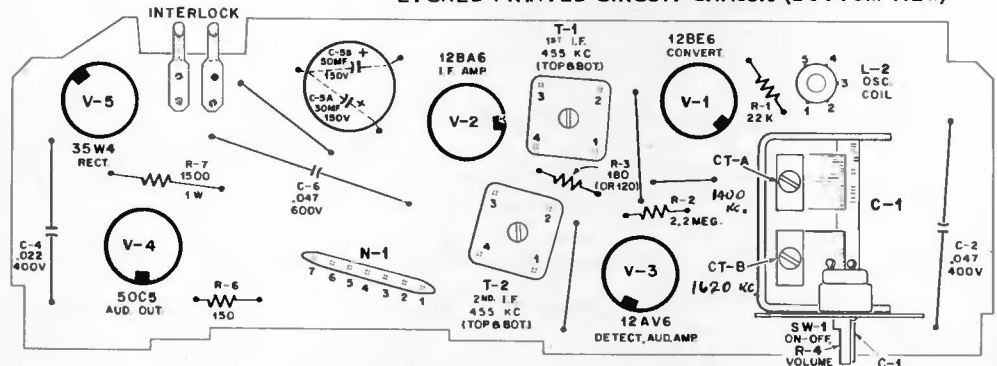


The models described in this Service Note are AC operated superheterodyne clock-radios designed for reception of programs in the AM broadcast band. They are electrically very similar; differing only in use of a tone control circuit (not used in model G-1704), automatically controlled appliance outlet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

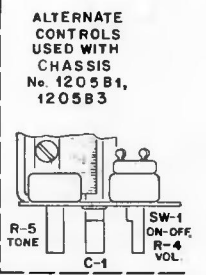
To remove defective components one of several methods may be used. A recommended method is to cut close to the body of the defective component and solder the new part to the remaining leads. Another method is to apply heat at the junction point of the component wire lead and the printed board and lift 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.



ETCHED PRINTED CIRCUIT CHASSIS (BOTTOM VIEW)



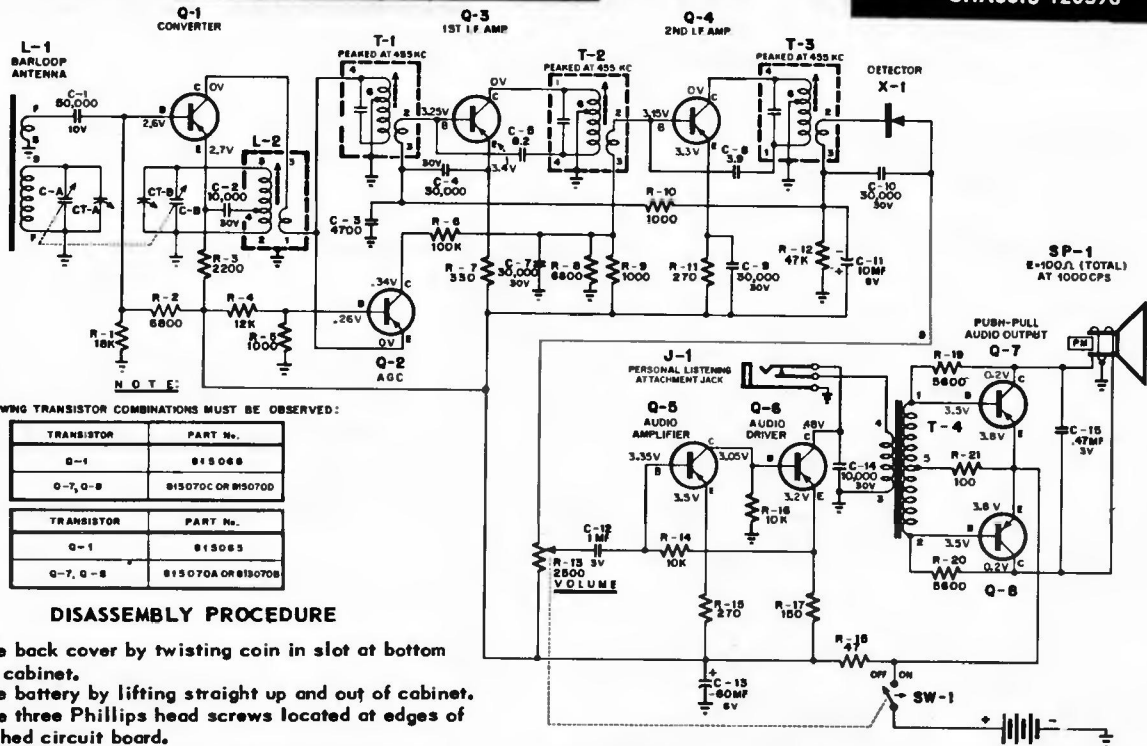
TUBE LOCATIONS AND ALIGNMENT POINTS



ALTERNATE CONTROLS USED WITH CHASSIS No. 1205B1, 1205B3

Emerson Radio

MODEL 707
CHASSIS 120598



THE FOLLOWING TRANSISTOR COMBINATIONS MUST BE OBSERVED:

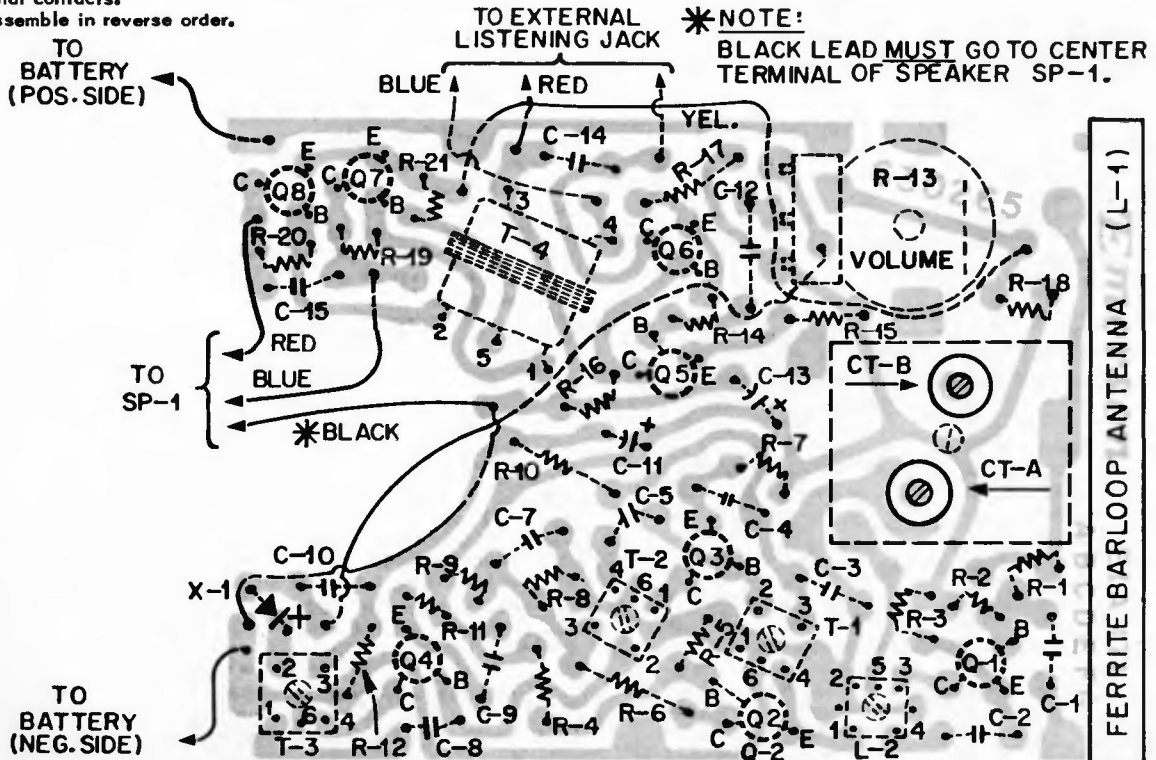
TRANSISTOR	PART No.
Q-1	815068
Q-7, Q-8	815070C OR 815070D

TRANSISTOR	PART No.
Q-1	815065
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 (Kx1000) AND 1/4 WATT.



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

Emerson Radio

MODEL 941-B
CH. 120569-B

MODEL 943-B
CH. 120569-D

(For circuit diagram see next page adjacent at right)

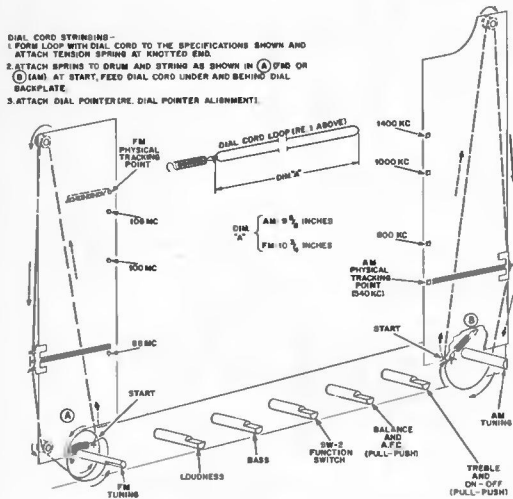


FIG. 2A, B - DIAL CORD STRINGING

CONTROL SHAFTS (REFER TO FIG. 2 FOR FUNCTION)

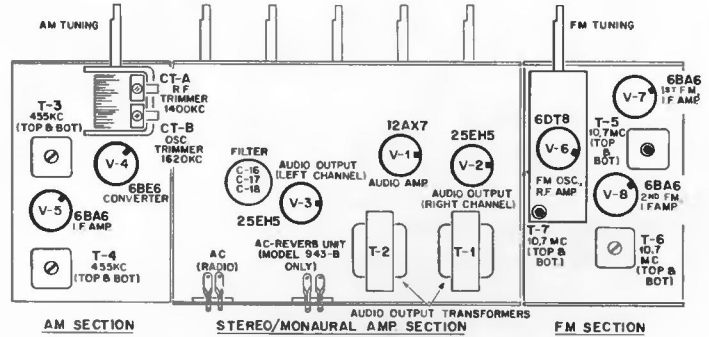
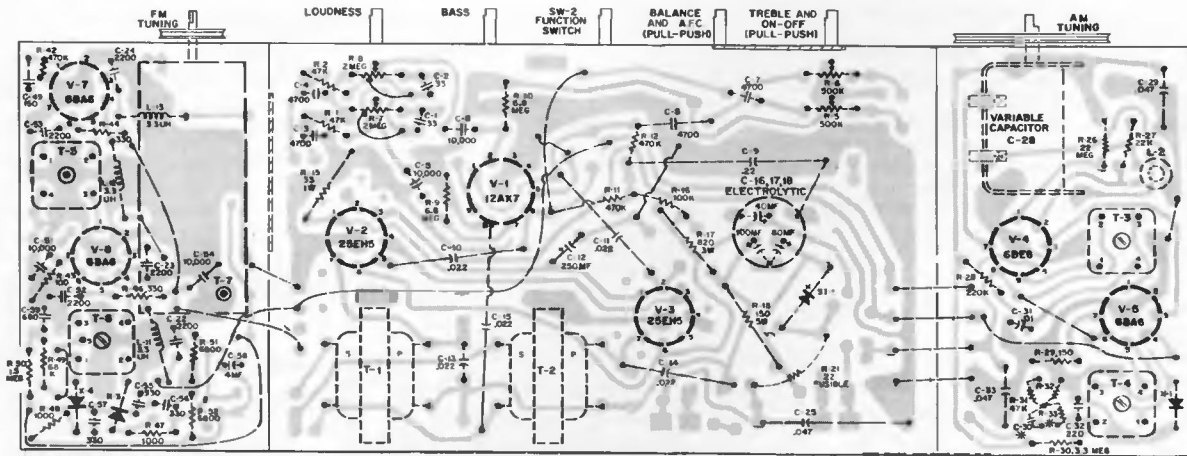


FIG. 3 - TUBE LOCATIONS AND ALIGNMENT POINTS



ETCHED PRINTED CIRCUIT BOARD, BOTTOM VIEW

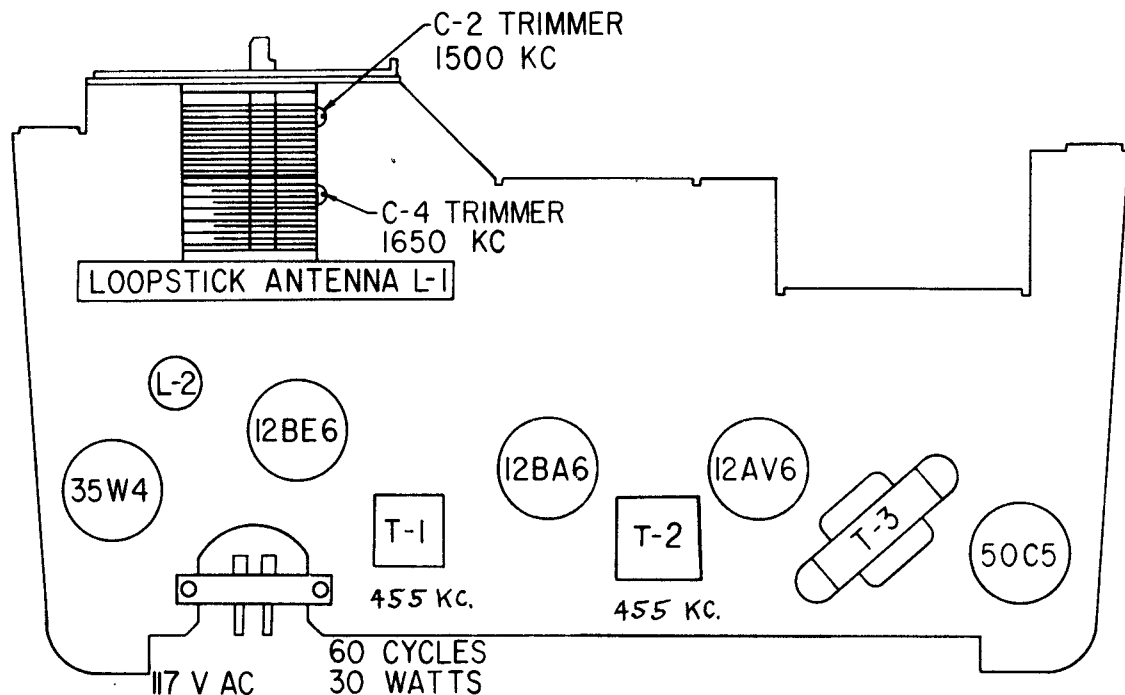
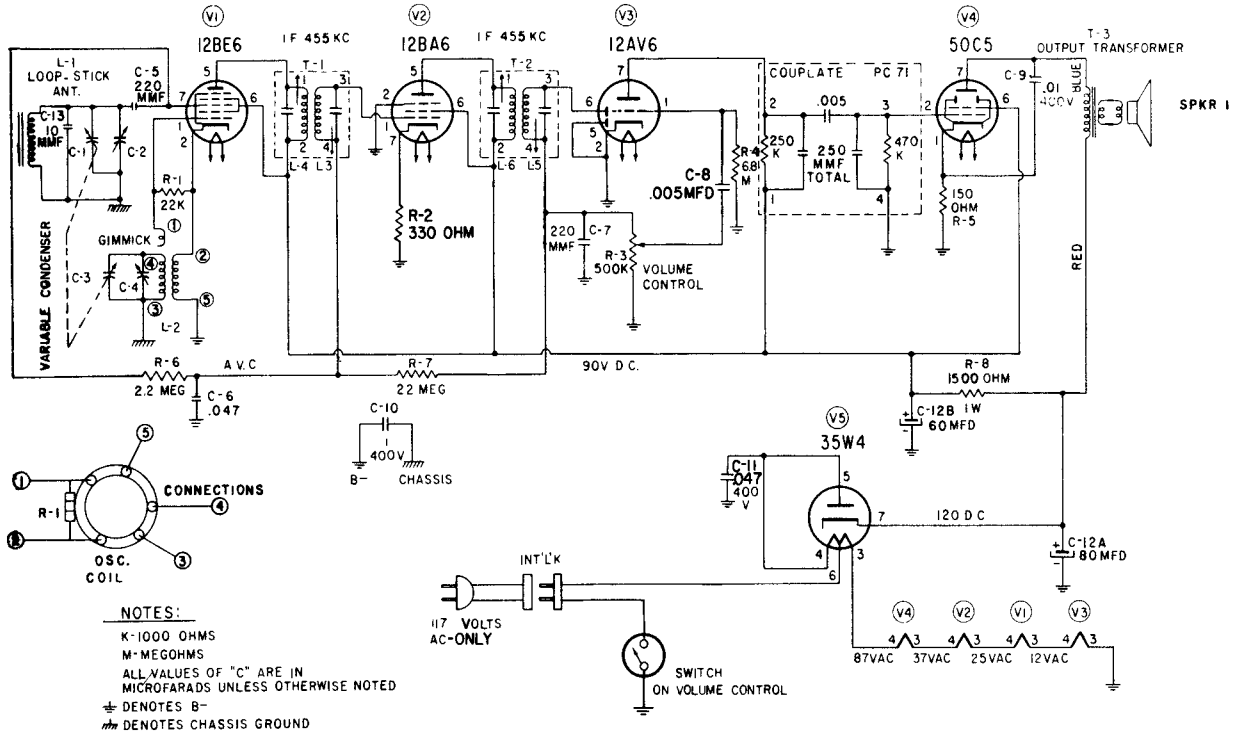
RESISTANCE READINGS CHART, CHASSIS 120569-B, 569-D

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

NOTES: * Measured with low side of VTVM connected to junction of R-18, C-16 (B+ point).
‡ Capacitor charge-wait until meter settles (about 30 seconds).

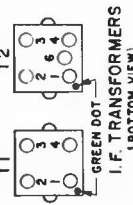
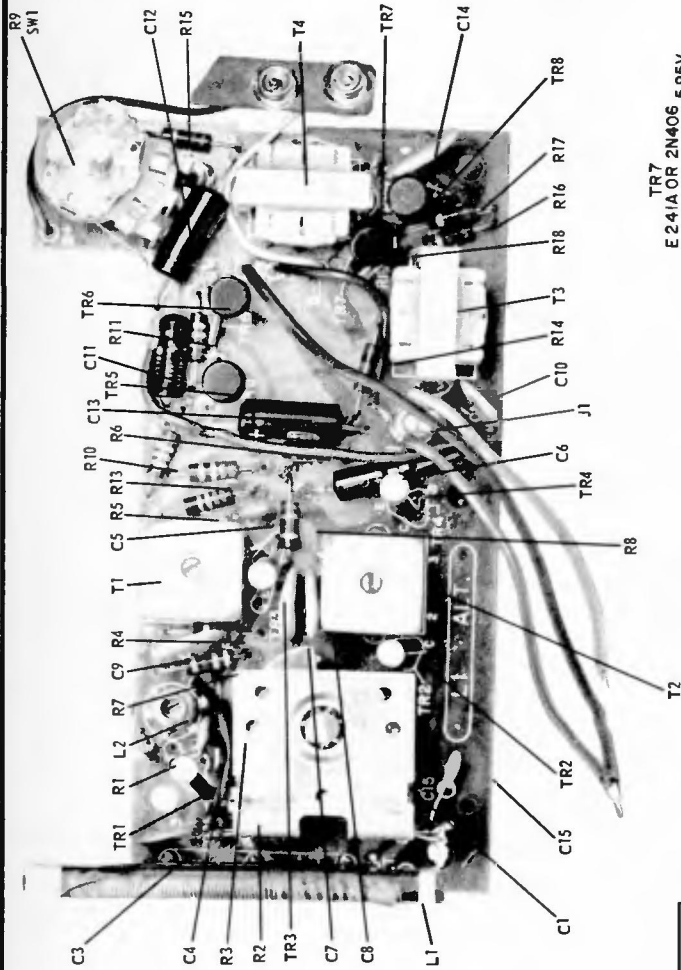
Gamble-Shogmo, Inc.

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



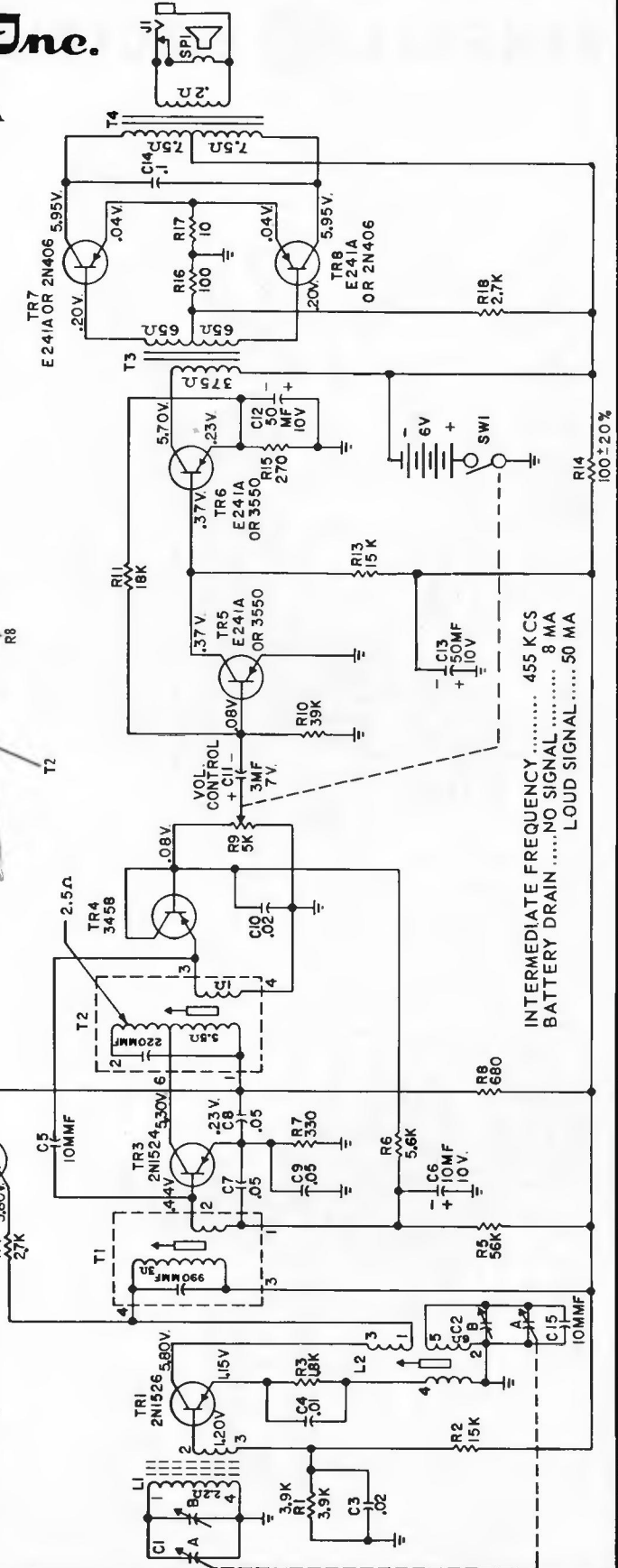
OSCILLATOR COIL
(BOTTOM VIEW)

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

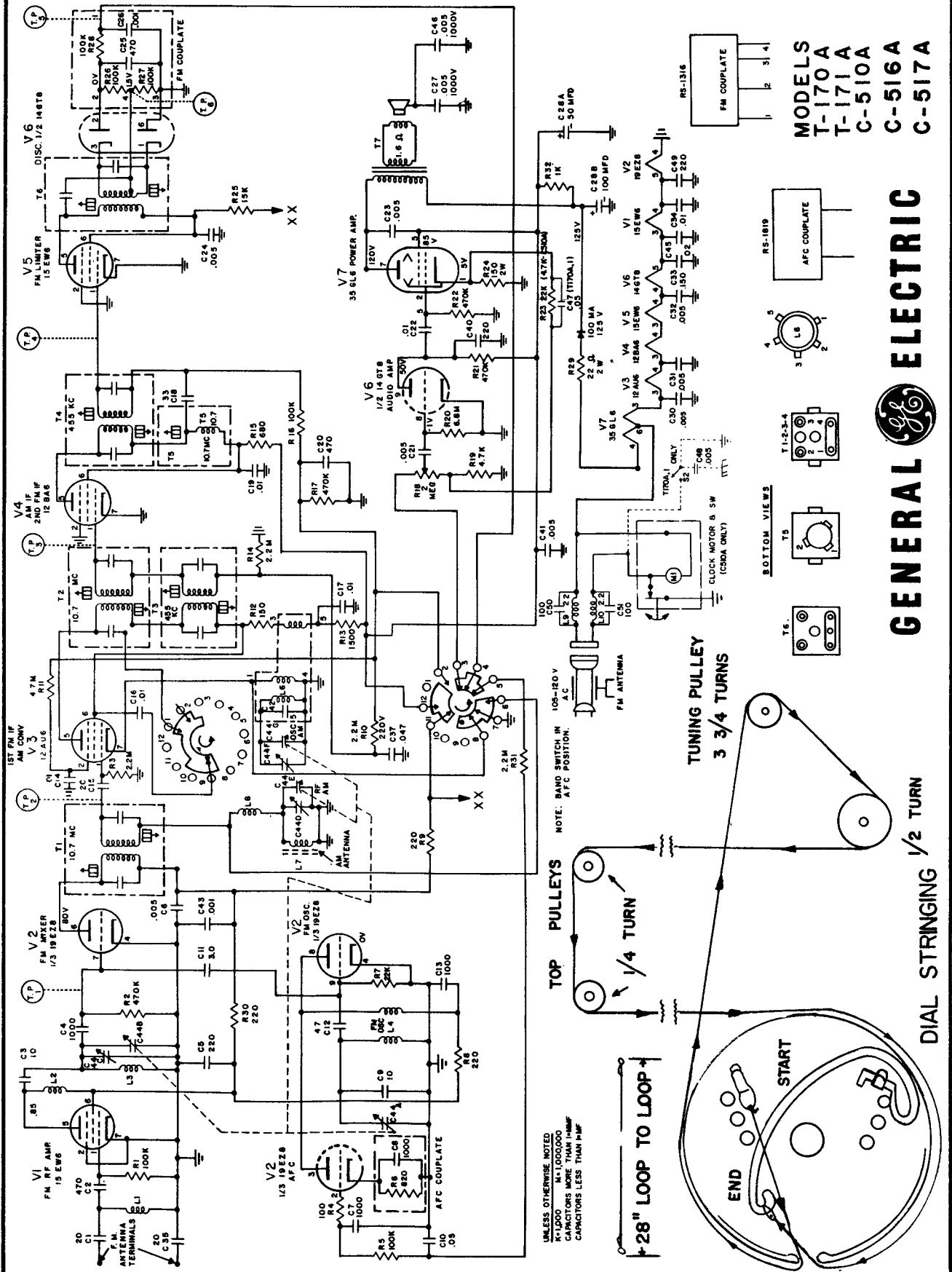
TO SERVICE RADIO

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, 5.80V.

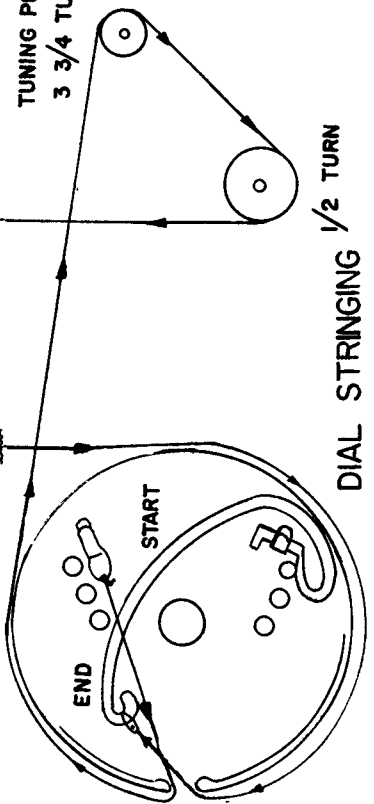


INTERMEDIATE FREQUENCY 455 KCS
BATTERY DRAIN NO SIGNAL 8 MA
LOUD SIGNAL 50 MA

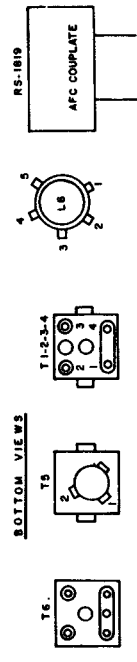


UNLESS OTHERWISE NOTED
 R=1000 Ω
 K=10,000 Ω
 M=1,000,000 Ω
 CAPACITORS MORE THAN 100PF
 CAPACITORS LESS THAN 100PF

28" LOOP TO LOOP



MODELS
 T-170A
 T-171A
 C-510A
 C-516A
 C-517A



GENERAL ELECTRIC



RS-1316
 FM COMPLATE

RS-1819
 AFC COMPLATE

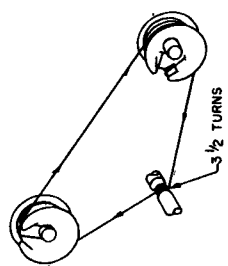
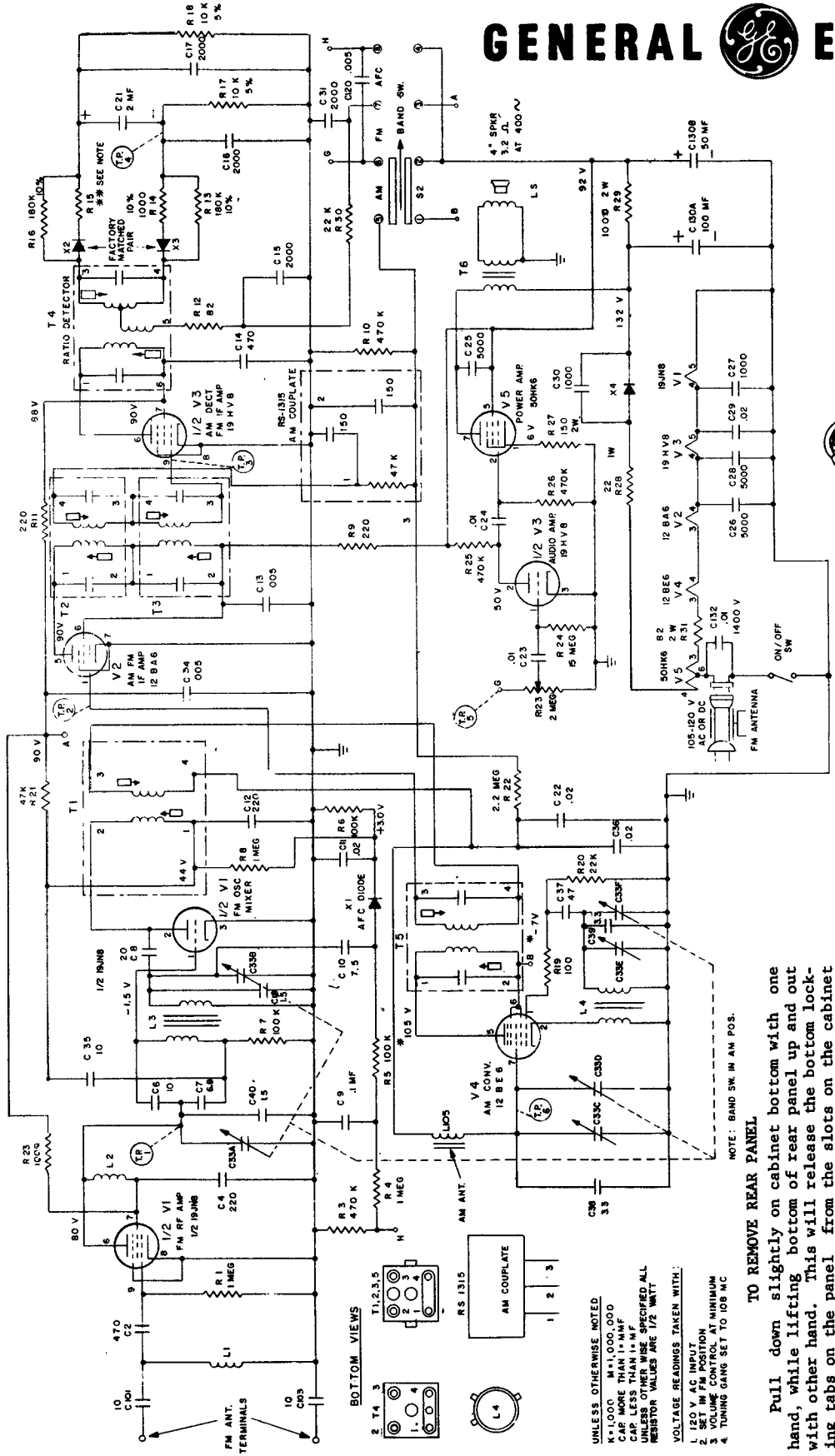
T1-2-3-4

T5

T6



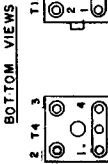
**RADIO
MODEL
T-230A**



STRINGING DIAGRAM

* SET IN AM POSITION
 † IF DIODES X2 OR X3 NEED REPLACEMENT, REPLACE WITH 1N34A TYPE DIODES. THEN CHANGE R10 TO 680 OHMS TO ACHIEVE MAXIMUM PERFORMANCE. AS RECEIVED, R10 MAY BE ANY VALUE FROM 100 TO 300 OHMS. DIODES X2 AND X3 ARE SELECTED IN THE DIODES PAIR CURRENTLY IN THE RECEIVER.

I.F. AM 455 KC
 FM 10.7 MC



BOTTOM VIEWS

UNLESS OTHERWISE NOTED
 * 1,000 M+1,000,000
 CAP MORE THAN 1+M+MF
 CAP LESS THAN 1+M+MF
 UNLESS OTHERWISE SPECIFIED ALL
 RESISTOR VALUES ARE 1/2 WATT

VOLTAGE READINGS TAKEN WITH:
 1. 120 V AC INPUT
 2. SET IN FM POSITION
 3. VOLUME CONTROL AT MINIMUM
 4. TUNING GANG SET TO 105 MC

TO REMOVE REAR PANEL

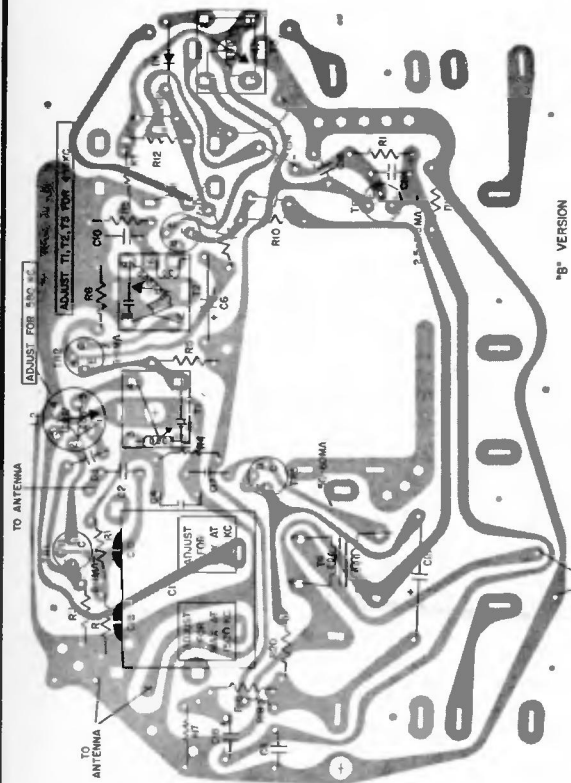
Pull down slightly on cabinet bottom with one hand, while lifting bottom of rear panel up and out with other hand. This will release the bottom locking tabs on the panel from the slots on the cabinet bottom. Then pull panel out and down, releasing top locking tabs from top slots.

TO REMOVE CHASSIS FROM CABINET

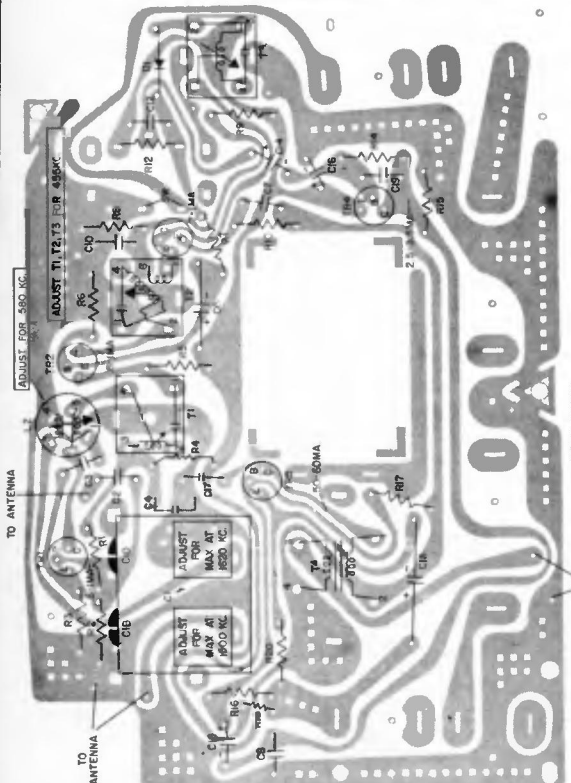
1. Remove rear panel as detailed above.
2. Pull out volume and tuning control knobs.
3. Remove nut securing volume control to cabinet.
4. Remove four screws on cabinet bottom which fasten the chassis down and remove screw holding front bracket.
5. Unsolder speaker leads.
6. Slide chassis out to rear.

GENERAL ELECTRIC

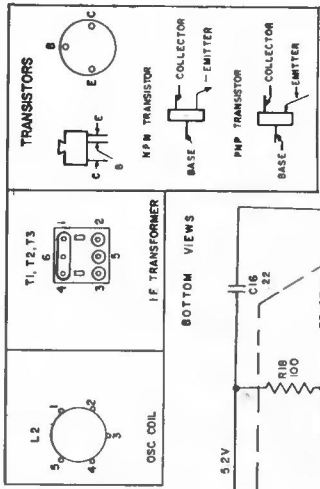
MODELS
P795A,B
P796A,B
P797A,B



"B" VERSION



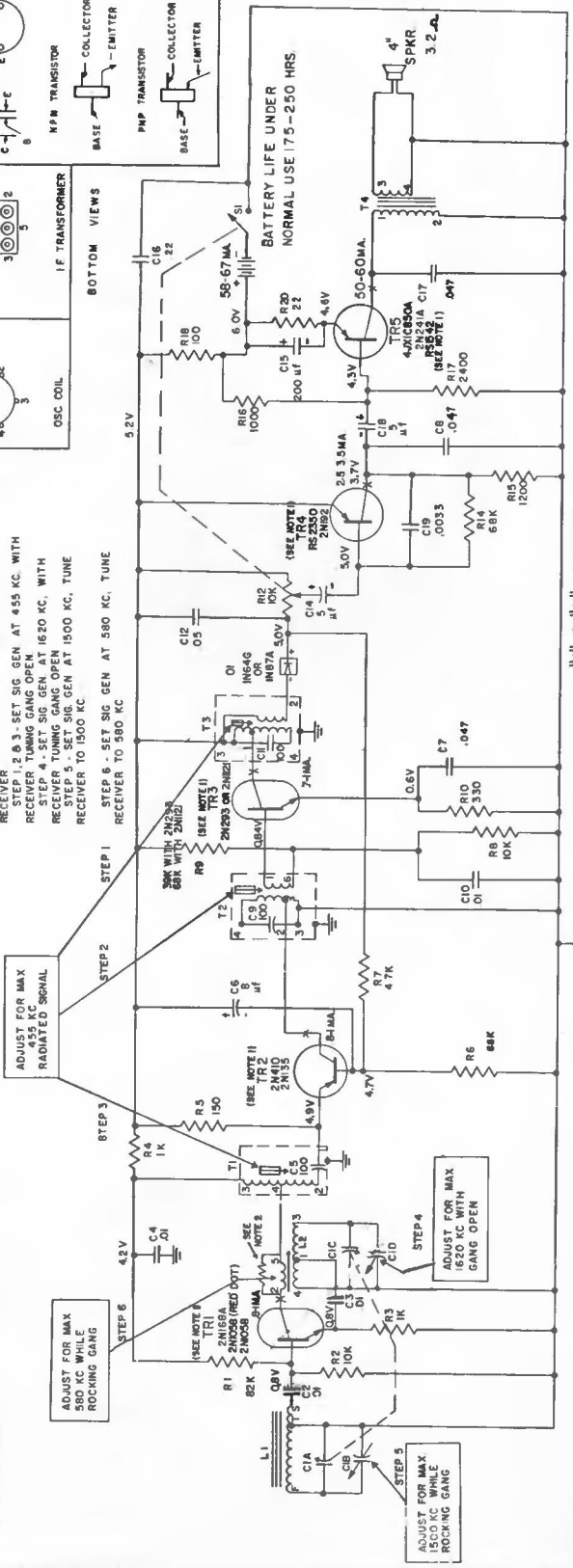
"A" VERSION



ALIGNMENT
SET VOLUME CONTROL AT MAXIMUM
SET TUNING RANGE OUTPUT METER OR SCOPE ACROSS
VOICE COIL
INDUCTIVELY COUPLE SIGNAL GENERATOR TO
RECEIVER
STEP 1 - 2.9.3 - SET SIG. GEN. AT 455 KC. WITH
RECEIVER TUNING GANG OPEN
STEP 2 - 2.9.3 - SET SIG. GEN. AT 1620 KC. WITH
RECEIVER TUNING GANG OPEN
STEP 5 - SET SIG. GEN. AT 1500 KC. TUNE
RECEIVER TO 1500 KC.
STEP 6 - SET SIG. GEN. AT 580 KC. TUNE
RECEIVER TO 580 KC.

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

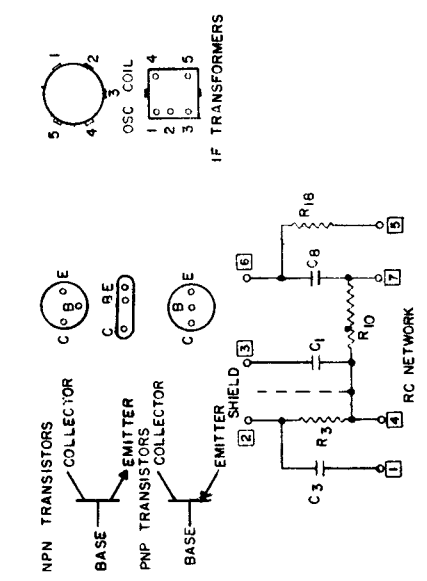
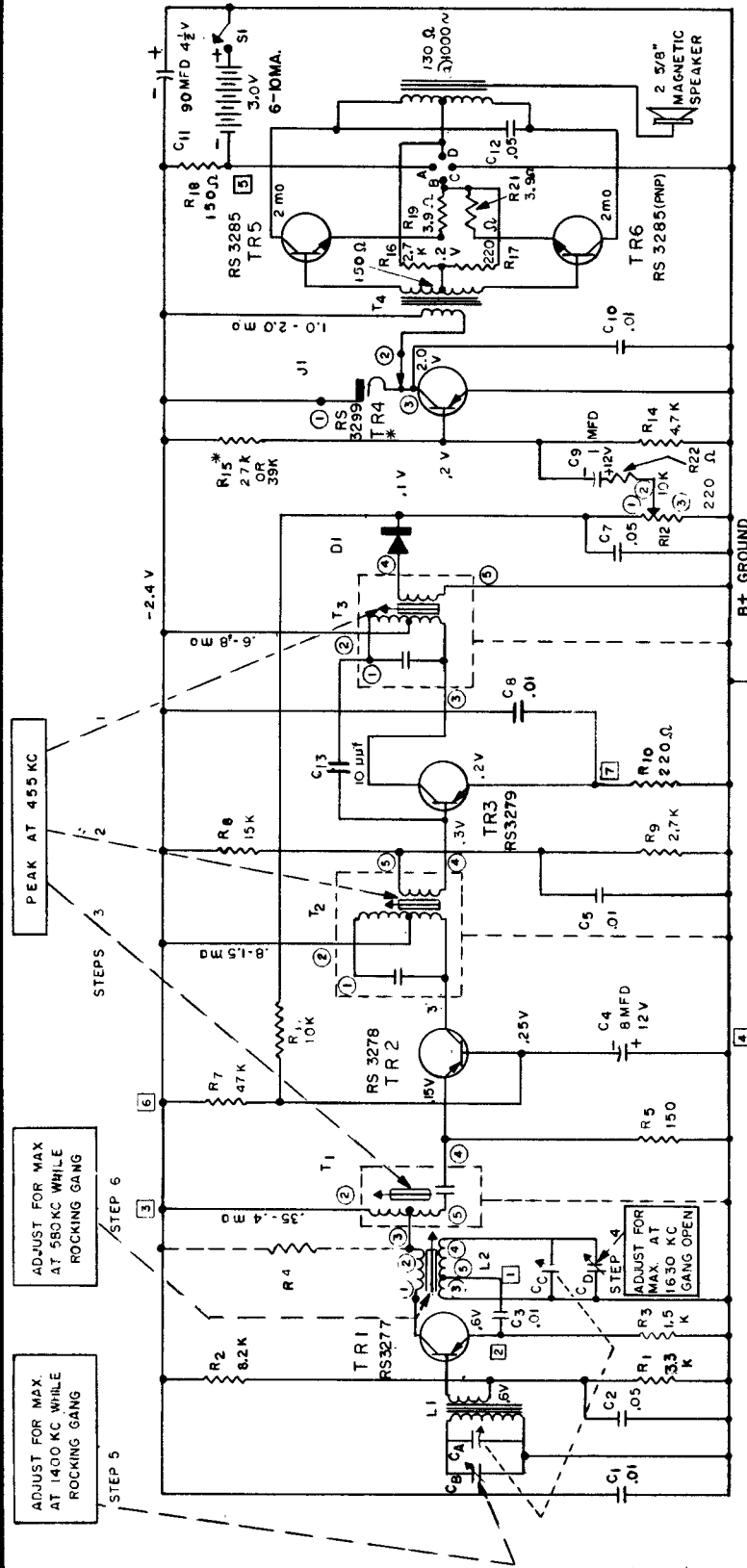
NOTES -
1- REPLACE WITH TRANSISTOR TYPES SHOWN
2- 3900 OHMS, USE ONLY WITH
2N1058 (RED DOT)



"A" & "B" VERSION

GENERAL ELECTRIC

MODELS
P820A
P821A



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

- NOTES:**
- UNLESS OTHERWISE NOTED - CAPACITORS MORE THAN 1 μ FD CAPACITORS LESS THAN 1 μ FD RESISTORS ARE 1/2 WATT & K=1000 VOLTAGES & CURRENT READINGS ARE AVERAGE UNDER NO SIGNAL CONDITIONS VOLTAGES ARE NEGATIVE WITH RESPECT TO GROUND.
 - FOR NPN TRANSISTORS IN TR5 & TR6 (a) JUMPER C TO D (b) JUMPER A TO B
 - FOR PNP TRANSISTORS IN TR5 & TR6 (a) JUMPER A TO D (b) JUMPER C TO B
 - WHEN TR4 IS RED, R15 IS 27K WHEN TR5 IS YELLOW, R15 IS 39K

TO REMOVE CIRCUIT BOARD

- Remove cabinet back.
- Remove screw that is mounted next to volume control.
- Place finger nail under phone jack and lift chassis up, then slide slightly in direction of cabinet bottom.

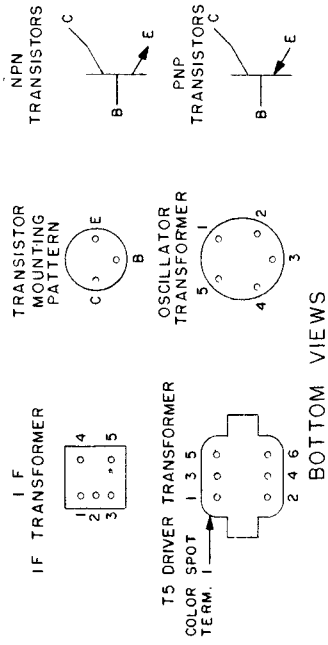
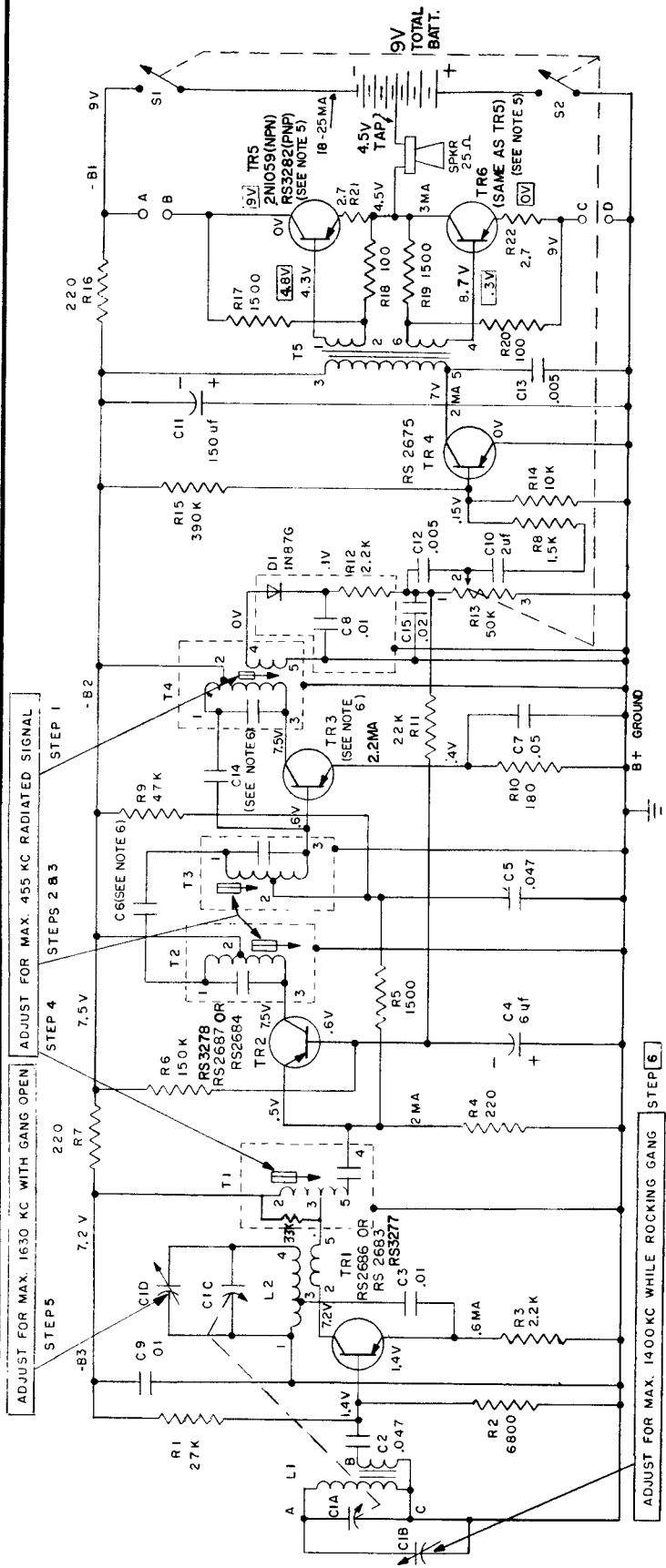
When replacing chassis, carefully tilt chassis so that tuning knob fits into knob opening, then slide chassis up towards cabinet top. Chassis mounting screw hole must line up with hole in mounting boss on cabinet.

TO REMOVE VOLUME CONTROL

- Remove tuning knob.
- Remove two screws mounted under tuning knob.
- Remove control.

TO REMOVE TUNING CAPACITOR

- Remove pulley from gang shaft.
- Remove two mounting screws.
- Unsolder the three gang connection lugs on dip-solder side of board.



- 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 mills. This is measured by disconnecting one of the 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.

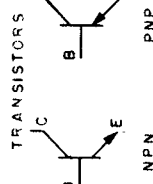
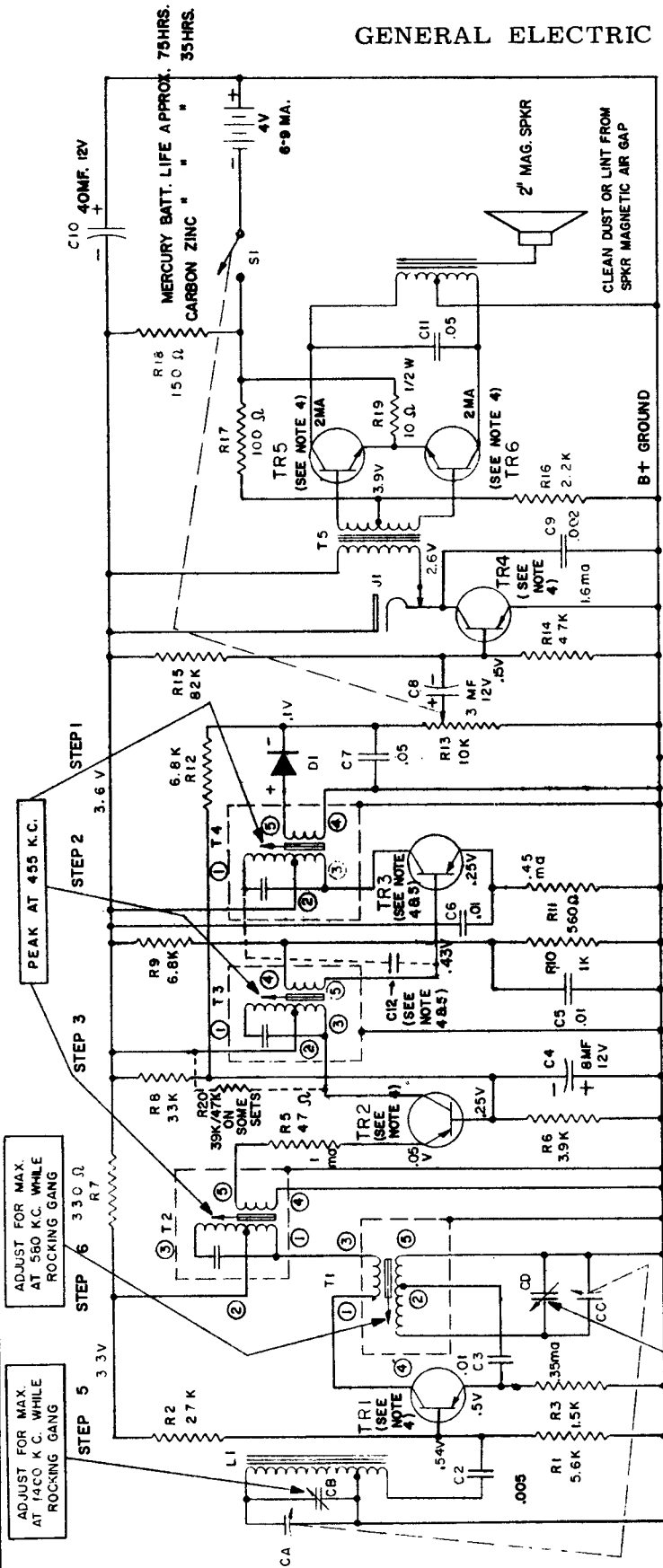
- NOTES:**
1. UNLESS OTHERWISE NOTED - CAPACITORS MORE THAN 1 = MMF CAPACITORS LESS THAN 1 = MF RESISTORS ARE 1/2 WATT K = 1000
 2. VOLTAGES ARE NEGATIVE WITH RESPECT TO GROUND UNLESS OTHERWISE NOTED AND VOLUME CONTROL MINIMUM.
 3. REPLACE TRANSISTORS WITH TYPES SHOWN
 4. VOLTAGES SHOWN IN \square ARE WITH TR5
 5. TR6 PNP.
 6. WHEN TR5 & TR6 ARE NPN, JUMPER B TO D & A TO C. WHEN TR5 & TR6 ARE PNP, JUMPER A TO B & C TO D.
 7. 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

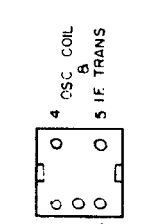
MODEL P835A

GENERAL ELECTRIC Models P850B,C, P851C

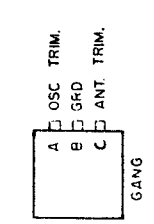
Models P825A, P826A, are electrically the same as the models covered on this page.



TRANSISTORS
NPN PNP



4 OSC COIL
5 IF TRANS



GANG
E-EMITTER
B-BASE
C-COLLECTOR

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

4. TRANSISTOR COMPLEMENT

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

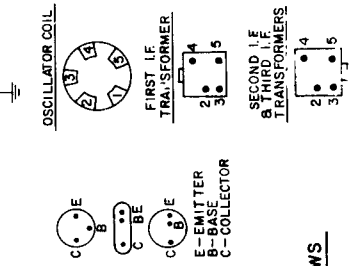
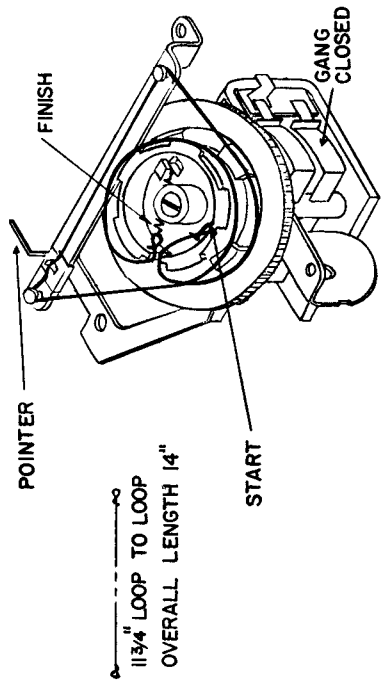
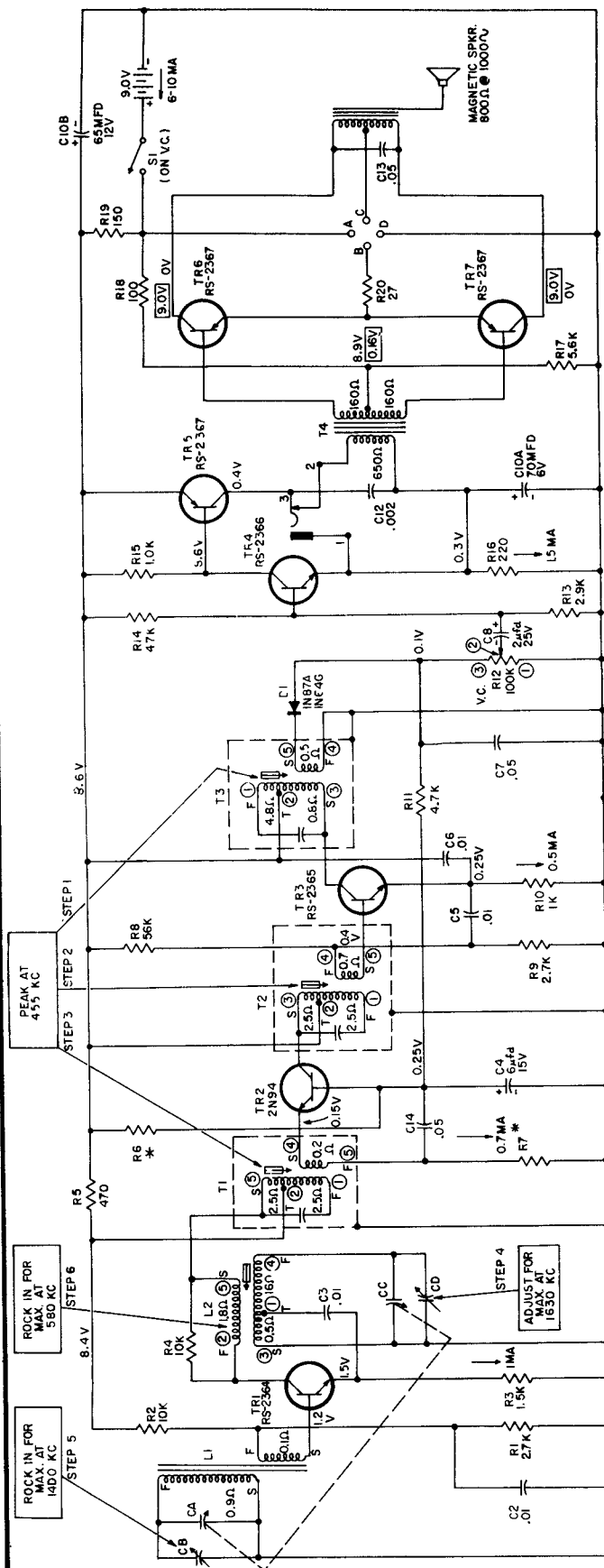
ALIGNMENT

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.



BOTTOM VIEWS

COILS AND TRANSFORMERS

RS-2601 T4	Driver Transformer.....	1.60
RS-2602 T1	1st I.F.....	2.10
RS-2603 T2	2nd I.F.....	2.10
RS-2604 T3	3rd I.F.....	2.10
RS-2605 L2	Oscillator Coil.....	1.10
RS-2607 L1	Antenna.....	1.90

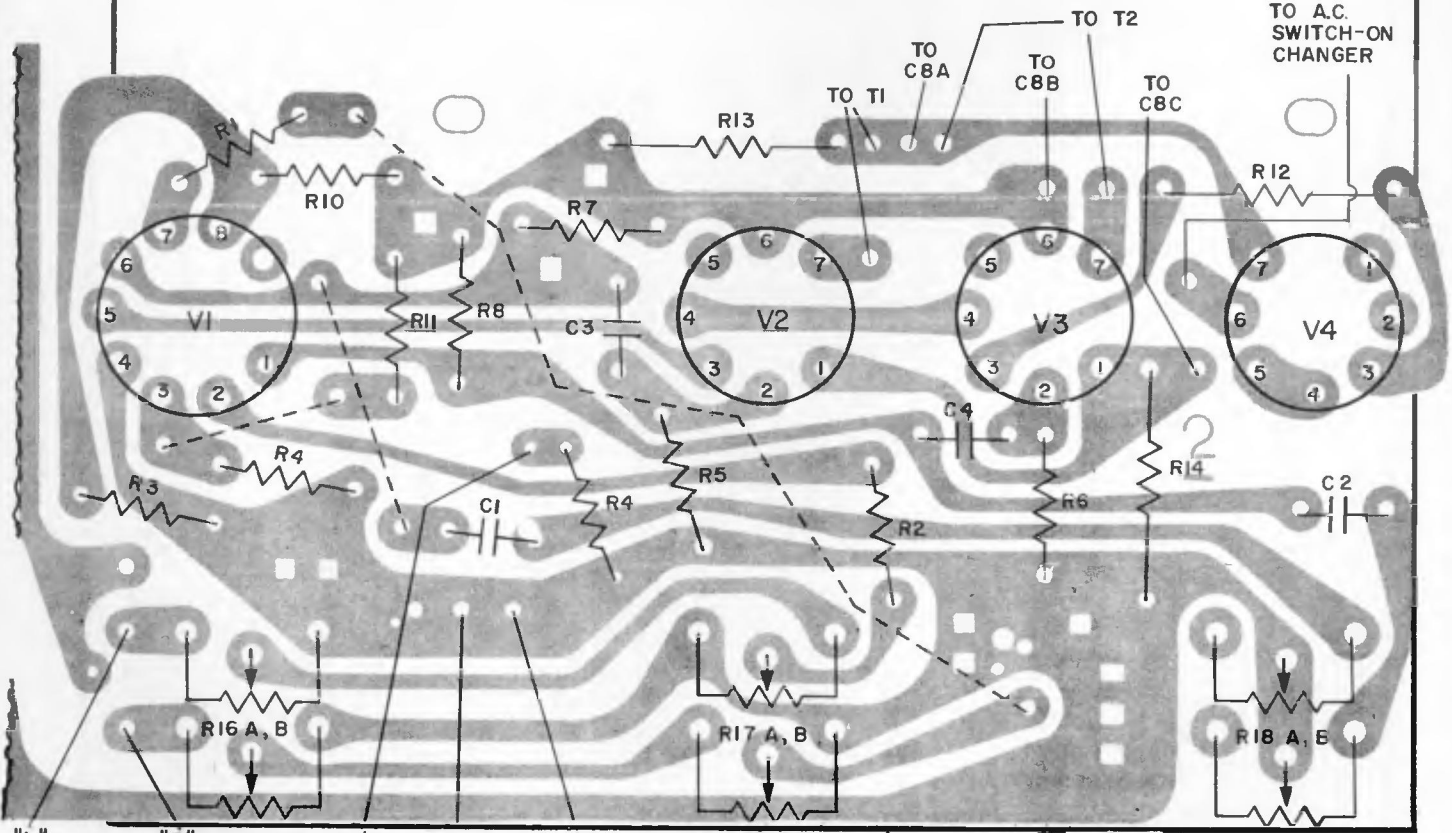
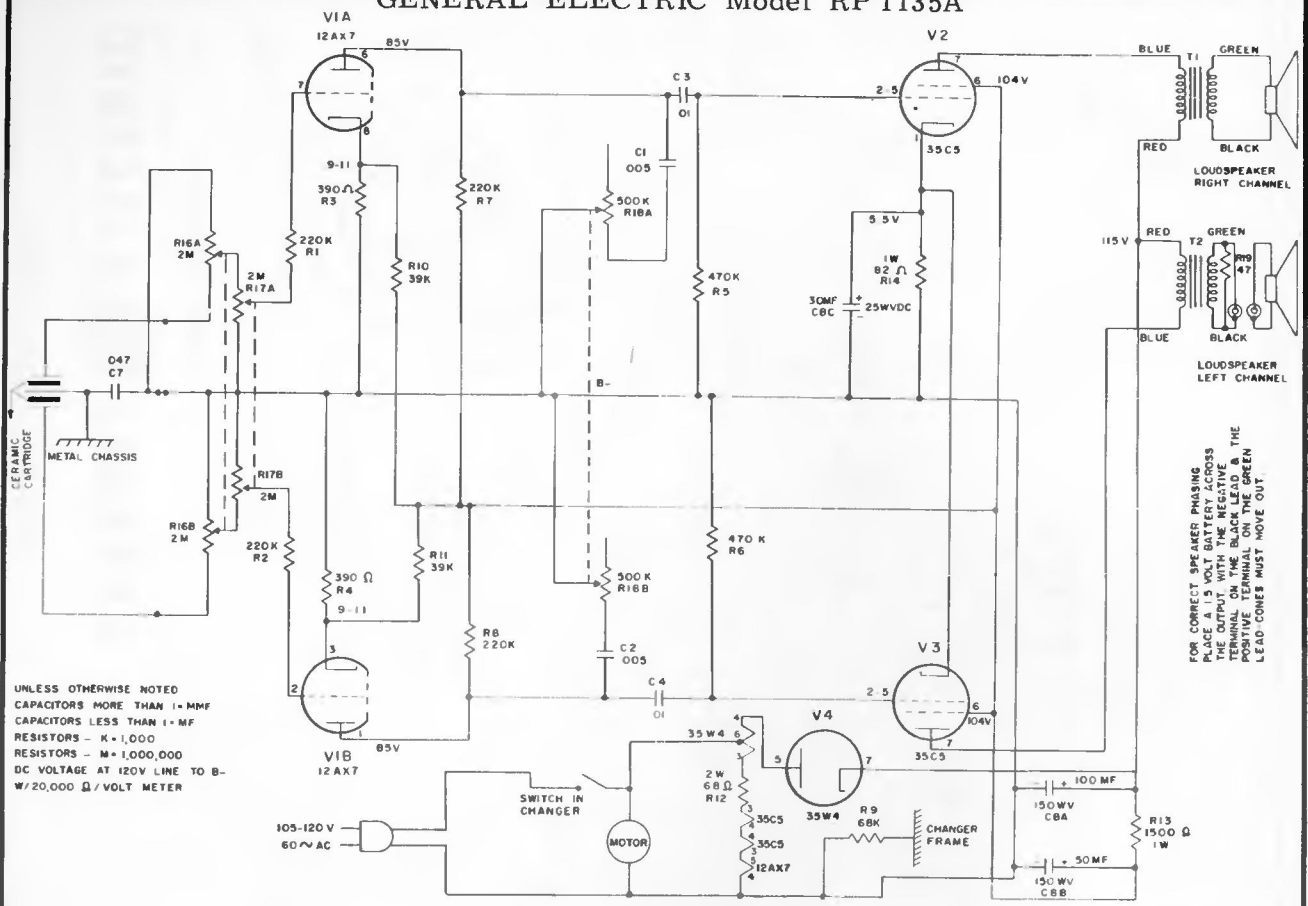
ALIGNMENT
 SET VOLUME CONTROL AT MAXIMUM
 CONNECT OUTPUT METER OR SCOPE ACROSS VOICE COIL
 INDUCTIVELY COUPLE SIGNAL GENERATOR TO RECEIVER

- NOTES**
 1- UNLESS OTHERWISE NOTED- CAPACITORS MORE THAN 10 MF CAPACITORS LESS THAN 10 MF RESISTORS ARE 1/2 WATT & K=1000
 2- VOLTAGE & CURRENT RELATIONS AVERAGE POSITIVE WITH RESPECT TO GROUND.
 3- SIMILAR APPROVED TRANSISTORS MAY BE USED.
 4- VOLTAGES SHOWN IN L.J. ARE FOR NPN TRANSISTORS IN TR6 & TR7.
 5- FOR PNP TRANSISTORS IN TR6 & TR7
 A- JUMPER C TO B
 B- R18 = 100Ω
 C- R18 = 5.6KΩ
 D- R19 = 5.6KΩ
 6- FOR NPN 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 7/2
 2N94-132 82K 220
 2N94-362 150K 220
 RS 3306 470

GENERAL ELECTRIC
 MODELS P9001A P9011A

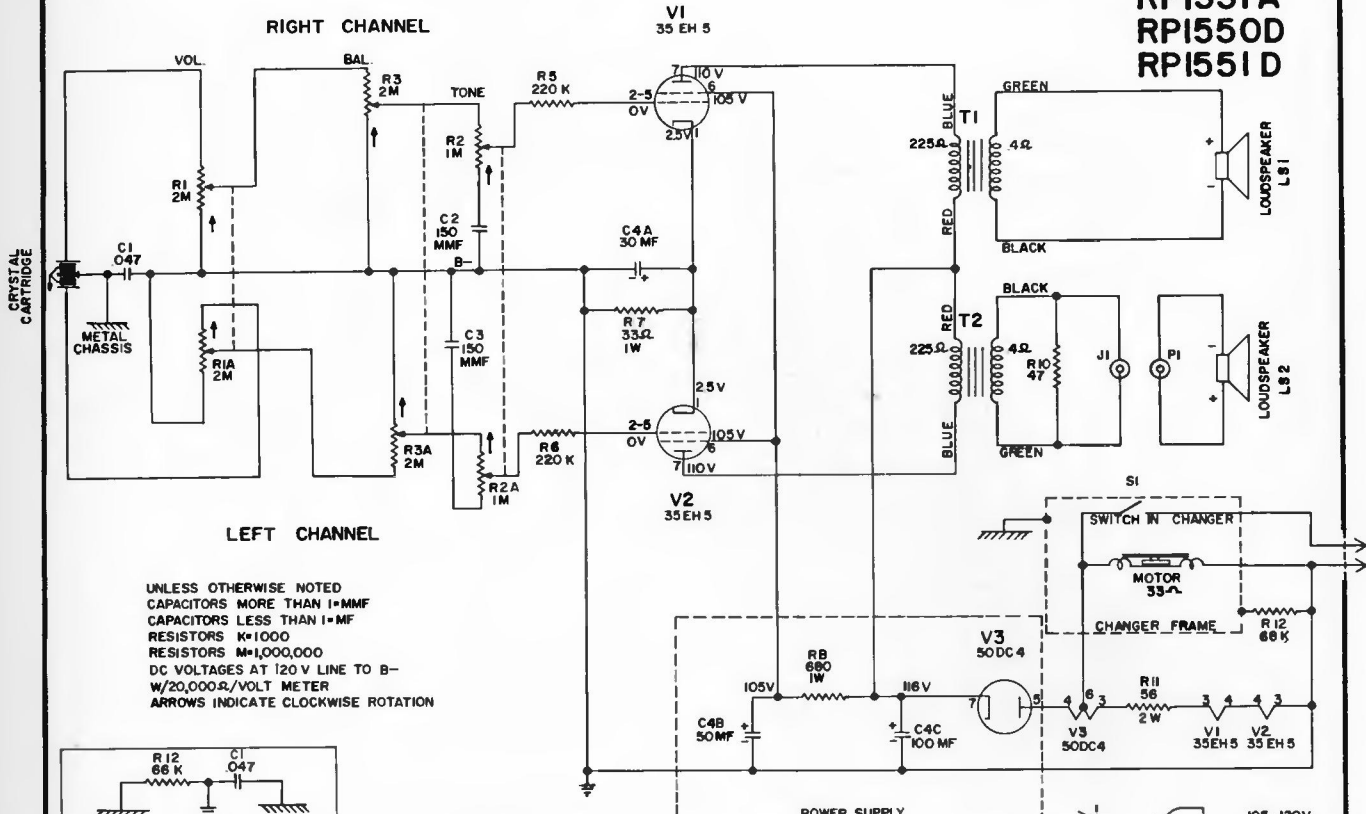
VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

GENERAL ELECTRIC Model RP 1135A

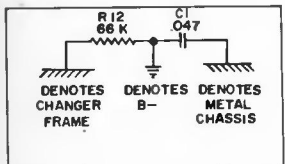


GENERAL ELECTRIC

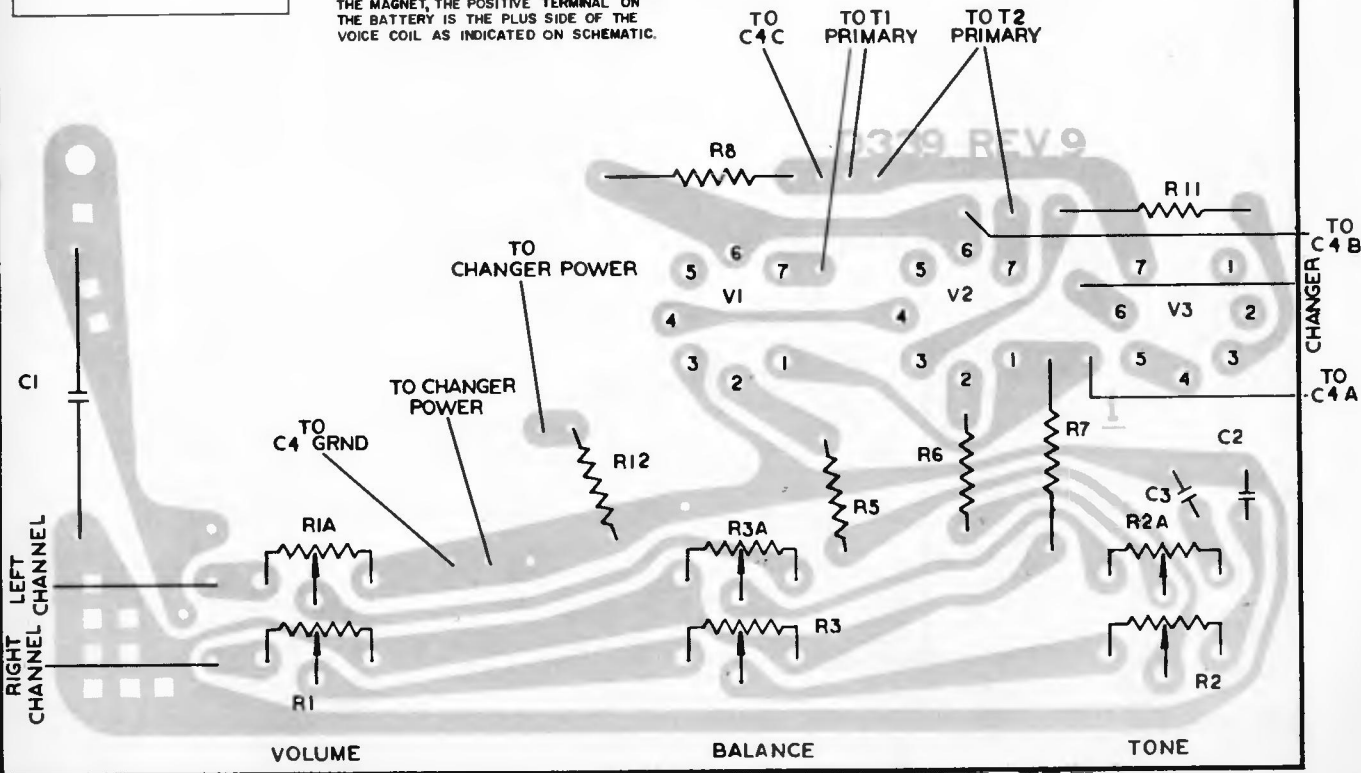
MODELS
 RPI550A
 RPI551A
 RPI550D
 RPI551D

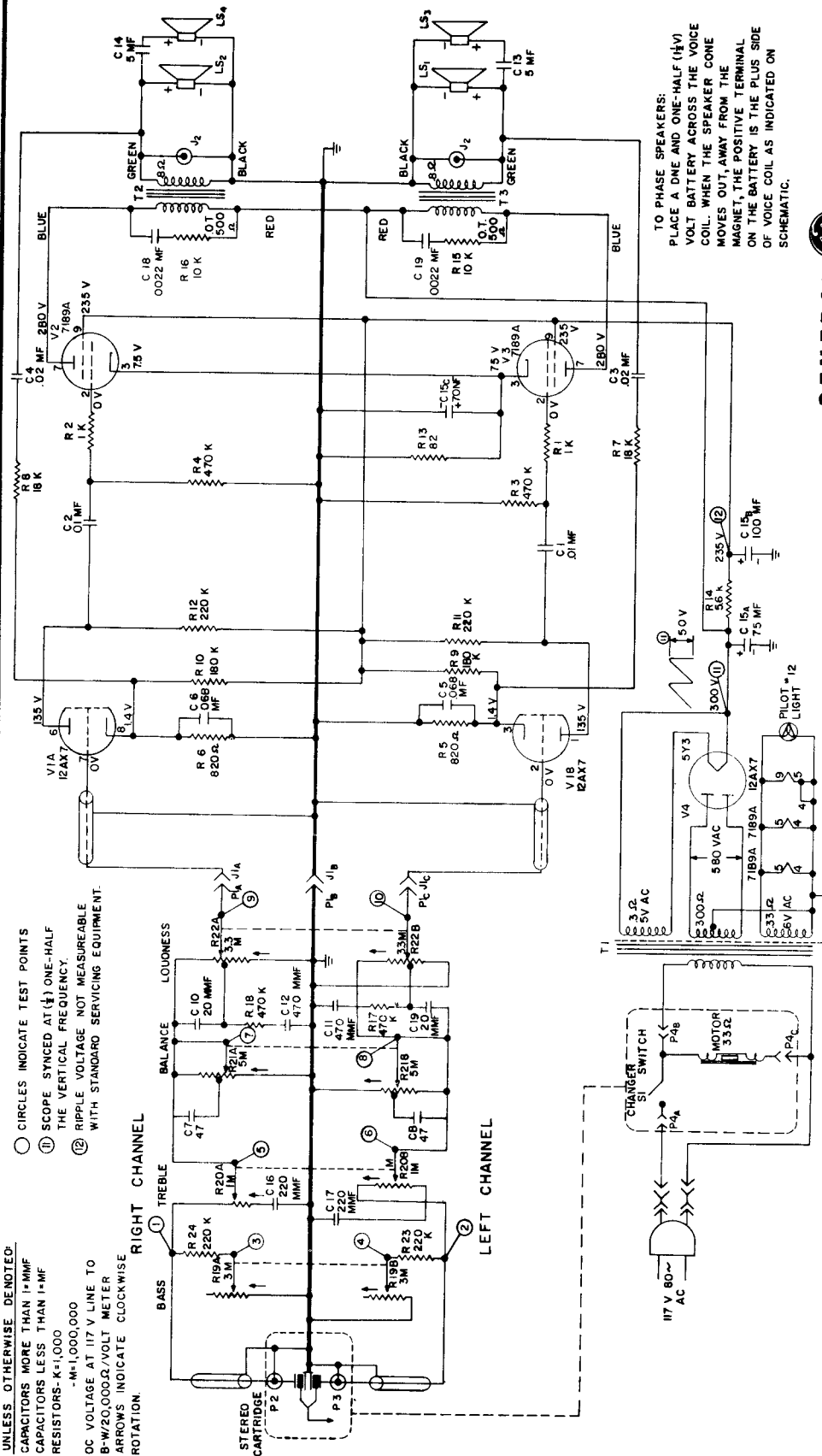


UNLESS OTHERWISE NOTED
 CAPACITORS MORE THAN 1-MMF
 CAPACITORS LESS THAN 1-MMF
 RESISTORS K=1000
 RESISTORS M=1,000,000
 DC VOLTAGES AT 120 V LINE TO B-
 W/20,000Ω/VOLT METER
 ARROWS INDICATE CLOCKWISE ROTATION



TO PHASE SPEAKERS
 PLACE A ONE AND ONE-HALF (1½-V) VOLT
 BATTERY ACROSS THE VOICE COIL WHEN
 THE SPEAKER CONE MOVES OUT, AWAY FROM
 THE MAGNET, THE POSITIVE TERMINAL ON
 THE BATTERY IS THE PLUS SIDE OF THE
 VOICE COIL AS INDICATED ON SCHEMATIC.





UNLESS OTHERWISE DENOTED:
 CAPACITORS MORE THAN 1-MMF
 CAPACITORS LESS THAN 1-MMF
 RESISTORS - K=1,000
 -M=1,000,000
 DC VOLTAGE AT 117 V LINE TO
 B-W/20,000Ω/VOLT METER
 ARROWS INDICATE CLOCKWISE
 ROTATION.

○ CIRCLES INDICATE TEST POINTS
 ① SCOPE SYNCED AT 1/4 ONE-HALF
 THE VERTICAL FREQUENCY.
 ② RIPPLE VOLTAGE NOT MEASURABLE
 WITH STANDARD SERVICING EQUIPMENT.

TO PHASE SPEAKERS:
 PLACE A ONE AND ONE-HALF (1½) VOLT BATTERY ACROSS THE VOICE COIL. WHEN THE SPEAKER CONE MOVES OUT, AWAY FROM THE MAGNET, THE POSITIVE TERMINAL ON THE BATTERY IS THE PLUS SIDE OF VOICE COIL AS INDICATED ON SCHEMATIC.

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.

TO REMOVE RECORD CHANGER

1. Remove the screws holding the back cover to the cabinet and remove the back cover.
2. Remove (pull down) the plastic power plug (AC2) and signal plugs from the changer.
3. Flip the two shipping screw clips on the changer to a vertical position.
4. Remove the changer.

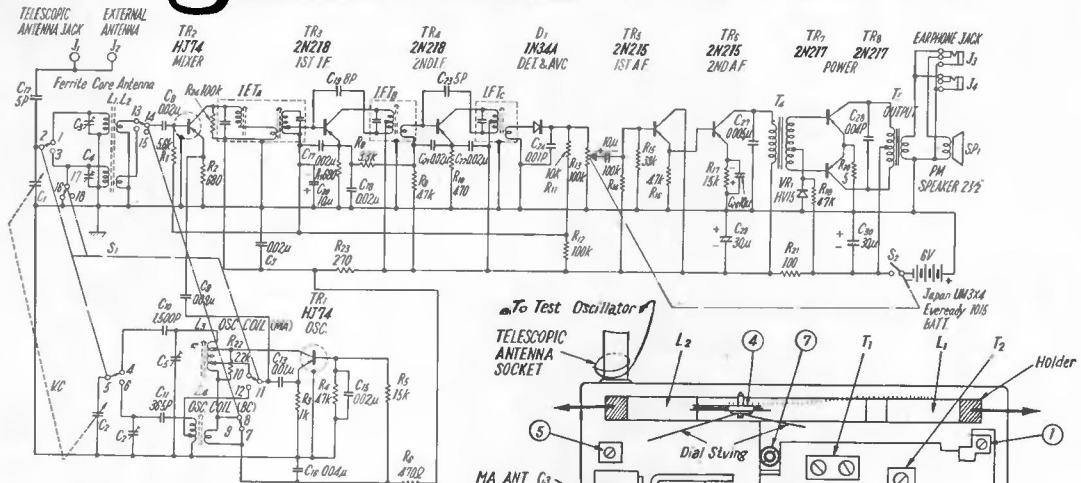
TO REMOVE CONTROL CHASSIS

1. Remove the knobs.
2. Follow step one as described in "To Remove Record Changer."
3. Remove the signal plugs from the changer and remove the lead dresser clamp holding the plugs.

TO REMOVE SPEAKERS

1. Follow step one as described in "To Remove Record Changer."
2. Unsolder and label all leads on the speakers to assure proper phasing of the speakers when reassembling.
3. Remove the 5/16 inch nuts holding the speaker and crossover capacitors.

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

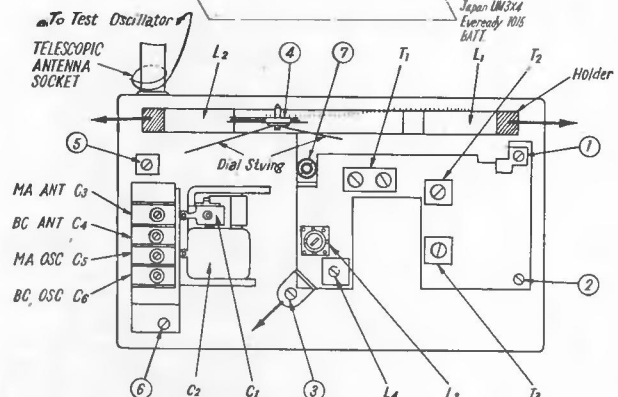
Adjustment of high frequency circuit (MA)

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	Receive MA 4 Mc	1.65 Mc	L1	
17	Repeat 15 & 16		Repeat 15 & 16	

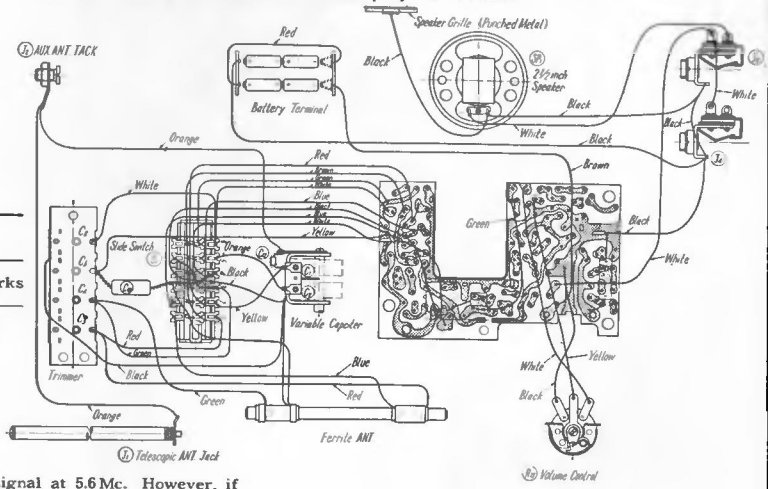
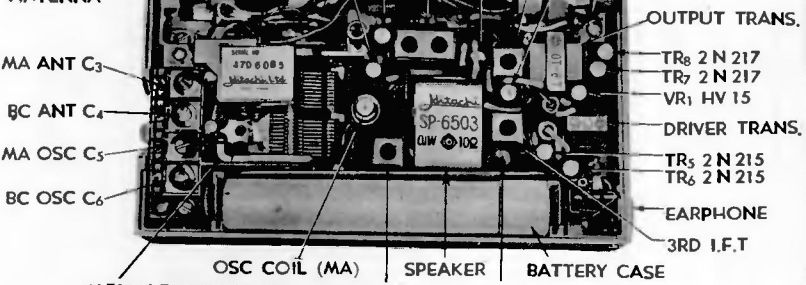
*1. When you adjust 12 & 15, watch image.

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.

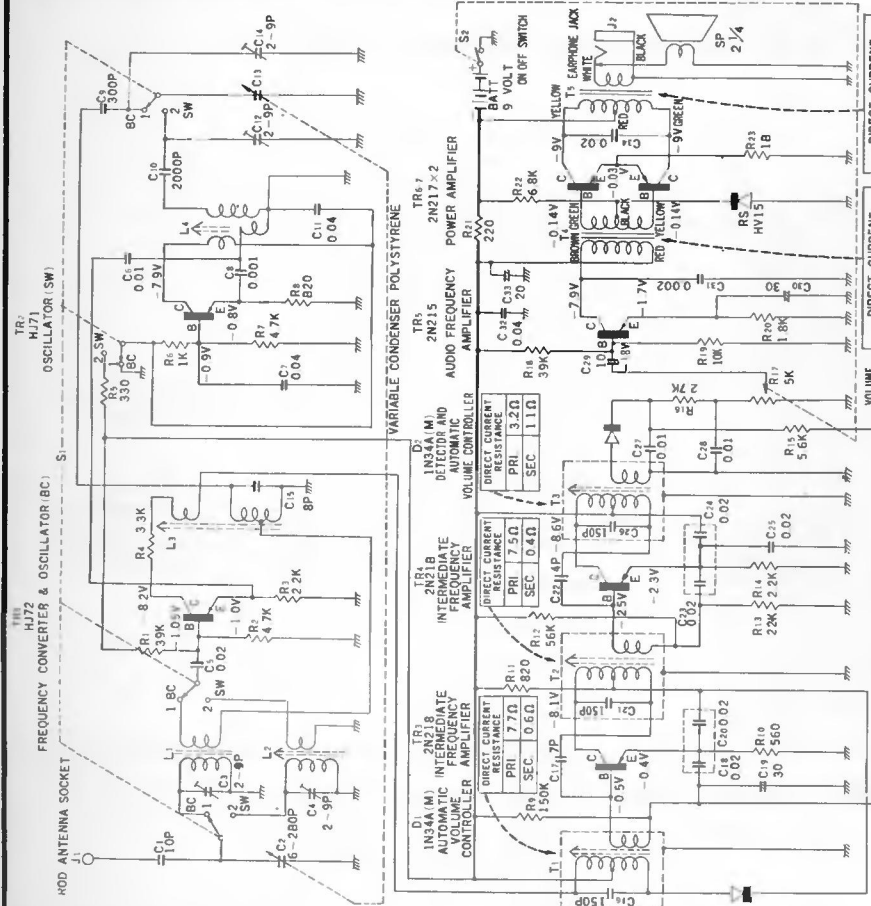


FERRITE ANTENNA



Hitachi, Ltd.

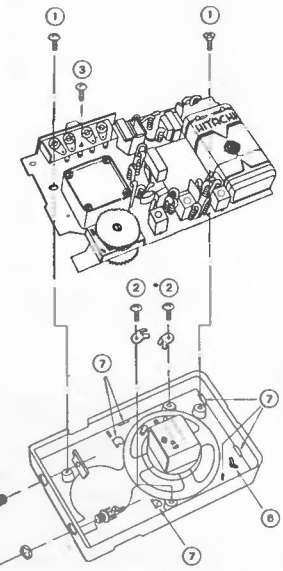
MODEL WH-761



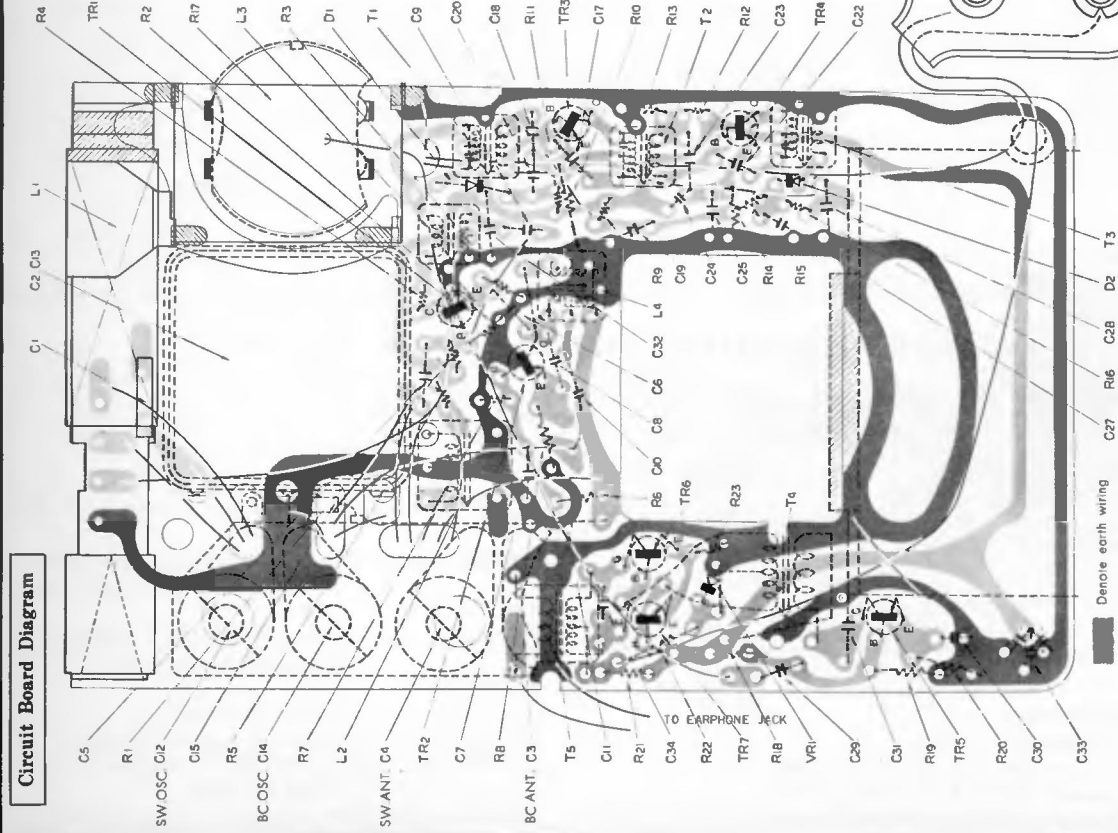
DIRECT CURRENT RESISTANCE	
PRI	RED - BROWN 90Ω
SEC	GREEN - RED 55Ω
DIRECT CURRENT RESISTANCE	
PRI	RED - BROWN 360Ω
SEC	YELLOW - BLACK 360Ω

DIRECT CURRENT RESISTANCE	
PRI	RED - BROWN 90Ω
SEC	GREEN - RED 55Ω
DIRECT CURRENT RESISTANCE	
PRI	RED - BROWN 360Ω
SEC	YELLOW - BLACK 360Ω

INTERMEDIATE FREQUENCY.....455 kc

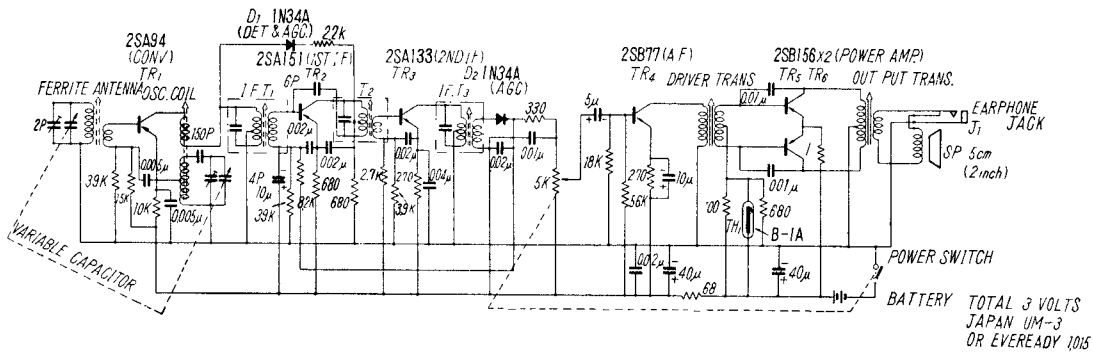


Receiver Assembly
BATTERY CONNECTOR



Hitachi, Ltd.
MODEL WH-761

Hitachi, Ltd. Model TH-660 Circuit Schematic Diagram

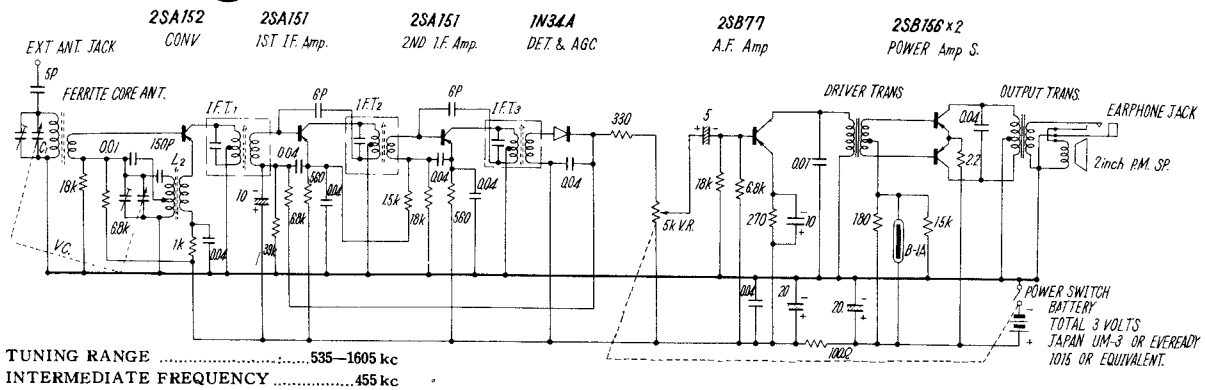


SPECIFICATIONS :

DIMENSIONS 2 $\frac{1}{4}$ " W x 3 $\frac{1}{2}$ " H x 1 $\frac{1}{2}$ " 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, 2SB156 x 2 (Push-pull Power Amp.)

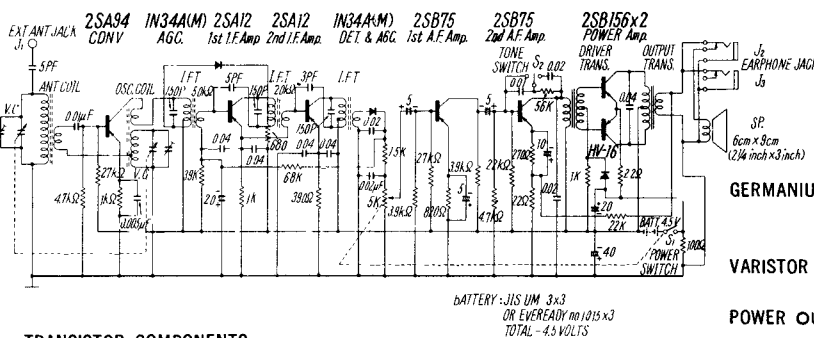
GERMANIUM DIODE Hitachi Crystal Diode. 1N34A (2nd Detector, and Automatic Volume Controller)
 THERMISTOR Hitachi Thermistor, B-1A (Temperature Compensator)
 POWER OUTPUT 100 mW (Undistorted)
 150mW (Maximum)
 LOUD SPEAKER 2 inch P. M. Speaker
 EL-214 can be plugged in.
RECOMMENDED BATTERIES EVEREADY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

Hitachi, Ltd. Model TH-661 Circuit Schematic Diagram



TUNING RANGE 535-1605 kc
 INTERMEDIATE FREQUENCY 455 kc

HITACHI 7-Transistor Portable Radio TH-759



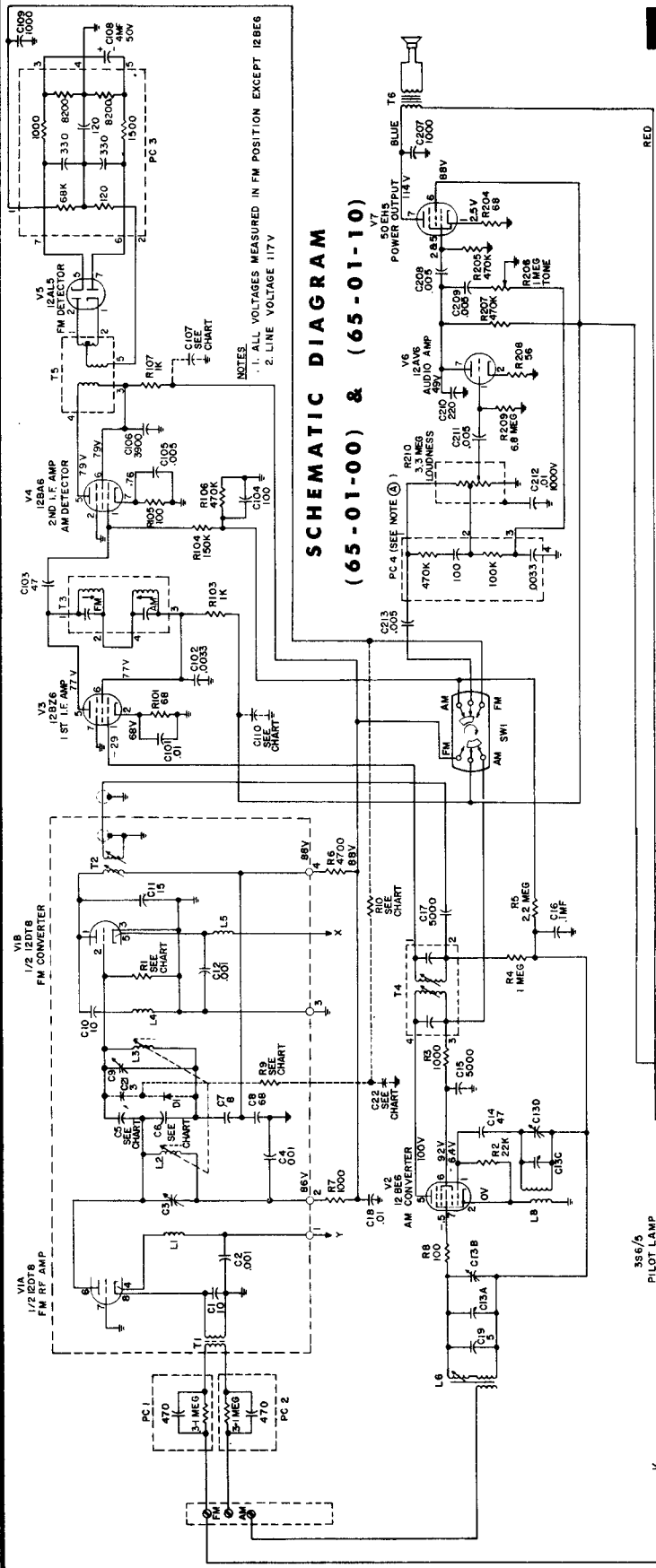
TRANSISTOR COMPONENTS :

Hitachi Transistor, 2SA 94 (MIX.)
 Hitachi Transistor, 2SA12 x 2, (I. F. Amp., 2-stage)
 Hitachi Transistor, 2SB75 x 2, (A. F. Amp., 2-stage)
 Hitachi Transistor, 2SB156 x 2, (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 $\frac{1}{4}$ inch P.M. Speaker.
 EARTHPHONE JACK Hitachi Magnetic Earphone, EL-219, can be plugged in.
RECOMMENDED BATTERY EVEREADY 1015 or its equivalent.

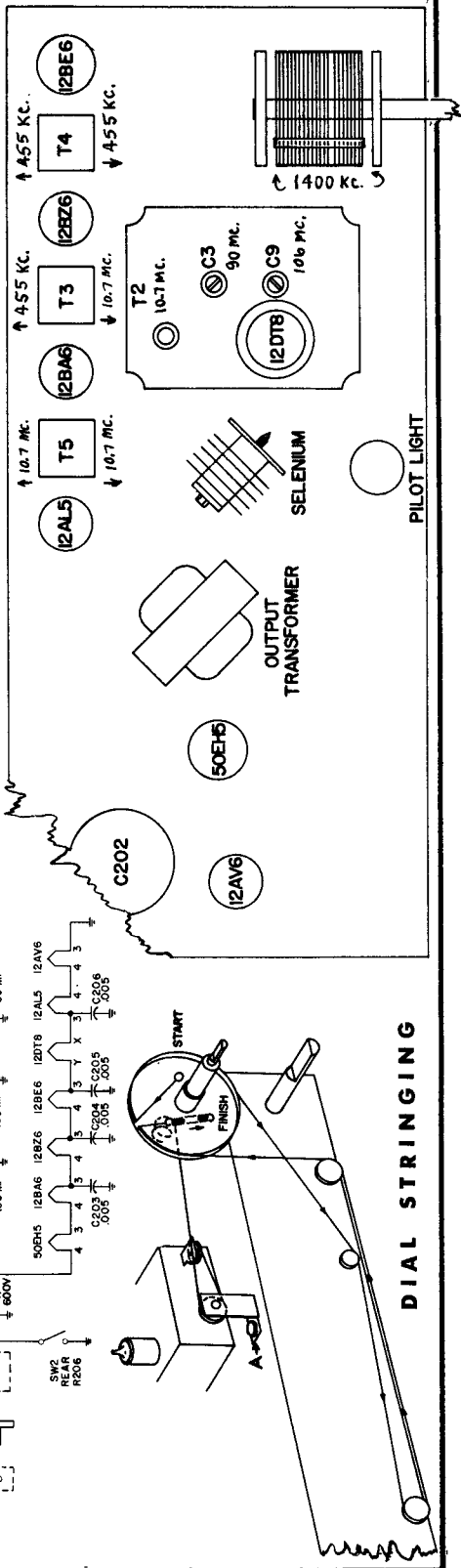
Magnavox

65 SERIES RADIO CHASSIS



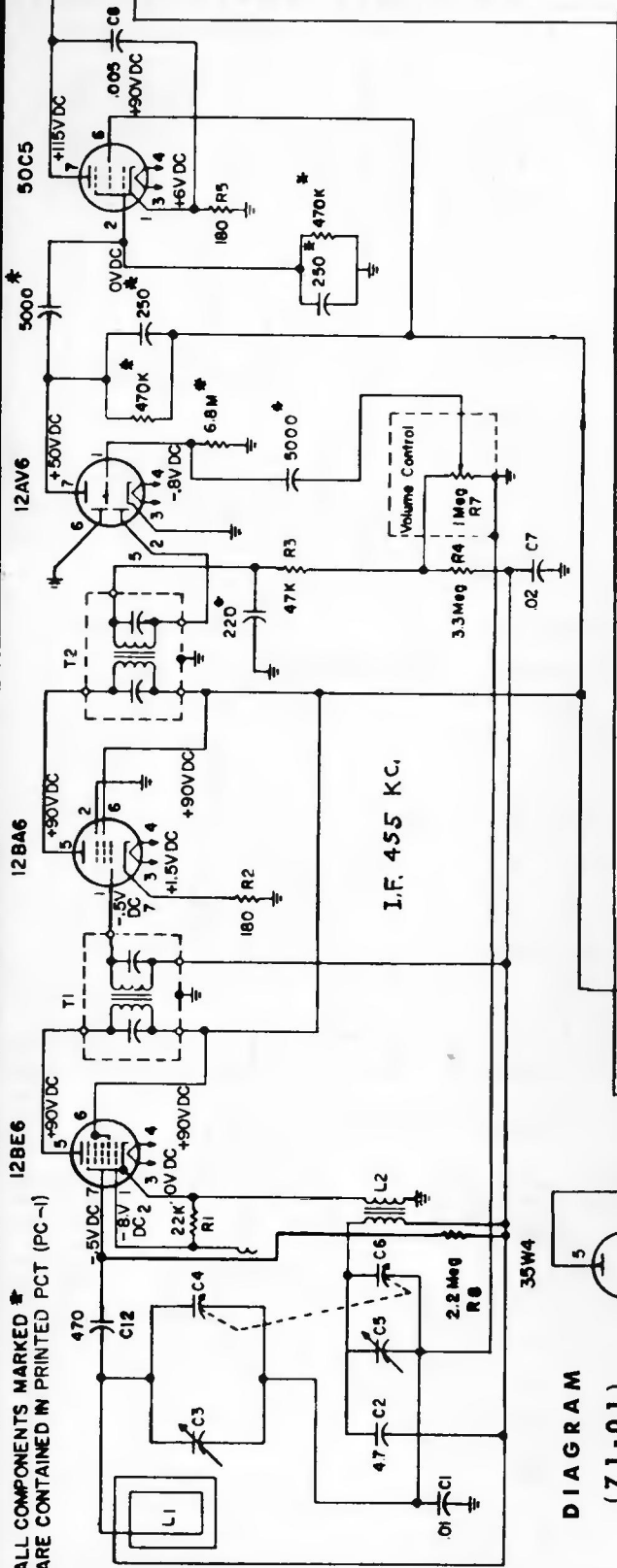
CHASSIS	R1	R9	R10	C5	C6	C21	D1	C10	C107	C22
65-01-00	1MEG	OMIT	20K	20	20	OMIT	OMIT	.005	.005	OMIT
65-01-10	220K	1MEG	15	15	3	USE	OMIT	OMIT	OMIT	.

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



Magnavox

71 SERIES RADIO CHASSIS



ALL COMPONENTS MARKED * ARE CONTAINED IN PRINTED PCT (PC-1)

I.F. 455 KC.

DIAGRAM (71-01)

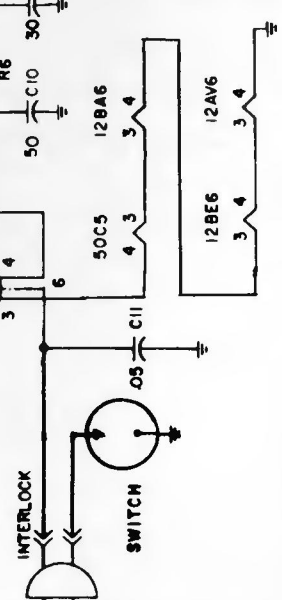
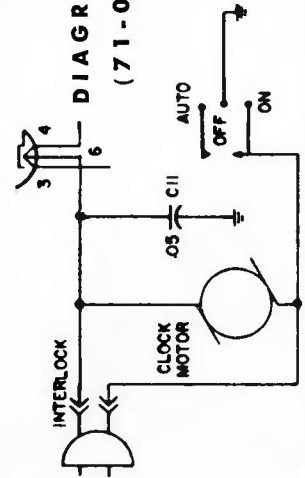
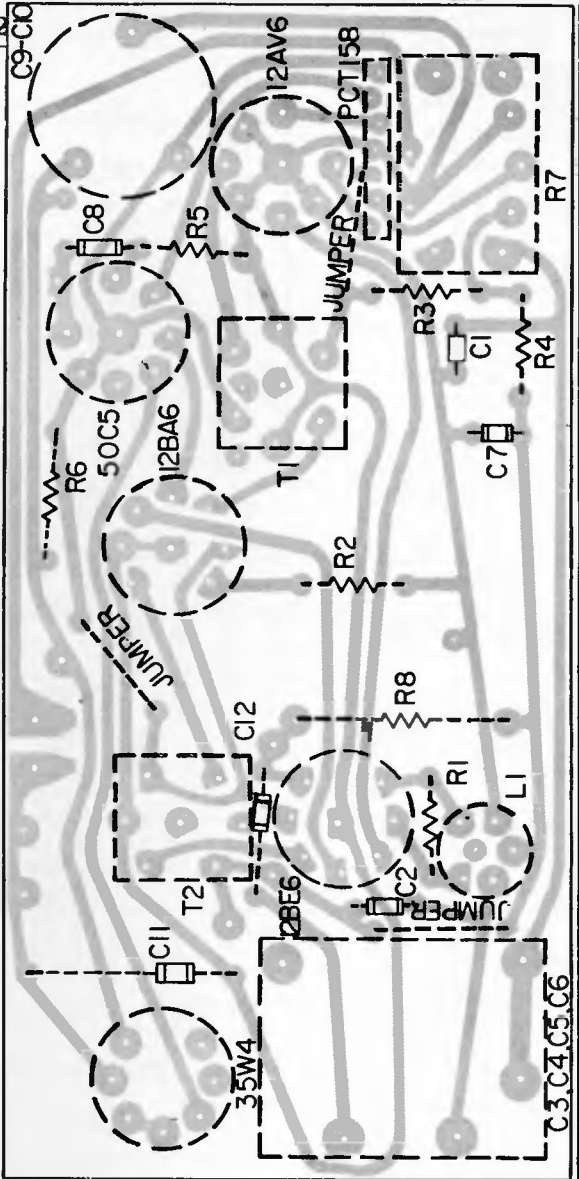


DIAGRAM (71-02)

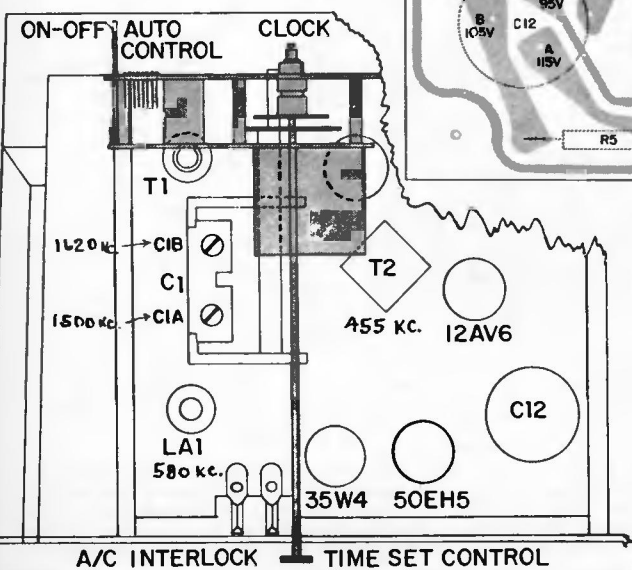
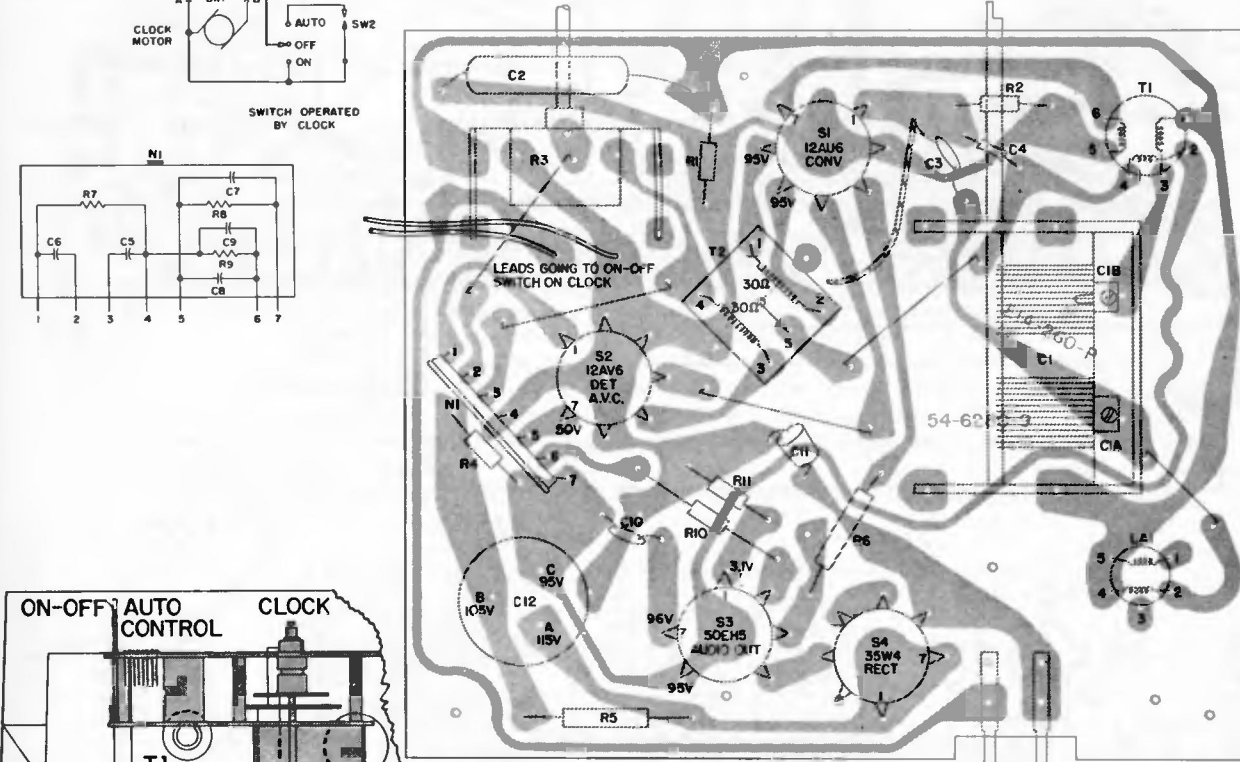
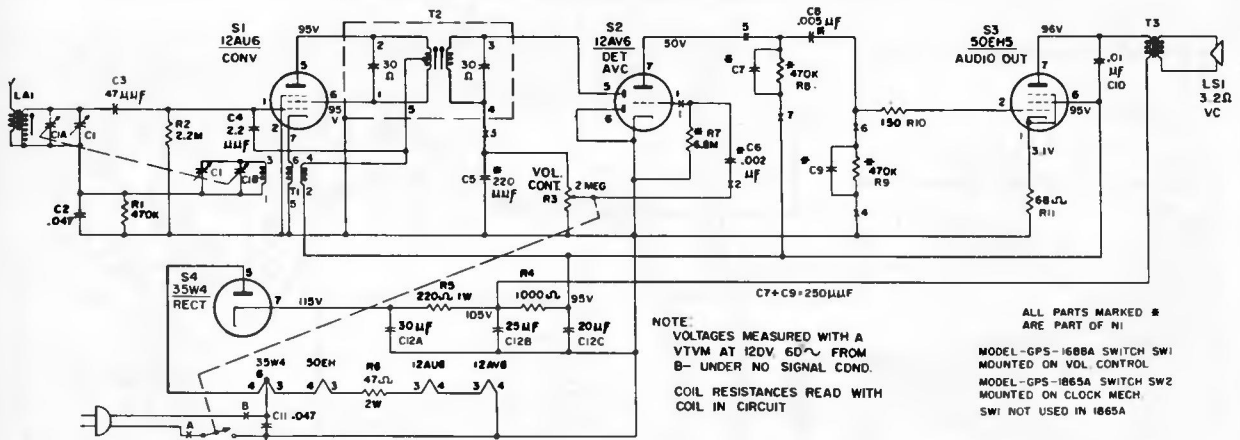


(VIEWED FROM WIRING SIDE OF BOARD)



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

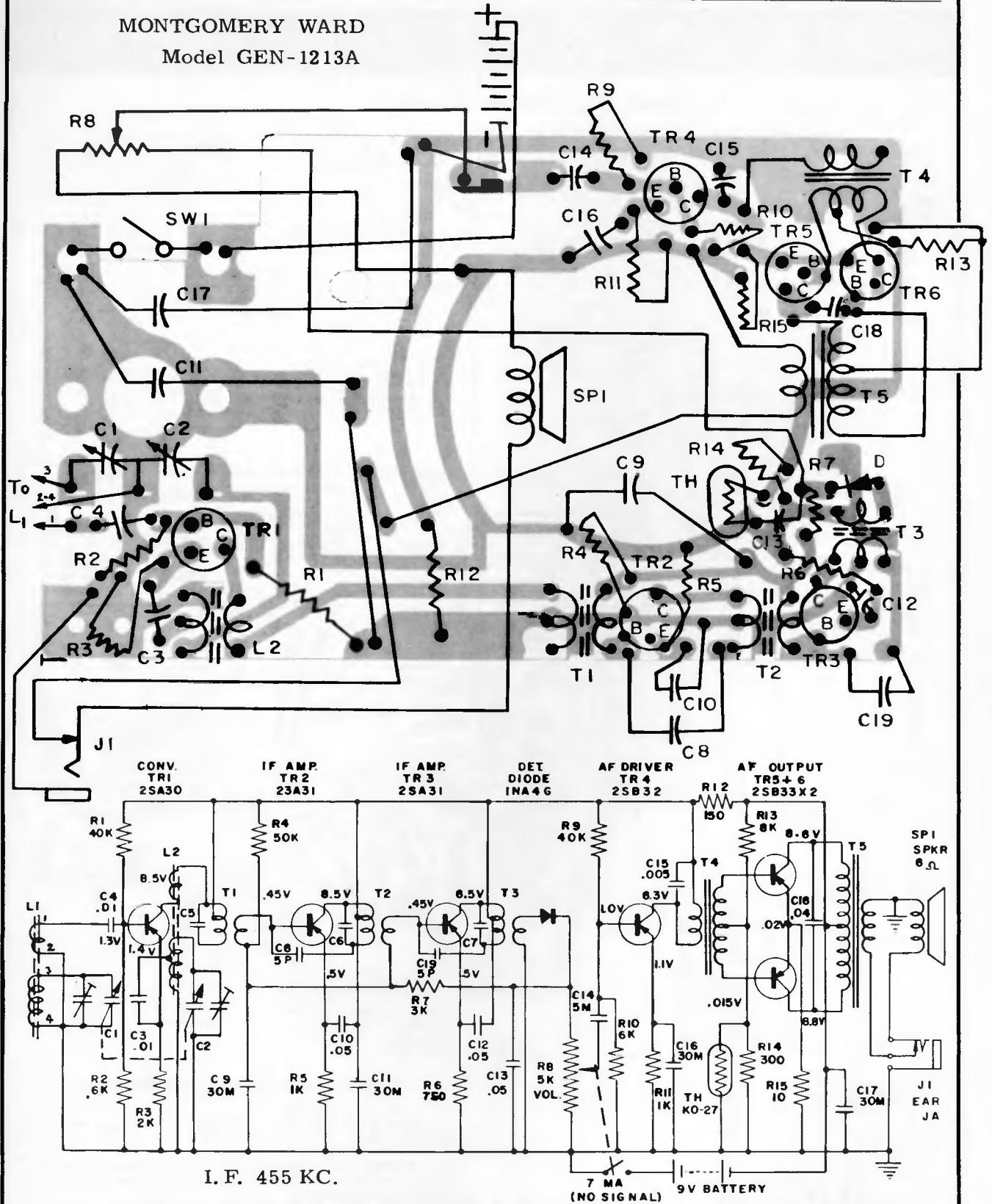
MODELS GPS-1688A AND GPS-1865A



CHASSIS-PANEL REMOVAL INFORMATION

1. Remove the two screws holding on the back, and remove the back.
2. Remove the screw holding the perma-circuit panel (screw located through the volume control frame into the boss of the cabinet).
3. Remove knobs -- (leads going to the output transformer do not have to be unsoldered, as they are long enough to permit panel removal).
4. Remove Perma-Circuit Panel.

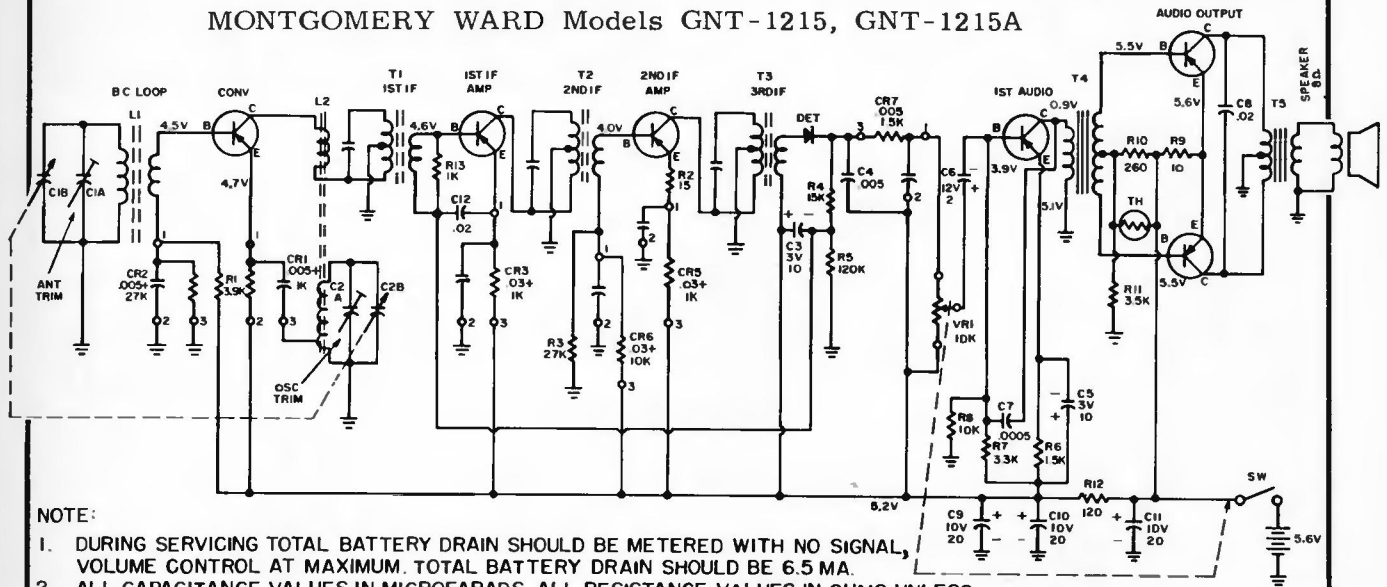
MONTGOMERY WARD
Model GEN-1213A



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.

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

MONTGOMERY WARD Models GNT-1215, GNT-1215A



NOTE:

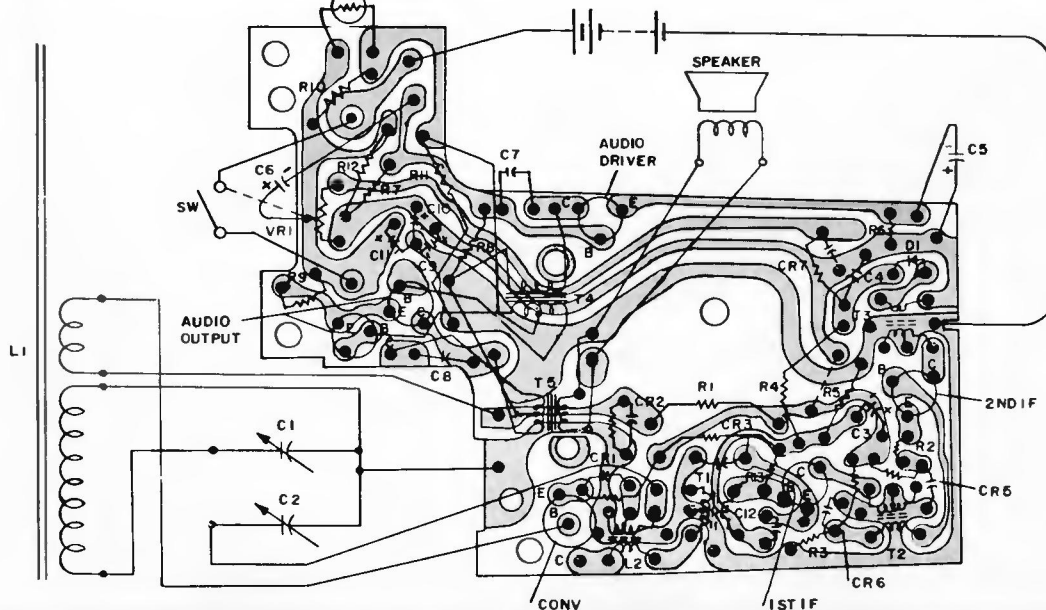
1. DURING SERVICING TOTAL BATTERY DRAIN SHOULD BE METERED WITH NO SIGNAL, VOLUME CONTROL AT MAXIMUM. TOTAL BATTERY DRAIN SHOULD BE 6.5 MA.
2. ALL CAPACITANCE VALUES IN MICROFARADS. ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
3. VOLTAGE MEASUREMENTS MADE WITH A V.T.V.M FROM POINTS INDICATED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

I. F. 455 KC.

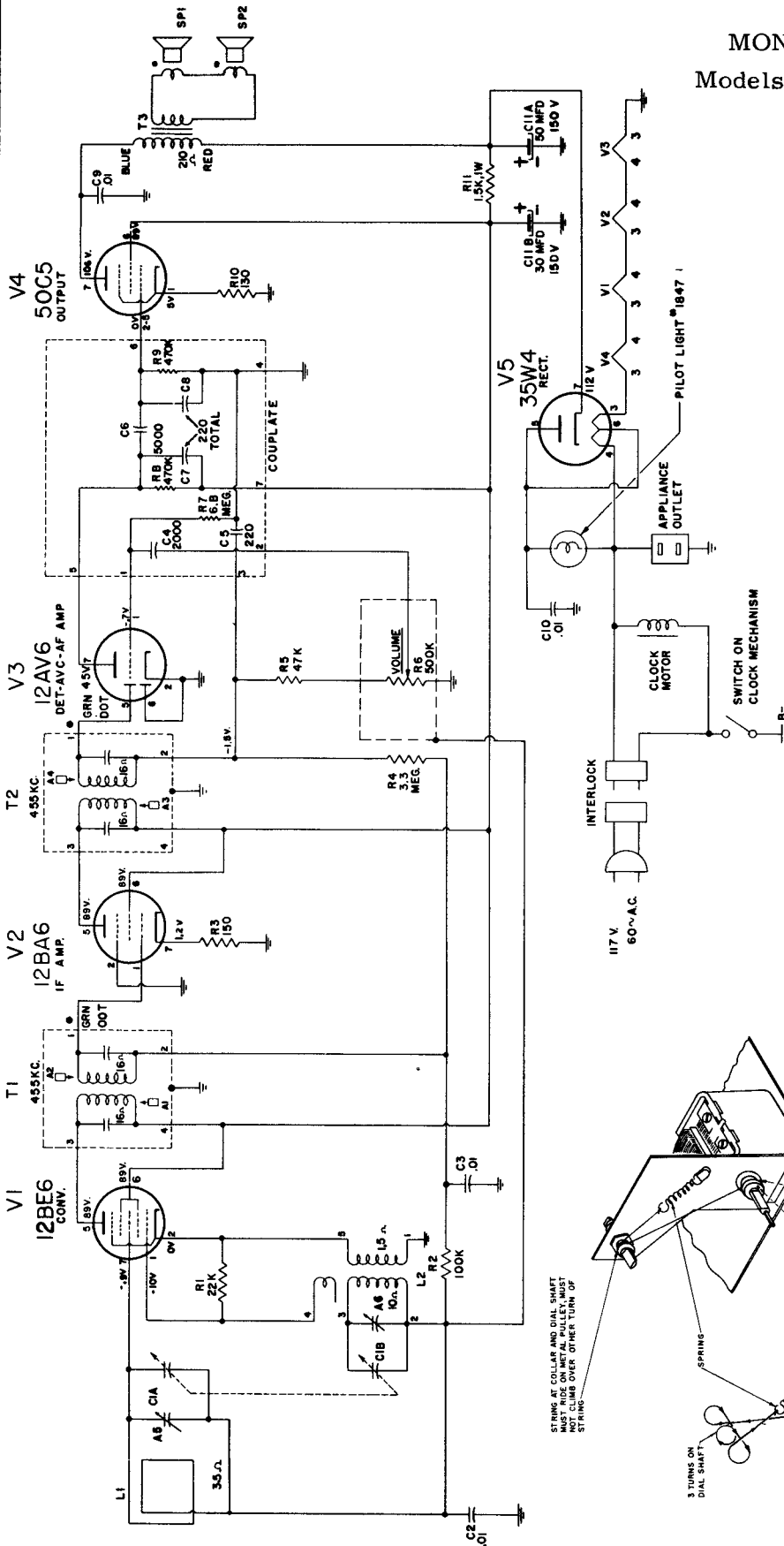
To check for a circuit defect which would cause excessive battery drain, an overall current measurement and supplementary voltage measurement should be made.

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 30MA 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 effect IF alignment.

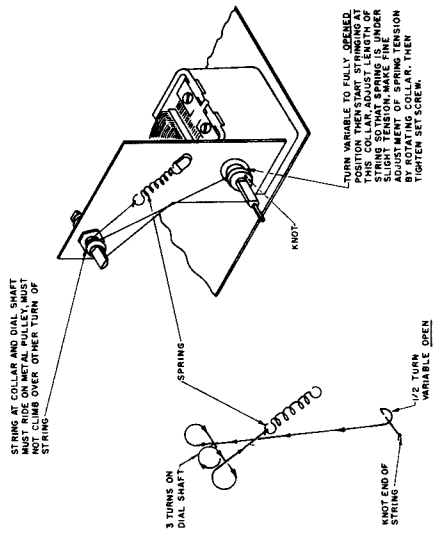
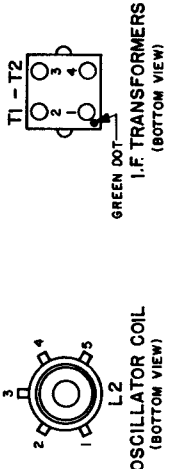
Do not short across the base and collector terminals of the transistors while the radio is operating, as permanent damage to the transistor may result.



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; ±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. TOLERANCE ±0.5%, VOLTAGE RATING, DISCS 800V UNLESS OTHERWISE SPECIFIED.



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.

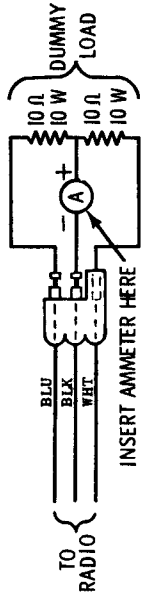
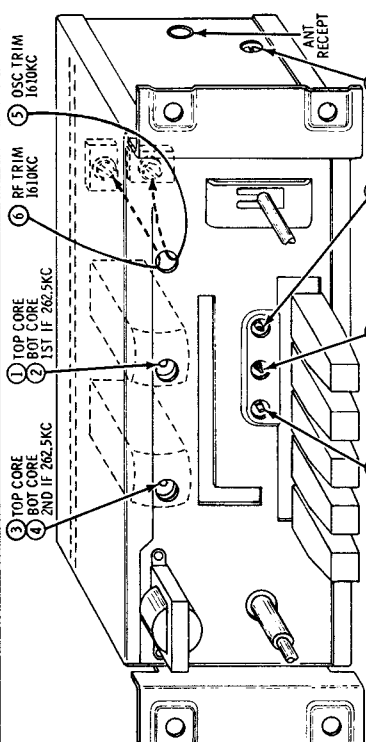
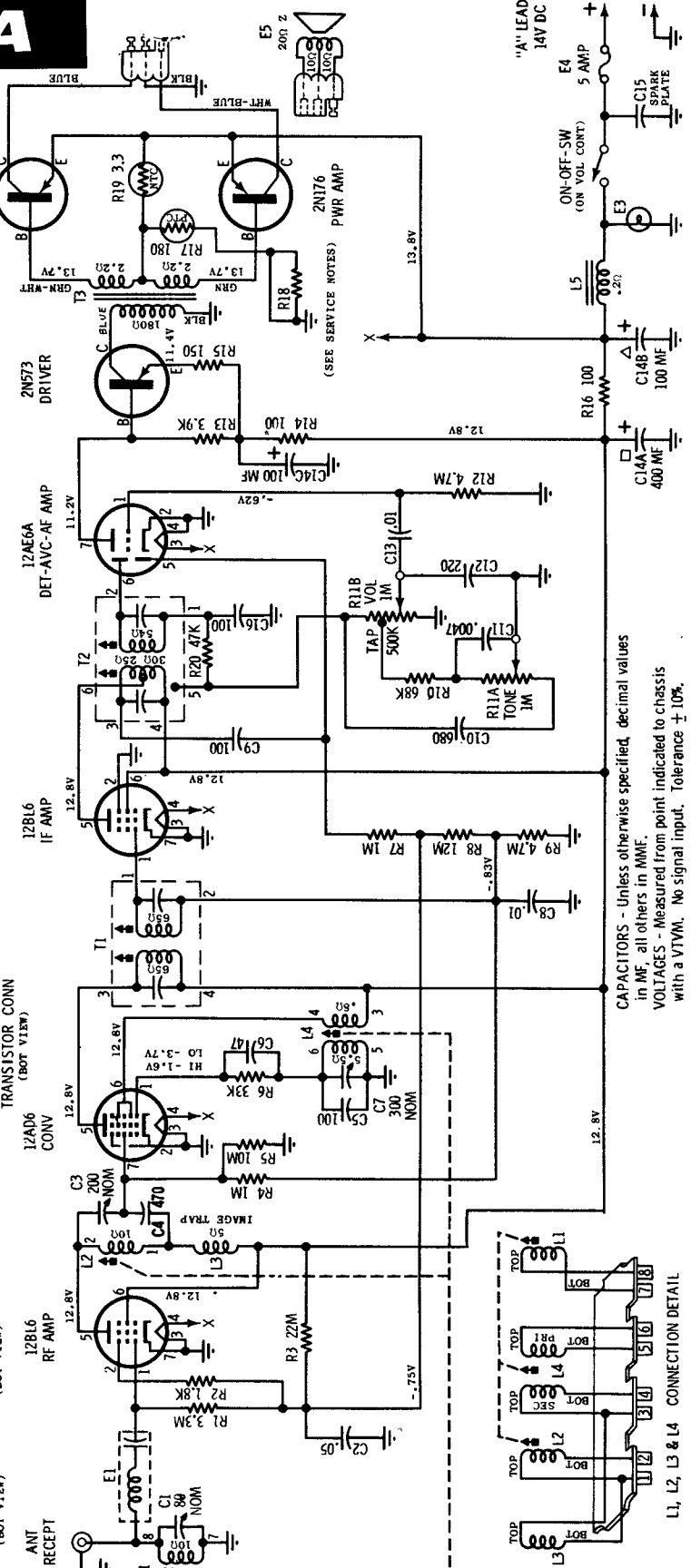
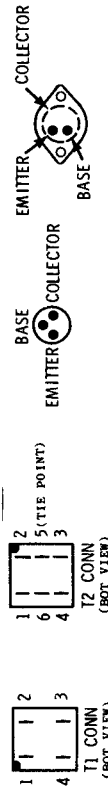


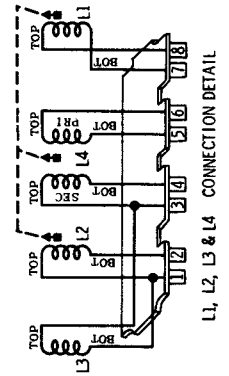
ILLUSTRATION - ADJUSTING TRANSISTOR CURRENT OR OPERATING SET WITHOUT SPEAKER



ALIGNMENT POINT LOCATION DETAIL



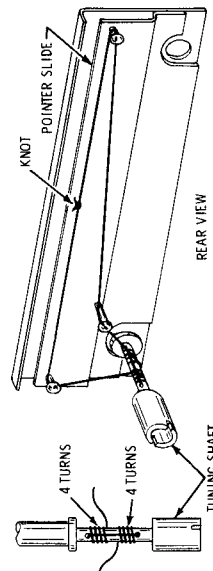
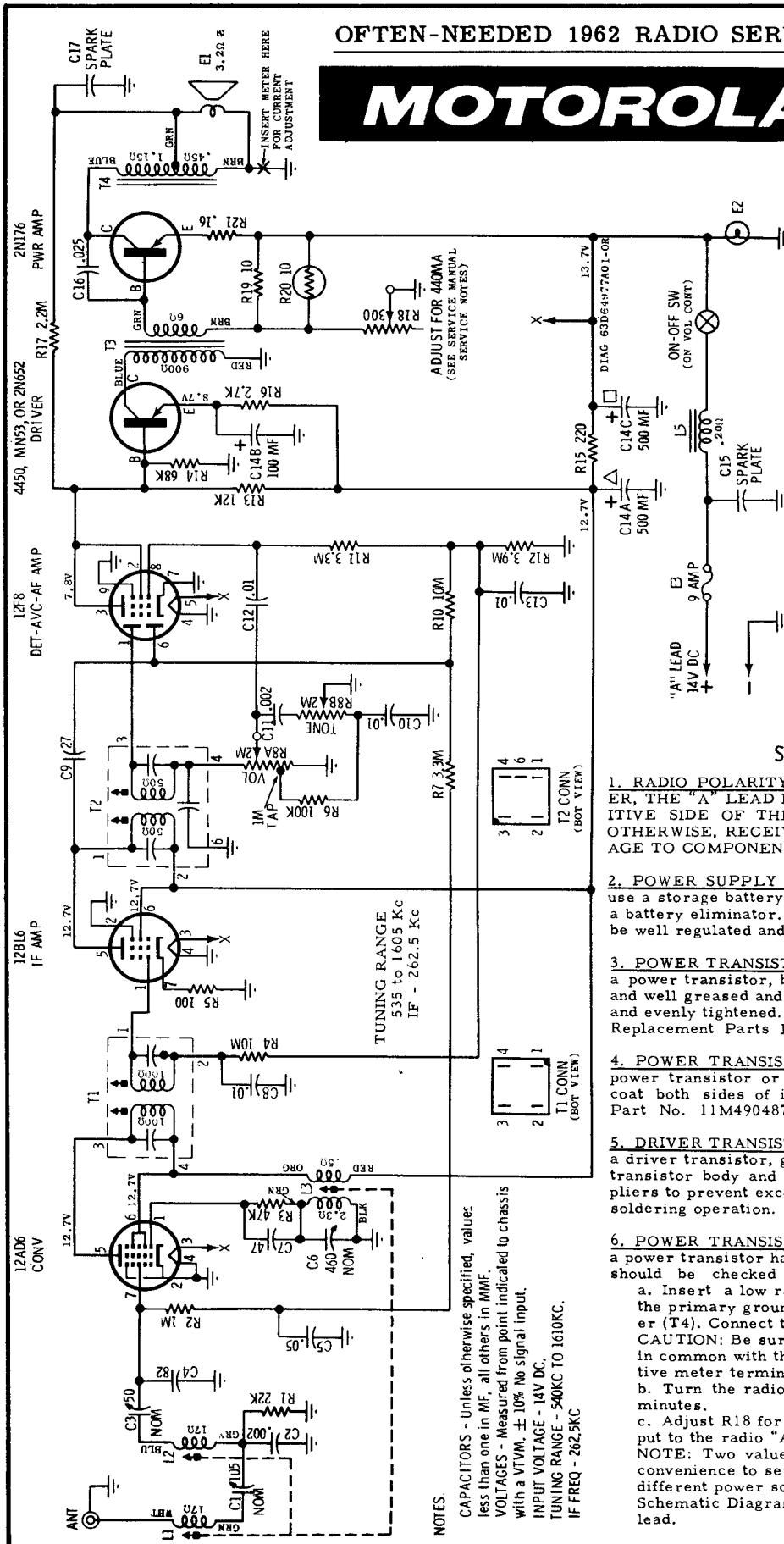
CAPACITORS - Unless otherwise specified, decimal values in MF, all others in MME.
VOLTAGES - Measured from point indicated to chassis with a VTVM. No signal input. Tolerance $\pm 10\%$.



L1, L2, L3 & L4 CONNECTION 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

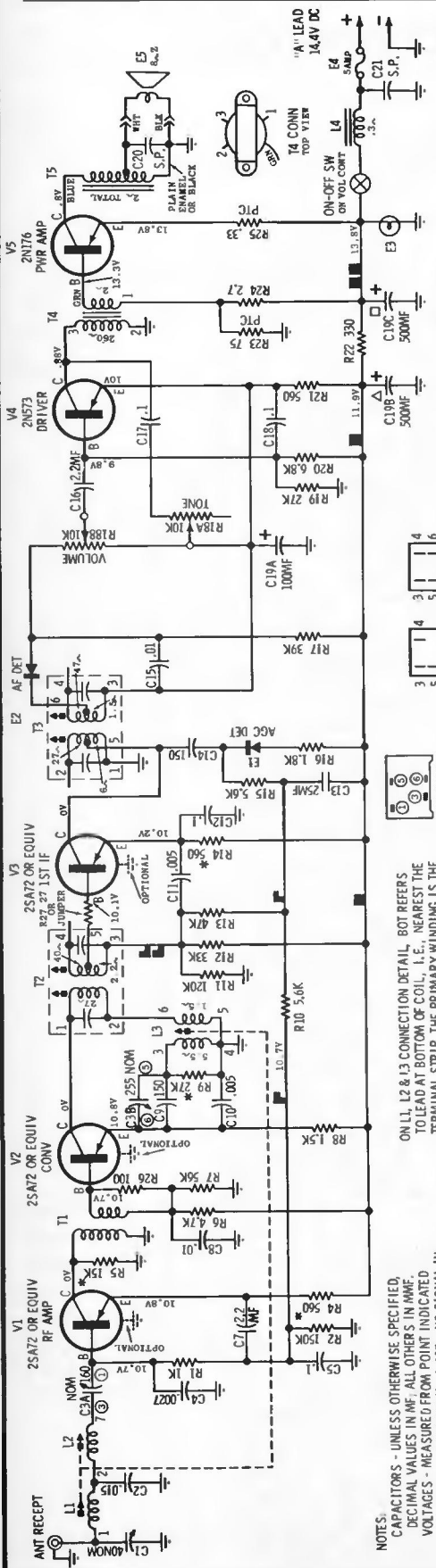
SERVICE NOTES

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.

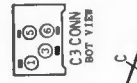
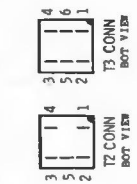
NOTES.
CAPACITORS - Unless otherwise specified, values less than one in MF, all others in MMF.
VOLTAGES - Measured from point indicated to chassis with a VTVM. $\pm 10\%$ No signal input.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540KC TO 1610KC.
IF FREQ - 262.5KC

MOTOROLA

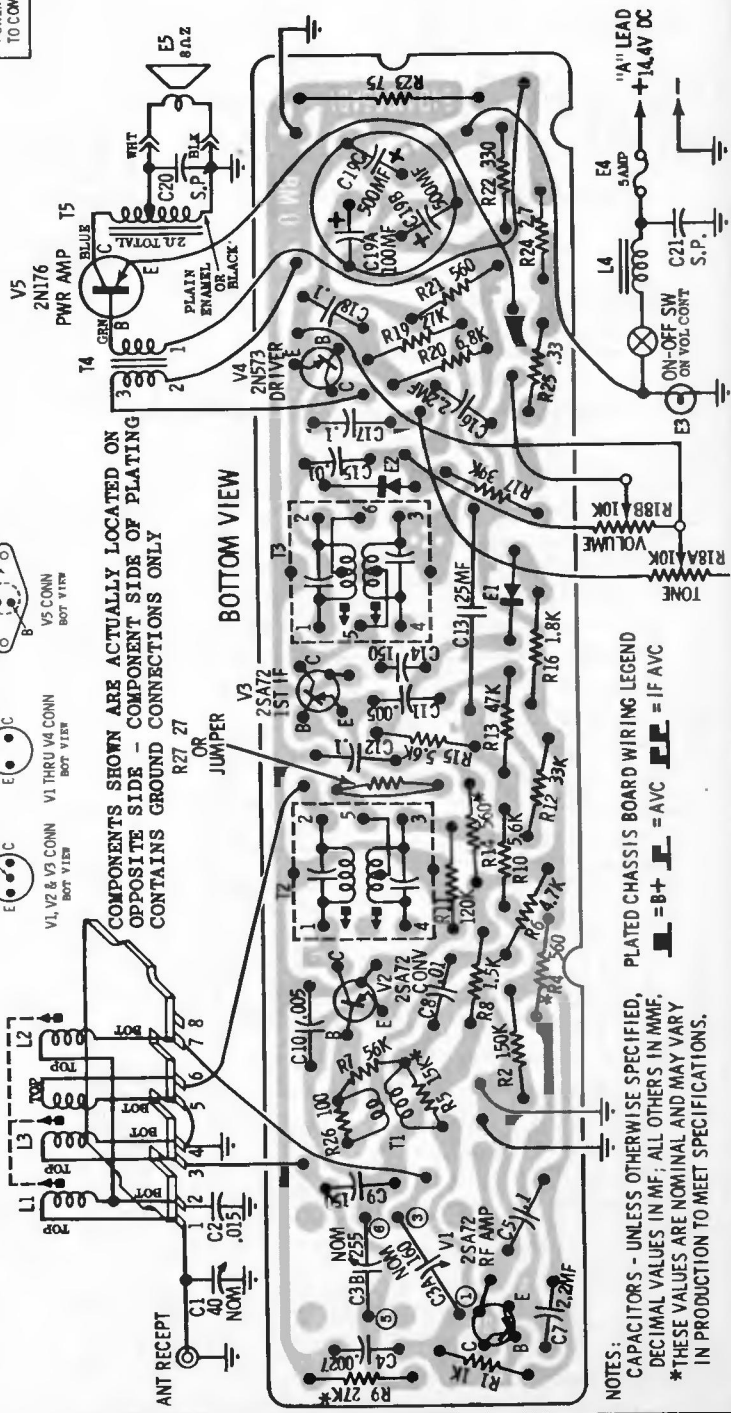
auto radio
MOTOROLA 2TMXD
RENAULT 5555



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 - 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 - 540 KC TO 1610 KC.
IF FREQ. - 262.5 KC.

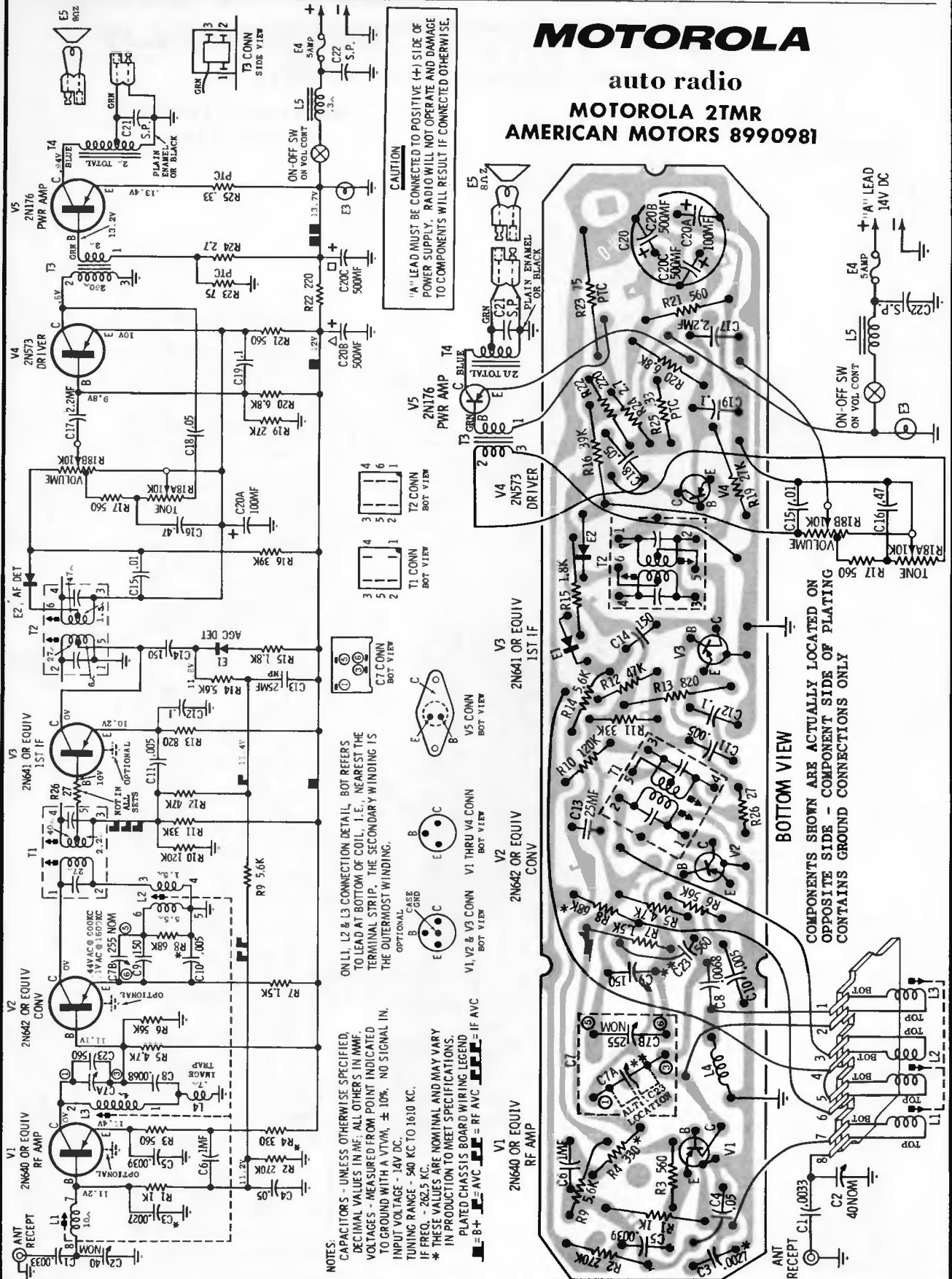


COMPONENTS SHOWN ARE ACTUALLY LOCATED ON OPPOSITE SIDE - COMPONENT SIDE OF PLATING CONTAINS GROUND CONNECTIONS ONLY

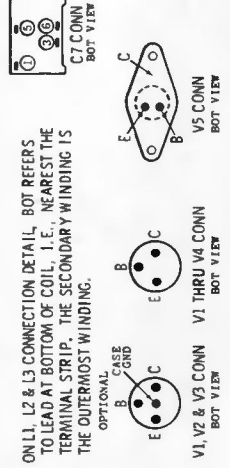
NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF, ALL OTHERS IN MMF.
* THESE VALUES ARE NOMINAL AND MAY VARY IN PRODUCTION TO MEET SPECIFICATIONS.
PLATED CHASSIS BOARD WIRING LEGEND
= B+ = AVC = IF AVC

MOTOROLA

auto radio
MOTOROLA 2TMR
AMERICAN MOTORS 8990981



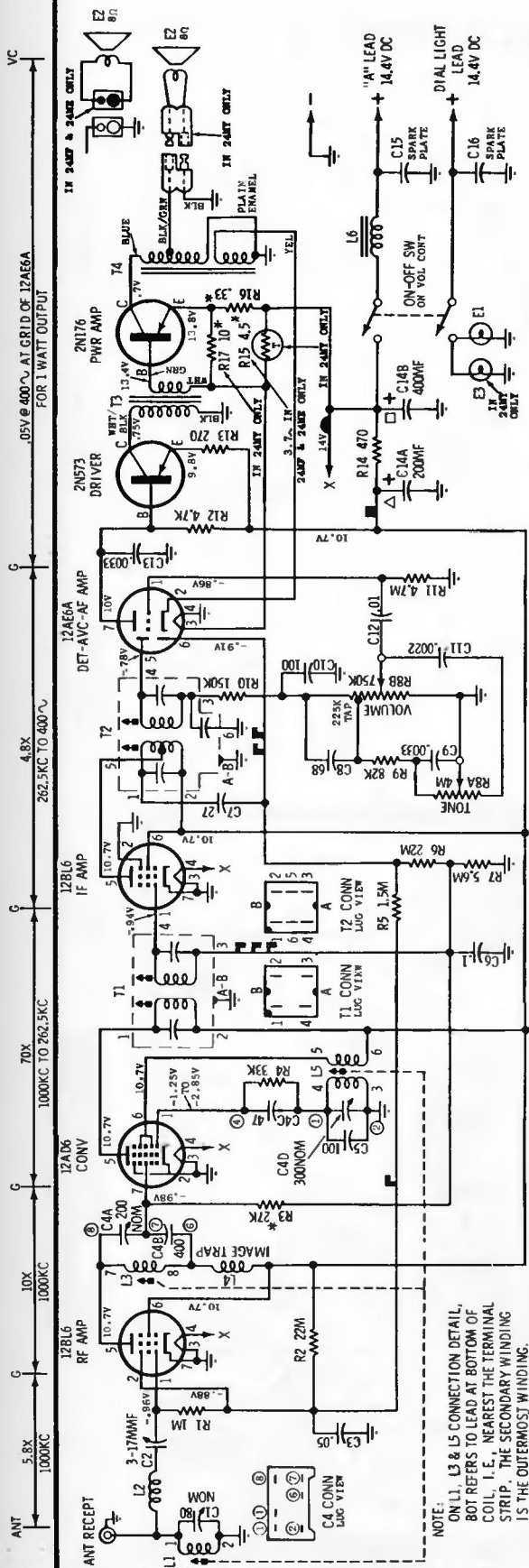
CAUTION
 "A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.



NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF. VOLTAGES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM, ± 10%, NO SIGNAL IN. INPUT VOLTAGE - 14V DC. TUNING RANGE - 540 KC TO 1610 KC. IF FREQ. - 262.5 KC. THESE VALUES ARE NOMINAL AND MAY VARY IN PRODUCTION TO MEET SPECIFICATIONS.

PLATED CHASSIS BOARD-WIRING LEGEND:
 ■ = B+ □ = AVC ▨ = RF AVC ▩ = IF AVC

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

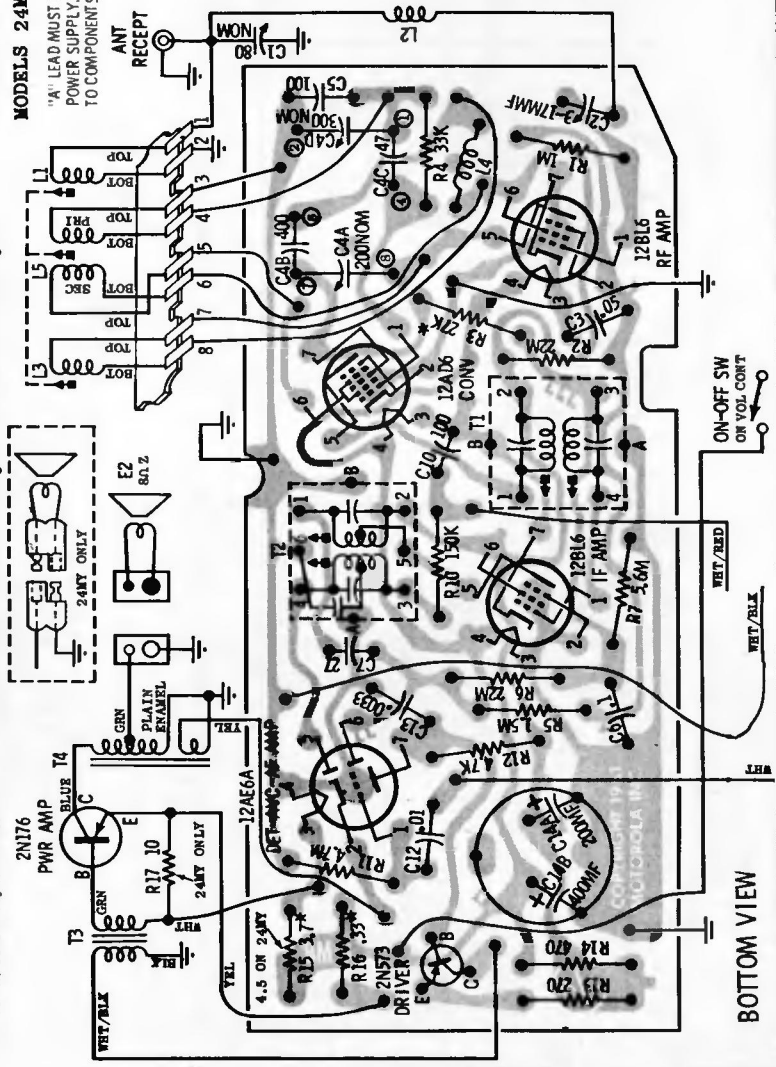


MODELS 24ME, 24MF & 24MY SCHEMATIC DIAGRAM

"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
⊥ = RF AVC **⊥⊥** = AVC
⊥⊥⊥ = IF AVC

NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF. VOLTAGES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM, ± 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.

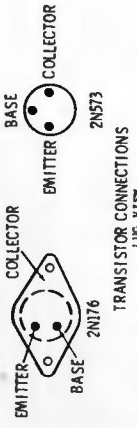


MOTOROLA

auto radio

- MOTOROLA**
- 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.

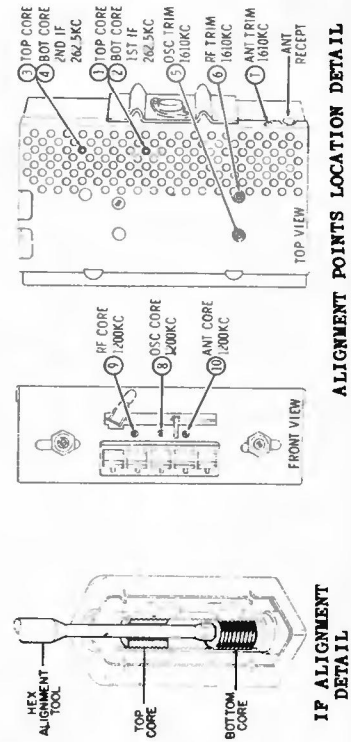
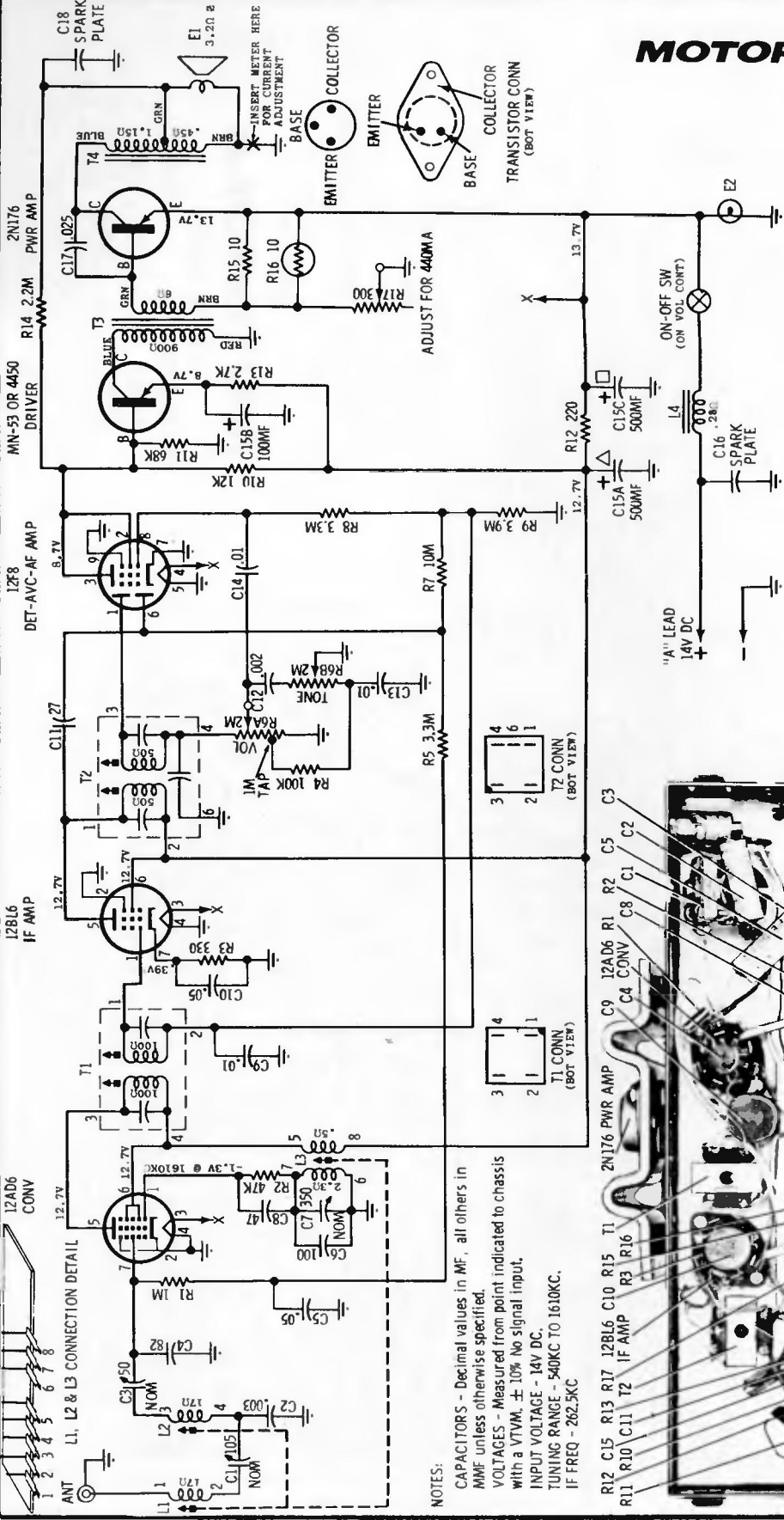


ANT 5.8X 1000KC
 10X 1000KC
 70X 1000KC TO 262.5KC
 4.8X 262.5KC TO 400V
 G
 12A66A
 2N573 DRIVER
 2N176 PWR AMP
 IN 24MY & 24ME ONLY
 VC

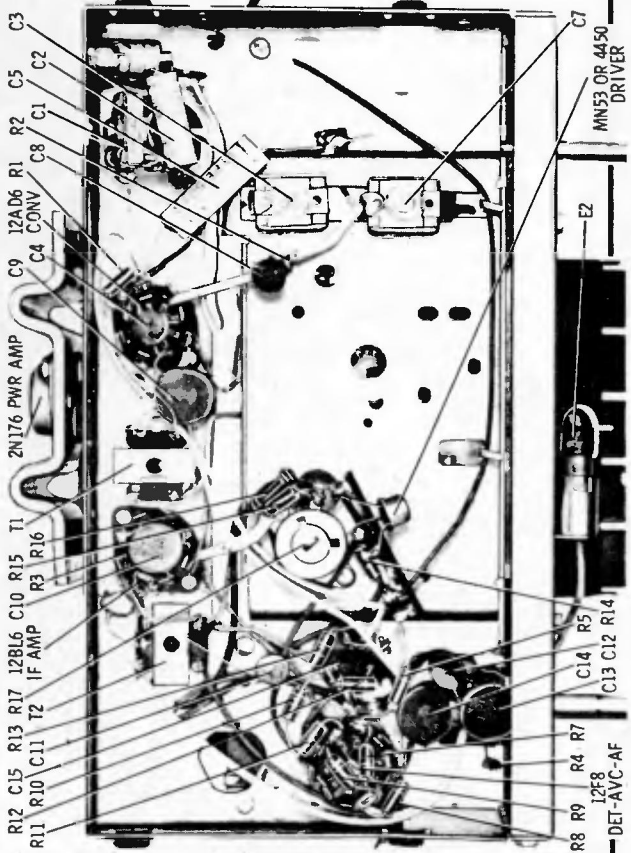
VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

MOTOROLA

MODEL
CA61X



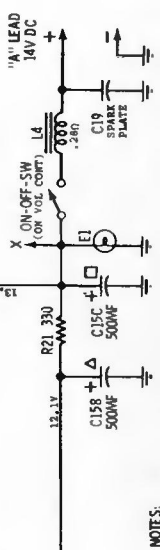
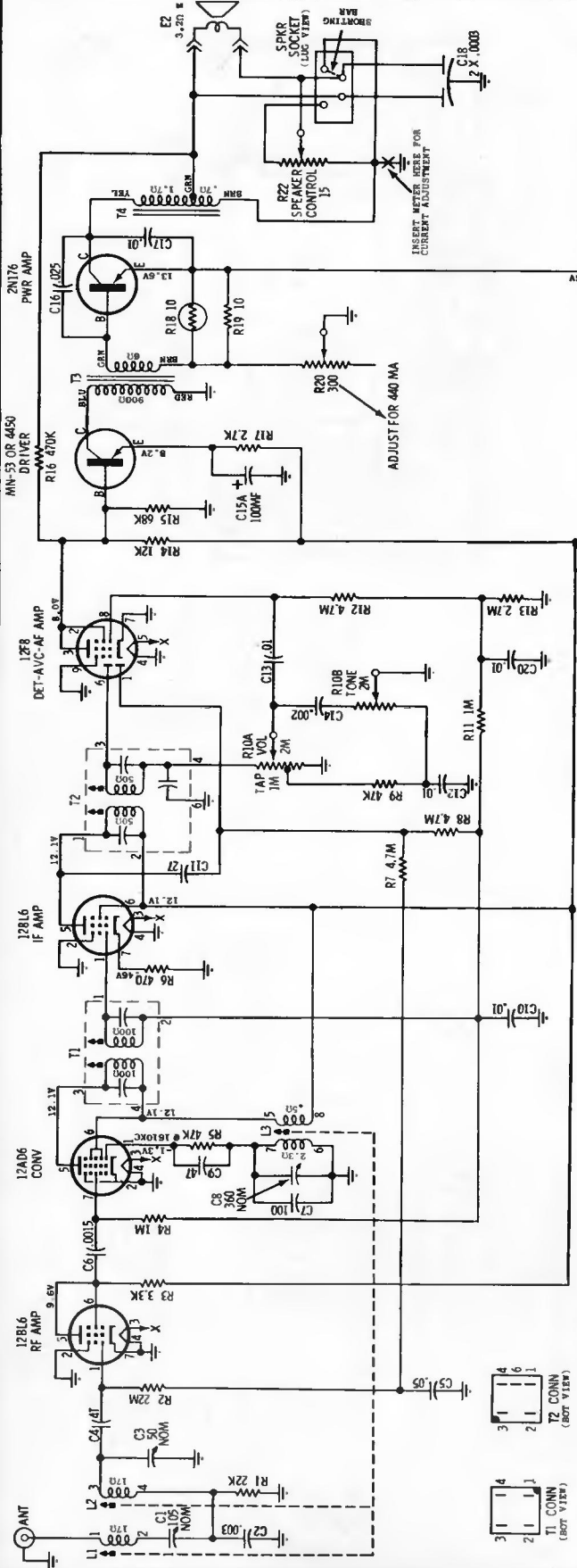
NOTES:
CAPACITORS - Decimal values in MF, all others in MMF unless otherwise specified.
VOLTAGES - Measured from point indicated to chassis with a VTVM. $\pm 10\%$ No signal input.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540KC TO 1610KC.
IF FREQ - 262.5KC



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

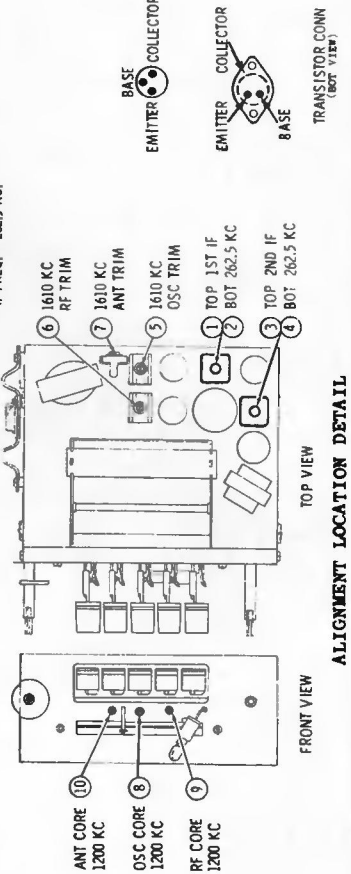
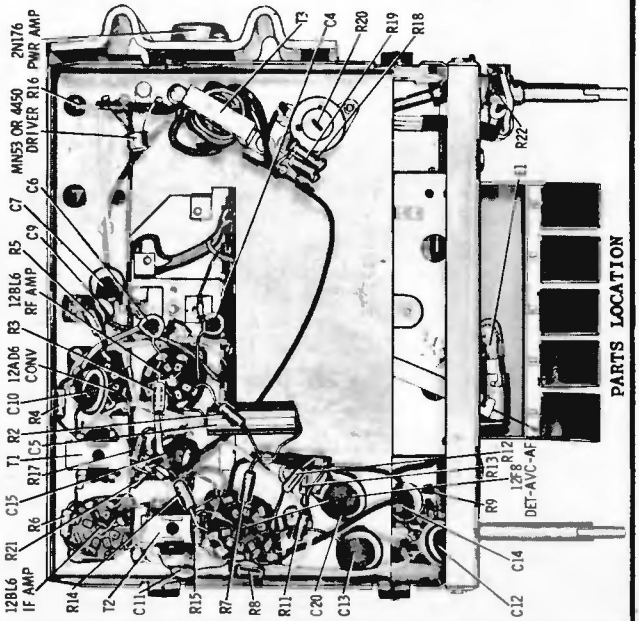
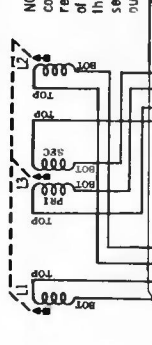
MOTOROLA

MODEL
OEA61X



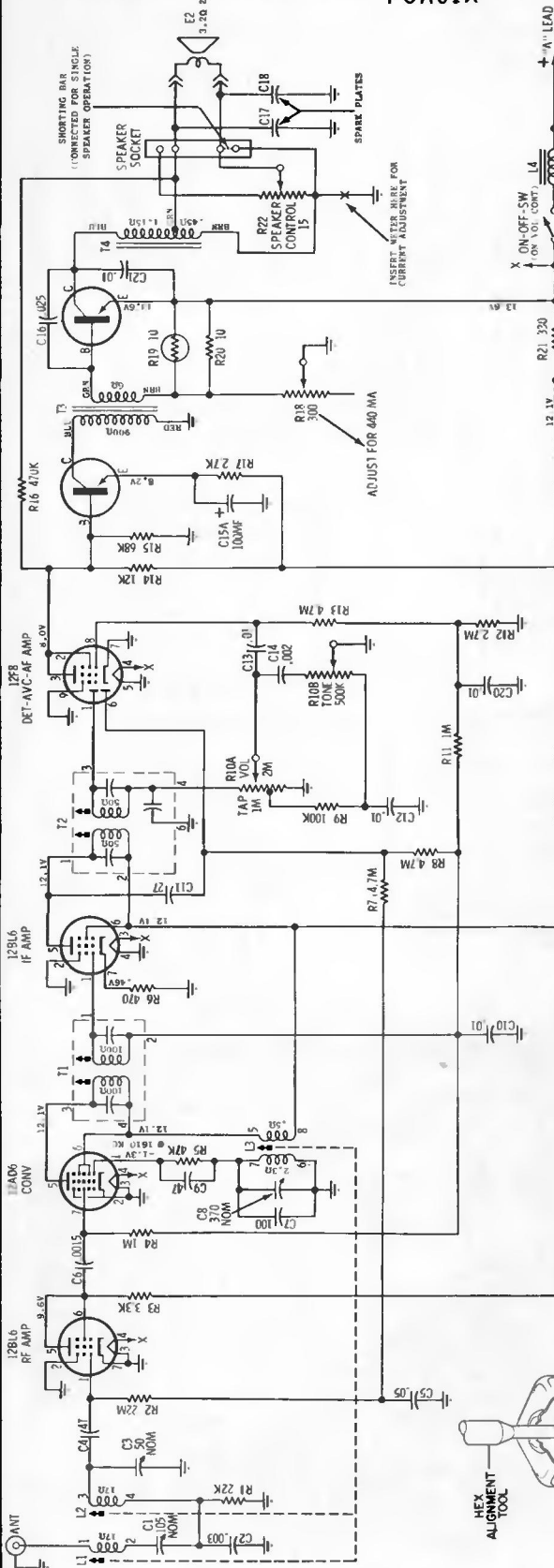
NOTES:
CAPACITORS - Decimal values in MF, all others in MAF, unless otherwise specified.
VOLTAGES - Measured from point indicated to chassis with a VTVM. No signal input. Tolerance $\pm 10\%$.
INPUT VOLTAGE - 14V D.C.
TUNING RANGE - 540 KC to 1610 KC.
IF FREQ. - 262.5 KC.

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



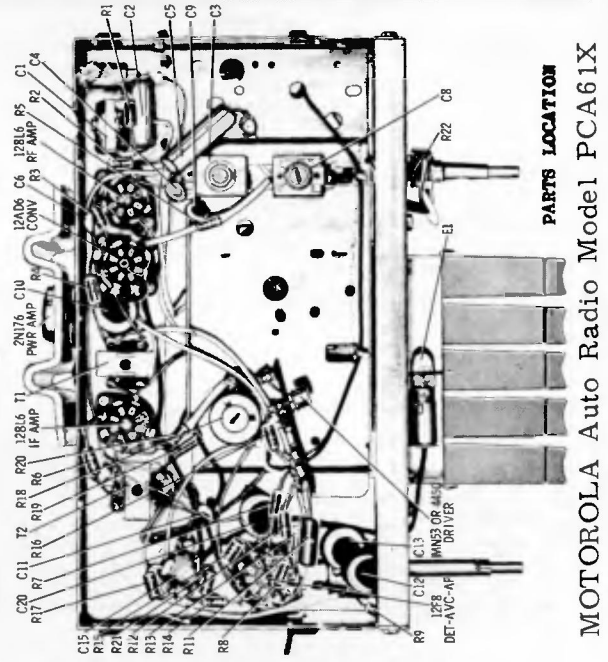
MOTOROLA MODEL PCA61X

2N176
PART AMP
MN-53 OP.4850
DRIVER



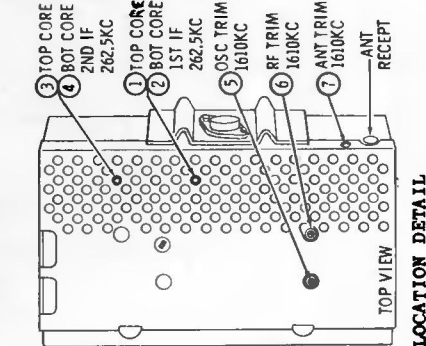
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

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.

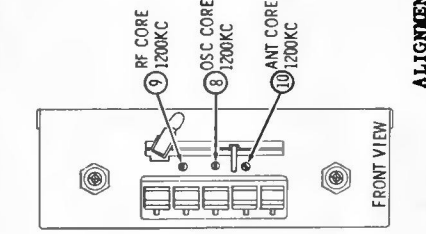
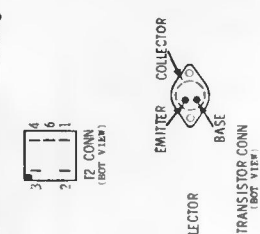


PARTS LOCATION
MOTOROLA Auto Radio Model PCA61X

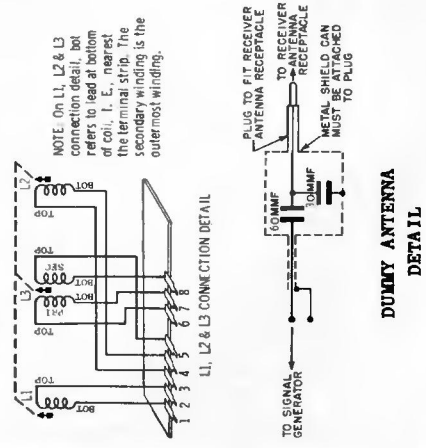
IF ALIGNMENT
DETAIL



ALIGNMENT LOCATION DETAIL



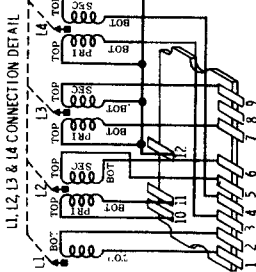
DUMMY ANTENNA
DETAIL



MOTOROLA auto radio

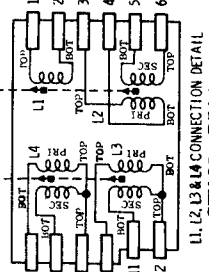
CTA62 CTM62

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

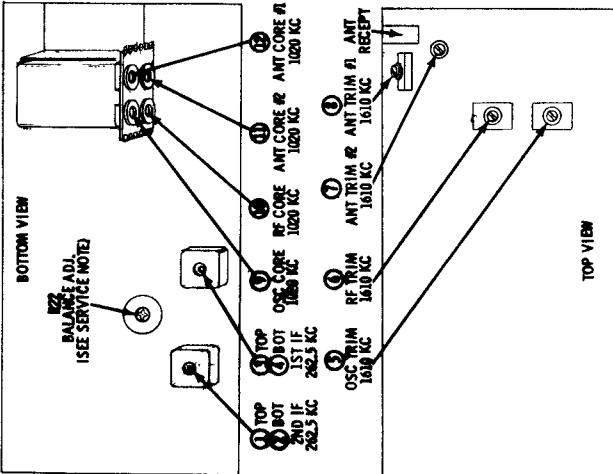


CTA62 DIAGRAM

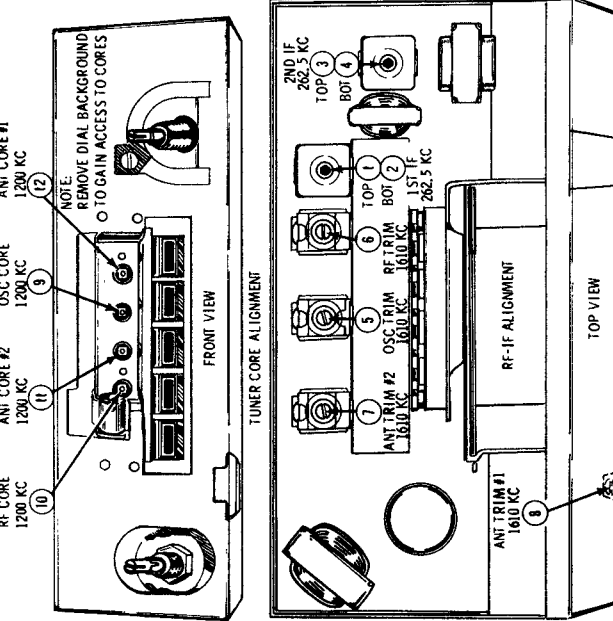
NOTE: ON L1, L2, L3 & L4 CONNECTION DETAIL, BOT. REFERS TO LEAD AT BOTTOM OF COIL, I.E., NEAREST THE TERMINAL STRIP. THE SECONDARY WINDING IS THE OUTERMOST WINDING.



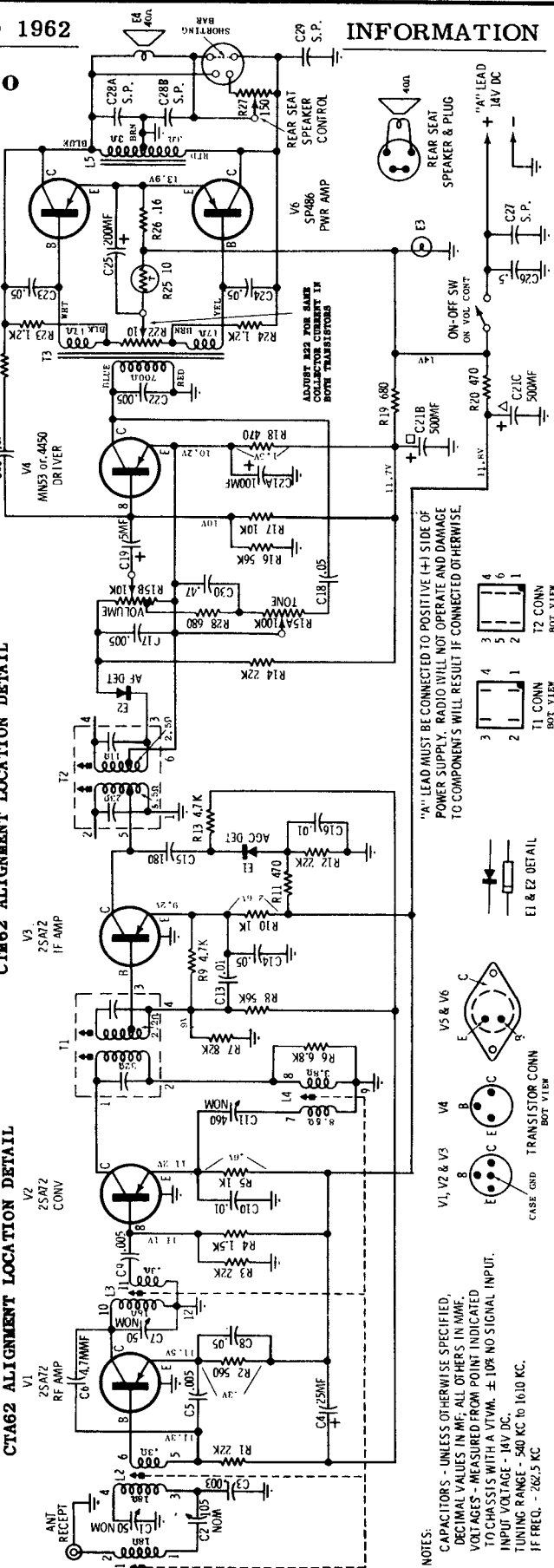
CTM62 DIAGRAM



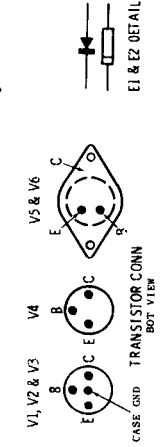
CTM62 ALIGNMENT LOCATION DETAIL



CTA62 ALIGNMENT LOCATION DETAIL



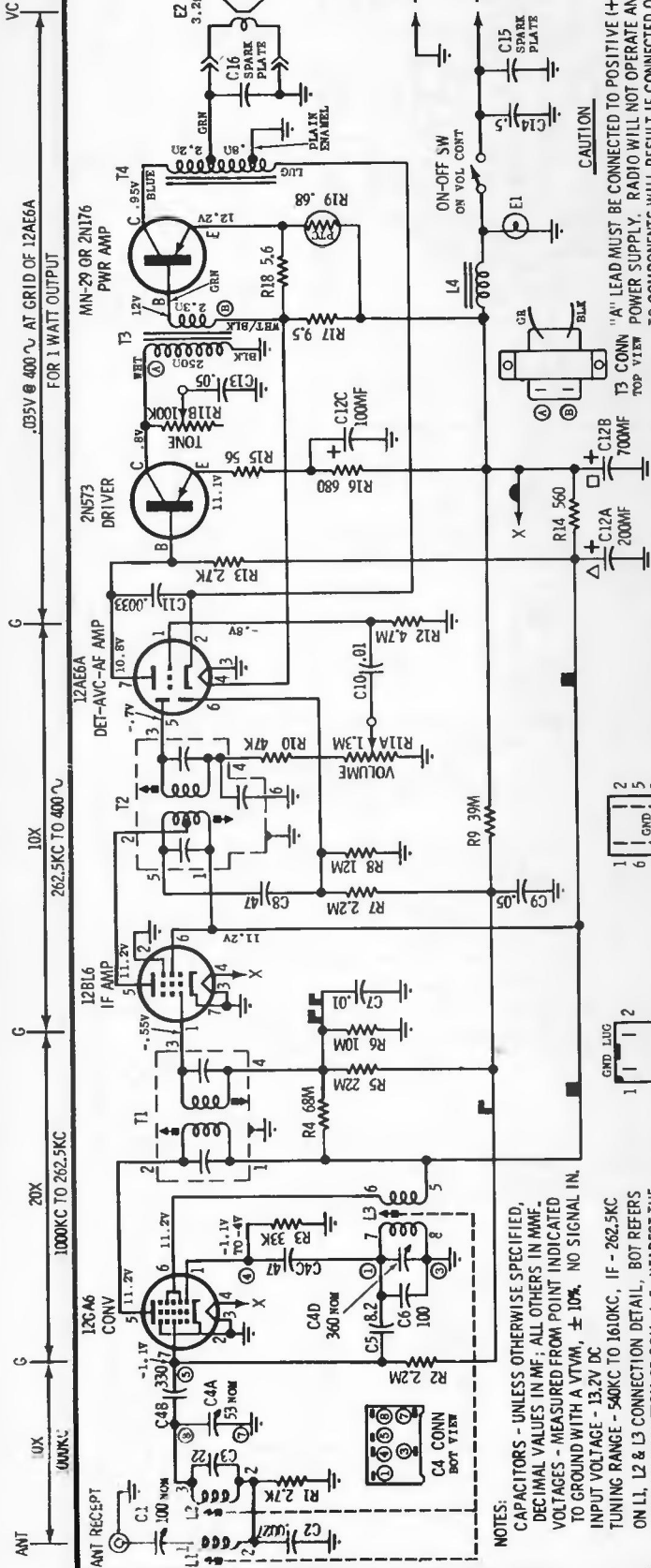
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.



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

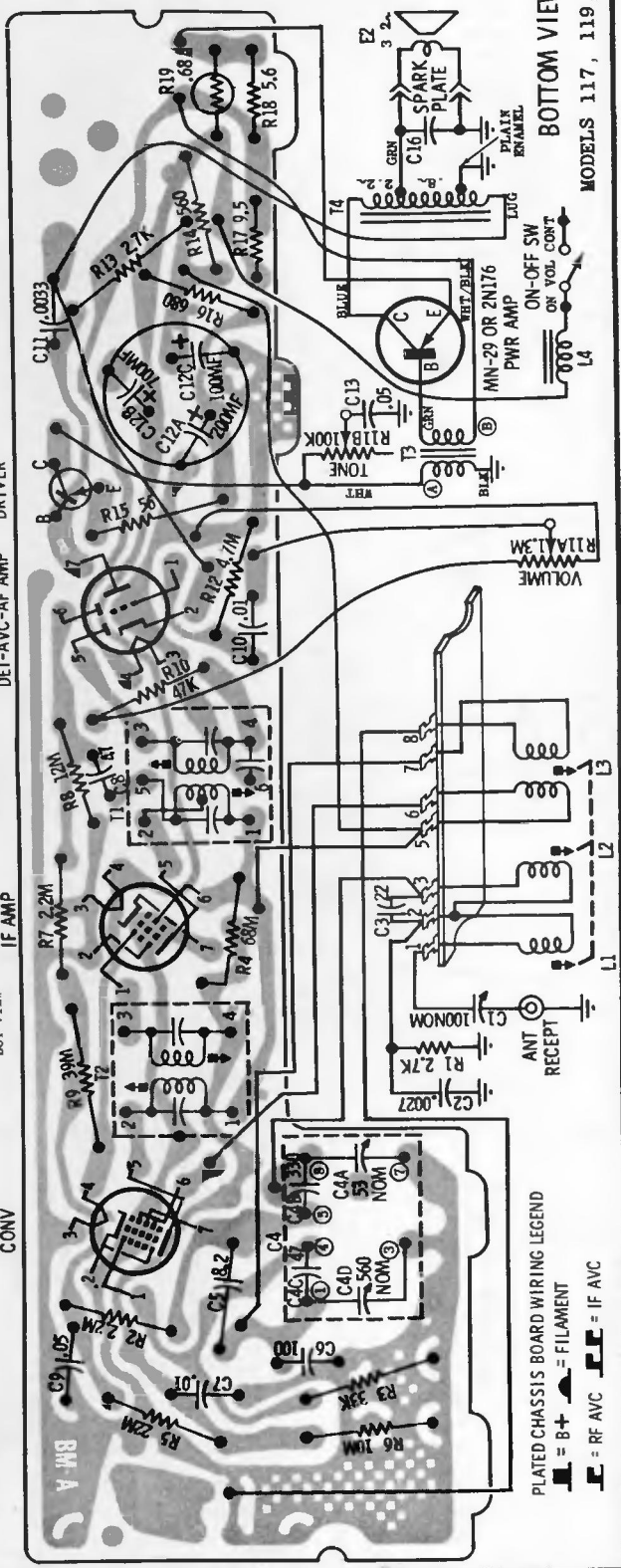
MOTOROLA

auto radio MOPAR 117, 119, 120



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

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
 = RF AVC
 = IF AVC

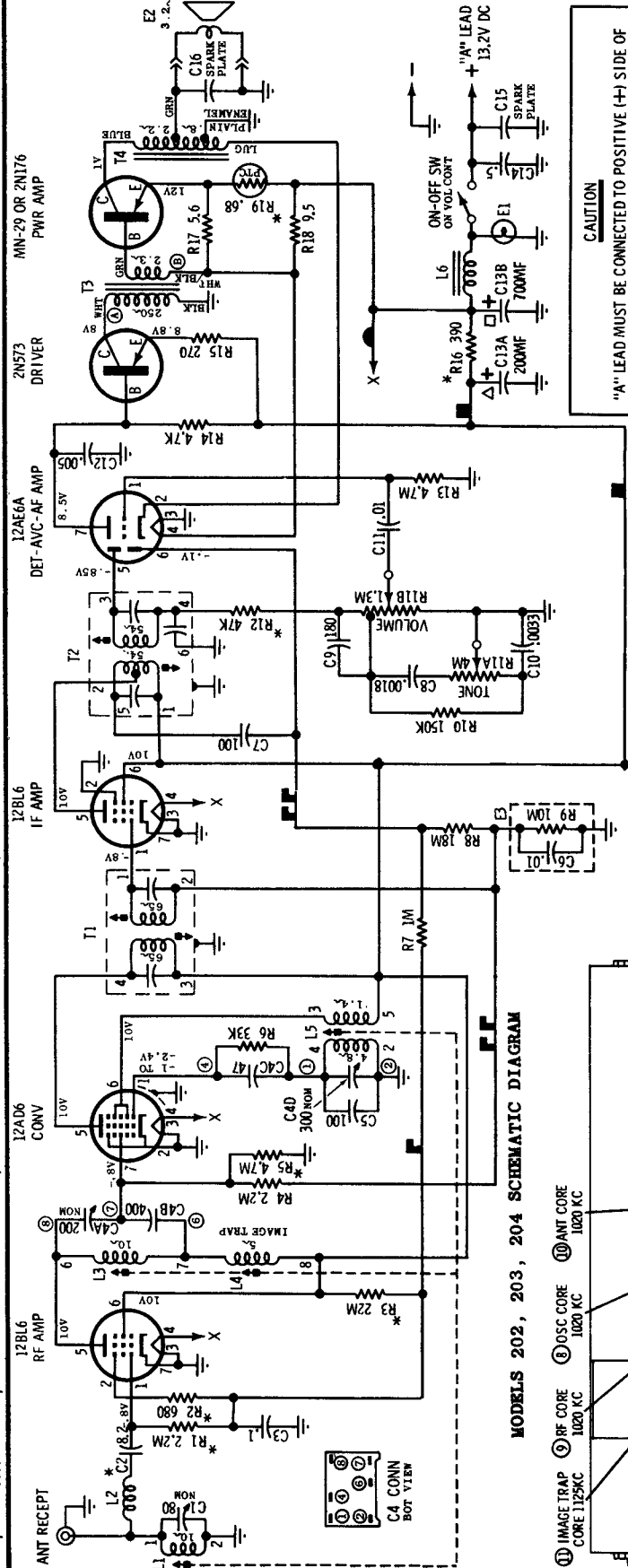
MODELS 117, 119, 120
BOTTOM VIEW

MOTOROLA

auto radio

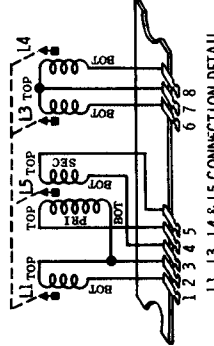
MOPAR 202, 203, 204

VC
 .3V @ 400 CYCLES AT GRID OF 12A66A
 FOR 1 WATT OUTPUT
 MN-29 OR 2N176
 PWR AMP
 2N573
 DRIVER
 12A66A
 DET-AVC-AF AMP
 20X
 262.5 KC TO 400 CYCLES
 12B86
 IF AMP
 30X
 1000 KC TO 262.5 KC
 12A06
 CONV
 10X
 1000 KC
 12B86
 RF AMP
 9X
 1000 KC
 ANT RECEPT
 ANT

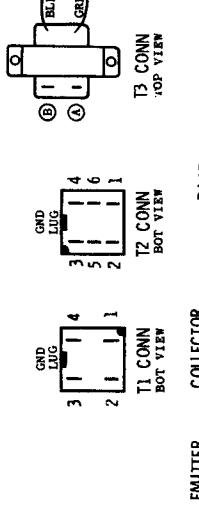


CAUTION
 "A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

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



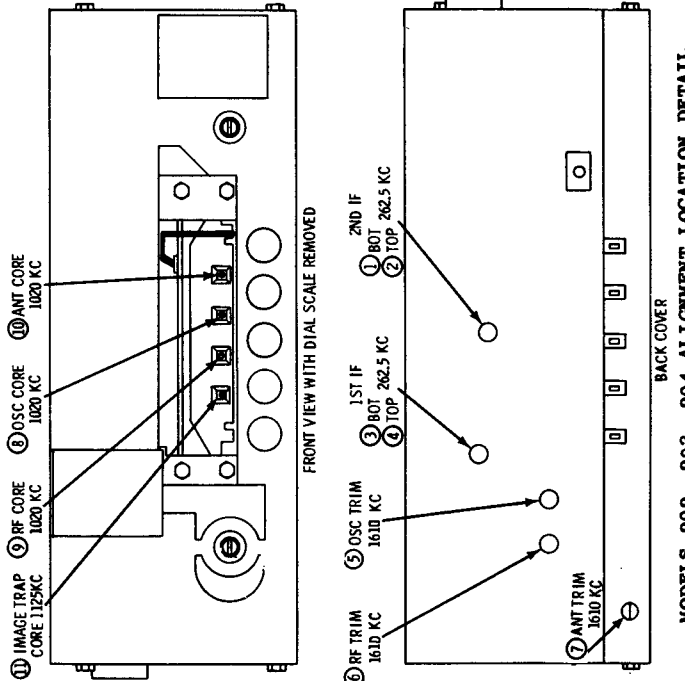
ON L1, L3, L4 & L5 CONNECTION DETAIL, BOT REFERS TO LEAD AT BOTTOM OF COIL, I. E., NEAREST THE TERMINAL STRIP. THE SECONDARY WINDING IS THE OUTERMOST WINDING.



* 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. ± 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



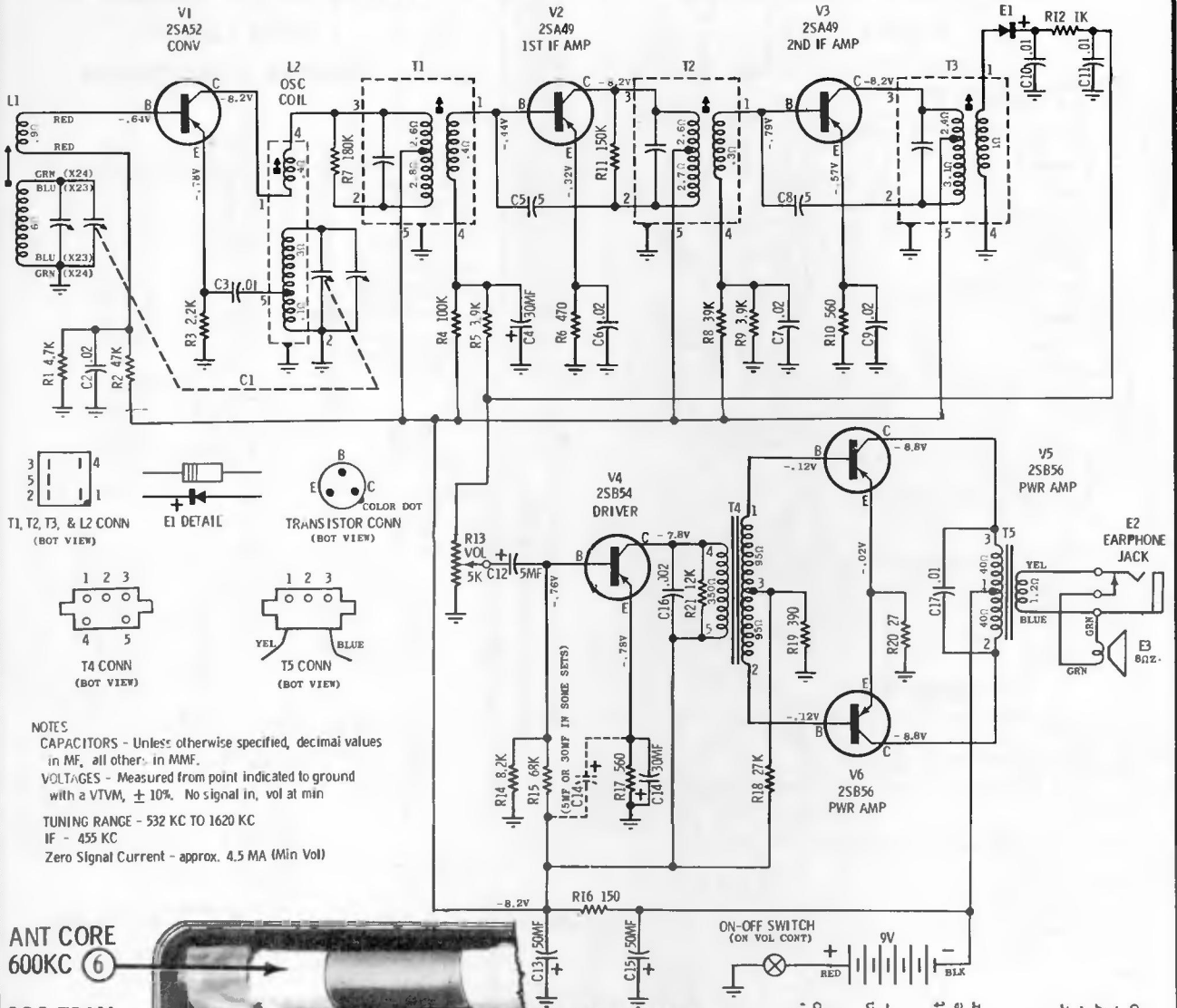
- ① IMAGE TRAP CORE 125 KC
- ② RF CORE 1020 KC
- ③ OSC CORE 1020 KC
- ④ ANT CORE 1020 KC
- ⑤ RF TRIM 1610 KC
- ⑥ 1ST IF 1610 KC
- ⑦ ANT TRIM 1610 KC

FRONT VIEW WITH DIAL SCALE REMOVED

BACK COVER

MODELS 202, 203, 204 ALIGNMENT LOCATION DETAIL

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



T1, T2, T3, & L2 CONN (BOT VIEW)

E1 DETAIL

TRANSISTOR CONN (BOT VIEW)

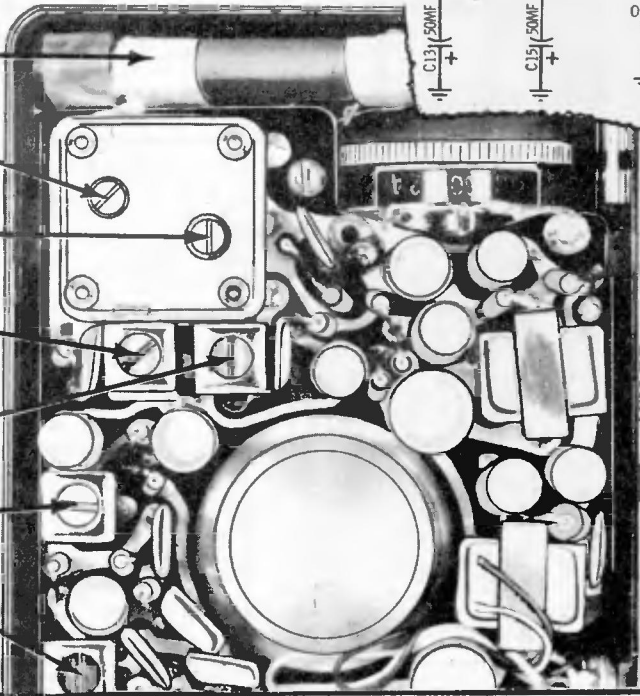
T4 CONN (BOT VIEW)

T5 CONN (BOT VIEW)

NOTES

CAPACITORS - Unless otherwise specified, decimal values in MF, all other in MMF.
 VOLTAGES - Measured from point indicated to ground with a VTVM, $\pm 10\%$. No signal in, vol at min
 TUNING RANGE - 532 KC TO 1620 KC
 IF - 455 KC
 Zero Signal Current - approx. 4.5 MA (Min Vol)

- 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. 66A64621 1).

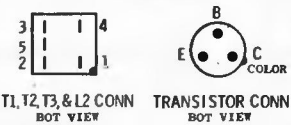
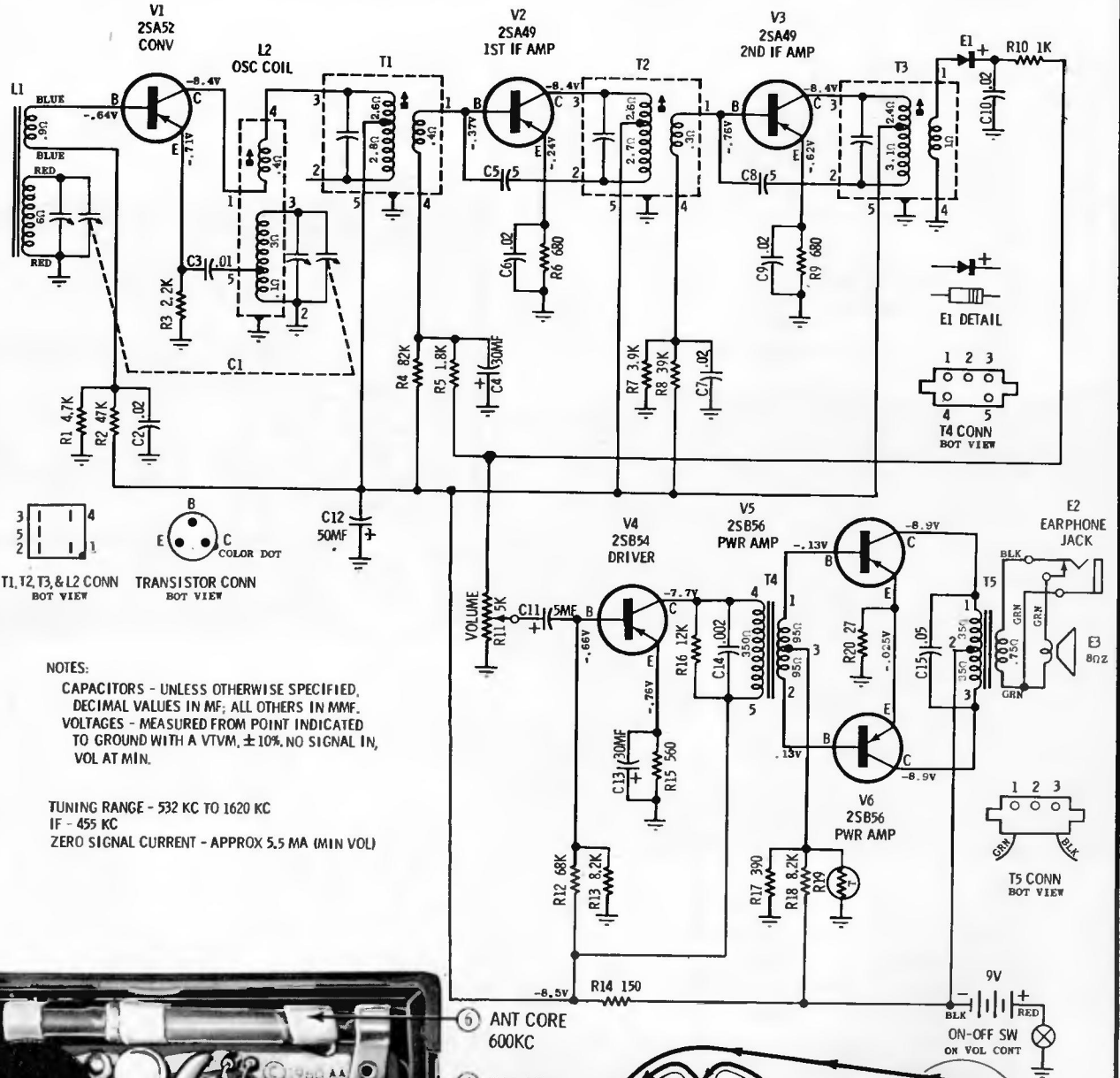
POWER SUPPLY

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 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



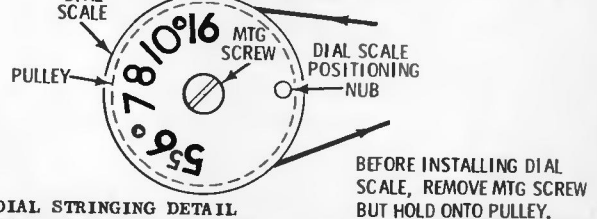
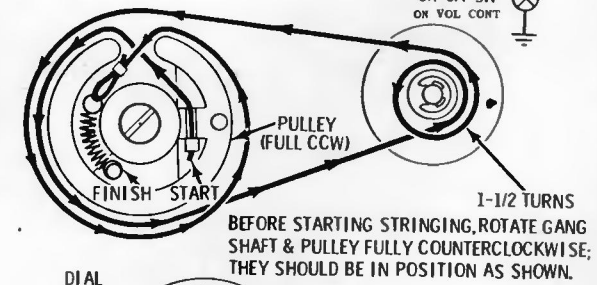
NOTES:

CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF. VOLTAGES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM, ± 10%, NO SIGNAL IN, VOL AT MIN.

TUNING RANGE - 532 KC TO 1620 KC
IF - 455 KC
ZERO SIGNAL CURRENT - APPROX 5.5 MA (MIN VOL)



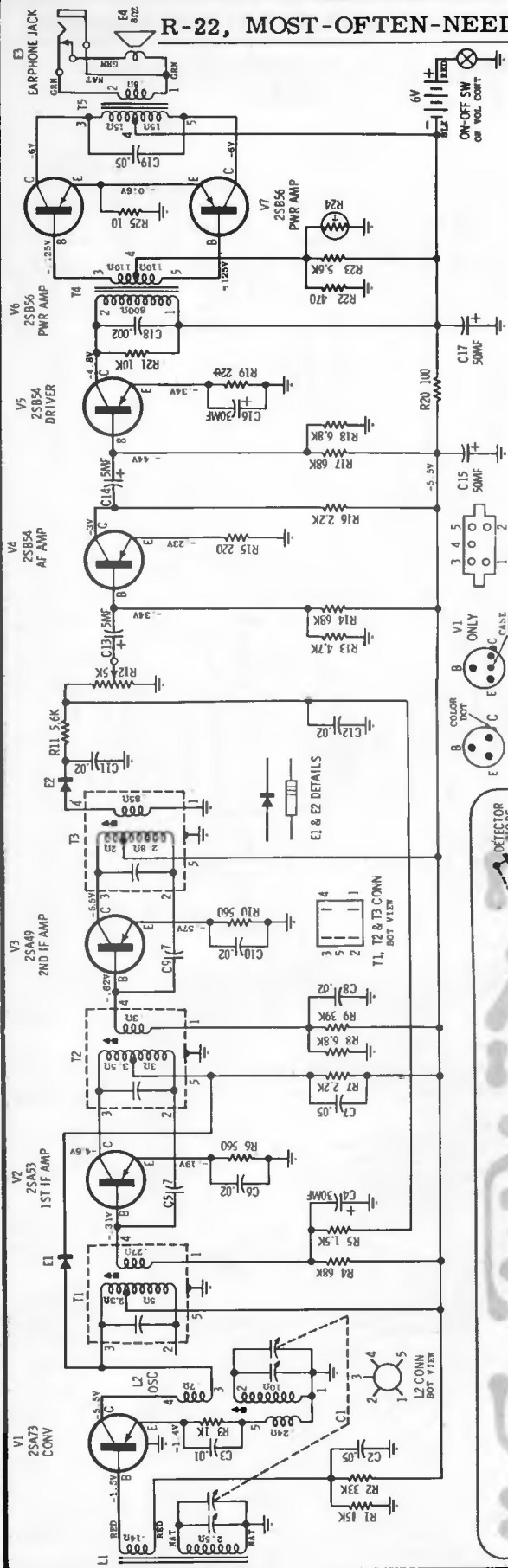
- ① ANT CORE 600KC
- ② OSC TRIM 1620KC
- ③ ANT TRIM 1620KC
- ④ OSC CORE 532KC
- ⑤ 1ST IF 455KC
- ⑥ 2ND IF 455KC
- ⑦ 3RD IF 455KC
- ⑧ ANT CORE 600KC



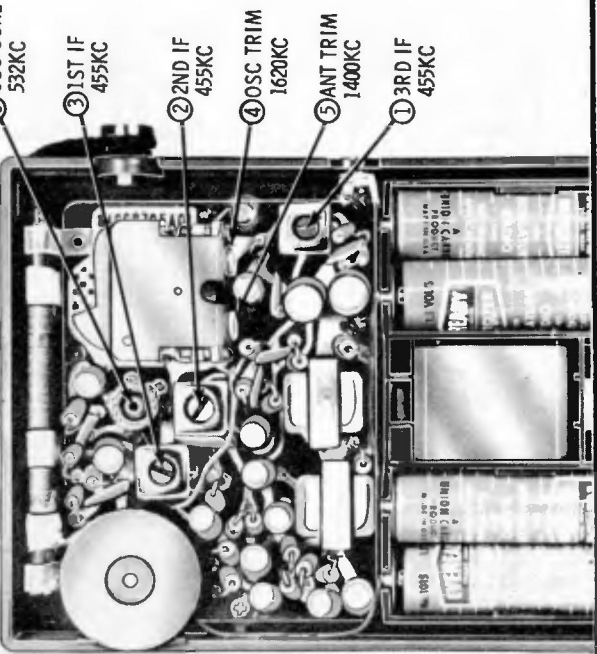
ALIGNMENT POINT LOCATIONS

MOTOROLA

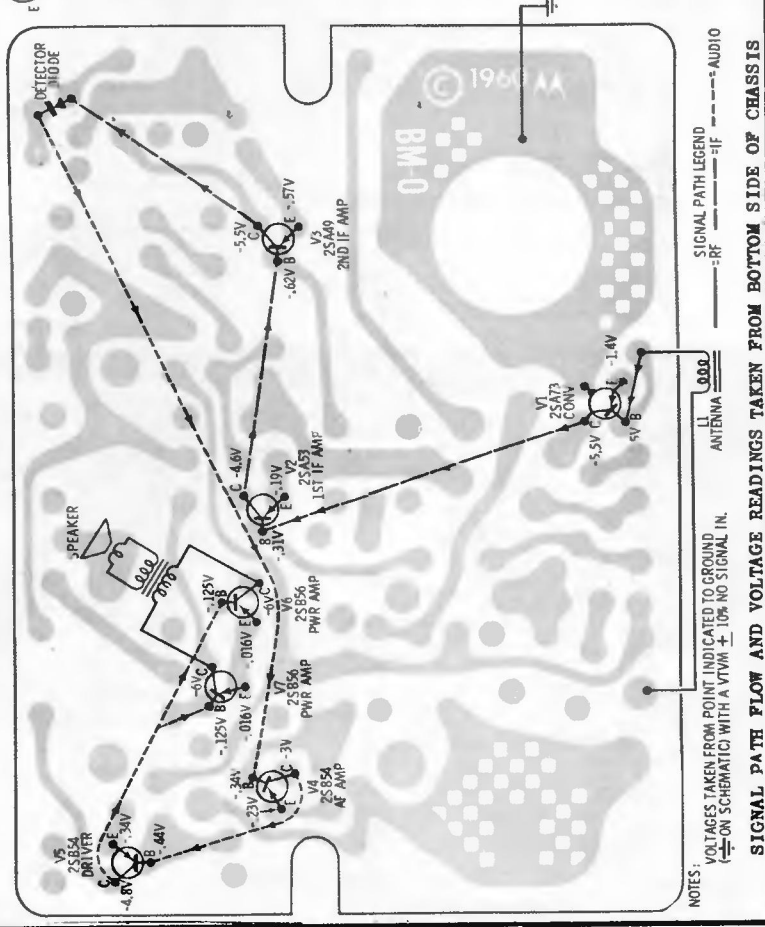
MODEL CHASSIS
X 26 HS-883



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



ALIGNMENT POINT LOCATIONS



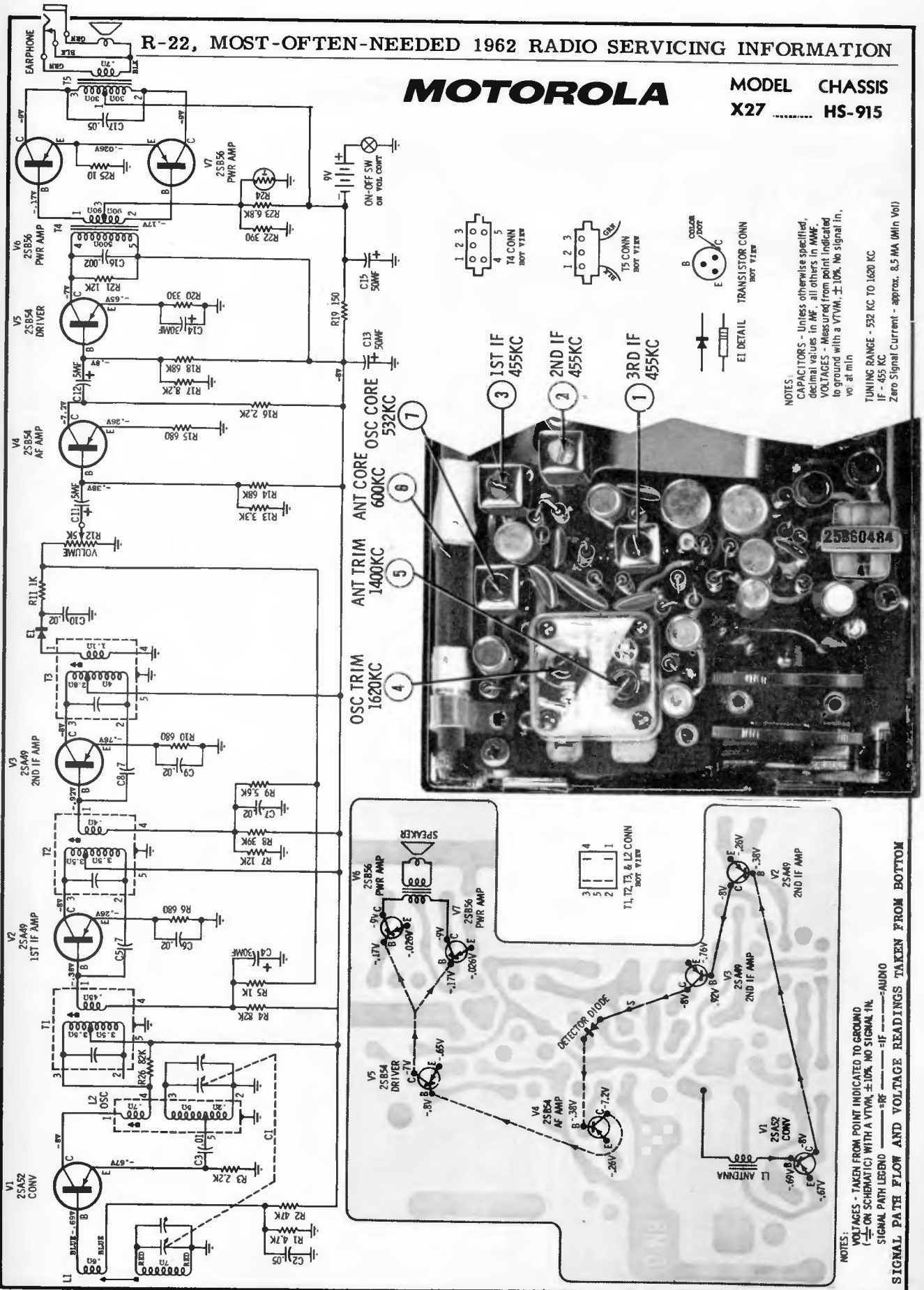
NOTES:
VOLTAGES TAKEN FROM POINT INDICATED TO GROUND (—) ON SCHEMATIC WITH A VTVM ± 10% NO SIGNAL IN.

SIGNAL PATH FLOW AND VOLTAGE READINGS TAKEN FROM BOTTOM SIDE OF CHASSIS

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 MUF.
VOLTAGES - Measured from point indicated to ground with a VTVM, $\pm 10\%$. No signal in, no at min.
TUNING RANGE - 532 KC TO 1620 KC
IF - 455 KC
Zero Signal Current - approx. 8.5 MA (Min V₀₁)

ALIGNMENT POINT LOCATIONS

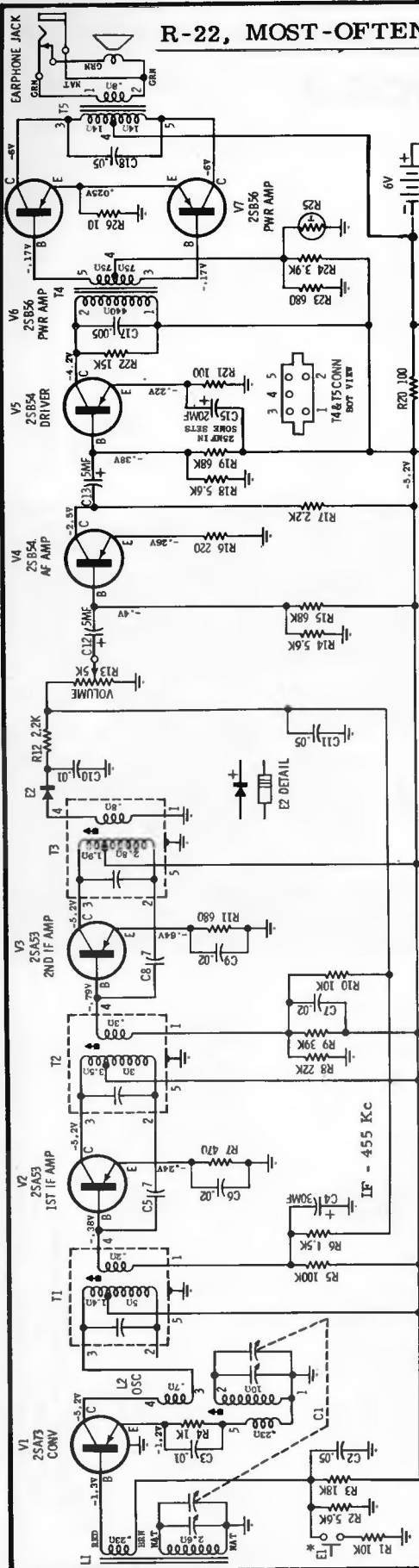
NOTES:
VOLTAGES - TAKEN FROM POINT INDICATED TO GROUND (— ON SCHEMATIC) WITH A VTVM $\pm 10\%$. NO SIGNAL IN.
SIGNAL PATH LEGEND — RF — IF — AUDIO
SIGNAL PATH FLOW AND VOLTAGE READINGS TAKEN FROM BOTTOM

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

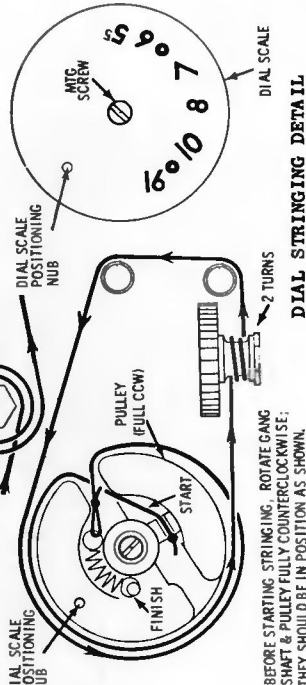
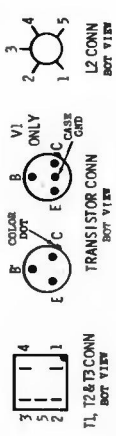
MOTOROLA

MODEL
X28

CHASSIS
HS-884



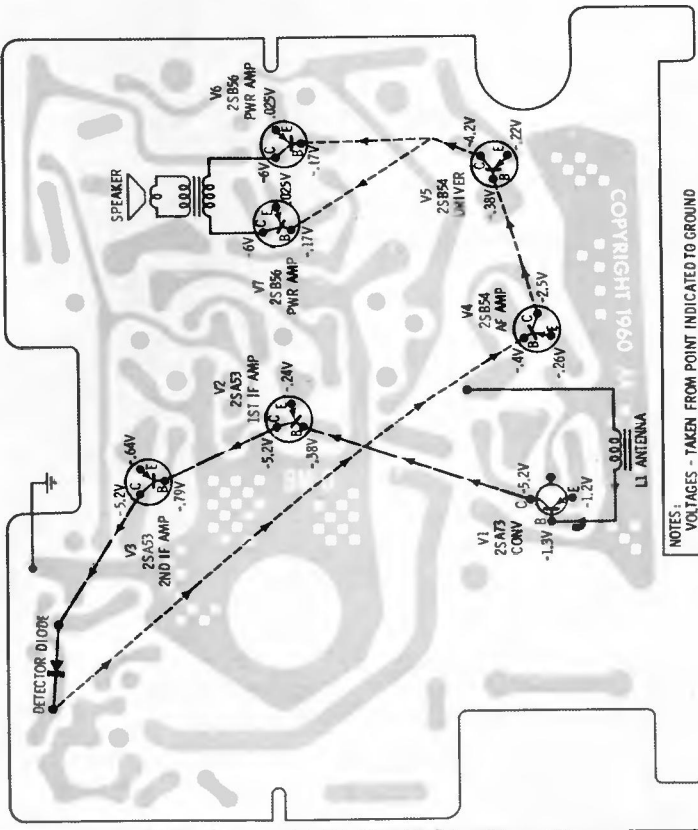
NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
VOLTAGES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM, $\pm 10\%$, NO SIGNAL IN, VOL AT MIN.
ZERO SIGNAL CURRENT - APPROX 12 MA (MIN VOL) IS LOCATED ON FRONT OF RADIO - PUSH TO CLOSE.
* PUSHBUTTON SWITCH (BATTERY LIFE INDICATOR) TUNING RANGE - 552 KC TO 1620 KC
IF - 455 KC



BEFORE STARTING STRINGING, ROTATE GANG SHAFT & PULLEY FULLY COUNTERCLOCKWISE; THEY SHOULD BE IN POSITION AS SHOWN.

CHASSIS REMOVAL

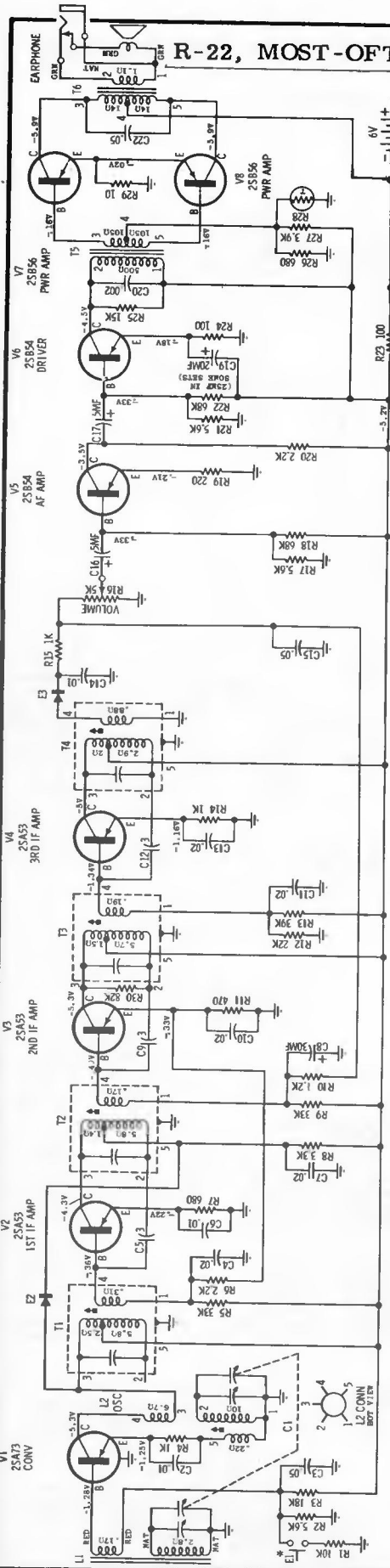
1. Remove 3 cabinet mounting screws (2 are located under carrying strap; the other on bottom of cabinet).
2. Lift out bezel, escutcheon & chassis as an assembly.
3. Remove 3 chassis mounting screws & lift up chassis.
4. If necessary, unsolder all chassis connecting leads. If it becomes necessary to remove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



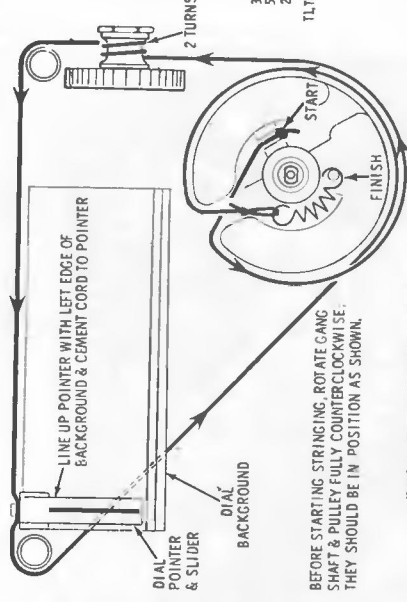
NOTES:
VOLTAGES - TAKEN FROM POINT INDICATED TO GROUND
(---) ON SCHEMATIC WITH A VTVM, $\pm 10\%$, NO SIGNAL IN.
SIGNAL PATH LEGEND --- = RF --- = IF --- = AUDIO
TAKEN FROM BOTTOM SIDE OF CHASSIS

MOTOROLA

MODEL CHASSIS
X29 HS-885



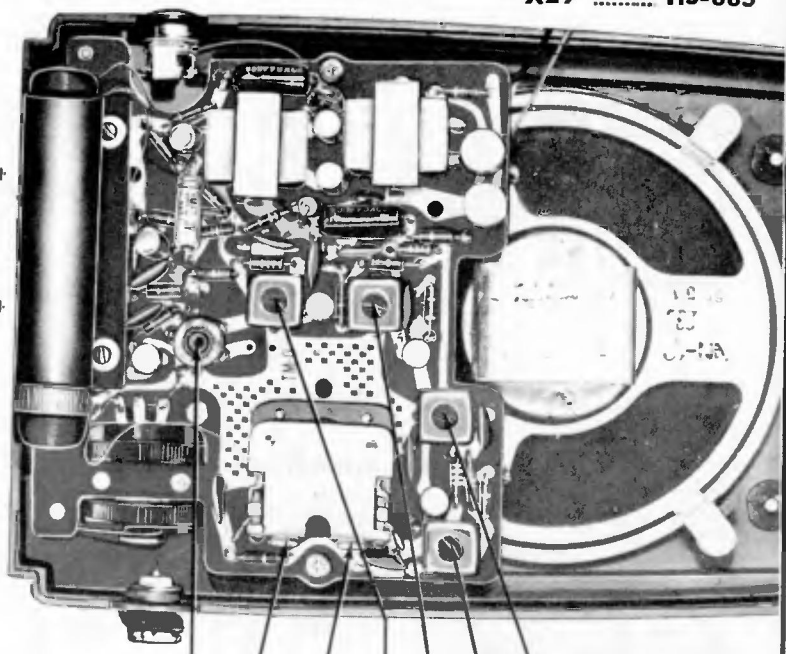
NOTES
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF, ALL OTHERS IN MMF. VALUES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM, ± 10% NO SIGNAL IN, VOLUME WITH A VTVM, ± 10% NO SIGNAL IN, ZERO SIGNAL CURRENT - APPROX 10.5MA MAIN VDU
 * PUSHBUTTON SWITCH (BATTERY LIFE INDICATOR) IS LOCATED ON FRONT OF RADIO - PUSH TO CLOSE.
 TUNING RANGE - 532 KC TO 1620 KC
 IF - 455 KC



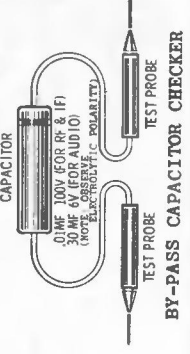
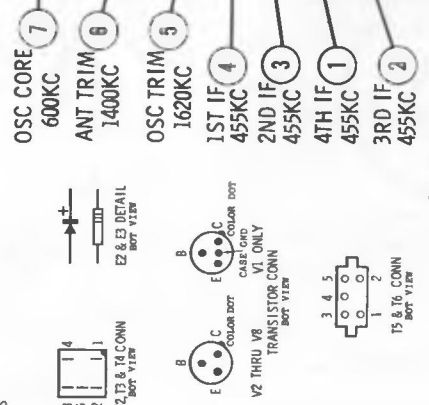
DIAL STRINGING DETAIL

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 mgt nut (a special tool is available - order Part No. 66A646211).

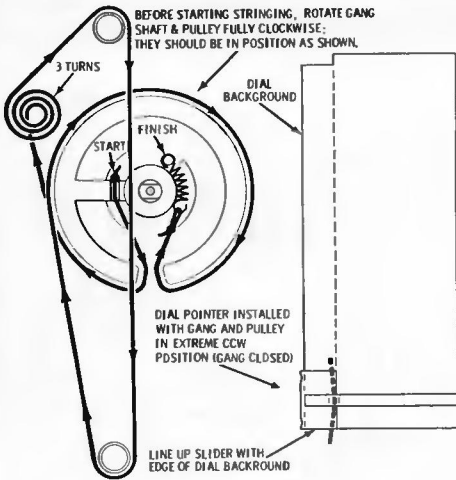
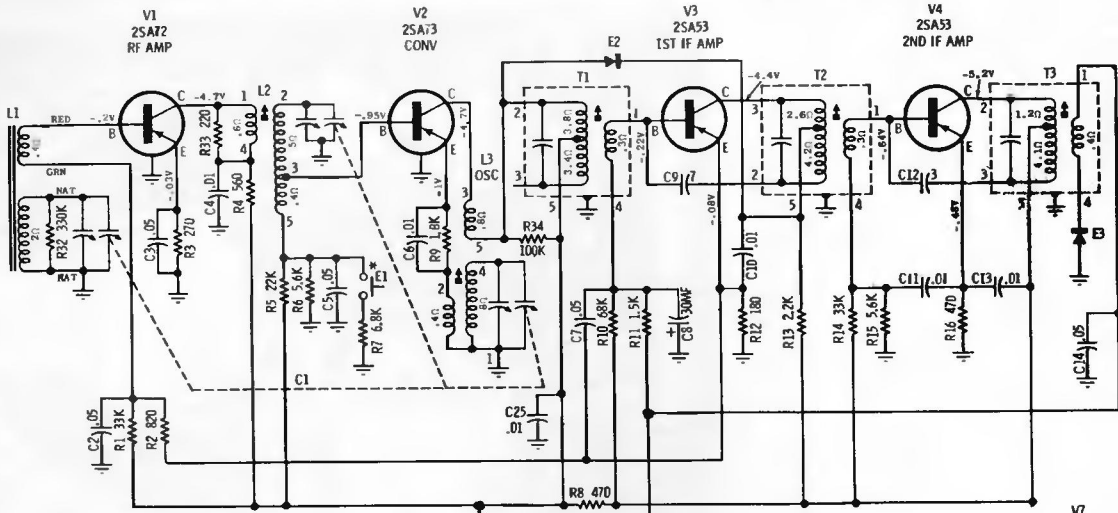


ALIGNMENT POINT LOCATIONS

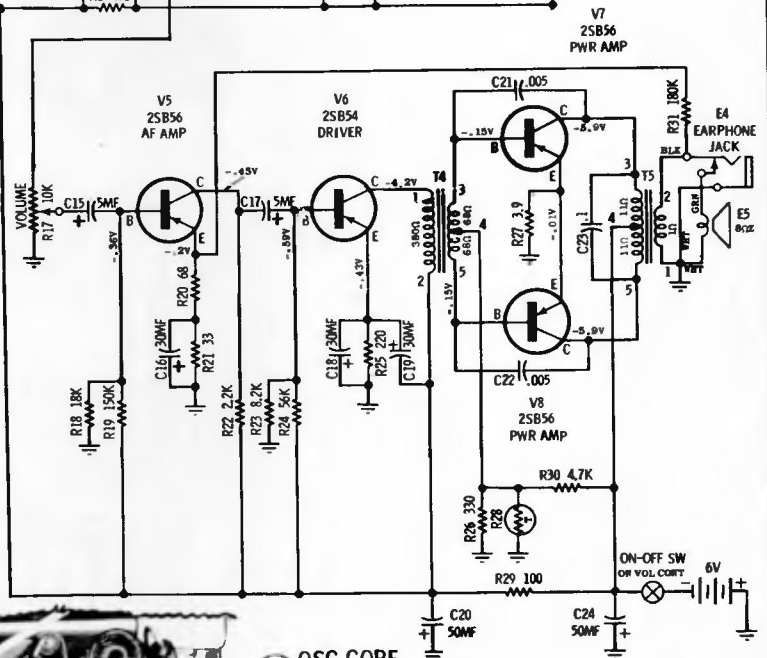


MOTOROLA

MODEL CHASSIS
X31 HS-894



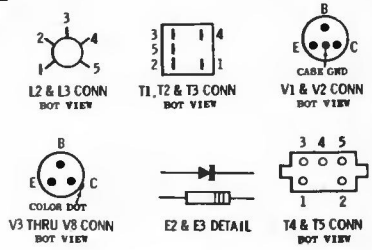
DIAL STRINGING DETAIL



- RF CORE 600KC ⑧
- ANT TRIM 1400KC ⑤
- OSC TRIM 1620KC ④
- RF TRIM 1400KC ⑥



- ⑦ OSC CORE 600KC
- ③ 1ST IF 455KC
- ② 2ND IF 455KC
- ① 3RD IF 455KC



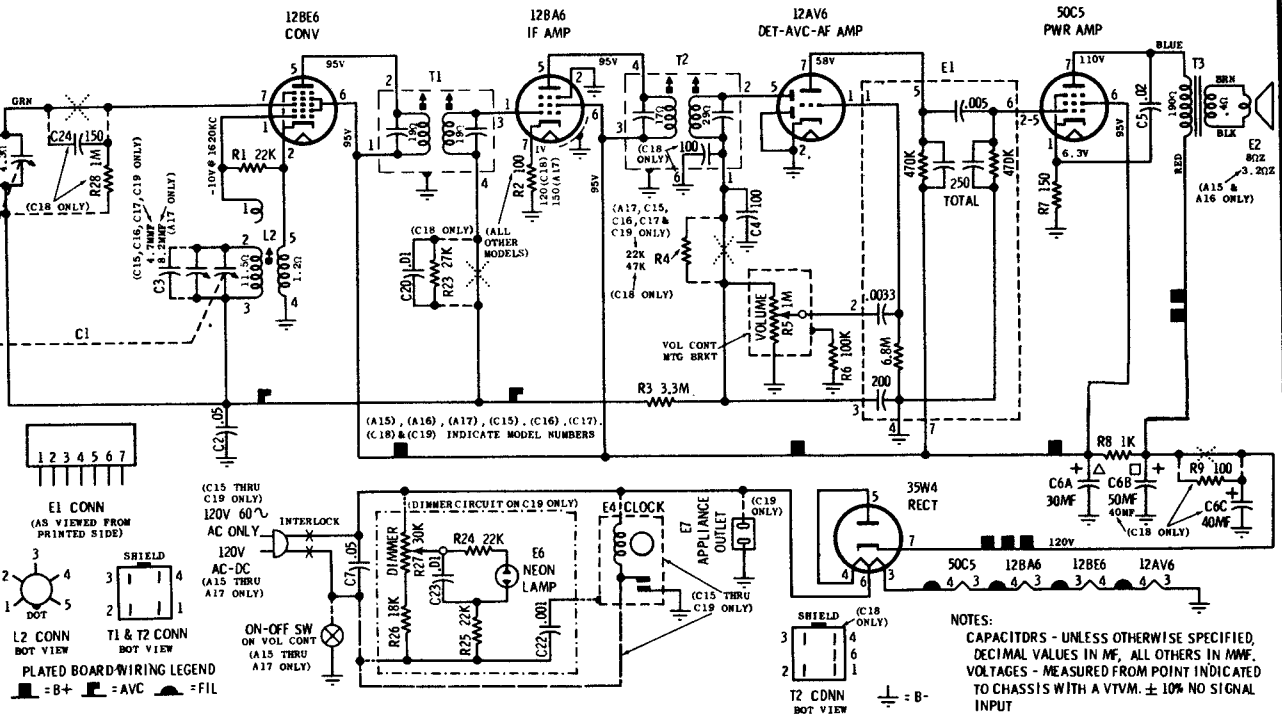
NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF. VOLTAGES - MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM, ±10%, NO SIGNAL IN, VOL AT MIN.

* PUSHBUTTON SWITCH (BATTERY LIFE INDICATOR) IS LOCATED ON FRONT OF RADIO - PUSH TO CLOSE ZERO SIGNAL CURRENT - APPROX 13 MA (MIN VOL) TUNING RANGE - 532 KC TO 1620 KC IF - 455 KC

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.

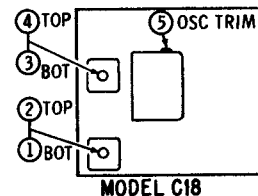
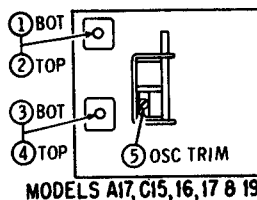
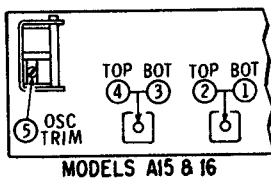
MODEL C18

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.

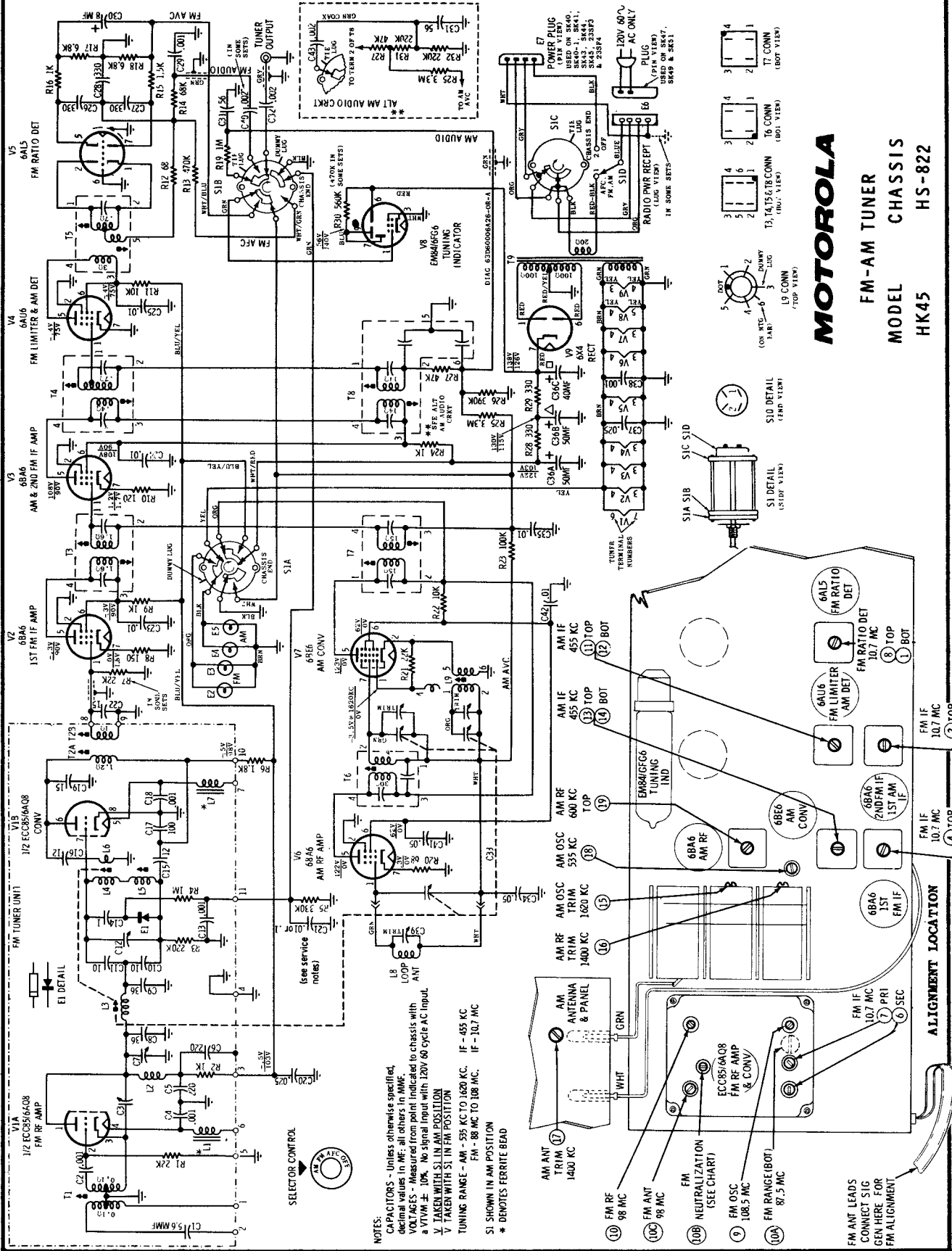


VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

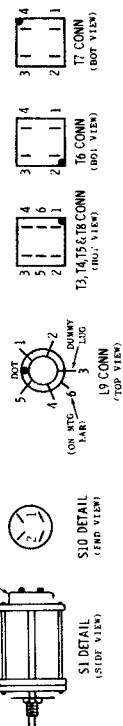
MOTOROLA FM-AM Tuner, Model HK45, Chassis HS-822

MOTOROLA

FM-AM TUNER
MODEL
HK45
CHASSIS
HS-822



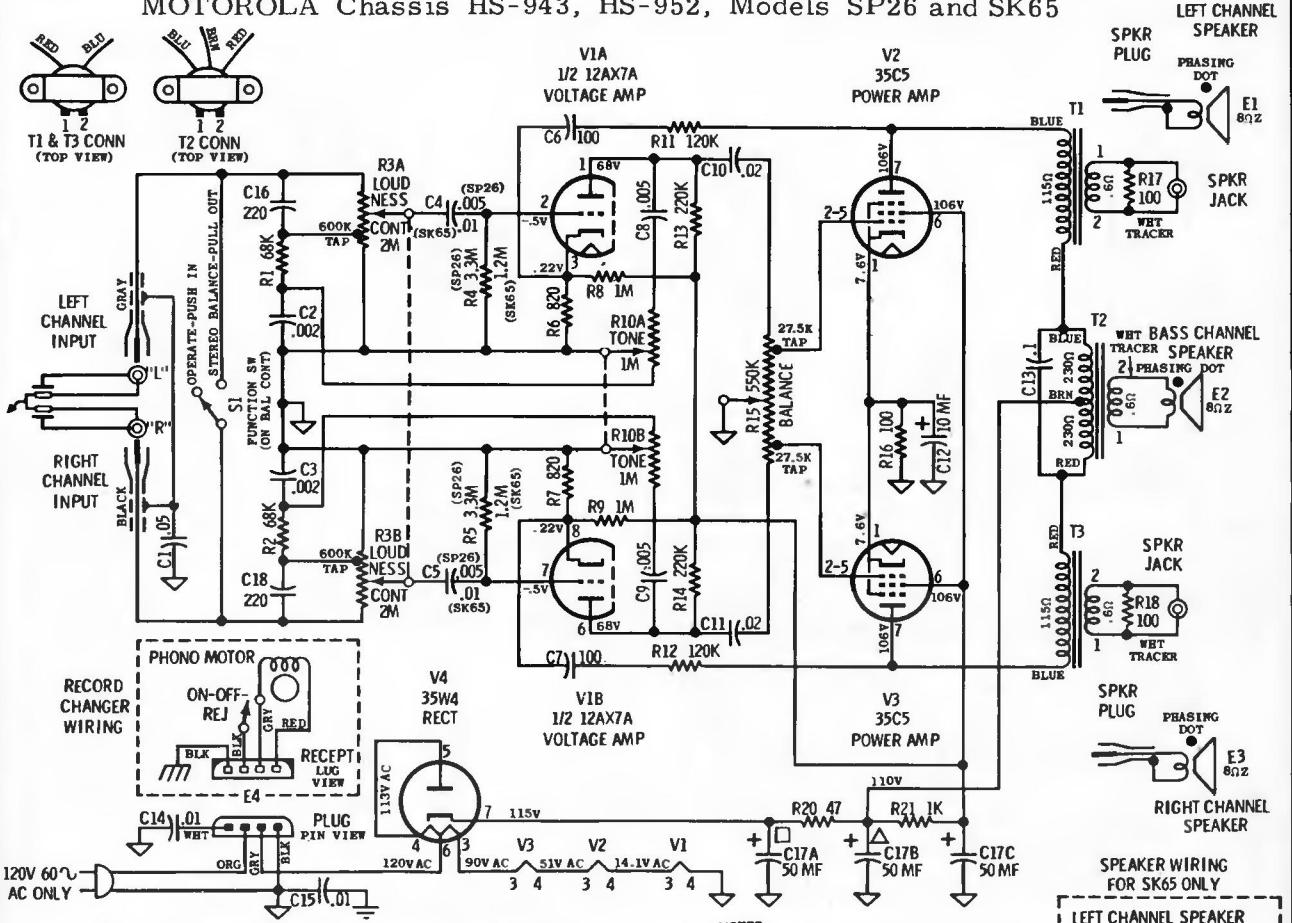
NOTES:
CAPACITORS - Unless otherwise specified, decimal values in μF ; all others in pF .
VOLTAGES - Measured from point indicated to chassis with a VVM $\pm 10\%$. No signal input with 120V 60 cycle AC input.
V TAKEN WITH SL IN AM POSITION
V TAKEN WITH S1 IN FM POSITION
TUNING RANGE - AM - 535 KC TO 1620 KC. IF - 455 KC
FM - 88 MC TO 108 MC.
S1 SHOWN IN AM POSITION
* DENOTES FERRITE BEAD



FM ANT LEADS
CONNECT SIG
GEN HERE FOR
FM ALIGNMENT

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

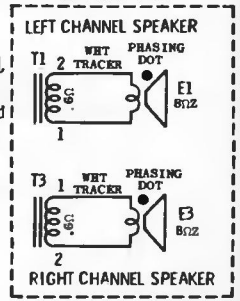
MOTOROLA Chassis HS-943, HS-952, Models SP26 and SK65



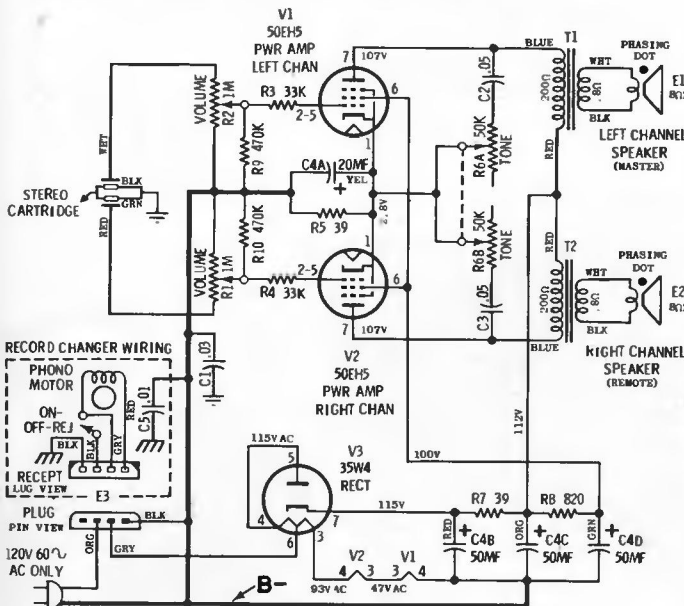
HS-943 & 952 SCHEMATIC-MODELS SP26 & SK65

NOTES:

CAPACITORS - Unless otherwise specified, decimal values in MF; all others in MMF.
 VOLTAGES - Measured from point indicated to B- with a VTVM, ±10%. No signal in.
 ↓ = B- ⊥ = Chassis = Record changer frame

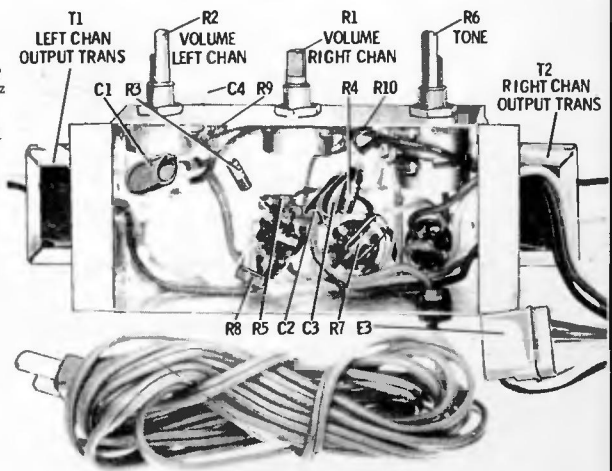


MOTOROLA Chassis HS-942, Model SP25



NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF, ALL OTHERS IN MMF.
 VOLTAGES - MEASURED FROM POINT INDICATED TO B- WITH A VTVM, ±10% NO SIGNAL INPUT.
 ⊥ = CHASSIS GROUND = RC GROUND

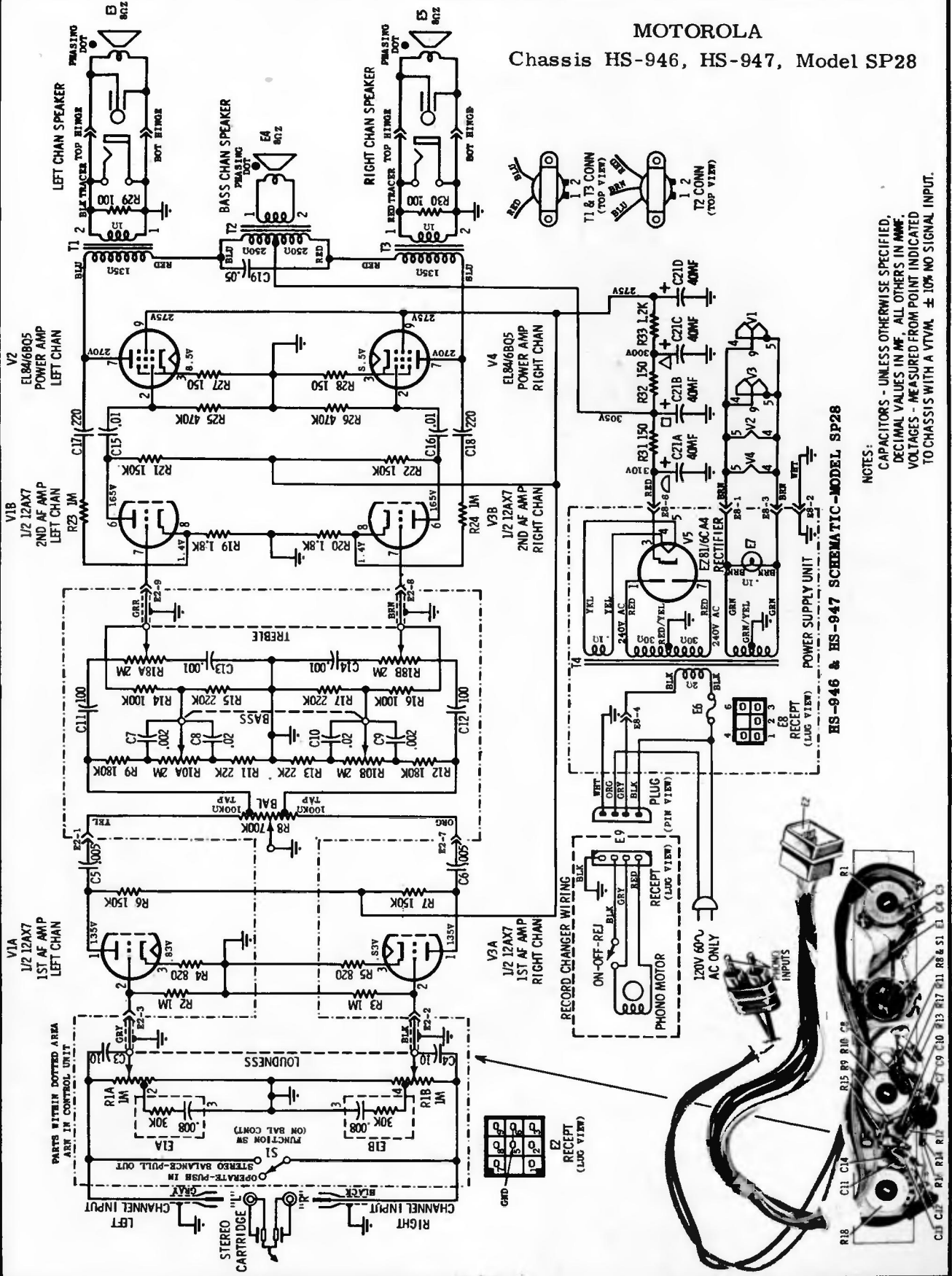
HS-942 SCHEMATIC-MODEL SP25



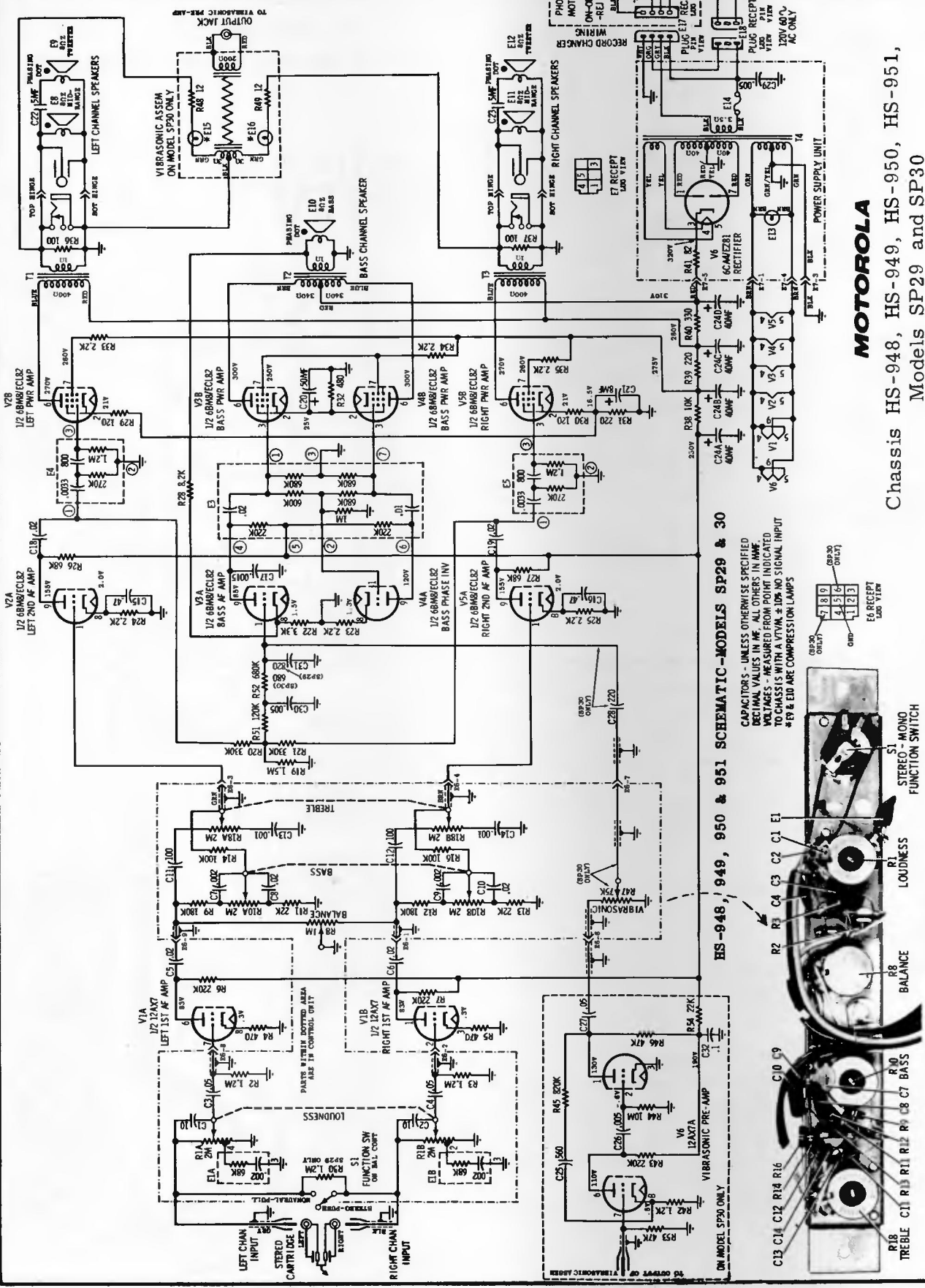
HS-942 PARTS LOCATION

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

MOTOROLA
Chassis HS-946, HS-947, Model SP28

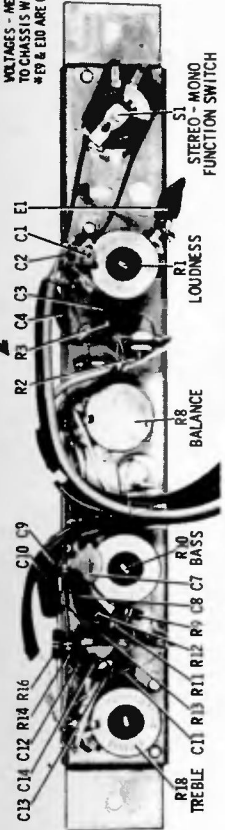


NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED,
 DECIMAL VALUES IN MF, ALL OTHERS IN MMF.
 VOLTAGES - MEASURED FROM POINT INDICATED
 TO CHASSIS WITH A VTVM ± 10% NO SIGNAL INPUT.



HS-948, 949, 950 & 951 SCHEMATIC-MODELS SP29 & 30

CAPACITORS - UNLESS OTHERWISE SPECIFIED DECIMAL VALUES IN MF. ALL OTHERS IN MMF. VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM & DPN-NO SIGNAL INPUT *E9 & E10 ARE COMPRESSION LAMPS

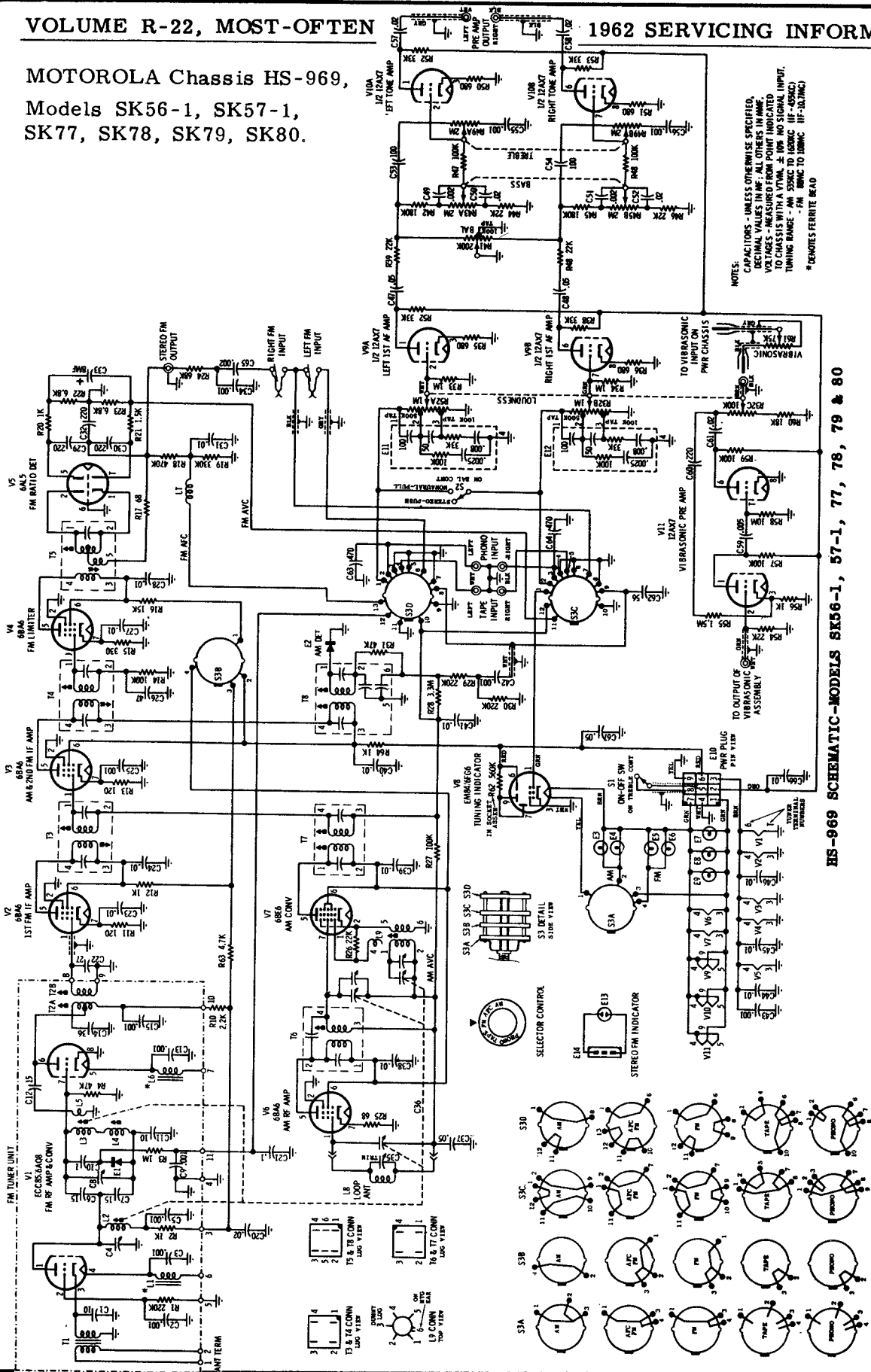


HS-949 PARTS LOCATION

MOTOROLA

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

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

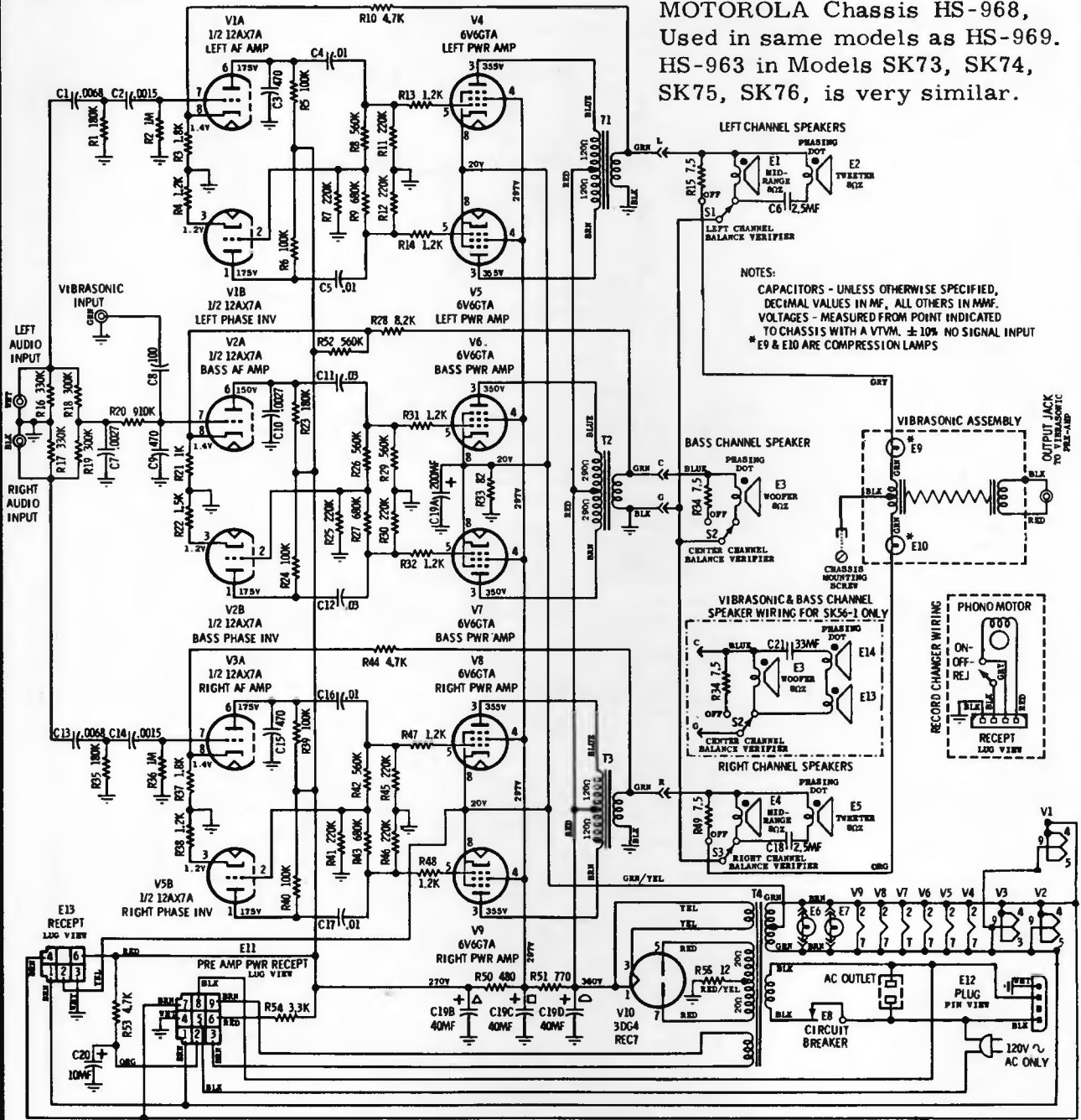


HS-969 SCHEMATIC-MODELS SK56-1, 57-1, 77, 78, 79 & 80

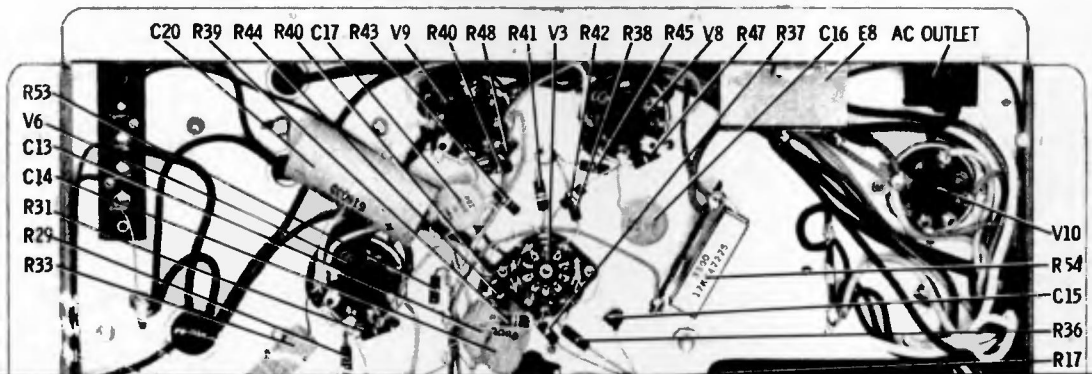
MOTOROLA Chassis HS-969, Models SK56-1, SK57-1, SK77, SK78, SK79, SK80

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



Packard Bell

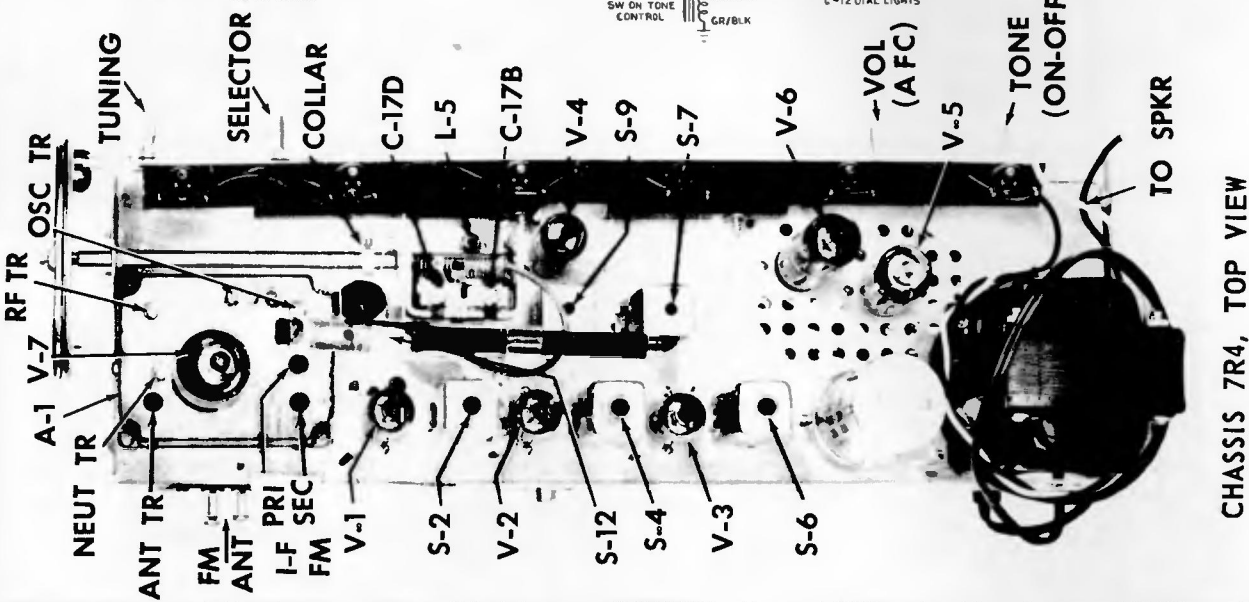
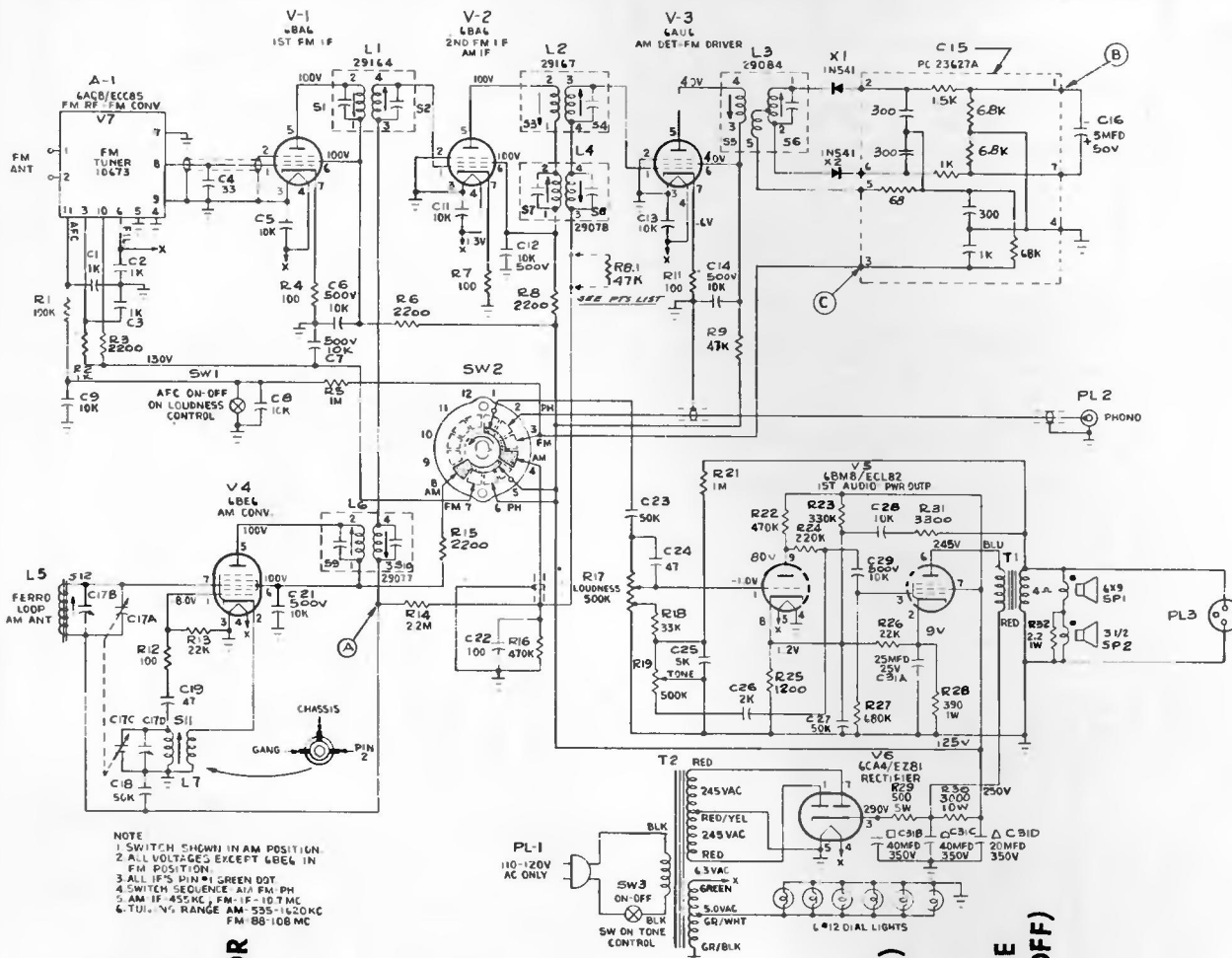
MODEL 7R4 RADIO

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

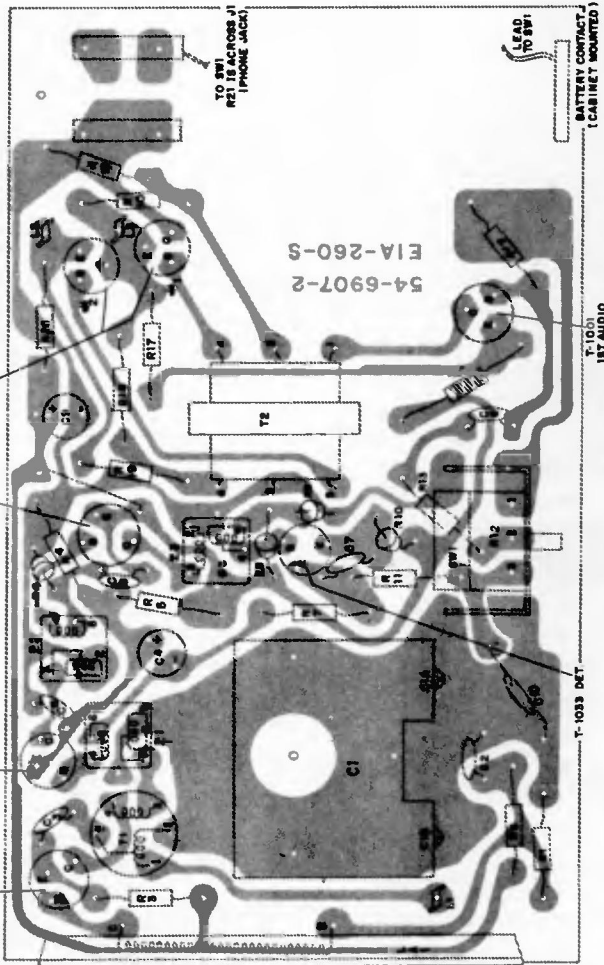
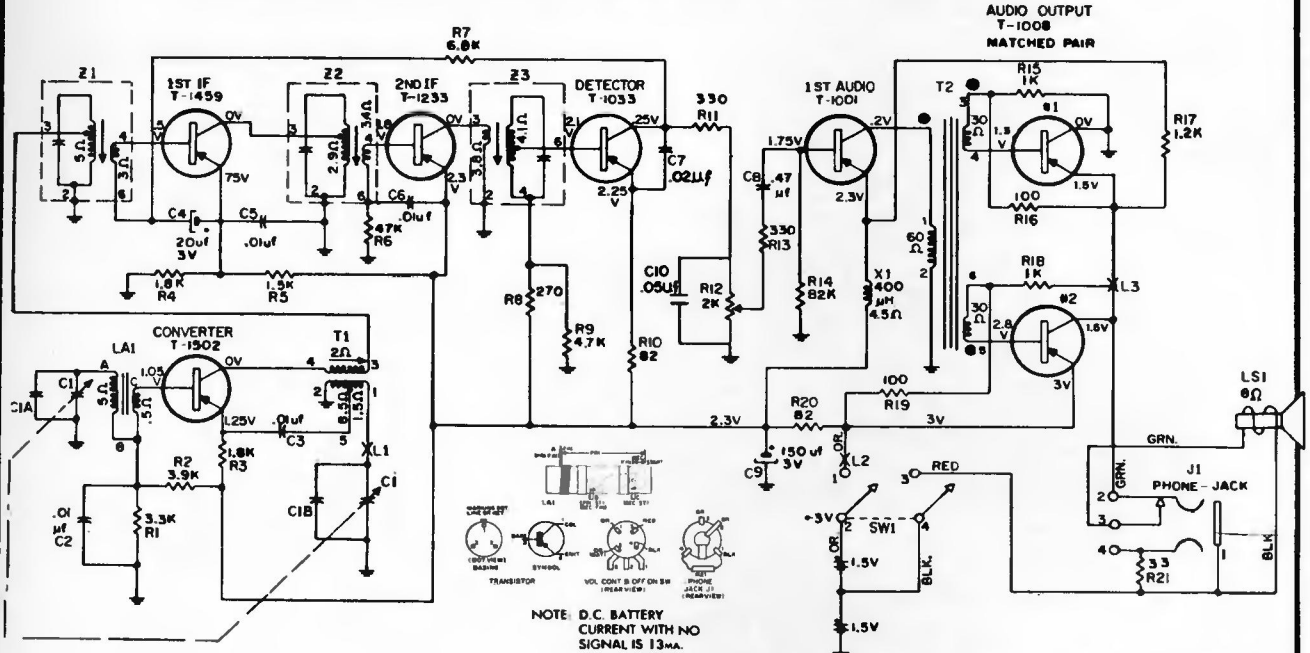
AM radio: 530 kc to 1620 kc; I-F 455 kc

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



CHASSIS 7R4, TOP VIEW

PHILCO PORTABLE RADIO TRANSISTOR MODEL T-71, CODE 124



Component Panel Bottom View—Showing Parts Location

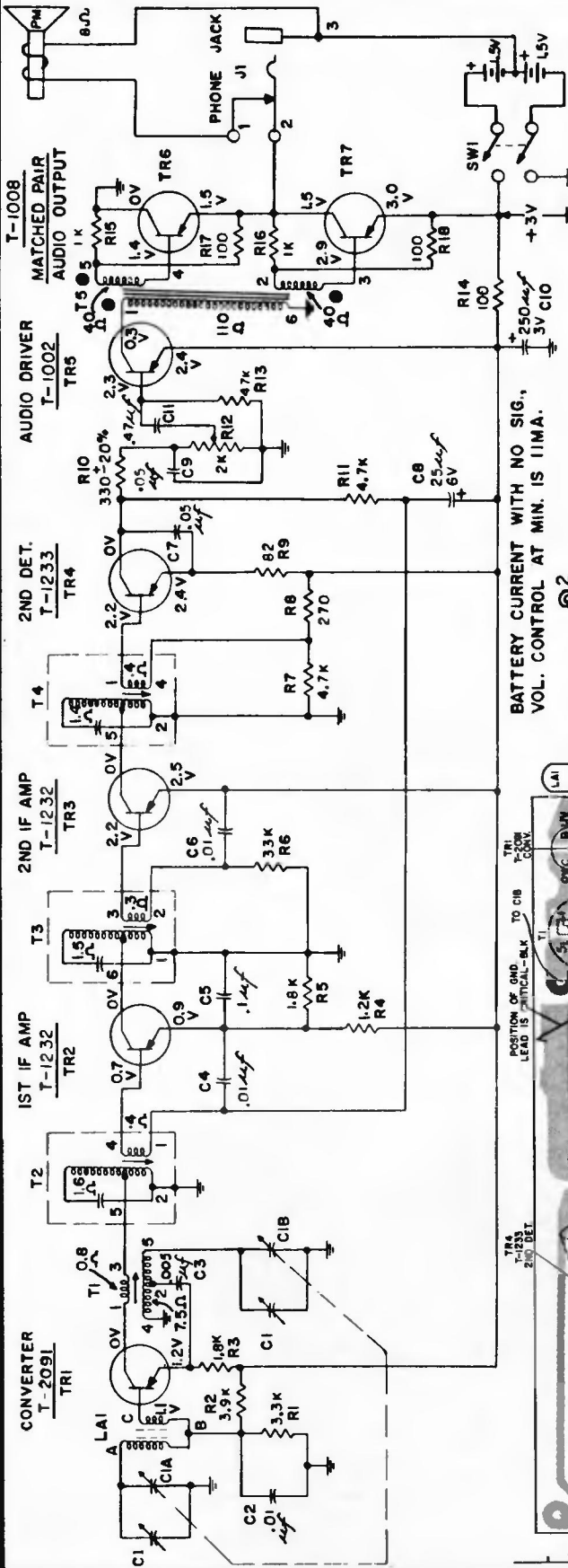
ALIGNMENT CHART

STEP	SIGNAL GENERATOR CONNECTION TO RADIO	DIAL SETTING	RADIO SPECIAL INSTRUCTIONS	ADJUST
1	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. (Tuning gang fully open)	Adjust for maximum output.	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

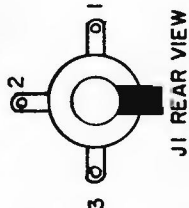
MODEL T-77, CODE 124



BATTERY CURRENT WITH NO SIG., VOL. CONTROL AT MIN. IS 11MA.

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

ALL VOLTAGES MEASURED FROM B MINUS



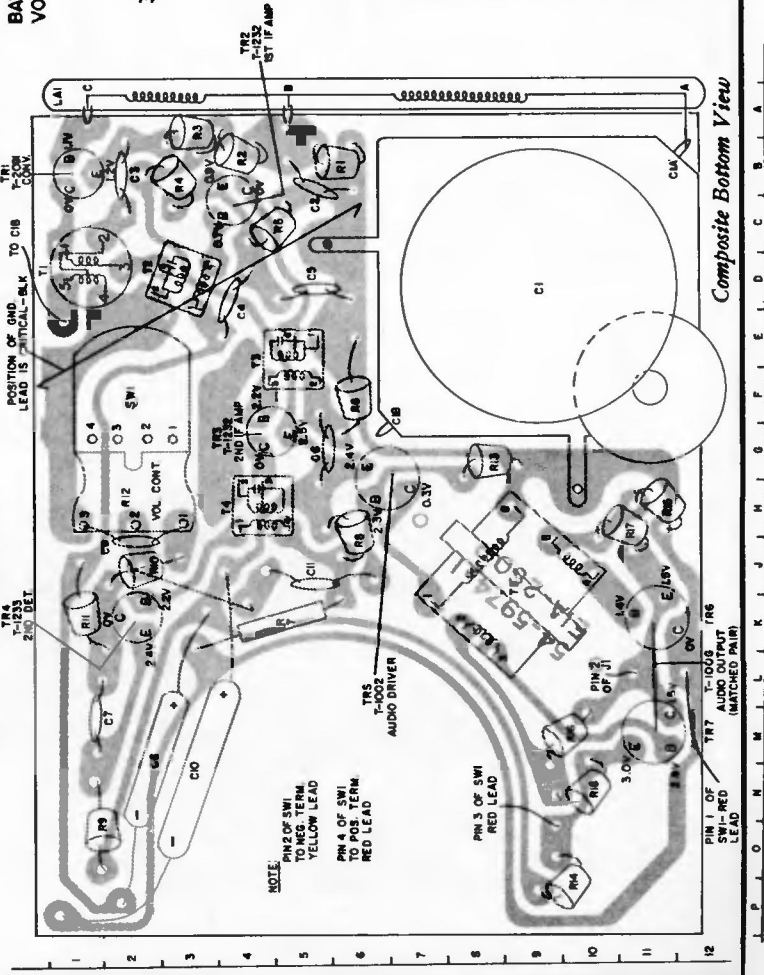
SERVICE NOTES

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.

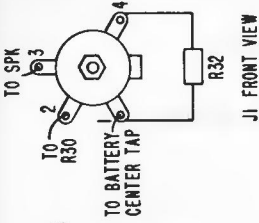
NOTE: Panel Removal

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.

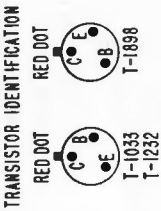


PHILCO TRANSISTOR RADIO

MODEL T-88, CODE 124

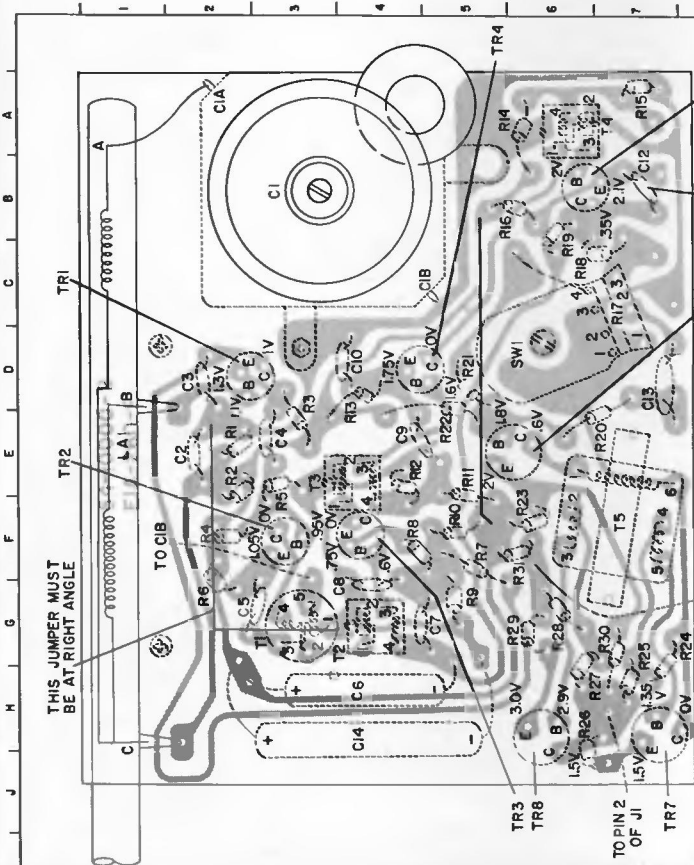
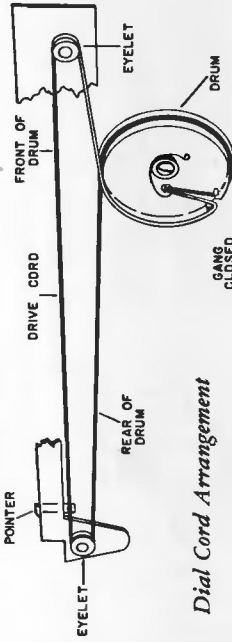


NOTES:
 ALL RESISTOR VALUES EXPRESSED IN OHMS AND ALL CAPACITOR VALUES EXPRESSED IN MICROFARADS UNLESS OTHERWISE NOTED.
 WHEN CHECKING DC RESISTANCES POSITIVE LEAD GOES TO BASE OF TRANSISTORS WITH NO SIGNAL VOLUME CONTROL AT MINIMUM, CURRENT = 9 MILLIAMPS

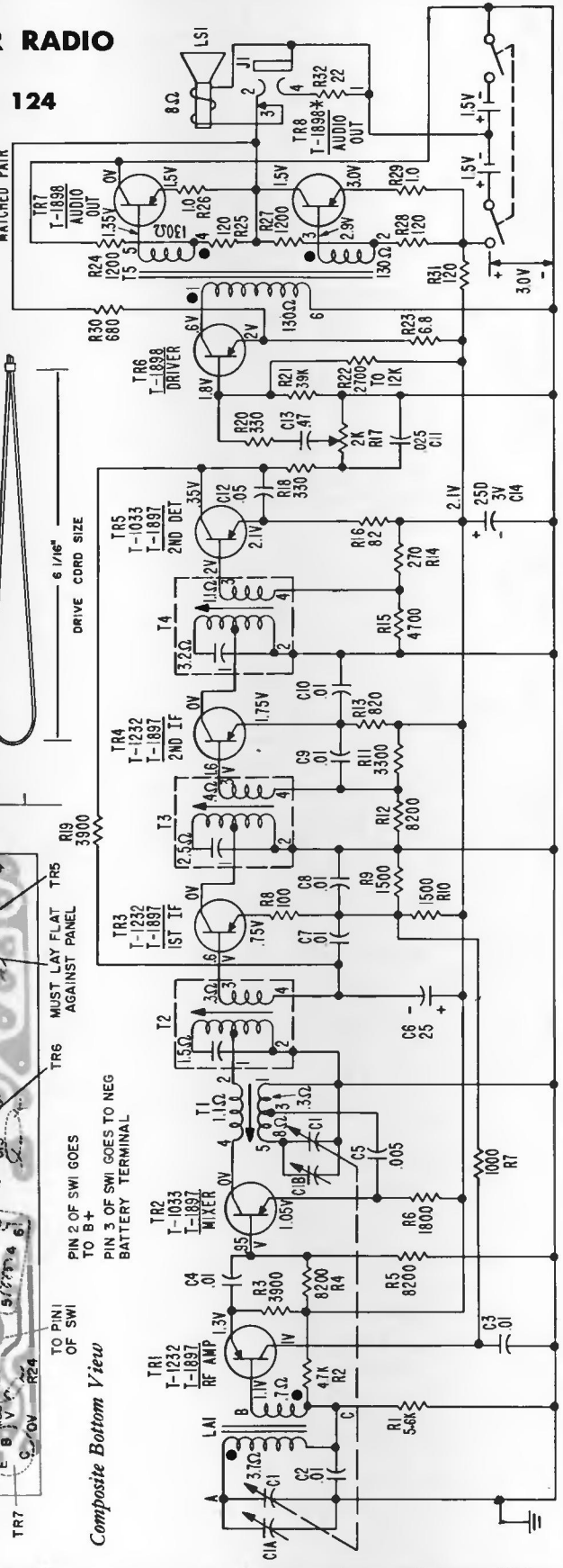


FREQUENCY COVERAGE—535 TO 1620 KC.
INTERMEDIATE FREQUENCY—455 KC.

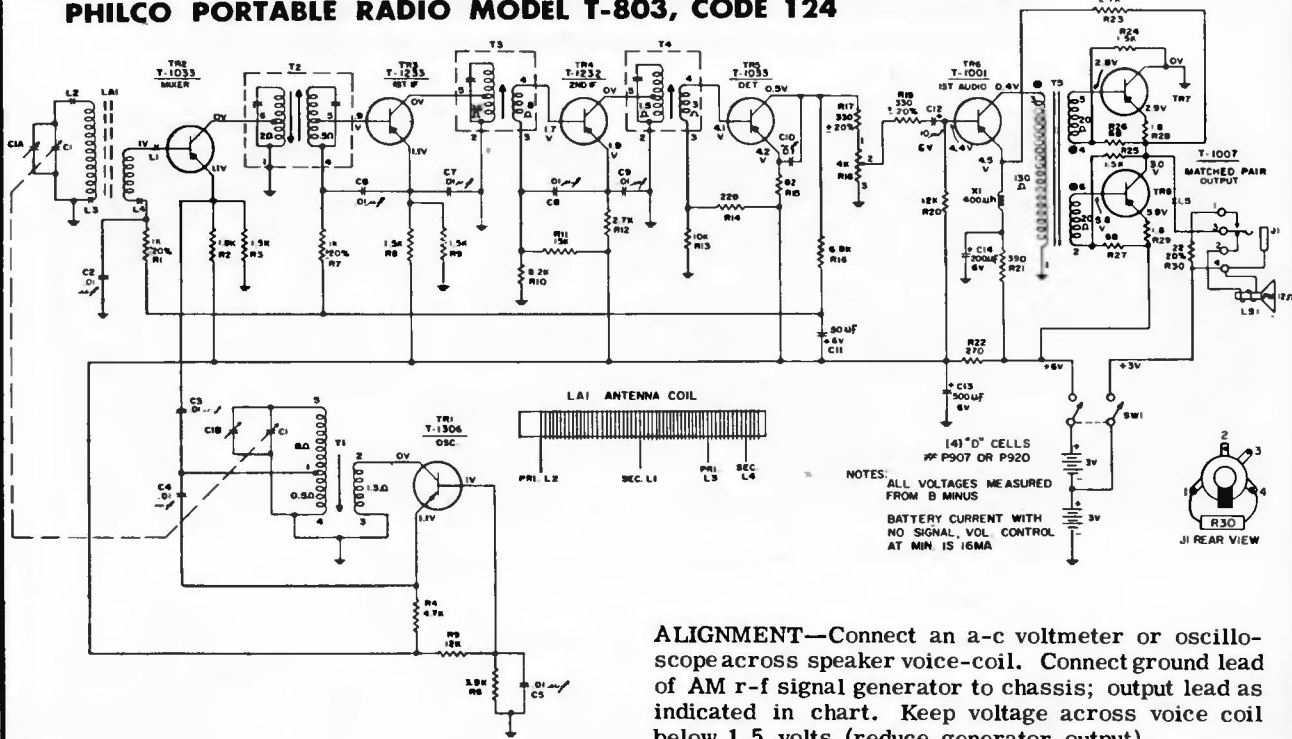
When replacing driver transistor TR6, current limiting resistor R22 must be of proper value to provide 2.1 ma collector current with the transistor employed. Refer to parts list for the replacement transistor which is shipped with the proper resistor.



Composite Bottom View



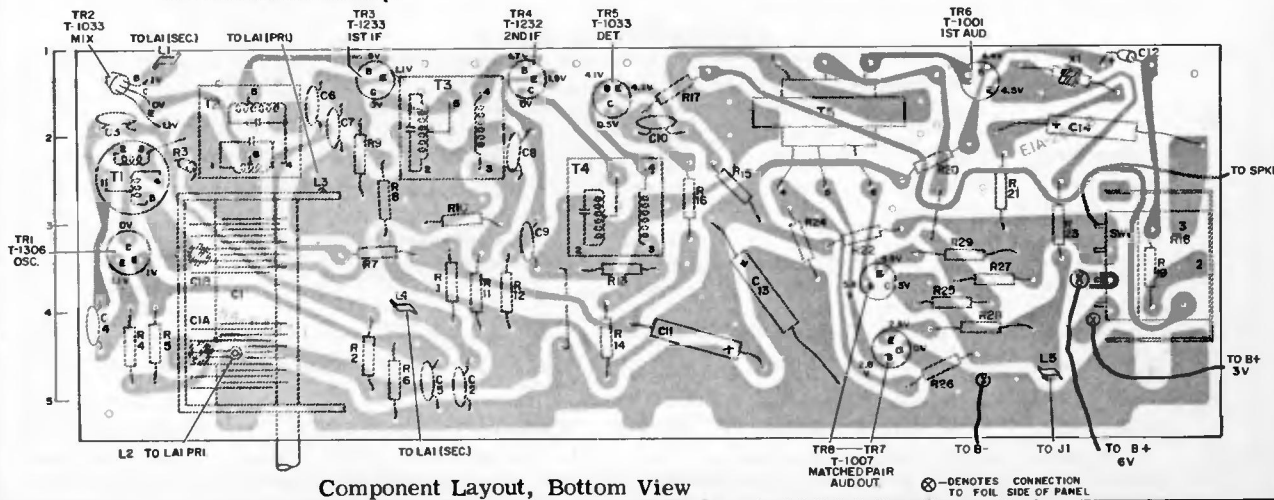
PHILCO PORTABLE RADIO MODEL T-803, CODE 124



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		
	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	ADJUST
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)

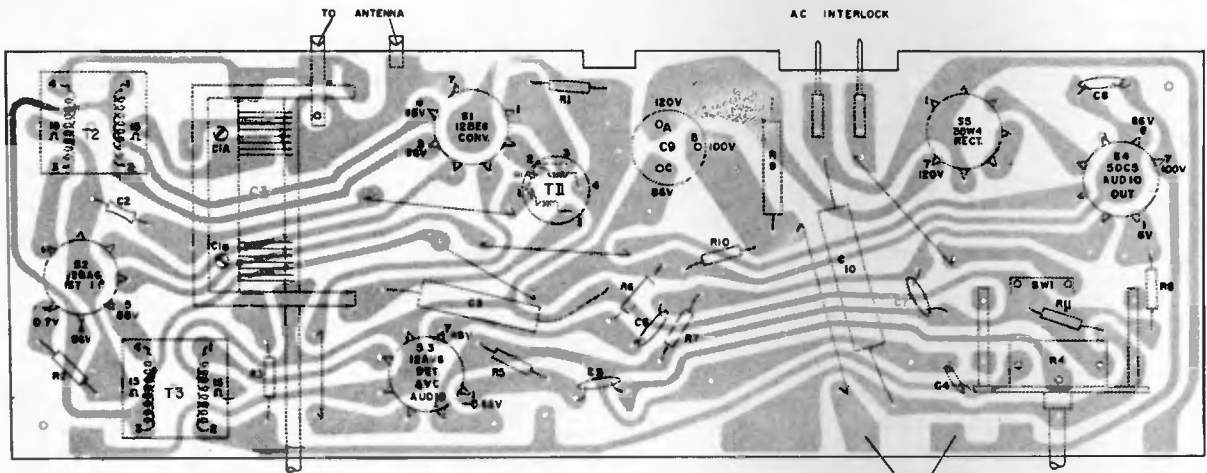


Figure 1. Bottom View of Perma Circuit Panel Component Layout Models K-849, K-850

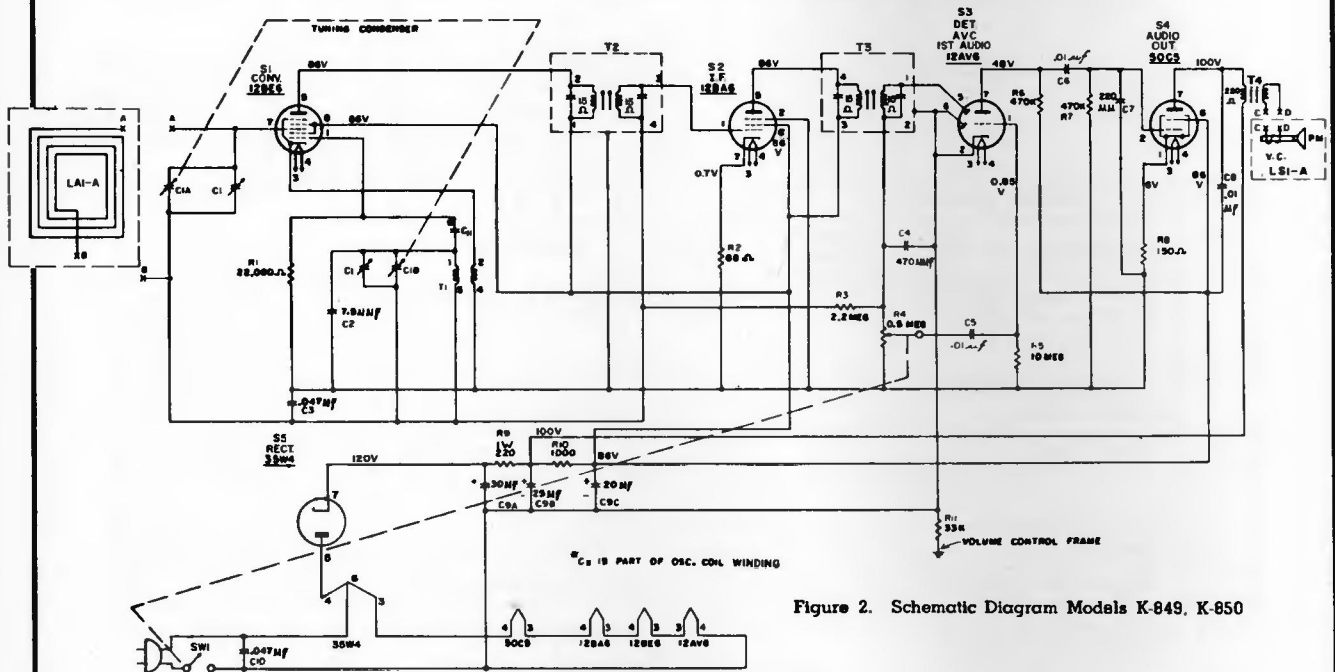


Figure 2. Schematic Diagram Models K-849, K-850

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)

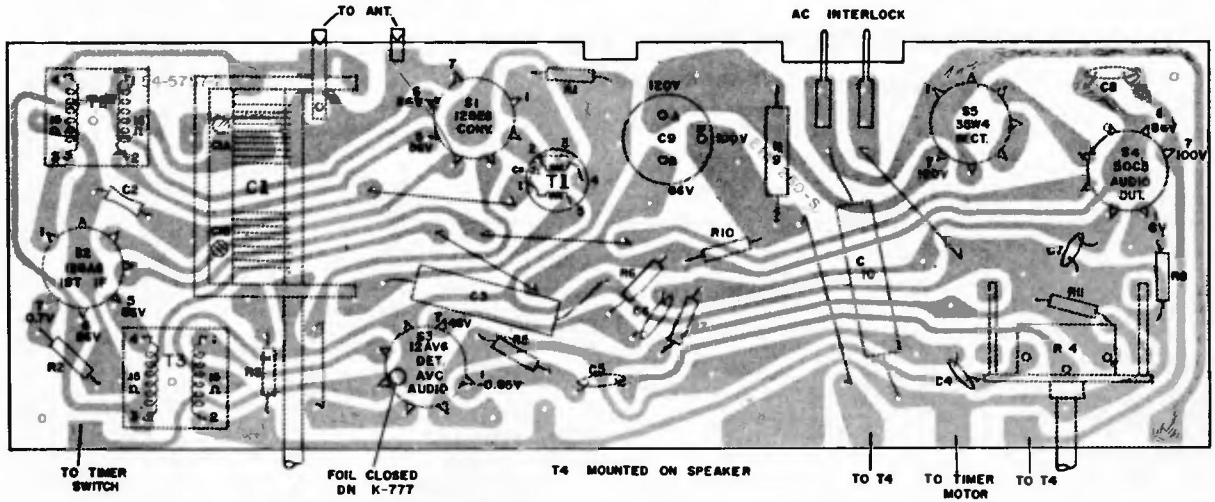


Figure 3. Bottom View of Perma Circuit Panel Component Layout Model K-778

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.

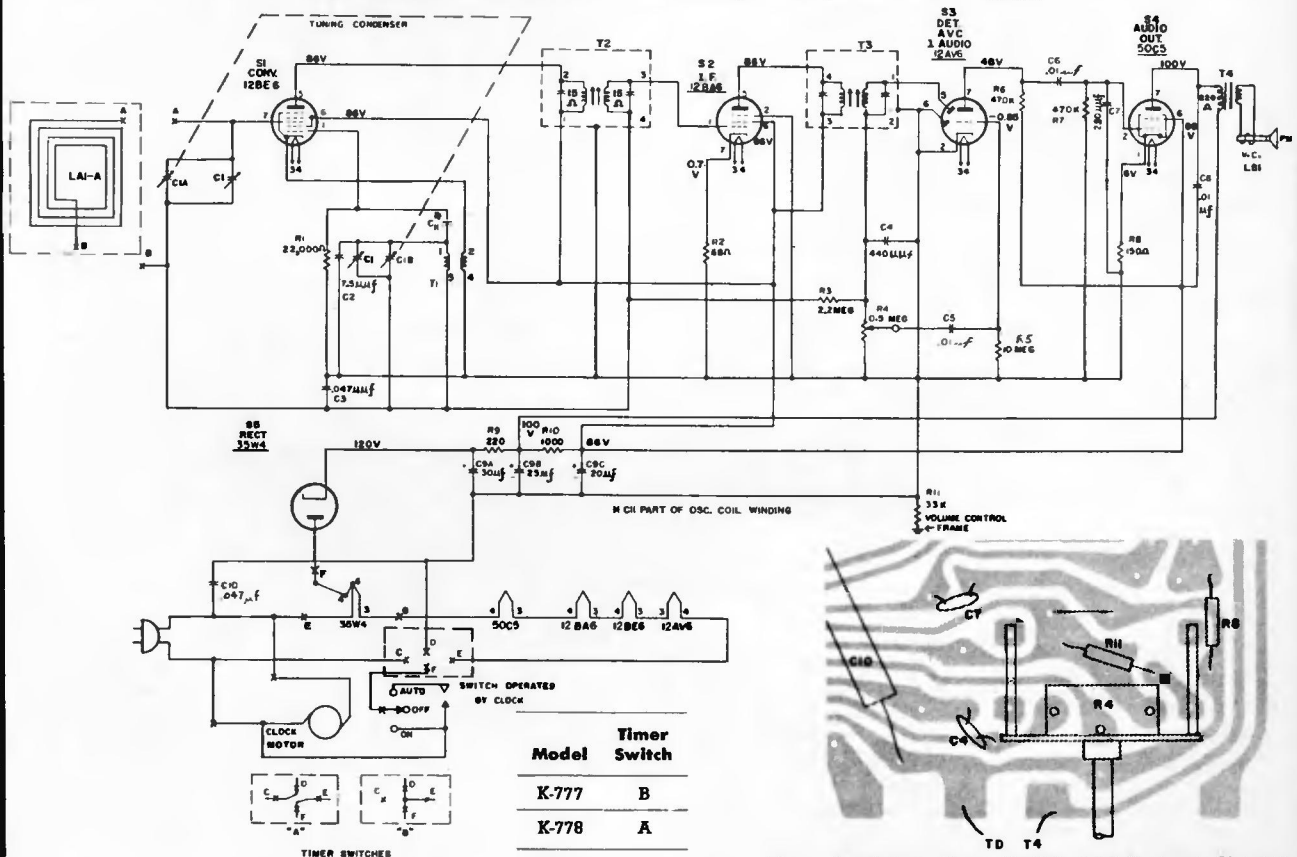


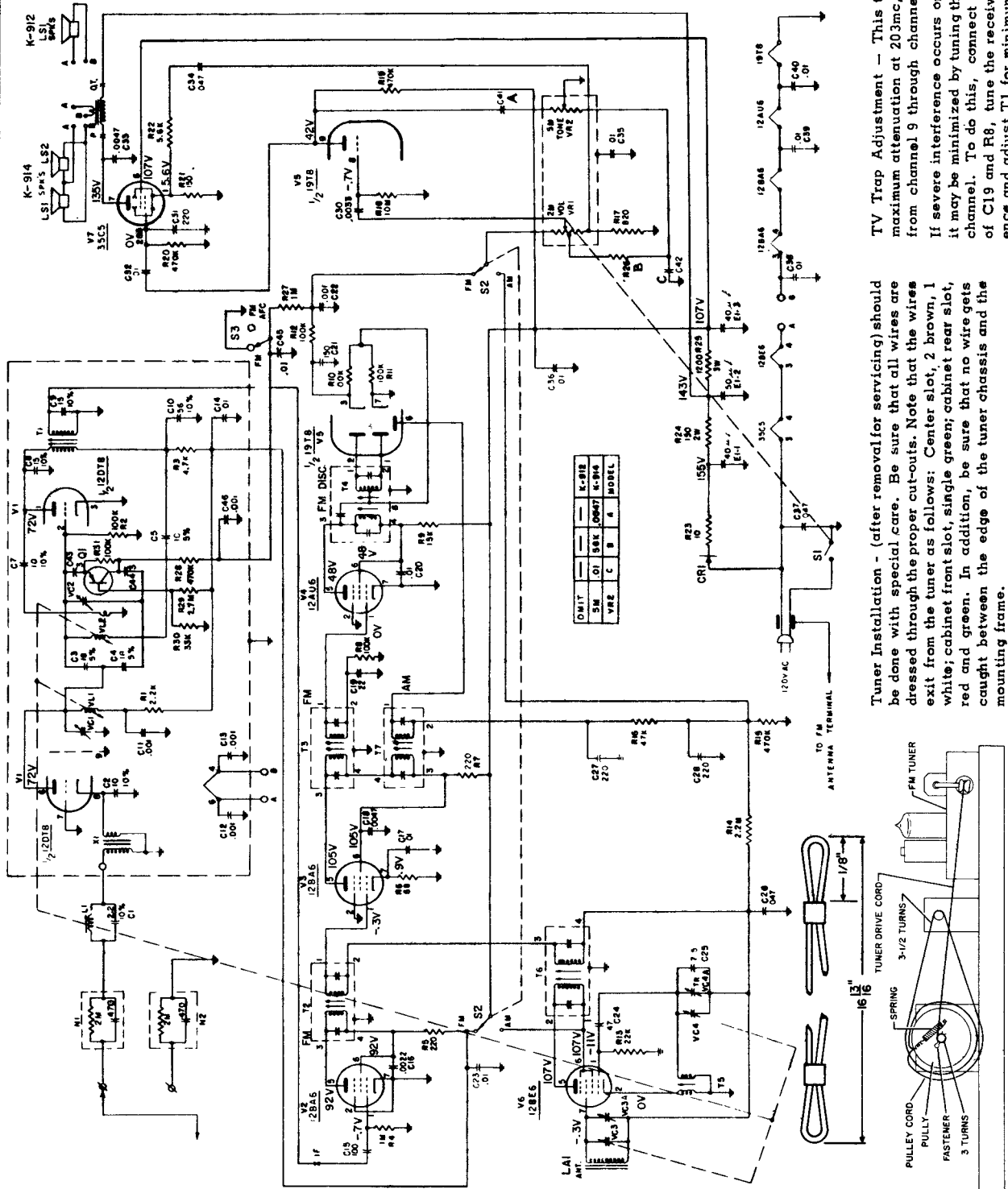
Figure 4. Schematic Diagram Models K-777, K-778

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

PHILCO

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

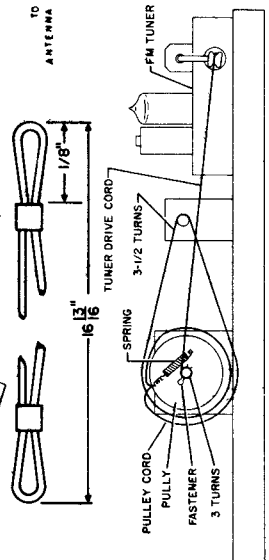
(Continued on the next page at right)



TV Trap Adjustment - This trap, factory adjusted for maximum attenuation at 203mc, will reduce interference from channel 9 through channel 13 television stations. If severe interference occurs on one particular channel, it may be minimized by tuning this trap to that particular channel. To do this, connect a VTVM to the junction of C19 and R8, tune the receiver for maximum interference and adjust T1 for minimum meter indication.

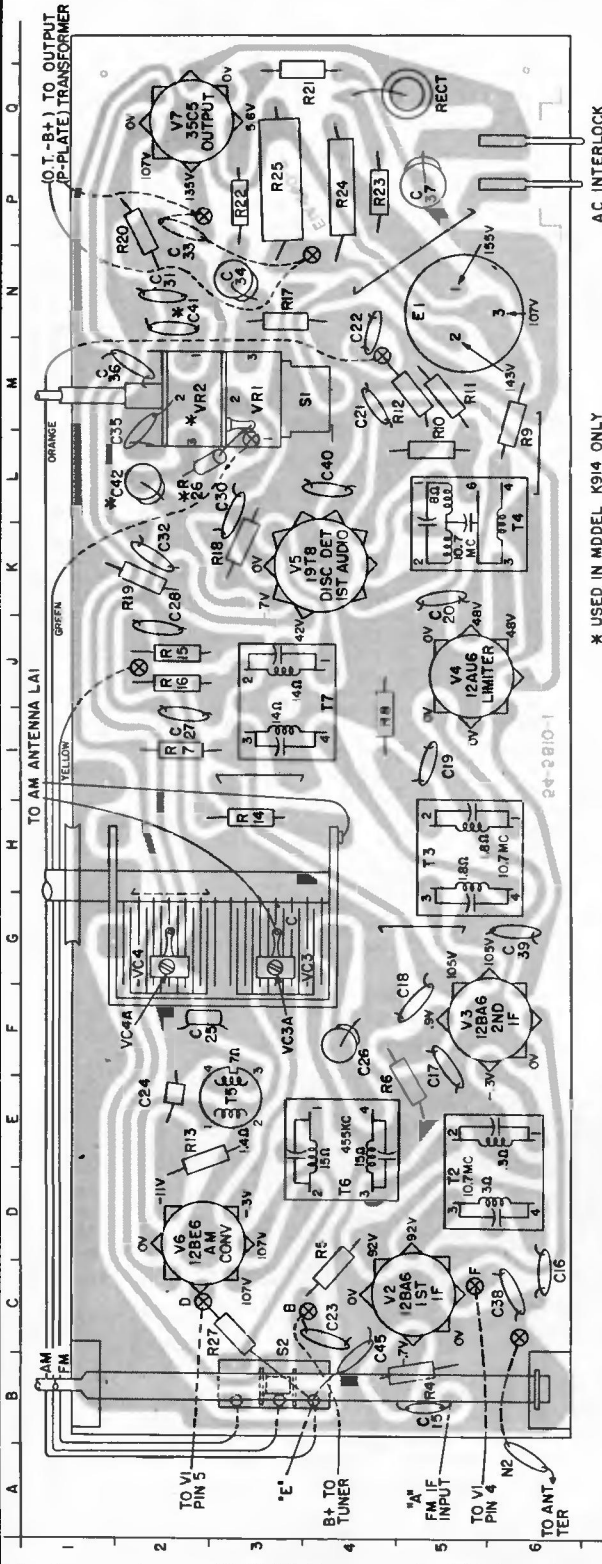
Tuner Installation - (after removal for servicing) should be done with special care. Be sure that all wires are dressed through the proper cut-outs. Note that the wires exit from the tuner as follows: Center slot, 2 brown, 1 white; cabinet front slot, single green; cabinet rear slot, red and green. In addition, be sure that no wire gets caught between the edge of the tuner chassis and the mounting frame.

Dial Cord Stringing



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

(Continued from preceding page)



PARTS LIST

Sym- bol	Loca- tion	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).

**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)

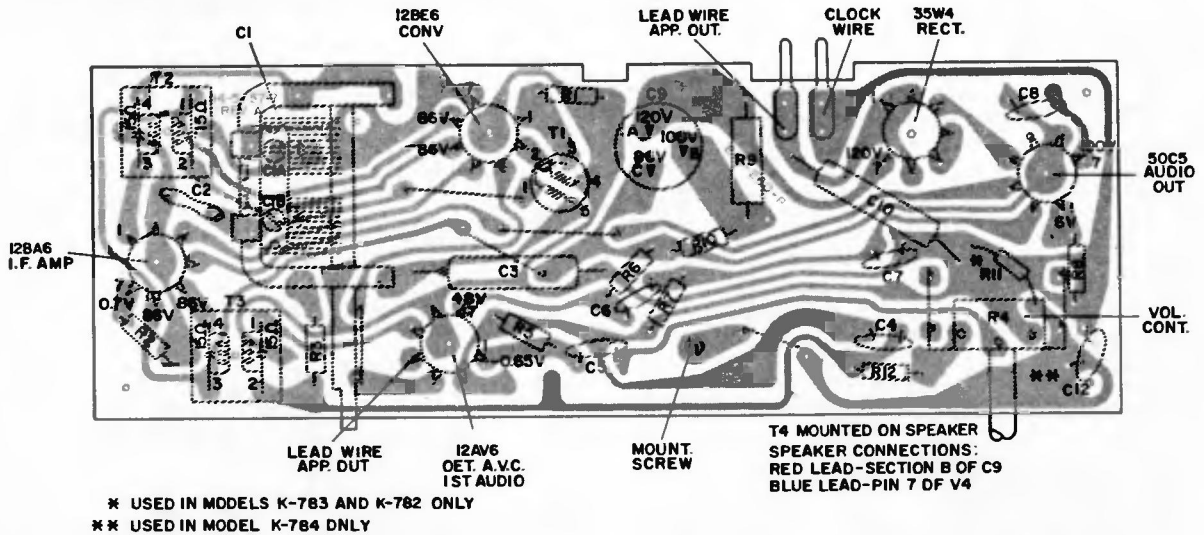


Figure 2. Bottom View of Perma Circuit Panel Component Layout Models K-782, K-783, K-784

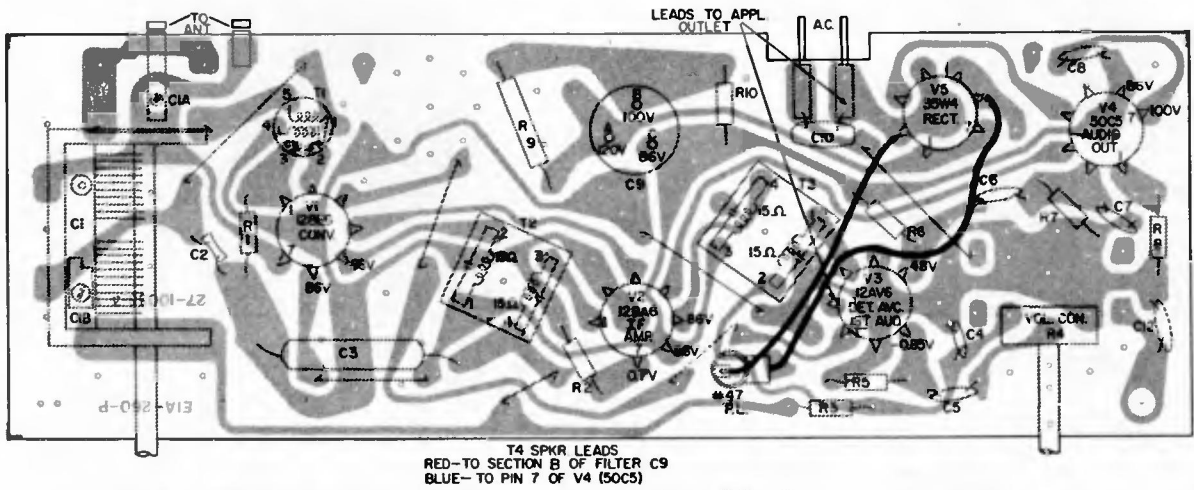


Figure 3. Bottom View of Perma Circuit Component Layout Model K-785 (Layout Model K-858 is similar)

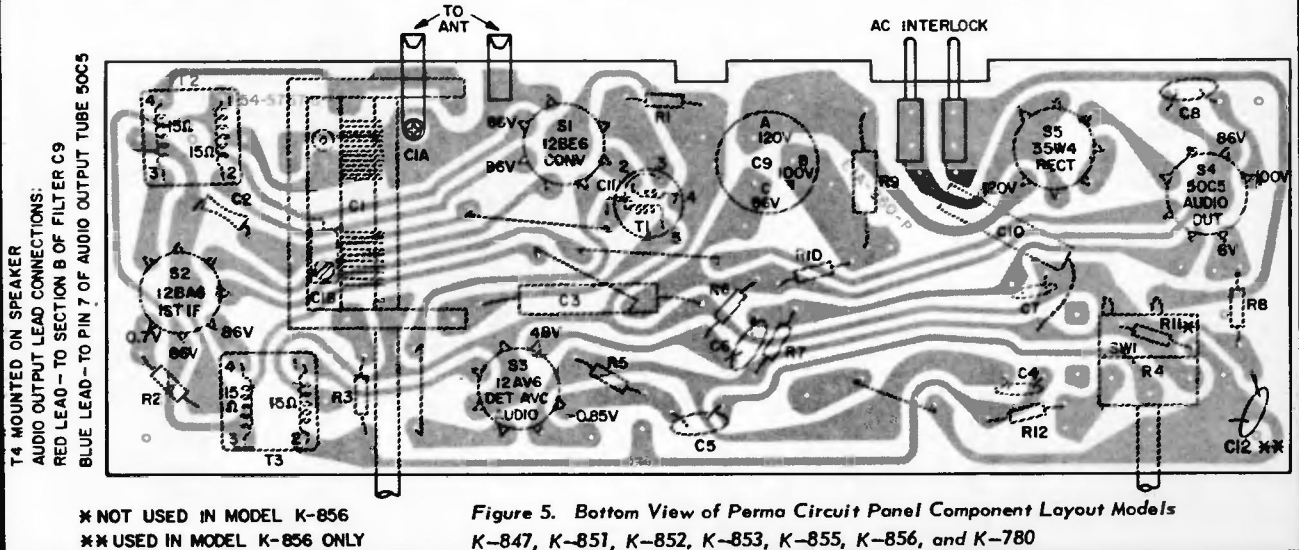
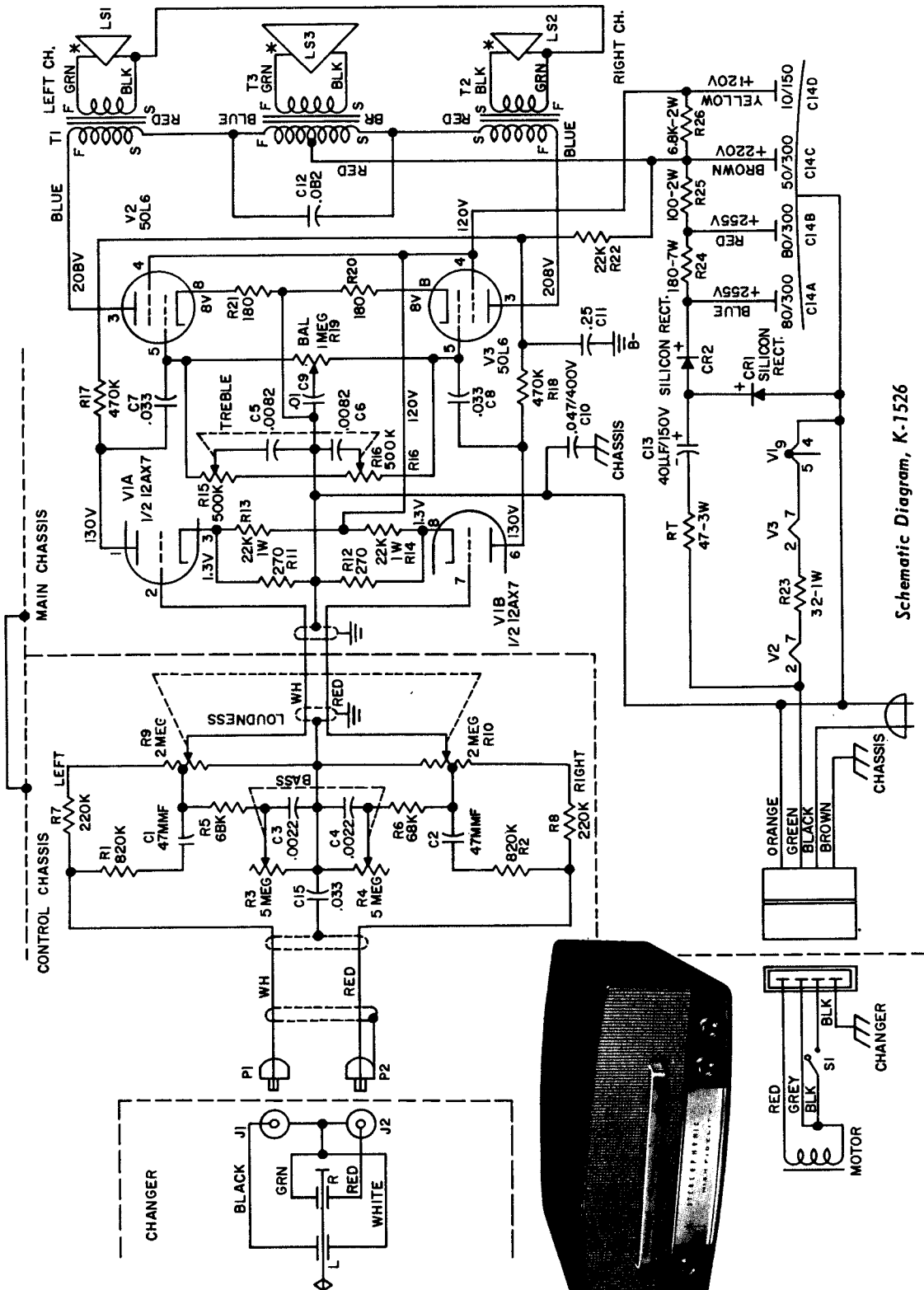
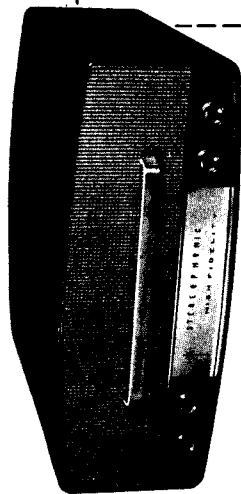


Figure 5. Bottom View of Perma Circuit Panel Component Layout Models K-847, K-851, K-852, K-853, K-855, K-856, and K-780

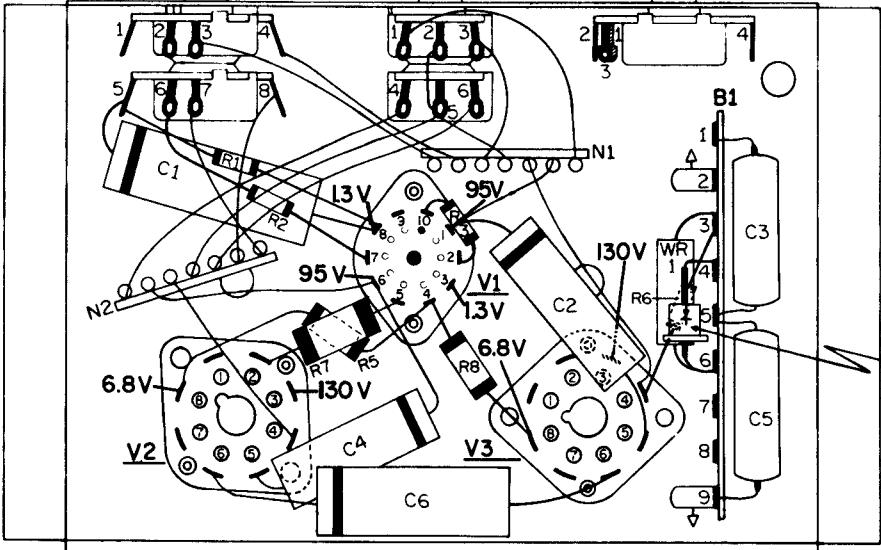
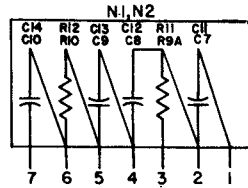
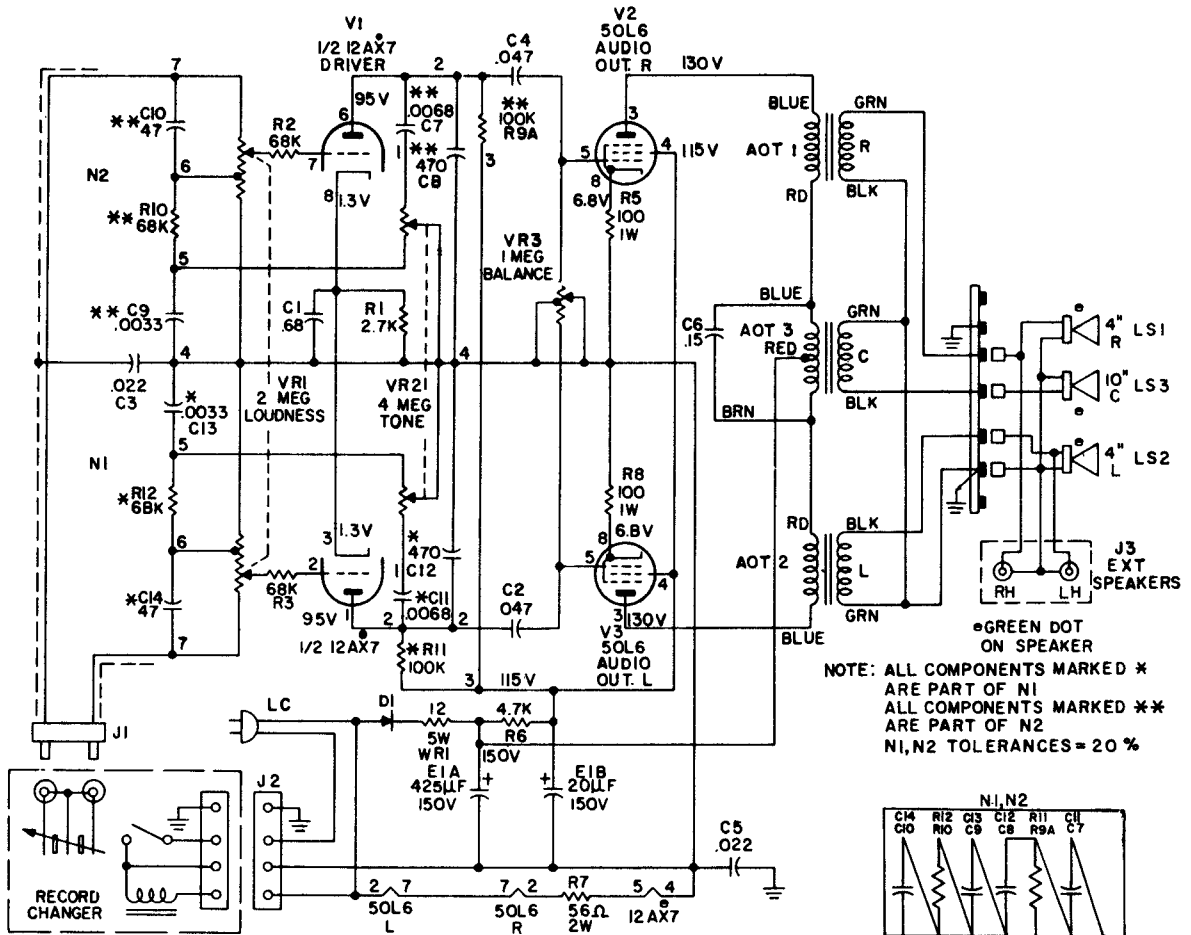
PHILCO MODEL K-1526



Schematic Diagram, K-1526



PHILCO AMPLIFIER—MODEL K-1628



Bottom View, Model K-1628 Showing Component Locations

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

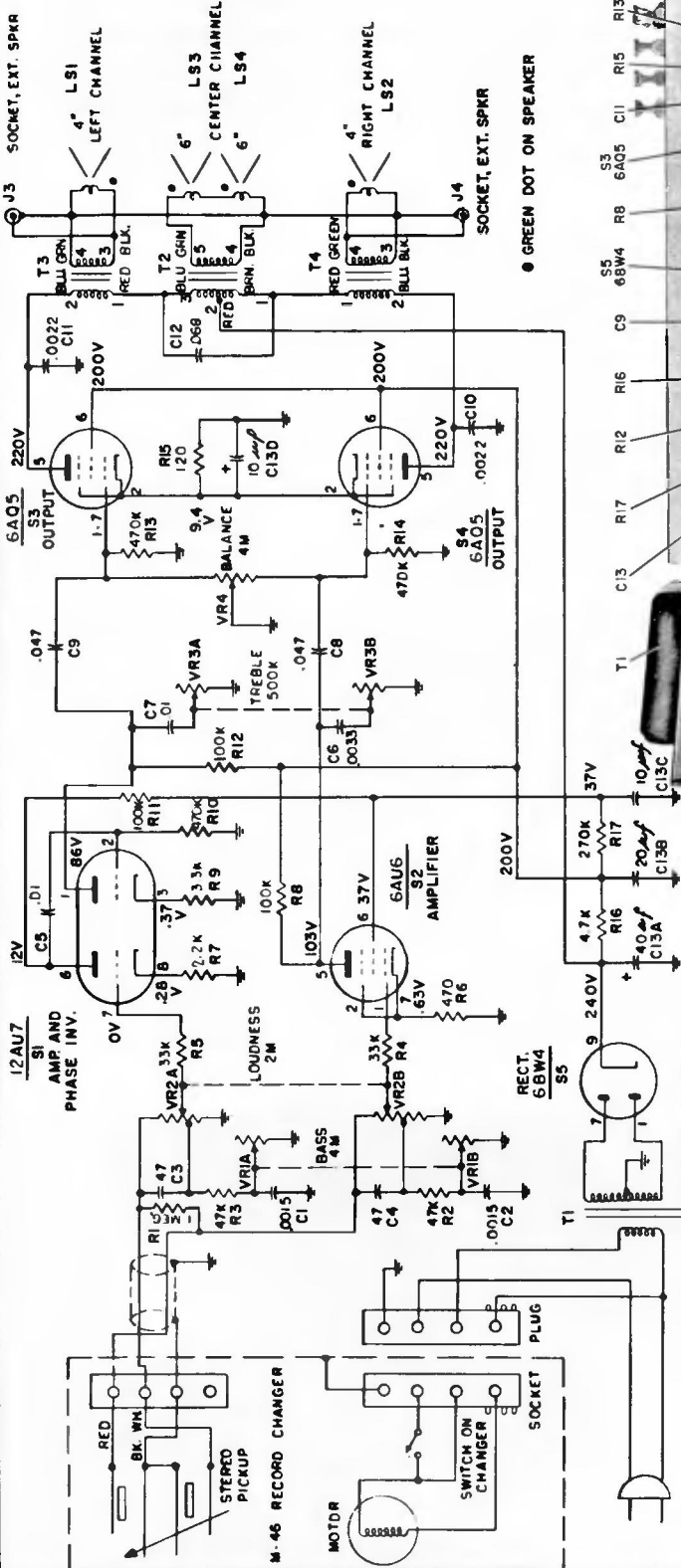
POWER CONSUMPTION: Model K-1628 — 55 watts.

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 8Ω and magnet weight is .68 ounces. This model employs a 10", 16Ω woofer, for central bass listening.

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

PHILCO
AMPLIFIER — MODEL K-1632

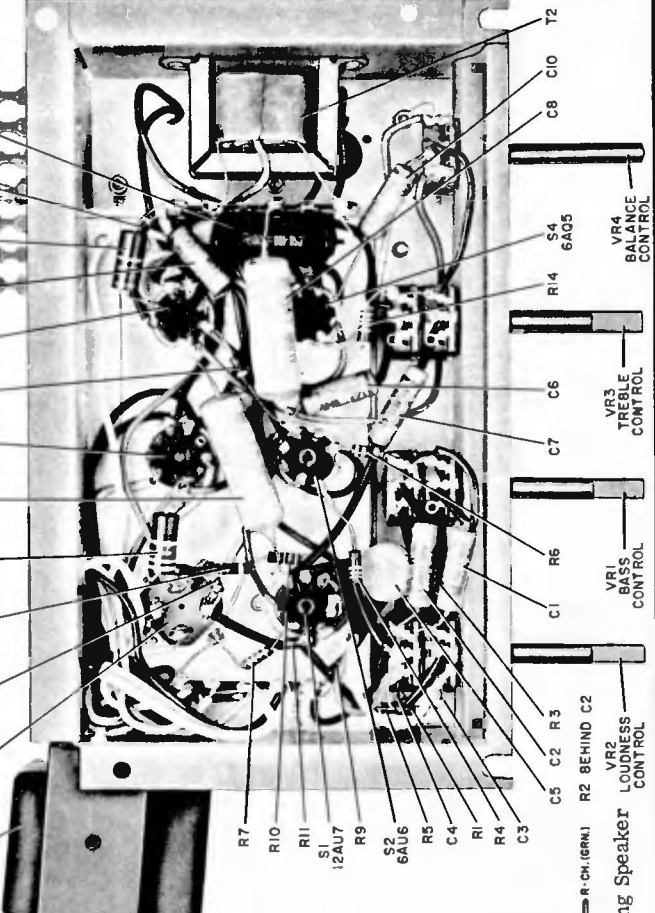
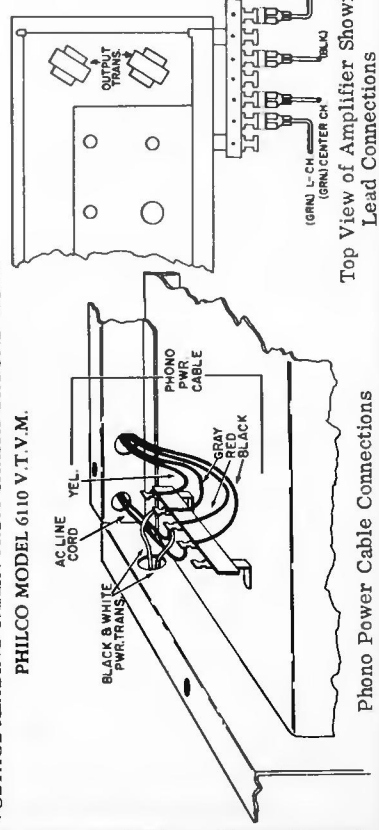


RESISTANCE READINGS

COMPONENT	PRIMARY	SECONDARY
T2	800Ω with C.T.	1.5Ω
T3	2600Ω	.6Ω
T4	2600Ω	.6Ω

NOTE: All resistance readings made with component in circuit.

VOLTAGE READING TAKEN FROM CHASSIS GROUND WITH PHILCO MODEL 6110 V.T.V.M.



RCA VICTOR

Models

1-RH-10, 1-RH-11,
1-RH-12, 1-RH-13,

1-TP-1E, HE, JE (Late Prod.)

Model 1-RJ-19

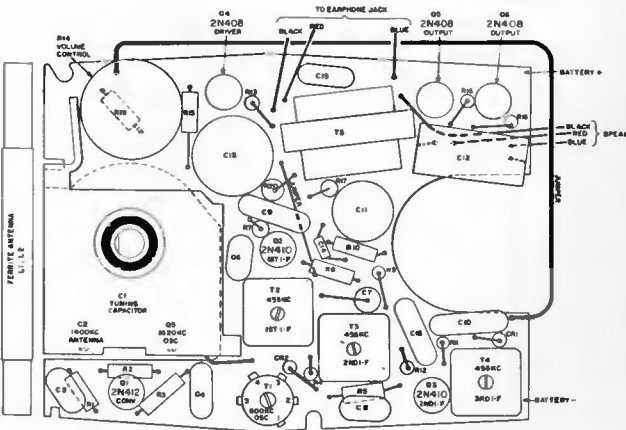
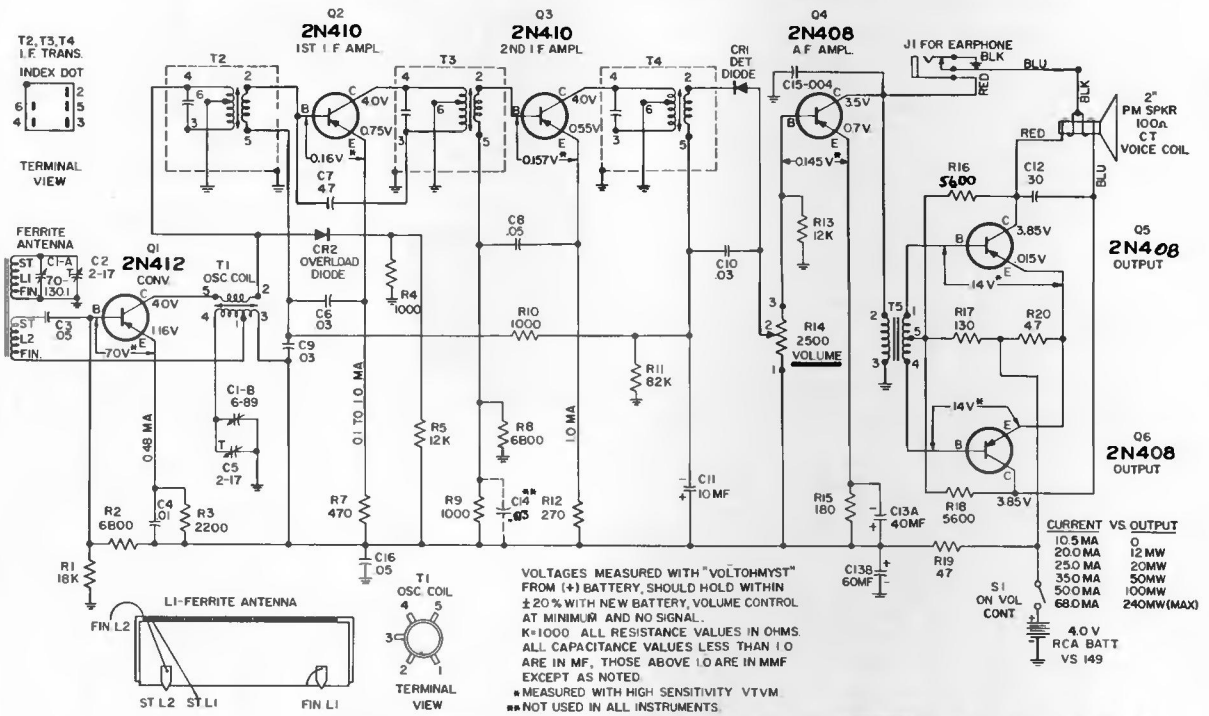
Chassis No. RC-1199D

CHASSIS REMOVAL

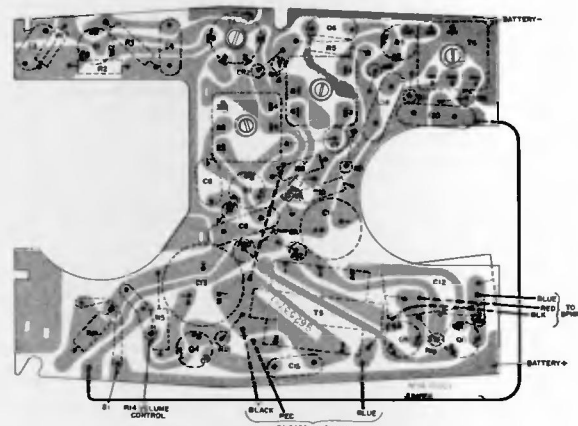
1. Unsolder the battery spring contacts from the circuit board. DO NOT ATTEMPT TO REMOVE CONTACTS FROM CASE. The battery contacts are heat sealed to the plastic case front.
2. Pull the dial knob off of tuning condenser shaft.
3. Remove the knurled nut holding the earphone jack to the case.
4. Remove the two screws holding the circuit board to the case and lift chassis from the case.
5. If necessary to separate chassis and speaker, unsolder speaker leads from wiring side of board. AVOID UNSOLDERING LEADS AT SPEAKER TERMINALS SINCE EXCESSIVE HEAT WILL DAMAGE VOICE COIL LEADS.

CRITICAL LEAD DRESS

1. Dress lead from diode to volume control between speaker magnet and top of battery.
2. Keep leads to earphone jack as short as possible.
3. Dress leads from output transistors to speaker towards the edge of the board (away from speaker pot) so as to provide sufficient room for 0.3 mf capacitor.



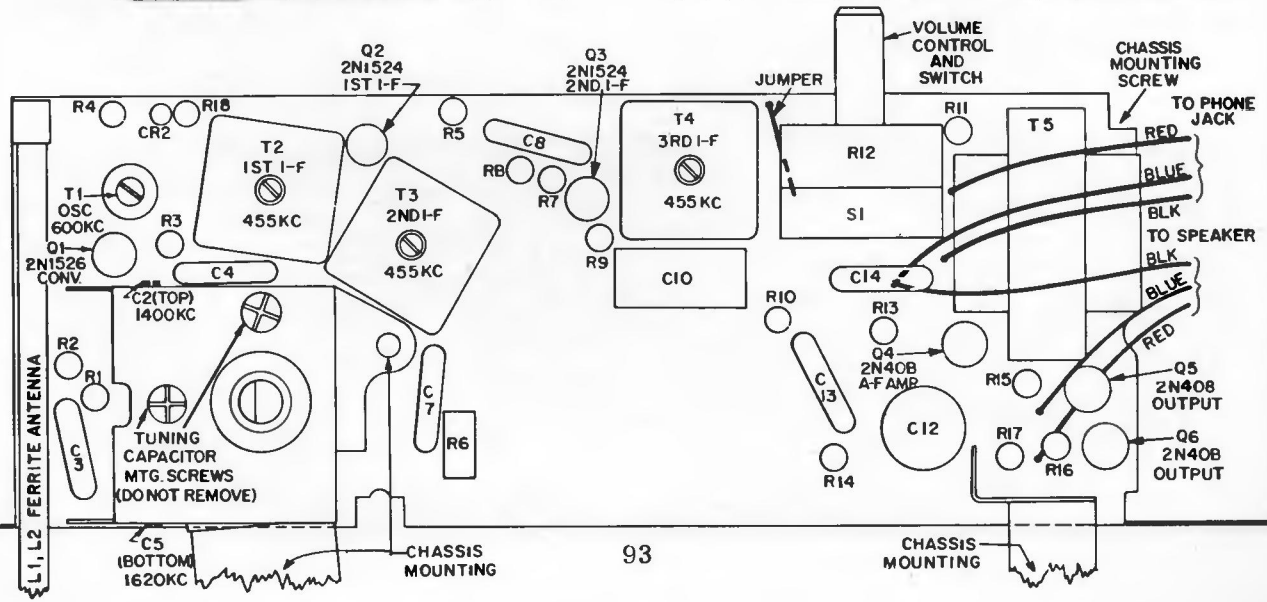
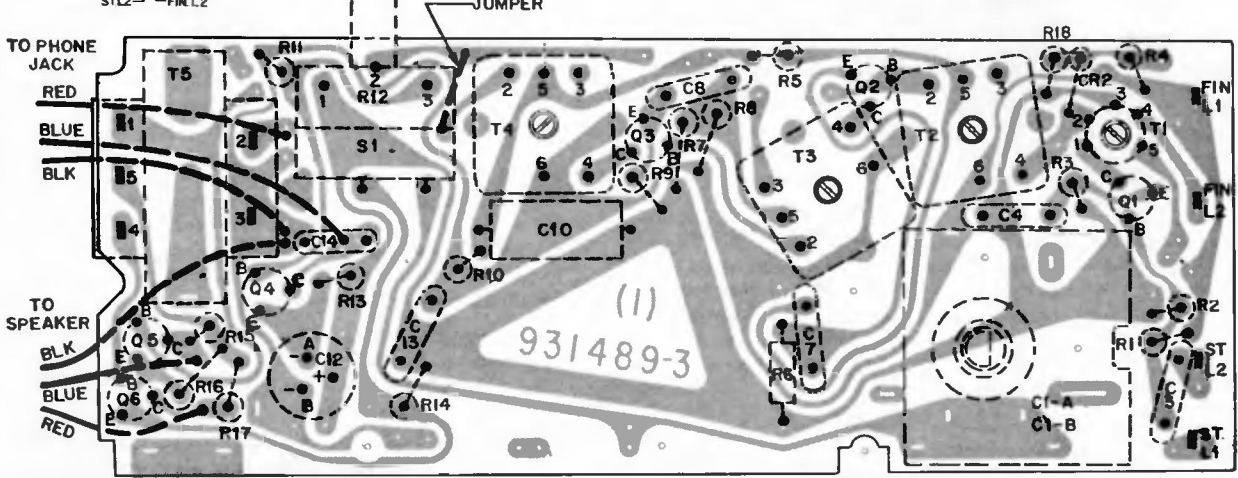
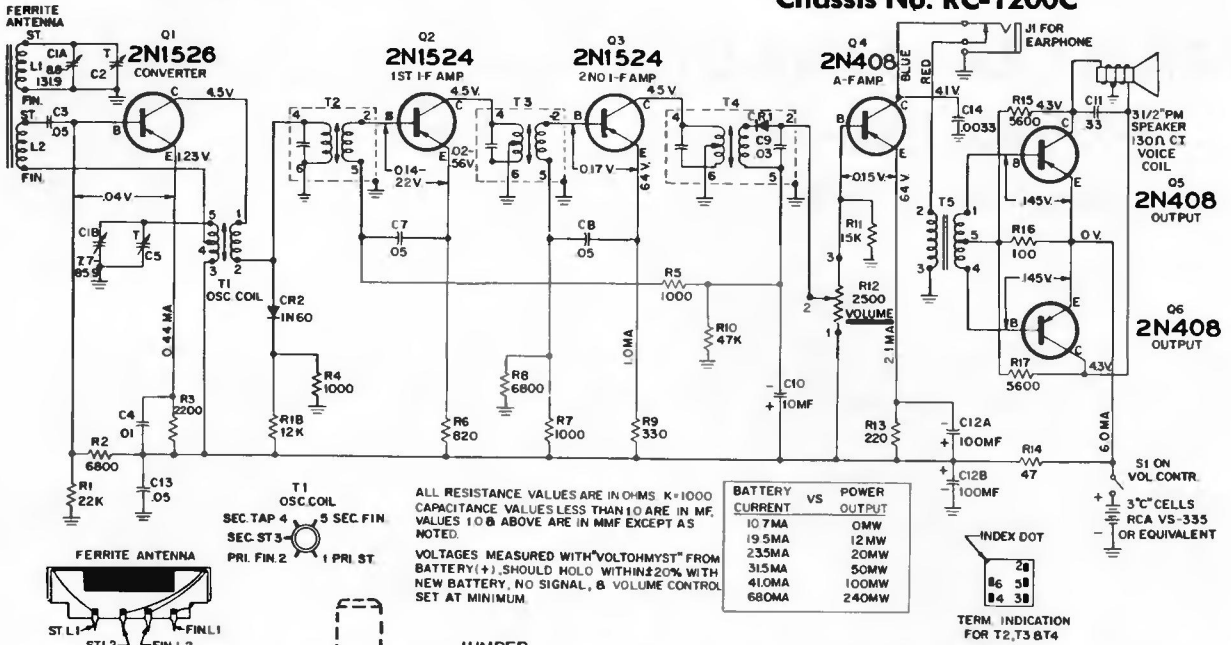
Chassis Layout—View from Component Side



Chassis Layout—View from Wiring Side

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

Chassis No. RC-1200C

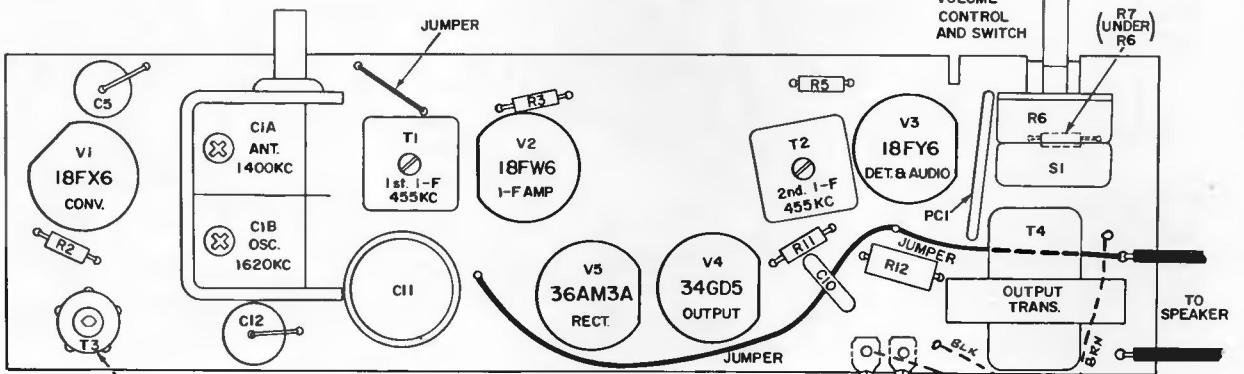
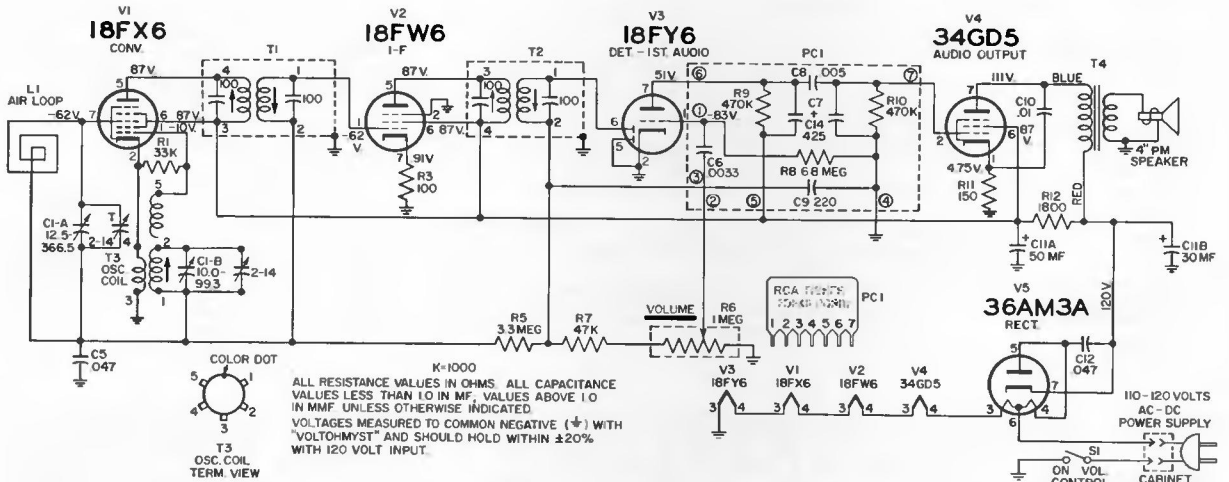
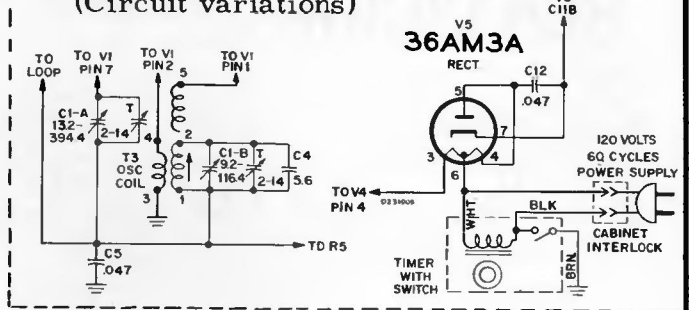


RCA Models

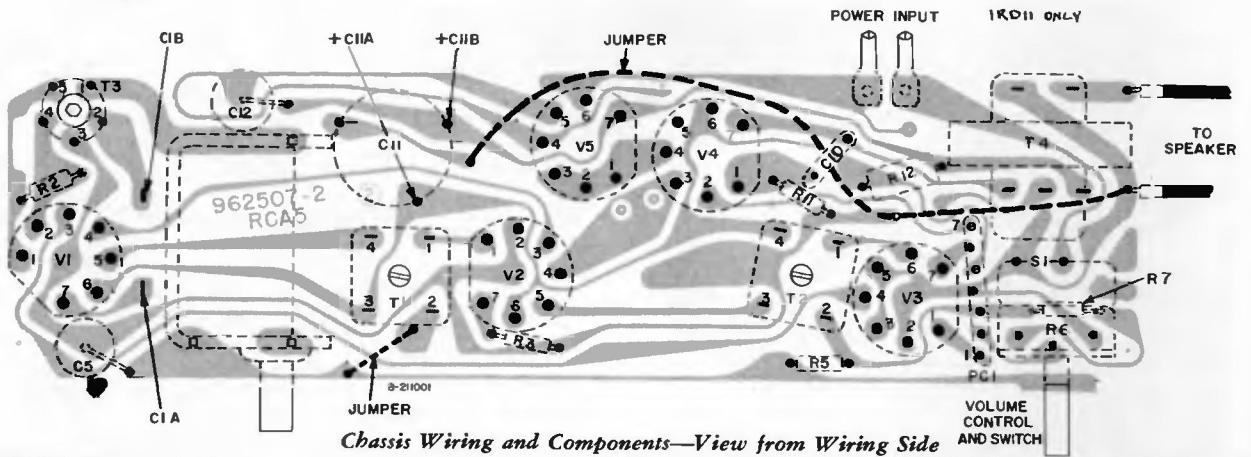
**1-RA-11, 1-RA-20, 1-RA-23,
1-RA-25, 1-RA-26**

Chassis No. RC-1202F

Model 1-RD-11, Chassis RC-1202H
(Circuit variations)



Chassis Layout—View from Component Side

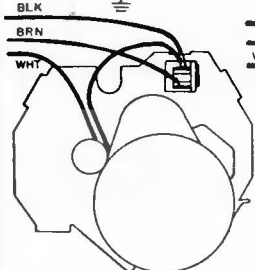
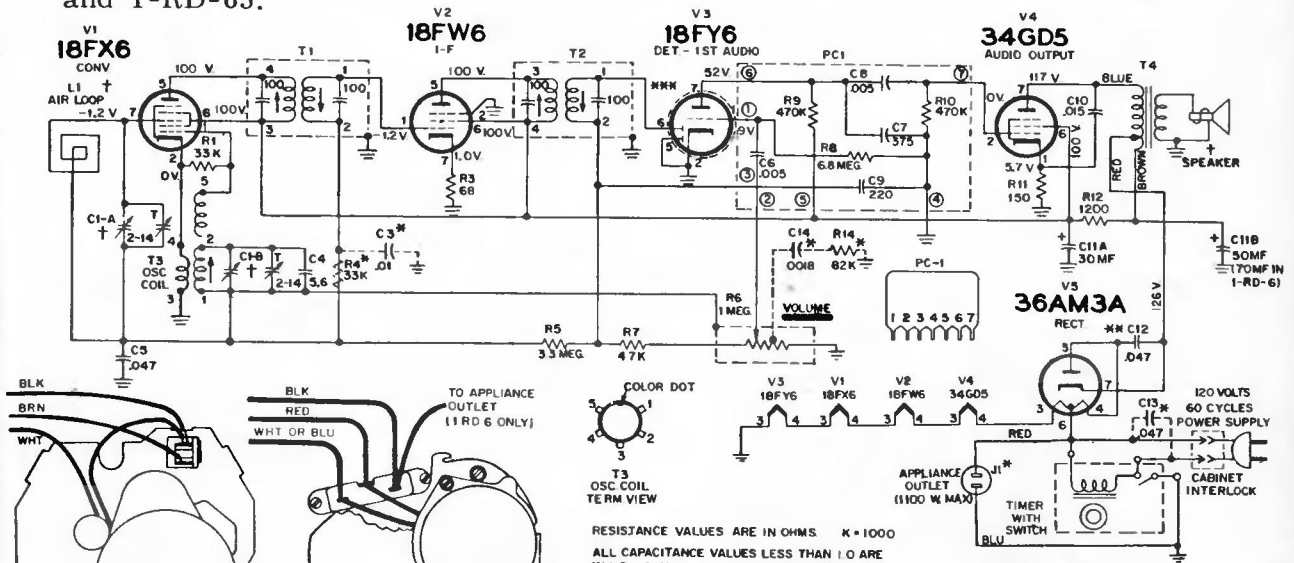


Chassis Wiring and Components—View from Wiring Side

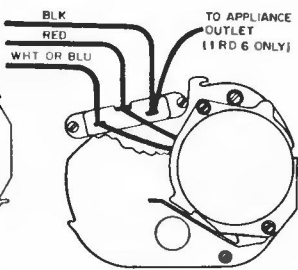
RCA VICTOR

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.



1-RD-3



1-RD-4, -5, -6

Clock Wiring Diagrams

RESISTANCE VALUES ARE IN OHMS K=1000
ALL CAPACITANCE VALUES LESS THAN 1.0 ARE IN MF, VALUES 1.0 AND ABOVE ARE IN MMF, EXCEPT AS NOTED.

VOLTAGES MEASURED TO COMMON NEGATIVE(+) WITH "VOLTOHMYST" AND SHOULD HOLD WITHIN ±20% WITH RATED LINE VOLTAGE.

*USED ON RC-1202T ONLY (R4, R14, C14, C13, C11 & J1)

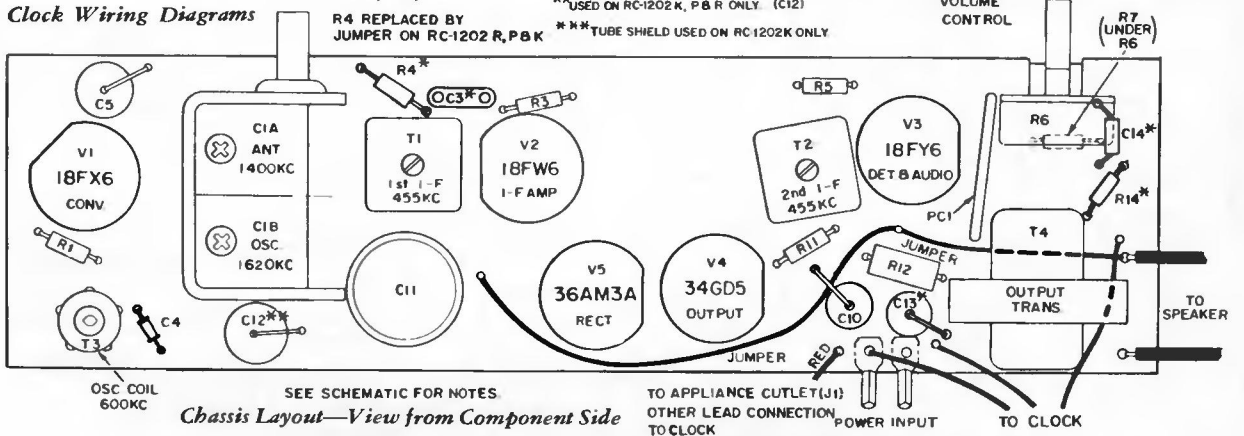
**USED ON RC-1202K, P & R ONLY. (C12)

***TUBE SHIELD USED ON RC-1202K ONLY

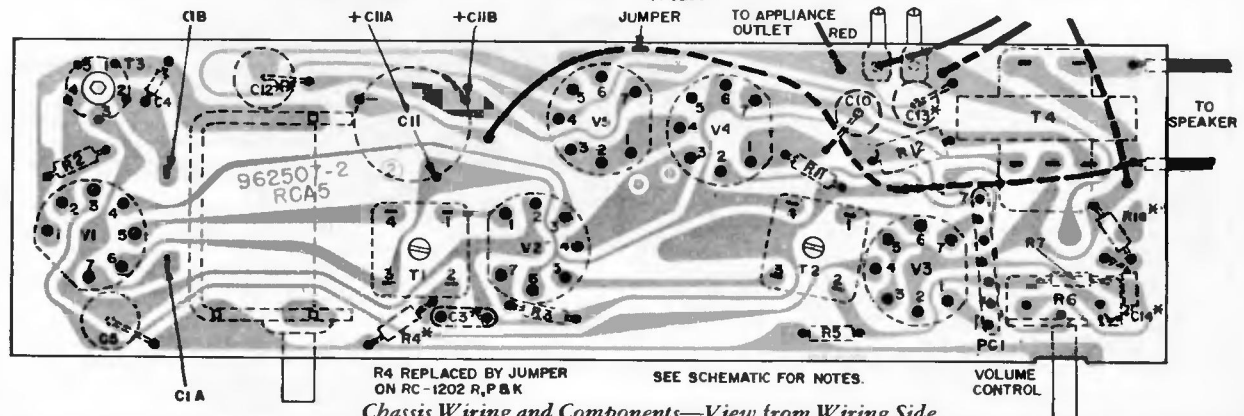
† SEE TABLE BELOW

	RC-1202K	RC-1202 P&R	RC-1202T
L1	AIR LOOP	FERRITE ROD	"FILTERAMIC"
C1-A	13.2-394.4	13.4-312.9	11.2-392.4
C1-B	9.2-116.4	13-127.8	7.2-114.4
SPKR	4"PM	3"x5"PM	3"x5"PM

R4 REPLACED BY JUMPER ON RC-1202 R, P & K



Chassis Layout—View from Component Side



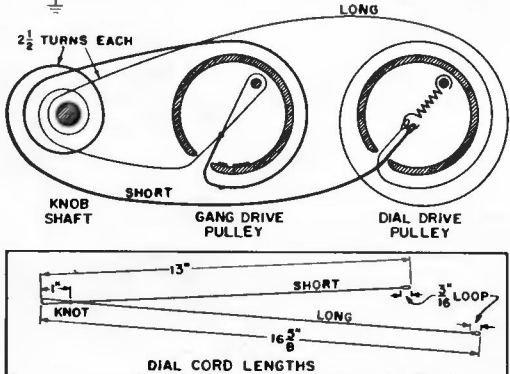
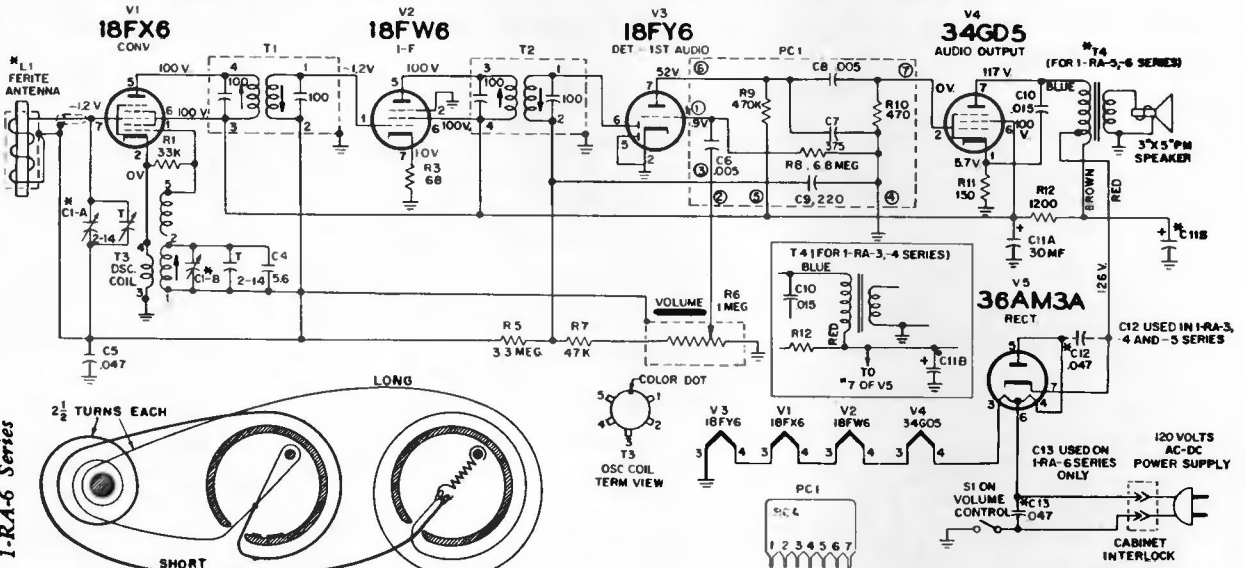
Chassis Wiring and Components—View from Wiring Side

R4 REPLACED BY JUMPER ON RC-1202 R, P & K

SEE SCHEMATIC FOR NOTES.

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.

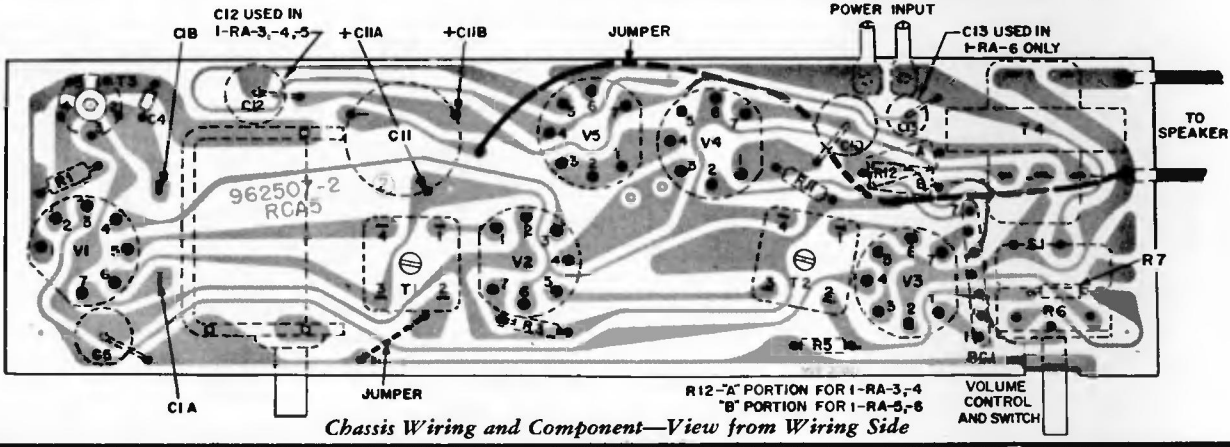
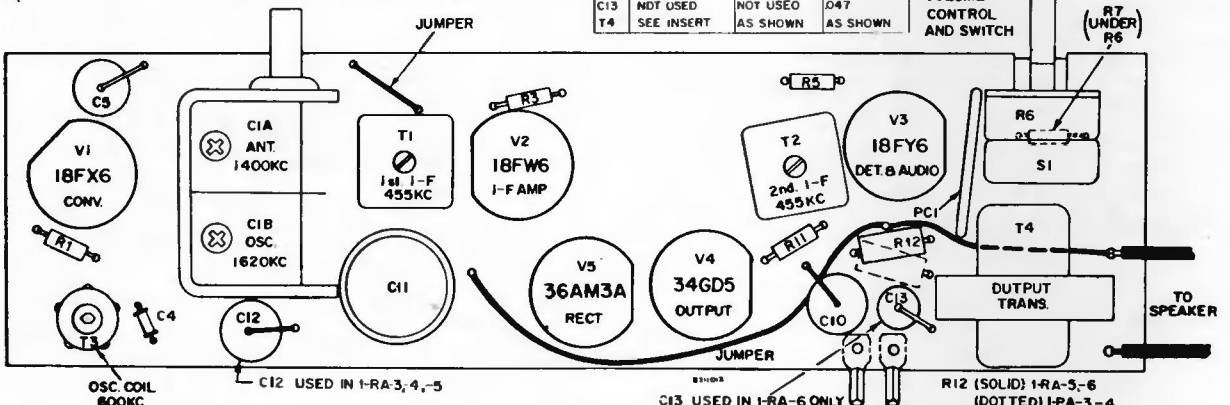


Dial Cord Assembly for 1-RA-5 Series and 1-RA-6 Series

NOTE: SCHEMATIC IS FOR MODEL 1-RA-6. COMPONENTS MARKED (X) VARY FOR OTHER MODELS. SEE TABLE BELOW.

	1-RA-3, 1-RA-4 (RC-1202L)	1-RA-5 (RC-1202M)	1-RA-6 (RC-1202N)
L1	FERRITE ROD	FERRITE ROD	FILTERAMIC (SHIELD ON FILTERAMIC ANT ONLY)
C1-A	13.4-312.9	13.4-312.9	15.2-396.4
C1-B	13-127.8	13-127.8	11.2-118.4
C1-C	50 MF	50 MF	70 MF
C12	047	047	NOT USED
C13	NOT USED	NOT USED	047
T4	SEE INSERT	AS SHOWN	AS SHOWN

ALL RESISTANCE VALUES IN OHMS. ALL CAPACITANCE VALUES LESS THAN 1.0 IN MF, VALUES ABOVE 1.0 IN MMF UNLESS OTHERWISE INDICATED. VOLTAGES MEASURED TO COMMON NEGATIVE (⊖) WITH "VOLTHMYST" AND SHOULD HOLD WITHIN ± 20% WITH 120 VOLT INPUT.

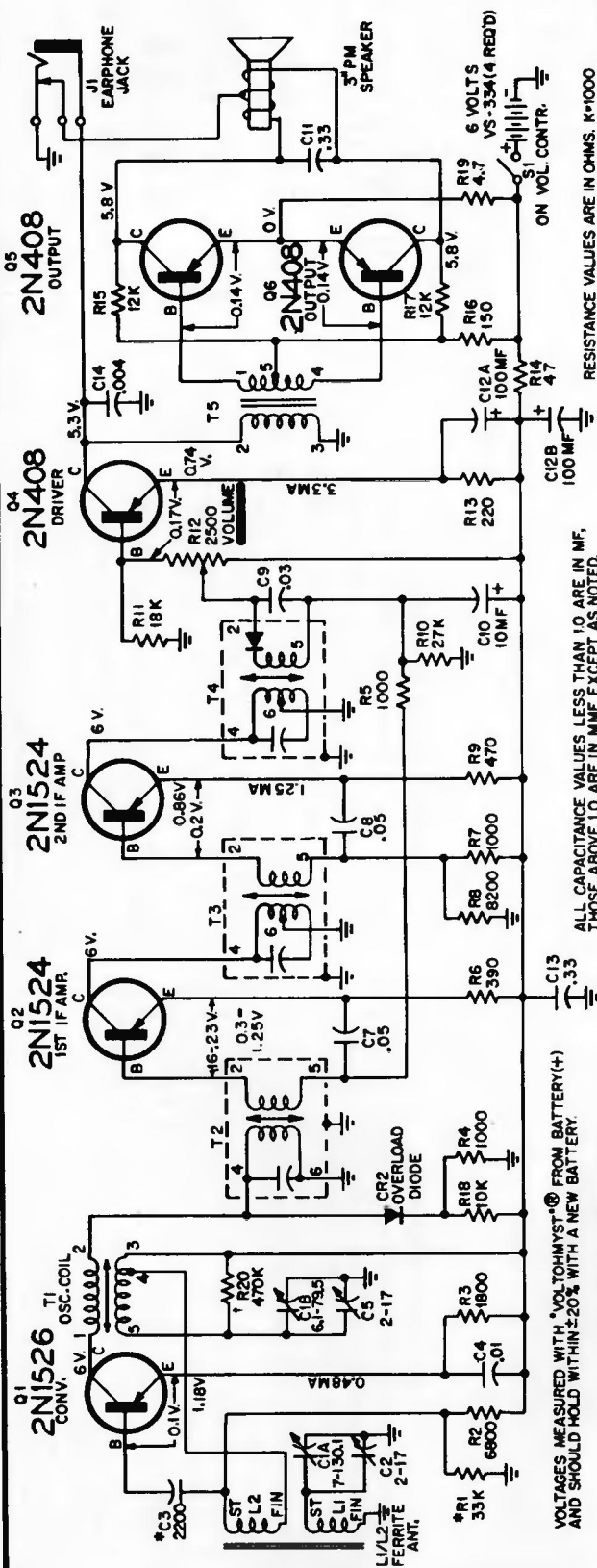


Chassis Wiring and Component—View from Wiring Side

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

RCA Victor Models 1RG31, 1RG33, 1RG34, 1RG41, 1RG43, 1RG46

Chassis RC-1208A, RC-1208B



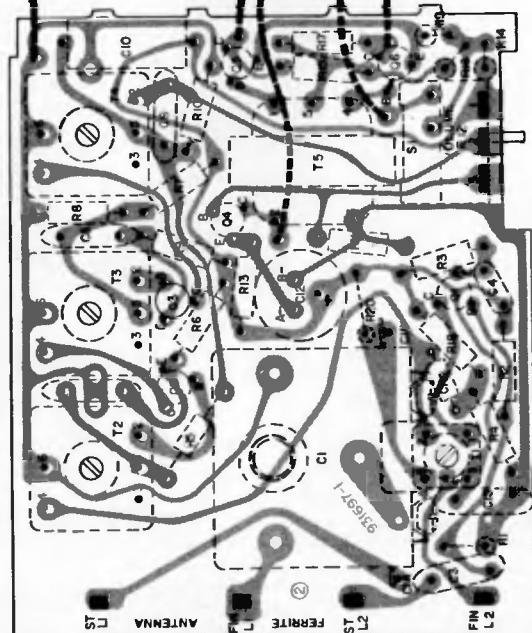
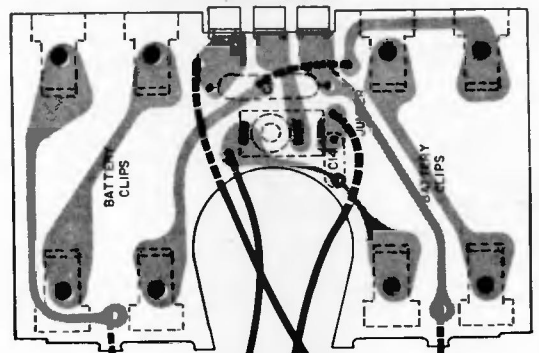
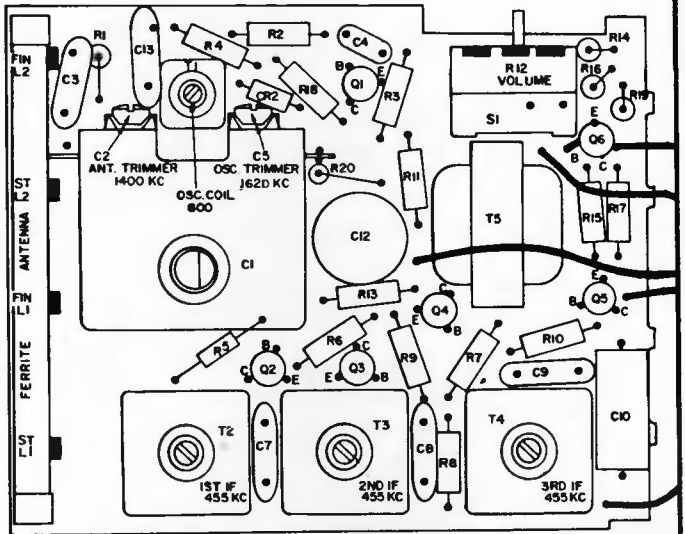
VOLTAGES MEASURED WITH "VOLTOHMYST"® FROM BATTERY(+) AND SHOULD HOLD WITHIN ±20% WITH A NEW BATTERY.

PRODUCTION CHANGES

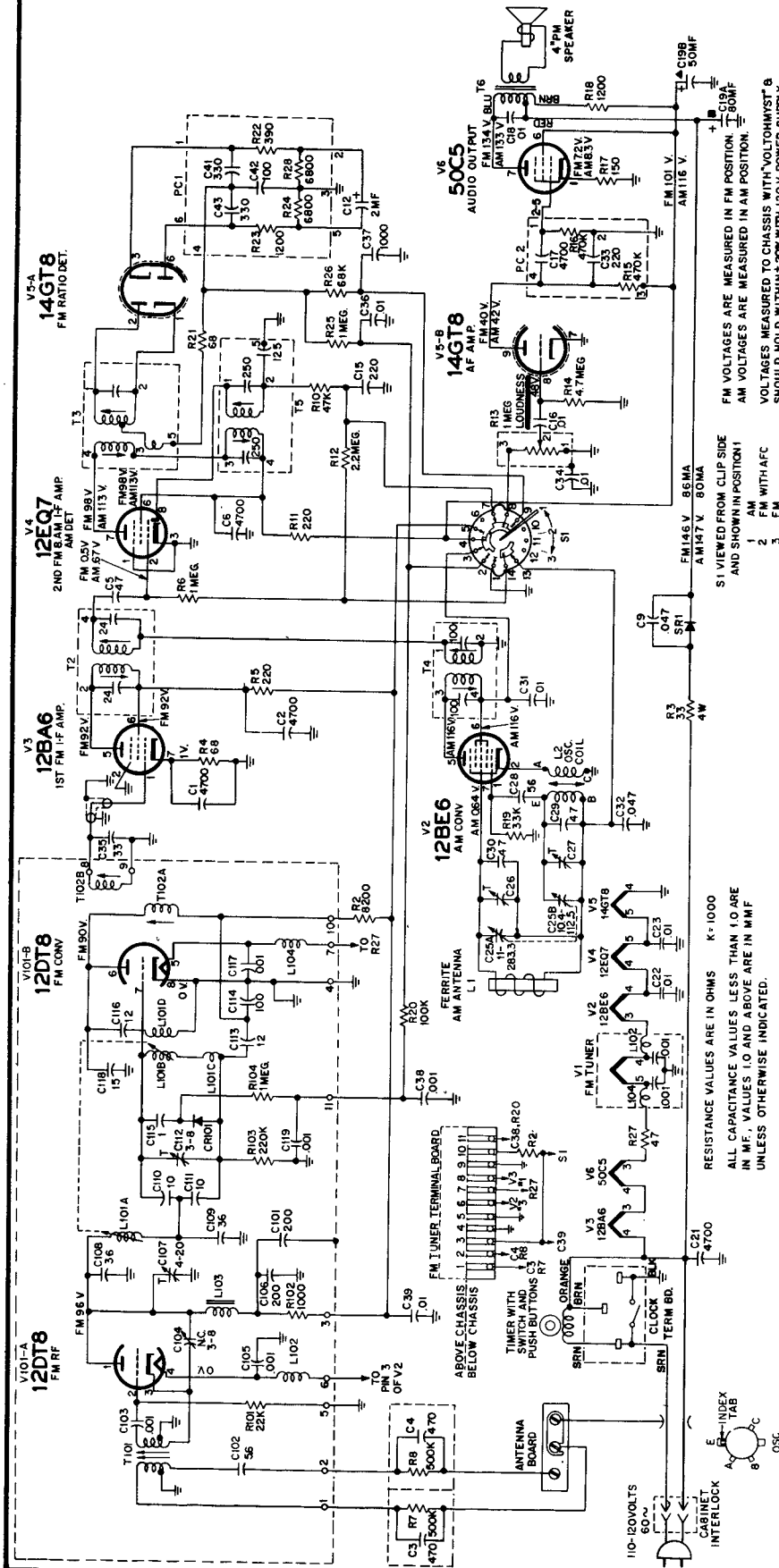
† In some instruments R20 (470K) is omitted.
 * In some instruments R1 is 27K and C3 is .03 ml.

ALL CAPACITANCE VALUES LESS THAN 10 ARE IN MF, THOSE ABOVE 10 ARE IN MMF EXCEPT AS NOTED.

RESISTANCE VALUES ARE IN OHMS, K=1000



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.)

CHASSIS INSTALLATION

1. Turn AM tuning condenser to the FULLY CLOSED position.
2. Rotate the tuning knob to position the drive pulley with the NOTCH of the extended lips matching the spring on the condenser shaft. Dial pointer should indicate approximately 540 kc.
3. Push the formed spring (mounted on the condenser shaft) into the notch in the pulley as the chassis is slid into the case. If necessary, squeeze the spring together with long-nose pliers.
4. Fasten the chassis in place with two retaining screws through the back apron of the chassis. Replace speaker or resistor output transformer leads.
5. Secure the volume control to the cabinet front with the hex nut. Push knob on control shaft.
6. Solder the AM antenna leads to the tuning condenser.
7. Position the cabinet hood so that the power interlock socket and jacks will mate. Push the two sections of the cabinet together.
8. Fasten the three cabinet assembly screws.

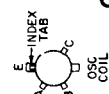
CHASSIS REMOVAL

1. Remove two screws at the bottom rear of cabinet.
2. Loosen one screw in hand cut-out at top center of cabinet. Screw will remain captive in the cabinet hood.
3. Pull cabinet apart.
4. Pull off volume control knob. DO NOT ATTEMPT TO REMOVE TUNING KNOB.
5. Remove hex nut holding volume control to cabinet front.
6. Unsolder leads connecting AM antenna to tuning condenser.
7. Bend three retaining lugs to permit removal of power line antenna from cabinet front.
8. Remove two screws holding speaker to cabinet front, or unsolder three leads to output transformer on speaker from terminal strips on chassis.
9. Remove two screws at rear apron of chassis.
10. Slide chassis straight out back of the cabinet.

FM VOLTAGES ARE MEASURED IN FM POSITION
AM VOLTAGES ARE MEASURED IN AM POSITION.
VOLTAGES MEASURED TO CHASSIS WITH "VOLTOHMYST" A
SHOULD HOLD WITHIN ±20% WITH 120 V. POWER SUPPLY.

S1 VIEWED FROM CLIP SIDE
AND SHOWN IN POSITION 1!
1 AM
2 FM WITH AFC
3 FM

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

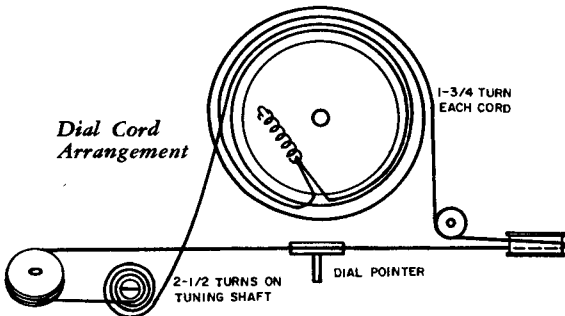


RCA Victor Models 1-RC-30, 1-RC-31, 1-RC-34, Chassis RC-1201D, Continued

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.

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.

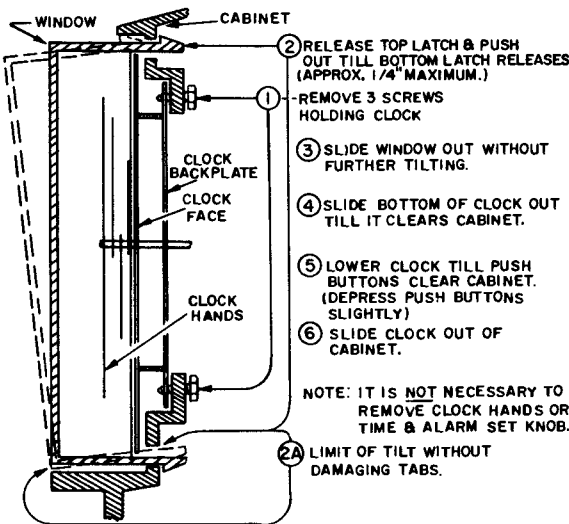


THE CHASSIS IS CONNECTED DIRECTLY TO ONE SIDE OF THE POWER LINE. AN ISOLATION TRANSFORMER SHOULD BE USED DURING ALIGNMENT OR OTHER SERVICE WORK.

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.

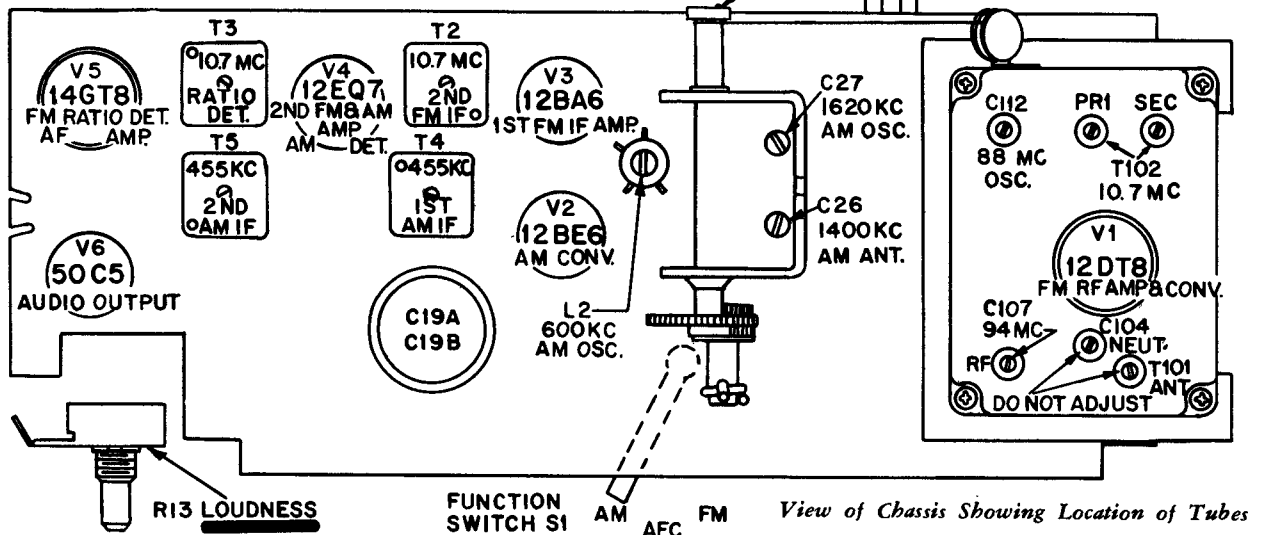
Step	Connect high side of signal gen. to—	Set signal gen. to—	Set radio dial to—	Adjust for maximum
1	Antenna gang (C25A) through 0.01 mf capacitor	455 kc (modulated)	Gang fully open	T5 (2nd AM IF) top & bottom
2				T4 (1st AM IF) top and bottom
3	Repeat steps 1 and 2.			
4		1620 kc (modulated)	1620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



TO INSTALL CLOCK & WINDOW, REVERSE ABOVE PROCEDURE.

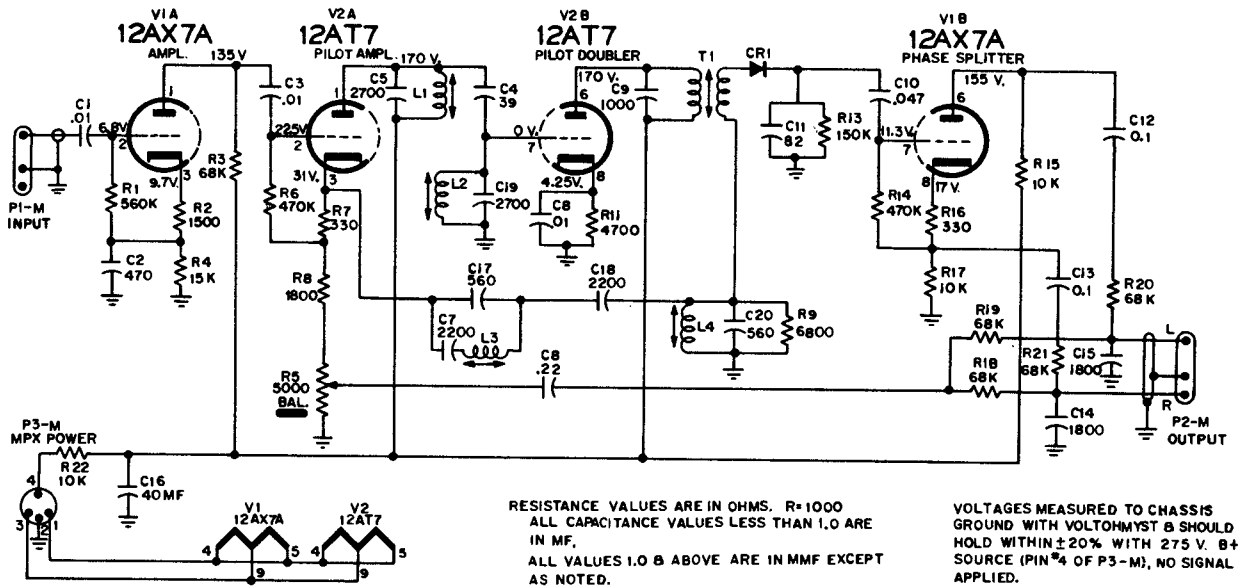
Clock and Window Removal

STRING DRIVE COLLAR 108 MC



RCA VICTOR

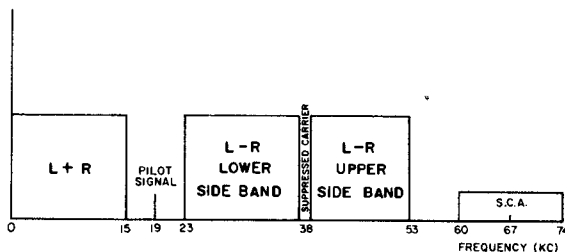
RK-295 Chassis No. RS-200



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.

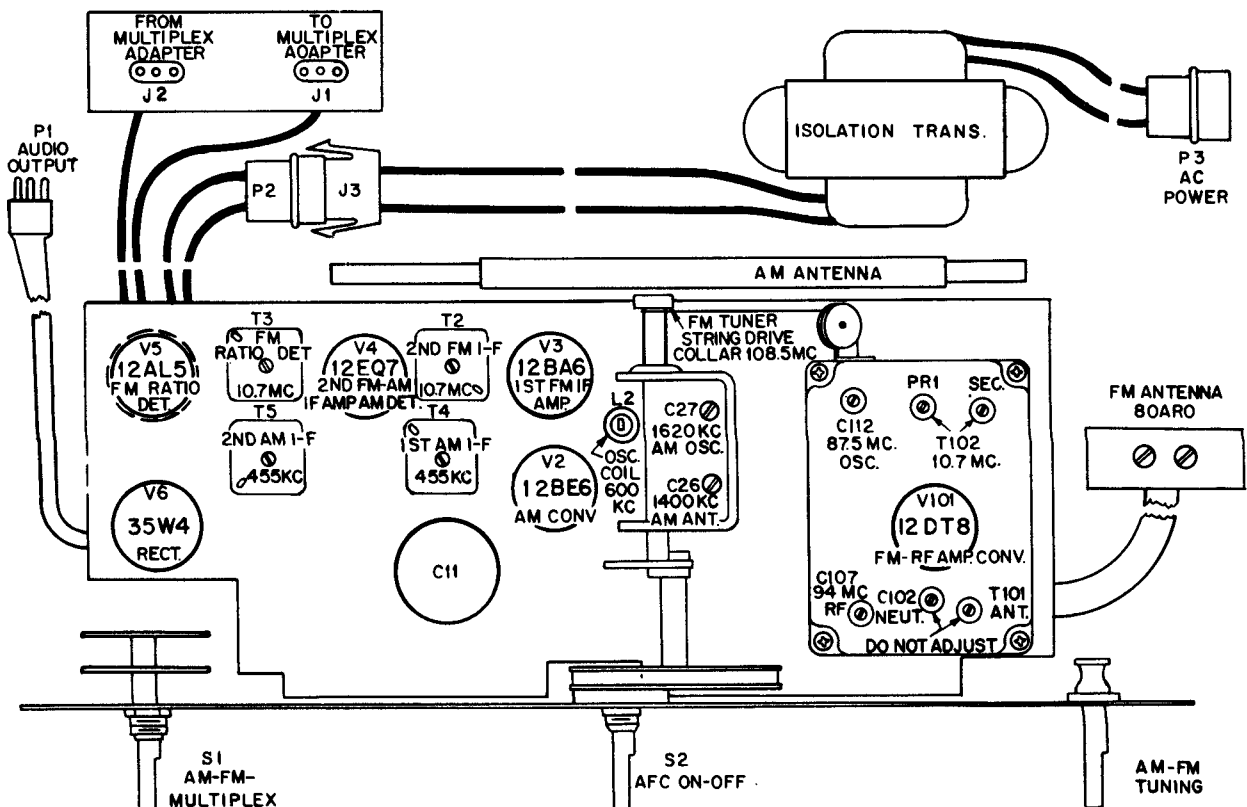
The 1-VE-0 Series instruments use the RS-193D audio amplifier. The RS-193D chassis is similar to the RS-193A except that it does not contain a function switch, a tuner input, a tuner AC power output, a multiplex power output, or a dial light.

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.

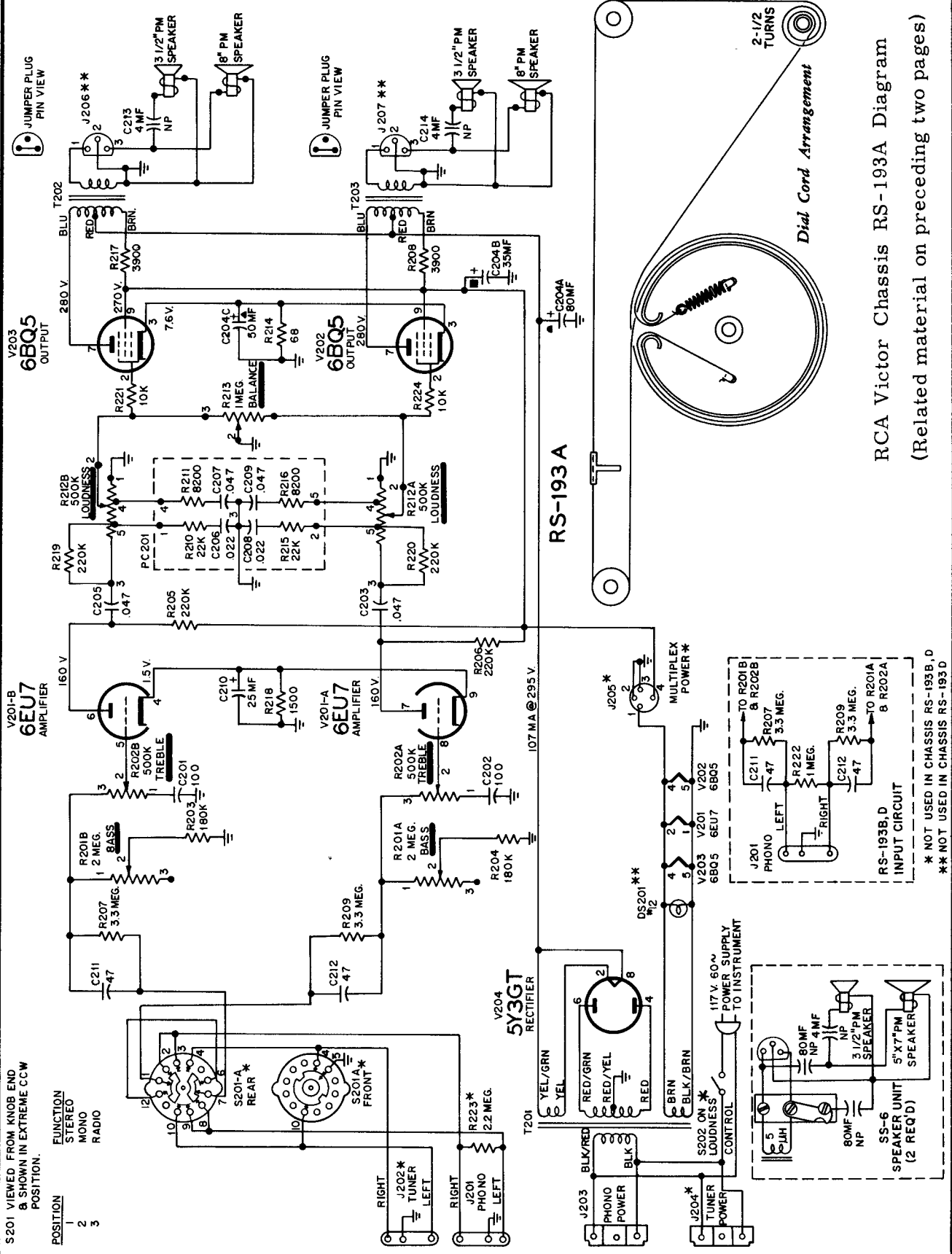
To receive FM multiplex broadcasts:

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.

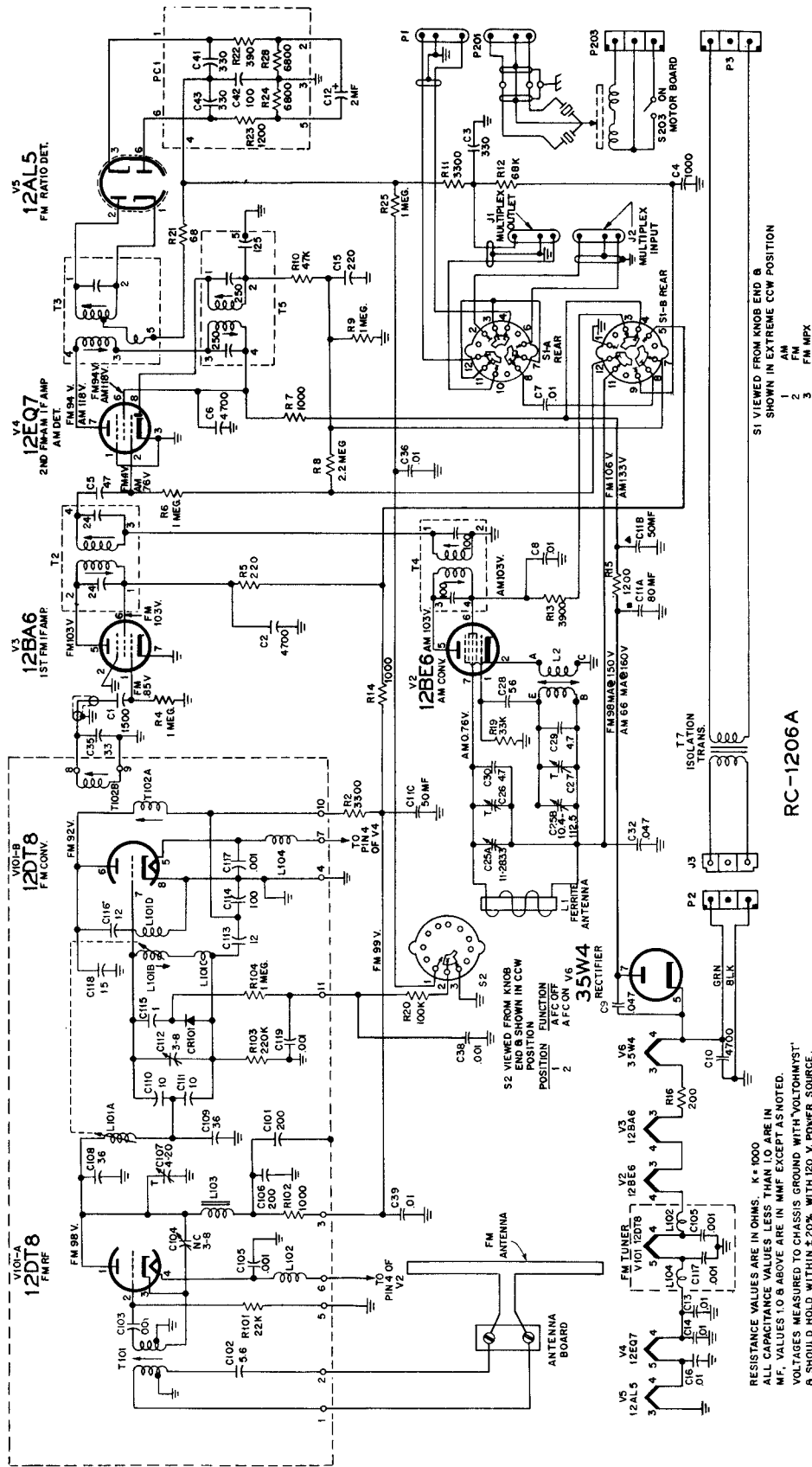


Chassis RC-1206A—Location of Major Components

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



RCA Victor Chassis RS-193A Diagram
(Related material on preceding two pages)



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(SY3) 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.

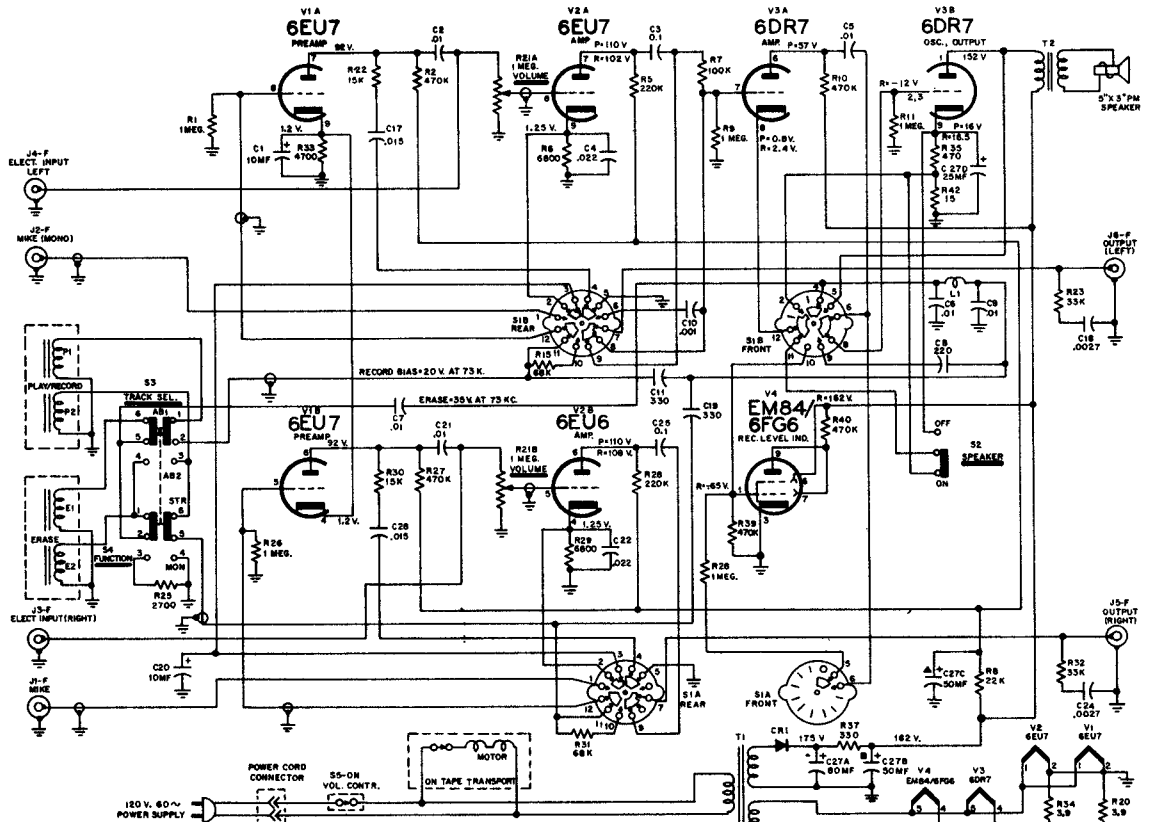
RCA Victor
Chassis RC-1206A

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

RESISTANCE VALUES ARE IN OHMS. K = 1000
ALL CAPACITANCE VALUES LESS THAN 1.0 ARE IN MF.
VALUES 1.0 & ABOVE ARE IN MMF EXCEPT AS NOTED.
VOLTAGES MEASURED TO CHASSIS GROUND WITH "VOLTORMYST"
& SHOULD HOLD WITHIN ±20% WITH 120 V. POWER SOURCE.

RCA VICTOR TAPE RECORDER

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



RESISTANCE VALUES ARE IN OHMS. K=1000
ALL CAPACITANCE VALUES LESS THAN 10 ARE IN
PF. VALUES 1.0 & ABOVE ARE IN MMF EXCEPT
AS NOTED.

VOLTAGES ARE MEASURED TO CHASSIS GROUND
WITH SENIOR VOLTOHMIST. Ⓟ SHOULD HOLD WITHIN
20% WITH 120 V. POWER SOURCE, NO SIGNAL. VOL.
CONTR. SET AT MINIMUM.

RECORD SWITCH VIEWED FROM
SHAFT END B SHOWN IN POS. 1

VOLTAGES ARE THE SAME FOR PLAY & RECORD
POSITIONS UNLESS OTHERWISE INDICATED
(R=RECORD, P=PLAY)

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:

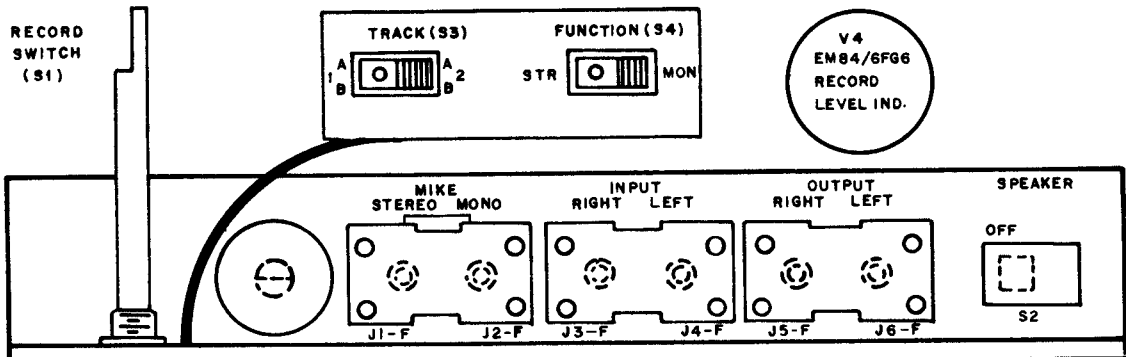
1. Turn REWIND-STOP-PLAY knob to rewind position.
2. Pull off RECORD, REWIND-STOP-PLAY, SPEED CONTROL and VOLUME knobs. **Note:** To remove SPEED control knob, twist while gently pulling the knob. When the knob is replaced, push it on firmly until the knob seats with a click.
3. The control escutcheon 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.

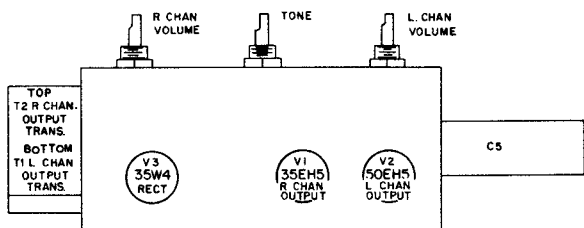
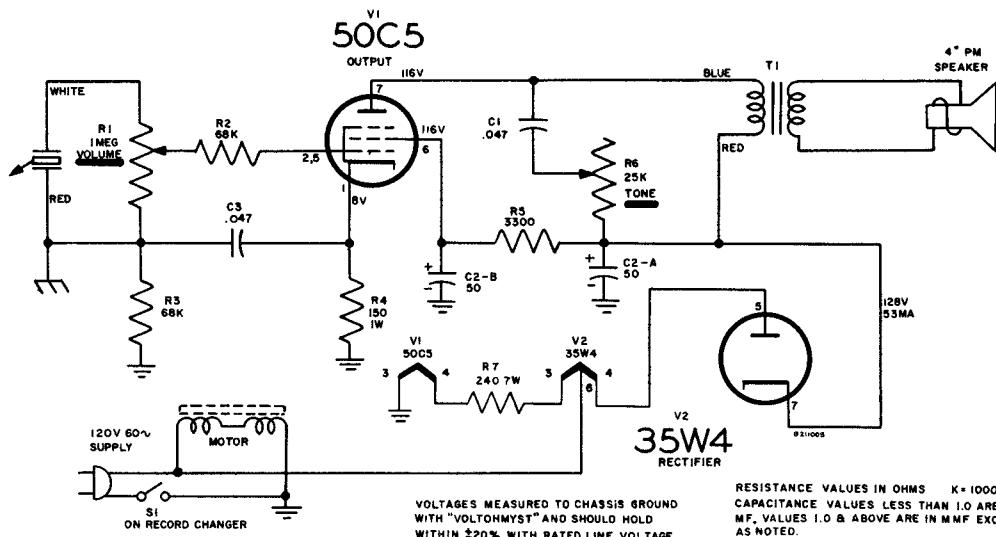
8. To reassemble, reverse the foregoing procedure.



RCA VICTOR

Model 1-VA-14

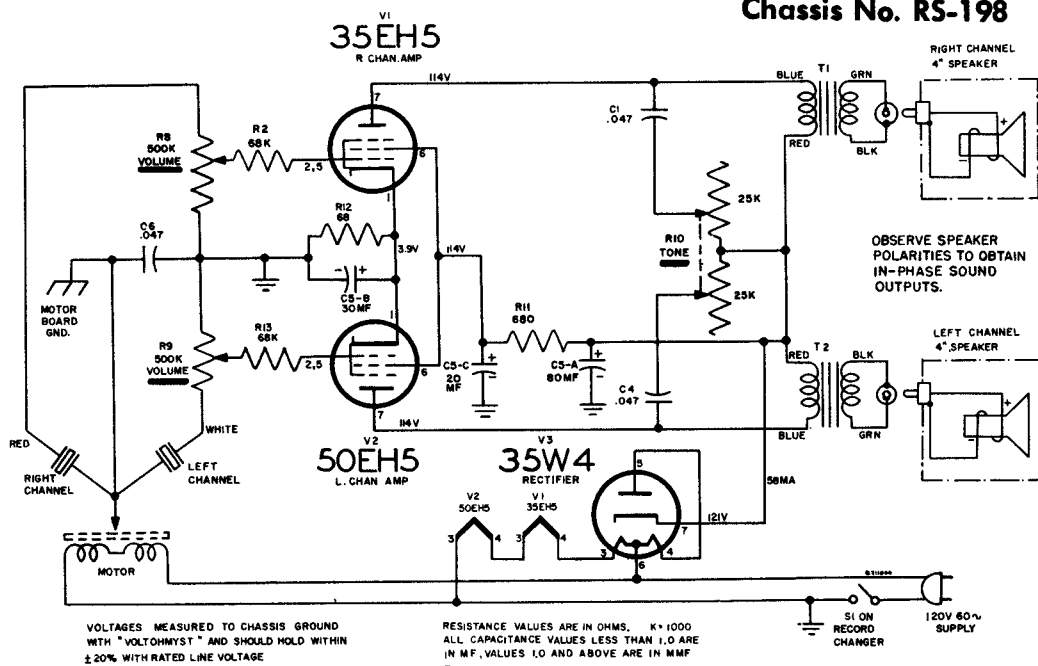
Chassis No. RS-197



RCA VICTOR

Model 1-VC-15

Chassis No. RS-198

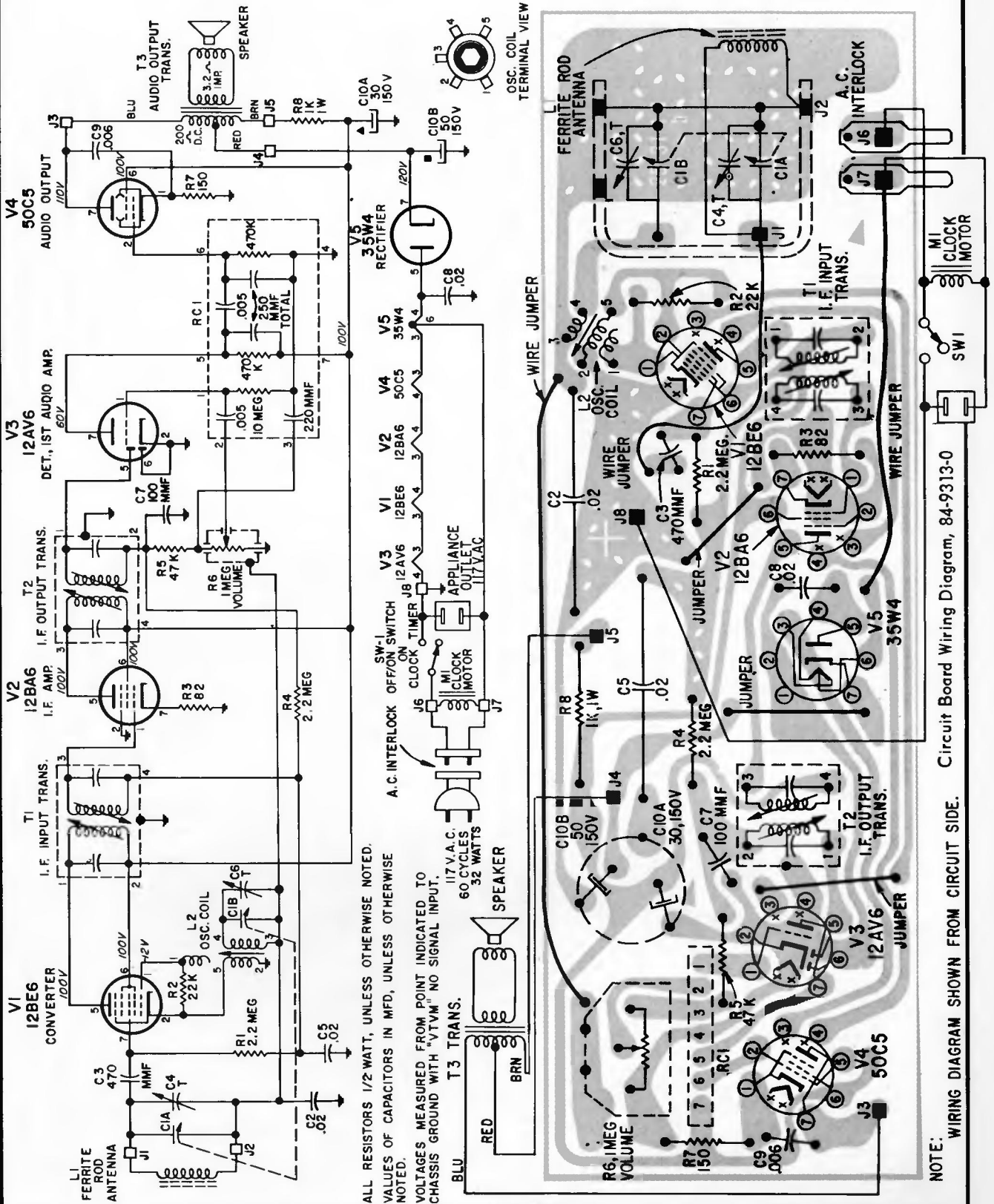


SEARS, ROEBUCK AND CO.

Models 1035, 1036, 1037, 1038

Silvertone

CHASSIS NO. 528.53940



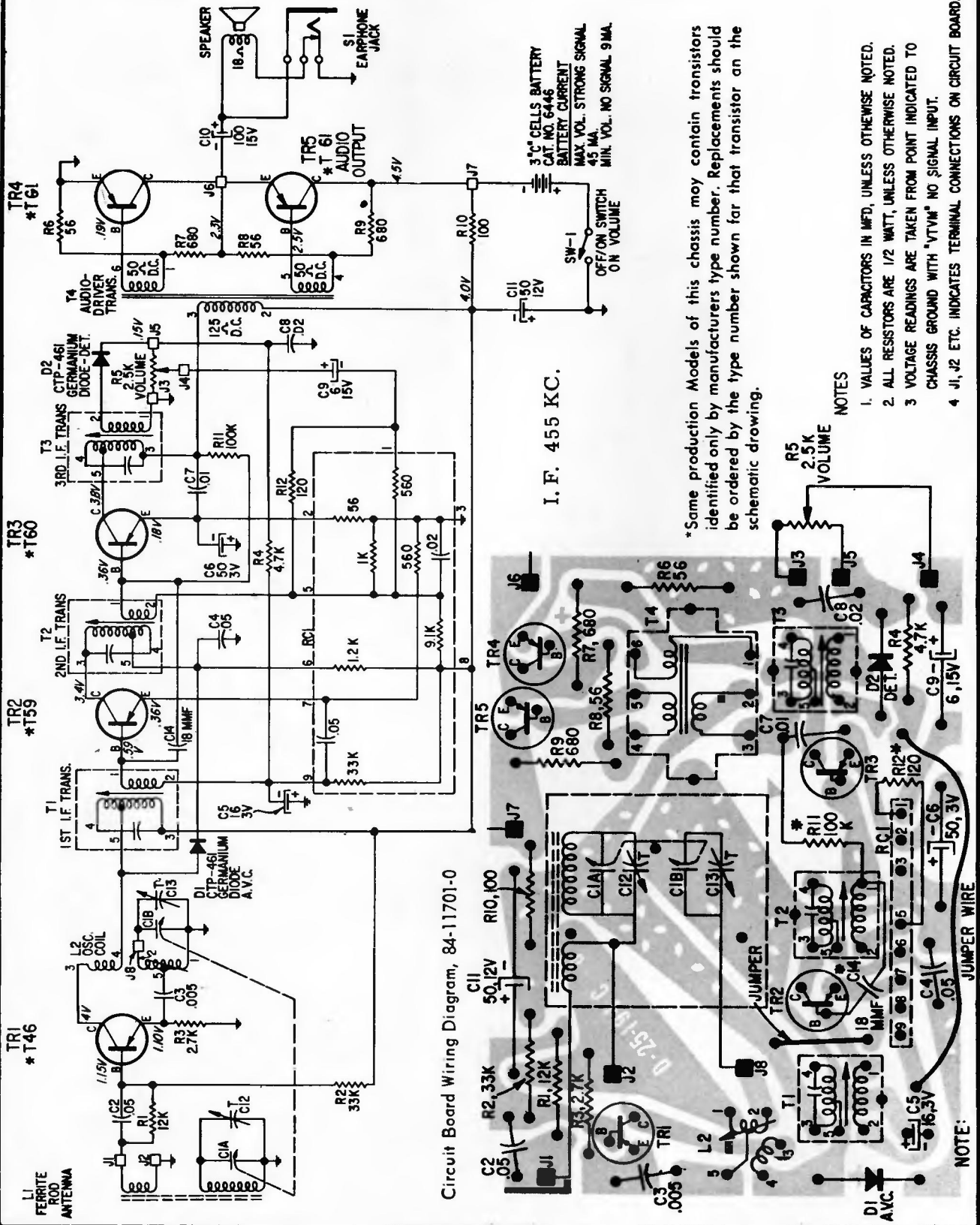
NOTE: WIRING DIAGRAM SHOWN FROM CIRCUIT SIDE. Circuit Board Wiring Diagram, 84-9313-0

SEARS, ROEBUCK AND CO.

CHASSIS NO. 528.53740

Models 1212, 1213, 1214

Silvertone



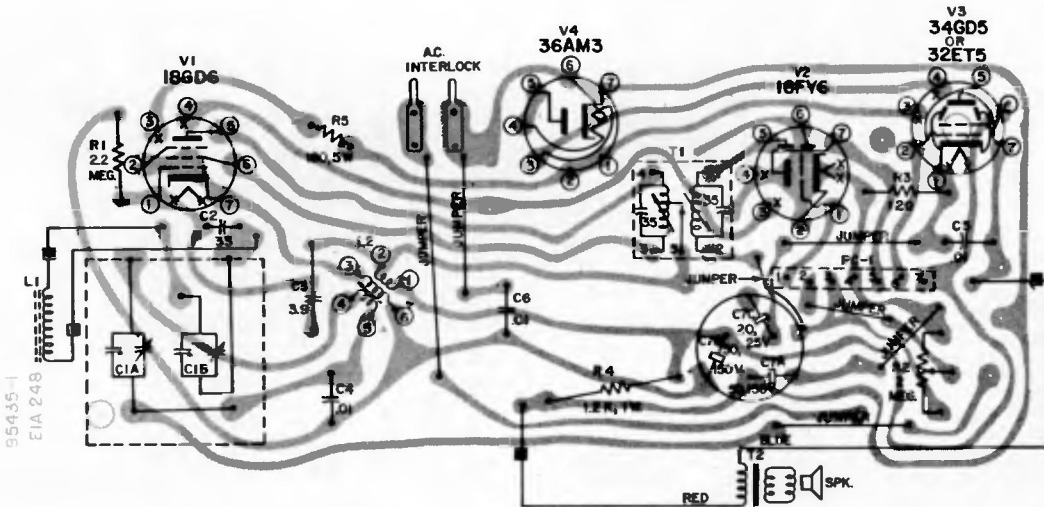
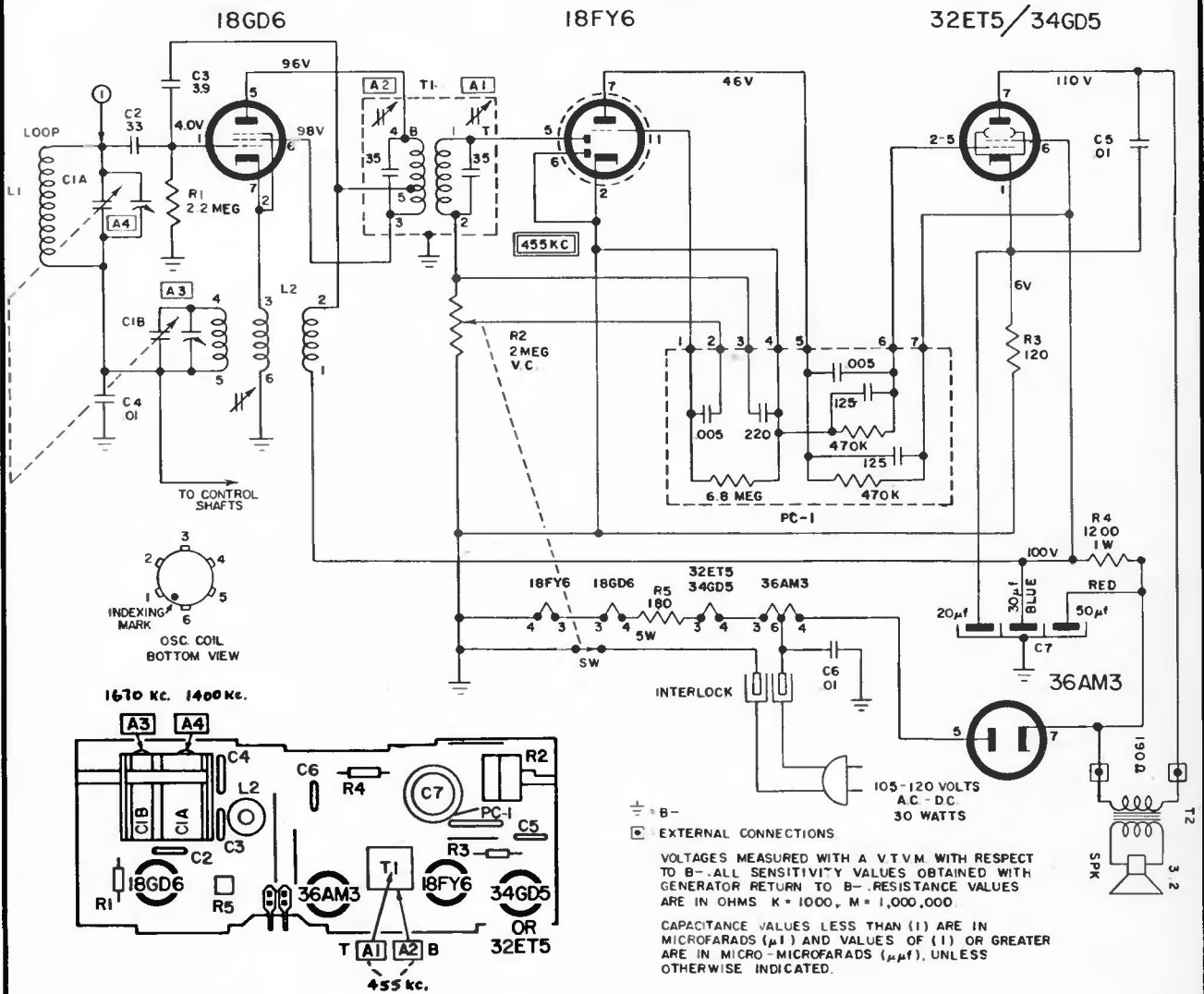
*Same production Models of this chassis may contain transistors identified only by manufacturers type number. Replacements should be ordered by the type number shown for that transistor on the schematic drawing.

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.

SEARS, ROEBUCK and CO. *Silvertone*

CHASSIS 132.63901
MODEL 2000

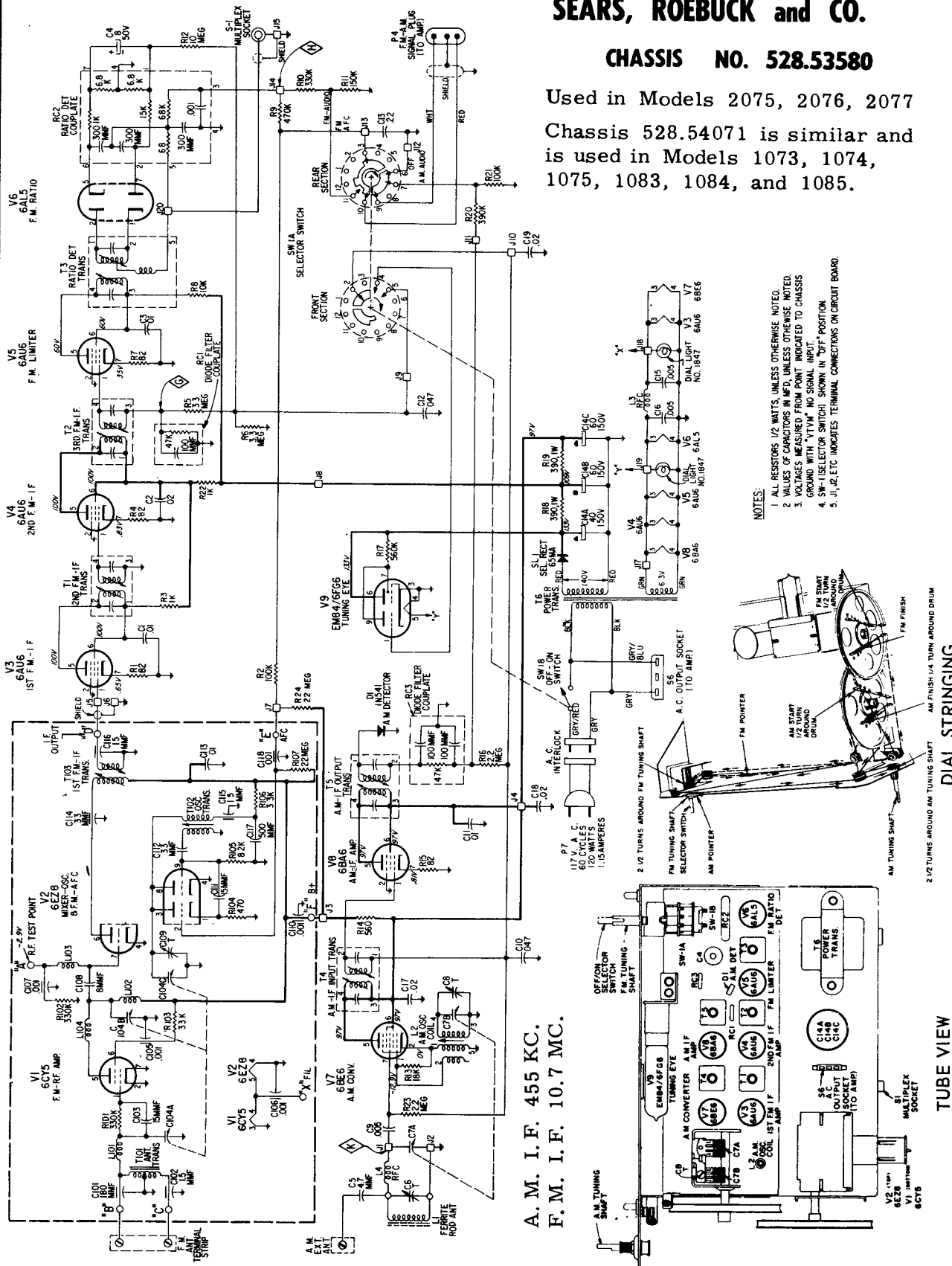


SEARS, ROEBUCK and CO.

CHASSIS NO. 528.53580

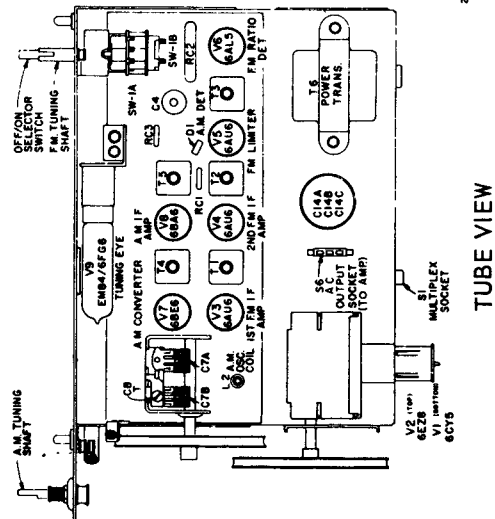
Used in Models 2075, 2076, 2077

Chassis 528.54071 is similar and is used in Models 1073, 1074, 1075, 1083, 1084, and 1085.



- NOTES:
- 1 ALL RESISTORS 1/2 WATTS, 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 SW-1 (SELECTOR SWITCH) SHOWN IN "OFF" POSITION.
 - 5 J1, J2, ETC INDICATES TERMINAL CONNECTIONS ON CIRCUIT BOARD.

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



DIAL STRINGING

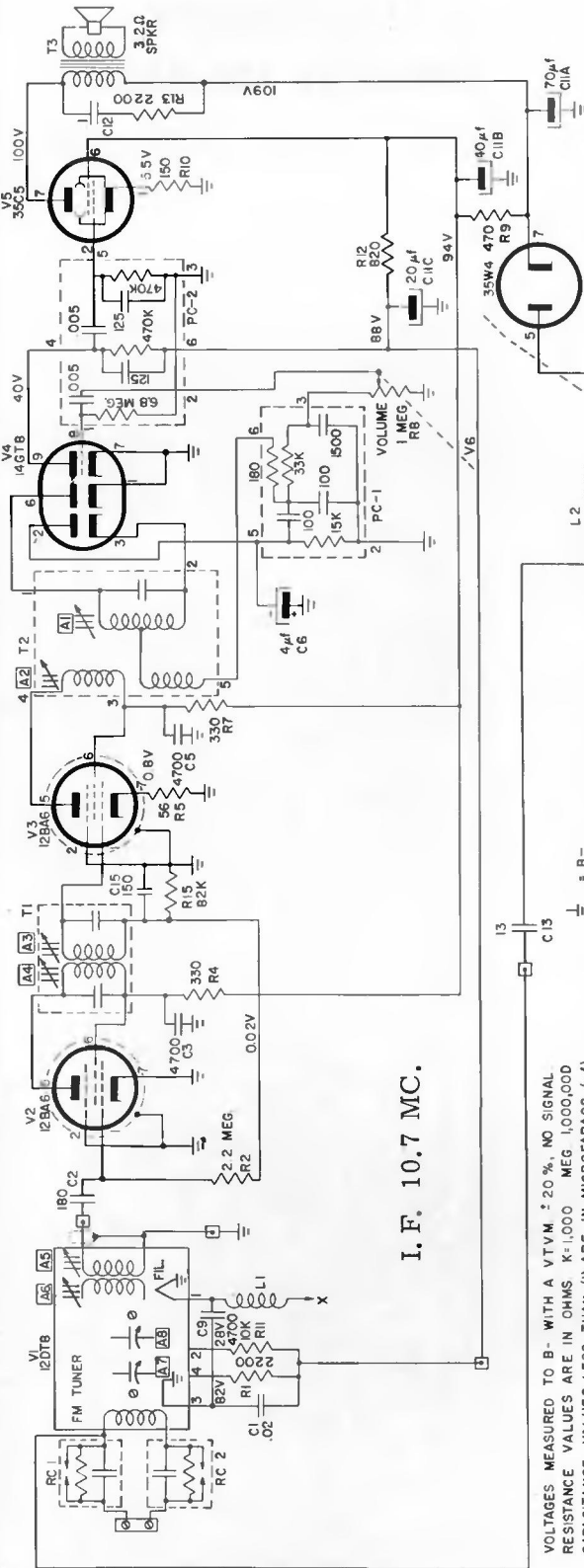
TUBE VIEW

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

SEARS, ROEBUCK and CO.

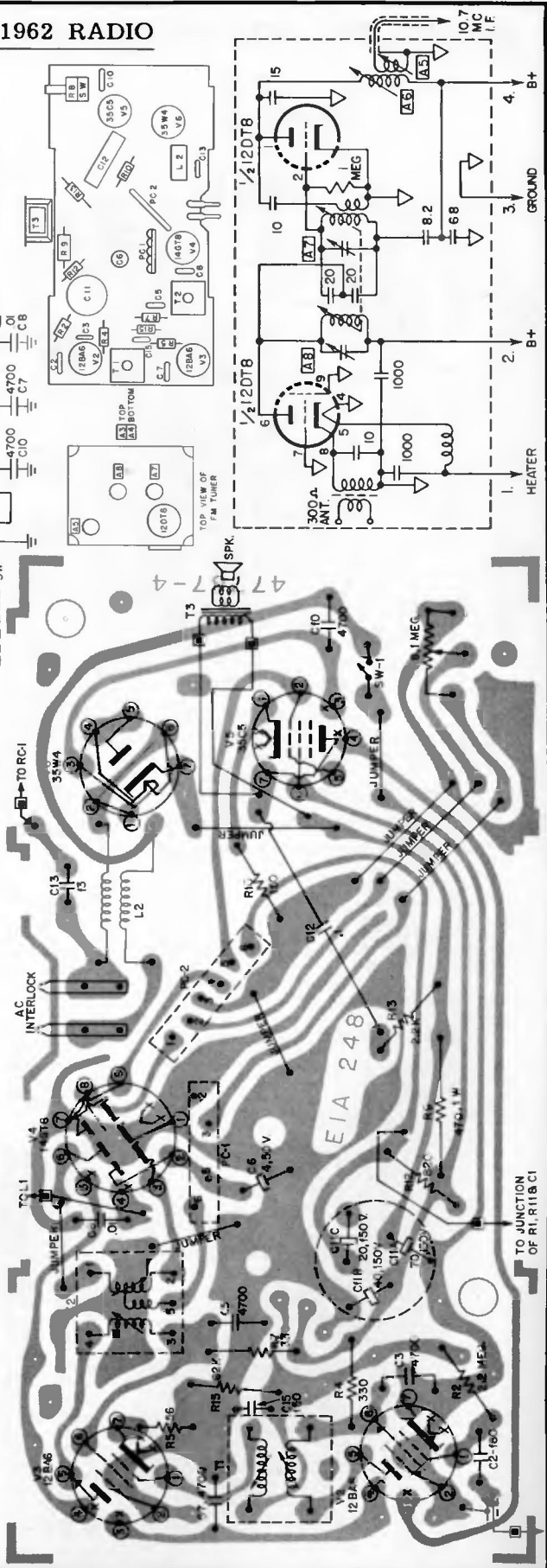
Chassis 132.64402

Models 2018, 2019



I. F. 10.7 MC.

VOLTAGES MEASURED TO B- WITH A VTVM ± 20%, NO SIGNAL
 RESISTANCE VALUES ARE IN OHMS, K=1000 MEG 1,000,000
 CAPACITANCE VALUES LESS THAN (1) ARE IN MICROFARADS (μF),
 AND VALUES (1) OR GREATER ARE IN MICROMICROFARADS (μμF),
 UNLESS OTHERWISE INDICATED



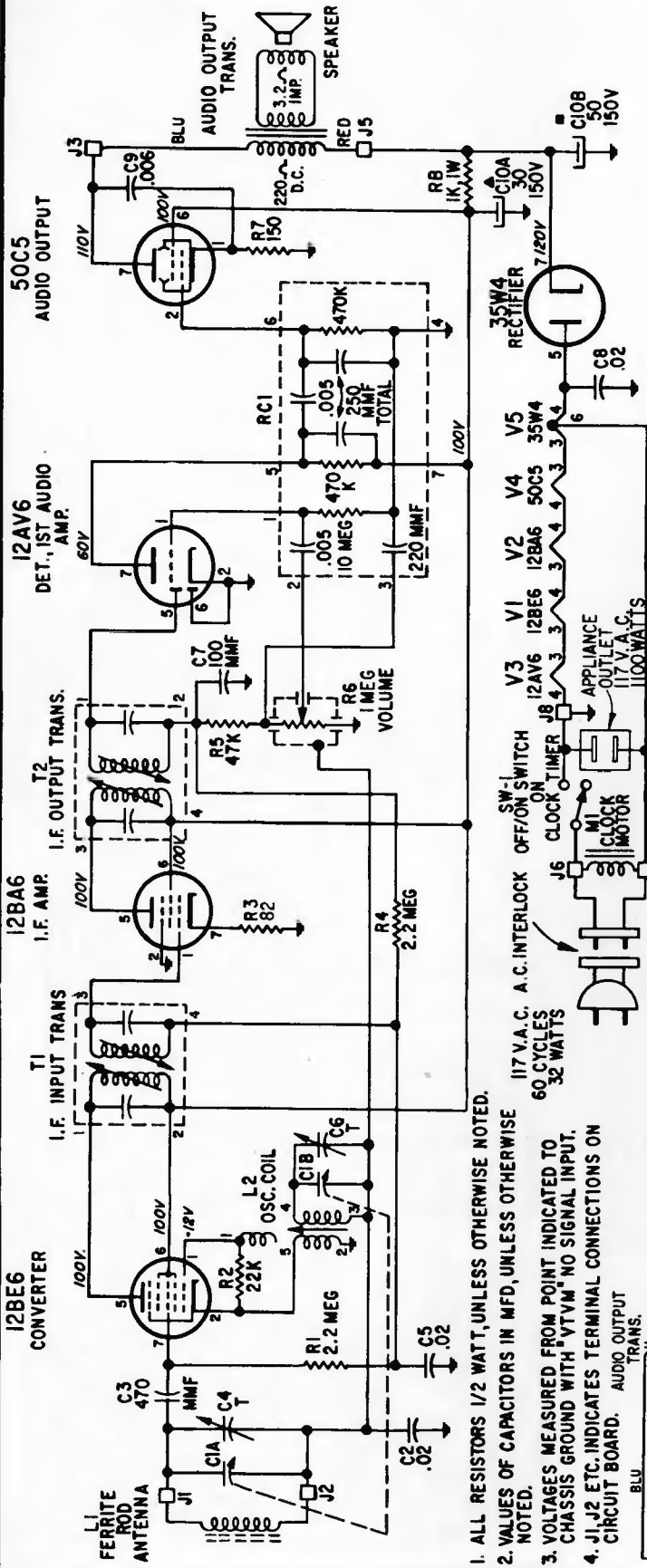
TUNER SCHEMATIC

SEARS, ROEBUCK and Co.

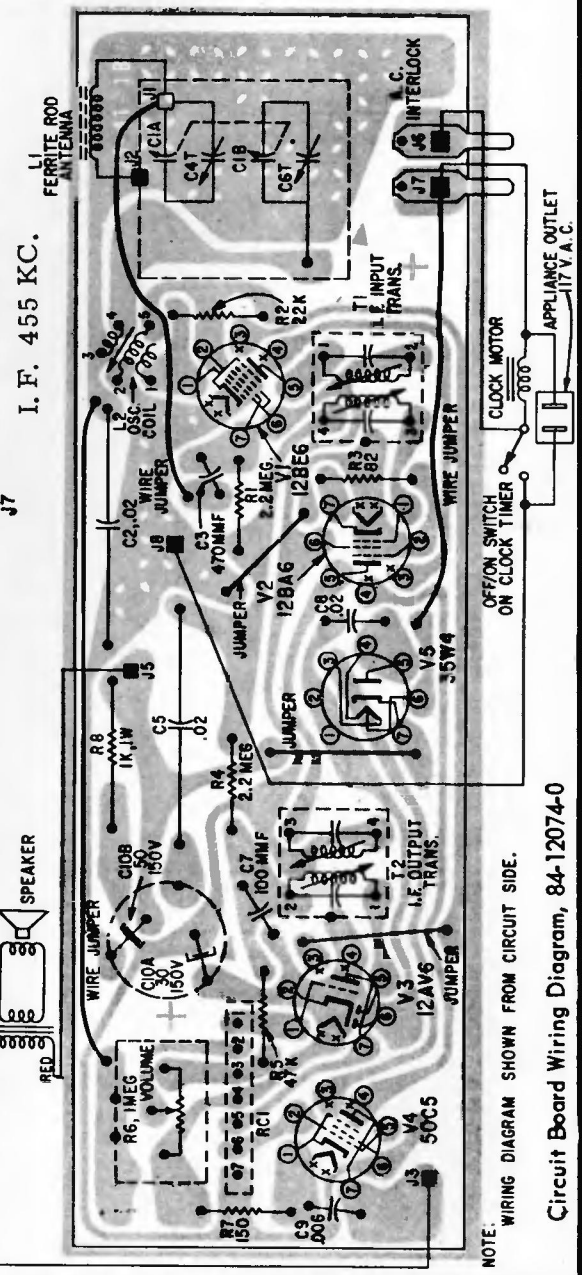
Silvertone®
CLOCK-RADIO

CHASSIS No. 528.53760

Models 2035, 2036, 2037, 2038

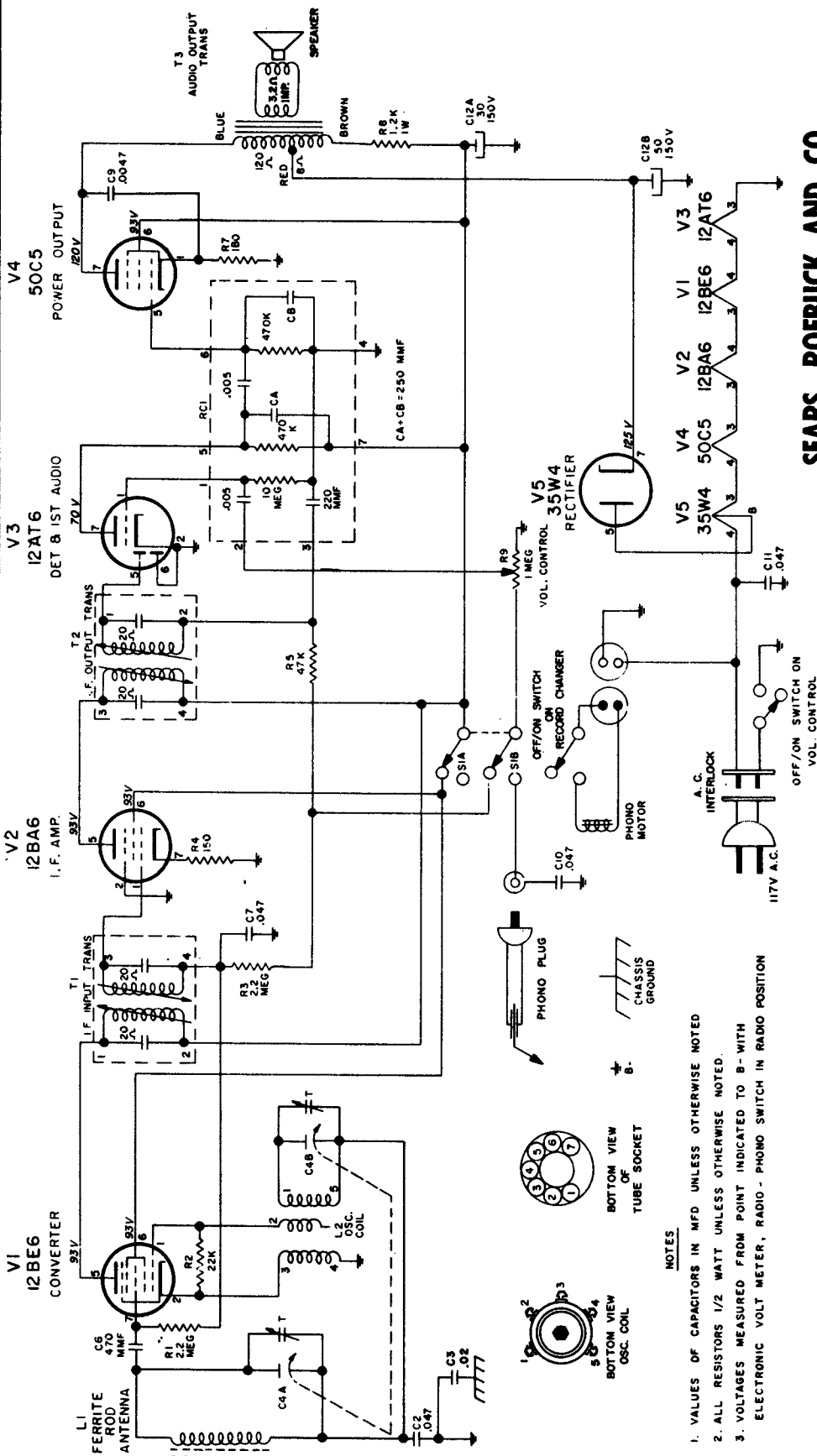


1. ALL RESISTORS 1/2 WATT, UNLESS OTHERWISE NOTED.
2. VALUES OF CAPACITORS IN MFD, UNLESS OTHERWISE NOTED.
3. VOLTAGES MEASURED FROM POINT INDICATED TO CHASSIS GROUND WITH "VTVM" NO SIGNAL INPUT.
4. J1, J2 ETC. INDICATES TERMINAL CONNECTIONS ON CIRCUIT BOARD. AUDIO OUTPUT TRANS. BLU.



NOTE: WIRING DIAGRAM SHOWN FROM CIRCUIT SIDE.

Circuit Board Wiring Diagram, 84-12074-0

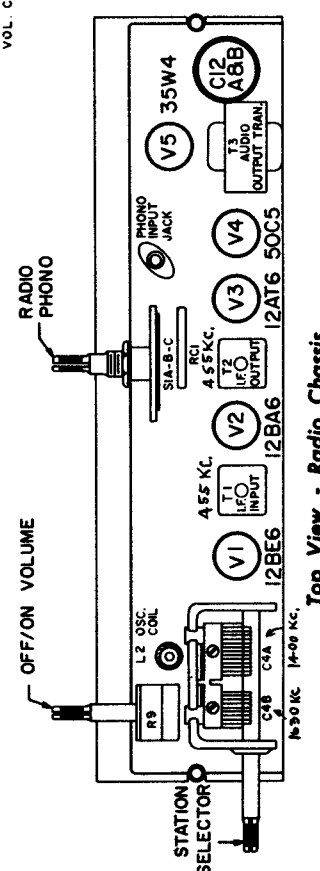


**SEARS, ROEBUCK AND CO.
RADIO
CHASSIS NO. 528.53071**

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

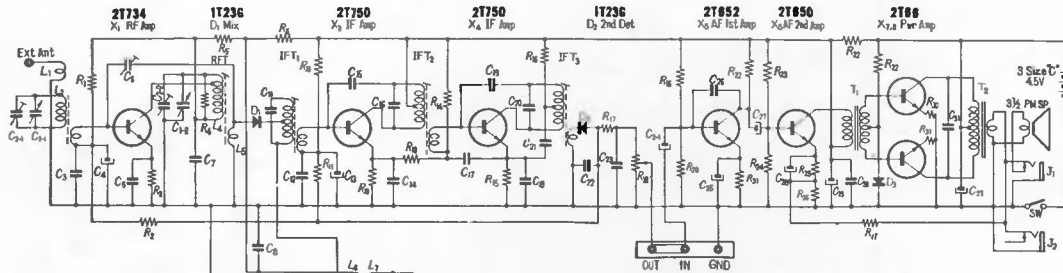
* Models 9040 & 9040A
are exactly the same.

- NOTES**
1. VALUES OF CAPACITORS IN MFD UNLESS OTHERWISE NOTED
 2. ALL RESISTORS 1/2 WATT UNLESS OTHERWISE NOTED.
 3. VOLTAGES MEASURED FROM POINT INDICATED TO B- WITH ELECTRONIC VOLT METER, RADIO - PHONO SWITCH IN RADIO POSITION

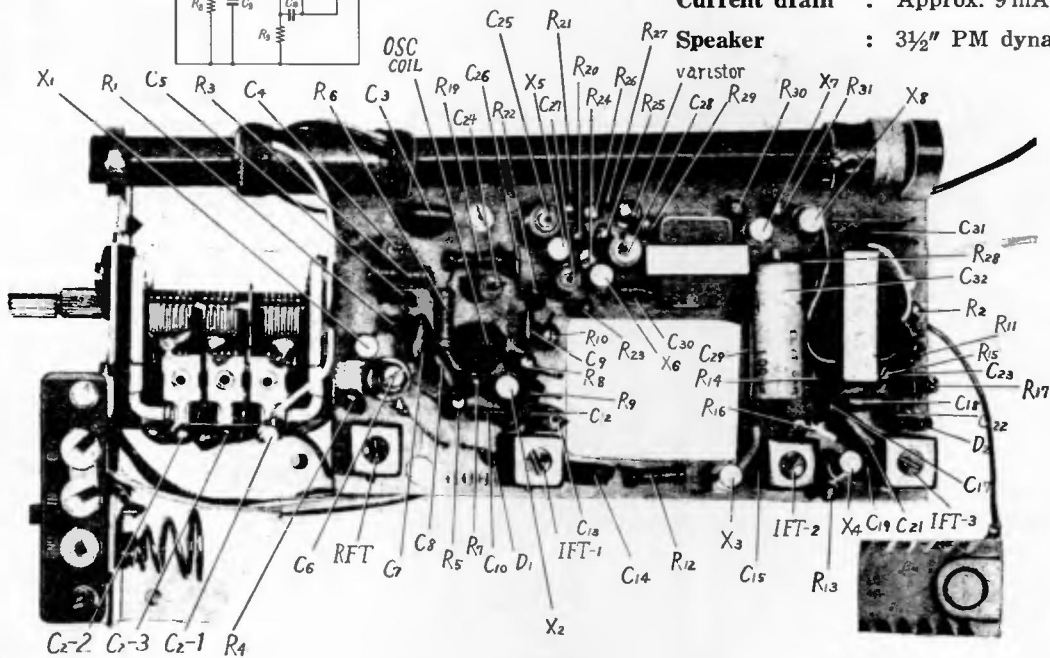


Top View - Radio Chassis

SONY TR-84



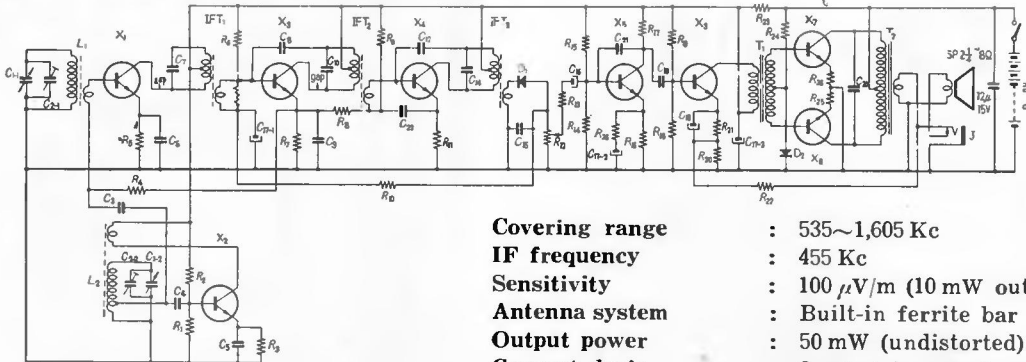
IF frequency : 455 Kc
Current drain : Approx. 9 mA at 0 signal
Speaker : 3 1/2" PM dynamic 8 Ω.



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 1/2 W	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	150 KΩ RL 1/8 W	R ₂₃	10 KΩ " "	IFT ₁	LI-023AP
C ₁₁ ①	180 PF	R ₁	8.7 KΩ " "	R ₂₄	3.3 KΩ " "	IFT ₂	LI-008BP
C ₁₂	0.02 μF MXL (Maylor)	R ₂	560 Ω " "	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 ②	2 PF (Styrol)	R ₅	220 Ω " "	R ₂₈	60 Ω " "	SP	3 1/2" 8 Ω
C ₁₆ ①	180 PF	R ₆	220 Ω " "	R ₂₉	2.2 KΩ RL 1/8 W		DS-008-1
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)		

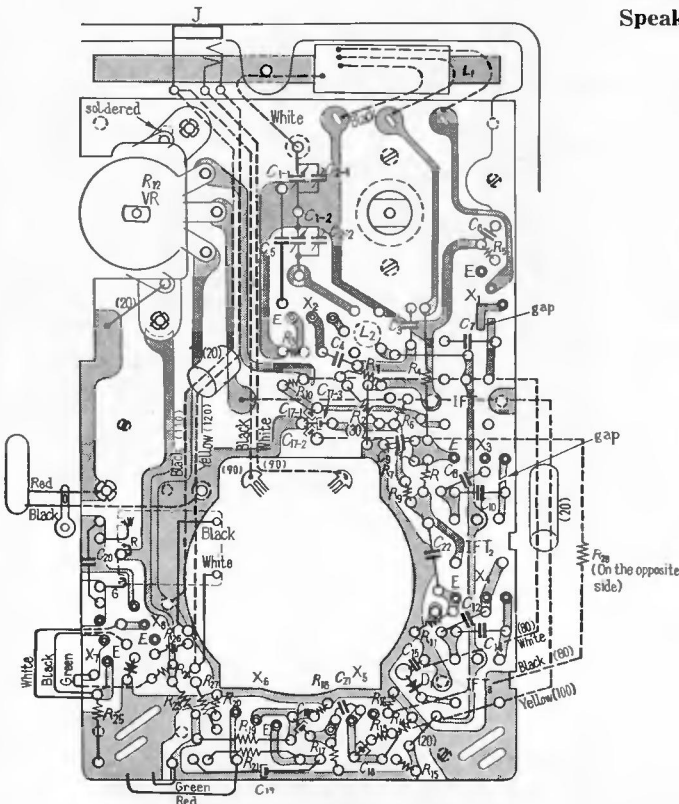
① Built in IFT
 ② To be adjusted

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



Circuit board of TR-86 (Printed side)

Audio Transformer

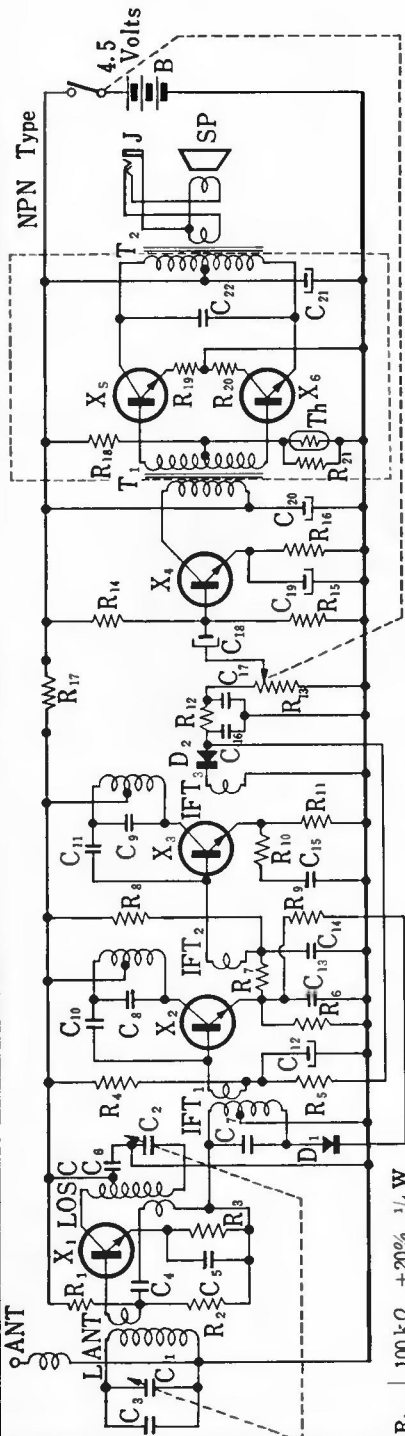
- Input transformer TI-002
6 K Ω : 3 K Ω
DC resistance 500 Ω : 280 Ω
- Output transformer TX-002
1.4 K Ω : 8 Ω
DC resistance 100 Ω : 0.5 Ω

Symbol	Description	Symbol	Description
L ₁	Antenna coil LA-033-LE	R ₂₅	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 ₂₉	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 (2SC76)
R ₁₆	820 Ω " "	X ₂	Oscillator 2 T 7 (2SC73)
R ₁₇	2.2 K Ω " "	X ₃	IF 2 T 7 (2SC76)
R ₁₈	10 K Ω " "	X ₄	IF 2 T 7 (2SC76)
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.

SONY

TR-608



Covering frequency : 535~1605 kc
IF frequency : 455 kc
Sensitivity : 200 μ V/m with built-in ferrite bar antenna
 40 μ V/m with external aerial
Battery : 3 size "C" flashlight batteries (4.5 Volts)
Current drain : 7.5 mA \pm 20% at zero signal

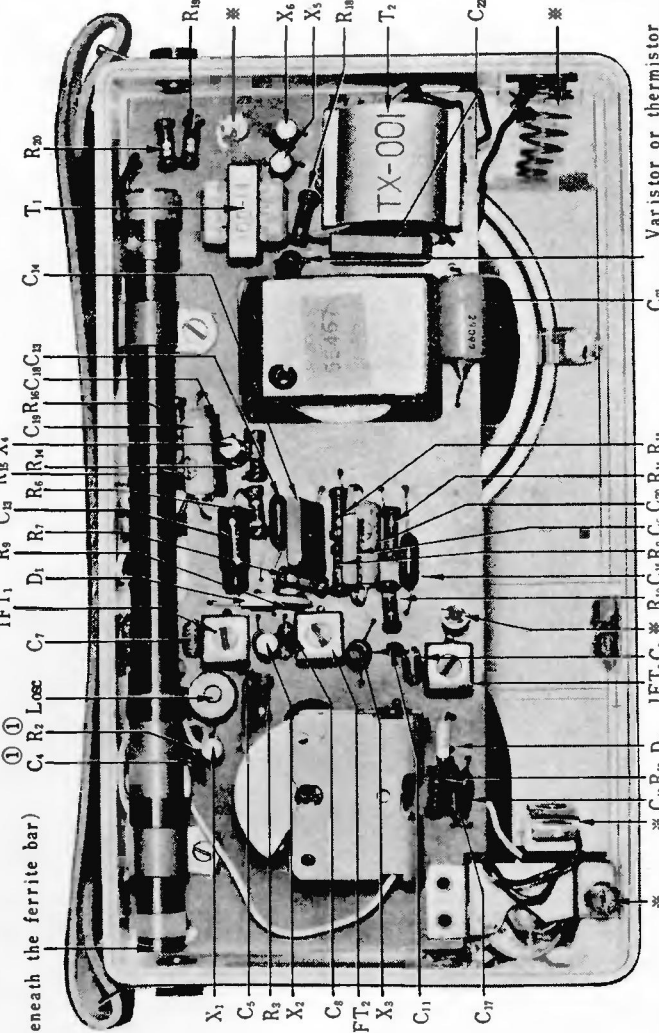
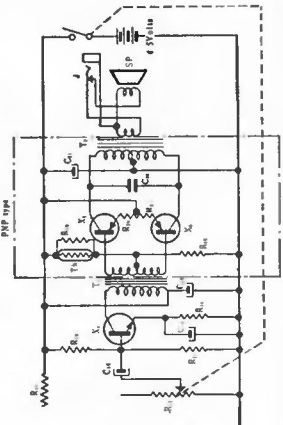
- Transistor 2T73 (2SD73)
- " 2T76 (2SC76)
- " 2T76 (2SC76)
- " 2T6 (2SD65)
- " 2T85
- Diode 1T23 (1S75)
- Thermistor S-250 1T22 (1S75)

- X₁ LANT
- X₂ OSC
- X₃ IF₁
- X₄ IF₂
- X₅ IF₃
- X₆ IF₄
- D₁ T₁
- D₂ J
- Th SP

- R₁ 100 k Ω $\frac{1}{4}$ W
- R₂ \pm 20% " " " "
- R₃ \pm 5% " " " "
- R₄ 1 k Ω " " " "
- R₅ 56 k Ω " " " "
- R₆ \pm 20% " " " "
- R₇ 5.6 k Ω " " " "
- R₈ 470 Ω " " " "
- R₉ 3.3 k Ω " " " "
- R₁₀ 33 k Ω " " " "
- R₁₁ 1.5 k Ω " " " "
- R₁₂ 220 Ω " " " "
- R₁₃ 470 Ω " " " "
- R₁₄ 1 k Ω " " " "
- R₁₅ 5 k Ω " " " "
- R₁₆ 10 k Ω " " " "
- R₁₇ 330 k Ω " " " "
- R₁₈ 60 Ω " " " "
- R₁₉ 3.3 k Ω " " " "
- R₂₀ 5 Ω " " " "
- R₂₁ 5 Ω " " " "
- R₂₂ 220 Ω " " " "

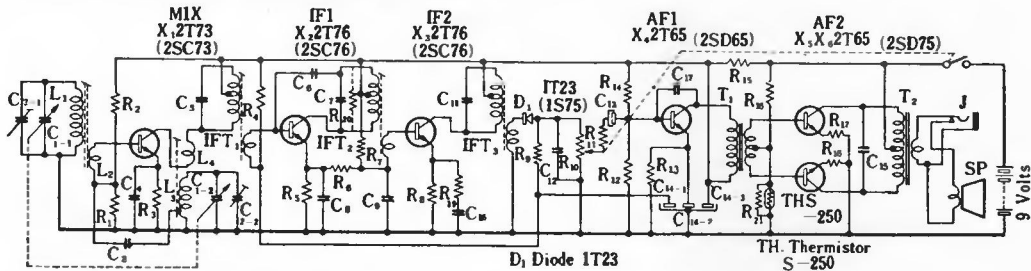
- C₁ Tuning condenser
- C₂ 3 PF
- C₃ 0.01 μ F
- C₄ 0.005 μ F
- C₅ 0.05 μ F
- C₆ 200 PF
- C₇ 200 PF
- C₈ 200 PF
- C₉ 1 PF
- C₁₀ 1 PF
- C₁₁ 30 μ F
- C₁₂ 30 μ F
- C₁₃ 0.01 μ F
- C₁₄ 0.05 μ F
- C₁₅ 0.01 μ F
- C₁₆ 0.01 μ F
- C₁₇ 30 μ F
- C₁₈ 30 μ F
- C₁₉ 30 μ F
- C₂₀ 100 μ F
- C₂₁ 0.1 μ F
- C₂₂ 0.1 μ F

TR-608 PNP 2T32 X₁X₂



TR-608 Mounted circuit board (NPN)

SONY TR-610



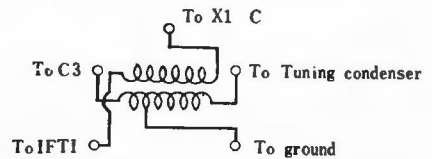
L_1, L_2	Antenna Coil	R_8	470 Ω $\pm 20\%$ 1/4 W	C_3	0.01 μF
L_3, L_4	Oscillator Coil	R_9	8.2 k Ω $\pm 10\%$ "	C_4	0.005 μF
IFT ₁	I.F. transformer	R_{10}	5 k Ω VR with switch	C_5	200 pF (Built in IFT)
IFT ₂	"	R_{11}	470 Ω $\pm 20\%$ 1/4 W	C_6	2 pF
IFT ₃	"	R_{12}	8.2 k Ω $\pm 10\%$ "	C_7	200 pF (Built in IFT)
T ₁	Interstage transformer	R_{13}	1.5 k Ω $\pm 20\%$ "	C_8	0.02 μF
T ₂	Output transformer	R_{14}	27 k Ω " "	C_9	0.005 μF
J	Earphone Jack	R_{15}	220 Ω " "	C_{11}	200 pF (Built in IFT)
SP	2 1/4" PM Speaker 8 Ω	R_{16}	7.5 k Ω $\pm 10\%$ "	C_{12}	0.02 μF
R_1	8.2 k Ω $\pm 5\%$ 1/4 W	R_{17}	22 Ω $\pm 20\%$ "	C_{13}	10 μF 3V
R_2	110 k Ω $\pm 20\%$ "	R_{18}	22 Ω " "	C_{14-1}	20 μF 10V
R_3	1.5 k Ω $\pm 5\%$ "	R_{19}	150 Ω " "	C_{14-2}	20 μF 10V
R_4	130 k Ω $\pm 20\%$ "	R_{20}	220 k Ω " "	C_{14-3}	20 μF 10V
R_5	470 Ω " "	R_{21}	220 Ω " "	C_{15}	0.04 μF
R_6	1.5 k Ω " "	C_1	PVC-2 M. Tuning condenser	C_{16}	0.005 μF
R_7	33 k Ω $\pm 10\%$ "	C_2		Trimmer condenser	C_{17}

TR-610 Circuit board printed side

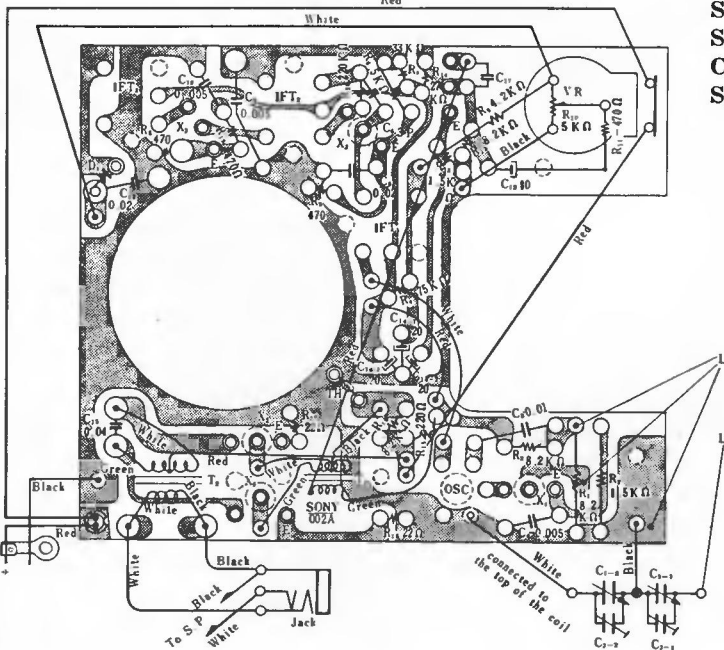
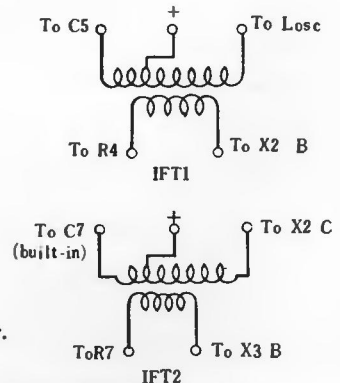
IF frequency : 455 kc
Sensitivity : 400 $\mu V/m$ at 10 mW output
Selectivity : 18 db at 10 kc off resonance
Current drain : Approx. 5 mA at zero signal
Speaker : 2 1/4" PM dynamic 8 Ω

Coils

(a) Oscillator coil (bottom view)



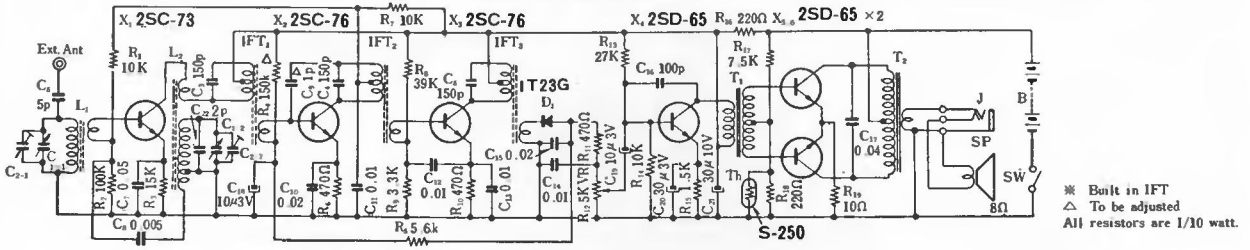
(b) IFT (bottom view)



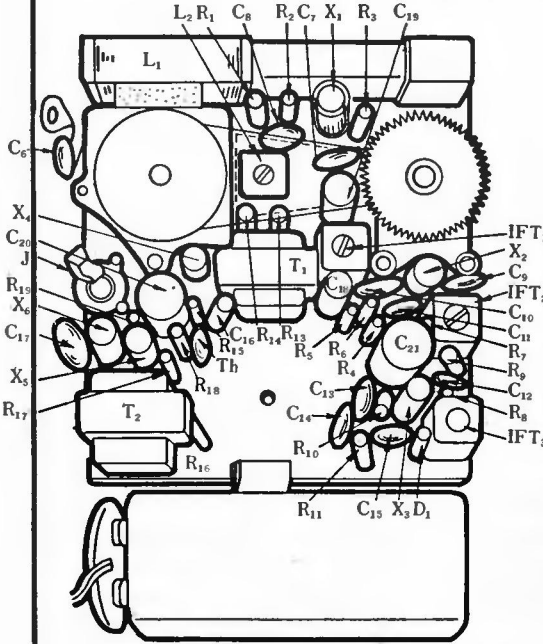
How to remove Cabinet

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

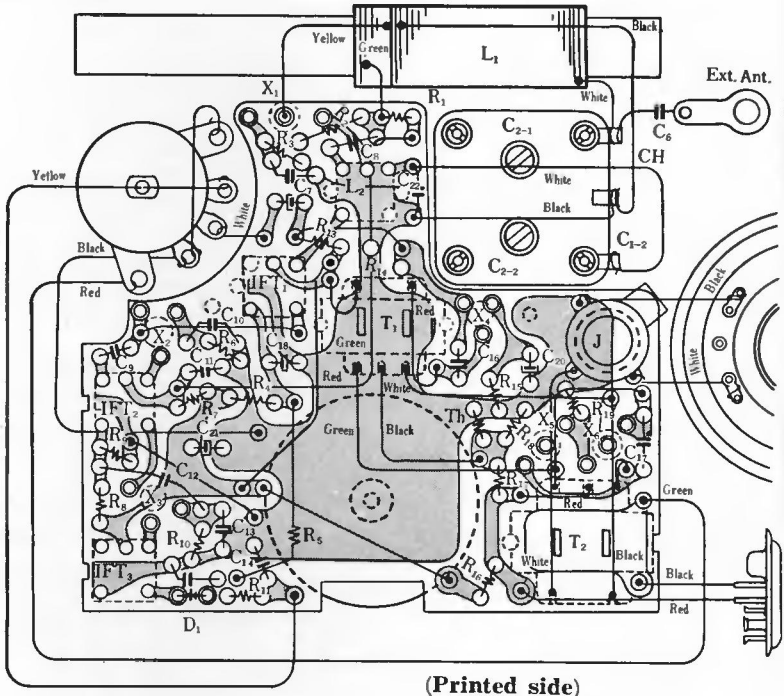
SONY TR-620



※ 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 L₂
 Upper limit: 1680 kc " C₂₋₂
- 2) Tracking adjustment
 Checking point
 620 kc Adjust L₁
 1400 kc " C₂₋₁

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 μA	2.85~3.75 V
X ₂	310~390 μA	0.145~0.18 V
X ₃	550~680 μA	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		

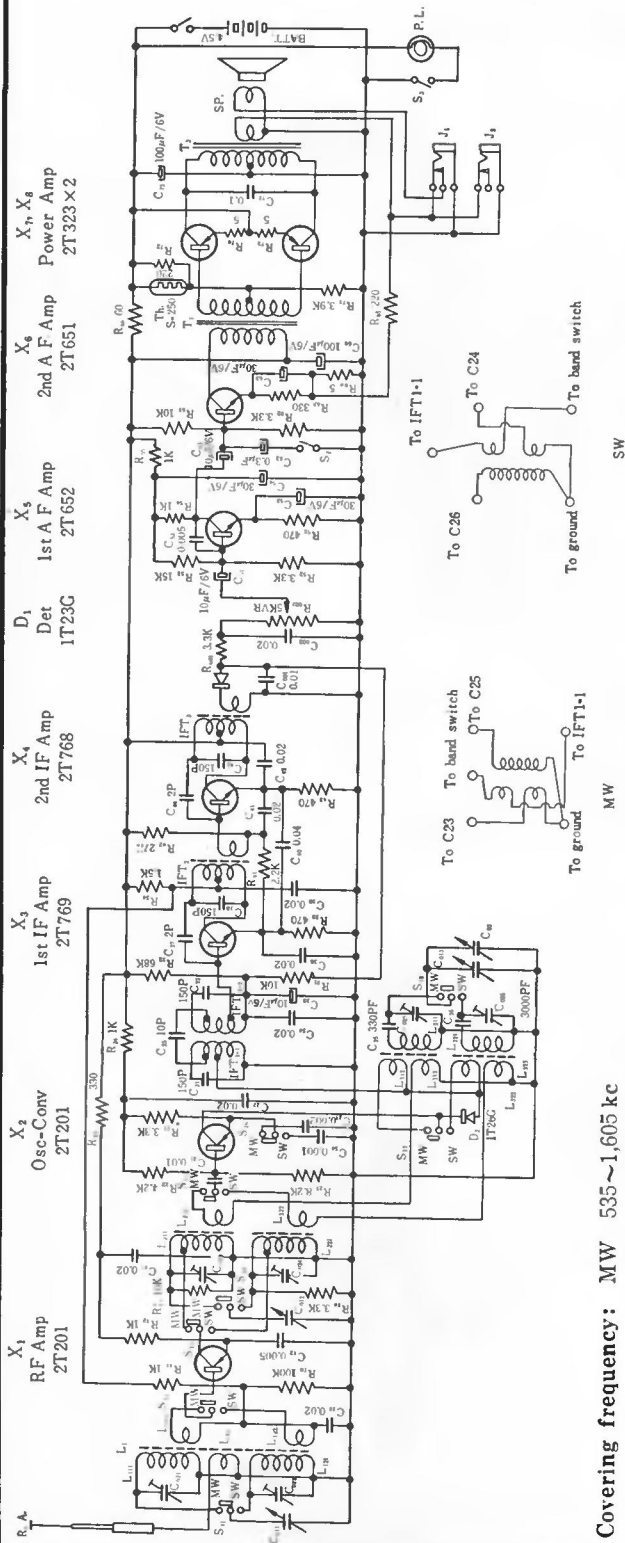
(Current drain at 0 signal: Approx. 6 mA)

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

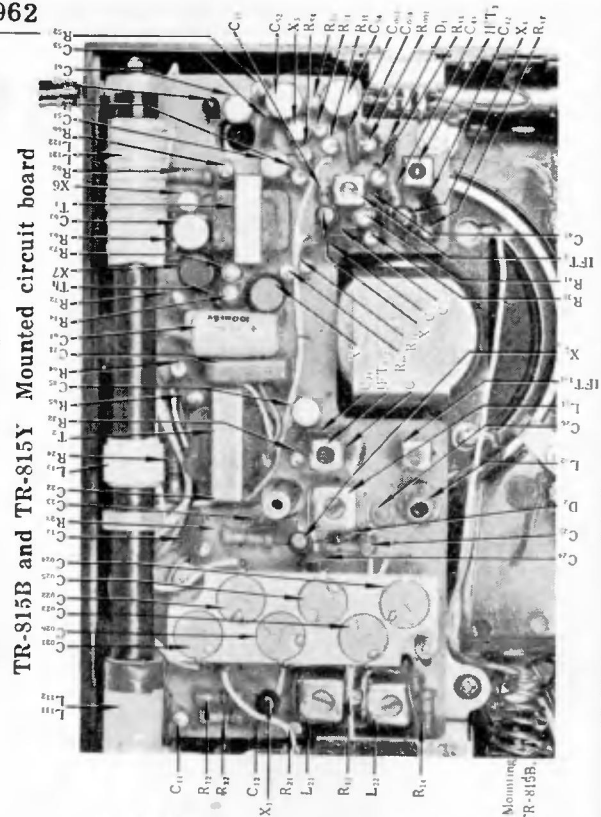
SW 3.9~12 Mc for TR-815B, 6~18 Mc for TR-815Y

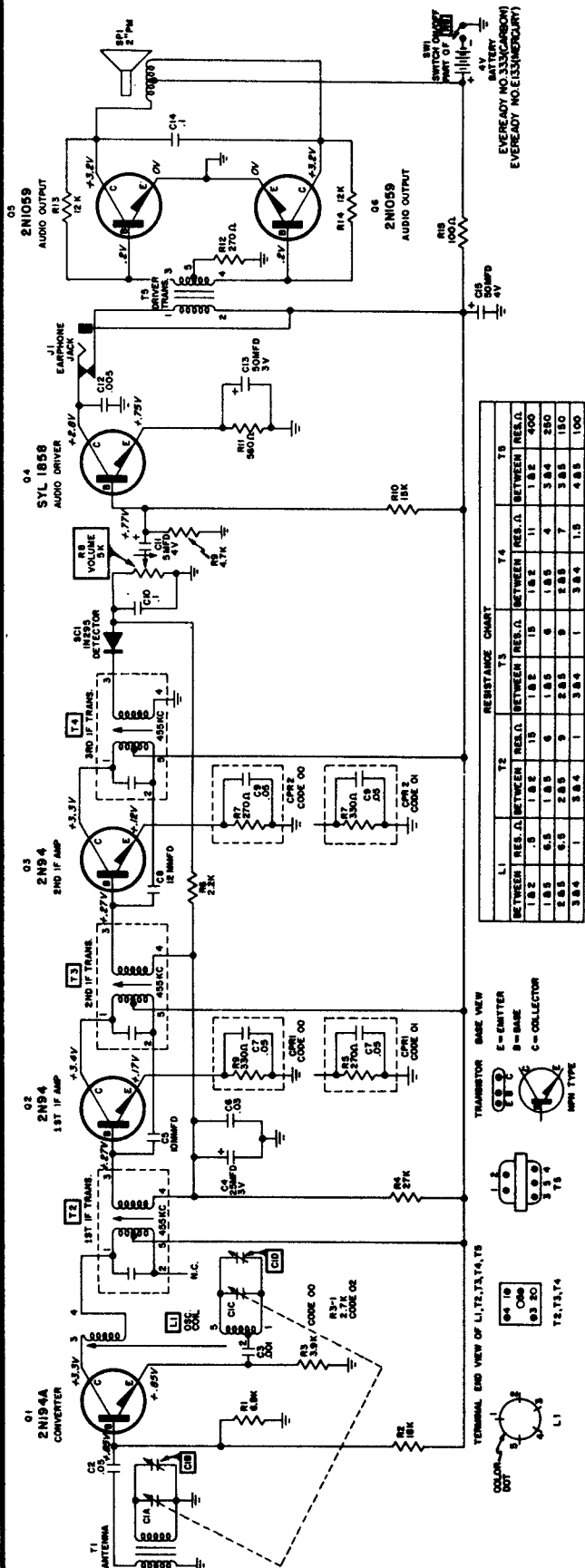
IF frequency : 455 kc

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.

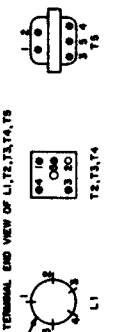
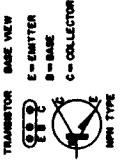
TR-815B and TR-815Y Mounted circuit board





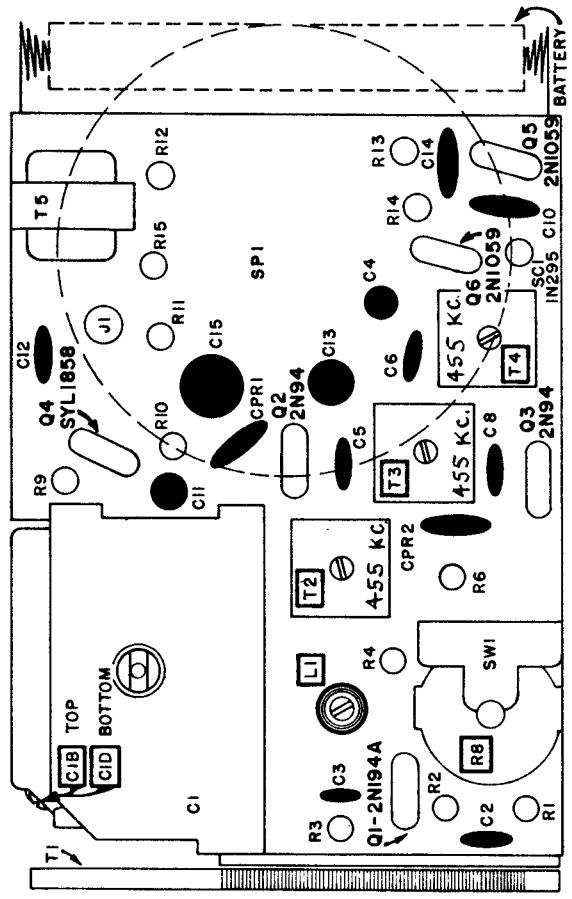
RESISTANCE CHART

	T1	T2	T3	T4	T5
BETWEEN RES. Ω	1.82	1.82	1.82	1.82	1.82
BETWEEN RES. Ω	1.82	1.82	1.82	1.82	1.82
BETWEEN RES. Ω	1.82	1.82	1.82	1.82	1.82
BETWEEN RES. Ω	1.82	1.82	1.82	1.82	1.82
BETWEEN RES. Ω	1.82	1.82	1.82	1.82	1.82
BETWEEN RES. Ω	1.82	1.82	1.82	1.82	1.82
BETWEEN RES. Ω	1.82	1.82	1.82	1.82	1.82
BETWEEN RES. Ω	1.82	1.82	1.82	1.82	1.82
BETWEEN RES. Ω	1.82	1.82	1.82	1.82	1.82
BETWEEN RES. Ω	1.82	1.82	1.82	1.82	1.82



SCHEMATIC NOTES

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.



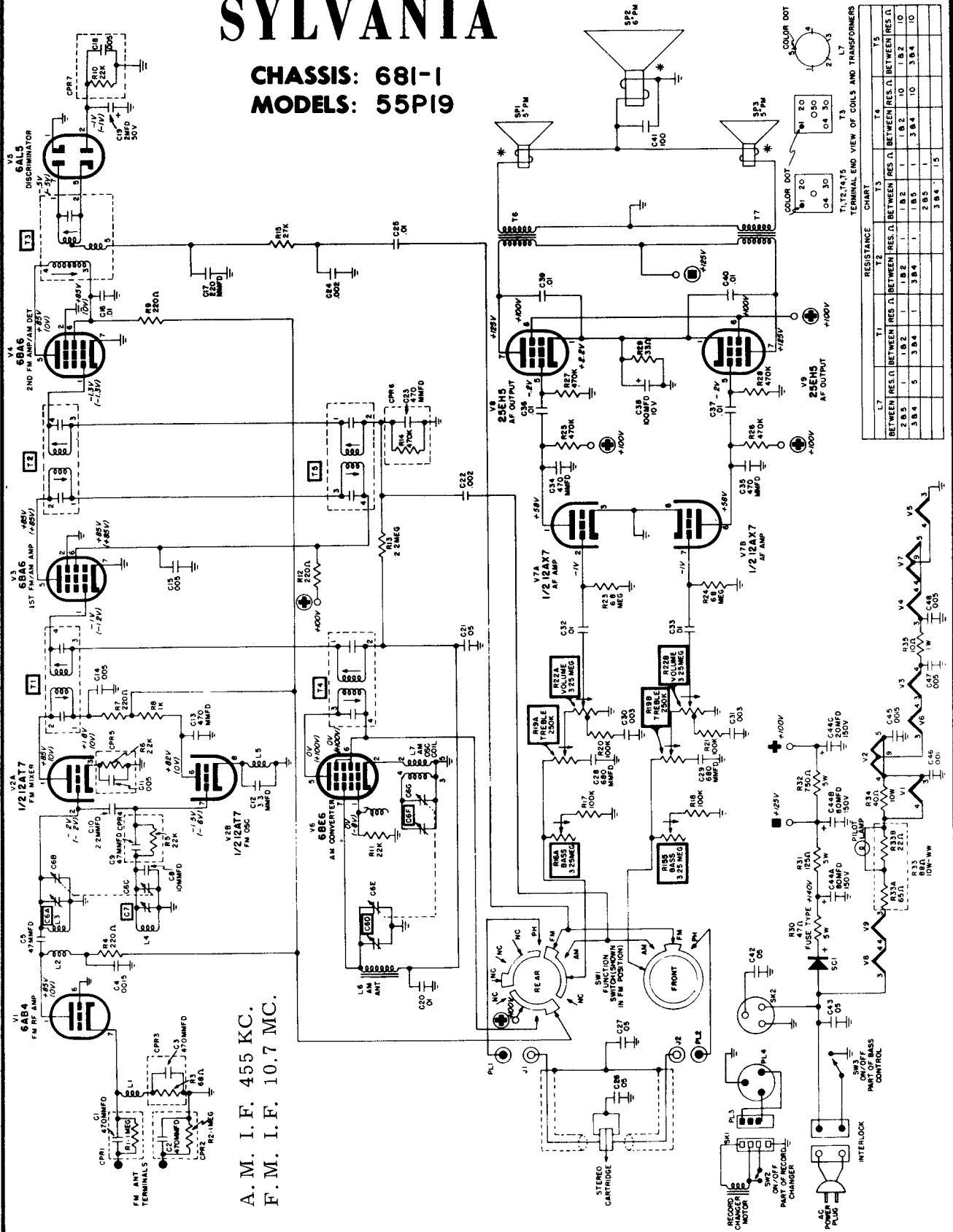
TOP PARTS LAYOUT

SYLVANIA

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

SYLVANIA

CHASSIS: 68I-1
MODELS: 55PI9



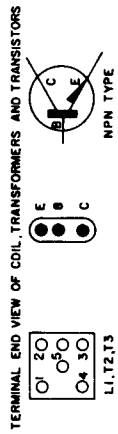
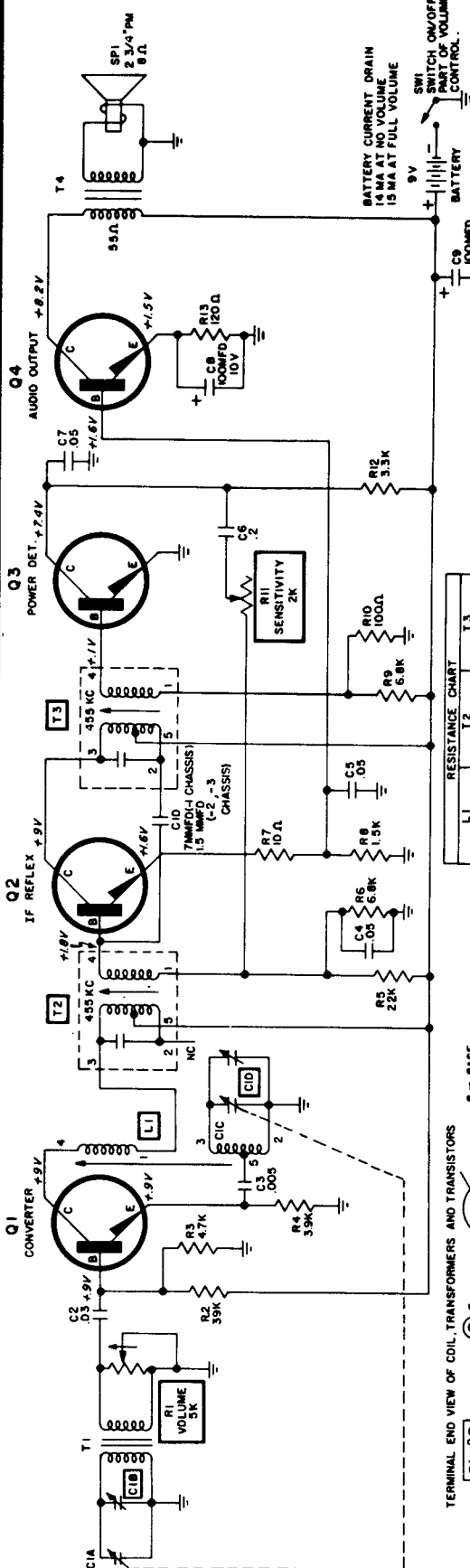
A.M. I.F. 455 KC.
F.M. I.F. 10.7 MC.

RESISTANCE CHART
TERMINAL END VIEW OF COILS AND TRANSFORMERS

	T1	T2	T3	T4	T5
BETWEEN RES. Ω BETWEEN RES. Ω					
1	1.82	1.82	1.82	1.02	1.02
2	3.64	3.64	3.64	3.64	3.64
3	5.46	5.46	5.46	5.46	5.46
4	7.28	7.28	7.28	7.28	7.28
5	9.10	9.10	9.10	9.10	9.10
6	10.92	10.92	10.92	10.92	10.92
7	12.74	12.74	12.74	12.74	12.74
8	14.56	14.56	14.56	14.56	14.56
9	16.38	16.38	16.38	16.38	16.38
10	18.20	18.20	18.20	18.20	18.20

SEE CHART BELOW FOR TRANSISTOR COMPLEMENT

VOLUME R-22, MOST-OFTEN



RESISTANCE CHART

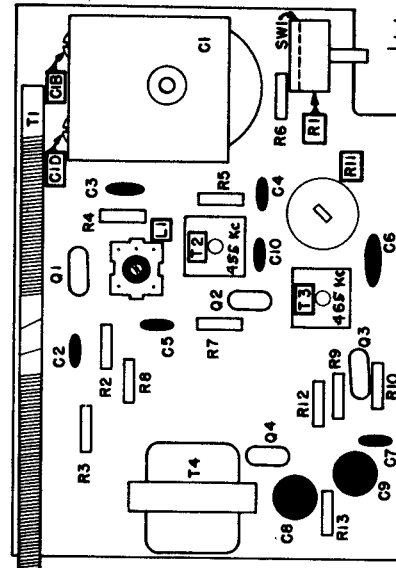
L1	T2	T3
BETWEEN RES. BETWEEN RES.	BETWEEN RES.	BETWEEN RES.
1.84	1.50	1.84
2.83	8.50	2.83
2.85	5.0	2.50
3.85	8.0	3.85

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.

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.



RADIO INFORMATION

TOP PARTS LAYOUT

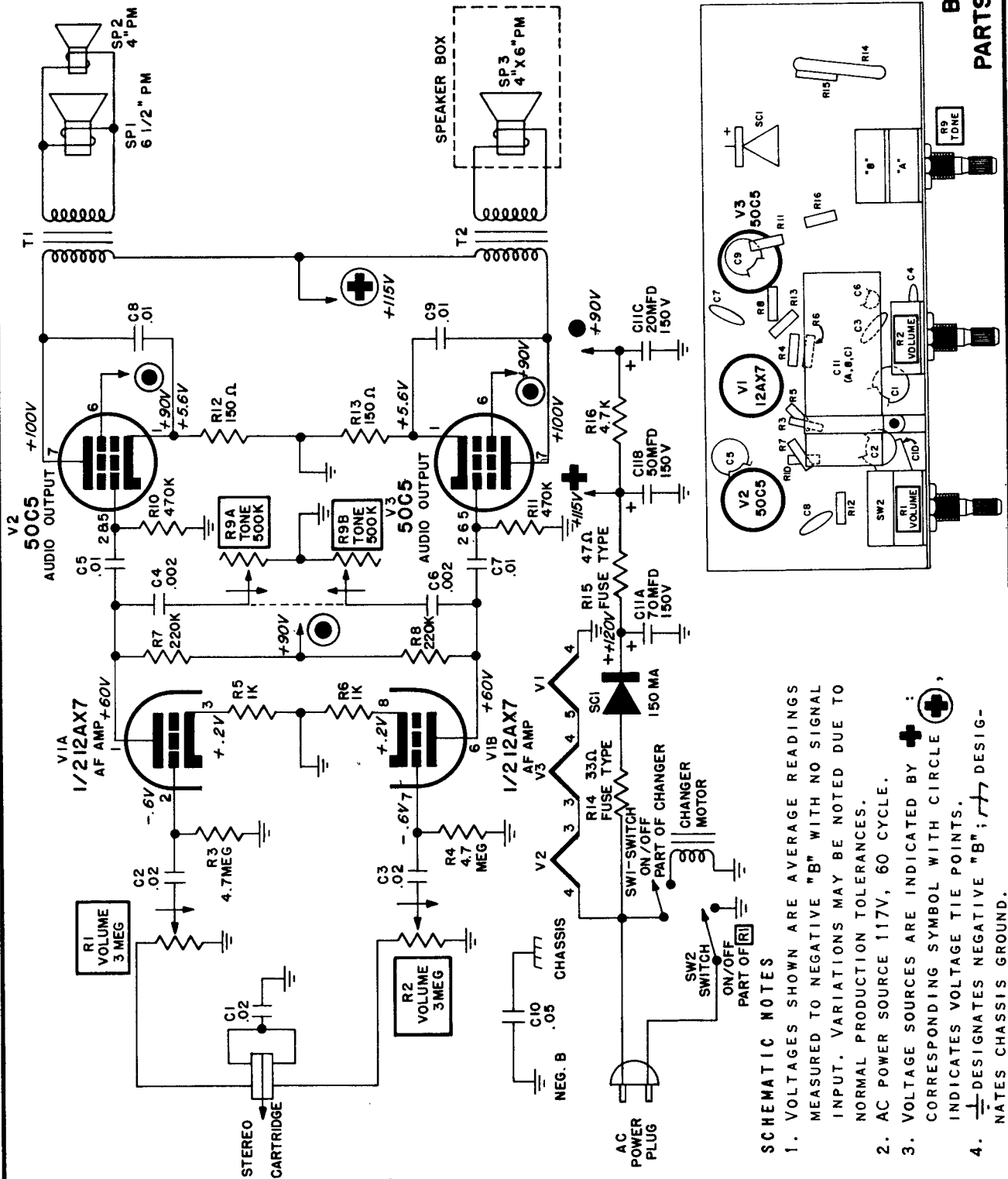
SYLVANIA
 CHASSIS: 682-1,-2,-3
 MODELS: 4PI9WD (-1CHASSIS)
 4PI9W (-2CHASSIS)
 4PI9WC (-3CHASSIS)

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

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

SYLVANIA

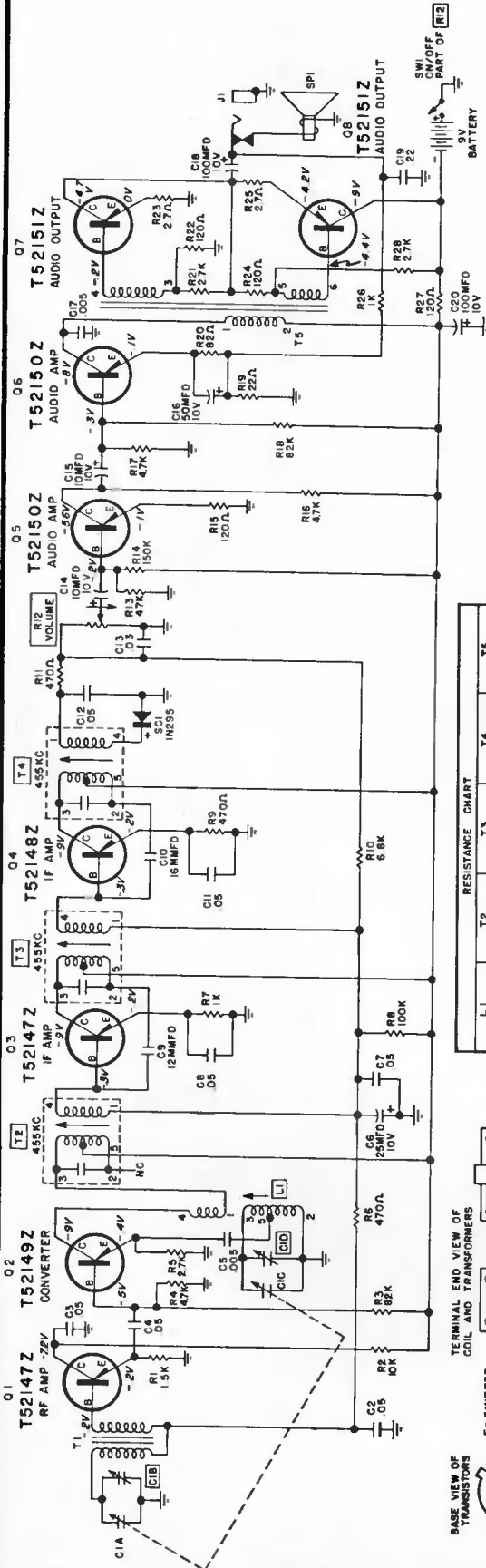
CHASSIS: 691-1
MODELS: 45C20



BOTTOM PARTS LAYOUT

SCHEMATIC NOTES

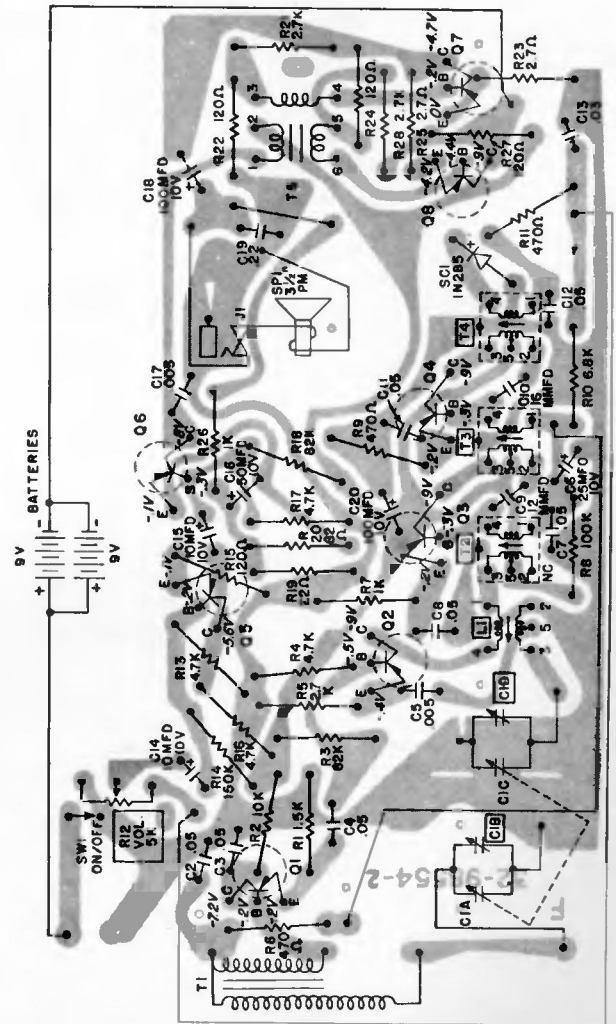
1. VOLTAGES SHOWN ARE AVERAGE READINGS MEASURED TO NEGATIVE "B" WITH NO SIGNAL INPUT. VARIATIONS MAY BE NOTED DUE TO NORMAL PRODUCTION TOLERANCES.
2. AC POWER SOURCE 117V, 60 CYCLE.
3. VOLTAGE SOURCES ARE INDICATED BY :
CORRESPONDING SYMBOL WITH CIRCLE
INDICATES VOLTAGE TIE POINTS.
4. ⊕ DESIGNATES NEGATIVE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



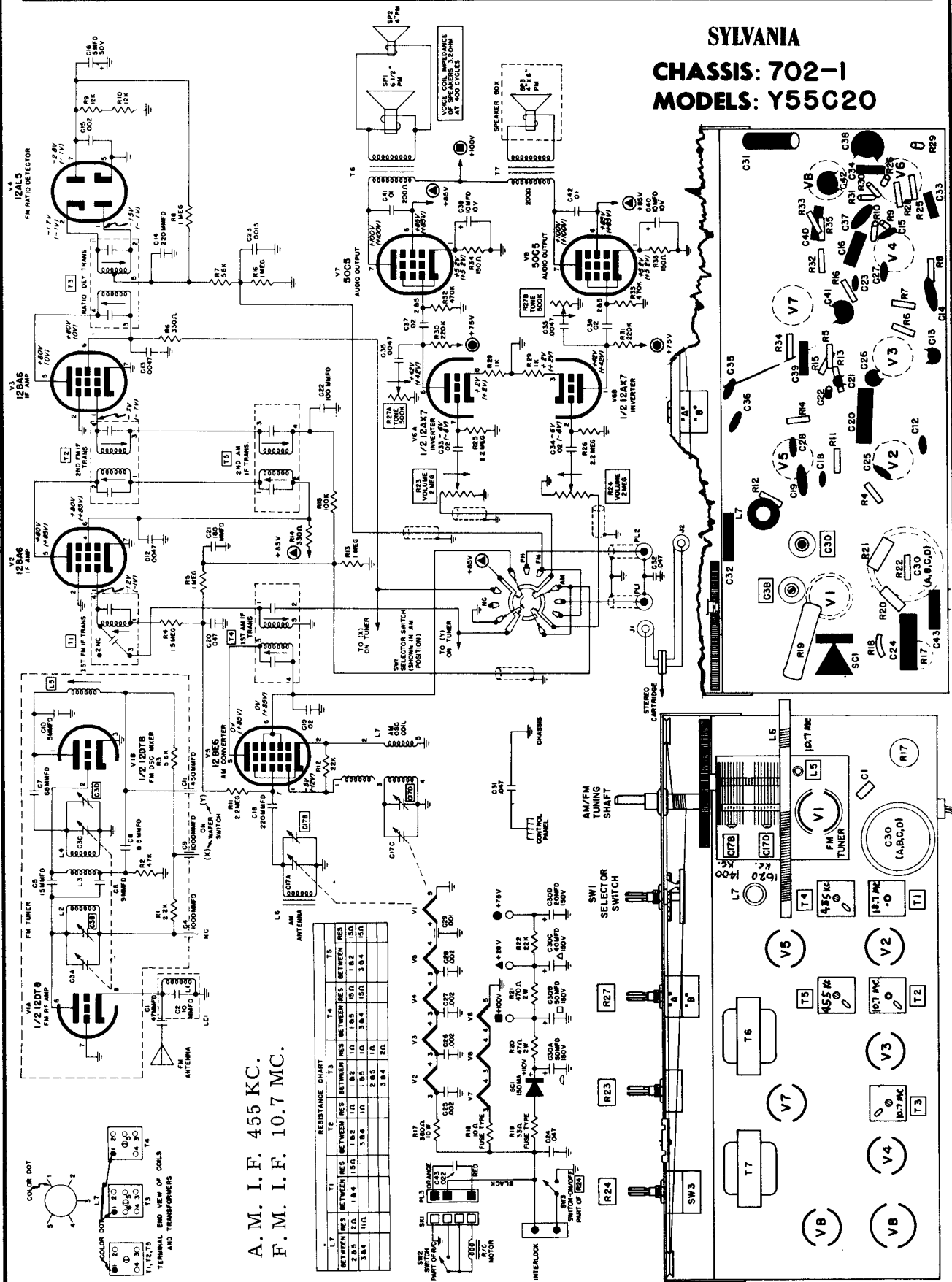
SCHEMATIC NOTES

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. ⚡ DESIGNATES CHASSIS GROUND.

SYLVANIA
CHASSIS: 700-2
MODELS: TH16 SERIES



SYLVANIA
CHASSIS: 702-1
MODELS: Y55C20



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

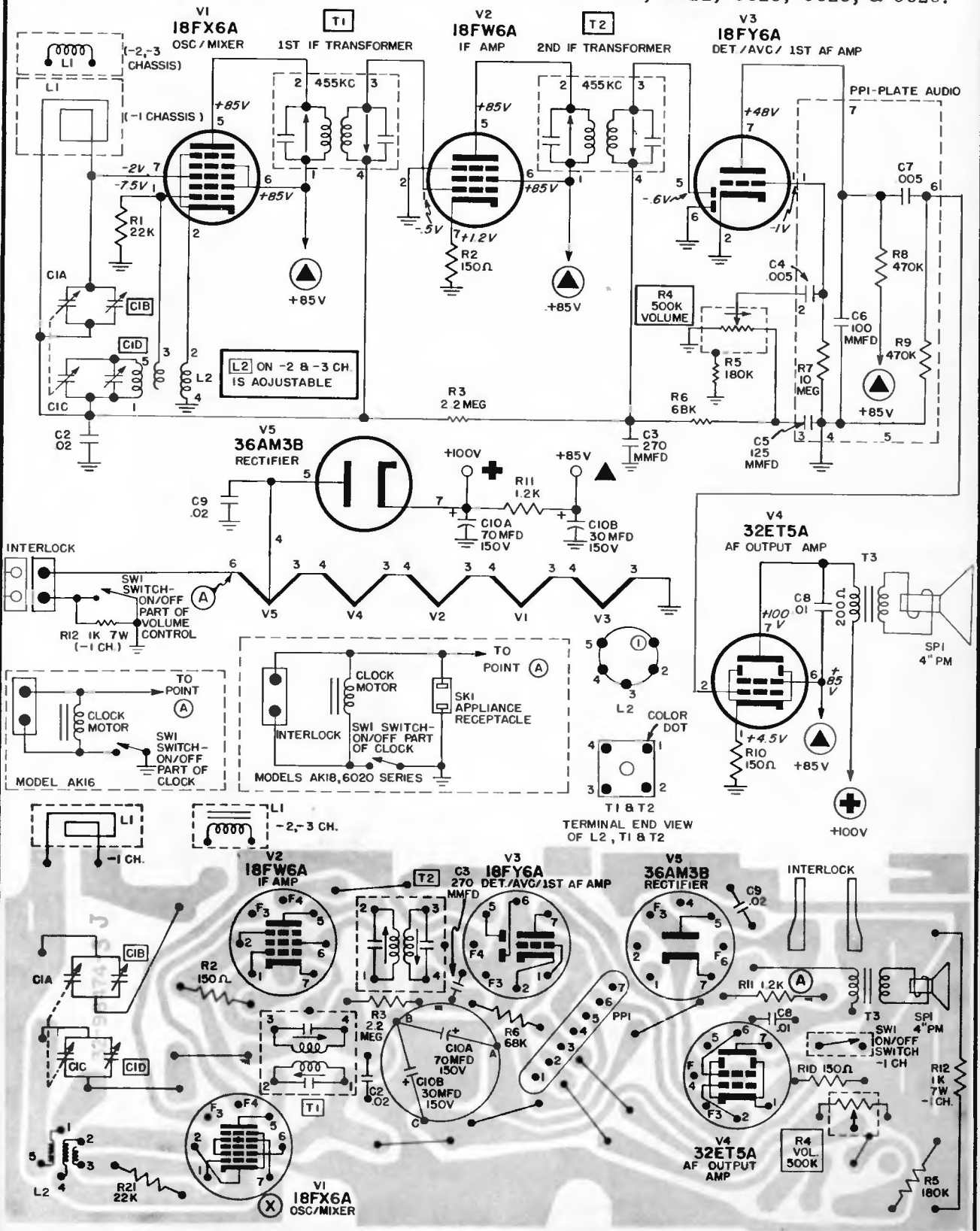
RESISTANCE CHART

T1	T2	T3	T4	T5
BETWEEN PINS	BETWEEN PINS	BETWEEN PINS	BETWEEN PINS	BETWEEN PINS
2.85	1.01	1.51	1.82	1.11
3.84	1.01	1.51	1.82	1.11
3.84	1.01	1.51	1.82	1.11
3.84	1.01	1.51	1.82	1.11
3.84	1.01	1.51	1.82	1.11

SYLVANIA

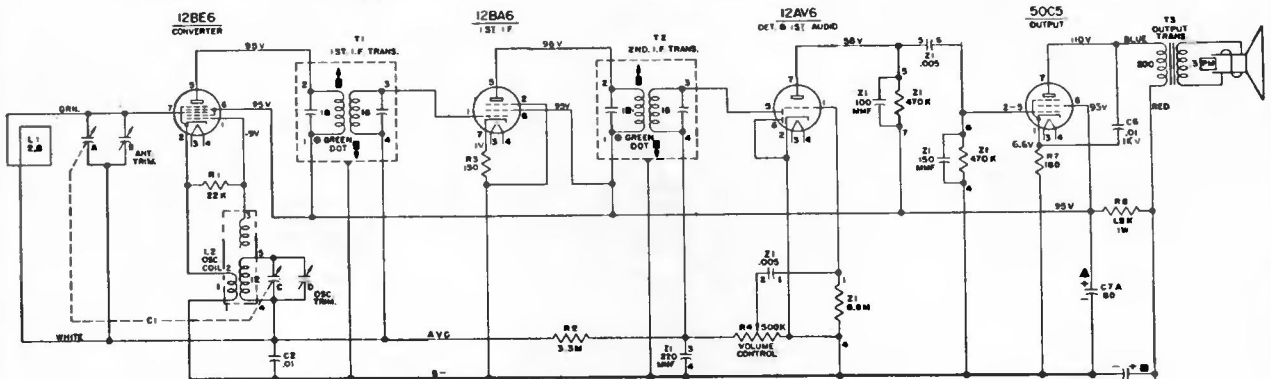
CHASSIS: 711-1, -2, -3

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



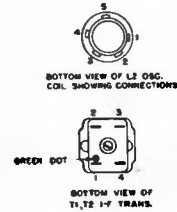
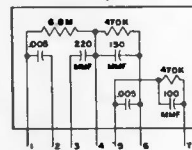
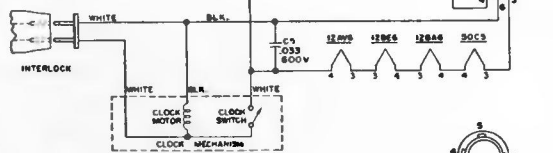
Westinghouse

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 cheater cord or a TV AC interlock line cord to power the radio while servicing.

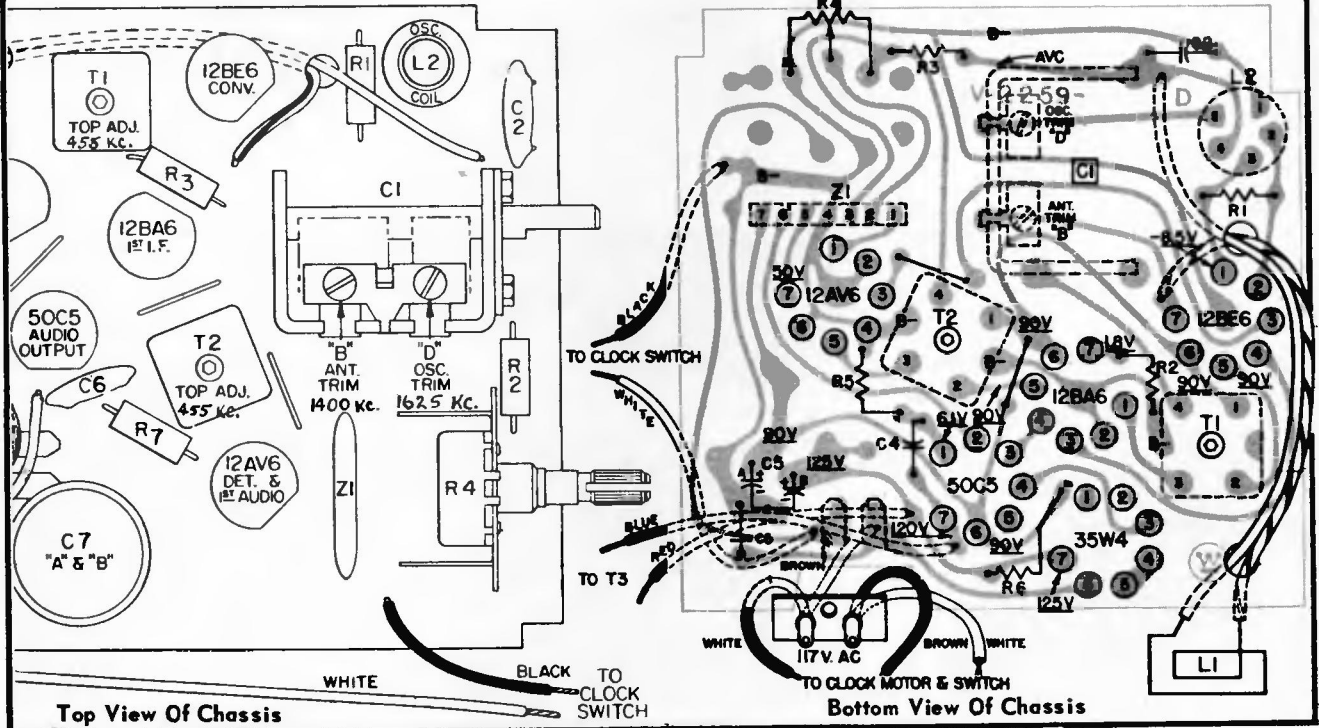


NOTES:

1. ALL VOLTAGES MEASURED FROM COMMON NEGATIVE USING A V.T.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.

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.

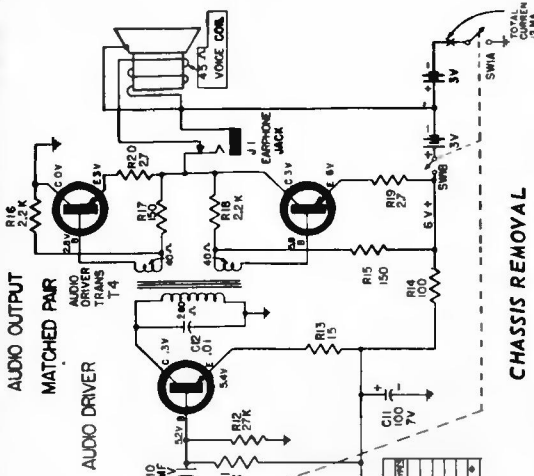


Top View Of Chassis

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.

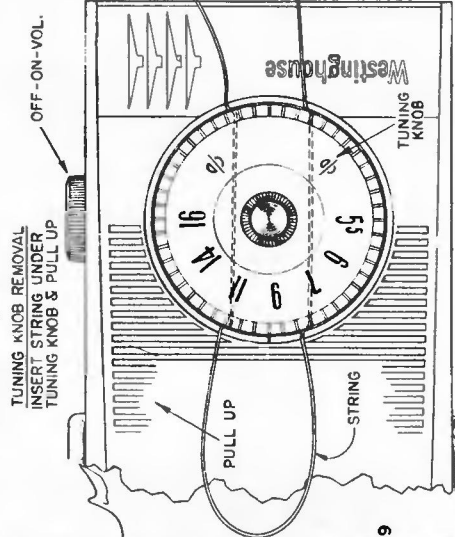
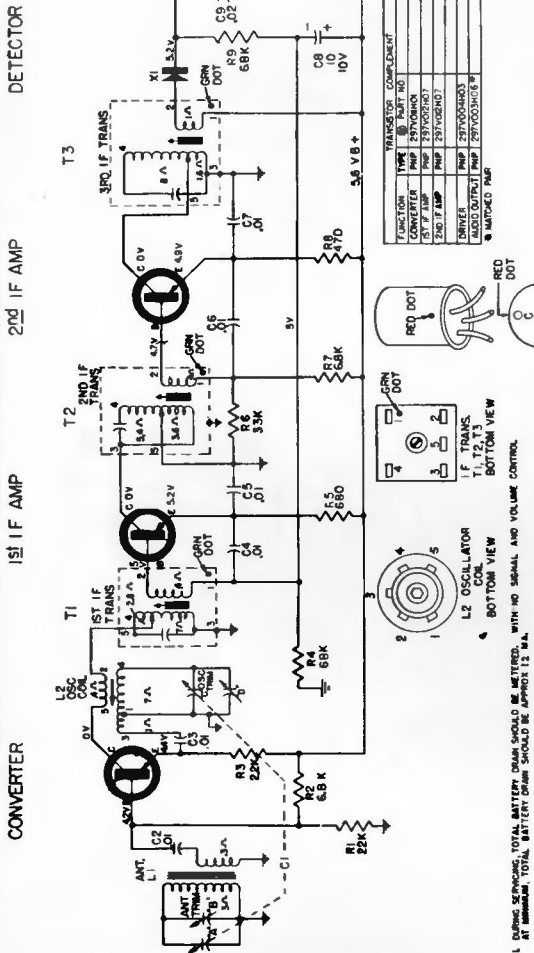
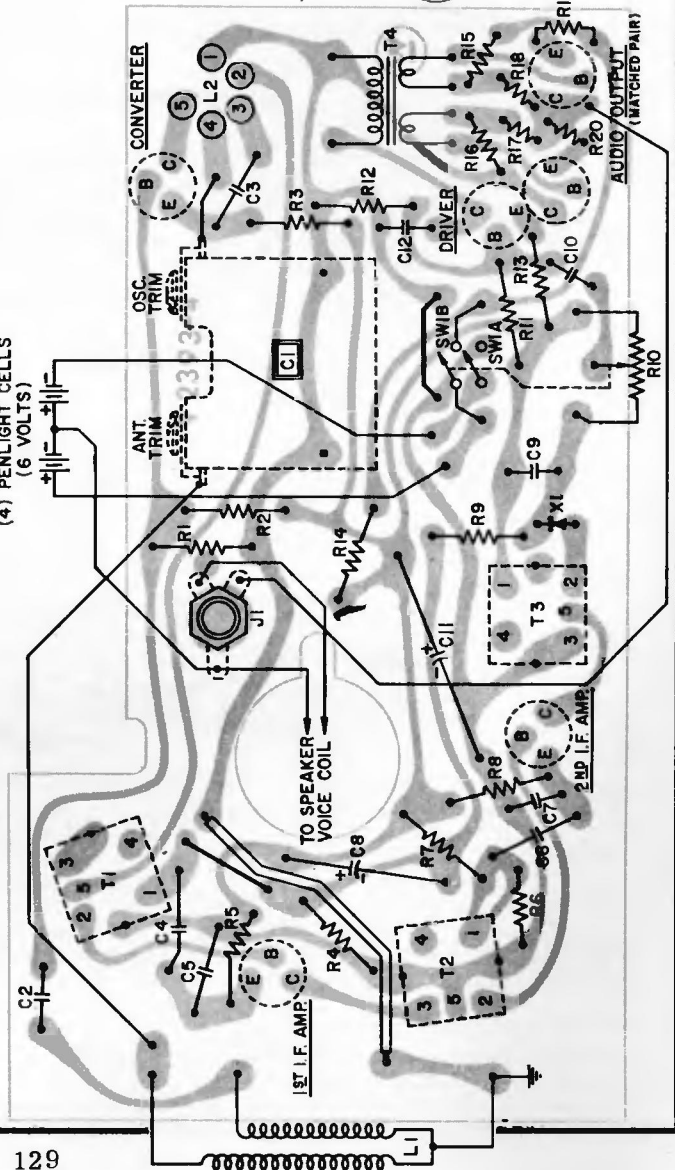


Figure 1 - Tuning Knob Removal



Frequency Range 540 to 1600 KC
Intermediate Frequency 455 KC

(4) PENLIGHT CELLS (6 VOLTS)



CONVERTER
1ST IF AMP
2ND IF AMP
DETECTOR

CONVERTER

1ST IF AMP

2ND IF AMP

DETECTOR

AUDIO DRIVER
MATCHED PAIR
AUDIO OUTPUT

AUDIO OUTPUT

WESTINGHOUSE

TRANSFORMER COMPONENTS

FUNCTION	TYPE	PART NO.	ALTERNATE TERMINALS
CONVERTER	PMP	257000003	2/4/5/6
1ST IF AMP	PMP	257000007	2/3/4
DRIVER	PMP	257000008	2/3/4
AUDIO OUTPUT	PMP	257000009	2/3/4/5/6

TRANSFORMER PARTS

FUNCTION	TYPE	PART NO.	ALTERNATE TERMINALS
CONVERTER	PMP	257000003	2/4/5/6
1ST IF AMP	PMP	257000007	2/3/4
DRIVER	PMP	257000008	2/3/4
AUDIO OUTPUT	PMP	257000009	2/3/4/5/6

IF TRANS.
T1, T2, T3
BOTTOM VIEW

L2 OSCILLATOR COIL
BOTTOM VIEW

L1 ANT. COIL
BOTTOM VIEW

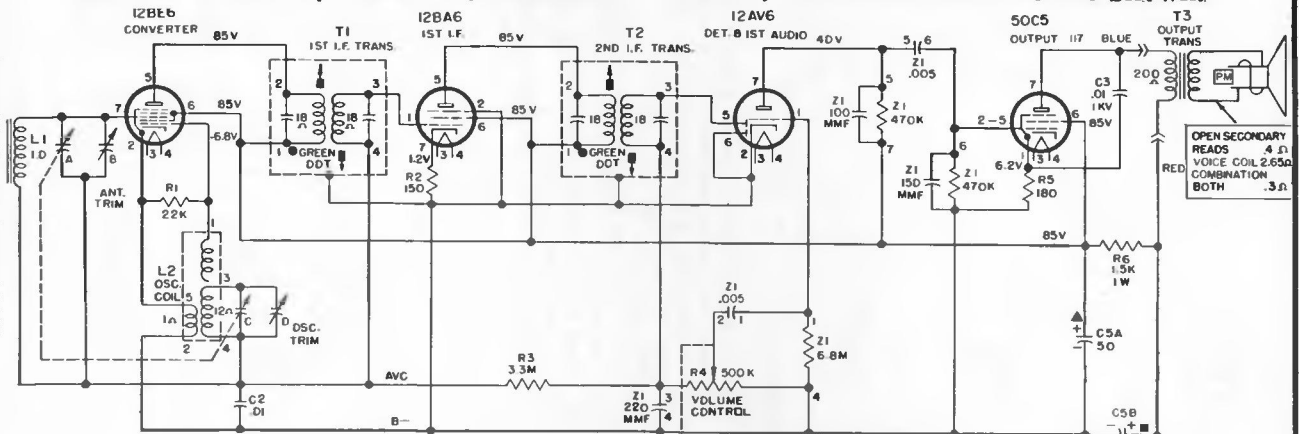
RED DOT
BOTTOM VIEW

GRN DOT
BOTTOM VIEW

1. DURING SERVICING, TOTAL BATTERY DRAIN SHOULD BE MONITORED. WITH NO SIGNAL AND VOLUME CONTROL.
2. VOLTAGE MEASUREMENTS MADE WITH A V.T.M. FROM POINTS INDICATED TO GND. WITH TUNING CAPACITOR AT MINIMUM. TOTAL BATTERY DRAIN SHOULD BE APPROX 12 M.A.
3. ALL CAPACITORS ARE IN MICROGRAMS AND RESISTORS IN OHMS 5 UNLESS OTHERWISE SHOWN.

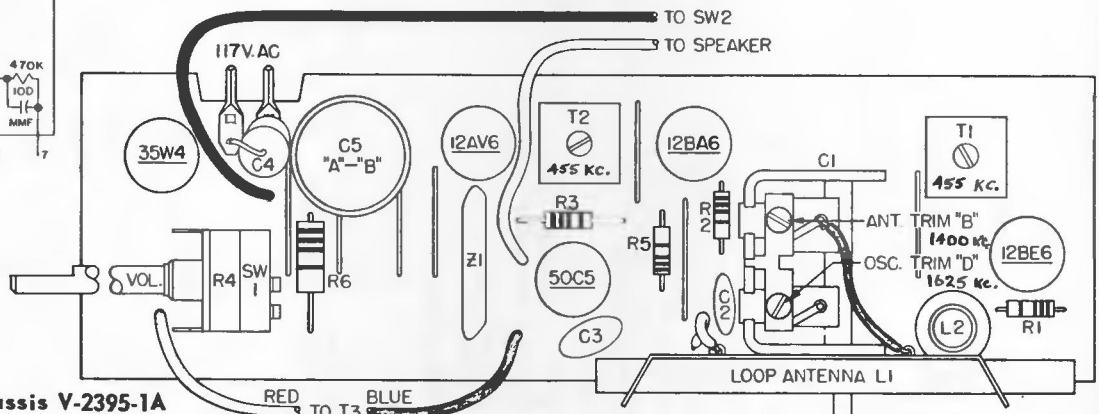
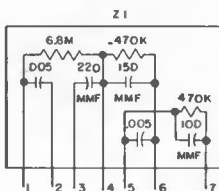
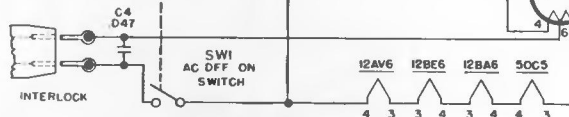
VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

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.

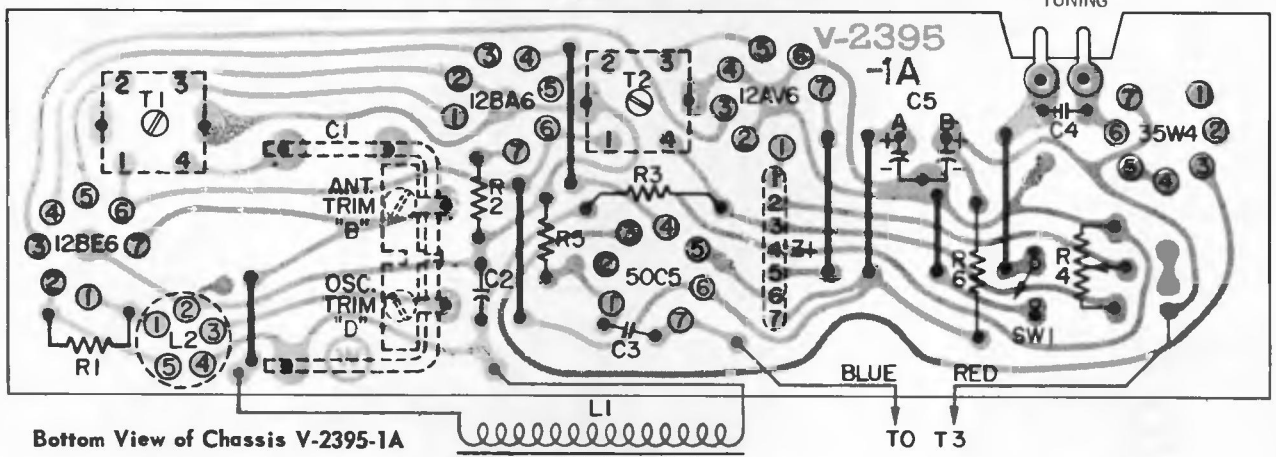


NOTES:

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 MFO AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED



Top View of Chassis V-2395-1A



Bottom View of Chassis V-2395-1A

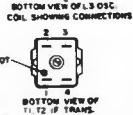
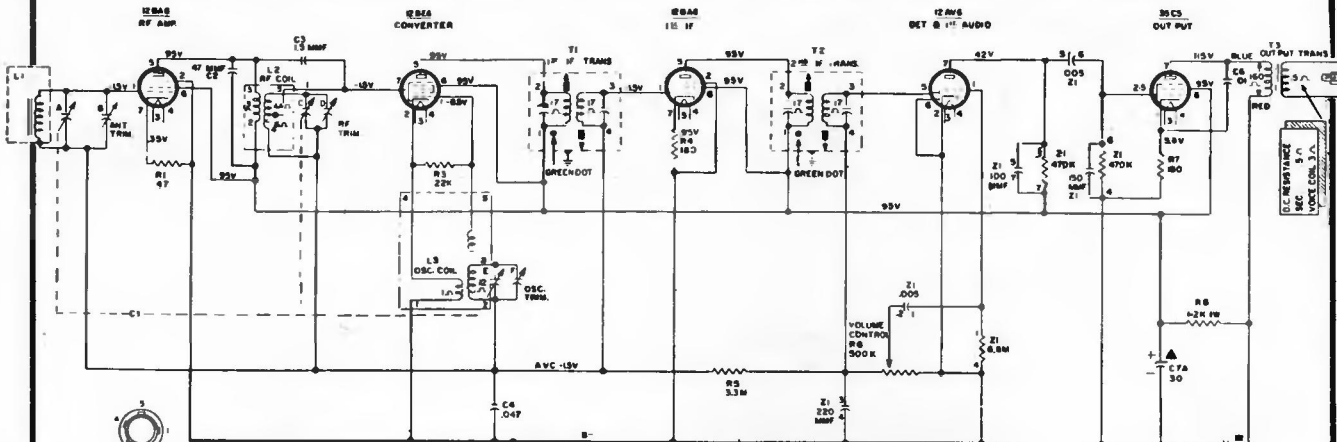
PRINTED BOARD REMOVAL

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

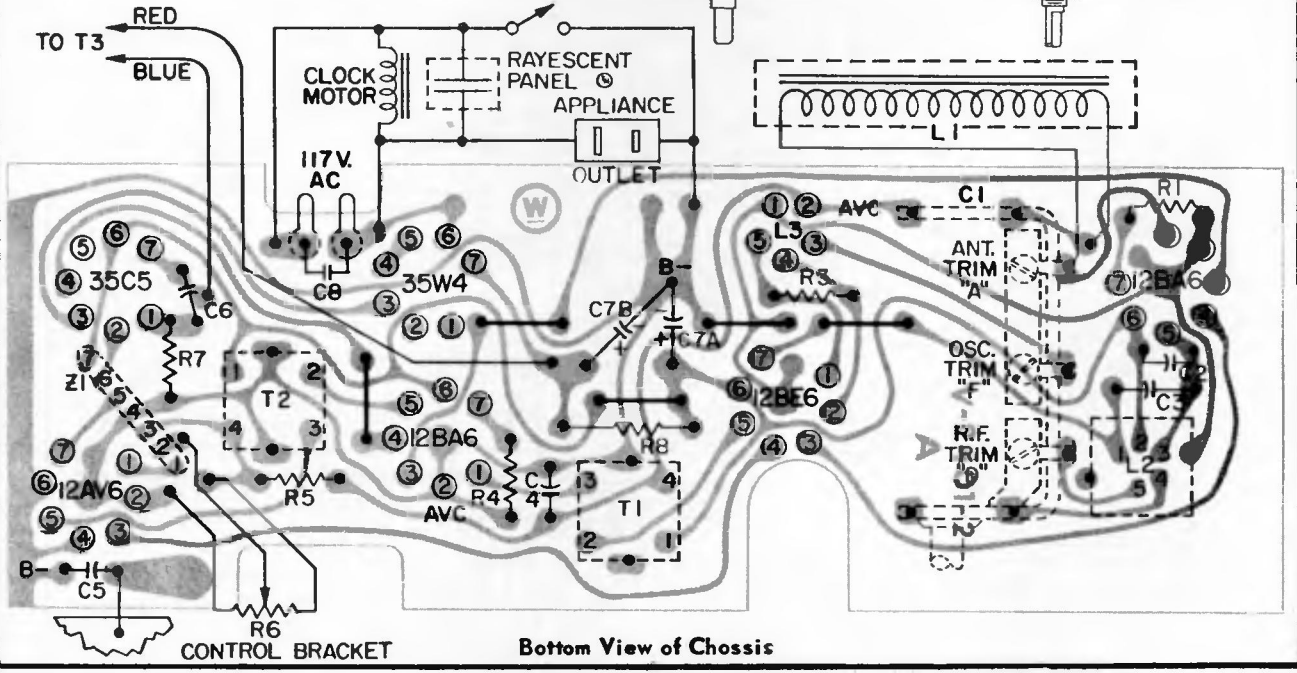
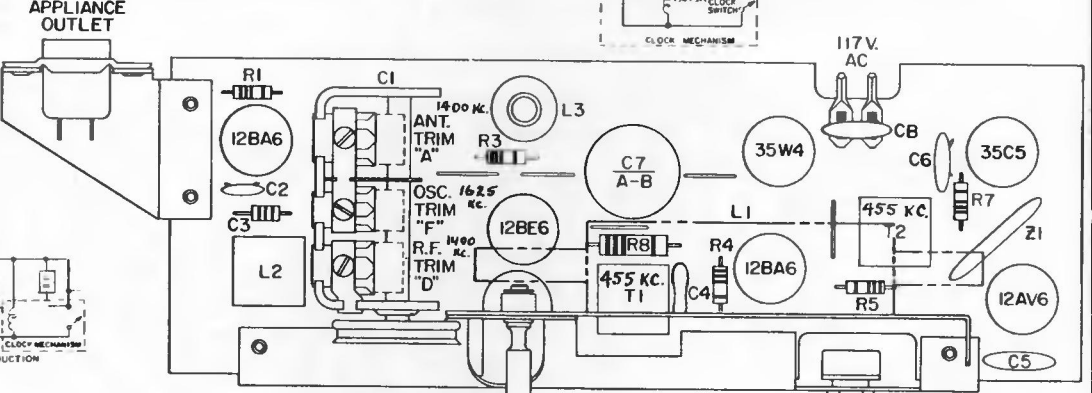
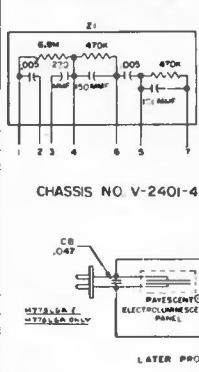
3. Loosen screw on bottom of cabinet slightly; then push forward on this screw to disengage AC line cord interlock.
4. Remove screw from bottom of cabinet. Front panel and attached PC board can now be removed from cabinet.
5. For PC board installation reverse the above procedure.

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

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



- NOTES:**
1. ALL VOLTAGES MEASURED FROM COMMON NEGATIVE USING A V.T.V.M. VOLUME CONTROL AT MINIMUM. LINE VOLTAGE SET AT 117 V.-A.C. READINGS SHOULD BE AS SHOWN $\pm 20\%$. TUNING CAPACITOR TUNED OFF STATION.
 2. ALL CAPACITANCE VALUES IN MFD AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
 3. * EARLY PRODUCTION WAS .025



Westinghouse

H-798P7
H-798P7GP

H-799P7
H-799P7GP

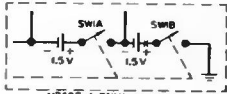
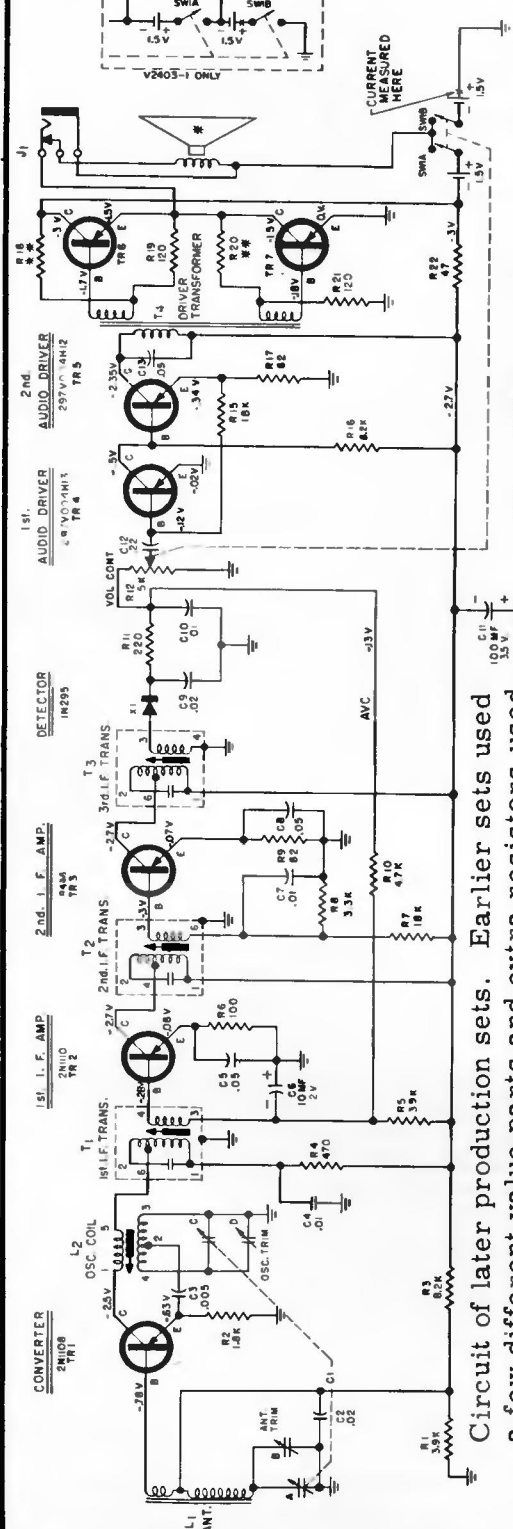
H-732P7
H-733P7
H-798P7A
H-798P7GA

H-732P7GP
H-733P7GP
H-799P7A
H-799P7GA

CHASSIS V-2403-4

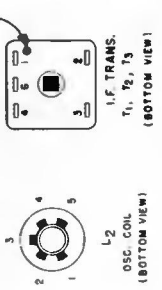
CHASSIS V-2403-1

AUDIO OUTPUT
MATCHED PAIR
R201 OR R358



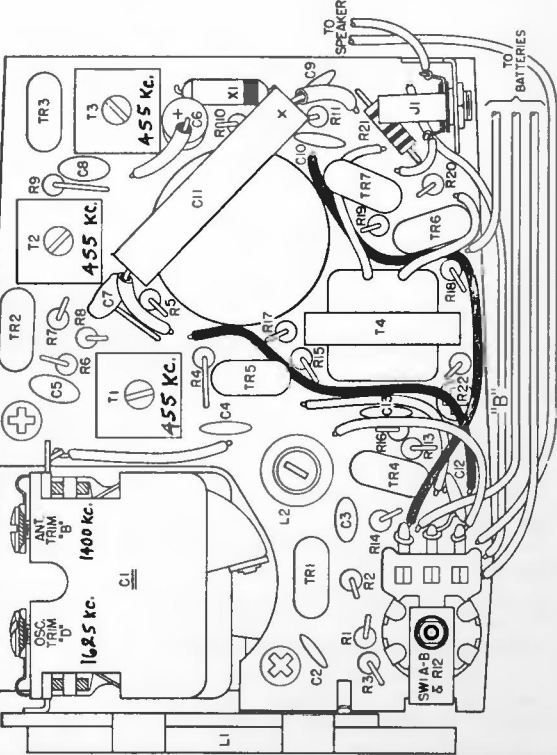
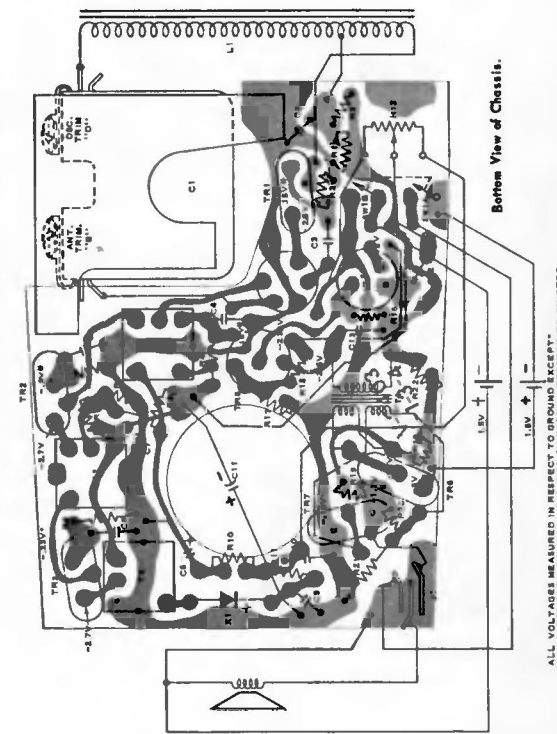
Circuit of later production sets. Earlier sets used a few different value parts and extra resistors used with another type TR4 transistor.

- NOTES:
1. DURING SERVICING, BATTERY DRAIN SHOULD BE METERED, WITH NO SIGNAL AND VOL CONT AT MINIMUM, CURRENT DRAIN AT POINT SHOWN SHOULD BE 15 MA. APPROX.
 2. ALL CAPACITANCE VALUES IN MFD., ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
 3. VOLTAGE MEASUREMENTS MADE WITH A V.T.M.M. FROM FORWARD BIAS. MEASURED ON BASE IN RESPECT TO Emitter. MAX. VOLUME CONTROL AT MIN. (NO SIGNAL INPUT) * SPEAKER IS A LATER CHANGE TO 75Ω.
 4. * R18 AND R20 SHOULD BE CHANGED FROM 800 OHMS TO 750 OHMS WHEN OUTPUT PAIR OF TRANSISTORS ARE REPLACED



FUNCTION	TYPE	ALTERNATE PART NO.	ALTERNATE W. PART NO.
CONVERTER	2N108	2N7020D01*	
I.F. AMP	2N110	2N7020D01*	
AUDIO DRIVER	2N416	2N7020D01*	
2ND AUDIO DRIVER	2N416	2N7020D01*	
AUDIO OUTPUT	R.201 OR R.358	2N7020D01*	

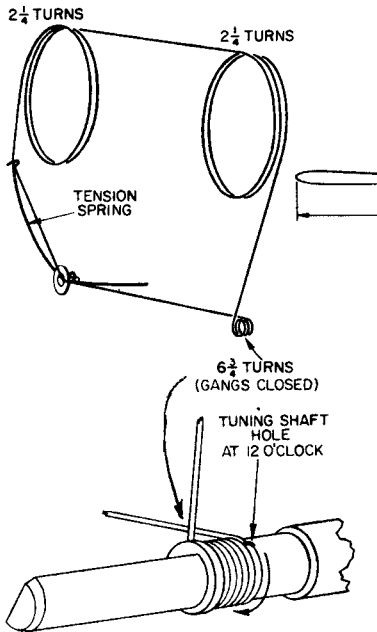
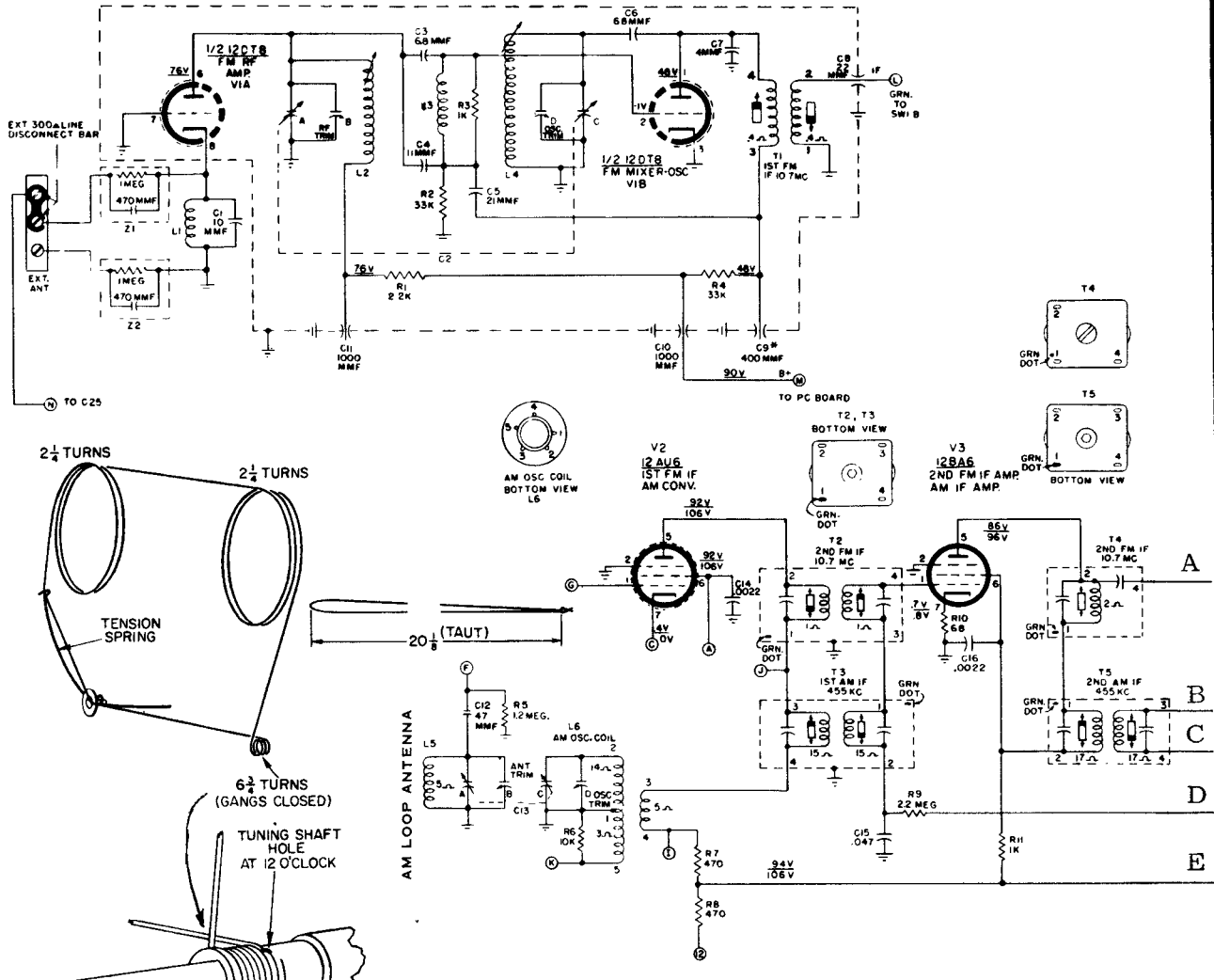
*MATCHED PAIR



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

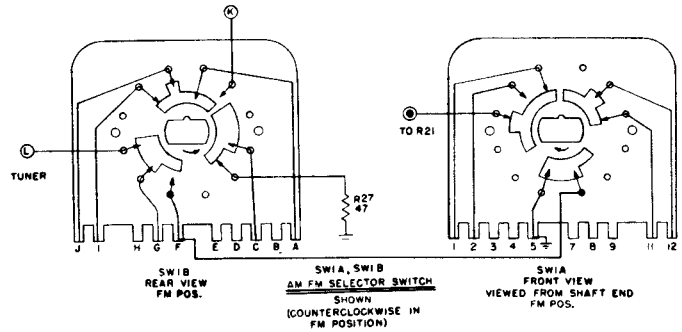


Dial Stringing diagram.

CHASSIS REMOVAL

1. Remove the two 3/2" long screws located at either end of the cabinet rear.
2. Remove the two short screws located on the cabinet bottom.
3. Separate the cabinet front from the cabinet back to expose the radio chassis. (The two 3/2" screws can be used to do this by pushing on both at same time).
4. Use a conventional TV AC interlock line cord to power the radio while servicing. It is recommended that the chassis be isolated from the power line by means of an isolation transformer.

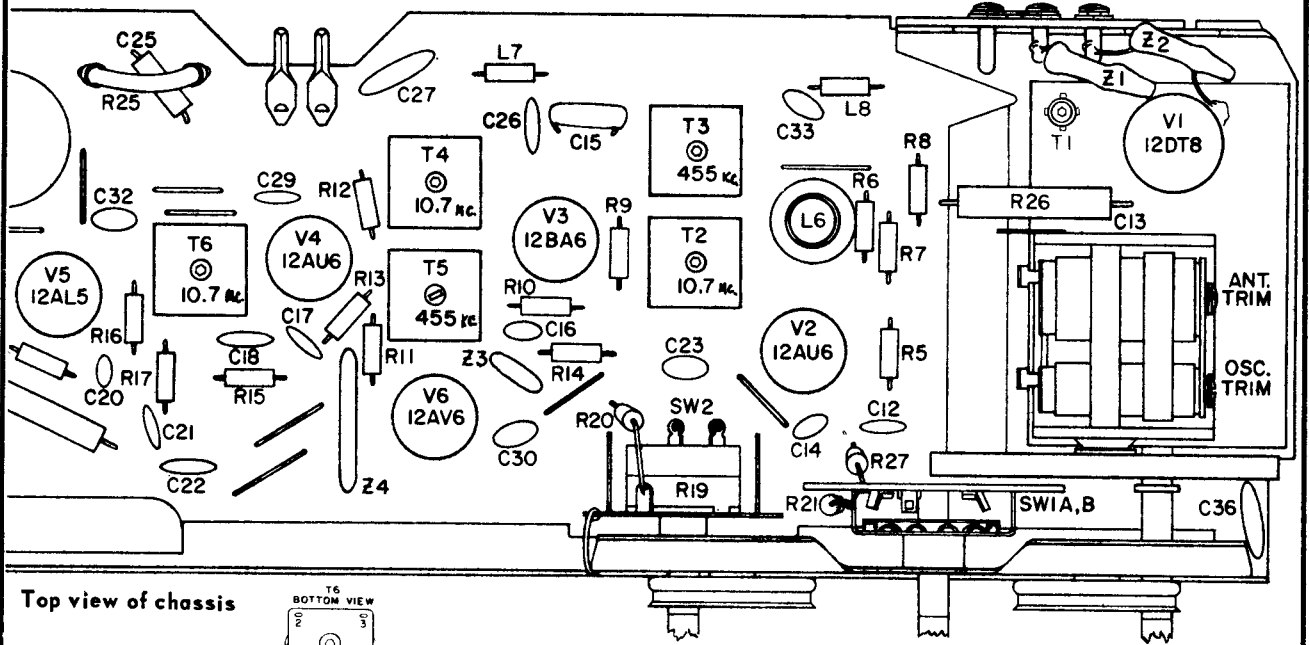
NOTES:
 1. VOLTAGES TAKEN WITH A VTVM FROM POINTS INDICATED TO B - TUNING CAPACITOR AT MAXIMUM VOLUME CONTROL AT MINIMUM LINE VOLTAGE AT 117 V.A.C.
 2. ALL CAPACITANCE ARE IN MFD & ALL RESISTANCE IN OHMS 1/2 WATT UNLESS STATED OTHERWISE
 3. VOLTAGES UNDERLINED ARE TAKEN IN FM POSITION.
 4. THESE TWO RESISTORS ARE NOT PART OF CIRCUIT BUT ARE TO BE ADDED FOR ALIGNMENT OF DISCRIMINATOR.
 * EARLY PRODUCTION WAS 350M MF



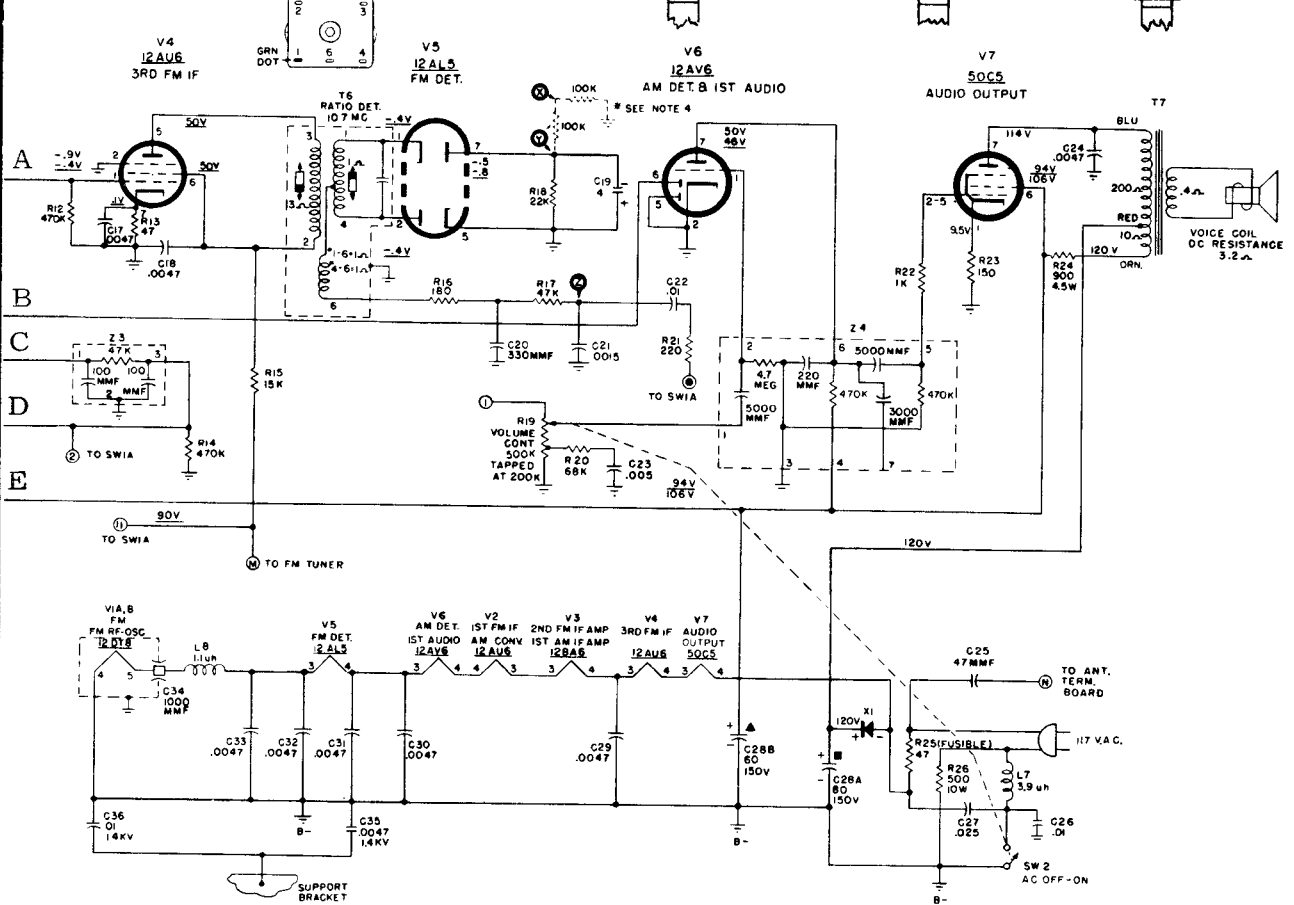
Connect to balance of diagram on next page.

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

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



Top view of chassis



KEY TO SLUG REPRESENTATION

1. The body of the slug is represented by □
2. A band is used to indicate the location of the slug (ex. □ indicates a top slug --- □ indicates a bottom slug).

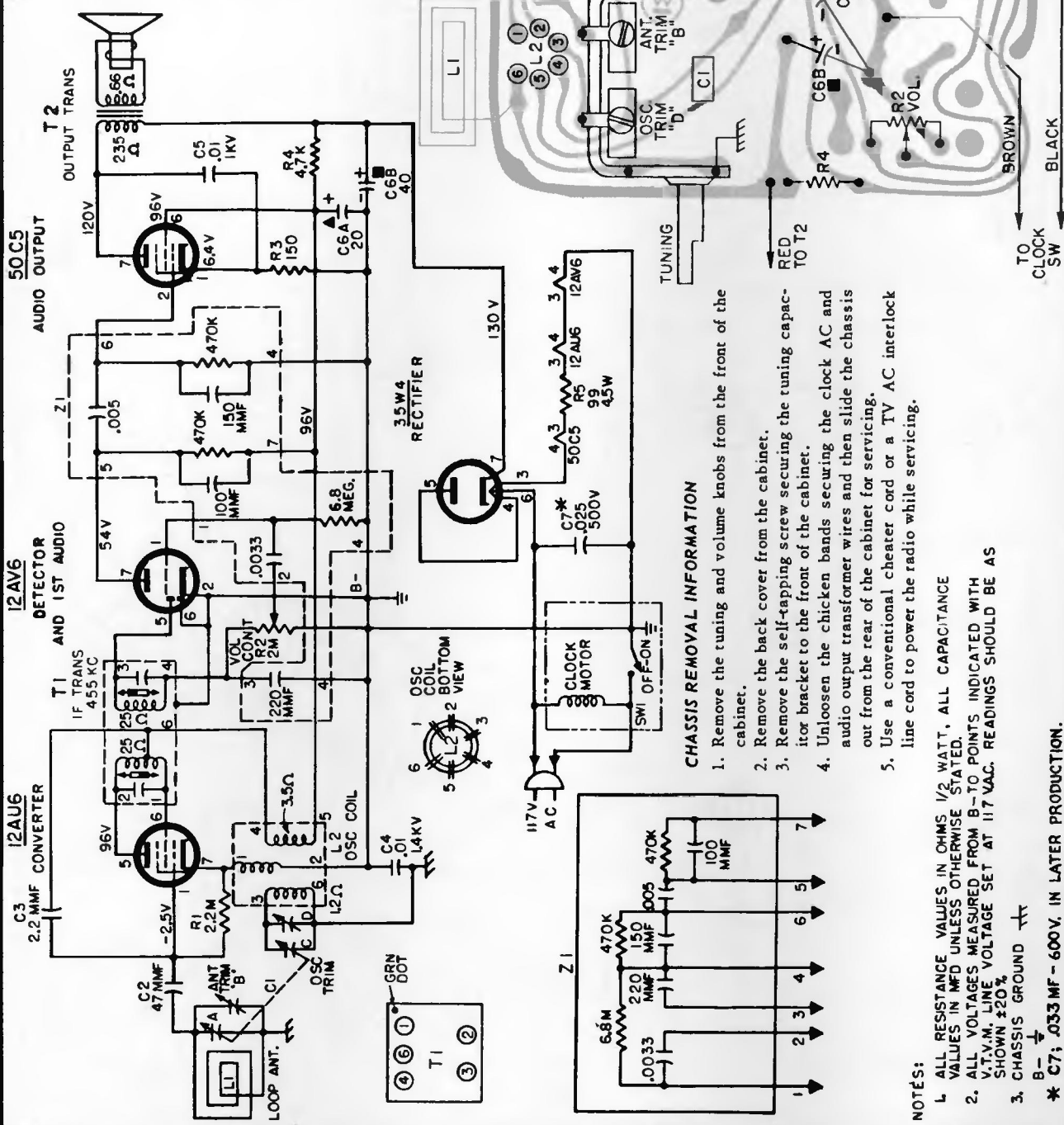
3. An arrow is used to indicate the direction from which the slug can be adjusted (ex. ↓ indicates a bottom slug adjustable from the bottom --- ↑ indicates a bottom slug adjustable from the top --- ↓↑ indicates a bottom slug adjustable from top or bottom.)

correspondingly marked wires on next page.

Westinghouse

MODEL
H-766L4-A

V-2420-1 CHASSIS



- CHASSIS REMOVAL INFORMATION**
1. Remove the tuning and volume knobs from the front of the cabinet.
 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 heater cord or a TV AC interlock line cord to power the radio while servicing.

NOTES:

L ALL RESISTANCE VALUES IN OHMS 1/2 WATT, ALL CAPACITANCE VALUES IN MFD UNLESS OTHERWISE STATED.

2. ALL VOLTAGES MEASURED FROM B-TO POINTS INDICATED WITH SHOWN ±20% LINE VOLTAGE SET AT 117 VAC. READINGS SHOULD BE AS SHOWN ±20%.

3. CHASSIS GROUND

B- →

* C7; .033 MF - 600V. IN LATER PRODUCTION.

Tube pin numbering is for bottom of socket.

Westinghouse

MODEL H-69ACSI
CHASSIS V-2507-7

PORTABLE - STEREO PHONO

- NOTES:
1. ALL CAPACITANCE VALUES IN MFD & ALL RESISTANCE VALUES IN OHMS, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
 2. LINE VOLTAGE MEASURED FROM CHASSIS GROUND USING A T.V.M. NO SIGNAL INPUT.
 3. LINE VOLTAGE SET AT 117 VAC READINGS SHOULD BE AS SHOWN ± 20%.
 4. ALL AMPLOID CONNECTORS VIEWED FROM CONTACT END.
 5. R & R13 ARE NOT INCLUDED IN Z1 OR Z2.
 6. VOLTAGES UNDERLINED WITH SW 2 IN MANUAL POSITION.

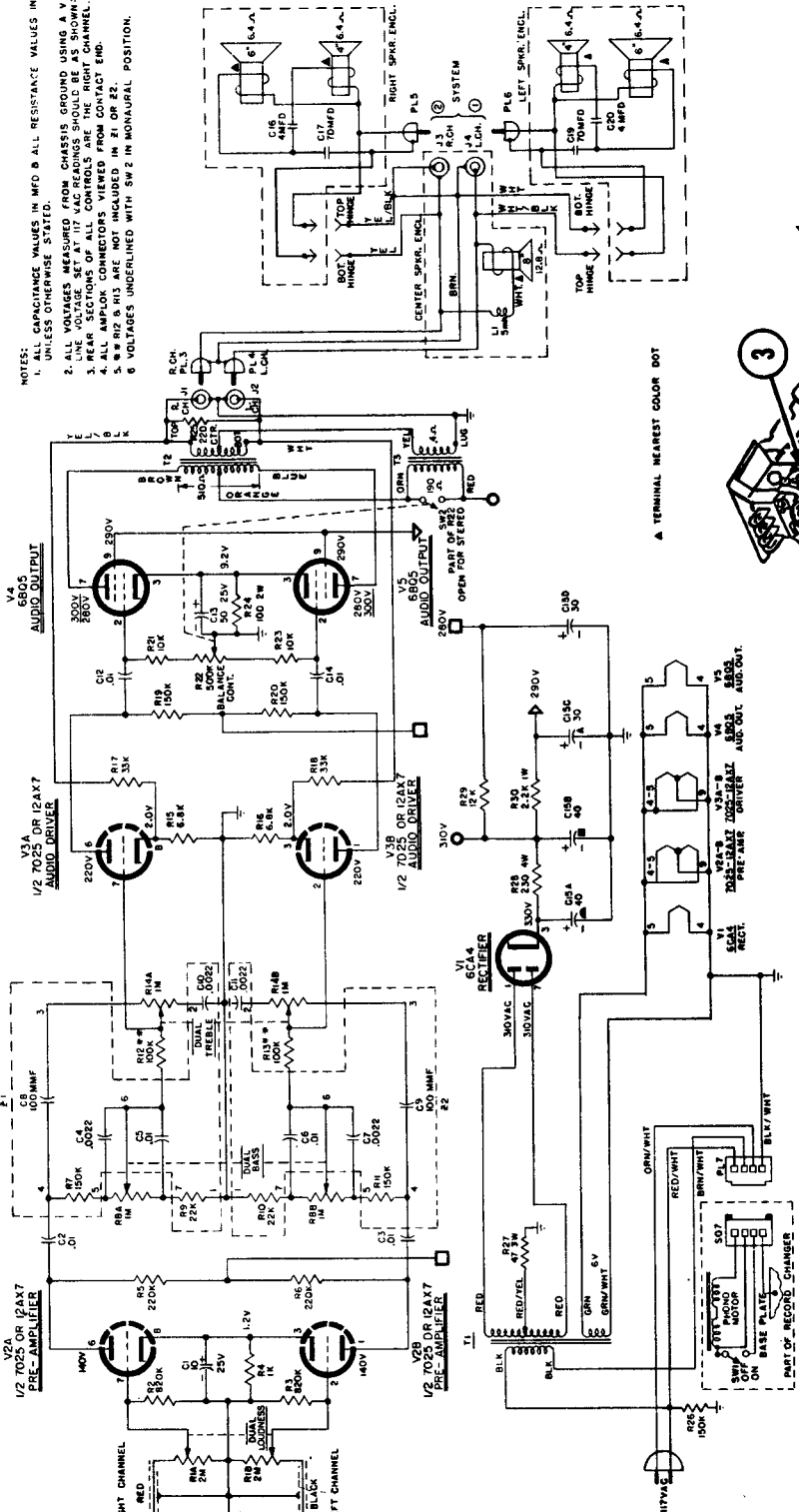
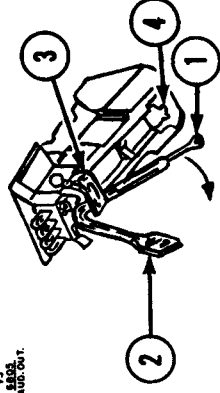


Figure 1
Stylus removal and replacement.



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.

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.

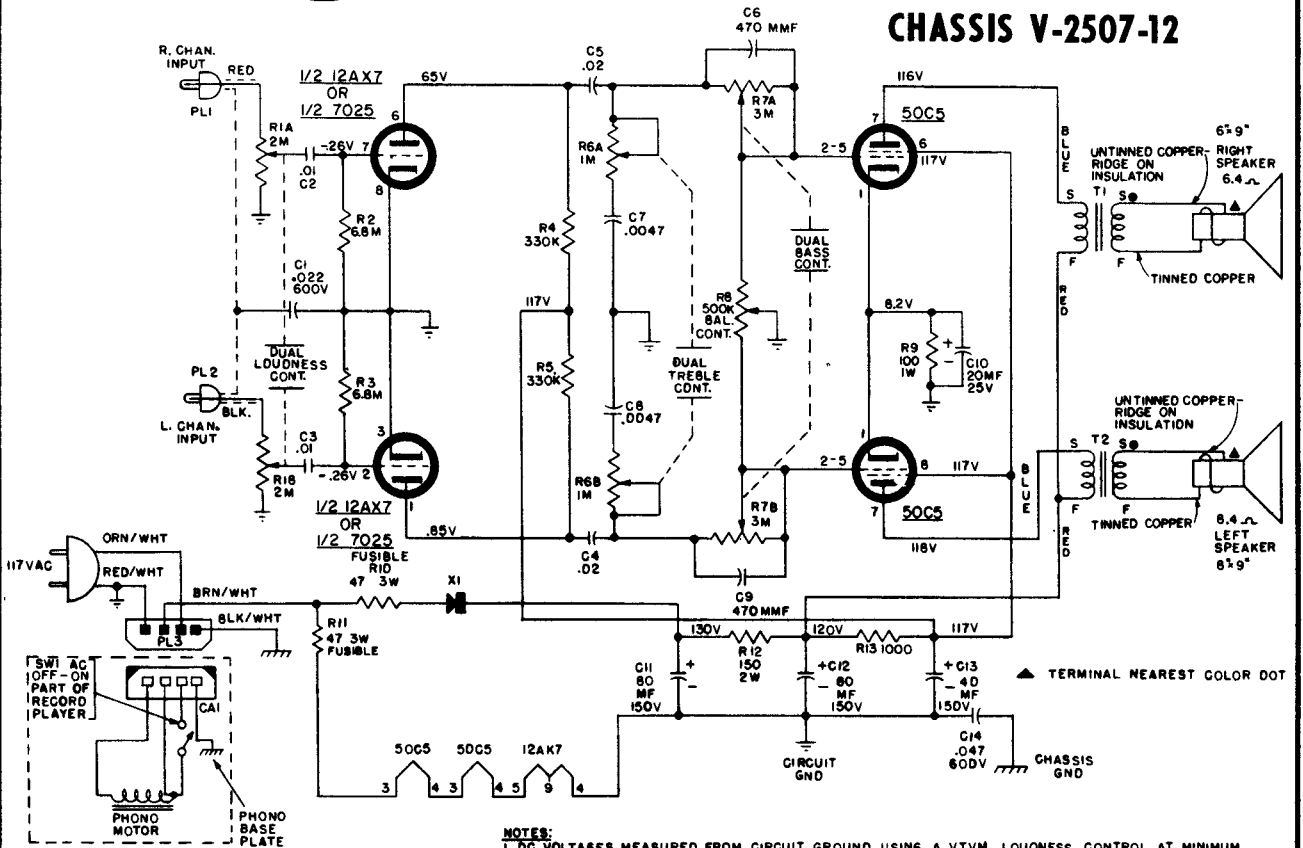
PHASING

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.

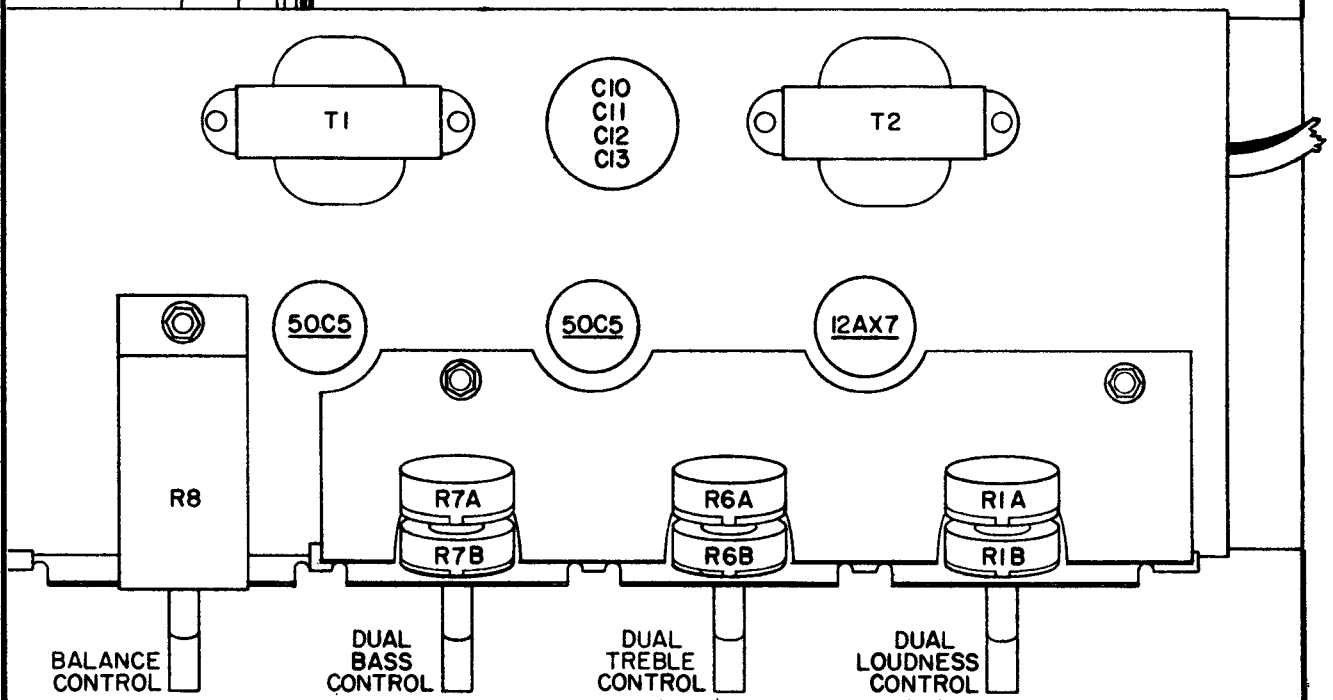
Westinghouse

MODELS H-79ACSI, H-79ACS2

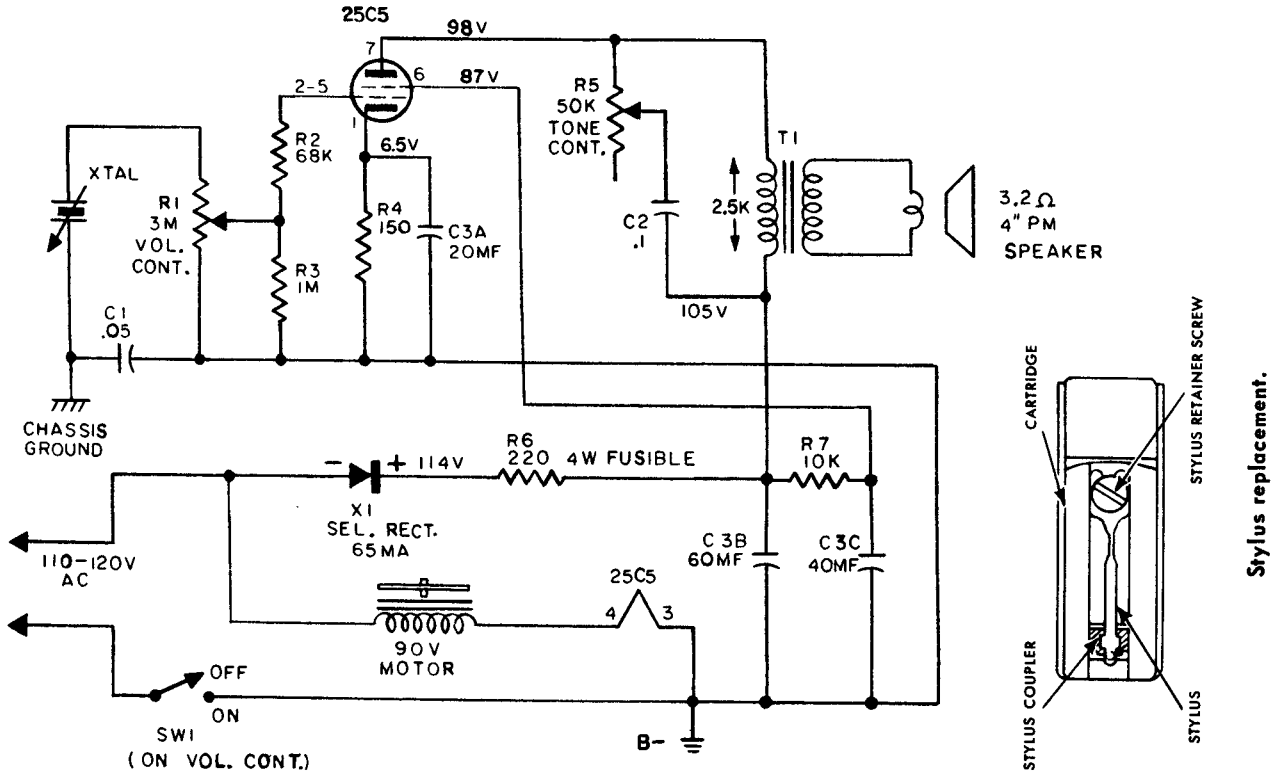
CHASSIS V-2507-12



- NOTES:**
1. DC VOLTAGES MEASURED FROM CIRCUIT GROUND USING A VTVM, LOUENESS 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.



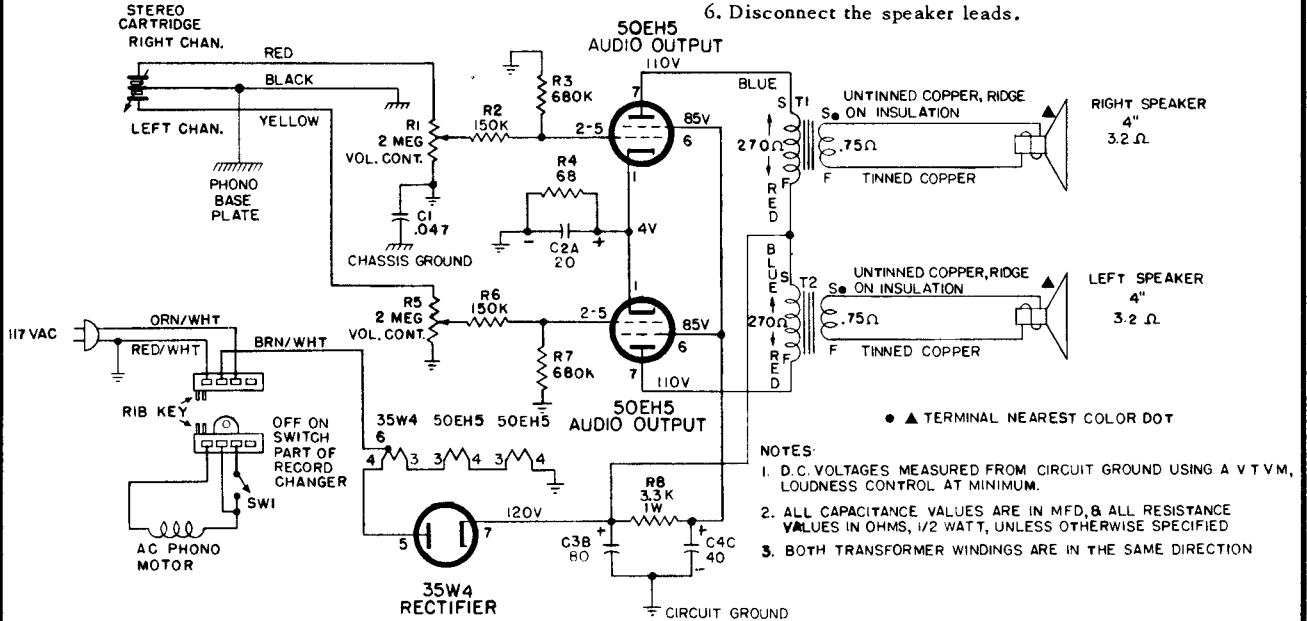
WESTINGHOUSE Models H-72MP1 and H-72MP2



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

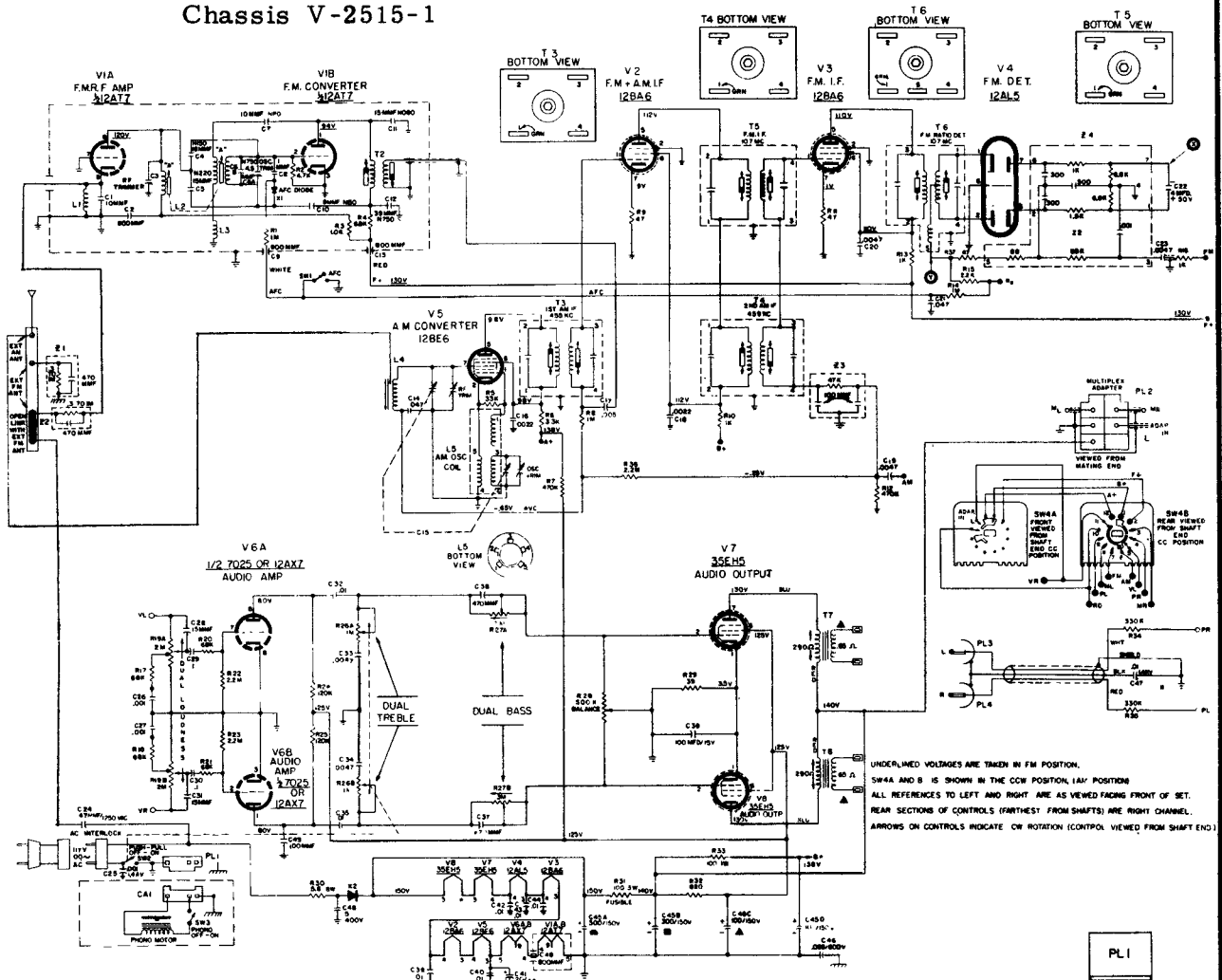
CHASSIS REMOVAL

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-lok 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.



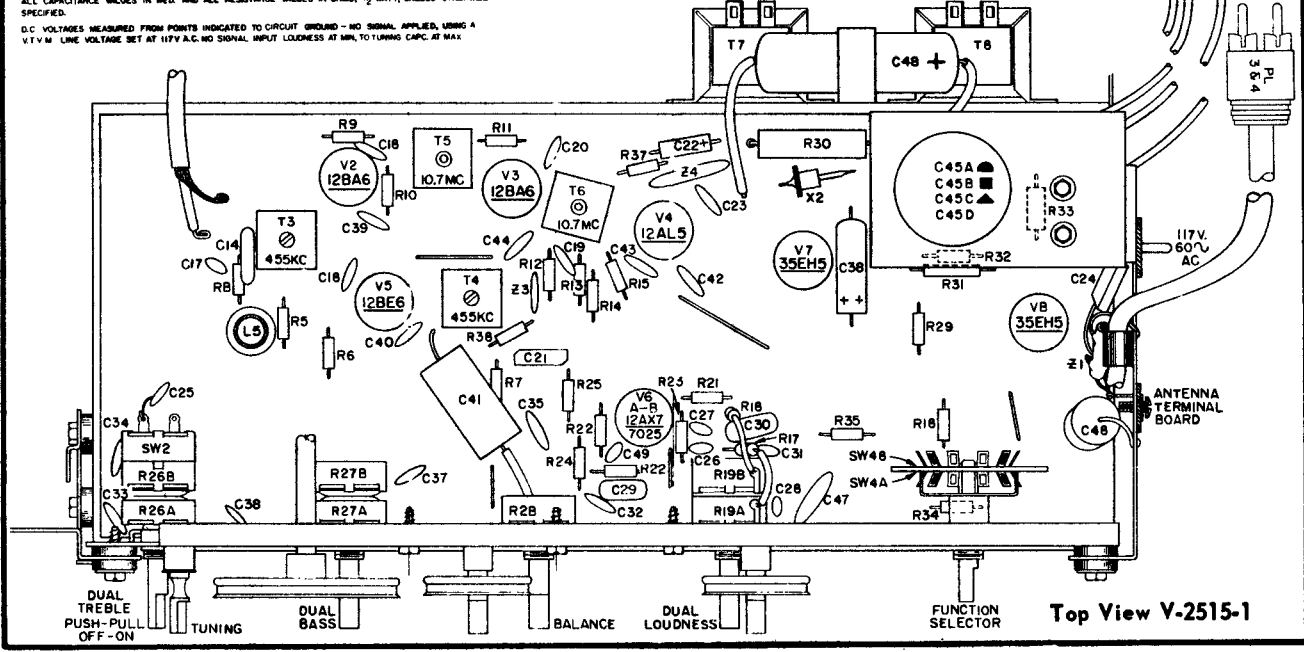
VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

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



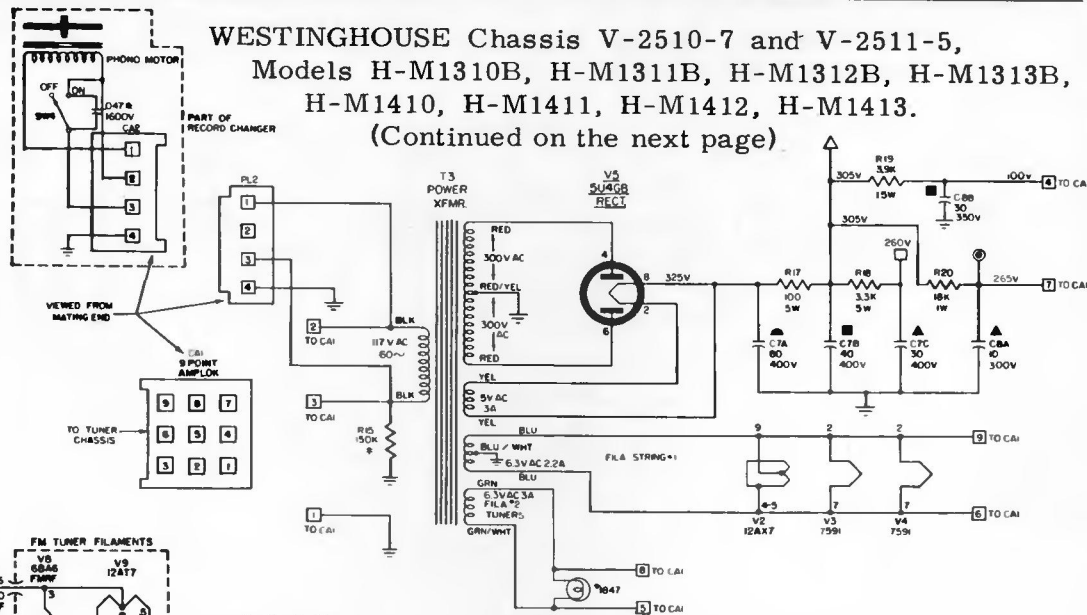
UNDERLINED VOLTAGES ARE TAKEN IN FM POSITION.
SW4A AND B IS SHOWN IN THE CCW POSITION, IAY POSITION.
ALL REFERENCES TO LEFT AND RIGHT ARE AS VIEWED FRONT OF SET.
REAR SECTIONS OF CONTROLS (FARTHEST FROM SHAFTS) ARE RIGHT CHANNEL.
ARROWS ON CONTROLS INDICATE CW ROTATION (CONTROL VIEWED FROM SHAFT END.)

ALL CAPACITANCE VALUES IN MFD. AND ALL RESISTANCE VALUES IN OHMS, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
D.C. VOLTAGES MEASURED FROM POINTS INDICATED TO CIRCUIT GROUND - NO SIGNAL APPLIED, USING A 1 V.T.M. LINE VOLTAGE SET AT 117V A.C. NO SIGNAL INPUT LOADNESS AT MIN. TO TUNING CAP. AT MAX.

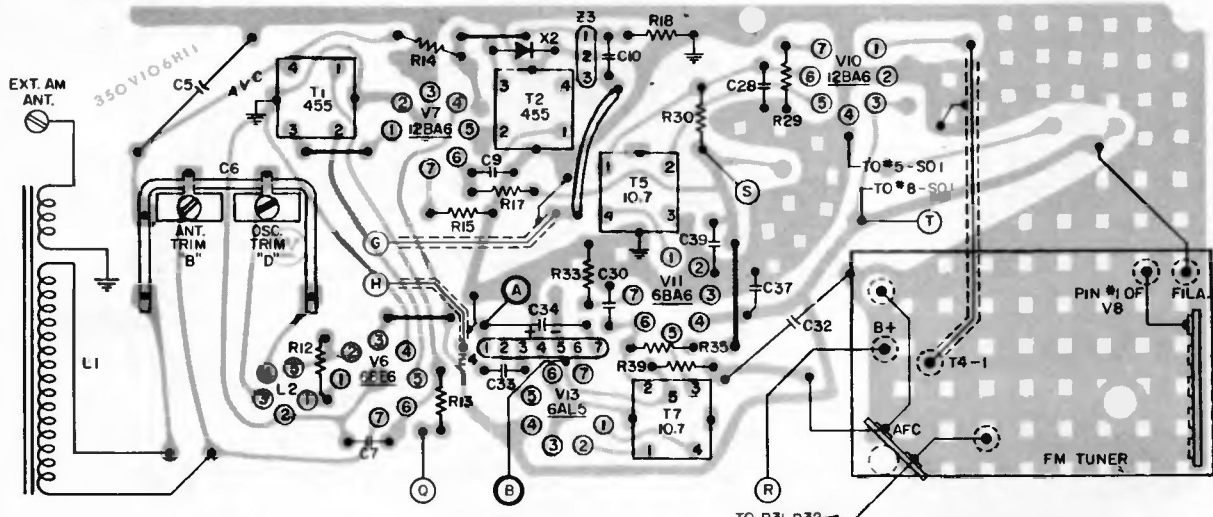
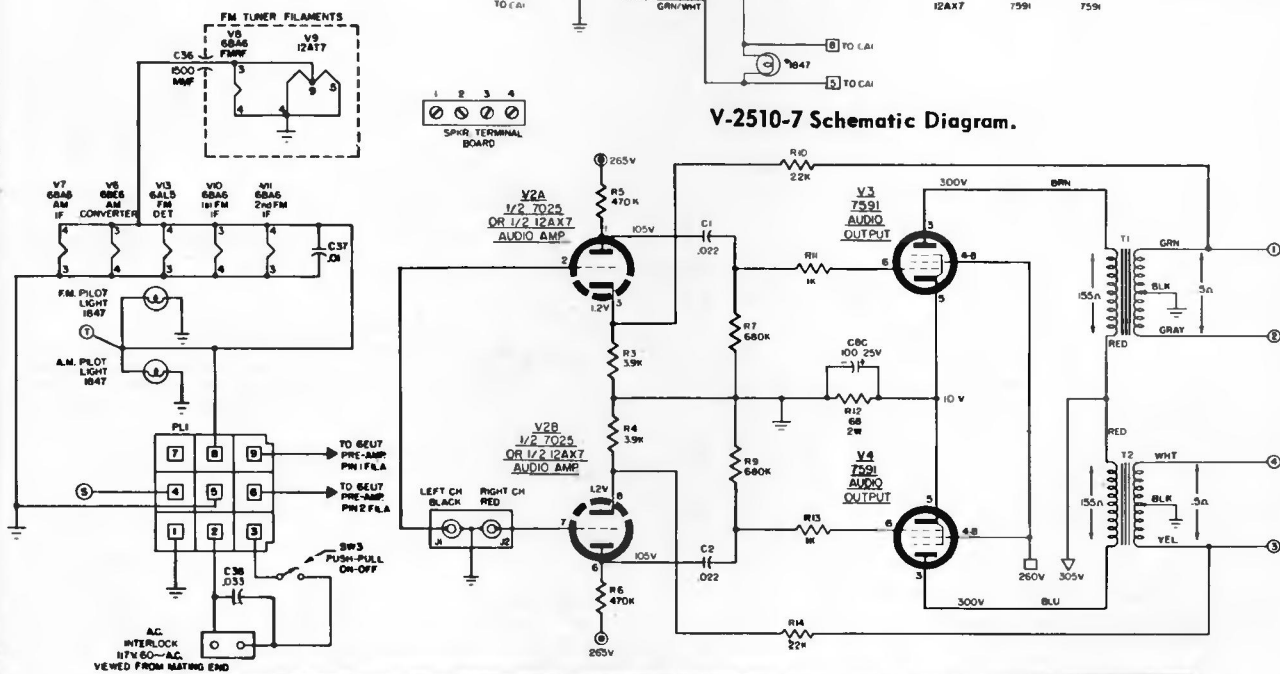


WESTINGHOUSE Chassis V-2510-7 and V-2511-5,
 Models H-M1310B, H-M1311B, H-M1312B, H-M1313B,
 H-M1410, H-M1411, H-M1412, H-M1413.
 (Continued on the next page)

- NOTES:
1. ALL CAPACITANCE VALUES ARE IN MFD. ALL RESISTANCE VALUES ARE IN OHMS UNLESS OTHERWISE SPECIFIED.
 2. ALL VOLTAGES MEASURED TO CHASSIS USING VTVM LINE.
 3. 1000 OHM RESISTOR NOT USED ON V-2500-13 CHASSIS.
 4. 0.04 MFD 160V ACROSS RECORD CHANGER SHUTOFF SWITCH USED ON V-2500-13 CHASSIS.



V-2510-7 Schematic Diagram.

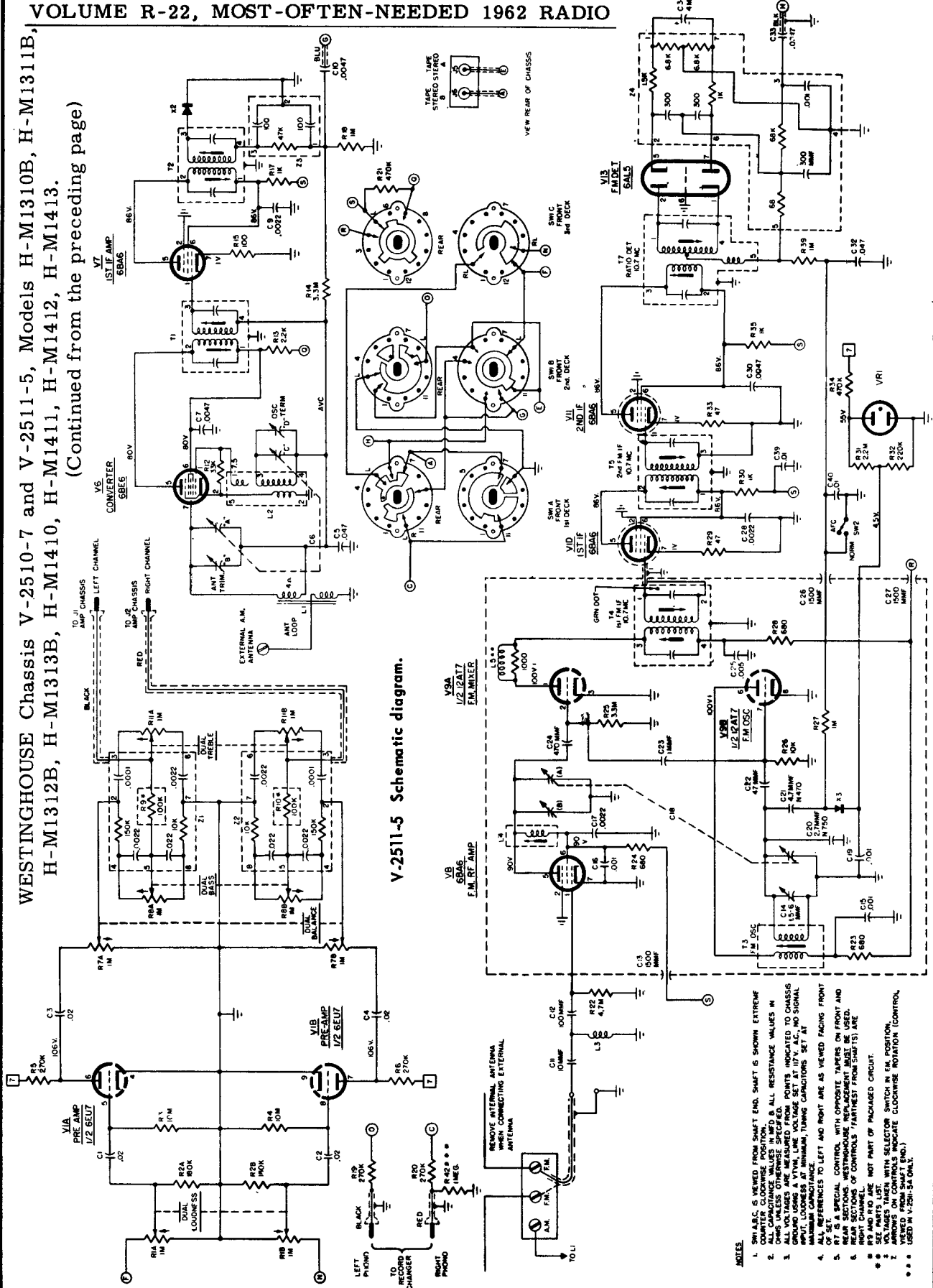


Bottom of PC board showing location of top components in solid outlines. Tube pin numbering is for bottom of socket.

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.

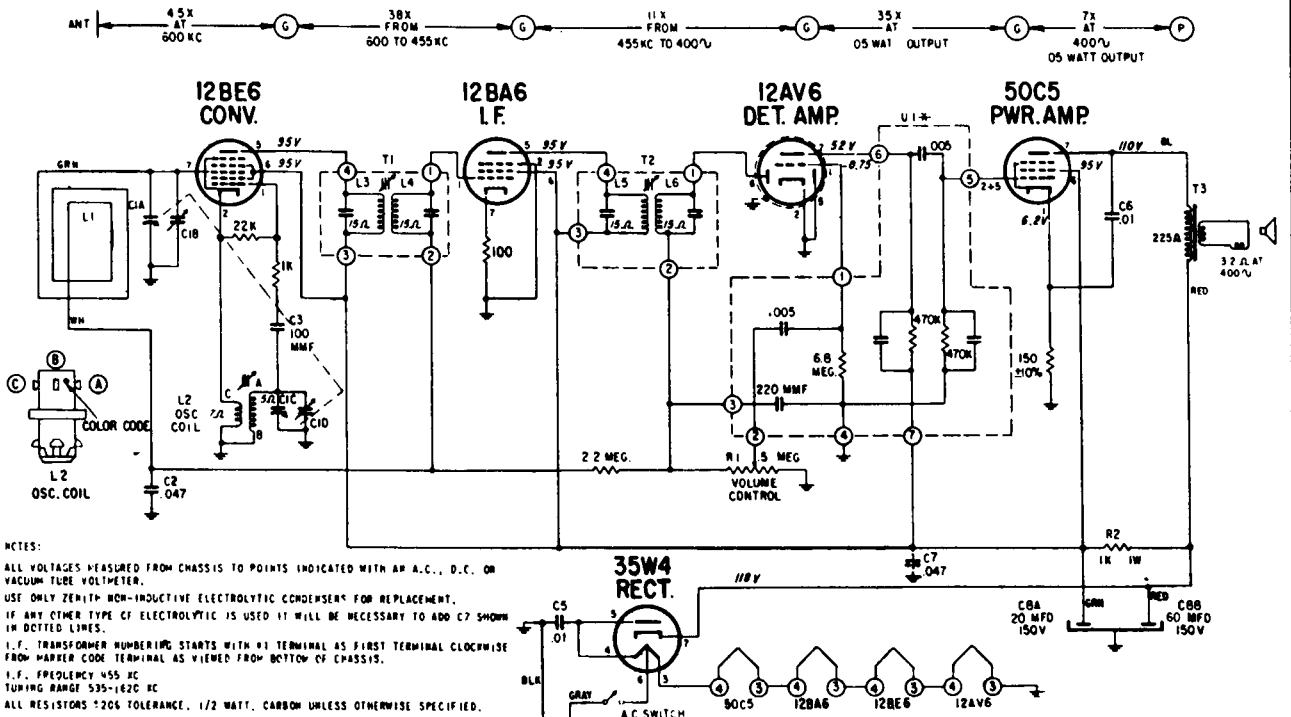
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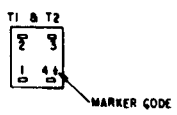
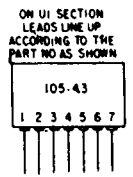
V-2511-5 Schematic diagram.

- NOTES
1. SW A, B, C VIEWED FROM SHAFT END. SHAFT IS SHOWN EXTREME.
 2. ALL CAPACITANCE VALUES IN μ F & ALL RESISTANCE VALUES IN Ω UNLESS OTHERWISE SPECIFIED. POINTS INDICATED TO CHASSIS GROUND UNLESS A V-TAP OR VOLTAGE C.T. IS SHOWN.
 3. INPUT LOADNESS AT MINIMUM, TUNING CAPACITORS SET AT MAXIMUM CAPACITANCE.
 4. ϕ SET. REFERENCES TO LEFT AND RIGHT ARE AS VIEWED FACING FRONT.
 5. RT IS A SPECIAL CONTROL WITH OPPOSITE TAPERS ON FRONT AND REAR SECTIONS. WESTINGHOUSE REPLACEMENT MUST BE USED.
 6. FRONT CHANNEL.
 7. RIGHT CHANNEL.
 8. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 9. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 10. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 11. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 12. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 13. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 14. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 15. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 16. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 17. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 18. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 19. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 20. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 21. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 22. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 23. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 24. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 25. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 26. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 27. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 28. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 29. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.
 30. ϕ & ϕ ARE NOT PART OF PACKAGED CIRCUIT.

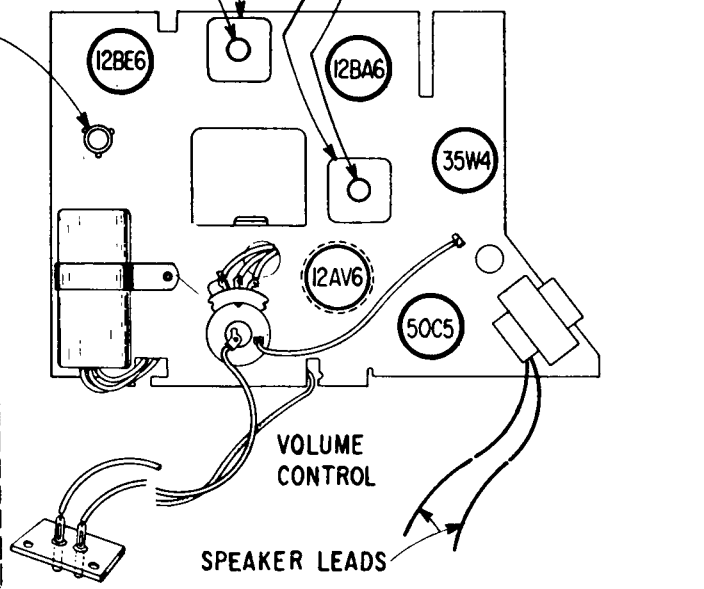
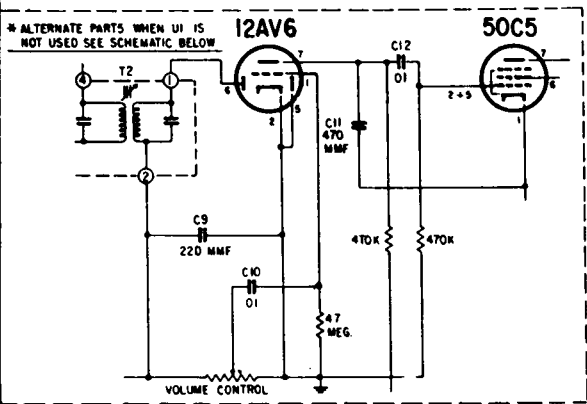
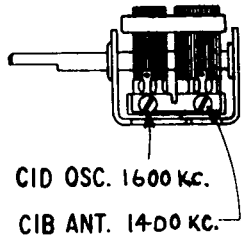
ZENITH RADIO MODELS H509C,P AND W CHASSIS 5F02



NOTES:
 ALL VOLTAGES MEASURED FROM CHASSIS TO POINTS INDICATED WITH AN A.C., D.C. OR VACUUM TUBE VOLTMETER.
 USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSERS FOR REPLACEMENT.
 IF ANY OTHER TYPE OF ELECTROLYTIC IS USED IT WILL BE NECESSARY TO ADD C7 SHOWN IN DOTTED LINES.
 I.F. TRANSFORMER NUMBERING STARTS WITH #1 TERMINAL AS FIRST TERMINAL CLOCKWISE FROM MARKER CODE TERMINAL AS VIEWED FROM BOTTOM OF CHASSIS.
 I.F. FREQUENCY 455 KC
 TUNING RANGE 535-620 KC
 ALL RESISTORS $\pm 20\%$ TOLERANCE, 1/2 WATT, CARBON UNLESS OTHERWISE SPECIFIED.

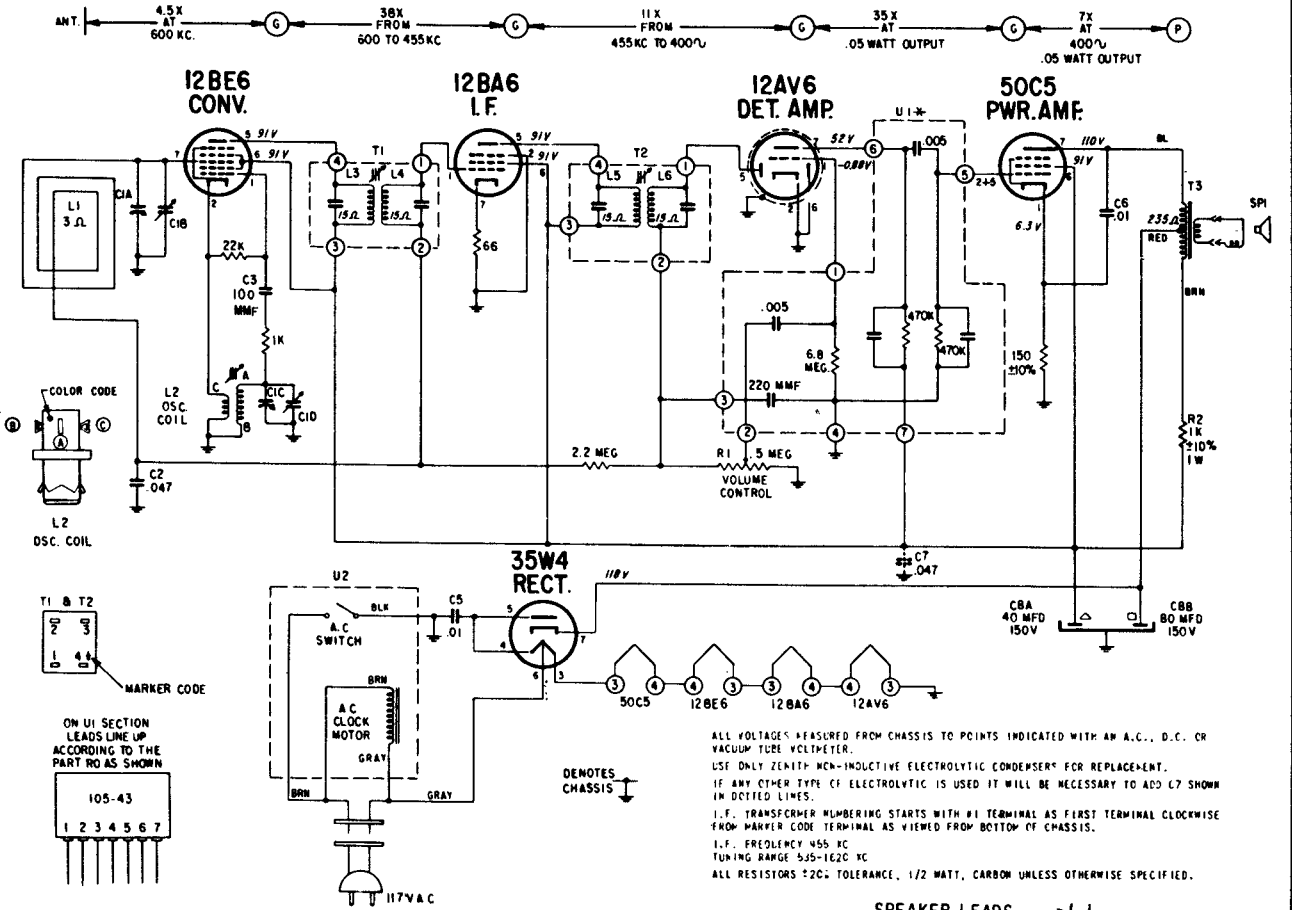


- T1-1ST I.F. TRANSFORMER
- T2-2ND I.F. TRANSFORMER
- L3 PRIMARY BOTTOM
- L4 SECONDARY TOP 455 KC.
- L5 PRIMARY BOTTOM
- L6 SECONDARY TOP 455 KC.

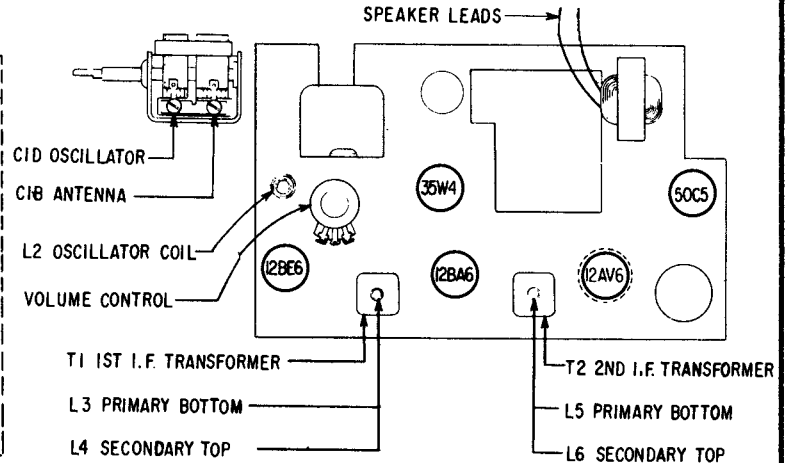
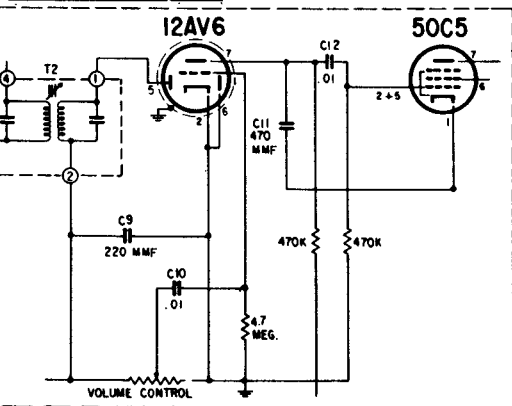


VOLUME R-22, MOST-OFTEN-NEEDED 1962 RADIO SERVICING INFORMATION

ZENITH Radio Model H519, Chassis 5H07

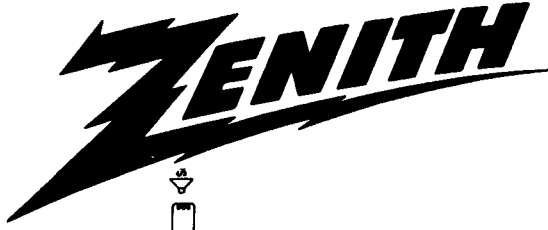


* ALTERNATE PARTS WHEN U1 IS NOT USED SEE SCHEMATIC BELOW



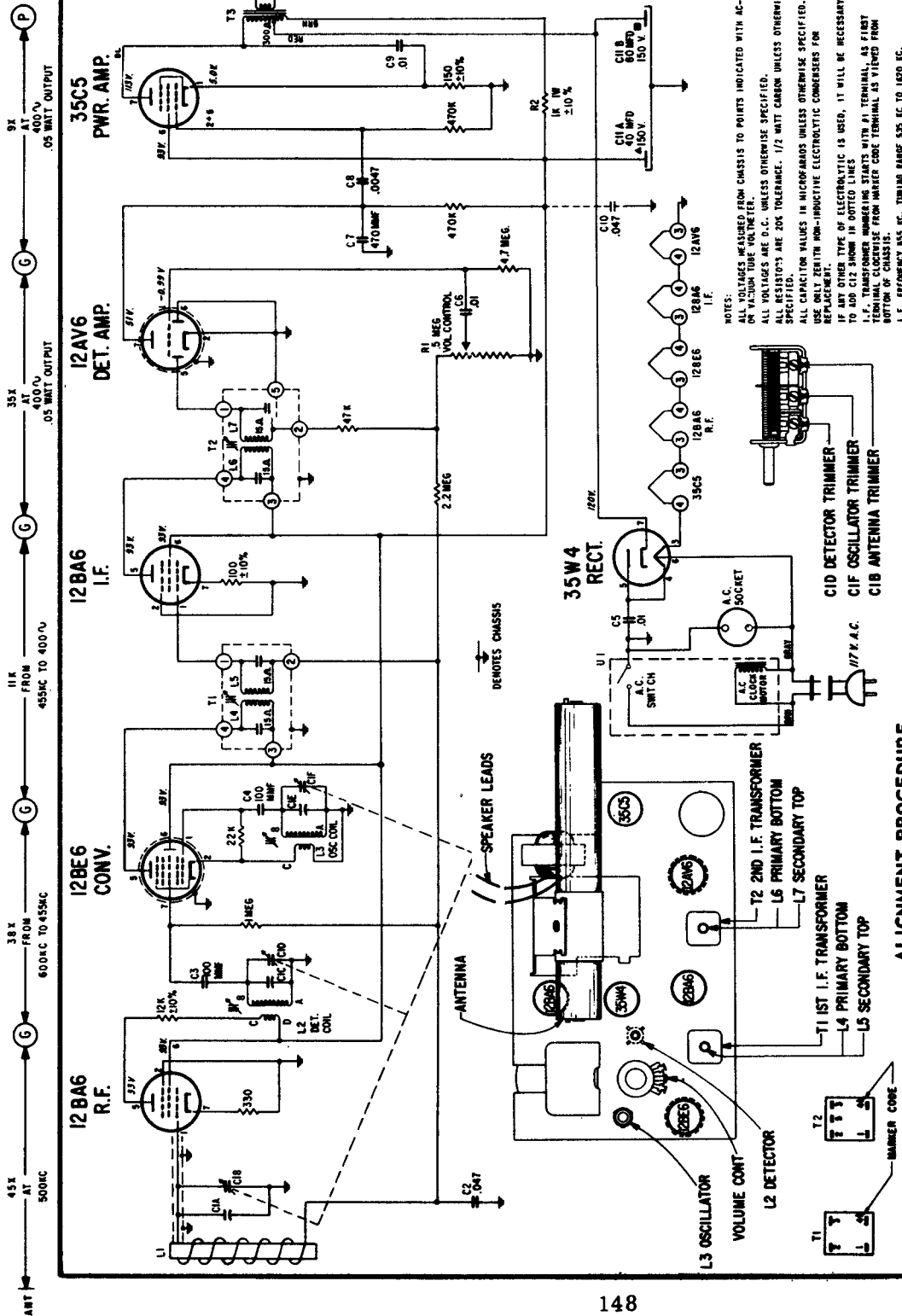
ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Sig. Frequency	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3 L4, L5, L6,	For I.F. Alignment.
2	One Turn Loop Coupled Loosely to Wave-magnet	—	1600 Kc.	1600 Kc.	C1D	Set Oscillator to Dial Scale.
3		—	1400 Kc.	1400 Kc.	C1B	Align Antenna Stage.

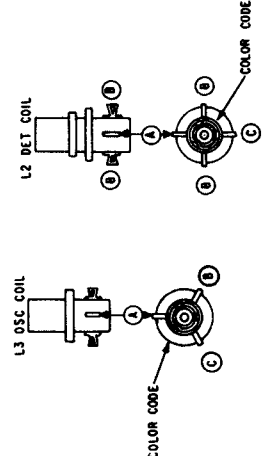


MODEL H624

Chassis 6H03



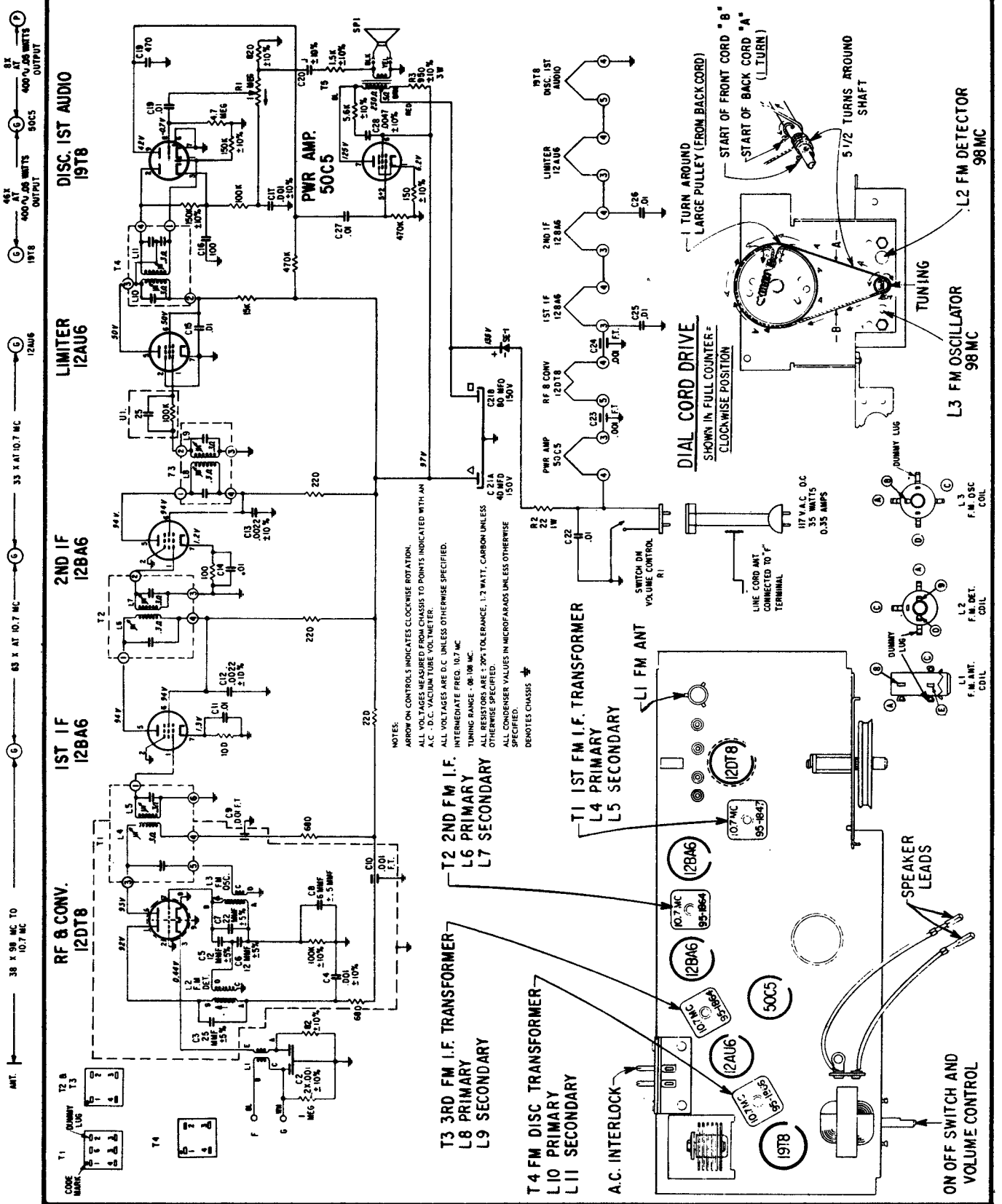
NOTES:
 ALL VOLTAGES MEASURED FROM CHASSIS TO POINTS INDICATED WITH AC-DC
 ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
 ALL RESISTORS ARE 20% TOLERANCE. 1/2 WATT CARBON UNLESS OTHERWISE
 SPECIFIED.
 ALL CAPACITOR VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
 USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSERS FOR
 REPLACEMENT.
 IF ANY OTHER TYPE OF ELECTROLYTIC IS USED, IT WILL BE NECESSARY
 TO ADD C12 SHOWN IN DOTTED LINES
 I.F. TRANSFORMER NUMBERING STARTS WITH #1 TERMINAL, AS FIRST
 TERMINAL IN CASES WHERE FROM NUMBER CODE TERMINAL AS VIEWED FROM
 REAR OF CHASSIS.
 I.F. FREQUENCY 555 KC, TUNING RANGE 525 KC TO 1620 KC.



ALIGNMENT PROCEDURE

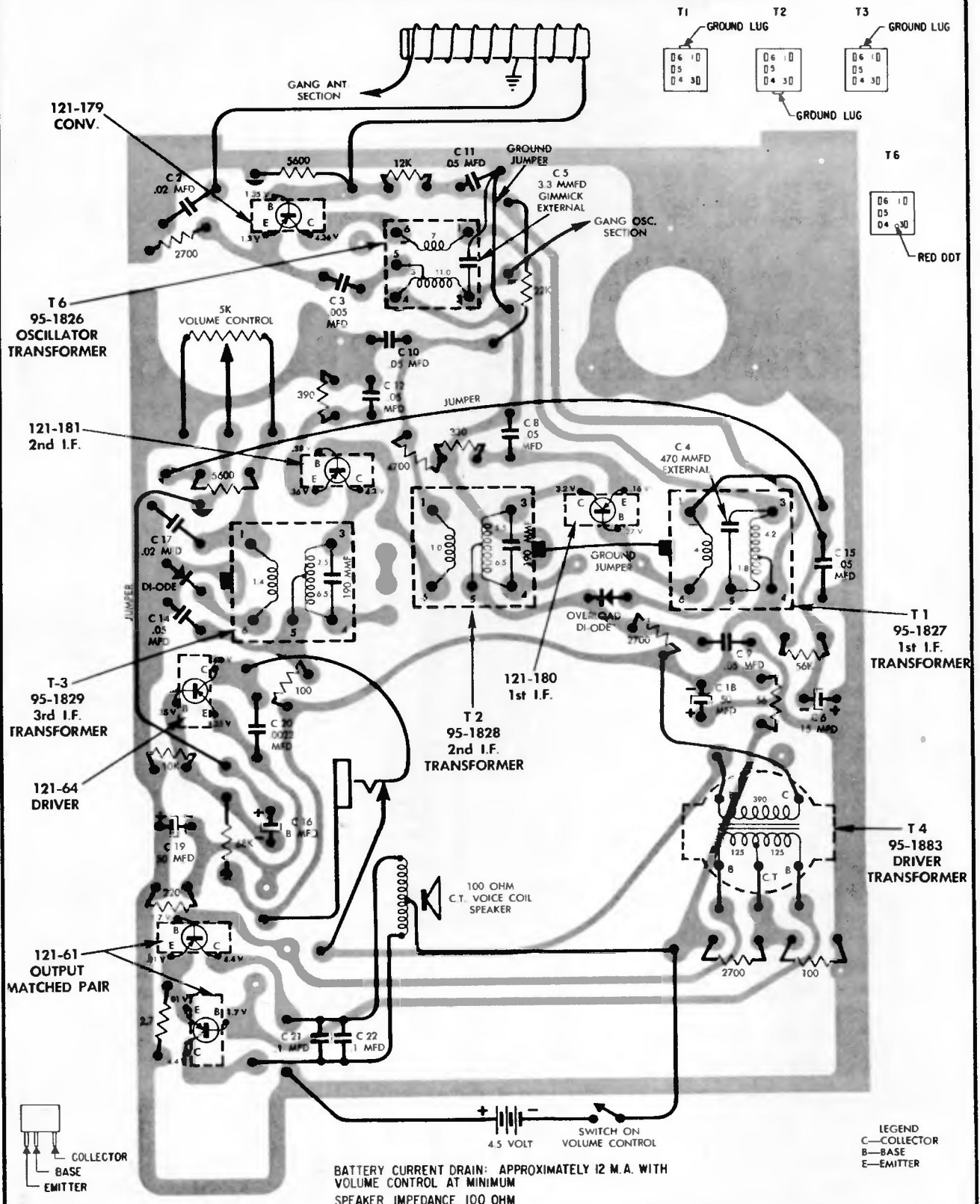
Operation	Connect Oscillator To	Dummy Antennas	Input Sig. Frequency	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L4, L5, L6, L7	For I.F. Alignment.
2	One Turn Loop Coupled Loosely to Wave-magnet	—	1600 Kc.	1600 Kc.	C1F	Set Oscillator to Dial Scale.
3	—	—	1400 Kc.	1400 Kc.	C1D,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

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)

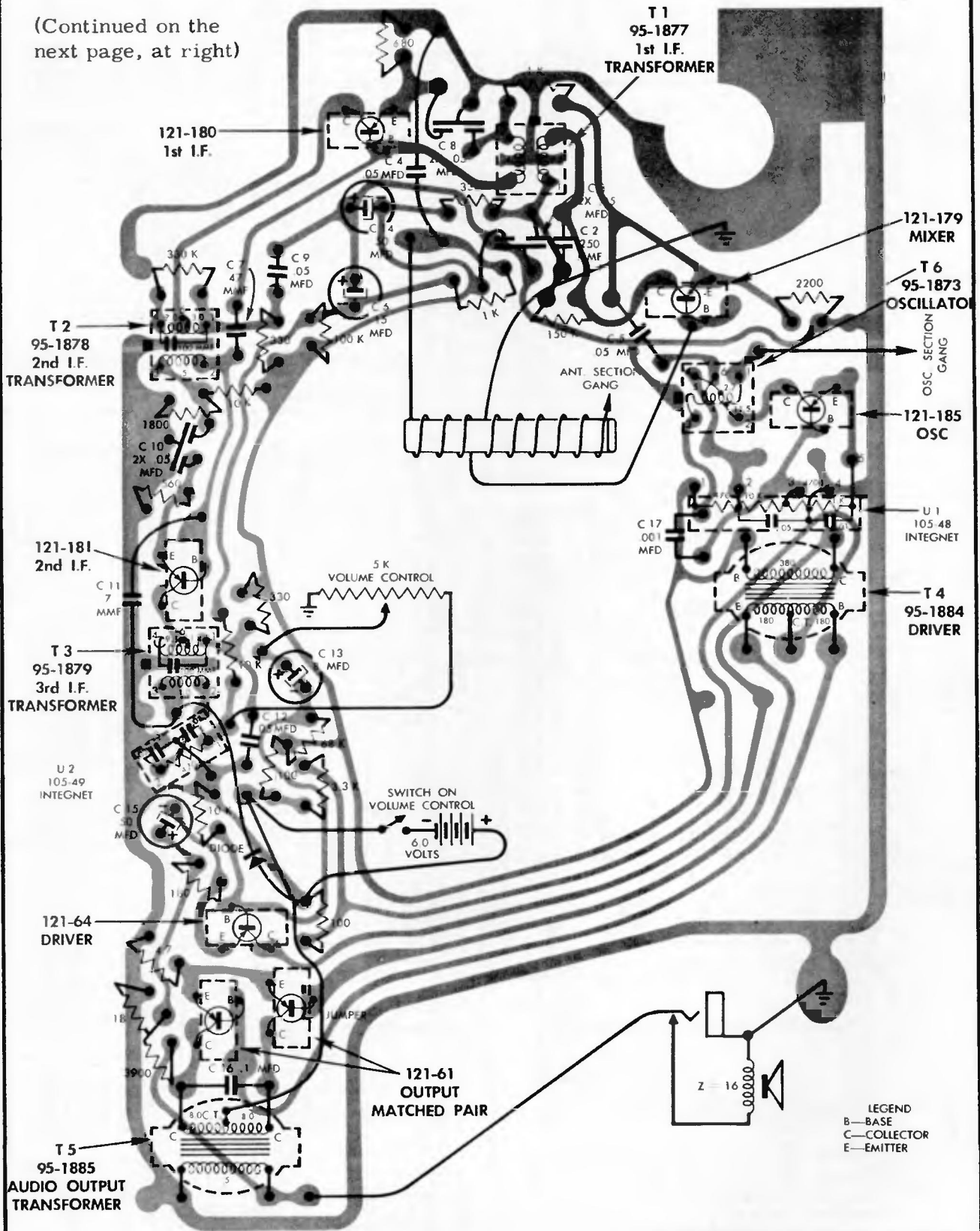


CHASSIS, WIRING AND COMPONENTS

VIEWED FROM WIRING SIDE

ZENITH RADIO Model Royal 400, Chassis 7GT40Z2, Continued

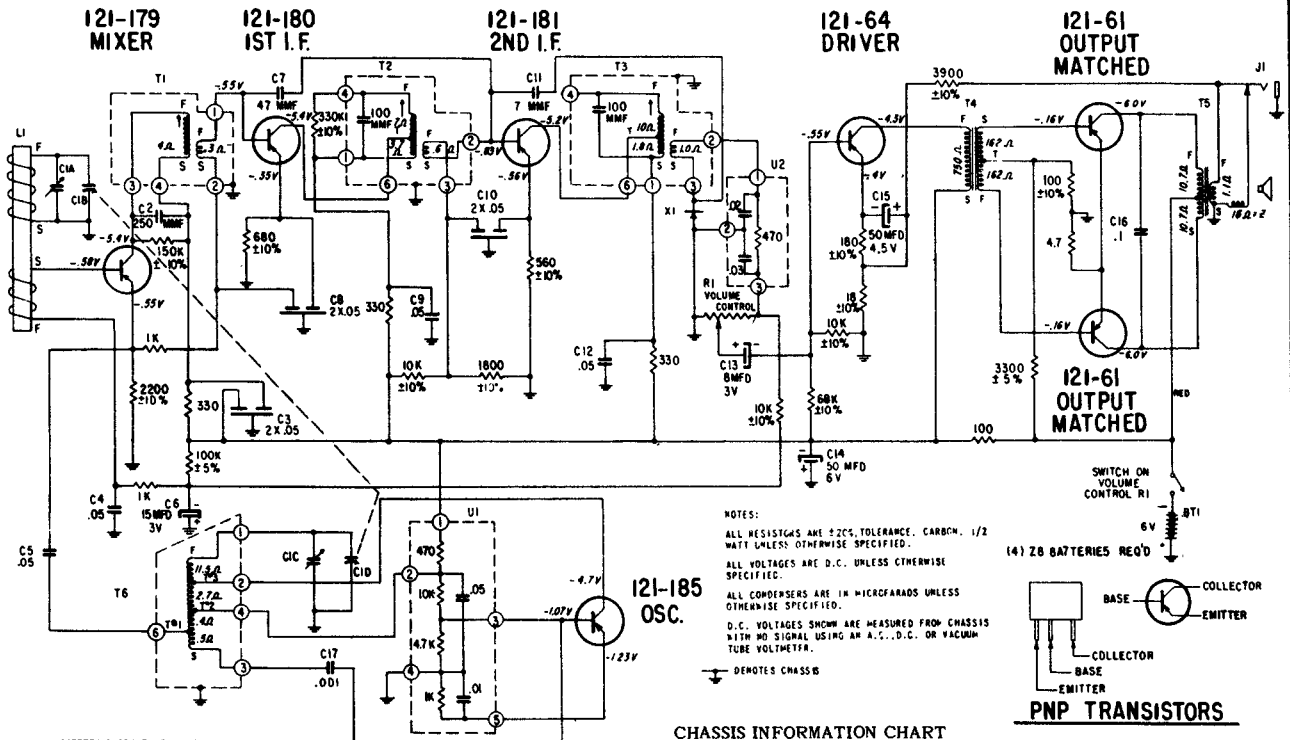
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CHASSIS, WIRING AND COMPONENTS

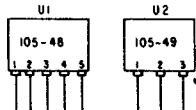
VIEWED FROM WIRING SIDE

ZENITH RADIO Model Royal 400, Chassis 7GT40Z2, Continued



BATTERY CURRENT DRAIN: APPROX. 12 MA. WITH VOLUME CONTROL AT MIN.

ON U1 AND U2 LEADS, LINE UP ACCORDING TO THE PART NO. AS SHOWN



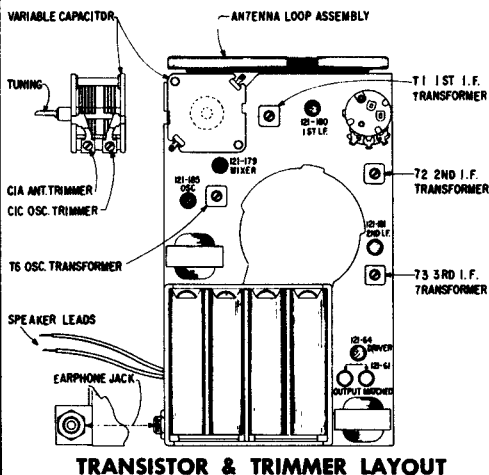
CHASSIS INFORMATION CHART

Chassis	Chassis Color Dot	Transistor Layout Label Color	Part No.	Mixer	Osc.	1st I.F.	2nd I.F.	Crystal Diode	Driver	Output	Supplier R.C.A.
7GT40Z2	Black	Black 102-8126	Zenith RETMA Type	121-179	121-185	121-80	121-181	103-19	121-64	121-61	R.C.A.
				2N1527	2N1525	2N1525	2N1525	1N87G	2N407	2N407	
				PNP	PNP	PNP	PNP		PNP	PNP	

This transistor portable chassis is a conventional superheterodyne receiver using an individual mixer and oscillator to produce the 455Kc intermediate frequency. The first and second intermediate frequency amplifiers are conventional. A (103-19) is used as the diode detector and AVC voltage source. This is then followed by a driver stage and a class "B" push-pull output stage. As you can see from the chart, the chassis uses a pair of matched transistors in the final output stage and therefore should one transistor fail, both transistors must be replaced simultaneously as chances are they will not perform properly unless so matched.

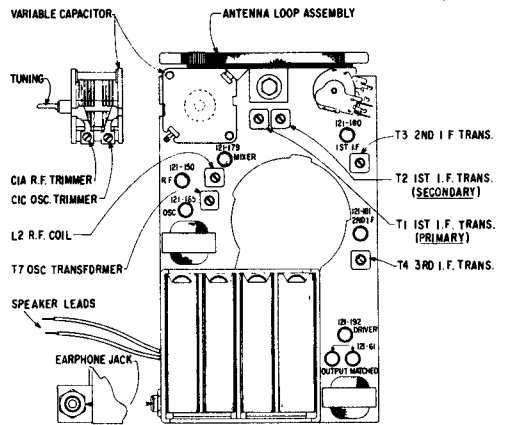
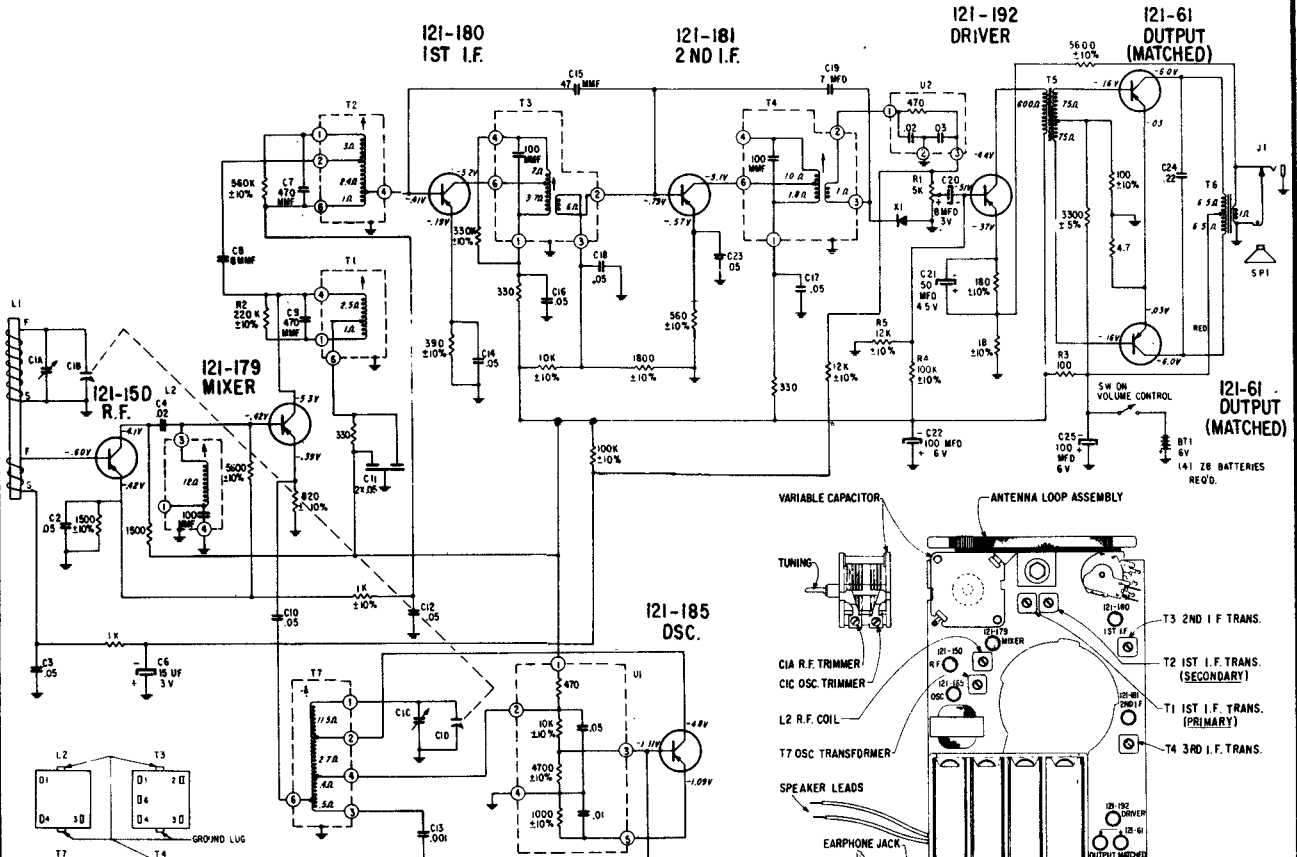
ALIGNMENT PROCEDURE

Operation	Input Signal Frequency	Connect Inner Conductor From Oscillator To	Connect Outer Shield Conductor From Oscillator To	Set Dial At	Trimmers
1	455 KC	ONE TURN LOOSELY COUPLED TO WAVEMAGNET	Chassis	600 KC	Adj. T1, T2, T3 for maximum output.
2	1620 KC		—	Gang wide open.	C1C
3	535 KC		—	Gang Closed	Adjust slug in T6
4	REPEAT STEPS 2 & 3		—	—	—
5	1260 KC		—	1260 KC	C1A



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

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



TRANSISTOR & TRIMMER LAYOUT

NOTES:
 ALL RESISTORS ARE 1/2 WATT, CARBON 20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
 ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
 ALL CAPACITORS ARE IN MICRO-FARADS UNLESS OTHERWISE SPECIFIED.
 S.C. VOLTAGES SHOWN ARE MEASURED FROM CHASSIS WITH NO SIGNAL USING AN A.C.-D.C. OR VACUUM TUBE VOLTMETER.
 DENOTES CHASSIS

BATTERY CURRENT DRAIN APPROX. 15 MA WITH VOLUME CONTROL AT MINIMUM
 SPEAKER IMPEDANCE 16 OHMS

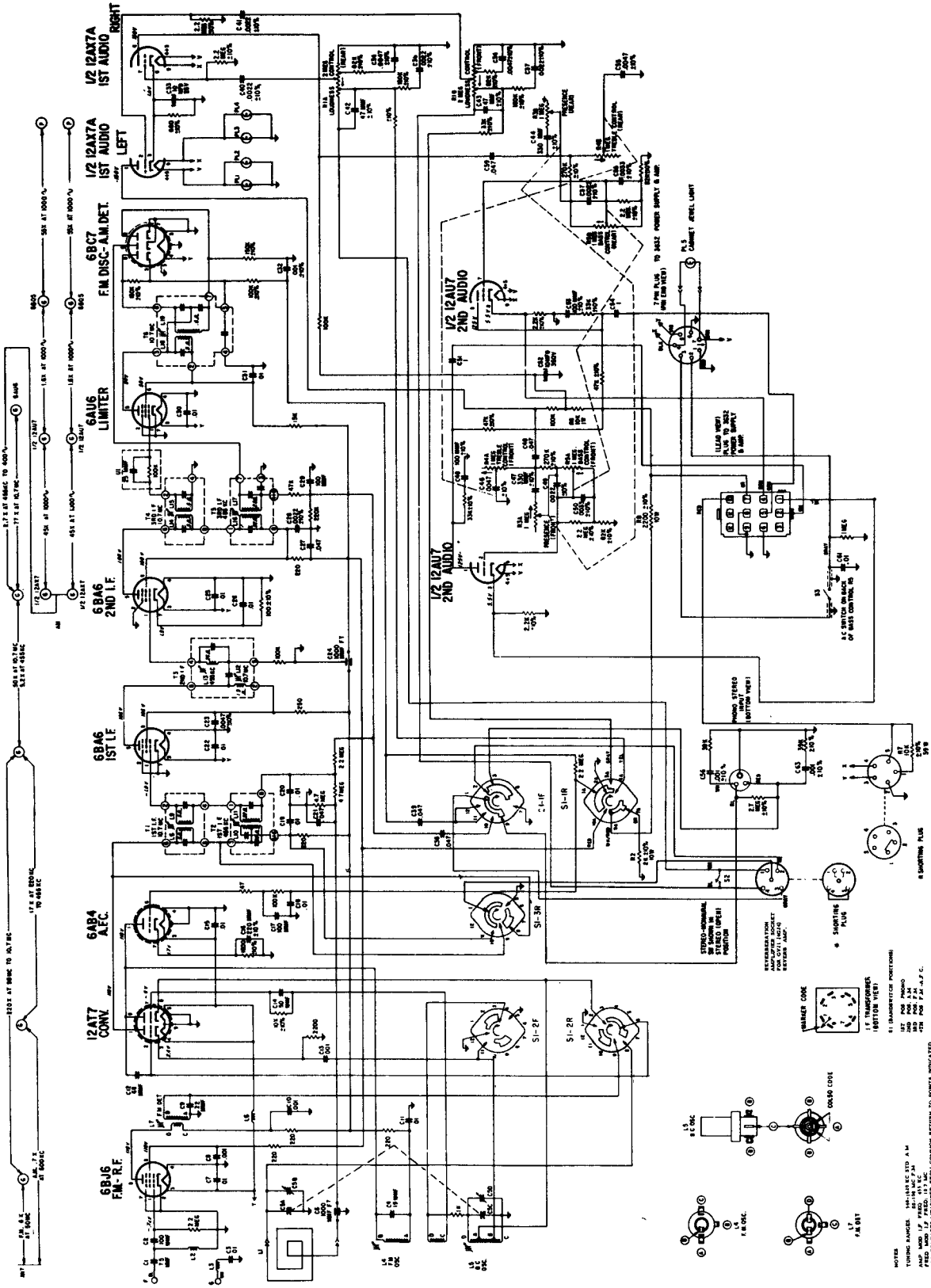
ALIGNMENT PROCEDURE

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	C1C	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	C1A	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 9G26 used in Model SFF2535-1



9G26 SCHEMATIC FOR MODEL SFF2535-1

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

INDEX

	<u>Arvin, Cont.</u>		<u>G.E. Cont.</u>		<u>Motorola, Cont.</u>		<u>Motorola, Cont.</u>	
	1.62201	11	P825A	32	C16	65	HS-938	65
	1.62402	14	P826A	32	A17	65	HS-939	65
	1.64901	10	P835A	31	C17	65	HS-942	67
<u>Admiral Corp.</u>	1.65301	12	P850B,C	32	C18	65	HS-943	67
4R3	1.65501	13	P851C	32	C19	65	HS-944	68
6M3A			RP1135A	34	X23	58	HS-945	68
7B2	<u>Bulova Watch</u>		RP1155A,C	36	24ME	51	HS-946	69
7B2B	890	15	RC1200	36-37	24MF	51	HS-947	69
7B2C			RC1201	36	24MY	51	HS-948	70
7B2D	<u>Delco</u>		RC1202	36-37	X24	58	HS-949	70
8A2	989393	17	RC1203	36	SP25	67	HS-950	70
Y2081	989692	18	RC1210	36-37	X25	59	HS-951	70
Y2081A	989831	16	RC1211	36	SP26	67	HS-952	67
Y2082			RC1212	36-37	X26	60	HS-953	73
Y2082A	<u>Emerson Radio</u>		RC1213	36	SP27	68	HS-954	73
Y2083	707	21	RP1550A,D	35	X27	61	HS-963	72
Y2083A	941B	22	RP1551A,D	35	SP28	69	HS-968	72
Y2091	943B	22	RP1590A	36	X28	62	HS-969	71
Y2093	G-1701	19	RP1170	36-37	SP29	70		
Y2098	G-1702	19	P9001A	33	X29	63	<u>Oldsmobile</u>	
Y2101	G-1704	20	P9011A	33	SP30	70	989393	17
Y2102	G-1705	20			X31	64		
Y2108	G-1706	20	<u>Hitachi, Ltd.</u>		HK45	66	<u>Packard-Bell</u>	
Y2221	120569B	22	TH-660	40	SK56-1	71	7R4	74
Y2223	120569D	22	TH-661	40	SK57-1	71		
Y2226	120578	19	TH-759	40	CA61X	52	<u>Philco Corp.</u>	
Y2229	120579	19	WH-761	39	OEA61X	53	T-61	75
Y2252	120580	20	WH-822M	38	PCA61X	54	T-71	76
Y2253	120581	20			CTA62	55	T-77	77
Y2256	120583	20	<u>International</u>		CTM62	55	T-88	78
Y3133	120598	21	<u>Harvester</u>		SK65	67	K-777	81
Y3137			244079-R91	47	SK66	73	K-778	81
	<u>Ford</u>		244113-R91	47	SK67	73	K-780	84-86
<u>American Motors</u>	C2AZ-18805	51			SK73	72	K-782	84
8990981	C2GY-18805	51	<u>Magnavox</u>		SK74	72	K-783	84
	C2YY-18805	51	65	41	SK75	72	K-784	84-86
	<u>Gamble-Skogmo</u>		71	42	SK76	72	K-785	84
	RA48-8260A	24			SK77	71	T-803	79
<u>Arvin</u>	RA48-8261A	24	<u>Montgomery</u>		SK78	71	K-847	84
31R25	RA48-8266A	24	<u>Ward</u>		SK79	71	K-849	80
31R26	RA50-9908A	25	GEN-1213A	44	SK80	71	K-850	80
61R13	RA50-9909A	25	GNT-1215	45	117	56	K-851	84-86
61R16			GNT-1215A	45	119	56	K-852	84
61R19			GPS-1688A	43	120	56	K-853	84
61R23	<u>General</u>		GEN-1691A	46	202	57	K-855	84-86
61R26	<u>Electric</u>		GPS-1865A	43	203	57	K-856	84
61R29	T170A	27	GEN-1869A	46	204	57	K-858	84
61R35	T171A	27			HS-744	65	K-912	82-83
61R39	T230A	28	<u>Motorola</u>		HS-813	65	K-914	82
61R48	C495A	26	2TMR	50	HS-822	66	K-1414	87
61R49	C496A	26	2TMXD	49	HS-880	58	K-1424	87
61R58	C500A	26	C2AZ-18805	51	HS-881	58	K-1426	88
80P78	C510	27	C2GY-18805	51	HS-882	59	K-1526	89
81P68	C516A	27	C2YY-18805	51	HS-883	60	K-1628	90
81P75	C517A	27	O4MI	47	HS-884	62	K-1632	91
81P78	P795A,B	29	11MX	48	HS-885	63		
1.61601	P796A,B	29	A15	65	HS-894	64	<u>Pontiac</u>	
1.61701	P797A,B	29	C15	65	HS-915	61	989692	18
1.62001	P820A	30	A16	65	HS-922	65	989831	16
	P821A	30						

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

RCA Victor		RCA, Continued		Sears, Cont.		Sylvania, Cont.		Westinghouse+	
1RA11	94	1VC15	105	1038	107	682-1,-2	123	H-M1410	144
1RA20	94	1-VE-0	101	1073	110	682-3	123	H-M1411	144
1RA23	94	1-VE-1	101	1074	110	691-1	124	H-M1412	144
1RA25	94	1-VE-2	101	1075	110	700-2	125	H-M1413	144
1RA26	94	1VE075	101	1083	110	702-1	126	H-M1700	143
1RA30	96	1VE086	101	1084	110	711-1,-2	127	H-M1701	143
1RA33	96	1VE094	101	1085	110	711-3	127	H-M1702	143
1RA35	96	1VE105	101	1212	108	6022	127	H-M1703	143
1RA36	96	1VE106	101	1213	108	6025	127	V-2259-7	128
1RA42	96	1VE107	101	1214	108	6028	127	V-2259-8	128
1RA43	96	1VE205	101	2000	109	6029	127	V-2393-4	129
1RA44	96	1VE207	101	2018	111			V-2395-1A	130
1RA45	96	1VE224	101	2019	111	<u>Westinghouse</u>		V-2395-7	130
1RA50	96	1VE229	101	2035	112	H-69ACS1	139	V-2398-3	131
1RA51	96	1VE246	101	2036	112	H-72MP1	142	V-2401-4	132
1RA52	96	1-VF-1	101	2037	112	H-72MP2	142	V-2403-1	133
1RA55	96	1-VF-2	101	2038	112	H-76ACS1	142	V-2403-3	136
1RA60	96	1VF105	101	2075	110	H-76ACS2	142	V-2403-4	133
1RA61	96	1VF106	101	2076	110	H-78ACS1	138	V-2403-5	136
1RA64	96	1VF107	101	2077	110	H-78ACS2	138	V-2407-1	134
1RA65	96	1VF205	101	8038	113	H-79ACS1	141	V-2407-2	134
1RC30	98-99	1VF207	101	9040,A	113	H-79ACS2	141	V-2420-1	137
1RC31	98	1VF224	101	132.63901	109	H-81ACS1	140	V-2506-6	138
1RC34	98	1VF229	101	132.64402	111	H-81ACS2	140	V-2507-7	139
1RD11	94	1VF246	101	528.53071	113	H-732P7	133	V-2507-11	140
1RD30	95	1YC11	104	528.53580	110	H-732P7GP	133	V-2507-12	141
1RD32	95	RS-193A	101	528.53740	108	H-733P7,+	133	V-2508-11	142
1RD33	95	RS-193B	101	528.53760	112	H-746T5A	130	V-2510-7	144
1RD37	95	RS-193D	101	528.53880	106	H-747T5A	130	V-2511-5	144
1RD40	95	RS-196	104	528.53940	107	H-761N7	134	V-2515-1	143
1RD41	95	RS-197	105	528.54071	110	H-762N7	134		
1RD44	95	RS-198	105			H-764N7	134	<u>Zenith Radio</u>	
1RD45	95	RS-200	100	<u>Sony</u>		H-765N7	134	4G24	156
1RD50	95	RK-295	100	TR-84	114	H-766L4A	137	5F02	146
1RD52	95	RC-1199D	92	TR-86	115	H-775L6A	132	5G29	157
1RD53	95	RC-1200C	93	TR-608	116	H-776L6A	132	5H07	147
1RD56	95	RC-1201D	98	TR-610	117	H-777N7	134	6GT42Z2	150
1RD60	95	RC-1202F	94	TR-620	118	H-778N7	134	6H03	148
1RD61	95	RC-1202H	94	TR-815B,Y	119	H-779N7	134	6H06	149
1RD63	95	RC-1202K	95			H-780N7	134	7GT40Z2	152
1RD65	95	RC-1202L	96	<u>Sylvania</u>		H-790P6	129	8HT40Z2	154
1RG11	93	RC-1202M	96	4P19W,+	123	H-790P6GP	129	9G26	158
1RG14	93	RC-1202N	96	6P08	121	H-791P6,+	129	GV21	156
1RG15	93	RC-1202P	95	6P09	121	H-795P6,+	136	GPS80	156
1RG31	97	RC-1202R	95	AK15	127	H-796P6,+	136	150	150
1RG33	97	RC-1202T	95	AT15	127	H-798P7,+	133	400	152
1RG34	97	RC-1206A	101	AK16	127	H-799P7,+	133	500H	154
1RG41	97	RC-1208A	97	AT16	127	H-803T5	128	H509C,P,W	146
1RG43	97	RC-1208B	97	TH16	125	H-804L5	131	H519	147
1RG46	97			AK17	127	H-805L5	131	H624	148
1RH10	92	<u>Renault</u>		AK18	127	H-806L5	131	H722C,G,W	149
1RH11	92	55555	49	45C20	124	H-808L5	130	SFF2504T	157
1RH12	92			45P18	120	H-809L5	130	SFF2505T	157
1RH13	92	<u>Sears,Roebuck</u>		55P19	122	H-816L5	128	SFF2535-1	158
1RJ19	92	1031	106	Y55C20	126	H-M1310B	144	SFF2604-1	157
1TPE,HE	92	1035	107	664-1	120	H-M1311B	144	SFF2605-1	157
1TPE,JE	92	1036	107	666-1,-2	121	H-M1312B	144	SFF2607-1	157
1VA14	105	1037	107	681-1	122	H-M1313B	144	G3388	157