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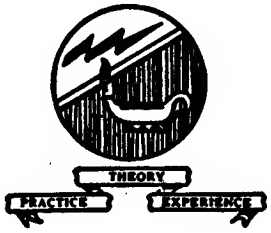
1961

Volume R-21

RADIO DIAGRAMS

and Servicing Information



Compiled by

M. N. BEITMAN

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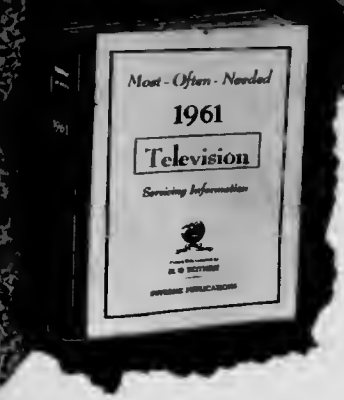

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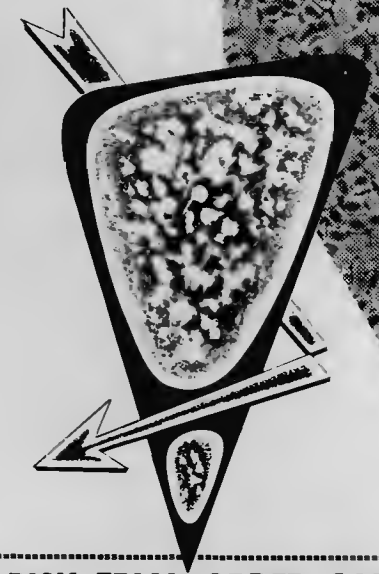

RADIO VOLUMES

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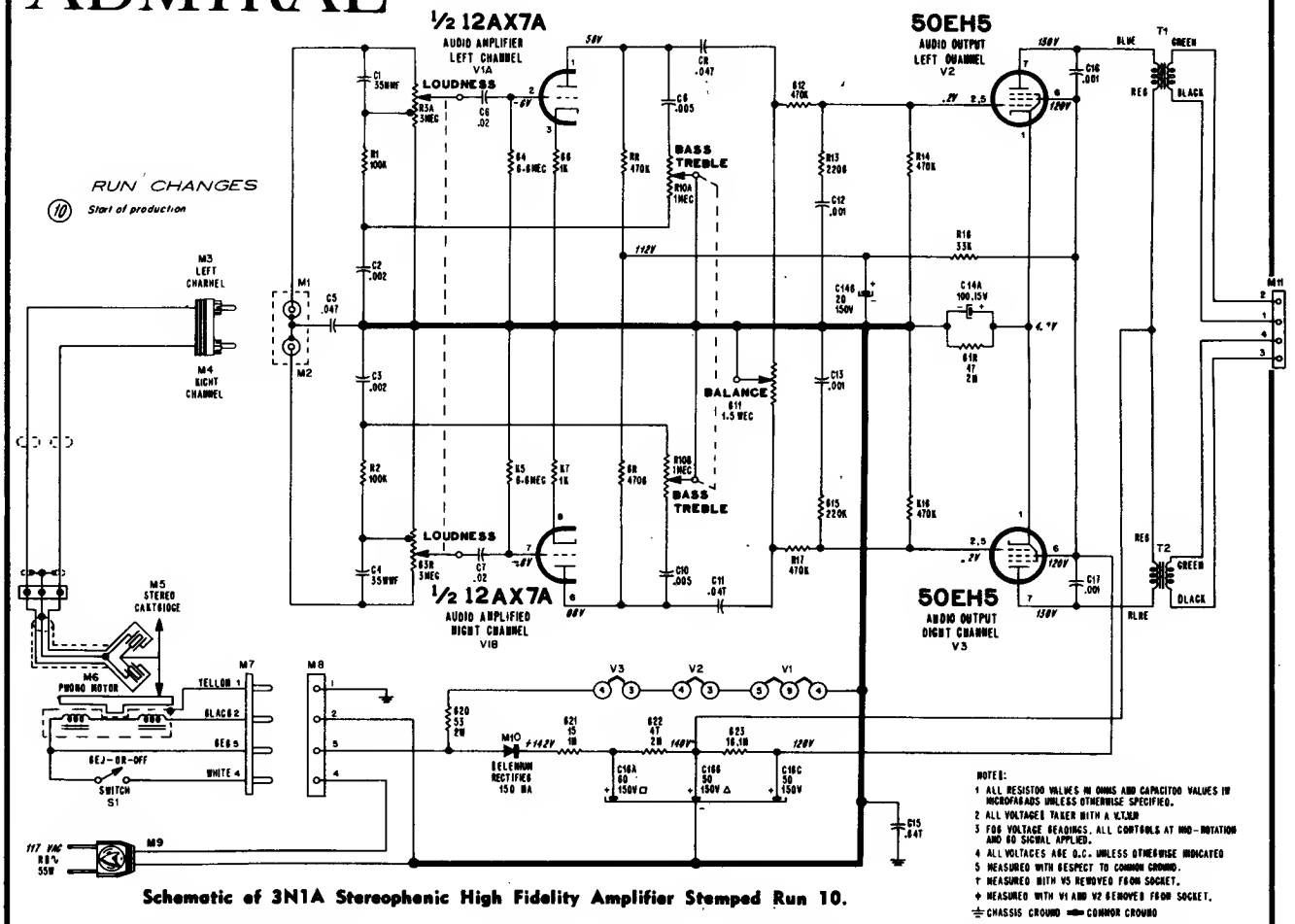
ADMIRAL

CHASSIS 3N1A, MODELS Y4049, Y4071, Y4072, Y4073



Schematic of 3N1A Stereophonic High Fidelity Amplifier Stamped Run 10.

NOTES:
1 ALL RESISTOR VALUES IN OHMS AND CAPACITOR VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
2 ALL VOLTAGES TAKEN WITH A V.T.V.M.
3 FOR VOLTAGE READINGS, ALL CONTROLS AT MID-ROTATION AND NO SIGNAL APPLIED.
4 ALL VOLTAGES ARE D.C. UNLESS OTHERWISE INDICATED
5 MEASURED WITH RESPECT TO COMMON GROUND.
† MEASURED WITH V5 REMOVED FROM SOCKET.
+ MEASURED WITH V1 AND V2 REMOVED FROM SOCKET.
⏚ CHASSIS GROUND ⏚ COMMON GROUND

RUN 11 In All Sets
To improve performance (tonal quality) at low volume level, resistors R1 and R2 were changed from 100,000 ohms to one megohm, one-half-watt.

CHASSIS REMOVAL

Model Y4049: Remove the metal grille by removing the screws along the top and side of the grille.

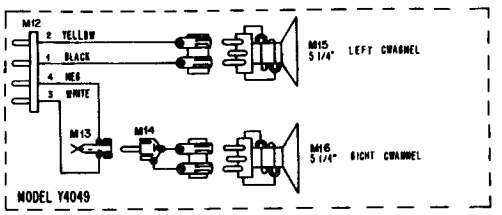
Disconnect the phono motor plug (M7), the two channel input plugs (M3 and M4), and speaker plug (M12). Remove the three control knobs by pulling them straight out from the control shafts.

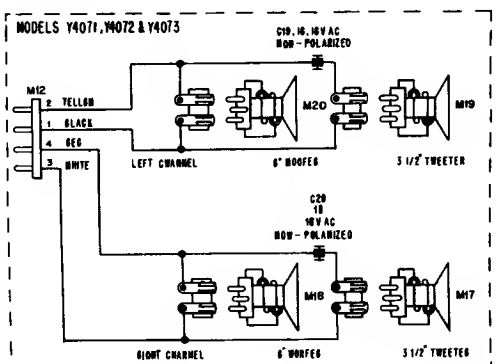
Remove the screws holding the phono motor board. Lift the board with the record changer out of cabinet. To avoid marring the cabinet or damaging the record changer, do not allow the bottom of the record changer to scrape across the cabinet when removing.

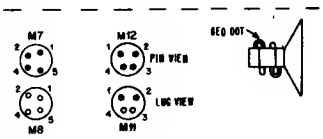
Remove the four nuts holding the chassis to the cabinet. Remove chassis from cabinet.

Models Y4071, Y4072 and Y4073: Disconnect the phono motor plug (M7), the two channel input plugs (M3 and M4), and speaker plug (M12). Remove the three control knobs by pulling them straight out from the control shafts.

Remove the four nuts holding the chassis to the cabinet. Remove chassis from cabinet.







ADMIRAL

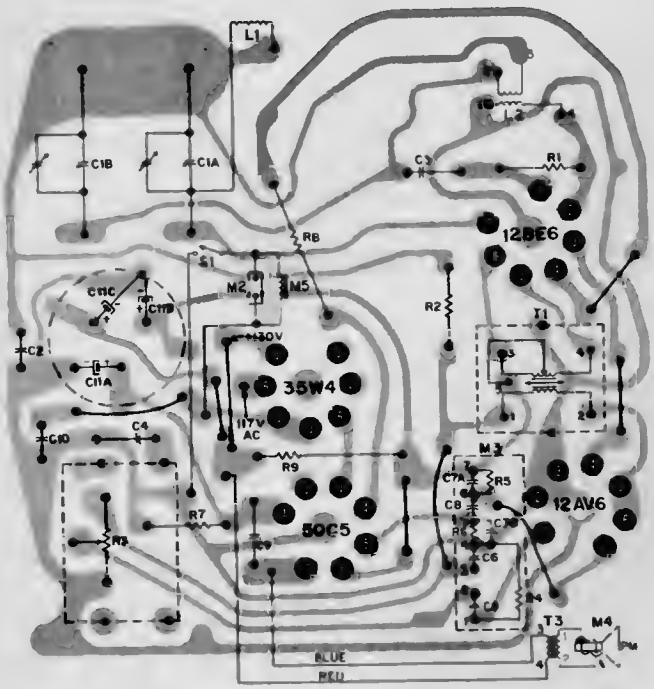
TABLE CLOCK RADIO

MODEL	COLOR	CHASSIS
Y1189A	Grey-Green	4E3A

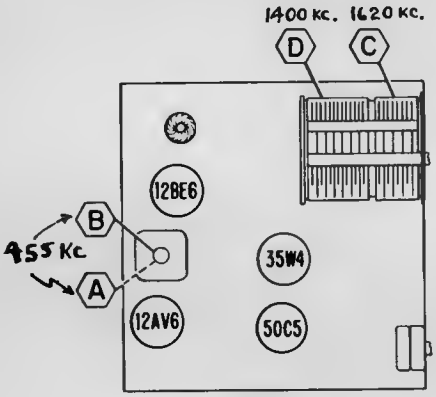
CLOCK RADIO

MODEL	COLOR	NAME	CHASSIS
Y3037	Beige and White	Sinclair	4N3
Y3038	Turquoise and White		

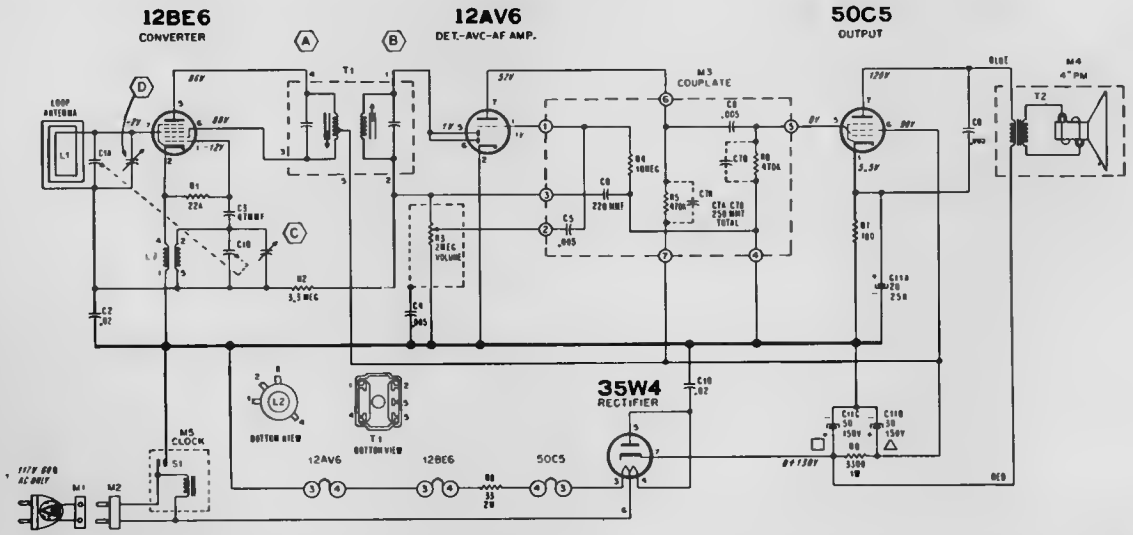
The tube complement, tube locations and etched wiring board of the 4N3 chassis, is identical to that of the 4E3A chassis.



Rear View of Etched Circuit Board, Used in 4E3A Chassis.



Tube and Alignment Point Locations.



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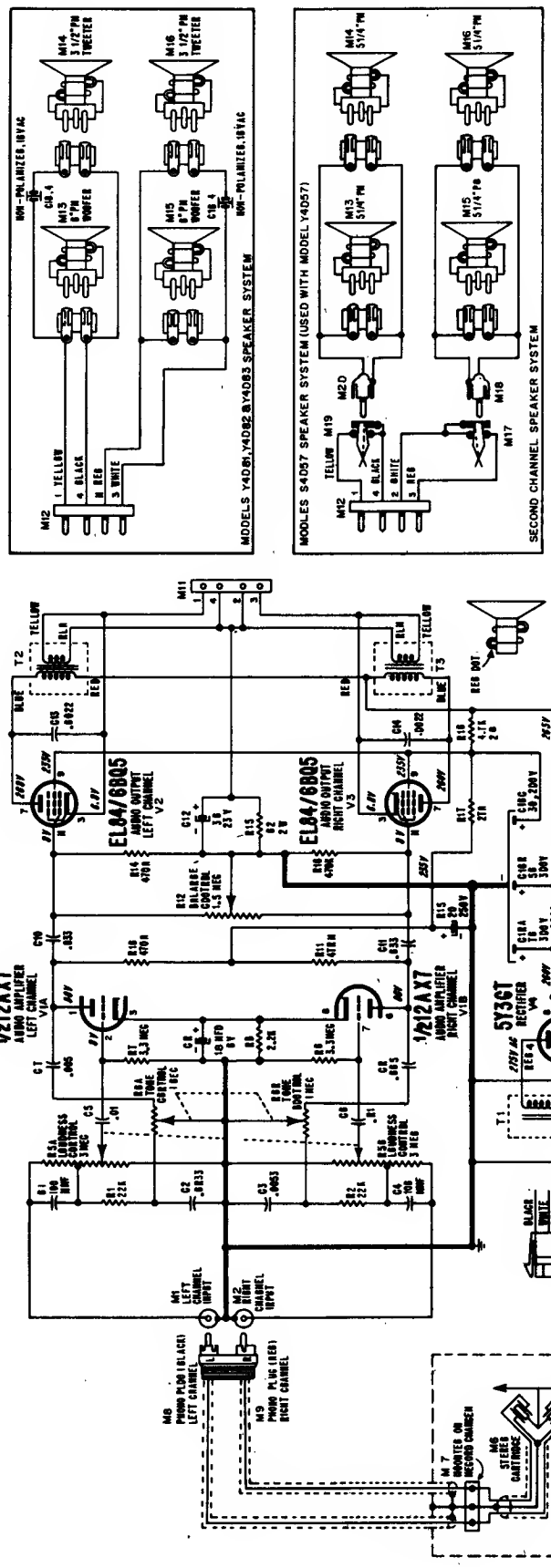
Chassis 4F3A
Models Y4057, Y4081, Y4082, and Y4083



CHANGER REMOVAL

Model Y4057:

Disconnect line cord. Remove record changer compartment back panel by removing five (5) screws. Lift out panel.

Remove six motor board mounting screws.

Disconnect changer phono output plug and changer power plug.

Remove changer and motor board from cabinet.

Models Y4081, Y4082, & Y4083:

To remove the record changer, perform the following procedure.

IMPORTANT: Before removing record changer from cabinet, make sure record changer "floats" on its spring mounting.

Remove screws holding the record changer compartment panel back and record changer bottom cover.

Speed clips (at bottom of each changer hold down screw) extend through holes in panel under changer. Press clip until it is perpendicular to the changer pan. Remove changer from cabinet for servicing. Disconnect all leads.

CHASSIS REMOVAL

Disconnect line cord.

Remove three (3) amplifier control knobs. (Pull knobs straight off from control shafts.)

Remove record changer compartment back panel by removing screws. Lift out panel.

Disconnect changer phono output plug, speaker and changer power plug.

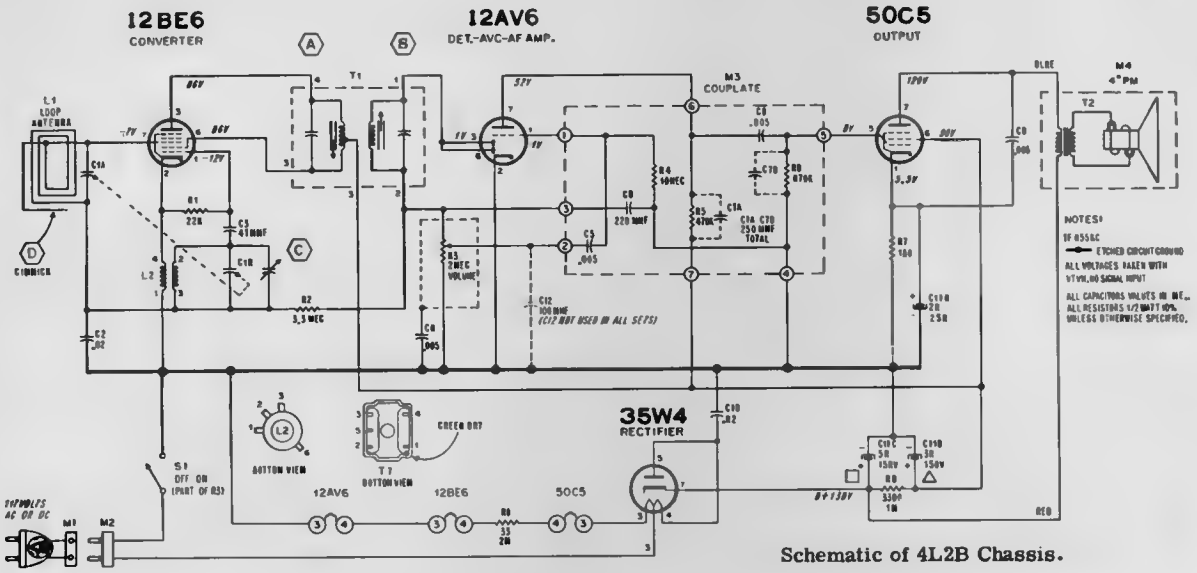
Remove two hexnuts to dismount interlock plug.

Remove four hexnuts mounting the chassis.

Lift entire assembly carefully from cabinet.

Admiral

CHASSIS 4L2B, MODELS 4L26B, 4L27B, 4L28B, 4L29B

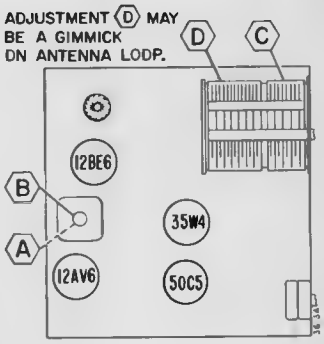


Schematic of 4L2B Chassis.

After start of production of the 4L2B chassis, two components were added to provide better shielding and better RF by-passing in the audio stages.

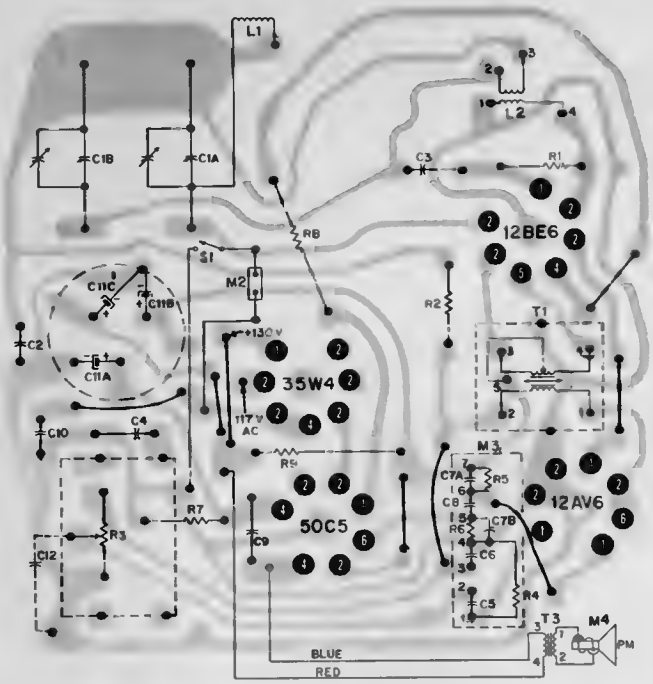
A metal shield (Admiral part number 15A2267-1) was installed over the audio couplate (M3) with one point soldered to pin No. 4 on the couplate. A 100 mmf capacitor (part number 65D10-154) was added from the center-tap of the volume control (R3) to the etched foil ground.

In some cases this capacitor was installed on the rear of the board and in other cases it was added on component side of board on the Volume control terminals.



Tube and Alignment Point Locations.

The 4L2B chassis is a completely new design of the very popular 4L2 and 4L2A chassis.



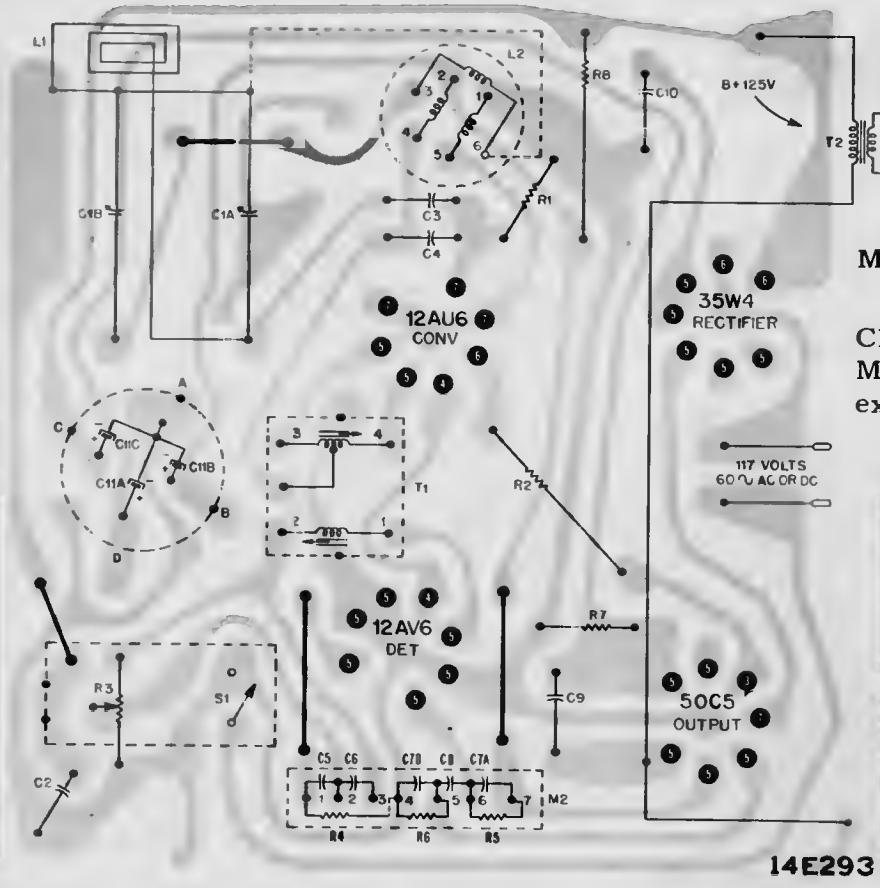
Rear View of Etched Circuit Board, Used in 4L2B Chassis.

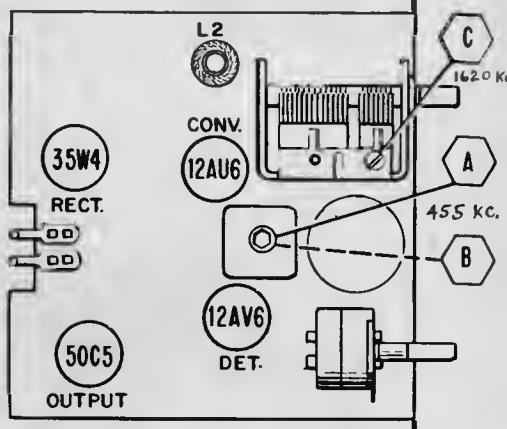
ADMIRAL

CHASSIS 4P3

MODELS Y2993, Y2996, Y2998, and Y2999.

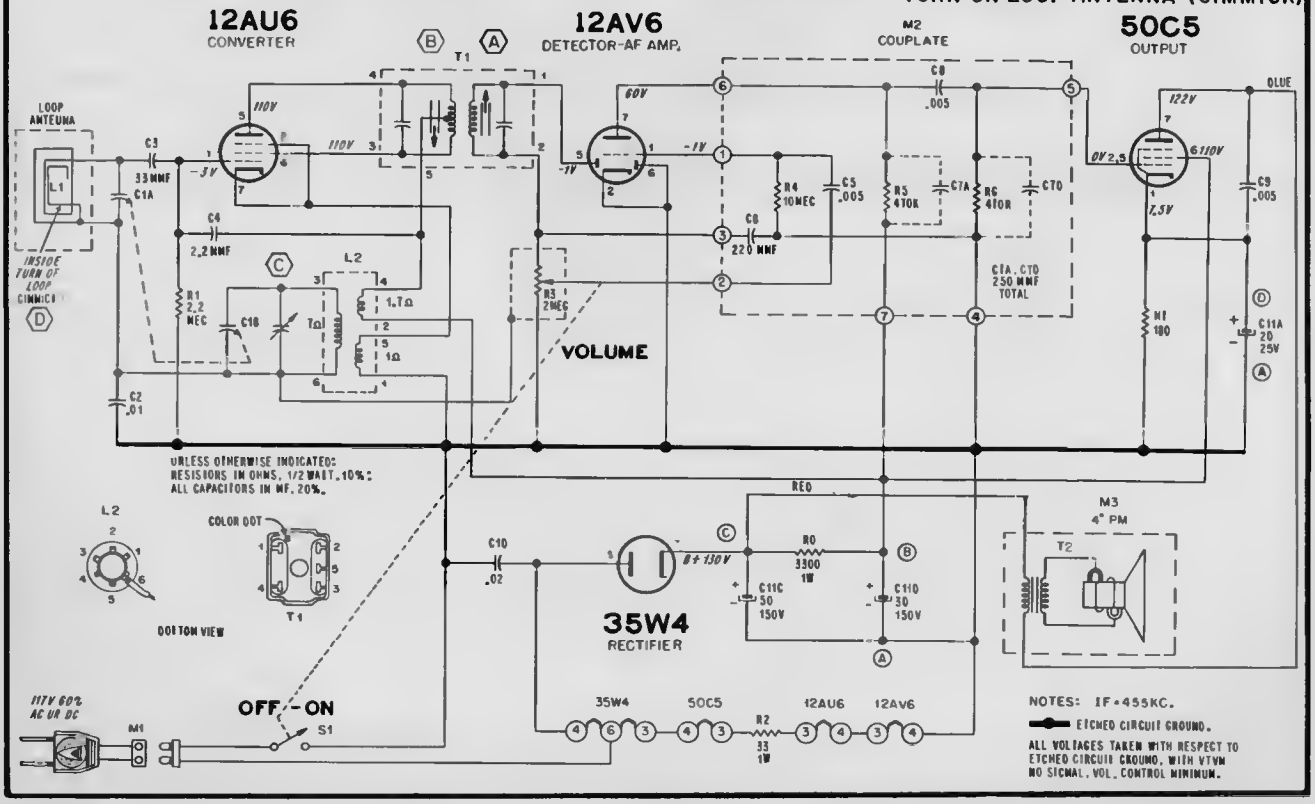
Chassis 4P3A used in Clock Model Y3037A is identical except for clock.





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

ALIGNMENT 1400 KC, (D) IS AN INSIDE TURN ON LOOP ANTENNA (GIMMICK)



NOTES: IF=455KC.

ETCHED CIRCUIT GROUND.

ALL VOLTAGES TAKEN WITH RESPECT TO ETCHED CIRCUIT GROUND, WITH VTVM NO SIGNAL, VOL. CONTROL MINIMUM.

Admiral

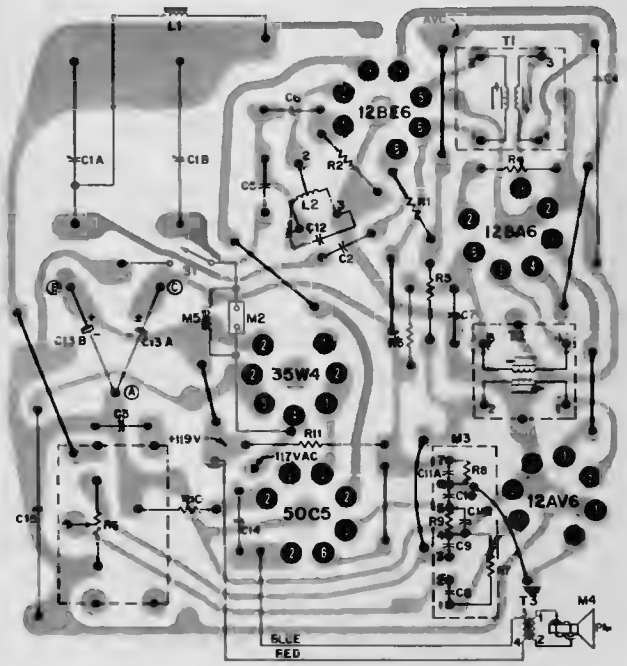
CORRECTION IN COMPONENT SYMBOLS ON THE ETCHED CIRCUIT BOARD

In some chassis C3 is shown alongside the electrolytic capacitor (C13). This C3 should be deleted. C8 shown on opposite side of C13 should be read as C3. (C8 is part of couplate M3 and should therefore not show on the board.)

TABLE CLOCK RADIO

MODEL	COLOR	CHASSIS
Y853C	White	5B5C
Y865B	Melon & White	5B5B
Y866B	Yellow & White	

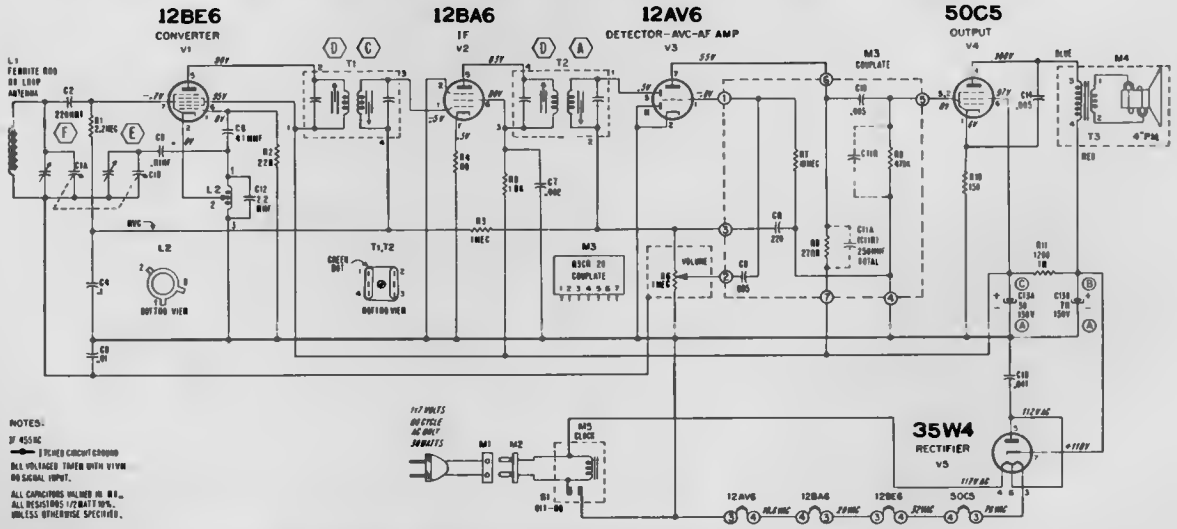
Both 5B5B and 5B5C chassis are very similar to Chassis 5B5, which is covered on page 5, of Vol. 20, 1960 Radio Diagrams manual, and these instructions may be used for alignment and chassis removal.



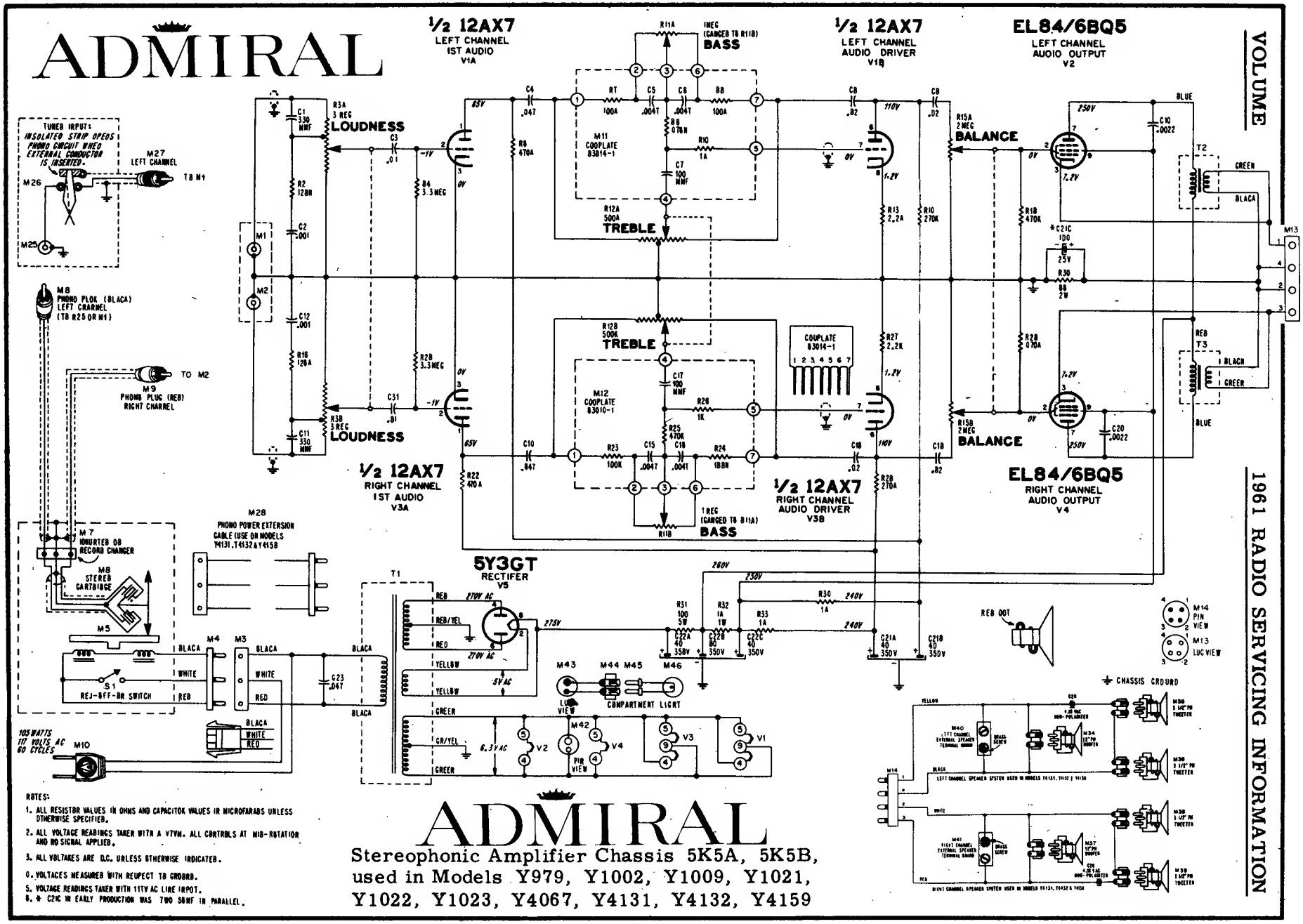
The 5B5B and 5B5C chassis differ from the 5B5 chassis in the following respects: The RF input is now shunt fed to the converter to reduce the loading effect and noise pickup of the antenna. The tuning gang and oscillator coil have been redesigned and also the IF amplifier bias and screen bypassing have been increased to reduce, to a minimum, any tendency toward IF regeneration.

There are no electrical circuit differences between the 5B5B and 5B5C chassis. The 5B5B chassis is equipped with a clock having the Snooze Alarm and Sleep Switch features while the 5B5C clock does not. The etched circuit board has been changed to comply with the new circuit changes, plus a few relocations of components, etc.

Rear View of Etched Circuit Board in Chassis 5B5B and 5B5C. Gray area represents etched wiring, black symbols and lines represent components and connections on opposite side.



Schematic of 5B5B and 5B5C Chassis.

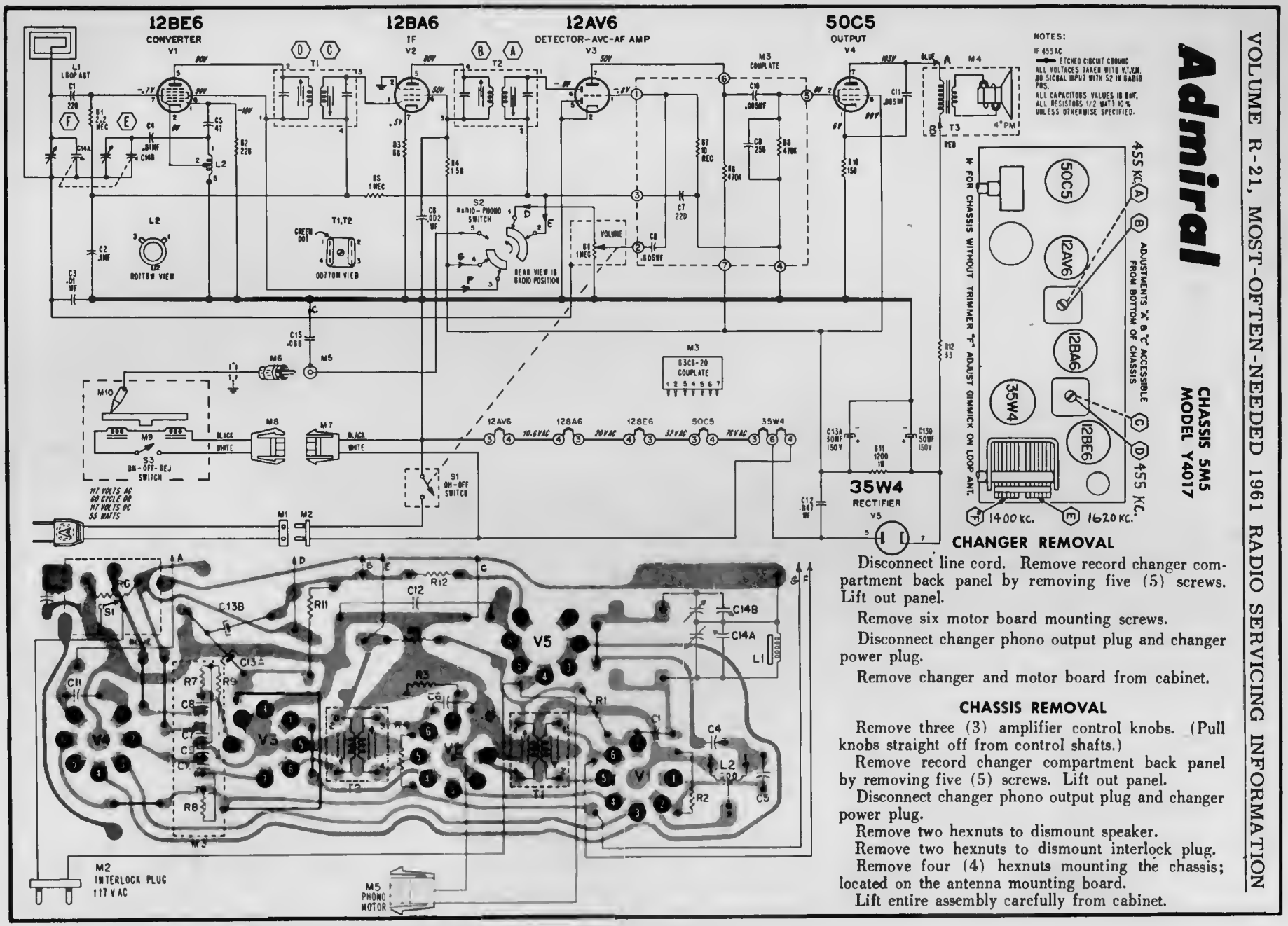


NOTES:

1. ALL RESISTOR VALUES IN OHMS AND CAPACITOR VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL VOLTAGE READINGS TAKEN WITH A VTVM. ALL CONTROLS AT MID-ROTATION AND NO SIGNAL APPLIED.
3. ALL VOLTAGES ARE D.C. UNLESS OTHERWISE INDICATED.
4. VOLTAGES MEASURED WITH RESPECT TO GROUND.
5. VOLTAGE READINGS TAKEN WITH 117V AC LINE INPUT.
6. * C21C IN EARLY PRODUCTION WAS TWO 50MF IN PARALLEL.

ADMIRAL

Stereophonic Amplifier Chassis 5K5A, 5K5B, used in Models Y979, Y1002, Y1009, Y1021, Y1022, Y1023, Y4067, Y4131, Y4132, Y4159



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

CHANGER REMOVAL

Disconnect line cord. Remove record changer compartment back panel by removing five (5) screws. Lift out panel.

Remove six motor board mounting screws.

Disconnect changer phono output plug and changer power plug.

Remove changer and motor board from cabinet.

CHASSIS REMOVAL

Remove three (3) amplifier control knobs. (Pull knobs straight off from control shafts.)

Remove record changer compartment back panel by removing five (5) screws. Lift out panel.

Disconnect changer phono output plug and changer power plug.

Remove two hexnuts to dismount speaker.

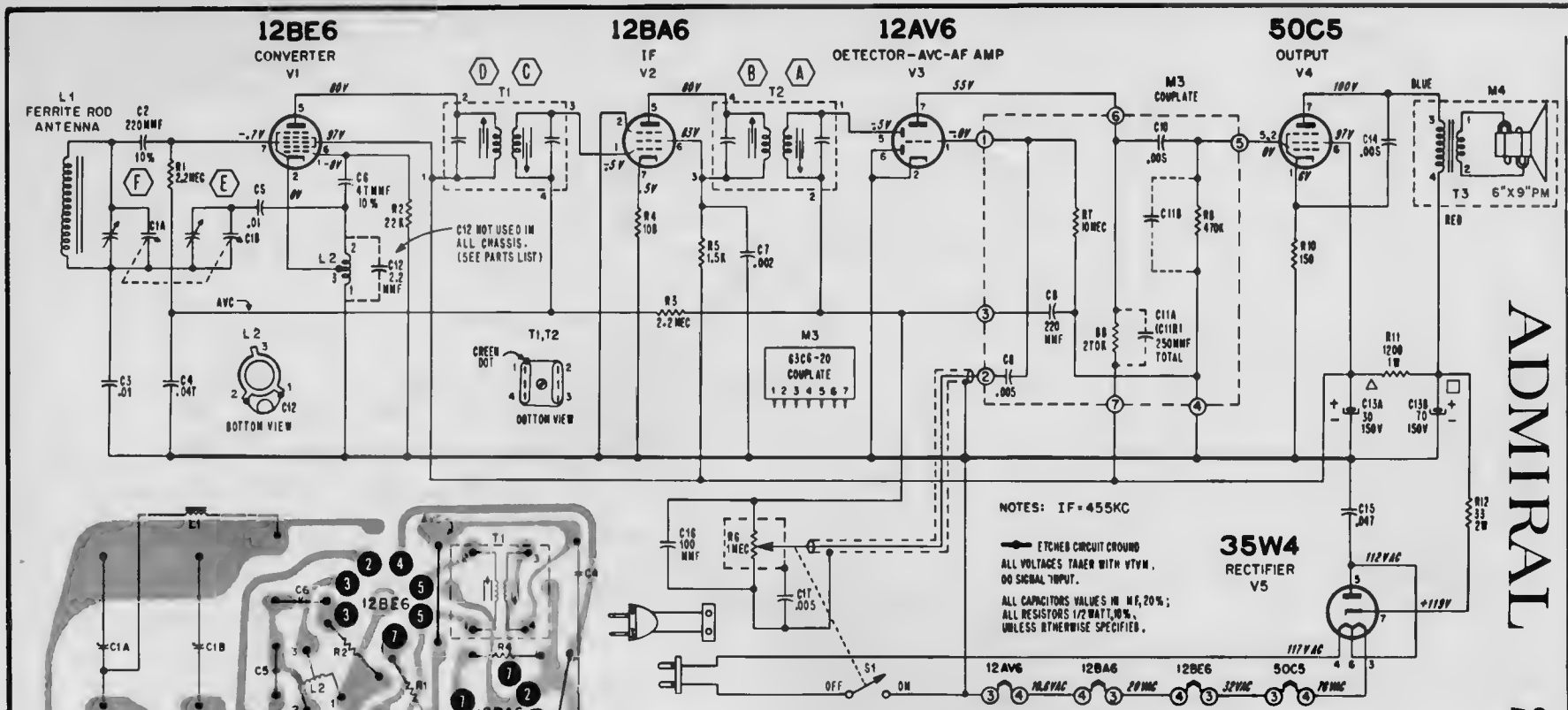
Remove two hexnuts to dismount interlock plug.

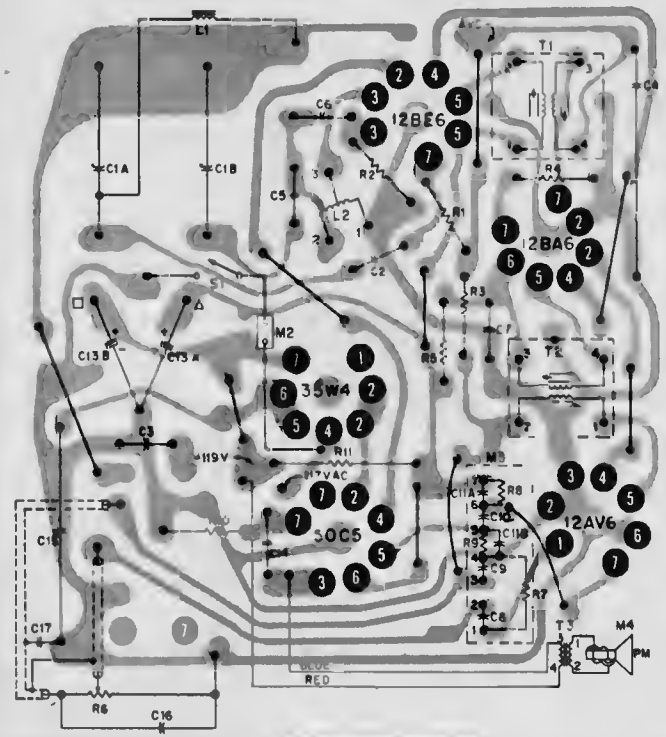
Remove four (4) hexnuts mounting the chassis; located on the antenna mounting board.

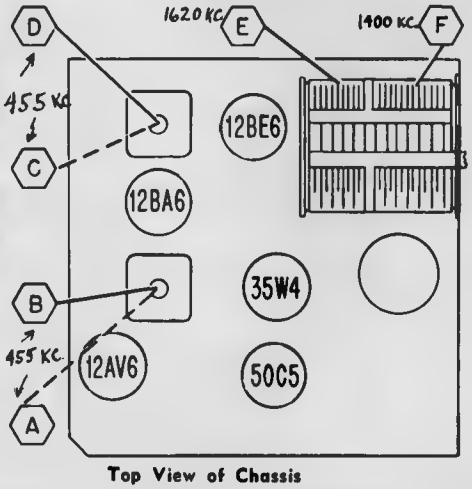
Lift entire assembly carefully from cabinet.

ADMIRAL

CHASSIS 5R5
MODELS Y3021 • Y3027





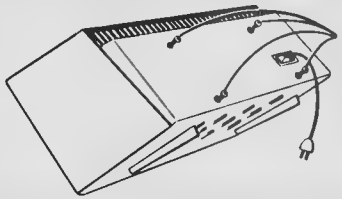


Top View of Chassis

VOLTAGE DATA

All readings made between tube socket terminals and etched circuit ground.
Dial turned to low frequency end; volume control at minimum.
All voltages measured with vacuum-tube voltmeter, on 117 Volts AC line.

TO REMOVE CHASSIS FOR SERVICING

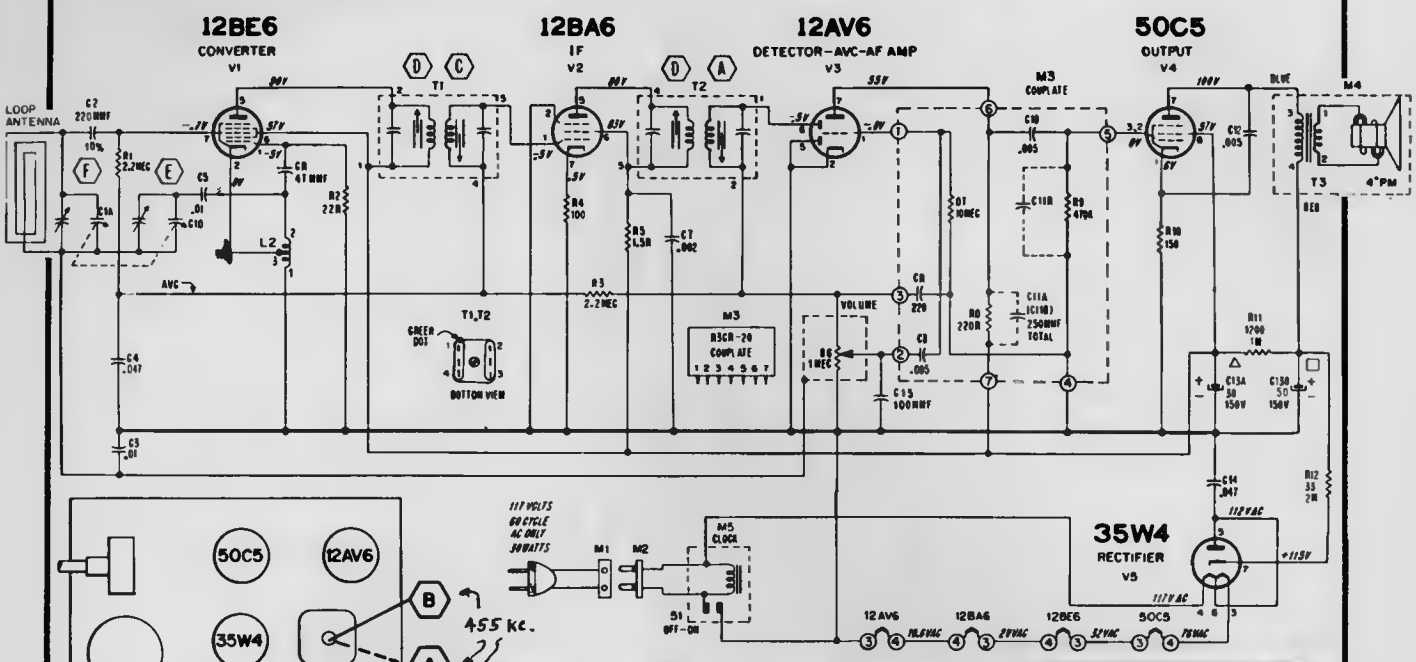


LOOSEN THESE SCREWS UNTIL HELD ONLY BY LAST THREADS. THEN PUSH AGAINST SCREWS WITH THUMBS. REMOVE SCREWS AFTER CHASSIS SLIDES FORWARD.

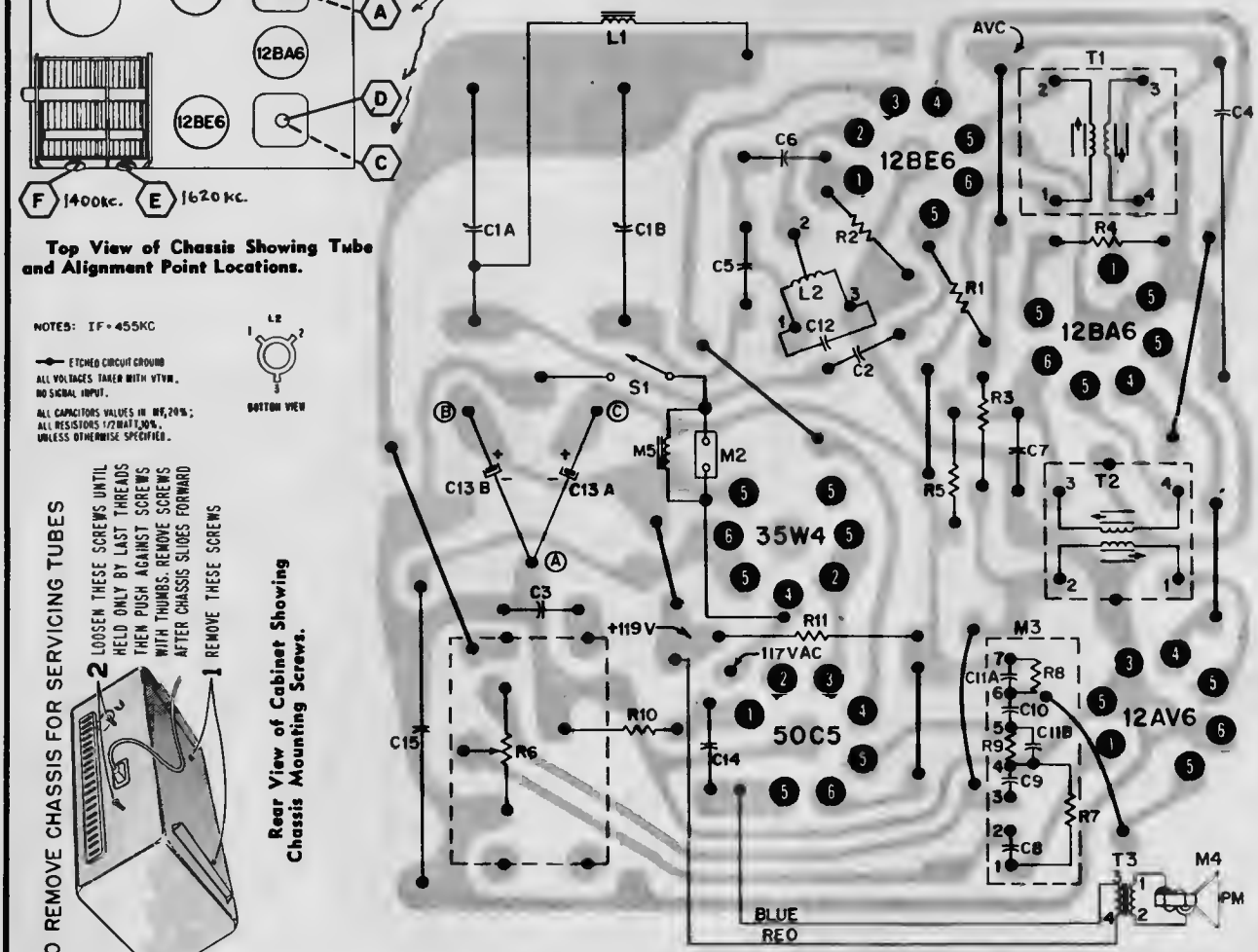
Rear View of Etched Circuit Board. Gray area represents etched wiring; black symbols and lines represent components and connections on opposite side.

ADMIRAL

CHASSIS 5S5
MODELS Y3046 - Y3048 - Y3049



Top View of Chassis Showing Tube and Alignment Point Locations.



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

NOTES: IF = 455KC

ETCHED CIRCUIT GROUND

ALL VOLTAGES TAKEN WITH VTVM. NO SIGNAL INPUT.

ALL CAPACITORS VALUES IN MF, 20%; ALL RESISTORS 1/2 WATT, 10%, UNLESS OTHERWISE SPECIFIED.

TO REMOVE CHASSIS FOR SERVICING TUBES

2 LOOSEN THESE SCREWS UNTIL HELD ONLY BY LAST THREADS THEN PUSH AGAINST SCREWS WITH THUMBS. REMOVE SCREWS AFTER CHASSIS SLIDES FORWARD

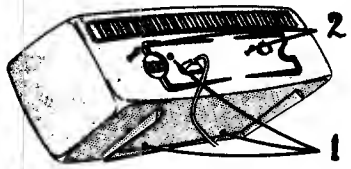
1 REMOVE THESE SCREWS

Rear View of Cabinet Showing Chassis Mounting Screws.

ADMIRAL

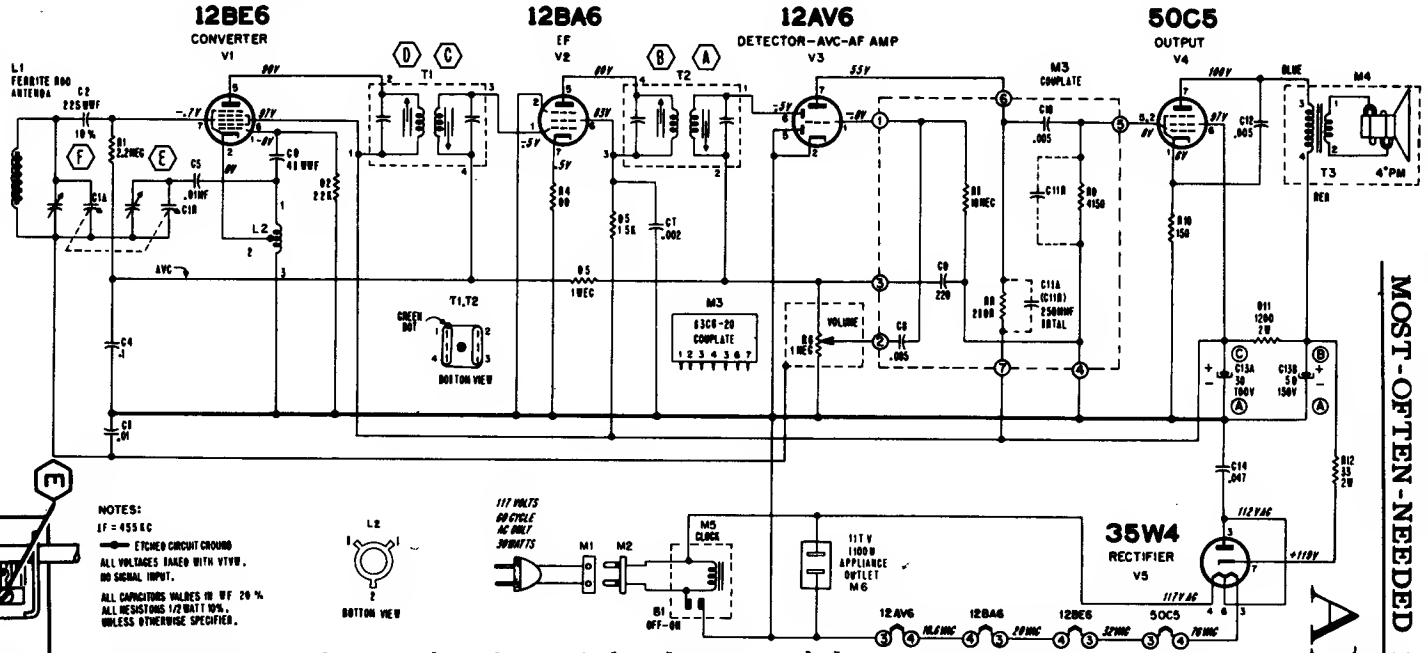
CHASSIS 5T5 // - Y3058
MODELS Y3051 - Y3053

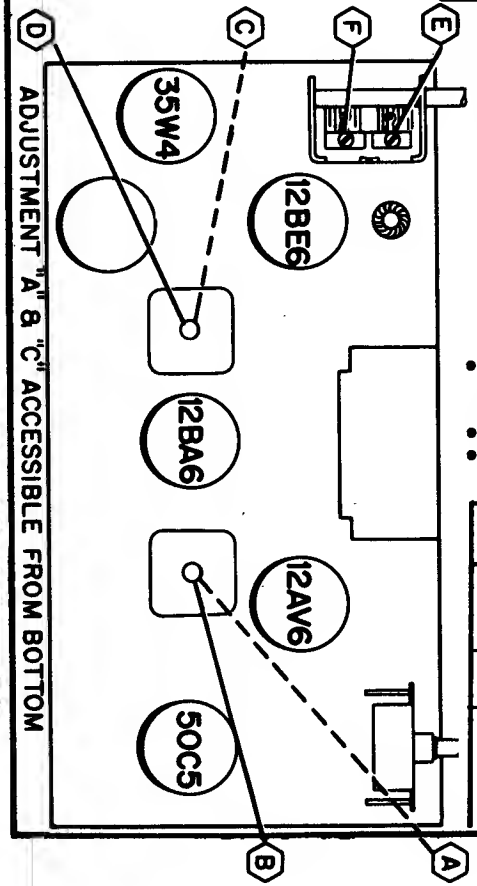
TO REMOVE CHASSIS



1 REMOVE THESE SCREWS

2 LOOSEN THESE SCREWS UNTIL HELD ONLY BY LAST THREADS THEN PUSH AGAINST SCREWS WITH THUMBS. REMOVE SCREWS AFTER CHASSIS SLIDES FORWARD





ADJUSTMENT "A" & "C" ACCESSIBLE FROM BOTTOM

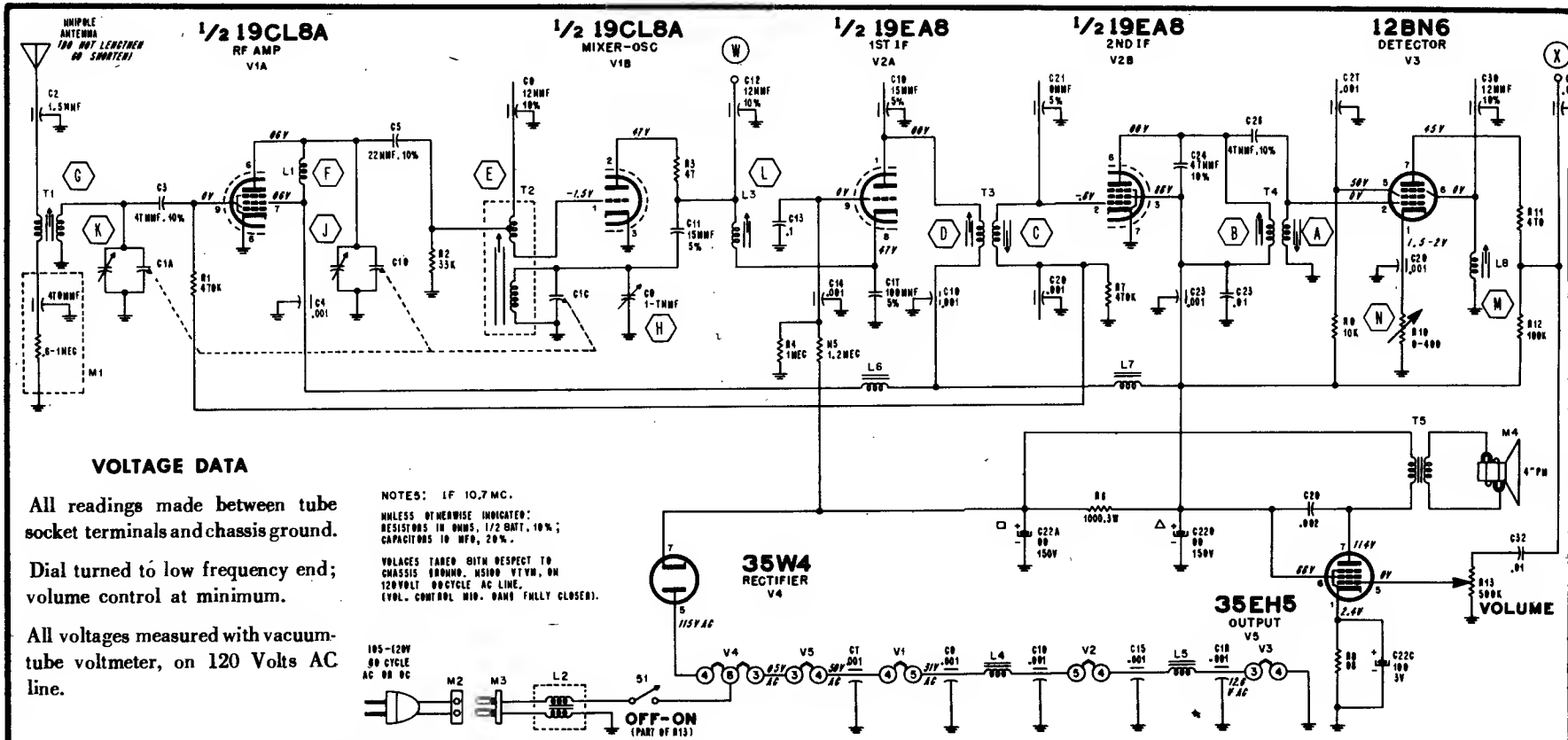
Top View of Chassis Showing Tube and Alignment Point Locations.

- All readings made between tube socket terminals and common etched circuit ground.
- Dial turned to low frequency end; volume control at minimum.
- All voltages measured with vacuum-tube voltmeter, on 117 Volts AC line.

ALIGNMENT PROCEDURE

- Use an isolation transformer if available; otherwise, connect a .1 mfd. capacitor in series with low side of signal generator and connect to common ground.
- Set volume control full on.
- Disconnect voice coil leads and connect output meter across ontput secondary. Use a 3.2 ohm load.
- Use lowest setting of signal generator capable of producing adequate indication on lowest scale of output meter.
- Use a non-metallic alignment tool with a blade 3/32" wide for aligning IF transformers.
- Repeat adjustments to insure good results.

STEP	CONNECTION OF SIGNAL GENERATOR	SIGNAL GENERATOR FREQUENCY	RECEIVER GANG SETTING	ADJUSTMENTS
1	Through a .1 mf capacitor to stator, Antenna section of gang tuning capacitor	455 KC	Gang fully open	"A", "B", "C" and "D" for maximum output
2	Same as "STEP 1"	1620 KC	Gang fully open	"E" for maximum output
3	Use a radiated signal. Loop of several turns of wire, or place generator lead close to ferrite antenna for adequate signal pickup.	1400 KC	Tune in on generator signal	"F" for maximum output

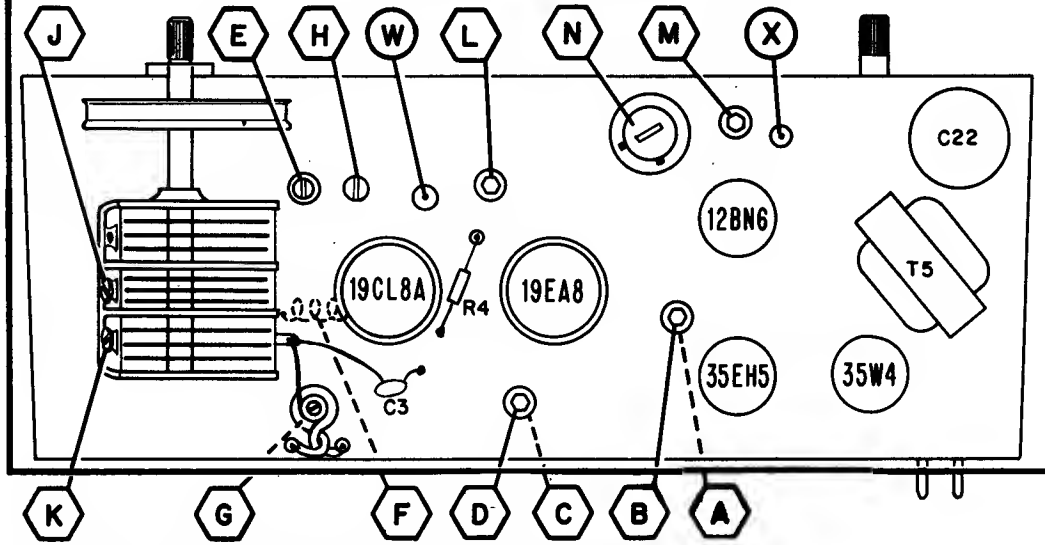


VOLTAGE DATA

All readings made between tube socket terminals and chassis ground.

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

All voltages measured with vacuum-tube voltmeter, on 120 Volts AC line.



DASHED LINE INDICATES ADJUSTMENT FROM UNDERSIDE OF CHASSIS

VOLTAGE PRECAUTION

Do Not Connect an Earth Ground To This Receiver

The chassis is connected directly to one side of the power line. To avoid possibility of damage to test equipment or to receiver, do not place the chassis directly on a metal service bench, tools, or other metal objects.

ADMIRAL

CHASSIS 5V5
MODEL Y3083

(Alignment continued on the next page)

ADMIRAL

CHASSIS 5V5, MODEL Y3083
Alignment Procedure, Continued

ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

- Allow set and test equipment to warm up for approximately 15 minutes before alignment.
- Use an isolating transformer or insert a .01 mfd capacitor in series with the high side of signal generator. DO NOT CONNECT AN EARTH GROUND TO THIS RECEIVER.
- Connect a short wire jumper from the center point of C30 to chassis. (To short L8 to chassis ground.)
- Set signal generator for 400 or 1000 cycle modulation, 30%. Set volume control full on. Keep signal generator output low to prevent overloading.
- Turn bias control, (R10) to full counterclockwise position (maximum bias point).
- Connect the VTVM across output transformer secondary (voice coil leads). Use the 1.5 volt AC scale for output readings.

  NOTE: If available, a commercial output meter is more desirable for this purpose. Disconnect voice coil leads and use a 3.2 ohm load.
- Use nonmetallic alignment tools. Use hex tool (Admiral part no. 98A30-7) for transformer adjustment slugs.

STEP	SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	RECEIVER GANG SETTING	ADJUSTMENT FOR MAXIMUM
1	Test Point W (Center Point of C12)	10.7 MC	Fully open	A, B, C, and D
2	Set trimmers J and K one turn from tight. Set adjustment screw (H) ½ inch above chassis.			
3	Antenna. (Center point of C2 through 75 ohm resistor.)	87.5 MC	Fully closed (set indicator dial on end mark)	E, *F, and G
4	Same as step 3	108 MC	108 MC	H, J, K and L
5	Same as step 3	87.5 MC	Fully closed	Touch-up E
6	Same as step 3	108 MC	108 MC	Touch-up H, J and K
7	a. Set up equipment as in step 1 above. b. Remove short across L8 and adjust M for maximum output. c. Adjust N (R10, starting from full clockwise position) to the first point of maximum sound. Use weakest signal possible.			
7 op.	OPTIONAL METHOD FOR STEP 7 a. Disconnect signal generator from receiver. b. Remove wire jumper from across L8 (C30 to chassis ground). c. Tune in a very weak signal, or reduce signal level, until a strong hiss is heard in the sound. (If necessary coil up antenna in a ball or short antenna lead to chassis or both.) d. Adjust M (quadrature coil, L8) for maximum output. e. Adjust N (R10) for maximum output and clearest tone.			

IF ALIGNMENT CHECK USING SWEEP GENERATOR AND OSCILLOSCOPE

a. Use the same equipment setup as in step 1 but add the oscilloscope (vert. input) connected to test point "X".

b. Use a wideband sweep, unmodulated for response check, except the final adjustment given in step e.

c. Sweep generator signal injected at the same points as given in steps above.

d. Oscilloscope pattern should be a typical response curve. Adjust as in step 1 for best symmetry as well as maximum gain.

e. Final Adjustment: With generator connected as in step 4, and dial set to 108 MC; use ±75 KC sweep and 400 cycle modulation. Remove short from across L8. Adjust M and N for maximum output, using minimum signal input.

*Coil (L3) is adjusted by squeezing or spreading turns of the coil.

CHASSIS REMOVAL

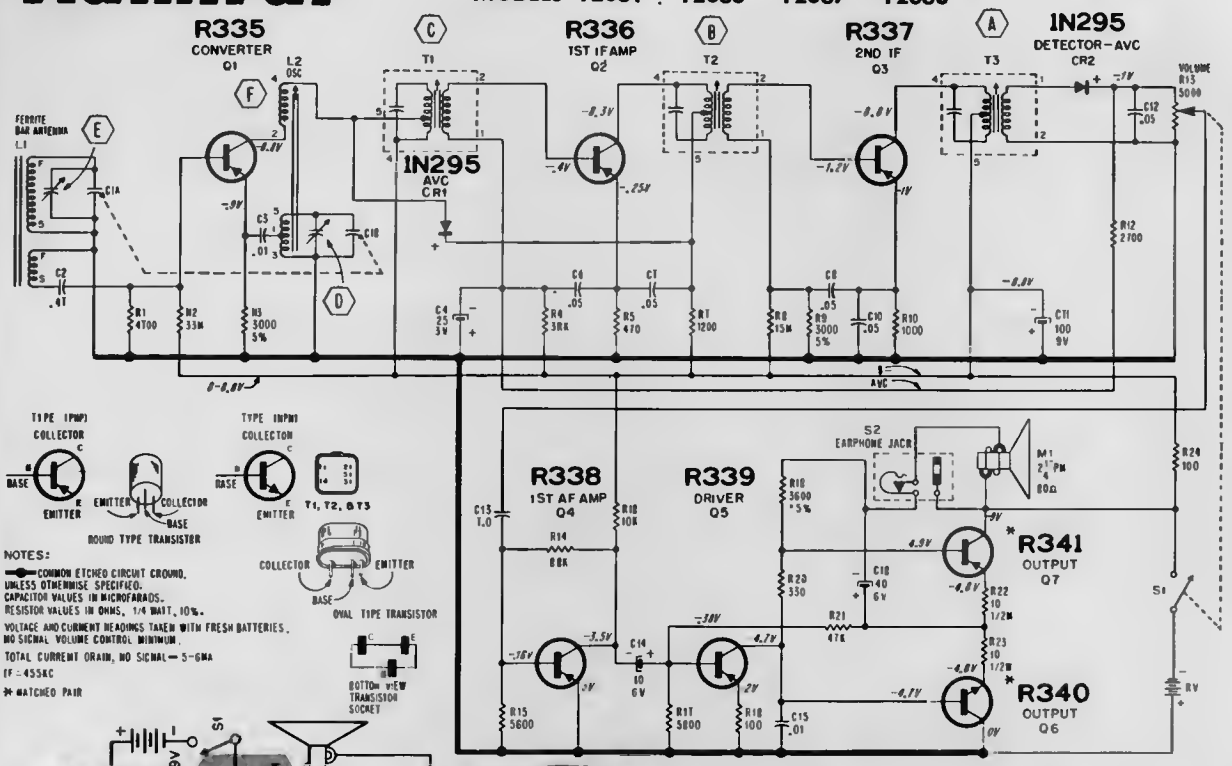
To remove the chassis from the cabinet it is necessary to remove only the rear cabinet section, since the front panel and knobs are attached to the chassis.

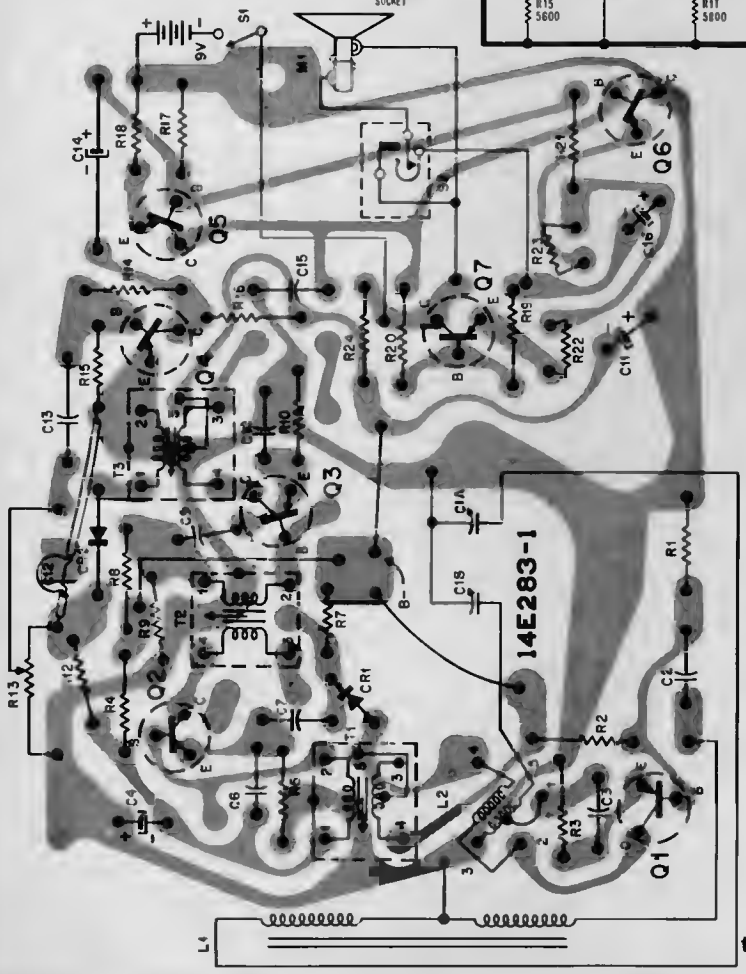
1. Turn set bottom side up and using a screw driver, force chassis forward by pushing on the front panel section visible through the elongated chassis mounting holes. A small elevation is provided on the section of the panel inside this slot for this purpose. After the AC interlock connection has been broken, the chassis with the front panel attached will slide forward easily and out of the rear section.

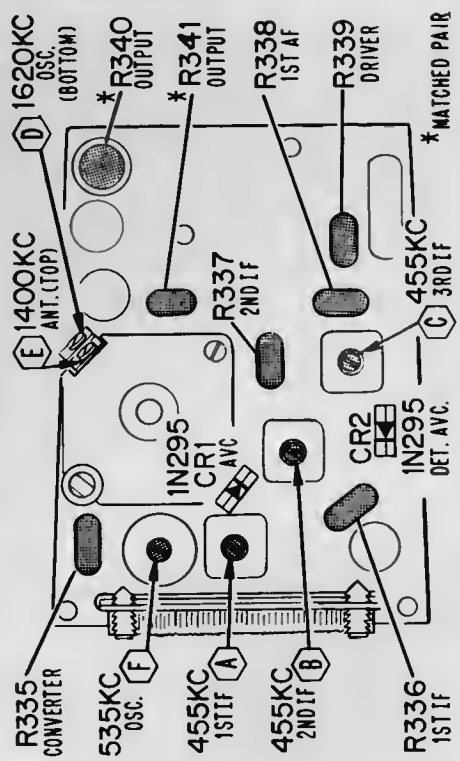
Admiral

CHASSIS 7A2

MODELS Y2061 : Y2063 • Y2067 • Y2068







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

Transistor and Alignment Point Locations

REMOVING CHASSIS FROM CABINET

Remove the three Phillips head screws securing the etched circuit board to the front case.

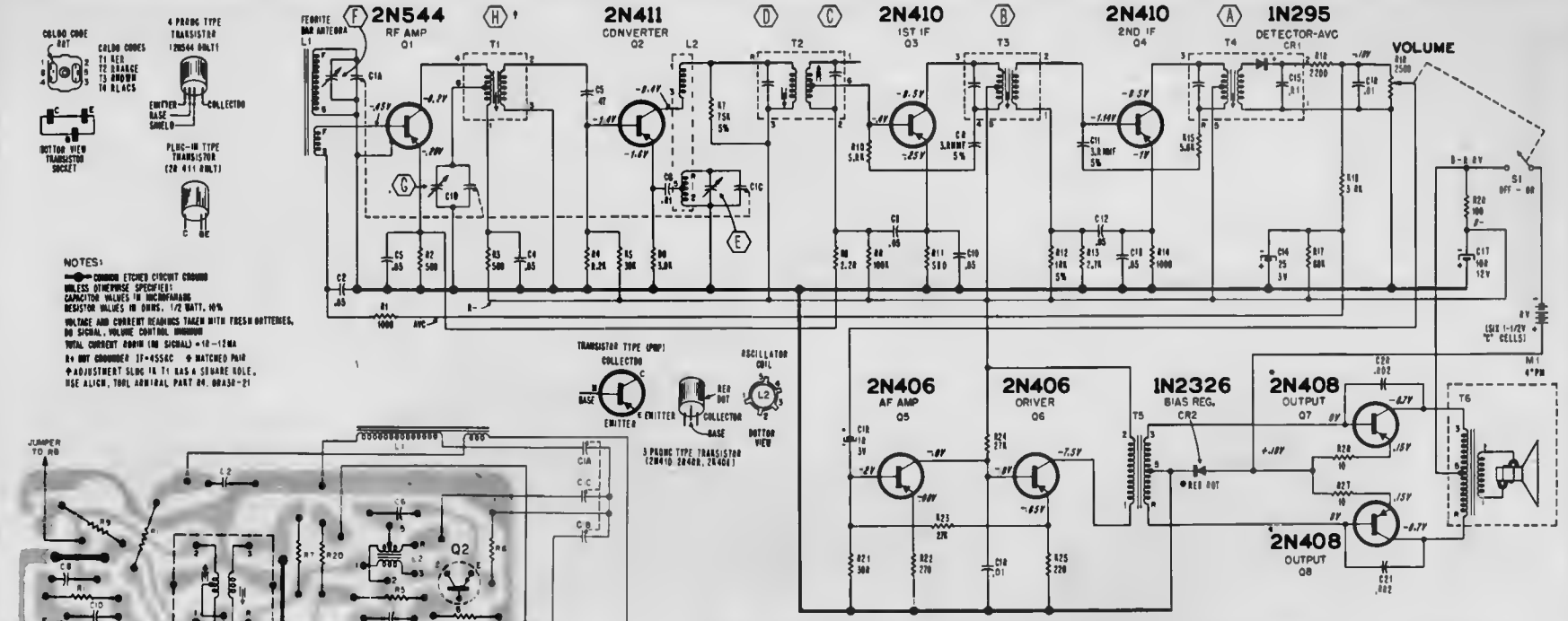
Admiral

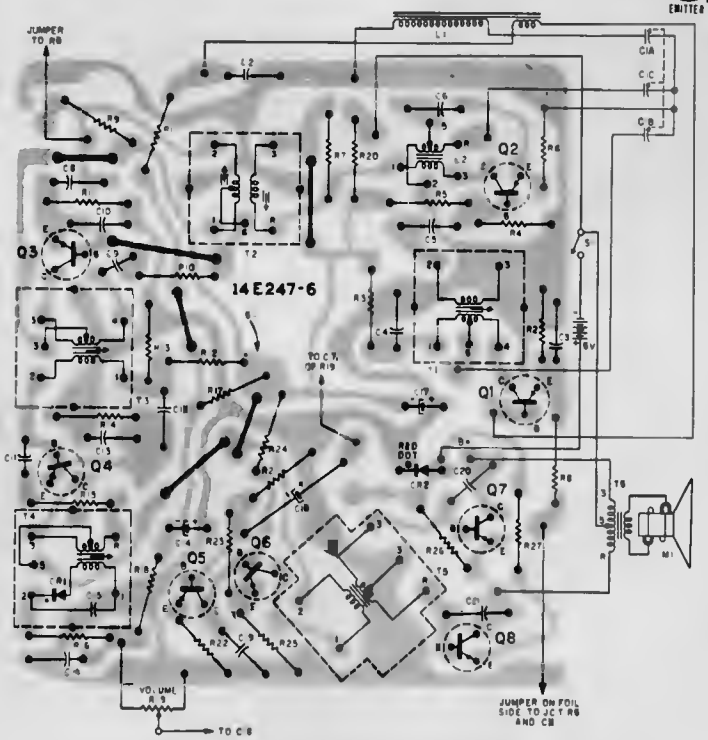
CHASSIS 7D2

MODEL Y2119

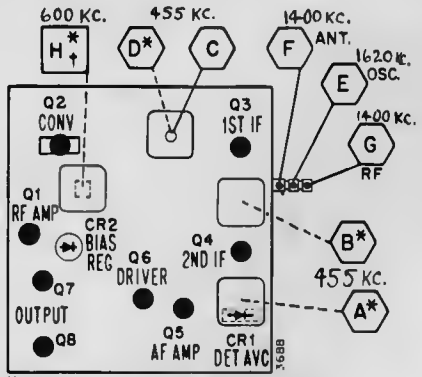
Rear View Showing Battery Case Removed.

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





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



*ADJUST FROM REAR SIDE OF BOARD
†ALIGNMENT SLUG HAS SQUARE HOLE

Top View of Chassis Showing Transistor and Alignment Point Locations.

REMOVING CHASSIS FROM CABINET

1. Remove the two knobs plus the two chassis mounting screws at the bottom of the cabinet, if used.
2. Unsnap back cover and remove battery case.
3. Remove the two nuts at the right corners of the chassis.
4. Keeping one hand on front escutcheon, slide chassis to right to remove from cabinet.

NOTE: The left side of the chassis (from rear) is held only by two flanges on the escutcheon.

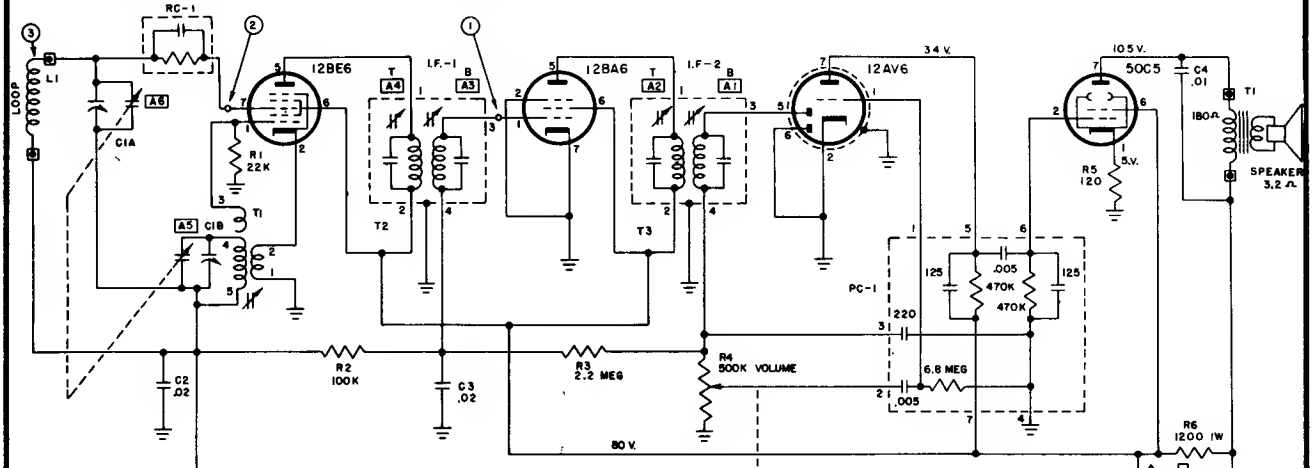
WARNING: NEVER ALLOW THE BATTERY CONNECTORS ON BATTERY HOLDER TO COME IN CONTACT WITH THE METAL CHASSIS.

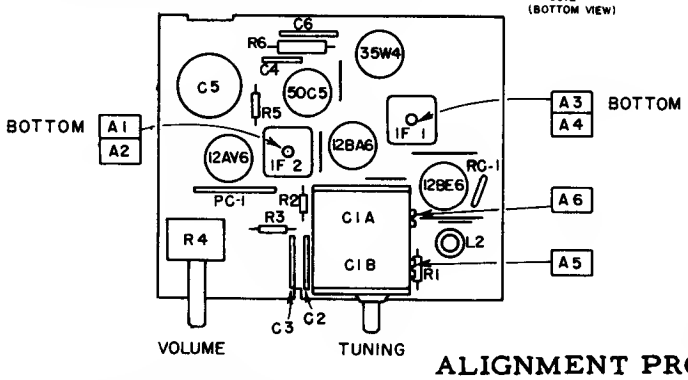
The contact of the negative clip to the metal chassis, even with the set turned off, can damage the "Battery Miser" diode.

Admiral

MODEL Y2127
CHASSIS 8D2

ARVIN RADIO MODELS 10R16 10R18 CODE 1.42202





APPROXIMATE SENSITIVITIES

CIRCUIT POINT	DUMMY TO GENERATOR	INPUT FOR .05 WATT OUTPUT (0.4 VOLTS ACROSS VC.)	INPUT FOR .5 WATT OUTPUT (1.26 VOLTS ACROSS VC.)
1	.05 μf AT 455 KC	2000 μV	5000 μV
2	.05 μf AT 455 KC	60	150
3	STANDARD LOOP AT 1000 KC	200 μV / M	500 μV / M

ALIGNMENT PROCEDURE

PRELIMINARY:

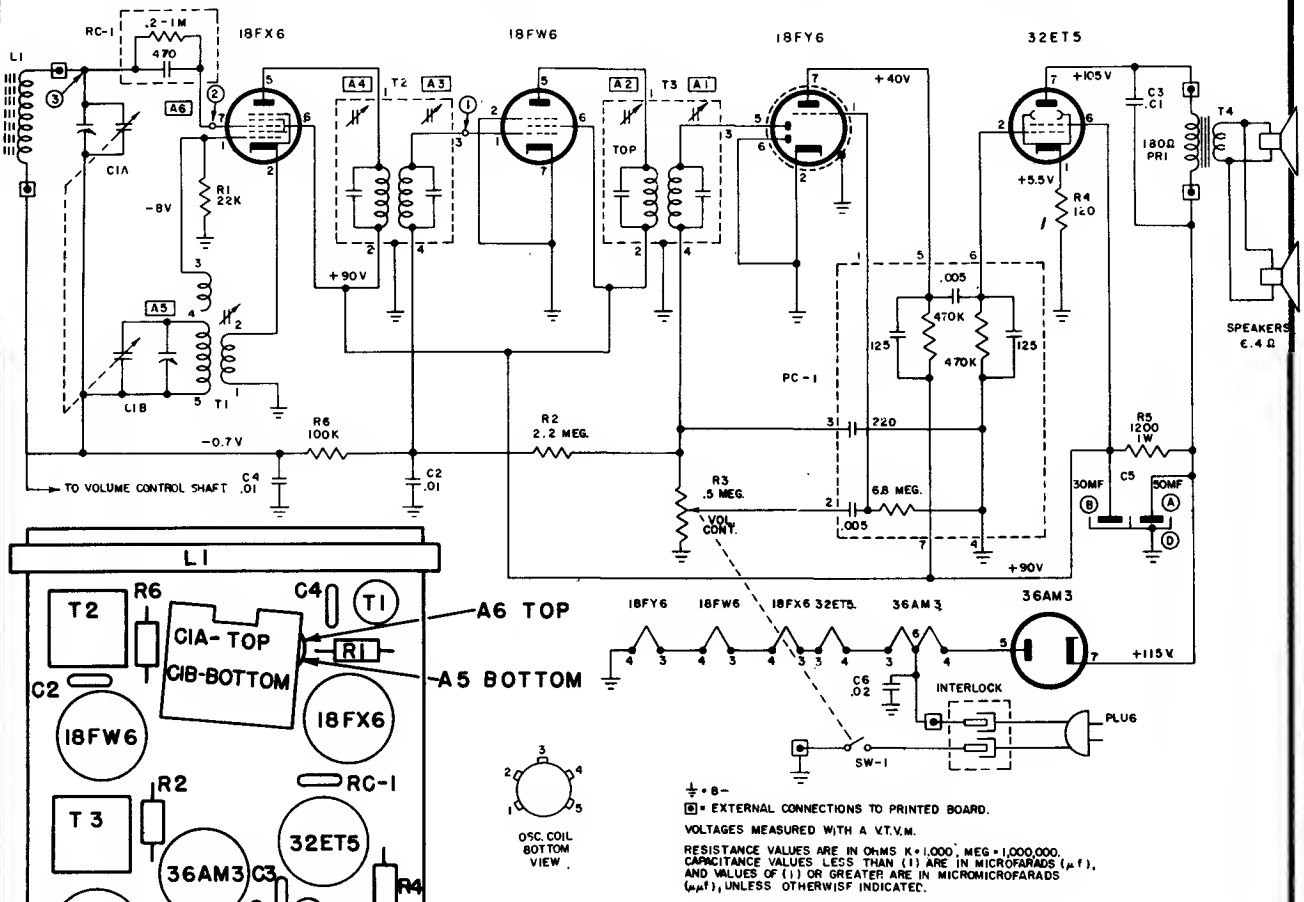
Output meter connection ..... Across speaker voice coil
Output meter reading to indicate 500 milliwatts (standard output)... 1.26 volts
Connection of generator ground lead ..... Floating ground
Generator modulation ..... 30% 400 cycles
Position of Volume Control ..... Fully clockwise

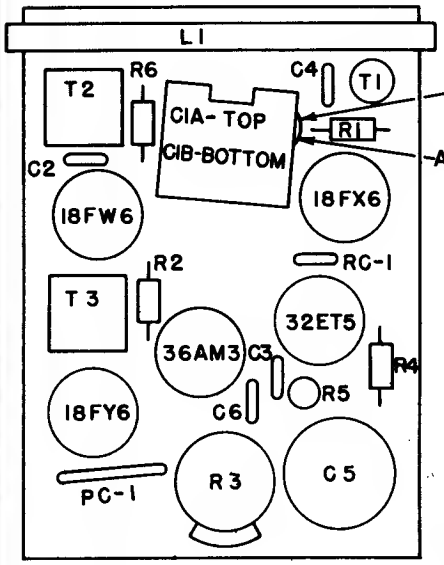
Position of Variable	Frequency of Generator	Dummy Antenna	Generator Output Connection	Trimmers Adjusted in Order Shown for Maximum Output	Function of Trimmer
Open	455 Kc	.05 μ fd	Pin 7 12BE6	A1, A2, A3, A4	I.F.
Open	1670 Kc		* Test Loop	A5	Oscillator
1400	1400 Kc		* Test Loop	A6	Antenna
1000	1000 Kc		* Test Loop	Fan C1A Plates	
600	600 Kc		* Test Loop	Fan C1A Plates	

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

The alignment procedure should be repeated in the original order for greatest accuracy. Always keep the output from the signal generator at its lowest possible value to make the AVC action of the receiver ineffective.

ARVIN MODELS 10R32 10R38 10R39 CHASSIS 1. 49801





ALIGNMENT PROCEDURE

Output meter connection . . . Across speaker voice coil
Connection of generator ground lead . . Floating ground
Generator modulation . . . . . 30% 400 cycles
Position of Volume Control. . . . . Fully clockwise

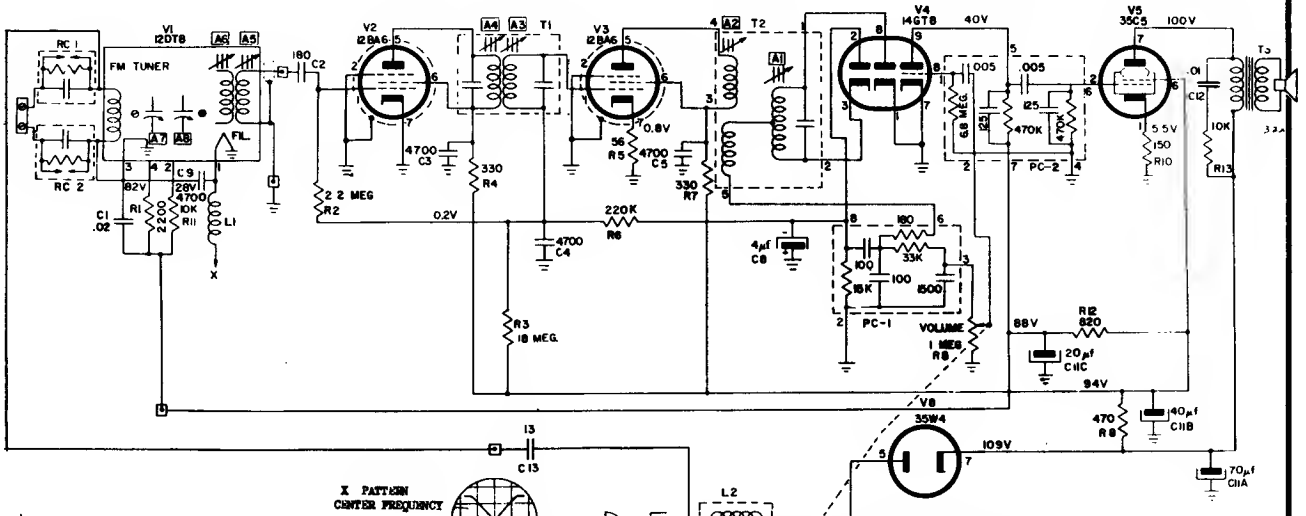
Position of Variable	Frequency of Generator	Dummy Antenna	Generator Output Connection	Trimmers Adjusted in Order Shown for Maximum Output	Function of Trimmer
Open	455 Kc	.05 μ fd	Pin 7 18FX6	A1, A2, A3, A4	I.F.
Open	1670 Kc		* Test Loop	A5	Oscillator
1400	1400 Kc		* Test Loop	A6	Antenna
1000	1000 Kc		* Test Loop	Fan C1A Plates	
600	600 Kc		* Test Loop	Fan C1A Plates	

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

The alignment procedure should be repeated in the original order for greatest accuracy. Always keep the output from the signal generator at its lowest possible value to make the AVC action of the receiver ineffective.

ARVIN MODELS 30R12 30R18

CODE 1. 48101
CODE 1. 48102

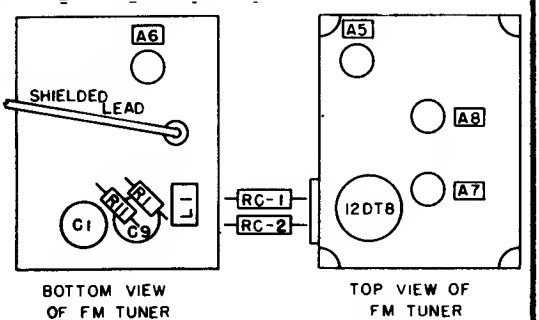


VOLTAGES MEASURED TO B- WITH A VTVM ±20%, NO SIGNAL. RESISTANCE VALUES ARE IN OHMS. K=1,000 MEG 1,000,000 CAPACITANCE VALUES LESS THAN (1) ARE IN MICROFARADS (μf), AND VALUES OF (1) OR GREATER ARE IN MICROMICROFARADS (μμf), UNLESS OTHERWISE INDICATED.

ALIGNMENT PROCEDURE

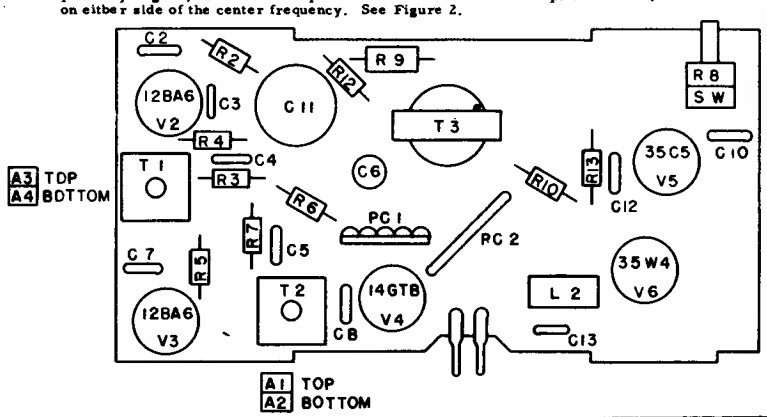
Detector and I. F. alignment using signal Generator and Oscilloscope.

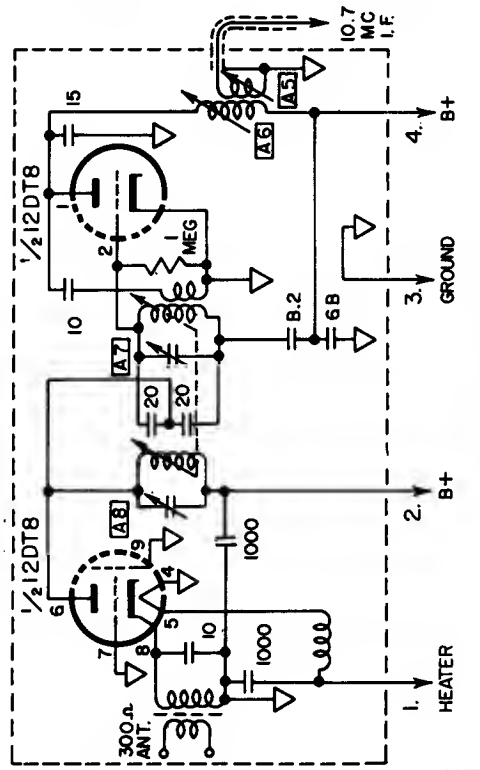
1. Connect FM Generator, High Side, to grid (pin 1) of 12BA6 2nd I. F. tube through .01 mfd. dummy.
2. Set generator frequency to 10.7 Mc. modulated either 60 cycles or 400 cycles, 480 Kc sweep (240 Kc deviation)
3. Connect vertical input of scope across volume control of receiver (grounded terminal to B-, ungrounded terminal to high side of control).
4. Set scope switch for internal synchronization and set horizontal oscillator to 2X frequency of modulating voltage of generator. (120 or 800 cycles)
5. Tune FM to high end of band.
6. Adjust frequency vernier of horizontal oscillator on scope until the pattern becomes stationary.
7. Adjust ratio detector primary slug No. A2 (outer peak) for maximum vertical sweep of the scope pattern.
8. Adjust ratio detector secondary slug No. A1 (outer peak) to center the cross-over point of the pattern. Pattern should look like Figure 1, with the same amount of curve on both ends, and the cross-over point in the center.
9. Adjust I. F. slugs A3, A4 (outer peak) for greatest vertical sweep of the pattern, consistent with linearity. If the I. F. slugs are adjusted for maximum sweep of the pattern, the pattern may become non-linear. Therefore, adjustment should be made for the greatest sweep which can be obtained and still have all four ends of the "X" pattern similar in size and shape.
10. Connect generator to antenna across on the back of the chassis.
11. Adjust tuner slugs A5, A6 for greatest vertical sweep consistent with linearity.
12. Check the alignment of the I. F. and detector circuits by varying the signal generator frequency above and below the center frequency of 10.7 Mc. If the receiver is perfectly aligned, two small "X" patterns of similar size and shape will result, one on either side of the center frequency. See Figure 2.



BOTTOM VIEW OF FM TUNER

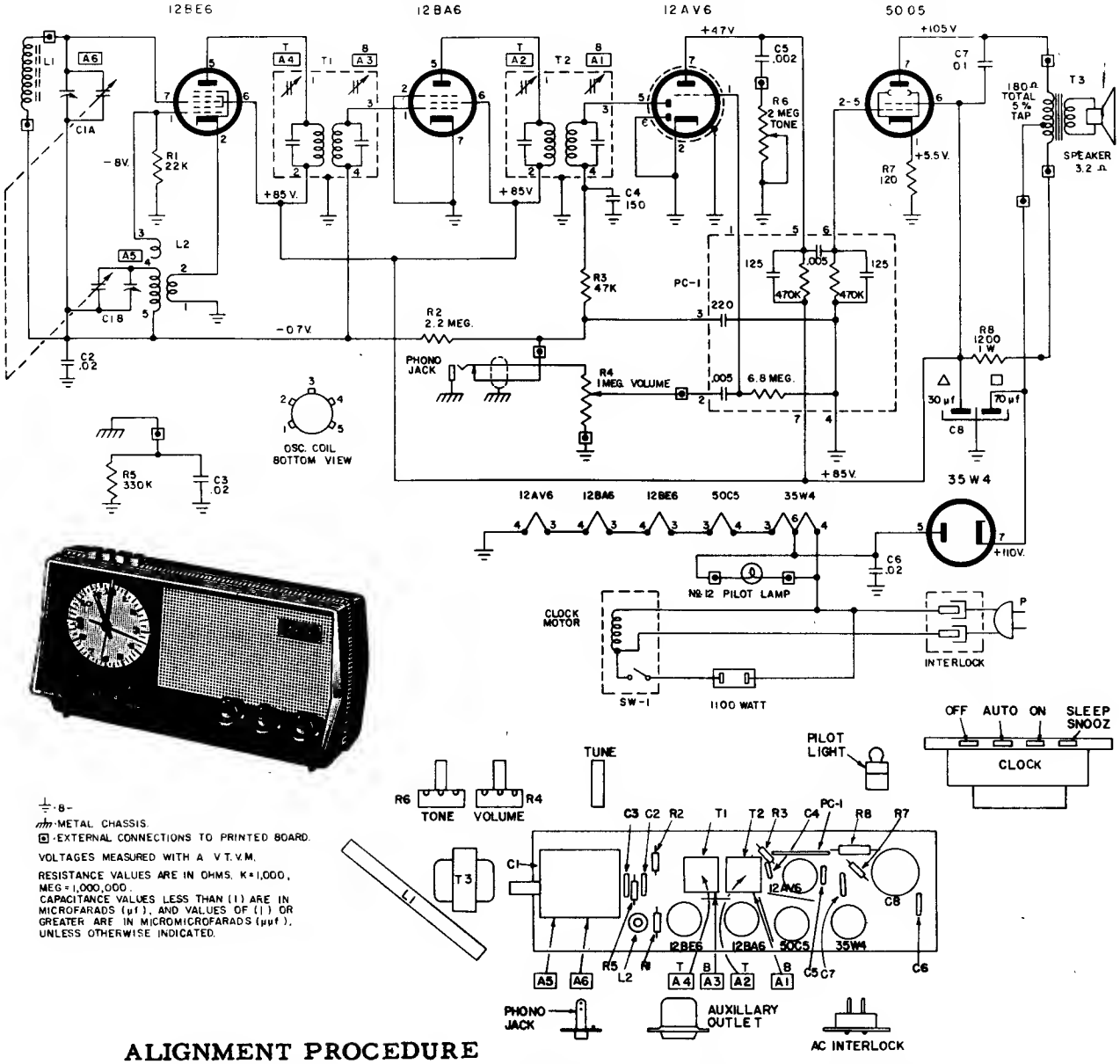
TOP VIEW OF FM TUNER





TUNER SCHEMATIC

ARVIN RADIO MODELS 50R65 50R67 CODE 1.47001



⏚-B-
⏚ METAL CHASSIS.
⊡ EXTERNAL CONNECTIONS TO PRINTED BOARD.

VOLTAGES MEASURED WITH A V.T.V.M.

RESISTANCE VALUES ARE IN OHMS, K=1,000, MEG=1,000,000. CAPACITANCE VALUES LESS THAN (1) ARE IN MICROFARADS (μf), AND VALUES OF (1) OR GREATER ARE IN MICROMICROFARADS (μμf), UNLESS OTHERWISE INDICATED.

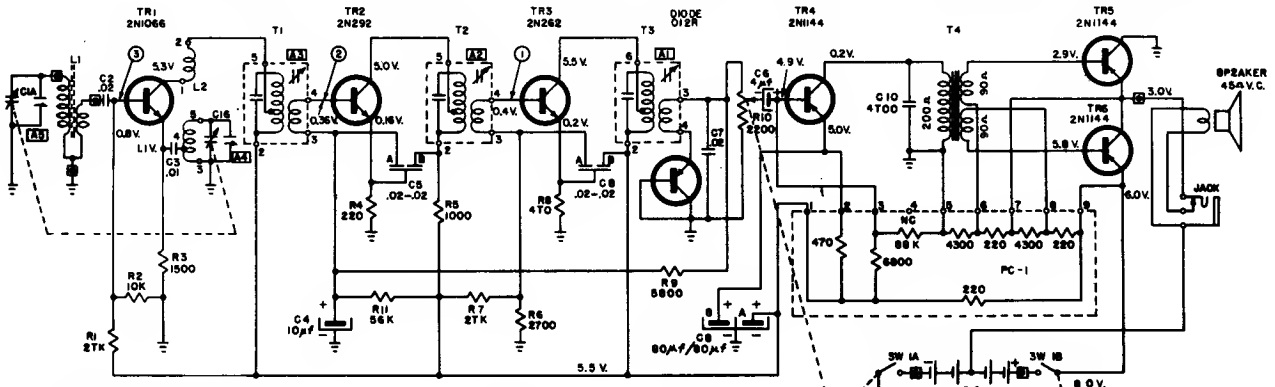
ALIGNMENT PROCEDURE

Position of Variable	Frequency of Generator	Dummy Antenna	Generator Output Connection	Trimmers Adjusted in Order Shown for Maximum Output	Functions of Trimmer
Open	455	.05 μf	Pin 7 12BE6	A1, A2, A3, A4	I.F.
Open	1670		* Test Loop	A5	Oscillator
1400	1400		* Test Loop	A6	Antenna
600	600		* Test Loop	Check Point	

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

The alignment procedure should be repeated in the original order for greatest accuracy. Always keep the output from the signal generator at its lowest possible value to make the AVC action of the receiver ineffective.

Arvin MODELS 60R23 60R28 60R29 CHASSIS 1.49201

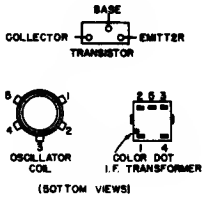


CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (μf), AND VALUES GREATER THAN 1.0 ARE IN MICRO-MICROFARADS (μμf) EXCEPT WHERE NOTED.

VOLTAGE READINGS TO COMMON GROUND ARE MEASURED WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS WITH TUNING CAPACITOR CLOSED AND VOLUME CONTROL AT MAXIMUM CLOCKWISE ROTATION.

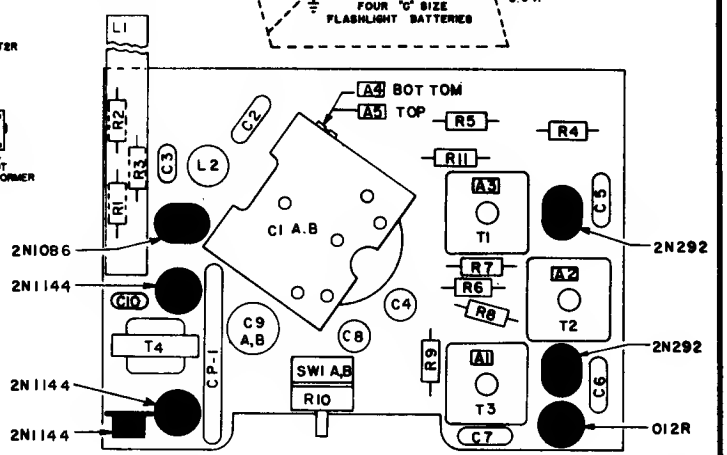
RESISTANCE VALUES ARE IN OHMS, K=1000.

⏚ = COMMON GROUND SYMBOL.
⊞ = EXTERNAL CONNECTION TO PRINTED CIRCUIT. TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS, 5 TO 8 MA.

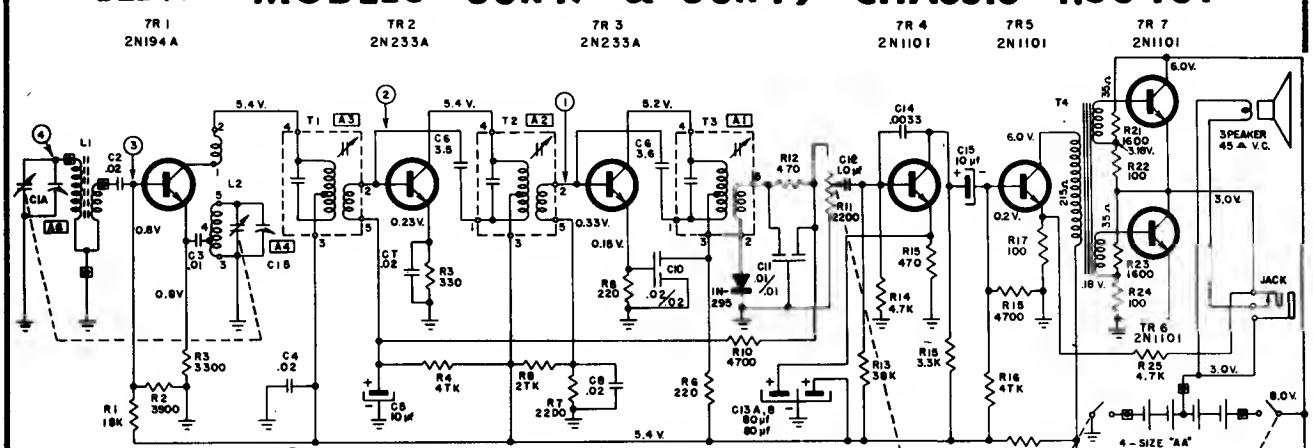


I. F. 455 KC.

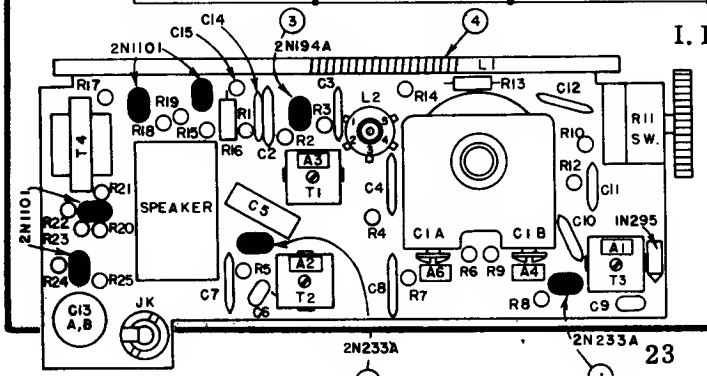
SIGNAL TEST POINTS	TEST FREQUENCY	SERIES CAPACITOR TO GENERATOR	INPUT FOR 5MW OUTPUT (47Ω ACROSS 4Ω VC)
①	455 KC	.05μf	2000μV
②	455 KC	.05μf	110μV
③	455 KC	.05μf	4μV
④	1000 KC	STANDARD LOOP	300μV M



Arvin MODELS 60R47 & 60R49 CHASSIS 1.50401



I. F. 455 KC.

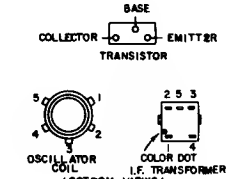


CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (μf) AND VALUES GREATER THAN 1.0 ARE IN MICRO-MICROFARADS (μμf) EXCEPT WHERE NOTED.

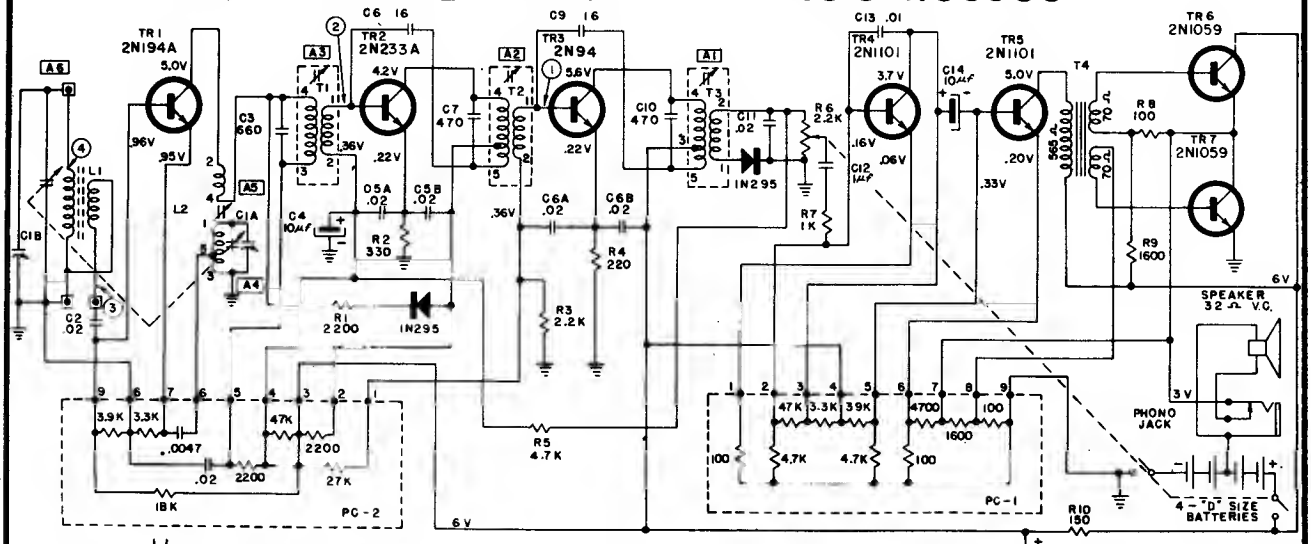
VOLTAGE READINGS TO COMMON GROUND ARE MEASURED WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS WITH TUNING CAPACITOR CLOSED AND VOLUME CONTROL AT MAXIMUM CLOCKWISE ROTATION.

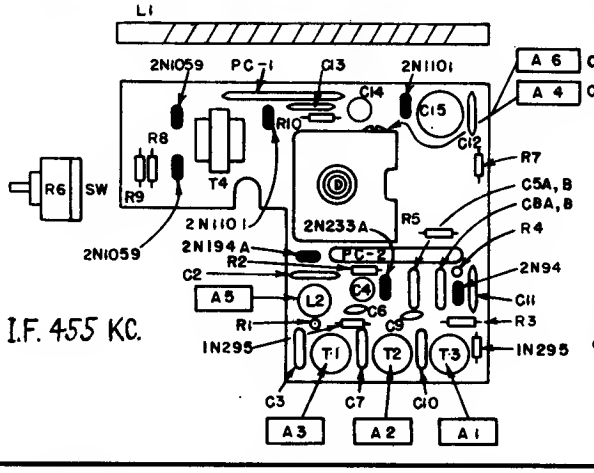
RESISTANCE VALUES ARE IN OHMS; K=1000.

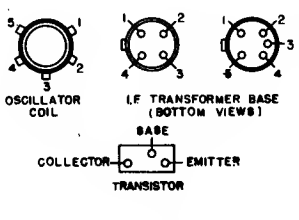
+ =COMMON GROUND SYMBOL.
⊞ =EXTERNAL CONNECTION TO PRINTED CIRCUIT. UNDER NO SIGNAL CONDITIONS WITH TUNING CAPACITOR CLOSED AND VOLUME CONTROL AT TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS, 7 TO 11 MA.



Arvin MODEL 60R58 CHASSIS 1.50300







RESISTANCE VALUES ARE IN OHMS; K=1000.

CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (μf), & VALUES GREATER THAN 1.0 ARE IN MICRO-MICROFARADS (μμf) EXCEPT WHERE NOTED.

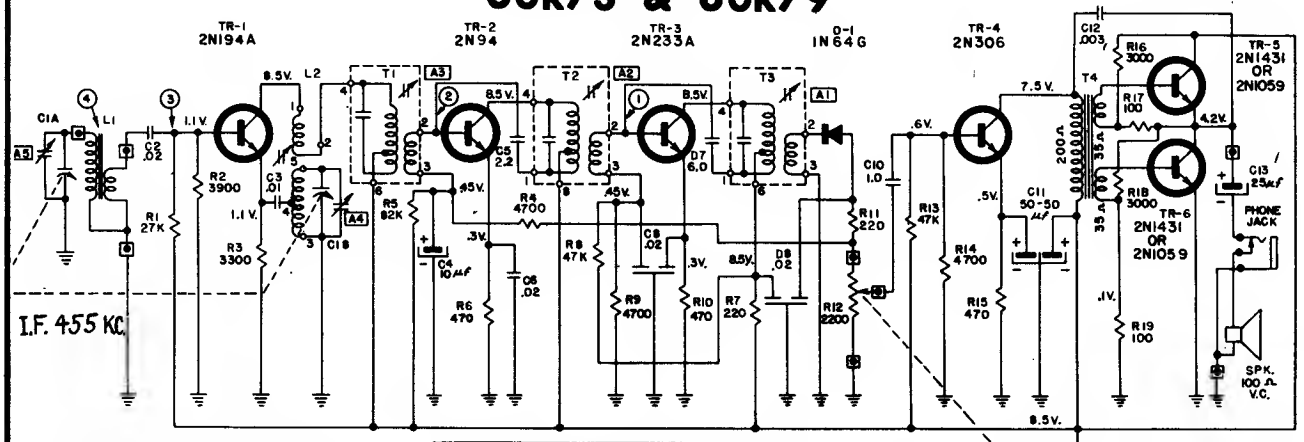
VOLTAGE READINGS TO COMMON GROUND ARE MEASURED WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS WITH TUNING CAPACITOR CLOSED & VOLUME CONTROL AT MAXIMUM CLOCKWISE ROTATION.

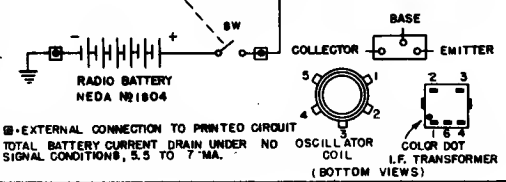
⏚ - COMMON GROUND SYMBOL.

⊡ - EXTERNAL CONNECTION TO PRINTED CIRCUIT.

SIGNAL TEST POINT	TEST FREQUENCY	SERIES CAPACITOR TO GENERATOR	INPUT FOR 50 M W OUTPUT (1.26 V. ACROSS 32Ω)
1	455 KC	.05 μf	900 μV
2	455 KC	.05 μf	30 μV
3	455 KC	.05 μf	5 μV
4	1000 KC	STANDARD LOOP	200 μV/M

ARVIN MODELS 60R63 & 60R69 60R73 & 60R79 CHASSIS 1.50101





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 VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS WITH TUNING CAPACITOR CLOSED AND VOLUME CONTROL AT MAXIMUM CLOCKWISE ROTATION.

RESISTANCE VALUES ARE IN OHMS; K=1000.

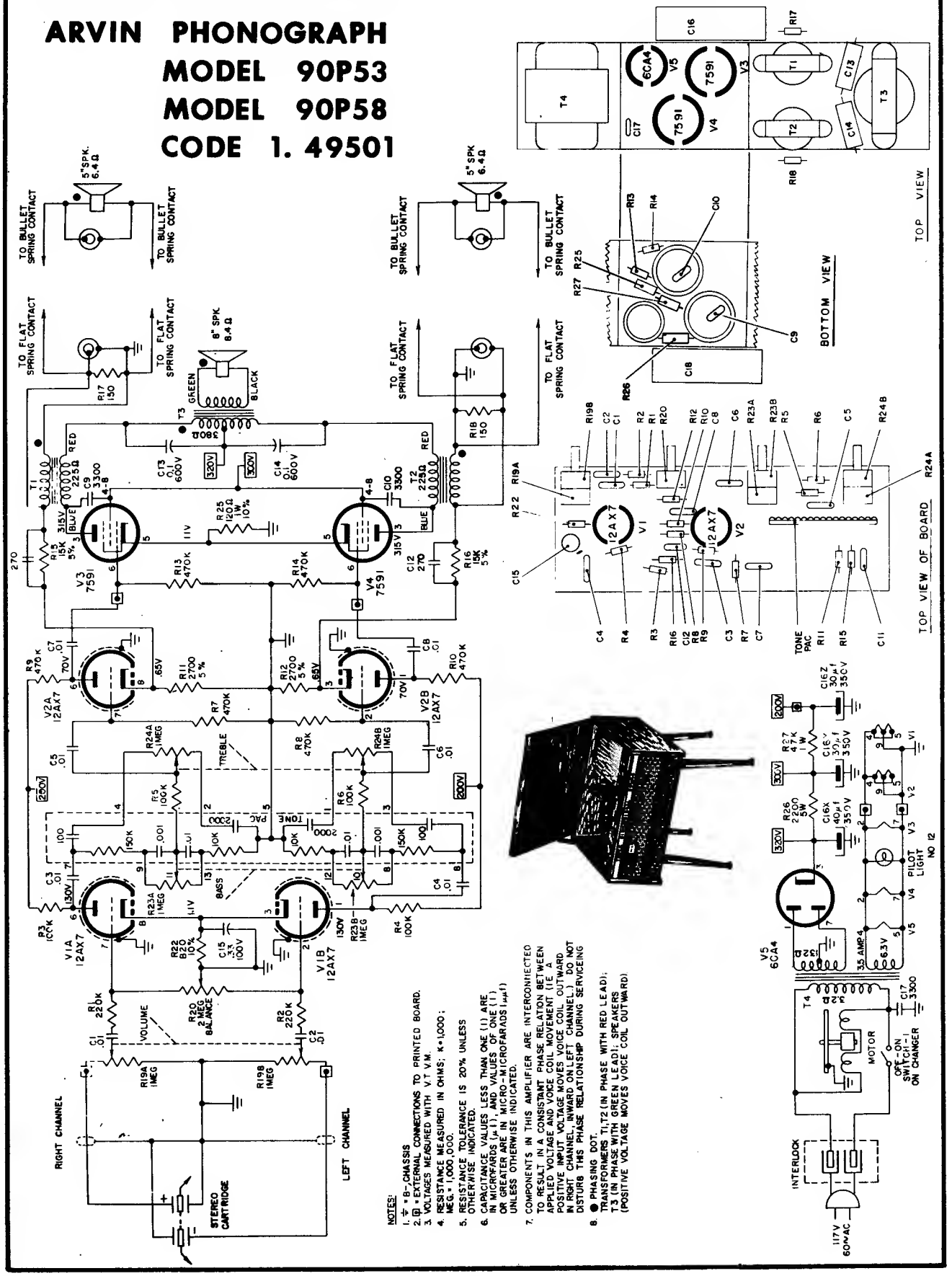
⏚ - COMMON GROUND SYMBOL.

SIGNAL TEST POINTS	TEST FREQUENCY	SERIES CAPACITOR TO GENERATOR	INPUT FOR 9 M W OUTPUT (1.7 V ACROSS 100Ω)
①	455KC	.05μf	500μV
②	455KC	.05μf	50 μV
③	455KC	.05μf	2 μV
④	1000KC	STANDARD LOOP	200 μV/M

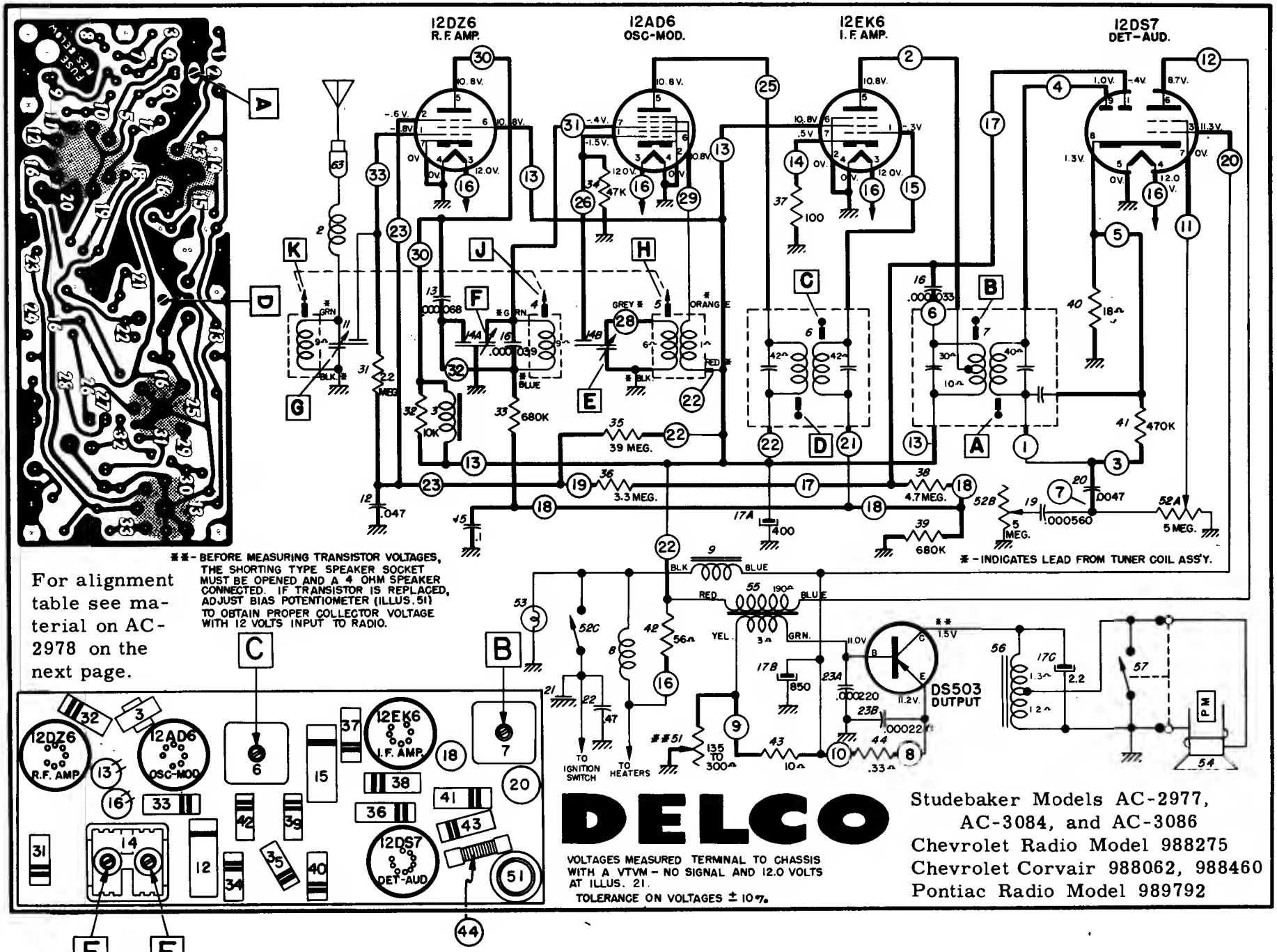
⊡ - EXTERNAL CONNECTION TO PRINTED CIRCUIT

TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS, 5.5 TO 7 MA.

ARVIN PHONOGRAPH
MODEL 90P53
MODEL 90P58
CODE 1. 49501

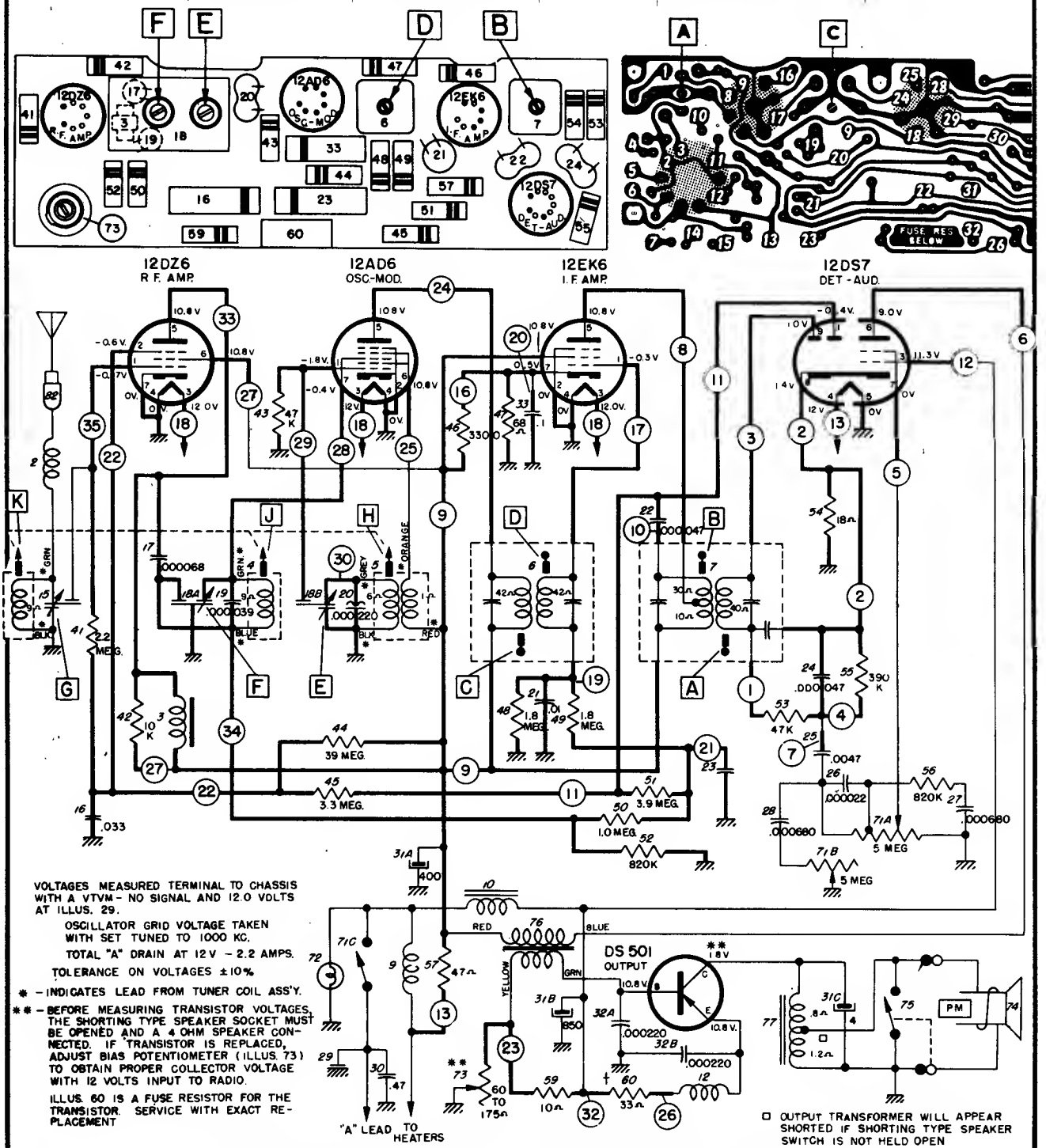


NOTES:
1. ⏚ = B- CHASSIS
2. Ⓔ = EXTERNAL CONNECTIONS TO PRINTED BOARD.
3. VOLTAGES MEASURED WITH V.T.V.M.
4. RESISTANCE MEASURED IN OHMS; K=1,000; MEG.=1,000,000.
5. RESISTANCE TOLERANCE IS 20% UNLESS OTHERWISE INDICATED.
6. CAPACITANCE VALUES LESS THAN ONE (1) ARE IN MICROFARDS (μf), AND VALUES OF ONE (1) OR GREATER ARE IN MICRO-MICROFARADS (μμf) UNLESS OTHERWISE INDICATED.
7. COMPONENTS IN THIS AMPLIFIER ARE INTERCONNECTED TO RESULT IN A CONSISTANT PHASE RELATION BETWEEN APPLIED VOLTAGE AND VOICE COIL MOVEMENT (IE. A POSITIVE INPUT VOLTAGE MOVES VOICE COIL OUTWARD IN RIGHT CHANNEL, INWARD ON LEFT CHANNEL.) DO NOT DISTURB THIS PHASE RELATIONSHIP DURING SERVICING
8. ● PHASING DOT.
   TRANSFORMERS T1,T2 (IN PHASE WITH RED LEAD);
   T3 (IN PHASE WITH GREEN LEAD); SPEAKERS
   (POSITIVE VOLTAGE MOVES VOICE COIL OUTWARD)


12DZ6
R.F. AMP.
12AD6
OSC-MOD.
12EK6
I.F. AMP.
12DS7
DET-AUD.
BOTTOM VIEW
** - BEFORE MEASURING TRANSISTOR VOLTAGES, THE SHORTING TYPE SPEAKER SOCKET MUST BE OPENED AND A 4 OHM SPEAKER CONNECTED. IF TRANSISTOR IS REPLACED, ADJUST BIAS POTENTIOMETER (ILLUS. 51) TO OBTAIN PROPER COLLECTOR VOLTAGE WITH 12 VOLTS INPUT TO RADIO.
* - INDICATES LEAD FROM TUNER COIL ASS'Y.
For alignment table see material on AC-2978 on the next page.
DS503 OUTPUT
TO IGNITION SWITCH
TO HEATERS
VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VTVM - NO SIGNAL AND 12.0 VOLTS AT ILLUS. 21.
TOLERANCE ON VOLTAGES ± 10%.
DELCO
Studebaker Models AC-2977, AC-3084, and AC-3086
Chevrolet Radio Model 988275
Chevrolet Corvair 988062, 988460
Pontiac Radio Model 989792

DELCO Studebaker Radio Models AC-2978, AC-3085, AC-3087

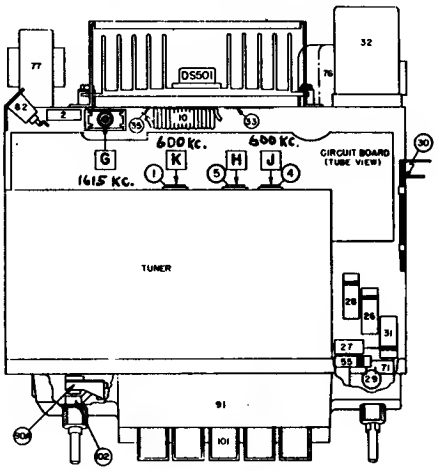
STEPS	SERIES CAPACITOR OR DUMMY ANTENNA	CONNECT SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	TUNE RECEIVER TO	ADJUST IN SEQUENCE FOR MAX. OUTPUT
1	0.1 Mfd.	12AD6 Grid (Pin #7)	262 KC.	High Frequency Stop	A, B, D, C,
2	0.000068 Mfd.	Antenna Connector	1615 KC.	High Frequency Stop	*E, F, G
3	0.000068 Mfd.	Antenna Connector	600 KC.	Signal Generator Signal	J, K
4	0.000068 Mfd.	Antenna Connector	1615 KC.	High Frequency Stop	F, G

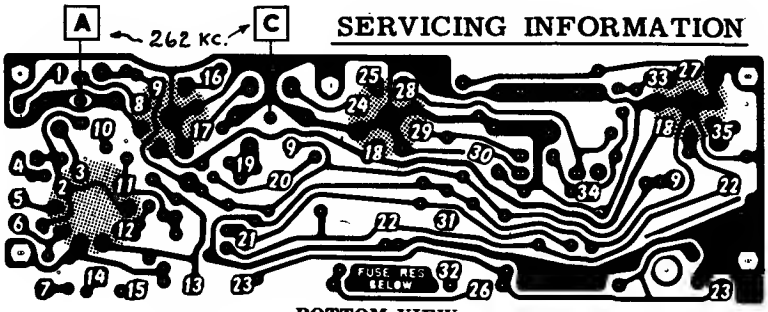


STUDEBAKER AC-2978—PRINTED CIRCUIT SHOWN IN HEAVY LINES.

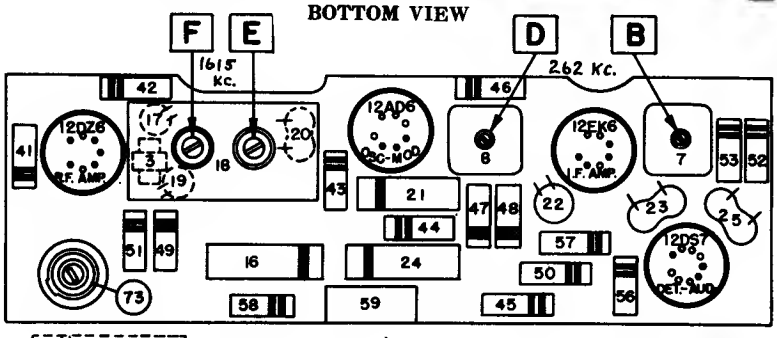
DELCO

BUICK MODEL 980051

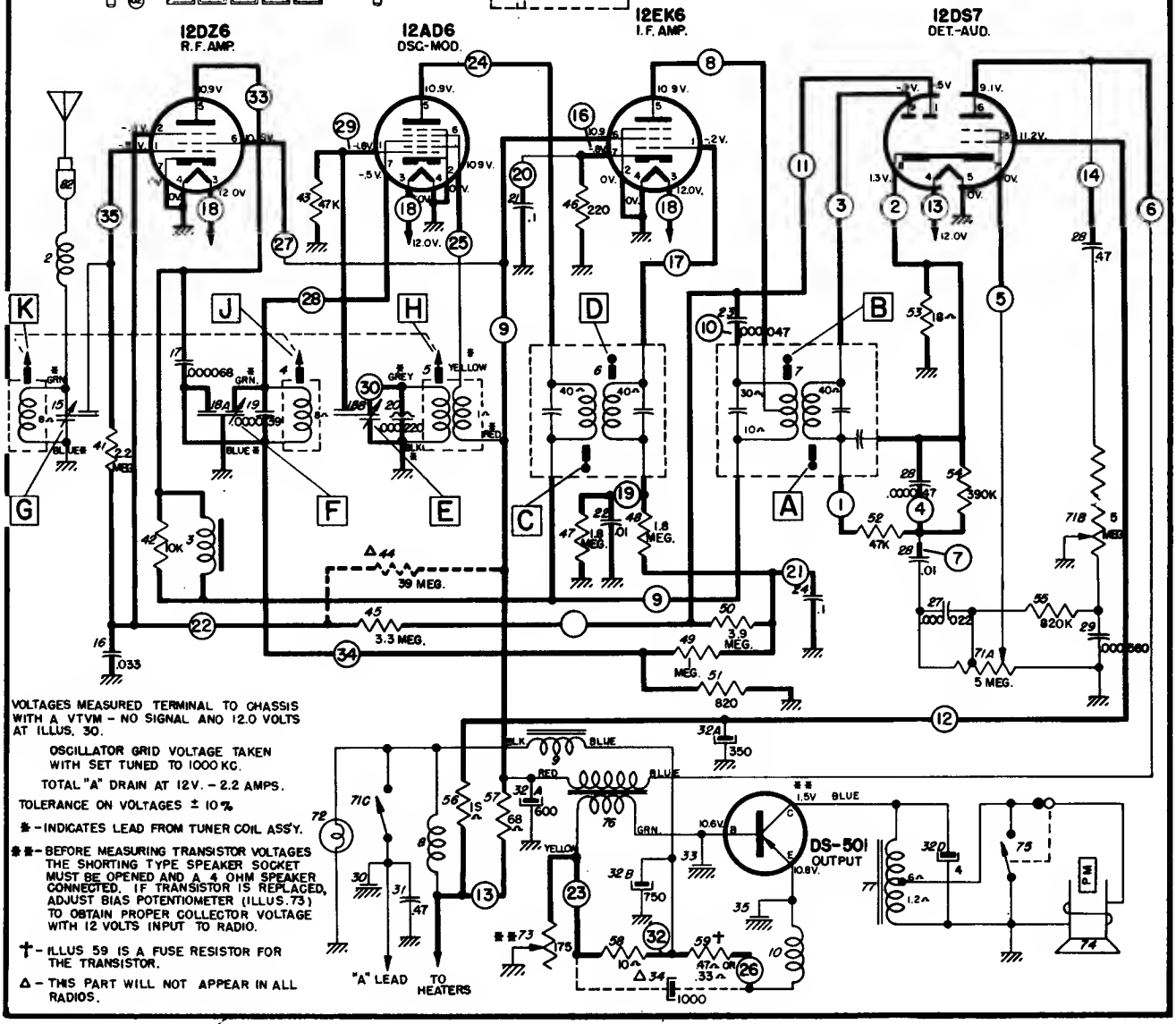




BOTTOM VIEW



TOP VIEW



VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VTVM - NO SIGNAL AND 12.0 VOLTS AT ILLUS. 30.

OSCILLATOR GRID VOLTAGE TAKEN WITH SET TUNED TO 1000 KC.

TOTAL "A" DRAIN AT 12V. - 2.2 AMPS.

TOLERANCE ON VOLTAGES ± 10%

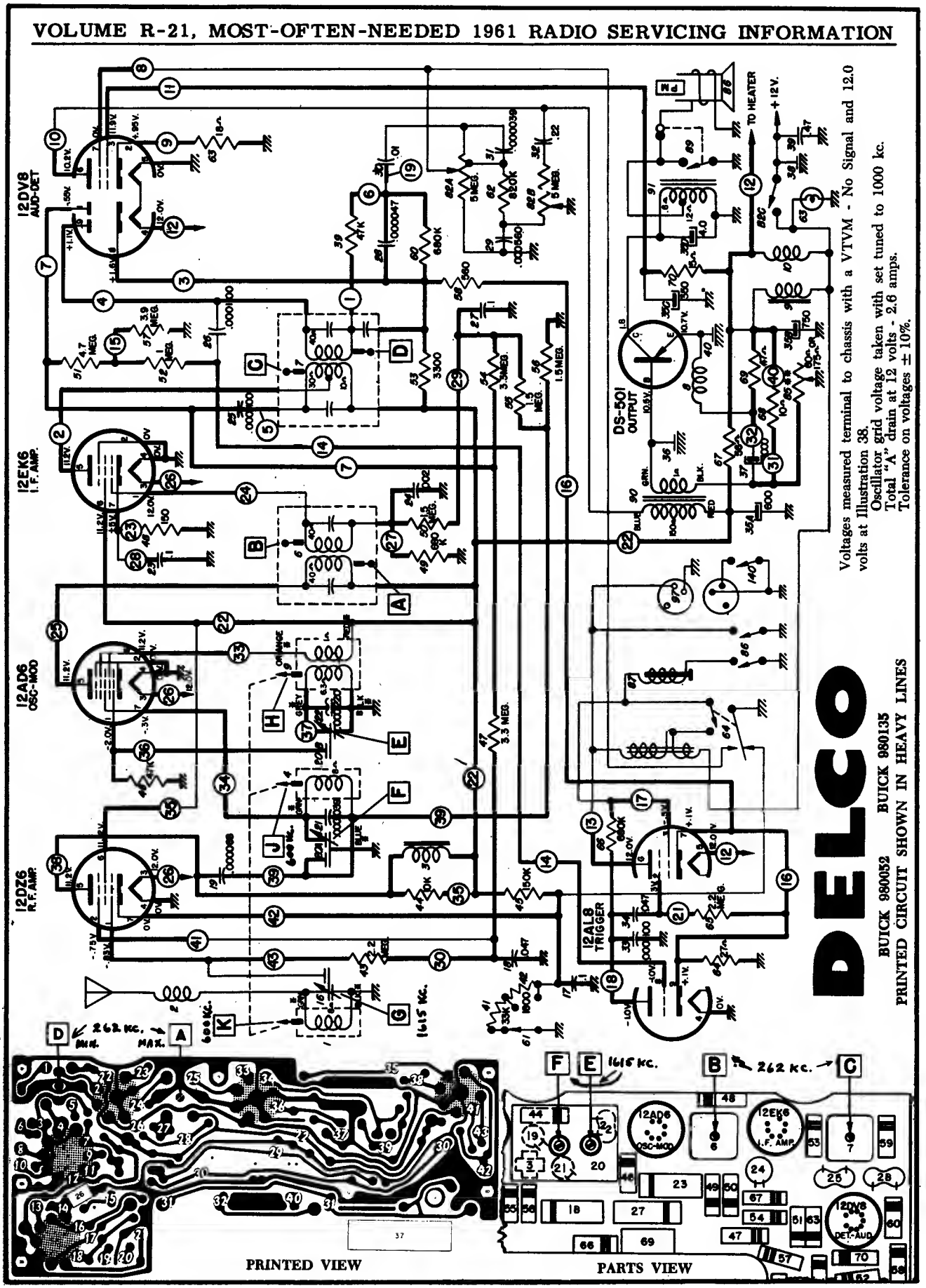
* - INDICATES LEAD FROM TUNER COIL ASS'Y.

** - BEFORE MEASURING TRANSISTOR VOLTAGES THE SHORTING TYPE 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 59 IS A FUSE RESISTOR FOR THE TRANSISTOR.

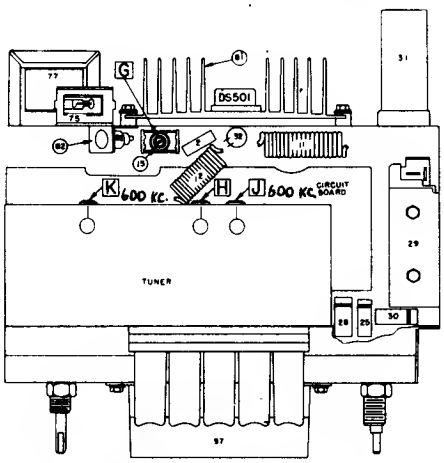
Δ - THIS PART WILL NOT APPEAR IN ALL RADIOS.

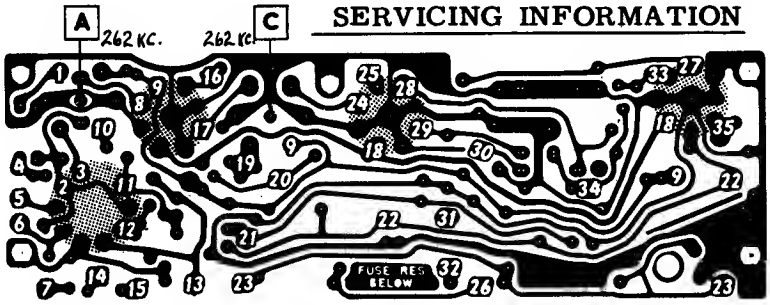
PRINTED CIRCUIT SHOWN IN HEAVY LINES


12DV8
AUD-DET
12EK6
I.F. AMP.
12AD6
OSC-MOD
12DZ6
R.F. AMP.
12AL8
TRIGGER
DS-501
OUTPUT
TO HEATER
+12V.
Voltages measured terminal to chassis with a VTVM - No Signal and 12.0 volts at Illustration 38.
Oscillator grid voltage taken with set tuned to 1000 kc.
Total "A" drain at 12 volts - 2.6 amps.
Tolerance on voltages ±10%.
DELCO
BUICK 980052
BUICK 980135
PRINTED CIRCUIT SHOWN IN HEAVY LINES
262 KC. MIN.
MAX.
600 KC.
1615 KC.
PRINTED VIEW
PARTS VIEW

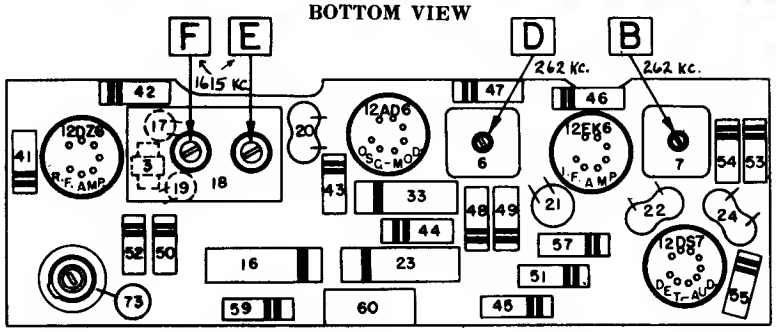
DELCO

CHEVROLET MODEL 988276

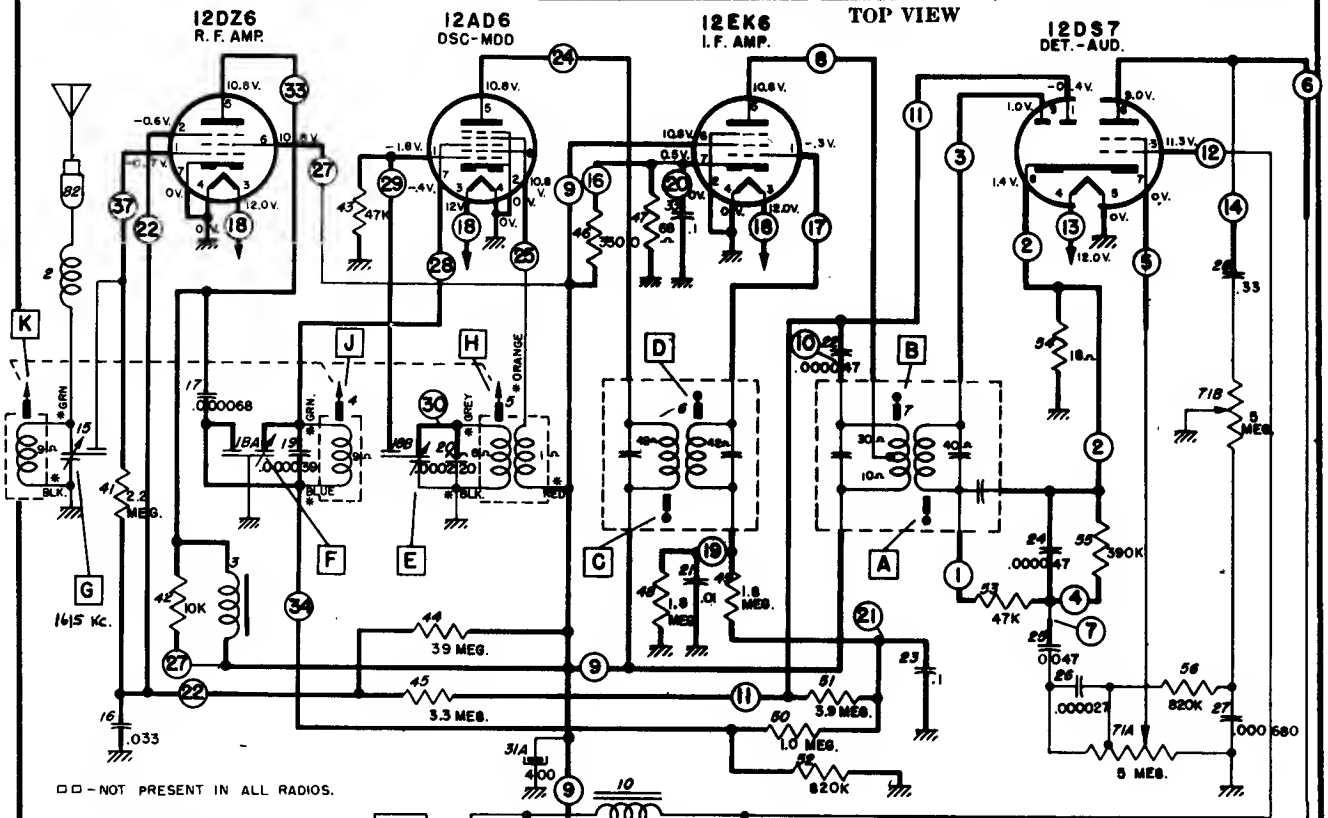




BOTTOM VIEW



TOP VIEW



□□ – NOT PRESENT IN ALL RADIOS.

VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VTVM – NO SIGNAL AND 12.0 VOLTS AT ILLUS. 29.

OSCILLATOR GRID VOLTAGE TAKEN WITH SET TUNED TO 1000 KC.

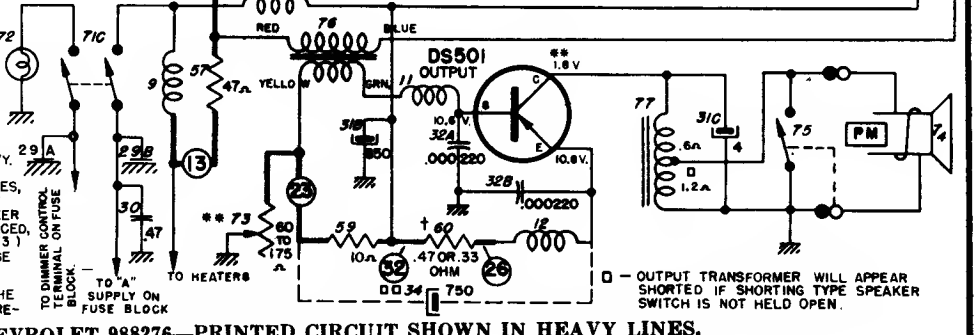
TOTAL "A" DRAIN AT 12 V. – 2.2 AMPS.

TOLERANCE ON VOLTAGES ± 10%

* – INDICATES LEAD FROM TUNER COIL ASS'Y.

** – BEFORE MEASURING TRANSISTOR VOLTAGES, THE SHORTING TYPE 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. 60 IS A FUSE RESISTOR FOR THE TRANSISTOR. SERVICE WITH EXACT REPLACEMENT.



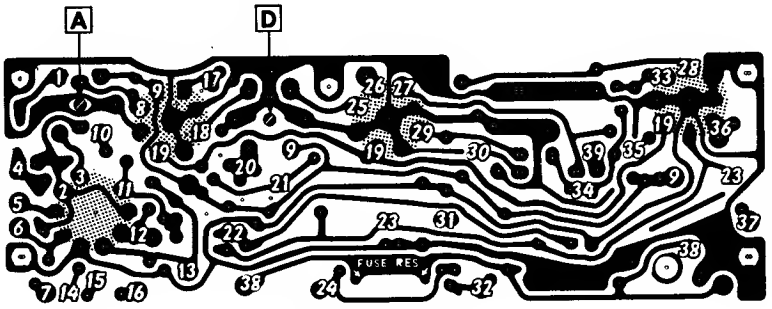
□ – OUTPUT TRANSFORMER WILL APPEAR SHORTED IF SHORTING TYPE SPEAKER SWITCH IS NOT HELD OPEN.

CHEVROLET 988276—PRINTED CIRCUIT SHOWN IN HEAVY LINES.

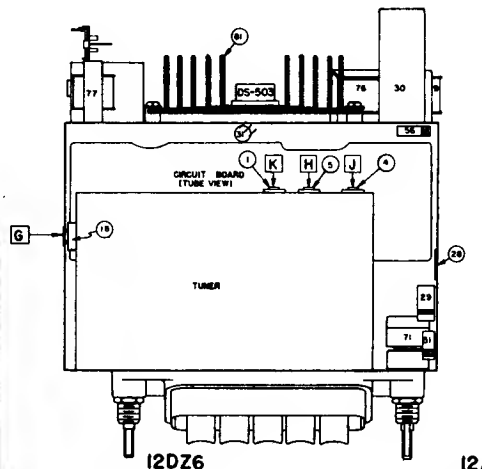
DELCO

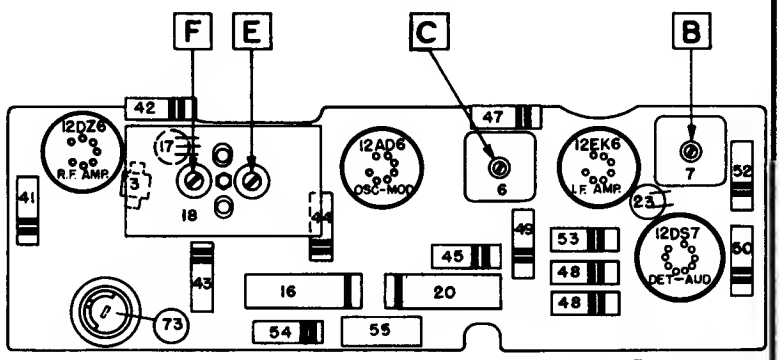
BUICK MODEL 980132
OLDSMOBILE MODEL 989387

Alignment in Table 3, Page 38

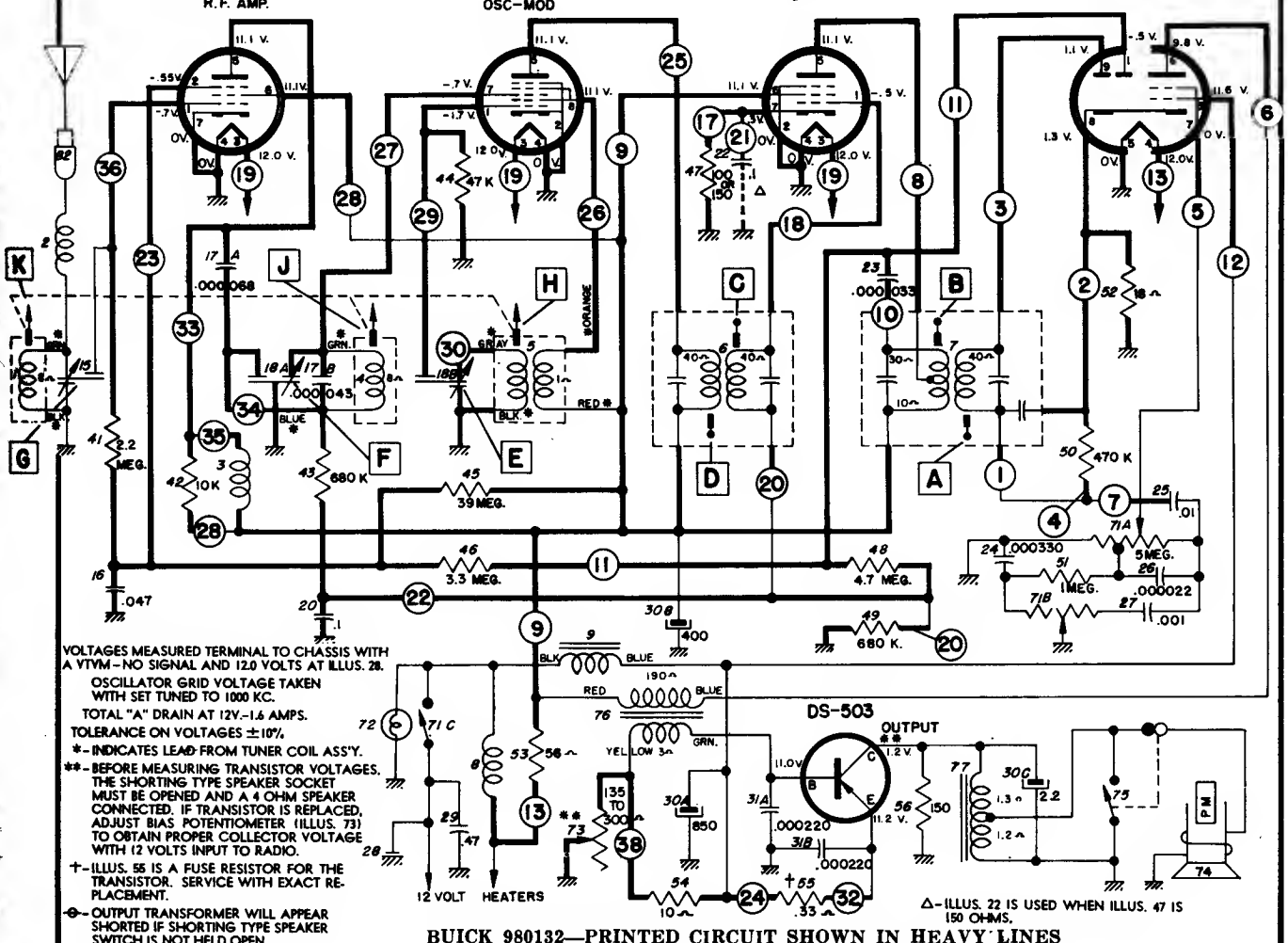


BOTTOM VIEW





TOP VIEW



VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VTVM – NO SIGNAL AND 12.0 VOLTS AT ILLUS. 28.

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 TYPE 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.

⊖–OUTPUT TRANSFORMER WILL APPEAR SHORTED IF SHORTING TYPE SPEAKER SWITCH IS NOT HELD OPEN.

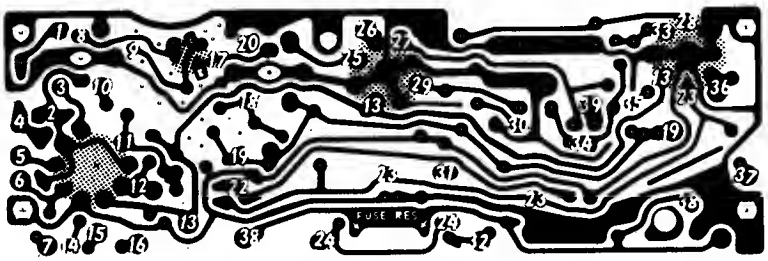
Δ–ILLUS. 22 IS USED WHEN ILLUS. 47 IS 150 OHMS.

BUICK 980132—PRINTED CIRCUIT SHOWN IN HEAVY LINES

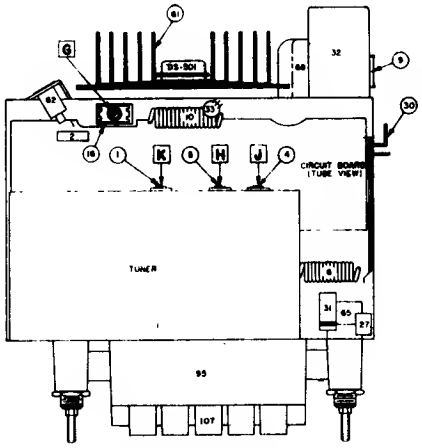
DELCO

BUICK MODEL 980134

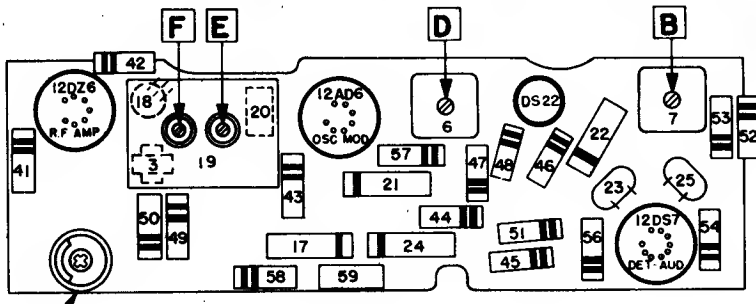
Alignment in Table 1, Page 38



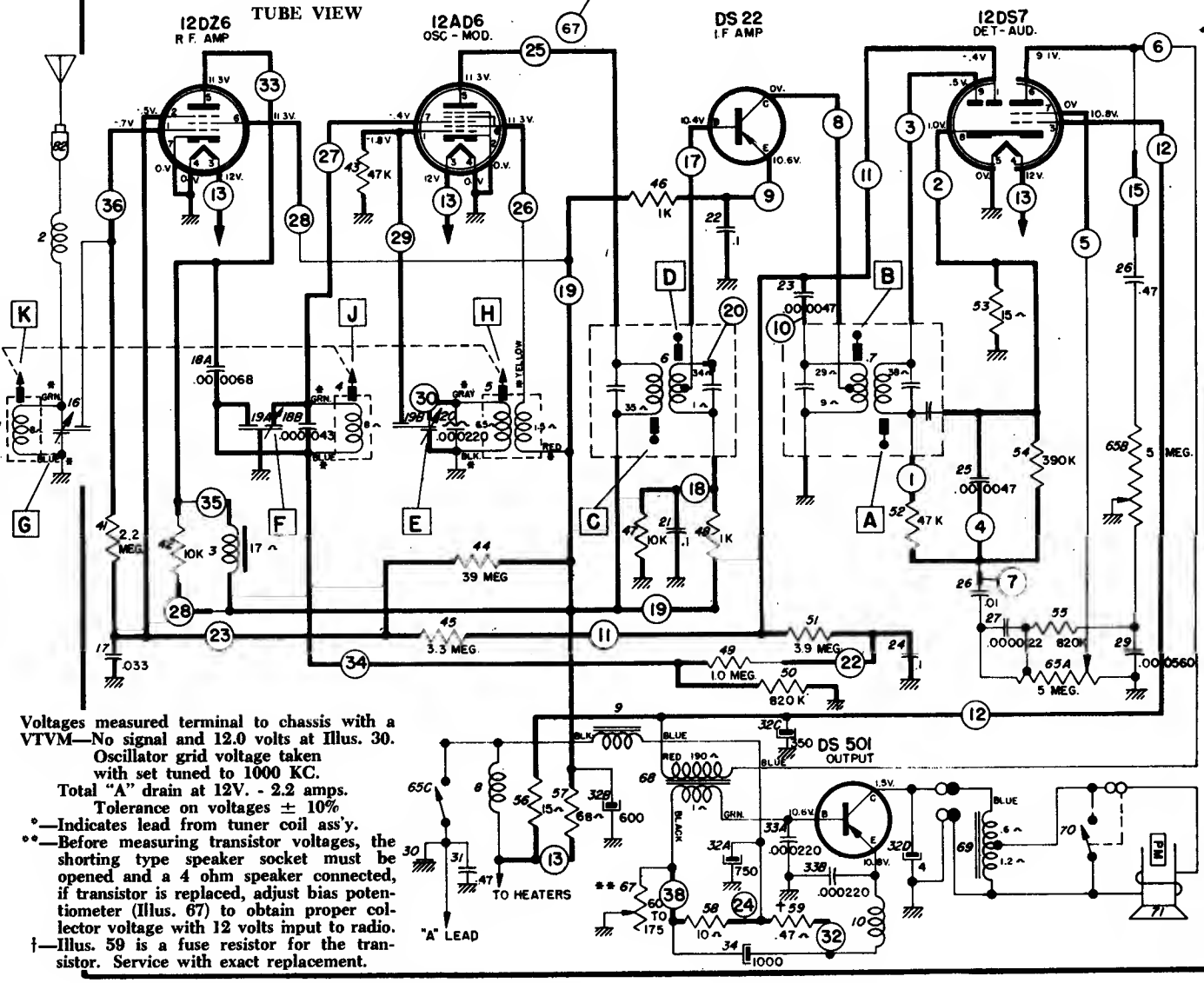
BOTTOM VIEW



TUBE VIEW



TOP VIEW



Voltages measured terminal to chassis with a VTVM—No signal and 12.0 volts at Illus. 30. Oscillator grid voltage taken with set tuned to 1000 KC.
Total "A" drain at 12V. - 2.2 amps.
Tolerance on voltages ± 10%
*—Indicates lead from tuner coil ass'y.
**—Before measuring transistor voltages, the shorting type speaker socket must be opened and a 4 ohm speaker connected, if transistor is replaced, adjust bias potentiometer (Illus. 67) to obtain proper collector voltage with 12 volts input to radio.
†—Illus. 59 is a fuse resistor for the transistor. Service with exact replacement.

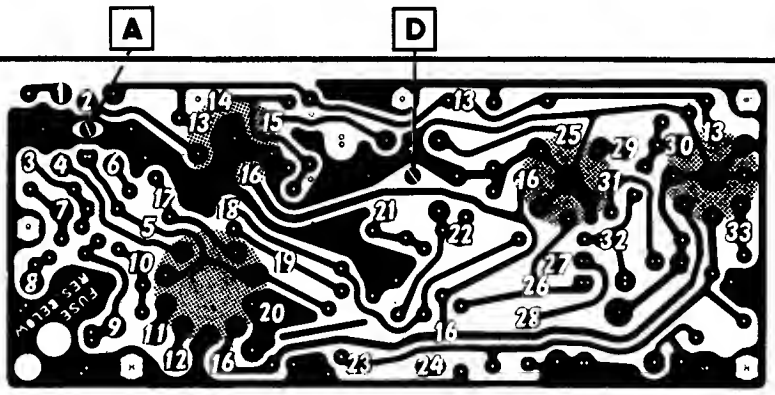
NUMBERS ON PRINTED CIRCUIT BOARD CORRESPOND WITH NUMBERS IN CIRCLES ON SCHEMATIC

PRINTED CIRCUIT SHOWN IN HEAVY LINES

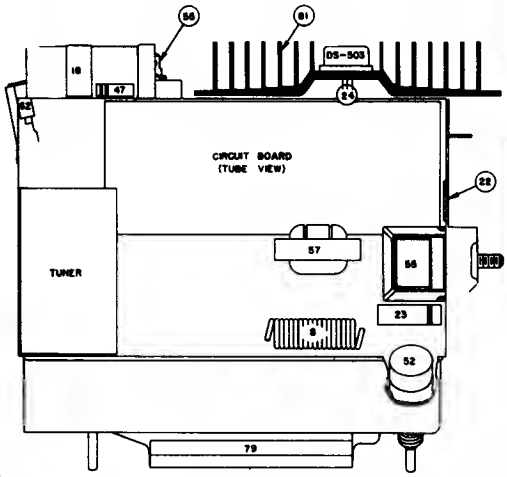
DELCO

CHEVROLET MODEL 988413

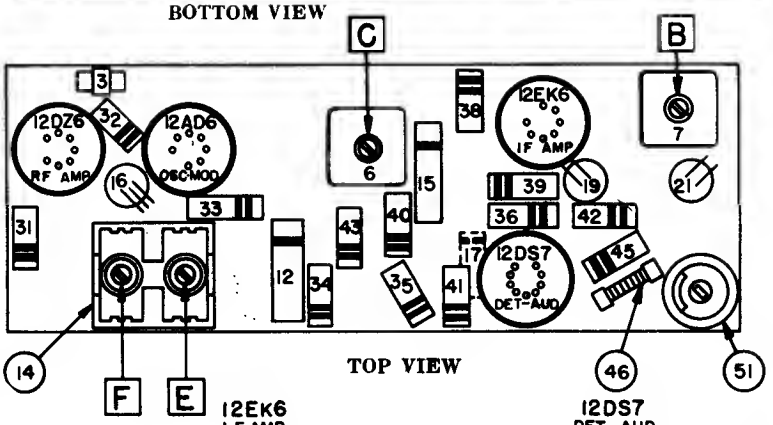
Alignment in Table 4, Page 38



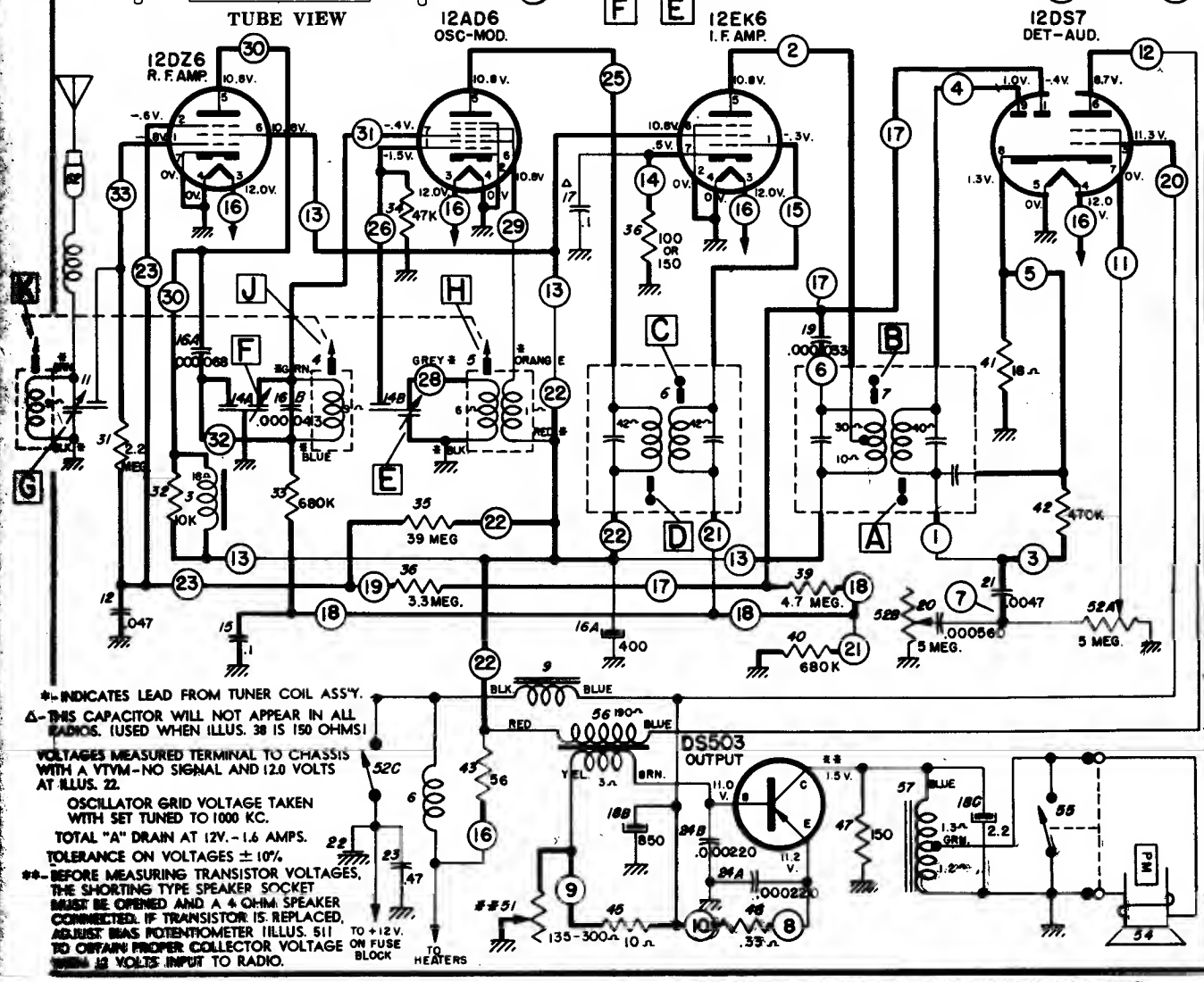
BOTTOM VIEW



TUBE VIEW



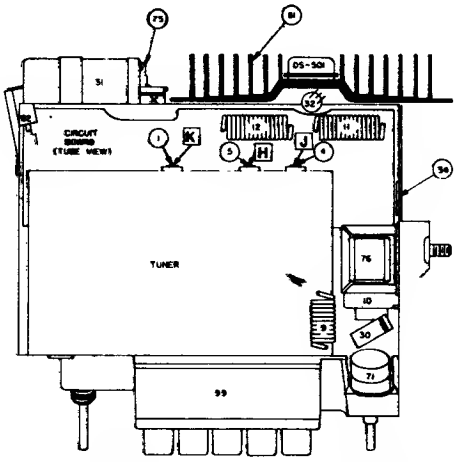
TOP VIEW

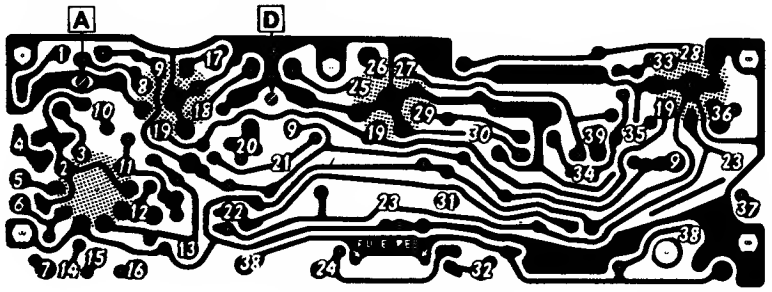


PRINTED CIRCUIT SHOWN IN HEAVY LINES.

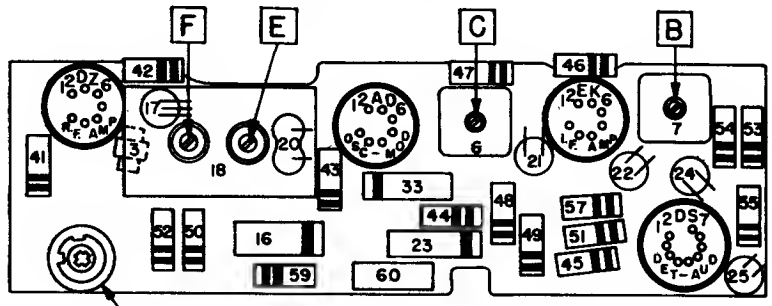
DELCO
CHEVROLET MODEL 988414

Alignment in Table 1, Page 38

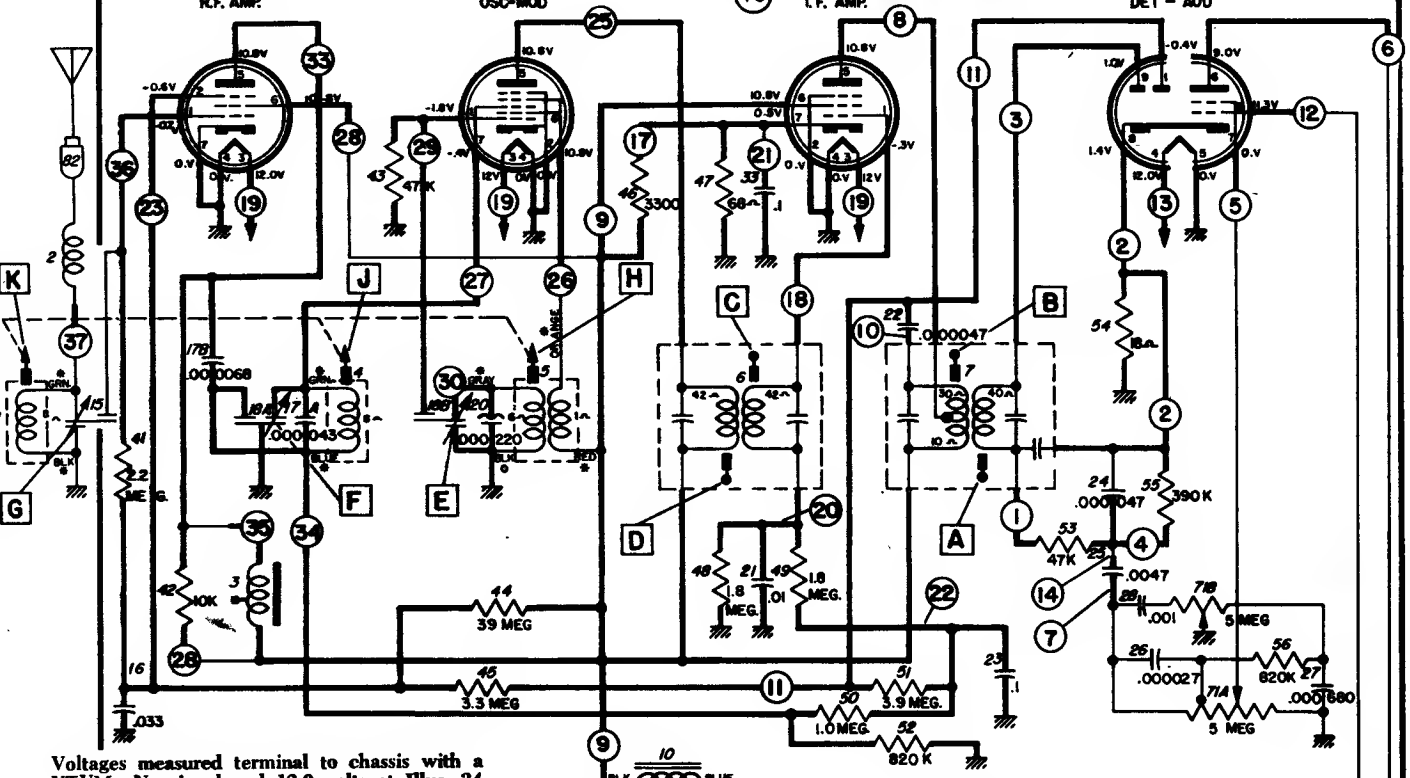




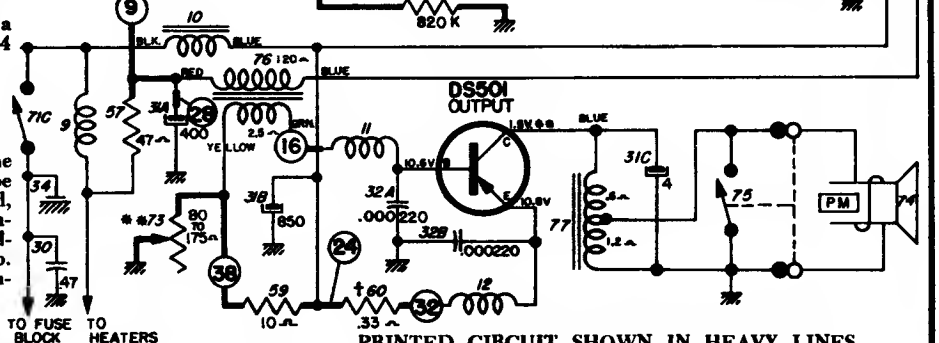
BOTTOM VIEW



12DZ6 R.F. AMP. | 12AD6 OSC-MOD | 12EK6 I.F. AMP. | TOP VIEW | 12DS7 DET – AUD



Voltages measured terminal to chassis with a VTVM—No signal and 12.0 volts at Illus. 34 Oscillator grid voltage taken with set tuned to 1000 KC.
Total "A" drain at 12V. - 2.2 amps.
Tolerance on voltages ± 10%
°—Indicates lead from tuner coil ass'y.
°°—Before measuring transistor voltages, the shorting type 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. 60 is a fuse resistor for the transistor. Service with exact replacement.

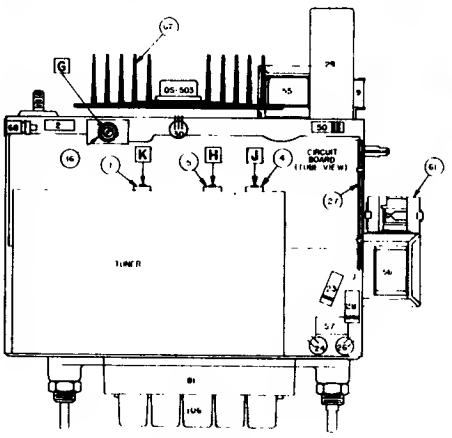


CHEVROLET 988414

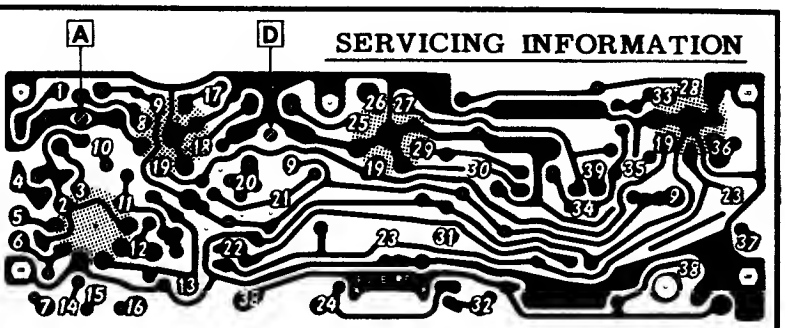
PRINTED CIRCUIT SHOWN IN HEAVY LINES.

DELCO
CHEVROLET CORVAIR 988468

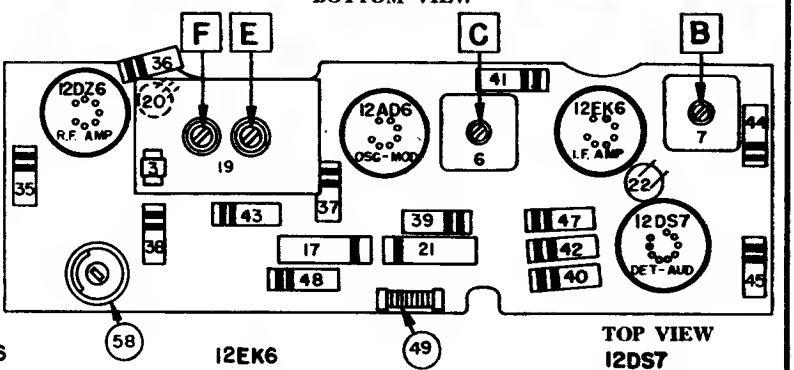
Alignment in Table 1, Page 38



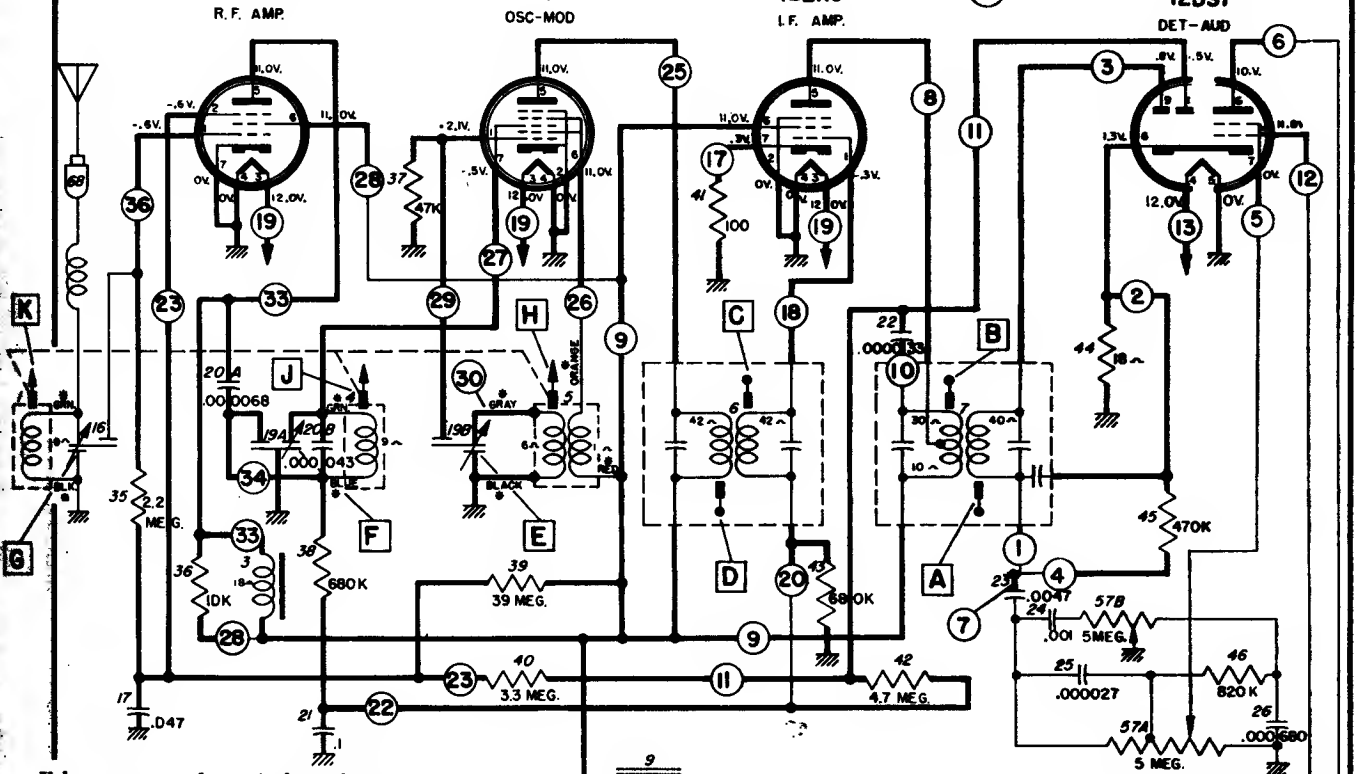
TUBE VIEW



BOTTOM VIEW



TOP VIEW



Voltages measured terminal to chassis with a VTVM—No signal and 12.0 volts at Illus. 27 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 type speaker socket must be opened and a 4 ohm speaker connected, if transistor is replaced, adjust bias potentiometer (Illus. 58) to obtain proper collector voltage with 12 volts input to radio.
†—Illus. 49 is a fuse resistor for the transistor. Service with exact replacement.

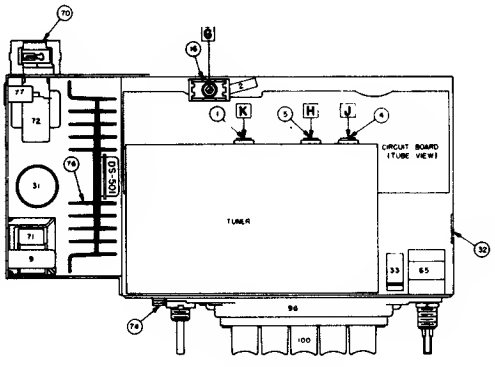
CHEVROLET CORVAIR 988468

PRINTED CIRCUIT SHOWN IN HEAVY LINES.

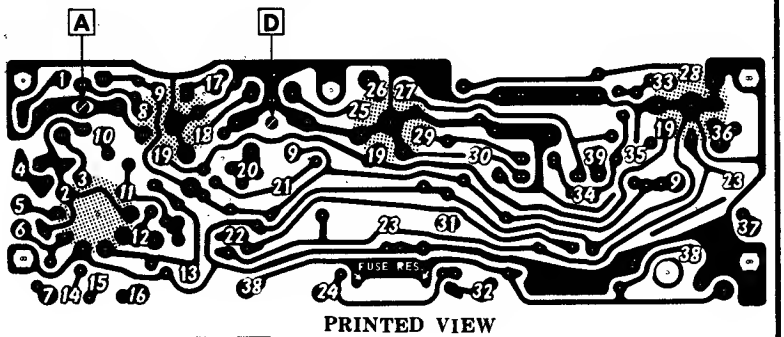
DELCO

OLDSMOBILE MODEL 989392

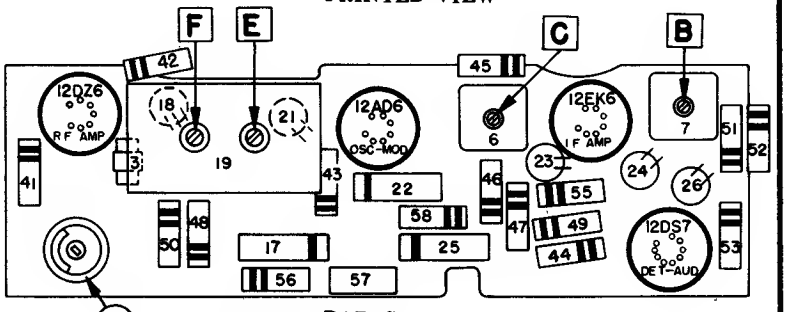
Alignment in Table 2, Page 38



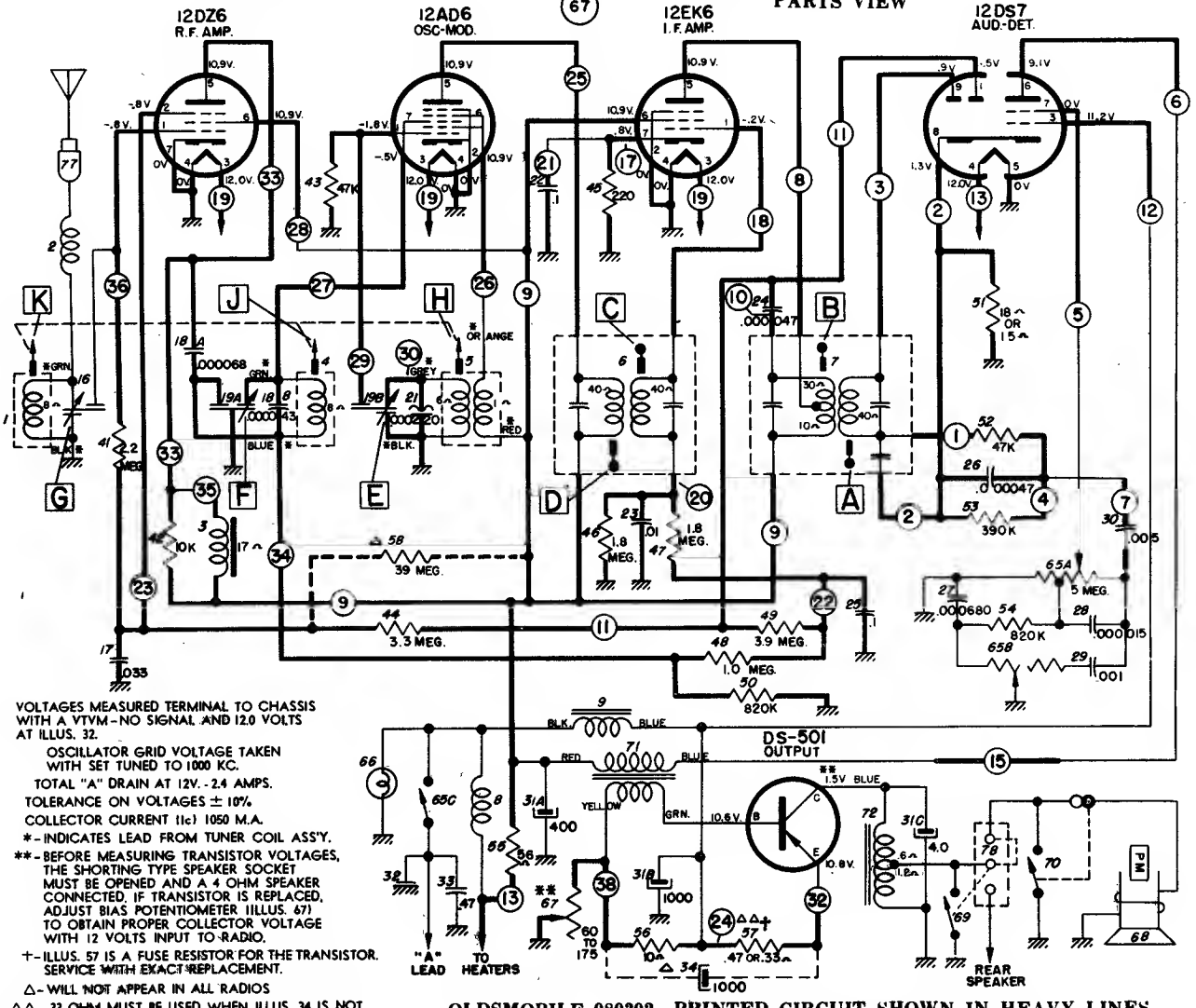
TUBE VIEW



PRINTED VIEW



PARTS VIEW



VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VTVM - NO SIGNAL AND 12.0 VOLTS AT ILLUS. 32.

OSCILLATOR GRID VOLTAGE TAKEN WITH SET TUNED TO 1000 KC.

TOTAL "A" DRAIN AT 12V. - 2.4 AMPS.

TOLERANCE ON VOLTAGES ± 10%

COLLECTOR CURRENT (Ic) 1050 M.A.

*- INDICATES LEAD FROM TUNER COIL ASS'Y.

**- BEFORE MEASURING TRANSISTOR VOLTAGES, THE SHORTING TYPE SPEAKER SOCKET MUST BE OPENED AND A 4 OHM SPEAKER CONNECTED. IF TRANSISTOR IS REPLACED, ADJUST BIAS POTENTIOMETER (ILLUS. 67) TO OBTAIN PROPER COLLECTOR VOLTAGE WITH 12 VOLTS INPUT TO RADIO.

+- ILLUS. 57 IS A FUSE RESISTOR FOR THE TRANSISTOR. SERVICE WITH EXACT REPLACEMENT.

△- WILL NOT APPEAR IN ALL RADIOS

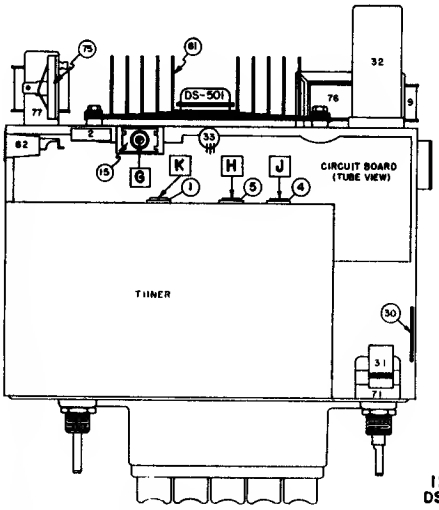
△△- .33 OHM MUST BE USED WHEN ILLUS. 34 IS NOT PRESENT.

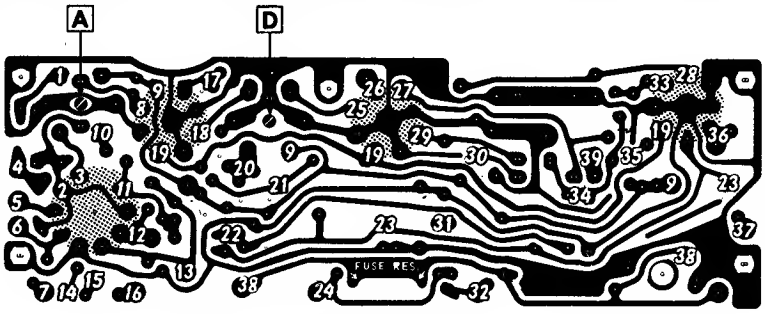
OLDSMOBILE 989392—PRINTED CIRCUIT SHOWN IN HEAVY LINES

DELCO

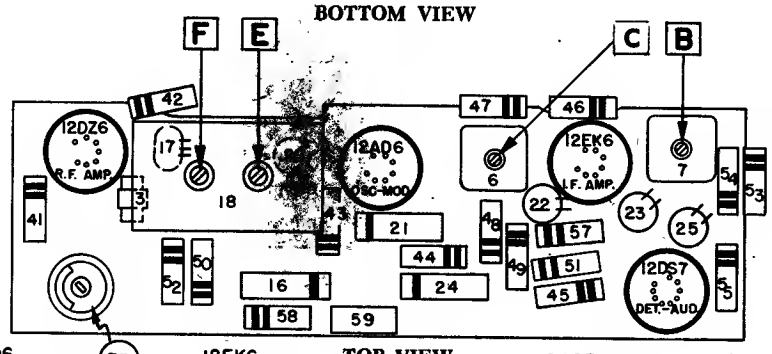
PONTIAC MODEL 989693

Alignment in Table 2, Page 38

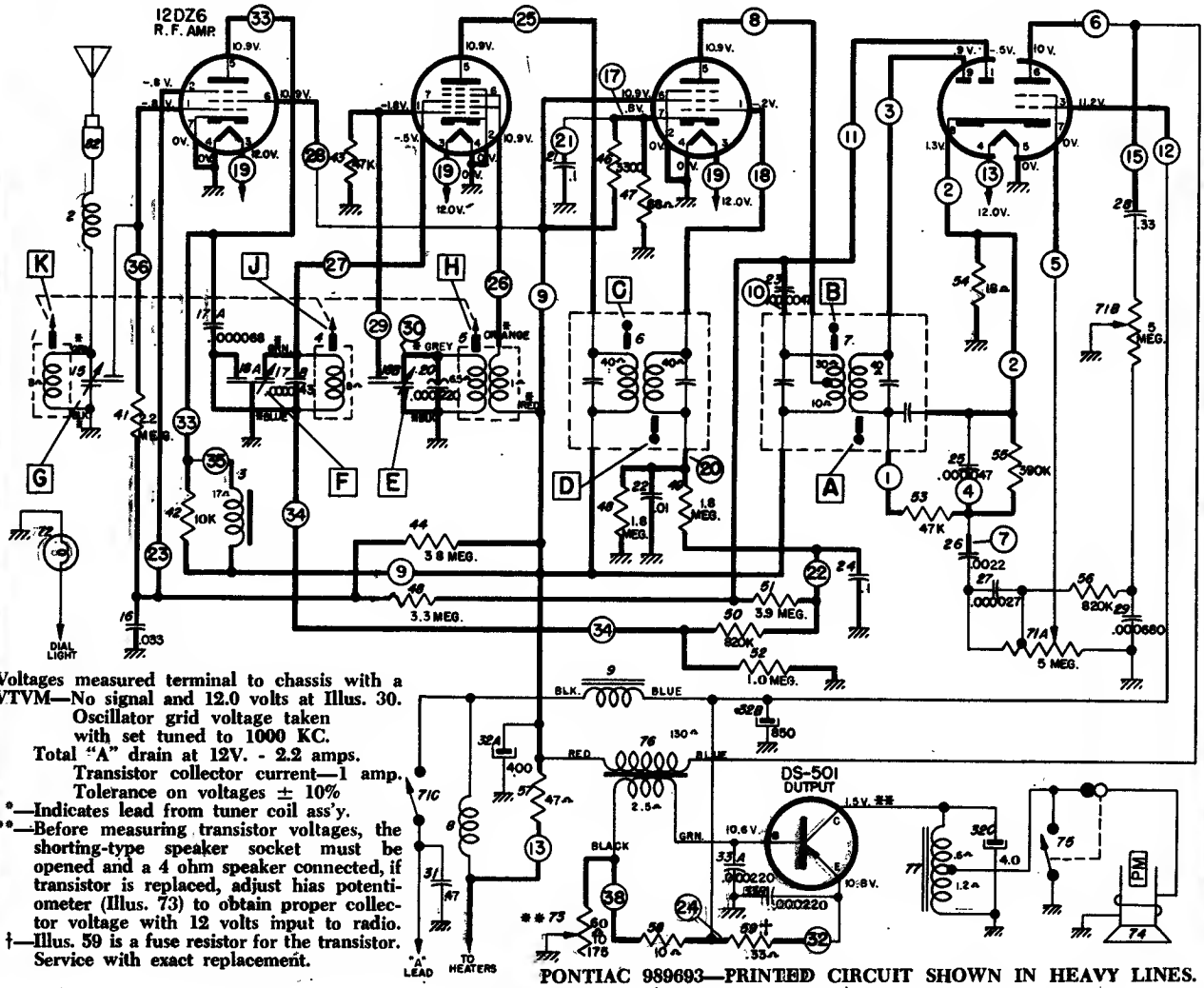




BOTTOM VIEW



12AD6 DSC-MDD. | 12EK6 I. F. AMP. | TOP VIEW | 12DS7 DET.-AUD.



Voltages measured terminal to chassis with a VTVM—No signal and 12.0 volts at Illus. 30. Oscillator grid voltage taken with set tuned to 1000 KC.

Total "A" drain at 12V. - 2.2 amps. Transistor collector current—1 amp. Tolerance on voltages ± 10%

*—Indicates lead from tuner coil ass'y.

**—Before measuring transistor voltages, the shorting-type 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. 59 is a fuse resistor for the transistor. Service with exact replacement.

PONTIAC 989693—PRINTED CIRCUIT SHOWN IN HEAVY LINES.

DELCO Alignment Procedure for Various 1961 Auto Radios

Output Meter Connections ..... Across Voice Coil
Generator Return ..... To Receiver Chassis
Dummy Antenna ..... In Series With Generator
Volume Control Position ..... Maximum Volume
Generator Output ..... Minimum for Readable Indication

TABLE 1, Alignment for Buick 980134, Chevrolet 988414, Chevrolet Corvair 988468

STEP	SERIES CONDENSER OR DUMMY ANTENNA	CONNECT SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	TUNE RECEIVER TO	ADJUST IN SEQUENCE FOR MAX OUTPUT
1	0.1 Mfd.	12AD6 Grid (Pin #7)	262 KC	High Frequency Stop	A, B, D, C
2	.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	*E, F, G
3	.000082 Mfd.	Antenna Connector	600 KC	Signal Generator Signal	J, K
4	.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	F, G
5	.000082 Mfd.	Antenna Connector	1100 KC	Signal Generator Signal	L**

TABLE 2, Alignment for Oldsmobile 989392 and Pontiac Model 989693

STEPS	SERIES CAPACITOR OR DUMMY ANTENNA	CONNECT SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	TUNE RECEIVER TO	ADJUST IN SEQUENCE FOR MAX. OUTPUT
1	0.1 Mfd.	12AD6 Grid (Pin #7)	262 KC	High Frequency Stop	A, B, C, D
2	0.000068 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	*E, F, G
3	0.000068 Mfd.	Antenna Connector	600 KC	Signal Generator Signal	J, K
4	0.000068 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	F, G
5	0.000068 Mfd.	Antenna Connector	1100 KC	Signal Generator Signal	L**

TABLE 3, Alignment for Buick 980132 and Oldsmobile Model 989387

STEPS	SERIES CONDENSER OR DUMMY ANTENNA	CONNECT SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	TUNE RECEIVER TO	ADJUST IN SEQUENCE FOR MAX. OUTPUT
1	0.1 Mfd.	12AD6 Grid (Pin #7)	262 KC	High Frequency Stop	A, B, D, C
2	.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	*E, F, G
3	.000082 Mfd.	Antenna Connector	600 KC	Signal Generator Signal	J, K
4	.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	F, G
5	.000082 Mfd.	Antenna Connector	900 KC	Signal Generator Signal	L***

TABLE 4, Alignment for Chevrolet Model 988413

STEPS	SERIES CAPACITOR OR DUMMY ANTENNA	CONNECT SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	TUNE RECEIVER TO	ADJUST IN SEQUENCE FOR MAX. OUTPUT
1	0.1 Mfd.	12AD6 Grid (Pin #7)	262 KC	High Frequency Stop	A, B, C, D,
2	0.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	*E, F, G,
3	0.000082 Mfd.	Antenna Connector	600 KC	Signal Generator Signal	J, K
4	0.000082 Mfd.	Antenna Connector	1615 KC	High Frequency Stop	F, G

*Before making this adjustment check mechanical setting of oscillator core "H." The rear of the core should be 1⅝" from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form.) Core adjustment should be made with a non-metallic screw driver.

**L, is the pointer adjustment screw which is on the connecting link, between the pointer assembly and the parallel guide bar. It should be adjusted so that the dial pointer corresponds with the 1100 K.C. mark on the dial.

***L is the pointer adjustment screw which is on the connecting link, between the pointer assembly and the parallel guide bar. It should be adjusted so that the dial pointer corresponds with the 900 KC mark on the dial.

With the radio installed and the car antenna plugged in, adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station between 600 and 1000 KC (see sticker on case.)

EMERSON Models 907B, 926B

EMERSON RADIO
Model 907B, Chassis 120478B
Model 926B, Chassis 120505B

EMERSON RADIO

Models 920 and 925

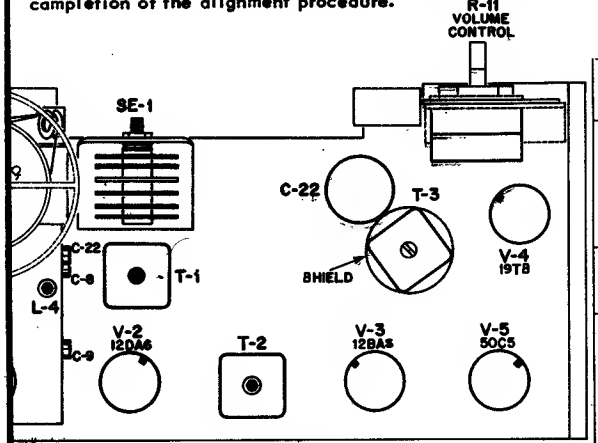
Chassis 120494B

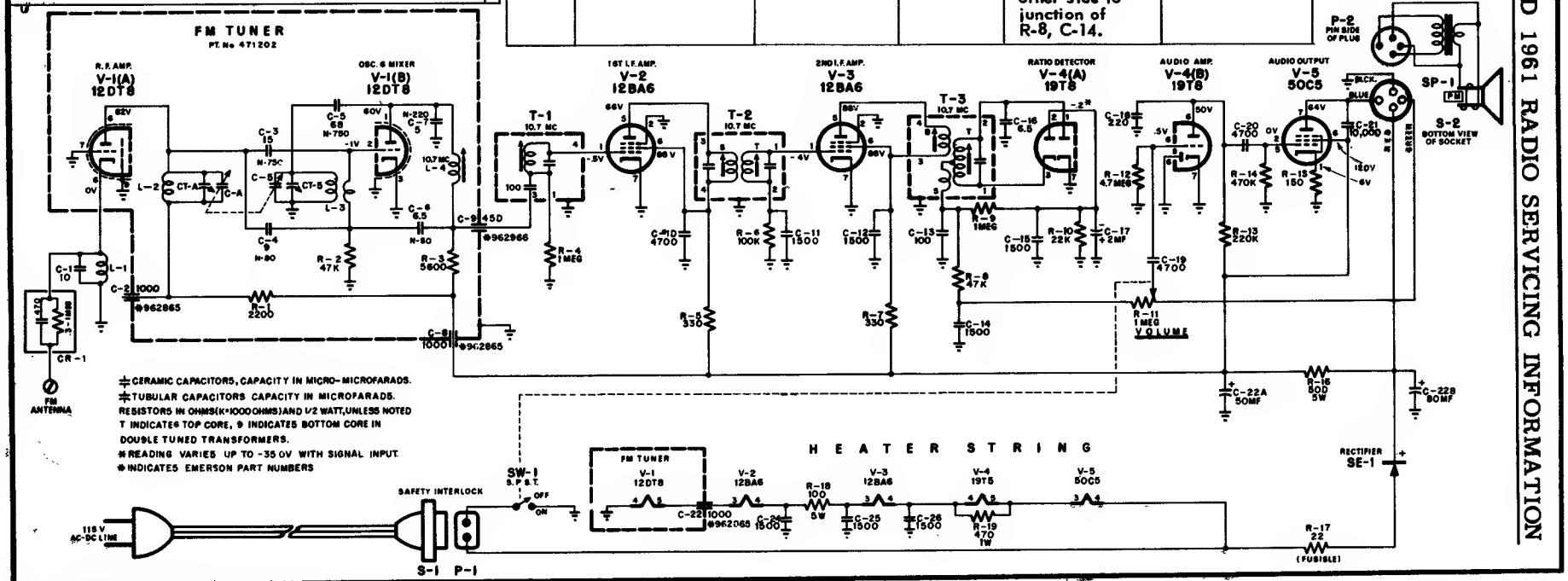
I.F. ALIGNMENT PROCEDURE USING R.F. GENERATOR AND VTVM

Use of this method requires balancing of the ratia detector output before attempting alignment. To accomplish this, construct a voltage divider network by placing two 100 K resistors in series and wire them across C-17 (2 mfd. stabilizer capacitor). Be sure to remove this network after completion of the alignment procedure.

1. Voltages indicated are positive DC, resistances in ohms, unless otherwise indicated.
2. Measurements made with Voltohmyst or equivalent.
3. All measurements taken between pin and chassis ground.
4. All voltage measurements taken under the following conditions:
   a) Line voltage maintained at 117 volts.
   b) Tuning control turned fully counterclockwise (low end)

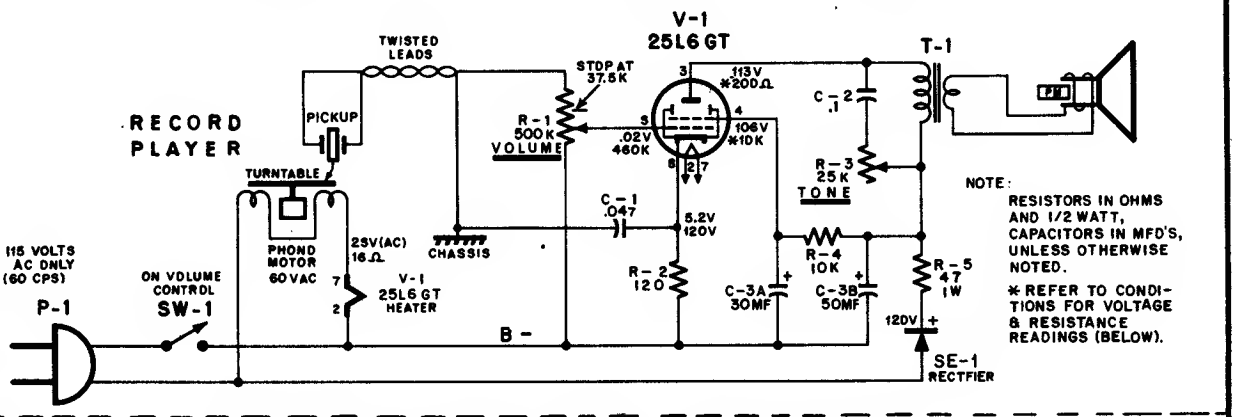
STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	DIAL SETTING	VTVM	ADJUST	REMARKS
1.	High side ta ant. input, low side to chassis through a .25 mfd. capacitor.	10.7 MC (unmod.)	Extreme CCW pos. (low end)	Across C-17 (near V-4). Use negative scale.	T-3 bottom, T-2 bottom, T-2 top, T-1 (1st IF), L-4 mixer coil.	Adjust in order given for max. neg. voltage. Maintain sig. gen. output for readings under 2 volts.
2.	" "	"	"	"	T-1 (1st IF)	Retune for max. neg. voltage.
3.	" "	"	"	One side of meter to center-tap of voltage divider network across C-17, other side to junction of R-8, C-14.	T-3 Top	Adjust for 0 volts output between pos. and neg. meter swing.



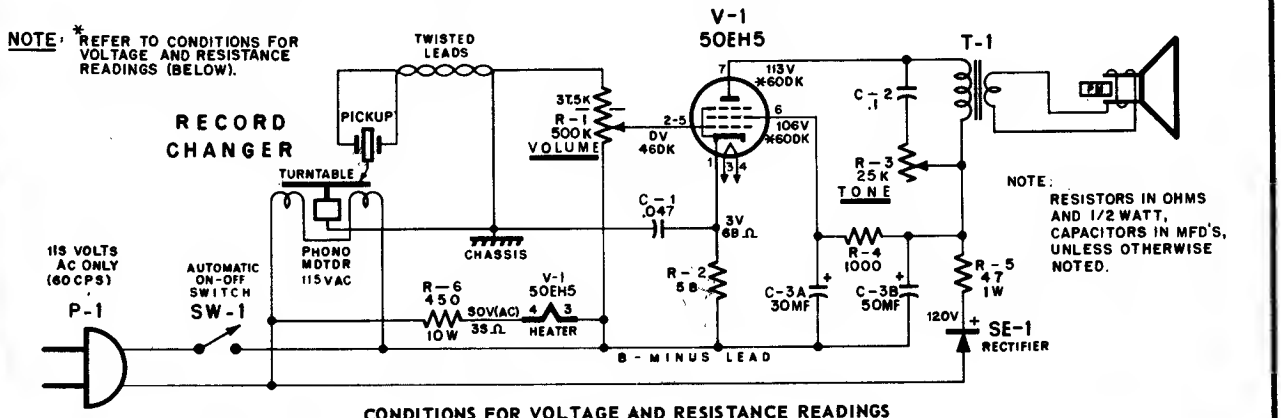


≠CERAMIC CAPACITORS, CAPACITY IN MICRO-MICROFARADS.
≠TUBULAR CAPACITORS CAPACITY IN MICROFARADS.
RESISTORS IN OHMS(K=1000 OHMS) AND 1/2 WATT, UNLESS NOTED
T INDICATES TOP CORE, B INDICATES BOTTOM CORE IN DOUBLE TUNED TRANSFORMERS.
*READING VARIES UP TO -35.0V WITH SIGNAL INPUT.
# INDICATES EMERSON PART NUMBERS

EMERSON RADIO Model 933B, Chassis 120547B



EMERSON RADIO Model 935B, Chassis 120548B



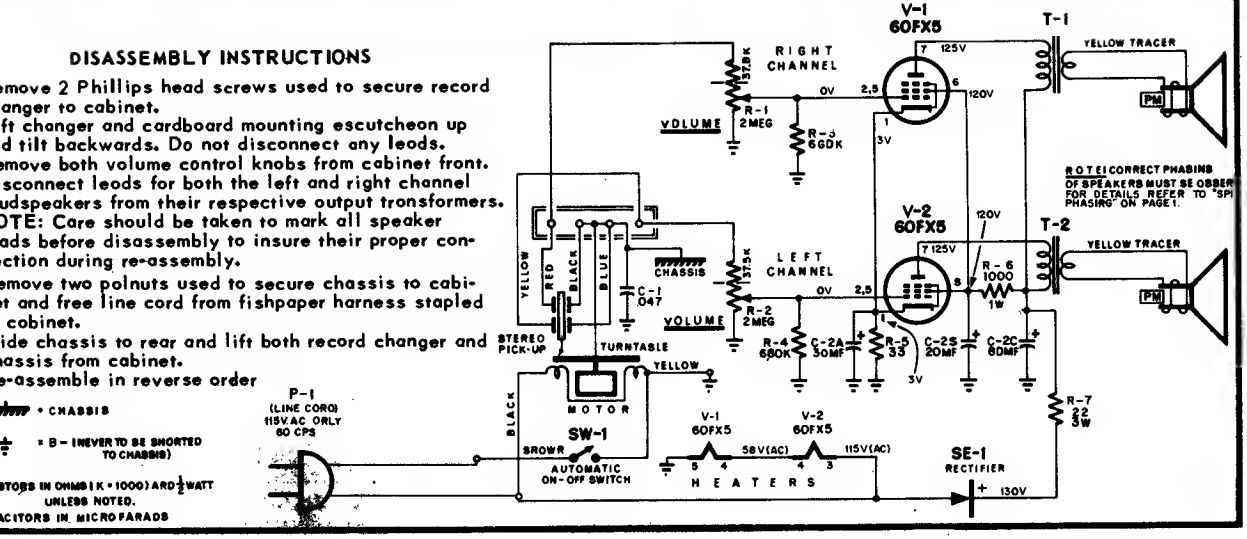
CONDITIONS FOR VOLTAGE AND RESISTANCE READINGS

1. Voltages indicated are positive d.c., resistances in ohms, unless otherwise indicated.
2. Measurements made with valtahmyst or equivalent.
3. All measurements taken from pin to B minus unless otherwise indicated.
4. Voltage measurements taken with:
   a) Line voltage maintained at 115 volts a.c.
   b) Volume control set for maximum volume.
5. Resistance measurements taken with:
   a) Pawer line cord disconnected fram autlet.
   b) Volume cantral set for maximum volume.
6. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings,
7. N.C. denotes no connection, K is kilohms, Meg. is megohms.
8. Resistances marked with * vary due to capacitor charge. Allow about 30 seconds for meter to settle.

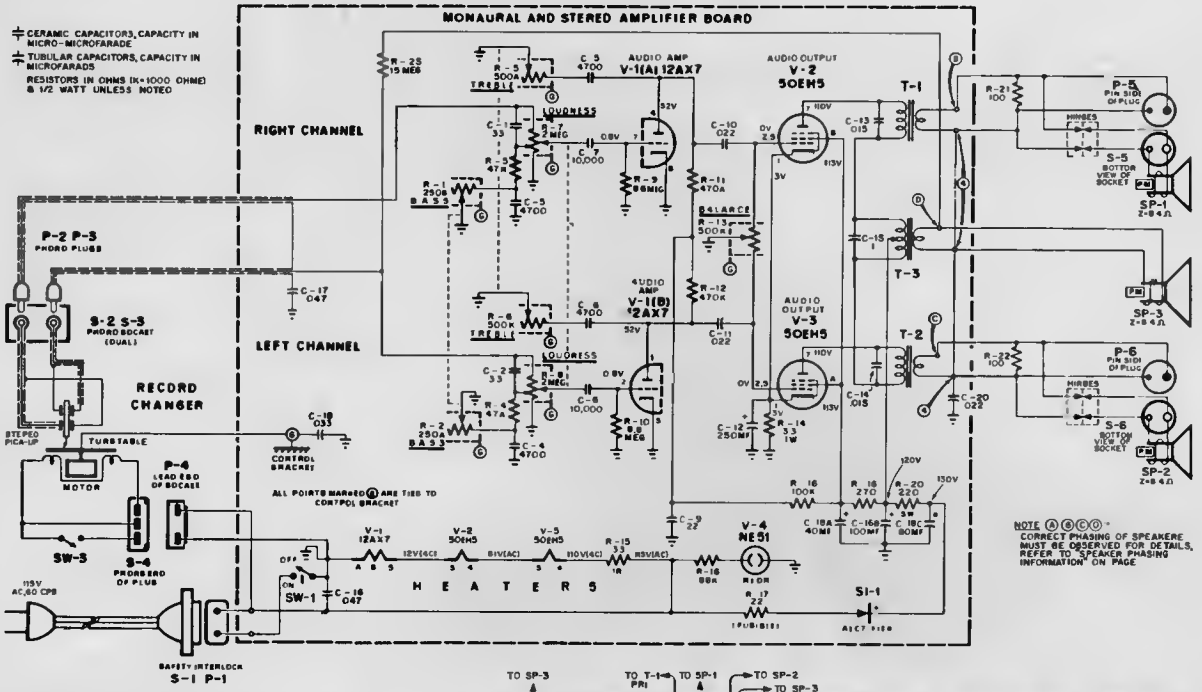
EMERSON RADIO Model 937B, Chassis 120558B

DISASSEMBLY INSTRUCTIONS

1. Remove 2 Phillips head screws used to secure record changer to cabinet.
2. Lift changer and cardboard mounting escutcheon up and tilt backwards. Do not disconnect any leods.
3. Remove both volume control knobs from cabinet front.
4. Disconnect leods for both the left and right channel loudspeakers from their respective output transformers. NOTE: Care should be taken to mark all speaker leads before disassembly to insure their proper connection during re-assembly.
5. Remove two polnuts used to secure chassis to cabinet and free line cord from fishpaper harness stapled to cobinet.
6. Slide chassis to rear and lift both record changer and chassis from cabinet.
7. Re-assemble in reverse order



EMERSON RADIO Model 938B, Chassis 120559B



Voltage measurements token with:
A) Line voltage maintained at 115 volts A.C.
B) Laudness cantral set for minimum volume.
C) Record changer in "aff" position.

MODEL: 938-B

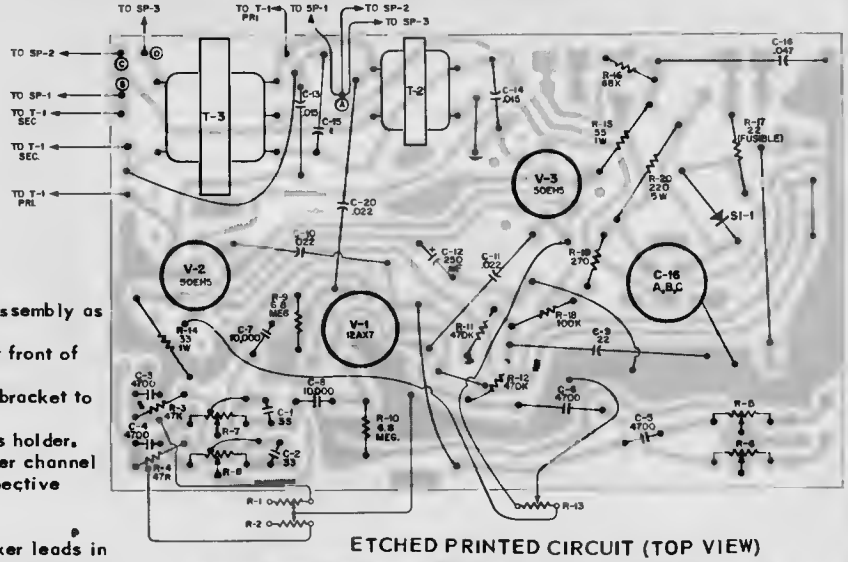
CHASSIS 120559-B

TO REMOVE CHASSIS

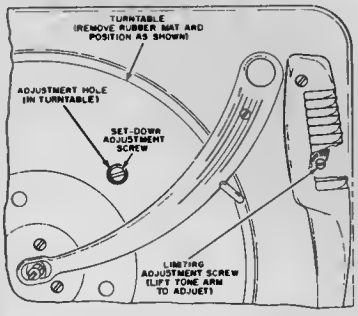
Remove record changer and mounting board assembly as outlined above.
Remove knobs from amplifier control panel at front of cobinet.
Remove screws used to secure AC interlock bracket to cabinet.
Slide pilot light and socket assembly from its holder.
Unclip connectors for the right channel, center channel and left channel loudspeakers from their respective terminals.

NOTE: Care must be taken to mark all speaker leads in some manner before disconnecting, to assure proper re-connection of each during re-assembly.

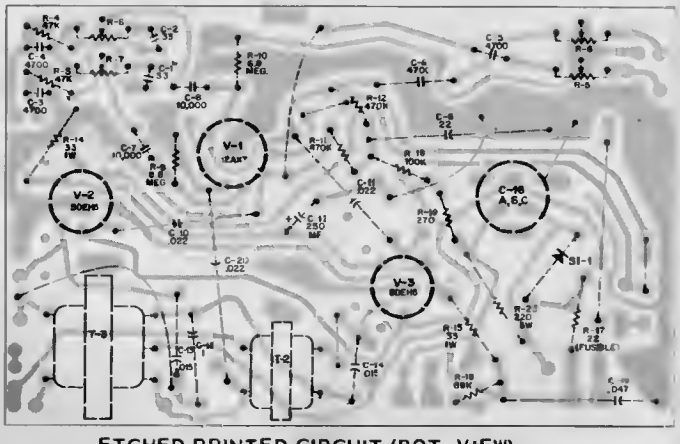
Remove four Palnuts used to secure chassis and remove chassis from cabinet.
Re-assemble in reverse order.



ETCHED PRINTED CIRCUIT (TOP VIEW)



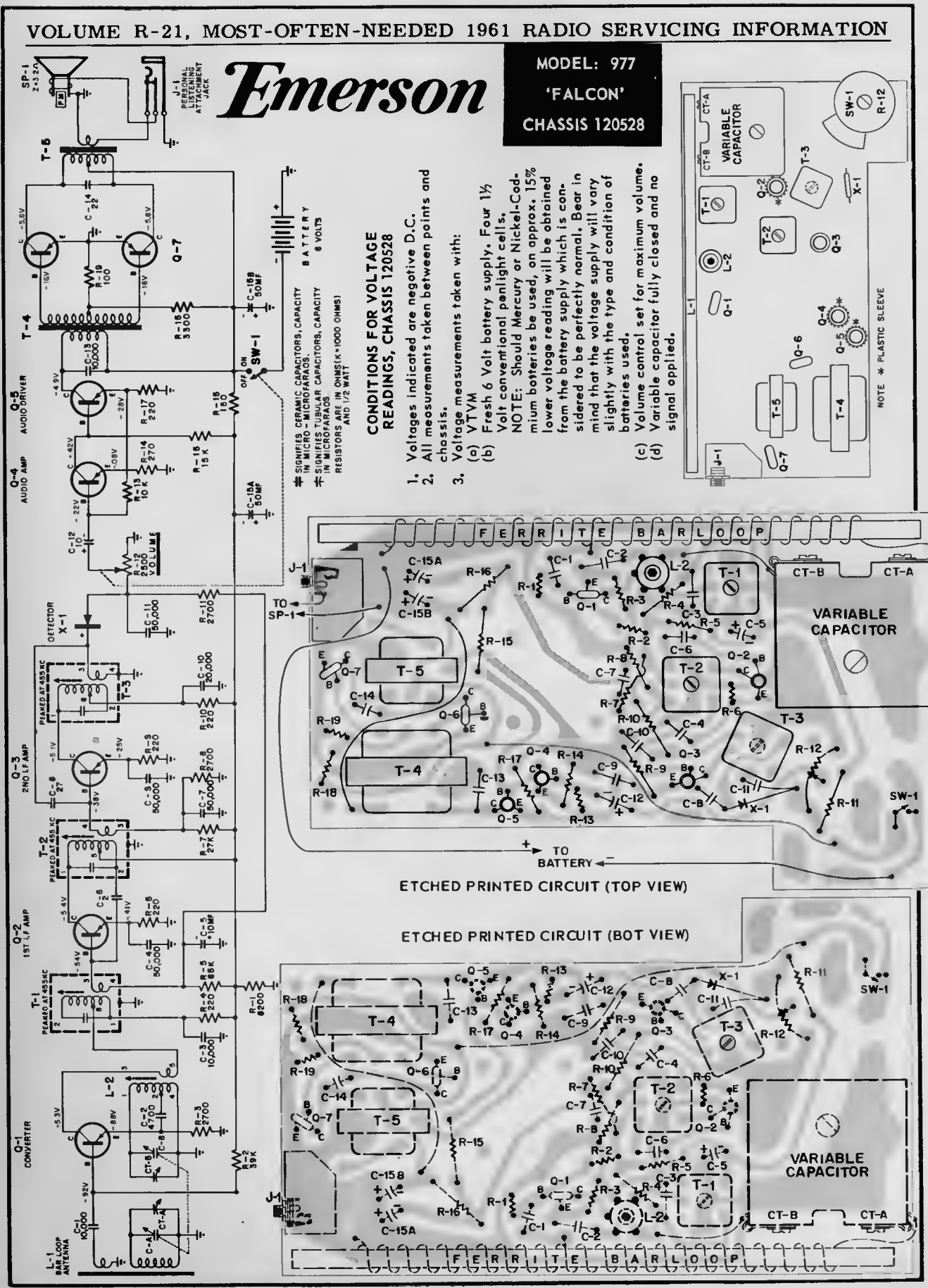
RECORD CHANGER 819170, ADJUSTMENT SETTINGS



ETCHED PRINTED CIRCUIT (BOT. VIEW)

Emerson

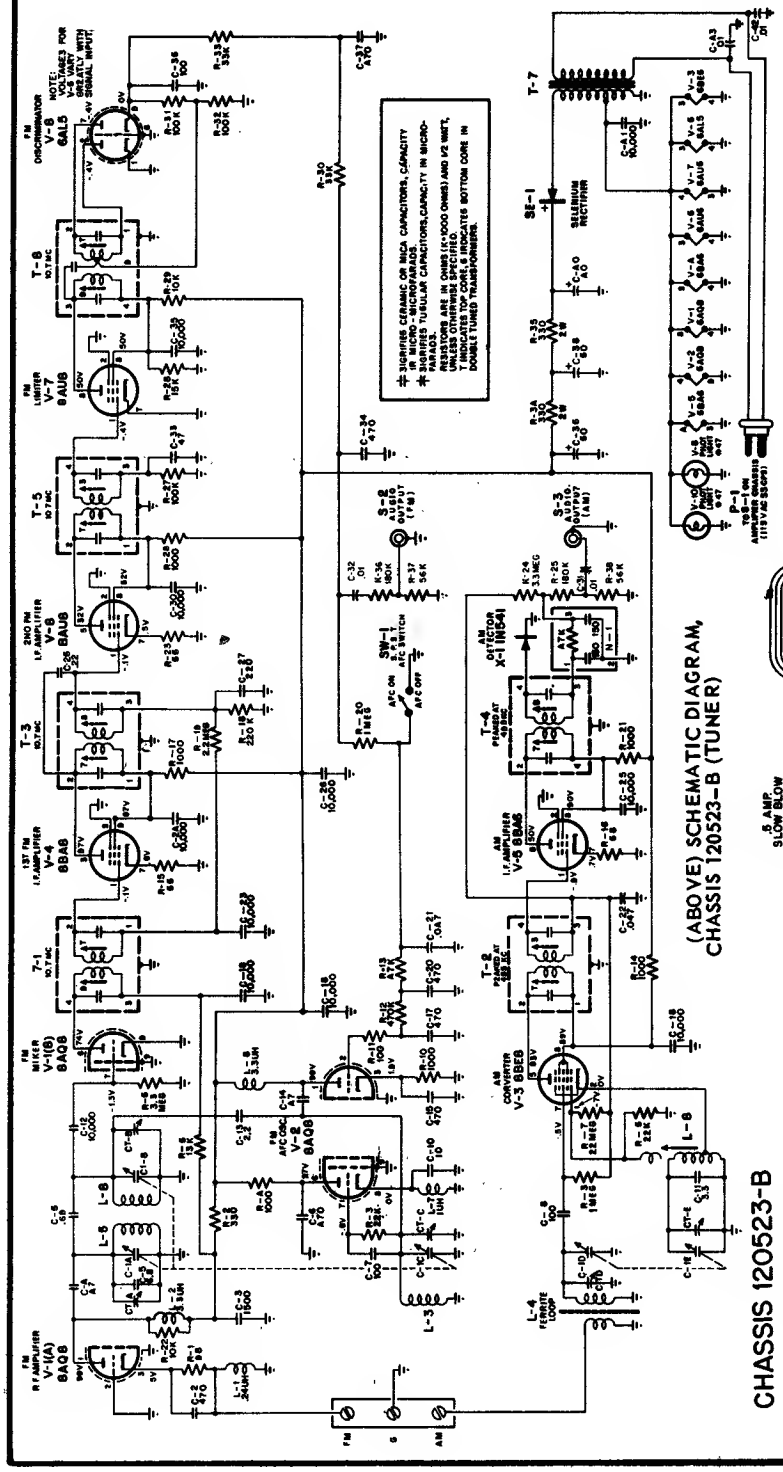
MODEL: 977
'FALCON'
CHASSIS 120528



Emerson Radio

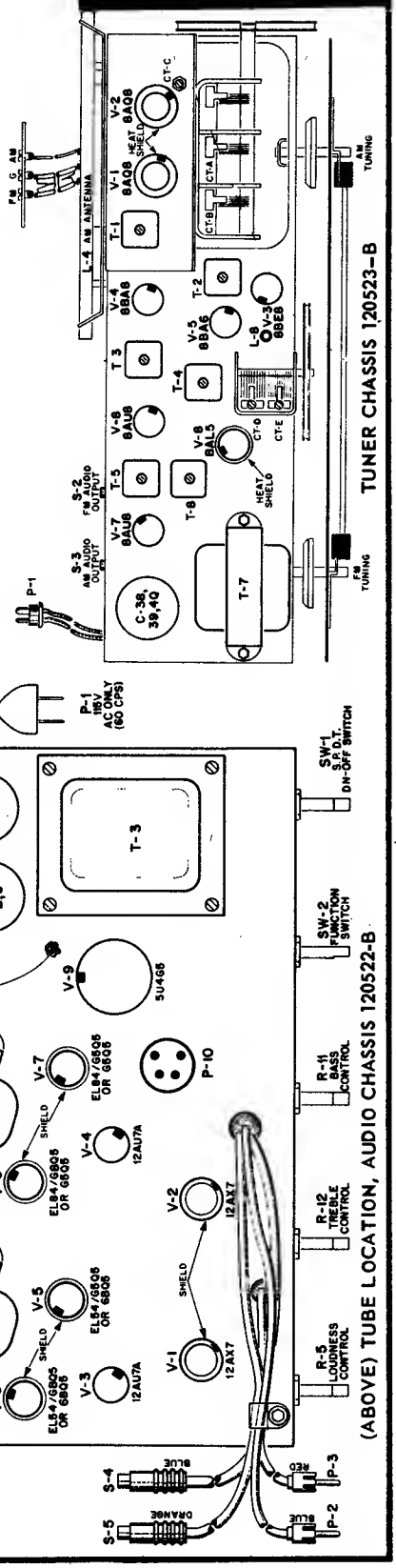
MODEL 944-B
CH-120522-B (AUDIO)
CH-120523-B (TUNER)

Model 944B, using Audio 120522B and Tuner 120523B, has essential information on this page and the next page adjacent at right. Model 914B, using Tuner 120482B and Audio 120483B, is very similar to this combination.



(ABOVE) SCHEMATIC DIAGRAM, CHASSIS 120523-B (TUNER)

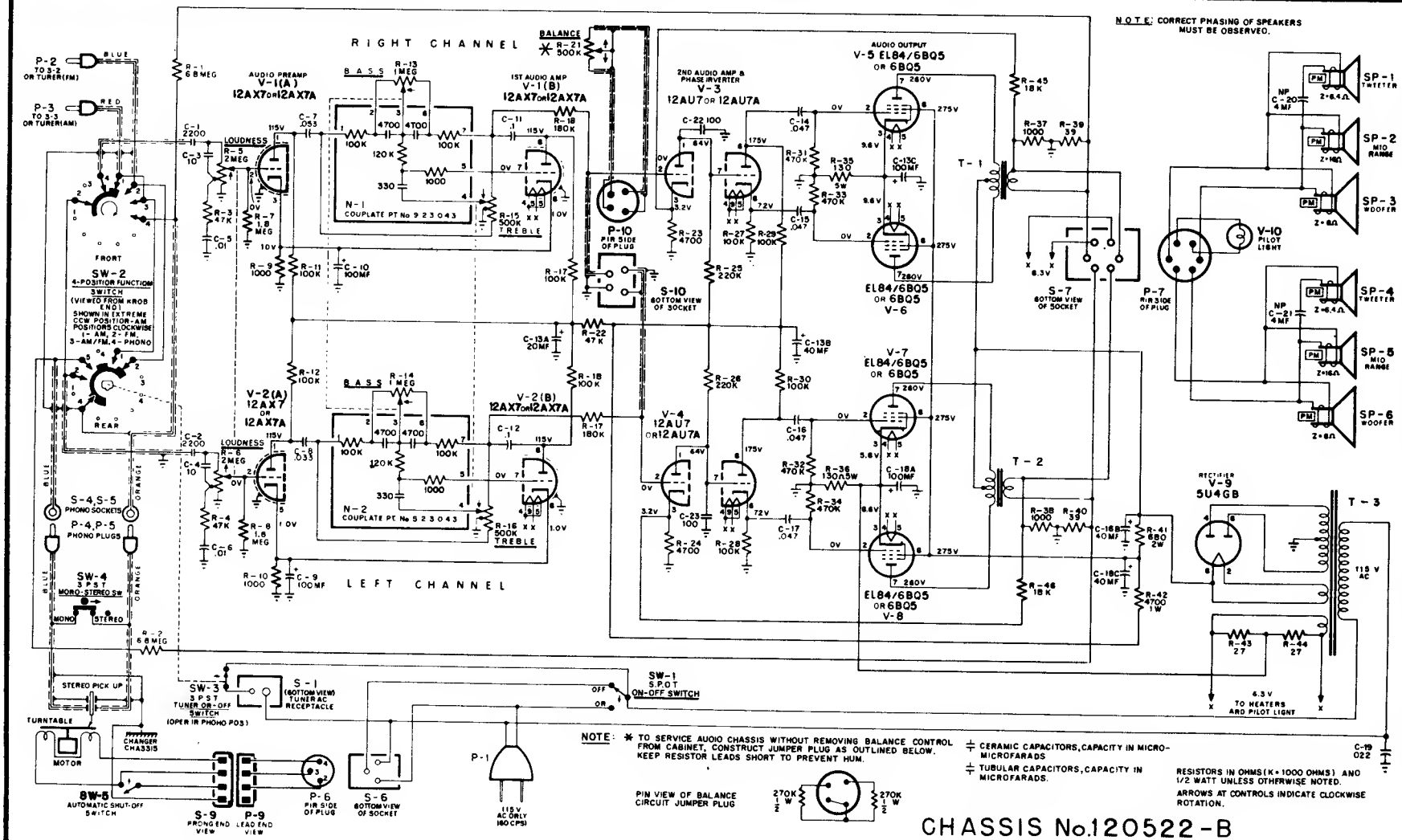
CHASSIS 120523-B



(ABOVE) TUBE LOCATION, AUDIO CHASSIS 120522-B

TUNER CHASSIS 120523-B

SCHEMATIC DIAGRAM, CHASSIS 120522–B (AUDIO)



EMERSON RADIO AND PHONOGRAPH CORP.

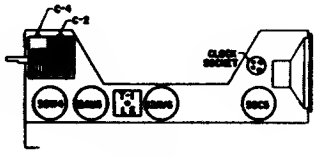
Model 944B, using Audio Chassis 120522B and Tuner Chassis 120523B; Model 914B, using Tuner Chassis 120482B and Audio Chassis 120483B, are very similar to 944B covered on this and preceding page.

CHASSIS No. 120522-B

1. Voltages are positive DC, resistances in ohms, unless otherwise indicated.
2. All measurements taken with Voltohmyst or equivalent.
3. All measurements taken between tube pin and chassis unless otherwise noted.
4. Voltage measurements made with:
   a) Line voltage maintained at 115 volts AC.
   b) Loudness control set for minimum volume (max CCW), all others set at mid-range.
   c) No signal input (AM or FM) to tuner chassis.
   d) No signal input to audio chassis.
   e) SW-2 (on audio chassis) may be in any position.

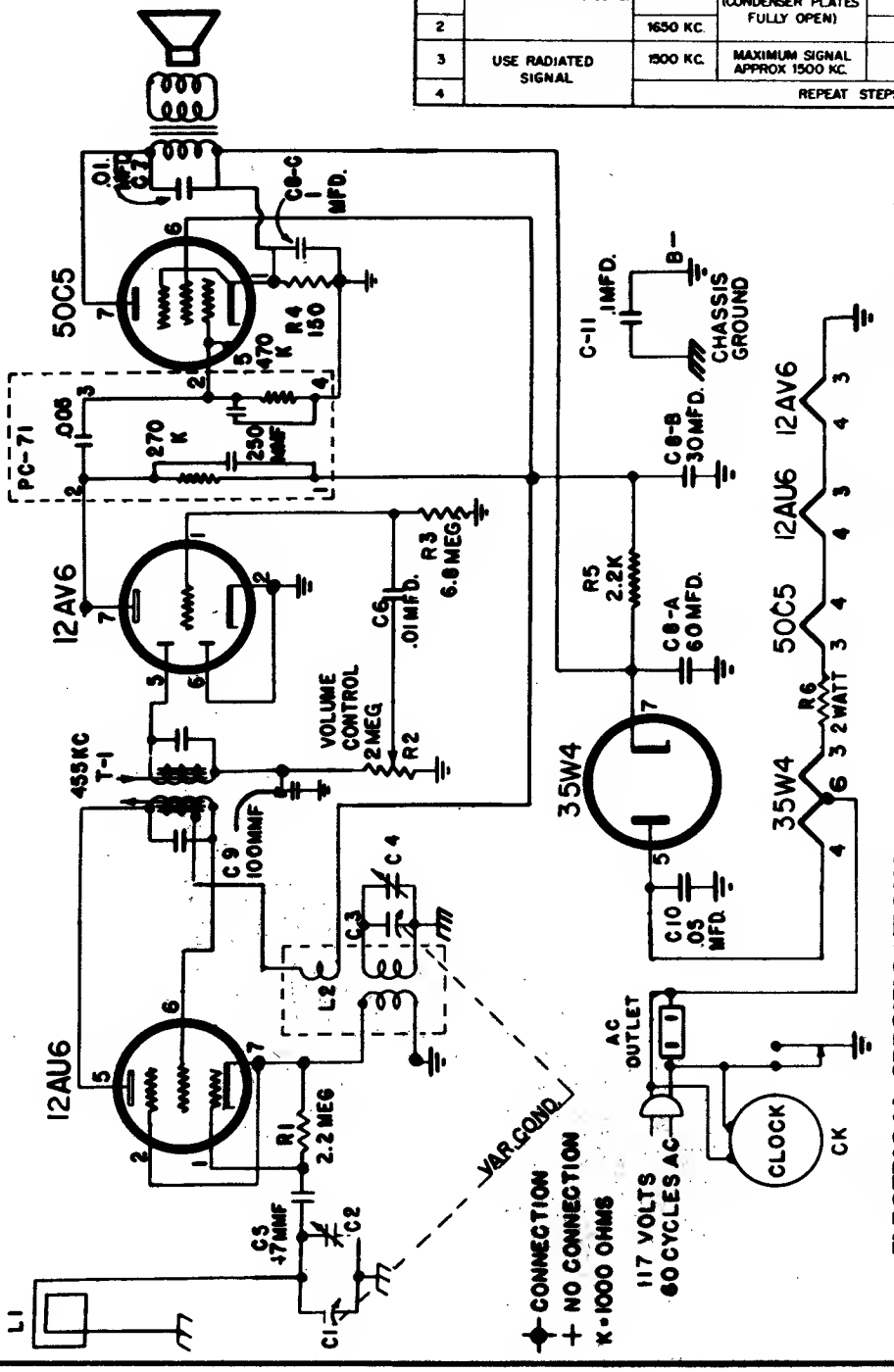
Gamble-Skogmo, Inc.

CORONADO MODEL RA 48-8182A



ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO-	SET SIGNAL GENERATOR TO-	TURN RECEIVER DIAL TO-	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	ANTENNA SECTION TUNING CONDENSER IN SERIES WITH .1 MFD. COND.	455 KC.	FULL CLOCKWISE POSITION (CONDENSER PLATES FULLY OPEN)	BOTTOM & TOP OF T-1 IN SAME ORDER (I F TRANSFORMER)
2		1650 KC.		C4 (OSCILLATOR TRIMMER)
3	USE RADIATED SIGNAL	1500 KC.	MAXIMUM SIGNAL APPROX 1500 KC.	C2 (ANTENNA TRIMMER)
4		REPEAT STEPS 2 AND 3		

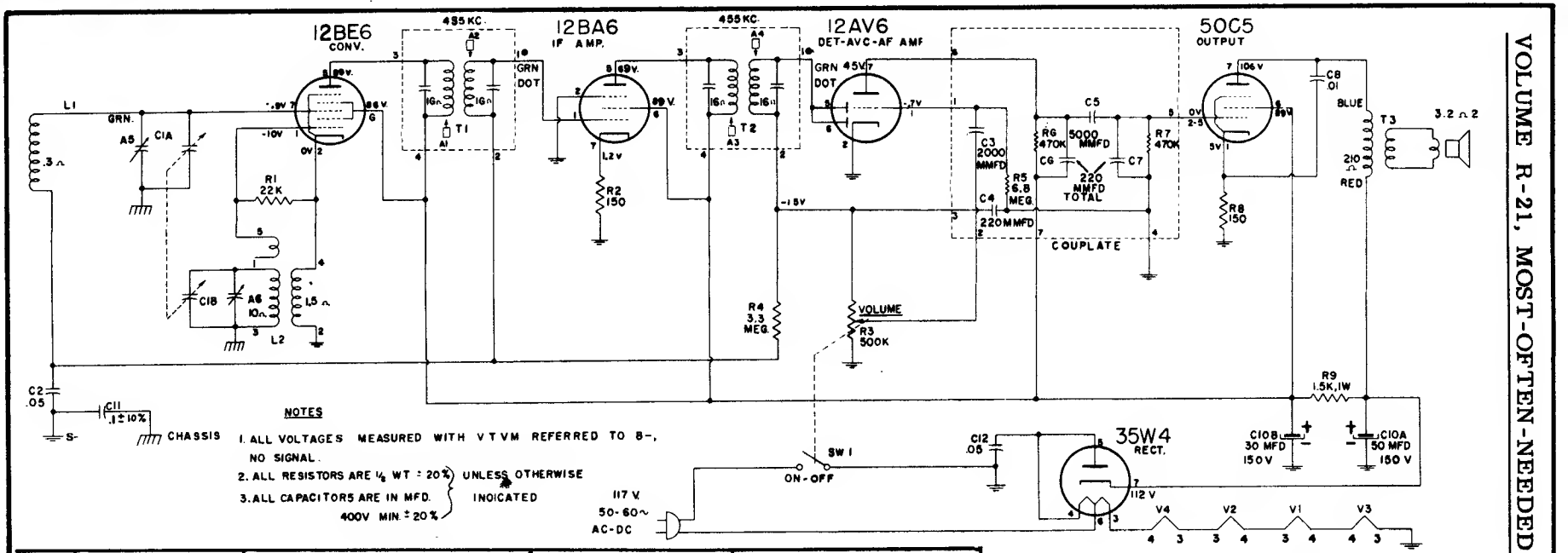


AS A MUSICAL WAKE-UP ALARM

1. Adjust the volume and tune the radio to the desired station you would like to hear in the morning.
2. Set the Red hand to the time you want to be awakened by gently moving the "Alarm and Time Set Knob" forward — toward front of cabinet.
3. Turn the Knob at hour 6 to "Auto" position. The radio is now set to be turned on automatically at the desired time.

ELECTRICAL SPECIFICATIONS

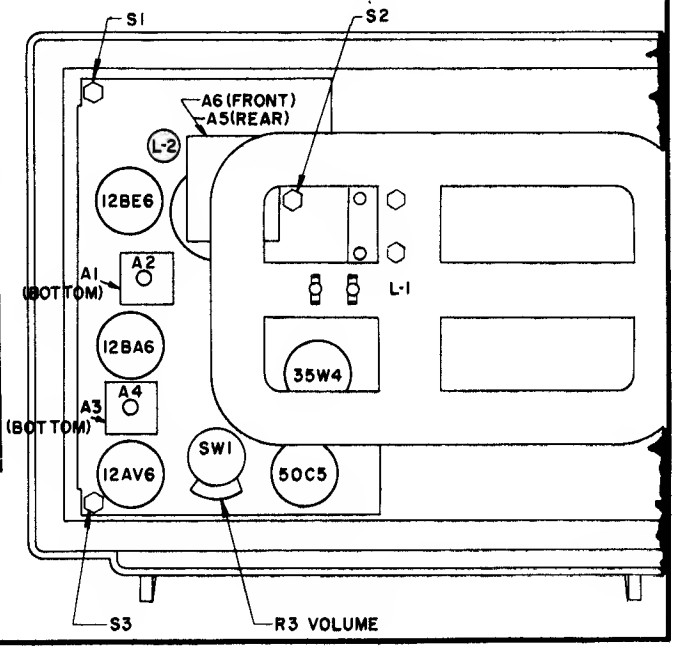
Power Supply	117 Volts AC
Frequency Range	540-1650 KC
Intermediate Frequency	455 KC
Sensitivity	3000 microvolts on loop for 50 MW output
Selectivity	10 KC 2X at 455 KC
Speaker	4" Alnico PM 3.2 Ohm voice coil
Power Consumption	30 Watts
Power Output	1.5 Watts, undistorted



NOTES

1. ALL VOLTAGES MEASURED WITH V T V M REFERRED TO B-, NO SIGNAL.
2. ALL RESISTORS ARE 1/2 WT ± 20% UNLESS OTHERWISE
3. ALL CAPACITORS ARE IN MFD. INDICATED
400V MIN. ± 20%

STEP	Set receiver dial to:	Adjust test oscillator frequency to:	Use dummy antenna in series with output of signal generator consisting of:	Attach output of Signal Generator to:	Refer to Fig. 1 for location of alignment adjustments.
1.	Tuning gang fully open (Minimum capacity)	455 KC	.05 MFD Condenser 400V.	High side of signal generator to mixer grid. Ground lead of generator through . 05 to chassis	Using a non-metallic alignment tool, adjust all the I.F. transformer cores for maximum output.
2.	Tuning gang fully open (Minimum capacity)	Exactly 1640 KC	Loosely couple generator output to loop antenna. Bring a short length of insulated hook-up wire fashioned into a coil of a few turns close to the antenna loop and connect generator output to one end of this wire. Signal generator ground remains connected through .05 MFD condenser to chassis.		Adjust trimmer A6 for maximum output.
3.	1400 KC	1400 KC	Leave connected as above.		Adjust trimmer A5 for maximum output.



CAUTION: Be sure during RF alignment that the hand, or any objects on the bench, do not come in close contact with the antenna loop or detuning will occur and alignment will be incorrect. Wherever possible, RF alignment should be completed with chassis in its normal position in its cabinet.

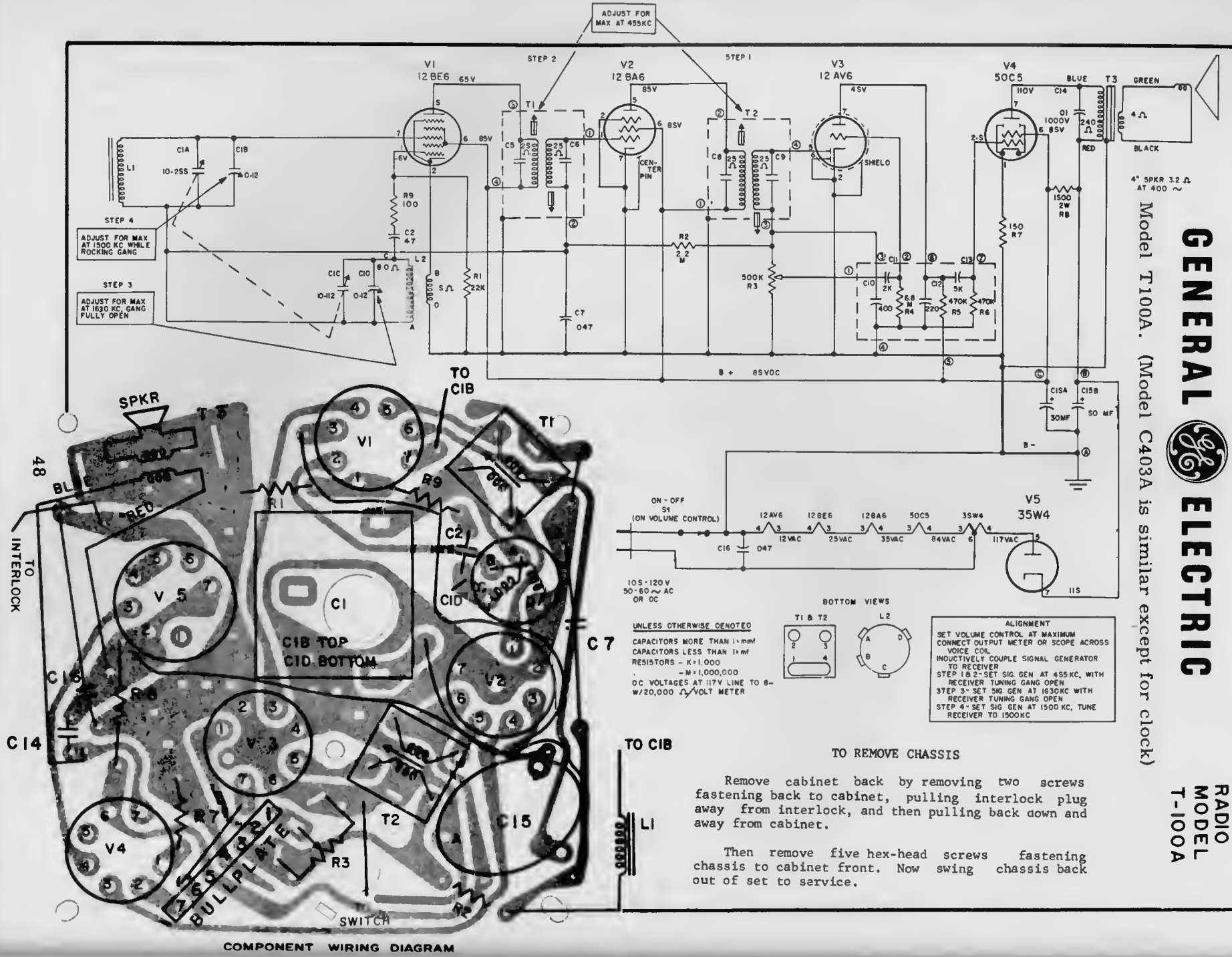
Gamble-Skogmo.

CORONADO MODELS
RA 50-8231 & RA 50-8232

GENERAL ELECTRIC

Model T100A. (Model C403A is similar except for clock)

RADIO MODEL T-100A



COMPONENT WIRING DIAGRAM

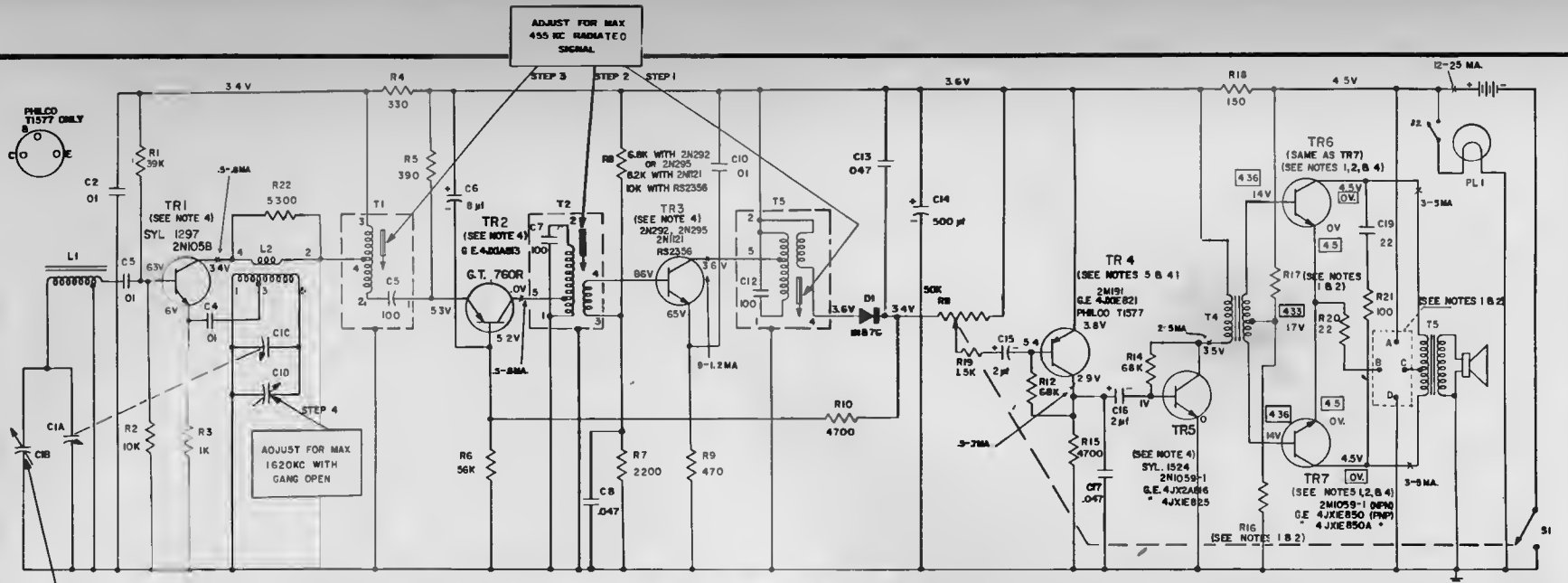
TO REMOVE CHASSIS

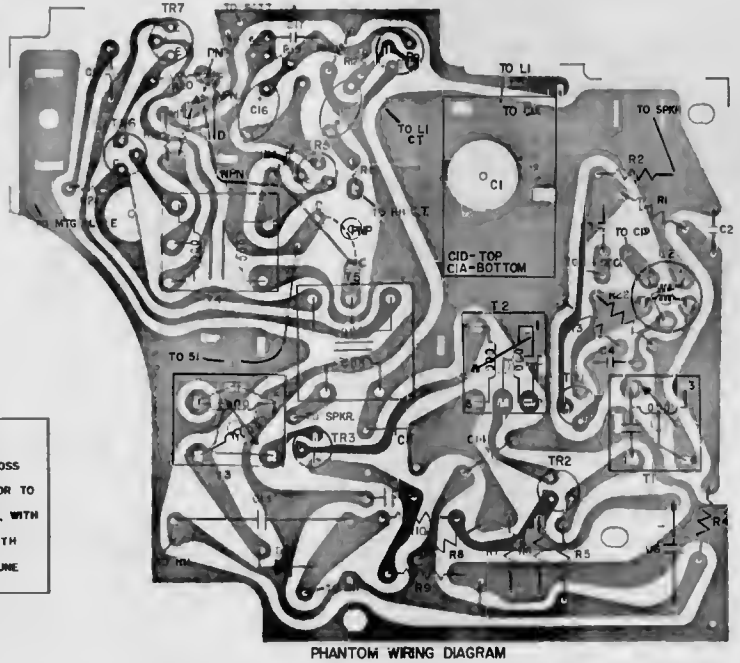
Remove cabinet back by removing two screws fastening back to cabinet, pulling interlock plug away from interlock, and then pulling back down and away from cabinet.

Then remove five hex-head screws fastening chassis to cabinet front. Now swing chassis back out of set to service.

GENERAL ELECTRIC

Radio Models T145A, T146A





PHANTOM WIRING DIAGRAM

NOTES—

1. FOR NPN TR6 & TR7
   - A. CONNECT A JUMPER WIRE BETWEEN POINTS B & D (SEE PHANTOM WIRING DIAGRAM)
   - B. " " " " A & C. (SEE PHANTOM WIRING DIAGRAM)
   - C. R16 MUST BE 50 OHMS
   - D. R17 MUST BE 1K
2. FOR PNP TR6 & TR7
   - A. CONNECT A JUMPER WIRE BETWEEN POINTS A & B. C & D (SEE PHANTOM WIRING DIAGRAM)
   - B.
   - C. R16 MUST BE 1K
   - D. R17 MUST BE 50 OHMS
3. T1577 (PHILCO) TRANSISTOR BASE LEAD MUST BE SOLDERED INTO B2 AS SHOWN ON PHANTOM WIRING DIAGRAM. BASE LEAD OF ALL OTHER RECOMMENDED TRANSISTORS FOR TR4 MUST BE SOLDERED INTO B1.
4. REPLACE WITH TRANSISTOR TYPES SHOWN.
5. UNLESS OTHERWISE NOTED— CAPACITORS MORE THAN 1 = MMF; CAPACITORS LESS THAN 1 = MF; RESISTORS ARE 1/2 WATT; K = 1000
6. VOLTAGES ARE POSITIVE WITH RESPECT TO GROUND UNDER NO SIGNAL CONDITIONS
7. VOLTAGES SHOWN IN ☐ ARE WITH TR6 & TR7 PNP.

ALIGNMENT

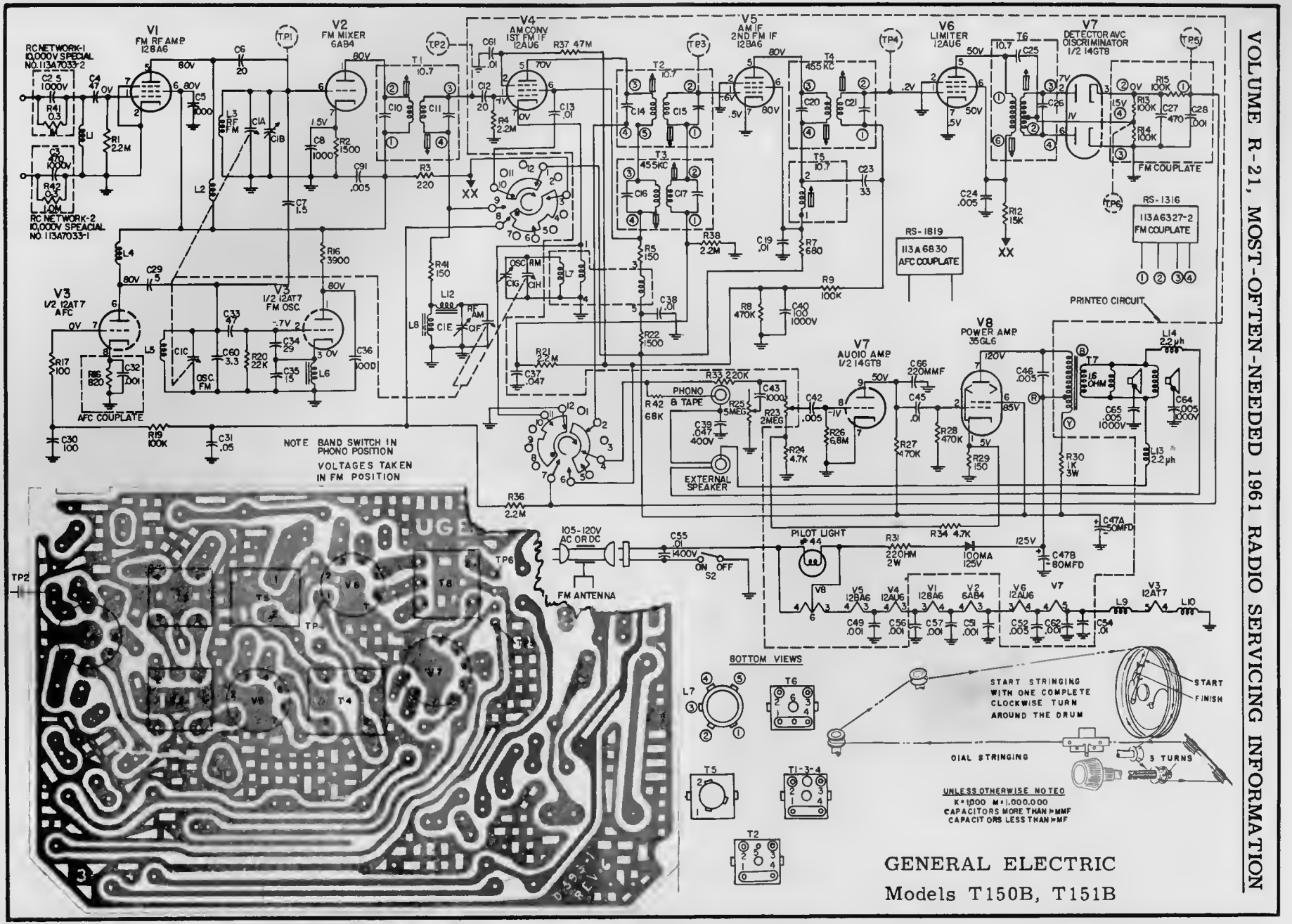
SET VOLUME CONTROL AT MAXIMUM
CONNECT OUTPUT METER OR SCOPE ACROSS VOICE COIL
INDUCTIVELY COUPLE SIGNAL GENERATOR TO RECEIVER
STEP 1 2 & 3 - SET SIG GEN AT 455 KC, WITH RECEIVER TUNING GANG OPEN
STEP 4 SET SIG GEN AT 1620 KC, WITH RECEIVER TUNING GANG OPEN
STEP 5 - SET SIG GEN AT 1400 KC, TUNE RECEIVER TO 1400 KC

CAPACITORS

C1 -- Tuning Cap.
C2 -- .01mf.
C3 -- .01mf.
C4 -- .01mf.
C6 -- 8mf.
C8 -- .047mf.
C10-- .01mf.
C13-- .047mf.
C14-- 500mf.
C15-- 2mf.
C16-- 2mf.
C17-- .047mf.
C19-- .22mf.

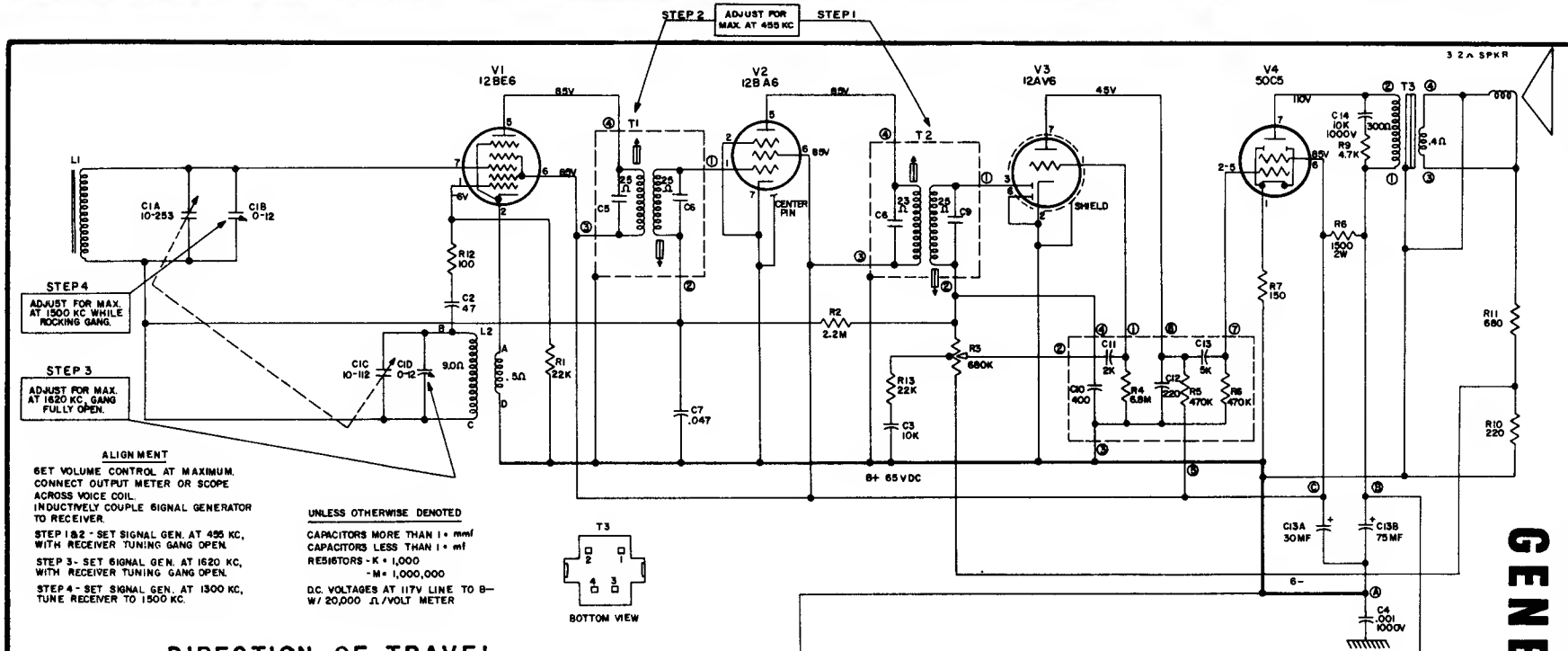
RESISTORS

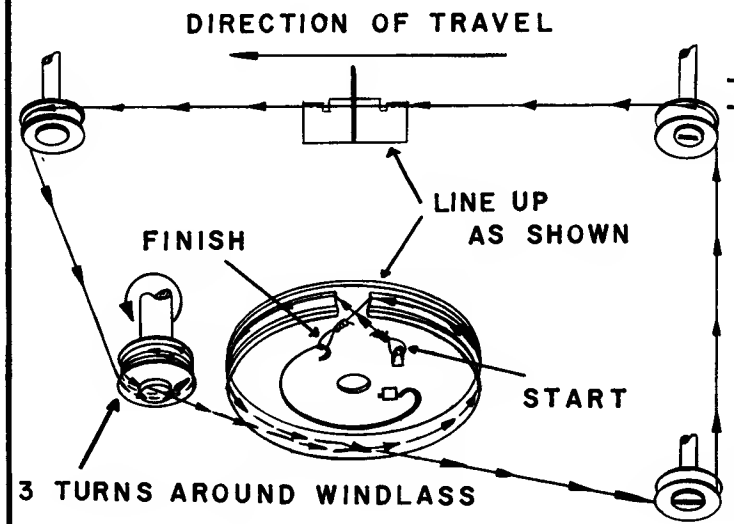
R1 -- 39K
R2 -- 10K
R3 -- 1K
R4 -- 330
R5 -- 390
R6 -- 56K
R7 -- 2.2K
R8 - 6.8K, 8.2K, or 10K
R9 -- 470
R10-- 4.7K
R11-- 50K
R12-- 68K
R13-- 4.7K
R14-- 68K
R16-- (See Notes)
R17-- (See Notes)
R18-- 150
R19-- 1.5K
R20-- 2.2
R21-- 100
R22-- 3.3K



GENERAL ELECTRIC

Models T150B, T151B





STRINGING DIAGRAM

TO REMOVE CABINET BACK

Four hex-head screws fasten the cabinet back to the cabinet front. Two are located in the recessed hand-grip, and two on the lower rear edge of the cabinet. Remove these screws and pull out the interlock plug to remove the back.

TO REMOVE CHASSIS

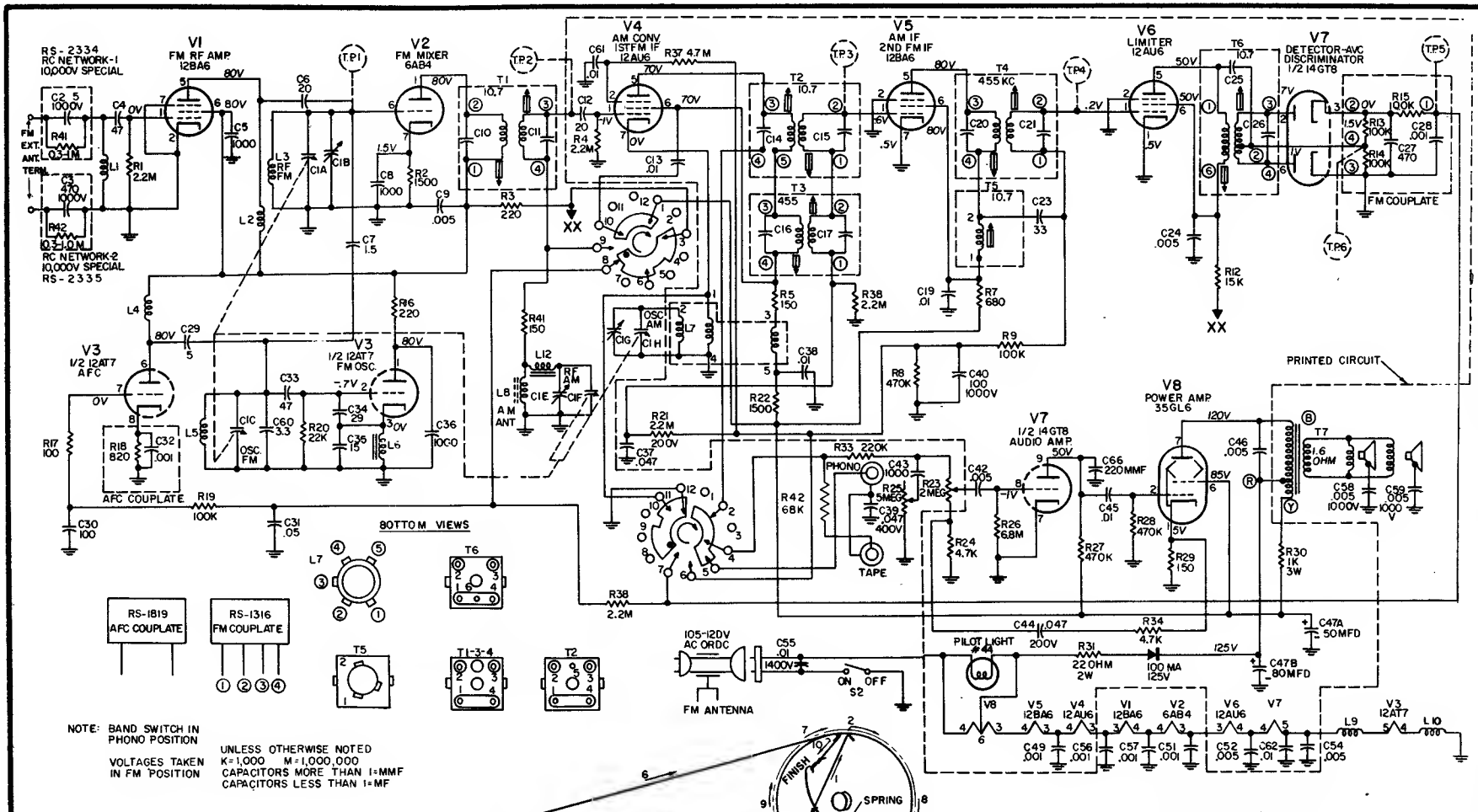
Four hex-head screws fasten the cabinet back to cabinet bottom, two fasten the volume control to the cabinet front, and one fastens the antenna bracket to the cabinet front. Remove these screws and the volume control knob.

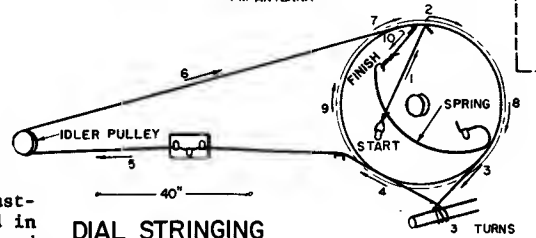
The dial drum is captive and remains on the cabinet front. The tuning gang shaft will slide out of the dial drum when the chassis is pulled out of the cabinet.

When replacing the chassis, be sure to line the flat side of the gang shaft up with the flat side of the dial drum hole. This will allow the gang shaft to enter the dial drum.

GENERAL ELECTRIC

MODELS T165A, T166A





DIAL STRINGING

FM OSCILLATOR COIL

The FM oscillator coil, L5, may require adjustment if components, other than tubes, are changed in the FM oscillator-mixer section. Check the band end frequencies. If the set tunes through 108 and 88 MC do not touch the coil. If the oscillator frequency is low, adjust L5 by spreading the turns slightly. (This raises the dial frequency.) If the oscillator frequency is high, adjust L5 by squeezing the turns together slightly. (This lowers the dial frequency.)

NOTE: A small change in the space between 2 turns of L5 shifts the frequency approximately 1 MC.

GENERAL ELECTRIC

Model T210B

TO REMOVE CABINET

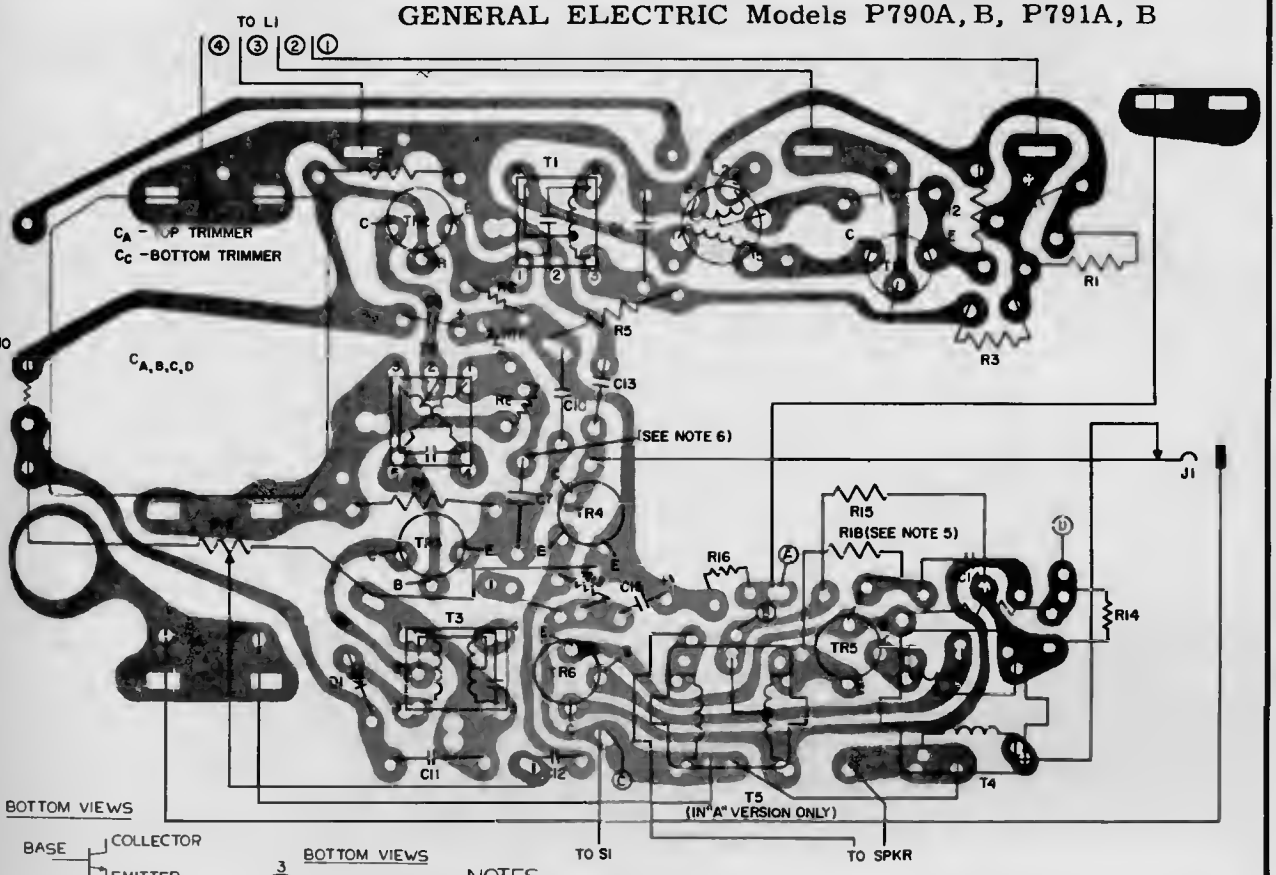
1. Remove 2 cab. rear screws & separate front & back.
2. Chassis can remain on cabinet front for trouble-shooting and alignment.

(Knobs are removed by releasing captive clips with a screwdriver.)

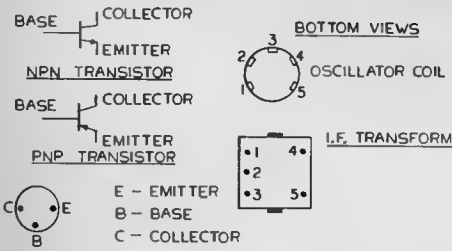
TO REMOVE A SPEAKER

1. Same as No. 1 above.
2. Unscrew the six hex-head screws holding the grille to the cabinet front.
3. Label and unsolder speaker leads from speaker terminals. Reversed speaker leads will cause distorted audio.
4. Unscrew the four screws around front of speaker and remove the speaker from cabinet front.

GENERAL ELECTRIC Models P790A, B, P791A, B

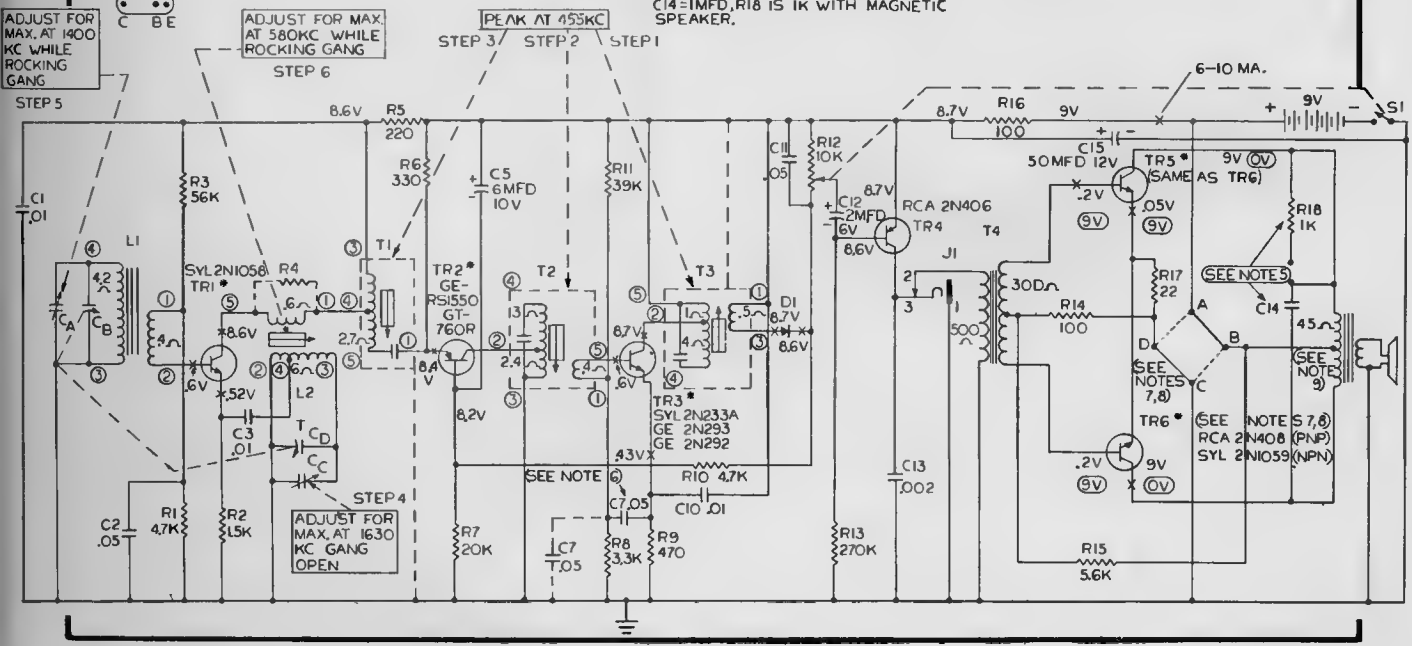


BOTTOM VIEWS



NOTES.

1. UNLES OTHERWISE NOTED: CAPACITORS MORE THAN 1=MMF CAPACITORS LESS THAN 1=MF RESISTORS ARE 1/2 WATT & K=1000
2. VOLTAGE & CURRENT READINGS ARE AVERAGE UNDER NO SIGNAL CONDITIONS. VOLTAGES ARE POSITIVE WITH RESPECT TO GROUND.
3. SIMILIAR APPROVED TRANSISTORS MAY BE USED.
4. VOLTAGES SHOWN IN ⬭ ARE FOR PNP TRANSISTORS IN TR5 & TR6.
5. C14=.02MFD, R18 IS REPLACED BY JUMPER WITH DYNAMIC SPEAKER. C14=1MFD, R18 IS 1K WITH MAGNETIC SPEAKER.
6. IF TR3 IS 2N293 OR 2N292, C7 GOES TO GROUND.
7. FOR NPN TRANSISTORS IN TR5 & TR6
   A. JUMPER A TO B
   B. JUMPER C TO D
8. FOR PNP TRANSISTORS IN TR5 & TR6
   A. JUMPER A TO D
   B. JUMPER B TO C
9. RESISTANCE ACROSS OUTPUT TRANSFORMER IS 45Ω WITH DYNAMIC SPEAKER. READING WITH MAGNETIC SPEAKER IS 85Ω.



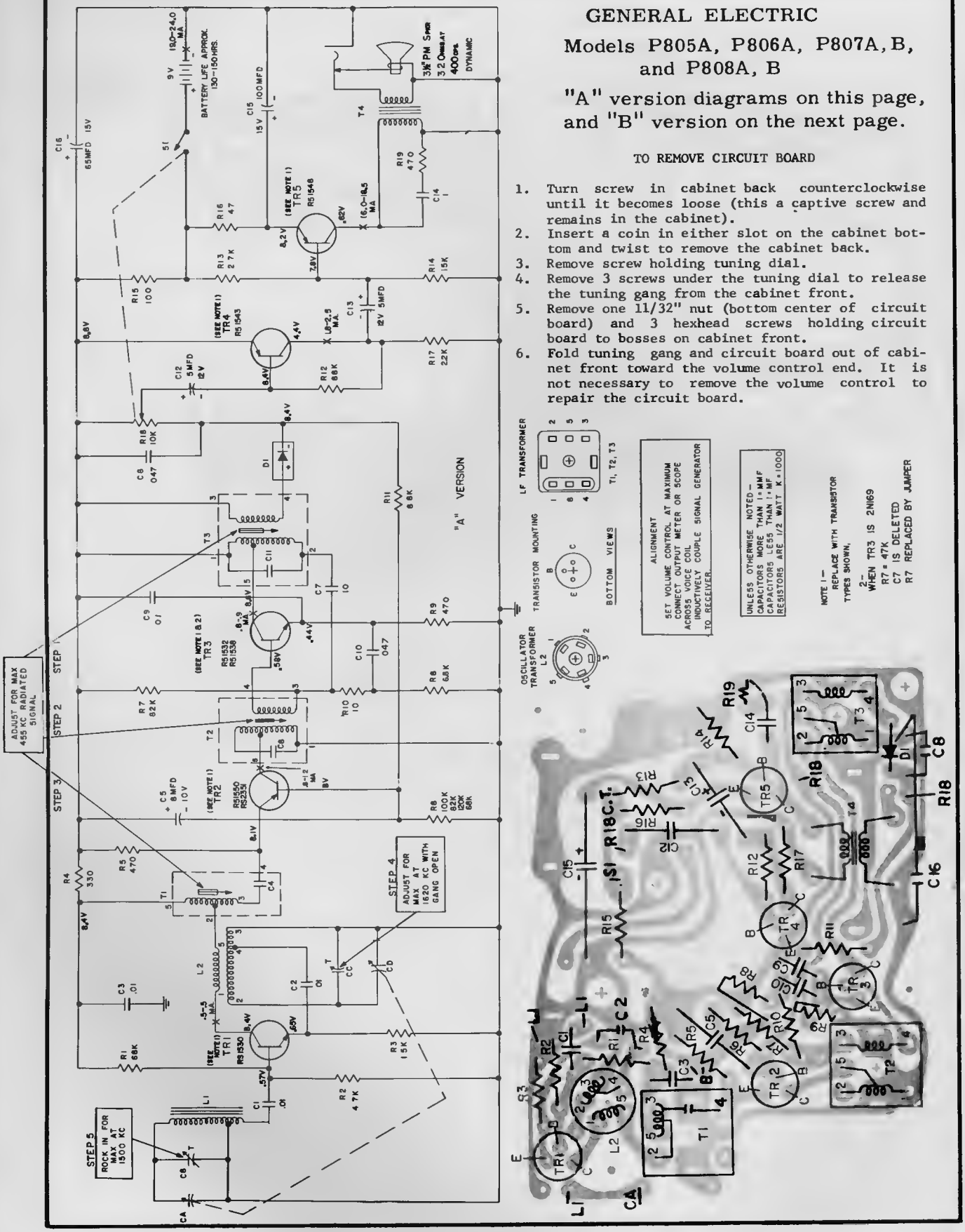
GENERAL ELECTRIC

Models P805A, P806A, P807A,B, and P808A, B

"A" version diagrams on this page, and "B" version on the next page.

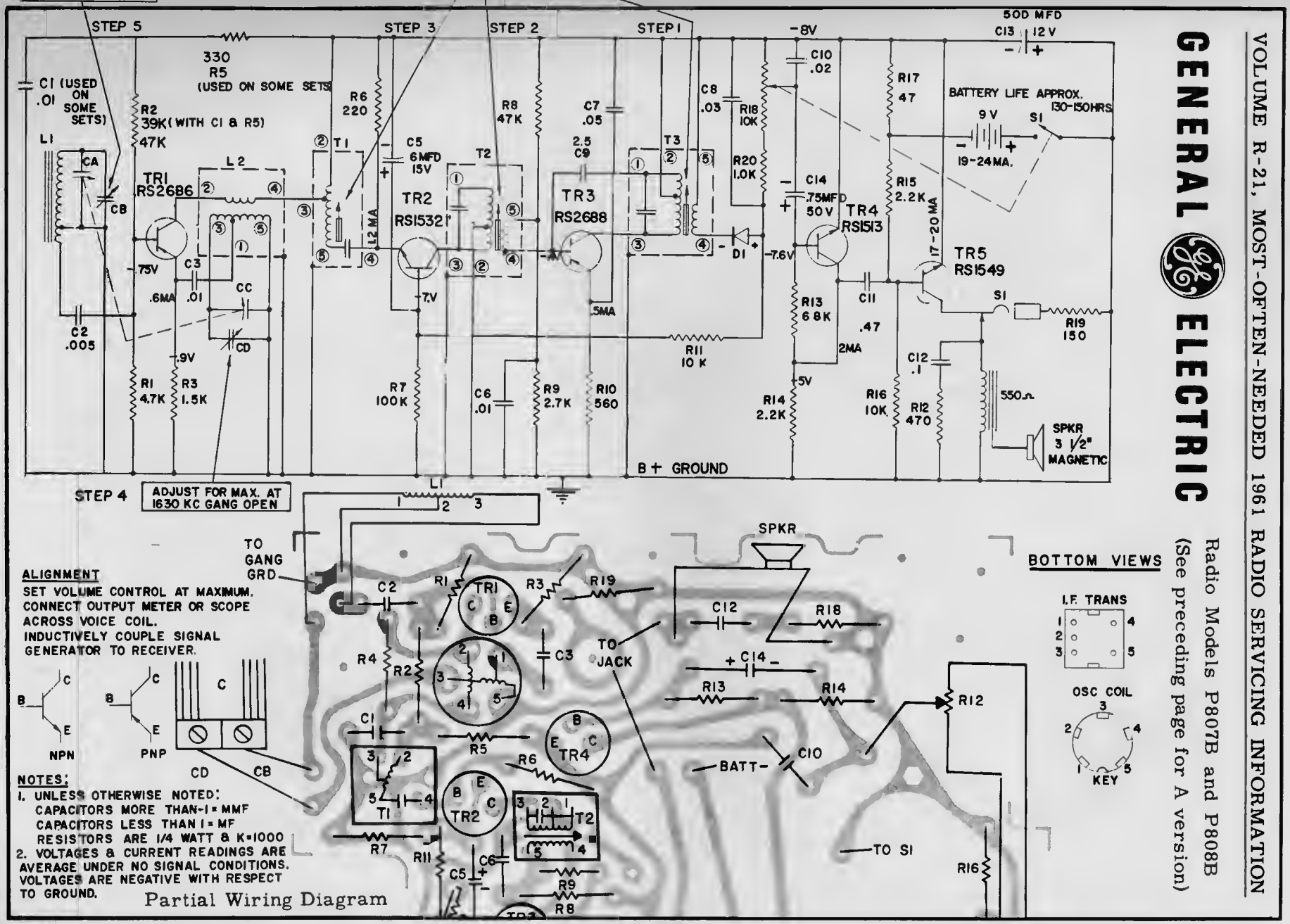
TO REMOVE CIRCUIT BOARD

1. Turn screw in cabinet back counterclockwise until it becomes loose (this a captive screw and remains in the cabinet).
2. Insert a coin in either slot on the cabinet bottom and twist to remove the cabinet back.
3. Remove screw holding tuning dial.
4. Remove 3 screws under the tuning dial to release the tuning gang from the cabinet front.
5. Remove one 11/32" nut (bottom center of circuit board) and 3 hexhead screws holding circuit board to bosses on cabinet front.
6. Fold tuning gang and circuit board out of cabinet front toward the volume control end. It is not necessary to remove the volume control to repair the circuit board.

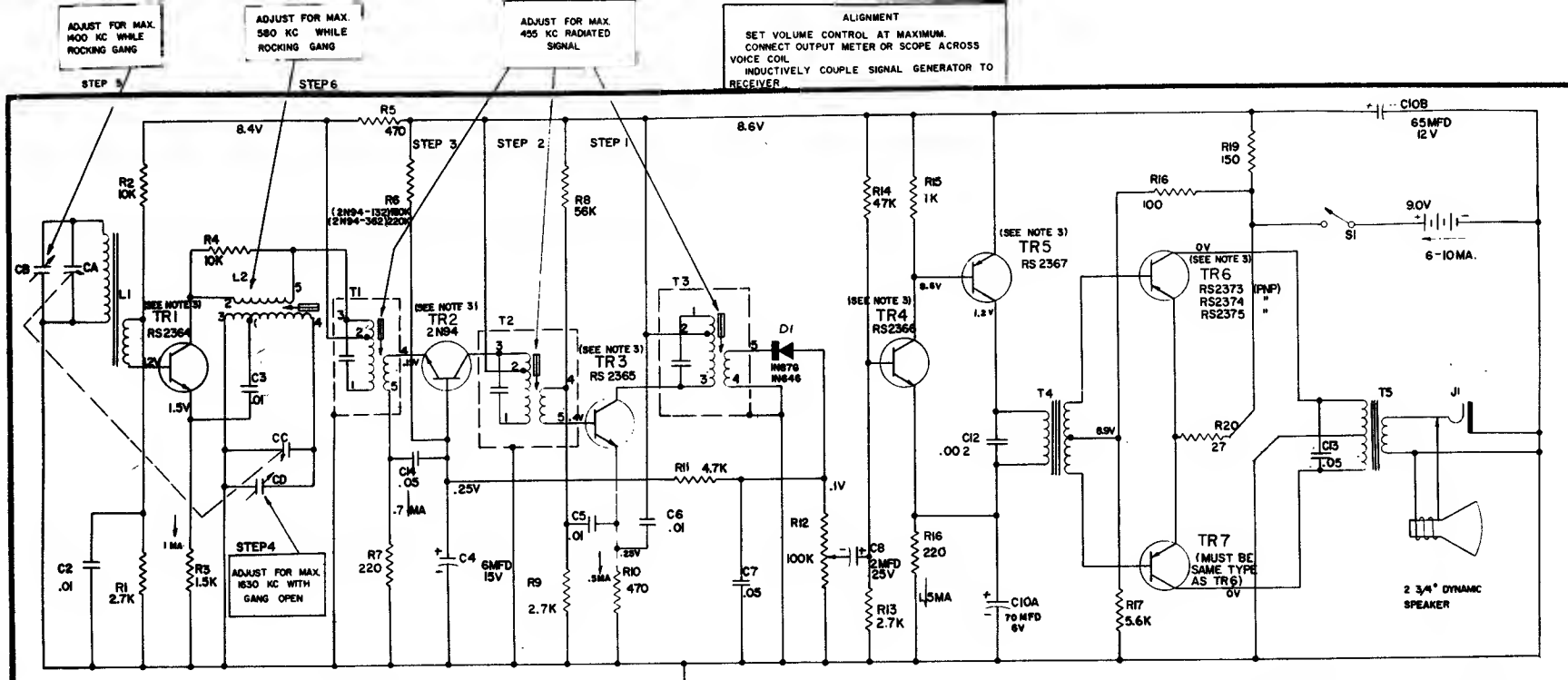


GENERAL ELECTRIC

Radio Models P807B and P808B
(See preceding page for A version)



Partial Wiring Diagram



TO REMOVE CHASSIS

1. Disengage screw on rear of cabinet.
2. Insert coin in slot on bottom of cabinet and twist to remove cabinet back.
3. Remove 5 screws holding board to cabinet bosses. (Do not remove screws from antenna holder.)
4. Swing circuit board up 90° from cabinet front.

TO REMOVE VOLUME CONTROL AND/OR TUNING CAPACITOR

1. Remove chassis.
2. Remove volume control knob.
3. Remove two screws holding tuning capacitor mounting plate to cabinet front.
4. Unscrew metal stud holding mounting bracket near speaker and dial scale opening.
5. Carefully lift out chassis and controls, tilt unit slightly to slide dial pointer out of opening.

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 minimum, tuning gang closed, and with no-signal conditions.

The total receiver current drain is 6 to 10 mils. This is measured by inserting a milliammeter in series with the battery (-) and pivoted connector.

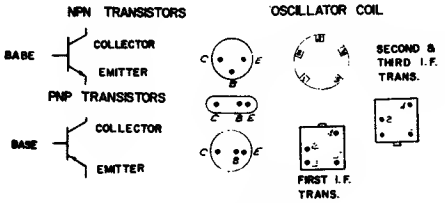
If an excessive total current drain is recorded, the individual collector currents of each transistor should be checked. An excessive current reading may mean a shorted transistor; no current will indicate that a transistor or associated circuit component is defective.

NO RECEPTION:
1. Check battery voltage and battery contacts.
2. Check on-off switch.
3. Check all antenna lead connections.
4. Check coil L2.

WEAK AUDIO:
1. Check battery voltage for 9 volts.
2. Check battery current.
3. Check transistor collector currents.
4. Check alignment.

INTERMITTENT:
1. Check battery contacts for corrosion.
2. Check solder connections on dip-soldered side of circuit board.

Intermittent audio, motorboating, and poor reception is frequently caused by poor battery contact or low battery voltage.



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 POSITIVE WITH RESPECT TO GROUND UNDER NO SIGNAL CONDITIONS.
3. REPLACE WITH TRANSISTOR TYPES SHOWN, OR ORDER BY CATALOG NUMBER AS LISTED IN PARTS LIST.

GENERAL ELECTRIC
Models P815A, P816A

GENERAL ELECTRIC

MODELS P830C and P831C

NOTES

1 UNLESS OTHERWISE NOTED-CAPACITORS MORE THAN 1=MMF CAPACITORS LESS THAN 1=MF RESISTORS ARE ½ WATT K=1000

2 VOLTAGE AND CURRENT READINGS ARE AVERAGE UNDER NO SIGNAL CONDITIONS VOLTAGES ARE POSITIVE WITH RESPECT TO GROUND

3 VOLTAGES SHOWN IN ▭ ARE FOR PNP TRANSISTORS IN TR5 AND TR6

4 REPLACE WITH TRANSISTOR TYPES SHOWN,
5 FOR NPN TR5 AND TR6
A CONNECT R17 ("A" SIDE) TO POINT "C"
B CONNECT YELLOW LEAD FROM T5 TO POINT "B"
C R14 MUST BE 100 ohms
D R15 MUST BE 5.6K

6 FOR PNP TR5 AND TR6
A. CONNECT R17 ("A" SIDE) TO POINT "B"
B CONNECT YELLOW LEAD FROM T5 TO POINT "C"
C R14 MUST BE 5.6K
D. R15 MUST BE 100 OHMS

MOUNTING VIEW OF GANG

A OSCILLATOR TRIMMER
B GROUND
C ANTENNA TRIMMER

I.F TRANSFORMERS

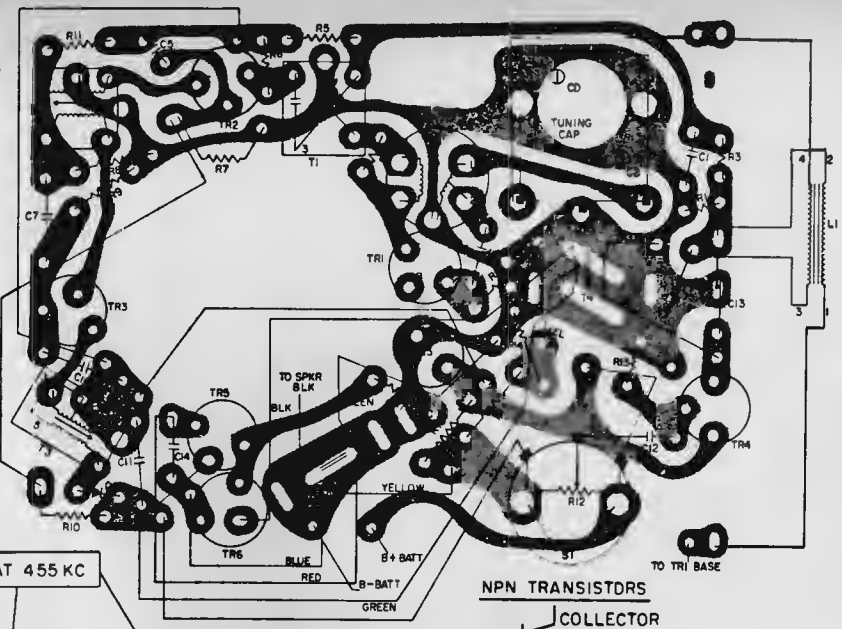
OSCILLATOR COIL

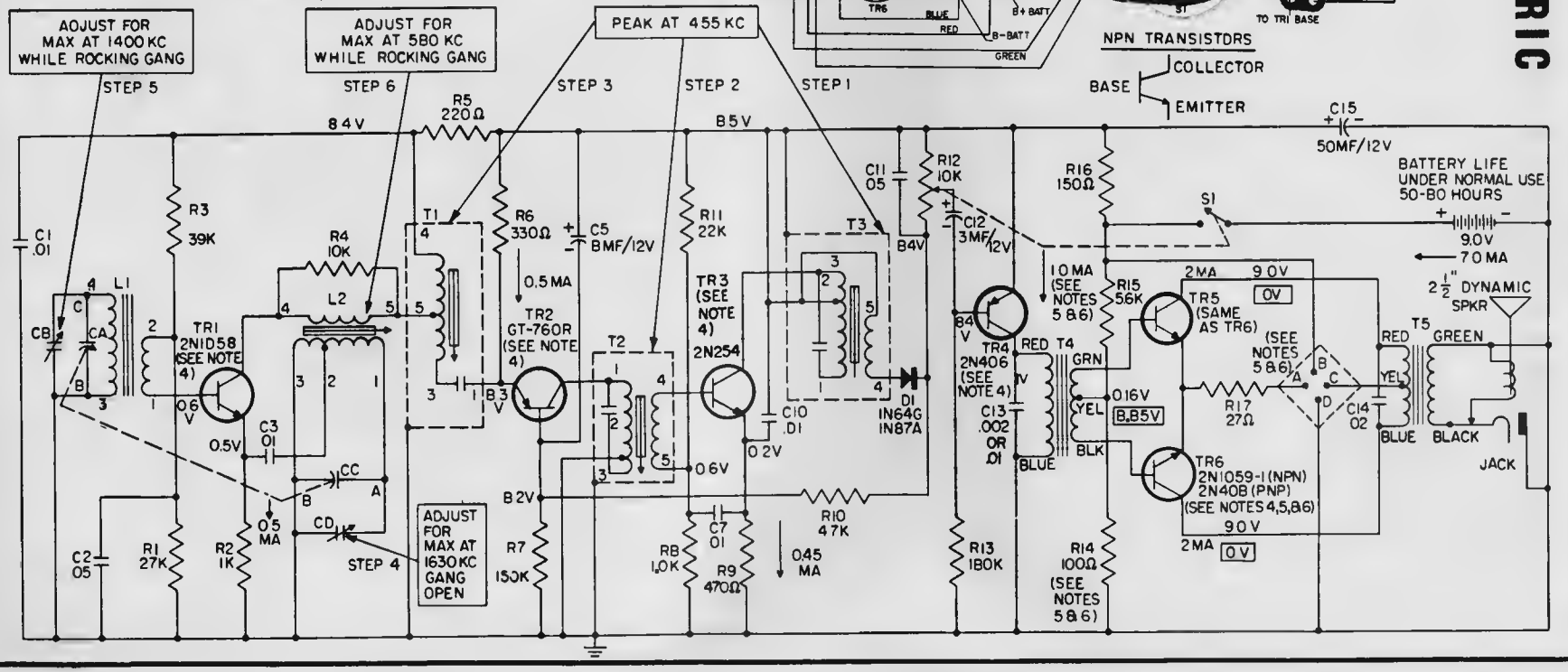
BOTTOM VIEWS

E-EMITTER
B-BASE
C-COLLECTOR

PNP TRANSISTORS

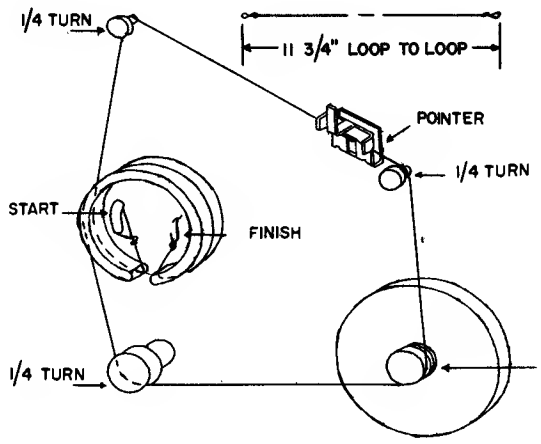
NPN TRANSISTORS





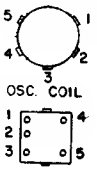
GENERAL ELECTRIC

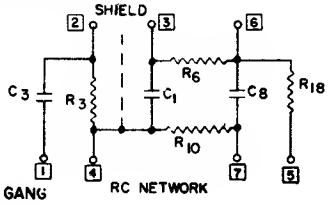
MODELS
P830E
P831E



NOTES:
1. UNLESS OTHERWISE NOTED—
   CAPACITORS MORE THAN 1=μfd
   CAPACITORS LESS THAN 1=μfd
   RESISTORS ARE 1/2 WATT & K=1000
2. VOLTAGES & CURRENT READINGS ARE AVERAGE UNDER NO SIGNAL CONDITIONS VOLTAGES ARE NEGATIVE WITH RESPECT TO GROUND.
3. REPLACE WITH TRANSISTOR TYPES SHOWN.
4. FOR NPN TRANSISTORS IN TR5 & TR6
   (a) JUMPER C TO D
   (b) JUMPER A TO B
5. FOR PNP TRANSISTORS IN TR5 & TR6
   (a) JUMPER A TO D
   (b) JUMPER C TO B

IF TRANSFORMERS





TO REMOVE CIRCUIT BOARD

1. Remove cabinet back.
2. Remove screw that is mounted next to volume control.
3. Place fingernail 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.

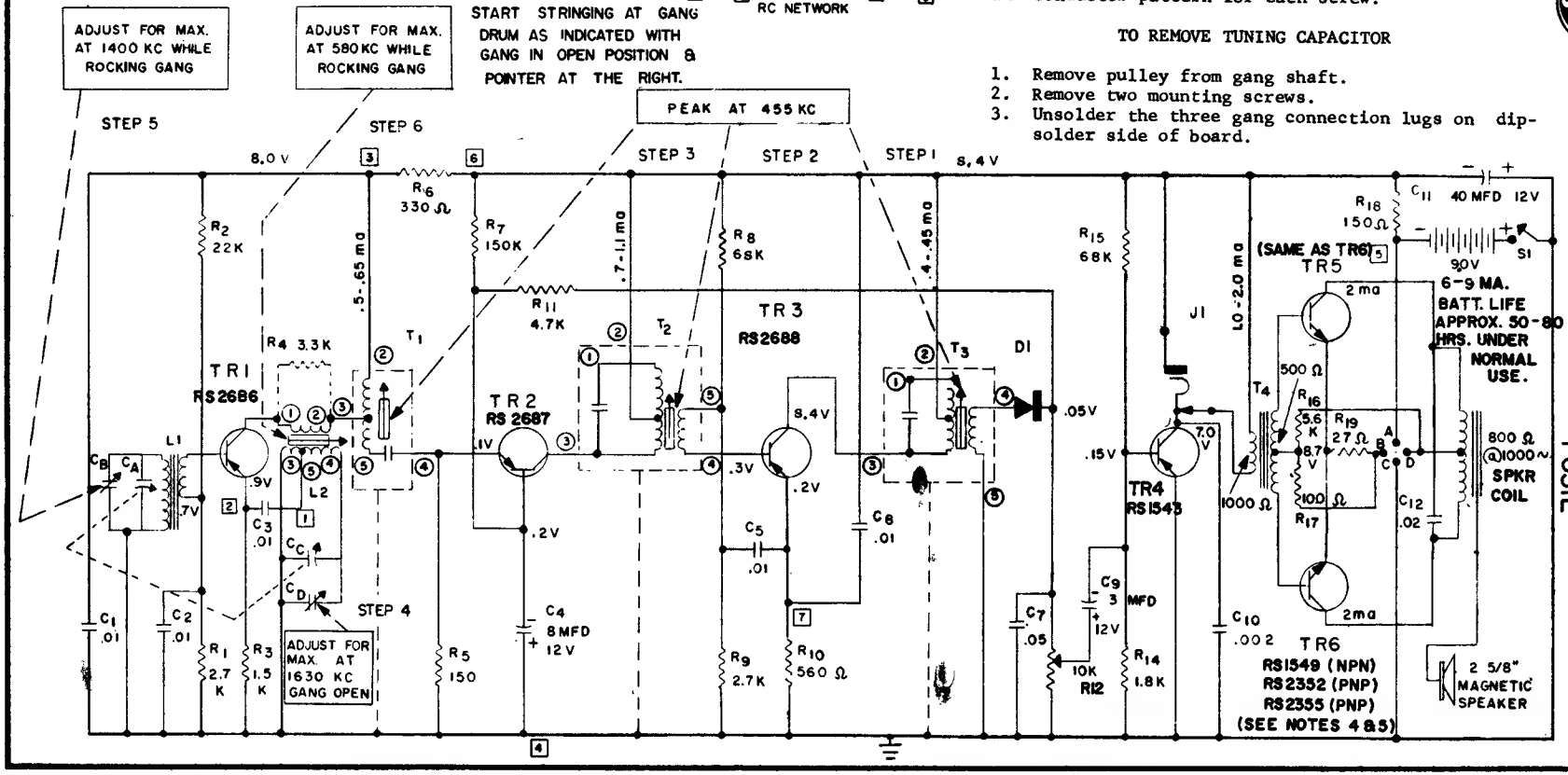
TO REMOVE VOLUME CONTROL

1. Remove tuning knob.
2. Remove two screws mounted under tuning knob.
3. Remove control.

IMPORTANT: After installing volume control, be sure there is continuity between mounting screw head and conductor pattern for each screw.

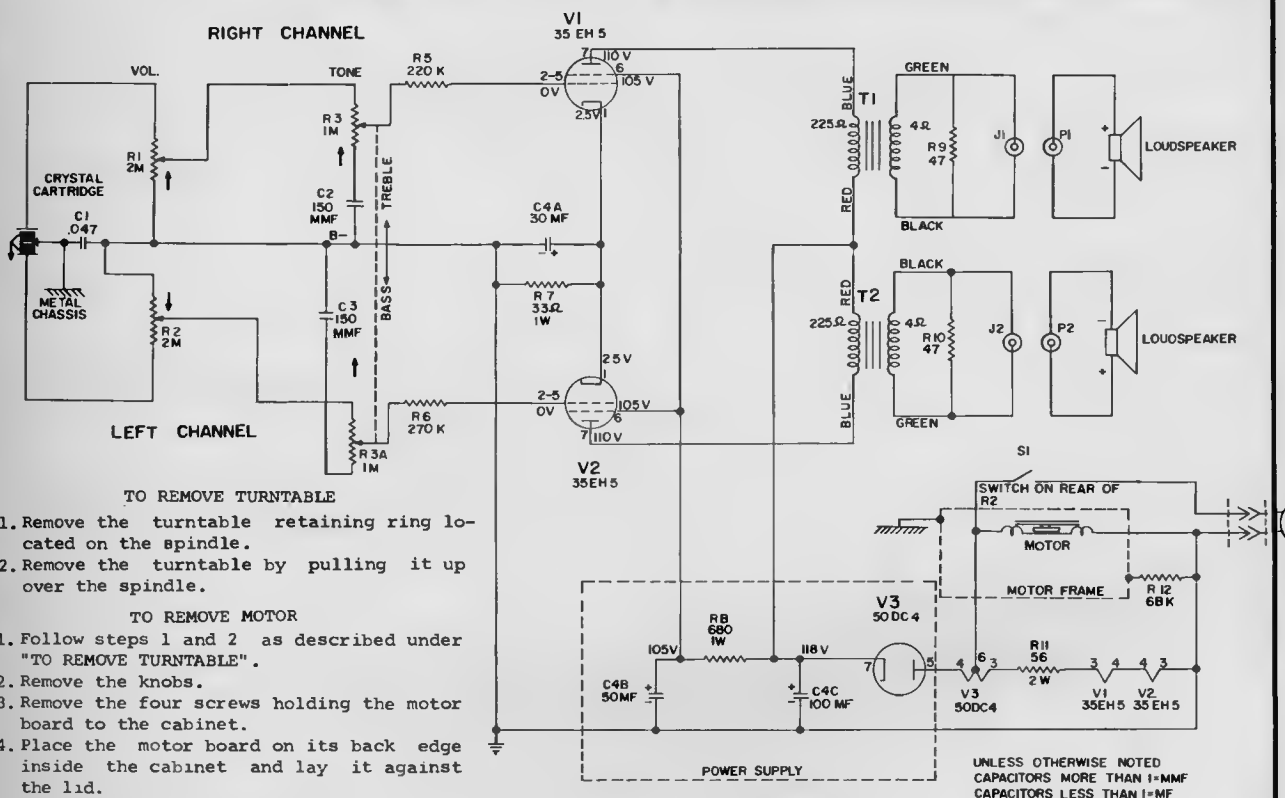
TO REMOVE TUNING CAPACITOR

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



GENERAL ELECTRIC

Exact material for Model RP1100A, Models RP1127A, RP1128A are similar.



TO REMOVE TURNTABLE

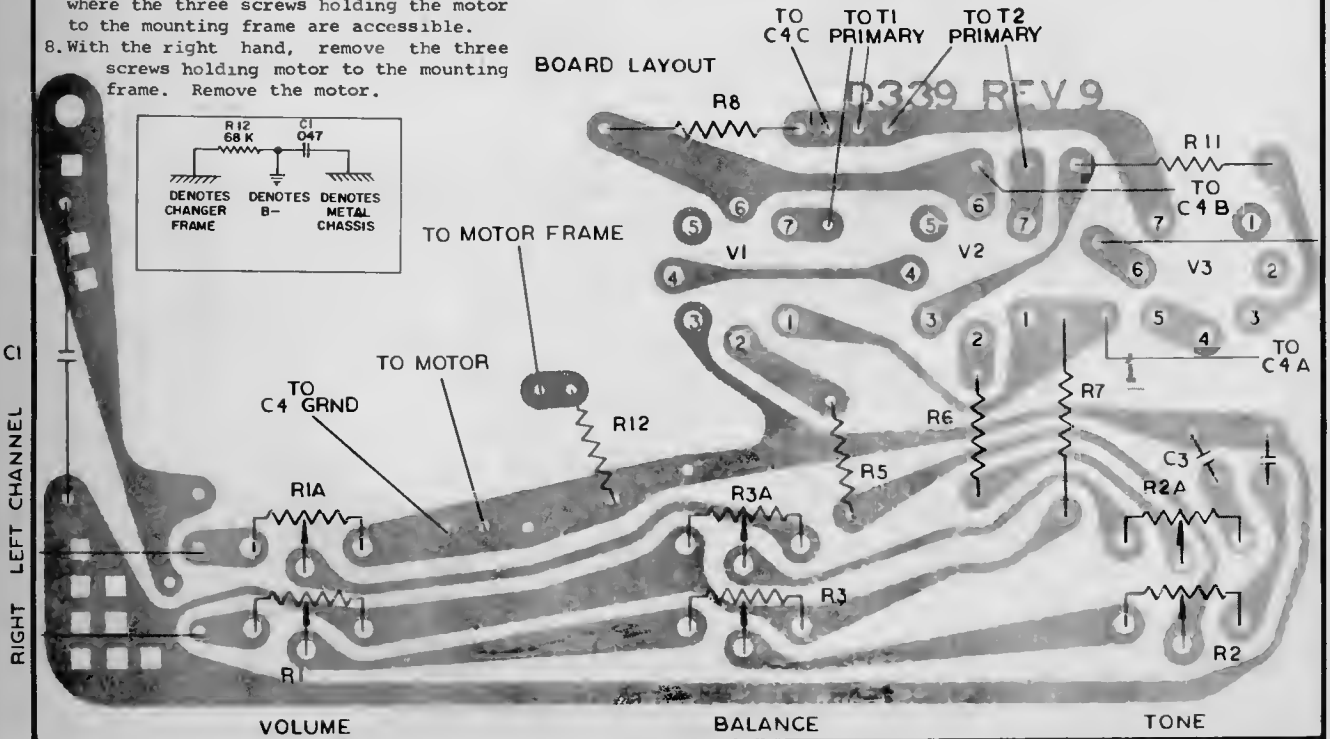
1. Remove the turntable retaining ring located on the spindle.
2. Remove the turntable by pulling it up over the spindle.

TO REMOVE MOTOR

1. Follow steps 1 and 2 as described under "TO REMOVE TURNTABLE".
2. Remove the knobs.
3. Remove the four screws holding the motor board to the cabinet.
4. Place the motor board on its back edge inside the cabinet and lay it against the lid.
5. Remove the 5/16 inch nut holding the ground lug to the motor.
6. Remove the two plastic Twist Caps on the motor leads.
7. Place the left hand on the motor and bring the motor board back to a position where the three screws holding the motor to the mounting frame are accessible.
8. With the right hand, remove the three screws holding motor to the mounting frame. Remove the motor.

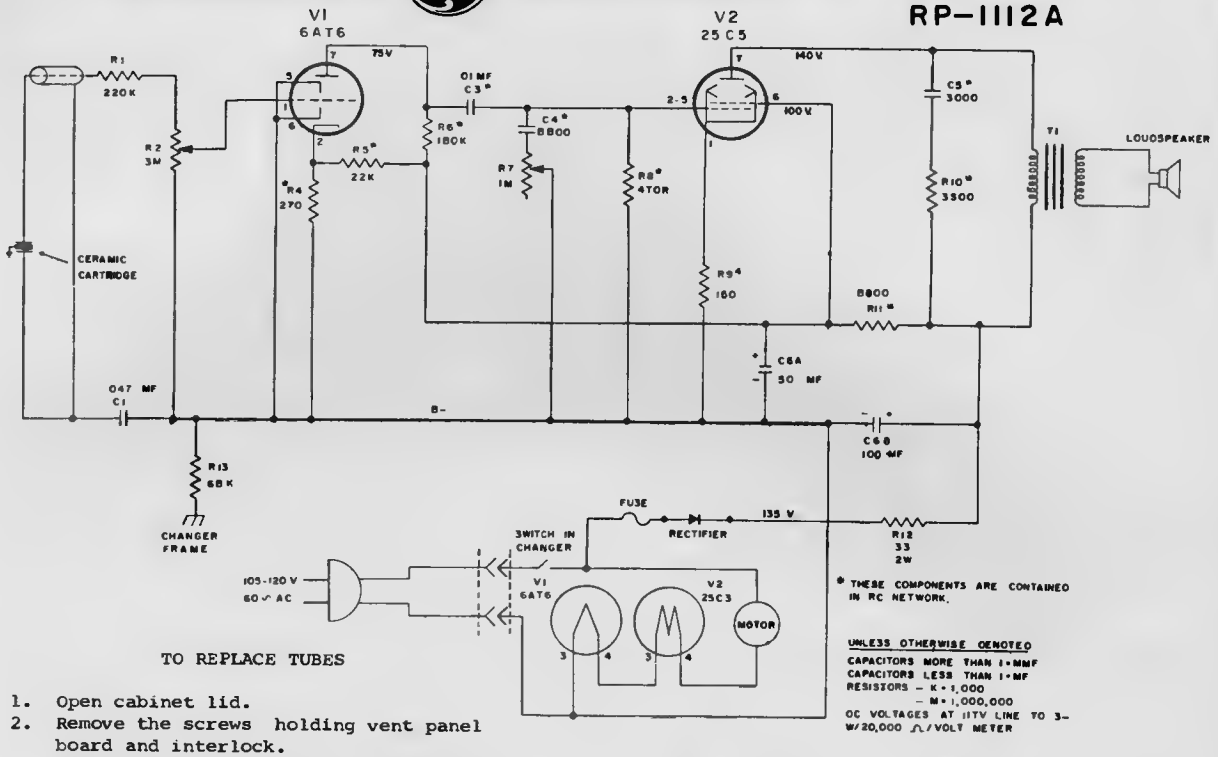
TO PHASE SPEAKERS
PLACE A ONE AND ONE-HALF (1½V) VOLT BATTERY ACROSS THE VOICE COIL WHEN THE SPEAKER CONE MOVES OUT, AWAY FROM THE MAGNET, THE POSITIVE TERMINAL ON THE BATTERY IS THE PLUS SIDE OF THE VOICE COIL AS INDICATED ON SCHEMATIC.

UNLESS OTHERWISE NOTED
CAPACITORS MORE THAN 1=MMF
CAPACITORS LESS THAN 1=MF
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



GENERAL ELECTRIC

PHONO
MODEL
RP-1112A



* THESE COMPONENTS ARE CONTAINED IN RC NETWORK.

UNLESS OTHERWISE DENOTED
CAPACITORS MORE THAN 1 MMF
CAPACITORS LESS THAN 1 MF
RESISTORS – K = 1,000
– M = 1,000,000
DC VOLTAGES AT ITV LINE TO B- W/20,000 Ω/VOLT METER

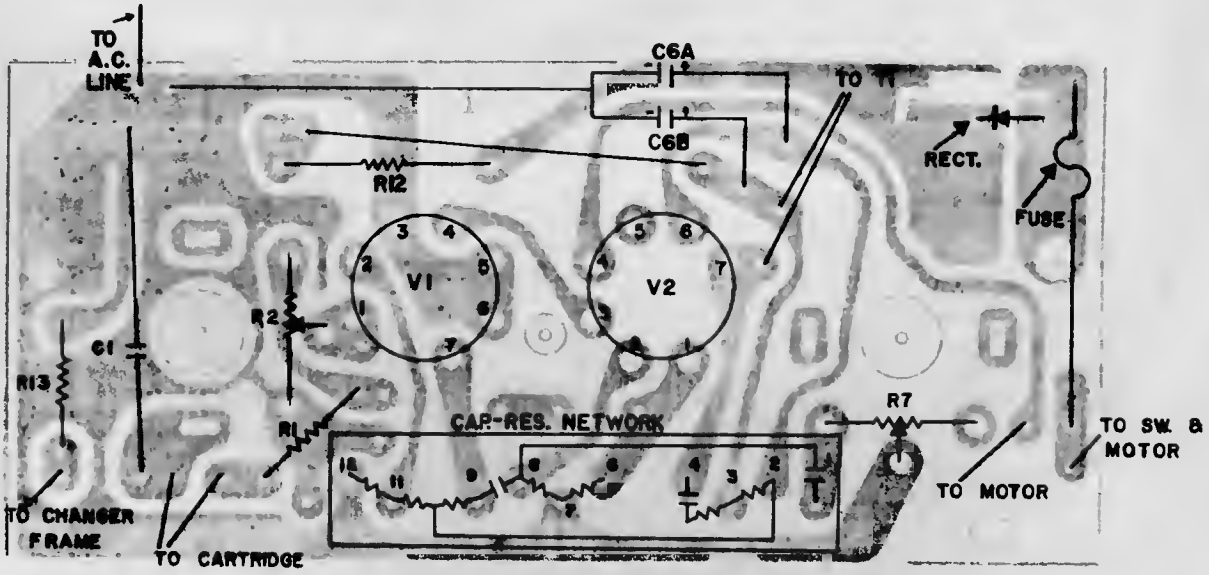
TO REPLACE TUBES

1. Open cabinet lid.
2. Remove the screws holding vent panel board and interlock.
3. Remove vent panel.board. (Interlock is automatically disconnected.)

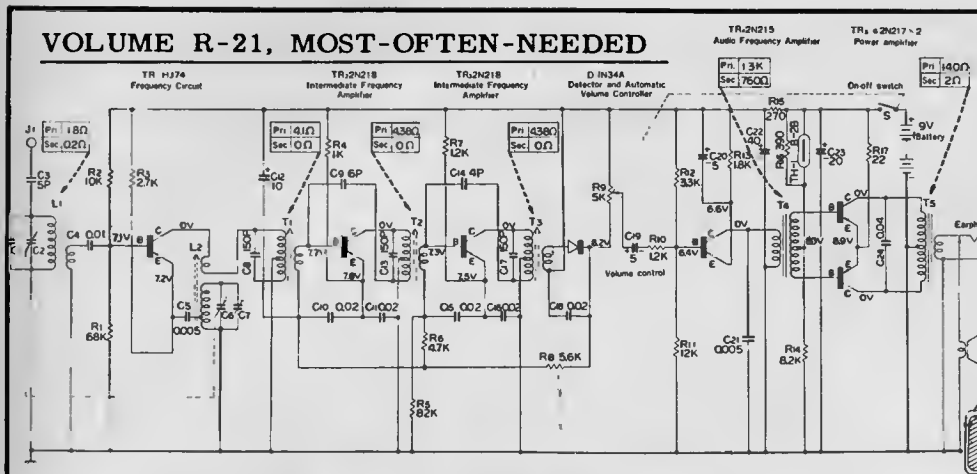
TO REMOVE AMPLIFIER CHASSIS

1. Follow steps 1 thru 3 as above.
2. Remove volume and tone knobs.
3. Loosen screws on interlock bracket, slide interlock out of mounting slot. (Mark location of bracket on cabinet before removing so that bracket can be "keyed" to correct location when replacing.)
4. Remove three screws on cabinet brace above speaker.
5. Lift out grille (with all electronic components) and place down in front of cabinet carefully.
6. Remove amplifier chassis by removing the three screws holding chassis to grille.

When replacing knobs, brace back of each control (volume and tone) with one finger as the knob is pressed on.

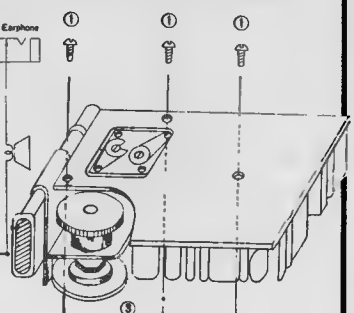


COMPONENT LOCATIONS - BOTTOM VIEW - RP-1110A



Hitachi

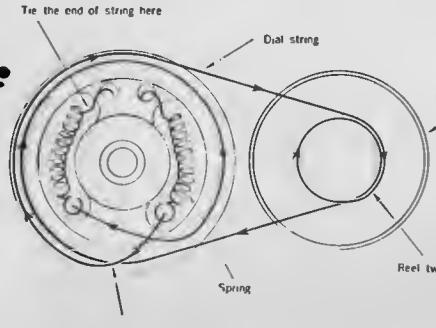
MODEL TH-627R



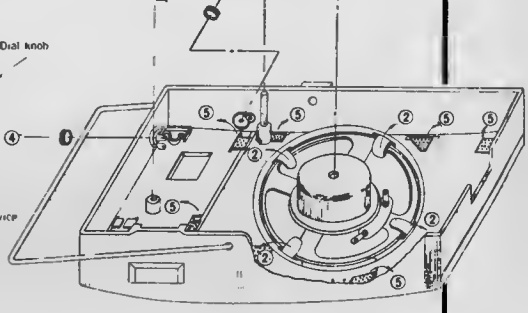
Hitachi, Ltd.

Tokyo Japan

MODEL TH-627R

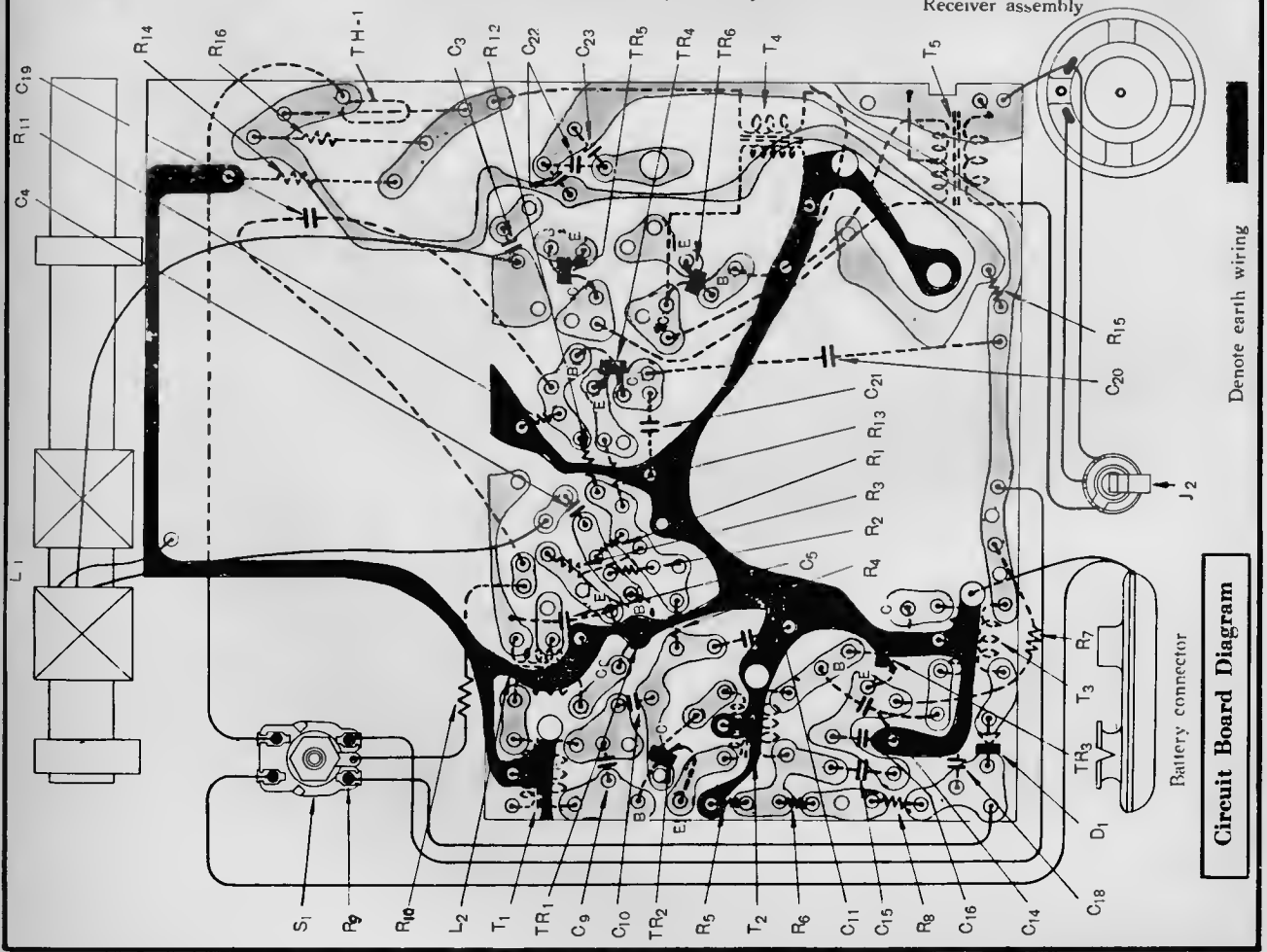


Dial string assembly



Receiver assembly

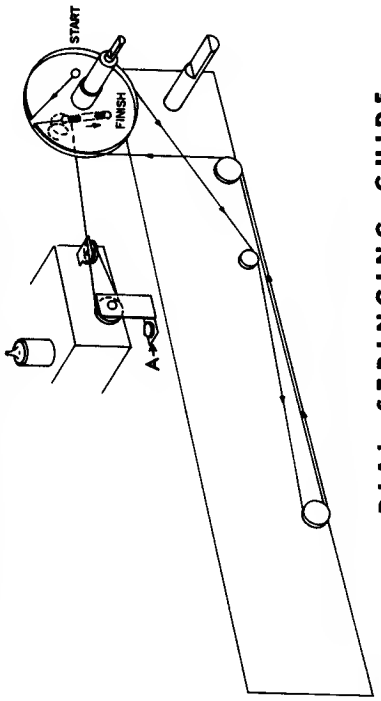
Tuning range	BC 535~1,605 kc,
Intermediate frequency	455 kc



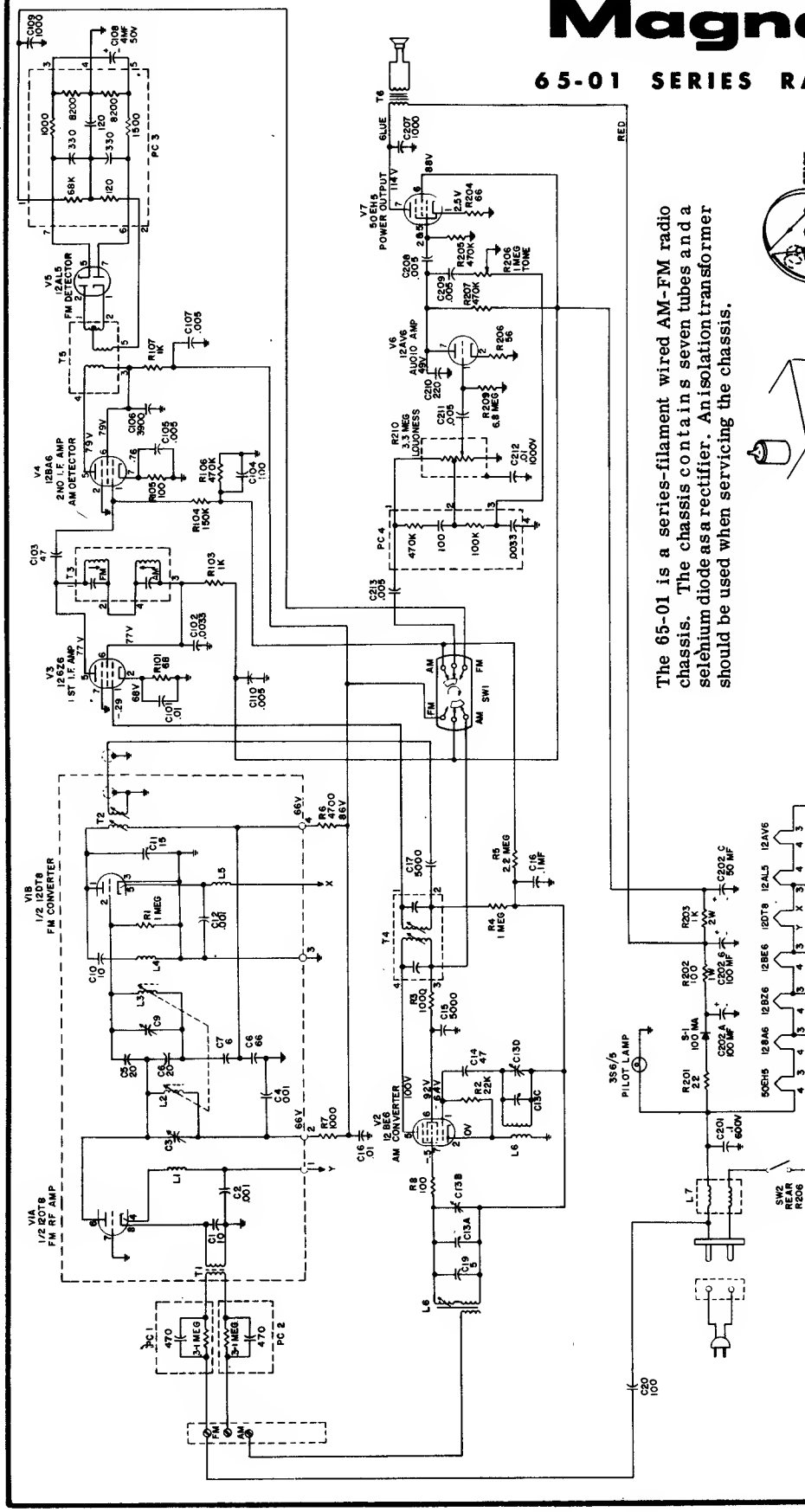
Magnavox

65-01 SERIES RADIO CHASSIS

The 65-01 is a series-filament wired AM-FM radio chassis. The chassis contains seven tubes and a selenium diode as a rectifier. An isolation transformer should be used when servicing the chassis.



DIAL STRINGING GUIDE



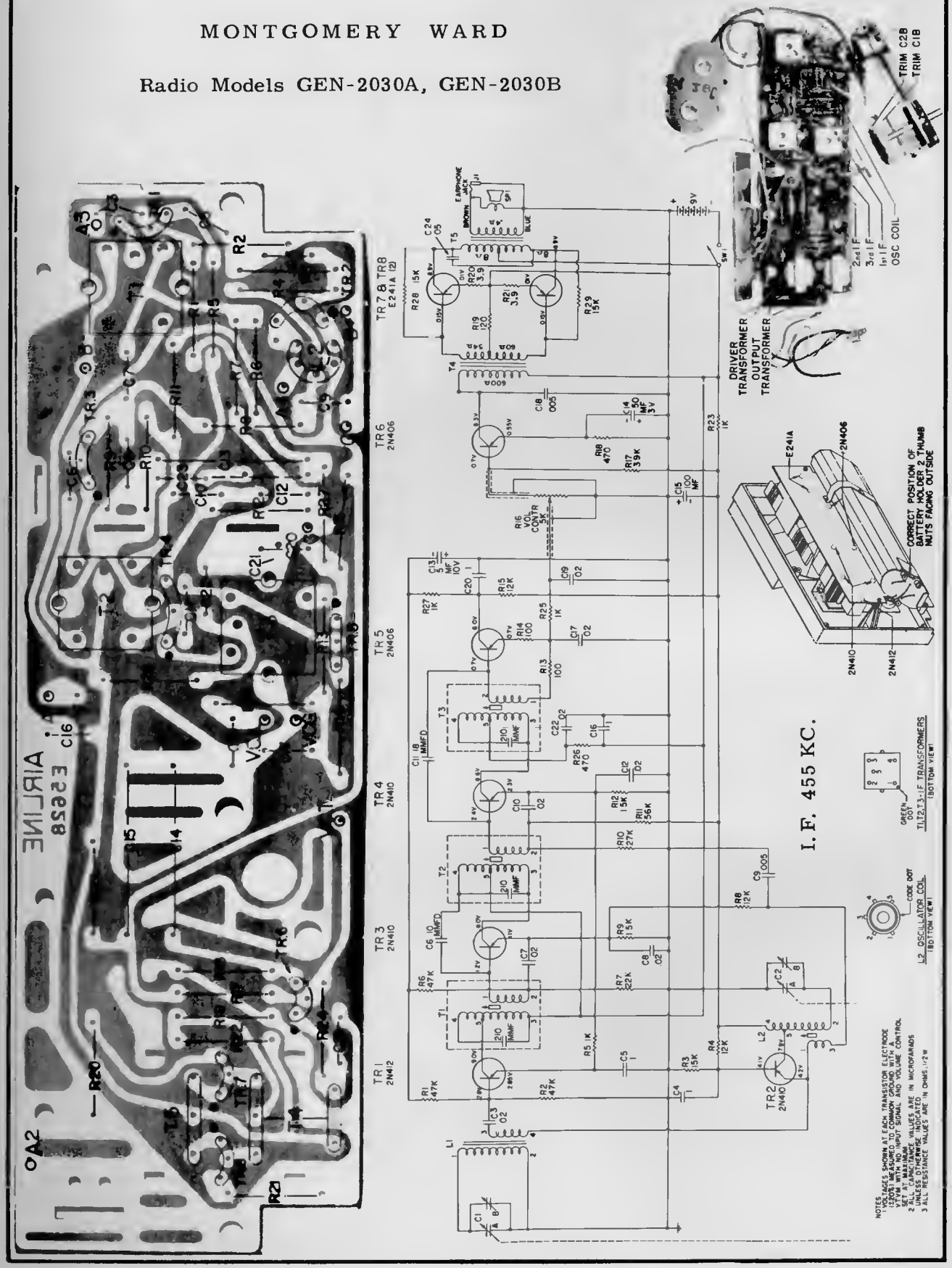
NOTES:
1. ALL VOLTAGES MEASURED IN FM POSITION EXCEPT 12BE6
2. LINE VOLTAGE 117 V

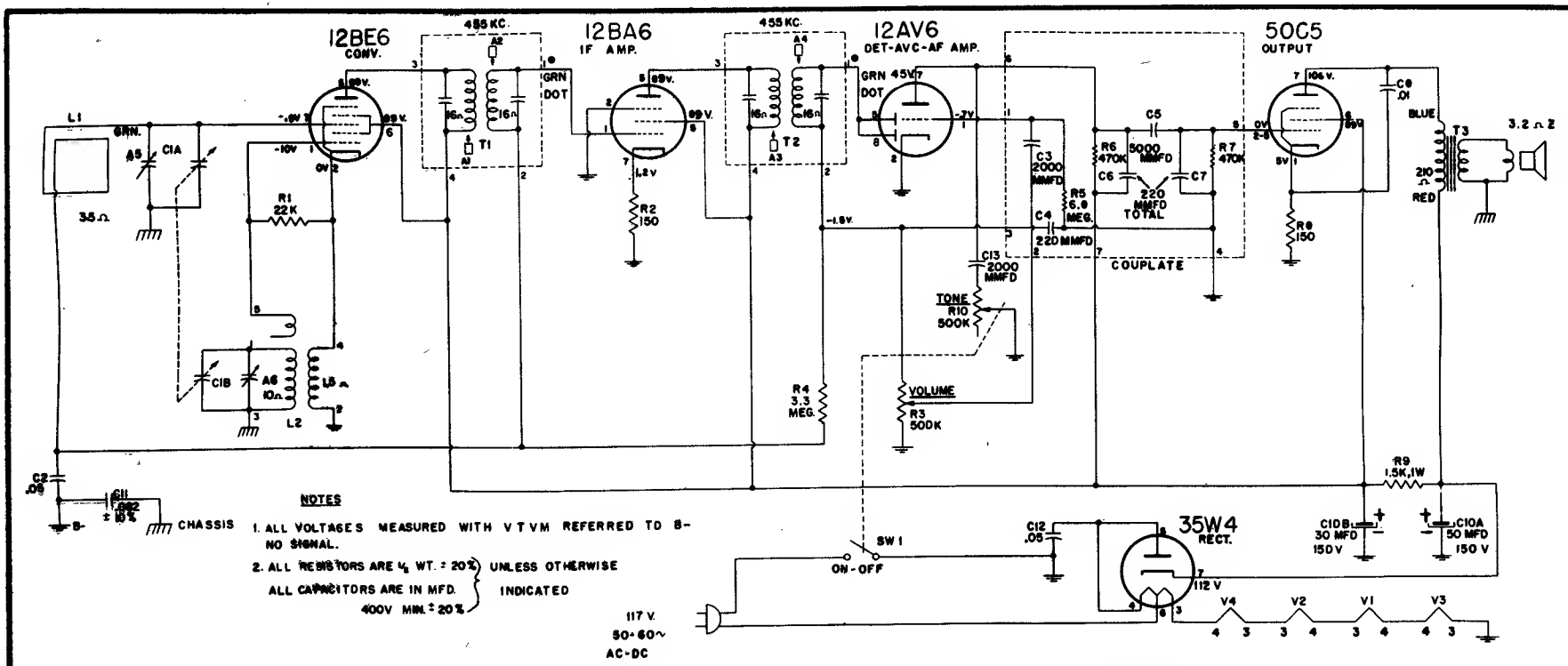
SPECIFICATIONS

Power Source Rating	
Frequency	60 cps.
Voltage	117 volts
Wattage	60 watts
Tuning Frequency Range	540-1620KC
Broadcast Band	88-108MC
FM Band	455KC
IF Frequency (AM)	10.7MC
(FM)	

MONTGOMERY WARD

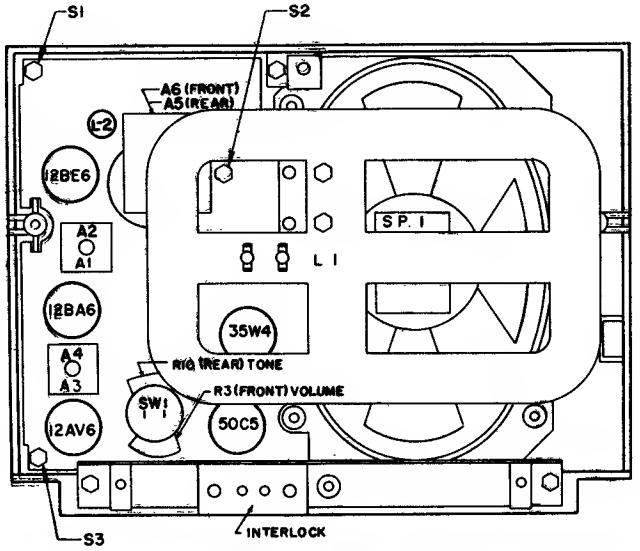
Radio Models GEN-2030A, GEN-2030B

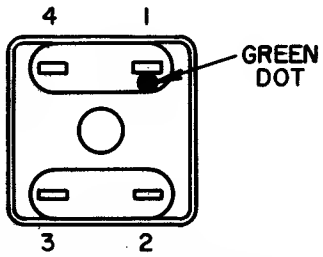




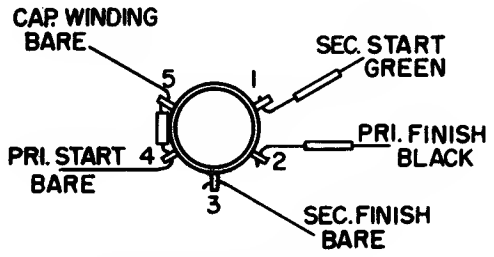
NOTES

1. ALL VOLTAGES MEASURED WITH V T V M REFERRED TO B- NO SIGNAL.
2. ALL RESISTORS ARE ½ WT. ± 20% UNLESS OTHERWISE
   ALL CAPACITORS ARE IN MFD. INDICATED
   400V MIN. ± 20%





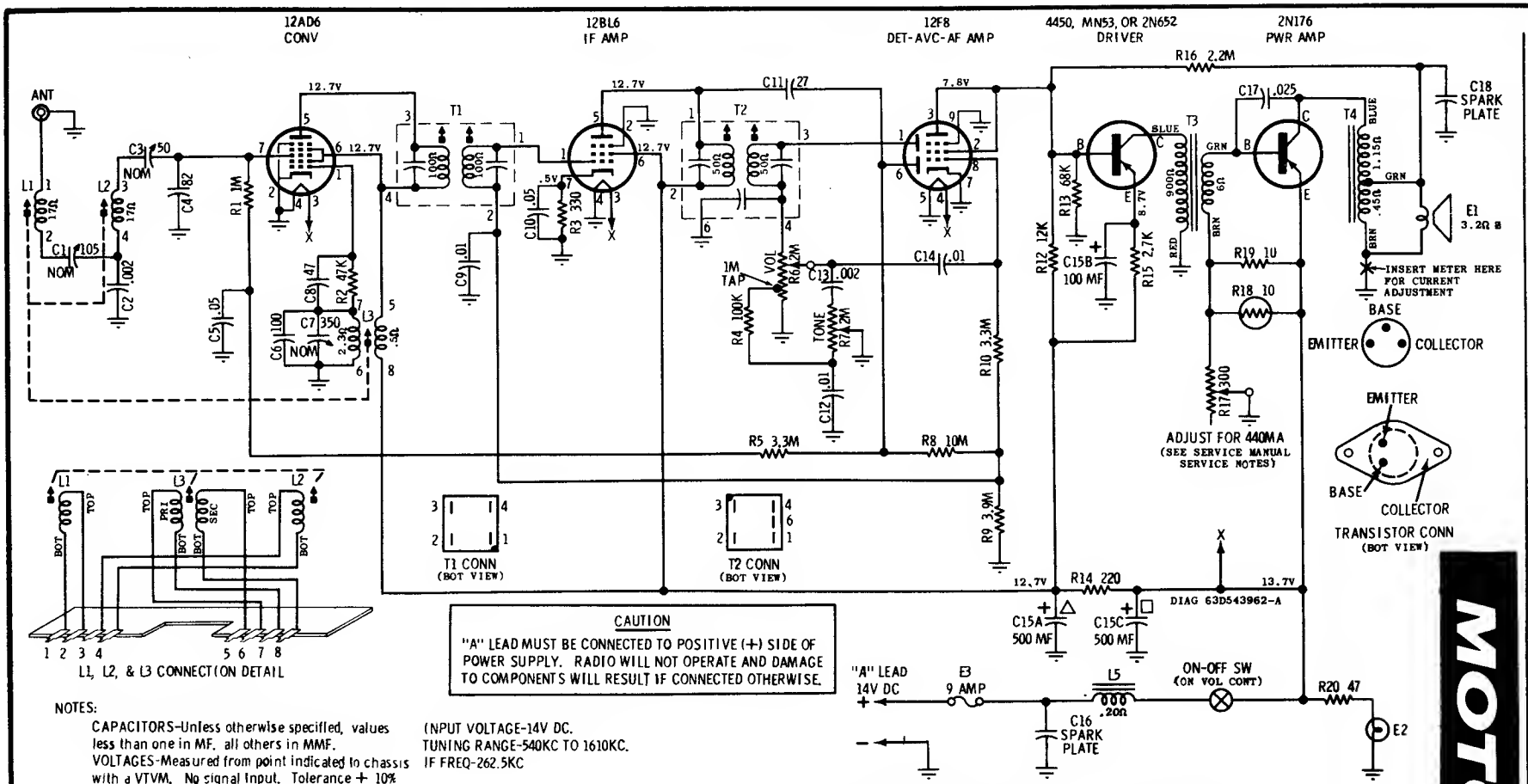
T1, T2-I.F TRANSFORMERS
(BOTTOM VIEW)



L2-OSCILLATOR COIL
(BOTTOM VIEW)

MONTGOMERY WARD

Radio Models GEN-1667A and GEN-1668A



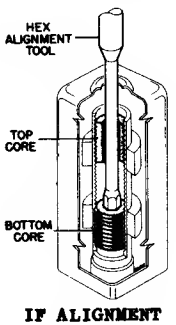
CAUTION

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

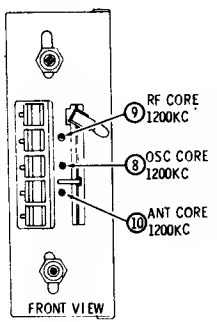
NOTES:

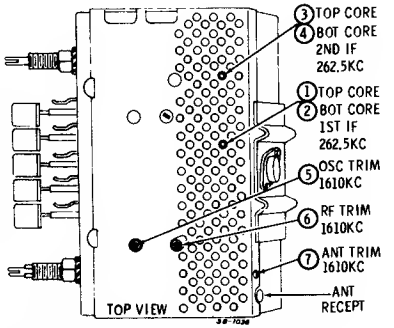
CAPACITORS–Unless otherwise specified, values less than one in MF, all others in MMF.
VOLTAGES–Measured from point indicated to chassis with a VTVM. No signal input. Tolerance ± 10%

INPUT VOLTAGE–14V DC.
TUNING RANGE–540KC TO 1610KC.
IF FREQ–262.5KC



IF ALIGNMENT DETAIL





ALIGNMENT POINTS LOCATION DETAIL

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). Be sure the speaker ground lead is connected in common with the transformer ground lead to the positive meter terminal. Connect negative terminal of the meter to ground.

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

c. Adjust R17 for a reading of 360 ma with 12.6 volts input to the radio "A" lead.

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

MOTOROLA

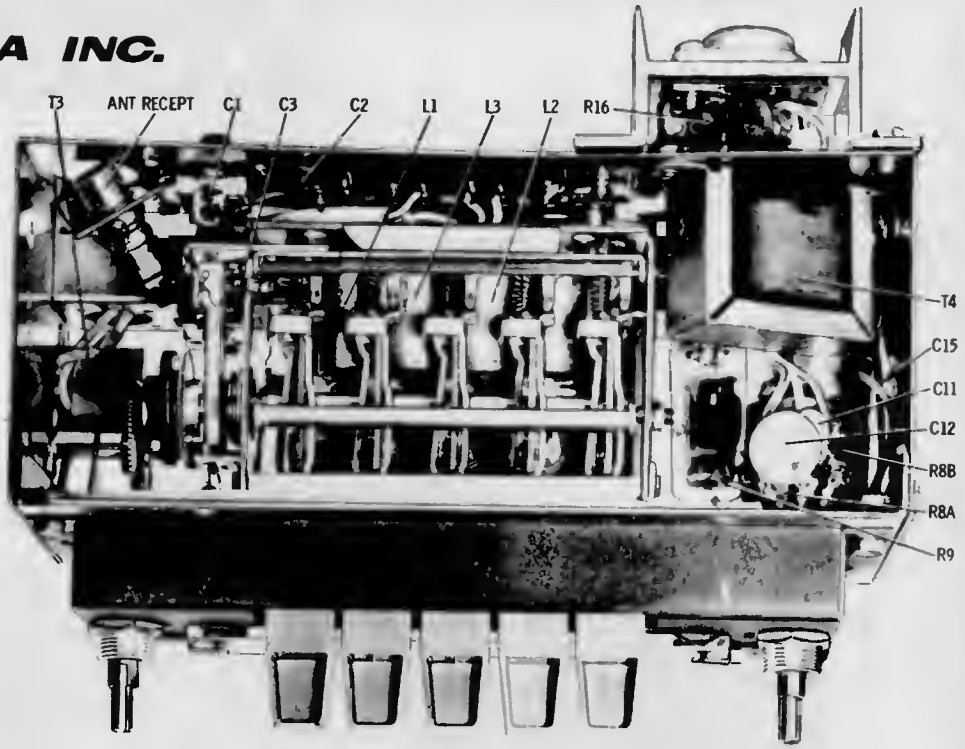
MODEL 10AX

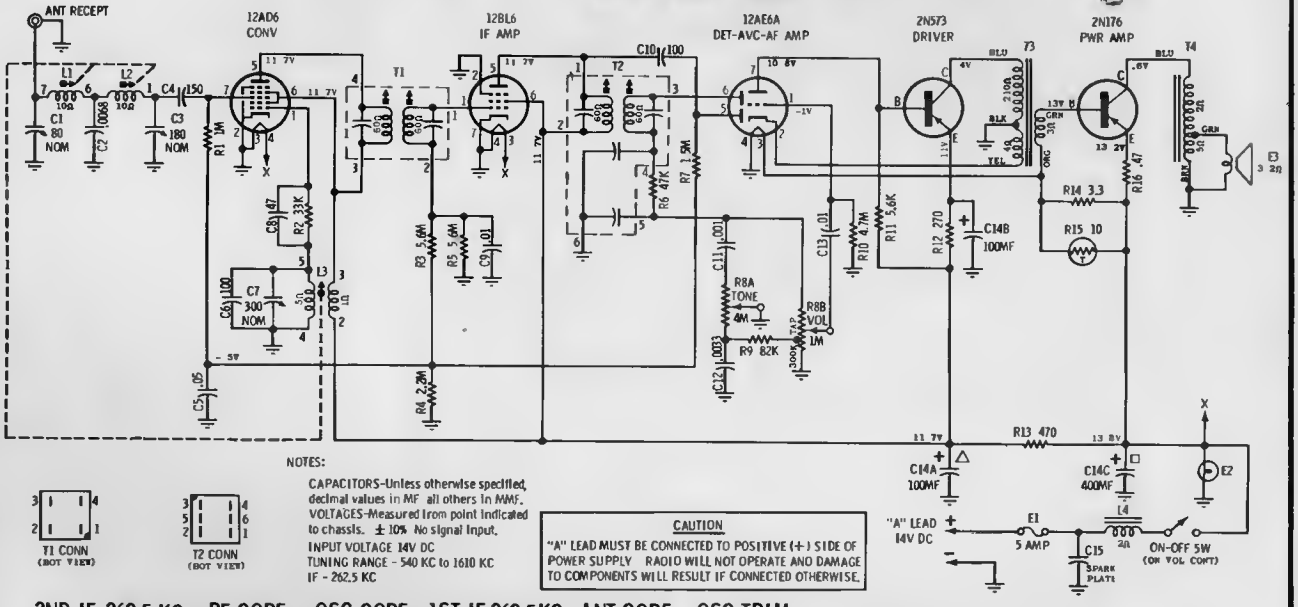
MOTOROLA INC.

AUTO RADIO

MODEL
MOTOROLA 13MA

AMERICAN MOTORS
8990832





NOTES:

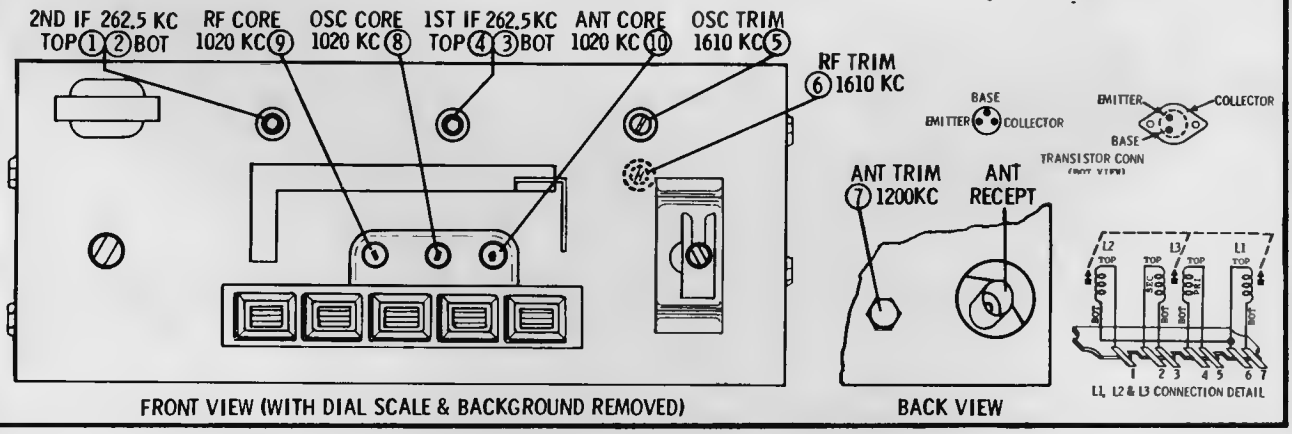
CAPACITORS-Unless otherwise specified, decimal values in MF all others in MMF. VOLTAGES-Measured from point indicated to chassis. ± 10% No signal input. INPUT VOLTAGE 14V DC TUNING RANGE - 540 KC to 1610 KC IF - 262.5 KC

T1 CONN (BOT VIEW)

T2 CONN (BOT VIEW)

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.



FRONT VIEW (WITH DIAL SCALE & BACKGROUND REMOVED)

BACK VIEW

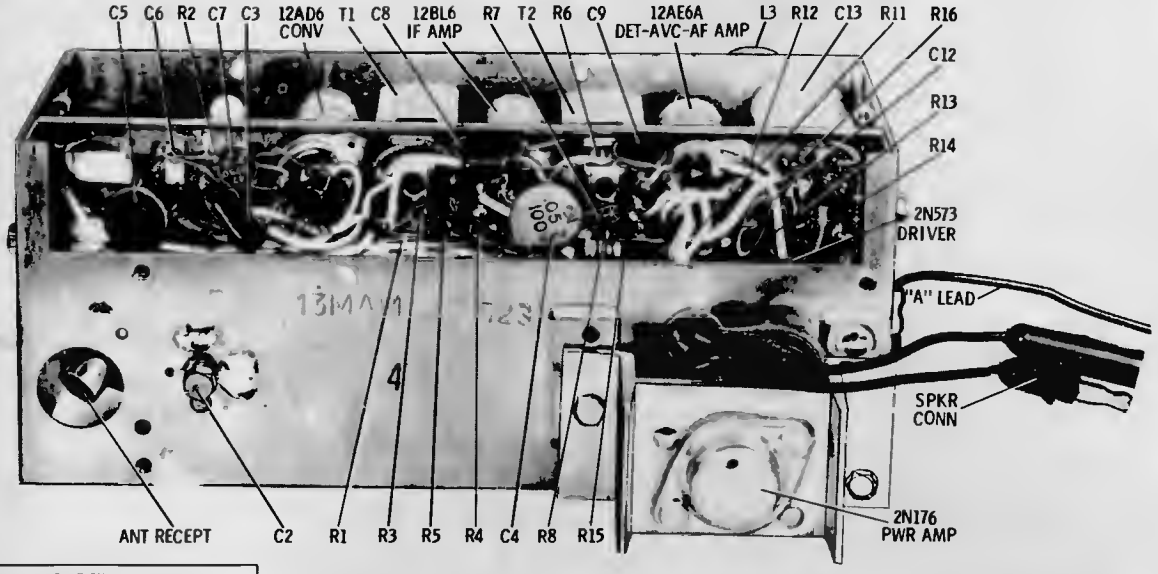
ALIGNMENT POINTS LOCATION DETAIL

MOTOROLA

MODEL

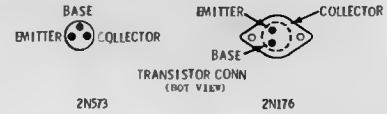
MOTOROLA 13MAM
AMERICAN MOTORS 8990831

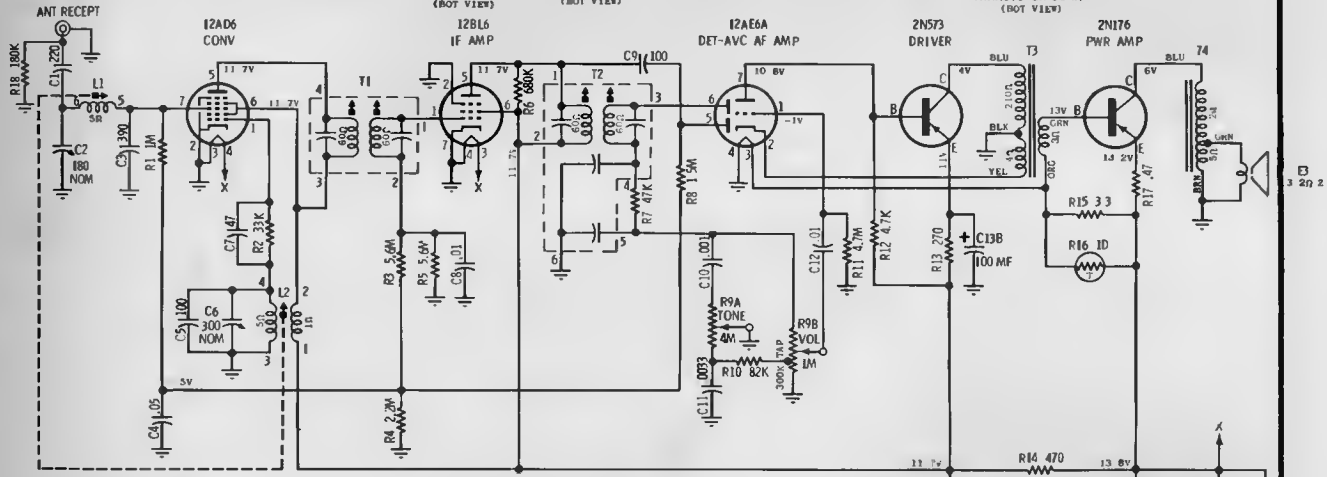
PARTS LOCATION

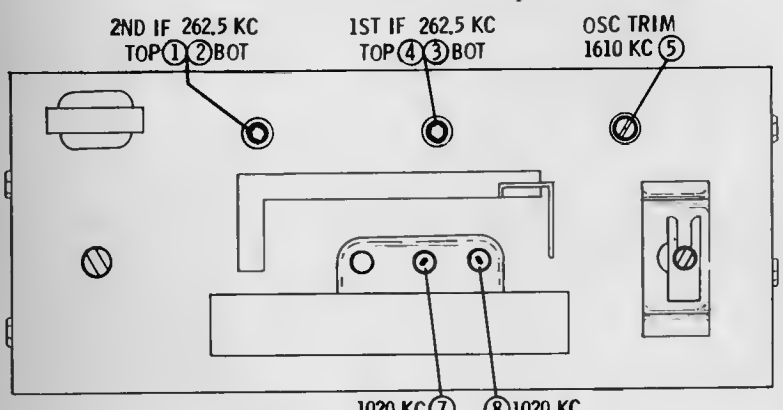


CAUTION

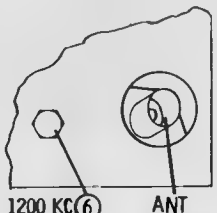
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.



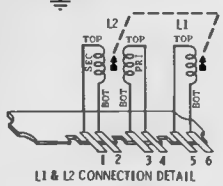




FRONT VIEW (WITH DIAL SCALE & BACKGROUND REMOVED)



BACK VIEW

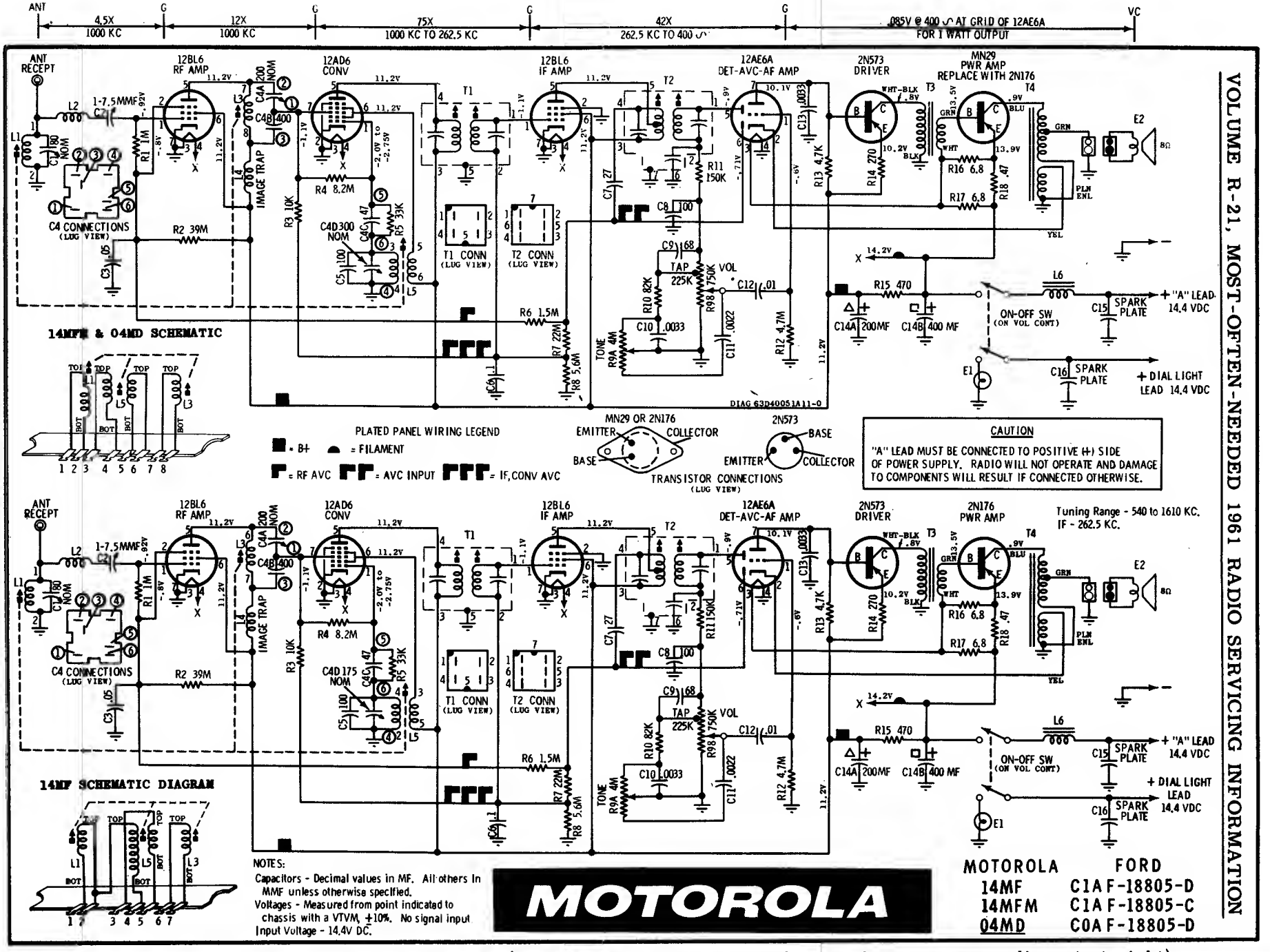


L1 & L2 CONNECTION DETAIL

NOTES:

CAPACITORS-Unless otherwise specified, decimal values in MF, all others in MMF.
VOLTAGES-Measured from point indicated to chassis. ± 10% No signal input.
INPUT VOLTAGE 14V DC
TUNING RANGE - 540 KC to 1610 KC
IF - 262.5 KC

ALIGNMENT POINTS LOCATION DETAIL



NOTES:
Capacitors - Decimal values in MF. All others in MMF unless otherwise specified.
Voltages - Measured from point indicated to chassis with a VTVM, ±10%. No signal input
Input Voltage - 14.4V DC.

MOTOROLA

MOTOROLA	FORD
14MF	C1AF-18805-D
14MFM	C1AF-18805-C
04MD	C0AF-18805-D

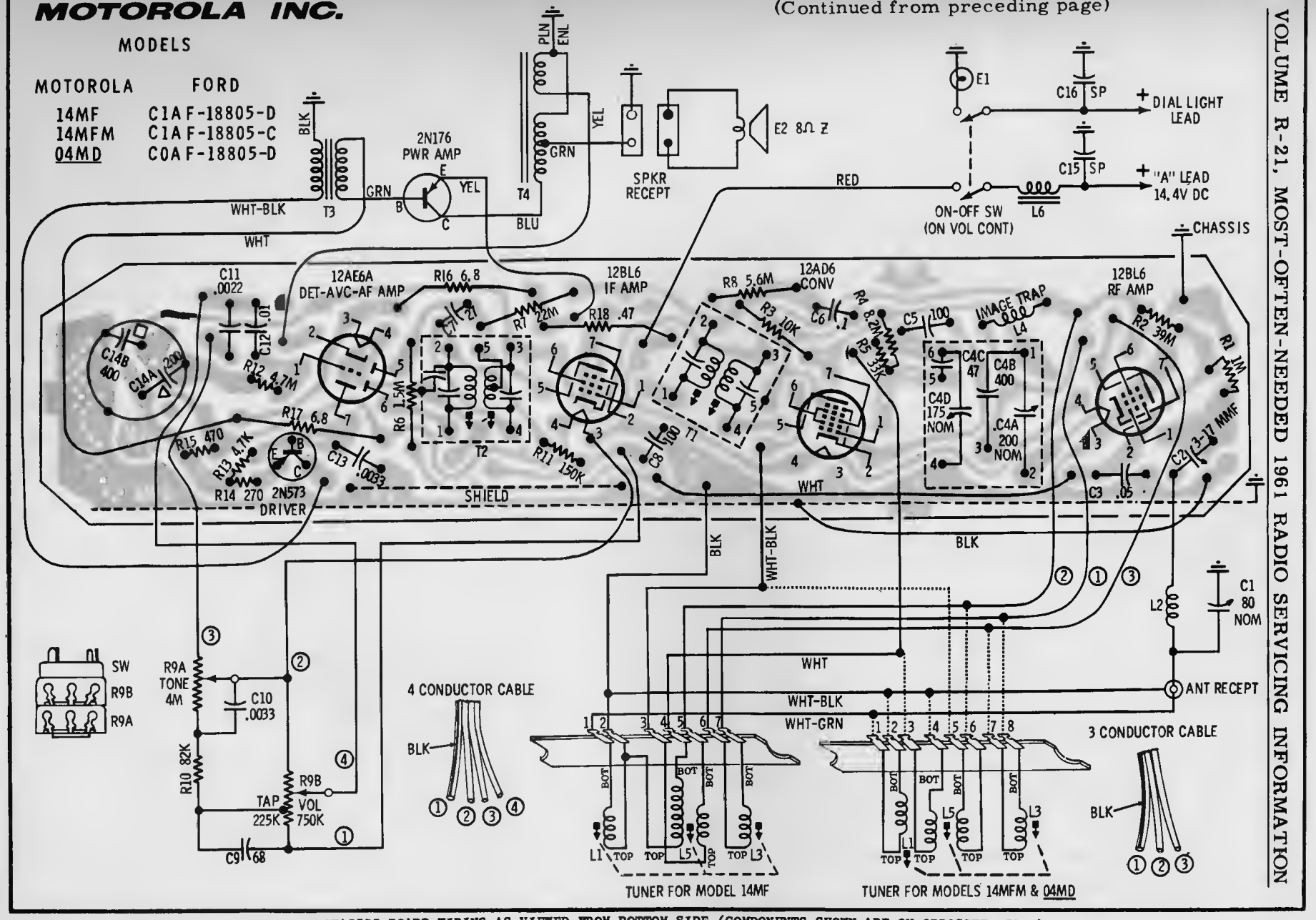
(Additional service material is on the next page, adjacent at right)

MOTOROLA INC.

(Continued from preceding page)

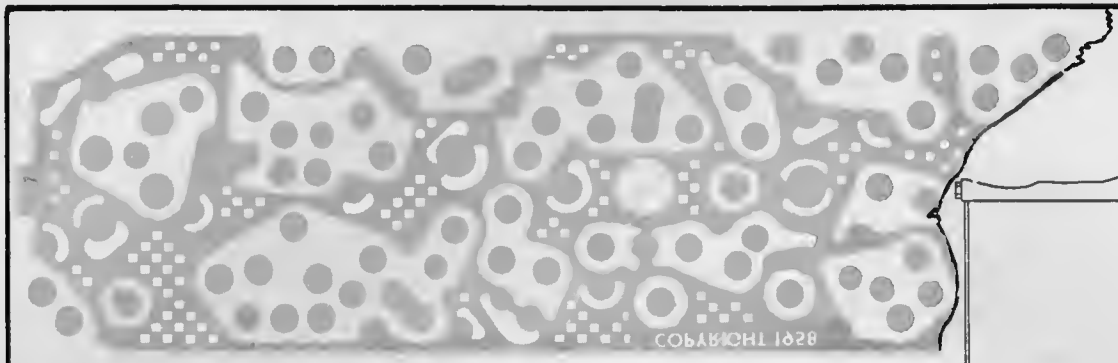
MODELS

MOTOROLA	FORD
14MF	C1AF-18805-D
14MFM	C1AF-18805-C
04MD	C0AF-18805-D

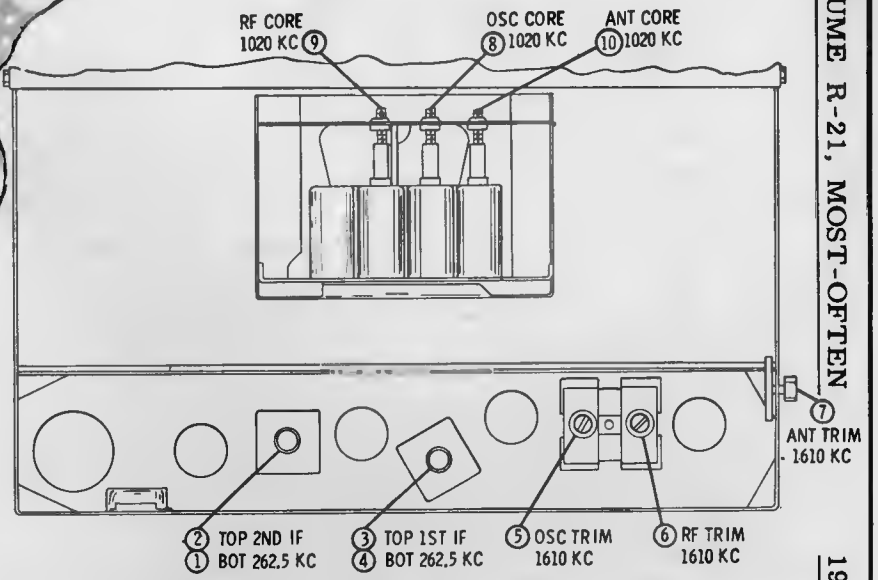


PLATED CHASSIS BOARD WIRING AS VIEWED FROM BOTTOM SIDE (COMPONENTS SHOWN ARE ON OPPOSITE SIDE)

MOTOROLA Model 14MR
American Motors 8990833



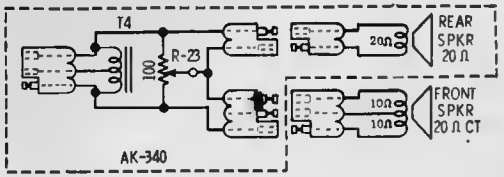
PLATED CHASSIS BOARD GROUND CONNECTIONS AS SEEN THRU BOARD FROM WIRING SIDE

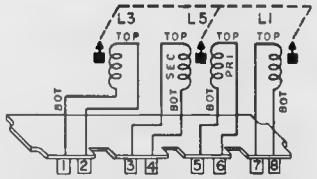


ALIGNMENT POINTS LOCATION DETAIL

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





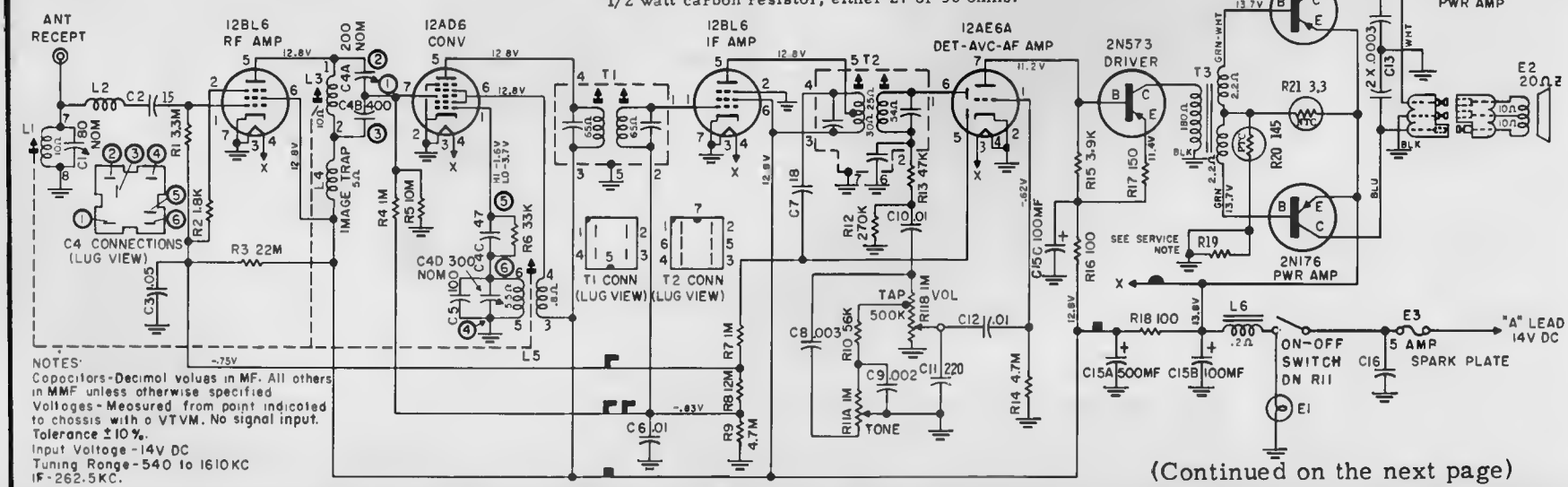
L1, L3 & L5 CONNECTION DETAIL

PLATED PANEL WIRING LEGEND

■ = B+ ◓ = FILAMENT

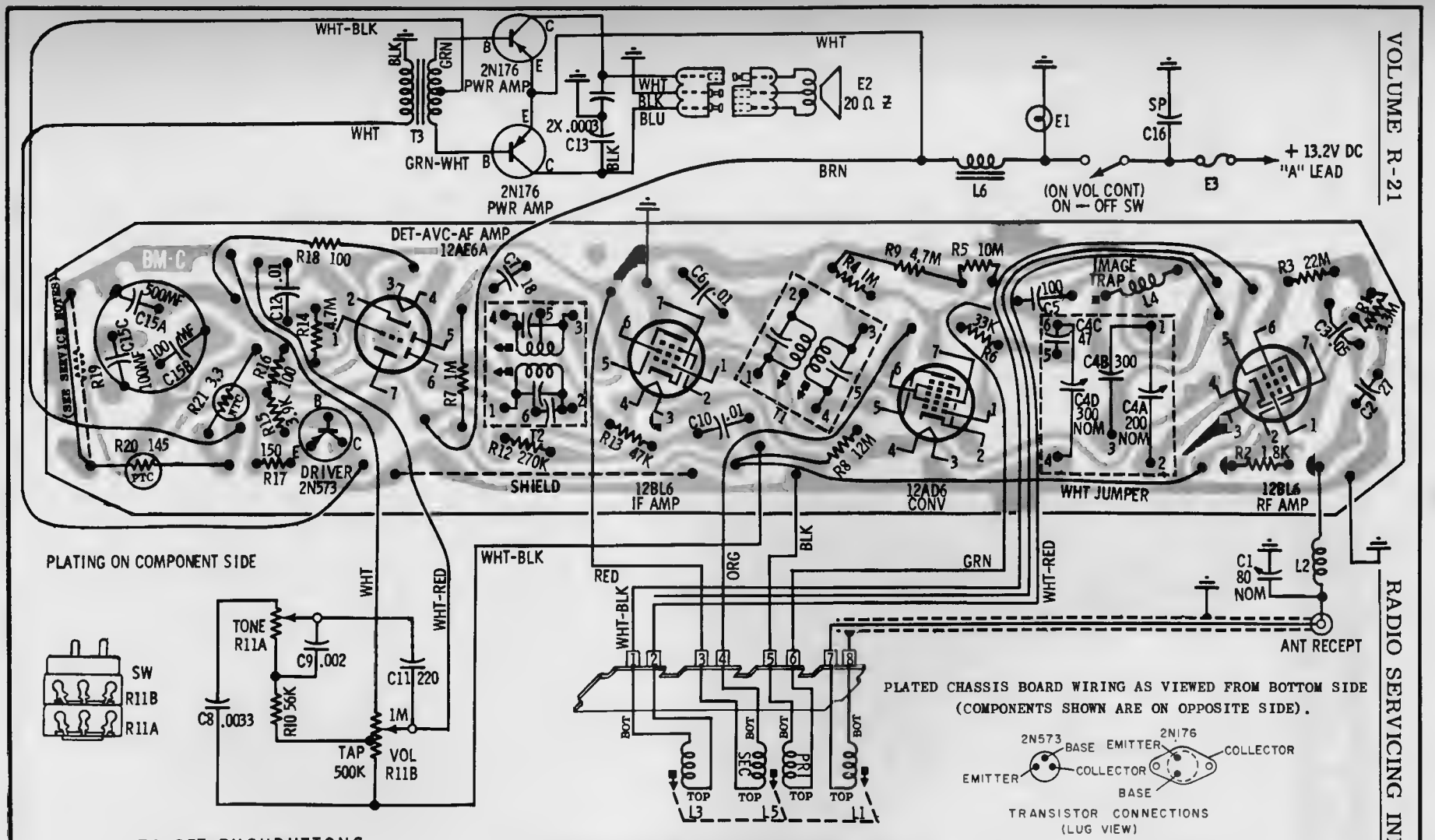
▛ = RF AVC ▛ ▛ = IF CONV AVC

R19 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.



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 ±10%.
Input Voltage - 14V DC
Tuning Range - 540 to 1610 KC
IF - 262.5 KC.

(Continued on the next page)



TO SET PUSHBUTTONS

1. Turn receiver on and allow it to operate for fifteen minutes.
2. Unlock pushbuttons by pulling them out to unlock position.
3. Accurately tune in a desired station.
4. Lock one of the pushbuttons to this station by pushing it in firmly.
5. Repeat steps 3 & 4 until all five pushbuttons are set.

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

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 R19 as required.

MODEL

MOTOROLA 14MR

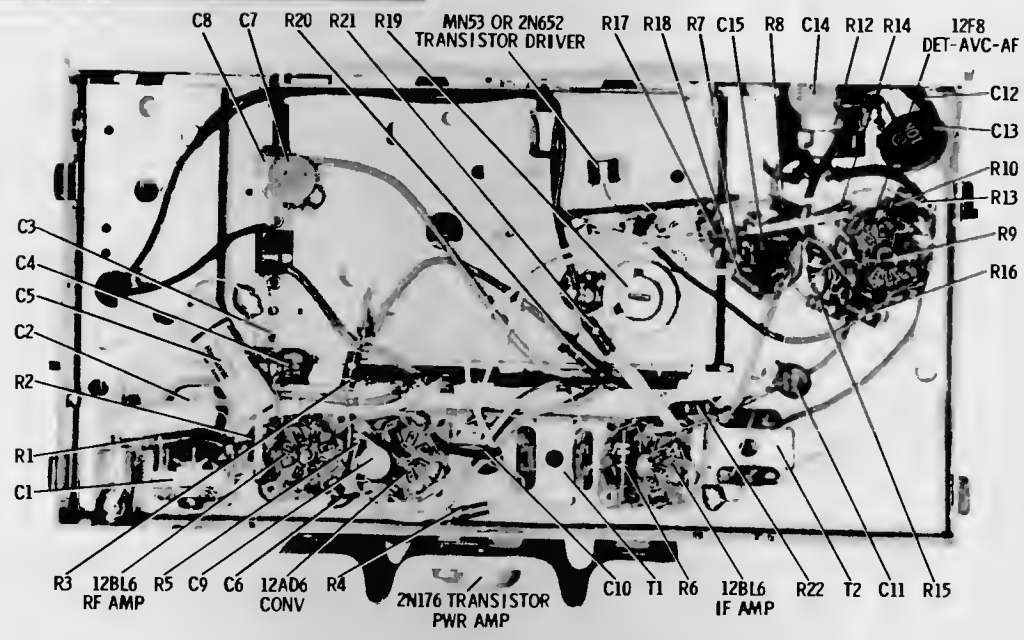
AMERICAN MOTORS 8990833

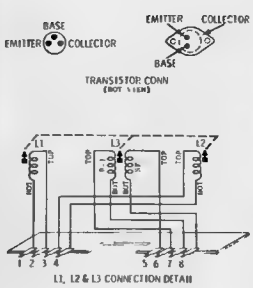
(Continued from preceding page)

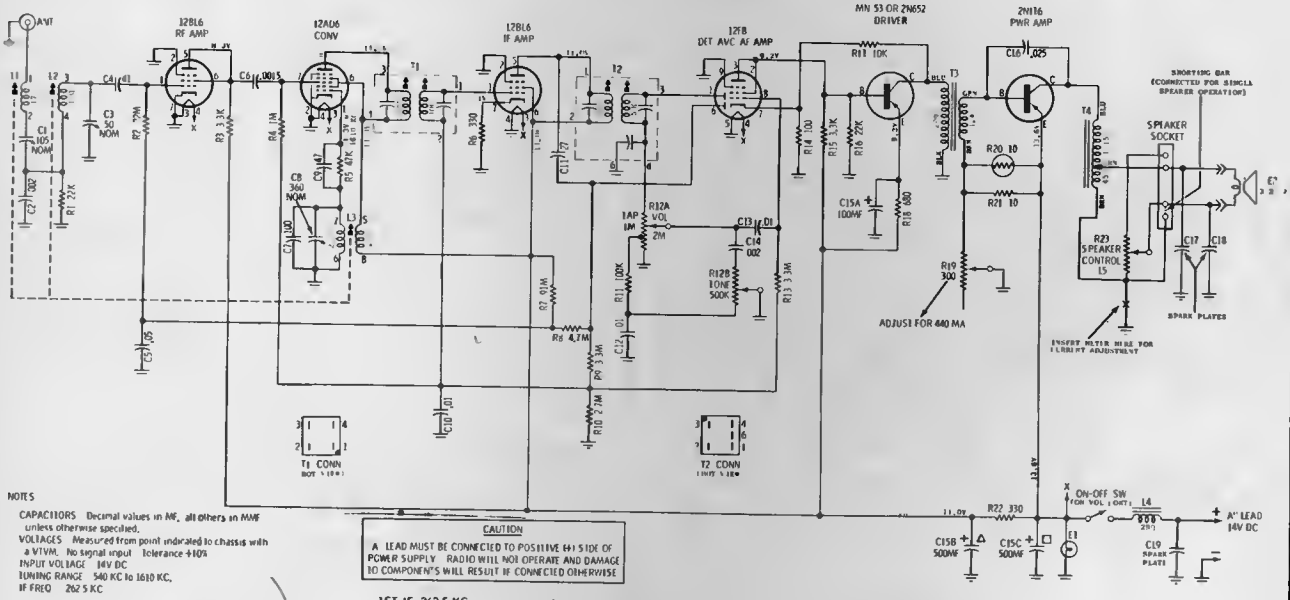
MOTOROLA

AUTO RADIO

MODELS
BKA60X
PCA60X





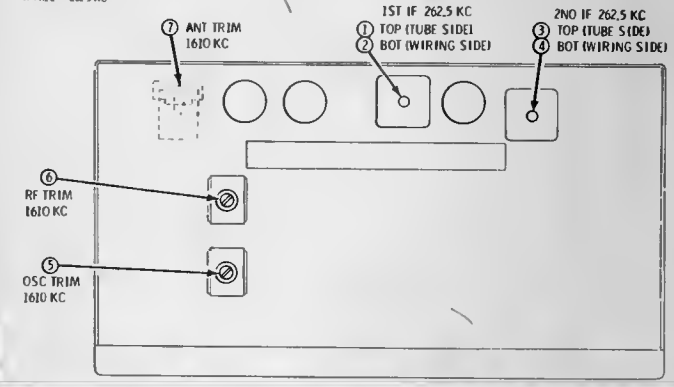


NOTES

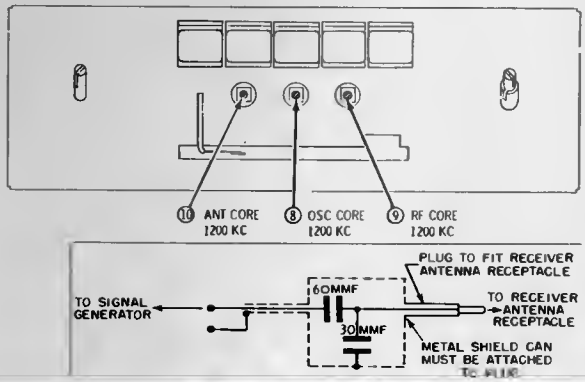
CAPACITORS Decimal values in MF, all others in MMF unless otherwise specified.
VOLTAGES Measured from point indicated to chassis with a VTVM. No signal input Tolerance +10%
INPUT VOLTAGE 14V DC
TUNING RANGE 540 KC to 1610 KC.
IF FREQ 262.5 KC

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



ALIGNMENT LOCATION DETAIL

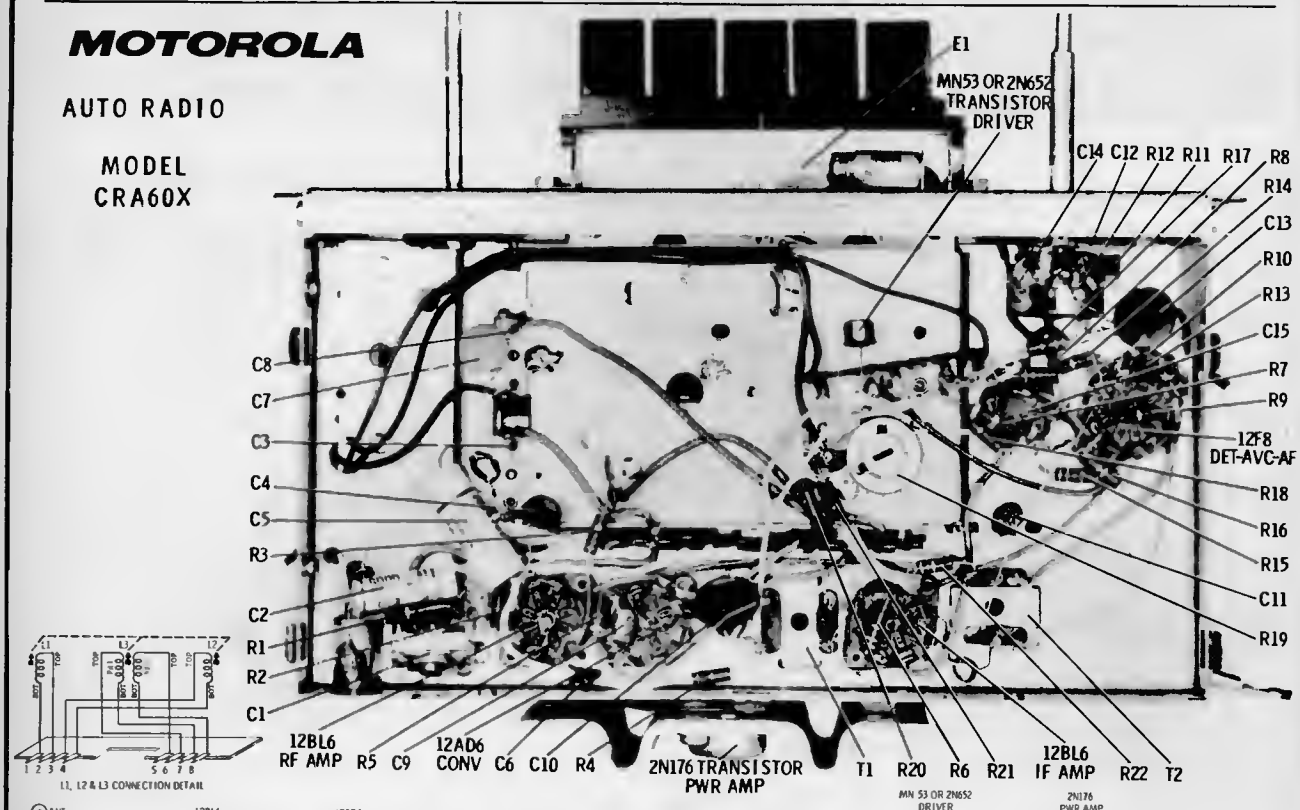


DUMMY ANTENNA

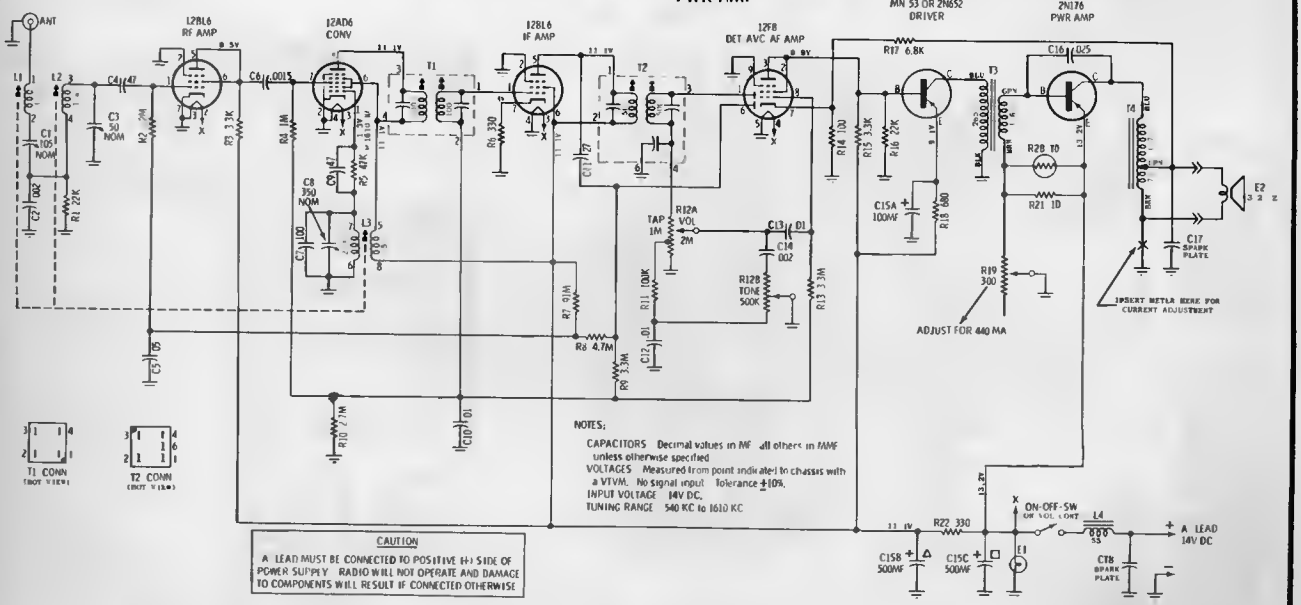
MOTOROLA

AUTO RADIO

MODEL CRA60X

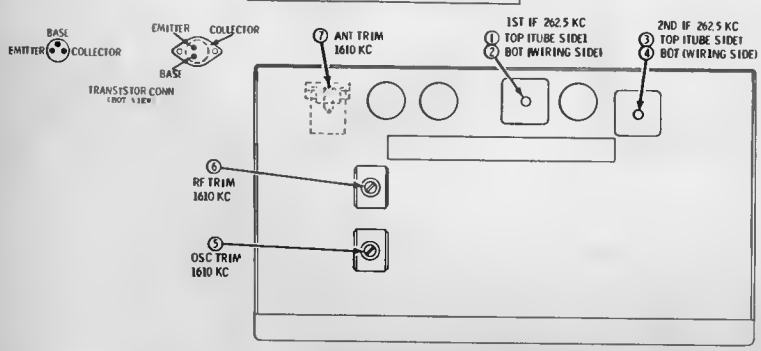


L1, L2 & L3 CONNECTION DETAIL

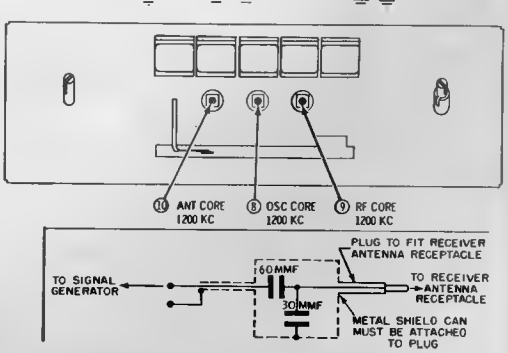


NOTES;
CAPACITORS Decimal values in MF all others in MMF unless otherwise specified
VOLTAGES Measured from point indicated to chassis with a VTVM. No signal input Tolerance ±10%.
INPUT VOLTAGE 14V DC.
TUNING RANGE 540 KC to 1610 KC

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



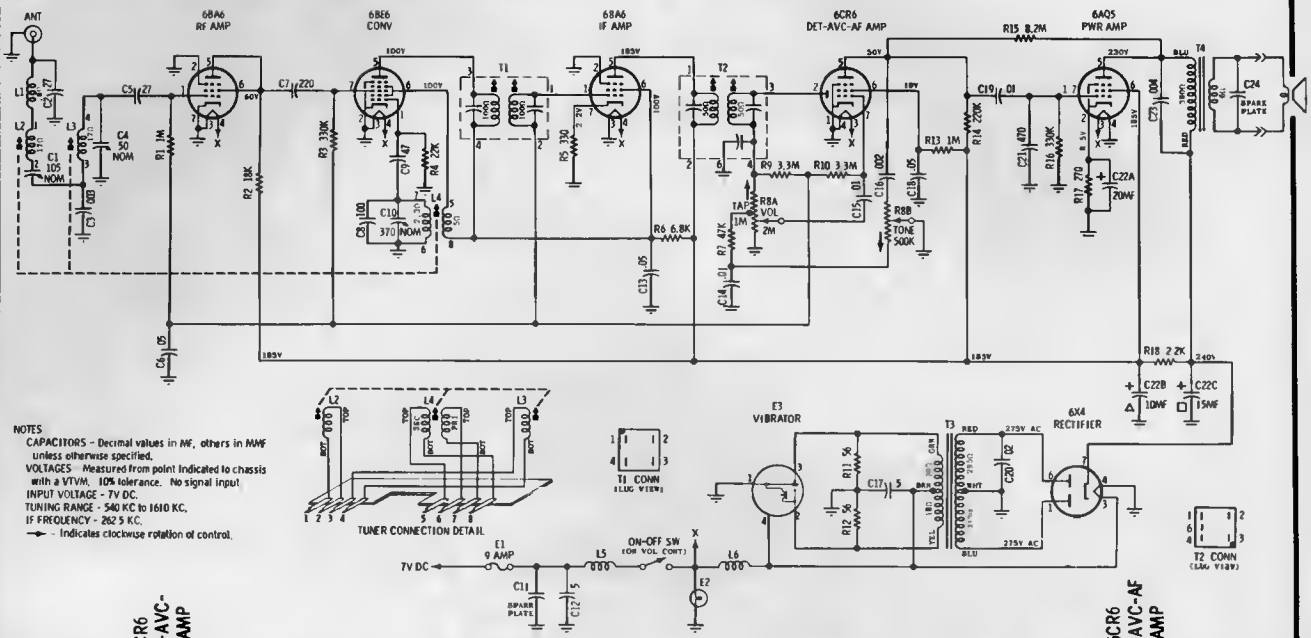
ALIGNMENT LOCATION DETAIL

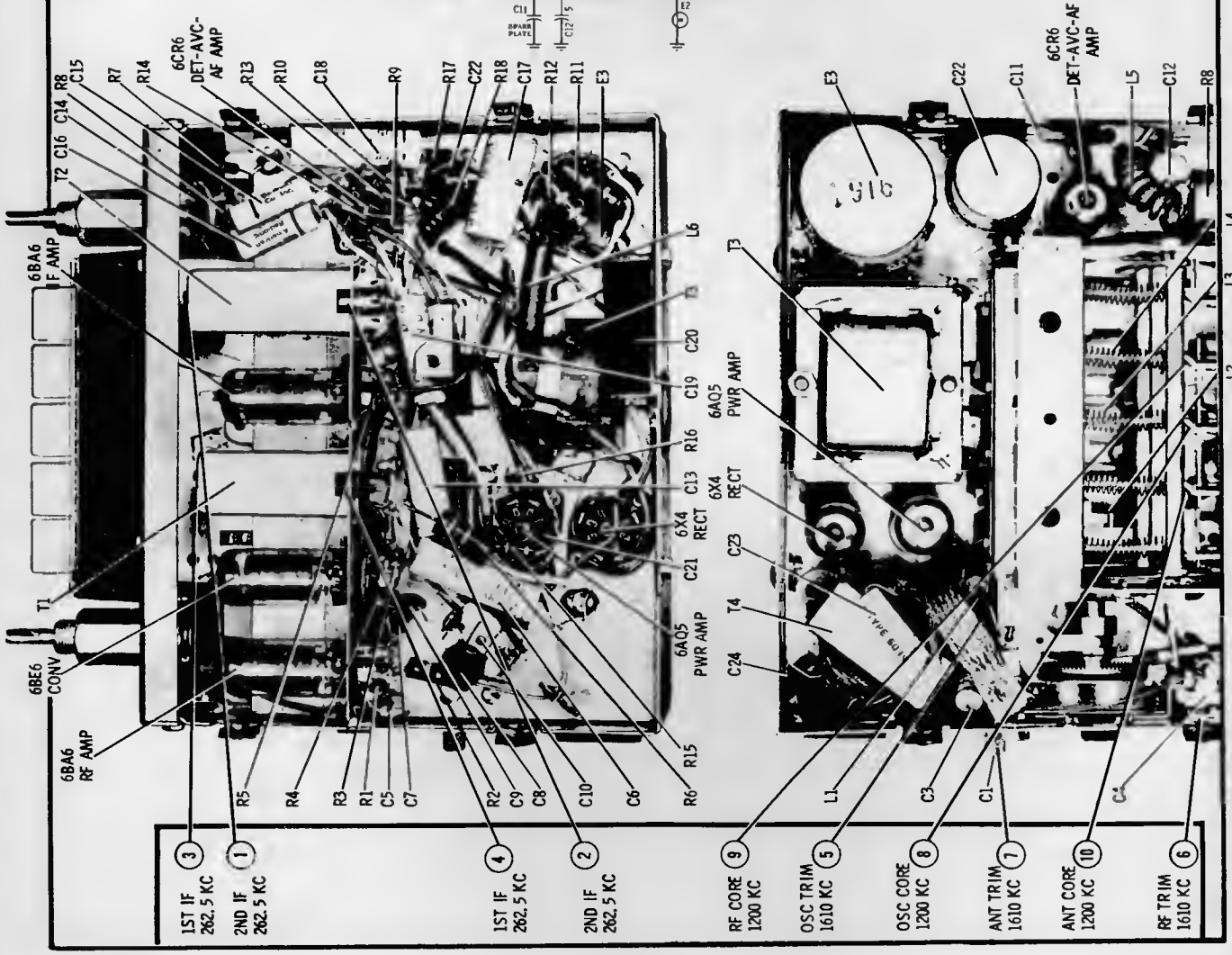


DUMMY ANTENNA

MOTOROLA

MODEL
VWA60





MOTOROLA

AUTO RADIO

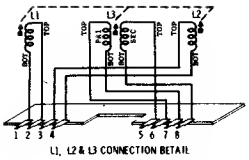
MODEL
CRM60X

Automotive type superheterodyne receiver designed for custom installation in the 1960 Corvair car. This receiver contains a transistor driver stage, a transistor output stage, and four miniature tubes designed to operate directly from the car's storage battery.

MOTOROLA

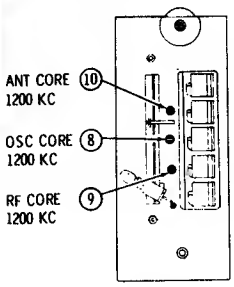
AUTO RADIO

MODEL OEA60X

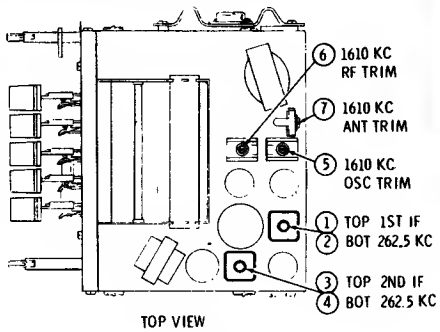


L1, L2 & L3 CONNECTION DETAIL

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 ±10%.
INPUT VOLTAGE - 14V DC.
TUNING RANGE - 540 KC to 1610 KC.
IF FREQ. - 262.5 KC.

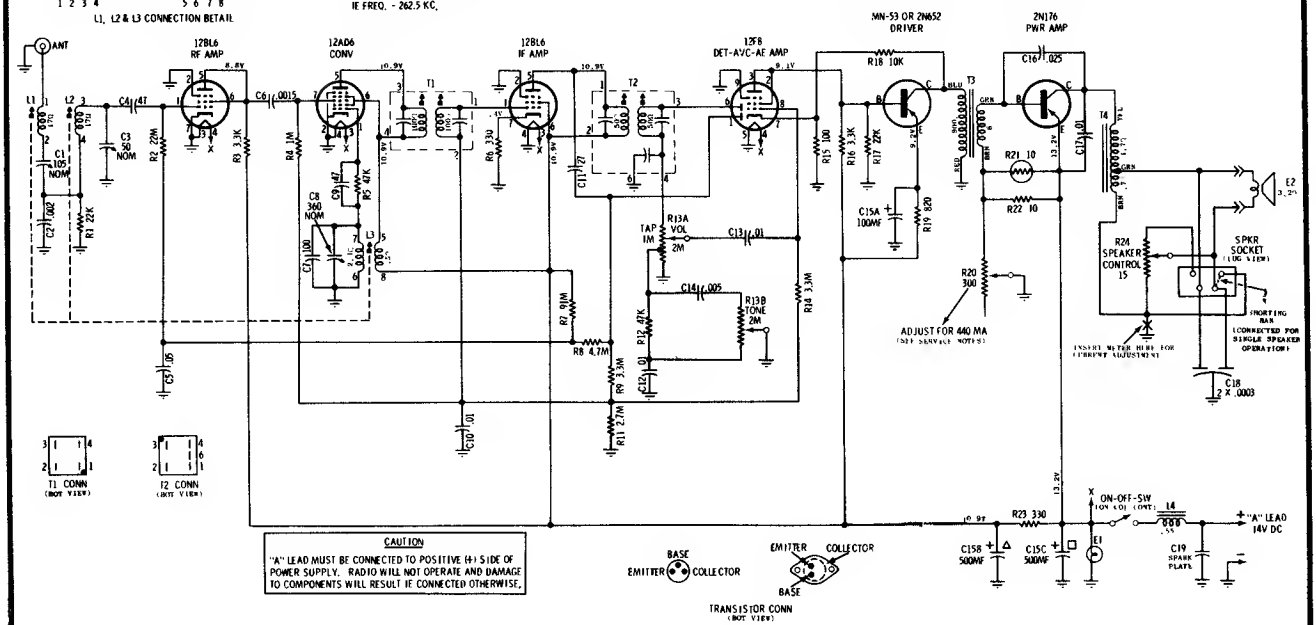


FRONT VIEW



TOP VIEW

ALIGNMENT LOCATION DETAIL



TYPE - Automotive type superheterodyne receiver designed for custom installation in the 1960 Oldsmobile cars.

TO SET PUSHBUTTONS

Pushbuttons may be set up in any order. However, for convenience in remembering, it is suggested that stations be set up in frequency sequence from left to right. During pushbutton set-up, the antenna should be fully extended and antenna trimmer properly peaked at 1400 Kc.

1. Turn receiver on and allow it to operate for fifteen minutes.
2. Unlock pushbuttons by pulling them out with your fingers. In the unlocked position, button will extend about 1/2" forward of its normal position.
3. Accurately tune in station desired for pushbutton setup.
4. Lock one of the pushbuttons to this station by pushing it in firmly.
5. Repeat steps 3 & 4 for remaining pushbuttons

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.

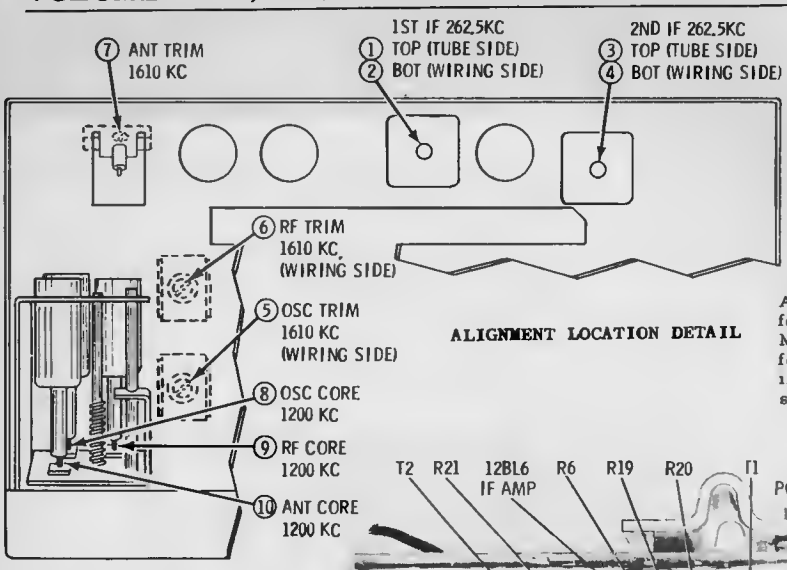
6. POWER TRANSISTOR CURRENT ADJUSTMENT - After a power transistor has been replaced, the collector current should be checked and adjusted for proper operation.
   a. Insert a low range (0-1 or 0-2 amp) DC ammeter in the primary ground return lead of the output transformer (T4). Connect the negative post 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 R20 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 accomodate different power sources. The current value stated on the Schematic Diagram is for 14 volts input to the "A" lead.

MOTOROLA

Exact material for MODEL CTA61 used in 1961 Chevrolet cars.

MODEL BKA61 used in 1961 Buick cars is identical electrically.

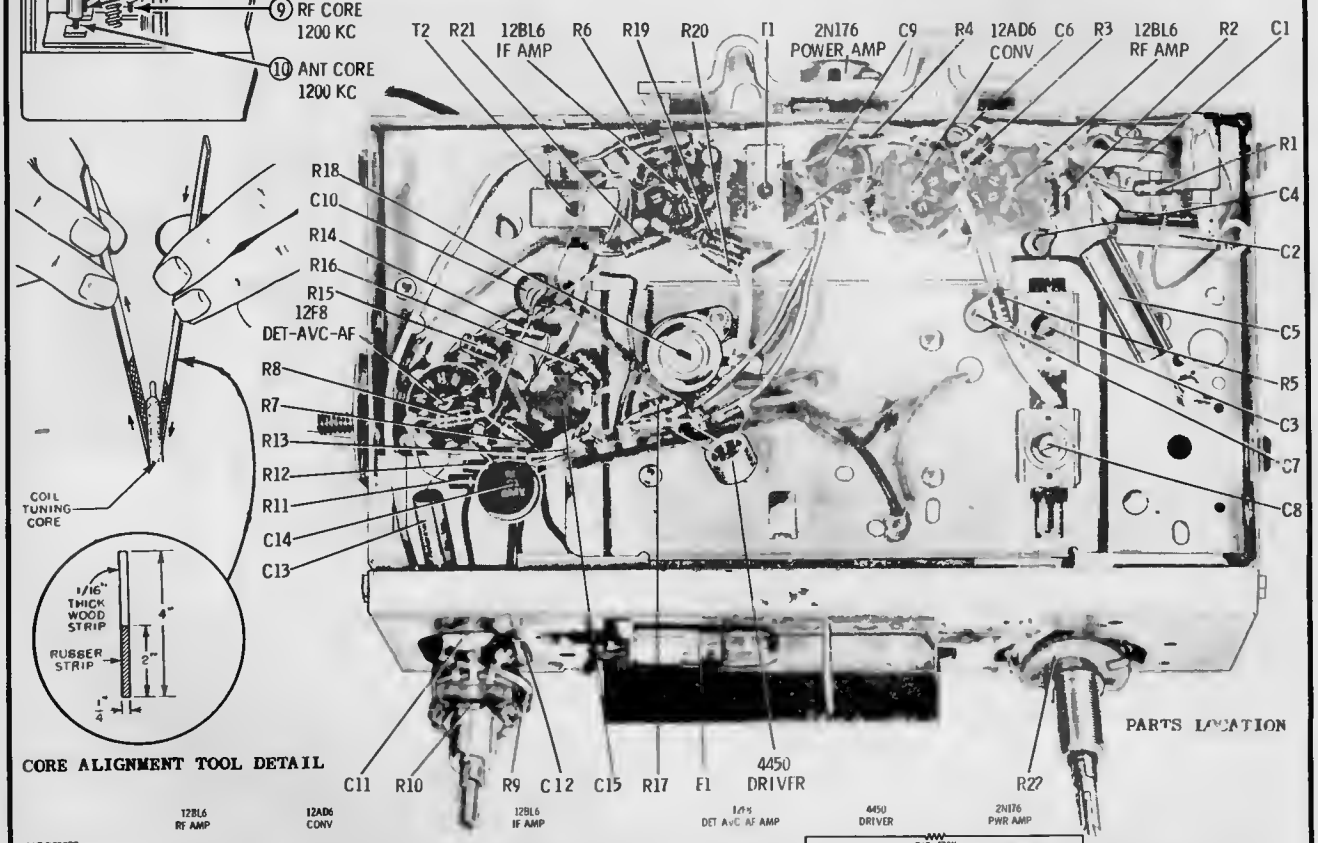


ALIGNMENT LOCATION DETAIL

MOTOROLA

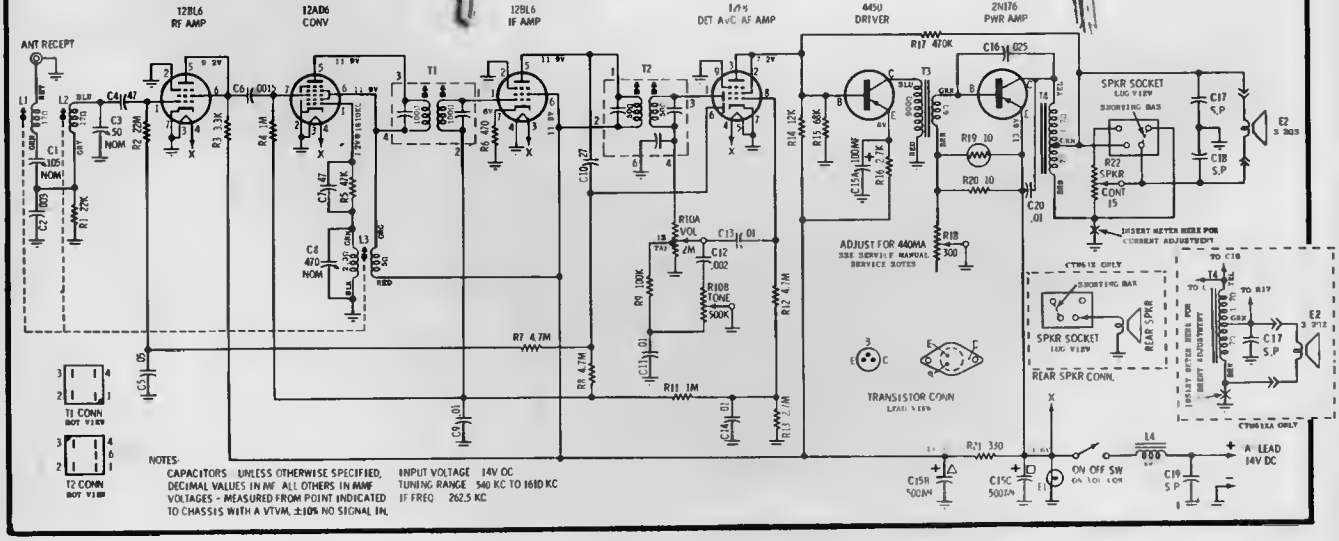
MODEL
CTM61X
CTM61XA

Automotive type superheterodyne receivers designed for custom installation in the 1961 Chevrolet cars. Model CTM61X contains a speaker control & socket for adding a rear speaker, model CTM61XA does not, in all other respects, these two receivers are the same.



PARTS LOCATION

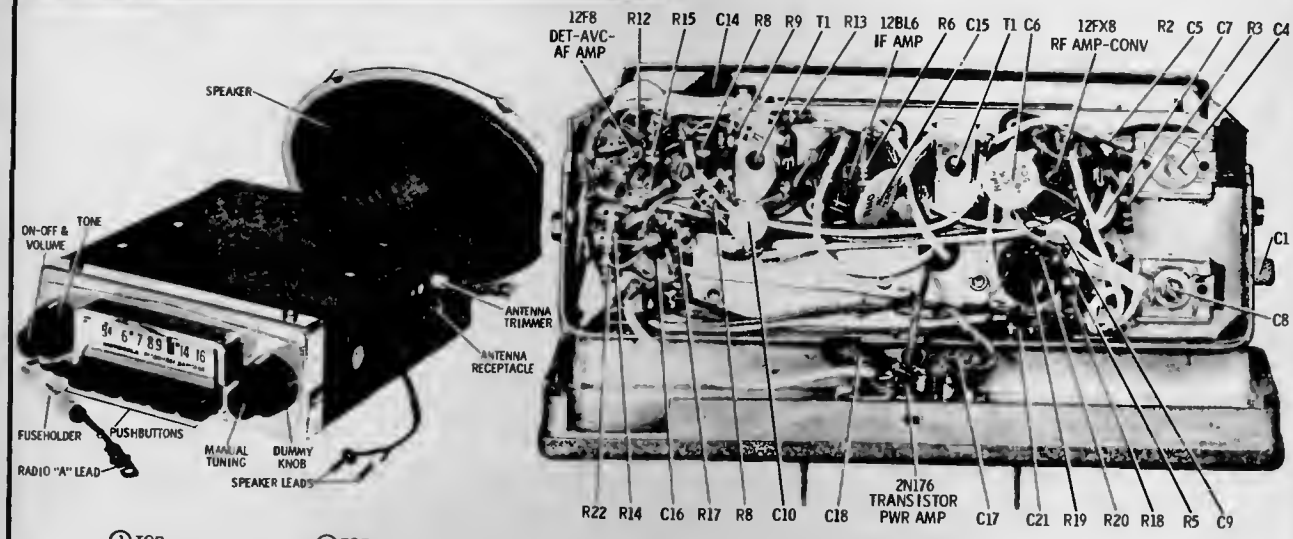
CORE ALIGNMENT TOOL DETAIL



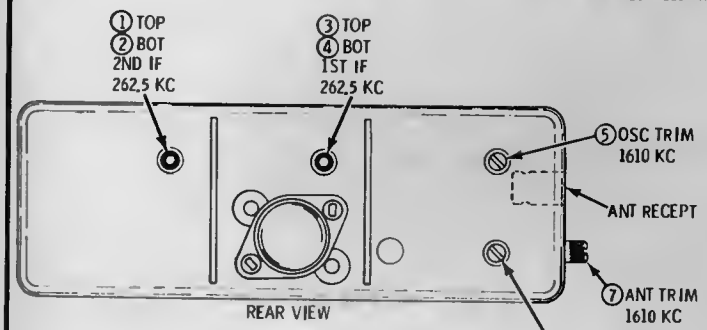
NOTES-
CAPACITORS UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF ALL OTHERS IN MMF
VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM, ±10% NO SIGNAL IN.
INPUT VOLTAGE 14V DC
TUNING RANGE 540 KC TO 1610 KC
IF FREQ 262.5 KC

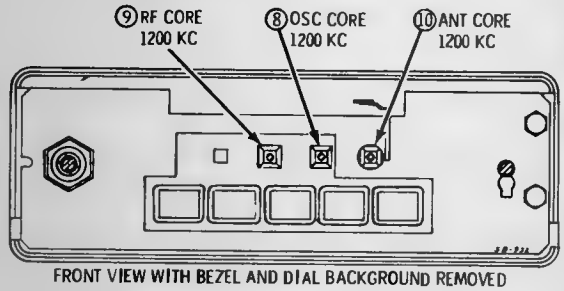
MOTOROLA

MODEL
500X

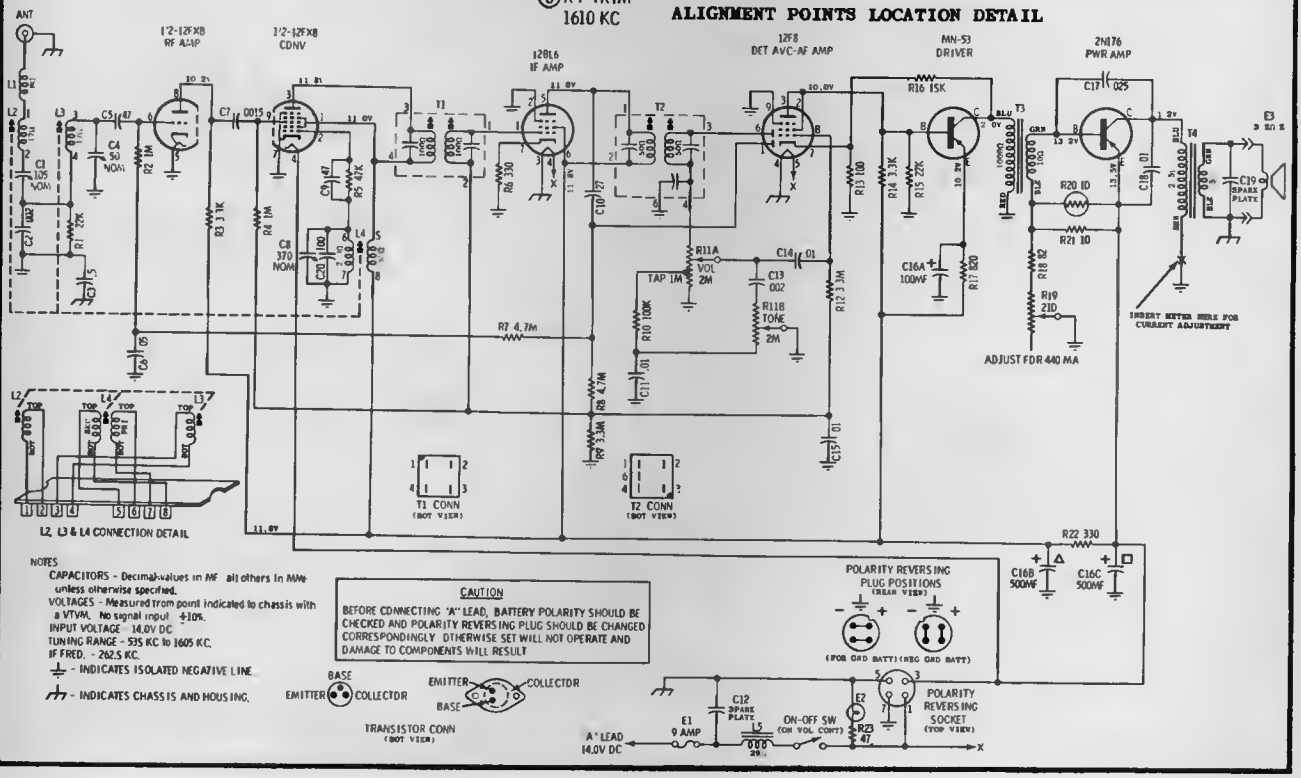


PARTS LOCATION





ALIGNMENT POINTS LOCATION DETAIL



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. ±10%.
INPUT VOLTAGE - 14.0V DC
TUNING RANGE - 535 KC to 1605 KC.
IF FREQ. - 262.5 KC.
⏚ - INDICATES ISOLATED NEGATIVE LINE.
⏚ - INDICATES CHASSIS AND HOUSING.

CAUTION

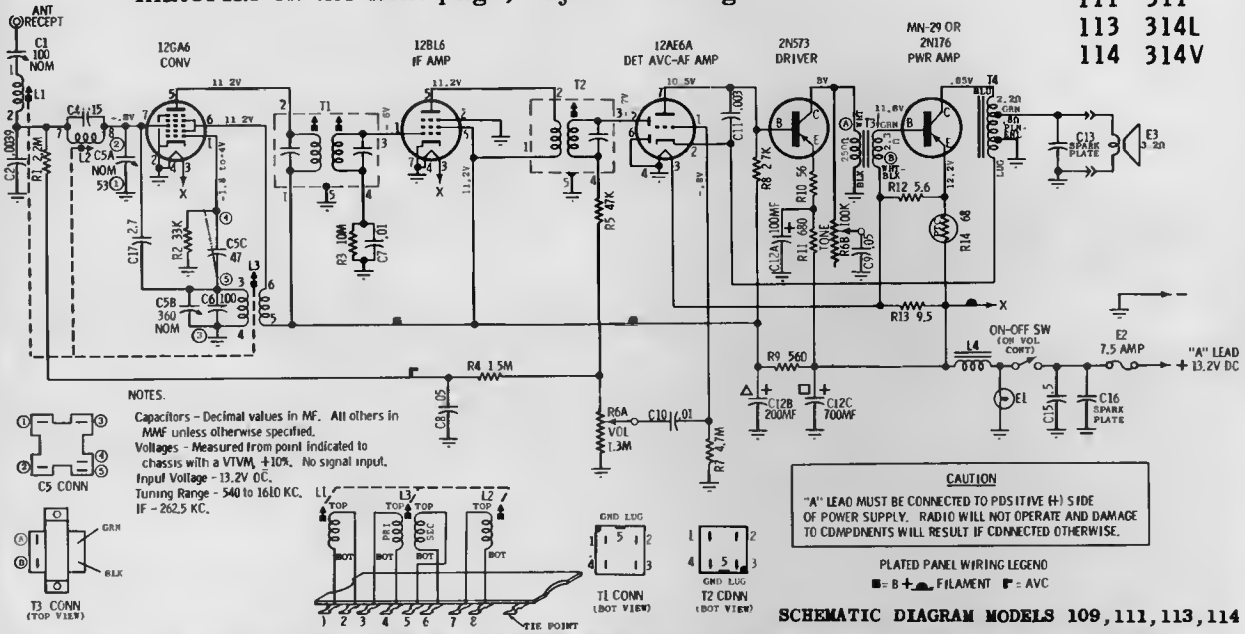
BEFORE CONNECTING "A" LEAD, BATTERY POLARITY SHOULD BE CHECKED AND POLARITY REVERSING PLUG SHOULD BE CHANGED CORRESPONDINGLY OTHERWISE SET WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT

MOTOROLA INC.

MODELS

MoPar
109 309
111 311
113 314L
114 314V

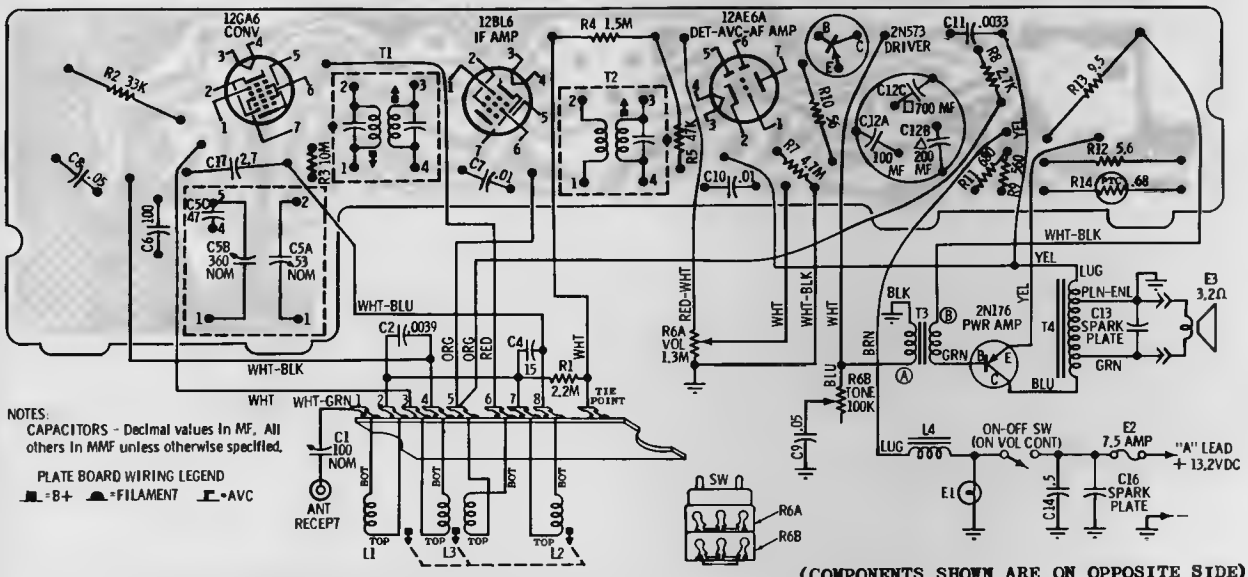
Schematic diagram for some models and other service material on the next page, adjacent at right.



NOTES.
Capacitors – Decimal values in MF. All others in MMF unless otherwise specified.
Voltages – Measured from point indicated to chassis with a VTVM, ±10%. No signal input.
Input Voltage – 13.2V DC.
Tuning Range – 540 to 1610 KC.
IF – 262.5 KC.

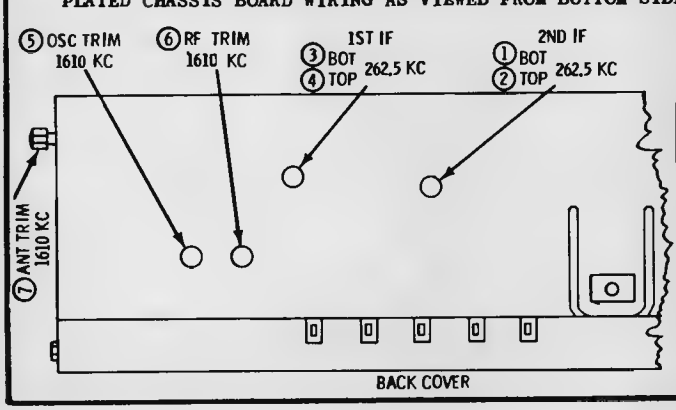
CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

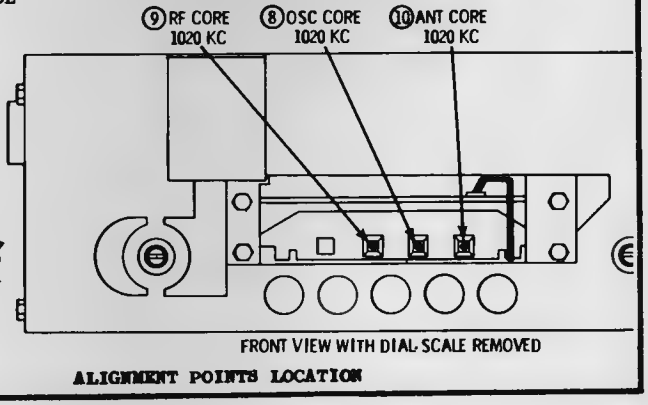
SCHEMATIC DIAGRAM MODELS 109,111,113,114



NOTES:
CAPACITORS - Decimal values in MF. All others in MMF unless otherwise specified.

PLATED CHASSIS BOARD WIRING AS VIEWED FROM BOTTOM SIDE (COMPONENTS SHOWN ARE ON OPPOSITE SIDE).

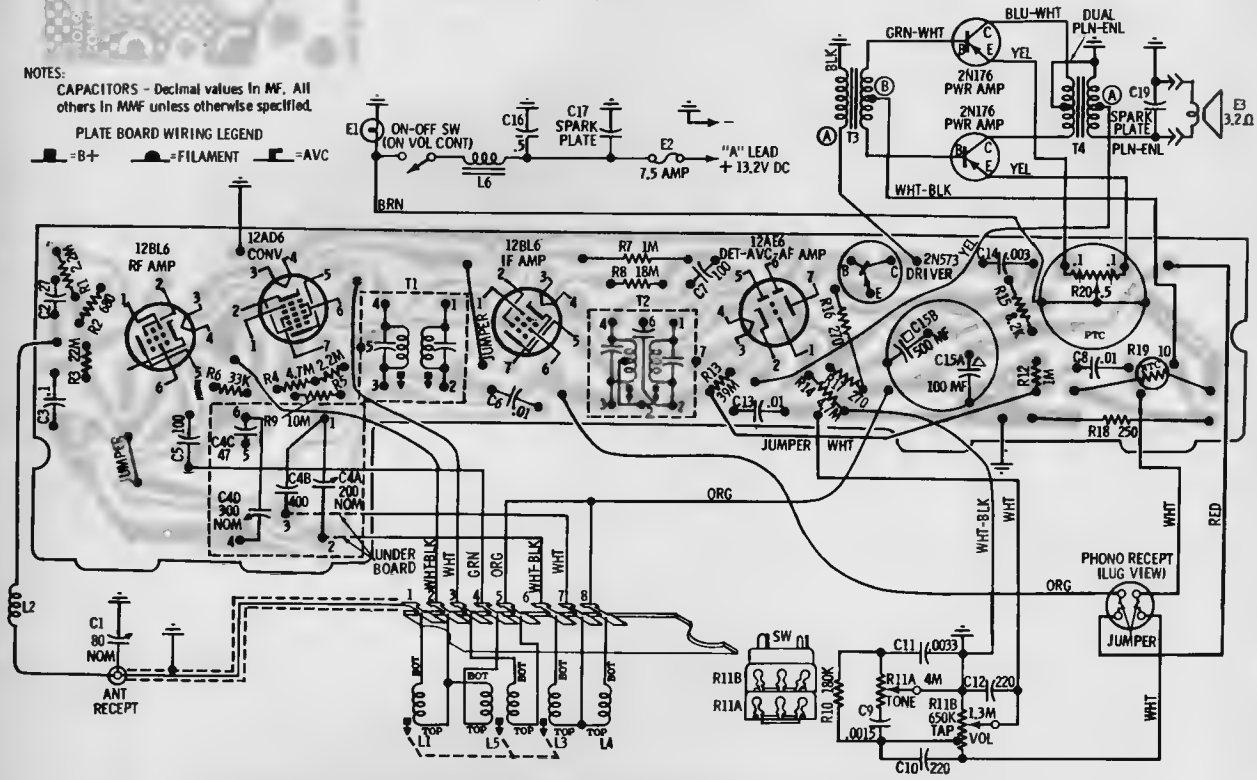




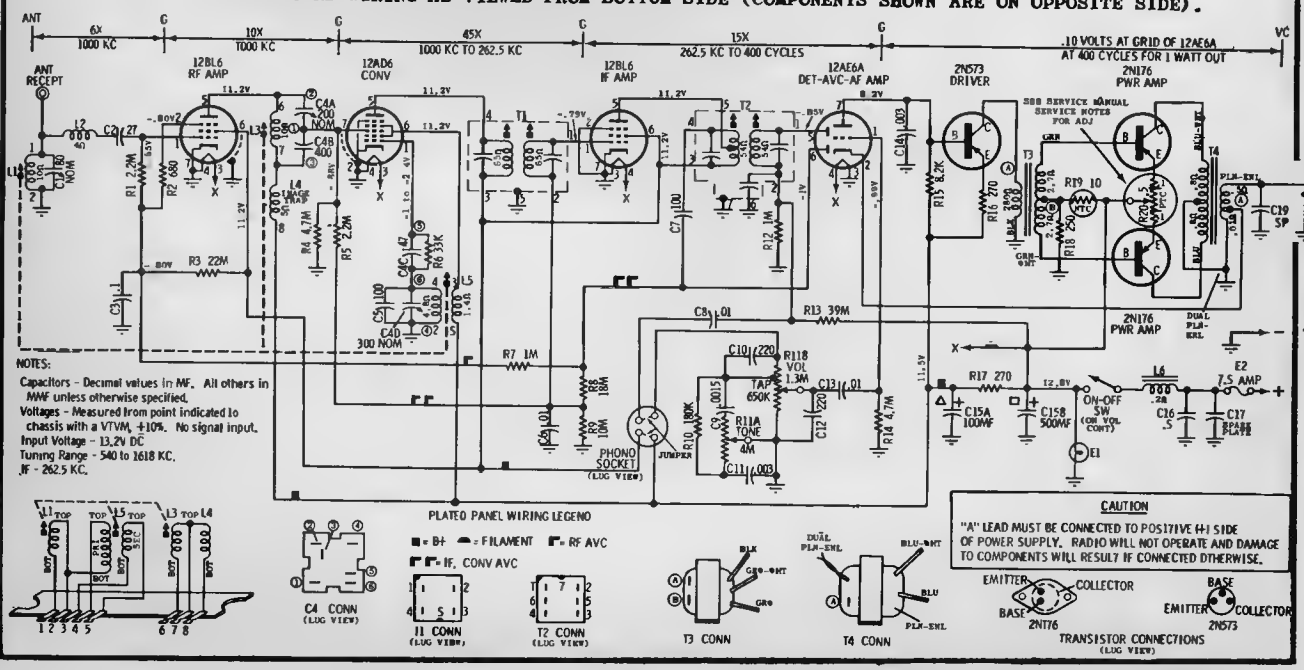
ALIGNMENT POINTS LOCATION

MOTOROLA Models 109, 111, 113, 114, 309, 311, 314L, 314V, Continued

PLATED CHASSIS BOARD GROUND CONNECTIONS AS SEEN THRU BOARD FROM WIRING SIDE
MODELS 309, 311, 314L, 314V



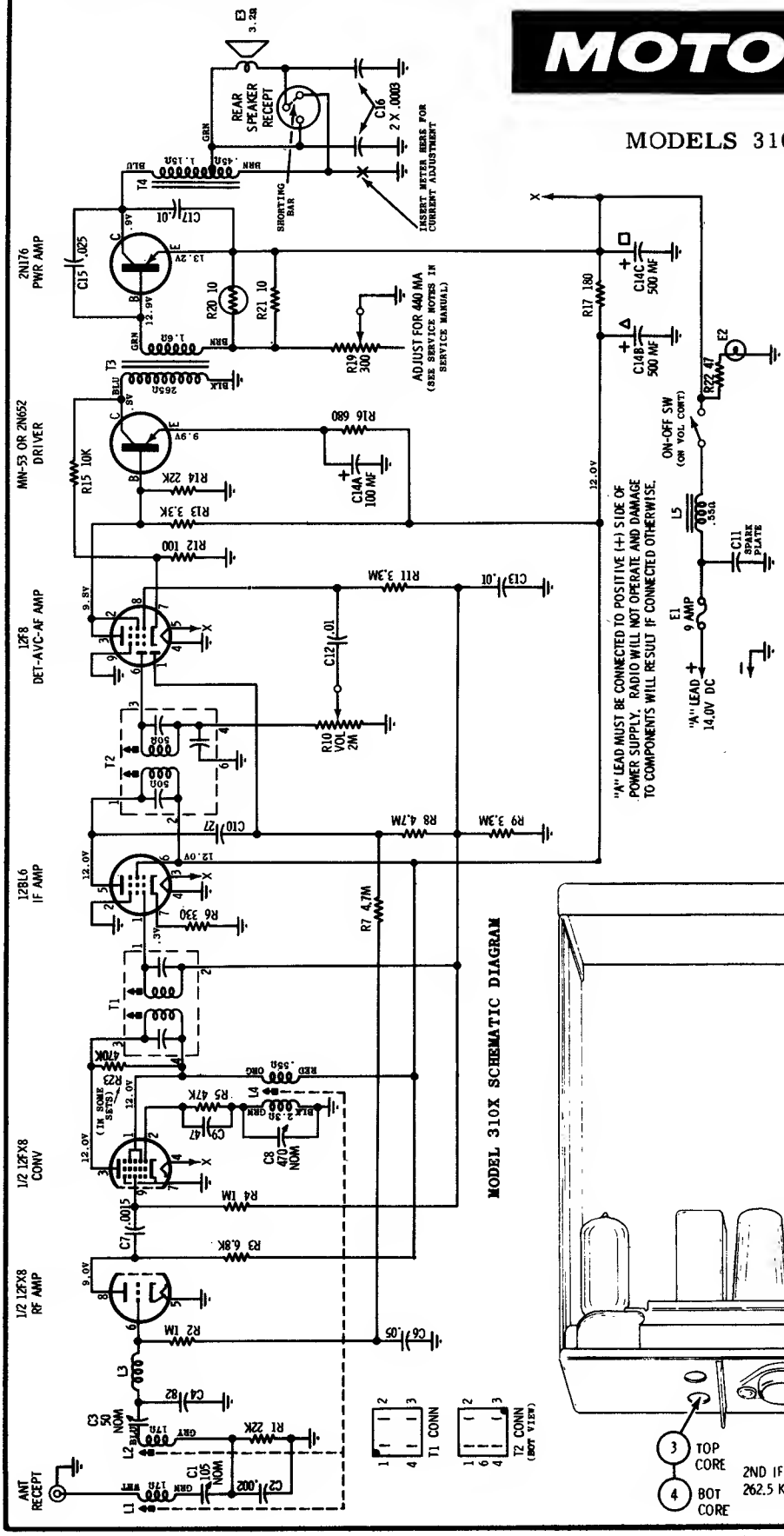
PLATED CHASSIS BOARD WIRING AS VIEWED FROM BOTTOM SIDE (COMPONENTS SHOWN ARE ON OPPOSITE SIDE).



SCHEMATIC DIAGRAM MODELS 309,311,314L,314V

MOTOROLA

MODELS 310X and 311X



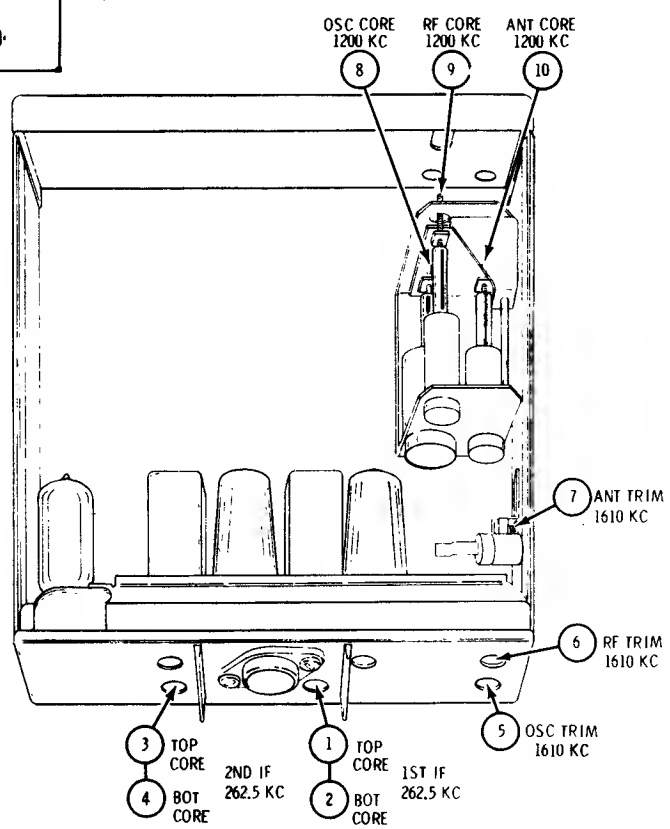
MODEL 310X SCHEMATIC DIAGRAM

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.

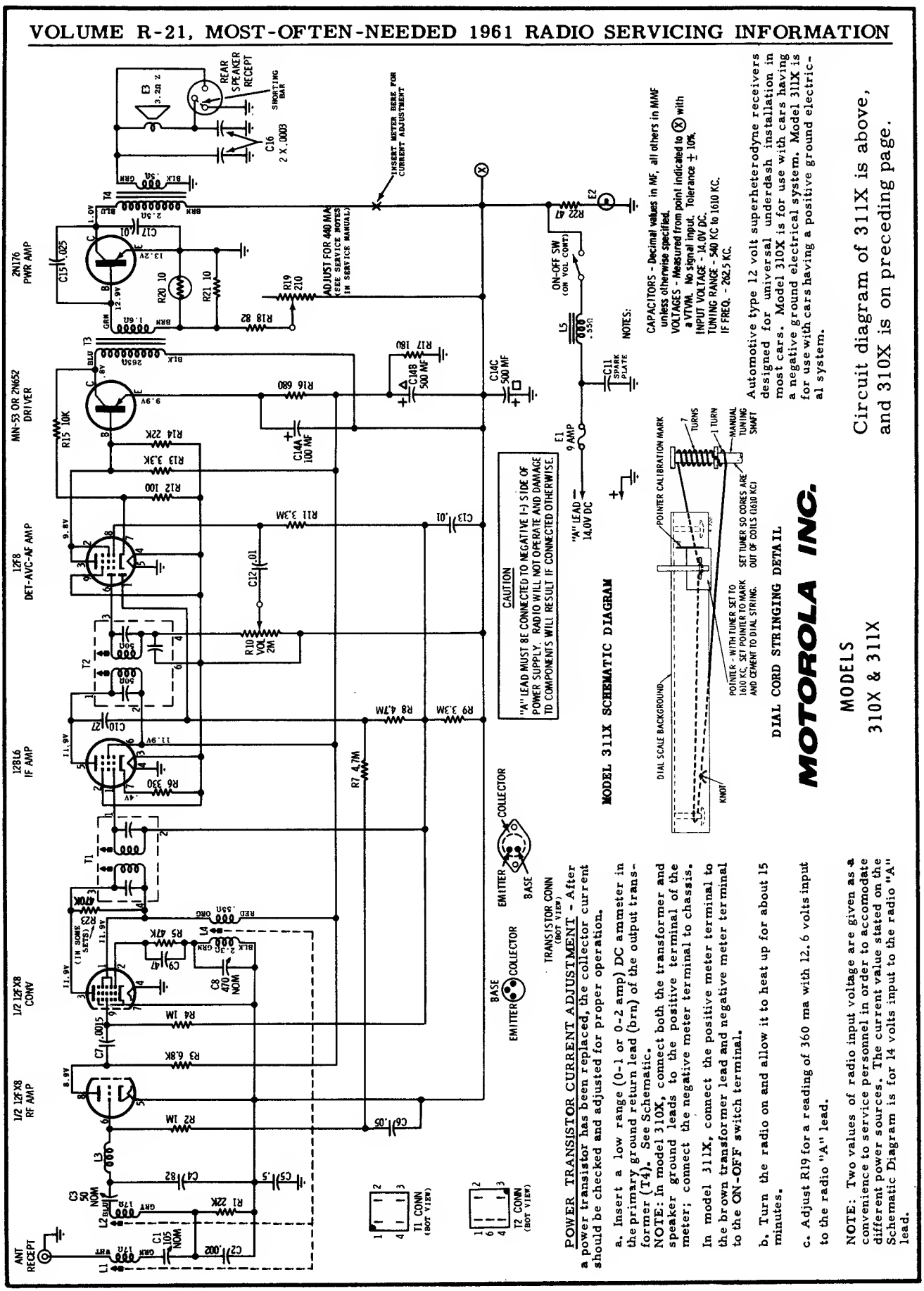
MOTOROLA INC.

MODELS 310X and 311X

Schematic diagram of 310X is on this page, diagram of 311X is on the next page, all other service material applicable to both.



ALIGNMENT POINTS LOCATION



Automotive type 12 volt superheterodyne receivers designed for universal underdash installation in most cars. Model 310X is for use with cars having a negative ground electrical system. Model 311X is for use with cars having a positive ground electrical system.

Circuit diagram of 311X is above, and 310X is on preceding page.

MOTOROLA INC.

MODELS
310X & 311X

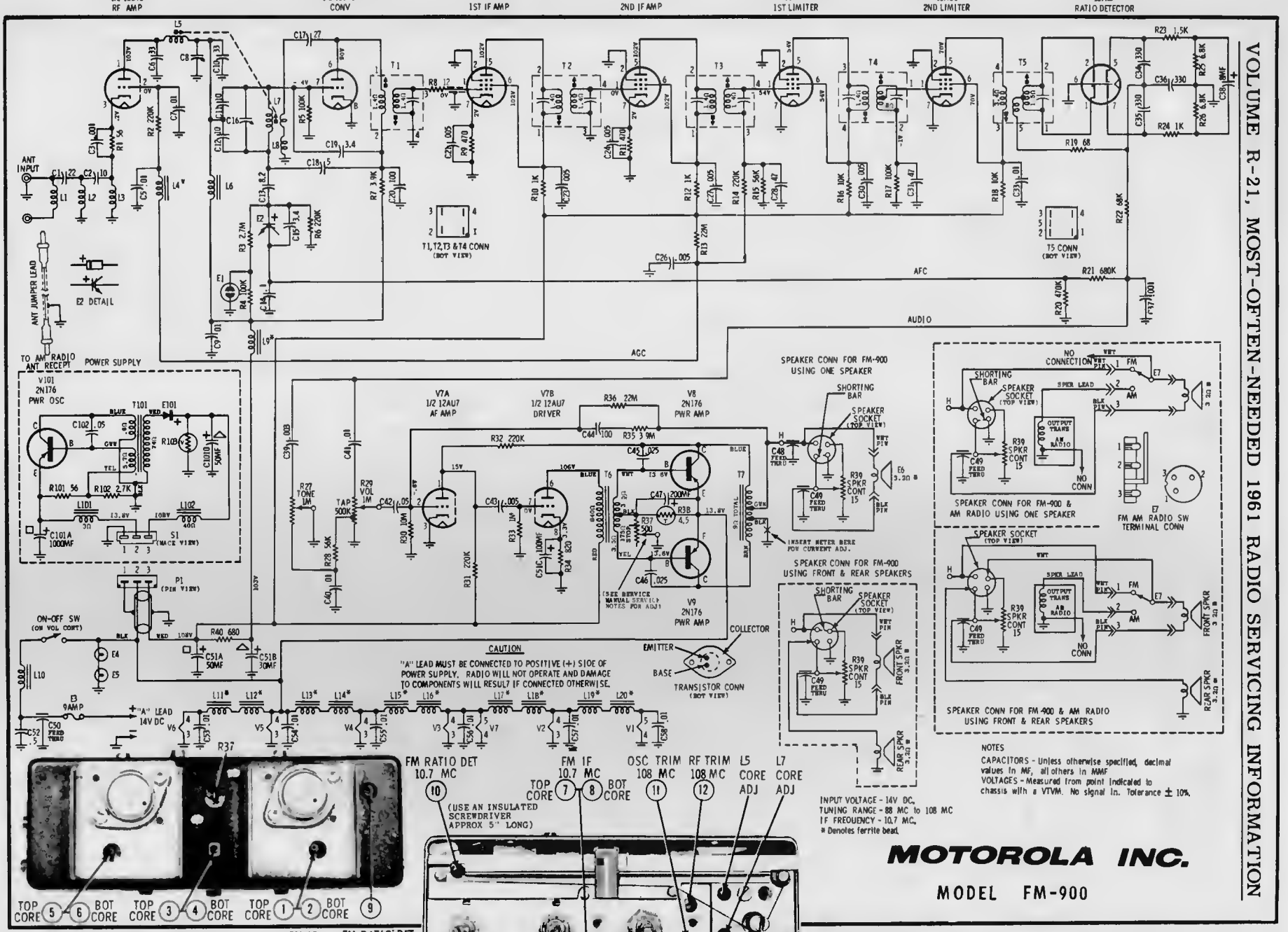
POWER TRANSISTOR CURRENT ADJUSTMENT - After a power transistor has been replaced, the collector current should be checked and adjusted for proper operation.

a. Insert a low range (0-1 or 0-2 amp) DC ammeter in the primary ground return lead (brn) of the output transformer (T4). See Schematic.
NOTE: In model 310X, connect both the transformer and speaker ground leads to the positive terminal of the meter; connect the negative meter terminal to chassis.
In model 311X, connect the positive meter terminal to the brown transformer lead and negative meter terminal to the ON-OFF switch terminal.

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

c. Adjust R19 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 accomodate 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, decimal values in MF, all others in MMF

VOLTAGES - Measured from point indicated to chassis with a VTVM. No signal in. Tolerance ± 10%.

INPUT VOLTAGE - 14V DC.
TUNING RANGE - 88 MC to 108 MC
IF FREQUENCY - 10.7 MC.
* Denotes ferrite bead.

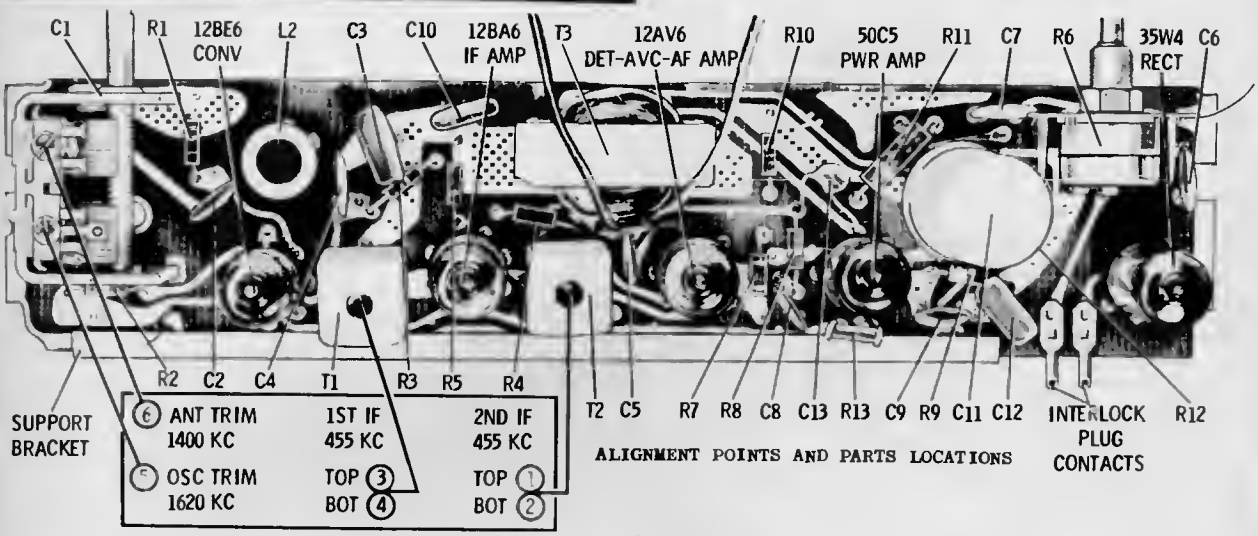
MOTOROLA INC.

MODEL FM-900

MOTOROLA

MODELS A3B, N

CHASSIS HS-746



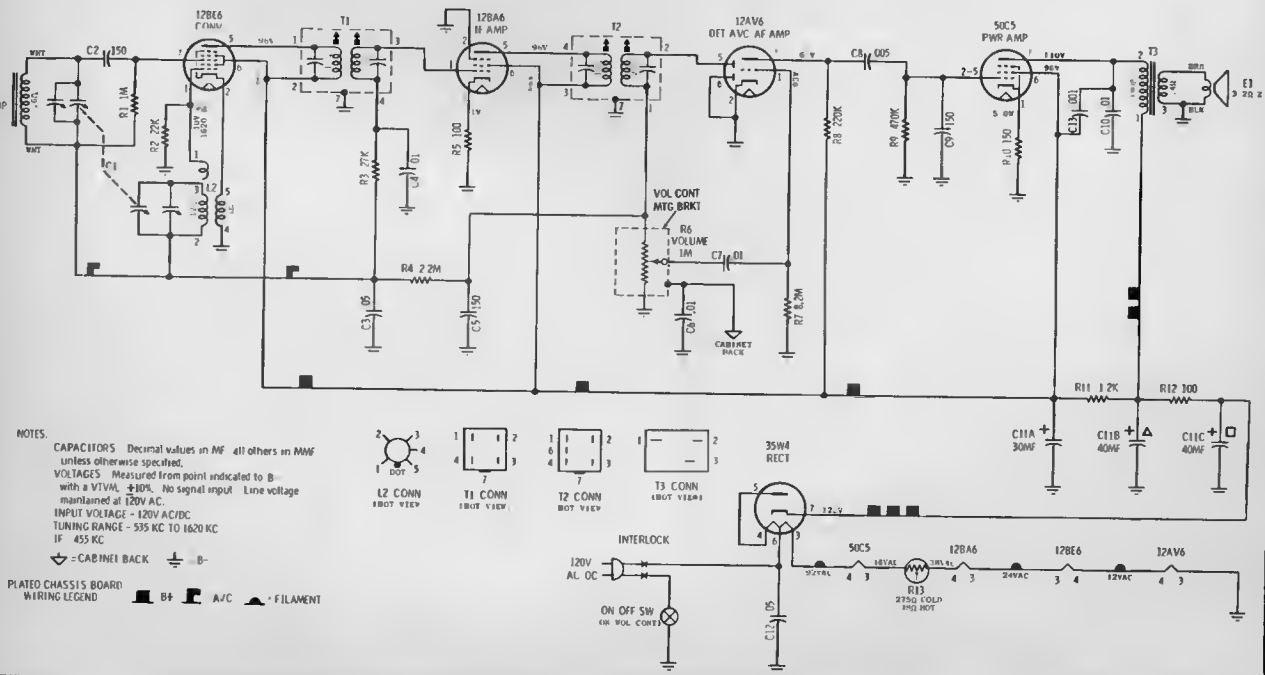
ALIGNMENT POINTS AND PARTS LOCATIONS

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 maximum. Attenuate generator output to maintain .4 volts on output meter to prevent overloading the receiver.

STEP	GENERATOR CONNECTION	GENERATOR FREQUENCY (400 cycle mod)	GANG SETTING	ADJUST	REMARKS
IF ALIGNMENT					
1.	12BE6 grid (pin 7) thru .1 mf & B-	455 Kc	Fully open	1, 2, 3 & 4	Adjust for maximum.
RF ALIGNMENT					
2.	Radiation loop*	1620 Kc	Fully open	5	Adjust for maximum.
3.	"	1400 Kc	Tune for max	6	"

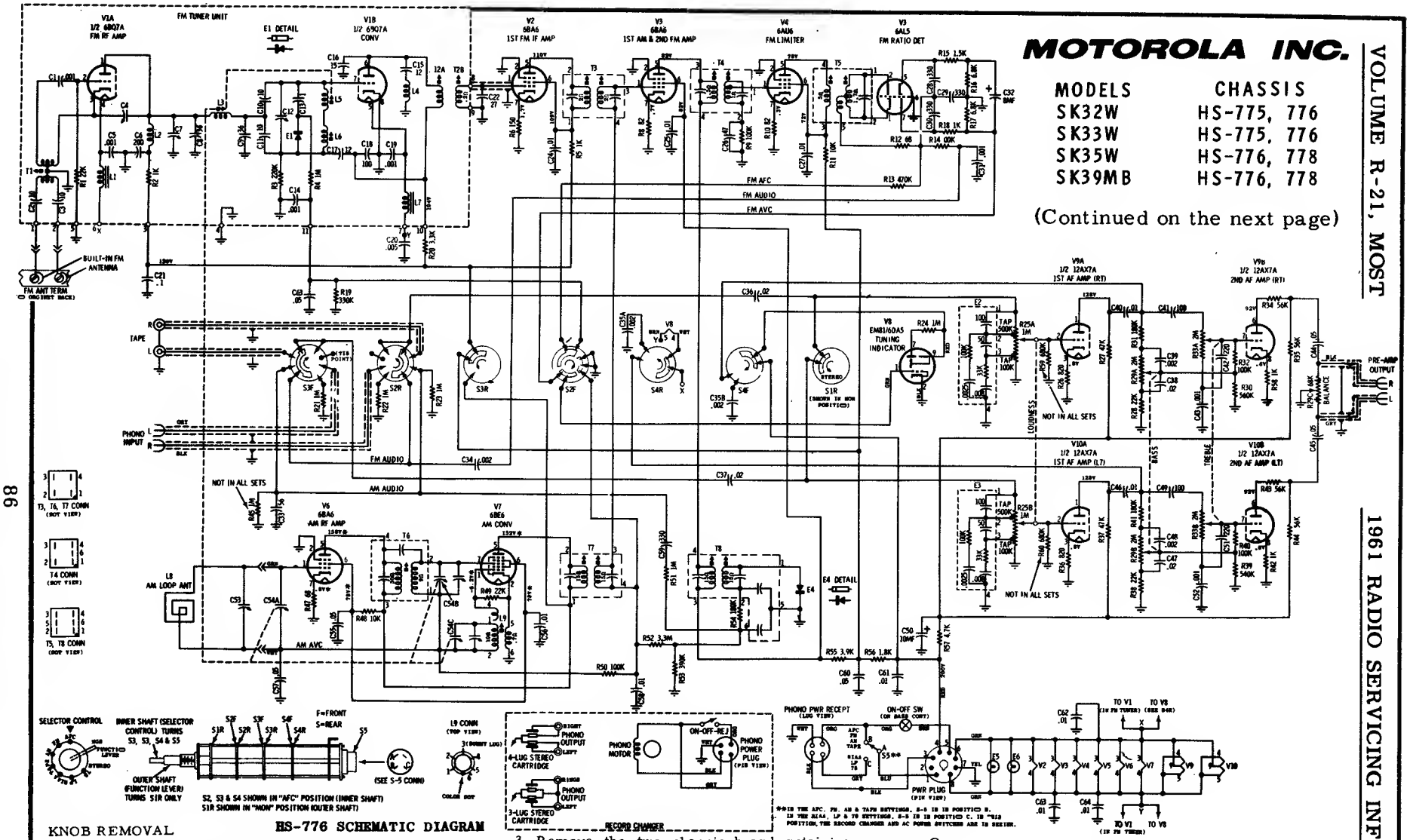
*Connect generator output across 5" diameter, 5 turn loop and couple inductively to receiver loop. Keep radiation loop at at least 12" from receiver loop.



MOTOROLA INC.

MODELS	CHASSIS
SK32W	HS-775, 776
SK33W	HS-775, 776
SK35W	HS-776, 778
SK39MB	HS-776, 778

(Continued on the next page)



HS-776 SCHEMATIC DIAGRAM

KNOB REMOVAL

Grasp control knob by the knurled edge and pull upward. Do not attempt to lift by metal disc.

TUNER/PRE-AMP CHASSIS REMOVAL

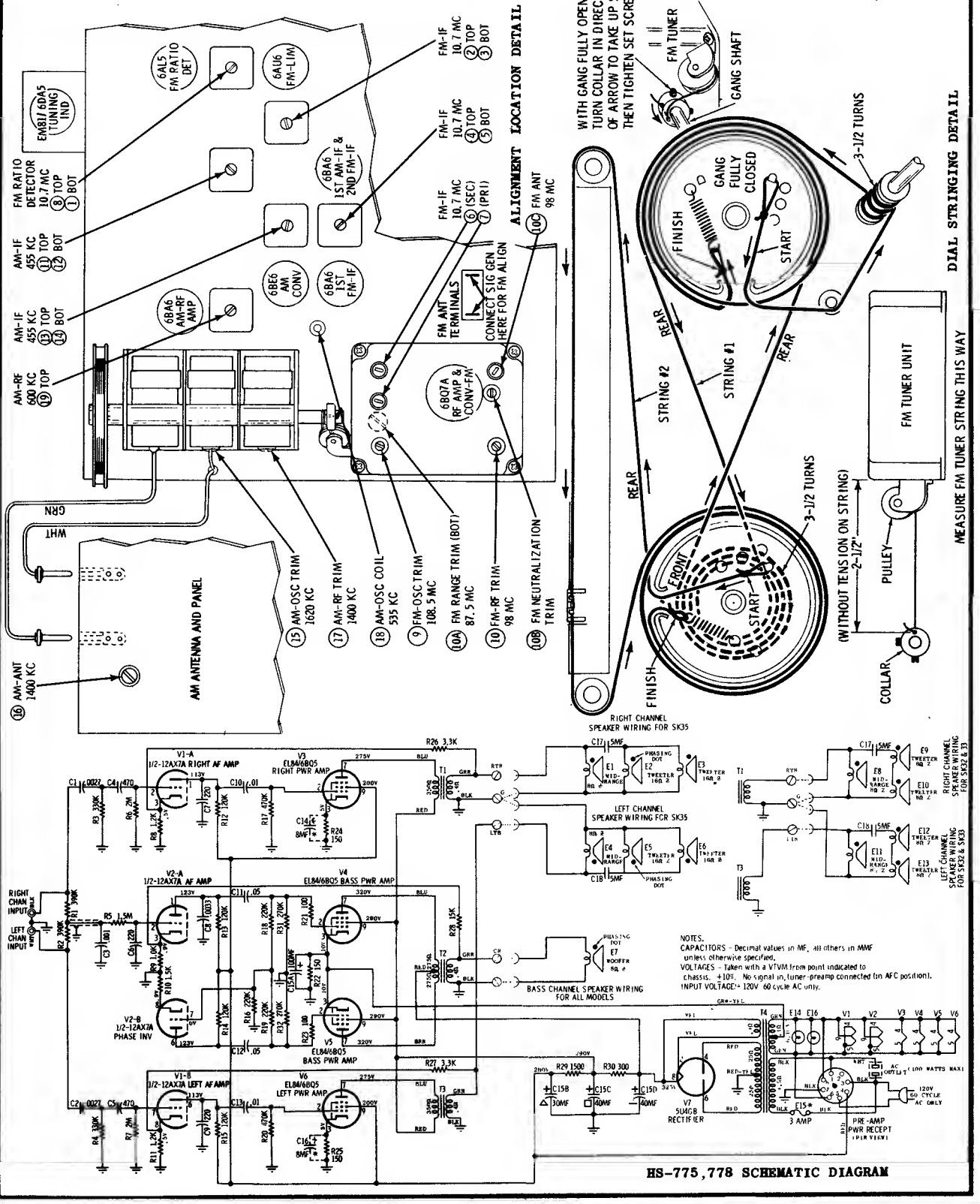
1. Remove control knobs (See Knob Removal Instructions), and cabinet back. Then, remove large bezel, secured with three screws which become visible when control knobs are removed.
2. Disconnect all leads and plugs emanating from or terminating at tuner/pre-amp chassis.
3. Remove the two chassis-board retaining screws. On models SK32 and SK33, the chassis-board retaining screws will be found at the bottom of the board and may be removed from back of cabinet. On Model SK35, open the Right Channel door and remove the two screws and washers visible on side panel. Place hand under chassis to prevent chassis from dropping down.
4. Remove two screws located at top of chassis retaining board (visible after removal of large bezel).
5. Remove chassis from mounting board.

NOTES:
CAPACITORS - Decimal values in MF, all others in MMF unless otherwise specified.
TUNING RANGE - AM, 540KC TO 1600KC
FM, 88MC TO 108MC
VOLTAGES - Measured from point indicated to chassis with a VTVM, ± 10%. No signal input. Tuner in AFC position (Voltages marked with * taken with tuner in AM position.)
⏚ = CHASSIS

MOTOROLA

MODELS	CHASSIS
SK32W	HS-775, 776
SK33W	HS-775, 776
SK35W	HS-776, 778
SK39MB	HS-776, 778

(Continued from preceding page)



HS-775,778 SCHEMATIC DIAGRAM

MOTOROLA

PORTABLE RADIO

MODEL	CHASSIS
X14B	HS-795
X14E	HS-795
X14R	HS-795
X14W	HS-795

Battery Voltage - Normally this receiver should operate satisfactorily until the battery voltage reaches 6 volts, operation below 6 volts may be unsatisfactory due to increased distortion.

Battery Drain - 3 to 5 ma with no input signal and volume at minimum level.

MOTOROLA INC.

MODEL	CHASSIS
X15A	HS-796
X15E	HS-796
X15N	HS-796

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 (except in output stage).
Resistances measured with transistors removed from associated circuitry.
ZERO SIGNAL CURRENT - 5.2 M.A. (MIN VOL)

MOTOROLA INC.

MODEL	CHASSIS
X16B	HS-797
X16G	HS-797
X16N	HS-797

CHASSIS REMOVAL

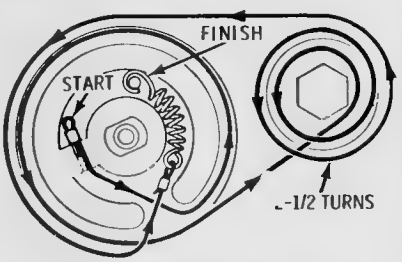
1. Rotate cabinet handle to its carrying position.
2. Loosen captivated back panel mounting screw completely and remove back panel.
3. Remove cabinet back mounting screw and cabinet back.
4. Remove carrying handle and On-Off and Volume knob.
5. Remove 3 chassis mounting screws (in doing so, the cabinet back mounting bracket will also come out).
6. Remove chassis from cabinet (lift up right side of chassis first, to allow the tuning knob to clear its cutout on the cabinet).

BATTERY DRAIN

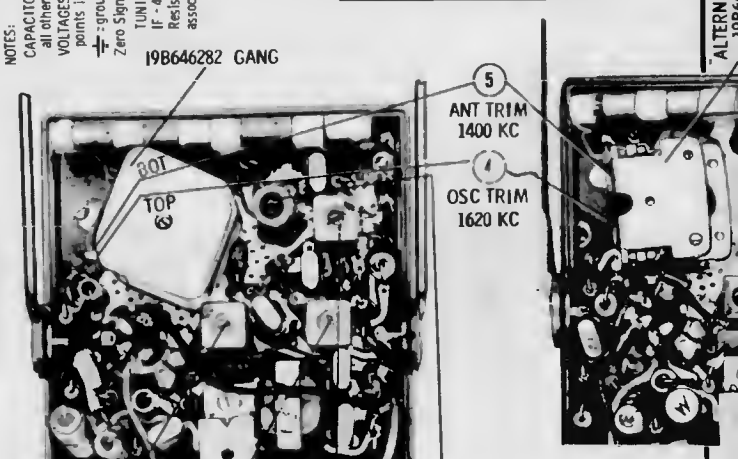
10-14 ma (max) with no input signal

NOTE: Due to the type of circuitry involved, there are two separate battery current paths, therefore, a DPST on-off switch is used. This necessitates two current measurements.

A very simple, convenient method of measuring battery drain can be made without unsoldering any connections. The only items necessary are a low resistance DC milliammeter and a jumper wire or two milliammeters. With the receiver turned off, place a milliammeter across the open terminals of one section of the switch and the jumper across the other section of the switch; the receiver is automatically turned on at the minimum volume level. The meter should read 10-14 ma; then interchange jumper wire and milliammeter connections, the meter should read 10-14 ma. If two milliammeters are available, place one across each section of the switch, each meter should read 10-14 ma.

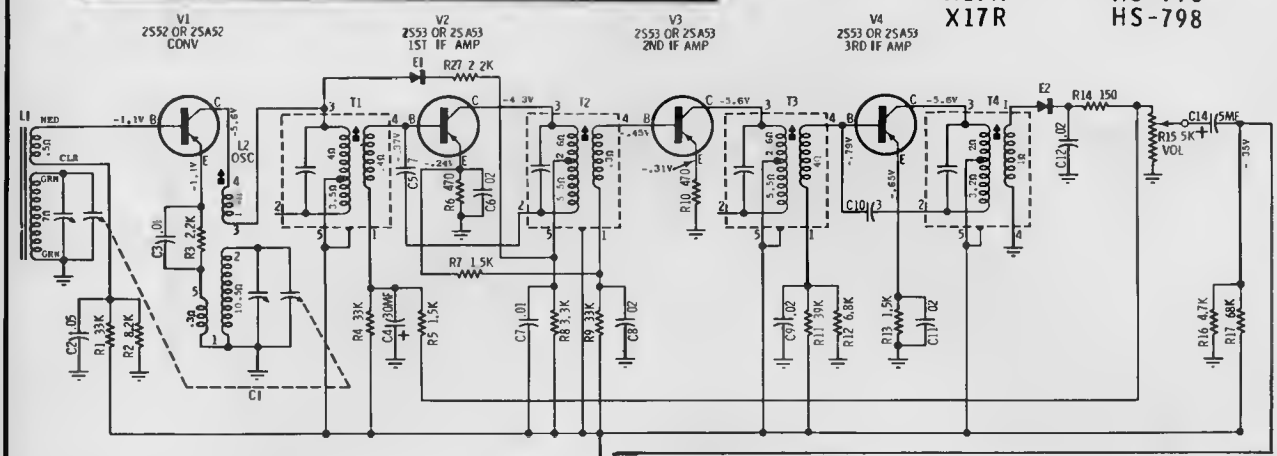


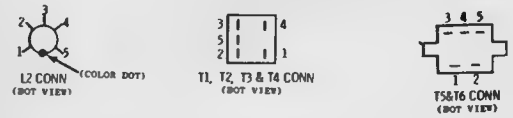
GANG SET TO HIGH END (1620 KC)

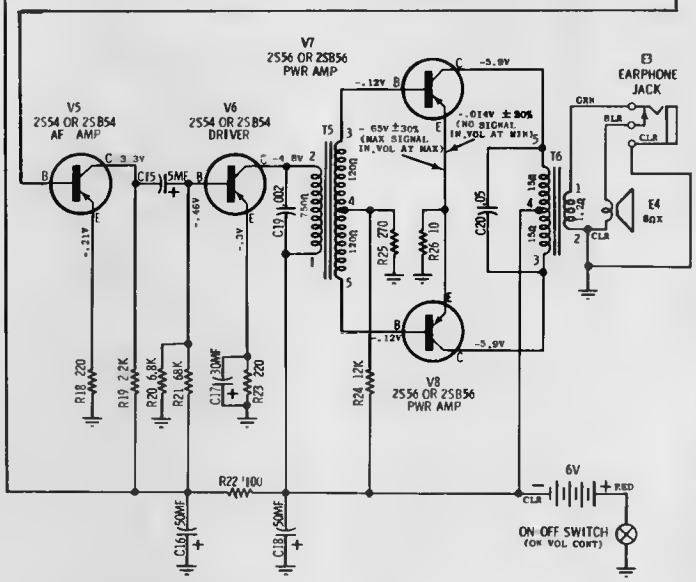


MOTOROLA

MODEL	CHASSIS
X17B	HS-798
X17N	HS-798
X17R	HS-798

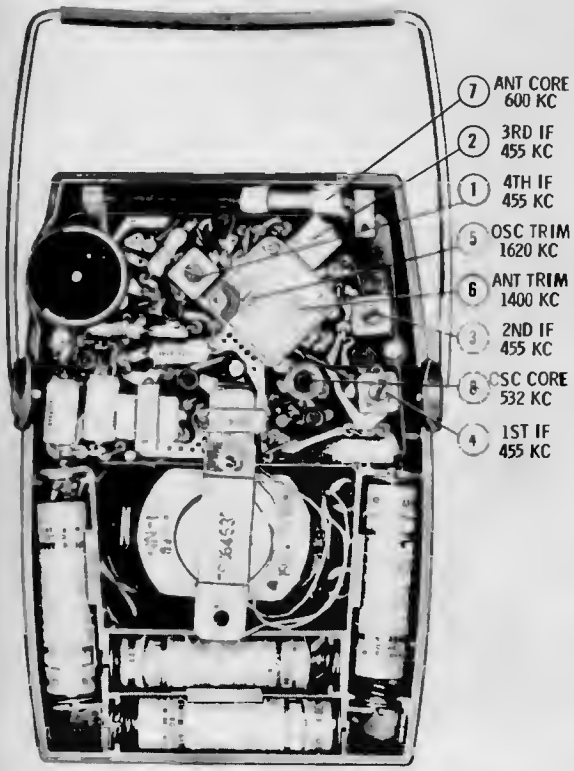






NOTES
CAPACITORS - Unless otherwise specified, decimal values in MF, all others in MMF
VOLTAGES - Measured from point indicated to ground with a VTVM, ±10%. No signal in
TUNING RANGE 535 KC to 1620 KC.
IF - 455 KC

Resistances measured with transistors removed from associated circuitry.
Zero signal current = 7.0MA (Min Vol)
⏚ = Ground



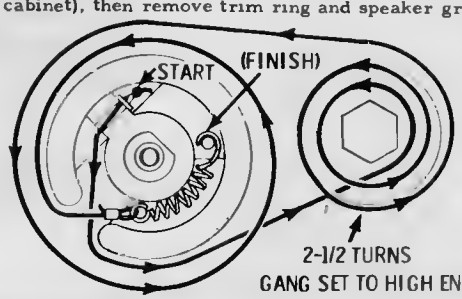
ALIGNMENT POINT LOCATIONS

CHASSIS REMOVAL

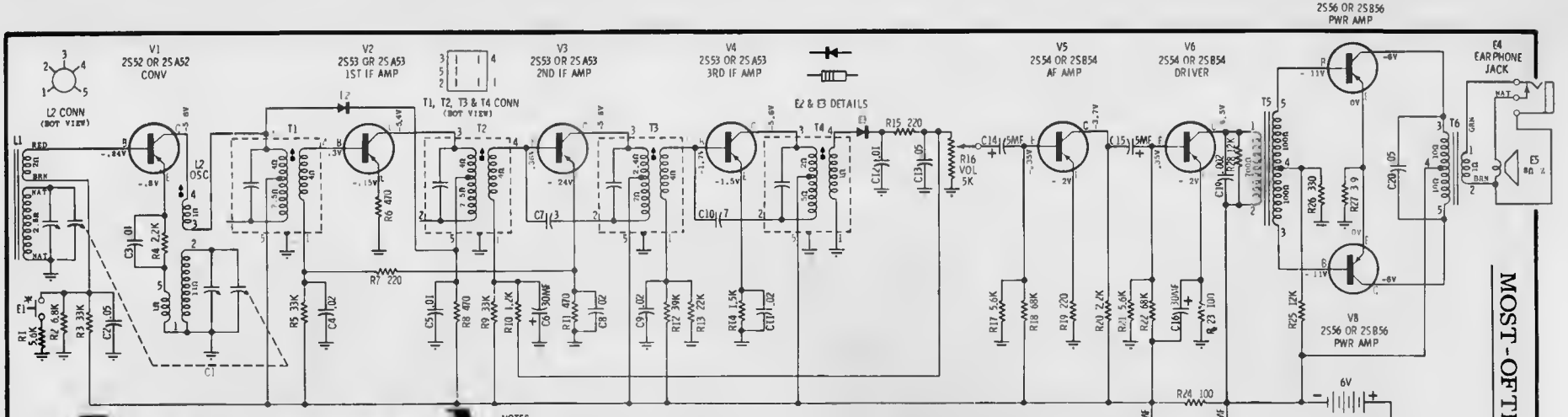
1. Loosen captivated cabinet back mounting screw and pull off cabinet back.
2. Remove 2 chassis mounting screws.
3. Slide chassis to the right and lift out of cabinet.

SPEAKER REMOVAL

1. Loosen captivated cabinet back mounting screw and pull off cabinet back.
2. Remove batteries and unsolder speaker lead connected to chassis, then unsolder earphone jack lead connected to chassis.
3. Remove chassis (see Chassis Removal).
4. Lift up 4 speaker trim ring mounting ears (located at rear of cabinet), then remove trim ring and speaker grille.



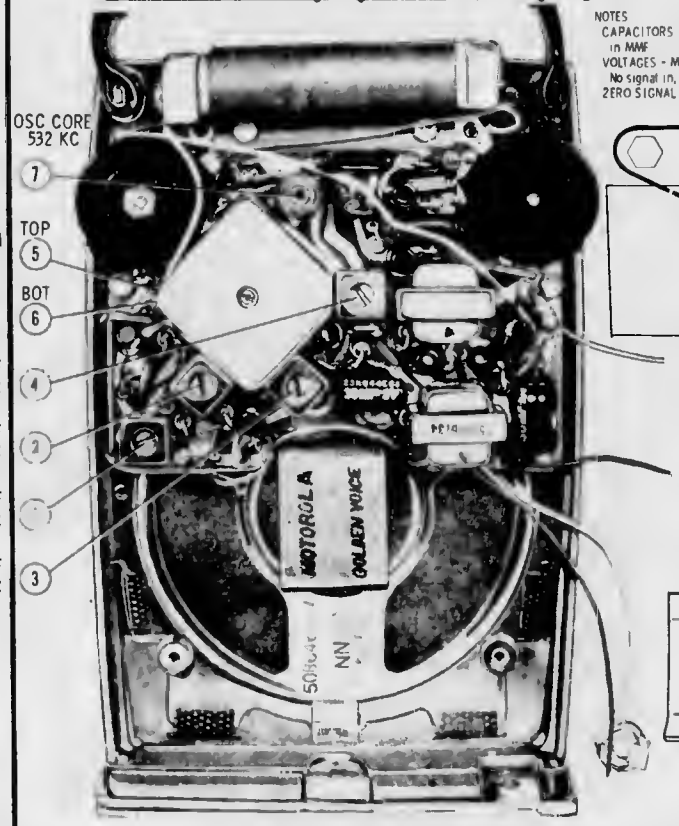
DIAL STRINGING DETAIL



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
ZERO SIGNAL CURRENT APPROX 9 MA (MIN VOL)

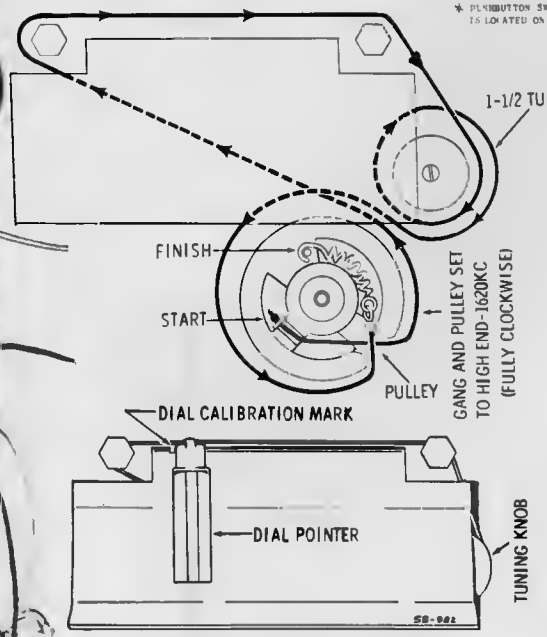
TUNING RANGE - 535 to 1620 KC
IF 455 KC
Resistances measured with transistors removed from associated circuitry
⏚ = GROUND

* PUSHBUTTON SWITCH (BATTERY LIFE INDICATOR IS LOCATED ON FRONT OF RADIO - PUSH TO CLOSE)



ALIGNMENT POINT LOCATIONS

92
OSC TRIM 1620 KC
ANT TRIM 1400 KC
1ST IF 455 KC
3RD IF 455 KC
4TH IF 455 KC
2ND IF 455 KC



NOTE: UPON COMPLETION OF DIAL STRINGING, ROTATE TUNING KNOB FULLY COUNTERCLOCKWISE SO THAT GANG IS FULLY CLOSED (532 KC); PLACE DIAL POINTER SO THAT EDGE OF POINTER JUST COVERS DIAL CALIBRATION MARK.

DIAL STRINGING DETAIL

CHASSIS REMOVAL

1. Lift off battery compartment cover and remove batteries.
2. Remove 2 cabinet back mounting screws located under batteries and remove cabinet back far enough to gain access to earphone jack; unscrew earphone jack mounting nut.
   NOTE: A special tool for removing the earphone jack is available. Order Motorola Part Number 66A646211.
3. Unsolder battery leads connected to battery compartment on cabinet back.
4. Unsolder lead and 5.6K resistor (R-1) connected to Battery Life Indicator Switch E-1.
5. Remove 2 chassis mounting screws.
6. Lift up chassis far enough to make bottom accessible, then unsolder appropriate leads.

SPEAKER REMOVAL

1. Remove chassis from cabinet (see Chassis Removal).
2. Remove decorative nut from cabinet front (on Battery Life Indicator Button).
3. From inside front cabinet, bend up the 8 speaker grille mounting tabs and then remove the grille and speaker gasket.
4. Bend up the 3 speaker mounting tabs and remove speaker (from front of cabinet).

MOTOROLA INC.

MODEL	CHASSIS
X19A	HS-799
X19E	HS-799

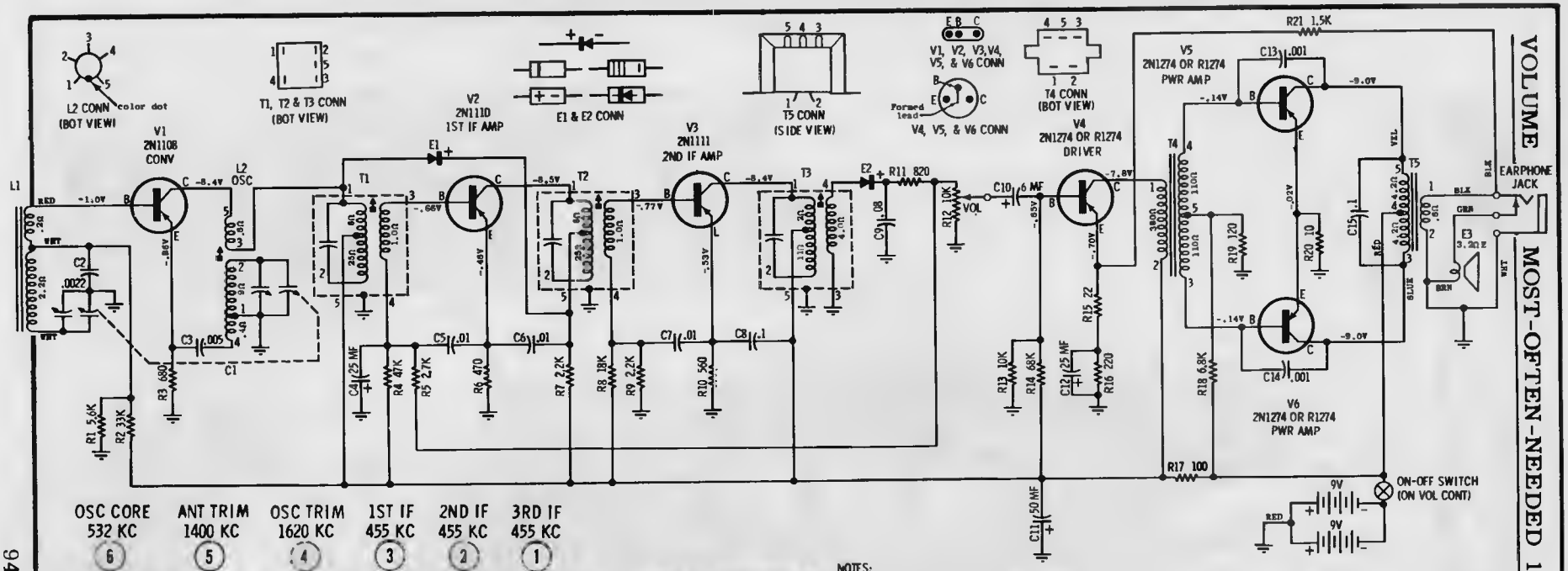
MOTOROLA

MODEL L20E **CHASSIS** HS-800

NOTES:
CAPACITORS Unless otherwise specified, decimal values in MF, all others in MMF
VOLTAGES Measured from point indicated to ground or across points indicated with a VTVM. ±10%. No signal in
TUNING RANGE 535 KC to 1620 KC
IF 455 KC
Resistances measured with transistors removed from associated circuitry
⏚ Ground
ZERO SIGNAL CURRENT APPROX 12 MA (MIN VOL)

CHASSIS REMOVAL

1. Loosen two back panel mounting screws 5 or 6 turns (a coin can be used for a screwdriver) and remove panel (if necessary, press thumb against bottom center edge; the panel will swing free, allowing easy removal).
2. To remove cabinet back, remove 2 cabinet back mounting screws located under batteries, then remove back.
3. Remove volume, tuning and pointer knobs.
4. From front of cabinet, remove dial scale by first removing the two dial scale mounting screws, then remove scale.
5. Remove 2 chassis mounting screws located under dial scale and volume control mounting nut.
6. Unscrew earphone jack mounting nut.
7. Unsolder chassis leads.
8. Remove chassis from cabinet.



OSC CORE 532 KC (6) | ANT TRIM 1400 KC (5) | OSC TRIM 1620 KC (4) | 1ST IF 455 KC (3) | 2ND IF 455 KC (2) | 3RD IF 455 KC (1)

ALIGNMENT POINT LOCATIONS

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 KC to 1620 KC.
IF - 455 KC.

Resistances measured with transistors removed from associated circuitry.
⏚ = Ground
ZERO SIGNAL CURRENT - APPROX 12 M. A. (MIN VOL)

CABINET BACK REMOVAL

1. Loosen captivated back panel mounting screws completely and remove back panel.
2. Remove batteries and unsnap connectors.
3. Press button to release handle.
4. Remove 2 cabinet back mounting screws.
5. Unfasten actuator arms from handle rods by using a screwdriver (to push them to the side).
6. Remove cabinet back.

VOLTAGE READINGS TAKEN FROM BOTTOM SIDE OF CHASSIS

NOTES - VOLTAGES: MEASURED FROM POINT INDICATED TO GROUND (⏚) WITH A VTVM, ± 10%, NO SIGNAL IN.

MOTOROLA INC.

PORTABLE / TABLE RADIO

MODEL	CHASSIS
XT18B	HS-802
XT18S	HS-802

CORDLESS 1500 SERIES

MOTOROLA

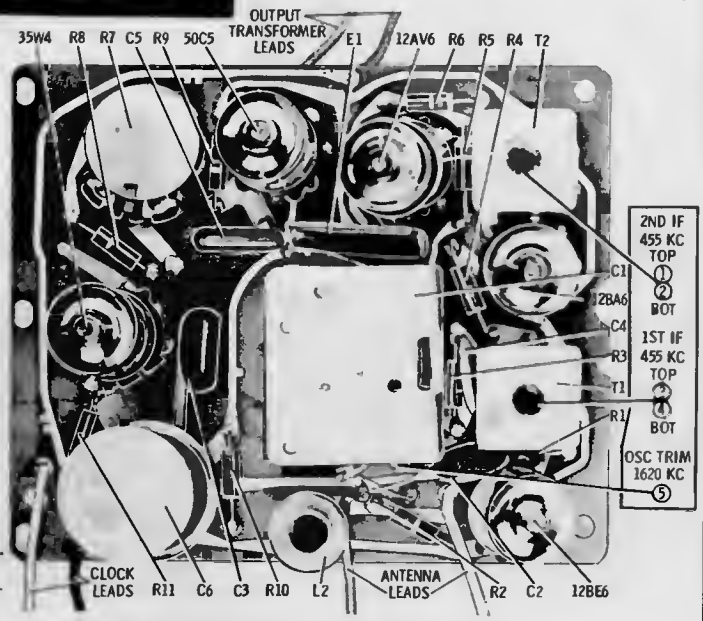
MODELS	CHASSIS
C10N	HS-813
C10P	HS-813
C10W	HS-813

The material on this page is exact for sets listed above. The additional radios listed below are practically identical electrically.

MODELS	CHASSIS
C11B	HS-814
C11G	HS-814
C11S	HS-814

TO REMOVE CHASSIS FROM CABINET

1. Remove volume and tuning knobs.
2. Remove cabinet back - 2 screws hold it in place.
3. From front, remove palnut located under volume knob.
4. From rear, unsolder 2 cabinet back loop leads, then remove 3 chassis mounting screws.
5. Remove chassis from cabinet, to free chassis, unsolder appropriate leads.

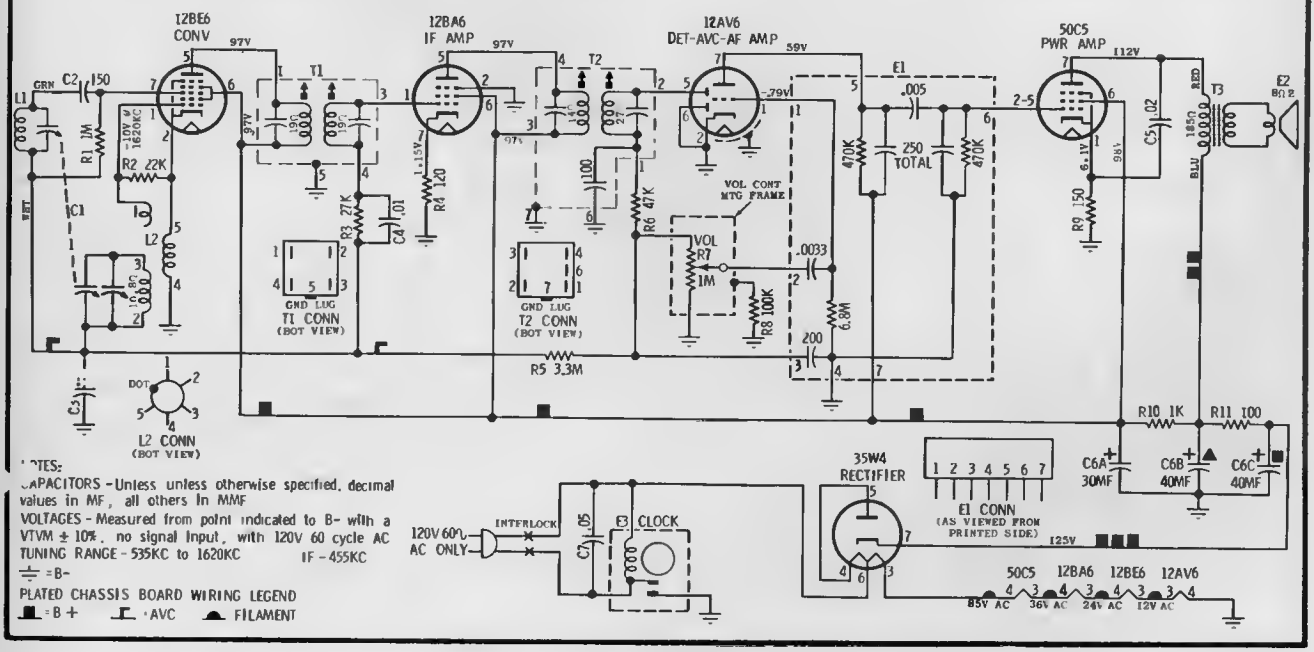


ALIGNMENT POINTS AND PARTS LOCATION

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 maximum. Attenuate generator output to maintain .64 volts on output meter to prevent overloading.

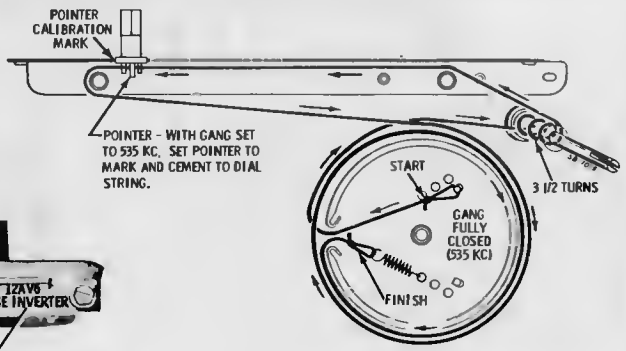
STEP	GENERATOR CONNECTION	GENERATOR FREQUENCY (400 cycle mod)	GANG SETTING	ADJUST	REMARKS
IF ALIGNMENT					
1.	Grid of conv (pin 7, 12BE6) thru .1 mf & B-	455 Kc	Fully open	1,2,3, & 4	Adjust for maximum.
RF ALIGNMENT					
2.	Grid of conv (pin 7, 12BE6) thru .1 mf & B-	1620 Kc	Fully open	5	Adjust for maximum.



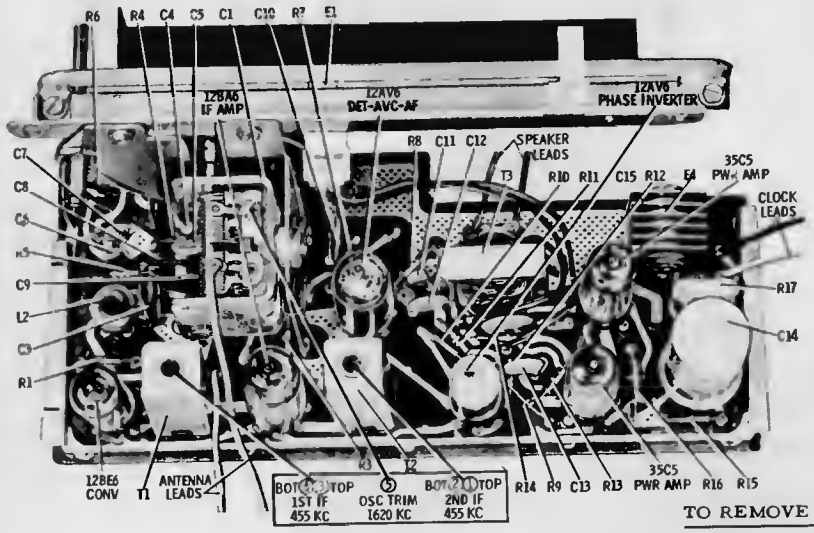
NOTES:
CAPACITORS - Unless unless otherwise specified, decimal values in MF, all others in MMF
VOLTAGES - Measured from point indicated to B- with a VTVM ± 10%, no signal input, with 120V 60 cycle AC
TUNING RANGE - 535KC to 1620KC IF - 455KC
⏚ = B-
PLATED CHASSIS BOARD WIRING LEGEND
■ = B+ ▬ = AVC ▲ = FILAMENT

MOTOROLA INC.

MODELS	CHASSIS
C12B	HS-815
C12P	HS-815
C12W	HS-815



DIAL STRINGING DETAIL



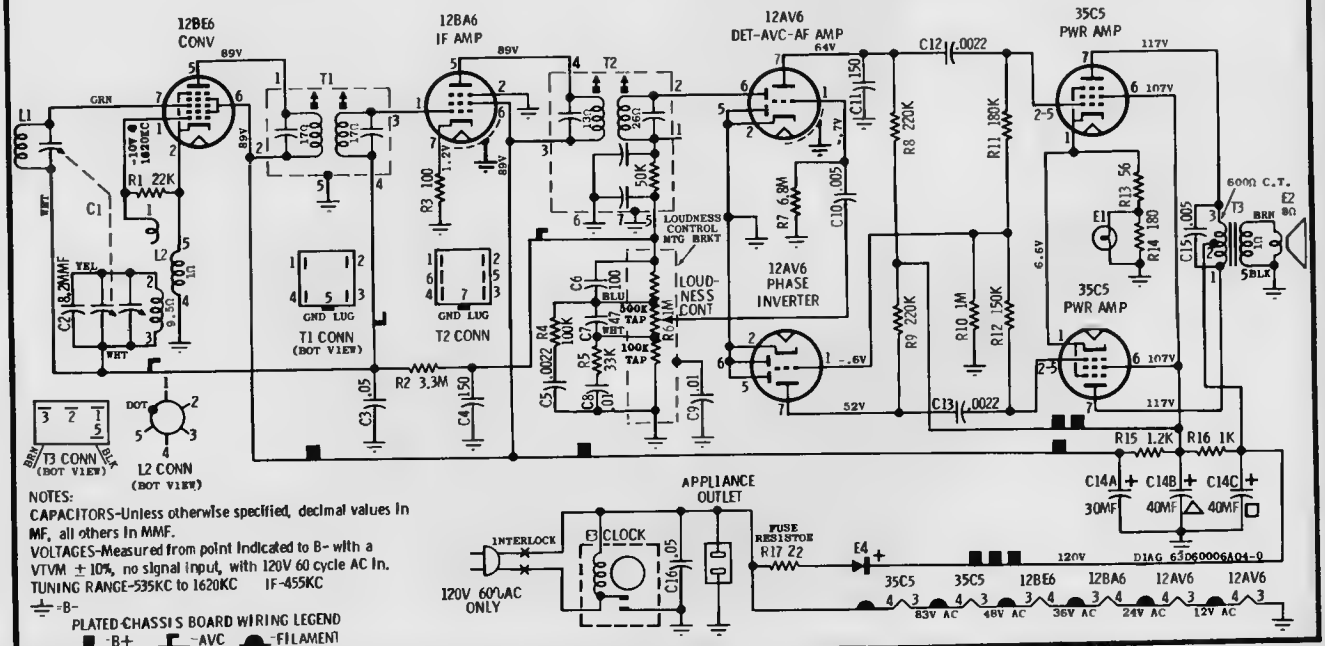
ALIGNMENT POINTS AND PARTS LOCATION

TO REMOVE CHASSIS FROM CABINET

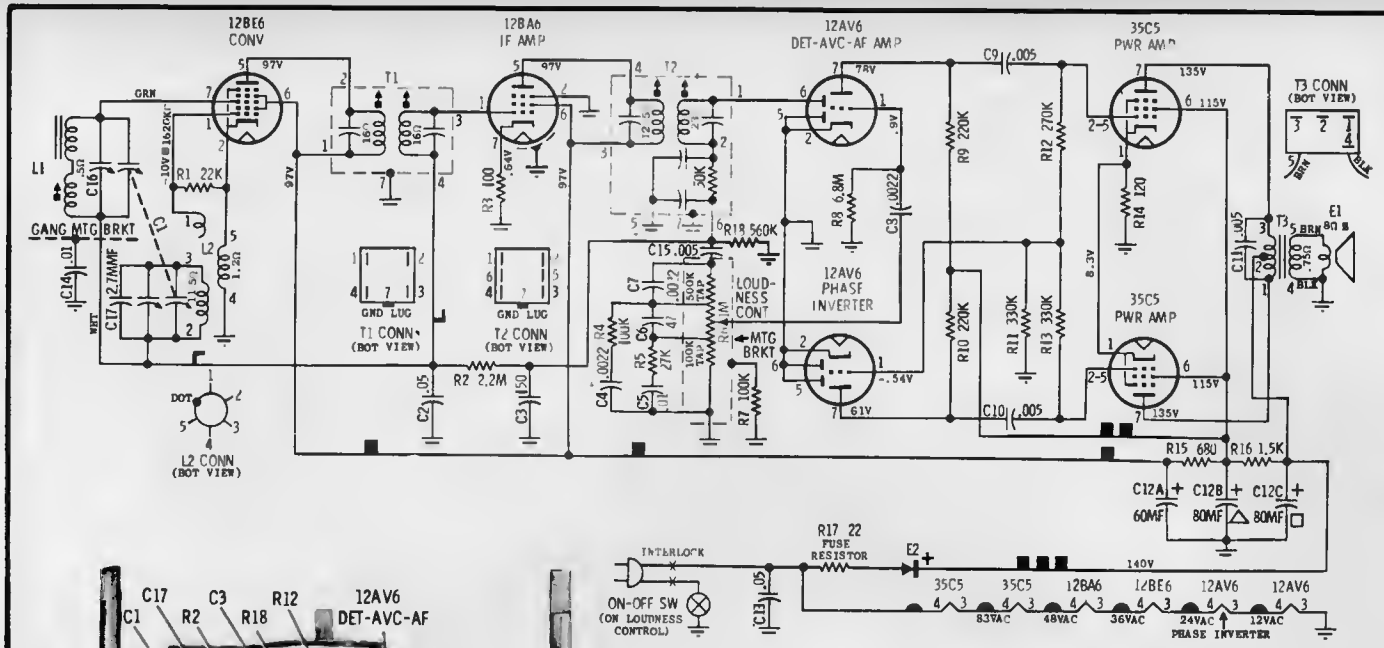
1. Remove cabinet back - 5 screws hold it in place.
2. From rear, unsolder 2 cabinet back loop leads, then remove the 2 screws that mount the pointer slide bracket (on chassis) to the cabinet.
3. Unsolder 2 chassis leads connected to clock and 2 speaker leads.
4. Remove volume and tuning knobs.
5. From front, remove palnut located under volume knob.
6. Remove chassis from cabinet.

TO REMOVE CLOCK FROM CABINET

1. Remove cabinet back - 5 screws hold it in place.
2. Unsolder all leads connected to clock.
3. Remove 2 appliance outlet bracket mounting screws and remove bracket.
4. Insert a screwdriver between the cabinet and left edge of the clock crystal (near 9 o'clock on clock face) to release catch, then pry out crystal.
5. Set the Hour, Minute and Alarm Set hands to 12 o'clock (use the Time Set-Auto Set knob for this purpose). Remove clock hands by pulling them straight off from their mounting shaft in this order: Second, Minute, Hour and Alarm Set.
6. From rear, remove 4 clock mounting lockscrews and remove clock from cabinet.

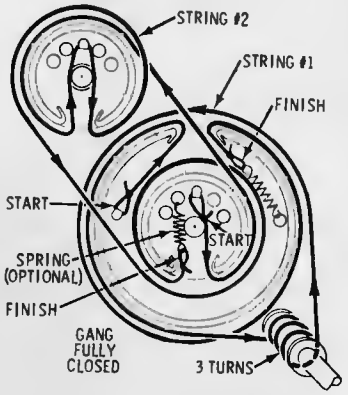


NOTES:
CAPACITORS-Unless otherwise specified, decimal values in MF, all others in MMF.
VOLTAGES-Measured from point indicated to B- with a VTVM ± 10%, no signal input, with 120V 60 cycle AC in.
TUNING RANGE-535KC to 1620KC IF-455KC
⏚=B-
PLATED-CHASSIS BOARD WIRING LEGEND
B+ AVC FILAMENT

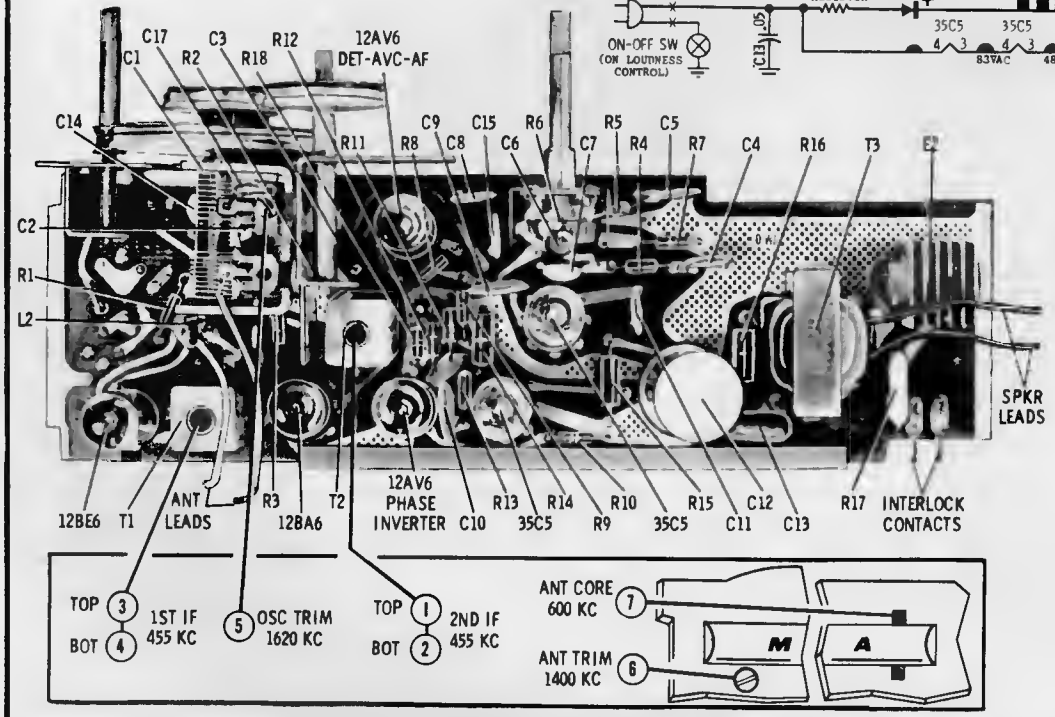


NOTES
CAPACITORS-Unless otherwise specified, decimal values in MF, all others in MMF.
VOLTAGES-Measured from point indicated to B- with a VTVM ±10%, no signal input with 120V 60 cycle AC in.
TUNING RANGE-535KC to 1620KC (IF-455KC)
⏚-B-

PLATED CHASSIS BOARD WIRING LEGEND
B+ AVC FILAMENT



DIAL STRINGING DETAIL



ALIGNMENT ADJUSTMENTS & PARTS LOCATION

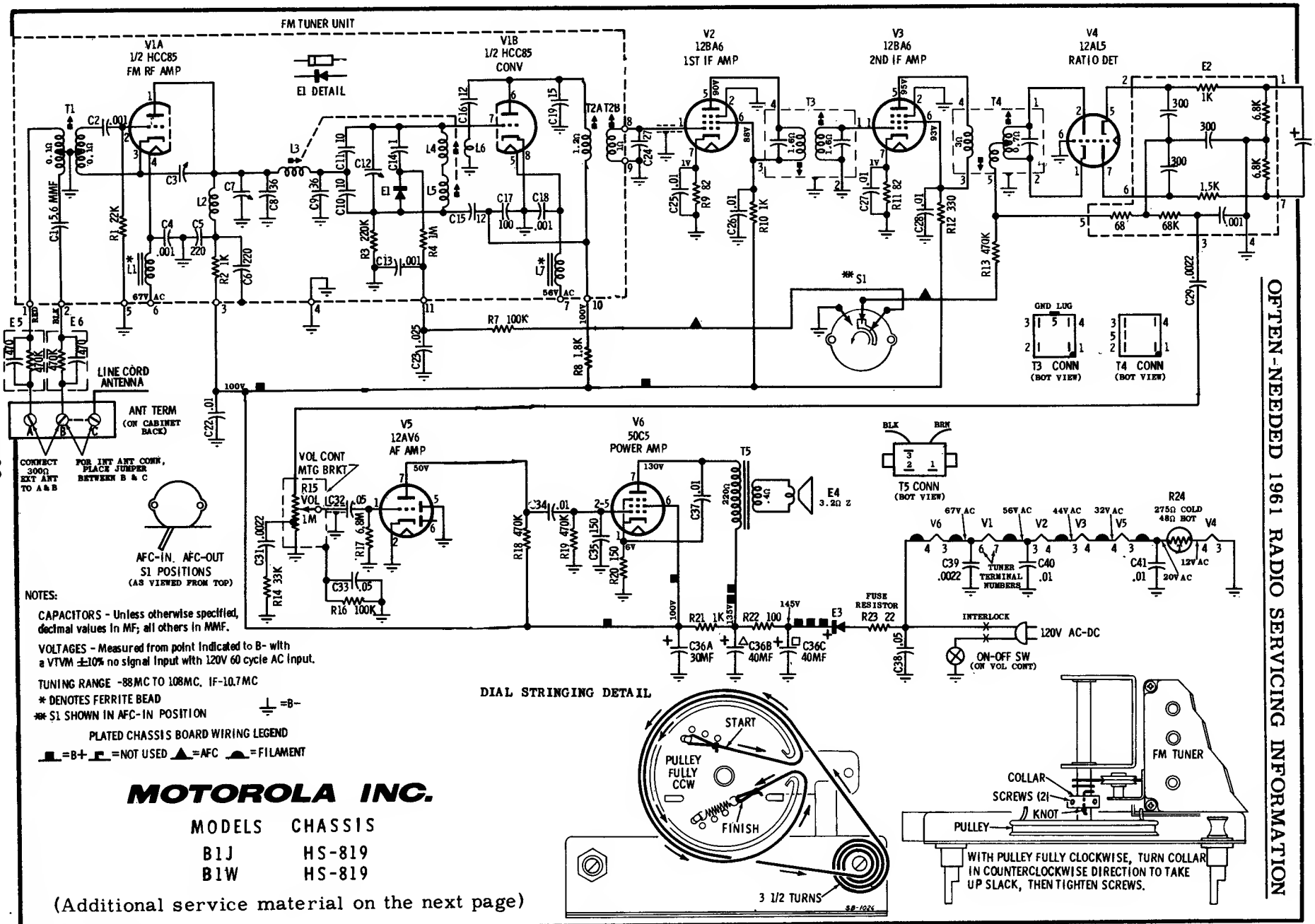
Ref. No.	Part Number	Description
C-1	19B60323A01	Capacitor, variable: 2 gang
C-2	8B128613	Capacitor, mylar: .05 mf 400V
C-3	21K129730	Capacitor, cer disc: 150 mmf 500V
C-4	21K129965	Capacitor, cer disc: .0022 mf 500V
C-5	21K129718	Capacitor, cer disc: .01 mf 500V
C-6	21R115593	Capacitor, cer disc: 47 mmf 500V
C-7	21K129965	Capacitor, cer disc: .0022 mf 500V
C-8	21K129965	Capacitor, cer disc: .0022 mf 500V
C-9	21K129921	Capacitor, cer disc: .005 mf 500V
C-10	21K129921	Capacitor, cer disc: .005 mf 500V
C-11	21K129921	Capacitor, cer disc: .005 mf 500V
C-12	23B60423A01	Capacitor, electrolytic: 60-80-80 mf/150V
C-13	8B128613	Capacitor, mylar: .05 mf 400V
C-14	21K129718	Capacitor, cer disc: .01 mf 500V
C-15	21K129921	Capacitor, cer disc: .005 mf 500V
C-16	20B60120A01	Capacitor, mica trim: 1.3 mmf to 11 mmf
C-17	21A541621	Capacitor, cer tub: 2.7 mmf 500V NTC

TO REMOVE CHASSIS FROM CABINET

1. Remove back cover - 4 screws hold it in place.
2. From rear, remove 3 dial crystal mounting screws and 3 chassis mounting screws.
3. From front, remove 2 control knobs, dial crystal and dial pointer (observe dial calibration).
4. Unsolder 2 speaker leads and remove chassis from cabinet.

MOTOROLA

MODELS	CHASSIS
A11A	HS-824
A11W	HS-824



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 with 120V 60 cycle AC input.

TUNING RANGE -88MC TO 108MC. IF-10.7MC

* DENOTES FERRITE BEAD

** S1 SHOWN IN AFC-IN POSITION

⏚ =B-

PLATED CHASSIS BOARD WIRING LEGEND

=B+ =NOT USED =AFC =FILAMENT

DIAL STRINGING DETAIL

WITH PULLEY FULLY CLOCKWISE, TURN COLLAR IN COUNTERCLOCKWISE DIRECTION TO TAKE UP SLACK, THEN TIGHTEN SCREWS.

MOTOROLA INC.

MODELS	CHASSIS
B1J	HS-819
B1W	HS-819

(Additional service material on the next page)

OFTEN-NEEDED 1961 RADIO SERVICING INFORMATION

MOTOROLA INC.

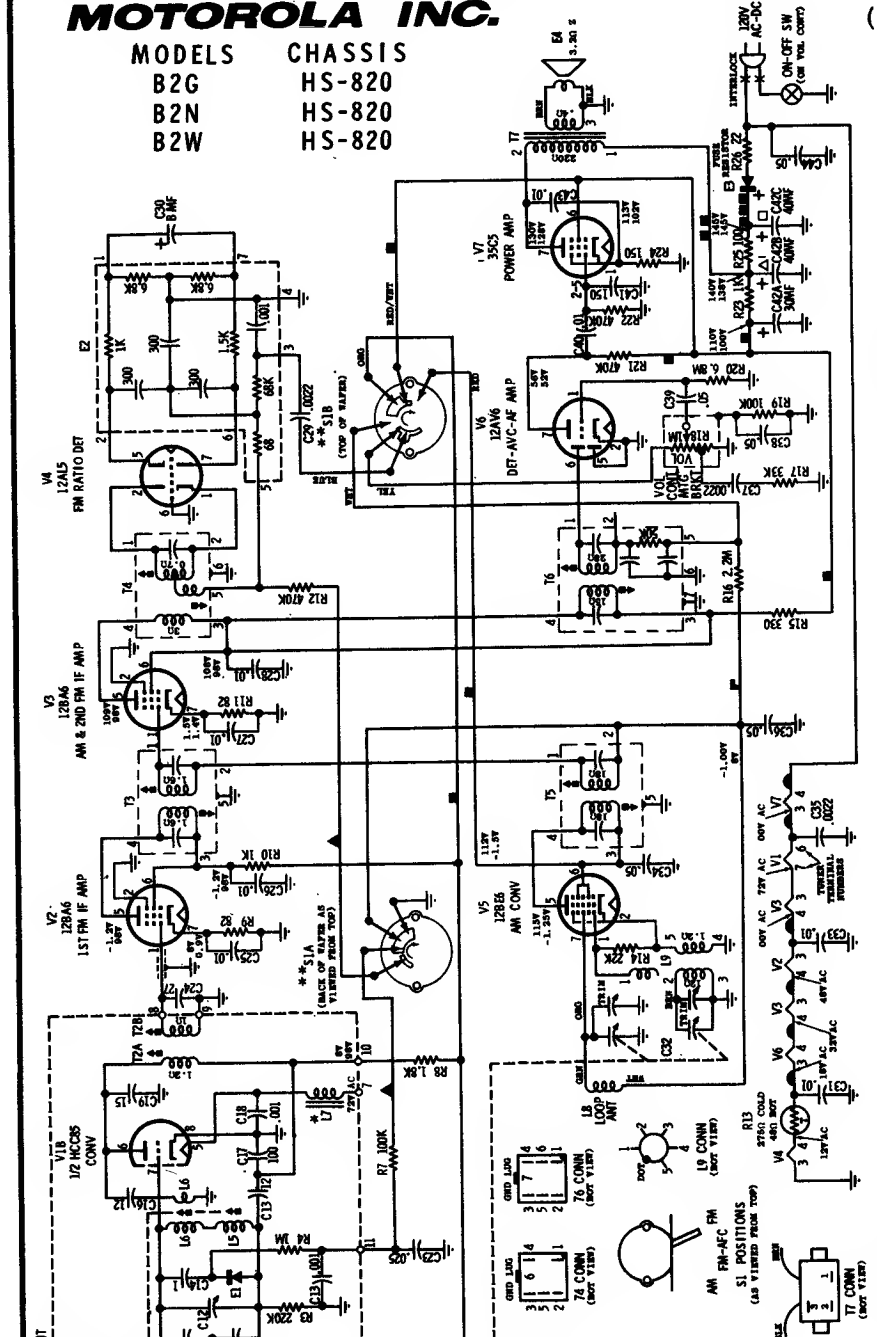
MODELS	CHASSIS
B1J	HS-819
B1W	HS-819

(Continued from preceding page)

MOTOROLA INC.

MODELS	CHASSIS
B2G	HS-820
B2N	HS-820
B2W	HS-820

(Continued on the next page)



DIAL STRINGING DETAIL

(Continued on the next page)

PLATED CHASSIS BOARD

All plated circuit wiring is on bottom of board. The top side is for ground shielding only. No circuits are carried through holes and across the board underneath components. The plated chassis board wiring diagram is shown as viewed from bottom (wiring) side.

TO REMOVE CHASSIS FROM CABINET

1. Remove control knobs - pull straight off.
2. Remove 4 screws holding cabinet back to cabinet.
3. Remove 2 screws holding chassis support channel.
4. Remove 1 screw holding drive pulley bracket to inside front of cabinet.
5. Unsolder speaker leads.
6. Remove chassis from cabinet.

MOTOROLA

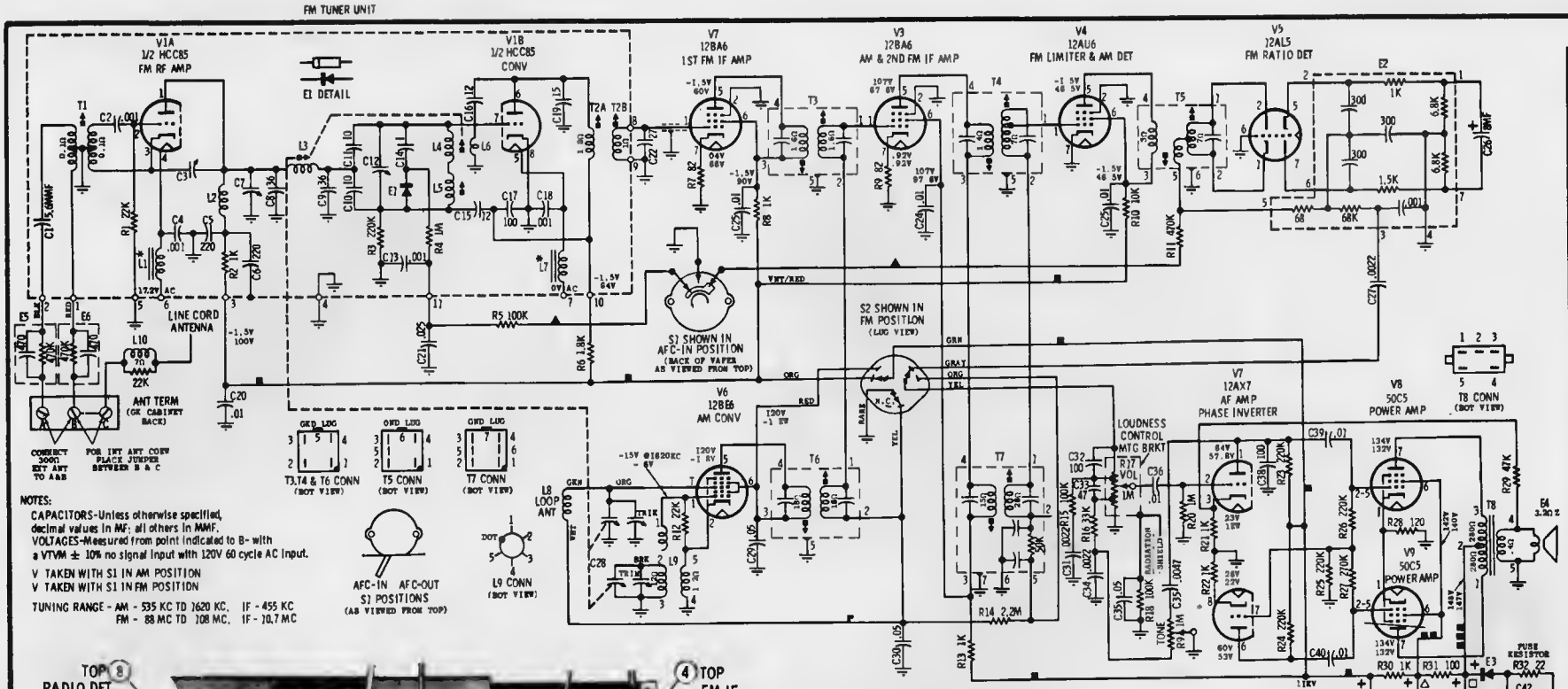
(Service material continued from preceding page)

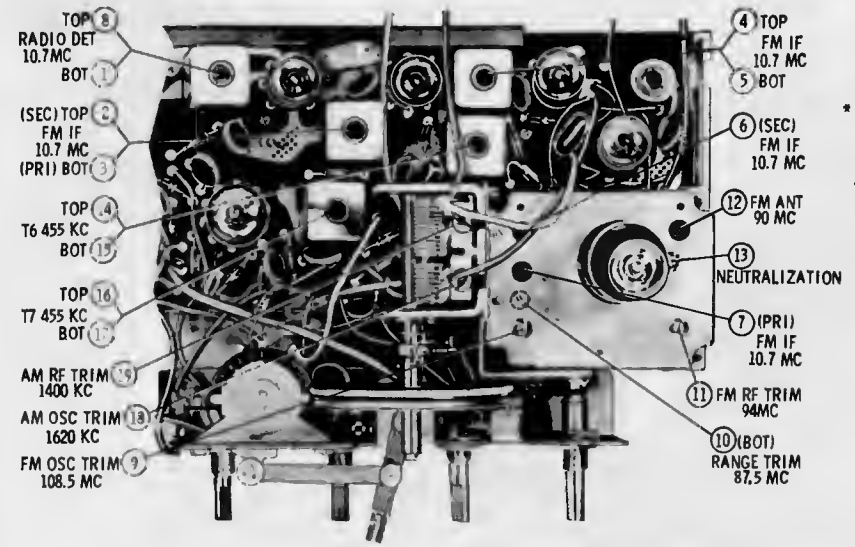
MODELS	CHASSIS
B2G	HS-820
B2N	HS-820
B2W	HS-820

ALIGNMENT POINTS LOCATION

PLATED CHASSIS BOARD WIRING AS VIEWED FROM BOTTOM (COMPONENTS SHOWN ARE LOCATED ON OPPOSITE SIDE)

FM TUNER PLATED CHASSIS WIRING



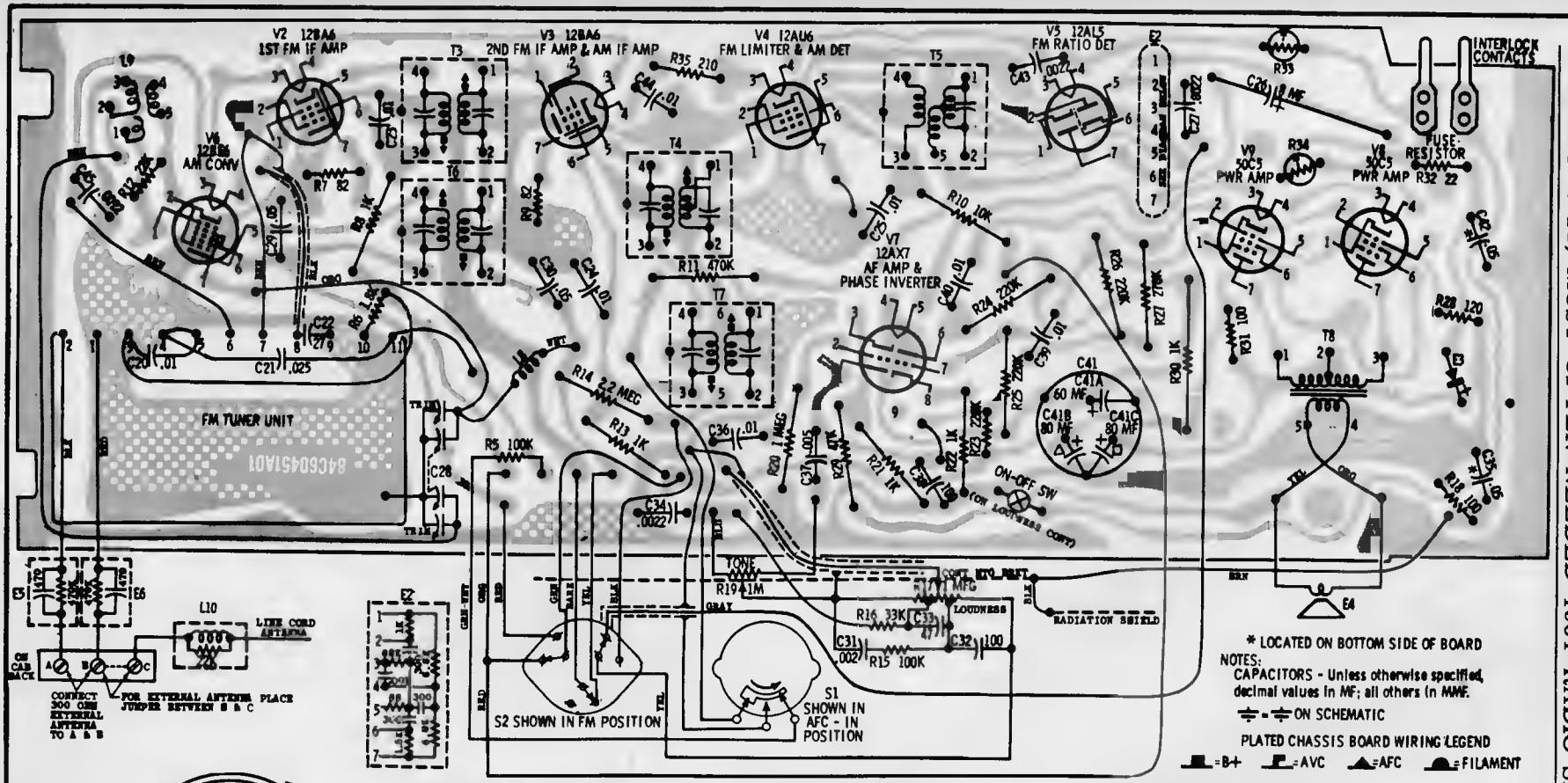


ALIGNMENT POINTS LOCATION

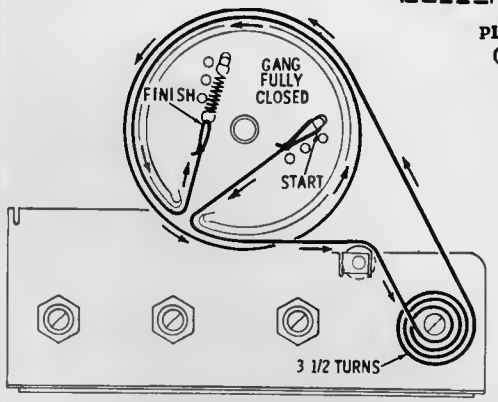
MOTOROLA

MODEL	CHASSIS
B3E	HS-821
B3W	HS-821

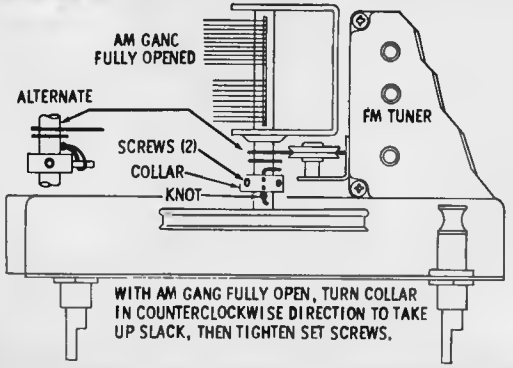
(Continued on the next page, adjacent at right)



PLATED CHASSIS BOARD WIRING AS VIEWED FROM BOTTOM
(COMPONENTS SHOWN ARE LOCATED ON OPPOSITE SIDE)



DIAL STRINGING DETAIL

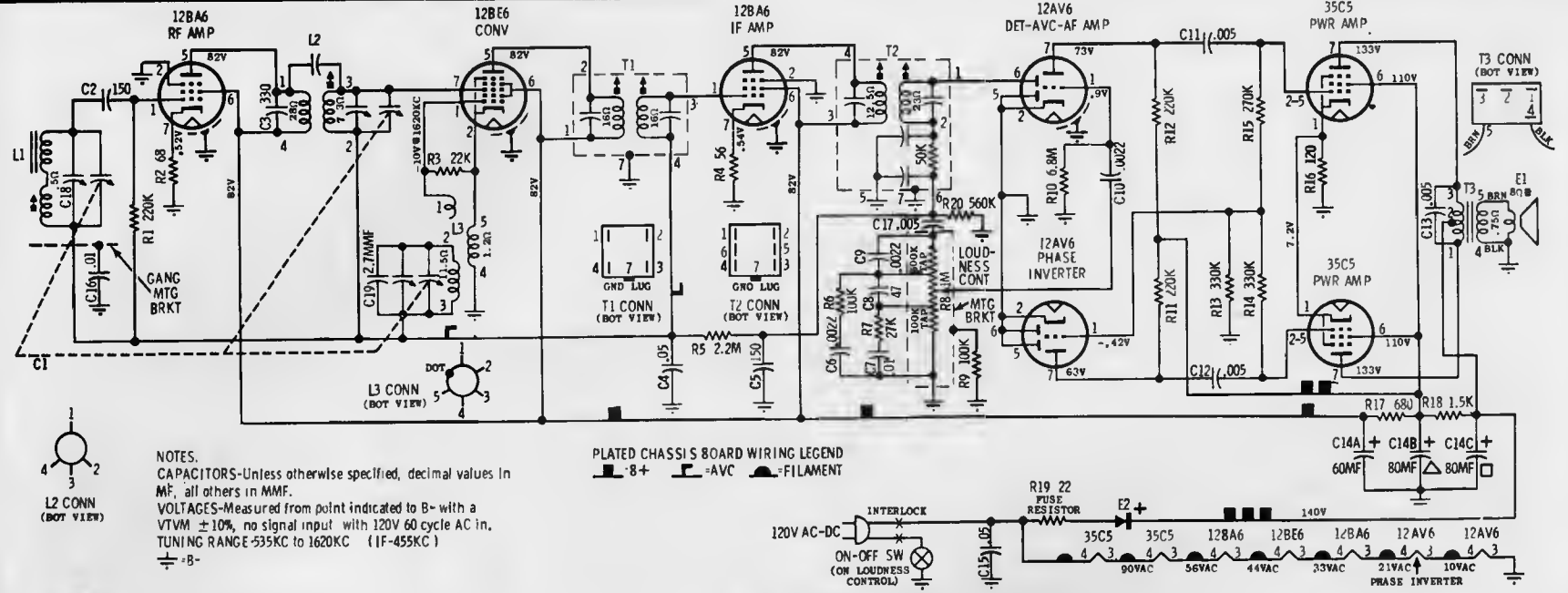


TO REMOVE CHASSIS FROM CABINET

1. Remove control knobs - pull straight off.
2. Remove 4 screws holding cabinet back to cabinet.
3. Remove 2 screws holding chassis support channel.
4. Remove 1 screw that mounts the AM gang mounting bracket to cabinet.
5. Remove dial crystal from cabinet - insert a screwdriver between the cabinet and top edge of the crystal to release catch, then pry out crystal.
6. Remove dial pointer - pull straight out.
7. Remove 2 chassis mounting palnuts from front of radio.
8. Unsolder speaker leads. 9. Unsolder lead of bottom shield.
10. Remove chassis from cabinet.

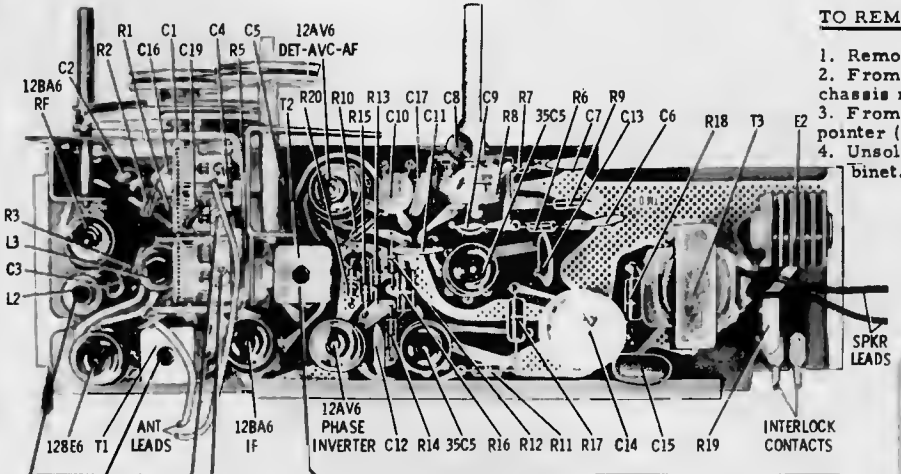
MOTOROLA Model B3E, W, Chassis HS-821

(Material continued from preceding page)



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 with 120V 60 cycle AC in.
TUNING RANGE-535KC to 1620KC (IF-455KC)
⏚=B-

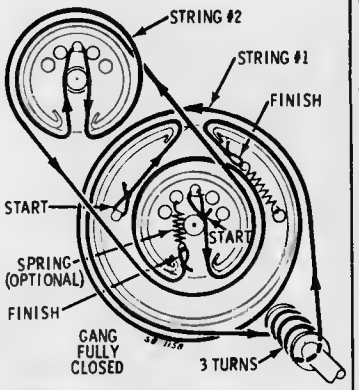
PLATED CHASSIS BOARD WIRING LEGEND
8+ =AVC =FILAMENT



ALIGNMENT ADJUSTMENTS & PARTS LOCATION

TO REMOVE CHASSIS FROM CABINET

1. Remove back cover - 4 screws hold it in place.
2. From rear, remove 3 dial crystal mounting screws and 3 chassis mounting screws.
3. From front, remove 2 control knobs, dial crystal and dial pointer (observe dial calibration).
4. Unsolder 2 speaker leads and remove chassis from cabinet.

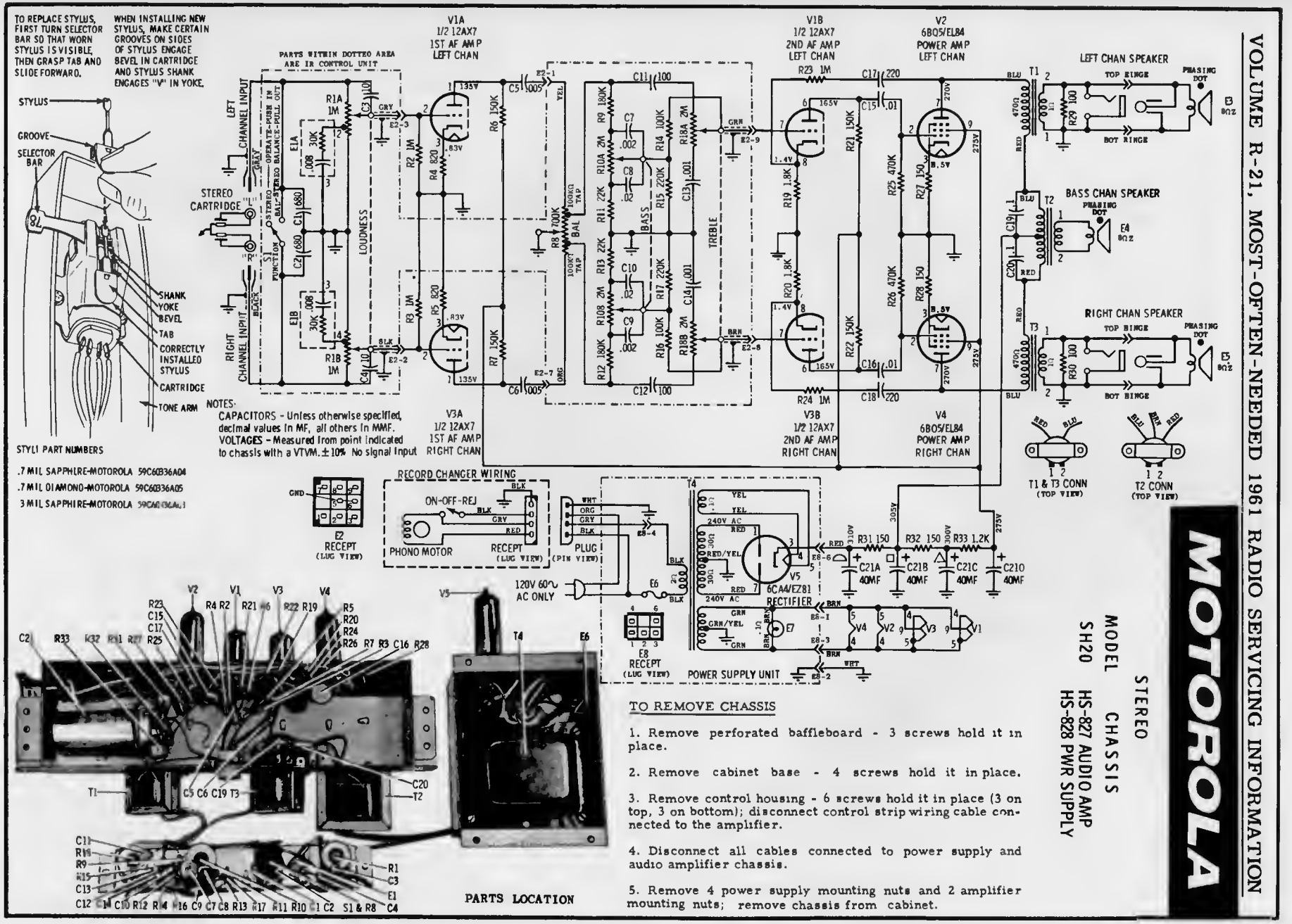


DIAL STRINGING DETAIL

MOTOROLA

MODEL A12N

CHASSIS HS-825



TO REMOVE CHASSIS

1. Remove perforated baffleboard - 3 screws hold it in place.

2. Remove cabinet base - 4 screws hold it in place.

3. Remove control housing - 6 screws hold it in place (3 on top, 3 on bottom); disconnect control strip wiring cable connected to the amplifier.

4. Disconnect all cables connected to power supply and audio amplifier chassis.

5. Remove 4 power supply mounting nuts and 2 amplifier mounting nuts; remove chassis from cabinet.

MOTOROLA

STEREO CHASSIS

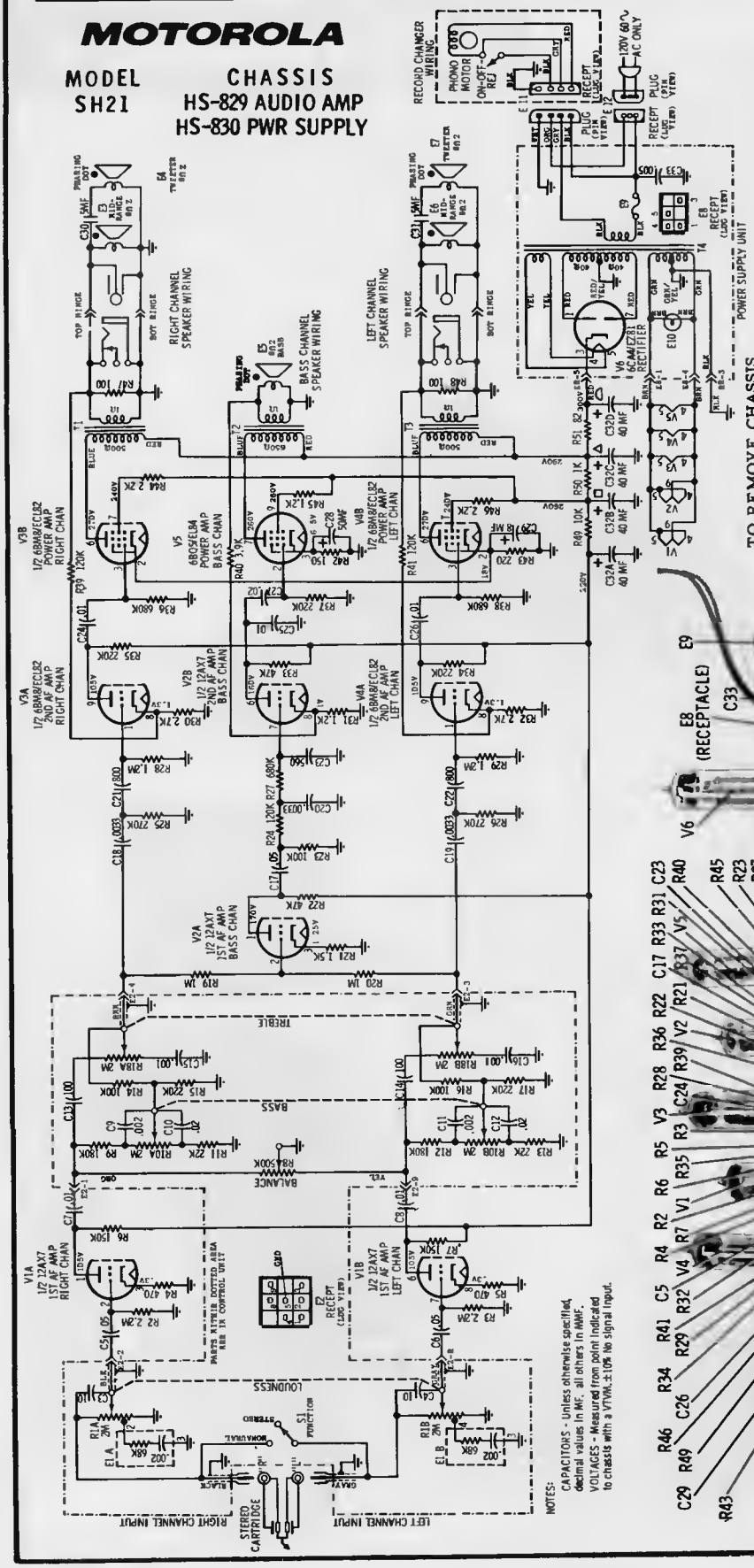
MODEL SH20

HS-827 AUDIO AMP
HS-828 PWR SUPPLY

MOTOROLA

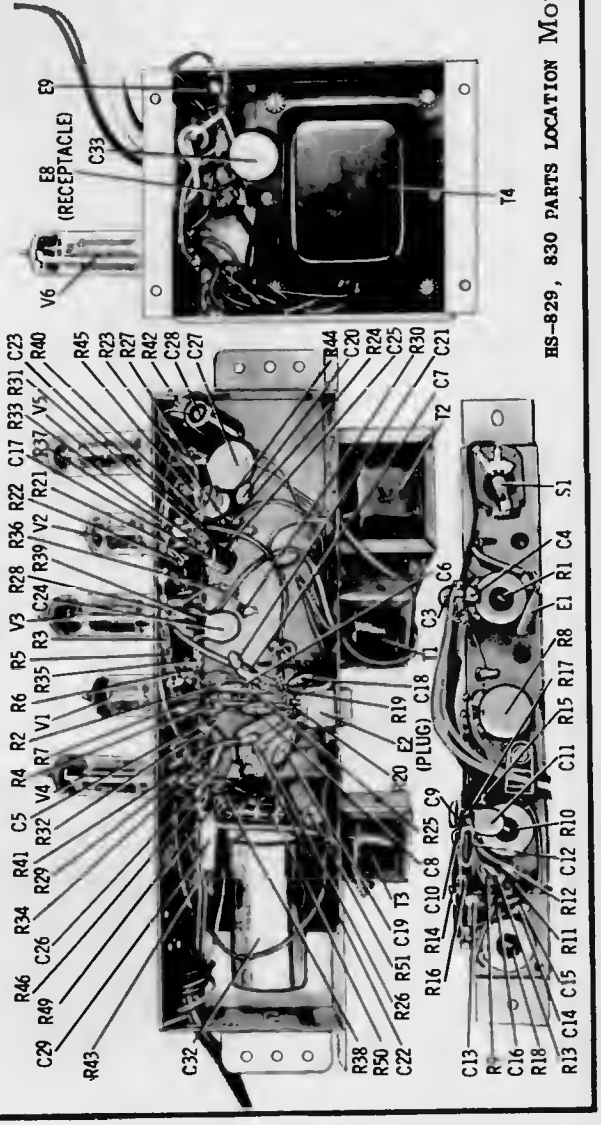
MODEL SH21

CHASSIS HS-829 AUDIO AMP HS-830 PWR SUPPLY



TO REMOVE CHASSIS

1. Remove perforated baffleboard - 3 screws hold it in place.
2. Remove cabinet base - 4 screws hold it in place.
3. Remove 5 control knobs, 2 escutcheon mounting nuts, escutcheon; then remove two control strip mounting screws.
4. Disconnect control strip cables from amplifier chassis & record changer; remove control strip.
5. Unsolder all speaker and power hinge connecting leads from amplifier chassis (code all leads). Disconnect cable between amplifier and power supply. Disconnect AC cord from power supply chassis, then remove on-off indicator light - 1 screw holds it in place.
6. Remove 2 amplifier mounting nuts & 4 power supply mounting nuts.
7. Remove chassis from cabinet.
8. NOTE: Before replacing chassis into cabinet, remember: (1) to retaple the interconnecting cables to their original locations, and (2) to push the perforated baffleboard into its mounting slot in the record changer mounting board as it is being installed.



HS-829, 830 PARTS LOCATION

Motorola Model SH21, Chassis HS-829, HS-830

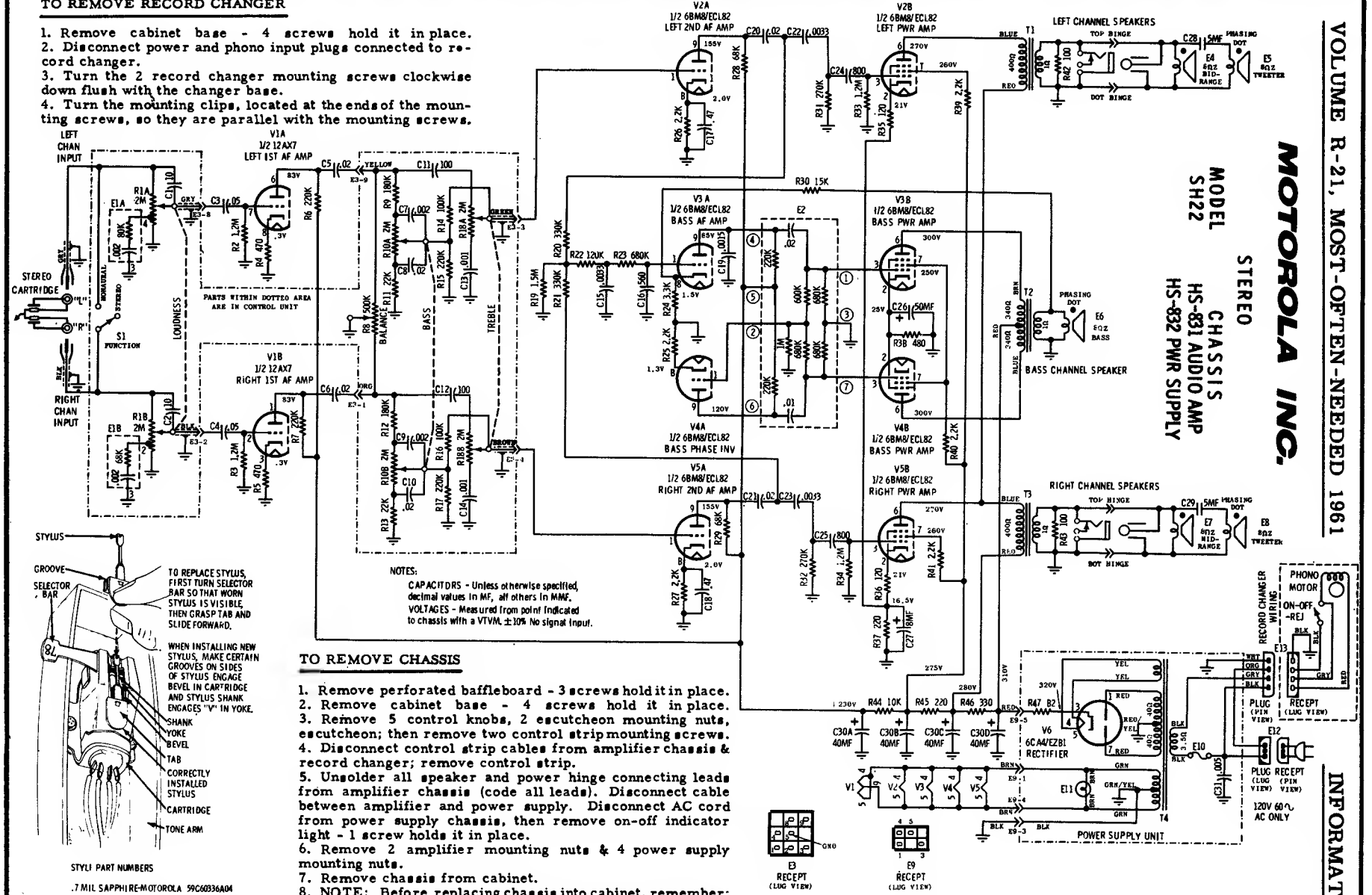
TO REMOVE RECORD CHANGER

1. Remove cabinet base - 4 screws hold it in place.
2. Disconnect power and phono input plugs connected to record changer.
3. Turn the 2 record changer mounting screws clockwise down flush with the changer base.
4. Turn the mounting clips, located at the ends of the mounting screws, so they are parallel with the mounting screws.

STYLI PART NUMBERS

.7 MIL SAPPHIRE-MOTOROLA 59C60336A04
.7 MIL DIAMOND-MOTOROLA 59C60336A05
3 MIL SAPPHIRE-MOTOROLA 59C60336A03

STYLUS REPLACEMENT

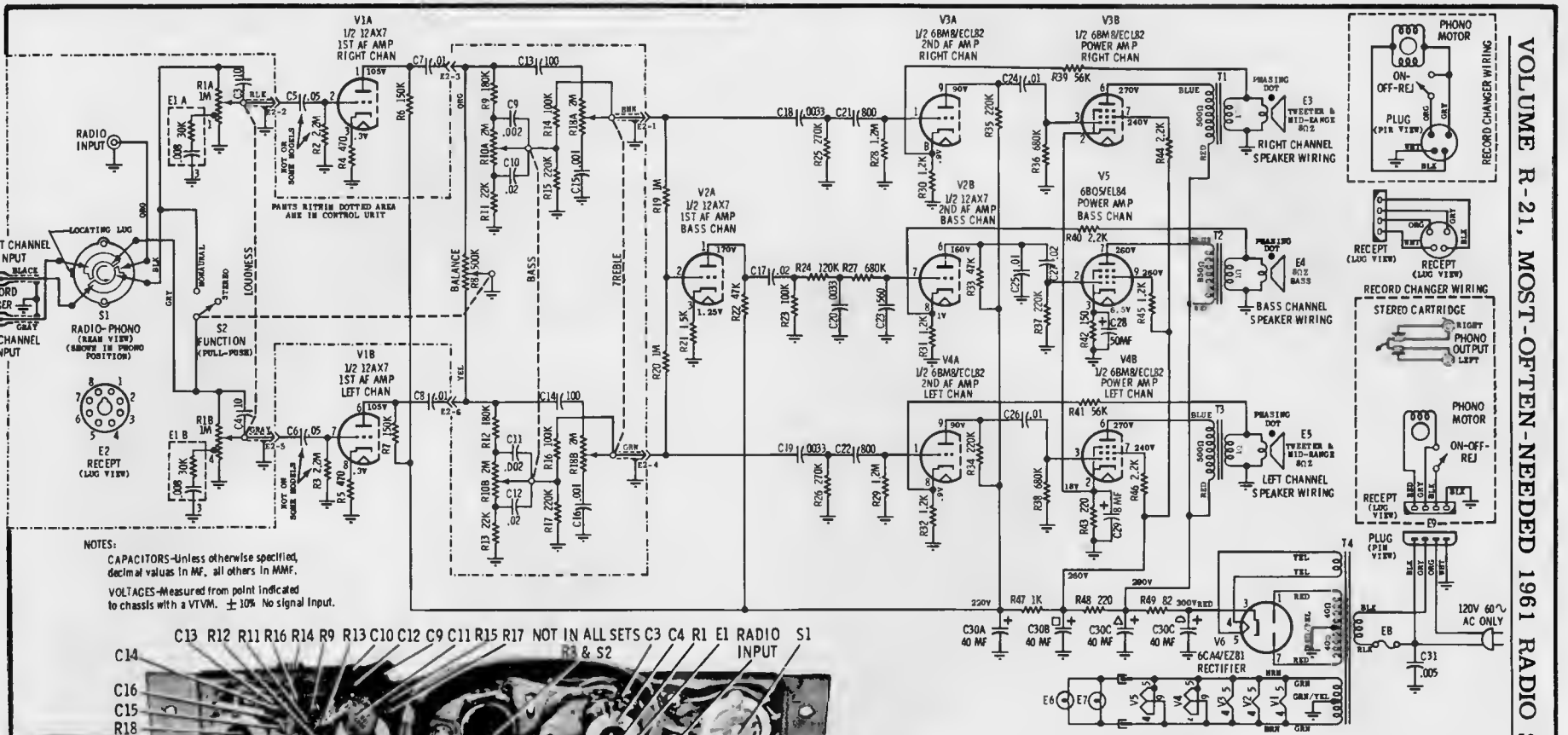


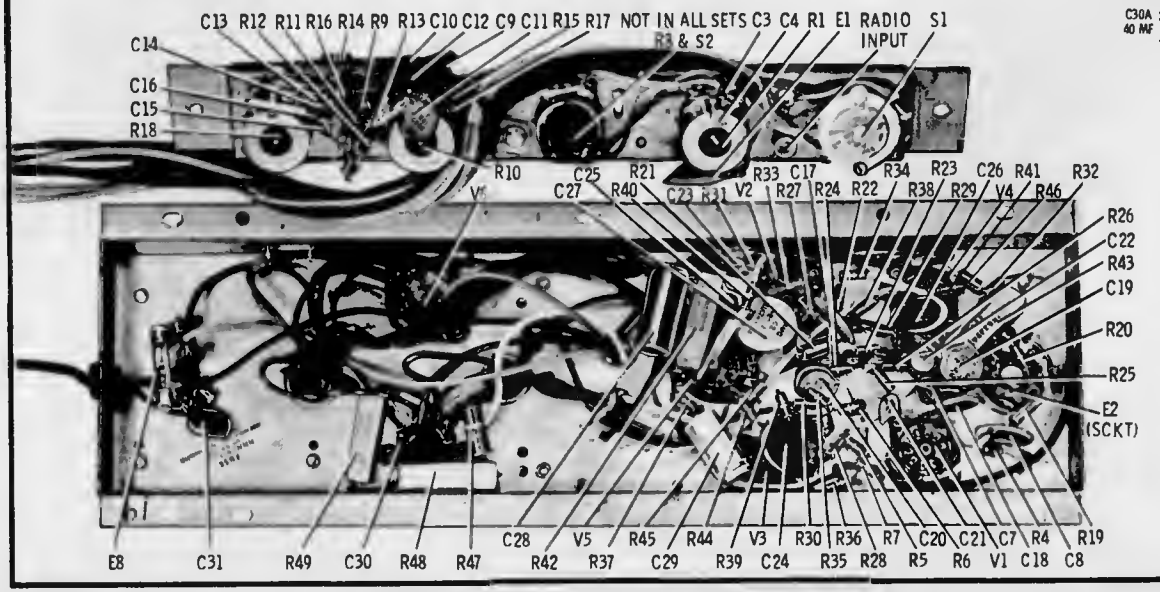
NOTES:
CAPACITORS - Unless otherwise specified, decimal values in MF, all others in MMF.
VOLTAGES - Measured from point indicated to chassis with a VTVM. ±10% No signal input.

TO REMOVE CHASSIS

1. Remove perforated baffleboard - 3 screws hold it in place.
2. Remove cabinet base - 4 screws hold it in place.
3. Remove 5 control knobs, 2 escutcheon mounting nuts, escutcheon; then remove two control strip mounting screws.
4. Disconnect control strip cables from amplifier chassis & record changer; remove control strip.
5. Unsolder all speaker and power hinge connecting leads from amplifier chassis (code all leads). Disconnect cable between amplifier and power supply. Disconnect AC cord from power supply chassis, then remove on-off indicator light - 1 screw holds it in place.
6. Remove 2 amplifier mounting nuts & 4 power supply mounting nuts.
7. Remove chassis from cabinet.
8. NOTE: Before replacing chassis into cabinet, remember: (1) to restaple the interconnecting cables to their original locations, and (2) to push the perforated baffleboard into its mounting slot in the record changer mounting board as it is being installed.

Motorola Model SH22, Chassis HS-831, HS-832





HS-833A PARTS LOCATION (SEE PRODUCTION CHANGES)

PRODUCTION CHANGES

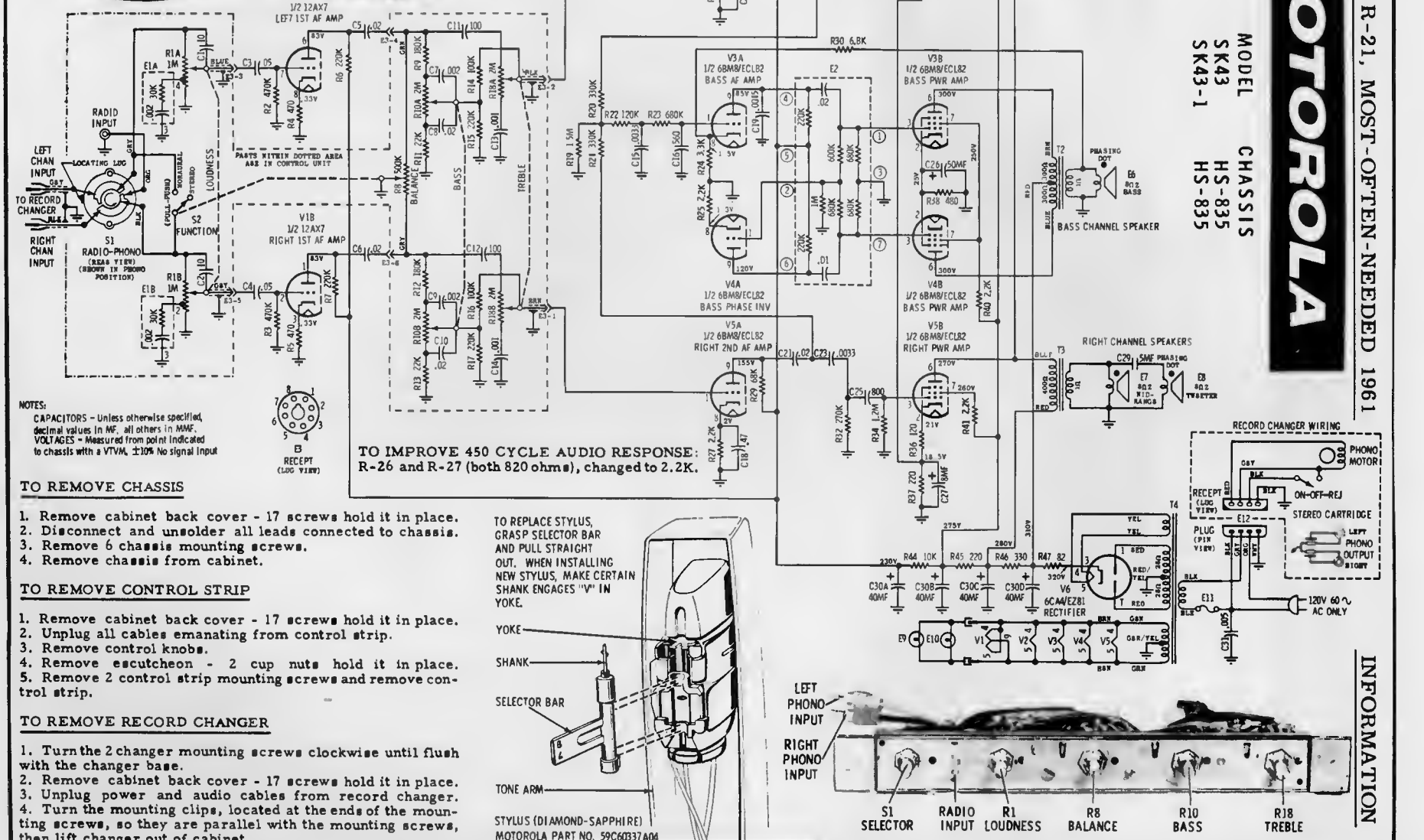
Chassis Coding	Changes
HS-833A	Original chassis
HS-833B	TO REDUCE NOISY LOUDNESS CONTROL OPERATION: C-5 (.05 mf), C-6 (.05 mf), R-2 (470K), and R-3 (470K) added.
HS-833C	TO ADD BASS BOOST: R-2 and R-3 (both 470K) changed to 2.2 meg.
HS-833D	TO REDUCE LEAKAGE CURRENT: C-31 (.05 mf) changed to .005 mf.

MOTOROLA INC.

MODEL	CHASSIS
SK40	HS-833
SK40-1	HS-833
SK41	HS-833

MOTOROLA

MODEL CHASSIS
SK43 HS-835
SK43-1 HS-835



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

TO IMPROVE 450 CYCLE AUDIO RESPONSE: R-26 and R-27 (both 820 ohms), changed to 2.2K.

TO REMOVE CHASSIS

1. Remove cabinet back cover - 17 screws hold it in place.
2. Disconnect and unsolder all leads connected to chassis.
3. Remove 6 chassis mounting screws.
4. Remove chassis from cabinet.

TO REMOVE CONTROL STRIP

1. Remove cabinet back cover - 17 screws hold it in place.
2. Unplug all cables emanating from control strip.
3. Remove control knobs.
4. Remove escutcheon - 2 cup nuts hold it in place.
5. Remove 2 control strip mounting screws and remove control strip.

TO REMOVE RECORD CHANGER

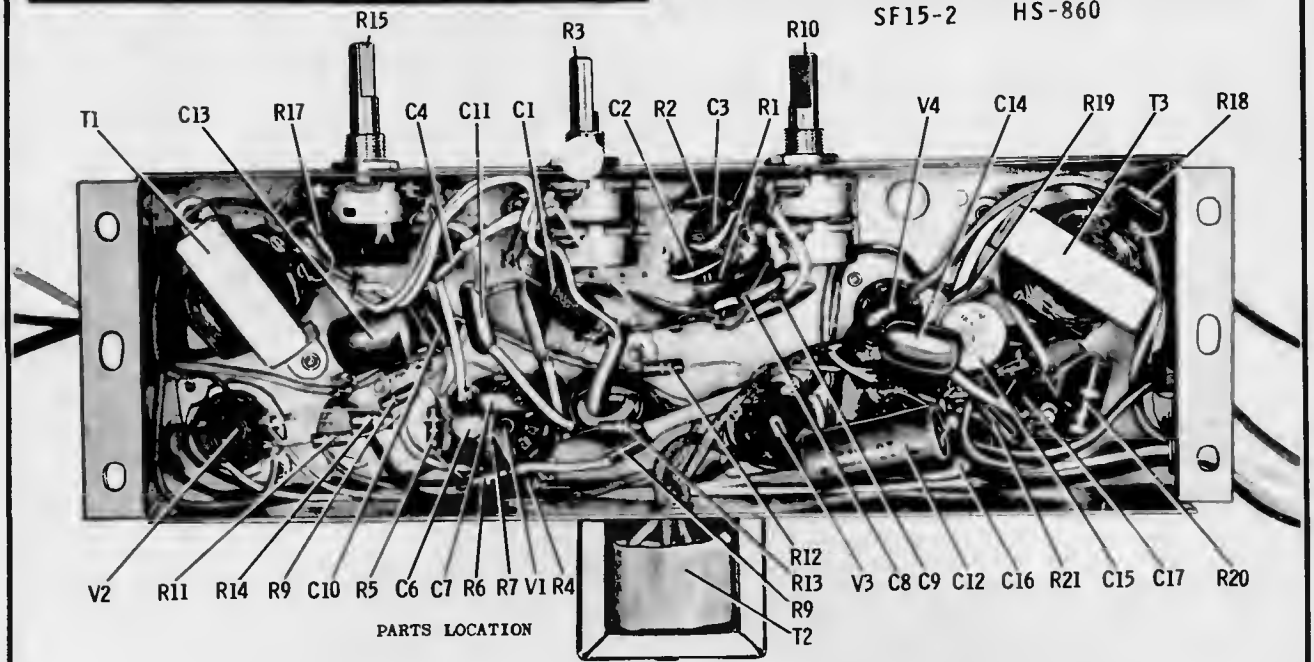
1. Turn the 2 changer mounting screws clockwise until flush with the changer base.
2. Remove cabinet back cover - 17 screws hold it in place.
3. Unplug power and audio cables from record changer.
4. Turn the mounting clips, located at the ends of the mounting screws, so they are parallel with the mounting screws, then lift changer out of cabinet.

TO REPLACE STYLUS, GRASP SELECTOR BAR AND PULL STRAIGHT OUT. WHEN INSTALLING NEW STYLUS, MAKE CERTAIN SHANK ENGAGES "V" IN YOKE.

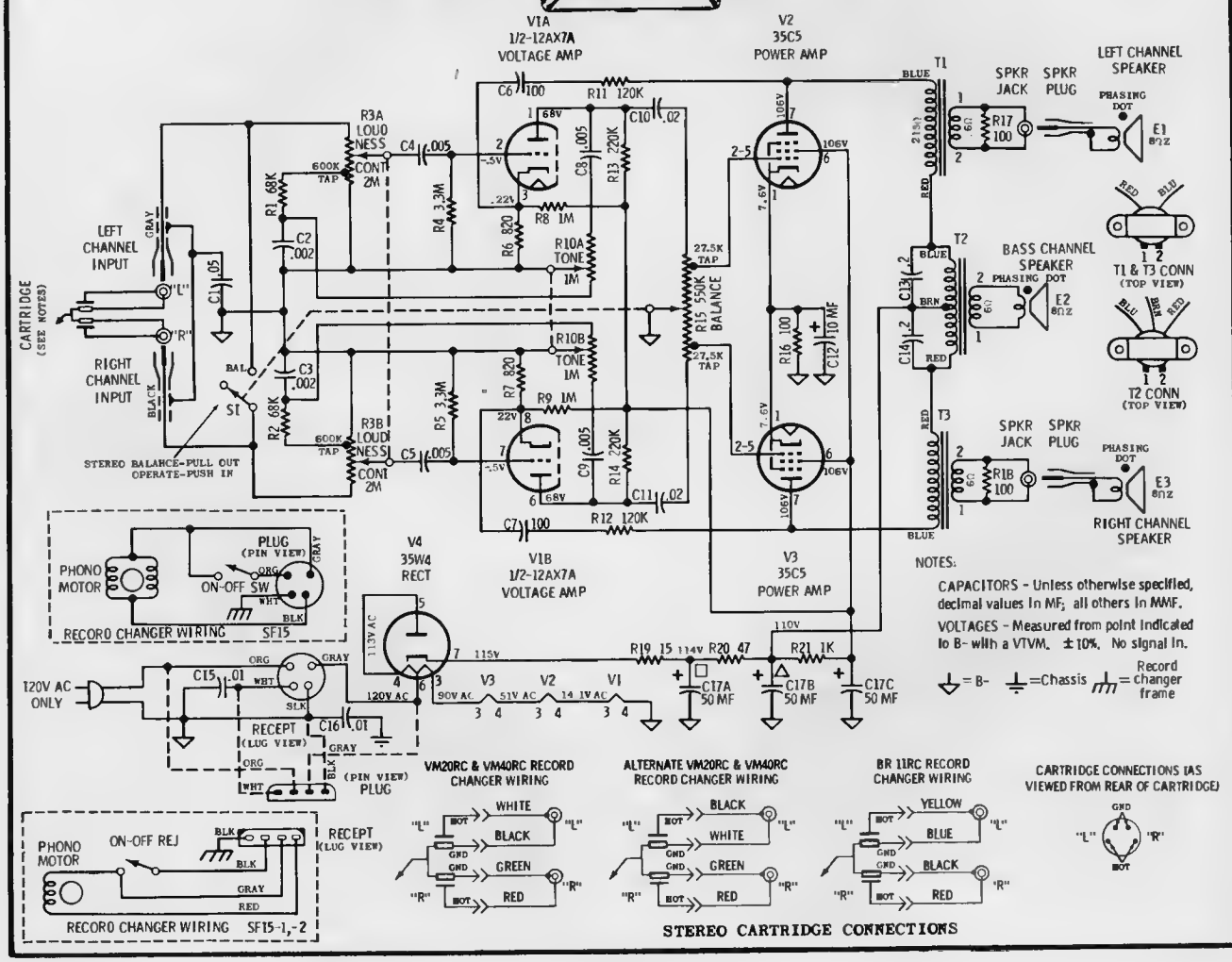
STYLUS REPLACEMENT SK43-1 SERIES

MOTOROLA

MODEL	CHASSIS
SF15	HS-860
SF15-1	HS-898
SF15-2	HS-860



PARTS LOCATION

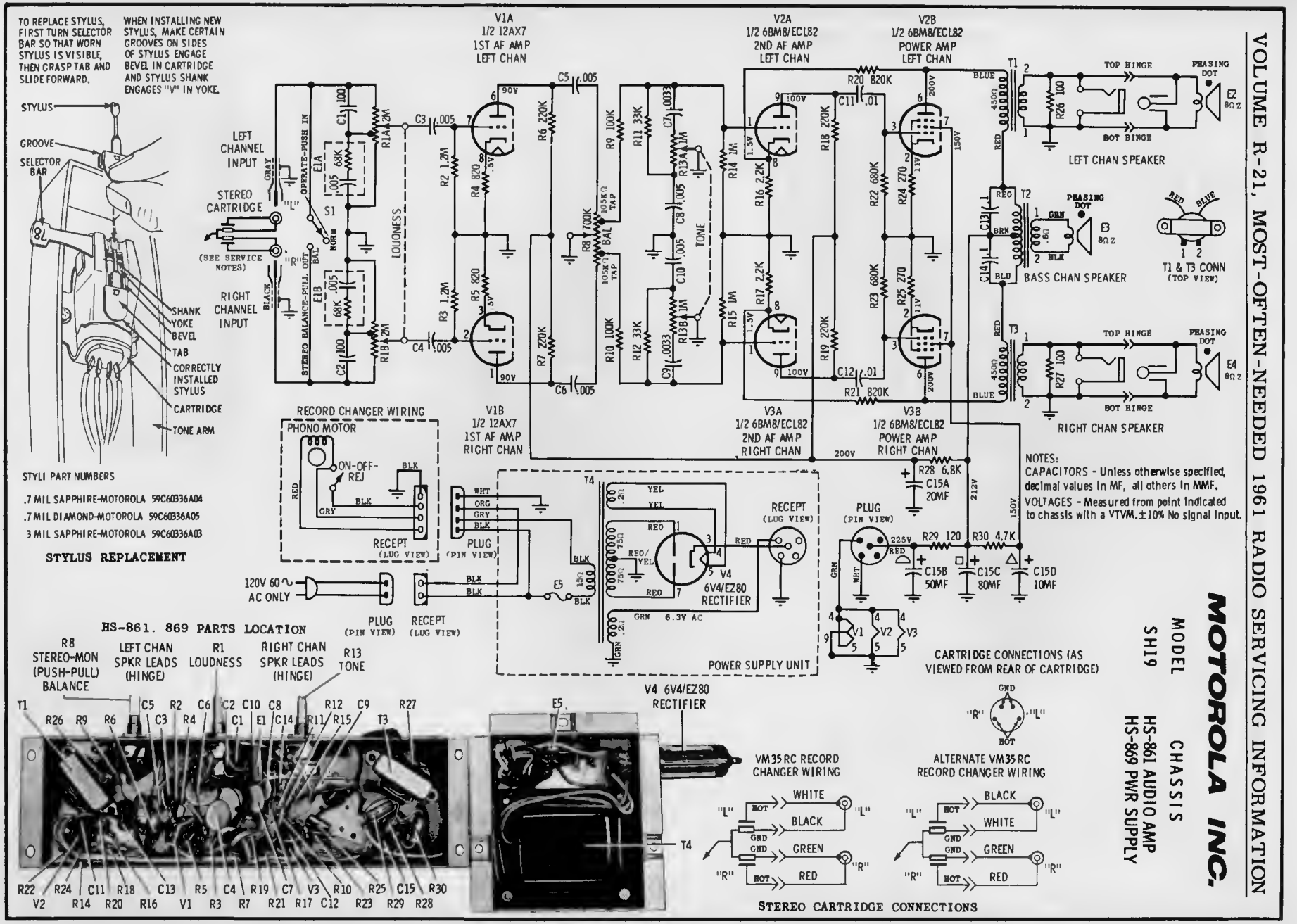


NOTES:

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.

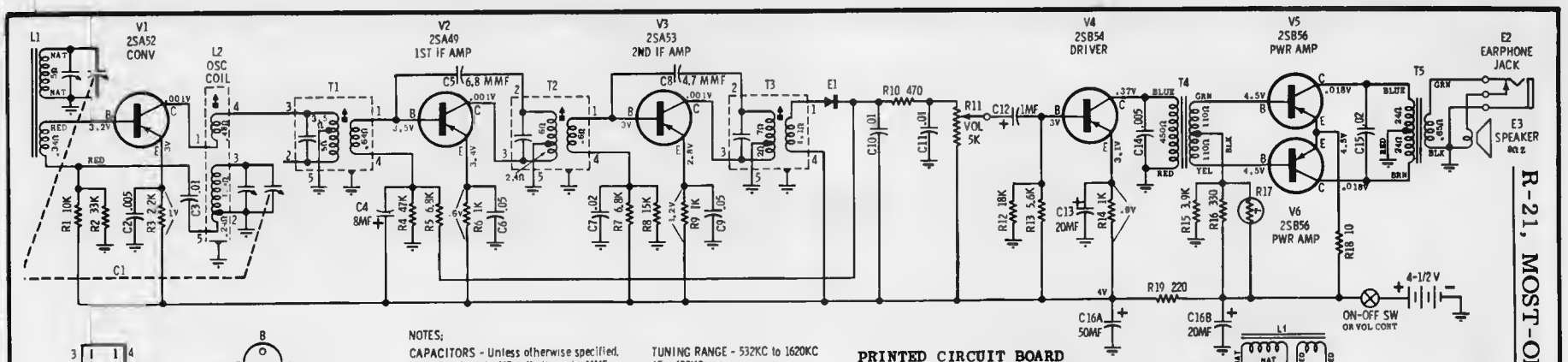
⏚ = B- ⏚ = Chassis ⏚ = Record changer frame



MOTOROLA INC.

MODEL CHASSIS

SH19 HS-861 AUDIO AMP
HS-869 PWR SUPPLY



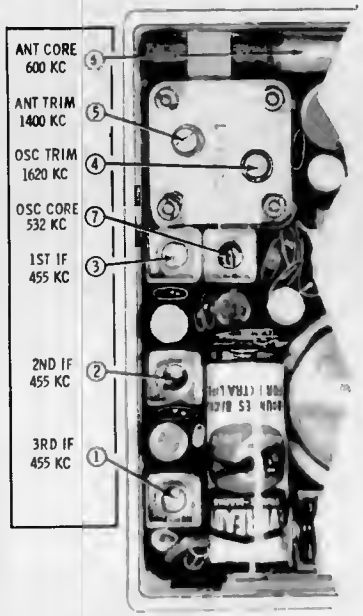
T1, T2, 3 & L2 CONN BOTTOM VIEW

TRANSISTOR CONN LEAD VIEW (COLOR DOT)

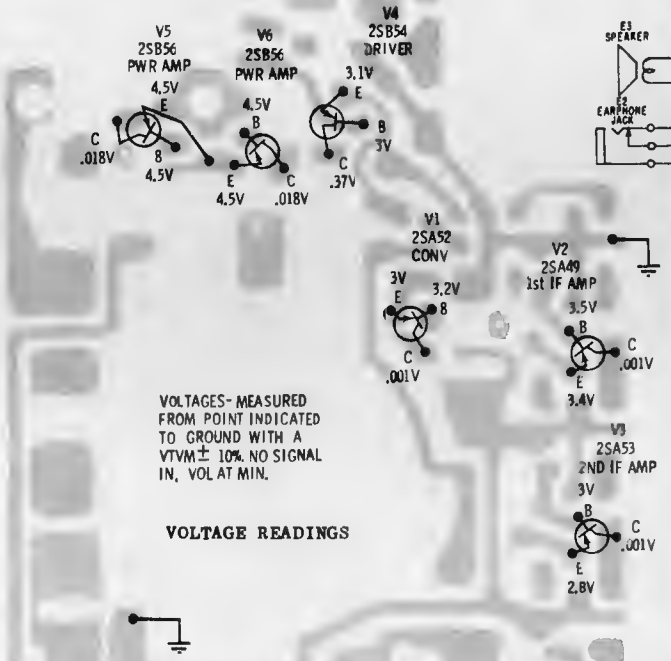
NOTES;
CAPACITORS - Unless otherwise specified, decimal values in MF, all others in MMF.
VOLTAGES - Measured from point indicated to ground with a VTVM, ± 10%, No signal in.
ZERO SIGNAL CURRENT - 4.8M A.(MIN VOL)

TUNING RANGE - 532KC to 1620KC
IF - 455KC
⏚ = GROUND

PRINTED CIRCUIT BOARD

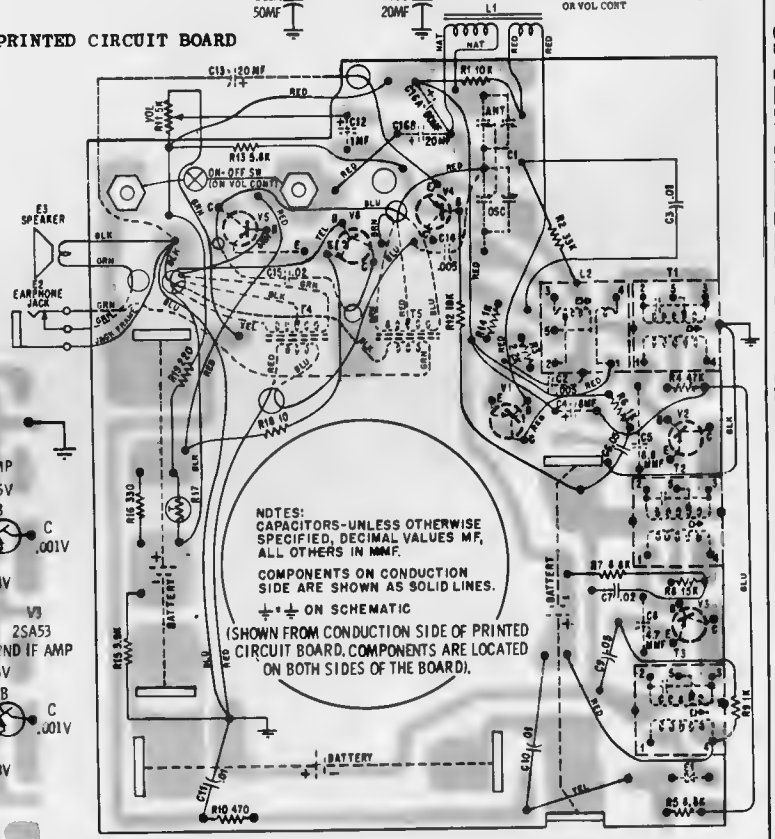


ALIGNMENT POINT LOCATIONS



VOLTAGES- MEASURED FROM POINT INDICATED TO GROUND WITH A VTVM ± 10%. NO SIGNAL IN, VOL AT MIN.

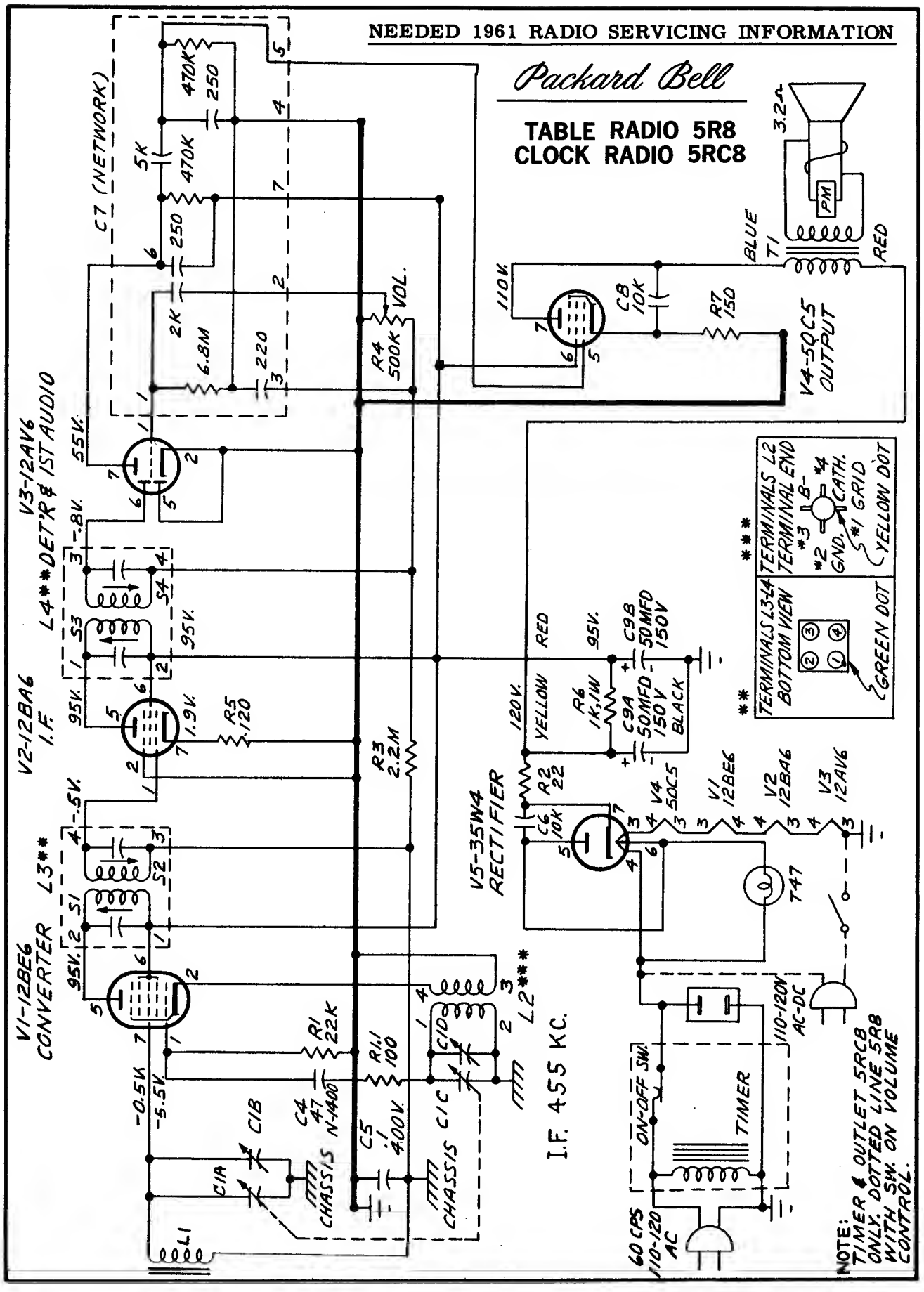
VOLTAGE READINGS

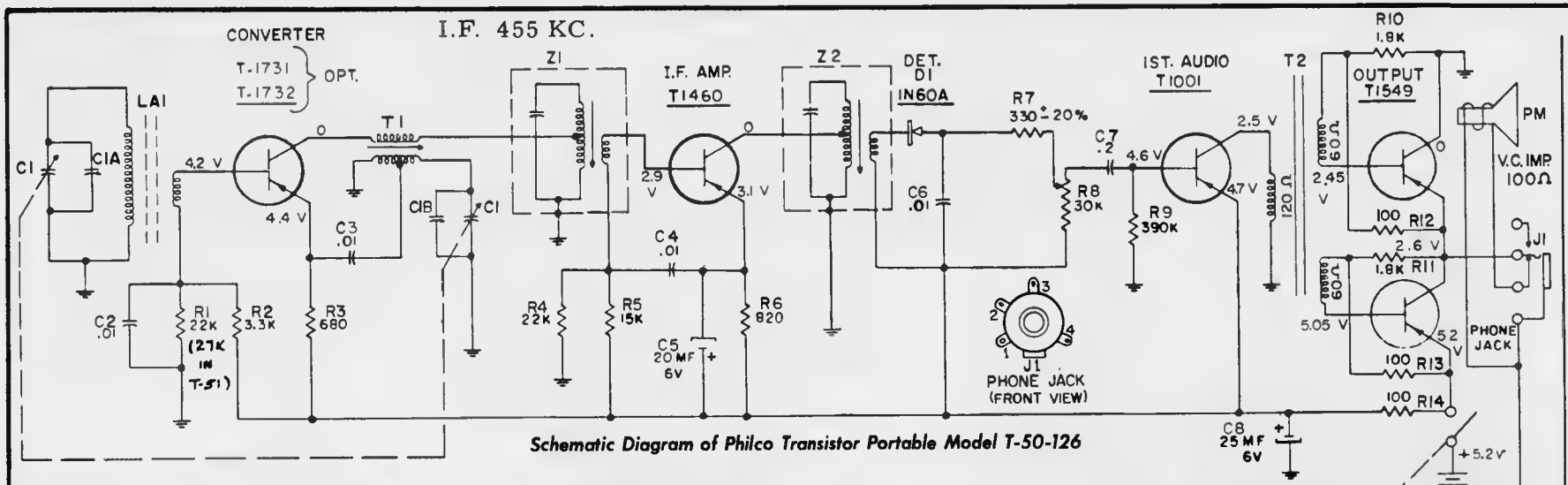


NOTES:
CAPACITORS-UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES MF, ALL OTHERS IN MMF.
COMPONENTS ON CONDUCTION SIDE ARE SHOWN AS SOLID LINES.
⏚ ON SCHEMATIC
(SHOWN FROM CONDUCTION SIDE OF PRINTED CIRCUIT BOARD. COMPONENTS ARE LOCATED ON BOTH SIDES OF THE BOARD).

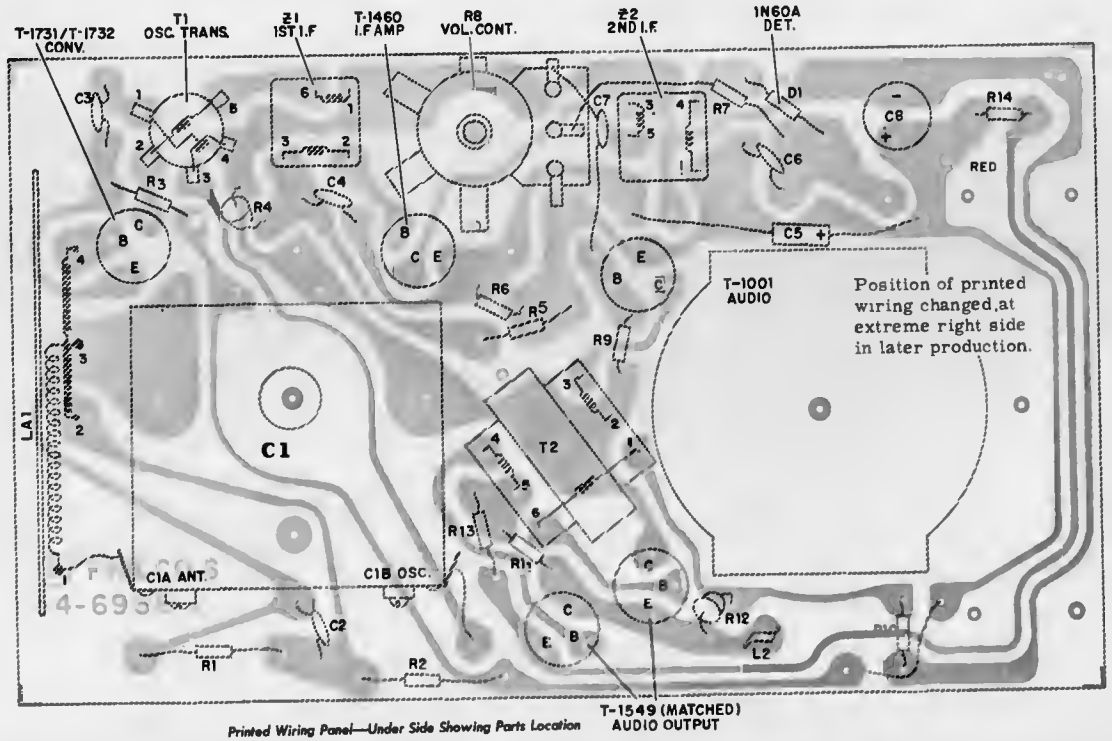
MOTOROLA

MODEL X21W CHASSIS HS-876


Packard Bell
TABLE RADIO 5R8
CLOCK RADIO 5RC8
C7 (NETWORK)
470K
250
5K
470K
250
2K
6.8M
220
R4 500K VOL.
55V.
V3-12AV6
1ST AUDIO
-.8V.
L4** DET'R &
95V.
V2-12BA6
I.F.
95V.
1.9V.
R5 120
-.5V.
L3**
V1-12BE6
CONVERTER
95V.
-0.5V.
-5.5V.
R1 22K
R1.1 100
C4 47 N-1400
C5 .1 400V.
C1A
C1B
CHASSIS
C1C
C1D
CHASSIS
L1
L2***
I.F. 455 KC.
R3 2.2M
110V.
C8 10K
R7 150
V4-50C5
OUTPUT
3.2Ω
PM
BLUE
T1
RED
120V.
YELLOW
R6 1K,1W
C9A 50MFD 150V
C9B 50MFD 150V
95V.
RED
BLACK
R2 22
C6 10K
V5-35W4
RECTIFIER
V4 50C5
V1 12BE6
V2 12BA6
V3 12AV6
747
TERMINALS L2
TERMINAL END
*3 B-
*2 GND.
*4 CATH.
*1 GRID
YELLOW DOT
TERMINALS L3,4
BOTTOM VIEW
GREEN DOT
ON-OFF SW.
TIMER
110-120V AC-DC
60 CPS 110-120 AC
NOTE:
TIMER & OUTLET 5RC8 ONLY. DOTTED LINE 5R8 WITH SW. ON VOLUME CONTROL.



Schematic Diagram of Philco Transistor Portable Model T-50-126



Printed Wiring Panel—Under Side Showing Parts Location

NOTES:
ALL RESISTORS 1/2W, 10%, CARBON.
VOLTAGES MEASURED TO GROUND WITH A 20,000 Ω/VOLT METER UNDER NO SIGNAL CONDITION.
COIL RESISTANCES READ WITH COIL IN CIRCUIT.

PANEL LEAD CONNECTIONS

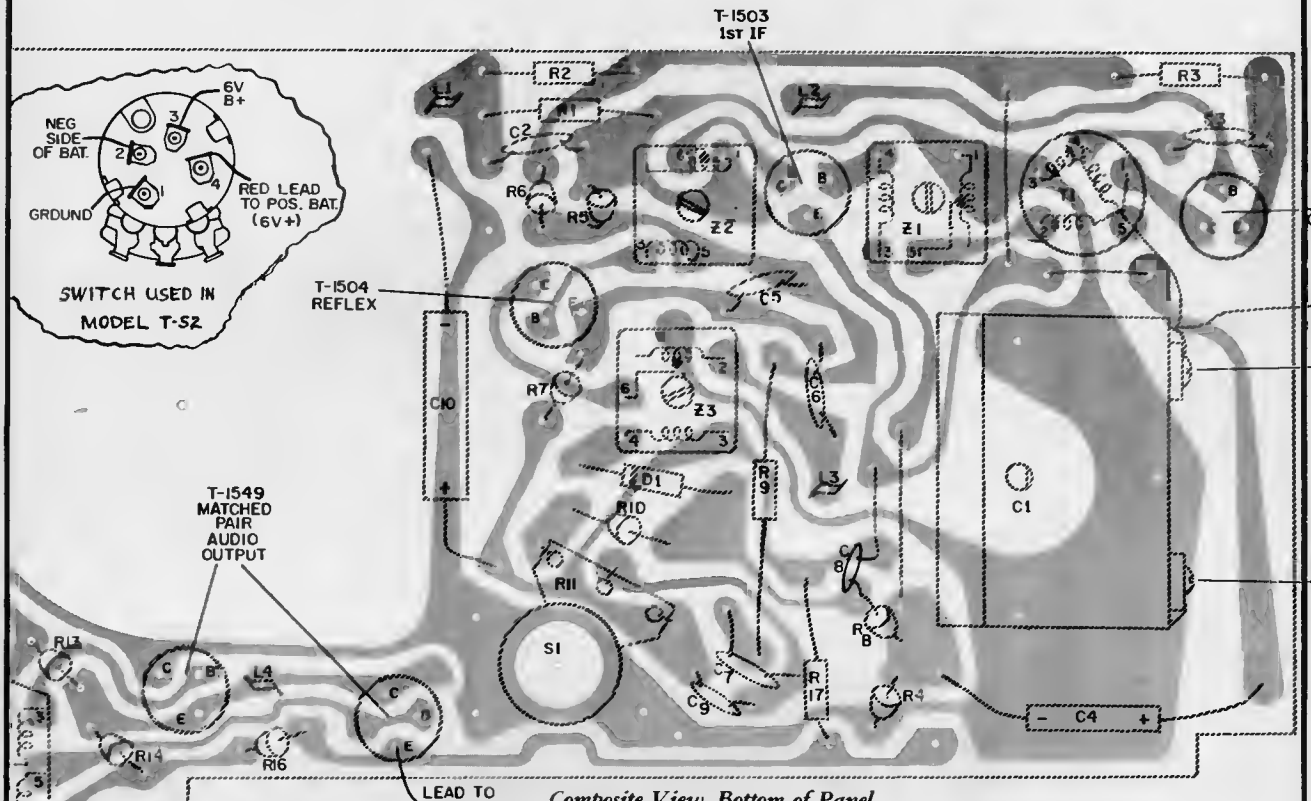
Black lead from negative battery contact to switch lug #7.
Bare wire from switch lug #6 to ground tab of volume control and to frame of gang.
Red lead from positive battery contact to switch lug #5.
Red lead from switch lug #4 to Panel.
White lead from voltage supply center-tap to J1, lug #1.
Blue lead from J1, lug #1, to speaker.
White lead from J1, lug #3, to speaker.
Brown lead from J1, lug #2 to panel L2.

PHILCO MODEL T-50-126
MODEL T51-124

PHILCO Models T-50-126, T-51-124

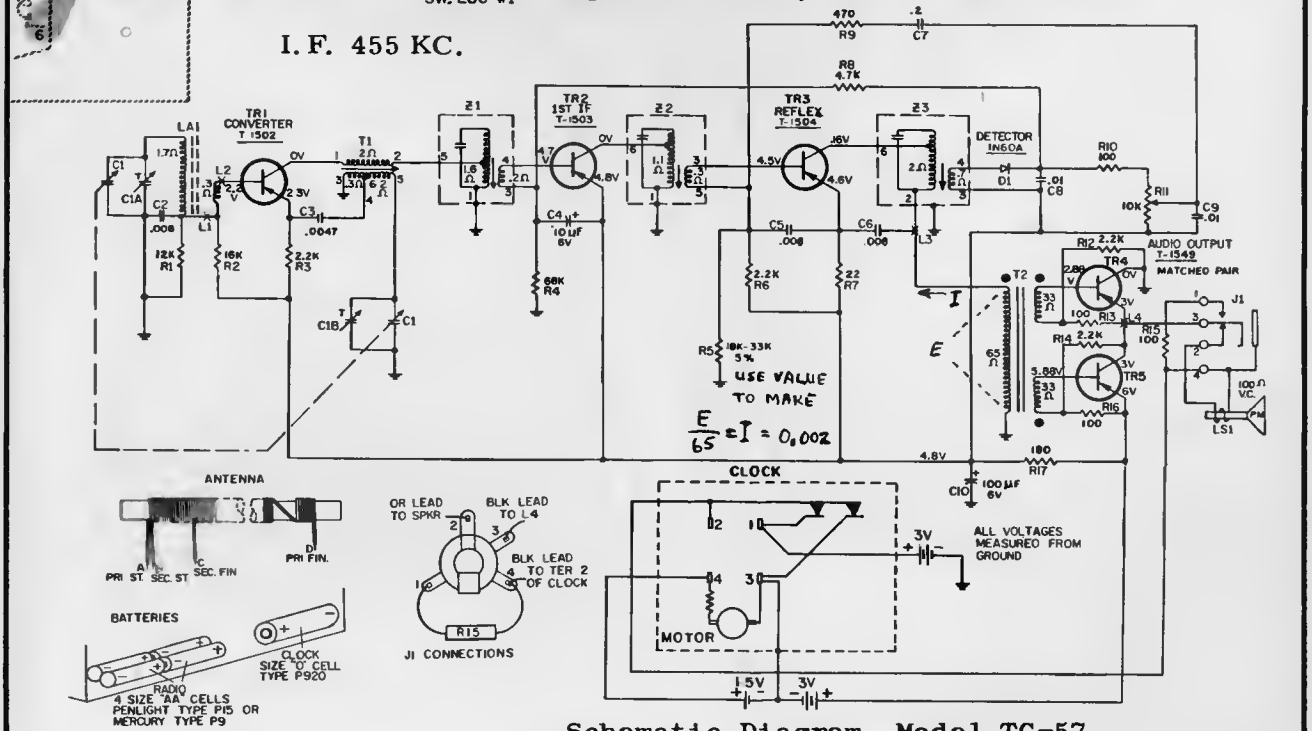
PHILCO MODEL T-52, CODE 124, and CLOCK RADIO MODEL TC-57

These two models use identical perma-circuit panel assembly, but the switch of T-52 is manually operated.



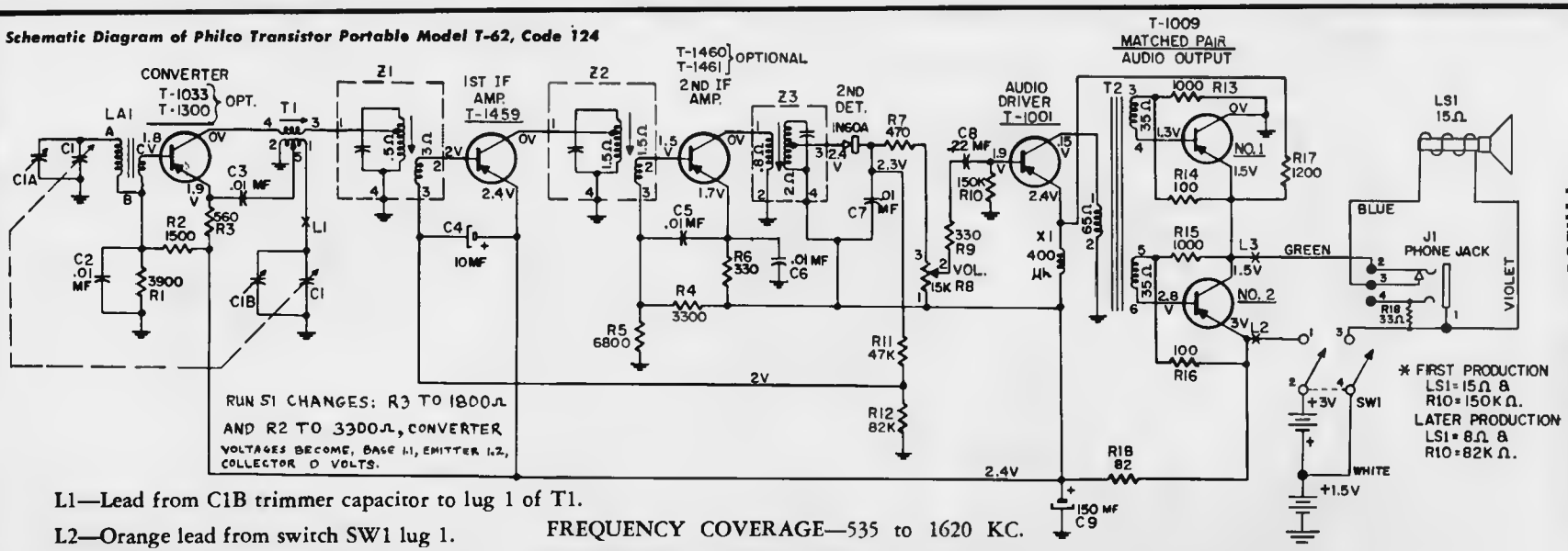
Composite View, Bottom of Panel

I. F. 455 KC.



Schematic Diagram, Model TC-57

Schematic Diagram of Philco Transistor Portable Model T-62, Code 124



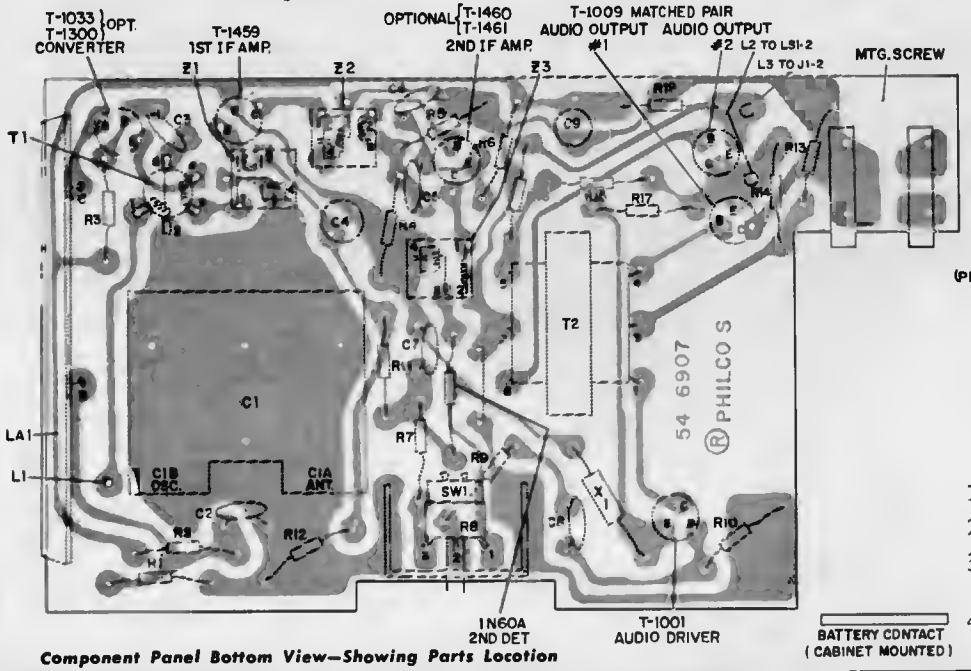
L1—Lead from C1B trimmer capacitor to lug 1 of T1.

L2—Orange lead from switch SW1 lug 1.

L3—Green lead from phone jack.

FREQUENCY COVERAGE—535 to 1620 KC.

INTERMEDIATE FREQUENCY—455 KC.

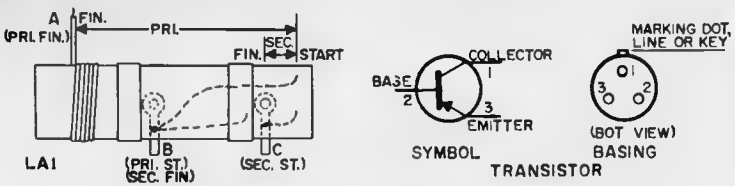


Component Panel Bottom View—Showing Parts Location

SERVICE NOTES

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

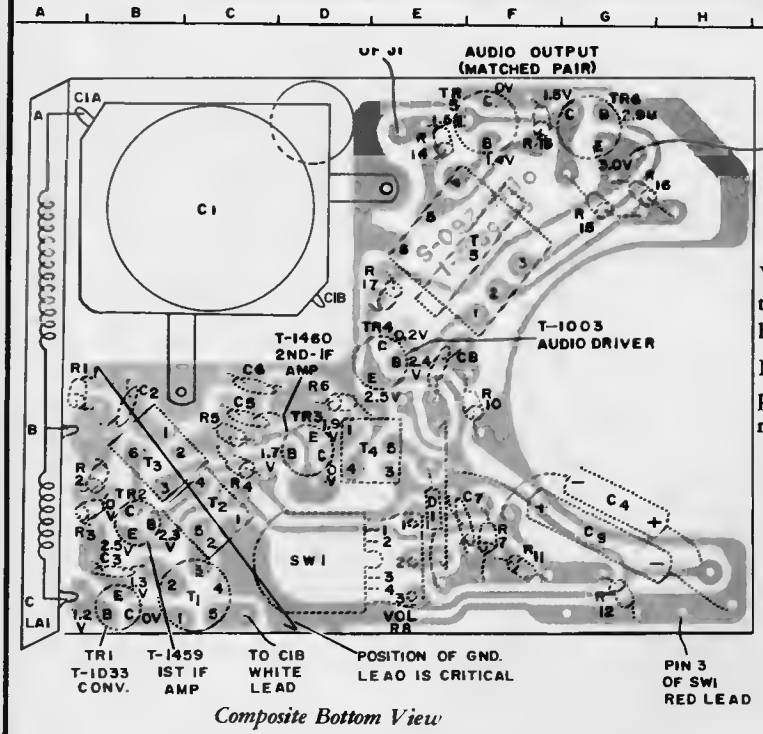
Normally, the transistors should be the last item suspected. If C9 opens serious audio oscillation will result.



PRINTED-WIRE PANEL REMOVAL

1. Remove the snap-on back of the cabinet and the batteries.
2. Remove the tri-mount fastener next to the battery clips.
3. Carefully spread the sides of the cabinet to free the panel from each of the 4 slotted cabinet supports.
4. Withdraw the panel assembly by sliding it toward the speaker end of the cabinet to free the tuning knob.

PHILCO PORTABLE RADIO TRANSISTOR MODEL T-66, CODE 124



Composite Bottom View

NOTE:
PIN 2 OF SWI
TO POS. TERM-
YEL. LEAD

PIN 4 OF SWI
TO NEG. TERM
RED LEAD

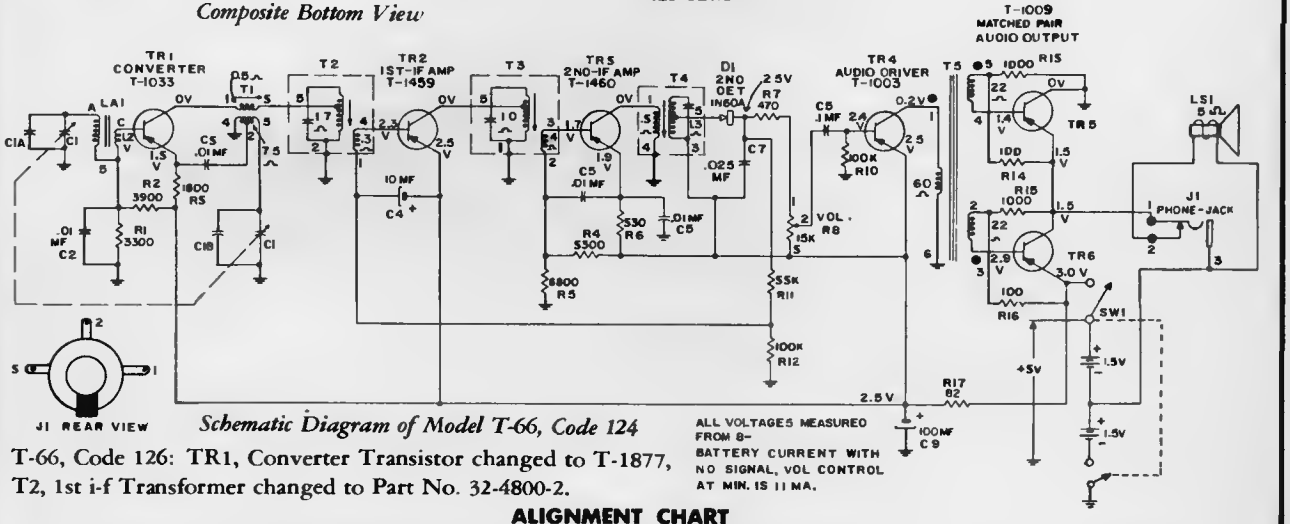
SERVICE NOTES

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 C9 opens serious audio oscillation will result.

NOTE: Panel Removal

Before panel can be removed from cabinet, a screw located next to the 2nd I-F transformer (C4 graph location) must be removed. Then depress clips on each side of cabinet. Speaker will remain in cabinet.



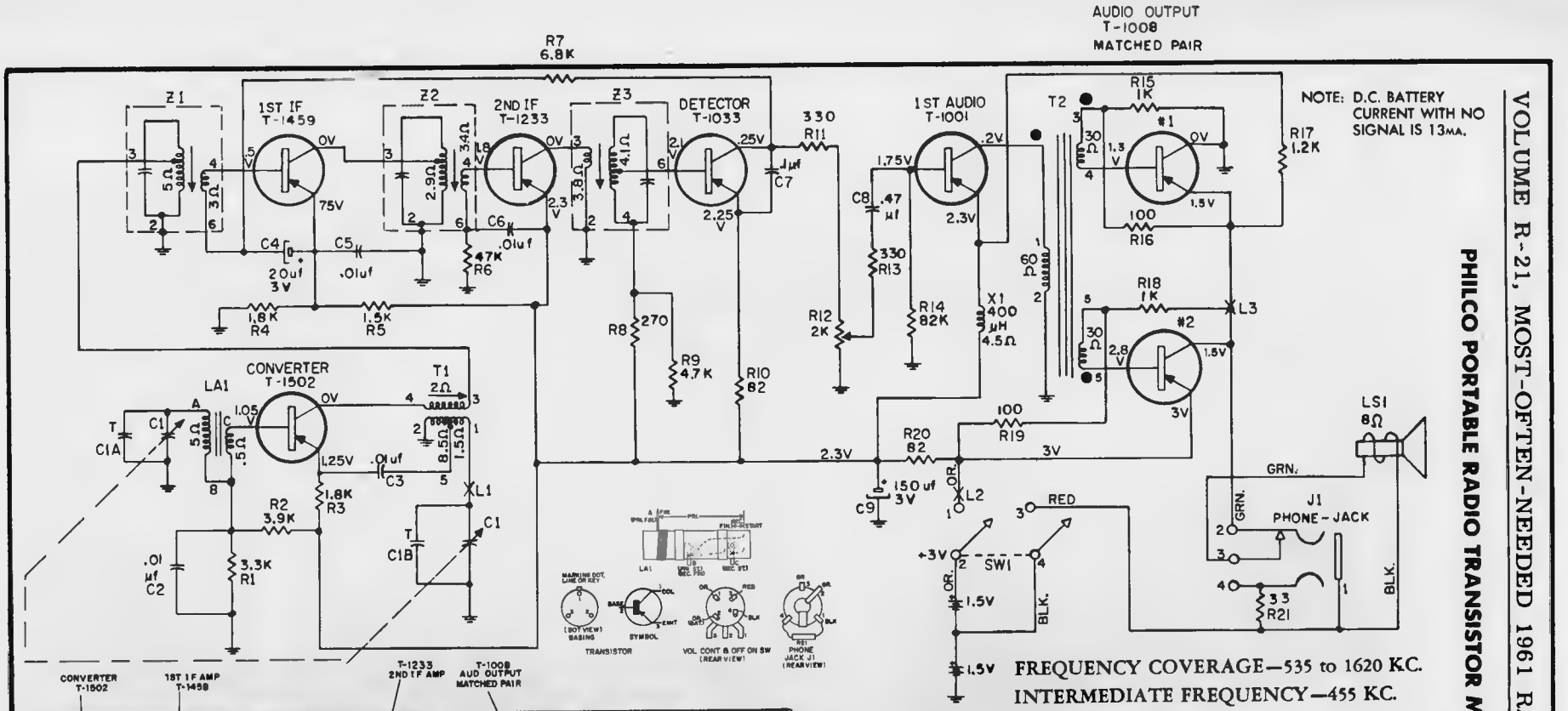
Schematic Diagram of Model T-66, Code 124

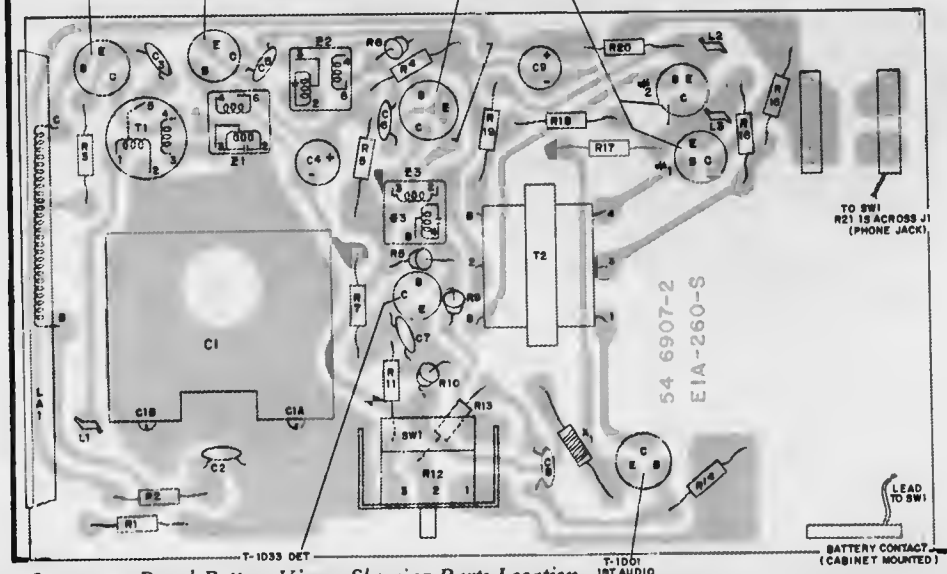
T-66, Code 126: TR1, Converter Transistor changed to T-1877, T2, 1st i-f Transformer changed to Part No. 32-4800-2.

ALIGNMENT CHART

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

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





Component Panel Bottom View—Showing Parts Location

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

TERMINAL LUG IDENTIFICATION

L1—Lead from C1B Trimmer Capacitor Lug 1 of T1
L2—Green Lead from Switch SW1, Lug 1
L3—Green Lead from Phono Jack

SERVICE NOTES

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

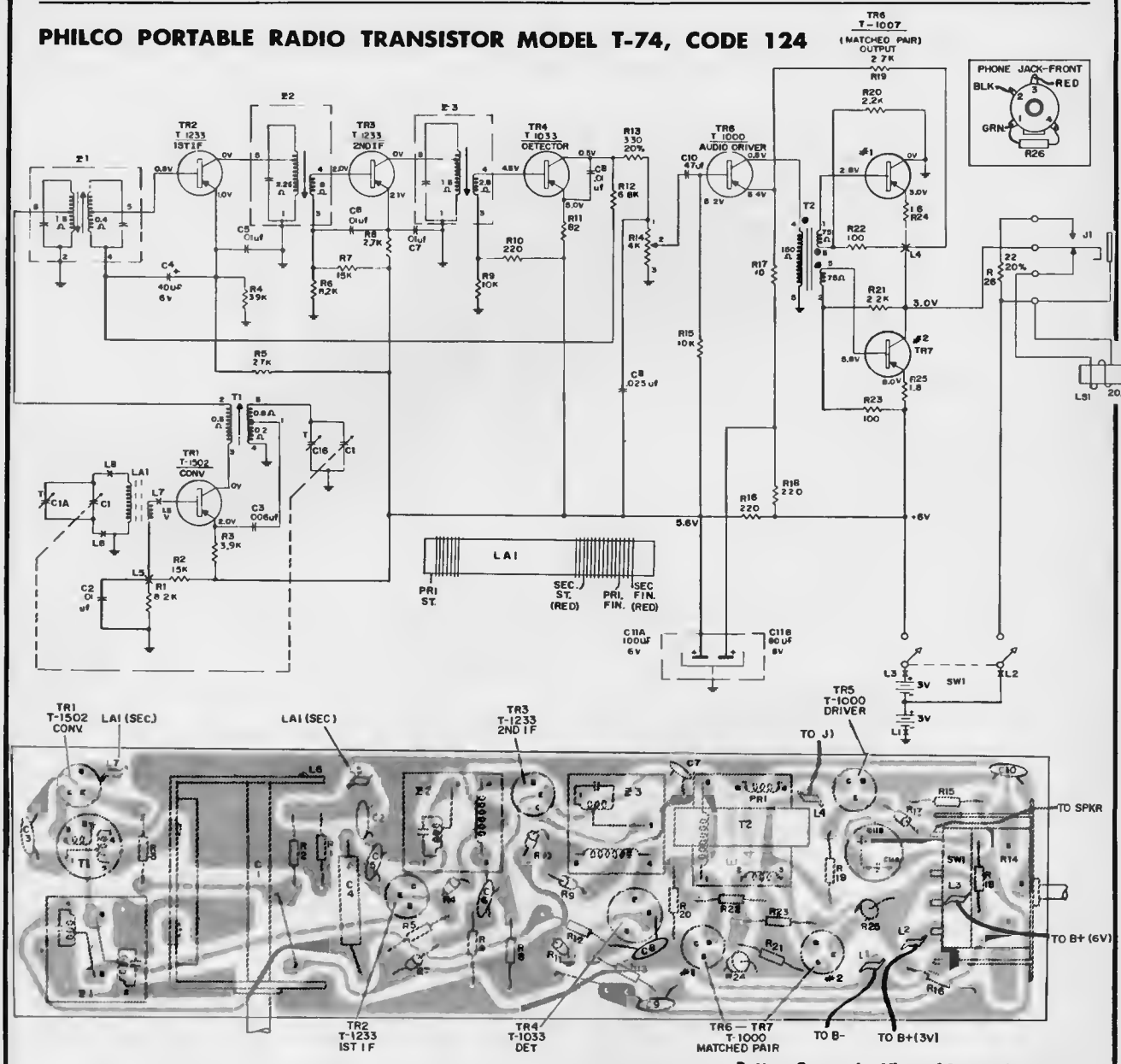
Normally, the transistors should be the last item suspected. If C9 opens serious audio oscillation will result.

SCHEMATIC NOTES

All voltages taken with a Philco Meter Model 8102, 20,000 ohms per volt. All measurements taken between ground and points indicated. Coil resistances read with coil in circuit.

●—Black dots located at (T2) Audio Transformer indicates phasing polarity of transformer.

PHILCO PORTABLE RADIO TRANSISTOR MODEL T-74, CODE 124



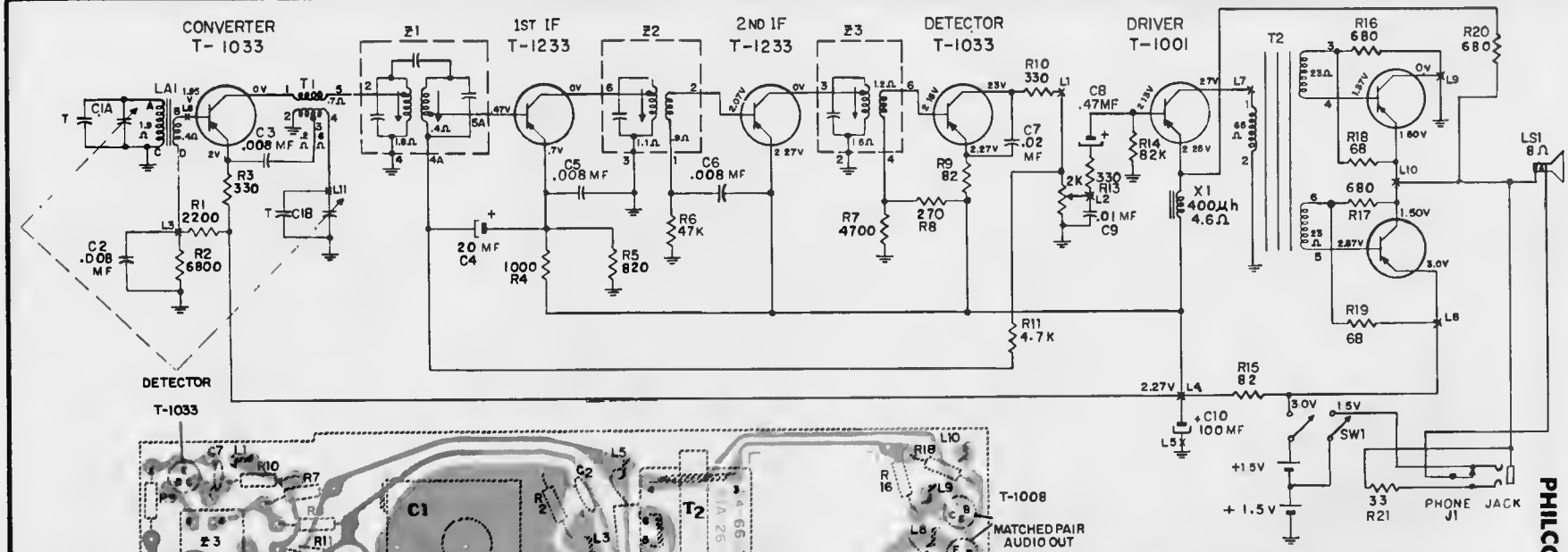
Bottom Composite View of Perma-Circuit Panel

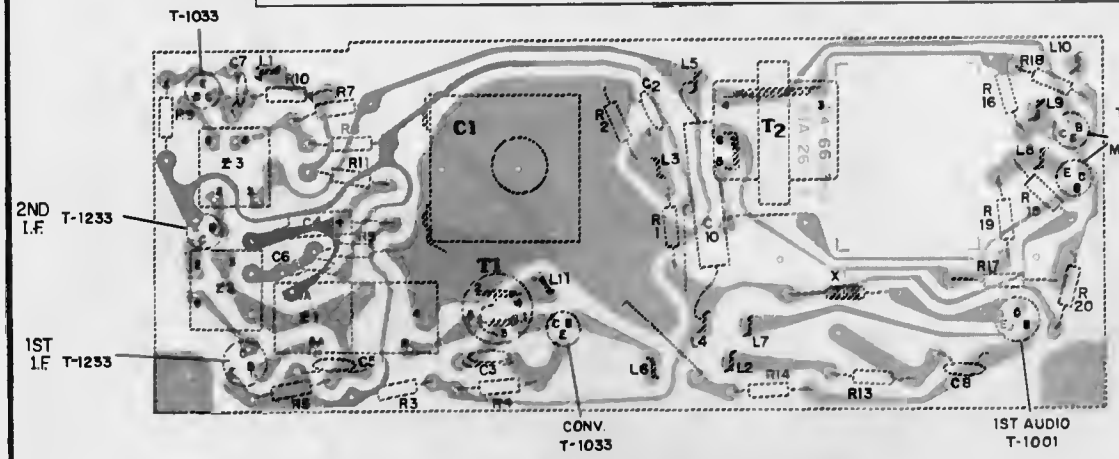
ALIGNMENT CHART

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

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

AUDIO OUTPUT
T-1008. MATCHED PAIR

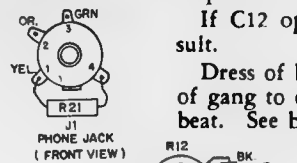


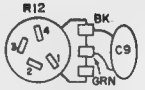


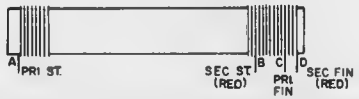
Printed Wiring Panel, Foil Side, Showing Parts Location

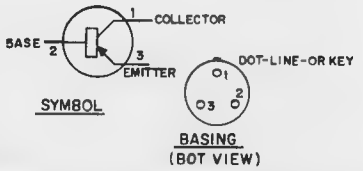
PANEL LUG CONNECTION

L1	Yellow wire from volume control	L6	Green lead from LA1 secondary
L2	Green wire from volume control	L7	Red wire from T2
L3	Green wire from LA1 secondary	L8	Red wire to lug 4 on switch
L4	Positive lead of C10	L9	Black wire to chassis ground
	Black lead from C1	L10	Yellow wire to speaker
	Black lead from T2		Yellow wire to private listening jack
L5	Negative lead from C10	L11	Black & white wire to C11









FREQUENCY COVERAGE—535 to 1620 KC.

INTERMEDIATE FREQUENCY—455 KC.

SERVICE NOTES

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

Normally, the transistors should be the last item suspected.

If C12 opens serious audio oscillation will result.

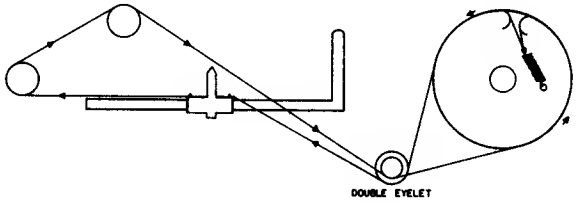
Dress of black lead from top, center, frame lug of gang to end ground lug is important to reduce beat. See base layout for lead dress.

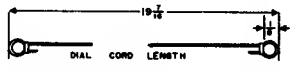
PHILCO MODELS J-769 J-772 J-773 J-774 J-775 J-838 J-840 J-842 J-845 J-846

Material applicable to these sets is below and on pages 122 and 123.

MODELS J-769, J-772, J-773, J-774 and J-775 have similar circuitry with slight variations as shown.

MODELS J-838, J-840, J-842, J-845 and J-846 have similar circuitry with slight variations as shown.



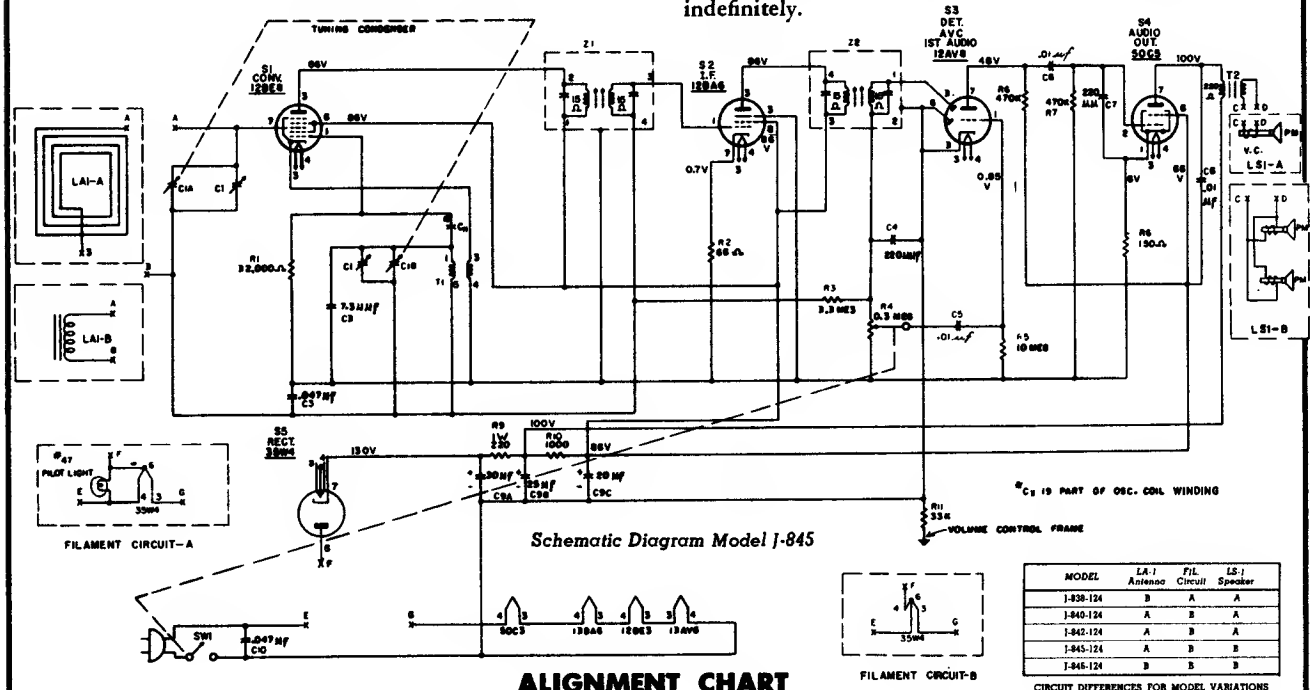


Dial Cord Installation—Model J 774 (Rear View)

SPEAKER PHASING, Models J-845, J-846—When replacing or connecting the two paralleled speakers, it is possible that an out of phase condition may exist; this is readily apparent by weak output and serious distortion. To correct, interchange the leads to one of the speakers.

MODELS J-774 J-775

The push button on top of the cabinet is the Forty Winks alarm control. This feature enables the user to silence the buzzer for 10 minutes. After 10 minutes the buzzer will come on again. The 10 minute cycle may be repeated indefinitely.



Schematic Diagram Model J-845

MODEL	LA-1 Antenna	FIL. Circuit	LS-1 Speaker
J-838-124	B	A	A
J-840-124	A	B	A
J-842-124	A	B	A
J-845-124	A	B	B
J-846-124	B	B	B

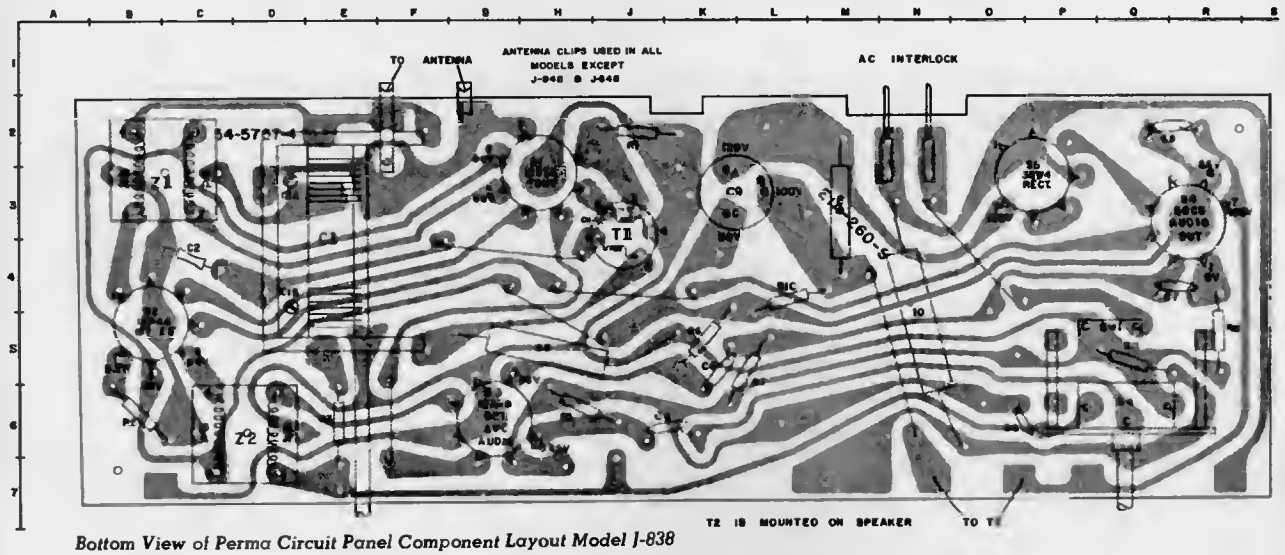
CIRCUIT DIFFERENCES FOR MODEL VARIATIONS

ALIGNMENT CHART

STEP	SIGNAL GENERATOR CONNECTION TO RADIO	SIGNAL GENERATOR DIAL SETTING	RADIO DIAL SETTING	RADIO SPECIAL INSTRUCTIONS	ADJUST
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.	Z2—top Z2—bottom Z1—bottom Z1—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.

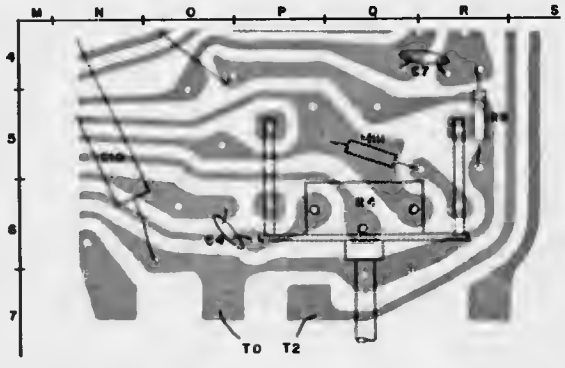
PHILCO Models J-769, J-772, J-773, J-774, J-775, J-838, J-840, etc., Continued



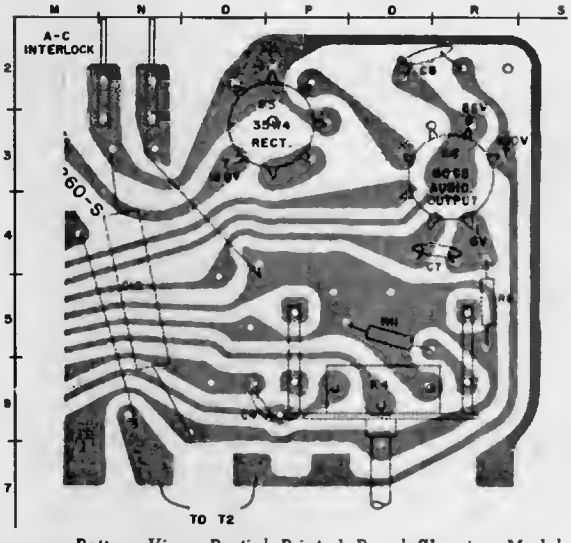
Bottom View of Perma Circuit Panel Component Layout Model J-838

MODEL J-773

In model J-773 the silence time for the forty winks is 7 minutes. After 7 minutes the buzzer goes on again. This 7 minute cycle may be repeated 5 times.



Bottom View, Partial Printed Panel Showing Model J-769 Foil Difference in B-Circuit

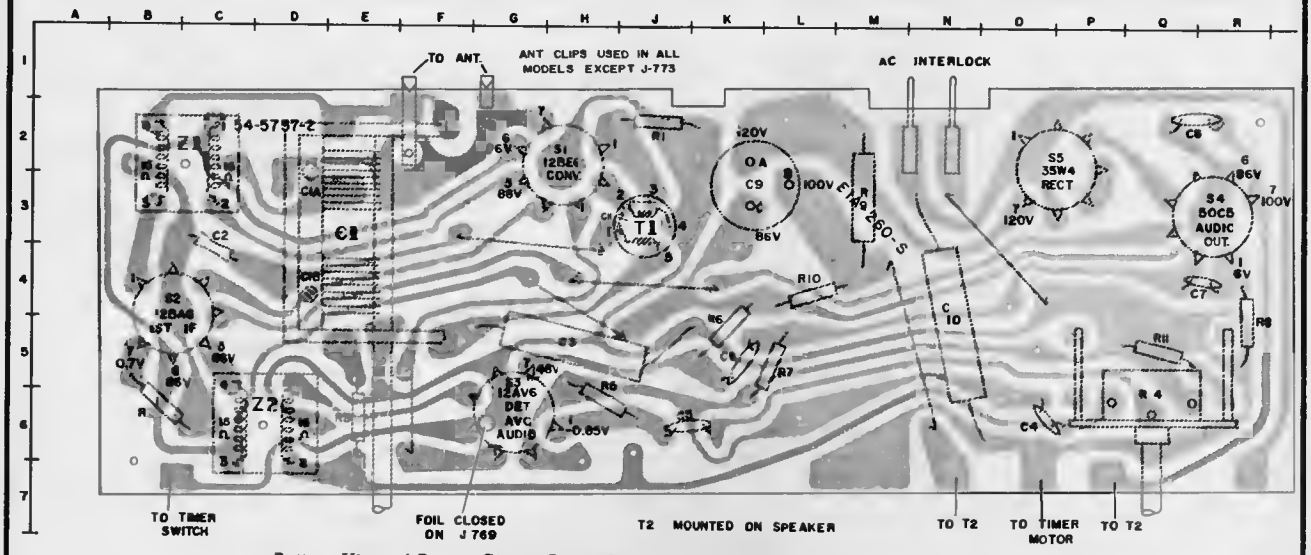


Bottom View, Partial Printed Panel Showing Model J-775 Foil Difference in Rect Fil Circuit and Connections to T2

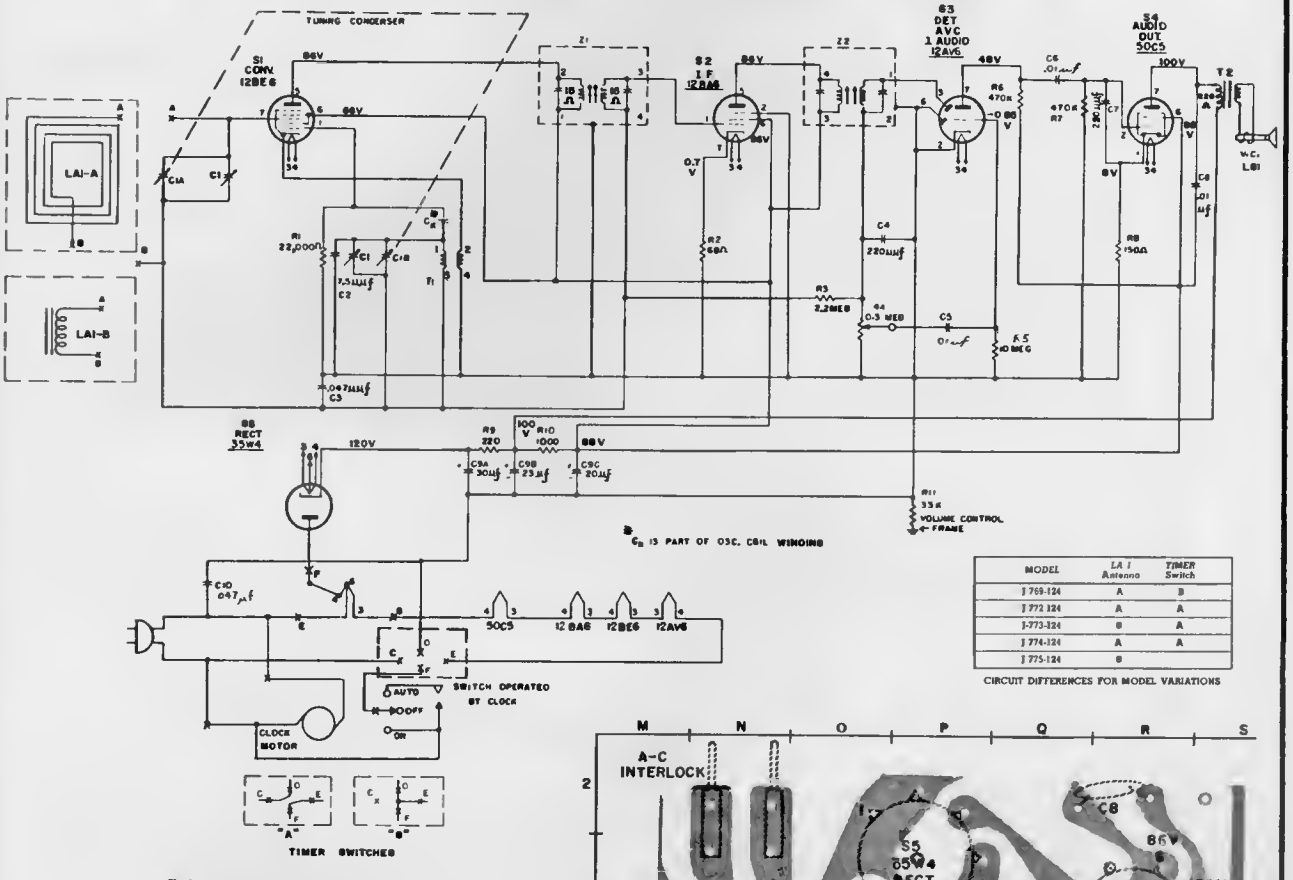
PARTS COMMON TO ALL MODELS

Symbol	Location	Description	Service Part No
C1	E3	Capacitor, variable, tuning	
C2	C4	Capacitor, 7.5 mmf, temp. comp.	30-1224-83
C3	H5	Capacitor, .047 mf, AVC	30-4650-45
C4	O6	Capacitor, 220 mmf, diode filter	30-1262-23
C5	J6	Capacitor, .01 mf, 1st audio grid	30-1262
C6	K5	Capacitor, .01 mf, output grid	30-1262
C7	Q4	Capacitor, 220 mmf, output grid	30-1262-23
C8	Q2	Capacitor, .01 mf, output plate	30-1262
C9	L3	Capacitor, electrolytic (3 section) 20 mf, 25 mf, 30mf, +150VDC	30-2585-11
C10	N5	Capacitor, .047 mf line bypass	30-4650-45
R1	J2	Resistor, converter grid, 22,000 ohms	66-3228340
R2	B6	Resistor, I-F bias, 68 ohms	66-0688340
R3	E6	Resistor, AVC filter, 2.2 megohms	66-5228340
R4	Q6	Resistor, volume control, .5 megohms	
R5	H6	Resistor, 1st audio grid, 10 megohms	66-6108340
R6	K5	Resistor, 1st audio plate, 470,000 ohms	66-4478340
R7	L5	Resistor, audio output grid, 470,000 ohms	66-4478340
R8	R5	Resistor, audio output bias, 150 ohms	66-1158340
R9	M3	Resistor, B+ filter, 220 ohms, 1 watt	66-1224340
R10	L4	Resistor, B+ filter, 1000 ohms	66-2108340
R11	Q5	Resistor, isolation, 33,000 ohms	66-3338340
T1	J3	Transformer, osc.	32-4756-1
T2		Part of Speaker	32-8384-2
Z1	C2	Transformer, 1st I-F	32-4583-23
Z2	D6	Transformer, 2nd I-F	32-4583-23
	G1	Contact Panel, antenna	28-12282

PHILCO Models J-769, J-772 thru J-775, J-838, J-840, J-842, etc., Continued



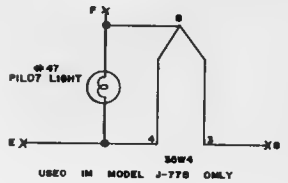
Bottom View of Perma Circuit Panel Component Layout Models J-772, J-773, J-774

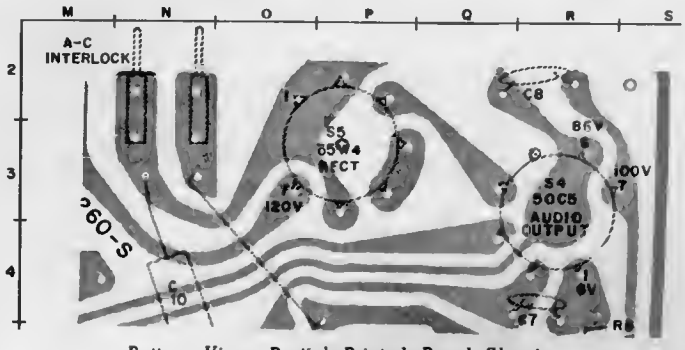


MODEL	LA 1 Antenna	TIMER Switch
J 769-124	A	B
J 772 124	A	A
J-773-124	B	A
J 774-124	A	A
J 775-124	B	

CIRCUIT DIFFERENCES FOR MODEL VARIATIONS

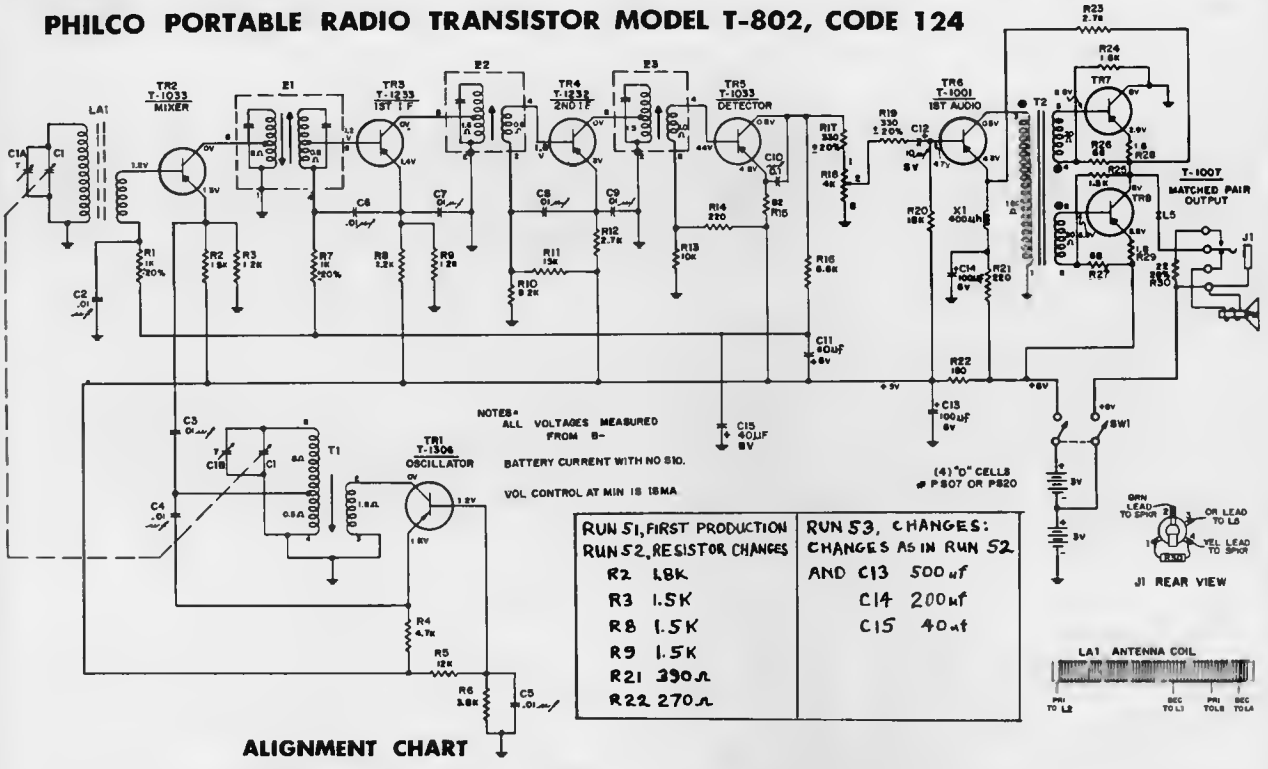
Schematic Diagram Model J-772





Bottom View, Partial Printed Panel Showing Models J-840, J-842, J-845, J-846. Foil Difference in Rect. Filament Circuit

PHILCO PORTABLE RADIO TRANSISTOR MODEL T-802, CODE 124

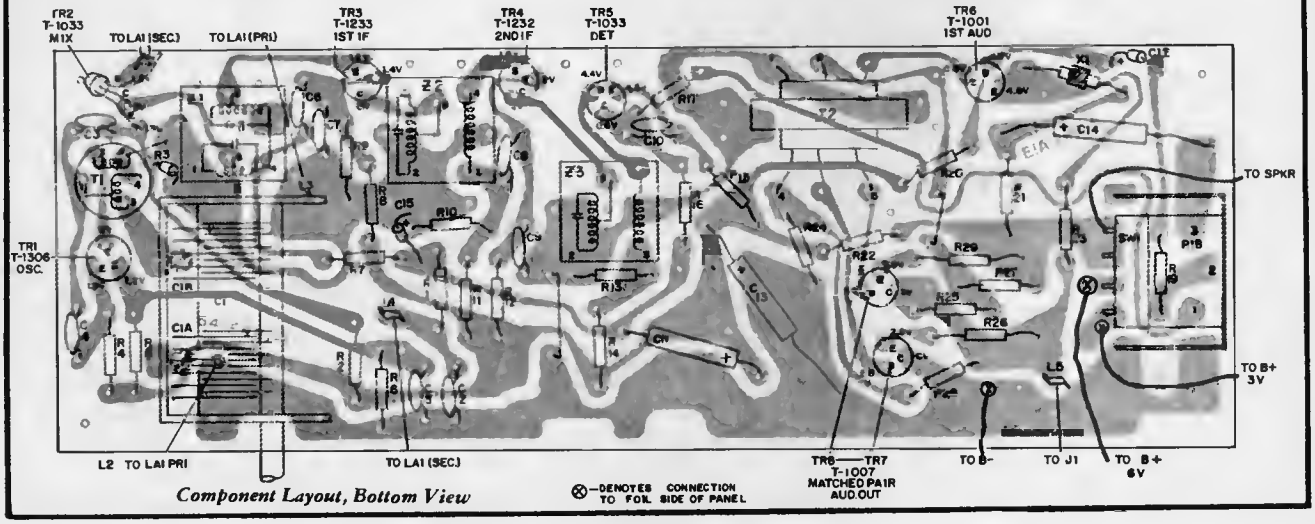


RUN 51, FIRST PRODUCTION RUN 52, RESISTOR CHANGES	RUN 53, CHANGES: CHANGES AS IN RUN 52
R2 L8K R3 1.5K R8 1.5K R9 1.5K R21 390Ω R22 270Ω	AND C13 500 uf C14 200uf C15 40uf

ALIGNMENT CHART

STEP	SIGNAL GENERATOR CONNECTION TO RADIO	SIGNAL GENERATOR DIAL SETTING	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.	Adjust for maximum output in order given.	Z3—3rd i-f pri. Z2—2nd i-f pri. Z1—bot. core Z1—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.



Component Layout, Bottom View

PHILCO PORTABLE RADIO TRANSISTOR MODEL T-901, CODE 124

Reference Symbol	Location	Description
C1	—	Capacitor, variable, tuning
C2	A6	Capacitor, .008 mfd, r-f base
C3	C8	Capacitor, .008 mfd, r-f emitter
C4	F7	Capacitor, .008 mfd, osc. emitter
C5	F6	Capacitor, .008 mfd, osc. base
C6	B5	Capacitor, .008 mfd, mixer base
C7	D7	Capacitor, .008 mfd, mixer emitter
C8	E3	Capacitor, .008 mfd, 1st i-f
C9	E1	Capacitor, .008 mfd, 1st i-f
C10	F5	Capacitor, .008 mfd, 2nd i-f
C11	H2	Capacitor, .008 mfd, 2nd i-f
C12	K5	Capacitor, .008 mfd, det. base
C13	J6	Capacitor, .025 mfd, det. collector
C14	G9	Capacitor, .1 mfd, volume control
C15	L6	Capacitor, 40 mfd, AVC filter
C16*	M5	Capacitor, 40 mfd, AVC filter
C17	L8	Capacitor, 10 mfd, Audio coupling
C18A*	N5	Capacitor, 200 mfd, B+ filter
C18B*	N5	Capacitor, 100 mfd, driver emitter
J1	Case	Jack, listening
LA1	Case	Antenna coil
LS1	Case	Speaker, 12Ω V.C., 4 inch
R1	G8	Resistor, 1.5KΩ, r-f amp. emit.
R2*	C9	Resistor, 1.5KΩ, r-f amp. emit.
R3	C8	Resistor, 4.7KΩ, osc. emit.
R4	H8	Resistor, 12KΩ, osc. base
R5	H6	Resistor, 3.9 KΩ, osc. base
R6	B1	Resistor, 1.0KΩ, r-f amp. base
R7	B5	Resistor, 47KΩ, mixer base
R8	B2	Resistor, 39KΩ, mixer base
R9	D5	Resistor, 3.3KΩ, mixer emitter
R10	A3	Resistor, 1.0KΩ, 1st i-f base
R11*	E3	Resistor, 1.2KΩ, 1st i-f emit.
R12*	E1	Resistor, 1.2KΩ, 1st i-f emit.
R13	F5	Resistor, 8.2KΩ, 2nd i-f base
R14	F5	Resistor, 15KΩ, 2nd i-f base
R15	H5	Resistor, 2.7KΩ, 2nd i-f emit.
R16	M4	Resistor, 10KΩ, 2nd det. base
R17	M4	Resisror, 220Ω, 2nd det. base
R18	K5	Resistor, 82Ω, 2nd det. emit.
R19	J6	Resistor, 6.8KΩ, 2nd det. col.
R20	H7	Resistor, 330Ω, 2nd det. col.
R21	—	Resistor, 4KΩ, var. vol. control
R22	L9	Resistor, 330Ω, driver input filter
R23*	M6	Resistor, 3.9KΩ, aud. driver base
R24*	Q3	Resistor, 120Ω, B+ filter
R25*	Q4	Resistor, 220Ω, aud. driver emit.
R26	Q8	Resistor, 2.7KΩ, aud. feed-back
R27	P3	Resistor, 1.5KΩ, aud. collector
R28	R5	Resistor, 1.5KΩ, aud. output col.
R29	Q5	Resistor, 68Ω, TR8 base
R30	S3	Resistor, 68Ω, TR9 base
R31	S6	Resistor, 1.8Ω, TR8 emitter
R32	R5	Resistor, 1.8Ω, TR9 emitter
R33	J1	Resistor, 22Ω, jack
SW1	R21	Switch
T1	E8	XFMR, osc.
T2	N7	XFMR, aud. out.
TR1	A7	Transistor, r-f amp., T-1233
TR2	F7	Transistor, osc., T-1306
TR3	D5	Transistor, mixer, T-1033
TR4	D1	Transistor, 1st i-f, T-1233
TR5	H3	Transistor, 2nd i-f, T-1232
TR6	H5	Transistor, det., T-1033
TR7	L7	Transistor, aud. drive, T-1001
TR8**	R9	Transistor, aud. out., T-1007
TR9**	R8	Transistor, aud. out., T-1007
X1	K7	Choke, 400μh
Z1	B6	Transformer, R-F transistor
Z2	B3	Transformer, 1st I-F
Z3	F3	Transformer, 2nd I-F
Z4	J3	Transformer, 3rd I-F

* RUN 2—CHANGE INFORMATION

C16—deleted
C18A—400 mfd
C18B—300 mfd
R2—1.8KΩ
R11—1.5KΩ
R12—1.5KΩ
R23—12KΩ
R24—270Ω
R25—390Ω

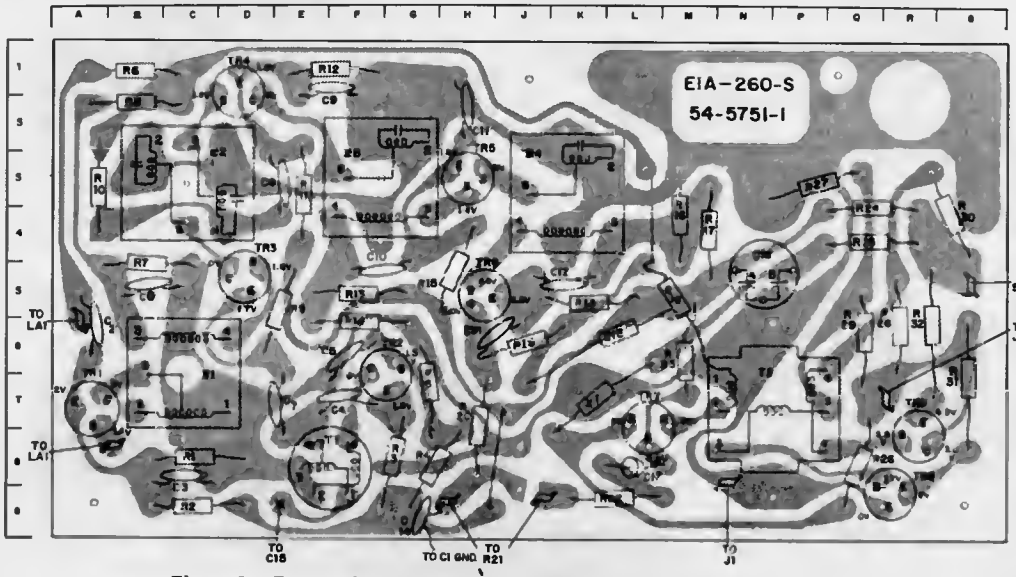
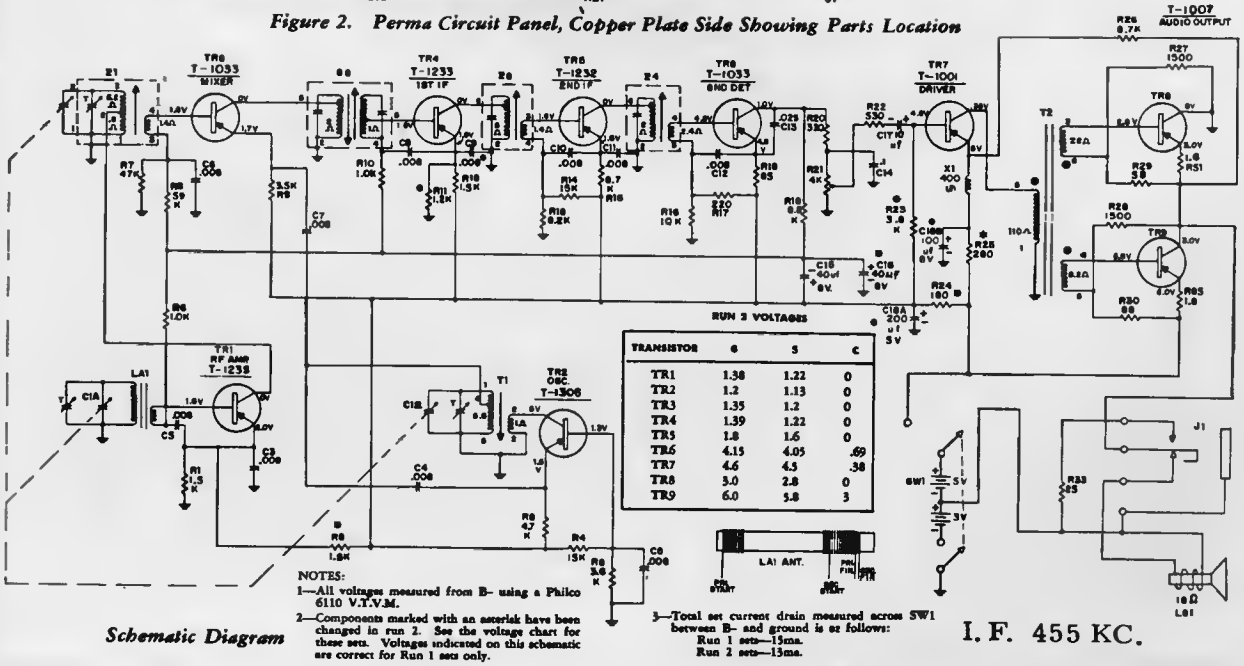


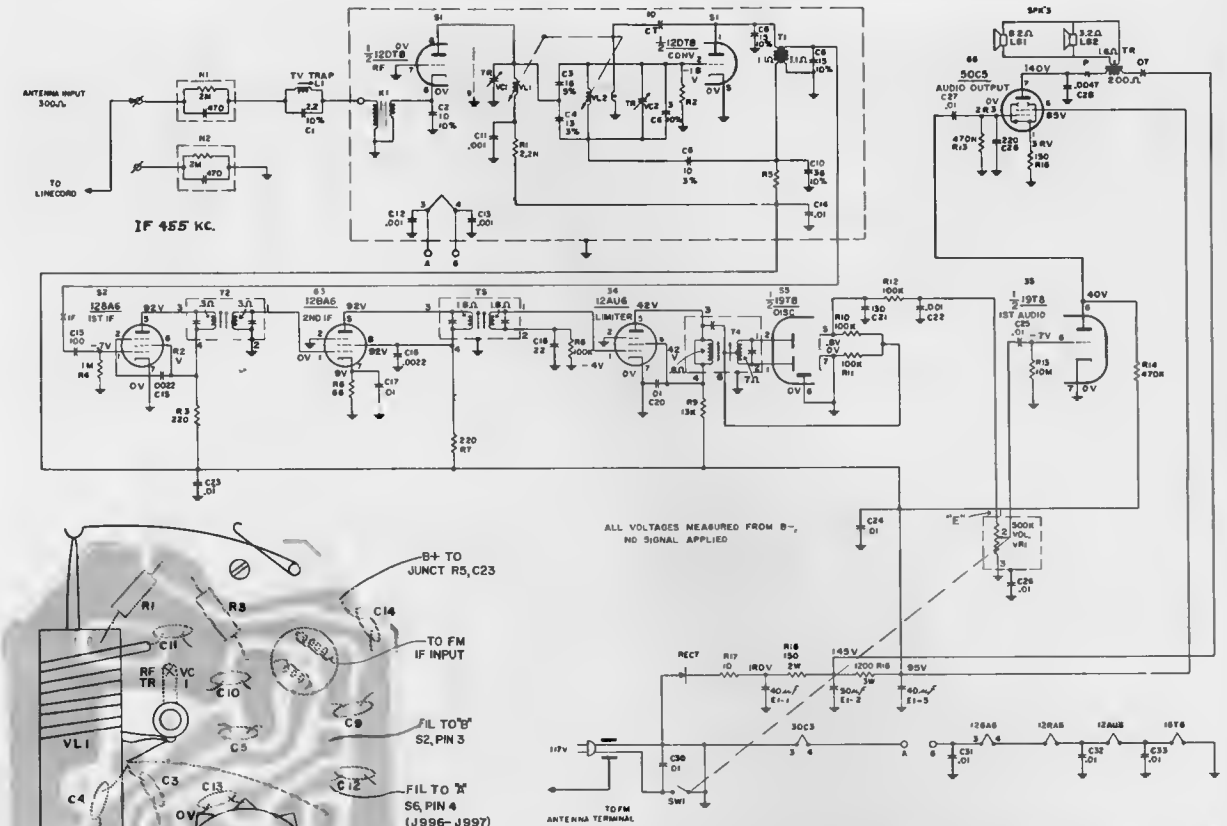
Figure 2. Perma Circuit Panel, Copper Plate Side Showing Parts Location

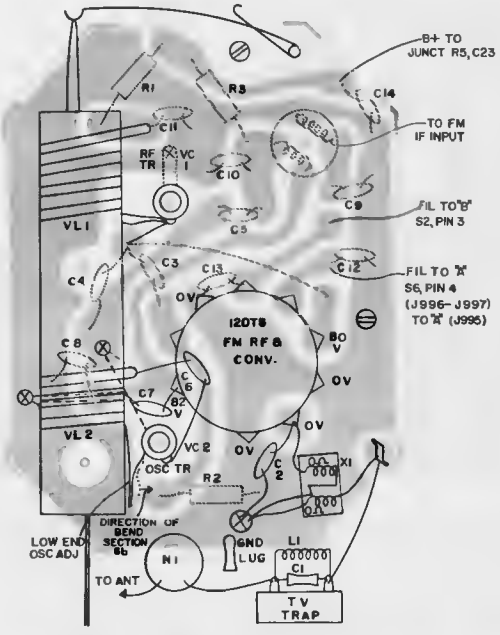


Schematic Diagram

NOTES:
1—All voltages measured from B- using a Philco 6110 V.T.V.M.
2—Components marked with an asterisk have been changed in run 2. See the voltage chart for these sets. Voltages indicated on this schematic are correct for Run 1 sets only.
3—Total set current drain measured across SW1 between B- and ground is as follows:
Run 1 sets—15ma.
Run 2 sets—13ma.

PHILCO FM MODEL J-995

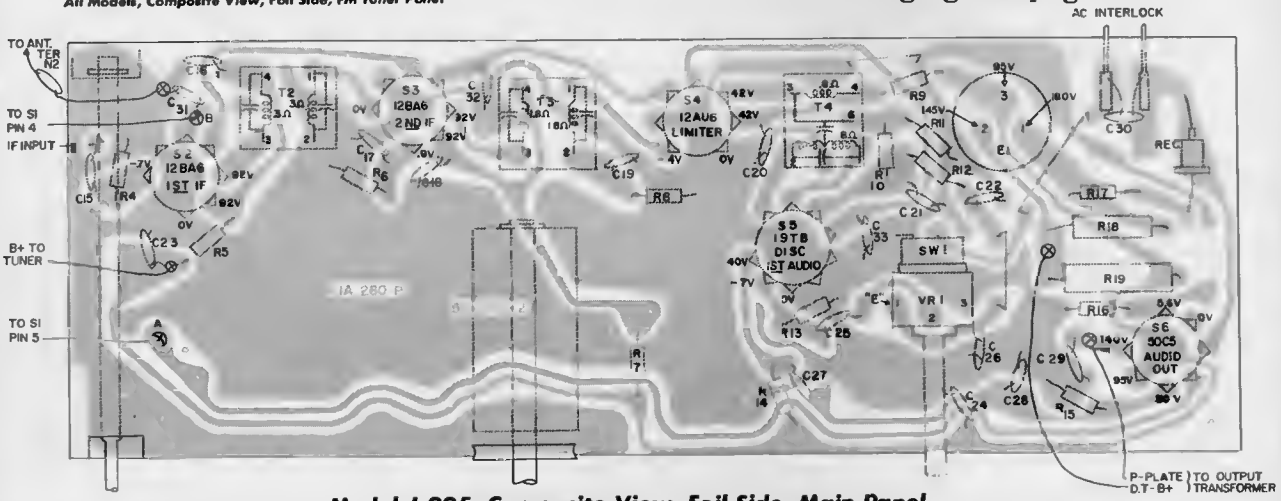




All Models, Composite View, Foil Side, FM Tuner Panel

FM tuner disassembly. Remove chassis from cabinet and place foil side up, tuner toward left. To remove bottom shield from tuner remove two screws located at left edge of shield and screw located under left lug of antenna terminal board (remove terminal board mounting screw first). Loosen screw located near antenna terminal board and remaining tuner mounting screw located near left front corner of main panel. Slide shield to left far enough to clear wires and screws. Retighten remaining tuner mounting screws. The perma-circuit wiring panel can now be removed. To do so, remove screw holding TV trap mounting board. Disconnect ground lug from panel and the tuner drive cord from the pulley shaft. Remove screws holding panel in housing. The panel may now be lifted up and out of the tuner housing.

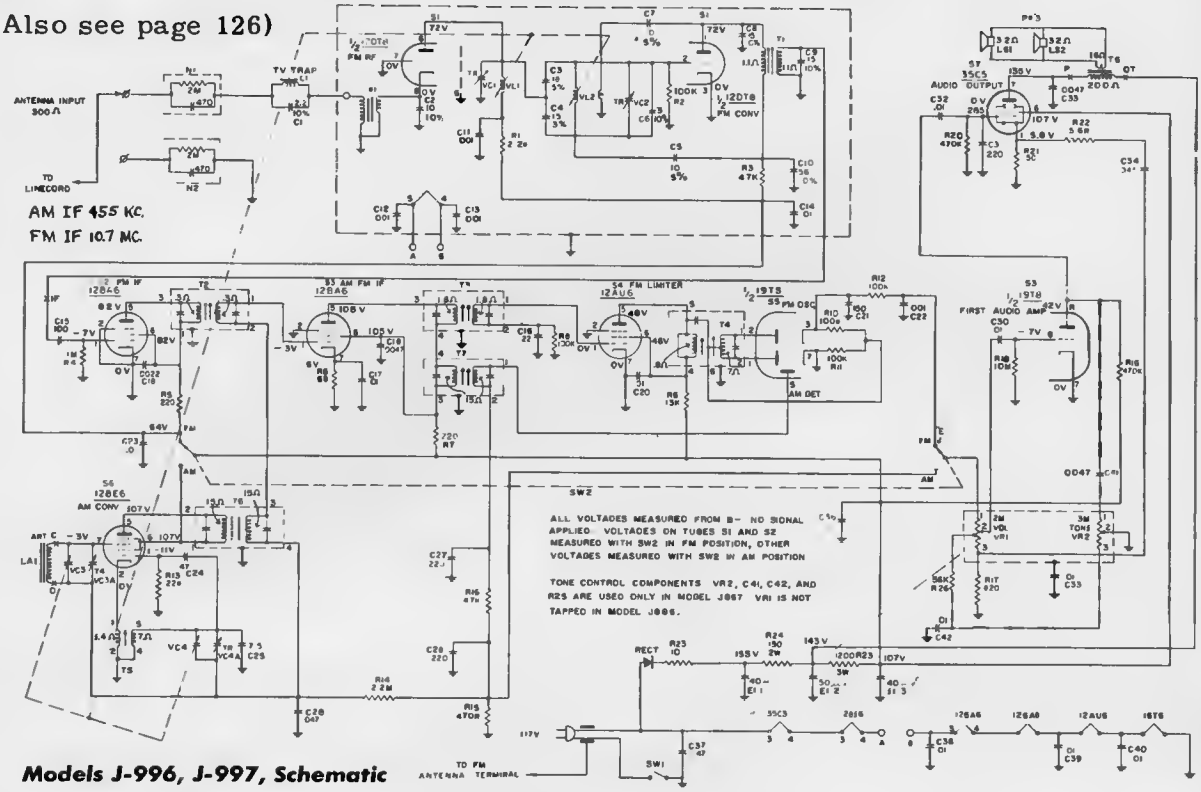
(For dial stringing see page 127)



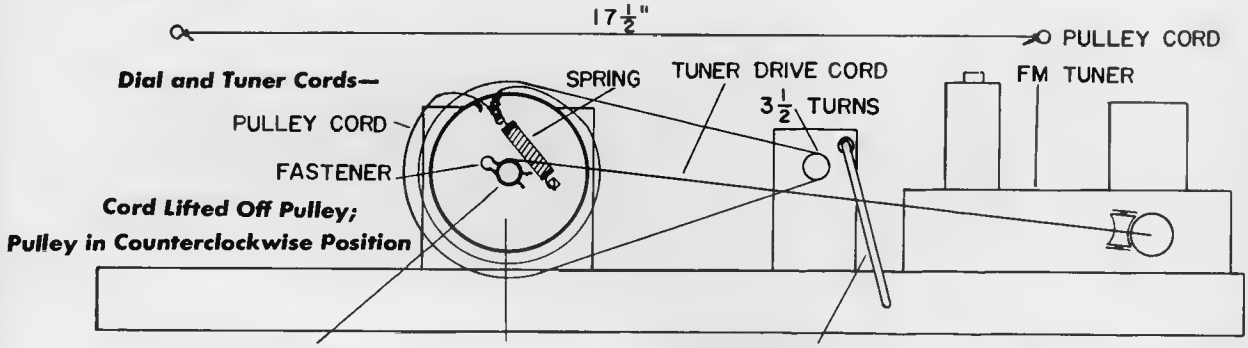
Model J-995, Composite View, Foil Side, Main Panel

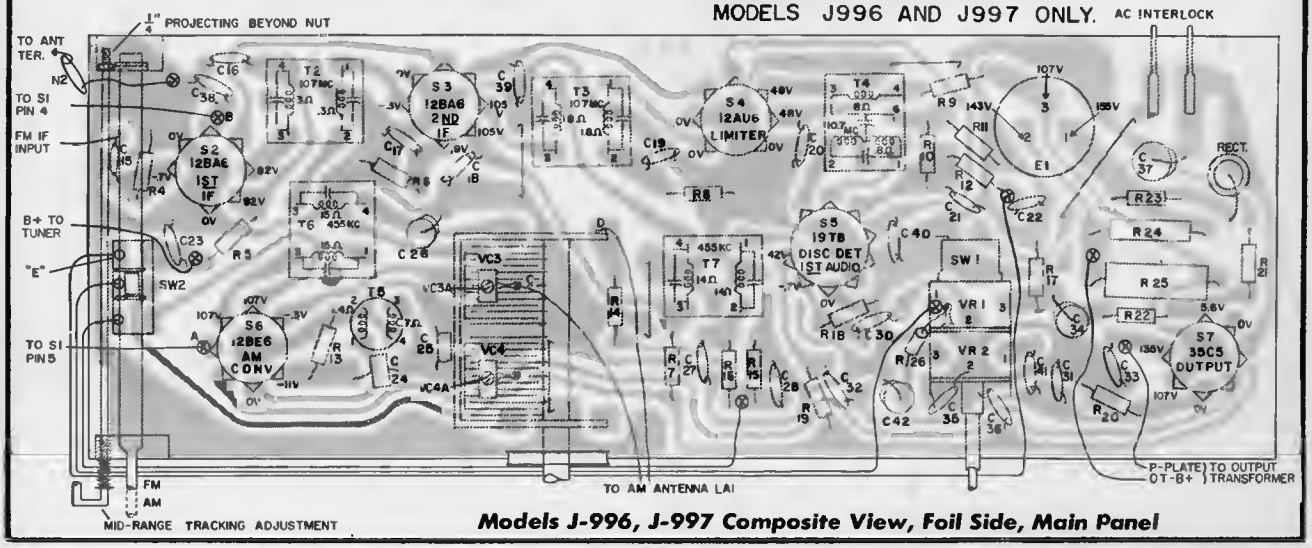
PHILCO AM/FM MODELS J-996, J-997

(Also see page 126)



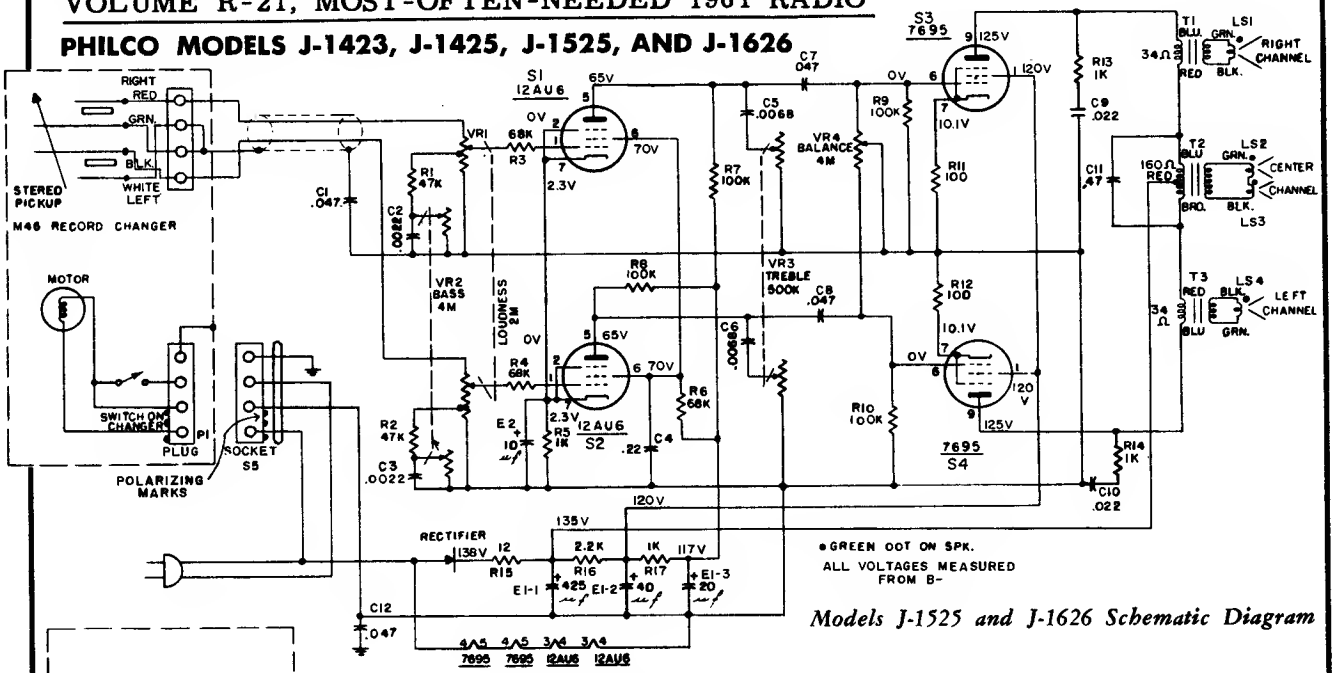
Models J-996, J-997, Schematic



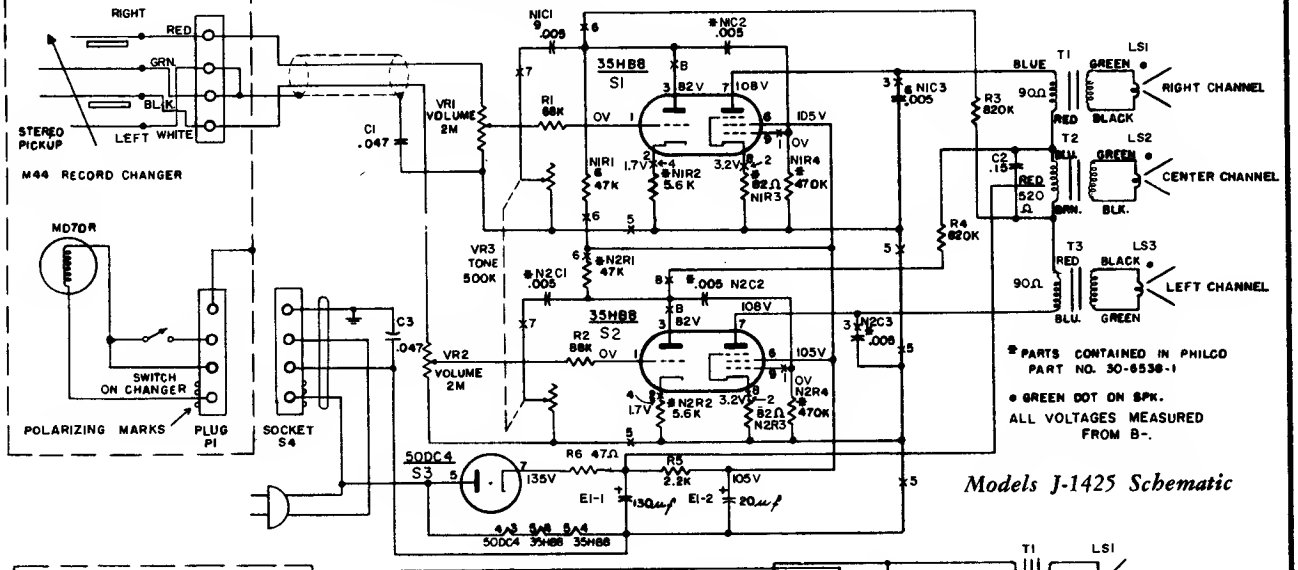


Models J-996, J-997 Composite View, Foil Side, Main Panel

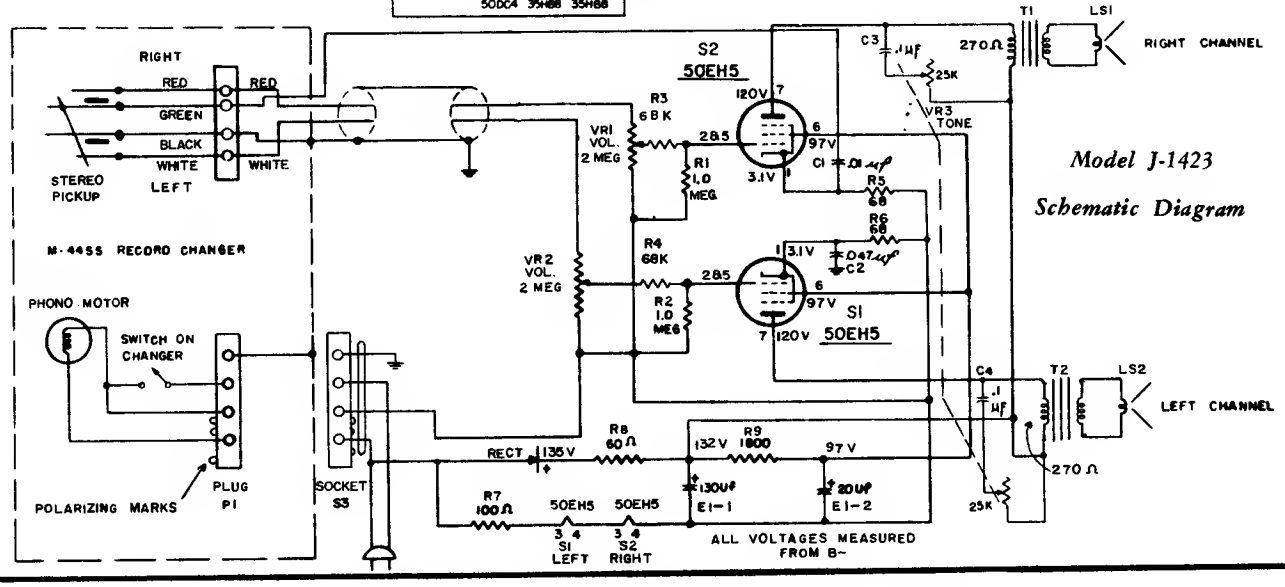
PHILCO MODELS J-1423, J-1425, AND J-1626



Models J-1525 and J-1626 Schematic Diagram



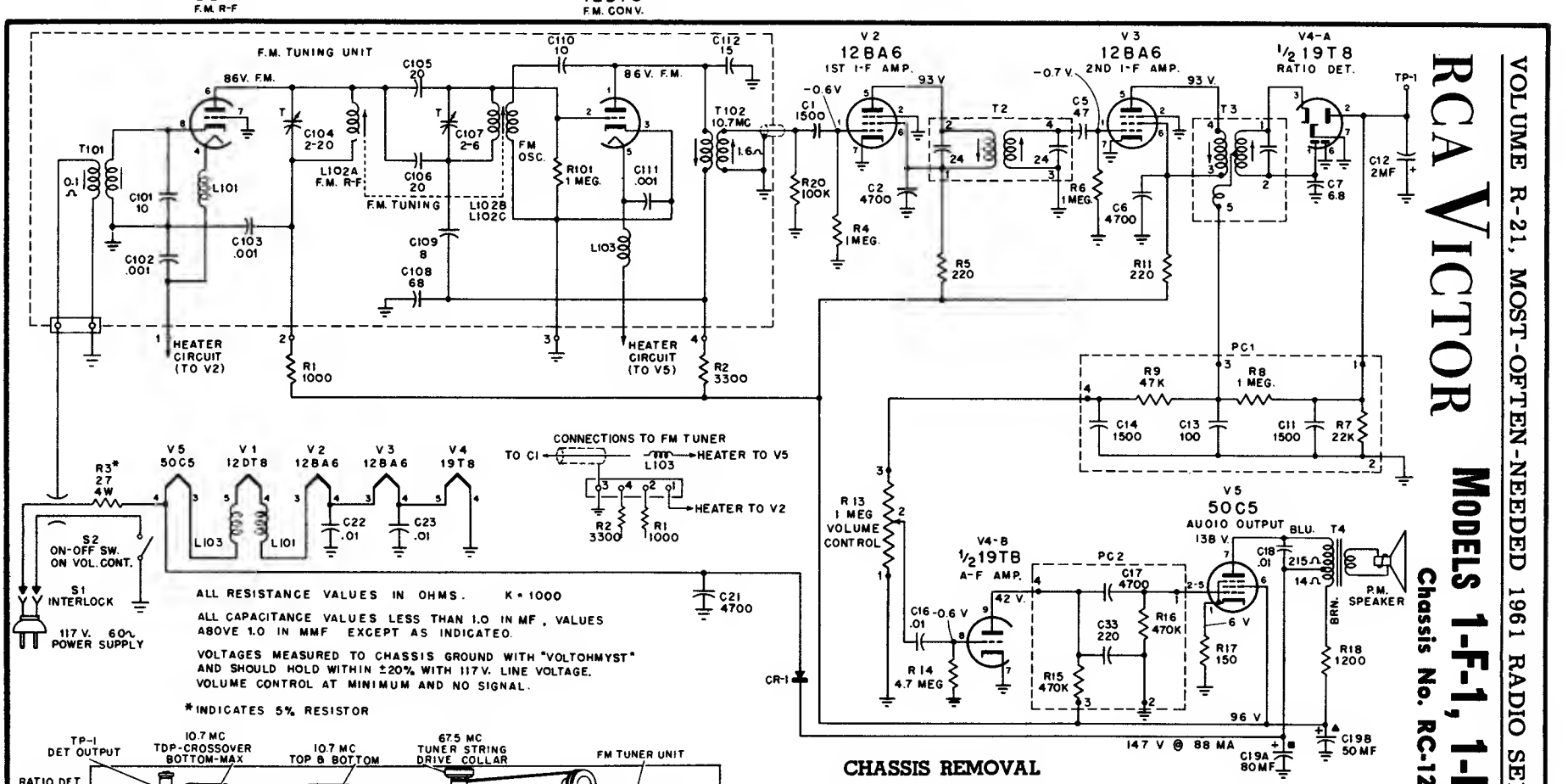
Models J-1425 Schematic

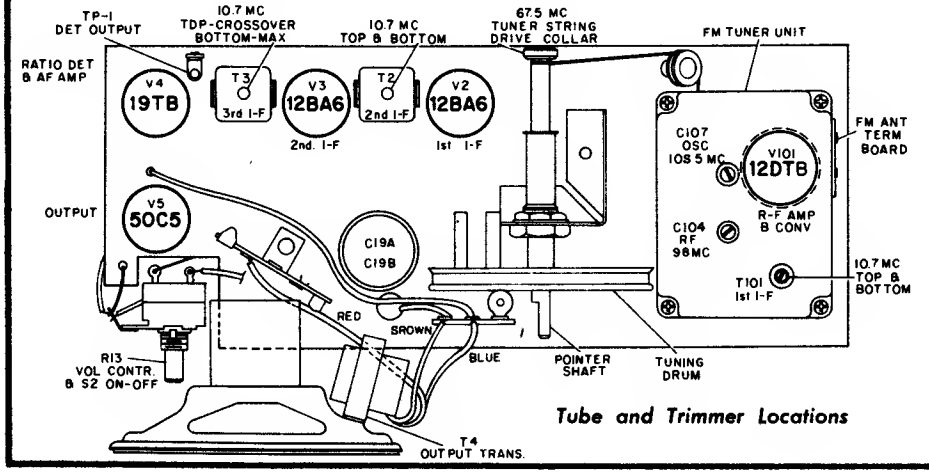


Model J-1423 Schematic Diagram

RCA VICTOR MODELS 1-F-1, 1-F-2 SERIES

Chassis No. RC-1201A





Tube and Trimmer Locations

CHASSIS REMOVAL

1. Remove two screws at bottom rear of cabinet and one screw at top center—this screw will remain with cabinet back.
2. Pull cabinet apart.
3. Pull off volume control knob and remove hex nut holding volume control to cabinet front.
4. Unhook dial drive cord and remove from drum.
5. Bend three retaining lugs to permit removal of power line antenna from cabinet front.
6. Remove two screws holding speaker to cabinet front.
7. Remove two screws at rear apron of chassis.
8. Pull tuning drum shaft out of dial pointer.

CHASSIS INSTALLATION

From back side of cabinet front—squeeze toward center, two lugs of plastic dial crystal—lay crystal and pointer aside.

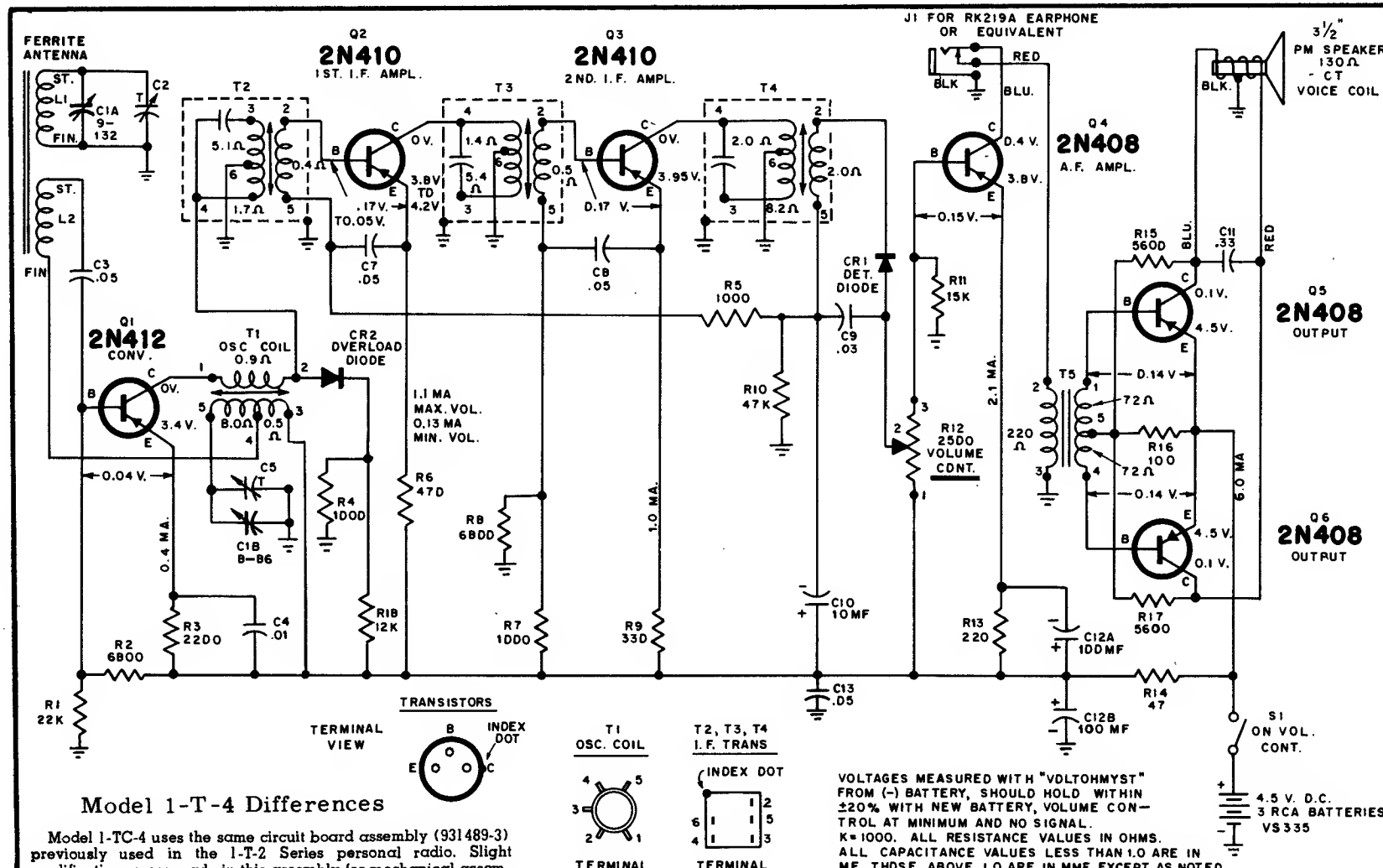
Reinstall in reverse order of "Chassis Removal".

RCA Victor
Models 1-F-1, and
1-F-2 Series,
Chassis RC-1201A

RCA VICTOR

1-T-1, 1-T-2 Series, and Models 1-T-3, 1-T-4
Chassis RC-1200 and RC-1200A

(Continued on the next page)



VOLTAGES MEASURED WITH "VOLTOHMYST" FROM (-) BATTERY, SHOULD HOLD WITHIN ±20% WITH NEW BATTERY, VOLUME CONTROL AT MINIMUM AND NO SIGNAL. K=1000. ALL RESISTANCE VALUES IN OHMS. ALL CAPACITANCE VALUES LESS THAN 1.0 ARE IN MF, THOSE ABOVE 1.0 ARE IN MMF EXCEPT AS NOTED.

Model 1-T-4 Differences

Model 1-TC-4 uses the same circuit board assembly (931489-3) previously used in the 1-T-2 Series personal radio. Slight modifications were made in this assembly for mechanical assembly and for clock operation. Major differences are as follows:

1. The battery contacts are attached to the bottom cover and not to the chassis.
2. There is no earphone jack.
3. The antenna is mounted on a fiber plate and is parallel to the lengthwise dimension of the chassis.
4. The switch on the volume control is a double-pole single-throw type and is used to select either RADIO or ALARM mode of operation. At maximum counterclockwise rotation S1A is open and S1B is closed. With the volume control in this position and the radio energized, audio regeneration occurs and a buzzing noise is reproduced by the speaker.

BATTERY CURRENT vs. OUTPUT

Output Voltage Across Speaker (Blue to Red)	Approximate Battery Current
0	11 ma
1.14 r.m.s. — 3.2 p-p	24 ma
1.8 r.m.s. — 5.0 p-p	32 ma
2.5 r.m.s. — 7.0 p-p	42 ma
3.9 r.m.s. — 10.9 p-p	68 ma

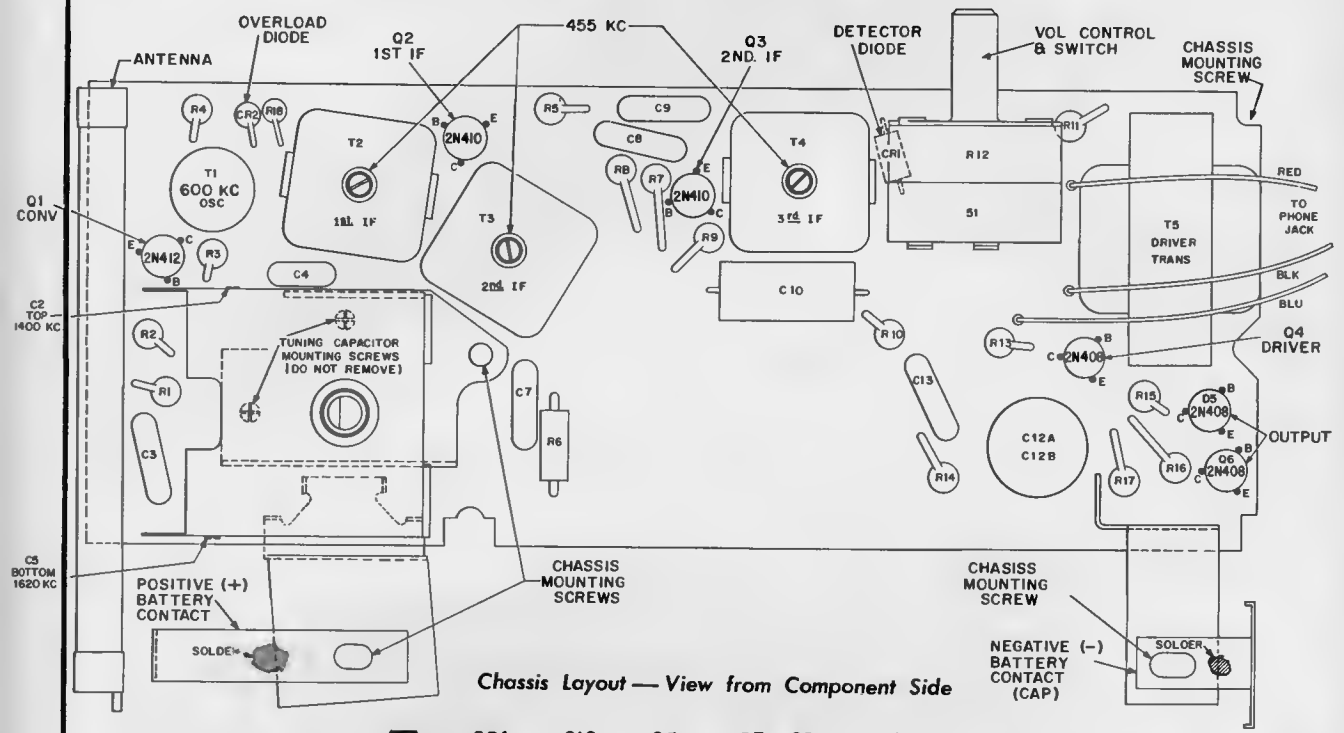
RCA VICTOR 1-T-1 SERIES

(Continued from preceding page)

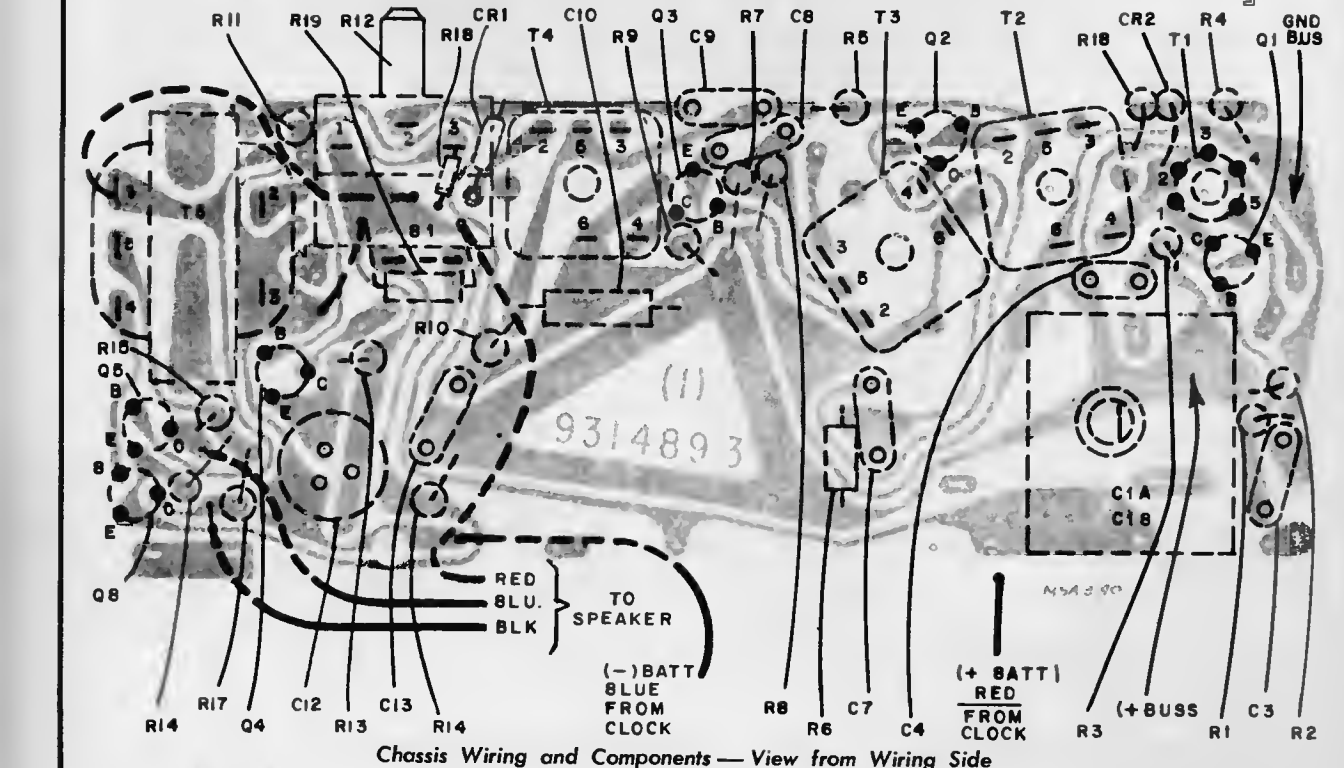
Chassis No. RC-1200

1-T-2 SERIES, MODEL 1-T-3 1-TC-4

Chassis No. RC-1200A Circuit Board No. 931489-3



Chassis Layout — View from Component Side

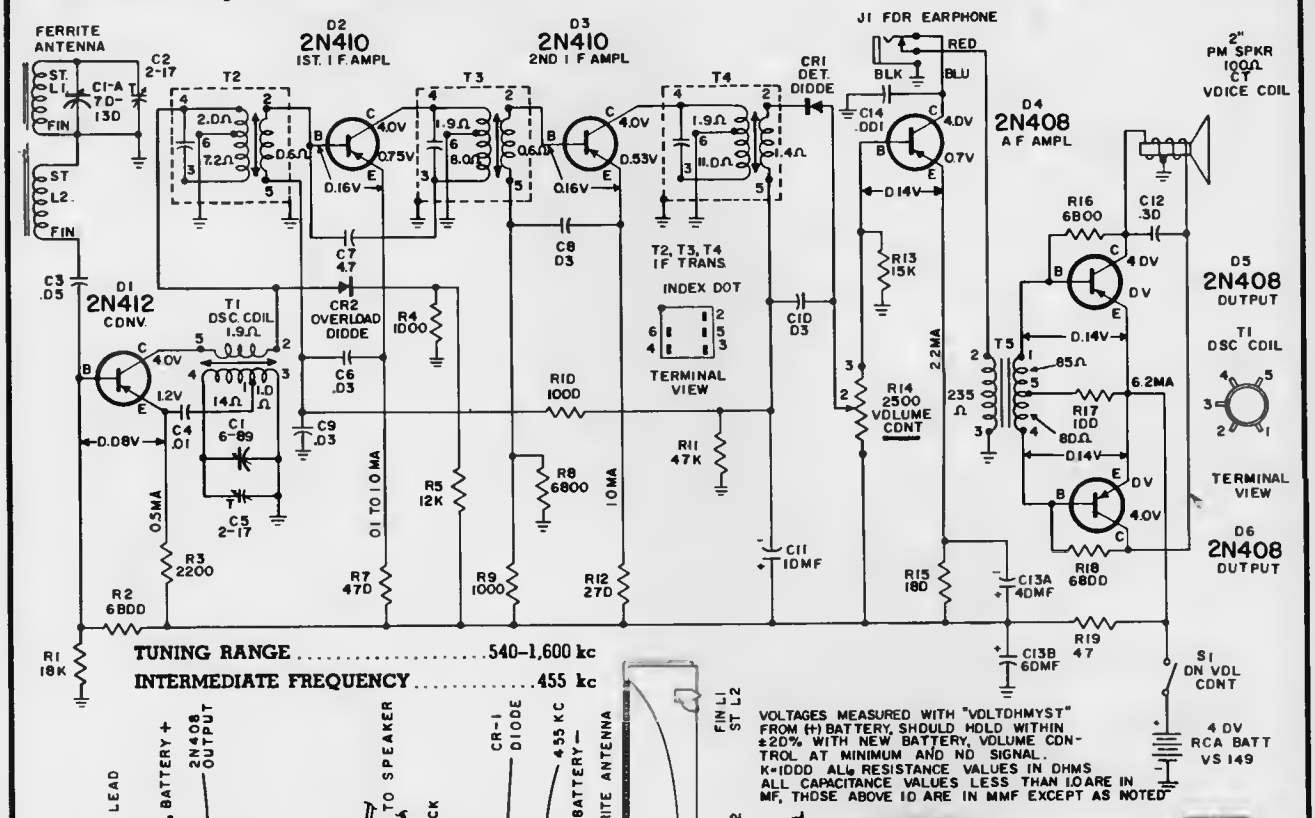


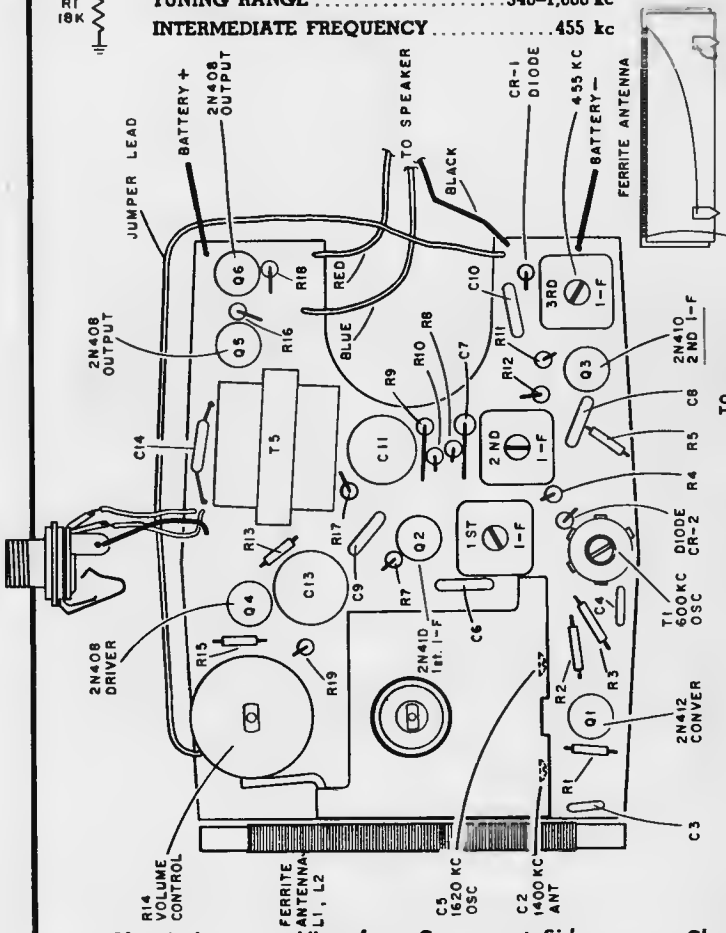
Chassis Wiring and Components — View from Wiring Side

RCA VICTOR 1-TP-1 SERIES, 1-TP-2 SERIES

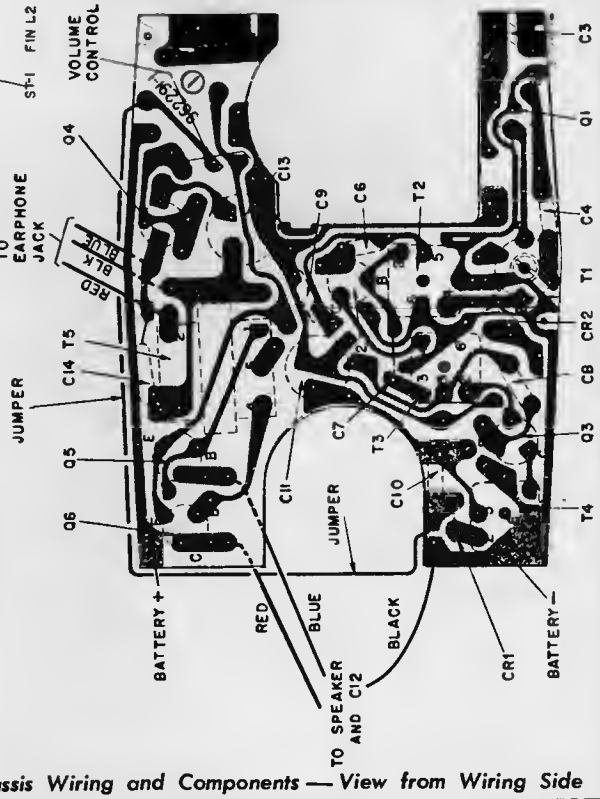
Chassis No. RC-1199
RC-1199-A
Circuit Board No. 962291-1

(For later type see next page)





Chassis Layout — View from Component Side

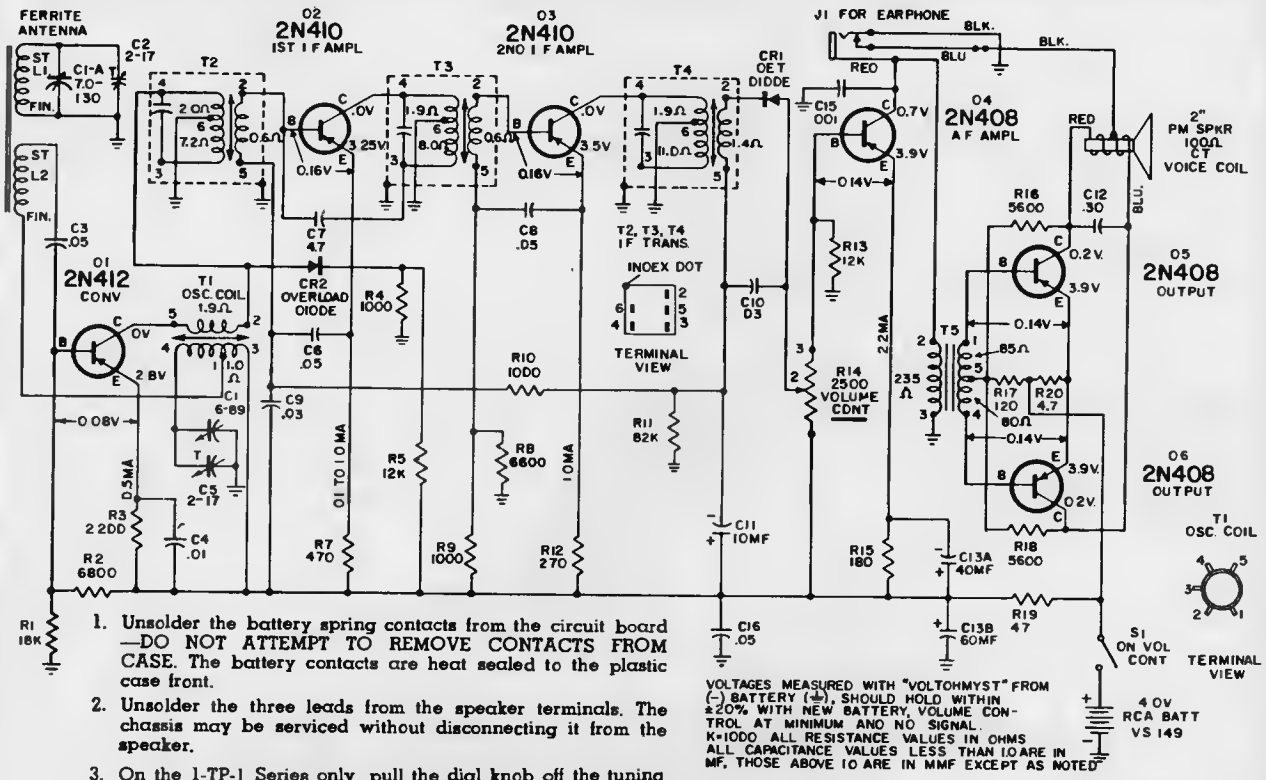


Chassis Wiring and Components — View from Wiring Side

RCA VICTOR 1-TP-1 SERIES

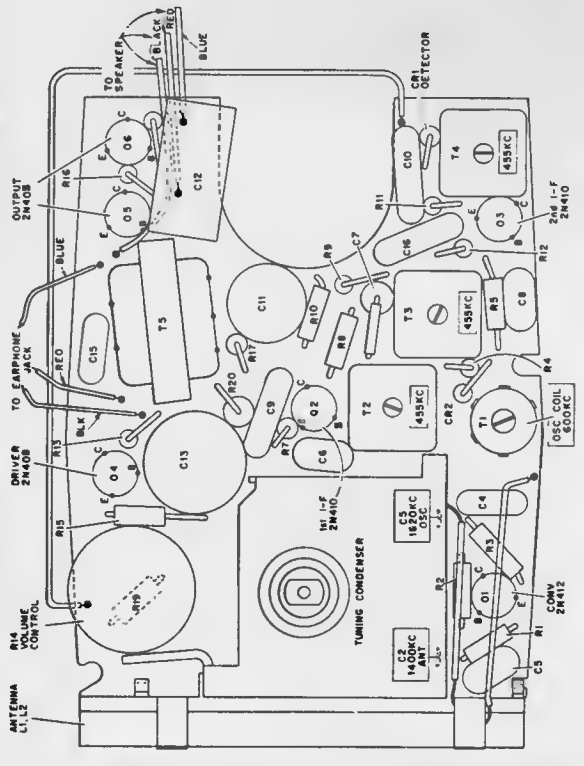
Chassis No. RC-1199B

Circuit Board No. 962537-1

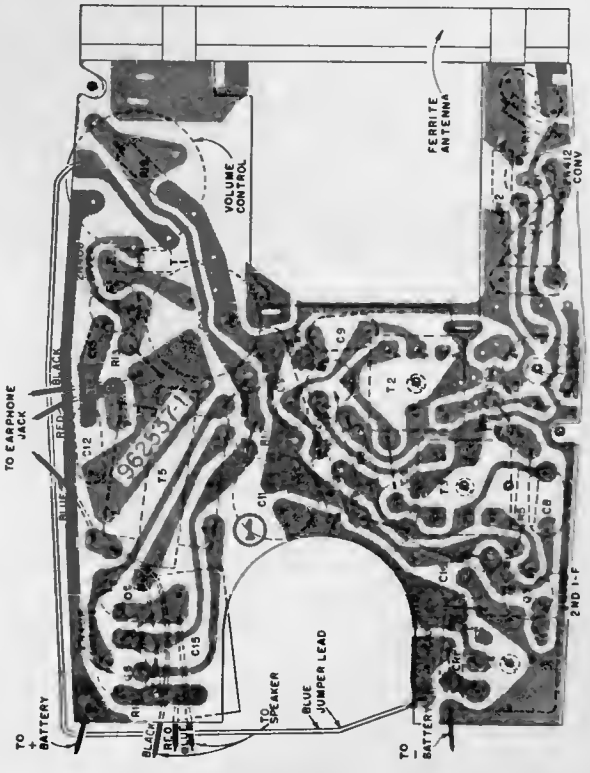


VOLTAGES MEASURED WITH "VOLTOHMYST" FROM (-) BATTERY (⏚), SHOULD HOLD WITHIN ±20% WITH NEW BATTERY, VOLUME CONTROL AT MINIMUM AND NO SIGNAL.
K=1000 ALL RESISTANCE VALUES IN OHMS
ALL CAPACITANCE VALUES LESS THAN 1.0 ARE IN MF, THOSE ABOVE 10 ARE IN MMF EXCEPT AS NOTED

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. Unsolder the three leads from the speaker terminals. The chassis may be serviced without disconnecting it from the speaker.
3. On the 1-TP-1 Series only, pull the dial knob off the tuning condenser shaft.
4. Remove the knurled nut holding the earphone jack to the case.
5. Remove the two screws holding the circuit board to the case and lift chassis from the case.



Chassis Layout — View from Component Side



Wiring and Components — View from Wiring Side

The assembly represented above is viewed from the wiring side of the board.
The printed wiring, on the near side of the board, is presented in "phantom" view superimposed on the component layout of the reverse side.

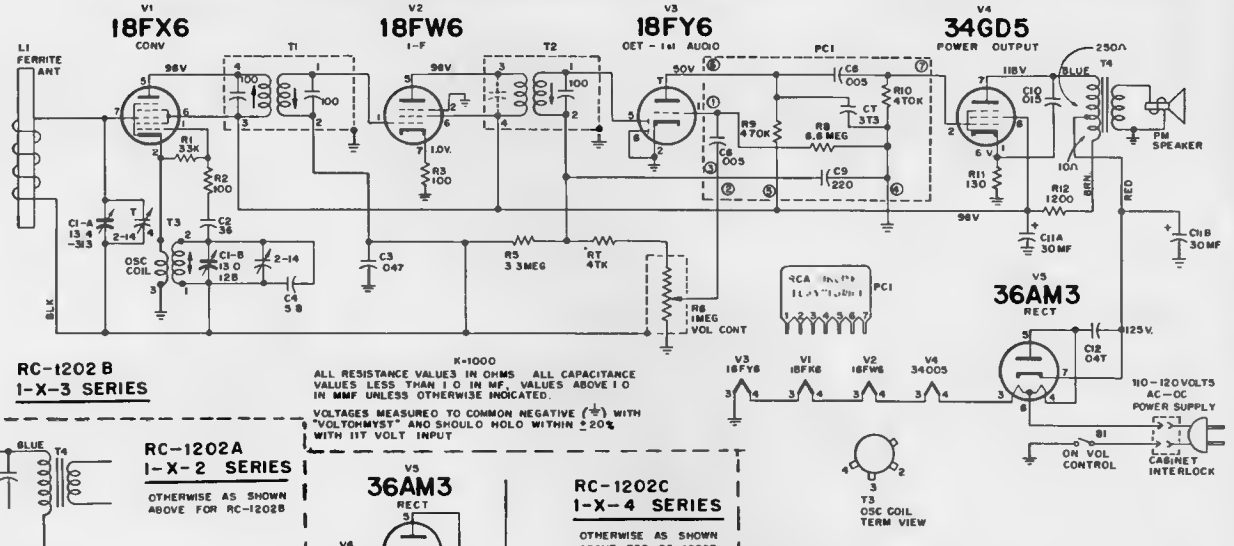
RCA

1-X-2 Series, 1-X-3 Series

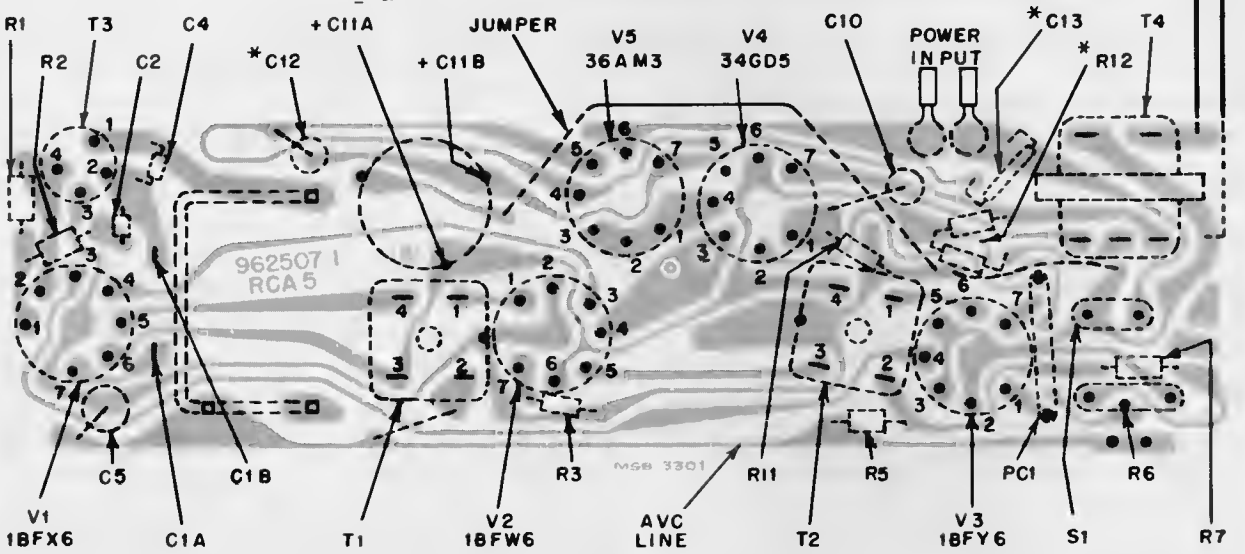
Chassis No. RC-1202A, RC-1202B

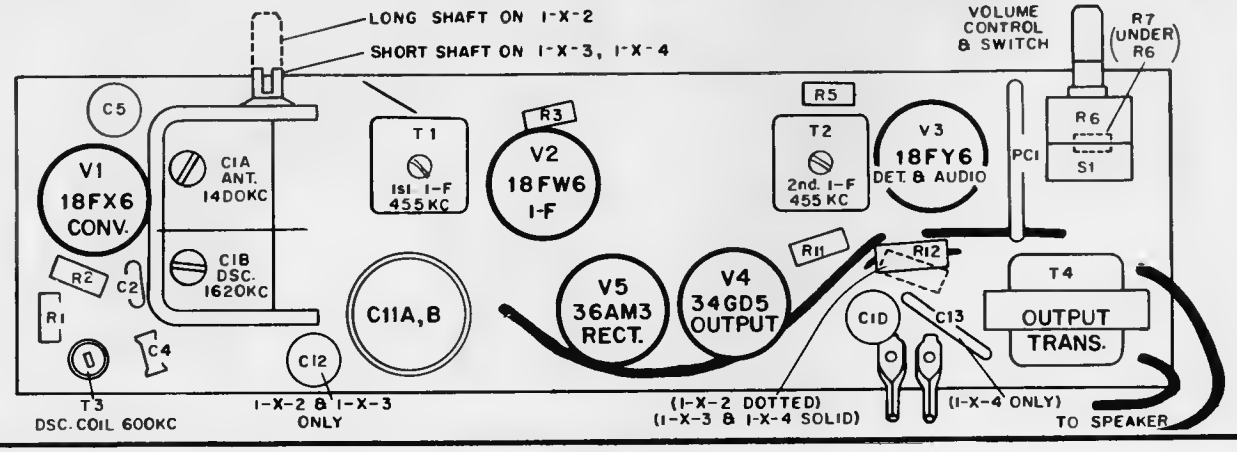
1-X-4 Series

Chassis No. RC-1202C



* C12 USED IN 1-X-2 & 1-X-3
C13 USED IN 1-X-4
TWO POSITIONS SHOWN FOR R12

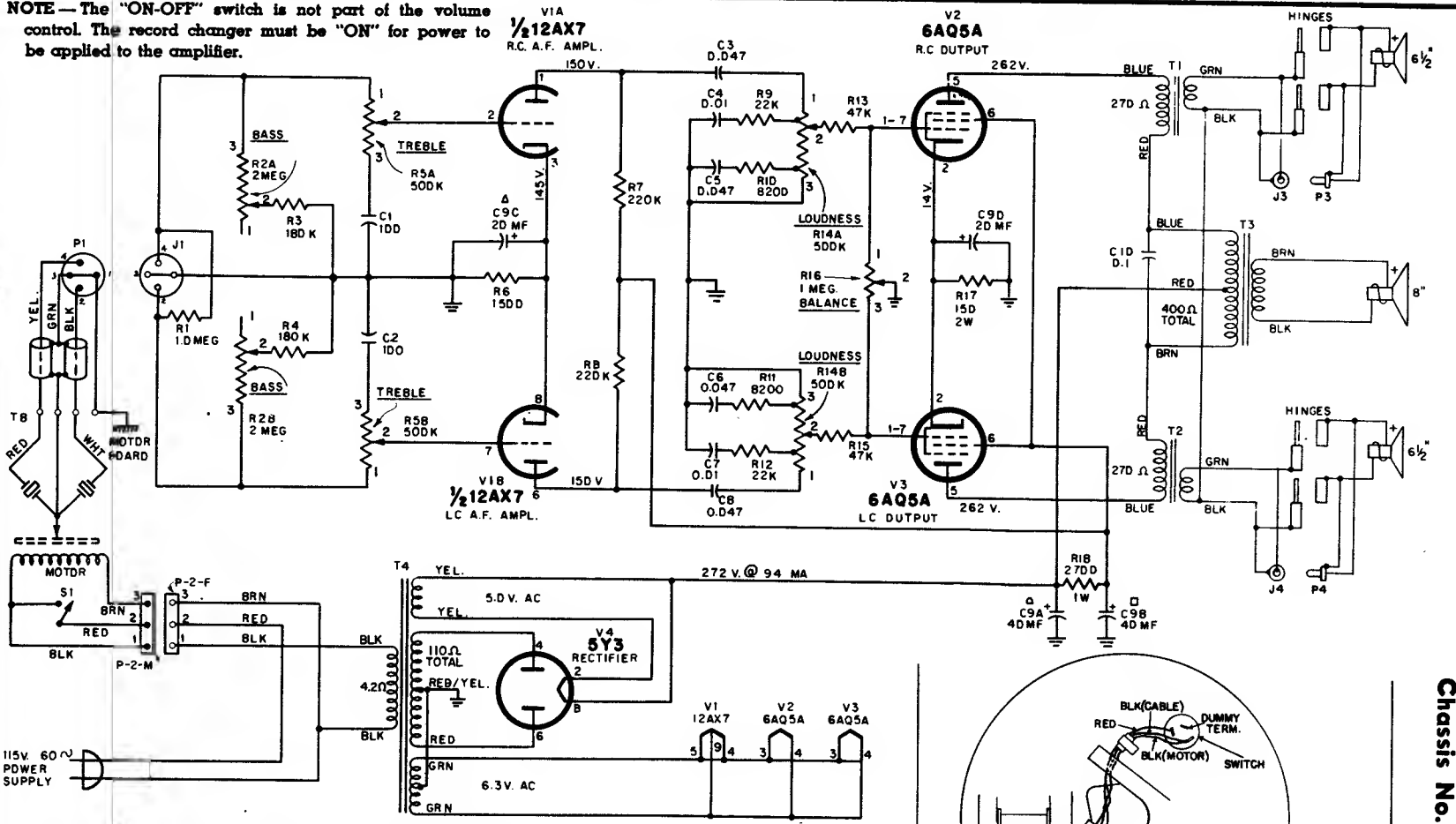




RCA VICTOR VP-34 SERIES

Chassis No. RS-34P

NOTE — The "ON-OFF" switch is not part of the volume control. The record changer must be "ON" for power to be applied to the amplifier.

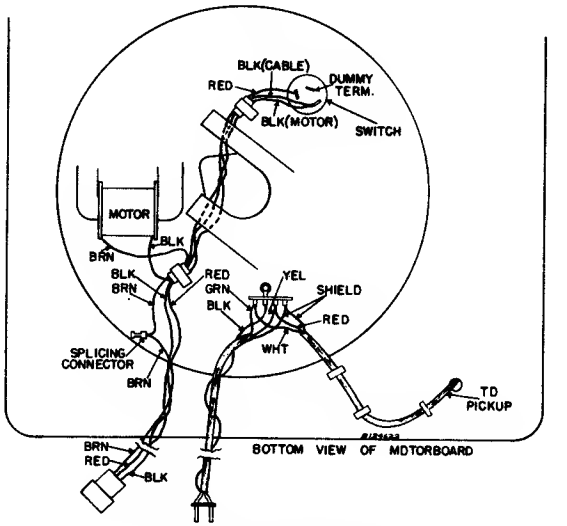


Model VP-34 is a portable stereo-orthophonic, hi-fidelity "Victrola." It is a complete multi-channel record playing system consisting of a record changer, an amplifier, and three speakers housed in a 3-piece luggage-type cabinet. The record changer, amplifier, and 8" PM "woofer" speaker are contained in the main unit. A 6½" PM "Duo-cone" speaker and its 10' interconnecting cable, are contained in each of the hinged, swing-out side units.

When carrying, the side units are closed across the front of the main unit and latched to it. When operating, the side units are swung out, one to each side of the main unit; in this position the hinges function as the speaker connectors. Should greater stereophonic effect be desired, the side units may be lifted off the main unit (split hinges) and placed equidistant from it at each side. When thus used, the interconnecting cables of the side units are plugged into the appropriate jacks

VOLTAGES MEASURED TO CHASSIS GROUND WITH "VOLTOHMYST" SHOULD HOLD WITHIN ± 20% WITH 115 V. LINE. VOLUME CONTROL AT MINIMUM NO SIGNAL.

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

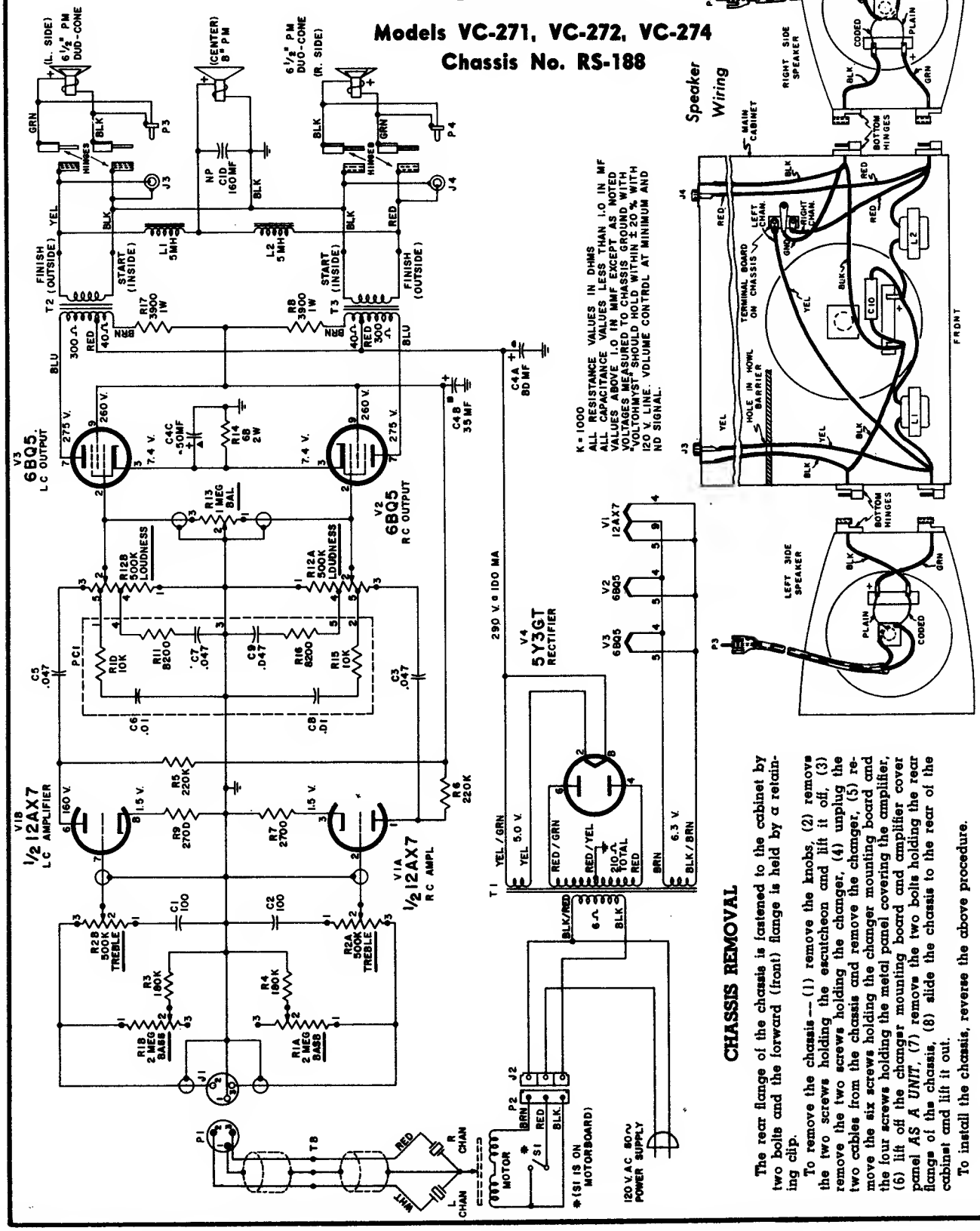


Record Changer Wiring

RCA VICTOR

VP-33 SERIES
VC-270 SERIES

Models VC-271, VC-272, VC-274
Chassis No. RS-188



CHASSIS REMOVAL

The rear flange of the chassis is fastened to the cabinet by two bolts and the forward (front) flange is held by a retaining clip.

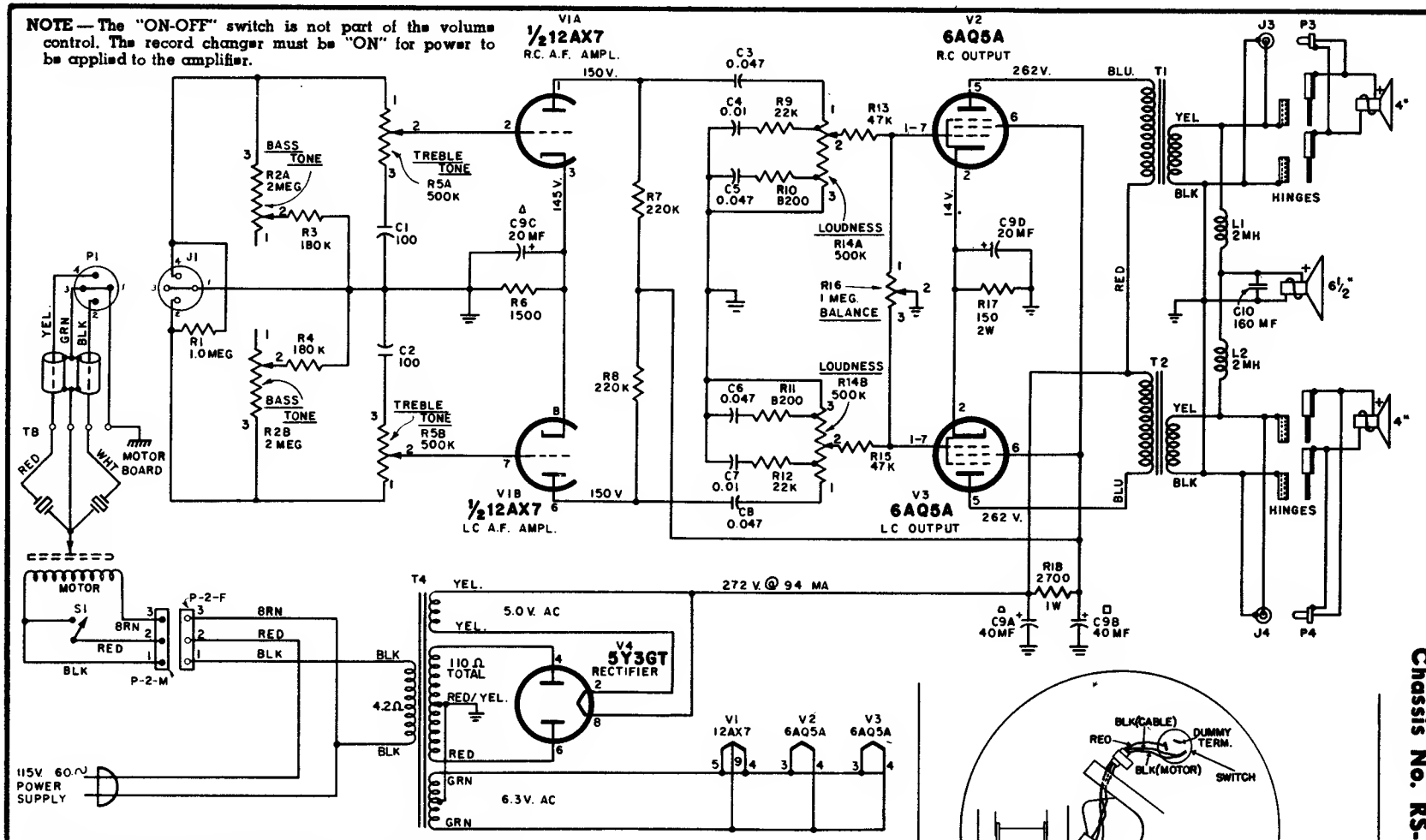
To remove the chassis — (1) remove the knobs, (2) remove the two screws holding the escutcheon and lift it off, (3) remove the two screws holding the changer, (4) unplug the two cables from the chassis and remove the changer, (5) remove the six screws holding the changer mounting board and the four screws holding the metal panel covering the amplifier, (6) lift off the changer mounting board and amplifier cover panel *AS A UNIT*, (7) remove the two bolts holding the rear flange of the chassis, (8) slide the chassis to the rear of the cabinet and lift it out.

To install the chassis, reverse the above procedure.

RCA VICTOR

MODEL VP-36

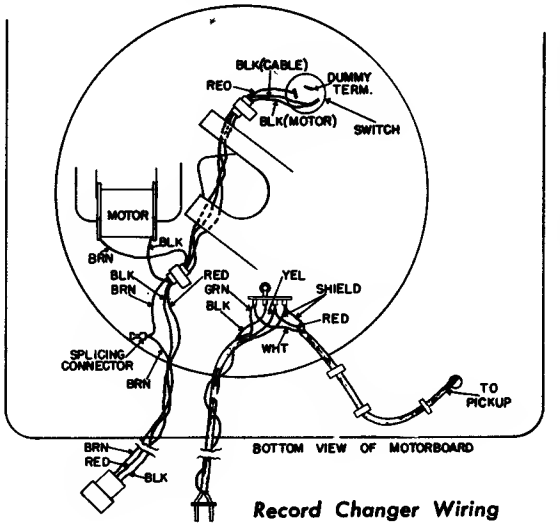
Chassis No. RS-182A



Model VP-36 is a portable stereo-orthophonic, hi-fidelity "Victrola." It is a complete multi-channel record playing system consisting of a record changer, an amplifier, and three speakers housed in a 3-piece luggage-type cabinet. The record changer, amplifier, and 6½" PM "woofer" speaker are contained in the main unit. A 4" PM "Duo-cone" speaker, and its 10' interconnecting cable, are contained in each of the hinged swing-out side units.

When carrying, the side units are closed across the front of the main unit and latched to it. When operating, the side units are swung out, one to each side of the main unit; in this position the hinges function as the speaker connectors. Should greater stereophonic effect be desired, the side units may be lifted off the main unit (split hinges) and placed equidistant from it at each side.

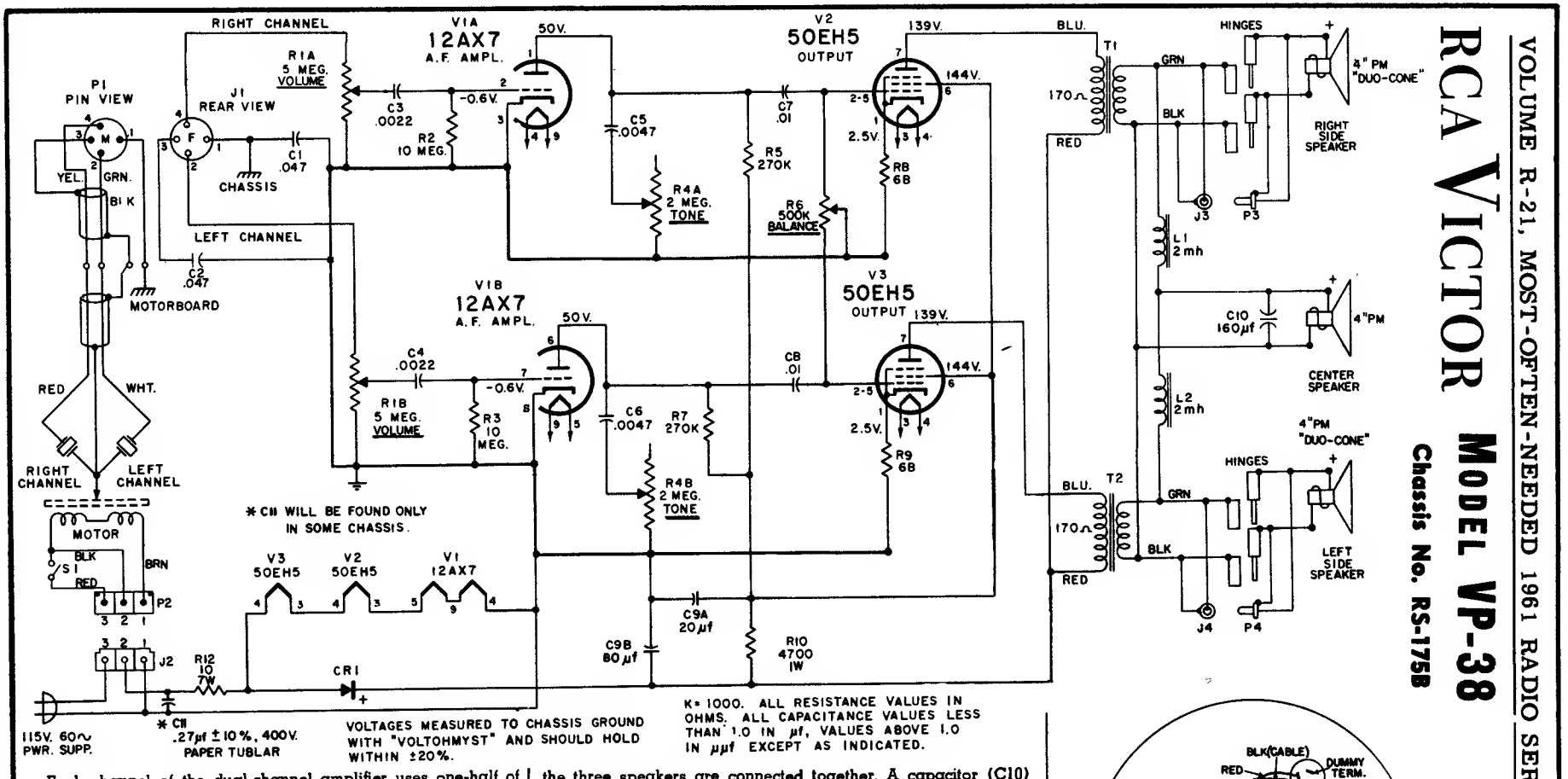
VOLTAGES MEASURED TO CHASSIS GROUND WITH "VOLTOHMYST" SHOULD HOLD WITHIN ± 20% WITH 115 V. LINE.
VOLUME CONTROL AT MINIMUM NO SIGNAL.
K= 1000
ALL RESISTANCE VALUES IN OHMS.
ALL CAPACITANCE VALUES LESS THAN 1.0 IN MF. VALUES ABOVE 1.0 IN MMF. EXCEPT AS INDICATED.



Record Changer Wiring

RCA VICTOR MODEL VP-38

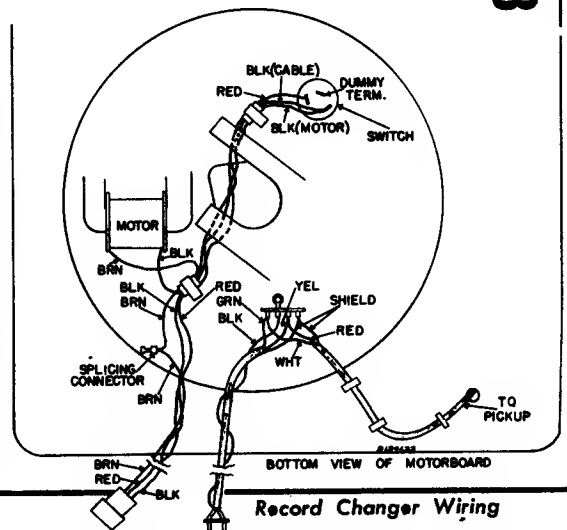
Chassis No. RS-175B



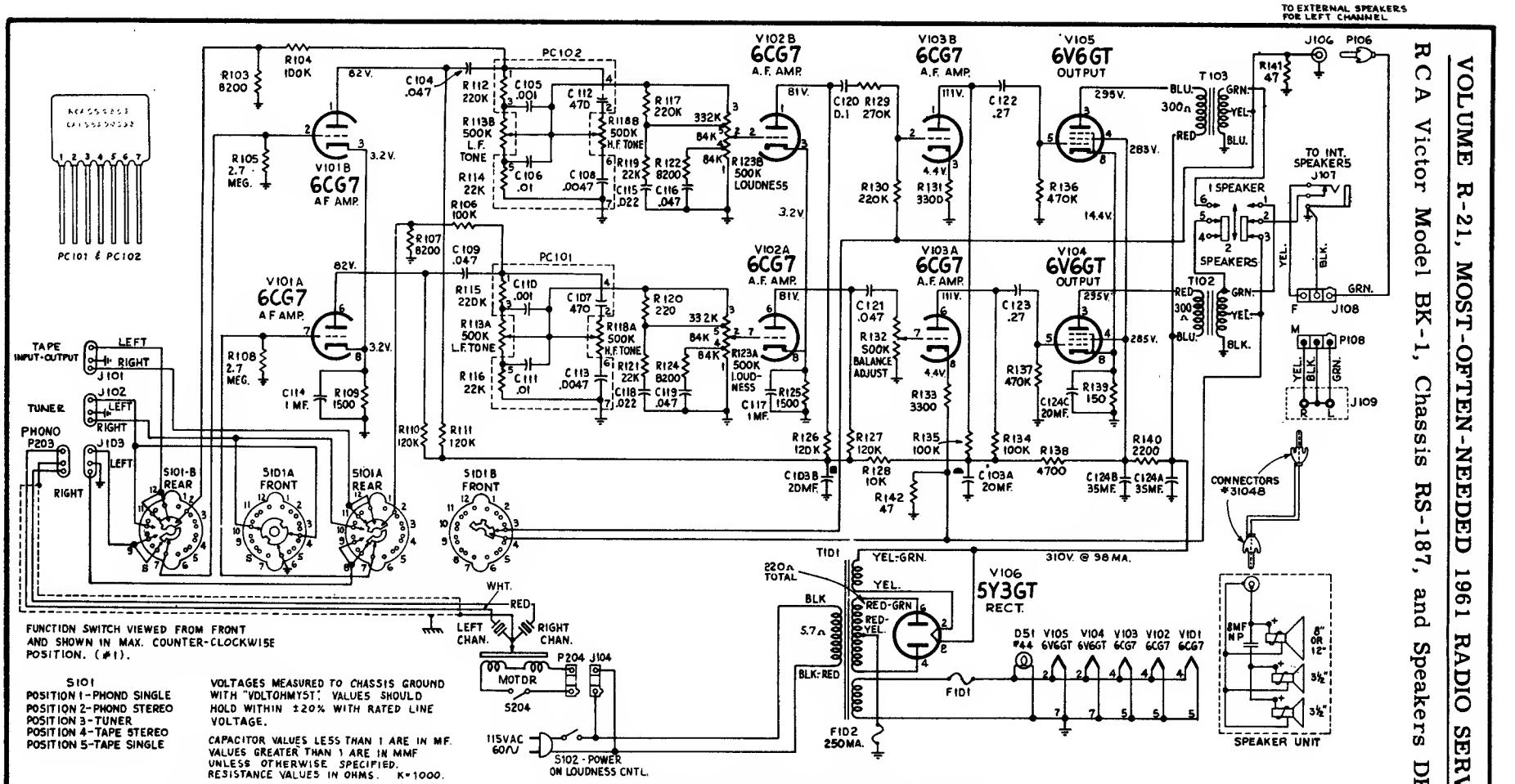
Each channel of the dual-channel amplifier uses one-half of the 12AX7 tube as an AF amplifier, and one of the 50EH5 tubes as a power amplifier. The Volume and Tone controls are dual section potentiometers; one section of each control is connected in each channel, thus providing simultaneous regulation of the two channels. The Balance control is a single section potentiometer connected between the grid circuits of the two output stages; it has its variable arm grounded. Channel balance is achieved as the arm of the control moves toward one end or the other, thus decreasing the gain of one channel while concurrently increasing the gain of the other.

Multi-channel operation is accomplished by the use of three speaker systems and a filter network in the speaker circuitry. The left and right side speakers are direct connected to their respective output transformers. Two reactors (L1 and L2) are connected in series between the high sides of the two output transformer secondaries, and the center speaker is connected to the junction of the two reactors. The low (ground) side of the three speakers are connected together. A capacitor (C10) is connected across the center speaker.

The side speakers are designed primarily to reproduce only those frequencies in the middle and higher ranges. The two 2mh reactors (L1 and L2) pass and combine the low frequencies of the two side channels to the center speaker. The 160 μf capacitor (C10) acts as an additional bypass to filter out any of the middle range and higher frequencies thus preventing their reproduction by the center speaker. To prevent *electrical* cancellation of frequencies at the center speaker, the side-channel signals must be in-phase; this condition is achieved by the use of an "in-phase" pickup. In this system the middle range and higher frequencies, wherein lay the greatest stereophonic effect, are reproduced only in the left and right side speakers; and the combined low frequencies, of the two side channels, are reproduced in the center speaker. The cross-over frequency is approximately 200 cycles.



Record Changer Wiring



CHANNEL GAIN EQUALIZATION

A gain equalization control is provided to enable the gain of the RIGHT CHANNEL speakers to be balanced with the gain of the LEFT CHANNEL speakers.

This equalization control (R132) is located on the bottom apron of the chassis toward the front of the cabinet. When adjusting this control, four conditions must exist.

1. A monaural signal input must be used. This should be a monaural record; use a frequency test record when measuring with an output meter or use a music record for listening test.
2. The function switch (S101) must be in #2 position (PH STEREO). This enables the two channels to have independent outputs.
3. The speaker selection switch (S103) must be in the "2 SPKRS" position. This is necessary for the two channels to have independent outputs.
4. Both Right and Left speaker systems must be connected or the outputs loaded equally with resistors. If output is measured with an output meter, a channel having no speakers connected will have an abnormally high output voltage reading.

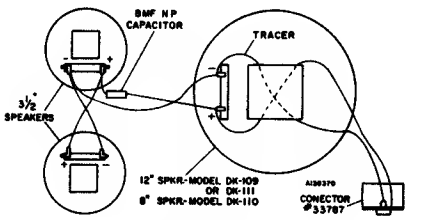
Adjust the equalization control (R132) to obtain right channel output equal to left channel output. The left channel gain is not adjustable.

SPEAKER SELECTION SWITCH

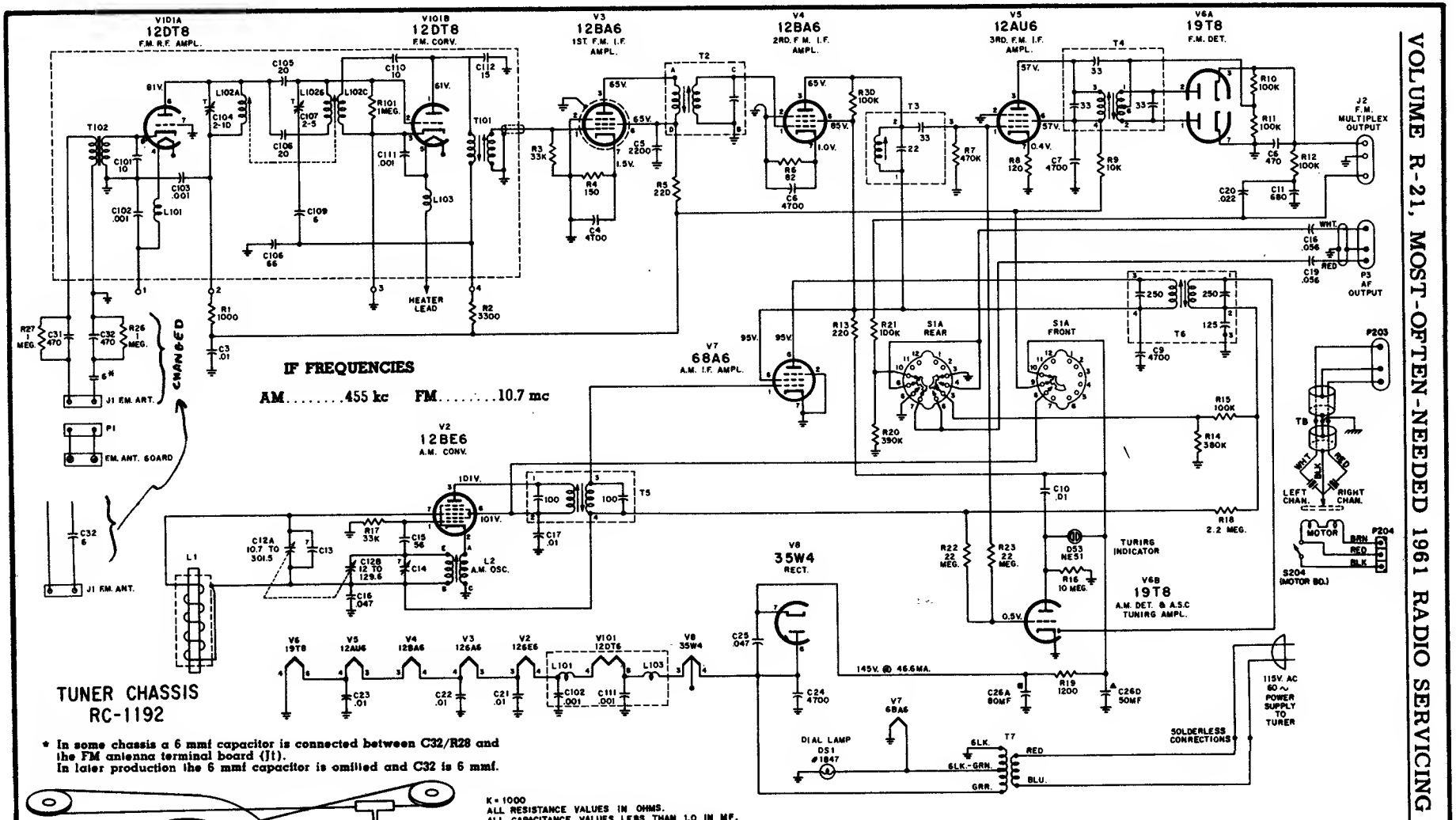
The speaker selection switch (S103) must be set at "1 SPKR" at all times except when a speaker unit is connected to the left channel output J109L.

When only one speaker unit is used it should be connected to J109R.

For stereophonic reproduction, speaker units must be connected to both J109R and J109L. The speaker selection switch must be set at "2 SPKR".



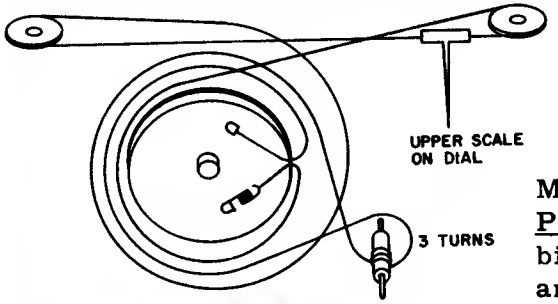
Speaker Connection Diagram



* In some chassis a 6 mmf capacitor is connected between C32/R28 and the FM antenna terminal board (J1). In later production the 6 mmf capacitor is omitted and C32 is 6 mmf.

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

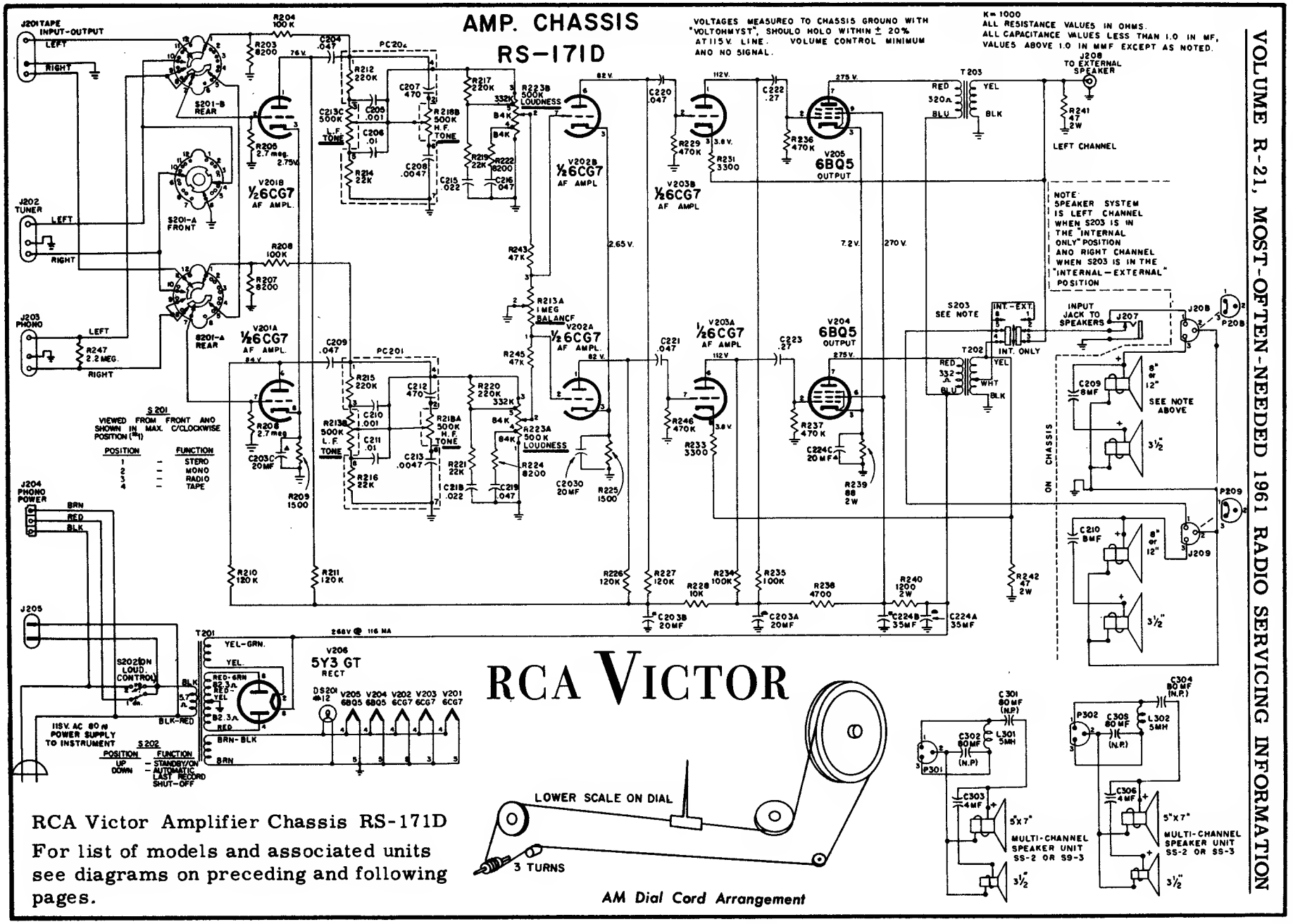
VOLTAGES MEASURED TO CHASSIS GROUND WITH "VOLTOHMYST" SHOULD HOLD WITHIN ± 20 % AT 115 V. LINE. VOLUME CONTROL MINIMUM AND NO SIGNAL.



FM Dial Cord Arrangement

RCA VICTOR

Models TPM-11, TPM-12, TPM-13, VC-13, VCR-13, VC-14, VCR-14, VC-16, PM-17, VC-17, PM-18, and VC-22, all use tuner RC-1192. Some of these combinations use Pre-Amplifier RS-179 and Power Amplifier RS-177A. Others use amplifier RS-171D or RS-171F. Material above and on the next two pages.

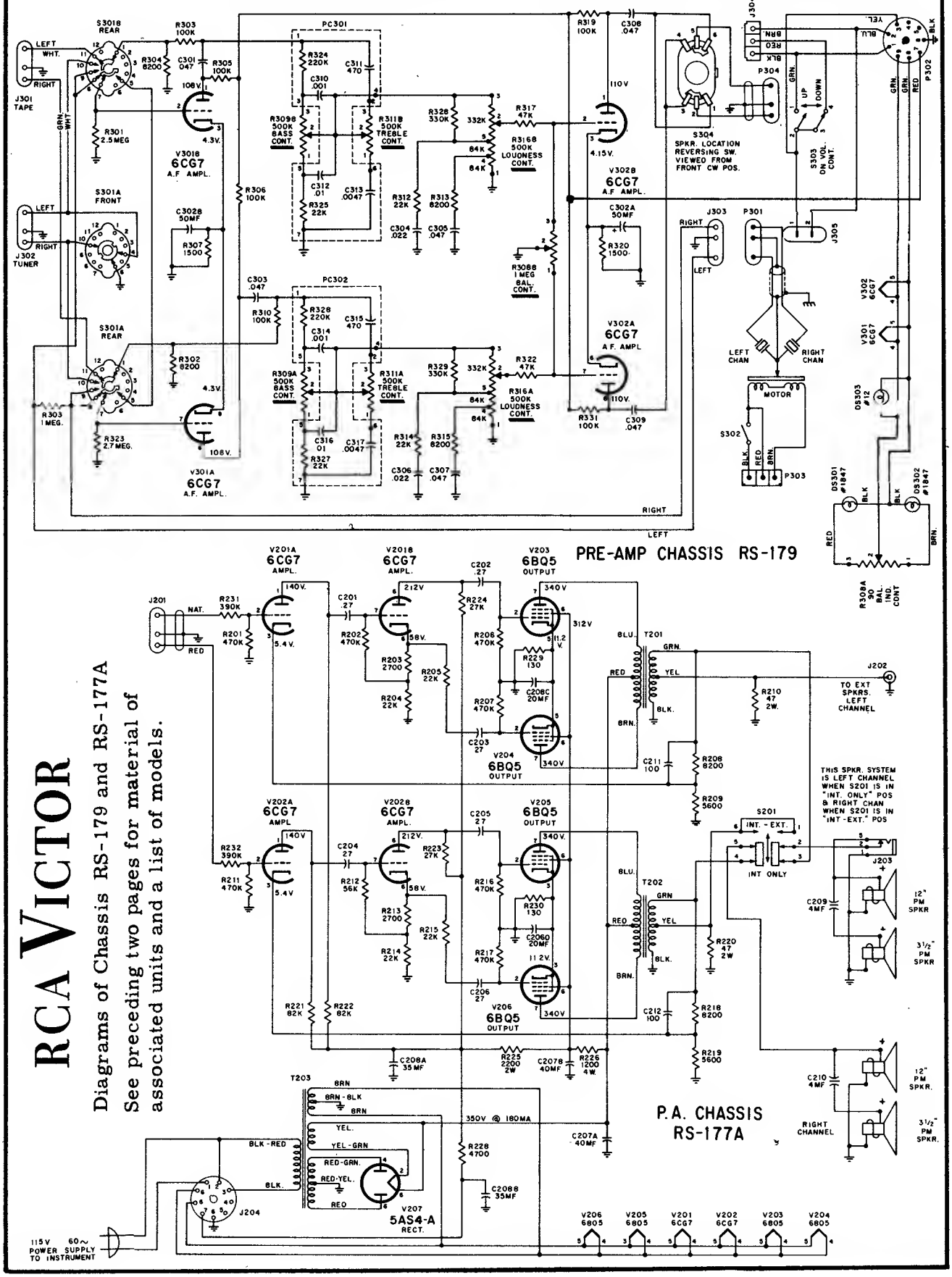


RCA VICTOR

AM Dial Cord Arrangement

RCA Victor Amplifier Chassis RS-171D

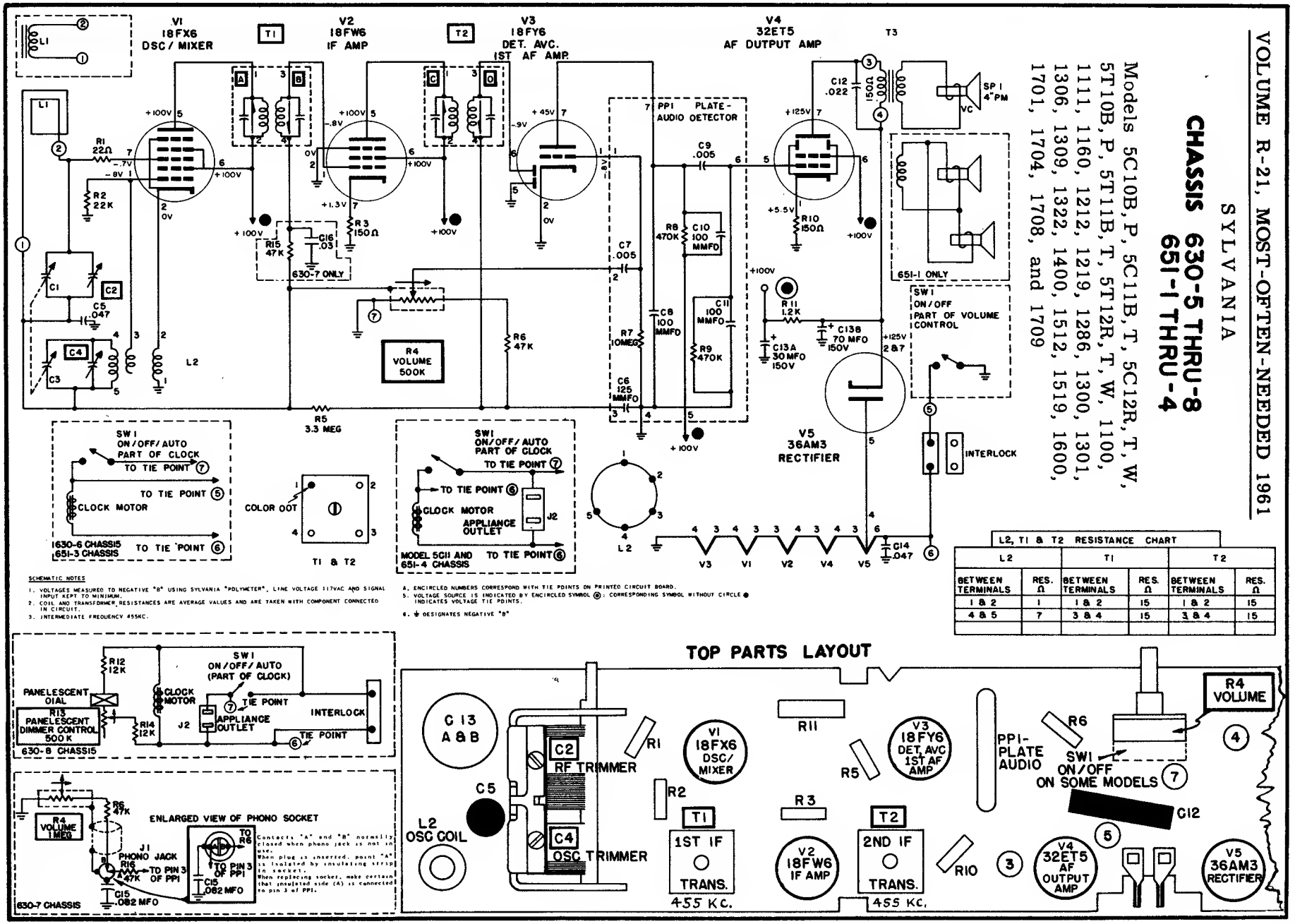
For list of models and associated units see diagrams on preceding and following pages.


PRE-AMP CHASSIS RS-179
P.A. CHASSIS RS-177A
RCA VICTOR
Diagrams of Chassis RS-179 and RS-177A
See preceding two pages for material of associated units and a list of models.
S3018 REAR
S301A FRONT
S301A REAR
J301 TAPE
J302 TUNER
V3018 6CG7 A.F. AMPL.
V3028 6CG7 A.F. AMPL.
V302A 6CG7 A.F. AMPL.
V301A 6CG7 A.F. AMPL.
PC301
PC302
S304 SPKR. LOCATION REVERSING SW. VIEWED FROM FRONT CW POS.
S303 ON VOL. CONT.
P304
P302
P301
J303
J305
S302
P303
LEFT CHAN
RIGHT CHAN
MOTOR
DS303 #12
DS301 #1847
DS302 #1847
R308A 50 BAL. IND. CONT
V201A 6CG7 AMPL.
V201B 6CG7 AMPL.
V203 6BQ5 OUTPUT
V204 6BQ5 OUTPUT
V202A 6CG7 AMPL
V202B 6CG7 AMPL.
V205 6BQ5 OUTPUT
V206 6BQ5 OUTPUT
V207 5AS4-A RECT.
T201
T202
T203
J201
J202
J203
J204
S201
TO EXT SPKRS. LEFT CHANNEL
THIS SPKR. SYSTEM IS LEFT CHANNEL WHEN S201 IS IN "INT. ONLY" POS & RIGHT CHAN WHEN S201 IS IN "INT-EXT." POS
INT. - EXT.
INT ONLY
12" PM SPKR
3½" PM SPKR
RIGHT CHANNEL
350V @ 180MA
115V 60~ POWER SUPPLY TO INSTRUMENT
V206 6BQ5
V205 6BQ5
V201 6CG7
V202 6CG7
V203 6BQ5
V204 6BQ5

SYLVANIA

CHASSIS 630-5 THRU-8 651-1 THRU-4

Models 5C10B, P, 5C11B, T, 5C12R, T, W, 5T10B, P, 5T11B, T, 5T12R, T, W, 1100, 1111, 1160, 1212, 1219, 1286, 1300, 1301, 1306, 1309, 1322, 1400, 1512, 1519, 1600, 1701, 1704, 1708, and 1709



SCHEMATIC NOTES

1. VOLTAGES MEASURED TO NEGATIVE "B" USING SYLVANIA "POLYMETER". LINE VOLTAGE 117VAC AND SIGNAL INPUT KEPT TO MINIMUM.
2. COIL AND TRANSFORMER RESISTANCES ARE AVERAGE VALUES AND ARE TAKEN WITH COMPONENT CONNECTED IN CIRCUIT.
3. INTERMEDIATE FREQUENCY 455KC.
4. ENCIRCLED NUMBERS CORRESPOND WITH TIE POINTS ON PRINTED CIRCUIT BOARD.
5. VOLTAGE SOURCE IS INDICATED BY ENCIRCLED SYMBOL Ⓐ; CORRESPONDING SYMBOL WITHOUT CIRCLE Ⓐ INDICATES VOLTAGE TIE POINTS.
6. ⏚ DESIGNATES NEGATIVE "B"

L2, T1 & T2 RESISTANCE CHART

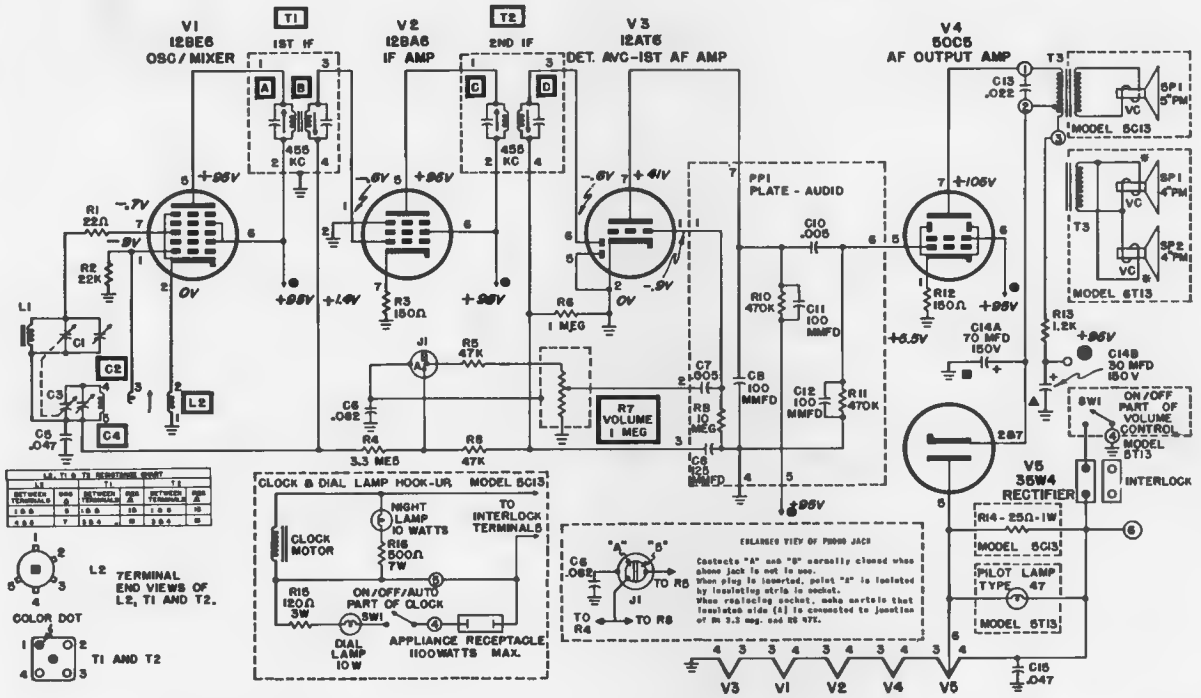
L2		T1		T2	
BETWEEN TERMINALS	RES. Ω	BETWEEN TERMINALS	RES. Ω	BETWEEN TERMINALS	RES. Ω
1 & 2	1	1 & 2	15	1 & 2	15
4 & 5	7	3 & 4	15	3 & 4	15

Contacts "A" and "B" normally closed when phono jack is not in use. When plug is inserted, point "A" is isolated by insulating strip in socket. When replacing socket, make certain that insulated side (A) is connected to pin 3 of PP1.

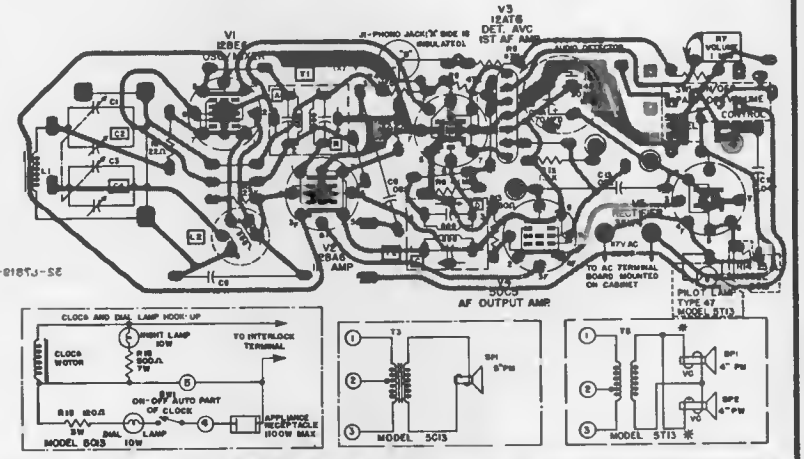
TOP PARTS LAYOUT

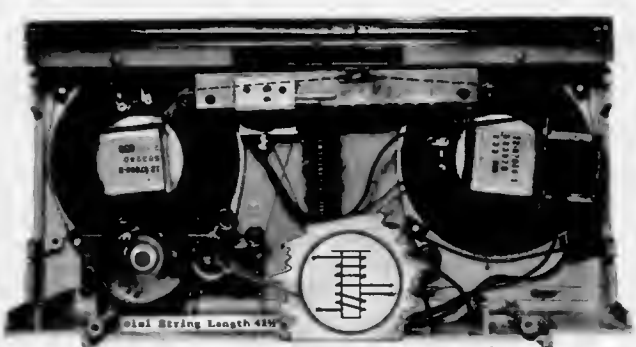
SYLVANIA

CHASSIS: 631-2,-3
MODELS: 5C13, 5T13

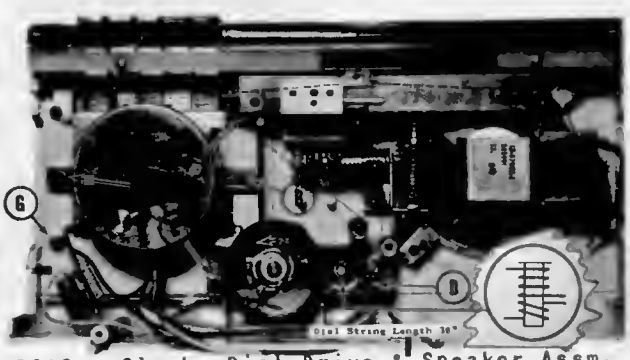


I.F. 455 KC. Encircled numbers correspond with tie points on printed board. Voltage source is indicated by encircled dot symbol; corresponding symbol dot without circle is voltage tie point. Ground ⏚ is B- and reference point for voltage measurements.

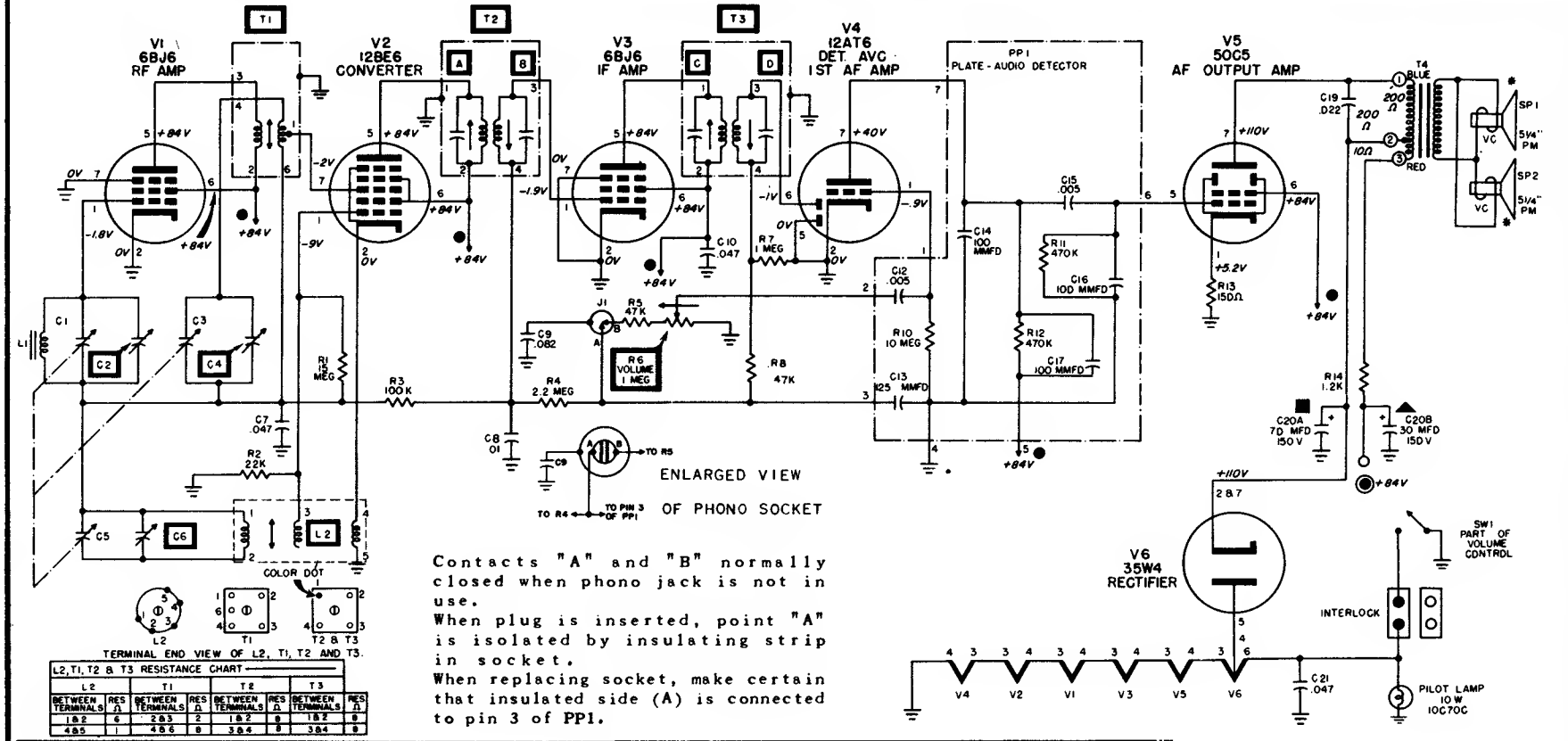




5T13 - Dial Drive & Speaker Assm.

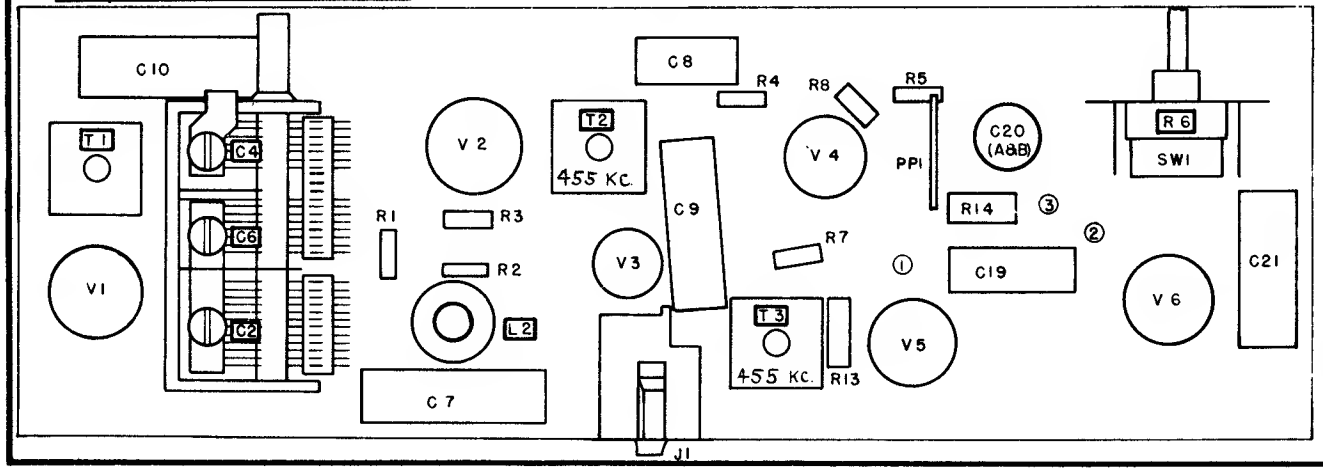


5C13 - Clock, Dial Drive & Speaker Assm.



L2, T1, T2 & T3 RESISTANCE CHART

L2		T1		T2		T3	
BETWEEN TERMINALS	RES Ω	BETWEEN TERMINALS	RES Ω	BETWEEN TERMINALS	RES Ω	BETWEEN TERMINALS	RES Ω
1&2	6	2&3	2	1&2	0	1&2	0
4&5	1	4&6	0	3&4	0	3&4	0

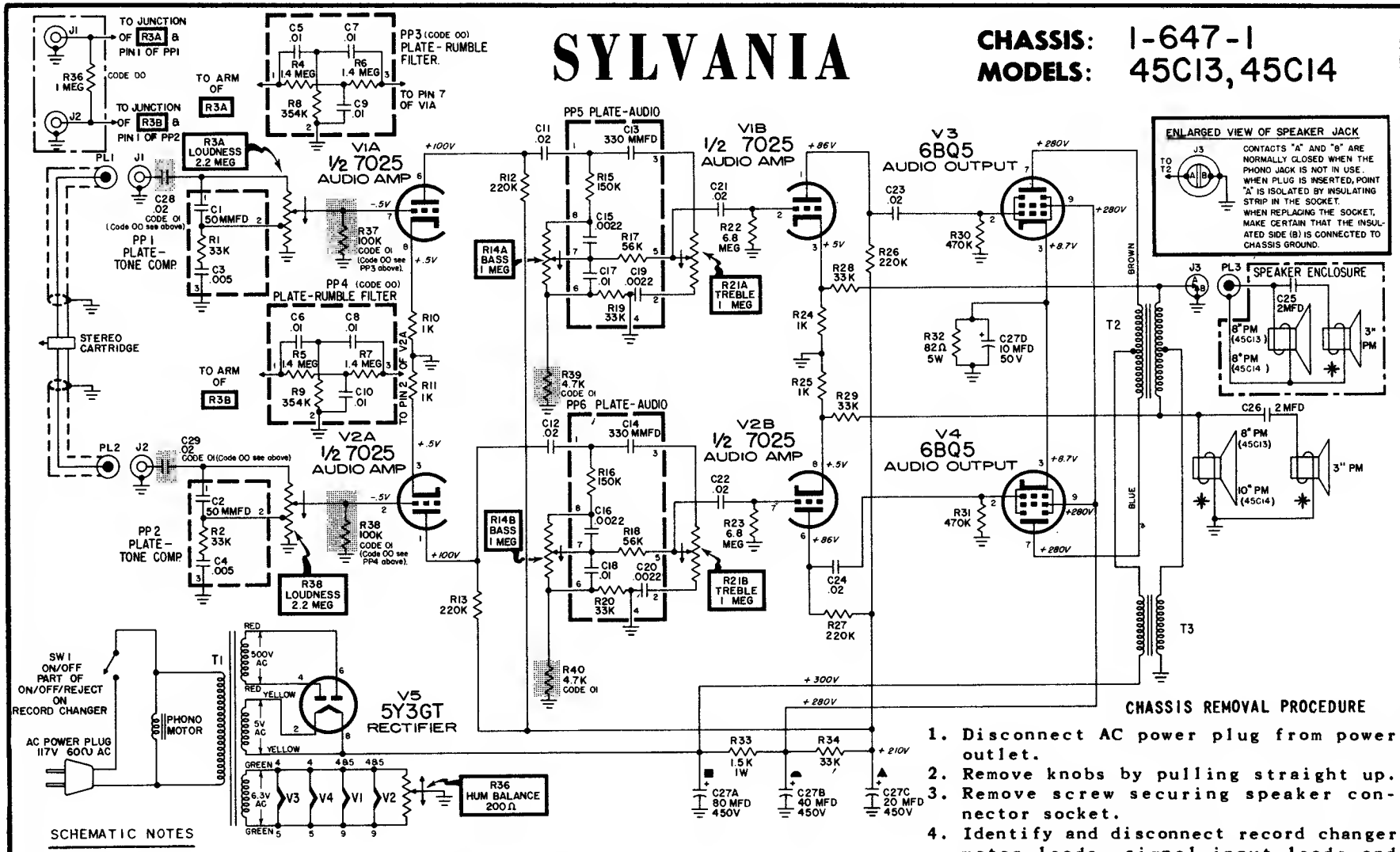


SYLVANIA

CHASSIS: 632-3
MODELS: 6T14 SERIES

SYLVANIA

CHASSIS: 1-647-1
MODELS: 45C13, 45C14



SCHEMATIC NOTES

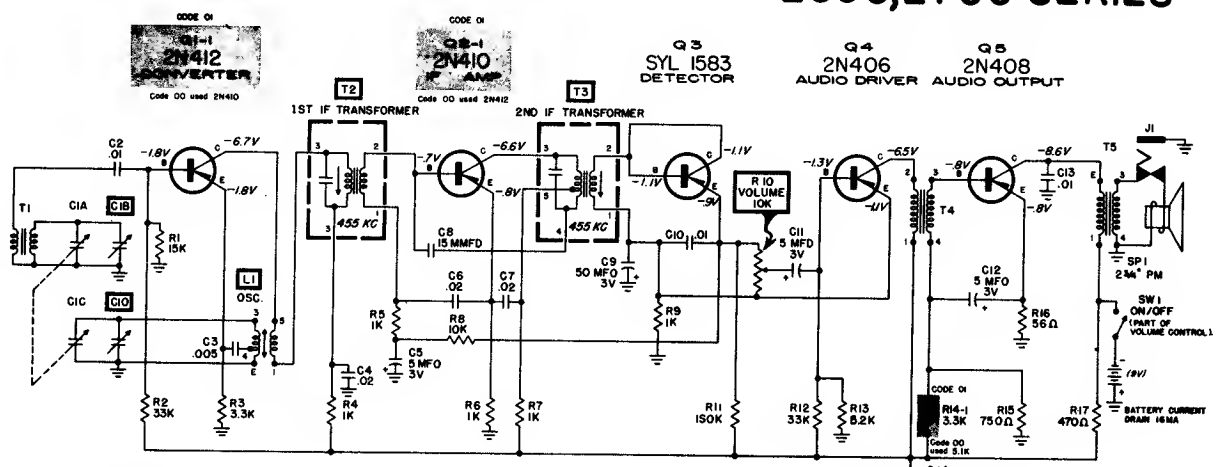
1. VOLTAGES SHOWN ARE AVERAGE READINGS MEASURED TO CHASSIS WITH NO SIGNAL INPUT. VARIATIONS MAYBE NOTED DUE TO NORMAL PRODUCTION TOLERANCES.
2. LINE VOLTAGE 117 VOLT 60 CYCLE.
3. LOUDNESS, BASS AND TREBLE CONTROLS ARE DUAL GANGED CONTROLS.
4. SHADED AREAS DESIGNATE CODE CHANGES.
5. ALL CAPACITORS IN MICROFORADS UNLESS OTHERWISE SPECIFIED.
6. ✱ INDICATE COLOR DOT ON SPEAKERS FOR CORRECT PHASING.
7. ⏚ DESIGNATE CHASSIS GROUND.

CHASSIS REMOVAL PROCEDURE

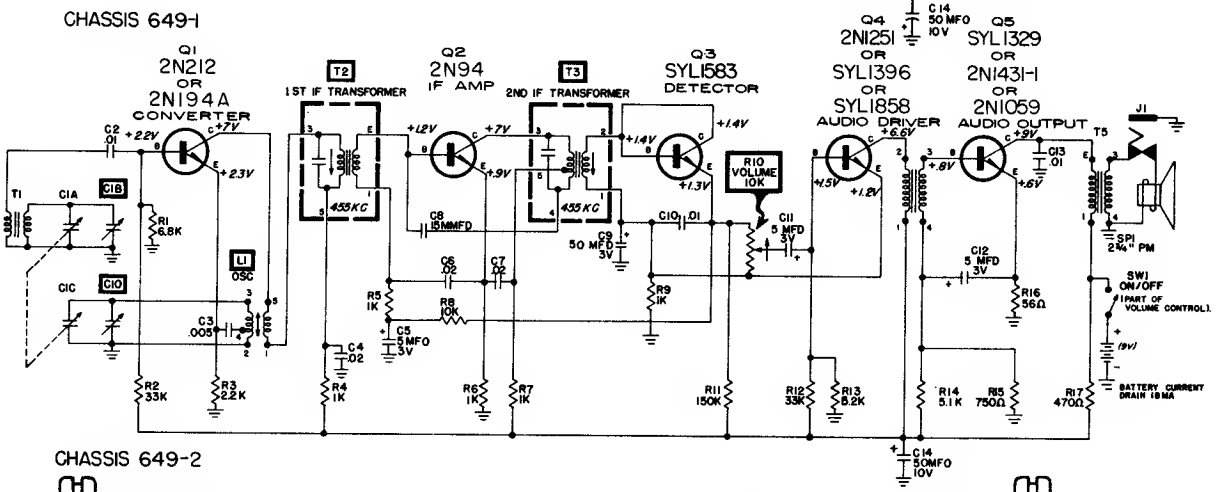
1. Disconnect AC power plug from power outlet.
2. Remove knobs by pulling straight up.
3. Remove screw securing speaker connector socket.
4. Identify and disconnect record changer motor leads, signal input leads and speaker leads.
5. While supporting chassis remove the three (3) screws securing chassis mounting board to cabinet. Remove chassis and board.
6. For under chassis tests, etc. remove the four (4) screws securing chassis to board. Remove board.

SYLVANIA

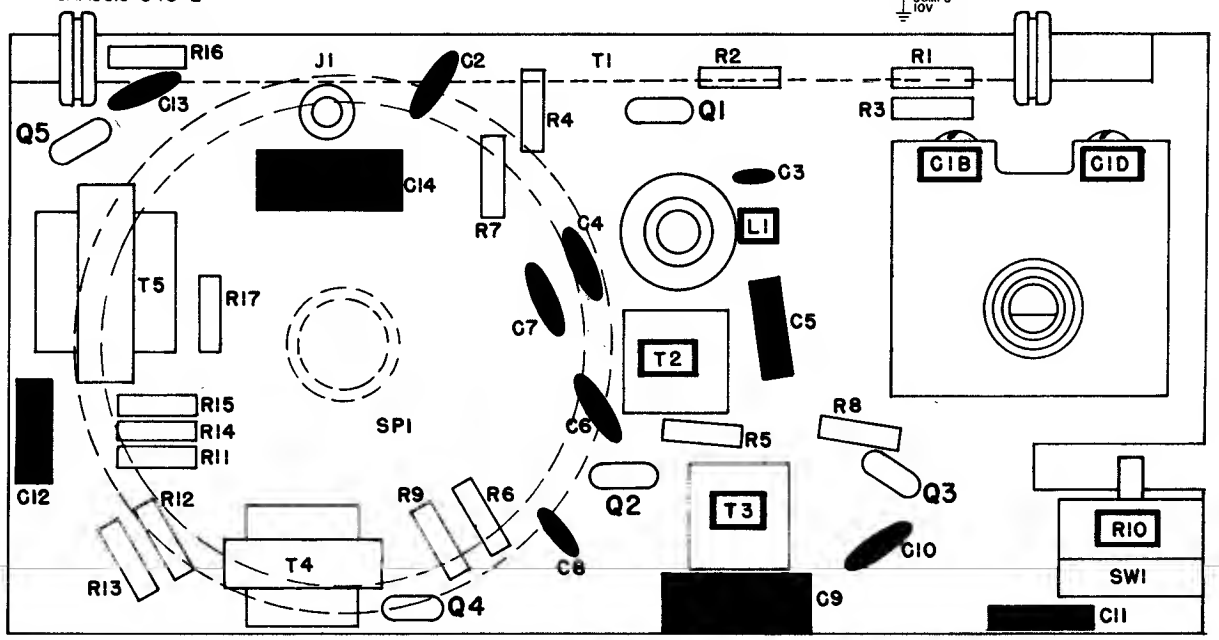
CHASSIS: 649-1,-2
MODELS: 5P16
2300,2400,2500,
2600,2700 SERIES



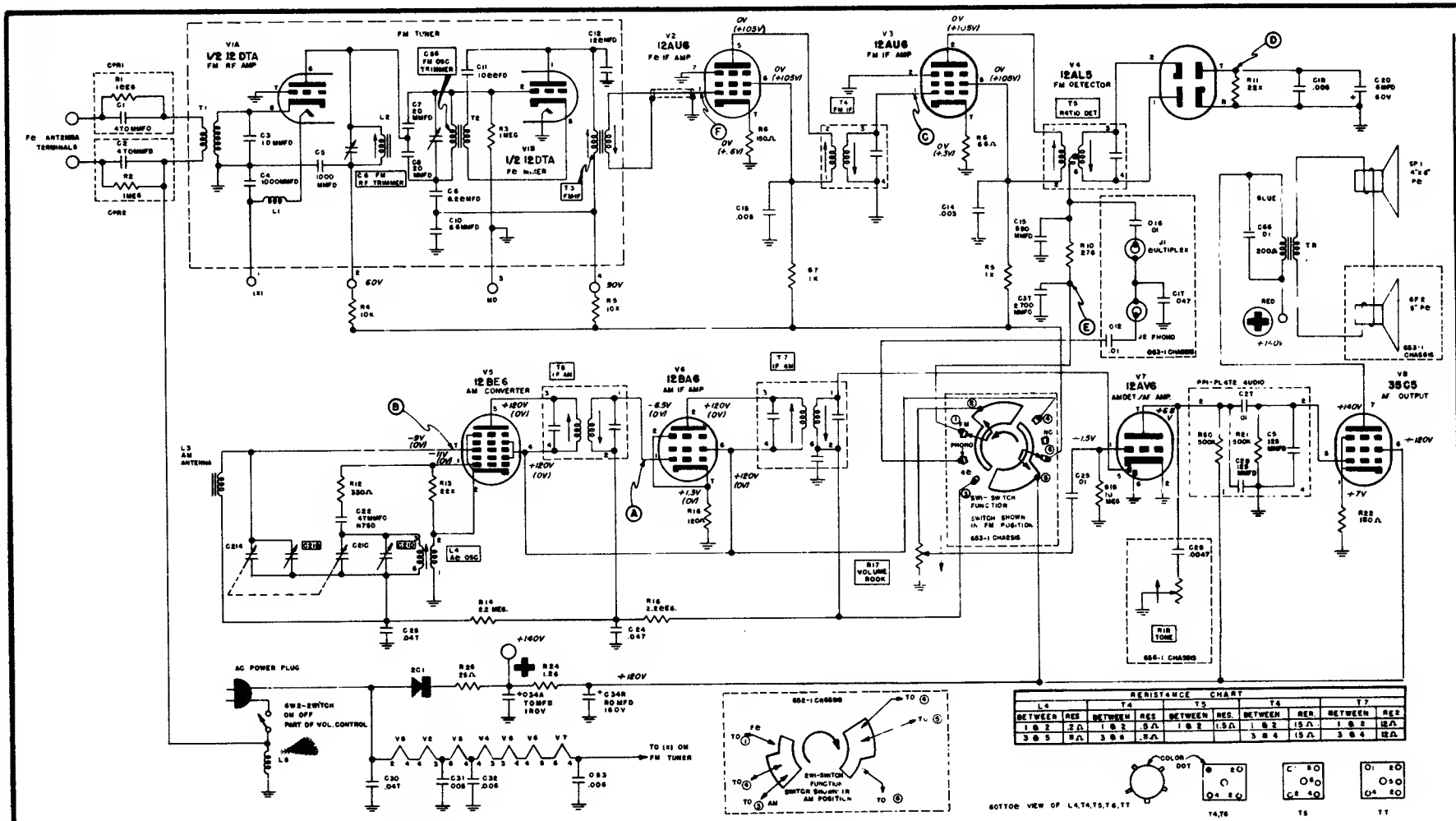
CHASSIS 649-1



CHASSIS 649-2



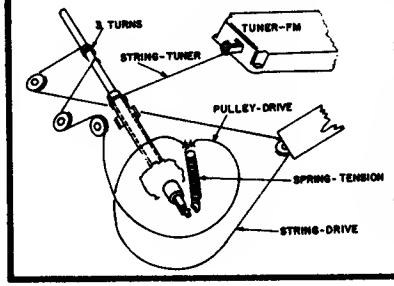
TOP VIEW - PRINTED BOARD ASSEMBLY



RESISTANCE CHART

L4		T4		T5		T6		T7	
BETWEEN	RES	BETWEEN	RES	BETWEEN	RES.	BETWEEN	RES.	BETWEEN	RES
1 & 2	2Ω	1 & 2	.5Ω	1 & 2	1.5Ω	1 & 2	15Ω	1 & 2	12Ω
3 & 5	9Ω	3 & 6	.5Ω			3 & 4	15Ω	3 & 4	12Ω

DRIVE STRING REPLACEMENT



Replacement of drive string may be accomplished as shown in the illustration. Install string as shown, winding three turns clockwise around tuning shaft with the turns progressing toward the rear of the chassis. After string is installed, rotate the tuning shaft several times in order to take up any slack in the string.

Ths string from the FM tuner to the tuning shaft is wound two (2) turns counterclockwise snd then tied to the clip.

SPECIFICATIONS

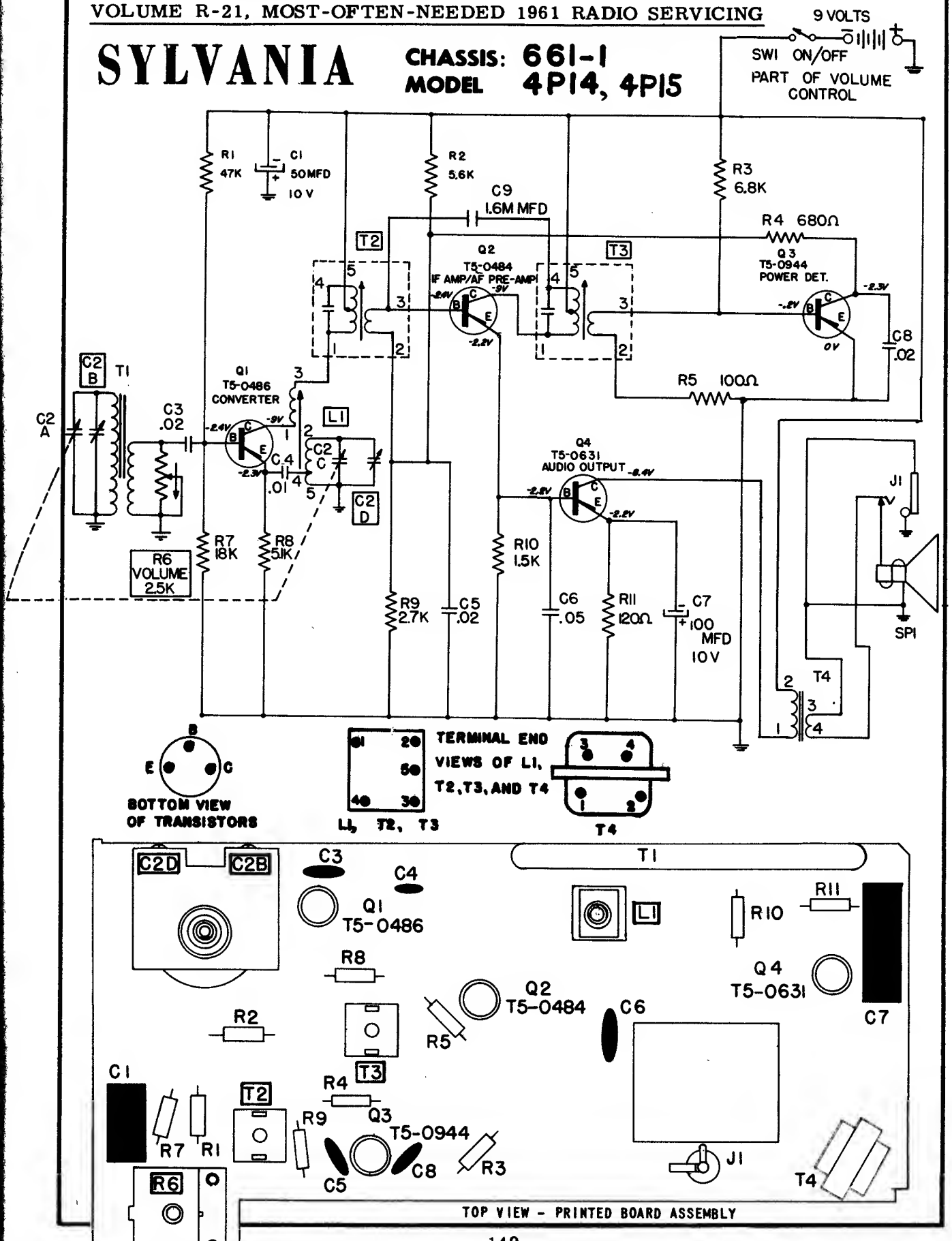
FREQUENCY RANGE (AM) 540KC to 1650KC
FREQUENCY RANGE (FM) 88MC to 108MC
POWER SUPPLY 117 VOLTS, 60 CYCLE (AC)
POWER CONSUMPTION..... 35 WATTS
INTERMEDIATE FREQUENCY (IF) AM 455KC
INTERMEDIATE FREQUENCY (IF) FM 10.7MC

SYLVANIA

CHASSIS: 652-1/653-1
MODELS: 8F15, 8F16

SYLVANIA

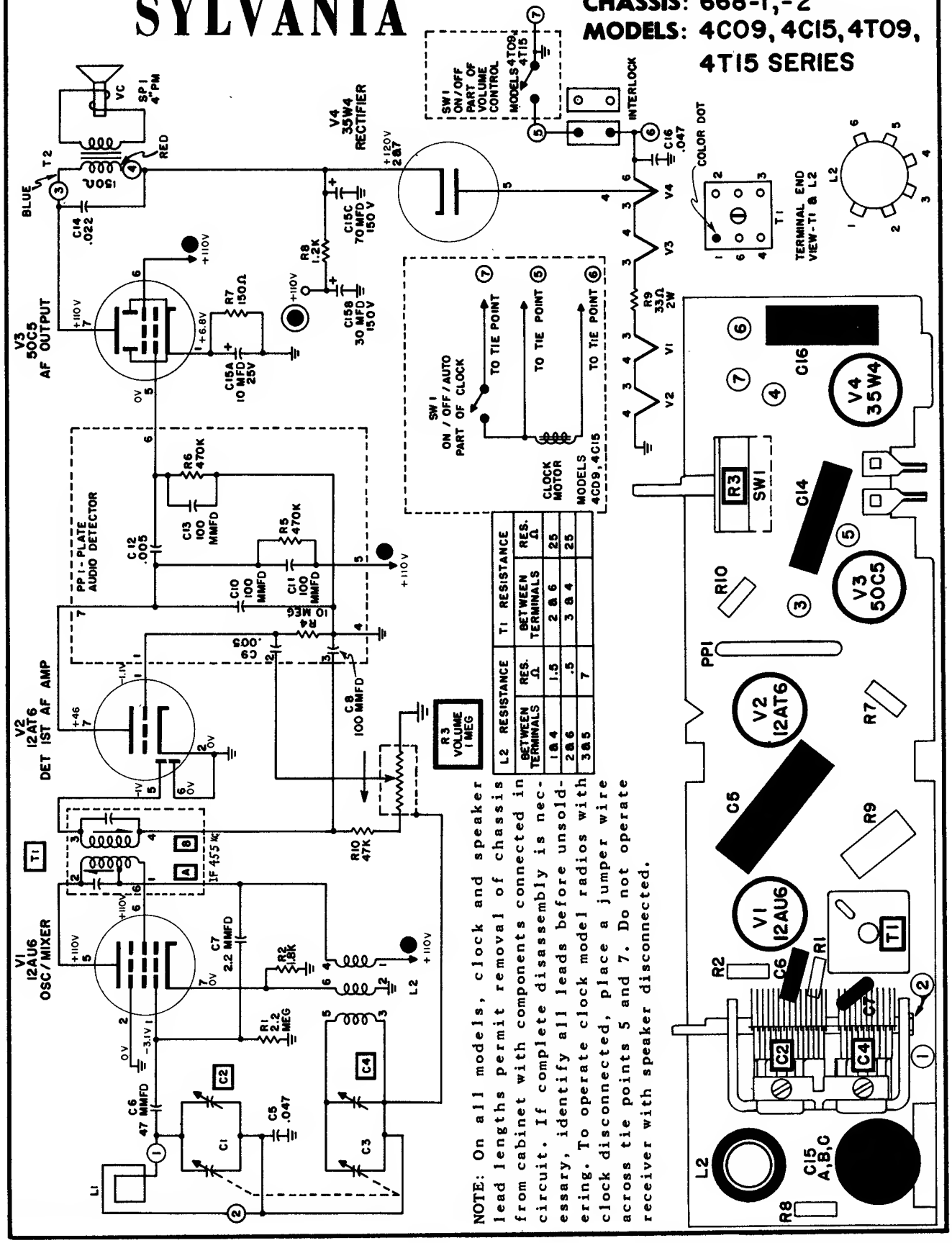
CHASSIS: 661-1
MODEL 4P14, 4P15



TOP VIEW - PRINTED BOARD ASSEMBLY

SYLVANIA

CHASSIS: 668-1,-2
MODELS: 4C09, 4C15, 4T09, 4T15 SERIES



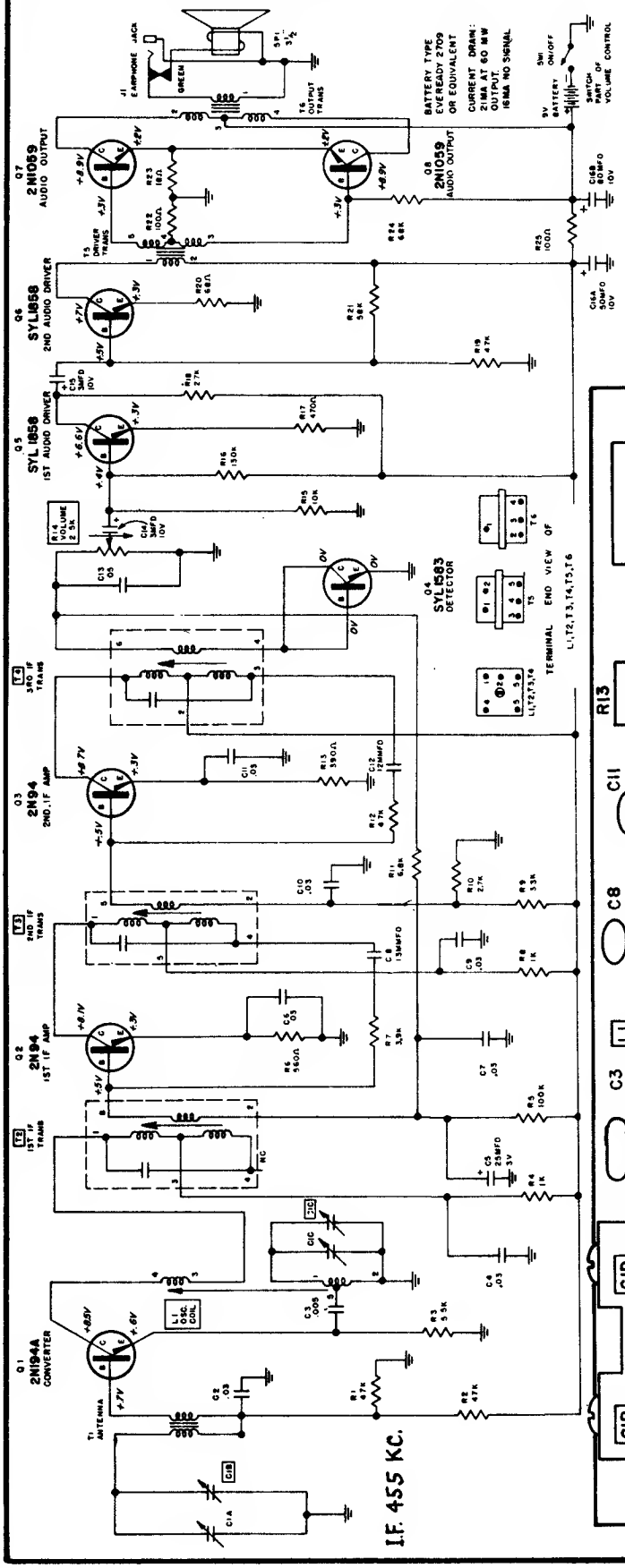
L2 RESISTANCE		T1 RESISTANCE	
BETWEEN TERMINALS	RES. Ω	BETWEEN TERMINALS	RES. Ω
1 & 4	1.5	2 & 6	25
2 & 6	.5	3 & 4	25
3 & 5	7		

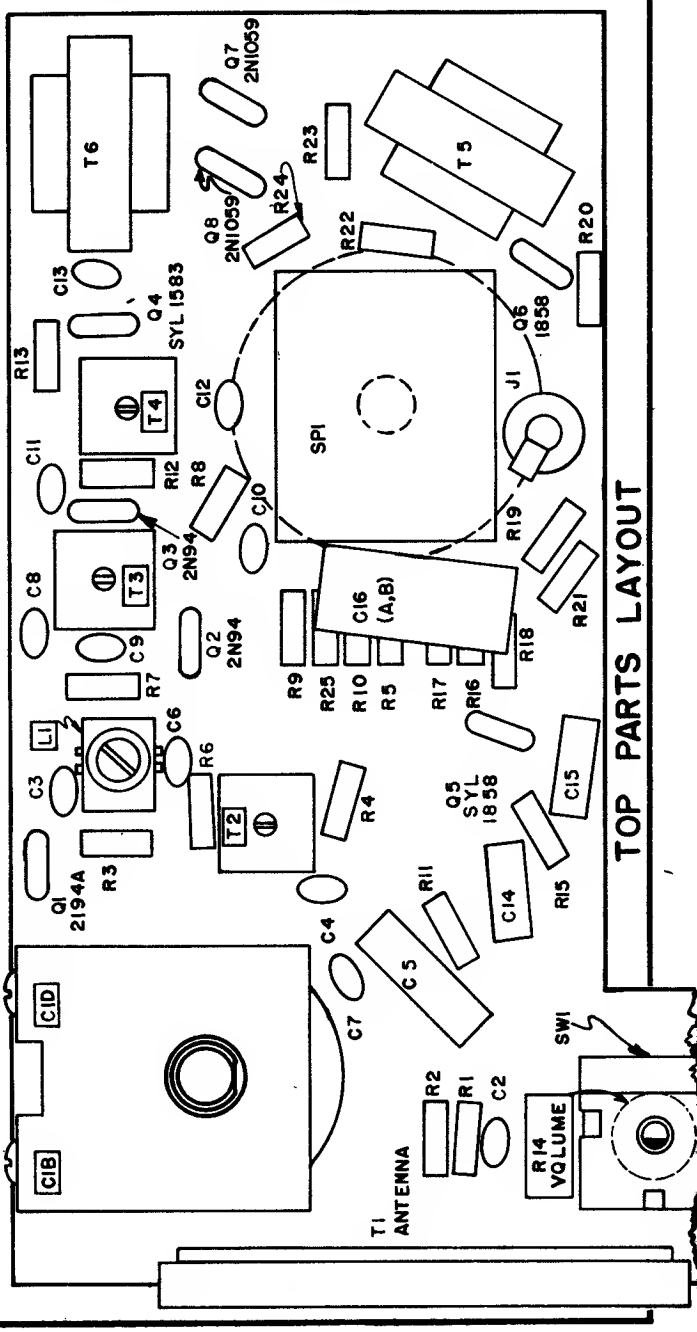
NOTE: On all models, clock and speaker lead lengths permit removal of chassis from cabinet with components connected in circuit. If complete disassembly is necessary, identify all leads before unsoldering. To operate clock model radios with clock disconnected, place a jumper wire across tie points 5 and 7. Do not operate receiver with speaker disconnected.

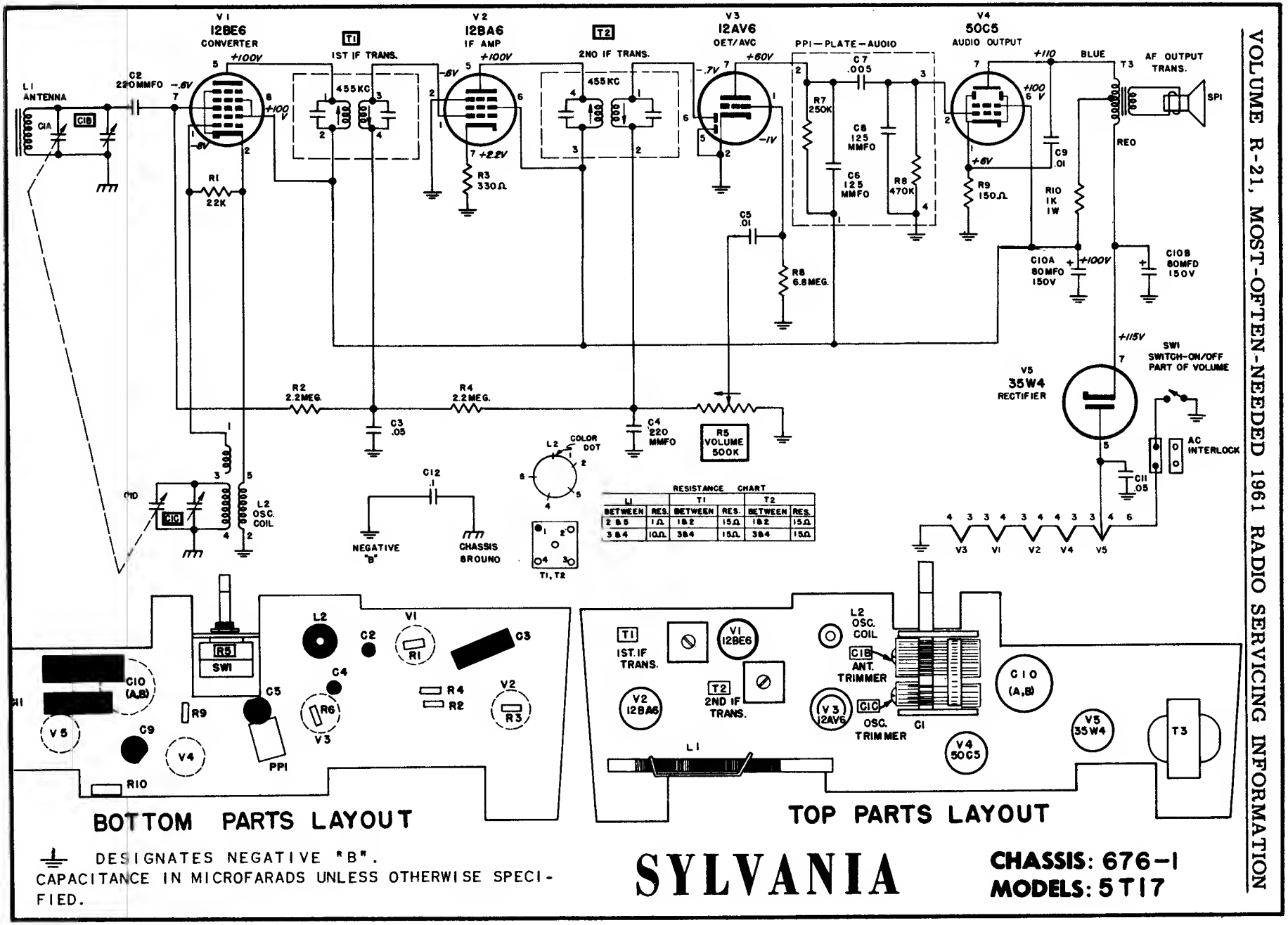
SYLVANIA

CHASSIS: 673—1
MODELS: 8P18 SERIES

RESISTANCE CHART												
L1		T2		T3		T4		T5		T6		
BETWEEN	RES	BETWEEN	RES	BETWEEN	RES	BETWEEN	RES	BETWEEN	RES	BETWEEN	RES.
182	5Ω	183	35Ω	183	35Ω	182	25Ω	182	300Ω	284	100Ω
185	5Ω	184	75Ω	184	75Ω	185	5Ω	384	150Ω	283	55Ω
384	1Ω	285	1Ω	285	1Ω	485	1Ω	385	250Ω		







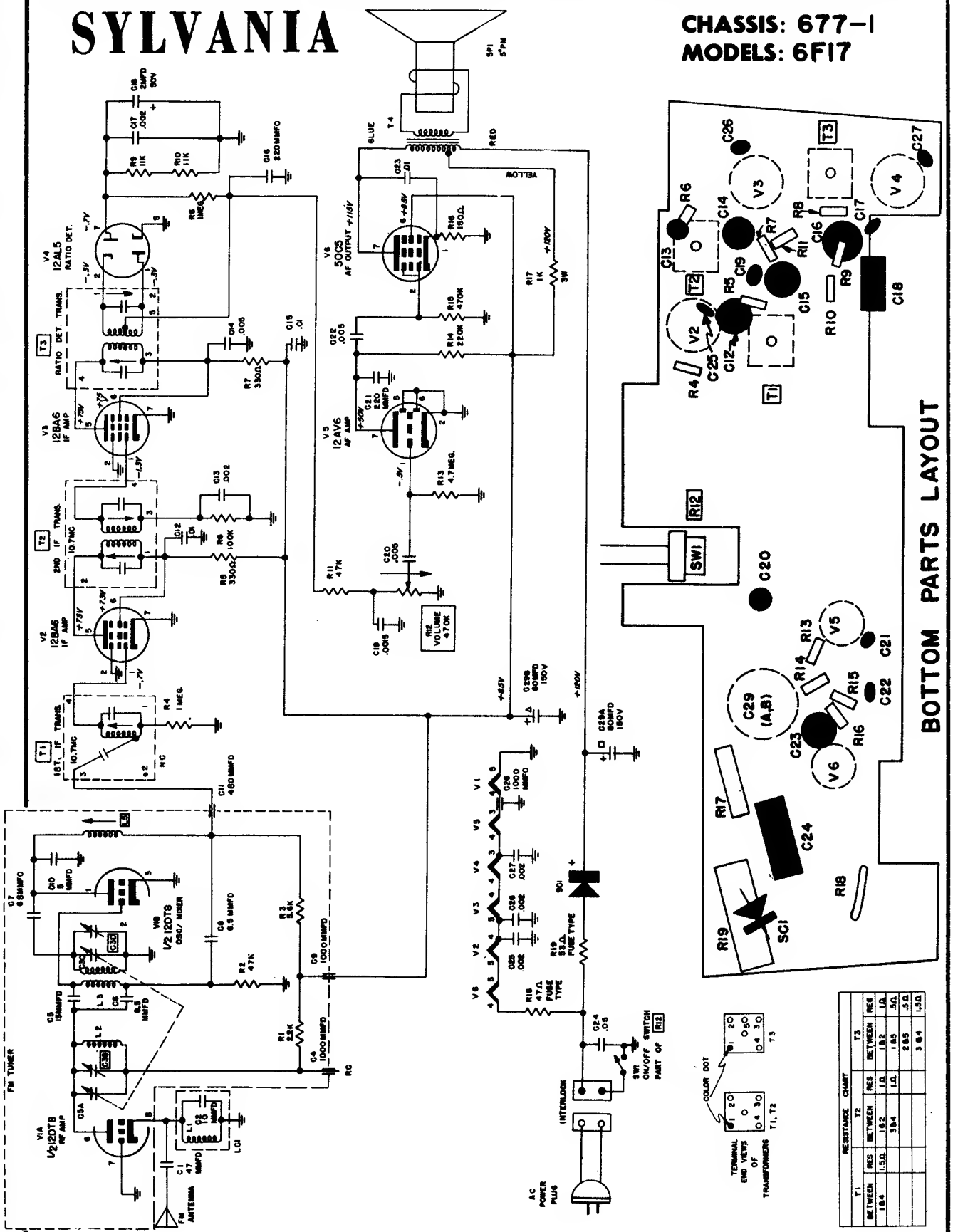
⏚ DESIGNATES NEGATIVE "B".
CAPACITANCE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.

SYLVANIA

CHASSIS: 676-1
MODELS: 5T17

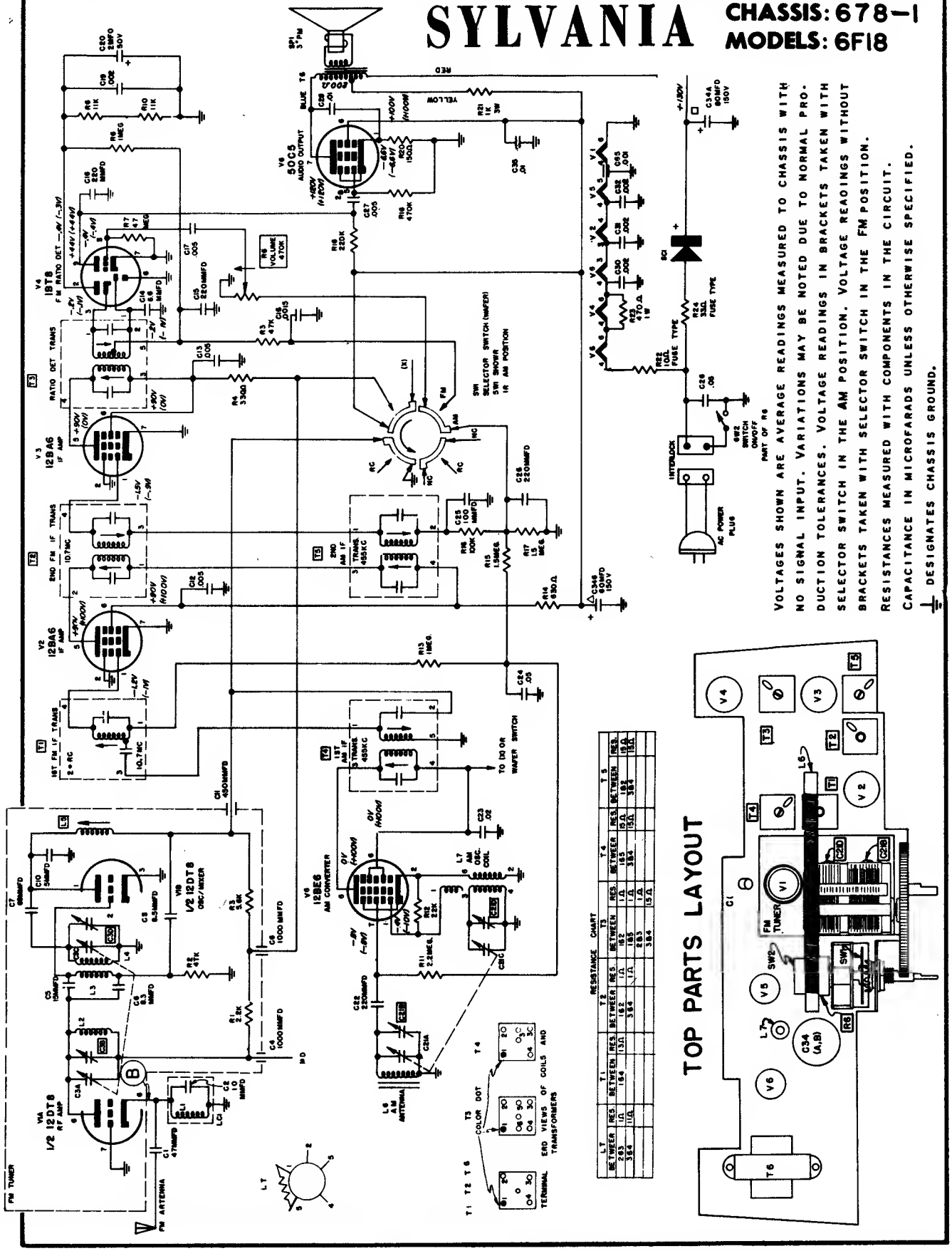
SYLVANIA

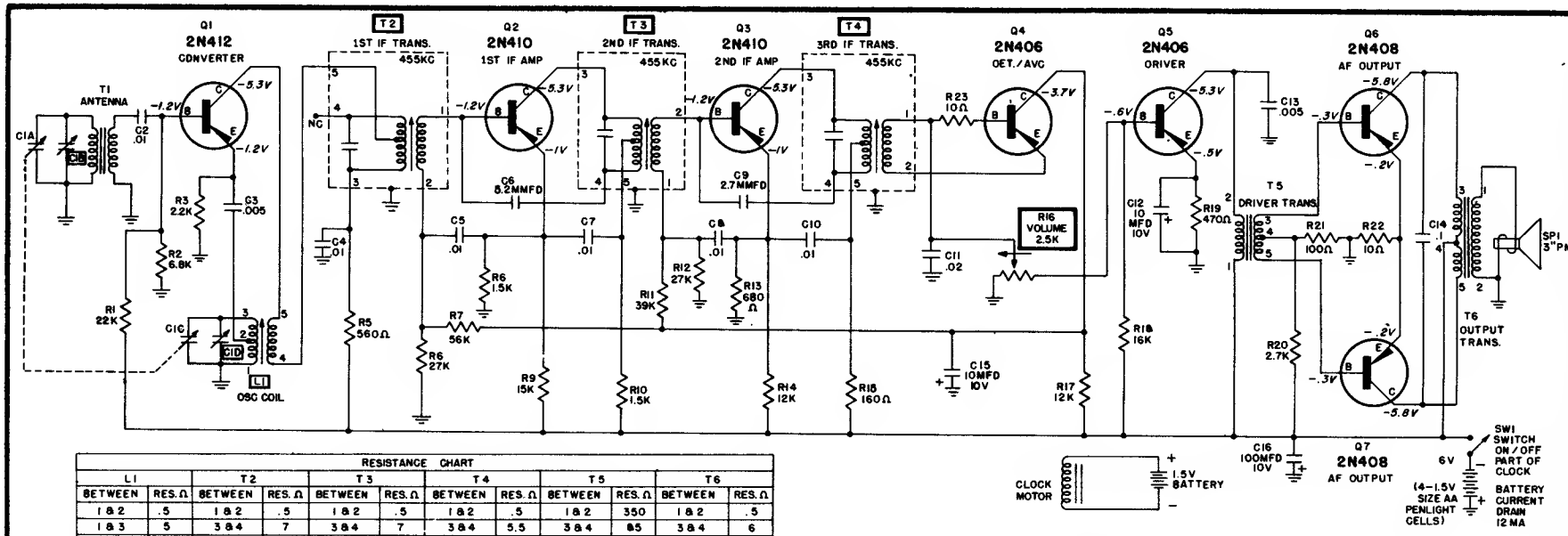
CHASSIS: 677-1
MODELS: 6F17



SYLVANIA

CHASSIS: 678-1
MODELS: 6F18

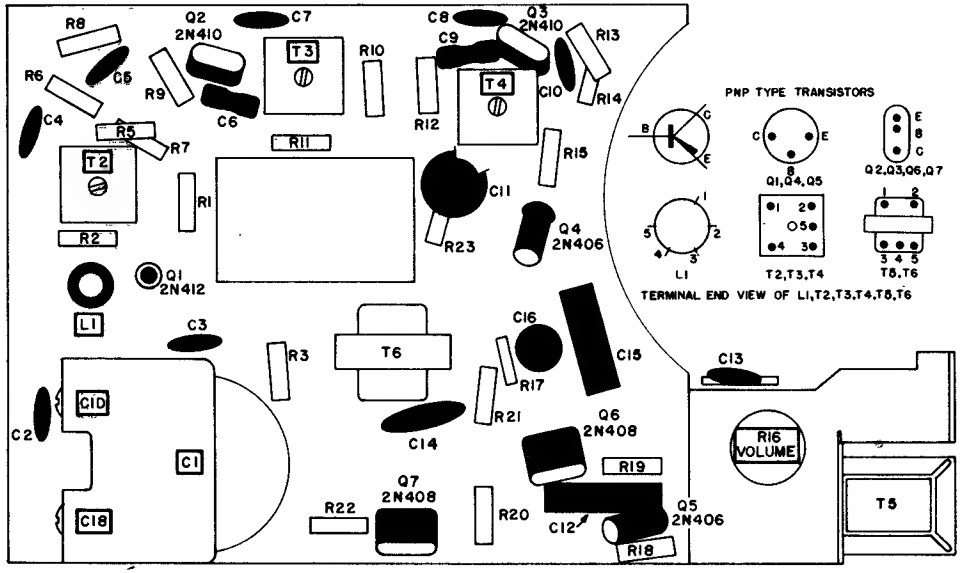




RESISTANCE CHART												
L1		T2		T3		T4		T5		T6		
BETWEEN	RES.Ω	BETWEEN	RES.Ω	BETWEEN	RES.Ω	BETWEEN	RES.Ω	BETWEEN	RES.Ω	BETWEEN	RES.Ω	
1 & 2	.5	1 & 2	.5	1 & 2	.5	1 & 2	.5	1 & 2	350	1 & 2	.5	
1 & 3	5	3 & 4	7	3 & 4	7	3 & 4	5.5	3 & 4	85	3 & 4	6	
2 & 3	4.5	3 & 5	5.5	3 & 5	2.5	3 & 5	1	3 & 5	140	3 & 5	12	
4 & 5	.5	4 & 5	1.5	4 & 5	3.5	4 & 5	4.5	4 & 5	55	4 & 5	6	

RESISTANCE VALUES TAKEN WITH COMPONENTS IN THE CIRCUIT.

ALL CAPACITORS IN MICROFARADS UNLESS OTHERWISE SPECIFIED.



CHASSIS REMOVAL

1. Remove volume and station selector knobs by pulling straight outward.
2. Press the right side of case to separate back cover from front of case. Remove back being careful to pass time set knob thru hole in back cover.
3. Remove two (2) screws securing clock battery holder to speaker. Remove holder as far as leads permit.
4. Remove two (2) screws (located on the bottom of case) which secures radio battery holder to case. Remove holder as far as leads permit.
5. Remove three (3) screws and one (1) nut securing corners of chassis to case.
6. Lift chassis from case as far as leads permit.
7. To replace chassis reverse the above procedure making certain all insulating washers removed are replaced.

NOTE: Do not operate receiver with speaker disconnected.

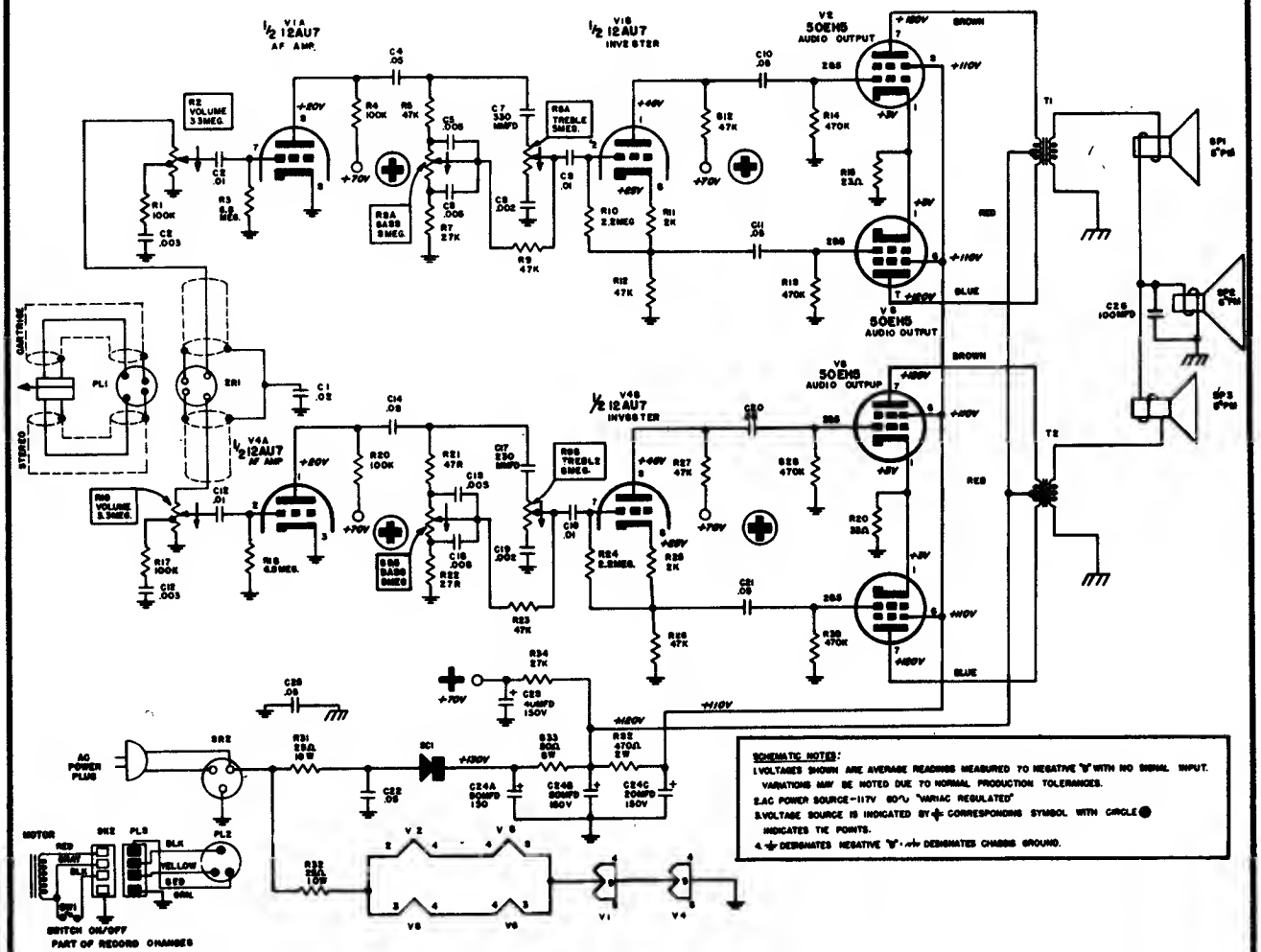
SYLVANIA

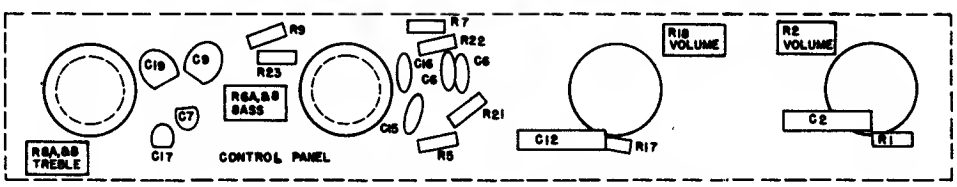
CHASSIS: 679-1

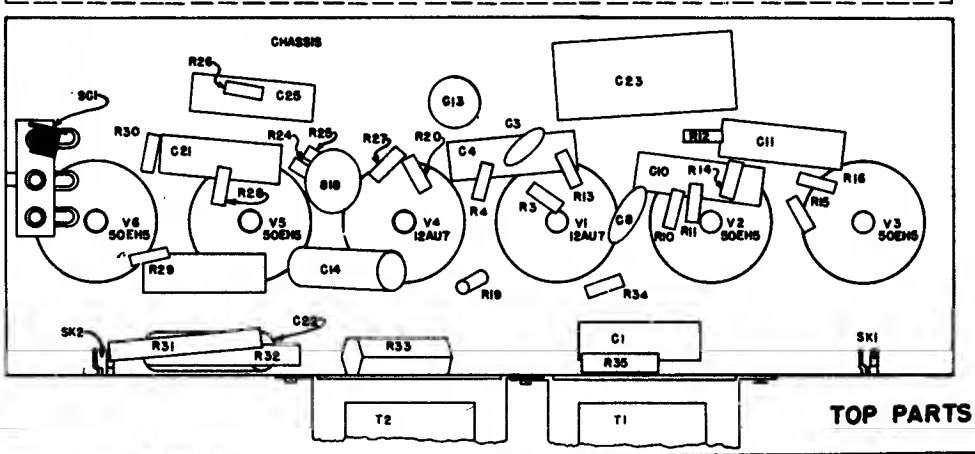
MODELS: 7K10, 7K11 SERIES

SYLVANIA

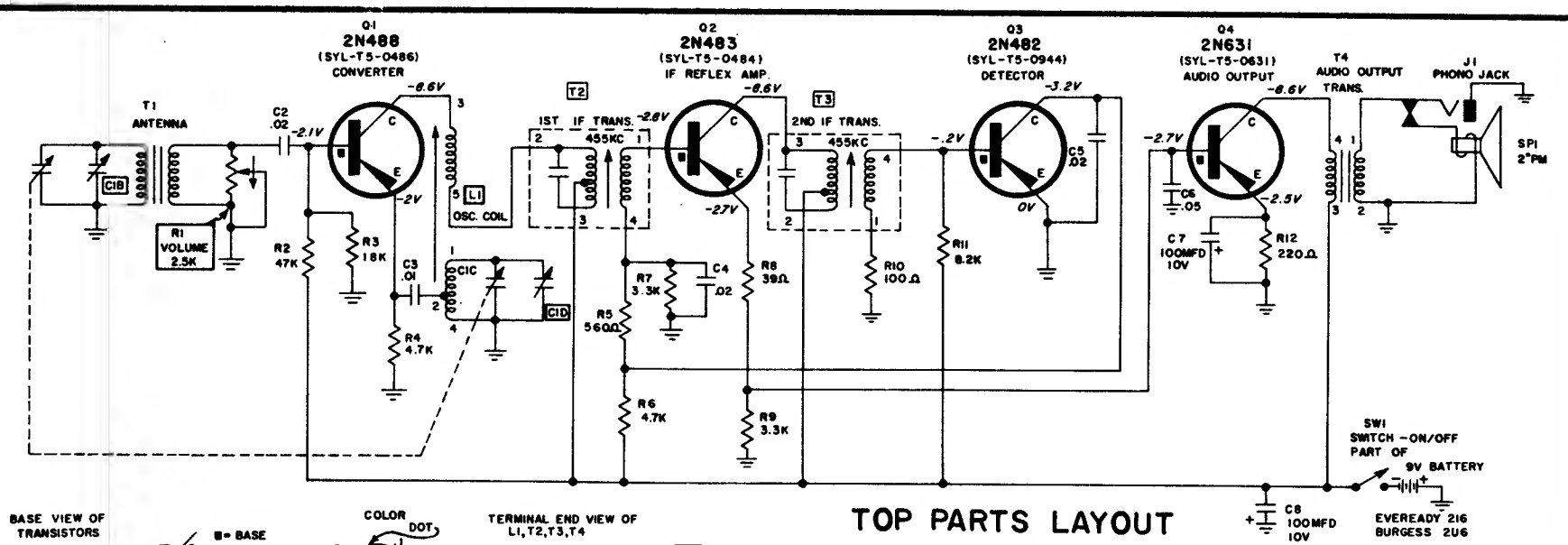
CHASSIS: 680-1
MODELS: 45P19



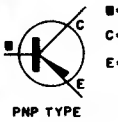


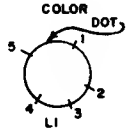


TOP PARTS LAYOUT



BASE VIEW OF TRANSISTORS





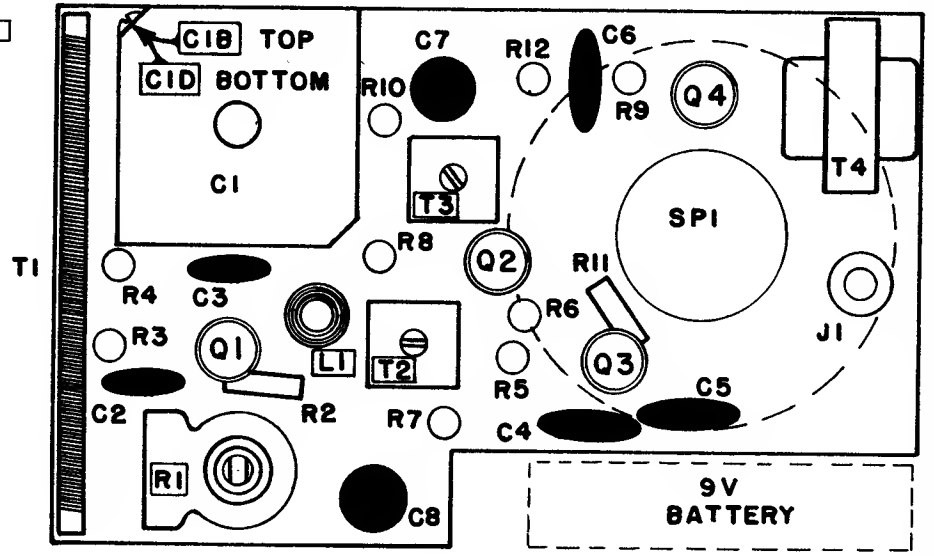
TERMINAL END VIEW OF L1,T2,T3,T4

RESISTANCE CHART							
L1		T2		T3		T4	
BETWEEN	RES.	BETWEEN	RES.	BETWEEN	RES.	BETWEEN	RES.
1 & 2	8Ω	1 & 4	1Ω	1 & 4	1Ω	1 & 2	1Ω
1 & 4	8.5Ω	2 & 3	5Ω	2 & 3	2Ω	3 & 4	40Ω
2 & 4	.5Ω						
3 & 5	1Ω						

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.

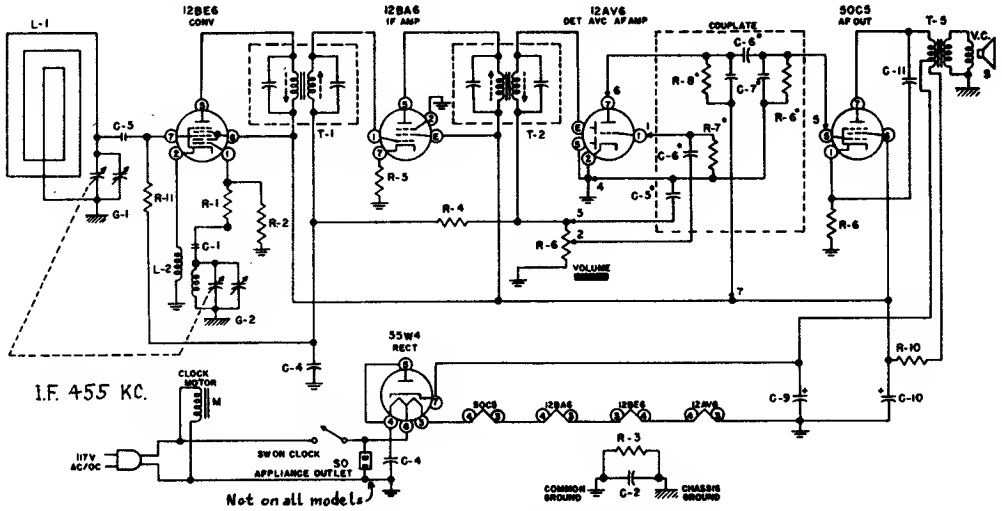
TOP PARTS LAYOUT



SYLVANIA

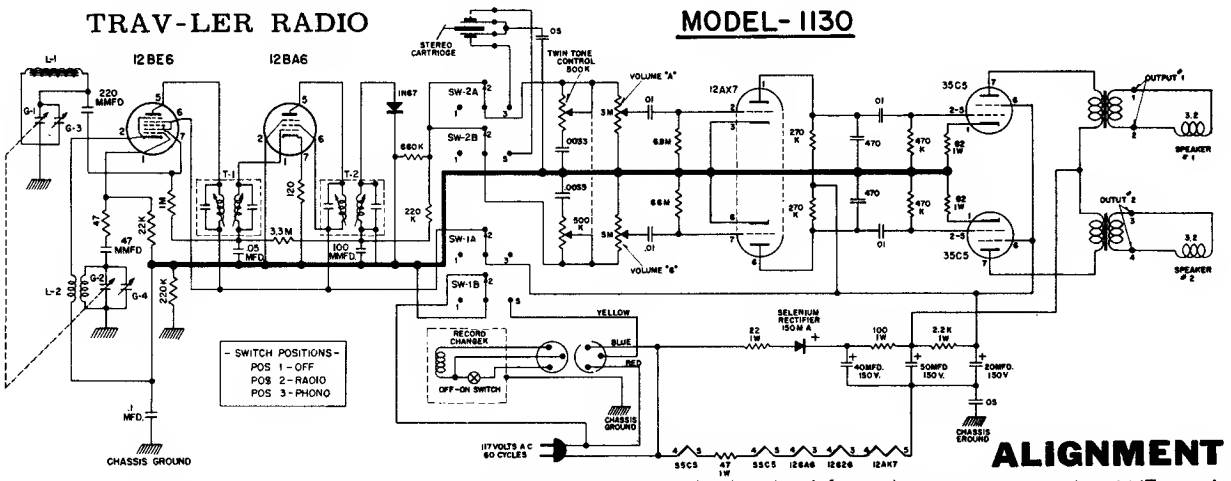
CHASSIS: 690-1
MODELS: 4P05, 4P06

TRAV-LER Models 60C300, 60C301, 60C302, 60C303, 60C320, 60C321, 60C322, 60C323

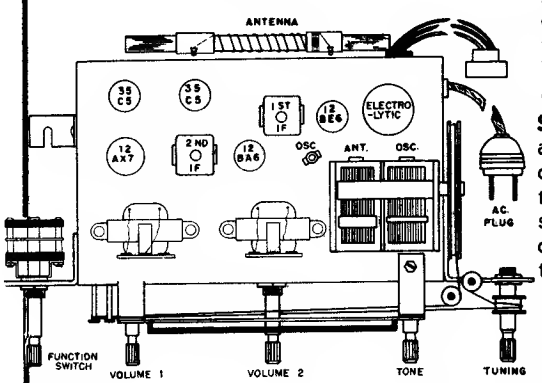


PART NO.		DESCRIPTION	PART NO.		DESCRIPTION	PART NO.		DESCRIPTION
IR-4	R-1	47Ω RESISTOR 1/2W. 20%	CC-12	C-1	47 MMFD CERAMIC CONDENSER	SPK-55X	S	4" P.M. SPEAKER
IR-45	R-2	22M.Ω. RESISTOR 1/2W. 10%	PC-8	C-2	.1 MFD. CONDENSER 400 V.		V.C.	VOICE COIL
IR-20	R-3	220M.Ω. RESISTOR 1/2W. 20%	CC-33	C-3	220 MMFD. 500 V. 20% CER. COND.		T-3	OUTPUT TRANSFORMER
IR-25	R-4	3.3MEG. RESISTOR 1/2W. 20%	PC-5	C-4	.05 MFD. CONDERSER 400 V.	LL-46	L-1	LOOP ANTENNA
IR-155	R-5	120Ω RESISTOR 1/2W. 10%	MC-16	C-5*	220 MMFD.	LO-27	L-2	OSC. COIL
VC-101	R-6	1 MEG. VOLUME CONTROL		C-6*	.002 MFD.	SO-54	SO	APPLIANCE OUTLET SOCKET
MC-19	R-7*	6.6 MEG.		C-7*	250 MMFD.			
	R-8*	470M.Ω.		C-8*	.005 MFD.	CK-7	M	ELECTRIC CLOCK
IR-98	R-9	150Ω RESISTOR 1/2W. 10%	EC-68	C-6	70 MFD. 150 W.V.O.C. ELECTROLYTIC		SW	
IR-42	R-10	1000Ω RESISTOR 1 W. 10%		C-10	40 MFD.			
IR-12	R-11	1MEG. RESISTOR 1/2W. 20%	PC-47	C-11	.02 MFD. CONDENSER 400 V.			
LI-19	T-1	IRPUT I.F. TRANSFORMER	GC-24	G-1	TUNING CONDENSER			
	T-2	OUTPUT I.F. TRANSFORMER		G-2				

TRAV-LER RADIO MODEL-1130



ALIGNMENT



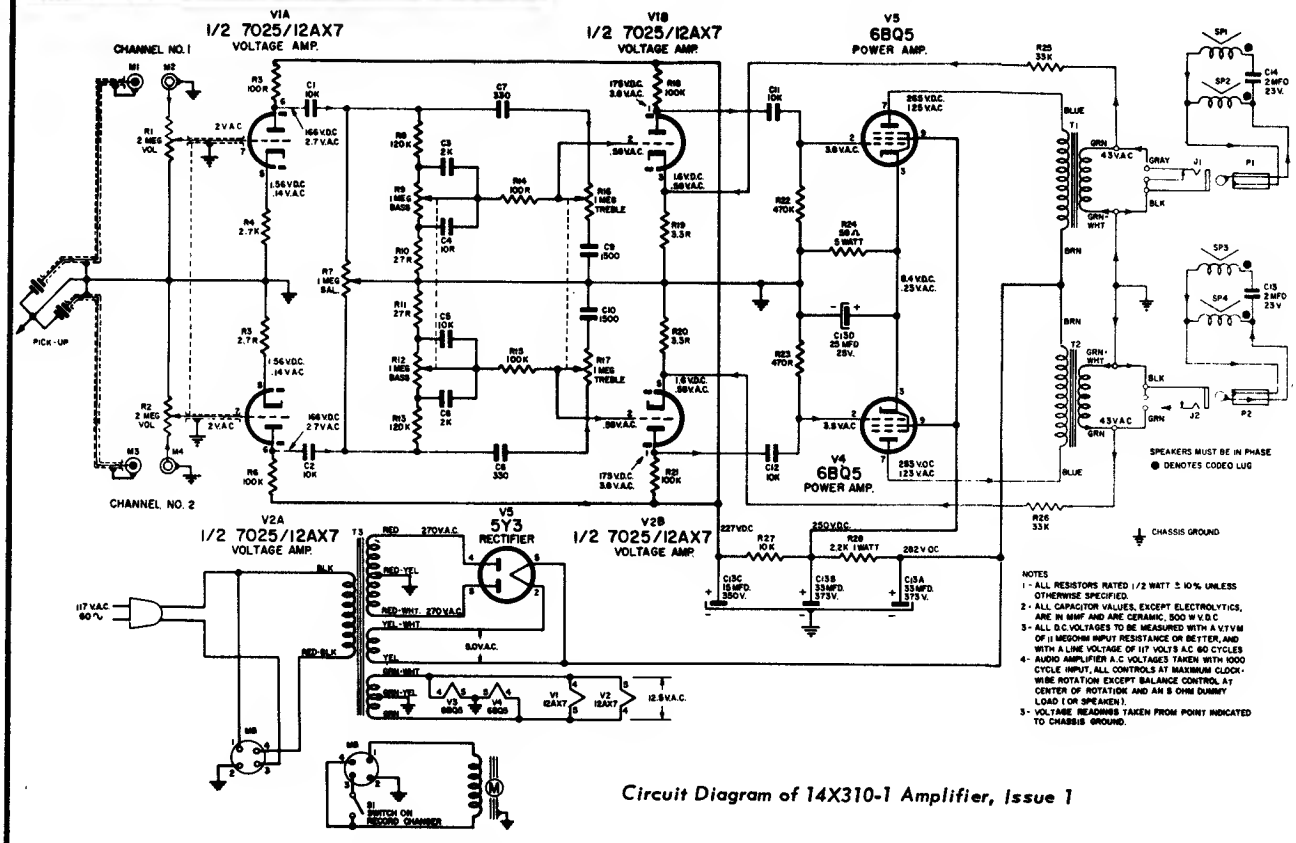
FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser through a .1 MFD. condenser. The ground lead from the generator must be connected to "B" minus under the chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the movable iron cores in the IF cans.

SECOND STEP: With the leads from the generator still connected as in IF alignment, adjust the generator to 1610 KC. Make sure that the gang condenser is turned to complete minimum capacity. Adjust the generator to 1610 KC. and adjust the oscillator trimmer of the receiver until the signal is tuned in. Next, turn the gang condenser to complete maximum capacity. Adjust the generator to 540 KC., then adjust the iron core in the end of the oscillator coil until the signal is tuned in.

THIRD STEP: Remove the generator leads from the gang condenser and the chassis. Loosely couple the generator to the antenna by laying the hot generator lead near the antenna rod. Set the generator at 1400 KC. and tune in the 1400 KC. signal on the receiver. Adjust the ANT. trimmer until a maximum signal is noted on the output meter.

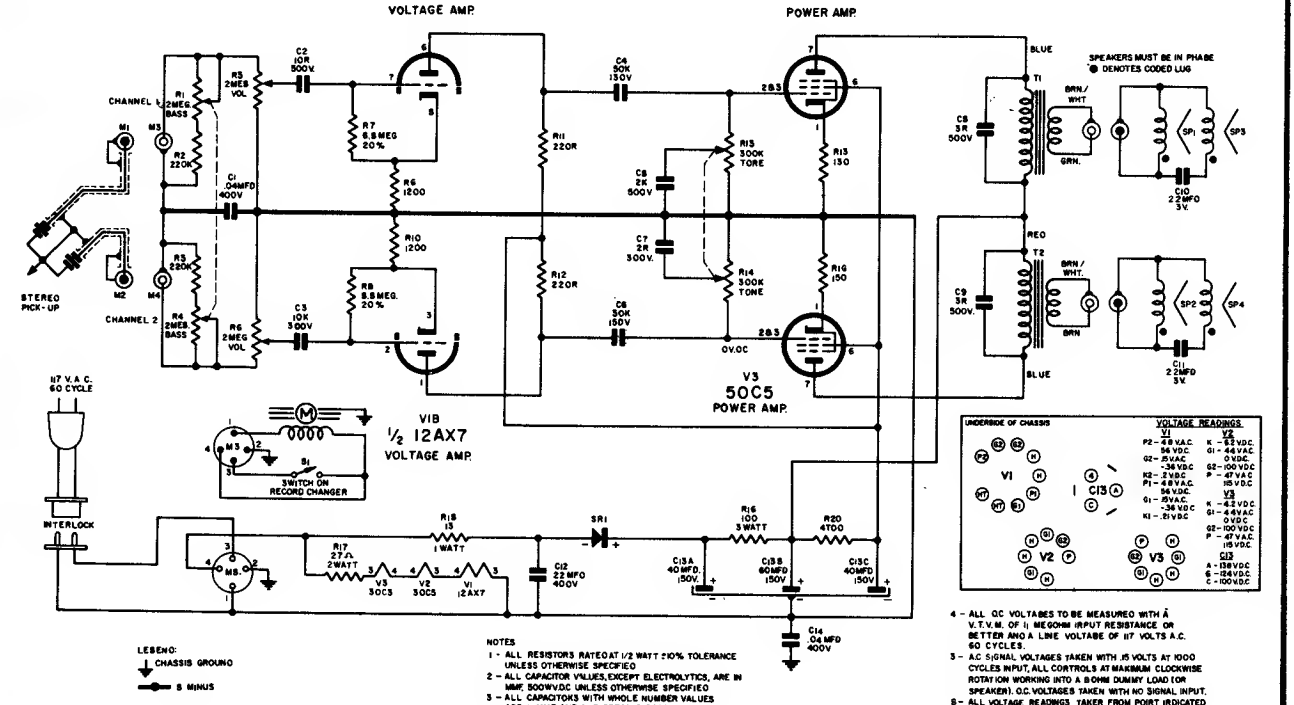
[redacted]

MODEL 1050-1A FONOGRAF

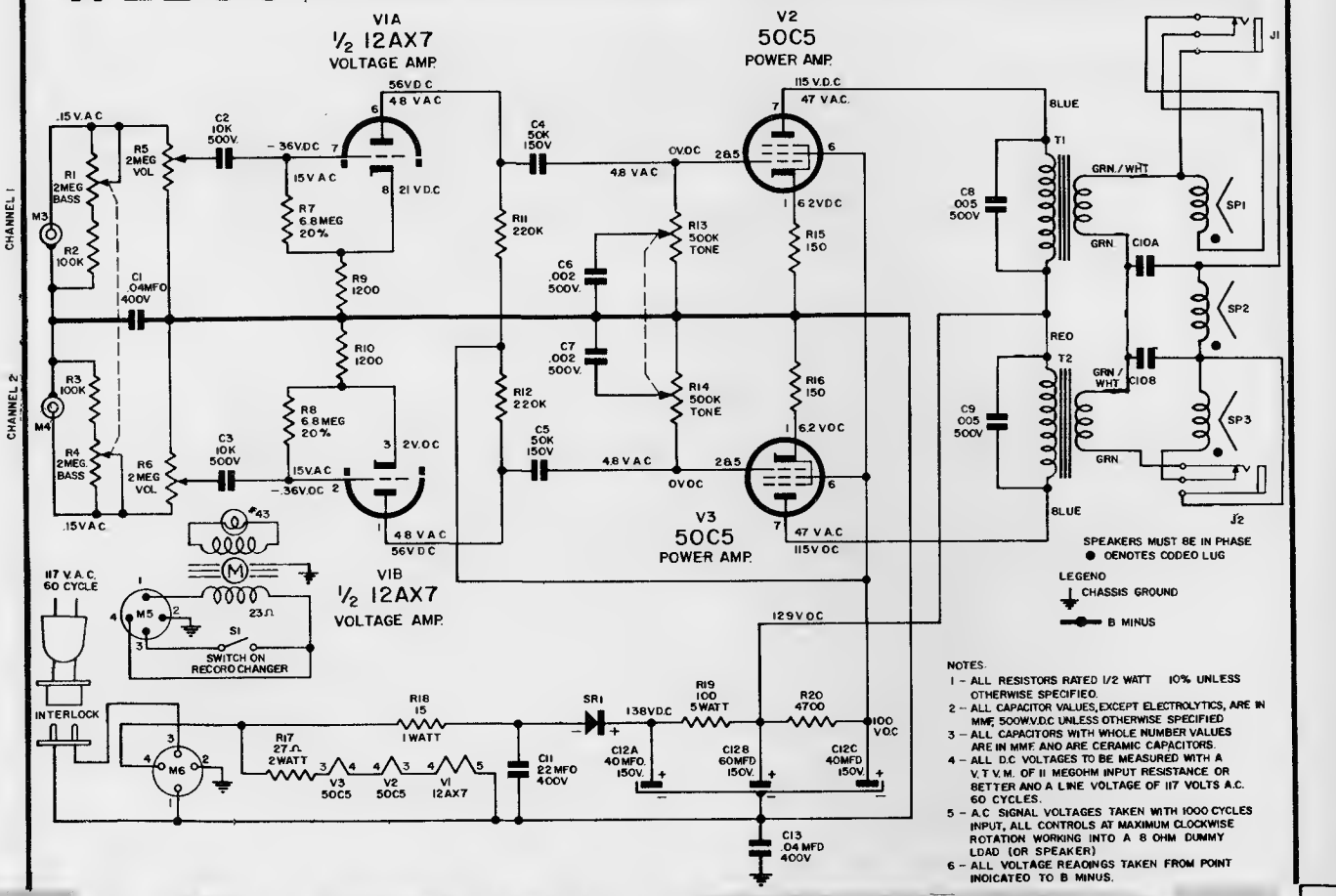


Circuit Diagram of 14X310-1 Amplifier, Issue 1

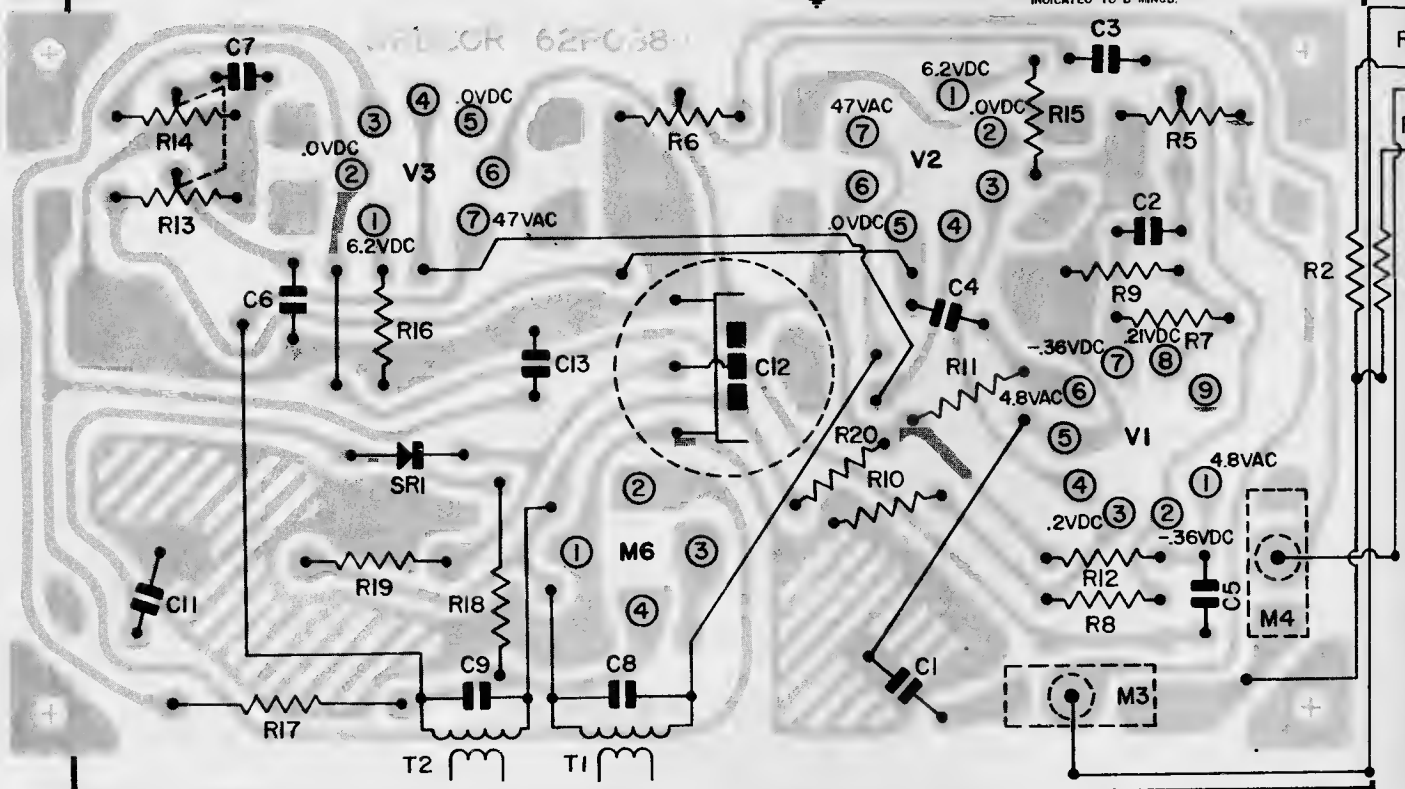
WEBCOR MODEL 1172-1 FONOGRAF



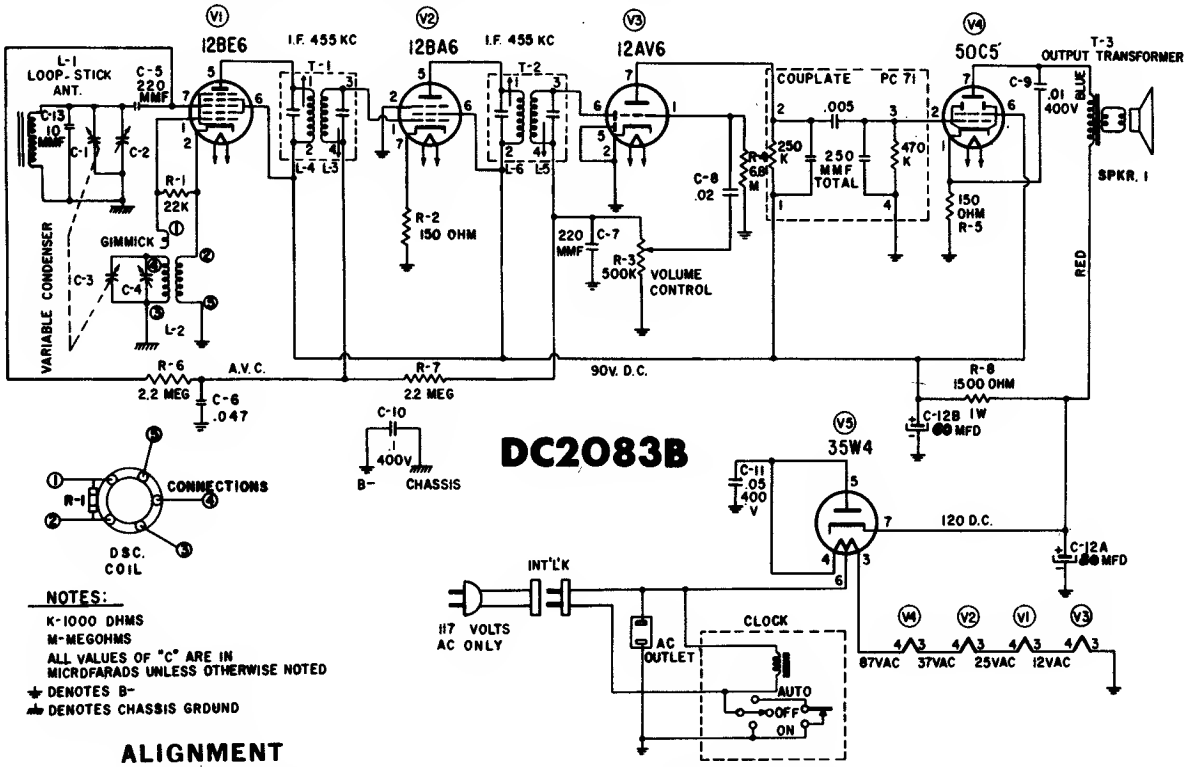
WEBCOR Amplifier 14X331, used in Models BC1055, MC1055, WC1055



NOTES:
1 – ALL RESISTORS RATED 1/2 WATT 10% UNLESS OTHERWISE SPECIFIED.
2 – ALL CAPACITOR VALUES, EXCEPT ELECTROLYTICS, ARE IN MMF, 500WV.DC UNLESS OTHERWISE SPECIFIED
3 – ALL CAPACITORS WITH WHOLE NUMBER VALUES ARE IN MMF AND ARE CERAMIC CAPACITORS.
4 – ALL D.C VOLTAGES TO BE MEASURED WITH A V.T.V.M. OF 11 MEGOHM INPUT RESISTANCE OR BETTER AND A LINE VOLTAGE OF 117 VOLTS A.C. 60 CYCLES.
5 – A.C SIGNAL VOLTAGES TAKEN WITH 1000 CYCLES INPUT, ALL CONTROLS AT MAXIMUM CLOCKWISE ROTATION WORKING INTO A 8 OHM DUMMY LOAD (OR SPEAKER)
6 – ALL VOLTAGE READINGS TAKEN FROM POINT INDICATED TO B MINUS.



WESTERN AUTO Model DC2083B, Exact Service Material.
Model DC2173A is the same electrically, while additional Models DC2082B and DC2172A are very similar electrically but do not use clock-switching network.



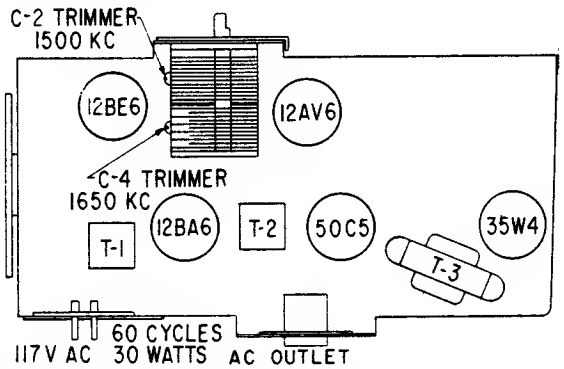
NOTES:
K-1000 OHMS
M-MEGOHMS
ALL VALUES OF "C" ARE IN MICRDFARADS UNLESS OTHERWISE NOTED
⏚ DENOTES B-
⏚ DENOTES CHASSIS GRDUND

ALIGNMENT

Equipment required: Modulated RF signal generator; output meter; insulated screwdriver, two .1 mfd 600 volt condensers. To insure proper alignment, a radiated signal will be required during part of the alignment procedure. To radiate a signal, connect a loop of about 6 inches in diameter (two or three turns of #18 or #22 wire) across the output of the signal generator, and place this loop parallel to the loop of the receiver to be aligned, at a distance of about 10 or 12 inches. Connect the output meter and signal generator as follows:

Output meter: Connect across the speaker voice coil and turn the volume control to maximum (extreme clockwise position). Signal generator: When the generator is not used to radiate a signal, connect the low side to B--through a .1 mfd condenser, clip the high side through a .1 mfd 600 volt condenser to the point at which signal injection is required, and keep the output as low as possible. Proceed in the sequence shown in the alignment chart.

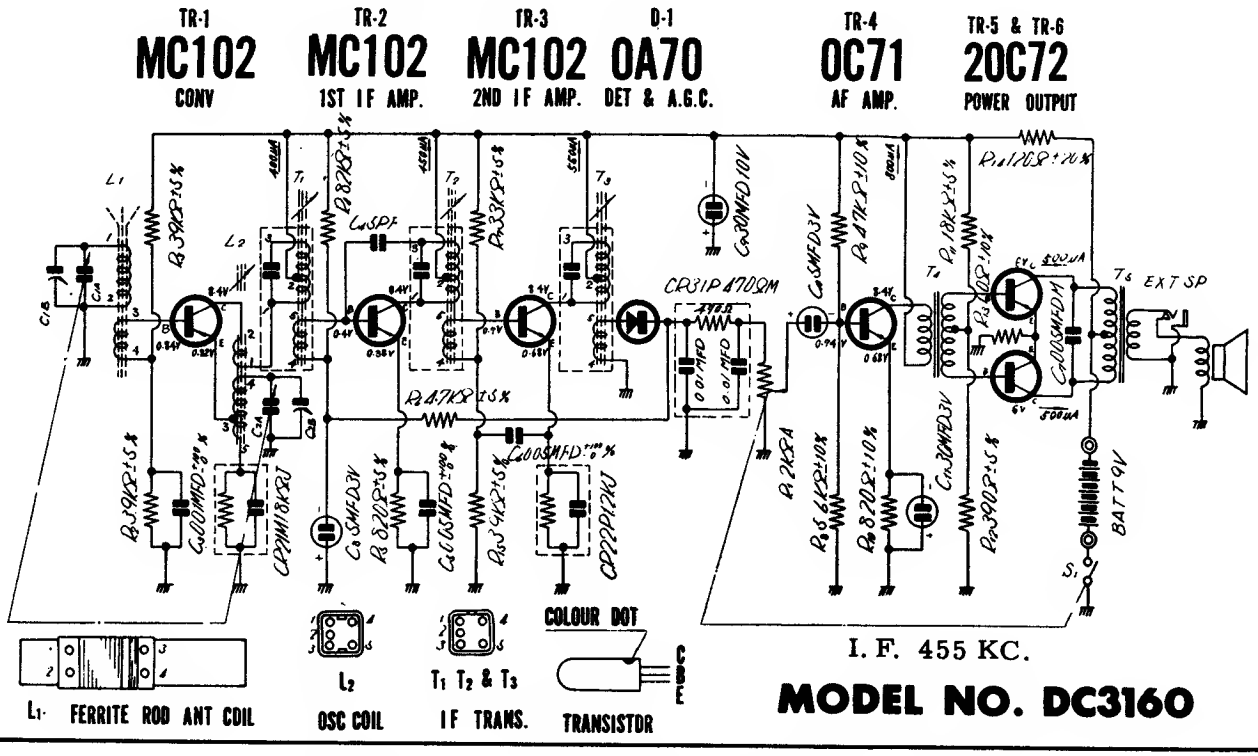
The chassis is attached to the front panel and must be removed from the cabinet before alignment can be performed. To remove the front panel from the cabinet remove the two screws on back of cabinet.



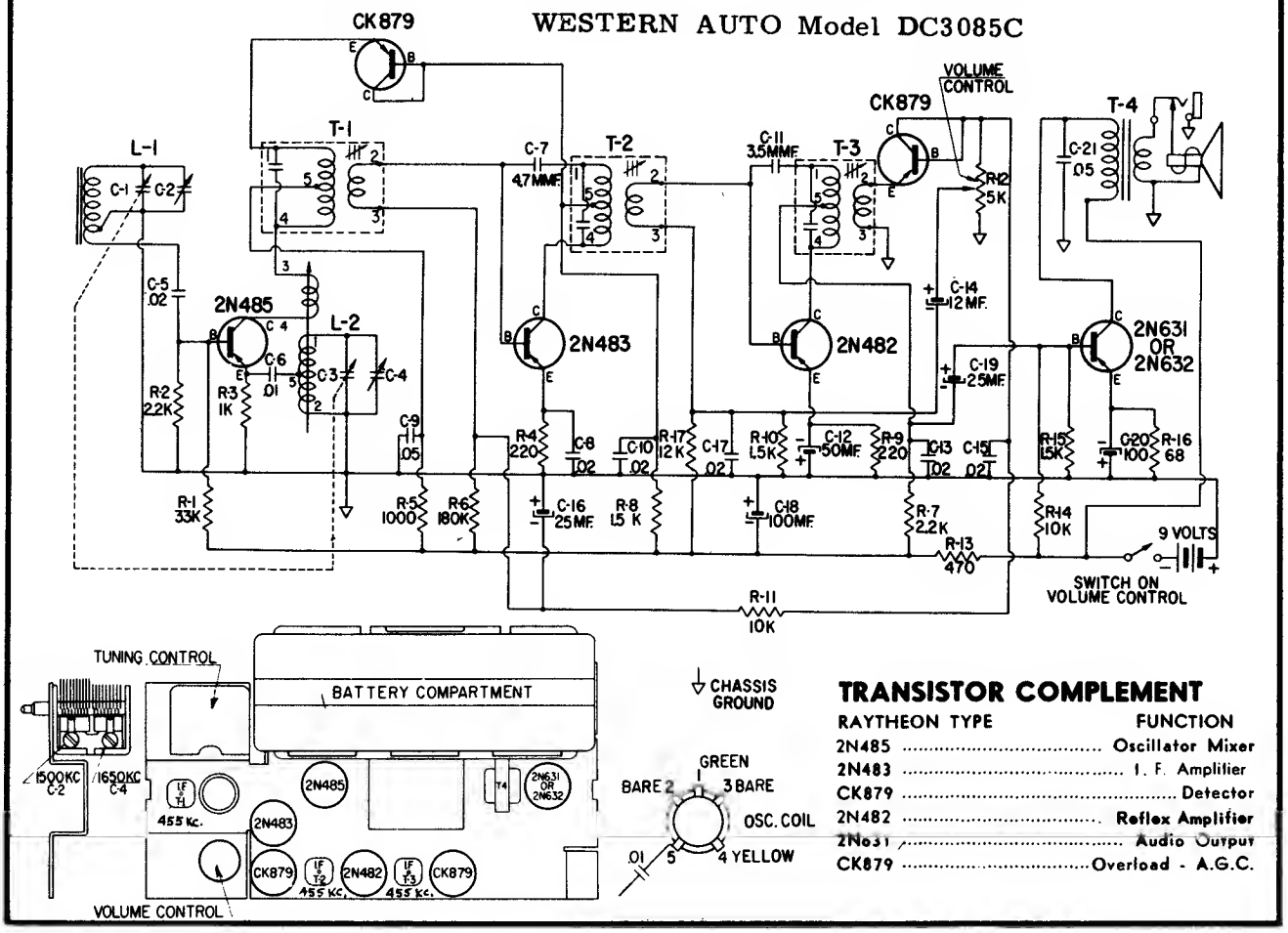
ALIGNMENT PROCEDURE CHART

Step	Connect High Side of Signal Generator To—	Set Signal Generator To—	Turn Receiver Dial To—	Adjust The Following for Maximum Output (Keep Signal From Signal Generator As Low As Possible)
1	Antenna Section Tuning Condenser in Series with .1MFD. Cond.	455 KC.	Full Counter Clockwise (Condenser Plates Fully Open)	Top and Bottom T2 and T1 (I.F. Transformers)
2		1650 KC.		C4 (Oscillator Trimmer)
3	Use Radiated Signal	1500 KC.	Maximum Signal Approx. 1500 KC.	C2 Antenna Trimmer)
4			Repeat Steps 2 and 3	

WESTERN AUTO Model DC3160



WESTERN AUTO Model DC3085C

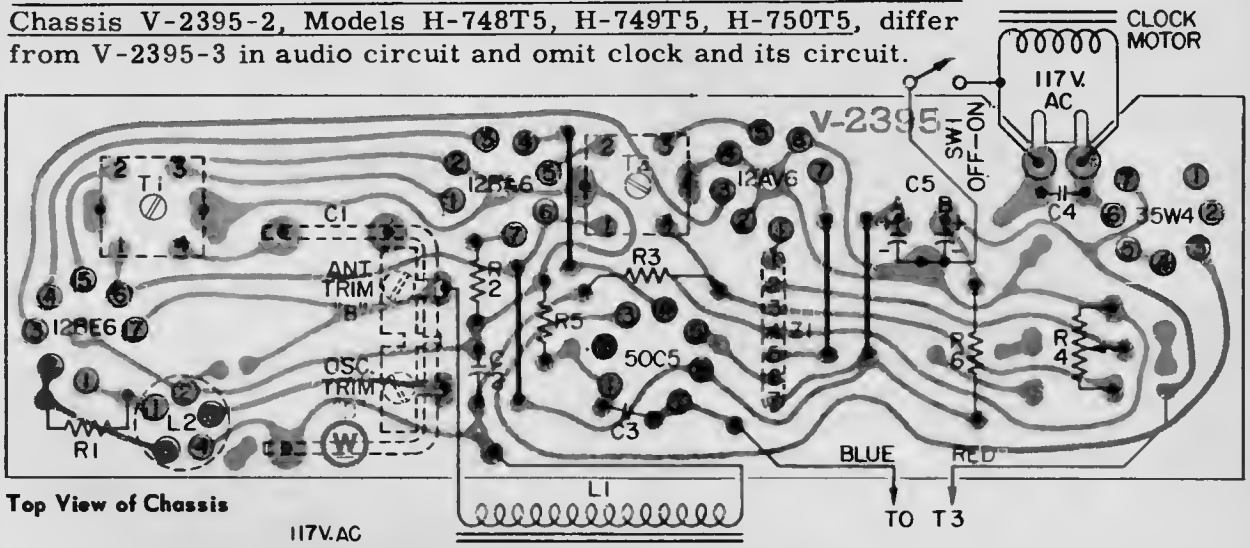


TRANSISTOR COMPLEMENT

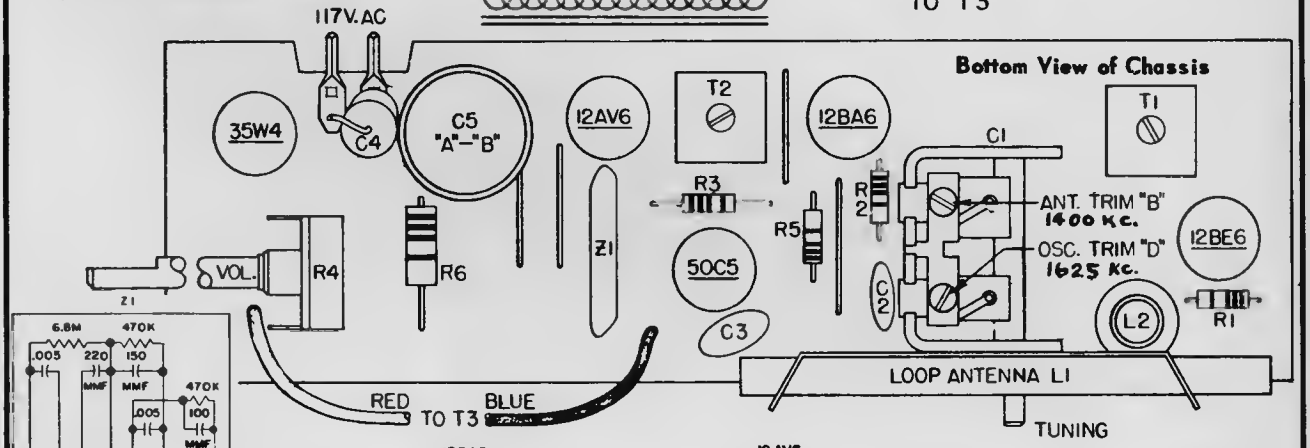
RAYTHEON TYPE	FUNCTION
2N485	Oscillator Mixer
2N483	I. F. Amplifier
CK879	Detector
2N482	Reflex Amplifier
2N631	Audio Output
CK879	Overload - A.G.C.

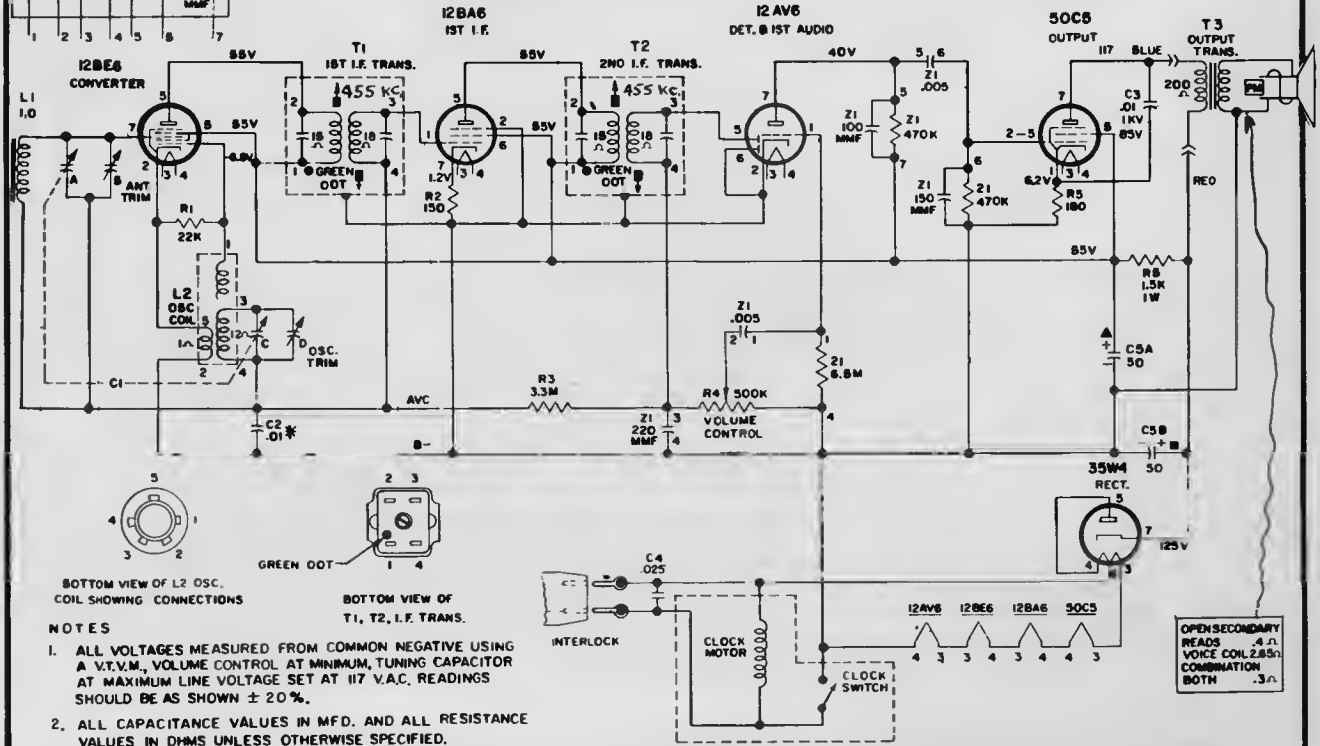
WESTINGHOUSE Chassis V-2395-3, Models H-753L5, H-755L5.

Chassis V-2395-2, Models H-748T5, H-749T5, H-750T5, differ from V-2395-3 in audio circuit and omit clock and its circuit.



Top View of Chassis



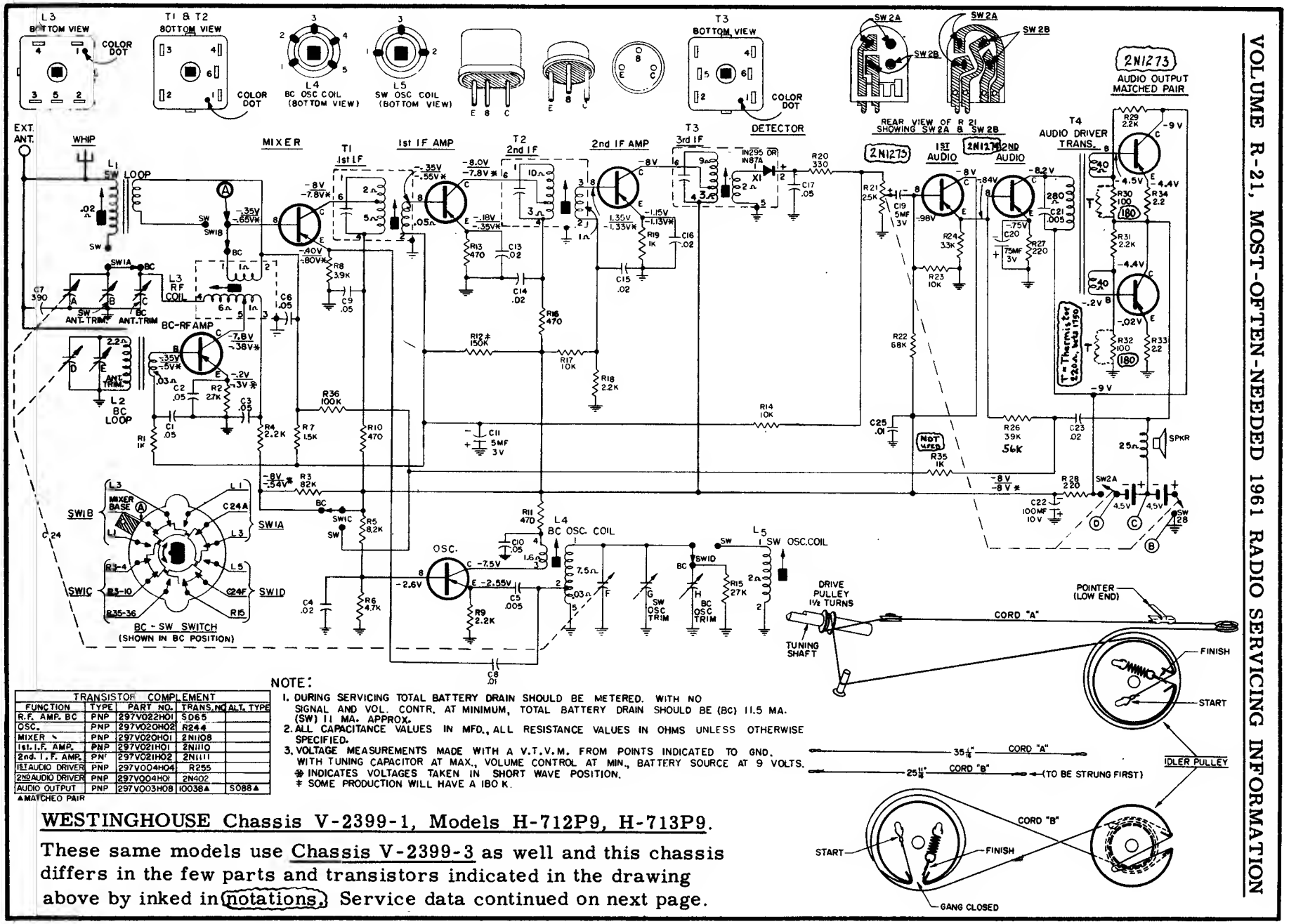


BOTTOM VIEW OF L2 OSC. COIL SHOWING CONNECTIONS

BOTTOM VIEW OF T1, T2, I.F. TRANS.

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 ± 20%.
2. ALL CAPACITANCE VALUES IN MFD. AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.



TRANSISTOR COMPLEMENT				
FUNCTION	TYPE	PART NO.	TRANS. NO	ALT. TYPE
R.F. AMP. BC	PNP	297V022H01	SD65	
OSC.	PNP	297V020H02	R244	
MIXER	PNP	297V020H01	2N1108	
1st I.F. AMP.	PNP	297V021H01	2N1110	
2nd. I. F. AMP.	PNP	297V021H02	2N1111	
1ST AUDIO DRIVER	PNP	297V004H04	R255	
2ND AUDIO DRIVER	PNP	297V004H01	2N402	
AUDIO OUTPUT	PNP	297V003H08	10038▲	5088▲

▲MATCHED PAIR

NOTE:

1. DURING SERVICING TOTAL BATTERY DRAIN SHOULD BE METERED. WITH NO SIGNAL AND VOL. CONTR. AT MINIMUM, TOTAL BATTERY DRAIN SHOULD BE (BC) 11.5 MA. (SW) 11 MA. APPROX.
2. ALL CAPACITANCE VALUES IN MFD., ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
3. VOLTAGE MEASUREMENTS MADE WITH A V.T.V.M. FROM POINTS INDICATED TO GND. WITH TUNING CAPACITOR AT MAX., VOLUME CONTROL AT MIN., BATTERY SOURCE AT 9 VOLTS.

* INDICATES VOLTAGES TAKEN IN SHORT WAVE POSITION.
‡ SOME PRODUCTION WILL HAVE A IBO K.

WESTINGHOUSE Chassis V-2399-1, Models H-712P9, H-713P9.

These same models use Chassis V-2399-3 as well and this chassis differs in the few parts and transistors indicated in the drawing above by inked in notations. Service data continued on next page.

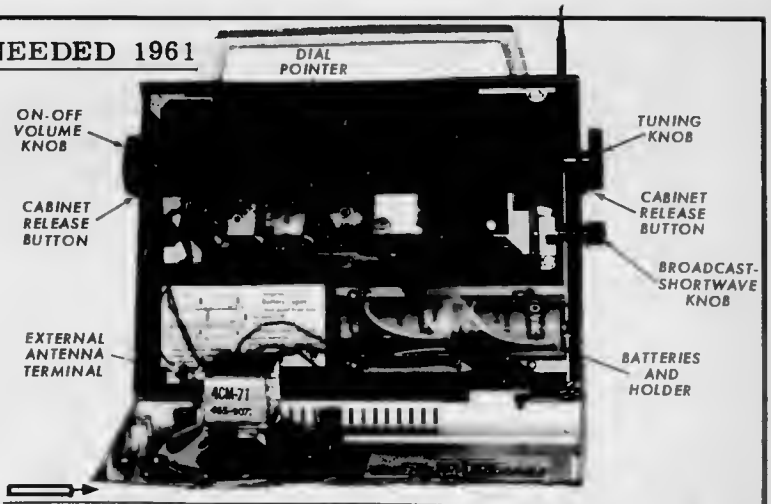
WESTINGHOUSE

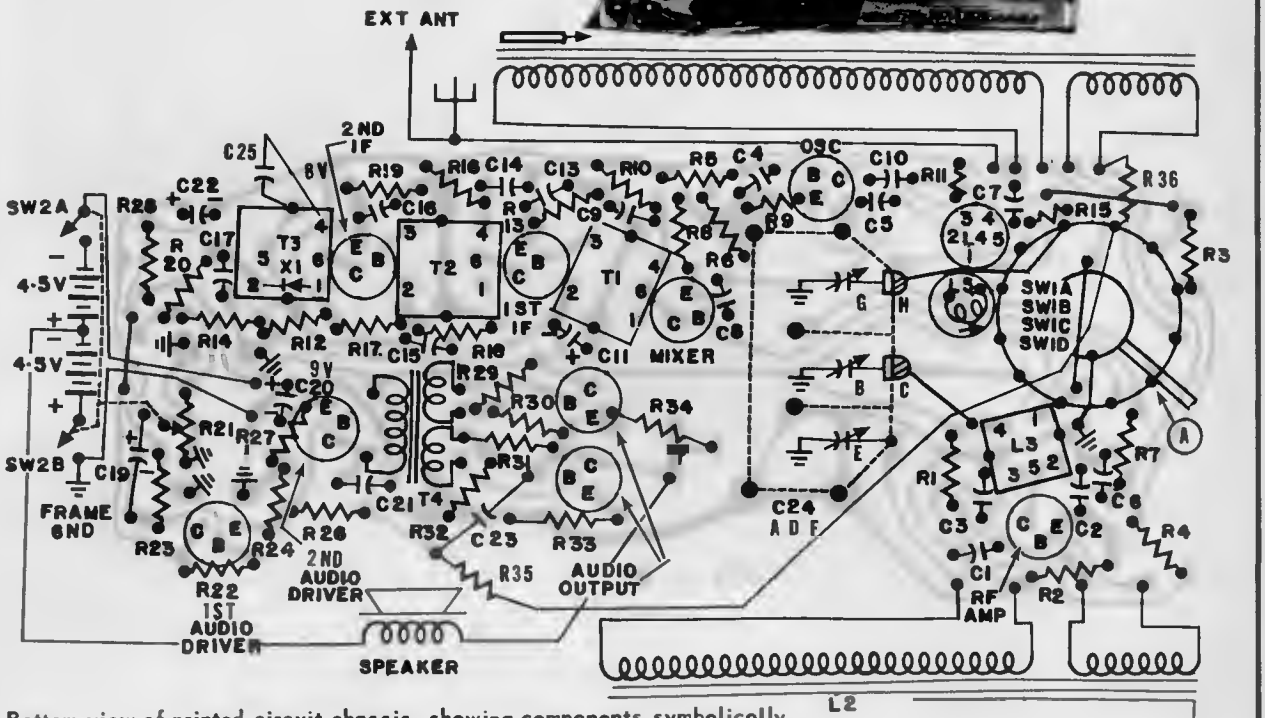
Chassis V-2399-1

Models H-712P9, H-713P9

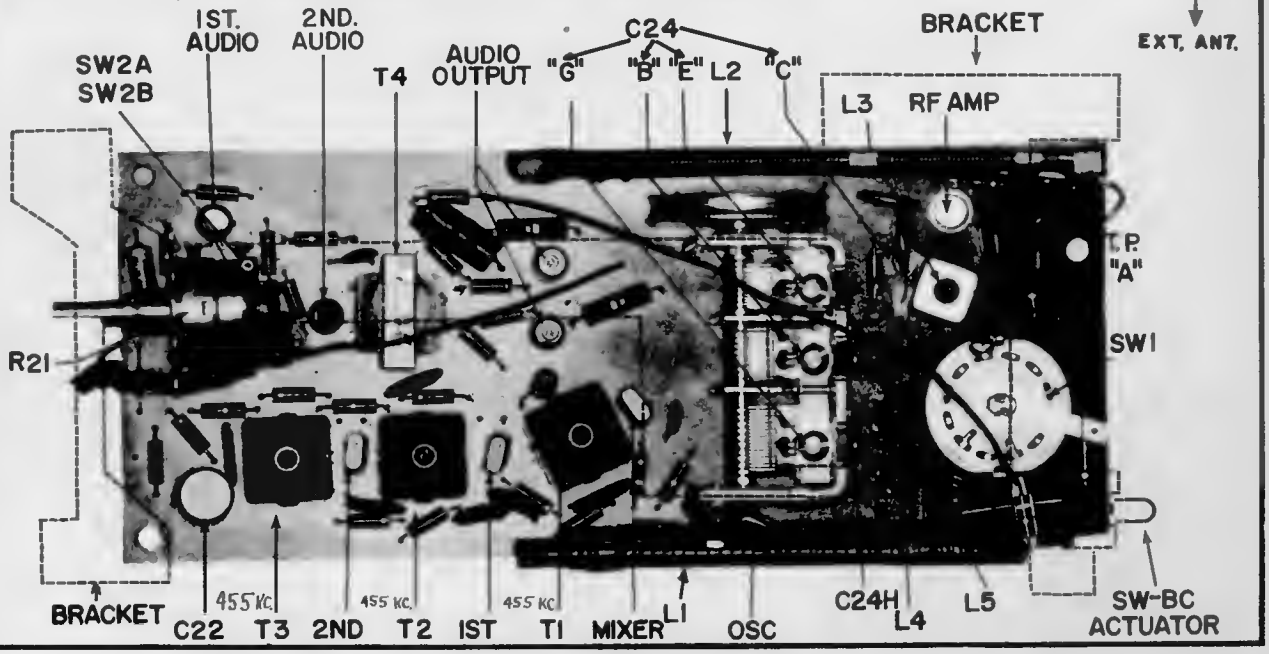
(Continued from preceding page.)

Frequency Range
Broadcast ..... 540 to 1600KC
Short Wave ..... 2.4 to 6.5MC
Intermidiate Frequency 455KC





Bottom view of printed circuit chassis, showing components symbolicolly.



Westinghouse Chassis V-2397-4, Models H-725P6A, H-726P6A, H-727P6A, H-728P6A, H-771P6, H-771P6GP, H-772P6, -GP, H-773P6, and H-773P6GP.

TRANSISTOR COMPLEMENT			
FUNCTION	TYPE	PART NO.	ALTERNATES
CONVERTER	PNP	297V01H01	2N412
1st I.F. AMP	PNP	297V02H05	2N410
2nd I.F AMP	PNP	297V02H06	2N410
AUDIO DRIVER	PNP	297V04H03	2N406
AUDIO OUTPUT	PNP	297V03H04	2N408*
* MATCHED PAIR (SEE NOTES)			

NOTES:
1. DURING SERVICING, TOTAL BATTERY CURRENT SHOULD BE METERED, WITH NO SIGNAL, AND VOLUME CONTROL AT MINIMUM. TOTAL BATTERY DRAIN SHOULD BE APPROX. 9 MA.
2. VOLTAGE MEASUREMENTS MADE WITH A VTVM FROM POINTS INDICATED TO GROUND, WITH TUNING CAPACITOR AT MAXIMUM, VOLUME CONTROL AT MINIMUM & BATTERY SOURCE AT 6 VOLTS.
3. ALL CAPACITORS LESS THAN ONE ARE IN MMFD. ALL CAPACITORS GREATER THAN ONE ARE IN MFD. ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED. 1/2 WATT.
- ANY TWO AUDIO OUTPUT TRANSISTORS WITH IDENTICAL COLOR CODE DOT ON TOP CAN BE USED AS A MATCHED PAIR.

AUDIO OUTPUT MATCHED PAIR

AUDIO DRIVER

DETECTOR

2nd I. F. AMP

1st I. F. AMP

CONVERTER

TOTAL CURRENT MEASURED HERE

GRN. DOT OR DIMPLE OVER (+) ON TOP OF CAN

I.F. TRANS. T1, T2 & T3 (BOTTOM VIEW)

OSC. COIL (BOTTOM VIEW)

RED DOT

ANT. TRIM. "B"

OSC. TRIM "D"

CONV.

1ST I.F.

2ND I.F.

DRIVER

AUDIO OUT. MATCHED PAIR

Bottom View of Chassis

AUDIO DRIVER

2ND I.F AMP

1625 Kc. OSC. TRIM "D"

1400 Kc. ANT TRIM "B"

455 Kc.

CONVERTER

IF 455 Kc.

AUDIO OUTPUT

1ST I F AMP

PLACE BATTERIES WITH BUTTONS AS SHOWN

RED

BLACK

1.5V BATTERY

POWER SUPPLY

EVEREADY	635
BURGESS	13D
RAY-O-VAC	1LP
MALLORY	M14R

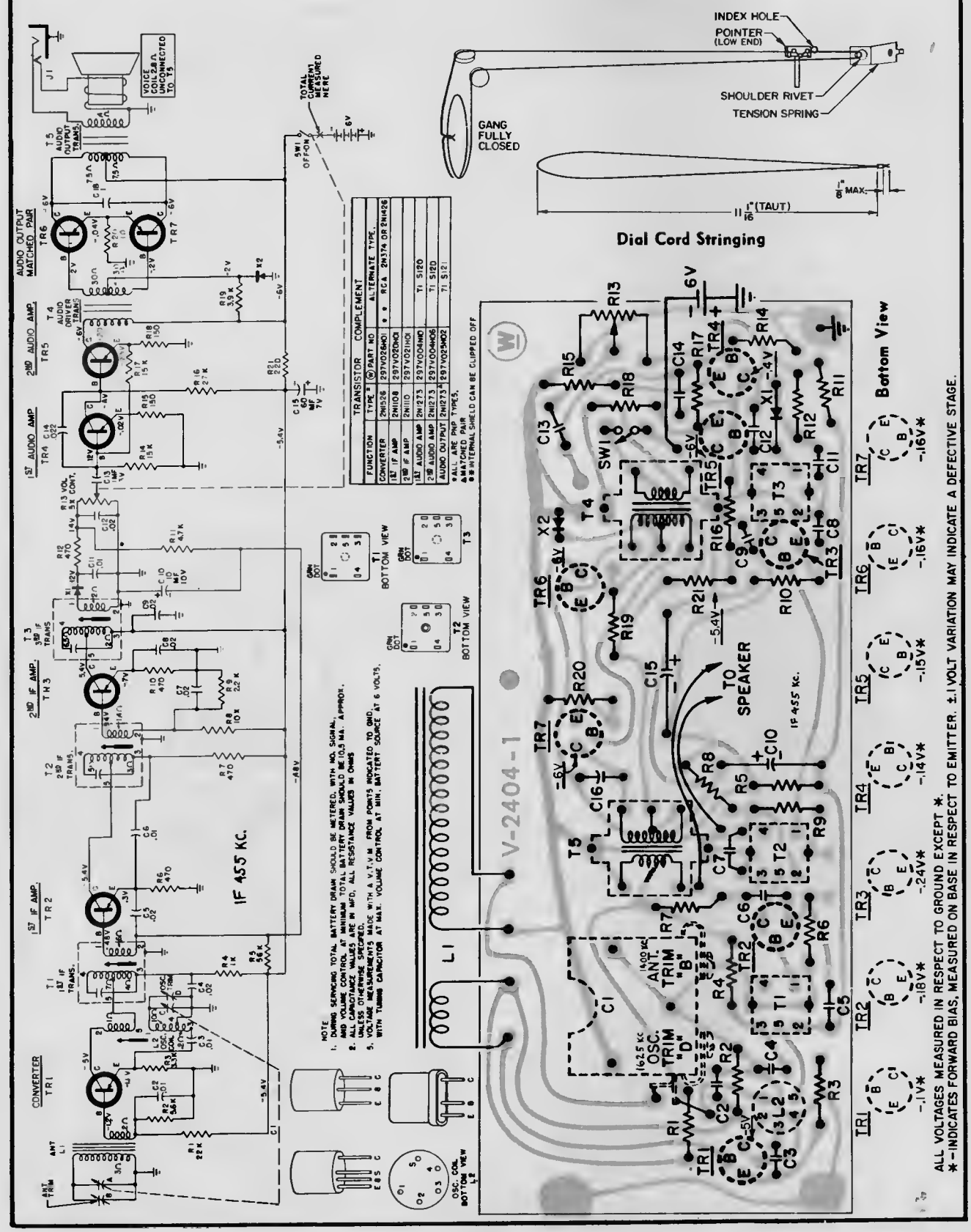
Top View of Chassis

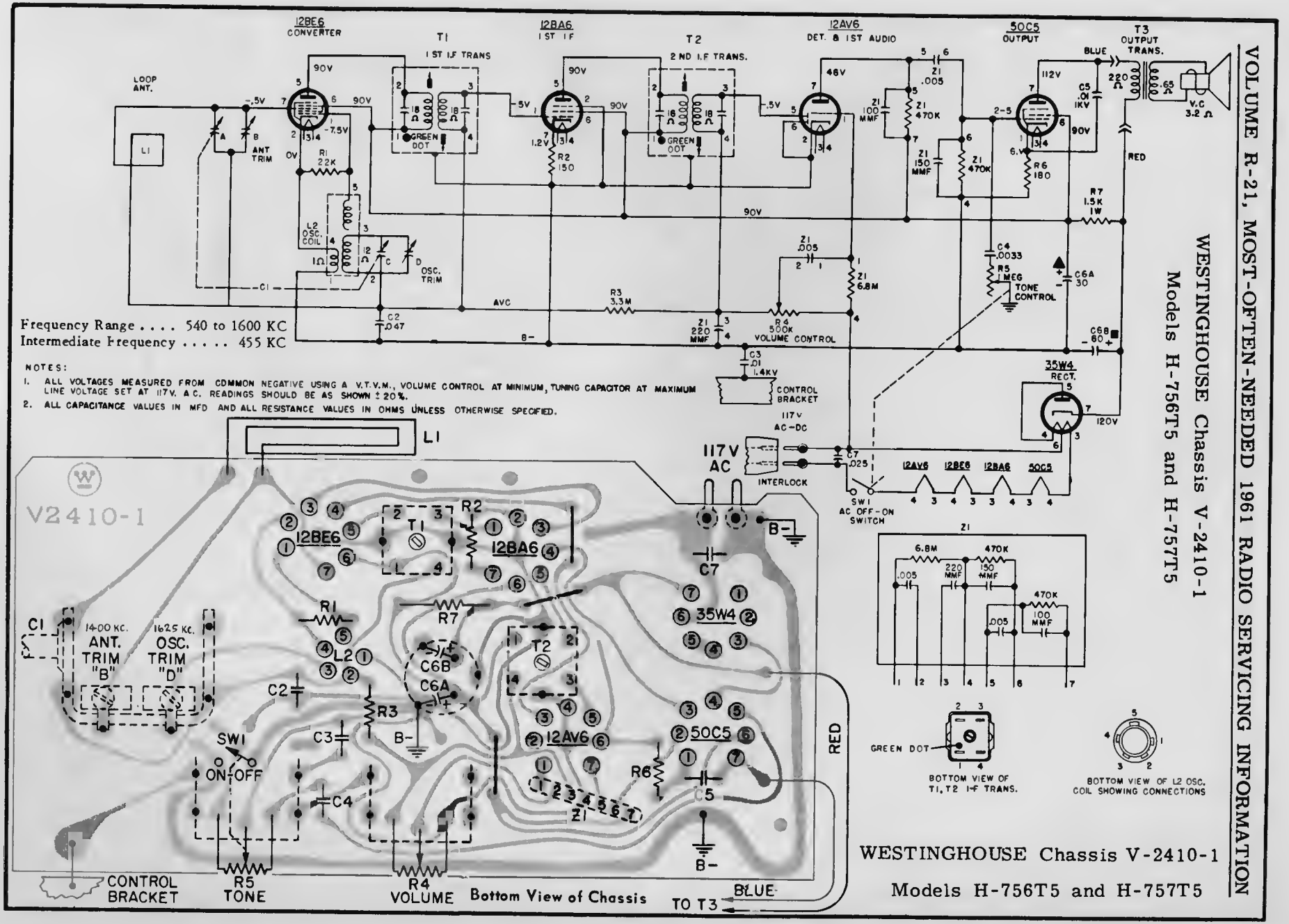
WESTINGHOUSE

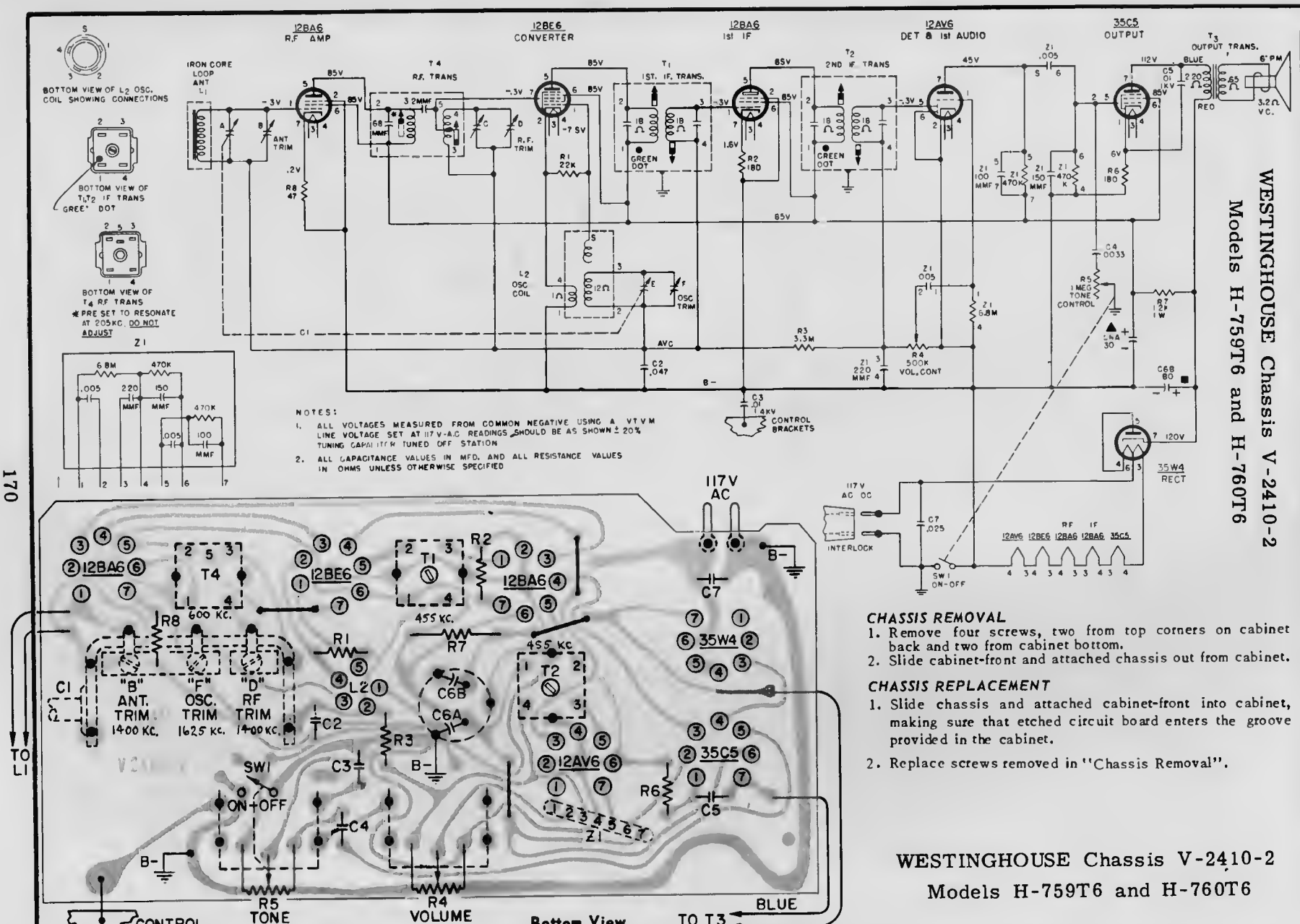
Chassis V-2401-3,
Models H-718T5A,
H-719T5A, H-720T5A.

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

WESTINGHOUSE Chassis V-2404-1, Models H-737P7, H-738P7




WESTINGHOUSE Chassis V-2410-1
Models H-756T5 and H-757T5
12BE6 CONVERTER
T1 1ST I.F TRANS
12BA6 1ST I.F
T2 2ND I.F TRANS.
12AV6 DET. & 1ST AUDIO
50C5 OUTPUT
T3 OUTPUT TRANS.
LOOP ANT.
ANT. TRIM
OSC. TRIM
OSC. COIL
GREEN DOT
VOLUME CONTROL
TONE CONTROL
CONTROL BRACKET
35W4 RECT.
117V AC-DC
INTERLOCK
SW1 AC OFF-ON SWITCH
Frequency Range .... 540 to 1600 KC
Intermediate Frequency ..... 455 KC
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 117V. A.C. READINGS SHOULD BE AS SHOWN ± 20%.
2. ALL CAPACITANCE VALUES IN MFD AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
V2410-1
1400 KC. ANT. TRIM "B"
1625 KC. OSC. TRIM "D"
SW1 ON-OFF
CONTROL BRACKET
R5 TONE
R4 VOLUME
Bottom View of Chassis
TO T3
BLUE
RED
GREEN DOT
BOTTOM VIEW OF T1, T2 I-F TRANS.
BOTTOM VIEW OF L2 OSC. COIL SHOWING CONNECTIONS
WESTINGHOUSE Chassis V-2410-1
Models H-756T5 and H-757T5



CHASSIS REMOVAL

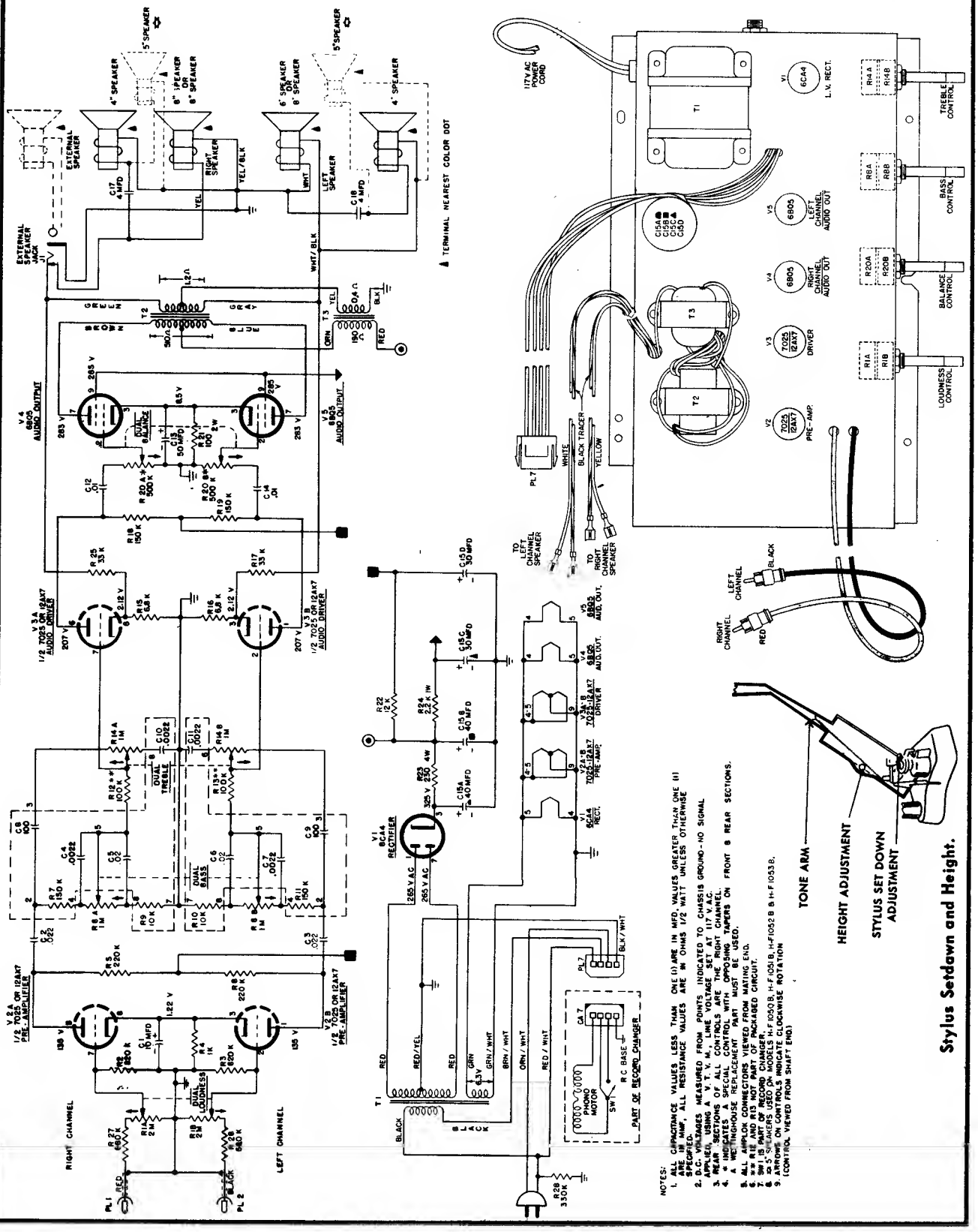
1. Remove four screws, two from top corners on cabinet back and two from cabinet bottom.
2. Slide cabinet-front and attached chassis out from cabinet.

CHASSIS REPLACEMENT

1. Slide chassis and attached cabinet-front into cabinet, making sure that etched circuit board enters the groove provided in the cabinet.
2. Replace screws removed in "Chassis Removal".

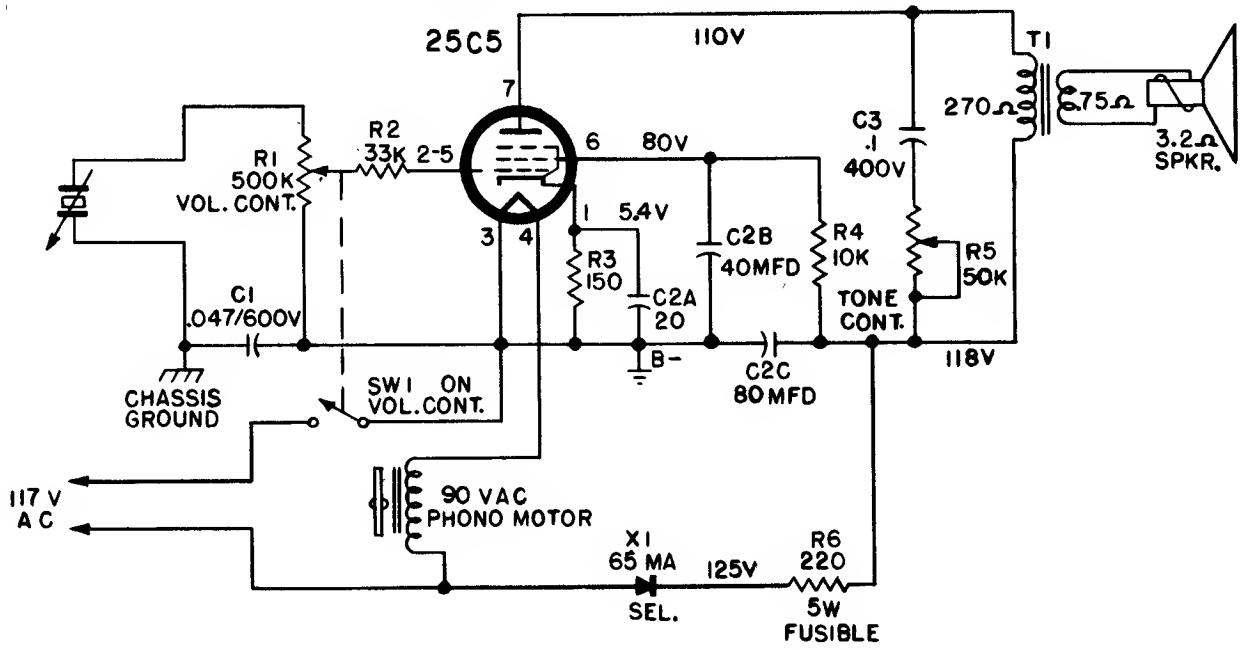
WESTINGHOUSE Chassis V-2410-2
Models H-759T6 and H-760T6

WESTINGHOUSE Chassis V-2512-3, used in Models H-F1010A, H-F1011A, H-F1012A, H-F1013A, H-F1050B, H-F1051B, H-F1052B, H-F1053B

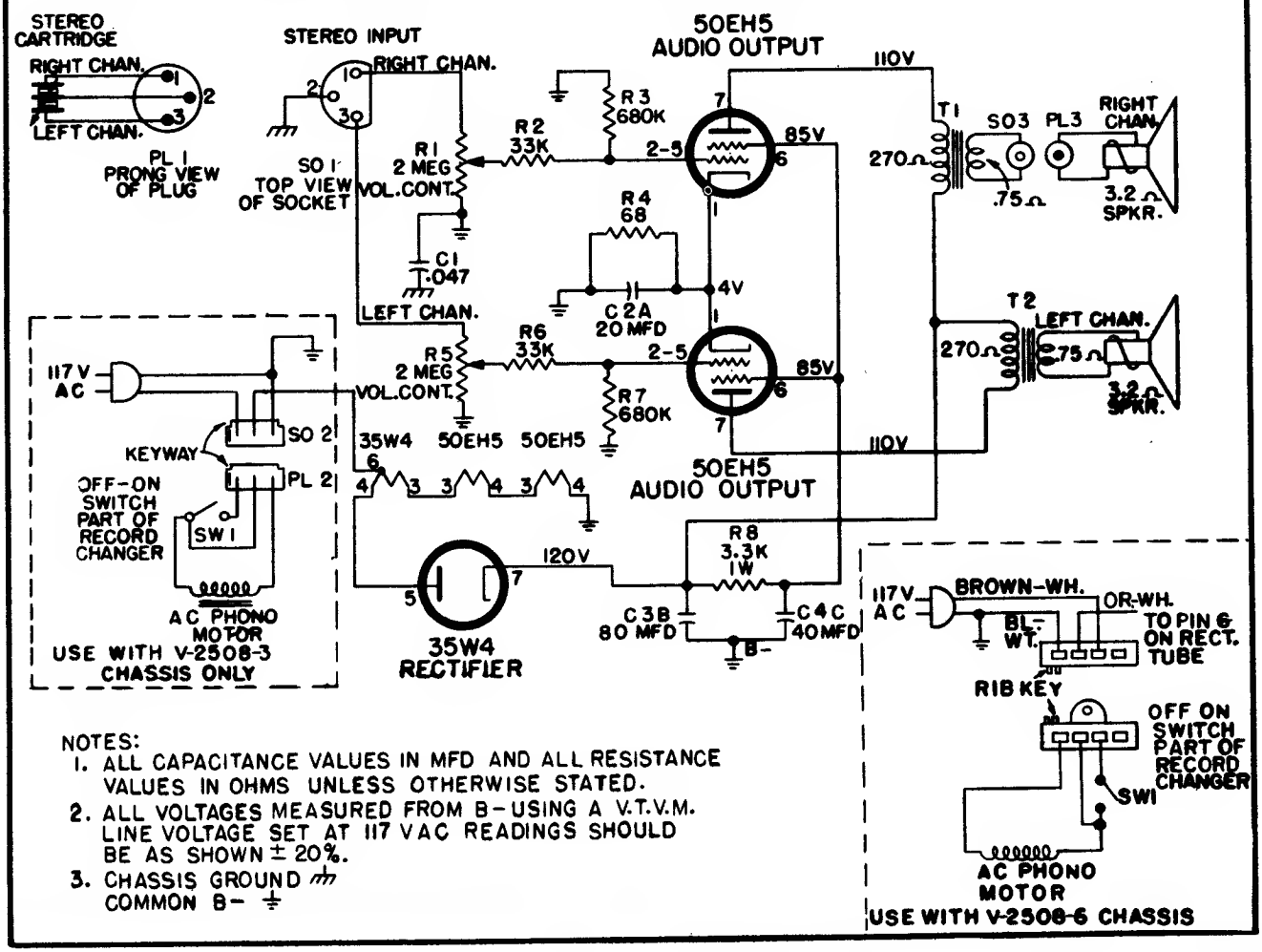


NOTES:
1. ALL CAPACITANCE VALUES LESS THAN ONE (1) ARE IN MFD. VALUES GREATER THAN ONE (1) ARE IN MMF, ALL RESISTANCE VALUES ARE IN OHMS 1/2 WATT UNLESS OTHERWISE SPECIFIED.
2. D.C. VOLTAGES MEASURED FROM POINTS INDICATED TO CHASSIS GROUND - NO SIGNAL APPLIED, USING A V.T.V.M., LINE VOLTAGE SET AT 117 V.A.C.
3. REAR SECTIONS OF ALL CONTROLS ARE THE RIGHT CHANNEL.
4. * INDICATES A SPECIAL CONTROL WITH OPPOSING TAPERS ON FRONT & REAR SECTIONS.
5. ALL MICROPHONE REPLACEMENT PART MUST BE USED.
6. ** R12 AND R13 NOT PART OF SHIELDED CIRCUIT.
7. SW-1 IS PART OF RECORD CHANGER.
8. ☆ 5" SPEAKERS USED ON MODELS H-F1050B, H-F1051B, H-F1052B & H-F1053B.
9. ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END.)

WESTINGHOUSE Chassis V-2508-7, Models H-61MP2, H-61MP3

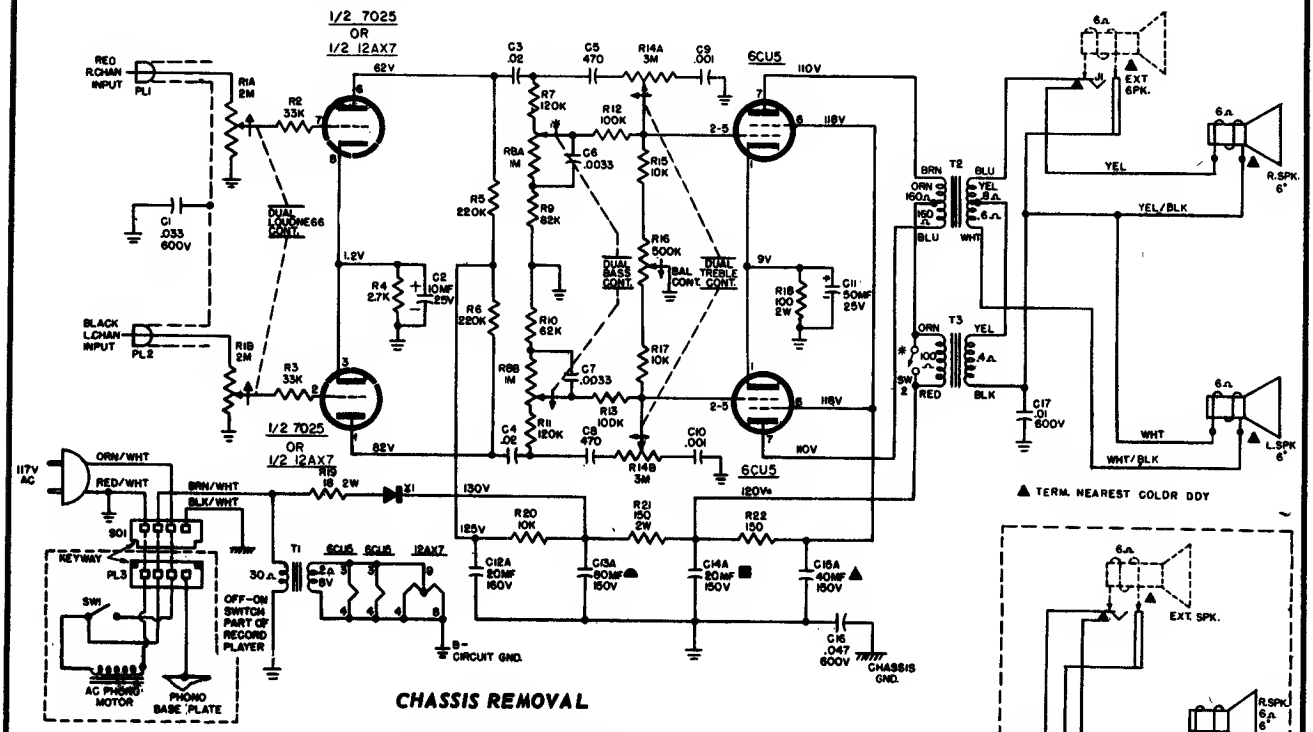


WESTINGHOUSE Chassis V-2508-3, V-2508-6, Models H-64ACS1, H-64ACS2



NOTES:
1. ALL CAPACITANCE VALUES IN MFD AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE STATED.
2. ALL VOLTAGES MEASURED FROM B- USING A V.T.V.M. LINE VOLTAGE SET AT 117 VAC READINGS SHOULD BE AS SHOWN ± 20%.
3. CHASSIS GROUND ⏚ COMMON B- ⏚

WESTINGHOUSE Chassis V-2507-8, Models H-70ACS1, H-70ACS3, H-70ACS4



NOTES:

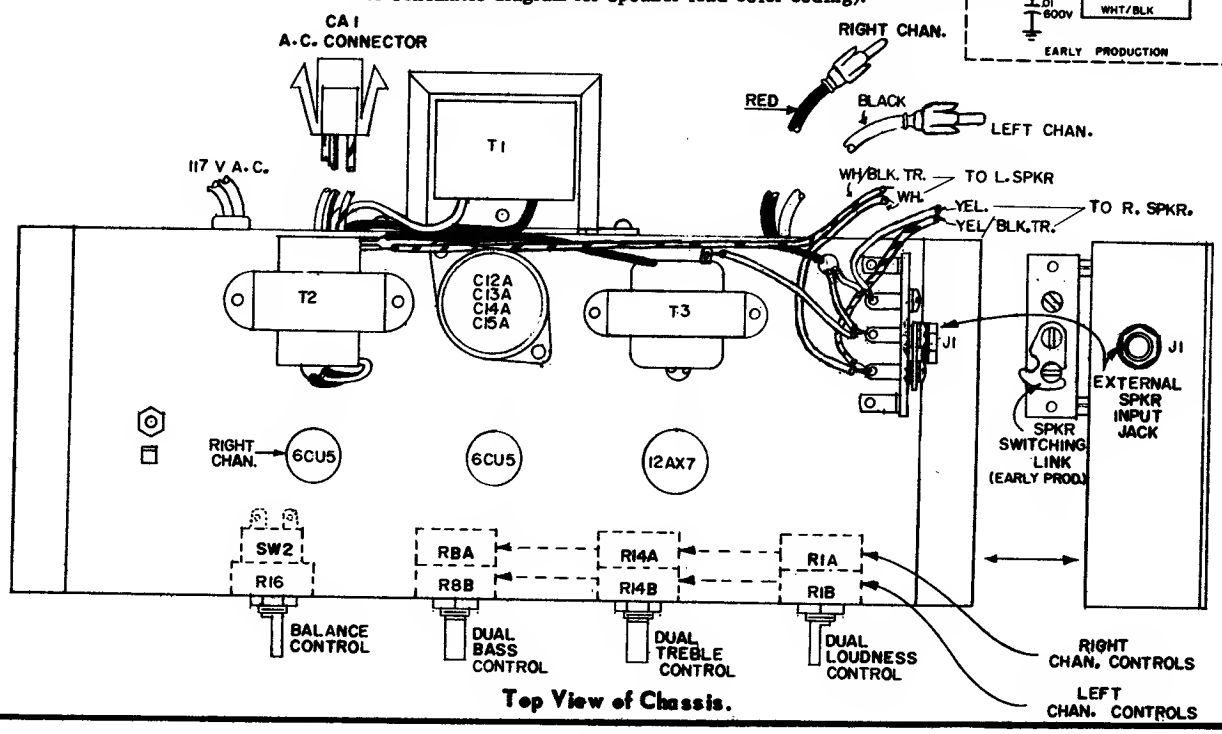
1. ALL CAPACITANCE VALUES LESS THAN 1 ARE IN MFD, AND VALUES GREATER THAN 1 ARE IN MMFD, WHILE ALL RESISTANCE VALUES ARE IN OHMS 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
2. D.C VOLTAGES MEASURED FROM B- USING VTVM, LINE VOLT. SET AT 117 V. AC. READING SHOULD BE WITHIN ±20%
3. AMPLOK CONNECTORS VIEWED FROM CONTACT END.
4. REAR SECTIONS OF ALL CONTROLS ARE RIGHT CHANNEL.
5. ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

* SW 2 USED IN EARLY PRODUCTION ONLY. THIS SWITCH IS OPEN IN STEREO POSITION.

CHASSIS REMOVAL

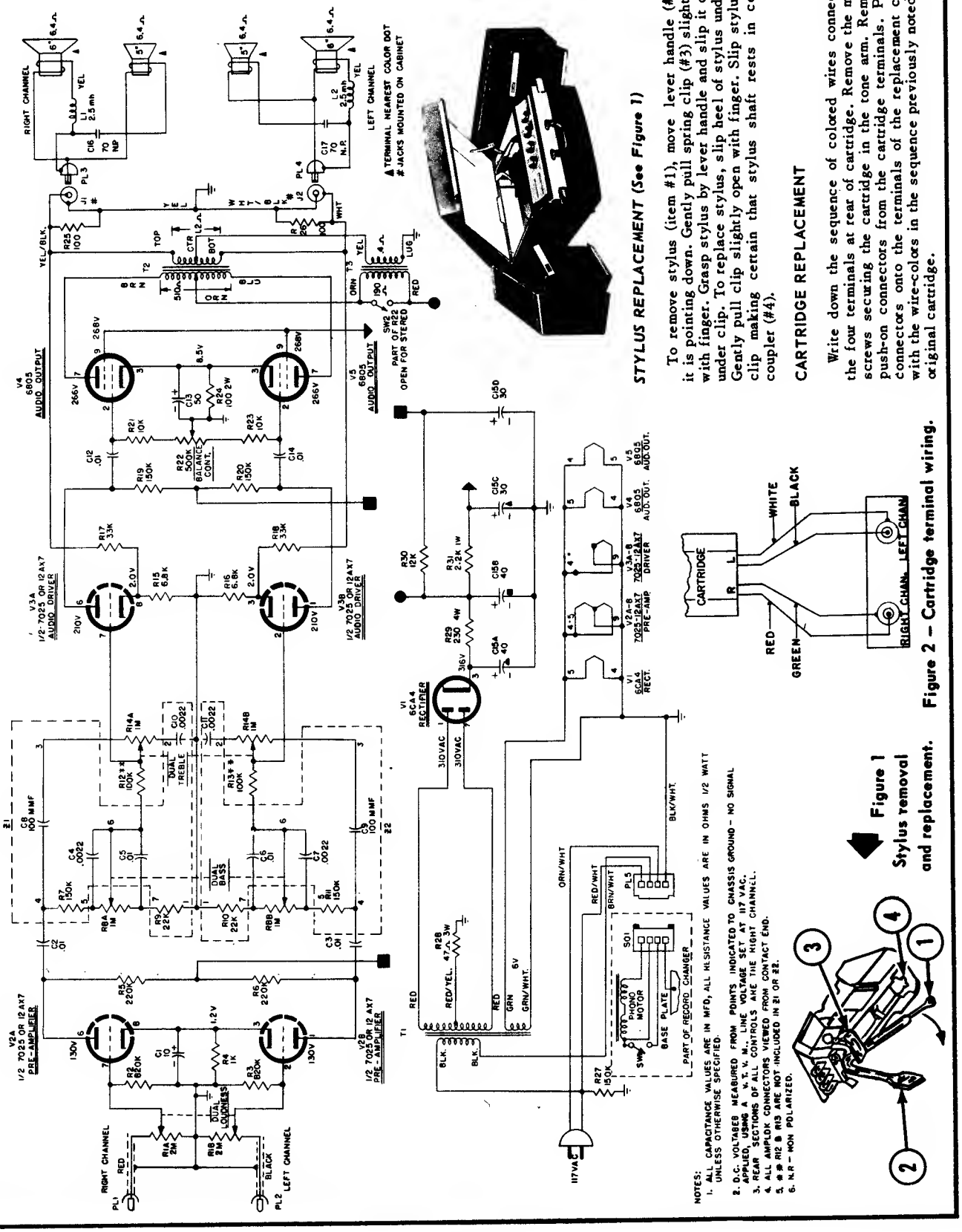
1. Remove control knobs.
2. Disconnect Amp-Lok type plug from record changer.
3. Remove phono plugs from record changer noting color of cables and their respective jacks.
4. Disconnect speaker leads noting connections with regard to lead color and speaker phasing dots.
5. Remove two nuts securing left speaker baffle and remove baffle.
6. Remove four nuts securing chassis and remove chassis.

NOTE: Be sure during chassis installation that phono cables to changer and leads to speakers are properly phased (refer to schematic diagram for speaker lead color coding).



Top View of Chassis.

WESTINGHOUSE Chassis V-2507-6
Models H-68ACS1 and H-68ACS2



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

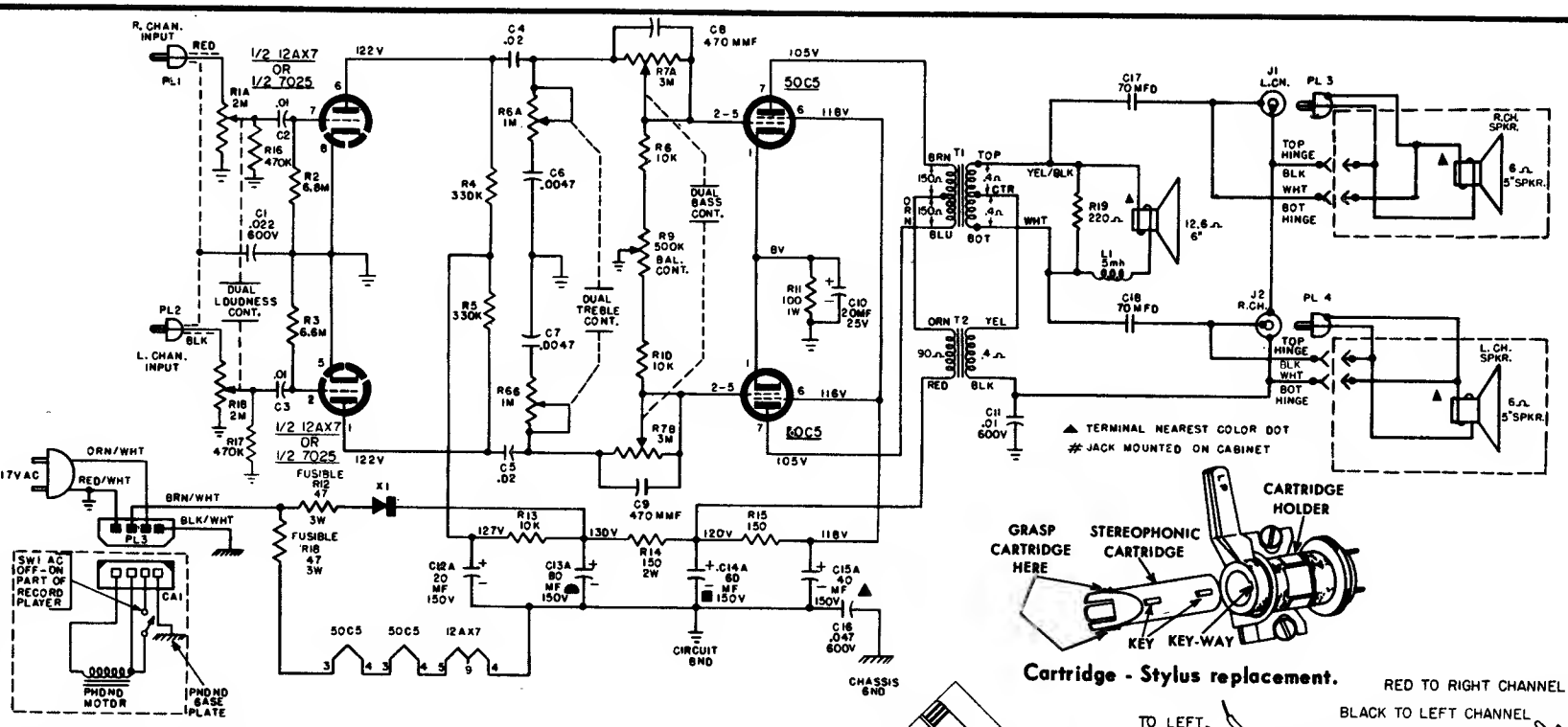
Write down the sequence of colored wires connecting to the four terminals at rear of cartridge. Remove the mounting screws securing the cartridge in the tone arm. Remove the push-on connectors from the cartridge terminals. Push the connectors onto the terminals of the replacement cartridge with the wire-colors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

Figure 2 – Cartridge terminal wiring.

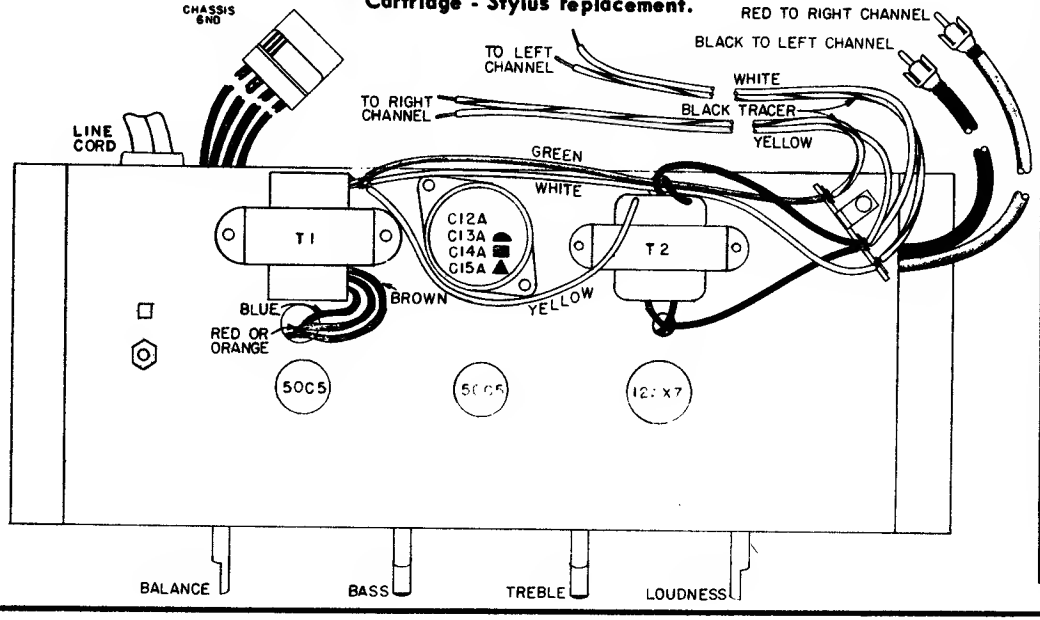
Figure 1
Stylus removal and replacement.

WESTINGHOUSE Chassis V-2507-5

Models H-67ACS1, H-67ACS2



Cartridge - Stylus replacement.



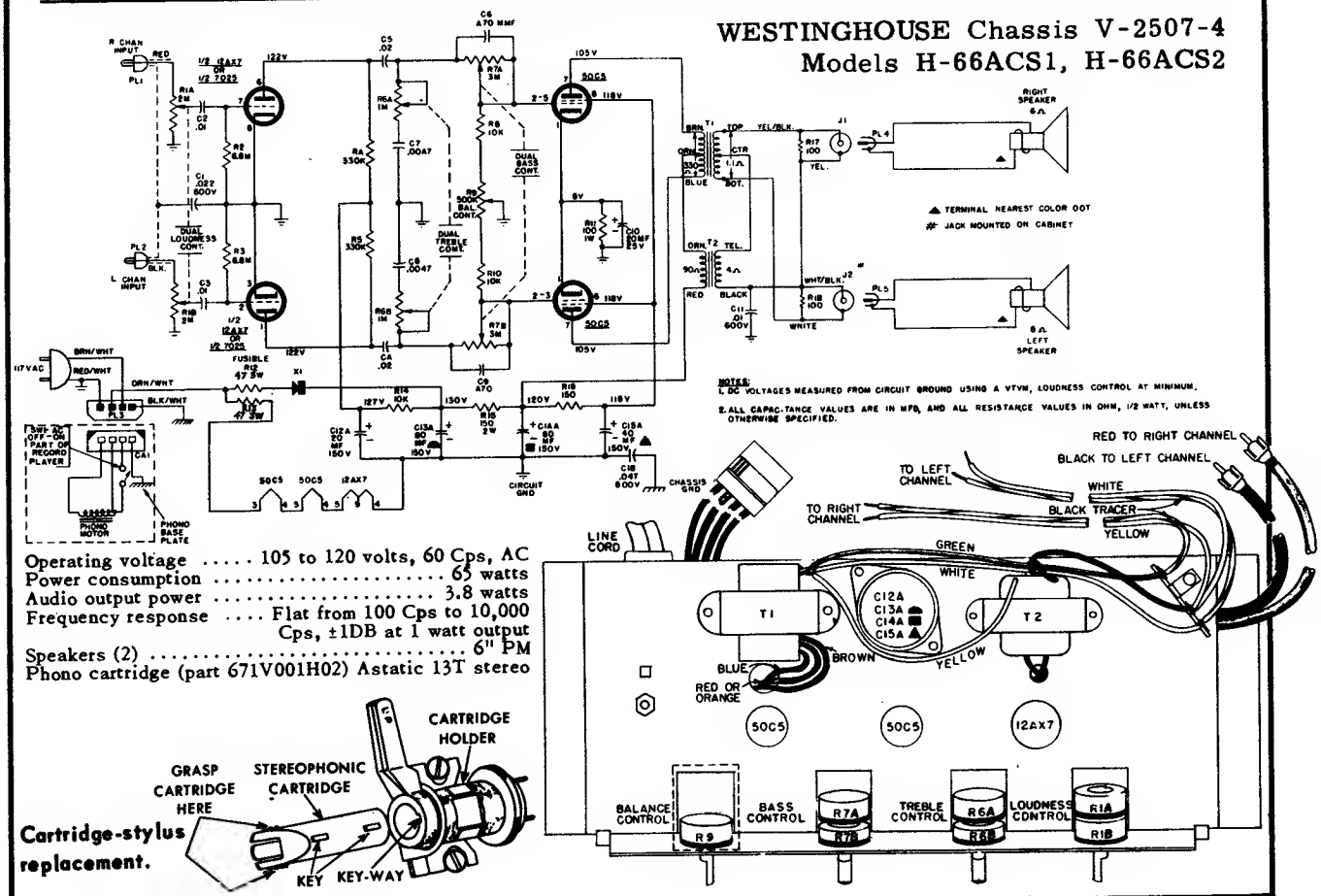
NOTES:

1. DC VOLTAGES MEASURED FROM CIRCUIT GROUND USING A VTVM, LOUDNESS CONTROL AT MINIMUM.
2. ALL CAPACITANCE VALUES ARE IN MFD, AND ALL RESISTANCE VALUES IN OHM, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.

CHASSIS REMOVAL

1. Remove control knobs. Remove the escutcheon mounting board attached to the cabinet by 4 Phillips screws. Remove the perforated tube service cover which is attached to the cabinet by 3 Phillips screws.
2. Remove the 4 Phillips screws holding the motorboard. Lift the motorboard.
3. Note the color and location of the two coax cables connecting to the record changer. Disconnect the amp-lok plug and the two coax cable plugs from the record changer. Remove the record changer.
4. Remove the 2 nuts holding the speaker to the cabinet front and remove the speaker. Note the connections of the speaker leads to the terminal board and unsolder them from the terminals.
5. Remove the 4 nuts holding the chassis and remove the chassis.

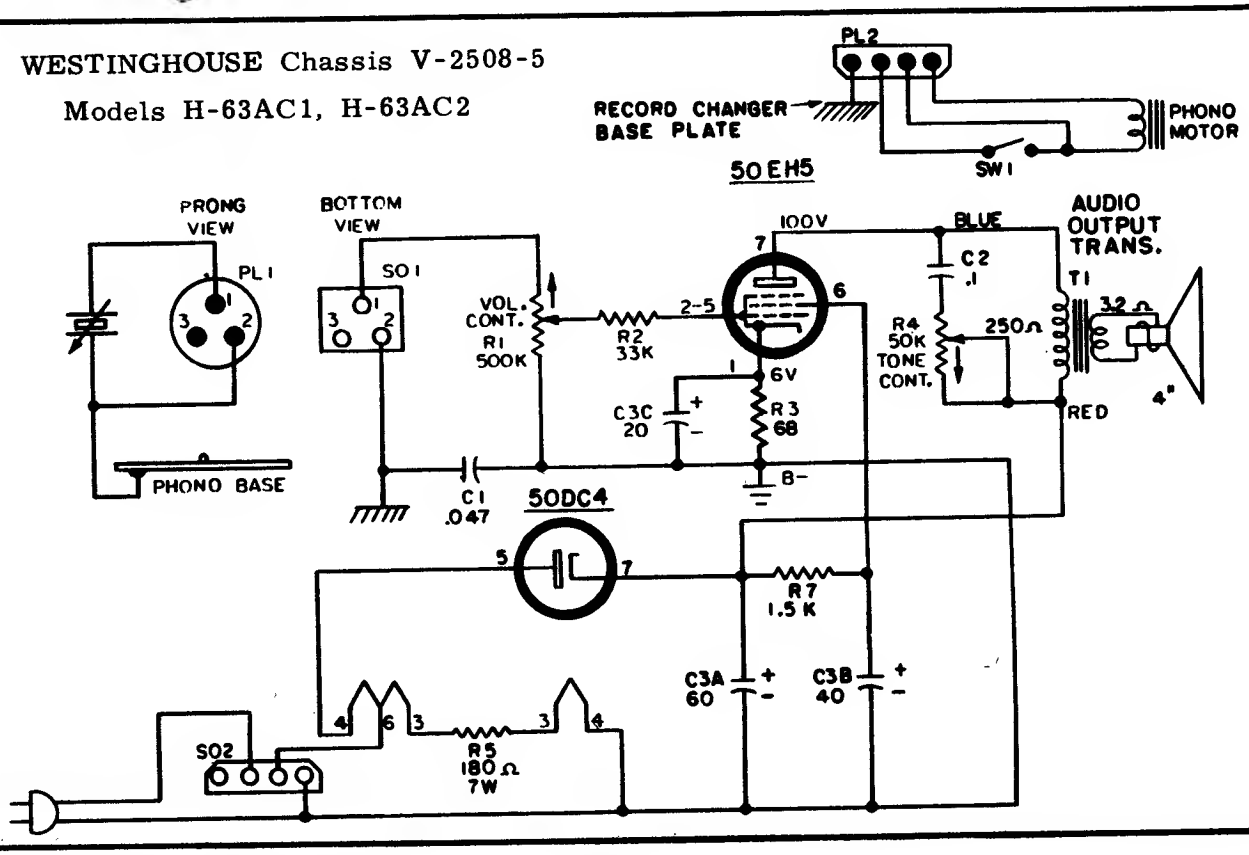
WESTINGHOUSE Chassis V-2507-4
Models H-66ACS1, H-66ACS2

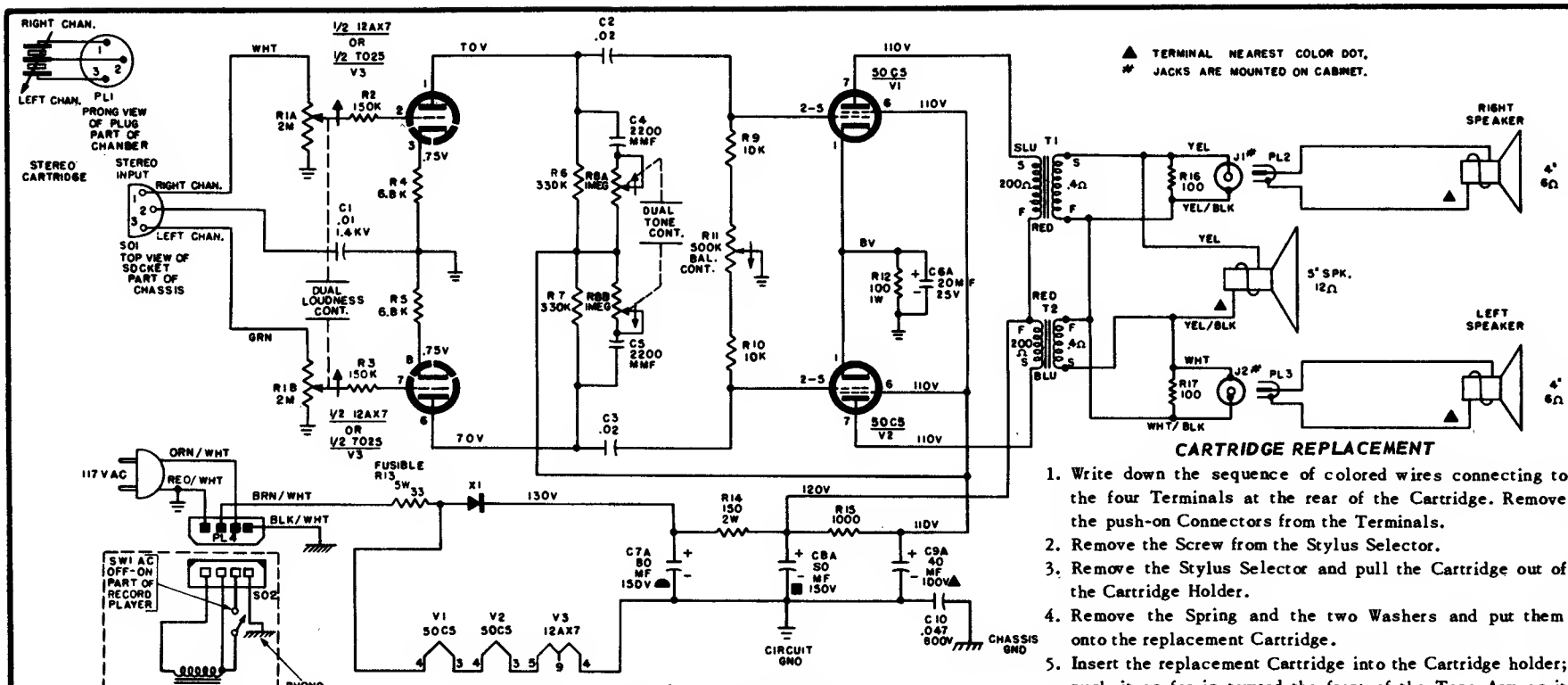


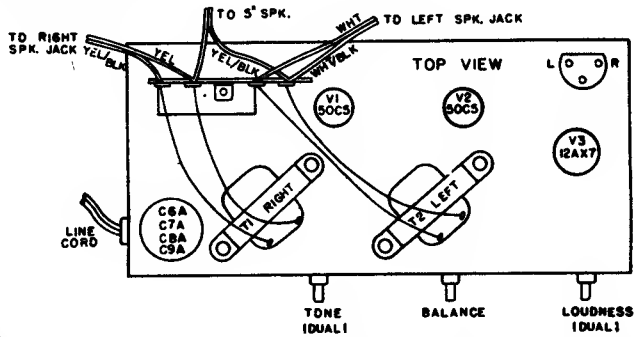
Operating voltage ..... 105 to 120 volts, 60 Cps, AC
Power consumption ..... 65 watts
Audio output power ..... 3.8 watts
Frequency response .... Flat from 100 Cps to 10,000 Cps, ±1DB at 1 watt output
Speakers (2) ..... 6" PM
Phono cartridge (part 671V001H02) Astatic 13T stereo

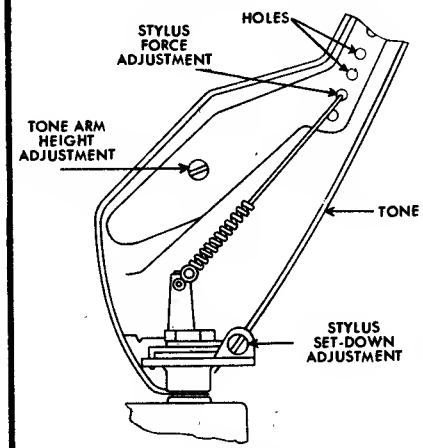
Cartridge-stylus replacement.

WESTINGHOUSE Chassis V-2508-5
Models H-63AC1, H-63AC2









Stylus Setdown.

NOTES:

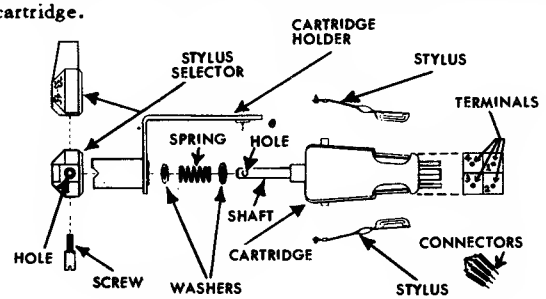
1. DC VOLTAGES MEASURED FROM CIRCUIT GROUND USING A VTVM, LOUDNESS CONTROL AT MINIMUM. LINE VOLTAGE SET AT 117 V. AC. READINGS SHOULD BE AS SHOWN ±20%.
2. ALL CAPACITANCE VALUES LESS THAN ONE (1) ARE IN MFD. VALUES GREATER THAN ONE (1) ARE IN MMF. ALL RESISTANCE VALUES ARE IN OHMS 1/2 WATT UNLESS OTHERWISE SPECIFIED.
3. DUAL CONTROLS ARE WIRED REAR SECTION RIGHT CHAN.- PANEL SECTION LEFT CHAN.
4. ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END.)

WESTINGHOUSE Chassis V-2506-5

Models H-65ACS1, H-65ACS2

CARTRIDGE REPLACEMENT

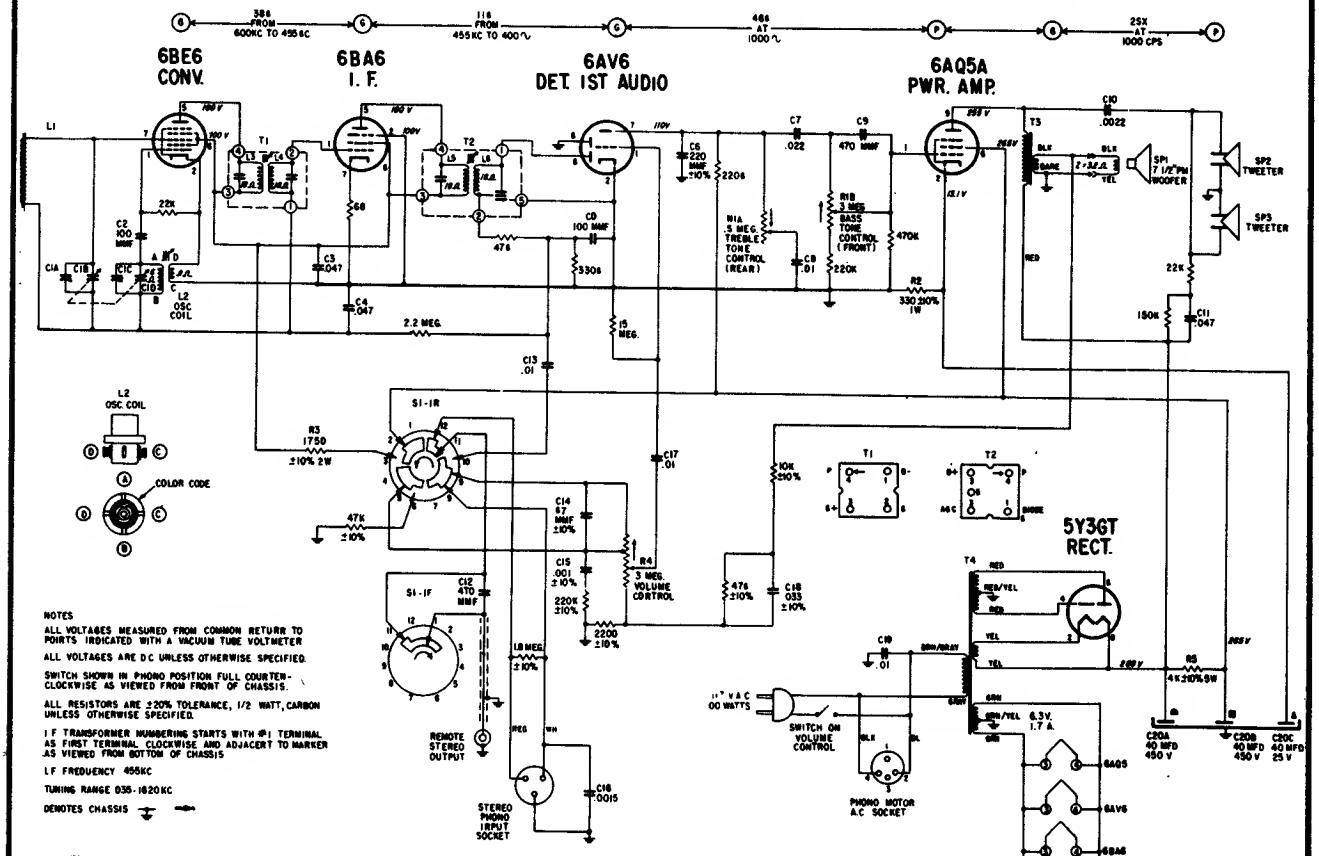
1. Write down the sequence of colored wires connecting to the four Terminals at the rear of the Cartridge. Remove the push-on Connectors from the Terminals.
2. Remove the Screw from the Stylus Selector.
3. Remove the Stylus Selector and pull the Cartridge out of the Cartridge Holder.
4. Remove the Spring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

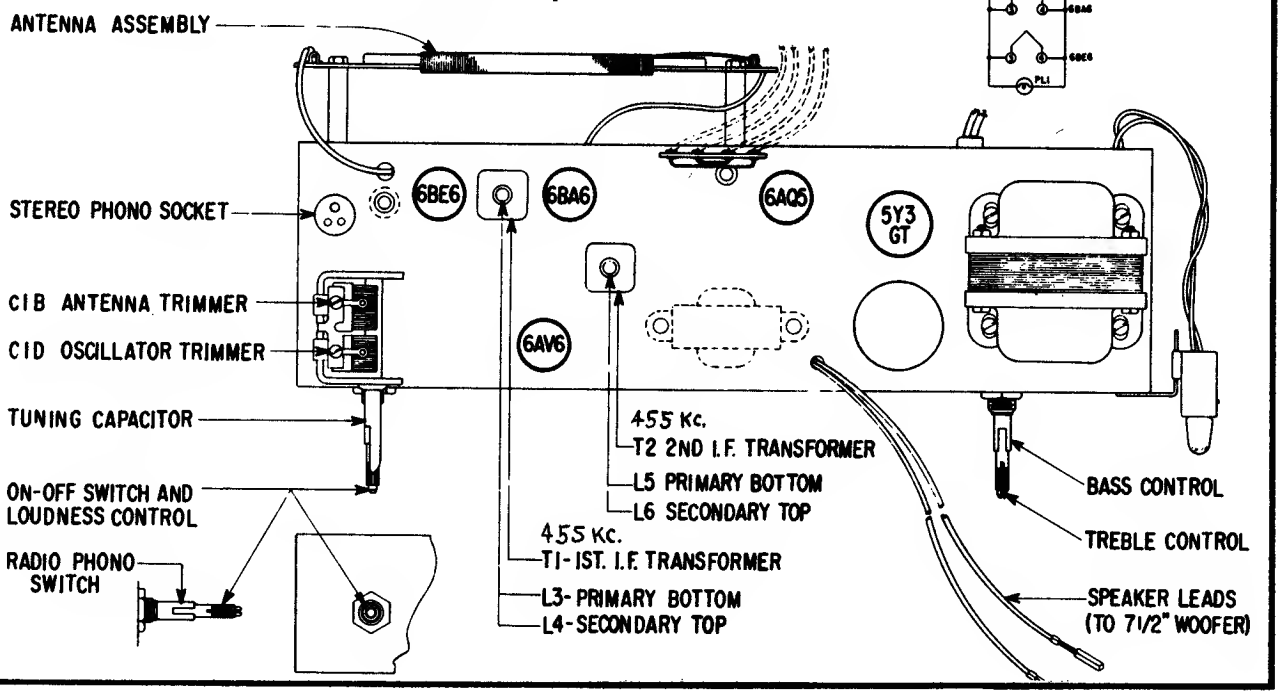


ZENITH RADIO CORPORATION

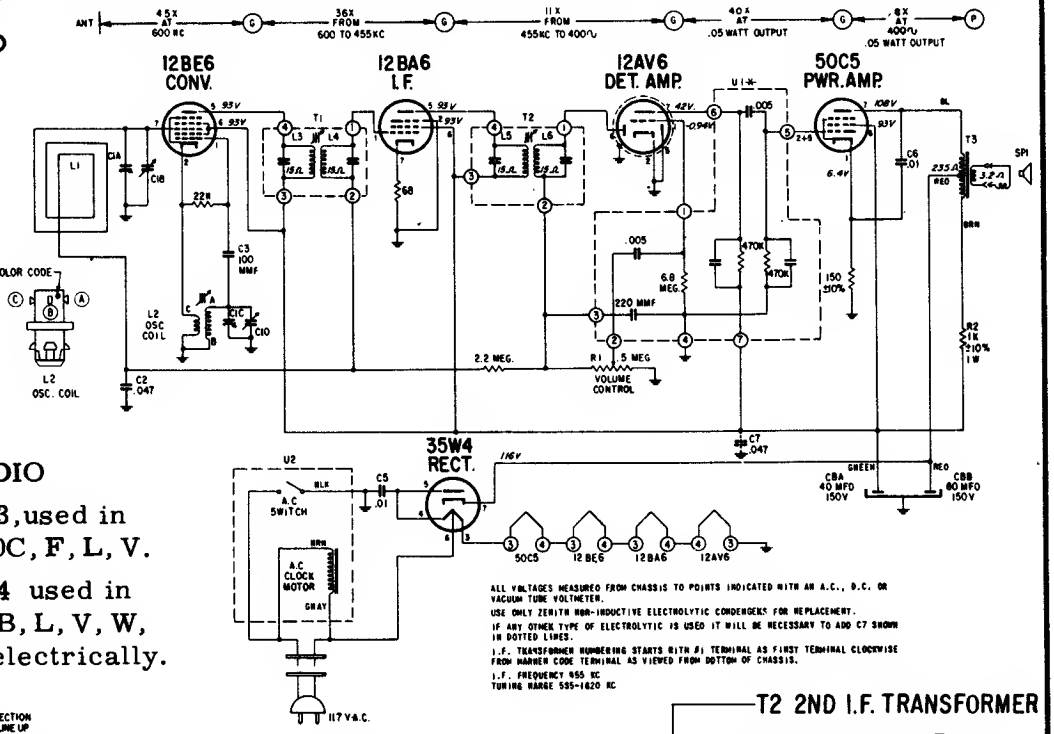
MODEL SFD–660 PORTABLE

STEREOPHONIC PHONOGRAPH CHASSIS 5D20





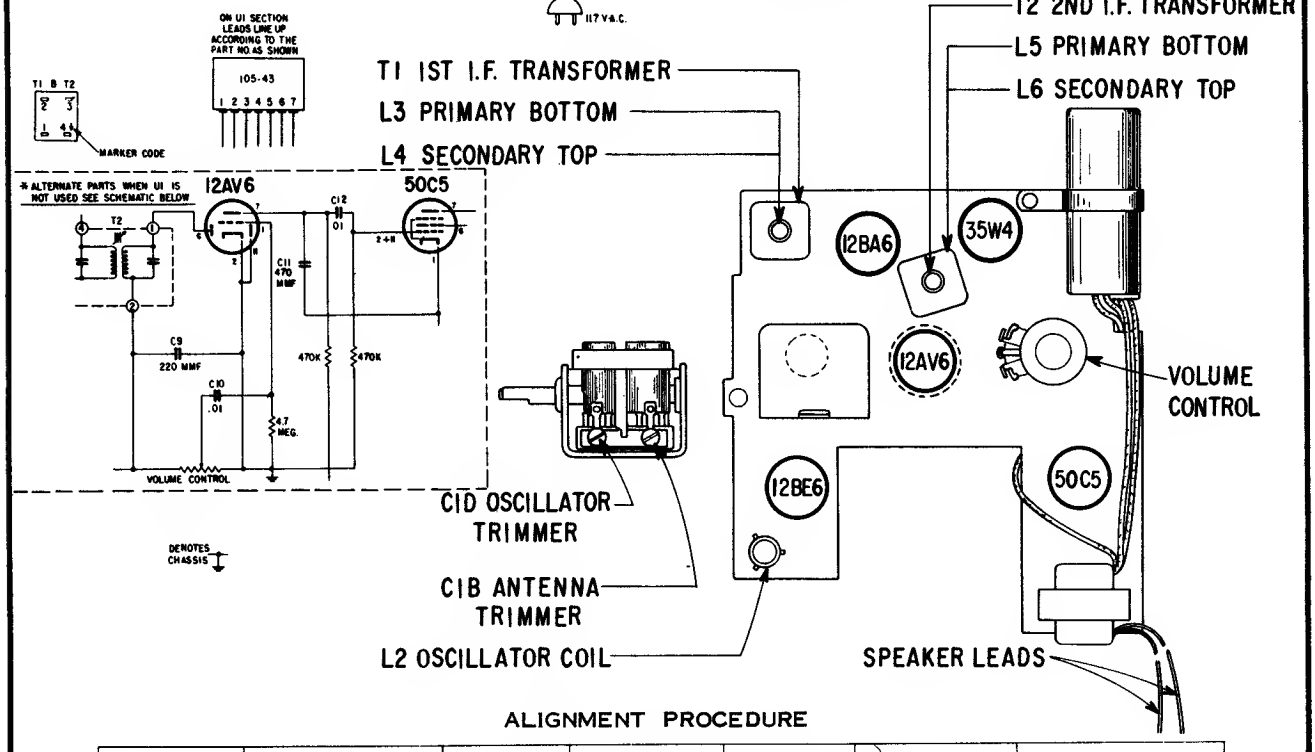
ZENITH RADIO



ZENITH RADIO

Chassis 5F03, used in Models XD60C, F, L, V.

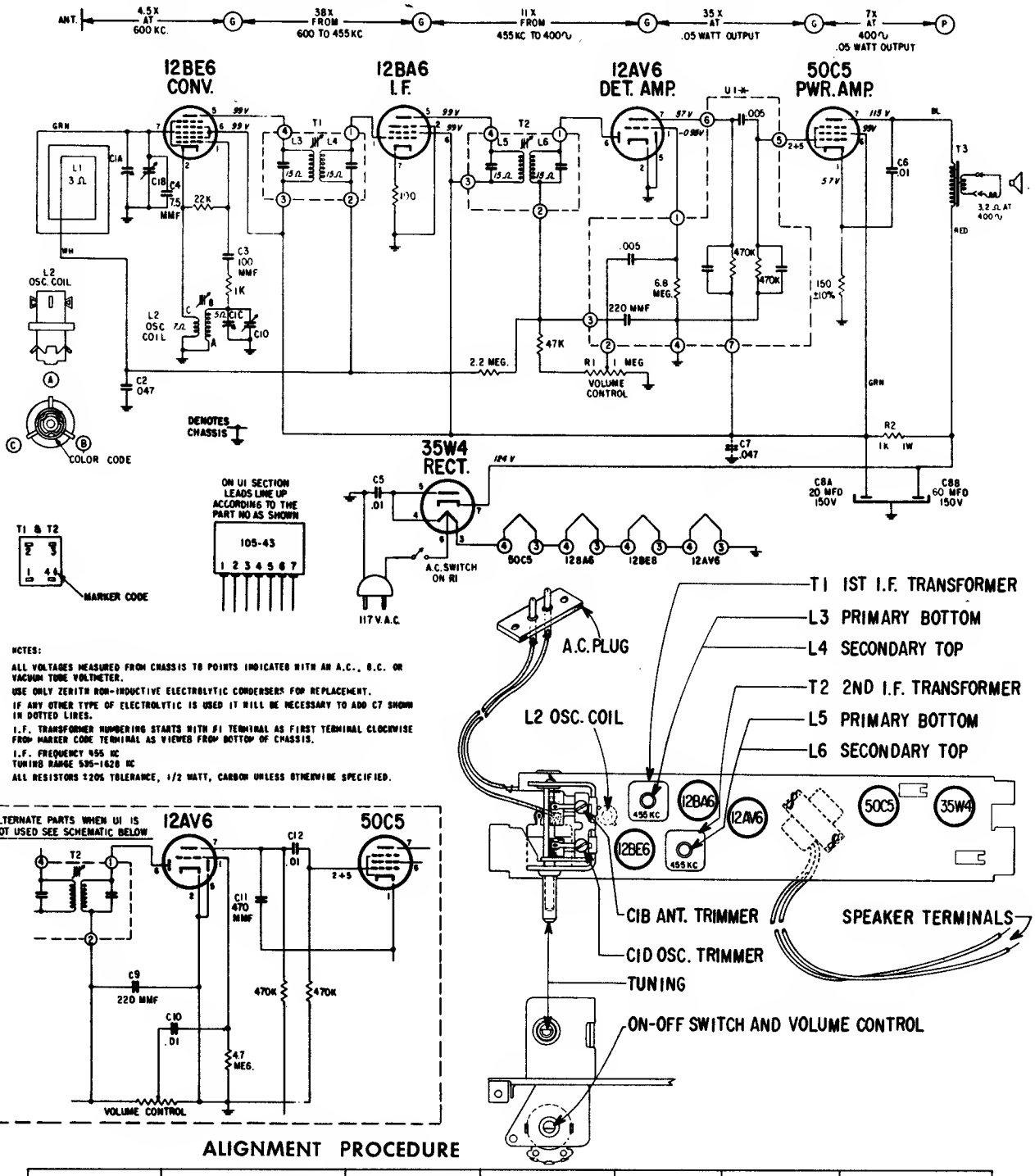
Chassis 5E04 used in Models E514B, L, V, W, is the same electrically.



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

ZENITH RADIO MODELS F512F,C,W,L, CHASSIS 5F13



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.

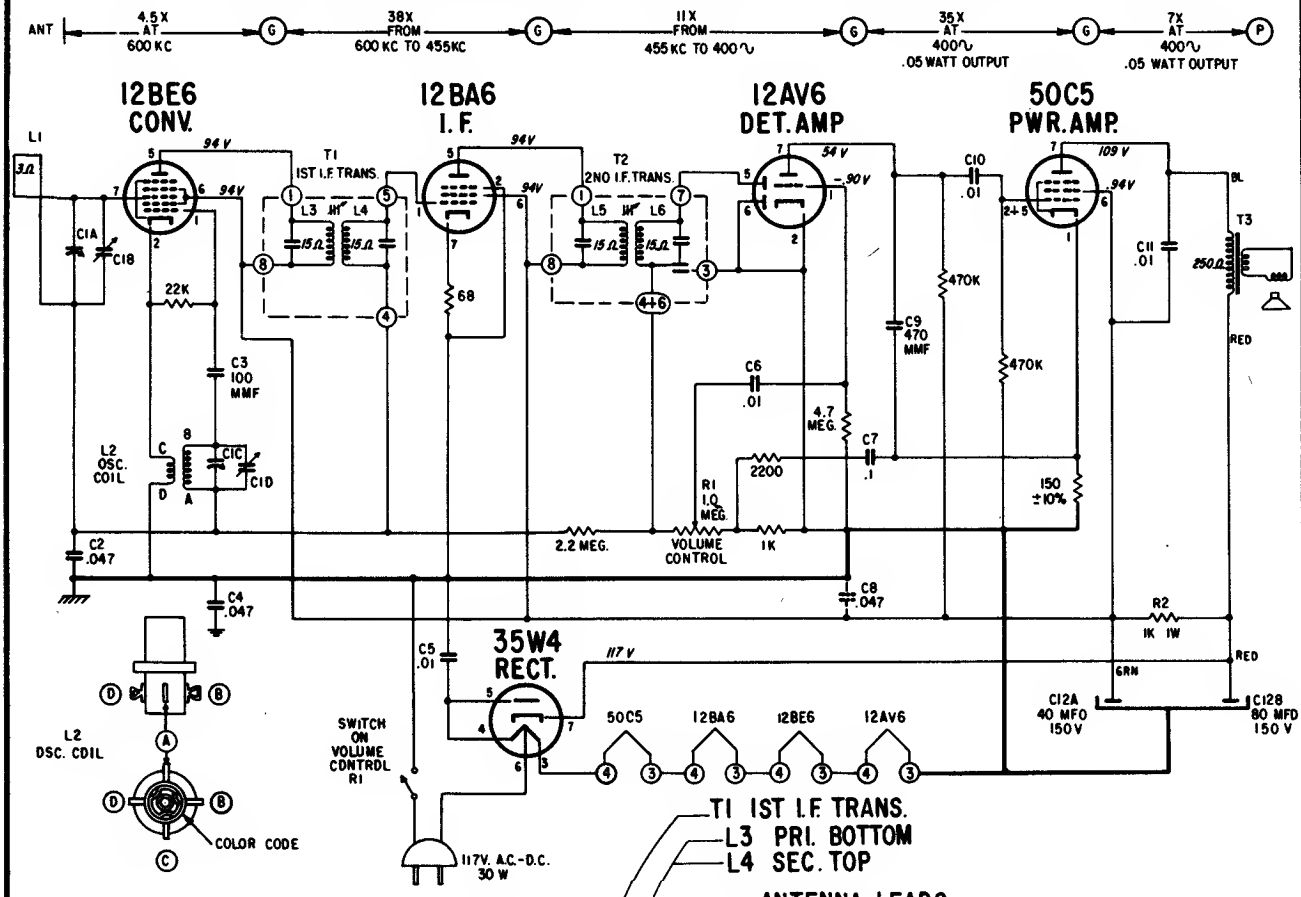
I.F. FREQUENCY 455 KC
TUNING RANGE 535-1620 KC

ALL RESISTORS ±20% TOLERANCE, 1/2 WATT, CARBON UNLESS OTHERWISE SPECIFIED.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3,4,5,6	For I.F. Alignment.
2	One Turn Loop Coupled Loosely to Wave Magnet	——	1600 Kc.	1600 Kc.	CID	Set Oscillator to Dial Scale
3		——	1400 Kc.	1400 Kc.	CIB	Align Antenna Stage

ZENITH RADIO CORPORATION MODELS XD50C, G, R, W, CHASSIS 5D12



NOTES:

ALL VOLTAGES MEASUREO FROM COMMON RETURN TO POINTS INOICATEO WITH AN A.C.,O.C. OR VACUUM TUBE VOLTMETER.

ALL VOLTAGES ARE O.C. UNLESS OTHERWISE SPECIFIED.

USE ONLY ZENITH NON-INOUCTIVE ELECTROLYTIC CONDENSERS FOR REPLACEMENT. IF ANY OTHER TYPE OF ELECTROLYTIC IS USED IT WILL BE NECESSARY TO ADD C8 SHOWN IN DOTTEO LINES.

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

ALL RESISTORS ±20% TOLERANCE, 1/2 WATT, CARBON UNLESS OTHERWISE SPECIFIED.

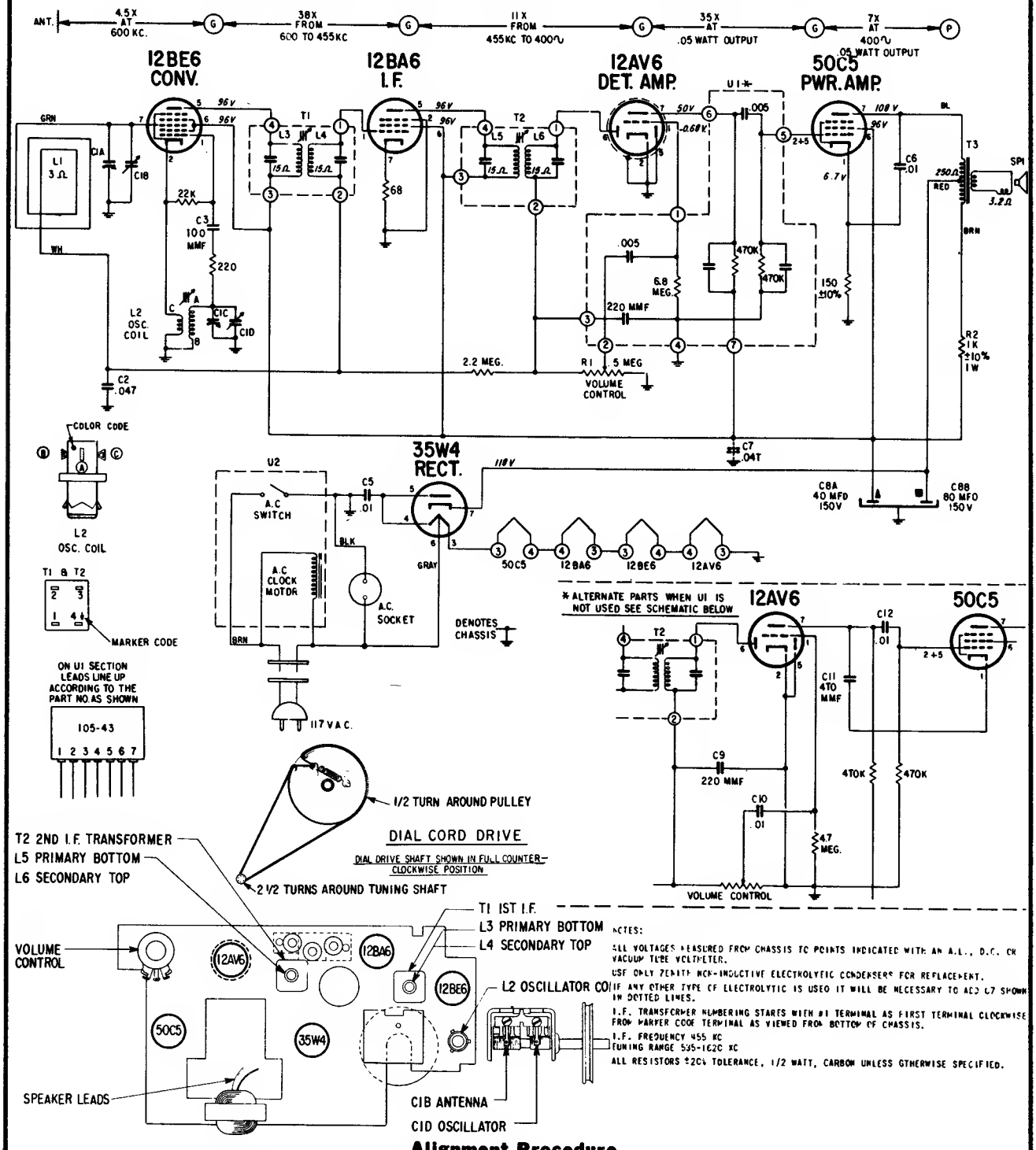
I.F. FREQUENCY 455 KC.
TUNING RANGE 535-1620 KC

DENOTES CHASSIS DENOTES COMMON RETURN 8–

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

ZENITH RADIO Chassis 5G09, Models G516C, L, V, W



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.

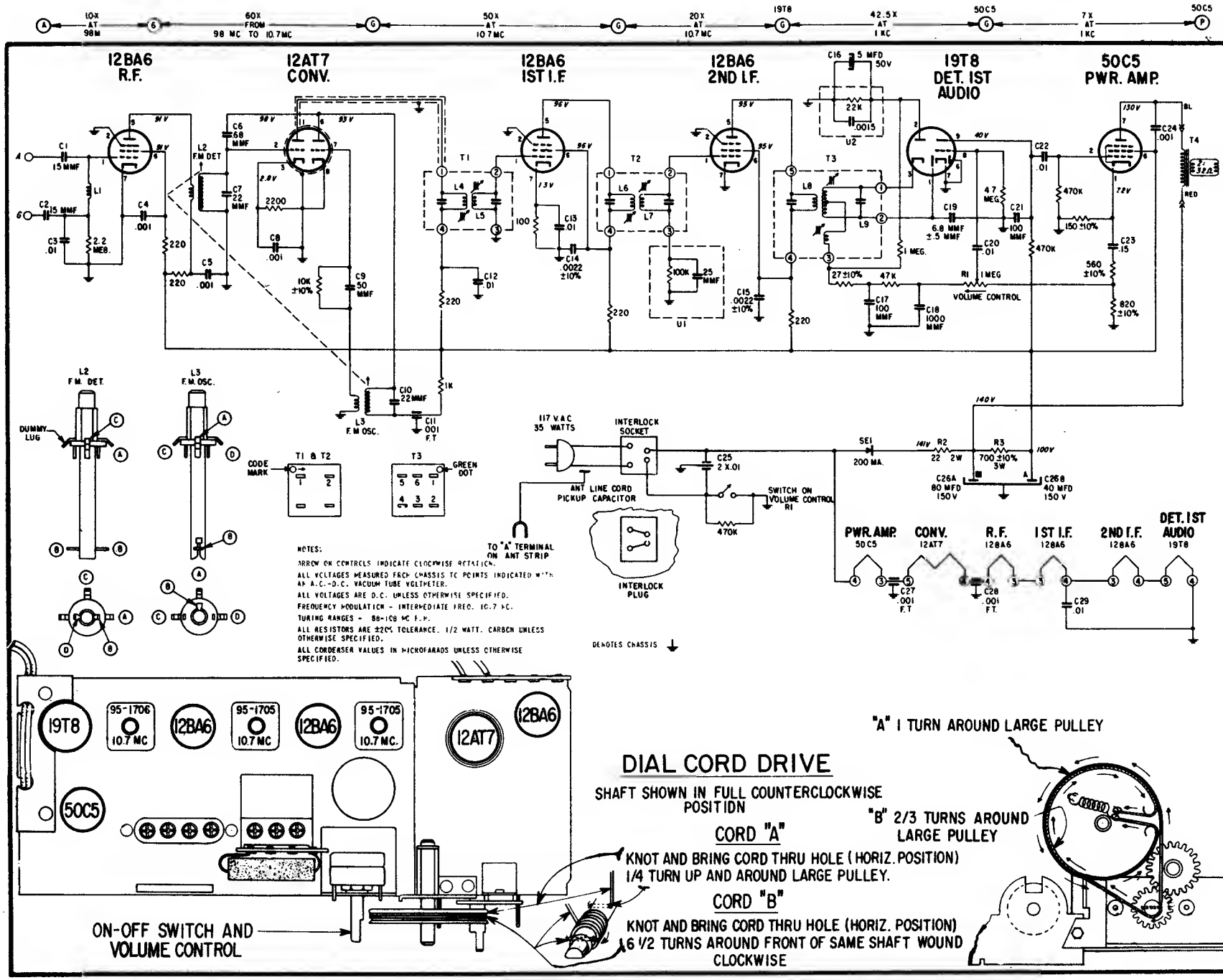
I.F. TRANSFORMER NUMBERING STARTS WITH #1 TERMINAL AS FIRST TERMINAL CLOCKWISE FROM MARKER CODE TERMINAL AS VIEWED FROM BOTTOM OF CHASSIS.

I.F. FREQUENCY 455 KC
TUNING RANGE 535-1620 KC

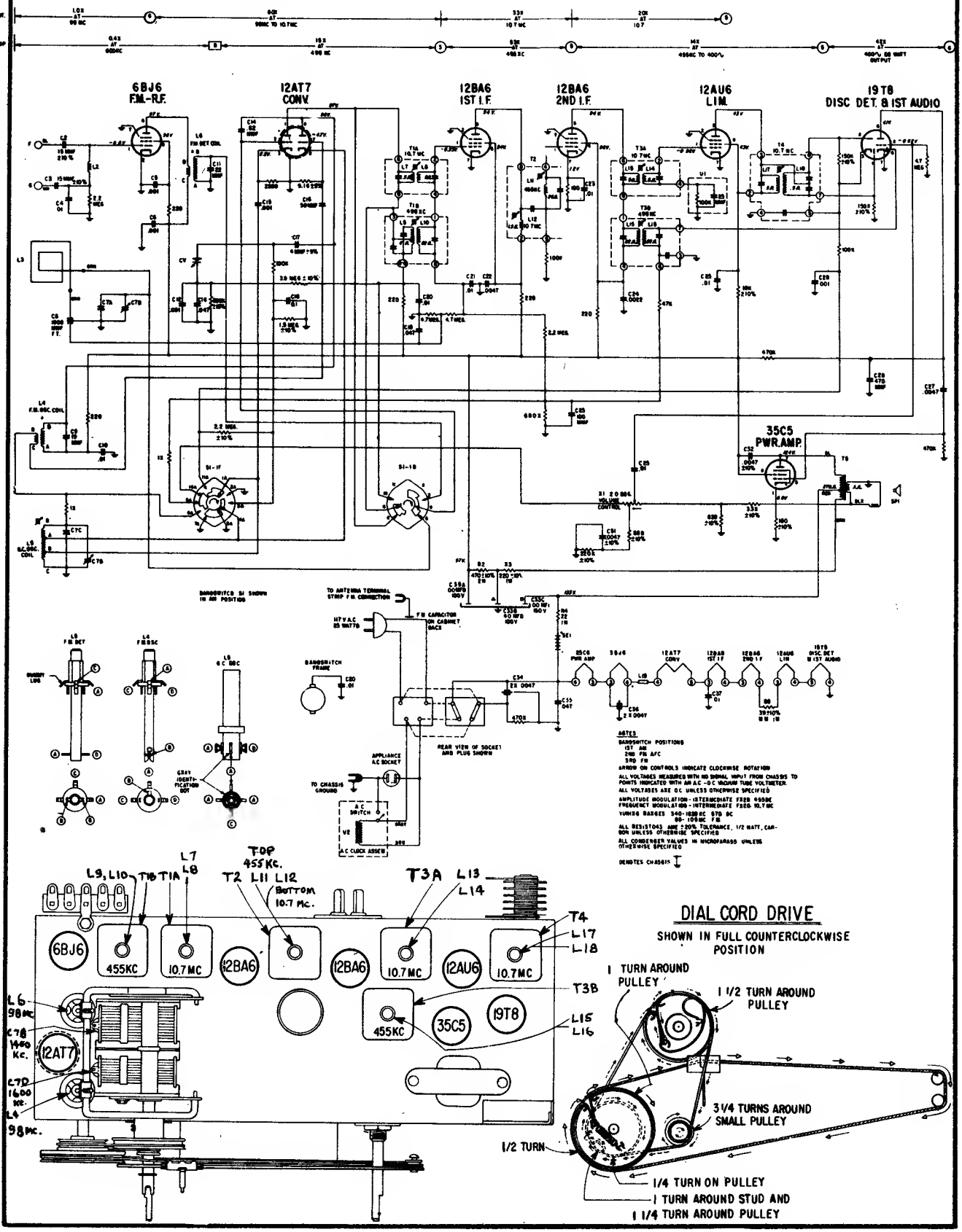
ALL RESISTORS ±20% TOLERANCE, 1/2 WATT, CARBON UNLESS OTHERWISE SPECIFIED.

Alignment Procedure

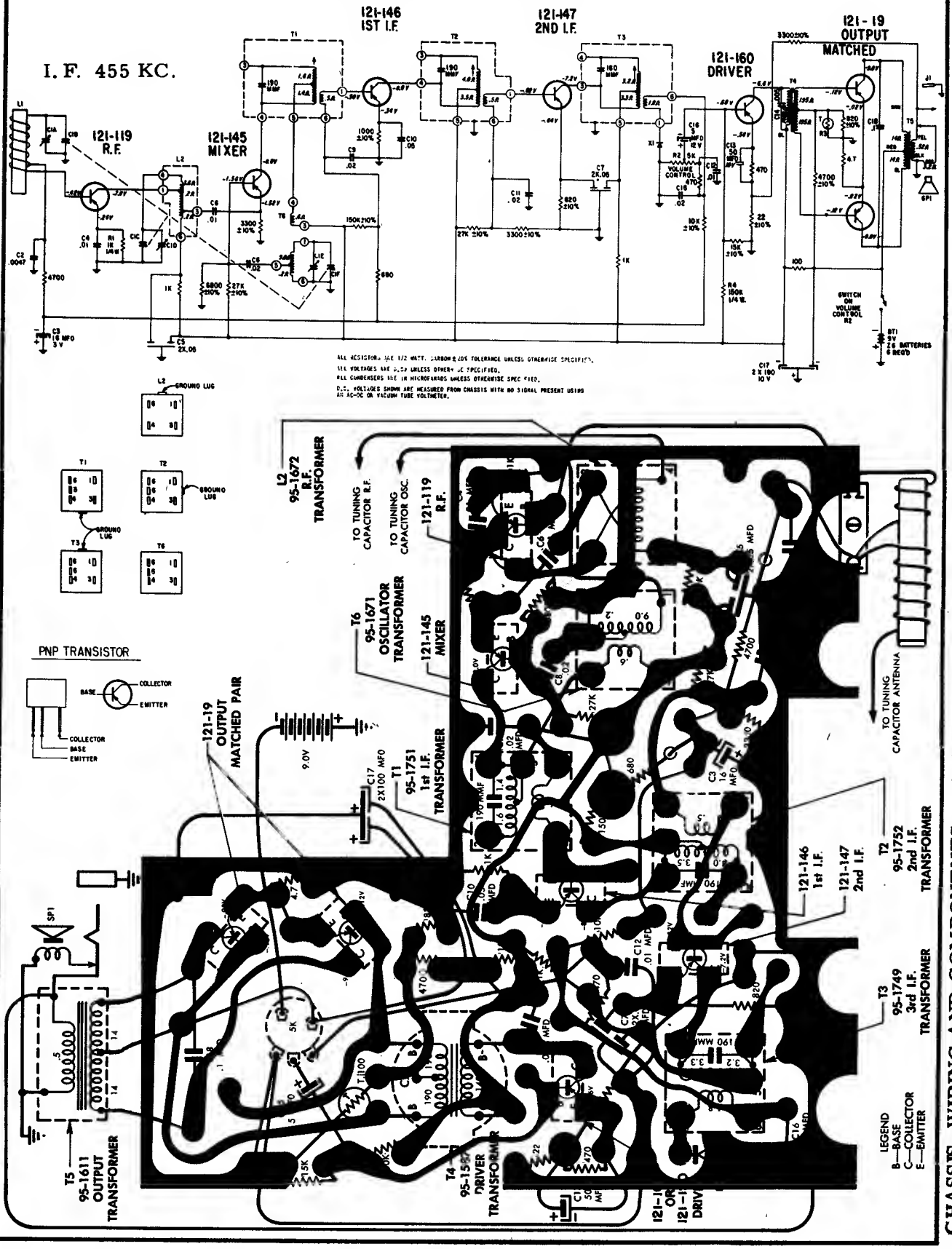
OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.05 Mfd.	455 Kc.	600 Kc.	L3, 4, 5, 6	For I.F. Alignment.
2	One Turn Loop Coupled Loosely to Wave Magnet	—	1600 Kc.	1600 Kc.	CID	Set Oscillator to Dial Scale
3		—	1400 Kc.	1400 Kc.	CIB	Align Antenna Stage


12BA6 R.F.
12AT7 CONV.
12BA6 1ST I.F.
12BA6 2ND I.F.
19T8 DET. 1ST AUDIO
50C5 PWR. AMP.
L2 F.M. DET.
L3 F.M. OSC.
DUMMY LUG
T1 & T2
T3
CODE MARK
GREEN DOT
117 V.A.C. 35 WATTS
INTERLOCK SOCKET
ANT LINE CORD PICKUP CAPACITOR
SWITCH ON VOLUME CONTROL R1
TO "A" TERMINAL ON ANT STRIP
INTERLOCK PLUG
VOLUME CONTROL
PWR. AMP. 50C5
CONV. 12AT7
R.F. 12BA6
1ST I.F. 12BA6
2ND I.F. 12BA6
DET. 1ST AUDIO 19T8
NOTES:
ARROW ON CONTROLS INDICATE CLOCKWISE ROTATION.
ALL VOLTAGES MEASURED FROM CHASSIS TO POINTS INDICATED WITH AN A.C.-D.C. VACUUM TUBE VOLTMETER.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
FREQUENCY MODULATION - INTERMEDIATE FREQ. 10.7 MC.
TUNING RANGES - 88-108 MC F.M.
ALL RESISTORS ARE ±20% TOLERANCE. 1/2 WATT. CARBON UNLESS OTHERWISE SPECIFIED.
ALL CONDENSER VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
DENOTES CHASSIS
19T8
95-1706 10.7 MC
12BA6
95-1705 10.7 MC
12BA6
95-1705 10.7 MC.
12AT7
12BA6
50C5
ON-OFF SWITCH AND VOLUME CONTROL
DIAL CORD DRIVE
SHAFT SHOWN IN FULL COUNTERCLOCKWISE POSITION
CORD "A"
KNOT AND BRING CORD THRU HOLE (HORIZ. POSITION) 1/4 TURN UP AND AROUND LARGE PULLEY.
CORD "B"
KNOT AND BRING CORD THRU HOLE (HORIZ. POSITION) 6 1/2 TURNS AROUND FRONT OF SAME SHAFT WOUND CLOCKWISE
"A" 1 TURN AROUND LARGE PULLEY
"B" 2/3 TURNS AROUND LARGE PULLEY

ZENITH MODEL F728C, L & W, CHASSIS 7F03



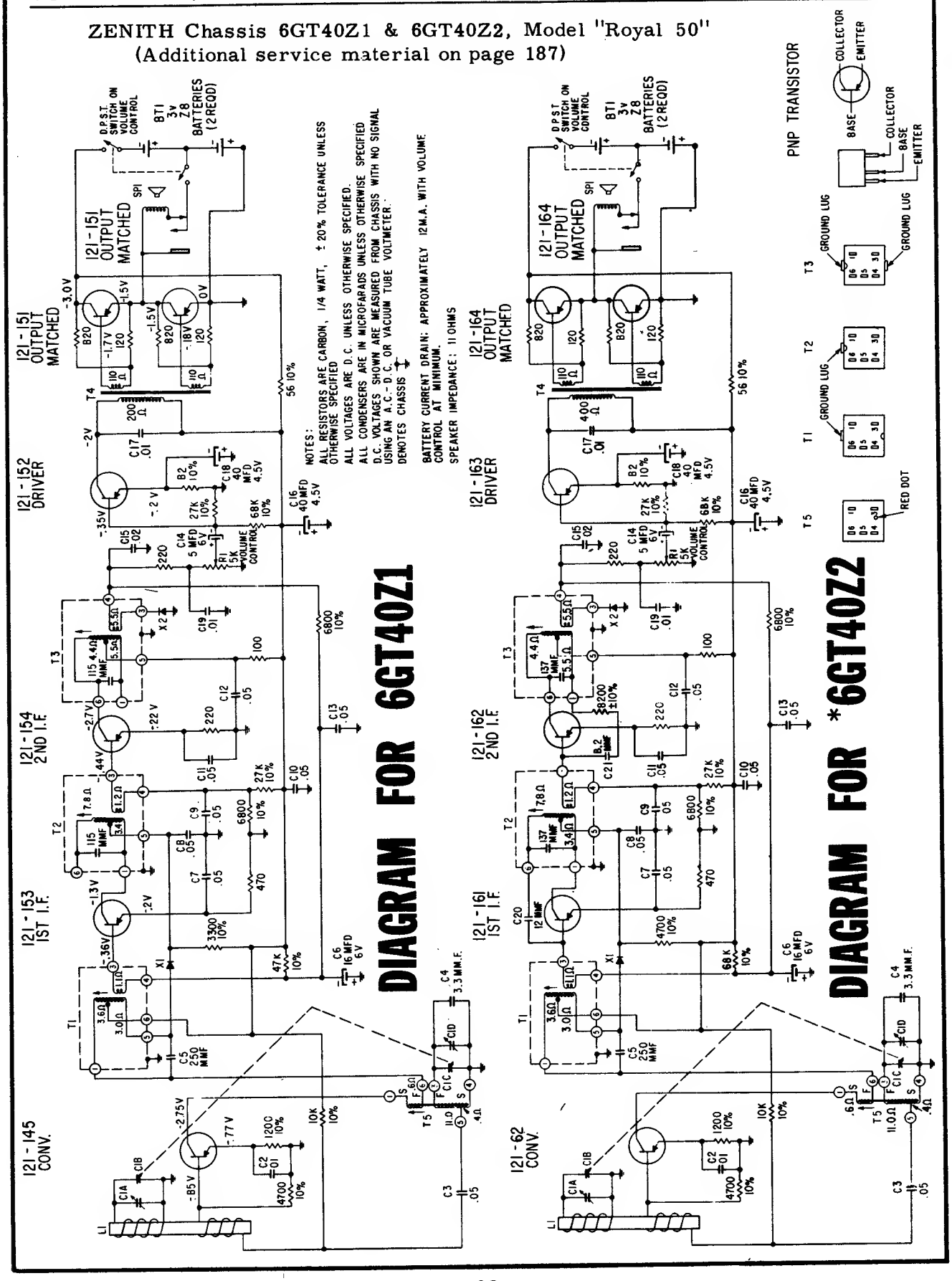
ZENITH RADIO Chassis 7FT45Z1, Model "Royal 475"



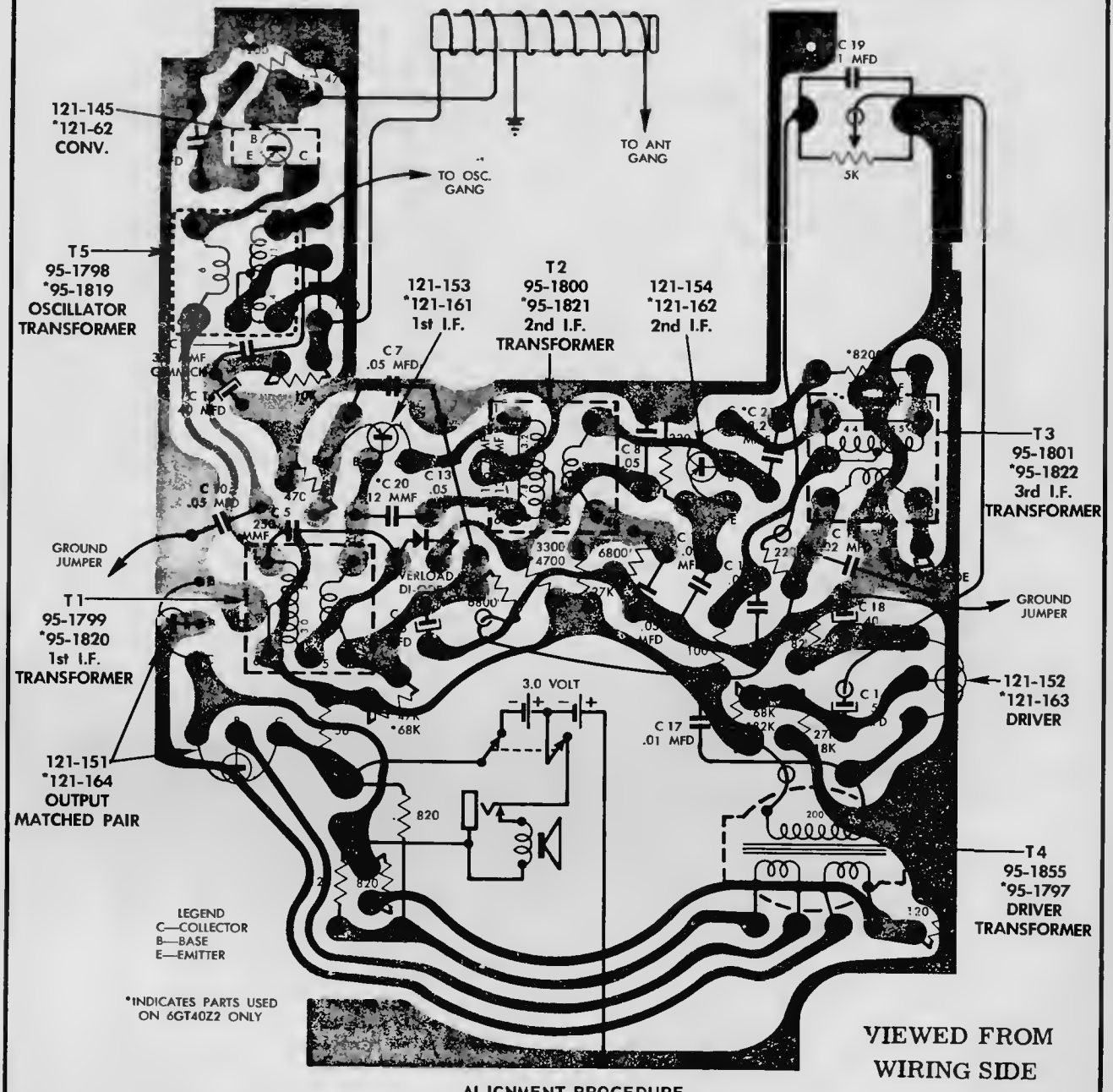
CHASSIS, WIRING AND COMPONENTS VIEWED FROM WIRING SIDE

ZENITH Chassis 6GT40Z1 & 6GT40Z2, Model "Royal 50"

(Additional service material on page 187)



ZENITH Chassis 6GT40Z1 & 6GT40Z2, Model "Royal 50" Continued



VIEWED FROM WIRING SIDE

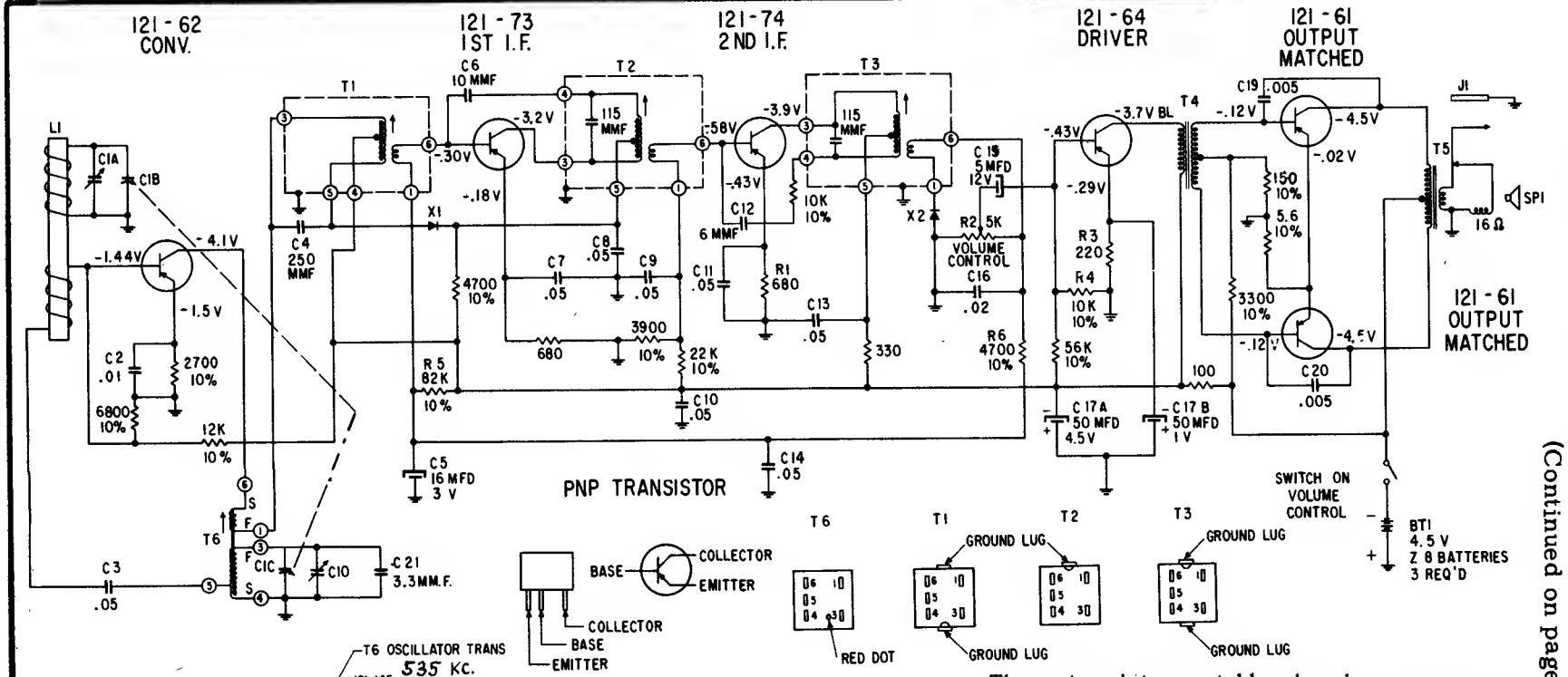
ALIGNMENT PROCEDURE

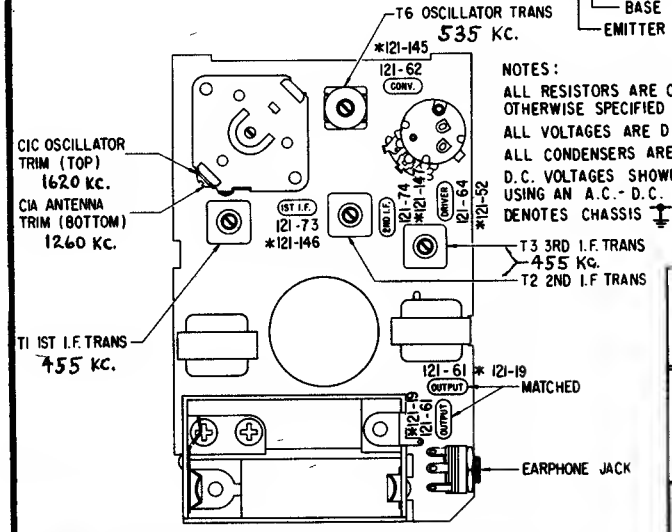
Operation	Input Signal Frequency	Connect Inner Conductor From Oscillator To	Connect Outer Shield Conductor From Oscillator To	Set Dial At	Trimmers	Purpose
1	455 KC	ONE TURN LOOSELY COUPLED TO WAVEMAGNET	Chassis	600 KC	Adj. T1, T2, T3 for maximum output.	For I.F. Alignment
2	1620 KC		–	Gang wide open.	C1D	Set Oscillator to dial scale.
3	600 KC		–	Near 600 KC	Adjust slug in T5	While rocking gang, adjust T5 for maximum output regardless of dial accuracy.
4	REPEAT STEPS 2 & 3		–	–	–	–
5	1260 KC		–	1260 KC	C1A	Align loop ant.

DIAGRAM FOR 6ET42Z2

ZENITH Chassis 6ET42Z1 & 6ET42Z2, Model "Royal 100"

(Continued on page 189)





TRANSISTOR & TRIMMER LAYOUT FOR CHASSIS 6ET42Z2 & 6ET42Z1

NOTES:

ALL RESISTORS ARE CARBON, 1/2 WATT, ± 20% TOLERANCE UNLESS OTHERWISE SPECIFIED

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.

ALL CONDENSERS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.

D.C. VOLTAGES SHOWN ARE MEASURED FROM CHASSIS WITH NO SIGNAL USING AN A.C.- D.C. OR VACUUM TUBE VOLTMETER.

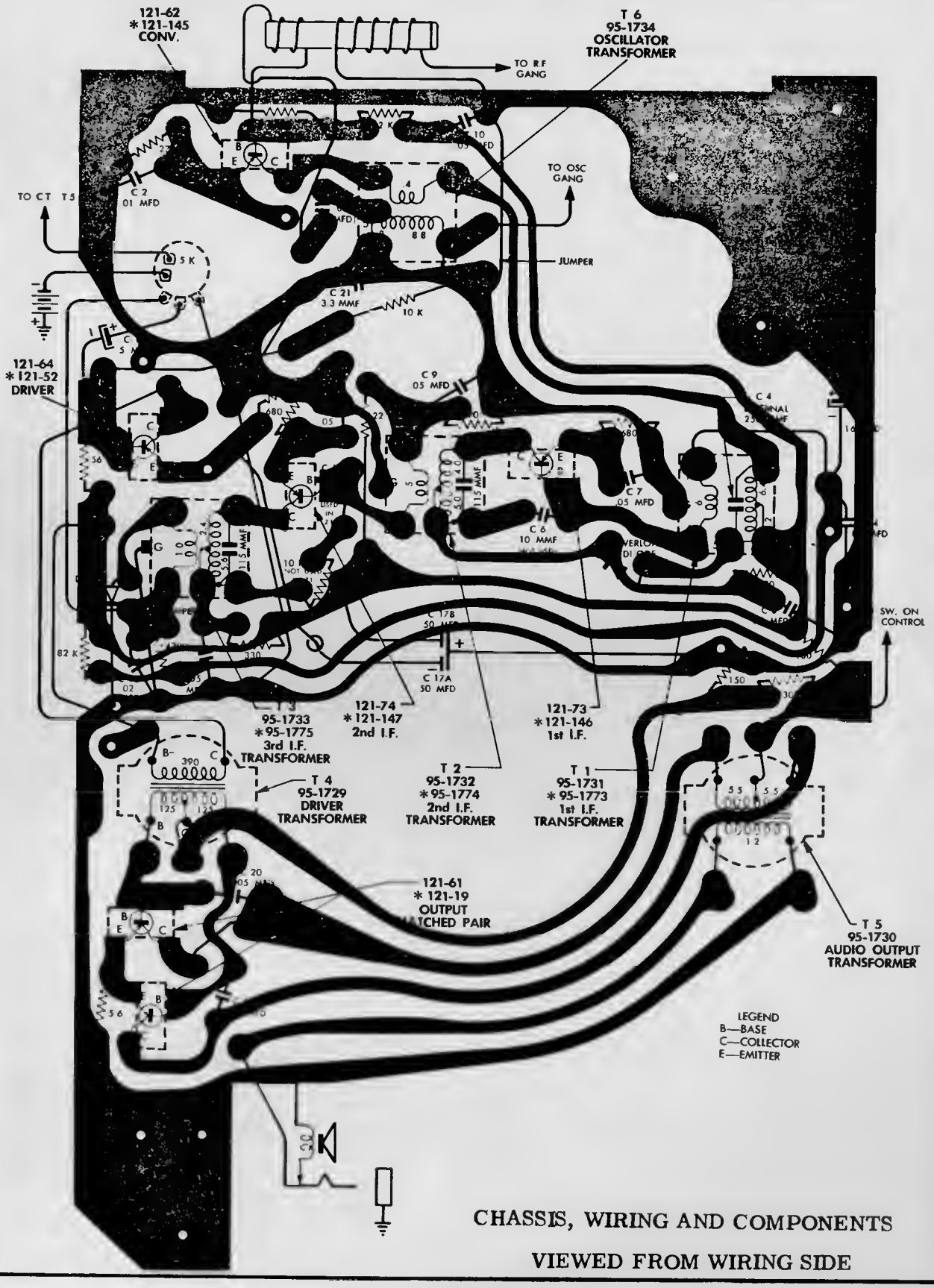
DENOTES CHASSIS

These trsnsistor portable chassis sre conventional superheterodyne receivers. Chassis 6ET 42Z2&6ET42Z1 are virtually identical except for different transistors and a few other parts. The parts marked by astericks on the chassis wiring and component drawing apply only to chsssis 6ET42Z1. Both chassis have a converter to produce the 455 Kc intermediate frequency.

CHASSIS INFORMATION CHART

Chassis	Transistor Layout Label Color	Part No.	Conv.	1st I.F.	2nd I.F.	Crystal Diode Detector	Driver	Output-Output	Supplier
*6ET42Z1	Red 102-7651	Zenith RETMA Type	121-145 2N1108 PNP	121-146 2N1110 PNP	121-147 2N1111 PNP	103-19 1N87G	121-52 R120 PNP	121-19 R16 Matched Pair PNP PNP	Texas Instrument
6ET42Z2	102-7302	Zenith RETMA Type	121-62 2N411 PNP	121-73 2N409 PNP	121-74 2N409 PNP	103-19 1N87G	121-64 2N407 PNP	121-61 2N407 Matched Pair PNP PNP	R.C.A.

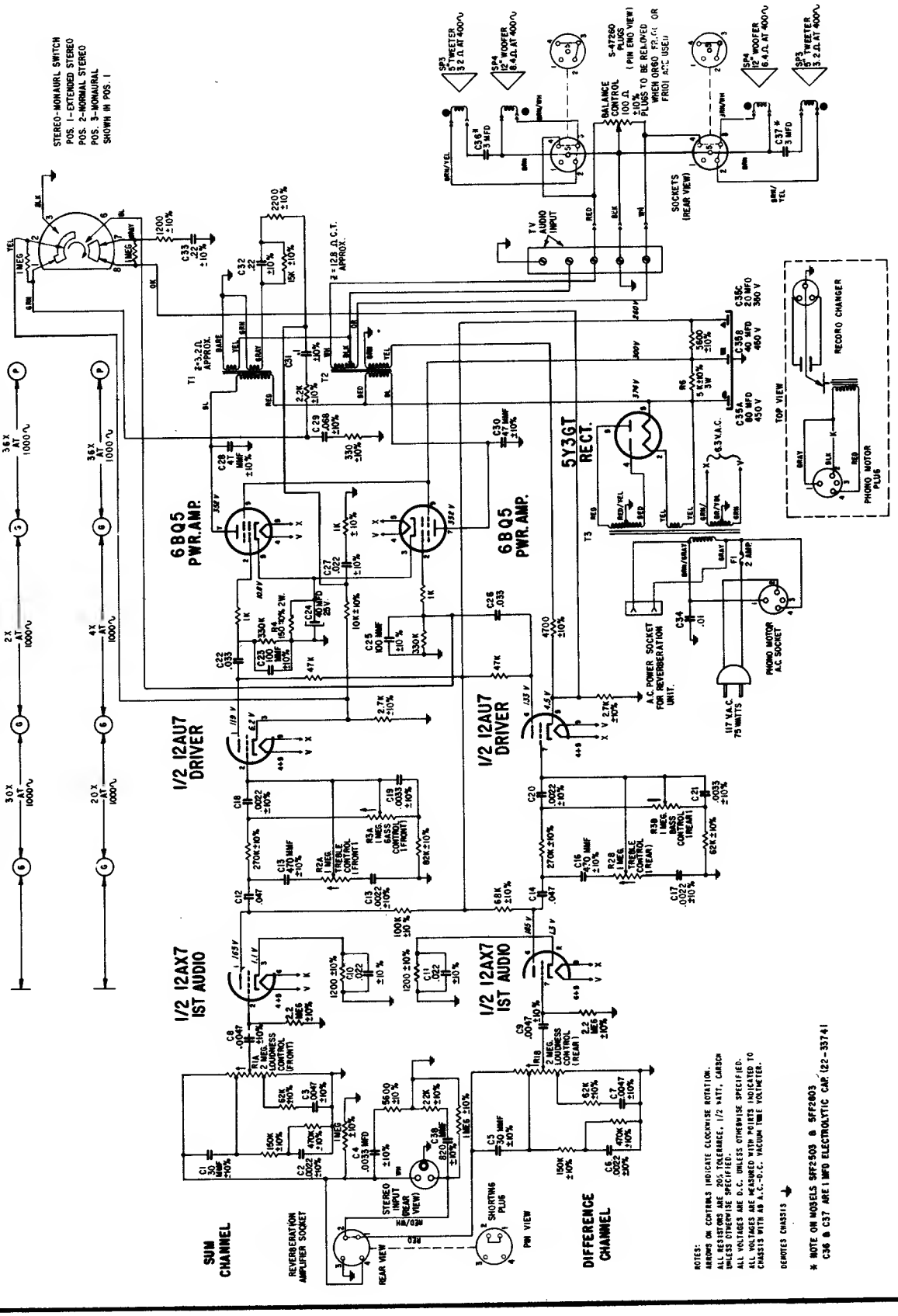
ZENITH Chassis 6ET42Z1 & 6ET42Z2, Model "Royal 100" Continued



CHASSIS, WIRING AND COMPONENTS

VIEWED FROM WIRING SIDE

ZENITH Chassis 5F29, Models SFF2503T, SFF2505T, SFF2603, etc.,



ZENITH RADIO 5F29 Schematic For Models SFF2503T, SFF2603, SFF2505T, SFF2605, SFF2606 & SFF2607

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