

Most - Often - Needed

1965

Volume R-25

**RADIO
DIAGRAMS**

and Servicing Information

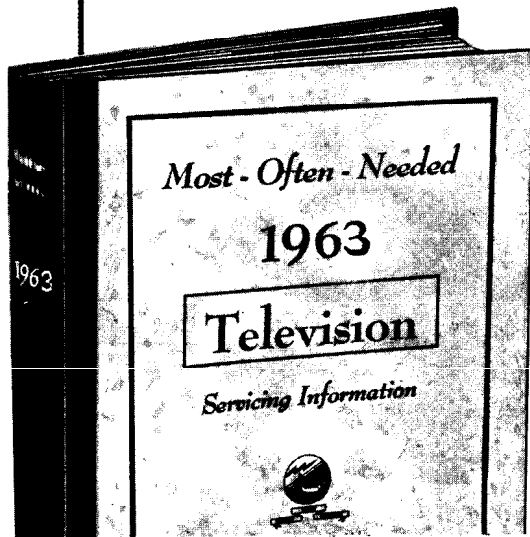


Compiled by

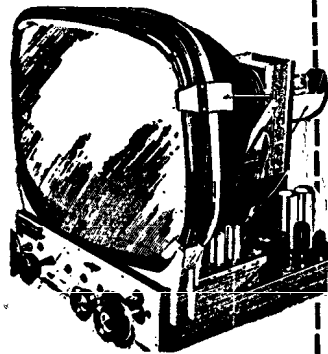
M. N. BEITMAN

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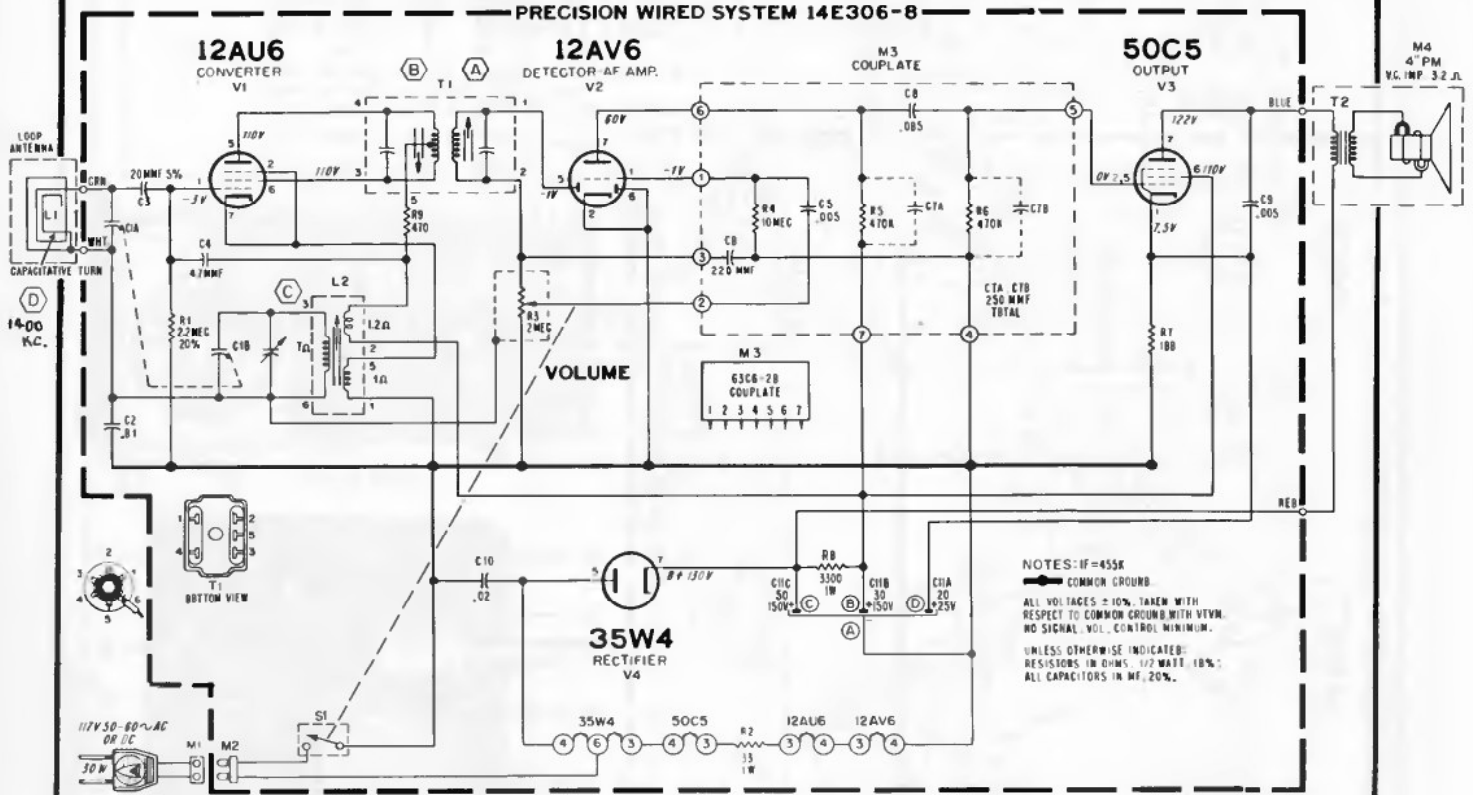
Name: _____

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ADMIRAL

Chassis 4A4, used in Models Y3503, Y3508, Y3509



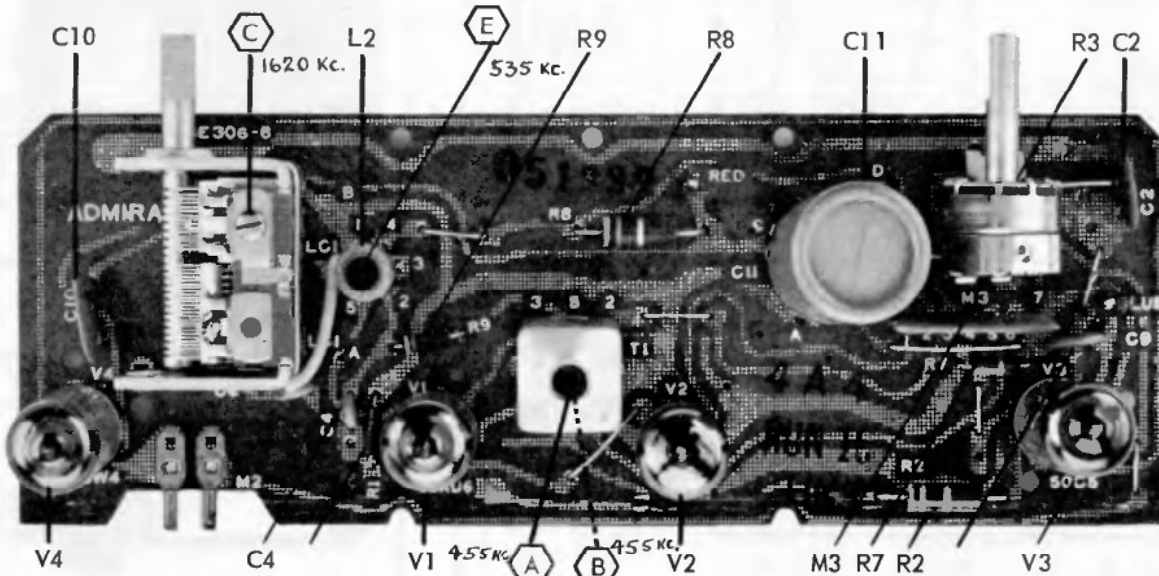
ALIGNMENT PROCEDURE

Set volume control full on.

Connect output meter across output secondary. Disconnect speaker and use a 3.2 ohm load.

Use lowest setting of signal generator capable of producing adequate indication on lowest scale of meter.

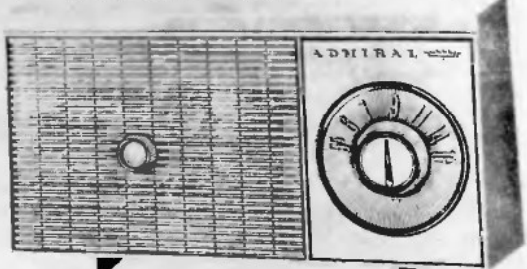
By using alignment tool 98A30-7, you can align the IF transformer slugs from the top of the chassis.



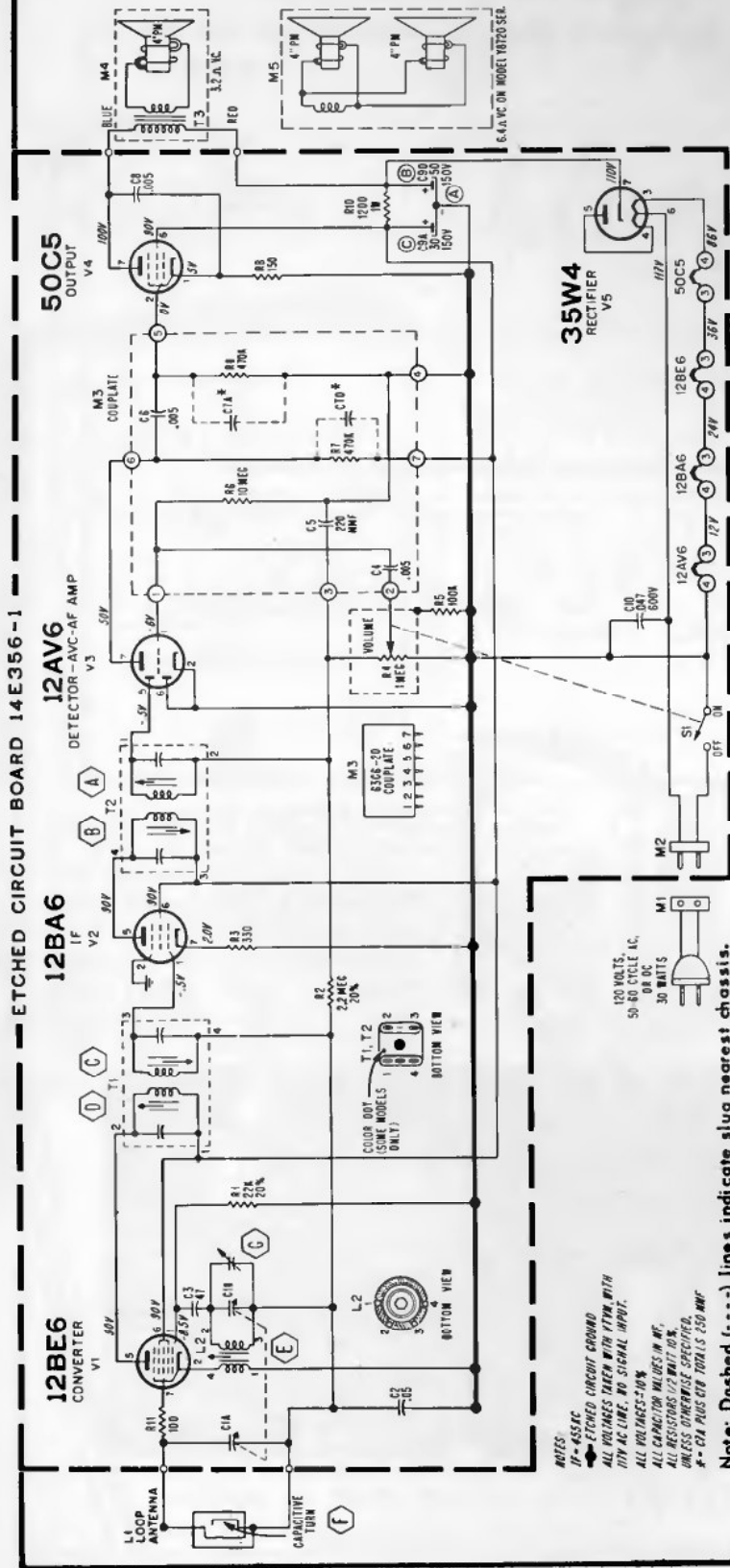
TOP VIEW OF CHASSIS 4A4 SHOWING COMPONENTS AND ALIGNMENT POINTS

Admiral

MODEL CHART		
MODEL	COLOR	CHASSIS
Y3703	White	5E6
Y3708	Green	
Y3709	Blue	
Y3710	Gray	5E6
Y3714	Pink	
Y3717	Beige	
Y3720	Gray	5E6
Y3727	Beige	
Y3729	Blue	

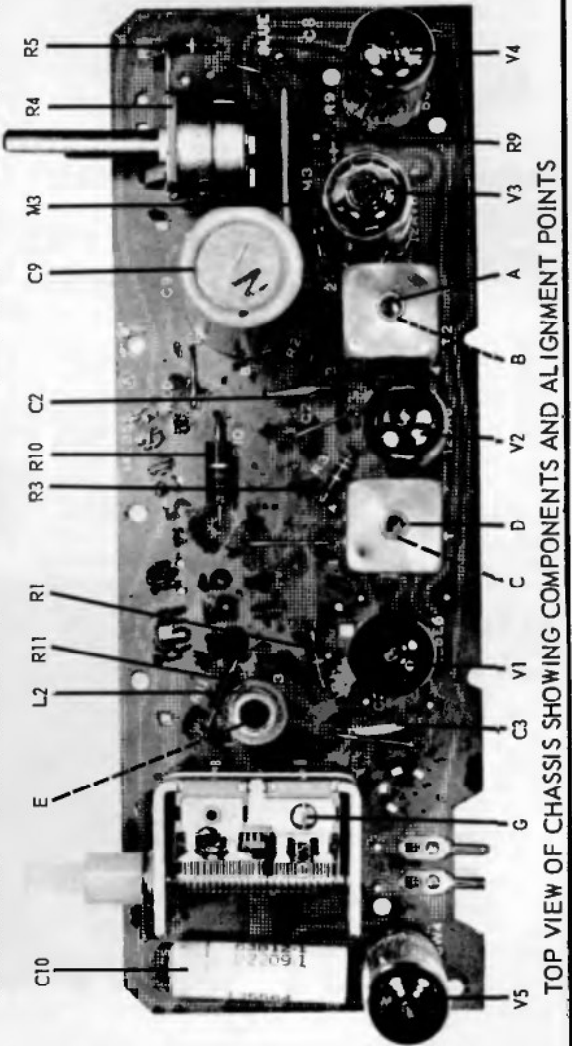


Y3710 SERIES



NOTES:
 1. 6.3V AC
 2. STENCILED CIRCUIT GROUND
 3. ALL VOLTAGES TAKEN WITH P.T.M., WITH 100V AC LINE, NO SIGNAL INPUT.
 4. ALL VOLTAGES = 10%
 5. ALL CAPACITOR VALUES IN MF.
 6. ALL RESISTORS 1/2 WATT, 10%
 7. UNLESS OTHERWISE SPECIFIED,
 8. 4-CM PLUS CTR TUBES 250 MF

Note: Dashed (---) lines indicate slug nearest chassis.



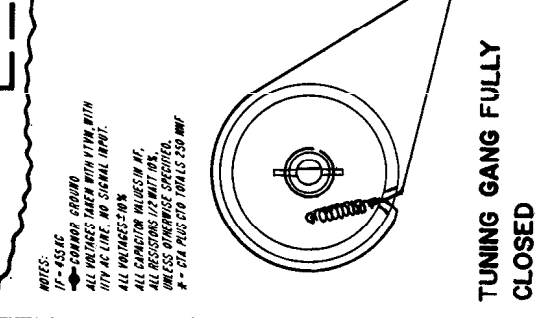
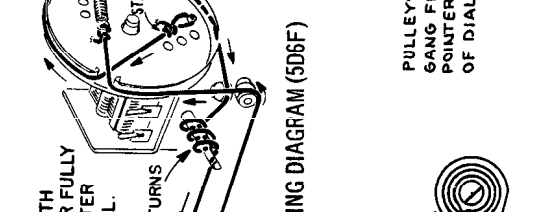
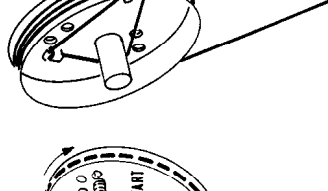
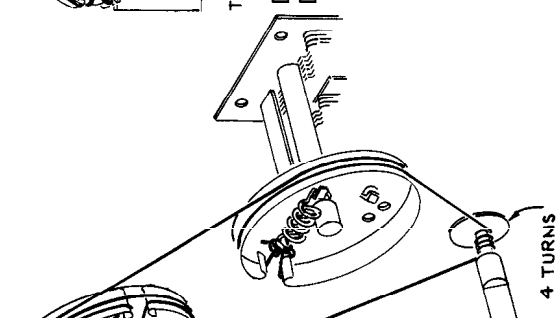
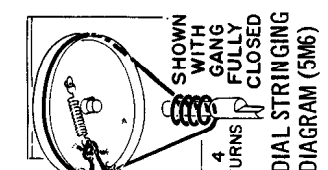
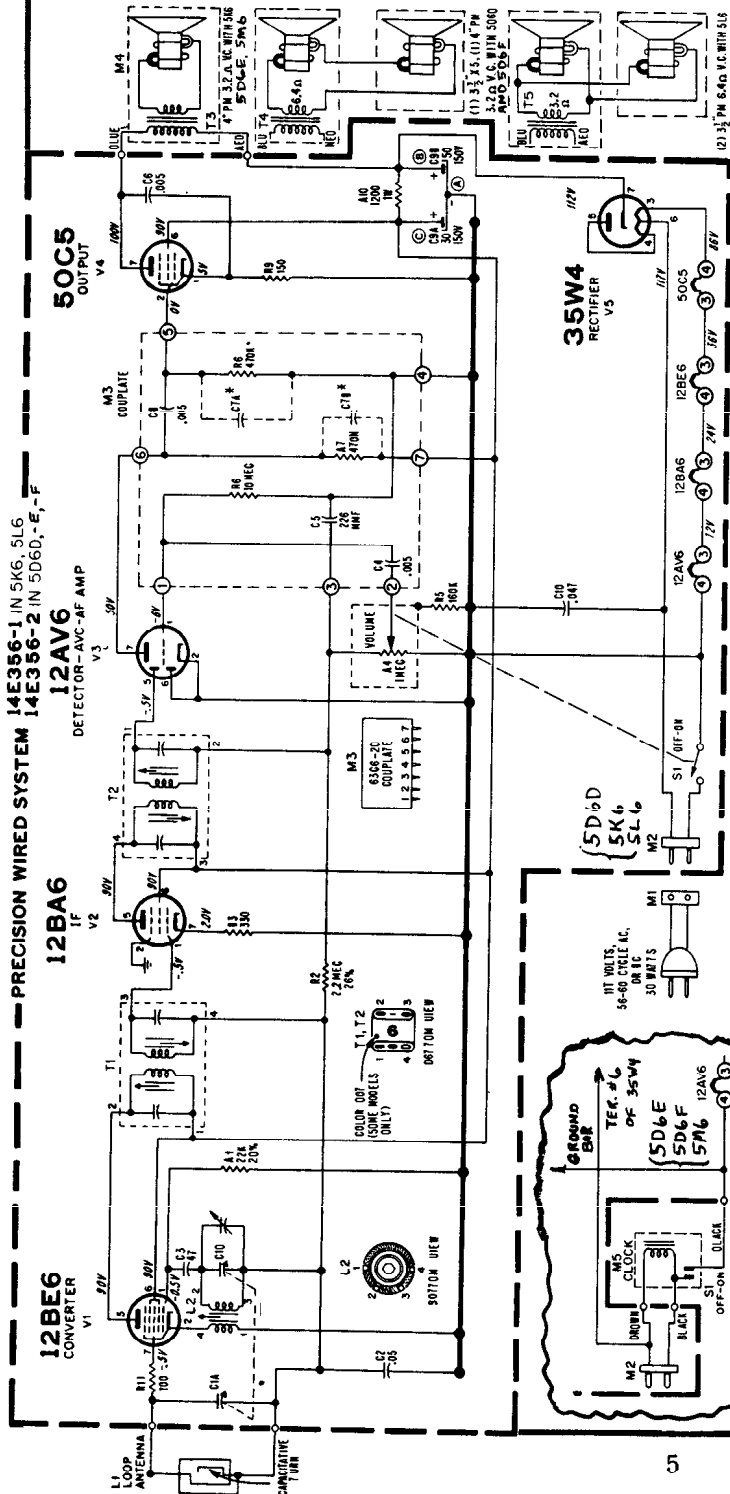
TOP VIEW OF CHASSIS SHOWING COMPONENTS AND ALIGNMENT POINTS

Admiral

Chassis 5D6D, Models Y3321A, Y3323A,
 Chassis 5K6, Models Y3513, Y3517, Y3519,
 Chassis 5L6, Models Y3523, Y3528, Y3529,

The following clock models are similar to above:

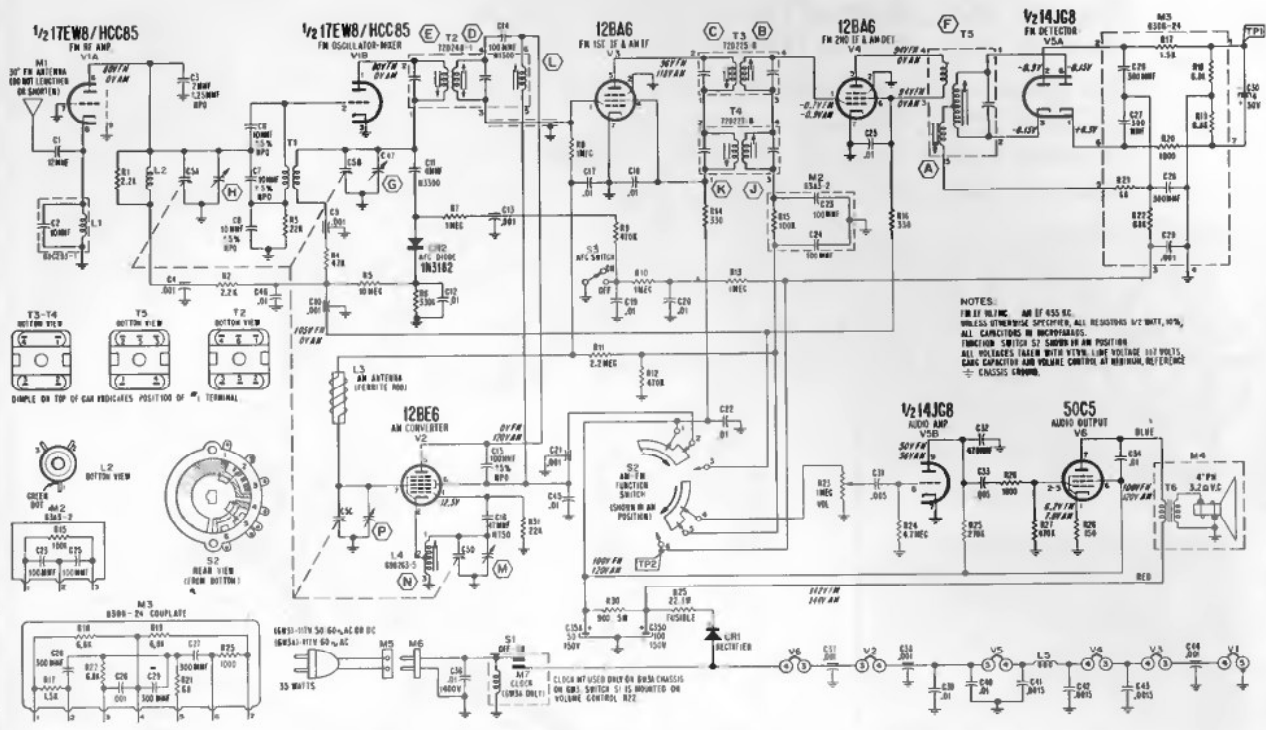
Chassis 5D6E, Models Y3543, Y3554, Y3557, Y3559,
 Chassis 5D6F, Models Y3381A, Y3383A,
 Chassis 5M6, Models Y3564, Y3568, Y3569, Y3573, Y3577, Y3579.



NOTES:
 IF-455KC
 * - GND - COMMON GROUND
 ALL VOLTAGES TAKEN WITH VTVM, WITH 100K AC LINE, NO SIGNAL INPUT.
 ALL VOLTAGES 100K
 ALL CAPACITOR VALUES IN pF, UNLESS OTHERWISE SPECIFIED.
 * - C1A PLUS C10 TOTALS 250 pF

Admiral

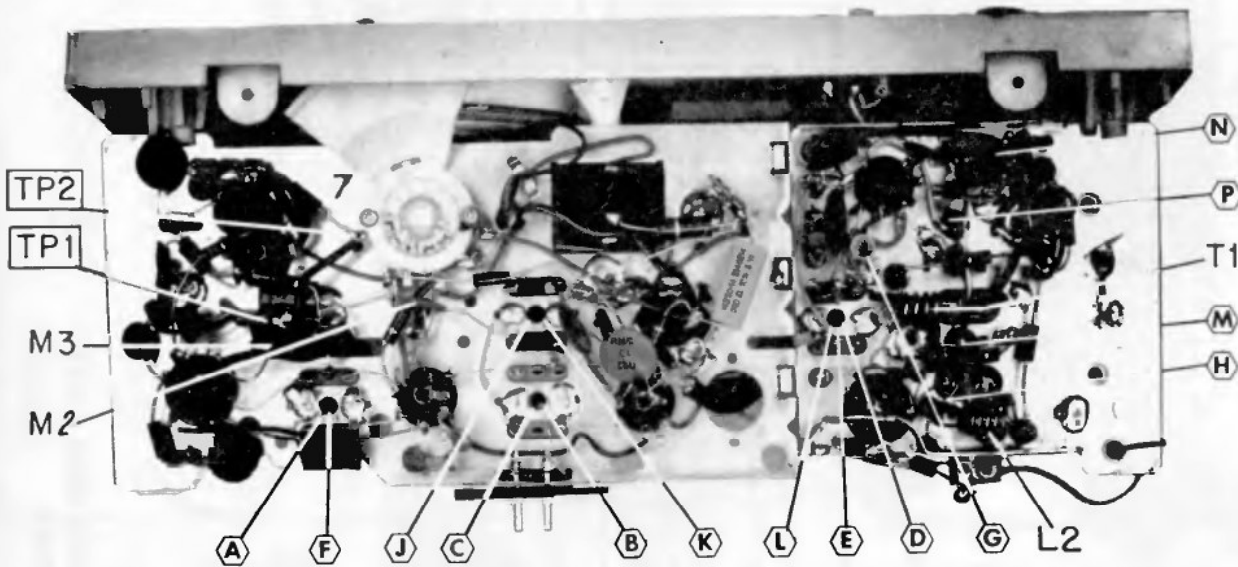
Chassis 6W3, 6W3A, used in Models Y3408, Y3411, Y3412



CHASSIS REMOVAL

1. Loosen two screws in back of cabinet until they are free from the cabinet front.
2. Remove two screws from bottom securing cabinet front to cabinet back.

3. With screwdriver, carefully pry cabinet front assembly away from the cabinet back by inserting screwdriver tip in the two notches in bottom of cabinet front assembly. This will break the AC interlock connection and allow the chassis with cabinet front to be pulled straight out from cabinet back.

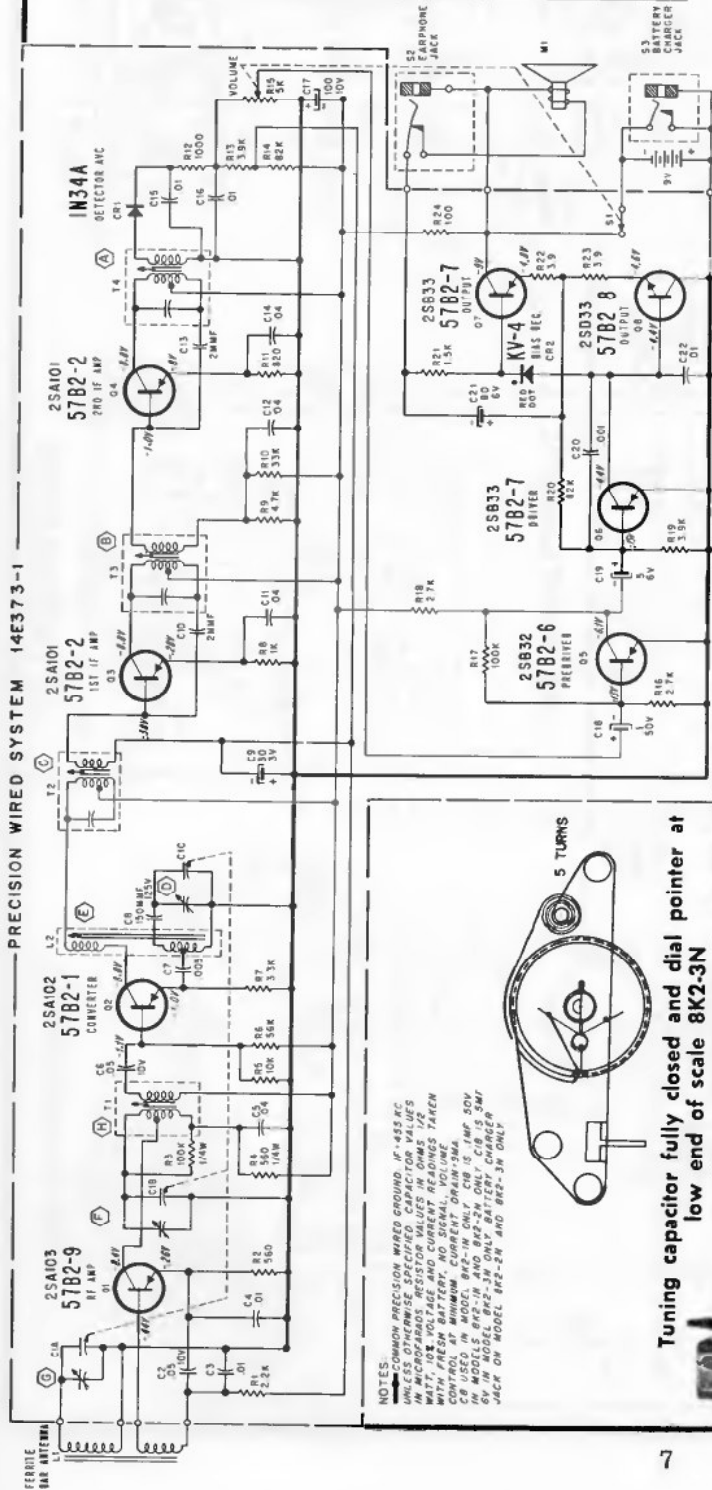


BOTTOM VIEW WITH SHIELD REMOVED

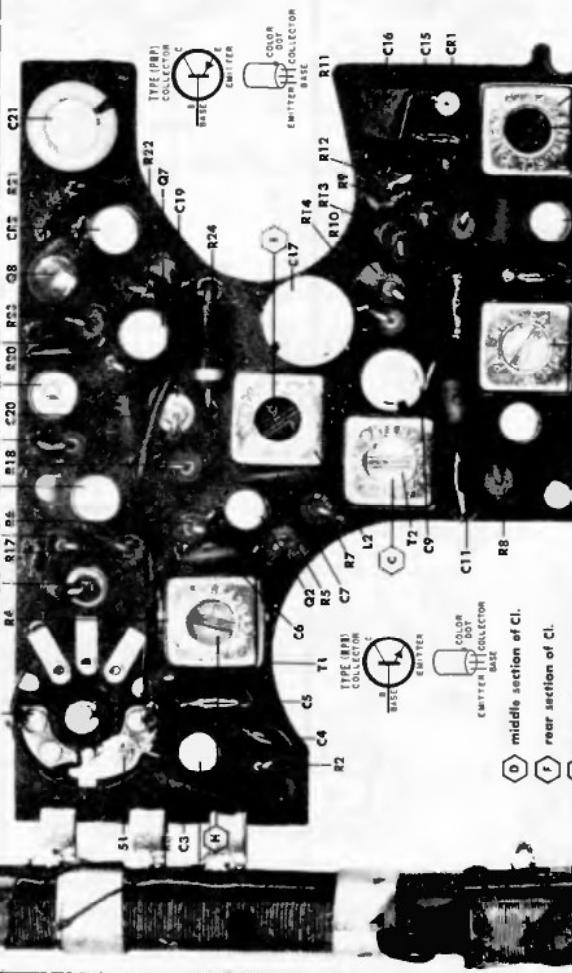
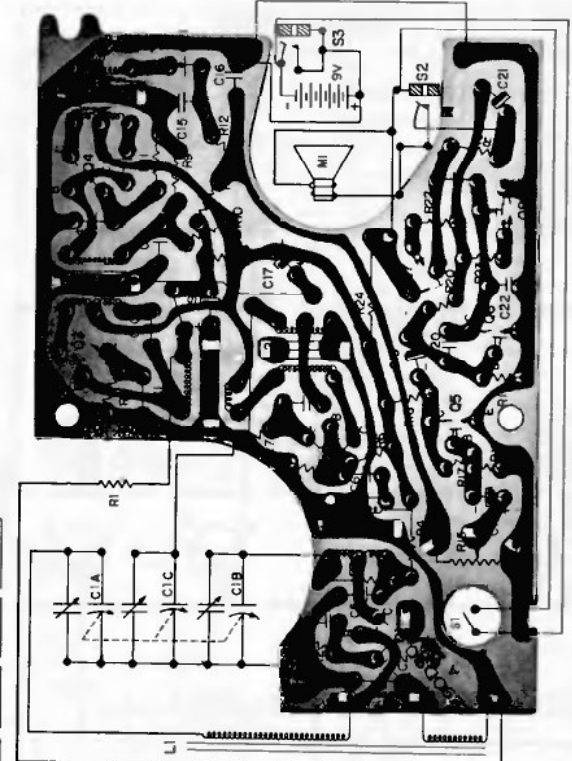
A C E and K are bottom slugs. B F J and L are top slugs.
 G H M and P are adjustable from the top of the chassis only.

ADMIRAL

MODEL	COLOR	CHASSIS
Y2411GP Y2413GP	Black White	8K2-1N
Y2421GP Y2428GP	Black White	8K2-2N
Y2441	Black	8K2-3N



NOTES:
 COMMON PRECISION WIRED GROUND - IF - 455 KC.
 ALL RESISTOR VALUES ARE IN MICROHMS UNLESS OTHERWISE SPECIFIED.
 ALL CAPACITOR VALUES ARE IN MICROHMS UNLESS OTHERWISE SPECIFIED.
 WATT, VOL, VOLTAGE AND CURRENT READINGS TAKEN FROM THE REAR BATTERY JACK.
 CB USED IN MODEL 8K2-1N ONLY. CB IS 1MF, 50V.
 IN MODELS 8K2-1N AND 8K2-2N ONLY. CB IS 5MF.
 JACK ON MODEL 8K2-2N AND 8K2-3N ONLY.



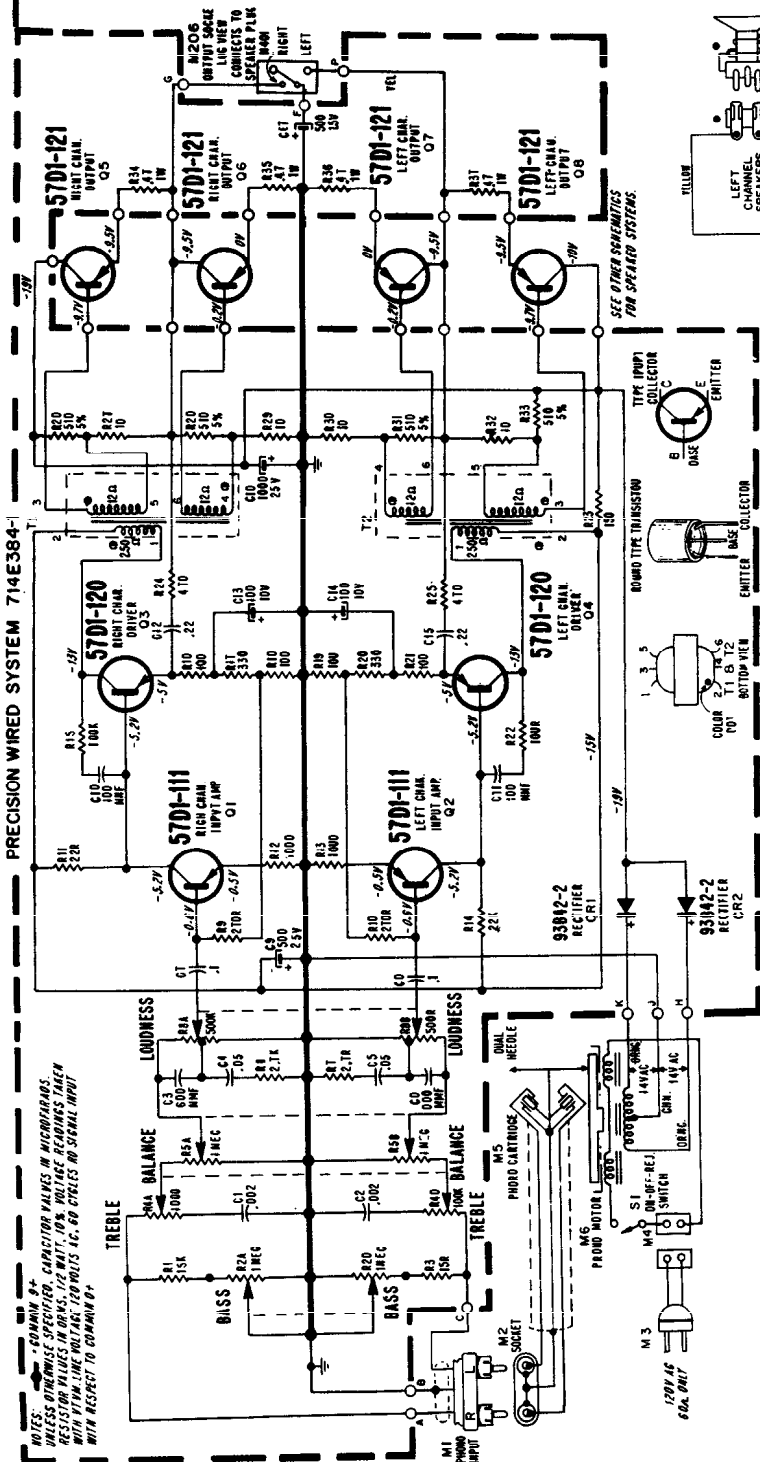
Connections to bottom of etched circuit board.

Tuning capacitor fully closed and dial pointer at low end of scale 8K2-3N

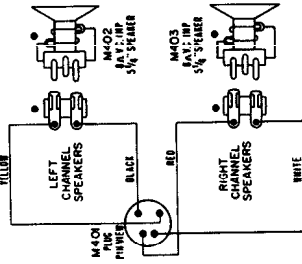
Admiral

8N2 CHASSIS

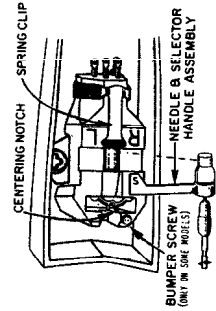
MODEL CHART			
MODEL	COLOR	CHASSIS	RECORD CHANGER
Y8157	Beige & White	8N2	RC7M5G-66AW
Y8177	Brown		RC7M5F-67AW
Y8181	Black		RC7M5F-67AW
Y8201	Walnut		RC7M5F-67AW
Y8202	Mahogany		RC7M5F-67AW



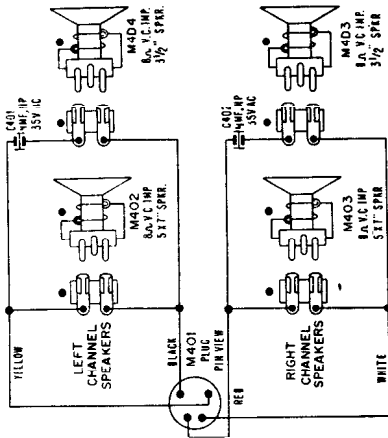
8N2 CHASSIS SCHEMATIC



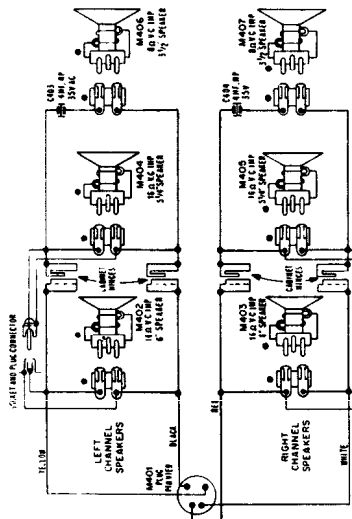
Y8157 SPEAKER WIRING



Y8177 SPEAKER WIRING



Y8181 SPEAKER WIRING

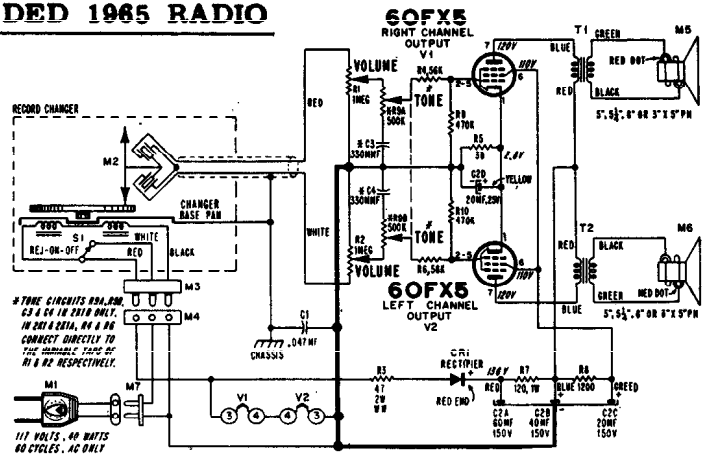
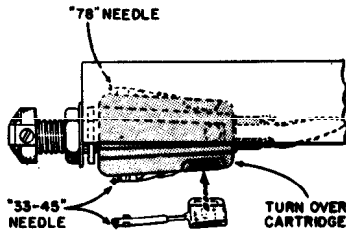


Y8181 SPEAKER WIRING

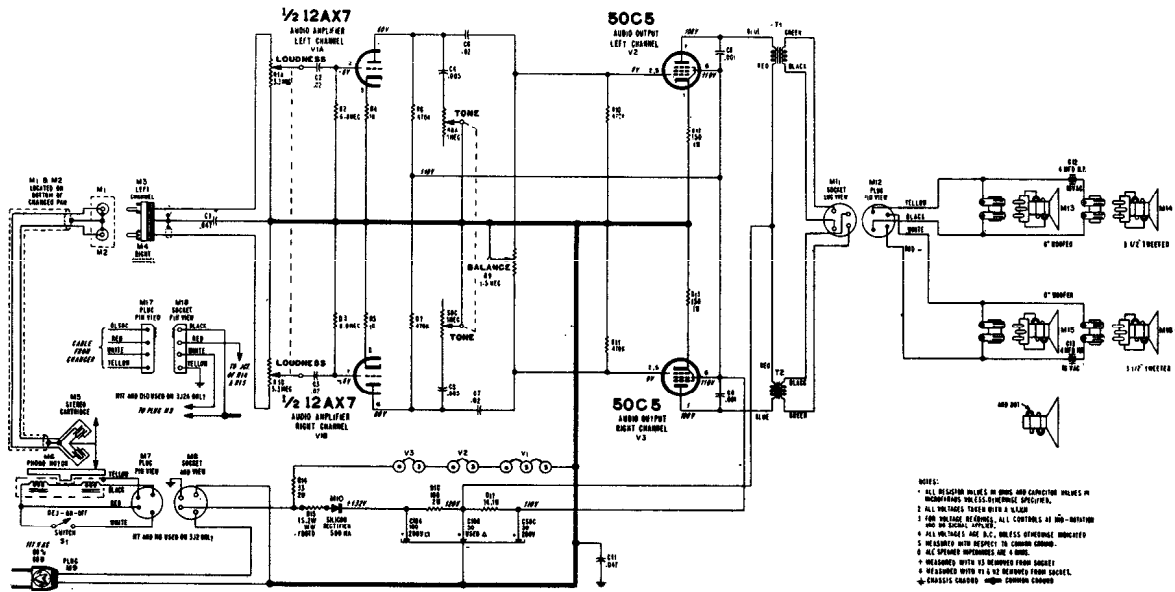
VOLUME R-25, MOST-OFTEN-NEEDED 1945 RADIO

Admiral

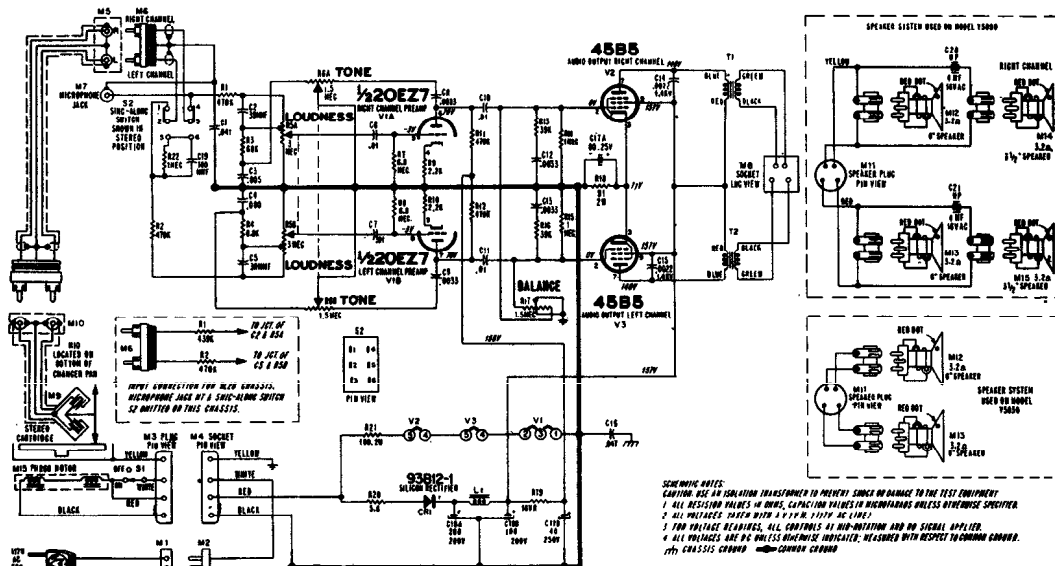
Chassis 2K1, 2K1A, 2K1B,
Models Y5009, Y5017, Y5027



ADMIRAL Chassis 3J2A, Models Y6001, Y6002, Y6021, Y6022



ADMIRAL Chassis 3L2A, -B, Models Y5037, Y5097



Admiral

Tuner 12A2 used in models listed at right. Diagram across pages 10 and 11. Material on related units is on page 12.

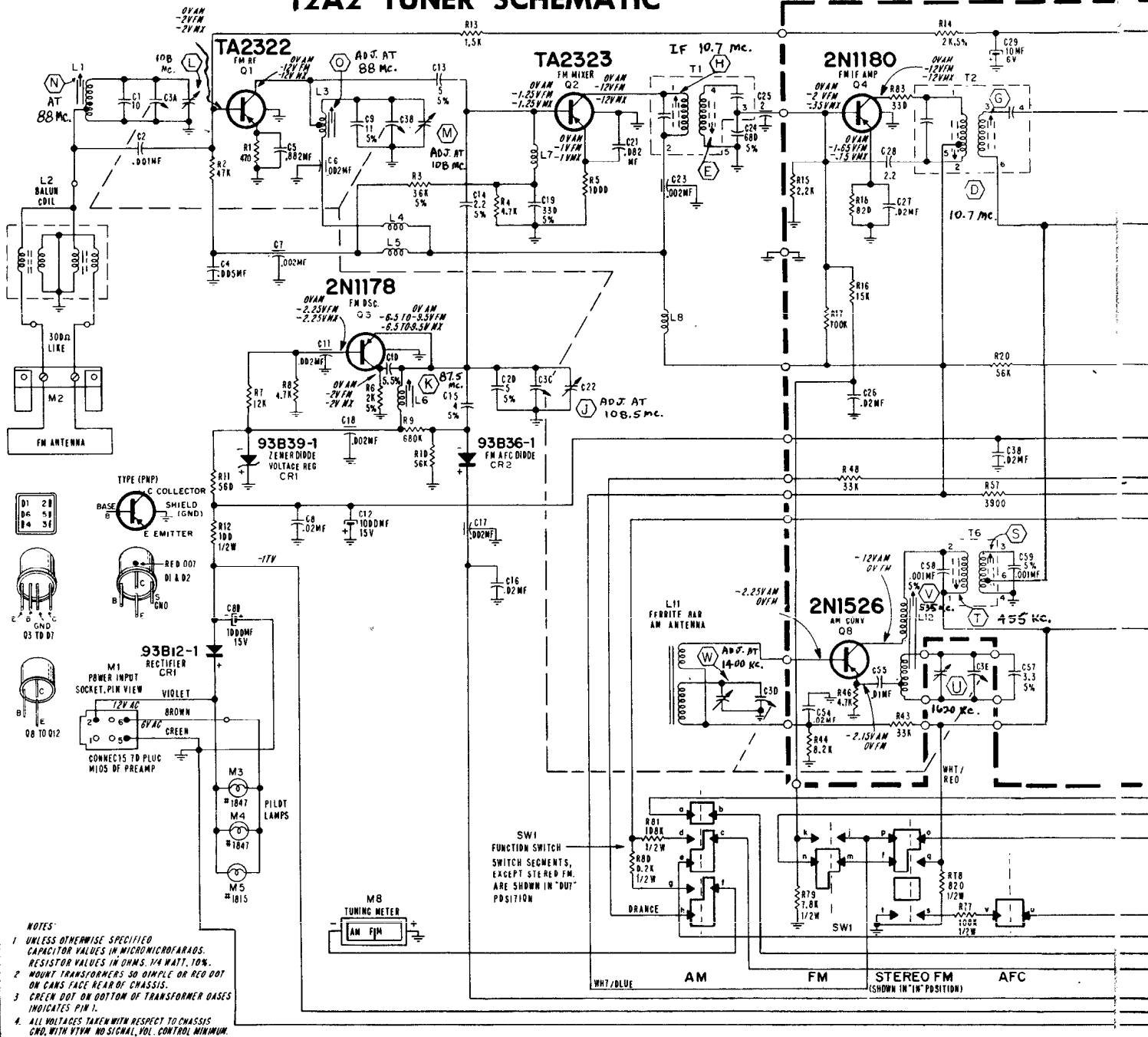
MODEL IDENTIFICATION CHART

MODEL	FINISH	CHASSIS
Y8601	Walnut	12A2,4C4 & 8D3
Y8615	Maple	RC7K4K-73AN
Y8629	Cherry	

Y701A IDENTIFICATION CHART

MODEL	TYPE	CHASSIS
TM731	Tuner	12A2
PA741	Preamplifier	4C4
PS751	Power Unit	8D3
SS1501	Speakers	2 Enclosures
RP771	Record Changer	RC7K4K-73AN
Y701A	Complete Unit	All Above.

12A2 TUNER SCHEMATIC

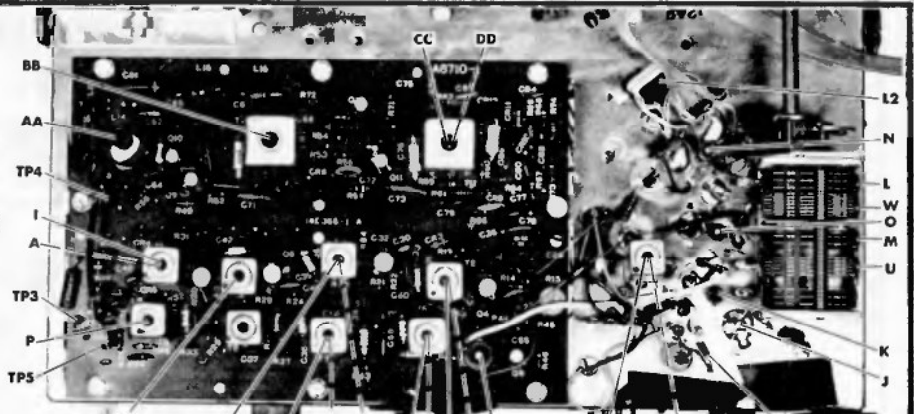


VOLUME R-25, RADIO

Admiral

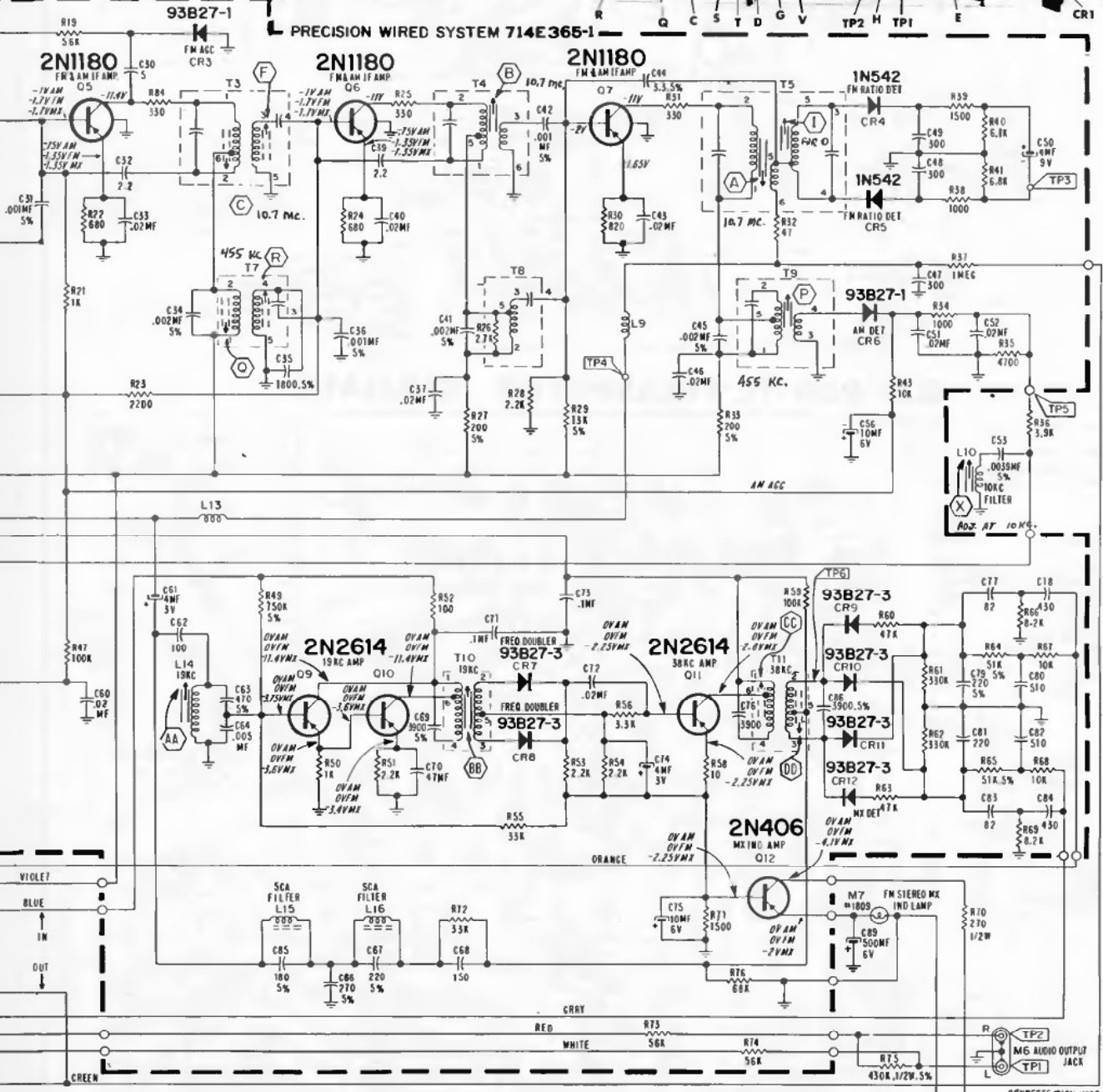
TUNER 12A2

(Continued from page 10)

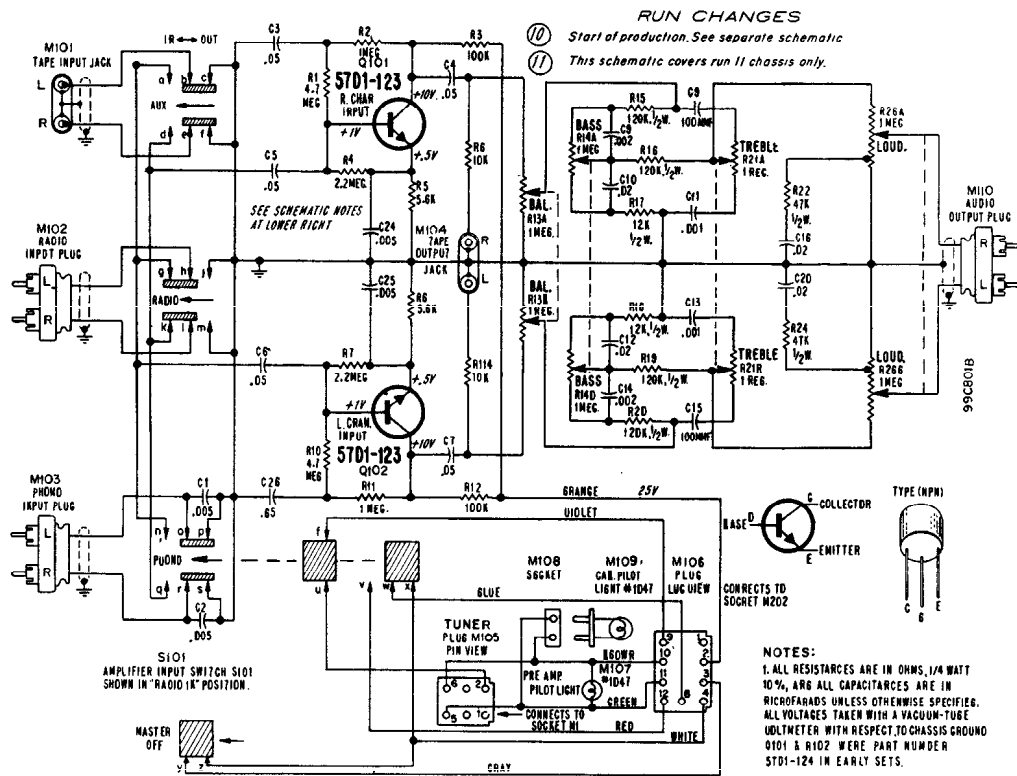


TOP VIEW OF 12A2 TUNER CHASSIS. ADJUSTMENTS INDICATED BY DASHED LINES ARE UNDER CHASSIS

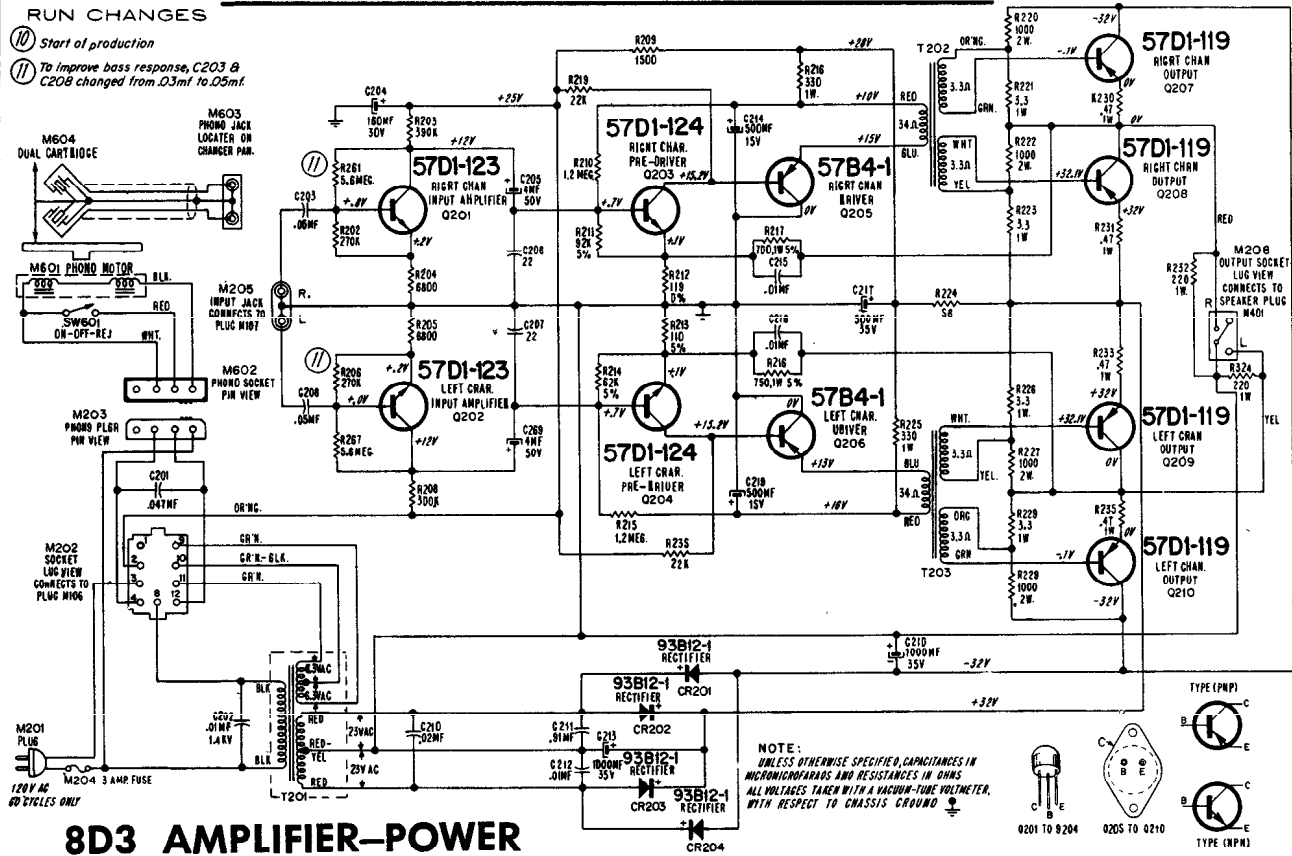
PRECISION WIRED SYSTEM 714E365-1



ADMIRAL 4C4 Preamplifier and 8D3 Power Unit (For models see page 10)

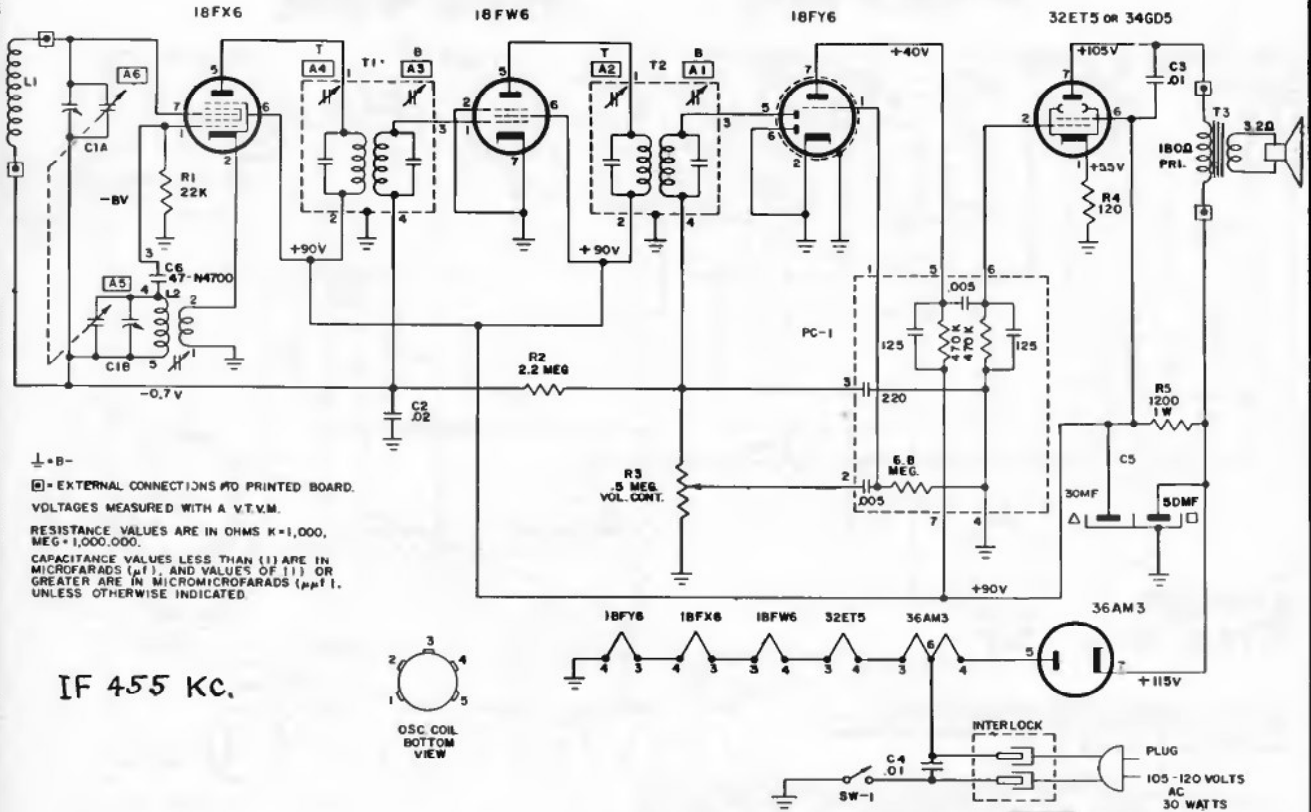


4C4 RUN 11 PREAMPLIFIER SCHEMATIC

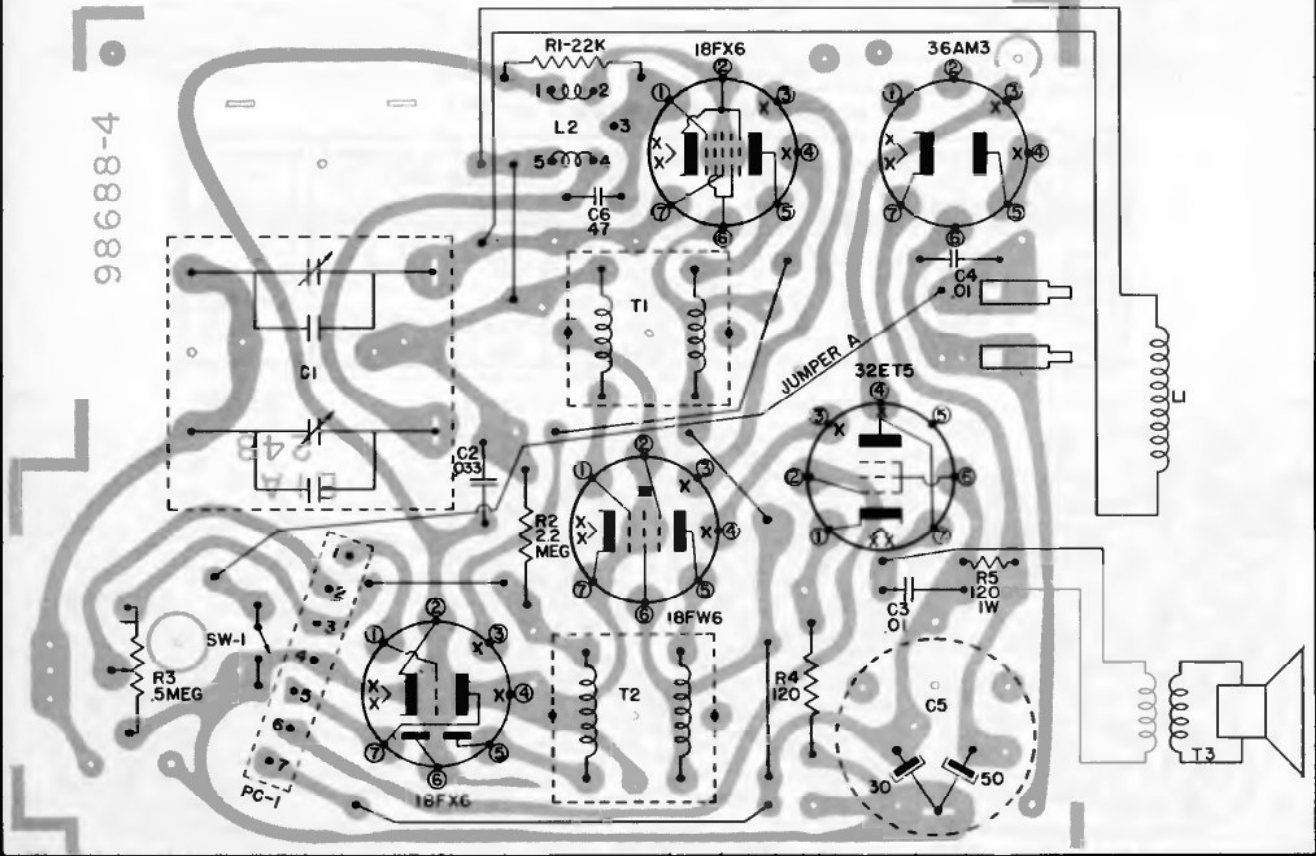


Arvin

MODELS 13R07, 13R08
CODE 1.86401

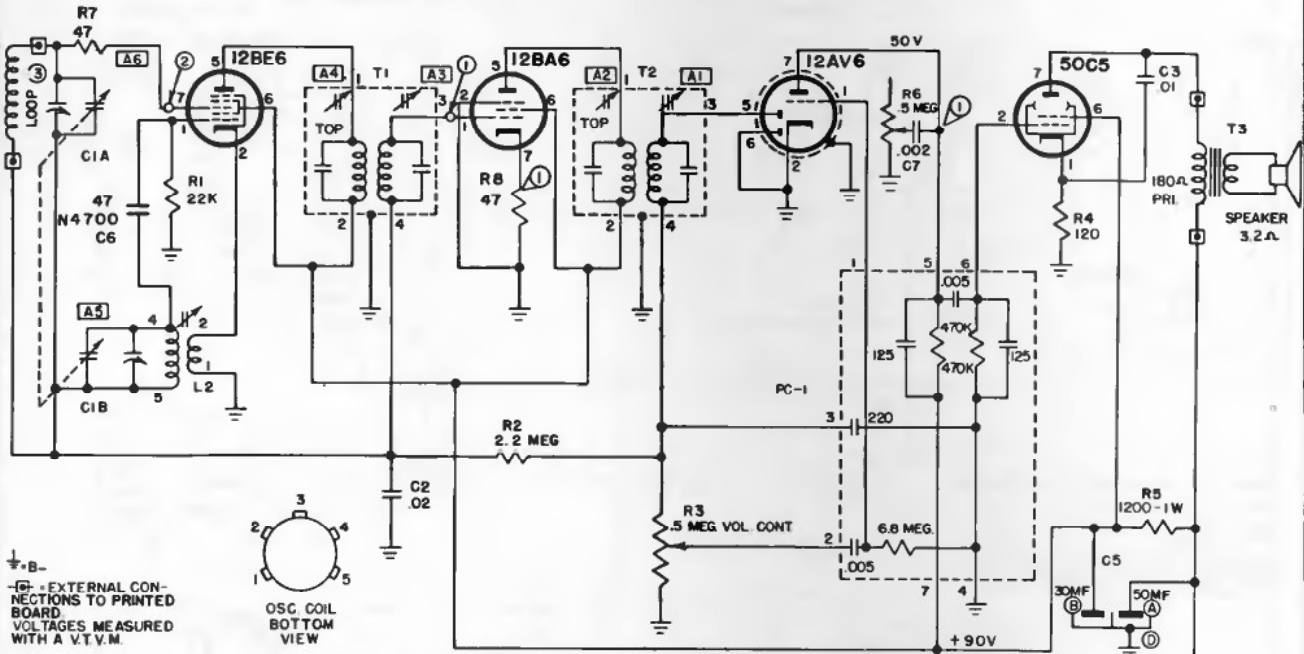


98688-4

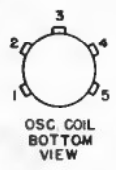


Arvin

CODE 1.81001
MODEL 14R18



⊕-B-
-C- EXTERNAL CONNECTIONS TO PRINTED BOARD
VOLTAGES MEASURED WITH A V.T.V.M.



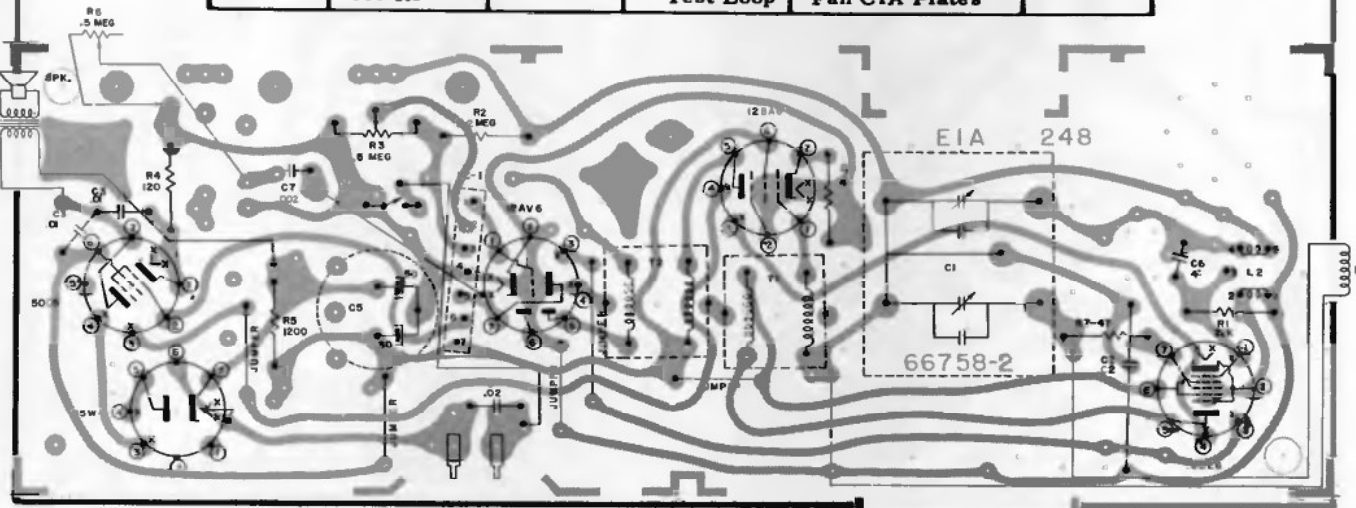
RESISTANCE VALUES ARE IN OHMS K=1,000, MEG=1,000,000.
CAPACITANCE VALUES LESS THAN 10 ARE IN MICROFARADS (μF),
AND VALUES OF 10 OR GREATER ARE IN MICROMICROFARADS (μμF), UNLESS OTHERWISE INDICATED.

APPROXIMATE SENSITIVITIES

CIRCUIT POINT	DUMMY TO GENERATOR	INPUT FOR 0.5 WATT OUTPUT (0.4 VOLTS ACROSS VC)	INPUT FOR 5 WATT OUTPUT (1.0 VOLTS ACROSS VC)
1	.05 μF AT 455 KC	2000 UV	5000 UV
2	.05 μF AT 455 KC	60	150
3	STANDARD LOOP AT 1000 KC	200 UV/M	500 UV/M

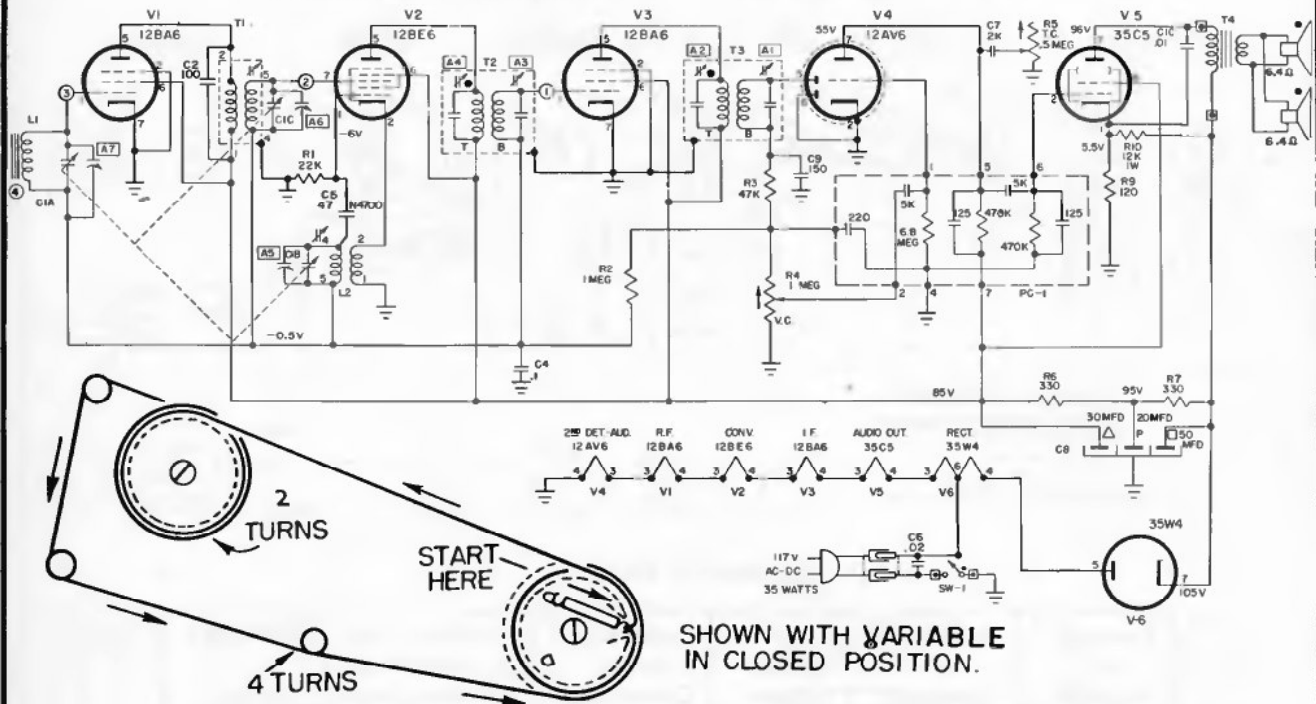
ALIGNMENT PROCEDURE

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 μfd	Pin 7 12BE6	A1, A2, A3, A4	I. F.
Open	1640 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	



Arvin®

CODE 1. 81501
MODEL 14R68



⊕ -B-
⊠ -EXTERNAL CONNECTIONS TO PRINTED BOARD.
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.

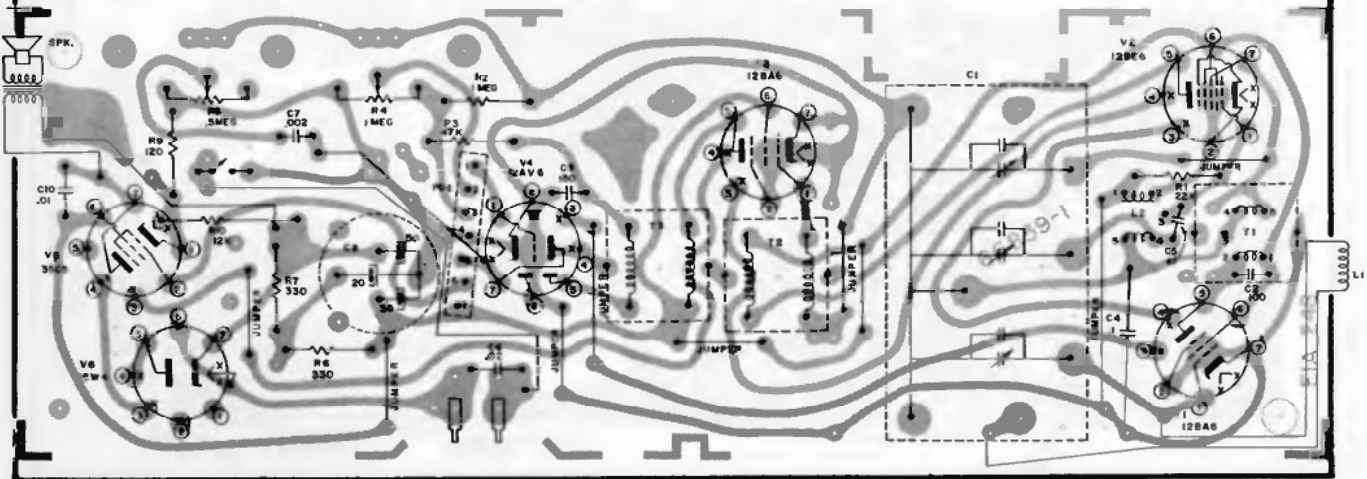


APPROXIMATE SENSITIVITIES

CIRCUIT POINT	DUMMY GENERATOR TO	INPUT FOR 50 WATT OUTPUT (1.4 VOLTS ACROSS VC.)	INPUT FOR 5 WATT OUTPUT (1.25 VOLTS ACROSS VC.)
1	.05 μf AT 455 KC	32 00 UV	8000 UV
2	.05 μf AT 455 KC	160 UV	400 UV
3	.05 μf AT 1000 KC	90 UV	90 UV
4	STANDARD LOOP AT 1000 KC	TS UV / M	125 UV / M

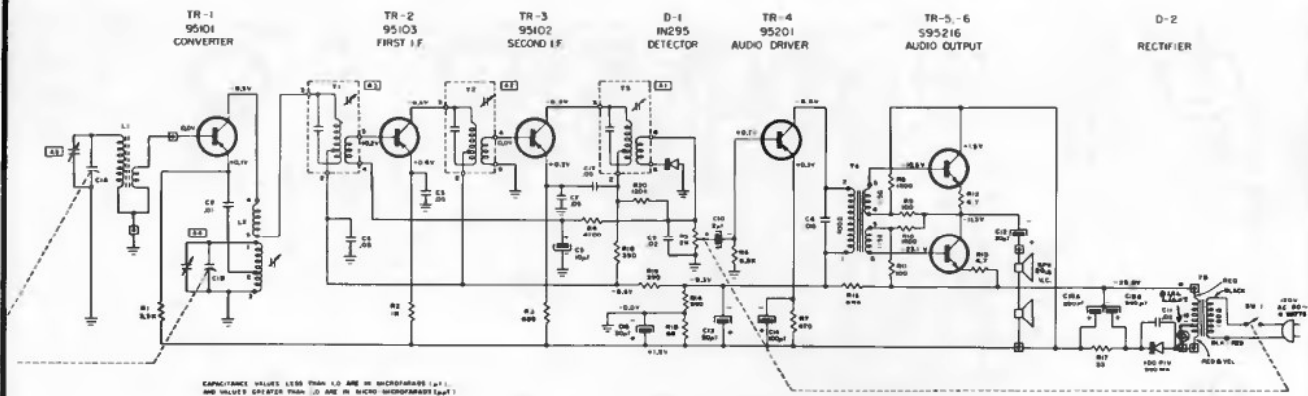
ALIGNMENT PROCEDURE

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 μfd	Pin 7 12BE6	A1, A2, A3, A4	I. F. Oscillator Antenna
Open	1640 Kc		Test Loop	A5	
1400	1400 Kc		Test Loop	A6	
1000	1000 Kc		Test Loop	Fan CIA Plates	
600	600 Kc		Test Loop	Fan CIA Plates	



Arvin

CODE 1. 82001
MODEL 15R75



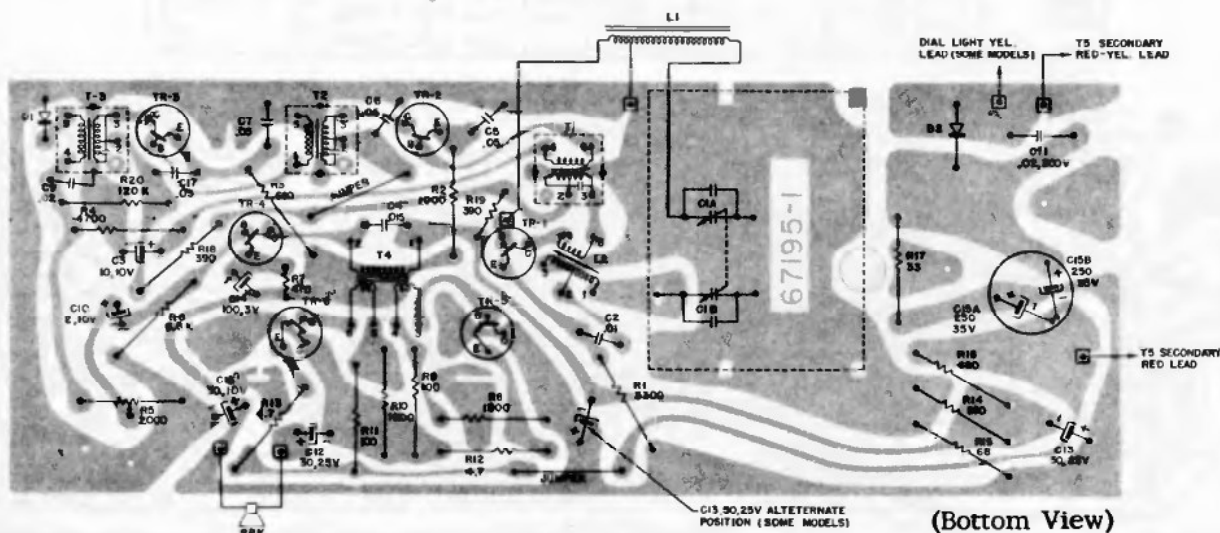
CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (μF), AND VALUES GREATER THAN 1.0 ARE IN MICROFARADS (μF) EXCEPT WHERE NOTED.
VOLTAGE MEASUREMENTS TO COMMON GROUND (⊕) ARE MEASURED WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS AND VOLTAGE CONTROL AT MINIMUM VOLTAGE POSITION.
RESISTANCE VALUES ARE IN OHMS; R¹ = 1,000.
⊕ - COMMON GROUND SYMBOL.
- - - EXTERNAL CONNECTION TO PRINTED CIRCUIT.
⊗ - NORMAL DC CONNECTION; ⊕ TO NO SIGNAL, ⊕ TO SIGNAL.



ALIGNMENT DATA

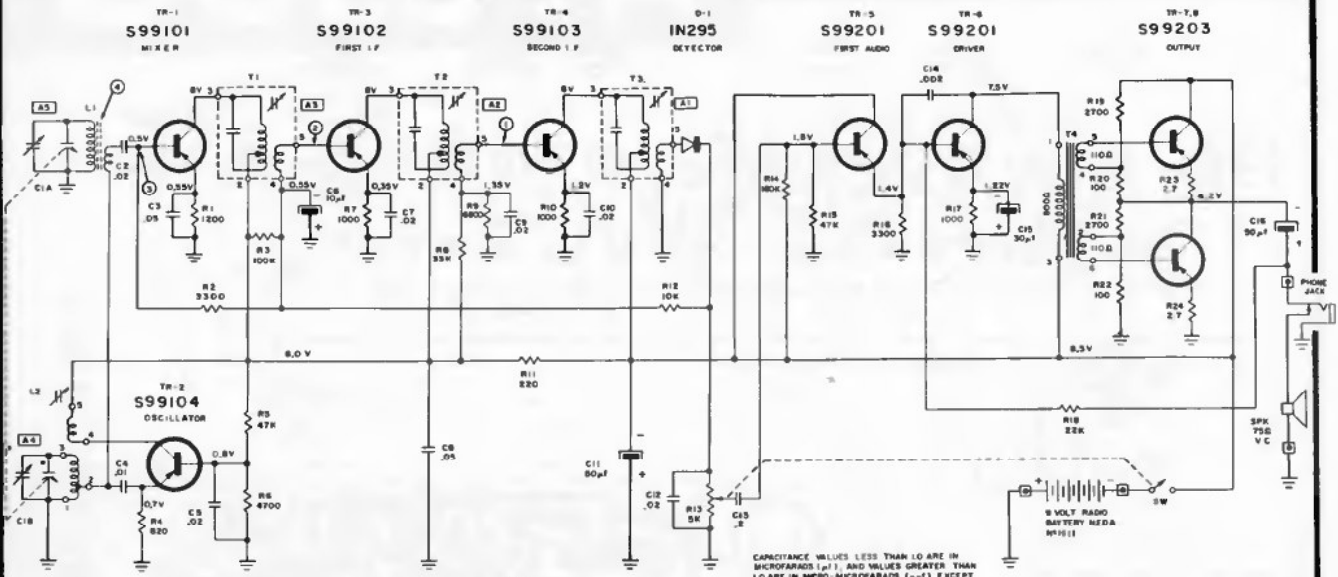
Position of Variable	Frequency of Generator	Dummy Antenna	Generator Output Connection	Trimmer Adj. in order shown for Max. Output	Functions of Trimmer
Open	455 Kc	.05 mf.	C1A	A1 (Top of T3) A2 (Top of T2) A3 (Top of T1)	I. F. I. F. I. F.
Open	1640 Kc		*Test Loop	A4	Oscillator
1400 Kc	1400 Kc		*Test Loop	A5	Antenna
600 Kc	600 Kc		*Test Loop	Check Point	

*Three (3) turns of wire 6" in diameter placed about one foot from the receiver antenna.
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.

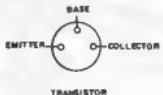


Arvin

CODE 1. 81601
MODEL 64R38



SIGNAL TEST POINTS	TEST FREQUENCY	SERIES CAPACITOR TO GENERATOR	INPUT FOR 9.9W OUTPUT (.4V ACROSS 75Ω)
①	455 Kc	.05 μf	500 μV
②	455 Kc	.05 μf	25 μV
③	455 Kc	.05 μf	2 μV
④	1000 Kc	STANDARD LOOP	200 μV/W



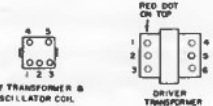
CAPACITANCE VALUES LESS THAN 10 ARE IN MICROFARADS (μf) AND VALUES GREATER THAN 10 ARE IN MICO-MICROFARADS (μμf) EXCEPT WHERE NOTED.

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 POSITION.

RESISTANCE VALUES ARE IN OHMS, K=1000.

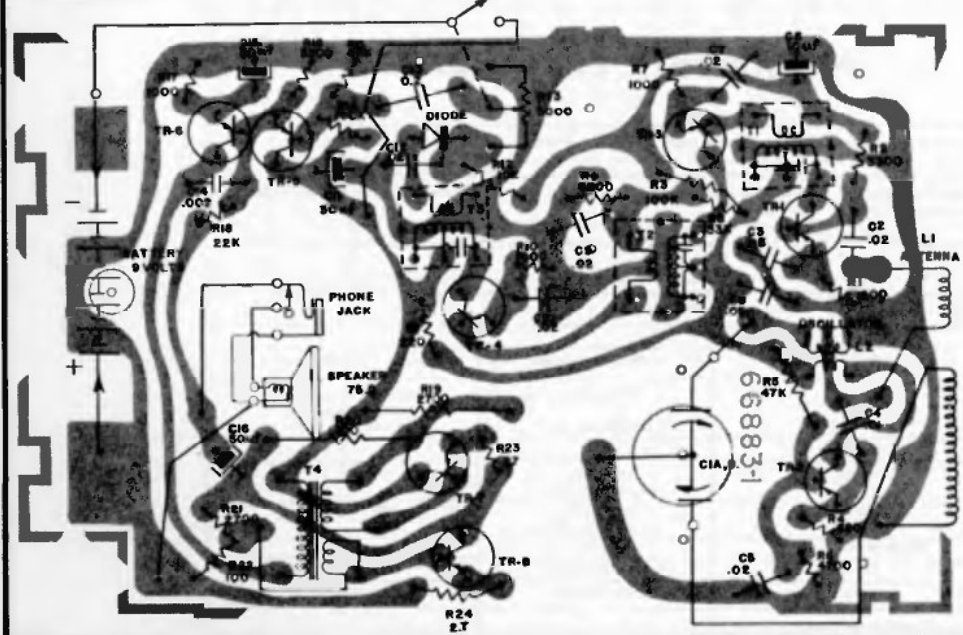
Δ=COMMON GROUND SYMBOL
⊞=EXTERNAL CONNECTION TO PRINTED CIRCUIT

TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS, 8 TO 14 MA.

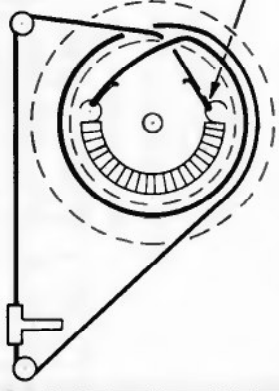


ALIGNMENT PROCEDURE

Position of Variable	Generator Frequency	Dummy Antenna	Generator Connections	Trimmers Adj. in order shown for Max. Output	Function of Trimmer
Open	455 Kc	.05 μf	C1A	A1 (Top of T3) A2 (Top of T2) A3 (Top of T1) A4 A5 Check Point	I. F. I. F. I. F. Oscillator Antenna
Open	1640 Kc		*Test Loop		
1400 Kc	1400 Kc		*Test Loop		
600 Kc	600 Kc		*Test Loop		

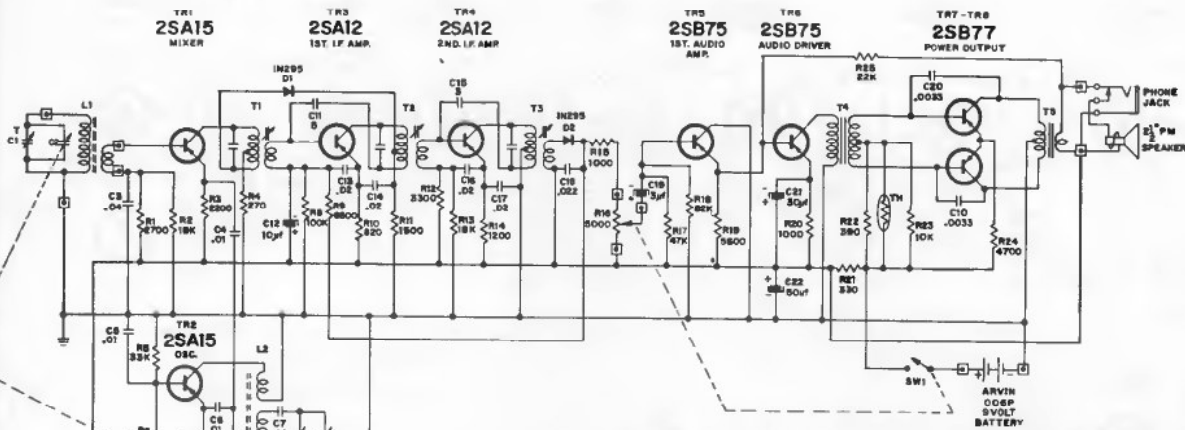


NOTE: SHOWN WITH VARIABLE IN CLOSED POSITION. START HERE



Arvin

CODE 1. 84701
MODEL 64R29



□ EXTERNAL CONNECTOR TO PRINTED CIRCUIT BOARD

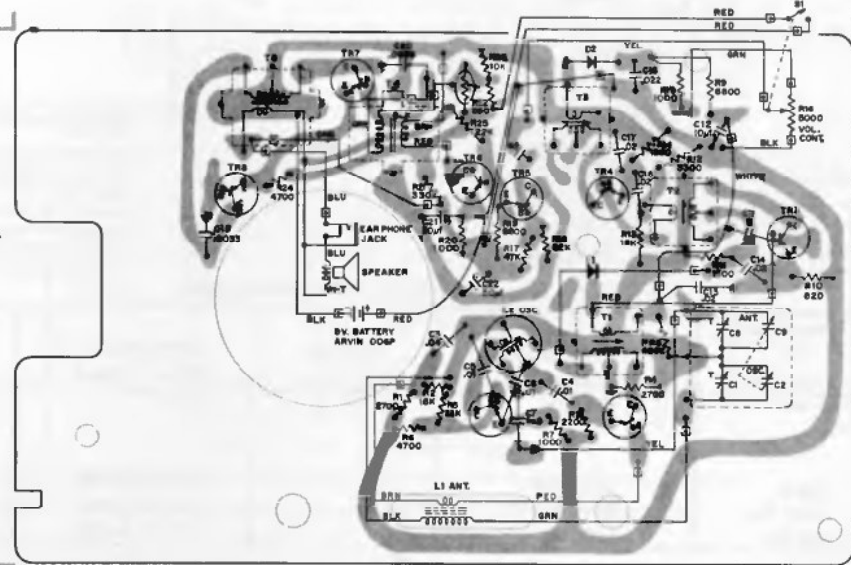
RESISTANCE VALUES ARE IN OHMS; K=1000

CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (μ f)
AND VALUES GREATER THAN 1.0 ARE IN MICRO-MICROFARADS (μ mf)
EXCEPT WHERE NOTED.

VOLTAGE READINGS TO COMMON GROUND (+) ARE MEASURED
WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS.

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

Circuit Board Top View



Alignment Procedure

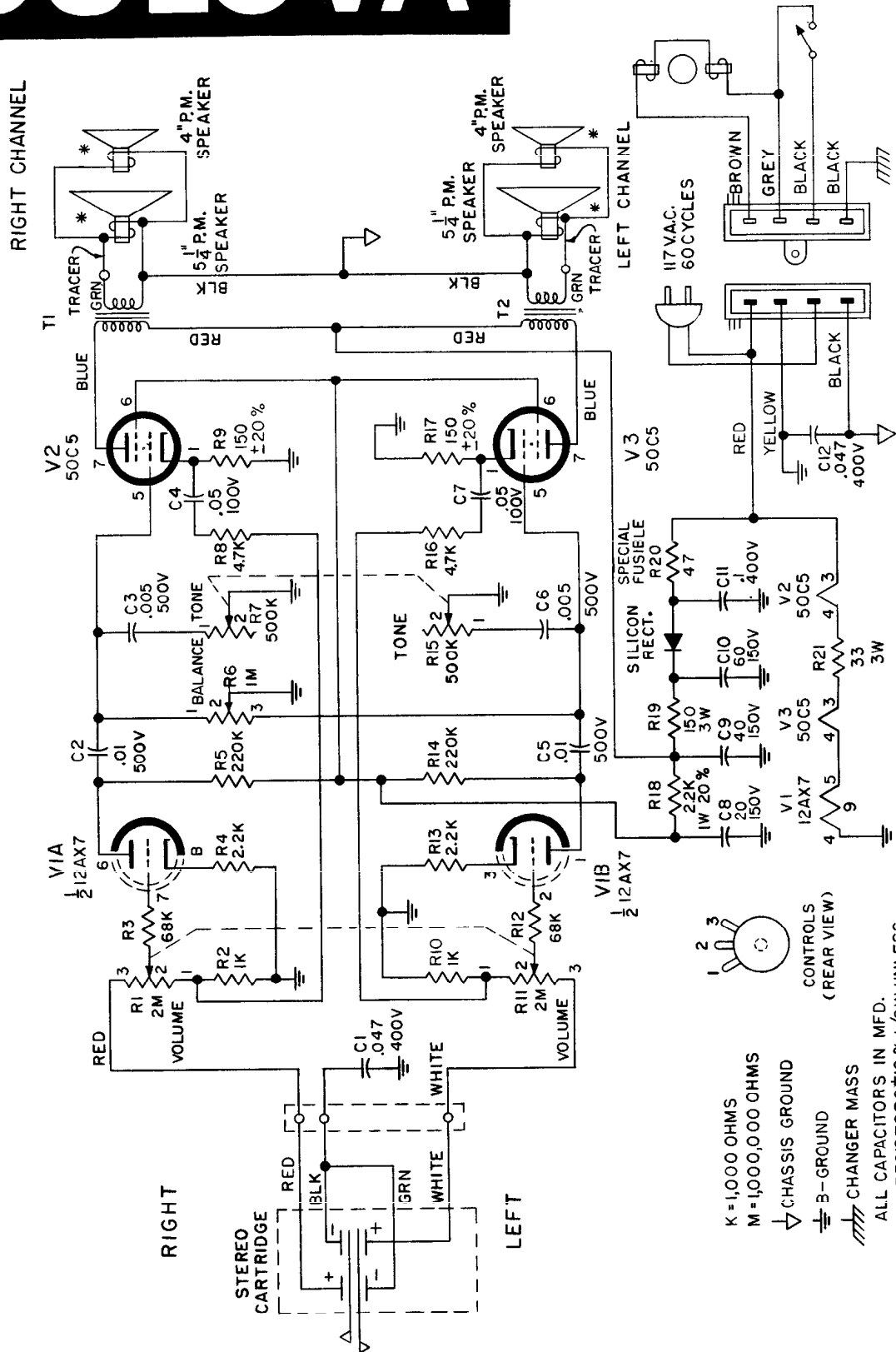
1. A new 9V. Battery or equivalent power supply must be used. The no signal voltage must not be less than 8 volts.
2. Turn volume control to maximum. Connect output of a signal generator (modulated with 400c/s \pm 30%) to a loop antenna (4 inch in diameter, looped 2 or 3 rounds). Connect the loop antenna to the ferrite-core antenna. Connect the ground terminal of the signal generator to the receiver chassis.
3. Connect a vacuum-tube voltmeter (with an AC 3V or less scale) to the earphone jack (positive side connected to negative side with an 8 resistor).
4. Make adjustments per the following table to gain maximum readings on voltmeter. During alignment, adjust output level of signal generator so that voltmeter reading will not exceed 0.5V at maximum.

Step	Generator Frequency	Position of Variable	Adjust -- for max. output
1		Quiet point	3rd I.F. Trans. T3
2	455 Kc		2nd I.F. Trans. T2
3		at high freq. end	1st I.F. Trans. T1
4	Repeat steps 1, 2 and 3		
5	520 Kc	Quiet point	osc. coil L2
6	1,650 Kc	at low freq. end	
7		Quiet point	osc. trimmer C8
8	Repeat steps 5 and 6	at high freq. end	
9	600 Kc	600 Kc signal	ant. L1 position
10	1,400 Kc	1,400 Kc signal	ant. trimmer C1
11	Repeat steps 8 and 9		

BULOVA

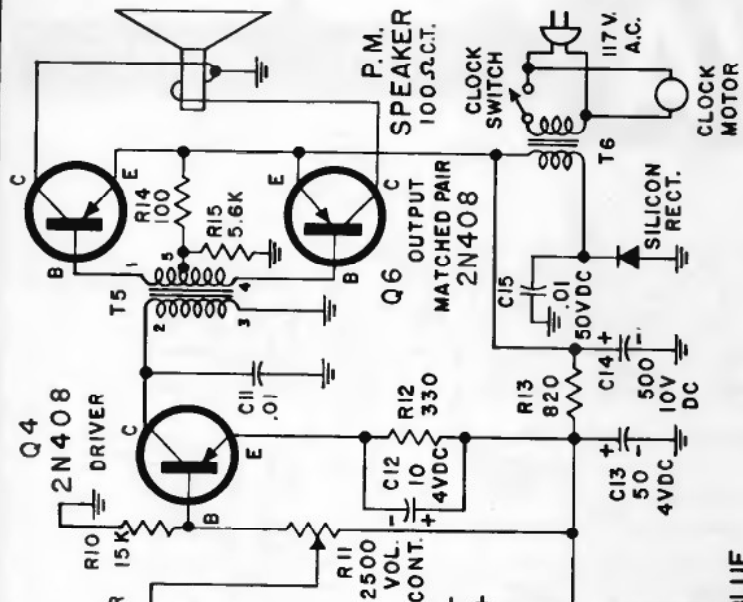
MODEL #S-912

SCHEMATIC DIAGRAM OF CHASSIS MODEL S-912



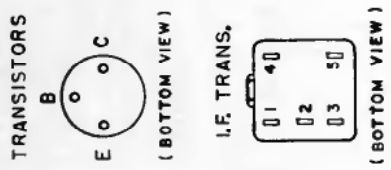
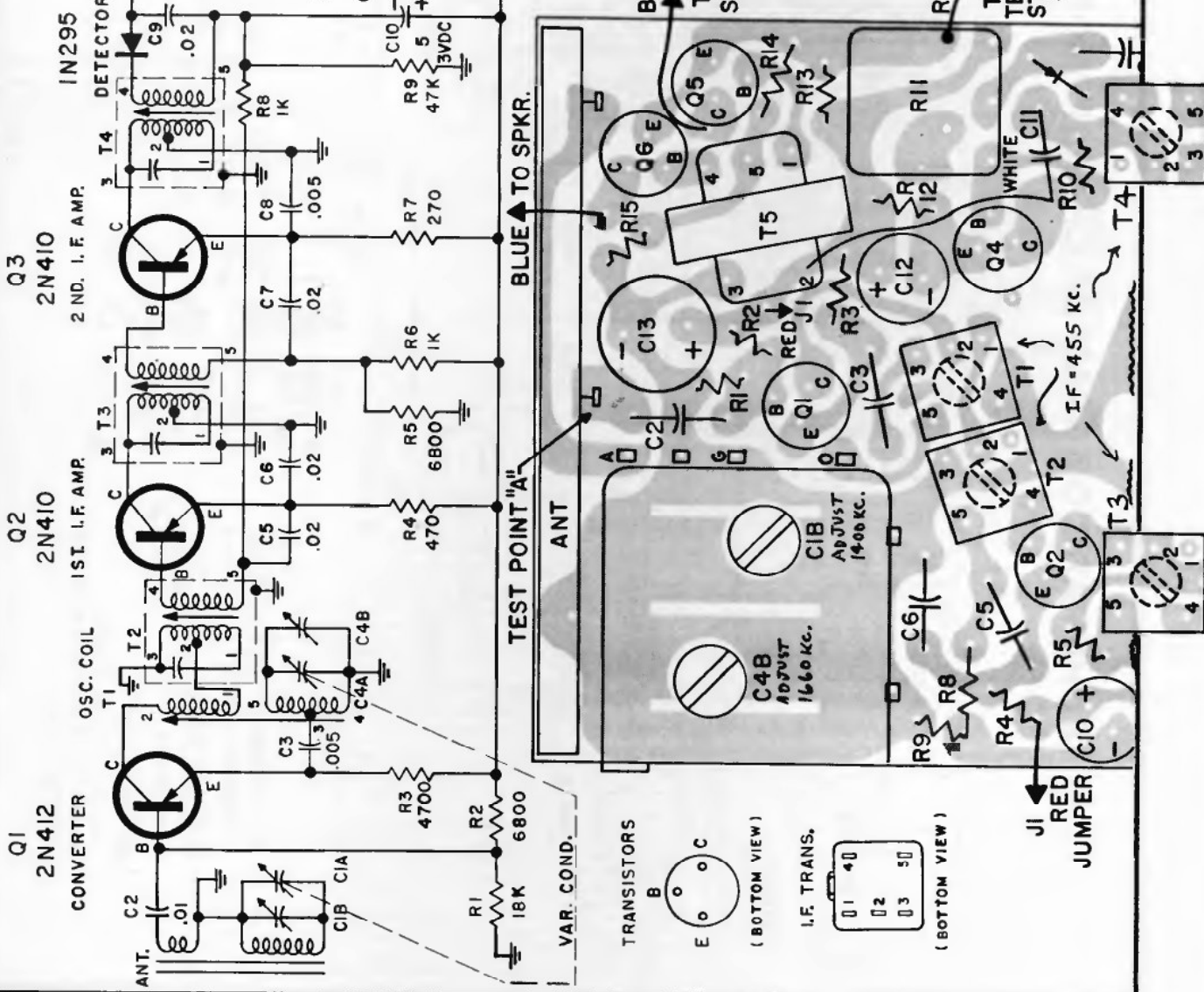
K = 1,000 OHMS
 M = 1,000,000 OHMS
 ▽ CHASSIS GROUND
 ⊕ B-GROUND
 ⊕ CHANGER MASS
 ALL CAPACITORS IN MFD.
 ALL RESISTORS ±10% 1/2W UNLESS OTHERWISE NOTED

Q5
2N408



ALL RESISTORS 1/4 WATT $\pm 10\%$.
 K = 1,000 OHMS.
 ALL CAPACITORS IN MFD. UNLESS OTHERWISE NOTED.
 DC WORKING VOLTAGE IS 25V.
 ⊕ = CHASSIS GROUND.

BULOVA Viceroy
 ALL TRANSISTOR CLOCK RADIO
 MODEL 430 SERIES



BLUE TO SPKR.

RED TO TERM STRIP

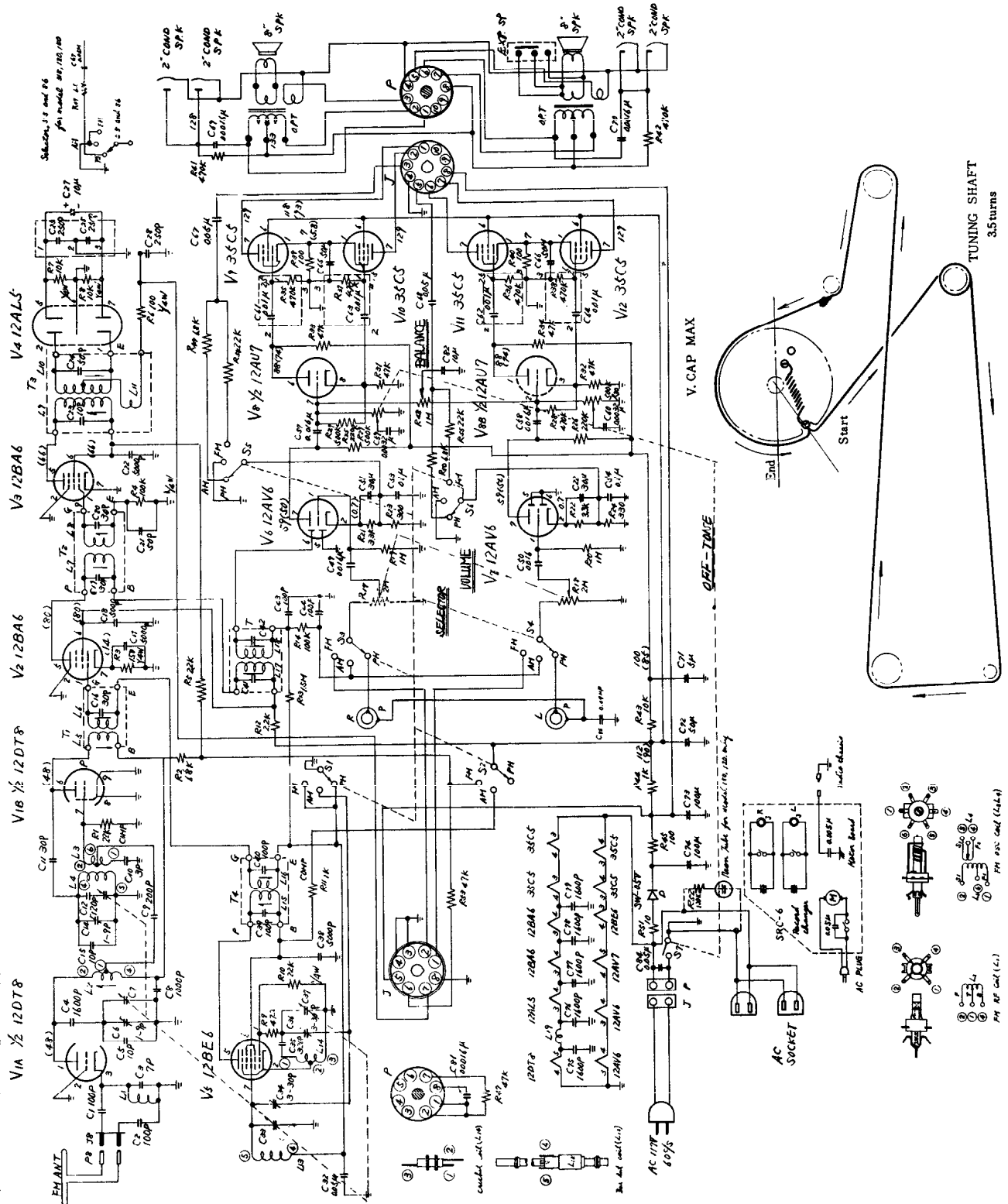
JI RED JUMPER

DELMONICO

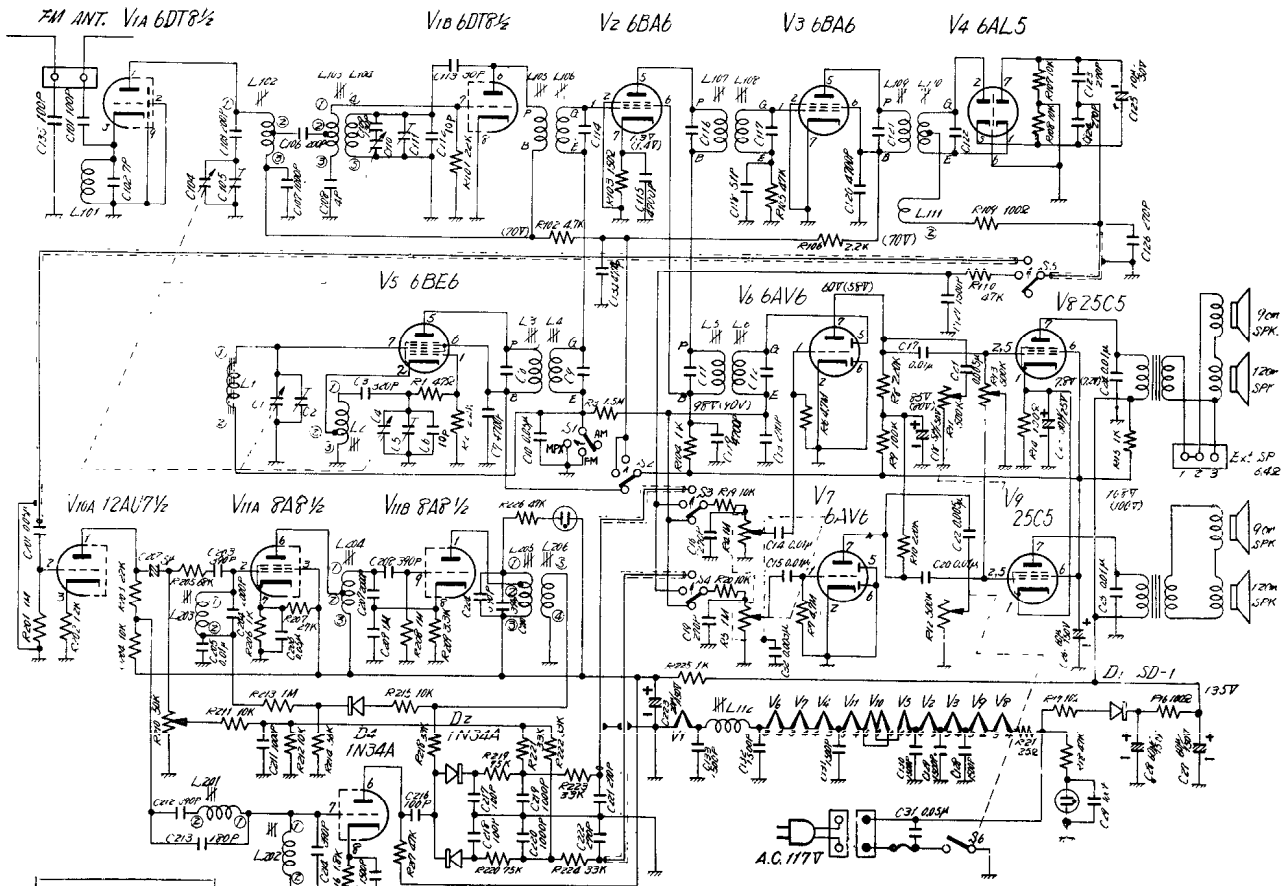
RADIO Tuning Range : FM 88-108MC AM 535-1605KC
 Intermediate Frequency : FM 10.7MC AM 455KC
 Antenna : FM Built-in folded dipole antenna
 AM Built-in ferrite bar Antenna

MODEL 120

MODEL 150



DELMONICO MODEL FMS-411



Voltage at AM
(Voltage at FM)

1. Schematic is shown with band (S₁~S₅) in AM position
2. Voltages are mesured with no signal using V. T. V. M

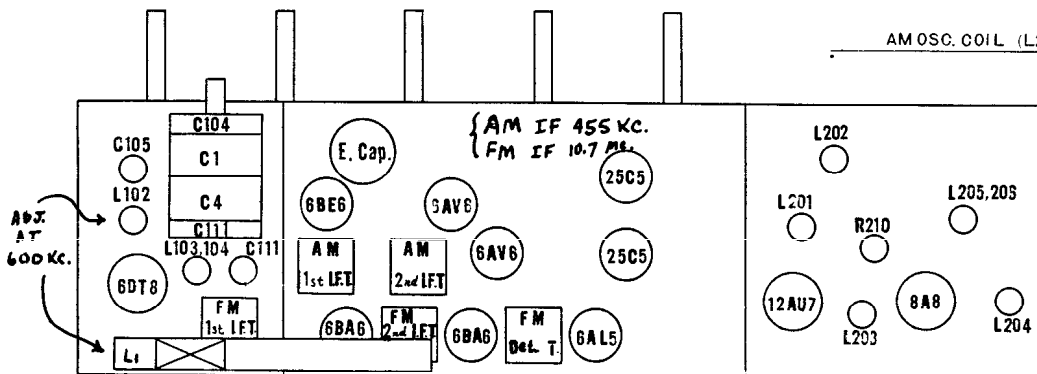
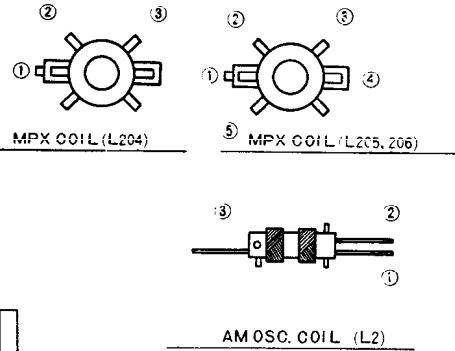
END

CONDENSER
CLOSED

START

CORD IS 61"

3 TURNS

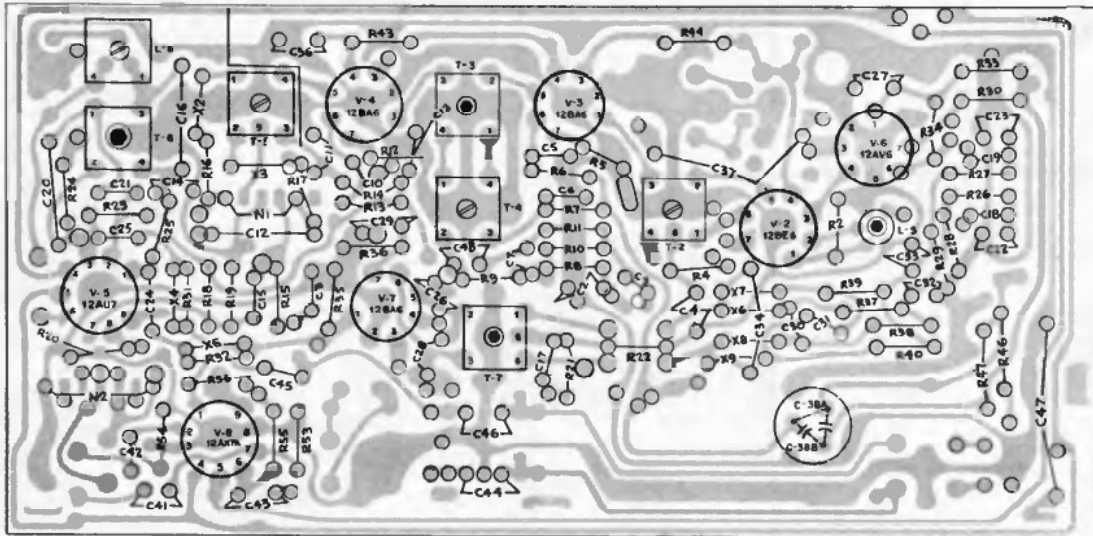


MODEL AND CHASSIS CROSS-REFERENCE

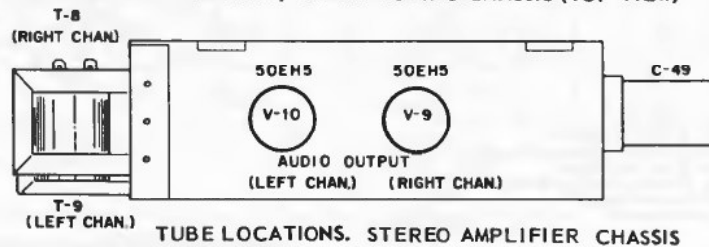
Emerson Radio

Chassis 120715, 120716, 120724
(material on pages 23 through 25)

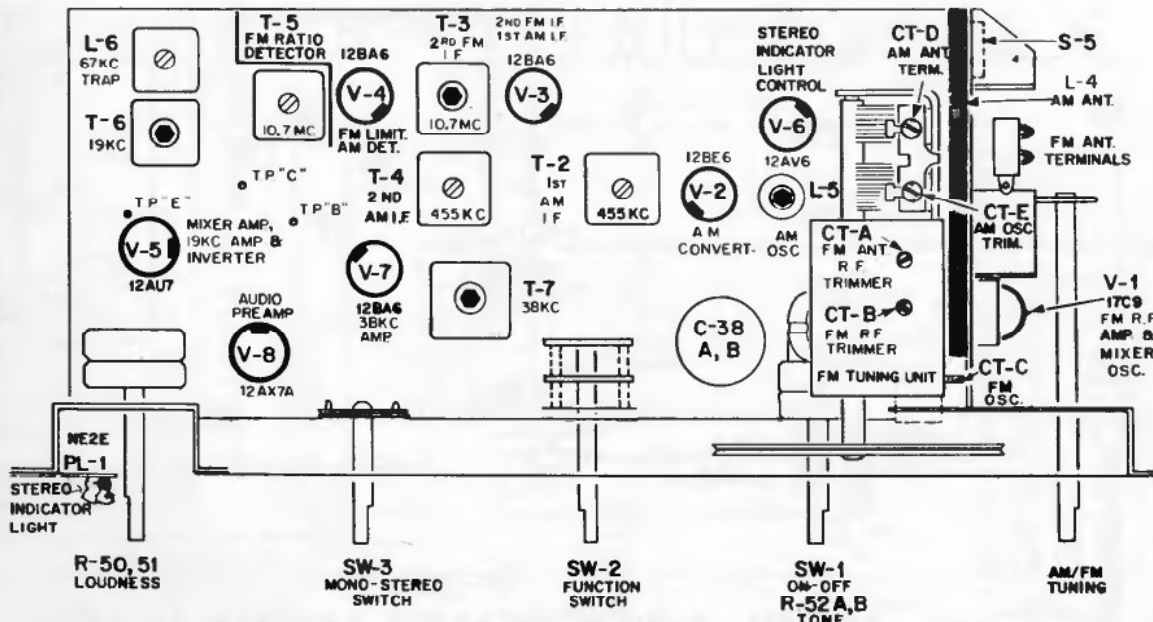
MODEL NUMBER	AM/FM TUNER	STEREO AMPLIFIER
P-1925A	120715	120716
P-1927	120715	120716
P-1935	120724	120716
P-1938	120724	120716



ETCHED PRINTED CIRCUIT, AM-FM TUNING CHASSIS (TOP VIEW)



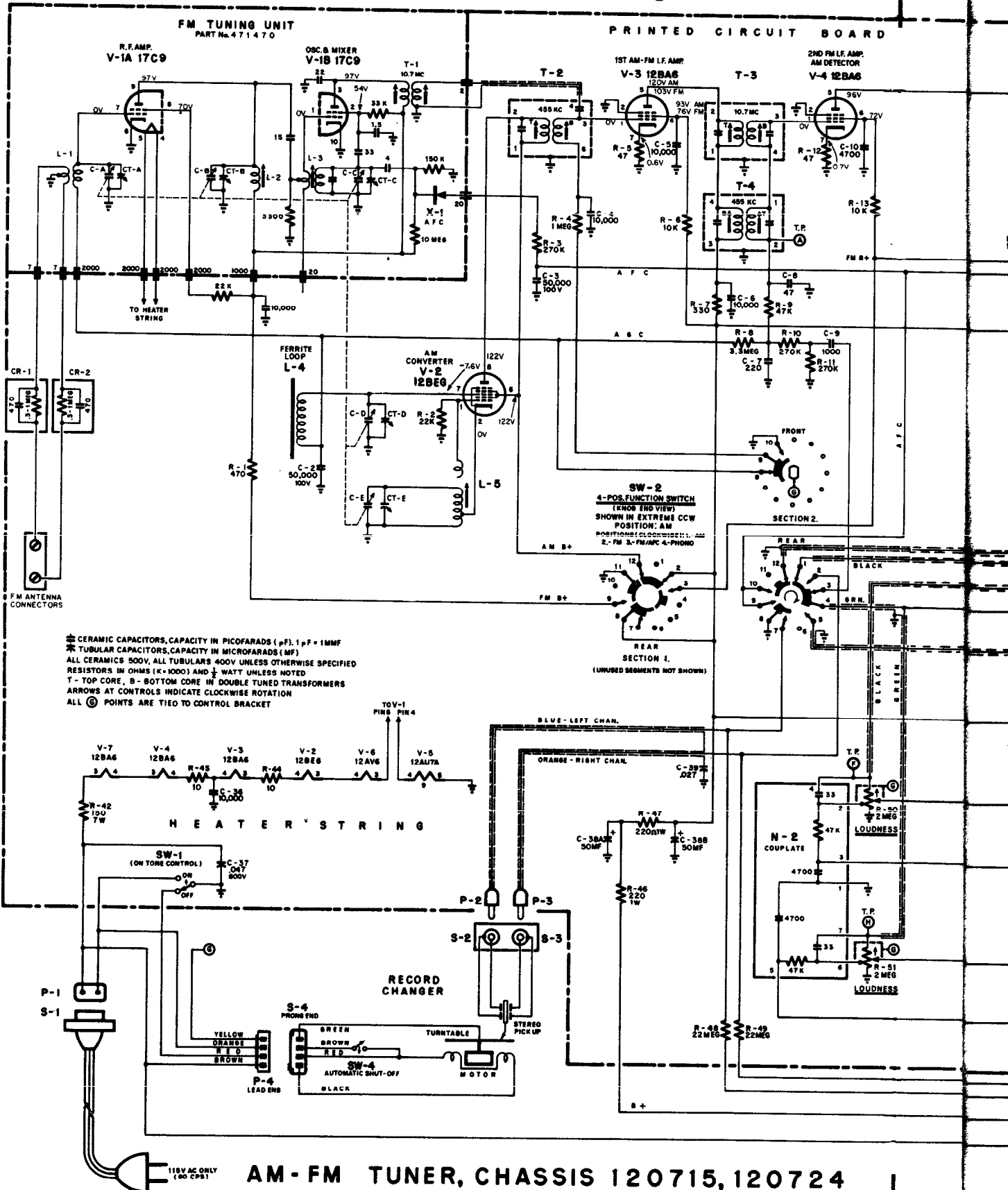
TUBE LOCATIONS, STEREO AMPLIFIER CHASSIS



TUBE LOCATIONS AND ALIGNMENT POINTS, AM-FM TUNING CHASSIS.

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

EMERSON Chassis 120715, 120716, 120724, Schematic Diagram



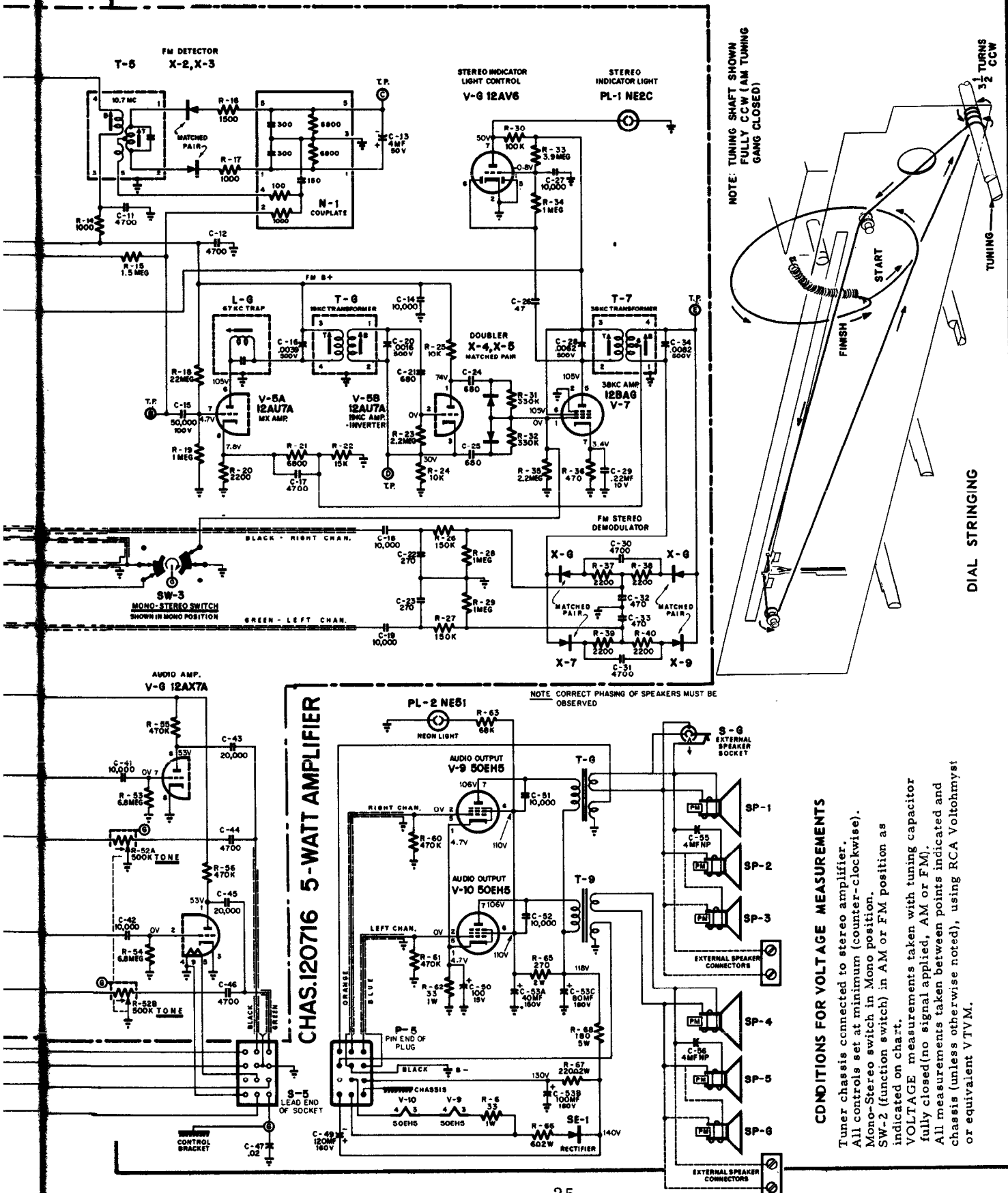
* CERAMIC CAPACITORS, CAPACITY IN PICOFARADS (pF). 1 pF = 1MMF
 * TUBULAR CAPACITORS, CAPACITY IN MICROFARADS (MF)
 ALL CERAMICS 500V, ALL TUBULARS 400V UNLESS OTHERWISE SPECIFIED
 RESISTORS IN OHMS ($\times 1000$) AND 3 WATT UNLESS NOTED
 T - TOP CORE, B - BOTTOM CORE IN DOUBLE TUNED TRANSFORMERS
 ARROWS AT CONTROLS INDICATE CLOCKWISE ROTATION
 ALL $\text{\textcircled{C}}$ POINTS ARE TIED TO CONTROL BRACKET

SW - 2
 4-POS. FUNCTION SWITCH
 (KNOB END VIEW)
 SHOWN IN EXTREME CCW
 POSITION: AM
 POSITIONS CLOCKWISE:
 2 - FM 3 - FM/AMC 4 - PHONO

N - 2
 COUPLATE
 T.P.
 LOUDNESS
R - 51
 2 MEG
 LOUDNESS

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

EMERSON Chassis 120715, 120716, 120724, Diagram, Continued



NOTE: TUNING SHAFT SHOWN FULLY CCW (AM TUNING GANG CLOSED)

DIAL STRINGING

NOTE: CORRECT PHASING OF SPEAKERS MUST BE OBSERVED

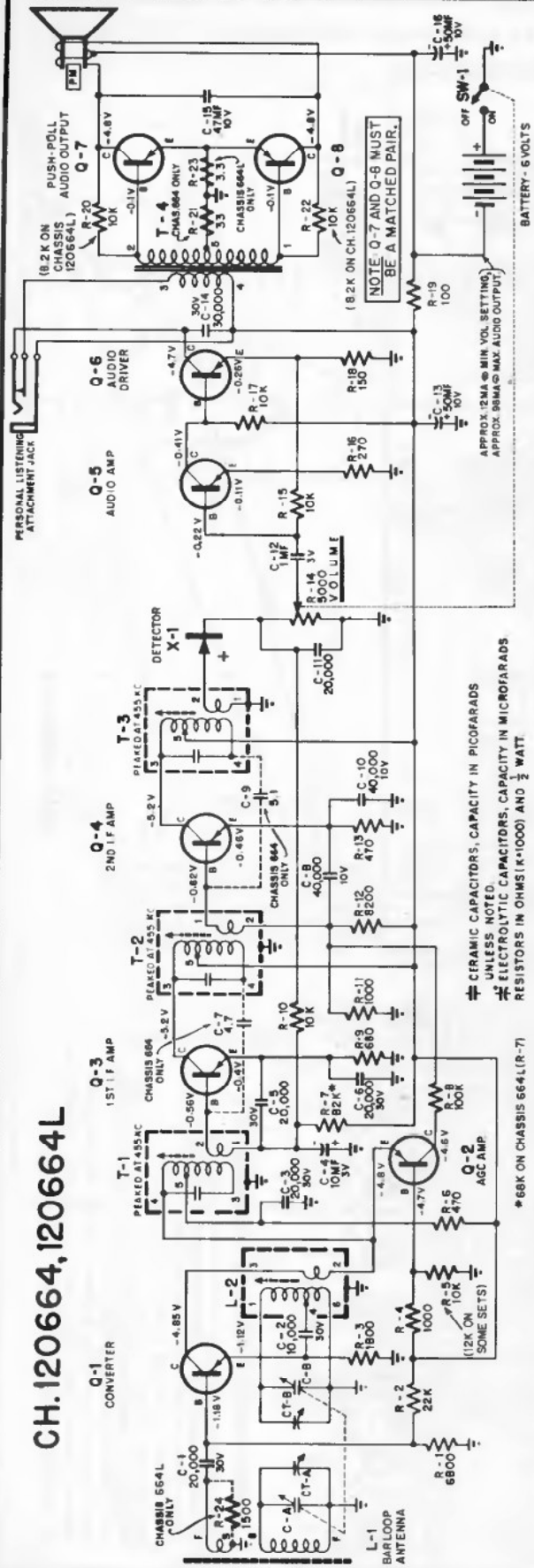
CONDITIONS FOR VOLTAGE MEASUREMENTS

Tuner chassis connected to stereo amplifier.
 All controls set at minimum (counter-clockwise).
 Mono-Stereo switch in Mono position.
 SW-2 (function switch) in AM or FM position as indicated on chart.
 VOLTAGE measurements taken with tuning capacitor fully closed (no signal applied, AM or FM).
 All measurements taken between points indicated and chassis (unless otherwise noted), using RCA Voltohmmyst or equivalent VTVM.

Emerson Radio

MODEL 899
"MERCURY"
CH. 120664, 664L

CH. 120664, 120664L



NOTE: Q-7 AND Q-8 MUST BE A MATCHED PAIR.

NOTE: THE FOLLOWING TRANSISTOR COMBINATIONS MUST BE OBSERVED (CHASSIS 664 ONLY):

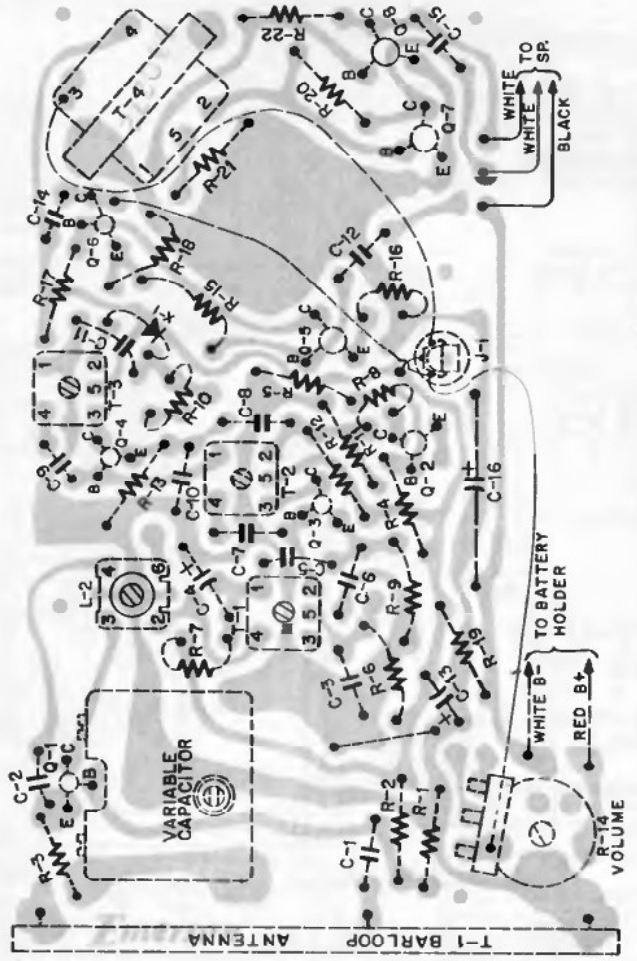
TRANSISTOR	PART No.	TRANSISTOR	PART No.
Q-1	815065	Q-7, Q-8	813070 OR 815070

NOTE: THE FOLLOWING TRANSISTOR COMBINATIONS MUST BE OBSERVED (CHASSIS 664L ONLY):

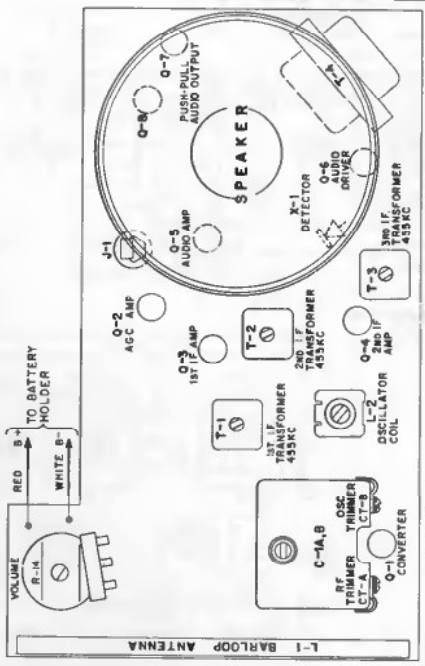
TRANSISTOR	PART No.	TRANSISTOR	PART No.
Q-6	815120BMC	Q-7, Q-8	815120C
Q-7, Q-8	815120E		

⊞ CERAMIC CAPACITORS, CAPACITY IN PICOFARADS UNLESS NOTED.
⊞ ELECTROLYTIC CAPACITORS, CAPACITY IN MICROFARADS.
⊞ RESISTORS IN OHMS (K=1000 AND 1/2 WATT).

*68K ON CHASSIS 664L(R-7)



ETCHED PRINTED CIRCUIT CHASSIS 120664, 120664-L (BOTTOM VIEW)



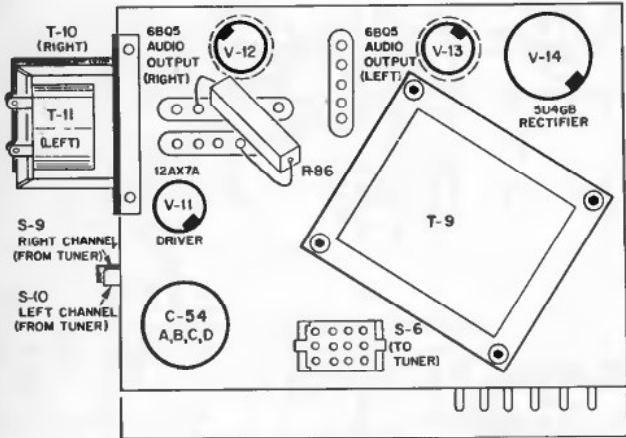
Emerson Radio

MODELS:
P-1939, P-1940
AUDIO CH.: 120719
AM/FM TUNER: 120720C

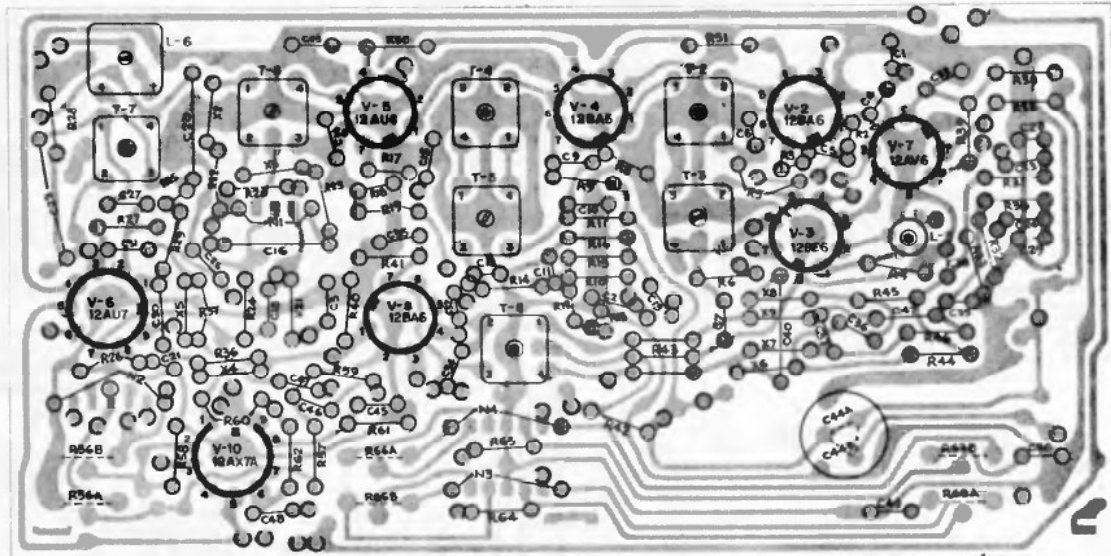
DUMONT

MODELS:
524, 525, 526.

(Material on pages 27 through 29)

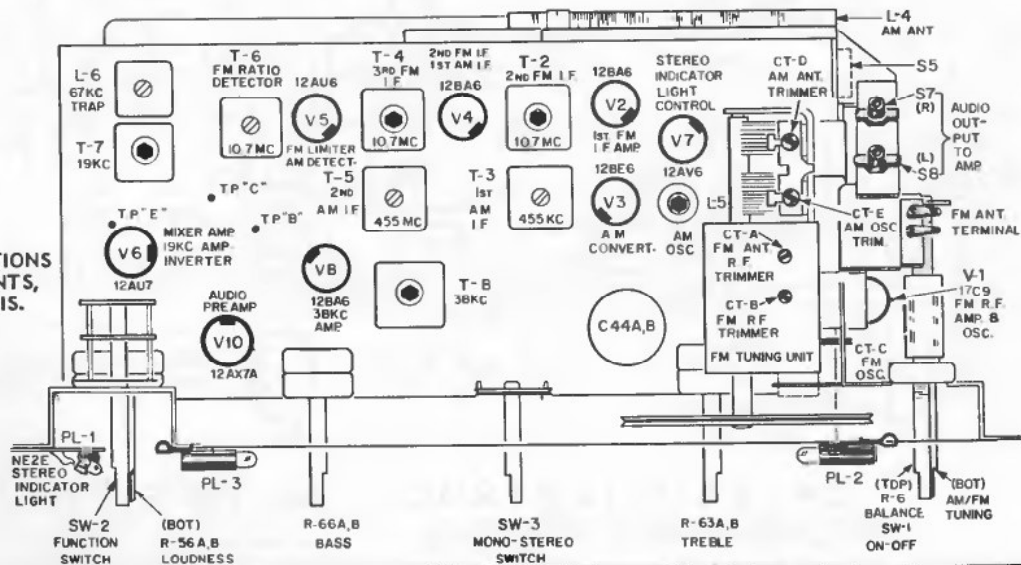


TUBE LOCATIONS.
STEREO AMP. CHASSIS



ETCHED PRINTED CIRCUIT, AM-FM TUNING CHASSIS (TOP VIEW)

TUBE LOCATIONS
AND ALIGNMENT POINTS,
AM-FM TUNING CHASSIS.

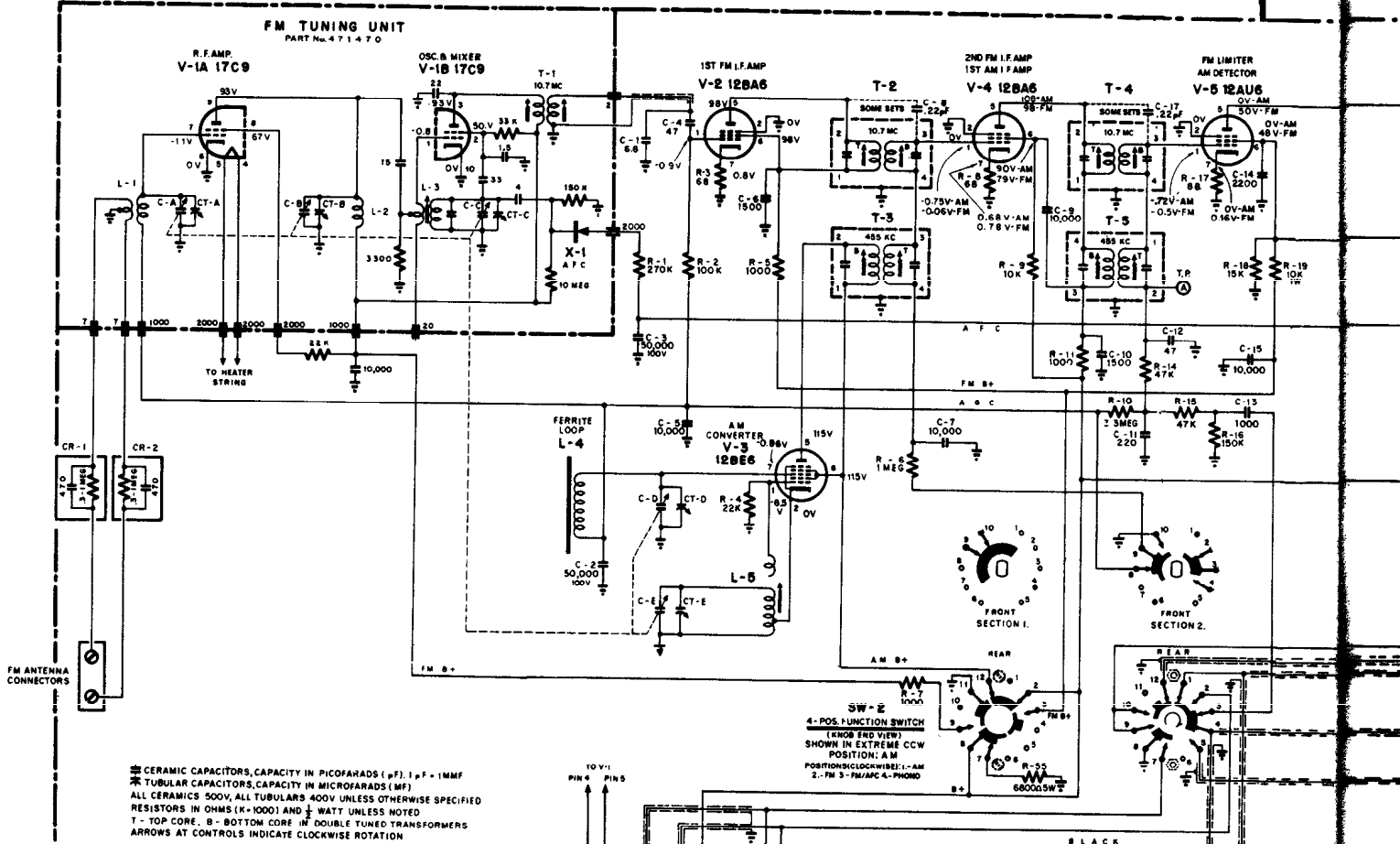


VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

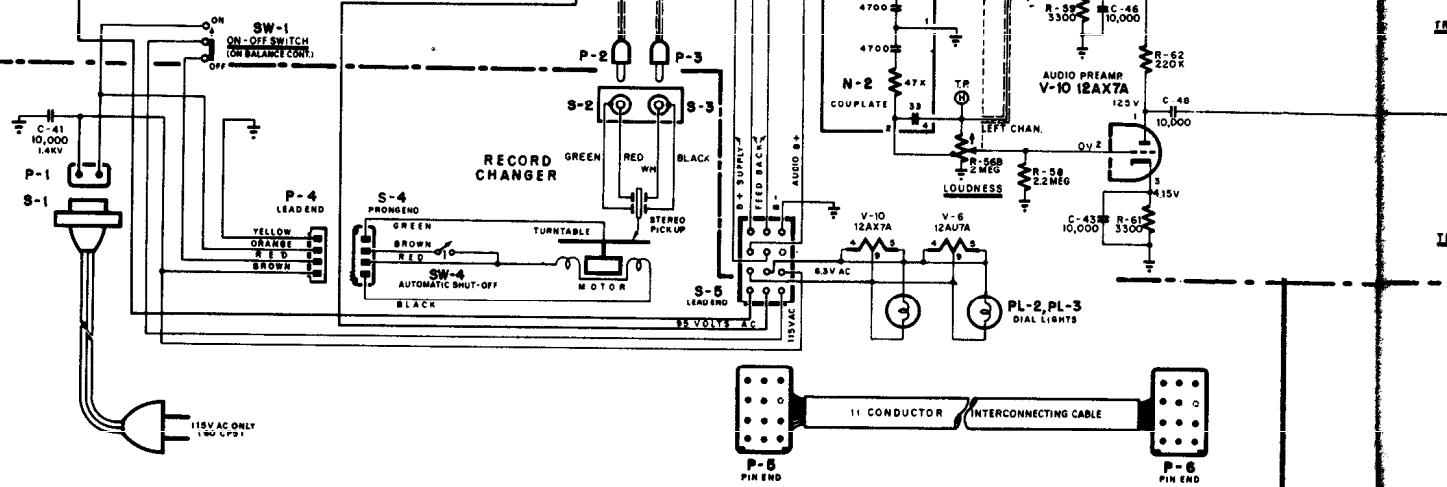
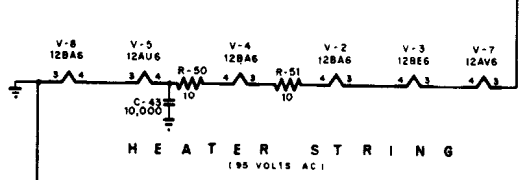
EMERSON and DUMONT Chassis 120719 and 120720C Diagrams

FM TUNING UNIT

PART No. 471470



⊠ CERAMIC CAPACITORS, CAPACITY IN PICOFARADS (pF), 1 pF = 1MMF
 ⊠ TUBULAR CAPACITORS, CAPACITY IN MICROFARADS (MF)
 ALL CERAMICS 500V, ALL TUBULARS 400V UNLESS OTHERWISE SPECIFIED
 RESISTORS IN OHMS (K=1000) AND Ω WATT UNLESS NOTED
 T - TOP CORE, B - BOTTOM CORE IN DOUBLE TUNED TRANSFORMERS
 ARROWS AT CONTROLS INDICATE CLOCKWISE ROTATION

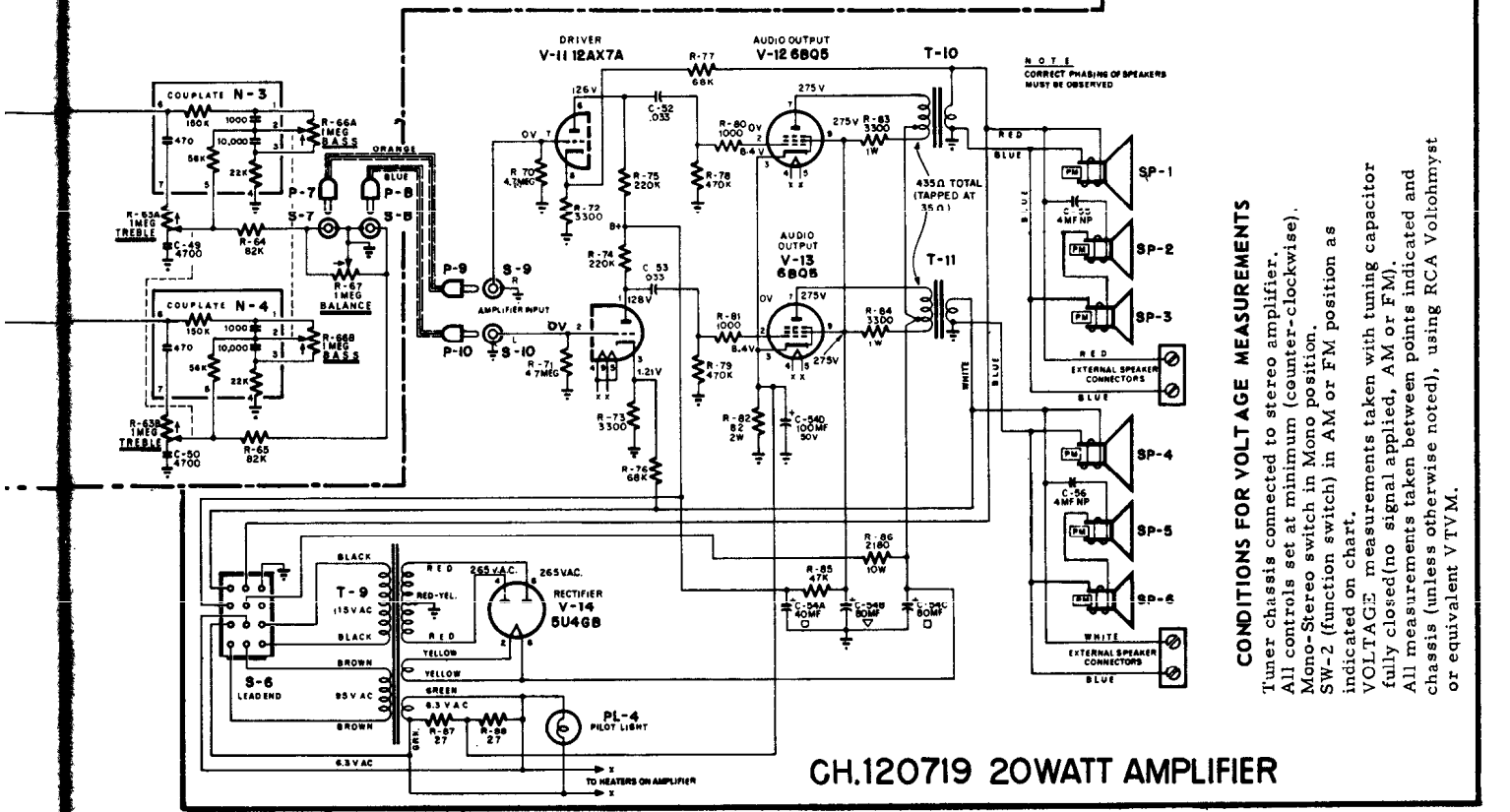
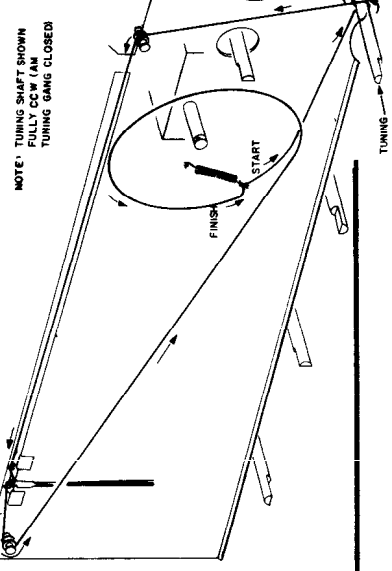
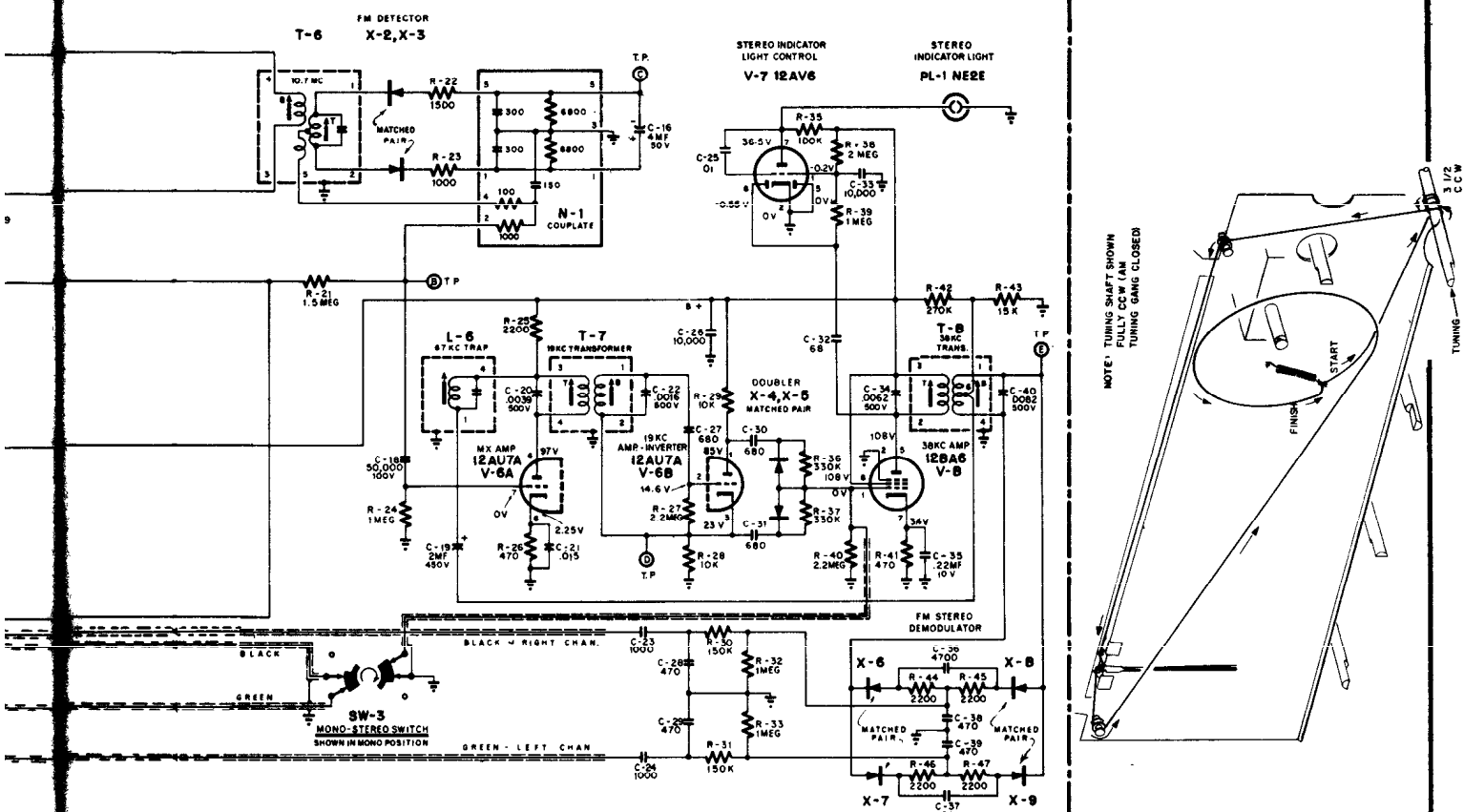


CHASSIS 120720C AM-FM STEREO TUNER

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

EMERSON and DUMONT Chassis 120719 and 120720C Diagrams, Continued

PRINTED CIRCUIT BOARD

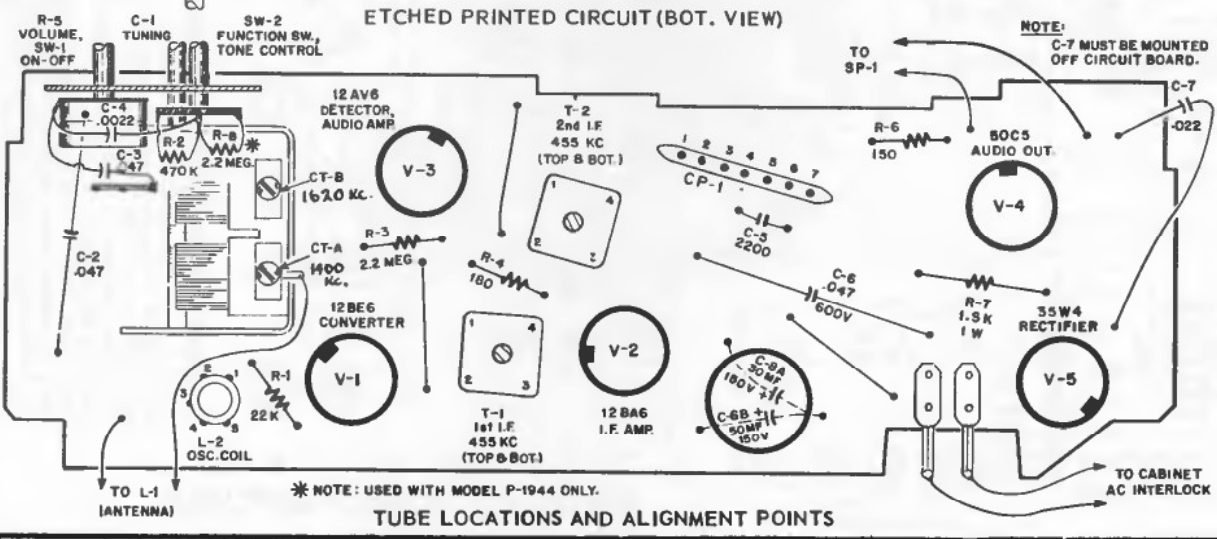
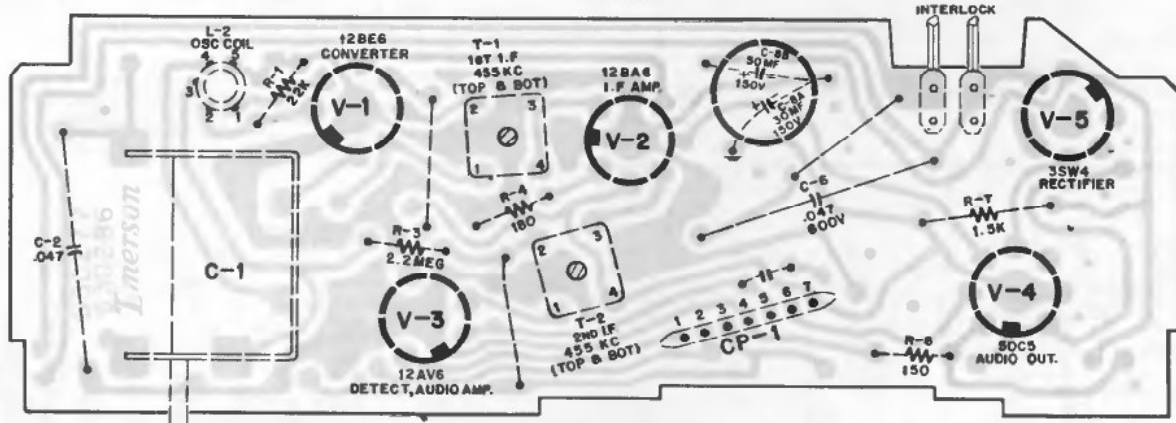
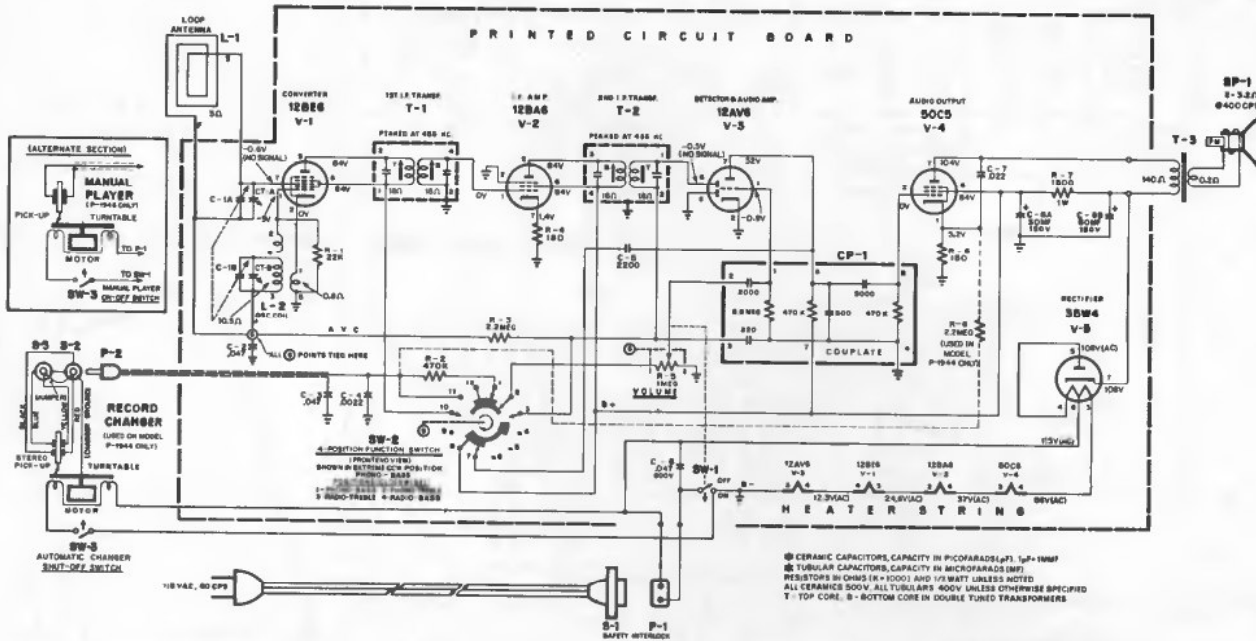


CONDITIONS FOR VOLTAGE MEASUREMENTS
 Tuner chassis connected to stereo amplifier.
 All controls set at minimum (counter-clockwise).
 Mono-Stereo switch in Mono position.
 SW-2 (function switch) in AM or FM position as indicated on chart.
 VOLTAGE measurements taken with tuning capacitor fully closed (no signal applied, AM or FM).
 All measurements taken between points indicated and chassis (unless otherwise noted), using RCA Volt ohmmyst or equivalent V TVM.

CH.120719 20WATT AMPLIFIER

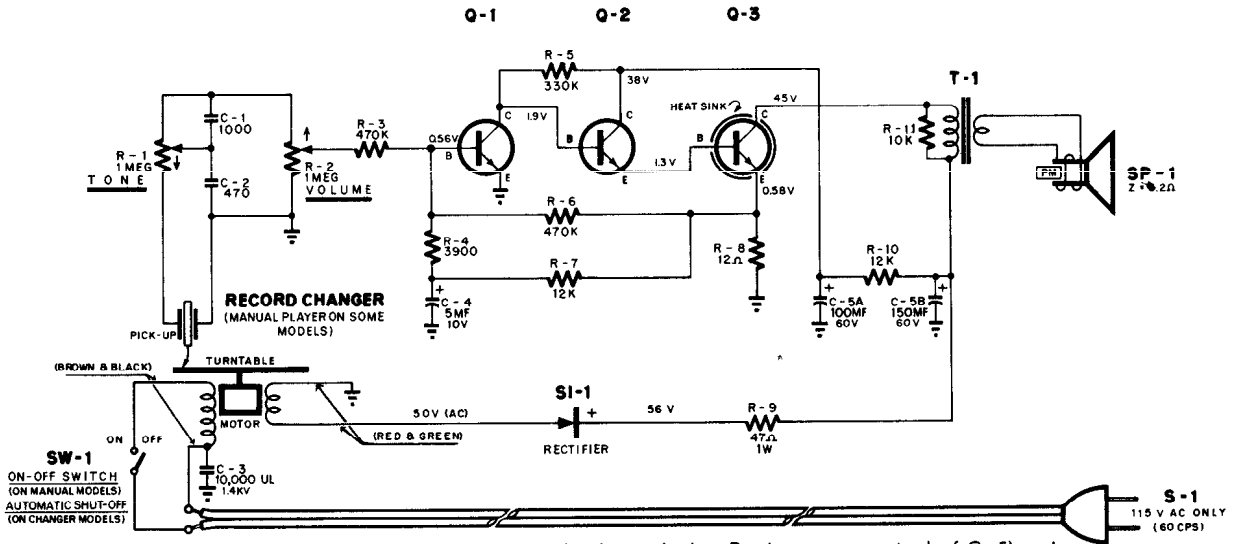
Emerson Radio

MODELS:
P-1944, P-1946
CHASSIS: 120726

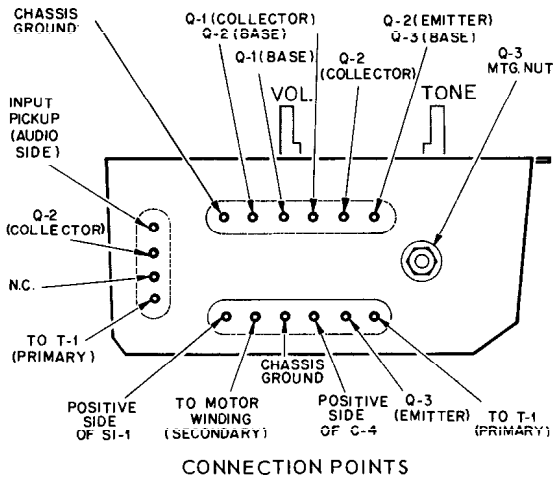


Emerson Radio

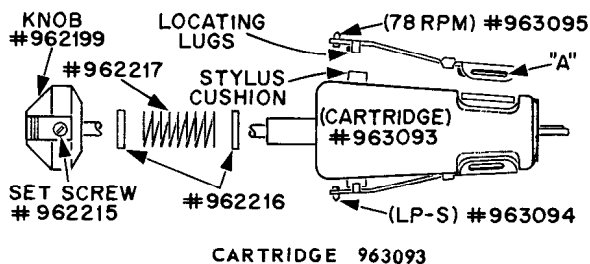
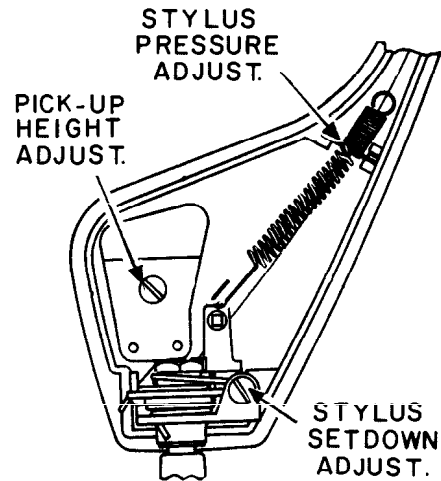
MODELS:
32P01, 32P02
CHASSIS: 120745



NOTE: All voltages measured with VTVM with common lead attached to B- (common terminal of C-5) and volume control set at minimum (fully counter-clockwise).



ADJUSTMENT SETTINGS, RECORD CHANGER 819218



To replace either of the styli in cartridge number 963093, remove defective stylus by releasing clipped-on end at point (A). When installing new stylus, be sure the two locating lugs directly behind the sapphire tip are seated on either side of the stylus cushion.

Cartridge number 963093 (Ronette DC-500) is supplied complete with mounting bracket and all associated parts. To replace, remove cartridge mounting screw from top of tone arm, install new cartridge and replace mounting screw.

STYLUS SET-DOWN

Raise pick-up arm and adjust screw indicated for proper set-down on lead-in groove of 10" record. When correctly positioned for a 10" record, set-down point for 7" and 12" records should also be correct.

PICK-UP HEIGHT

Raise pick-up arm to a vertical position and adjust screw indicated until pick-up clears a stack of 10 records on the turntable by at least 1/8". A check should then be made to see that pick-up arm does not contact underside of remaining records stacked on the spindle shelf, and also to see that pick-up arm clears top of rest post during change cycle.

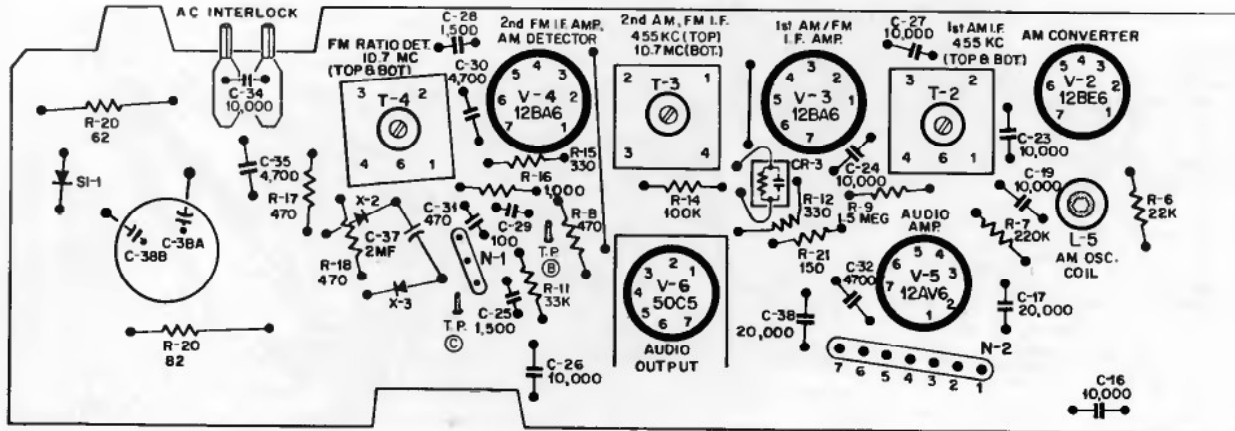
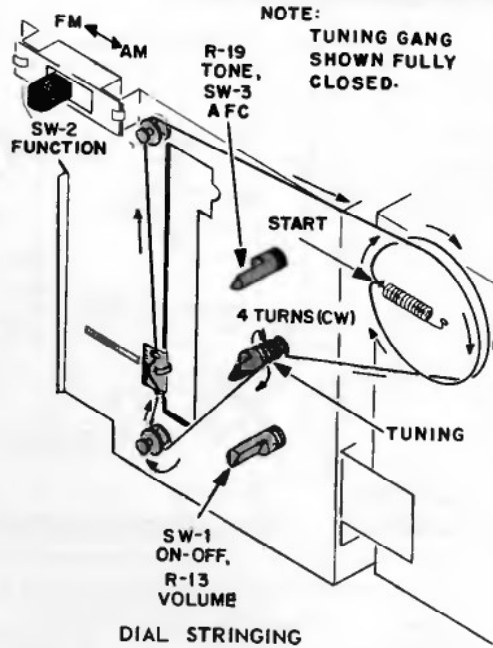
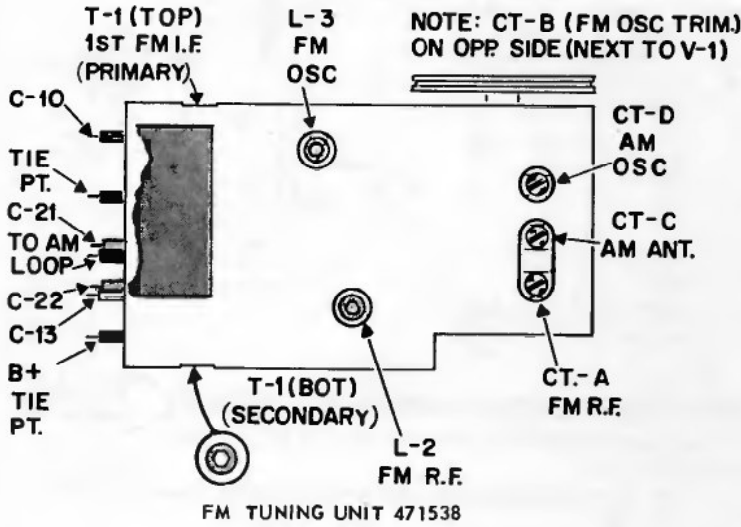
STYLUS PRESSURE

Adjust stylus pressure by repositioning balance spring in the various holes provided inside pick-up arm until correct pressure of 6 to 8 grams is obtained.

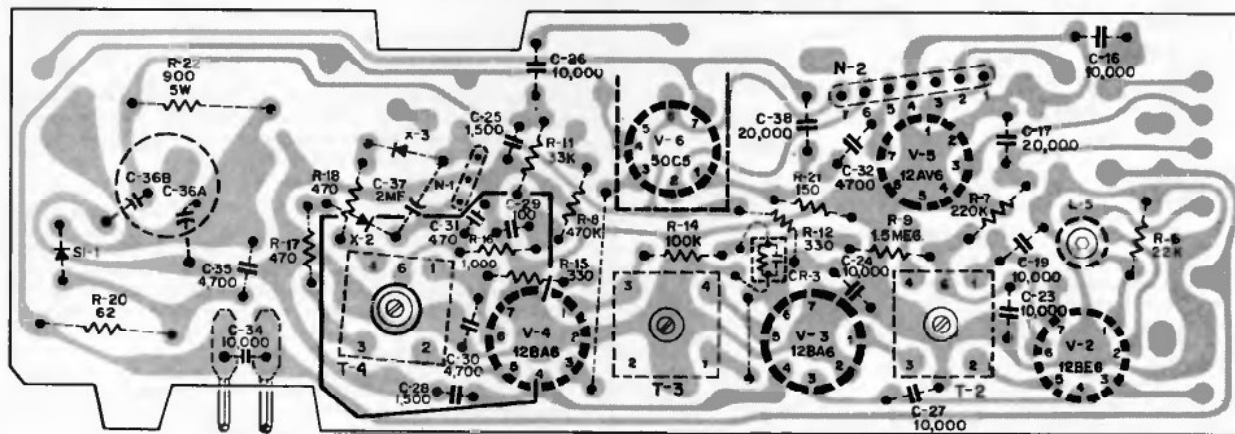
Emerson Radio

MODEL: 31T01
CHASSIS: 120747

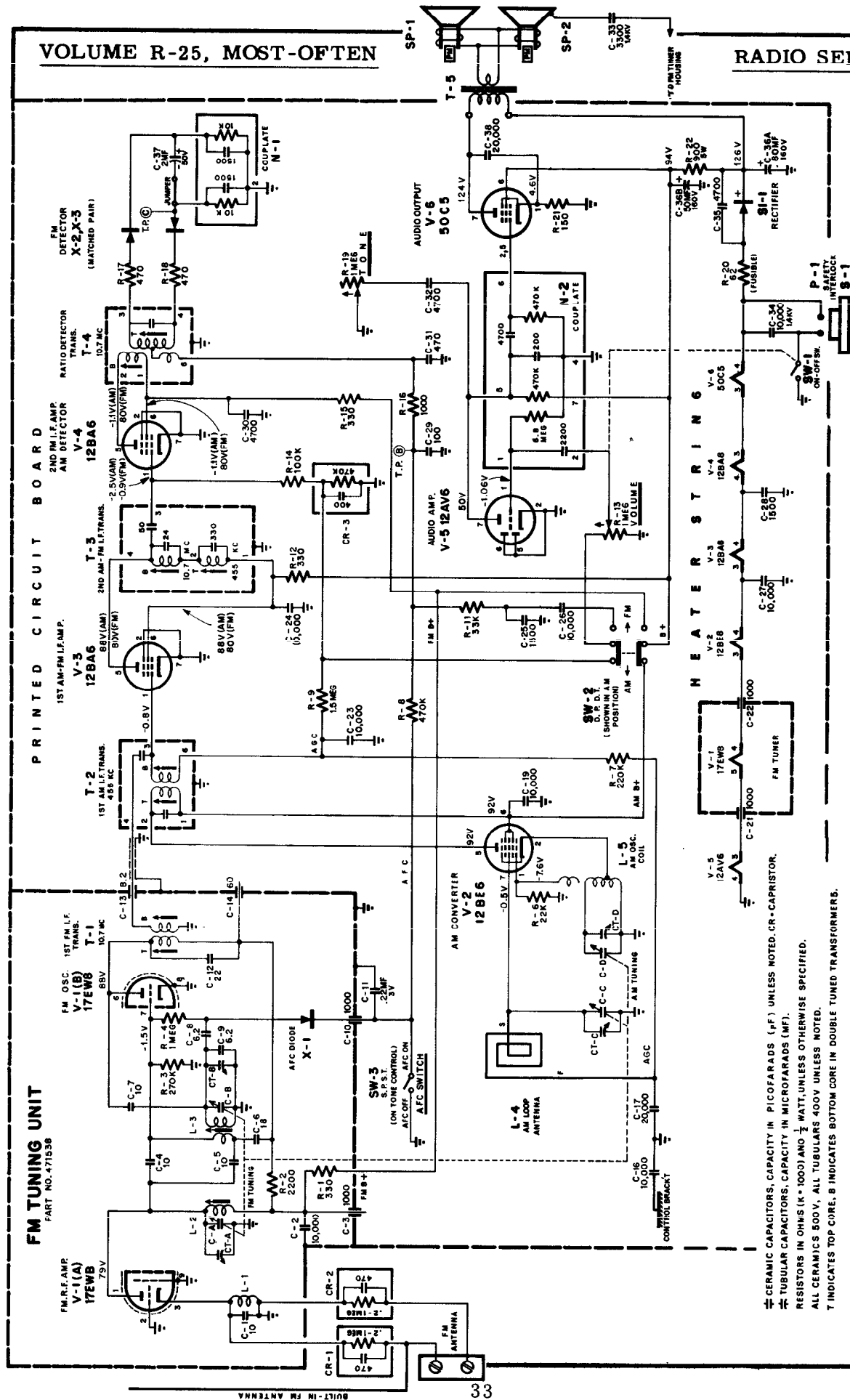
Model 31T01, Chassis 120747
(For diagram see page 33)



TUBE LOCATIONS AND ALIGNMENT POINTS



ETCHED CIRCUIT CHASSIS (BOTTOM VIEW)



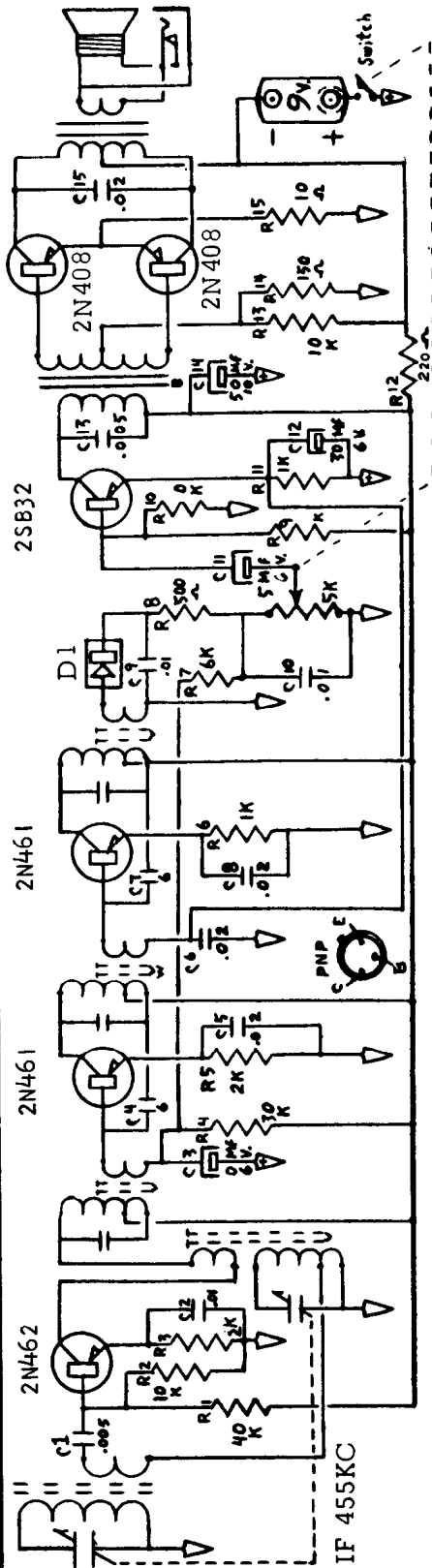
MODEL: 31T01
CHASSIS: 120747



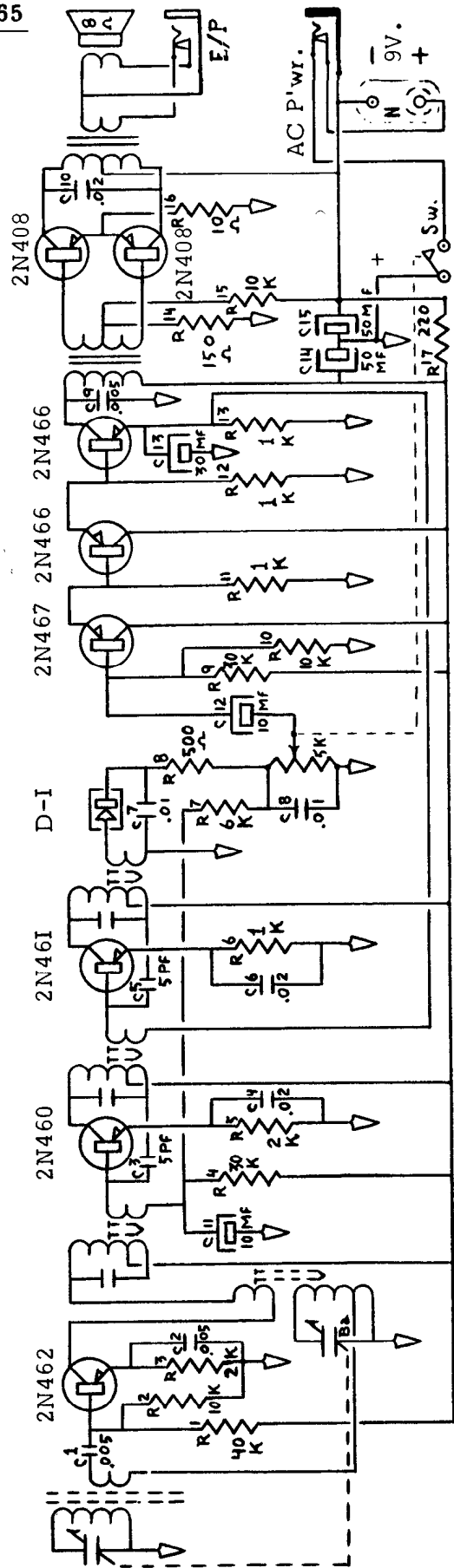
EMERSON Model 31T01, Chassis 120747
(Continued from page 32)

⚡ CERAMIC CAPACITORS, CAPACITY IN PICOFARADS (PF) UNLESS NOTED. CR - CAPACITOR.
 ⚡ TUBULAR CAPACITORS, CAPACITY IN MICROFARADS (MF).
 ⚡ RESISTORS IN OHMS (K=1000) AND 1/2 WATT UNLESS OTHERWISE SPECIFIED.
 ⚡ ALL CERAMICS 500V. ALL TUBULARS 400V UNLESS NOTED.
 T INDICATES TOP CORE. B INDICATES BOTTOM CORE IN DOUBLE TUNED TRANSFORMERS.

Gamble-Shogmo, Inc.



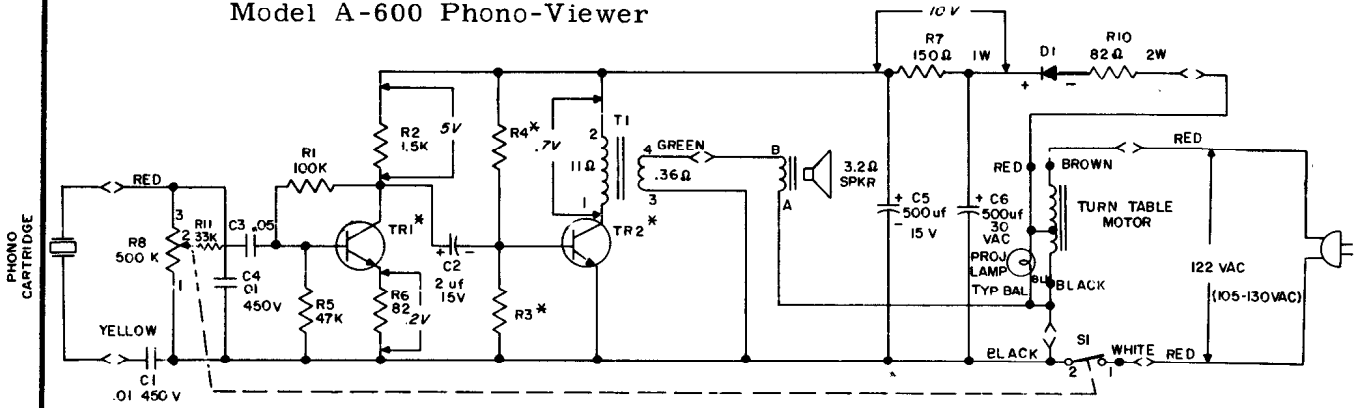
MODEL 60-9925A



MODEL RA 60-9930B

GENERAL ELECTRIC

Model A-600 Phono-Viewer

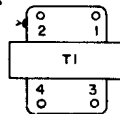


UNLESS OTHERWISE NOTED
CAPACITORS MORE THAN 1 = MMF
CAPACITORS LESS THAN 1 = MF
RESISTORS ARE 1/2 WATT, K=1000

SEE LIST FOR VALUES OF RESISTORS
R3 AND R4. (VALUES CHANGE WITH
TRANSISTOR RATINGS)

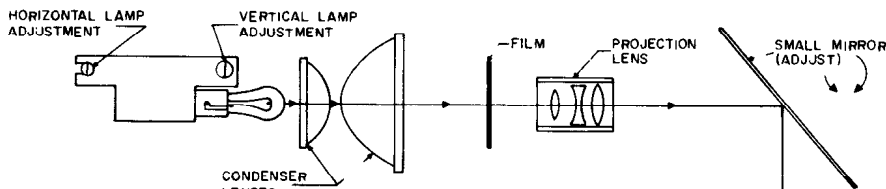
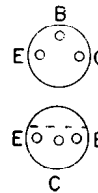
— > — = WIRE NUT CONNECTIONS

TAB ON TOP
OVER PIN 2

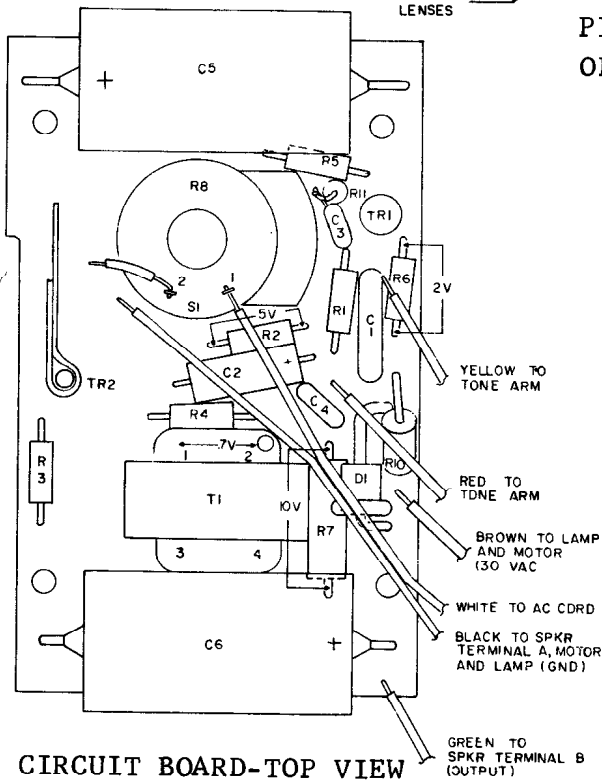


BOTTOM VIEW

TRANSISTOR
MOUNTING



PICTORIAL DIAGRAM-
OPTICAL SYSTEM



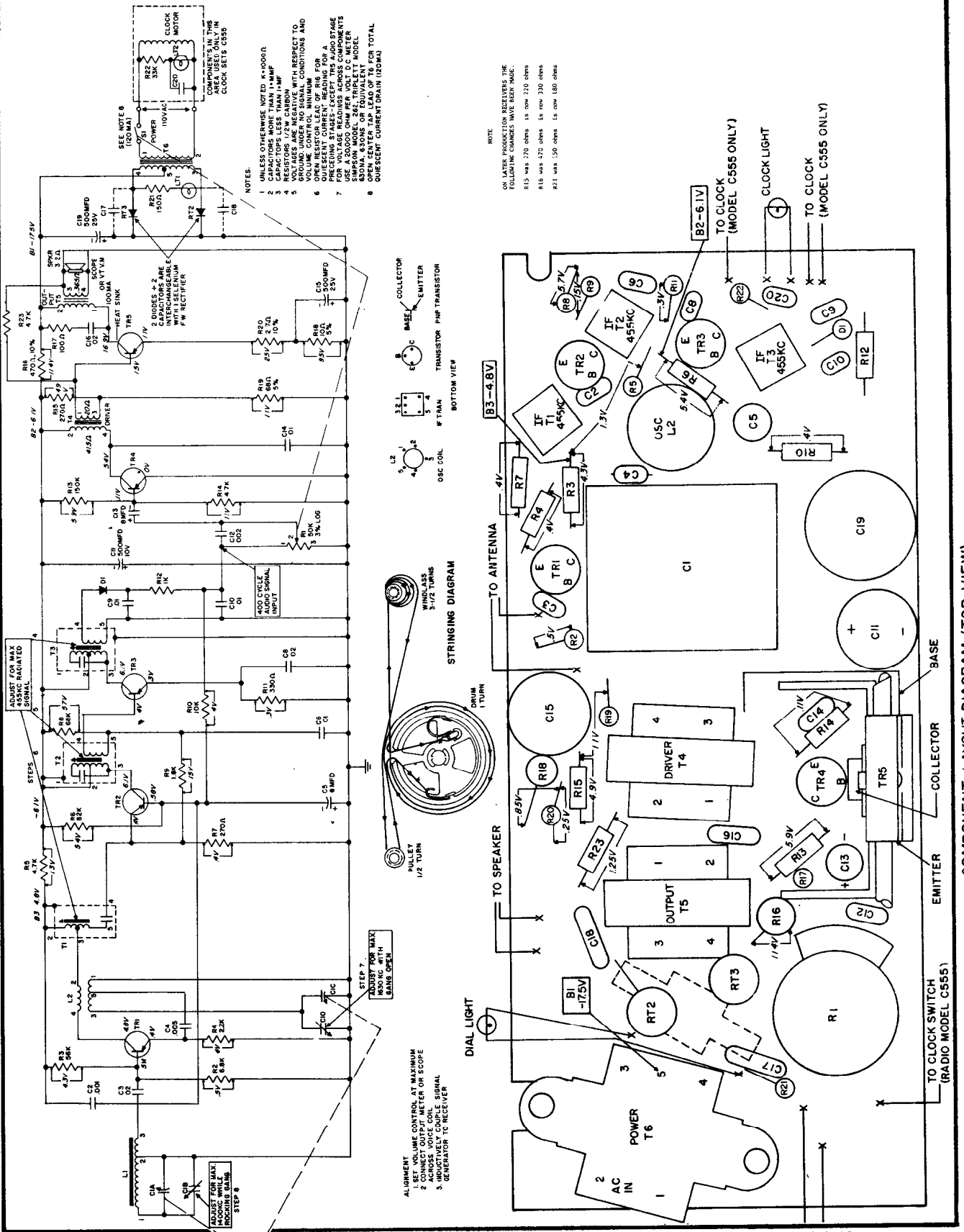
CIRCUIT BOARD-TOP VIEW

* TRANSISTORS

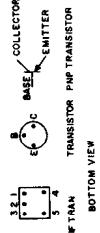
TR1	MAY BE EITHER RS-7501, RS-7502, RS-7503, RS-7504 OR RS-7505			
TR2	MAY BE EITHER	WITH R3 A VALUE OF	AND R4 A VALUE OF	WITH HEATSIK NO
	RS-7601 OR	1K	10K	RS-6683
	RS-7602 OR	1K	12K	RS-6683
	RS-7603 OR	1K	12K	RS-6683
	RS-7604 OR	1K	12K	RS-6683
	RS-7605 OR	1K	12K	RS-6683
	RS-7619 OR	1.5K	12K	
	RS-7620	1.5K	12K	

GENERAL ELECTRIC

Models T295A and C555A



- NOTES:**
- 1 UNLESS OTHERWISE NOTED, K=1000Ω
 - 2 UNLESS OTHERWISE NOTED, M=1000μF
 - 3 CAPACITORS LESS THAN 1μF
 - 4 RESISTORS 1/2W CARBON FILM RESISTORS
 - 5 RESISTORS UNDER 100Ω MUST BE CONDUCTING AND GROUND UNDER NO SIGNAL CONDITIONS
 - 6 VOLUME CONTROL MINIMUM BEARING FOR PRECEDING STAGES-EXCEPT TR5 ADD STAGE TO PRECEDING STAGES
 - 7 USE A GOOD OHM METER VOLTS D.C. METER
 - 8 SIMPSON MODEL 242, TRIPLETT MODEL 100, OR EQUIVALENT
 - 9 OPEN CENTER TAP LEAD OF TR6 FOR TOTAL QUERSCENT CURRENT DRAIN (200mA)

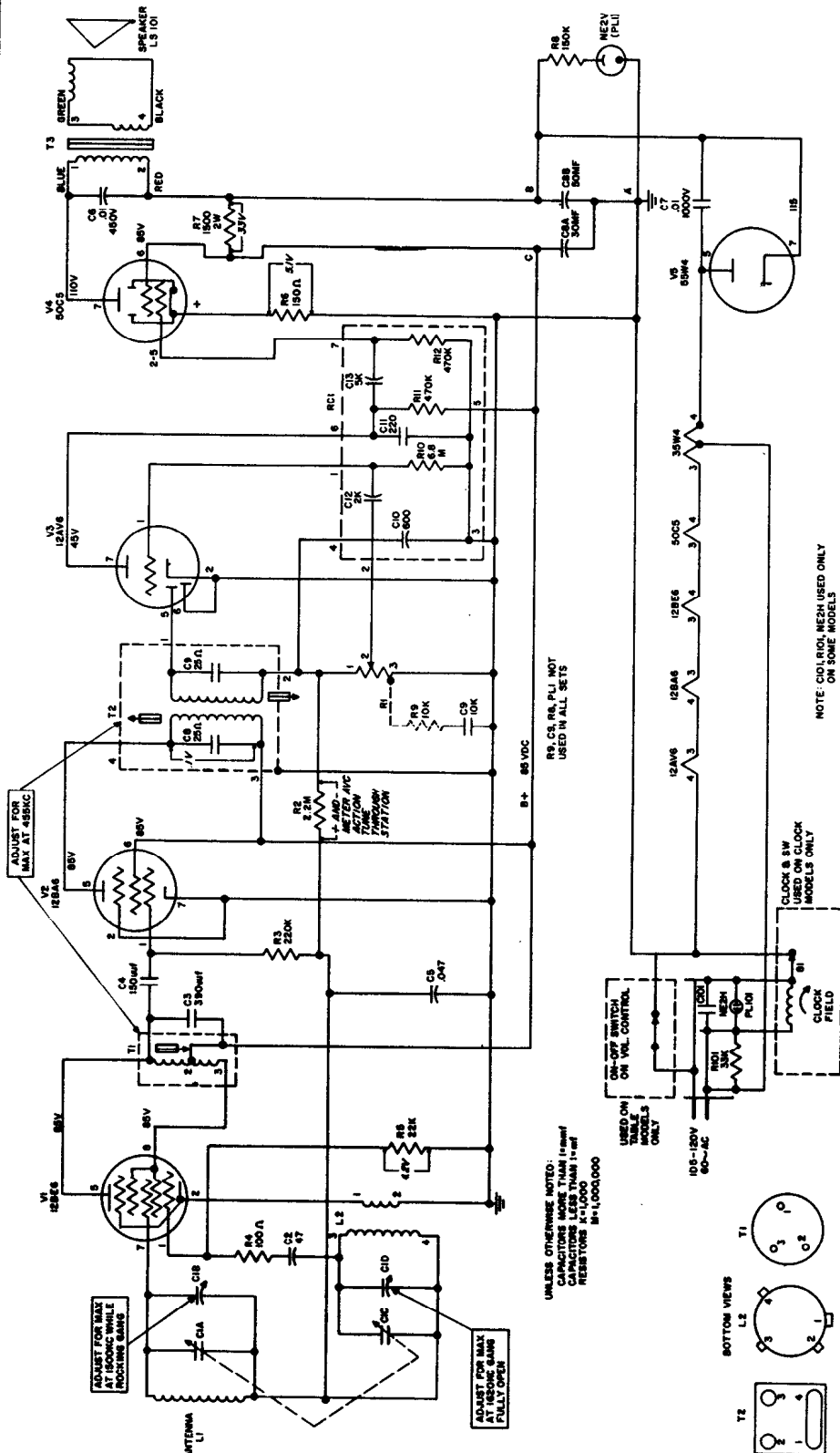


NOTE:
ON LATER PRODUCTION RECEIVERS THE FOLLOWING CHANGES HAVE BEEN MADE:
R13 WAS 270 OHMS IN ROW 210 OHMS
R16 WAS 270 OHMS IN ROW 330 OHMS
R21 WAS 150 OHMS IN ROW 180 OHMS

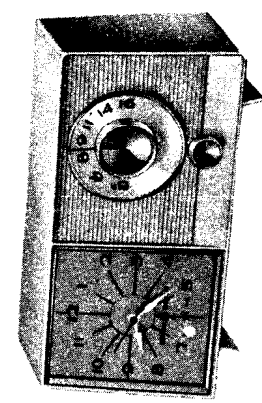
COMPONENT LAYOUT DIAGRAM (TOP VIEW)
RADIO MODEL C555

GENERAL ELECTRIC

Models C403D, C505B, C506B

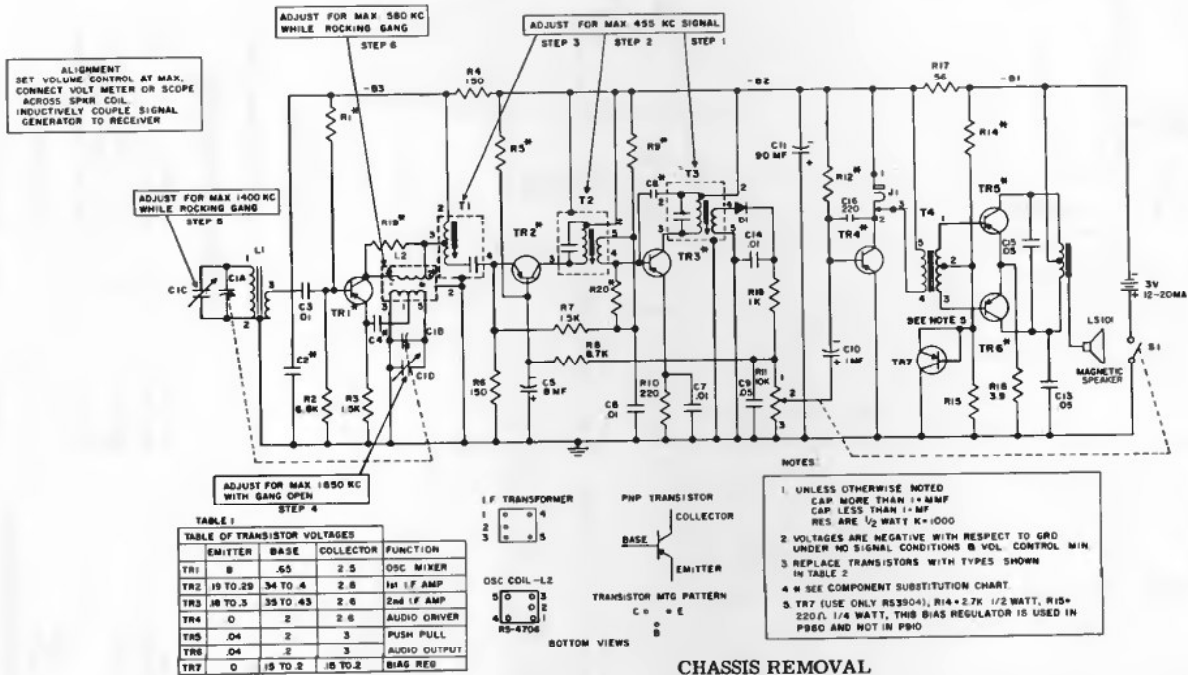


CATALOG NO.	SYMBOL	DESCRIPTION
RS-6440	C1	Tuning Capacitor
RS-1785	C2	47 mmf. cap. N2200
	C3	390 mmf. MICA cap.
	C4	150 mmf. cap.
	C5	.05 mfd. cap.
	C6	.01 mfd. cap. 450V
	C7	.01 mfd. cap. 1000V
RS-2060	C8	75/30 mfd. 150V ELECTROLYTIC
RS-6437	R1	500 K Volume Control
RS-6442	L1	Antenna
RS-6443	L2	Osc. Coil
RS-2149	T1	I.F. Transformer
RS-6439	T2	I.F. Transformer
	T3	Output Transformer
RS-6441	RG1	COUPLATE
RS-6441	RG1	Audio Couplate



GENERAL ELECTRIC

Models P910AA, P911AA, P914AA, P945B, P950A, P960A, P995A, P996A
(For Table 2, Component Substitution Chart, see page 39, at right)



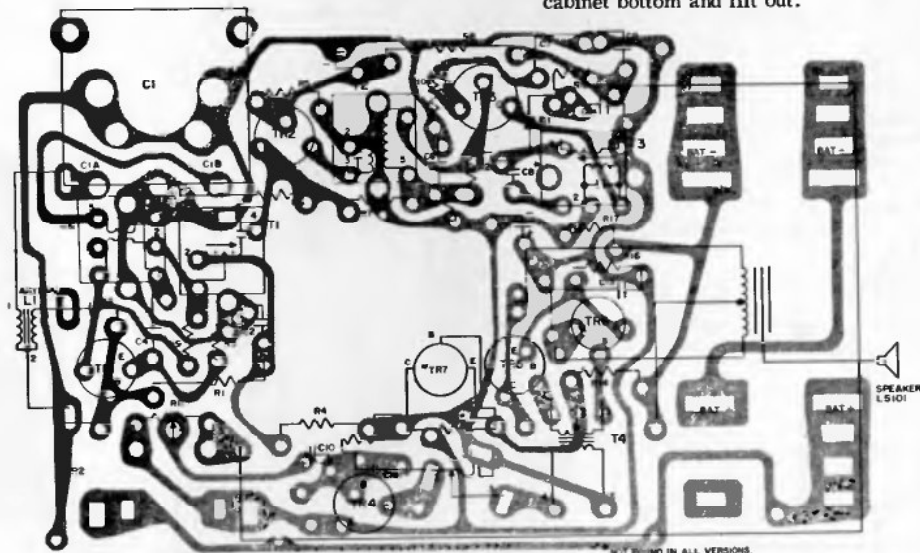
TROUBLESHOOTING

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 quiescent receiver current drain is 12 to 20 mls. This is measured by inserting a milliammeter in series with the batteries.

CHASSIS REMOVAL

- Remove the dial knob screw with a small Phillips screw driver and lift off the dial knob.
- Remove cabinet back by inserting a coin in the slot on the bottom of the set, giving it a slight twist.
- Remove two 1/8" Phillips-head screws located underneath the batteries.
- Remove 1/8" Phillips-head screw located next to the tuning capacitor.
- Slide out the circuit board in the direction of the cabinet bottom and lift out.



VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION



Models P910AA, P911AA, P914AA, P945B, P950A, P960A, P995A, P996A

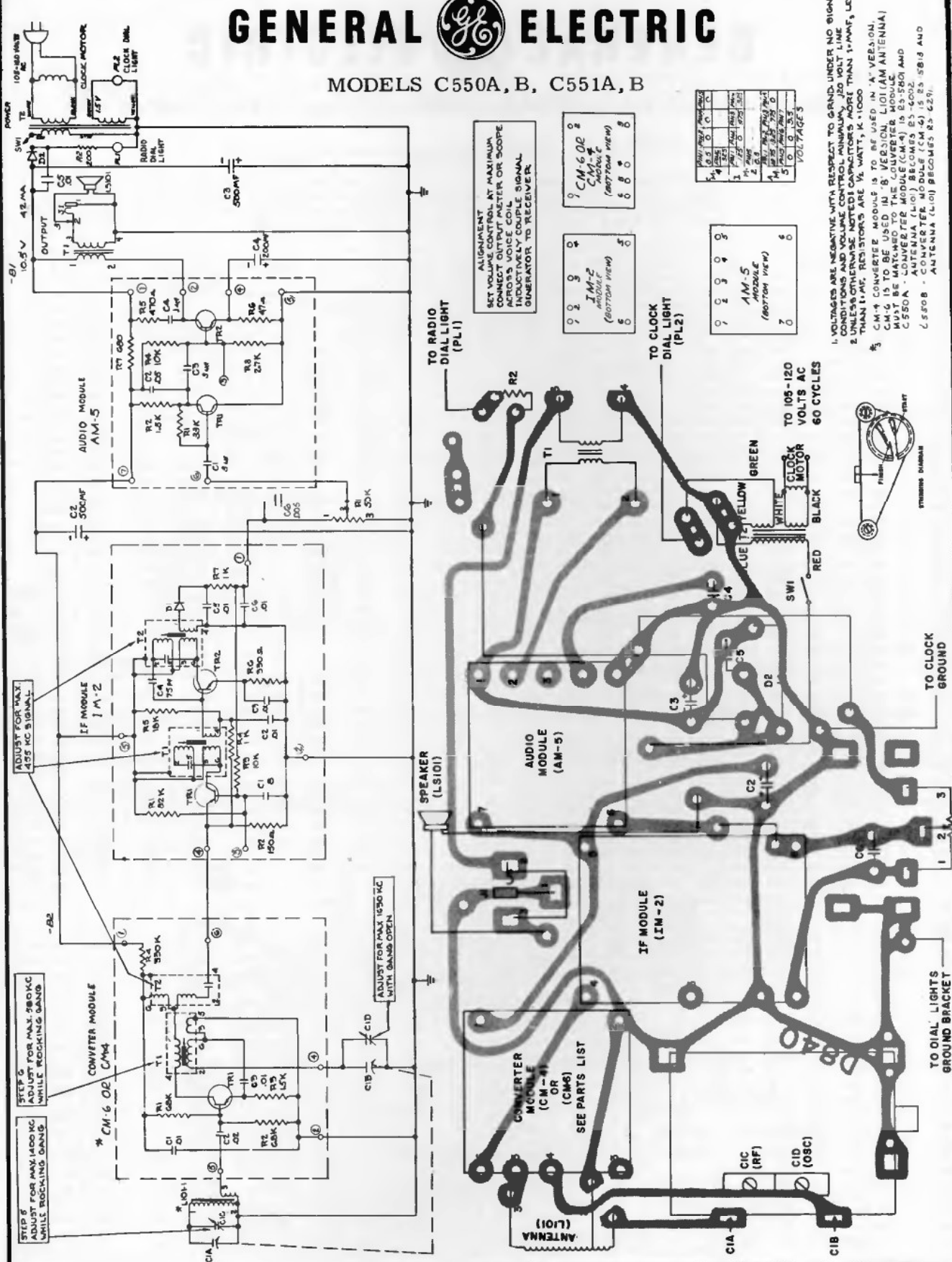
TABLE 2, COMPONENT SUBSTITUTION CHART

The following components may vary in different group versions of this model. Use it to determine the necessary changes required when substituting another component for the original one. When substituting from one group, all items listed as being in the new group must be used.

GROUP	TR1	TR2	TR3	TR4	TR5,6	R1	R5	R8	R9	R12	R14	R15	R19	R20	C2	C4	C8
1	RS-3868	RS-3862	RS-3863	RS-5531	RS-5734	18K	27K	8.2K	12K	100K	2.7K	220	8.2K	3.3K	.005	.005	omit
2	RS-3868	RS-3862	RS-3863	RS-5531	RS-5735	18K	27K	8.2K	12K	100K	2.7K	220	8.2K	3.3K	.005	.005	omit
3	RS-3868	RS-3862	RS-3863	RS-5531	RS-5736	18K	27K	8.2K	12K	100K	2.7K	220	8.2K	3.3K	.005	.005	omit
4	RS-3868	RS-3862	RS-3863	RS-5531	RS-5737	18K	27K	8.2K	12K	100K*	2.7K	220	8.2K	3.3K	.005	.005	omit
5	RS-3868	RS-3862	RS-3863	RS-5532	RS-5734	18K	27K	8.2K	12K	120K	2.7K	220	8.2K	3.3K	.005	.005	omit
6	RS-3868	RS-3862	RS-3863	RS-5532	RS-5735	18K	27K	8.2K	12K	120K	2.7K	220	8.2K	3.3K	.005	.005	omit
7	RS-3868	RS-3862	RS-3863	RS-5532	RS-5736	18K	27K	8.2K	12K	120K	2.7K	220	8.2K	3.3K	.005	.005	omit
8	RS-3868	RS-3862	RS-3863	RS-5532	RS-5737	18K	27K	8.2K	12K	120K	2.7K	220	8.2K	3.3K	.005	.005	omit
9	RS-3868	RS-3862	RS-3863	RS-5533	RS-5731	18K	27K	8.2K	12K	180K	1.8K	150	8.2K	3.3K	.005	.005	omit
10	RS-3868	RS-3862	RS-3863	RS-5533	RS-5732	18K	27K	8.2K	12K	180K	1.8K	150	8.2K	3.3K	.005	.005	omit
11	RS-3868	RS-3862	RS-3863	RS-5533	RS-5733	18K	27K	8.2K	12K	180K	1.8K	150	8.2K	3.3K	.005	.005	omit
12	RS-3868	RS-3862	RS-3863	RS-5533	RS-5734	18K	27K	8.2K	12K	180K	1.8K	150	8.2K	3.3K	.005	.005	omit
13	RS-3868	RS-3862	RS-3863	RS-5533	RS-5735	18K	27K	8.2K	12K	180K	1.8K	150	8.2K	3.3K	.005	.005	omit
14	RS-3868	RS-3862	RS-3863	RS-5533	RS-5736	18K	27K	8.2K	12K	180K	1.8K	150	8.2K	3.3K	.005	.005	omit
15	RS-3868	RS-3862	RS-3863	RS-5533	RS-5737	18K	27K	8.2K	12K	180K	1.8K	150	8.2K	3.3K	.005	.005	omit
16	RS-3868	RS-3862	RS-3863	RS-5534	RS-5731	18K	27K	8.2K	12K	220K	1.8K	150	8.2K	3.3K	.005	.005	omit
17	RS-3868	RS-3862	RS-3863	RS-5534	RS-5732	18K	27K	8.2K	12K	220K	1.8K	150	8.2K	3.3K	.005	.005	omit
18	RS-3868	RS-3862	RS-3863	RS-5534	RS-5733	18K	27K	8.2K	12K	220K	1.8K	150	8.2K	3.3K	.005	.005	omit
19	RS-3868	RS-3862	RS-3863	RS-5535	RS-5731	18K	27K	8.2K	12K	270K	1.8K	150	8.2K	3.3K	.005	.005	omit
20	RS-3868	RS-3862	RS-3863	RS-5535	RS-5732	18K	27K	8.2K	12K	270K	1.8K	150	8.2K	3.3K	.005	.005	omit
21	RS-3868	RS-3862	RS-3863	RS-5535	RS-5733	18K	27K	8.2K	12K	270K	1.8K	150	8.2K	3.3K	.005	.005	omit
22	RS-5107	RS-5206	RS-5312	RS-5531	RS-5734	22K	47K	12K	18K	100K	2.7K	220	omit	omit	.01	.01	RS-3413
23	RS-5107	RS-5206	RS-5312	RS-5531	RS-5735	22K	47K	12K	18K	100K	2.7K	220	omit	omit	.01	.01	RS-3413
24	RS-5107	RS-5206	RS-5312	RS-5531	RS-5736	22K	47K	12K	18K	100K	2.7K	220	omit	omit	.01	.01	RS-3413
25	RS-5107	RS-5206	RS-5312	RS-5531	RS-5737	22K	47K	12K	18K	100K	2.7K	220	omit	omit	.01	.01	RS-3413
26	RS-5107	RS-5206	RS-5312	RS-5532	RS-5734	22K	47K	12K	18K	120K	2.7K	220	omit	omit	.01	.01	RS-3413
27	RS-5107	RS-5206	RS-5312	RS-5532	RS-5735	22K	47K	12K	18K	120K	2.7K	220	omit	omit	.01	.01	RS-3413
28	RS-5107	RS-5206	RS-5312	RS-5532	RS-5736	22K	47K	12K	18K	120K	2.7K	220	omit	omit	.01	.01	RS-3413
29	RS-5107	RS-5206	RS-5312	RS-5532	RS-5737	22K	47K	12K	18K	120K	2.7K	220	omit	omit	.01	.01	RS-3413
30	RS-5107	RS-5206	RS-5312	RS-5533	RS-5731	22K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.01	RS-3413
31	RS-5107	RS-5206	RS-5312	RS-5533	RS-5732	22K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.01	RS-3413
32	RS-5107	RS-5206	RS-5312	RS-5533	RS-5733	22K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.01	RS-3413
33	RS-5107	RS-5206	RS-5312	RS-5533	RS-5734	22K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.01	RS-3413
34	RS-5107	RS-5206	RS-5312	RS-5533	RS-5735	22K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.01	RS-3413
35	RS-5107	RS-5206	RS-5312	RS-5533	RS-5736	22K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.01	RS-3413
36	RS-5107	RS-5206	RS-5312	RS-5533	RS-5737	22K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.01	RS-3413
37	RS-5107	RS-5206	RS-5312	RS-5534	RS-5731	22K	47K	12K	18K	220K	1.8K	150	omit	omit	.01	.01	RS-3413
38	RS-5107	RS-5206	RS-5312	RS-5534	RS-5732	22K	47K	12K	18K	220K	1.8K	150	omit	omit	.01	.01	RS-3413
39	RS-5107	RS-5206	RS-5312	RS-5534	RS-5733	22K	47K	12K	18K	220K	1.8K	150	omit	omit	.01	.01	RS-3413
40	RS-5107	RS-5206	RS-5312	RS-5535	RS-5731	22K	47K	12K	18K	270K	1.8K	150	omit	omit	.01	.01	RS-3413
41	RS-5107	RS-5206	RS-5312	RS-5535	RS-5732	22K	47K	12K	18K	270K	1.8K	150	omit	omit	.01	.01	RS-3413
42	RS-5107	RS-5206	RS-5312	RS-5535	RS-5733	22K	47K	12K	18K	270K	1.8K	150	omit	omit	.01	.01	RS-3413
43																	
44																	
45	RS-5109	RS-5206	RS-5312	RS-5535	RS-5733	18K	47K	12K	18K	270K	1.8K	220	omit	omit	.01	.005	RS-3413
46	RS-5109	RS-5206	RS-5312	RS-5531	RS-5734	18K	47K	12K	18K	100K	2.7K	220	omit	omit	.01	.005	RS-3413
47	RS-5109	RS-5206	RS-5312	RS-5531	RS-5735	18K	47K	12K	18K	100K	2.7K	220	omit	omit	.01	.005	RS-3413
48	RS-5109	RS-5206	RS-5312	RS-5531	RS-5736	18K	47K	12K	18K	100K	2.7K	220	omit	omit	.01	.005	RS-3413
49	RS-5109	RS-5206	RS-5312	RS-5531	RS-5737	18K	47K	12K	18K	100K	2.7K	220	omit	omit	.01	.005	RS-3413
50	RS-5109	RS-5206	RS-5312	RS-5532	RS-5734	18K	47K	12K	18K	120K	2.7K	220	omit	omit	.01	.005	RS-3413
51	RS-5109	RS-5206	RS-5312	RS-5532	RS-5735	18K	47K	12K	18K	120K	2.7K	220	omit	omit	.01	.005	RS-3413
52	RS-5109	RS-5206	RS-5312	RS-5532	RS-5736	18K	47K	12K	18K	120K	2.7K	220	omit	omit	.01	.005	RS-3413
53	RS-5109	RS-5206	RS-5312	RS-5532	RS-5737	18K	47K	12K	18K	120K	2.7K	220	omit	omit	.01	.005	RS-3413
54	RS-5109	RS-5206	RS-5312	RS-5533	RS-5731	18K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.005	RS-3413
55	RS-5109	RS-5206	RS-5312	RS-5533	RS-5732	18K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.005	RS-3413
56	RS-5109	RS-5206	RS-5312	RS-5533	RS-5733	18K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.005	RS-3413
57	RS-5109	RS-5206	RS-5312	RS-5533	RS-5734	18K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.005	RS-3413
58	RS-5109	RS-5206	RS-5312	RS-5533	RS-5735	18K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.005	RS-3413
59	RS-5109	RS-5206	RS-5312	RS-5533	RS-5736	18K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.005	RS-3413
60	RS-5109	RS-5206	RS-5312	RS-5533	RS-5737	18K	47K	12K	18K	180K	1.8K	150	omit	omit	.01	.005	RS-3413
61	RS-5109	RS-5206	RS-5312	RS-5534	RS-5731	18K	47K	12K	18K	220K	1.8K	150	omit	omit	.01	.005	RS-3413
62	RS-5109	RS-5206	RS-5312	RS-5534	RS-5732	18K	47K	12K	18K	220K	1.8K	150	omit	omit	.01	.005	RS-3413
63	RS-5109	RS-5206	RS-5312	RS-5534	RS-5733	18K	47K	12K	18K	220K	1.8K	150	omit	omit	.01	.005	RS-3413
64	RS-5109	RS-5206	RS-5312	RS-5535	RS-5731	18K	47K	12K	18K	270K	1.8K	150	omit	omit	.01	.005	RS-3413
65	RS-5109	RS-5206	RS-5312	RS-5535	RS-5732	18K	47K	12K	18K	270K	1.8K	150	omit	omit	.01	.005	RS-3413
66	RS-5109	RS-5206	RS-5312	RS-5535	RS-5733	18K	47K	12K	18K	270K	1.8K	150	omit	omit	.01	.005	RS-3413

GENERAL ELECTRIC

MODELS C550A, B, C551A, B



UNIT	RESISTANCE	VOLTAGE
1	0.5	0
2	0.5	0
3	0.5	0
4	0.5	0
5	0.5	0
6	0.5	0
7	0.5	0

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

CM-6 OR CM-4
TOP VIEW
1 2 3 4 5 6

IM-2
BOTTOM VIEW
1 2 3 4 5 6

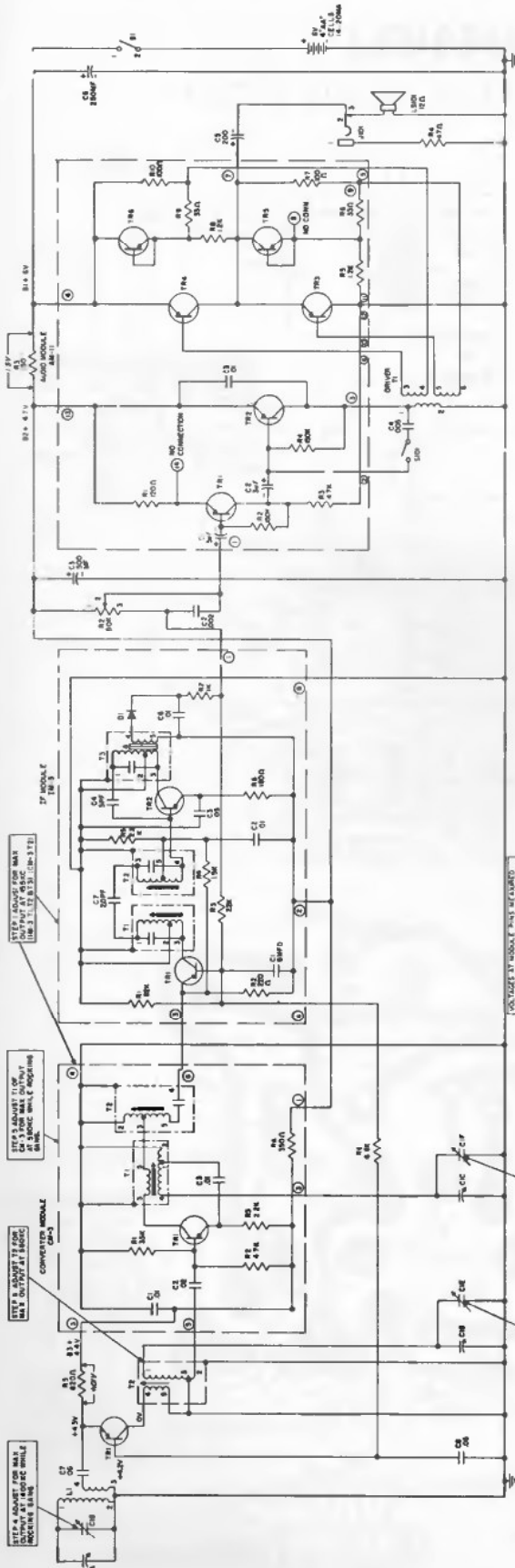
AM-5
BOTTOM VIEW
1 2 3 4 5 6

1. VOLTAGES ARE NEGATIVE WITH RESPECT TO GROUND UNDER NO SIGNAL CONDITIONS AND VOLUME CONTROL MINIMUM.
2. UNLESS OTHERWISE NOTED, ALL RESISTORS ARE 1/4 WATT, 5% TOL, LEAD 1000.
3. CM-4 CONVERTER MODULE IS TO BE USED IN "A" VERSION.
4. RESISTORS IN "B" VERSION L101 (AM ANTENNA).
5. CM-5 IS TO BE WIRING TO THE CONVERTER MODULE.
6. C550A - CONVERTER MODULE (CM-4) IS 25-5801 AND ANTENNA (L101) BECOMES 25-6002.
7. C551A - CONVERTER MODULE (CM-4) IS 25-5811 AND ANTENNA (L101) BECOMES 25-6281.

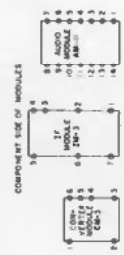


GENERAL ELECTRIC

MODEL P920A



NOTES:
 1. UNLESS OTHERWISE NOTED, ALL CAPACITORS ARE .05 MFD 50V.
 2. VOLTAGES ARE POSITIVE WITH RESPECT TO COMMON UNLESS OTHERWISE NOTED.
 3. DIMENSIONED UNLESS OTHERWISE NOTED.
 4. PARTS LISTED IN THIS LIST ARE TYPICAL AND NOT NECESSARILY THE TYPE OF COMPONENT USED.



VOLTAGES IN MODULES WITH BATTERY IN CONTACT TO GROUND

PIN	TEST 1	PIN 8	TEST 2
1	1.2	1.0	1.0
2	0.7	0.6	0.5
3	0.3	0.2	0.2
4	0.3	0.2	0.2
5	0.3	0.2	0.2
6	0.3	0.2	0.2
7	0.3	0.2	0.2
8	0.3	0.2	0.2
9	0.3	0.2	0.2
10	0.3	0.2	0.2
11	0.3	0.2	0.2
12	0.3	0.2	0.2
13	0.3	0.2	0.2
14	0.3	0.2	0.2

STEP A ADJUST TUNING COIL FOR MAXIMUM AUDIO OUTPUT

STEP B ADJUST TUNING COIL FOR MAXIMUM AUDIO OUTPUT

STEP C ADJUST TUNING COIL FOR MAXIMUM AUDIO OUTPUT

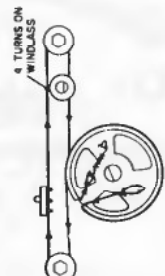
STEP D ADJUST TUNING COIL FOR MAXIMUM AUDIO OUTPUT

STEP E ADJUST TUNING COIL FOR MAXIMUM AUDIO OUTPUT

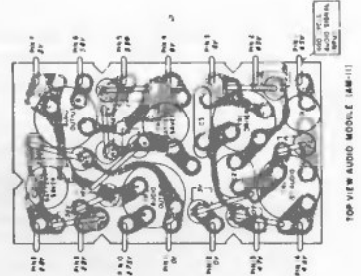
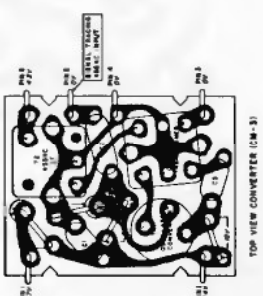
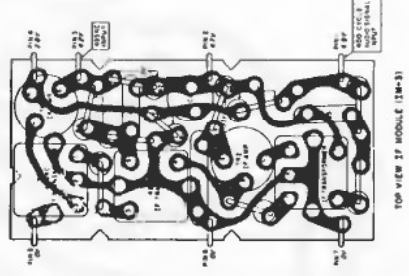
STEP F ADJUST TUNING COIL FOR MAXIMUM AUDIO OUTPUT

STEP G ADJUST TUNING COIL FOR MAXIMUM AUDIO OUTPUT

STEP H ADJUST TUNING COIL FOR MAXIMUM AUDIO OUTPUT

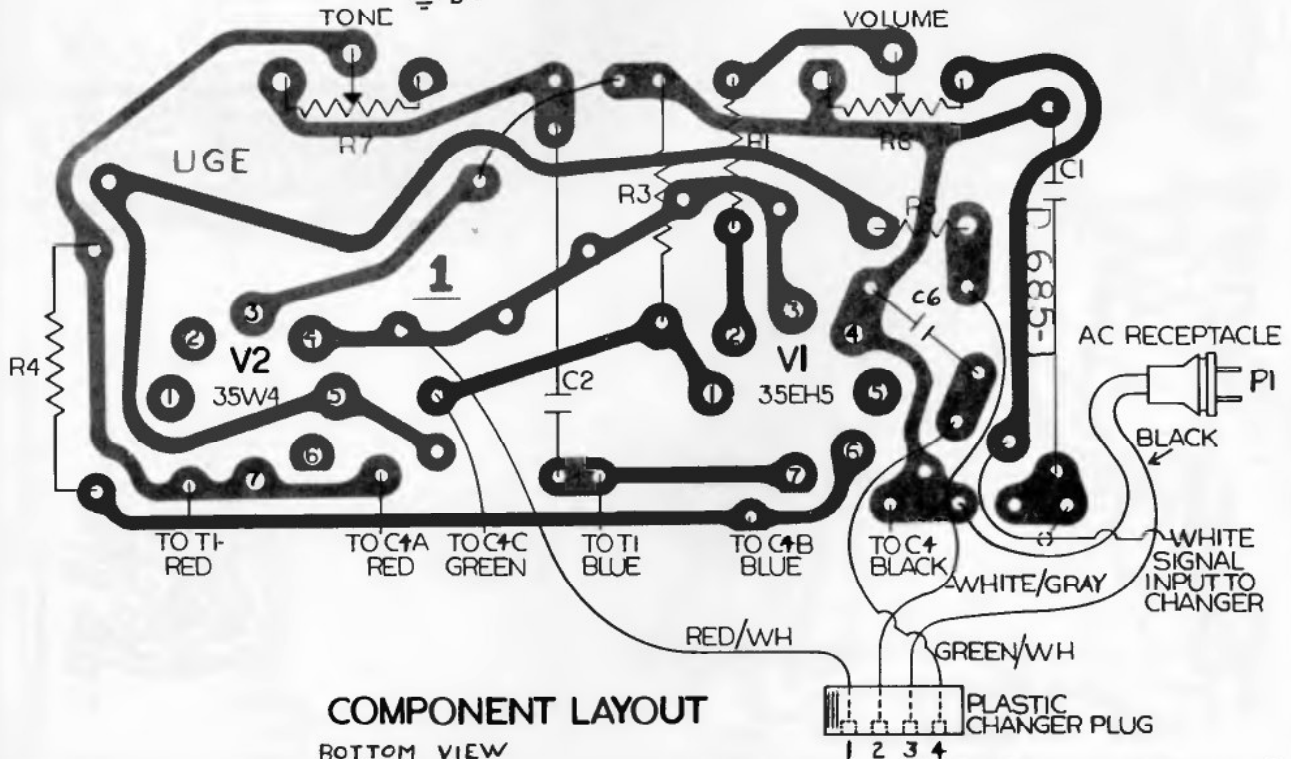
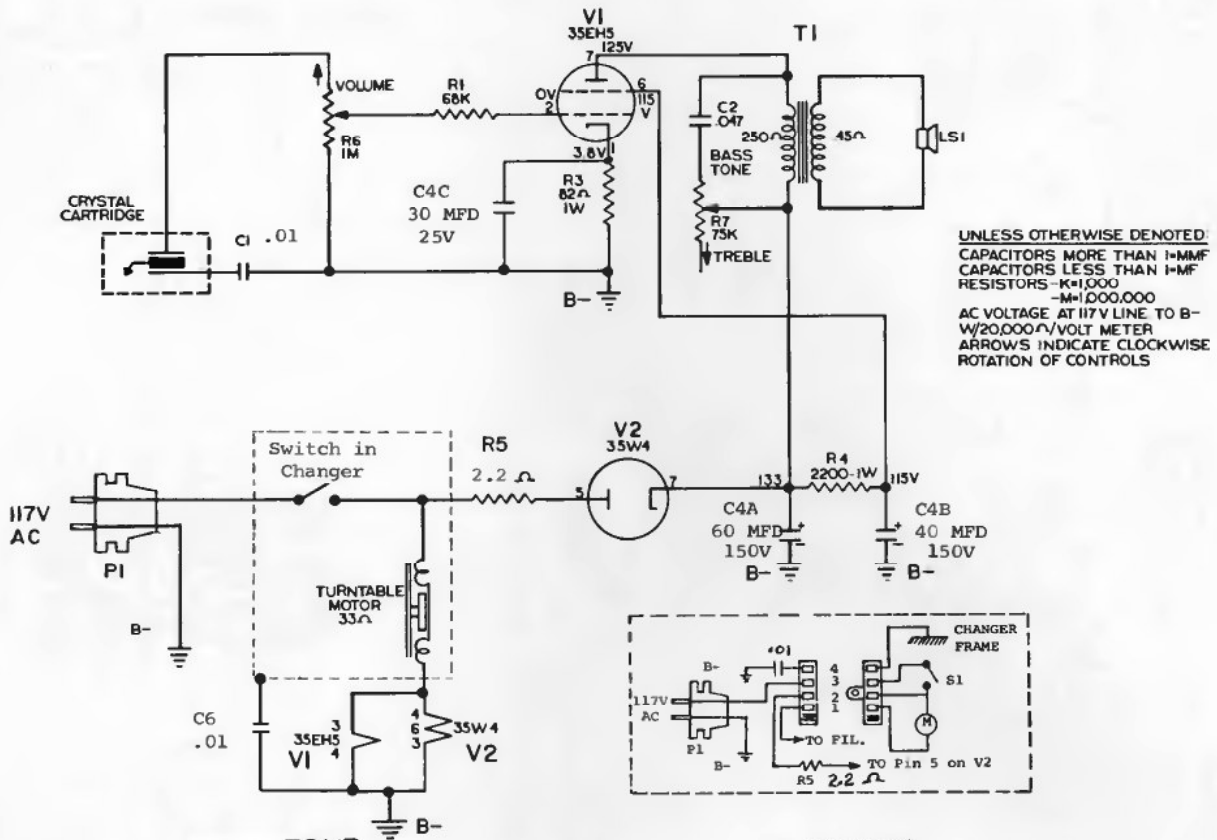


STRINGING DIAGRAM



GENERAL ELECTRIC

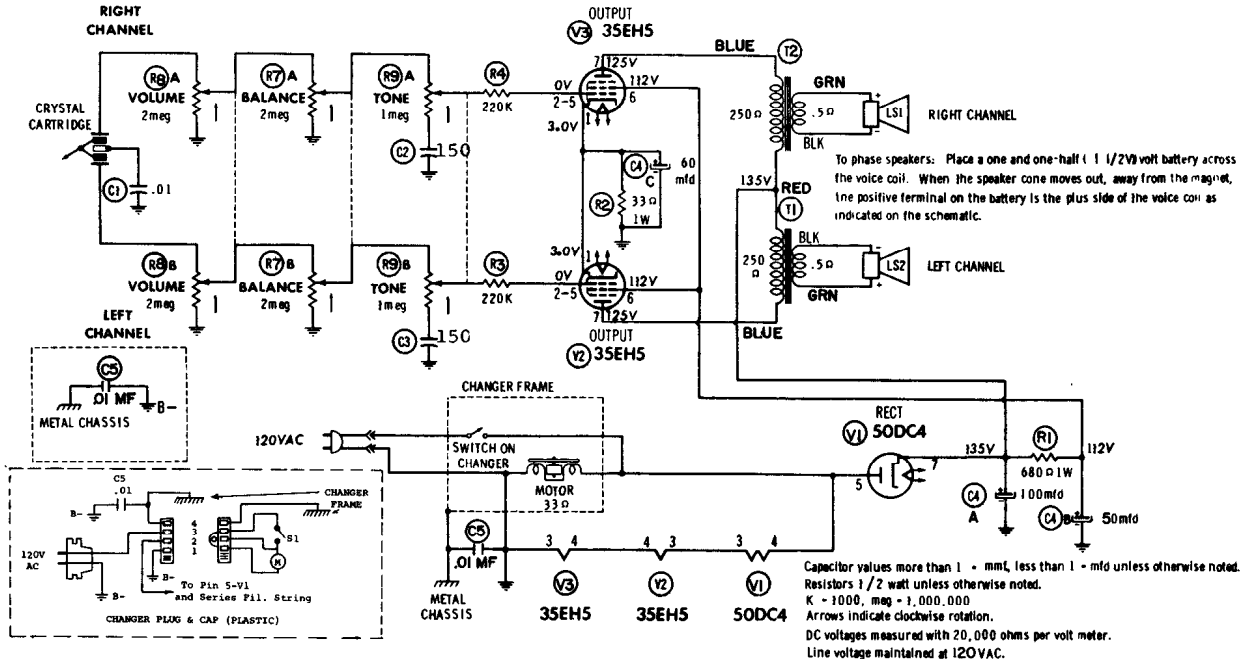
Models RP2020A, -B, RP2021, RP2100, RP2101, RP2108



COMPONENT LAYOUT
BOTTOM VIEW

GENERAL ELECTRIC

Models RP2040A, RP2041A, RP2140, RP2142, RP2143



TO REMOVE RECORD CHANGER

1. Open record changer compartment and place record changer into playing position.
2. Remove two (2) screws from the back cover and remove back cover.
3. Place the shipping screw clips to a vertical position.
4. Lift the record changer and tilt upwards until the plastic power plug and signal plugs are accessible. Remove plugs from record changer.
5. Remove record changer from compartment.

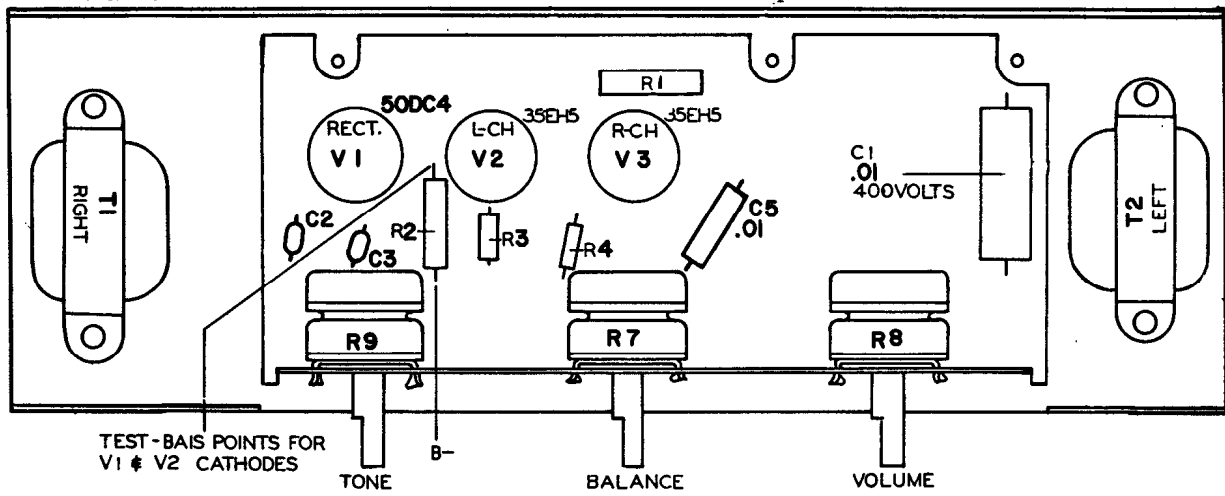
TO REMOVE AMPLIFIER

1. Follow Steps 1 through 4 as described under "TO REMOVE RECORD CHANGER".
2. Remove knobs from control panel.
3. Free all wires from the metal lead dresser tabs.
4. Slide the AC power receptacle from the bracket.

5. Remove tape and wire nuts connecting the speaker leads. Be sure to label speaker leads to assure proper phasing when re-assembling.
6. Remove screw holding electrolytic.
7. Remove all tubes from amplifier.
8. Remove nuts holding amplifier to cabinet and remove amplifier.

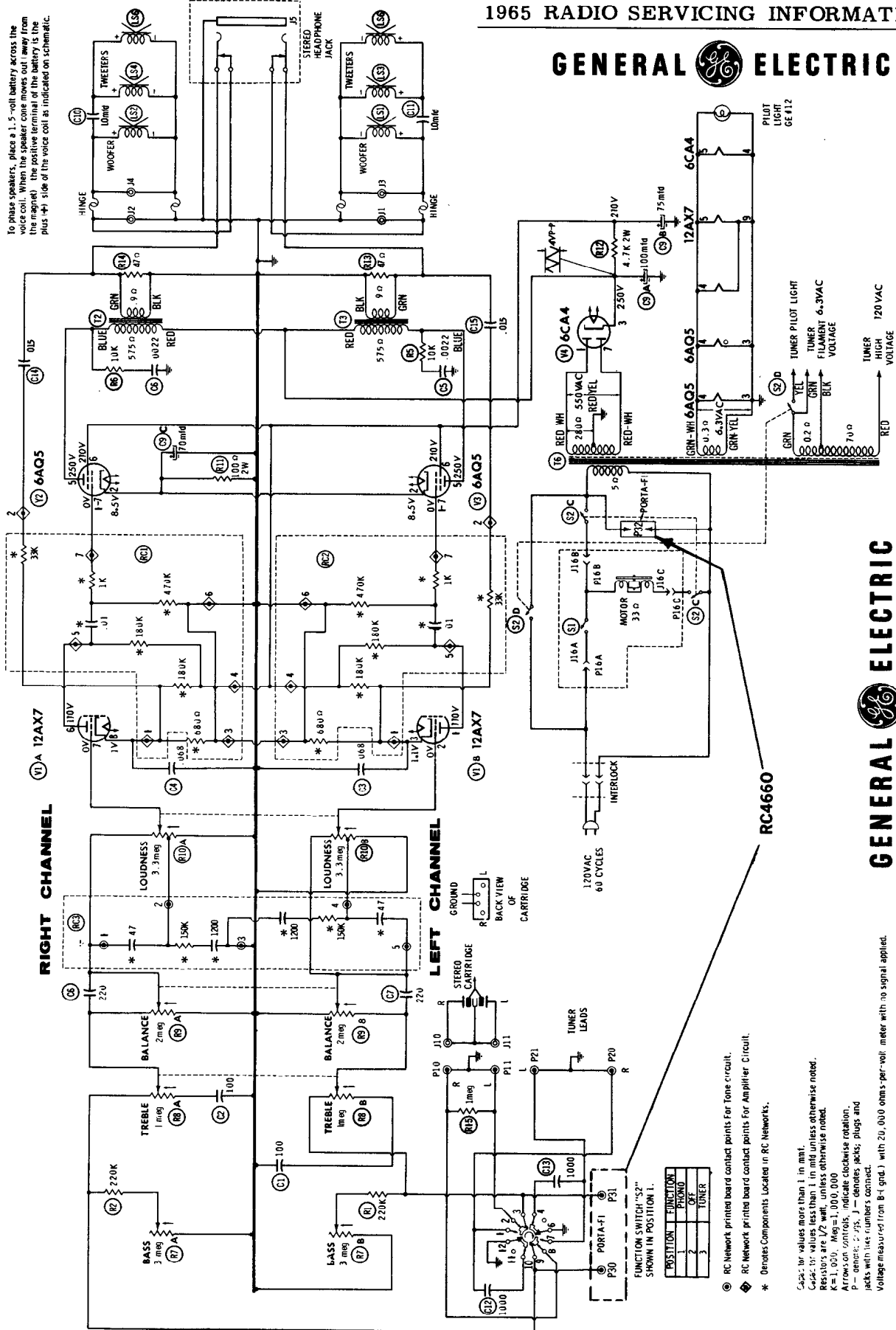
TO REMOVE SPEAKER

1. Unclasp speaker wing clamp and swing out speaker enclosure.
2. Lift wing enclosure off hinges and place grille front on a soft cloth.
3. Remove six (6) screws from speaker enclosure back and remove back.
4. Unsolder and label speaker leads to assure proper phasing when reassembling.
5. Remove nuts holding speaker to grille and remove speaker.



GENERAL ELECTRIC

To phase speakers, place a 1.5-volt battery across the voice coil. When the speaker cone moves out away from the magnet, the positive terminal of the battery is the plus (+) side of the voice coil as indicated on schematic.



GENERAL ELECTRIC

Models RC4640A, RC4641, RC4642, RC4650A, B, RC4651, RC4652, RC4660, RC4661, RC4662

- ⊙ RC Network printed board contact points for Tone circuit.
 - ◆ RC Network printed board contact points for Amplifier Circuit.
 - * Denotes Components Located in RC Networks.
- Cap: for values more than 1 in. mnt.
 Cap: for values less than 1 in. mnt unless otherwise noted.
 Resistor's are 1/2 watt, unless otherwise noted.
 K=1,000, Meg=1,000,000
 Arrows on controls, indicate clockwise rotation.
 P - denotes: 5/16, J - denotes: jacks; plugs and jacks with hex numbers connect.
 Voltage measured from B (-) to GND (+) with 20,000 ohms-per-volt meter with no signal applied.

FUNCTION SWITCH "S2" SHOWN IN POSITION 1.

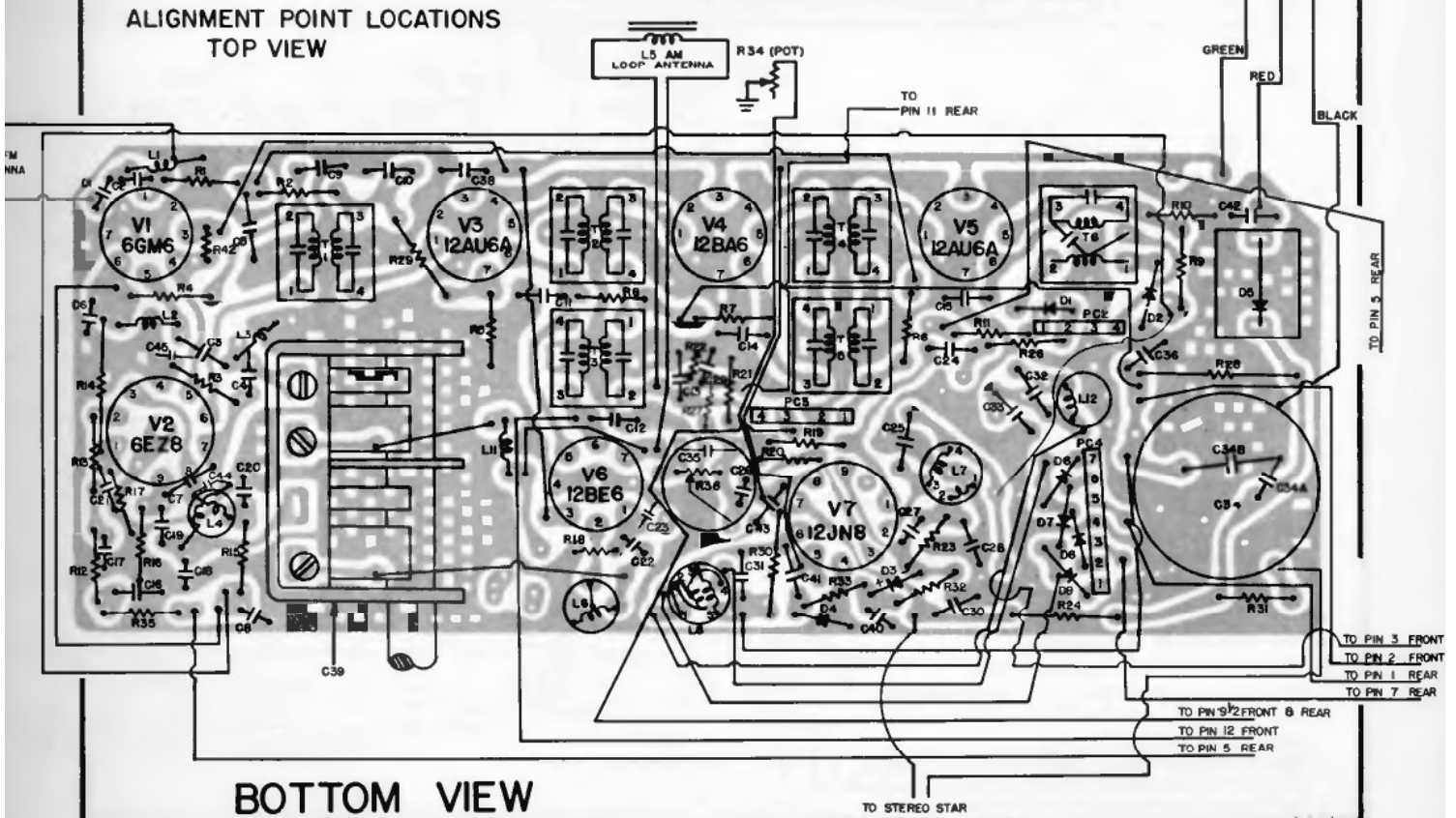
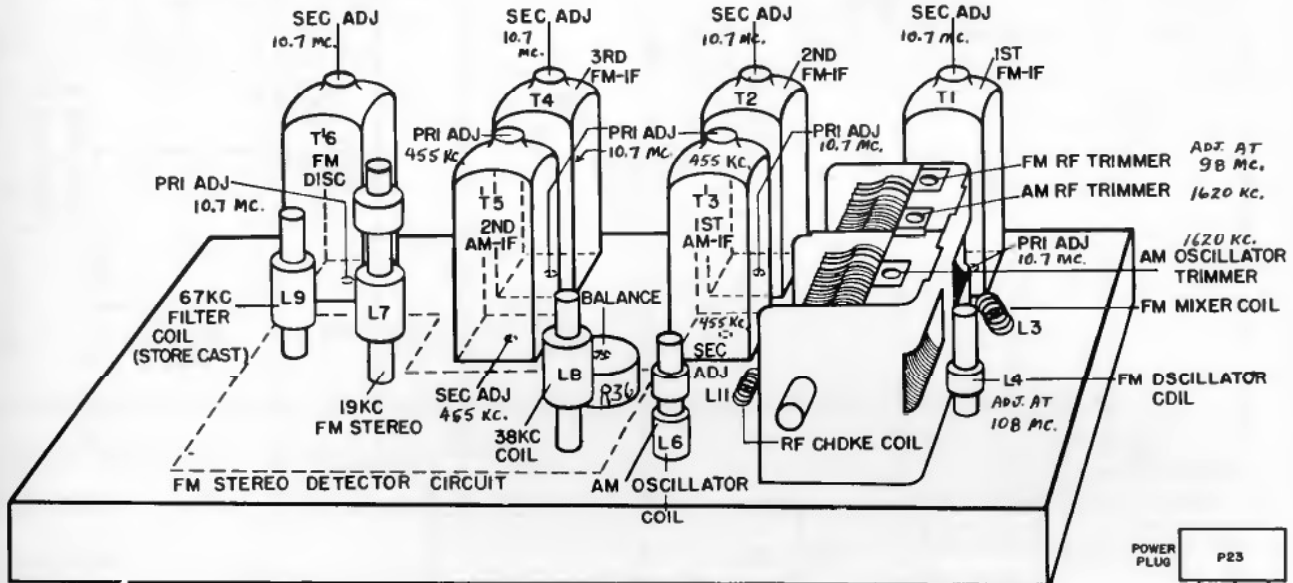
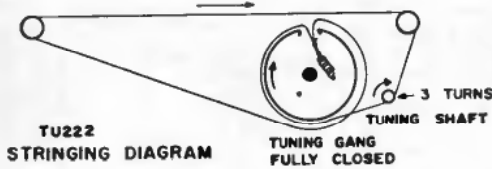
POSITION	FUNCTION
1	PHONO
2	OFF
3	TUNER

GENERAL ELECTRIC

(Continued on pages 46-47)

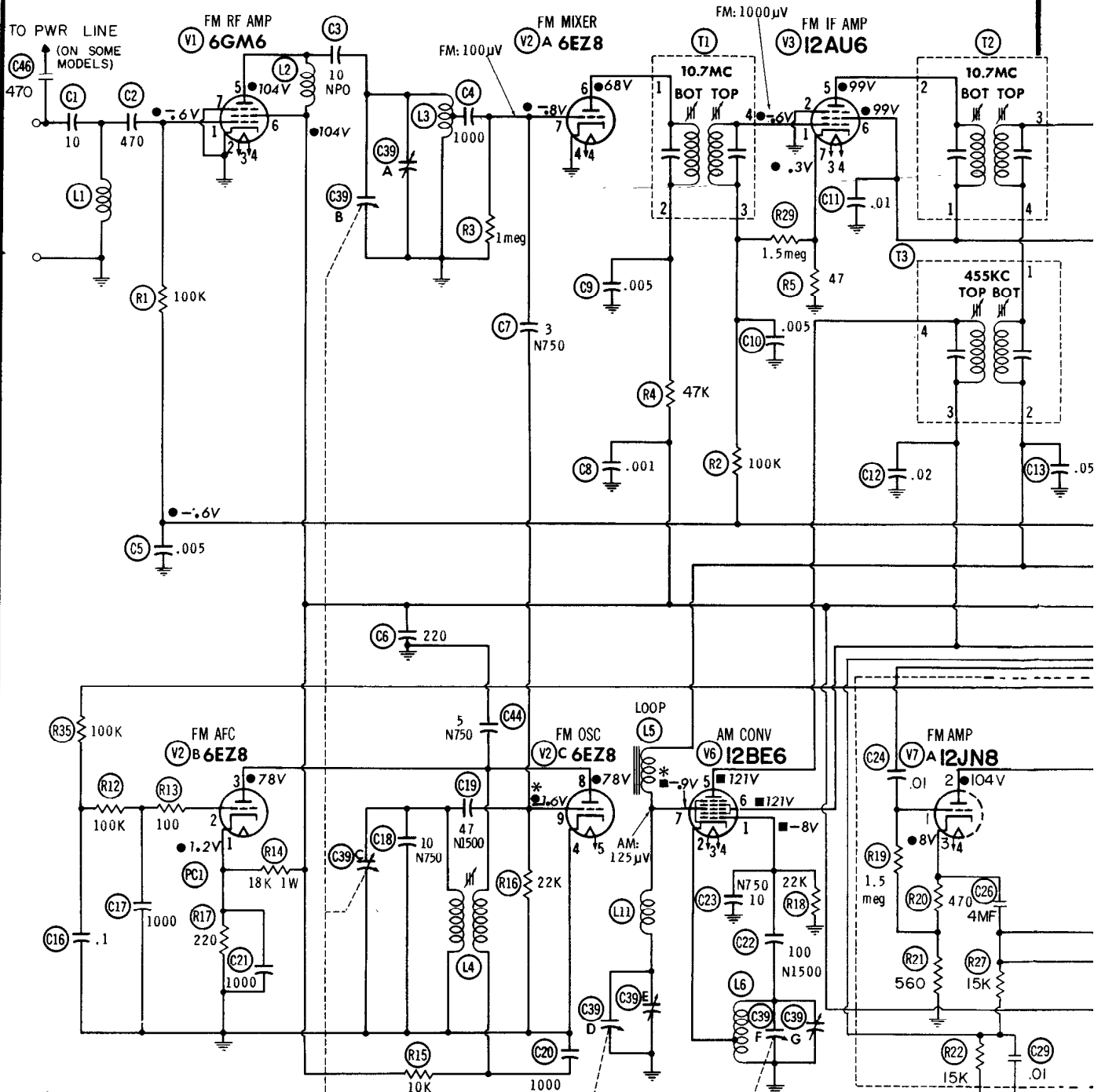
TU222 AM-FM FM STEREO TUNERS

- TU222-1
- TU222-2
- TU222-3
- TU222-5
- TU222-8
- TU222-9
- TU222-10
- TU222-11
- TU222-12



VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

GENERAL ELECTRIC TU222 AM-FM Tuner Diagram



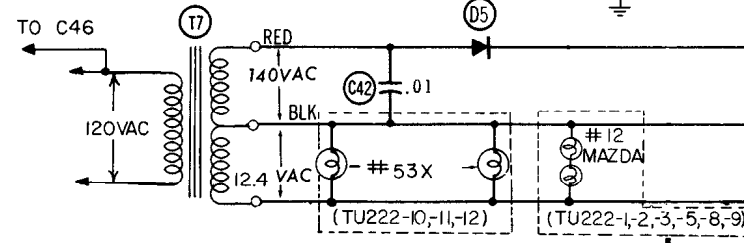
K=1,000, Meg=1,000,000
 All DC voltages measured with respect to ground using a VTVM.
 Line voltage maintained at 120 VAC.

- Taken in FM position, no signal applied.
- Taken in AM position, no signal applied.
- * Measured with 470KΩ resistor in series with DC probe of VTVM.

FM-IF sensitivities are μV inputs for -1VDC on limiter grid.
 AM-IF sensitivities are μV input (30% mod., 400 cps) for 100mv output.

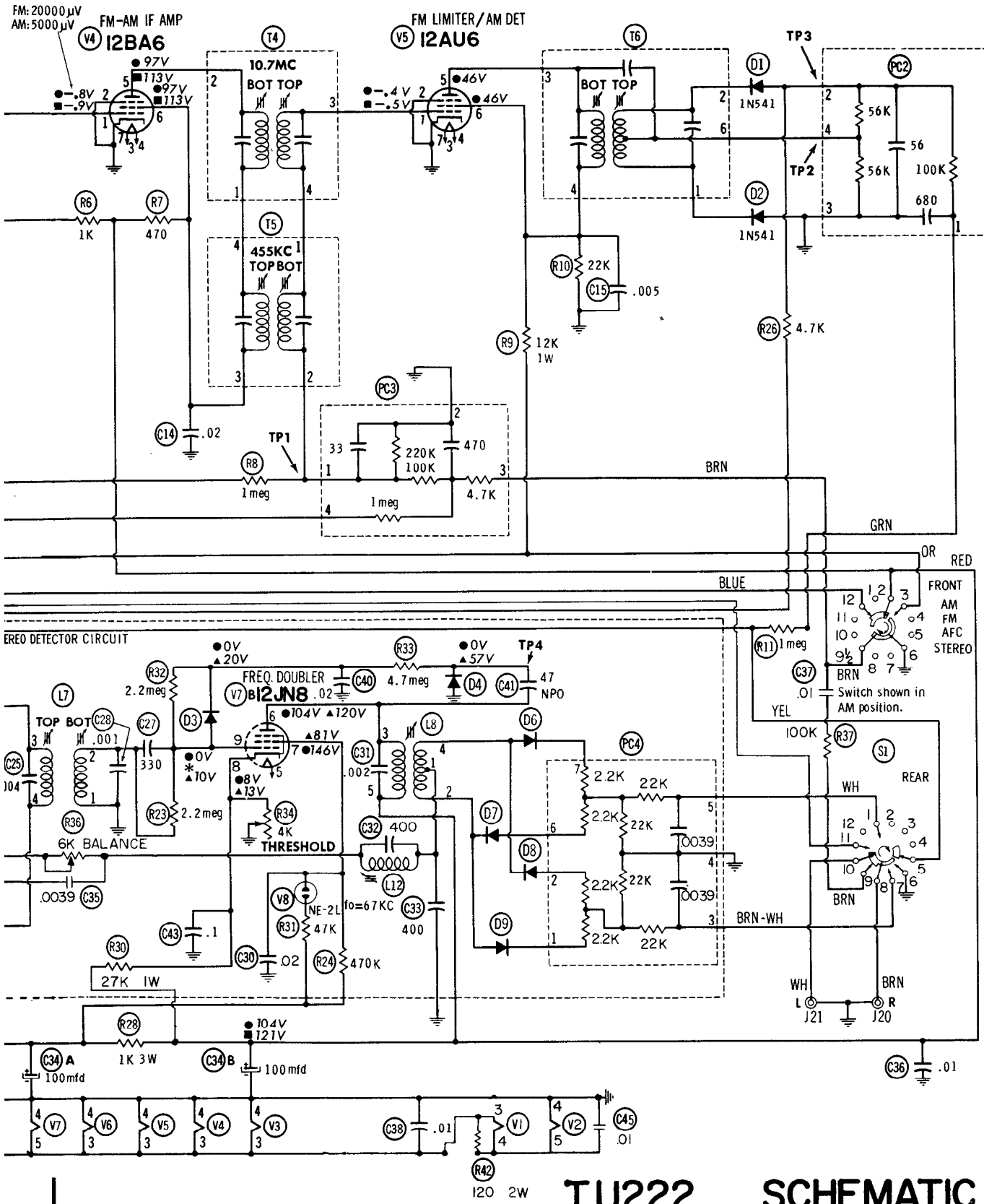
Capacitor values more than 1 in mfd.
 Capacitor values less than 1 in mfd, unless otherwise noted.
 Resistors are 10%, 1/2 watt, unless otherwise noted.

▲ Approximate value when receiving FM Stereo station.



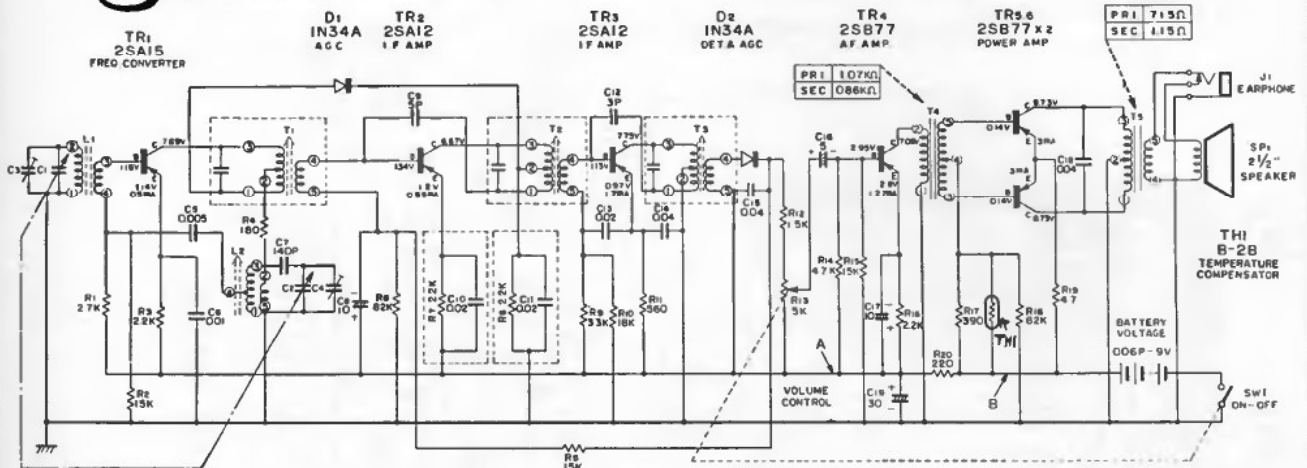
VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

GENERAL ELECTRIC TU222 AM-FM Tuners, Continued



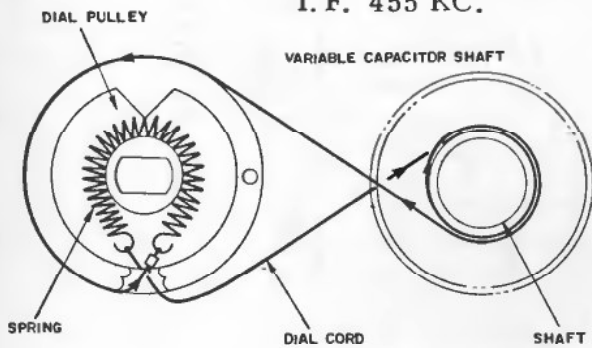
Hitachi, Ltd.

MODEL TH-600

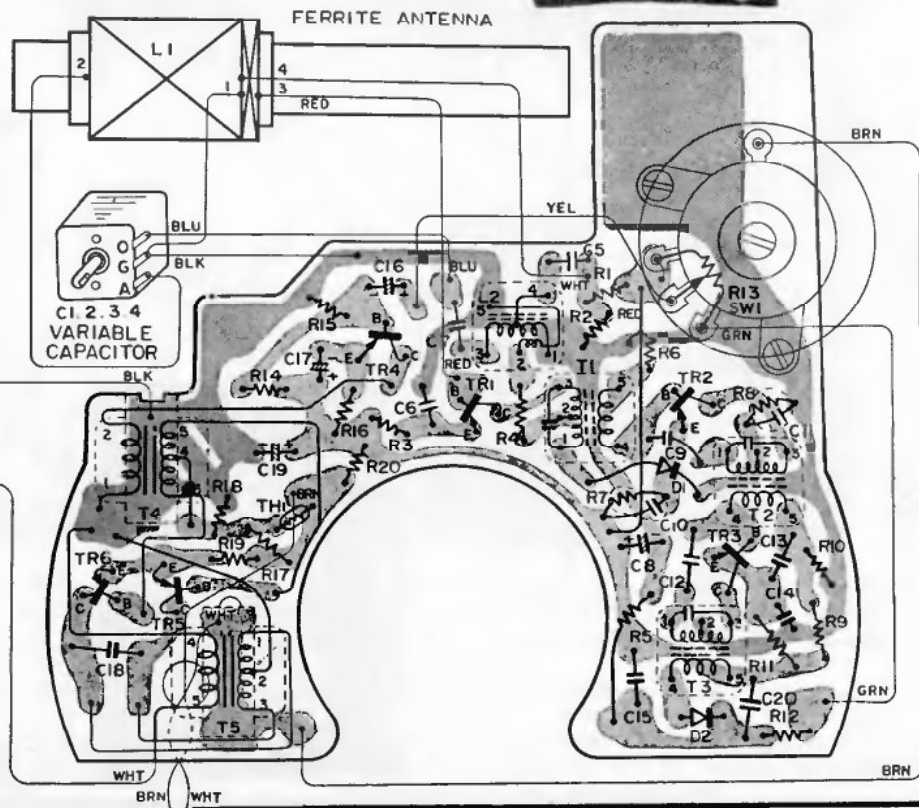
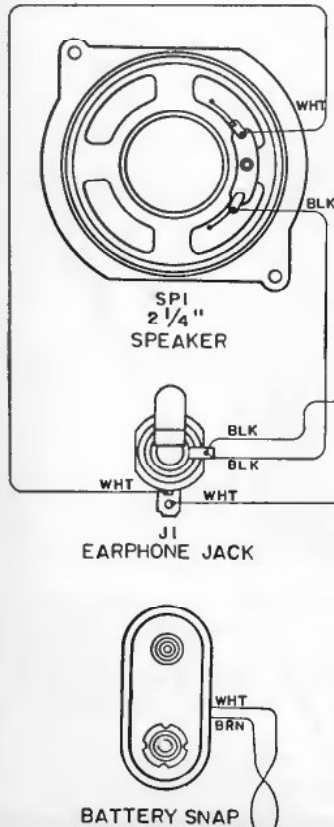


I. F. 455 KC.

The printed circuit board may be removed after removing the back cover and two mounting screws of the printed circuit board shown in Fig.



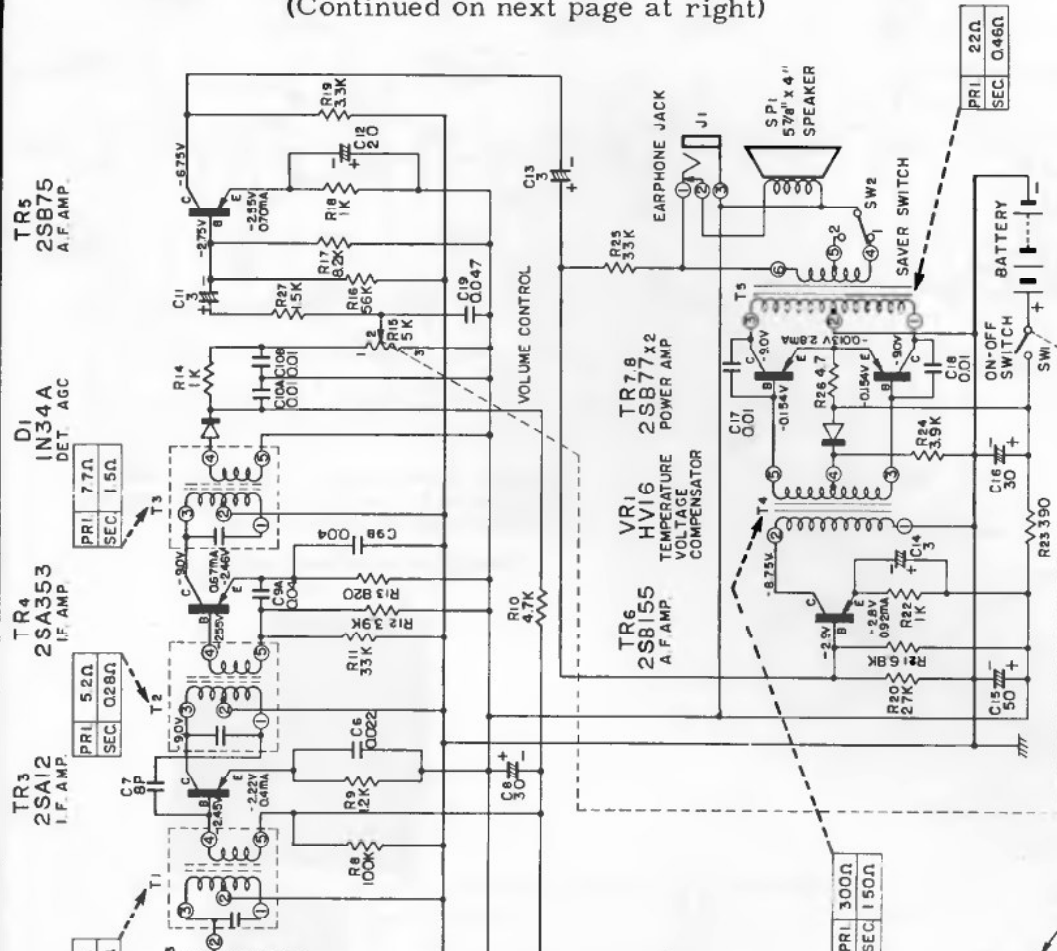
PRINTED CIRCUIT BOARD HOLDING SCREWS



Hitachi, Ltd.

MODEL TH-812

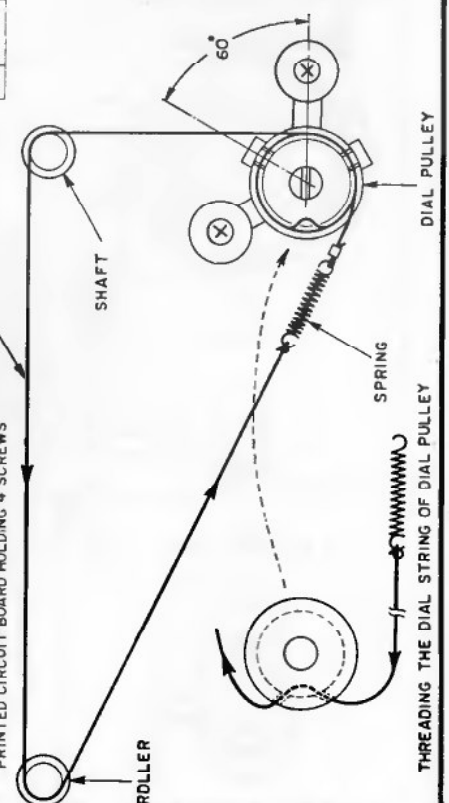
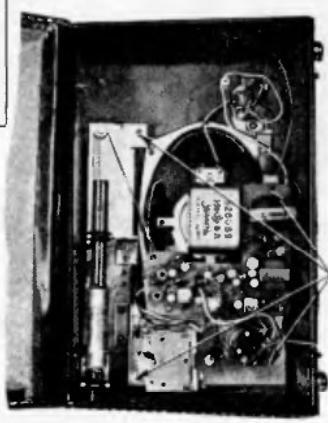
(Continued on next page at right)



CIRCUIT DIAGRAM (TH-812)

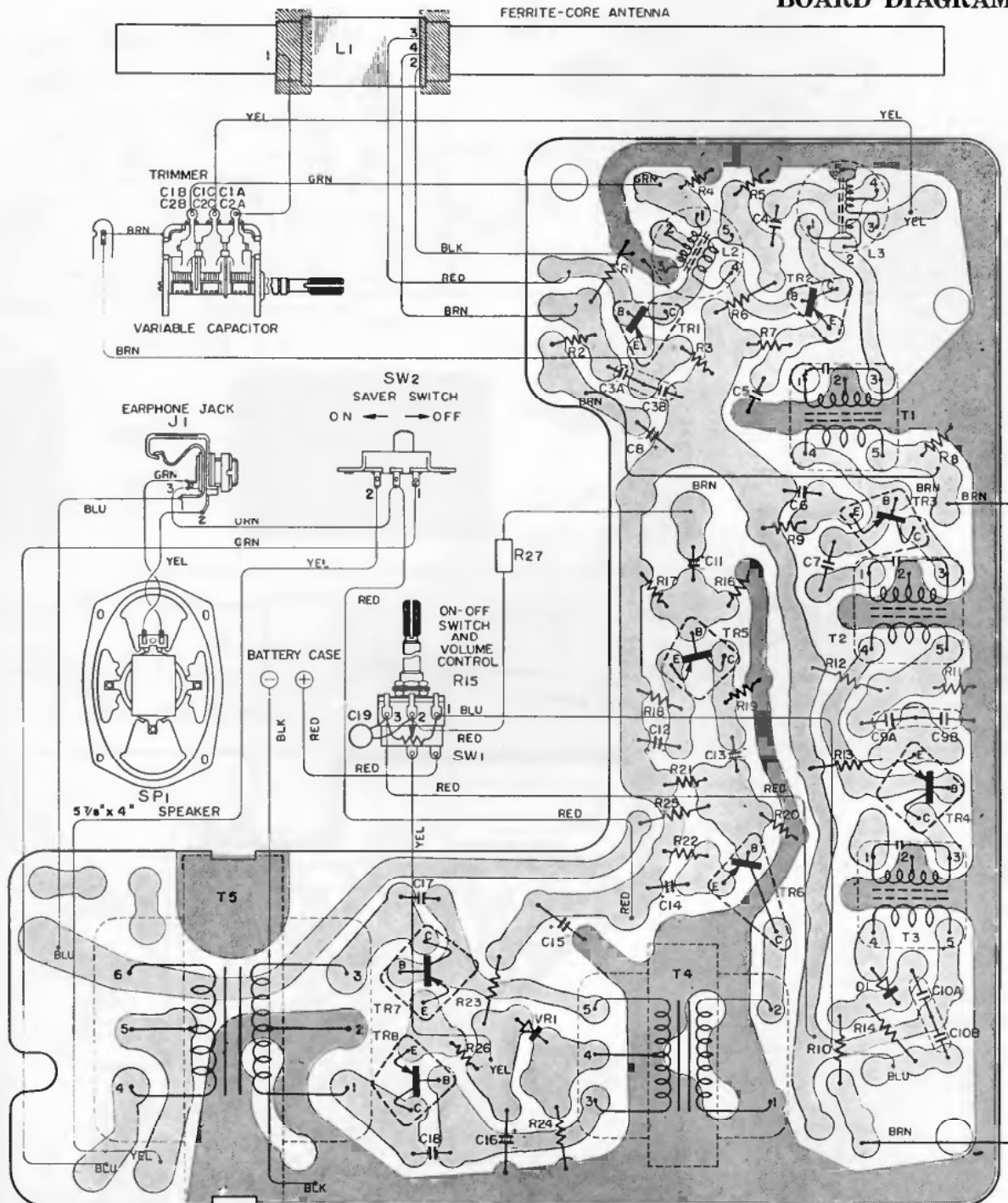
- NOTES:**
1. Voltage and current values are those of no signal time.
 2. Resistance unit is Ω; unit of capacity is either μF or F.

I. F. 455 KC.



HITACHI Model TH-812, Continued from page at left.

BOARD DIAGRAM



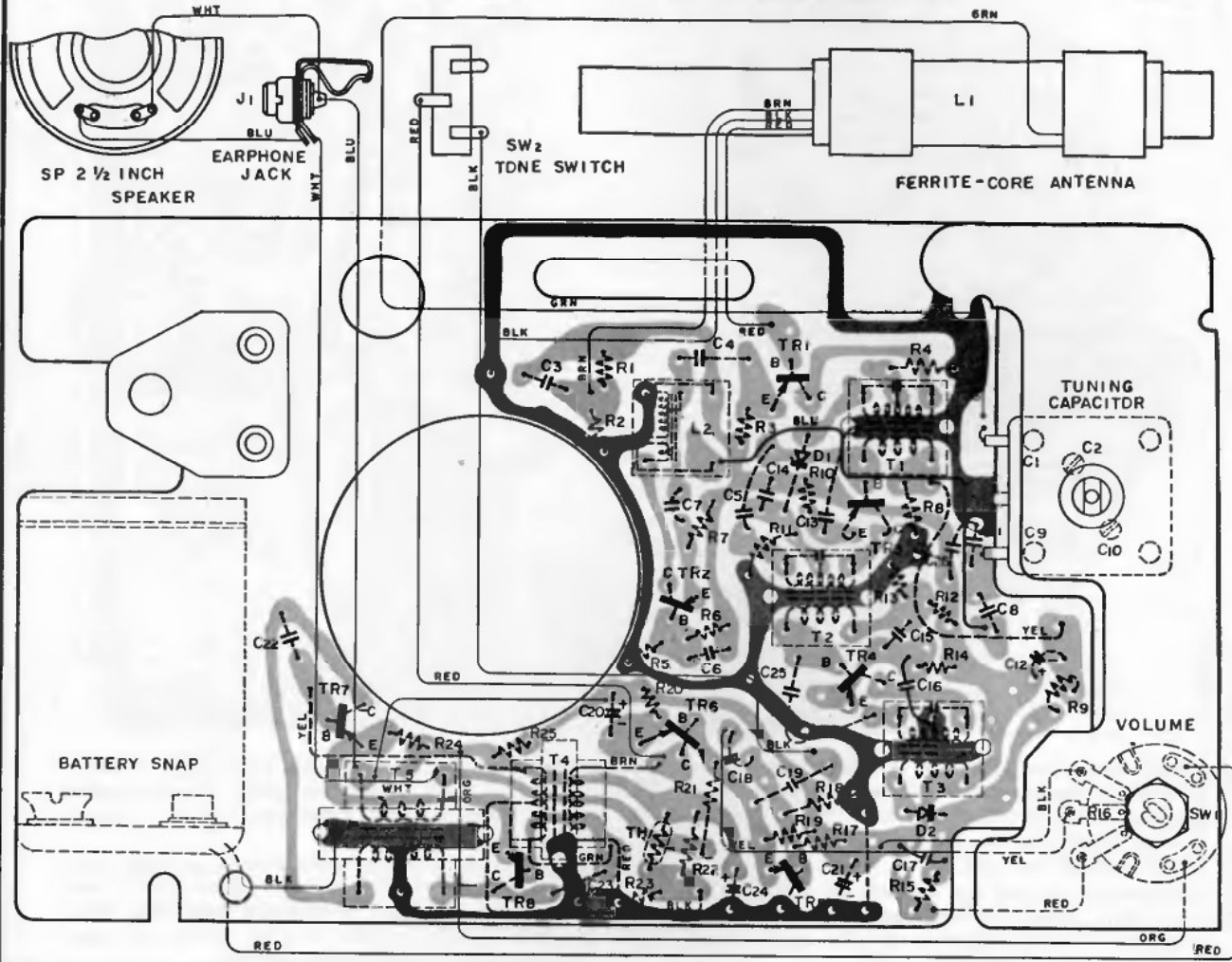
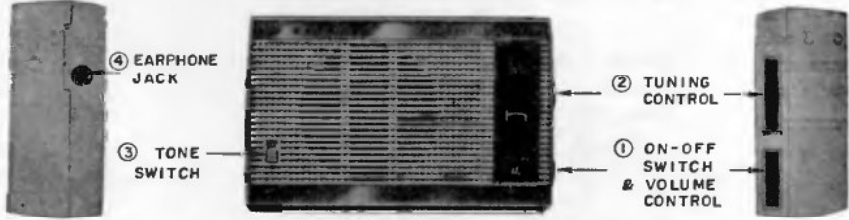
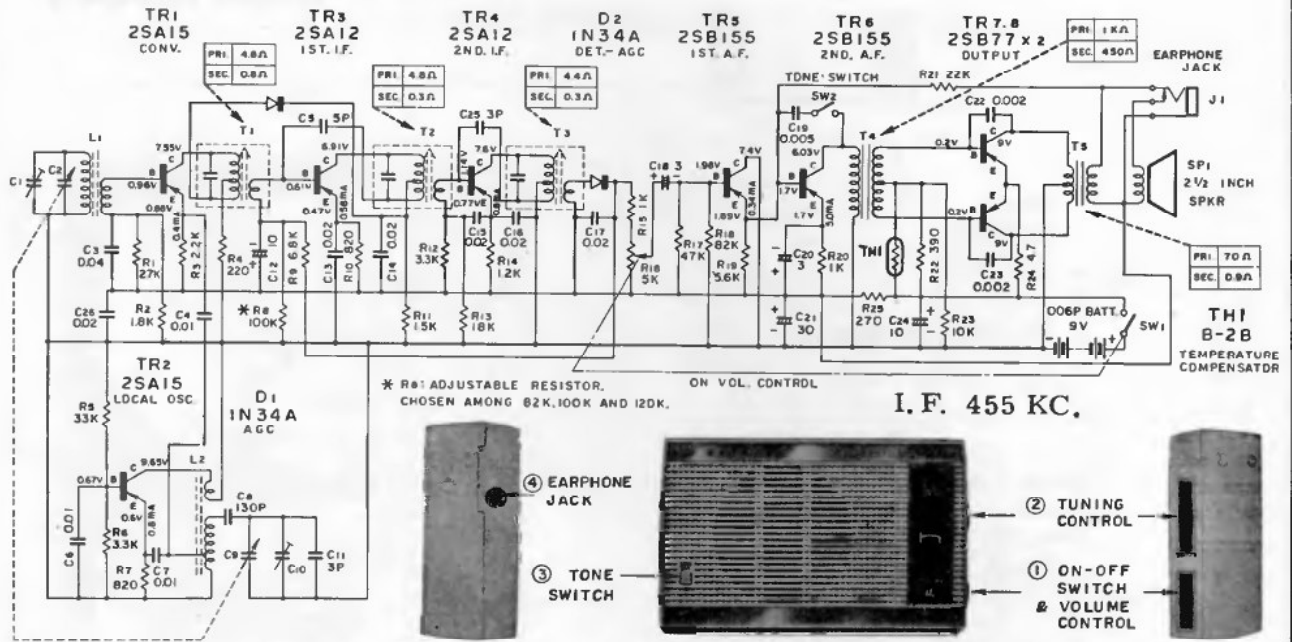
Signal tracing by injection of a signal from a signal generator is recommended as test procedure. The signal generator should be connected in series with a capacitor to avoid shorting out bias voltages. Of the transistors used in this receiver, the BASE is the signal input terminal (corresponding to signal grid of tubes), the COLLECTOR is the signal output terminal (corresponding to plate of tubes), and the EMITTER is the common terminal (corresponding to cathode of tubes).

The output circuit used in this receiver is of "Class-B" type. In "Class-B" output, the battery current increases greatly with increased signal input to the "Class-B" transistors.

Extreme care should be taken to avoid accidental shorting of transistor elements to circuit ground. This is especially true of the output transistors; if either BASE terminal is accidentally grounded for a few seconds, the output transistors will be permanently damaged.

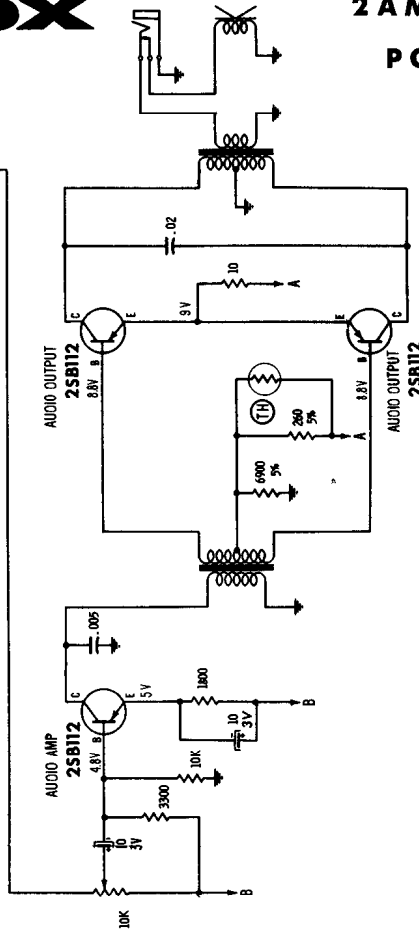
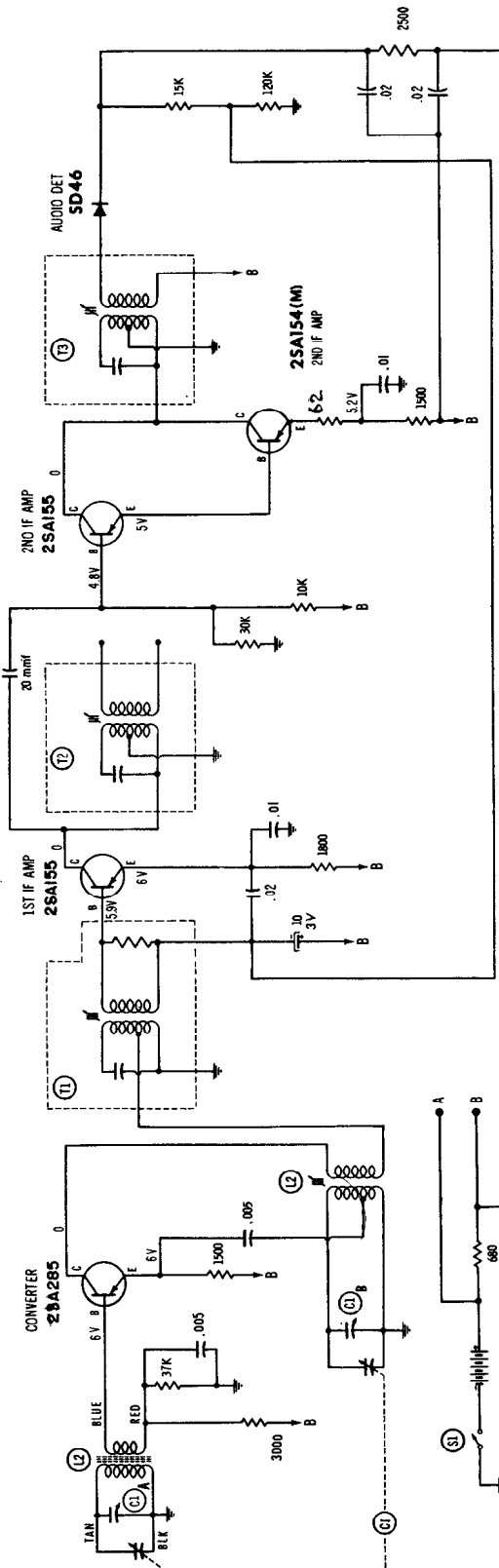
Hitachi, Ltd.

MODEL TH-848



Magnavox

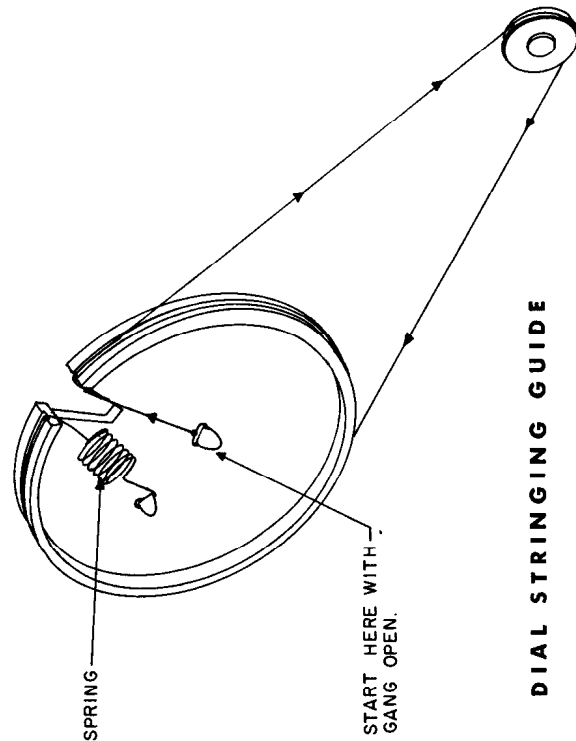
2AM-70 TRANSISTOR PORTABLE RADIO



ALIGNMENT

COUPLING	SIGNAL GENERATOR		RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
	FREQUENCY					
Loop	455KC		Tuning Gang fully open	Across voice coil	T3, T2, T1	Adjust for maximum output.
Loop	600KC		600KC	Across voice coil	L2, L1	Adjust for maximum output.
Loop	1400KC		1400KC	Across voice coil	C1A, C1B	Adjust for maximum output.
Loop	600KC		600KC	Across voice coil	---	Recheck step 2.

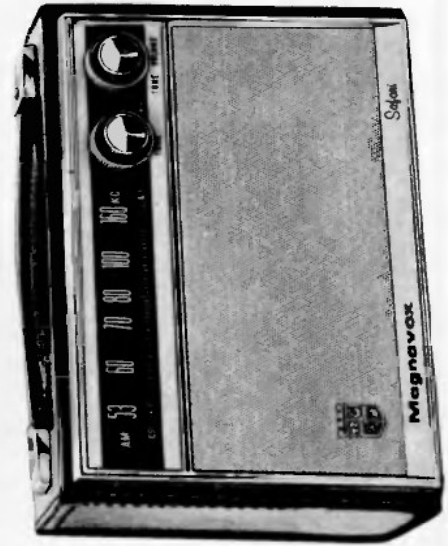
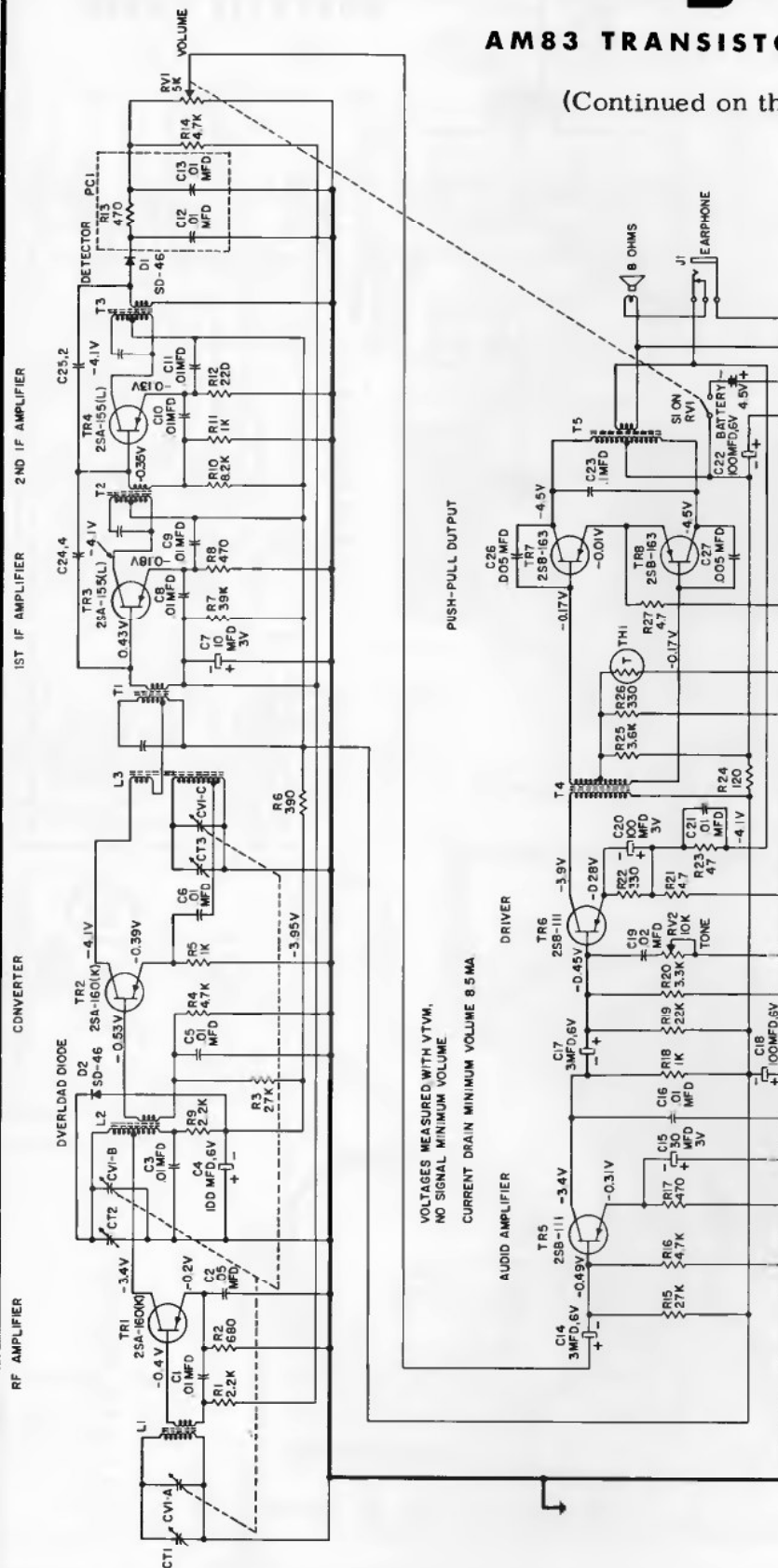
If new antenna is inserted, adjust L1 by moving coil. Wax into place after it has been properly adjusted.



Magnavox

AM83 TRANSISTOR PORTABLE RADIO

(Continued on the next page, at right)



ALIGNMENT

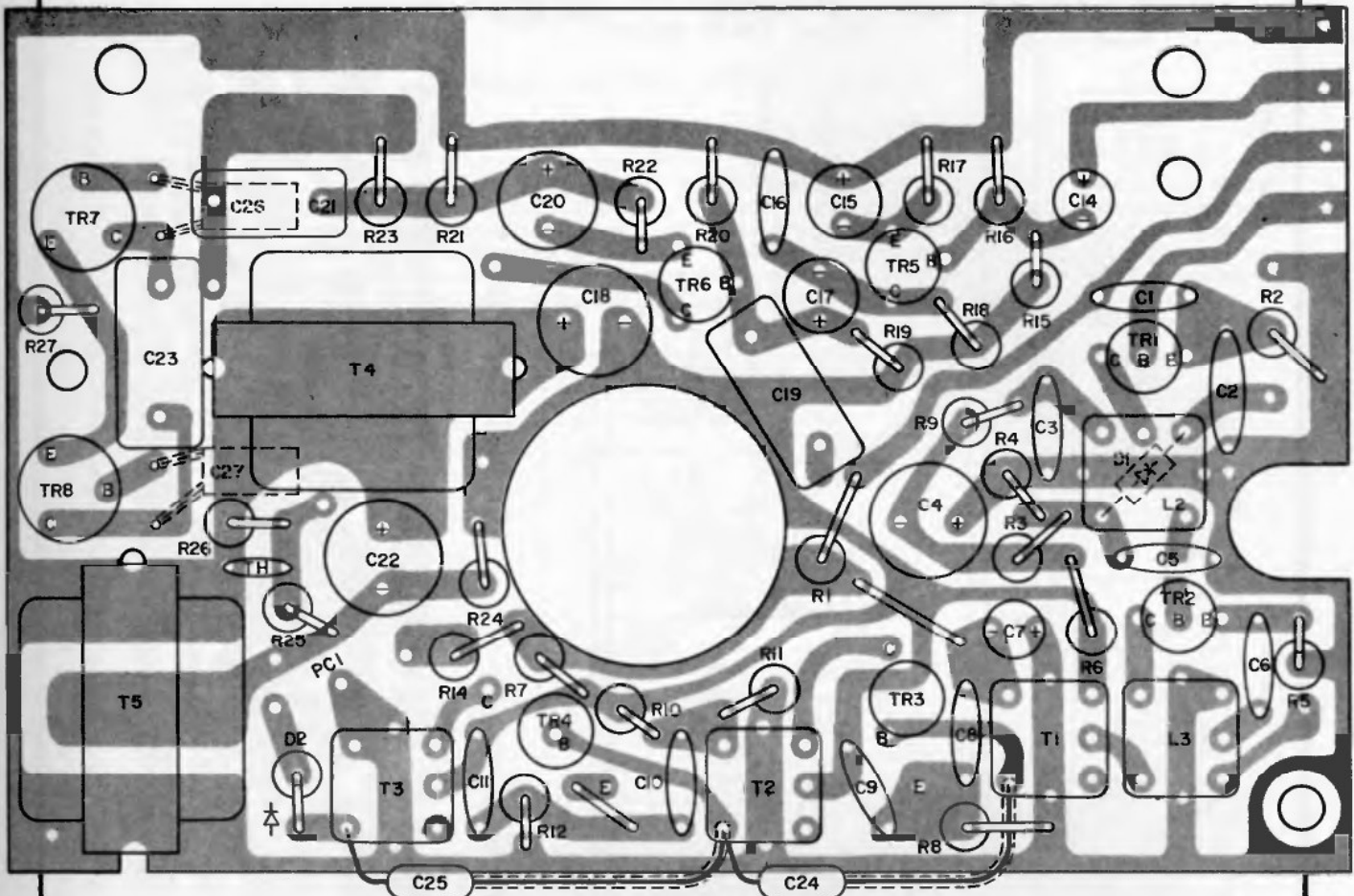
Volume control should be adjusted at maximum position and Tone control at flat level. Output of signal generator should be no higher than necessary to obtain an output reading. Loosely couple generator to Receiver Antenna.

SIGNAL GENERATOR	RADIO DIAL	OUTPUT	ADJUST	REMARKS
COUPLING	FREQUENCY	METER		
Loop	455KC	Across voice coil	T3, T2, T1	Adjust for maximum output.
Loop	600KC	Across voice coil	L3, L2, L1	Adjust for maximum output.
Loop	1400KC	Across voice coil	CT3, CT2, CT1	Adjust for maximum output.
Loop	600KC	Across voice coil	---	Recheck step 2.

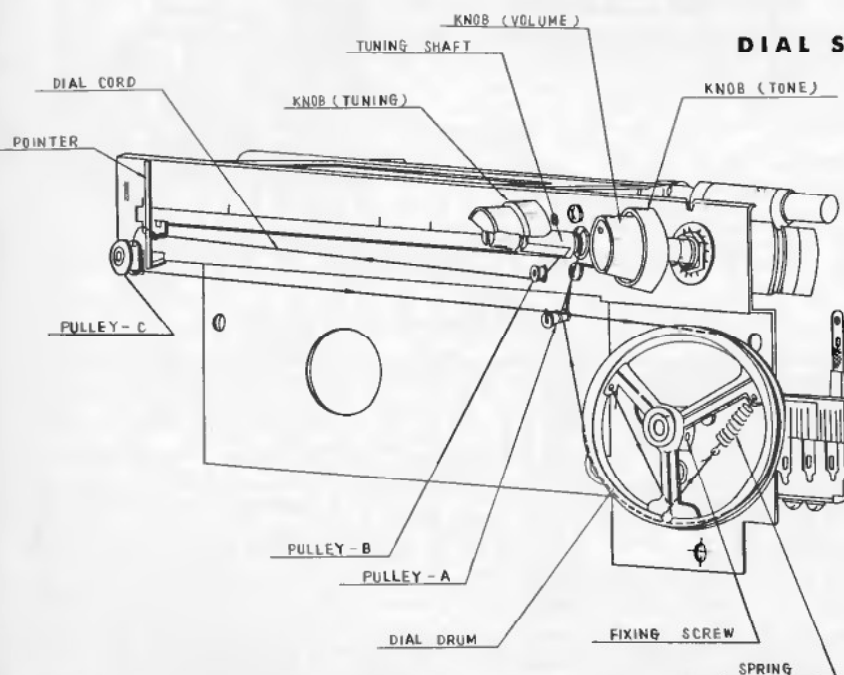
If new antenna is inserted, adjust L1 by moving coil. Wax into place after it has been properly adjusted.

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

MAGNAVOX Model AM83, Continued from preceding page at left



**PRINTED WIRING AND COMPONENT PLACEMENT PATTERN
(VIEWED FROM PRINTED WIRING SIDE OF BOARD)**

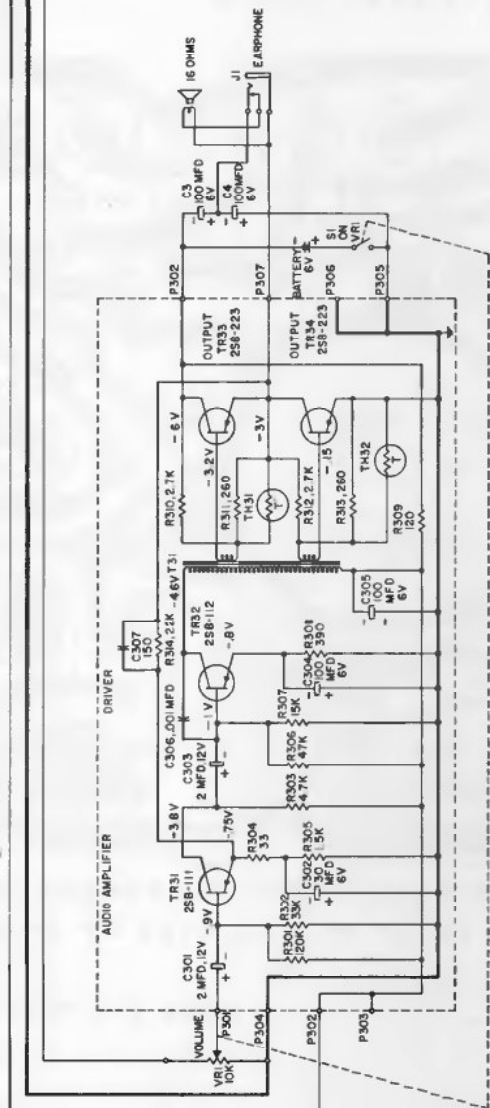
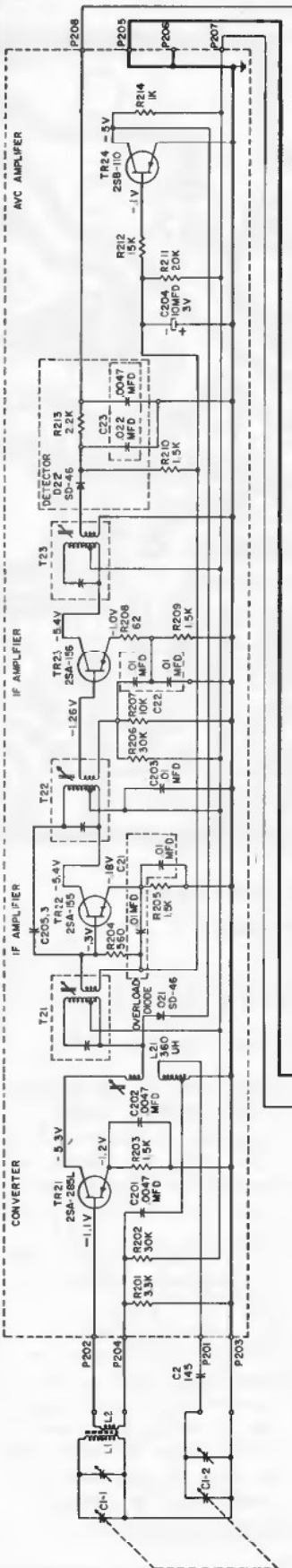


DIAL STRINGING GUIDE

DIAL STRINGING GUIDE

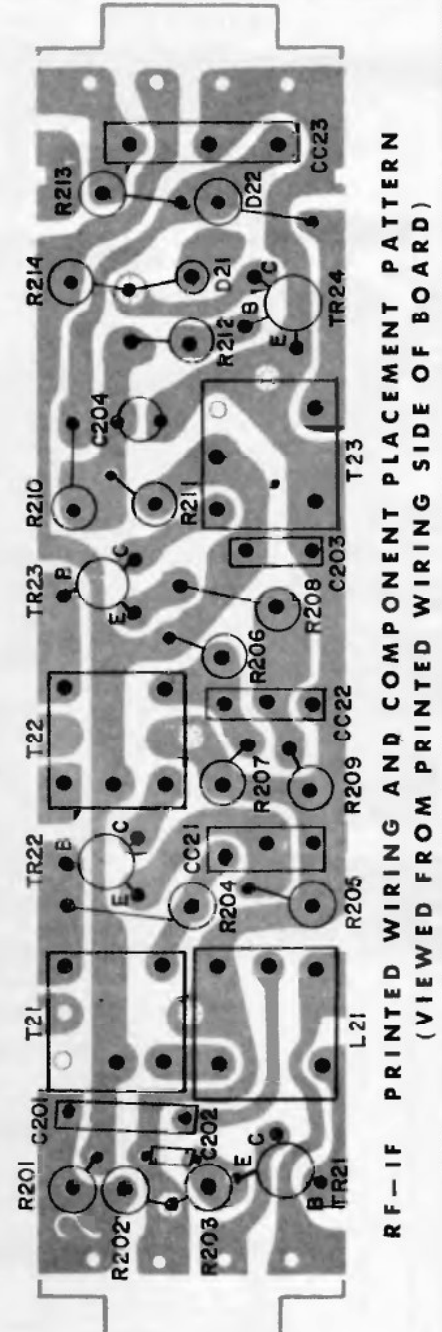
1. STRING SHOULD BE PRE-STRETCHED . APPROX. 1% BEFORE BEING ASSEMBLED TO CHASSIS.
2. FIGURE SHOWS THE VARIABLE AIR CONDENSER FULLY CLOSED CONDITION.
3. FASTEN ONE END OF STRING TO DIAL DRUM.
4. NEXT WIND STRING 2 TURNS AROUND THE TUNING SHAFT THROUGH THE PULLEY - A.
5. REEL STRING ALONG PULLEYS ACCORDING TO THE ORDER AS SHOWN FIGURE: PULLEY NO. B-C-A.
6. WIND STRING $\frac{3}{4}$ TURNS ALONG THE GUTTER OF DIAL DRUM
7. FINALLY FASTEN THE OTHER END OF STRING TO THE SPRING. STRING SHOULD BE STRETCHED AS FULLY AS POSSIBLE.

MAGNA VOX
Model AM82 Radio



CURRENT DRAIN MINIMUM VOLUME 8 MA
20% TOLERANCE ON ALL READINGS.

VOLTAGE MEASURED WITH VTVM, NO SIGNAL
AND VOLUME CONTROL SET TO MINIMUM



RF—IF PRINTED WIRING AND COMPONENT PLACEMENT PATTERN
(VIEWED FROM PRINTED WIRING SIDE OF BOARD)

ALIGNMENT

SIGNAL GENERATOR		RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
COUPLING	FREQUENCY				
Loop	455KC	Tuning Gang fully open	Across voice coil	T23, T22, T21	Adjust for maximum output.
Loop	600KC	600KC	Across voice coil	L21, L1	Adjust for maximum output.
Loop	1400KC	1400KC	Across voice coil	C1-1, C1-2	Adjust for maximum output.
Loop	600KC	600KC	Across voice coil	---	Recheck step 2.

If new antenna is inserted, adjust L1 by moving coil. Wax into place after it has been properly adjusted.

Magnavox

R207 AM/FM RADIO TUNER

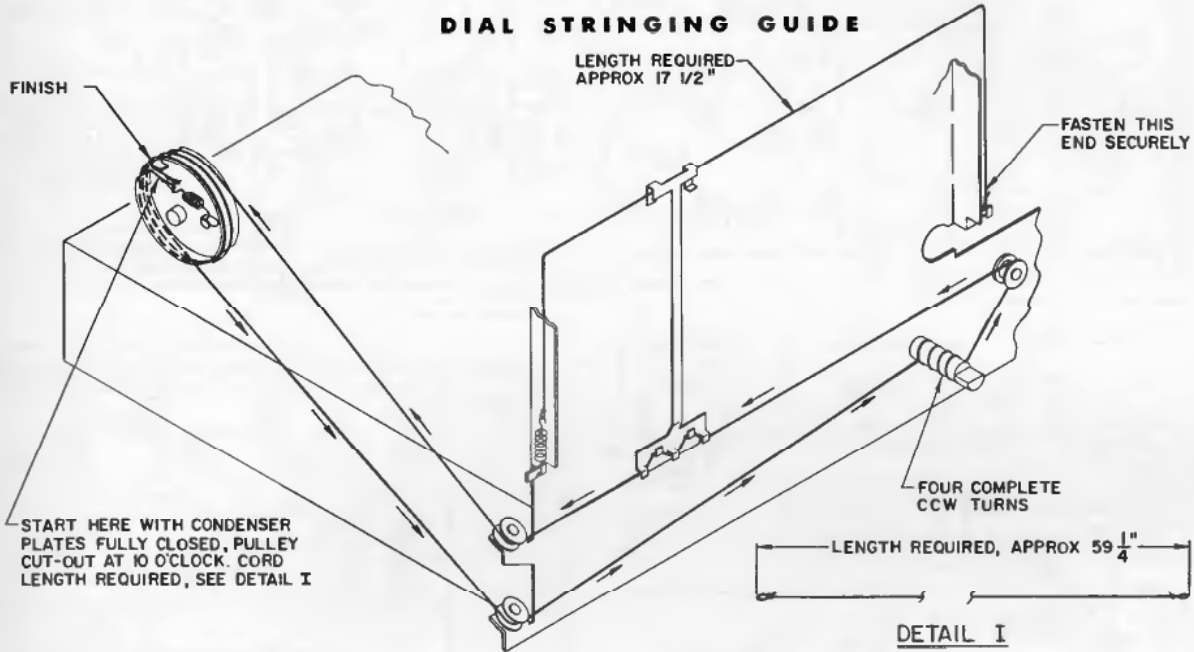
MODELS 2ST686, 2ST687, 2ST690

(Material below and continued on the next three pages)

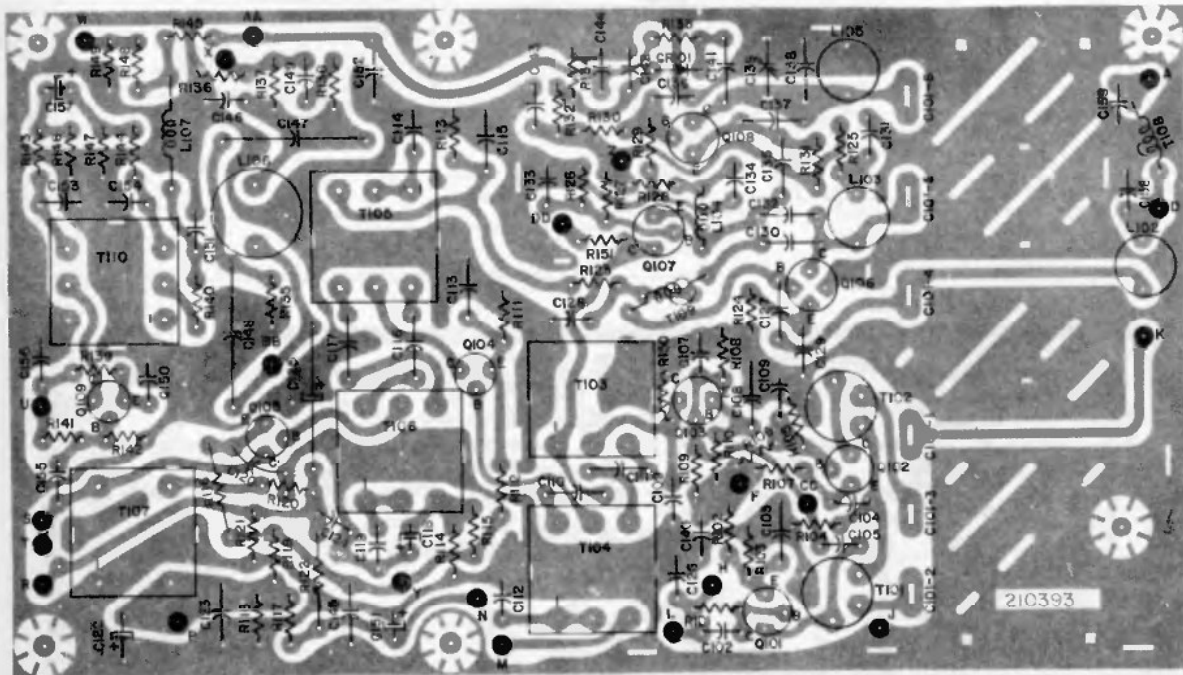
The R207 Series chassis are AM-FM tuners using transistors throughout the entire circuit. These tuners are designed to operate in conjunction with an external audio amplifier which also provides the DC voltage necessary to operate the tuner. This DC voltage is dropped from a -31 VDC and regulated at -16VDC.

The Sensitivity Control (R403) is used to adjust the point at which the diodes cut off. To set this control, tune the receiver off station and adjust this control clockwise until the background noise just disappears. For reception of weak stations, it may be necessary to reduce this setting slightly.

DIAL STRINGING GUIDE

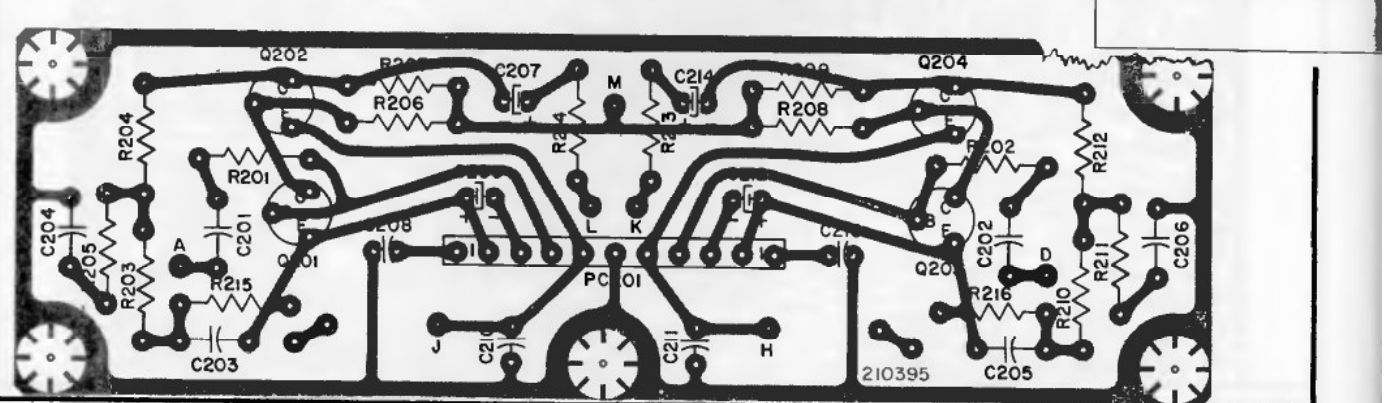
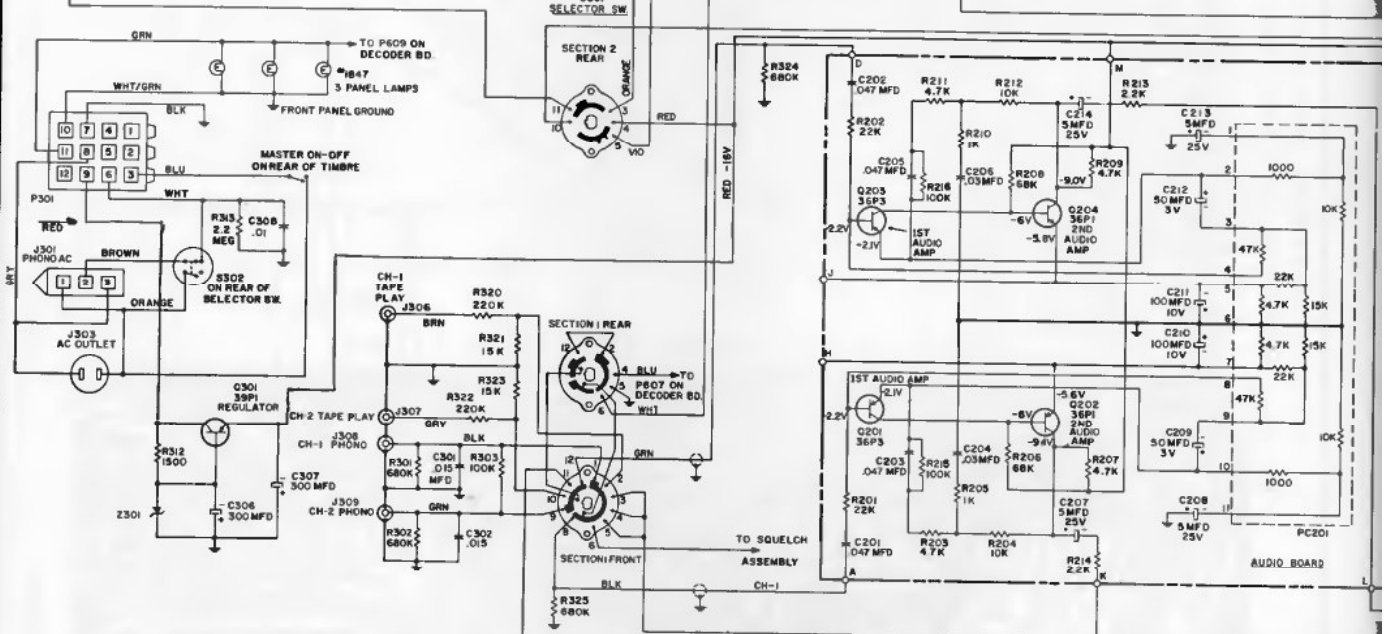
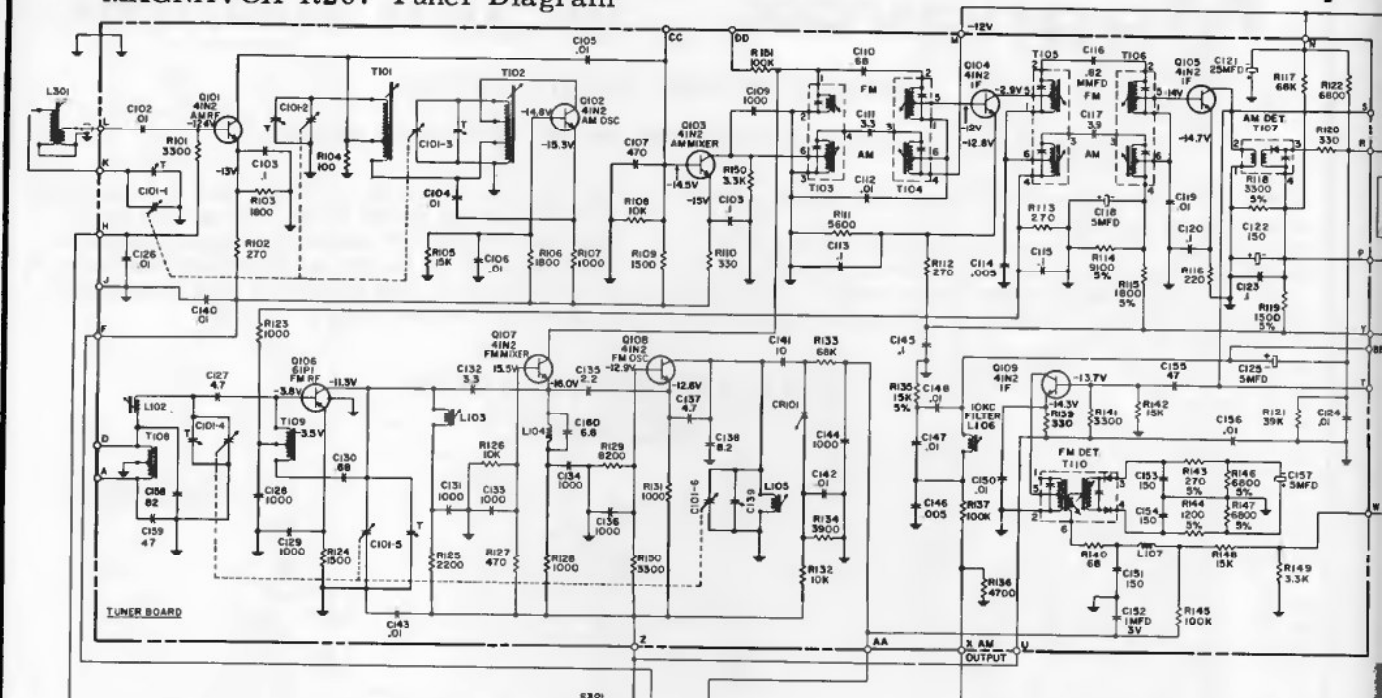


AM-FM-IF BOARD (BOTTOM VIEW)



VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

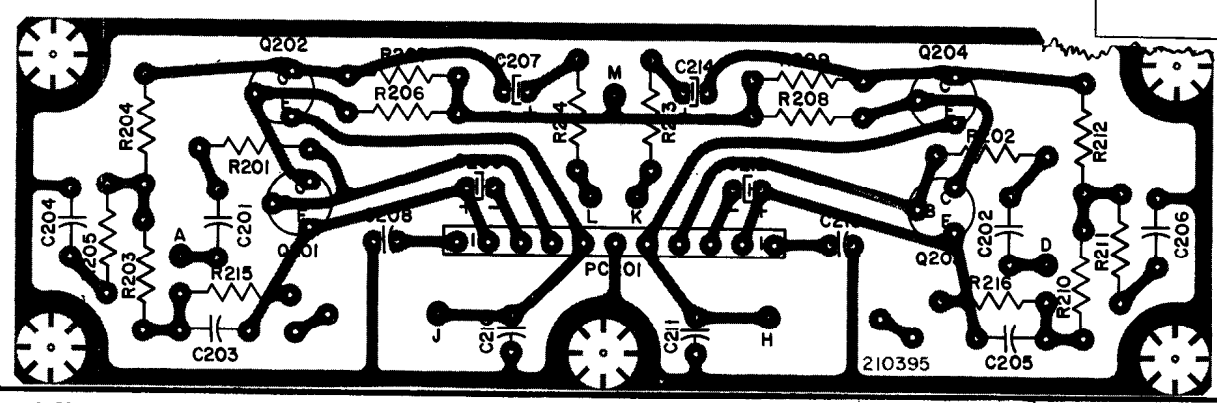
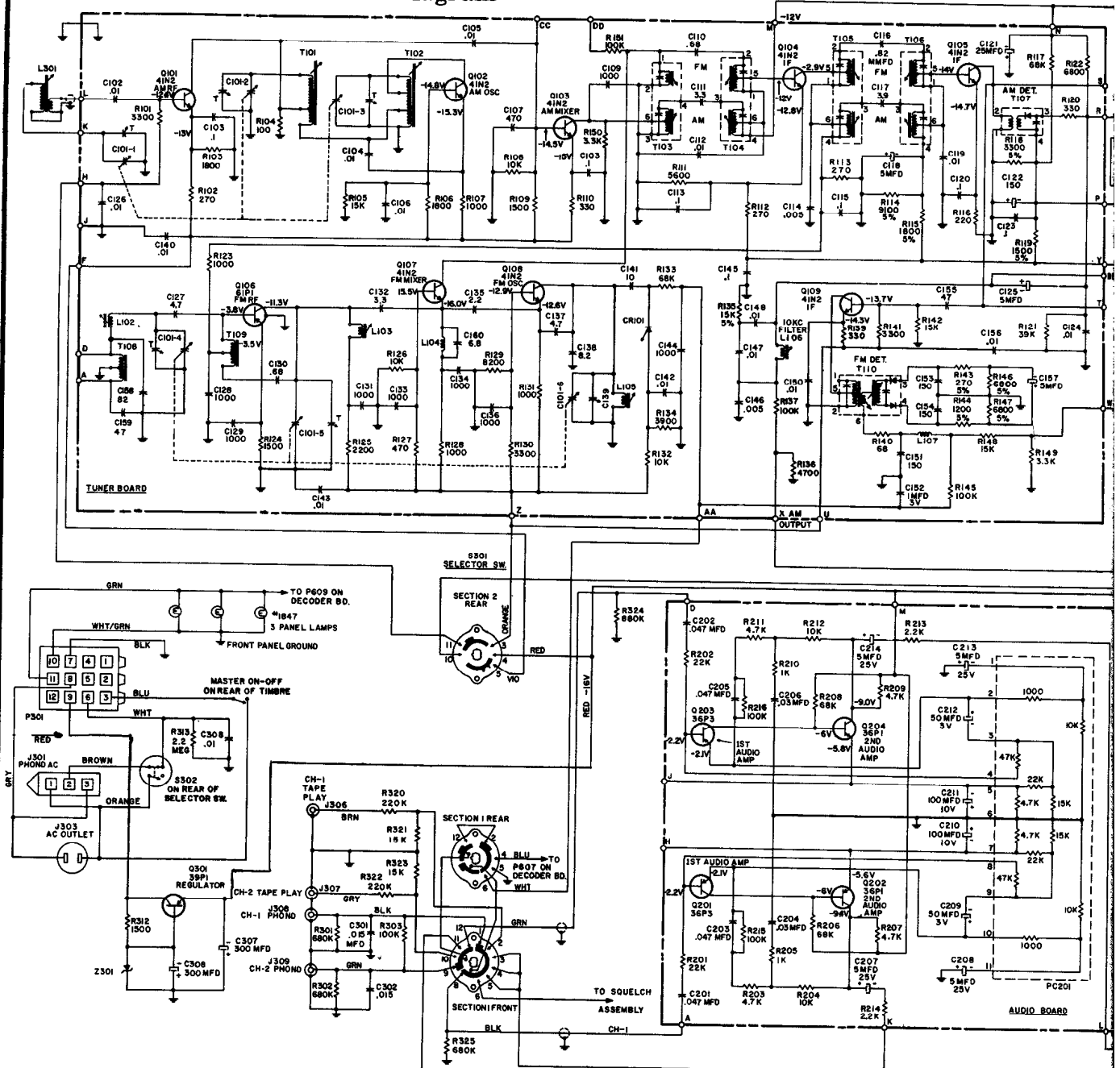
MAGNAVOX R207 Tuner Diagram



AUDIO BOARD (BOTTOM VIEW) 58

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

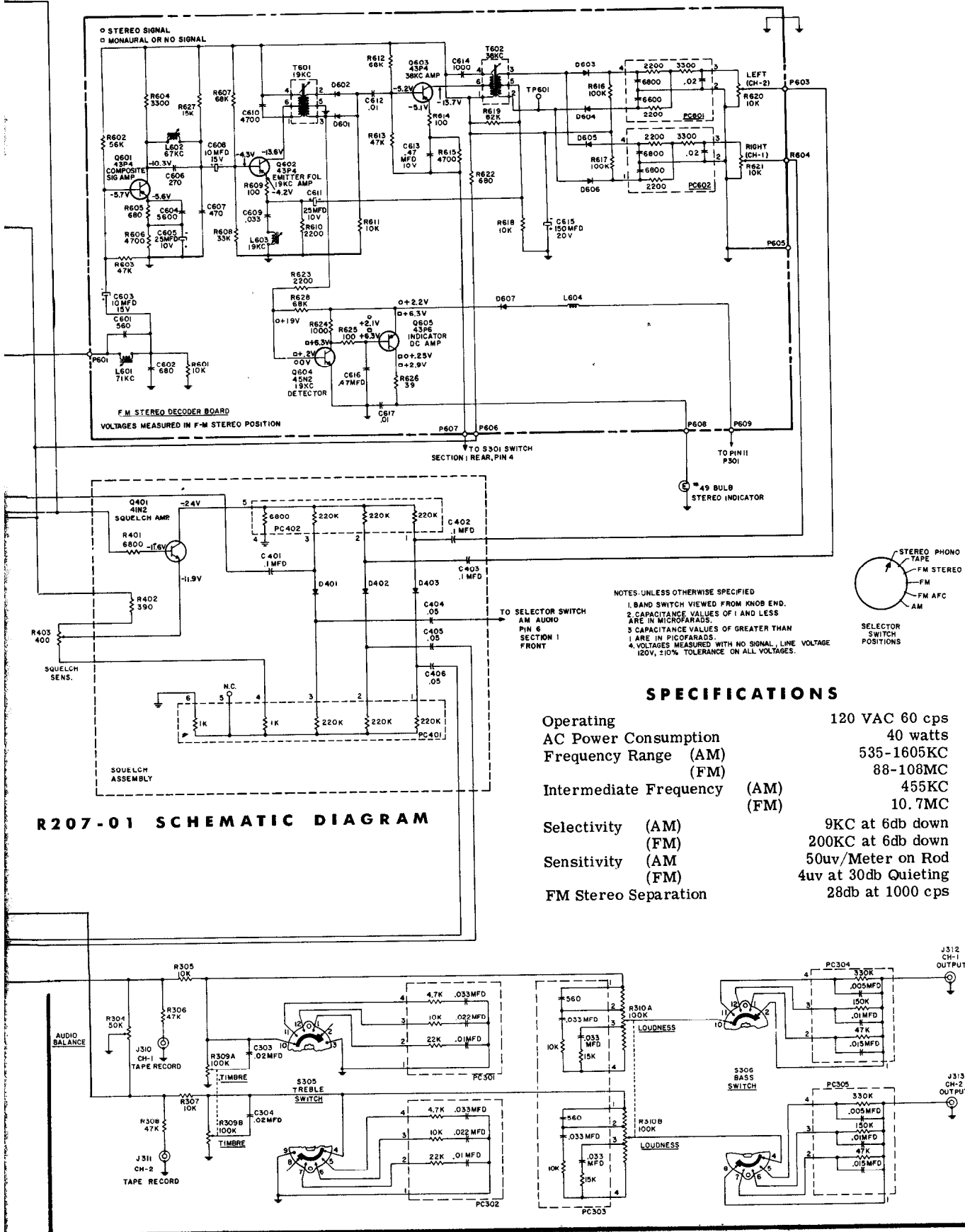
MAGNAVOX R207 Tuner Diagram



AUDIO BOARD (BOTTOM VIEW) 58

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

MAGNAVOX R207 Tuner Diagram, Continued



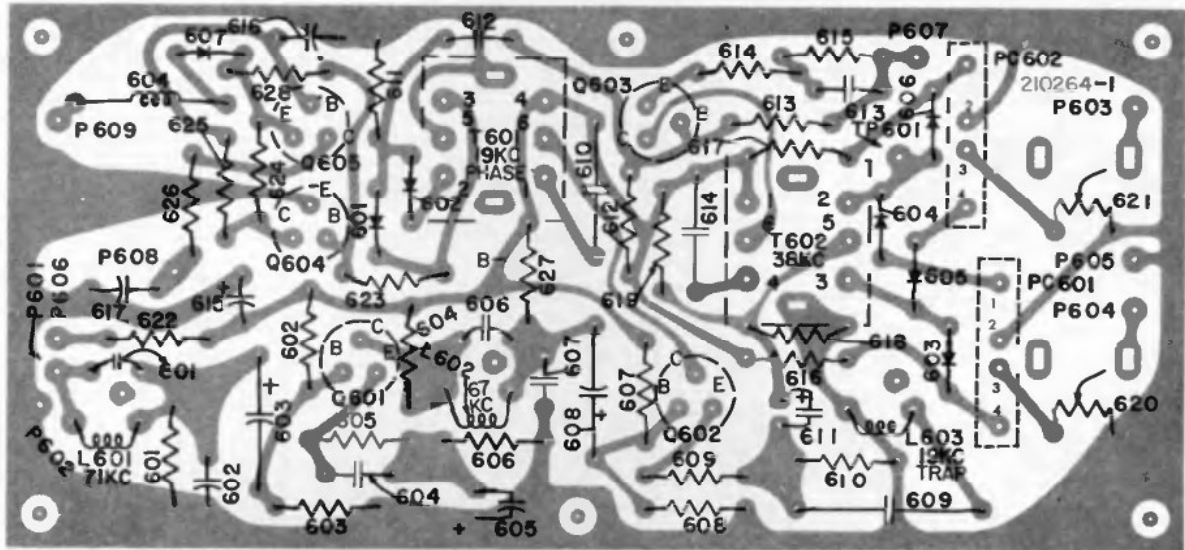
R207-01 SCHEMATIC DIAGRAM

SPECIFICATIONS

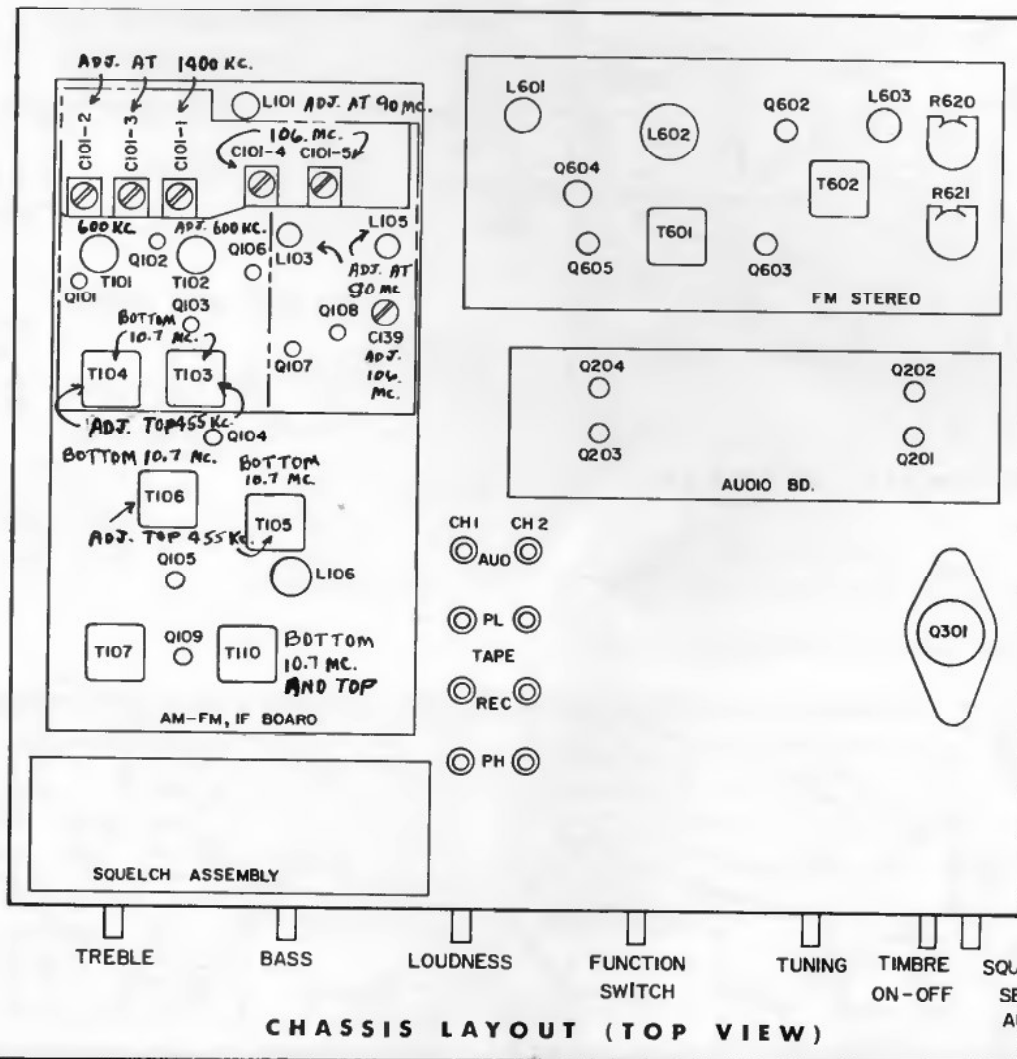
Operating	120 VAC 60 cps
AC Power Consumption	40 watts
Frequency Range (AM)	535-1605KC
(FM)	88-108MC
Intermediate Frequency (AM)	455KC
(FM)	10.7MC
Selectivity (AM)	9KC at 6db down
(FM)	200KC at 6db down
Sensitivity (AM)	50uv/Meter on Rod
(FM)	4uv at 30db Quieting
FM Stereo Separation	28db at 1000 cps

MAGNAVOX R207 AM/FM Radio Tuner

(Continued from preceding three pages)



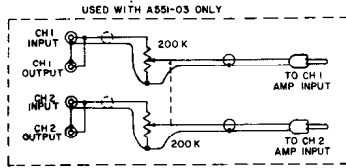
FM STEREO BOARD (BOTTOM VIEW)



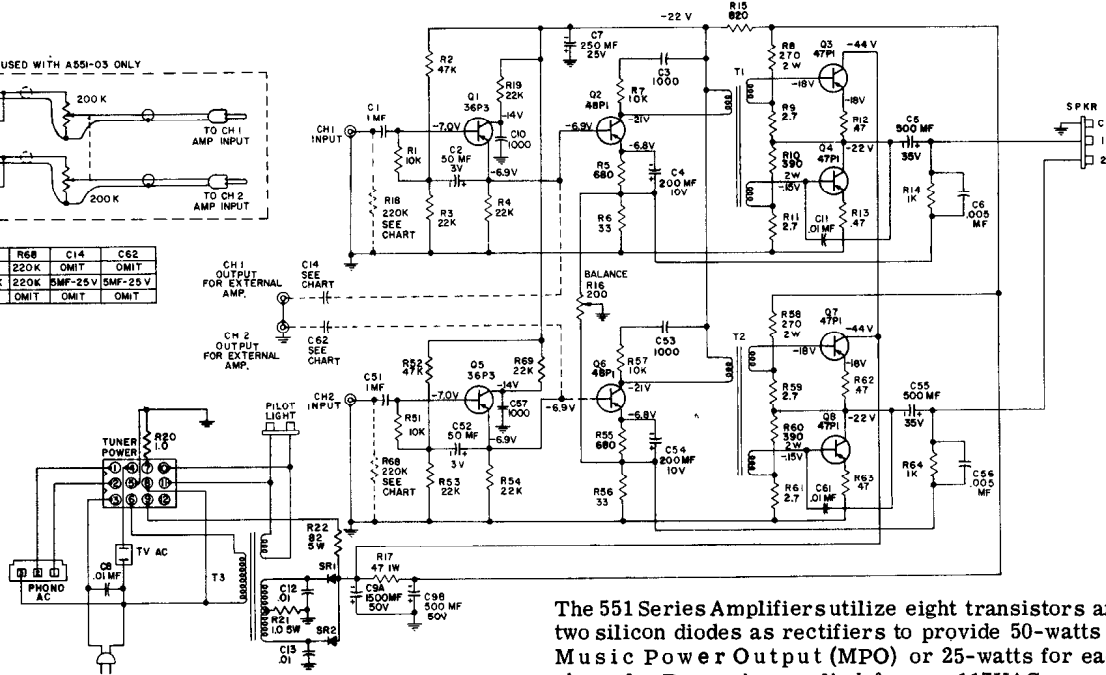
CHASSIS LAYOUT (TOP VIEW)

Magnavox

A551 SERIES AMPLIFIER



CHASSIS	R10	R6B	C14	C62
A551-01	220K	220K	OMIT	OMIT
A551-02	220K	220K	5MF-25V	5MF-25V
A551-03	OMIT	OMIT	OMIT	OMIT

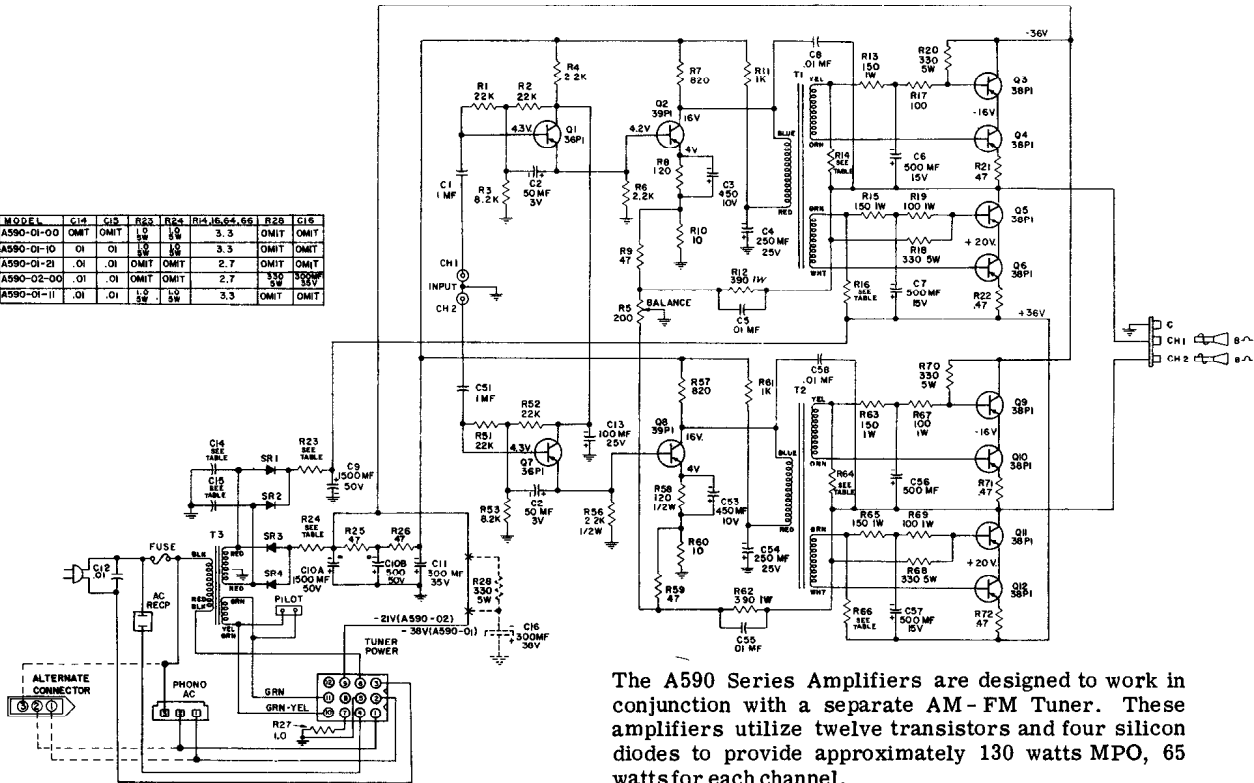


These amplifiers are the transformerless output type designed to use the speaker voice coil as the load. This type of circuit is quite common in transistor audio amplifiers. The voice coil impedance, therefore, plays an important part in the overall operation of the amplifier.

The 551 Series Amplifiers utilize eight transistors and two silicon diodes as rectifiers to provide 50-watts of Music Power Output (MPO) or 25-watts for each channel. Power is supplied from a 117VAC source. The power transformer is a step-down type designed to provide approximately 36 VDC @ 300MA after rectification by the two silicon diodes. These amplifiers are designed to work in conjunction with, and supply power for, a separate AM-FM transistor tuner.

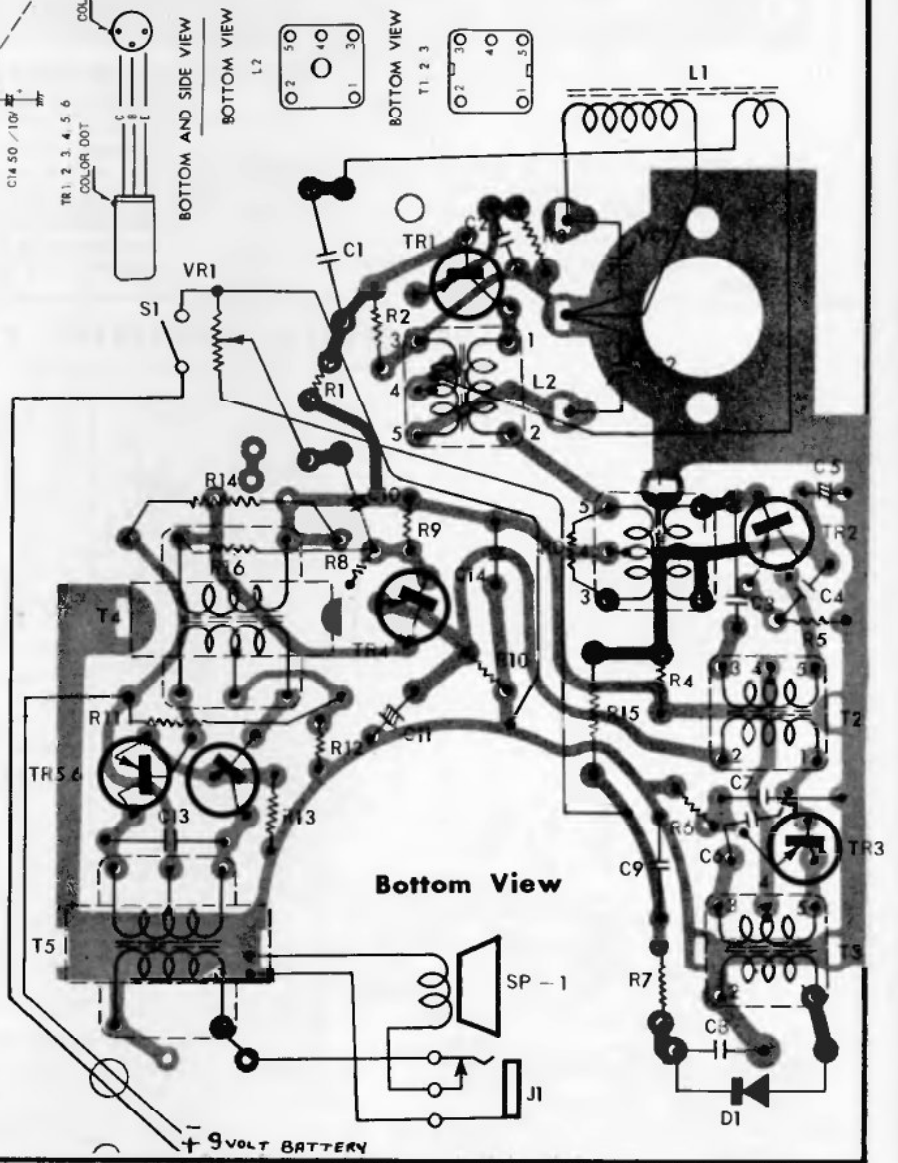
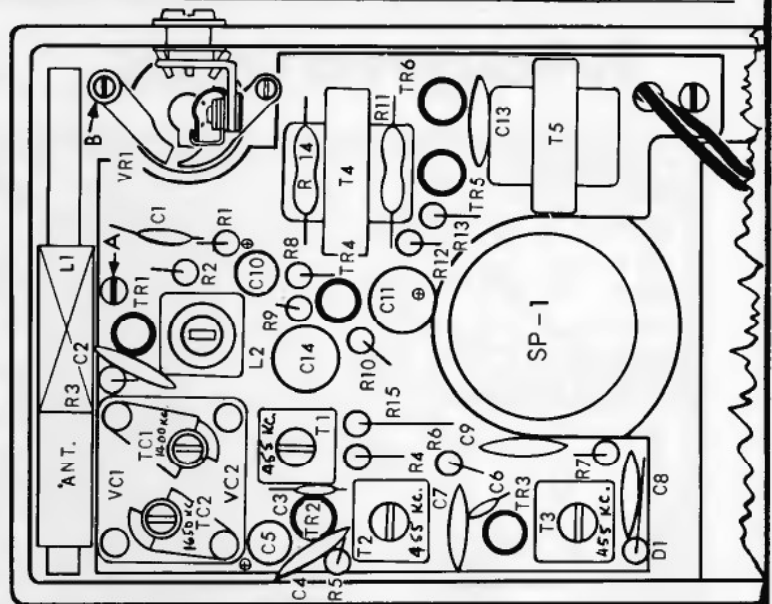
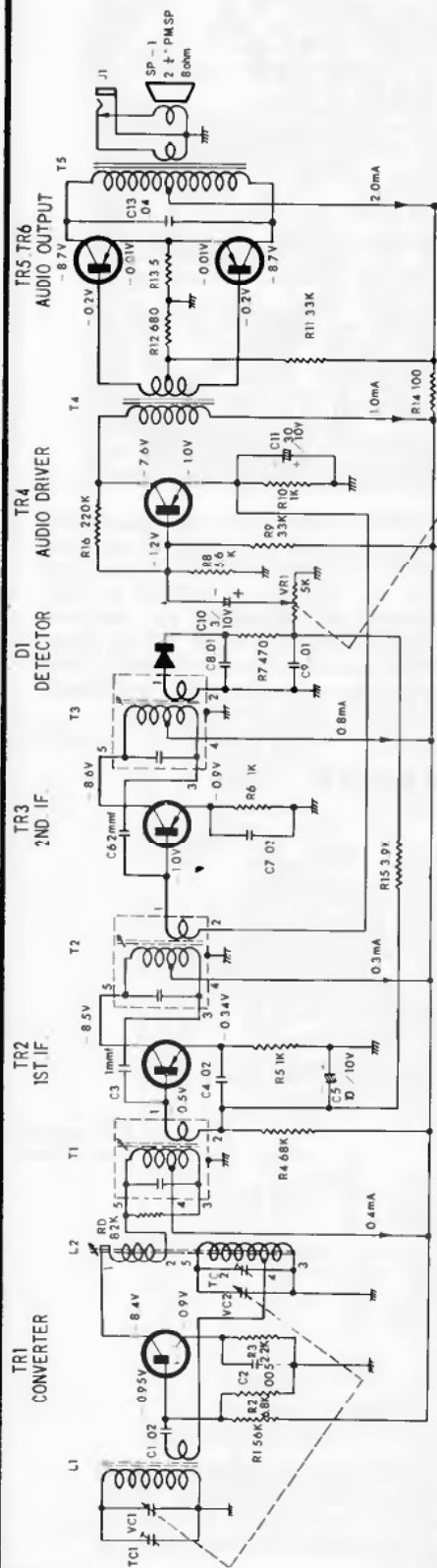
A590 SERIES AMPLIFIER CHASSIS

MODEL	C14	C15	R22	R24	R4,16,64,66	R28	C18
A590-01-00	OMIT	OMIT	10	5	3.3	OMIT	OMIT
A590-01-10	01	01	10	5	3.3	OMIT	OMIT
A590-01-21	01	01	OMIT	OMIT	2.7	OMIT	OMIT
A590-02-00	01	01	OMIT	OMIT	2.7	330	330
A590-01-11	01	01	10	5	3.3	OMIT	OMIT

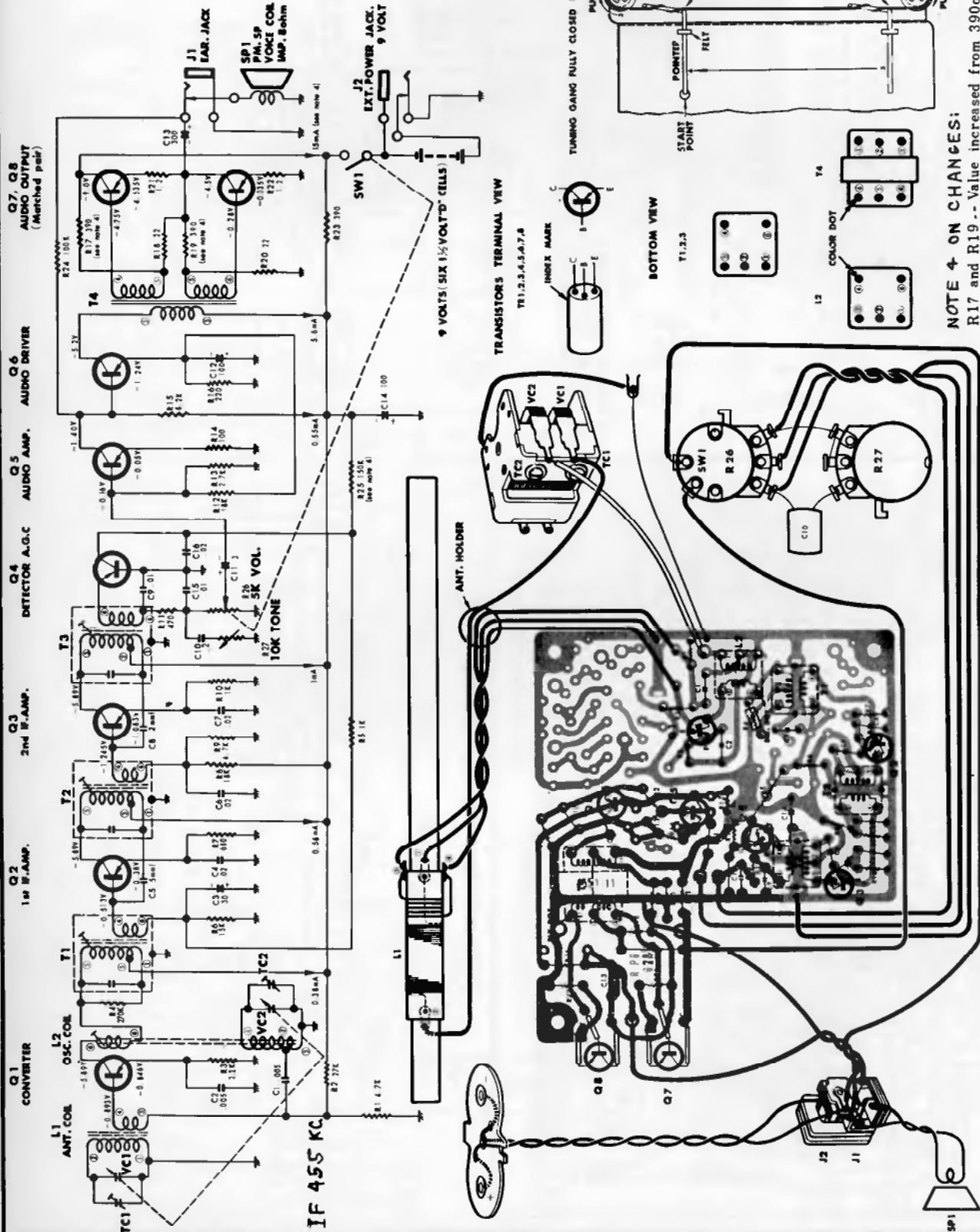


The A590 Series Amplifiers are designed to work in conjunction with a separate AM-FM Tuner. These amplifiers utilize twelve transistors and four silicon diodes to provide approximately 130 watts MPO, 65 watts for each channel.

MONTGOMERY WARD
Models GEN-1250A
and GEN-1251A



MONTGOMERY WARD
Model GEN-1257A



NOTE 4 ON CHANGES:
R17 and R19 -- Value increased from 390ohms to 470ohms
R25 Value decreased from 150ohms to 120ohms

Bottom view of PC Board.

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

MODELS
GEN-1802A, GEN-1803A,
GEN-1804A, GEN-1805A,
& GEN-1806A

- NOTES:**
1. ALL CAPACITANCE VALUES ARE IN MICROFARADS ±80% - 20% 50V MIN. UNLESS OTHERWISE INDICATED.
 2. ALL RESISTANCE VALUES ARE IN OHMS, 1/2W ±10% UNLESS OTHERWISE INDICATED.
 3. VOLTAGES SHOWN AT EACH TRANSISTOR ELECTRODE (±20%) MEASURED TO COMMON GROUND, WITH A VTVM WITH NO INPUT SIGNAL AND VOLUME CONTROL SET AT MAXIMUM, NEGATIVE GROUNDING.
 4. ALL COIL AND TRANSFORMER RESISTANCES ARE MEASURED OUT OF CIRCUIT, RESISTANCES LESS THAN 1 OHM ARE NOT SHOWN.

IF 455 KC.



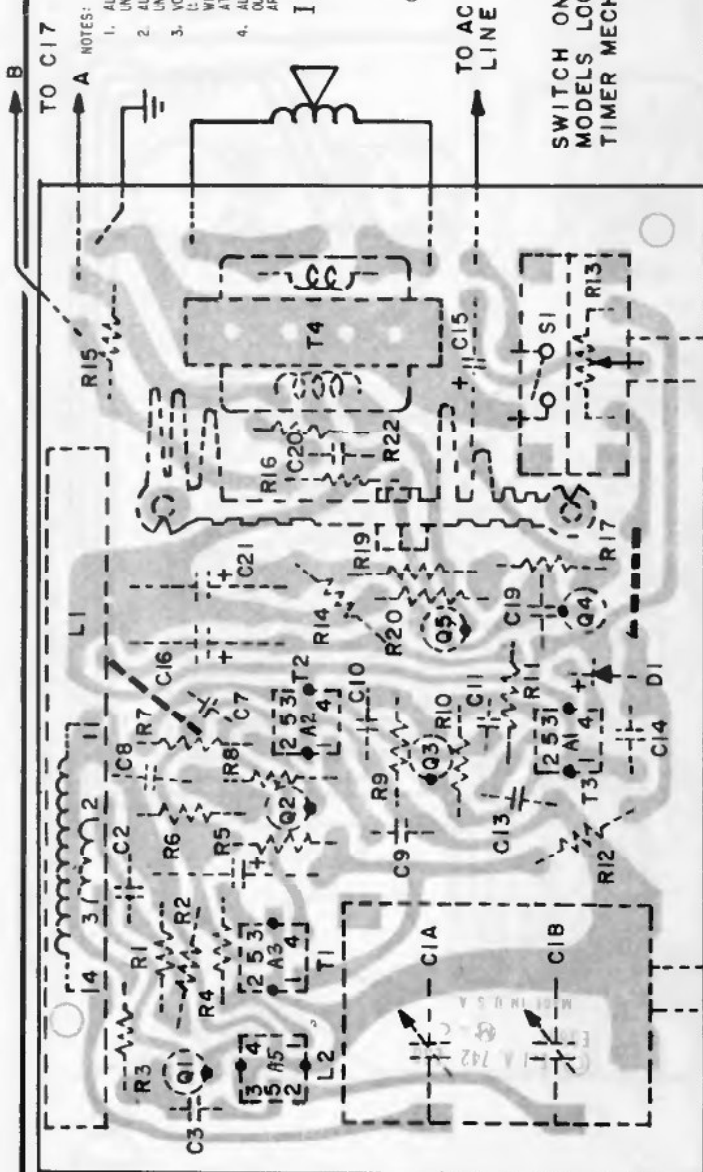
Q1, 02, 03, 05

TRANSISTORS (BOTTOM VIEW)

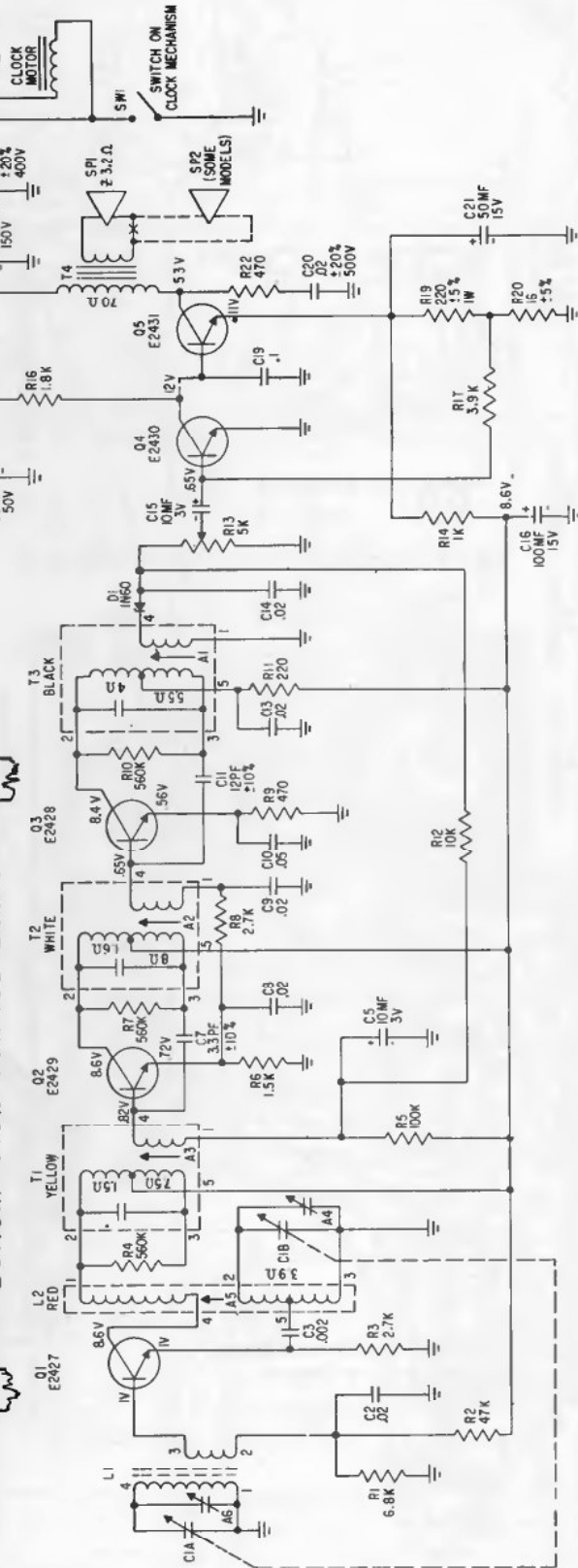


OSCILLATOR COIL AND I.F. TRANSFORMERS (BOTTOM VIEW)

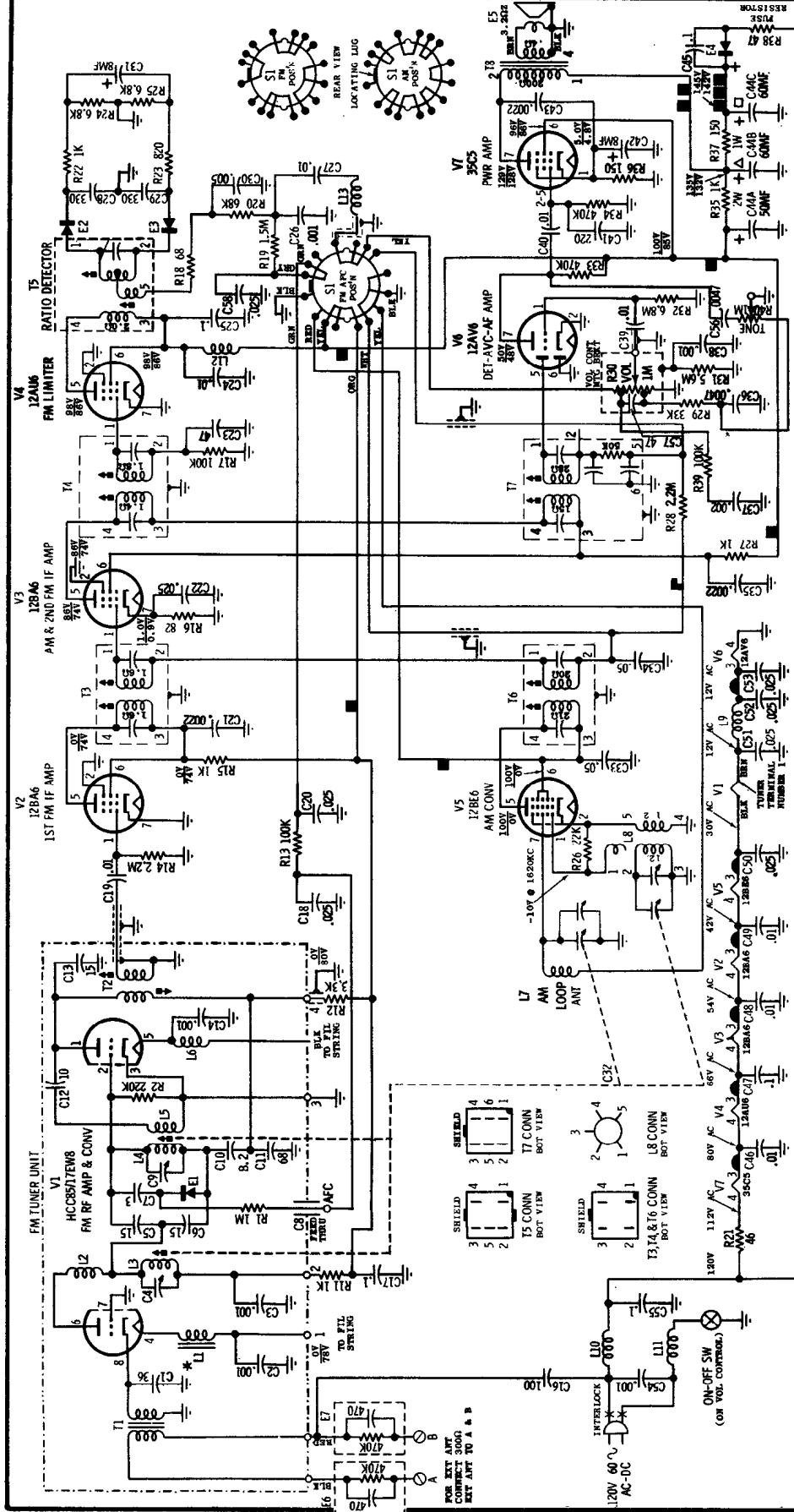
SWITCH ON CLOCK MODELS LOCATED ON TIMER MECHANISM



Bottom View Printed Board



VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

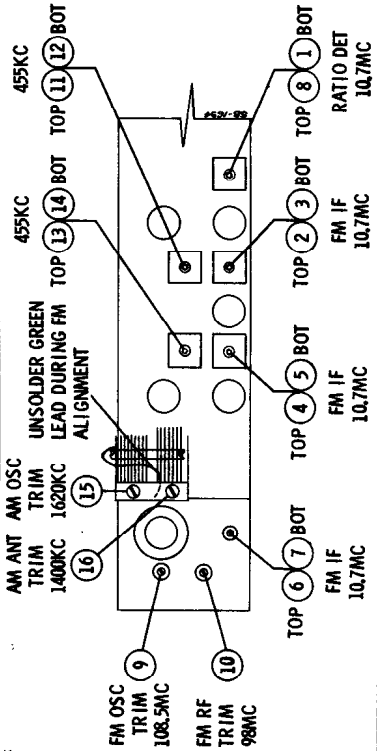


V TAKEN WITH S1 IN AM POSITION
 V TAKEN WITH S1 IN FM POSITION

PLATED CHASSIS BOARD WIRING LEGEND
 = B+ = AVC = FIL
 NOT TO BE USED

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~ AC INPUT

TUNING RANGE - AM - 535 KC TO 1620 KC. IF - 455 KC
 FM - 88 MC TO 108 MC. IF - 10.7MC
 ± = B-



ALIGNMENT LOCATIONS

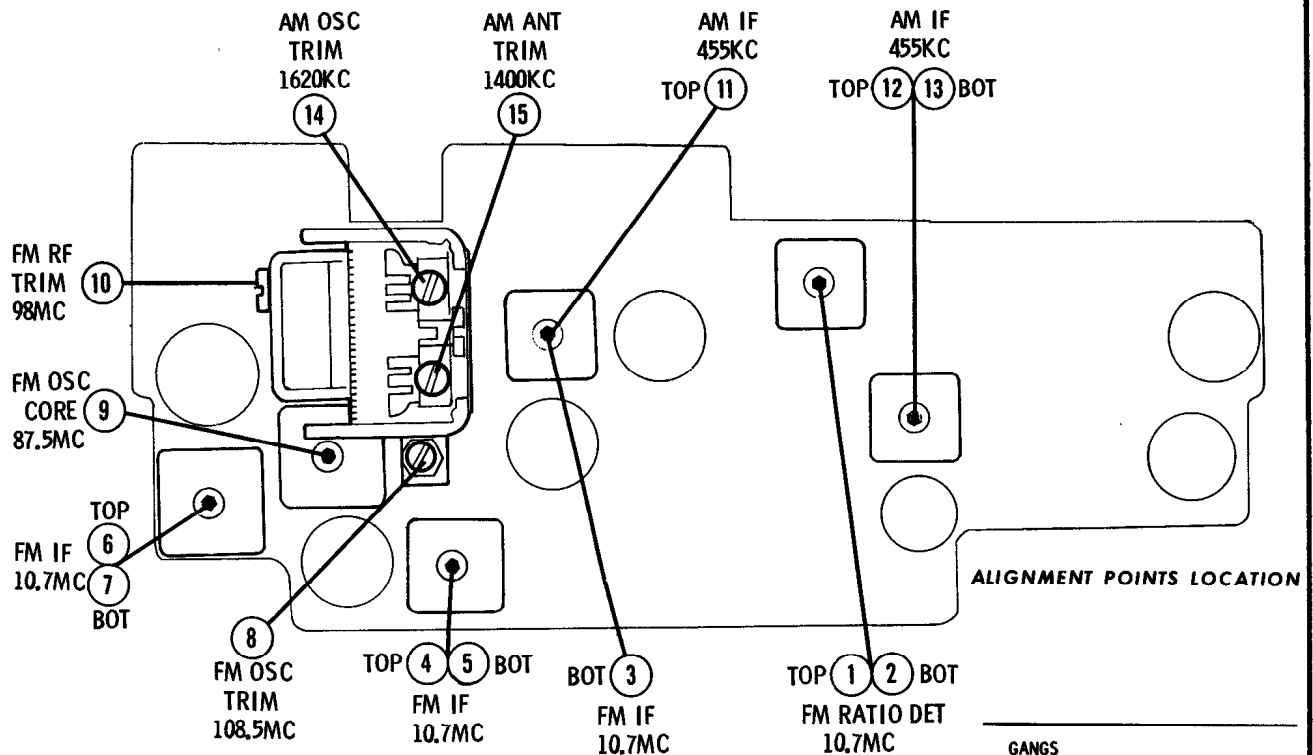
MOTOROLA
CHASSIS HS-4109
MODELS B7, B10

Chassis HS-4108, Model B7,
 Chassis HS-4123, Model B8,
 are similar to HS-4109.

MOTOROLA

CHASSIS HS-4135,4134 MODELS BC4, B11, B12

(Diagram on page 67, plated chassis views on page 68)



CHASSIS REMOVAL - ALL MODELS

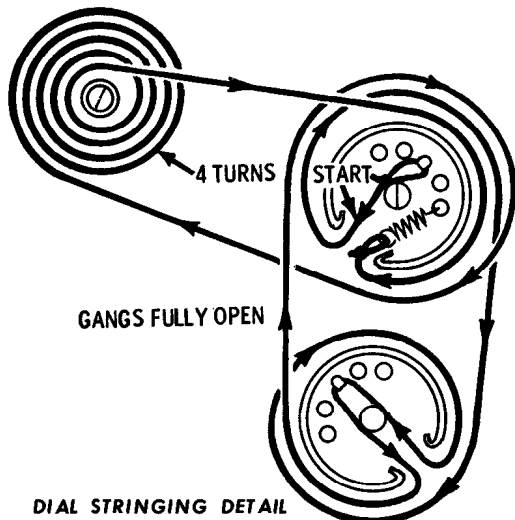
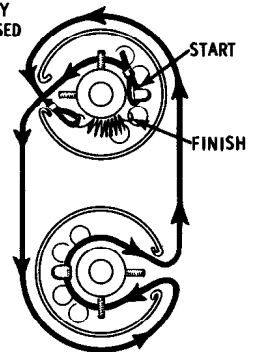
1. Remove tuning knob only; do not attempt to remove captivated volume knob and pointer dial.
2. Remove 4 cabinet back mounting screws, separate back from front of cabinet, then disconnect FM antenna connecting lead from inside back; if necessary, unsolder leads connected to cabinet back.

3. Remove screw from left side of AM antenna insulator and screw from AM gang mounting bracket.

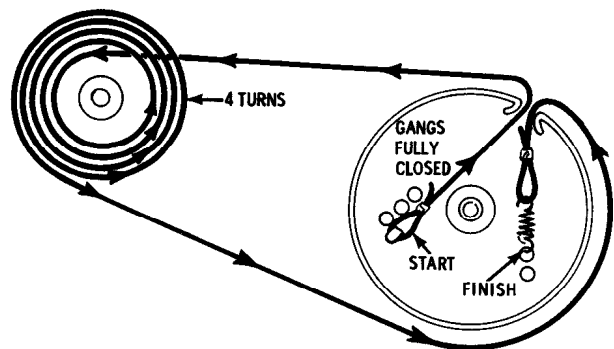
4. On Model B12 only, also remove 2 chassis bracket mounting screws located at right and left sides inside cabinet; then remove 3 screws from bottom of cabinet.

5. Slide chassis out from rear of cabinet; when re-installing chassis into cabinet, make sure the slots at the rear of the volume knob and pointer dial line up properly with their respective shafts on the chassis.

GANGS FULLY CLOSED

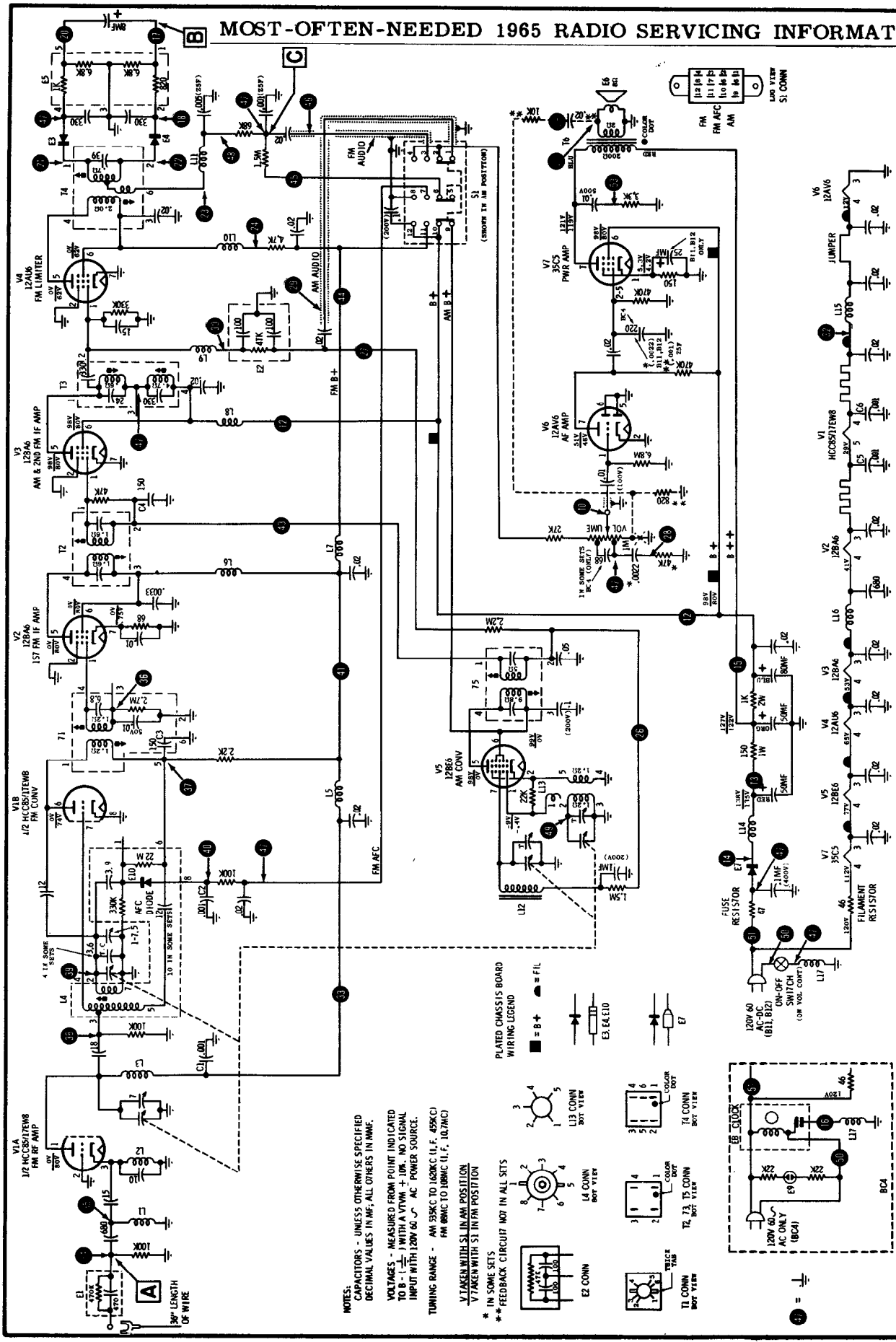


DIAL STRINGING DETAIL



ALTERNATE STRINGING USED IN SOME SETS

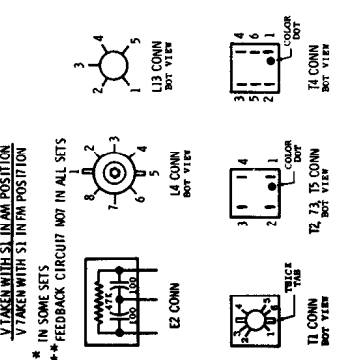
MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION



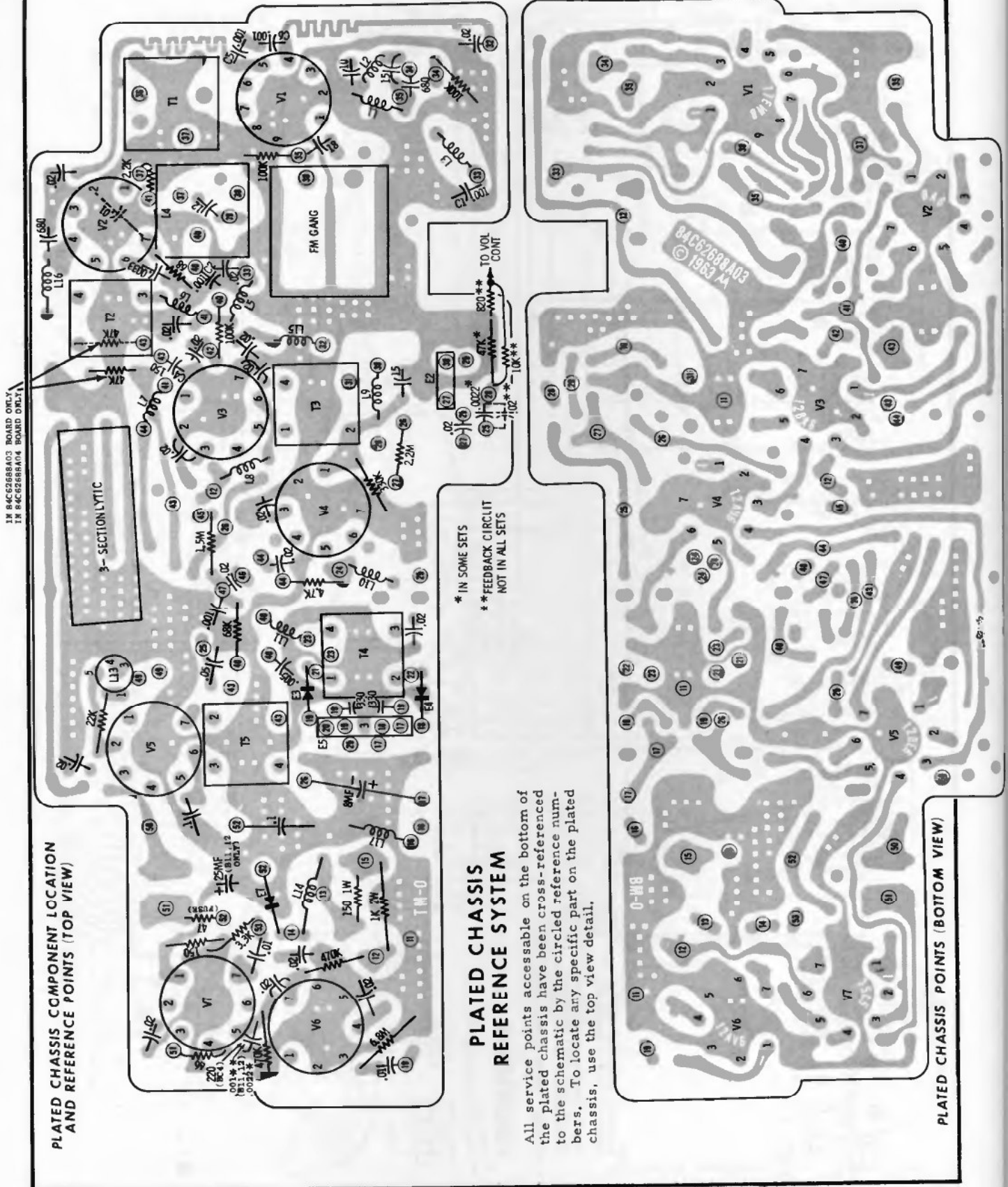
NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED DECIMAL VALUES IN MF; ALL OTHERS IN MME.
 VOLTAGES - MEASURED FROM POINT INDICATED TO B - 1 WITH A VTVM - ± 10%. NO SIGNAL INPUT WITH 120V 60 AC POWER SOURCE.
 TUNING RANGE - AM 530KC TO 1620KC (I.F. 455KC) FM 88MC TO 108MC (I.F. 10.7MC)

V TAKEN WITH SL IN AM POSITION
 V TAKEN WITH S1 IN FM POSITION

* IN SOME SETS
 ** FEEDBACK CIRCUIT NOT IN ALL SETS



MOTOROLA Chassis HS-4134, HS-4135, Models BC4, B11, B12, Continued



PLATED CHASSIS COMPONENT LOCATION AND REFERENCE POINTS (TOP VIEW)

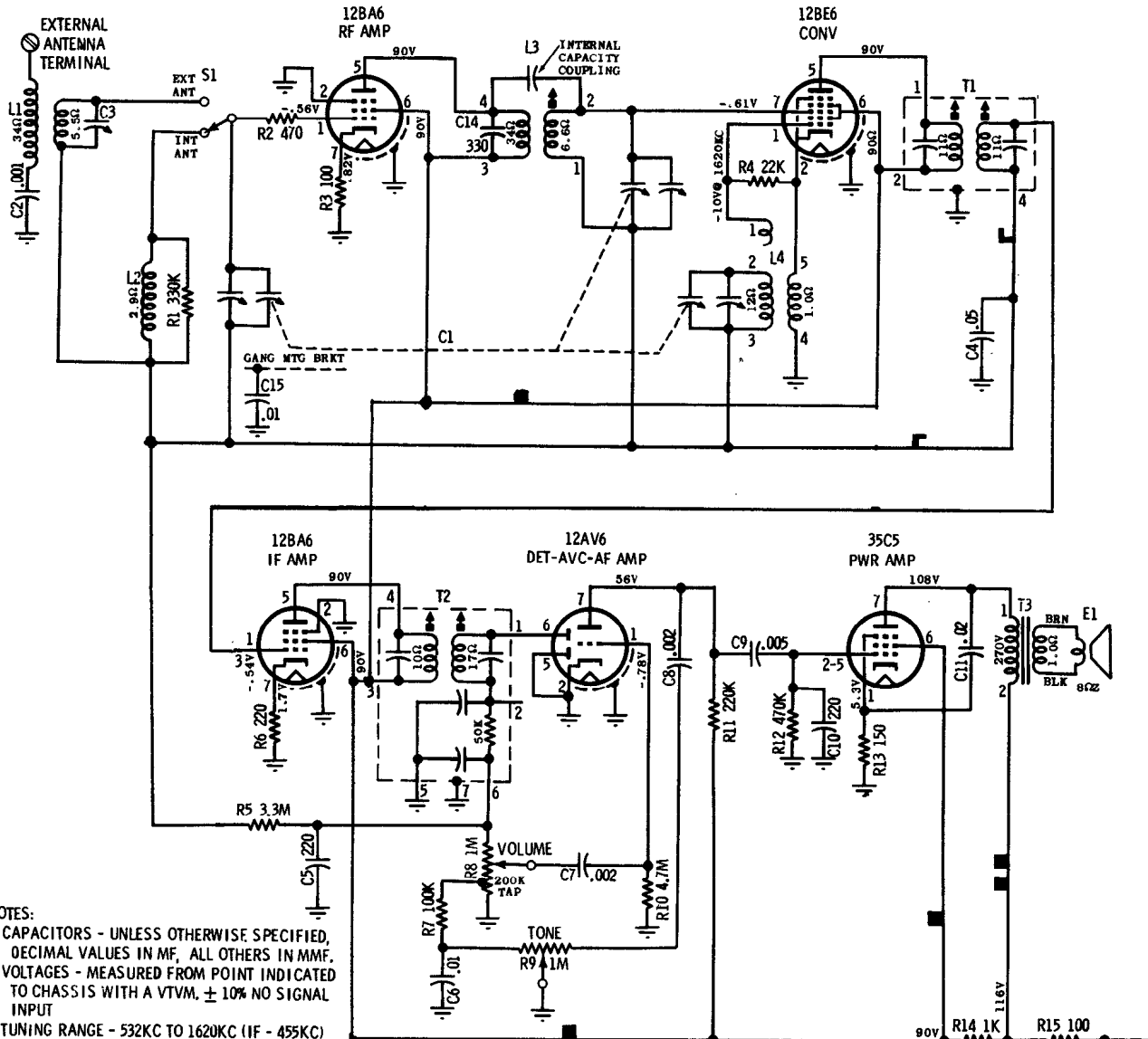
PLATED CHASSIS REFERENCE SYSTEM

All service points accessible on the bottom of the plated chassis have been cross-referenced to the schematic by the circled reference numbers. To locate any specific part on the plated chassis, use the top view detail.

* IN SOME SETS
 * * FEEDBACK CIRCUIT NOT IN ALL SETS

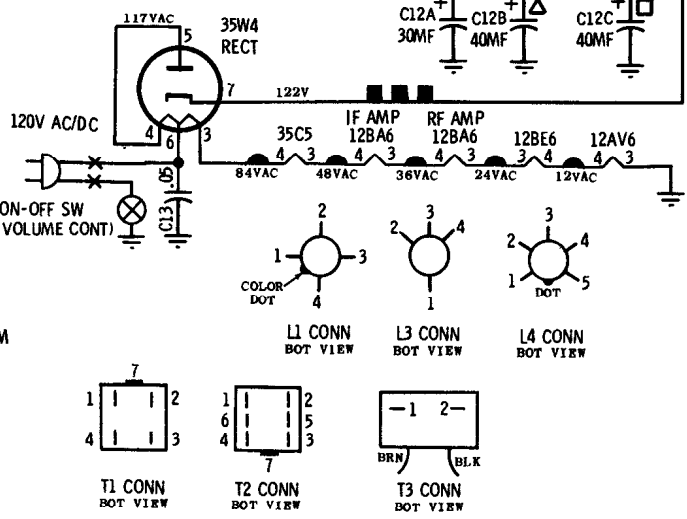
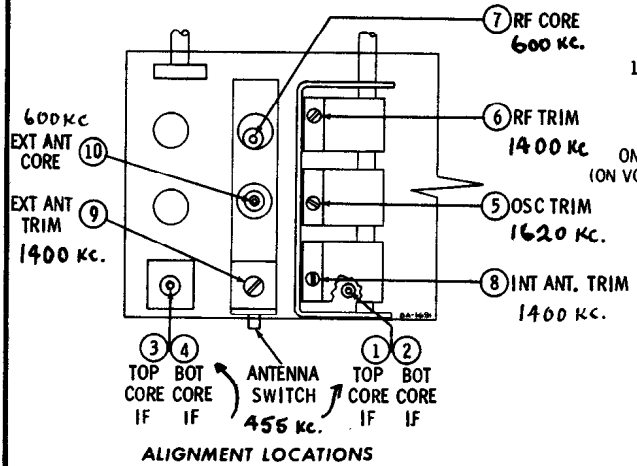
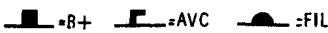
PLATED CHASSIS POINTS (BOTTOM VIEW)

MOTOROLA CHASSIS HS-4137 MODEL A25



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
 TUNING RANGE - 532KC TO 1620KC (IF - 455KC)

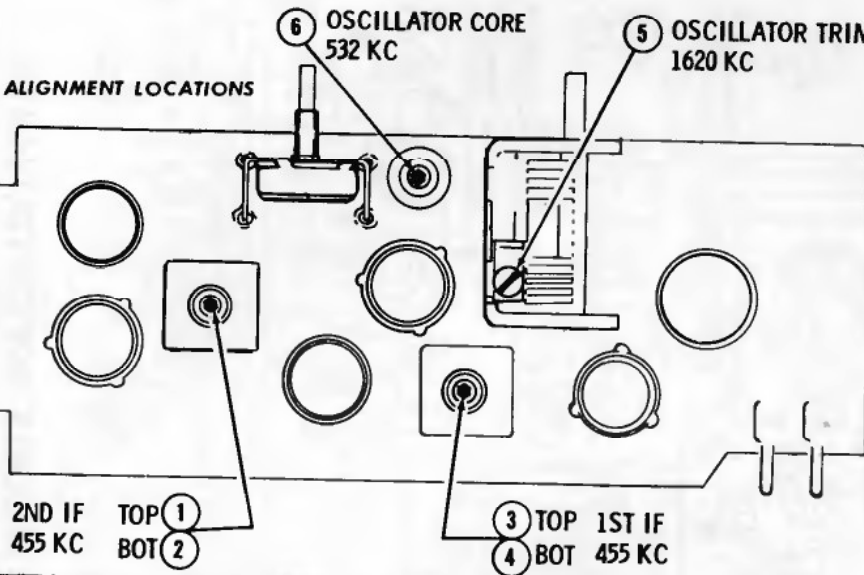
PLATED BOARD WIRING LEGEND



VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

MOTOROLA Models A26, A27, C38, C39, Continued

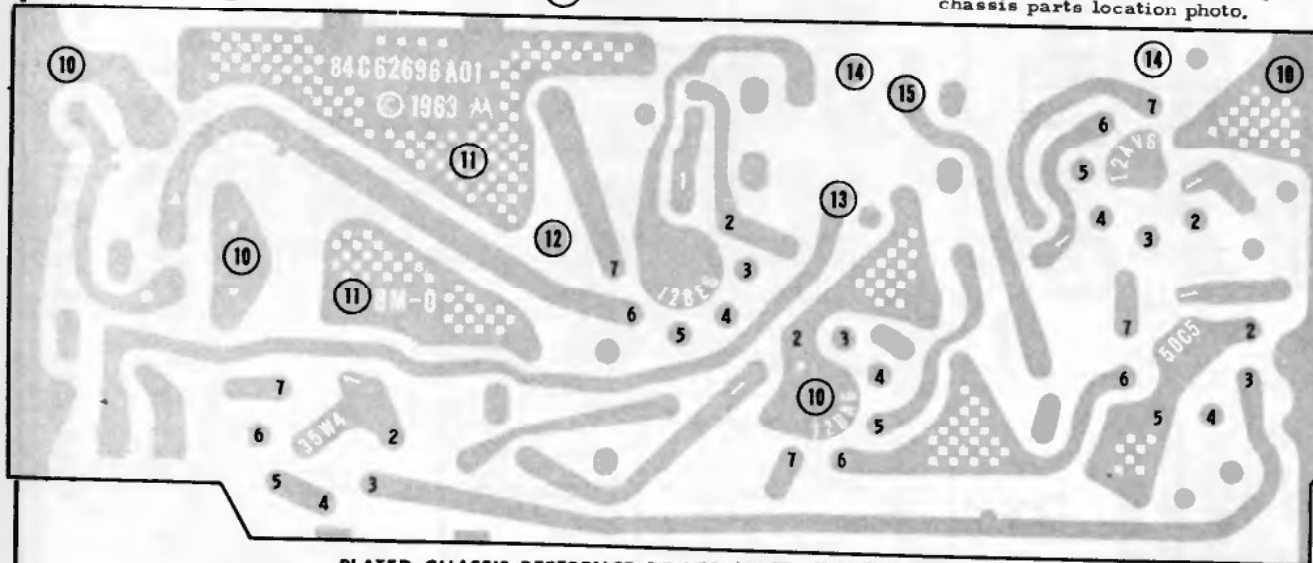
ALIGNMENT LOCATIONS



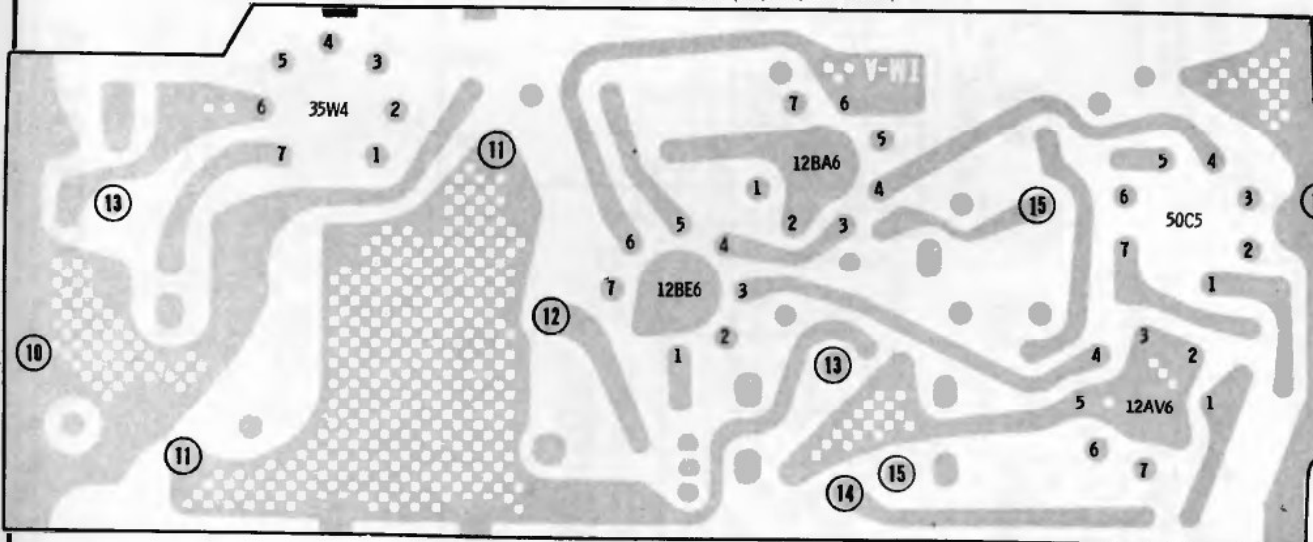
MODEL A27

PLATED CHASSIS REFERENCE SYSTEM

All service points accessible on the bottom of the plated chassis have been cross-referenced to the schematic by the circled reference numbers. To locate any specific part on the plated chassis, use the plated chassis parts location photo.



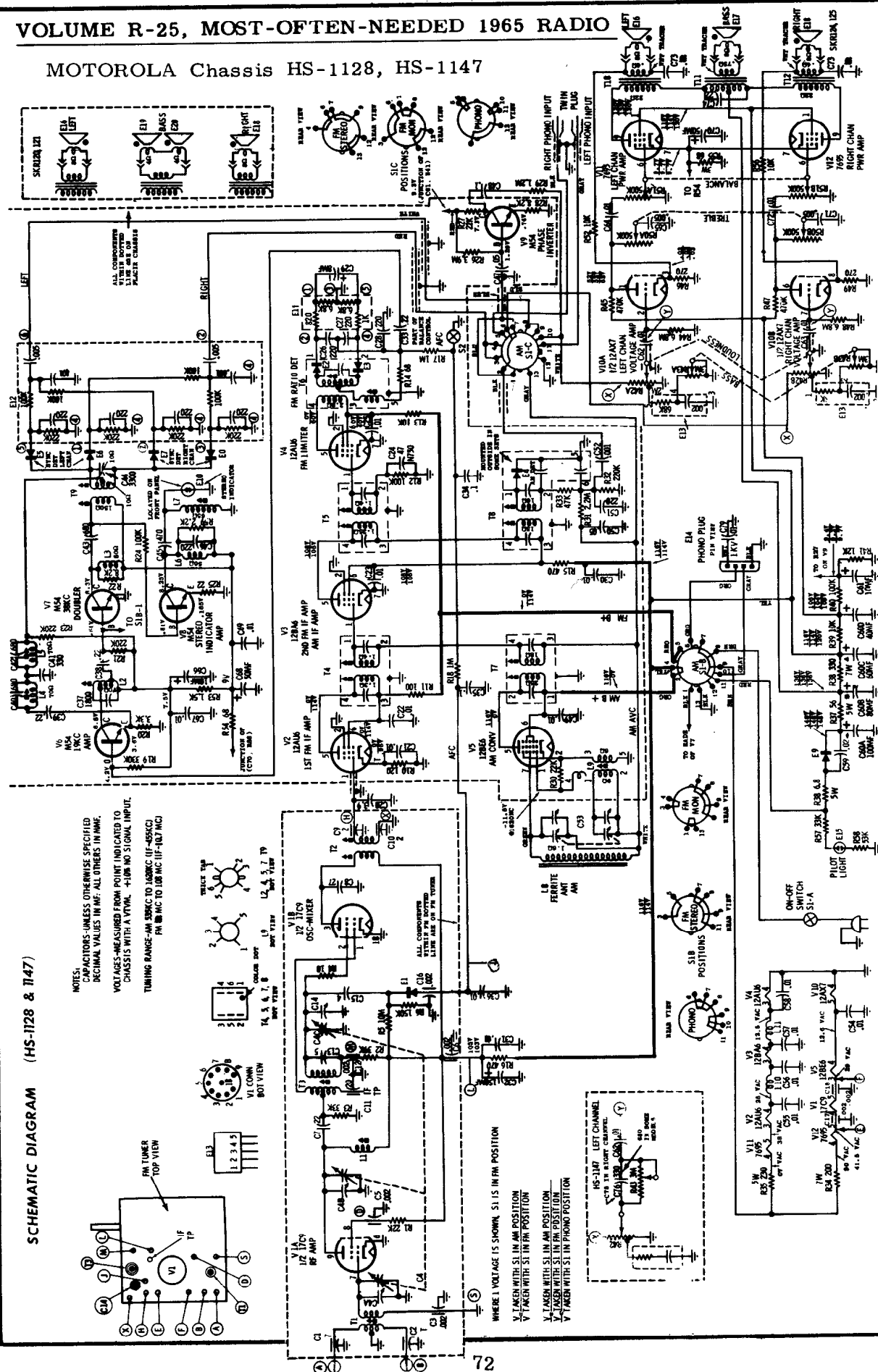
PLATED CHASSIS REFERENCE POINTS (BOTTOM VIEW)



PLATED CHASSIS REFERENCE POINTS (TOP VIEW)

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO

MOTOROLA Chassis HS-1128, HS-1147



SCHEMATIC DIAGRAM (HS-1128 & 1147)

NOTES:
 CAPACITORS UNLESS OTHERWISE SPECIFIED
 DECIMAL VALUES IN MF, ALL OTHERS IN MMF.
 VOLTAGES MEASURED FROM POINT INDICATED TO
 CHASSIS WITH A VTVM. +100 NO SIGNAL INPUT.
 TUNING RANGE-AM 530KC TO 1600KC (IF-455KC)
 FM 88 MC TO 108 MC (IF-107 MC)

WHERE 1 VOLTAGE IS SHOWN, S1 IS IN FM POSITION
 1/2 TAKEN WITH S1 IN AM POSITION
 1/4 TAKEN WITH S1 IN FM POSITION
 1/8 TAKEN WITH S1 IN AM POSITION
 1/16 TAKEN WITH S1 IN PHONO POSITION

HS-1147 LEFT CHANNEL
 CTR 100% STOPT. CHANNEL
 100% STOPT. CHANNEL

ALL COMPONENTS
 LISTED ARE SUPPLIED
 WITH THIS CHASSIS

FM TUNER
 TOP VIEW

FM TUNER
 BOTTOM VIEW

FM TUNER
 SIDE VIEW

FM TUNER
 FRONT VIEW

FM TUNER
 REAR VIEW

FM TUNER
 TOP VIEW

FM TUNER
 BOTTOM VIEW

FM TUNER
 SIDE VIEW

FM TUNER
 FRONT VIEW

FM TUNER
 REAR VIEW

FM TUNER
 TOP VIEW

FM TUNER
 BOTTOM VIEW

FM TUNER
 SIDE VIEW

FM TUNER
 FRONT VIEW

FM TUNER
 REAR VIEW

FM TUNER
 TOP VIEW

FM TUNER
 BOTTOM VIEW

FM TUNER
 SIDE VIEW

FM TUNER
 FRONT VIEW

FM TUNER
 REAR VIEW

FM TUNER
 TOP VIEW

FM TUNER
 BOTTOM VIEW

FM TUNER
 SIDE VIEW

FM TUNER
 FRONT VIEW

FM TUNER
 REAR VIEW

FM TUNER
 TOP VIEW

FM TUNER
 BOTTOM VIEW

FM TUNER
 SIDE VIEW

FM TUNER
 FRONT VIEW

FM TUNER
 REAR VIEW

FM TUNER
 TOP VIEW

FM TUNER
 BOTTOM VIEW

FM TUNER
 SIDE VIEW

FM TUNER
 FRONT VIEW

FM TUNER
 REAR VIEW

FM TUNER
 TOP VIEW

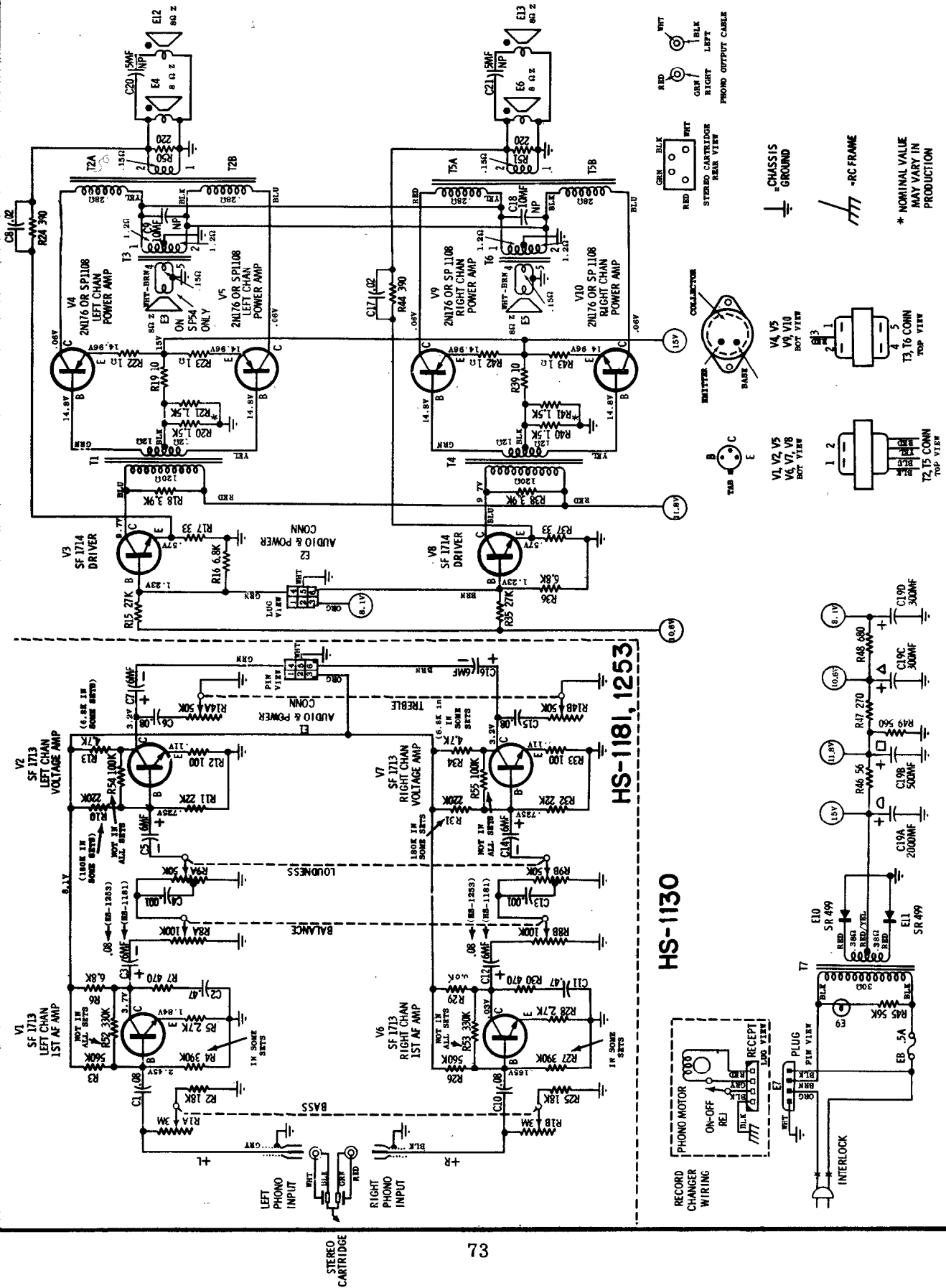
FM TUNER
 BOTTOM VIEW

MOTOROLA MODELS SKR120,121,124,125

CHASSIS HS-1128,1147

MOTOROLA

MOTOROLA CHASSIS HS-1130, 1181, 1253, MODELS SP53, SP54



MOTOROLA CHASSIS HS-1137,1138,1222

MODELS SK136,161,162,SKR135,136,161,162, SK-166, SKR-166, SKR-167

(Material on pages 74 through 76)

Three-Channel Stereophonic Consoles; SK versions use the HS-1137 pre-amp, SKR versions use the HS-1138 tuner pre-amp; all versions use the HS-1222 power amp.

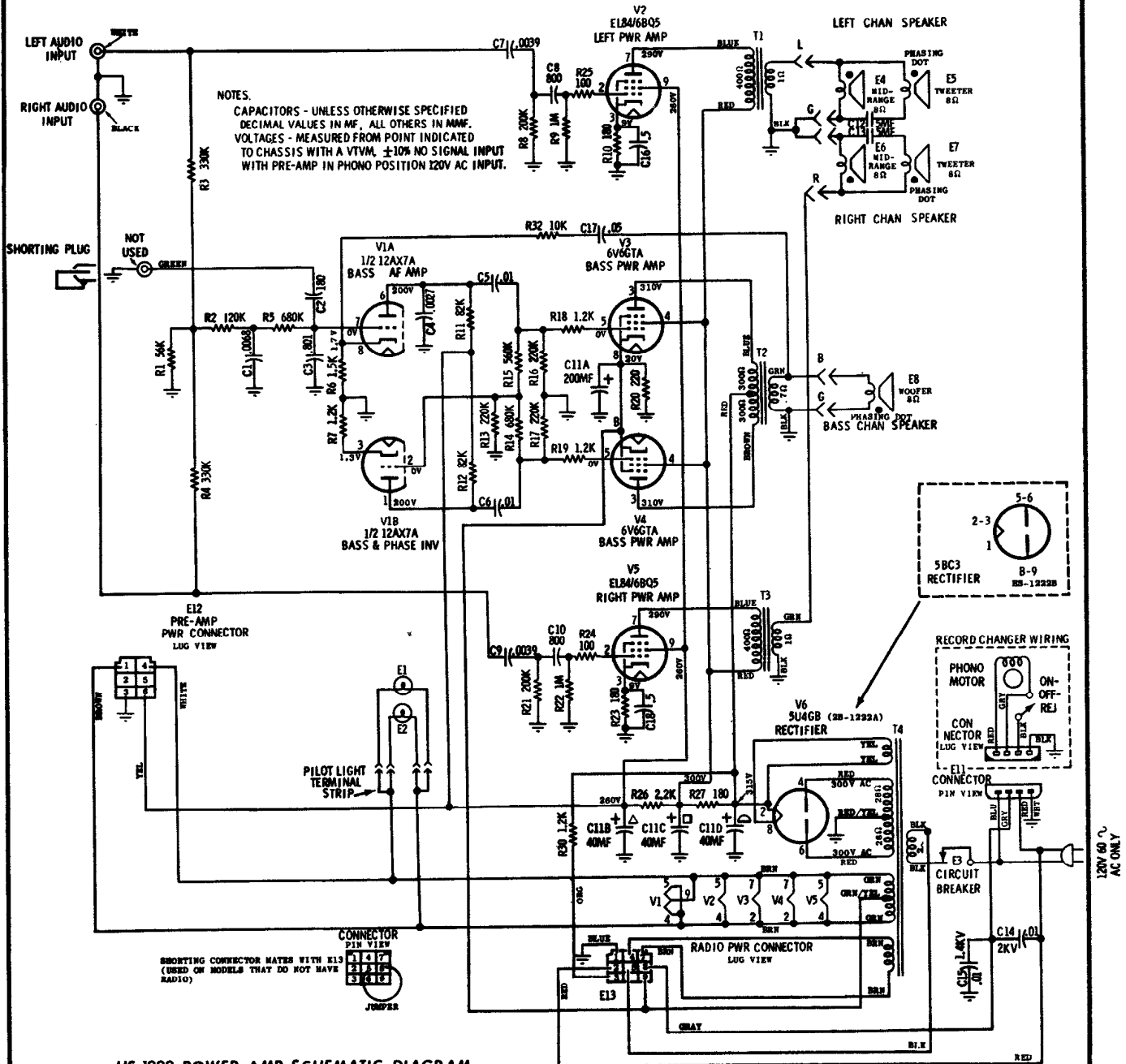
OPERATING AMPLIFIER WITH LOAD - Always operate the amplifier chassis with an output load (either the speakers or an 8 ohm, 10 watt resistive load) across each channel.

SPEAKER PHASING - Refer to the schematic diagram.

ELECTRICAL SPECIFICATIONS

Power Supply: 120 volts, 60 cycle AC only

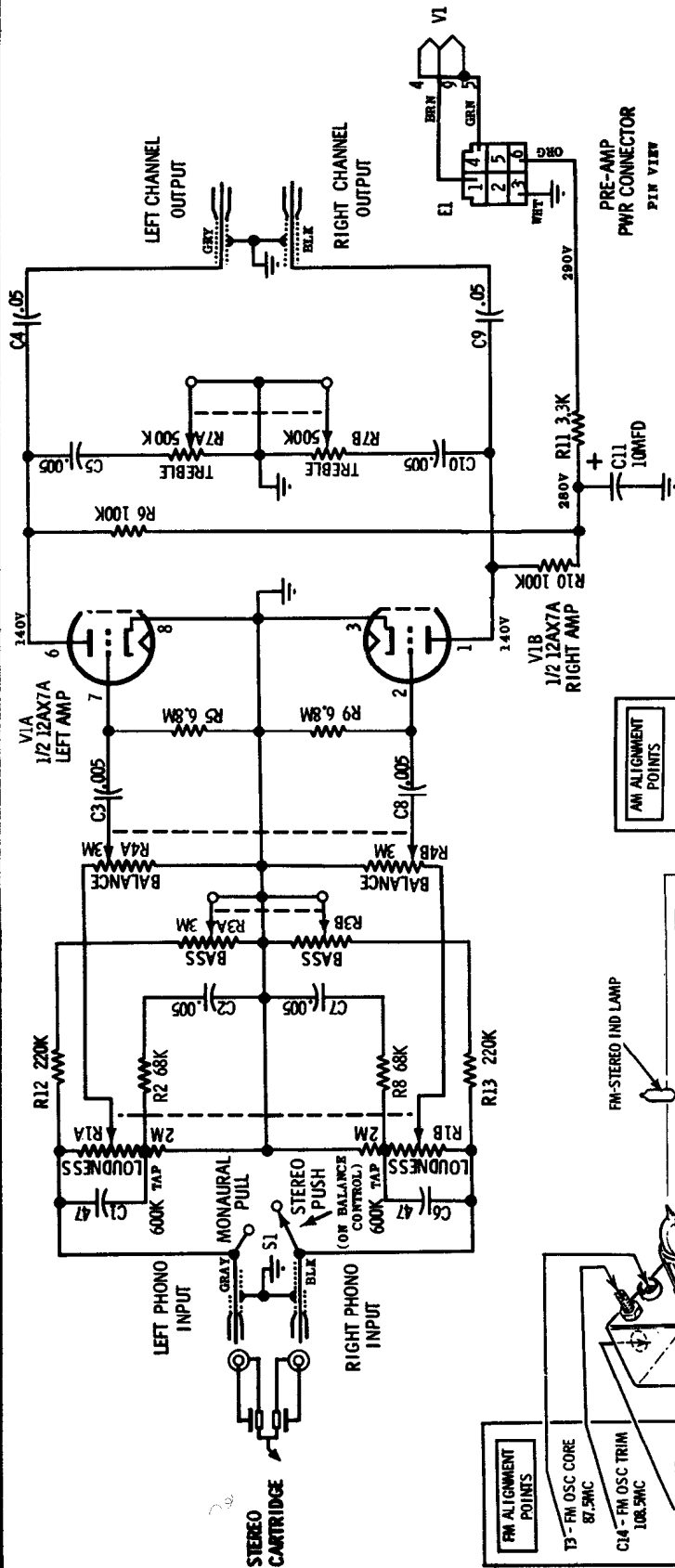
Power Consumption: 190 watts (includes radio power).



HS-1222 POWER AMP SCHEMATIC DIAGRAM

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

MOTOROLA Chassis HS-1137, HS-1138 (see pages 74, 76, for related data)



HS-1137 PRE-AMP SCHEMATIC DIAGRAM

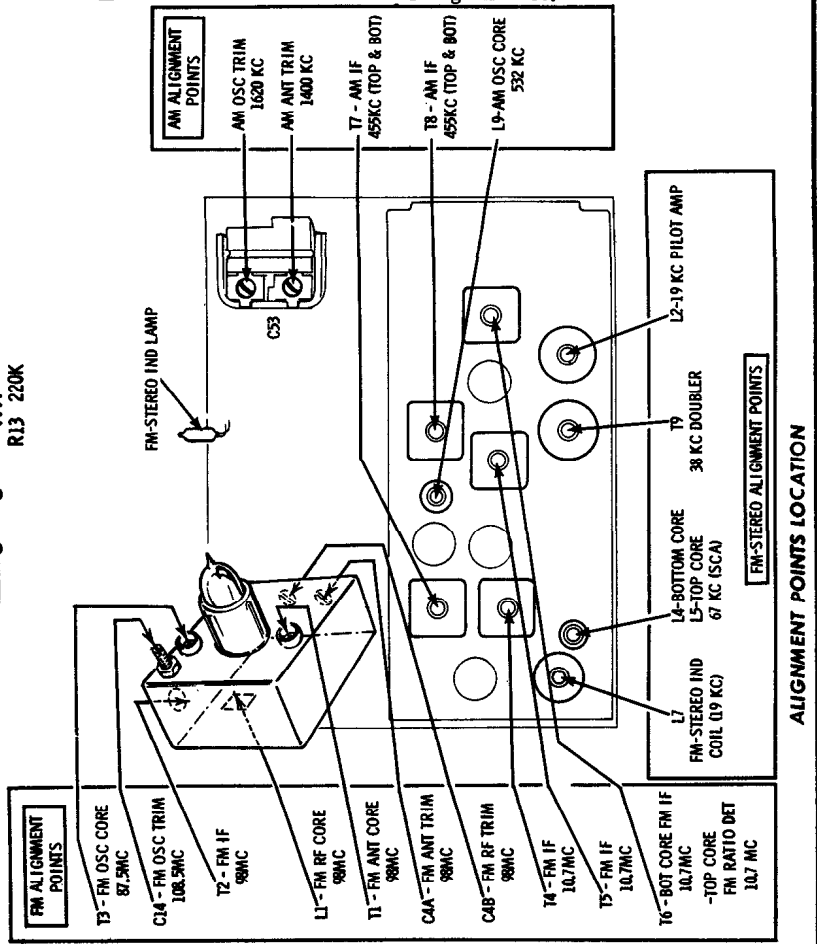
CHASSIS REMOVAL

Pre-Amp (HS-1137)

1. Remove control knobs.
2. Remove back cover by removing screws.
3. Remove record storage compartment by removing its bezel and then compressing top edges.
4. Remove 4 hex nuts and 1 machine screw located next to loudness control.
5. Pull pre-amp down and disconnect any leads if necessary.

TUNER CHASSIS (HS-1138)

1. Remove back cover by removing screws and pulling cover back to disengage inter-lock plug.
2. Remove record storage compartment by removing screw in bracket at bottom of storage compartment to remove it.
3. Disconnect cables, remove the chassis mounting screws and lift chassis out. Power amp chassis can be removed by removing screws holding chassis to cabinet bottom and lifting chassis out. Be sure all cables are disconnected before removing chassis.



ALIGNMENT POINTS LOCATION

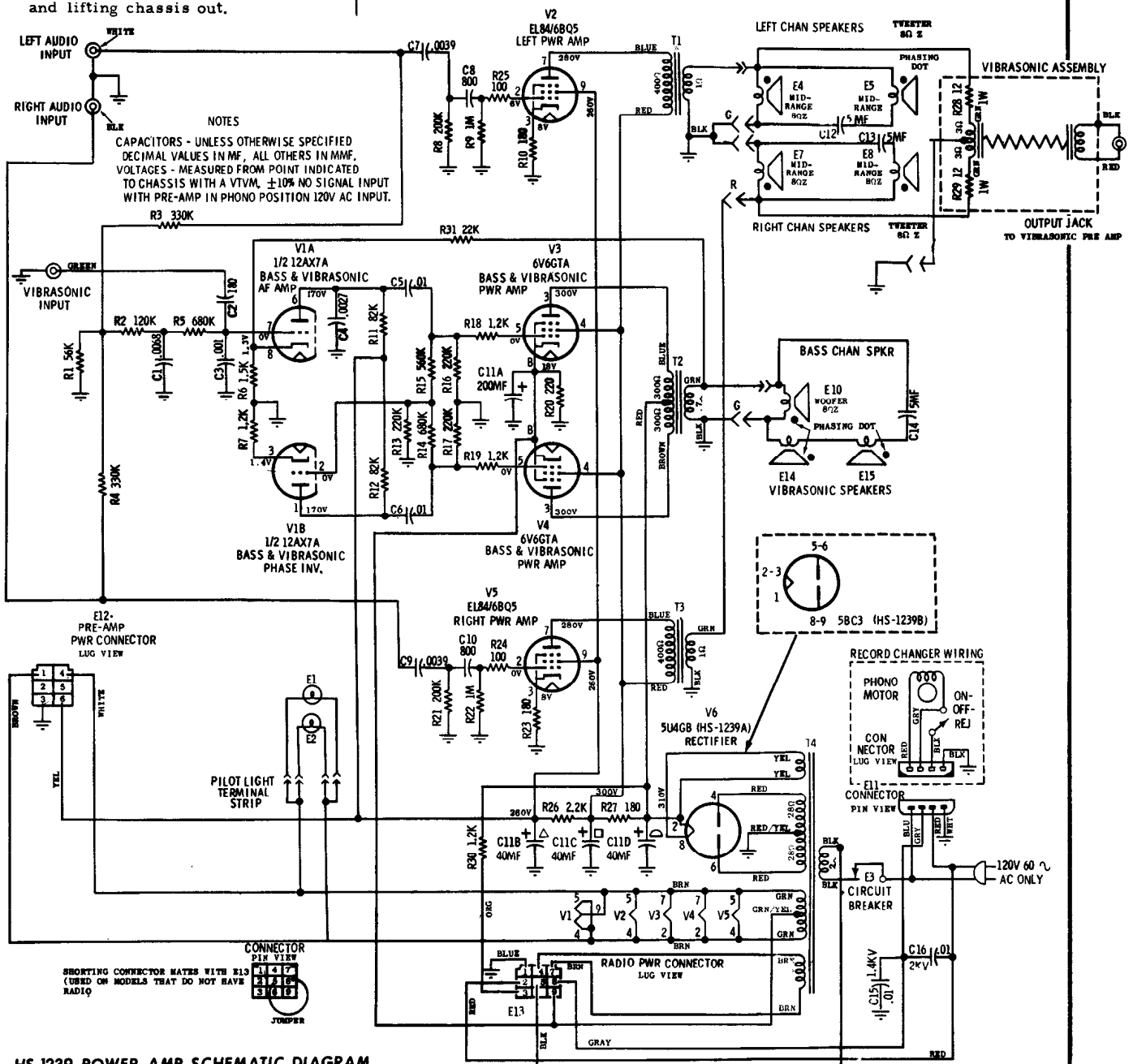
MOTOROLA

MODELS SK145,163,SKR145,163 CHASSIS HS-1185,1186,1239

CHASSIS REMOVAL

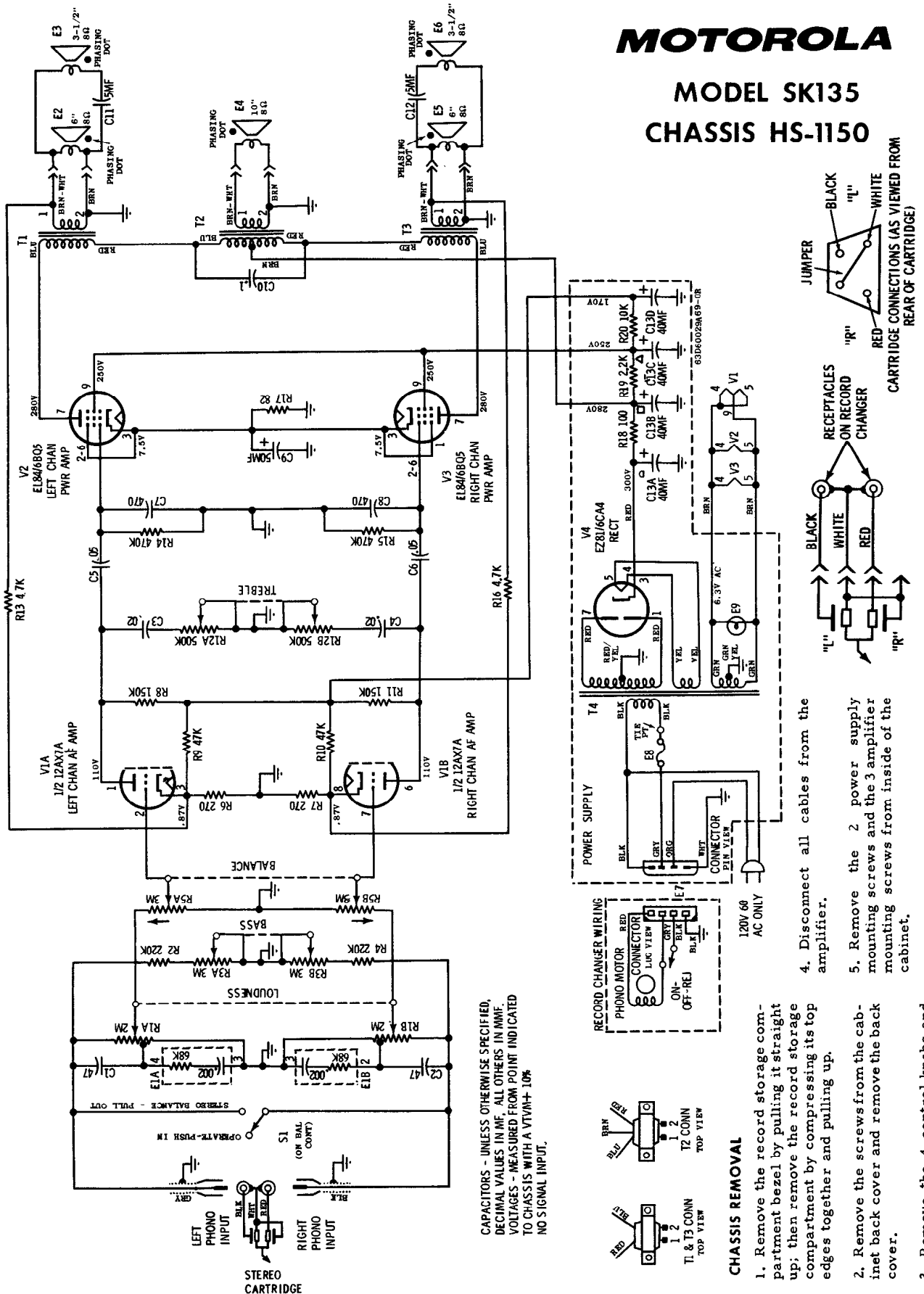
1. Remove back cover by removing screws and pulling cover back to disengage inter-lock plug.
2. Remove record storage compartment by removing screw in bracket at bottom of storage compartment. Compress top edges of compartment to remove it.
3. Disconnect cables, remove chassis mounting screws and lift chassis out. Power amp chassis can be removed by removing screws holding chassis to cabinet bottom and lifting chassis out.

These models are three-channel Stereophonic consoles. SK versions use HS-1186 pre-amp chassis which is very similar to HS-1137 (on page 75); SKR versions use HS-1185 tuner which is very similar to HS-1138 (page 76); all versions use HS-1239 power amplifier, schematic diagram below.



MOTOROLA

MODEL SK135 CHASSIS HS-1150



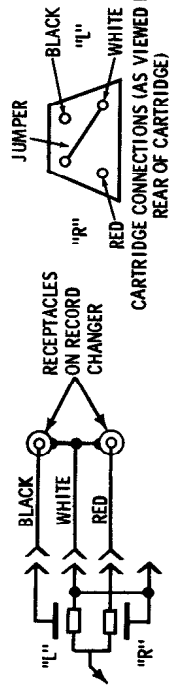
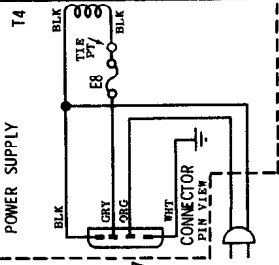
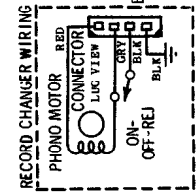
CHASSIS REMOVAL

1. Remove the record storage compartment bezel by pulling it straight up; then remove the record storage compartment by compressing its top edges together and pulling up.
2. Remove the screws from the cabinet back cover and remove the back cover.
3. Remove the 4 control knobs and the 2 cup nuts on the control shafts.

4. Disconnect all cables from the amplifier.

5. Remove the 2 power supply mounting screws and the 3 amplifier mounting screws from inside of the cabinet.

6. Remove chassis from cabinet.

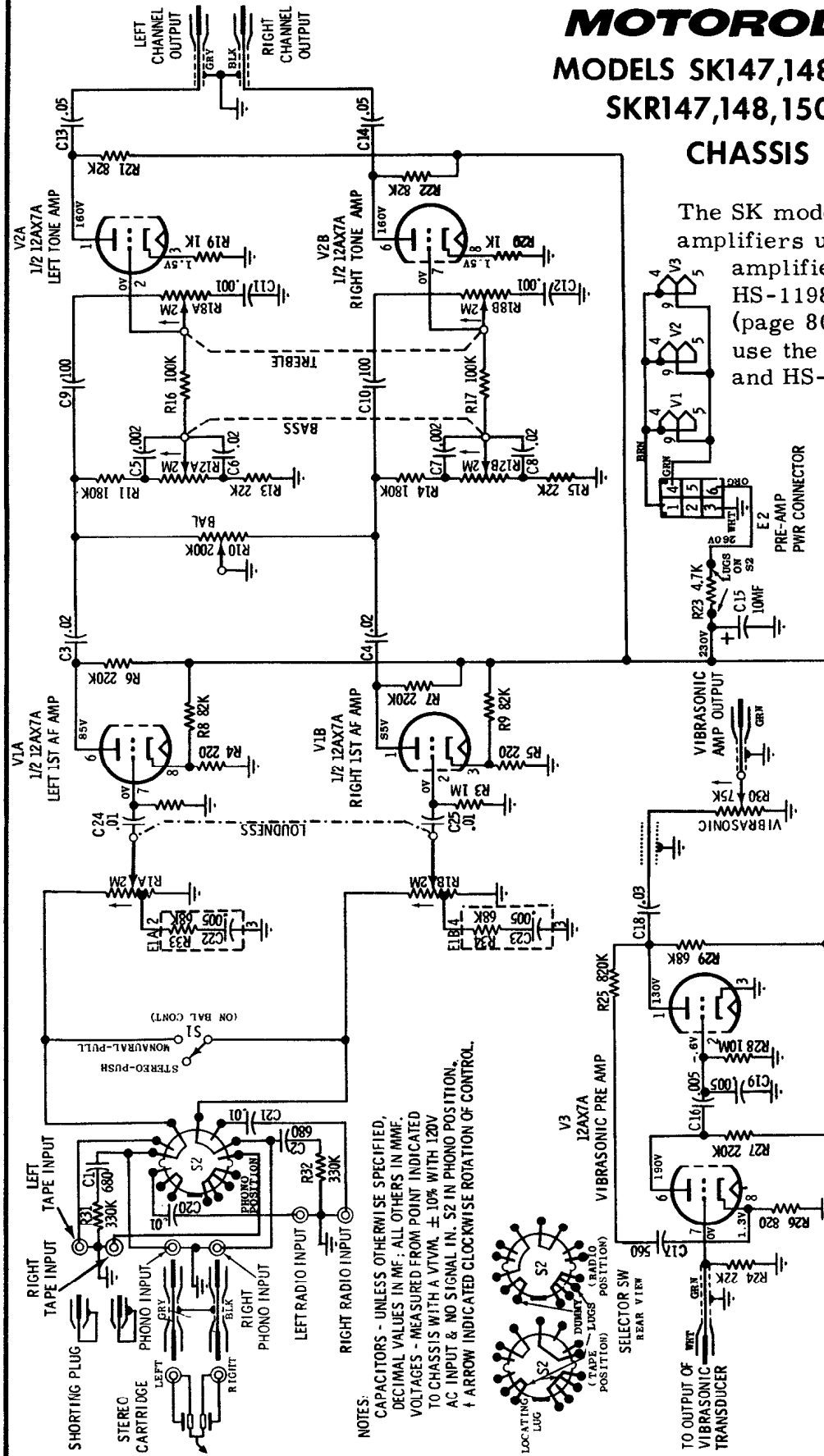


MOTOROLA

MODELS SK147,148,150,154,164,165,
SKR147,148,150,153,154,164,165
CHASSIS HS-1141,1197,1198

The SK models are stereophonic amplifiers using HS-1197 pre-amplifier (this page) and HS-1198 power amplifier (page 80). The SKR types use the same amplifiers and HS-1141 tuner (p. 81).

HS-1197 PRE-AMP SCHEMATIC DIAGRAM



NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF.; ALL OTHERS IN MMF.
VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM, ±10% WITH 120V AC INPUT & NO SIGNAL IN. S2 IN PHONO POSITION.
↑ ARROW INDICATED CLOCKWISE ROTATION OF CONTROL.

CHASSIS REMOVAL (HS-1197)
1. On models that contain the built-in AM-FM tuner, HS-1141, it will be necessary to remove the HS-1141 as described above because the HS-1199 pre-amp is attached to it.
2. On models not containing the AM-FM tuner, remove the cabinet back cover as above, disconnect all cables, then remove the 2 chassis

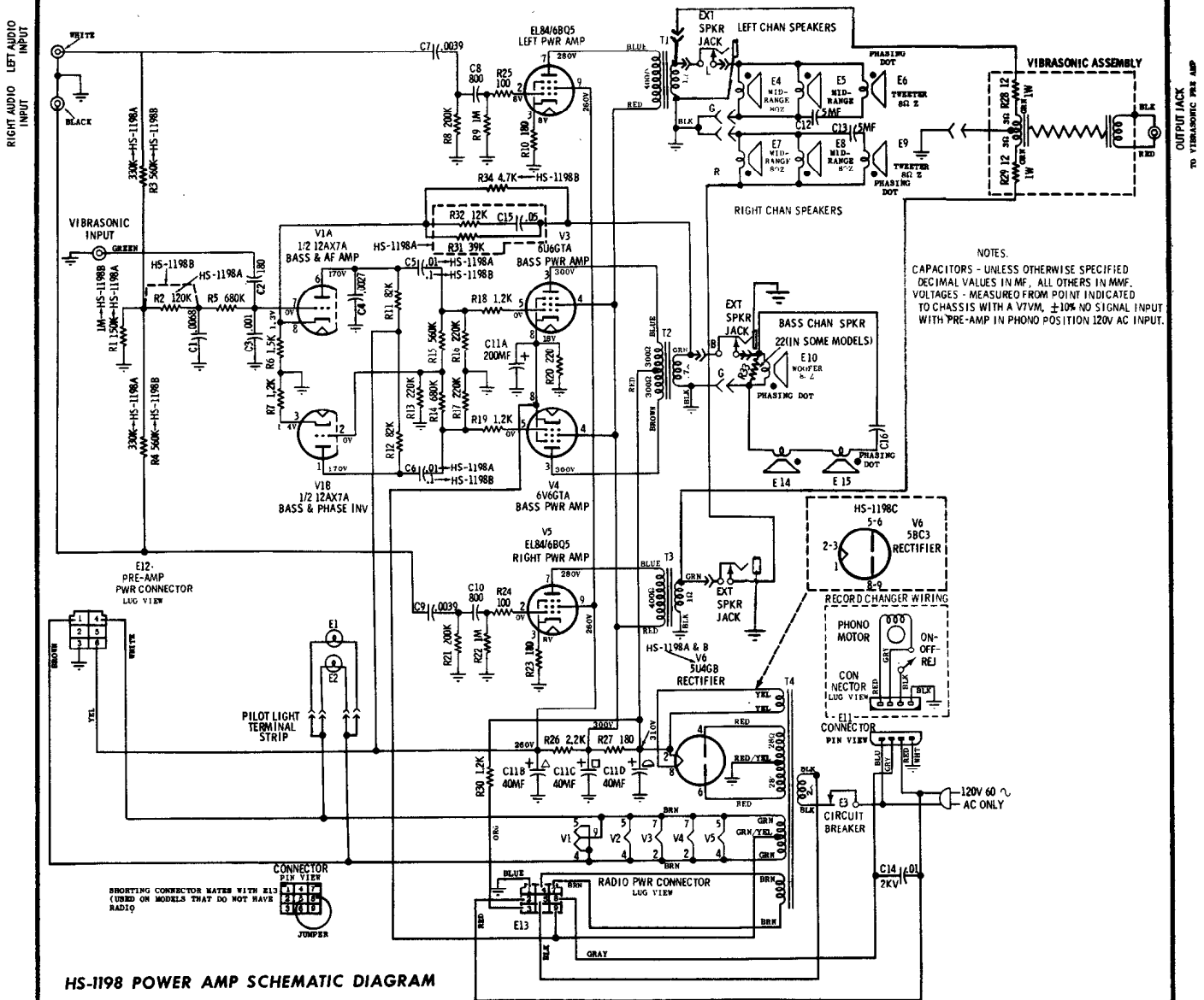
CHASSIS REMOVAL (HS-1141)
1. Remove cabinet back cover mounting screws and cabinet back cover.
2. On models that use a record well, remove the well as follows: Remove record well bezel by lifting straight up, then remove well by compressing top edges and pulling up.
3. Unplug all cables and leads; remove 2 chassis mounting wing nuts

CHASSIS REMOVAL (POWER AMP HS-1198)
1. Remove cabinet back cover mounting screws and cabinet back cover.
2. Disconnect all cables, remove chassis mounting screws then the chassis.

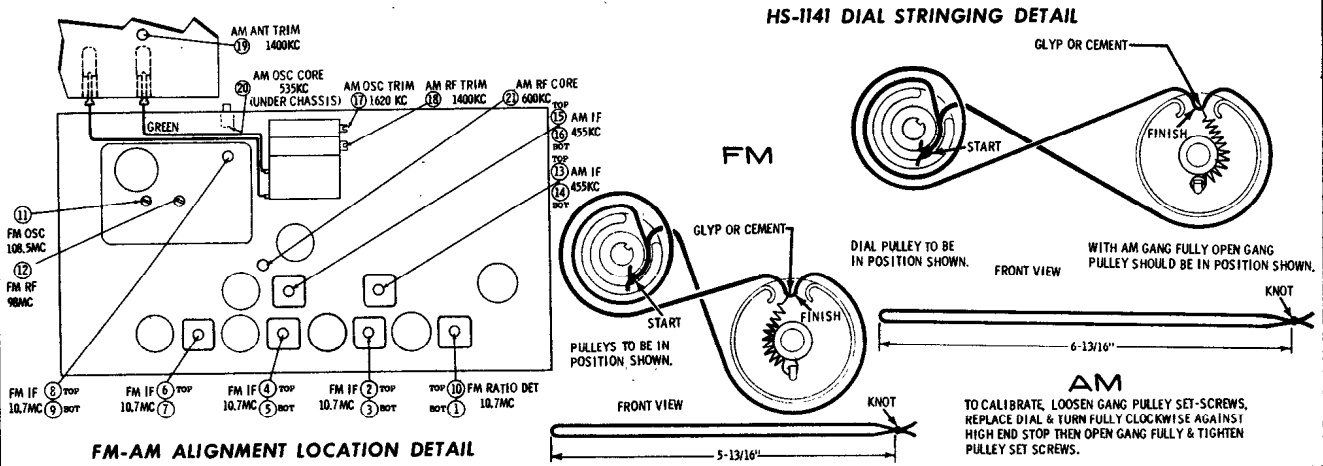
mounting hex nuts and 2 rubber sleeves with eyelets and remove chassis from cabinet.

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

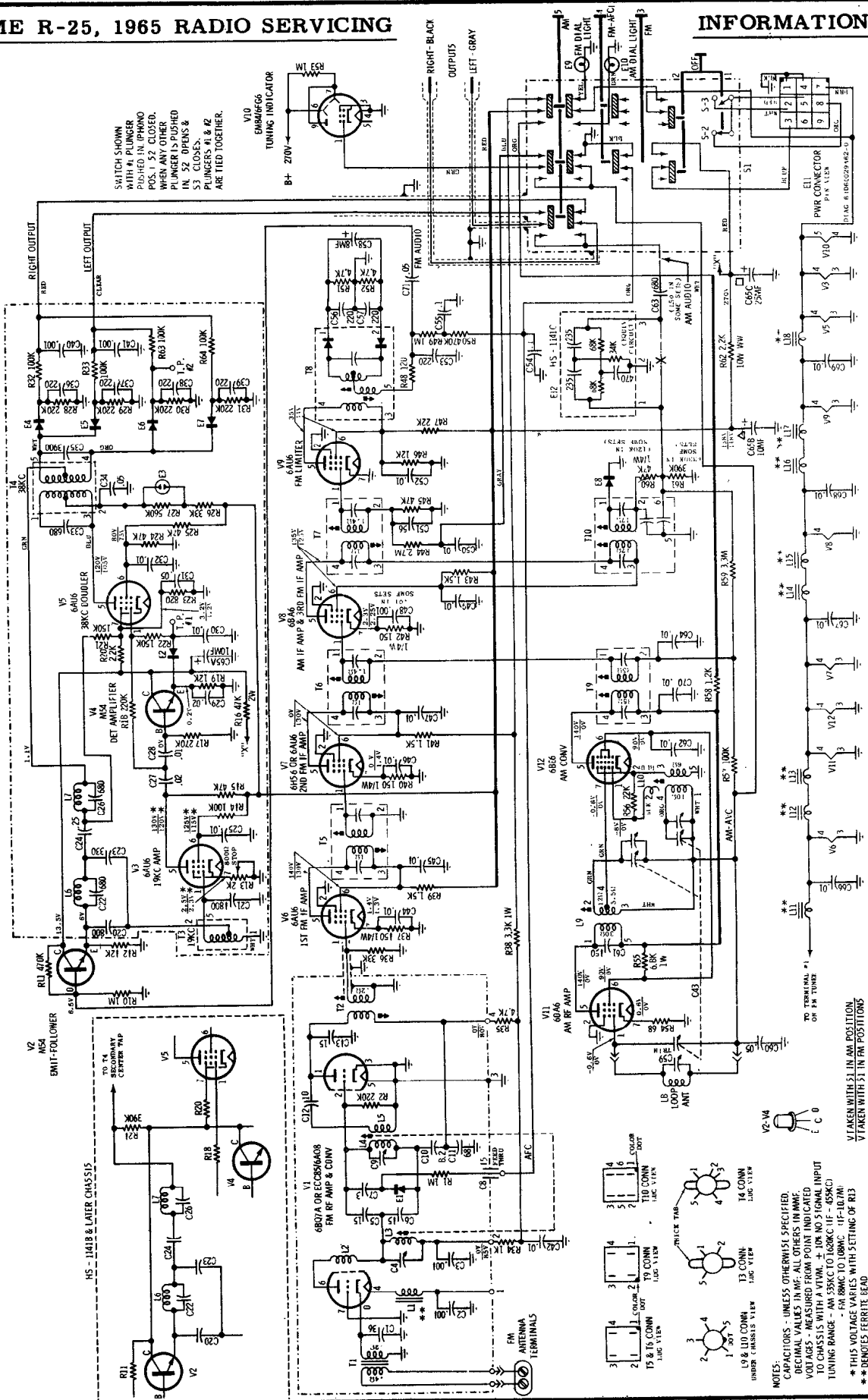
MOTOROLA Chassis HS-1198 Amplifier (for list of models see page 79)



Additional material for HS-1141 Tuner, see page 81



MOTOROLA Chassis HS-1141 Tuner used in various models, see pages 79 and 82
 (Tuner HK81 uses HS-1141 and is used with various models)



HS-1141: AM-FM TUNER REVISED SCHEMATIC

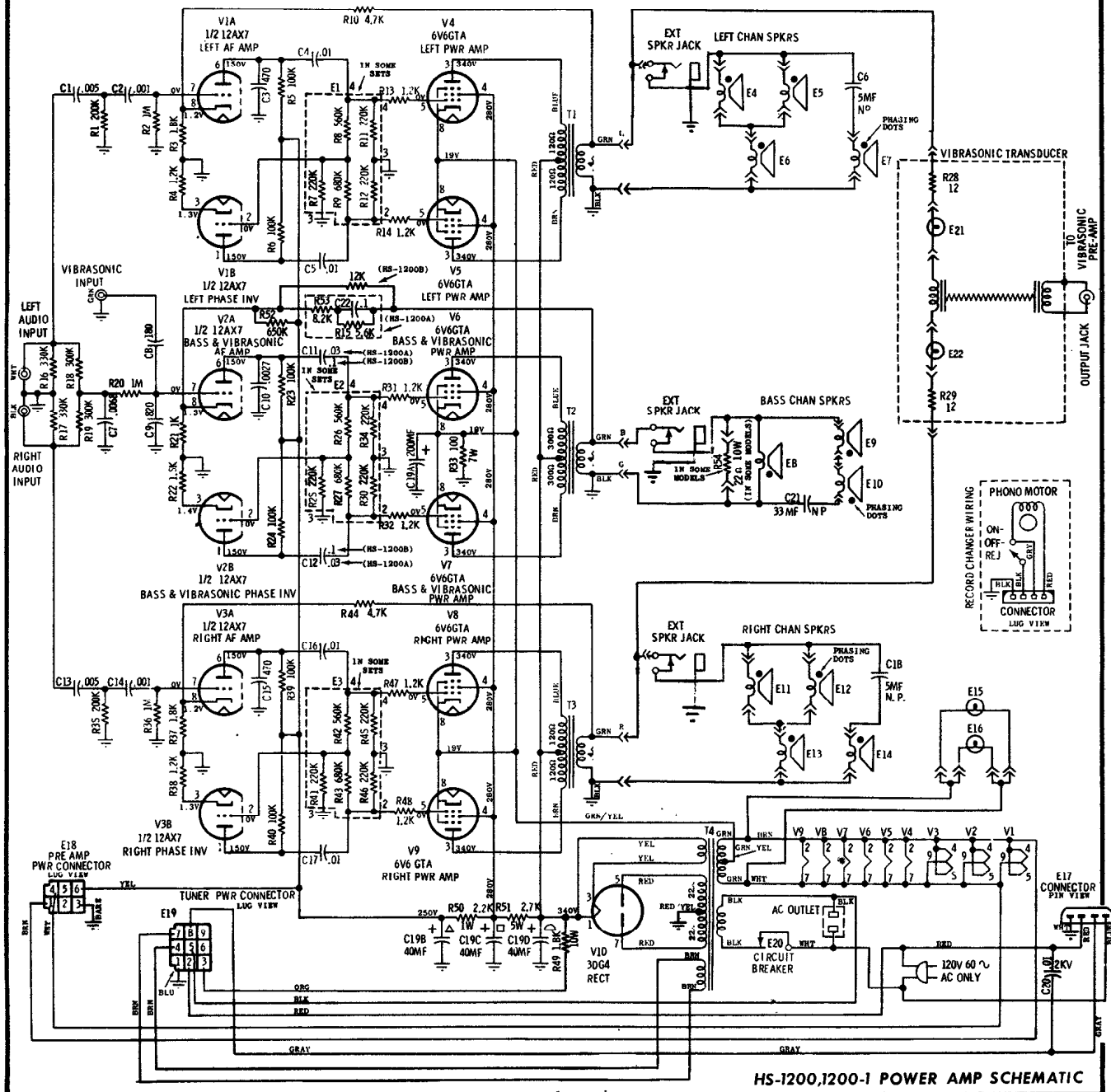
NOTES:
 CAPACITORS - UNLESS OTHERWISE SPECIFIED, DECIMAL VALUES IN MF; ALL OTHERS IN MMF.
 VOLTAGES - MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM. \pm 10% NO. 5 SIGNAL INPUT
 TUNING RANGE - AM 530KC TO 1600KC (IF - 455KC)
 * THIS VOLTAGE TAKES WITH SETTING OF RD
 ** RESISTORS 1/2W - 10% UNLESS OTHERWISE NOTED

MOTOROLA

MODELS SK151,152, SKR151,152,155,156,157,158,159,160

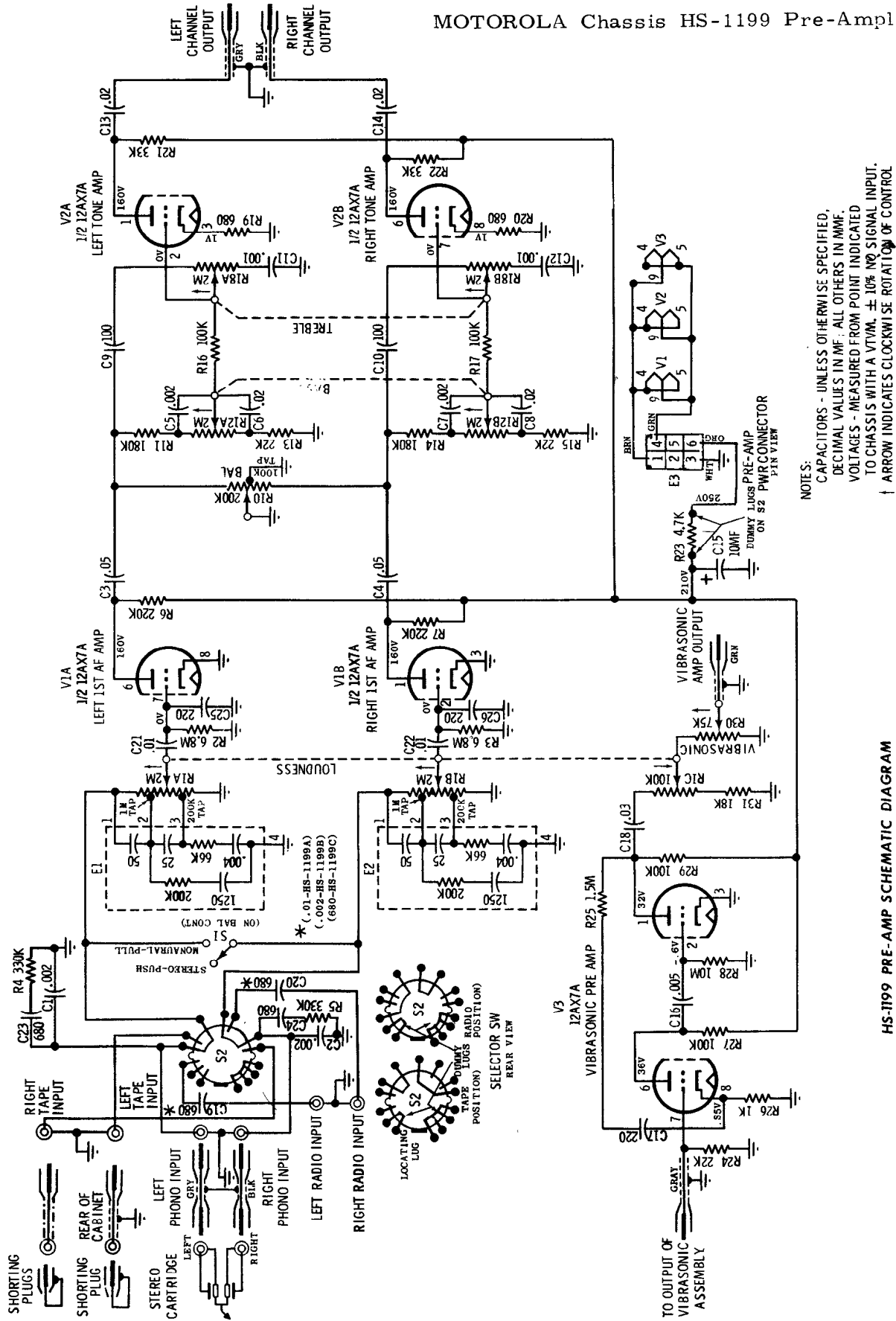
CHASSIS HS-1141,1199,1200,1200-1

Models with SK prefix use HS-1199 pre-amplifier (see page 83) and HS-1200 or HS-1200-1 (see circuit below) for stereo reproduction. Stereo models with SKR prefix use the same amplifiers and HS-1141 tuner (diagram on page 81). Other tuner data on page 80.



VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

MOTOROLA Chassis HS-1199 Pre-Amplifier



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.
 † ARROW INDICATES CLOCKWISE ROTATION OF CONTROL.

HS-1199 PRE-AMP SCHEMATIC DIAGRAM

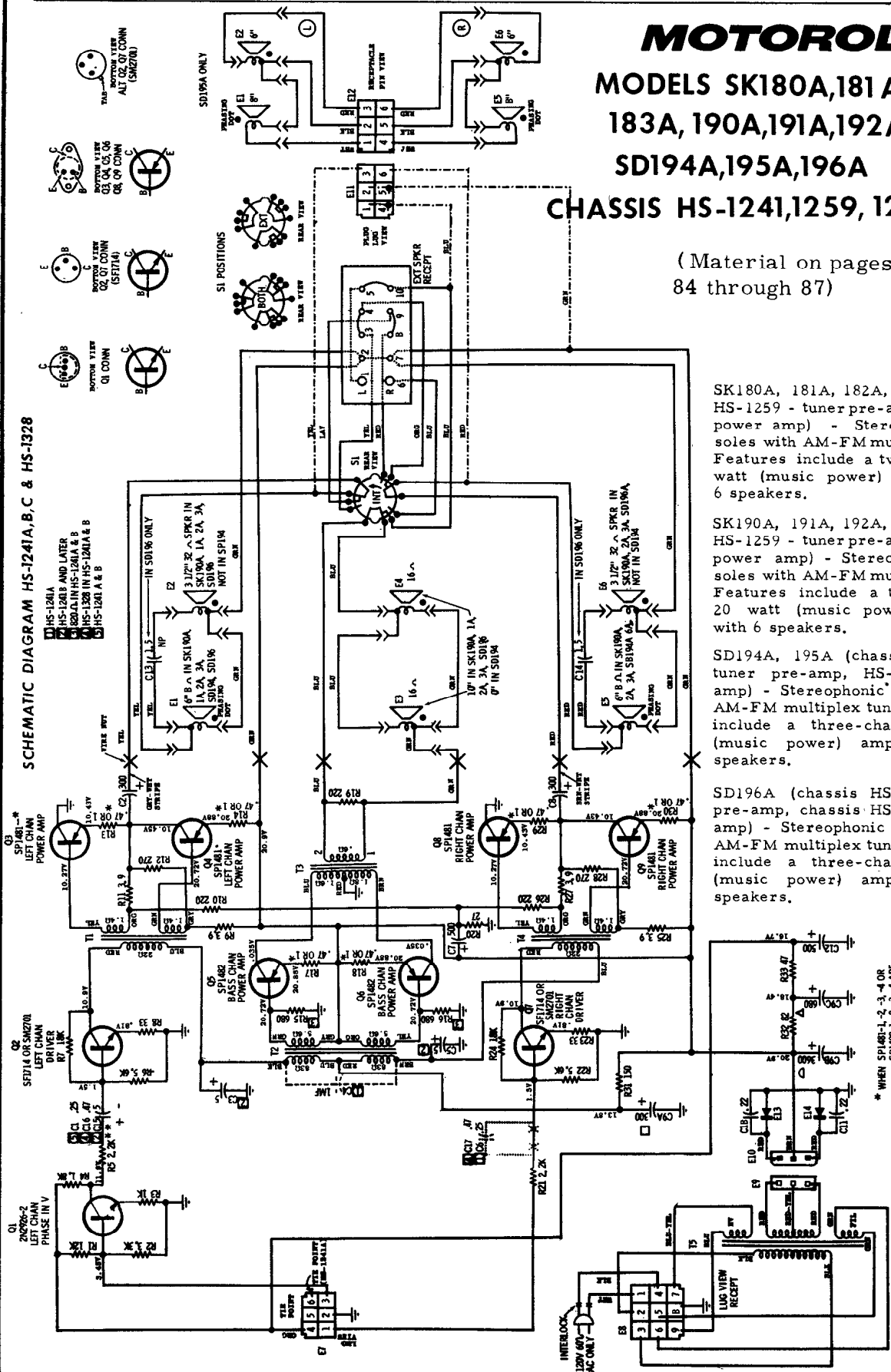
MOTOROLA

MODELS SK180A, 181A, 182A,
183A, 190A, 191A, 192A, 193A
SD194A, 195A, 196A

CHASSIS HS-1241, 1259, 1264, 1328

(Material on pages
84 through 87)

SCHEMATIC DIAGRAM HS-1241A, B, C & HS-1328



SK180A, 181A, 182A, 183A (chassis HS-1259 - tuner pre-amp, HS-1264 - power amp) - Stereophonic consoles with AM-FM multiplex tuners. Features include a two-channel, 10 watt (music power) amplifier and 6 speakers.

SK190A, 191A, 192A, 193A (chassis HS-1259 - tuner pre-amp, HS-1241 - power amp) - Stereophonic consoles with AM-FM multiplex tuners. Features include a three-channel, 20 watt (music power) amplifier with 6 speakers.

SD194A, 195A (chassis HS-1259 - tuner pre-amp, HS-1241 - power amp) - Stereophonic consoles with AM-FM multiplex tuners. Features include a three-channel, 20 watt (music power) amplifier with 4 speakers.

SD196A (chassis HS-1259 - tuner pre-amp, chassis HS-1328 - power amp) - Stereophonic console with AM-FM multiplex tuners. Features include a three-channel, 20 watt (music power) amplifier with 6 speakers.

NOTES:
CAPACITORS: IN μ F, UNLESS OTHERWISE SPECIFIED.
VOLTAGES: MEASURED FROM POINT INDICATED TO CHASSIS WITH VTVM \pm 3%. NO SIGNAL IN.

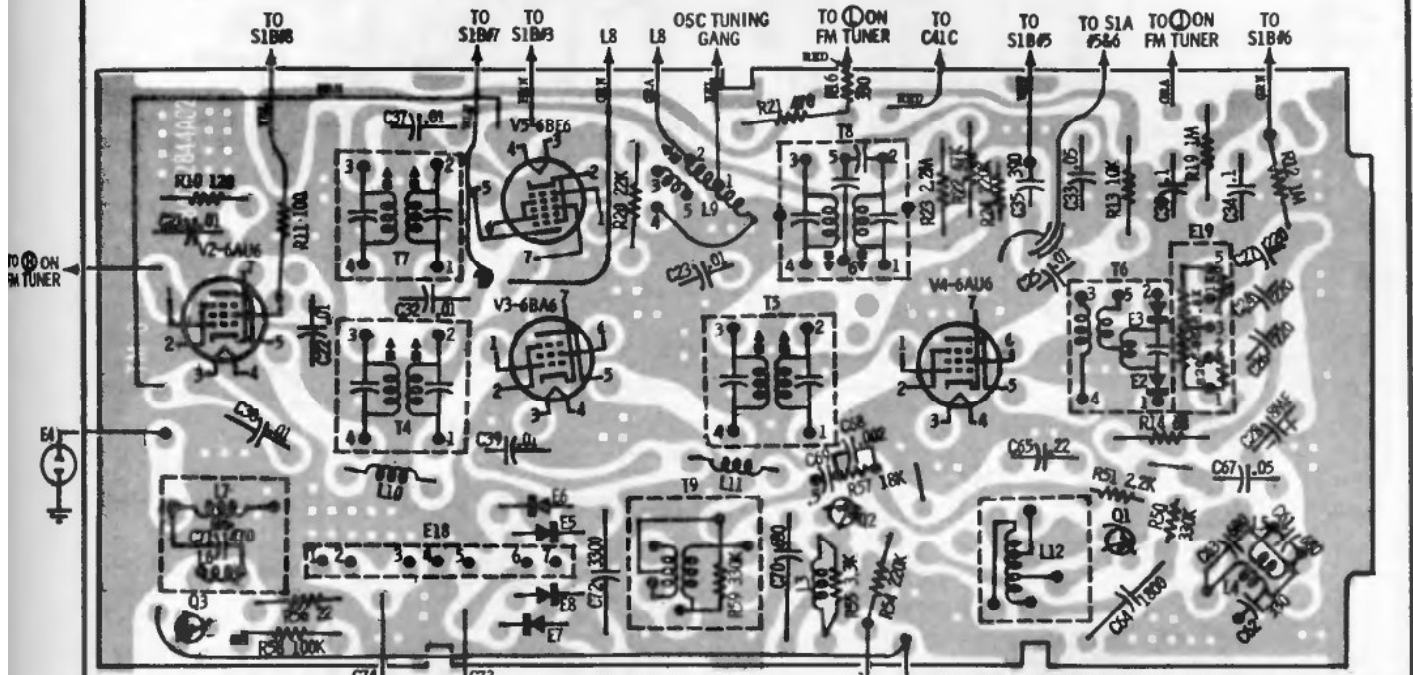
* WHEN SPI481-1, -2, -3, -4 OR SPI482-1, -2, -3, -4 ARE USED EMITTER RESISTOR IS 47 Ω .
WHEN SPI481-5, -6, -7 OR SPI482-5, -6, -7 ARE USED EMITTER RESISTOR IS 1 Ω .

HS-1241A, B, C & HS-1328 SCHEMATIC
= CHASSIS

MOTOROLA

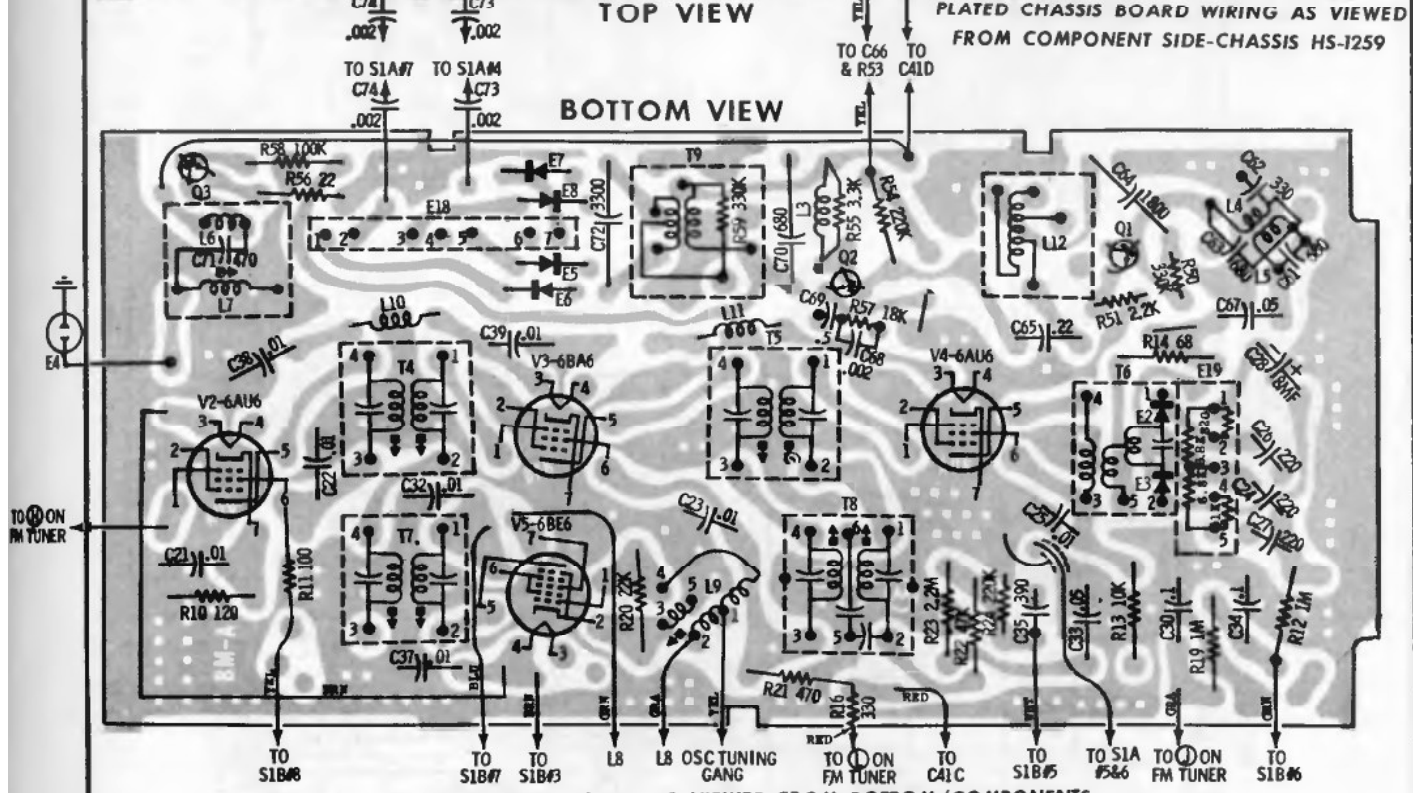
MODELS SK180A,181A,182A,183A,
190A,191A,192A,193A SD194A,195A,196A
CHASSIS HS-1241,1259,1264,1328

(Continued)



TOP VIEW

PLATED CHASSIS BOARD WIRING AS VIEWED FROM COMPONENT SIDE-CHASSIS HS-1259



BOTTOM VIEW

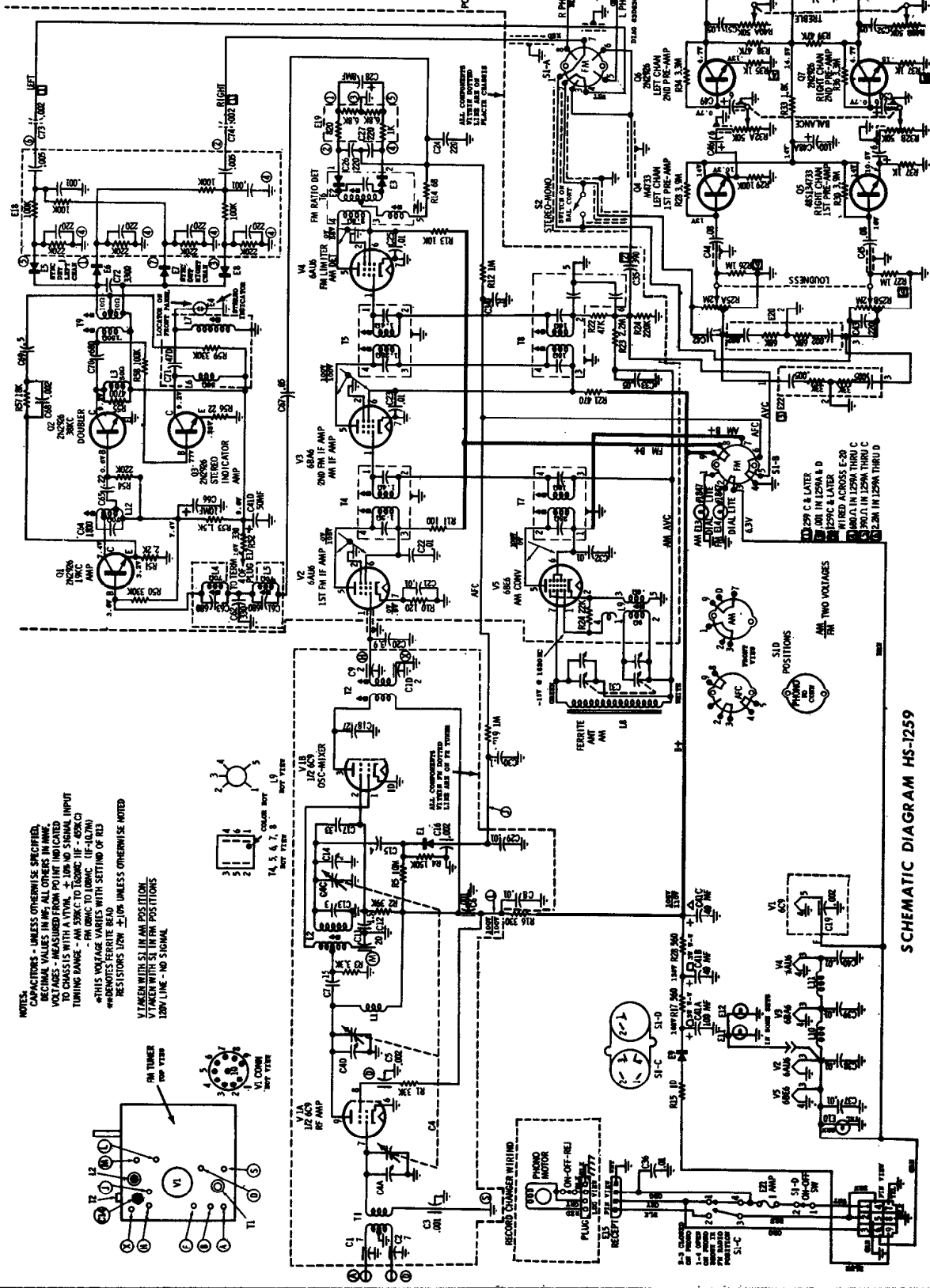
PLATED CHASSIS BOARD AS VIEWED FROM BOTTOM-(COMPONENTS SHOWN ARE LOCATED ON OPPOSITE SIDE)-CHASSIS HS-1259

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO

MOTOROLA

MODELS SK180A,181A,182A,183A,
190A,191A,192A,193A SD194A,195A,196A
CHASSIS HS-1241,1259,1264,1328

(Continued)



NOTES:
CAPACITORS - UNLESS OTHERWISE SPECIFIED,
DECIMAL VALUES IN P.F. ALL OTHERS IN M.F.
VOLTAGES MEASURED FROM POINT INDICATED
TUNING RANGE - AM 530 TO 1600 LF - 40K(C)
*THIS VOLTAGE VARIES WITH SETTING OF R13
**DENOTES FERRITE BEAD
RESISTORS 120W ± 10% UNLESS OTHERWISE NOTED
V1 TAKEN WITH SL IN AM POSITION
V2 TAKEN WITH SL IN FM POSITION
120V LINE - NO SIGNAL

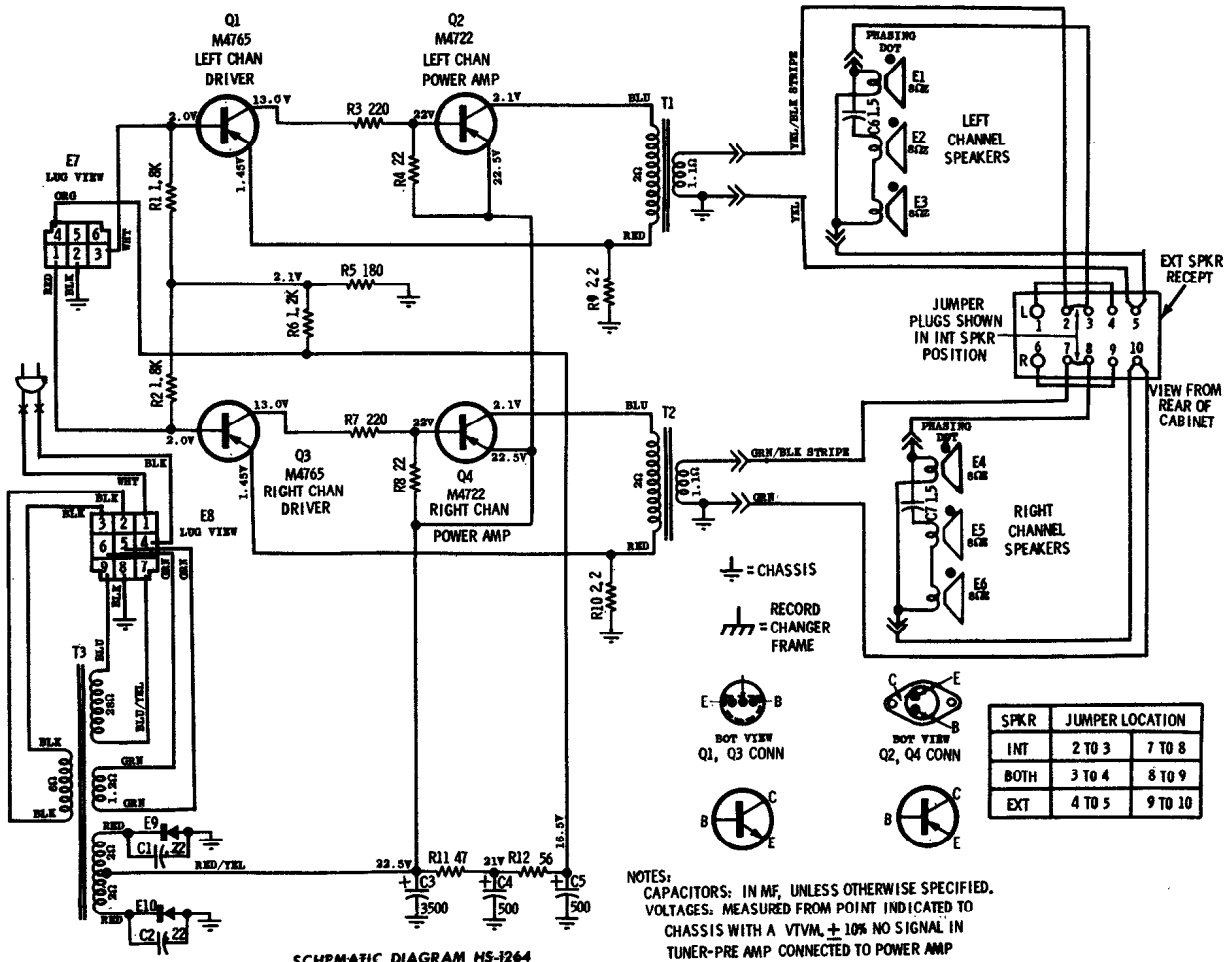
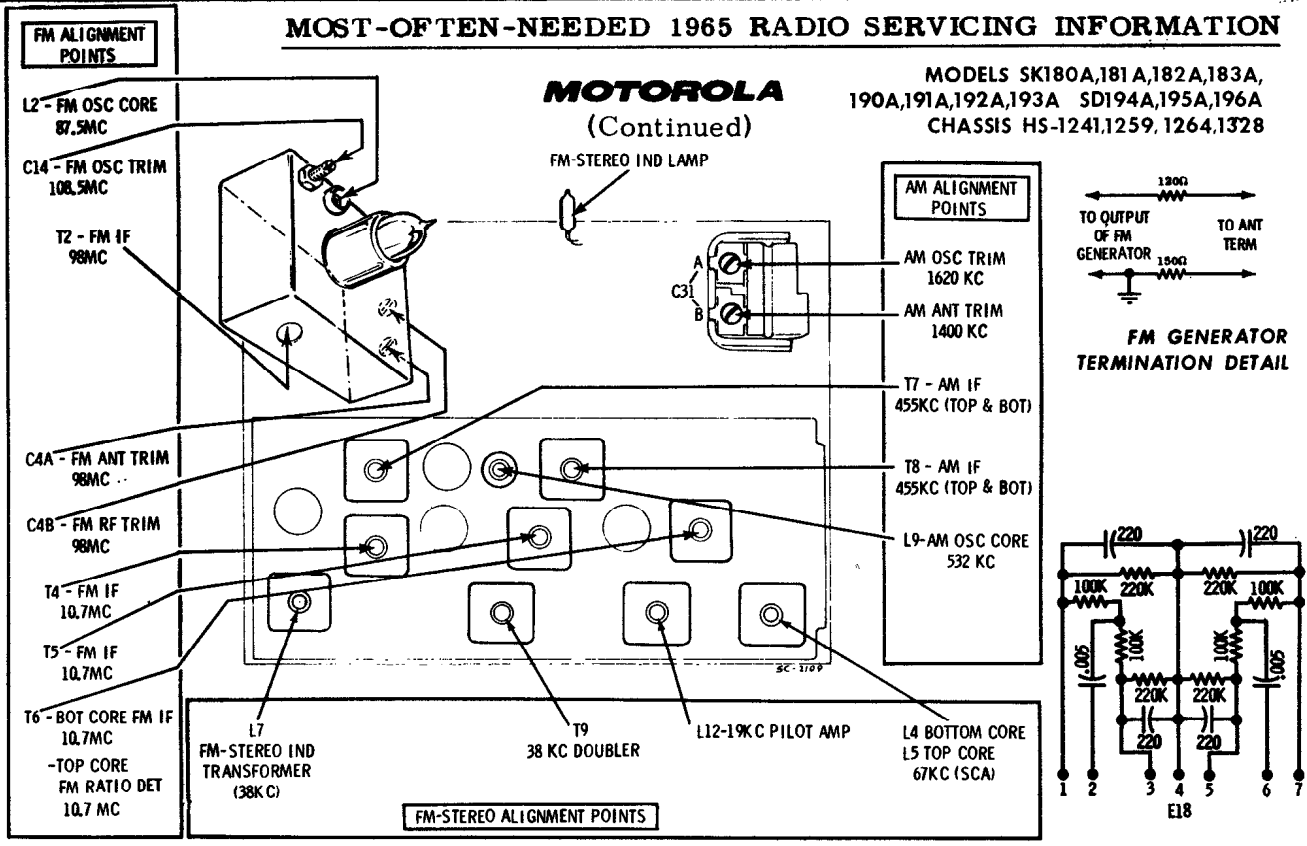
SCHEMATIC DIAGRAM HS-1259

MOTOROLA Chassis HS-1259 (for list of models see page 84)

MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

MOTOROLA
(Continued)

MODELS SK180A,181A,182A,183A,
190A,191A,192A,193A SD194A,195A,196A
CHASSIS HS-1241,1259,1264,1328



NOTES:
CAPACITORS: IN MF, UNLESS OTHERWISE SPECIFIED.
VOLTAGES: MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM, ±10% NO SIGNAL IN TUNER-PRE AMP CONNECTED TO POWER AMP

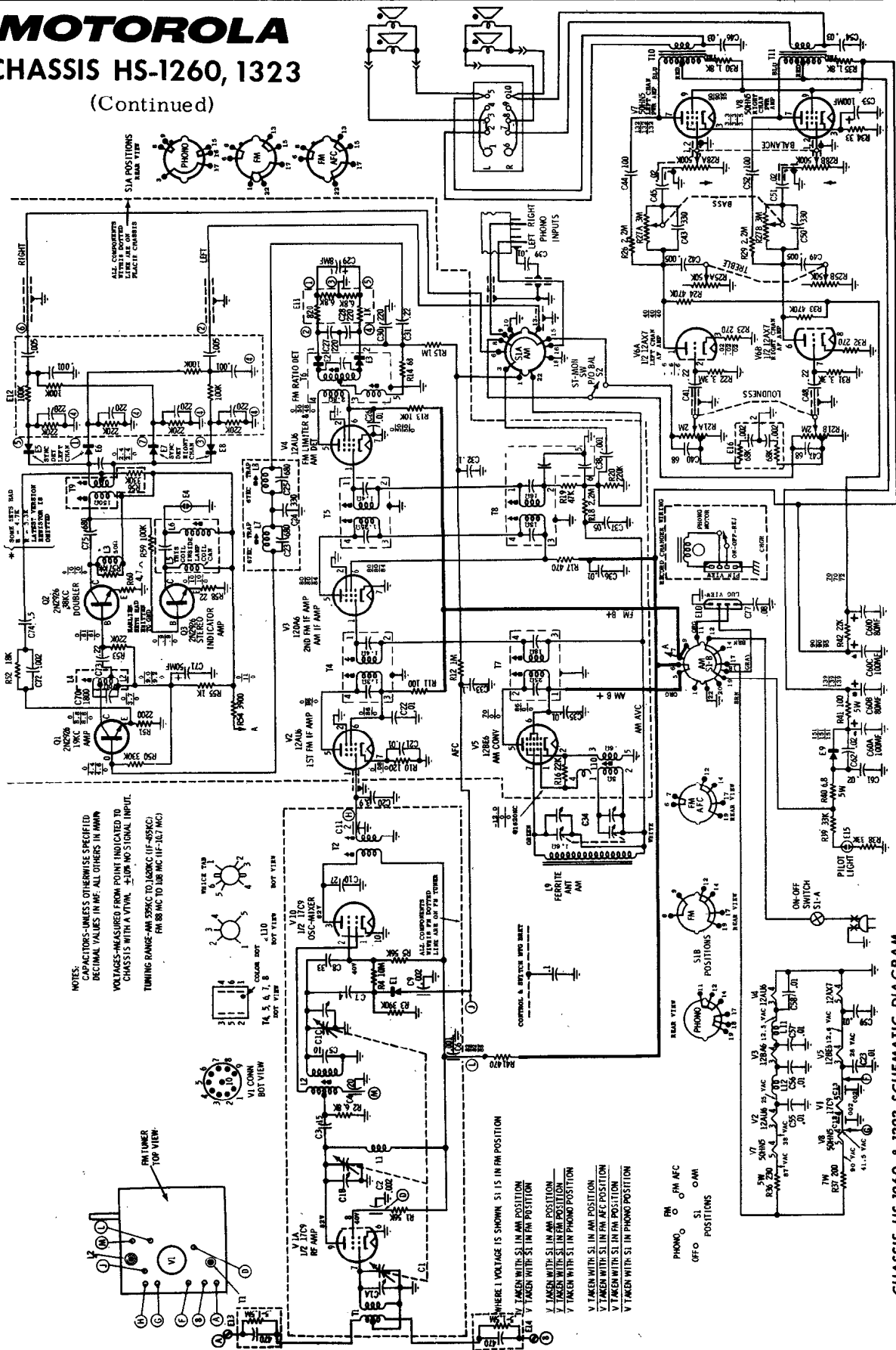
MOTOROLA

CHASSIS HS-1260, 1323

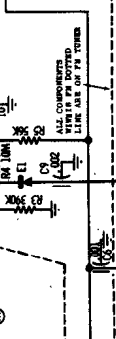
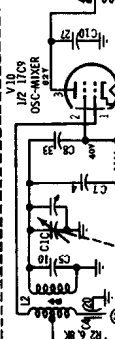
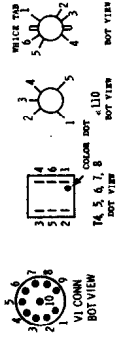
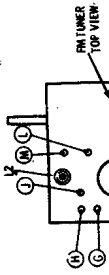
(Continued)

MOTOROLA Chassis HS-1260, HS-1323, Models SK172A, -173A, -176A, -177A, -178A, -178A, ST82A

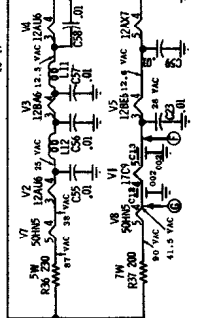
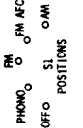
(Continued on next page)



NOTES:
 CAPACITORS—UNLESS OTHERWISE SPECIFIED
 DECIMAL VALUES IN MF, ALL OTHERS IN MMF
 VOLTAGES—MEASURED FROM POINT INDICATED TO
 CHASSIS WITH A VIVAL. ±10% NOMINAL INPUT.
 TUNING RANGE—AM 550KC TO 1600KC (IF-455KC);
 FM 88 MC TO 108 MC (IF-262 MC)



WHERE 1 VOLTAGE IS SHOWN S1 IS IN FM POSITION
 V TAKEN WITH S1 IN AM POSITION
 V TAKEN WITH S1 IN FM POSITION
 V TAKEN WITH S1 IN AM POSITION
 V TAKEN WITH S1 IN FM POSITION
 V TAKEN WITH S1 IN AM POSITION
 V TAKEN WITH S1 IN FM POSITION



CHASSIS HS-1260 & 1323 SCHEMATIC DIAGRAM

MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

MOTOROLA Chassis HS-1260, HS-1323, Continued

FM ALIGNMENT POINTS

- L2 - FM OSC CORE 87.5MC
- C1C - FM OSC TRIM 108.5MC
- T2 - FM IF 98MC

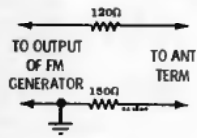
- C1A - FM ANT TRIM 98MC
- C1B - FM RF TRIM 98MC
- T4 - FM IF 10.7MC
- T5 - FM IF 10.7MC
- T6 - BOT CORE FM IF 10.7MC
- TOP CORE FM RATIO DET 10.7 MC

FM-STEREO IND LAMP

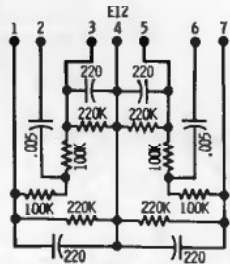
AM ALIGNMENT POINTS

- AM OSC TRIM 1620 KC
- AM ANT TRIM 1400 KC
- T7 - AM IF 455KC (TOP & BOT)
- T8 - AM IF 455KC (TOP & BOT)
- L10 - AM OSC CORE 532 KC

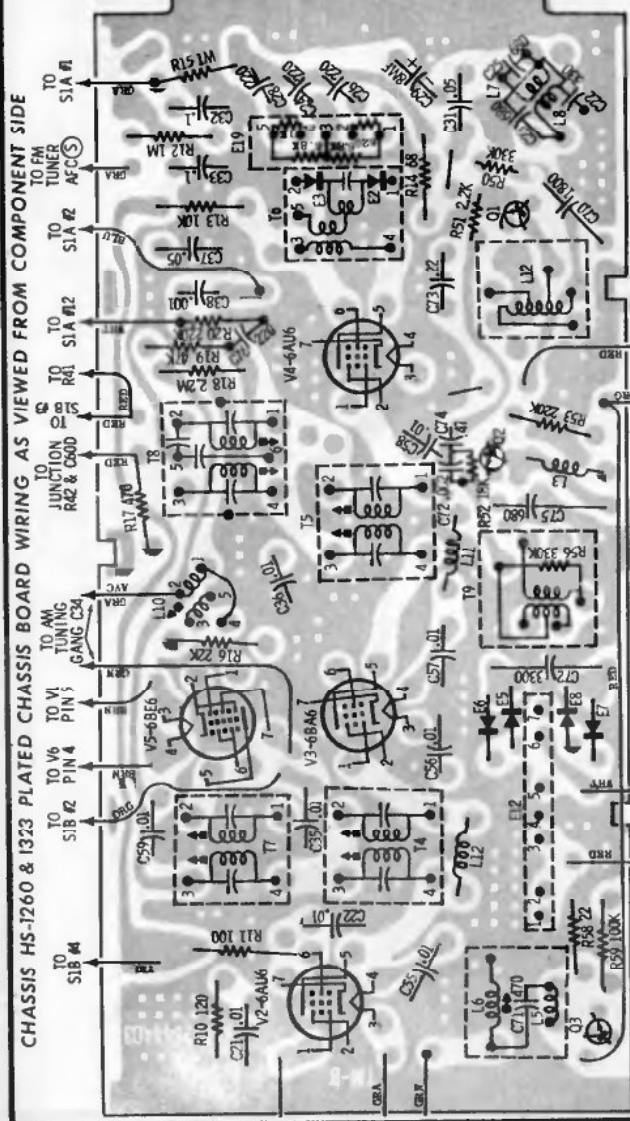
FM-STEREO ALIGNMENT POINTS (HS-1260 & 1323 ONLY)



FM GENERATOR TERMINATION DETAIL

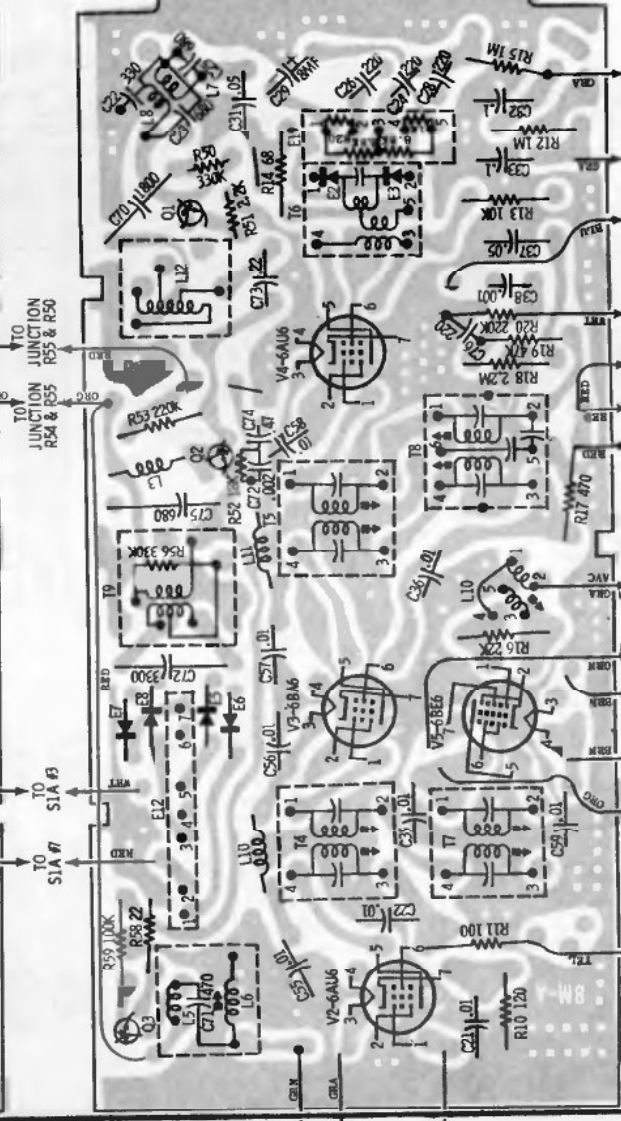


TOP VIEW

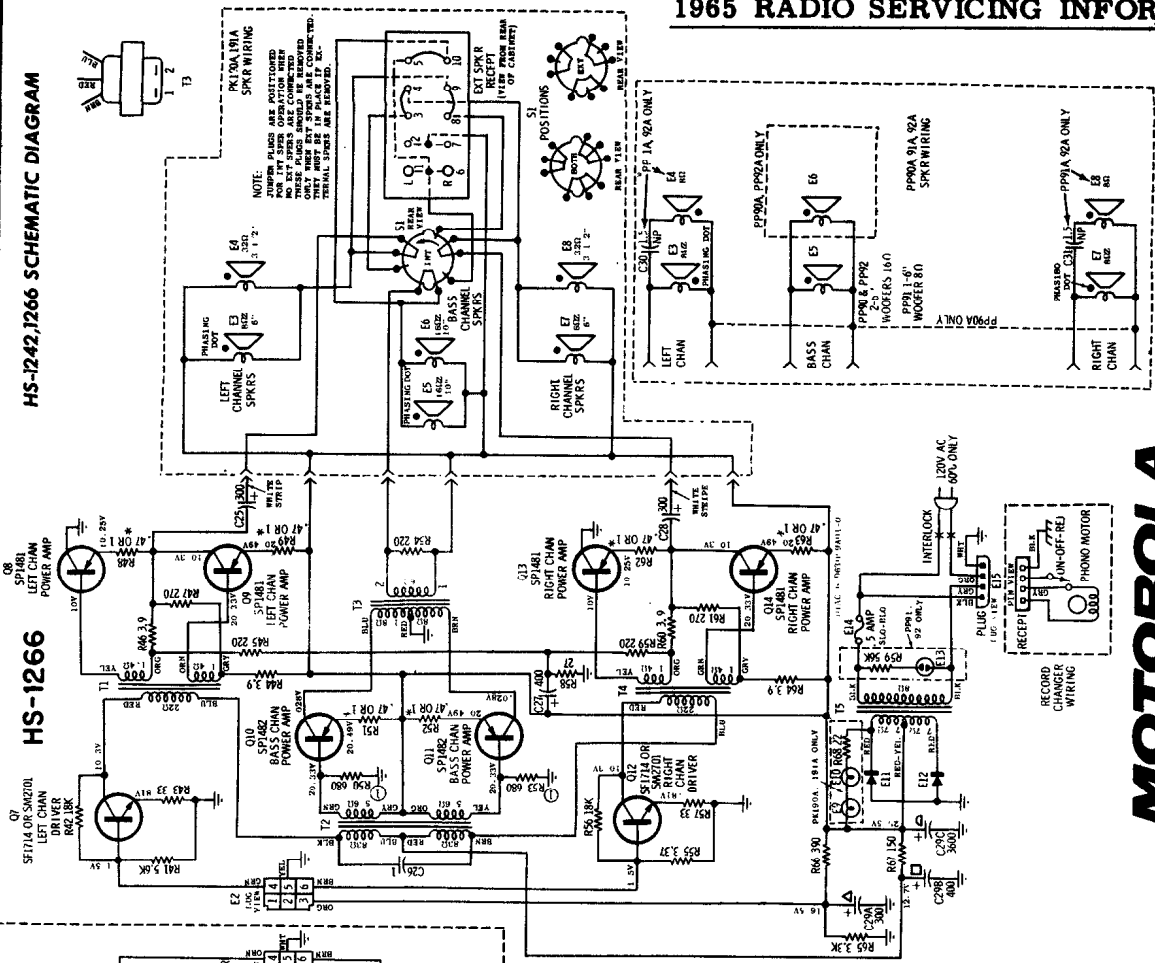


VIEWED FROM BOTTOM SIDE - COMPONENTS SHOWN ARE LOCATED ON OPPOSITE SIDE)

BOTTOM VIEW



HS-1242,1266 SCHEMATIC DIAGRAM



HS-1266

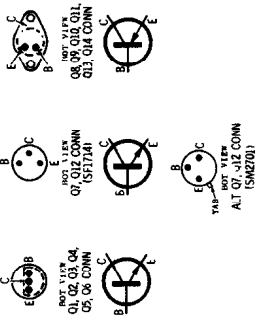
HS-1242

NOTES: CAPACITORS: IN MF, UNLESS OTHERWISE SPECIFIED. VOLTAGES: MEASURED FROM POINT INDICATED TO CHASSIS WITH VTVM \pm 10%. NO SIGNAL IN HS-1242 & 1266 CONNECTED TOGETHER.

⊖ CHASSIS

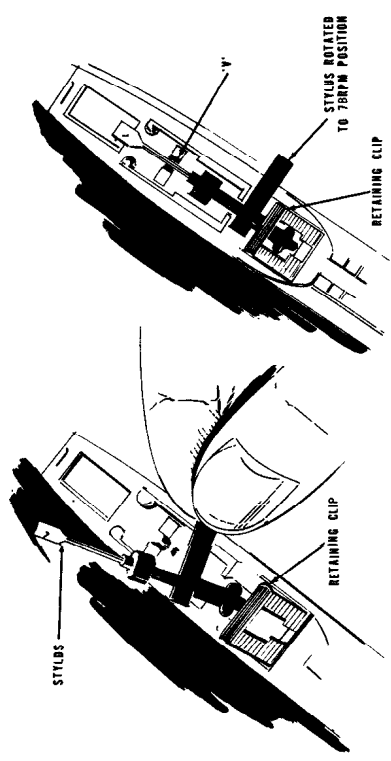
Ⓜ RECORD CHANGER FRAME

Ⓢ IN SOME MODELS



MOTOROLA

MODELS PK190A,191A,PP90A,91A, 92A
CHASSIS HS-1242,1266

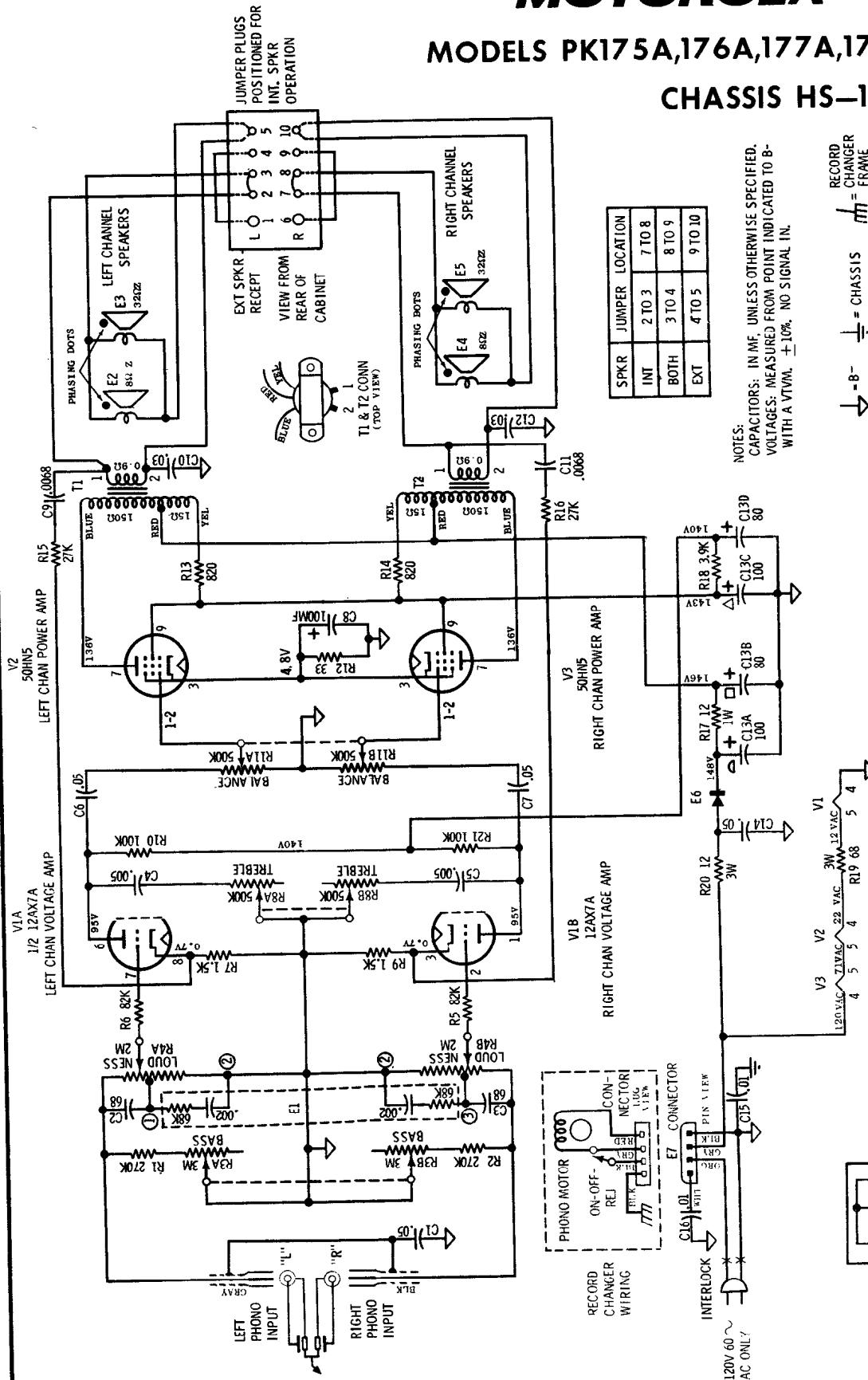


STYLUS REPLACEMENT

MOTOROLA

MODELS PK175A, 176A, 177A, 178A

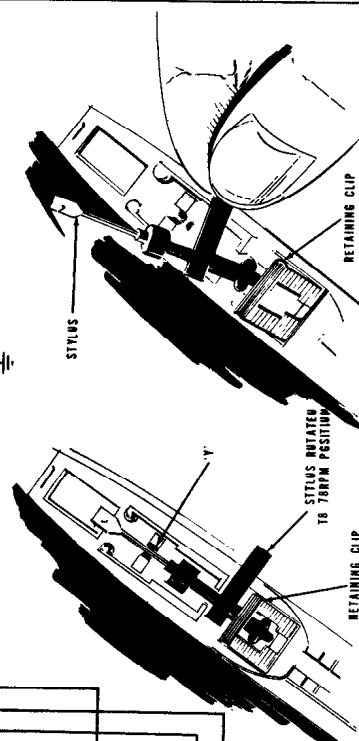
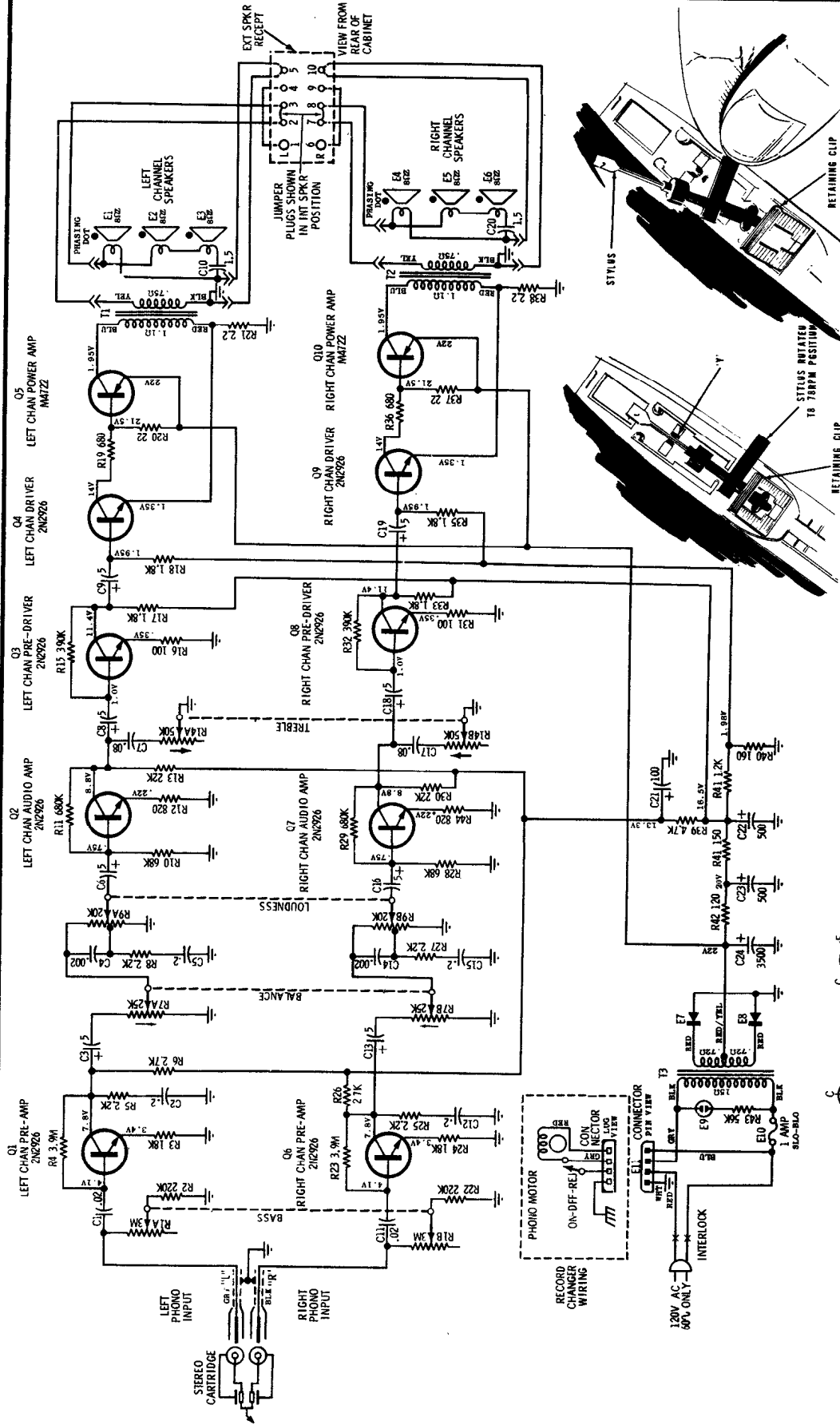
CHASSIS HS-1261



NOTES:
CAPACITORS: IN MF, UNLESS OTHERWISE SPECIFIED.
VOLTAGES: MEASURED FROM POINT INDICATED TO B- WITH A VTVM. ± 10%. NO SIGNAL IN.

→ -B- = CHASSIS
RECORD CHANGER FRAME

OPERATING AMPLIFIER WITH LOAD - Always operate the amplifier chassis with an output load (either the speakers or an 8 ohm 10 watt resistive load) across each channel.



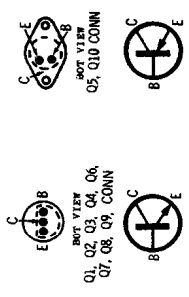
STYLUS REPLACEMENT

MOTOROLA

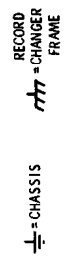
MODELS PK180A, 182A, 183A

CHASSIS HS-1262

SPKR	JUMPER LOCATION
INT	2 TO 3
BOTH	3 TO 4
EXT	4 TO 5

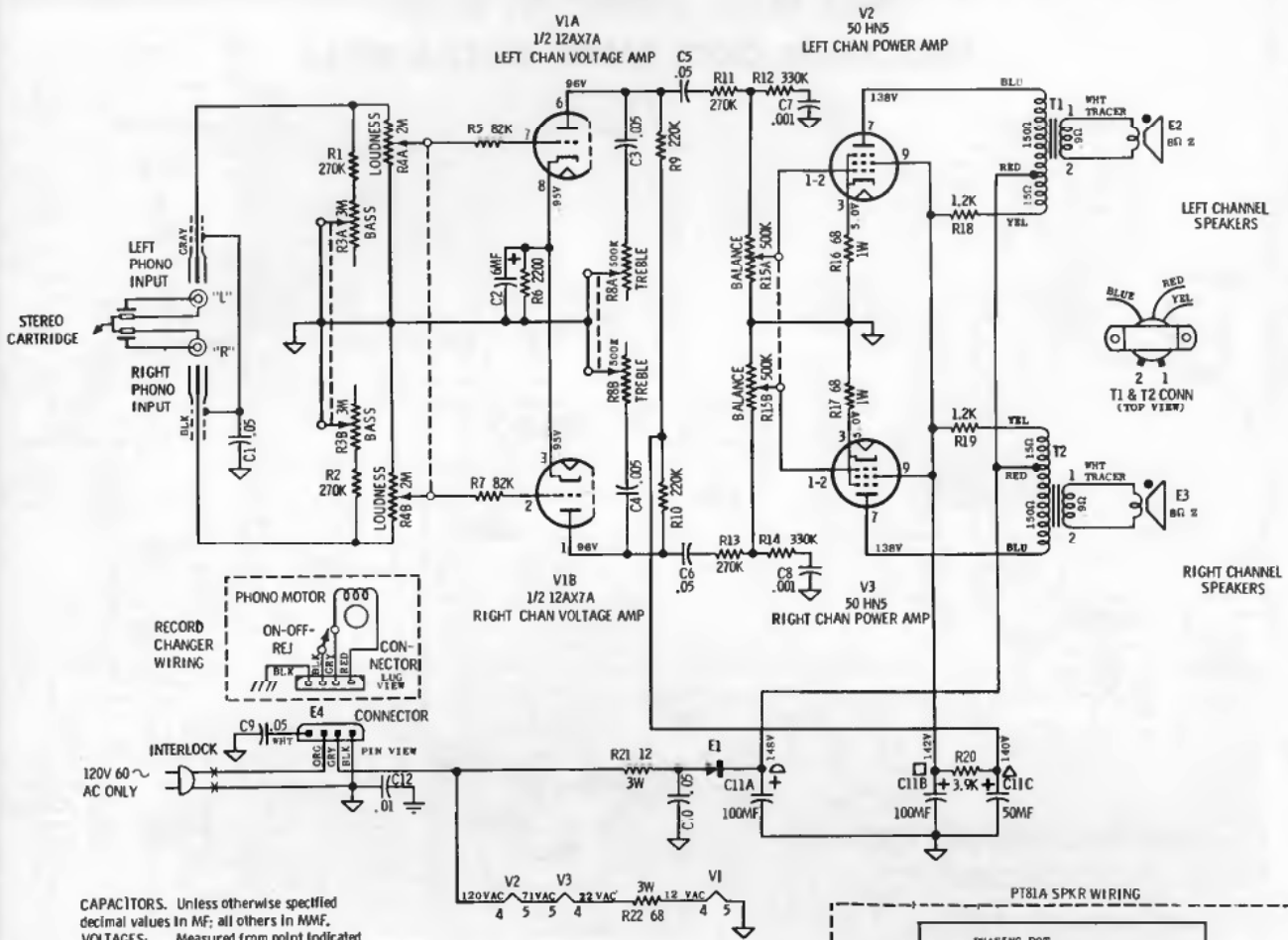


NOTES:
CAPACITORS: IN MF, UNLESS OTHERWISE SPECIFIED.
VOLTAGES: MEASURED FROM POINT INDICATED TO CHASSIS WITH A VTVM, $\pm 10\%$ NO SIGNAL IN.



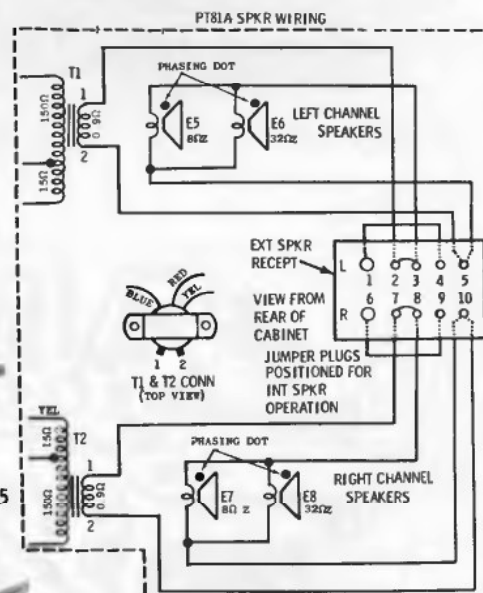
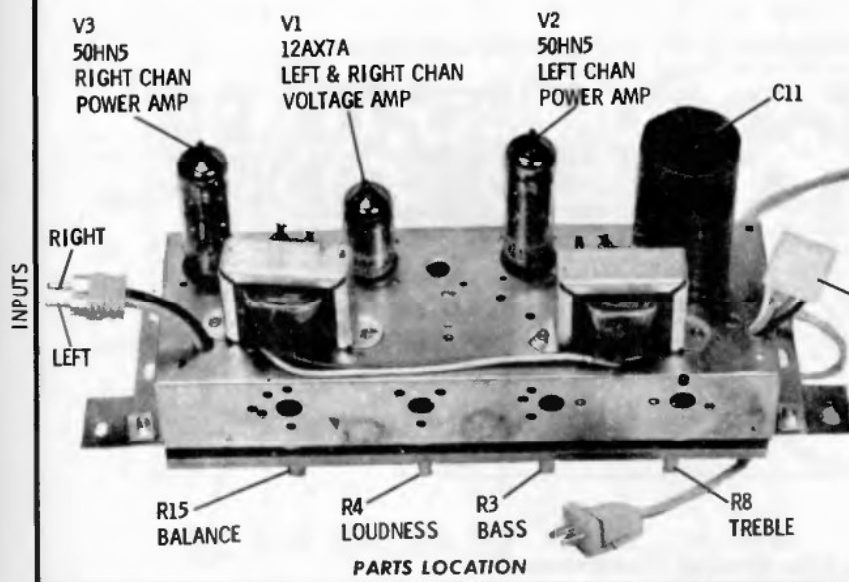
MOTOROLA

MODELS PP80A, PT81A CHASSIS HS-1269



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

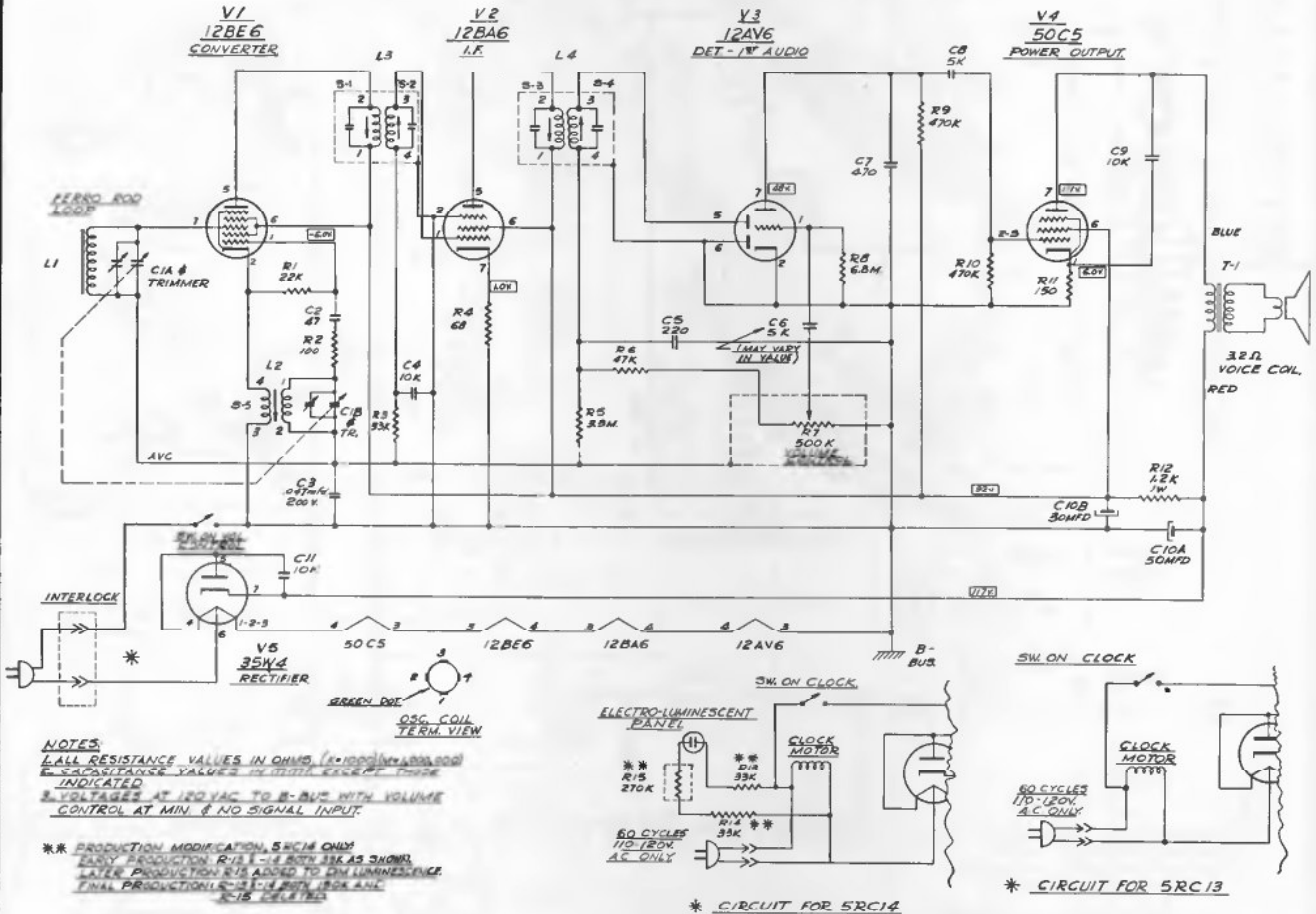


SPKR	JUMPER LOCATION
INT	2 TO 3 7 TO 8
BOTH	3 TO 4 8 TO 9
EXT	4 TO 5 9 TO 10

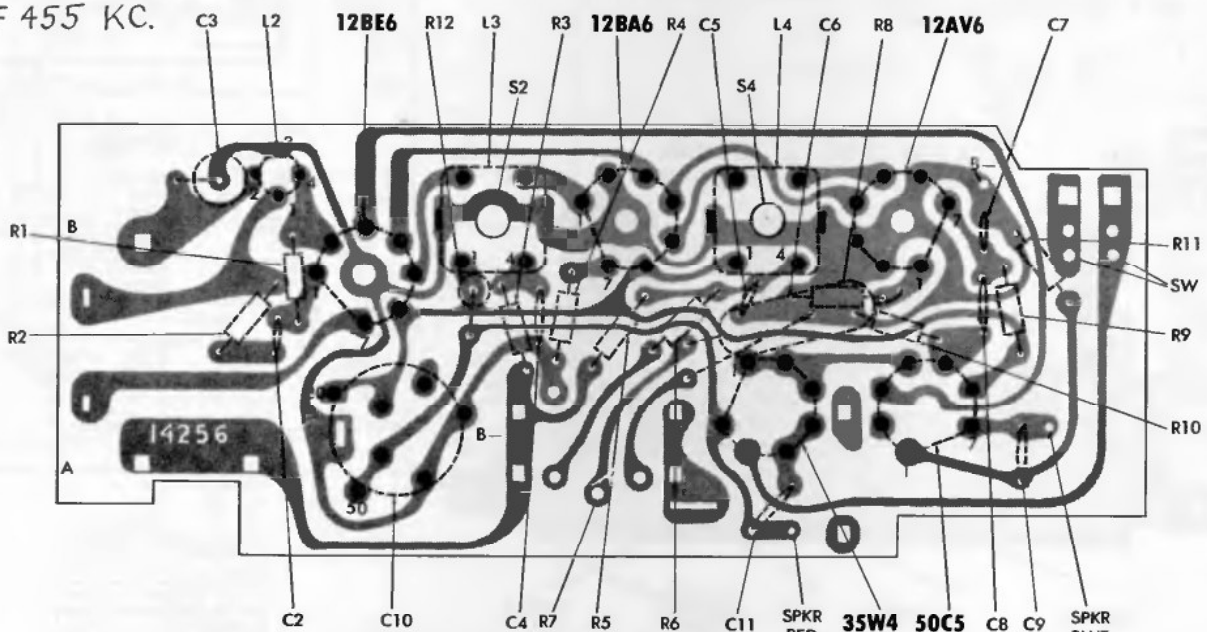
Packard Bell

TABLE MODEL RADIOS 5R11 & 5R12

TABLE MODEL CLOCK RADIOS 5RC13 & 5RC14



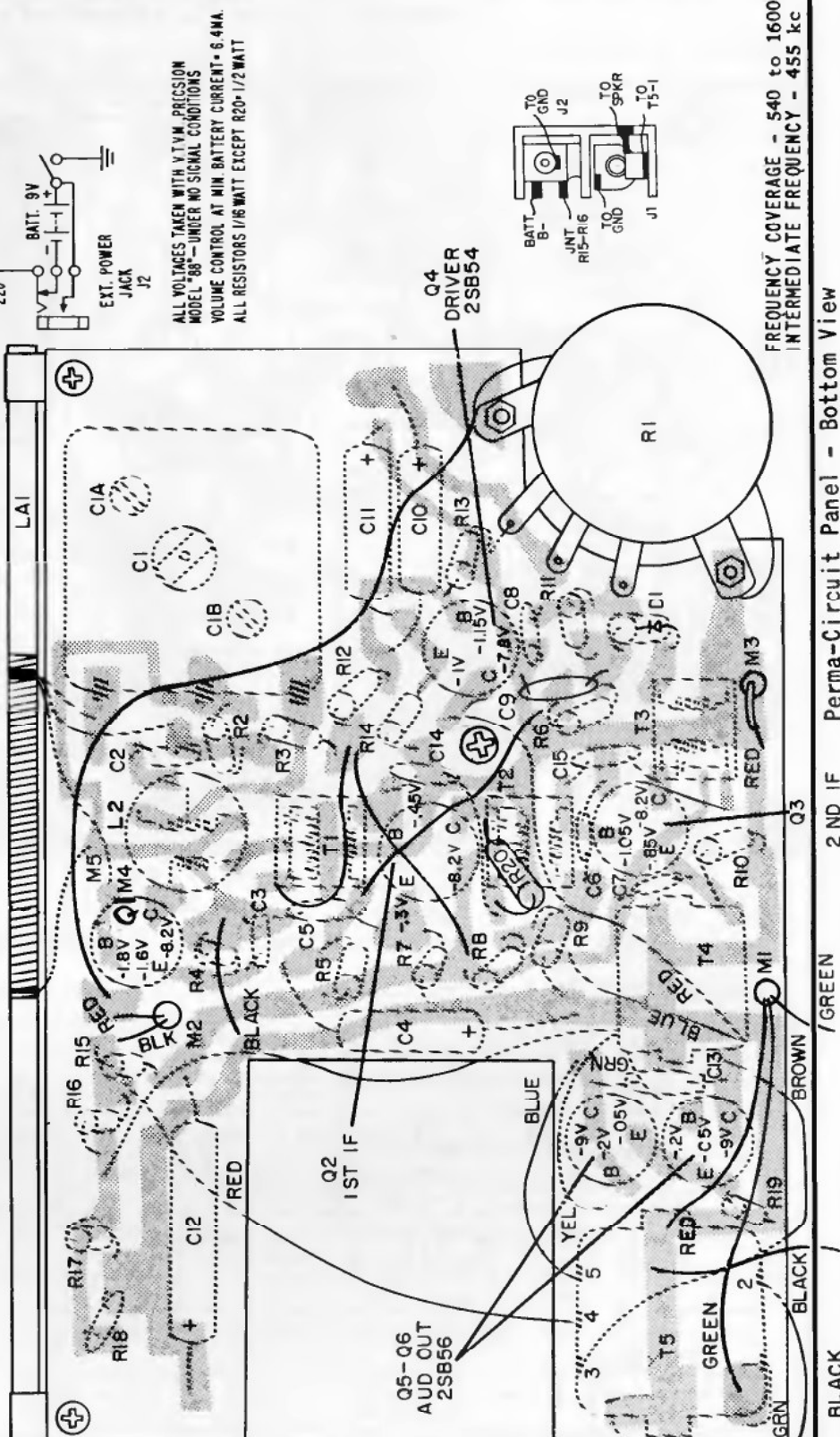
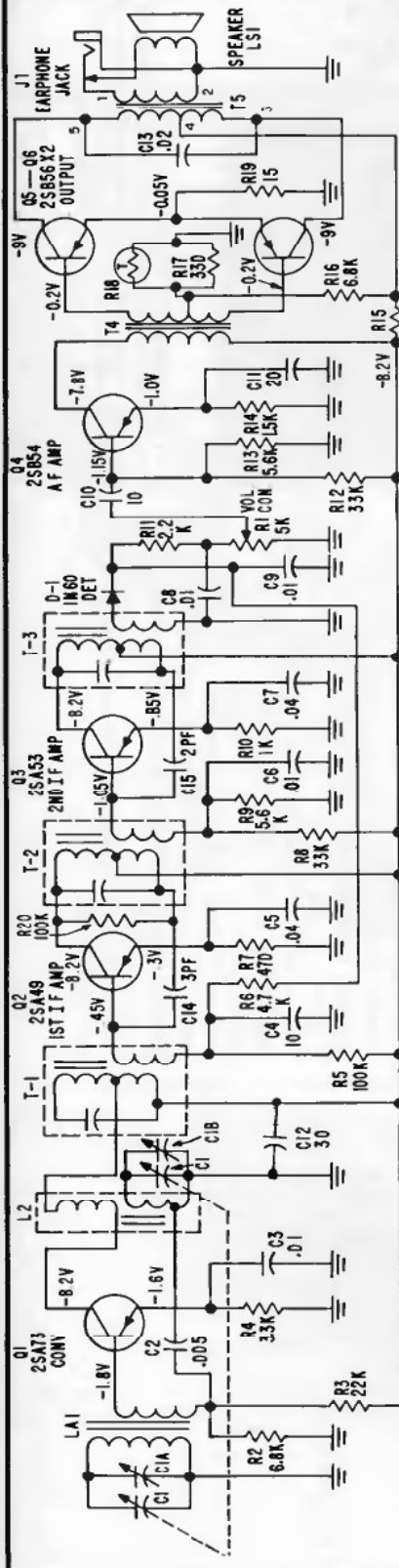
IF 455 KC.



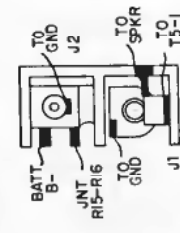
Phantom View of Wiring Side, Showing Connections

PHILCO

TRANSISTOR PORTABLE MODEL T-69



ALL VOLTAGES TAKEN WITH V.T.V.M. PRECISION MODEL '88— UNDER NO SIGNAL CONDITIONS
VOLUME CONTROL AT MIN. BATTERY CURRENT • 6.4 MA.
ALL RESISTORS 1/8 WATT EXCEPT R20—1/2 WATT



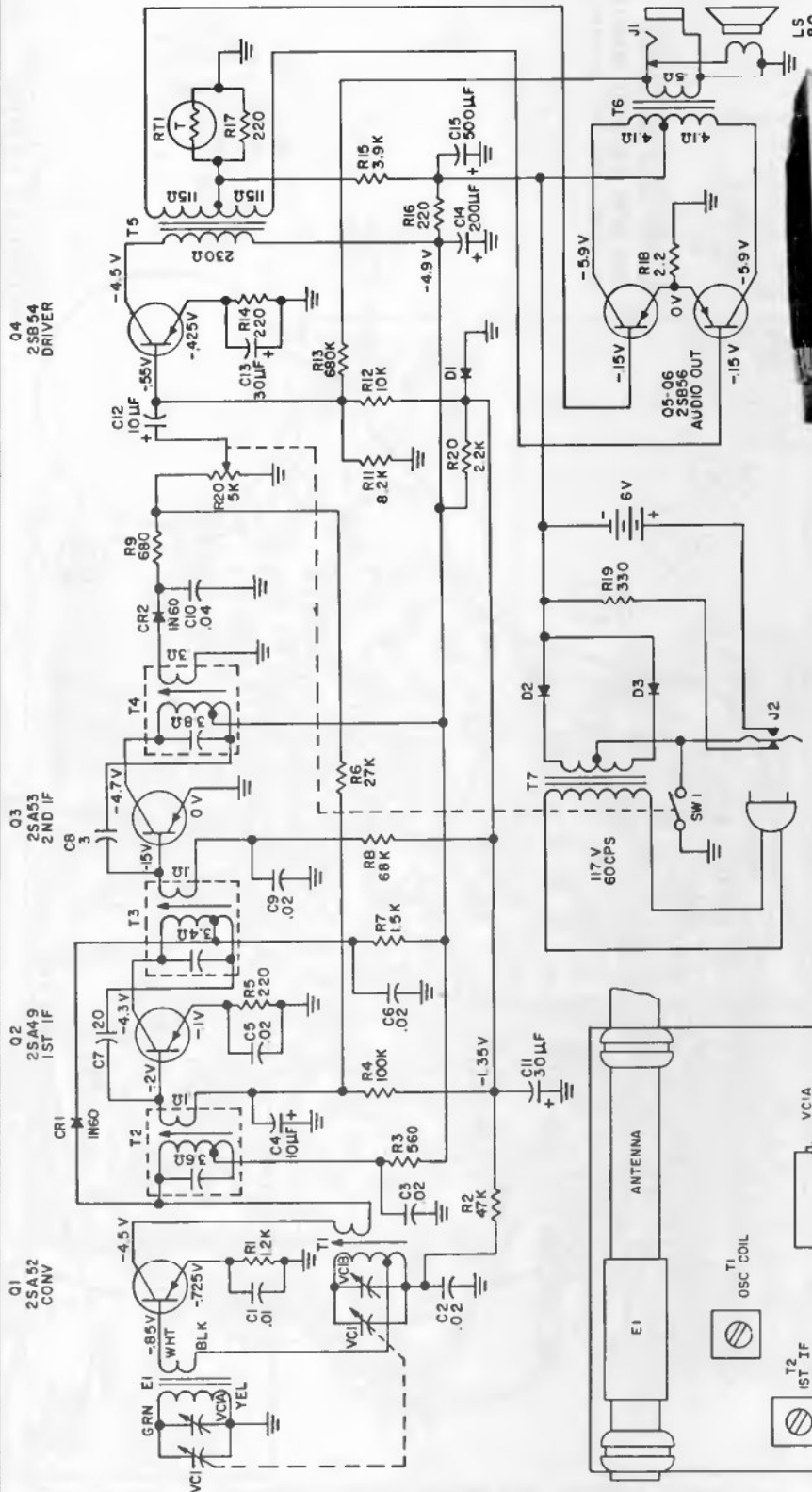
FREQUENCY COVERAGE - 540 to 1600 kc.
INTERMEDIATE FREQUENCY - 455 kc

Perma-Circuit Panel - Bottom View

PHILCO

TRANSISTOR PORTABLE MODEL NT601

(Continued on page 97, adjacent at right)



- NOTES:**
1. ALL COIL RESISTANCES MEASURED IN CIRCUIT
 2. ALL VOLTAGES MEASURED FROM B+6V TO POINTS INDICATED
 3. VOLTAGES TAKEN WITH NO SIGNAL AND VOLUME CONTROL AT MINIMUM, UNDER SAME CONDITIONS BATTERY CURRENT 8 MA PRECISION VTVM MODEL '88
 4. ALL VOLTAGES AND RESISTANCES MEASURED WITH INDICATED, VALUES LESS THAN ONE ARE IN MFDS
 5. ALL CAPACITOR VALUES IN PF, UNLESS OTHERWISE INDICATED, VALUES LESS THAN ONE ARE IN MFDS

CABINET REMOVAL

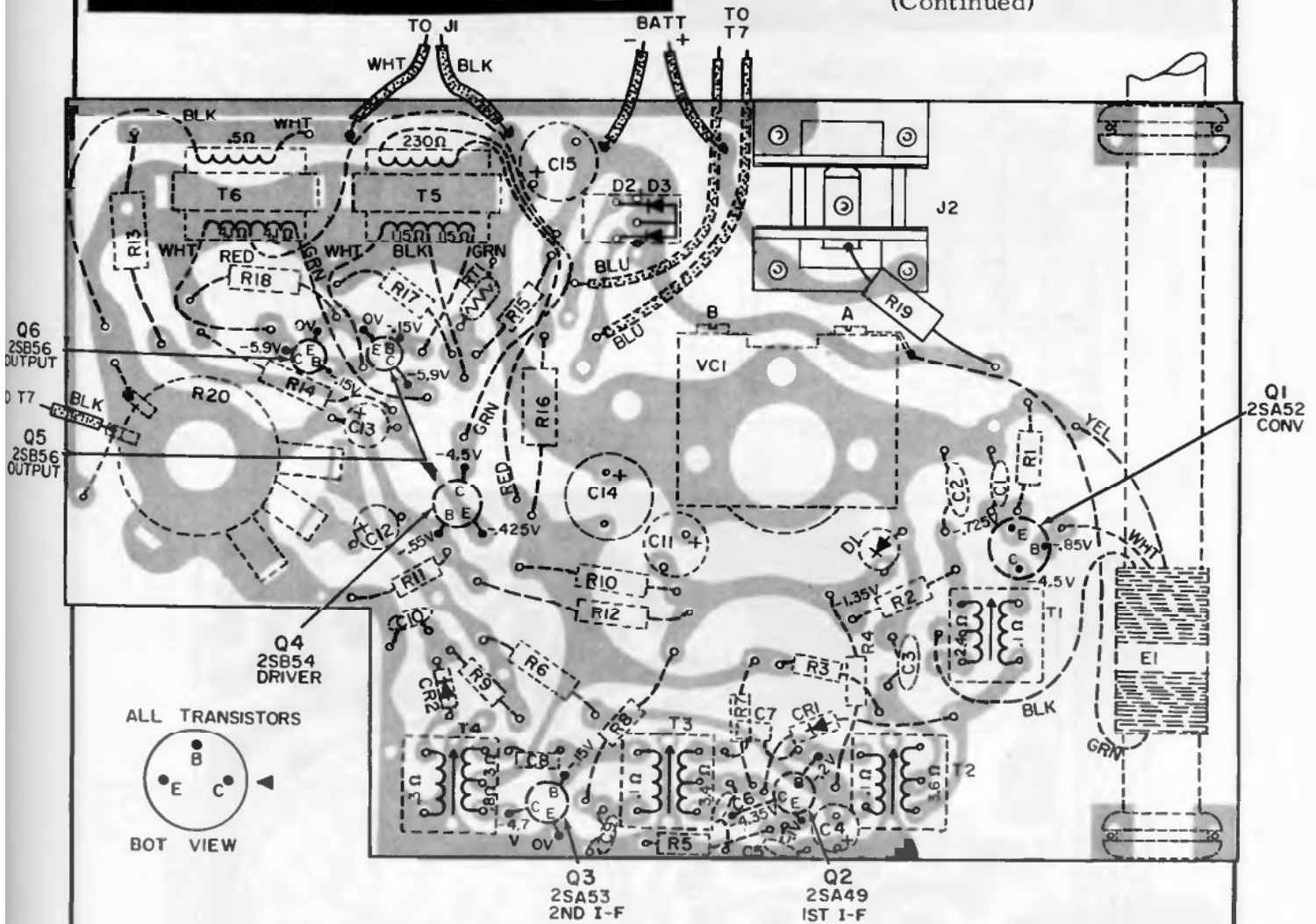
1. Remove Back - Loosen two screws on back.
2. Remove Volume Knob - Pull off.
3. Remove Tuning Knob - Insert Screwdriver thru hole in bottom of Cabinet and loosen two Screws on Tuning Knob, Rotate Knob as necessary to reach screws.
4. Remove Battery Case - Remove four screws inside case and lift out Case and Cord compartment.
5. Remove Chassis Panel - Remove five screws on Panel and Lift out.
6. Remove Power Transformer - Remove two screws on transformer.

Chassis Alignment Points

PHILCO

TRANSISTOR PORTABLE MODEL NT601

(Continued)



Bottom View - Perma-Circuit Panel, Top View Component Layout - NT601

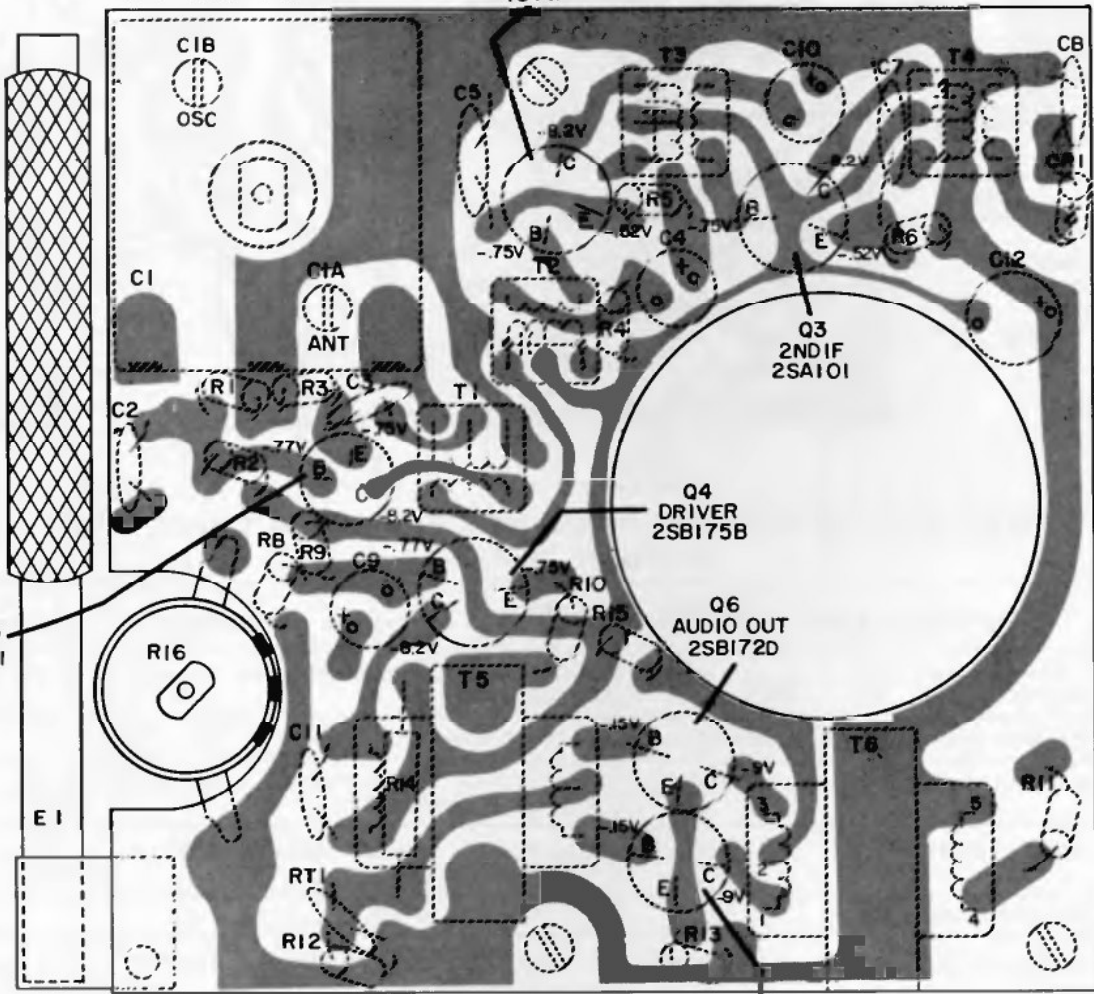
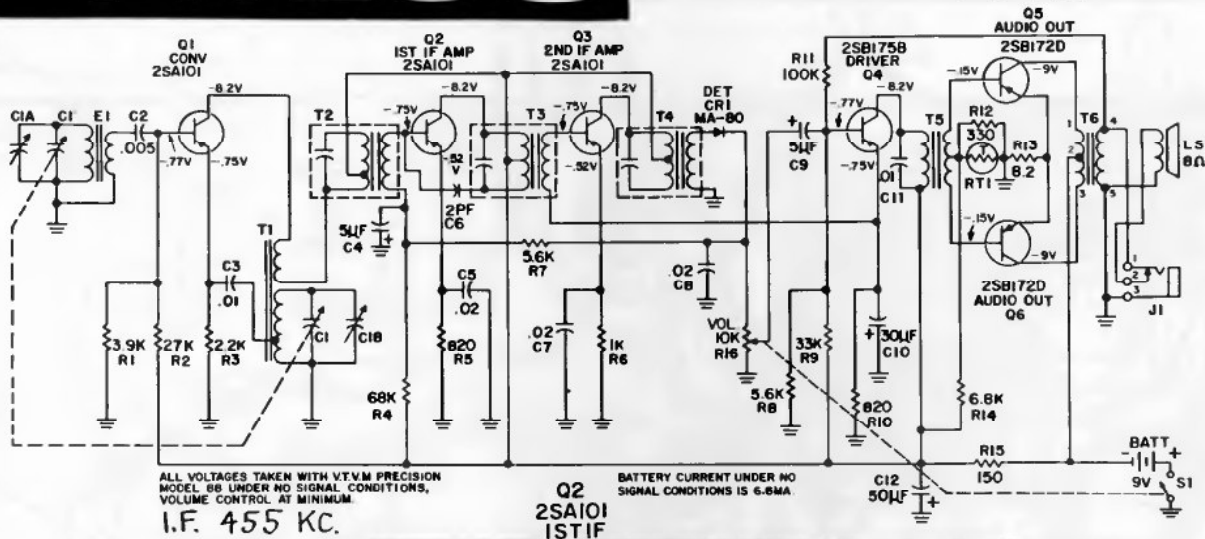
ALIGNMENT CHART

STEP	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	ADJUST
1	USE RADIATING LOOP SEE NOTE	455KC	TUNING GANG FULLY OPEN	ADJUST FOR MAX. OUTPUT	T4, T3, T2
2	REPEAT STEP 1 UNTIL NO FURTHER IMPROVEMENT IS OBTAINED				
3	SAME AS STEP 1	525KC	TUNING GANG FULLY CLOSED	ADJUST FOR MAX. OUTPUT	T1 OSC. COIL
4	SAME AS STEP 1	1630KC	TUNING GANG FULLY OPEN	ADJUST FOR MAX. OUTPUT	VC1B OSC. TRIM.
5	REPEAT STEPS 3 AND 4				
6	SAME AS STEP 1	1400KC	1400KC	ADJUST FOR MAX. OUTPUT	VC1A ANT. TRIM.
7	SAME AS STEP 1	600KC	600KC	ADJUST COIL ONLY IF NECESSARY	E1 ANT. COIL

NOTE: FOR RADIATING LOOP, USE A 6 TO B TURN, 6 INCH DIAMETER LOOP MADE OF INSULATED WIRE. CONNECT LOOP TO GENERATOR TERMINALS AND PLACE ABOUT 12 INCHES FROM RADIO.

PHILCO

TRANSISTOR PORTABLE MODEL NT-600



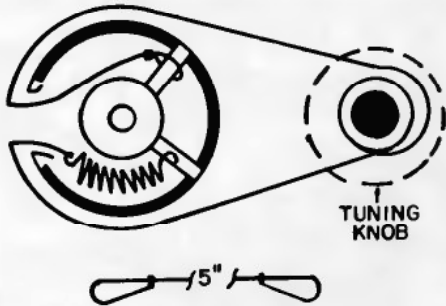
NOTE: WHEN REPLACING BATTERY, NEW BATTERY MAY READ SEVERAL TENTHS OF A VOLT HIGHER THAN ORIGINAL BATTERY. THEREFORE, VOLTAGES MAY READ SLIGHTLY HIGHER THAN THOSE INDICATED ON BASE LAYOUT.

Q5 AUDIO OUT 2SBI72D
Perma Circuit Panel
Bottom View, Showing Parts on Top



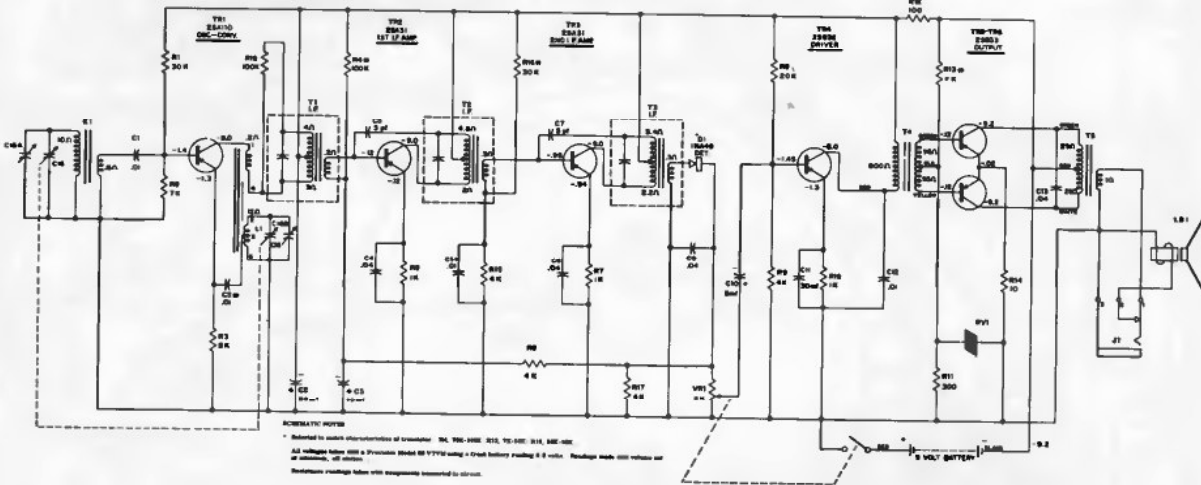
MODEL NT602

(Alignment data on page 100)

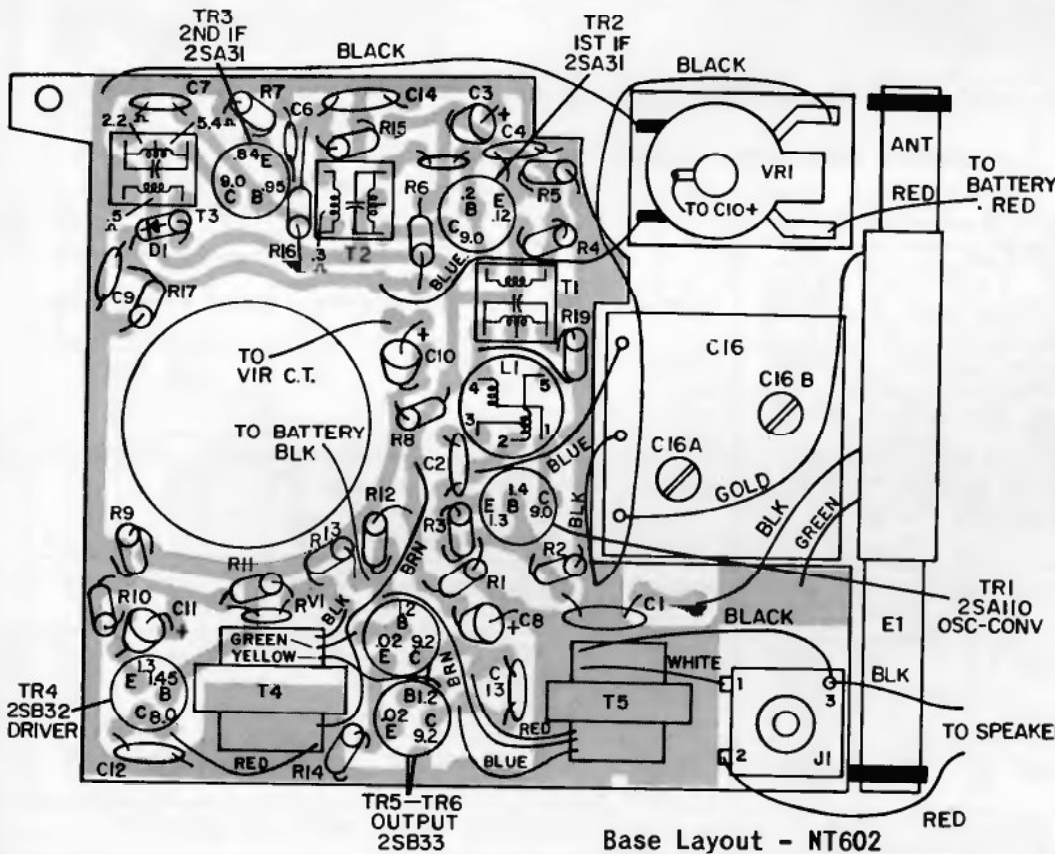


Dial Cord Stringing - Model NT602

FREQUENCY COVERAGE: 530KC to 1650KC
 INTERMEDIATE FREQUENCY: 455KC
 ANTENNA: Self-contained ferrite

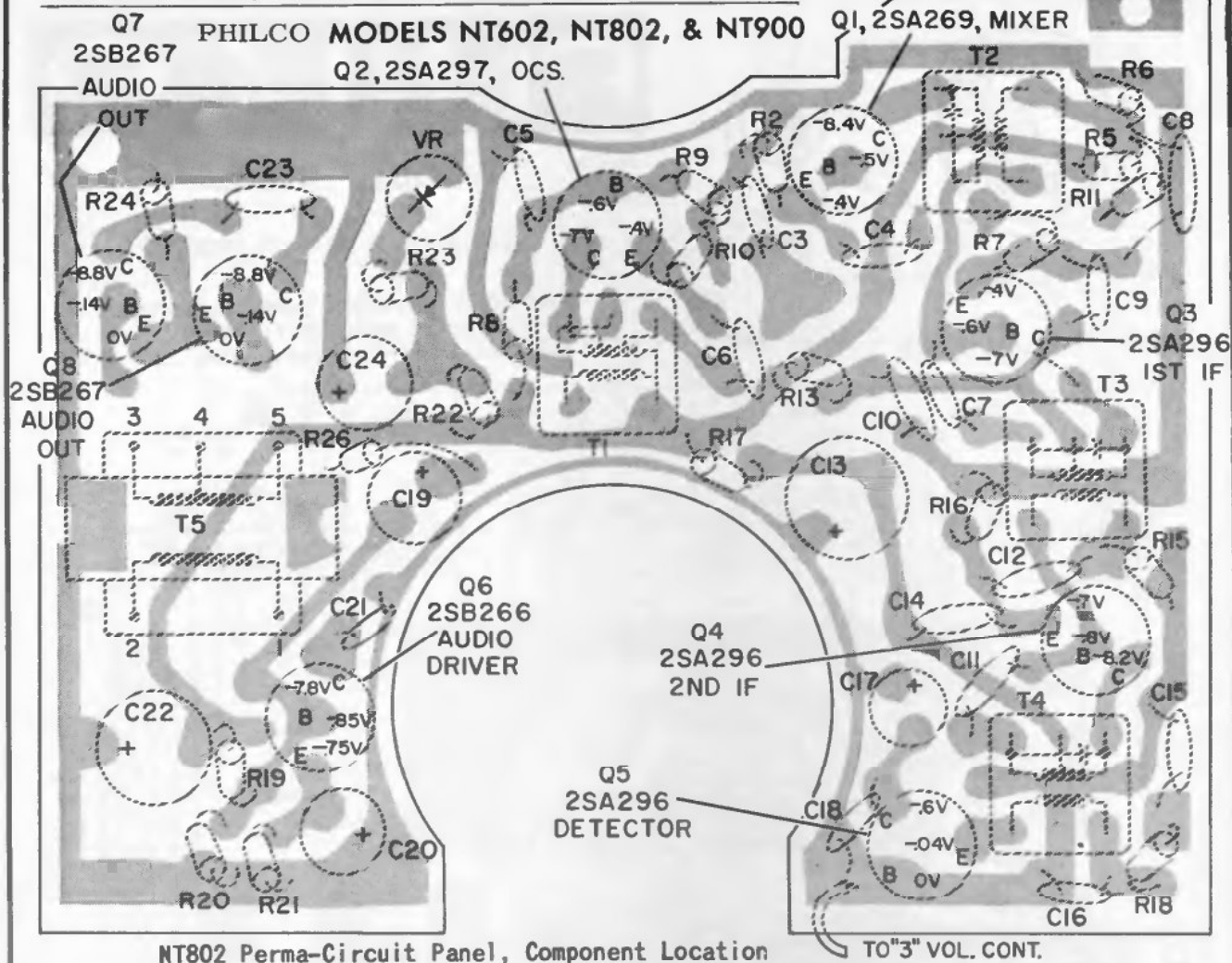


Schematic Diagram - NT602



NT602

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO



NT802 Perma-Circuit Panel, Component Location

ALIGNMENT PROCEDURE - NT602, NT802 AND NT900

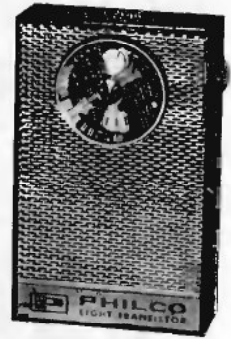
ALIGNMENT: Connect an a-c voltmeter or oscilloscope across speaker voice coil. Connect ground lead of AM R-F generator to chassis; output lead as indicated in chart. Keep voltage across voice coil below .6 volts (reduce generator output).

STEP	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	NT602	NT802	NT900
1	CONNECT SIGNAL GENERATOR THRU A 0.1 MF CAPACITOR TO RF SECTION OF GANG (C1A)	455KC	TUNING GANG FULLY OPEN	ADJUST FOR MAX. IN ORDER GIVEN	T3 T2 T1	T4 T3 T2	T4 T3 T2
2	USE RADIATING LOOP (SEE NOTE BELOW)	520KC	520KC	ADJUST FOR MAX. ROCK TUNING GANG WHILE MAKING ADJUSTMENTS	L1	T1	T1
3	SAME AS STEP 2	1650KC	1650KC	ADJUST FOR MAX. OUTPUT	C16B	C1B	C1B
4	SAME AS STEP 2	620KC	620KC	SLIDE ANTENNA COIL BACK AND FORTH FOR MAX. OUTPUT	ANT. COIL	ANT. COIL	ANT. COIL
5	SAME AS STEP 2	1400KC	1400KC	ADJUST FOR MAX. OUTPUT	C16A	C1A	C1A

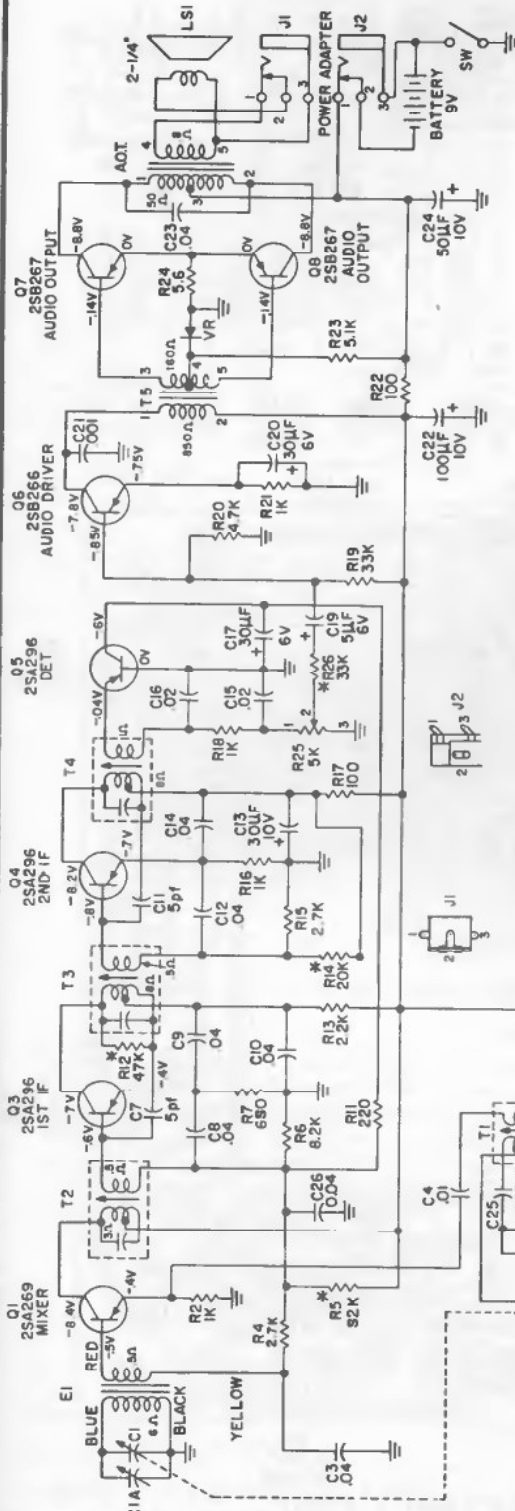
NOTE: USE A 6 TO 8 INCH DIAMETER LOOP MADE UP OF INSULATED WIRE. CONNECT TO GENERATOR TERMINALS, AND LOOSE COUPLE TO RADIO ANTENNA.

PHILCO

MODEL NT802

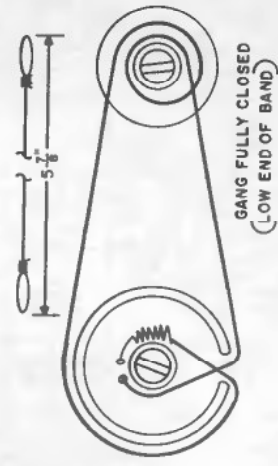


NT802



ALL VOLTAGES TAKEN WITH "PRECISION" VTVM MODEL '88". VOLUME CONTROL SET AT MINIMUM, NO SIGNAL. UNDER SAME CONDITIONS, BATTERY CURRENT 8.6MA.
ALL COIL RESISTANCES TAKEN IN CIRCUIT

* R12	47K, 100K
R26	3.3K, 4.7K
R5	68K, 82K
R14	20K, 18K, 22K



PERMA-CIRCUIT PANEL REMOVAL NT802

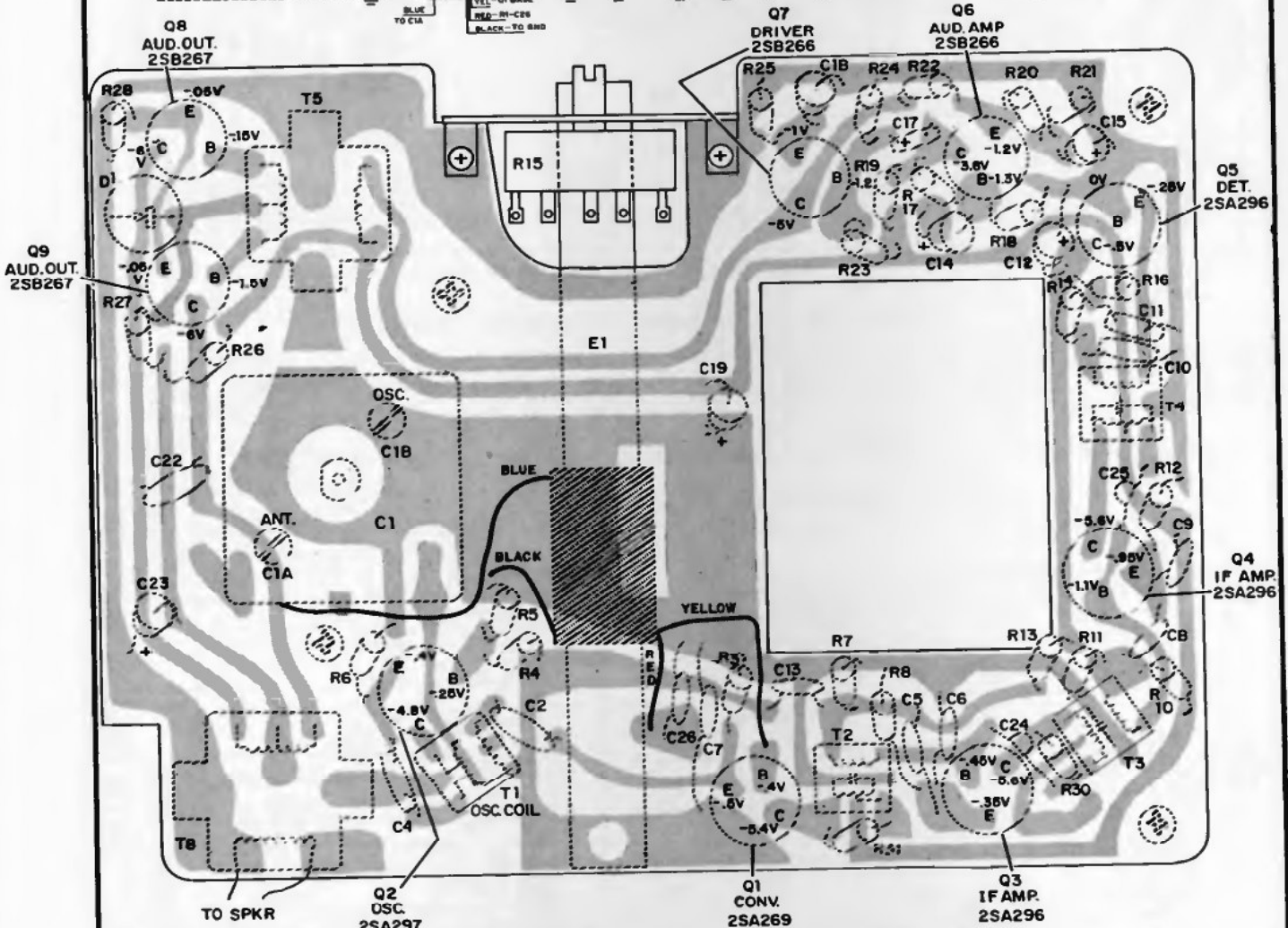
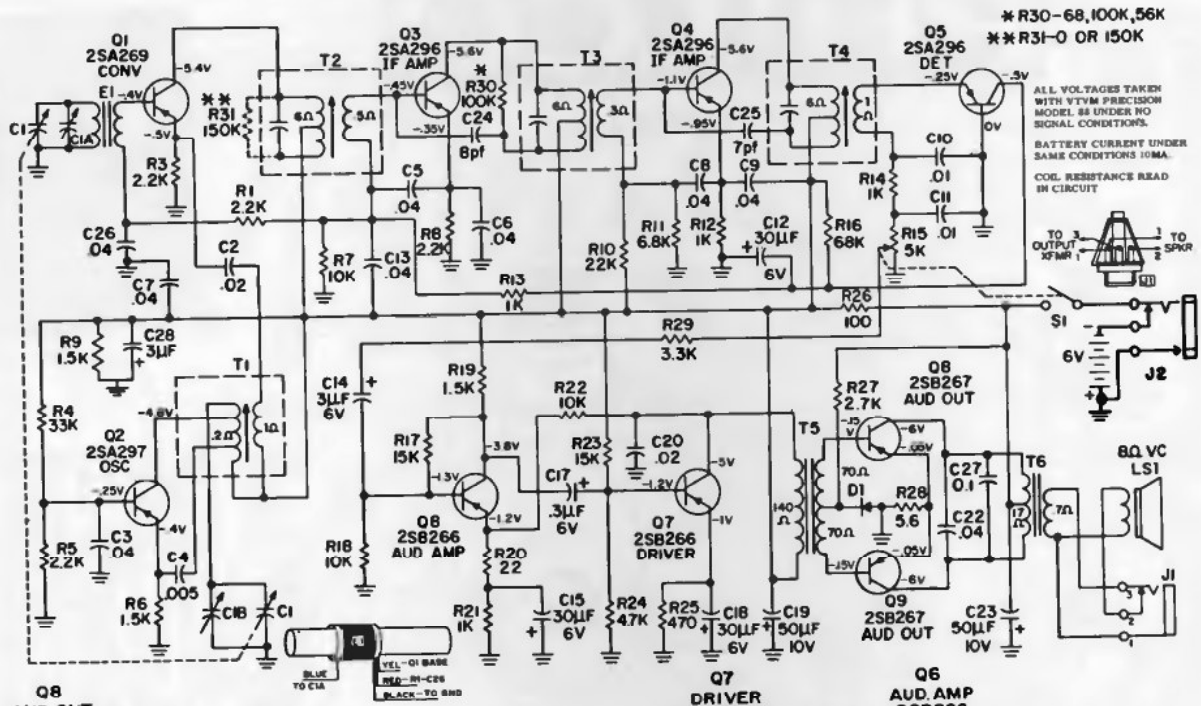
Panel Removal - To remove panel from cabinet, remove three Phillips head screws located at A1, C9 and G1 (see bottom component location view). Panel and jack assembly may now be lifted out simultaneously. The speaker will remain in the cabinet. Jack assembly and panel can not be removed separately. They must be removed together. Remove jack assembly by prying up side of jack assembly toward front of radio.



Bottom Component Location

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

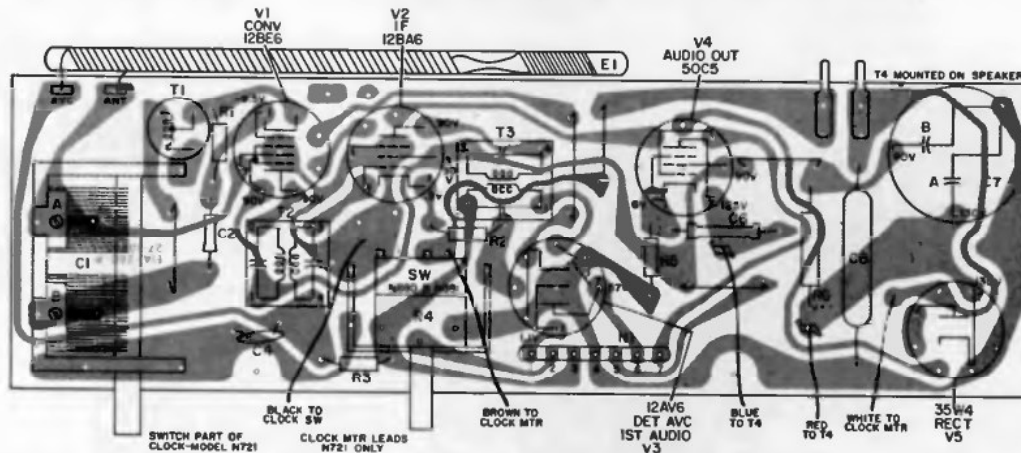
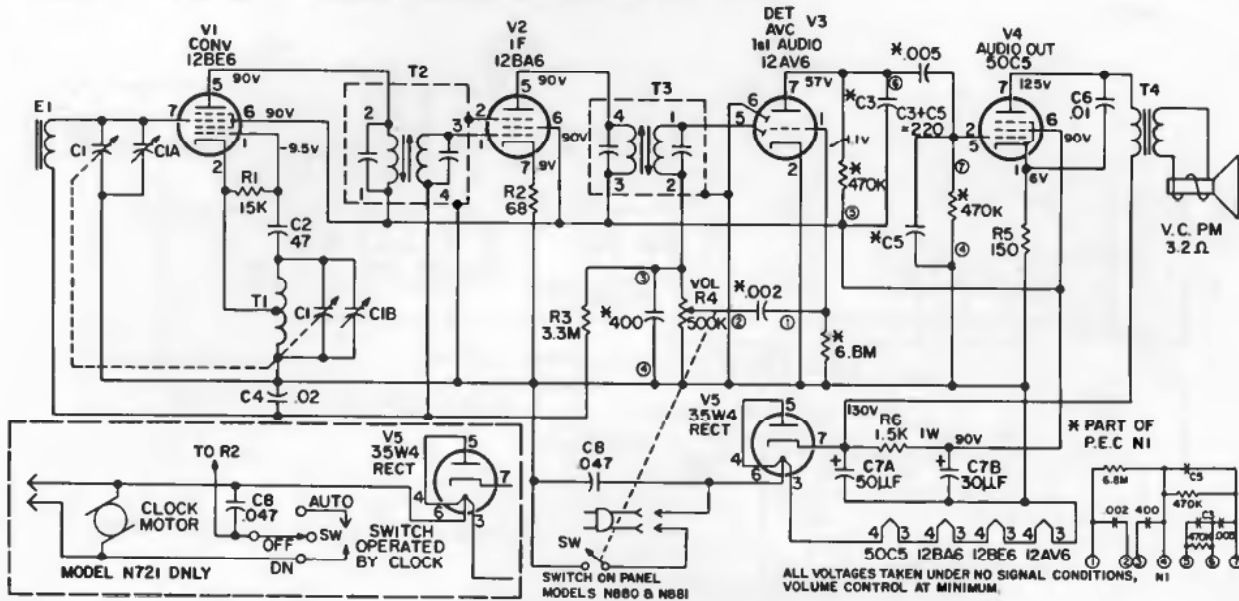
PHILCO Model NT900, Continued (Alignment data on page 100)



Bottom View of Perma-Circuit Panel - NT900

PHILCO

TABLE/CLOCK AM RADIOS MODELS N721, N880, & N881



Models N721, N880 & N881 - Component Layout Perma-Circuit Panel, Bottom View

ALIGNMENT PROCEDURE

Allow test equipment to warm up for 15 minutes before proceeding with alignment. Connect AC voltmeter or oscilloscope across speaker voice coil. Use an AM RF signal generator. Connect ground lead to B minus and output lead as indicated in chart. Attenuate signal generator output throughout alignment to maintain output level below 1 volt.

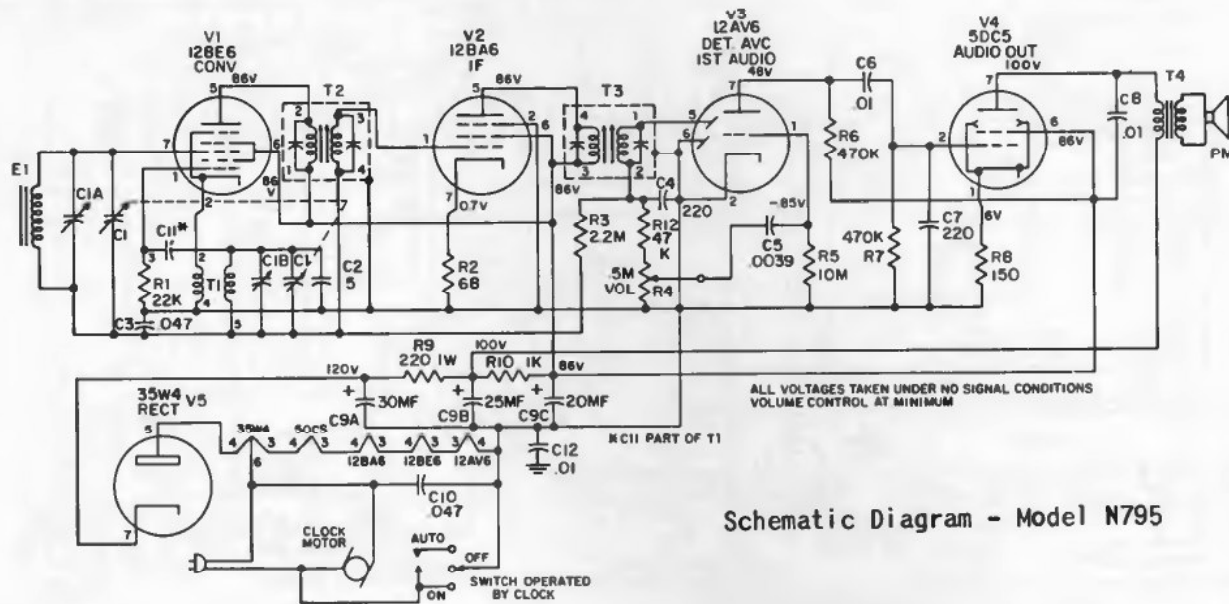
STEP	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	SPECIAL INSTRUCTIONS	ADJUST
1	CONNECT GENERATOR THROUGH A .1 MF CAPACITOR TO ANTENNA SECTION OF GANG	455KC	TUNING GANG FULLY OPEN	ADJUST FOR MAXIMUM OUTPUT IN ORDER GIVEN	T3 - TOP T3 - BOTTOM T2 - BOTTOM T2 - TOP
2	USE RADIATING LOOP	1620KC	1620KC	ADJUST FOR MAXIMUM	C1B - OSC. TRIM.
3	SAME AS STEP 2	1400KC	1400KC	ADJUST FOR MAXIMUM	C1A - ANT. TRIM.

NOTE: Use a 6 to 8 turn 6-inch diameter loop made of insulated wire. Connect to signal generator and loosely couple to radio antenna.

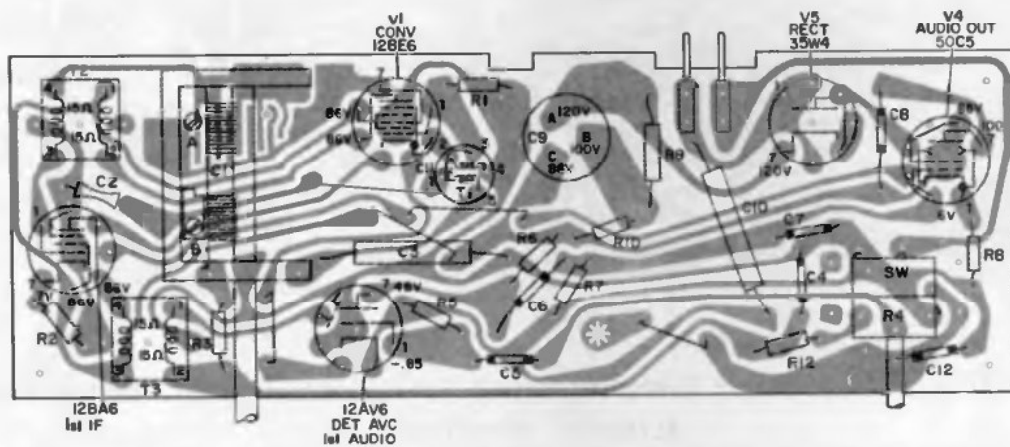
PHILCO

MODEL N795

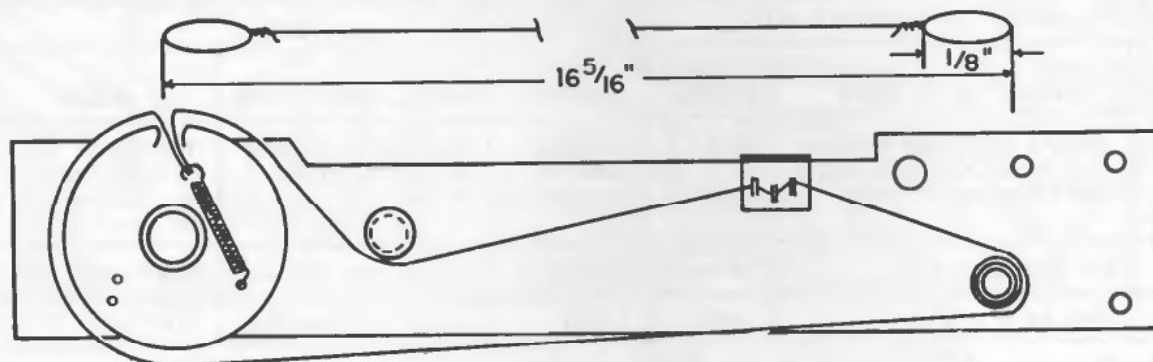
(For alignment see table on page 103)



Schematic Diagram - Model N795



Model N795 - Component Layout Perma-Circuit Panel, Bottom View



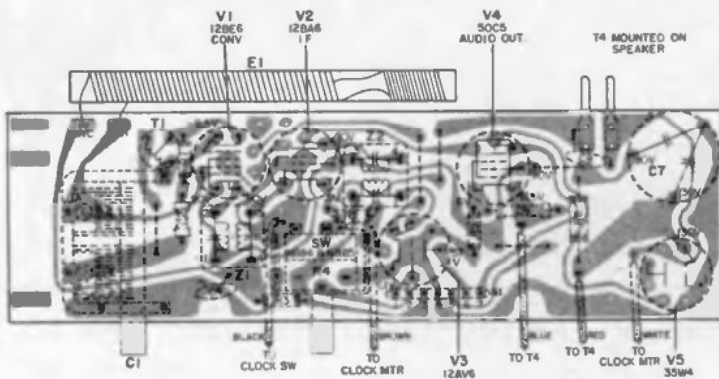
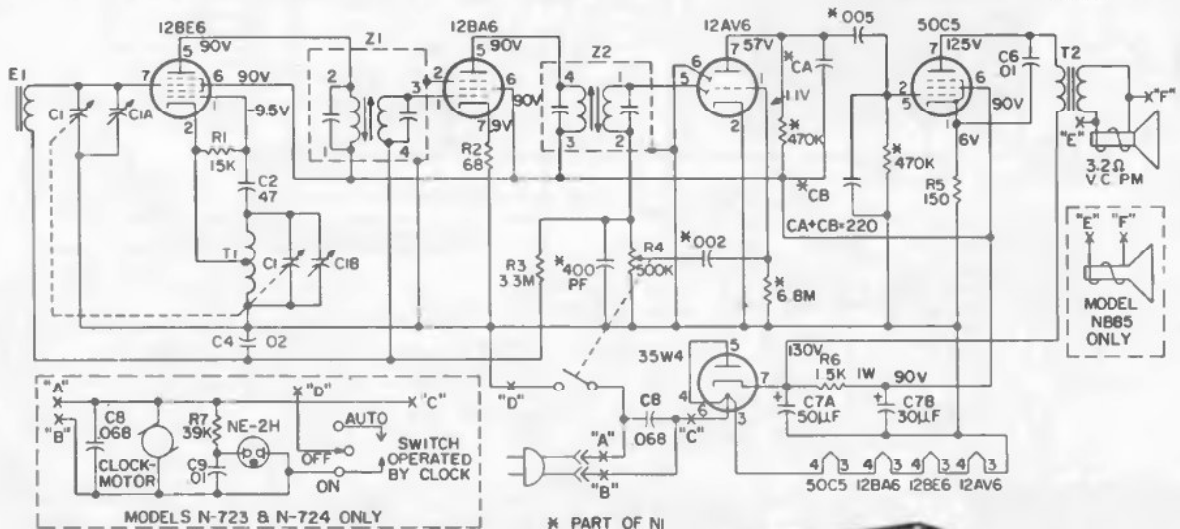
Dial Cord Stringing - Model N795 Only

PHILCO

AM Only Models N-723, N-724, N-884, N-885



N-884



Bottom View Perma-Circuit Panel

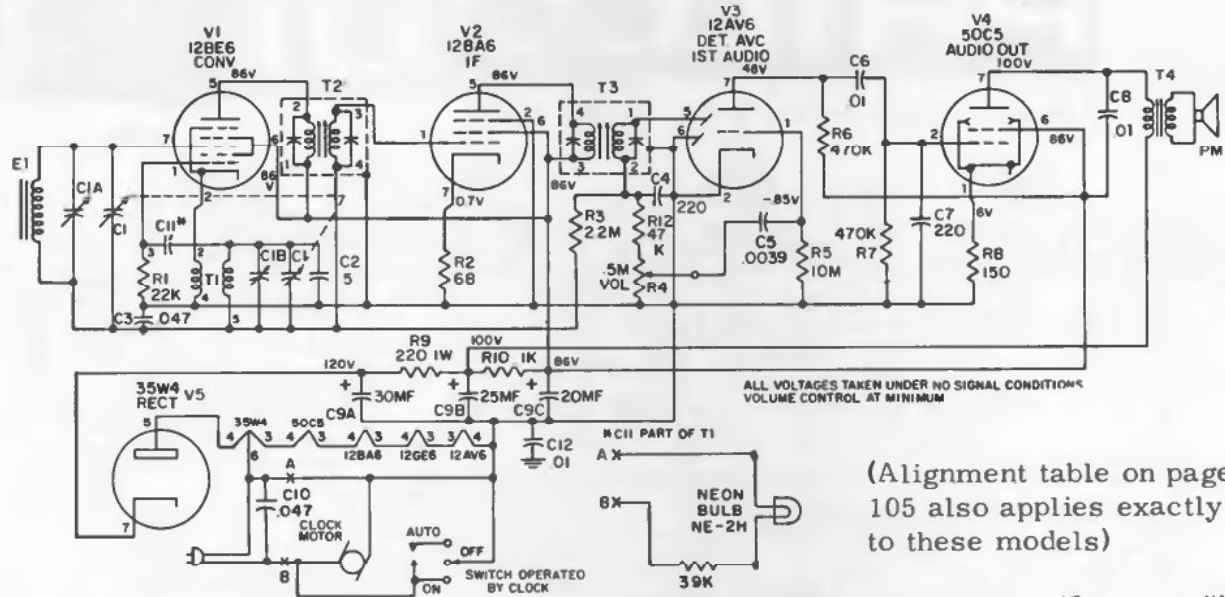
ALIGNMENT

Connect an a-c voltmeter or oscilloscope across speaker voice coil. Connect ground lead of the AM R-F signal generator to chassis output lead as indicated in chart. Keep voltage across voice coil below .5 volt (reduce generator output). Set volume control to maximum, tuning control as indicated in chart. During alignment keep antenna and chassis in same relative position as they are in cabinet.

SIGNAL GENERATOR		RADIO			
STEP	CONNECTION TO RADIO	DIAL SETTING	DIAL SETTING	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.	455KC	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).	1620KC	1620KC	Adjust for maximum output.	C1-B - osc.
3	Same as Step 2.	1500KC	1500KC	Adjust for maximum output.	C1-A - serial

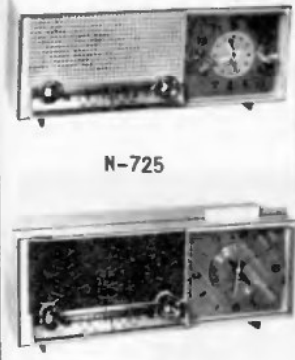
NOTE: Make up a 6-8 turn, 6 inch diameter loop from insulated wire, connect to signal-generator leads, and place near radio loop. For proper adjustment of the oscillator trimmer, fully open the tuning gang and insert a .006 inch non-metallic shim between the heel of the rotor and the top of the stator plates. Close the tuning gang sufficiently to hold the shim in place, and then remove the shim without disturbing the gang setting.

PHILCO Models N-725 and N-727



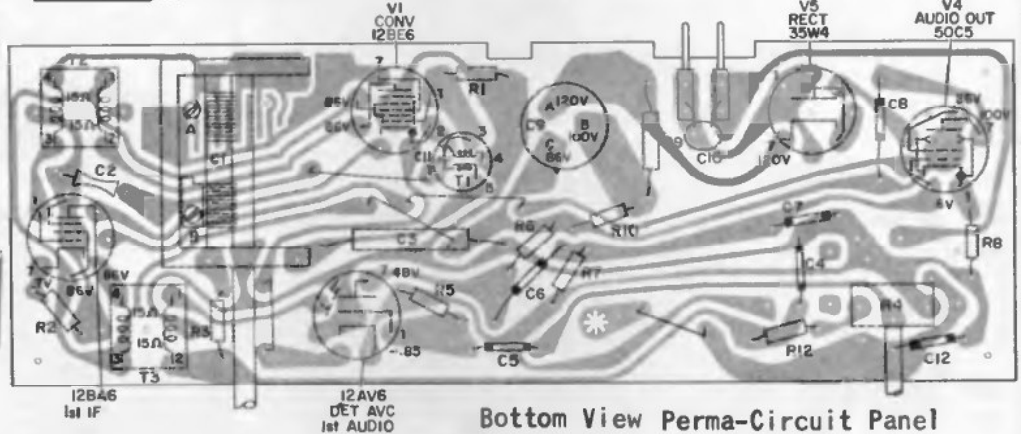
ALL VOLTAGES TAKEN UNDER NO SIGNAL CONDITIONS
VOLUME CONTROL AT MINIMUM

(Alignment table on page 105 also applies exactly to these models)



N-725

N-727



Bottom View Perma-Circuit Panel

SYM-BOL	LOCA-TION	DESCRIPTION	SERVICE PART NO.
C1	C2	Capacitor, variable tuning	
C2	B2	Capacitor, 5 pf, temp. comp.	30-1287-1
C3	E3	Capacitor, .047 mf, AVC	30-4650-45
C4	L4	Capacitor, 220 pf, diode filter	30-1283-25
C5	G5	Capacitor, .0039 mf, 1st audio	30-1283-64
C6	G4	Capacitor, .01 mf, out. grid	30-1283-69
C7	L3	Capacitor, 220 pf, out. grid	30-1283-25
C8	M1	Capacitor, .01 mf, out. plate	30-1283-69
C9	H2	Capacitor, electrolytic 30/25/20	30-2585-11
C10	J2	Capacitor, .047 line bypass	30-4650-45
C11	F2	Part of T1	*
C12	M5	Capacitor, .01 mf, B- to gnd.	30-1283-69

SYM-BOL	LOCA-TION	DESCRIPTION	SERVICE PART NO.
R1	F1	Resistor, 22K ohms, osc. grid	
R2	A4	Resistor, 68 ohms, I-F cathode	
R3	C4	Resistor, 2.2M ohms, AVC	
R4	M4	Control, volume	
R5	F4	Resistor, 10M ohms, 1st audio grid	
R6	G3	Resistor, 470K, 1st audio plate	
R7	H4	Resistor, 470K, 1st output grid	
R8	N3	Resistor, 150 ohms, output cathode	
R9	J2	Resistor, 220 ohms, 1W, B+ filter	
T1	H1	Transformer, oscillator	32-4756-1
Z1	B1	Transformer, 1st I-F	32-4583-23
Z2	B4	Transformer, 2nd I-F	32-4583-23

PHILCO

MODELS N-730, N-940

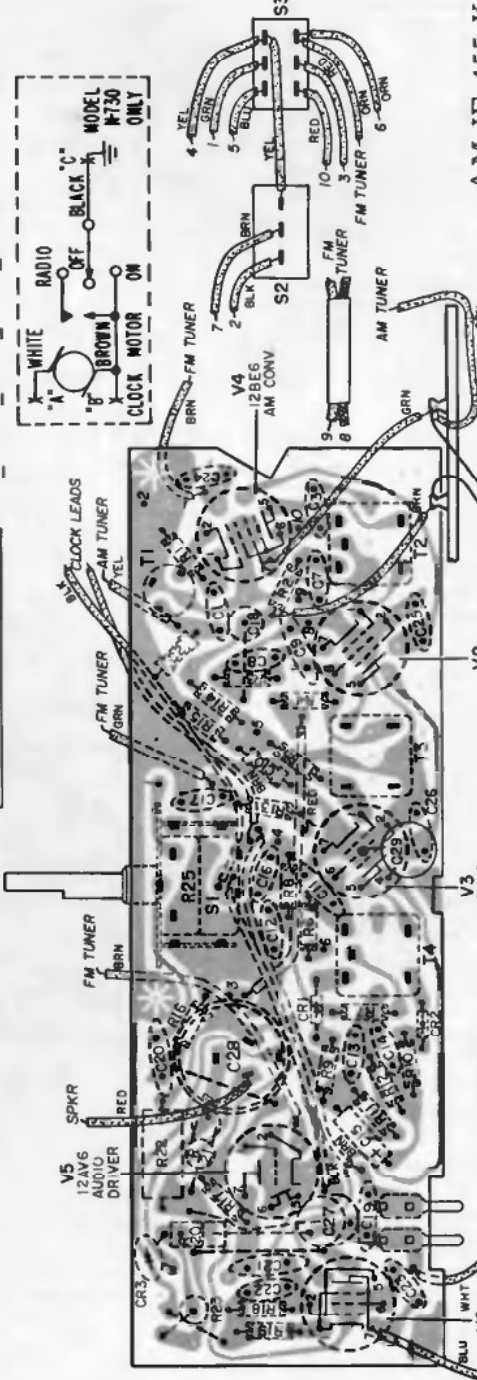
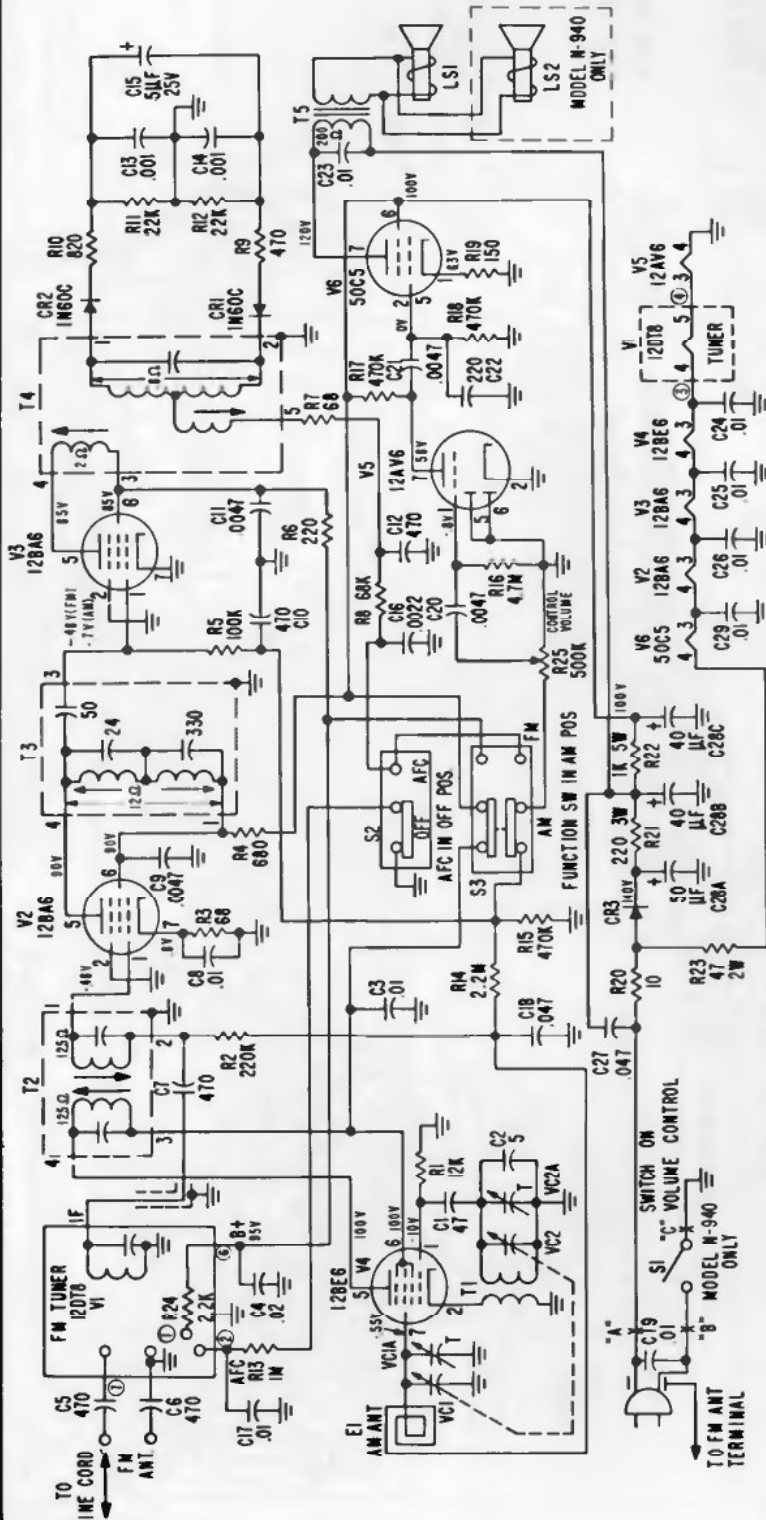


N-730



N-940

AM IF 455 KC.
FM IF 10.7 MC.



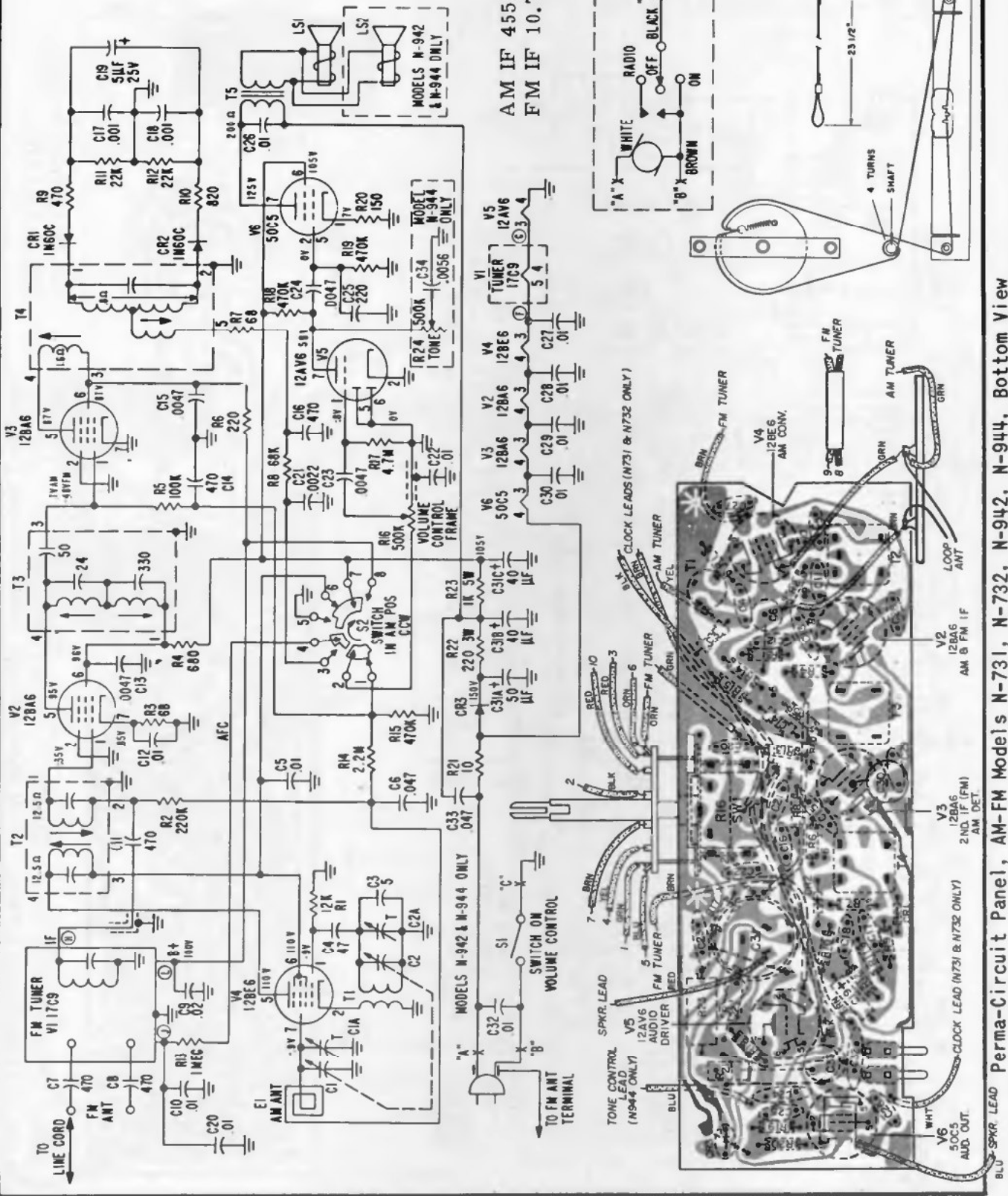
Perma-Circuit Panel, AM-FM Models N-730, N-940, Bottom View

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

PHILCO

Models N-731, N-732,
N-942, N-944

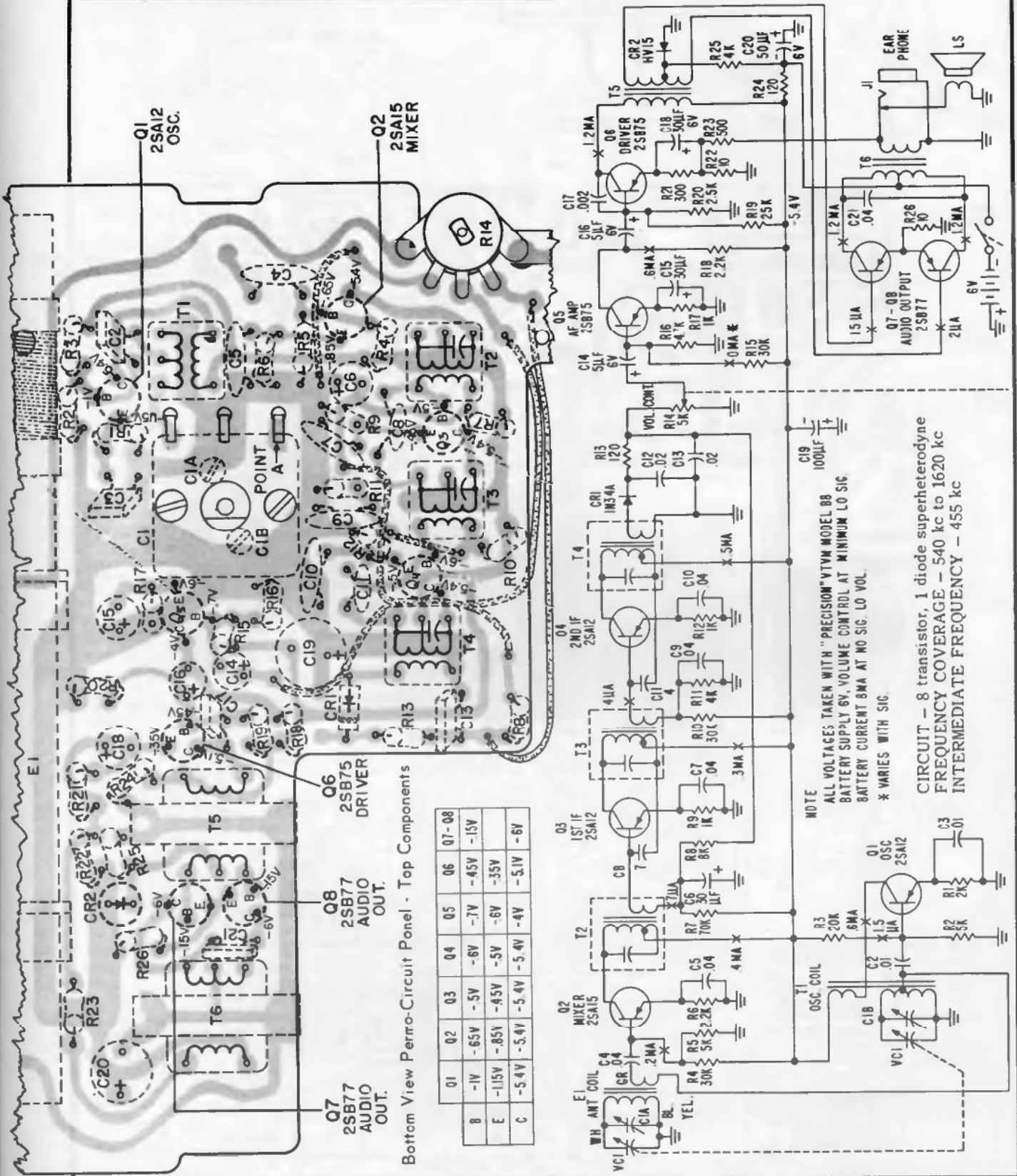
AM IF 455 KC.
FM IF 10.7 MC.



Perma-Circuit Panel, AM-FM Models N-731, N-732, N-942, N-944, Bottom View

PHILCO

TRANSISTOR PORTABLE MODEL NT-807



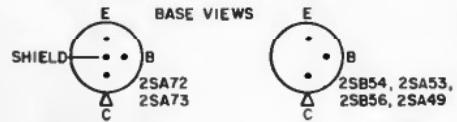
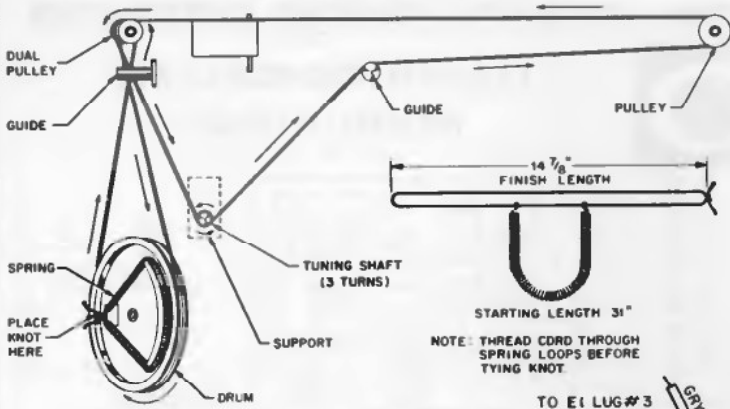
Bottom View Permo-Circuit Panel - Top Components

	01	02	03	04	05	06	07-08
B	-1V	-65V	-5V	-6V	-7V	-45V	-15V
E	-115V	-85V	-45V	-5V	-6V	-35V	
C	-5.4V	-5.4V	-5.4V	-5.4V	-4V	-5.1V	-6V

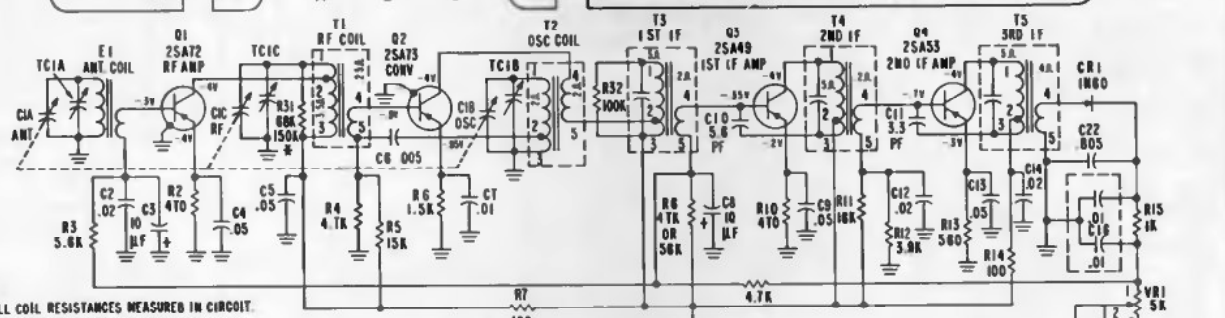
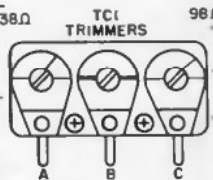
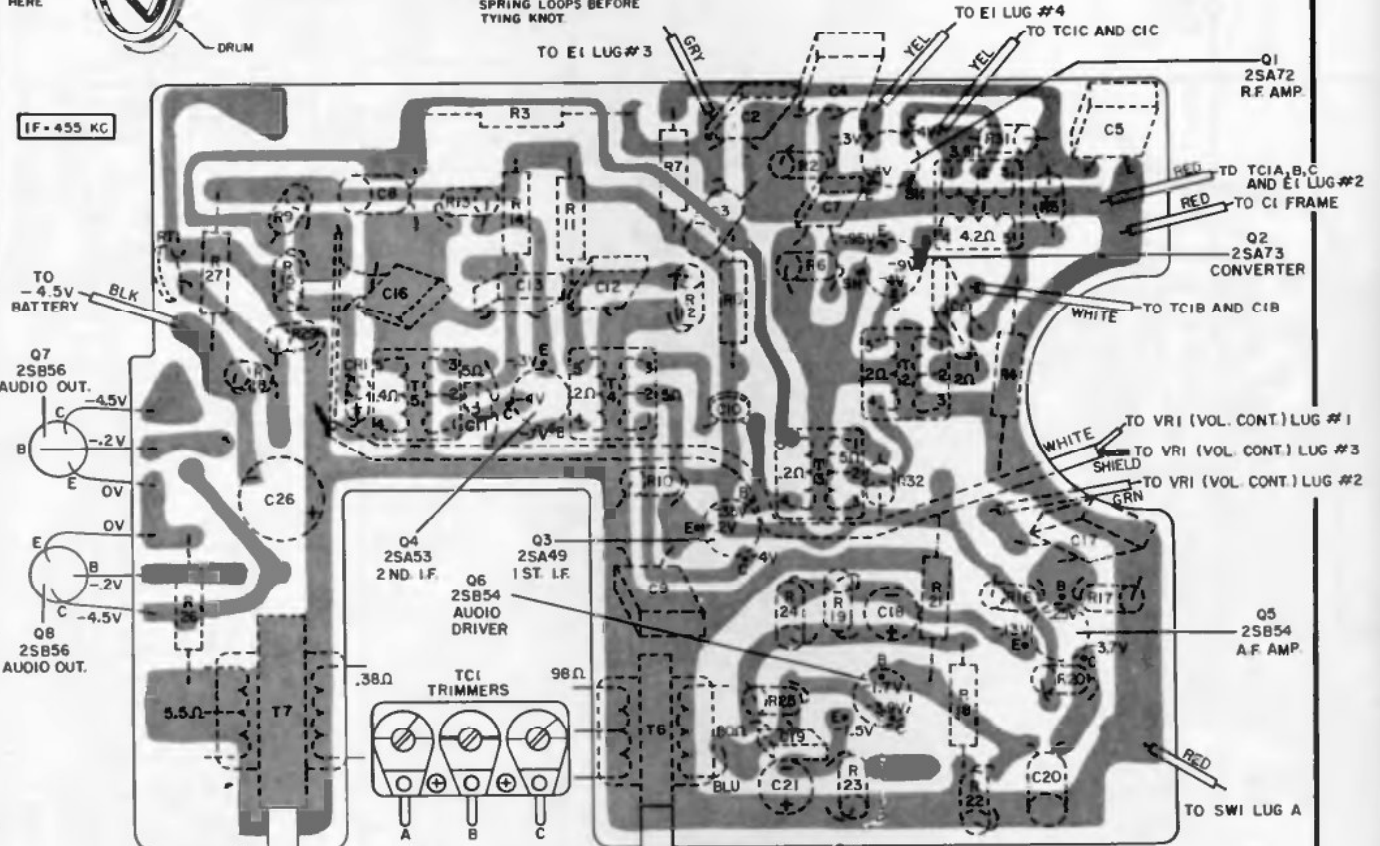
NOTE
ALL VOLTAGES TAKEN WITH "PRECISION" VTVM MODEL 88
BATTERY SUPPLY 6V, VOLUME CONTROL AT MINIMUM LO SIG.
BATTERY CURRENT 8MA AT NO SIG. LO VOL.
* VARIES WITH SIG.

CIRCUIT - 8 transistor, 1 diode superheterodyne
FREQUENCY COVERAGE - 540 kc to 1620 kc
INTERMEDIATE FREQUENCY - 455 kc

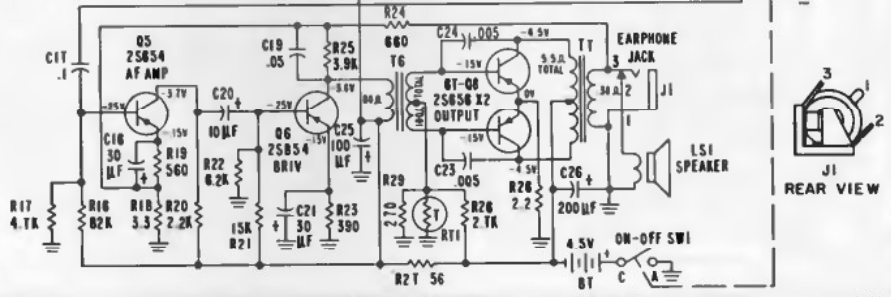
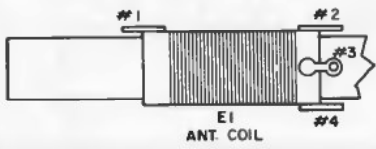
PHILCO
MODEL NT-808



IF = 455 KC.

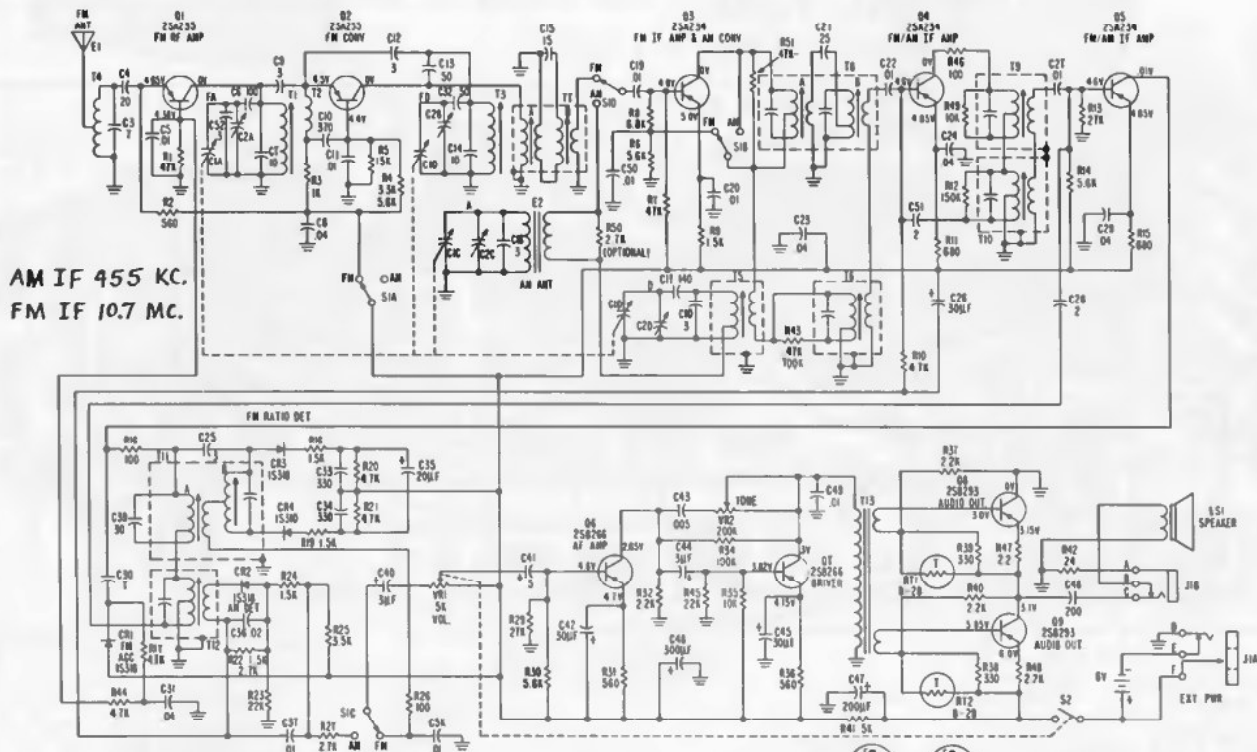


- NOTES:
1. ALL COIL RESISTANCES MEASURED IN CIRCUIT.
2. ALL VOLTAGES MEASURED FROM B+ 4.5V TO POINTS INDICATED.
3. VOLTAGES TAKEN WITH NO SIGNAL AND WITH VOLUME CONTROL AT MINIMUM, UNDER SAME CONDITIONS BATTERY CURRENT BRAIN 12MA.
4. VOLTAGES AND RESISTANCES TAKEN WITH "PRECISION" VTVM MODEL "66"
* REPLACE WITH ORIGINAL VALUE.



PHILCO

AM-FM TRANSISTOR PORTABLE MODEL NT-906



AM IF 455 KC.
FM IF 10.7 MC.

1. ALL VOLTAGES MEASURED FROM D- TO POINTS INDICATED
2. VOLTAGES READ WITH NO SIGNAL AND VOLUME AT MINIMUM UNDER SAME CONDITIONS BATTERY CURRENT AM-12MA FM-14MA
3. VOLTAGE READINGS MAY BE HIGHER WITH NEW BATTERIES
4. VOLTAGES MEASURED WITH "PRECISION" VTVM MODEL "80"
5. VOLTAGES TAKEN IN AM POSITION EXCEPT Q1 AND Q2 WHICH WERE TAKEN IN FM POSITION

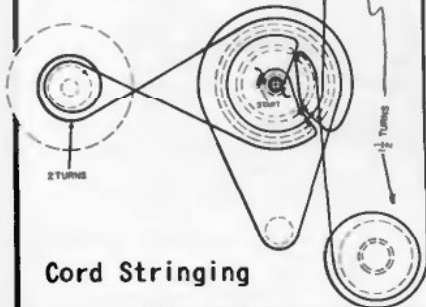
NOTE:-

1. ALL RESISTANCE READINGS MEASURED IN-CIRCUIT
2. ALL VOLTAGES AND RESISTANCES WERE MEASURED WITH "PRECISION" VTVM MODEL "80"

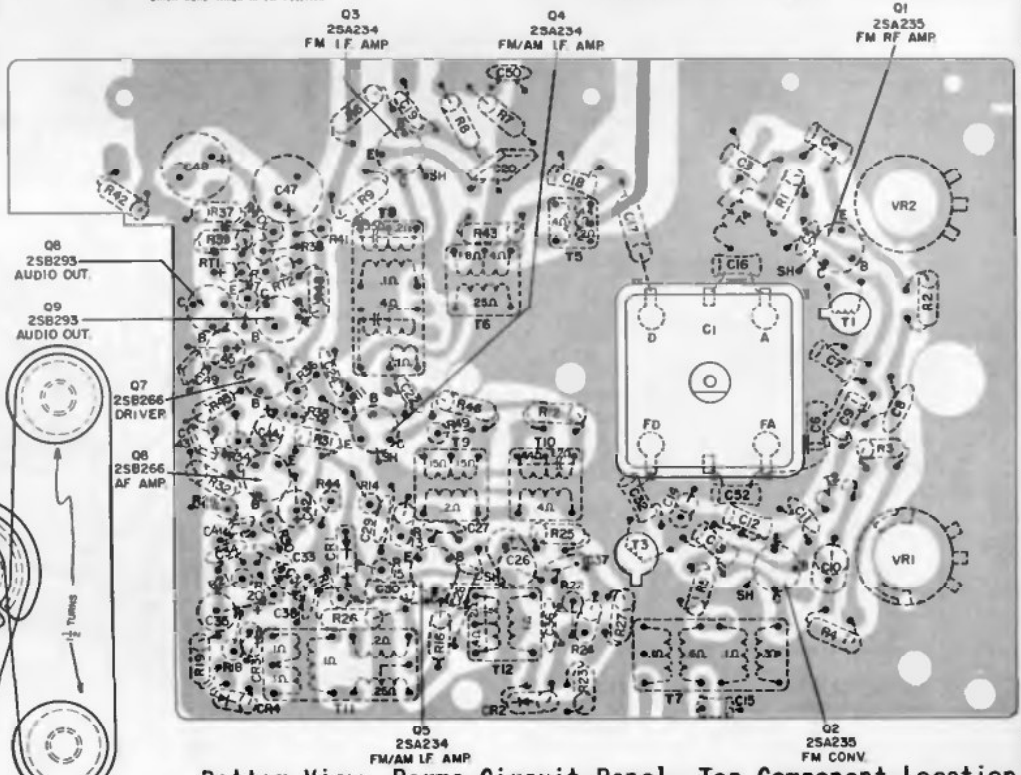
VOLTAGE CHART

	C	B	E
Q1	0	3.22	1.68
	0	4.38	4.65
Q2	0	1.25	1.5
	0	4.4	4.5
Q3	0	4.6	5.0
	0	8.28	3.2
	0	4.6	4.85
	0	4.45	4.7
Q4	05	4.6	4.85
	05	4.6	4.68
	2	6.5	4.6
	2	3.2	4.4
Q5	3	3.82	4.15
	3	3.52	4.0
Q6	0	3.0	3.15
	0	3.0	3.12
	3.1	3.85	6.0
	3.1	3.92	5.0

VOLTAGES MARKED WITH READ WITH SWITCH IN FM POSITION, ALL OTHERS IN AM. BATTERY CURRENT MEASURED WITH VOLUME AND TONE CONTROL AT MINIMUM AND NO SIGNAL. ON FM 14MA, AM 12MA



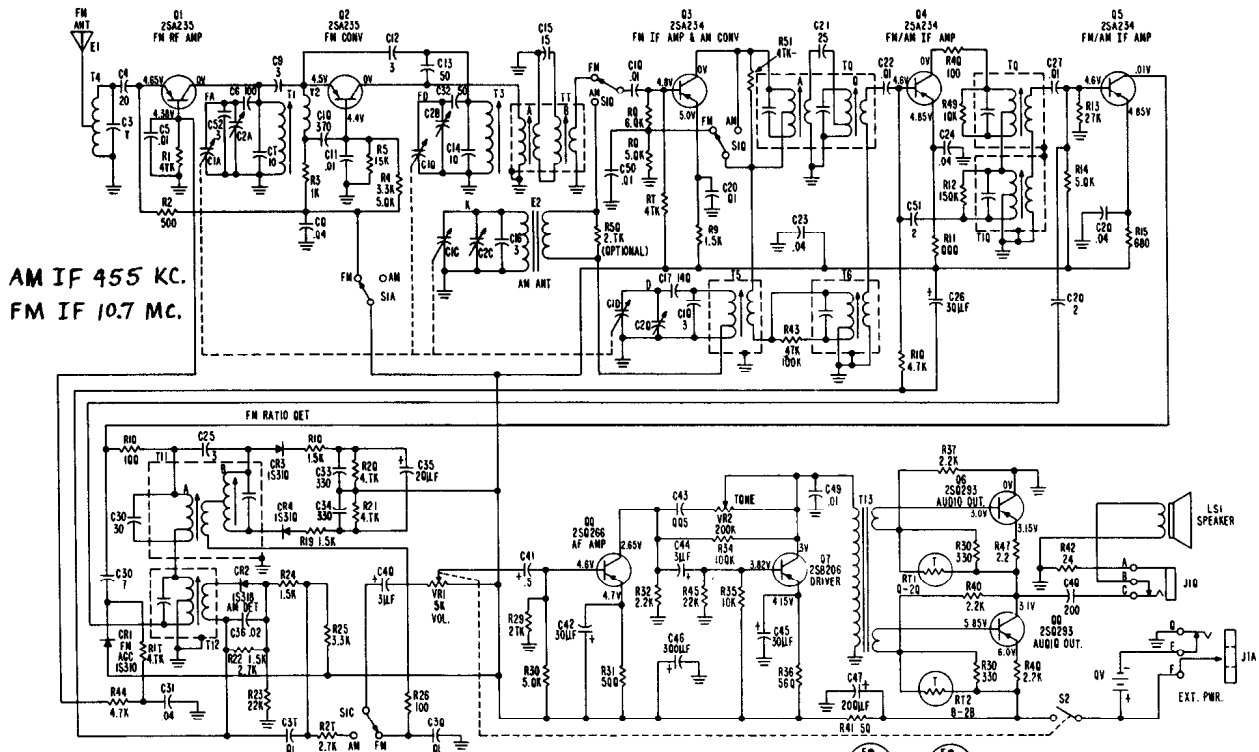
Cord Stringing



Bottom View, Perma-Circuit Panel, Top Component Location

PHILCO

AM-FM TRANSISTOR PORTABLE MODEL NT-906



AM IF 455 KC.
FM IF 10.7 MC.

1. ALL VOLTAGES MEASURED FROM 0- TO POINTS INDICATED
2. VOLTAGES READ WITH NO SIGNAL AND VOLUME AT MINIMUM UNDER SAME CONDITIONS. BATTERY CURRENT: AM-12MA FM-14MA
3. VOLTAGE READINGS MAY BE HIGHER WITH NEW BATTERIES
4. VOLTAGES MEASURED WITH "PRECISION" VTVM MODEL "80"
5. VOLTAGES TAKEN IN AM POSITION EXCEPT Q1 AND Q2 WHICH WERE TAKEN IN FM POSITION

TRANSISTOR BASING
OUTLINE VIEW

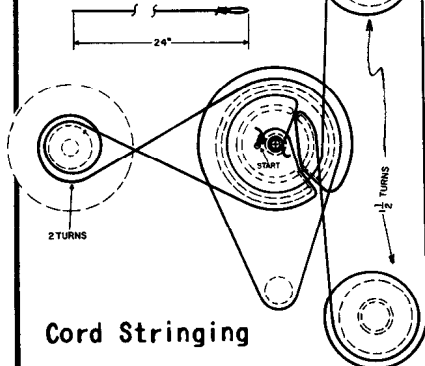
- E-EMITTER
- B-BASE
- C-COLLECTOR
- S-SHIELD

NOTE:-
1. ALL RESISTANCE READINGS MEASURED IN-CIRCUIT.
2. ALL VOLTAGES AND RESISTANCES WERE MEASURED WITH "PRECISION" VTVM MODEL "80".

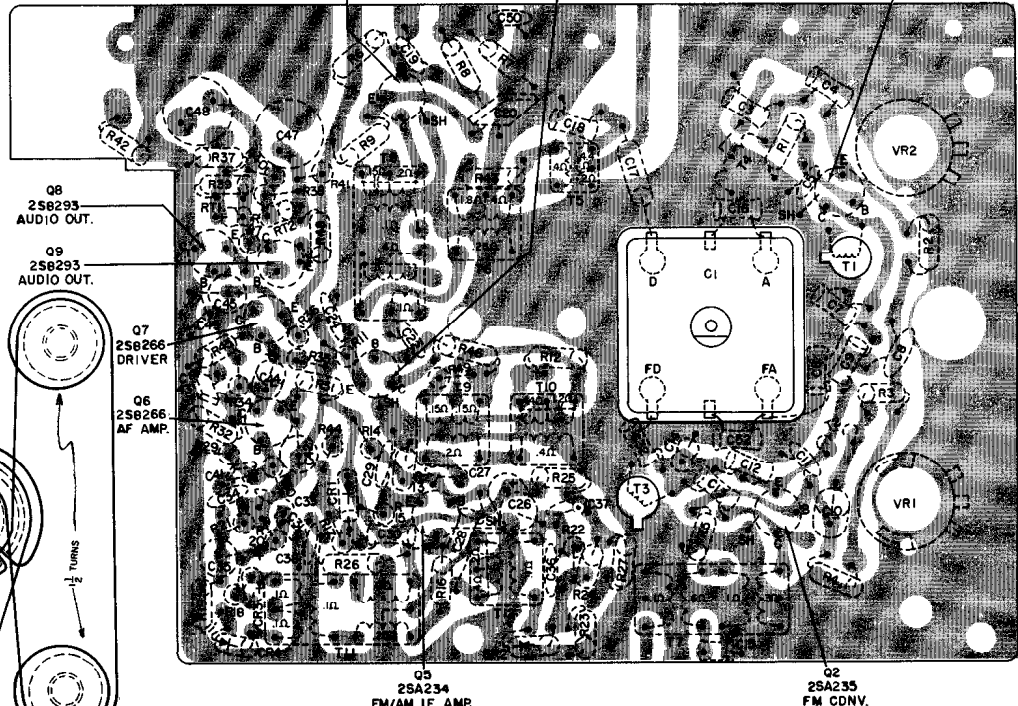
VOLTAGE CHART

	C	B	E
Q1	0	3.22	1.68
Q2	0	4.38	4.65
	0	1.25	1.5
Q3	0	4.8	5.0
	0	2.8	3.2
Q4	0	4.6	4.85
	0	4.45	4.7
Q5	.05	4.6	4.85
	.05	4.6	4.68
Q6	2.65	4.6	4.7
	2.52	4.4	4.55
Q7	3	3.82	4.15
	3	3.52	4.0
Q8	0	3.0	3.15
	0	3.0	3.15
Q9	3.1	5.85	6.0
	3.1	5.55	6.0

VOLTAGES MARKED WITH * READ WITH SWITCH IN FM POSITION, ALL OTHERS IN AM. BATTERY CURRENT MEASURED WITH VOLUME AND TONE CONTROL AT MINIMUM AND NO SIGNAL. ON FM 14MA, AM 12MA.



Cord Stringing

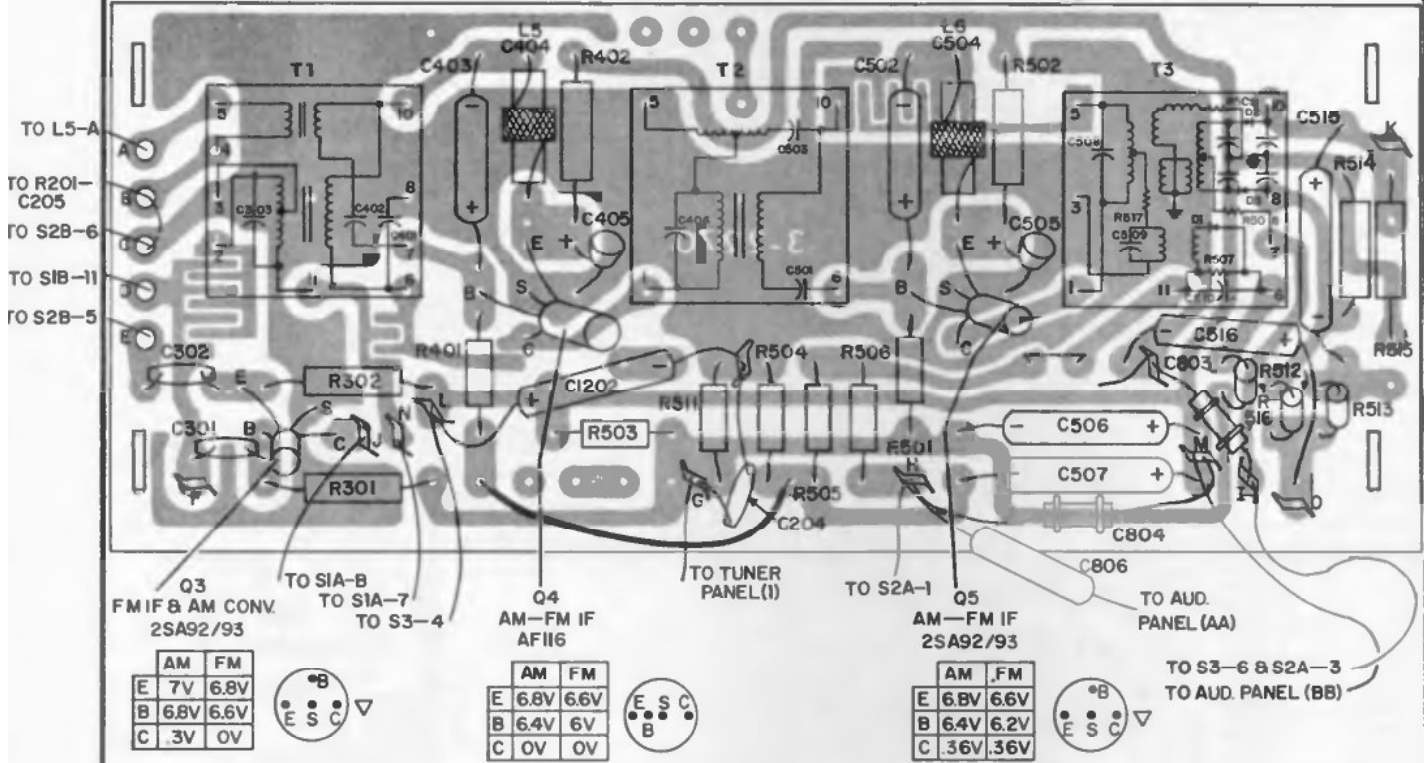


Bottom View, Perma-Circuit Panel, Top Component Location

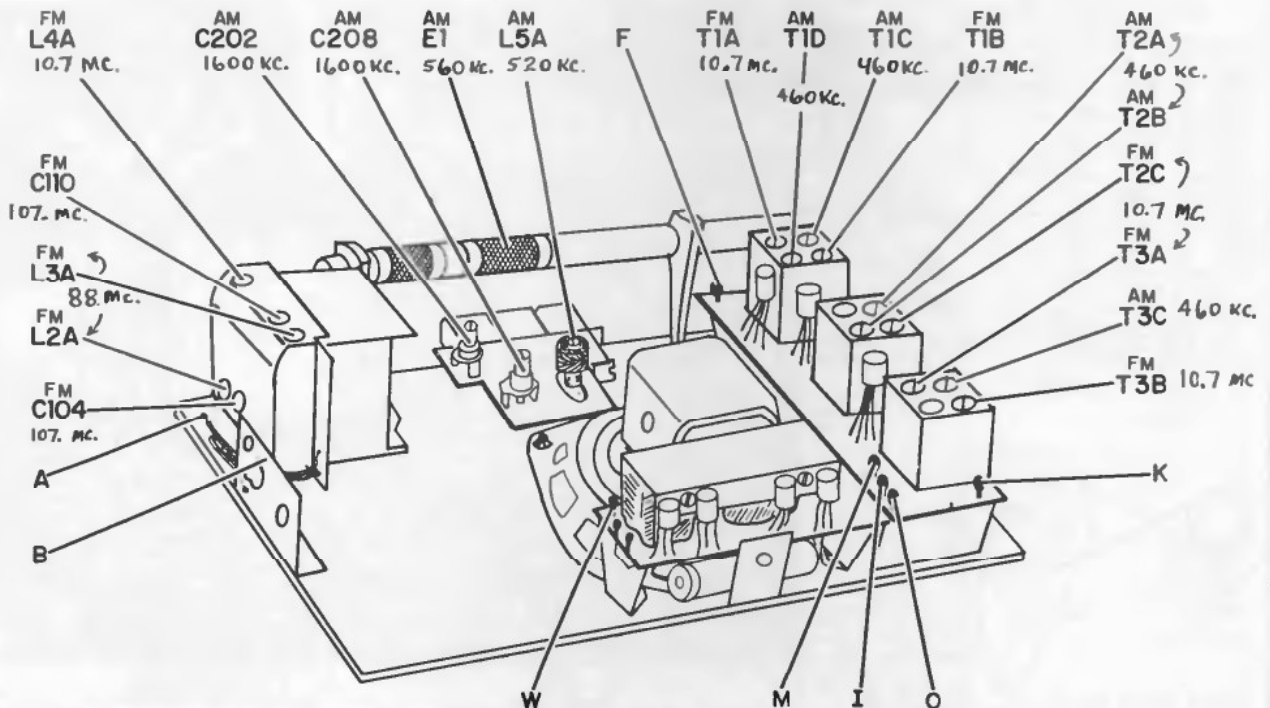
PHILCO

MODEL T-908

(Continued on the next page at right)



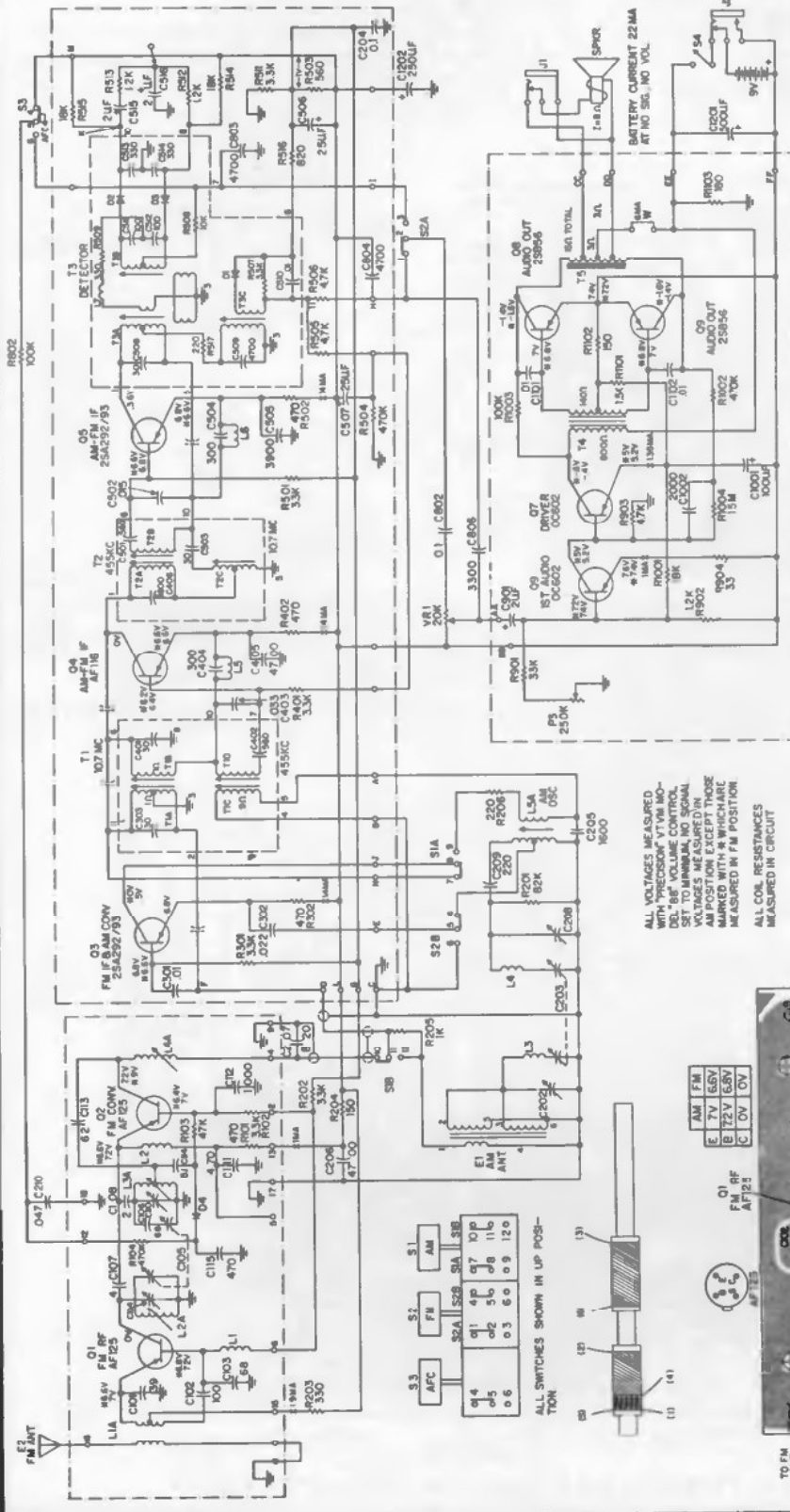
Top View, IF Panel



AM-FM CHASSIS ALIGNMENT POINTS

PHILCO MODEL T-908

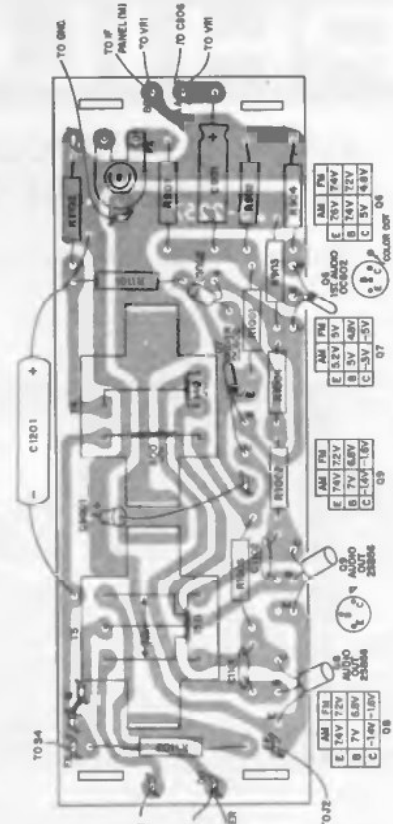
(Continued from the page at left)



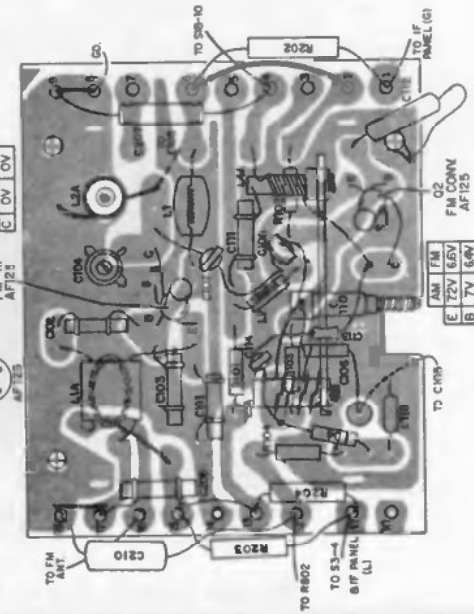
ALL VOLTAGES MEASURED
REL. SET VOLUME CONTROL
SET TO MINIMUM, NO SIGNAL
VOLTAGES MEASURED IN
AM POSITION EXCEPT THOSE
WHICH ARE SPECIFICALLY
MEASURED IN FM POSITION
ALL COL. RESISTANCES
MEASURED IN CIRCUIT

ALL SWITCHES SHOWN IN UP POS.

S1	AM
S2	FM
S3	AFC
O1	4P
O2	5B
O3	6.0
O4	9.0
O5	12.0



Top View, Audio Output Panel



Top View, FM Tuner Panel

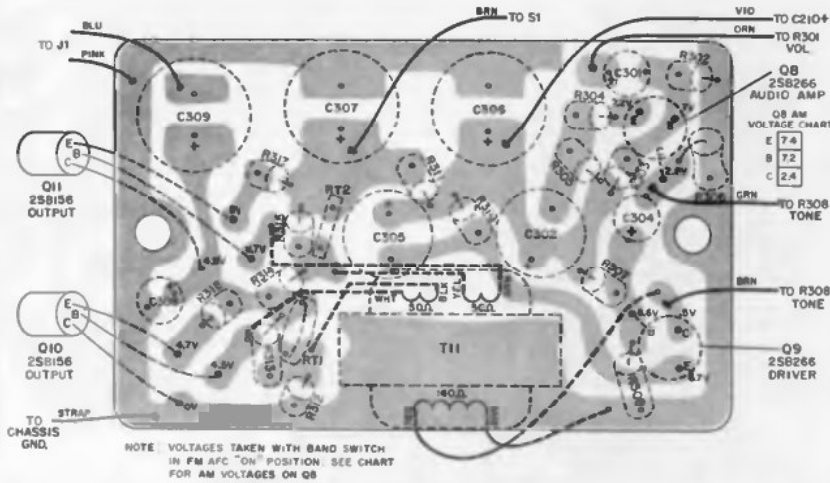
PHILCO

AM-FM TRANSISTOR PORTABLE MODEL NT-913

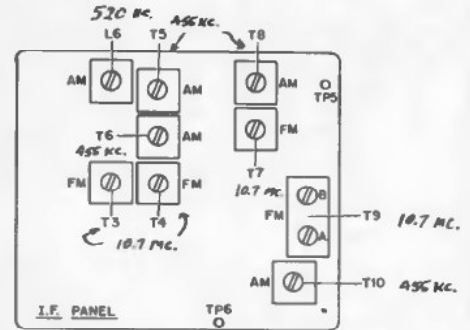
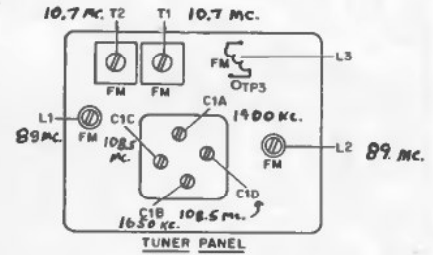
(Continued on the next page at right)

CABINET REMOVAL FOR SERVICING

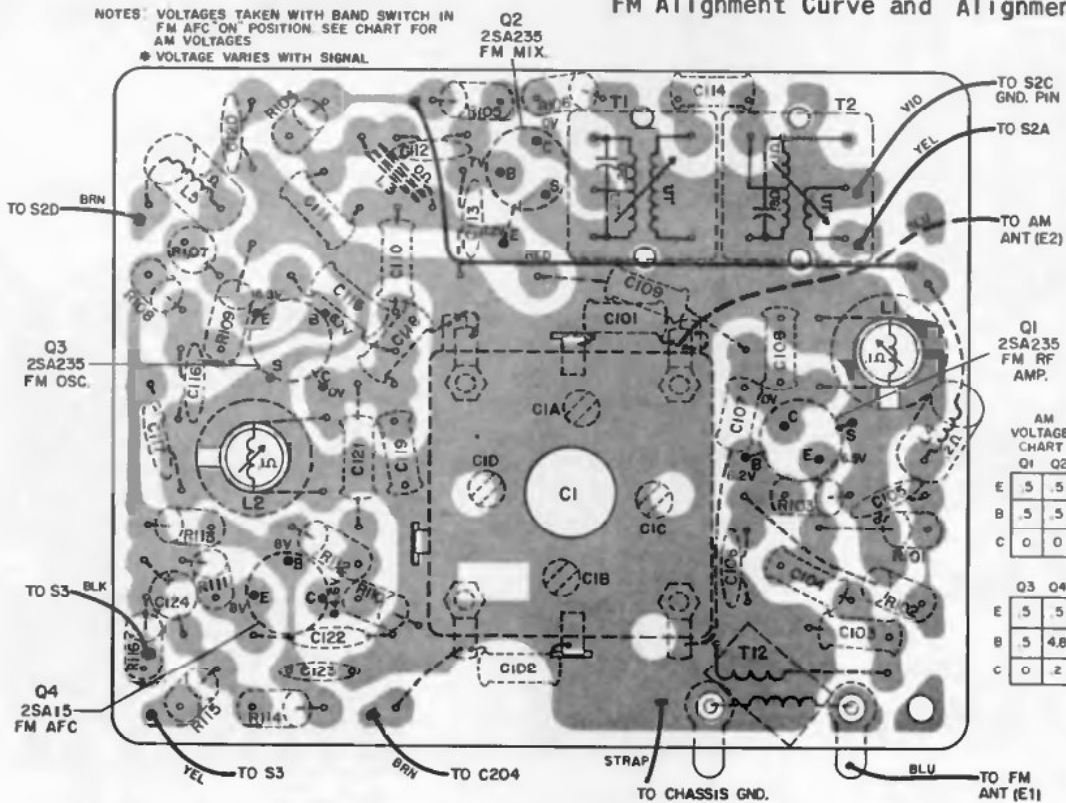
1. Remove two screws from bottom of cabinet.
2. Loosen two screws located under handle (turn CCW five turns maximum). Do not remove screws.
3. Lay radio on its back; lift front frame with chassis from cabinet.
4. Remove nut holding power jack in cabinet.
5. FM antenna lead and battery leads must be unsoldered to detach cabinet completely.



Bottom View - Audio Perma-Circuit Panel
Top Components Layout



FM Alignment Curve and Alignment Points



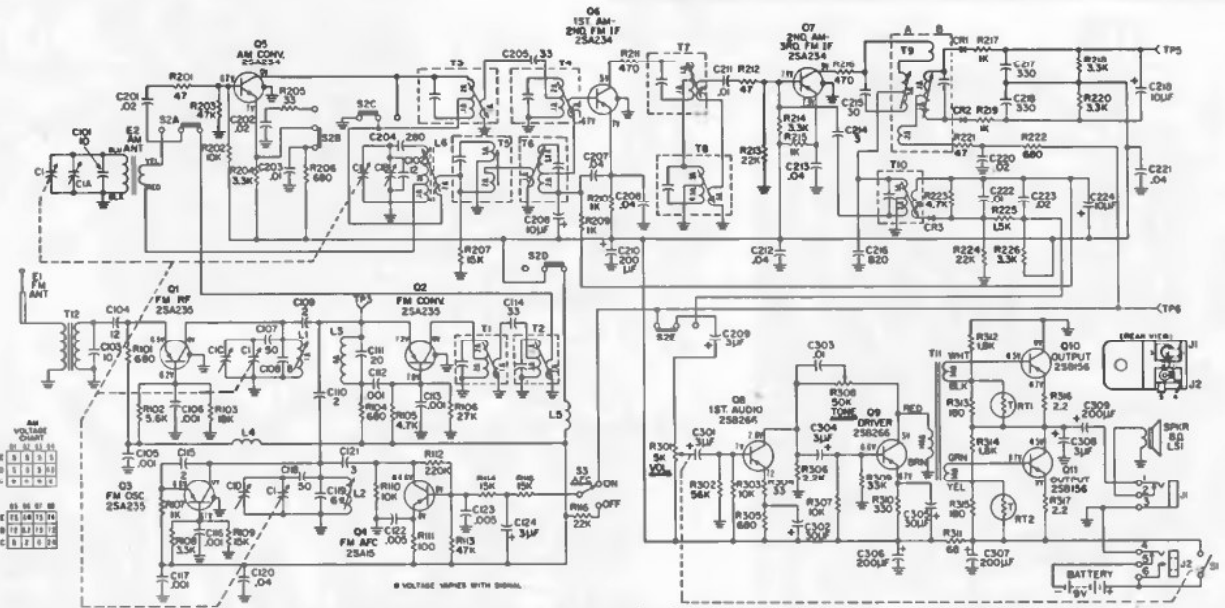
Bottom View - Tuner Perma-Circuit Panel Top Components Layout

NOTES: VOLTAGES TAKEN WITH BAND SWITCH IN FM AFC ON POSITION. SEE CHART FOR AM VOLTAGES
* VOLTAGE VARIES WITH SIGNAL

AM VOLTAGE CHART	
	Q1 Q2
E	.5 .5
B	.5 .5
C	0 0
Q3 Q4	
E	.5 .5
B	.5 4.8
C	0 .2

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

PHILCO Model NT-913, Continued from page at left



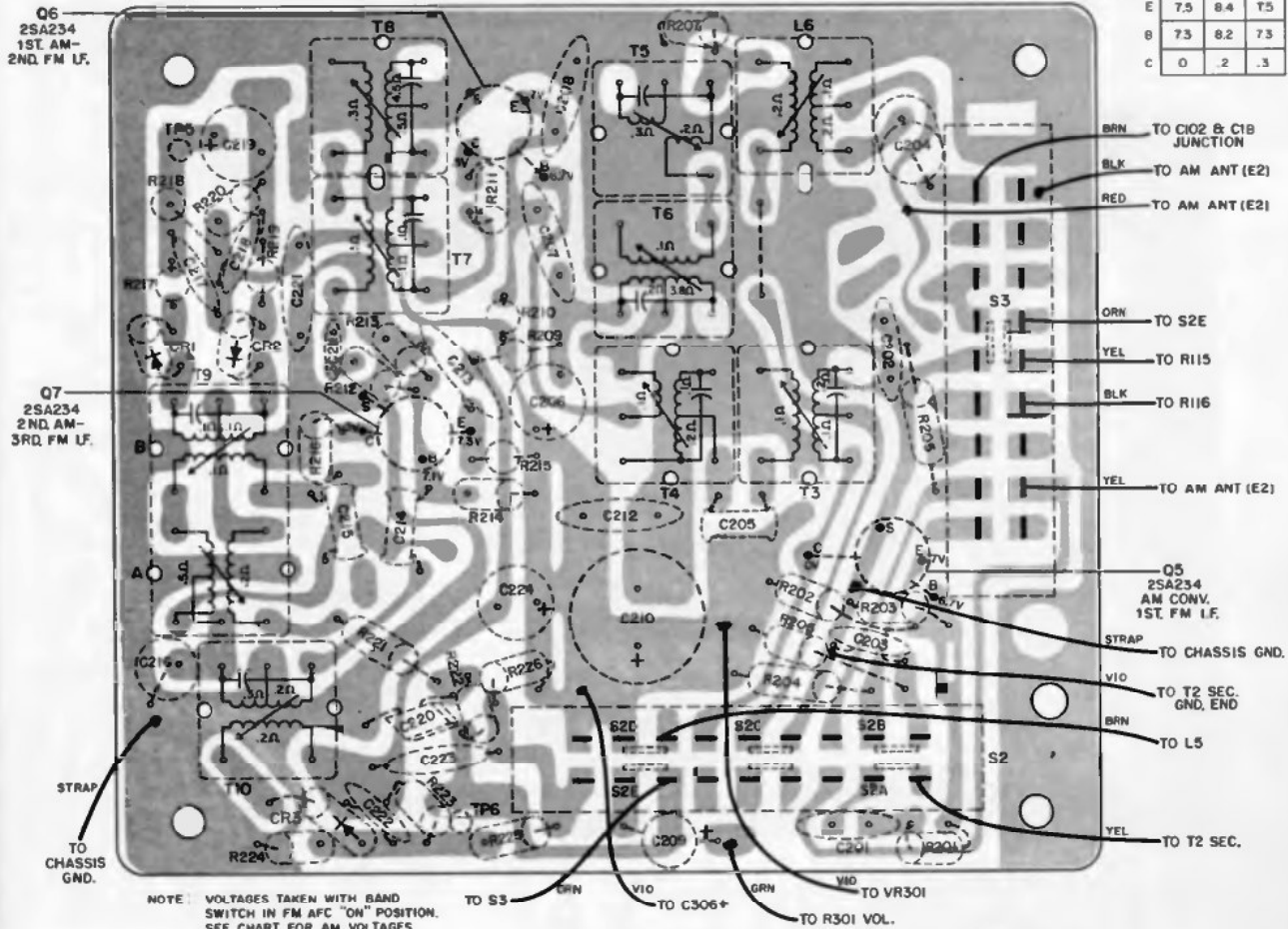
NOTES
 1. ALL CAPACITANCE VALUES OF 1.0 AND ABOVE ARE PF. ALL VALUES LESS THAN 1.0 ARE IN MFD'S UNLESS OTHERWISE INDICATED.
 2. ALL VOLTAGES AND RESISTANCES MEASURED WITH "PRECISION MODEL 88 VTM", AND BAND SWITCH IN FM AFC "ON" POSITION AS SHOWN. RESISTANCES MEASURED IN CIRCUIT.
 3. BATTERY CURRENT FOR FM 25MA, AM 18MA.
 4. VOLTAGE AND CURRENT READINGS MEASURED WITH VOLUME AT MINIMUM AND NO SIGNAL.

TRANSISTOR BASINGS - NT-913 VIEW

2SA15	2SA234
2SA15	2SA234
2SA15	2SA234

AM VOLTAGE CHART

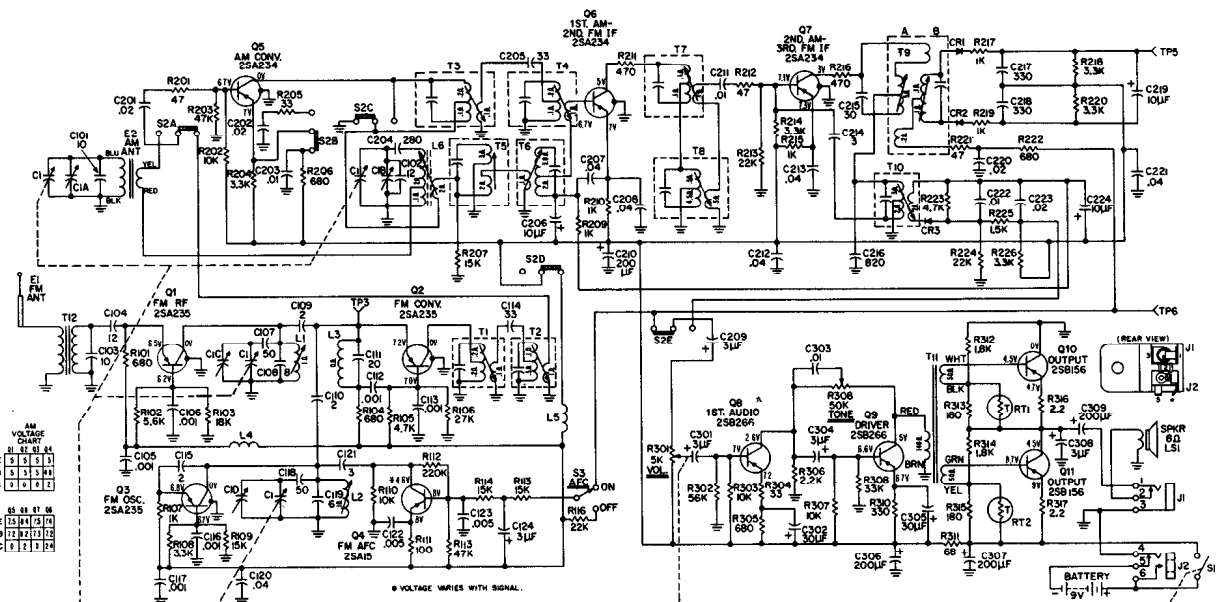
	Q5	Q6	Q7
E	7.5	8.4	7.5
B	7.3	8.2	7.3
C	0	.2	.3



NOTE: VOLTAGES TAKEN WITH BAND SWITCH IN FM AFC "ON" POSITION. SEE CHART FOR AM VOLTAGES

Bottom View - IF Perma-Circuit Panel Top Components Layout

PHILCO Model NT-913, Continued from page at left



AM VOLTAGE CHART

E	1	2	3	4
B	1	3	3	4
C	1	1	1	2

AS AS AS M

E	15	14	13	12
B	15	12	11	11
C	1	1	1	2

NOTES: 1. ALL CAPACITANCE VALUES OF 1.0 AND ABOVE ARE PF. ALL VALUES LESS THAN 1.0 ARE IN MFDS UNLESS OTHERWISE INDICATED.
 2. ALL VOLTAGES AND RESISTANCES MEASURED WITH "PRECISION MODEL 68 VTM"; AND BAND SWITCH IN FM AFC "ON" POSITION AS SHOWN, RESISTANCES MEASURED IN CIRCUIT.
 3. BATTERY CURRENT FOR FM 25MA, AM 18MA.
 4. VOLTAGE AND CURRENT READINGS MEASURED WITH VOLUME AT MINIMUM AND NO SIGNAL.

TRANSISTOR BASINGS-BOTTOM VIEWS

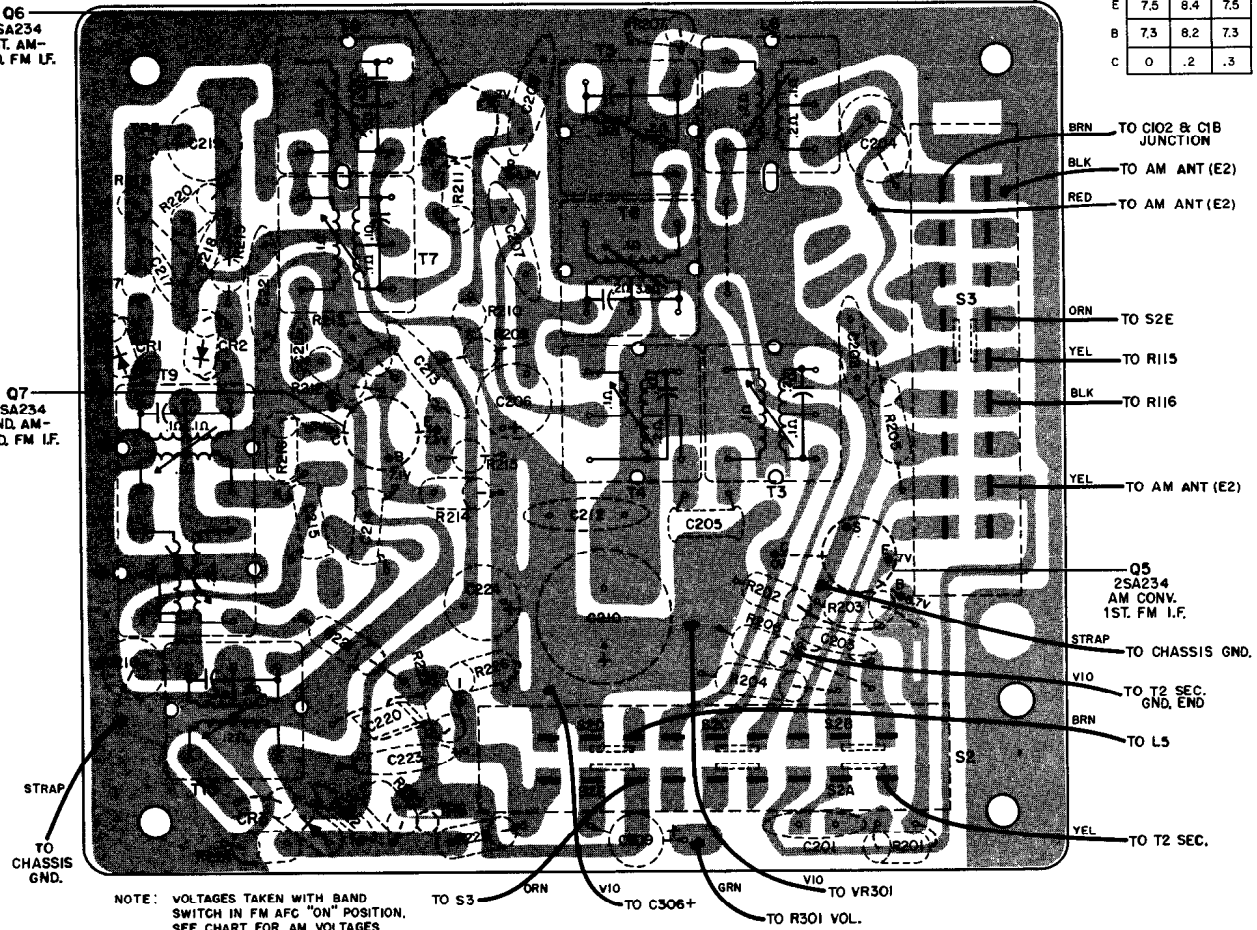
2SA15	2SB266	2SB156	2SA234	2SA235
-------	--------	--------	--------	--------

AM VOLTAGE CHART

	Q5	Q6	Q7
E	7.5	8.4	7.5
B	7.3	8.2	7.3
C	0	.2	.3

Q6
2SA234
1ST. AM-
2ND. FM I.F.

Q7
2SA234
2ND. AM-
3RD. FM I.F.

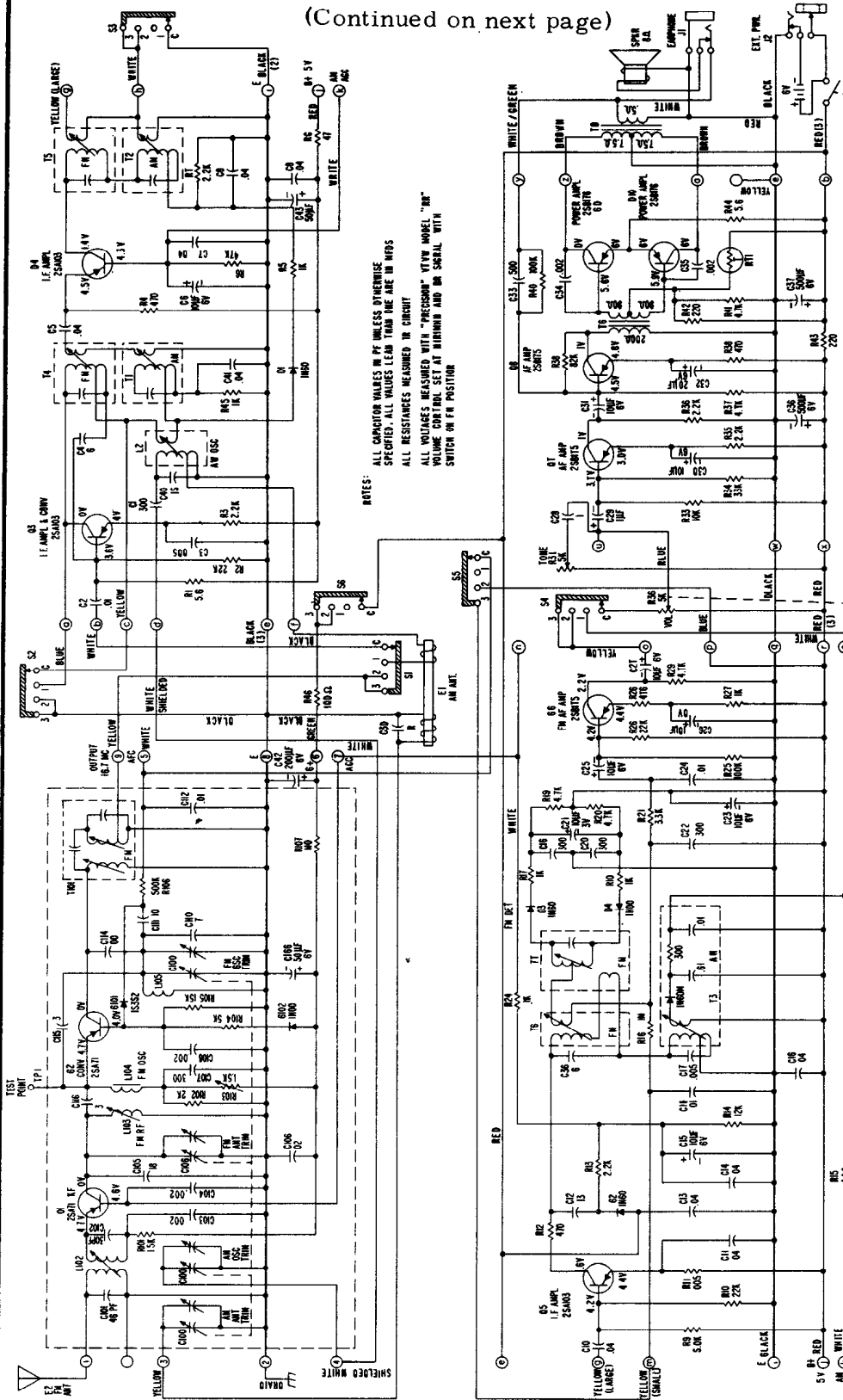


NOTE: VOLTAGES TAKEN WITH BAND SWITCH IN FM AFC "ON" POSITION. SEE CHART FOR AM VOLTAGES

Bottom View - IF Perma-Circuit Panel Top Components Layout

PHILCO MODEL NT-1004

(Continued on next page)



NOTES:
 ALL CAPACITOR VALUES IN PF UNLESS OTHERWISE SPECIFIED. ALL VALUES LESS THAN ONE ARE IN MFD'S
 ALL RESISTANCES MEASURED IN CIRCUIT
 ALL VOLTAGES MEASURED WITH "PROCESSOR" SET IN MODEL "FM" VOLUME CONTROL SET AT NORMINAL AND ON SERIAL WITH SWITCH IN FM POSITION

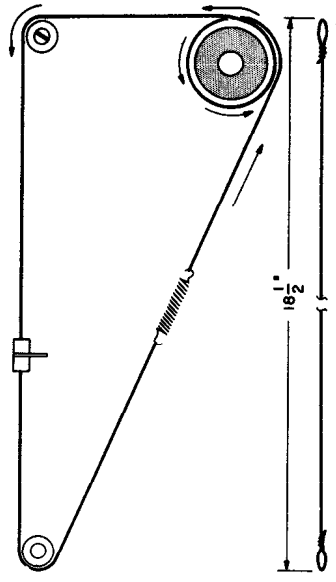
AM-FM TRANSISTOR PORTABLE—MODEL NT-1004

Chassis Removal

1. Remove Battery Sleeve with Batteries.
2. Remove 4 Screws located at each corner of chassis.
3. Remove Knobs and pull FM antenna out of cabinet and fold down.
4. Lift chassis straight up out of cabinet, now bottom sides of Perma-Circuit Panels are accessible.

Tuner Removal

1. Remove chassis from cabinet.
2. Remove Dial Cord, Tuning Sleeve and Tuning Gear Assy.
3. Unsolder all leads including grounding lug to chassis.
4. Remove three screws holding tuner to chassis frame.



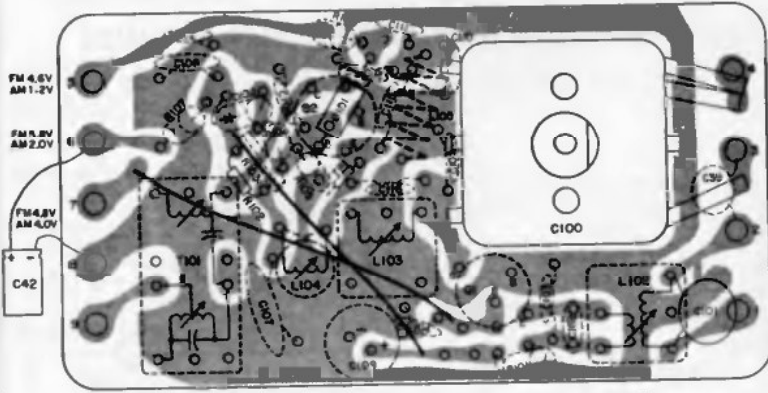
Dial Cord - Model NT1004

MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

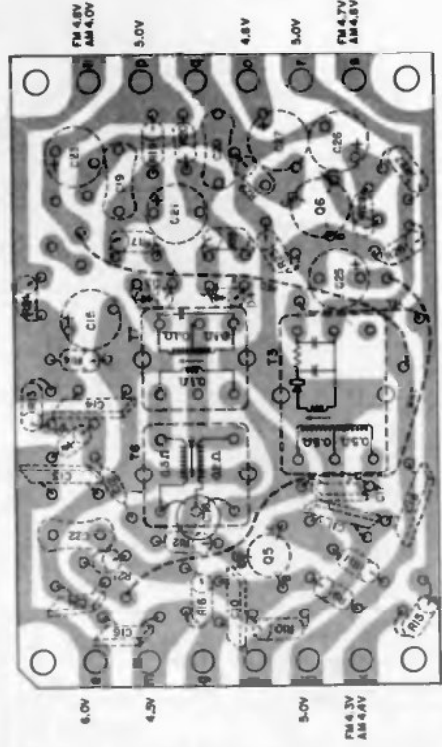
TEST POINT
FM 4.7V
AM 1.7V

25A71
Q1-Q2
A 4.7V
B 4.8V
C 0V

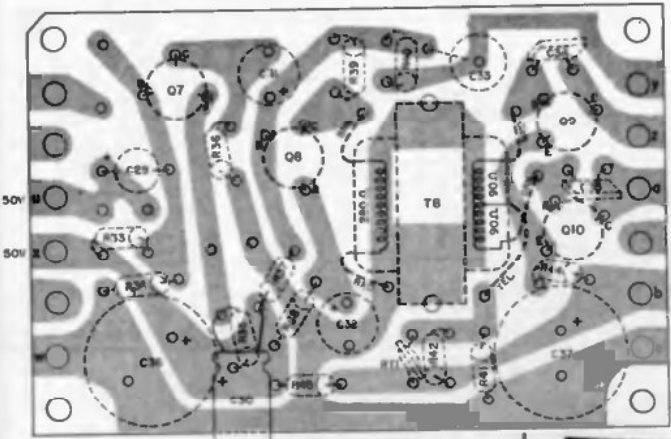
PHILCO Model NT-1004
(Continued from page adjacent at left)



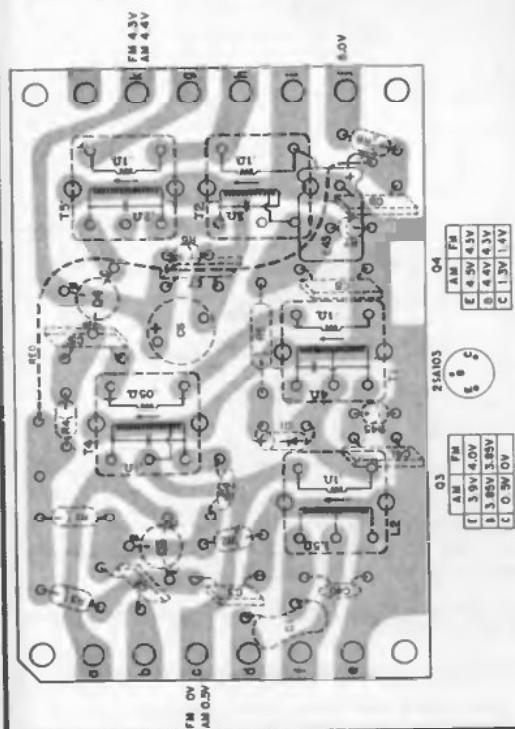
Bottom View - Tuner Perma-Circuit Panel



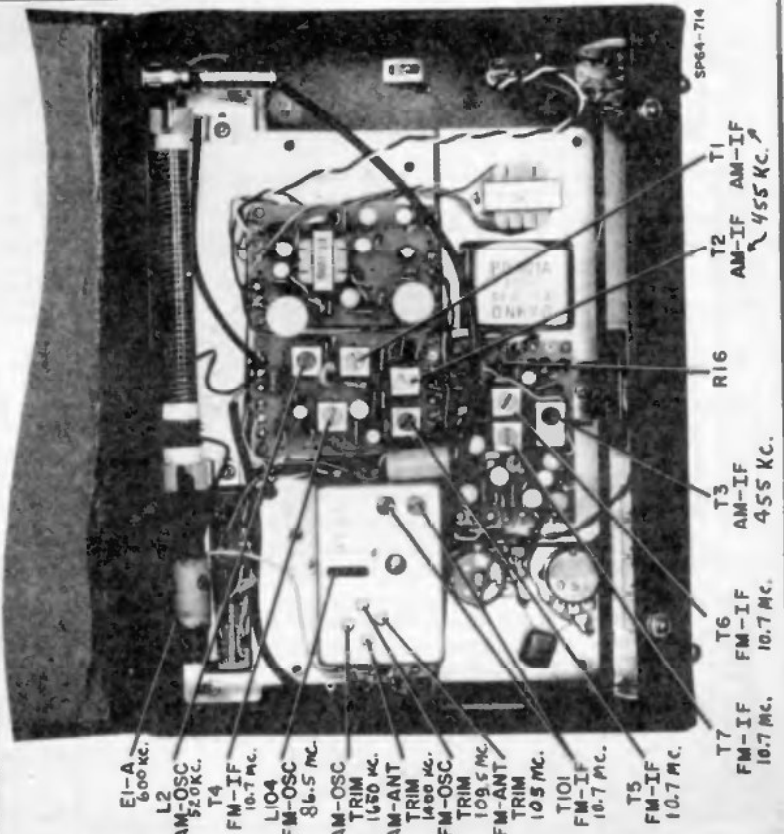
Bottom View - IF and Detector Perma-Circuit Panel



Bottom View - Audio Perma-Circuit



Bottom View - AM Conv.-FM AGC Perma-Circuit Panel

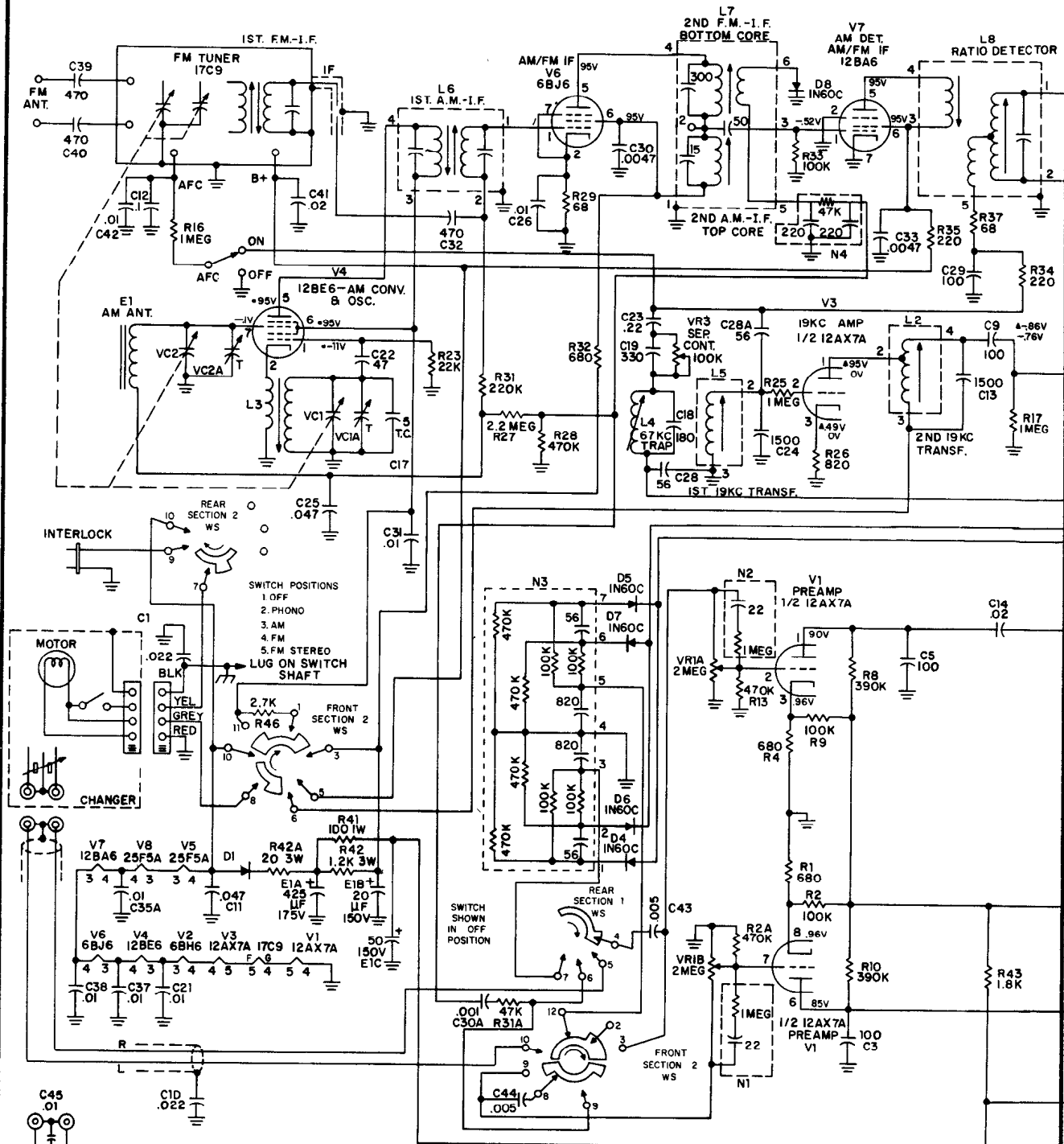


Alignment Points - Model NT1004

PHILCO

**MODELS M-1001, M-1620, M-1662, M-1663,
M-1664, & M-1700 AMPLIFIER & TUNER**

Also Model M-1701 is like M-1663



**AMPLIFIER AND TUNER PANEL REMOVAL
MODELS M-1001, M-1620,
M-1662, M-1663, M-1664**

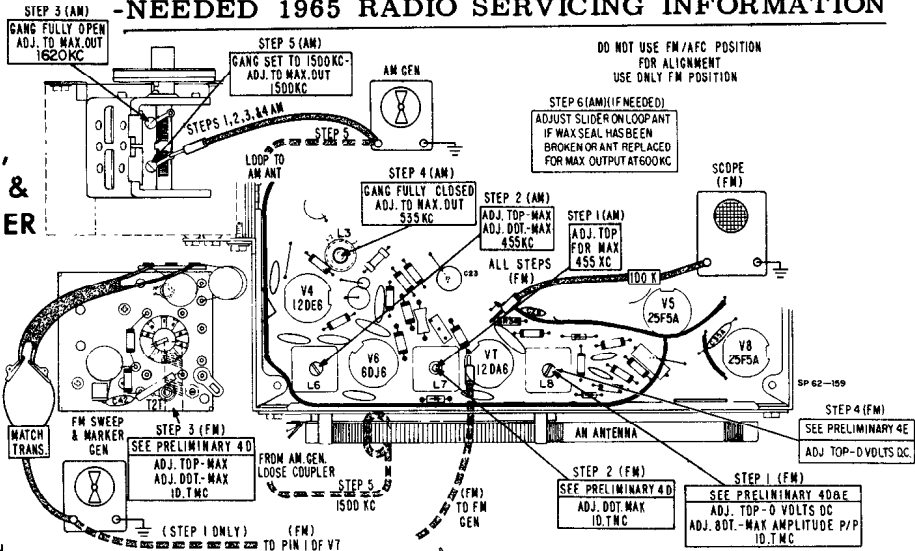
(USED ON MODELS
M-1620 & M-1700.
C10 OMITTED ON
THESE MODELS)

1. Unsolder all wires holding perma-circuit panel in chassis.

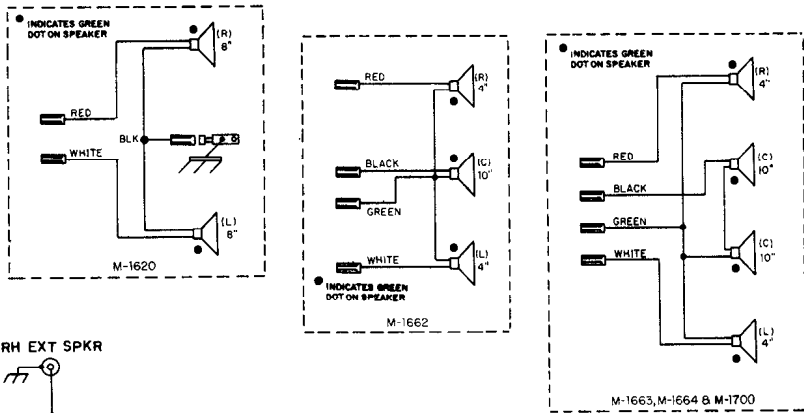
2. Remove two nuts securing function switch and loudness control front dial panel.
3. Remove three screws securing rear chassis piece and remove piece.
4. Remove five screws securing panel to chassis.
5. Pull panel back and away from chassis.

PHILCO

MODELS M-1001, M-1620,
M-1662, M-1663, M-1664, &
M-1700 AMPLIFIER & TUNER

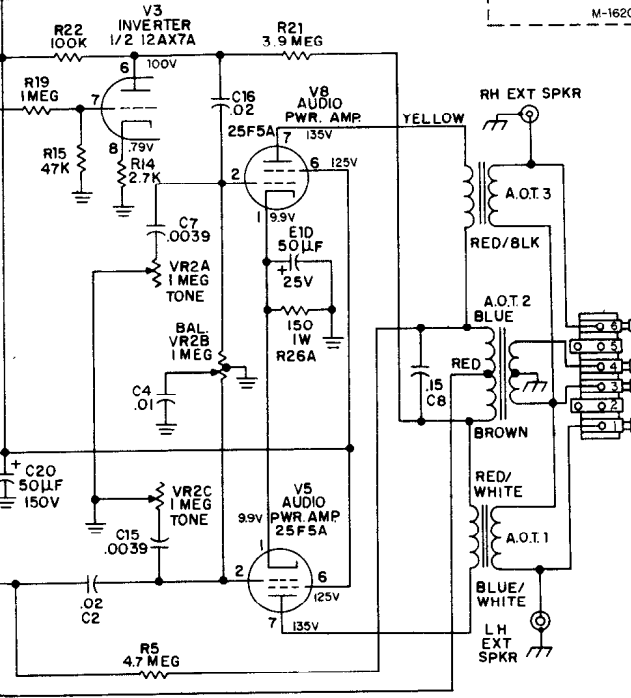
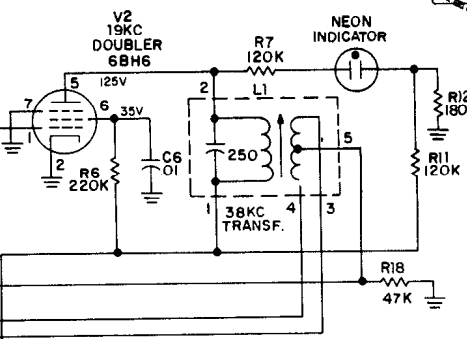
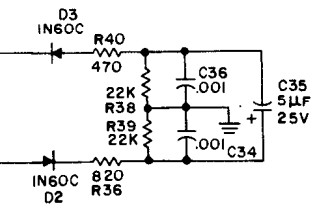


Alignment Procedure Chart



PRELIMINARY ALIGNMENT INFORMATION

1. Connect amplifier through isolation transformer to eliminate dangerous shock hazard.
2. Allow receiver and test equipment 15 minutes to warm up and stabilize.
3. For AM Alignment -
 - A. Connect VTVM across one external speaker jack.
 - B. Use 30% modulation on generator for AM alignment.
 - C. Proceed with alignment steps as illustrated in alignment chart.
4. For FM Alignment -
 - A. Connect FM generator, through a 72 ohm to 300 ohm matching network, to antenna terminals.
 - B. Use ± 120 KC sweep deviation for FM alignment.
 - C. Keep generator output as low as possible throughout FM alignment procedure.
 - D. Adjust top and bottom core of T2T, bottom core of L7 and bottom core of L8 for a symmetrical maximum amplitude "S" curve with 10.7 mc marker in the middle. Curve must be obtained in T2T with tuning slugs nearest to end of coil form.
 - E. Add VTVM across scope connections to adjust only the top of L8.
 - F. Proceed with alignment steps as illustrated in alignment chart.

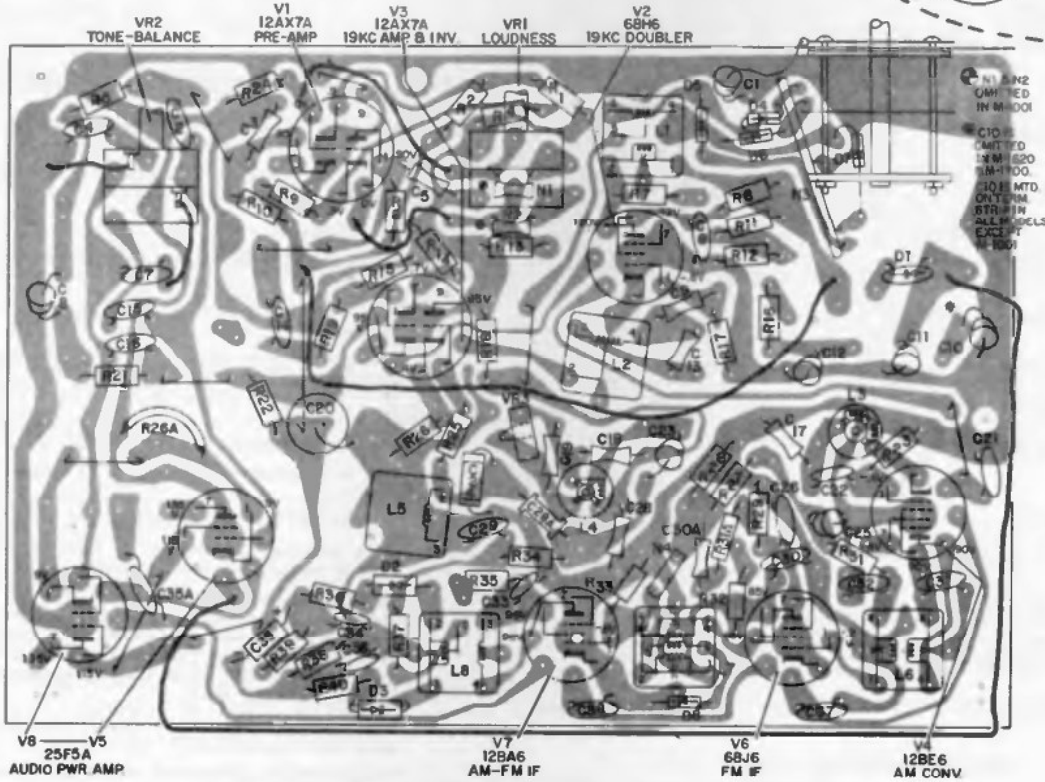
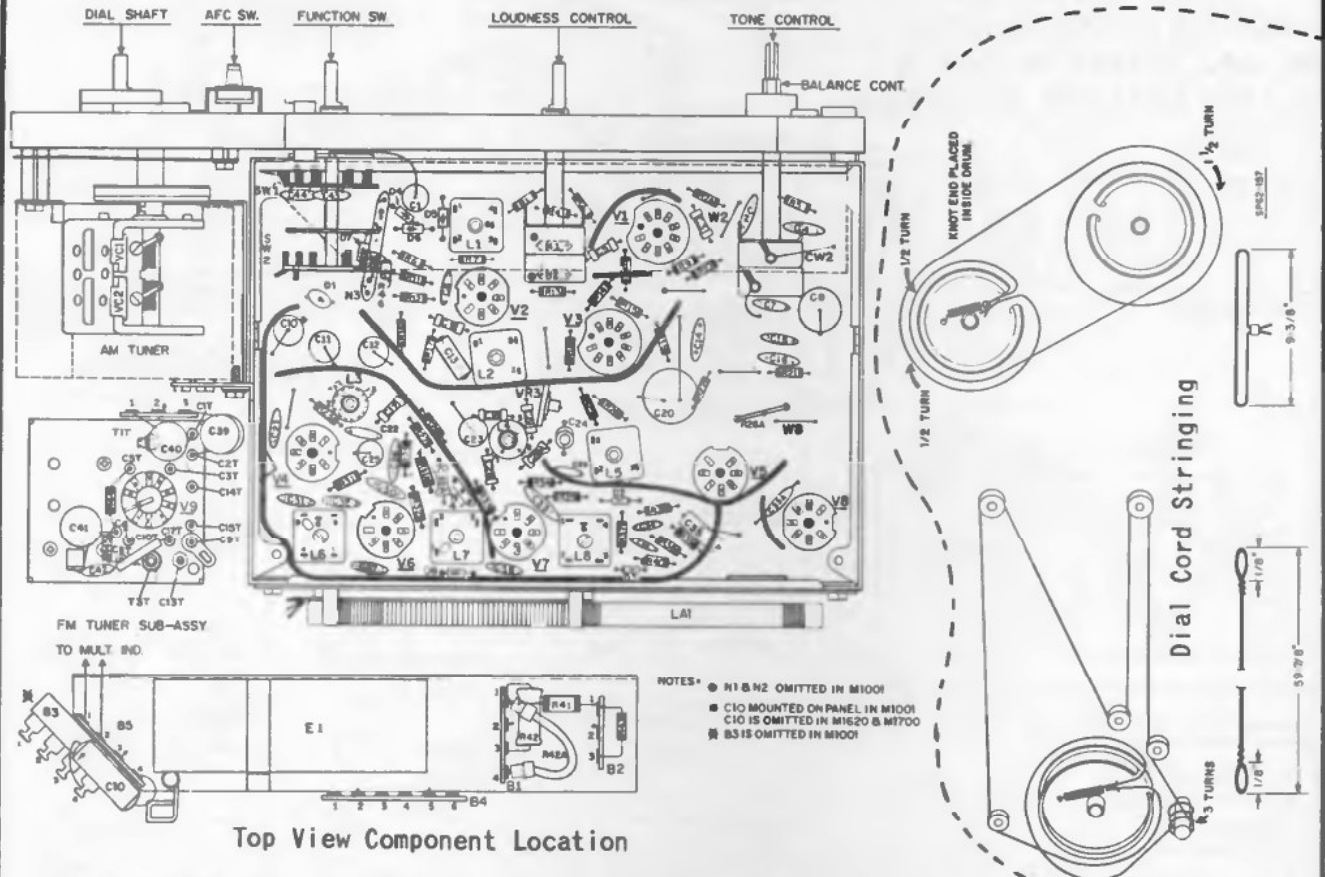


ALL VOLTAGES TAKEN WITH "PRECISION" VTVM MODEL "88" ALL CONTROLS SET AT MINIMUM, SELECTOR SWITCH SET TO PHONO POSITION UNLESS OTHERWISE NOTED.
 *VOLTAGES TAKEN IN AM POSITION.
 *VOLTAGES TAKEN IN FM STEREO POSITION.

Circuit for M-1001 differs in some details.
 (Continued on page 120)

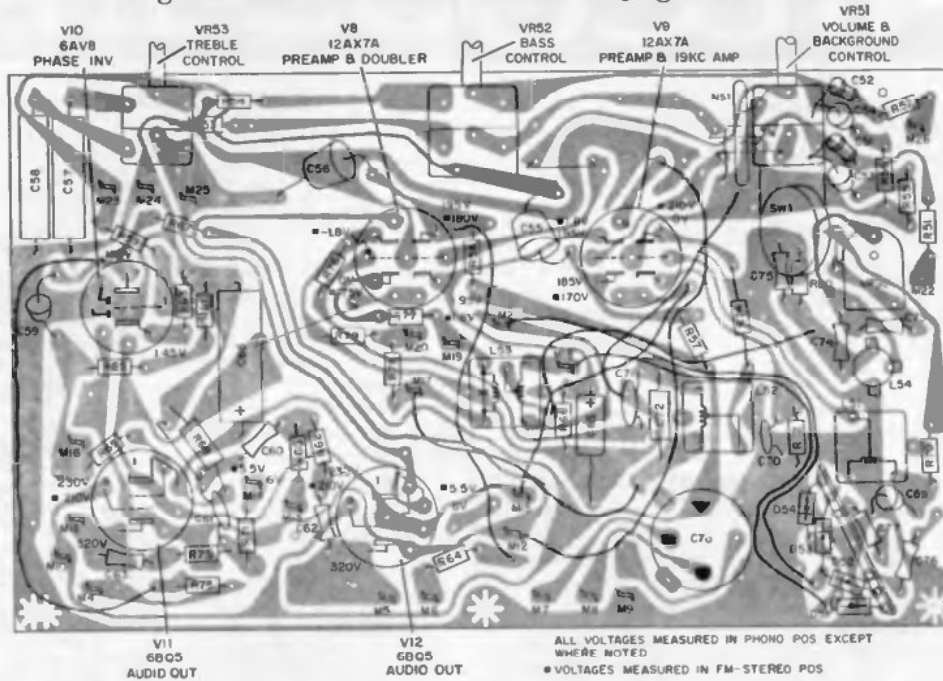
VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

PHILCO Models M-1001, M-1620, M-1662, M-1663, M-1664, M-1700, Continued



VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

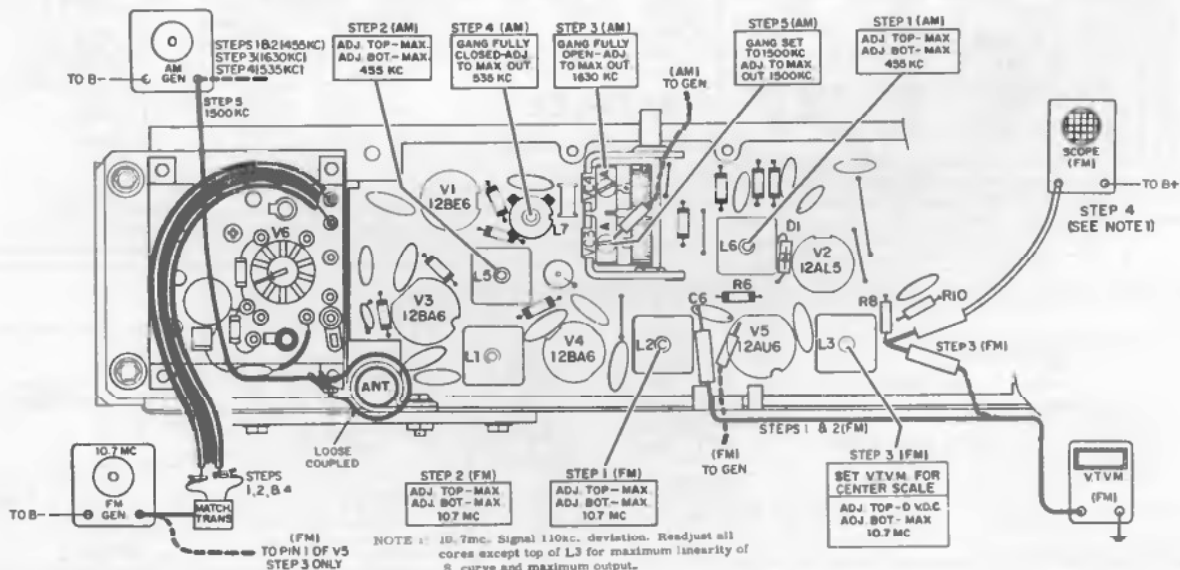
PHILCO Models M-1666, M-1669, M-1680, M-1688, M-1689, M-1704
(Circuit diagram and other information on pages 122-123)



Bottom Perma-Circuit View, Parts Location

PRELIMINARY ALIGNMENT INFORMATION

1. Connect amplifier through isolation transformer to eliminate dangerous shock hazard.
2. Allow receiver and test equipment 15 minutes to warm up and stabilize.
3. For AM Alignment -
 - A. Connect VTVM across center output transformer.
 - B. Use 30% modulation on generator for AM alignment.
 - C. Proceed with alignment steps as illustrated in alignment chart.
4. For FM Alignment -
 - A. Connect FM generator, through a 72 ohm to 300 ohm matching network, to antenna terminals.
 - B. Alignment is to be made in FM position. DO NOT USE FM/AFC position.
 - C. Use ± 75 kc sweep deviation for FM alignment.
 - D. Keep generator output as low as possible throughout FM alignment procedure.

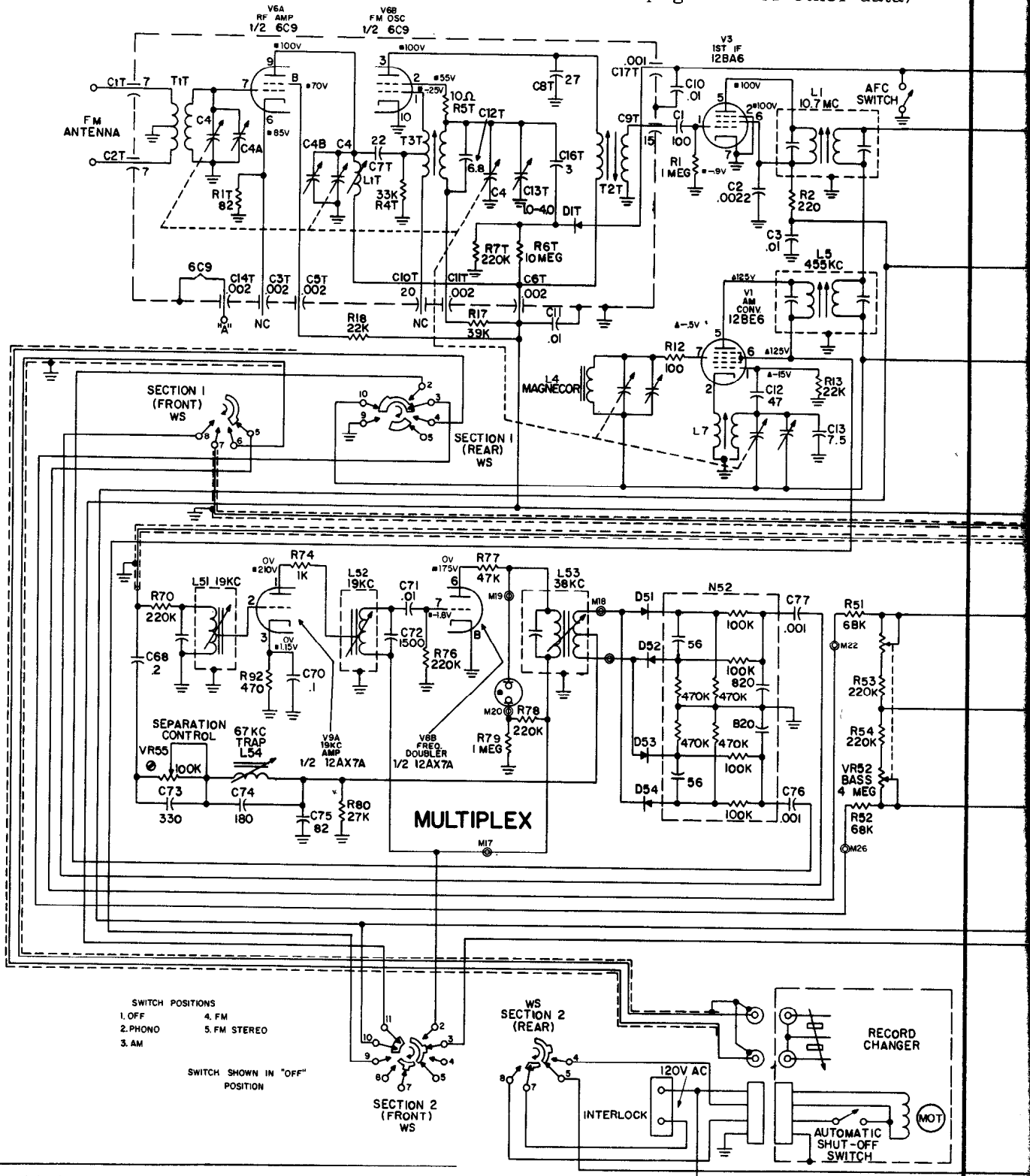


Alignment Procedure Chart AM-FM Tuner

PHILCO

MODELS M-1666, M-1669, M-1680,
M-1688, M-1689, & M-1704
AMPLIFIER & TUNER

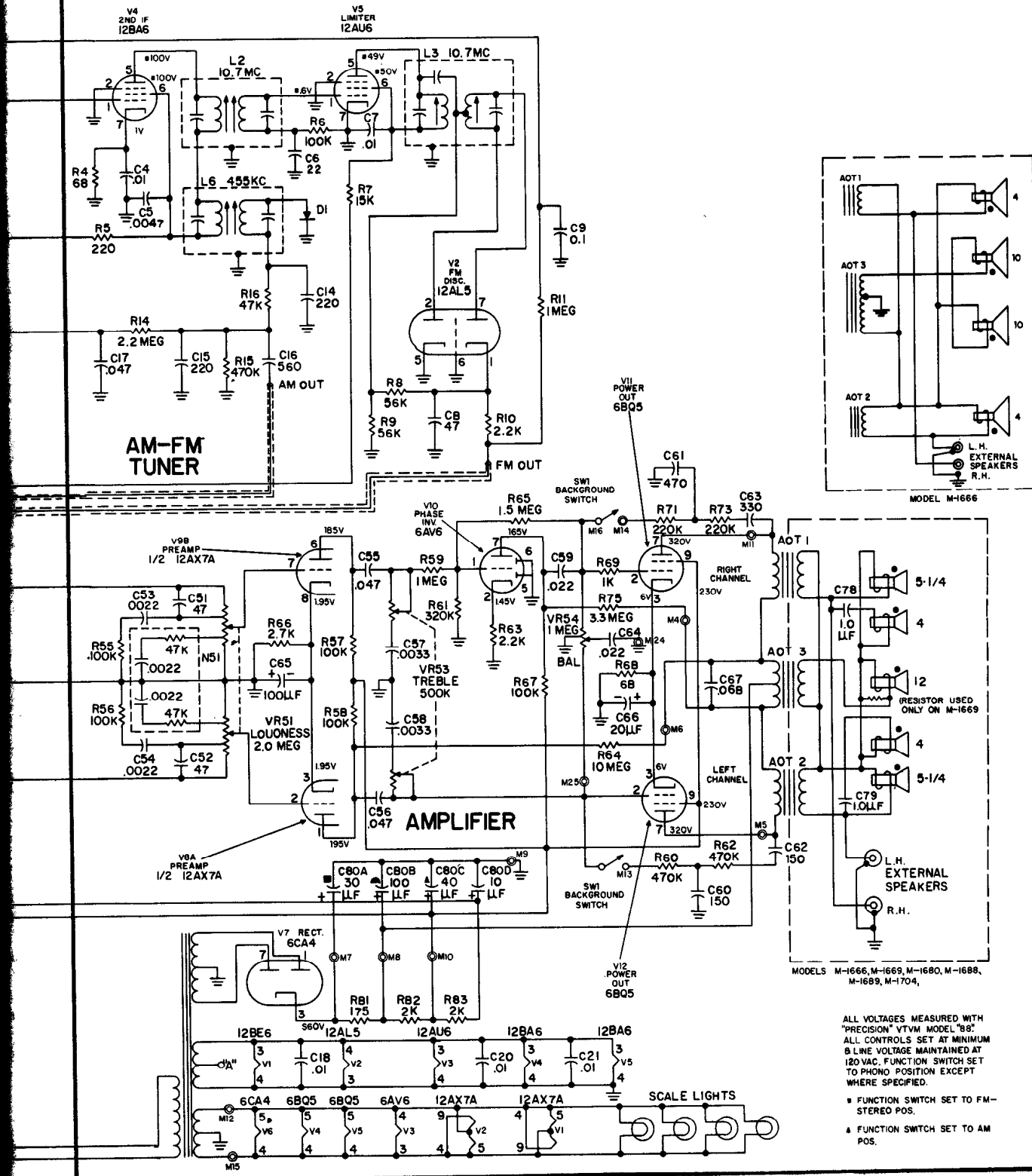
(See page 121 for other data)



PHILCO

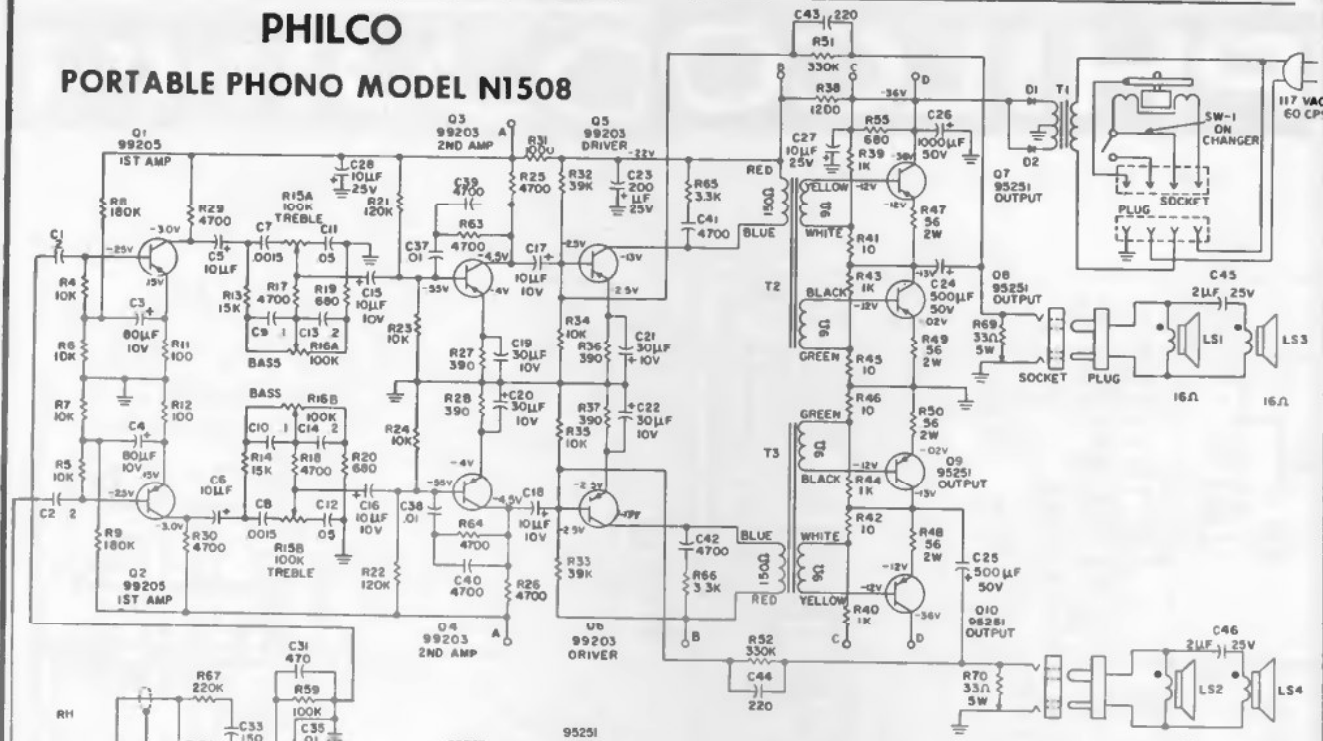
MODELS M-1666, M-1669, M-1680,
M-1688, M-1689, M-1704, & M-1741
AMPLIFIER & TUNER

(Continued)

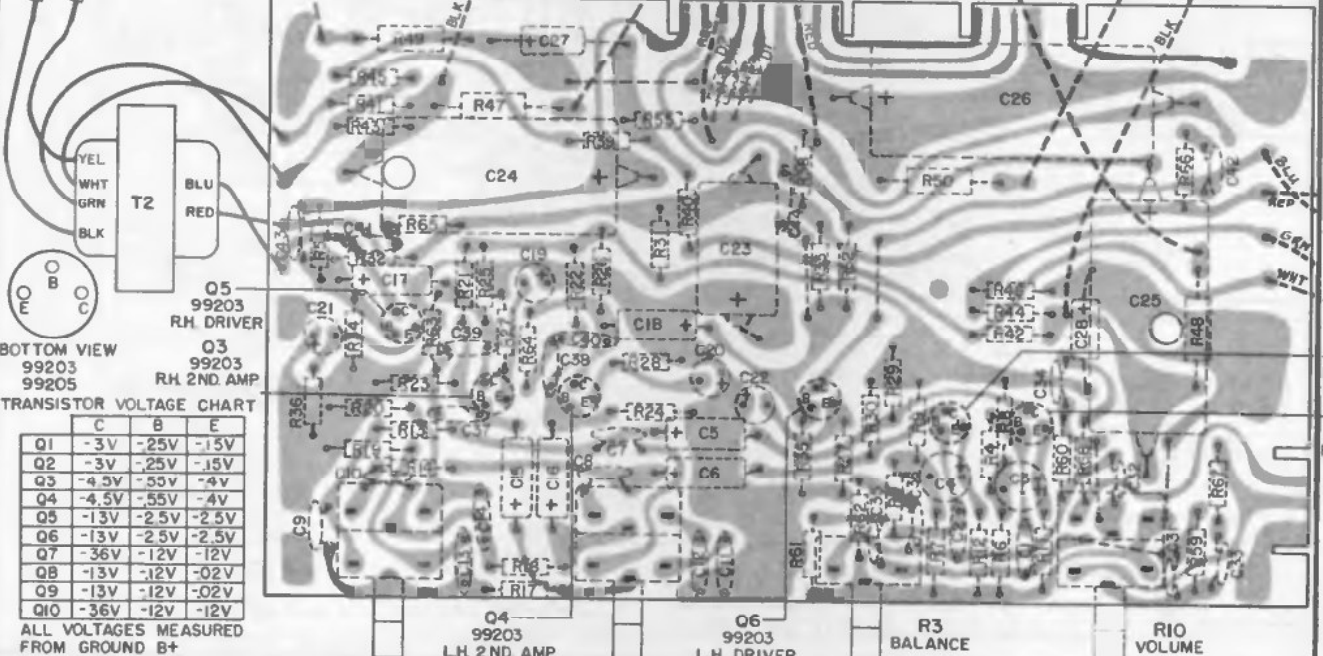
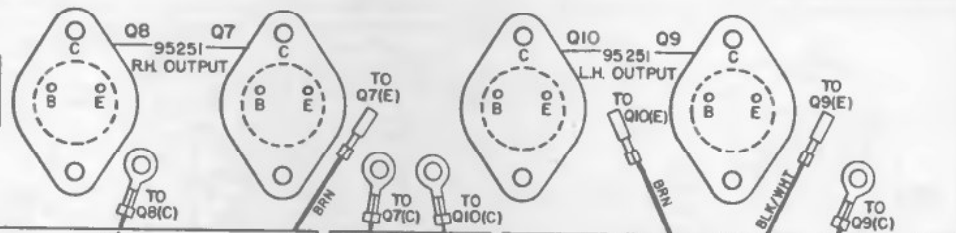
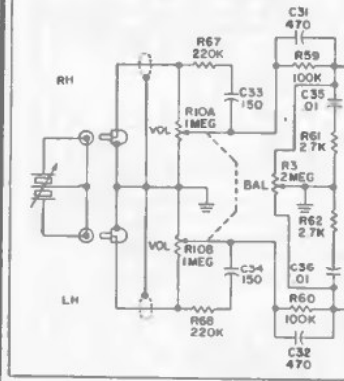


PHILCO

PORTABLE PHONO MODEL N1508



NOTES
 VOLTAGES MEASURED WITH VTVM "PRECISION" MODEL "88" TO GROUND B+
 ALL CAPACITANCE VALUES OF 10 AND ABOVE ARE IN PF AND ALL
 VALUES BELOW 10 ARE IN UF UNLESS OTHERWISE INDICATED
 ALL RESISTANCES MEASURED IN-CIRCUIT WITH VTVM



BOTTOM VIEW
 99203 RH. DRIVER
 99203 Q3
 99205 RH. 2ND AMP

TRANSISTOR VOLTAGE CHART

	C	B	E
Q1	-3V	-25V	-15V
Q2	-3V	-25V	-15V
Q3	-4.5V	-55V	-4V
Q4	-4.5V	-55V	-4V
Q5	-13V	-2.5V	-2.5V
Q6	-13V	-2.5V	-2.5V
Q7	-36V	-12V	-12V
Q8	-13V	-12V	-02V
Q9	-13V	-12V	-02V
Q10	-36V	-12V	-12V

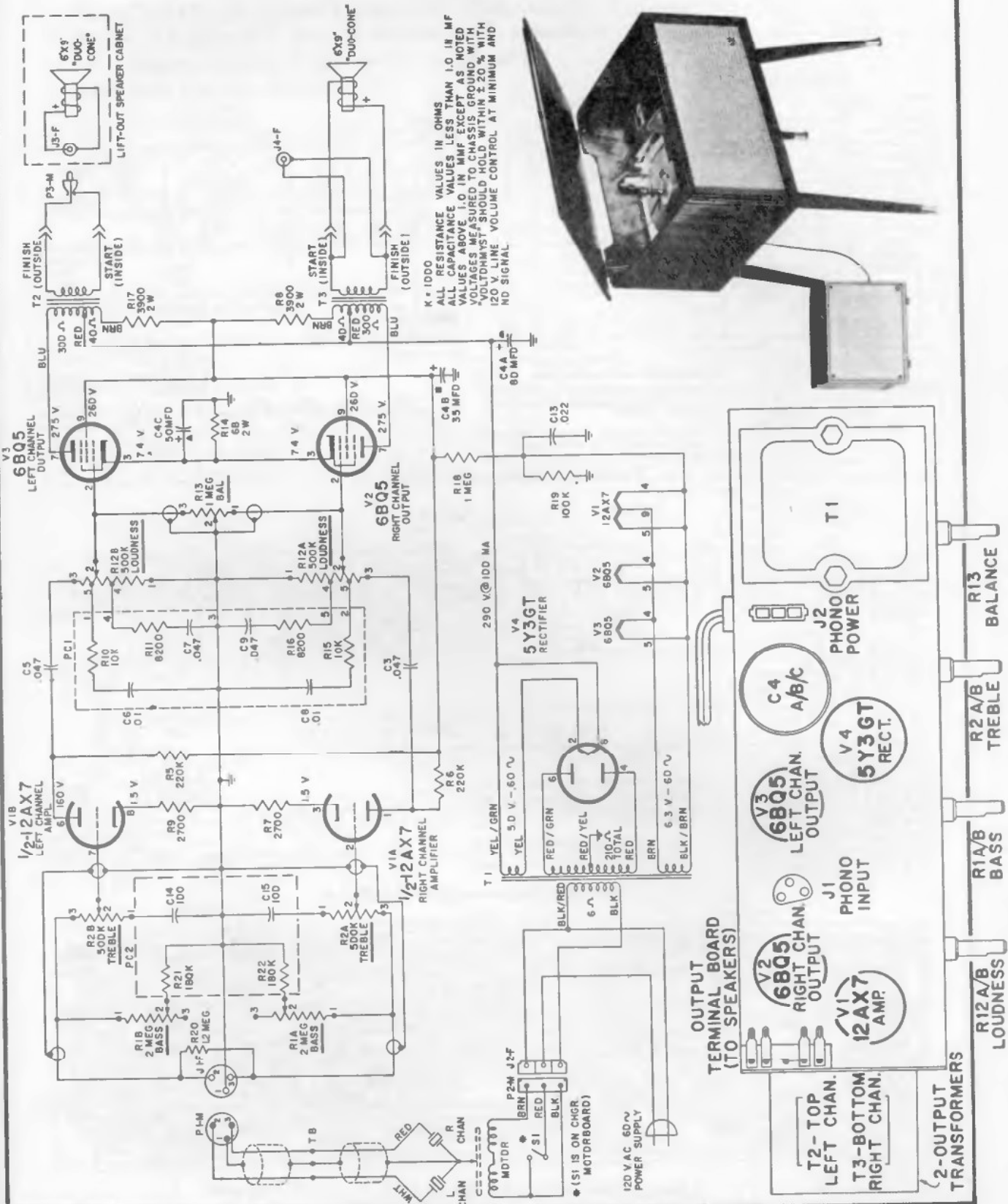
ALL VOLTAGES MEASURED FROM GROUND B+

R16 BASS R15 TREBLE 124 Bottom View Perma Circuit Panel-Top Component Layout

RCA VICTOR

Model VFE 01W

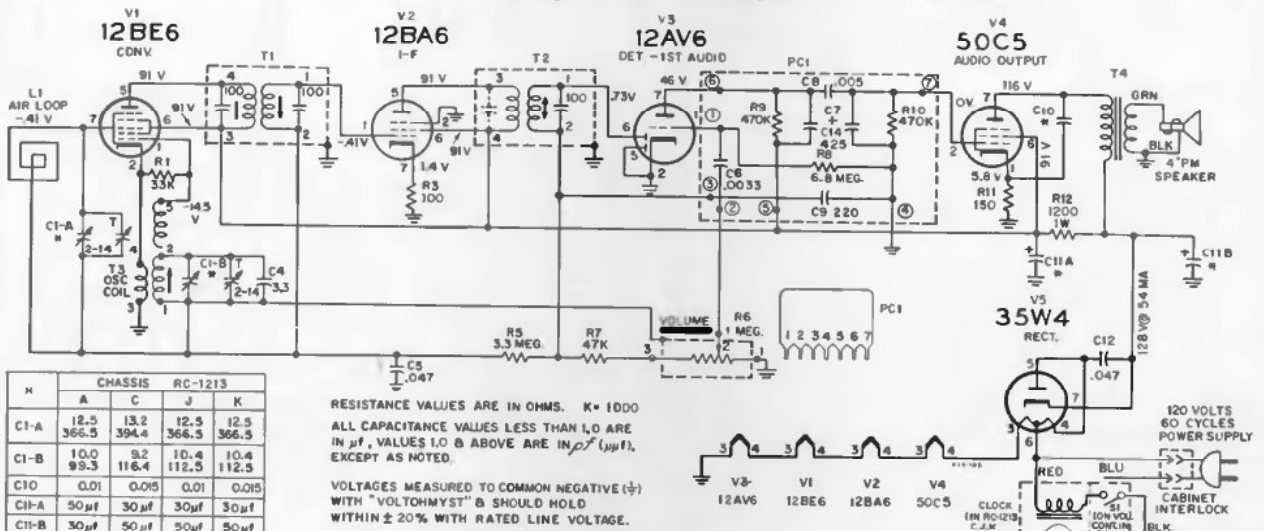
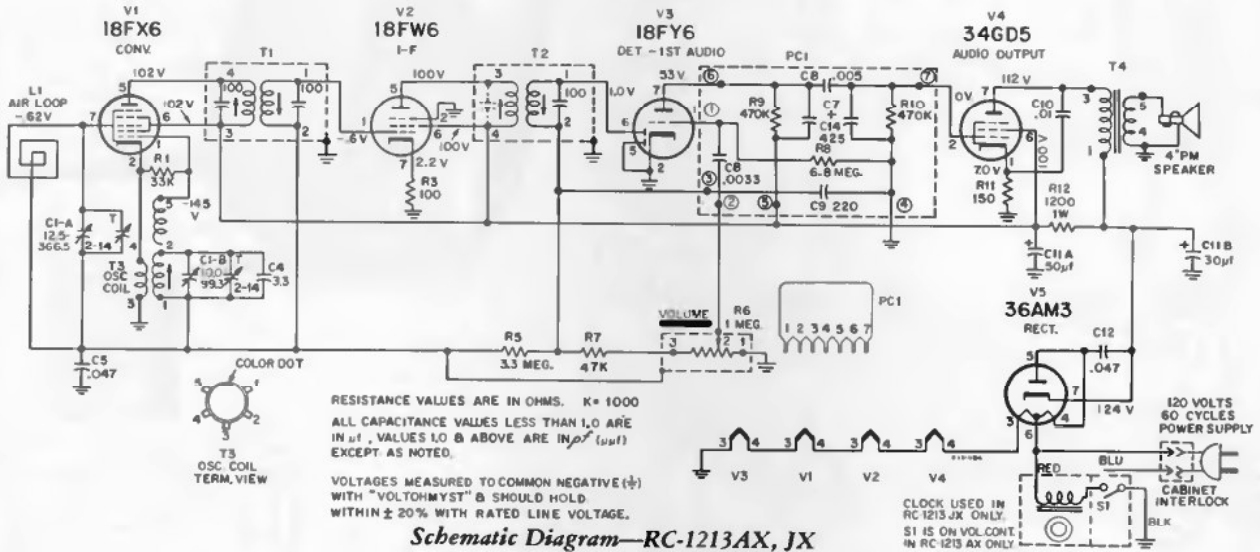
Chassis RS-188B



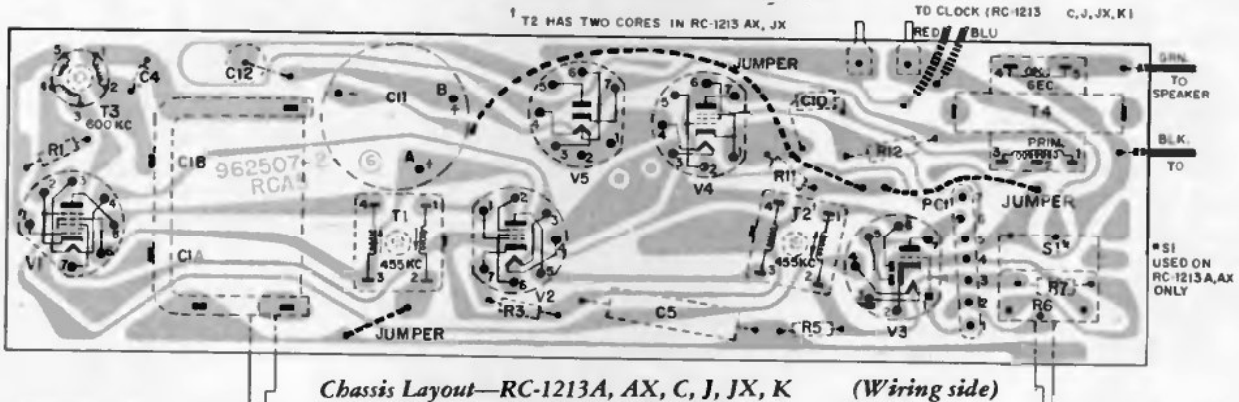
K = 1000
 ALL RESISTANCE VALUES IN OHMS
 ALL CAPACITANCE VALUES LESS THAN 1.0 IN MF
 VALUES ABOVE 1.0 IN MF EXCEPT AS NOTED
 VOLTAGE MEASUREMENTS SHOULD BE TAKEN WITH
 120 V LINE VOLUME CONTROL AT MINIMUM AND
 NO SIGNAL

RCA VICTOR

Models RFA 11V, VX, RFA 15A, AX, V, VX, Z, ZX, use Chassis RC-1213A, AX
 Models RFD 11V, VX, use Chassis RC-1213J, JX
 Model RFD 15V uses Chassis RC-1213C or K
 Models RFD 19G, V, Z, use Chassis RC-1213D, L
 (Material below and on page at right)



X	CHASSIS RC-1213			
	A	C	J	K
C1-A	12.5 366.5	13.2 394.6	12.5 366.5	12.5 366.5
C1-B	10.0 99.3	9.2 116.4	10.4 112.5	10.4 112.5
C10	0.01	0.015	0.01	0.015
C11-A	50 μ f	30 μ f	30 μ f	30 μ f
C11-B	30 μ f	50 μ f	50 μ f	50 μ f



RCA VICTOR

(Continued from page adjacent at left)

Models RFA 11V, VX, RFA 15A, AX, V, VX, Z, ZX, all use Chassis RC-1213A, AX
 Models RFD 11V, VX, use Chassis RC-1213J, JX
 Model RFD 15V uses Chassis RC-1213C or K
 Models RFD 19G, V, Z, use Chassis RC-1213D, L

TUBE AND CHASSIS ACCESSIBILITY

1. DO NOT ATTEMPT TO REMOVE THE KNOBS. The tuning and volume control knobs are held captive to the cabinet by retainers on their shafts.
2. Remove the back cover by lifting the protrusions on the bottom of the back cover, out of the slots in the base of the cabinet.
3. Unsolder speaker leads if necessary. Avoid putting a strain on the speaker leads.
4. Remove two chassis retainers (screws or clips), one at the volume control and one on the left end mounting.
5. Grasp tuning capacitor and volume control, and pull chassis out of knobs and mounting slots.

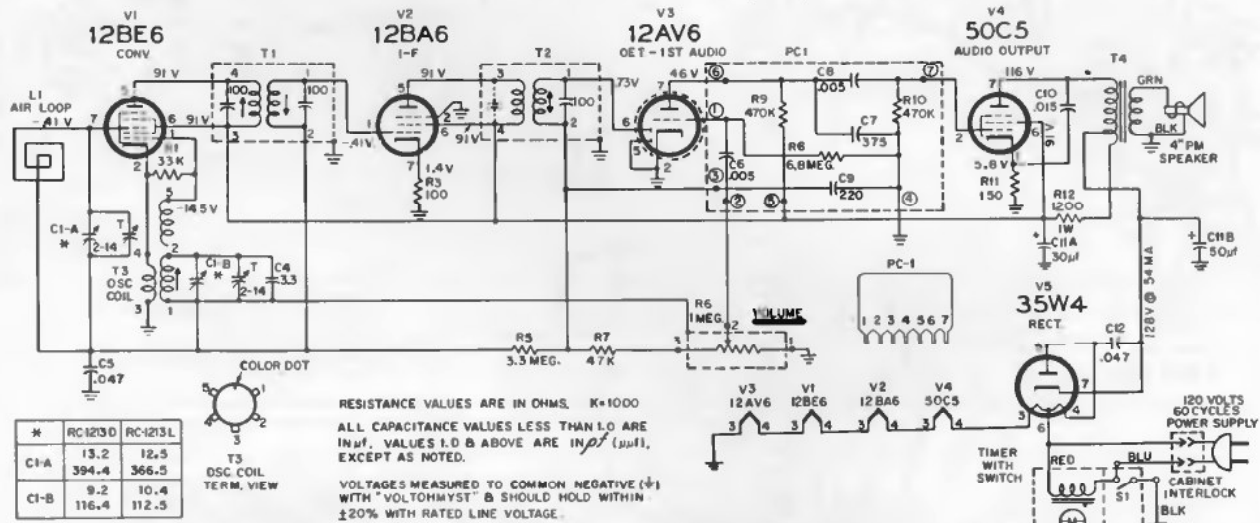
To reassemble—reverse above procedure.

The "Security Sealed Circuitry" chassis used in these instruments are all basically similar; the differences, where they exist, are shown in the schematic diagrams, in the chassis layout diagrams and in the replacement parts list. 100 ma. type tubes are used in chassis RC-1213AX and JX, and 150 ma. type tubes in chassis RC-1213A, C, D, J, K and L. The "X" chassis are found in the "X" models.

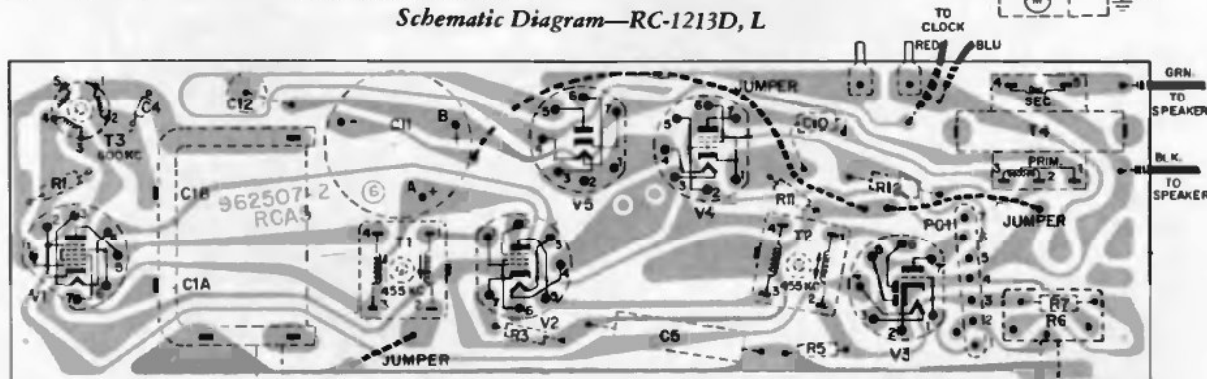
ALIGNMENT PROCEDURE

Step	Connect high side of signal gen. to—	Set signal gen. to—	Turn radio dial to—	Adjust—for peak output
1	Pin #1 of V2 (12BA6 or 18FW6) through .01 mf copocilor	455 kc (Modulated)	Quite point near 1600 kc	T2 (2nd I-F trans.), top and bottom cores (See note)
2	Pin #7 of V1 (12BE6 or 18FX6) through .01 mf copocilor			T1 (1st I-F trans.), top and bottom cores
3	Repeat steps 1 and 2			
4		1620 kc (Modulated)	Gong fully open	C1-B-T (osc. trimmer)
5	Short wire placed near antenna to radiote signal	1400 kc (Modulated)	1400 kc	C1-A-T (Anl. trimmer)
6		600 kc (Modulated)	600 kc (rock gong)	T3 (osc. coil)
7	Repeat steps 3, 4 and 5			

NOTE: In chassis using the 150 ma. type tubes, T2 may have only one core which may be adjusted from either the top or bottom.



Schematic Diagram—RC-1213D, L



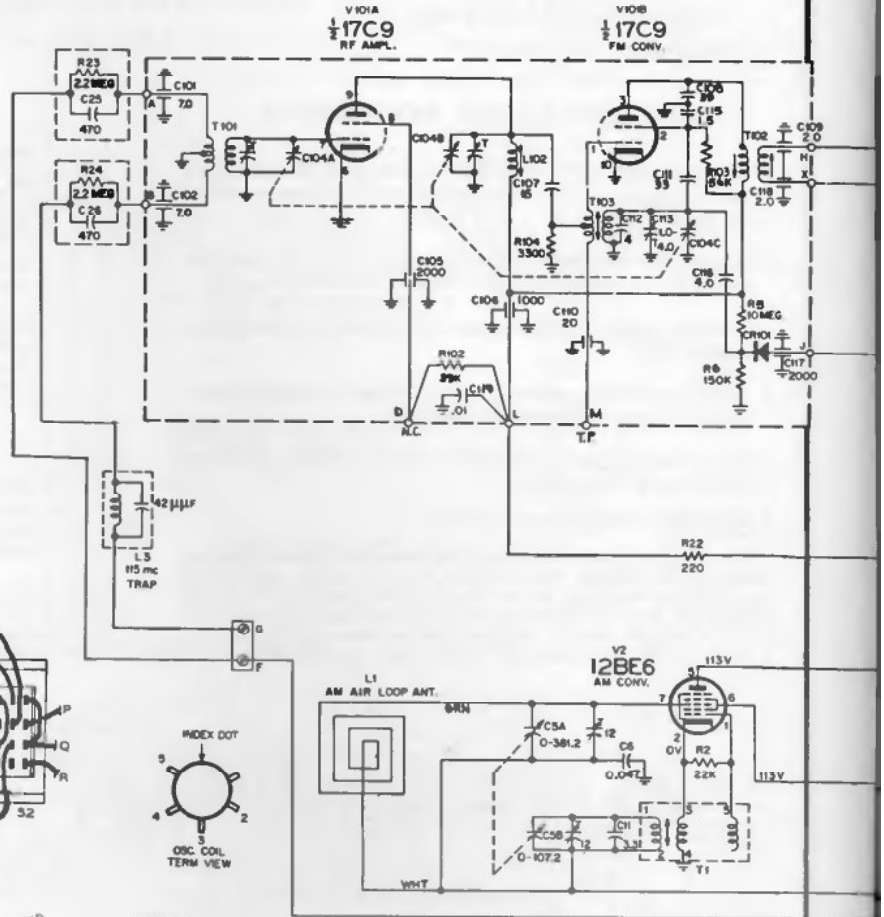
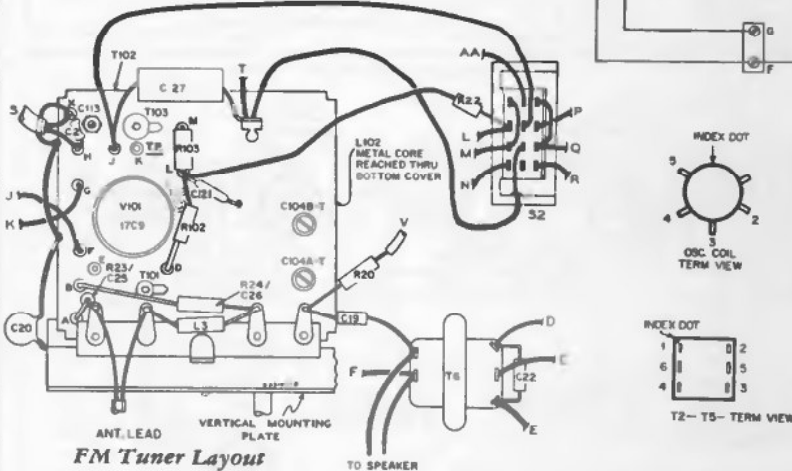
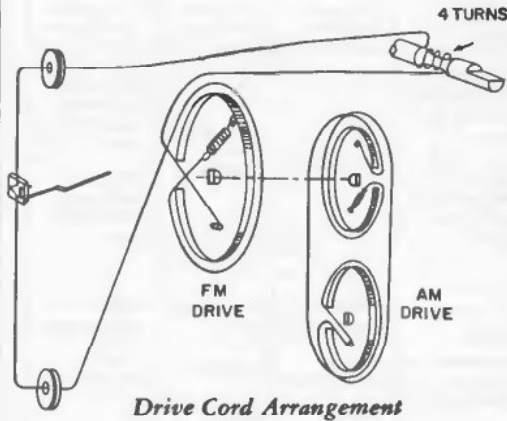
Chassis Layout—RC-1213D, L (Wiring Side)

RCA VICTOR

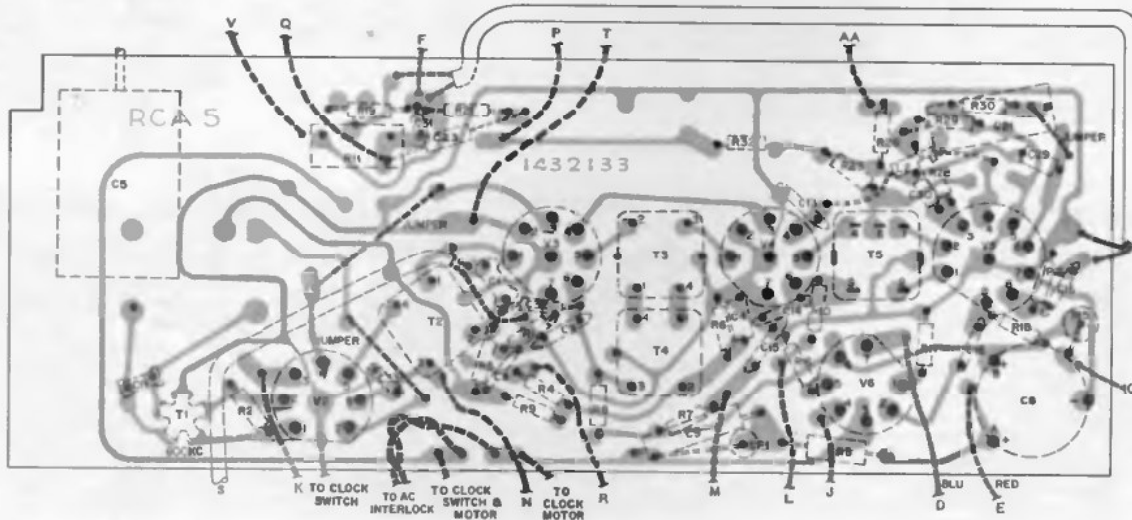
Models RFC 15E, V, RFC 19W, use Chassis RC-1210F, and Model RFS 15W use Chassis RC-1210E.

(Continued on the page at right)

FREQUENCIES	Tuning	IF
AM	535-1620 kc	455 kc
FM	88-108 mc	10.7 mc



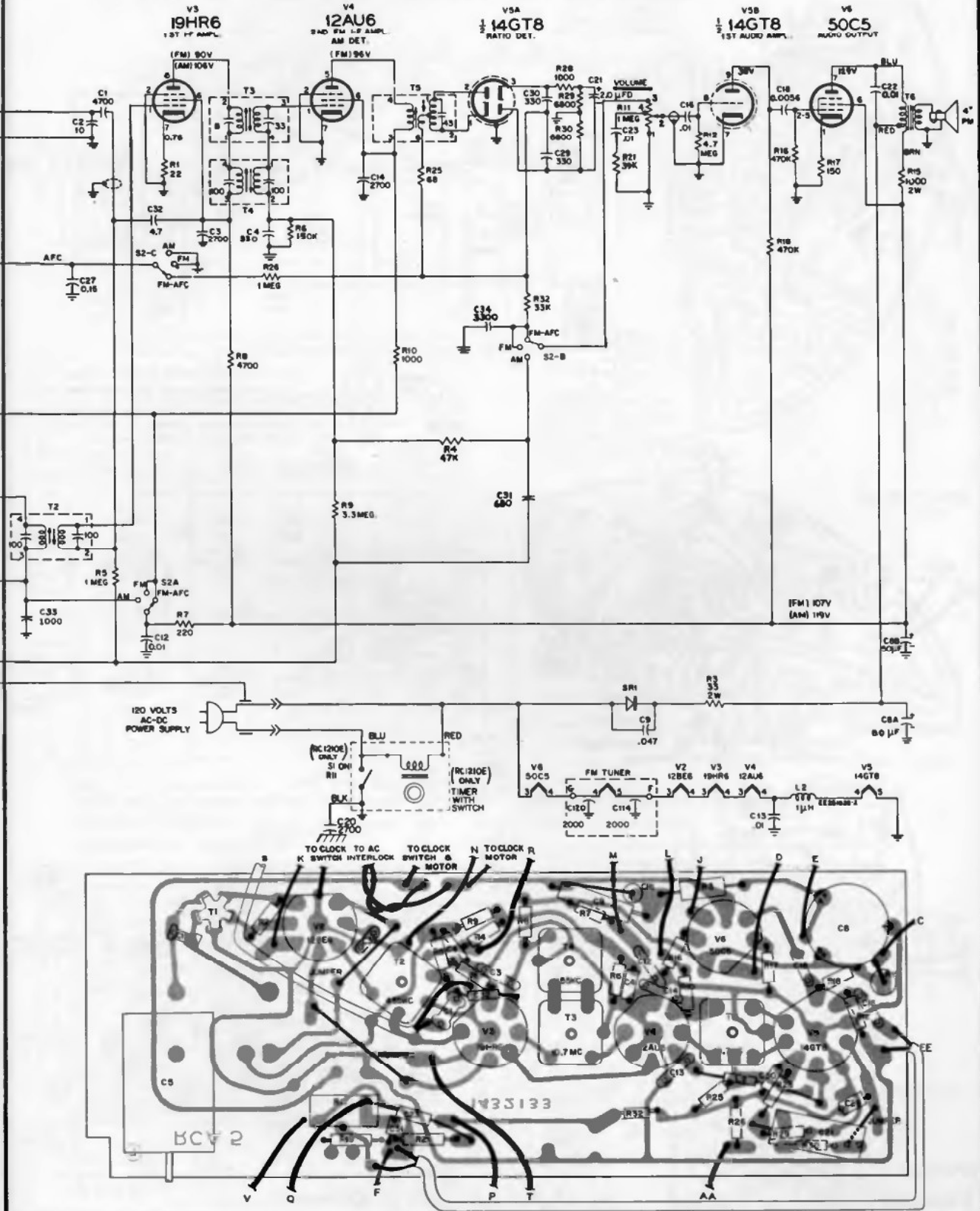
K=1000
ALL RESISTANCE VALUES IN OHMS
ALL CAPACITANCE VALUES LESS THAN 1.0 IN μ F, VALUES ABOVE 1.0 IN μ MFD UNLESS OTHERWISE INDICATED
VOLTAGES MEASURED TO COMMON NEG. (4) WITH "VOLTOHMIST" B SHOULD HOLD WITHIN $\pm 20\%$ WITH 120 VOLT INPUT.



RCA VICTOR

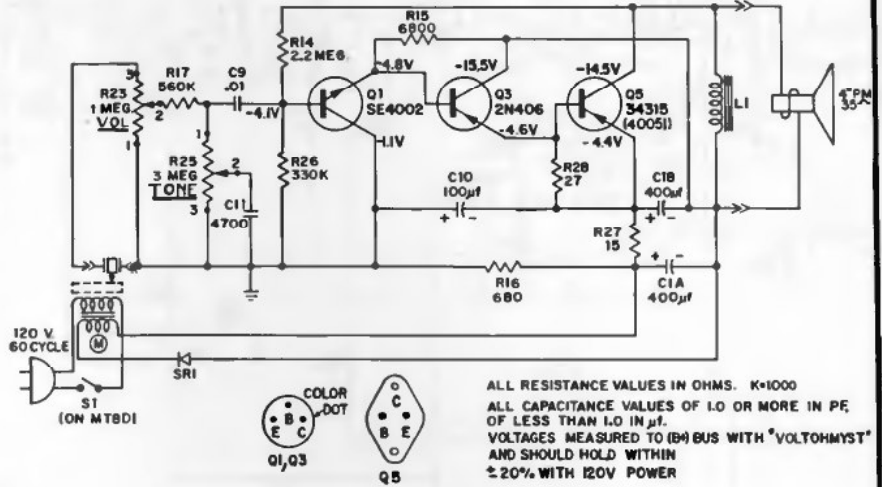
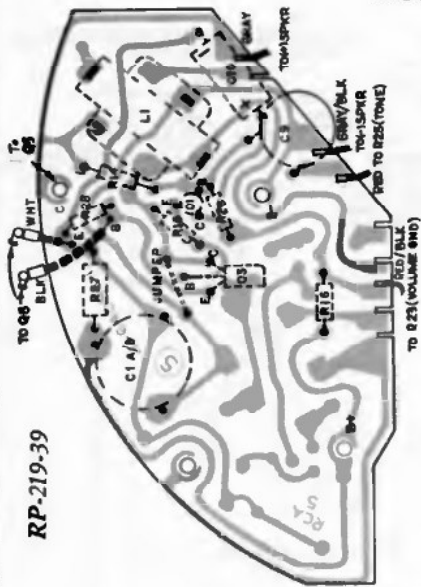
Models RFC 15E, V, RFC 19W, use Chassis RC-1210F,
and Model RFS 15W use Chassis RC-1210E.

(Continued from page at left)

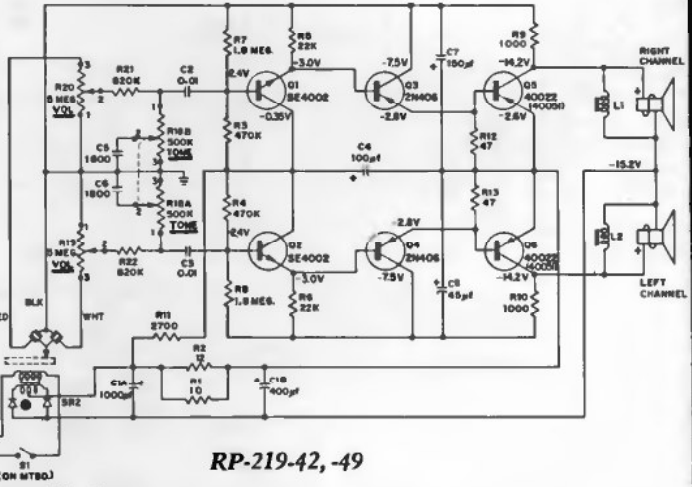
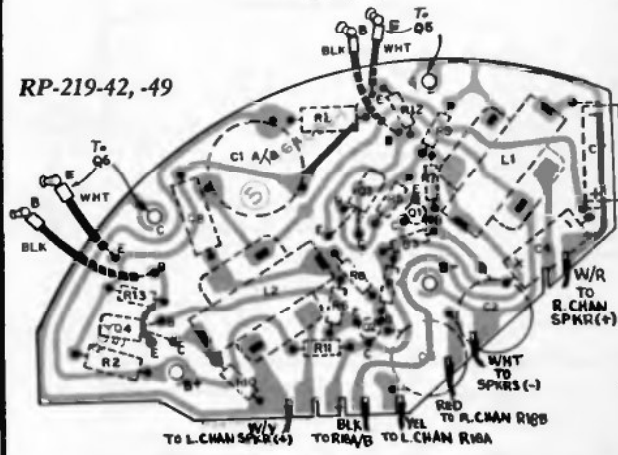


RCA VICTOR

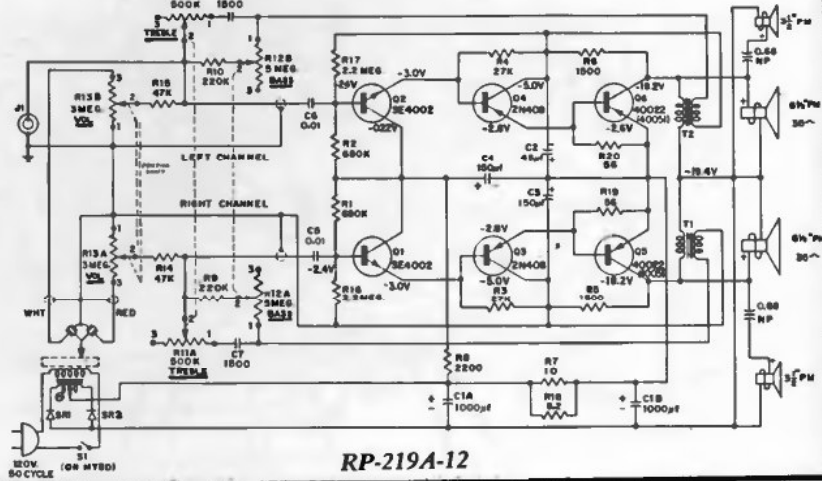
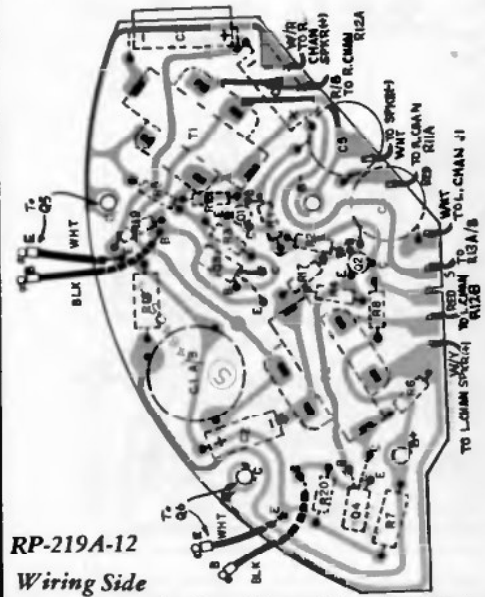
Models VFP 09E, T, VFP 11A, B, G, use Chassis RP-219-39
 Models VFP 19E, T, VFP 21A, T, VFP 32E, G, use RP-219-49
 Models VFP 43A, VFP 49E, use Chassis RP-219-42
 Models VFP 58A, VFP 60E, use Chassis RP-219A-12



RP-219-42, -49

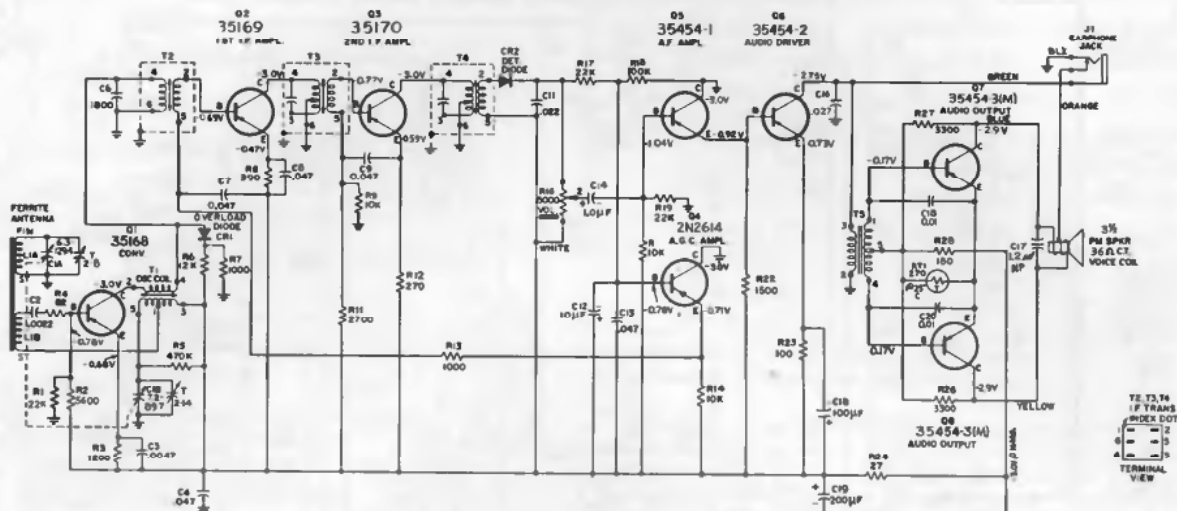


RP-219A-12
 Wiring Side



RCA VICTOR

Models RFG 20A, H, V, use Chassis RC-1219A, B
 Models RFG 25B, E, use Chassis RC-1219B

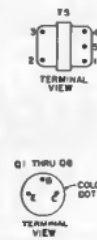


ALIGNMENT PROCEDURE

Step	Connect High Side of Signal Generator to—	Signal Gen. Output	Dial Pointer Setting	Adjust for Max. Output
1				T4 (3rd I-F)
2		455 kc	Gang fully open	T3 (2nd I-F)
3				T2 (1st I-F)
4	Loop or piece of short wire placed near antenna for radiated signal	Repeat Steps 1, 2, and 3		
5		1620 kc	Gang fully open	Oscillator trimmer C18-T
6		1400 kc	1400 kc (rock gang if necessary)	Antenna trimmer C1A-T
7		600 kc	600 kc (rock gang)	Osc. coil T1
8	Repeat Steps 5, 6, and 7			

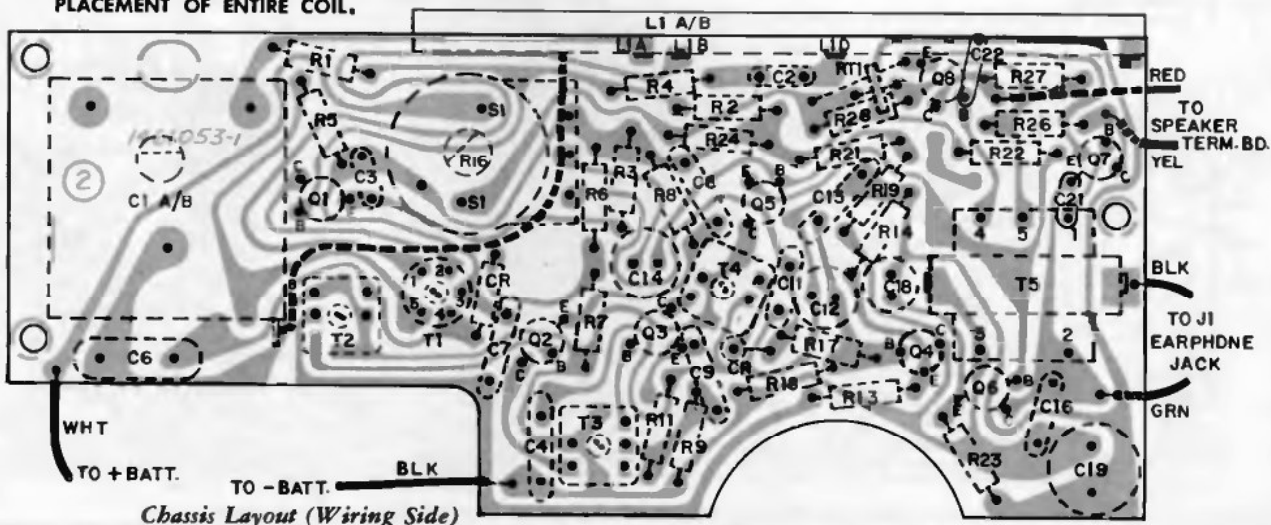
USE PROPER ALIGNMENT TOOL FOR MAKING ADJUSTMENTS. CORES ARE EASILY BROKEN BY IMPROPER HANDLING, MAKING NECESSARY REPLACEMENT OF ENTIRE COIL.

VOLTAGES MEASURED WITH "VOLTOHMIST" FROM (+) BATTERY. SHOULD HOLD WITHIN ±20% WITH NEW BATTERY. VOLUME CONTROL AT MINIMUM & NO SIGNAL.
 R4=1000. ALL RESISTANCE VALUES IN OHMS. ALL CAPACITANCE VALUES LESS THAN 1.0 ARE IN PF. THOSE ABOVE 1.0 ARE IN μF EXCEPT AS NOTED. 07 & 08 ARE A MATCHED PAIR.



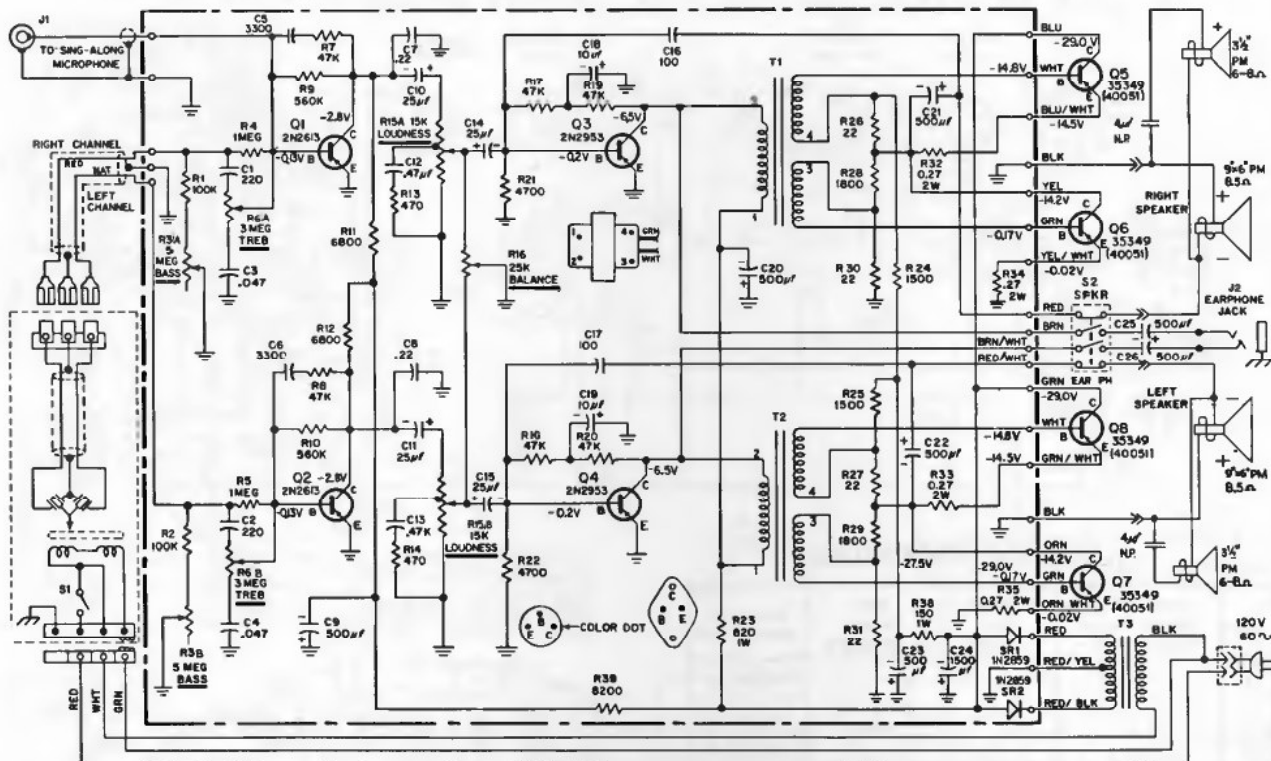
CHASSIS REMOVAL

1. Remove tuning and volume knobs.
2. Open case as explained under "Battery Replacement."
3. Remove three screws securing chassis. (Two at battery end of board and one at speaker end.)
4. Remove nut holding earphone jack (RC-1219B) or slide earphone jack out of slot (RC-1219A).
5. Unsolder speaker wires if necessary (or remove clips holding speaker to case).
6. Unsolder battery wires if necessary.
7. Lift board out of case.



RCA VICTOR

Model VFP 65 E Chassis RS-206A



All capacitance values below 1.0 are in μ f. Those 1.0 and above are in ρ f (μ f), unless otherwise noted.

ACCESS TO CHASSIS

The chassis is accessible through the small panel on the rear of the instrument.

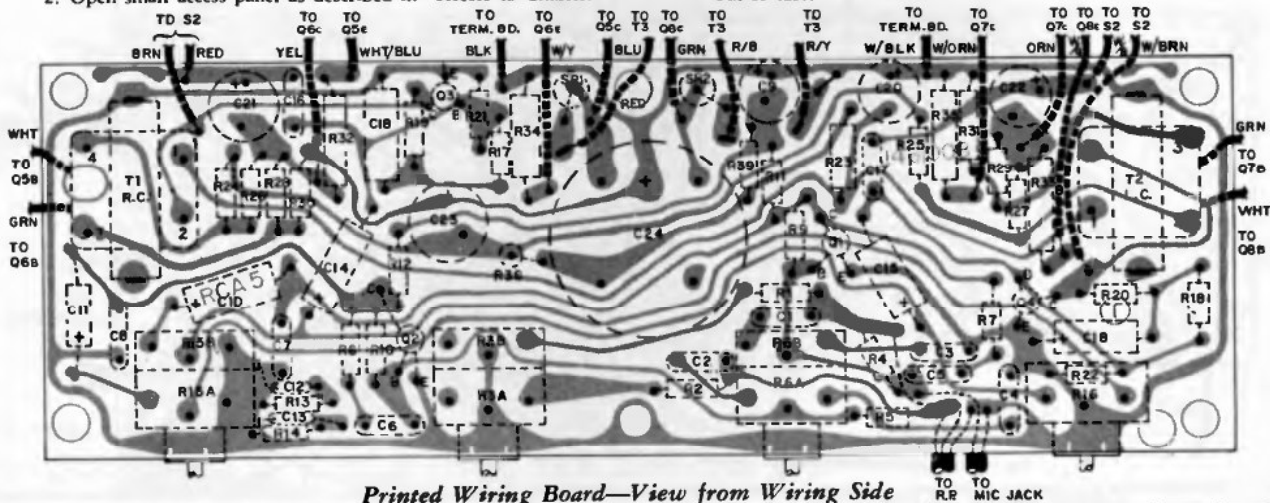
1. Remove power cord.
2. Remove three (3) painted screws holding small access panel on rear of instrument.
3. Swing panel down and to right on its pivot. DO NOT ATTEMPT TO REMOVE PANEL.

CHASSIS REMOVAL

The top of the record changer compartment comprises the complete chassis. It rests on and is secured to a ledge at the front and is held by screws at the rear. The recommended procedure for its removal is as follows:

1. Remove knobs.
2. Open small access panel as described in "Access to Chassis."

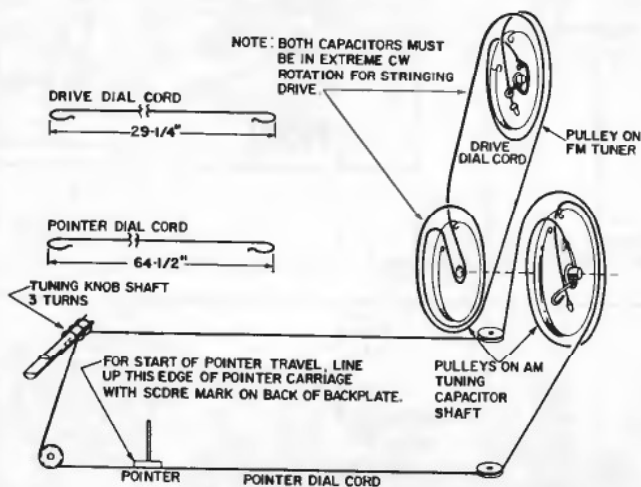
3. Position two (2) holes in access panel over screws holding power cord interlock.
 4. Remove two (2) machine screws holding interlock.
 5. Pull record changer drawer down.
- If it is not desired to remove chassis completely, omit Steps 6 and 7.
6. Unscrew two (2) bolts securing record changer in drawer. (Lift mat of turntable and reach bolts through access holes in turntable, one at front and one at rear.) DO NOT ATTEMPT TO REMOVE RECORD CHANGER DRAWER.
 7. Lift up changer and disconnect cables.
 8. Remove four (4) plated screws holding front of chassis to horizontal ledge located inside of compartment at front of top.
 9. Remove wires, running down each back corner of compartment, from holding clips.
 10. Remove four (4) painted screws holding rear of chassis to rear of instrument—just below the access panel. (Hold chassis—top of compartment—to prevent its falling.)
 11. Chassis may then be lowered and removed.
 12. Disconnect speaker cables from transformers and lift chassis out of case.



Printed Wiring Board—View from Wiring Side

RCA VICTOR

(Material on pages 133 through 135)



Dial Cord Arrangement

Model Series	Tuner Chassis	Amplifier Chassis
VFR05M	RC-1215D	RS-203C
VFR05W	RC-1215D	RS-203C
VFR19M	RC-1215D	RS-203C
VFR25L	RC-1215D	RS-203C
VFT05M	RC-1215E	RS-203C
VFT05W	RC-1215E	RS-203C
VFT10E	RC-1215E	RS-203C
VFT19M	RC-1215E	RS-203C
VFT22W	RC-1215E	RS-203C
VFT25L		

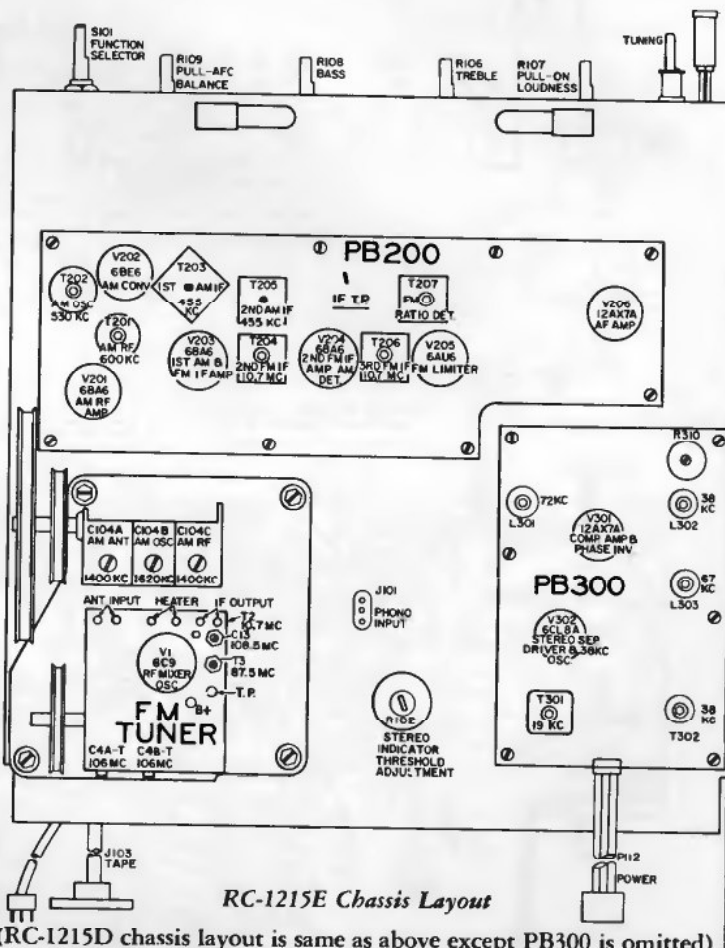
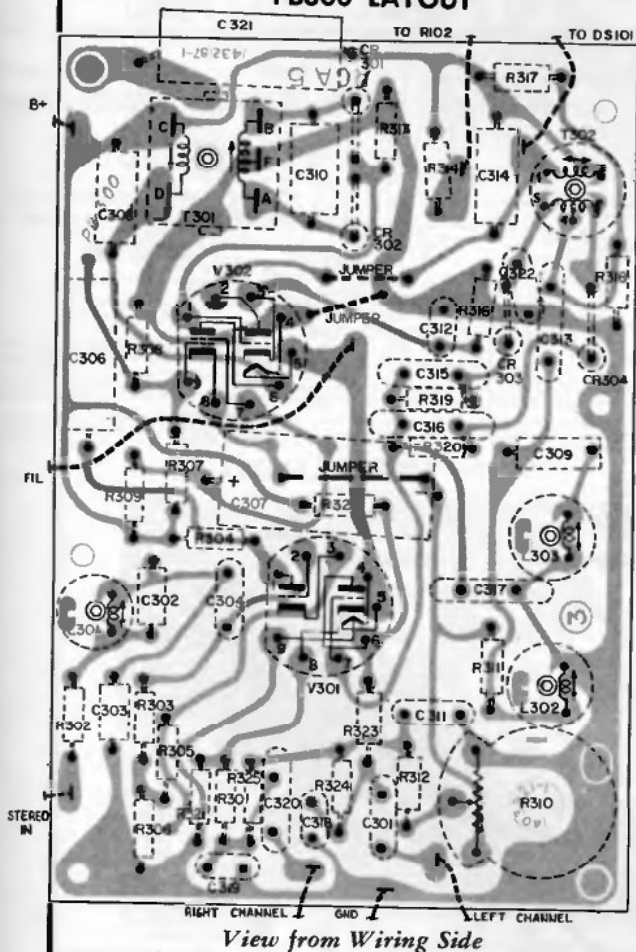
Tuner Chassis RC-1215D is an AM/FM tuner (No Stereo)

Tuner Chassis RC-1215E is an AM/FM/FM-Stereo tuner

All instruments are self-contained combination Radio/"Victrola" consoles designed to provide in the cabinet stereophonic reproduction. Models in the VFT 0, 1, and 2 series contain an AM/FM/FM-Stereo tuner, a stereophonic record changer, a dual channel audio amplifier, and two complete speaker systems. The VFR 0, 1, and 2 series instruments do not incorporate FM-Stereo or the stereo indicator light, but in all other respects are identical to the VFT 0, 1, and 2 series combination consoles.

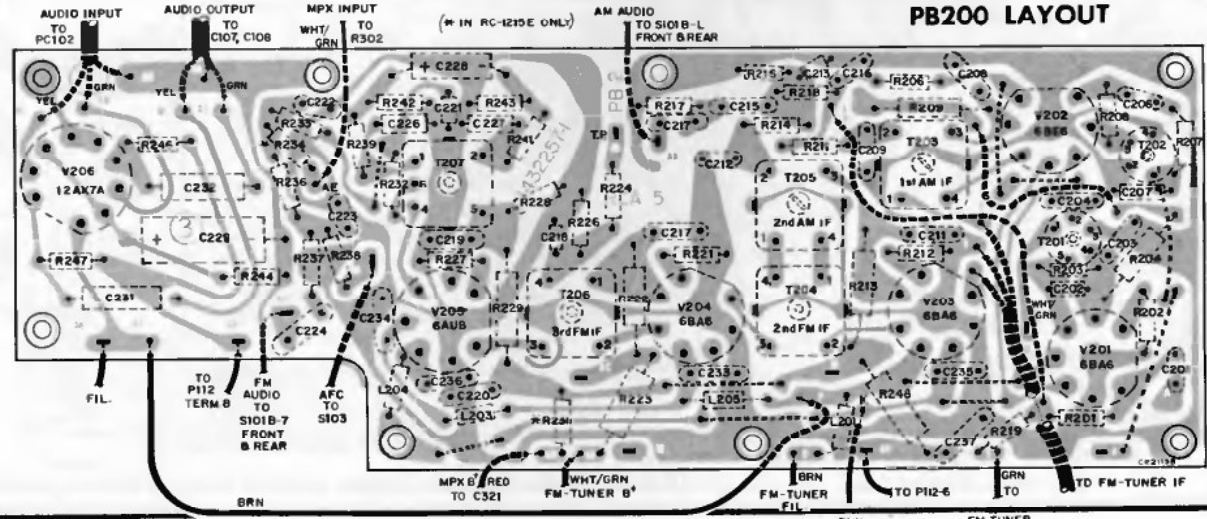
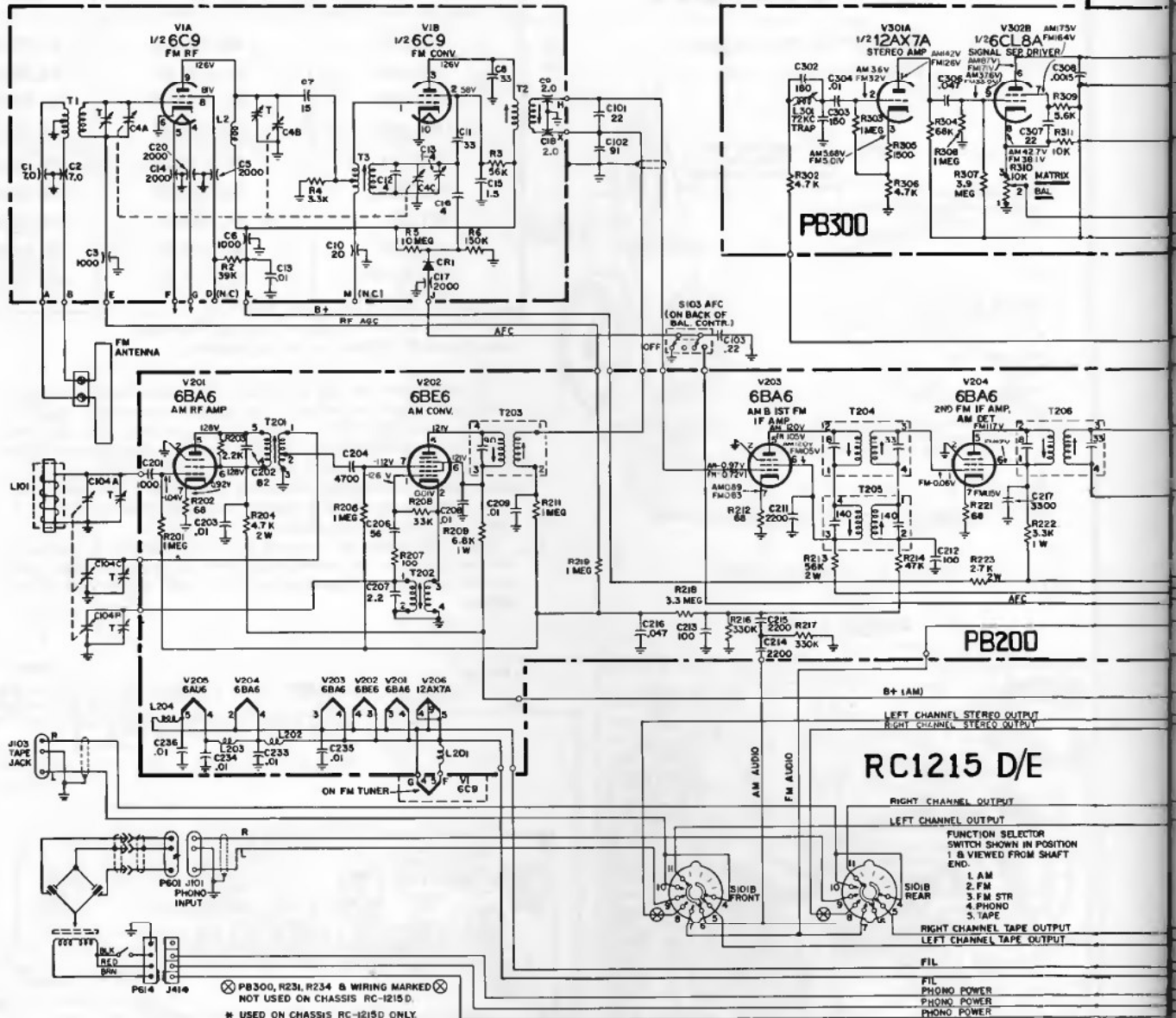
Tape input jacks are provided in all instruments as well as a terminal block for the connection of external speakers. When used, external speakers are connected in parallel with the internal speaker system.

PB300 LAYOUT



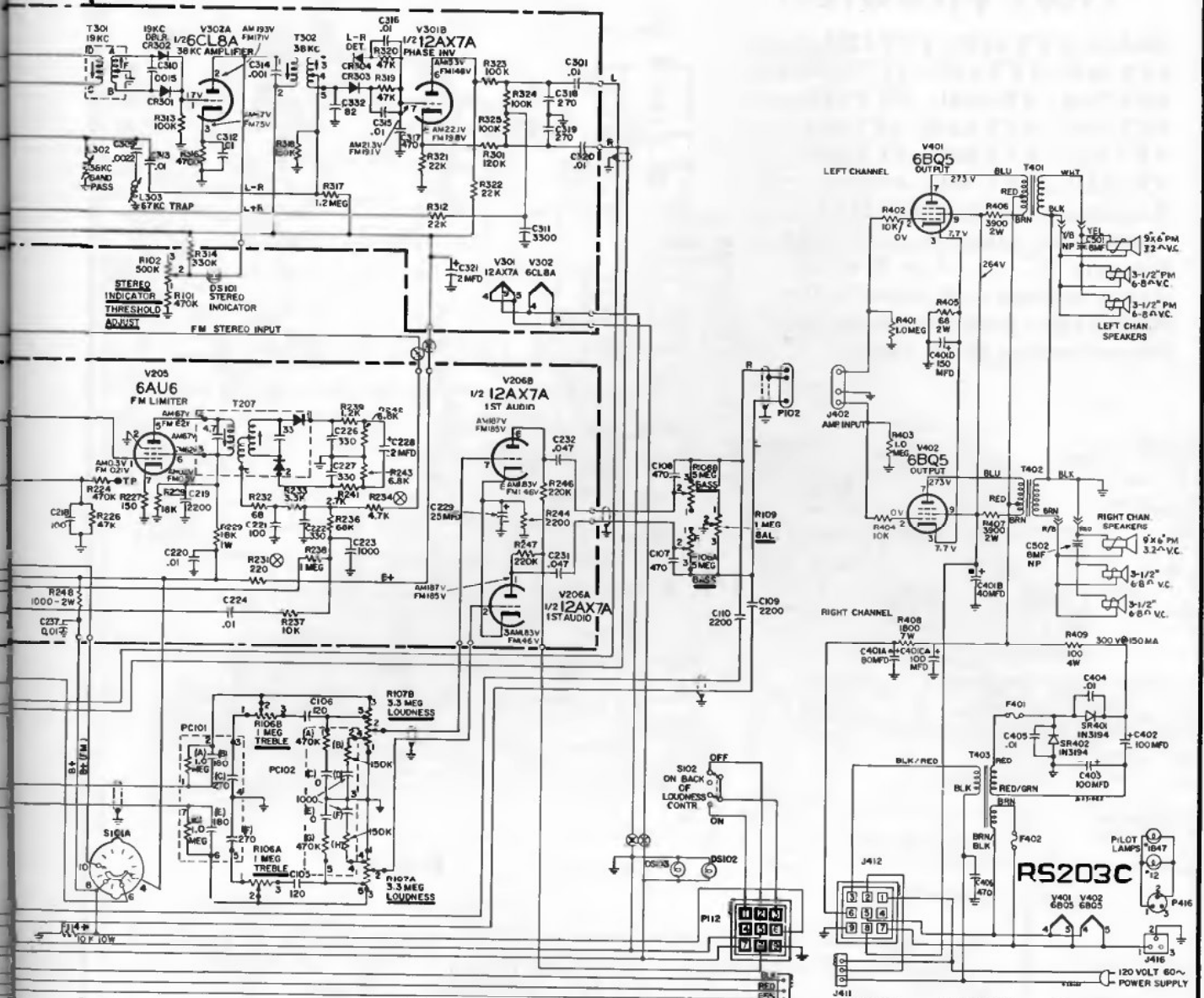
VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

RCA Victor Tuner Chassis RC-1215D, E, Amplifier Chassis RS-203C, Continued

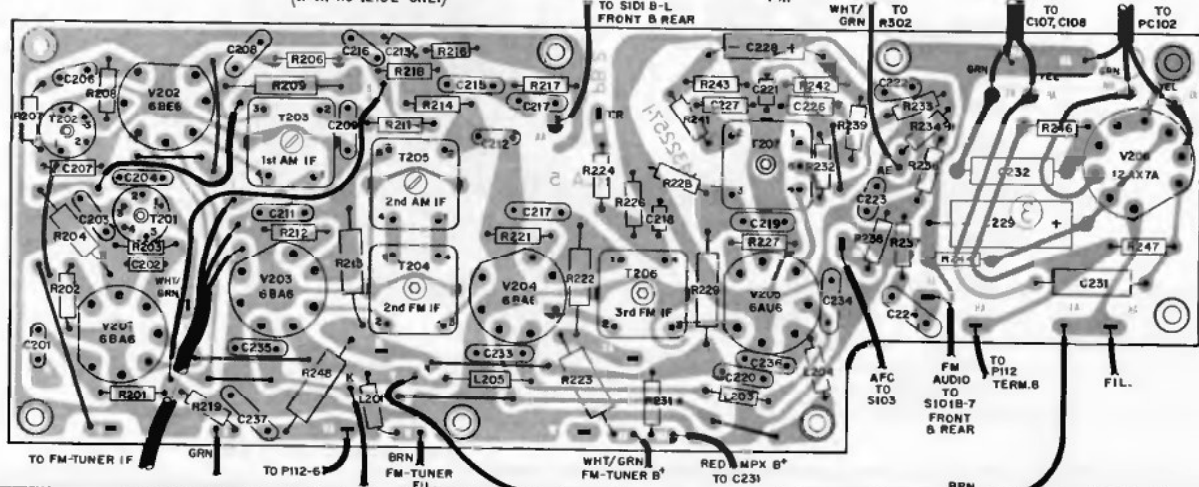


VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

RCA Victor Tuner Chassis RC-1215D, E, Amplifier Chassis RS-203C, Continued

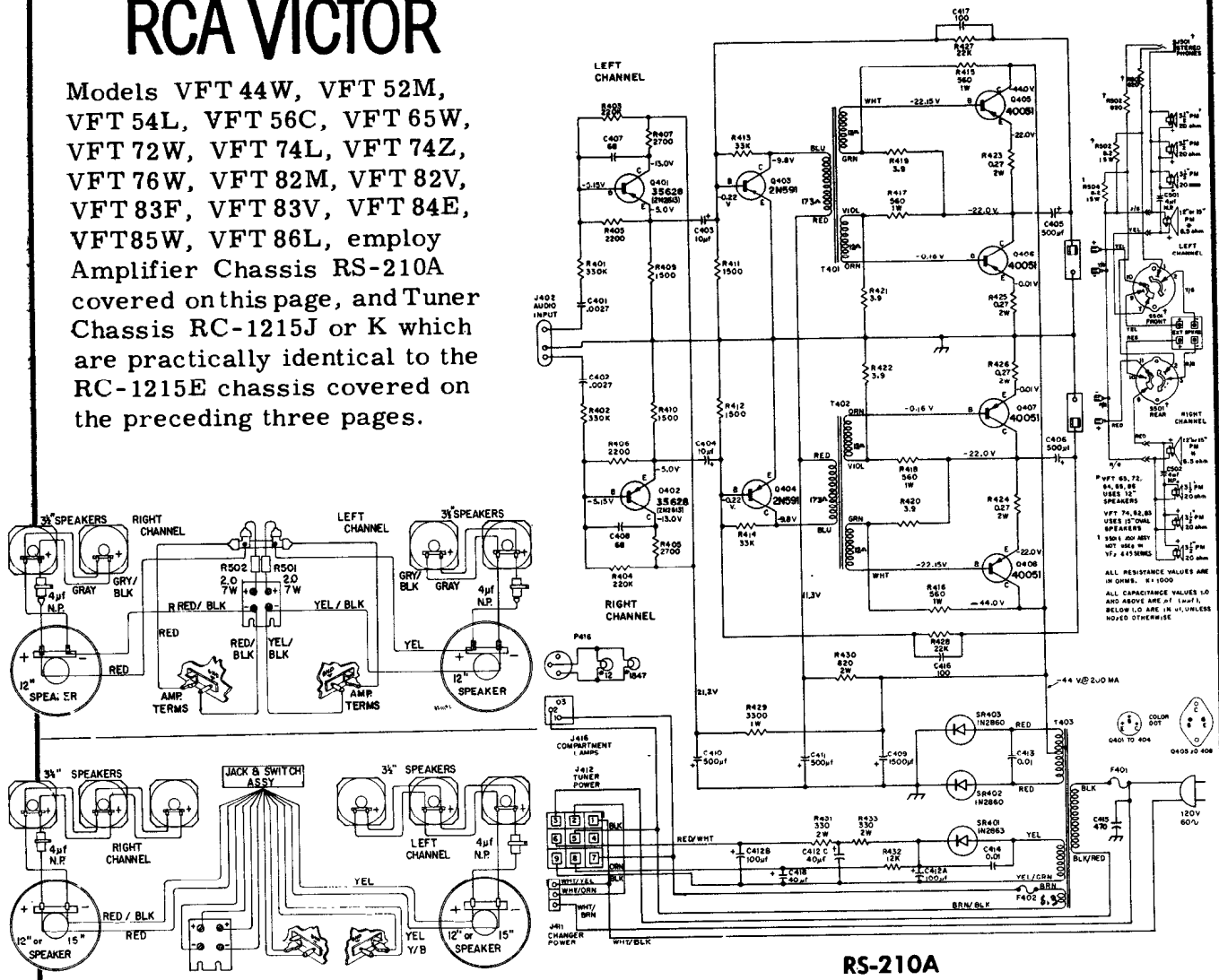


(* IN RC-1215E ONLY)

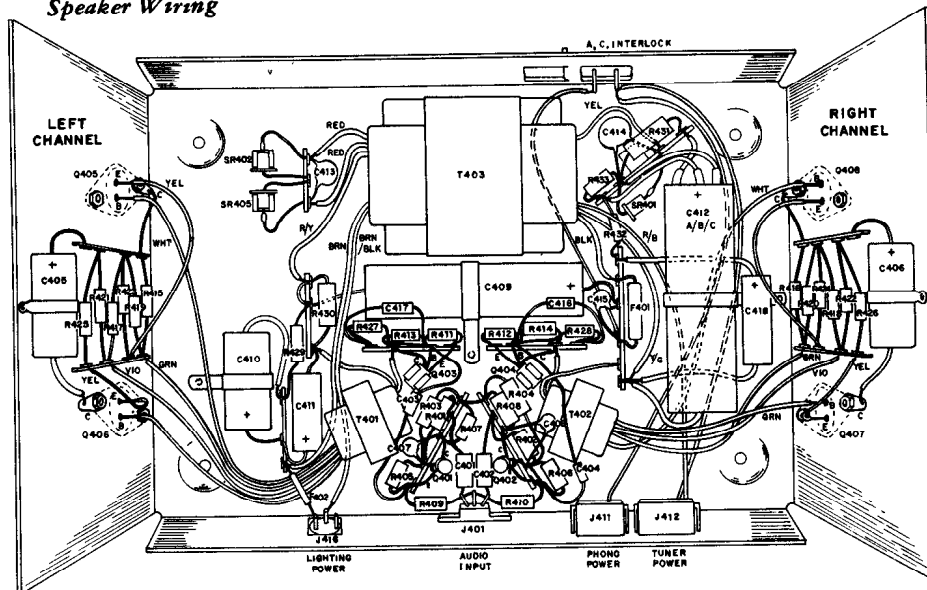


RCA VICTOR

Models VFT 44W, VFT 52M, VFT 54L, VFT 56C, VFT 65W, VFT 72W, VFT 74L, VFT 74Z, VFT 76W, VFT 82M, VFT 82V, VFT 83F, VFT 83V, VFT 84E, VFT 85W, VFT 86L, employ Amplifier Chassis RS-210A covered on this page, and Tuner Chassis RC-1215J or K which are practically identical to the RC-1215E chassis covered on the preceding three pages.

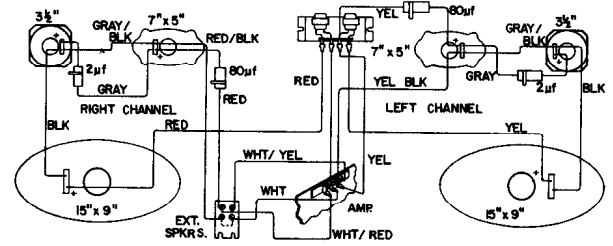
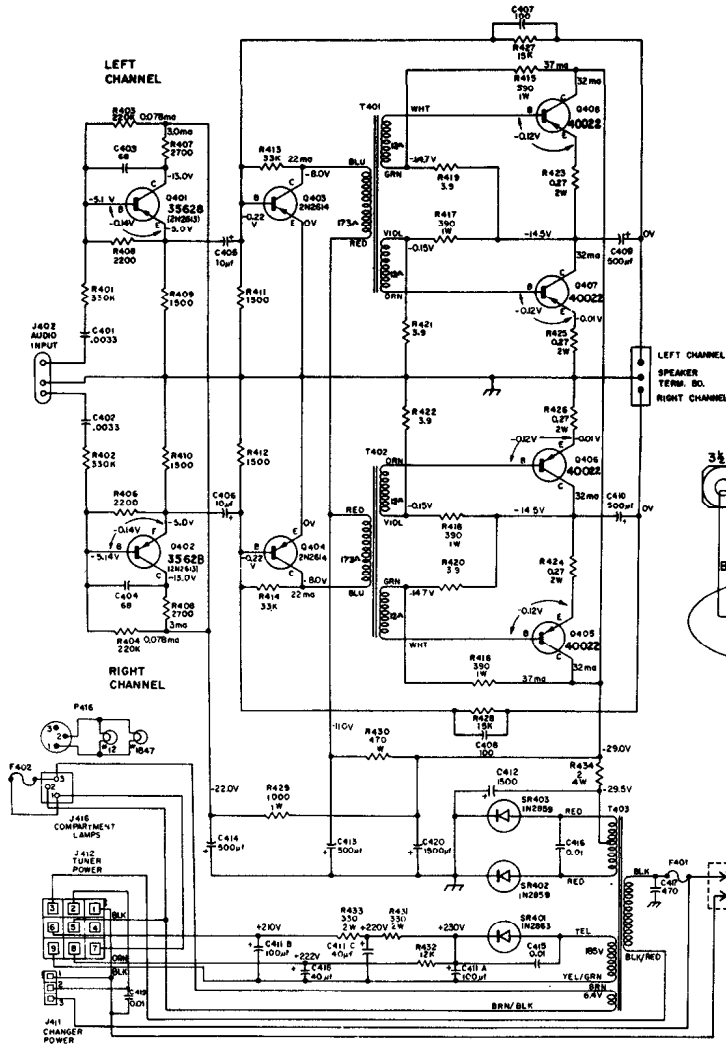


Speaker Wiring

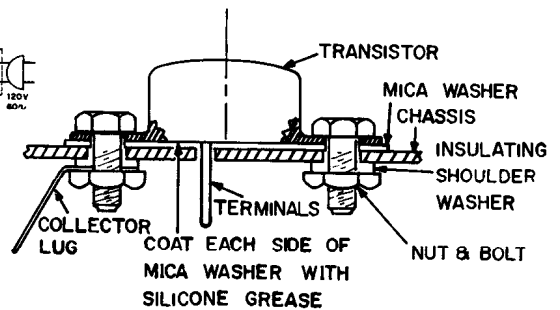


RCA VICTOR

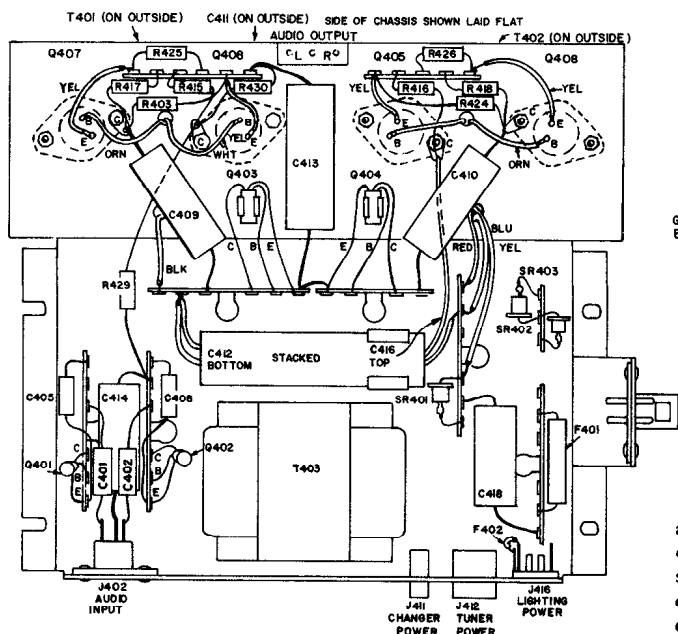
Models VFT 26W, VFT 27L, VFT 28M, VFT 29W, VFT 30W, and VFT 31L, employ Amplifier Chassis RS-212A covered on this page, and Tuner Chassis RC-1215M which is practically identical to RC-1215E chassis covered on preceding pages.



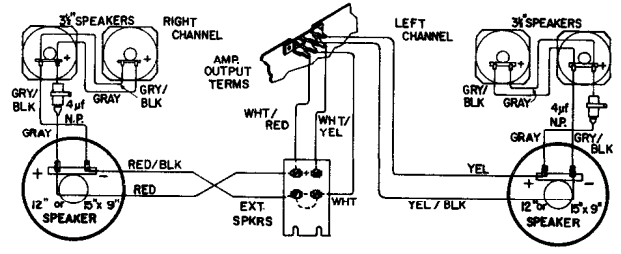
Speaker Wiring—VFT 26, 27, 28



Output Transistor Mounting



RS 212A Chassis Layout



Speaker Wiring—VFT 29, 30, 31

A terminal board is available on the rear of the instrument for the attachment of accessory external speakers (RCA XFK21, 22, 23 or equivalent) should they be desired. A jack is available in the record storage compartment for use of binaral headphones (RCA XFK 11 or equivalent). A switch adjacent to the jack provides for various operating modes of the internal speakers, external speakers (if used) and the headphones.

RCA VICTOR

RGD 24 Series

Chassis RC-1213P

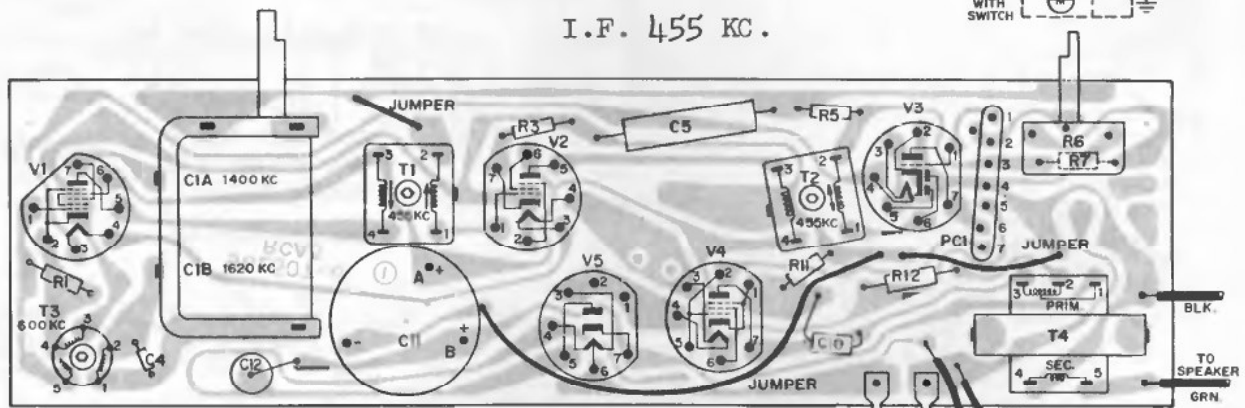
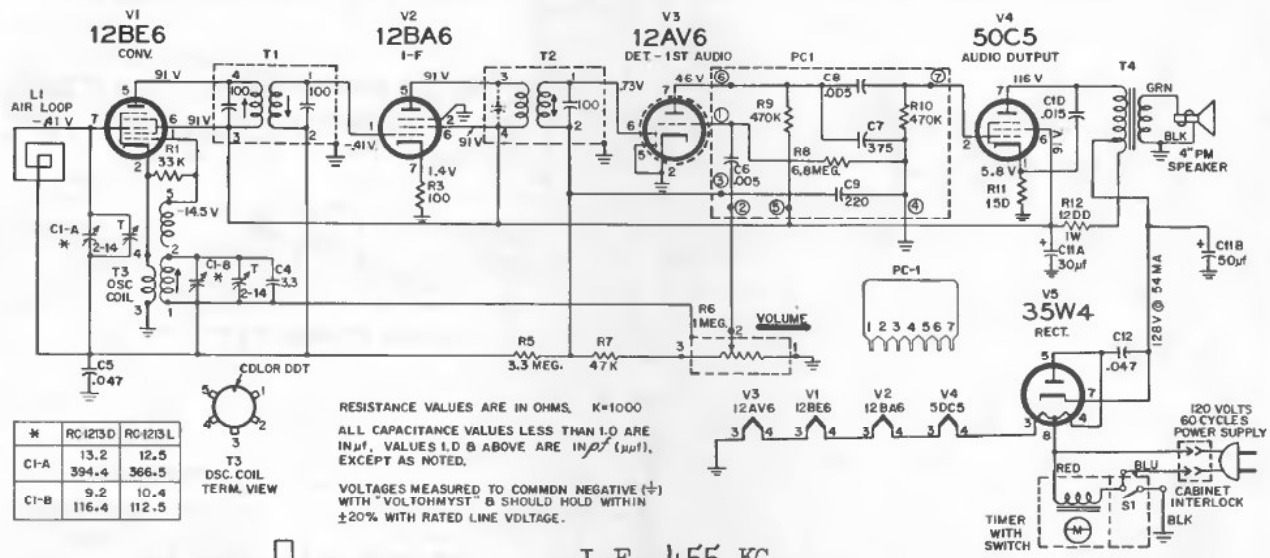
Model RGD 24A—Light Blue

Model RGD 24N—Cream

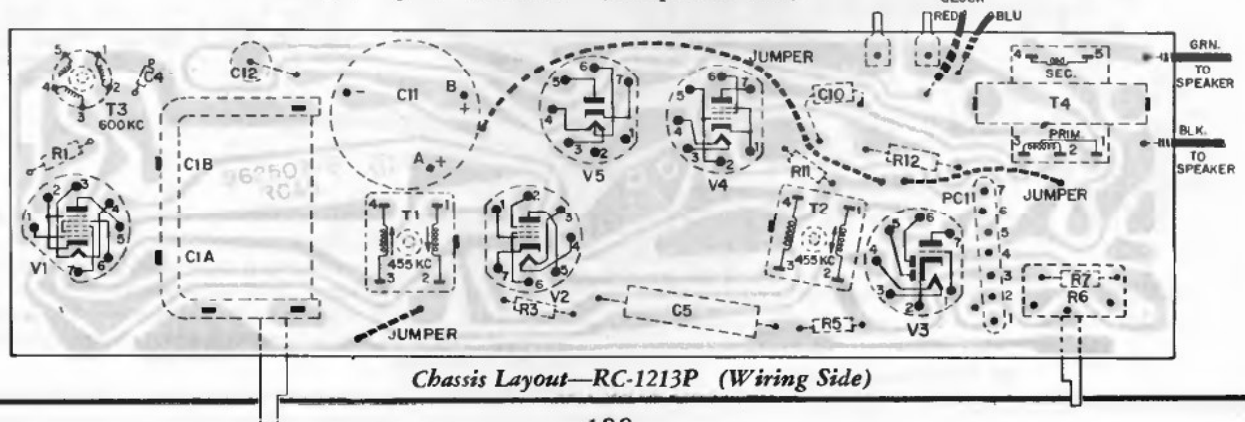
Model RGD 24Y—Iceberg White

TUBE AND CHASSIS ACCESSIBILITY

1. DO NOT ATTEMPT TO REMOVE THE KNOBS. The tuning and volume control knobs are held captive to the cabinet by retainers on their shafts.
2. Remove the back cover by lifting the protrusions on the bottom of the back cover, out of the slots in the base of the cabinet.
3. Unsolder speaker leads if necessary. Avoid putting a strain on the speaker leads.
4. Remove two chassis retainers (screws or clips), one at the volume control and one on the left end mounting.
5. Grasp tuning capacitor and volume control, and pull chassis out of knobs and mounting slots.



Chassis Layout—RC-1213P (Component Side)



Chassis Layout—RC-1213P (Wiring Side)

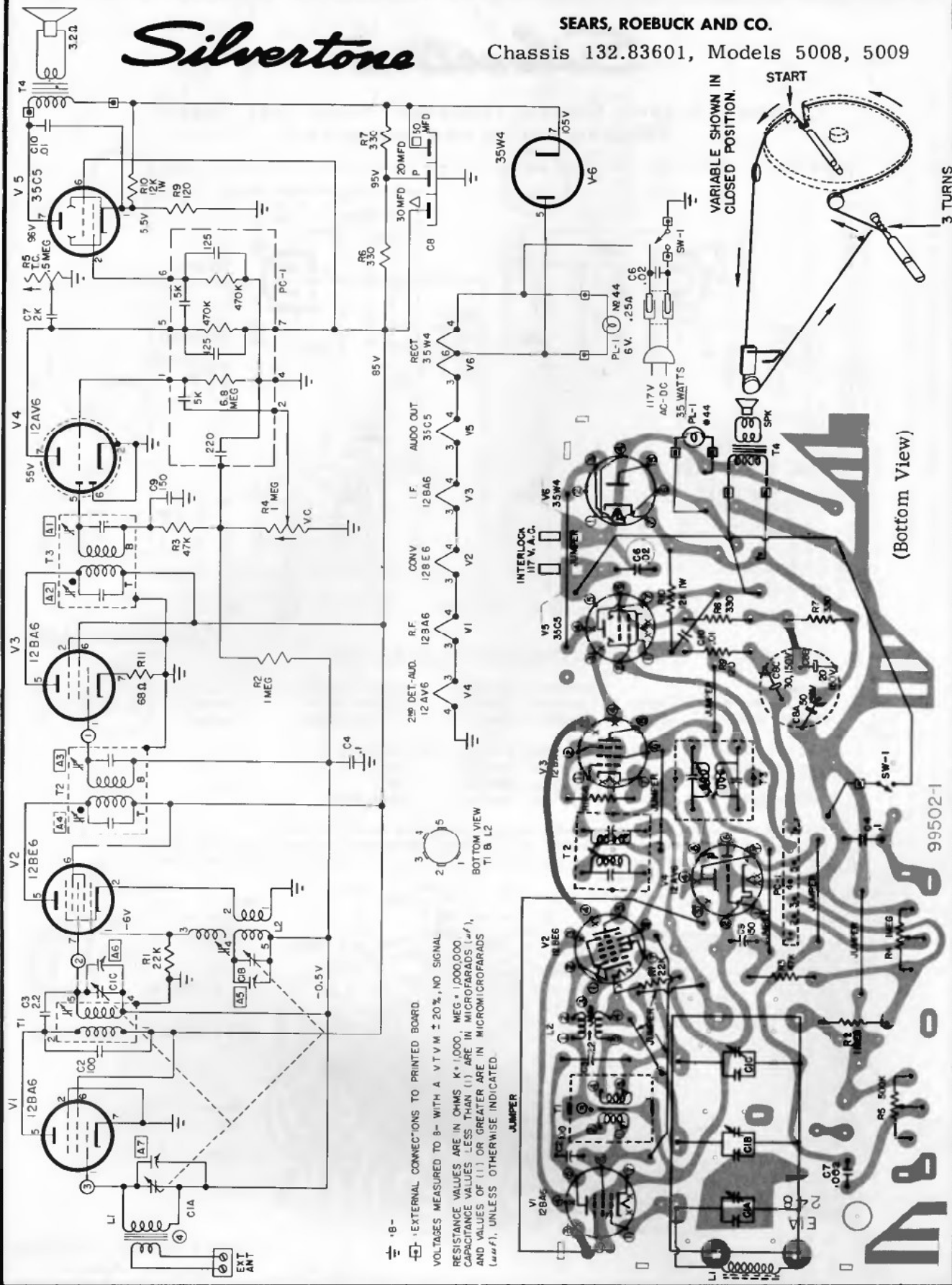
Silvertone

SEARS, ROEBUCK AND CO.

Chassis 132.83601, Models 5008, 5009

STRINGING DIAGRAM

CIRCUIT BOARD DIAGRAM



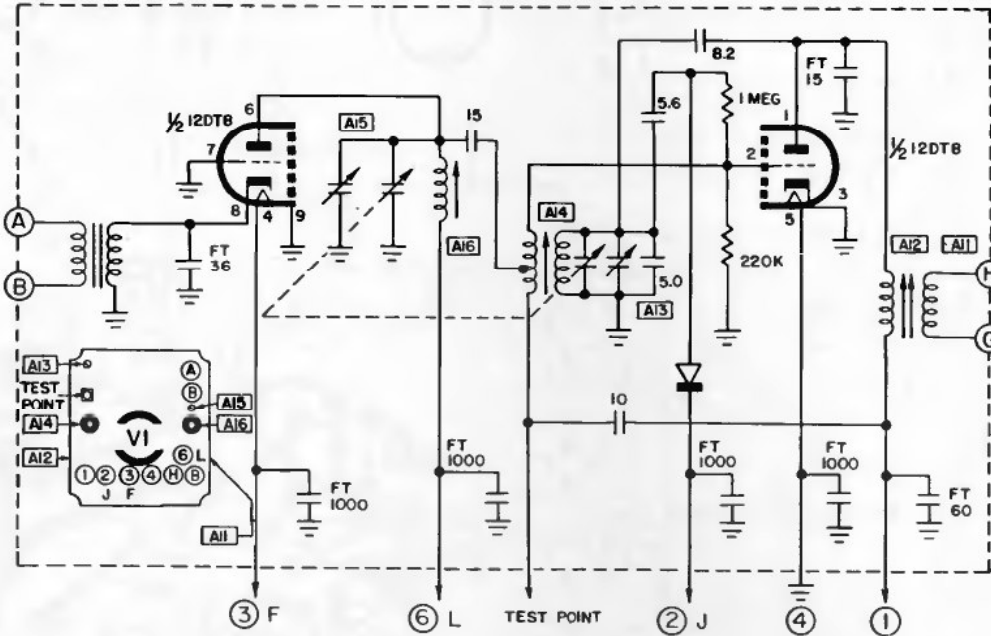
⊖ - 18-
 ⊕ - EXTERNAL CONNECTIONS TO PRINTED BOARD.
 VOLTAGES MEASURED TO B- WITH A V.T.V.M. ± 20%, NO SIGNAL.
 RESISTANCE VALUES ARE IN OHMS K = 1,000, MEG = 1,000,000.
 CAPACITANCE VALUES LESS THAN (1) ARE IN MICROFARADS (μF),
 AND VALUES OF (1) OR GREATER ARE IN MICROMICROFARADS
 (μμF), UNLESS OTHERWISE INDICATED.

(Bottom View)

99502-1

Silvertone

Sears, Roebuck Chassis 132.84101, Models 5045, 5046
(Diagram and top view on page 141)

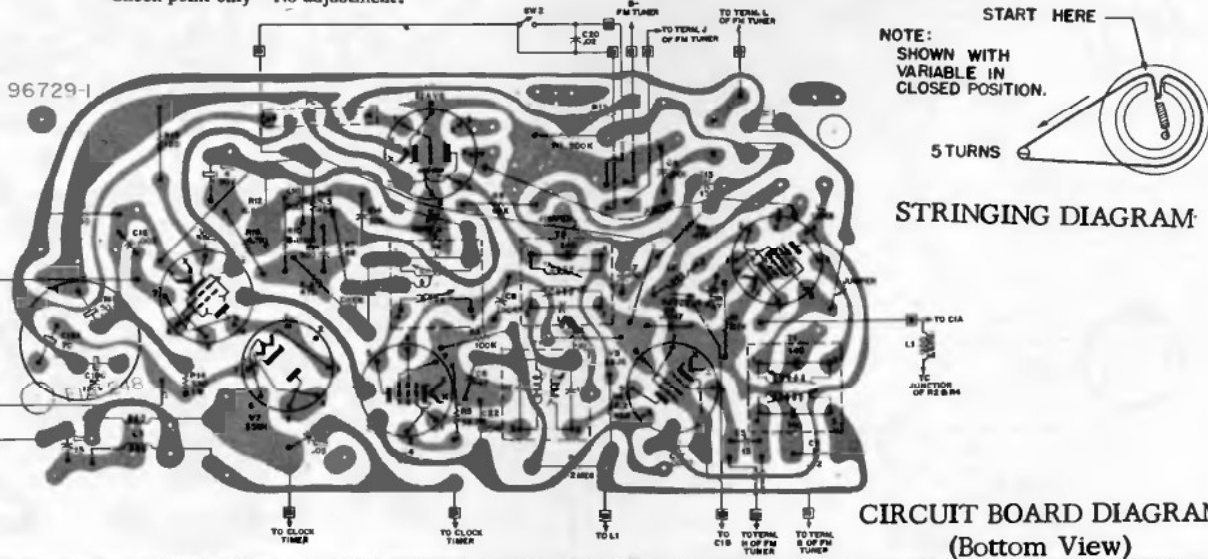


TUNER SCHEMATIC

AM ALIGNMENT PROCEDURE

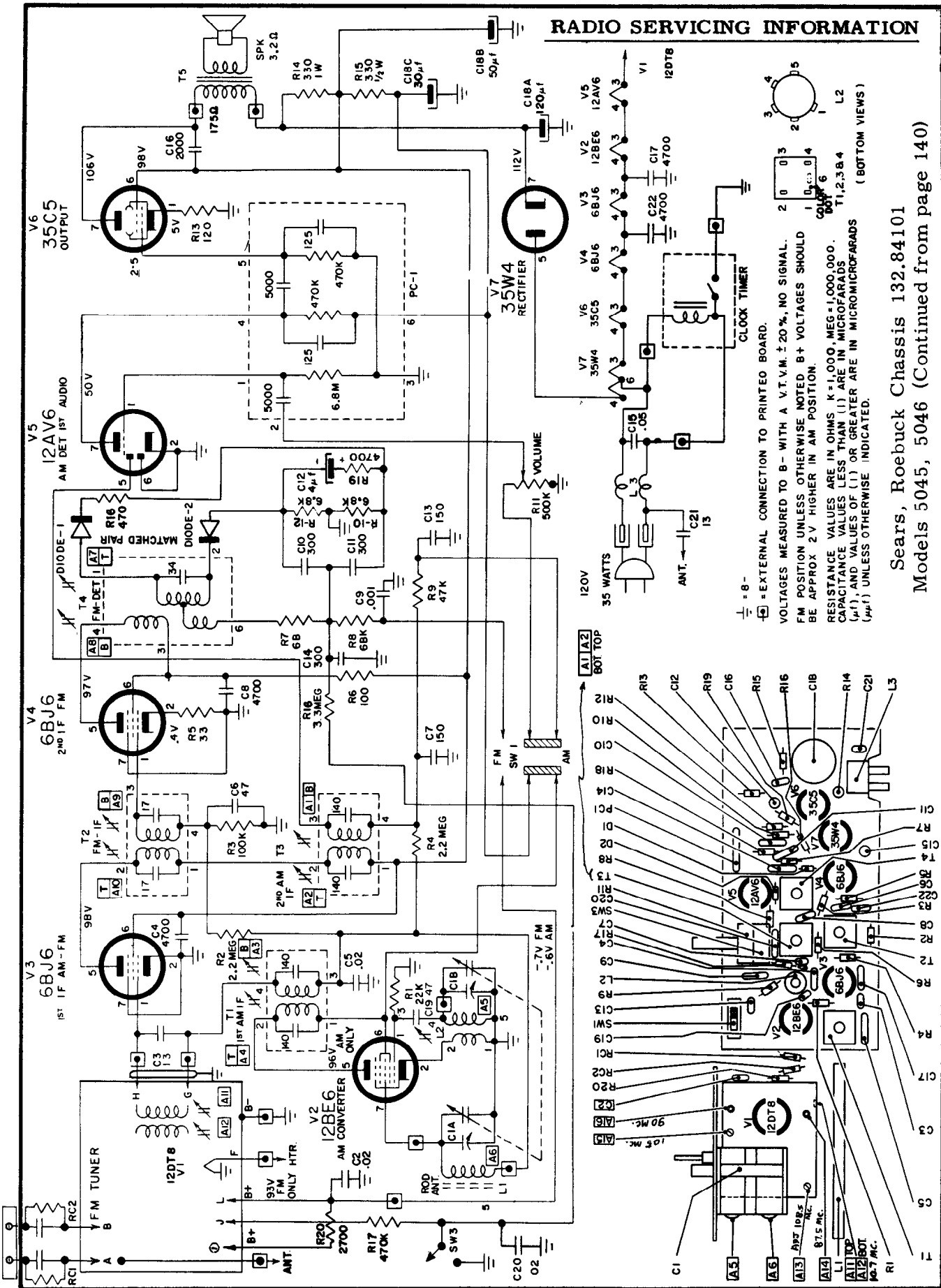
Position of Variable	Generator Frequency	Dummy Antenna	Generator Connection (high)	Generator Connection Ground Lead	Adjust Trimmer in Order Shown for Max. Output	Trimmer Function
Open	455 Kc	.05 mfd.	Pin 7, 12BE6	B-through	A1, 2, 3, 4	I. F.
Open	1640 Kc		*Test Loop	Test Loop	A5	Oscillator
1400 Kc	1400 Kc		*Test Loop	Test Loop	A6	Antenna
**600 Kc	600 Kc		*Test Loop	Test Loop	Check Point	

*Three (3) turns of wire 6" in diameter placed about one foot from the receiver antenna.
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.
** Check point only - No adjustment.



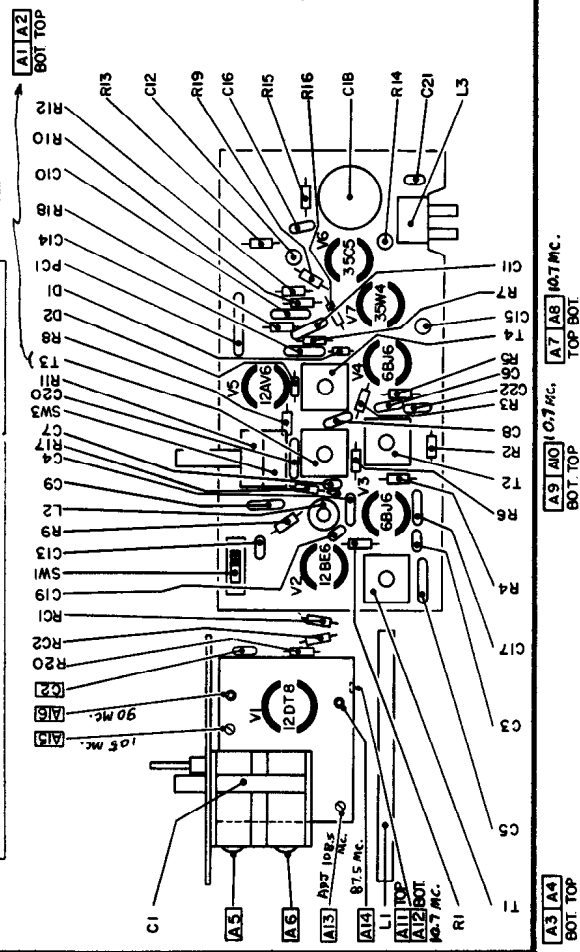
CIRCUIT BOARD DIAGRAM
(Bottom View)

RADIO SERVICING INFORMATION



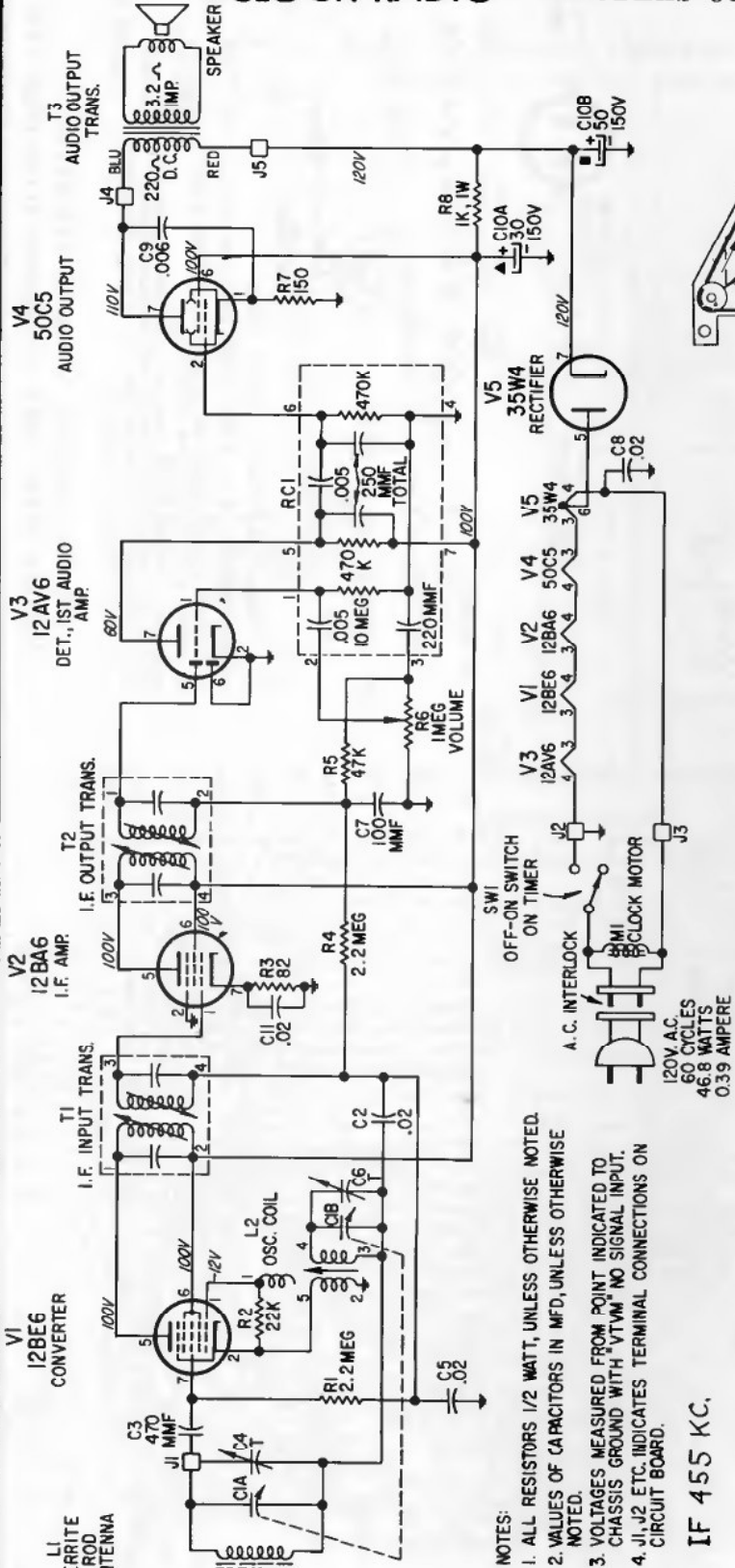
Sears, Roebuck Chassis 132.84101
Models 5045, 5046 (Continued from page 140)

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



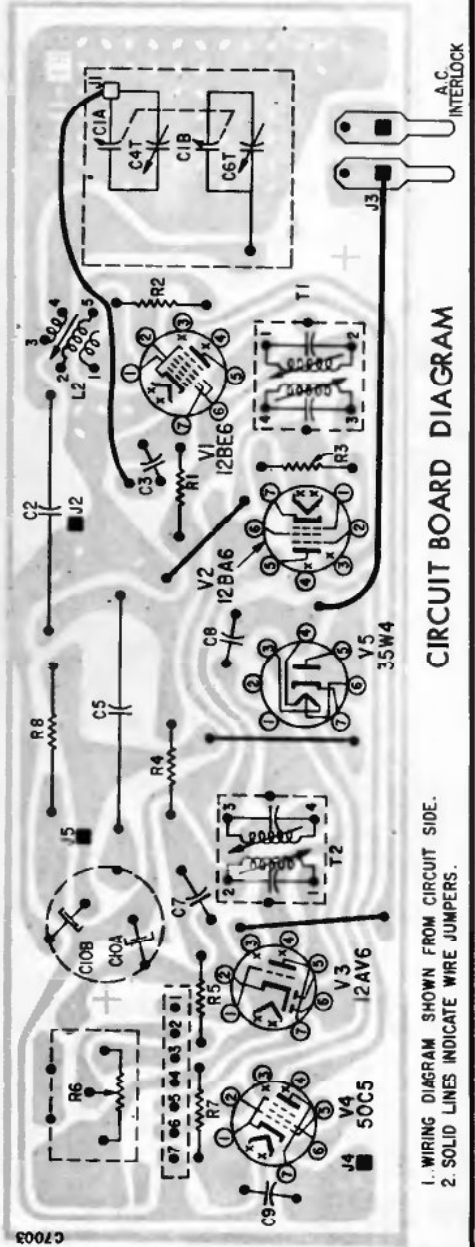
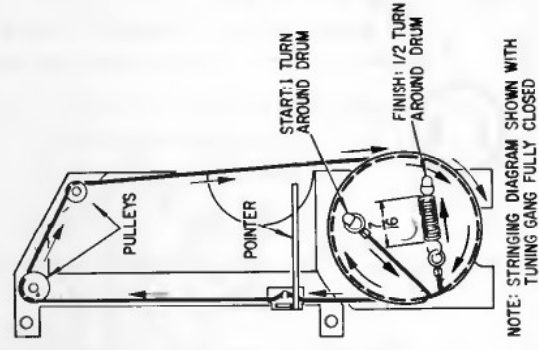
SEARS | *Silvertone* RADIO CHASSIS NO. 528.63101

CLOCK-RADIO MODELS 5036, 5037, 5038, 5039



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

IF 455 KC.



STRINGING DIAGRAM

CIRCUIT BOARD DIAGRAM

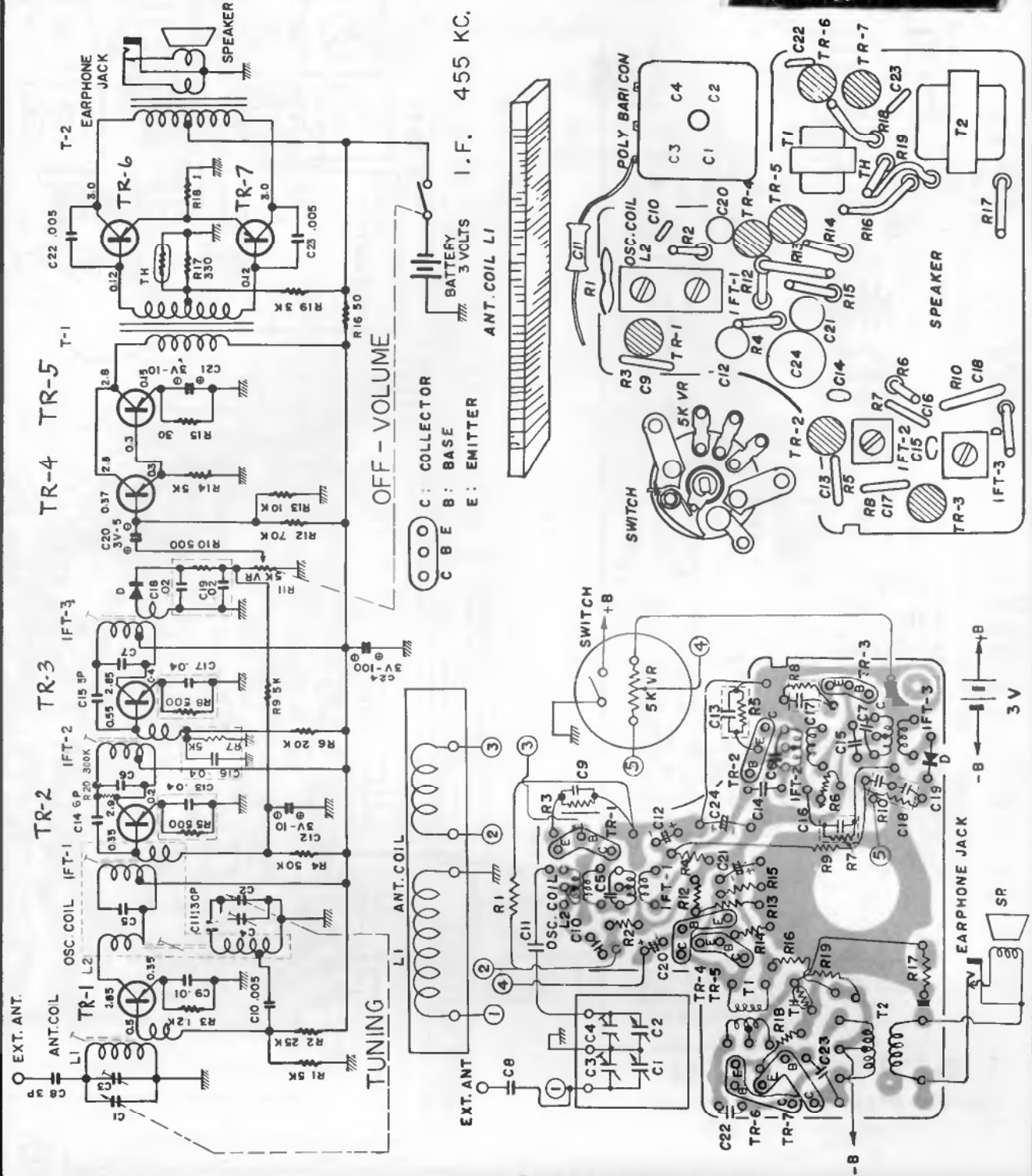


SHARP ELECTRONICS CORP.

MODEL BP-374



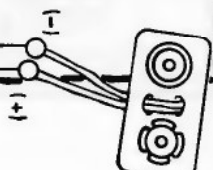
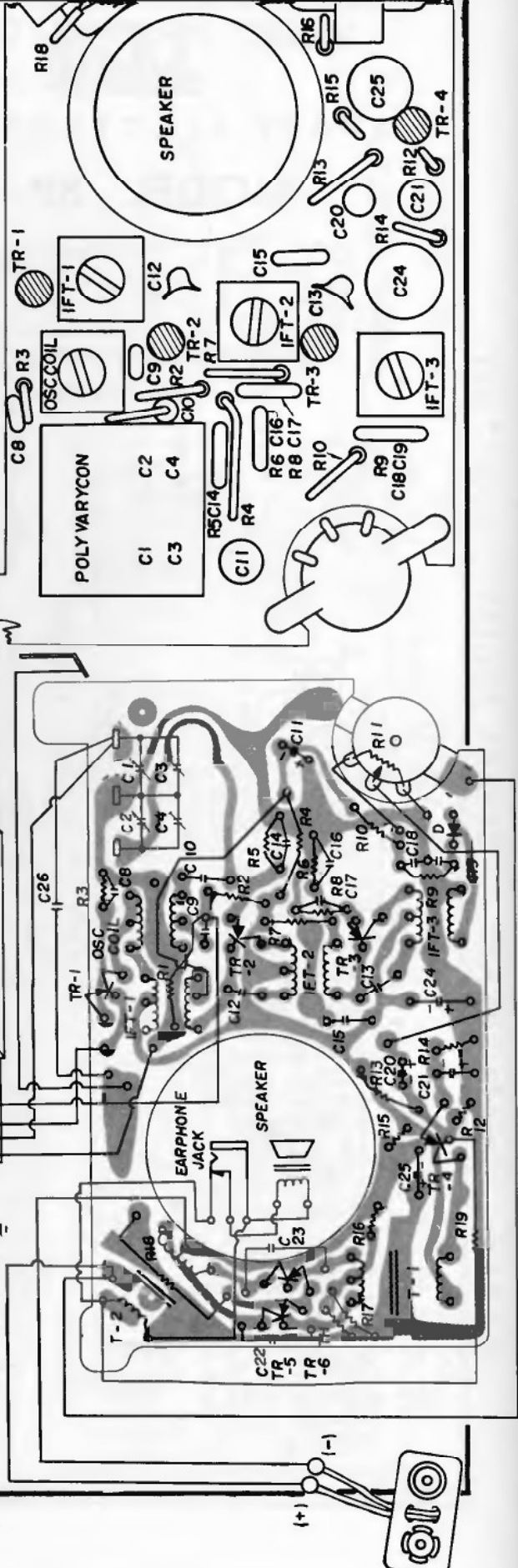
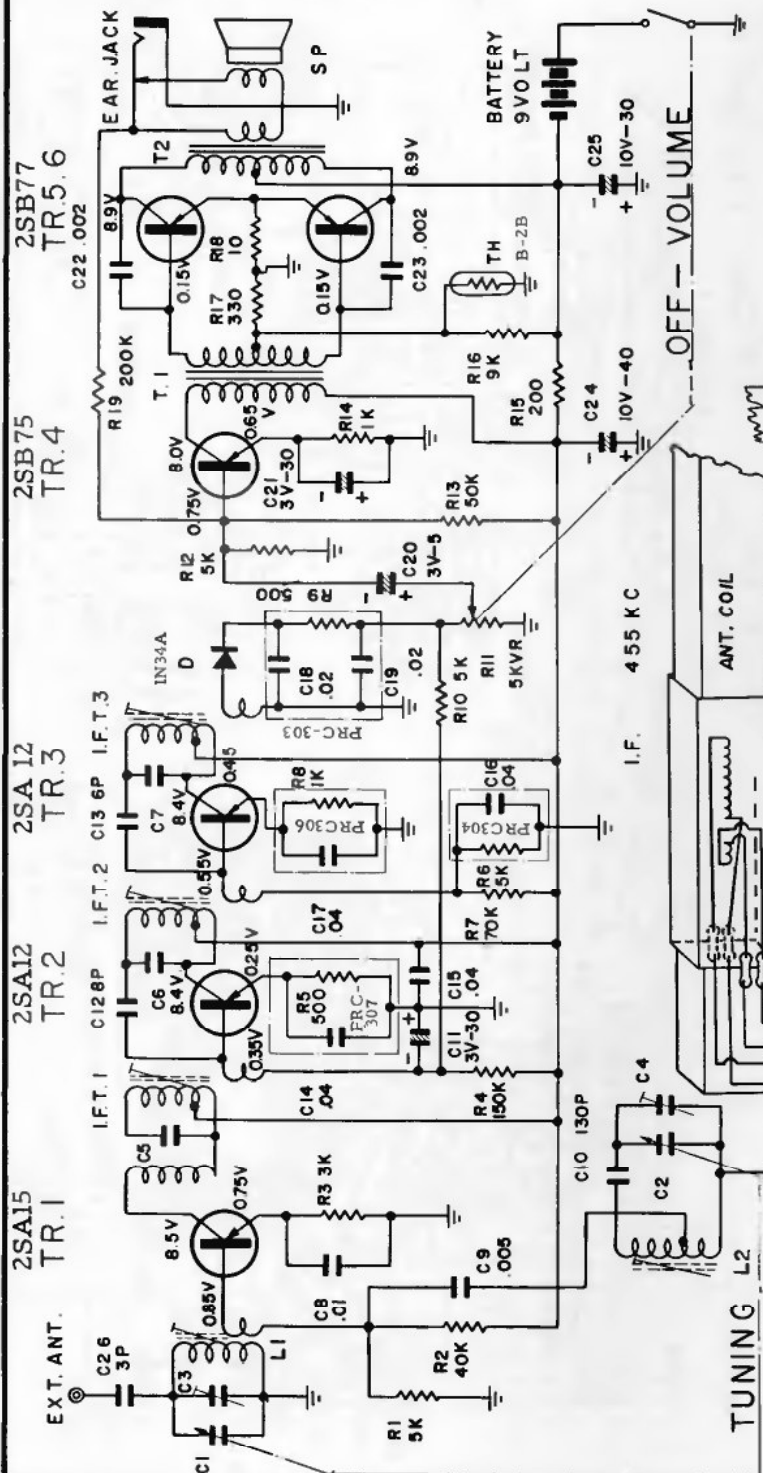
2SA337 2SA12 2SA12 2SB155 2SB77 (x2)





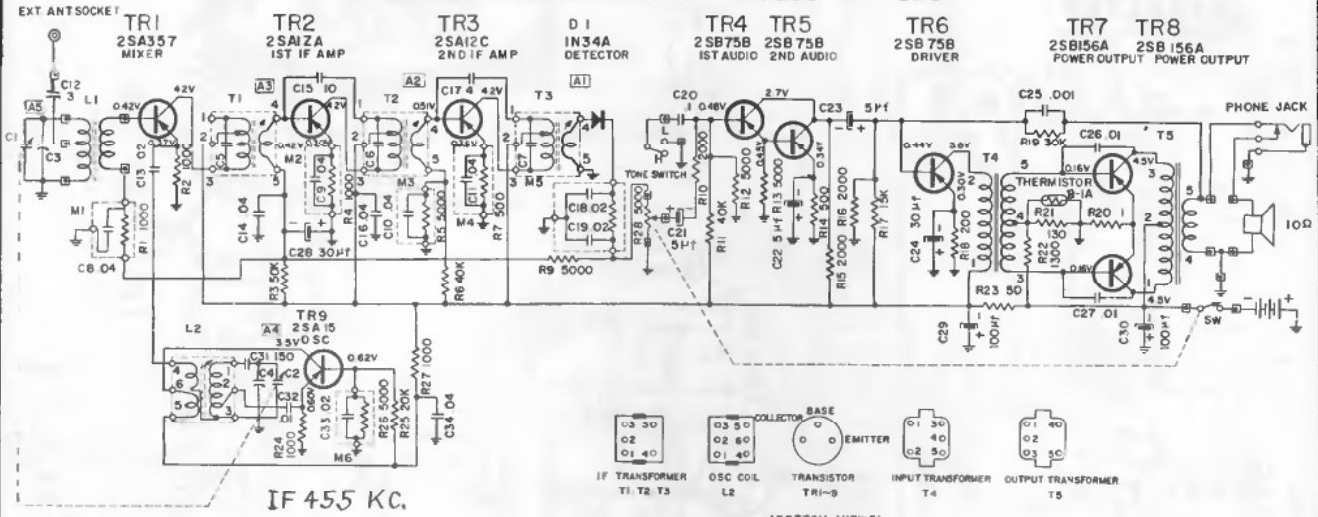
SHARP ELECTRONICS

MODEL BP-460



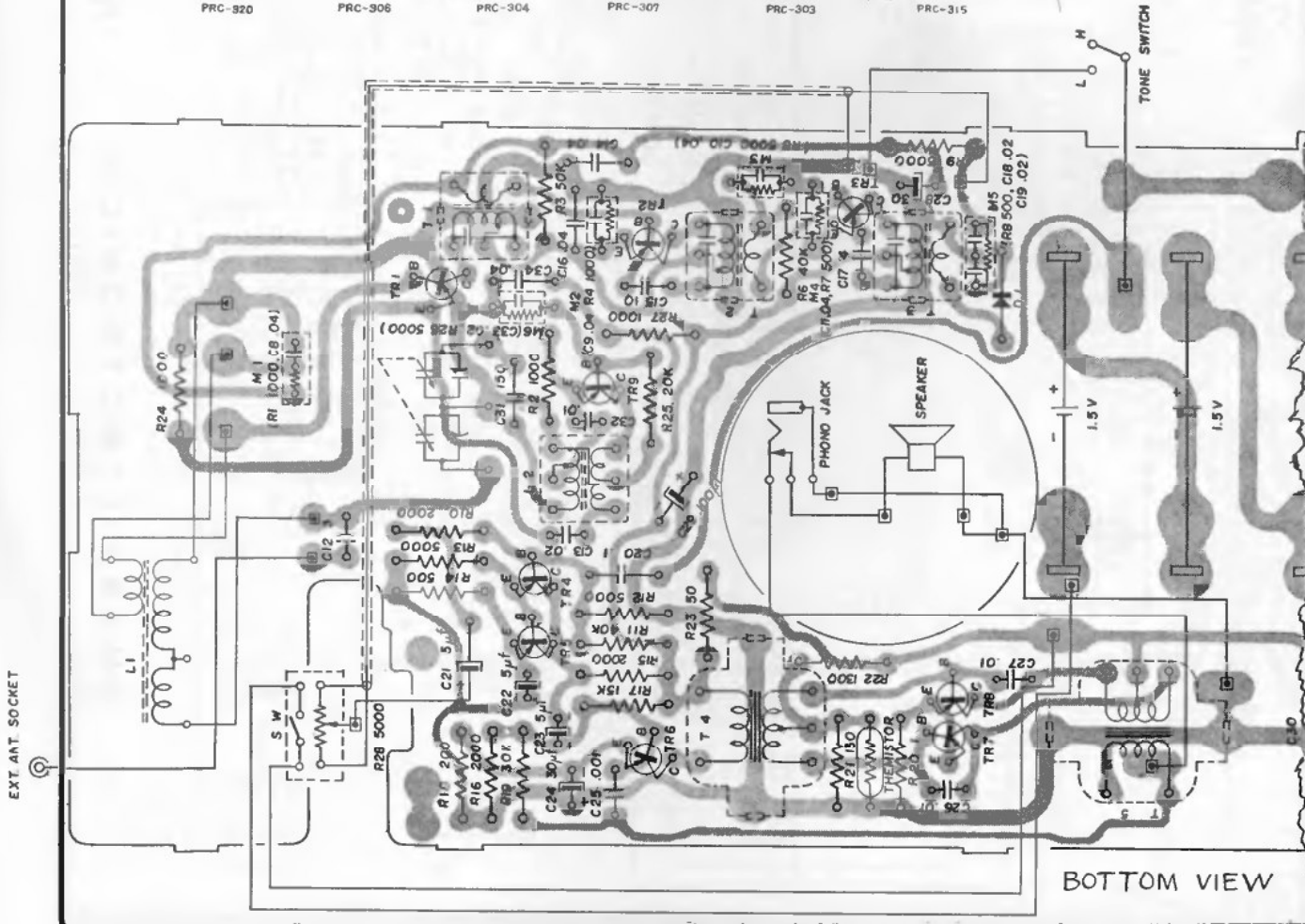
VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

SHARP ELECTRONICS Model BP-485



⊥ = COMMON GROUND
 □ = EXTERNAL CONNECTOR TO PRINTED CIRCUIT BOARD.
 RESISTANCE VALUES ARE IN OHMS; K=1000.
 CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS(μF) AND VALUES GREATER THAN 1.0 ARE IN MICRO-MICROFARADS(MMF) EXCEPT WHERE NOTED.
 VOLTAGE READINGS TO COMMON GROUND(⊥) ARE MEASURED WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITIONS.
 TOTAL BATTERY CURRENT DRAIN UNDER NO SIGNAL CONDITIONS IS 11 TO 100 MA.

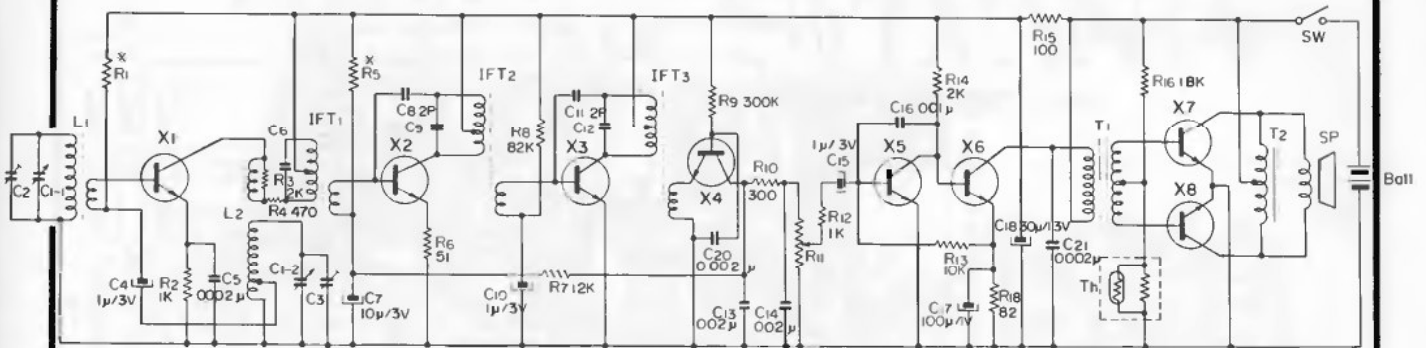
M1=C8 04+R1 1000, M2=C9 04+R4 1000, M3=C10 04+R5 5000, M4=C11 04+R7 500, M5=C16 02+R8 500, M6=C33 02+R26 5000.
 PRC-320 PRC-306 PRC-304 PRC-307 PRC-303 PRC-315



VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

SONY CORPORATION

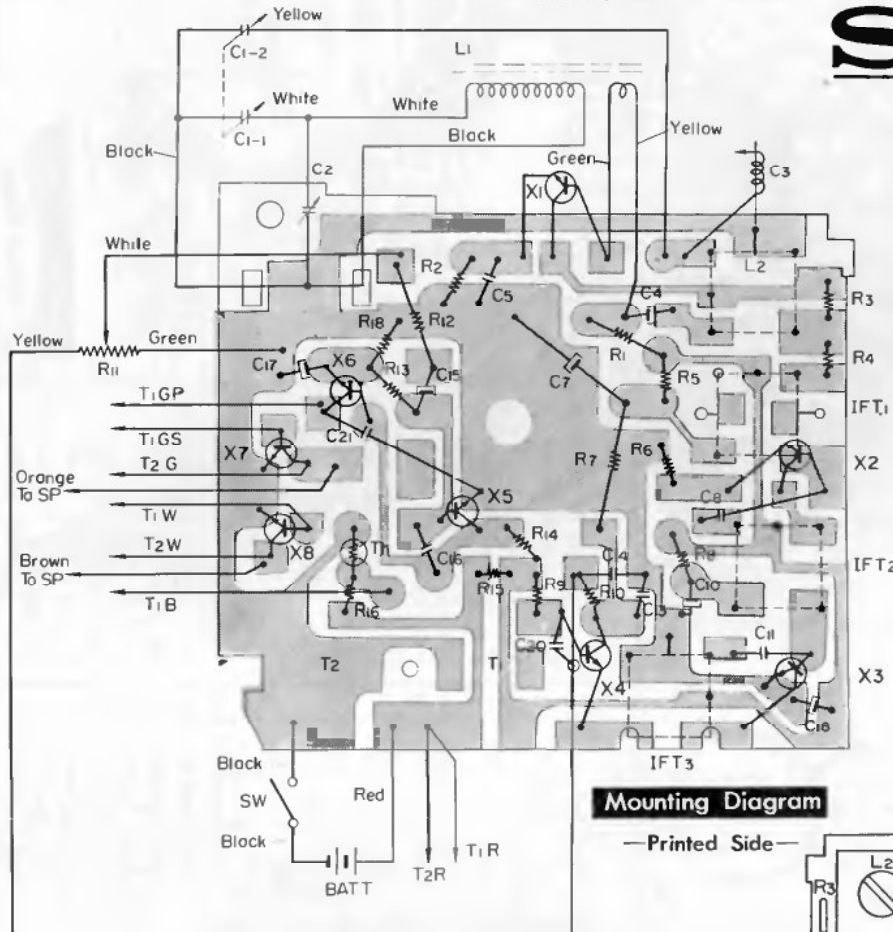
Model TR-8



X To be adjusted

SONY

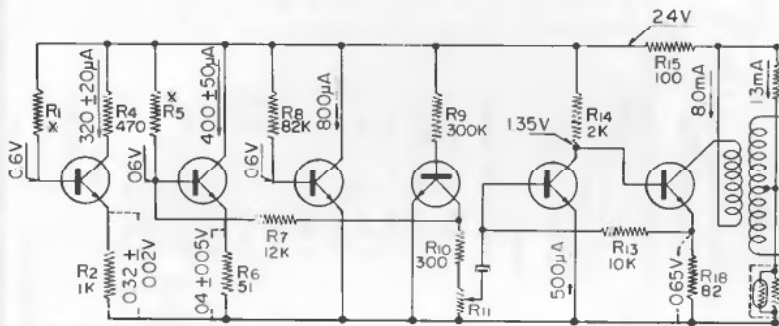
TR-8



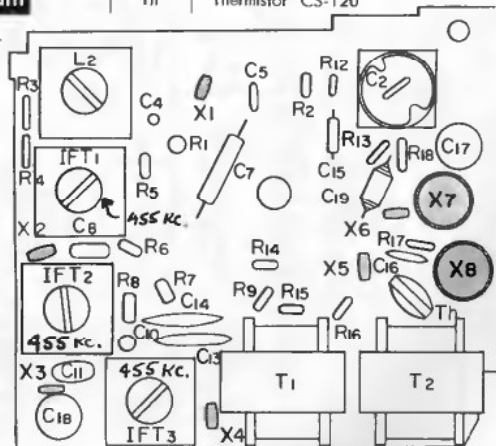
Mounting Diagram

—Printed Side—

Symbol	Description
L ₁	Ferrite Bar Antenna
L ₂	Oscillator Coil
IFT ₁	IF Transformer
IFT ₂	"
IFT ₃	"
X ₂	"
T ₁	Driver Transformer
T ₂	Output Choke Coil
SP	Speaker
SW	Power Switch (built in VR)
Batt.	Mercury Battery (2.6 V)
X ₁	Transistor TX-128
X ₂	" TX-128
X ₃	" TX-128
X ₄	" TX-128
X ₅	" TX-128
X ₆	" TX-128
X ₇	" 2SD6
X ₈	" 2SD6
Th	Thermistor CS-120



Voltage and Current Distribution Chart at Zero Signal



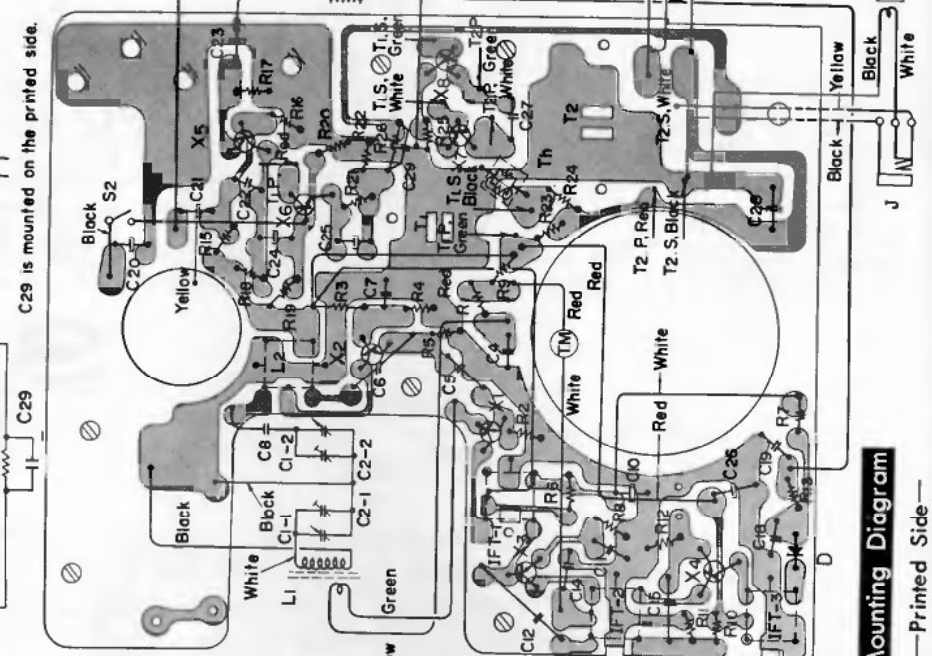
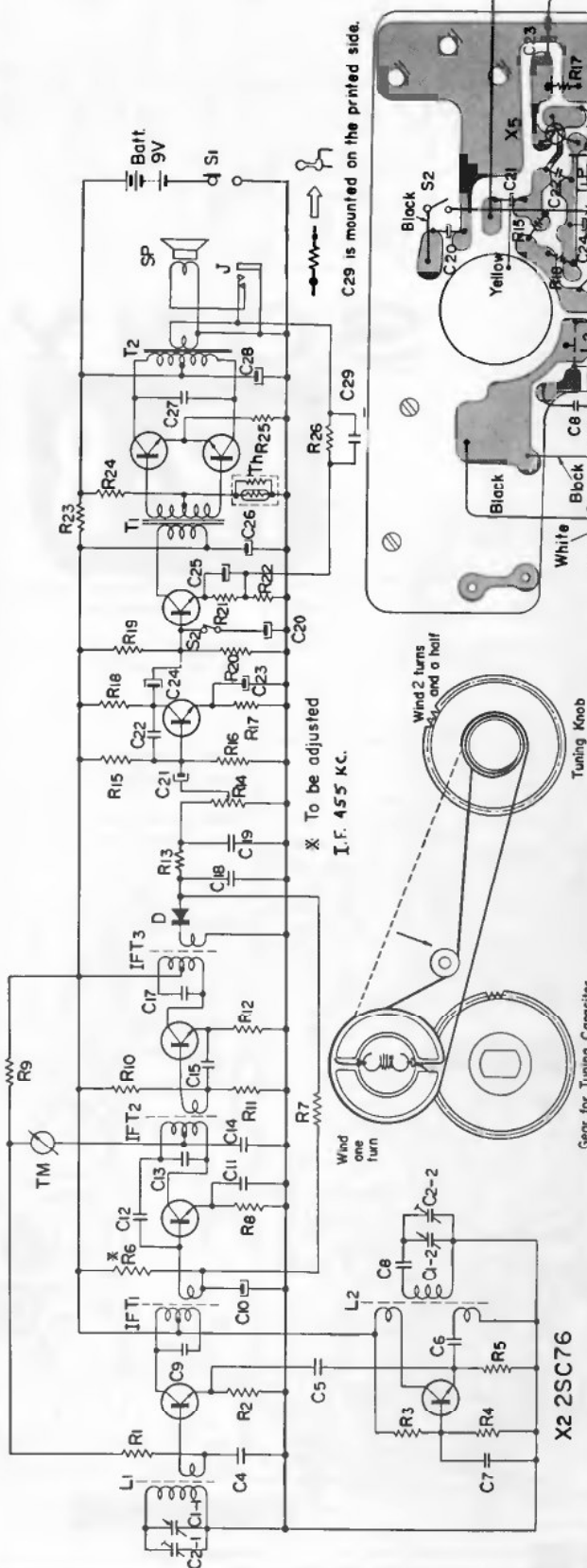
Mounting Diagram

—Parts Side—

SONY CORPORATION

Model TR-830

X1 2SC73 X3 2SC76 X4 2SC76 X5 2SD65 X6 2SD66 X7.8 2SD65



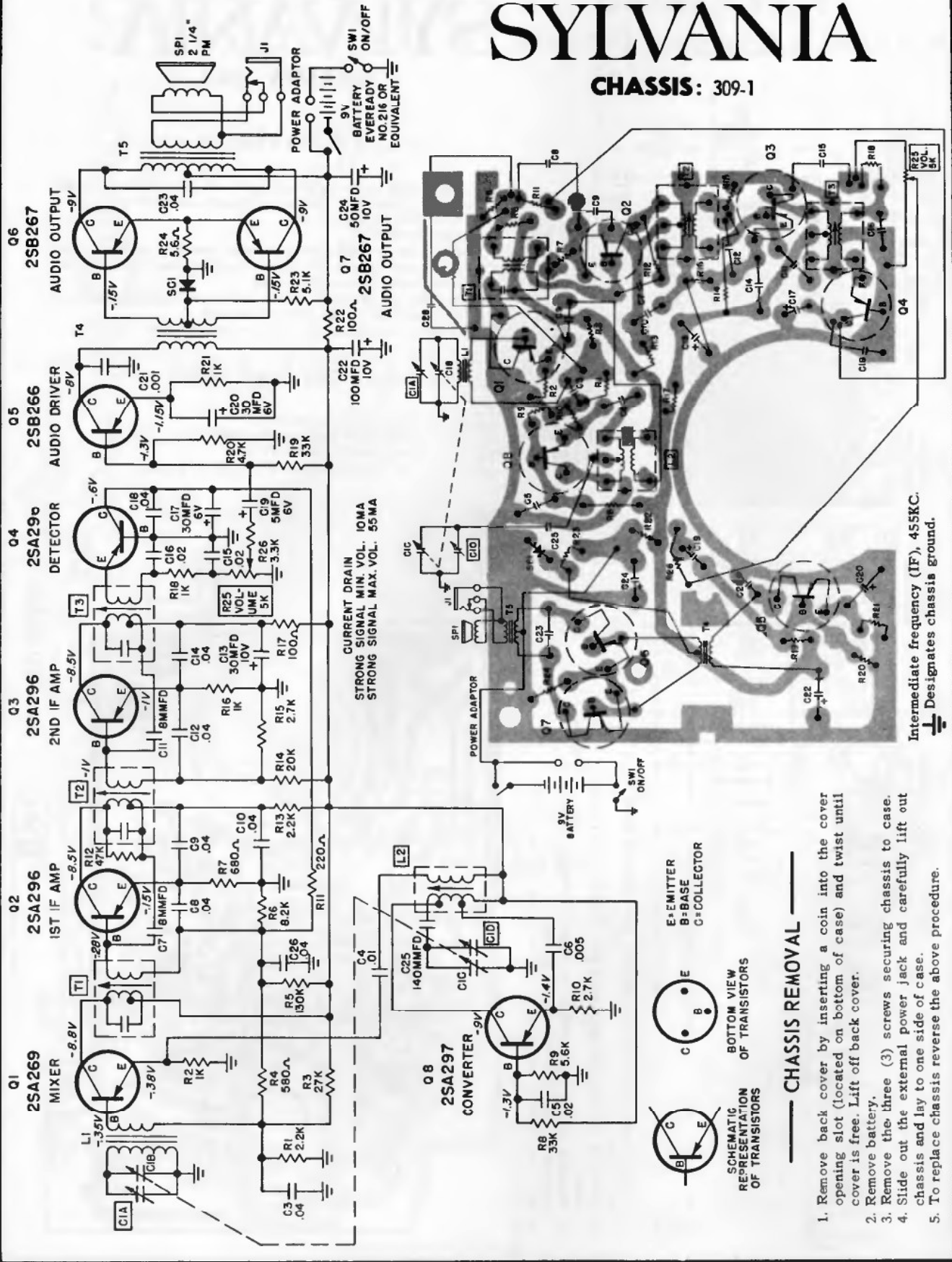
Mounting Diagram
—Printed Side—

Symbol	Description	Symbol	Description	Symbol	Description
D	Diode 1N23G	R ₁₆	5.6K Ω	C ₁₀	10 μF 3V Electrolytic
Th	Thermistor CS-120	R ₁₇	1K Ω	C ₁₁	0.02 μF Ceramic
R ₁	Resistor 10K Ω 1/8W Carbon	R ₁₈	1K Ω	C ₁₂	1PF
R ₂	30K Ω "	R ₁₉	27K Ω	C ₁₃	150PF (built in IFT ₂)
R ₃	39K Ω 1/8W Carbon	R ₂₀	10K Ω	C ₁₄	0.01 μF Ceramic
R ₄	5.6K Ω "	R ₂₁	1K Ω	C ₁₅	0.01 μF "
R ₅	2.2K Ω "	R ₂₂	10 Ω	C ₁₆	—deleted—
R ₆	120K Ω "	R ₂₃	220 Ω	C ₁₇	150PF (built in IFT ₃)
R ₇	5.6K Ω "	R ₂₄	7.5K Ω	C ₁₈	0.02 μF Ceramic
R ₈	470 Ω "	R ₂₅	10 Ω	C ₁₉	0.01 μF "
R ₉	10K Ω "	R ₂₆	680 Ω	C ₂₀	0.3 μF 15V Electrolytic
R ₁₀	39K Ω "	C ₁₋₁₋₂	Capacitor	C ₂₁	10 μF 3V "
R ₁₁	3.3K Ω "	C ₂₋₁₋₂	Tuning Capacitor, 2 gang	C ₂₂	0.005 μF Mylar
R ₁₂	470 Ω "	C ₃₋₁₋₂	Trimmer Capacitor, 2 unit	C ₂₃	10 μF 3V Electrolytic
R ₁₃	1.8K Ω "	C ₄	0.02 μF Ceramic	C ₂₄	10 μF 6V "
R ₁₄	5K Ω Volume Control	C ₅	0.002 μF Mylar	C ₂₅	30 μF 3V "
R ₁₅	36K Ω 1/8W Carbon	C ₆	0.002 μF "	C ₂₆	30 μF 10V "
		C ₇	0.01 μF Ceramic	C ₂₇	0.04 μF Ceramic
		C ₈	150PF Styrol	C ₂₈	50 μF 10V Electrolytic
		C ₉	150PF (built in IFT ₁)	C ₂₉	0.02 μF Ceramic

* To be adjusted

SYLVANIA

CHASSIS: 309-1



SYLVANIA

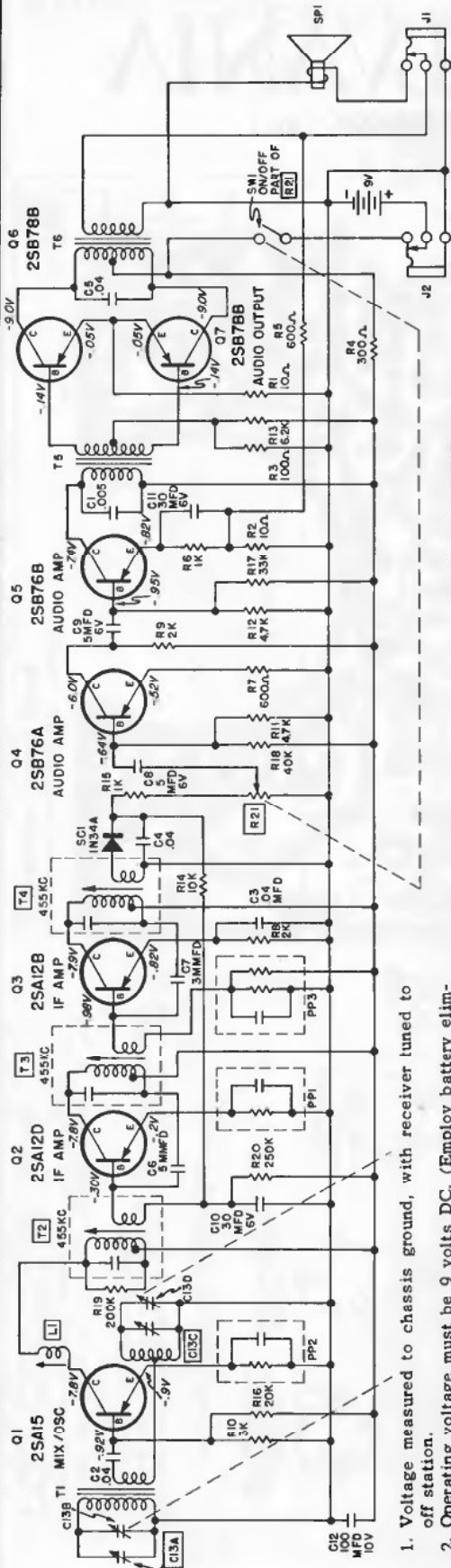
CHASSIS: 324-1

CHASSIS REMOVAL

1. Remove back cover by inserting a coin into the cover opening slot (located on bottom of case) and twist until cover is free. Lift off back cover.
2. Remove battery.
3. Remove the two (2) screws located near the corners of the chassis and loosen the screw securing the clamp on the speaker field. Remove the clamp.
4. Slide out the external power jack and carefully lift out chassis and lay to one side of the case.
5. To replace chassis reverse the above procedure.

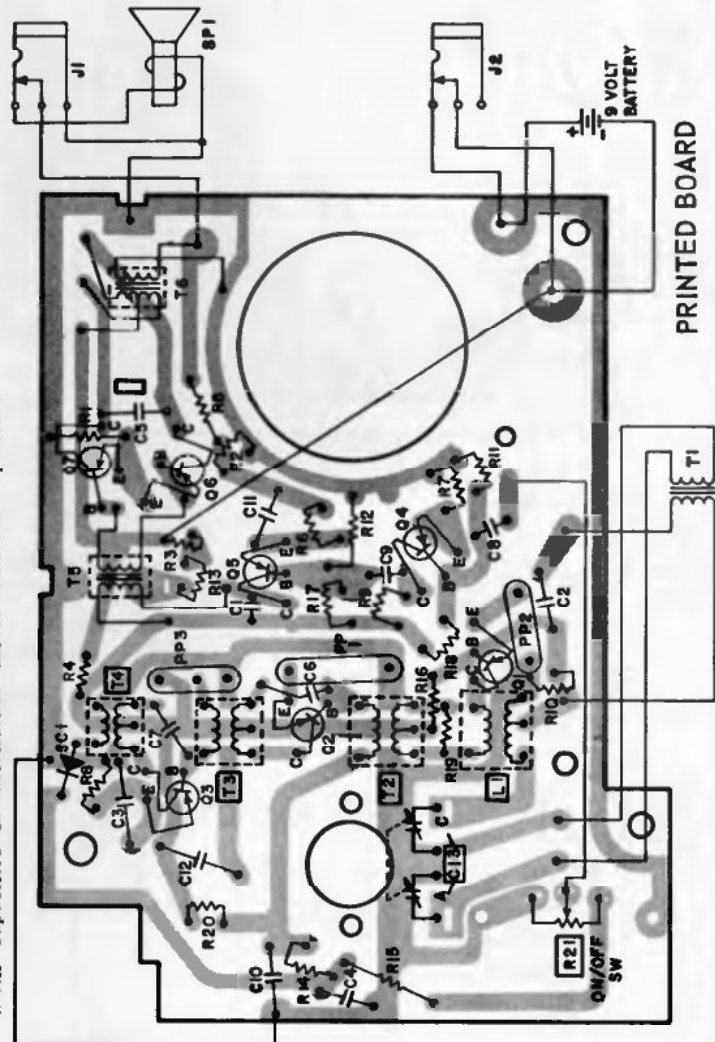
BATTERY COMPLEMENT

EVEREADY number 216
 RAY - O - VAC number 1604
 MALLORY number TR146R
 OR EQUIVALENT TYPE BATTERIES.



BATTERY: 9V EVEREADY
 NO. 216 OR EQUIVALENT
 MIN. CURRENT DRAIN 50MA DC
 MAX. CURRENT DRAIN 500MA DC

1. Voltage measured to chassis ground, with receiver tuned to off station.
2. Operating voltage must be 9 volts DC. (Employ battery eliminator)
3. Voltages shown are average readings. Variations may be noted due to normal production tolerance.
4. All capacitors in microfarads unless otherwise specified.

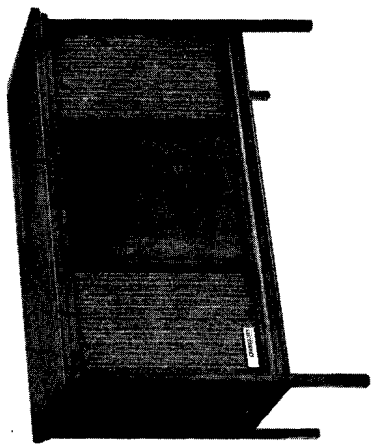
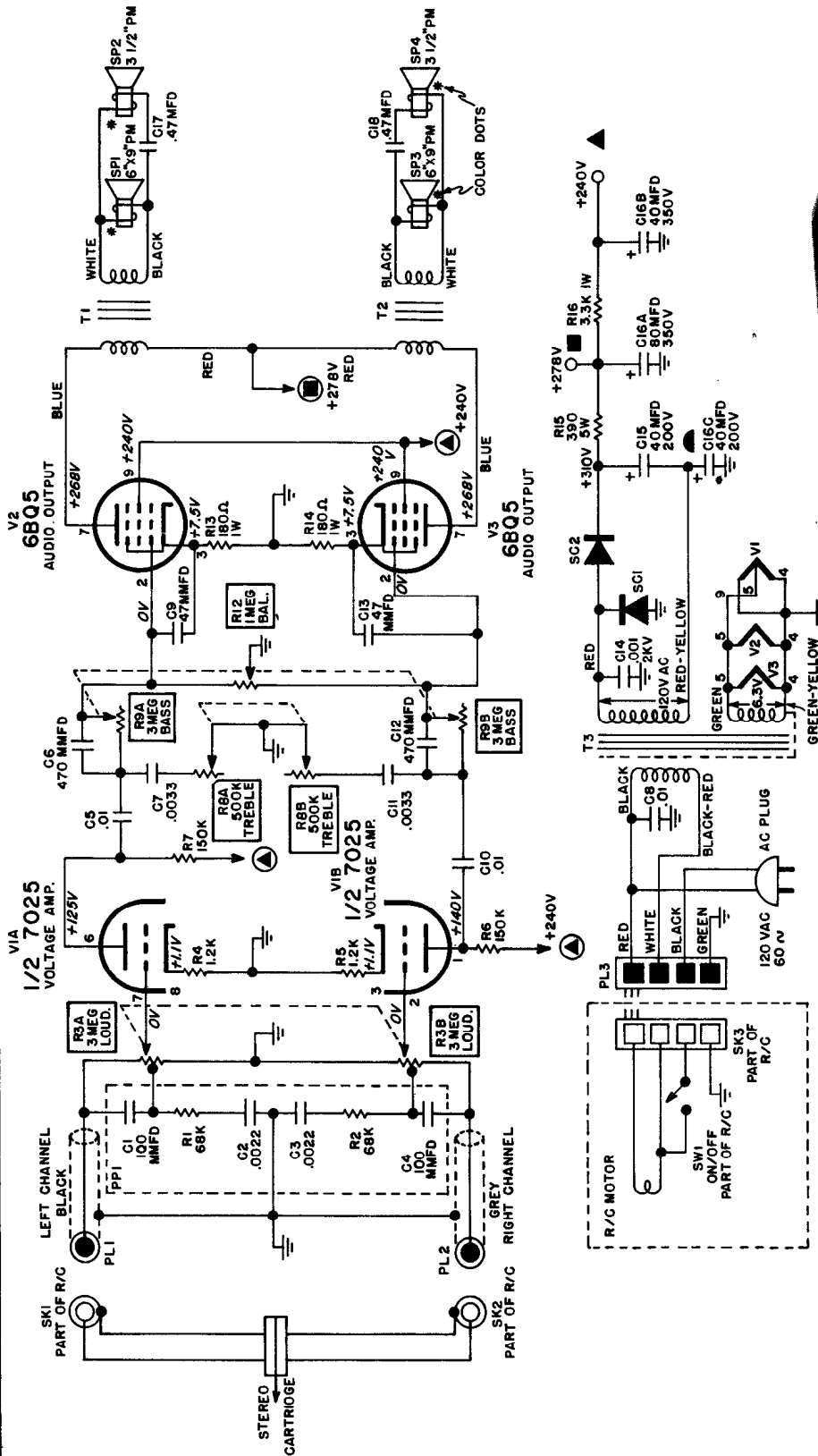


SYLVANIA

CHASSIS: 408-1,-2

MODELS SC508K, M, TG, W, SC511M, W

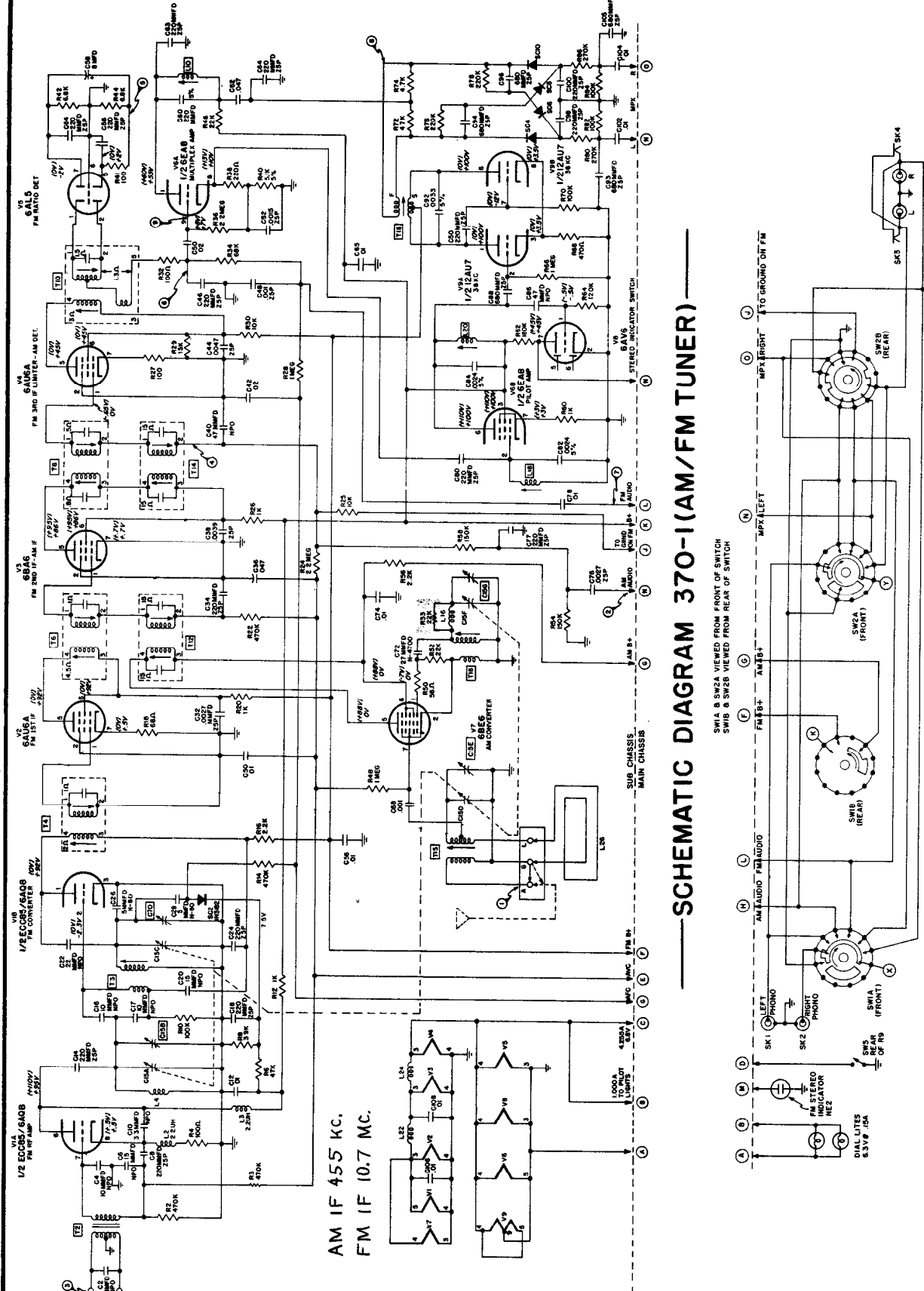
MODEL
SC511M,W



— SCHEMATIC NOTES —

1. VOLTAGES SHOWN ARE AVERAGE READINGS MEASURED TO CHASSIS WITH NO SIGNAL INPUT. VARIATIONS MAY BE NOTED DUE TO NORMAL PRODUCTION TOLERANCE.
2. LINE VOLTAGE 120 VOLT, 60 CYCLE.
3. ALL CAPACITORS IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
4. VOLTAGE SOURCES ARE INDICATED BY SYMBOLS ▲ ; THE CORRESPONDING SYMBOLS WITH CIRCLES ● INDICATE VOLTAGE TIE POINTS.
5. [R3], [R8] AND [R9] ARE DUAL CONTROLS.
6. ⊥ DESIGNATES CHASSIS GROUND.

SYLVANIA Tuner 370-1 used in Chassis 802-1, -2, and 803-1, -2

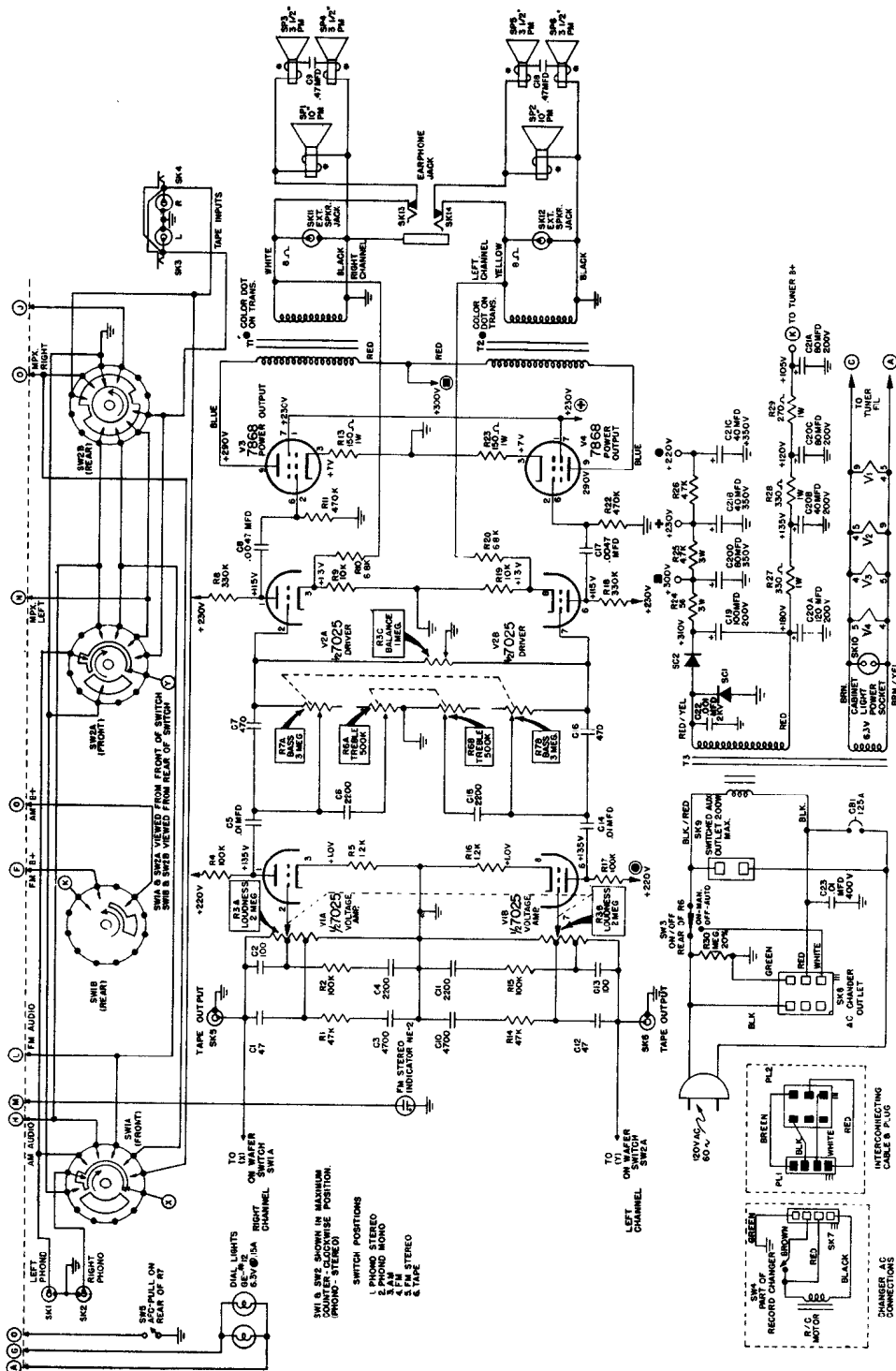


Input circuit of Chassis 802-1, -2. See next page at right for balance of circuit and other data.

SYLVANIA

CHASSIS: 803-1, -2

MODELS SC541W, SC542CH, GN, M, SC543, SC561M, W
 (These models use Tuner 370-1, see page 152 for diagram)

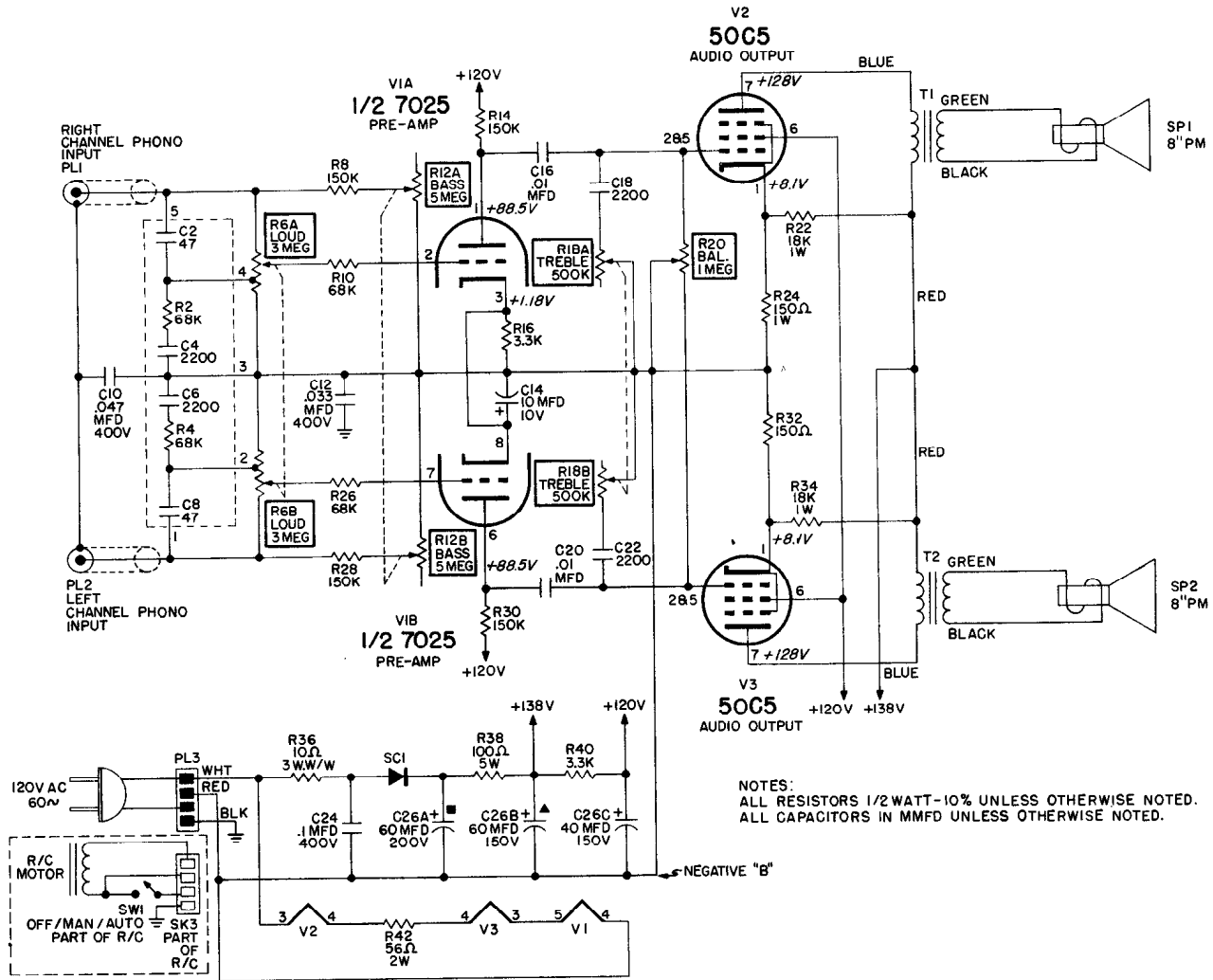


SCHEMATIC NOTES

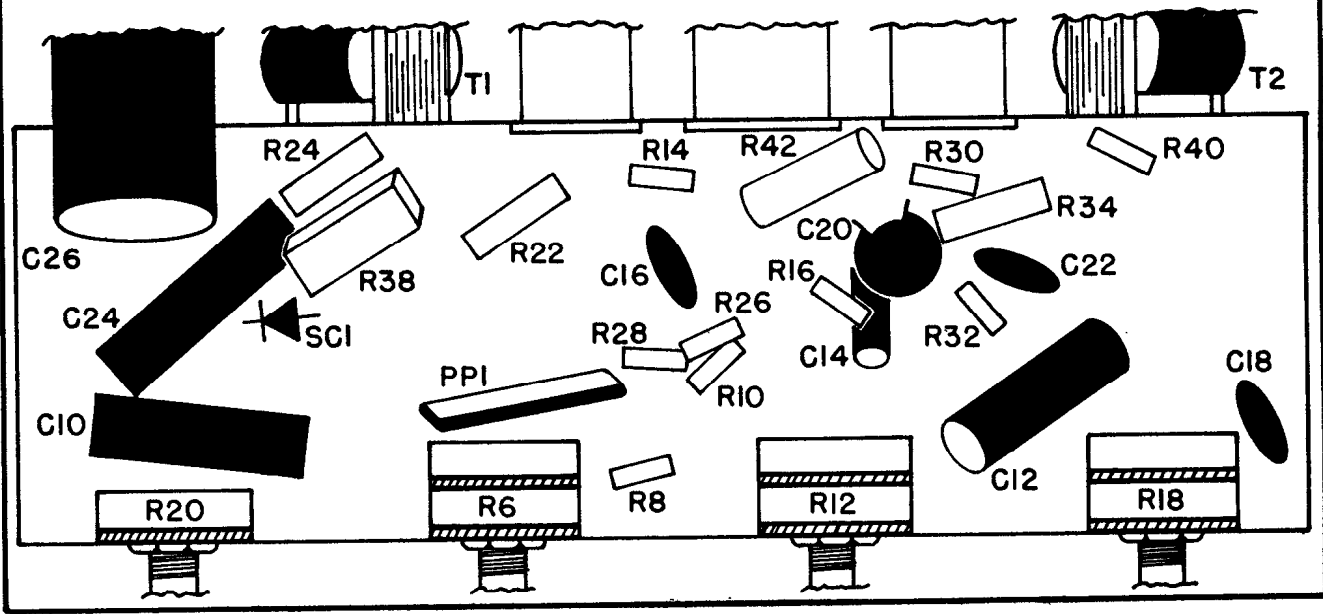
1. VOLTAGES SHOWN ARE AVERAGE READINGS MEASURED TO CHASSIS WITH NO SIGNAL INPUT. VARIATIONS MAY BE NOTED DUE TO NORMAL PRODUCTION TOLERANCES.
2. AC POWER SOURCE 120 VOLT, 60 CYCLE.
3. CAPACITANCE IN MICROMICROFARADS UNLESS OTHERWISE SPECIFIED.
4. A VOLTAGE SOURCE IS INDICATED BY A SYMBOL ● ; THE CORRESPONDING SYMBOL WITH A CIRCLE ○ INDICATES THE VOLTAGE TIE POINT.
5. $\frac{1}{2}$ DESIGNATES CHASSIS GROUND.
6. * INDICATES COLOR DOT ON SPEAKERS FOR CORRECT PHASING.
7. [R3], [R6], [R7], ARE DUAL GANGED CONTROLS.

SYLVANIA

CHASSIS: 413-1
MODEL: 45P41 SERIES



— BOTTOM PARTS LAYOUT —



SYLVANIA

CHASSIS: 802-5
 MODELS: SC721, SC724 SERIES

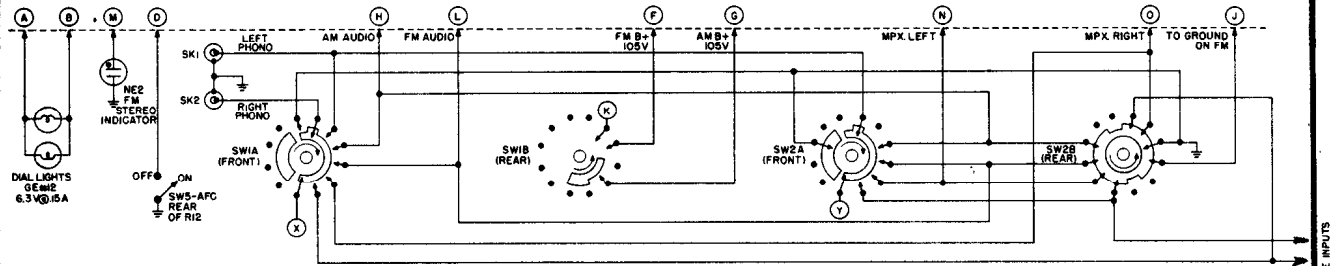
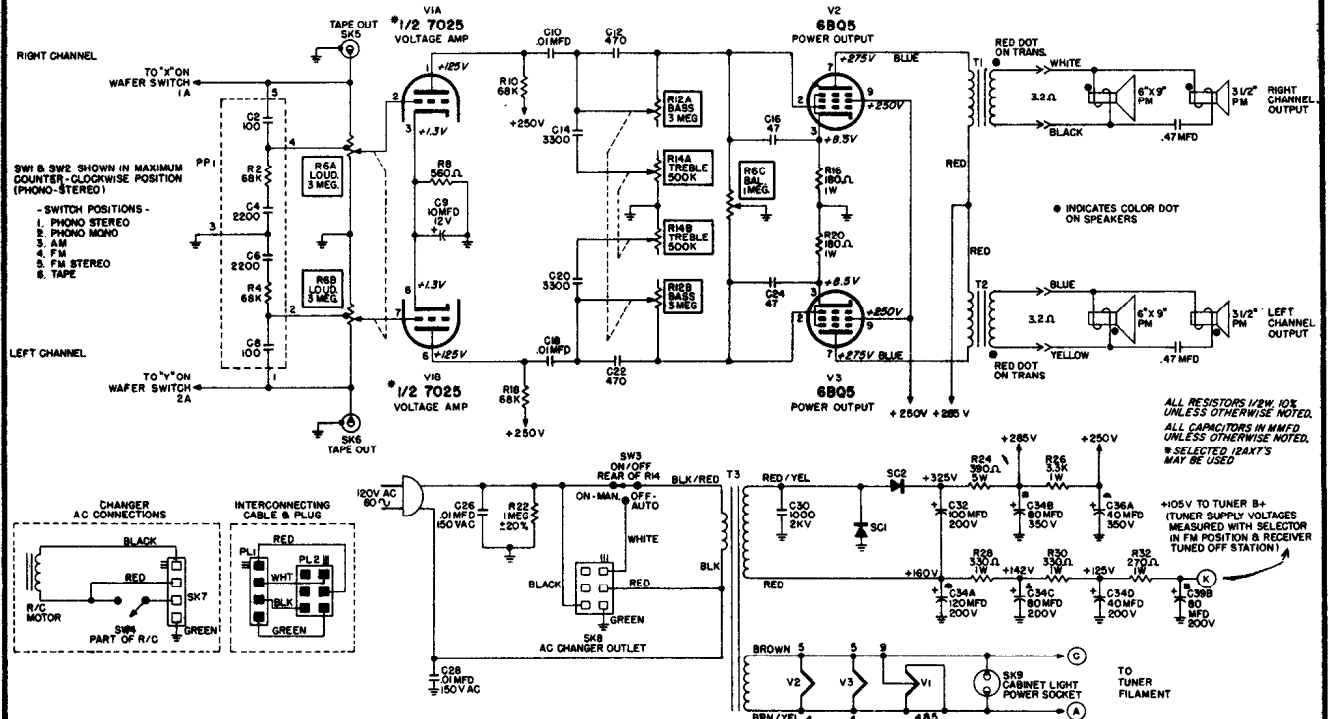
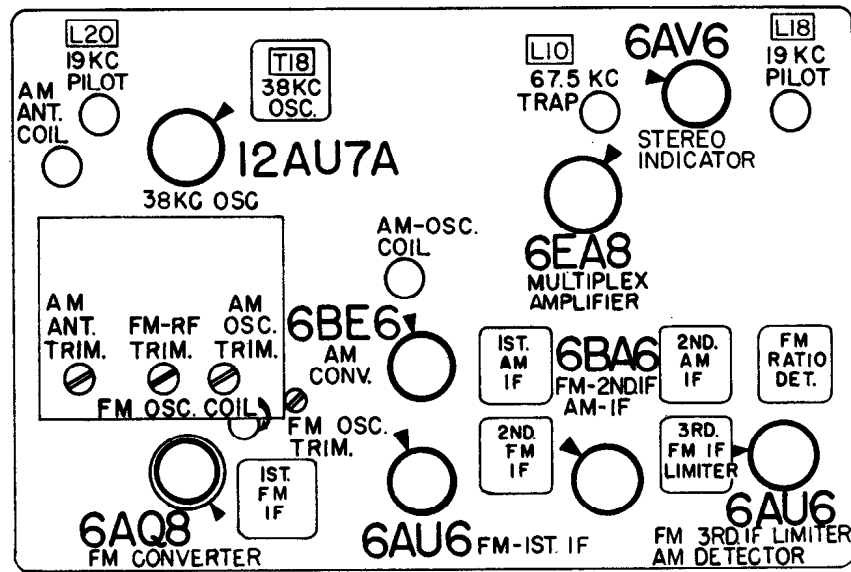


DIAGRAM 802-5



TOP PARTS LAYOUT (371-1)



- CHASSIS REMOVAL**
1. Disconnect AC power cord from power outlet.
 2. Remove screws securing backcover to cabinet; remove back-cover.
 3. Identify and disconnect the following:
 - A. Speaker leads at output transformer.
 - B. Record changer motor plug on chassis.
 - C. Phono input leads on chassis.
 - D. Antenna lead connections on antenna terminal board.
 - E. Jewel indicating light connector at bottom rear of chassis.
 4. Remove screw anchoring AC line cord to the inside of the base of the cabinet.
 5. Remove the two (2) screws securing antenna terminal board to cabinet.
 6. Remove control knobs on the control panel by pulling straight up.
 7. Remove seven (7) screws securing chassis to cabinet and remove chassis from cabinet.

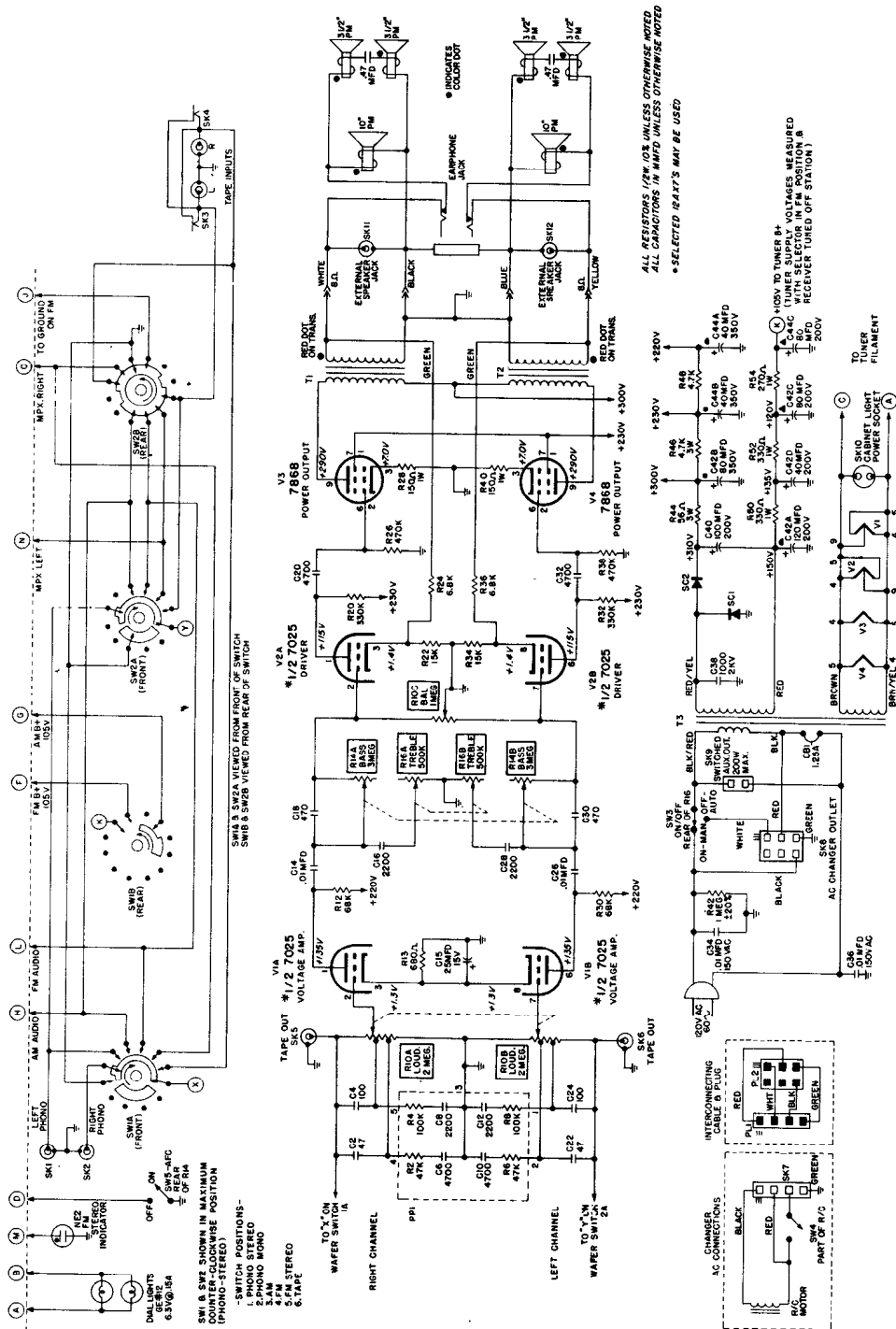
SYLVANIA

CHASSIS: 803-5

MODELS: SC740, SC741, SC743, SC744, SC746, SC748 SERIES

(These models use 371-1 AM-FM Tuner, see pages 156-157 for data)

SCHEMATIC DIAGRAM 803-5



SCHEMATIC NOTES

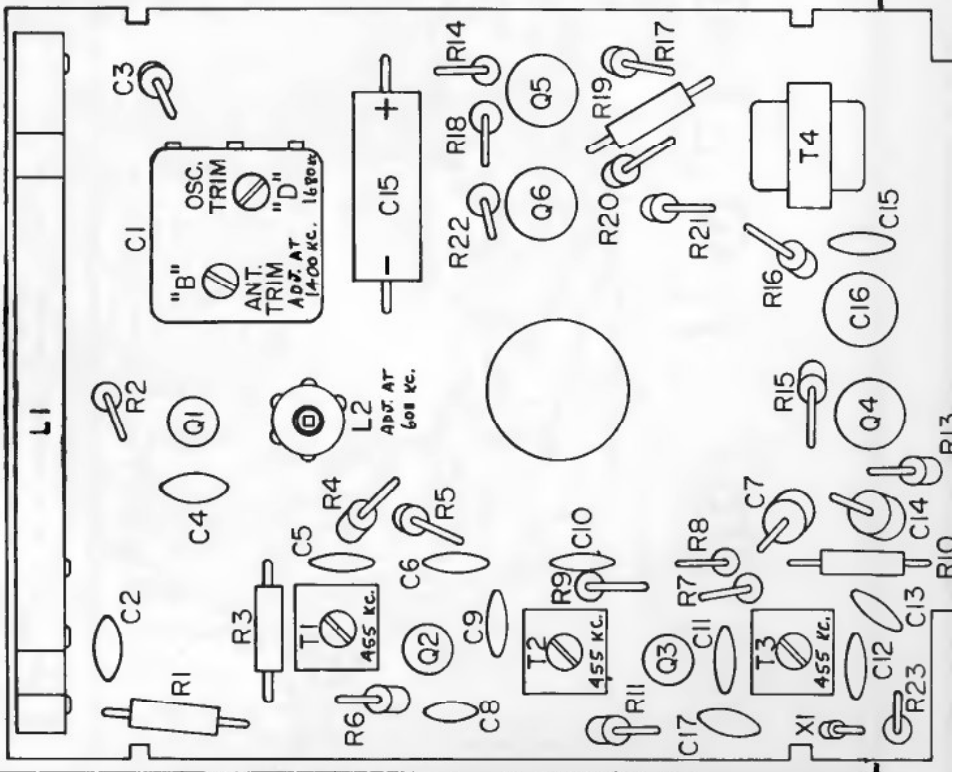
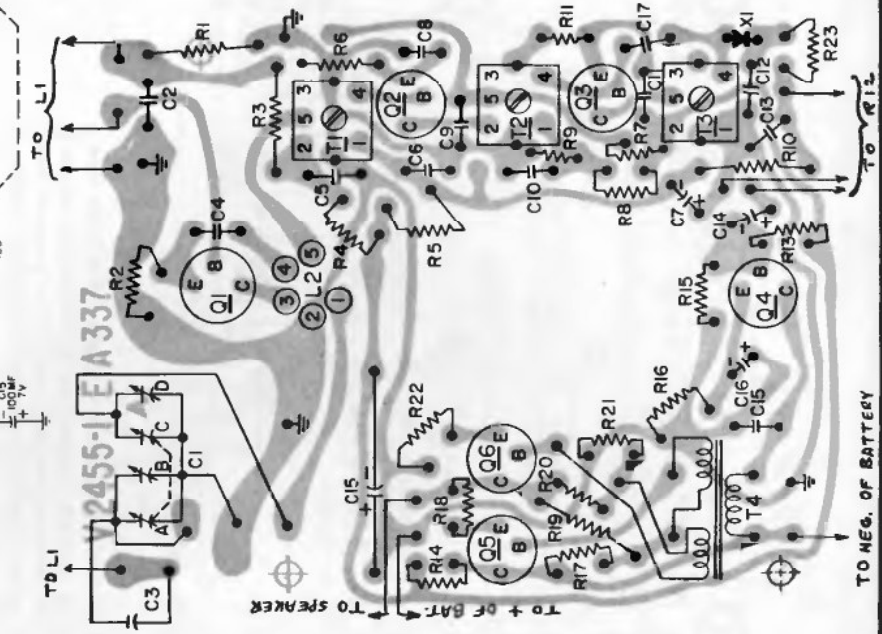
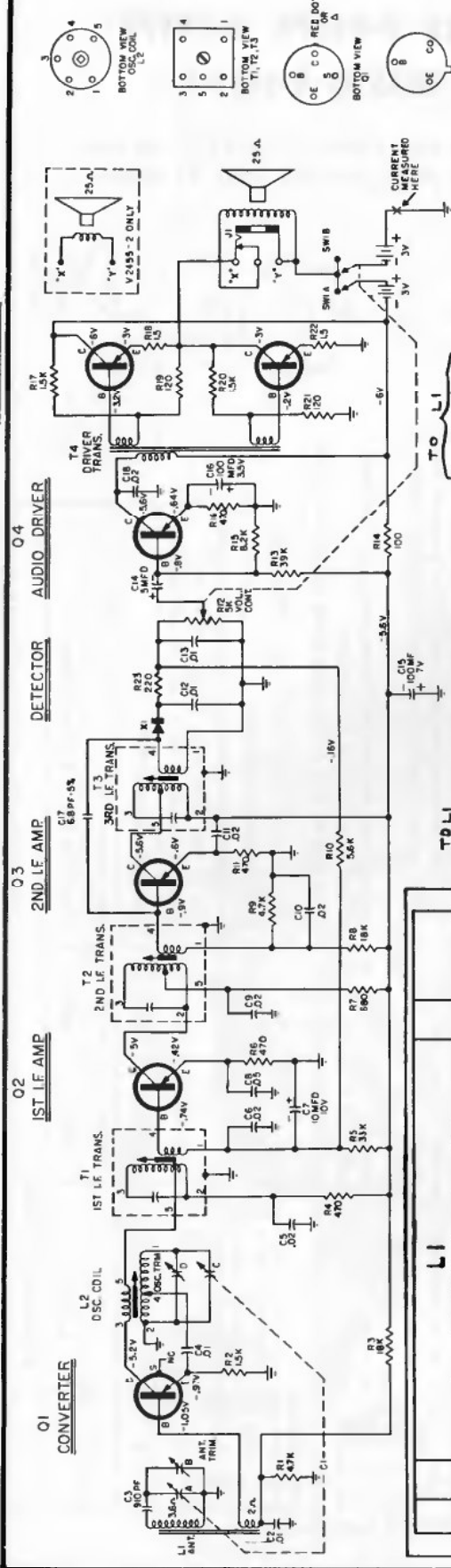
1. Voltages shown are average readings measured to chassis with no signal input. Variations may be noted due to normal production tolerances.
2. AC power source 120 volt, 60 cycle.
3. Capacitance in micro-microfarads unless otherwise noted.
4. $\frac{\square}{\square}$ designates chassis ground.
5. ● indicates color dot on speakers for correct phasing.
6. \square , \square , \square , are dual ganged controls.

Westinghouse

MODEL
H-890P6GP
CHASSIS V-2455-1

FUNCTION	TRANSISTOR COMPLEMENT	TYPE	W	PART NO.	ALTERNATE
CONVERTER	Q1	PNP	257V055M01	257V026H03	
1ST LF	Q2	PNP	257V038H04		
2ND LF	Q3	PNP	257V038H03		
AUDIO DRIVER	Q4	PNP	257V055H02	257V004H06	
AUDIO OUTPUT	Q5	PNP	257V050M02	257V022H06	

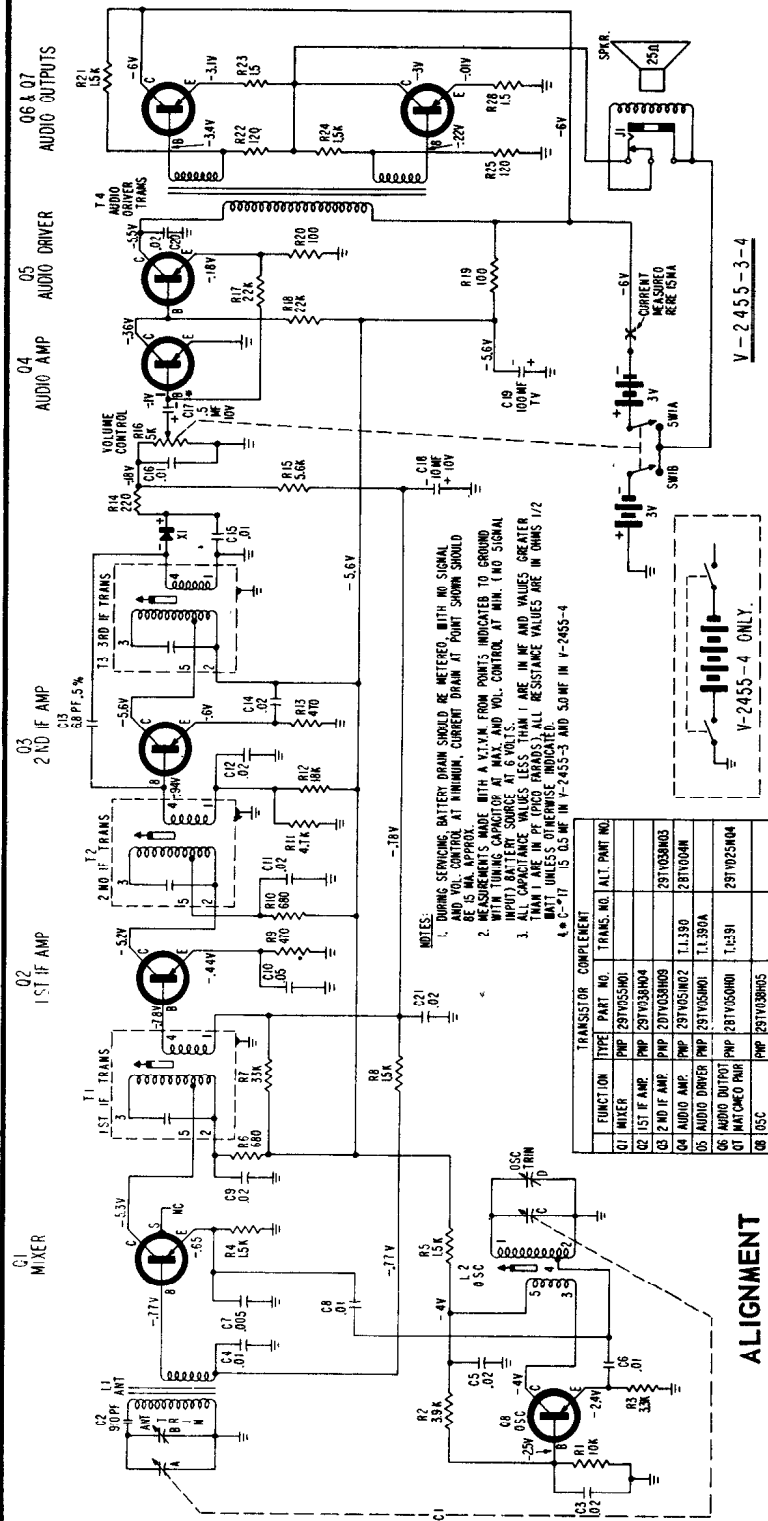
05 B Q6
AUDIO OUTPUT



Westinghouse

MODELS H-898P8 H-899P8 CHASSIS V-2455-4

Also Models H-893P8GP, using Chassis V-2455-3, and Model H-897P8, using Chassis V-2455-5, are similar to V-2455-4 on this page and the page at right.



- NOTES:
1. DURING SERVICING, BATTERY DRAIN SHOULD BE MONITORED. WITH NO SIGNAL INPUT, ANTENNA CURRENT SHOULD BE 100 MA. WITH SIGNAL INPUT, CURRENT SHOULD BE 100 MA. WITH TUNING CAPACITOR AT MAX. AND VOL. CONTROL AT MIN. (NO SIGNAL INPUT) BATTERY SOURCE AT 6 VOLTS.
 2. MEASUREMENTS MADE WITH A VTVM FROM POINTS INDICATED TO GROUND.
 3. ALL CAPACITANCE VALUES LESS THAN 1 ARE IN MF AND VALUES GREATER THAN 1 ARE IN UF UNLESS OTHERWISE INDICATED.
 4. C-11, C-12, C-13, C-14, C-15, C-16, C-17, C-18, C-19, C-20, C-21, C-22, C-23, C-24, C-25, C-26, C-27, C-28, C-29, C-30, C-31, C-32, C-33, C-34, C-35, C-36, C-37, C-38, C-39, C-40, C-41, C-42, C-43, C-44, C-45, C-46, C-47, C-48, C-49, C-50, C-51, C-52, C-53, C-54, C-55, C-56, C-57, C-58, C-59, C-60, C-61, C-62, C-63, C-64, C-65, C-66, C-67, C-68, C-69, C-70, C-71, C-72, C-73, C-74, C-75, C-76, C-77, C-78, C-79, C-80, C-81, C-82, C-83, C-84, C-85, C-86, C-87, C-88, C-89, C-90, C-91, C-92, C-93, C-94, C-95, C-96, C-97, C-98, C-99, C-100.

TRANSFORMER	COMPLEMENT	FUNCTION	TYPE	PART NO.	TRANS. NO.	ALT. PART NO.
C1	MIXER	PMP	291V05S001			
C2	1ST IF AMP	PMP	291V05B004			
C3	2ND IF AMP	PMP	291V05S003			291V05S003
C4	AUDIO AMP	PMP	291V05S002	T.L.390		291V05S004
C5	AUDIO DRIVER	PMP	291V05S001	T.L.390A		
C6	AUDIO OUTPUT	PMP	291V05S001	T.L.391		291V05S004
C7	MATCHED PAIR	PMP	291V05S003			

ALIGNMENT

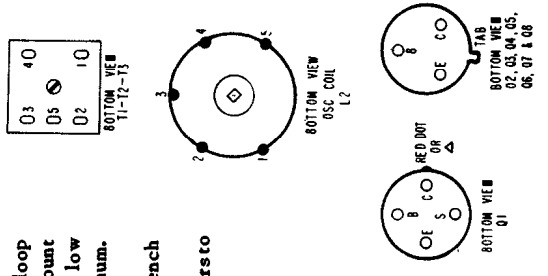
SIGNAL GENERATOR - Use a generator providing modulated 455KC and AM broadcast frequencies. Connect a 4 or 5 turn loop of wire across output cable. Place the loop near the ferrite core antenna of the receiver. To increase or decrease the amount of signal coupled to the receiver move the loop closer or further from the antenna. Keep the output of the generator low enough to just give an indication on the VTVM or output meter to avoid AVC action. Keep the volume control set at maximum.

INDICATOR - Connect a VTVM or output meter across the voice coil.

RECEIVER - Set the volume control to maximum. During the last three steps be sure 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.

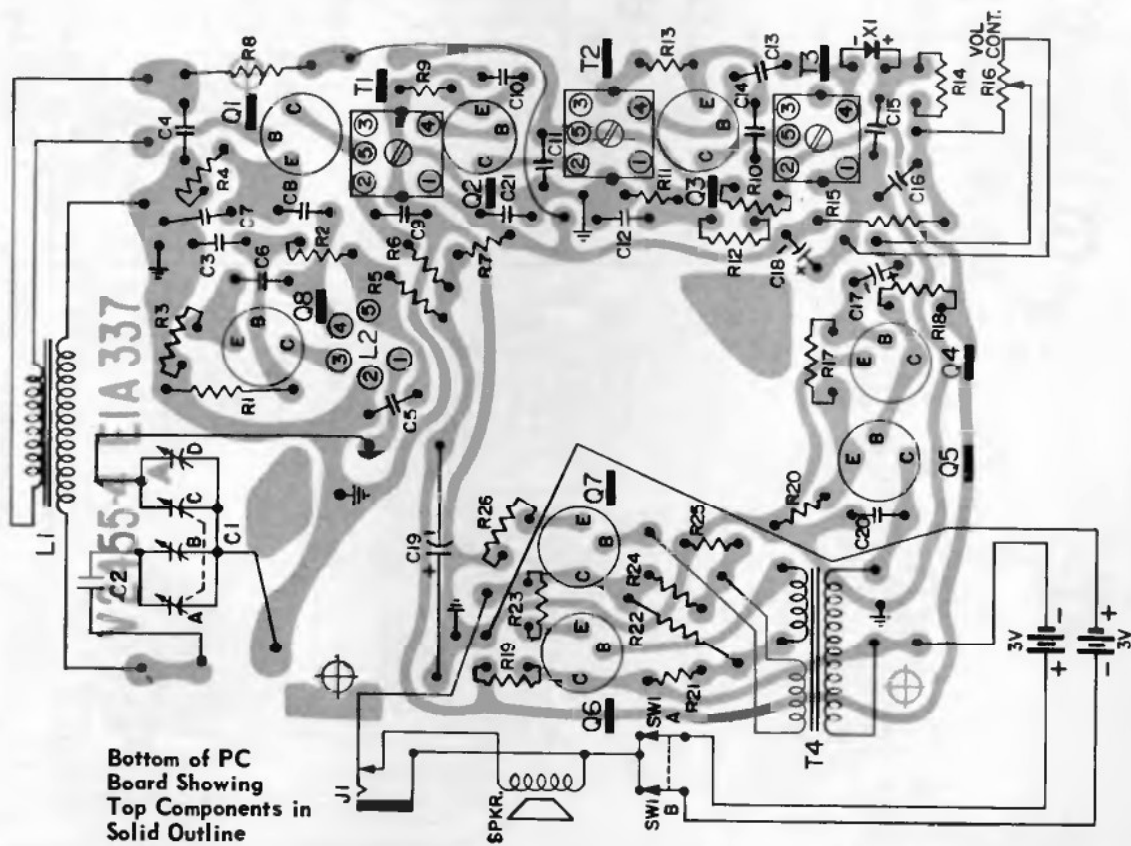
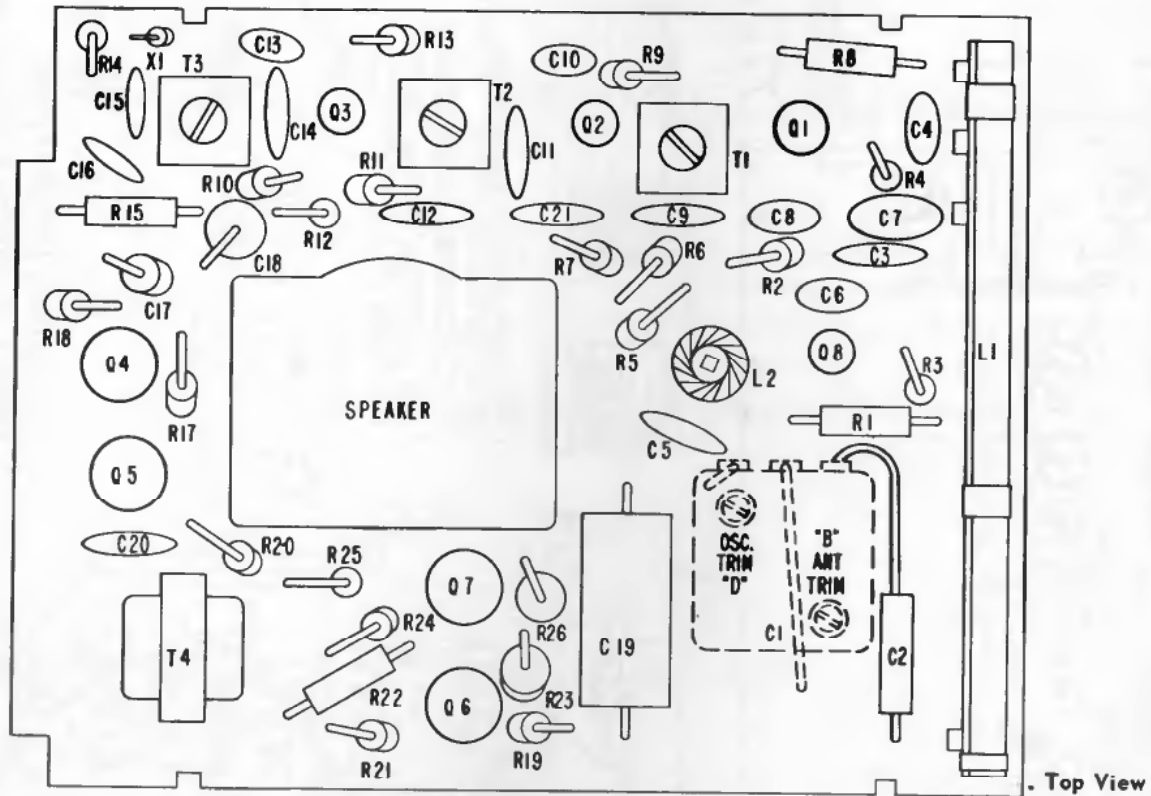
ALIGNMENT TOOL - Use a fiber aligning tool that snugly fits the hex shaped hole in the cores of the IF transformers to prevent chipping.

Step	Loosely couple modulated signal to:	Generator Frequency	C1 Setting	Adjust for maximum
1.	Loop L1	455KC	Minimum	T3, T2 and T1 in order. Reduce generator output if necessary for T2 and T1 adjustments.
2.	Loop L1	1680KC	Minimum	Oscillator trimmer "D"
3.	Loop L1	1400KC	1400KC	Ant. trimmer "B"
4.	Loop L1	600KC	600KC	Oscillator coil, L2, if necessary.
5.	Repeat steps 2, 3 & 4.			



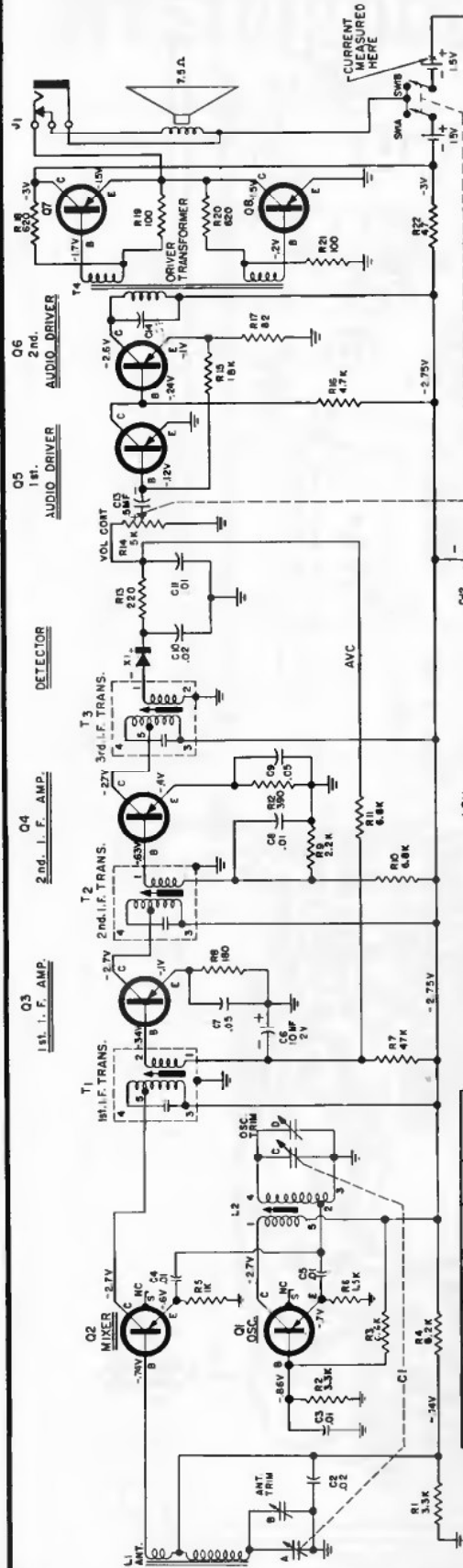
VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

WESTINGHOUSE Chassis V-2455-4, Models H-898P8, H-899P8, Continued



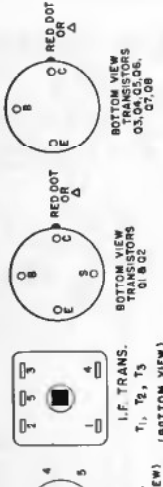
VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

AUDIO OUTPUT
MATCHED PAIR

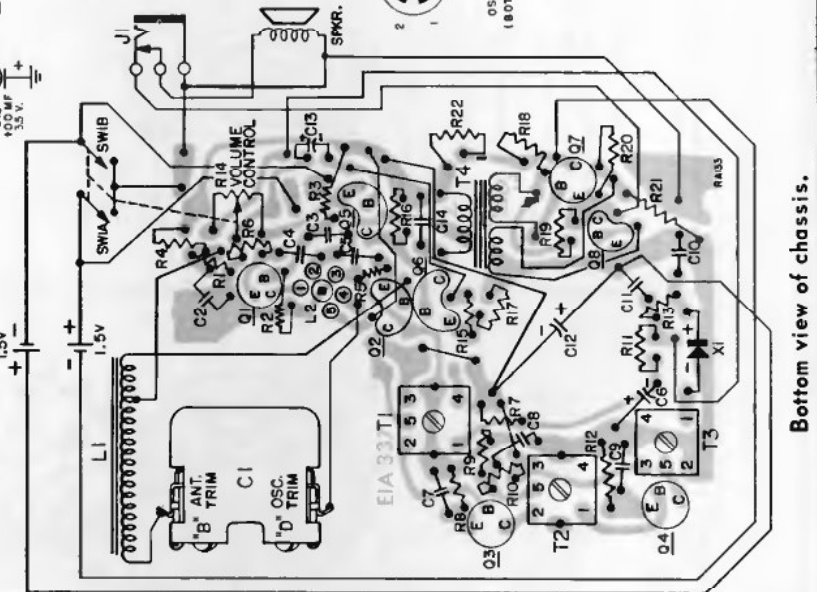


FUNCTION	TYPE	W PART NO.	ALTERNATE W PART NO.
MIXER		2B7V033H01	
OSC.		2B7V033H01	
1ST I.F. AMP		2B7V033H01	
2ND I.F. AMP		2B7V033H01	
2ND AUDIO DRIVER		2B7V033H01	
AUDIO OUTPUT	5	2B7V033H01	

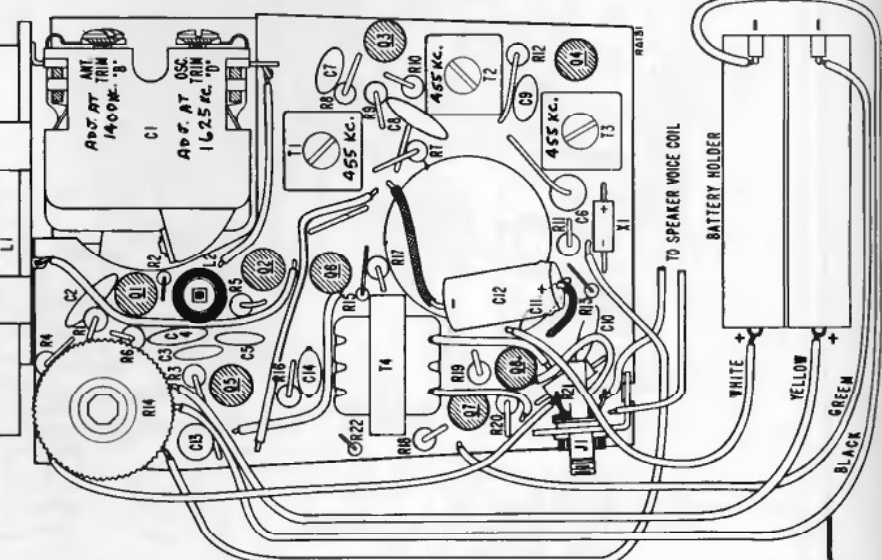
NOTES:
 1. DURING SERVICING, BATTERY DRAIN SHOULD BE METERED WITH NO SIGNAL AND VOL. CONT. AT MAXIMUM. CURRENT DRAIN AT POINT SHOWN SHOULD BE 15 MA. APPROX.
 2. ALL CAPACITANCE VALUES IN MFD., ALL RESISTANCE 1/2 W. VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
 3. VOLTAGE MEASUREMENTS MADE WITH A VTMM. FROM POINTS INDICATED TO GND. WITH TUNING CAPACITOR AT MAXIMUM CAPACITANCE WITH NO SIGNAL INPUT. BATTERY SOURCE AT 3 VOLTS.



WESTINGHOUSE
 Models H-903P8GP, H-904P8GP
 Chassis V-2403-7

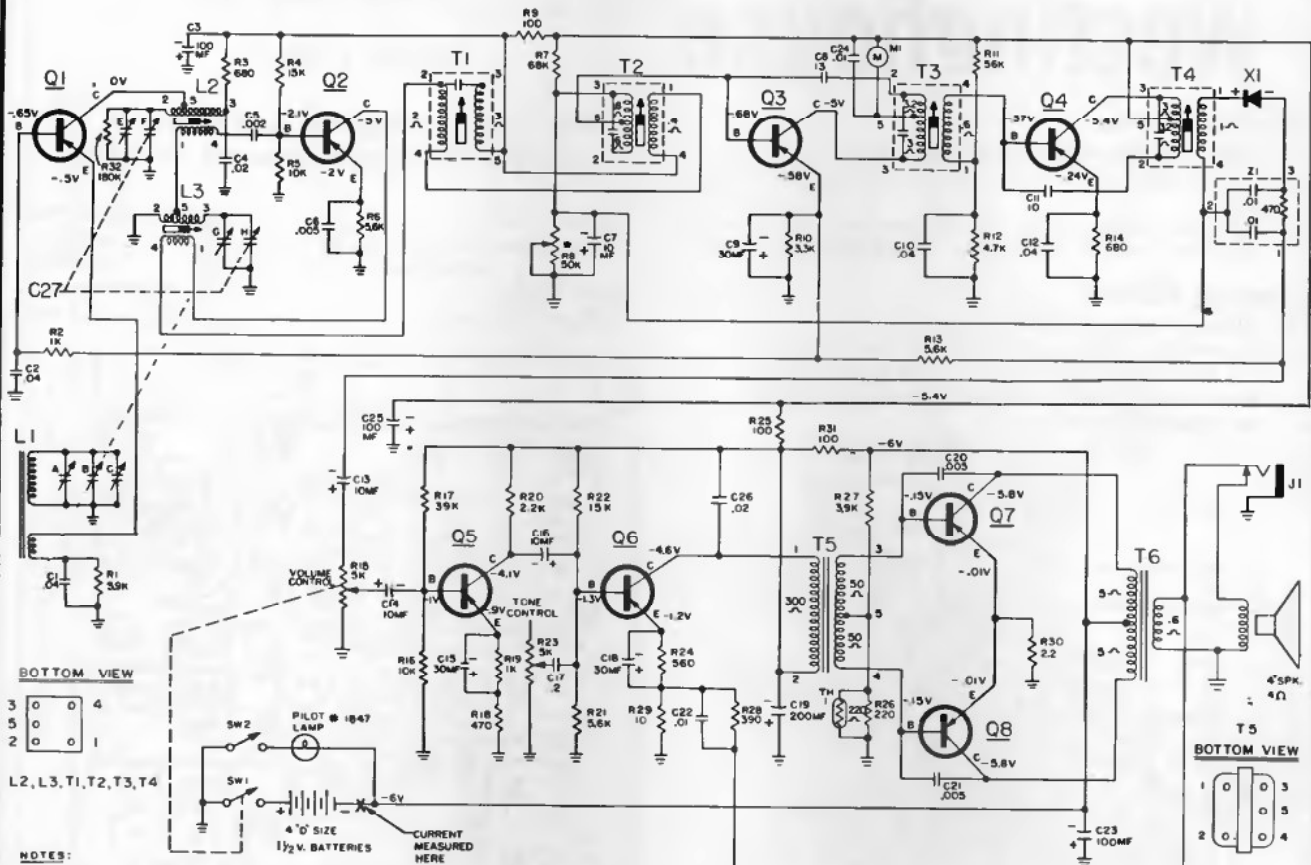


Bottom view of chassis.

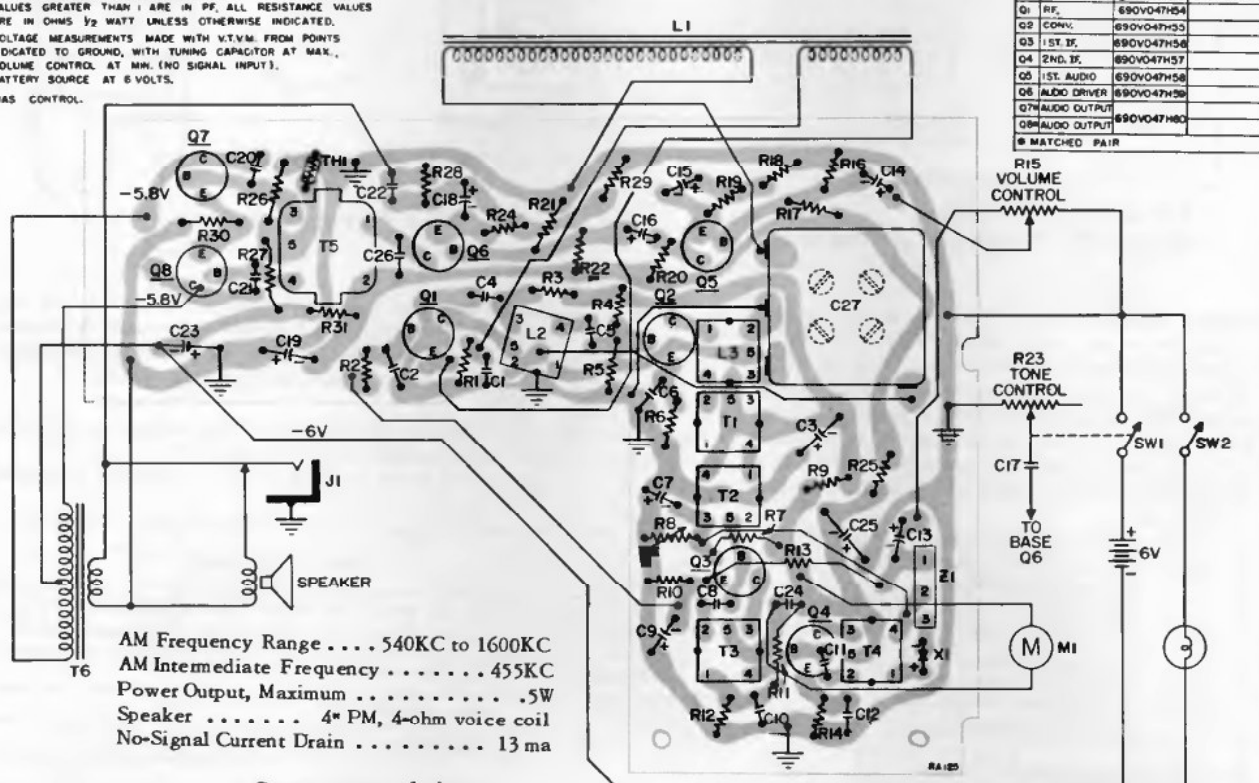


VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

WESTINGHOUSE Model H-907P8, Chassis V-2456-1



FUNCTION	PART NO.	COMPLEMENT
Q1 RE.	690V047H54	
Q2 CONV.	690V047H53	
Q3 1ST. IF.	690V047H56	
Q4 2ND. IF.	690V047H57	
Q5 1ST. AUDIO	690V047H58	
Q6 AUDIO DRIVER	690V047H59	
Q7 AUDIO OUTPUT	690V047H60	
Q8 AUDIO OUTPUT	690V047H60	
		• MATCHED PAIR



Bottom view of chassis.

Westinghouse

H-902P6GP

CHASSIS V-2461-1

CHASSIS REMOVAL

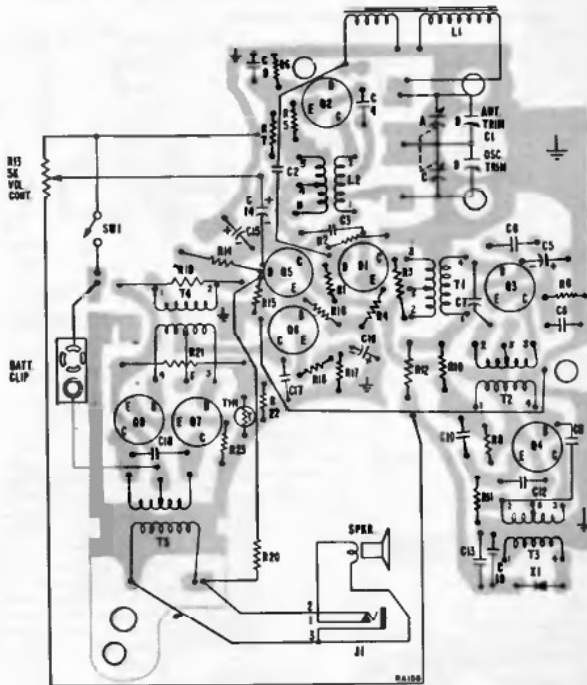
1. Remove the nut holding the earphone jack.
2. Remove three screws holding the PC board to the cabinet front.
3. Slide the chassis to the rear so that the Volume knob clears the cabinet. The speaker remains in the cabinet.

SPEAKER REMOVAL

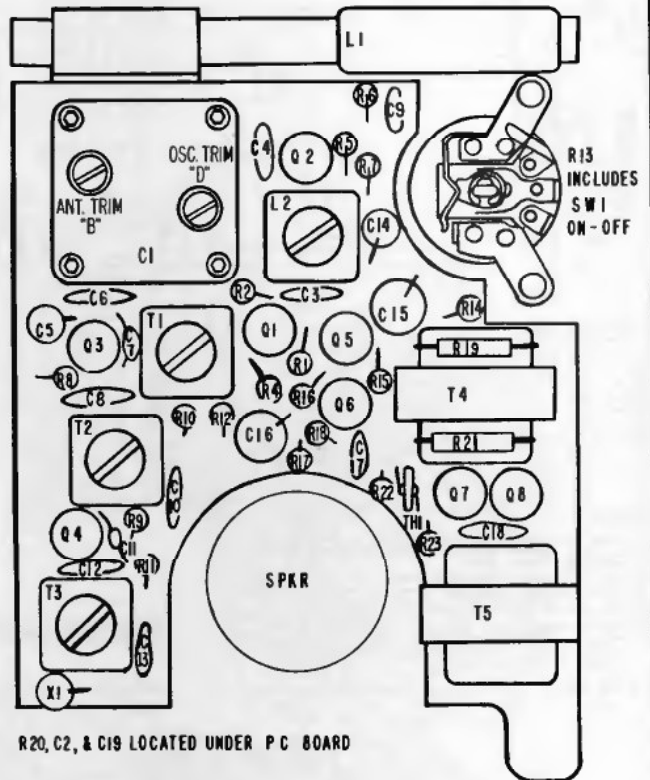
1. Follow steps 1 thru 3 above.
2. Remove the speaker grille from the front of the cabinet. The grille is held to the cabinet front by metal tabs.
3. When replacing the speaker, the terminals should be at the bottom of the cabinet.

For circuit diagram and other material see page adjacent at right.

Speaker 2" round, 8 ohm PM
 Power Output (undistorted)140 watt
 (maximum).200 watt
 Power Supply (1) 9V battery
 No Signal Current Drain 6.6 ma



Bottom View of PC Board,
 Showing Top Components in Solid Outline.



Top View of PC Board.

ALIGNMENT

SIGNAL GENERATOR — Use a generator providing modulated 455KC and AM broadcast frequencies. Connect a 4 or 5 turn loop of wire across output cable. Place the loop near the ferrite core antenna of the receiver. To increase or decrease the amount of signal coupled to the receiver move the loop closer or further from the antenna. Keep the output of the generator low enough to just give an indication on the VTVM or output meter to avoid AVC action. Keep the volume control set at maximum.

INDICATOR — Connect a VTVM or output meter across the voice coil.

RECEIVER — Set the volume control to maximum. During the last three steps be sure 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.

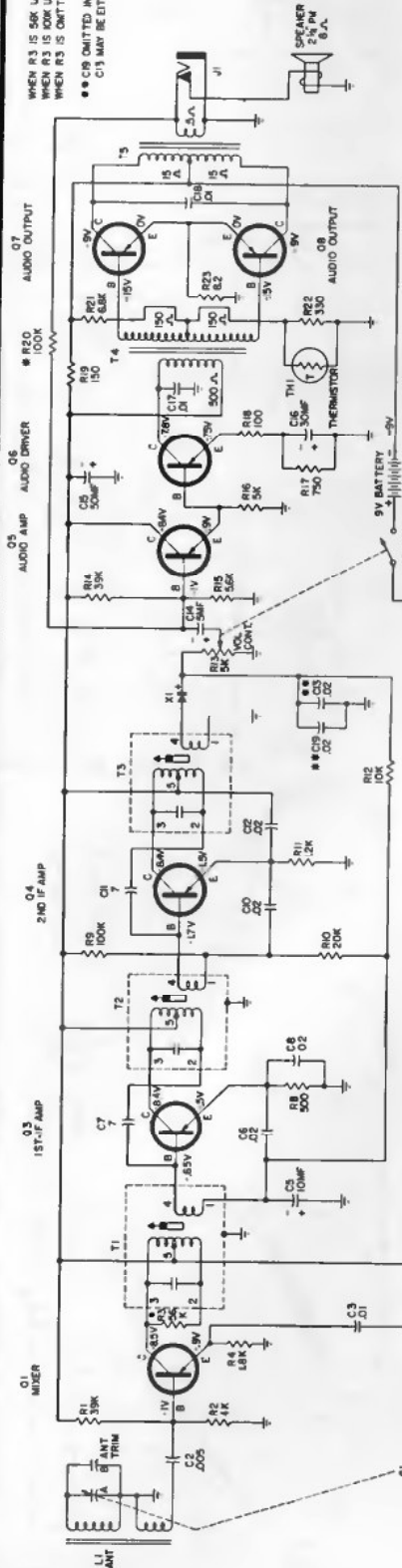
ALIGNMENT TOOL — Use a fiber aligning tool that snugly fits the hex shaped hole in the cores of the IF transformers to prevent chipping.

Step	Loosely coupled modulated signal to:	Generator Frequency	C1 Setting	Adjust for maximum
1.	Loop L1	455KC	Minimum	T3, T2 and T1 in order. Reduce generator output if necessary for T2 and T1 adjustments.
2.	Loop L1	1650KC	Minimum	Oscillator trimmer "D"
3.	Loop L1	1400KC	1400KC	Ant. trimmer "B"
4.	Loop L1	600KC	600KC	Oscillator coil, L2, if necessary.
5.	Repeat steps 2, 3 & 4.			

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

WESTINGHOUSE Model H-902P6GP, Chassis V-2461-1, Continued

WHEN R3 IS 56K USE 100K FOR R20
WHEN R3 IS 100K USE 56K FOR R20
WHEN R3 IS OMITTED USE 56K FOR R20
C13 MAY BE EITHER .02 OR .04



- NOTES
1. DURING SERVICING, TOTAL BATTERY CURRENT SHOULD BE SETTED, WITH NO SIGNAL, & VOLUME CONTROL AT MINIMUM. TOTAL BATTERY DRAIN SHOULD BE APPROX 8 M.A.
 2. VOLTAGE MEASUREMENTS MADE WITH A VTVM FROM POINTS INDICATED TO GROUND WITH TUNING CAPACITOR AT MAXIMUM. VOLUME CONTROL AT MINIMUM & BATTERY SOURCE AT 9 VOLTS.
 3. UNLESS OTHERWISE INDICATED, ALL CAPACITANCE VALUES LESS THAN ONE ARE IN P.F. & VALUES GREATER THAN ONE ARE IN P.F. ALL RESISTANCE VALUES ARE IN OHMS, 1/4 WATT.

TO MEASURE CURRENT DRAIN
PLACE METER ACROSS SW1
CURRENT DRAIN APPROX. 8 MA



TRANSISTOR	FUNCTION	COMPLEMENT	TYPE	PART NO.
O1	MIXER	PNP	90002SH19	
O2	OSC	PNP	90002SH20	
O3	1ST IF AMP	PNP	90002SH21	
O4	2ND IF AMP	PNP	90002SH22	
O5	AUDIO AMP	PNP	90002SH23	
O6	DRIVER	PNP	90002SH24	
O7	AUDIO OUTPUT	PNP	90002SH25	
		MATCHED PNP		

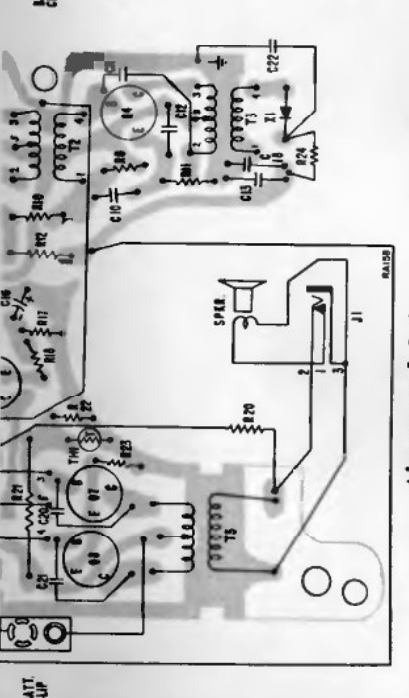
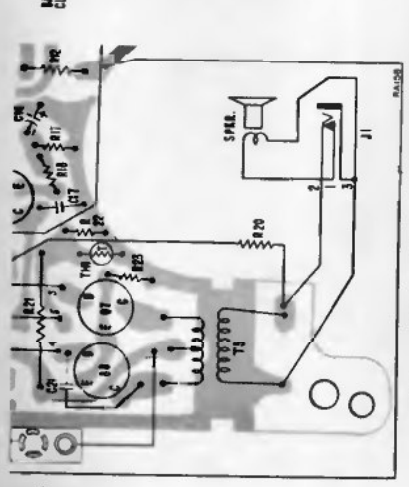
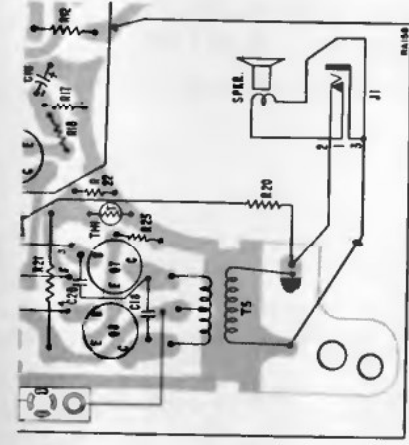
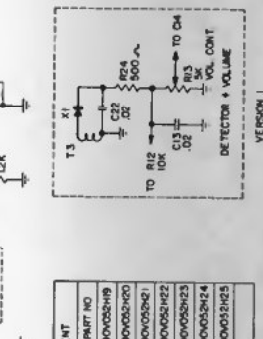
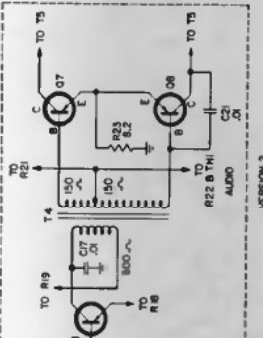
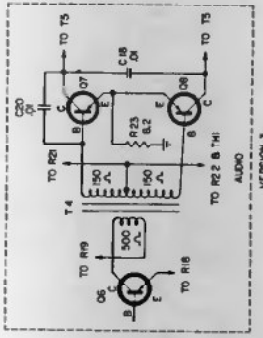
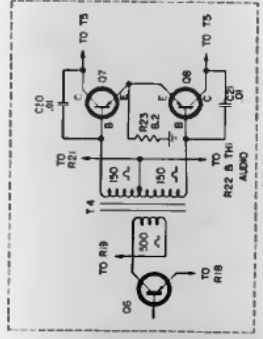


Figure 2C - Alternate 3

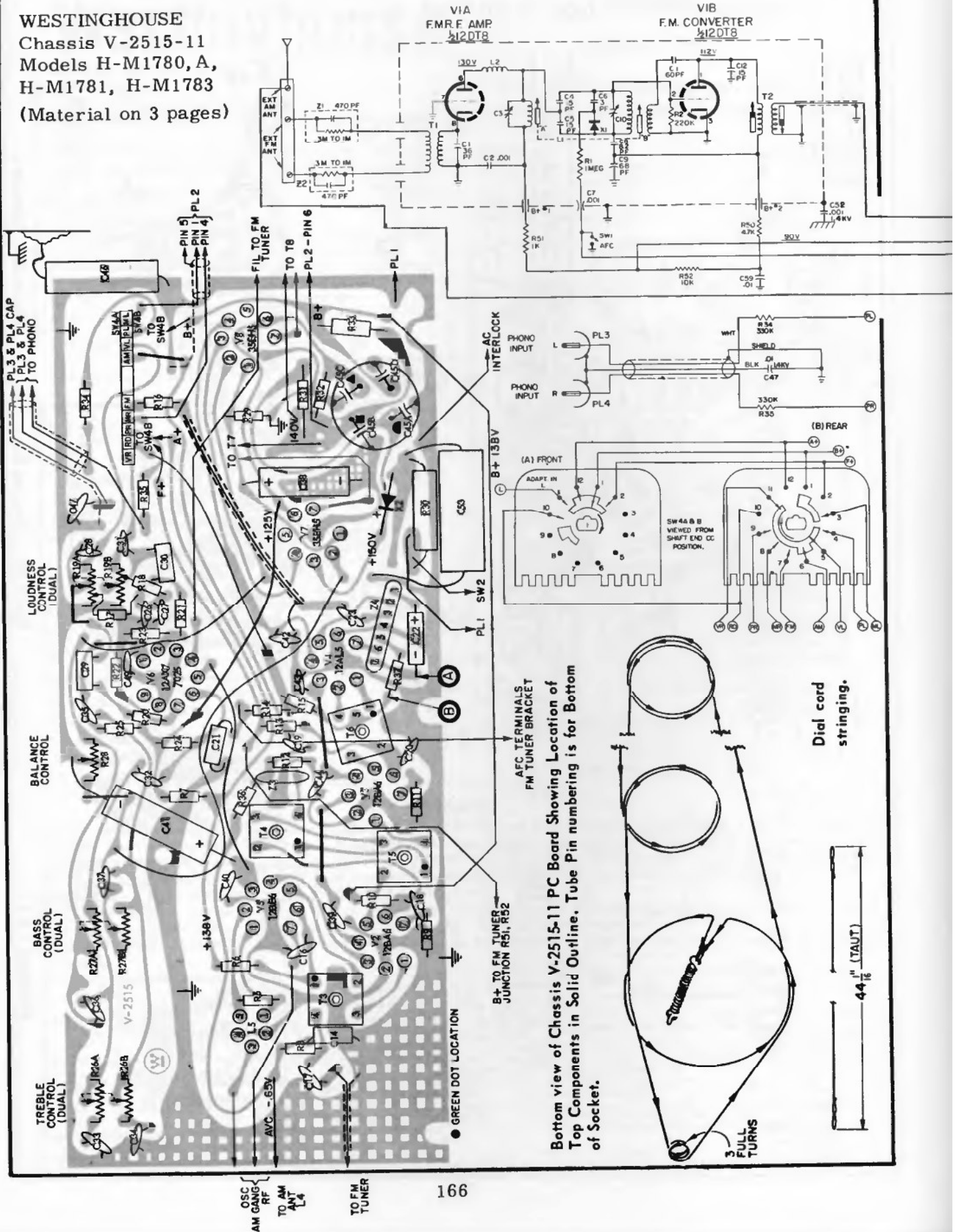
Figure 2B - Alternate 2

Alternates 1 & 4

Bottom Views of PC Board, Showing Circuit Alternates.

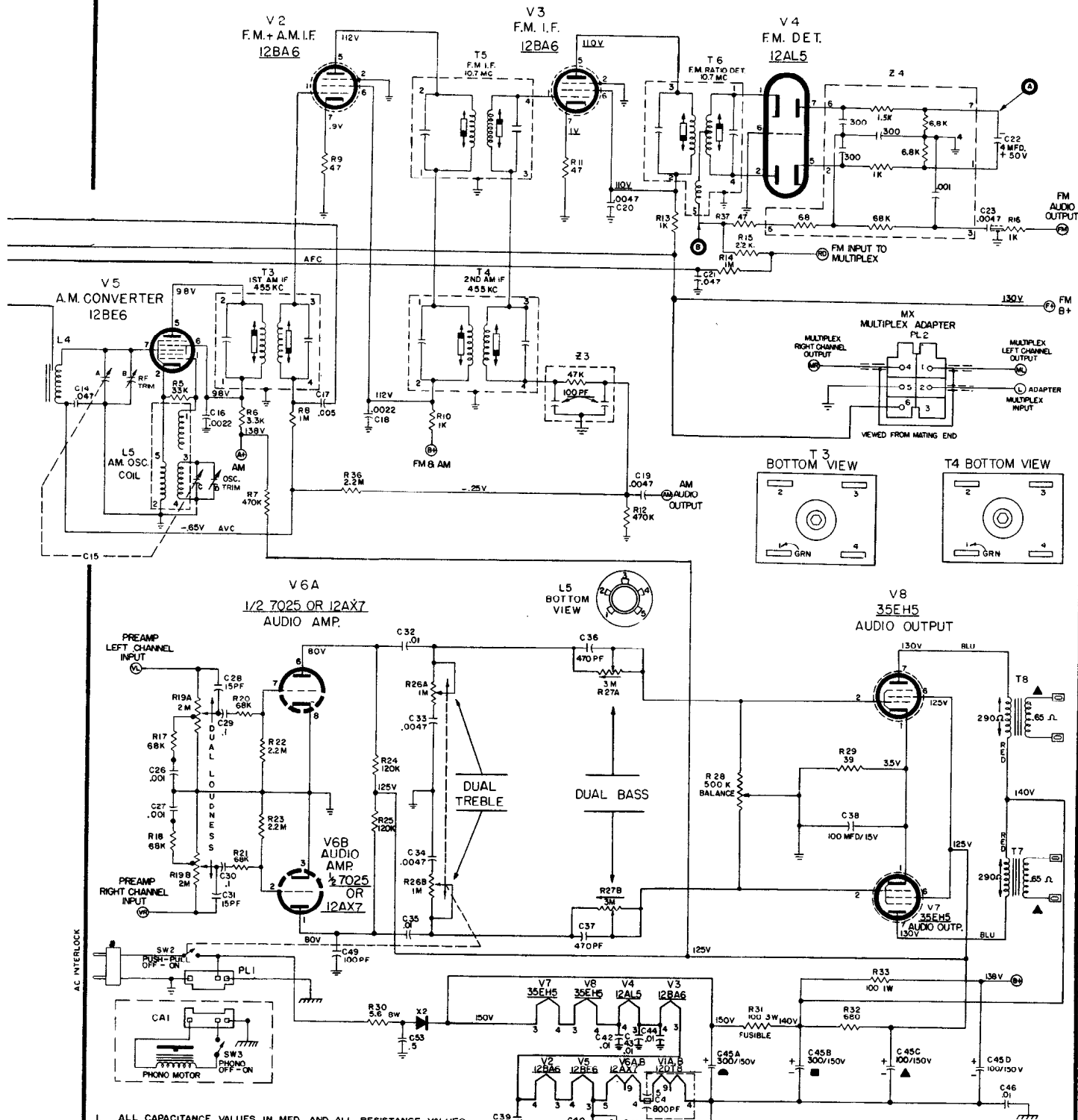
VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

WESTINGHOUSE
 Chassis V-2515-11
 Models H-M1780, A,
 H-M1781, H-M1783
 (Material on 3 pages)



VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

WESTINGHOUSE Chassis V-2515-11, Models H-M1780, A, H-M1781, H-M1783

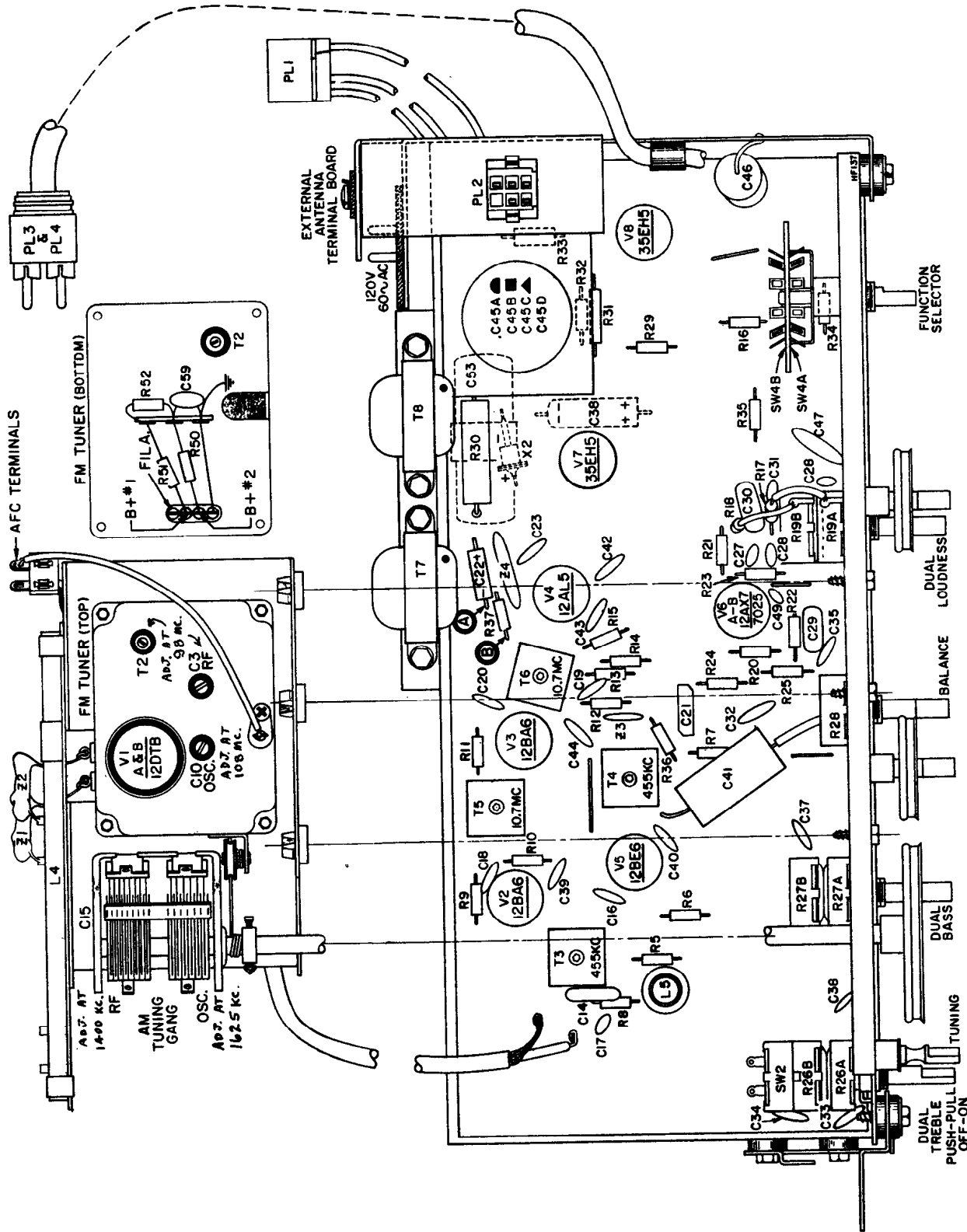


1. ALL CAPACITANCE VALUES IN MFD. AND ALL RESISTANCE VALUES IN OHMS, $\frac{1}{2}$ WATT, UNLESS OTHERWISE SPECIFIED.
2. D.C. VOLTAGES MEASURED FROM POINTS INDICATED TO CIRCUIT GROUND - NO SIGNAL APPLIED, USING A V.T.V.M. LINE VOLTAGE SET AT 120 V A.C. NO SIGNAL INPUT LCUDNESS AT MIN, TO TUNING CAPC. AT MAX.
3. UNDERLINED VOLTAGES ARE TAKEN IN FM POSITION.
4. SW4A AND B IS SHOWN IN THE CCW POSITION. (AM POSITION)
5. ALL REFERENCES TO LEFT AND RIGHT ARE AS VIEWED FACING FRONT OF SET.
6. REAR SECTIONS OF CONTROLS (FARTHEST FROM SHAFTS) ARE RIGHT CHANNEL.
7. ARROWS ON CONTROLS INDICATE CW ROTATION (CONTROL VIEWED FROM SHAFT END.)

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

WESTINGHOUSE Chassis V-2515-11, Models H-M1780, A, H-M1781, H-M1783

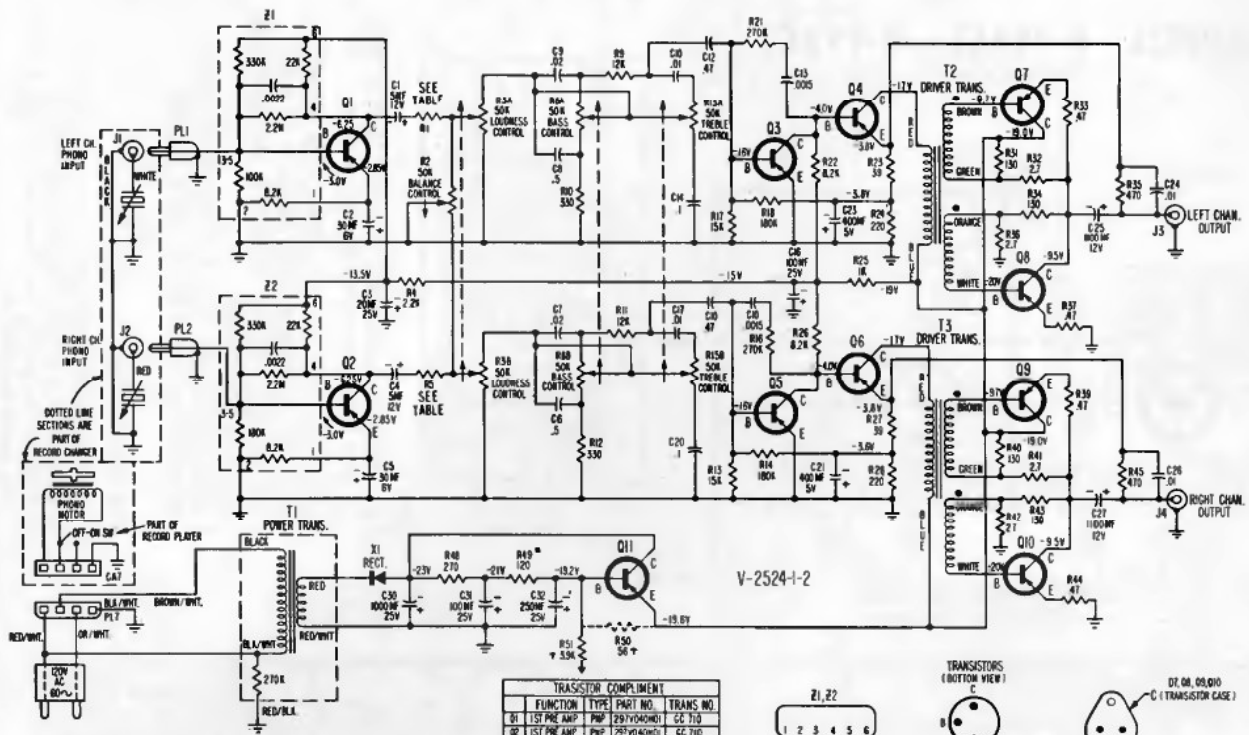
(Continued)



Top View of V-2515-11 Chassis

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

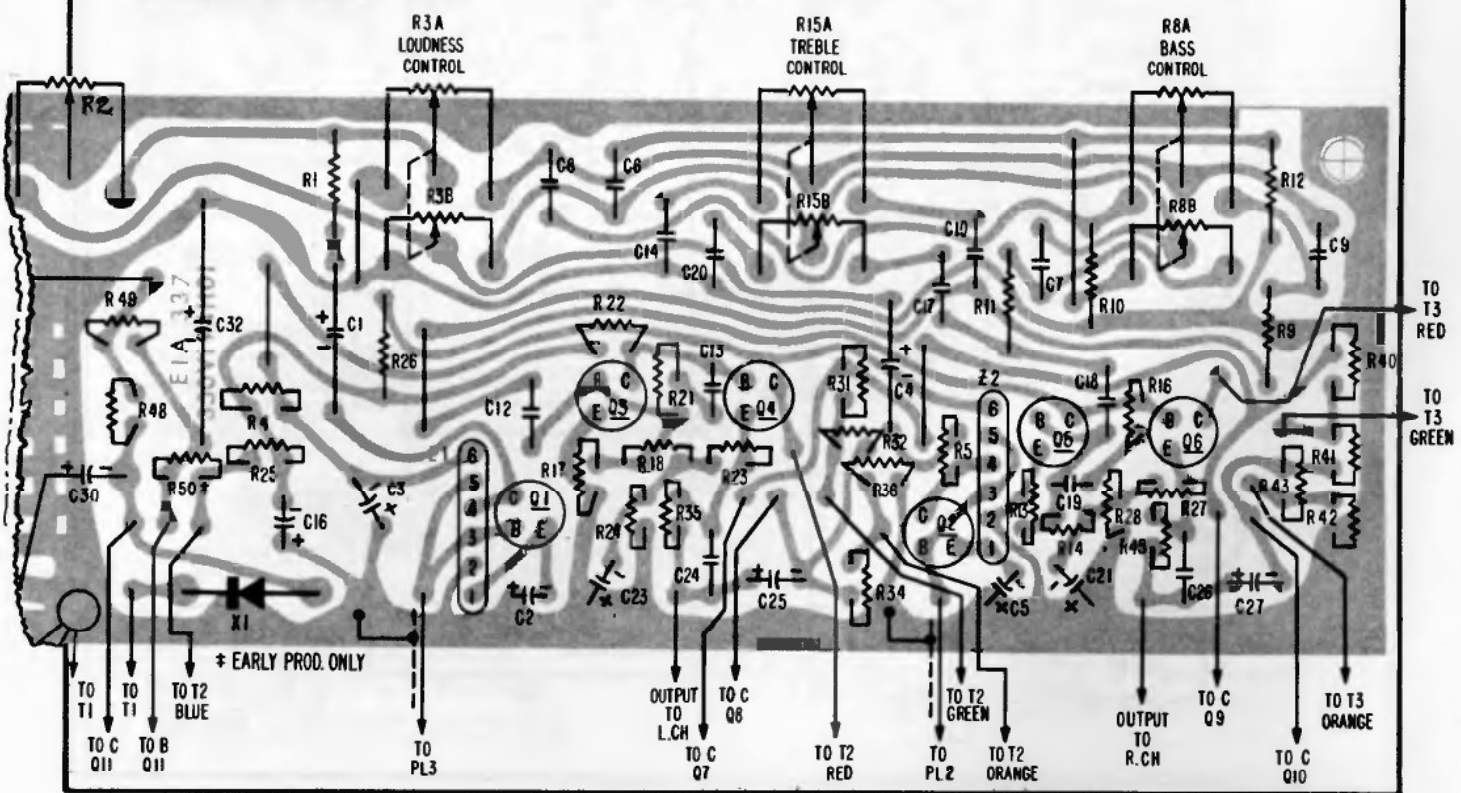
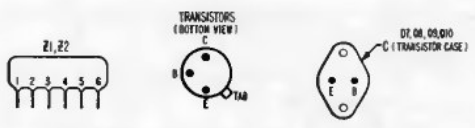
WESTINGHOUSE Models H-91ACS1, H-120ACS1, H-121ACS1, Chassis V-2524-1
 Model H-92ACS1, Chassis V-2524-2
 Models H-F1030, H-F1031, H-F1033, Chassis V-2524-3



1. ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROLS VIEWED FROM SHaft END).
2. REAR SECTIONS OF CONTROLS ARE RIGHT CHANNEL.
3. D.C. VOLTAGES MEASURED FROM CIRCUIT GROUND USING A VOLT. CONTROLS SET AT MINIMUM.
4. ALL CAPACITANCE VALUES ARE IN MFD AND ALL RESISTANCE VALUES IN OHMS, 1/2 WATT UNLESS OTHERWISE SPECIFIED.
- EARLY PRODUCTION WAS 270 OHMS; 120 USED WITH R51.
- † R50 RESISTOR USED IN EARLY PRODUCTION ONLY; R51 LATER PROD. ONLY.

FUNCTION	TYPE	PART NO.	TRANS. NO.
Q1 1ST PRE AMP	PNP	287Y040H01	CC 710
Q2 1ST PRE AMP	PNP	287Y040H02	CC 710
Q3 2ND PRE AMP	PNP	287Y040H03	CC 710
Q4 AUDIO DRIVER	PNP	287Y040H04	CC 676
Q5 1-ND PRE AMP	PNP	287Y040H05	CC 710
Q6 AUDIO DRIVER	PNP	287Y040H06	CC 676
Q7 AUDIO OUT	PNP	287Y040H07	B 1709
Q8 AUDIO OUT	PNP	287Y040H08	B 1709
Q9 AUDIO OUT	PNP	287Y040H09	B 1709
Q10 G. MULTIPLIER	PNP	287Y040H10	B 1709

CHASSIS NO.	R1	R5
V-2524-1-2	560 Ω	560 Ω
V-2524-3	2700 Ω	2700 Ω

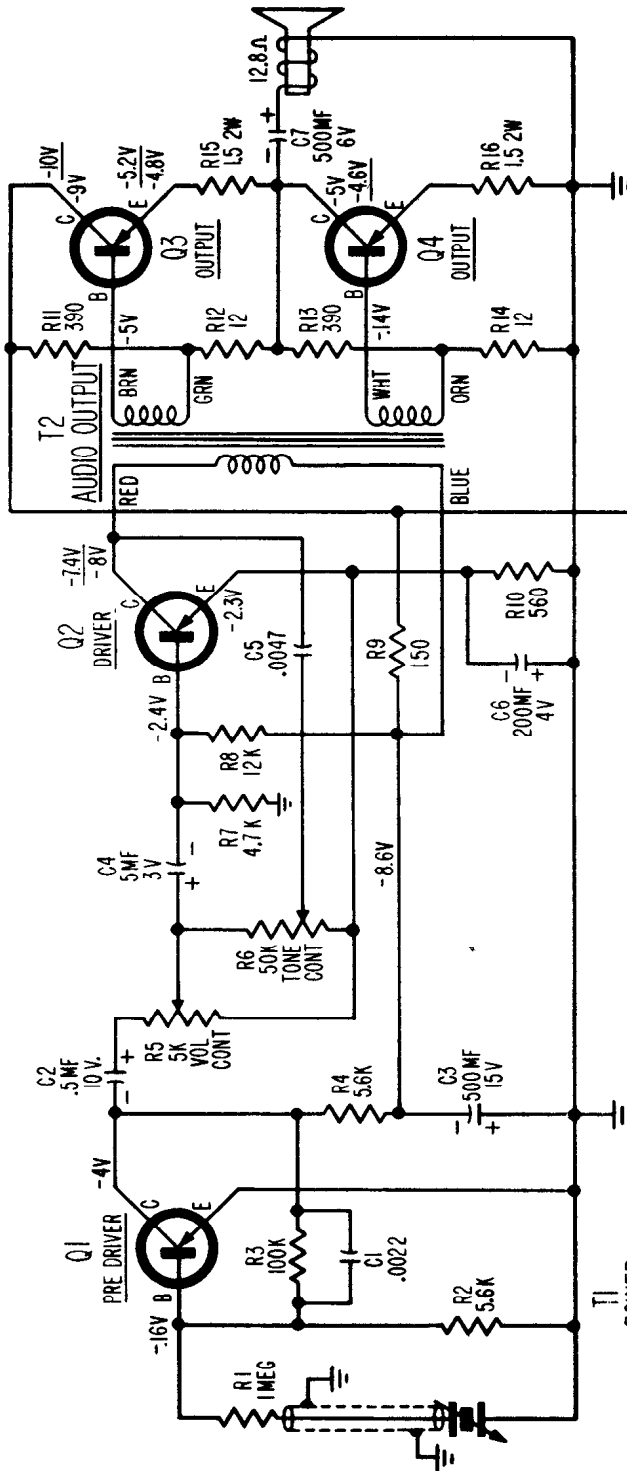


Bottom view of PC board.

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MODELS H-99AC1 H-99AC2
charcoal gray olive green

CHASSIS V-2526-1

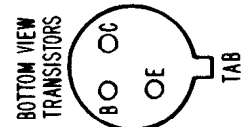


TRANSISTOR CHART			
FUNCTION	TYPE	PART NO.	ALT. TYPE
CAPAC. MULT.	2N1038	297V057H02	Q5
OUTPUT *	2N1038	297V057H01	Q4
OUTPUT *	2N1038	297V057H01	Q3
DRIVER	6C639	297V040H16	Q2
PRE DRIVER	6C639	297V040H16	Q1
*MATCHED PAIR			

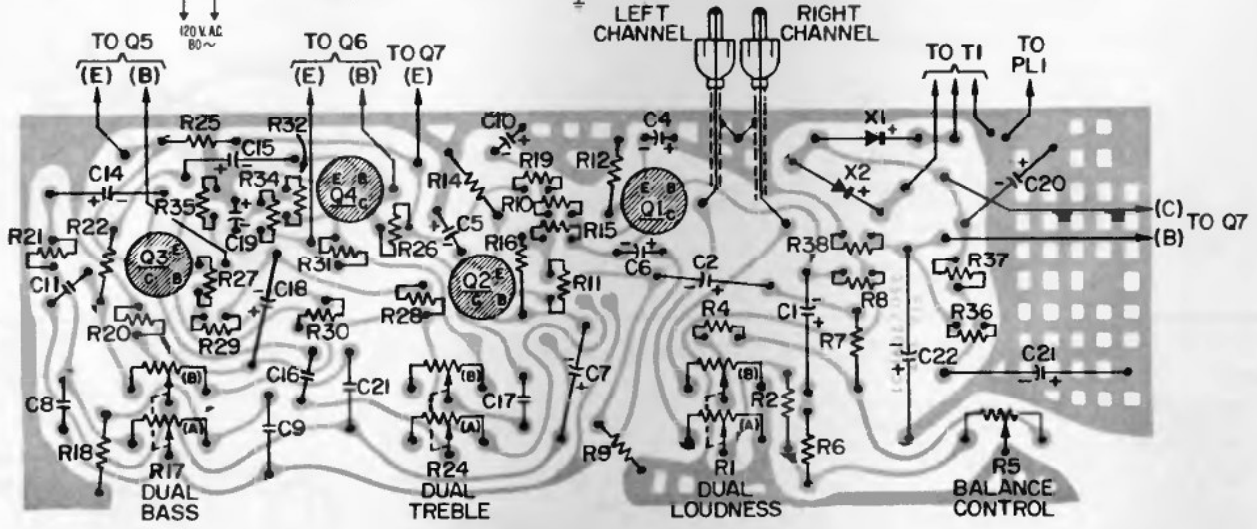
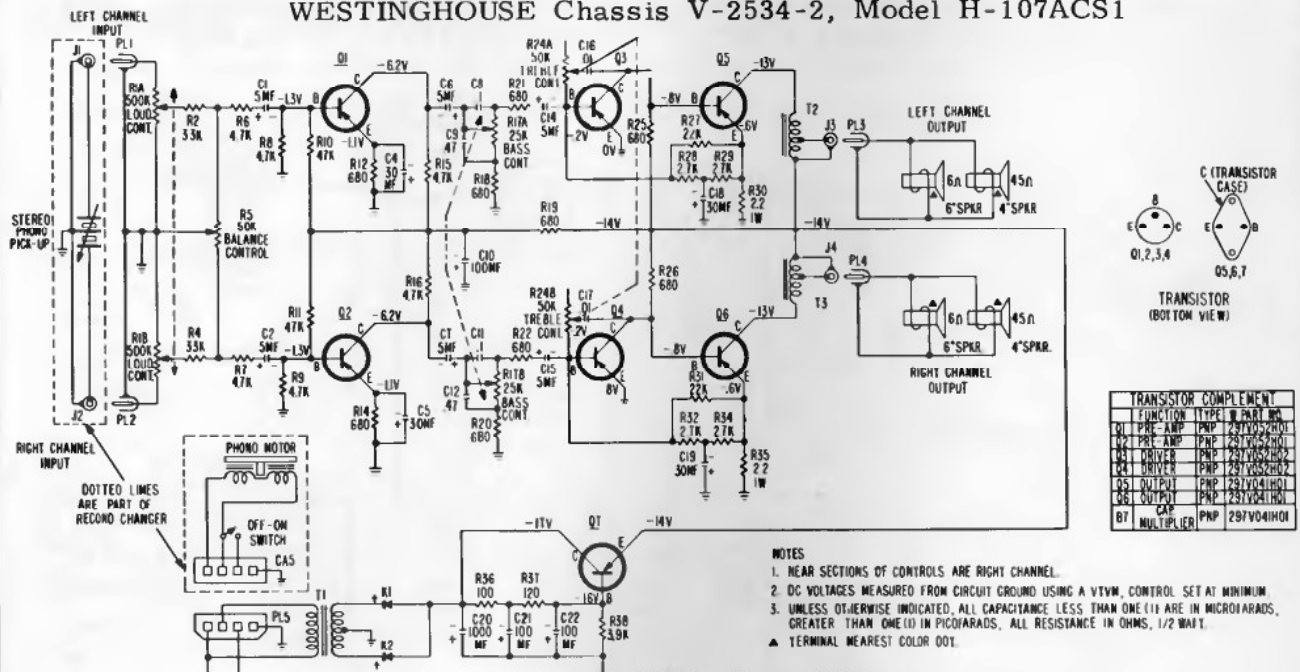
- NOTE:
1. ALL CAPACITOR VALUES IN MFD, & ALL RESISTORS IN OHMS 1/2 WATT RATING UNLESS OTHERWISE SPECIFIED.
 2. A TOLERANCE OF ±20% IS ACCEPTABLE FOR VOLTAGES TAKEN WITH V.I.V.M. FROM POINTS INDICATED TO * WITH LINE VOLTAGE AT 120 VAC. KNOWN FRESH BATTERIES MUST BE USED IN BATTERY POSITION.
 3. UNDERLINED VOLTAGES TAKEN IN AC POSITION. ALL OTHER VOLTAGES APPLY TO BOTH BATTERY AND AC POSITIONS.

CHASSIS REMOVAL

1. Remove the two knobs.
2. Remove the 4 screws that secure the grille.
3. Pull out the grille. The chassis is attached to the grille and comes out with it.



WESTINGHOUSE Chassis V-2534-2, Model H-107ACS1



WESTINGHOUSE Chassis V-2537-2
Models H-105ACS1, A, H-106ACS1

CHASSIS REMOVAL

1. Remove the VOLUME knobs.
2. Remove the six screws from the baffle.
3. Remove the escutcheon and the two screws under it.
4. Pull out the baffle. The chassis is fastened to the baffle by two speed nuts.

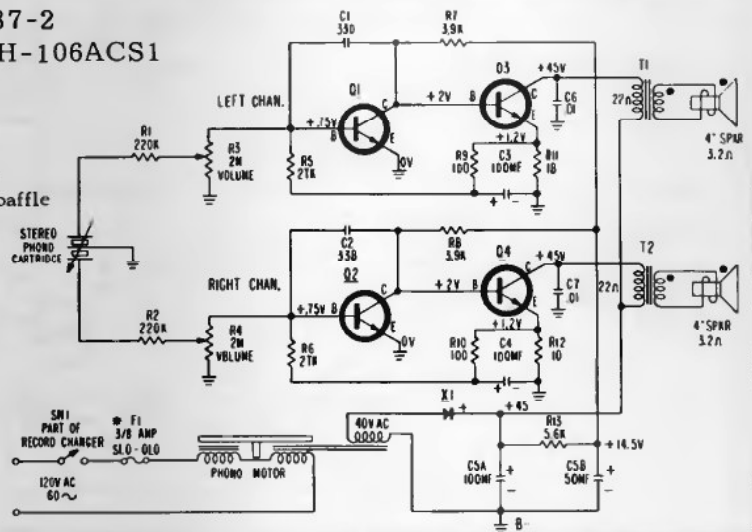
FUNCTION	TYPE	PART NO.
Q1-Q2	DRIVER	NPN 291V055H01
Q3-Q4	AUDIO OUTPUT	NPN 291V060H01

SEE NOTE 3



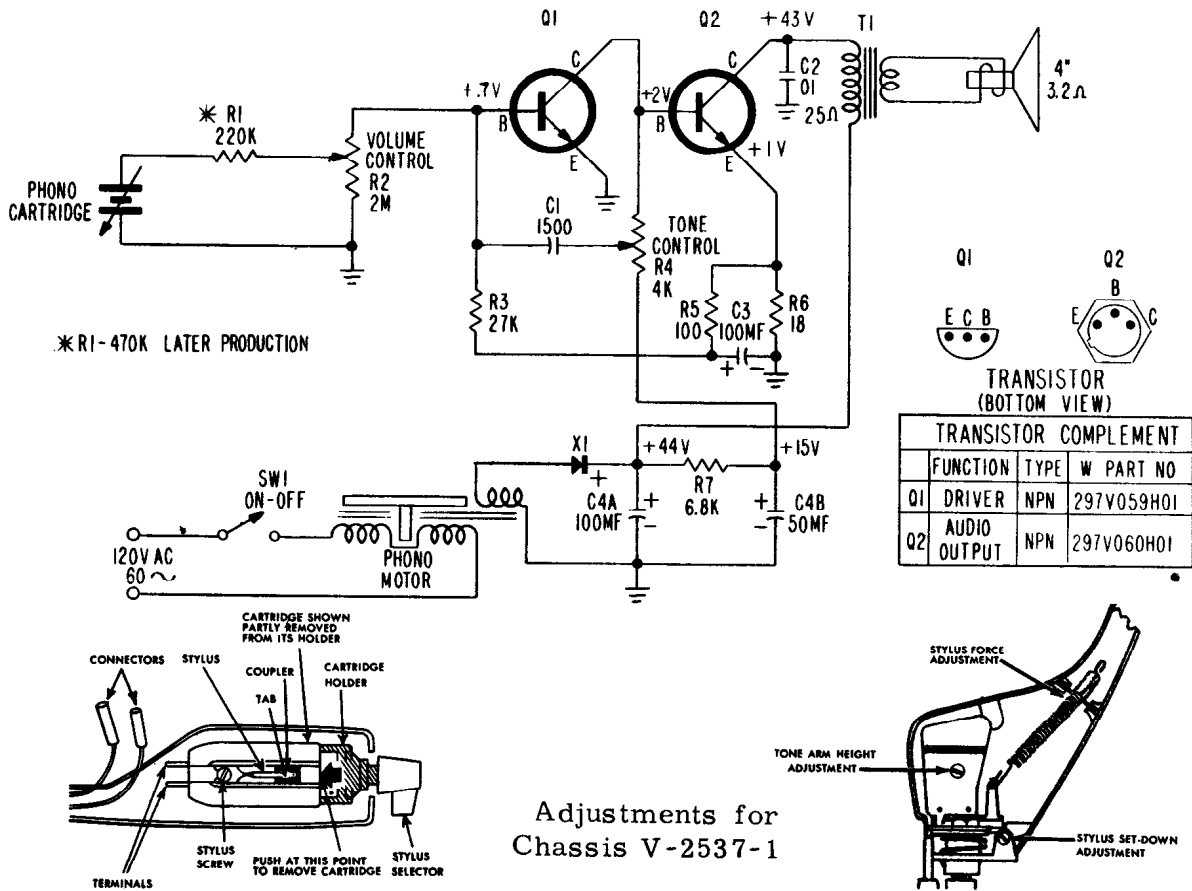
NOTES

- ★ EARLY PRODUCTION ONLY.
- VOLTAGE MEASUREMENTS MADE WITH A VTVM FROM POINTS INDICATED TO GROUND, VOLUME CONTROLS AT MINIMUM, LINE VOLTAGE AT 120 VAC.
- UNLESS OTHERWISE INDICATED, ALL CAPACITANCE VALUES LESS THAN 1 ARE IN PF, VALUES GREATER THAN 1 ARE IN μ F. ALL RESISTANCE VALUES ARE IN OHMS, 1/2 WATT.
- IF EITHER RIGHT OR LEFT CHANNEL DRIVER OR OUTPUT TRANSISTOR BECOMES DEFECTIVE, ORDER AND REPLACE BOTH DRIVER OR BOTH OUTPUT TRANSISTORS.



VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

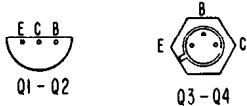
WESTINGHOUSE Chassis V-2537-1, Models H-100AC1, H-100AC2
 Chassis V-2537-3, Models H-111MP1, H-111MP2



WESTINGHOUSE Chassis V-2536-1, Models H-102ACS1, H-102ACS2

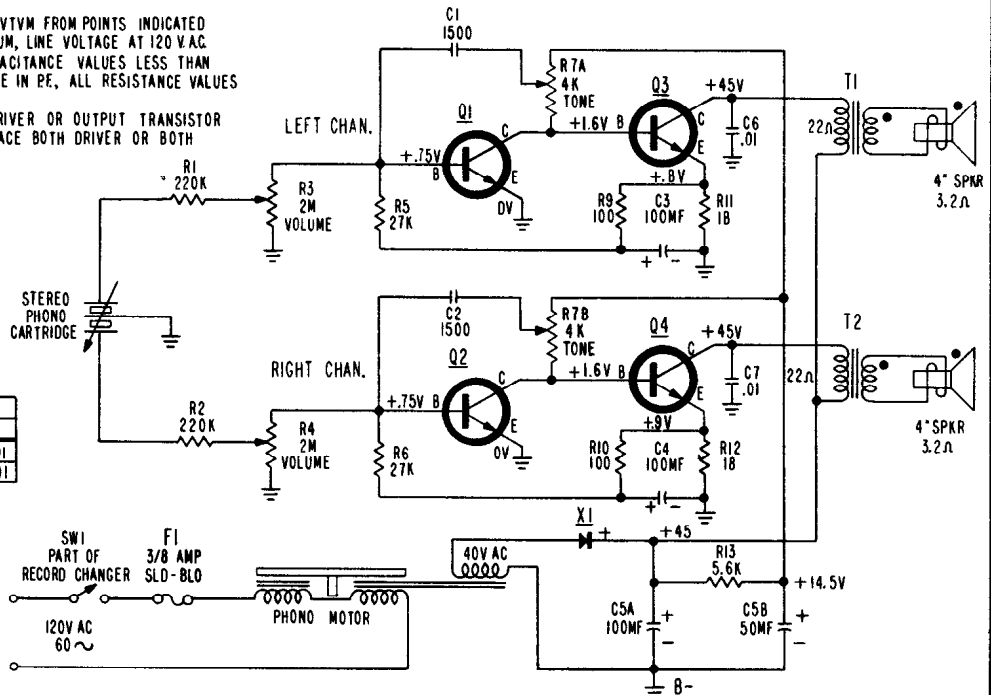
NOTES

- VOLTAGE MEASUREMENTS MADE WITH A VTVM FROM POINTS INDICATED TO GROUND, VOLUME CONTROLS AT MINIMUM, LINE VOLTAGE AT 120 V.A.C.
- UNLESS OTHERWISE INDICATED: ALL CAPACITANCE VALUES LESS THAN 1 ARE MF & VALUES GREATER THAN 1 ARE IN PF, ALL RESISTANCE VALUES ARE IN OHMS, 1/2 WATT.
- IF EITHER RIGHT OR LEFT CHANNEL DRIVER OR OUTPUT TRANSISTOR BECOMES DEFECTIVE, ORDER AND REPLACE BOTH DRIVER OR BOTH OUTPUT TRANSISTORS.



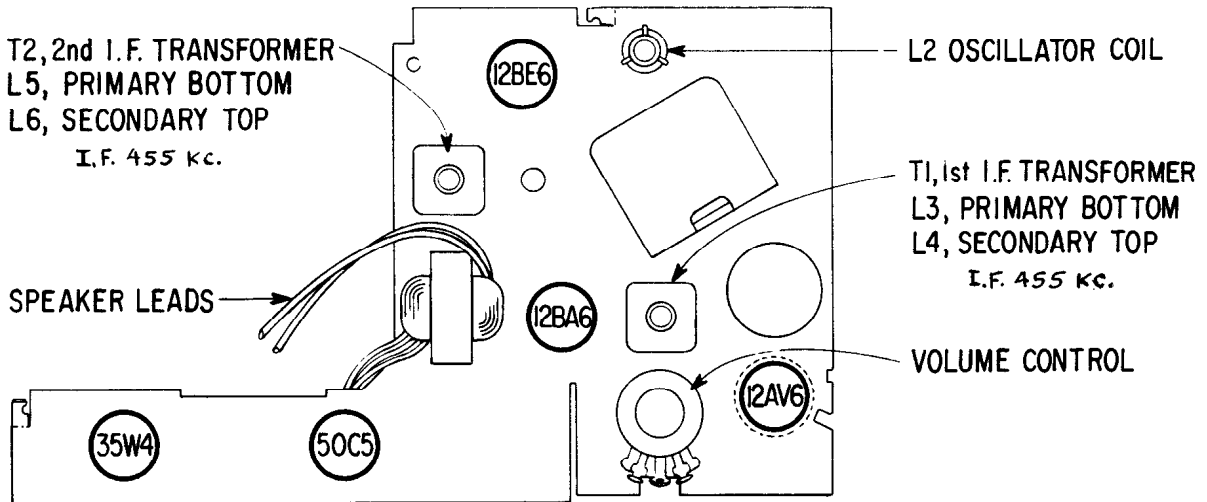
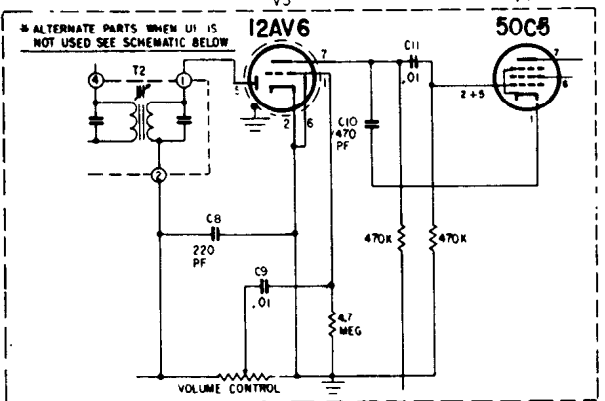
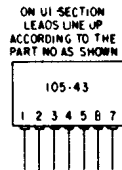
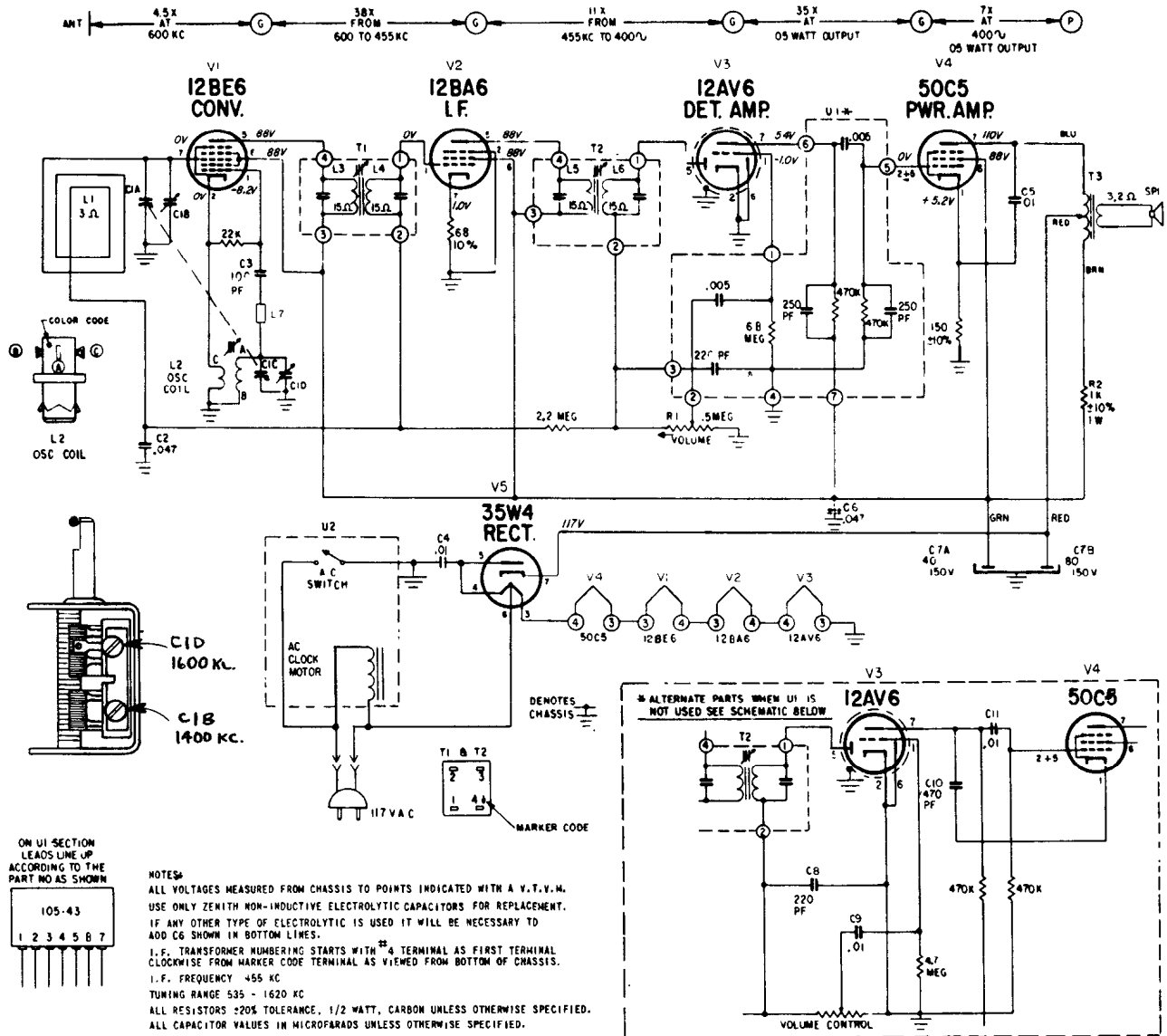
TRANSISTOR COMPLEMENT			
FUNCTION	TYPE	W	PART NO
Q1 - Q2	DRIVER	NPN	297V059H01
Q3 - Q4	AUDIO OUTPUT	NPN	297V060H01

SEE NOTE 3

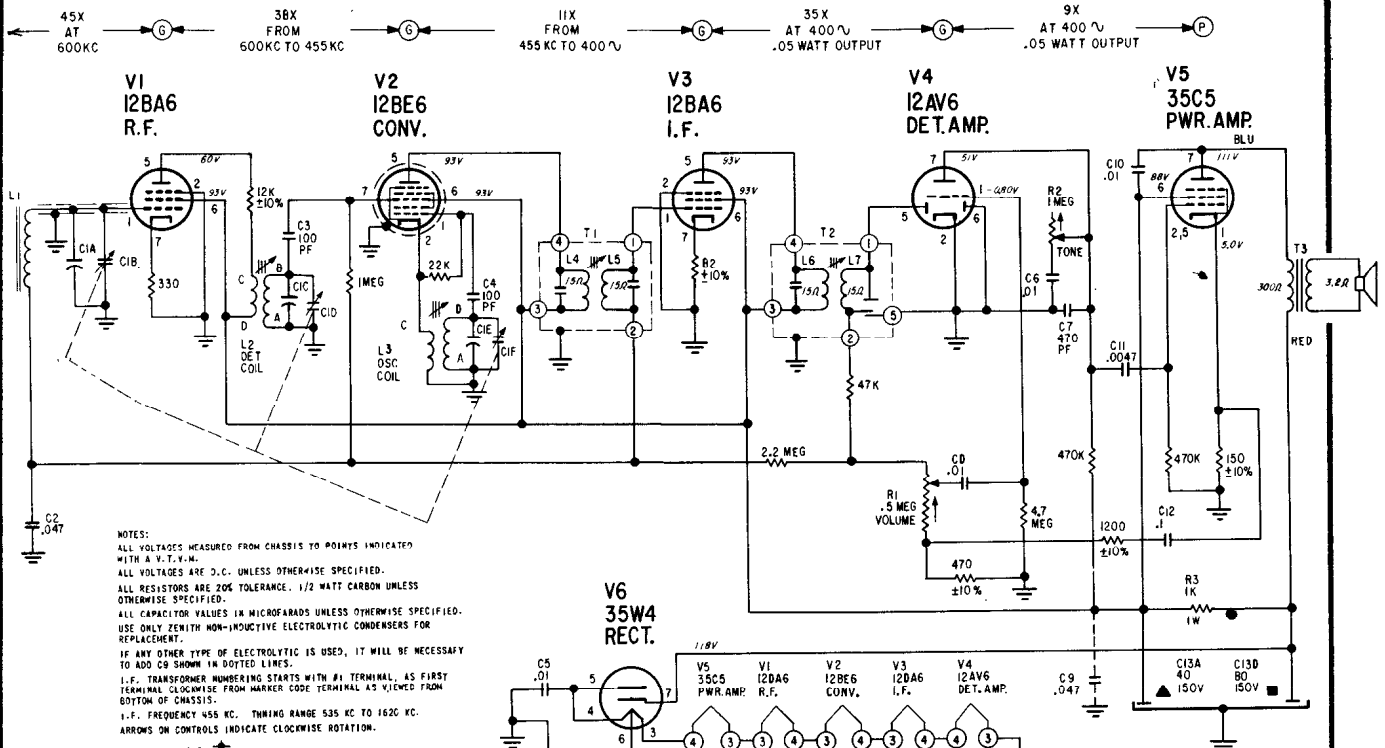


ZENITH RADIO MODELS L513C,F,V & W AND L514C,P,W & G USING CHASSIS 5L02

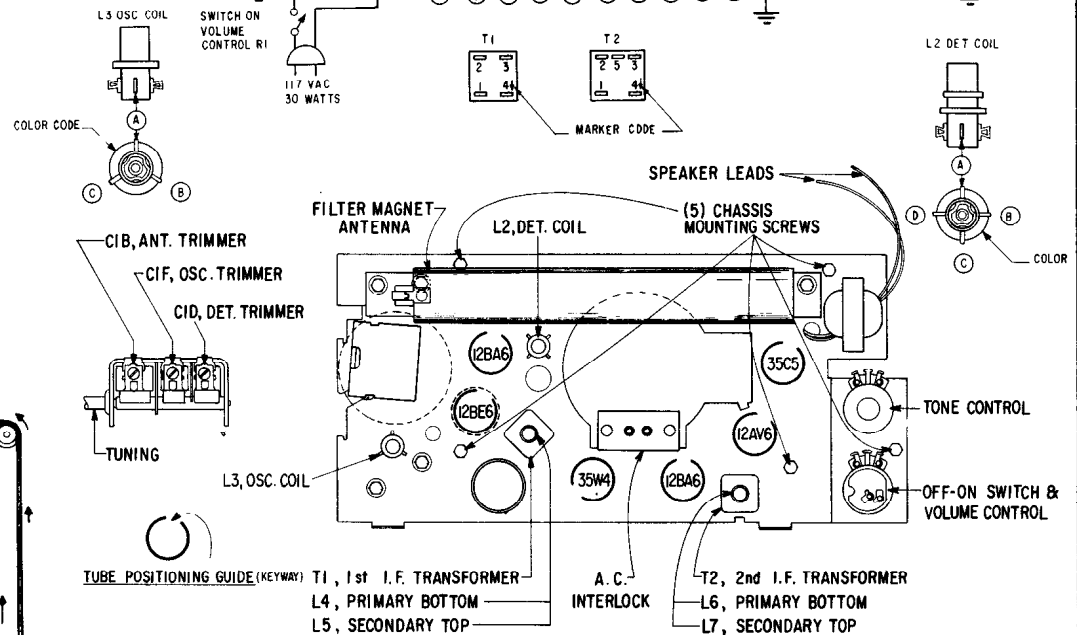
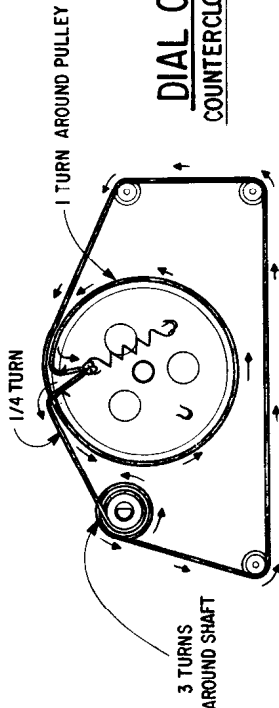
Also Models L509J, L, W, Chassis 5J13 (less Clock) are similar to 5L02



ZENITH RADIO CORPORATION MODELS L615G, L & W CHASSIS 6L05



DIAL CORD DRIVE
 COUNTERCLOCKWISE POSITION

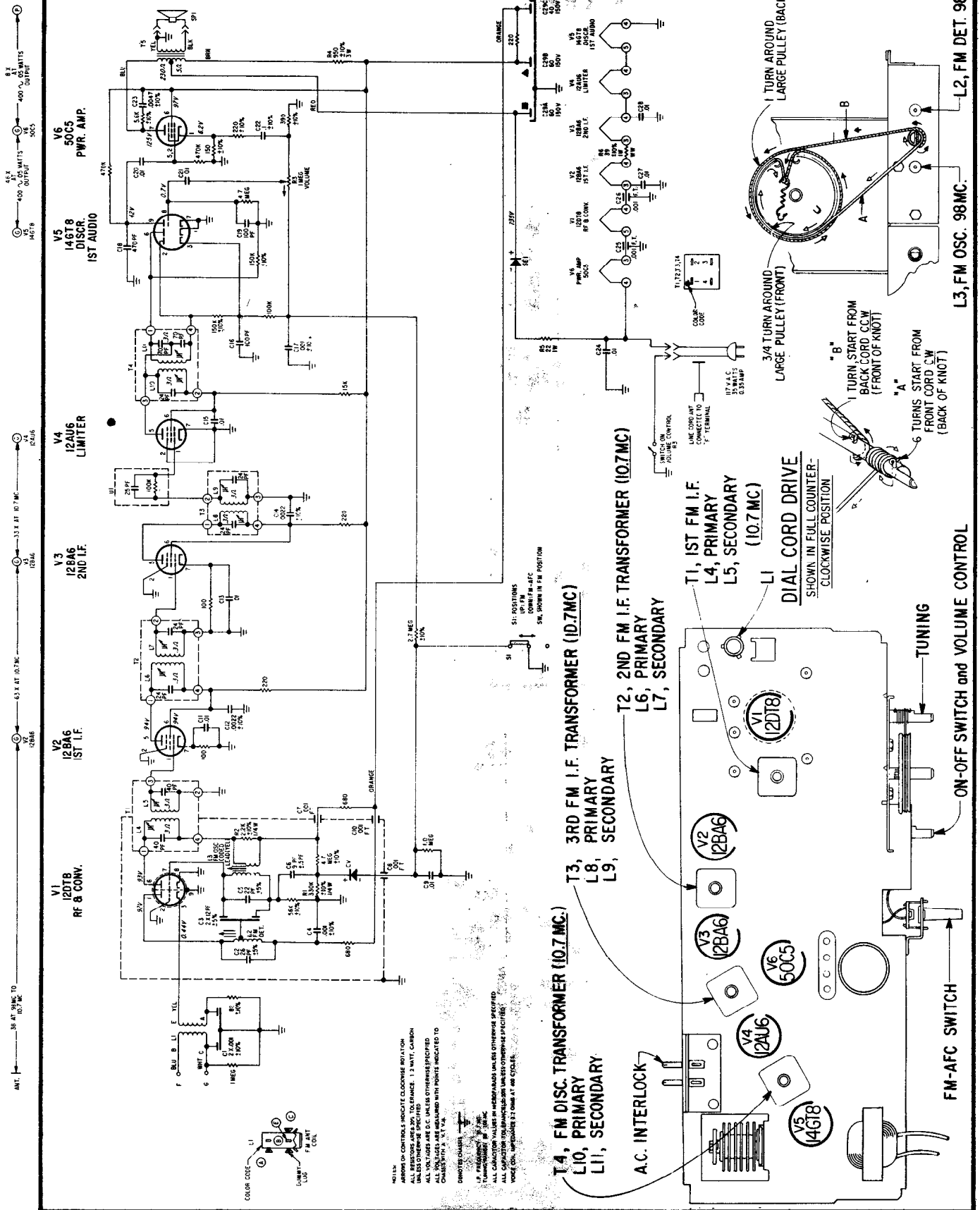


ALIGNMENT PROCEDURE

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

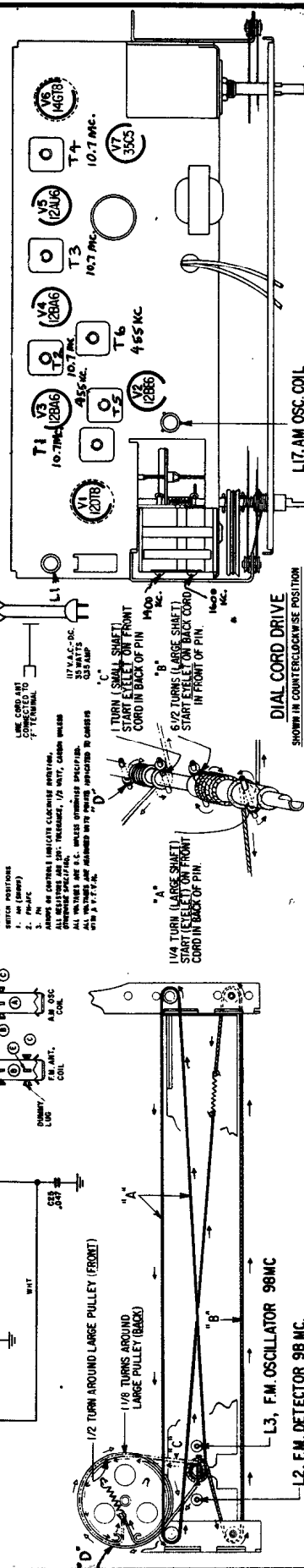
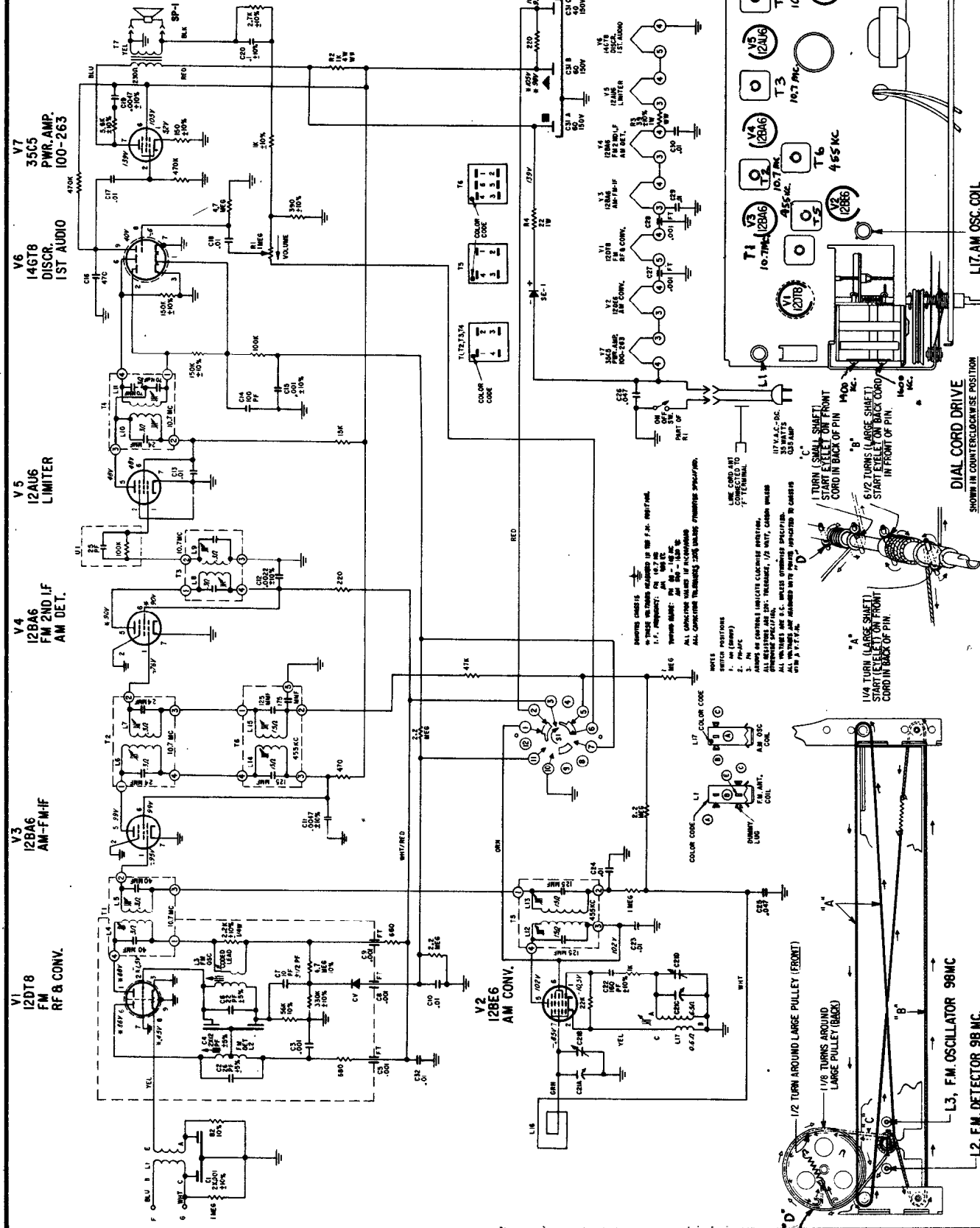
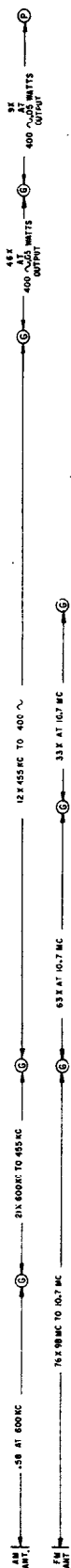
VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

ZENITH RADIO MODEL M722C, L & W CHASSIS 6M06



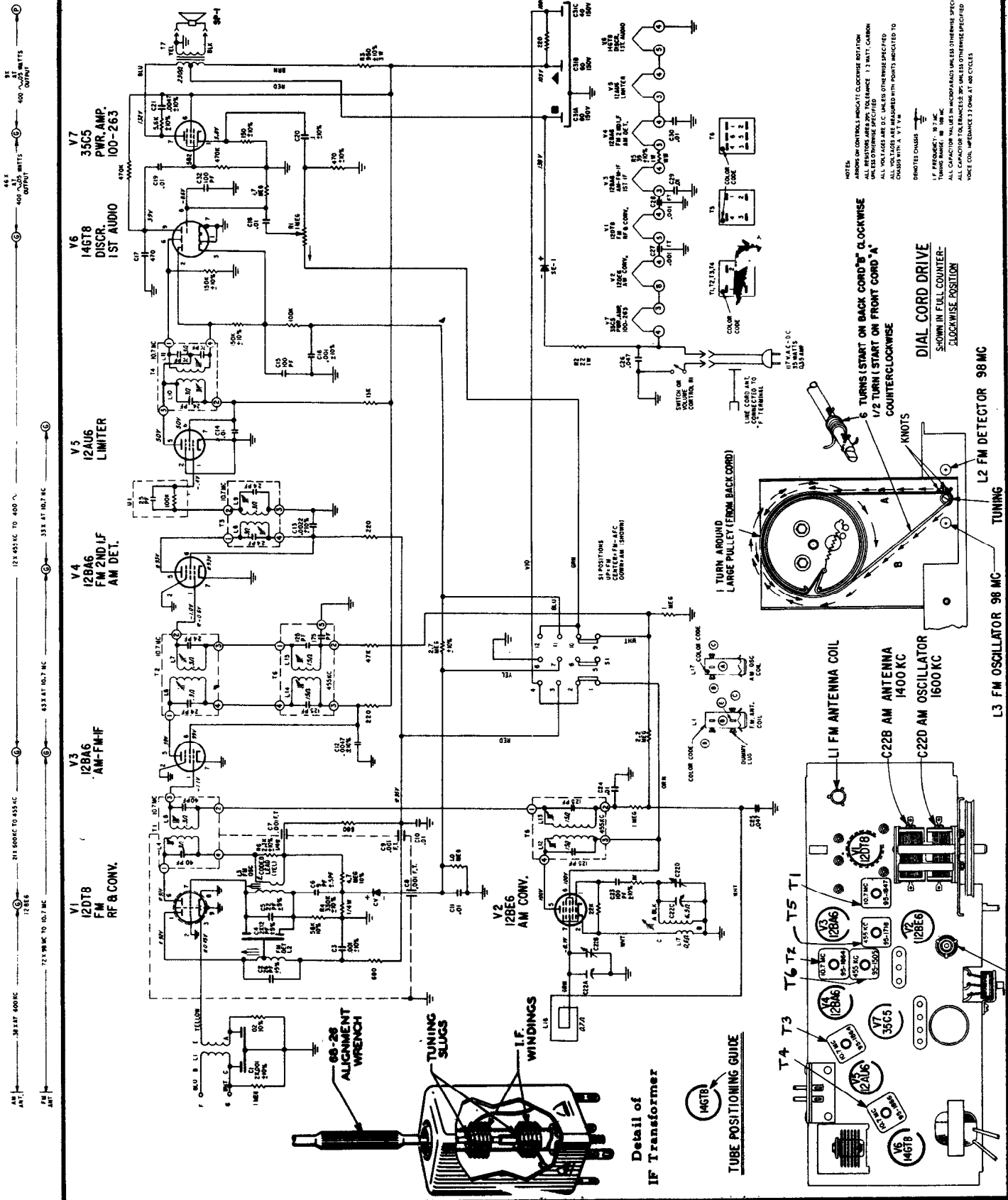
VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO

ZENITH RADIO CORPORATION
MODEL L724C, L&W CHASSIS 7L02



VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

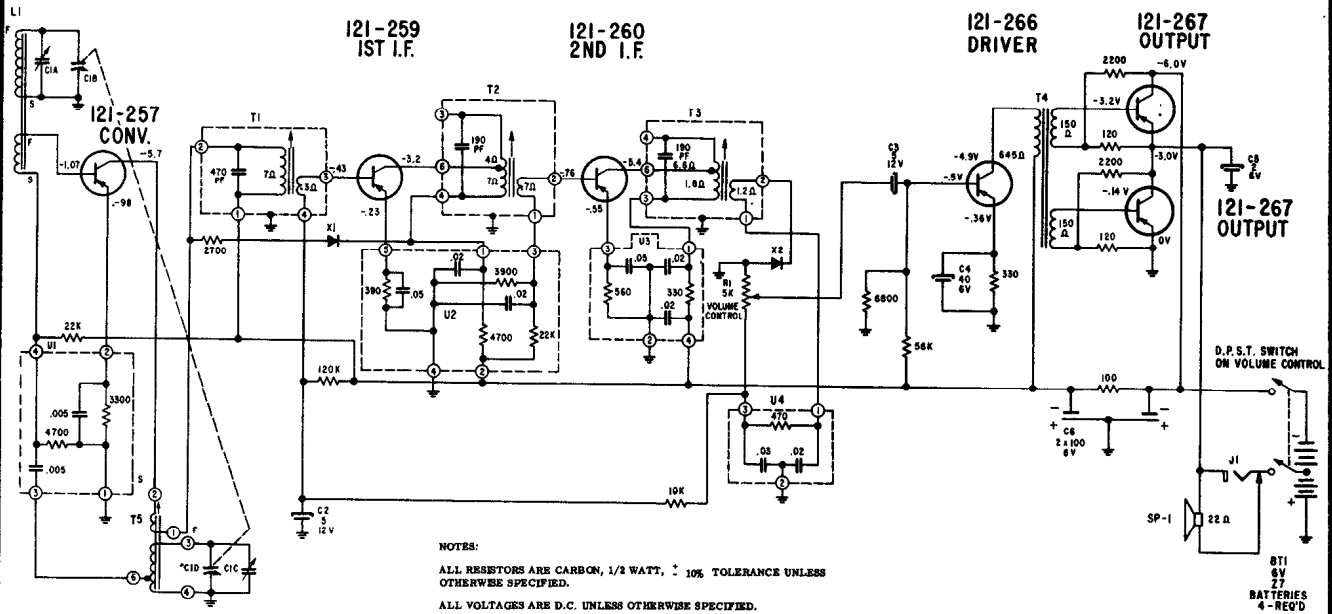
ZENITH RADIO Models M723A, C, W, Chassis 7M04,
Clock Models L727C, L, W, Chassis 7L03, are almost identical.



ZENITH RADIO MODEL "ROYAL 645L"

CHASSIS 6LT45Z2

(Continued on the next page, at right)



NOTES:

ALL RESISTORS ARE CARBON, 1/2 WATT, ± 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.

ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.

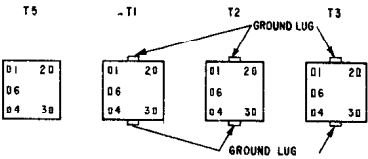
ALL CONDENSERS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.

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

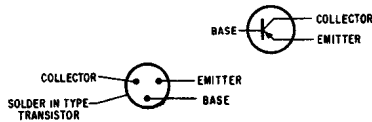
⊥ DENOTES CHASSIS

BATTERY CURRENT DRAIN APPROX. 7 MA WITH VOLUME CONTROL AT MINIMUM.

SPEAKER IMPEDANCE 22 Ω AT 400 CPS.

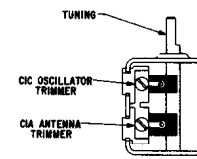


PNP TRANSISTORS



ALIGNMENT PROCEDURE

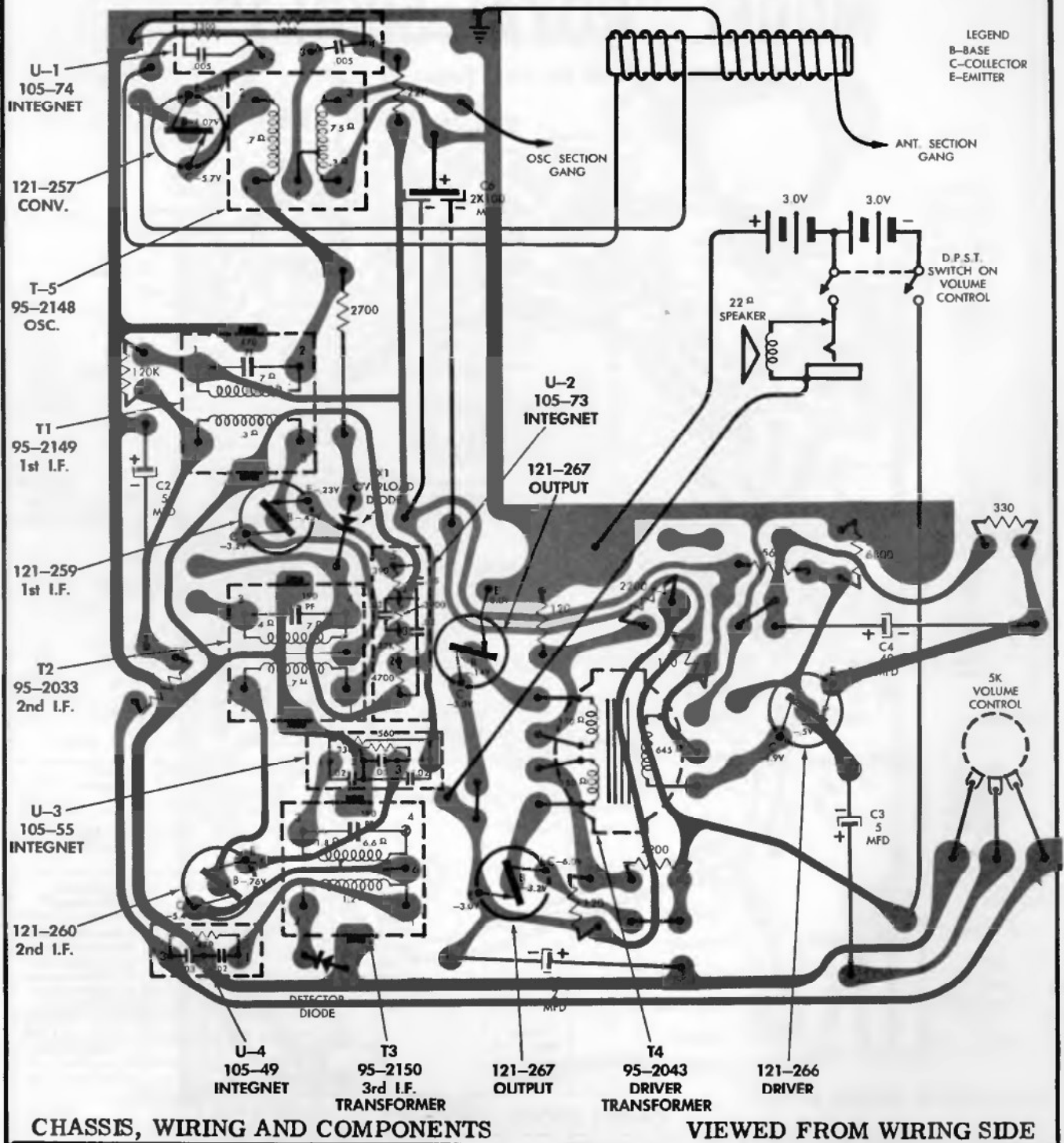
Operation	Input Signal Frequency	Connect Inner Conductor From Oscillator To	Connect Outer Shield Conductor From Oscillator To	Set Dial At	Trimmers	Purpose
1	455 KC	ONE TURN LOOSELY COUPLED TO WAVEMAGNET	Chassis	600 KC	Adj. T1, T2, T3 for maximum output.	For I.F. Alignment
2	1620 KC		—	Gang wide open.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



TRANSISTOR INFORMATION CHART

Chassis	Part No.	Conv.	1st I.F.	2nd I.F.	Crystal Diode	Driver	Output-Output	Supplier
6LT45Z2	Zenith Type E.I.A.	121-257 PNP 2N1526	121-259 PNP 2N1524	121-260 PNP 2N1524	103-44	121-266 PNP 2N406	121-267 Pair PNP 2N408	R.C.A.

ZENITH RADIO Model Royal 645L, Chassis 6LT45Z2
(Continued from preceding page, at left)

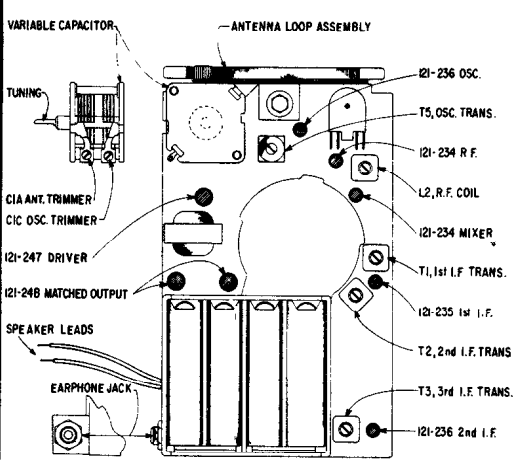
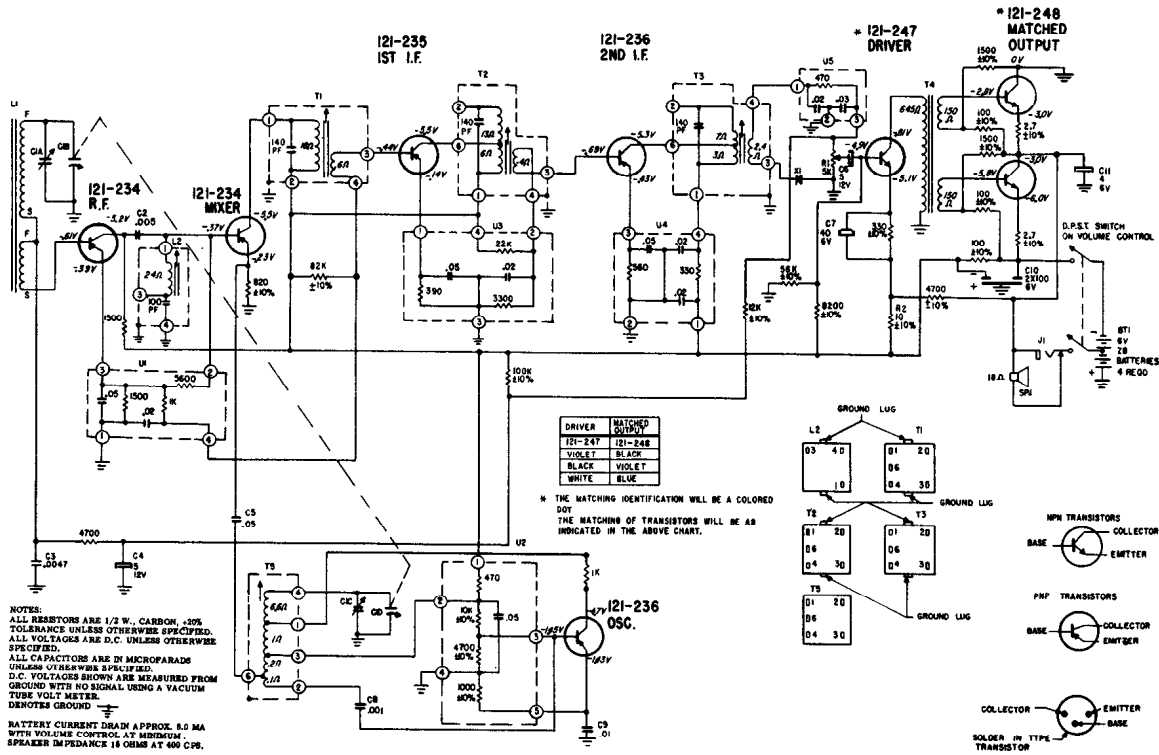


Resistors and capacitors should be replaced by clipping out the defective part and neatly soldering in the new part. If a unit, such as the oscillator coil or I.F. transformer, is to be removed heat the mounting lugs with a pencil type soldering iron and move them away from the soldered connection with a long-nose pliers or metal pick. Continue heating the lugs and brush away the molten

solder with a small stiff glue brush. Remove the defective unit by lifting it off the chassis. Before inserting the new unit, be certain that the lug holes are open and free from solder. Forcing a lug against a solder filled lug hole may break the bond between the chassis base and the printed wiring. It is, therefore, necessary to exercise care when replacing units.

ZENITH RADIO CHASSIS 8LT40Z1 MODEL "ROYAL 500H-1"

(Continued on the next page, at right)



TRANSISTOR & TRIMMER LAYOUT

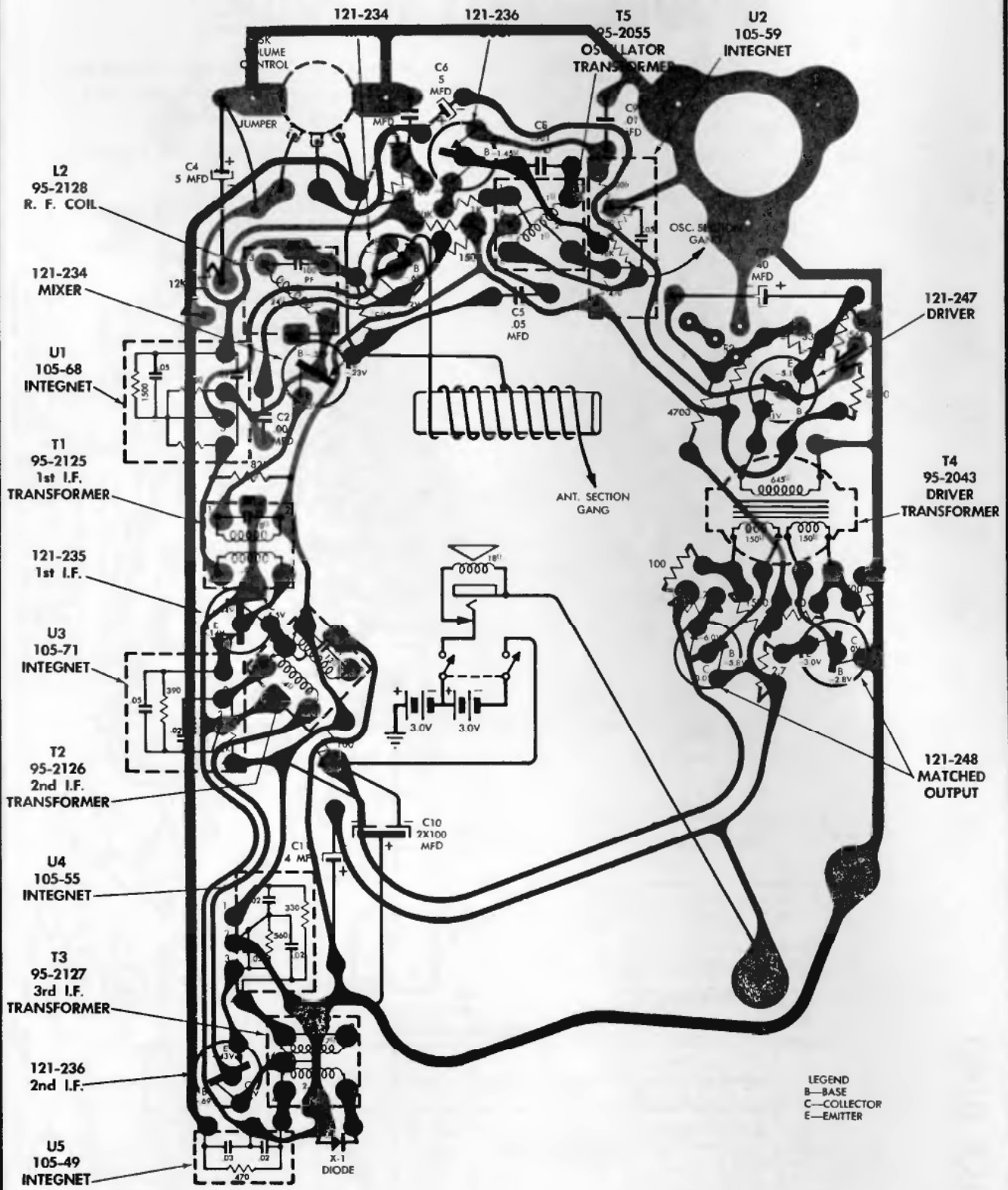
ALIGNMENT PROCEDURE

Operation	Input Signal Frequency	Connect Inner Conductor From Oscillator To	Set Dial At	Trimmers	Purpose	
1	455 KC	ONE TURN LOOSELY COUPLED TO THE ANTENNA	600 KC	Adj. T1, T2, T3 for Maximum output	For I.F. Alignment	
2	455 KC		600 KC	Adj. L2 for Minimum output	Tune Trap to IF Frequency	
3	1620 KC		Gang Wideopen	C1C	Set Oscillator To Dial Scale	
4	600 KC		Near 600	Adjust slug in T5	Adjust T5 for Maximum output while rocking gang. Tune T5 for Maximum output regardless of dial accuracy	
5	Repeat Steps 3 & 4					
6	1260 KC		1260 KC	C1A	Align Loop Antenna	

CHASSIS INFORMATION CHART

CHASSIS	PART NO.	R.F.	MIXER	OSC.	1ST I.F.	2ND I.F.	CRYSTAL DIODE DETECTOR	DRIVER	OUTPUT-OUTPUT	SUPPLIER
8LT40Z1	Zenith Type E.I.A.	I21-234 PNP GC282	I21-234 PNP GC282	I21-236 PNP GC284	I21-235 PNP GC284	I21-236 PNP GC284	103-19 or 103-44	I21-247 NPN GC608	I21-248 Pair NPN NPN GC609	Texas Instrument

ZENITH RADIO Model "Royal 500H-1" -- Chassis 8LT40Z1
 (Continued from preceding page, at left)

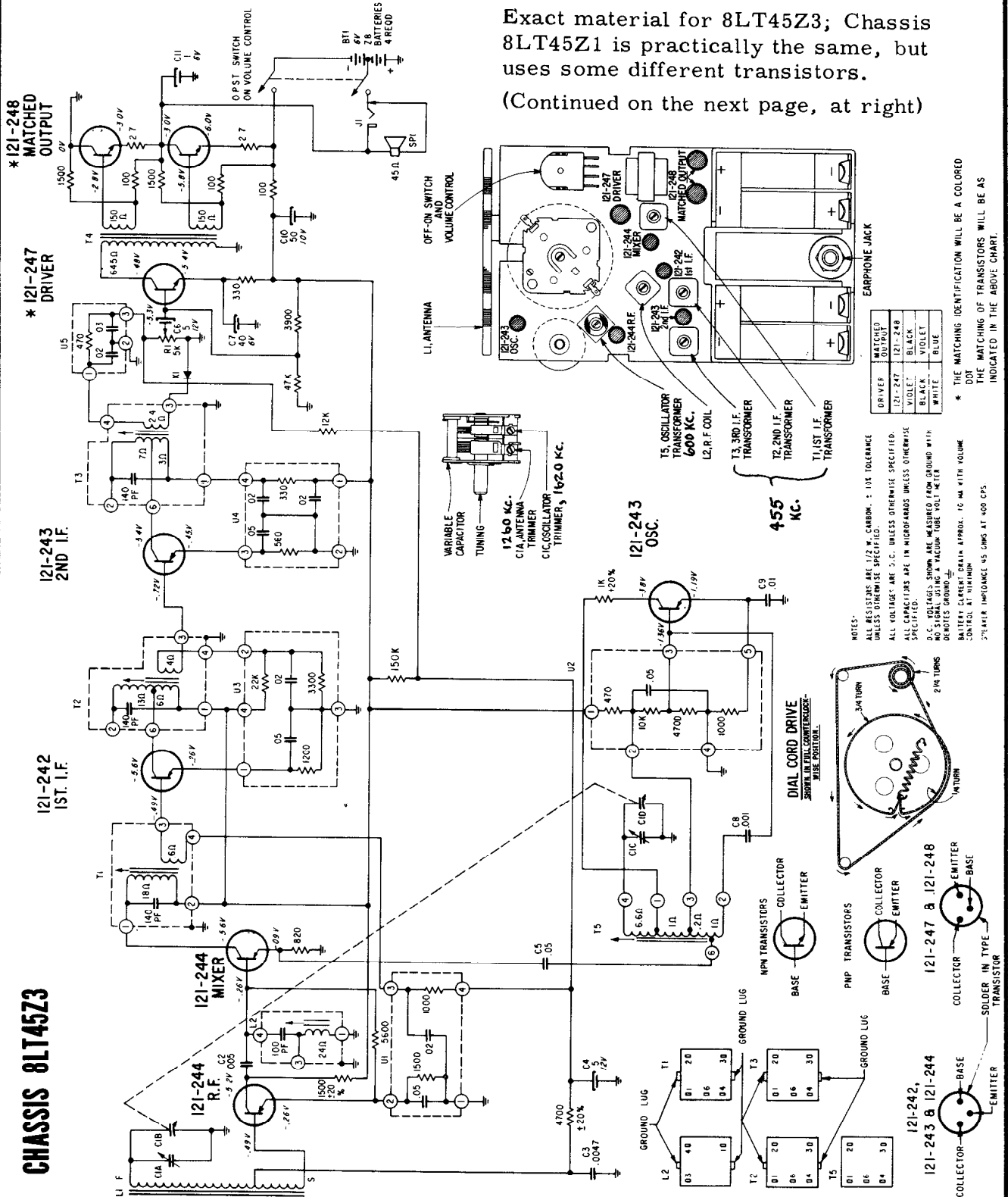


CHASSIS, WIRING AND COMPONENTS

VIEWED FROM WIRING SIDE

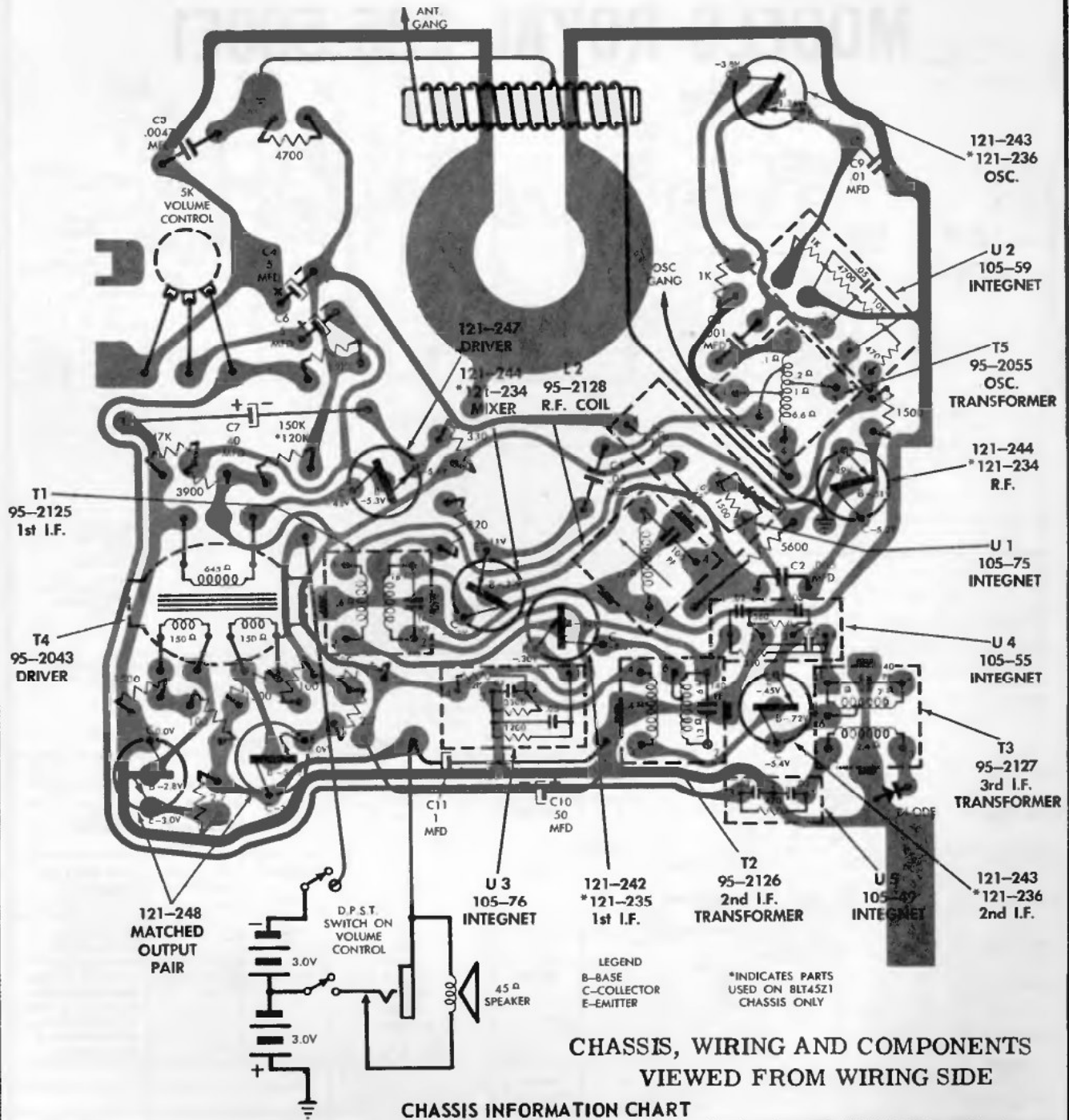
ZENITH RADIO CHASSIS 8LT45Z1 & 45Z3 MODEL "ROYAL 500L"

Exact material for 8LT45Z3; Chassis 8LT45Z1 is practically the same, but uses some different transistors.
(Continued on the next page, at right)



VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

ZENITH RADIO Chassis 8LT45Z1, 8LT45Z3, Model "Royal 500L"
 (Continued from preceding page, at left)

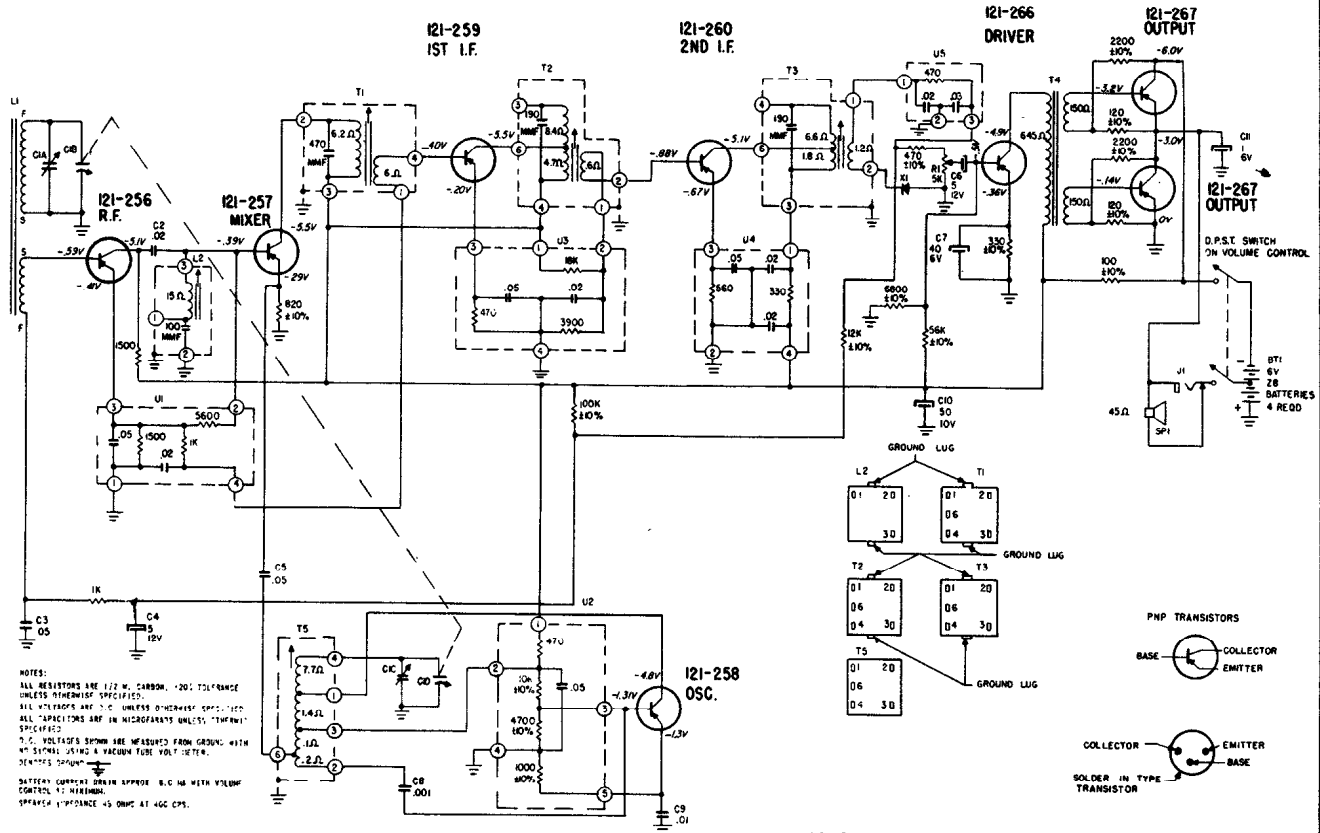


CHASSIS, WIRING AND COMPONENTS
 VIEWED FROM WIRING SIDE

CHASSIS INFORMATION CHART

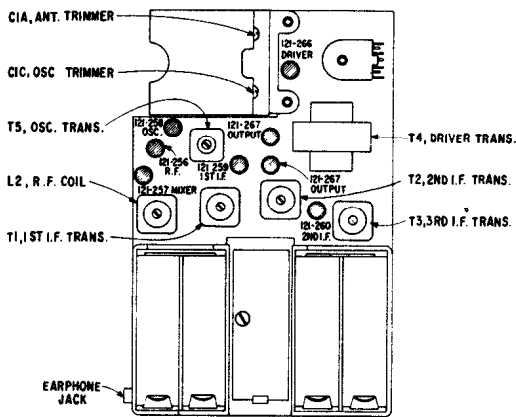
Chassis	Part No.	R. F.	Mixer	Osc.	1st I.F.	2nd I.F.	Crystal Diode Detector	Driver	Output	Supplier
8LT45L1	Zenith Type E.I.A.	121-234 PNP GC282	121-234 PNP GC282	121-236 PNP GC284	121-235 PNP GC284	121-236 PNP GC284	103-19 or 103-44	121-247 NPN GC608	121-248 Matched Pair NPN NPN GC609	Texas Instrument
8LT45Z3	Zenith Type E.I.A.	121-244 PNP 2N993	121-244 PNP 2N993	121-243 PNP 2N993	121-242 PNP 2N993	121-243 PNP 2N993	Same as Above	Same as Above	Same as Above	AmpereX

ZENITH RADIO CORP. CHASSIS 8KT40Z2 MODELS ROYAL 285-500E1



ALIGNMENT PROCEDURE

Operation	Input Signal Frequency	Connect Inner Conductor From Oscillator To	Set Dial At	Trimmers	Purpose	
1	455 KC	ONE TURN LOOSELY COUPLED TO THE ANTENNA	600 KC	Adj. T1, T2 T3 for Maximum output	For I.F. Alignment	
2	455 KC		600 KC	Adj. L2 for Minimum output	Tune Trap to IF Frequency	
3	1620 KC		Gang Wideopen	C1C	Set Oscillator To Dial Scale	
4	600 KC		Near 600	Adjust slug in T5	Adjust T5 for Maximum output while rocking gang. Tune T5 for Maximum output regardless of dial accuracy	
5	Repeat Steps 3 & 4					
6	1260 KC		1260 KC	C1A	Align Loop Antenna	



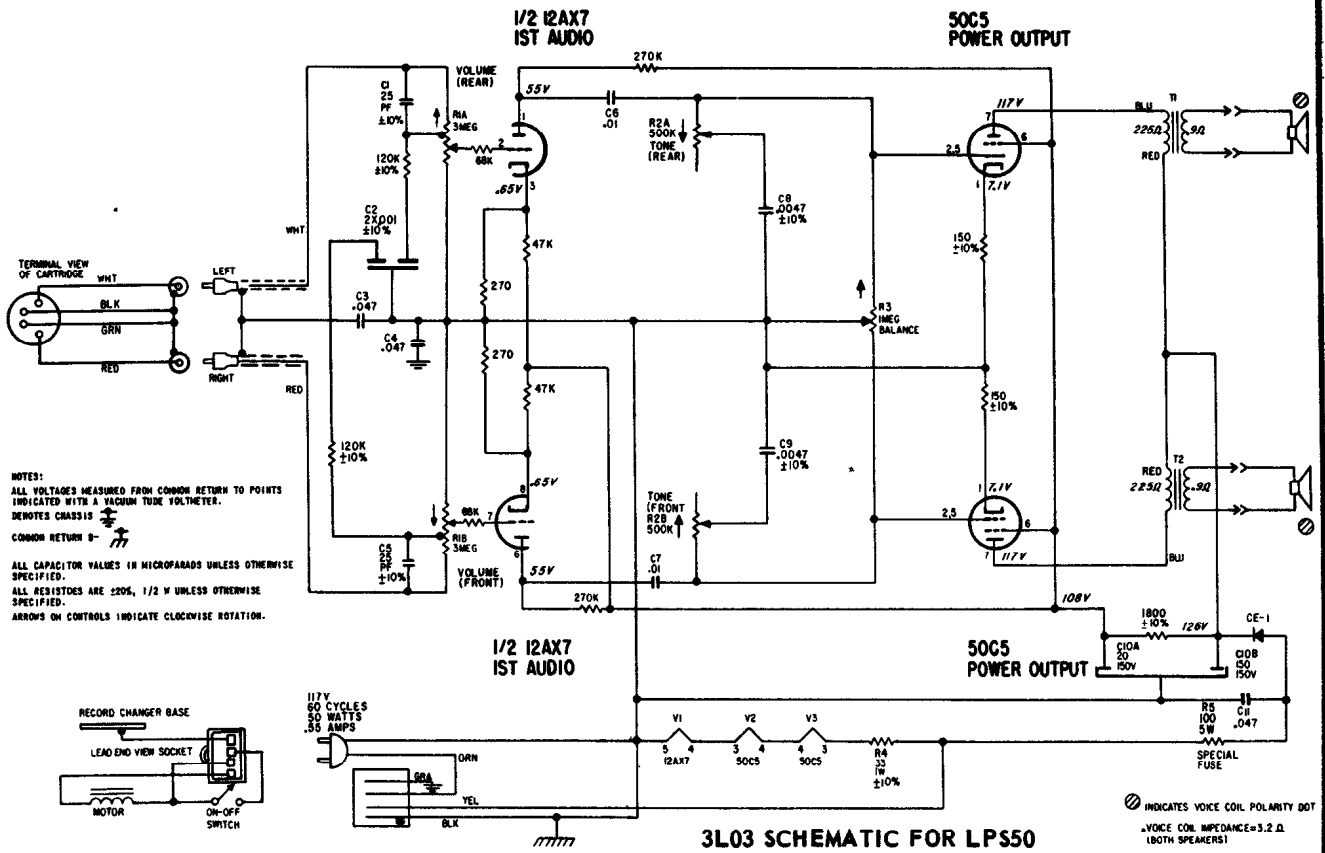
TRANSISTOR & TRIMMER LAYOUT

CHASSIS INFORMATION CHART

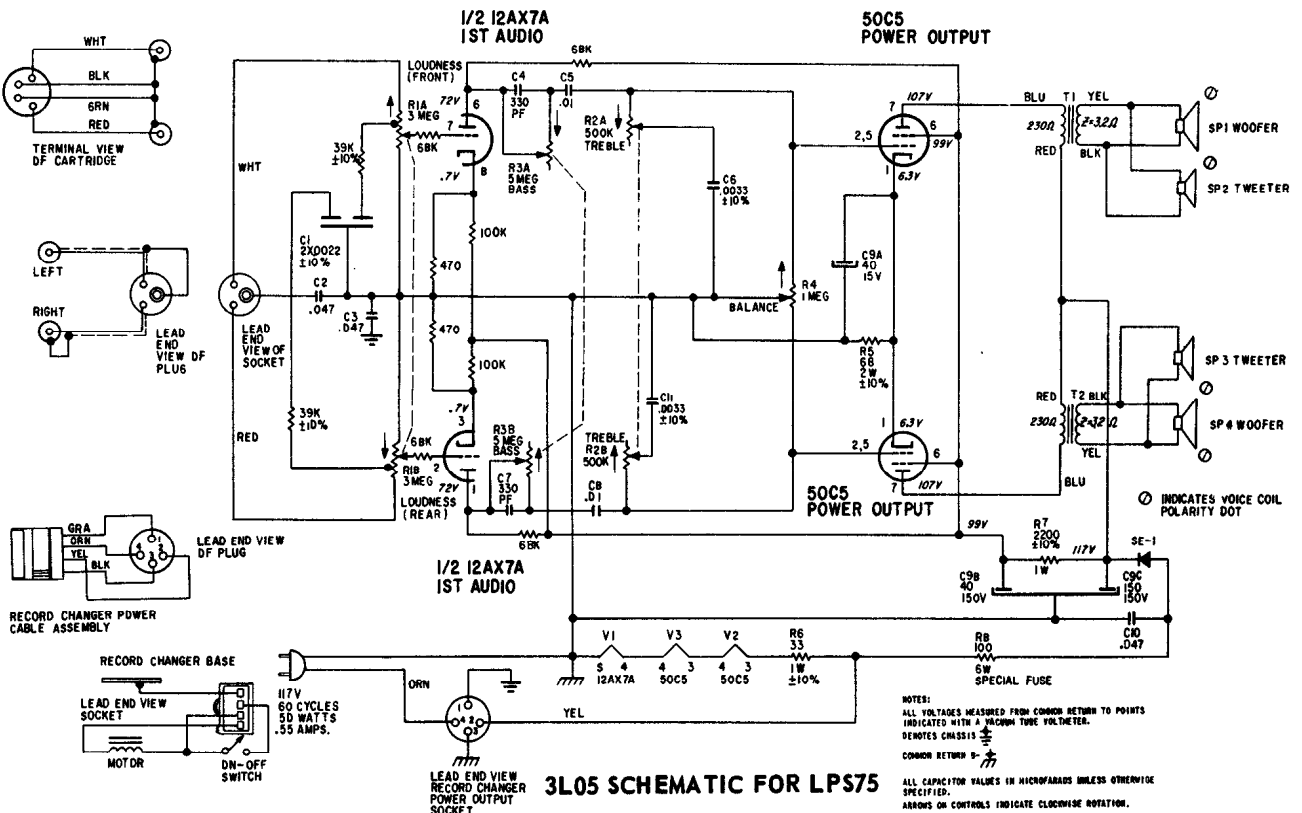
Chassis	Part No.	R.F.	Mixer	Osc.	1st I.F.	2nd I.F.	Crystal Diode Detector	Driver	Output-Output	Supplier
8KT40Z2	Zenith Type E.I.A.	121-256 PNP 2N1632	121-257 PNP 2N1526	121-258 PNP 2N1524	121-259 PNP 2N1524	121-260 PNP 2N1524	103-19 or 103-44	121-266 PNP 2N406	121-267 Pair PNP PNP 2N408	R.C.A.

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

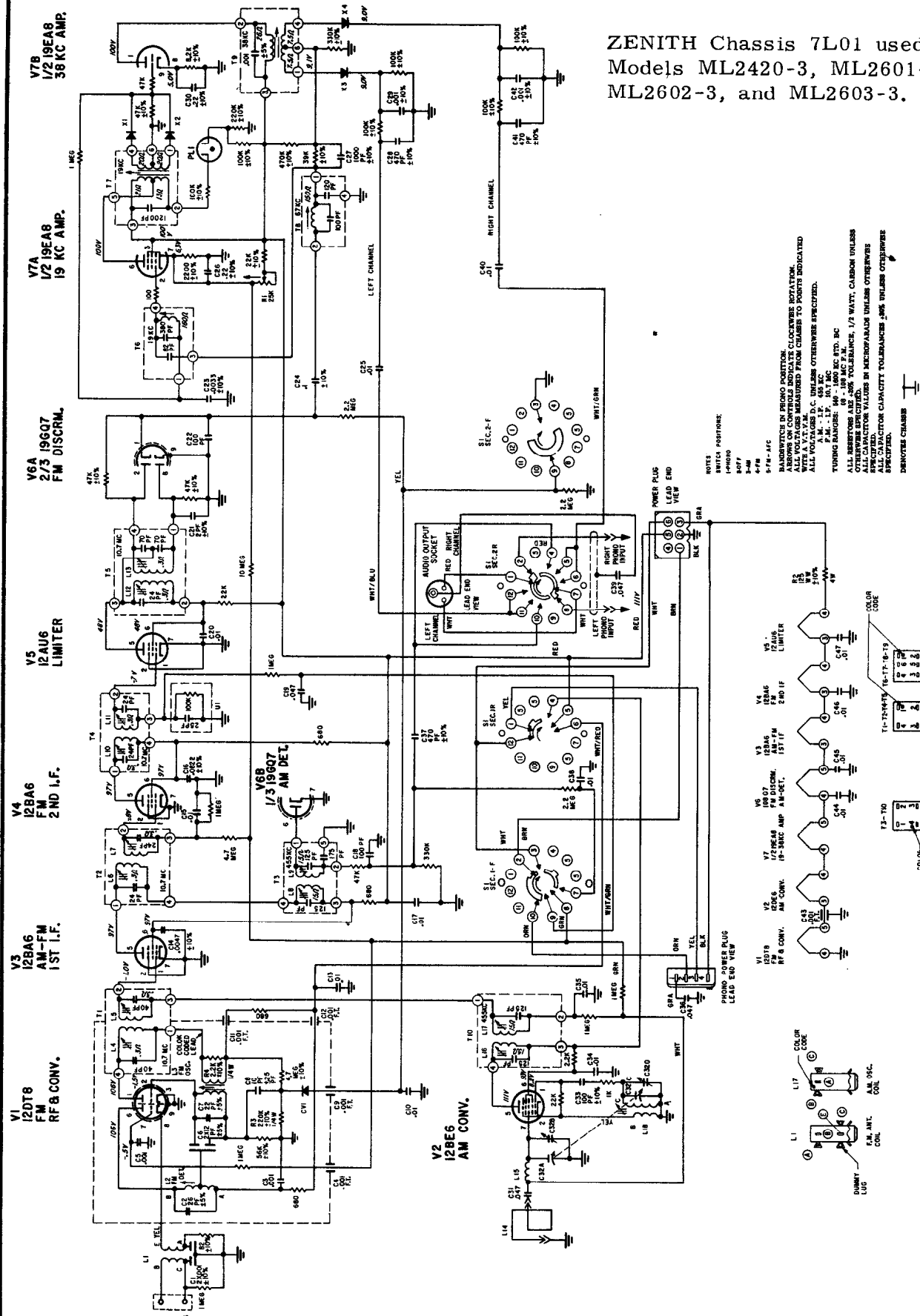
ZENITH Chassis 3L03, Model LPS50



ZENITH Chassis 3L05, Model LPS75



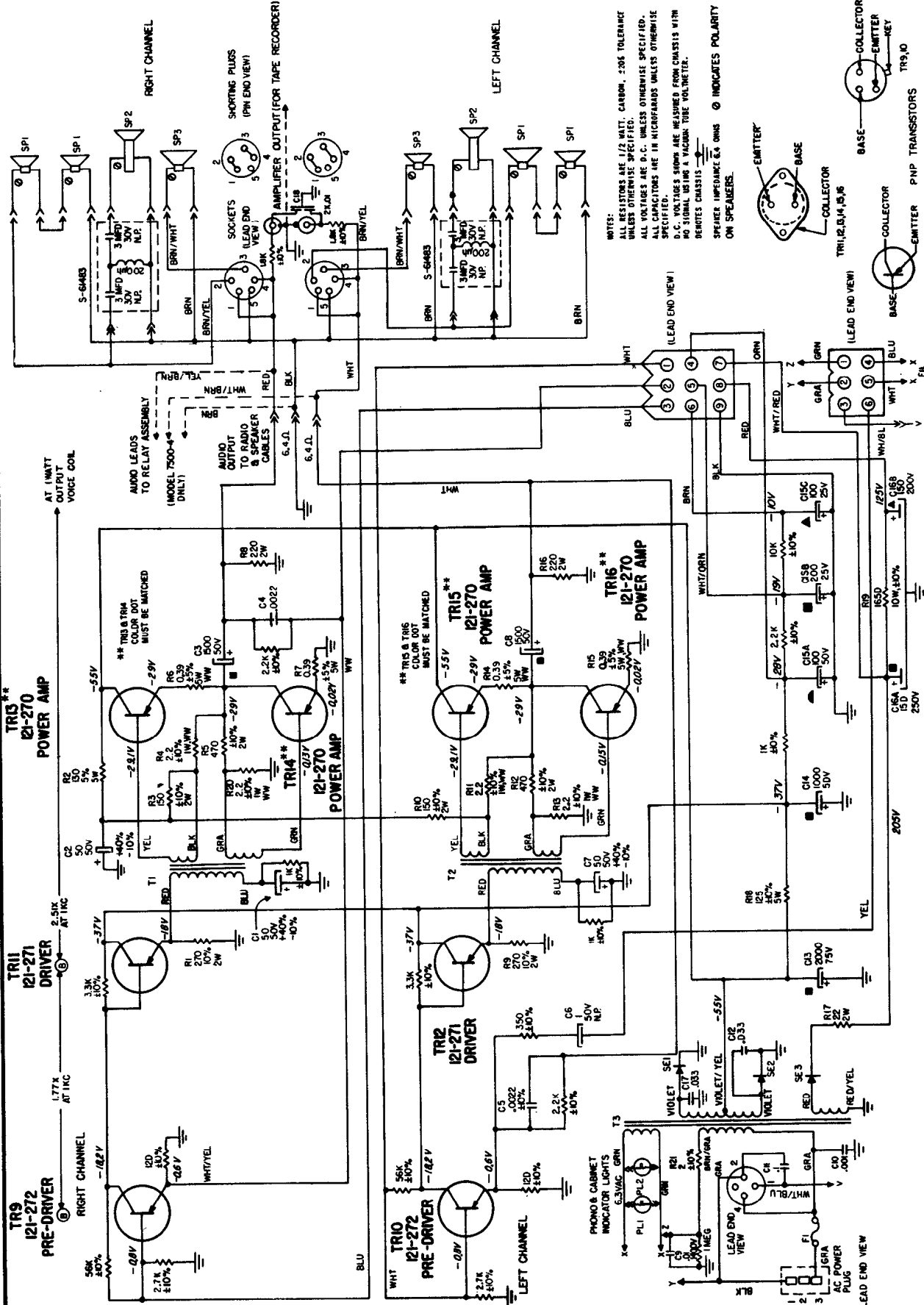
ZENITH Chassis 7L01 used in Models ML2420-3, ML2601-3, ML2602-3, and ML2603-3.



NOTES:
 SWITCH POSITIONS:
 1-19000
 2-500
 3-100
 4-100
 5-FM-AM
 6-FM-FC
 7-1000
 8-1000
 9-1000
 10-1000
 11-1000
 12-1000
 13-1000
 14-1000
 15-1000
 16-1000
 17-1000
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 98-1000
 99-1000
 100-1000

7L01 SCHEMATIC FOR MODELS ML2420-3, ML2601-3, ML2602-3 AND ML2603-3

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION



NOTES:
 ALL RESISTORS ARE 1/2 WATT, CARBON, 20% TOLERANCE UNLESS OTHERWISE SPECIFIED.
 ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
 ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
 D.C. VOLTAGE SUPPLY ARE MEASURED FROM CHASSIS WITH SPEAKER CHASSIS AT MAGNIFYING VOLTMETER.
 SPEAKER IMPEDANCE 8 & 16 OHMS ⊙ INDICATES POLARITY ON SPEAKERS.

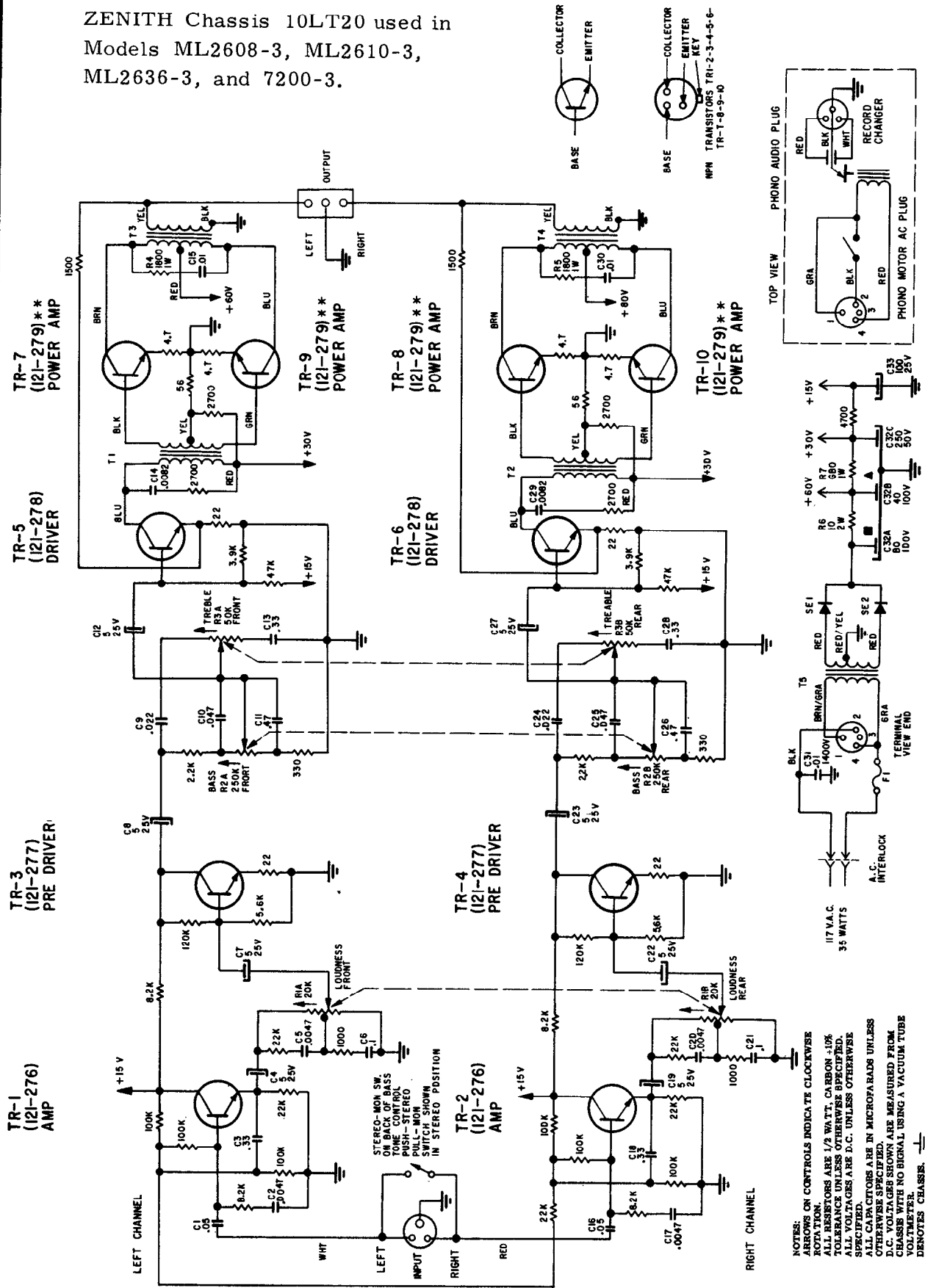
EMITTER
 BASE
 COLLECTOR

TR1,12,14,15,16
 BASE—EMITTER
 COLLECTOR—RET
 TR9,10
 BASE—EMITTER
 COLLECTOR—RET
 PNP TRANSISTORS

ZENITH 8L125Z SCHEMATIC FOR MODELS ML2670-3, ML2675-3, ML2685-3 AND 7500-3

VOLUME R-25, MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

ZENITH Chassis 10LT20 used in Models ML2608-3, ML2610-3, ML2636-3, and 7200-3.



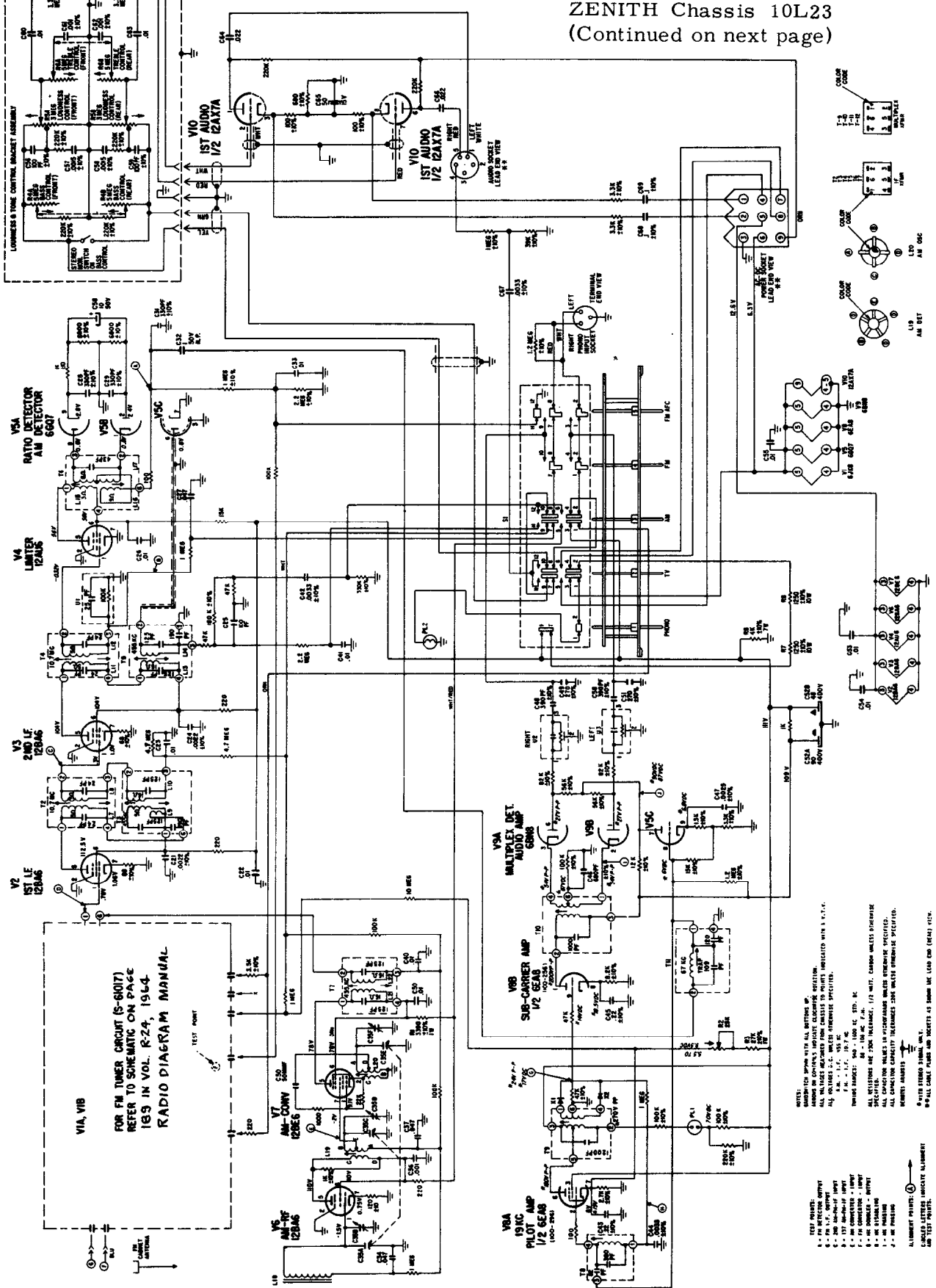
10LT20 SCHEMATIC FOR MODELS ML2608-3, ML2610-3, ML2636-3 AND 7200-3

NOTES:
 ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION.
 RESISTORS ARE 1/2 WATT, CARBON, 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.
 ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
 ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
 D.C. VOLTAGES SHOWN ARE MEASURED FROM CHASSIS WITH NO SIGNAL USING A VACUUM TUBE METER.
 DENOTES CHASSIS.

8 SPEAKER IMPEDANCE 8.4 OHMS.
 * * ALL 121-279 TRANSISTORS IN ANY ONE CHASSIS MUST HAVE THE SAME COLOR CODE.

MOST-OFTEN-NEEDED 1965 RADIO SERVICING INFORMATION

ZENITH Chassis 10L23
(Continued on next page)

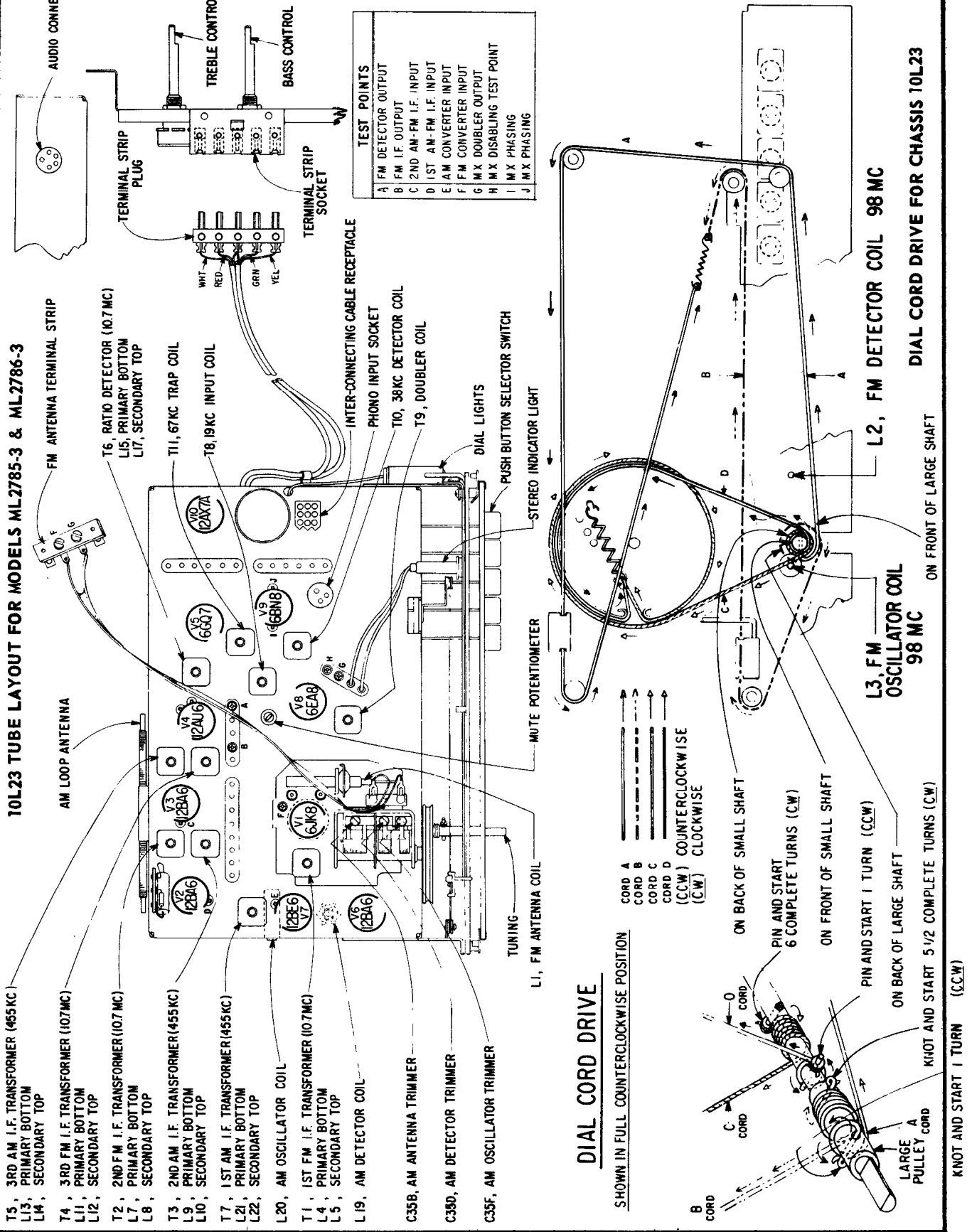


VIA, V1B
FOR FM TUNER CIRCUIT (S-8017)
REFER TO SCHEMATIC ON PAGE
183 IN VOL. R-24, 1964
RADIO DIAGRAM MANUAL

NOTES:
1. TEST POINTS:
A - 193C PILOT AMP
B - 193C PILOT AMP
C - 193C PILOT AMP
D - 193C PILOT AMP
E - 193C PILOT AMP
F - 193C PILOT AMP
G - 193C PILOT AMP
H - 193C PILOT AMP
I - 193C PILOT AMP
J - 193C PILOT AMP
K - 193C PILOT AMP
L - 193C PILOT AMP
M - 193C PILOT AMP
N - 193C PILOT AMP
O - 193C PILOT AMP
P - 193C PILOT AMP
Q - 193C PILOT AMP
R - 193C PILOT AMP
S - 193C PILOT AMP
T - 193C PILOT AMP
U - 193C PILOT AMP
V - 193C PILOT AMP
W - 193C PILOT AMP
X - 193C PILOT AMP
Y - 193C PILOT AMP
Z - 193C PILOT AMP

ZENITH 10L23 SCHEMATIC FOR MODELS ML2785-3 AND ML2786-3

ZENITH Chassis 10L23, Models ML2785-3 and ML2786-3, Continued



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<u>Admiral Corp.</u>		<u>Admiral, Cont.</u>		<u>Emerson, Cont.</u>		<u>Hitachi</u>		<u>Motorola, Cont.</u>	
2K1, A, B	9	Y3717	4	P-1938	23	TH-600	49	SKR148	79
3J2A	9	Y3720	4	P-1939	27	TH-812	50	SK150	79
3L2A, B	9	Y3727	4	P-1940	27	TH-848	52	SKR150	79
4A4	3	Y3729	4	P-1944	30	<u>Magnavox</u>		SK151	82
4C4	12	Y5009	9	P-1946	30	2AM-70	53	SKR151	82
5D6D	5	Y5017	9	120664, L	26	2ST686	57	SK152	82
5D6E	5	Y5027	9	120715	23	2ST687	57	SKR152	82
5D6F	5	Y5037	9	120716	23	2ST690	57	SK154	79
5E6	4	Y5097	9	120719	27	AM82	56	SKR154	79
5K6	5	Y6001	9	120720C	27	AM83	54	SKR155	82
5L6	5	Y6002	9	120724	23	R207	57	SKR156	82
5M6	5	Y6021	9	120726	30	A551	61	SKR157	82
6W3, A	6	Y6022	9	120745	31	A590	61	SKR158	82
8D3	12	Y8157	8	120747	32	<u>Montgomery</u>		SKR159	82
8K2-1N	7	Y8177	8	471538	32	<u>Ward</u>		SKR160	82
8K2-2N	7	Y8181	8			GEN-1250A	62	SK161	74
8K2-3N	7	Y8201	8	<u>Gamble-Skogmo</u>		GEN-1251A	62	SKR161	74
8N2	8	Y8202	8	60-9925A	34	GEN-1257A	63	SK162	74
12A2	10	Y8601	10	RA60-9930B	34	GEN-1802A	64	SKR162	74
Y701A	10	Y8615	10			GEN-1803A	64	SK163	77
PA731	10	Y8629	10	<u>General</u>		GEN-1804A	64	SKR163	77
TM731	10			<u>Electric</u>		GEN-1805A	64	SK164	79
PS751	10	<u>Arvin</u>		T7	48	GEN-1806A	64	SKR164	79
Y2411GP	7	13R07	13	TU222	45	<u>Motorola</u>		SK165	79
Y2413GP	7	13R08	13	T295	36	BC4	66	SKR165	79
Y2421GP	7	14R18	14	C403D	37	B7	65	SK166	74
Y2423GP	7	14R68	15	C505B	37	B8	65	SKR166	74
Y2441	7	15R75	16	C506B	37	B9	65	SKR167	74
Y3321A	5	64R29	18	C550A, B	40	B10	65	SK172A	88
Y3323A	5	64R38	17	C551A, B	40	BC11	66	SK173A	88
Y3381A	5	1.81001	14	C555A	36	BC12	66	PK175A	91
Y3383A	5	1.81501	15	A-600	35	A25	69	SK175A	88
Y3408	6	1.81601	17	P910AA	38	A26	70	PK176A	91
Y3411	6	1.82001	16	P911AA	38	A27	70	SK176A	88
Y3412	6	1.84701	18	P914AA	38	C38	70	PK177A	91
Y3503	3	1.86401	13	P920A	41	C39	70	SK177A	88
Y3508	3			P950A	38	SP53	73	PK178A	91
Y3509	3	<u>Bulova Watch</u>		P960A	38	SP54	73	SK178A	88
Y3513	5	430	20	P995A	38	PP80A	93	PK180A	92
Y3517	5	S-912	19	P996A	38	HK81	81	SK180A	84
Y3519	5			RP2020A, B	42	PT81A	93	SK181A	84
Y3523	5	<u>Delmonico</u>		RP2021	42	ST82A	88	PK182A	92
Y3528	5	120	21	RP2040A	43	PP90A	90	SK182A	84
Y3529	5	150	21	RP2041A	43	PP91A	90	PK183A	92
Y3543	5	FMS-411	22	RP2100	42	PP92A	90	SK183A	84
Y3554	5			RP2101	42	SKR120	72	PK190A	90
Y3557	5	<u>DuMent</u>		RP2108	42	SKR121	72	SK190A	84
Y3559	5	524	27	RP2140	43	SKR124	72	PK191A	90
Y3564	5	525	27	RP2142	43	SKR125	72	SK191A	84
Y3568	5	526	27	RP2143	43	SK135	78	SK192A	84
Y3569	5			RC4640A	44	SKR135	74	SK193A	84
Y3573	5	<u>Emerson Radio</u>		RC4641	44	SK136	74	SD194A	84
Y3577	5	31T01	32	RC4642	44	SKR136	74	SD195A	84
Y3579	5	32P01	31	RC4650A, B	44	SK145	77	SD196A	84
Y3703	4	32P02	31	RC4651	44	SKR145	77	HS-1128	72
Y3708	4	899	26	RC4652	44	SK147	79	HS-1130	73
Y3709	4	P-1925A	23	RC4660	44	SKR147	79	HS-1137	74
Y3710	4	P-1927	23	RC4661	44	SKR147	79	HS-1138	74
Y3714	4	P-1935	23	RC4662	44	SK148	79	HS-1141	79

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HS-1185 77	N-944 108	VFT-72W 136	SC515M,W 153	V-2524-2 169
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HS-1197 79	NT-1004 116	VFT-76W 136	SC526K 153	V-2526-1 170
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