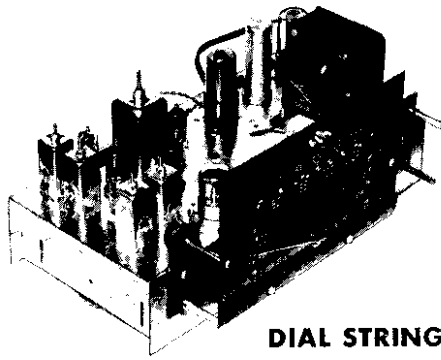
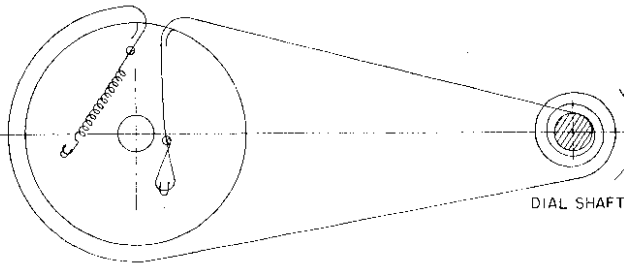


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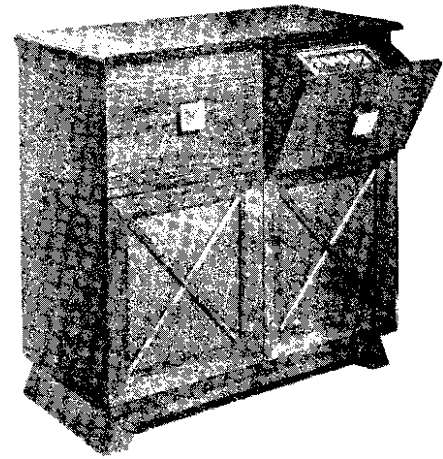


DIAL STRINGING

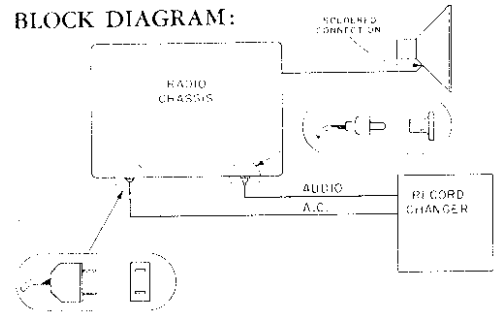


ELECTRICAL AND MECHANICAL DATA

Frequency Range ..... (AM) 535 KC to 1650 KC  
 (FM) 88 MC to 108 MC  
 Intermediate Frequency (AM) 455 KC, (FM) 10.7 MC  
 Power Supply ..... 117 volts AC, 60 cycles  
 Output Impedance ..... 3.2 ohms at 400 cycles  
 Power output (Undistorted) ..... 3.5 watts  
 Power output (Maximum) ..... 5 watts



BLOCK DIAGRAM:



Record Changer:

- One of the following:
- 78 R.P.M. Webster Model 148
- 78 R.P.M. Webster Model 149
- 78 and 33 1/3 R.P.M. Webster Model 246
- 78 and 33 1/3 R.P.M. V.M. Corporation Model 400-D-3

TUBE COMPLEMENT

1	7F8	FM Oscillator—Converter	1	6AL5	FM Detector
1	6BE6	AM Oscillator—Converter	1	6AT6	AM Detector—AVC
1	6BA6	AM-FM 1st IF Amplifier			1st Audio (AM-FM)
1	6BA6	FM 2nd IF Amplifier	1	6V6GT	Power Output
			1	5Y3GT	Rectifier

SOCKET VOLTAGES

Tube	Position	1	2	3	4	5	6	7	8	Band Switch
7F8	FM Osc.—Conv.	-2*	0	230	0	4	240	6.3 AC	0	FM
6BE6	AM Osc.—Conv.	-12*	0	0	6.3 AC	230	120	0	—	AM
6BA6	FM-AM IF	-0.8*	0	0	6.3 AC	230	95	1	—	FM
6BA6	FM 2nd IF	0	0	0	6.3 AC	230	85	1	—	FM, AM
6AT6	AM Det.- 1st AF	-1.5*	0	0	6.3 AC	-2.7*	0	100	—	AM
6AL5	FM Disc.	0	-1*	0	6.3 AC	-0.5*	NC	-0.5*	—	FM
6V6GT	AF Output	0	0	280	250	0	NC	6.3 AC	14	FM, AM
5Y3GT	Rect.	—	5V AC to pin 8	NC	260 AC	NC	260 AC	NC	300	FM, AM

All voltages measured to chassis unless otherwise noted.  
 DC voltages measured with 20,000 ohm/volt meter.  
 All voltages DC unless otherwise noted.

All measurements made with no signal input to receiver.  
 \* Must be measured with VTVM with 100,000 ohm composition resistor in series with probe.

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**ALIGNMENT PROCEDURE**

**NOTES**

- 1—Before beginning alignment, the pointer must be set at the highest mark on the dial with the tuning condenser fully open.
- 2—The AM section should be completely aligned before beginning the FM alignment.
- 3—The set should be allowed to warm up 15 minutes before aligning.
- 4—An output meter should be connected across the speaker voice coil for AM alignment. Keep the volume control at maximum on AM and use as low a signal input as possible for AM and FM.
- 5—For AM and FM tracking, bend plates of the variable (RF Section) as required.
- 6—In FM alignment, care must be taken to set the receiver oscillator frequency 10.7 MC *above* the incoming signal frequency.
- 7—The dummy antenna for FM alignment is two 150 ohm composition resistors; one in series with each generator lead.

**ALIGNMENT CHART**

STEP NO.	BAND SWITCH POSITION	SIGNAL GENERATOR	CONNECTION TO RECEIVER	DUMMY ANTENNA	DIAL SETTING	ADJUST	REMARKS
1	AM	455 KC Mod.	6BE6 Conv. Grid Pin 7	0.1 mfd	1600 KC	T2 Pri., Sec., T4 Pri., Sec.	Adjust for Max. output
2	AM	1600 KC Mod.	Ext. Antenna Clip	0.1 mfd	1600 KC	C19 BC Osc. Trimmer	Adjust for Max. output
3	AM	1400 KC Mod.	Ext. Antenna Clip	0.1 mfd	1400 KC	C4 BC RF Trimmer	Adjust for Max. output
4	AM	600 KC Mod.	Ext. Antenna Clip	0.1 mfd	600 KC	See Note 5	See Note 5
5	FM	10.7 MC CW	FM Ant. Terminals	0.1 mfd	107 MC	T1 Pri. & Sec., T3 Pri. & Sec.; T5 Pri. only	Tune for Max. reading, VTVM from point A to chassis. See Ratio Detector Alignment.
6	FM	10.7 MC CW	FM Ant. Terminals	0.1 mfd	107 MC	T5 Sec.	Tune for Zero reading, VTVM from resistor junction to point C. See Ratio Detector Alignment
7	FM	107 MC CW	FM Ant. Terminals	300 ohms See Note 7	107 MC	C6 FM Osc. Trimmer	Adjust for Max. with VTVM from point A to chassis. See Note 6.
8	FM	107 MC CW	FM Ant. Terminals	300 ohms	107 MC	C9 FM RF Trimmer	Adjust for Max. with VTVM from Point A to chassis.
9	FM	98 MC CW	FM Ant. Terminals	300 ohms	98 MC	See Note 5	Adjust for Max. with VTVM from Point A to chassis.
10	FM	88 MC CW	FM Ant. Terminals	300 ohms	88 MC	See Note 5	Adjust for Max. with VTVM from Point A to chassis.

**RATIO DETECTOR ALIGNMENT**

(T1 and T3 should be tuned before tuning T5.)

**TUNING T5 PRIMARY**

Locate the ratio detector test points A, B, and C on the schematic diagram. Solder two 100,000 ohm composition resistors in series from point "A" to chassis. Connect a VTVM from point "A" to chassis and feed 10.7 MC CW into the FM antenna terminals. Adjust T5 primary (bottom slug) for maximum reading, setting the generator output to give about one volt meter reading. (An insulated aligning tool should be used for this adjustment.)

**TUNING T5 SECONDARY**

Connect the VTVM probe to point "C" and the VTVM common or ground lead to the junction

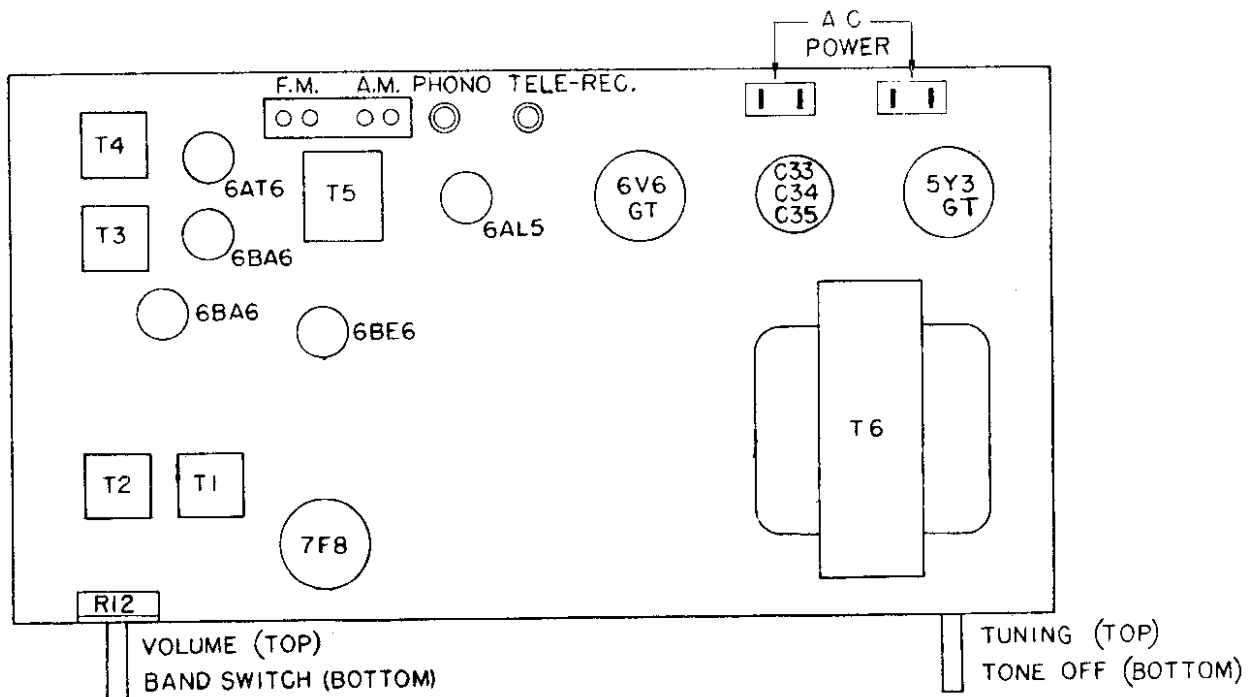
of the two 100,000 ohm resistors. Tune T5 secondary until the meter reading reverses polarity. Set the slug at this zero point.

**CHECKING BAND WIDTH**

Connect the signal generator to the grid of the 2nd FM IF tube. Set the generator to 100,000 microvolts at 10.7 MC CW. Shift the generator frequency above and below 10.7 MC and record the frequencies at which the maximum positive and negative meter readings are obtained. The difference between these two readings is the bandwidth of the ratio detector and should be 250 to 300 KC.

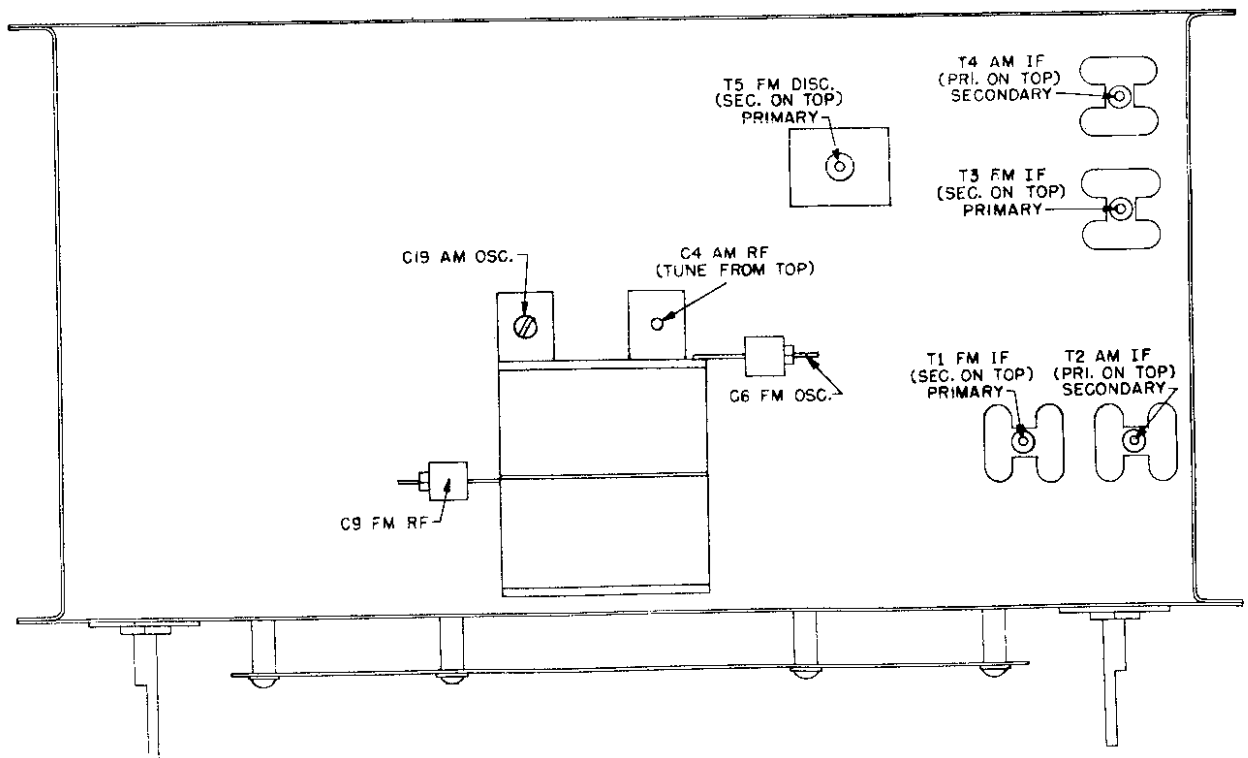
Remove the two 100,000 ohm resistors before beginning the FM RF alignment.

TUBE AND TRIMMER LOCATIONS



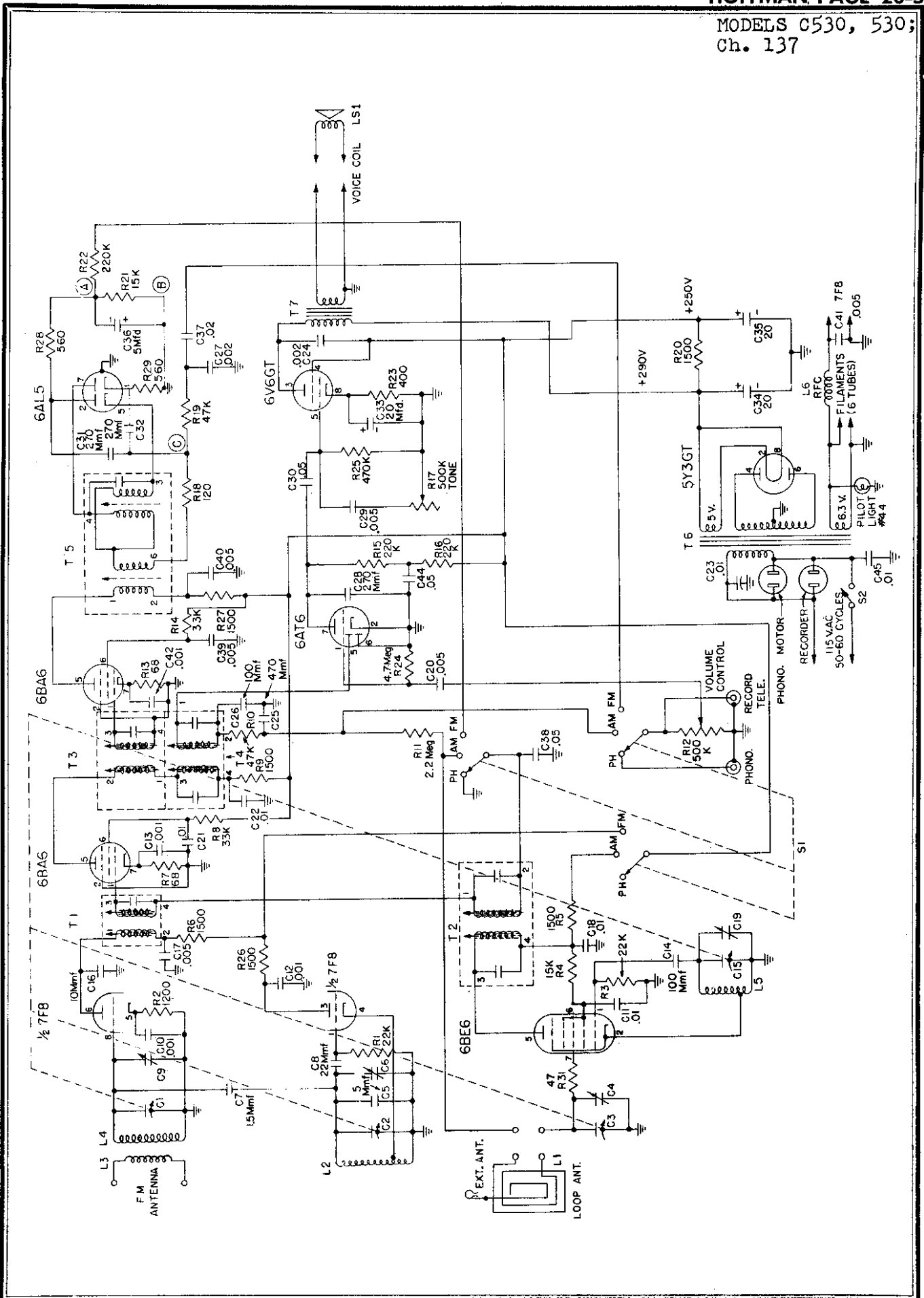
TOP VIEW OF CHASSIS

TUBE LOCATION



TRIMMER LOCATION—BOTTOM VIEW





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CHASSIS 137 PARTS LIST

Symbol	Description	Hoffman Part Nos.
C1, C2, C3, C15	4 Section Variable	4410
C4, C19	Trimmer (AM Section)	4313
C5	5 Mmf ±10% Ceramic N750	4028
C6, C9	Trimmer (FM Section)	4318
C7	1.5 Mmf ±10% Mica	4024
C8	22 Mmf ±10% Ceramic N150	4021
C10, C12, C13, C42	1000 Mmf Ceramic Hi-K	4025
C11, C18, C21, C22, C23	.01 Mfd 400V Paper	4112
C14, C26	100 Mmf ±20% Mica	4000
C16	10 Mmf ±10% Ceramic	4027
C17, C20, C39, C40, C41	5000 Mmf Ceramic Hi-K	4029
C24, C27	.002 Mfd 600V Paper	4118
C25	470 Mmf ±20% Mica	4003
C28, C31, C32	270 Mmf ±20% Mica	4001
C29	.005 Mfd 600V Paper	4102
C30, C44	.05 Mfd 400V Paper	4101
C33	20 Mfd 25V Electrolytic }	4200
C34, C35	20 Mfd 450V Electrolytic }	4209
C36	5 Mfd 50V Electrolytic	4106
C37	.02 Mfd 400V Paper	4100
C38	.05 Mfd 200V Paper	4501
R1, R3	22,000 Ohm ±20% 1/2W Carbon	4553
R2	1200 Ohm ±10% 1/2W Carbon	4539
R4	15,000 Ohm ±20% 1W Carbon	4534
R5, R6, R9, R26, R27	1500 Ohm ±20% 1/2W Carbon	4524
R7, R13	68 Ohm ±20% 1/2W Carbon	4556
R8, R14	33,000 Ohm ±20% 1W Carbon	4504
R10, R19	47,000 Ohm ±20% 1/2W Carbon	4502
R11	2.2 Meg ±20% 1/2W Carbon	4804
R12	.5 Meg Pot. (Volume Control)	4500
R15, R16, R22	.22 Meg ±20% 1/2W Carbon	4812
R17	.5 Meg Pot. W/switch (Tone Control)	4546
R18	120 Ohm ±10% 1/2W Carbon	4701
R20	1500 Ohm (W.W.) ±5% 6 1/2W	4521
R21	15,000 Ohm ±20% 1/2W Carbon	4587
R23	400 Ohm ±10% 1W Carbon	4544
R24	4.7 Meg ±20% 1/2W Carbon	4506
R25	.47 Meg ±20% 1/2W Carbon	4507
R28, R29	560 Ohm ±10% 1/2W Carbon	5279
L1	Loop Antenna (AM)	5247
L2	Oscillator Coil (FM)	5258
L3	Antenna Primary (FM)	5248
L4	Antenna Secondary (FM)	5282
L5	Oscillator Coil (AM)	5266
L6	Filament Choke	5284
T1	1st FM IF Transformer	5286
T2	1st AM IF Transformer	5285
T3	2nd FM IF Transformer	5287
T4	2nd AM IF Transformer	5288
T5	Ratio Detector Transformer	5012
T6	Power Transformer	5122
T7	Output Transformer	6002
S1	Band Switch	2217A
S2	On-Off Switch (Part of R17)	3514
	Dial	3510
	Knob, Indicator (Specify Color)	6203
	Knob, Plain (Specify Color)	518
	Plug, Phono	6105
	Pointer, Dial	6118
	Socket, Loctal	6103
	Socket, Miniature	6121
	Socket, Octal	6110
	Socket, Phono	6108
	Socket, Pilot Lamp	9507
	Socket, AC Power	424
	Spring, Dial Cable	
	Strip, Antenna Terminal	

NOTE: In some cases the following substitutions have been made:

- C24 is two .001 Mfd 600V in parallel.
- C27 is two .001 Mfd 600V in parallel.
- C42 is 1050 Mmf ±5% Mica.
- R8 and R14 are each 47,000 ohm ±20% 1 Watt.
- R23 is two 820 ohm ±10% 1/2 Watt in parallel.