

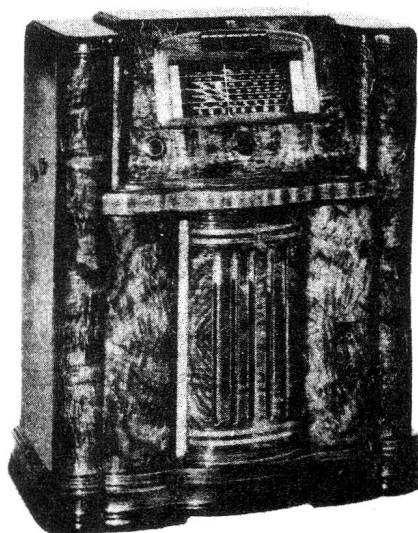


RCA Victor

MODEL A-33

Twelve-Tube, Seven-Band Superheterodyne TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical and Mechanical Specifications

FREQUENCY RANGES

("A" Band)540-1,720 kc (555-174m)
 ("B" Band)3.1-9.5 mc (97.5-31.5 m)
 31 Meter Spread Band9.45-11.8 mc (31.8-25.4 m)
 25 Meter Spread Band11.65-15-2 mc (25.6-19.9m)
 19 Meter Spread Band15.1-17.75 mc (19.9-16.9 m)
 16 Meter Spread Band17.73-18.5 mc (16.9-16.2 m)
 13 Meter Spread Band21.45-22.5 mc (13.95-13.3)

INTERMEDIATE FREQUENCY 455 kc

TUBE COMPLEMENT

(1) Type-6SK7 R-F Amplifier
 (2) Type-6SA7 Oscillator
 (3) Type-6SA7 1st Detector
 (4) Type-6B8-G A.V.C. Amplifier
 (5) Type-6U5/6G5 Tuning Indicator
 (6) Type-6SK7 1st I-F Amplifier
 (7) Type-6SK7 2nd I-F Amplifier
 (8) Type-6R7 ..2nd Detector and 2nd A-F Amplifier
 (9) Type-6SK7 1st Audio Amplifier
 (10) Type-6AD7-G ..Phase Inverter and Power Output
 (11) Type-6F6-G Power Output
 (12) Type-5U4-G Rectifier

PILOT LAMPS10 Type #51 6-8 volts, 0.2 amps.

POWER SUPPLY RATING

105-125 volts, 50-60 cycles 125 watts
 105-125 volts, 25-60 cycles 125 watts

POWER OUTPUT RATING

Undistorted 10 watts
 Maximum 12 watts

LOUDSPEAKER

Type-CRL-522-112 inch Electrodynamic
 Voice Coil Impedance11.5 ohms at 400 cycles

Height Width Depth

Cabinet Dimensions (inches)403217½
 Weight 120 lbs. (net) 135 lbs.. (shipping)
 Tuning Drive Ratio 25 to 1

General Description

Model A33 is a twelve tube, seven band superheterodyne receiver that uses a Magic Eye tube for tuning indications. Features of design include: Selectivity control, spread bands for short wave reception, magnetite core I-F and oscillator coils, temperature compensated circuits, one R-F and 2 I-F amplifier stages, separate A. V. C. amplifier stage, plug in phonograph connection and radio-phonos switch, speech-music switch with continuously variable bass-treble tone control, air core trimming capacitors. Rotatable shielded loop antenna and push button tuning for eight stations.

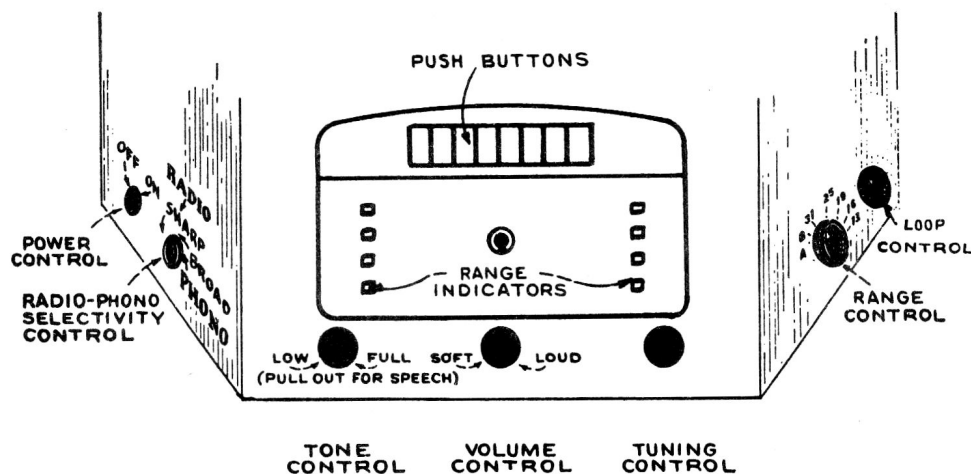


Figure 2—Controls

Circuit Arrangement

This receiver consists of a seven band twelve tube superheterodyne circuit. A single RF stage incorporates a loop as a first tuned stage, separate 1st detector and oscillator tubes with temperature compensated circuits reduce spreadband oscillator drift. Two stages of variable width intermediate frequency and additional I.F. amplification for the separate A.V.C.

stage. These are adjusted to resonance by moulded magnetite iron cores. A second detector tube and a 1st audio tube with an inverter stage operate the push pull pentode output.

Push button tuning of standard broadcast stations is provided by individual oscillator coils.

Radiotron Socket Voltages

Tube	Circuit	Plate	Screen Grid	Control Grid	Heater
6SK7	R.F.	230	100		6.4
6SA7	1st Det.	230	100		6.4
6SA7	Osc.	100	100		6.4
6SK7	1st I.F.	252	100		6.4
6B8G	AVC.-I.F.	230	*		6.4
6U5 - 6G5	Tuning indicator	*	*		6.4
6SK7	2nd I.F.	252	100		6.4
6SK7	1st A.F.	*110	*30		6.4
6R7	2nd Det. A.F.	*60	—		6.4
6AD7G	Inverter Output	357	275	22	6.4
6F6G	Output	357	275	22	6.4
5U4G	Rectifier	380	Volts D.C. across C82		5

*Can only be measured with high resistance voltmeter.

Note—All the above values hold within plus or minus 20% when measured with a 1000 ohm-per-volt meter, on a line voltage of 117 volts. All voltages are measured to chassis.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid the a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dials are fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 30° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that

it points to the "0°" mark on the calibration scale when the plates are fully meshed.

Spread-Band Alignment. —The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each band so that these stations come in at the correct points on the dial.

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations by known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

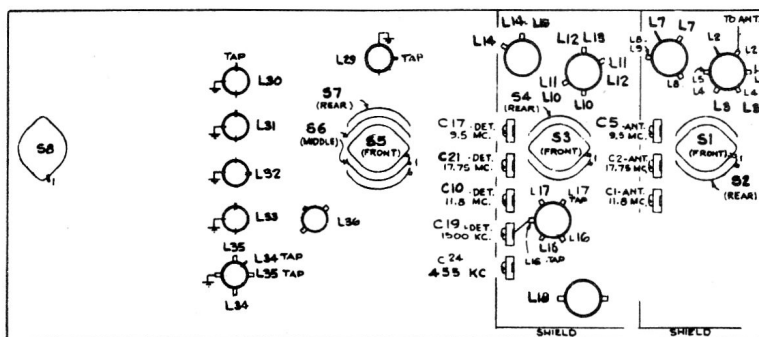


Figure 3—Coil and Trimmer Locations (Bottom View)

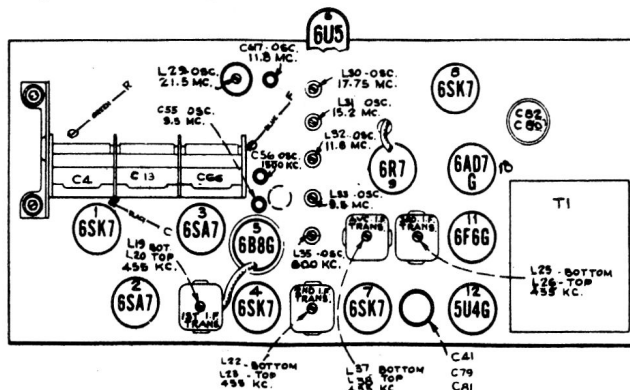


Figure 4—Tube and Trimmer Locations (Top View)

Pointer should be adjusted to coincide with lowest division mark on dial scale if any adjustments are made with chassis in cabinet.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Output
	Connection to Receiver	Dummy Antenna	Frequency Settings					
1	Turn selectivity control maximum counterclockwise for maximum selectivity.							
2	6SK7 2nd I.F. Grid	.01 Mfd.	455 kc	"A"	No Signal 550-750 kc	3rd I.F. Transformer	L25 & L26	Maximum
3	6SK7 1st I.F. Grid	.01 Mfd.	455 kc	"A"	No Signal 550-750 kc	2nd I.F. Transformer	L22 & L23	Maximum
4	6SA7 1st Det. Grid	.01 Mfd.	455 kc	"A"	No Signal 550-750 kc	1st I.F. Transformer	L19 & L20	Maximum
5	With selectivity control in BROAD position retouch L25 and L26 for selectivity curve 2.							
5A	With selectivity control in SHARP position see that curve 1 has not changed appreciably.							
6	6SA7 1st Det. Grid	.01 Mfd.	455 kc	"A"	No Signal 550-750 kc	A.V.C. I.F. Transformer	L37 & L38 *	Maximum
7	Green lead on Loop Socket	300 Ohms	455 kc	P.B. Position	No Signal 550-750 kc	I.F. Trap	C-24	Minimum
8	Green lead on Loop Socket	300 Ohms	1400 kc	"A"	1400 kc (152°)	H.F. Osc.	C-56	Maximum
9	Green lead on Loop Socket	300 Ohms	600 kc	"A"	600 kc (28°)	L.F. Osc.	L-35	Maximum
10	Green lead on Loop Socket	300 Ohms	1400 kc	"A"	1400 kc (152°)	Det.	C-19	Maximum
11	Radiation Loop**	300 Ohms	1400 kc	"A"	1400 kc (152°)	Loop	C-9 (On Loop)	Maximum
12	Antenna Terminal	300 Ohms	9.55 mc	31 M Band	9.55 mc (36°)	*** (Osc.) Det. Ant.	L33, C-17, C5	Maximum
13	Antenna Terminal	300 Ohms	11.8 mc	31 M Band	11.8 mc (169°)	*** (Osc.)	C-67	Maximum
14	Repeat operation 12 and 13 until correct on dial							
15	Antenna Terminal	300 Ohms	9.55 mc	"B" Band	9.55 mc (173°)	*** (Osc.)	C-55	Maximum
16	Antenna Terminal	300 Ohms	11.8 mc	25 M Band	11.8 mc (36°)	*** (Osc.) Det. Ant.	L32, C10, C1	Maximum
17	Antenna Terminal	300 Ohms	15.2 mc	19 M Band	15.2 mc (37°)	*** (Osc.)	L31	Maximum
18	Antenna Terminal	300 Ohms	17.75 mc	16 M Band	17.75 mc (28°)	**** (Osc.) Det. Ant.	L30, C21, C2	Maximum
19	Antenna Terminal	300 Ohms	21.5 mc	13 M Band	21.5 mc (59°)	**** (Osc.)	L29	Maximum

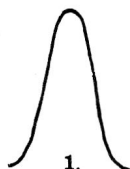
* Connect oscilloscope to lug C of A.V.C. transformer.

** Radiation loop comprising two turns of wire 18 inches in diameter should be placed 4 feet from receiver loop before aligning C-9.

*** Use minimum capacity or inductance peak.

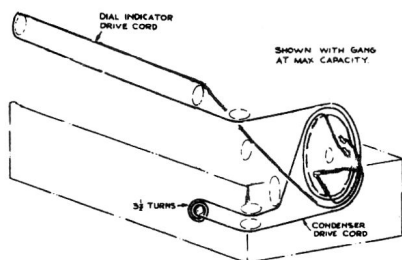
**** Use maximum inductance peak.

NOTE: Oscillator tracks above all signals except on 16 and 13 meter bands.

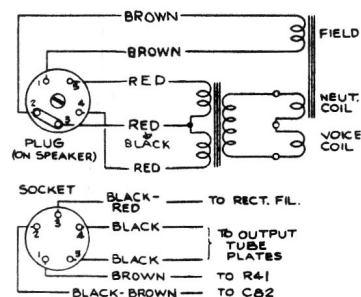


I.F. Selectivity Curves
At Left—"Sharp"
At Right—"Broad"





Drive Cord Diagram



Speaker Connections

PRECAUTIONARY LEAD DRESS:—

All oscillator leads should be kept as short as possible.

Both yellow leads in the antenna switch section must be dressed towards the lug end and away from the coil windings, and also held to length.

Both yellow leads to adjacent lugs on detector coil must be dressed towards lug end and away from the coil windings, and also held to length.

Lead from No. 4 on S-8 must be dressed along the chassis away from all heater leads.

Lead from No. 5 on S8: well away from all heater leads.

The diode lead and the ground lead from the third I-F must be twisted.

The diode lead and the ground lead from A.V.C. I-F transformer must be twisted.

The lead on No. 9 of S8 should be away from the volume control and first audio tube.

Enamel leads from the oscillator coil nearest the rear apron must bear tightly against each other.

The oscillator grid coupling condenser must bear tightly against the styrol; the sprayed mica must likewise bear on the styrol from the opposite side.

The long ground lead from the oscillator heater must be kept away from all condensers, resistors, and leads to R-F tubes.

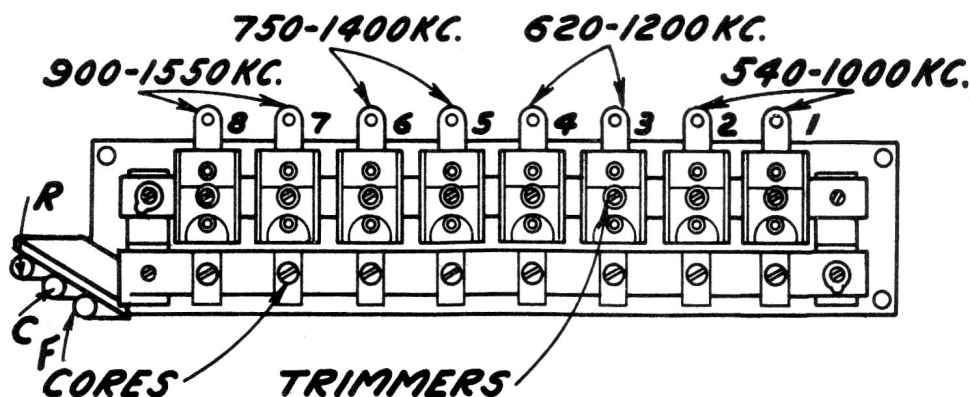


Fig. 5

Push Button Adjustment

The push buttons may be adjusted for any eight stations on the "A" band. The preferable arrangement is to adjust for stations in order of frequency.

Proceed as follows:—

(1) Turn "Range selector" to "A" position and manually tune in the first station, say 560 k.c.

(2) Turn "Range selector" to "P.B." position, press button No. 1 located first from left on front panel.

(3) Referring to Figure 5, adjust core and padder No. 1 for a peak at 560 k.c. This adjustment can be made with the assistance of the "Magic Eye".

(4) Proceed to adjust the other seven stations in order of frequency, as outlined above.

When a station is inaudible due to reception conditions a test oscillator should be substituted for the station signal.

REPLACEMENT PARTS FOR MODEL A-33

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
RECEIVER ASSEMBLIES			
35966	Board-Antenna-Ground board.....	36617	Coil-Oscillator Coil 13M band(L29)
12714	Capacitor-Air trimmer 2-12 mmfd. (C55,C56,C67).....	34652	Coil-R.F. coil A band (L16,L17)...
S-3045	Capacitor-Mica trimmer bank com- prising 3 capacitors of 3-30 mmfd. (C1,C2,C5).....	34650	Coil-R.F. coil B & 31M band (L14,L15).....
S-3046	Capacitor-Mica trimmer bank com- prising 5 capacitors of 2,2-20, 2, 5-50, 1, 3-30 (C10,C17,C19,C21, C24).....	34651	Coil-R.F. coil 25,19,16,13M band (L10,L11,L12,L13).....
35646	Capacitor-6 mmf (C54).....	34645	Condenser-Variable tuning con- denser (C4,C13,C66).....
33381	Capacitor-8.2 mmf (Ceramic)(C68)...	S-3014	Control-Tone Control (R24).....
13200	Capacitor-10 mmf (Silvered mica) (C23,C60).....	S-3006	Control-Volume control (R16).....
13002	Capacitor-12 mmf (Silvered mica) (C65).....	S-3027	Cord-Drive cord 27-5/8".....
33380	Capacitor-12 mmf (Ceramic)	S-3028	Cord-Drive cord 59- 1/2".....
12896	Capacitor-15 mmf (C57).....	31259	Core-Core & Stud for Oscillator Coil.....
31707	Capacitor-24 mmf (C20).....	35627	Drum-Drive drum.....
12948	Capacitor 33 mmf (C49).....	S-3015	Indicator-Station selector indicator
13141	Capacitor-47 mmf (Silvered mica)	11765	Lamp-Dial lamp Mazda #51.....
33102	Capacitor-47 mmf (Ceramic) (C11,C14).....	12493	Plug-5 contact female plug for speaker cable or band indicator cable
12723	Capacitor-56 mmf (Silvered mica) (C64).....	12567	Plug-5 contact plug for band indicator cable (male).....
36843	Capacitor-56 mmf (Ceramic) (C6,C16).....	36627	Pulley-Drive cord pulley 7/8".....
12813	Capacitor-82 mmf (C40).....	36618	Resistor-Voltage divider comprising one section of 3,450 ohms, one section of 3,900 ohms, one section of 22 ohms and one section of 135 ohms (R41,R42,R43,R44).....
12720	Capacitor-100 mmf (C36).....	36842	Resistor-5 ohm 1 watt (R34).....
12724	Capacitor-120 mmf (C25,C69).....	30152	Resistor-1000 ohm, 1/2 watt (R9)...
12694	Capacitor-220 mmf (C7,C12,C35,C75)...	30654	Resistor-1500 ohm, 1/2 watt (R7)...
13894	Capacitor-390 mmf (C18,C22).....	34767	Resistor-2200 ohm, 1/2 watt.....
33235	Capacitor-580 mmf (Silvered mica) (C58).....	30146	Resistor-4700 ohm, 1/4 watt (R3)...
36174	Capacitor-680 mmf (Silvered mica) (C59).....	30128	Resistor-12000 ohm, 1/4 watt (R17)...
30057	Capacitor-2700 mmf (C62).....	36714	Resistor-15000 ohm, 1/2 watt (R25)...
13895	Capacitor-5600 mmf (C61).....	13998	Resistor-22000 ohm, 1/4 watt(R5,
5005	Capacitor-.0035 mfd (C42,C91).....	12454	Resistor-33000 ohm, 1/4 watt(R29)...
33584	Capacitor-.005 mfd (C47,C52).....	30787	Resistor-47000 ohm, 1/2 watt(R20)...
4937	Capacitor-.01 mfd (C39,C48,C53,C71)...	13715	Resistor-68000 ohms, 1/4 watt(R14)...
4870	Capacitor-.025 mfd (C50,C51).....	14138	Resistor-68000 ohm, 1/2 watt (R22).....
32787	Capacitor-.05 mfd (C26,C27,C28, C43,C44,C45,C46,C72,C76,C77).....	14560	Resistor-100000 ohm, 1/4 watt (R4,R8,R10,R18,R28,R40).....
4839	Capacitor-.1 mfd. (C37,C70,C78)....	3252	Resistor-100000 ohm, 1/2 watt(R31)...
36623	Capacitor-Electrolytic comprising 1 section of 30 mfd 350 volts, 1 section of 5. mfd 350 volts, and 1 section of 20 mfd 250 volts (C81, C41, C79).....	13734	Resistor-120000 ohm, 1/4 watt(R13, R36).....
35016	Capacitor-Electrolytic comprising one section of 40 mfd 450 volts and one section of 100 mfd 25 volts (C82, C80).....	14583	Resistor-220000 ohm, 1/2 watt(R21, R27).....
S-3022	Coil-Oscillator Coil for P.B. but not on P.B. assembly (L36).....	14983	Resistor-330000 1/4 watt(R26, R32,R33).....
S-3024	Coil-I.F. trap coil.....(L18)...	30784	Resistor-330000 ohm, 1/2 watt(R19)...
34647	Coil-Antenna Coil "B" and 31M band (L7,L8,L9).....	12285	Resistor-470000 ohm, 1/4 watt(R12, R23,R39).....
36629	Coil-Antenna coil 25,19,16,13 M band (L2,L3,L4,L5,L6).....	13730	Resistor-1 megohm, 1/4 watt(R1, R37,R38).....
36632	Coil-Oscillator coil "A" & "B" band (L34,L35).....	12679	Resistor-2.2 megohm, 1/4 watt(R2, R11,R15,R30,R35).....
36635	Coil-Oscillator Coil 31M band(L33)...	14530	Screw-#8-32 square head for drive drum (Pkg.10).....
36634	Coil-Oscillator Coil 25M band(L32)...	36658	Shaft-Extension shaft for select- ivity switch.....
36633	Coil-Oscillator Coil 19M band(L31)...	S-3054	Screen-Light diffuser screen.....
34657	Coil-Oscillator Coil 16M band(L30)...	S-3019	Shaft-Tuning shaft and flywheel...
		S-2824	Socket-A.C. outlet socket.....
		31364	Socket-Dial lamp socket.....
		35787	Socket-Phono input socket.....
		31251	Socket-Tube socket.....
		34864	Socket-Tuning tube socket.....
		31418	Spring-Drive cord spring (Pkg.3)...
		S-3020	Switch-Range switch (S1, S2, S3, S4, S5, S6, S7).....

REPLACEMENT PARTS FOR MODEL A-33--Continued

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
S-3013	Switch-Phono,radio selectivity switch (S8).....	S-3055	PUSH-BUTTON ASSEMBLY Capacitor-Trimmer capacitor bank (C83 to C90).....
S-3052	Switch-A.C. power switch (S10).....	35805	Coil-Oscillator coil(L39 to L46)..
34664	Switch-Slide switch for tone control (S9).....	S-3056	Switch-Push button switch assembly
36614	Transformer-1st I.F. transformer (L19,L20,C29,C30).....		MISCELLANEOUS ASSEMBLIES
36443	Transformer-2nd I.F. transformer (L22,L23,C31,C32).....	36005	Button-Station selector push button.....
36615	Transformer-3rd I.F. and AVC transformer (L25,L26,C33,C34,L37,L38,C73,C74).....	S-3018	Dial-Station selector dial scale.
S-3035	Transformer-60 cycle power transformer (T1).....	S-3057	Knob-Tone control knob.....
36977	Transformer-25 cycle power transformer (T1).....	34489	Knob-A.C. power, selectivity switch, loop and range switch knob.....
	SPEAKER ASSEMBLY	36038	Knob-Tuning or volume control knob.....
13866	Cap-Dust cap for cone centre.... (Pkg.5).....	S-3058	Loop-Antenna loop assembly (L1,C9).....
S-3025	Coil-Field Coil (L47).....	S-3053	Marker-Push button call letter marker (1 set).....
S-3030	Cone-Reproducer cone & voice coil...	S-3060	Shaft-Loop antenna drive shaft...
31539	Plug-5 contact male plug.....	14270	Spring-Knob retaining spring (Pkg.2).....
S-3029	Reproducer complete.....	34053	Spring-Push button retaining spring (Pkg.5).....
S-3026	Transformer-Output transformer(T2)..	S-2547	Tool-Push button tuning set up tool.....