



RCA Victor
SERVICE MANUAL

VOLUME 2

For

1939 and 1940

Broadcast Radio Receivers

All-Wave Radio Receivers

RCA Victrolas

Miscellaneous Service Information

SERVICE DIVISION

RCA VICTOR COMPANY LIMITED

HALIFAX - MONTREAL - TORONTO
WINNIPEG - CALGARY - VANCOUVER



RCA Victor

SERVICE NOTES 1939 - 1940

Radio Receivers - - Victrolas - - Record Players

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

Table of Contents

	Pages
1. Model Number Index for 1939-1940—Bound Volume.....	2
2. Service Notes on 1939-1940—A.C. Models	3- 94
3. Service Notes on 1939-1940—Radio Phonograph Models	95-166
4. Service Notes on 1939-1940—AC-DC Models	167-176
5. Service Notes on 1939-1940—Battery Operated Models	177-226
6. Service Notes on 1939-1940—Automobile Receivers	227-250
7. Service Notes on 1939-1940—Record Players and Changers	251-270
8. *Supplementary Information	271-272

*Reference to this section is made by letter (A), (B), (C) etc., in the Model Number Index.

For Replacement Parts Prices refer to the RCA Victor Replacement Parts Price List
obtainable from your RCA Victor Parts Distributor.

MODEL NUMBER INDEX FOR 1939 - 1940 BOUND VOLUME

AC M o d e l s

<u>Model No.</u>	<u>Page No.</u>	<u>(Supplementary* Information Pages 271-272)</u>
A-1.....	3	..... (A, T)
A-2.....	3	..... (A, T)
A-3.....	9	
A-4.....	9	
A-5.....	17	
A-6.....	23	
A-8.....	31	..... (B)
A-10.....	23	
A-20.....	39	
A-20E.....	30	
A-21.....	43	
A-22.....	51	
A-22E.....	70	
Q-22.....	59	
Q-22C.....	59	
A-30.....	63	
A-31.....	51	
A-32.....	71	
A-33.....	79	
A-34.....	43	..... (P)
Ace.....	87	
Victorette.....	91	..... (R)

RADIO PHONOGRAPH COMBINATIONS

VR-1.....	95	
VR-2.....	101	
VR-3.....	109	..... (C)
VR-4.....	95	
VR-6.....	101	
VR-8.....	113	..... (D)
VR-8L.....	125	
VR-8S.....	125	
VR-10.....	129	
VR-10S.....	125	
VR-40.....	131	..... (M)
VR-41.....	135	..... (O)
VR-42.....	139	
VR-50.....	145	..... (E)
VR-51.....	151	
VR-52.....	157	
U-60A.....	165	

AC-DC MODELS

Duette.....	167	..... (F)
Little Nipper.....	171	
Master Nipper.....	173	..... (V)
Nipper.....	175	

BATTERY OPERATED MODELS

<u>Model No.</u>	<u>Page No.</u>	<u>(Supplementary* Information Pages 271-272)</u>
B-1.....	177	
B-2.....	181	
B-3.....	181	
B-4.....	189	
B-5.....	189	
6B2.....	181	
6B3.....	181	
6B4.....	189	
6B5.....	189	
BP10.....	197	
BP10-A.....	197	
B-60.....	199	
B-61.....	203	
B-62.....	209	
B-70.....	203	
94BT-1.....	213	..... (S)
Companion.....	209	
Nipperette.....	217	
Pick-me-Up.....	221	..... (G)
Portette.....	223	..... (H)

AUTOMOBILE RECEIVERS

Commander.....	227	..... (I, W)
Cruiser.....	233	..... (J, W)
Imperial.....	239	..... (K, W)
Royal.....	245	..... (L, W)

RECORD PLAYERS AND CHANGERS

V-1.....	251	..... (M)
V-2.....	253	
V-3.....	255	..... (Y)
VA-22.....	257	
R96.....	259	
RP-140.....	263	
RP-152E.....	267	..... (N, Z)

Supplementary Information. 271-272

MISCELLANEOUS DATA

	<u>Page No.</u>
Analysis of Radio Interference Phenomena	150
Cabinet Repair.....	170
Decalcomania Replacement.....	170
Dial Lamp Reference Chart.....	124
External Cross Modulation.....	16
Fuse Reference Chart.....	124
Refelting Turntables.....	124
Spring Wound Motor data.....	156
Wave Trap data.....	22

*Where a letter symbol (A), (B), (C) etc. appears opposite a model in the above index refer to corresponding supplementary paragraphs contained in Supplementary Information (Pages 271-272).

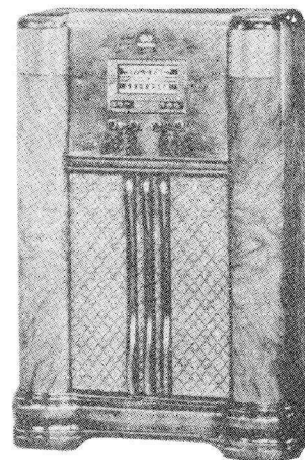
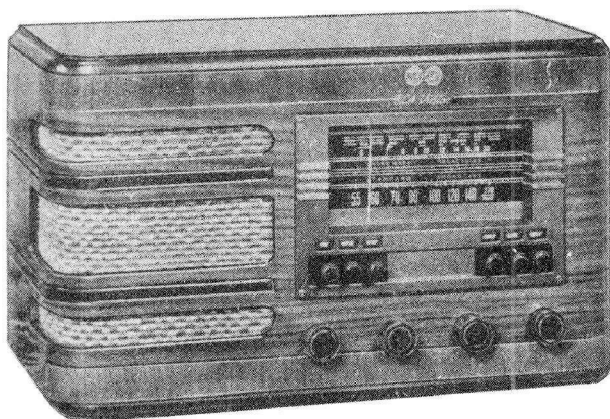


RCA Victor

MODELS A1 and A2

**Five- and Six-Tube, Two-Band, Push-Button Tuning, A-C,
Superheterodyne Receivers**
TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

FREQUENCY RANGES

"Standard Broadcast" 540-1,720 kc
"Short Wave" 5-8 to 21 mc
Intermediate Frequency 455 kc

R-F ALIGNMENT FREQUENCIES

"Short Wave" 20 mc (osc., ant.)
"Standard Broadcast" 1,500 kc (osc.)
Six Push-Button Tuning Positions 550-1,720 kc

TUBE COMPLEMENT

(1) Type-6SA7 First-Detector—Oscillator	(4) Type-6F6G Audio Power Amplifier
(2) Type-6SK7 .. Intermediate-Frequency Amplifier	(5) Type-5Y4G Full-Wave Rectifier
(3) Type-6SQ7 ... Second-Detector A.F. and A.V.C.	(6) Type-6U5 (Model A2 only) Tuning Tube
Pilot Lamp	Mazda 47, 6.3 volts, .15 amp.

POWER SUPPLY RATING

Rating A 105-125 volts, 50-60 cycles, 80 watts
Rating B 105-125 volts, 25-60 cycles, 80 watts

POWER OUTPUT

Undistorted 2.5 watts
Maximum 4.5 watts

LOUDSPEAKER

Type Electrodynamic
Voice-coil impedance 2.25 ohms at 400 cycles

Mechanical Specifications

Models	A1	A2
Height (inches)	9	38
Width (inches)	15	24
Depth (inches)	7	12
Chassis Base Dimensions	12 in. wide, 5 $\frac{3}{4}$ in. deep, 2 $\frac{1}{4}$ in. high	
Over-all Chassis Height	6 $\frac{5}{8}$ inches	
Tuning Drive Ratio	10 to 1	

General Description

The Model "A2" is a six-tube receiver with a "Magic Eye" tuning indicator, and twelve-inch electro dynamic loudspeaker, housed in a console cabinet of beautifully matched veneers. The Model "A1" is a five-tube receiver, similar to the Model "A2" but without the "Magic Eye" tube, and incorporates a five inch electrodynamic speaker housed in a table type cabinet of conventional design. Both models incorporate a two band receiver with mechanical

push button tuning for six stations in the standard broadcast range.

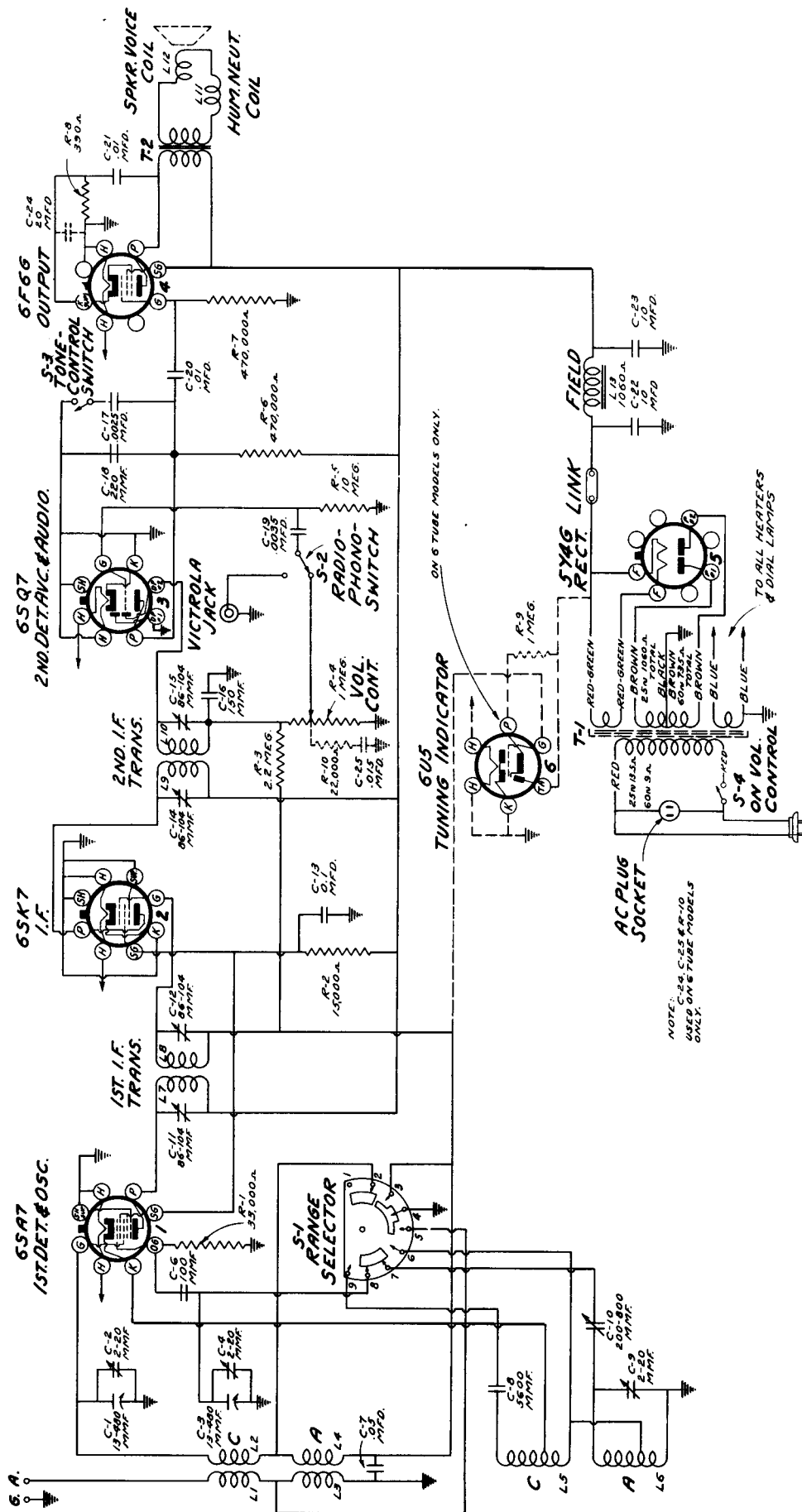
Features of design include:— Mechanical push button tuning for six stations, two point tone control, Victrola and television input jack, positive Victrola, television radio switch, A.C. power socket mounted on the chassis back apron, air core I.F. transformers of new design, new edge-lighted, straight line dial and a dust proof, electrodynamic loudspeaker.

Adjustments for Electric Tuning

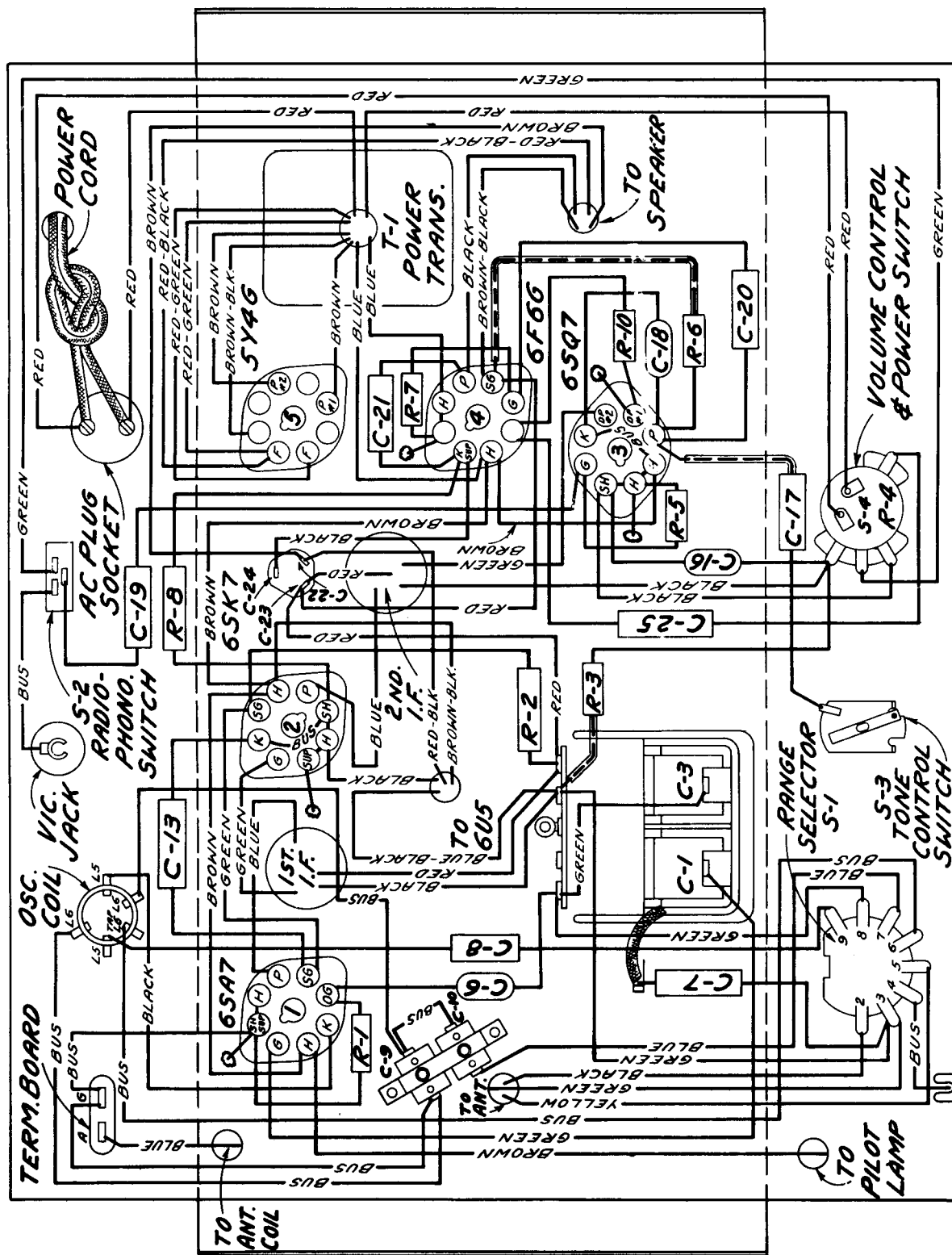
These models have six push buttons for mechanical tuning of six different stations in the standard broadcast range. Allow at least a five minute warm-up period before making any adjustments.

To adjust the push-buttons proceeds as follows:—

1. Make a list of the desired stations, arranged in order from the low to the high frequencies.
2. Manually tune in the desired station accurately.
3. Loosen push button by turning counterclockwise.
4. Press the push button in as far as it will go and accurately retune station
5. With the push button still held in, tighten it by tuning in a clockwise direction.



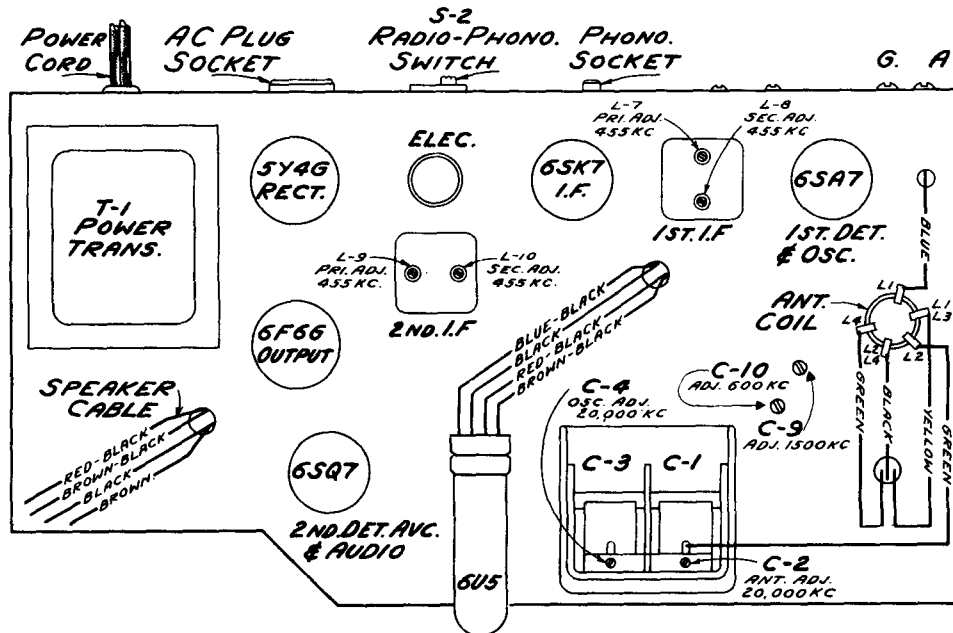
Schematic Circuit Diagram



Precautionary Lead Dress.—

1. Twist red leads of A.C. switch together away from green lead to volume control.
2. Dress all leads away from antenna coil.
3. Pilot lamp lead must be dressed against side apron away from dial drive drum.

Tube and Trimmer Locations



Tube and Trimmer Locations

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the RCA Victor Service Manual.

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 A-V-C action.

The Alignment Procedure is carried out in the usual manner. By no means attempt to align these receivers without the assistance of an accurate test oscillator and visual output indicator.

Dial Indicator Adjustment — Adjust dial pointer after chassis is securely fastened in cabinet. The pointer should be adjusted to the low frequency calibration mark with the gang completely meshed.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	C14 and C15 (2nd I-F Trans.)
2	6SA7 det. grid in series with .01 mfd.	455 kc		C11 and C12 (1st I-F Trans.)
3	Antenna Terminal, in series with 400 ohms	20 mc	20 mc "C" band	C4* (osc.) C2** (ant.)
4	Antenna Terminal in series with 200 mmc.	600 k.c.	600 k.c. "A" band	C10 (osc.)
5	Antenna Terminal, in series with 200 mmf.	1,500 kc	1,500 kc "A" band	C9 (osc.)

*Use minimum capacity peak if two peaks can be obtained.

**Rock gang slightly and use maximum capacity peak if two peaks can be obtained with C2. Check to determine that C4 has been adjusted to the correct peak by tuning to approximately (19.09 mc), where a weaker signal should be received.

Note: Oscillator tracks 455 kc above signal on all bands.

Radiotron Socket Voltages

TYPE	PLATE	Screen Grid	Cathode	Heater
6SA7	278V	96V	0	6.6V
6SK7	278V	96V	0	6.6V
6SQ7	66V*		0	6.6V
6F6-G	258V	277V	17.8V	6.6V
5Y4-G		OUTPUT VOLTAGE		358V

*Cannot be measured with an ordinary voltmeter.

Victrola & Television Attachments.—A jack is provided on the back apron of the chassis for connection to a Victrola or Television attachment. This jack feeds into the audio input circuit of the receiver. The audio output of a Victrola or Television Attachment is handled by the audio circuit in the same manner as the regular broadcast programs. A switch is provided on the back apron of the chassis to cut

the jack in and out of the circuit.

Loudspeaker.—The loudspeaker is designed for convenient, economical service. The field and hum neutralizing coils are removable once the field retaining screw has been removed. Replacement parts, for the speakers, are shown in the Replacement Parts List.

REPLACEMENT PARTS FOR MODELS A1 and A2

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			
S-1809	Board-Antenna-ground terminal board	33722	Transformer-1st I.F. transformer (L7,L8,C11,C12).....
S-2465	Cable-Tuning indicator cable assembly (6 tube model only).....	33723	Transformer-2nd I.F. transformer (L9,L10,C14,C15).....
S-2466	Capacitor-Dual trimmer 2-20 mmfd. and 300-800 mmfd. (C9,C10).....	S-2457	Transformer-Power transformer-105-125 Volt 50-60 cycle (T1)..
12720	Capacitor-100 mmfd. (C6).....	33619	Transformer-Power transformer-105-125 volt 25-60 cycle (T1)..
12725	Capacitor-150 mmfd. (C16).....	33631	Volume control & power switch (S4,R4) (5 tube only).....
12694	Capacitor-220 mmfd. (C18).....	33776	Volume control & power switch (S4,R4) (6 tube only).....
13895	Capacitor-5,600 mmfd. (C8).....	REPRODUCER ASSEMBLIES	
3932	Capacitor-.0025 mfd. (C17).....	(RL78-6) 5 Tube Model	
30303	Capacitor-.0035 mfd. (C19).....	S-2468	Coil-Hum Neutralizing Coil (L1)..
4937	Capacitor-.01 mfd. (C20,C21).....	S-2463	Coil-Field Coil (L13).....
11315	Capacitor-.015 mfd. (C25)(used on 6 Tube only).....	S-2375	Cone-Reproducer cone & voice coil (L12).....
32787	Capacitor-.05 mfd. (C7).....	S-2469	Reproducer complete.....
4839	Capacitor-0.1 mfd. (C13).....	S-2464	Transformer-Output transformer(T2)
32342	Capacitor-Electrolytic capacitor consisting of two 10 mfd., sections (C22,C23) (used on 5 Tube model only).....	REPRODUCER ASSEMBLIES	
32240	Capacitor-Electrolytic capacitor consisting of two 10 mfd., sections and one 20 mfd. section (C22,C23,C24)(used on 6 tube model only).....	(103534-501) 6-Tube Model	
33732	Coil-Antenna coil (L1,L2,L3,L4)....	13866	Cap-Dust cap for cone center (Pkg. 5).....
33733	Coil-Oscillator coil (L5,L6).....	11469	Coil-Hum neutralizing coil (L11)..
33635	Condenser-2 gang variable condenser complete with drum (C1,C2,C3,C4).	S-2438	Coil-Field Coil (L13).....
S-2456	Cord-Indicator pointer drive cord 36" long.....	31275	Cone-Reproducer cone & voice coil (L12).....
11891	Lamp-Dial lamp.....	31302	Plug-4 contact female plug for speaker cable (6 tube only).....
5040	Plug-4 contact female plug for speaker cable (6 tube only).....	S-2459	Reproducer-complete.....
S-2467	Pulley-Drive cord pulley.....	14355	Transformer-Output transformer (T2).....
31388	Resistor-390 ohm, 1 watt (R8).....	14357	Washer-Spring washer to hold field coil (Pkg.5).....
33489	Resistor-15,000 ohm, 2.5 watt (R2).	MISCELLANEOUS ASSEMBLIES	
13998	Resistor-22,000 ohm, 1/4 watt (R10) (6 tube only).....	S-2460	Button-Station selector push button and 103510-1 screw assembly.....
12454	Resistor-33,000 ohm, 1/4 watt (R1).	33636	Dial-Station selector dial scale.
12285	Resistor-470,000 ohm,1/4 watt (R6, R7).....	33637	Escutcheon-Station selector escutcheon.....
12679	Resistor-2.2 meg., 1/4 watt (R3)...	33633	Indicator-Station selector indicator pointer.....
13601	Resistor-10 meg., 1/4 watt (R5)....	30863	Knob-Volume, tone, tuning or range switch knob.....
33726	Retainer-Drive shaft retainer (Pkg. 5).....	S-2461	Marker-Station call letter marker (1 set).....
33725	Shaft-Station selector knob shaft..	S-2470	Spring-Knob retaining spring(Pkf.5)
31418	Spring-Drive cord tension spring (Pkg.2).....		
31364	Socket-Dial lamp socket.....		
14278	Socket-Phono input socket.....		
S-2447	Socket-AC power socket.....		
33632	Switch-Range Switch (S1).....		
33634	Switch-Radio-Phono Switch (S2).....		
33630	Switch-Tone control switch (S3)....		



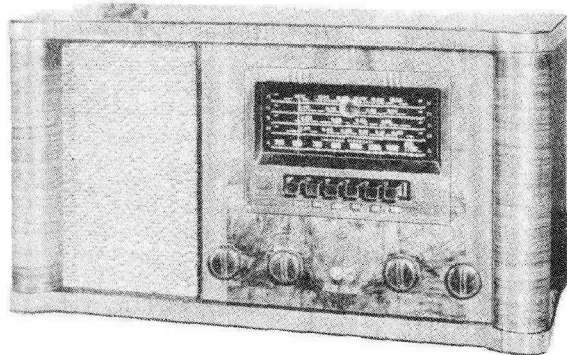
RCA Victor

MODELS A3 and A4

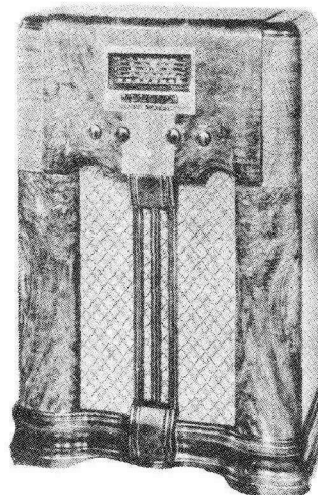
Seven-Tube, Five-Band, A-C, Superheterodyne Receivers

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model A3



Model A4

Electrical Specifications

FREQUENCY RANGES

Standard Broadcast (A)	540-1,720 kc
"49 M" (49 Meters)	5,900-6,240 kc
"31 M" (31 Meters)	9,410-9,690 kc
"25 M" (25 Meters)	11,680-11,920 kc
"19 M" (19 Meters)	15,090-15,380 kc

Intermediate Frequency 455 kc.

TUBE COMPLEMENT

(1) Type-6SK7	R-F Amplifier
(2) Type-6SA7	First Detector, Oscillator
(3) Type-6SK7	Intermediate Amplifier
(4) Type-6SQ7	Second det., A-F Amp., and A.V.C.

Pilot Lamps (2) Mazda No. 44, 6.3 volts, 0.25 amp.

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 80 watts
Rating B	105-125 volts, 25-60 cycles, 80 watts

LOUDSPEAKER (RL79-1) (A3)

Type	6 inch Electrodynamic
Impedance (V.C.)	3.4 ohms at 400 cycles

R-F ALIGNMENT FREQUENCIES

"49 M" (49 Meters)	6,100 kc. (osc., det., ant.)
"31 M" (31 Meters)	9,550 kc. (osc.)
"25 M" (25 Meters)	11,800 kc. (osc.)
"19 M" (19 Meters)	15,200 kc. (osc.)
"Standard Broadcast"	600 kc. (osc.), 1,500 kc. (osc., Det., Ant.)

(5) Type-6F6G	Power Output
(6) Type-6U5	Tuning Tube
(7) Type-5Y4-G	Full wave Rectifier

POWER OUTPUT

Undistorted	2 watts
Maximum	5 watts

LOUDSPEAKER (RL70H-1) (A4)

Type	12 inch Electrodynamic
Impedance (V.C.)	3.4 ohms at 400 cycles

General Description

These receivers employ a seven-tube, five band, superheterodyne circuit, the arrangement of which is shown by the Schematic Circuit Diagram. Features of design include: Spread Band "Overseas" dial; an r-f amplifier stage with "cumulative-wound" antenna and detector "A" Band coil for high signal to noise ratio; magnetite-core i-f transformers and

low frequency oscillator tracking; full automatic volume control; phonograph television sockets; "Magic Eye" Tuning Tube; dust-proof electrodynamic loudspeaker; plunger-type, air dielectric trimming capacitors; temperature-stabilized capacitors; radio-phonotelevision tone control switch, and an edge lighted horizontal dial and pointer.

Circuit Arrangement

The circuit consists of an r-f amplifier stage; first detector, oscillator stage; i-f amplifier stage; second detector, audio voltage amplifier, and automatic volume control stage; power-amplifier stage; tuning indicator; and a full-wave rectifier.

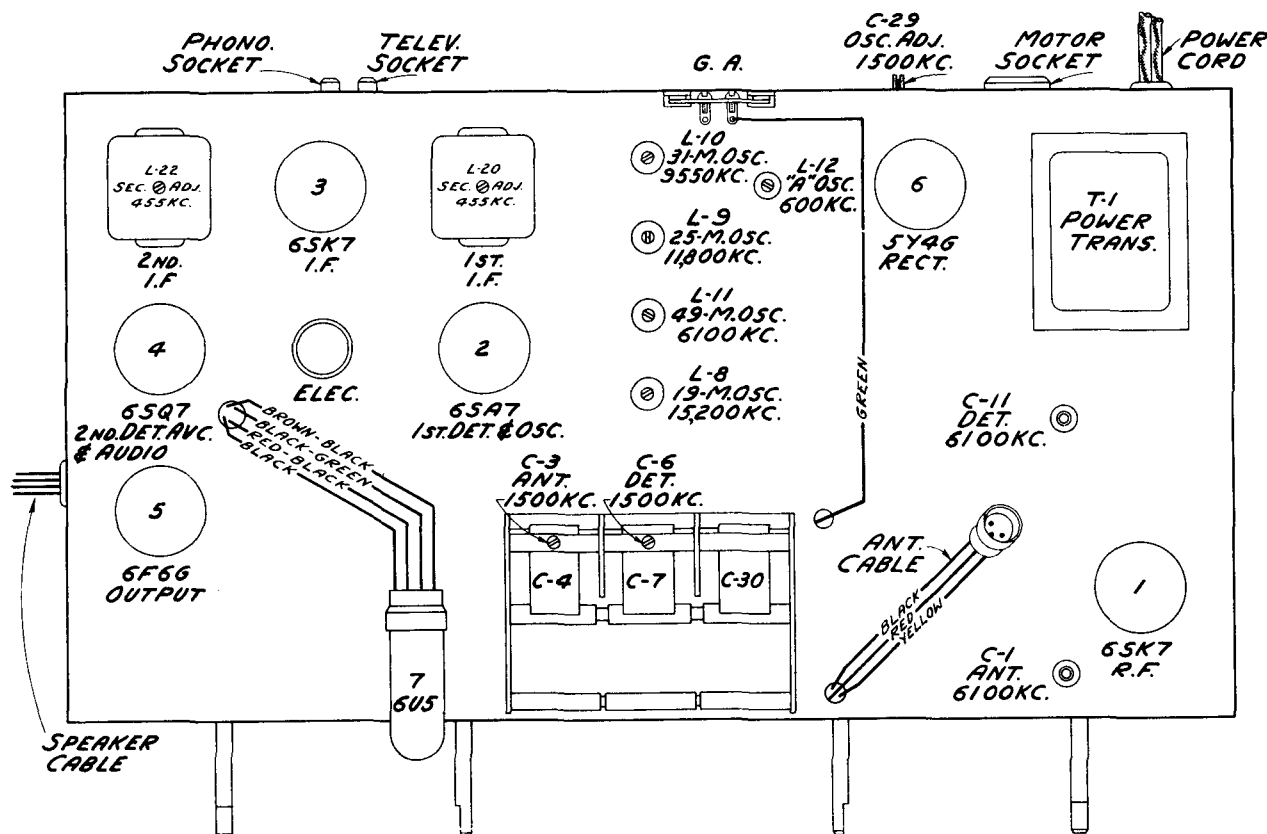
The antenna and first-detector coils are constructed with a special type of winding (cumulative) to provide increased sensitivity and selectivity on the "Standard Broadcast" band. Special capacitors shunting the spread-band oscillator coils compensate for temperature variations to reduce oscillator frequency drift.

Spread-band tuning is accomplished electrically by shunting the oscillator section of the variable capacitor with relatively large temperature-stabilized fixed capacitors for tuning the oscillator coils on the

"19M," "25M," "31M" and "49M" bands. Antenna and first-detector coils are designed to be sufficiently broad-tuned to require no variable tuning over the narrow frequency range of the spread-bands.

The spread-band oscillator coils and the "Standard Broadcast" band oscillator, first detector, and antenna coils are all wound on separate forms. The antenna and first detector spread-band coils are tapped. Undesirable interaction between coils is avoided by shorting the unused sections by means of the range selector.

The intermediate-frequency amplifier consists of a Type 6SK7 tube in a single stage transformer-coupled circuit. The windings of all i-f transformers are resonated by fixed capacitors and are adjusted by moulded magnetite cores to tune to 455 kc.



Chassis Layout and Alignment Adjustments

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. 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 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum 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.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6SK7 2nd I.F. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	2nd I.F. Trans.	L21 & L22
2	6SA7 Det. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	1st I.F. Trans.	L19 & L20
3	Ant. Term	300 Ohms	6,100 kc	"49 M"	6.1 mc (95°)	"49M" Osc.	L11
4	Ant. Term	300 Ohms	6,100 kc	"49 M"	6.1 mc (95°)	"49M" Det.	C-11
5	Ant. Term	300 Ohms	6,100 kc	"49 M"	6.1 mc (95°)	"49M" Ant.	C-1
6	Ant. Term	300 Ohms	9,550 kc	"31 M"	9.55 mc (137°)	"31M" Osc.	L10
7	Ant. Term	300 Ohms	11,800 kc	"25 M"	11.8 mc (115°)	"25M" Osc.	L9
8	Ant. Term	300 Ohms	15,200 kc	"19 M"	15.2 mc (130°)	"19M" Osc.	L8
9	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" H-F Osc.	C29
10	Ant. Term	200 Mmfd.	600 kc	"A"	600 kc (201°)	"A" L-F Osc.	L12
11	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" Det.	C6
12	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" Ant.	C3

NOTE:—Align the I.F. Circuits by means of the oscillograph, for a symmetrical curve. Peak R.F. stages of all bands.

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 of 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.

NOTE:—All spread band adjustments should be made with the chassis fastened in the cabinet and the pointer accurately aligned to the dial.

Spread-band Adjustments.—Bottom shield-pan must be in place before attempting spread-band alignment. Alignment of the spread bands requires special procedure since test oscillators used alone are not ordinarily sufficiently accurate for this purpose.

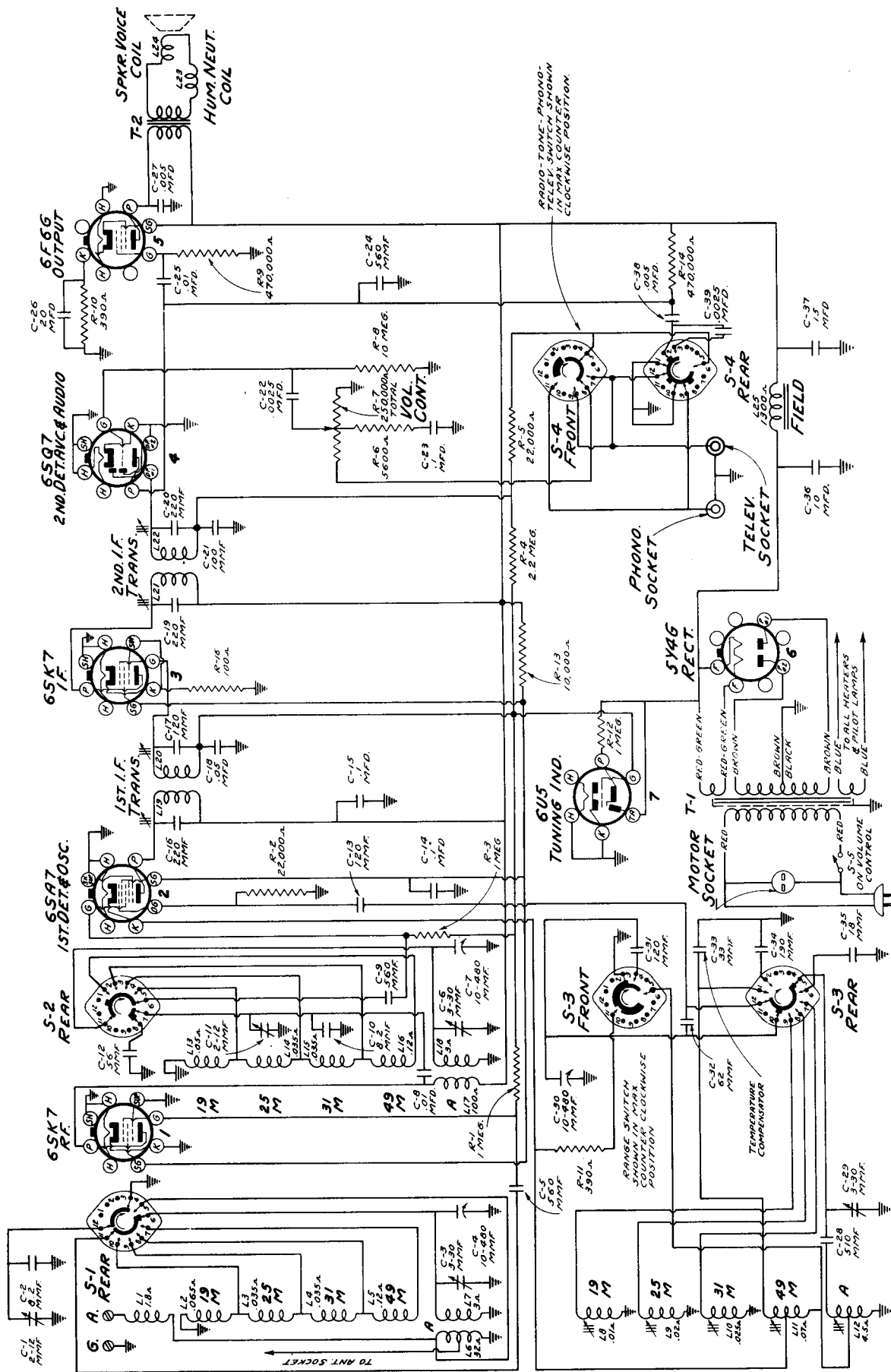
The RCA Stock No. 9572 Crystal Calibrator affords a convenient and accurate alignment standard. Wrap a few turns of wire around the crystal calibrator and connect one free end to the antenna terminal of the receiver. Using the crystal calibrator to obtain the necessary accuracy, follow the tabulated alignment procedure for the "31M.", "25M.", and "19M." bands.

For the "49M." band, snap crystal calibrator "Hi-Lo" switch to "Hi", turn the range selector to "49M." band, and set receiver dial pointer to 6.0 mc. Adjust oscillator adjusting core L11 for minimum "Tuning Tube" opening. Use the peak indicated by the alignment table. Snap "Hi-Lo" switch to "Lo" and locate 6,100 kc (the first 100 kc harmonic above 6,000 kc) by slightly readjusting L11 with the dial pointer set at 6.1 mc. This method insures selection of correct crystal-calibrator harmonic.

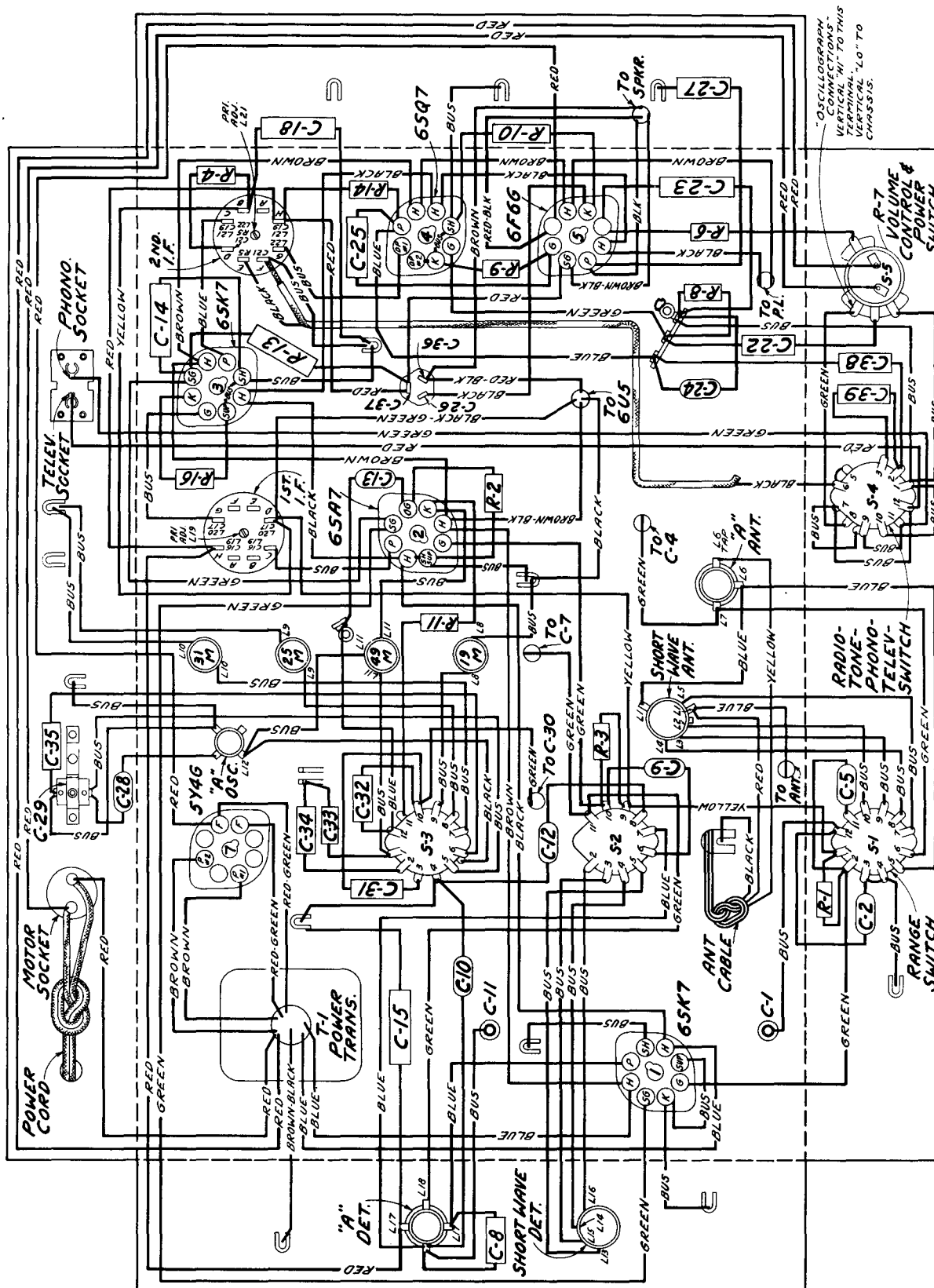
When aligning with the RCA Stock No. 150 Test Oscillator use the variable (unmodulated) oscillator† and "Magic Eye" indication of receiver output. Set test-oscillator dial 800 kc lower than the desired signal for the four lower frequency ranges and 800 kc higher than the desired signal for the two high ranges and use in same manner as TMV-97-C. Insert an open-circuit telephone plug in the test oscillator "Ext. Mod." jack, so the modulated fixed-frequency oscillator will be cut off, and align on the unmodulated variable oscillator signal, which will close the "Tuning Tube" and evidence itself by a rushing noise in the speaker.

If the crystal calibrator signals are weak, disconnect test oscillator while using the crystal calibrator.

† The No. 150 Test Oscillator employs a fixed-frequency (800 kc), modulated oscillator and a variable, unmodulated oscillator. The scale is calibrated to the sum frequency for the two higher frequency ranges and to the difference frequency for the four lower frequency ranges.



Schematic Circuit Diagram



Chassis Wiring Diagram

RADIOTRON SOCKET VOLTAGES

Type	Plate	Screen Grid	Cathode	Heater
6SK7 R.F.	250V	90V	.....	6.6V
6SA7 Conv.	250V	90V	.....	6.6V
6SK7 I.F.	250V	90V	.....	6.6V
6SQ7 A.F.	90*V	.....	.....	6.6V
6F6G Output	240V	250V	17V	6.6V
6U5 Indicator	358V	.....	.....	6.6V
5Y4G Rectifier	345/345V	.....	358V	5.0V

*Cannot be accurately measured with an ordinary voltmeter due to the high value of series resistance. All the above values hold within + 20% when measured with a 1000 ohm-per-volt type of meter, on a line voltage of 115 volts.

Precautionary Lead Dress

(1) Dress speaker cable leads against chassis side apron, away from 6SQ7 grid circuit leads.

(2) Twist red A.C. leads together—dress along chassis apron, below phono-television sockets, upwards to clamp on chassis side apron and across to power switch on volume control.

(3) Dress filament leads away from 6SQ7 tube.

(4) Dress 6SQ7 grid lead against chassis below all crossing leads. Remove any excess length of this lead.

(5) Dress 6SQ7 plate lead close to chassis.

Push Button Adjustments

The push buttons should be adjusted for six favorite stations after the receiver has had a brief warm-up period.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high.

Proceed as follows:—

1. Set the accessory tone knob to "Radio" and turn the range selector to "A" band position.

2. Remove the six push buttons by inserting a small screwdriver blade in the slot provided on the under side of the button. Press the screwdriver blade upwards at the same time pull the button forward.

3. Loosen the push arm adjusting screws accessible through the push button openings.

4. Press in the tuning knob and accurately tune in the first station.

5. With station accurately tuned in, press in the first push button and tighten screw.

6. Proceed in a similar manner to adjust the remainder of the push buttons.

7. Replace push buttons by inserting in the escutcheon openings, spring side down. Press button in as far as possible to securely lock button in escutcheon.

8. Place call letter tabs in openings provided.

Note:—When difficulty is experienced in setting up the push buttons due to sticking cams, unscrew cam screw $\frac{1}{2}$ turn and rotate gang back and forth until the cam plate moves freely.

RCA Victor "Magic Rodtenna"—The Model A4 receiver is designed for use with Stock No. S-2477 Rodtenna. A three prong plug is provided on the chassis for convenient connection of this antenna, wherever the conventional type of outdoor antenna, is not practical. It is not advisable to replace a conventional type of antenna with the Rodtenna. Read the instructions enclosed with the Rodtenna for complete details.

REPLACEMENT PARTS FOR MODELS A3 TABLE & A4 CONSOLE

7 TUBE, 5 BAND AC RECEIVER

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			
S-2524	Arm-Trip arm located on range switch shaft.....	32086	Roller-Drive shaft rubber roller...
14517	Board-Ant.-Gnd.terminal board.....	33438	Screw-Thumb screw for tuning indicator bracket (Pkg.2).....
14394	Cable-Tuning indicator cable assembly.....	31364	Socket-Dial lamp socket.....
30766	Cap-Tuning indicator rubber cap.....	S-2447	Socket-AC input socket.....
12714	Capacitor-Air-trimmer 2-12 mmfd. (C1,C11).....	31251	Socket-tube socket.....
S-2578	Capacitor-Mica trimmer 3-30 mmfd. (C3,C6,C29).....	33514	Socket-Phono-Television socket.....
13001	Capacitor-8.2 mmfd. (C2,C10).....	31418	Spring-Drive cord tension spring (Pkg.2).....
31350	Capacitor-18 mmfd. (C35).....	S-2583	Switch-Range Switch (S1,S2,S3).....
31354	Capacitor-33 mmfd. (Temp.Comp.)(C33)	S-2584	Switch-Tone,Phono,Television Switch (S4).....
12723	Capacitor-56 mmfd. (C12).....	S-2534	Transformer-1st I.F. Transformer (L19,L20,C16,C17).....
31349	Capacitor-62 mmfd. (C32).....	33761	Transformer-2nd I.F. Transformer (L21,L22,C19,C20,C21).....
31352	Capacitor-120 mmfd. (C31).....	S-2535	Transformer-Power Transformer, 105-125 volts,25-60 cycles (T1)...
12724	Capacitor-120 mmfd. (C13).....	S-2476	Transformer-Power transformer, 105-125 volts 50-60 cycles (T1)...
31351	Capacitor-190 mmfd. (C34).....	REPRODUCER ASSEMBLIES (RL79-1)	
30608	Capacitor-510 mmfd. (C28).....	32907	Cap-Dust cap for cone center (Pkg.5).....
12537	Capacitor-560 mmfd. (C5,C9,C24).....	31647	Coil-Field coil (L25).....
5107	Capacitor-.0025 mfd. (C22,C39).....	32906	Coil-Hum neutralizing coil (L23)...
4838	Capacitor-.005 mfd. (C27,C38).....	32934	Cone-Reproducer cone & voice coil (L24).....
4937	Capacitor-.01 mfd. (C25).....	31302	Plug-4 contact male plug.....
14393	Capacitor-.01 mfd. (C8).....	33078	Reproducer complete.....
4886	Capacitor-.05 mfd. (C18).....	32905	Transformer-Output transformer (T2).....
11414	Capacitor-0.1 mfd. (C14,C15,C23)...	REPRODUCER ASSEMBLIES(RL70H-1)	
S-2579	Capacitor-Electrolytic capacitor consisting of one 10 mfd.,one 15 mfd., and one 20 mfd.sections (C26,C36,C37).....	13866	Cap-Dust cap for cone center - (Pkg. 5).....
S-2585	Coil-Antenna "A" band coil (L6,L7)...	12012	Coil-Field coil (L25).....
S-2580	Coil-Antenna "Spread Band" coil (L1,L2,L3,L4,L5).....	11469	Coil-Hum neutralizing coil (L23)...
S-2586	Coil-R.F. "A" band coil (L17,L18)...	31275	Cone-Reproducer cone & voice coil (L24).....
31266	Coil-R.F. "Spread Band" coil (L13,L14,L15,L16).....	31302	Plug-4 contact male plug.....
S-2581	Coil-Oscillator "A" band coil (L12)...	31592	Reproducer complete.....
S-2582	Coil-19M band oscillator coil (L8)...	14355	Transformer-Output transformer (T2).....
31254	Coil-25M band oscillator coil (L9)...	MISCELLANEOUS ASSEMBLIES	
31255	Coil-31M band oscillator coil (L10)...	S-2537	Button-Station selector push button.....
31256	Coil-49M band oscillator coil (L11)...	S-2576	Dial-Glass dial scale.....
S-2536	Control-Volume control & power switch (R7,S5).....	S-2539	Escutcheon-Station selector dial escutcheon.....
S-2529	Cord-Drive Cord.....	S-2540	Knob-Volume,tone,range or tuning control knob.....
S-2530	Drive-Friction drive assembly.....	S-2541	Marker-Push button call letters markers (1 set).....
34267	Drum-Drive cord drum complete with set screws and calibrator dial.....	14270	Spring-Knob retaining spring - (Pkg. 10).....
S-2531	Indicator-Station selector indicator pointer.....	S-2543	Spring-Push button retaining spring (Pkg.3).....
11891	Lamp-Pilot lamp.....	S-2542	Tool-Push button adjusting tool.....
5040	Plug-4 contact female speaker plug..		
14459	Resistor-100 ohm, 1/4 watt (R15,R16)		
12261	Resistor-390 ohm, 1/4 watt (R11)....		
31388	Resistor-390 ohm, 1 watt (R10).....		
S-2587	Resistor-10,000 ohm, 4 watt (R13)...		
S-1894	Resistor-5,600 ohm, 1/4 watt (R6)...		
13998	Resistor-22,000 ohm, 1/4 watt (R2,R5)		
12285	Resistor-470,000 ohm,1/4 watt (R9)...		
12013	Resistor-1 meg.,1/10 watt (R1,R3)...		
12679	Resistor-2.2 meg.,1/4 watt (R4).....		
13601	Resistor-10 meg., 1/4 watt (R8).....		
S-2446	Retainer-AC female socket retainer (Pkg.3).....		

External Cross Modulation

By

Dudley E. Foster*

Some years ago reports began to be heard concerning a type of interference with broadcast reception which had never before been noticed. The interference occurred only in localities having high field strength from one or more local stations, and its new characteristic was that the program of the strong local station was heard when the receiver was tuned to one particular other station, but not to still others. The effect was not due to lack of selectivity because, when tuning the receiver, the local station could be tuned out and then would reappear when a certain other station was tuned in. Occasionally two local stations would be heard together on a frequency which was quite different from that of either one of them.

This type of interference also had other peculiarities. In the area in which it occurred, it would be found in one house whereas the house next door would be free from interference even when the same set was used. In those houses where it occurred, any make or model of receiver, including battery sets, experienced it. Still another puzzling factor was that the interference was not constant, being much more severe at some times than at others, and occasionally disappearing entirely for a period. In one case the interference was eliminated by opening the window through which the antenna lead-in passed, and in another case the interference was heard only when a certain bedroom light was turned on.

These characteristics led to the deduction that the interference was not caused in the radio receiver, but by some agency external to the receiver itself. This was further proved by laboratory experiments with two signal generators simulating the desired and interfering stations. In the laboratory, inputs of three or four volts applied to the receiver did not cause interference, whereas, in the field at those locations having this type of interference, field strengths causing less than half a volt signal to be impressed on the receiver were present. Furthermore, decreasing the length of antenna did not eliminate the interference.

A survey was made to determine whether interference of this nature had been noticed in other parts of the country. Reports as a result of this survey showed it to be present in certain areas in or near metropolitan centres.

Since by this time it was evident that the trouble was some form of cross modulation, and since it was exterior to the receiver, this type of interference was designated "external cross modulation."

A location was found where the cross modulation existed consistently and a study was made to determine the fundamental cause and a remedy. In this location, a battery receiver with a short antenna exhibited cross modulation inside the house, but when the receiver was a few feet outside the house, cross modulation ceased. A trap circuit in the antenna was of no benefit, which was further proof that the difficulty was external to the receiver. It was observed that at this location, as well as at others where the effect was serious, that the house wiring was of the knob and tube type and the service mains from the distribution transformer were overhead. A filter near the receiver, consisting of two 0.1 mfd. condensers across the line with the center point grounded had only a slight effect on the interference, but an additional condenser across the line where it entered the house greatly decreased the cross modulation. It was further found that by placing the antenna at a distance from the power lines and using a shielded lead-in, the external cross modulation disappeared.

This experience showed that the cross modulation was due to rectification of radio frequencies in the power wiring, with resultant new, spurious frequencies being induced in the antenna or lead-in. Radio signals were picked up by the power wiring or other metallic conductors near the receiving antenna and at some point along the conductor were impressed on a rectifier or non-linear circuit element. The characteristic giving the output current of a rectifying element is commonly expressed as a series expansion in ascending powers of the applied voltage, the applied voltage in this case being the radio-frequency signals present on the power wiring or other conductor. The power-series representation of the rectifier characteristic discloses the new harmonic and combination frequencies which result from the rectification process. A simple laboratory test confirmed the observations. Two antennas were placed a few feet apart and to one of them a radio receiver was connected. An impedance was connected between the other antenna and ground, and when a simple diode was connected across this impedance, cross modulation of the signals in the first antenna occurred.

The question arises as to where the rectifier may exist in the field. Wherever there is a poor connection between any two metallic bodies, especially if oxidation is present, rectification can take place. **The poor contact may be in the lighting lines, in piping, or even in the antenna itself.** In one case the trouble was located at a point where a pipe passed through metal wall lathing. Bonding the pipe and lath together eliminated the interference. In another case two pipes were found to be touching and insertion of a block of wood between them cleared up the cross modulation. When such a rectifier exists and one or more powerful signals are present, new frequencies are generated by the rectifier. Where only one powerful signal is present, the only new frequencies made by the rectifier are multiples of the fundamental, that is the second harmonic, third harmonic, etc. of the signal frequency. Where two strong signals exist, a number of cross modulation combinations take place. Let us call the frequency of one of the strong stations a, and that of the other b, then the rectifier generates the following frequencies:

a+b	2a-b
a-b	2b+a
2a	2b-a
2b	3a
2a+b	3b

An effect also takes place whereby the modulation of station with frequency a is heard on station b, and the modulation of station b is heard on a.

It should be noted that these spurious frequencies do not depend upon the presence of a second harmonic from either of the stations. If both stations are entirely free from harmonic radiation these same frequencies are generated if a rectifier is present.

Let us suppose that two stations are so located that in the region between them signal strengths of 0.1 volt per meter occur from both, and that one station is on 650 kc. and the other on 750 kc. Then the following table shows the frequencies produced.

a = 650 kc.	2a+b = 2,050 kc.
b = 750 kc.	2a-b = 550 kc.
a+b = 1,400 kc.	2b+a = 2,150 kc.
a-b = 100 kc.	2b-a = 850 kc.
2a = 1,300 kc.	3a = 1,950 kc.
2b = 1,500 kc.	3b = 2,250 kc.

In this example these two stations would produce five new frequencies in the broadcast band and five new frequencies outside the broadcast band where one or both the stations together would be heard. It can be appreciated readily that a large amount of interference will be produced in this manner. The interference produced by station of frequency (a) on frequency (b) and vice versa has been found to be serious only when the rectifying action is particularly severe because the modulation of the strong desired station usually masks the interfering modulation.

It may be seen also that there is a possibility of hum modulation being introduced when a rectifying condition exists in the power wiring. In this case, one of the frequencies is that of the signal carrier and the other that of the lighting system, which is usually 60 cycles. The rectifying action then imposes a 60-cycle modulation on the carrier. Some instances of modulation hum in receivers at certain locations have been traced to this source. Hum of this type would be present in a battery receiver at the same location. The remedy is the same as for interference between stations, namely elimination of the rectifying condition or changed installation of the antenna to avoid pickup of resultant spurious frequencies.

Knowledge of the frequencies produced is helpful in determining whether a case of interference is due to external cross modulation or not. Most of the combination frequencies are readily calculated when the frequencies of the two stations having high field strength are known. The combination 2a-b and 2b-a are usually in the broadcast band and for that reason are troublesome.

In investigating a situation where interference exists, the first step should be to determine whether or not it is due to external cross modulation by observing the frequencies at which interference exists.

For example, with the two strong signals at 650 kc. and 750 kc., if the program from both is heard at 550 kc., 850 kc. and 1,400 kc., it may be safely assumed that the trouble is due to external cross modulation. If the interference is not due to external cross modulation, shortening the antenna or installation of a wave trap

(Continued on page 22)



RCA Victor

MODEL A-5

Six-Tube, Two-Band, AC, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

Electrical Specifications

FREQUENCY RANGES

Standard Broadcast 540-1,720 kc
Short Wave 5.8-18 mc

INTERMEDIATE FREQUENCY 455 kc

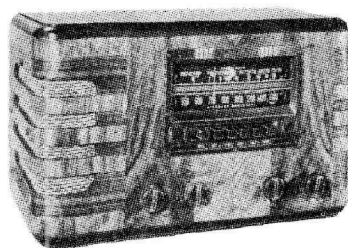
TUBE COMPLEMENT

- (1) Type-6SA7... 1st Detector—Oscillator
- (2) Type-6SK7 I-F Amplifier
- (3) Type-6SQ7..... 2nd Detector, A.V.C.,
and A-F Amplifier
- (4) Type-6F6-G Power Output
- (5) Type-5Y4G Rectifier
- (6) Type-6U5 Tuning Indicator

PILOT LAMPS (2) Mazda No. 44, 6.3 volts,
0.25 amp.

POWER OUTPUT RATING

Undistorted 2.5 watts
Maximum 4.5 watts



LOUDSPEAKER (RL-79-1)

Type 6-inch Electrodynamic
V.C. Impedance... 3.4 ohms at 400 cycles

POWER SUPPLY RATINGS

Rating A.... 105-125 volts, 50-60 cycles,
80 watts

Rating B.... 105-125 volts, 25-60 cycles,
80 watts

Push Button Adjustments

The push buttons should be adjusted for six favorite stations after the receiver has had a brief warm-up period.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high.

Proceed as follows:—

1. Set the accessory tone knob to "Radio" and turn the range selector to "A" band position.

2. Remove the six push buttons by inserting a small screwdriver blade in the slot provided on the under side of the button. Press the screwdriver blade upwards at the same time pull the button forward.

3. Loosen the push arm adjusting screws accessible through the push button openings.

4. Press in the tuning knob and accurately tune in the first station.

5. With station accurately tuned in, press in the first push button and tighten screw.

6. Proceed in a similar manner to adjust the remainder of the push buttons.

7. Replace push buttons by inserting in the escutcheon openings, spring side down. Press button in as far as possible to securely lock button in escutcheon.

8. Place call letter tabs in openings provided.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. 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 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum 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.

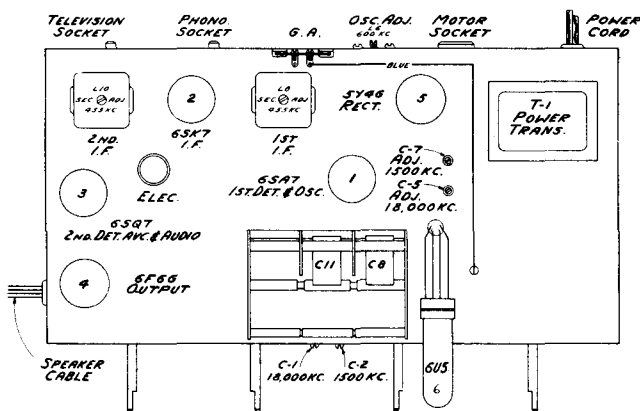
On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.

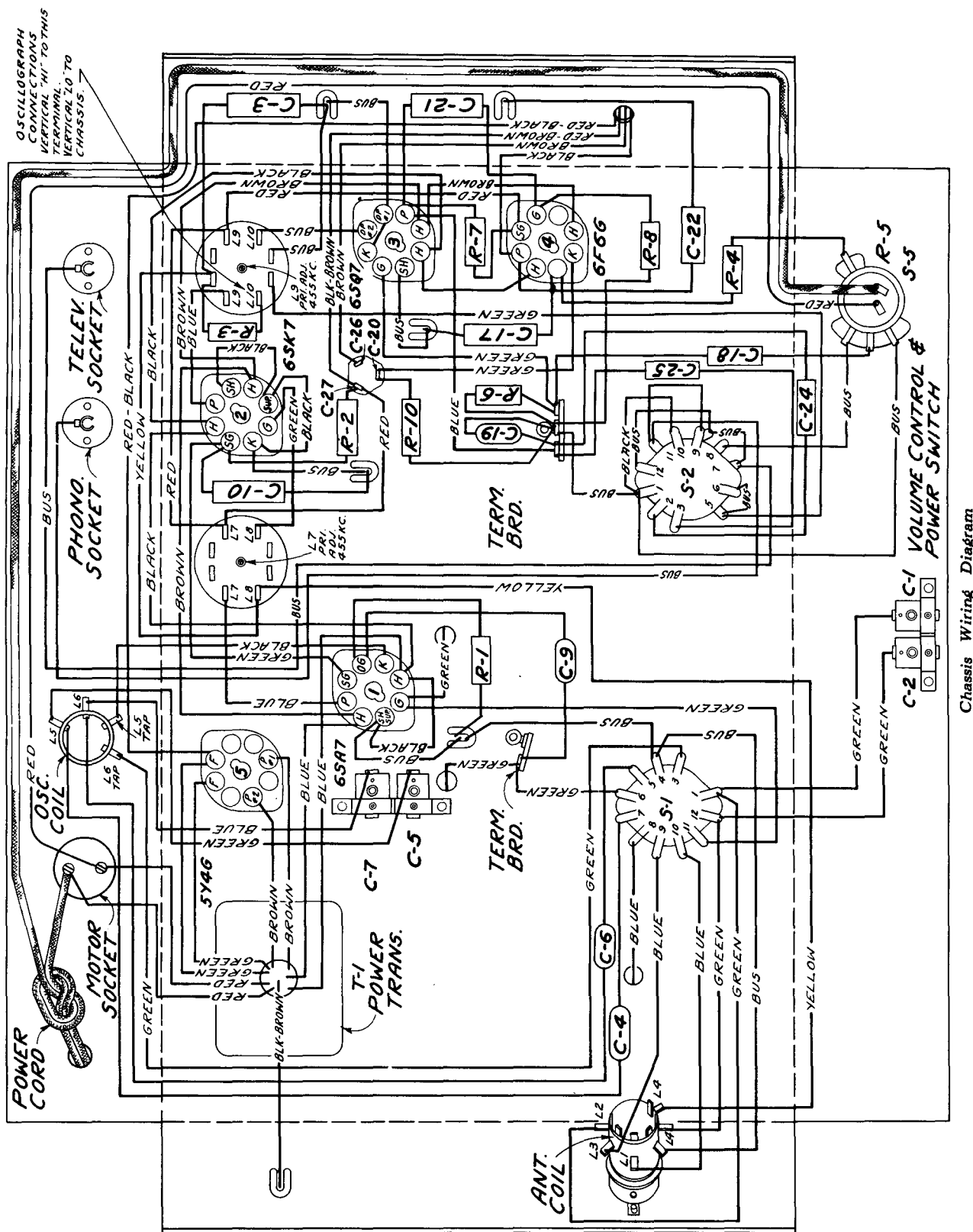
Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 grid in series with .01 mfd.	455 kc	"A" Band Quiet Point between 550-750 kc	L9 and L10 (2nd I-F Trans.)
2	6SA7 grid in series with .01 mfd.			L7 and L8 (1st I-F Trans.)
3	Ant. terminal in series with 300 ohms	18 mc	18 mc (24") "C" Band	C5 (osc.)* C1 (ant.)
4	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc (41.75°) "A" Band	C7 (osc.) C2 (ant.)
5		800 kc	800 kc (200.25°) "A" Band	L6 (osc.) Rock Gang
6	Repeat step 4.			

* Use minimum capacity peak if two can be obtained.

Note: Oscillator tracks above signal on all bands.







Chassis Wiring Diagram

REPLACEMENT PARTS FOR MODEL A5

SIX-TUBE, TWO BAND

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			
14517	Board-Antenna-ground terminal board...	33761	Transformer-2nd I.F. transformer (L9,L10,C14,C15).....
14394	Cable-Tuning tube cable & socket (R9)..	S-2476	Transformer-Power transformer 105-125 volt 60 cycle (T1).....
30766	Cap-Tuning tube cap.....	S-2535	Transformer-Power transformer 105-125 volts 25/60 cycle (T1)....
31292	Capacitor-Dial trimmer capacitor 3-30 mmfd. (C1,C2,C5,C7).....	S-2536	Volume control & power switch (R5, S5).....
12723	Capacitor-56 Mmfd. (C9).....	REPRODUCER ASSEMBLIES (RL79-1)	
30433	Capacitor-510 mmfd. (C6).....	32906	Coil-Hum neutralizing coil (L11)...
12537	Capacitor-560 mmfd. (C19).....	31647	Coil-Field coil (L13).....
12897	Capacitor-4700 mmfd. (C4).....	32934	Cone-Reproducer cone and voice coil (L12).....
3932	Capacitor-.0025 mfd. (C25,C18).....	31302	Plug-4 prong male plug.....
4838	Capacitor-.005 mfd. (C24,C22).....	33078	Reproducer complete.....
4937	Capacitor-.01 mfd. (C21).....	32905	Transformer-Output transformer (T2).....
4839	Capacitor-0.1 mfd. (C10,C3,C16,C17)..	MISCELLANEOUS ASSEMBLIES	
32240	Capacitor-Electrolytic capacitor consisting of two 10 mfd. and one 20 mfd. sections (C20,C26,C27).....	32907	Cap-Dust cap for cone centre(Pkg.5) .
S-2527	Coil-Antenna coil (L1,L2,L3,L4).....	S-2537	Button-Push button.....
S-2528	Coil-Oscillator coil (L5,L6).....	S-2538	Dial-Station selector glass dial scale.....
S-2529	Cord-Indicator pointer drive cord.....	S-2539	Escutcheon-Dial escutcheon less push buttons.....
34267	Drum-Variable condenser drive drum...	S-2540	Knob-Range,tuning,tone or volume control knob.....
S-2531	Indicator-Pointer & carriage assembly.	S-2541	Marker-Station call letter markers (1 set).....
11891	Lamp-Pilot lamp.....	14270	Spring-Knob retaining spring (Pkg.10).....
5040	Plug-4 contact female plug for speaker cable.....	S-2542	Tool-Push button adjusting tool....
31388	Resistor-390 ohm, 1 watt (R10).....	S-2543	Spring-Push button retaining spring (Pkg.3).....
S-1894	Resistor-5,600 ohm, 1/4 watt (R4).....		
33489	Resistor-15,000 ohm 2.5 watts (R2)....		
13998	Resistor-22,000 ohm, 1/4 watt(R1,R11).		
S-1690	Resistor-470,000 ohm,1/4 watt(R7,R8)..		
12679	Resistor-2.2 meg. 1/4 watt (R3).....		
13601	Resistor-10 meg. 1/4 watt (R6).....		
S-2446	Retainer-AC power socket retainer (Pkg.3).....		
32086	Roller-Drive Shaft rubber roller.....		
S-2447	Socket-AC power socket.....		
31364	Socket-Pilot light socket.....		
33514	Socket-Phono & Television receptacle..		
31251	Socket-Radiotron socket.....		
31418	Spring-Drive cord tension spring(Pkg.2)		
S-2533	Switch-Range switch (S1).....		
33424	Switch-Tone-Phono-Telev.Switch (S2)...		
S-2534	Transformer-1st I.F. transformer (L7,L8,C12,C13).....		

External Cross Modulation

(Continued from page 16)

tuned to the interfering signal, or both, will remedy the situation.

Cross modulation may, of course, be produced in the radio-frequency or first-detector stage of the receiver if the tubes are not of the remote cut-off or variable-mu type or if the operating bias is, for any reason, incorrect. Cross modulation occurring in the receiver can be differentiated from that due to external causes by use of a short antenna, a wave trap tuned to the strongest interfering station, or by substituting another receiver. These expedients will eliminate, or greatly reduce, cross modulation which takes place in the receiver, but will not affect external cross modulation.

As seen from some of the cases, the rectifying element may be in the power wiring, piping, or in the antenna itself. Therefore, the first step in eliminating the trouble should be to make sure that the antenna and ground connections to the receiver have secure, tight joints throughout, soldered joints in the antenna being preferable. If this does not cure the interference, the next step is to endeavor to find the rectifying element elsewhere. If the rectifier is in the power wiring, connection of two 0.1 mfd. condensers across the lighting lines, with the center point going as directly as possible to a good ground, should produce at least some decrease in the cross modulation. In this connection it should be remembered that steam or gas piping, and in some cases water piping, may have joints which are electrical rectifiers, and in this event use of such piping as a ground for the receiver will intensify cross modulation. The house should be examined for indications of pipes or electrical conduits which touch each other. If such points are found they should be separated by a block of wood or else bonded together securely.

If the source of rectification cannot be located, it still is usually possible to secure interference-free reception by the proper type of antenna installation. The location for an antenna which is free

from cross modulation can be readily found by the use of a portable battery receiver equipped with a short antenna. It will be found that the cross modulation occurs in the battery receiver when it is within the house, but disappears a few feet outside the house. By this exploration means, a location for the antenna is to be found where cross modulation does not exist. The spurious frequencies will, however, be picked up on the lead-in unless it is thoroughly shielded. In some cases metallic braid shielding may not be good enough and concentric transmission line cable, which is now available in small sizes, must be used. Since the shielded cable is low in impedance, it is necessary to use matching transformers at the antenna and at the receiver to obtain maximum efficiency. If such transformers are used, they should be examined for possibility of poor connections which will cause rectification and resultant cross-modulation interference. It must be remembered also that the ground lead of the receiver is capable of picking up radio-frequency energy so that it should be as short and direct as possible. The receiver should be relocated to accomplish this if necessary.

The steps involved in eliminating external cross-modulation interference area:

- 1—Calculate the frequency combination values to make sure the interference is external cross-modulation.
- 2—Examine antenna and ground for poor connections.
- 3—Try capacity filter across light lines.
- 4—Look for and eliminate rectifying contacts in piping or wiring.
- 5—Find antenna location free from cross modulation and install antenna there with shielded lead-in to set.

By following this procedure it should be possible to clear up even stubborn cases of interference due to external cross modulation.

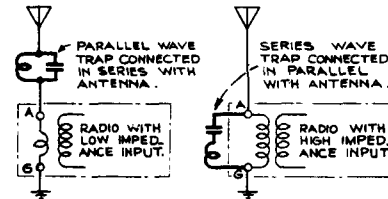
RCA WAVE TRAP DATA

Complete electrical specifications for all available RCA wave traps are given below.

On sets with a low-impedance input (few turns on primary of antenna coil, with a d-c resistance usually less than 10 ohms) the trap should be connected in series with the antenna.

On sets with a high-impedance input (large number of turns on primary of antenna coil, with a d-c resistance of 10 ohms or more) the trap should be connected in parallel with the antenna.

Frequency ranges and "Q" are approximate.



<p>IND. 1 MILLIHENRY CAP. 60-120 MMF. RANGE 400-520 KC Q = 50 IMPEDANCE 150,000Ω (WITH 4700Ω RESISTOR SHORTED)</p> <p>STOCK No. 11649</p>	<p>IND. 1.55 MILLIHENRY MIN. 2.35 MILLIHENRY MAX. USUALLY USED WITH 56 MMF. CAP. RANGE 400-520 KC Q = 110 IMPEDANCE PARALLEL 660,000Ω SERIES 58Ω</p> <p>STOCK No. 12654</p>
<p>IND. 106 MICROHENRIES CAP. 800-1300 MMF. RANGE 440-560 KC. Q = 50 IMPEDANCE 17,500Ω</p> <p>STOCK No. 11667</p>	<p>IND. 14 MICROHENRIES MIN. 40 MICROHENRIES MAX. CAP. 750 MMF. RANGE 920-1550 Q = 110 IMPEDANCE 25,000Ω</p> <p>STOCK No. 32189</p>
<p>IND. 280 MICROHENRIES CAP. 400 MMF. RANGE 460 KC. Q = 80 IMPEDANCE 64,000Ω</p> <p>STOCK No. 13838</p>	

Stock No. 13467 Universal Wave Trap

The RCA Universal wave trap (not illustrated) is designed for use in localities where unusual interference is caused by intense signals from local transmitting stations.

This trap uses a magnetite core transformer providing a high "Q" circuit. Adjustment to the interfering signal is made by means of a low-loss air dielectric variable condenser.

Attenuation is minus 30 db. or 32-1 voltage reduction. Range 435 to 1700 kilocycles.



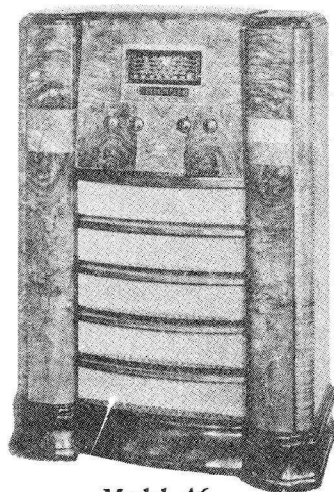
RCA Victor

MODELS A6 & A10 (Band Spread)

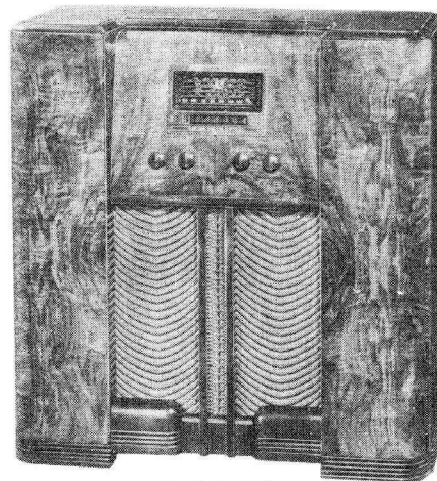
Eight-Tube, Five-Band, A-C, Superheterodyne Receivers

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model A6



Model A10

Electrical Specifications

FREQUENCY RANGES

Standard Broadcast (A)	540-1,720 kc
"49 M" (49 Meters)	5,900-6,240 kc
"31 M" (31 Meters)	9,410-9,690 kc
"25 M" (25 Meters)	11,680-11,920 kc
"19 M" (19 Meters)	15,090-15,380 kc

R-F ALIGNMENT FREQUENCIES

"49 M" (49 Meters)	6,100 kc. (osc., det., ant.)
"31 M" (31 Meters)	9,550 kc. (osc.)
"25 M" (25 Meters)	11,800 kc. (osc.)
"19 M" (19 Meters)	15,200 kc. (osc.)
"Standard Broadcast"	600 kc. (osc.), 1,500 kc. (osc., det., ant.)

Intermediate Frequency 455 kc.

RADIOTRON COMPLEMENT

(1) Type-6SK7	R-F Amplifier	(5) Type-6F6	Power Output
(2) Type-6SA7	First Detector-Oscillator	(6) Type-6F6	Power Output
(3) Type-6B8	Intermediate Amplifier	(7) Type-6U5	Tuning Tube
(4) Type-6SC7	Phase Inverter	(8) Type-5Y4G	Full wave Rectifier

Pilot Lamps (2) Mazda No. 44, 6.3 volts, 0.25 amp.

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 80 watts
Rating B	105-125 volts, 25-60 cycles, 80 watts

POWER OUTPUT

Undistorted	5 watts
Maximum	8 watts

LOUDSPEAKER (RL70H-1)

Type	12 inch Electrodynamic
Impedance (V.C.)	3.4 ohms at 400 cycles

General Description

These receivers employ an eight-tube, five band, superheterodyne circuit, the arrangement of which is shown in the Schematic Circuit Diagram. Features of design include:—Highly selective r-f amplifier stage with high “Q” cumulative wound” antenna and detector “A” Band coils giving a high signal to noise ratio; stabilized oscillator circuit incorporating the new single ended type converter tube; magnetite-core i.f. transformers of new design; magnetite-core oscillator coils on all bands; automatic volume con-

trol circuits; phono and television audio input sockets; A.C. socket on rear chassis apron; Tuning Indicator tube for fine, accurate tuning of all bands; radio-phono-television; nine position tone control; dust-proof electrodynamic loudspeaker; plunger-type, air dielectric trimmer capacitors; temperature-stabilized capacitors in the oscillator circuits; aural compensation on volume control; and a horizontal, edge lighted dial individually calibrated for each band.

Circuit Arrangement

The circuit consists of an r-f amplifier stage; first detector (oscillator) stage; i-f amplifier; second detector, and automatic volume control stage; a phase inverter stage; and a push-pull, class AB, power-amplifier stage; tuning indicator; and a full-wave rectifier.

The antenna and first-detector coils are constructed with a special type of winding (cumulative) to provide increased sensitivity and selectivity on the “Standard Broadcast” band. Special capacitors shunting the spread-band oscillator coils compensate for temperature variations to reduce oscillator frequency drift.

Spread-band tuning is accomplished electrically by shunting the oscillator section of the variable capacitor with relatively large temperature-stabilized fixed capacitors for tuning the oscillator coil on the

“19M,” “25M,” “31M” and “49M” bands. Antenna and first-detector coils are designed to be sufficiently broad-tuned to require no variable tuning over the narrow frequency range of the spread-bands.

The spread-band oscillator coils and the “Standard Broadcast” band oscillator, first detector, and antenna coils are all wound on separate forms. The antenna and first detector spread-band coils are tapped. Undesirable interaction between coils is avoided by shorting the unused sections by means of the range selector.

The intermediate-frequency amplifier consists of a Type 6B8 tube in a single stage transformer-coupled circuit. The windings of all i-f transformers are resonated by fixed capacitors and are adjusted by moulded magnetite cores to tune to 455 kc.

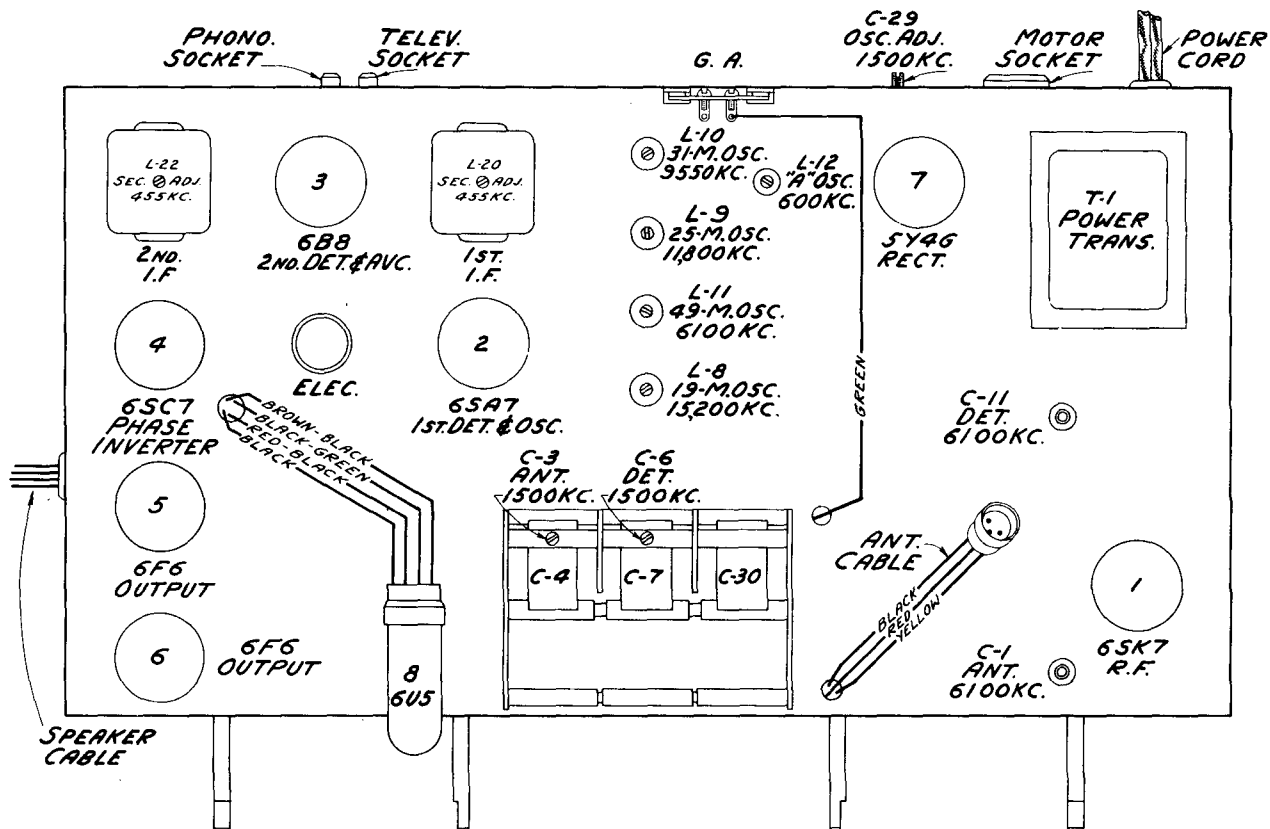


Fig. 1—Chassis Layout and Alignment Adjustments

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. 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 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum 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.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6SK7 2nd I.F. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	2nd I.F. Trans.	L21 & L22
2	6SA7 Det. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	1st I.F. Trans.	L19 & L20
3	Ant. Term	300 Ohms	6,100 kc	"49 M"	6.1 mc (95°)	"49M" Osc.	L11
4	Ant. Term	300 Ohms	6,100 kc	"49 M"	6.1 mc (95°)	"49M" Det.	C-11
5	Ant. Term	300 Ohms	6,100 kc	"49 M"	6.1 mc (95°)	"49M" Ant.	C-1
6	Ant. Term	300 Ohms	9,550 kc	"31 M"	9.55 mc (137°)	"31M" Osc.	L10
7	Ant. Term	300 Ohms	11,800 kc	"25 M"	11.8 mc (115°)	"25M" Osc.	L9
8	Ant. Term	300 Ohms	15,200 kc	"19 M"	15.2 mc (130°)	"19M" Osc.	L8
9	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" H-F Osc.	C29
10	Ant. Term	200 Mmfd.	600 kc	"A"	600 kc (201°)	"A" L-F Osc.	L12
11	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" Det.	C6
12	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" Ant.	C3

NOTE:—Align the I.F. Circuits by means of the oscillograph, for a symmetrical curve. Peak R.F. stages of all bands.

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-bearing the test-oscillator against short-wave stations of 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-bearing 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.

NOTE:—All spread band adjustments should be made with the chassis fastened in the cabinet and the pointer accurately aligned to the dial.

Spread-band Adjustments.—Alignment of the spread bands requires special procedure since test oscillators used alone are not ordinarily sufficiently accurate for this purpose. The RCA Stock

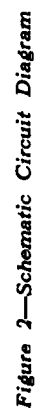
No. 9572 Crystal Calibrator affords a convenient and accurate alignment standard. Wrap a few turns of wire around the crystal calibrator and connect one free end to the antenna terminal of the receiver. Using the crystal calibrator to obtain the necessary accuracy, follow the tabulated alignment procedure for the "31M.", "25M.", and "19M." bands.

For the "49M." band, snap crystal calibrator "Hi-Lo" switch to "Hi", turn the range selector to "49M." band, and set receiver dial pointer to 6.0 mc. Adjust oscillator adjusting core L11 for minimum "Tuning Tube" opening. Use the peak indicated by the alignment table. Snap "Hi-Lo" switch to "Lo" and locate 6,100 kc (the first 100 kc harmonic above 6,000 kc) by slightly readjusting L11 with the dial pointer set at 6.1 mc. This method insures selection of correct crystal-calibrator harmonic.

When aligning with the RCA Stock No. 150 Test Oscillator use the variable (unmodulated) oscillator† and "Magic Eye" indication of receiver output. Set test-oscillator dial 800 kc lower than the desired signal for the four lower frequency ranges and 800 kc higher than the desired signal for the two high ranges and use in same manner as TMV-97-C. Insert an open-circuit telephone plug in the test oscillator "Ext. Mod." jack, so the modulated fixed-frequency oscillator will be cut off, and align on the unmodulated variable oscillator signal, which will close the "Tuning Tube" and evidence itself by a rushing noise in the speaker.

If the crystal calibrator signals are weak, disconnect test oscillator while using the crystal calibrator.

† The No. 150 Test Oscillator employs a fixed-frequency (800 kc), modulated oscillator and a variable, unmodulated oscillator. The scale is calibrated to the sum frequency for the two higher frequency ranges and to the difference frequency for the four lower frequency ranges.



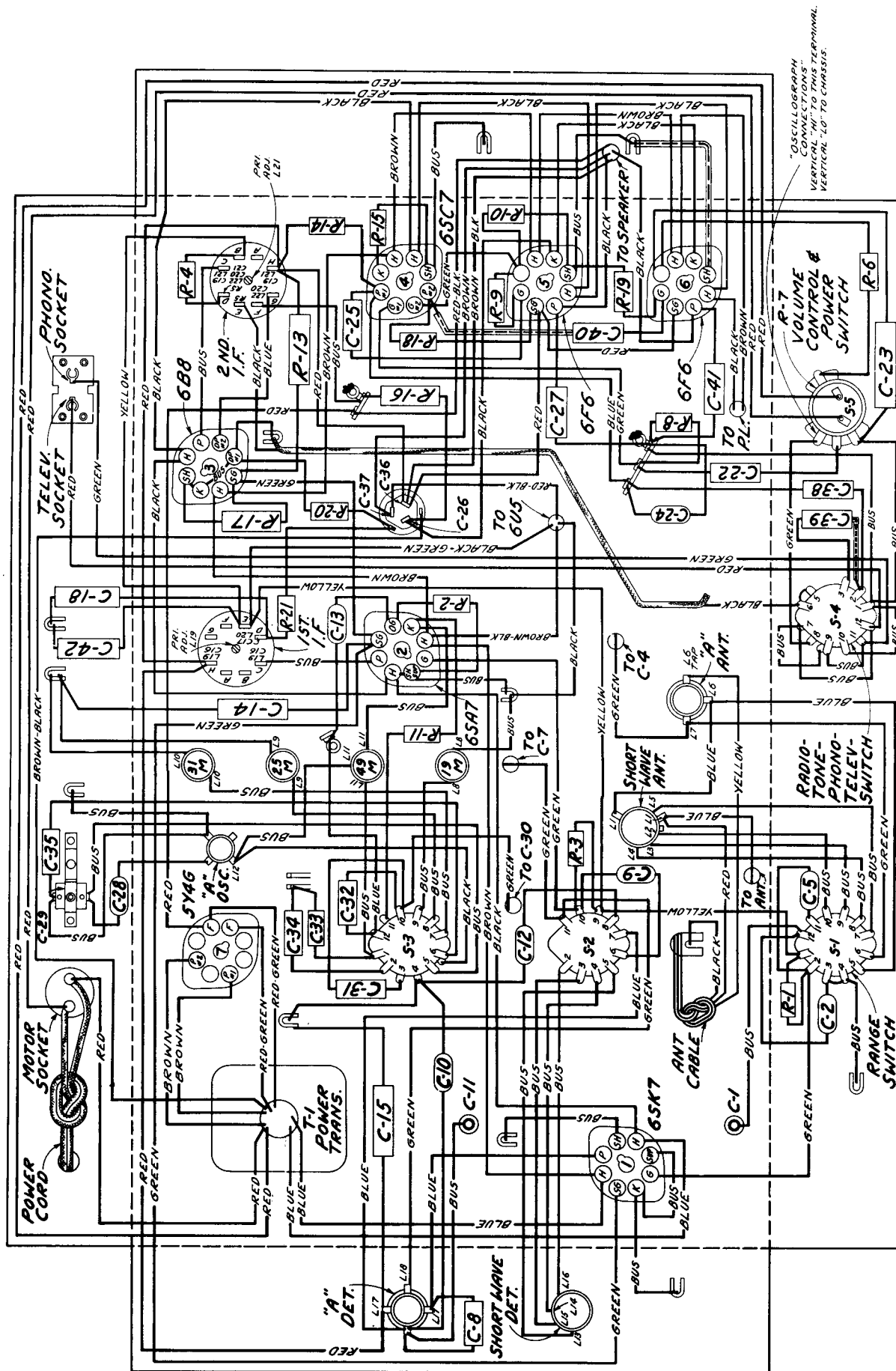


Figure 3—Chassis Wiring Diagram

RADIOTRON SOCKET VOLTAGES

Type	Plate	Screen Grid	Control Grid	Cathode	Heater
6SK7 R.F.	225V	80V	....	....	6.5V
6SA7 Conv.	255V	80V	....	....	6.5V
6B8 I.F.	225V	80V	-.2V	....	6.5V
6SC7 Audio	70*V	....	....	2V	6.5V
6F6 Output	330V	225V	....	20V	6.5V
6U5 Indicator	330V	....	....	....	6.5V
5Y4G Rectifier	....	....	330V	....	5.0V

* Cannot be accurately measured with the ordinary voltmeter due to high series resistance.

Note:—All the above values hold within + 20% when measured with a 1,000 ohm-per-volt meter, on a line voltage of 115 volts.

Precautionary Lead Dress

- (1) Dress Speaker cable leads against chassis side apron.
- (2) Twist red A.C. leads together — dress along

chassis apron, below phono-television sockets, upwards to clamp on chassis side apron and across to power switch on volume control.

Push Button Adjustments

The push buttons should be adjusted for six favorite stations after the receiver has had a brief warm-up period.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high.

Proceed as follows:—

1. Set the accessory tone knob to "Radio" and turn the range selector to "A" band position.
2. Remove the six push buttons by inserting a small screwdriver blade in the slot provided on the under side of the button. Press the screwdriver blade upwards at the same time pull the button forward.
3. Loosen the push arm adjusting screws accessible through the push button openings.

4. Press in the tuning knob and accurately tune in the first station.

5. With station accurately tuned in, press in the first push button and tighten screw.

6. Proceed in a similar manner to adjust the remainder of the push buttons.

7. Replace push buttons by inserting in the escutcheon openings, spring side down. Press button in as far as possible to securely lock button in escutcheon.

8. Place call letter tabs in openings provided.

Note:—When difficulty is experienced in setting up the push buttons due to sticking cams, unscrew cam screw $\frac{1}{2}$ turn and rotate gang back and forth until the cam plate moves freely.

RCA Victor "Magic Rodtenna"—These receivers are designed for use with Stock No. S-2477 Rodtenna. A three prong plug is provided on the chassis for convenient connection of this antenna, wherever the conventional type of outdoor antenna, is not practical. It is not advisable to replace a conventional type of antenna with the Rodtenna. Read the instructions enclosed with the Rodtenna for complete details.

REPLACEMENT PARTS FOR MODELS A6 & A10

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			
S-2524	Arm-Trip arm located on range switch shaft.....	30730	Resistor-2,700 ohm, 1/2 watt (R15)
14517	Board-Ant.-Gnd. terminal board.....	S-1894	Resistor-5,600 ohm, 1/4 watt (R6)
14394	Cable-Tuning indicator cable assembly.....	S-2595	Resistor-10,000 ohm, 2 watt (R17)
30766	Cap-Tuning indicator rubber cap.....	12288	Resistor-10,000 ohm, 1/4 watt (R10)
12714	Capacitor-Air trimmer 2-12 mmfd.(C1,C11)	13998	Resistor-22,000 ohm, 1/4 watt (R2,R5)
S-2578	Capacitor-Mica trimmer 3-30 mmfd.(C29).....	12199	Resistor-270,000 ohm, 1/4 watt (R14,R18)
13001	Capacitor-8.2 mmfd.(C2,C10).....	12285	Resistor-470,000 ohm, 1/2 watt (R9,R19,R21)
31350	Capacitor-18 mmfd.(C35).....	12013	Resistor-1 meg., 1/10 watt (R1,R3)
31354	Capacitor-33 mmfd.(Temp.Comp.)(C33)	12679	Resistor-2.2 meg.. 1/4 watt (R4,R8).....
12723	Capacitor-56 mmfd.(C12).....	S-2446	Retainer-AC female socket re-tainer (Pkg.3).....
31349	Capacitor-62 mmfd.(C32).....	33438	Screw-Thumb screw for tuning indicator bracket (Pkg.2).....
31352	Capacitor-120 mmfd.(C31).....	31364	Socket-Dial lamp socket.....
12724	Capacitor-120 mmfd.(C13).....	S-2447	Socket-AC input socket.....
31351	Capacitor-190 mmfd.(C34).....	31251	Socket-Tube socket.....
30608	Capacitor-510 mmfd.(C28).....	33514	Socket-Phono-Television socket..
12537	Capacitor-560 mmfd.(C5,C9,C24).....	31419	Spring-Drive cord tension spring (Pkg.2).....
5107	Capacitor-.0025 mfd.(C39).....	S-2583	Switch-Range switch (S1,S2,S3)..
4838	Capacitor-.005 mfd.(C27,C38,C41)...	S-2584	Switch-Tone,Phono,Television Switch (S4).....
4937	Capacitor-.01 mfd.(C22,C25,C40)...	S-2596	Transformer-1st I.F. transformer (L19,L20,C16,C17).....
14393	Capacitor-.01 mfd.(C8).....	33761	Transformer-2nd I.F. transformer (L21,L22,C19,C20,C21,R5).....
4886	Capacitor-.05 mfd.(C42).....	S-2597	Transformer-Power 105-125 volts, 25-60 cycle (T1).....
4839	Capacitor-0.1 mfd.(C14,C23).....	S-2548	Transformer-Power 105-125 volts, 50-60 cycles (T1).....
12484	Capacitor-.25 mfd.(C15,C18).....	REPRODUCER ASSEMBLIES (CRL-511-1)	
S-2579	Capacitor-Electrolytic capacitor consisting of one 10 mfd., one 15 mfd., and one 20 mfd. sections (C26,C36,C37).....	13866	Cap-Dust cap for cone center (Pkg.5).....
S-2585	Coil-Antenna "A" band coil (L6,L7)...	S-2598	Coil-Field coil (L25).....
S-2580	Coil-Antenna "Spreadband" coil (L1,L2,L3,L4,L5)	11469	Coil-Hum neutralizing coil (L23)
S-2586	Coil-R.F. "A" band coil (L17,L18)....	31275	Cone-Reproducer cone & voice coil (L24).....
31266	Coil-R.F. "Spreadband" coil (L13,L14,L15,L16)	31539	Plug-5 contact male plug.....
S-2581	Coil-Oscillator "A" band coil (L12).	S-2599	Reproducer complete.....
S-2582	Coil-19M oscillator coil (L8).....	14534	Transformer-Output (T2).....
31254	Coil-25M oscillator coil (L9).....	MISCELLANEOUS ASSEMBLIES	
31255	Coil-31M oscillator coil (L10).....	S-2537	Button-Station selector push button.....
31256	Coil-49M oscillator coil (L11).....	S-2576	Dial-Glass dial scale.....
S-2536	Control-Volume control & Power switch (R7,S5).....	S-2539	Escutcheon-Station selector dial escutcheon.....
S-2529	Cord-Drive cord.....	S-2540	Knob-Volume, tone, range or tuning control knob.....
S-2530	Drive-Friction drive assembly.....	S-2541	Marker-Push button call letter markers (1 set).....
34267	Drum-Drive cord drum complete with set screws and calibration dial...	14270	Spring-Knob retaining spring (Pkg.10).....
S-2531	Indicator-Station selector indicator pointer.....	S-2543	Spring-Push button retaining spring (Pkg.3).....
11891	Lamp-Pilot lamp.....	S-2542	Tool-Push button adjusting tool.
12493	Plug-5 contact female speaker plug..		
30789	Resistor-33 ohm, 1/2 watt (R20).....		
12262	Resistor-680 ohm, 1/4 watt (R11).....		
S-2593	Resistor-560 ohm, 2 watt (R16).....		
S-2594	Resistor-8,000 ohm, 5 watt (R13).....		



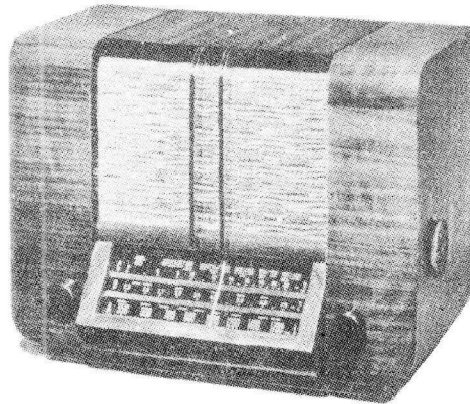
RCA Victor

MODEL A-20E

Five tube, three band, AC, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical and Mechanical Specification

Power Supply Rating

Rating 105-125, 220-250 volts, 60 cycle, 70 watts

General Description

This receiver is similar to Model A-20 with the exception of the power transformer which is designed to operate on either 110 or 220 volt 60 cycle Power supply. A line voltage change switch located on the chassis rear apron is used to provide operation on either of the supply voltages shown above.

Information pertaining to alignment, voltages, Parts, etc., will be found in the Service Notes for model A-20.

Replacement Parts peculiar to Model A-20E

32827 Switch—Line change switch

35708 Transformer—Power Transformer 105-125, 220-250 volt, 60 cycle

For all other parts see A-20 Service Notes



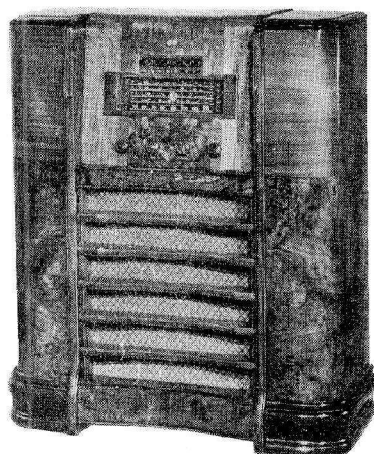
RCA Victor

MODEL A8 (Band Spread)

Eleven-Tube, Five-Band, A-C, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model A8

Electrical Specifications

FREQUENCY RANGES

Standard Broadcast (A)	540-1,720 kc
"49 M" (49 Meters)	5,900-6,240 kc
"31 M" (31 Meters)	9,410-9,690 kc
"25 M" (25 Meters)	11,680-11,920 kc
"19 M" (19 Meters)	15,090-15,380 kc

R-F ALIGNMENT FREQUENCIES

"49 M" (49 Meters)	6,100 kc. (osc., det., ant.)
"31 M" (31 Meters)	9,550 kc. (osc.)
"25 M" (25 Meters)	11,800 kc. (osc.)
"19 M" (19 Meters)	15,200 kc. (osc.)
"Standard Broadcast"	600 kc. (osc.), 1,500 kc. (osc., det., ant.)

Intermediate Frequency 455 kc.

RADIOTRON COMPLEMENT

- (1) Type-6K7 R.F. Amplifier
- (2) Type-6SA7 First Detector
- (3) Type-6SJ7 Oscillator
- (4) Type-6SK7 I.F. Amplifier
- (5) Type-6SK7 I.F. Amplifier
- (6) Type-6SQ7 Audio Amp.

- (7) Type-6SF5 Phase Inverter
- (8) Type-6F6 Power Output
- (9) Type-6F6 Power Output
- (10) Type-5T4 Full Wave Rectifier
- (11) Type-6U5 Tuning Indicator

Pilot Lamps One Mazda 47, 6-8 volts, .15 amp.; Two Mazda 44, 6.3 volt, .25 amp.
Fuse (Motor) 3 Ampere

POWER SUPPLY RATINGS

Rating A 105-125 volts, 50-60 cycles, 120 watts
Rating B 105-125 volts, 25-60 cycles 120 watts

POWER OUTPUT

Undistorted 7 watts
Maximum 10 watts

LOUDSPEAKER (RL70H-2)

Type 12 inch Electrodynamic
Impedance (V.C.) 3.4 ohms at 400 cycles

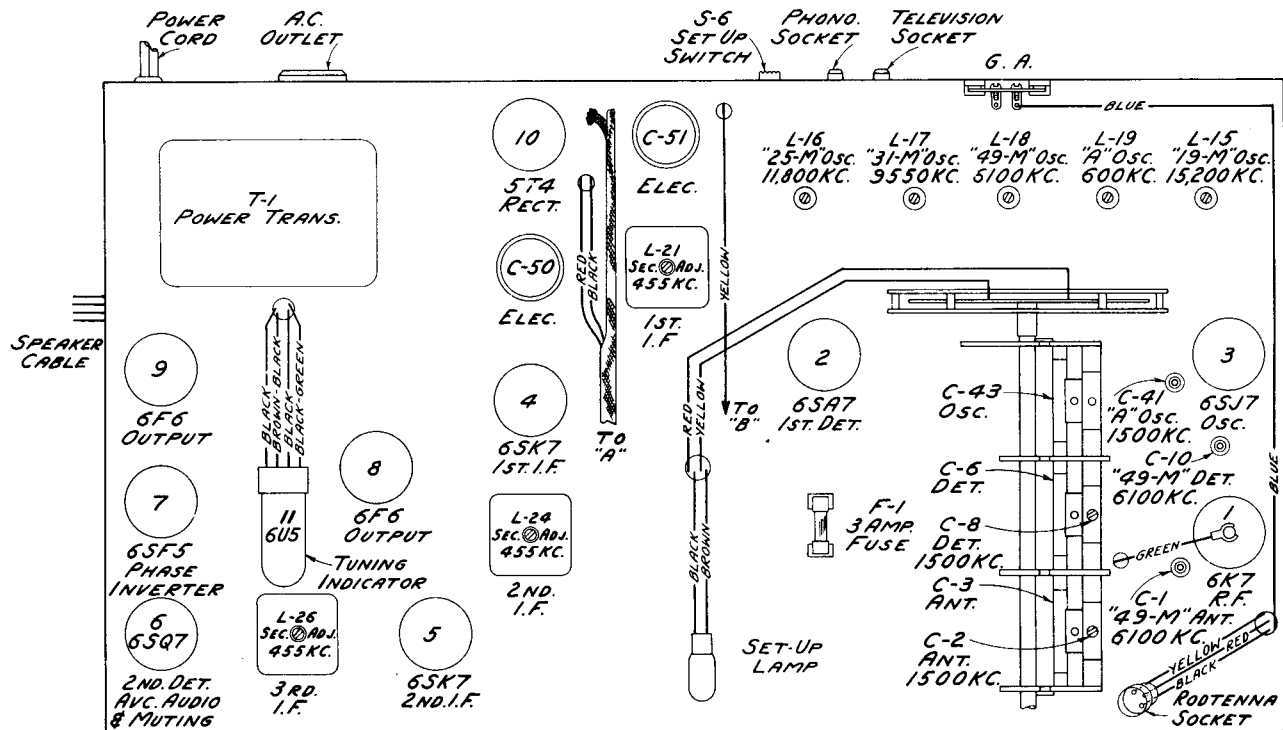
Mechanical Specifications

Height	40 1/4 inches
Width	33 3/4 inches
Depth	15 1/8 inches
Weight (Shipping)	105 pounds
Weight (Net)	90 pounds
Chassis Base Dimensions	15 1/2 inches x 8 1/2 inches x 3 1/4 inches
Overall Chassis Height	8 3/4 inches
Operating Controls	(1) Power-Volume, (2) Radio-Phono-Telev. Tone Switch, (3) Manual Tuning, (4) Range Switch, (5) Eight Push Buttons

General Description

This receiver employs an eleven-tube, five-band, "Magic Brain" superheterodyne circuit, the arrangement of which is shown in the Schematic circuit diagram. Features of design include:— "Electric Tuning" for seven broadcast stations, push-pull power output stage; magnetite-core I.F. transformers and oscillator coils; temperature-stabilized capacitors; four short wave spread bands; automatic volume

control; Phono and Television audio input sockets; "Magic Eye" tuning tube; aural-compensated audio volume control; Radio-Phono-Television tone control switch; "Electric tuning" set-up switch; phase inverter circuit; "Magic Rodenna" attachment plug; A.C. outlet socket; new straight line "Spread Band" dial; variable selectivity I.F. channel; and a 12 inch, dust proof electrodynamic loudspeaker.



Chassis Layout and Alignment Adjustments

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in 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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. 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 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum 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.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6SK7 2nd I.F. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	3rd I.F. Trans.	L25. & L26
2	6SK7 1st I.F. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	2nd I.F. Trans.	L23 & L24
3	6SA7 1st Det. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	1st I.F. Trans.	L20 & L21
4	Ant. Term	300 Ohms	6,100 kc	"49 M"	6.1 mc (106°)	"49M" Osc.	L18
5	Ant. Term	300 Ohms	6,100 kc	"49 M"	6.1 mc (106°)	"49M" Det.	C10
6	Ant. Term	300 Ohms	6,100 kc	"49 M"	6.1 mc (106°)	"49M" Ant.	C-1
7	Ant. Term	300 Ohms	9,550 kc	"31 M"	9.55 mc (73.5°)	"31M" Osc.	L17
8	Ant. Term	300 Ohms	11,800 kc	"25 M"	11.8 mc (90°)	"25M" Osc.	L16
9	Ant. Term	300 Ohms	15,200 kc	"19 M"	15.2 mc (78°)	"19M" Osc.	L15
10	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (151.5°)	"A" H-F Osc.	C41
11	Ant. Term	200 Mmfd.	600 kc	"A"	600 kc (30°)	"A" L-F Osc.	L19
12	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (151.5°)	"A" Det.	C8
13	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (151.5°)	"A" Ant.	C2

NOTE:—Align the I.F. Circuits by means of the oscillograph, for a symmetrical curve. Peak R.F. stages of all bands. Manual tuning button must be depressed during the alignment.

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 of 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.

NOTE:—All spread band adjustments should be made with the chassis fastened in the cabinet and the pointer accurately aligned to the dial.

Spread-band Adjustments.—Alignment of the spread bands requires special procedure since test oscillators used alone are not ordinarily sufficiently accurate for this purpose. The RCA Stock

No. 9572 Crystal Calibrator affords a convenient and accurate alignment standard. Wrap a few turns of wire around the crystal calibrator and connect one free end to the antenna terminal of the receiver. Using the crystal calibrator to obtain the necessary accuracy, follow the tabulated alignment procedure for the "31M.", "25M.", and "19M." bands.

For the "49M." band, snap crystal calibrator "Hi-Lo" switch to "Hi", turn the range selector to "49M." band, and set receiver dial pointed to 6.0 mc. Adjust oscillator adjusting core L18 for minimum "Tuning Tube" opening. Use the peak indicated by the alignment table. Snap "Hi-Lo" switch to "Lo" and locate 6,100 kc (the first 100 kc harmonic above 6,000 kc) by slightly readjusting L18 with the dial pointer set at 6.1 mc. This method insures selection of correct crystal-calibrator harmonic.

When aligning with the RCA Stock No. 150 Test Oscillator use the variable (unmodulated) oscillator† and "Magic Eye" indication of receiver output. Set test-oscillator dial 800 kc lower than the desired signal for the four lower frequency ranges and 800 kc higher than the desired signal for the two high ranges and use in same manner as TMV-97-C. Insert an open-circuit telephone plug in the test oscillator "Ext. Mod." jack, so the modulated fixed-frequency oscillator will be cut off, and align on the unmodulated variable oscillator signal, which will close the "Tuning Tube" and evidence itself by a rushing noise in the speaker.

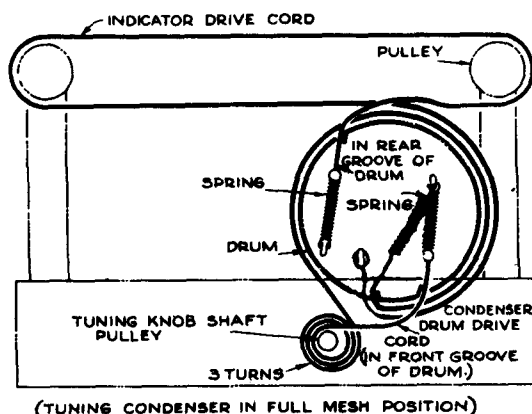
If the crystal calibrator signals are weak, disconnect test oscillator while using the crystal calibrator.

† The No. 150 Test Oscillator employs a fixed-frequency (800 kc), modulated oscillator and a variable, unmodulated oscillator. The scale is calibrated to the sum frequency for the two higher frequency ranges and to the difference frequency for the four lower frequency ranges.

RADIOTRON SOCKET VOLTAGES

Type	Plate	Screen Grid	Control Grid	Cathode	Heater
6K7 R.F.	220V	80V	....	....	6.5V
6SA7 Conv.	220V	80V	....	2.3V	6.5V
6SJ7 Osc.	165V	165V	....	....	6.5V
6SK7 1st I.F.	225V	80V	....	3.5V	6.5V
6SK7 2nd I.F.	225V	80V	....	3.0V	6.5V
6SQ7 Audio	135V	....	....	....	6.5V
6SF5 Inverter	135V	....	....	....	6.5V
6F6 Output	350V	230V	-22V	....	6.5V
6F6 Output	350V	230V	-22V	....	6.5V
6U5 Indicator	350V	....	....	....	6.5V

NOTE:—All the above voltage values should hold within plus or minus 20% when measured with a 1,000 ohms-per-volt meter, on a line voltage of 115 volts.



— Drive Cord Arrangement for Tuning Condenser.

Electric Tuning Mechanism

The circuit of the electric tuning mechanism is shown on page 7. A separate push button assembly is mounted in the cabinet, removed from the chassis. Seven buttons are provided for electric tuning, the eighth button being used for manual

tuning and alignment purposes. The tuning unit assembly is similar to those used in the '39 series receivers, refer to Service Notes for these receivers for mechanical details.

Adjustments for Electric Tuning

Proceed to set up for Electric Tuning as follows:—

(1) Place the Set-up Switch, located on the rear of the chassis, to "SET-UP" position.

(2) Push in Manual tuning button and tune in the first station by means of the Manual Tuning Control.

(3) Press button No. 1 (button on extreme left).

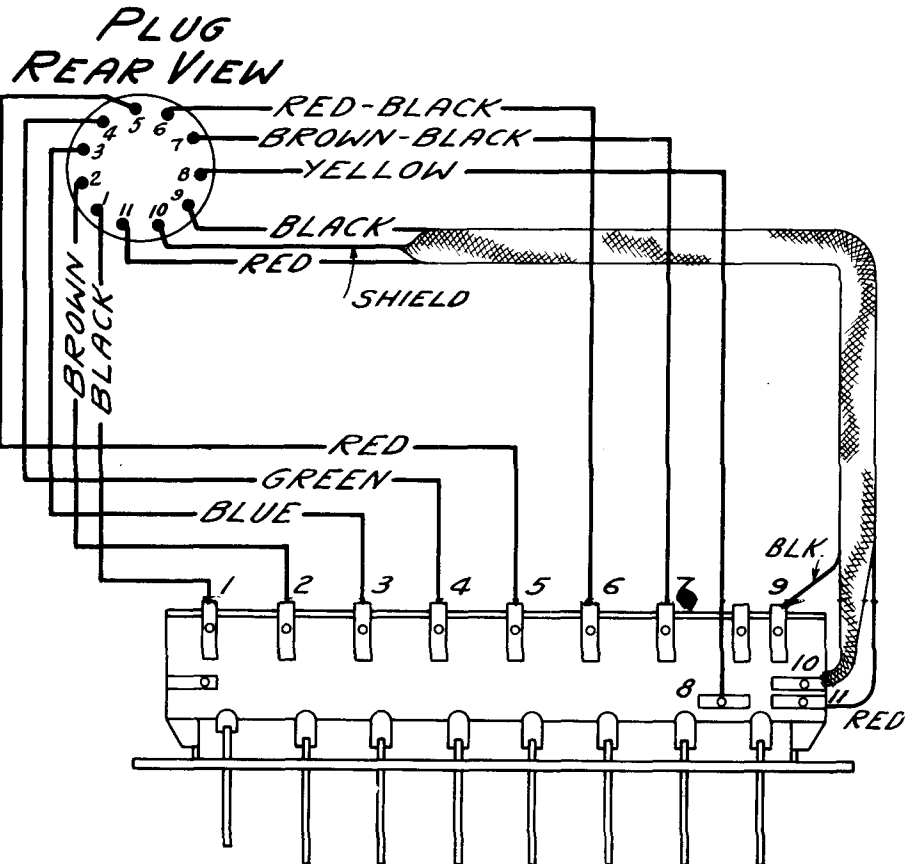
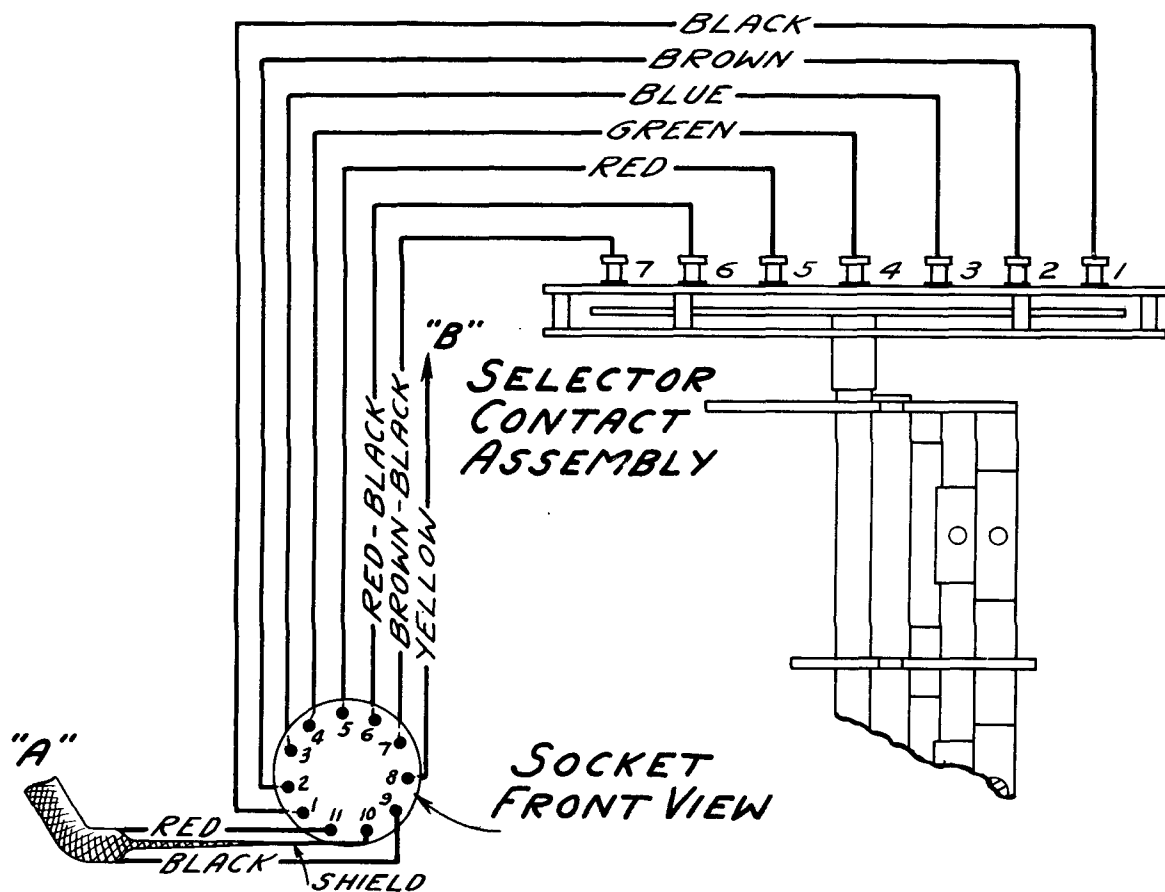
(4) Looking in the back of the receiver you will see two semi-circular slots mounted in an assembly on the rear of the gang. In the slots are seven adjusting pins corresponding to the seven push buttons. Pin No. 1 is in the lower slot on the left hand side.

RCA Victor "Magic Rodtenna"—This receiver is designed for use with Stock No. S-2477 Rodtenna. A three prong plug is provided on the chassis for convenient connection of this antenna, wherever the conventional type of outdoor antenna, is not practical. It is not advisable to replace a conventional type of antenna with the Rodtenna. Read the instructions enclosed with the Rodtenna for complete details.

Pin No. 2 is in the upper slot on the left hand side. The pins are staggered in a similar manner around the slots.

(5) Move pin No. 1 along the slot until the pilot light located in the centre of the chassis, near the front of the cabinet, goes out. Button No. 1 is now set to the station originally tuned in manually.

(6) Reset the Set-up Switch (located on the chassis back apron) to "OPERATE" position. In the event, station is not heard properly, when No. 1 button is pressed, repeat above procedure.



REPLACEMENT PARTS FOR MODEL A8

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			
30766	Cap-Tuning indicator tube rubber cap.....	11452	Resistor-470,000 ohm,1/10 watt(R28)
31863	Board-Ant.-grd.terminal board.....	12013	Resistor-1 meg.,1/10 watt (R1).....
12884	Capacitor-Adjustable air trimmer 2-20 mmfd.(C1,C10).....	13730	Resistor-1 meg.,1/4 watt (R2).....
12714	Capacitor-Adjustable air trimmer (C41).....	31056	Resistor-1.2 meg.,1/10 watt (R17)...
31350	Capacitor-18 mmfd.(C42).....	5131	Resistor-2.2 meg.,1/10 watt (R11)...
31353	Capacitor-15 mmfd.(C39).....	12679	Resistor-2.2 meg.,1/4 watt (R15)...
31354	Capacitor-33 mmfd.(Temp.Comp.)(C47)	31418	Spring-indicator drive cord tension spring (Pkg.2).....
31348	Capacitor-510 mmfd.(C40).....	13638	Spring-Drive cord tension spring (Pkg.5).....
31349	Capacitor-62 mmfd. (C44).....	14887	Retainer-Indicator drive cord pulley retainer(Pkg.10).....
31352	Capacitor-120 mmfd.(C45).....	S-2446	Retainer-A.C.socket retainer(Pkg.3)
12724	Capacitor-120 mmfd.(C9).....	31365	Socket-Dial lamp socket(Insulated).
31351	Capacitor-190 mmfd.(C48).....	31364	Socket-Dial lamp socket.....
12694	Capacitor-220 mmfd.(C7).....	S-2447	Socket-A.C.female socket.....
12720	Capacitor-100 mmfd.(C32).....	33514	Socket-Phono.-Telev.socket.....
12724	Capacitor-120 mmfd.(C46).....	31572	Socket-Antenna cable socket.....
5107	Capacitor-.0025 mfd.(C29).....	31251	Socket-Tube socket.....
30303	Capacitor-.0035 mfd.(C55).....	33491	Switch-Tuning unit set up switch(S6)
4838	Capacitor-.005 mfd. (C28,C35,C37).	S-2624	Switch-Range switch (S1,S2,S3).....
14393	Capacitor-.01 mfd.(C4,C5,C11,C12, C15,C16,C18,C19,C23,C31,C33,C34, C54).....	S-2625	Switch-Station selector push button switch.....
4886	Capacitor-.05 mfd.(C49).....	S-2627	Tone control-Radio,Phono,Telev., tone switch(S4).....
4839	Capacitor-0.1 mfd.(C17,C22,C24,C30)	S-2628	Transformer-First I.F.transformer (L20,L21,L22,C13,C14).....
12484	Capacitor-.25 mfd.(C36,C38,C53)...	S-2629	Transformer-Second I.F.transformer (L23,L24,C20,C21).....
30867	Capacitor-0.5 mfd.(C52).....	S-2630	Transformer-Third I.F.transformer (L25,L26,C25,C26,C27,R12).....
5212	Capacitor-16 mfd.electrolytic capacitor(C51).....	31226	Transformer-Power transformer 110 volt,25/60 cy.(T1).....
14531	Capacitor-25 mfd.electrolytic capacitor(C50).....	31225	Transformer-Power transformer 110 volt,50/60 cy.(T1).....
32088	Capacitor-60 mfd.(60 cy.only)(C56)	S-2631	Volume Control & power switch(R13,S5)
32435	Capacitor-180 mfd.(25 cy.only)(C56)	TUNING MOTOR ASSEMBLIES	
S-2621	Coil-"A" band antenna coil (L6,L7)	31229	Body-Station setting contact body, less contact tip and tip spring...
31257	Coil-"A" band oscillator coil(L19)	32093	Damper-Variable condenser tuning motor damper.....
	L2,L3,L4,L5).....	31239	Gear-Knob shaft drive gear & hub...
31266	Coil-Spread band detector coil (L8,L9,L10,L11).....	32434	Motor-Tuning drive motor 25 cy.(M1)
31258	Coil-19 meter band oscillator coil (L14,L15).....	32095	Motor-Tuning drive motor 60 cy.(M1)
31254	Coil-25 meter band oscillator coil (L16).....	31228	Plate-Station setting contact plate
31255	Coil-31 meter band oscillator coil (L17).....	31231	Plunger-Station setting contact plunger (Pkg.2).....
31256	Coil-49 meter band oscillator coil (L18).....	32086	Roller-Friction roller mounted on tuning motor shaft.....
31234	Condenser-3 gang variable condenser(C3,C2,C6,C8,C43).....	31233	Rotor-Selector disc-mounts on rear of gang shaft.....
31273	Drum-Station selector drive cord drum.....	14350	Screw-8/32 square head set screw for selector disc.(Pkg.10).....
31480	Lamp-Electric tuning adjustment lamp.....	31232	Spring-Station setting contact tip spring (Pkg.10).....
11891	Lamp-Dial lamp.....	31230	Spring-Station setting contact body spring (Pkg.10).....
31280	Pulley-Indicator drive cord pulley	32094	Washer-Spring tension washer for motor damper.....
5040	Plug-4 contact female speaker plug	REPRODUCER ASSEMBLIES RL70H-2	
31271	Pulley-Station selector knob shaft pulley.....	13866	Cap-Dust cap for cone center(Pkg.5)
31250	Resistor-Voltage divider comprising one 1,500 ohm,one 2,650 ohm,one 3,400 ohm,one 12 ohm, and one 180 ohm sections(R23,R24,R25,R26,R27)	11234	Coil-Field coil (L29).....
11296	Resistor-330 ohm,1/4 watt (R4)....	11469	Coil-Neutralizing coil (L28).....
12512	Resistor-470 ohm,1/4 watt (R9)....	31275	Cone-Reproducer cone & voice coil(L27)
14720	Resistor-1000 ohm,1/4 watt(R6,R7, R8).....	5039	Plug-4 contact male speaker plug...
12312	Resistor-3,300 ohm,1/4 watt (R14).	31530	Reproducer complete.....
14284	Resistor-22,000 ohm,1/10 watt(R29)	14534	Transformer-Output (T2).....
11300	Resistor-33,000 ohm,1/10 watt (R3, R21).....	14357	Washer-Field coil retaining washer (Pkg.5).....
11281	Resistor-100,000 ohm,1/10 watt(R5)	MISCELLANEOUS ASSEMBLIES	
14560	Resistor-100,000 ohm,1/4 watt(R10, R19,R30).....	S-2632	Button-Station selector push button
12264	Resistor-220,000 ohm,1/10 watt(R16, R31).....	31281	Cord-Indicator pointer drive cord...
11453	Resistor-270,000 ohm,1/10 watt(R18, R20).....	31283	Cord-Variable condenser drum drive cord.....
		S-2633	Dial-Station selector dial scale...
		S-2634	Escutcheon-Station selector dial scale escutcheon.....
		S-2209	Fuse-3 Ampere tuning motor fuse(F1)
		34383	Indicator-Station selector indicator pointer ass'y.....
		S-2540	Knob-Volume,tone,range or tuning control knob.....
		S-2541	Markers-Station call letter markers (1 set).....
		S-2635	Screw-Push button spring & spacer retaining screw (Pkg.10).....
		14270	Spring-Knob retaining spring(Pkg.10)
		S-2636	Spring-Push button actuating spring (Pkg.3).....



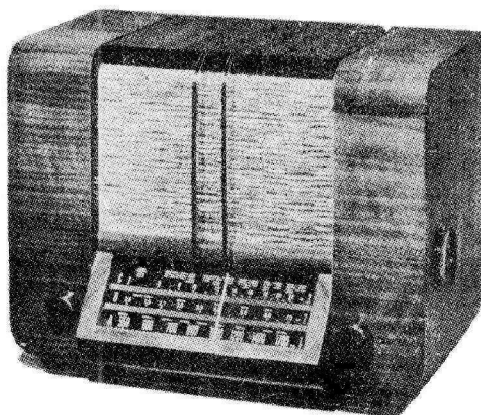
RCA Victor

MODEL A-20 (Globe Trotter)

Five-Tube, Three-Band, A-C Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical and Mechanical Specifications

FREQUENCY RANGES

"Standard Broadcast" (A) ----- 540-1,720 kc (555-174 m)
 "Medium Wave" (B) ----- 2.3-7.0 mc (130-42.8 m)
 "Short Wave" (C) ----- 7.0-22.0 mc (42.8-13.6 m)
 Intermediate Frequency ----- 455 kc

TUBE COMPLEMENT

(1) TYPE-6SA7 ----- First Detector—Oscillator
 (2) TYPE-6SK7 ----- Intermediate Amplifier
 (3) TYPE-6SQ7 ----- Second-Detector, A.V.C., and A-F Amplifier
 (4) TYPE-6F6-G ----- Power Output
 (5) TYPE-5Y4-G ----- Full-Wave Rectifier
 Pilot Lamp (1) ----- Mazda 44, 6.3 volts, 0.25 amp.

POWER OUTPUT RATING

Undistorted ----- 1.5 watts
 Maximum ----- 3.3 watts

LOUDSPEAKER

Type RL-78-2 ----- 5-inch Electrodynamic
 Voice-Coil Impedance ----- 3.4 ohms at 400 cycles

POWER SUPPLY RATINGS

Rating A ----- 105-125 volts, 50-60 cycles, 70 watts
 Rating B ----- 105-125 volts, 25-60 cycles, 70 watts

CABINET DIMENSIONS

Height ----- 10½ inches
 Width ----- 13½ inches
 Depth ----- 8¾ inches
 Weight (net) ----- 18½ pounds
 Chassis Base Dimensions ----- 12 in. wide, 5¼ in. deep, 2¾ in. high
 Overall Chassis Height ----- 7 inches
 Tuning Drive Ratio ----- 18 to 1

General Description

Model A-20 is a three-band, table type superheterodyne receiver designed to cover the standard broadcast range of 540 to 1,720 kilocycles, and the short-wave range from 2.3 to 22 megacycles. The cabinet is designed in the Continental manner. Features of design include:—magnetite-core I.F. transformers; magnetite-core

"A" band oscillator coil; automatic volume control; continuously variable high frequency tone control; edge-lighted straight-line dial, Phono input socket, A.C. outlet socket, Radio-Phono transfer switch, and a dust-proof electrodynamic loudspeaker.

Miscellaneous Service Data

Precautionary Lead Dress

1. Lead from 2nd I.F. (E) to volume control should be kept close to chassis.
2. R.F. coil leads should be kept short and away from coil.
3. Leads to 6,000 mmf. (C25) should be as short as possible and condenser dressed away from chassis, bearing against 10 ohm (R3) resistor.

Victrola Attachment.—A jack is provided on the rear of chassis for connection to a Victrola Attachment. The cable from the attachment should be terminated in a Stock No. 31048 plug to fit the jack.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

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 ground terminal, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the rear of the 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 45 degree mark on the drum scale must be in a horizontal position when the plates are fully meshed. The distance from the edge of the chassis to the drum must not exceed $\frac{3}{8}$ -inch. The drum is held to the shaft by means of a set screw, 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.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

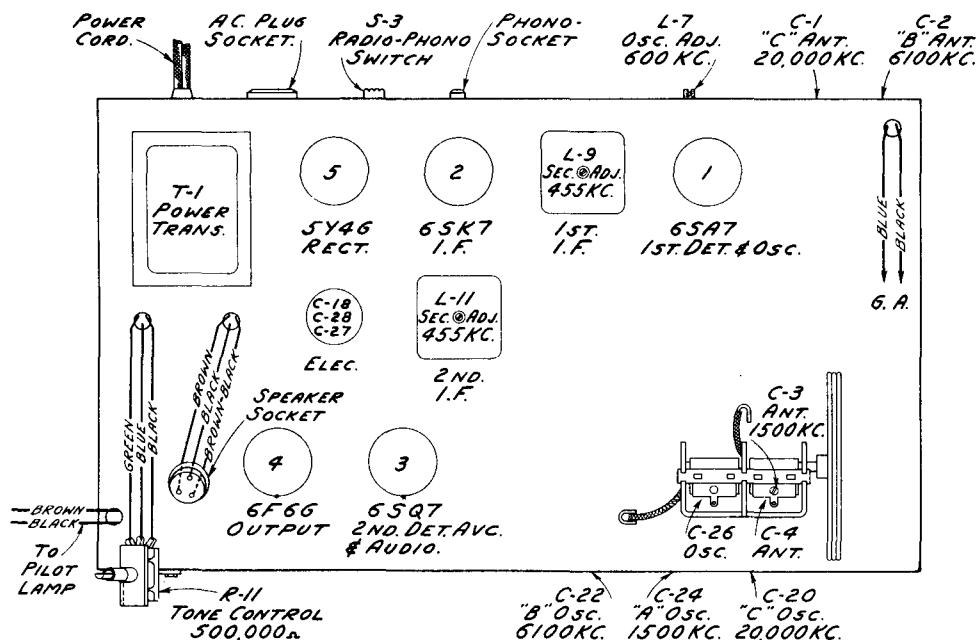
Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band quiet point between 550-750 kc	L10 and L11 (2nd I.F. trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd. **	455 kc		L8 and L9 (1st I.F. trans.)
3	Antenna lead (blue) in series with 200 mmfd.	600 kc	600 kc (33°) "A" Band	L7†
4		1,500 kc	1,500 kc (152.4°) "A" Band	C3 (ant.) C24 (osc.)
5	Repeat steps 3 and 4			
6	Antenna lead (blue) in series with 400 ohms	20 mc	20 mc (155.4°) "C" Band	C20 (osc.)* C1 (ant.)
7		6 mc	6 mc (149°) "B" Band	C22 (osc.)* C2 (ant.)
8	Antenna lead (blue) in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C24 (osc.)

* Use minimum capacity peak if two peaks can be obtained.

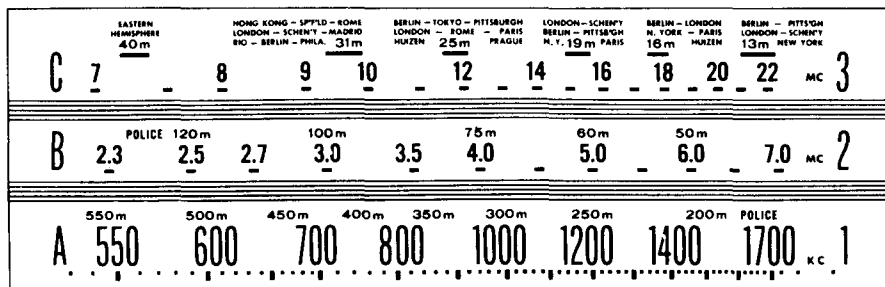
† Rock gang condenser slightly while adjusting L7.

** Make test-oscillator connection to lug on tuning condenser stator (oscillator section) in series with .01 mfd. condenser.

Note.—Oscillator tracks 455 kc above signal on all bands.



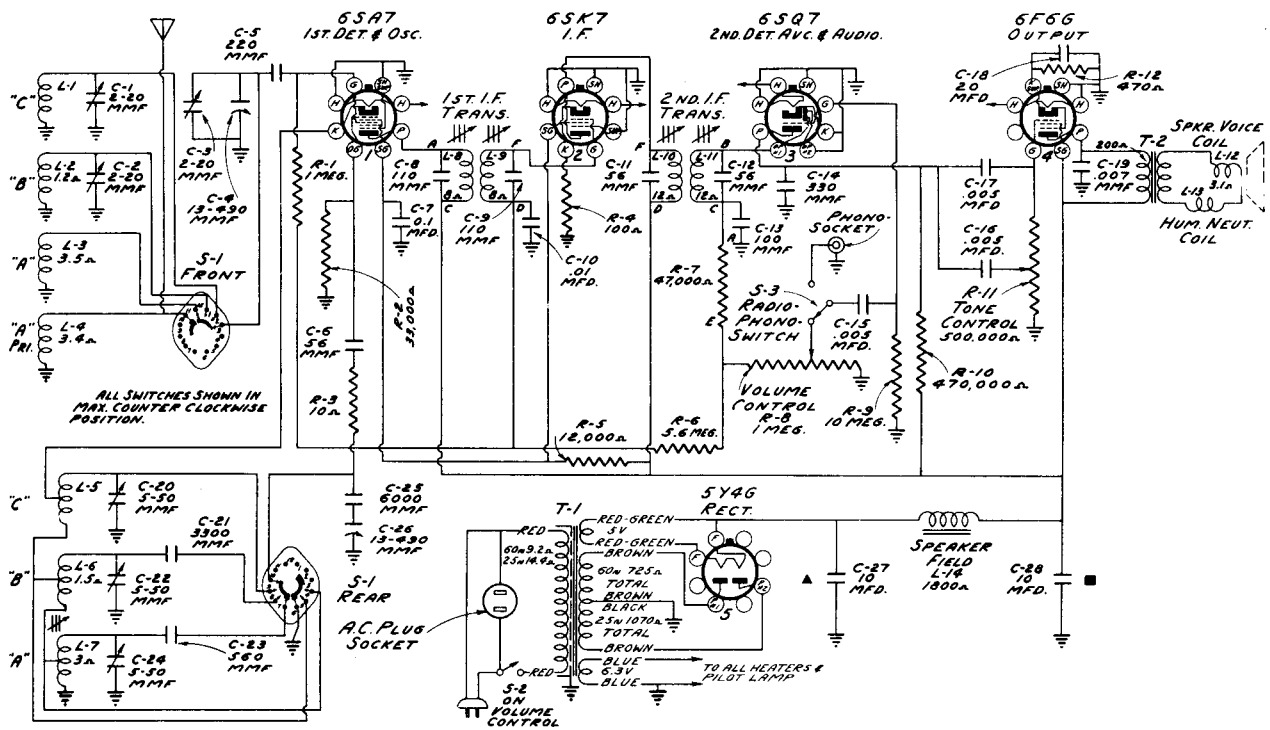
Tube and Trimmer Locations



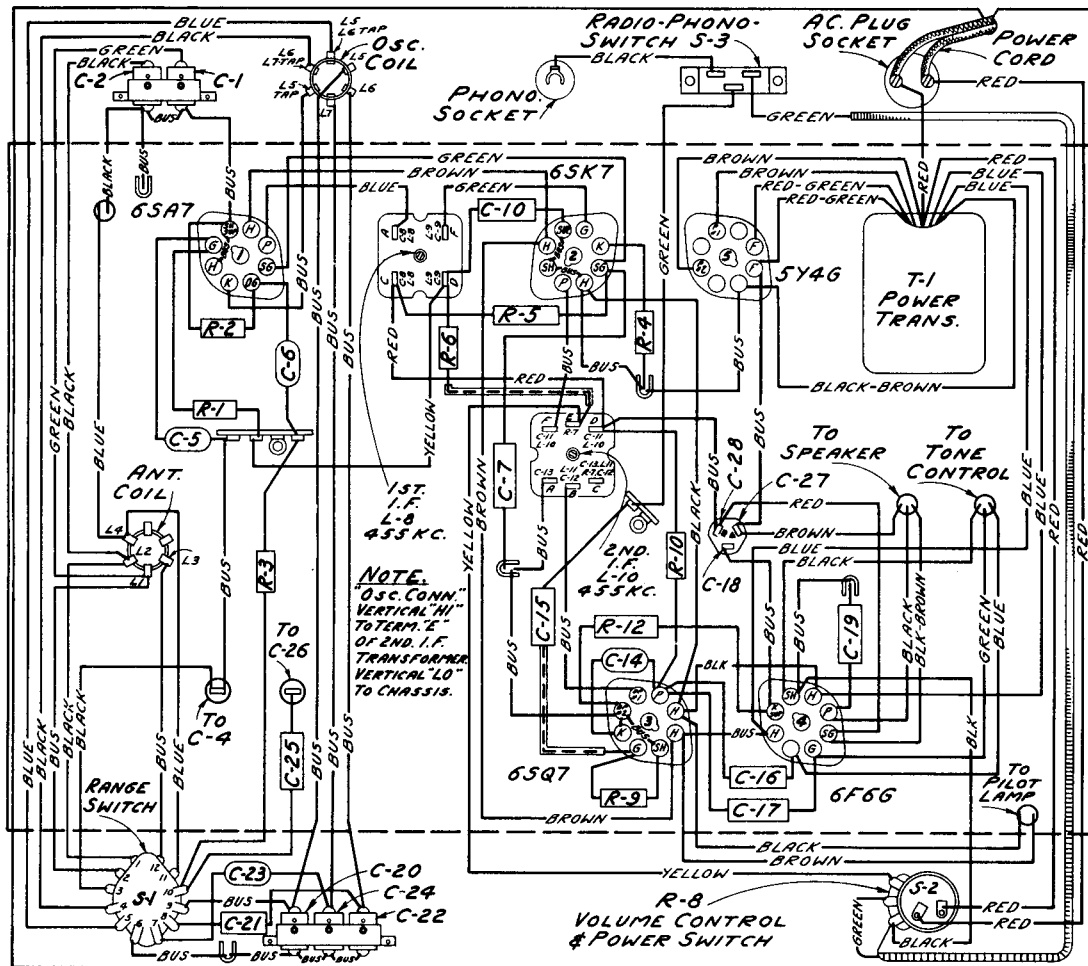
Calibration Scale

Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 33° on the calibration scale corresponds to approximately 7.9 mc on "C" band, and 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."



Schematic Circuit Diagram.



Chassis Wiring Diagram.

Radiotron Socket Voltages

TYPE	PLATE	SCREEN GRID	CATHODE	HEATER
6SA7	230V	100V	—	6.3V
6SK7	230V	100V	—	6.3V
6SQ7	98V*	—	—	6.3V
6F6-G	220V	230V	15V	6.3V
5Y4-G	OUTPUT VOLTAGE 335V			5.0V

NOTE: Values marked with a star () are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading. Above values hold within plus or minus 20% when measured with a 1000 ohm-per-volt meter.

REPLACEMENT PARTS

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			
32830	Capacitor-Trimmer capacitor bank two sections (C1,C2).....	32848	Screw-Drum set screw (Pkg.5).....
32829	Capacitor-Trimmer capacitor bank three sections (C20,C22,C24).....	S-2676	Shaft-Station selector drive shaft...
12723	Capacitor-56 mmfd. (C6).....	31364	Socket-Pilot lamp socket.....
12694	Capacitor-220 mmfd. (C5).....	14278	Socket-Phono input socket and plate..
12952	Capacitor-330 mmfd. (C14).....	31251	Socket-Tube socket.....
12537	Capacitor-560 mmfd. (C23).....	S-2447	Socket-A.C. outlet socket.....
31403	Capacitor-3,300 mmfd. (C21).....	31418	Spring-Drive cord tension spring (Pkg.2).....
31405	Capacitor-6,000 mmfd. (C25).....	S-2678	Switch-Range switch (S1).....
4838	Capacitor-.005 mfd. (C15,C16,C17).....	33634	Switch-Radio-phon set-up switch(S3).
5148	Capacitor-.007 mfd. (C19).....	S-2679	Transformer-1st I.F. transformer (L8,L9,C8,C9).....
14393	Capacitor-.01 mfd. (C10).....	32825	Transformer-2nd I.F. transformer (L10,L11,C11,C12,C13,R7).....
4839	Capacitor-0.1 mfd. (C7).....	32911	Transformer-Power transformer 105/125 volts 50/60 cycles (T1).....
32240	Capacitor-Electrolytic, 2 sections 10 mfd; one section 20 mfd. (C18,C27, C28).....	32910	Transformer-Power transformer 105/125 volts, 25/60 cycles (T1).....
32821	Coil-Antenna coil (L1,L2,L3,L4).....	REPRODUCER ASSEMBLIES (RL 78-2)	
32824	Coil-Oscillator coil (L5,L6,L7).....	32907	Cap-Dust cap for cone centre (Pkg.5).
32817	Condenser-2 gang variable condenser (C3,C4,C26).....	32903	Coil-Field coil (L14).....
S-2670	Control-Tone control (R11).....	32906	Coil-Hum neutralizing coil (L13).....
S-2671	Control-Volume control and power switch (R8,S2).....	32904	Cone-Reproducer cone and dust cap(L12)
32634	Cord-Station selector pointer drive cord (47" long).....	5118	Plug-3 prong speaker plug.....
32835	Drum-Drive cord drum assembly.....	32902	Reproducer complete.....
11891	Lamp-Pilot lamp Mazda #44.....	32905	Transformer-Output (T2).....
5119	Plug-3 contact female speaker plug....	MISCELLANEOUS ASSEMBLIES	
13988	Resistor-10 ohm, 1/4 watt (R3).....	32837	Dial-Station selector dial scale.....
S-2575	Resistor-100 ohm, 1/4 watt (R4).....	32847	Indicator-Station selector pointer & carriage.....
30681	Resistor-470 ohm, 1 watt (R12).....	S-2680	Knob-Tuning knob.....
31389	Resistor-12,000 ohm, 2-1/2 watt (R5)...	S-2681	Knob-Range switch knob.....
12454	Resistor-33,000 ohm, 1/4 watt (R2).....	32839	Knob-Tone control knob.....
12285	Resistor-470,000 ohm, 1/4 watt (R10)...	S-2682	Knob-Volume control knob.....
13730	Resistor-1 meg., 1/4 watt (R1).....	14270	Spring-Knob retaining spring (Pkg.3).
11668	Resistor-5.6 meg., 1/4 watt (R6).....		
13601	Resistor-10 meg., 1/4 watt (R9).....		
S-2446	Retainer-A.C. socket retaining ring (Pkg.3).....		
S-2497	Retainer-Drive shaft retainer(Pkg.10).		



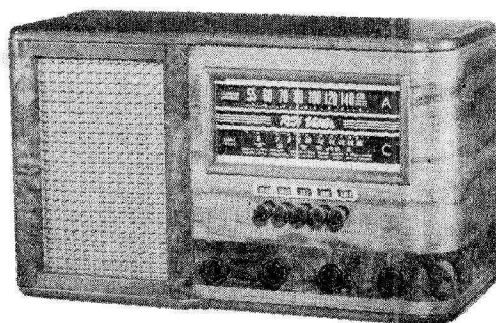
RCA Victor

MODELS A21 & A34

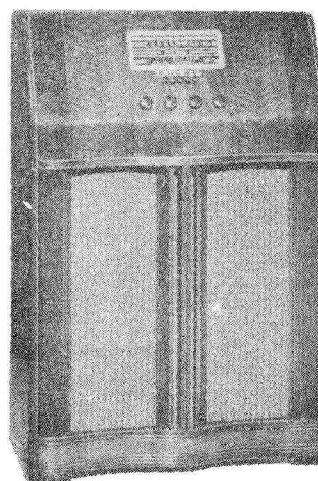
Five-Tube, Two-Band, Push-Button Tuning, A-C,
Superheterodyne Receivers

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model A21



Model A34

Electrical and Mechanical Specifications

FREQUENCY RANGES

"Standard Broadcast" 540-1,720 kc
"Short Wave" 5.8 to 20 mc
Intermediate Frequency 455 kc

R-F ALIGNMENT FREQUENCIES

"Short Wave" 20 mc (osc., ant.)
"Standard Broadcast" 600, 1,500 kc (osc.)
Five Push-Button Tuning Positions 550-1,720 kc

TUBE COMPLEMENT

(1) Type-6SA7 First-Detector—Oscillator
(2) Type-6SK7 Intermediate-Frequency Amplifier
(3) Type-6SQ7 Second-Detector A.F. and A.V.C.
Pilot Lamp

(4) Type-6F6G Audio Power Amplifier
(5) Type-5Y4G Full-Wave Rectifier

Mazda 51, 7.5 volts, .2 amp.

POWER SUPPLY RATING

Rating A 105-125 Volts, 50-60 Cycles, 80 Watts
Rating B 105-125 Volts, 25-60 Cycles, 80 Watts

CABINET DIMENSIONS

	A21	A34
Height (inches)	9	38
Width (inches)	15	25
Depth (inches)	7	12

POWER OUTPUT

Undistorted 2.5 watts
Maximum 4.5 watts

Chassis Base Dimensions...12" wide, 5½" deep, 2½" high

Overall Chassis Height 6½ inches

Tuning Drive Ratio 10 to 1

LOUDSPEAKER

Type Electrodynamic
Voice-coil impedance 3 ohms at 400 cycles

General Description

The RCA Victor Model A21 is a five tube, two band superheterodyne chassis housed in a table type cabinet. Features of design include:—Mechanical push button tuning for five stations, two point tone control, Phono input socket, air core I.F. Transformers, new type, edge lighted three dimensional dial and a five inch electrodynamic speaker. The Model A34 is a five tube, two

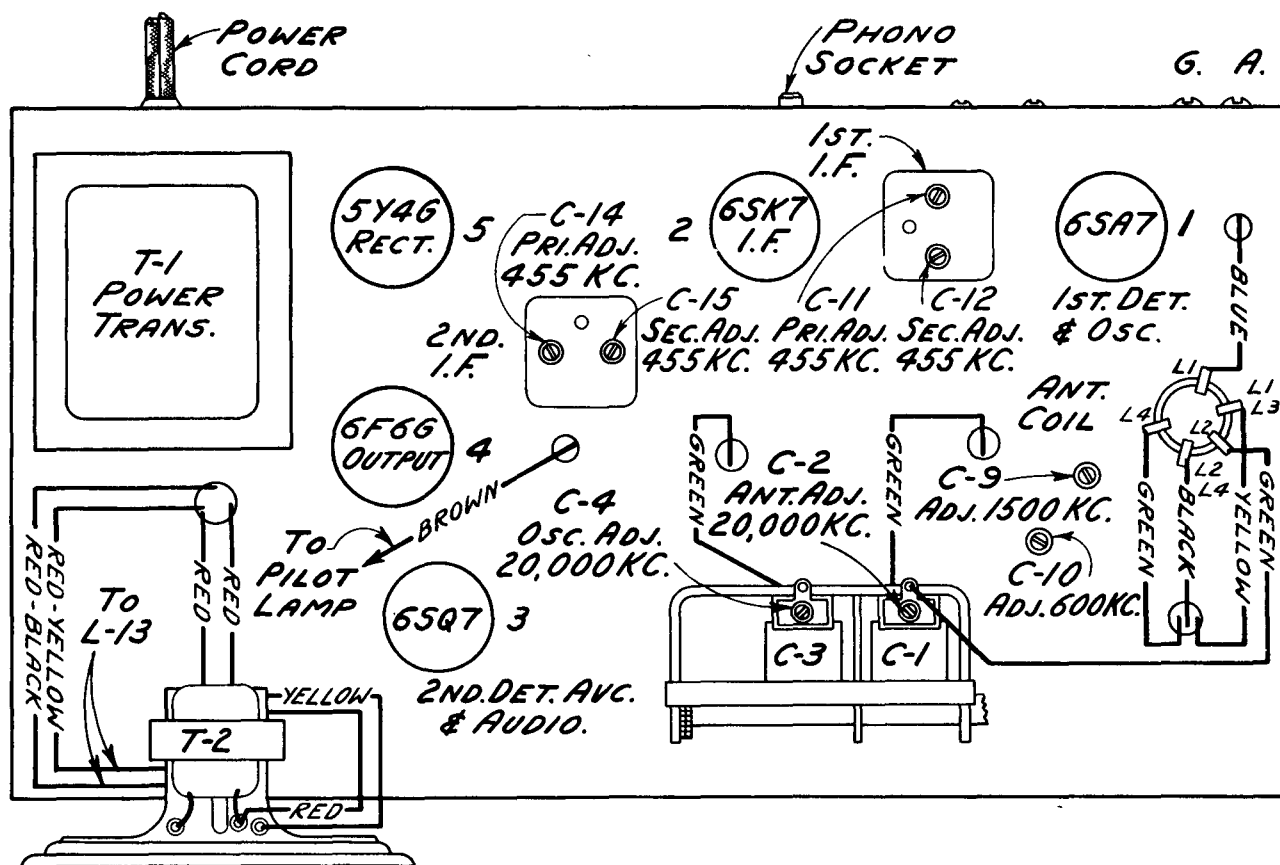
band superheterodyne chassis housed in a console type cabinet of functional design. Features of design include:—Mechanical push button tuning for five stations, two point tone control, phono input socket, A.C. outlet socket, Radio-phonos switch, air core I.F. Transformers, three dimensional edge-lighted dial and a twelve inch electrodynamic loudspeaker.

Adjustments for Electric Tuning

These models have five push buttons for mechanical tuning of five different stations in the standard broadcast range. Allow at least a five minute warm-up period before making any adjustments.

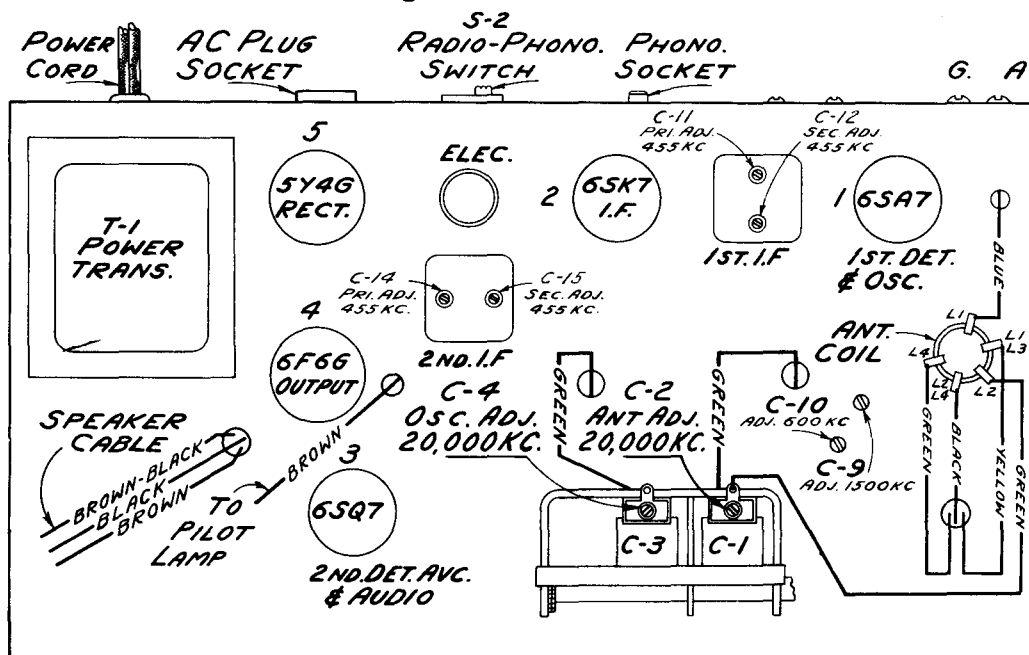
To adjust the push-buttons proceeds as follows:—

1. Make a list of the desired stations, arranged in order from the low to the high frequencies.
2. Manually tune in the desired station accurately.
3. Loosen push button by turning counterclockwise.
4. Press the push button in as far as it will go and accurately retune station.
5. With the push button still held in, tighten it by turning in a clockwise direction.



Chassis Layout and Alignment Adjustments (A21)

Alignment Procedure



Chassis Layout and Alignment Adjustments (A34)

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are made in the usual manner.

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 A-V-C action.

The Alignment Procedure is carried out in the usual manner. By no means attempt to align these receivers without the assistance of an accurate test oscillator and visual output indicator.

Dial Indicator Adjustment.—With gang in full mesh (max. cap.) position, adjust pointer to the extreme left mark on dial plate.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	C14 and C15 (2nd I-F Trans.)
2	6SA7 det. grid in series with .01 mfd.	455 kc		C11 and C12 (1st I-F Trans.)
3	Antenna Terminal, in series with 300 ohms	20 mc	20 mc "C" band	C4* (osc.) C2** (ant.)
4	Antenna Terminal in series with 200 mmc.	600 k.c.	600 k.c. "A" band	C10 (osc.)
5	Antenna Terminal, in series with 200 mmf.	1,500 kc	1,500 kc "A" band	C9 (osc.)

*Use minimum capacity peak if two peaks can be obtained.

**Rock gang slightly and use maximum capacity peak if two peaks can be obtained with C2. Check to determine that C4 has been adjusted to the correct peak by tuning to approximately (19.09 mc), where a weaker signal should be received.

Note: Oscillator tracks 455 kc above signal on all bands.

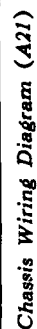
Radiotron Socket Voltages

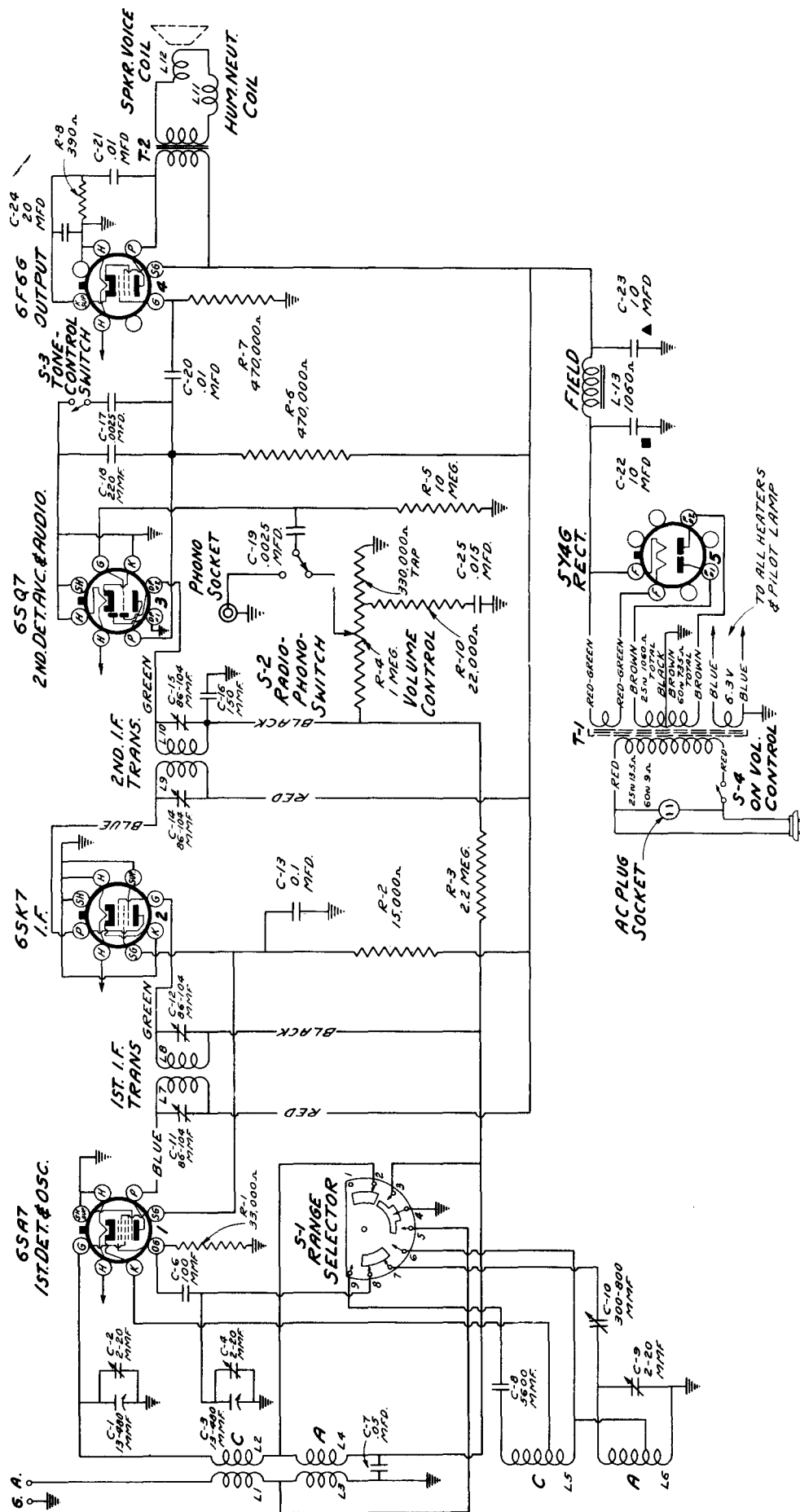
TYPE	PLATE	Screen Grid	Cathode	Heater
6SA7	278V	96V	0	6.6V
6SK7	278V	96V	0	6.6V
6SQ7	66V*		0	6.6V
6F6-G	258V	277V	17.8V	6.6V
5Y4-G		OUTPUT VOLTAGE	358V	

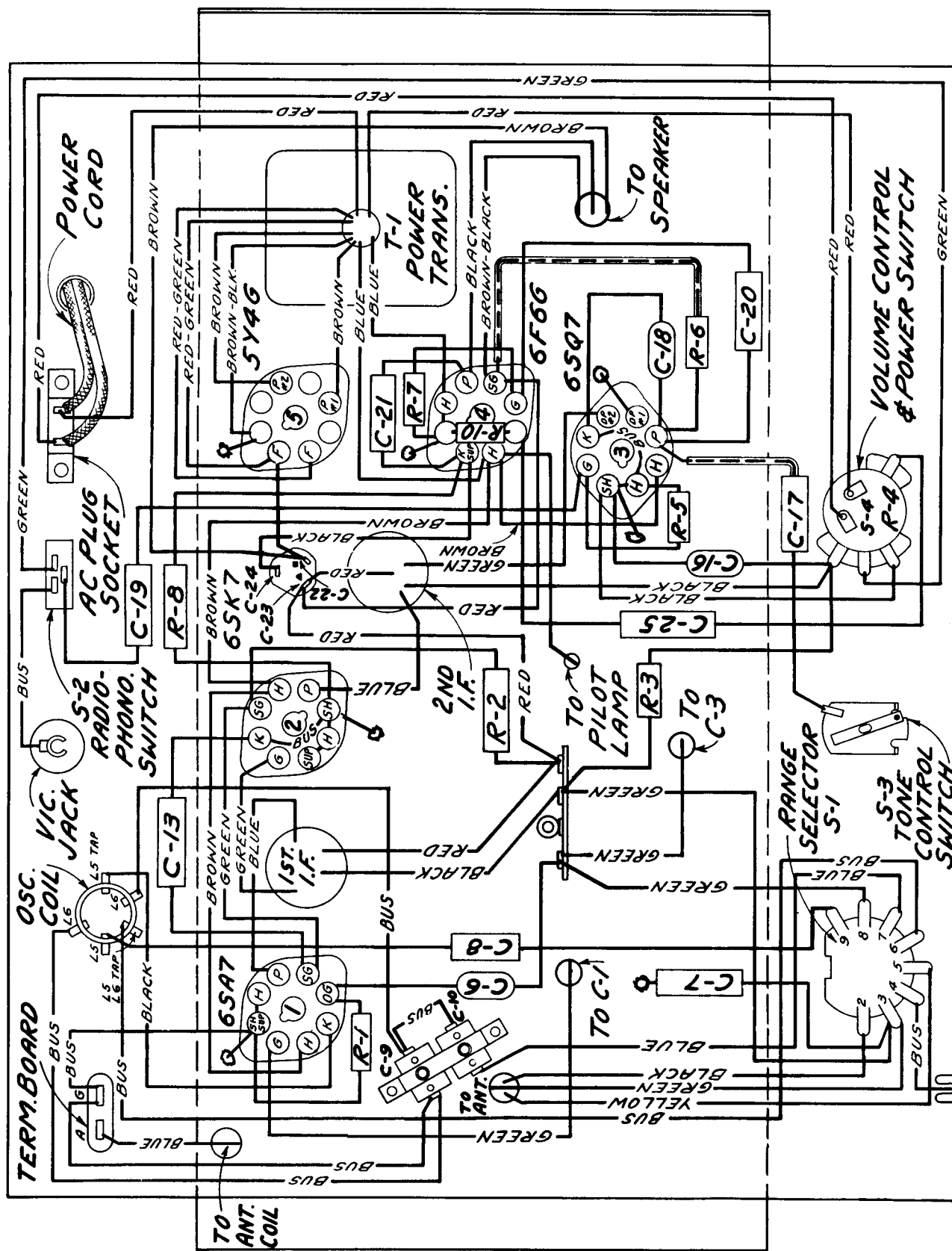
*Cannot be measured with an ordinary voltmeter.

NOTE: The voltage values listed above should hold within plus or minus 20% when measured with a 1,000 ohm per volt meter on a line voltage of 117 volts.

Schematic Circuit Diagram (A21)







REPLACEMENT PARTS FOR MODELS A21 and A34

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			
S-2821	Board-Ant. ground terminal board....	33722	Transformer-1st I.F. transformer...
S-2466	Capacitor-Adjustable capacitor one section 2-20 mmfd. one section 300-800 mmfd.(C9,C10).....	33723	Transformer-2nd I.F. transformer...
12720	Capacitor-100 mmfd.(C6).....	S-2067#	Transformer-Power transformer 105-125 volts 25/60 cycle.....
12725	Capacitor-150 mmfd.(C16).....	S-2066#	Transformer-Power transformer 105-125 volts 50/60 cycle.....
12694	Capacitor-220 mmfd.(C18).....	33619X	Transformer-Power transformer 105-125 volts 25/60 cycle.....
13895	Capacitor-5600 mmfd.(C8).....	S-2457X	Transformer-Power transformer 105-125 volts 50/60 cycle.....
5107	Capacitor-.0025 mfd.(C17,C19).....	33631#	Volume control and power switch....
4858	Capacitor-.01 mfd.(C20,C21).....	33776X	Volume control and power switch....
11315X	Capacitor-.015 mfd.(C25).....	#REPRODUCER ASSEMBLIES (CRL-503-6)	
32787	Capacitor-.05 mfd.(C7).....	32907	Cap-Dust cap for cone center (Pkg.5)
4839	Capacitor- 0.1 mfd.(C13).....	32906	Coil-Hum neutralizing coil.....
S-2822#	Capacitor-Electrolytic comprising 2-5mfd,1-20 mfd.sections(C22,C23,C24)	S-2387	Coil-Field coil.....
32240X	Capacitor-Electrolytic,2 sections 10 mfd, one section 20 mfd.(C22,C23,C24)...	S-2375	Cone-Reproducer cone,dust cap and gasket.....
33732	Coil-Antenna coil.....	S-2838	Reproducer complete.....
33733	Coil-Oscillator coil.....	S-2389	Transformer-Output transformer....
S-2823	Condenser-2 gang variable tuning condenser complete with push arms, gears, etc.(C1,C2,C3,C4).....	X REPRODUCER ASSEMBLIES (12 inch)	
S-2837	Cord-Variable condenser drive cord.	13866	Cap-Dust cap for cone center (Pkg.5)
33633	Indicator-Station selector indicator pointer.....	S-2458	Coil-Field coil.....
11765	Lamp-Pilot lamp Mazda #51.....	11469	Coil-Hum neutralizing coil.....
5119X	Plug-3 contact female speaker plug.	31275	Cone-Reproducer cone and voice coil
31388X	Resistor-390 ohm, 1 watt..(R8).....	5118	Plug-3 contact male plug.....
30499#	Resistor-470 ohm,1/2 watt.(R8).....	S-2827	Reproducer complete.....
33489X	Resistor-15,000 ohm, 2.5 watts(R2).	14355	Transformer-Output transformer....
S-2060#	Resistor-18,000 ohm, 1 watt..(R27).	MISCELLANEOUS ASSEMBLIES	
13998X	Resistor-22,000 ohm,1/4 watt.(R10).	S-2641	Button-Station selector bush button
12454	Resistor-33,000 ohm,1/4 watt.(R1)...	S-2829#	Dial-Station selector dial scale...
12285	Resistor-470,000 ohm,1/4 watt(R6,R7)	S-2830X	Dial-Station selector dial scale...
12679	Resistor-2.2 meg.,1/4 watt.(R3)....	32994	Escutcheon-Push button escutcheon..
13601	Resistor-10 meg.,1/4 watt..(R5)....	S-2831X	Escutcheon-Dial escutcheon complete
33725	Shaft-Station selector knob shaft..	30863#	Knob-Tuning volume,tone or range control knob.....
31319	Socket-Tube socket.....	S-2832X	Knob-Tuning volume,tone or range control knob.....
31364	Socket-Pilot lamp socket.....	31589	Marker-Push button call letter markers (1 set).....
S-2824X	Socket-A.C. input socket.....	30900#	Spring-Knob retaining spring (Pkg.5).....
14278	Socket-Phono input socket.....		
31418	Spring-Drive cord tension spring (Pkg.2).....		
S-2825	Switch-Range switch.....		
33634	Switch-Radio-phono switch.....		
S-2826	Tone control switch.....		

X - A-34 only.

A-21 only.



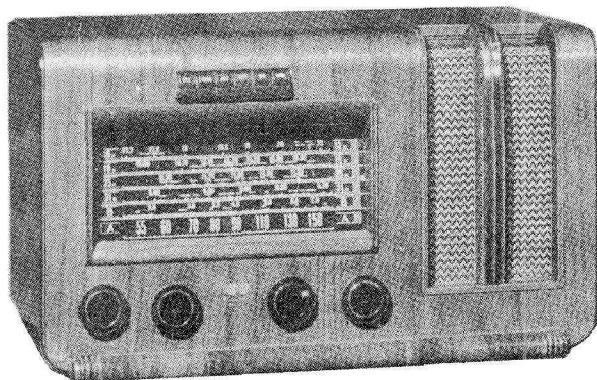
RCA Victor

MODELS A22 & A31

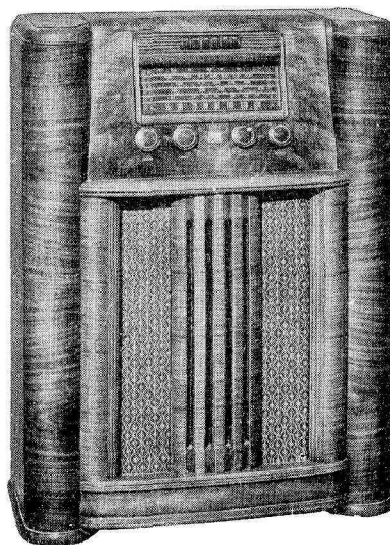
Seven-Tube, Six-Band, A-C, Superheterodyne Receivers

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model A22



Model A31

Electrical Specifications

FREQUENCY RANGES

Standard Broadcast (A)	.....540-1,550	k.c.
Short Wave (B)	.....2,300-7,500	k.c.
31 M	.....9,450-9,700	k.c.
25 M	.....11,680-11,920	k.c.
19 M	.....15,030-15,380	k.c.
16-13 M	.....17,700-22,000	k.c.

Intermediate Frequency

R. F. ALIGNMENT FREQUENCIES

"B" (49 Meters)	.....6,100	k.c. (osc.)
31 M (31 Meters)	.....9,550	k.c. (osc., det., ant.)
25 M (25 Meters)	.....11,800	k.c. (osc.)
19 M (19 Meters)	.....15,200	k.c. (osc.)
Standard Broadcast (A)	.....600	k.c. (osc.), 1400 k.c. (osc., det., ant.)

..... 455 k.c.

RADIOTRON COMPLEMENT

(1) Type-6SK7	..... R-F Amplifier
(2) Type-6SA7	..... First Detector-Oscillator
(3) Type-6SK7	..... Intermediate Amplifier
(4) Type-6SQ7	..... 2nd. Det., A. V. C. & A. F.

Pilot Lamps (2)

(5) Type-6F6G	..... Power Output
(6) Type-5Y4G	..... Full Wave Rectifier
(7) Type-6U5	..... Tuning Tube

..... Mazda No. 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS

Rating A	..... 105-125 volts, 50-60 cycles, 80 watts
Rating B	..... 105-125 volts, 25-60 cycles, 80 watts

POWER OUTPUT

Undistorted	..... 3 watts
Maximum	..... 4.5 watts

LOUDSPEAKER (CRL-520-1) (A31 only)

Type	..... 12 inch Electrodynamic
Impedance (V.C.)	..... 3 ohms at 400 cycles

LOUDSPEAKER (CRL-517-1) (A22 only)

Type	.....
Impedance (V.C.)	..... 3 ohms at 400 cycles

Electrical and Mechanical Specifications (continued)

CABINET DIMENSIONS

	A22	A31
Width	22 inches	28 $\frac{3}{4}$ inches
Depth	10 $\frac{3}{4}$ inches	13 $\frac{1}{2}$ inches
Height	13 inches	39 $\frac{1}{4}$ inches

POWER OUTPUT

Undistorted	3 watts
Maximum	4.5 watts

PUSH BUTTON TUNING RANGE

Button No. 1	Phonograph
Button No. 2	540—1,000 k.c.
Button No. 3	540—1,000 k.c.
Button No. 4	620—1,200 k.c.
Button No. 5	750—1,400 k.c.
Button No. 6	900—1,570 k.c.

General Description

These receivers employ a seven-tube, six band super-heterodyne circuit, the arrangement of which is shown in the Schematic Circuit Diagram. Features of design include:—Loop antenna as the first tuned circuit; high gain R.F. stage; stabilized oscillator circuit resulting in less frequency drift; magnetite core I.F. transformers; magnetite core oscillator coils on all bands; automatic volume control; A.C. outlet on chassis back

apron; Tuning indicator tube for fine, accurate tuning on all bands; variable tone control circuit; push button tuning of five Standard Broadcast stations by means of pre-set oscillator coils; dust proof electrodynamic loudspeaker; temperature stabilized capacitors in the oscillator circuits; and a large, edge lighted dial individually calibrated for each band.

Circuit Arrangement

The circuit consists of an R.F. amplifier stage incorporating the Loop Antenna as the first tuned circuit; first detector (oscillator) stage; I.F. amplifier stage; second detector, A.V.C. and first Audio stage and a single pentode output operating in Class A-B; tuning indicator; and a well regulated power supply.

The Loop Antenna used as the first tuned stage is in the circuit on all bands; temperature compensated capacitors are used in the oscillator circuits to reduce oscillator drift.

Spread band tuning is accomplished electrically by shunting the oscillator section of the variable capacitor with relatively large temperature—stabilized fixed cap-

acitors for tuning the oscillator coils on the 16-13M, 19M, 25M, 31M bands. Antenna and detector coils are designed to be sufficiently broad-tuned to require no variable tuning over the narrow frequency range of the spread bands.

The intermediate frequency amplifier consists of a Type 6SK7 tube in a single stage transformer-coupled circuit. The windings of all I.F. Transformers are resonated by fixed capacitors and are adjusted by moulded magnetite cores to tune to 455K.C.

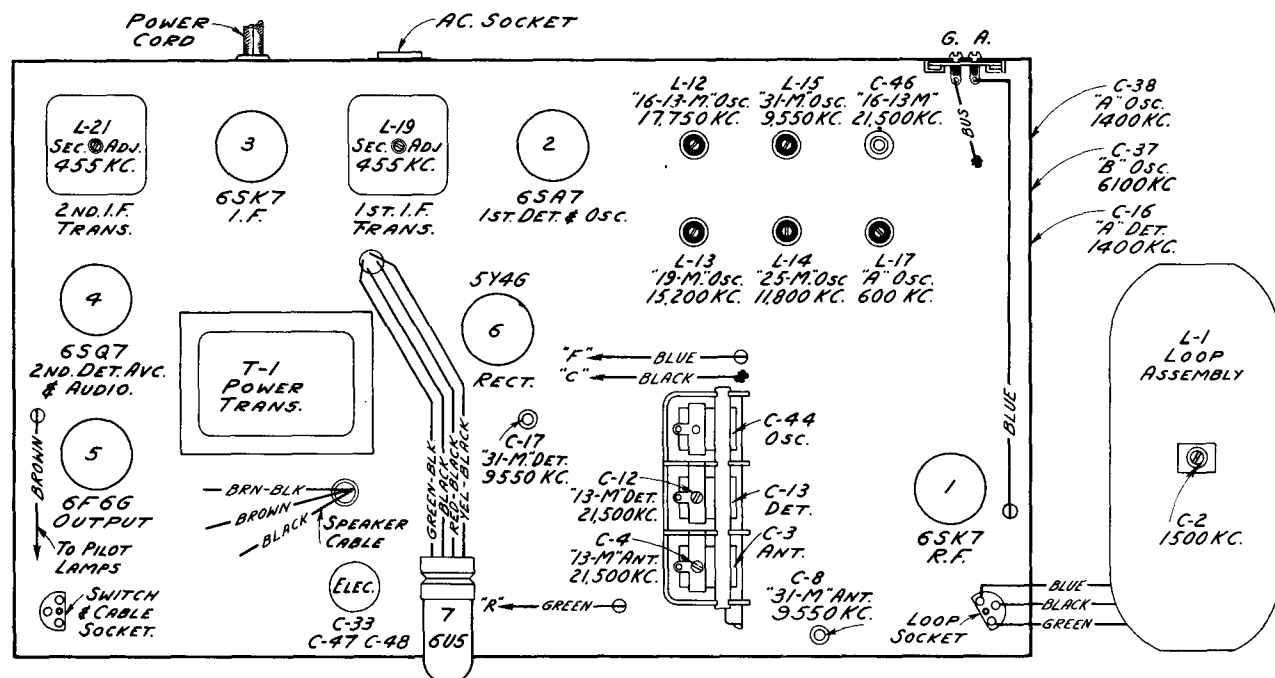


Fig. 1—Chassis Layout and Alignment Adjustments

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. 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 O° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum 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 chassis, and bend the wire so that it points to the O° mark on the calibration scale when the plates are fully meshed.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6SK7 2nd I.F. Grid	.1	455 kc	"A"	No Signal 550-750 kc	2nd I.F. Trans.	L20 & L21
2	6SA7 Det. Grid	.1	455 kc	"A"	No Signal 550-750 kc	1st I.F. Trans.	L18 & L19
3	Ant. terminal	300 Ohms	21,500 kc	"16-13 M"	21.5 mc (162°)	"16-13 M" Osc.	L46
4	Ant. terminal	300 Ohms	17,750 kc	"16-13 M"	17.75 mc (17°)	"16-13 M" Osc.	L12
5	Ant. terminal	300 Ohms	21,500 kc	"16-13 M"	21.5 mc (162°)	"16-13 M" Det.	C12
6	Ant. terminal	300 Ohms	21,500 kc	"16-13 M"	21.5 mc (162°)	"16-13 M" Ant.	C4
7	Ant. terminal	300 Ohms	15,200 kc	"19 M"	15.8 mc (94°)	"19 M" Osc.	L13
8	Ant. terminal	300 Ohms	11,800 kc	"25 M"	11.8 mc (99°)	"25 M" Osc.	L14
9	Ant. terminal	300 Ohms	9,550 kc	"31 M"	9.55 mc (73°)	"31 M" Osc.	L15
10	Ant. terminal	300 Ohms	9,550 kc	"31 M"	9.55 mc (73°)	"31 M" Det.	C17
11	Ant. terminal	300 Ohms	9,550 kc	"31 M"	9.55 mc (73°)	"31 M" Ant.	C8
12	Ant. terminal	300 Ohms	6,100 kc	"B"	6.1 mc (149°)	"B" Osc.	C37
13	Ant. terminal	300 Ohms	1,400 kc	"A"	1,400 kc (155°)	"A" H.F. Osc.	C38
14	Ant. terminal	300 Ohms	600 kc	"A"	600 kc (33°)	"A" LF Osc.	L17
15	Ant. terminal	300 Ohms	1,400 kc	"A"	1,400 kc (155°)	"A" Det.	C16
16	Radiation Loop	300 Ohms	1,500 kc	"A"	1,500 kc (163°)	Loop	C2*

NOTE:—Align the I.F. circuits by means of the oscillograph, for a symmetrical curve. Peak R.F. stages of all bands. * Radiation loop comprising two turns of wire 18 inches in diameter should be placed four feet from receiver loop before aligning "C2".

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 of 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.

NOTE:—Whenever possible spread band adjustments should be made with the chassis fastened in the cabinet and the pointer accurately aligned to the dial.

Spread-band Adjustments.—Alignment of the spread bands requires special procedure since test oscillators used alone are not ordinarily sufficiently accurate for this purpose. The RCA Stock No. 9572 Crystal Calibrator affords a convenient and accurate alignment standard. Wrap a few turns of wire around the crystal calibrator and connect one free end to the antenna terminal of the receiver. Using the crystal calibrator to obtain the necessary accuracy, follow the tabulated alignment procedure for the "31M.", "25M.", and "19M." bands.

For the "B" band, snap crystal calibrator "Hi-Lo" switch to "Hi", turn the range selector to "B" band, and set receiver dial pointer to 6.0 mc. Adjust oscillator padder C37 for minimum "Tuning Tube" opening. Use the peak indicated by the alignment table. Snap "Hi-Lo" switch to "Lo" and locate 6,100 kc (the first 100 kc harmonic above 6,000 kc) by slightly readjusting C37 with the dial pointer set at 6.1 mc. This method insures selection of correct crystal-calibrator harmonic.

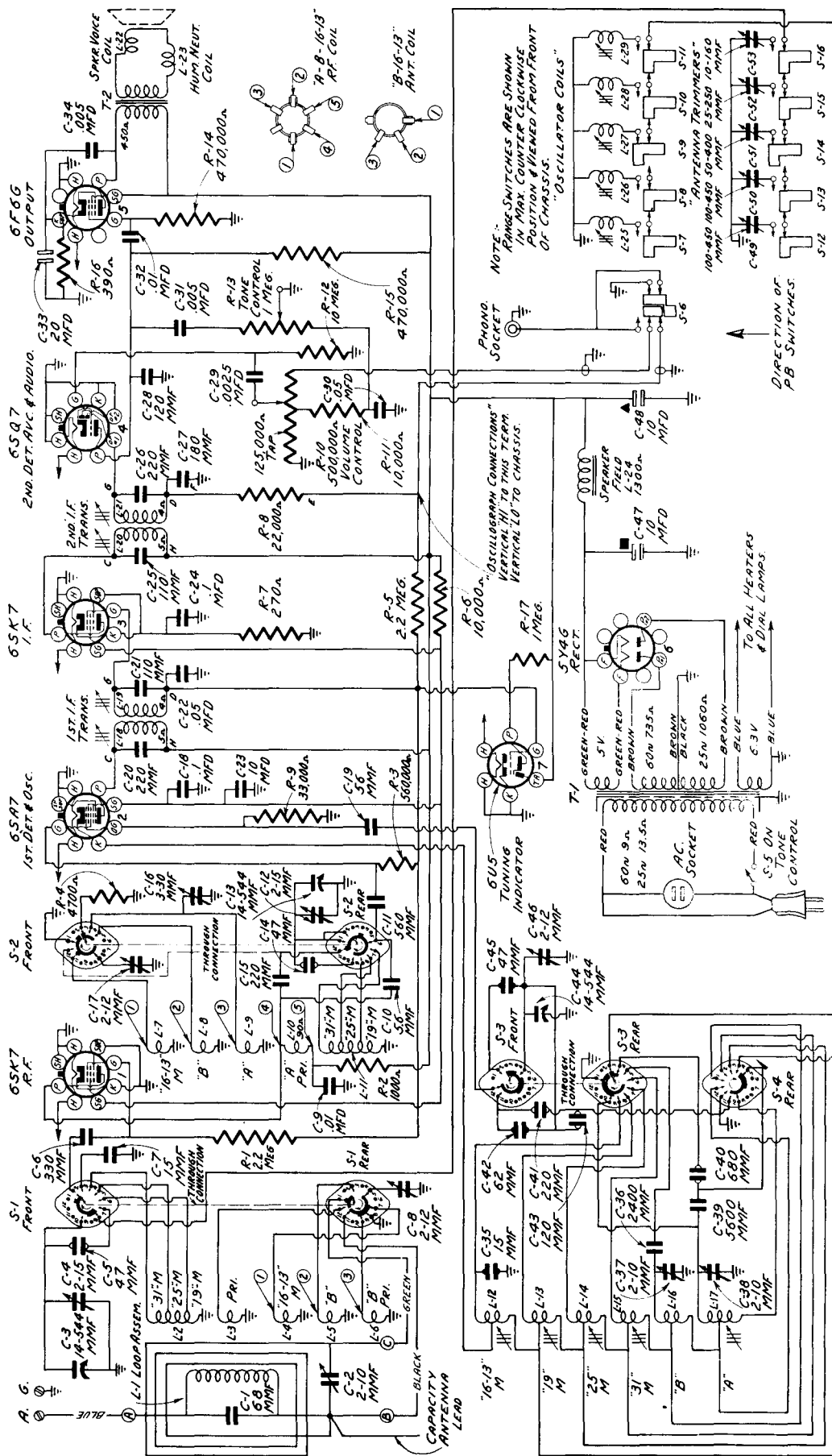


Figure 2—Schematic Circuit Diagram

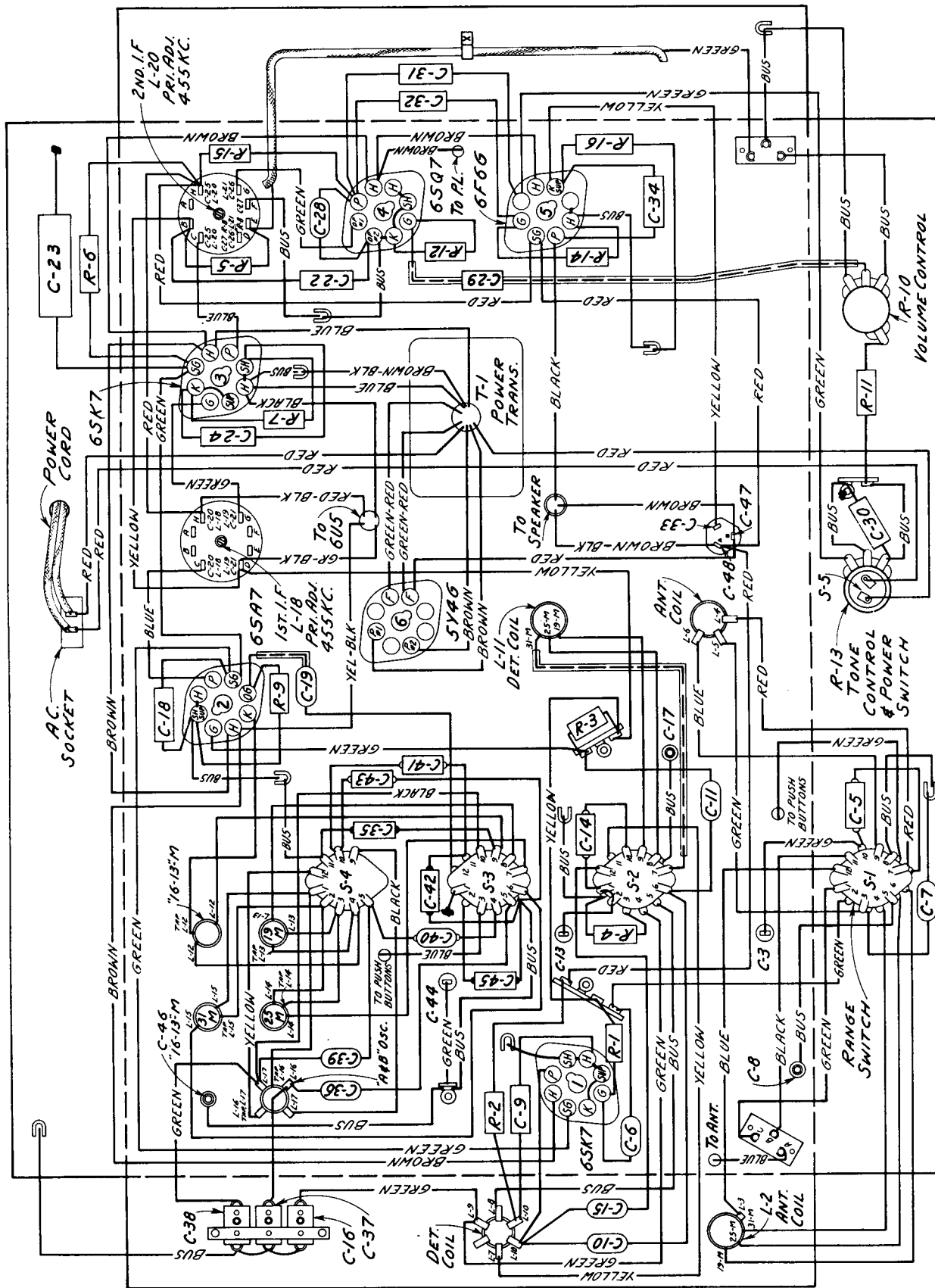


Figure 3—Chassis Wiring Diagram

RADIOTRON SOCKET VOLTAGES

Type	Plate	Screen Grid	Control Grid	Cathode	Heater
6SK7 R.F.	210	82V	....	....	6.3V
6SA7 Conv.	220	82V	....	....	6.3V
6SK7 I.F.	220	82V	-.2V	....	6.3V
6SQ7 Audio	195	....	....		6.3V
6F6G Output	205V	220V	....	13V	6.3V
5Y4G Rectifier	D.C. output measured across C48 340V				5.0V

Note:—All the above values hold within plus or minus 20% when measured with a 1,000 ohm-per-volt meter, on a line voltage of 115 volts. All voltages are measured to chassis.

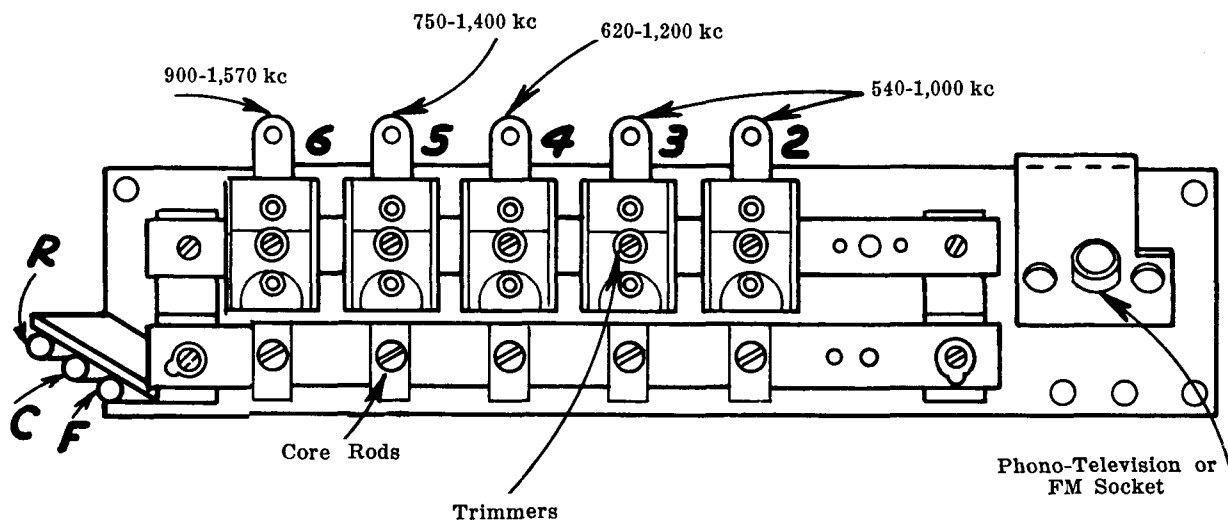


Fig. 4

Push Button Adjustment

The push buttons may be adjusted for any five 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. 2 located second from left on front panel.

(3) Referring to Figure 4, adjust core and trimmer No. 2 for a peak at 560 k.c.

(4) Proceed to adjust the other four 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

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

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION	LIST PRICE
RECEIVER ASSEMBLIES				
S-2876	Board-Ant.Ground Terminal Board....	12486	Resistor-560,000 ohm, 1/4 watt (R8).....	
12714	Capacitor-Adjustable Trimmer 2-12 mmf. (C8,C17,C46).....	12013	Resistor-1.0 megohms, 1/10 watt (R17).....	
31400	Capacitor-Trimmer Condenser two 2-10 mmfd, one 3-30 mmfd. (C16,C37,C38).....	12679	Resistor-2.2 megohms-1/4 watt (R1,R5).....	
12814	Capacitor-5.6 mfd. (C10).....	30992	Resistor-10. megohms-1/4 watt (R12).....	
12896	Capacitor-15 mmfd.(C7).....	S-2887	Shaft-Station selector drive shaft (Model A25 only).....	
36012	Capacitor-15 mmfd.(Temp.Comp.)(C35)	S-2888	Shaft-Station selector drive shaft (Model A38 only).....	
S-3008	Capacitor-47 mmfd.(Close Tol.) (C5,C14).....	S-2824	Socket-A.C. Socket.....	
35644	Capacitor-47 mmfd.(Temp.Comp.)(C45)	31364	Socket-Dial Lamp Socket.....	
12723	Capacitor-56 mmfd.(C19).....	36422	Socket-Loop Antenna & Push Button Switch Cable Socket.....	
S-2997	Capacitor-62 mmfd.(Temp.Comp.)(C42)	5119	Socket-Speaker Cable female connector.....	
13057	Capacitor-68 mmfd.(On Loop)(C1)....	31251	Socket-Tube socket.....	
12724	Capacitor-120 mmfd. (C28).....	13638	Spring-Drive cord tension spring (Pkg.2).....	
S-3100	Capacitor-120 mmfd.(Close Tol.)(C43)	S-2889	Switch-Range switch(S1,S2,S3,S4) (Model A25 only).....	
12694	Capacitor-220 mmfd. (C15).....	S-2890	Switch-Range switch(S1,S2,S3,S4) (Model A38 only).....	
S-2895	Capacitor-220 mmfd.(Close Tol.)(C41)	S-2891	Tone Control and Power Switch (R13,S5) (Model A25 only).....	
12952	Capacitor-330 mmfd. (C6).....	S-2892	Tone Control and Power Switch (R13,S5) (Model A38 only).....	
12537	Capacitor-560 mmfd. (C11).....	S-2899	Transformer-1st I.F. Transformer (L18,L19,C20,C21).....	
S-2988	Capacitor-680 mmfd.(Close Tol.)(C40)	S-2900	Transformer-2nd I.F. Transformer (L20,L21,C25,C26,C27,R8).....	
11622	Capacitor-2400 mmfd. (C36).....	S-2903	Transformer-Power-110 volt 25/60 cycle (T1).....	
13895	Capacitor-5600 mmfd. (C39).....	S-2904	Transformer-Power-110 volt 50/60 cycle (T1).....	
5107	Capacitor-.0025 mfd. (C29).....	S-2905	Volume Control (R10) (Model A25 only).....	
4838	Capacitor-.005 mfd. (C31,C34).....	S-2906	Volume Control (R10)(Model A38 only).....	
4937	Capacitor-.01 mfd. (C9,C32).....	SPEAKER ASSEMBLIES (CRL-517-1) 6" E M (Model A22 only)		
32787	Capacitor-.05 mfd. (C22,C30).....	32907	Cap-Dust cap for cone centre (Pkg.5).....	
4839	Capacitor-.1 mfd. (C18,C24).....	33077	Coil-Field coil (L24).....	
S-2894	Capacitor-Electrolytic 10 mfd.(C23)	35441	Cone-Speaker cone and voice coil (L22).....	
S-2925	Capacitor-Electrolytic comprising two sections 10 mfd, one section 20 mfd (C33,C47,C48).....	5118	Plug-3 contact male plug.....	
S-2877	Coil-Antenna coil "B-16-13" bands (L4,L5,L6).....	S-2875	Speaker complete.....	
S-2878	Coil-Ant.Coil "31-25-19" bands (L2,L3).....	32905	Transformer-Output (T2).....	
S-2879	Coil-R.F.Coil "A-B-16-13" bands (L7,L8,L9,L10).....	SPEAKER ASSEMBLIES (CRL-520-1) 12" E M (Model A31 only)		
S-2880	Coil-R.F. Coil "31-25-19" bands (L11).....	31825	Cap-Dust Cap for cone centre (Pkg.5).....	
S-2884	Coil-Oscillator 16-13 M Band (L12)....	12012	Coil-Field Coil (L24).....	
S-2881	Coil-Oscillator 19 M Band (L13).....	31275	Cone-Speaker cone and voice coil (L22).....	
S-2882	Coil-Oscillator 25 M Band (L14).....	5118	Plug-3 contact male plug connector	
S-2883	Coil-Oscillator 31 M Band (L15).....	S-2893	Speaker complete.....	
S-2885	Coil-Oscillator "A" and "B" band (L16,L17).....	S-2855	Transformer-Output (T2).....	
S-2898	Condenser-3 gang variable tuning Condenser (C3,C4,C12,C13,C44)....			
S-2897	Cord-Indicator pointer drive cord (53 1/2 long).....			
31273	Drum-Drive Cord Drum Assembly.....			
S-2886	Indicator-Station Selector Indicator Pointer.....			
11765	Lamp-Dial lamp Mazda #51.....			
31280	Pulley-Drive cord pulley.....			
14887	Retainer-Drive cord pulley retainer (Pkg.10).....			
30929	Resistor-270 ohms, 1/2 watt (R7)...			
31388	Resistor-390 ohms, 1 watt (R16)....			
14720	Resistor-1000 ohms, 1/4 watt (R2)...			
30146	Resistor-4700 ohms, 1/4 watt (R4)...			
14559	Resistor-10,000 ohm, 1/4 watt (R11)			
S-2587	Resistor-10,000 ohm, 4 watt (R6)...			
12454	Resistor-33,000 ohm, 1/4 watt (R9)...			
14659	Resistor-470,000 ohm, 1/4 watt (R14,R15).....			

REPLACEMENT PARTS

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
PUSH BUTTON SWITCH ASSEMBLY		MISCELLANEOUS ASSEMBLIES	
S-3241	Cable-Shielded phono cable less plug.....	35883	Button-Station selector push button.....
S-2908	Capacitor-Trimmer capacitor bank (C49,C50,C51,C52,C53).....	S-2913	Dial-Station selector dial scale
35803	Coil-Oscillator coil (L25,L26,L27,L28,L29).....	34489	Knob-Volume,tone or tuning control knob.....
35871	Core-Oscillator coil core.....	S-3316	Knob-Range Switch Knob (Outer section only).....
32641	Plug-Three prong male plug for Phono cable.....	S-2914	Knob-Range switch knob (Inner section only).....
31347	Socket-Phono input socket.....	S-2915	Loop-Antenna loop assembly (L1,C1,C2)(Model A25 only)....
S-2911	Switch-Push Button switch assembly (S6 to S16 inc.).....	S-2916	Loop-Antenna loop assembly (L1,C1,C2)(Model A38 only)....
		36149	Marker-Push button call letter markers (1 set).....
		34053	Spring-Push button retaining spring (Pkg.5).....
		14270	Spring-Knob retaining spring (Pkg.2).....
		S-2542	Tool-Push button tuning set up tool.....

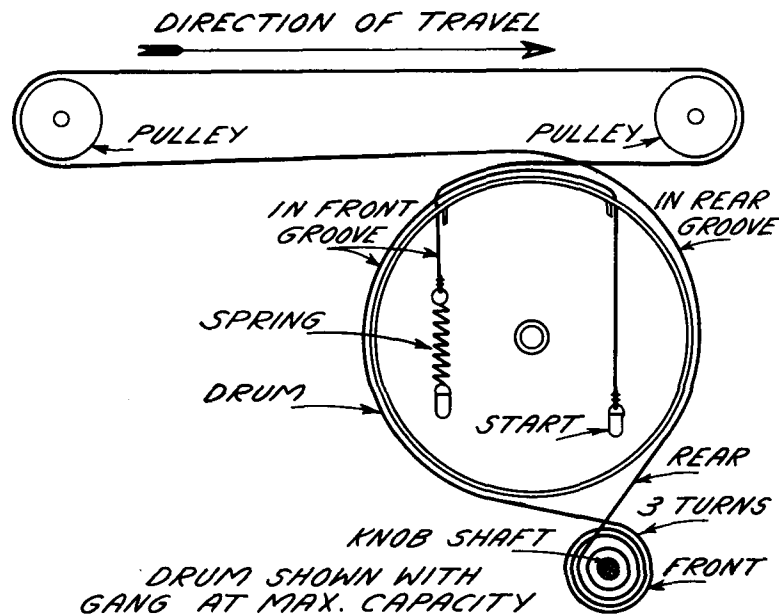


Fig. 5—Dial Drive Cord.



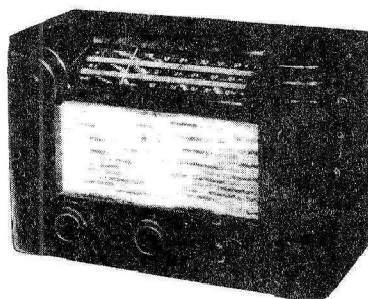
RCA Victor

MODELS Q22 and Q22C

Six-Tube, Five-Band, A-C, Superheterodyne Receivers

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical and Mechanical Specifications

FREQUENCY RANGES

Standard Broadcast ("A" Band)... 540-1,720 kc (556-174 m)
Medium Wave ("B" Band)..... 3.0-9.5 mc (100-31.6 m)
"31" Meter Spread Band..... 9.5-11.7 mc (31.6-25.6 m)
"25" Meter Spread Band..... 11.7-15.1 mc (25.6-19.9 m)
"19-13" Meter Spread Band.... 15.1-22.5 mc (19.9-13.3 m)

INTERMEDIATE FREQUENCY..... 455 kc

POWER SUPPLY RATINGS

Symbol	Voltages	Frequency (cycles)	Watts
Rating A	105-125	50-60	65
Rating B	105-125	25-60	65
Rating C ..	105-125, 200-250	50-60	65

TUBE COMPLEMENT

- (1) RCA-6SA7..... 1st Detector-Oscillator
- (2) RCA-6SK7..... I-F Amplifier
- (3) RCA-6SQ7..... 2nd Detector, A-F Amplifier, A.V.C.
- (4) RCA-6AD7-G..... Phase Inverter, Power Output
- (5) RCA-6F6-G..... Power Output
- (6) RCA-5Y3-G..... Rectifier

LOUDSPEAKER

Type (Electrodynamic).....6-inch..
V-C. Impedance
at 400 c.p.s.2.2 ohms.

POWER OUTPUT RATING

Undistorted 3 watts
Maximum 3.5 watts

CABINET DIMENSIONS (inches)

Height..... $10\frac{5}{8}$
Width..... $15\frac{7}{8}$
Depth..... $7\frac{7}{8}$
Net Weight (pounds)..... 20
Shipping Weight (pounds)... 24
Chassis Base Dimensions (inches) Height $2\frac{3}{4}$, Width $15\frac{1}{8}$,
Depth $5\frac{1}{4}$
Over-all Chassis Height..... $9\frac{1}{4}$ inches
Tuning Drive Ratio..... 25 to 1

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is 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 "180°" 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.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

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 "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

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 of 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.

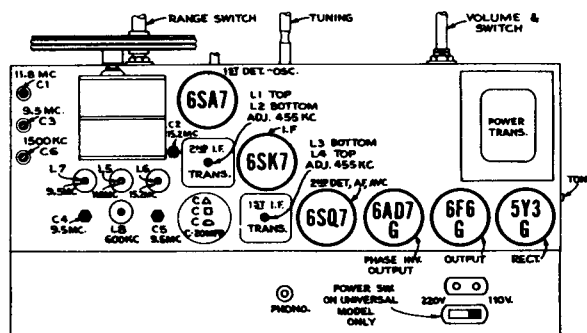
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	12C8 I-F grid in series with .01 mfd.	455 kc	A	Quiet Point near 180°	L3 and L4 2nd I-F Trans.
2	12SA7 1st Det. grid in series with .01 mfd.				L1 and L2 1st I-F Trans.
3	Ant. lead in series with 300 ohms	11.8 mc	25M	138.5°	L5 (osc.) C1 (ant.)
4		15.2 mc		17°	C2 (osc.)*
5		Repeat steps 3 and 4			
6		15.2 mc	19-13M	156°	L6 (osc.)**
7		9.5 mc	31M	156°	L7 (osc.)** C3 (ant.)
8		9.5 mc	B	11.5°	C4 (osc.)***
9	Ant. lead in series with 200 mmf.	1,500 kc	A	26°	C5 (osc.) C6 (ant.)
10		600 kc		150°	L8 (osc.) (Rock gang)
11		Repeat steps 9 and 10			

* Use minimum capacity peak if two can be obtained. Check image to determine that C2 has been adjusted to the correct peak by tuning receiver to approximately 14.29 mc (29°) where a weaker signal should be received.

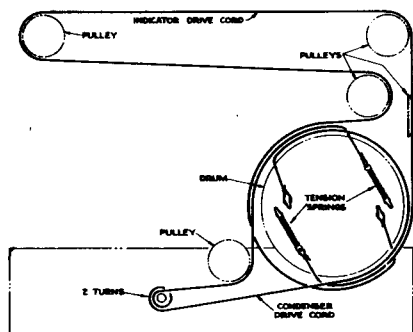
** Peak at minimum position of plunger if two peaks can be obtained.

*** Peak at minimum capacity if two peaks can be obtained.

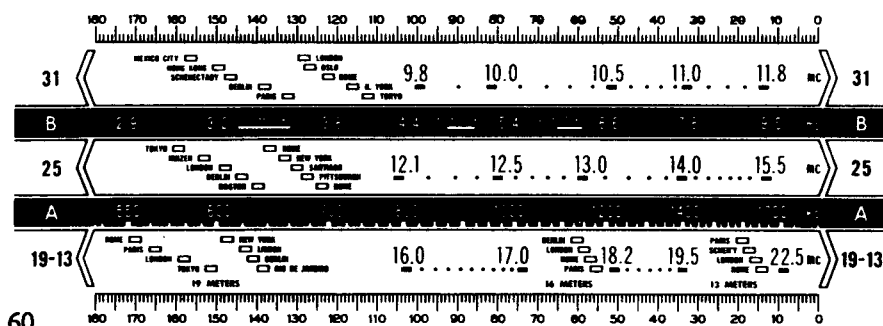
NOTE: Oscillator tracks above signal on all bands.



Tube and Trimmer Location



Dial-Indicator and Drive Mechanism



Calibration Scale

Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 150° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

Precautionary Lead Dress.—

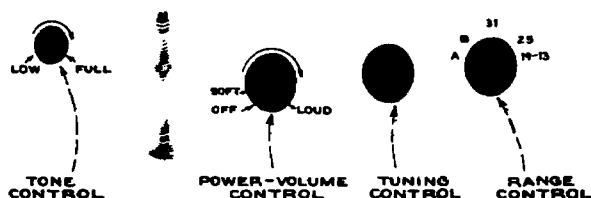
1. All leads between antenna coils and switch must be as short as possible and kept away from oscillator coil, leads and switches.
2. All oscillator coil leads must be kept apart from each other and other leads and parts.
3. Blue plate lead of 2nd I-F should be dressed under other leads and against chassis.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loud-speaker cement.

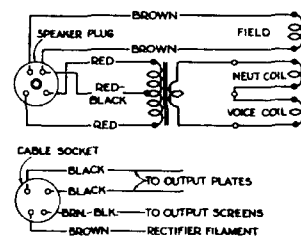
REPLACEMENT PARTS FOR MODELS Q22 and Q22C

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			
35640	Bracket-Bracket with one (1) pulley for indicator cord.....	13998	Resistor-22,000 ohms, 1/4 watt.....
35622	Bracket-Flywheel and shaft mounting bracket.....	12454	Resistor-33,000 ohms, 1/4 watt.....
35639	Bracket-Long bracket with three pulleys for indicator cord.....	13734	Resistor-120,000 ohms, 1/4 watt.....
12714	Capacitor-Medium air trimmer (C2, C4, C5).....	30493	Resistor-150,000 ohms, 1/2 watt.....
34654	Capacitor-Mica trimmer-comprising 3 sections (C1, C3, C6).....	14983	Resistor-330,000 ohms, 1/4 watt.....
35646	Capacitor-6 mmfd.....	30648	Resistor-470,000 ohms, 1/2 watt.....
36012	Capacitor-15 mmfd., ceramic.....	13730	Resistor-1 meg., 1/4 watt.....
31350	Capacitor-18 mmfd.....	12679	Resistor-2.2 meg., 1/4 watt.....
35644	Capacitor-47 mmfd., ceramic.....	13601	Resistor-10 meg., 1/4 watt.....
13141	Capacitor-47 mmfd., moulded.....	35633	Shaft-Range switch indicator knob shaft
30949	Capacitor-56 mmfd., mica (I-F).....	35637	Shaft-Tuning shaft.....
12723	Capacitor-56 mmfd., moulded.....	31364	Socket-Dial lamp socket.....
35645	Capacitor-68 mmfd., ceramic.....	31251	Socket-Tube socket.....
13057	Capacitor-68 mmfd., mica.....	14278	Socket-Phono, input socket.....
30904	Capacitor-100 mmfd., mica (I-F).....	13638	Spring-Drive cord spring.....
12720	Capacitor-100 mmfd., moulded.....	31418	Spring-Pointer cord spring.....
12694	Capacitor-220 mmfd.....	35621	Switch-Range switch.....
31433	Capacitor-560 mmfd.....	32827	Switch-Voltage change switch (Q22 only).....
35643	Capacitor-3,000 mmfd.....	35636	Transformer-First I-F transformer-less grid lead and clip.....
33806	Capacitor-.0015 mfd.....	35628	Transformer-Second I-F transformer...
5107	Capacitor-.0025 mfd.....	32910	Transformer-Power transformer-110 volts, 25 cycle (Q22 only).....
4838	Capacitor-.005 mfd.....	32852	Transformer-Power transformer-105-120 and 200-240 volts, 50-60 cyc. (Q22)...
4937	Capacitor-.01 mfd.....	32911	Transformer-Power transformer-110 volts, 60 cycle (Q22 only).....
4870	Capacitor-.025 mfd.....	33726	Washer-"C" washer for pulley Stock No. 35630.....
5196	Capacitor-.035 mfd.....	SPEAKER ASSEMBLIES (RL-79A6)	
32787	Capacitor-.05 mfd.....	35849	Cap-Dust cap.....
33014	Capacitor-Electrolytic comprising three sections of 10 mfd. and one section of 20 mfd.....	33966	Coil-Field coil.....
35632	Coil-Antenna coil-"A" band.....	35441	Cone-Cone complete with voice coil...
35631	Coil-Antenna coil-spread band.....	5039	Plug-4-prong male plug for speaker...
35623	Coil-Oscillator coil-A and B bands..	35809	Transformer-Output transformer.....
35624	Coil-Oscillator coil-19-13 meter band	35848	Speaker complete.....
35625	Coil-Oscillator coil-25 meter band..	MISCELLANEOUS ASSEMBLIES	
35626	Coil-Oscillator coil-31 meter band..	S-3062	Cabinet-Plastic cabinet.....
35619	Condenser-Variable tuning condenser.	35654	Dial-Glass dial scale.....
35629	Control-Tone control.....	35647	Frame-Dial frame complete-less pointer and dial.....
35620	Control-Volume control and power switch.....	35648	Indicator-Station selector indicator.
34662	Cord-Indicator drive cord.....	35652	Knob-Band indicator knob.....
35642	Dial-Calibrator dial for drive drum.	35651	Knob-Range switch knob.....
35627	Drum-Tuning condenser drive drum-less calibrator.....	35650	Knob-Tone control knob.....
35638	Flywheel-Tuning shaft flywheel.....	35955	Knob-Volume control or tuning knob...
5040	Plug-4 contact female plug for speaker cable.....	11891	Lamp-Dial lamp Mazda No. 44.....
35641	Pulley-Indicator cord pulley.....	35653	Mounting-One set speaker mounting hardware.....
35630	Pulley-Pulley operating between the tuning shaft and drive drum.....	14270	Spring-Retaining spring for knobs Stock Nos. 35650, 35955, 35651.....
30735	Resistor-560 ohms, 1 watt.....	4982	Spring-Retaining spring for knob Stock No. 35652.....
30128	Resistor-12,000 ohms, 1/4 watt.....		
35595	Resistor-15,000 ohms, 3 watts.....		



Location of Controls



Connections and Colors of Loudspeaker and Cable



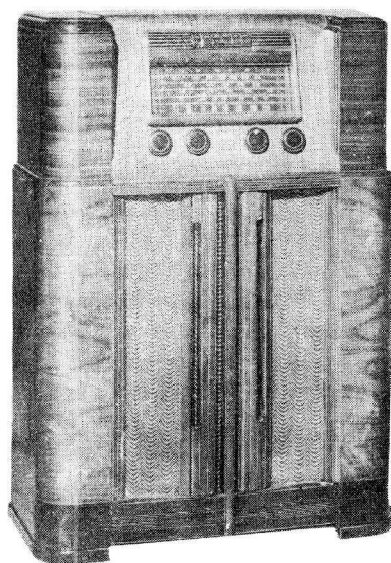
RCA Victor

MODEL A-30

Six-Tube, Five-Band, A-C, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

FREQUENCY RANGES

Standard Broadcast (A)	.....530-1,580	k.c.
Short Wave (B)	.....2,700-9,900	k.c.
31 M	.....9,450-12,400	k.c.
25 M	.....11,650-15,800	k.c.
19-13 M	.....15,060-22,700	k.c.

Intermediate Frequency 455 k.c.

R. F. ALIGNMENT FREQUENCIES

"B" (49 Meters)	.....9,550	k.c. (osc.)
31 M (31 Meters)	.....9,550	k.c. (osc., ant.)
25 M (25 Meters)	.....11,800	k.c. (osc.)
19-13M (19-13 Meters)	.....15,200	k.c. (osc., & ant.)
Standard Broadcast (A)	.....600	k.c. (osc.), 1400 k.c. (osc., ant.)

RADIOTRON COMPLEMENT

(1) Type-6SK7	..... R-F Amplifier	(4) Type-6SQ7	..... 2nd Det., A. V. C. & A. F.
(2) Type-6SA7	..... First Detector-Oscillator	(5) Type-6F6G	..... Power Output
(3) Type-6SK7	..... Intermediate Amplifier	(6) Type-5Y4G	..... Full wave Rectifier
Pilot Lamps (2)	..... Mazda No. 51, 7.5 volts, 0.2 amp.		

POWER SUPPLY RATINGS

Rating A	..... 105-125 volts, 50-60 cycles, 75 watts
Rating B	..... 105-125 volts, 25-60 cycles, 75 watts

POWER OUTPUT

Undistorted	..... 3 watts
Maximum	..... 4.5 watts

LOUDSPEAKER

Type	..... 12 inch Electrodynamic
Impedance (V.C.)	..... 3 ohms at 400 cycles

PUSH BUTTON TUNING RANGES

Button No. 1	..... Phonograph	Button No. 4	..... 620 k.c.-1200 k.c.
Button No. 2	..... 540 k.c.-1000 k.c.	Button No. 5	..... 750 k.c.-1400 k.c.
Button No. 3	..... 540 k.c.-1000 k.c.	Button No. 6	..... 900 k.c.-1570 k.c.

General Description

This receiver employs a six-tube, five band super-heterodyne circuit, the arrangement of which is shown in the Schematic Circuit Diagram. Features of design include: —Loop antenna as the first tuned circuit; high gain R.F. stage; stabilized oscillator circuit resulting in less frequency drift; magnetite core I.F. transformers; magnetite core oscillator coils on all bands;

automatic volume control; A.C. outlet on chassis back apron; variable tone control circuit; push button tuning of five Standard Broadcast stations by means of pre-set oscillator coils; dust proof electrodynamic loudspeaker; temperature stabilized capacitors in the oscillator circuits; and a large, edge lighted dial individually calibrated for each band.

Circuit Arrangement

The circuit consists of an R.F. amplifier stage incorporating the Loop Antenna as the first tuned circuit; first detector (oscillator) stage; I.F. amplifier stage; second detector, A.V.C. and first Audio stage with a single pentode output operating in Class A ; and a well regulated power supply.

Temperature compensated capacitors are used in the oscillator circuits to reduce oscillator drift.

The intermediate frequency amplifier consists of a Type 6SK7 tube in a single stage transformer-coupled circuit. The windings of all I.F. Transformers are resonated by fixed capacitors and are adjusted by moulded magnetite cores to tune to 455K.C.

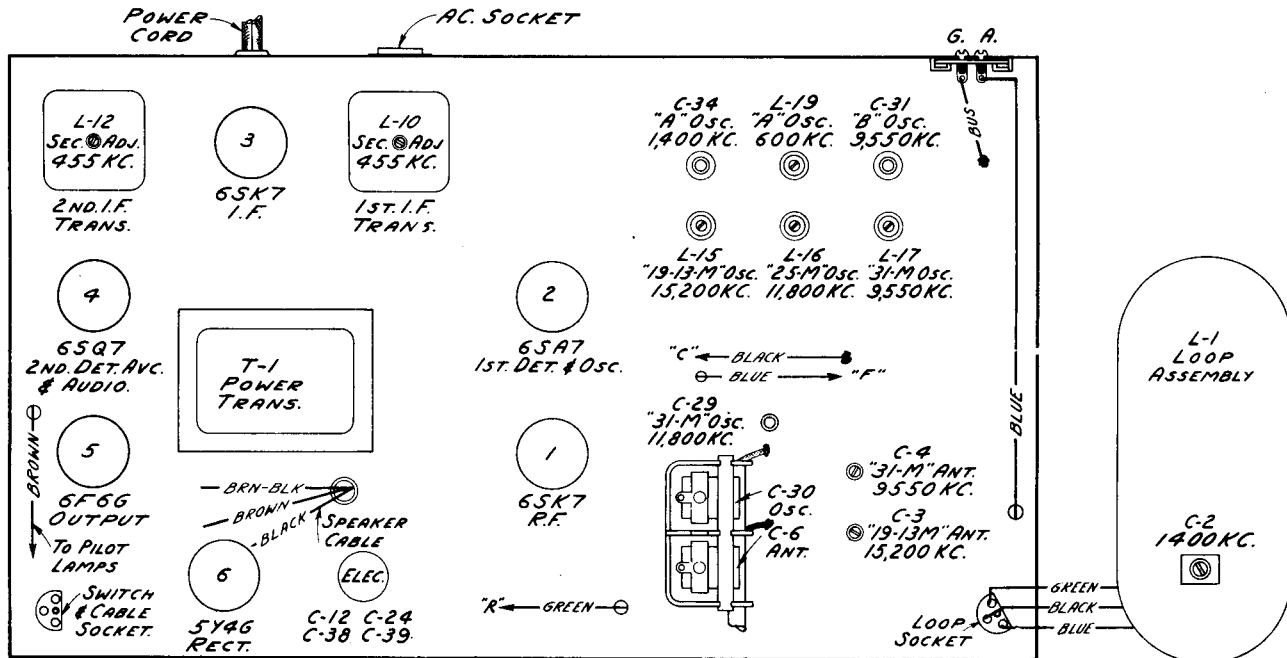


Fig. 1—Chassis Layout and Alignment Adjustments

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. 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 O° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum 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 chassis, and bend the wire so that it points to the O° mark on the calibration scale when the plates are fully meshed.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6SK7 2nd I.F. Grid	.1 Mfd.	455 kc	"A"	No. Signal 1600 kc	2nd I.F. Trans.	L11 & L12
2	6SA7 Det. Grid	.1 Mfd.	455 kc	"A"	No. Signal 1600 kc	1st I.F. Trans.	L9 & L10
3	Antenna Terminal	300 Ohms	9,550 kc	31 M	9.55 mc (40°)	31 M Osc.	L17
4	Antenna Terminal	300 Ohms	11,800 kc	31 M	11.8 mc (166.5°)	31 M Osc.	C29
5	Antenna Terminal	300 Ohms	9,550 kc	31 M	9.55 mc (40°)	31 M Ant.	C4
6	Antenna Terminal	300 Ohms	15,200 kc	19-13 M	15.2 mc (25.5°)	19-13 Osc.	L15
7	Antenna Terminal	300 Ohms	15,200 kc	19-13 M	15.2 mc (25.5°)	19-13 M Ant.	C3
8	Antenna Terminal	300 Ohms	11,800 kc	25 M	11.8 mc (42°)	25 M Osc.	L16
9	Antenna Terminal	300 Ohms	9,550 kc	"B"	9.55 mc (170°)	B Osc.	C31
10	Antenna Terminal	300 Ohms	1,400 kc	"A"	1400 kc (155°)	"A" H-F Osc.	C34
11	Antenna Terminal	300 Ohms	600 kc	"A"	600 kc (33.5°)	"A" L-F Osc.	L19
12	Radiation Loop	....	1,400 kc	"A"	1400 kc (155°)	"A" Ant.	C2* (on Loop)

NOTE:—Align the I.F. Circuits by means of the oscillograph, for a symmetrical curve. Peak R.F. stages of all bands. * Radiation loop comprising two turns of wire 18 inches in diameter should be placed 4 feet from receiver loop, before aligning "C2".

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 scales. 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 of 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.

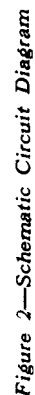
When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave

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.

NOTE:—Whenever possible spread band adjustments should be made with the chassis fastened in the cabinet and the pointer accurately aligned to the dial.

Spread-band Adjustments.—Alignment of the spread bands requires special procedure since test oscillators used alone are not ordinarily sufficiently accurate for this purpose. The RCA Stock No. 9572 Crystal Calibrator affords a convenient and accurate alignment standard. Wrap a few turns of wire around the crystal calibrator and connect one free end to the antenna terminal of the receiver. Using the crystal calibrator to obtain the necessary accuracy, follow the tabulated alignment procedure for the "31M.", "25M.", and "19M." bands.

For the "B" band snap crystal calibrator "Hi-Lo" switch to "Hi", turn the range selector to "B" band, and set receiver dial pointer to 9.0 mc. Adjust oscillator capacitor C31 for maximum signal. Snap "Hi-Lo" switch to "Lo" and locate 9500 kc (the fifth 100 kc harmonic above 9000 kc.) Adjust for maximum signal on 9500 kc.



RADIOTRON SOCKET VOLTAGES

Type	Plate	Screen Grid	Control Grid	Cathode	Heater
6SK7 R.F.	200V	95V	....	....	6.8V
6SA7 Conv.	215V	95V	....	....	6.8V
6SK7 I.F.	230V	95V	-2V	....	6.8V
6SQ7 Audio	*65V	....	....		6.8V
6F6G Output	320V	330V	....	22V	6.8V
5Y4G Rectifier	output measured across C39			330V	5.0V

* Actual voltage will be higher depending on internal resistance of voltmeter used.

Note:—All the above values hold within plus or minus 20% when measured with a 1,000 ohm-per-volt meter, on a line voltage of 115 volts. All voltages are measured to chassis.

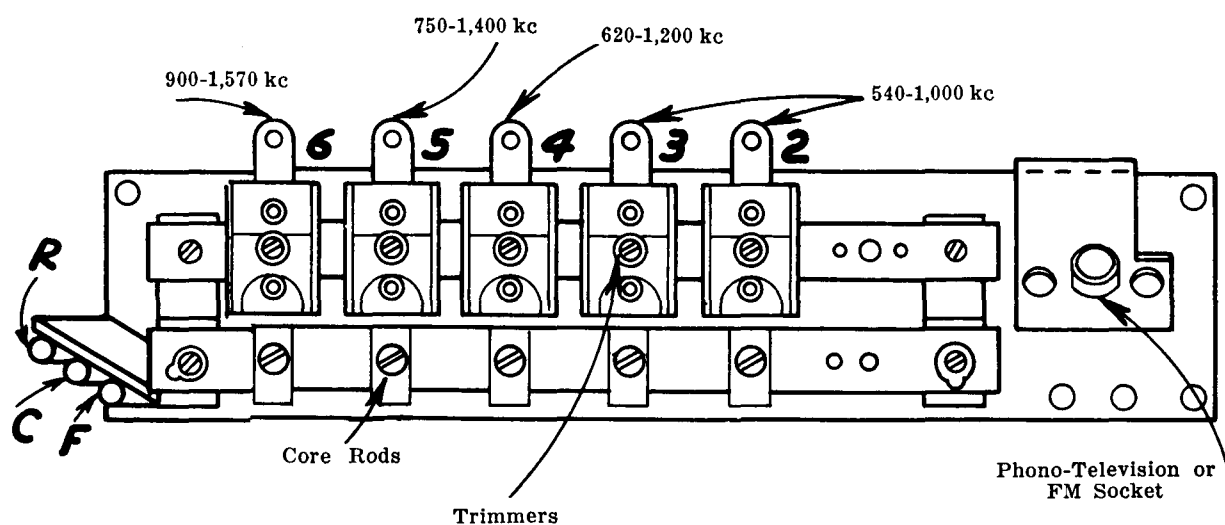


Fig. 4

Push Button Adjustment

The push buttons may be adjusted for any five 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. 2 located second from left on front panel.

- (3) Referring to Figure 4, adjust core and trimmer No. 2 for a peak at 560 k.c.

- (4) Proceed to adjust the other four 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.

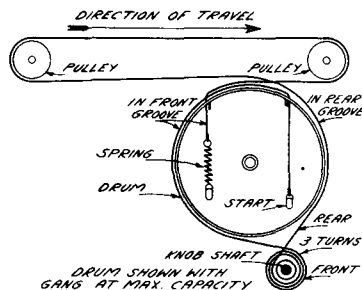


Fig. 5—Dial Drive Cord.

REPLACEMENT PARTS

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			
S-2876	Board-Antenna and Ground Terminal Board.....	30992	Resistor- 10 megohm 1/4 watt (R13)..
12714	Capacitor-Adjustable trimmer 2-12 mmfd.(C29,C31,C34).....	14887	Retainer-Drive cord pulley retainer (Pkg.10).....
S-2991	Capacitor-Adjustable trimmer 2 of 2-10 mmfd (C3,C4).....	35633	Shaft-Range indicator shaft.....
S-3007	Capacitor- 8.2 mmfd (Temp.comp.) (C36).....	S-2888	Shaft-Station selector drive shaft..
12948	Capacitor- 33 mmfd (C35).....	S-2824	Socket-A.C. Socket.....
35644	Capacitor- 47 mmfd (Temp.comp.) (C27).....	36422	Socket-Loop antenna or push button switch cable socket.....
S-3008	Capacitor- 47 mmfd (Close Tol.) (C5).....	31364	Socket-Dial lamp socket.....
12723	Capacitor- 56 mmfd (C11).....	31251	Socket-Tube socket.....
35645	Capacitor- 68 mmfd(Temp.comp.)(C28)	13638	Spring-Drive cord tension spring (Pkg.2).....
S-3009	Capacitor- 68 mmfd(Close Tol.)(C1,C7)	S-2990	Switch-Range switch (S1,S2,S3).....
12720	Capacitor- 100 mmfd(C9,C20).....	S-2892	Tone Control and Power Switch (R14,S4).....
12724	Capacitor- 120 mmfd(C45).....	35636	Transformer-1st I.F. Transformer (L9,L10,C14,C15).....
12694	Capacitor- 220 mmfd (C8).....	35628	Transformer-2nd I.F. Transformer (L11,L12,C18,C19).....
S-2988	Capacitor- 680 mmfd (Close Tol.) (C37).....	S-2903	Transformer-Power, 110 volt 25/60 cycle (T1).....
35643	Capacitor-3000 mmfd (C32).....	S-2904	Transformer-Power, 110 volt 50/60 cycle (T1).....
13895	Capacitor-5600 mmfd (C33).....	S-2906	Volume Control (R11).....
5107	Capacitor-.0025 mfd (C21).....	SPEAKER ASSEMBLIES	
33584	Capacitor-.005 mfd (C22,C25).....	31825	Cap-Dust cap for cone centre(Pkg.5).
4937	Capacitor-.01 mfd (C10,C23).....	S-2458	Coil-Field coil (L20).....
32787	Capacitor-.05 mfd (C16,C26).....	11469	Coil-Neutralizing coil (L14).....
4839	Capacitor-.1 mfd (C13,C17).....	31275	Cone-Speaker cone and voice coil (L13).....
33014	Capacitor-Electrolytic, 3 sections of 10 mfd, 1 section of 20 mfd. (C12,C24,C38,C39).....	5118	Plug-3 contact plug (male).....
S-2992	Coil-Antenna coil "B", "31" (L5,L6,L7).....	S-2827	Speaker complete.....
S-2993	Coil-Antenna coil 25, 19, 13 M (L2,L3,L4).....	S-2855	Transformer-Output Transformer (T2).
35876	Coil-Choke (L8,R1).....	PUSH BUTTON SWITCH ASSEMBLY	
S-2994	Coil-Oscillator coil "A and B" (L18,L19).....	S-2907	Cable-Shielded phono cable less plug
S-2995	Coil-Oscillator coil 19, 13 M (L15).	S-2908	Capacitor-Trimmed capacitor bank (C40 to C44).....
35625	Coil-Oscillator coil 25 M (L16).....	35803	Coil-Oscillator coil (L21 to L25)....
S-2996	Coil-Oscillator coil 31 M (L17).....	32641	Plug-3 prong male plug for phono cable.....
S-2989	Condenser-Two gang variable tuning condenser (C6,C30).....	31347	Socket-Phono input socket.....
S-2897	Cord-Indicator pointer drive cord (53 1/2").....	S-2911	Switch-Push Button switch assembly (S5 to S15).....
31273	Drum-Drive cord drum.....	MISCELLANEOUS ASSEMBLIES	
S-2886	Indicator-Station selector indicator pointer.....	35883	Button-Station selector push button.
11765	Lamp-Dial Lamp (Mazda 51).....	S-3012	Dial-Station selector dial scale....
5119	Plug-3 contact female speaker plug..	34489	Knob-Volume, tone or tuning knob....
31280	Pulley-Drive cord pulley.....	S-3316	Knob-Range switch knob(Outer section)
30929	Resistor- 270 ohm 1/2 watt (R7).....	S-3010	Knob-Range switch knob(Inner section)
31388	Resistor- 390 ohm 1 watt (R17).....	S-2916	Loop-Antenna loop assembly(L1,C1,C2)
14720	Resistor-1000 ohm 1/4 watt (R3).....	36149	Marker-Push button call letter marker (1 set).....
30694	Resistor-3900 ohm 1/2 watt (R2).....	34053	Spring-Push button retaining spring (Pkg.5).....
14559	Resistor-10,000 ohms 1/4 watt (R12).	14270	Spring-Knob retaining spring (Pkg.2).....
S-2587	Resistor-10,000 ohm 4 watt (R9).....	S-2542	Tool-Push button tuning set up tool.....
13998	Resistor-22,000 ohm 1/4 watt (R10)...		
12454	Resistor-33,000 ohm 1/4 watt (R6)...		
12412	Resistor-47,000 ohm 1/4 watt (R5)...		
30648	Resistor-470,000 ohm 1/4 watt (R15,R16).....		
12679	Resistor-2.2 megohms 1/4 watt(R4,R8)		



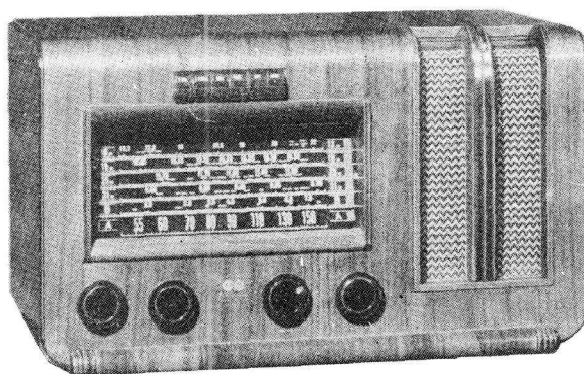
RCA Victor

MODEL A-22E

Seven tube, Six Band, AC, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical and Mechanical Specifications

POWER SUPPLY RATING

Rating 220-250 volts, 60 cycle, 80 watts

(All other specifications same as for Model A-22)

General Description

This receiver is similar to Model A-22 with the exception of the power transformer which is designed to operate on a 220-250 volt, 60 cycle supply.

Information pertaining to Alignment, Voltages, Parts, etc., will be found in the Service Notes for Model A-22.

Replacement Parts peculiar to Model A-22E

S-3384 Transformer—Power Transformer 220-250 volt, 60 cycle.

For all other parts see A-22 Service Notes.



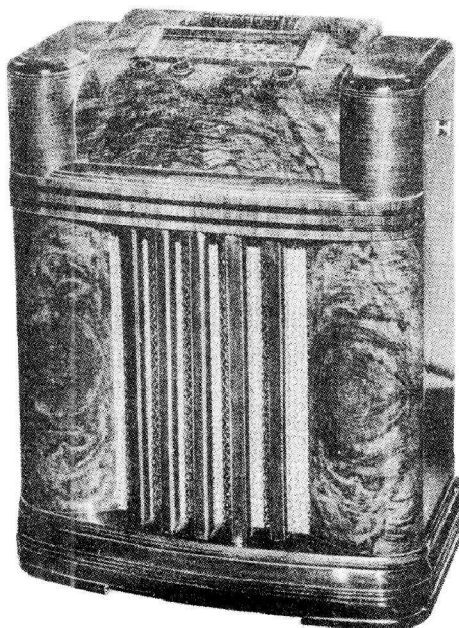
RCA Victor

MODEL A32

Nine-Tube, Six-Band, A-C, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR • COMPANY LIMITED • MONTREAL



Electrical Specifications

FREQUENCY RANGES

Standard Broadcast (A)	540-1,570	k.c.
Short Wave (B)	2,300-7,500	k.c.
31 M	9,450-9,700	k.c.
25 M	11,680-11,920	k.c.
19 M	15,030-15,380	k.c.
16-13 M	17,700-22,000	k.c.

Intermediate Frequency

R. F. ALIGNMENT FREQUENCIES

"B" (49 Meters)	6,100	k.c. (osc.)
31 M (31 Meters)	9,550	k.c. (osc., det., ant.)
25 M (25 Meters)	11,800	k.c. (osc.)
19 M (19 Meters)	15,200	k.c. (osc.)
Standard Broadcast (A)	600	k.c. (osc.), 1400 k.c. (osc., det., ant.)

(For order of alignment see page 3)

455 k.c.

RADIOTRON COMPLEMENT

(1) Type-6SK7	R-F Amplifier
(2) Type-6SA7	First Detector-Oscillator
(3) Type-6SK7	Intermediate Amplifier
(4) Type-6SQ7	2nd Det., A.V.C. & A.F.

(5) Type-6SF5	Audio amp.
(6) Type-6K6G	Power Output
(7) Type-6K6G	Power Output
(8) Type-5Y4G	Full wave Rectifier
(9) Type-6U5	Tuning Tube

Pilot Lamps (3) Mazda No. 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 80 watts
Rating B	105-125 volts, 25-60 cycles, 80 watts

POWER OUTPUT

Undistorted	5 watts
Maximum	9 watts

LOUDSPEAKER (CRL511-2)

Type	12 inch Electrodynamic
Impedance (V.C.)	3.4 ohms at 400 cycles

General Description

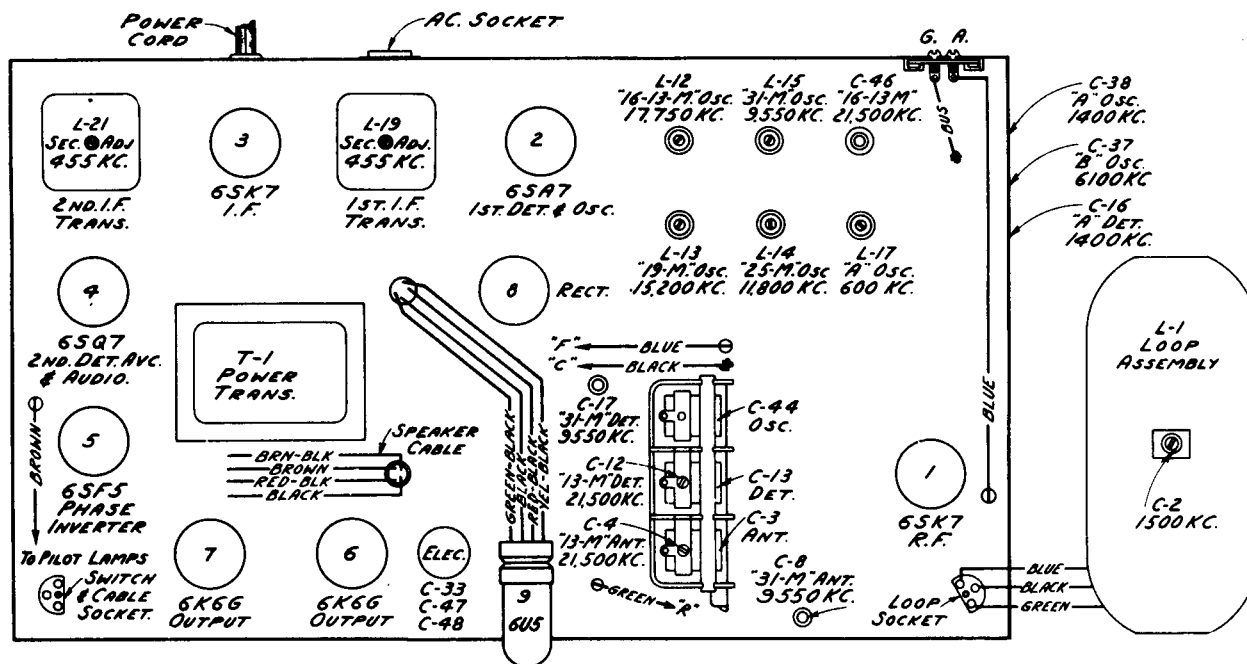
This receiver employs a nine tube, six band super-heterodyne circuit, the arrangement of which is shown in the schematic circuit diagram. Features of design include:—Rotatable loop antenna with Loop control knob; high gain R.F. stage; stabilized oscillator circuit; magnetite core I.F. transformers; magnetite core oscillator coils on all bands; automatic volume control circuit; Phono input socket; AC outlet on chassis back

apron; Tuning indicator tube; Illuminated band indicator; variable tone control circuit; push button tuning of seven Standard Broadcast stations by means of pre-set oscillator coils; dust proof, electrodynamic loudspeaker; temperature stabilized capacitors in the oscillator circuits; push-pull audio output stage and a large edge lighted horizontal glass dial.

Circuit Arrangement

The circuit consists of an R.F. amplifier stage incorporating the Loop Antenna as the first tuned circuit; first detector (oscillator) stage; I.F. Amplifier stage; second detector A.V.C. and 1st Audio stage; Audio driver stage; Push pull pentode power output; visual-tuning indicator and a well regulated power supply. The rotatable Loop Antenna used as the first tuned stage is in the circuit on all bands; temperature compensated capacitors in the oscillator circuits reduce oscillator drift. Spread band tuning is accomplished

electrically by shunting the oscillator section of the variable capacitor with relatively large temperature —stabilized fixed capacitors for tuning the oscillator coils on the 16-13M, 19M, 25M, 31M bands. Antenna and detector coils are designed to be sufficiently broad-tuned to require no variable tuning over the narrow frequency range of the spread bands. The windings of all I.F. transformers are resonated by fixed-capacitors and adjusted by moulded magnetite cores to tune to 455 K.C.



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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. 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 O° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum 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 chassis, and bend the wire so that it points to the O° mark on the calibration scale when the plates are fully meshed.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6SK7 2nd I.F. Grid	.1 Mfd.	455 kc	"A"	No Signal 550-750 kc	2nd I.F. Trans.	L20 & L21
2	6SA7 Det. Grid	.1 Mfd.	455 kc	"A"	No Signal 550-750 kc	1st I.F. Trans.	L18 & L19
3	Ant. Ter.	300 Ohms	6,100 kc	"B"	6.1 mc (149°)	"49 M" Osc.	C37
4	Ant. Ter.	300 Ohms	9,550 kc	"31 M"	9.55 mc (73°)	"31 M" Det.	C17
5	Ant. Ter.	300 Ohms	9,550 kc	"31 M"	9.55 mc (73°)	"31 M" Ant.	C8
6	Ant. Ter.	300 Ohms	9,550 kc	"31 M"	9.55 mc (73°)	"31 M" Osc.	L15
7	Ant. Ter.	300 Ohms	11,800 kc	"25 M"	11.8 mc (99°)	"25 M" Osc.	L14
8	Ant. Ter.	300 Ohms	15,200 kc	"19 M"	15.2 mc (94°)	"19 M" Osc.	L13
9	Ant. Ter.	300 Ohms	21,500 kc	"16-13 M"	21.5 mc (162°)	"16-13 M" Osc.	C46
10	Ant. Ter.	300 Ohms	17,750 kc	"16-13 M"	17.75 mc (17°)	"16-13 M" Osc.	L12
11	Ant. Ter.	300 Ohms	21,500 kc	"16-13 M"	21.5 mc (162°)	"16-13 M" Det.	C12
12	Ant. Ter.	300 Ohms	21,500 kc	"16-13 M"	21.5 mc (162°)	"16-13 M" Ant.	C 4
13	Ant. Ter.	300 Ohms	1,400 kc	"A"	1,400 kc (155°)	"A" H-F Osc.	C38
14	Ant. Ter.	300 Ohms	600 kc	"A"	600 kc (33.5°)	"A" L-F Osc.	L17
15	Ant. Ter.	300 Ohms	1,400 kc	"A"	1,400 kc (155°)	"A" Det.	C16
16	Radiation Loop	300 Ohms	1,400 kc	"A"	1,400 kc (155°)	"A" Ant.	C2*

NOTE:—Align the I.F. Circuits by means of the oscillograph, for a symmetrical curve. Peak R.F. stages of all bands. * Radiation loop comprising two turns of wire 18 inches in diameter should be placed 4 feet from receiver loop, before aligning "C2".

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 of 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.

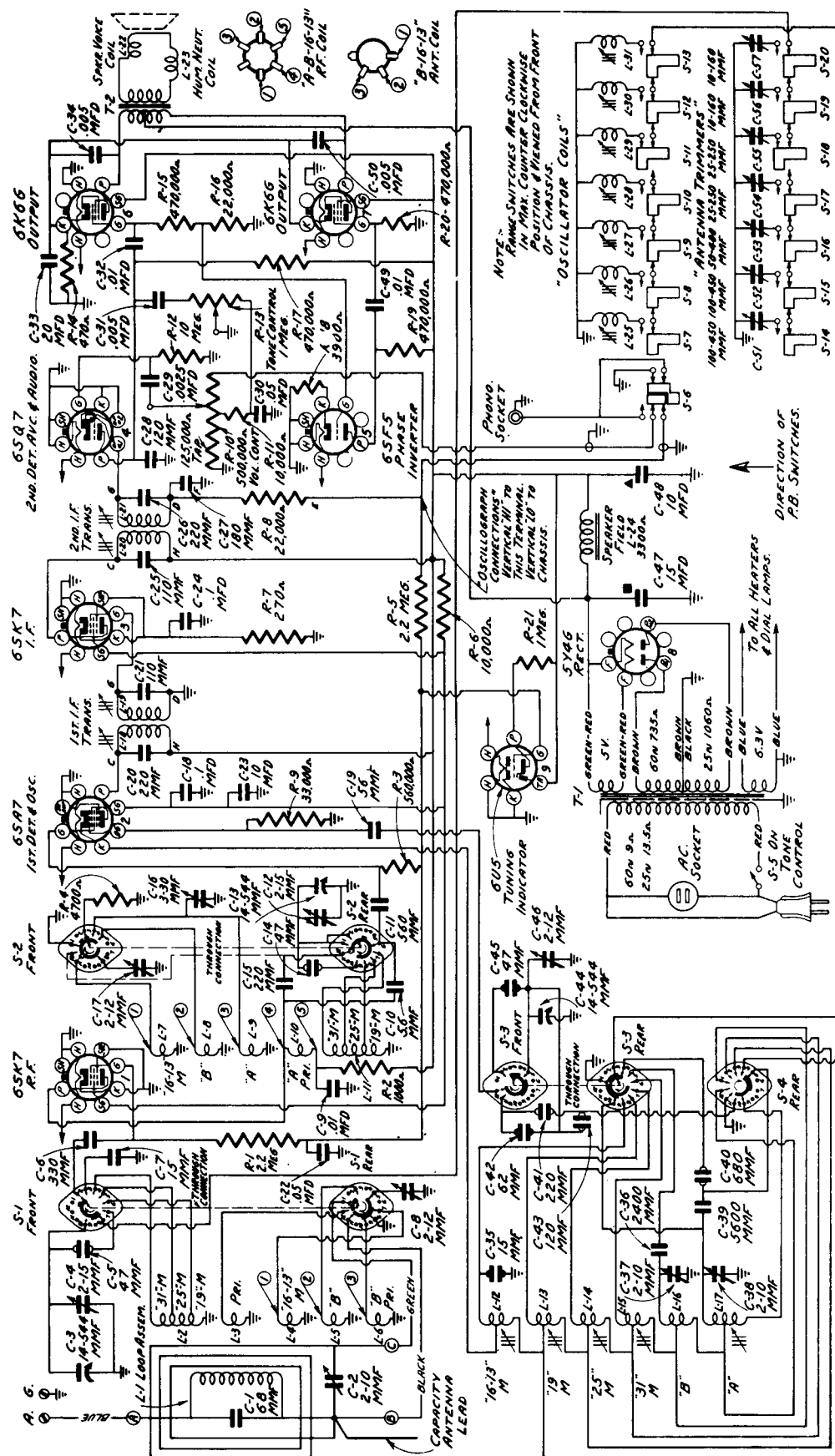
When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave

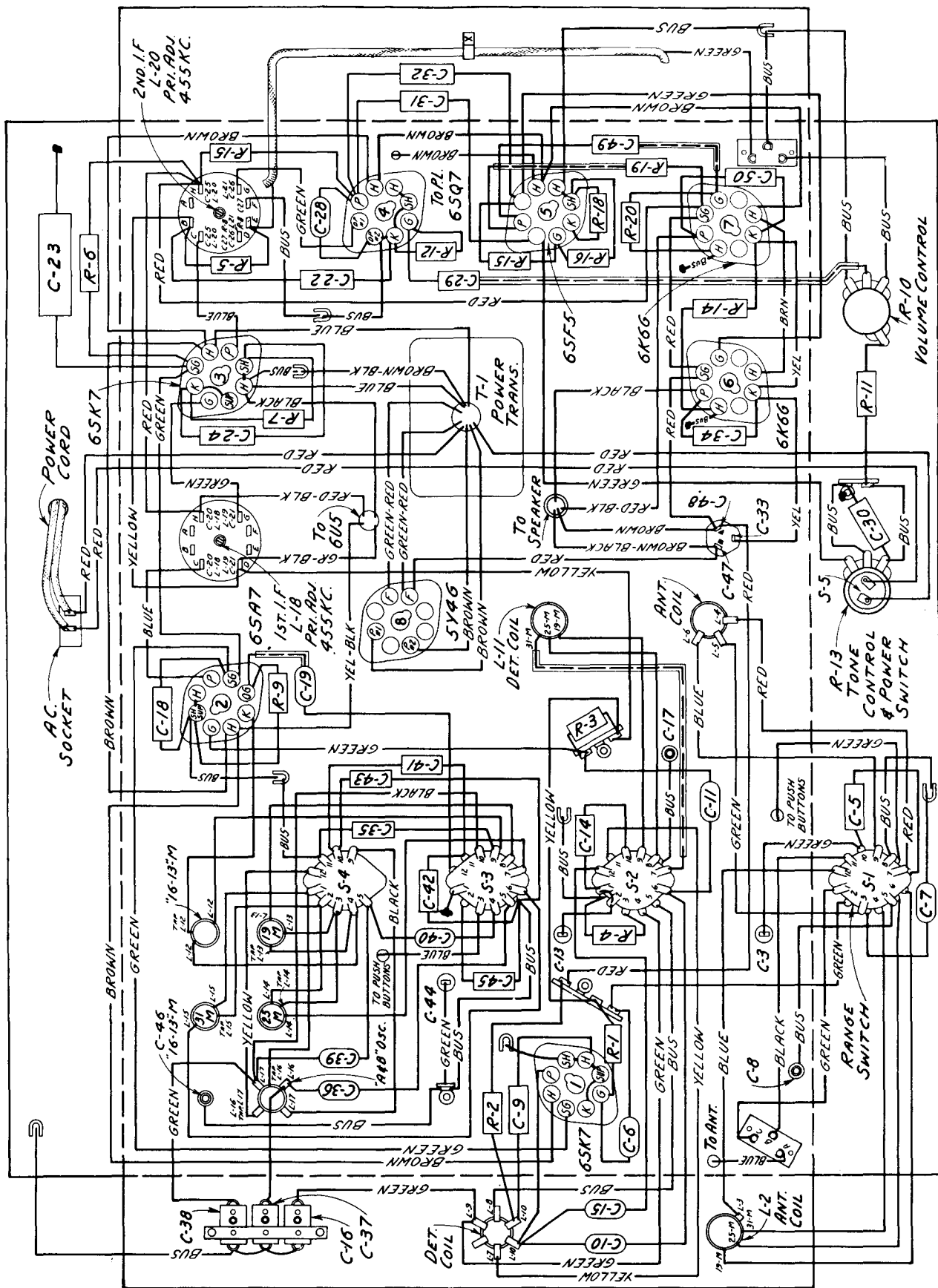
stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

NOTE:—Whenever possible spread band adjustments should be made with the chassis fastened in the cabinet and the pointer accurately aligned to the dial.

Spread-band Adjustments.—Alignment of the spread bands requires special procedure since test oscillators used alone are not ordinarily sufficiently accurate for this purpose. The RCA Stock No. 9572 Crystal Calibrator affords a convenient and accurate alignment standard. Wrap a few turns of wire around the crystal calibrator and connect one free end to the antenna terminal of the receiver. Using the crystal calibrator to obtain the necessary accuracy, follow the tabulated alignment procedure for the "31M.", "25M.", and "19M." bands.

For the "B" band, snap crystal calibrator "Hi-Lo" switch to "Hi", turn the range selector to "B" band, and set receiver dial pointer to 6.0 mc. Adjust oscillator padder C37 for minimum "Tuning Tube" opening. Use the peak indicated by the alignment table. Snap "Hi-Lo" switch to "Lo" and locate 6,100 kc (the first 100 kc harmonic above 6,000 kc) by slightly readjusting C37 with the dial pointer set at 6.1 mc. This method insures selection of correct crystal-calibrator harmonic.





RADIOTRON SOCKET VOLTAGES

Type	Plate	Screen Grid	Control Grid	Cathode	Heater
6SK7 R.F.	200V	100V	....	....	6.8V
6SA7 Conv.	195V	100V	....	....	6.8V
6SK7 I.F.	200V	100V	-2V	....	6.8V
6SQ7 2nd Det.	195V	....	....	....	6.8V
6SF5 Audio	95*V	....	....	2V	6.8V
6K6G Output	330V	200V	....	20V	6.8V
6U5 Indicator	210V	....	210V	....	6.8V
5Y4G Rectifier	Output measured across C48 200V			....	5.0V

Note:—All the above values hold within plus or minus 20 % when measured with a 1,000 ohm-per-volt meter, on a line voltage of 115 volts. All voltages are measured to chassis.

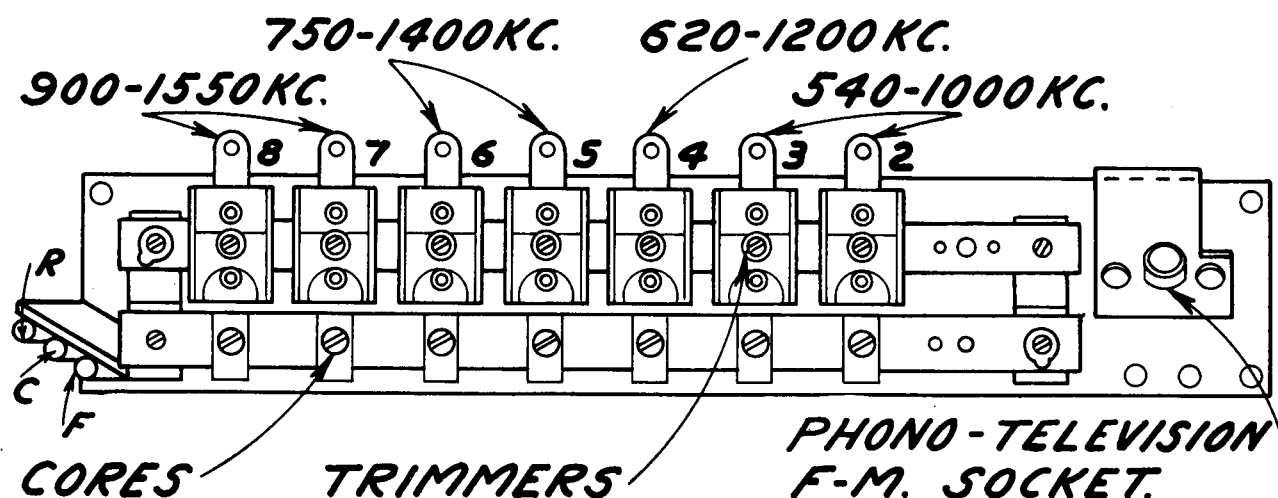


Fig. 4

Push Button Adjustment

The push buttons may be adjusted for any seven 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. 2 located second from left on front panel.

(3) Referring to Figure 4, adjust core and padder No. 2 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 six 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.

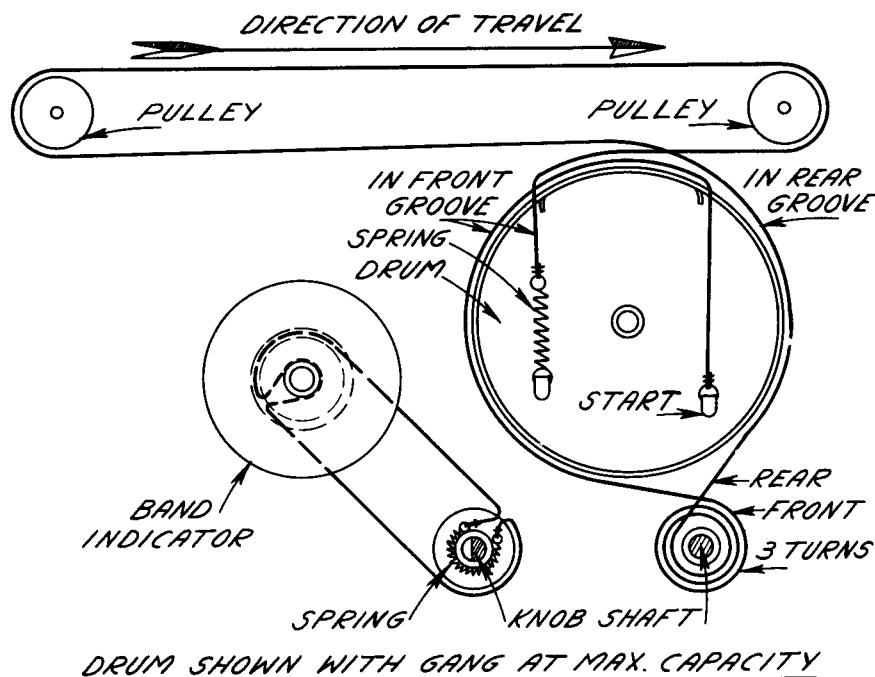


Fig. 5—Drive Cords

REPLACEMENT PARTS

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			
S-2876	Board-Antenna and Ground Terminal Board.....	S-2894	Capacitor-Electrolytic 10 mfd. (C23).....
12714	Capacitor-Adjustable trimmer 2-12 mmfd. (C8,C17,C46).....	S-2925	Capacitor-Electrolytic comprising 1 section 10 mfd. - one section 20 mfd., and one section 15 mfd. (C33,C47,C48).....
31400	Capacitor-Adjustable trimmer capacitor (C16,C37,C38).....	S-2877	Coil-Antenna coil "B-16-13" Bands (L4,L5,L6).....
12814	Capacitor- 5.6 mmfd. (C10).....	S-2878	Coil-Antenna coil "31-25-19" Bands (L2,L3).....
12896	Capacitor- 15 mmfd. (C7).....	S-2879	Coil-Det.Coil "A-B-16-13" Bands (L7,L8,L9,L10).....
36012	Capacitor- 15 mmfd. (Temp.comp.) (C35).....	S-2880	Coil-Det.Coil "31-25-19" Bands (L11).....
S-3008	Capacitor- 47 mmfd. (Close Tol.) (C5,C14).....	S-2881	Coil-19 meter band Oscillator coil (L13).....
35644	Capacitor- 47 mmfd. (Temp.comp.) (C45).....	S-2882	Coil-25 meter band Oscillator coil (L14).....
12723	Capacitor- 56 mmfd. (C19).....	S-2883	Coil-31 meter Band Oscillator coil (L15).....
S-3123	Capacitor- 62 mmfd. (Temp.comp.) (C42).....	S-2884	Coil-16-13 meter band Oscillator coil (L12).....
13057	Capacitor- 68 mmfd. (C1).....	S-2885	Coil-"A and B" Band Oscillator coil (L16,L17).....
12724	Capacitor- 120 mmfd. (C28).....	S-2898	Condenser-3 gang variable tuning condenser (C3,C4,C12,C13,C44).....
S-3100	Capacitor- 120 mmfd. (Close Tol.) (C43).....	S-2897	Cord-Indicator pointer drive cord (53½" long).....
12694	Capacitor- 220 mmfd. (C15).....	32634	Cord-Band Indicator drive cord...
S-2895	Capacitor- 220 mmfd. (Close Tol.) (C41).....	31273	Drum-Drive cord drum assembly....
12952	Capacitor-330 mmfd. (C6).....	S-2927	Drum-Band Indicator drive cord drum.....
12537	Capacitor- 560 mmfd. (C11).....	S-2886	Indicator-Station selector indicator pointer.....
S-2988	Capacitor- 680 mmfd. (Close Tol.) (C40).....	S-2928	Indicator-Band indicator assembly
12951	Capacitor-2400 mfd. (C36).....	11765	Lamp-Dial lamp Mazda #51.....
13895	Capacitor-5600 mmfd. (C39).....	5040	Plug-4 Contact speaker plug-(female).....
5107	Capacitor-.0025 mfd. (C29).....		
4838	Capacitor-.005 mfd. (C31,C34,C50).....		
14393	Capacitor-.01 mfd. (C9,C32,C49).....		
32787	Capacitor-.05 mfd. (C22,C30).....		
4839	Capacitor-0.1 mfd. (C18,C24).....		

REPLACEMENT PARTS

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
31280	Pulley-Drive cord pulley.....		SPEAKER ASSEMBLIES (CRL 511-2)
30929	Resistor-270 ohm 1/2 watt (R7)....	31825	Cap-Dust Cap for cone centre (Pkg.5).....
30681	Resistor-470 ohm 1 watt (R14)....	S-2937	Coil-Field Coil (L24).....
14720	Resistor-1000 ohm 1/4 watt (R2)....	11469	Coil-Hum neutralizing coil (L23).....
30694	Resistor-3900 ohm 1/4 watt (R18)....	31275	Cone-Speaker cone and voice coil (L22).....
30146	Resistor-4700 ohm 1/4 watt (R4)....	5039	Plug-4 contact plug (male).....
-3078	Resistor-10,000 ohm 1/4 watt (R11).....	S-2938	Speaker complete.....
S-2587	Resistor-10,000 ohm 4 watt (R6).....	S-2934	Transformer-Output (T2).....
30492	Resistor-22,000 ohm 1/4 watt (R8,R16).....		PUSH BUTTON SWITCH ASSEMBLY
12454	Resistor-33,000 ohm 1/4 watt (R9).....	S-3241	Cable-Shielded Phono cable, less plug.....
30648	Resistor-470,000 ohm 1/4 watt (R15,R17,R19,R20).....	S-2930	Capacitor-Trimmer capacitor bank (C51 to C57 inclusive).....
12486	Resistor-560,000 ohm 1/4 watt (R3).....	35803	Coil-Oscillator coil (L25 to L31 inclusive).....
12679	Resistor-2.2 megohm 1/4 watt (R1,R5).....	35871	Core-Oscillator coil core.....
30992	Resistor-10. megohm 1/4 watt (R12).....	32641	Plug-3 prong male plug for phono cable.....
14887	Retainer-Drive Cord Pulley retainer (Pkg.10).....	31347	Socket-Phono input socket.....
S-2888	Shaft-Station selector drive shaft.....	S-2931	Switch-Push Button switch only (S6 to S20 inclusive).....
S-2824	Socket-A.C.Socket.....		MISCELLANEOUS ASSEMBLIES
31364	Socket-Dial Lamp Socket.....	35883	Button-Station selector push button.....
36422	Socket-Loop Antenna or Push Button Switch Cable Socket.....	S-2913	Dial-Station selector dial scale.....
31251	Socket-Tube Socket.....	36038	Knob-Volume,Tone,Range or tuning control knob.....
30585	Spring-Band Indicator drive cord spring (Pkg.2).....	35650	Knob-Loop Antenna control knob.....
13638	Spring-Drive Cord Tension Spring (Pkg.2).....	S-2933	Loop-Antenna Loop Assembly (L1,C1,C2).....
S-2929	Switch-Range Switch (S1,S2,S3,S4).....	36149	Marker-Push button call letter markers (1 set).....
S-2892	Tone Control and Power Switch (R13,S5).....	S-2932	Shaft-Loop Antenna Drive Shaft.....
S-2899	Transformer-1st I.F. Transformer (L18,L19,C20,C21).....	34053	Spring-Push button retaining spring (Pkg.5).....
S-2900	Transformer-2nd I.F. Transformer (L20,L21,C25,C26,C27,R8).....	14270	Spring-Knob retaining spring (Pkg.2).....
S-2903	Transformer-Power-110 volt 25/60 cycle (T1).....	S-2542	Tool-Push Button set-up tool.....
S-2904	Transformer-Power-110 volt 50/60 cycle (T1).....		
S-2906	Volume Control (R10).....		

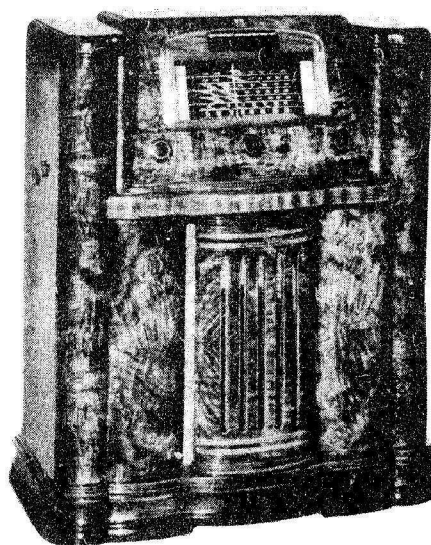


RCA Victor

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 Band	.....9.45-11.8 mc (31.8-25.4 m)
25 Meter Spread Band	.....11.65-15-2 mc (25.6-19.9m)
19 Meter Spread Band	.....15.1-17.75 mc (19.9-16.9 m)
16 Meter Spread Band	.....17.73-18.5 mc (16.9-16.2 m)
13 Meter Spread Band	.....21.45-22.5 mc (12.95-13.3)

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-522-1	.....12 inch Electrodynamic
Voice Coil Impedance	.....11.5 ohms at 400 cycles

Height Width Depth

Cabinet Dimensions (inches)	....40	....32	....17½
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-phonograph 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.

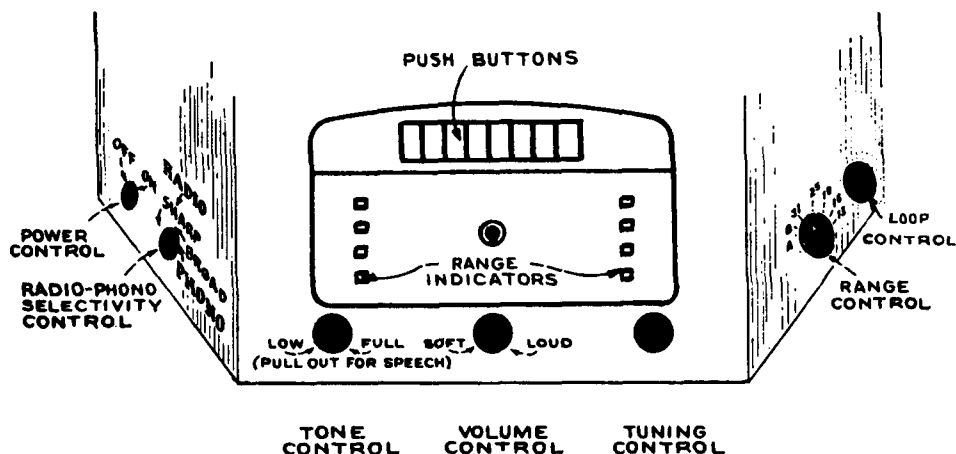


Figure 2—Controls

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.

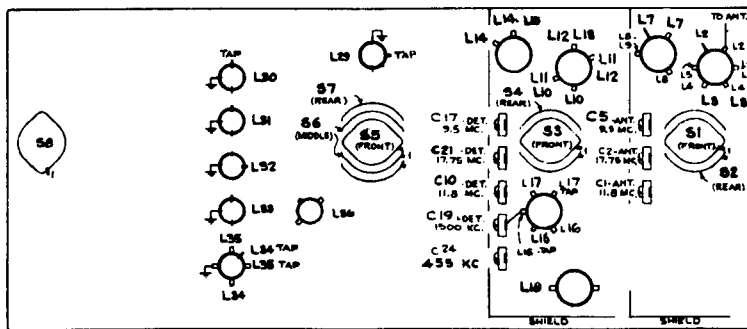


Figure 3—Coil and Trimmer Locations (Bottom View)

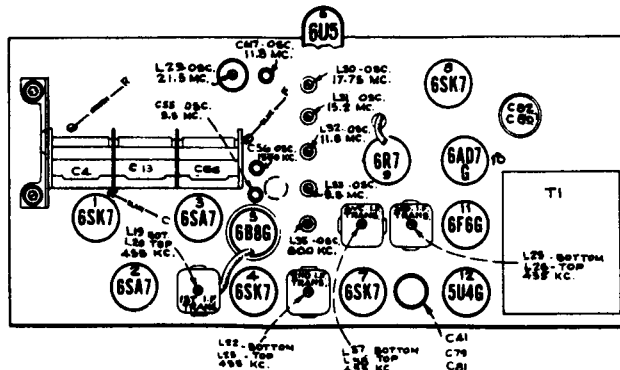


Figure 4—Tube and Trimmer Locations (Top View)

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.

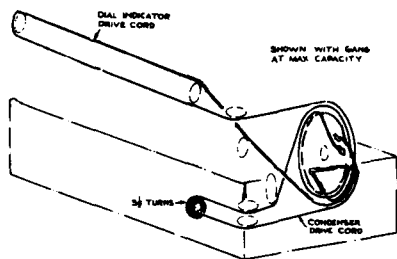
**** Use maximum inductance peak.

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

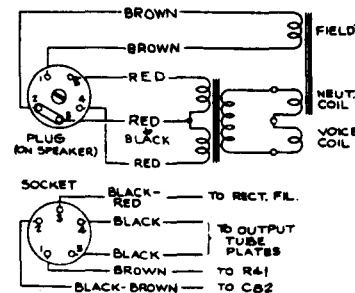


I.F. Selectivity Curves
At Left—"Sharp"
At Right—"Broad"





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.

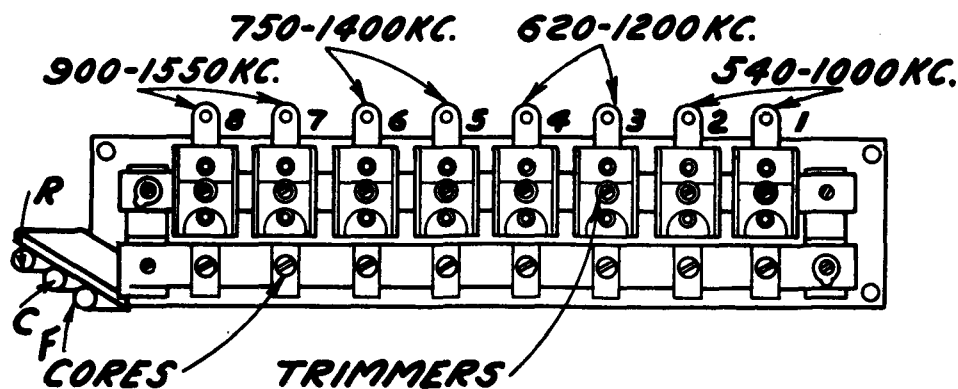


Fig. 5

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 comprising 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 comprising 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 condenser (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 selectivity 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	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.....



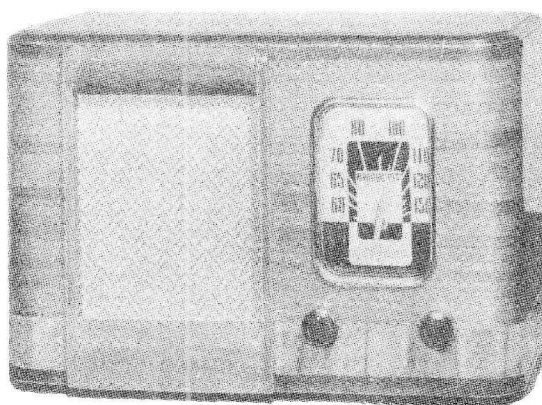
RCA Victor

ACE

Five-Tube, Single-Band, A-C, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

Frequency Range 540 to 1,600 k.c.
 R.F. Alignment Frequency....1,500 k.c. (osc., ant.)
 Intermediate Frequency 455 k.c.

LOUDSPEAKER

Type 5 inch Electrodynamic
 Voice-coil Impedance 3 ohms at 400 cycles

Tube Complement

(1) Type 6SA7 First-Det., Osc.
 (2) Type 6SK7.....Intermediate Frequency AMP.
 (3) Type 6SQ7.....Second-Det., A.V.C., A.F.

(4) Type 6K6-G Power Output
 (5) Type 5Y4G Full Wave Rectifier

POWER SUPPLY RATING

Rating A 105-125 volts, 50-60 cycle 50 watts
 Rating B 105-125 volts, 25-60 cycle 50 watts

POWER OUTPUT

Undistorted 1 watt
 Maximum 2 watts

Mechanical Specifications

	Height	Width	Depth
Cabinet Dimensions	8 $\frac{1}{8}$ inches	12 $\frac{7}{8}$ inches	8 inches
Chassis Base Dimensions	1 $\frac{7}{8}$ inches	9 $\frac{3}{4}$ inches	5 $\frac{7}{8}$ inches
Overall Chassis Height			4 inches
Weight (net)			10 $\frac{1}{2}$ pounds
Weight (shipping)			12 $\frac{3}{4}$ pounds
Operating Controls	(1) Power Switch—Volume, (2) Tuning		

General Description

This receiver employs a five tube, single band chassis incorporating a Loop Antenna as the first tuned circuit. Details of the electrical design are shown in the Schematic circuit diagram. Features of design include:—New single ended, metal tubes; full A.V.C. circuit; Loop antenna for ease of installation; stabilized oscillator circuit; sensitive, five inch electrodynamic loudspeaker; and a full vision dial housed in a modern styled cabinet of walnut veneers.

Alignment Procedure

Cathode-ray Alignment is the preferable method. Connections for the oscillograph are shown in the wiring 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 a-v-c action.

Pre-setting Dial. With gang condenser in full mesh position, move pointer to coincide with calibration mark at the low frequency end of dial.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Tune radio dial to—	Adjust the following for max. peak output
No. 1	6SK7 I-F grid, in series with .01 mfd.	455 kc	Quiet point between 550-750 kc	L5 and L6 (2nd I-F Transformer) L3 and L4 (1st I-F Transformer)
No. 2	6SA7 1st-det. grid in series with .01 mfd.	455 kc		
No. 3	Antenna lead, in series with 300 ohms	1,500 kc	1,500 kc	C5 (oscillator) C2 (antenna)

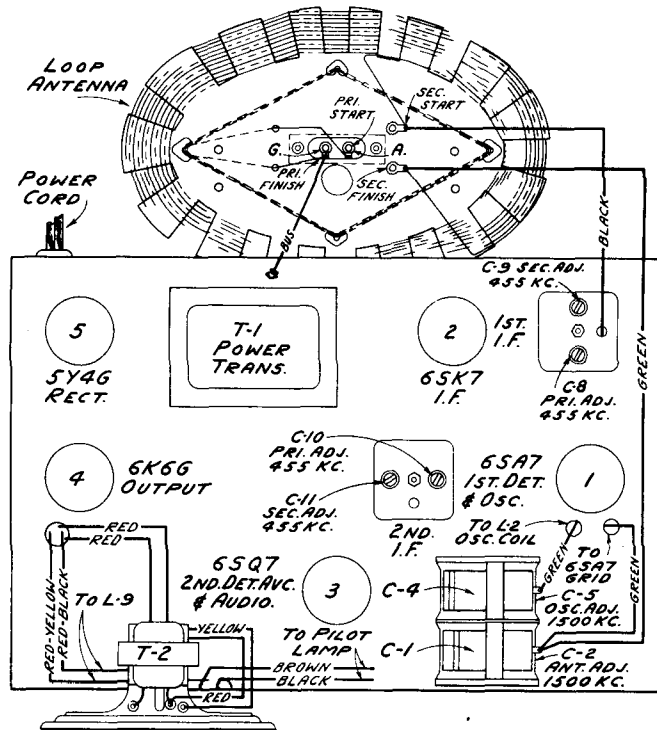


Fig. No. 1 Tube & Trimmer Locations

Radiotron Socket Voltages

Type	Plate	Screen Grid	Cathode	Filament
6SA7 det.	195 V	65 V	0 V	6.3 V. A.C.
6SA7 osc.	65 V	...	...	.....
6SK7	195 V	65 V	0 V	6.3 V. A.C.
6SQ7 amp.	62 V	...	0 V	6.3 V. A.C.
6K6G	185 V	195 V	12.5 V	6.3 V. A.C.
5Y4G	290/290 V	...	295 V	5 V. A.C.

The above measurements are all made to chassis. Measurements made with set tuned to quiet point, volume control set at minimum, using 1,000-ohm-per-volt meter, having ranges of 10, 50, 250, and 500 volts. (Use nearest range above the specified measured voltage.)

All the above values should hold within approximately $\pm 20\%$ for 115 volt, 25-60 cycle supply.

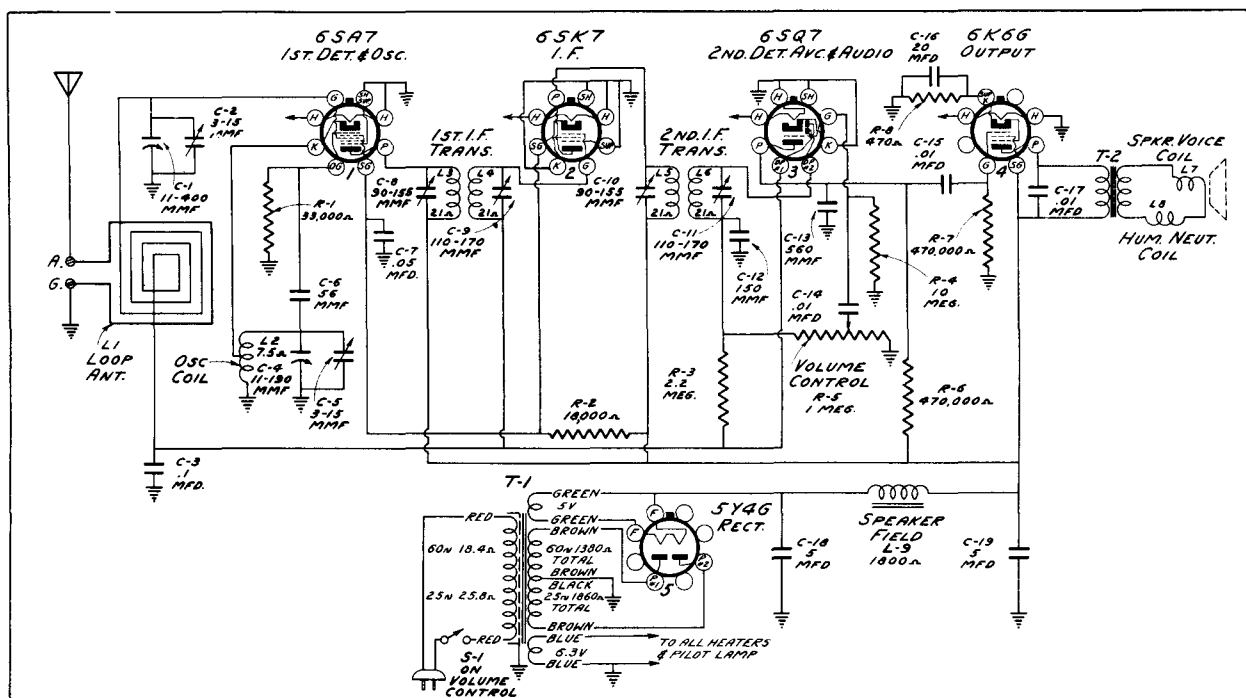


Fig No. 2 Schematic Circuit Diagram

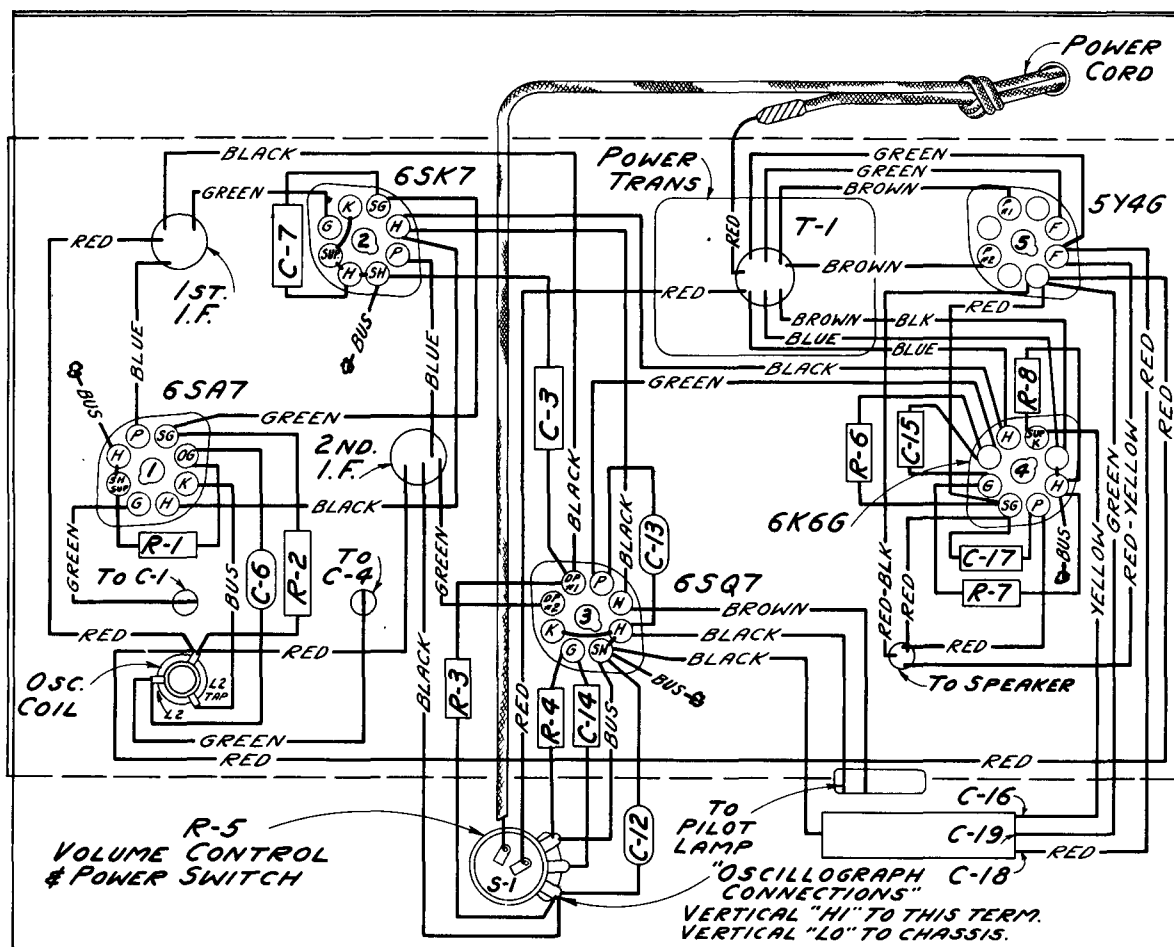


Fig. No. 3 Chassis Wiring Diagram

Precautionary Lead Dress

- (1) Keep a-c leads away from volume-control wiring.
- (2) Keep lead from high side of volume control away from plate circuit of 6SQ7 tube.
- (3) Dress speaker leads to front of chassis away from 6K6G tube.

REPLACEMENT PARTS FOR MODEL ACE

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			
12723	Capacitor-56 mmfd. (C6).....	31418	Spring-Drive cord tension spring (Pkg.3).....
12725	Capacitor-150 mmfd.(C12).....	S-2715	Transformer-1st I.F. Transformer (L3,L4,C8,C9).....
12537	Capacitor-560 mmfd.(C13).....	S-2716	Transformer-2nd I.F. Transformer (L5,L6,C10,C11).....
4858	Capacitor-.01 mfd. (C14).....	S-2316	Transformer-Power Transformer 105-125 volt,25-60 cy.(T1).....
14393	Capacitor-.01 mfd. (C15,C17).....	S-2317	Transformer-Power transformer 105-125 volt,50-60 cy.(T1).....
30847	Capacitor-.05 mfd. (C7).....	33631	Volume Control and Power Switch(R5).
4839	Capacitor-0.1 mfd. (C3).....		
S-2615	Capacitor-Electrolytic capacitor consisting of two 5 mfd. sections and one 20 mfd. section(C16,C18,C19)....	REPRODUCER ASSEMBLIES (CRL-593-1)	
S-2707	Coil-Oscillator Coil (L2).....	S-2375	Cone-Reproducer cone, dust cap and gasket (L7).....
S-2708	Condenser-2 gang variable tuning capacitor (C1,C2,C4,C5).....	S-2387	Coil-Field coil (L9).....
S-2709	Cord-Variable condenser drum drive cord.....	S-2388	Reproducer complete.....
S-2710	Dial-Station selector dial scale assembly.....	S-2389	Transformer-Output transformer (T2).
S-2309	Drum-Variable condenser drive cord drum.....		
S-2712	Indicator-Station selector indicator pointer.....	MISCELLANEOUS ASSEMBLIES	
11765	Lamp-Dial lamp.....	S-2732	Cover-Receiver back cover.....
S-2713	Loop-Antenna loop assembly (L1).....	S-2706	Crystal-Dial crystal.....
30499	Resistor-470 ohm 1/2 watt (R8).....	S-2368	Escutcheon-Station selector dial escutcheon.....
S-2060	Resistor-18,000 ohm, 1 watt (R2).....	30863	Knob-Station selector or volume control knob.....
12454	Resistor-33,000 ohm, 1/4 watt (R1)....	30900	Spring-Knob retaining spring (Pkg.5).....
12285	Resistor-470,000 ohm, 1/4 watt(R6,R7).		
12679	Resistor-2.2 meg., 1/4 watt (R3).....		
13601	Resistor-10.0 meg., 1/4 watt (R4).....		
14887	Retainer-Drive shaft retainer(Pkg.10).		
S-1469	Screw-Drum set screw (Pkg.10).....		
S-2714	Shaft-Drive shaft.....		
31251	Socket-Radiotron socket.....		
S-2719	Socket-Pilot lamp socket and lead assembly.....		



RCA Victor

VICTORETTE

Five-Tube, Single-Band, A-C, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

Electrical Specifications

Frequency Range 540 to 1,750 k.c.
 R.F. Alignment Frequency 1,500 k.c. (osc., ant.)
 Intermediate Frequency 455 k.c.

LOUDSPEAKER

Type 5 inch Electrodynamic
 Voice-coil Impedance..... 3 ohms at 400 cycles

Tube Complement

(1) Type 6A8 First-Det., Osc.
 (2) Type 6K7..... Intermediate Frequency AMP.
 (3) Type 6Q7G..... Second-Det., A.V.C., A.F.

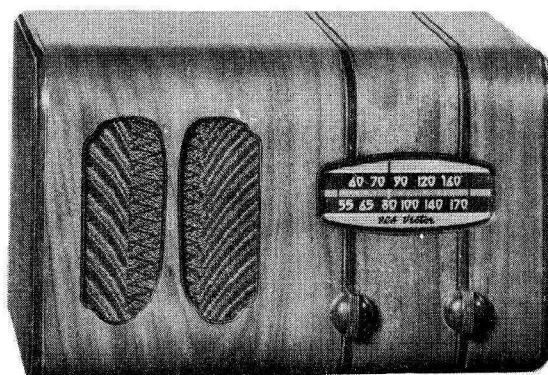
(4) Type 6F6-G Power Output
 (5) Type 5Y4G Full Wave Rectifier

POWER SUPPLY RATING

Rating A 105-125 volts, 50-60 cycle 50 watts
 Rating B 105-125 volts, 25-60 cycle 50 watts

POWER OUTPUT

Undistorted 1 watt
 Maximum 2 watts



Mechanical Specifications

	Height	Width	Depth
Cabinet Dimensions	8 1/4 inches	12 1/2 inches	7 3/8 inches
Chassis Base Dimensions	1 7/8 inches	9 3/4 inches	5 7/8 inches
Overall Chassis Height			4 inches
Weight (net)			10 1/2 pounds
Weight (shipping)			12 3/4 pounds
Operating Controls	(1) Power Switch—Volume, (2) Tuning		

General Description

This receiver employs a five-tube single band chassis. Features of design include:—Magnetite core I.F. transformers, stabilized oscillator circuit, electro-dynamic loudspeaker, and a large easy to read dial.

Alignment Procedure

Cathode-ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

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 a-v-c action.

Pre-setting Dial. With gang condenser in full mesh position, move pointer to coincide with calibration mark at the low frequency end of dial.

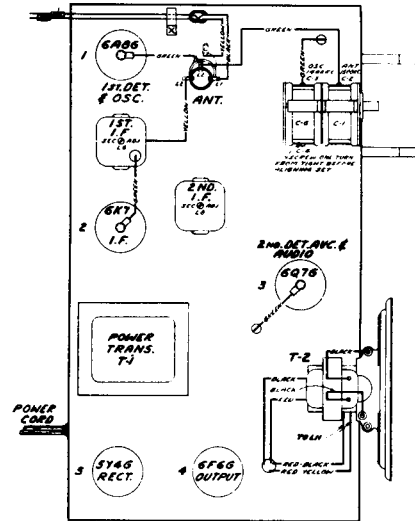


Fig. 1 Tube & Trimmer Locations.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Tune radio dial to—	Adjust the following for max. peak output
No. 1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F Transformer)
No. 2	6A8 1st-det. grid cap, in series with .01 mfd.	455 kc		L5 and L6 (1st I-F Transformer)
No. 3	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc (Top of "1" in 150)	C6* (oscillator) C3 (antenna)

Radiotron Socket Voltages

Type	Plate	Screen Grid	Control Grid	Filament
6A8 det.	210 V	135 V	0 V	6.3 V. A.C.
6A8 osc.	210 V	...	...	.....
6K7	210 V	135 V	0 V	6.3 V. A.C.
6Q7G amp.	100 V	...	0 V	6.3 V. A.C.
6F6G	190 V	210 V	0 V	6.3 V. A.C.
5Y4G	Plate 1 or 2 to Chassis 282 V	...	...	5 V. A.C.

The above measurements are all made to chassis. Measurements made with set tuned to quiet point, volume control set at minimum, using 1,000-ohm-per-volt meter, having ranges of 10, 50, 250, and 500 volts. (Use nearest range above the specified measured voltage.)

All the above values should hold within approximately $\pm 20\%$ for 115 volt, 25-60 cycle supply.

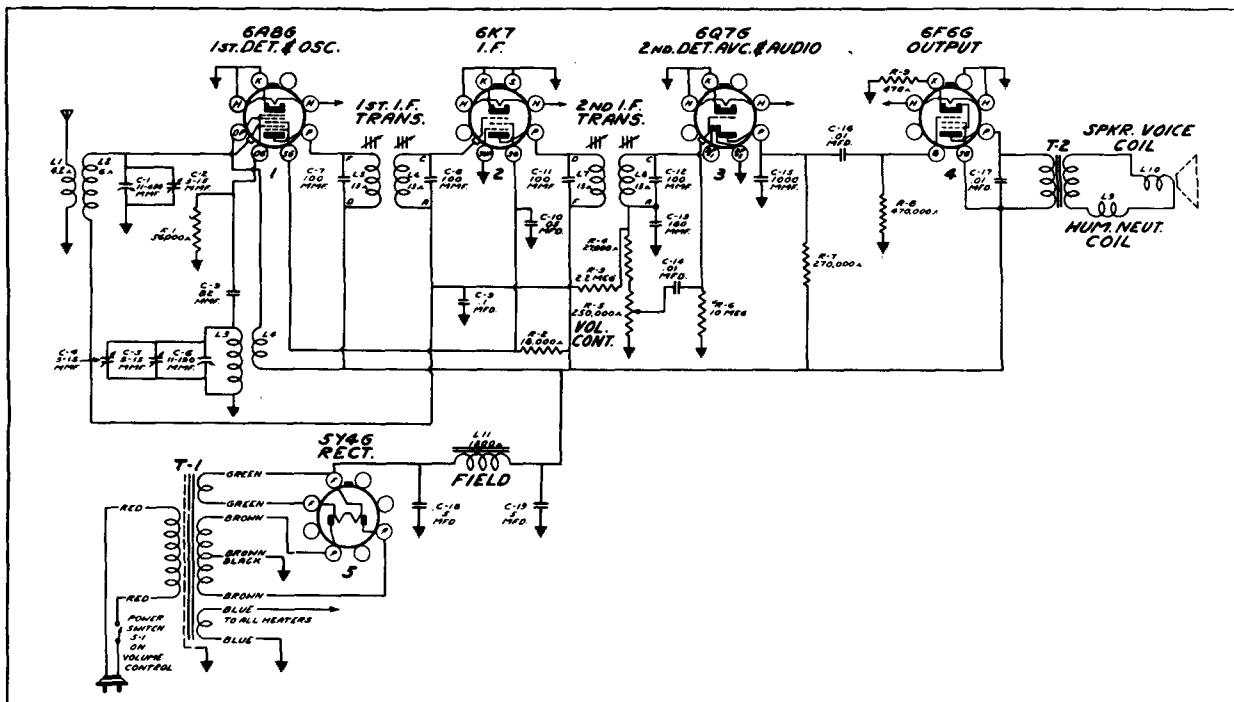


Figure 2. Schematic Circuit Diagram.

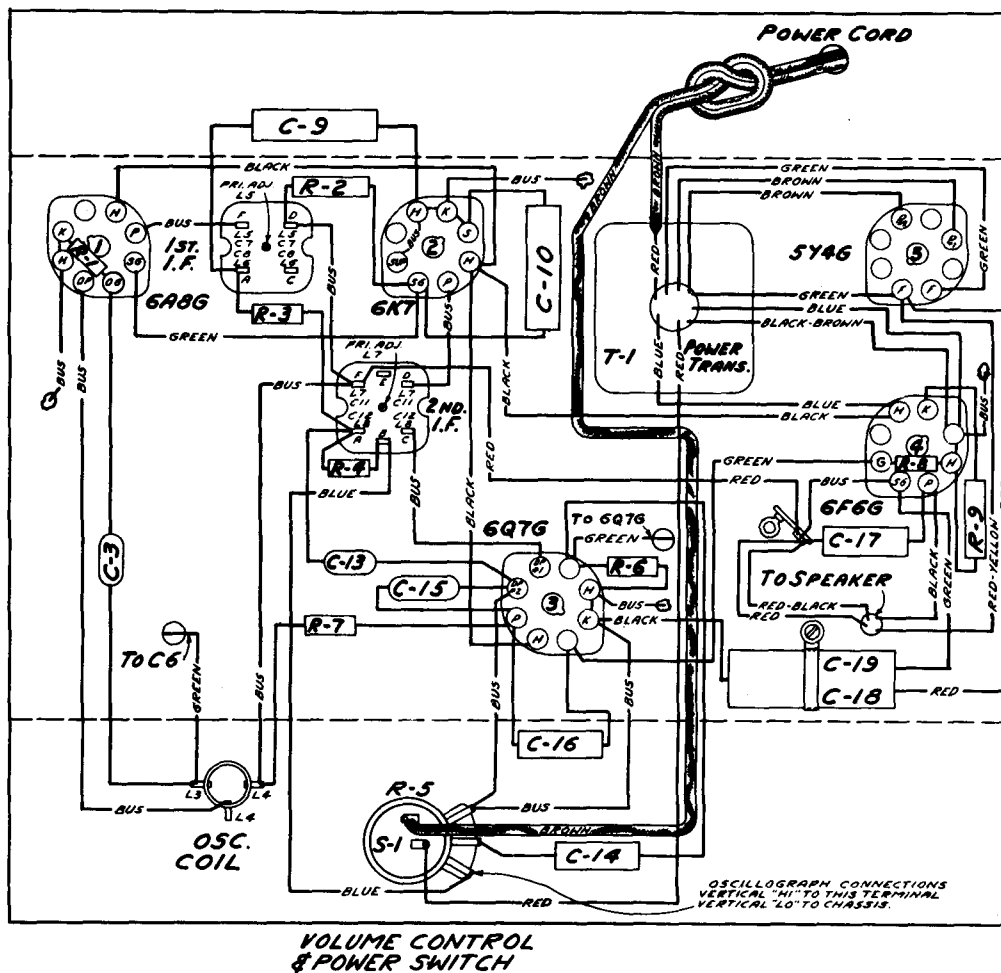


Fig. 3. Chassis Wiring Diagram.

Precautionary Lead Dress

- (1) Keep a-c leads away from volume-control wiring.
- (2) Keep lead from high side of volume control away from plate circuit of 6Q7G tube.
- (3) Dress speaker leads to front of chassis away from 6F6G tube.

REPLACEMENT PARTS FOR VICTORETTE

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			
S-2301	Cap-Grid connector cap (Pkg.of 5)...	31251	Socket-Radiotron socket.....
12813	Capacitor-82 mmfd. (C3).....	31418	Spring-Drive cord tension spring (Pkg.of 3).....
12720	Capacitor-100 mmfd. (C5,C6,C11,C12)..	S-2314	Transformer-1st I.F.Transformer (L5,L6,C7,C8).....
13003	Capacitor-180 mmfd. (C13).....	S-2315	Transformer-2nd I.F.Transformer (L7,L8,C11,C12).....
12725	Capacitor-1,000 mmfd. (C15).....	S-2316	Transformer-Power Transformer 105-125 volt,25-60 cycle (T1)...
4858	Capacitor-.01 mfd. (C14).....	S-2317	Transformer-Power Transformer 105-125 volt,50-60 cycle (T1)...
14393	Capacitor-.01 mfd. (C16,C17).....	S-2318	Volume control and power switch (R5,S1).....
30847	Capacitor-.05 mfd. (C10).....	REPRODUCER ASSEMBLIES	
4839	Capacitor-0.1 mfd. (C9).....	100696-1	
S-2302	Capacitor-Electrolytic capacitor consisting of two 5 mfd. sections (C18,C19).....		
30894	Coil-Antenna coil (L1,L2).....	S-2320	Cone-Reproducer cone and voice coil (L10).....
30895	Coil-Oscillator coil (L3,L4).....	S-2321	Reproducer complete.....
S-2303	Condenser-2 gang variable tuning condenser (C1,C2,C4,C5,C6).....	S-2322	Transformer-Output Transformer (T2).....
S-2305	Cord-Variable condenser drum drive cord.....	MISCELLANEOUS ASSEMBLIES	
30905	Core-Adjustable core for I.F.Transformer.....		
S-2307	Dial-Station selector dial scale assembly.....	S-2327	Crystal-Station selector dial crystal.....
S-2309	Drum-Variable condenser drive drum assembly.....	14269	Knob-Volume control or tuning knob.....
31420	Indicator-Station selector indicator pointer.....	S-2323	Screw-Chassis mounting screw and washer assembly (Pkg.of 4).....
31373	Pulley-Indicator drive cord pulley..	14270	Spring-Retaining spring for knob (Pkg.of 10).....
30499	Resistor-470 ohm, 1/2 watt (R9).....		
S-2060	Resistor-18,000 ohm,1 watt (R2).....		
14390	Resistor-27,000 ohm,1/10 watt (R4)...		
12286	Resistor-56,000 ohm,1/4 watt (R1)...		
11323	Resistor-270,000 ohm,1/4 watt (R7)...		
S-1690	Resistor-470,000 ohm,1/4 watt (R8)...		
12579	Resistor-2.2 meg. 1/4 watt (R3).....		
13601	Resistor-10 meg., 1/4 watt (R6).....		
14887	Retainer-Pulley or drive shaft retainer (Pkg.of 20).....		
S-1469	Screw-Variable capacitor drum set screw (Pkg.of 10).....		
S-2312	Shaft-Variable capacitor drum drive shaft.....		



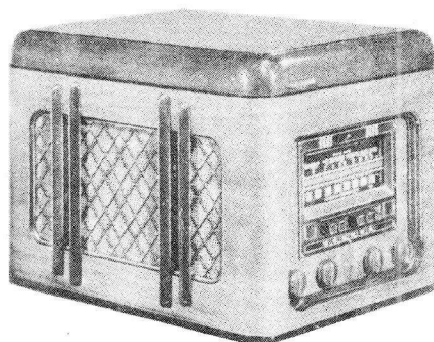
RCA Victor

MODELS VR-1 and VR-4

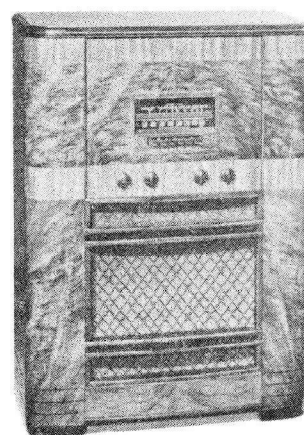
Five-Tube, Two-Band, AC, Superheterodyne Victrolas

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model VR-1



Model VR-4

Electrical Specifications

FREQUENCY RANGES

Standard Broadcast 540-1,720 kc
Short Wave 5.8-18 mc

INTERMEDIATE FREQUENCY 455 kc

TUBE COMPLEMENT

(1) Type-6SA7 1st Detector—Oscillator
(2) Type-6SK7 I-F Amplifier
(3) Type-6SQ7 2nd Detector, A.V.C.,
and A-F Amplifier
(4) Type-6F6-G Power Output
(5) Type-5Y4-G Rectifier
PILOT LAMPS (2) Mazda No. 44, 6.3 volts, 0.25 amp.

POWER OUTPUT RATING

Undistorted 2.5 watts
Maximum 4.5 watts

LOUDSPEAKER (VR-1) (RL79-1)

Type 6-inch Electrodynamic
V.C. Impedance 3.4 ohms at 400 cycles

LOUDSPEAKER (VR-4) (RL70H-1)

Type 12 inch Electrodynamic
V.C. Impedance 3.4 ohms at 400 cycles

POWER SUPPLY RATINGS

Rating A 105-125 volts, 50-60 cycles, 105 watts
Rating B 105-125 volts, 25-60 cycles, 105 watts

Push Button Adjustments

The push buttons should be adjusted for six favorite stations after the receiver has had a brief warm-up period.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high.

Proceed as follows:—

1. Set the accessory tone knob to "Radio" and turn the range selector to "A" band position.

2. Remove the six push buttons by inserting a small screwdriver blade in the slot provided on the under side of the button. Press the screwdriver blade upwards at the same time pull the button forward.

3. Loosen the push arm adjusting screws accessible through the push button openings.

4. Press in the tuning knob and accurately tune in the first station.

5. With station accurately tuned in, press in the first push button and tighten screw.

6. Proceed in a similar manner to adjust the remainder of the push buttons.

7. Replace push buttons by inserting in the escutcheon openings, spring side down. Press button in as far as possible to securely lock button in escutcheon.

8. Place call letter tabs in openings provided.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. 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 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum 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.

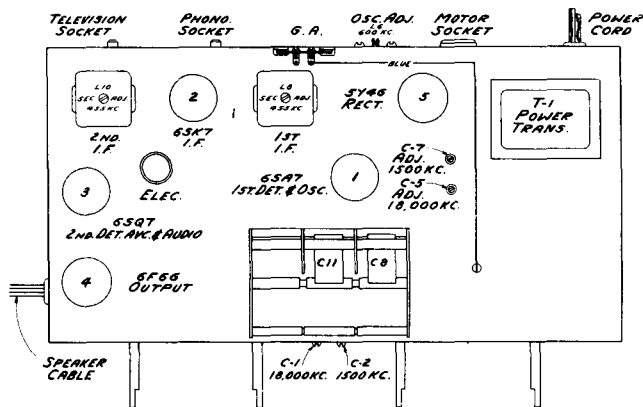
On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 grid in series with .01 mfd.	455 kc	"A" Band Quiet Point between 550-750 kc	L9 and L10 (2nd I-F Trans.)
2	6SA7 grid in series with .01 mfd.			L7 and L8 (1st I-F Trans.)
3	Ant. terminal in series with 300 ohms	18 mc	18 mc (24°) "C" Band	C5 (osc.)* C1 (ant.)
4	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc (41.75°) "A" Band	C7 (osc.) C2 (ant.)
5		600 kc	600 kc (200.25°) "A" Band	L6 (osc.) Rock Gang
6	Repeat step 4.			

* Use minimum capacity peak if two can be obtained.

Note: Oscillator tracks above signal on all bands.



Tube and Trimmer Locations

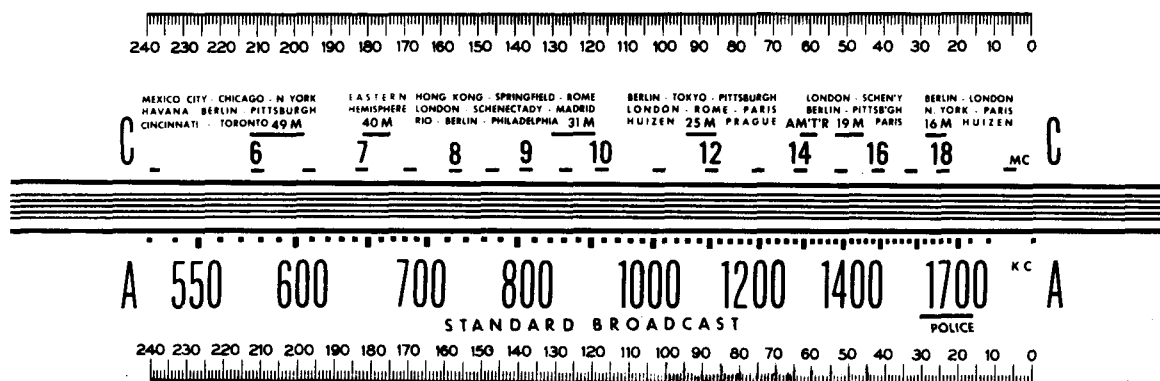
RADIOTRON SOCKET VOLTAGES

Type	Function	Plate	Screen Grid	Cathode	Heater
6SA7	Det.	260V	80V	----	6.6V
	Osc.	----	----	2.3V	----
6SK7	I.F.	260V	80V	----	6.6V
6SQ7	Audio	80*V	----	----	6.6V
6F6-G	Output	245V	260V	16V	6.6V
5Y4-G	Rectifier	----	----	350V	5.0V

* Cannot be measured with an ordinary voltmeter.

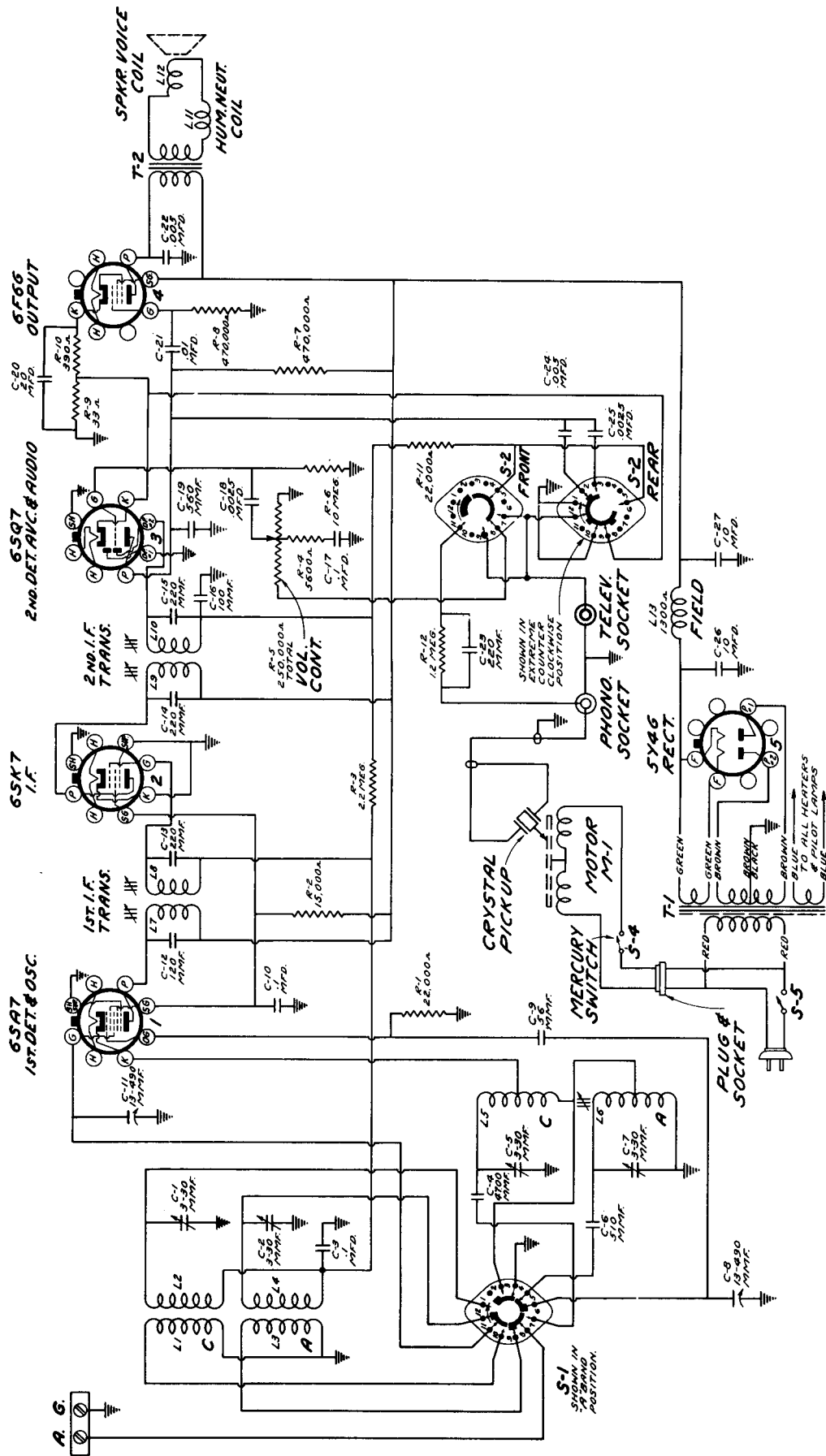
The above voltages are measured with a 1000 ohm-per-volt meter. All values should hold within + 20 percent.

Calibration Scale

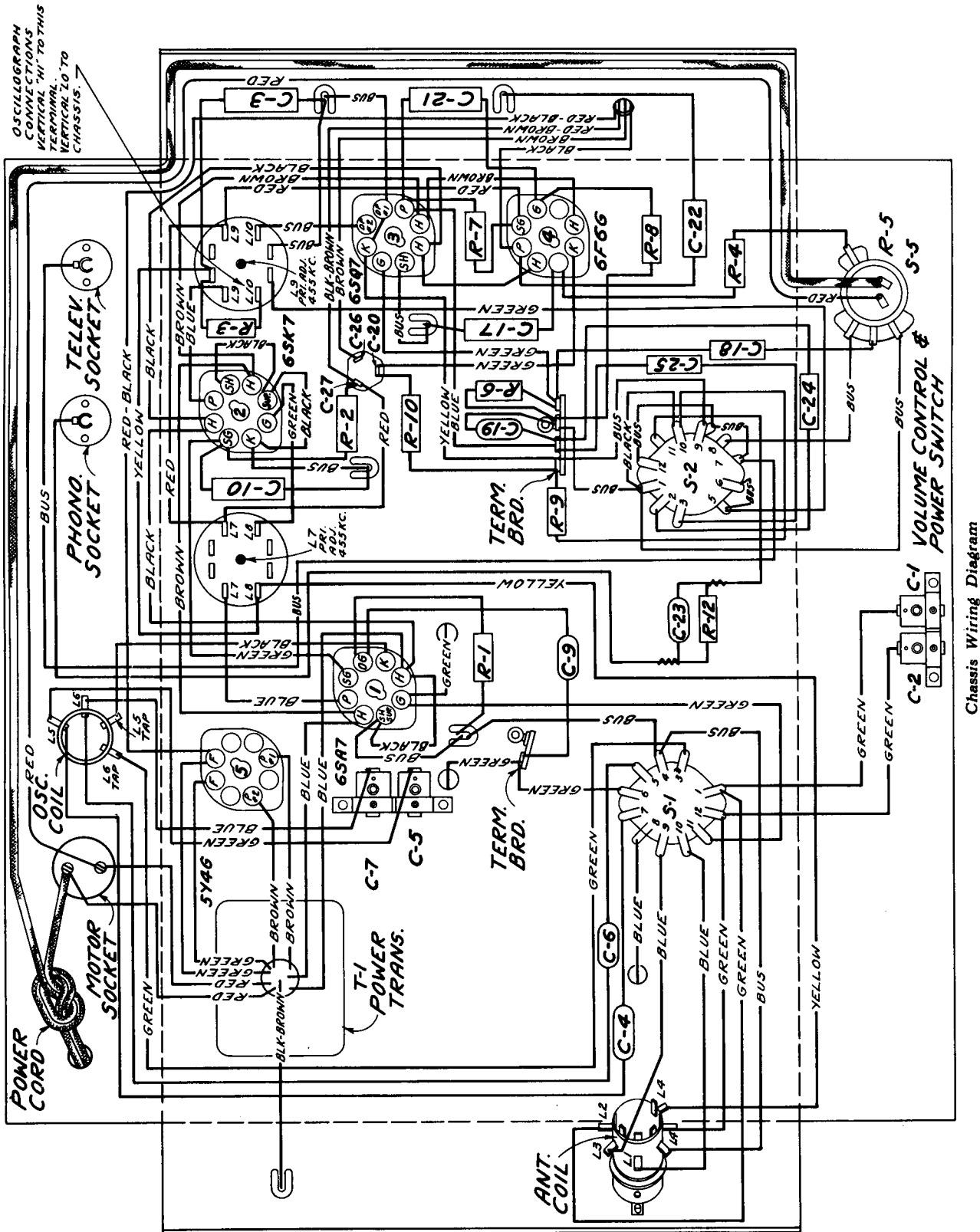


Receiver Dial Scales, and Corresponding 0-240° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example, 200.25° on the calibration scale corresponds to 600 kc on "A" band. Read instructions under "Alignment Procedure."



Schematic Circuit Diagram



Chassis Wiring Diagram

Miscellaneous Service Data

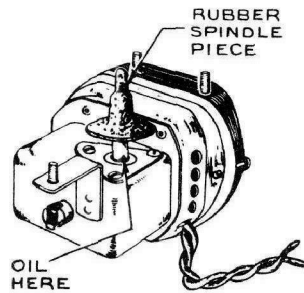
Phonograph Mechanism:

The phonograph motor is a self-starting, constant-speed induction type. It should be lubricated every six months by applying a few drops of light machine oil to the spindle bearing and oil hole.

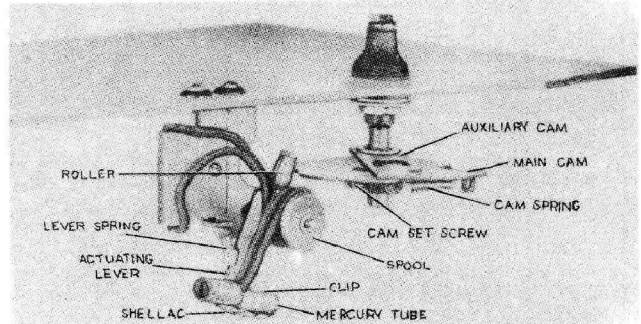
The motor spindle is tapered, and a conical rubber piece fits snugly on the spindle. The hole in the turntable bushing is tapered to fit the rubber. This provides an excellent self-centering floating mounting.

A metal washer is placed on the spindle under the rubber piece. The washer has ears on the under side which fit over a pin that projects through the spindle.

The motor switch is automatic for both starting and stopping, and when properly adjusted, will turn the motor on as the pickup is moved from the pickup rest toward the turntable. The switch should be adjusted so that it will snap into the "off" position when the pickup needle is 1 1/4 inches from the center line of the spindle shaft. The motor may be shut off at any time by placing the pickup on the pickup rest.



Phonograph Motor



Switch Mechanism

(Shown with pickup in rest position)

REPLACEMENT PARTS FOR MODELS VR-1 TABLE & VR-4 CONSOLE 5 TUBE 2 BAND AC COMBINATIONS

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		MOTOR BOARD ASSEMBLIES	
S-2524	Arm-Trip arm & set screw located on range switch.....	S-2285	Damper-Turntable damper plate and sleeve.....
14517	Board-Antenna ground terminal board..	32558	Motor-Phonograph motor 105/125 volts, 60 cycle (M1).....
31292	Capacitor-Dual, adjustable trimmer, two sections 3-30 mmfd. (C1,C2,C5, C7).....	32638	Motor-Phonograph motor 105/125 volts, 25 cycle (M1).....
12723	Capacitor-56 mmfd. (C9).....	31463	Turntable-Motor Turntable.....
12694	Capacitor-220 mmfd. (C23).....		
30608	Capacitor-510 mmfd. (C6).....	AUTOMATIC SWITCH ASSEMBLY	
12537	Capacitor-560 mmfd. (C19).....	33221	Cam-Cam assembly comprising main & auxiliary cams, hubs & set screws...
12897	Capacitor-4700 mmfd. (C4).....	32864	Lever-Actuating lever with roller & mercury tube clip.....
5107	Capacitor-.0025 mfd. (C18,C25).....	32869	Screw-Set screw for cam hub (Pkg.10)...
4838	Capacitor-.005 mfd. (C22,C24).....	32868	Spring-Actuating lever tension spring (Pkg.2).....
4937	Capacitor-.01 mfd. (C21).....	32867	Spring-Cam tension spring (Pkg.2)...
4839	Capacitor-0.1 mfd. (C3,C10,C17).....	32865	Support-Switch support & terminal board.....
32240	Capacitor-Electrolytic capacitor consisting of two 10 mf., and one 20 mfd. sections (C20,C26,C27).....	S-2549	Switch-Mercury tube & leads (S4)....
S-2527	Coil-Antenna coil (L1,L2,L3,L4).....	31608	Washer-"C" washer for actuating lever shaft (Pkg.10).....
S-2528	Coil-Oscillator coil (L5,L6).....		
S-2529	Cord-Indicator pointer drive cord....	PICKUP & ARM ASSEMBLIES	
S-2538	Dial-Station selector dial scale....	S-2451	Base-Pickup arm mounting base and pivot shaft.....
34267	Drum-Variable condenser drive drum...	33122	Crystal-Pickup crystal cartridge & needle screw.....
S-2531	Indicator-Station indicator pointer..	33529	Screw-Pickup needle screw.....
11891	Lamp-Dial Lamp.....	33591	Shell-Pickup shell less crystal unit and mounting base.....
5040	Plug-4 contact female speaker plug...		
14671	Resistor-33 ohms, 1/4 watt (R9).....	(VR1) REPRODUCER ASSEMBLIES (RL79-1)	
31388	Resistor-390 ohms, 1 watt (R10).....	32907	Cap-Dust cap for cone center (Pkg.5)
S-1894	Resistor-5,600 ohms, 1/4 watt (R4)...	33077	Coil-Field coil (L13).....
33489	Resistor-15,000 ohm, 2.5 watt (R2)...	32906	Coil-Hum neutralizing coil (L11)....
13998	Resistor-22,000 ohms, 1/4 watt (R1, R11).....	32934	Cone-Reproducer cone and voice coil (L12).....
12285	Resistor-470,000 ohms, 1/4 watt (R7,R8).....	31302	Plug-4 contact male plug.....
30208	Resistor-1.2 meg., 1/4 watt (R12)....	33078	Reproducer complete.....
12679	Resistor-2.2 meg., 1/4 watt (R3).....	32905	Transformer-Output (T2).....
13601	Resistor-10 meg., 1/4 watt (R6).....		
4669	Screw-Drum set screw (Pkg.10).....		
31418	Spring-Drive cord tension spring (Pkg.2).....		
31364	Socket-Dial lamp socket.....		
33514	Socket-Phono and television dual socket.....		
31251	Socket-Radiotron socket.....		
S-2533	Switch-Range Switch (S1).....		
33424	Switch-Tone-Phono-Television Switch (S2).....		
S-2534	Transformer-First I.F. Transformer (L7,L8,C12,C13).....		
33761	Transformer-2nd I.F. Transformer (L9,L10,C14,C15).....		
S-2535	Transformer-Power transformer 105/125 volts, 25 cycle (T1).....		
S-2548	Transformer-Power transformer 105/125 volts, 60 cycles (T1).....		
S-2536	Volume control & switch (R5,S5).....		

REPLACEMENT PARTS FOR MODELS VR-1 TABLE & VR-4 CONSOLE--Continued

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
	(VR4) REPRODUCER ASSEMBLIES (RL70 H-1)		MISCELLANEOUS ASSEMBLIES
13866	Cap-Dust cap for cone center (Pkg.5).....	S-2537	Button-Station selector push button
12012	Coil-Field coil (L13).....	S-2539	Escutcheon-Dial scale escutcheon...
11469	Coil-Hum neutralizing coil (L11).....	S-2540	Knob-Volume, tone, range or tuning control knob.....
31275	Cone-Reproducer cone and voice coil (L12).....	S-2541	Marker-Push button markers(1 set)...
31302	Plug-4 contact male plug.....	S-2446	Retainer-AC socket retainer(Pkg.3).
31592	Reproducer complete.....	S-2447	Socket-AC power socket.....
14355	Transformer-Output (T2).....	14270	Spring-Knob retaining spring(Pkg.10)
		S-2543	Spring-Push button retaining spring (Pkg.3).....
		S-2542	Tool-Push button adjusting tool....



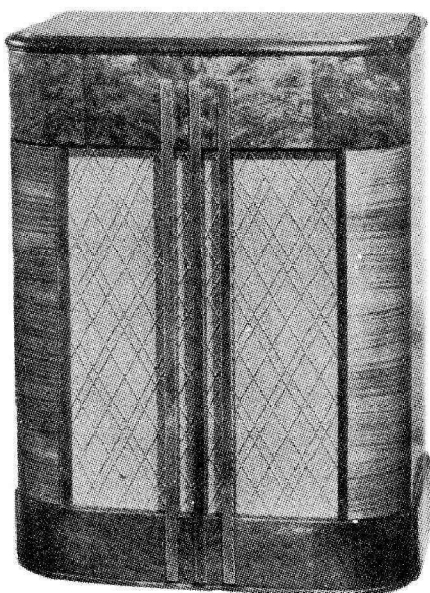
RCA Victor

VICTROLA MODELS VR-2 and VR-6

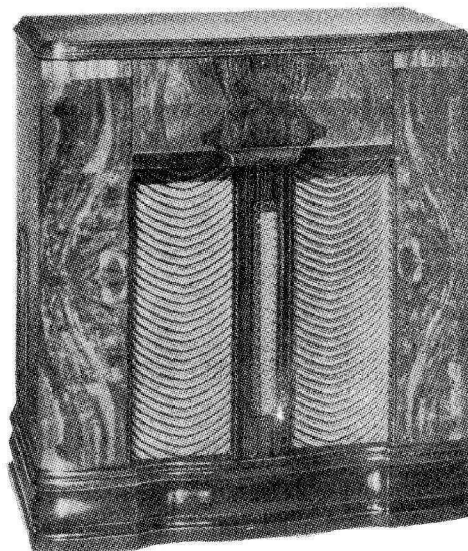
Six and Seven-Tube, Three-Band, A-C, Superheterodyne, Victrolas

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model VR-2



Model VR-6

Electrical Specifications

FREQUENCY RANGES

"Standard Broadcast" (A) 540-1,720 kc

Intermediate Frequency

"Medium Wave" (B) 2.3-7.0 mc

"Short Wave" (C) 7.0-22 mc

..... 455 kc

TUBE COMPLEMENT

(1) Type-6K7 R.F. Amplifier

(2) Type-6SA7 First Detector—Oscillator

(3) Type-6K7 ... Intermediate-Frequency Amplifier

(4) Type-6SQ7...Second Detector, 1st A-F, & A.V.C.

Pilot Lamps

(5) Type-6F6-G Power Output

(6) Type-5Y4G Rectifier

(7) Type-6U5 (VR-6) "Magic Eye" Tuning Indicator

.....Mazda 47, 6.3 volts, 0.15 amp.

POWER SUPPLY RATINGS

A 105-125 volts, 60 cycles, 115 watts

B 105-125 volts, 25 cycles, 115 watts

POWER OUTPUT

Undistorted 2 watts

Maximum 5 watts

PHONOGRAPH (VR-6)

Type Automatic

Record Capacity.....Eight 10-inch or seven 12-inch

Turntable Speed 78 r.p.m. adjustable

LOUDSPEAKER (RL-70H-1)

Type 12-inch Electrodynamic

Voice Coil Impedance 2.2 ohms at 400 cycles

PICKUP

Type Crystal

Impedance 100,000 ohms at 1,000 cycles

Average Output 1.5 volts at 1,000 cycles

across 500,000 ohm load

Mechanical Specifications

	Model VR-6
Height	34 inches
Width	30 1/2 inches
Depth	16 3/4 inches
Net Weight	83 pounds
Shipping Weight	102 pounds

	Model VR-2
Height	36 1/4 inches
Width	27 inches
Depth	16 3/4 inches
Net Weight	70 pounds
Shipping Weight	89 pounds

General Description

Model VR-2 is a six tube, three band receiver combined with a manually-operated phonograph. Model VR-6 uses the same chassis as the VR-2 with the addition of the "Magic Eye" tuning indicator combined with an automatic phonograph mechanism. Features of design include:—Magnetite core I.F. transformers

and low frequency "A" band oscillator adjustment; Radio-Phono-Television tone switch; Television audio input socket; mechanical push button tuning for six favorite stations; twelve inch electrodynamic loud-speaker and a large, easy-to-read, straight-line dial.

Motor Assembly (VR-2)

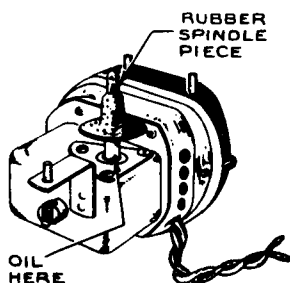
Phonograph Mechanism:

The phonograph motor is a self-starting, constant-speed induction type. It should be lubricated every six months by applying a few drops of light machine oil to the spindle bearing and oil hole.

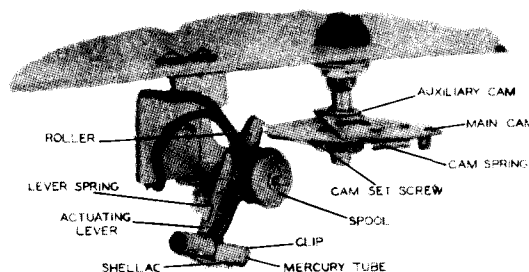
The motor spindle is tapered, and a conical rubber piece fits snugly on the spindle. The hole in the turntable bushing is tapered to fit the rubber. This provides an excellent self-centering floating mounting.

A metal washer is placed on the spindle under the rubber piece. The washer has ears on the under side which fit over a pin that projects through the spindle.

The motor switch is automatic for both starting and stopping, and when properly adjusted, will turn the motor on as the pickup is moved from the pickup rest toward the turntable. The switch should be adjusted so that it will snap into the "off" position when the pickup needle is 1 1/4 inches from the center line of the spindle shaft. The motor may be shut off at any time by placing the pickup on the pickup rest.

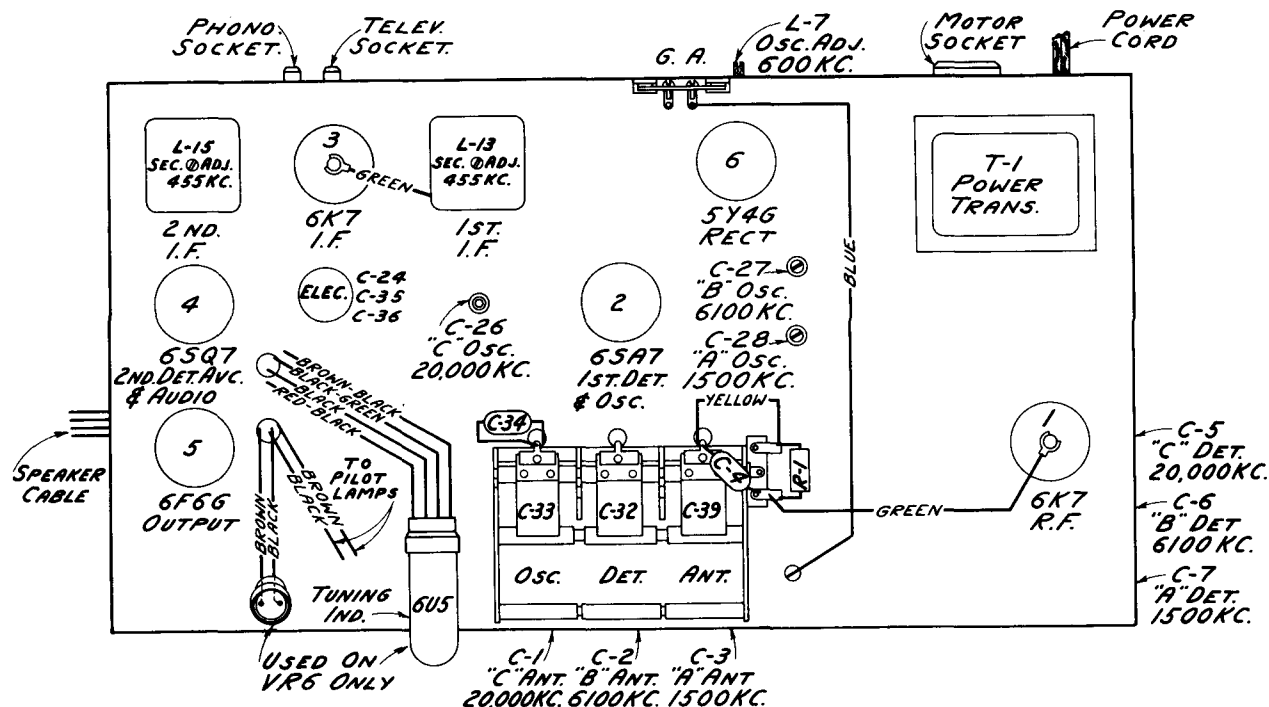


Phonograph Motor



Switch Mechanism

(Shown with pickup in rest position)



Chassis Layout and Alignment Adjustments

Alignment Procedure

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

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. 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 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum 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.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6K7 I.F. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	2nd I.F. Trans.	L14 & L15
2	6SA7 Det. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	1st I.F. Trans.	L12 & L13
3	Ant. Term	300 ohms	20,000 kc	"C"	20 mc (41°)	"C" Osc.	C26
4	Ant. Term	300 ohms	20,000 kc	"C"	20 mc (41°)	"C" Det.	C5
5	Ant. Term	300 ohms	20,000 kc	"C"	20 mc (41°)	"C" Ant.	C-1
6	Ant. Term	300 ohms	6,100 kc	"B"	6.1 mc (51°)	"B" Osc.	C27
7	Ant. Term	300 ohms	6,100 kc	"B"	6.1 mc (51°)	"B" Det.	C6
8	Ant. Term	300 ohms	6,100 kc	"B"	6.1 mc (51°)	"B" Ant.	C2
9	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" H-F Osc.	C28
10	Ant. Term	200 Mmfd.	600 kc	"A"	600 kc (201°)	"A" L-F Osc.	L7
11	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" Det.	C7
12	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" Ant.	C3

NOTE:—Align the I.F. Circuits by means of the oscillograph, for a symmetrical curve. Peak R.F. stages of all bands.

Radiotron Socket Voltages

Type	Plate	Screen Grid	Cathode	Heater
6K7 R.F.	265V	90V	.....	6.4V
6SA7 Conv.	265V	90V	.....	6.4V
6K7 I.F.	265V	90V	.....	6.4V
6SQ7 Audio	90V*	....	.....	6.4V
6F6G Output	255V	265V	17V	6.4V
5Y4G Rectifier	335V/335V		360V	5.0V

*Cannot be accurately measured with an ordinary voltmeter due to the high series resistance.

All the above values hold within plus or minus 20% when measured with 1000 ohm-per-volt meter.

Push Button Adjustments

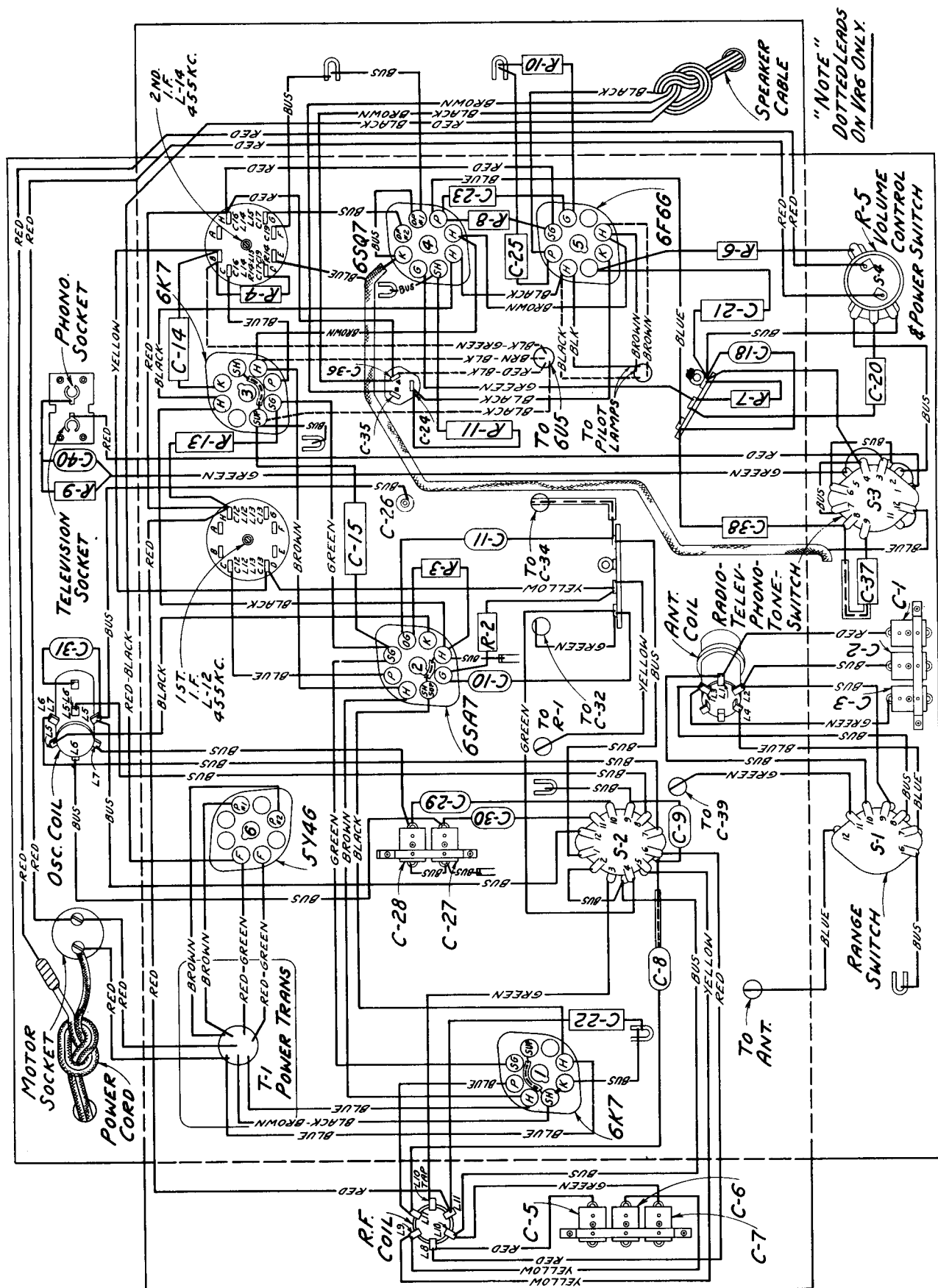
The push buttons should be adjusted for six favorite stations after the receiver has had a brief warm-up period.

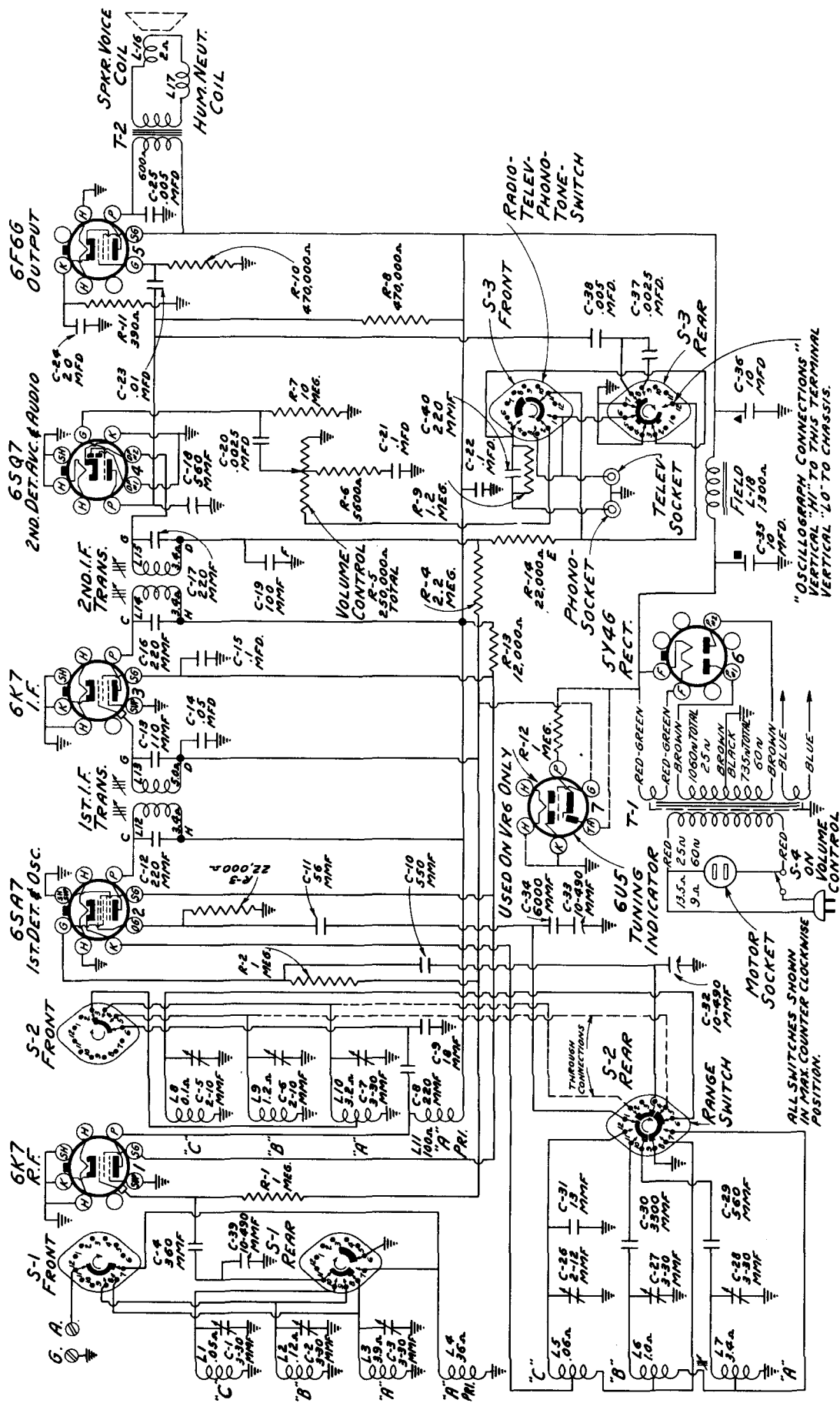
Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high.

Proceed as follows:—

1. Set the accessory tone knob to "Radio" and turn the range selector to "A" band position.
2. Remove the six push buttons by inserting a small screwdriver blade in the slot provided on the under side of the button. Press the screwdriver blade upwards at the same time pull the button forward.
3. Loosen the push arm adjusting screws accessible through the push button openings.
4. Press in the tuning knob and accurately tune in the first station.
5. With station accurately tuned in, press in the first push button and tighten screw.
6. Proceed in a similar manner to adjust the remainder of the push buttons.
7. Replace push buttons by inserting in the escutcheon openings, spring side down. Press button in as far as possible to securely lock button in escutcheon.
8. Place call letter tabs in openings provided.

Note:—When difficulty is experienced in setting up the push buttons due to sticking cams, unscrew cam screw ½ turn and rotate gang back and forth until the cam plate moves freely.





Automatic Record Changer (VR-6)

GENERAL INFORMATION

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc. are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

The turntable, spindle, and pinion gear are assembled by means of a 3/32 inch straight pin. This pin may be removed by gently driving with a standard pin punch.

If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

The 10 and 12 inch records must be absolutely flat for smooth operation when using a mixture of the two sizes.

A shorting switch, located in the pickup head, operates due to pressure when the pickup is placed on the pickup rest.

ADJUSTMENTS

A. Main Lever.—This lever is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle; and adjust rubber bumper bracket (A) so that the roller clears the nose of the cam plate by 1/16 inch.

B. Friction Clutch.—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5." If the motion of the pickup is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B." If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.

C. Pickup Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper elevation, stop the changer "in-cycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface.

D. & E. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10 inch record. Position of eccentric stud "E" governs the landing of the needle on a 12 inch record; this, however, is dependent on the proper 10 inch adjustment.

To adjust for needle landing, place 10 inch record on turntable; push index lever to reject position and return to the 10 inch position; see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is 4-11/16 inches from the nearest side of the turntable spindle; loosen the two screws "D" and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17." Leave approximately 1/32 inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone pointed screw "D".

After adjusting for needle landing on a 10 inch record, place 12 inch record on turntable; push index lever to reject and return to 12 inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5-11/16 inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motor board, otherwise incorrect landing may occur with 10 inch records.

F. & G. Record Separating Knife.—The upper plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the rotating record shelf "27" be accurately maintained. The spacing for the 10 inch record is nominally .058 inch, and for the 12 inch record is .075 inch.

To adjust, rotate the knife to the point of minimum

vertical separation from the record shelf and turn screw and locknut "F" to give .055—.061 inch separation. Screw "G" must not be depressed during this adjustment. After setting screw "F" adjust screw "G" so that when its tip is depressed flush with top of record shelf, the vertical spacing between the knife, in its lowest rotational position, and the shelf, is .072—.078 inch.

H. Record Support Shelf.—The record shelf revolves during the change cycle to allow the lower record to drop onto the turntable. Both posts are rotated simultaneously by a gear and rack coupled to the main lever "15," and it is necessary that adjustments be such that the record is released from both shelves at the same instant. To adjust, place a 12 inch record on the turntable, rotate mechanism into cycle to the point where tone arm is at maximum distance outward from turntable; lift record upward until it is in contact with both separating knives, then loosen screws "H" and shift record shelves so that the curved inner edges of the shelves are uniformly spaced at least 1/16 inch from record edge. Tighten the blunt nose screw "H," run mechanism through cycle several times to check action, then tighten cone pointed screw "H".

If record shelves or knives are bent, or not perfectly horizontal, improper operation and jamming of mechanism will occur.

J. Tone Arm Rest Support (not shown).—When the changer is out-of-cycle, the front lower edge of the pickup head should be 5/16 inch above surface of motor board. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers on underside of motor board.

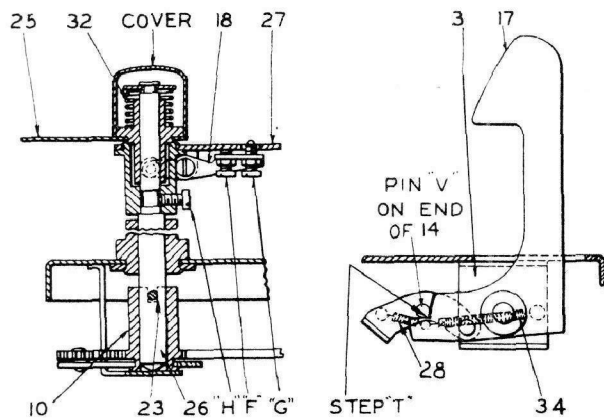
The felt washer between the turntable and spindle bearing should be soaked in light engine oil whenever the turntable is removed, or as required for proper operation.

Do not allow oil or grease to come in contact with, rubber mounting of tone arm base, rubber bumper, or flexible coupling of drive motor.

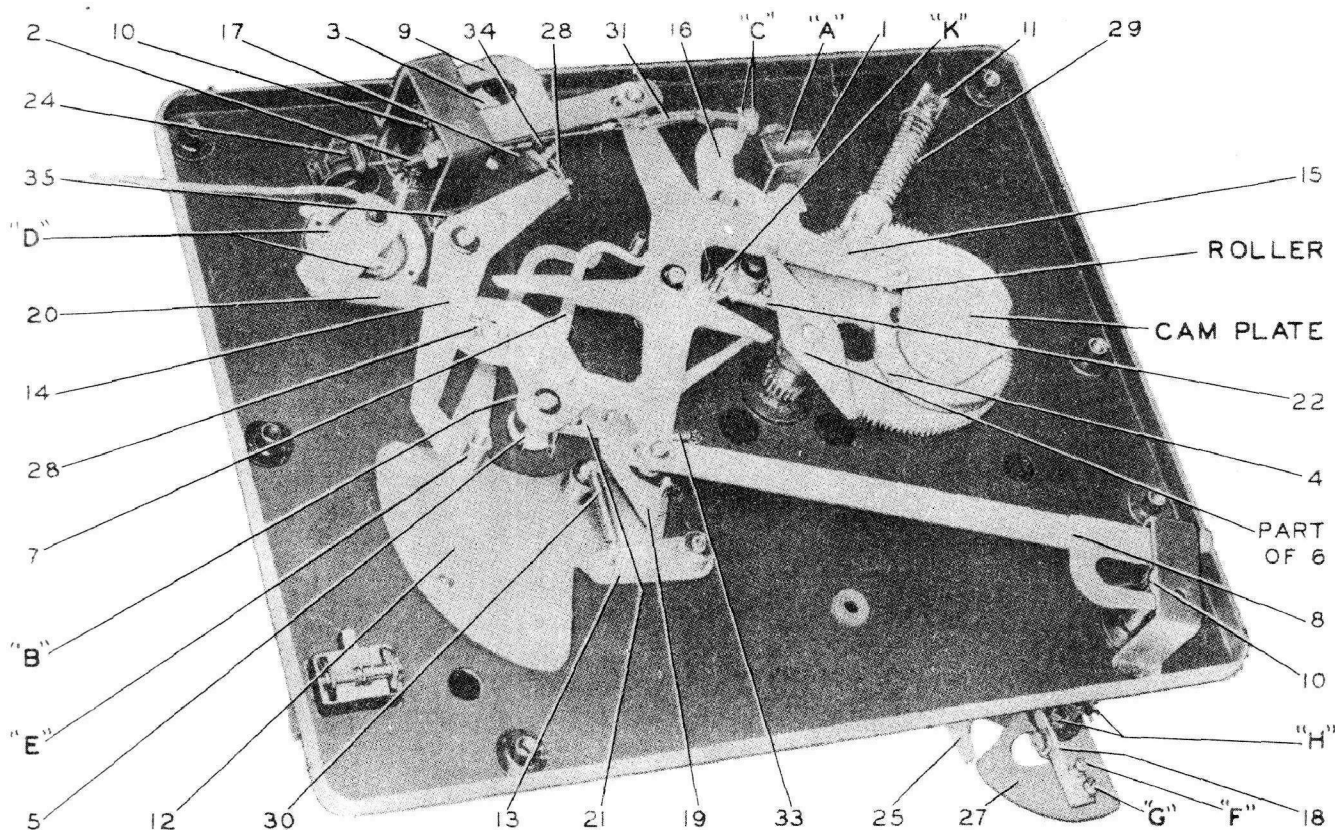
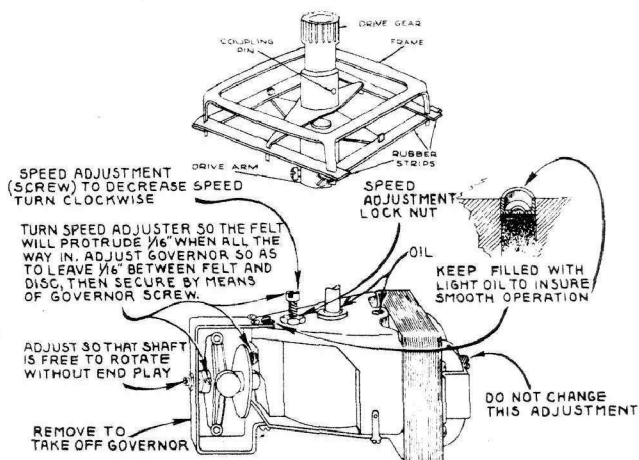
MISCELLANEOUS SERVICE HINTS

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and the usual mis-adjustments will enable ready adjustment in most cases.

1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A".
2. Needle does not land properly on both 10 and 12 inch records—Make complete adjustments "D" and "E".
3. Needle does not land properly on 12 inch record but correct on 10 inch—Effect adjustment "E".
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B". Also, see that levers "7" and "12" are free to move without touching each other.
5. Pickup strikes lower record of stack or drags across top record on turntable—Adjust lift cable per adjustment "C".
6. Needle does not track after landing—Friction clutch "5" adjustment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pickup output cable twisted.
7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; flexible coupling between motor and changer mechanism not correctly assembled; or instrument is not being operated at normal room temperature (65° F).
9. Record knives strike edge of records—Records warped; record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H".
11. Needle lands in 10 inch position on 12 inch record or misses record when playing both types mixed—Increase tension of pickup locating lever spring "34".



Details of Record Shelf Posts, and Locating Lever Assemblies (VR-6)



Bottom View of Automatic Record Changer

Bottom View of Automatic Record Changer (VR-6)

REPLACEMENT PARTS FOR MODELS VR-2 and VR-6

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			
14517	Board-Ant.Gnd.terminal board.....	S-2568	Capacitor-3,300 mmfd.(C30).....
14394	Cable-Tuning indicator cable and socket.....	S-2569	Capacitor-6,000 mmfd.(C34).....
31292	Capacitor-Adjustable trimmer (dual) (C27,C28).....	5107	Capacitor-.0025 mfd.(C20,C37).....
S-2550	Capacitor-Adjustable trimmer (triple) (C1,C2,C3).....	4838	Capacitor-.005 mfd.(C25,C38).....
31400	Capacitor-Adjustable trimmer (triple) (C5,C6,C7).....	4937	Capacitor-.01 mfd. (C23).....
12714	Capacitor-Air Trimmer (C26).....	4886	Capacitor-.05 mfd. (C14).....
13002	Capacitor-13 mmfd.(C31).....	4839	Capacitor- 0.1 mfd.(C15,C21,C22).....
31350	Capacitor-18 mmfd.(C9).....	32240	Capacitor-Electrolytic capacitor consisting of two 10 mfd., and one 20 mfd.sections (C24,C35,C36).....
12723	Capacitor-56 mmfd.(C11).....	S-2553	Coil-Antenna coil (L1,L2,L3,L4).....
12694	Capacitor-220 mmfd.(C8,C40).....	32824	Coil-Oscillator coil (L5,L6,L7).....
12952	Capacitor-360 mmfd.(C4).....	S-2555	Coil-R.F.coil (L8,L9,L10,L11).....
12537	Capacitor-550 mmfd.(C10,C18,C29).....	S-2529	Cord-Indicator pointer drive cord.....
		33552	Dial-Station selector dial scale.....
		S-2530	Drive-Friction drive assembly.....

REPLACEMENT PARTS FOR MODELS VR-2 and VR-6 (Cont'd.)

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
34267	Drum-Drive cord drum assembly.....	31114	Lever-Index lever assembly (12).....
S-2531	Indicator-Station selector pointer....	31137	Lever-Index lever tension spring lever (13).....
11891	Lamp-Dial lamp.....	31138	Lever-Locating lever & pawl assembly(14).....
5040	Plug-4 contact female speaker plug....	31113	Lever-Main lever assembly (15).....
31388	Resistor-390 ohm,1 watt (R11).....	31140	Lever-Pickup lift cable lever & spring assembly (16).....
S-1894	Resistor-5,600 ohm,1/4 watt (R6).....	31135	Lever-Pickup locating lever assembly(17).....
31389	Resistor-12,000 ohm,2.5 watt (R13)....	31130	Lever-record separator elevating lever and adjustment screws (18).....
13998	Resistor-22,000 ohm,1/4 watt (R3).....	31132	Lever-Trip detaining lever (19).....
12285	Resistor-470,000 ohm,1/4 watt(R8,R10)..	31115	Lever-Trip lever assembly (20).....
12013	Resistor-1 Meg,1/10 watt (R1,R2).....	31131	Lever-Trip regulator lever (21).....
30208	Resistor-1.2 meg.,1/4 watt (R9).....	31133	Pawl-Trip pawl assembly (22).....
12679	Resistor-2.2 meg.,1/4 watt (R4).....	31124	Pin-Record post drive pin(23)(Pkg.5)....
13601	Resistor-10 meg., 1/4 Watt (R7).....	14195	Screw-Set screw for flexible mounting (Pkg.2).....
S-2446	Retainer A.C. female socket retainer (Pkg.3).....	31117	Screw-Special screw to adjust clutch tension (Pkg.5).....
4669	Screw-Drum set screw (Pkg.10).....	31126	Separator-Record separator knife (25)...
31418	Spring-Drive cord tension spring (Pkg.2).....	31122	Shaft-Record separator post shaft(26)...
31364	Socket-Dial lamp socket.....	31125	Shelf-Record post shelf assembly (27)...
33514	Socket-Phono & Telev. socket.....	31141	Spindle-Turntable spindle shaft.....
31251	Socket-Tube socket.....	3676	Spring-Cam pawl tension spring on main gear (Pkg.5).....
S-2447	Socket-A.C. female socket.....	14190	Spring-Pickup locating lever short spring or locating lever pawl tension spring (28).....
S-2604	Switch-Range switch (S1,S2).....	31145	Spring-Main lever tension spring(29) (Pkg.2).....
33424	Switch-Tone & phono switch (S3).....	31136	Spring-Index lever tension spring(30) (Pkg.2).....
S-2596	Transformer-1st I.F.transformer (L12,L13,C12,C13).....	3666	Spring-Pickup cable tension spring(31) (Pkg.4).....
33761	Transformer-2nd I.F.transformer (L14,L15,C16,C17,C19,R14).....	31127	Spring-Record separator pressure spring (32) (Pkg.10).....
S-2476	Transformer-Power transformer 105/125 volt 50/60 cycle (T1).....	14191	Spring-Trip detaining lever tension spring (33) (Pkg.5).....
33618	Transformer-Power transformer 105/125 volt,25/60 cycle.....	31875	Spring-Pickup locating lever tension spring (34) (Pkg.5).....
S-2536	Volume control & power switch (R5,S4)..	32436	Spring-Locating lever tension spring(35) (Pkg.2).....
MOTOR BOARD ASSEMBLIES (VR-2)		31139	Turntable assembly-less spindle.....
S-2285	Damper-Turntable damper plate & sleeve	31128	Washer-"C" washer for top of record post (Pkg.5).....
32558	Motor-Phonograph motor 105/125 volts 60 cycle (MI).....	31143	Washer-Turntable thrust washers(1 set).. PICKUP & ARM ASSEMBLIES (VR-6)
32638	Motor-Phonograph motor 105/125 volts 25 cycle (MI).....	31162	Cable-Pickup arm lift cable.....
31463	Turntable-Motor turntable.....	33119	Cable-Shielded cable and plug.....
AUTOMATIC SWITCH ASSEMBLY (VR-2)		31156	Crystal-Pickup crystal cartridge and needle screw.....
33221	Cam-Cam assembly comprising main & auxiliary cams, hubs & set screws....	31159	Pickup and arm complete.....
32864	Lever-Actuating lever with roller & mercury tube clip.....	31160	Screw-Pickup needle screw.....
32869	Screw-Set screw for cam hub (Pkg.10)...	31161	Shaft-Pickup pivot arm & shaft assembly.. MOTOR BOARD ASSEMBLIES (VR-6)
32868	Spring-Actuating lever tension spring (Pkg.2).....	31149	Base-Pickup arm mounting base.....
32867	Spring-Cam tension spring (Pkg.2).....	14209	Bumper-Main lever rubber bumper(Pkg.2).. 9848
32865	Support-Switch support & terminal board.....	31148	Cup-Used needle cup,rest & lid complete. Escutcheon-Index escutcheon.....
S-2549	Switch-Mercury tube & leads (S4).....	31155	Spring-Needle cup lid tension spring (Pkg.5)..... MOTOR ASSEMBLIES (VR-6)
31608	Washer-"C" washer for actuating lever shaft (Pkg.10).....	31623	Governor-Motor governor 60 cycle.....
PICKUP & ARM ASSEMBLIES (VR-2)		31624	Governor-Motor governor 25 cycle.....
S-2451	Base-Pickup arm mounting base & pivot shaft.....	31157	Motor-105-125 volts,60 cycle (MI).....
33122	Crystal-Pickup crystal cartridge and needle screw.....	31448	Motor-105-125 volts,25 cycle (MI).....
33529	Screw-Pickup needle screw.....	30870	Plug-2 contact male plug for motor cable
33591	Shell-Pickup shell less crystal and mounting base.....	31447	Screw-Complete set of motor mounting screws,washers and spacers 25 cycle....
OPERATING MECHANISM (VR-6)		31158	Screw-Complete set of motor mounting screws,washers and spacers 60 cycle....
31134	Bracket-Pickup locating lever mounting bracket (3).....	31634	Shaft-Turntable shaft & gear 60 cycle...
32878	Cam-Cam & gear assembly (4).....	31636	Shaft-Turntable shaft & gear 25 cycle...
6808	Clutch-Trip lever friction clutch assembly (5).....	32912	Weight-Governor weight & spring 60 cycle
31146	Coupling-Motor coupling complete with drive gear,rubber strips,motor coupling & drive arm (6).....	32913	Weight-Governor weight & spring 25 cycle REPRODUCER ASSEMBLIES (RL700-1)
31129	Cover-Cap for top of record post.....	13866	Cap-Dust cap for cone center(Pkg.5)....
31116	Finger-Trip lever friction finger assembly (7).....	12012	Coil-Field coil (L18).....
31119	Gear-Long arm & rack gear for front left-hand record post (8).....	11469	Coil-Hum neutralizing coil (L17).....
31120	Gear-Short arm & rack gear for rear right hand record post (9).....	31275	Cone-Reproducer cone & voice coil(L16).. 31302
31121	Gear-Record post gear (10).....	13592	Plug-4 contact male plug.....
31123	Guide-Main lever spring guide (11)....	14355	Reproducer complete.....
			Transformer-Output (T2)..... MISCELLANEOUS ASSEMBLIES
		S-2537	Button-Station selector push button....
		S-2539	Escutcheon-Station selector dial escutcheon
		S-2540	Knob-Volume, tone,range or tuning control knob.....
		S-2541	Marker-Push button call letter markers (1 set).....
		14270	Spring-Knob retaining spring (Pkg.10)...
		S-2543	Spring-Push button retaining spring (Pkg.3).....



RCA Victor

MODEL VR-3

Five-Tube, Single-Band, A-C, Superheterodyne Victrola

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

Electrical Specifications

Frequency Range 540 to 1,750 k.c.
R.F. Alignment Frequency 1,500 k.c. (osc., ant.)
Intermediate Frequency 455 k.c.

LOUDSPEAKER
Type 5 inch Electrodynamic
Voice-coil Impedance..... 3 ohms at 400 cycles

Tube Complement

(1) Type 6A8 First-Det., Osc.
(2) Type 6K7..... Intermediate Frequency AMP.
(3) Type 6Q7G..... Second-Det., A.V.C., A.F.

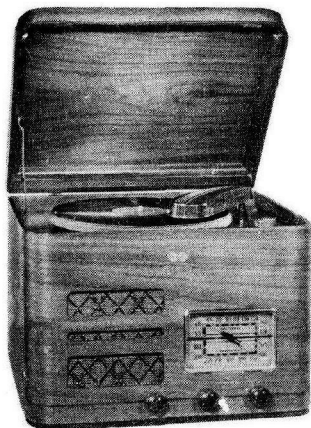
(4) Type 6F6-G Power Output
(5) Type 5Y4G Full Wave Rectifier

POWER SUPPLY RATING

Rating A 105-125 volts, 50-60 cycle watts
Rating B 105-125 volts, 25-60 cycle watts

POWER OUTPUT

Undistorted 1 watt
Maximum 2 watts



General Description

Model VR-3 RCA Victrola is a combination radio receiver and phonograph mechanism mounted in a modern styled table type cabinet. Features of design include:—Magnetite core I. F. transformers, stabilized oscillator circuit, electro-dynamic loudspeaker, Phono-Radio-Tone Switch, self-starting constant speed phonograph motor, motor toggle switch and a free-floating, light weight, crystal pickup of new design.

Mechanical Specifications

	Height	Width	Depth
Cabinet Dimensions	11 $\frac{3}{4}$ inches	15 $\frac{1}{4}$ inches	13 inches
Chassis Base Dimensions	1 $\frac{7}{8}$ inches	9 $\frac{3}{4}$ inches	5 $\frac{7}{8}$ inches
Overall Chassis Height			4 inches
Weight (net)			27 pounds
Weight (shipping)			34 pounds
Operating Controls	(1) Power Switch—Volume, (2) Tuning (3) Radio-Phono Switch		

Alignment Procedure

Cathode-ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

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 a-v-c action.

Pre-setting Dial. With gang condenser in full mesh position, move pointer to coincide with calibration mark at the low frequency end of dial.

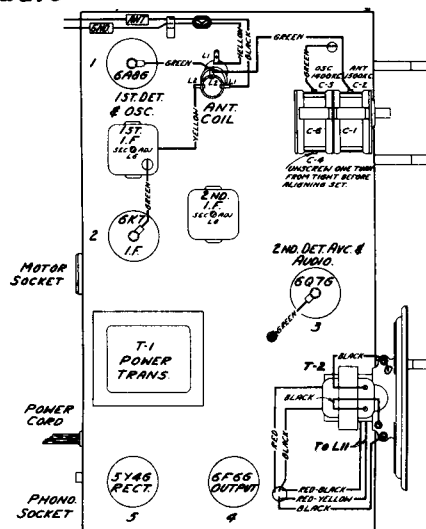


Fig. 1 Tube & Trimmer Locations.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Tune radio dial to—	Adjust the following for max. peak output
No. 1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F Transformer)
No. 2	6A8 1st-det. grid cap, in series with .01 mfd.	455 kc		L5 and L6 (1st I-F Transformer)
No. 3	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc	C6* (oscillator) C3 (antenna)

Radiotron Socket Voltages

Type	Plate	Screen Grid	Control Grid	Filament
6A8 det.	210 V	135 V	0 V	6.3 V. A.C.
6A8 osc.	210 V	...	...	.....
6K7	210 V	135 V	0 V	6.3 V. A.C.
6Q7G amp.	100 V	...	0 V	6.3 V. A.C.
6F6G	190 V	210 V	0 V	6.3 V. A.C.
5Y4G	Plate 1 or 2 to Chassis 282 V	...	...	5 V. A.C.

The above measurements are all made to chassis. Measurements made with set tuned to quiet point, volume control set at minimum, using 1,000-ohm-per-volt meter, having ranges of 10, 50, 250, and 500 volts. (Use nearest range above the specified measured voltage.)

All the above values should hold within approximately $\pm 20\%$ for 115 volt, 25-60 cycle supply.

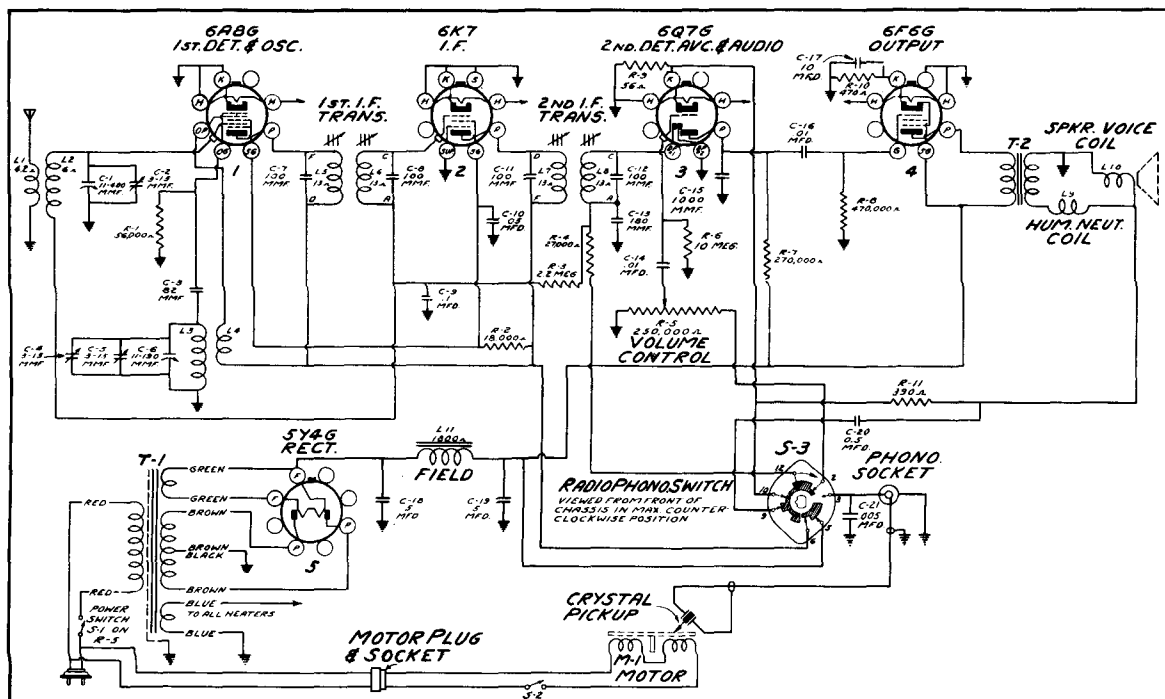


Figure 2. Schematic Circuit Diagram.

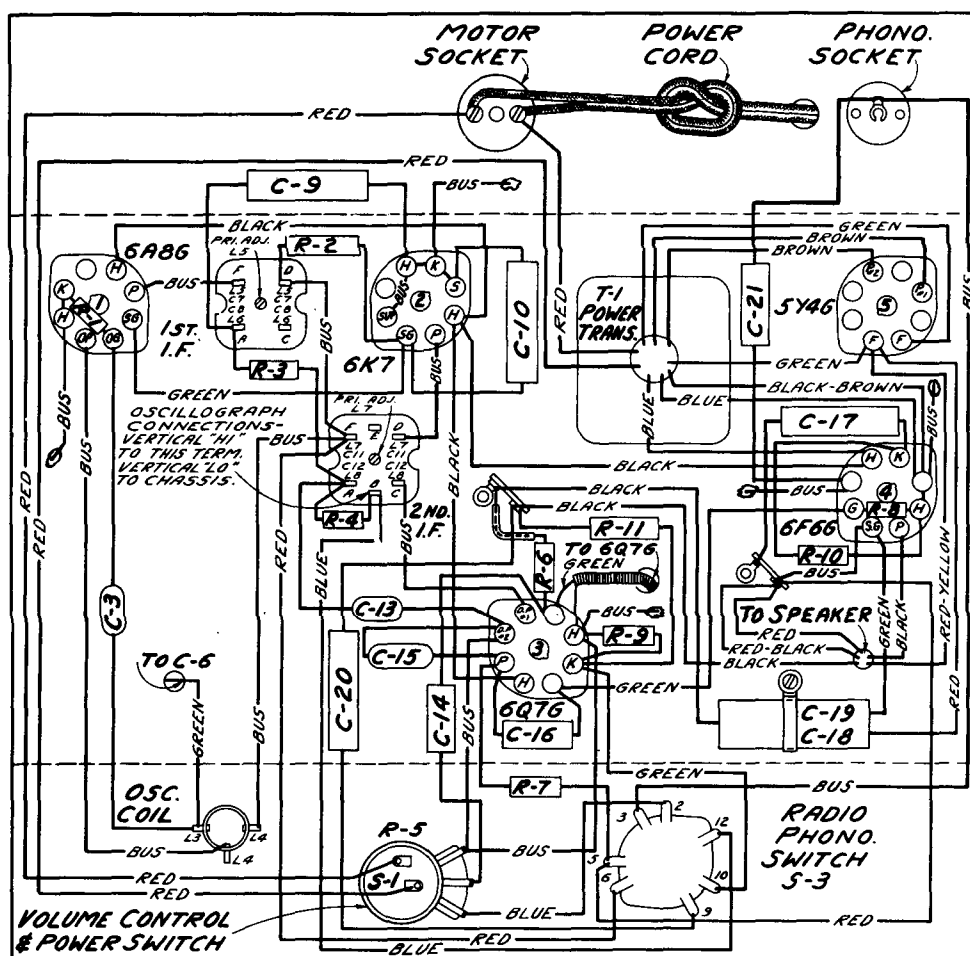
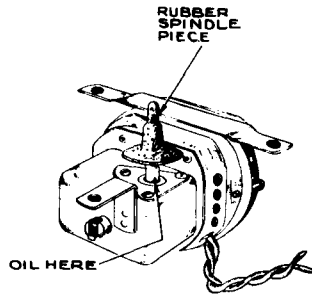


Fig. 3. Chassis Wiring Diagram.

Victrola Mechanism



The crystal pickup is sealed in a metal case as protection against extreme changes of climate. If failure occurs, do not attempt to repair the unit, but install a new crystal unit.

Motor Lubrication.—Apply a few drops of light machine oil to the spindle bearing and oil hole every six months.

The motor spindle is tapered, and a conical rubber piece fits snugly on the spindle. The hole in the turntable bushing is tapered to fit the rubber. This provides an excellent self-centering floating mounting.

A metal washer is placed on the spindle under the rubber piece. The washer has ears on the under side which fit over a pin that projects through the spindle.

REPLACEMENT PARTS FOR MODEL VR-3 FIVE TUBE "A" BAND COMBINATION

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			
S-2301	Cap-Grid contact cap (Pkg.of 5).....	S-2314	Transformer-First I.F. Transformer (L5,L6,C7,C8).....
12813	Capacitor-82 mmfd. (C3).....	S-2315	Transformer-2nd I.F. Transformer (L7,L8,C11,C12).....
12720	Capacitor-100 mmfd. (C5,C6,C11,C12)....	S-2317	Transformer-Power Transformer 105-125 volts 50/60 cycle (T1)..
13003	Capacitor-180 mmfd. (C13).....	S-2316	Transformer-Power Transformer 105-125 volt 25/60 cycle (T1)...
12725	Capacitor-1000 mmfd. (C15).....	S-2318	Volume control and power switch (R5,S1).....
4838	Capacitor-.005 mfd. (C21).....	14278	Socket-Phono input socket.....
14393	Capacitor-.01 mfd. (C14,C16).....	MOTOR BOARD ASSEMBLIES	
30847	Capacitor-.05 mfd. (C10).....	S-2285	Damper-Turntable damper plate and sleeve.....
4839	Capacitor-0.1 mfd. (C9).....	S-2450	Escutcheon-Toggle switch "On-Off" escutcheon (Pkg.of 2).....
12741	Capacitor-0.5 mfd. (C20).....	32558	Motor-110 volt,60 cycle motor complete (M1).....
S-2443	Capacitor-10 mfd. electrolytic (C17)...	32638	Motor-110 volt,25 cycle motor complete (M1).....
		4671	Switch-Motor toggle switch.....
		31463	Turntable-Motor turntable.....
		PICKUP & ARM ASSEMBLIES	
32338	Coil-Antenna coil (L1,L2).....	S-2451	Base-Pickup arm pivot shaft and base assembly.....
30895	Coil-Oscillator coil (L3,L4).....	33122	Crystal-Pickup crystal cartridge & needle screw.....
S-2444	Condenser-2 gang variable tuning condenser (C1,C2,C4,C5,C6).....	31048	Plug-Pickup cable plug.....
S-2306	Cord-Variable condenser drum drive cord.....	33529	Screw-Pickup needle screw.....
S-2445	Dial-Station selector dial scale.....	33591	Shell-Pickup arm shell,less base assembly and crystal unit.....
S-2309	Drum-Variable condenser drive drum assembly.....	MISCELLANEOUS ASSEMBLIES	
32605	Indicator-Station selector indicator pointer.....	32602	Escutcheon-Station selector dial escutcheon & crystal.....
11765	Lamp-Pilot lamp.....	14269	Knob-Station selector,volume or tone control knob.....
S-2216	Resistor-56 ohms, 1/4 watt (R9).....	14270	Spring-Retaining spring for knob (Pkg.of 10).....
12261	Resistor-390 ohms,1/4 watt (R11).....	REPRODUCER ASSEMBLIES	
30499	Resistor-470 ohms,1/2 watt (R10).....	CRL-503-1	
S-2060	Resistor-18,000 ohms,1 watt (R2).....	S-2387	Coil-Field coil (L11).....
14390	Resistor-27,000 ohms,1/10 watt (R4)...	S-2375	Cone-Reproducer cone & voice coil (L1).....
12286	Resistor-56,000 ohms,1/4 watt (R1)....	S-2388	Reproducer complete.....
11323	Resistor-270,000 ohms,1/4 watt (R7)...	S-2389	Transformer - Output trans-former.....
S-1690	Resistor-470,000 ohms,1/4 watt (R8)...		
12679	Resistor-2.2 meg.,1/4 watt (R3).....		
13601	Resistor-10 meg., 1/4 watt (R6).....		
S-2446	Retainer-Female A.C. socket retainer (Pkg.of 3).....		
S-1469	Screw-Variable capacitor drum set screw (Pkg.of 10).....		
S-2312	Shaft-Variable capacitor drum drive shaft.....		
S-2447	Socket-Female A.C. socket.....		
31251	Socket-Radiotron socket.....		
S-2448	Socket-Pilot lamp socket.....		
31418	Spring-Drive cord tension spring (Pkg.of 3).....		
S-2449	Switch-Tone-Phono switch (S3).....		



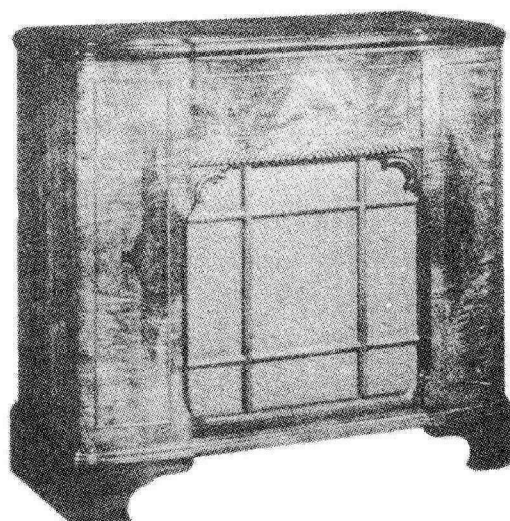
RCA Victor

MODEL VR-8

Eleven-Tube, Five-Band, Electric-Tuning, A-C, Victrola

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

FREQUENCY RANGES

"Standard Broadcast" (A)	540-1,720 kc
"49 Meter Band"	5,920-6,230 kc
"31 Meter Band"	9,480-9,690 kc
"25 Meter Band"	11,680-11,940 kc
"19 Meter Band"	15,080-15,390 kc

Intermediate Frequency 455 kc

TUBE COMPLEMENT

(1) Type-6K7	R-F Amplifier
(2) Type-6A8	First Detector
(3) Type-6J7	Heterodyne Oscillator
(4) Type-6K7	I-F Amplifier
(5) Type-6H6	Second Det., A.V.C., and Muting
(6) Type-6F5	Audio Voltage Amplifier

Pilot Lamps One Mazda 47, 6-8 volts, .15 amp; Two Mazda 44, 6.3 volts, .25 amp.
Fuse (Motor) 3 Ampere

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 145 watts
Rating B	105-125 volts, 25-30 cycles, 145 watts

POWER OUTPUT

Undistorted	10 watts
Maximum	12 watts

PHONOGRAPH

Record Capacity	Seven ten or twelve inch
Turntable Speed	78 R.P.M. (Adjustable)

R-F ALIGNMENT FREQUENCIES

"Standard Broadcast" (A)	1,500 kc (osc., det., ant.), 600 kc (osc.)
"49 Meter Band"	6,100 kc (osc.)
"31 Meter Band"	9,600 kc (osc., det., ant.)
"25 Meter Band"	11,800 kc (osc.)
"19 Meter Band"	15,200 kc (osc.)

(7) Type-6F5	A-F Amp. and Audio Phase Inverter
(8) Type-6F6	Power Output
(9) Type-6F6	Power Output
(10) Type-6U5	Tuning Tube
(11) Type-5T4	Full-Wave Rectifier

LOUDSPEAKER

Type	12-inch Electrodynamic
Voice Coil Impedance	2.2 ohms at 400 cycles

Type Pickup	Crystal
Pickup Impedance	80,000 ohms at 1,000 cycles

Mechanical Specifications

Height	34 inches
Width	36 $\frac{1}{4}$ inches
Depth	17 $\frac{1}{2}$ inches
Weight (net)	101 pounds
Weight (shipping)	138 pounds
Chassis Base Dimensions	15 $\frac{5}{8}$ inches x 8 $\frac{1}{2}$ inches x 3 $\frac{1}{8}$ inches
Over-all Chassis Height	8 $\frac{3}{4}$ inches
Operating Controls....(1)	Power Switch-Tone; (2) Volume; (3) Tuning; (4) Range Selector, left to right, "A," "49 Meter," "31 Meter," "25 Meter," "19 Meter;" Ten Push Buttons; left to right, Victrola-Attachment Switch; Eight Station Buttons, Dial-Tuning Button.

Tuning Drive Ratio (manual) 18 to 1

General Description

This receiver employs an eleven-tube, five-band "Magic Brain" superheterodyne circuit, the arrangement of which is shown in the Schematic Circuit Diagram. Features of design include electric tuning for eight broadcast stations; push-pull power output stage; magnetite-core i-f transformers; magnetite-core "A" band oscillator tracking adjustment; temperature-stabilized capacitors; four spread-bands; automatic volume control; "Magic Eye" tuning tube; 12-inch, dust-proof electrodynamic loudspeaker; aural-compensated audio volume control; continuously variable high-frequency tone control; provision for armchair control

attachment; new straight-line dial; illuminated band indicator; noise-reducing adjustment on "A" band and noise reduction on "C" band with RCA Victor Master Antenna; air-core trimmer condensers.

The phonograph has a self-starting motor, crystal pickup, and may be set to play ten-inch and twelve-inch records singly, or automatically. In the automatic position, seven twelve-inch; eight ten-inch; or a mixed group of seven, ten- and twelve-inch records, may be played in succession. The output of the pickup is "shorted" out when the pickup is on the pickup rest.

Calibration Scale

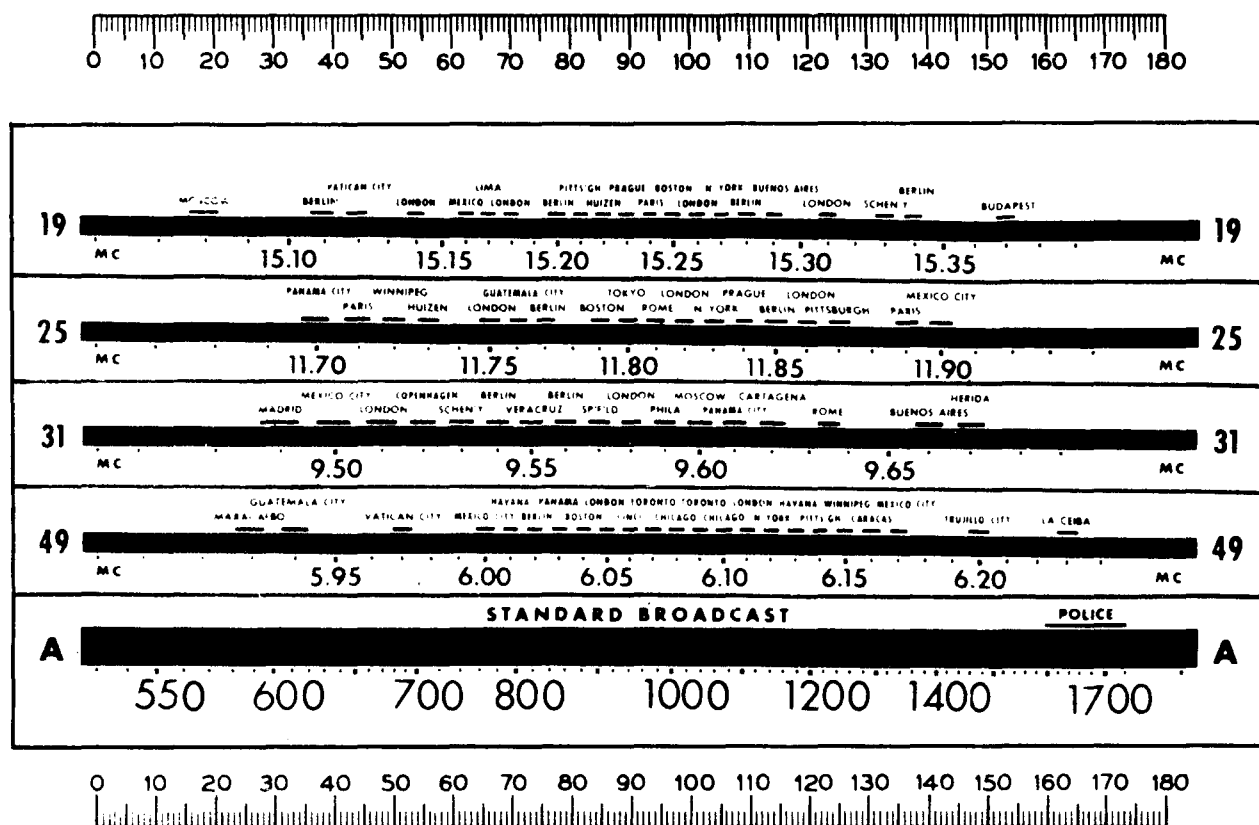


Figure 1—Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example 90° on the calibration scale corresponds approximately to 11.8 mc on the 25-meter band, and 940 kc on "A" band, etc. Read instructions under "Alignment Procedure."

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the rear of the indicator-drive-cord drum which is mounted on the front 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 "0" 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

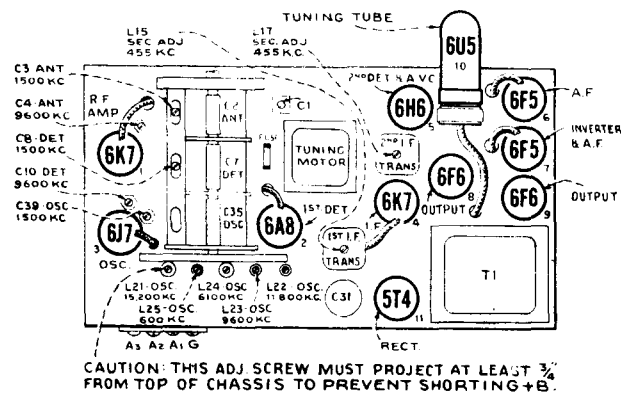


Figure 2—Tube and Trimmer Locations

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

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

For additional details, refer to the "RCA Victor Service Manual."

Steps	Connect the high side of test-oscillator to—	Tune Test-Oscillator to—	Range Selector	Set Tuning Gang to—	Adjust the following for max. peak output
No. 1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A"	Quiet point between 550-750 kc	L16, L17 (2nd I-F transformer)
No. 2	6A8 1st-det. grid cap, in series with .01 mfd.	455 kc	"A"		L14, L15 (1st I-F transformer)
No. 3	A2, in series with 100 mmf. Connect A3 to chassis.	1,500 kc	"A"	1,500 kc (151.5°)	C39 (osc.) C3 (ant.) C8 (det.)
No. 4	A2, in series with 100 mmf. Connect A3 to chassis.	600 kc	"A"	600 kc (30.0°)	L25 (osc.)
No. 5	A2, in series with 100 mmf. Connect A3 to chassis.	1,500 kc	"A"	1,500 kc (151.5°)	C39 (osc.)
No. 6	A2. Connect A1 to chassis.	6,100 kc	"49M"	6,100 kc (106°)	L24 (osc.)*
No. 7	A2. Connect A1 to chassis.	9,600 kc	"31M"	9,600 kc (102°)	L23 (osc.)** C4 (ant.) C10 (det.)
No. 8	A2. Connect A1 to chassis.	11,800 kc	"25M"	11,800 kc (90.0°)	L22 (osc.)**
No. 9	A2. Connect A1 to chassis.	15,200 kc	"19M"	15,200 kc (78.0°)	L21 (osc.)**

* Use maximum inductance peak (plunger in) if two peaks can be obtained.

** Use minimum inductance peak (plunger out) if two peaks can be obtained

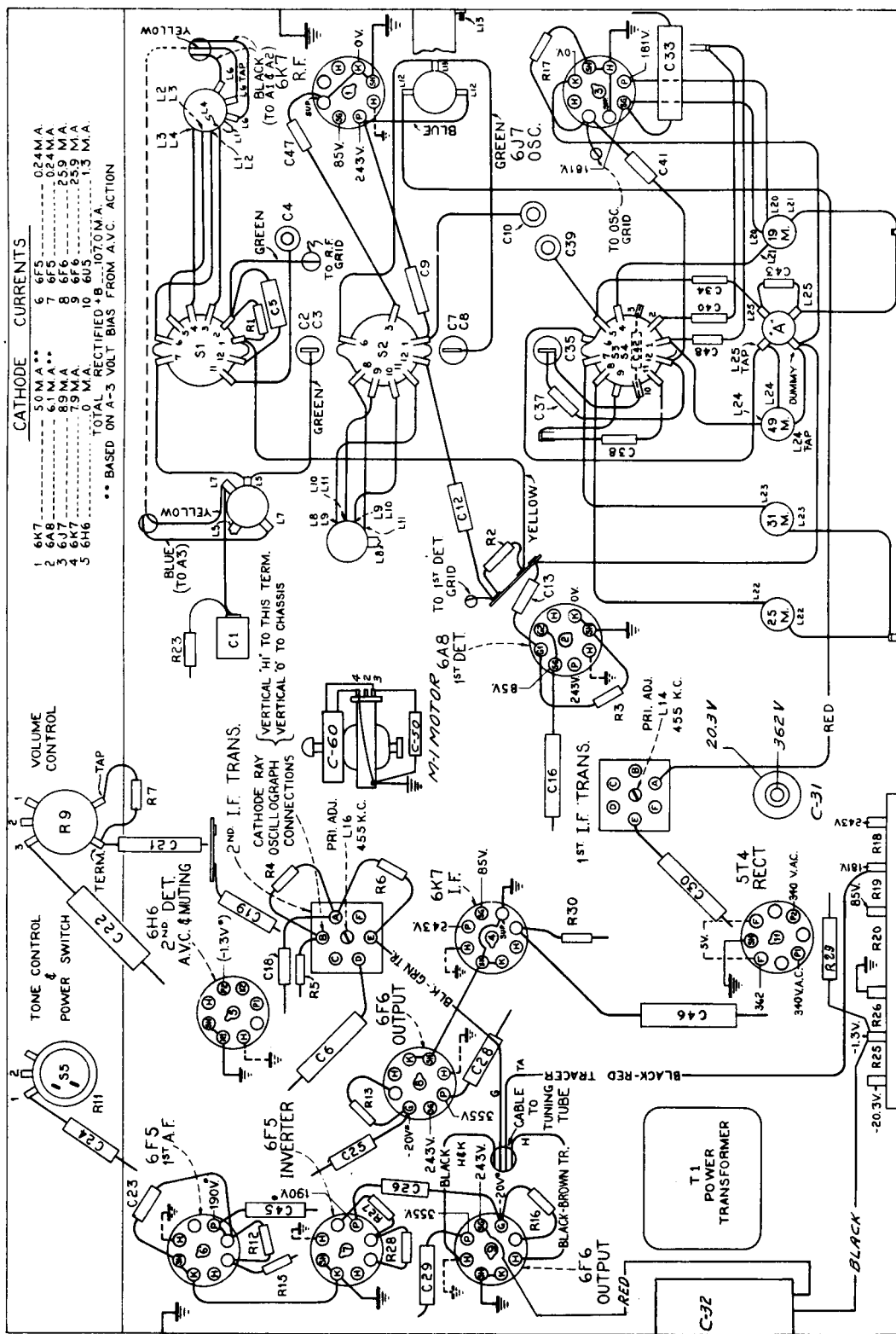
Note that the heterodyne oscillator tracks **above** the signal frequency on all bands except "49M," where it is lower than the signal frequency.

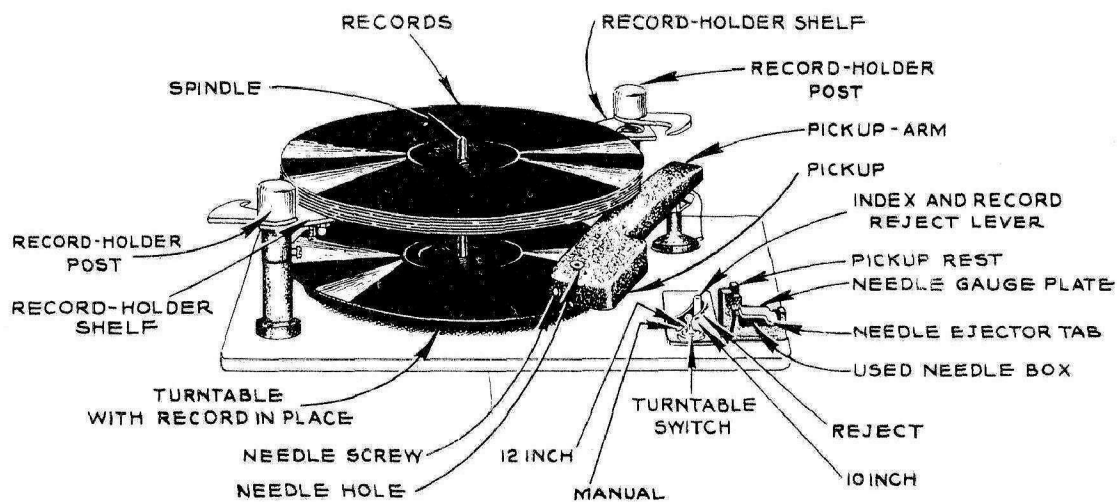
Adjustments for Electric Tuning

- Make a list of the desired eight stations, arranged in order from low to high frequencies.
- Turn range selector to "A" band, turn power on, and allow a few minutes for warming up.
- Press down the "dial-tuning" (right-hand) button.
- Manually tune in the first station on the list, using the "Magic Eye" for accurate tuning.
- Hold down the "dial-tuning" button, and press down station button No. 1 (second from left). Both buttons will stay down. Move adjusting pin No. 1

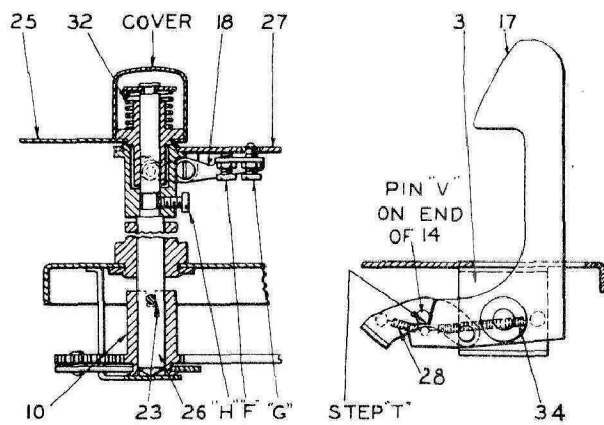
to the insulating line on the disc at the rear of gang. When the pin is correctly centered on the insulating line, the central dial lamp will go out.

- Press down any other button in order to release the dial-tuning button and station button No. 1. Then press down station button No. 1 again. The electric tuning mechanism will function to tune in the station, and the central dial lamp will stay on.
- Repeat this process for the remaining stations.

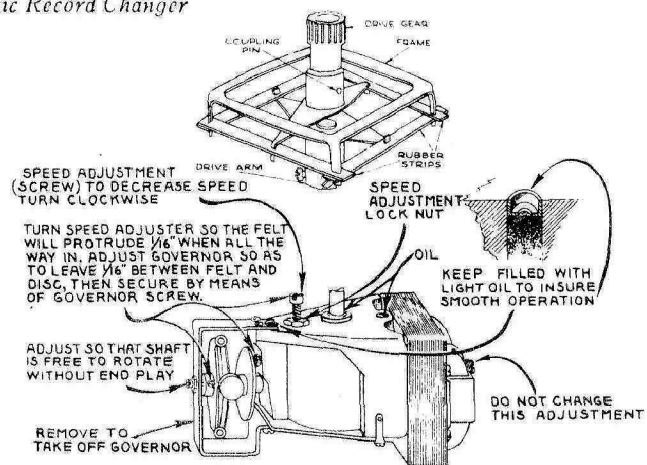




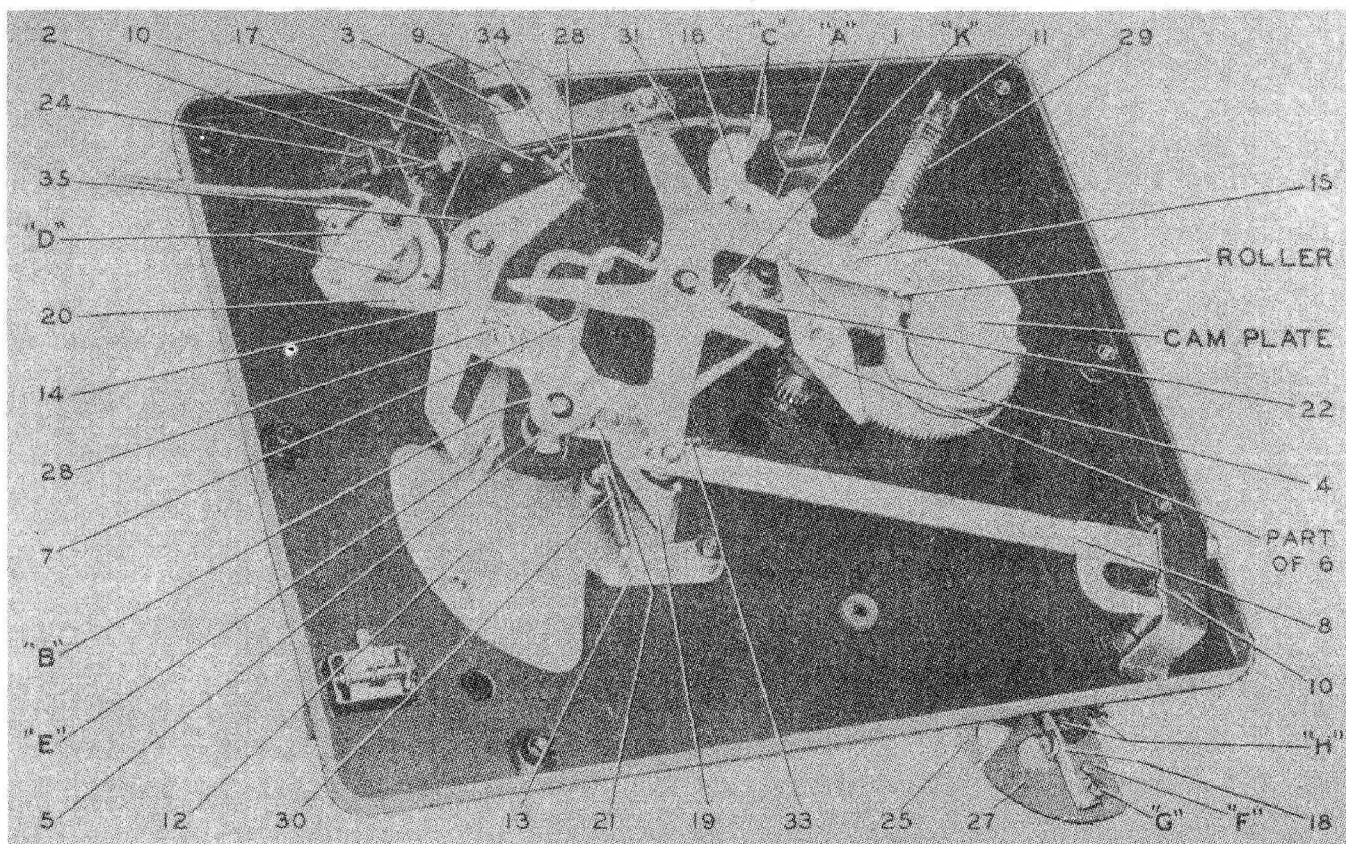
Top View of Automatic Record Changer



Details of Record Shelf Posts, and Locating Lever Assemblies



Motor Data and Coupling



Bottom View of Automatic Record Changer

NOTE: Numbers refer to parts—letters refer to adjustments.

Automatic Record Changer

GENERAL INFORMATION

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc. are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

The turntable, spindle, and pinion gear are assembled by means of a 3/32 inch straight pin. This pin may be removed by gently driving with a standard pin punch.

If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

The 10 and 12 inch records must be absolutely flat for smooth operation when using a mixture of the two sizes.

A shorting switch, located in the pickup head, operates due to pressure when the pickup is placed on the pickup rest.

ADJUSTMENTS

A. Main Lever.—This lever is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle; and adjust rubber bumper bracket (A) so that the roller clears the nose of the cam plate by 1/16 inch.

B. Friction Clutch.—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5." If the motion of the pickup is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B." If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.

C. Pickup Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper elevation, stop the changer "in-cycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface.

D. & E. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10 inch record. Position of eccentric stud "E" governs the landing of the needle on a 12 inch record; this, however, is dependent on the proper 10 inch adjustment.

To adjust for needle landing, place 10 inch record on turntable; push index lever to reject position and return to the 10 inch position; see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is 4-11/16 inches from the nearest side of the turntable spindle; loosen the two screws "D" and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17." Leave approximately 1/32 inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone pointed screw "D".

After adjusting for needle landing on a 10 inch record, place 12 inch record on turntable; push index lever to reject and return to 12 inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5-11/16 inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motor board, otherwise incorrect landing may occur with 10 inch records.

F. & G. Record Separating Knife.—The upper plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the rotating record shelf "27" be accurately maintained. The spacing for the 10 inch record is nominally .058 inch, and for the 12 inch record is .075 inch.

To adjust, rotate the knife to the point of minimum

vertical separation from the record shelf and turn screw and locknut "F" to give .055—.061 inch separation. Screw "G" must not be depressed during this adjustment. After setting screw "F" adjust screw "G" so that when its tip is depressed flush with top of record shelf, the vertical spacing between the knife, in its lowest rotational position, and the shelf, is .072—.078 inch.

H. Record Support Shelf.—The record shelf revolves during the change cycle to allow the lower record to drop onto the turntable. Both posts are rotated simultaneously by a gear and rack coupled to the main lever "15," and it is necessary that adjustments be such that the record is released from both shelves at the same instant. To adjust, place a 12 inch record on the turntable, rotate mechanism into cycle to the point where tone arm is at maximum distance outward from turntable; lift record upward until it is in contact with both separating knives, then loosen screws "H" and shift record shelves so that the curved inner edges of the shelves are uniformly spaced at least 1/16 inch from record edge. Tighten the blunt nose screw "H," run mechanism through cycle several times to check action, then tighten cone pointed screw "H".

If record shelves or knives are bent, or not perfectly horizontal, improper operation and jamming of mechanism will occur.

J. Tone Arm Rest Support (not shown).—When the changer is out-of-cycle, the front lower edge of the pickup head should be 5/16 inch above surface of motor board. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers on underside of motor board.

The felt washer between the turntable and spindle bearing should be soaked in light engine oil whenever the turntable is removed, or as required for proper operation.

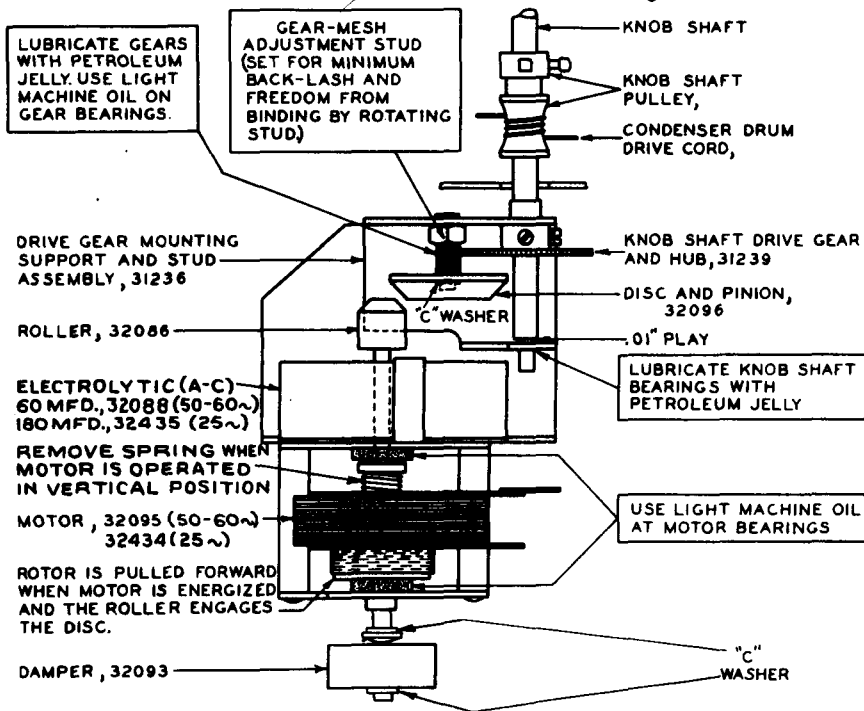
Do not allow oil or grease to come in contact with, rubber mounting of tone arm base, rubber bumper, or flexible coupling of drive motor.

MISCELLANEOUS SERVICE HINTS

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and the usual mis-adjustments will enable ready adjustment in most cases.

1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A".
2. Needle does not land properly on both 10 and 12 inch records—Make complete adjustments "D" and "E".
3. Needle does not land properly on 12 inch record but correct on 10 inch—Effect adjustment "E".
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B". Also, see that levers "7" and "12" are free to move without touching each other.
5. Pickup strikes lower record of stack or drags across top record on turntable—Adjust lift cable per adjustment "C".
6. Needle does not track after landing—Friction clutch "5" adjustment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pickup output cable twisted.
7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; flexible coupling between motor and changer mechanism not correctly assembled; or instrument is not being operated at normal room temperature (65° F.).
9. Record knives strike edge of records—Records warped; record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H".
11. Needle lands in 10 inch position on 12 inch record or misses record when playing both types mixed—Increase tension of pickup locating lever spring "34".

Electric Tuning Mechanism



When a station button is pushed in, it completes the 24-volt circuit through the corresponding station-setting contact and one-half of the brass selector disc, which is connected to one side of the motor field coil. This energizes the motor, and the rotor is pulled forward, engaging with the gear train that drives the tuning condenser and selector disc. The condenser and disc rotate until the insulation line comes under the particular station-setting contact, and the motor circuit is broken.

When the electric tuning mechanism is in action, the motor-supply voltage is fed into a diode rectifier circuit which applies a high bias to the first-audio amplifier. This prevents audio amplification and makes the set quiet or "mute" while the mechanism is operating.

The brass selector disc is fastened to the rear shaft of the tuning condenser by means of two set-screws. When the condenser is at maximum (plates fully meshed) the insulation line should be horizontal, with the operating-end at the left (viewed from rear). The operating-end has dark insulating material and the brass is beveled at this end.

The selector disc should be set so that the contact-tip plungers in the station-setting contacts project not more than 1/16-in. from the body of the contacts.

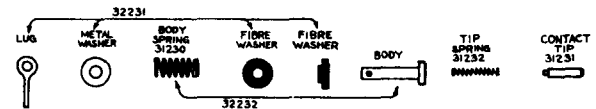
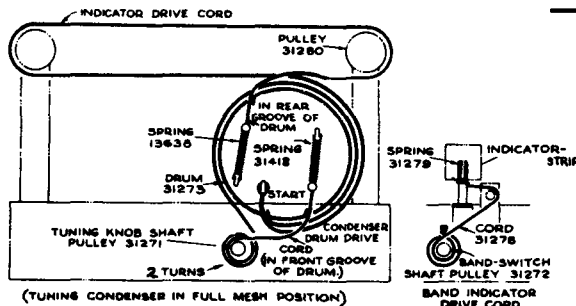
Lubrication

Motor bearings and gear bearings; use light machine oil.

Gear faces; use "Pure Oil No. 611" or petroleum jelly.

Dial-indicator pulleys and rails; use "Castordag" or petroleum jelly.

Selector disc; apply *thin* film of petroleum jelly.



Component Parts of Station Setting Contact

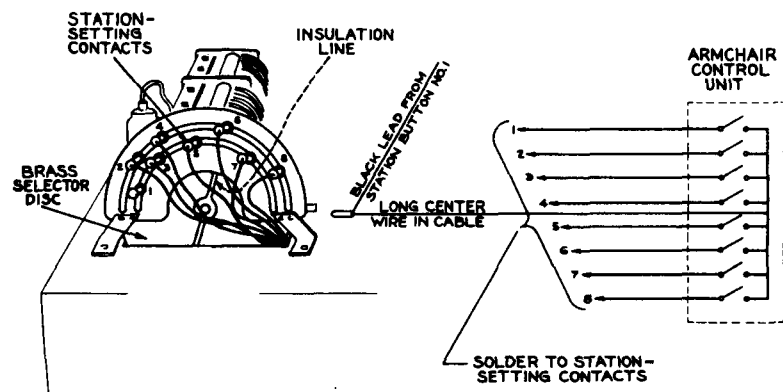
At left—Dial Mechanism

Armchair Control Unit

Station-Setting Contacts and Selector Disc

This illustration shows connections for a G8A Armchair Control Unit. This unit is not supplied with the receiver but may be added as an accessory.

Station Button	Color of Lead To Station-Setting Contact
No. 1	Black
No. 2	Brown
No. 3	Blue
No. 4	Green
No. 5	Red
No. 6	Red-black
No. 7	Brown-black
No. 8	Red-yellow



When a Model G8A Armchair Control is connected to the receiver it duplicates the action of the push-buttons on the front panel when No. 1 button is pressed down. The black lead from push-button No. 1 is unsoldered from No. 1 station-setting contact and soldered to a terminal board which is to be mounted on the frame of selector mechanism. If desired one of the other seven station buttons on the set may be used in place of No. 1 button.

This arrangement allows the use of only seven of the eight buttons when tuning in stations at the set, but allows the use of the entire eight buttons on the Armchair Control. In operating the G8A Armchair Control the push-button must be held down until the station has been tuned in. Care must be taken not to hold two of the station-buttons down at one time as both windings of the motor may be engaged instantaneously causing the motor to be inoperative and overheated.

REPLACEMENT PARTS FOR MODEL VR-8

11 TUBE AUTOMATIC VICTROLA

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			
31531	Board-Antenna and ground terminal board.....	14284	Resistor-22,000 ohm 1/10 Watt (R28).....
12714	Capacitor-Adjustable trimmer, 2-12 mmfd. (C39).....	11300	Resistor-33,000 ohm 1/10 Watt (R17).....
12884	Capacitor-Adjustable trimmer-2-20 mmfd. (C4,C10).....	11291	Resistor-100,000 ohm 1/10 Watt (R30).....
31252	Capacitor-Adjustable trimmer, 5-80 mmfd. (C1).....	11398	Resistor-220,000 ohm 1/10 Watt (R12, R15).....
31353	Capacitor-15 mmfd. (C43).....	12264	Resistor-220,000 ohm 1/4 Watt (R5,R42).....
12896	Capacitor-15 mmfd. (C51).....	11453	Resistor-270,000 ohm 1/10 Watt (R13,R16).....
31350	Capacitor-18 mmfd. (C38).....	11452	Resistor-470,000 ohm 1/10 Watt (R29).....
31354	Capacitor-33 mmfd. (C48).....	12013	Resistor-1 meg., 1/10 Watt (R2).....
12723	Capacitor-56 mmfd. (C47).....	13730	Resistor-1 meg., 1/4 Watt (R23,R1).....
31349	Capacitor-62 mmfd. (C37).....	31056	Resistor-1.2 meg., 1/10 Watt (R27).....
31352	Capacitor-100 mmfd. (C42).....	30208	Resistor-1.2 meg., 1/4 Watt (R45).....
12720	Capacitor-100 mmfd. (C23).....	5131	Resistor-2.2 meg. 1/10 Watt (R6).....
12724	Capacitor-120 mmfd. (C13,C41).....	31364	Socket-Dial lamp socket.....
12725	Capacitor-150 mmfd. (C18).....	13871	Socket-Magic Eye Socket.....
31351	Capacitor-190 mmfd. (C40).....	31251	Socket-Radiotron socket.....
31348	Capacitor-510 mmfd. (C34).....	31365	Socket-Tuning indicator lamp insulated socket.....
5107	Capacitor-.0025 mfd. (C53).....	31247	Switch-Range Switch (S1,S2,S3,S4)...
30303	Capacitor-.0035 mfd. (C45).....	31248	Tone Control-H.F. tone control and power switch (R11,S5).....
4838	Capacitor-.005 mfd. (C19,C24).....	32068	Transformer-First I.F. transformer (L14,L15,C14,C15).....
14393	Capacitor-.01 mfd. (C5,C12,C25,C26, C44,C49,C50).....	14283	Transformer-Second I.F. transformer (L16,L17,C17,C20).....
4858	Capacitor-.01 mfd. (C9,C33).....	31226	Transformer-Power transformer 110 Volt 25-60 cycle (T1).....
4886	Capacitor-.05 mfd. (C30).....	31225	Transformer-Power transformer 110 Volt 50-60 cycle (T1).....
4839	Capacitor-0.1 mfd. (C6,C16).....	31249	Volume Control (R9).....
12484	Capacitor-0.25 mfd. (C33,C46).....	TUNING MOTOR ASSEMBLIES	
30867	Capacitor-0.5 mfd. (C22).....	31229	Body-Station-setting contact body, less contact tip and tip spring...
S-2441	Capacitor-16 mfd. (C32).....	32093	Damper-Variable condenser tuning motor damper.....
S-2442	Capacitor-20 mfd. (C31).....	32096	Disc-Friction disc engaging roller on motor shaft.....
32088	Capacitor-60 mfd. (C60) (60 cyc. only).....	31239	Gear-Knob shaft drive gear and hub..
32435	Capacitor-180 mfd. (C60) (25 cyc. only).....	32434	Motor-Tuning drive Motor (MI) 25 cycle).....
31263	Coil-"A" band antenna coil (L5,L7).....	32095	Motor-Tuning drive Motor (MI) 60 cycle).....
31257	Coil-- "A" band oscillator coil (L25).....	31228	Plate-Station setting contact plate.....
31265	Coil - "A" band detector coil (L12, L13).....	31231	Plunger-Station setting contact plunger (Pkg.2).....
31264	Coil - 19,25,31 and 49 meter band-spread antenna coil (L1,L2,L3,L4, L6).....	32086	Roller-Friction roller mounted on tuning motor shaft.....
31266	Coil-19,25,31 and 49 meter band-spread detector coil (L8,L9,L10, L11).....	31233	Rotor-Selector rotor disc-mounts on rear of condenser shaft.....
31258	Coil-19 meter band oscillator coil (L20,L21).....	14350	Screw-8/32 square head set screw for selector disc Stock #31233 (Pkg.of 10).....
31254	Coil-25 meter band oscillator coil (L22).....	31232	Spring-Station setting contact tip spring (Pkg.of 10).....
31255	Coil-31 meter band oscillator coil (L23).....	31230	Spring-Station setting contact body spring (Pkg.10).....
31256	Coil-49 meter band oscillator coil (L24).....	32094	Washer-Spring tension washer for motor damper.....
31234	Condenser-3 gang variable condenser (C2,C3,C7,C8,C35).....	REPRODUCER ASSEMBLIES RL70H-4	
31273	Drum-Indicator drive cord drum.....	13866	Cap-Dust cap for cone center (Pkg. of 5).....
S-2440	Escutcheon-Station selector dial escutcheon - Less dial scale & buttons.....	11234	Coil-Field coil (L26).....
31717	Indicator-Station selector indicator pointer.....	11469	Coil-Neutralizing Coil (L18).....
11891	Lamp-Dial lamp.....	31275	Cone-Reproducer cone and voice coil (L19).....
31480	Lamp-Electric tuning adjustment indicator lamp.....		
12493	Plug-5 contact female plug for speaker cable.....		
31272	Pulley-Range switch pulley.....		
31250	Resistor-Voltage divider comprising one 1,500 ohm, one 2,950 ohm, one 3,400 ohm one 12 ohm, and one 180 ohm sections (R18,R19,R20,R25,R26)		

REPLACEMENT PARTS FOR MODEL VR-8 CONTINUED

11 TUBE AUTOMATIC VICTROLA

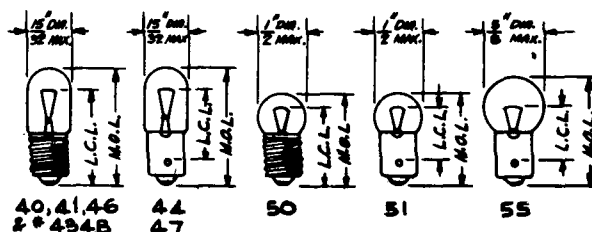
STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
31539	Plug-5 contact male plug for re-producer.....	31139	Turntable assembly-less spindle..
31538	Reproducer Complete.....	31128	Washers-"C" washers for top of record post (Pkg. 5).....
14534	Transformer-Output transformer (T2)...	31143	Washers-Turntable thrust washers (1 steel,1 bronze,1 felt).....
14357	Washer-Spring washer for field coil (Pkg.5).....		
	OPERATING MECHANISM		PICKUP AND ARM ASSEMBLIES
31134	Bracket-Pickup locating lever mounting bracket (3).....	31162	Cable-Pickup arm lift cable.....
32878	Cam-Cam and gear assembly (4).....	33119	Cable-Shielded cable and plug....
6808	Clutch-Trip lever friction clutch assembly (5).....	31156	Crystal-Pickup crystal cartridge and needle screw.....
31146	Coupling-Motor coupling complete with turntable, drive gear, rubber strips, motor coupling and drive arm (6).....	31159	Pickup and arm complete.....
31129	Cover-Cap for top of record post....	31160	Screw-Pickup needle screw.....
31116	Finger-Trip lever friction finger assembly (7).....	31161	Shaft-Pickup pivot arm and shaft assembly.....
31119	Gear-Long arm and rack gear for front left-hand record post (8).....		MOTOR BOARD ASSEMBLIES
31120	Gear-Short arm and rack gear for rear right hand record post (9).....	31149	Base-Pickup arm mounting base....
31121	Gear-Record post gear (10).....	14209	Bumper-Main lever rubber bumper (Pkg.2).....
31123	Guide-Main Lever spring guide (11)...	9848	Cup-Used needle cup, rest and lid complete.....
31114	Lever-Index lever assembly (12).....	31148	Escutcheon-Index escutcheon.....
31137	Lever-Index lever tension spring lever (13).....	31155	Spring-Needle cup lid tension spring (Pkg.5).....
31138	Lever-Locating lever and pawl assembly (14).....		MOTOR ASSEMBLIES
31113	Lever-Main lever assembly (15).....	31623	Governor-Motor Governor 60 cycle.
31140	Lever-Pickup lift cable lever and spring assembly (16).....	31624	Governor-Motor governor 25 cycle.
31135	Lever-Pickup locating lever assembly (17).....	31157	Motor-105-125 volts 60 cycle(Ml).
31130	Lever-Record separator elevating lever and adjustment screws (18)...	31448	Motor-105-125 volts 25 cycle(Ml).
31132	Lever-Trip detaining lever (19).....	30870	Plug-2 contact male plug for motor cable.....
31115	Lever-Trip lever assembly (20).....	31447	Screw-Complete set of motor mounting screws, washers and spacers 25 cycle.....
31131	Lever-Trip regulator lever (21).....	31158	Screw-Complete set of motor mounting screws, washers and spacers 60 cycle.....
31133	Pawl-Trip pawl assembly (22).....	31634	Shaft-Turntable shaft and gear 60 cycle.....
31124	Pin-Record post drive pin (23) (Pkg. 5).....	31636	Shaft-Turntable shaft and gear 25 cycle.....
14195	Screw-Set screw for flexible coupling (Pkg.2).....	32912	Weight-Governor weight and spring 60 cycle.....
31117	Screw-Special screw to adjust clutch tension (Pkg. 5).....	32913	Weight-Governor weight and spring 25 cycle.....
31126	Separator-Record separator Knife (25)		MISCELLANEOUS ASSEMBLIES
31122	Shaft-Record separator post shaft (26)	S-2438	Button-Station selector push button.....
31125	Shelf-Record post shelf assembly (27)	13103	Cap-Pilot lamp cap.....
31141	Spindle-Turntable spindle shaft.....	31345	Contact-Push button switch contacts comprising 10 contacts riveted to an insulating strip.
3676	Spring-Cam pawl tension spring on main gear (Pkg.5).....	31344	Contact-Push button switch contacts comprising 13 contacts riveted to an insulating strip.
14190	Spring-Pickup locating lever short spring or locating lever pawl tension spring (28).....	31278	Cord-Band indicator drive cord...
31145	Spring-Main lever tension spring (29) (Pkg.2).....	31281	Cord-Indicator pointer drive cord
31136	Spring-Index lever tension spring (30) (Pkg.2).....	31283	Cord-Variable condenser drum drive cord.....
3666	Spring-Pickup cable tension spring (31) (Pkg.4).....	S-2209	Fuse-3 Amp. motor fuse (F1).....
31127	Spring-Record separator pressure spring (32) (Pkg.10).....		
14191	Spring-Trip detaining lever tension spring (33) (Pkg. 5).....		
31875	Spring-Pickup locating lever tension spring (34) (Pkg.5).....		
32436	Spring-Locating lever tension spring (35) (Pkg.2).....		
31147	Strip-complete set of rubber strips for flexible coupling.....		

REPLACEMENT PARTS FOR MODEL VR-8 CONTINUED

11 TUBE AUTOMATIC VICTROLA

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
31555	Indicator-Band indicator strip.....	13638	Spring-Indicator pointer drive cord tension spring (Pkg.5).....
31355	Knob-Station selector, volume control, tone control or range switch knob.	31418	Spring-Variable condenser drive cord tension spring (Pkg.3).....
S-2183	Marker-Station call letter markers..	31279	Spring-Tension spring for band indicator (Pkg.10).....
31459	Marker-"Victrola" push button marker (Pkg.10).....	31313	Spring-Tension spring for switch latch bar (Pkg.5).....
S-2437	Marker-"Dial Tuning" push button marker (Pkg.10).....	14270	Spring-Retaining spring for knob (Pkg.10).....
31280	Pulley-Indicator pointer drive cord pulley.....	31360	Switch-Pickup switch for mounting on push button switch assembly.....
14887	Retainer-Indicator pointer drive cord pulley retainer (Pkg.20).....	31312	Switch-Push button switch and bracket assembly complete.....
31559	Screen-Dial color screen and light diffuser.....		
31347	Socket-Pickup socket and bracket....		

Lamps and fuses listed below are those commonly used in RCA VICTOR Receivers.



PILOT LAMPS AND DIAL LAMPS

Stock No.	Mazda Type No.	Volts	Amps.	Normal Candle Power	Bulb	Base	Max. Over-all Length
4340	40	6-8	0.15	0.5	T-3 $\frac{1}{2}$, Clear	Min.Screw	1-1/8
2755	41	2.5	0.5	0.5	T-3 $\frac{1}{2}$, Clear	Min.Screw	1-1/8
11891	44	6-8	0.25	0.75	T-3 $\frac{1}{2}$, Clear	Min.Bay	1-1/8
5226	46	6-8	0.25	0.75	T-3 $\frac{1}{2}$, Clear	Min.Screw	1-1/8
31480	47	6-8	0.15	0.5	T-3 $\frac{1}{2}$, Clear	Min.Bay	1-1/8
4991	50	6-8	0.2	1.0	G-3 $\frac{3}{8}$, Clear	Min.Screw	15/16
11765	51	6-8	0.2	1.0	G-3 $\frac{3}{8}$, Clear	Min.Bay	15/16
35976	51	6-8	0.2	1.0	G-3 $\frac{3}{8}$, Frosted	Min.Bay	15/16
5117	55	6-8	0.4	1.5	G-4 $\frac{1}{2}$, Clear	Min.Bay	1-1/16
4348	-	2.0	0.06	-	T-3 $\frac{1}{2}$, Clear	Min.Screw	1-1/8

FUSE DATA - (Tubular Glass Fuses)

Stock No.	Rating Amps.	Type	Length (Inches)	Diameter (Inches)	Voltages up to-
6125	0.25	8AG	1	1/4	250 V
3748	0.5	3AG	1 $\frac{1}{2}$	1/4	250 V
2725	1.5	3AG	1 $\frac{1}{2}$	1/4	250 V
3883	2.0	3AG	1 $\frac{1}{2}$	1/4	250 V
S-2209	3.0	8AG	1	1/4	250 V
10907	3.0	3AG	1 $\frac{1}{2}$	1/4	250 V

TIME DELAY TYPE

Stock No.	Rating Amps.	Type	Length (Inches)	Diameter (Inches)	Voltages up to-
5140	5.0	3AG	1 $\frac{1}{2}$	1/4	25 V
6148	10.0	3AG	1 $\frac{1}{2}$	1/4	25 V
5023	15.0	3AG	1 $\frac{1}{2}$	1/4	25 V
3646	20.0	3AG	1 $\frac{1}{2}$	1/4	25 V

Refelting Turntables

It is not necessary to replace turntables of the type used on Record Players and Phonograph Combinations, where the covering is damaged, since simple and economical repairs are possible. These turntables are covered with a pulverized felt, commonly termed "flock", which is applied during manufacture by applying a varnish undercoater to the table and spraying the "flock" onto the coated surface.

The "flock" and varnish undercoater required are available as standard stock items as follows:

Stock No.	Description	Colour
32729	Flock	Brown
32730	Flock	Red Brown
35349	Flock	Grey
37952	Flock	Dark Taupe
32731	Varnish Undercoater	

To effect repair of a damaged spot, apply a small amount of undercoat and then sprinkle or dust the "flock" over same, allowing it to dry thoroughly. Blow away excess material. Should it be necessary to re-coat the entire turntable surface, this may be done by placing the turntable in a sealed container or cardboard carton, after applying the undercoater. Dust a quantity of "flock" into the container in which the turntable is placed, thus forming a cloud which if left undisturbed, will settle evenly on the surface of the turntable.



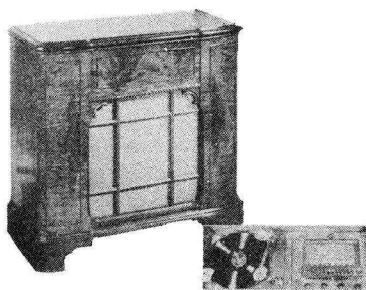
RCA Victor

MODELS VR8-L, VR8-S & VR10-S

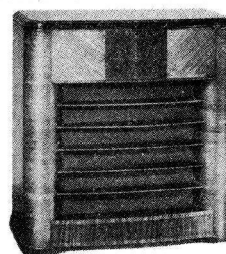
Eleven-Tube, Five-Band, Electric-Tuning, A-C, Victrolas

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Models VR8-L, VR8-S



Model VR10-S

Electrical Specifications

FREQUENCY RANGES

"Standard Broadcast" (A)	540-1,550 kc
"49 Meter Band"	5,920-6,230 kc
"31 Meter Band"	9,480-9,690 kc
"25 Meter Band"	11,680-11,940 kc
"19 Meter Band"	15,080-15,390 kc

Intermediate Frequency 455 kc

TUBE COMPLEMENT

(1) Type-6K7	R-F Amplifier
(2) Type-6A8	First Detector
(3) Type-6J7	Heterodyne Oscillator
(4) Type-6K7	I-F Amplifier
(5) Type-6H6	Second Det., A.V.C., and Muting
(6) Type-6F5	Audio Voltage Amplifier

Pilot Lamps One Mazda 47, 6-8 volts, .15 amp; Two Mazda 44, 6.3 volts, .25 amp.

Fuse (Motor) 3 Ampere

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 155 watts
Rating B	105-125 volts, 25-30 cycles, 155 watts

POWER OUTPUT

Undistorted	10 watts
Maximum	12 watts

PHONOGRAPH (RP140)

Record Capacity	Eight 10-inch or Seven 12-inch
Turntable Speed	78 R.P.M. (Adjustable)

R-F ALIGNMENT FREQUENCIES

"Standard Broadcast" (A)	1,500 kc (osc., det., ant.), 600 kc (osc.)
"49 Meter Band"	6,100 kc (osc.)
"31 Meter Band"	9,600 kc (osc., det., ant.)
"25 Meter Band"	11,800 kc (osc.)
"19 Meter Band"	15,200 kc (osc.)

(7) Type-6F5	A-F Amp. and Audio Phase Inverter
(8) Type-6F6	Power Output
(9) Type-6F6	Power Output
(10) Type-6U5	Tuning Tube
(11) Type-5T4	Full-Wave Rectifier

LOUDSPEAKER

Type	12-inch Electrodynamic
Voice Coil Impedance	2.2 ohms at 400 cycles

Type Pickup.....Crystal

Pickup Impedance.....100,000 ohms at 1,000 cycles

Mechanical Specifications

	VR10S	VR8L VR8S
Height	35	34 inches
Width	33 1/4	36 1/4 inches
Depth	17	17 1/8 inches
Weight (net)	106	103 pounds
Weight (shipping)	140	141 pounds
Chassis Base Dimensions	15 5/8 inches x 8 1/2 inches x 3 1/8 inches	
Over-all Chassis Height		8 1/4 inches
Operating Controls	(1) Power Switch-Tone; (2) Volume; (3) Tuning; (4) Range Selector, left to right, "A," "49 Meter," "31 Meter," "25 Meter," "19 Meter;" Ten Push Buttons; left to right, Victrola-Switch; Eight Station Buttons, Dial-Tuning Button.	
Tuning Drive Ratio (manual)	18 to 1	

General Description

These three receivers are identical differing in cabinet design only.

They employ an eleven-tube, five-band "Magic-Brain" superheterodyne circuit, the arrangement of which is shown in the Schematic Circuit Diagram. Features of design include electric tuning for eight broadcast stations; push-pull power output stage; magnetite-core i-f transformers; magnetite-core oscillator tracking adjustment; temperature-stabilized capacitors; four spread-bands; automatic volume control; "Magic Eye" tuning tube; 12-inch, dust-proof electrodynamic loudspeaker; aural-compensated audio volume control; continuously variable high-frequency tone control; new straight-line dial; illuminated band indicator.

The new RCA Victor "Magic Loop" antenna for "A" and Spread band operation; Loop control knob for ease in operation.

The RP140 automatic mechanism has a self-starting motor, crystal pickup, and may be set to play ten-inch and twelve-inch records singly, or automatically. In the automatic position, seven twelve-inch; eight ten-inch; or a mixed group of seven, ten- and twelve-inch records, may be played in succession.

Refer to the VR-8 Service Notes for Electric Tuning Mechanism, Socket Voltages and Wiring Diagram. Reference to the RP-140 Service Notes will give details of the automatic phono mechanism.

Alignment Procedure

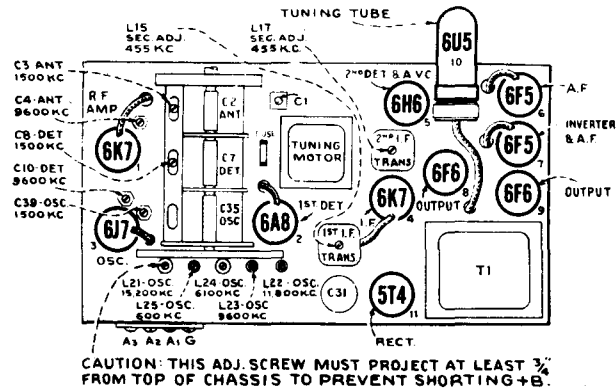
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the rear of the indicator-drive-cord drum which is mounted on the front 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 "0" 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



Tube and Trimmer Locations

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

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Steps	Connect the high side of test-oscillator to—	Tune Test-Oscillator to—	Range Selector	Set Tuning Gang to—	Adjust the following for max. peak output
No. 1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A"	Quiet point between 550-750 kc	L16, L17 (2nd I-F transformer)
No. 2	6A8 1st-det. grid cap, in series with .01 mfd.	455 kc	"A"		L14, L15 (1st I-F transformer)
No. 3	A2, in series with 100 mmf. Connect A3 to chassis.	1,500 kc	"A"	1,500 kc (167°)	C39 (osc.) C3 (ant.) C8 (det.)
No. 4	A2, in series with 100 mmf. Connect A3 to chassis.	600 kc	"A"	600 kc (35°)	L25 (osc.)
No. 5	A2, in series with 100 mmf. Connect A3 to chassis.	1,500 kc	"A"	1,500 kc (167°)	C39 (osc.)
No. 6	A in Series with 200 ohms	6,100 kc	"49M"	6,100 kc (108°)	L24 (osc.)*
No. 7	A in Series with 200 ohms	9,600 kc	"31M"	9,600 kc (102°)	L23 (osc.):** C4 (ant.) C10 (det.)
No. 8	A in Series with 200 ohms	11,800 kc	"25M"	11,800 kc (90.0°)	L22 (osc.):**
No. 9	A in Series with 200 ohms	15,200 kc	"19M"	15,200 kc (78.0°)	L21 (osc.):**

* Use maximum inductance peak (plunger in) if two peaks can be obtained.

** Use minimum inductance peak (plunger out) if two peaks can be obtained

Note that the heterodyne oscillator tracks above the signal frequency on all bands except "49M," where it is lower than the signal frequency.

NOTE: Loop Antenna must remain in circuit during alignment.

REPLACEMENT PARTS FOR MODELS VR8-L, VR8-S, VR10-S

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			
S-2842	Board-Ant.grd.terminal board.....	31225	Transformer-Power transformer 110 volt, 60 cycle (T1).....
12714	Capacitor-Adjustable trimmer, 2-12 mmfd. (C39).....	31450	Volume control (R9).....
12884	Capacitor-Adjustable trimmer - 2-20 mmfd. (C4, C10).....	TUNING MOTOR ASSEMBLIES	
13002	Capacitor-12 mmfd. (C1).....	32088	Capacitor-60 mfd., 60 cycle only (C60).....
12896	Capacitor-15 mmfd. (C51).....	32435	Capacitor-180 mfd., 25 cycle (60)....
S-1877	Capacitor-39 mmfd. (C57).....	32096	Disc-Friction disc & pinion engaging roller on motor shaft.....
12720	Capacitor-100 mmfd. (C23).....	31239	Gear-Knob shaft drive gear & hub..
12724	Capacitor-120 mmfd. (C13, C41).....	32434	Motor-Tuning drive motor (M2) 25 cyc.
12725	Capacitor-150 mmfd. (C18).....	32095	Motor-Tuning drive motor (M2) 60 cyc.
12723	Capacitor-56 mmfd. (C47).....	31228	Plate-Station setting contact plate
31353	Capacitor-15 mmfd. (Temp.Comp.) (C43)...	31231	Plunger-Station setting contact plunger (Pkg.2).....
31354	Capacitor-33 mmfd. (Temp.Comp.) (C48)...	32086	Roller-Friction roller mounted on motor shaft.
31350	Capacitor-18 mmfd. (C38).....	31233	Rotor-Selector rotor disc-mounts on condenser shaft.....
31352	Capacitor-120 mmfd. (C13, C41, C42).....	14350	Screw-8/32 square head set screw for selector disc Stock #31233 (Pkg.10).....
31351	Capacitor-190 mmfd. (C40).....	31681	Shaft-Dial drive knob shaft.....
31348	Capacitor-510 mmfd. (C34).....	31232	Spring-Station setting contact spring (Pkg.10).....
31349	Capacitor-62 mmfd. (C37).....	31230	Spring-Station setting contact body spring (Pkg.10).....
5107	Capacitor-.0025 mfd. (C53).....	REPRODUCER ASSEMBLIES (RL70H-504)	
30303	Capacitor-.0035 mfd. (C45).....	13866	Cap-Dust cap for cone center (Pkg.5)
4838	Capacitor-.005 mfd. (C19, C24, C28, C29)...	11234	Coil-Field coil (L26).....
4858	Capacitor-.01 mfd. (C5, C12, C21, C49, C50)	11469	Coil-Neutralizing coil (L18).....
4886	Capacitor-.05 mfd. (C30).....	31275	Cone-Reproducer cone and voice coil (L19).....
4839	Capacitor-0.1 mfd. (C6, C16).....	31539	Plug-5 contact male plug for reproducer.....
12484	Capacitor-0.25 mfd. (C33, C46).....	31538	Reproducer complete.....
4393	Capacitor-.01 mfd. (C9, C25, C26).....	14534	Transformer-Output transformer (T2)
S-2442	Capacitor-Electrolytic 20 mfd. dry (C31).....	14357	Washer-Spring washer for field coil (Pkg.5).....
S-2441	Capacitor-Electrolytic 16 mfd. dry (C32).....	OPERATING MECHANISM	
S-2843	Coil-"A" band detector coil (L12, L13)...	Refer to RP-140 Service Notes for Record Changing Mechanisms.	
31257	Coil-"A" band oscillator coil (L25)....	MISCELLANEOUS ASSEMBLIES	
31264	Coil-Band spread antenna coil (L1, L2, L3, L4, L5).....	S-2438	Button-Station selector push button.
31266	Coil-Bandspread detector coil (L8, L9, L10, L11).....	13103	Cap-Pilot lamp cap.....
31258	Coil-19 meter band oscillator coil (L20, L21).....	31345	Contact-Push button switch contacts comprising 10 contacts riveted to an insulating strip.....
31254	Coil-25 meter band oscillator coil (L22)	31344	Contact-Push button switch contacts comprising 13 contacts riveted to an insulating strip.....
31255	Coil-31 meter band oscillator coil (L23)	31281	Cord-Indicator pointer drive cord.
31256	Coil-49 meter band oscillator coil (L24)	31278	Cord-Band indicator drive cord....
31234	Condenser-3 gang variable condenser (C2, C3, C7, C8, C35).....	32634	Cord-Variable cond. drum drive cord
S-2844	Dial-Station selector dial scale.....	S-2848	Escutcheon-Dial escutcheon.....
31273	Drum-Indicator drive cord drum.....	S-2209	Fuse-3 Amp. motor fuse (F1).....
11891	Lamp-Dial lamp.....	31717	Indicator-Station selector indicator pointer.....
31480	Lamp-Electric tuning set-up lamp.....	31304	Indicator-Band indicator strip....
31271	Pulley-Knob shaft pulley.....	31355	Knob-Station selector, volume control range switch or loop control knob
12493	Plug-5 contact female plug for speaker cable.....	S-2840	Loop-Antenna loop assembly.....
31272	Pulley-Range switch pulley.....	S-2183	Marker-Station call letter markers (1 set).....
31250	Resistor-Voltage divider comprising one 1500 ohm, one 2950 ohm, one 3400 ohm, one 12 ohm, one 180 sections (R18, R19, R20, R25, R26).....	31459	Marker-"Victrola" push button marker (Pkg.10).....
14284	Resistor-22,000 ohm, 1/10 watt (R28)...	S-2437	Marker-"Dial Tuning" push button marker (Pkg.10).....
13998	Resistor-22,000 ohm (R4) 1/4 watt.....	31280	Pulley-Indicator pointer drive cord pulley.....
11300	Resistor-33,000 ohm, 1/10 watt (R7)....	14887	Retainer-Drive cord pulley retainer (Pkg.10).....
12454	Resistor-33,000 ohm, 1/4 watt (R17)....	31559	Screen-Light diffuser dial screen mounts on dial frame assembly....
11281	Resistor-100,000 ohm, 1/10 watt (R30)...	S-2841	Shaft-Antenna loop assembly drive shaft.....
11398	Resistor-220,000 ohm, 1/10 watt (R5, R42)	13638	Spring-Indicator pointer drive cord tension spring (Pkg.5).....
12264	Resistor-220,000 ohm, 1/4 watt (R12, R15)	31418	Spring-Variable condenser drive cord tension spring (Pkg.3).....
11453	Resistor-270,000 ohm, 1/10 watt (R13, R16)	31279	Spring-Band indicator tension spring (Pkg.10).....
11452	Resistor-470,000 ohm, 1/10 watt (R29)...	31970	Spring-Tension spring for switch latch bar (Pkg.5).....
13730	Resistor-1.0 meg. 1/4 watt (R1, R2, R23)...	14270	Spring-Retaining spring for knob (Pkg.5).....
30208	Resistor-1.2 meg. 1/4 watt (R27, R45)...	31360	Switch-Pickup switch mounted on push button switch assembly.....
5131	Resistor-2.2 meg. 1/10 watt (R6).....	31312	Switch-Push button switch & bracket assembly complete.....
14350	Screw-set screw for pulleys stock #31271 & 31272 (Pkg.10).....		
31364	Socket-Dial lamp socket.....		
31251	Socket-Radiotron socket.....		
31365	Socket-Electric Tuning set-up lamp socket.....		
S-2845	Switch-Range switch (S1, S2, S3).....		
31248	Tone control & power switch (R11, S5)...		
S-2846	Transformer-First I.F. transformer (L14, L15, C14, C15).....		
S-2847	Transformer-Second I.F. transformer (L16, L17, C17, C20, R5, R6).....		
31226	Transformer-Power transformer 110 volt, 25-60 cycle (T1).....		



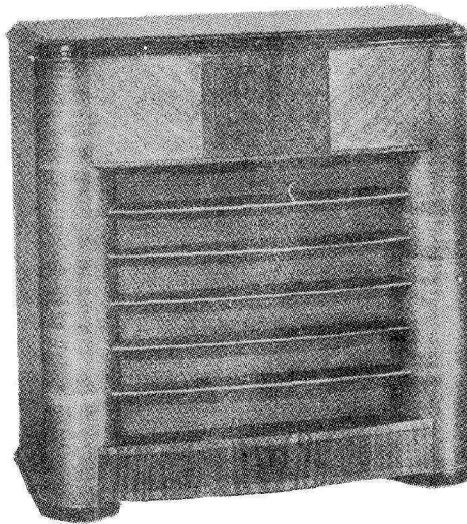
RCA Victor

MODEL VR-10

Eleven-Tube, Five-Band, Electric-Tuning, A-C, Victrola

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

FREQUENCY RANGES

"Standard Broadcast" (A)	540-1,720 kc
"49 Meter Band"	5,920-6,230 kc
"31 Meter Band"	9,480-9,690 kc
"25 Meter Band"	11,680-11,940 kc
"19 Meter Band"	15,080-15,390 kc

Intermediate Frequency 455 kc

TUBE COMPLEMENT

(1) Type-6K7	R-F Amplifier
(2) Type-6A8	First Detector
(3) Type-6J7	Heterodyne Oscillator
(4) Type-6K7	I-F Amplifier
(5) Type-6H6	Second Det., A.V.C., and Muting
(6) Type-6F5	Audio Voltage Amplifier

Pilot Lamps One Mazda 47, 6-8 volts, .15 amp; Two Mazda 44, 6.3 volts, .25 amp.
Fuse (Motor) 3 Ampere

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 145 watts
Rating B	105-125 volts, 25-30 cycles, 145 watts

POWER OUTPUT

Undistorted	10 watts
Maximum	12 watts

PHONOGRAPH

Record Capacity	Seven ten or twelve inch
Turntable Speed	78 R.P.M. (Adjustable)

R-F ALIGNMENT FREQUENCIES

"Standard Broadcast" (A)	1,500 kc (osc., det., ant.), 600 kc (osc.)
"49 Meter Band"	6,100 kc (osc.)
"31 Meter Band"	9,600 kc (osc., det., ant.)
"25 Meter Band"	11,800 kc (osc.)
"19 Meter Band"	15,200 kc (osc.)

(7) Type-6F5	A-F Amp. and Audio Phase Inverter
(8) Type-6F6	Power Output
(9) Type-6F6	Power Output
(10) Type-6U5	Tuning Tube
(11) Type-5T4	Full-Wave Rectifier

LOUDSPEAKER

Type	12-inch Electrodynamic
Voice Coil Impedance	2.2 ohms at 400 cycles

Type Pickup	Crystal
Pickup Impedance	80,000 ohms at 1,000 cycles

Mechanical Specifications

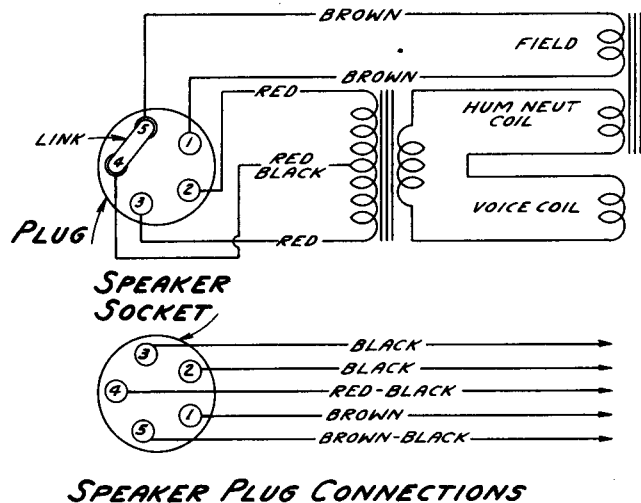
Height	35	inches
Width	33 1/4	inches
Depth	17	inches
Weight (net)	104	pounds
Weight (shipping)	138	pounds
Chassis Base Dimensions	15 1/2 inches x 8 1/2 inches x 3 1/8 inches	
Over-all Chassis Height	8 1/4	inches
Operating Controls.. (1) Power Switch-Tone; (2) Volume; (3) Tuning; (4) Range Selector, left to right, "A," "49 Meter," "31 Meter," "25 Meter," "19 Meter;" Ten Push Buttons; left to right, Victrola-Attachment Switch; Eight Station Buttons, Dial-Tuning Button.		
Tuning Drive Ratio (manual)	18 to 1	

General Description

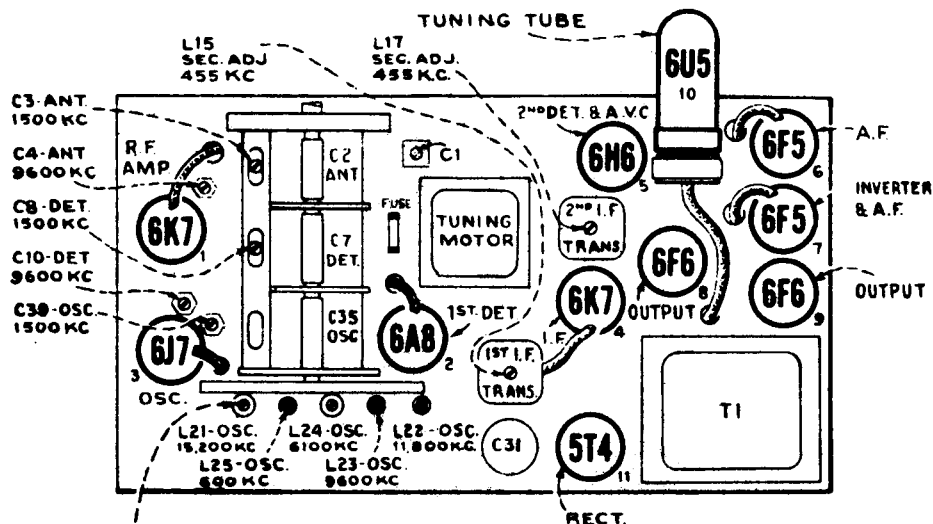
This receiver employs an eleven-tube, five-band "Magic Brain" superheterodyne circuit, similar in design to model VR-8. Features of design include electric tuning for eight broadcast stations; push-pull power output stage; magnetite-core i-f transformers; magnetite-core "A" band oscillator tracking adjustment; temperature-stabilized capacitors; four spread-bands; automatic volume control; "Magic Eye" tuning tube; 12-inch, dust-proof electrodynamic loudspeaker; aural-compensated audio volume control; continuously variable high-frequency tone control; provision for armchair control attachment; new straight-line dial; illuminated band indicator; noise-reducing adjustment on "A" band and noise reduction on "Spread bands" with RCA Victor Master Antenna.

The phonograph has a self-starting motor, crystal pick-up, and may be set to play ten-inch and twelve-inch records singly, or automatically. In the automatic position, seven twelve-inch; eight ten-inch; or a mixed group of seven, ten- and twelve-inch records, may be played in succession. The output of the pickup is "shorted" out when the pickup is on the pickup rest.

NOTE:—Reference should be made to the VR-8 Service Notes for Schematic and Wiring diagrams, Alignment Procedure, Adjustments for Electric Tuning, Replacement Parts List, etc. Models VR-8 and VR-10 differ in cabinet design only.



The above speaker plug and socket connections are common to the VR-8 and VR-10 receivers.



CAUTION: THIS ADJ. SCREW MUST PROJECT AT LEAST 3/4" FROM TOP OF CHASSIS TO PREVENT SHORTING +B.

Tube and Trimmer Locations



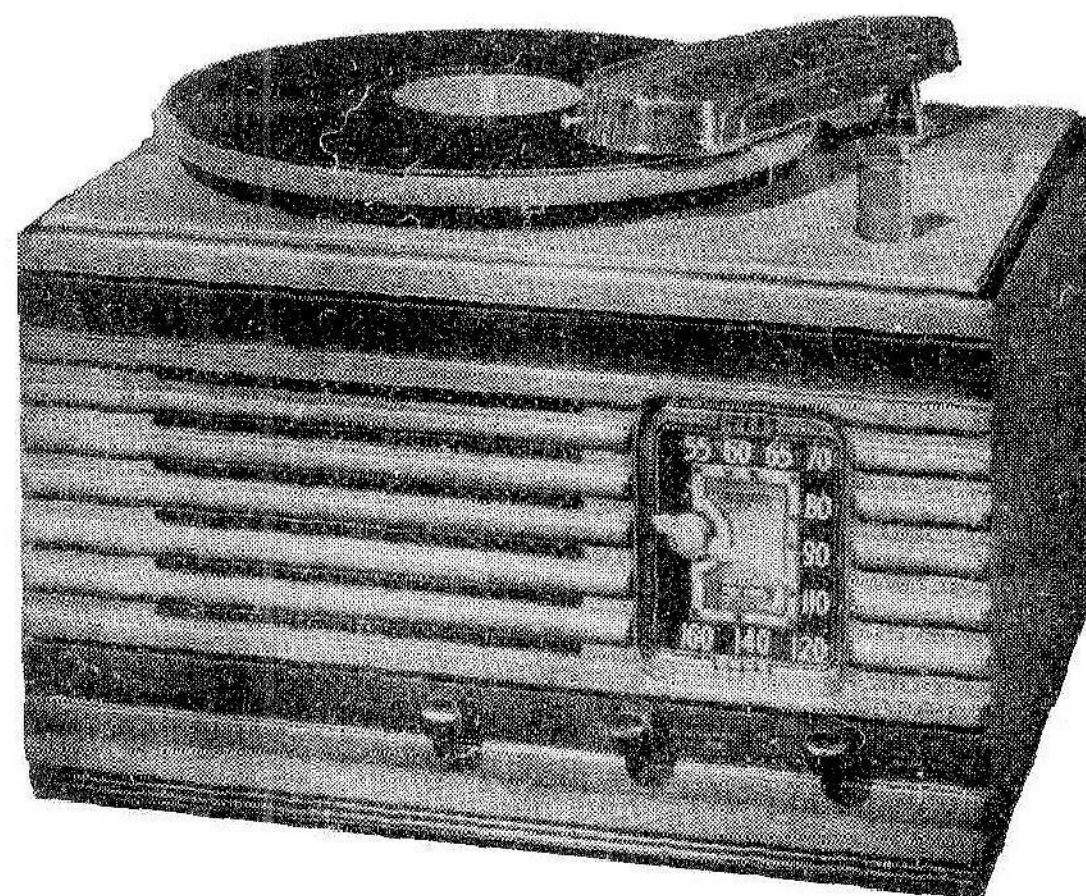
RCA Victor

MODEL VR-40

Five-Tube, Single-Band, AC, Victrola

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

Frequency Range 540-1,600 kc
Intermediate Frequency 455 kc

TUBE COMPLEMENT

(1) Type 12SA7 1st Det. Osc.
(2) Type 12SK7 I.F. Amplifier
(3) Type 12SQ7 2nd Det. A.V.C., A.F.
(4) Type 35L6GT Power Output
(5) Type 35Z5GT Rectifier
Dial Lamp Mazda No. 51, 7.5 volts, .2 amp.

POWER SUPPLY RATINGS

A 105-125 volts, 25 cycles, 40 watts
B 105-125 volts, 60 cycles, 40 watts

POWER OUTPUT (125-volt, 60-cycle supply)

Undistorted 1.0 watt
Maximum 1.5 watts

LOUDSPEAKER

Type 5-inch Electrodynamic
Voice-Coil Impedance 4.4 ohms at 400 cycles

PHONOGRAPH Synchronous (manual starting)

Records 10-inch and 12-inch, 78 r.p.m.
Pickup Crystal, 100,000 ohms at 1,000 c.p.s.
Average Output of Pickup .. 1½ volts at 1,000 c.p.s.
across ¼-meg. load

Mechanical Specifications

	Height	Width	Depth
Cabinet Dimensions (inches)	9	12¼	9⅝
Chassis Base (inches)	2½	9	5¼

Overall Chassis Height (inches) 6
Weight 16 lbs. (shipping)
Tuning Drive Ratio 1 to 1

General Description

The RCA Victor Model VR-40 is a five tube single band, superheterodyne receiver combined with a motor and crystal pickup unit to form a victrola of practical design. Although the receiver chassis is of the AC-DC type it can only be operated on AC of the proper rating, due to the phono motor. Features of design include:—Magnetite Core I.F. Trans-

formers; built in loop assembly with provision for use with an external antenna; Radio-phono switch incorporating the AC motor switch, beam power output tube; sensitive, five inch electrodynamic loudspeaker; light weight crystal pickup unit and a synchronous type manual starting motor.

CAUTION

Remove Power plug from outlet before servicing this receiver. Avoid contact of chassis or component parts to external ground.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that pointer is vertical.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 (I-F) grid in series with .01 mfd.	455 kc	Quiet point at 600 kc end of dial	C13, C14 (2nd I-F trans.)
2	Tuning condenser stator (ant.) in series with .01 mfd.			C11, C12 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter	1,600 kc	Full clockwise (out of mesh)	C8 (oscillator)
4		1,400 kc	Resonance on 1,400 kc signal	C3 (antenna)

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Radiotron Socket Voltages

Type	Plate	Screen Grid	Cathode	Filament
12SA7 Det.	90V	90V	—	12V
12SK7	90V	90	1.1V	12V
12SQ7	40V	—	—	12V
85L6GT	84V	90V	5V	35V
85Z5GT	114V	—	112V	35V

Note:—All voltages are measured to common wiring insulated from chassis with a line voltage of 117 volts.

Phonograph Motor Service Data

The synchronous motor used in this instrument is designed to be simple and foolproof. Among its many features are constancy of speed, low power consumption, single moving part, ease of starting, rubber damper, ease of repair and long life. The parts that may require attention are plainly shown by Figure 1. The motor is started by turning the radio-phono switch to "phono" position and giving the turntable a clockwise spin with the hand. Smooth starting and running will be insured by keeping the bearings well cleaned and oiled.

Rotor Adjustment

Use three 16-mil shims, spaced equally around the gap between rotor and stator. When rotor is suitably adjusted, securely tighten the three screws which hold the rotor to the turntable. The centering operation is very similar to that done with a dynamic speaker.

If top of rotor lamination assembly is not flush with top of stator laminations, additional steel washers should be inserted beneath the stator until it is raised to the desired level.

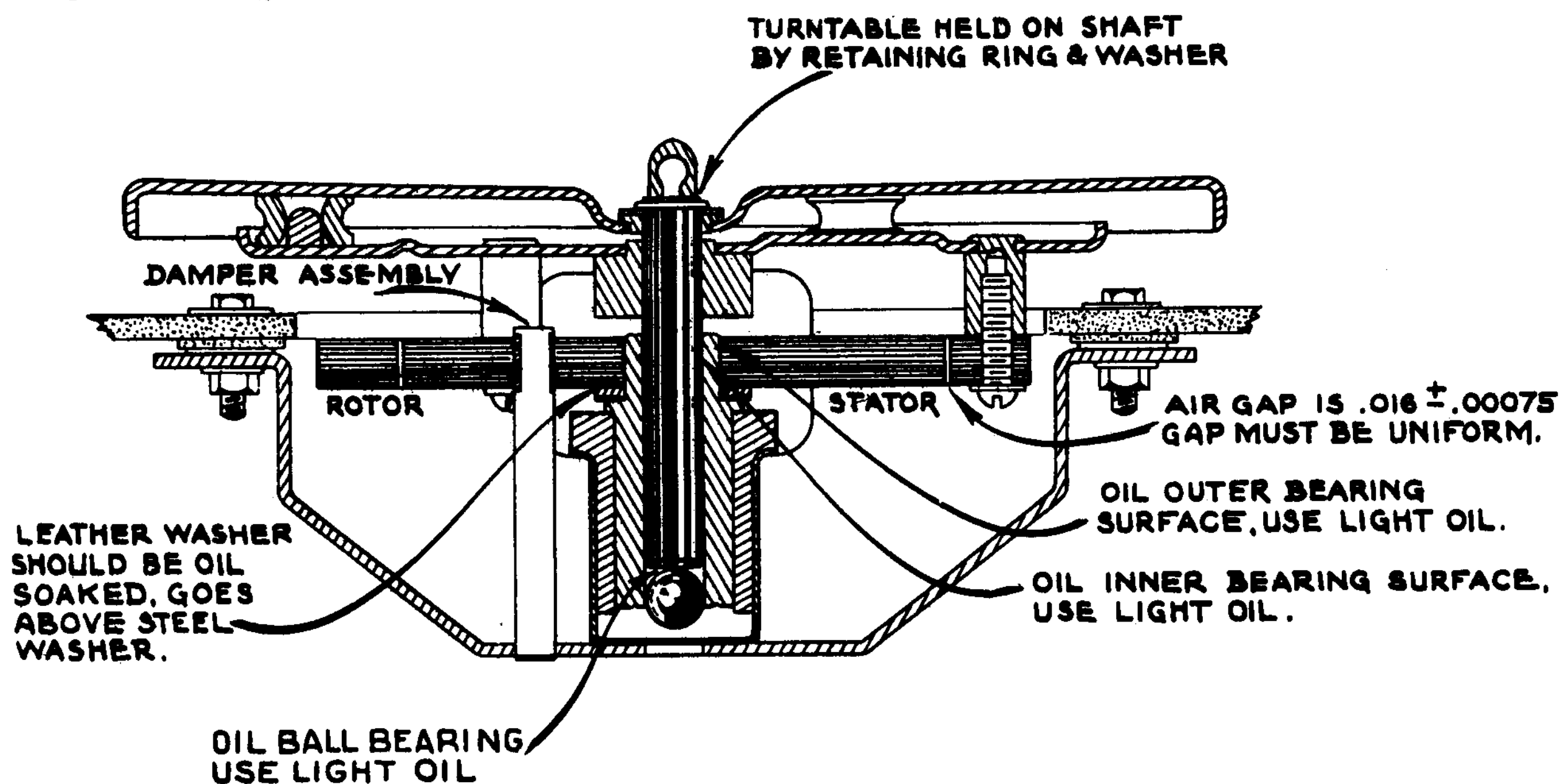


Figure 1—Motor Assembly

Hum and Vibration

A small amount of hum when starting, decreasing to a negligible amount while running, is normal. If excessive vibration occurs either at starting or running, it may be due to one of the following:

- (1) Insufficient lubrication in outer bearing or any other failure that will cause the stator to bind.
- (2) Metal washer above the leather washer at the bottom of the main bearing. It must be below.
- (3) Leather washer not oiled. When replacing the leather washer, make sure that it is thoroughly soaked in oil.
- (4) Motor not properly supported from motor board. Unless the motor is properly supported from the motor board, vibration will be excessive.

- (5) Burrs on salient poles of rotor or stator. They should be removed with fine emery cloth.

Removing the Rotor from the Stator

The rotor and turntable assembly simply rests on the ball bearing at the bottom of the vertical bearing, and may be removed by lifting out.

Lubrication

Both the rotor and stator have bearing surfaces about the center vertical axis. These bearings and the ball bearing at the bottom of the turntable's shaft should be oiled whenever motor is serviced. The leather washer beneath the stator is to be pliable and soaked in light oil.

Precautionary Lead Dress

1. Audio coupling capacitor to volume control must be dressed under the terminal board and down against the corner of the chassis.

2. The voice coil leads from the output transformer to the

speaker must be dressed away from the terminal on the terminal-board to which the above audio coupling capacitor is connected.

3. The output tube bypass condenser must be dressed away from the 12SQ7 tube.

REPLACEMENT PARTS FOR MODEL VR-40

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		REPRODUCER ASSEMBLIES	
12725	Capacitor-150 mmfd. (C5).....	32907	Cap-Dust cap for cone centre (Pkg.5).....
12694	Capacitor-220 mmfd. (C15,C16).....	S-2775	Coil-Field coil (L9).....
13894	Capacitor-390 mmfd. (C1).....	35066	Cone-Reproducer cone & voice coil (L7).....
4838	Capacitor-.005 mfd. (C23,C18).....	S-2777	Reproducer complete.....
11315	Capacitor-.015 mfd. (C17).....	MOTOR ASSEMBLIES	
4870	Capacitor-.025 mfd. (C2,C19,C20, C24,C25).....	S-2277	Base-Motor support,damper and bearing,cup assembly.....
4858	Capacitor-.01 mfd. (C6).....	31046	Bearing-Motor bearing assembly....
32787	Capacitor-.05 mfd. (C10).....	31041	Cap-Rubber spindle cap (Pkg.2)....
12484	Capacitor-0.25 mfd. (C7).....	S-3038	Coil-Set of 25 cycle motor coils..
S-2421	Capacitor-Electrolytic consisting of two 40 mfd. sections 25 cycle (C21,C22).....	S-3039	Coil-Set of 60 cycle motor coils..
35348	Capacitor-Electrolytic consisting of one 30 mfd. section and one 20 mfd.section 50 cycle (C21,C22)	31047	Cushion-Rubber cushion for bearing
S-2776	Coil-Oscillator coil (L1,L2).....	S-2269	Motor-110 volt,60 cy.motor complete (M1).....
S-2786	Condenser-2 gang variable tuning condenser and drum assembly (C3,C4,C8,C9).....	S-2270	Motor-110 volt,25 cy.motor complete (M1).....
32634	Cord-Condenser drum drive cord.....	S-2852	Mounting-Motor mounting assembly comprising screws, nuts, washers (1 complete set).....
35059	Dial-Station selector dial scale...	31040	Mounting-Turntable top, rubber mountings (Pkg.3).....
35063	Drum-Tuning condenser drive drum...	4577	Plug-Motor cable male plug.....
35062	Indicator-Station selector indicator pointer.....	S-2271	Retainer-Turntable top retaining ring, bushing and washer.....
11765	Lamp-Dial lamp.....	S-2273	Turntable-Turntable top plate 60 cycle.....
S-2850	Loop-Antenna loop assembly less name plate (L10).....	S-2274	Turntable-Turntable top plate 25 cycle.....
33558	Resistor-86 ohm, flexible type (R12).....	4083	Washer-Leather spacing washer (Pkg.10).....
32535	Resistor-120 ohm,flexible type(R10)	14231	Washer-Metal spacing washer (Pkg.10).....
S-2575	Resistor-100 ohm,1/4 watt (R4).....	PICKUP ASSEMBLIES	
13998	Resistor-22,000 ohm,1/4 watt (R1)..	S-2451	Base-Pickup arm pivot shaft, and base assembly.....
12412	Resistor-47,000 ohm,1/4 watt (R13)..	33122	Crystal-Pickup crystal and needle screw complete with viscoloid damper.....
13715	Resistor-68,000 ohm,1/4 watt (R9)..	33123	Damper-Viscoloid damper for pickup armature.....
12264	Resistor-220,000 ohm,1/4 watt (R2,R7).....	S-2853	Pickup arm and crystal assembly complete.....
12285	Resistor-470,000 ohm,1/4 watt (R8)..	33529	Screw-Needle screw.....
13730	Resistor-1.0 meg.,1/4 watt (R3)....	33591	Shell-Pickup shell less crystal unit and base.....
12679	Resistor-2.2 meg.,1/4 watt (R11)...	MISCELLANEOUS ASSEMBLIES	
13601	Resistor-10 meg., 1/4 watt (R6)....	35079	Crystal-Station selector dial crystal.....
35058	Shaft-Tuning condenser drive shaft.	S-2778	Knob-Volume, tuning or radio phono control knob.....
31319	Socket-Radiotron socket.....		
34449	Socket-Pilot lamp socket.....		
S-2854	Socket-Phono input socket and insulating plate.....		
30585	Spring-Drive cord tension spring (Pkg.2).....		
S-2851	Switch-Radio phono switch (S1).....		
35056	Transformer-Output transformer (T1)		
S-2787	Transformer-First I.F. transformer (L3,L4,C11,C12).....		
S-2788	Transformer-Second I.F. transformer (L5,L6,C13,C14).....		
S-2774	Volume control and power switch (R5,S2).....		

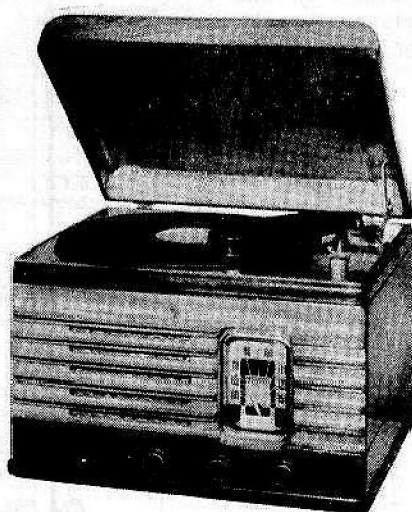


RCA Victor

VICTROLA MODEL VR-41

Five-Tube, Single-Band, A-C, Superheterodyne Victrola TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

Frequency Range 540 to 1,600 k.c.
R.F. Alignment Frequency 1,500 k.c. (osc., ant.)
Intermediate Frequency 455 k.c.

LOUDSPEAKER..... CRL-515-2
Type 6 inch Permanent Magnet Dynamic
Voice-coil Impedance 3 ohms at 400 cycles

Tube Complement

(1) Type 6SA7 First-Det., Osc.
(2) Type 6SK7..... Intermediate Frequency Amp.
(3) Type 6SQ7..... Second-Det., A.V.C., A.F.

(4) Type 6K6-G..... Power Output
(5) Type 5Y4G..... Full Wave Rectifier

POWER SUPPLY RATING

Rating A..... 105-125 volts, 50-60 cycle 90 watts
Rating B..... 105-125 volts, 25-60 cycle 90 watts

PHONOGRAPH MOTOR

Self starting, constant speed, induction type

POWER OUTPUT

Undistorted 1 watt
Maximum 2 watts
Crystal Pickup.
Impedance..... 100,000 ohms at 1000 C.P.S.
Average Output..... 1.5 volts at 1000 C.P.S.
across 500,000 ohm load

Mechanical Specifications

	Height	Width	Depth
Cabinet Dimensions	11 1/4 inches	15 1/2 inches	13 1/4 inches
Chassis Base Dimensions	1 7/8 inches	9 3/4 inches	5 7/8 inches
Overall Chassis Height			4 inches
Weight (net)			25 pounds
Weight (shipping)			28 pounds

General Description

The model VR-41 is a five tube single band Victrola combining the latest developments in both radio and phonograph circuits. The mechanism is housed in a table type cabinet of modern design. Features of the radio include a built-in loop antenna: new single ended, metal tubes; full automatic volume control; stabilized oscillator circuit; aurally compensated volume control; full vision dial; radio phono tone switch and a six inch Permanent Magnet dynamic high efficiency loudspeaker.

Features of the Victrola include: crystal pickup, constant speed rim drive synchronous motor and an automatic motor start switch.

Alignment Procedure

Cathode-ray Alignment is the preferable method. Connections for the oscillograph are shown in the wiring 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 a-v-c action.

Pre-setting Dial. With gang condenser in full mesh position, move pointer to coincide with calibration mark at the low frequency end of dial.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Tune radio dial to—	Adjust the following for max. peak output
No. 1	6SK7 I-F grid, in series with .01 mfd.	455 kc	Quiet point between 650-750 kc	L5 and L6 (2nd I-F Transformer) L3 and L4 (1st I-F Transformer)
No. 2	6SA7 1st-det. grid in series with .01 mfd.	455 kc		
No. 3	Antenna lead, in series with 300 ohms	1,500 kc	1,500 kc	C5 *(oscillator) C2 (antenna)

* Trimmer C21 on gang condenser should be unscrewed one complete turn before adjusting C5.

Radiotron Socket Voltages

Type	Plate	Screen Grid	Cathode	Filament
6SA7 det.	195 V	65 V	0.V	6.3 V. A.C.
6SA7 osc.	65 V	...	...	6.3 V. A.C.
6SK7	195 V	65 V	0.V	6.3 V. A.C.
6SQ7 amp.	62 V	...	0.V	6.3 V. A.C.
6K6G	185 V	195 V	12.5 V	6.3 V. A.C.
5Y4G	290/290 V	...	295 V	5 V. A.C.

The above measurements are all made to chassis. Measurements made with set tuned to quiet point, volume control set at minimum, using 1,000-ohm-per-volt meter, having ranges of 10, 50, 250, and 500 volts. (Use nearest range above the specified measured voltage.)

All the above values should hold within approximately $\pm 20\%$ for 115 volt, 25-60 cycle supply.

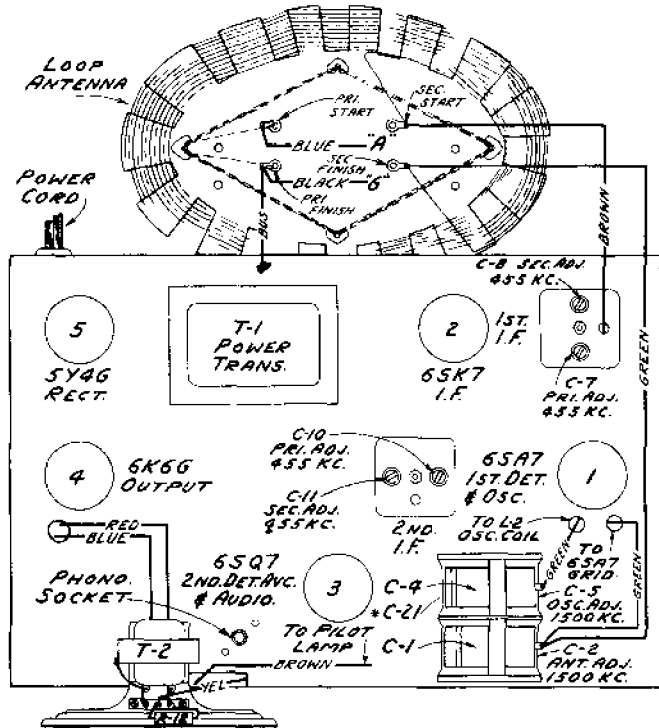


Fig. No. 1 Tube & Trimmer Locations

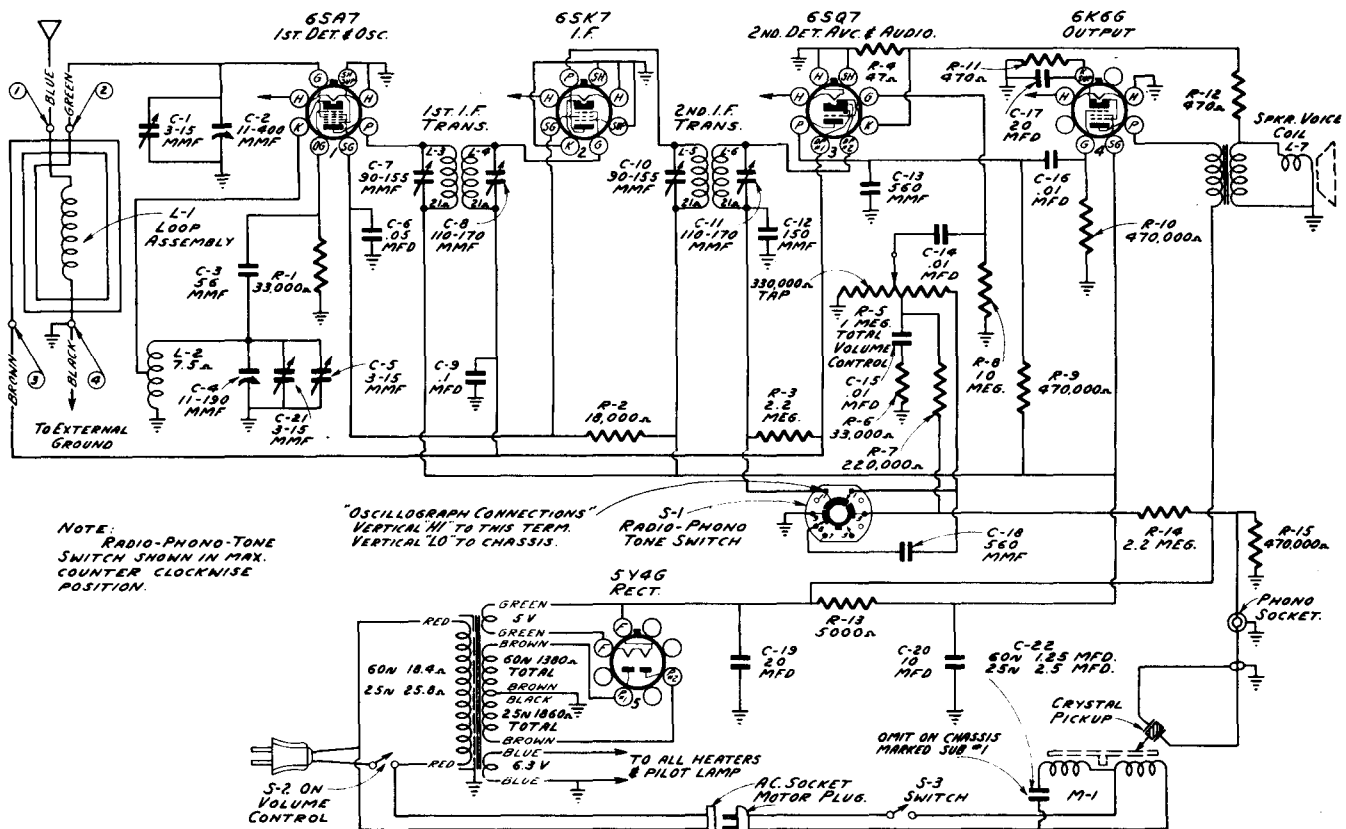


Fig No. 2 Schematic Circuit Diagram

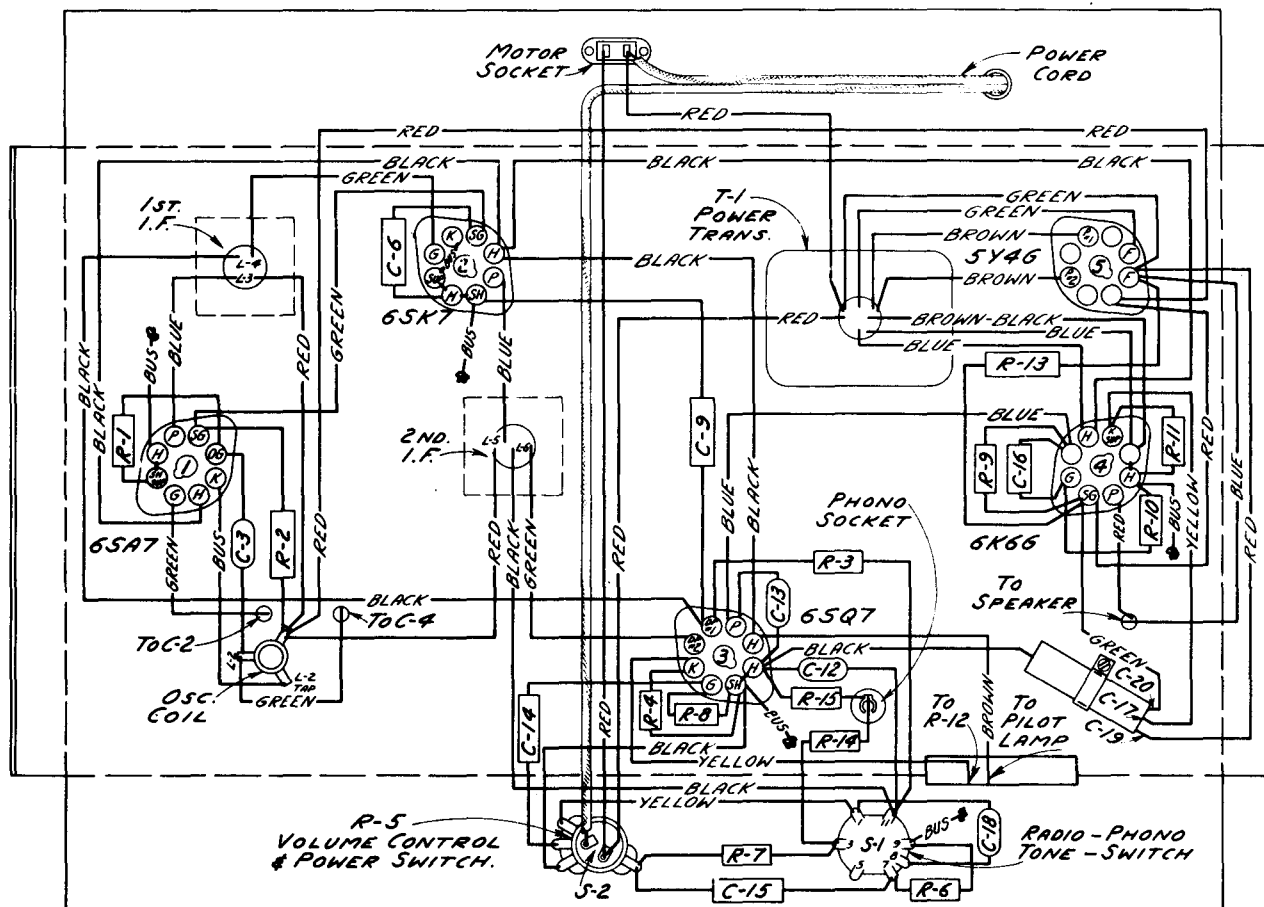


Fig. No. 3 Chassis Wiring Diagram

Precautionary Lead Dress

- (1) Keep a-c leads away from volume-control wiring.
- (2) Keep lead from high side of volume control away from plate circuit of 6SQ7 tube.
- (3) Dress speaker leads to front of chassis away from 6K6G tube.

REPLACEMENT PARTS FOR MODEL VR-41

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		MOTOR ASSEMBLIES	
12723	Capacitor-56 mmfd. (C3).....	36986	Arm-Drive wheel or idler wheel support arm.....
12725	Capacitor-150 mmfd. (C12).....	36989	Bushing-motor mounting rubber bushings.....
12537	Capacitor-560 mmfd. (C13,C18).....	36990	Capacitor-motor capacitor 1.25 mfd. for 60 cycle motor (C22).....
4858	Capacitor-.01 mfd. (C14,C15).....	4577	Connector-2 prong male connector plug.....
14393	Capacitor-.01 mfd. (C16).....	36984	Motor-110 volt 60 cycle motor.....
30847	Capacitor-.05 mfd. (C6).....	S-2872	Motor-110 volt 25 cycle motor.....
4839	Capacitor-.1 mfd. (C9).....	36995	Plate-Motor support plate with turntable bearing.....
S-3069	Capacitor-Electrolytic, comprising 2 sections of 20 mfd. and 1 section of 10 mfd. (C17,C19,C20)...	36997	Spring-Idler tension spring (Pkg.2)...
S-2707	Coil-Oscillator coil (L2).....	36996	Spindle-Turntable spindle.....
S-2708	Condenser-2 gang variable tuning condenser (C1,C2,C4,C5,C21).....	34422	Turntable 9 inch diameter.....
S-2709	Cord-Variable condenser drum drive cord.....	36994	Wheel-Rubber tired idler or drive wheel.....
S-2710	Dial-Station selector dial scale assembly.....	MOTOR ASSEMBLIES	
S-2712	Indicator-Station selector indicator pointer.....	Chassis Marked Sub.1	
11765	Lamp-Dial lamp.....	4577	Connector-2 prong male connector plug.....
S-3002	Loop-Antenna loop assembly (L1)....	S-3077	Motor-110 volt 60 cyc. motor.....
S-3074	Resistor-Wire wound resistor 5000 ohms (R13).....	S-3078	Motor-110 volt 25 cyc. motor.....
S-3075	Resistor-47 ohm 1/2 watt (R4).....	S-3079	Spindle-Turntable spindle.....
30499	Resistor-470 ohm 1/2 watt (R11,R12)...	S-3080	Spring-Drive wheel tension spring (Pkg.2).....
S-2060	Resistor-18,000 ohm, 1 watt (R2)...	S-3081	Turntable-Turntable less spindle....
12454	Resistor-33,000 ohm 1/4 watt (R1,R6).....	S-3082	Wheel-Rubber tired drive wheel.....
12264	Resistor-220,000 ohm, 1/4 watt (R7)...	AUTOMATIC SWITCH ASSEMBLY	
12285	Resistor-470,000 ohm, 1/4 watt (R9,R10,R15).....	S-3083	Bracket-A.C. switch bracket and hub..
12679	Resistor-2.2 meg., 1/4 watt (R3,R14)...	S-3084	Screw-Set screw for hub (Pkg.2).....
13601	Resistor-10 meg. 1/4 watt (R8).....	S-3085	Switch-A.C. motor switch only (S3)...
14887	Retainer-Drive shaft or pulley retainer (Pkg.10).....	PICKUP AND ARM ASSEMBLIES	
3903	Screw-Drive cord drum set screw (Pkg.10).....	S-2451	Base-Pickup arm pivot shaft and base assembly.....
S-3076	Shaft-Station selector drive shaft.....	33122	Crystal-Pickup crystal and needle screw.....
S-2824	Socket-A.C. socket.....	33123	Damper-Viscoid damper for pickup armature.....
S-2719	Socket-Pilot lamp socket and lead..	S-2853	Pickup arm and crystal assembly complete.....
14278	Socket-Phono socket.....	33529	Screw-Needle screw.....
31251	Socket-Tube socket.....	33591	Shell-Pickup shell less crystal unit and base.....
31418	Spring-Drive cord tension spring (Pkg.3).....	MISCELLANEOUS ASSEMBLIES	
S-3001	Switch-Radio phono Tone switch (S1)...	S-2706	Crystal-Dial crystal.....
S-2715	Transformer-1st I.F. transformer (L3,L4,C7,C8).....	S-2368	Escutcheon-Station selector dial escutcheon.....
S-2716	Transformer-2nd I.F. transformer (L5,L6,C10,C11).....	S-3086	Knob-Tone control knob.....
S-2316	Transformer-Power transformer 105/125 volt 25-60 cycle.....	S-3087	Knob-Volume control or tuning knob..
S-2317	Transformer-Power transformer 105/125 volt 50-60 cycle.....	30900	Spring-Knob spring (Pkg.2).....
S-2998	Volume control and power switch (R5,S2).....		
SPEAKER ASSEMBLIES			
CRL 515-2 6" P.M.L.			
32907	Cap-Dust cap for cone centre (Pkg.5)		
35441	Cone-Speaker cone (L7).....		
S-3003	Speaker-Complete.....		
S-3042	Transformer-Output transformer.....		



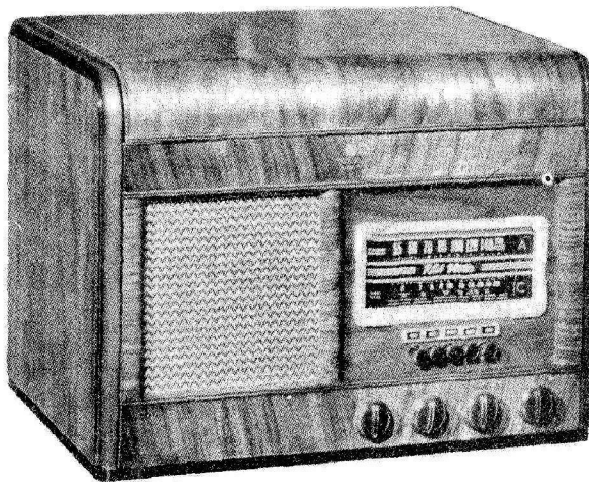
RCA Victor

VICTROLA MODEL VR-42

Five-Tube, Two-Band, A-C, Superheterodyne Radio-Phonograph Combination

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model VR-42

Electrical Specifications

FREQUENCY RANGES

Standard Broadcast	540-1550 kc
Short Wave	5.6-21 mc
Intermediate Frequency	455 kc

TUBE COMPLEMENT

(1) Type-6SA7	1st Detector—Oscillator
(2) Type-6SK7	I-F Amplifier
(3) Type-6SQ7	2nd Detector, A.V.C., and A-F Amplifier
(4) Type-6F6-G	Power Output
(5) Type-5Y4-G	Rectifier
Pilot Lamps (2) ..	Mazda No. 51, 7.5 volts, 0.2 amp.

POWER OUTPUT RATING

Undistorted	2.5 watts
Maximum	4.0 watts

LOUDSPEAKER (CRL517-1)

Type	6-inch Electrodynamic
V.C. Impedance	3.4 ohms at 400 cycles

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 90 watts
Rating B	105-125 volts, 25-60 cycles, 90 watts

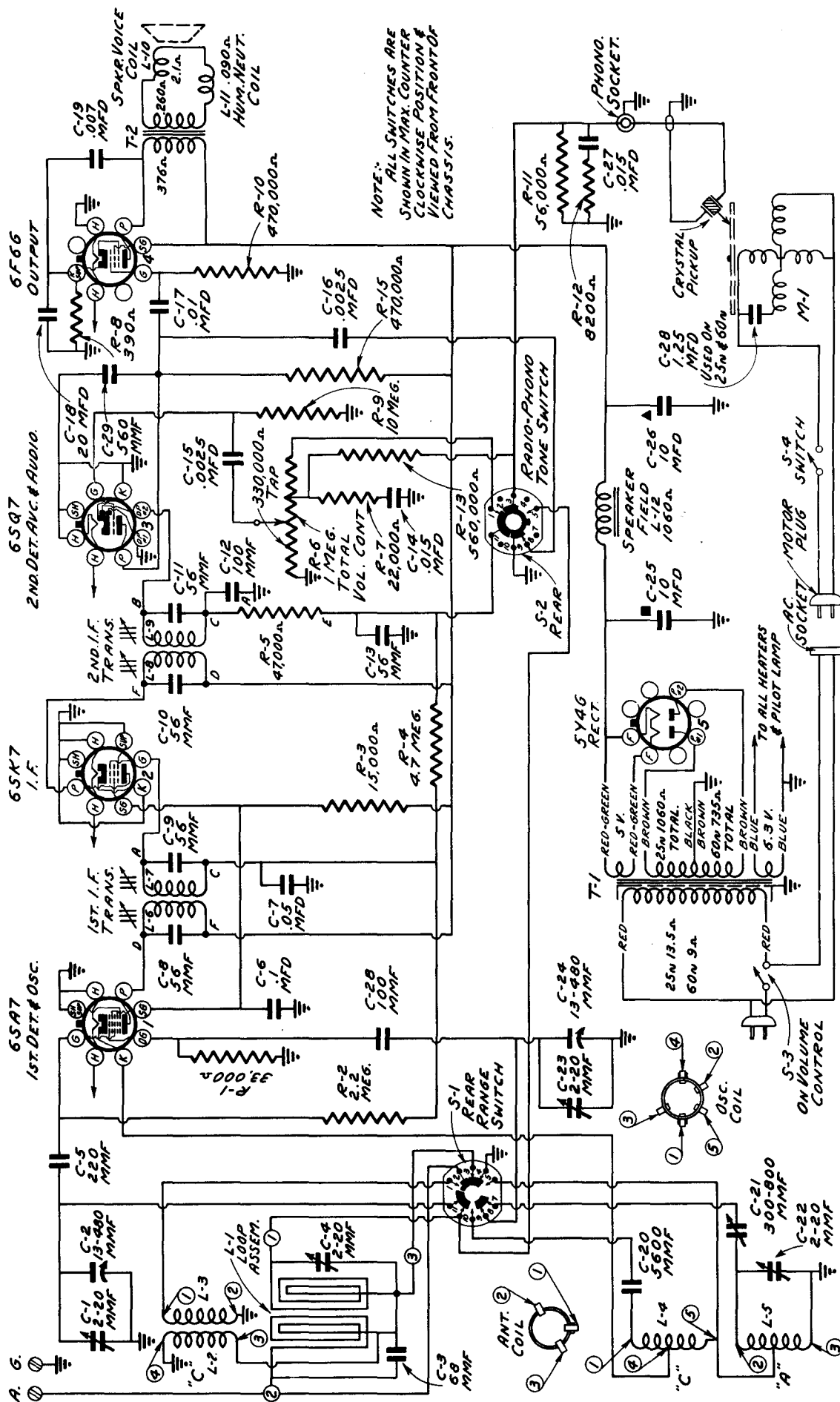
PHONOGRAPH MOTOR—Self-starting, constant speed, induction type Crystal Pickup.

Impedance	100,000 ohms at 1000 C.P.S.
Average Output	1.5 volts at 1000 C.P.S. across 500,000 ohm load

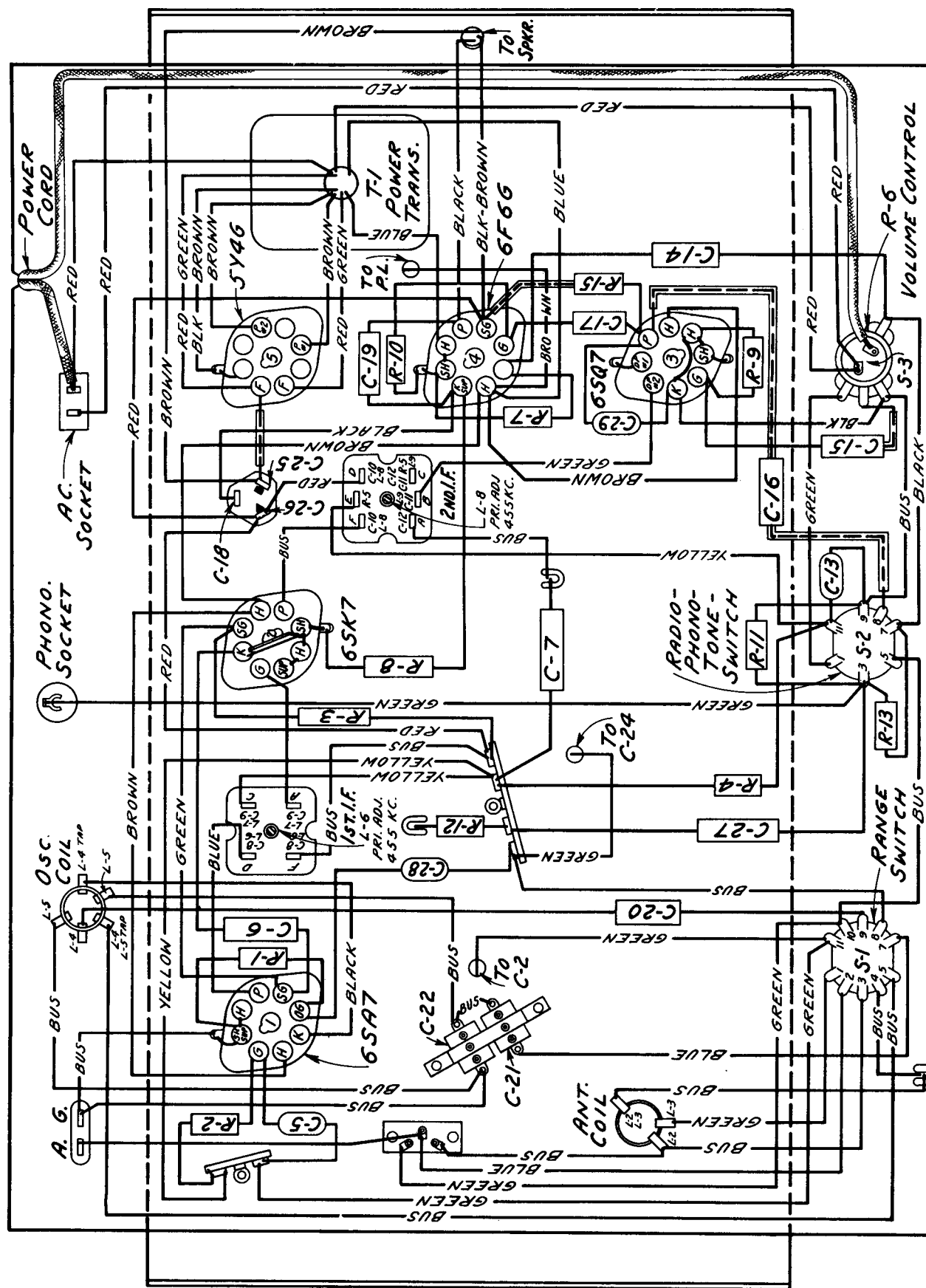
General Description

The Model VR-42 is a five tube, two band Victrola combining the latest developments in both radio and phonograph circuits. The mechanism is housed in a table type cabinet of modern design. Features of this model include: Crystal pickup, and a rim drive, con-

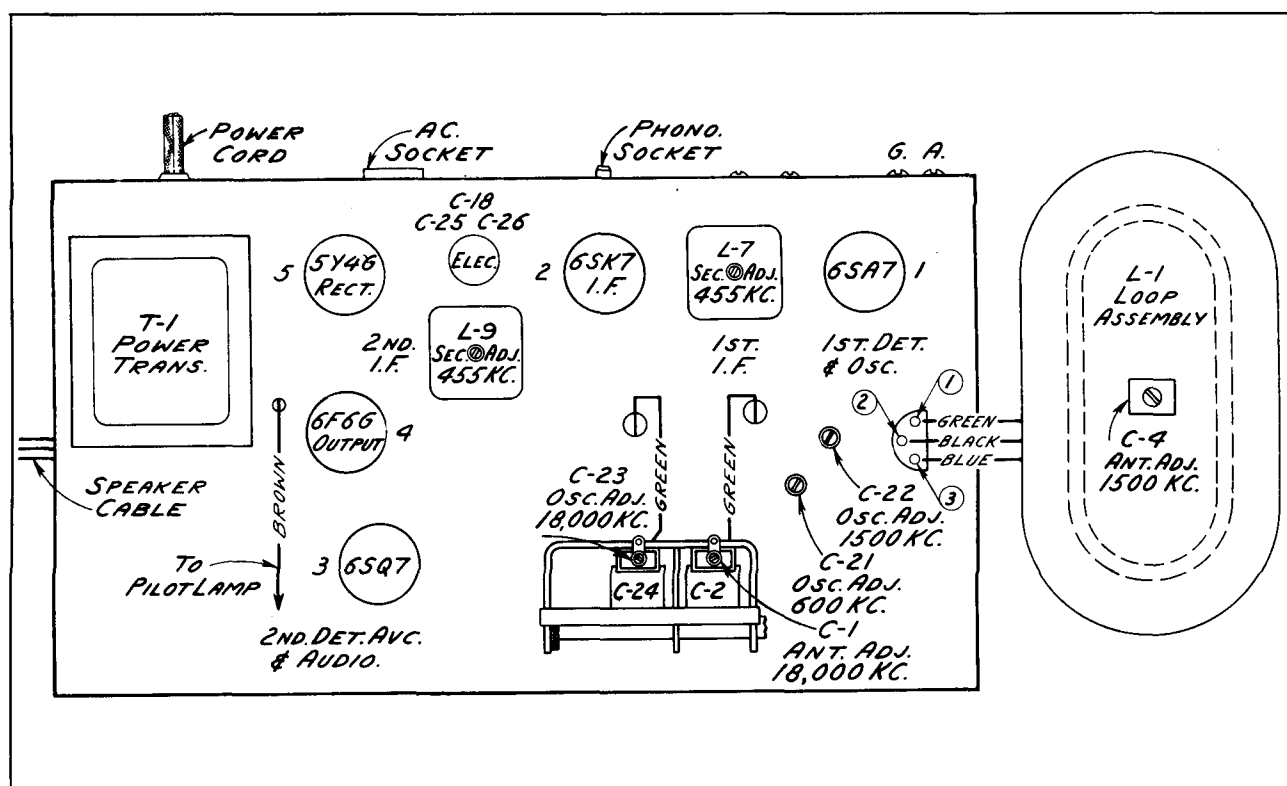
stant speed synchronous motor in the phonograph; five push buttons, loop antenna on the "A" band, Radio-Phono tone switch, aurally compensated volume control, large glass dial and a six inch high efficiency speaker in the radio.



Schematic Diagram



Chassis Wiring Diagram



Alignment Procedure

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

Test Oscillator.—For all alignment operations, keep the oscillator output as low as possible to avoid a-v-c action.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	6SK7 I-F grid through 0.1 mfd capacitor and ground	455 kc	Quiet point between 600-800 kc	L9 & L10 (2nd I-F trans.)
2	6SA7 1st det. grid through 0.1 mfd capacitor and ground			L7 & L8 (1st I-F trans.)
3	Ant. & Grd. Terminal Board	18 mc	Rock at 18 mc	C-1 antenna† C-23 oscillator
4	Radiation Loop consisting of two turns of wire located 4 to 6 feet from receiver	600 kc	Rock at 600 kc	C-21 oscillator
5		1,500 kc	1,500 kc	C-4 antenna C-22 oscillator

When making adjustments 4 and 5 the chassis must be in the cabinet, the loop connected, and all leads in their normal positions. When mounting chassis in cabinet if calibration does not line up with dial scale mounted on cabinet move pointer to agree with dial scale on cabinet.

† If two peaks can be obtained use low frequency (maximum capacity) peak.

RADIOTRON SOCKET VOLTAGES

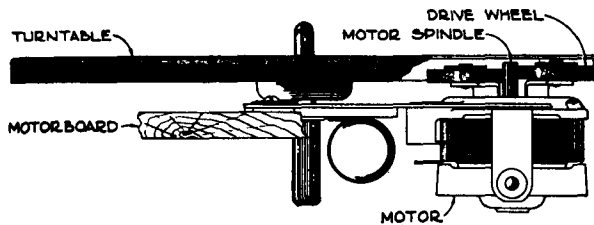
Type	Function	Plate	Screen Grid	Cathode	Heater
6SA7	Det.	260V	80V	....	6.6V
	Osc.	....	....	2.3V	....
6SK7	I.F.	260V	80V	....	6.6V
6SQ7	Audio	80*V	....	....	6.6V
6F6-G	Output	245V	260V	16V	6.6V
5Y4-G	Rectifier	....	....	350V	5.0V

*Cannot be measured with an ordinary voltmeter.

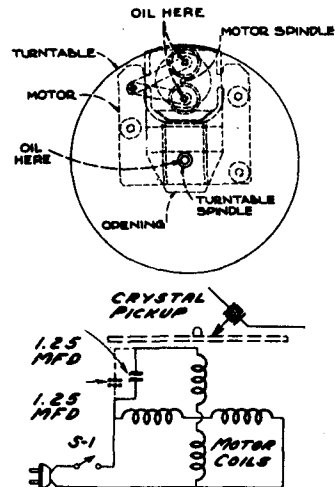
The above voltages are measured with a 1000 ohm-per-volt meter. All values should hold within plus or minus 20 percent.

The phonograph motor has its bearing filled with oil and sealed at the factory and hence should not require lubrication in the field. However the two rubber tired idler pulleys should have their bearings lubricated occasionally with S.A.E. 10 oil. Care should be taken not to get any oil, grease, or other foreign matter on the rubber tires. These tires and the motor spindle should be cleaned occasionally with quick drying naphtha.

The turntable spindle bearing should also be lubricated occasionally with S.A.E. 10 oil.



Motor Detail



Motor and Pickup Circuit

Push Button Adjustments

The push buttons should be adjusted for five favorite stations after the receiver has had a brief warm-up period.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high.

Proceed as follows:—

1. Set the Radio-Phono knob to "Radio" and turn the range selector to "A" band position.

2. Loosen the five push buttons by turning in a counter clockwise direction one turn.

3. Accurately tune in the first station by means of the tuning knob.

4. With station accurately tuned in, press in the first push button and tighten.

5. Proceed in a similar manner to adjust the remainder of the push buttons.

6. Place call letter tabs in openings provided.

REPLACEMENT PARTS FOR MODEL VR-42

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			
S-2482	Board-Ant.Gnd. Terminal board.....	12285	Resistor-470,000 ohm, $\frac{1}{2}$ watt (R10,R15)
S-2466	Capacitor-Adjustable capacitor one 2-20 mmfd; one 300-800 mmfd; sections (C21,C22).....	12486	Resistor-560,000 ohm, $\frac{1}{2}$ watt (R13)...
12723	Capacitor-56 mmfd. (C13).....	12679	Resistor-2.2 meg., $\frac{1}{2}$ watt (R2).....
13057	Capacitor-68 mmfd. (C3).....	S-2038	Resistor-4.7 meg., $\frac{1}{2}$ watt (R4).....
12720	Capacitor-100 mmfd. (C28).....	13601	Resistor-10 meg., $\frac{1}{2}$ watt (R9).....
12694	Capacitor-220 mmfd. (C5).....	S-2867	Shaft-Station selector drive shaft...
12537	Capacitor-560 mmfd. (C29).....	31319	Socket-Tube socket.....
13895	Capacitor-5600 mmfd. (C20).....	31364	Socket-Dial lamp socket.....
5107	Capacitor-.0025 mfd. (C15,C16).....	14278	Socket-Phone input socket.....
5148	Capacitor-.007 mfd. (C19).....	30585	Spring-Drive cord tension spring
11315	Capacitor-.015 mfd. (C14,C27).....	Pkg.3	.....
32787	Capacitor-.05 mfd. (C7).....	S-2824	Socket-A.C. Input socket.....
4839	Capacitor-0.1 mfd. (C6).....	S-2868	Switch-Range switch (S1).....
4858	Capacitor-.01 mfd. (C17).....	S-2869	Switch-Phono Tone Switch (S2).....
32240	Capacitor-Electrolytic comprising two 10 mfd., one 20 mfd., sections (C18,C25,C26).....	S-2861	Transformer-1st I.F. Transformer (L6,L7,C8,C9).....
S-2856	Coil-"C" band antenna coil (L2,L3)....	32825	Transformer-2nd I.F. Transformer (L8,L9,C10,C11,R5).....
S-2857	Coil-Oscillator coil (L4,L5).....	S-2457	Transformer-Power transformer 110 volt, 50/60 cycle.....
S-2823	Condenser-2 gang variable tuning condenser complete with push button mechanism (C1,C2,C23,C24).....	33619	Transformer-Power transformer 110 volt, 25 cycle.....
S-2837	Cord-Variable condenser drum drive cord.....	S-2870	Volume control and power switch (R6,S3).....
33633	Indicator-Station selector indicator pointer.....	REPRODUCER ASSEMBLIES (CRL 517-1) (6")	
11765	Lamp-Dial lamp Mazda #51.....	32907	Cap-Dust cap for cone center (Pkg.5).....
5119	Plug-3 contact female speaker plug...	33077	Coil-Field coil (L12).....
31388	Resistor-390 ohm, 1 watt (R8).....	32934	Cone-Reproducer cone and voice coil (L10).....
S-2858	Resistor-8,200 ohm, $\frac{1}{2}$ watt (R12).....	5118	Plug-3 contact male plug.....
33489	Resistor-15,000 ohm, $\frac{1}{2}$ watt (R3).....	S-2875	Reproducer complete.....
13998	Resistor-22,000 ohm, $\frac{1}{2}$ watt (R7).....	32905	Transformer-Output transformer (T2)...
12454	Resistor-33,000 ohm, $\frac{1}{2}$ watt (R1).....		
12286	Resistor-56,000 ohm, $\frac{1}{2}$ watt (R11)....		

REPLACEMENT PARTS FOR MODEL VR-42 (Cont'd.)

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
MOTOR ASSEMBLIES		PICKUP AND ARM ASSEMBLIES	
36986	Arm-Drive wheel or idler arm for 60 cycle.....	S-2451	Base-Pickup arm pivot shaft and base assembly.....
S-3261	Arm-Drive wheel or idler arm for 25 cycle.....	33122	Crystal-Pickup crystal and needle screw complete.....
36989	Bushing-Motor mounting rubber bushing.....	33123	Damper-Viscoloid complete for pickup armature.....
36990	Capacitor-1.25 mfd. motor capacitor (2 used on 25 cycle).....	S-2853	Pickup arm and crystal assembly complete.....
36984	Motor-110 volt 60 cycle (motor only).....	33529	Screw-Needle screw.....
S-2872	Motor-110 volt 25 cycle (motor only).....	33591	Shell-Pickup shell less crystal unit and base.....
36995	Plate-Motor support plate 60 cye..	MISCELLANEOUS ASSEMBLIES	
S-3262	Plate-Motor support plate 25 cye..	S-2641	Button-Station selector push button.....
36996	Spindle-Turntable spindle.....	S-2862	Dial-Station selector dial scale..
36997	Spring-Idler tension spring (60 cycle) (Pkg.2).....	32994	Escutcheon-Push button escutcheon.
S-3263	Spring-Idler tension spring (25 cycle) (Pkg.2).....	S-2863	Escutcheon-Dial scale escutcheon..
34422	Turntable (9 in. diameter).....	S-2873	Knob-Tuning, range, tone or volume Control knob.....
36994	Wheel-Rubber tired idler or drive wheel.....	S-2871	Loop-Antenna loop assembly (11,C3,C4).....
AUTOMATIC SWITCH ASSEMBLIES		31589	Marker-Station call letter markers (1 set).....
36772	Cam-Cam assembly comprising main and auxiliary cam, hub and set screw.....	S-2874	Mounting-Motor switch mounting hardware.....
32869	Screw-Set screw for cam hub(Pkg.10)	14270	Spring-Knob retaining spring (Pkg.5).....
36521	Spring-Actuating lever tension spring (Pkg.2).....	34422	Turntable-Phonograph turntable less spindle.....
36529	Switch-Contact and plunger (S1)		



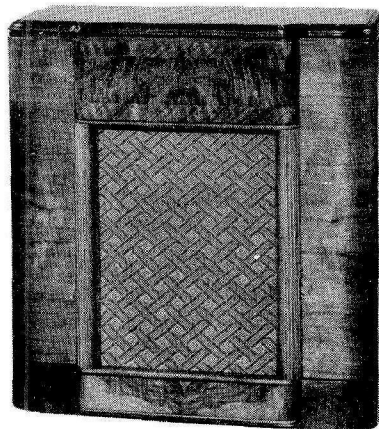
RCA Victor

VICTROLA MODEL VR-50

Six-Tube, Two-Band, A-C, Superheterodyne, Victrola

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model VR-50

Electrical Specifications

FREQUENCY RANGES

"Standard Broadcast" (A) 540-1,720 kc "Short Wave" (C) 7.0-22 mc
Intermediate Frequency 455 kc

TUBE COMPLEMENT

(1) Type-6SA7 First Detector—Oscillator	(4) Type-6F6-G Power Output
(2) Type-6SK7 .. Intermediate-Frequency Amplifier	(5) Type-5Y4G Rectifier
(3) Type-6SQ7 .. Second Detector, 1st A-F & A.V.C.	(6) Type-6U5 "Magic Eye" Tuning Indicator

Pilot Lamps Mazda 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS

A	105-125 volts,	60 cycles, 115 watts
B	105-125 volts,	25 cycles, 115 watts

POWER OUTPUT

Undistorted 2.5 watts
Maximum 4.0 watts

PHONOGRAPH

Type Automatic
Record Capacity.....Eight 10-inch or seven 12-inch
Turntable Speed 78 r.p.m.

LOUDSPEAKER

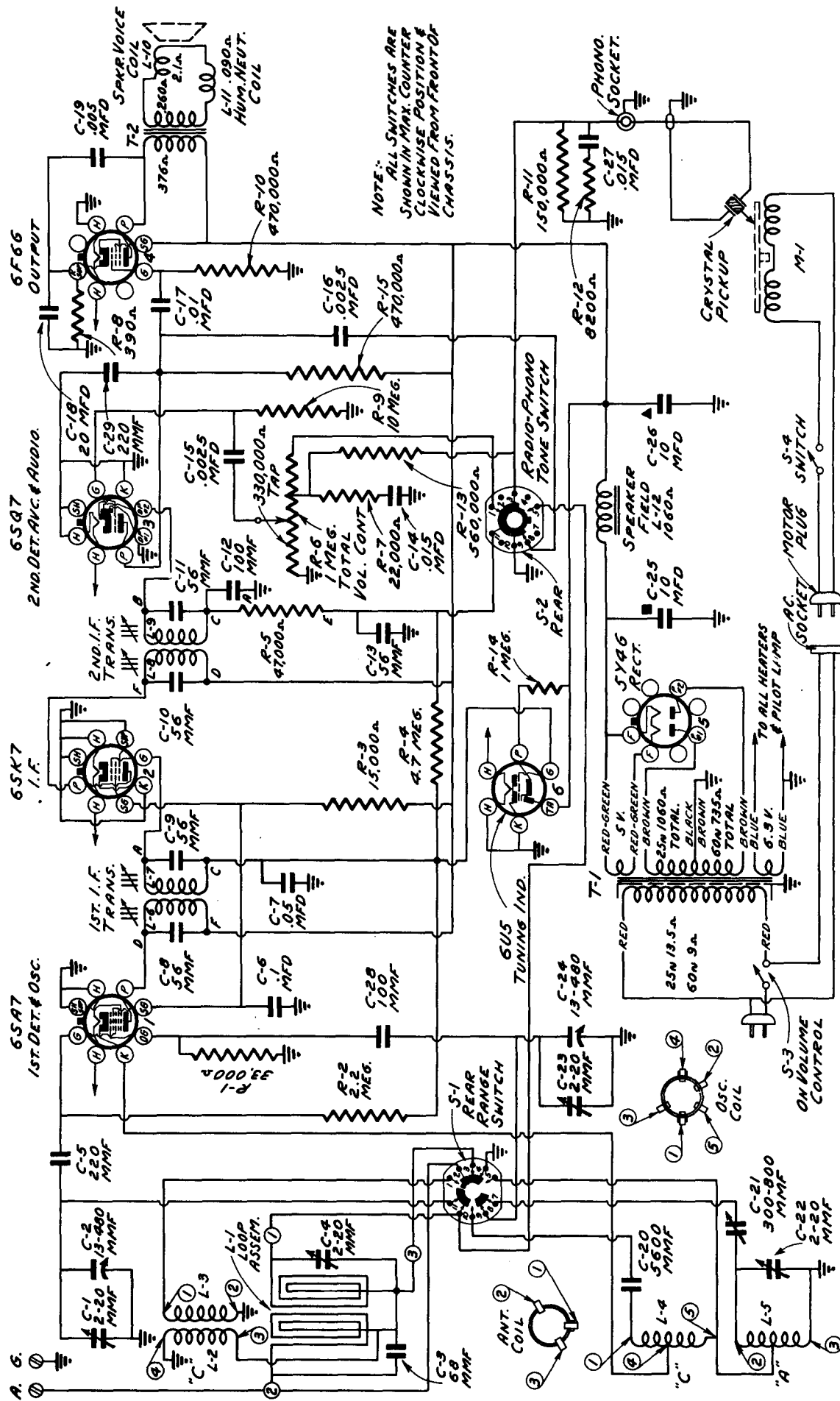
Type 12-inch Electrodynamic
Voice Coil Impedance 2.2 ohms at 400 cycles

PICKUP

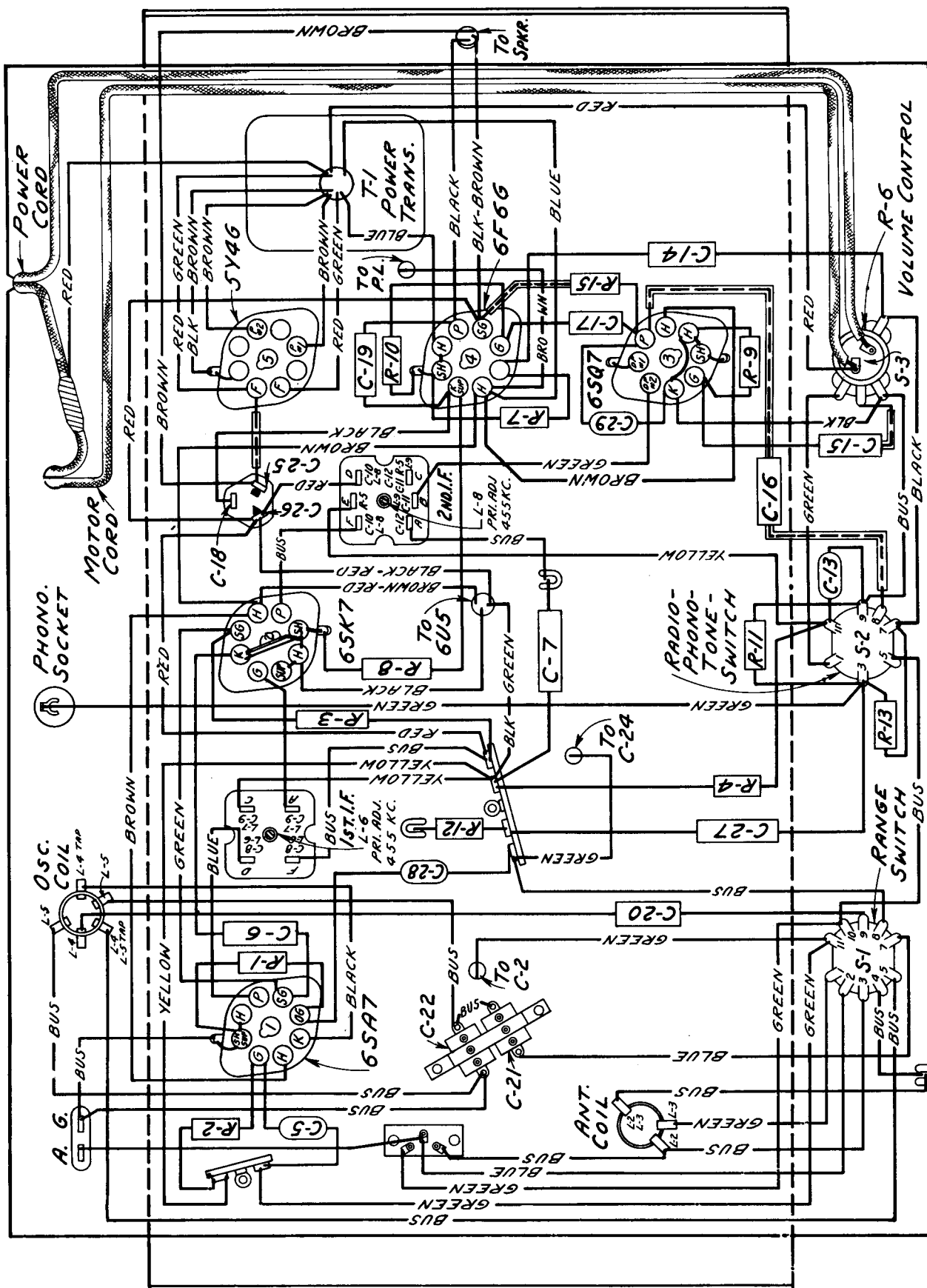
Type Crystal
Impedance 100,000 ohms at 1,000 cycles
Average Output 1.5 volts at 1,000 cycles
across 500,000 ohm load

Mechanical Specifications

Height	35 1/2 inches
Width	32 3/4 inches
Depth	17 inches
Net Weight	90 pounds
Shipping Weight	110 pounds



Schematic Diagram

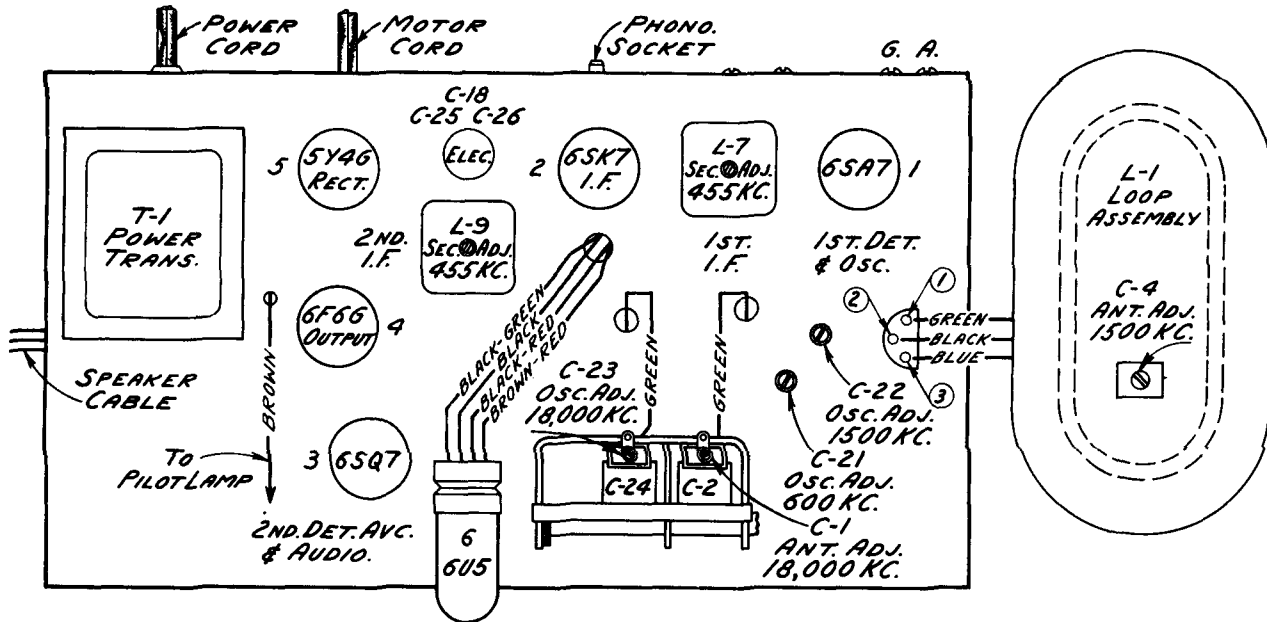


Chassis Wiring Diagram

General Description

The RCA Victrola Model VR-50 is a deluxe combination radio and phonograph housed in a console cabinet of exceptional beauty. The automatic phonograph incorporates the type RP152E mechanism which uses the rim drive type of motor. Reference to the RP152E service notes will disclose details of

adjustment. Features of design include:—Magic loop antenna, Magic Eye tuning indicator, aurally compensated volume control, Radio-Phono tone switch, stabilized oscillator coil, a large easy to read dial and a twelve inch electrodynamic loudspeaker.



Alignment Procedure

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

Test Oscillator.—For all alignment operations, keep the oscillator output as low as possible to avoid a-v-c action.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	6SK7 I-F grid through 0.1 mfd capacitor and ground	455 kc	Quiet point between 600-800 kc	L9 & L10 (2nd I-F trans.)
2	6SA7 1st det. grid through 0.1 mfd capacitor and ground			L7 & L8 (1st I-F trans.)
3	Ant. & Grd. Terminal Board	18 mc	Rock at 18 mc	C-1 antenna† C-23 oscillator
4	Radiation Loop consisting of two turns of wire located 4 to 6 feet from receiver	600 kc	Rock at 600 kc	C-21 oscillator
5		1,500 kc	1,500 kc	C-4 antenna C-22 oscillator

When making adjustments 4 and 5 the chassis must be in the cabinet, the loop connected, and all leads in their normal positions. When mounting chassis in cabinet if calibration does not line up with dial scale mounted on cabinet move pointer to agree with dial scale on cabinet.

†If two peaks can be obtained use low frequency (maximum capacity) peak.

RADIOTRON SOCKET VOLTAGES

Type	Function	Plate	Screen Grid	Cathode	Heater
6SA7	Det.	260V	80V	....	6.6V
	Osc.	....	....	2.3V	....
6SK7	I.F.	260V	80V	....	6.6V
6SQ7	Audio	80*V	....	....	6.6V
6F6-G	Output	245V	260V	16V	6.6V
5Y4-G	Rectifier	....	....	350V	5.0V

*Cannot be measured with an ordinary voltmeter.

The above voltages are measured with a 1000 ohm-per-volt meter. All values should hold within plus or minus 20 percent.

REPLACEMENT PARTS FOR MODEL VR-50

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			
S-2842	Board-Ant.Grd.terminal board.....	30585	Spring-Drive cord tension spring (Pkg.3).....
S-2466	Capacitor-Adjustable capacitor one 2-20 mmfd; one 300-800 mmfd. sections, (C21,C22).....	S-2859	Switch-Range Switch (S1).....
12723	Capacitor-56 mmfd. (C13).....	S-2860	Switch-Phono Tone Switch (S2).....
13057	Capacitor-68 mmfd. (C3).....	S-2861	Transformer-First I.F. Transformer (L6,L7,C8,C9).....
12720	Capacitor-100 mmfd. (C28).....	32825	Transformer-Second I.F. Transformer (L8,L9,C10,C11,C12,R5).....
12694	Capacitor-220 mmfd. (C5,C29).....	S-2457	Transformer-Power Transformer, 110 volt, 50/60 cycle (T1).....
5107	Capacitor-.0025 mfd. (C15,C16).....	33619	Transformer-Power Transformer, 110 volt, 25 cycle (T1).....
4838	Capacitor-.005 mfd. (C19).....	33776	Volume Control and power switch R6,S3
11315	Capacitor-.015 mfd. (C14,C27).....	REPRODUCER ASSEMBLIES (12 inch)	
32787	Capacitor-.05 mfd. (C7).....	13866	Cap Dust Cap for cone center (Pkg.5)
4839	Capacitor-0.1 mfd. (C6).....	S-2458	Coil-Field Coil (L12).....
4858	Capacitor-.01 mfd. (C17).....	11469	Coil-Hum Neutralizing coil (L11)...
13895	Capacitor-5600 mmfd. (C20).....	31275	Cone-Reproducer cone and voice coil (L10).....
32240	Capacitor-Electrolytic comprising two 10 mfd., one 20 mfd. section (C18,C25,C26).....	5118	Plug-3 contact plug (male).....
S-2856	Coil-"C" band antenna coil (L2,L3)....	S-2827	Reproducer complete.....
S-2857	Coil-Oscillator coil (L4,L5).....	14355	Transformer-Output transformer (T2)
S-2823	Condenser-2 gang variable tuning condenser complete with push button mechanism (C1,C2,C23,C24).....	REFER TO RP152E SERVICE NOTES for Record Changer Mechanism Parts.	
S-2837	Cord-Variable condenser drum drive cord.....	MISCELLANEOUS ASSEMBLIES	
33633	Indicator-Station selector indicator pointer.....	S-2641	Button-Station selector push button.....
11765	Lamp-Dial lamp Mazda #51.....	S-2862	Dial-Station selector dial scale.....
5119	Plug-3 contact female speaker plug...	32994	Escutcheon-Push Button Escutcheon
31388	Resistor-390 ohm, 1 watt (R8).....	S-2863	Escutcheon-Dial scale escutcheon complete.....
S-2858	Resistor-8,200 ohm, 1/4 watt (R12)...	S-2832	Knob-Tuning, range, tone or volume control knob.....
33489	Resistor-15,000 ohm, 2-1/2 watt (R3)...	S-2864	Loop-Antenna loop assembly (L1,C3,C4).....
13998	Resistor-22,000 ohm, 1/4 watt (R7)....	31589	Marker-Station call letter markers (1 set).....
12454	Resistor-33,000 ohm, 1/4 watt (R1)....	S-2865	Support-Lid support (L.H.).....
12285	Resistor-470,000 ohm, 1/4 watt (R10,R15)	S-2866	Support-Lid support (R.H.).....
12486	Resistor-560,000 ohm, 1/4 watt (R13)...		
12679	Resistor-2.2 meg., 1/4 watt (R2).....		
S-2038	Resistor-4.7 meg., 1/4 watt (R4).....		
13601	Resistor-10 meg., 1/4 watt (R9).....		
33725	Shaft-Station selector drive shaft...		
31319	Socket-Tube socket.....		
31364	Socket-Dial lamp socket.....		
14278	Socket-Phono input socket.....		

ANALYSIS OF RADIO INTERFERENCE PHENOMENA					
Character, Cause, Type Receivers Affected, Where Prevalent, and Service Remedies					
Type of Interference	Character of Interference	Cause	Type Receivers Affected	Where Prevalent	Suggested Service Remedies
IMAGE RESPONSE	Heterodyne whistle or second signal when tuned to certain stations	Strong signal at a frequency 2x I-F above desired station.	Superhet only. (1) With limited number tuned circuits ahead first detector. (2) With low impedance, high frequency resonant antenna primary circuits.	Locality strong BC stations near high end of band. Vicinity 1600-1750 Kc. Police Stations. Vicinity 1700-2000 Kc. amateur band.	(1) Wave trap tuned to interfering station. (2) Band elimination antenna such as RCA Magic Wave. (3) Re-align I-F.
HARMONIC OF I-F	Heterodyne whistle when tuning a station having same frequency as a harmonic of the I-F.	Second harmonic of station combines with oscillator fundamental forming a spurious I-F.	Superhet only. Selectivity does not affect.	Vicinity of station operating at twice I-F.	(1) Wave trap tuned to station. (2) Wave trap tuned to station second harmonic in mixer grid circuit. (3) Re-align I-F.
DIRECT I-F RESPONSE	Non-tunable code with intensity increasing toward low frequency end of band.	Commercial shore-to-ship code signal having frequency in I-F range, reaching input to I-F system.	Superhet only. (1) With limited selectivity ahead of I-F input and relatively high I-F gain. (2) With high impedance, low frequency antenna system.	Coastal areas near location of commercial stations.	(1) RCA Magic Wave antenna. (2) I-F wave trap. (3) Re-align I-F. (4) Orient loop for minimum.
HARMONICS OF OSCILLATOR	Reception of short wave code or broadcast signals at points in standard broadcast band.	Oscillator harmonics combine with short wave signals producing the required I-F. Especially prevalent on loop receivers due to secondary resonances of loop.	Superhet only. (1) With loop antenna. (2) Having oscillator rich in harmonics.	Rurally or where SW signals of proper frequency are intense.	(1) Use wave trap on interfering station. (2) Orientation of loop. (3) Re-align loop circuit. (4) Reduce oscillator excitation.
COMBINATION OF I-F	Whistle or second station(s) heard on practically all carriers.	Difference in frequency of two strong stations equal to I-F of receiver; the two stations mixing within receiver to form a constant spurious I-F.	Superhet only; having limited selectivity ahead of first detector.	Metropolitan areas, generally.	(1) Check by tracking of RF and antenna circuits. (2) Reduce size or effectiveness of antenna. (3) Install wave trap and tune to frequency of one of interfering stations. (4) Shift I-F.
HETERODYNE OSCILLATOR RADIATION	Whistle on a particular desired station, disappearing or changing frequency at random.	Radiation of receiver's heterodyne oscillator, due to oscillator strength, unusual coupling, resonant antenna, or transmission via power line.	Superhet only. (1) Without good shielding. (2) Without R-F stage.	Metropolitan areas, generally.	(1) Filter power line. (2) Use RCA Magic Wave antenna. (3) Reduce oscillator grid leak. (4) Shift I-F.
CROSS MODULATION WITHIN RECEIVER	Second station(s) appearing in background when tuned to desired station.	Strong interfering station modulating carrier of desired station within a nonlinear circuit or element of the receiver; or pickup and detection taking place in audio system.	TRF and Superhet. (1) With limited or no selection ahead of first tube. (2) With exposed grid circuits and wiring associated with early tuned stages. (3) Without variable-mu input tubes.	Metropolitan areas. Vicinity of very strong stations.	(1) Wave trap in antenna tuned to station causing trouble. (2) Filter power line. (3) Install RCA Magic Wave noise reducing antenna. (4) Shield exposed grid leads and wiring of first stages.
CROSS MODULATION EXTERNAL TO RECEIVER	Second station(s) in background on or between other stations.	Detection within, and re-radiation from as power lines, telephone lines, and other aerial metallic structures.	All types of receivers are affected regardless of selectivity or design.	Vicinity of unusually strong stations, especially where open-wire power lines are prevalent. Generally changes with weather.	(1) See that power line and telephone grounds are secure. (2) Ground conduits solidly. (3) Use RCA Magic Wave antenna. (4) Orient loop antenna for minimum interference.
SAME CHANNEL BEAT	Flutter, waver, or growl heard in background when tuned to desired station.	Second station assigned to same channel, but differing very slightly in carrier frequency.	Receivers with high sensitivity and extended bass response.	In areas remote from a usable assortment of strong stations. Wherever signals of two stations on same channel are comparable in strength.	(1) Use directive or loop antenna. (2) Reduce sensitivity of set. (3) Reduce bass response.
ADJACENT CHANNEL BEAT	Steady 10,000 cycle note or whistle.	Adjacent channel carrier beating with carrier to which receiver is tuned.	TRF and Superhet; especially those with limited selectivity and wide range of audio response.	Localities where adjacent channel station is strong compared to desired station.	(1) Suppress adjacent station with sharply tuned wave trap. (2) Re-align receiver carefully. (3) Reduce high-frequency response. (4) Use directive antenna.
MONKEY CHATTER	Unintelligible modulation superimposed upon desired station, having character of "inverted speech".	Side band of adjacent channel overlapping side band and combining with carrier of desired station. Also caused by harmonics from over-modulation of adjacent station.	TRF and Superhet; having wide band selectivity and audio response.	Localities where adjacent channel station is strong. Also aggravated by extended high frequency response of transmitter.	(1) Precisely re-align receiver to make more selective. (2) Reduce high frequency audio response.



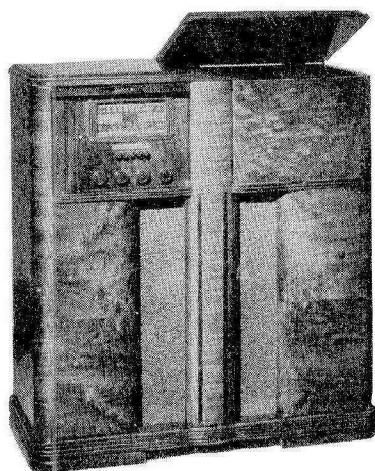
RCA Victor

VICTROLA MODEL VR-51

Seven-Tube, Two-Band, A-C, Superheterodyne, Victrola

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model VR51

Electrical Specifications

FREQUENCY RANGES

"Standard Broadcast" (A) 540-1,720 kc "Short Wave" (C) 7.0-22 mc
Intermediate Frequency 455 kc

TUBE COMPLEMENT

(1) Type-6SA7	First Detector—Oscillator	(4) Type-6AD7G	Inverter and Power Output
(2) Type-6SK7	Intermediate-Frequency Amplifier	(5) Type-6F6-G	Power Output
(3) Type-6SQ7	Second Detector, 1st A-F & A.V.C.	(6) Type-5Y4G	Rectifier
Pilot Lamps		(7) Type-6U5	"Magic Eye" Tuning Indicator

Mazda[®] 51, 6-8 volts, 0.2 amp.

POWER SUPPLY RATINGS

A	105-125 volts,	60 cycles, 115 watts
B	105-125 volts,	25 cycles, 115 watts

POWER OUTPUT

Undistorted 2.5 watts
Maximum 4.0 watts

PHONOGRAPH

Type Automatic
Record Capacity Eight 10-inch or seven 12-inch
Turntable Speed 78 r.p.m.

LOUDSPEAKER

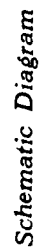
Type 12-inch Electrodynamic
Voice Coil Impedance 2.2 ohms at 400 cycles

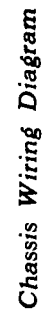
PICKUP

Type Crystal
Impedance 100,000 ohms at 1,000 cycles
Average Output 1.5 volts at 1,000 cycles
across 500,000 ohm load

Mechanical Specifications

Height	35 1/4 inches
Width	34 inches
Depth	17 inches
Net Weight	100 pounds
Shipping Weight	120 pounds

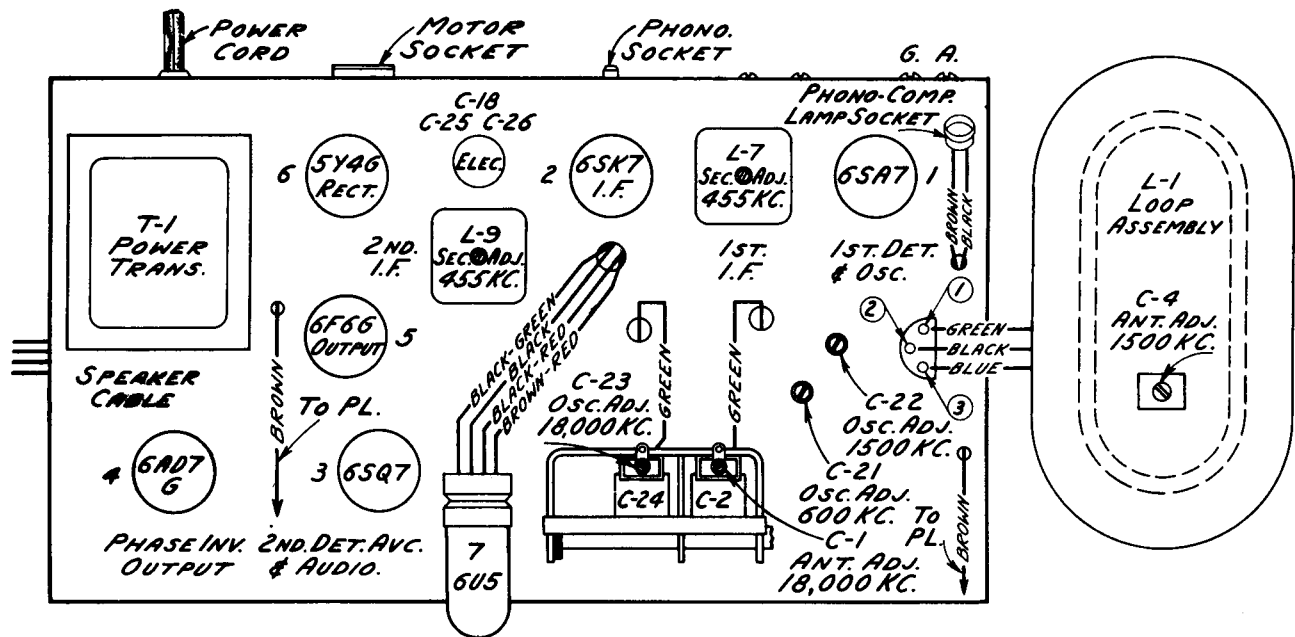




General Description

The RCA Victrola Model VR-51 is a deluxe combination radio and phonograph housed in a console cabinet of exceptional beauty. The automatic phonograph incorporates the type RP152E mechanism which uses the rim drive type of motor. Reference to the RP152E service notes will disclose details of

adjustment. Features of design include:—Rotatable Magic loop antenna, Magic Eye tuning indicator, aurally compensated volume control, Radio-Phono tone switch, stabilized oscillator coil, a large easy to read dial, inverter push pull output stage and a twelve inch electrodynamic loudspeaker.



Alignment Procedure

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

Test Oscillator.—For all alignment operations, keep the oscillator output as low as possible to avoid a-v-c action.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	6SK7 I-F grid through 0.1 mfd capacitor and ground			L9 & L10 (2nd I-F trans.)
2	6SA7 1st det. grid through 0.1 mfd capacitor and ground	465 kc	Quiet point between 600-800 kc	L7 & L8 (1st I-F trans.)
3	Ant. & Grd. Terminal Board	18 mc	Rock at 18 mc	C-1 antenna† C-23 oscillator
4	Radiation Loop consisting of two turns of wire located 4 to 6 feet from receiver	600 kc	Rock at 600 kc	C-21 oscillator
5		1,500 kc	1,500 kc	C-4 antenna C-22 oscillator

When making adjustments 4 and 5 the chassis must be in the cabinet, the loop connected, and all leads in their normal positions. When mounting chassis in cabinet if calibration does not line up with dial scale mounted on cabinet move pointer to agree with dial scale on cabinet.

†If two peaks can be obtained use low frequency (maximum capacity) peak.

RADIOTRON SOCKET VOLTAGES

Type	Function	Plate	Screen Grid	Cathode	Heater
6SA7	Det.	260V	80V	....	6.6V
	Osc.	....	....	2.3V	....
6SK7	I.F.	260V	80V	....	6.6V
6SQ7	Audio	80*V	....	....	6.6V
6AD7G	Inverter	175V	....	22V	6.6V
	Output	240V	250V	22V	6.6V
6F6-G	Output	240V	250V	22V	6.6V
5Y4-G	Rectifier	Measured Across C-25		350V	5.0V

*Cannot be measured with an ordinary voltmeter.

The above voltages are measured with a 1000 ohm-per-volt meter. All values should hold within plus or minus 20 percent.

REPLACEMENT PARTS FOR MODEL VR-51

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			
S-2842	Board-Ant. and Grnd terminal board.	S-2859	Switch-Range switch (S1).....
S-2466	Capacitor-Adjustable capacitor, one 2-20 mmfd; one 300-800 mmfd. section (C21,C22).....	S-2860	Switch-Phono & tone switch (S2)....
12723	Capacitor-56 mmfd (C13).....	S-2861	Transformer-First I.F. Transformer (L6,L7,C8,C9).....
13057	Capacitor-68 mmfd (C3).....	32825	Transformer-Second I.F. transformer (L8,L9,C10,C11,C12,R5).....
12720	Capacitor-100 mmfd.(C28).....	S-2457	Transformer-Power transformer 110 volt, 50/60 cycle (T1).....
12694	Capacitor-220 mmfd. (C5).....	33619	Transformer-Power transformer 110 volt, 25 cycle (T1).....
30433	Capacitor-470 mmfd. (C29).....	33776	Volume control and power switch (R6,S3).....
13895	Capacitor-5600 mmfd.(C20).....	SPEAKER ASSEMBLY (12" - CRL 523)	
5107	Capacitor-.0025 mfd.(C15,C16)....	13866	Cap-Dust cap for cone centre (Pkg.5).....
4838	Capacitor-.005 mfd. (C30,C31)....	S-2458	Coil-Field coil (L12).....
4858	Capacitor-.01 mfd. (C17,C19).....	11469	Coil-Hum neutralizing coil (L11)....
11315	Capacitor-.015 mfd.(C14,C27).....	31275	Cone-Speaker cone and voice coil (L10).....
32787	Capacitor-.05 mfd.(C7).....	5039	Plug-4 contact plug (male).....
4839	Capacitor-.1 mfd. (C6).....	S-3036	Speaker complete.....
32240	Capacitor-Electrolytic comprising two 10 mfd., and one 20 mfd. section (C18,C25,C26).....	S-2934	Transformer-Output transformer (T2)
S-2856	Coil-"C" band antenna coil(L2,L3)..	Refer to RP-152E Service Notes for Record Changer Mechanism Parts.	
S-2857	Coil-Oscillator coil (L4,L5).....	MISCELLANEOUS ASSEMBLIES	
S-3033	Condenser-2 gang variable tuning condenser complete with push-button mechanism(C1,C2,C23,C24)..	S-2641	Button-Station selector push button.
S-3037	Cord-Variable condenser drive cord	S-2862	Dial-Station selector dial scale....
33633	Indicator-Station selector indicator pointer.....	32994	Escutcheon-Call letter escutcheon...
11765	Lamp-Dial lamp Mazda #51.....	S-2971	Knob-Range switch and tone control knob.....
5040	Plug-4 contact female speaker plug	S-2972	Knob-Tuning or volume control knob..
S-3066	Resistor-560 ohm, 1 watt (R15)....	S-3031	Loop-Antenna loop assembly (L1,C4)..
14075	Resistor-8200 ohms, 1/4 watt (R17)	31589	Marker-Station call letter marker (1 set).....
33489	Resistor-15000 ohm,2-1/2 watt (R3)..	S-1797	Jewel-Compartment lamp jewel.....
13998	Resistor-22000 ohm, 1/4 watt (R7)..	30900	Spring-Knob spring (Pkg.5).....
12454	Resistor-33000 ohm, 1/4 watt (R1)..		
30180	Resistor-120,000 ohm,1/2 watt(R13)		
12748	Resistor-150,000 ohm, 1/4 watt (R11,R16).....		
30784	Resistor-330,000 ohm, 1/2 watt(R14)		
12285	Resistor-470,000 ohm,1/4 watt (R10,R12).....		
12486	Resistor-560,000 ohm,1/4 watt(R8)..		
12679	Resistor-2.2 meg. 1/4 watt (R2)...		
S-2038	Resistor-4.7 meg., 1/4 watt (R4)...		
13601	Resistor-10 meg., 1/4 watt (R9)...		
33725	Shaft-Station selector drive shaft		
S-2824	Socket-A.C. outlet socket.....		
31364	Socket-Dial lamp socket.....		
14278	Socket-Phono input socket.....		
31319	Socket-Tube socket.....		
30585	Spring-Drive cord tension spring (Pkg.3)		

SPRING WOUND MOTOR DATA

REPLACING SPRINGS IN SPRING WOUND MOTORS

There are two types of motors used in RCA Victor Portable Phonographs and Record Players, viz.; The "Angle" wind motor and the "Side" wind motor.

REPLACING MAINSPRING IN ANGLE WIND MOTORS

- (1) Take out 4 screws from top of motor to remove plate.
- (2) To remove the spring barrel, pull the barrel up carefully from the barrel cap, and lift about 3 inches to allow enough space to disconnect the main spring from arbor.
- (3) To remove spring, take a firm hold on the barrel, lift out the centre of the spring and uncoil until the spring is completely out of the barrel.
- (4) To reassemble new spring, first remove the retaining band from the spring by placing it in a vice and cutting the band. Care should be taken when removing loose spring from the vice.
- (5) Engage slot in end of spring on the barrel hook and wind spring in place, always keeping a firm hold on the barrel and spring.

CAUTION:- Make sure new spring is wound in same direction as the old one you removed.

- (6) The center of the new spring should be crimped to the size of the arbor so that it will hook to the arbor when placed in the spring barrel.

NOTE:- About a teaspoon of graphite should be placed in barrel before closing.

- (7) Reassemble as you disassembled in (1) and (2).

REPLACING MAINSPRING IN SIDE WIND MOTORS

- (1) Remove 2 screws in bottom plate, and left hand screw on top casting, and remove spring barrel from frame.
- (2) Remove the barrel cap by tapping the edge of the cap with a block and hammer, and disconnect the main spring from the arbor.

Proceed as in steps (3), (4), (5), (6) and (7).

SPRING WOUND MOTOR ADJUSTMENTS

Speed variations or WOWS may be experienced with instruments due to a variety of causes. Some of the troubles and corrections are listed below:

1. A regular WOW occurring on every revolution of the turntable, or every few revolutions.

- (a) A frequent cause of this difficulty is faulty adjustment of the governor springs. If the governor weights seem to oscillate in and out when the motor is in operation, the spring tension of the three weights may not be evenly balanced. Loosen the three spring clamping screws and position the springs so that all three weights are held with the same tension.
- (b) Another possible cause of this trouble is faulty adjustment of the governor bearings. To adjust these bearings:

First: Set the speed regulator lever so that the face of the felt friction pad is accurately parallel to the governor friction plate.

Second: Loosen both governor bearing set screws and position the governor so that the motor revolves at rated speed (78.4 rpm).

Third: Adjust the mesh of the worm and the drive gear by turning the eccentric bearings. These should be set so that the worm meshes properly with the gear without binding.

Fourth: Adjust the distance between bearings so that the governor turns freely with a minimum of end-play.

- (c) A take-up spring is mounted on the governor friction plate shaft to ensure against lost motion and erratic operation of this plate. It is essential that this spring be in place and adjusted to provide adequate tension.
- (d) Marred or broken teeth on either gear on the turntable shaft or on the intermediate gear shaft may cause this trouble. If inspection shows this to be the case, the defective gear should be replaced.

2. The turntable loses speed or WOWS on the louder parts of a record.

- (a) This may be caused by failure of the governor to respond accurately to speed changes, due to excessive or irregular friction between the sliding friction plate and the governor shaft. When this occurs it may be corrected by removing the weights and working the plate back and forth until it frees up. If the governor shaft does not have a smooth surface it may be necessary to smooth it down slightly using "Crocus Cloth" or to replace the governor.
- (b) This condition may also be caused by excessive friction in any part of the motor. Be sure that the governor bearings are properly adjusted as described in section 1 (b). Lubricate all bearings in the motor using a high grade light oil. The governor shaft, friction plate, and felt friction pad should also be lubricated with this oil. Lubricate the worm with a light grease such as RCA Stock No. 10975 Electric Motor Grease. Remove the main spring and pack it with a graphite lubricant.

3. The turntable speed changes erratically over long periods of time.

- (a) This may be caused by binding of the main spring due to improper lubrication. To correct this pack the spring with graphite grease as described in section 2 (b).
- (b) Make sure that the top of the main spring housing does not rub on the end of the winding shaft.
- (c) Inspect the gear teeth on the main spring gear. If these are marred or broken, it may be necessary to replace the spring assembly.

IDENTIFICATION OF GOVERNORS IN PHONO MOTORS

The following governors are similar with exception of the weight and spring assemblies. The rings referred to are two grooves cut in the fly-ball for identification purposes.

Stock No.	Identification
11703	Weight has two rings and uses spring .156 in. wide x .0076 in. thick. Balls measure 9/32 in. x 5/8 in. diameter.
31623	Weight has two rings and uses spring .156 in. wide x .0066 inches thick. Balls measure 9/32 in. x 5/8 in. diameter.
31624	Weight is plain and uses spring .156 inches wide x .0066 inches thick. Balls measure 5/16 in. x 5/8 in. diameter.
32034	Weight is plain and uses spring .187 in. wide x .0082 in. thick. Balls measure 5/16 in. x 5/8 in. diameter.



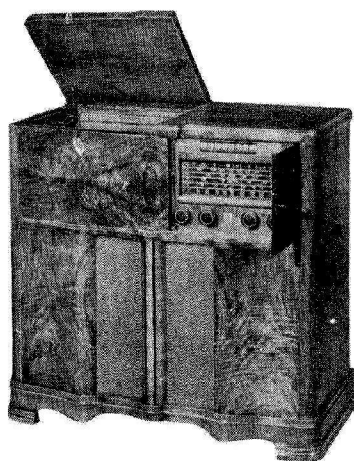
RCA Victor

VICTROLA MODEL VR52

Nine-Tube, Six-Band, A-C, Superheterodyne Victrola with Record Changer

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model VR52

Electrical Specifications

FREQUENCY RANGES

Standard Broadcast (A)	540-1,550	k.c.
Short Wave (B)	2,300-7,500	k.c.
31 M	9,450-9,700	k.c.
25 M	11,680-11,920	k.c.
19 M	15,030-15,380	k.c.
16-13 M	17,700-22,000	k.c.

Intermediate Frequency 455 k.c.

RADIOTRON COMPLEMENT

(1) Type-6SK7	R-F Amplifier
(2) Type-6SA7	First Detector-Oscillator
(3) Type-6SK7	Intermediate Amplifier
(4) Type-6SQ7	2nd Det., A.V.C. & A.F.

Pilot Lamps (4) Mazda No. 51 6-8 volts, 0.2 amp.

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 95 watts
Rating B	105-125 volts, 25-60 cycles, 95 watts

POWER OUTPUT

Undistorted	5 watts
Maximum	9 watts

PHONOGRAPH

Type	Automatic
Record Capacity	Eight 10-inch or seven 12-inch
Turntable Speed	78 r.p.m.

R. F. ALIGNMENT FREQUENCIES

"B" (49 Meters)	6,100 k.c. (osc.)
31 M (31 Meters)	9,550 k.c. (osc., det., ant.)
25 M (25 Meters)	11,800 k.c. (osc.)
19 M (19 Meters)	15,200 k.c. (osc.)
Standard Broadcast (A)	600 k.c. (osc.), 1400 k.c. (osc., det., ant.)

(5) Type-6SF5	Audio amp.
(6) Type-6K6G	Power Output
(7) Type-6K6G	Power Output
(8) Type-5Y4G	Full Wave Rectifier
(9) Type-6U5	Tuning Tube

LOUDSPEAKER (CRL511-2)

Type	12 inch Electrodynamic
Impedance (V.C.)	3.4 ohms at 400 cycles

PICKUP

Type	Crystal
Impedance	100,000 ohms at 1,000 cycles
Average Output	1.5 volts at 1,000 cycles across 500,000 ohm load

Cabinet Dimensions

Height	34 1/4 inches
Width	37 inches
Depth	18 1/4 inches
Net Weight	120 pounds
Shipping Weight	165 pounds

General Description

The RCA Victrola model VR52 is a deluxe combination radio and automatic phonograph housed in a console cabinet of exceptional beauty. The receiver employs a nine tube, six band super-heterodyne circuit, the arrangement of which is shown in the schematic circuit diagram. Features of design include:— Rotatable loop antenna and loop control knob; high gain R.F. stage; stabilized oscillator circuit; magnetite core I.F. transformers; magnetite core oscillator coils on all bands; automatic volume control circuit; Tuning indicator tube; Illuminated band indicator; variable tone con-

trol circuit; push button tuning of seven Standard Broadcast stations by means of pre-set oscillator coils; dust proof, electrodynamic loudspeaker; temperature stabilized capacitors in the oscillator circuits; push-pull output and a large edge lighted horizontal glass dial.

The automatic phonograph incorporates the type RP 152E mechanism which uses the rim drive type of motor. Reference to the RP 152E service notes will disclose details of adjustment.

Circuit Arrangement

The circuit consists of an R.F. amplifier stage incorporating the loop Antenna as the first tuned circuit; first detector (oscillator) stage; I.F. Amplifier stage; second detector A.V.C. and 1st Audio stage, Audio amplifier stage; a push pull pentode output; tuning indicator and a well regulated power supply. The Rotatable loop Antenna used as the first tuned stage is in the circuit on all bands; temperature compensated capacitors in the oscillator circuits reduce oscillator drift. Spread band tuning is accomplished elect-

rically by shunting the oscillator section of the variable capacitor with relatively large temperature—stabilized fixed capacitors for tuning the oscillator coils on the 16-13M, 19M, 25M, 31M bands. Antenna and detector coils are designed to be sufficiently broad-tuned to require no variable tuning over the narrow frequency range of the spread bands. The windings of all I.F. transformers are resonated by fixed capacitors and adjusted by moulded magnetite cores to tune to 455 K.C.

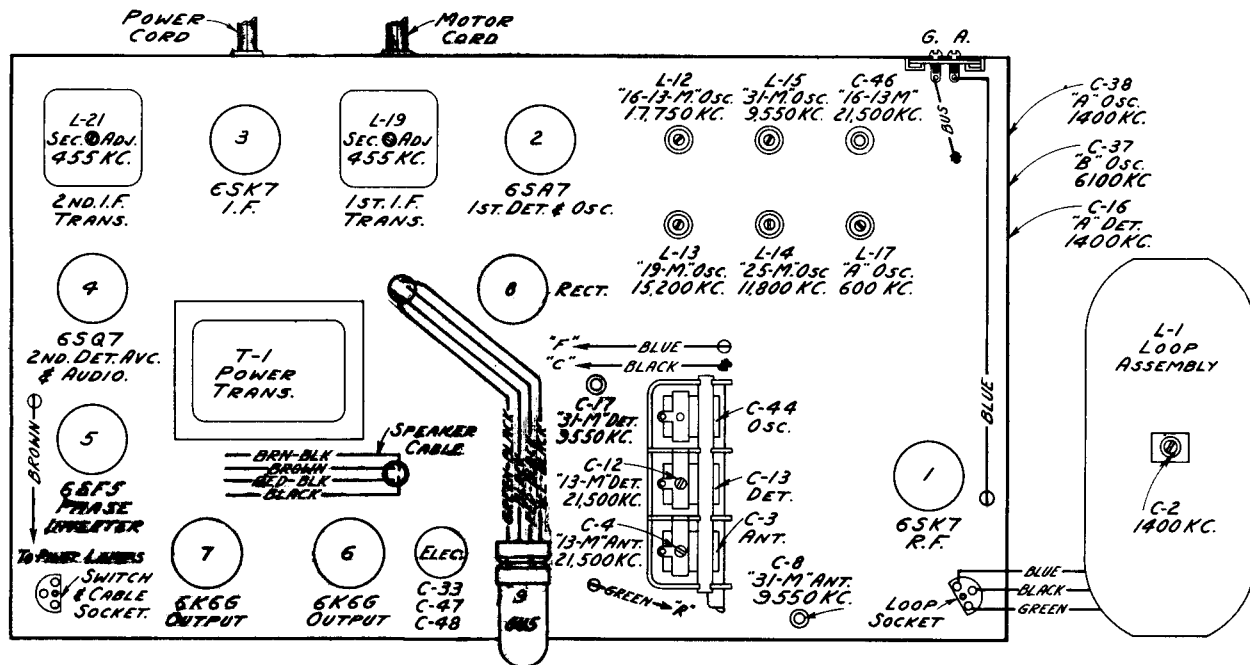


Fig. 1—Chassis Layout and Alignment Adjustments

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. 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 O° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum 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 chassis, and bend the wire so that it points to the O° mark on the calibration scale when the plates are fully meshed.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	6SK7 2nd I.F. Grid	.1 Mfd.	455 kc	"A"	No Signal 550-750 kc	2nd I.F. Trans.	L20 & L21
2	6SA7 Det. Grid	.1 Mfd.	455 kc	"A"	No Signal 550-750 kc	1st I.F. Trans.	L18 & L19
3	Ant. Ter.	300 Ohms	6,100 kc	"B"	6.1 mc (149°)	"49 M" Osc.	C37
4	Ant. Ter.	300 Ohms	9,550 kc	"31 M"	9.55 mc (73°)	"31 M" Det.	C17
5	Ant. Ter.	300 Ohms	9,550 kc	"31 M"	9.55 mc (73°)	"31 M" Ant.	C8
6	Ant. Ter.	300 Ohms	9,550 kc	"31 M"	9.55 mc (73°)	"31 M" Osc.	L15
7	Ant. Ter.	300 Ohms	11,800 kc	"25 M"	11.8 mc (99°)	"25 M" Osc.	L14
8	Ant. Ter.	300 Ohms	15,200 kc	"19 M"	15.2 mc (94°)	"19 M" Osc.	L13
9	Ant. Ter.	300 Ohms	21,500 kc	"16-13 M"	21.5 mc (162°)	"16-13 M" Osc.	C46
10	Ant. Ter.	300 Ohms	17,750 kc	"16-13 M"	17.75 mc (17°)	"16-13 M" Osc.	L12
11	Ant. Ter.	300 Ohms	21,500 kc	"16-13 M"	21.5 mc (162°)	"16-13 M" Det.	C12
12	Ant. Ter.	300 Ohms	21,500 kc	"16-13 M"	21.5 mc (162°)	"16-13 M" Ant.	C 4
13	Apt. Ter.	300 Ohms	1,400 kc	"A"	1,400 kc (155°)	"A" H-F Osc.	C38
14	Ant. Ter.	300 Ohms	600 kc	"A"	600 kc (33.5°)	"A" L-F Osc.	L17
15	Ant. Ter.	300 Ohms	1,400 kc	"A"	1,400 kc (155°)	"A" Det.	C16
16	Radiation Loop	.300 Ohms	1,400 kc	"A"	1,400 kc (155°)	"A" Ant.	C2*

NOTE:—Align the I.F. Circuits by means of the oscillograph, for a symmetrical curve. Peak R.F. stages of all bands. * Radiation loop comprising two turns of wire 18 inches in diameter should be placed 4 feet from receiver loop, before aligning "C2".

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 of 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.

NOTE:—Whenever possible spread band adjustments should be made with the chassis fastened in the cabinet and the pointer accurately aligned to the dial.

Spread-band Adjustments.—Alignment of the spread bands requires special procedure since test oscillators used alone are not ordinarily sufficiently accurate for this purpose. The RCA Stock No. 9572 Crystal Calibrator affords a convenient and accurate alignment standard. Wrap a few turns of wire around the crystal calibrator and connect one free end to the antenna terminal of the receiver. Using the crystal calibrator to obtain the necessary accuracy, follow the tabulated alignment procedure for the "31M.", "25M.", and "19M." bands.

For the "B" band, snap crystal calibrator "Hi-Lo" switch to "Hi", turn the range selector to "B" band, and set receiver dial pointer to 6.0 mc. Adjust oscillator padder C37 for minimum "Tuning Tube" opening. Use the peak indicated by the alignment table. Snap "Hi-Lo" switch to "Lo" and locate 6,100 kc (the first 100 kc harmonic above 6,000 kc) by slightly readjusting C37 with the dial pointer set at 6.1 mc. This method insures selection of correct crystal-calibrator harmonic.

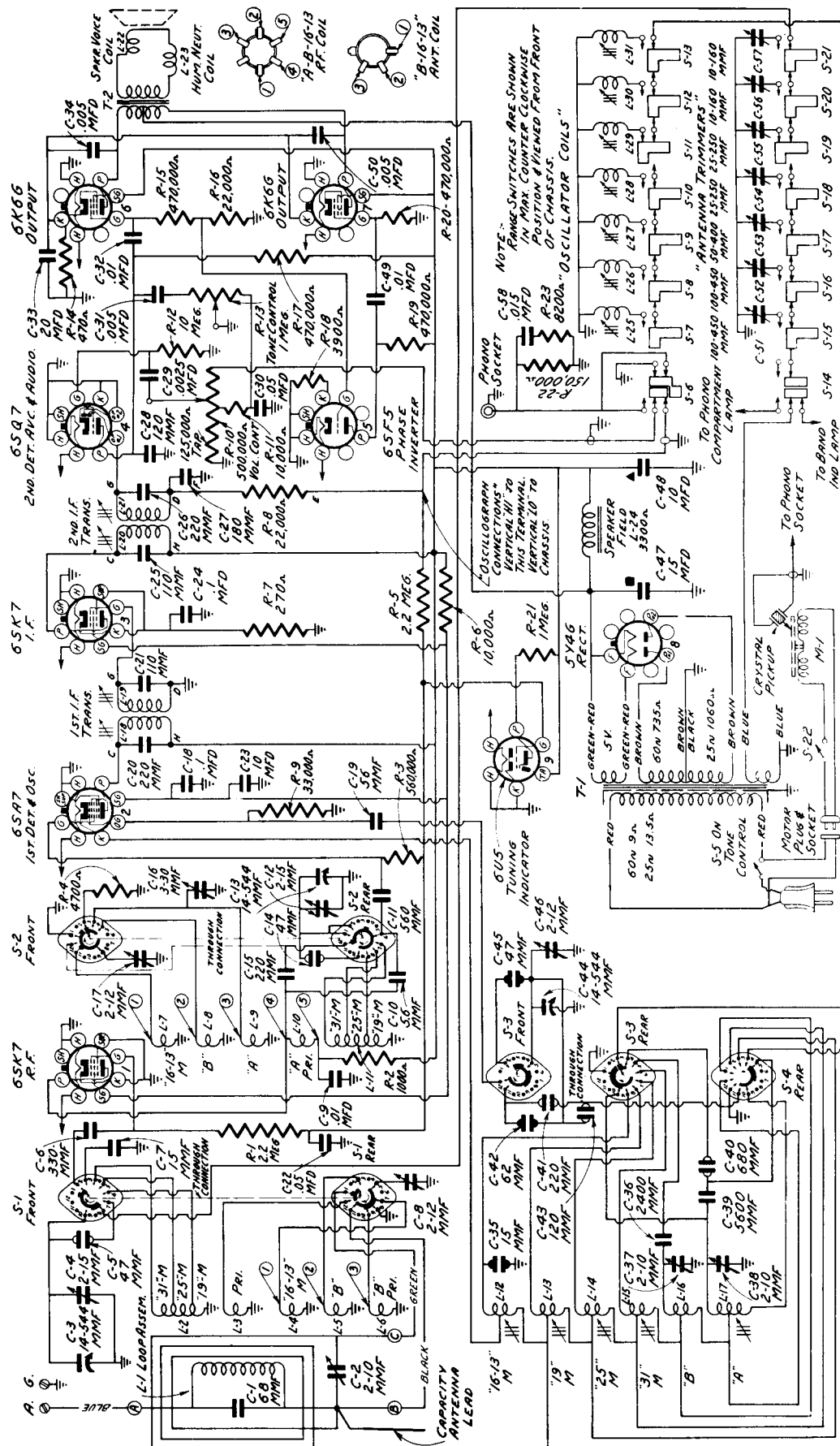


Figure 2—Schematic Circuit Diagram

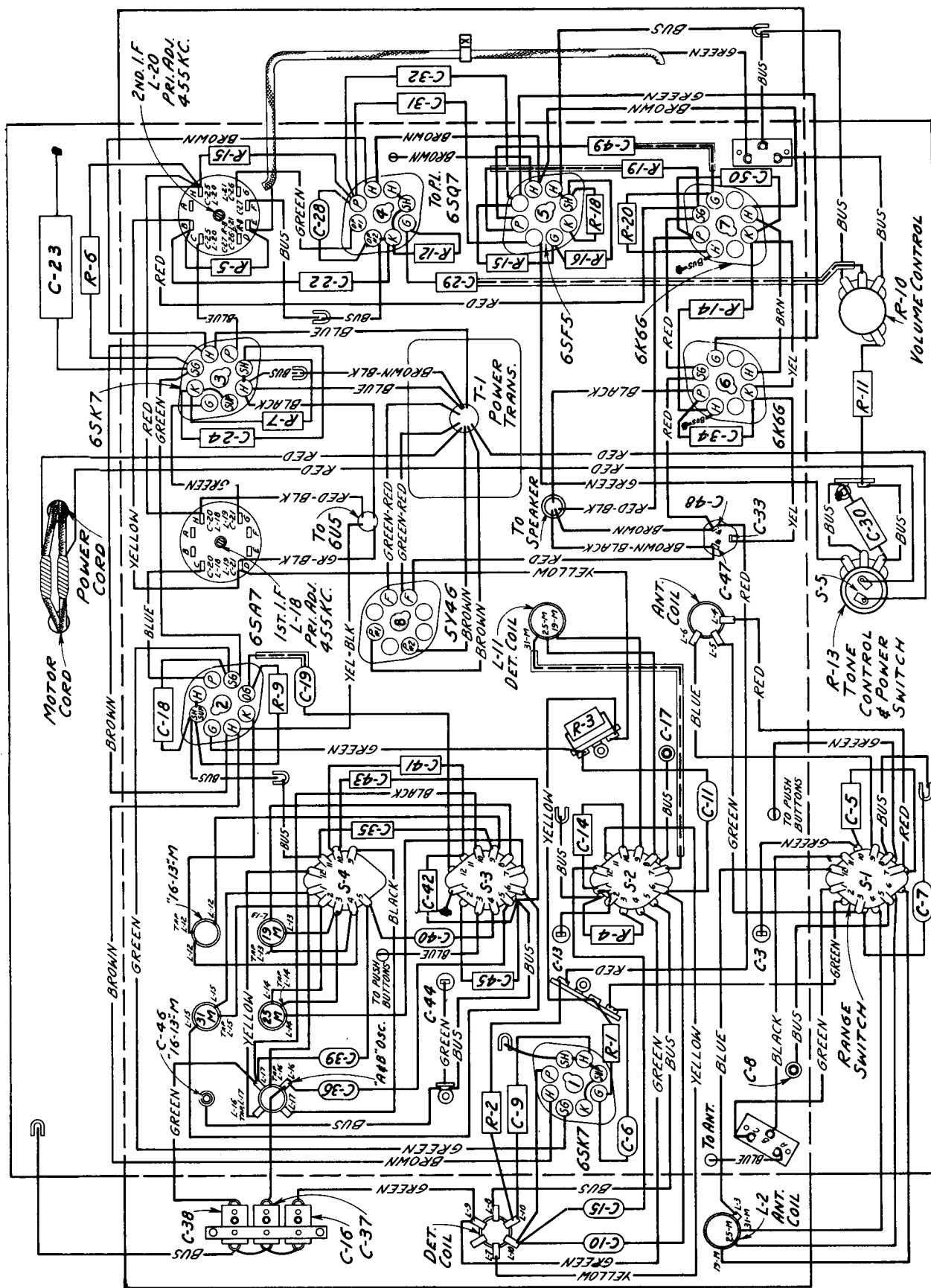


Figure 3—Chassis Wiring Diagram

RADIOTRON SOCKET VOLTAGES

Type	Plate	Screen Grid	Control Grid	Cathode	Heater
6SK7 R.F.	200V	100V	....	....	6.8V
6SA7 Conv.	195V	100V	....	....	6.8V
6SK7 I.F.	200V	100V	-2V	....	6.8V
6SQ7 2nd Det.	195V	....	....	....	6.8V
6SF5 Audio	95*V	....	....	2V	6.8V
6K6G Output	330V	200V	....	20V	6.8V
6U5 Indicator	210V	....	210V	....	6.8V

Note:—All the above values hold within plus or minus 20 % when measured with a 1,000 ohm-per-volt meter, on a line voltage of 115 volts. All voltages are measured to chassis.

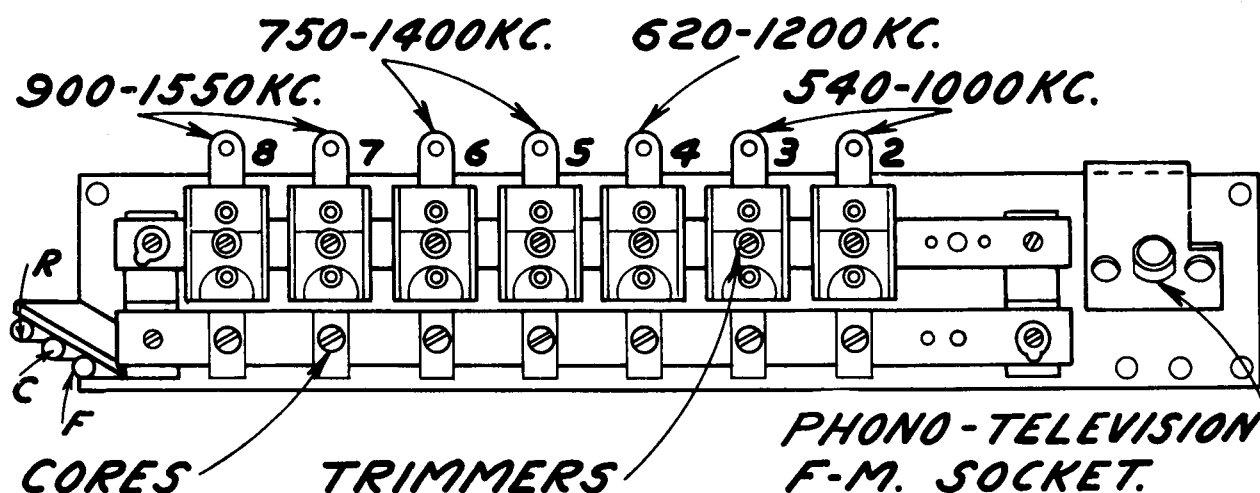


Fig. 4

Push Button Adjustment

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

Button No. 1 is used only for phonograph operation.

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. 2 located second from left on front panel.

(3) Referring to Figure 4, adjust core and trimmer No. 2 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 six 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.

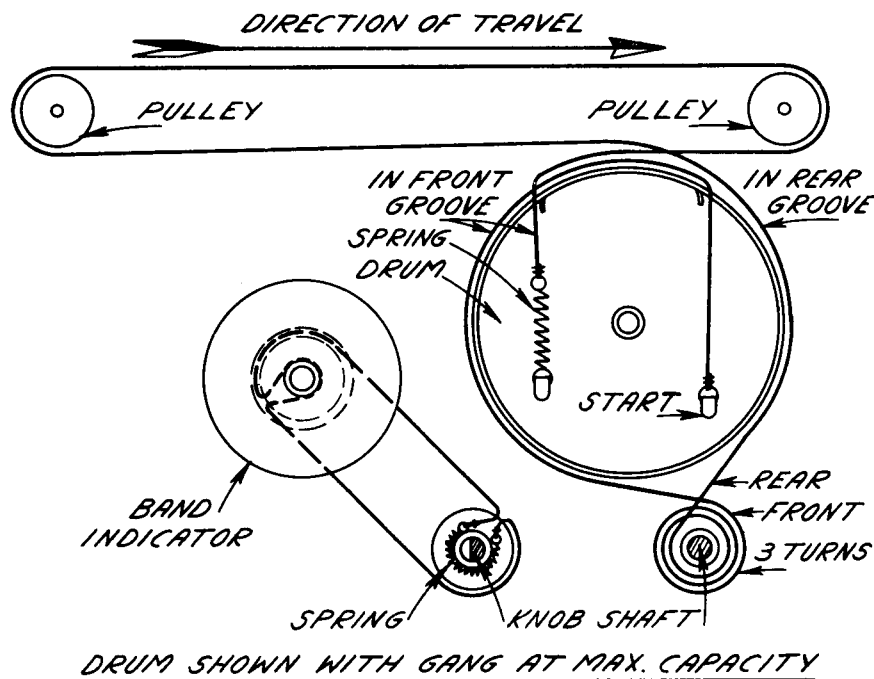


Fig. 5—Drive Cords

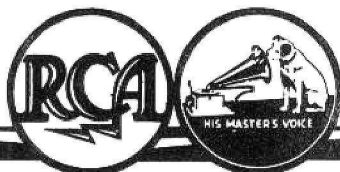
REPLACEMENT PARTS LIST

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			
S-2876	Board-Antenna and Ground Terminal Board.....	4839	Capacitor-0.1 mfd.(C18,C24).....
12714	Capacitor-Adjustable Trimmer 2-12 mmfd. (C8,C17,C46).....	S-2894	Capacitor-Electrolytic-10 mfd.(C23)
34783	Capacitor-Adjustable Trimmer Capacitor bank (C16,C37,C38).....	S-2925	Capacitor-Electrolytic comprising one section 10 mfd. one section 20 mfd., and one section 15 mfd. (C33,C47,C48).....
12814	Capacitor- 5.6 mmfd. (C10).....	S-2877	Coil-Antenna coil "B-16-13" Bands (L4,L5,L6).....
12896	Capacitor- 15 mmfd. (C7).....	S-2878	Coil-Antenna coil "31-25-19" Bands (L2,L3).....
36012	Capacitor- 15 mmfd. (Temp.comp.) (C35)	S-2879	Coil-R.F. Coil "A-B-16-13" Bands (L7,L8,L9,L10).....
S-3008	Capacitor- 47 mmfd. (Close Tol.) (C5,C14).....	S-2880	Coil-R.F. Coil "31-25-19" Bands (L11).....
35644	Capacitor- 47 mmfd. (Temp.comp.) (C45).....	S-2881	Coil-19 meter band Oscillator coil (L13).....
12723	Capacitor- 56 mmfd. (C19).....	S-2882	Coil-25 Meter band Oscillator coil (L14).....
S-3123	Capacitor- 62 mmfd. (Temp.comp.) (C42)	S-2883	Coil-31 Meter band Oscillator coil (L15).....
13057	Capacitor- 68 mmfd. (C1).....	S-2884	Coil-16-13 meter band Oscillator coil (L12).....
12724	Capacitor- 120 mmfd. (C28).....	S-2885	Coil-"A and B" Band Oscillator Coil (L16,L17).....
S-3100	Capacitor- 120 mmfd. (Close Tol.) (C43)	S-2898	Condenser-3 gang variable tuning condenser (C3,C4,C12,C13,C44)....
12694	Capacitor- 220 mmfd. (C15).....	S-2897	Cord-Indicator pointer drive cord (53½" long).....
S-2895	Capacitor- 220 mmfd. (Close Tol.) (C41)	32634	Cord-Band Indicator drive cord....
12952	Capacitor- 330 mmfd. (C6).....		
12537	Capacitor- 560 mmfd. (C11).....		
S-2988	Capacitor- 680 mmfd. (Close Tol.) (C40)		
12951	Capacitor-2400 mmfd. (C36).....		
13895	Capacitor-5600 mmfd. (C39).....		
5107	Capacitor-.0025 mfd. (C29).....		
4838	Capacitor-.005 mfd. (C31,C34,C50)...		
14393	Capacitor-.01 mfd. (C9,C32,C49).....		
32787	Capacitor-.05 mfd. (C22, C30).....		

REPLACEMENT PARTS-(Continued)

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
31273	Drum-Drive cord drum assembly.....		SPEAKER ASSEMBLIES (CRL 511-2)
S-2927	Drum-Band Indicator drive cord drum.....	31825	Cap-Dust cap for cone centre (Pkg.5).....
S-2886	Indicator-Station selector indicator pointer.....	S-2937	Coil-Field Coil (L24).....
S-2928	Indicator-Band indicator assembly.	11469	Coil-Hum neutralizing coil (L23).
11765	Lamp-Dial lamp Mazda #51.....	31275	Cone-Speaker cone and voice coil (L22).....
5040	Plug-4 Contact speaker plug(female)	5039	Plug-4 contact plug (male).....
31280	Pulley-Drive cord pulley.....	S-2938	Speaker complete.....
30929	Resistor-270 ohm 1/2 watt (R7)....	S-2934	Transformer-Output (T2).....
30681	Resistor-470 ohm 1 watt (R14).....		PUSH BUTTON ASSEMBLY
14720	Resistor-1000 ohm 1/4 watt (R2)...	S-2907	Cable-Shielded phono cable-less plug.....
30694	Resistor-3900 ohm 1/4 watt (R18)...	S-2930	Capacitor-Trimmer capacitor bank.
30146	Resistor-4700 ohm 1/4 watt (R4)...	11315	Capacitor-.015 mfd (C58).....
3078	Resistor-10,000 ohm 1/4 watt (R11)	35803	Coil-Oscillator coil (L25 to L31 inclusive).....
S-2587	Resistor-10,000 ohm 4 watt (R6)...	35871	Core-Oscillator coil core.....
30492	Resistor-22,000 ohm 1/4 watt (R8,R16).....	32641	Plug-3 Prong male plug for Phono cable.....
12454	Resistor-33,000 ohm 1/4 watt (R9).	14075	Resistor-8200 ohm-1/4 watt (R23)...
30648	Resistor-470,000 ohm 1/4 watt (R15,R17,R19,R20).....	14020	Resistor-150,000 ohm-1/4 watt (R22)
12486	Resistor-560,000 ohm 1/4 watt (R3)	31347	Socket-Phono Input Socket.....
12679	Resistor- 2.2 megohm 1/4 watt (R1,R5).....	S-3049	Switch-Push Button switch only...
30992	Resistor-10. megohm 1/4 watt (R12)		AUTOMATIC RECORD CHANGER MECHANISM
14887	Retainer-Drive cord pulley retainer (Pkg.10).....		REFER TO RP-152E Service Notes for Replacement Parts and Service Details.
S-2888	Shaft-Station selector drive shaft		MISCELLANEOUS ASSEMBLIES
S-2824	Socket-A.C. Socket.....	35883	Button-Station selector push button.....
31364	Socket-Dial Lamp Socket.....	S-1913	Dial-Station selector dial scale.
36422	Socket-Loop Antenna or Push Button Switch Socket.....	13103	Jewel-Compartment Lamp Jewel.....
31251	Socket-Tube Socket.....	36038	Knob-Volume,Tone,Range or tuning control knob.....
30585	Spring-Band Indicator drive cord spring (Pkg.2).....	35650	Knob-Loop Antenna control knob...
13638	Spring-Drive Cord Tension Spring (Pkg.2).....	S-2933	Loop-Antenna Loop Assembly (L1,C1,C2).....
S-2929	Switch-Range Switch (S1,S2,S3,S4).	36149	Marker-Push Button call letter markers (1 set).....
S-2892	Tone Control and Power Switch (R13,S5).....	S-3091	Shaft-Loop Antenna Drive Shaft...
S-2899	Transformer-1st I.F. Transformer (L18,L19,C20,C21).....	34053	Spring-Push Button retaining spring (Pkg.5).....
S-2900	Transformer-2nd I.F. Transformer (L20,L21,C25,C26,C27,R8).....	14270	Spring-Knob retaining spring(Pkg.2)
S-2903	Transformer-Power-110 volt 25/60 cycle (T1).....	S-2542	Tool Push Button set-up tool.....
S-2904	Transformer-Power-110 volt 50/60 cycle (T1).....		
S-2906	Volume Control (R10).....		



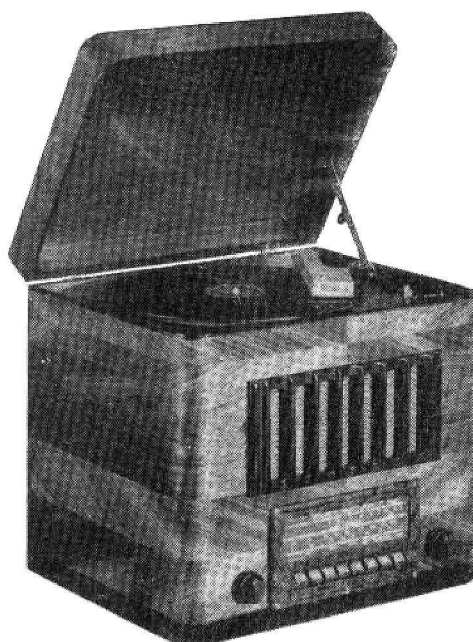
RCA Victor

MODEL U-60A

Supplement to Model U-60 Service Notes

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

FREQUENCY RANGES

"Standard Broadcast" (A) 540-1,720 kc
"Medium Wave" (B) 2.3-7 mc
"Short Wave" (C) 7-22 mc
Intermediate Frequency 455 kc

R-F ALIGNMENT FREQUENCIES

"Short Wave" (C) 20 mc (osc., ant.)
"Medium Wave" (B) 6.1 mc (osc.)
"Standard Broadcast" (A) 1,500 kc (osc.)
Six Electric Tuning Positions.....550-1,500 kc

Six Electric Tuning Positions.....550-1,500 kc

2 stations between approximately 550- 950 kc
2 stations between approximately 680-1,180 kc
2 stations between approximately 890-1,500 kc

TUBE COMPLEMENT

(1) Type-6K8 First-Detector—Oscillator
(2) Type-6K7 Intermediate-Frequency Amplifier
(3) Type-6H6 Second-Detector and A.V.C.

(4) Type-6K5G Audio Voltage Amplifier
(5) Type-6F6G Audio Power Amplifier
(6) Type-5Y4G Full-Wave Rectifier

Electrical Specifications (Contd.)

Pilot Lamps Mazda 47, 6.3 volts, .15 amp.

POWER SUPPLY RATING

Rating A 105-125 volts, 50-60 cycles, 90 watts
Rating B 105-125 volts, 25-60 cycles, 90 watts

POWER OUTPUT

Undistorted 2.5 watts
Maximum 4.5 watts

LOUDSPEAKER

Type Electrodynamic
Voice-coil impedance 2.25 ohms at 400 cycles

Mechanical Specifications

Models

Height (inches) 16 $\frac{11}{16}$
Width (inches) 16 $\frac{1}{4}$
Depth (inches) 13 $\frac{9}{16}$
Net Weight (pounds) 35
Shipping Weight 40
Chassis Base Dimensions 13-in. wide, 6 $\frac{1}{2}$ -in. deep, 2 $\frac{1}{2}$ -in. high
Over-all Chassis Height 6 inches
Tuning Drive Ratio 12 to 1

General Description

Model U-60A RCA Victrola is a combination radio receiver and phonograph mechanism mounted in a modern styled, table type cabinet of superbly matched veneers. The receiver chassis is identical to the Model U-60 Radio-Victrola. The phonograph assembly is of the manually operated type with a con-

stant speed motor, and a new style, balanced arm crystal pickup.

Refer to the Model U-60 Service Notes for Alignment Procedure and Adjustments for Electric Tuning.

REPLACEMENT PARTS PECULIAR TO MODEL U-60-A

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

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
MOTOR ASSEMBLIES		31465	Mounting-Pickup arm mounting assembly comprising rubber grommet, washer, lock washer and nut.....
S-2285	Damper-Turntable damper plate and sleeve.....	S-2279	Pickup-Pickup crystal and arm assembly complete.....
32558	Motor-110 volt, 60 cycle motor complete (M1).....	31048	Plug-Pickup cable plug.....
32638	Motor-110 volt, 25 cycle motor complete (M1).....	31160	Screw-Pickup needle screw.....
S-2328	Mounting-Motor mounting assembly consisting of screws, washers, spacers and lockwashers.....	MISCELLANEOUS MOTOR-BOARD ASSEMBLIES	
4577	Plug-Motor cable male plug.....	9848	Cup-Needle cup, rest and lid complete.....
31463	Turntable-Motor turntable.....	4573	Plug-Motor cable female plug.....
PICKUP AND ARM ASSEMBLIES		31155	Spring-Needle cup lid tension spring (Pkg. of 10).....
31469	Base-Pickup arm pivot shaft and base assembly.....	30100	Spring-Automatic switch latch springs (Pkg. of 10).....
31156	Crystal-Pickup crystal cartridge and needle screw.....	S-2278	Switch-Automatic switch and trip assembly.....
		S-2268	Switch-Motor switch (S50).....

Refer to Model U-60 Service Notes, for Receiver, Speaker and Miscellaneous Assemblies.



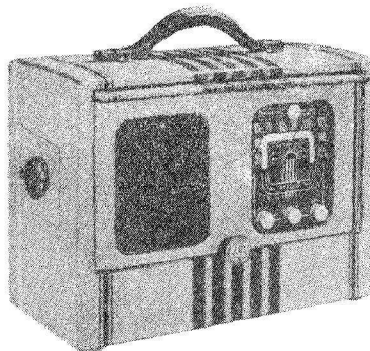
RCA Victor

DUETTE

Five-Tube, Two-Band, AC/DC or Battery operated Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical and Mechanical Specifications

Frequency Range 540-1,550 K.C. & 5.7-18.5 M.C.
Intermediate Frequency 455 K.C.

TUBE COMPLEMENT

(1) 1A7G 1st Det.—Osc.
(2) 1N5G I. F. Amplifier
(3) 1H5G 2nd Det., A-F, and AVC.
(4) 3Q5GT Output
(5) 35Z5GT Rectifier

POWER SUPPLY

110 to 125 volts, AC 25 or 60 cycles, or DC.

Series filament current05 Amps.

BATTERIES REQUIRED

"A" one 1.4 volt dry plug-in type

"B" two 45 volt dry plug-in type

CURRENT CONSUMPTION

"A"—0.25 Amps; "B" 10 m.a.

POWER OUTPUT

Undistorted 150 Milliwatts
Maximum 250 Milliwatts

LOUDSPEAKER

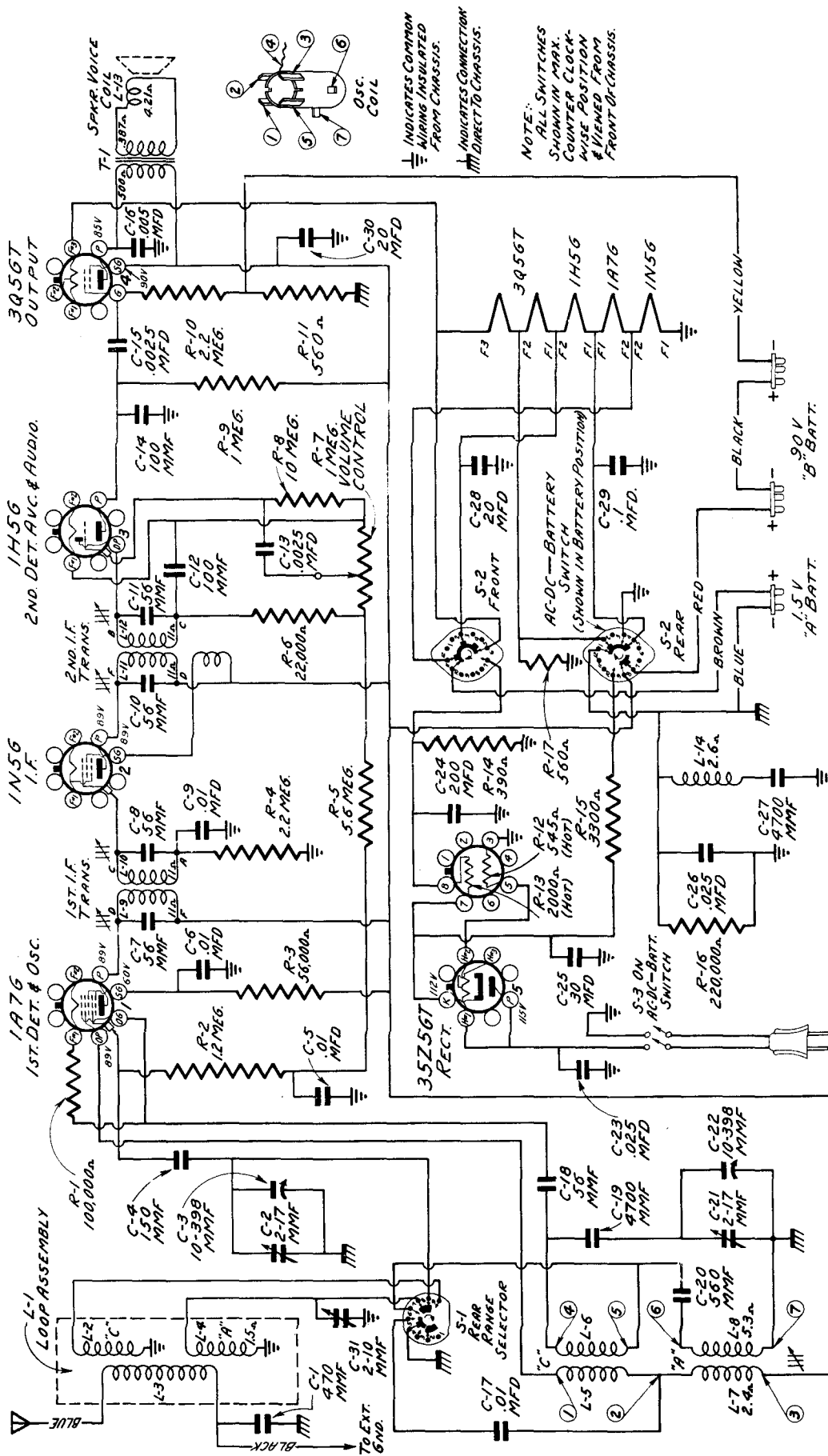
Type 5 inch "P.M." Dynamic
Voice Coil Impedance 5 ohms at 400 cycles

	Height	Width	Depth
Cabinet Dimensions (inches)	10 1/16"	13 1/2"	6 3/4"
Weight (net)	16 1/4 pounds		
Tuning drive ratio	6 to 1		

General Description

The RCA Victor Duette is a five tube, two band AC/DC and battery operated, portable type receiver of unusual design. Features of design include a loop antenna for "Broadcast" and "Short Wave" reception, AC/DC and battery switch, low drain 1.4 volt tubes

in the R.F. and I.F. circuits, five inch P.M. speaker, and a large easy to read dial. An ingenious filament network is used with the power switch, placing the filaments in parallel for battery operation and in series with the rectifier tube filament for AC/DC operation.



Schematic Circuit Diagram

Voltage measurements appearing above are made to chassis, with set tuned to quiet point. Values should hold within approximately plus or minus 20% with rated battery voltage.

Alignment Procedure

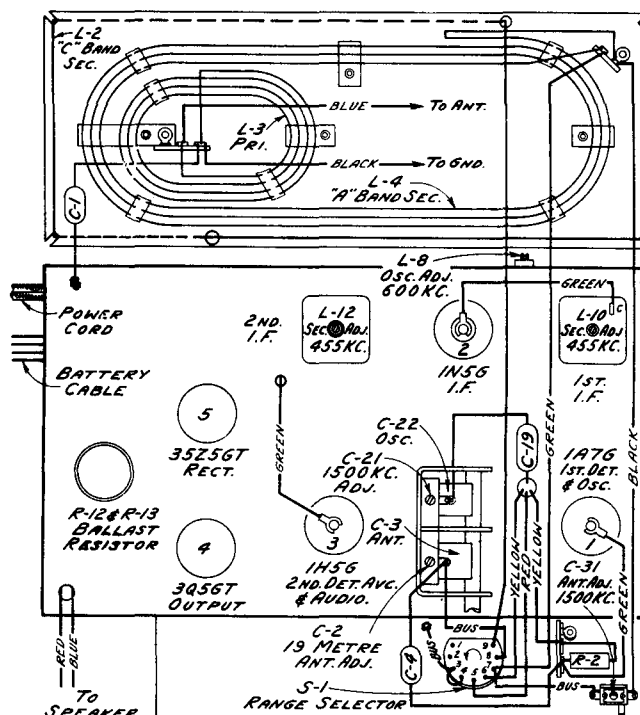
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action.

Align with switch in battery position.

Steps	Connect high side of test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust for Max. Peak
1	1A7-G 1st Det. grid cap in series with .01 mfd.	455 k.c.	quiet point around 1500 k.c. end of dial	L9, L10, L11, L12 (1st and 2nd I.F. transformers)
2	Antenna lead in series with 200 mmfd.	1500 k.c.	1500 k.c.	C21 (osc.) C31 (ant.)
3	Antenna lead in series with 200 mmfd.	600 k.c.	600 k.c.	*L8
4	Antenna lead in series with 300 ohms	18 m.c.	18 m.c.	C2

*Adjustment screw to be 10 turns past outside of fibre back on chassis before aligning.



REPLACEMENT PARTS FOR DUETTE

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			
S-2793	Ballast-Ballast resistor (R12, R13).....	13601	Resistor-10 meg.; 1/4 watt (R8)....
S-2810	Cable-Battery cable complete with plugs	S-2800	Shaft-station selector drive shaft
S-2811	Capacitor-Adjustable 2 - 10 mmfd. (C31)	S-2813	Socket-Tube socket.....
12723	Capacitor 56 mmfd. (C18).....	30585	Spring-Drive cord tension spring (Pkg.2).....
12720	Capacitor-100 mmfd. (C12, C14).....	S-2814	Switch-Range switch (S1).....
12725	Capacitor-150 mmfd. (C4).....	S-2801	Switch-A.C.-D.C. power switch (S2, S3).....
12952	Capacitor-470 mmfd. (C1).....	32263	Transformer-First I.F. Transformer (L9, L10, C7, C8).....
12537	Capacitor-560 mmfd. (C20).....	S-2815	Transformer-Second I.F. Transformer (L11, L12, C10, C11).....
12897	Capacitor-4700 mmfd. (C19, C27).....	S-2816	Volume Control (R7).....
5107	Capacitor-.0025 mfd. (C13, C15).....	REPRODUCER ASSEMBLIES	
4838	Capacitor-.005 mfd. (C16).....	(CRL-519) 5" P.M.	
4858	Capacitor-.01 mfd. (C5, C6, C9, C17).....	32907	Cap-Dust cap for cone center (Pkg. 5).....
4870	Capacitor-.025 mfd. (C23, C26).....	S-2802	Cone-Reproducer cone & voice coil (L13).....
4839	Capacitor-.01 mfd. (C29).....	5118	Plug-3 contact male plug.....
S-2794	Capacitor-Electrolytic capacitor comprising one 200 mfd. and one 20 mfd. sections (C24, C28).....	S-2803	Reproducer complete.....
S-2795	Coil-Oscillator coil (L5, L6, L7, L8)...	S-2804	Transformer - Output transformer (T1).....
S-2796	Coil-Filter coil (L14).....	MISCELLANEOUS ASSEMBLIES	
S-2797	Condenser-Variable tuning condenser and drum assembly (C2, C3, C21, C22)...	S-2805	Dial-Station selector dial scale assembly.....
S-2394	Cord-Variable tuning condenser drive cord.....	32633	Handle-Carrying handle.....
S-2798	Indicator-Dial indicator disc assembly.....	S-2806	Knob-Range switch, tuning or volume control knob.....
S-2799	Loop-Antenna loop assembly (L1).....	S-2809	Knob-Power switch knob.....
32208	Plug-2 prong male battery plug.....		
12827	Plug-3 prong male battery plug.....		
S-2793	Resistor-Ballast resistor, one 545 ohm and one 2000 ohm sections (R12, R13)		
S-2812	Resistor-390 ohm, 1/2 watt (R14).....		
11324	Resistor-560 ohm, 1/4 watt (R11, R17)...		
S-2819	Resistor-3300 ohm, 1/2 watt (R15).....		
14284	Resistor-22,000 ohm, 1/10 watt (R6)....		
12286	Resistor-56,000 ohm, 1/4 watt (R3)....		
11281	Resistor-100,000 ohm, 1/10 watt (R1)...		
12264	Resistor-220,000 ohm, 1/10 watt (R16)...		
S-2496	Resistor-1 meg., 1/10 watt (R9).....		
31056	Resistor-1.2 meg., 1/10 watt (R2).....		
12679	Resistor-2.2 meg., 1/4 watt (R4, R10)...		
S-2820	Resistor-5.6 meg.; 1/10 watt (R5).....		

CABINET REPAIRS

The following information although not complete is intended to be of assistance when repairing minor cabinet surface damage. All materials required to perform these repairs, will be found in the "RCA Victor Cabinet Refinishing Kit" Stock #9546.

Scratches

These fall into two classifications "fine" scratches and "Deep Scratches or Bruises".

Fine Scratches

These scratches are usually in the top finish only and can be taken out by rubbing with a felt pad, rubbing oil and charcoal. Always rub with the grain to avoid abrasive scratches. When scratches have been removed, rub over the spot with a soft rag and polish until lustre is restored.

Deep Scratches or Bruises

When the scratch or bruise is too deep to rub out by the above method, the burning in process should be used. Select a shade of stick shellac that will blend with the colour of the cabinet. Heat a round end knife (alcohol lamp or electric heater preferred) and slightly melt the stick shellac. Take enough of the shellac on end of knife to fill the scratch or bruise, work into opening with edge of warm knife, leaving shellac slightly higher than surface. After shellac is set, level to surface by rubbing with fine sandpaper and rubbing oil.

Follow by rubbing with polish and powdered charcoal using a felt pad to bring back the lustre. Wipe off the surface with a soft rag.

Decalcomania Replacement

Instructions for installation or replacement of decalcomania transfers on RCA Victor wood cabinets are as follows:-

- (1) Remove old decal using benzine and a block of felt, rubbing in the direction of the wood grain. Clean surface thoroughly.
 - (2) Apply a thin coat of "clear varnish" on the back side of the decal. Let dry until it becomes tacky.
 - (3) Apply decal to cabinet, rubbing gently over decal, making sure it is in complete contact with cabinet surface.
 - (4) Remove top layer of paper immediately after decal has stuck, by peeling off, after starting with finger nail.
 - (5) Apply water to last "Tissue" of decal with a sponge or rag, until the tissue can be rolled off.
 - (6) Use a slight amount of benzine on a cloth to remove excess varnish film from the cabinet. DO THIS GENTLY.
 - (7) Use dry cloth to wipe decal and cabinet surface clean.
-



RCA Victor

LITTLE NIPPER

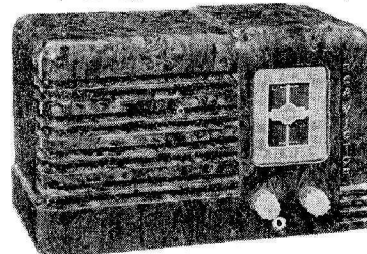
Five-Tube, Single-Band, AC-DC Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

General Description

The "Little Nipper" is a compact, five tube, superheterodyne receiver designed for 110 volt, A.C. or D.C. operation and housed in a molded, plastic cabinet. Features of design include: Stabilized oscillator circuit; full A.V.C. action in the R.F. and I.F. circuits; Phono input socket; beam power output stage and a four-inch, electrodynamic loudspeaker.



Little Nipper, Molded Cabinet

Electrical and Mechanical Specifications

FREQUENCY RANGE ----- 530-1,720 kc
TUBE COMPLEMENT
(1) Type 12SA7 ----- 1st-Detector—Oscillator
(2) Type 12SK7 ----- I-F Amplifier
(3) Type 12SQ7 ----- 2nd-Detector, 1st A-F, and A.V.C.
(4) Type 35L6GT ----- Power Output
(5) Type 35Z5GT ----- Half-Wave Rectifier
Dial Lamp (1) ----- Mazda 51, 7.5 volts, .2 amp.
POWER SUPPLY RATINGS
A-C Rating ----- 105-125 volts, 25-60 cycles, 30 watts
D-C Rating ----- 105-125 volts, direct current, 30 watts

INTERMEDIATE FREQUENCY ----- 455 kc
POWER OUTPUT (125 volt, 60 cycle supply)
Undistorted ----- 1.5 watts
Maximum ----- 2.0 watts
LOUDSPEAKER
Type ----- 4-inch Electrodynamic
Cabinet Dimensions ----- Height ----- 5 1/8 inches ----- Width ----- 8 5/8 inches ----- Depth ----- 4 1/4 inches
Weight (net) ----- 4 3/4 pounds
Shipping Weight ----- 6 pounds

CAUTION

Remove Power plug from outlet before servicing this receiver. Avoid contact of chassis or component parts to external ground.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning Condenser (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C10, C11, C12, C13 (1st and 2nd I-F transformers)
2	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C8 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C4 (antenna)

Radiotron Socket Voltages

Type	Plate	Screen Grid	Cathode	Filament
12SA7 Det.	90V	90V	—	12V
12SK7	90V	90	1.5V	12V
12SQ7	40V	—	—	12V
35L6GT	75V	90V	5V	35V
35Z5GT	114V	—	112V	35V

Note:—All voltages are measured to common wiring insulated from chassis with a line voltage of 117 volts.

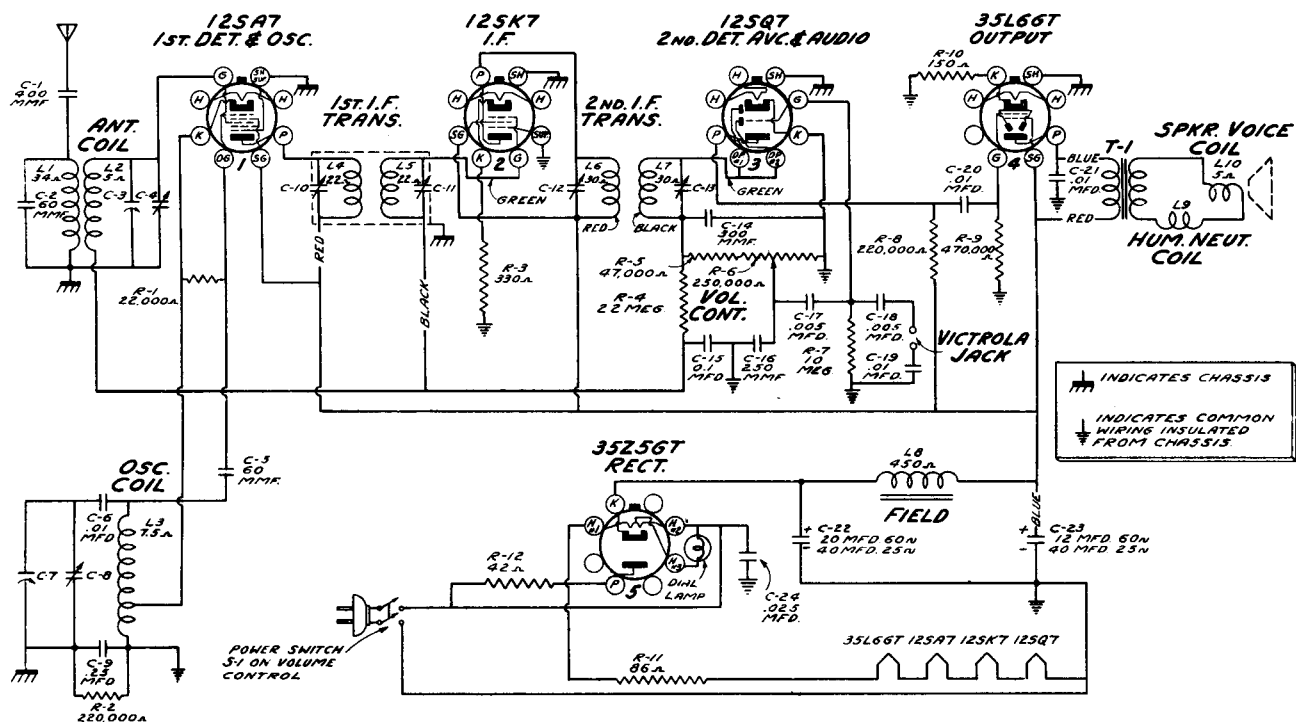
Precautionary Lead Dress

1. Dress 1st I-F plate and grid leads against chassis and away from each other. Dress plate lead from 12SK7 close to chassis.
2. Dress electrolytic capacitor against rear apron.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Antenna.—The set is equipped with a length of antenna wire. Do not connect the antenna direct to ground. If an outdoor antenna is used, it should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Victrola Attachment.—A jack is provided on the rear of chassis for connecting a Victrola Attachment into the audio-amplifying circuit. The cable from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.



Schematic Circuit Diagram

REPLACEMENT PARTS FOR MODEL "LITTLE NIPPER"

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			
S-2419	Antenna-Antenna Lead.....	12679	Resistor-2.2 meg., 1/4 watt (R4)....
13057	Capacitor-60 mmfd. (C2, C5).....	13601	Resistor-10 meg., 1/4 watt (R7)....
12488	Capacitor-250 mmfd. (C16).....	32943	Retainer-Dial scale retaining clip & washer (Pkg. 10).....
12952	Capacitor-300 mmfd. (C14).....	32945	Shaft-Station selector drive shaft.....
30433	Capacitor-400 mmfd. (C1).....	32537	Socket-Radiotron socket.....
4838	Capacitor-.005 mfd. (C17, C18).....	S-2425	Socket-Pilot lamp socket and lead.
14393	Capacitor-.01 mfd. (C6, C19, C20).....	14278	Socket-Phono input socket.....
4858	Capacitor-.01 mfd. (C21).....	30585	Spring-Drive cord tension spring (Pkg. 2).....
4839	Capacitor-.01 mfd. (C15).....	32966	Transformer-1st I.F. transformer (L4, L5, C10, C11).....
4870	Capacitor-.025 mfd. (C24).....	32967	Transformer-2nd I.F. transformer (L6, L7, C12, C13).....
12484	Capacitor-.025 mfd. (C9).....	S-2426	Volume control and power switch (R6, S1, S2).....
S-2420	Capacitor-Electrolytic capacitor comprising one 20 mfd. and one 10 mfd. 60 cy. (C22, C23).....	REPRODUCER ASSEMBLIES	
S-2421	Capacitor-Electrolytic capacitor comprising two 40 mfd. sections 25 cycle (C22, C23).....	S-2427	Cone-Reproducer cone & voice coil (L10).....
32572	Coil-Antenna coil (L1, L2).....	S-2428	Coil-Field Coil (L8).....
32962	Coil-Oscillator coil (L3).....	S-2429	Reproducer complete.....
32968	Condenser-2 gang variable tuning condenser (C3, C4, C7, C8).....	S-2430	Transformer-Output transformer (T1)
S-2432	Cord-Indicator drum drive cord.....	MISCELLANEOUS ASSEMBLIES	
35124	Dial-Station selector dial scale.....	S-2755	Cabinet-Molded plastic cabinet (Walnut).....
35117	Drum-Indicator drum assembly.....	S-2762	Cabinet-Molded plastic cabinet (Ivory).....
31480	Lamp-Dial lamp.....	S-2763	Cover-Cabinet back cover.....
32971	Resistor-42 ohm flexible type (R12)...	32571	Knob-Volume or tuning control knob (Tan).....
33558	Resistor-86 ohm flexible type (R11)...	32447	Knob-Volume or tuning control knob (Ivory).....
13428	Resistor-150 ohm, 1/4 watt (R10).....	32667	Spring-Retaining spring for knobs or drum (Pkg. 5).....
30538	Resistor-330 ohm, 1/4 watt (R3).....		
13998	Resistor-22,000 ohm, 1/4 watt (R1).....		
12412	Resistor-47,000 ohm, 1/4 watt (R5)...		
12264	Resistor-220,000 ohm, 1/4 watt (R2, R8)		
12285	Resistor-470,000 ohm, 1/4 watt (R9)...		
12679	Resistor-2.2 meg., 1/4 watt (R4).....		



RCA Victor

MASTER NIPPER

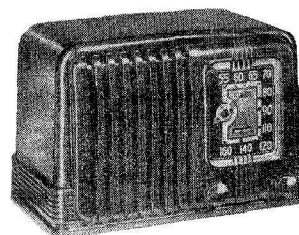
Five-Tube, Single-Band, AC-DC Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

General Description

The RCA Victor "Master Nipper" is a five-tube single band superheterodyne receiver housed in a plastic cabinet of modern design. Features include: Magnetite core I.F. transformers; built-in loop assembly with provision for use with an external antenna; beam power output tube; sensitive, five inch electrodynamic loudspeaker and a well filtered, rectifier network.



Master Nipper, Molded Cabinet
Supplied in ivory and walnut finish

Electrical and Mechanical Specifications

FREQUENCY RANGE 540-1,600 kc
Intermediate Frequency 455 kc

TUBE COMPLEMENT

- (1) Type 12SA7 1st-Detector-Oscillator
- (2) Type 12SK7 I-F Amplifier
- (3) Type 12SQ7 2nd-Detector, 1st A-F, and A.V.C.
- (4) Type 35L6GT Power Output
- (5) Type 35Z5GT Rectifier
- Dial Lamp (1) Mazda 51, 7.5 volts, 2 amp.

POWER SUPPLY RATINGS

A-C Rating 105-125 volts, 50-60 cycles, 30 watts
D-C Rating 105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted 1.0 watts
Maximum 1.5 watts

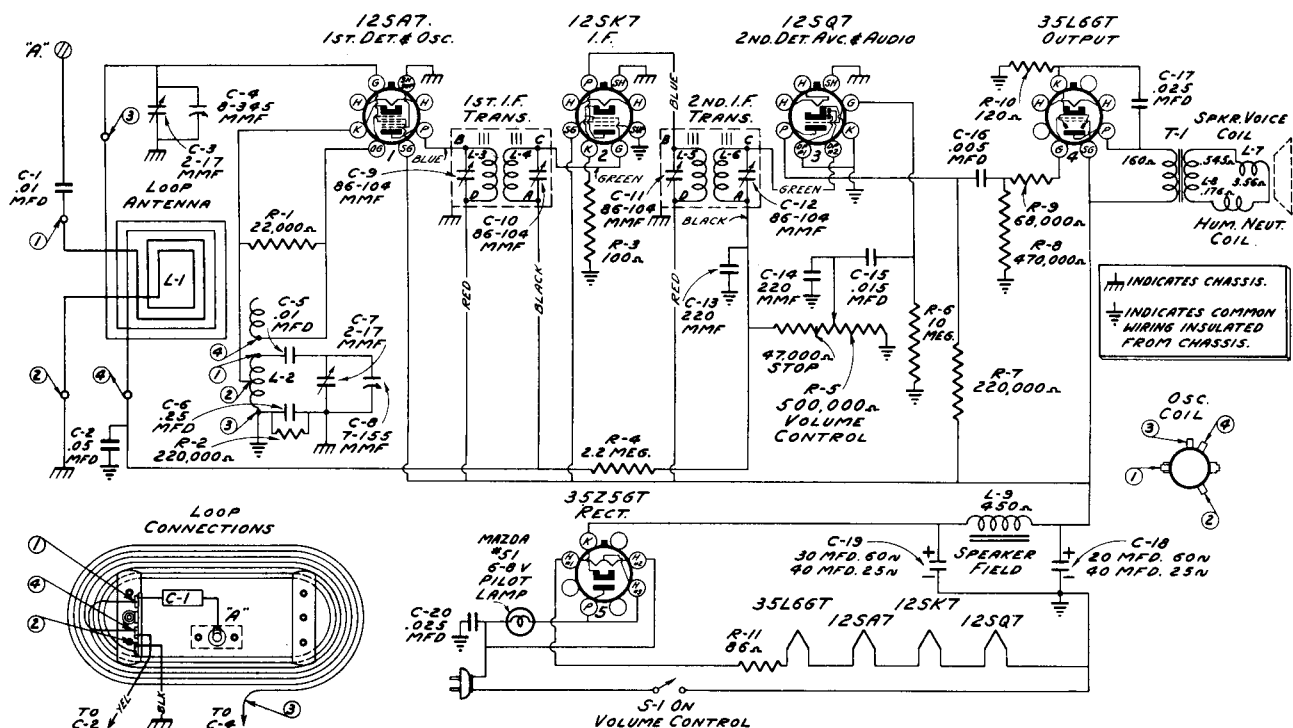
LOUDSPEAKER

Type 5-inch Electrodynamic

REPLACEMENT PARTS FOR MASTER NIPPER

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		31319	Socket-Radiotron socket.....
12694	Capacitor-220 mfd. (C13,C14).....	34449	Socket-Pilot lamp socket.....
4838	Capacitor-.005 mfd. (C16).....	30585	Spring-Drive cord tension spring (Pkg.2)
4858	Capacitor-.01 mfd. (C1,C5).....	35056	Transformer-Output transformer(T1).....
11315	Capacitor-.015 mfd. (C15).....	S-2787	Transformer-First I.F.transformer (L3,L4,C9,C10).....
4870	Capacitor-.025 mfd. (C17,C20).....	S-2788	Transformer-Second I.F.transformer (L5,L6,C11,C12).....
32787	Capacitor-.05 mfd. (C2).....	S-2774	Volume Control and power switch(R5,S1)..
12484	Capacitor-0.25 mfd.(C6).....	REPRODUCER ASSEMBLIES-(CRL-517) 5"	
S-2421	Capacitor-Electrolytic consisting of two 40 mfd. sections(C18,C19)25 cyc.	32907	Cap-Dust cap for cone centre(Pkg.5).....
S-2776	Coil-Oscillator coil (L2).....	S-2775	Coil-Field coil (L9).....
S-2786	Condenser-2 gang variable tuning condenser and drum assembly (C3,C4,C7,C8).....	S-2777	Reproducer complete less output transformer.....
32634	Cord-Condenser drum drive cord.....	MISCELLANEOUS ASSEMBLIES	
35059	Dial-Station selector dial scale.....	S-2784	Cabinet-Molded plastic cabinet (Walnut).....
35063	Drum-Tuning condenser drive drum.....	S-2785	Cabinet-Molded plastic cabinet (Ivory).....
35062	Indicator-Station selector indicator pointer.....	35079	Crystal-Station selector dial crystal...
11765	Lamp-Dial lamp.....	S-2778	Knob-Volume or tuning control knob(for walnut cabinet).....
S-2772	Loop-Antenna loop assembly(L1).....	S-2779	Knob-Volume or tuning control knob(for ivory cabinet).....
33558	Resistor-82 ohm,flexible type (R11)...		
32535	Resistor-120 ohm,flexible type(R10)...		
S-2575	Resistor-100 ohm,1/4 watt (R3).....		
13998	Resistor-22,000 ohm,1/4 watt (R1).....		
13715	Resistor-68,000 ohm,1/4 watt (R9).....		
12264	Resistor-220,000 ohm,1/4 watt(R2,R7)...		
12285	Resistor-470,000 ohm,1/4 watt (R8).....		
12679	Resistor-2.2 meg.;1/4 watt (R4).....		
13601	Resistor-10 meg; 1/4 watt (R6).....		
35058	Shaft-Tuning condenser drive shaft....		



Schematic Circuit Diagram

CAUTION

Remove Power plug from outlet before servicing this receiver. Avoid contact of chassis or component parts to external ground.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that pointer is vertical.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 (I-F) grid in series with .01 mfd.	455 kc	Quiet point at 600 kc end of dial	C11, C12 (2nd I-F trans.)
2	Tuning condenser stator (ant.) in series with .01 mfd.			C9, C10 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter	1,600 kc	Full clockwise (out of mesh)	C7 (oscillator)
4		1,400 kc	Resonance on 1,400 kc signal	C3 (antenna)

Radiotron Socket Voltages

Type	Plate	Screen Grid	Cathode	Filament
12SA7 Det.	90V	90V	—	12V
12SK7	90V	90	1.1V	12V
12SQ7	40V	—	—	12V
35L6GT	84V	90V	5V	35V
35Z5GT	114V	—	112V	35V

Note:—All voltages are measured to common wiring insulated from chassis with a line voltage of 117 volts.

Precautionary Lead Dress

1. Audio coupling capacitor to volume control must be dressed under the terminal board and down against the corner of the chassis.
2. The voice coil leads from the output transformer to the speaker must be dressed away from the terminal on the terminal-board to which the above audio coupling capacitor is connected.
3. The output tube bypass condenser must be dressed away from the 12SQ7 tube.



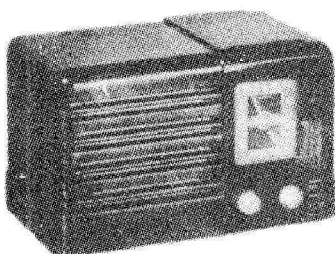
RCA Victor

NIPPER

Five-Tube, Single-Band, AC-DC Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Nipper, Molded Cabinet

Electrical and Mechanical Specifications

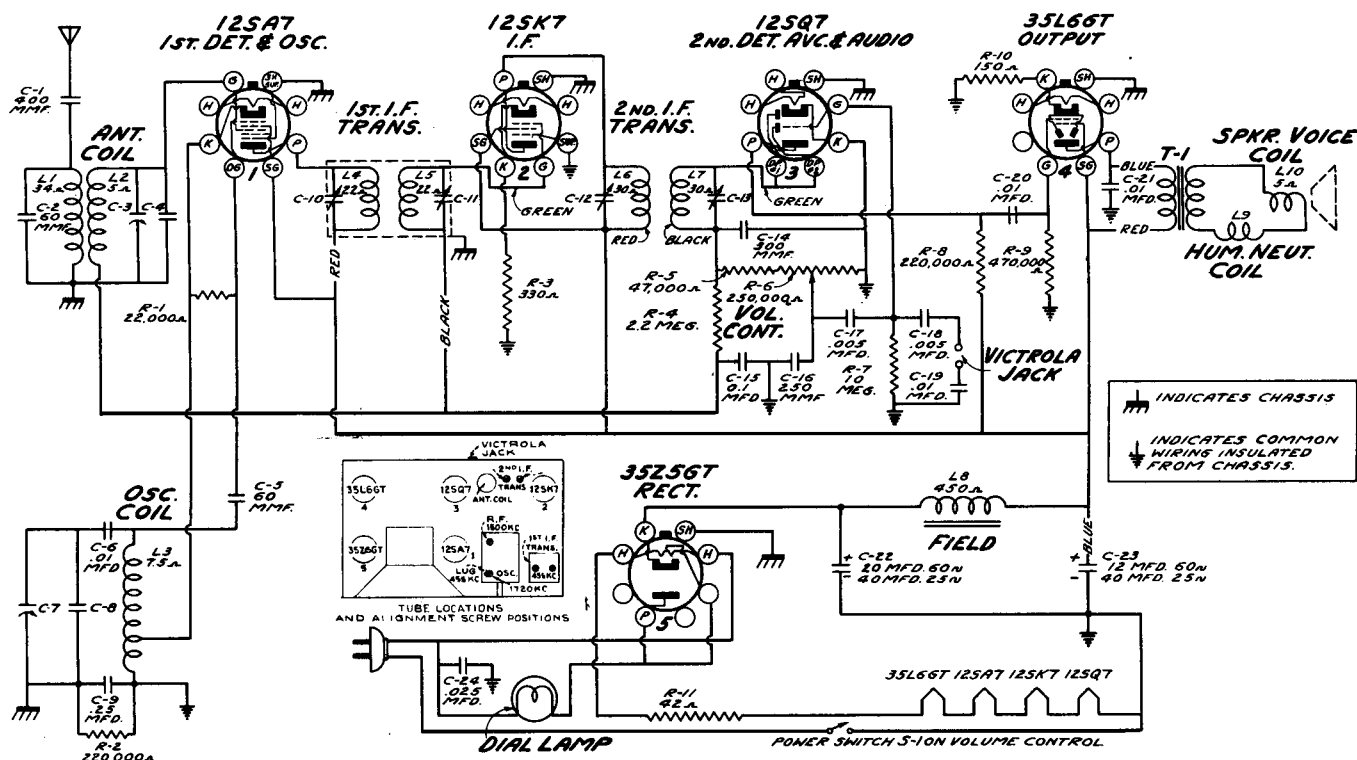
FREQUENCY RANGE ----- 530-1,720 kc
TUBE COMPLEMENT
(1) Type 12SA7 ----- 1st-Detector—Oscillator
(2) Type 12SK7 ----- I-F Amplifier
(3) Type 12SQ7 ----- 2nd-Detector, 1st A-F, and A.V.C.
(4) Type 35L6GT ----- Power Output
(5) Type 35Z5GT ----- Half-Wave Rectifier
Dial Lamp (1) ----- Mazda 47, 6.3 volts, .15 amp.
POWER SUPPLY RATINGS
A-C Rating ----- 105-125 volts, 25-60 cycles, 30 watts
D-C Rating ----- 105-125 volts, direct current, 30 watts

INTERMEDIATE FREQUENCY ----- 455 kc
POWER OUTPUT (125 volt, 60 cycle supply)
Undistorted ----- 1.5 watts
Maximum ----- 2.0 watts
LOUDSPEAKER
Type ----- 4-inch Electrodynamic
Cabinet Dimensions ----- Height 5 1/8 inches ----- Width 8 5/8 inches ----- Depth 4 1/2 inches
Weight (net) ----- 4 3/4 pounds
Shipping Weight ----- 6 pounds

REPLACEMENT PARTS FOR RCA NIPPER

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			
S-2419	Antenna-Antenna lead.....	32945	Shaft-Indicator drum drive shaft...
13057	Capacitor-60 mmfd. (C2,C5).....	32537	Socket-Radiotron socket.....
12488	Capacitor-250 mmfd. (C16).....	S-2425	Socket-Pilot lamp sockets and lead.
12952	Capacitor-300 mmfd. (C14).....	14278	Socket-Phone input socket.....
30433	Capacitor-400 mmfd. (C1).....	30585	Spring-Drive cord tension spring
4838	Capacitor-.005 mfd. (C17,C18)....		(Pkg. 10).....
14393	Capacitor-.01 mfd. (C6,C19,C20)...	32966	Transformer-1st I.F. Transformer
4858	Capacitor-.01 mfd. (C21).....		(L4,L5,C10,C11).....
4839	Capacitor-.01 mfd. (C15).....	32967	Transformer-2nd I.F. Transformer
4870	Capacitor-.025 (C24).....		(L6,L7,C12,C13).....
12484	Capacitor-0.25 (C9).....	S-2426	Volume Control and power switch
S-2420	Capacitor-Electrolytic capacitor		(R6,S1).....
	comprising one 20 mfd. and one	REPRODUCER ASSEMBLIES CRL-508-2	
	10 mfd. 60 cycle (C22,C23).....	S-2427	Cone-Reproducer Cone & Voice Coil
S-2421	Capacitor-Electrolytic capacitor		(L10).....
	comprising two 40 mfd. sections	S-2428	Coil-Field Coil (L8).....
	25 cycle (C22,C23).....	S-2429	Reproducer Complete.....
32572	Coil-Antenna coil (L1,L2).....	S-2430	Transformer-Output transformer(T1).
32962	Coil-Oscillator Coil (L3).....	REPRODUCER ASSEMBLIES	
32968	Condenser-2 gang variable tuning	Used on chassis Marked Sub "0"	
	condenser (C3,C4,C7,C8).....	32963	Reproducer complete.....
S-2432	Cord-Indicator drum drive cord....	32964	Transformer-Output transformer(T1).
33310	Dial-Station Selector dial scale..	MISCELLANEOUS ASSEMBLIES	
S-2423	Drum-Indicator and drum assembly..	S-2452	Moulded Cabinet Complete (ivory)...
31480	Lamp-Pilot lamp.....	S-2431	Cabinet Moulded Complete (mahogany)
32971	Resistor-42 ohm flexible type(R11)	S-2436	Cover-Back Cover for Cabinet.....
13428	Resistor-150 ohm 1/4 watt (R10)...	32571	Knob-Volume Control or Tuning
30538	Resistor-330 ohm 1/4 watt (R3)....		Knob.....
13998	Resistor-22,000 ohm 1/4 watt (R1)..	32657	Spring-Retaining Spring for Knob
12412	Resistor-47,000 ohm 1/4 watt (R5)..		or Drum (Pkg. 5).....
12264	Resistor-220,000 ohm 1/4 watt		
	(R2,R8).....		
12285	Resistor-470,000 ohm 1/4 watt (R9)		
12679	Resistor-2.2 meg. 1/4 watt (R4)...		
13601	Resistor-10 meg. 1/4 watt (R7)....		



Schematic Circuit Diagram

CAUTION

Remove Power plug from outlet before servicing this receiver. Avoid contact of chassis or component parts to external ground.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning Condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	(1st and 2nd I-F transformers)
2	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	(oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	(antenna)

Radiotron Socket Voltages

Type	Plate	Screen Grid	Cathode	Filament
12SA7 Det.	90V	90V	—	12V
12SK7	90V	90	1.5V	12V
12SQ7	40V	—	—	12V
35L6GT	75V	90V	5V	35V
35Z5GT	114V	—	112V	35V

Note:—All voltages are measured to common wiring insulated from chassis with a line voltage of 117 volts.

Precautionary Lead Dress

1. Dress 1st I-F plate and grid leads against chassis and away from each other. Dress plate lead from 12SK7 close to chassis.
2. Dress electrolytic capacitor against rear apron.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Antenna.—The set is equipped with length of antenna wire. Do not connect the antenna to ground. If an outdoor antenna is used, it should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Victrola Attachment.—A jack is provided on the rear of chassis for connecting a Victrola Attachment into the audio-amplifying circuit. The cable from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.



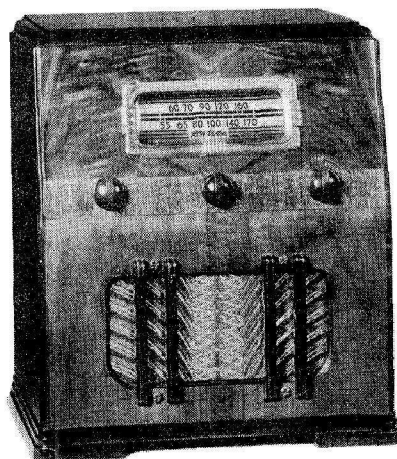
RCA Victor

MODEL B-1

Six-Tube, Single-Band, Battery Operated, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

TUBE COMPLEMENT

- | | |
|---|-------------------------------|
| (1) Type 1A7-G First Detector-Oscillator | (4) Type 1G4-G Phase Inverter |
| (2) Type 1N5-G I.F. Amplifier | (5) Type 1C5-G Power Output |
| (3) Type 1H5-G Second Det., A.F. Amp., & A.V.C. | (6) Type 1C5-G Power Output |
| Frequency Range | 540-1,740 K.C. |

POWER OUTPUT

Type Class "A-B"
 Undistorted3 watts
 Maximum4 watts

ALIGNMENT FREQUENCIES

I.F. 455 K.C.
 Ant. 1,500 K.C.
 Osc. 600 K.C., 1,500 K.C.

BATTERIES REQUIRED

"A" One 1.5 Volt Dry Plug-in (Eveready No. 740) or One 1.4 Volt Plug-in Aircell (Eveready No. A-1300)
 "B" Two 45 Volt Dry Plug-in "B" Batteries (Eveready No. 386)

CURRENT CONSUMPTION

"A" at 1.4 Volts4 Amps.
 "B" at 90 Volts 11.1 Milliamperes

LOUDSPEAKER

Type 6 inch Permanent Magnet Dynamic
 Voice Coil Impedance 3 ohms at 400 cycles

Mechanical Specifications

	Height	Width	Depth
Cabinet Dimensions	14 ¹ / ₁₆ "	12 ¹ / ₂ "	8 ³ / ₁₆ "
Chassis Base Dimensions	2"	9 ⁵ / ₈ "	5 ¹ / ₂ "
Overall Chassis Height			5 ³ / ₄ "
Operating Controls	(1) Power Switch-Volume, (2) Tuning, (3) Tone-Phono.		

General Description

The RCA Victor Model B-1 is a six-tube, single band, battery operated receiver housed in a table type cabinet of superbly matched veneers. Features of design include:—Magnetite core I.F. and oscillator transformers, automatic volume control, low frequency oscillator tracking, resistance coupled audio,

phase inversion, class "A-B" audio output stage, radio-phonograph switch and tone control, phono input socket, super-sensitive, six-inch, permanent magnet, dynamic loudspeaker, low current drain and a large, easy to read dial.

Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List.

Victrola Attachment. A jack located on the rear apron of the chassis is provided for connecting a Victrola Attachment into the audio-amplifying circuit. The cable running from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.

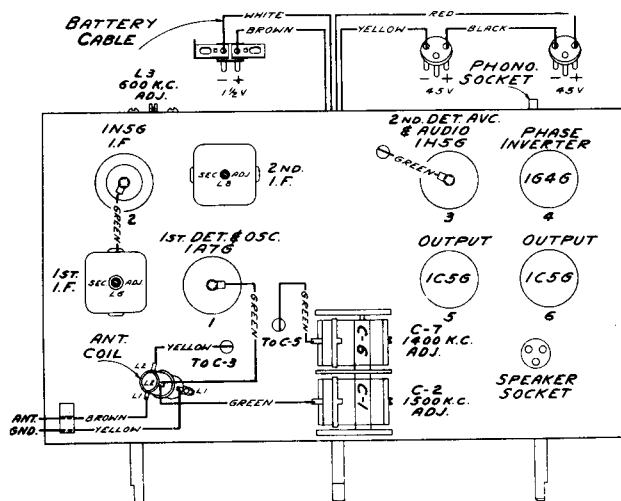


Fig. 1—Tube and Trimmer Locations

Alignment Procedure

Calibrate the tuning dial by adjusting the dial pointer to the low-frequency calibration mark on dial with the gang condenser plates in full-mesh position. This is a friction adjustment.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 3.

Cathode-ray alignment is highly preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver "G" (ground) terminal for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

Order of Alignment	Test Oscillator			Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Radiotron	Dummy Antenna	Frequency Setting				
1	1N5G Grid Cap	.1 Mfd.	455 k.c.	No Signal 550-750 k.c.	2nd I.F. Trans.	L7 & L8	Symmetrical Curve
2	1A7G Det. Grid Cap	.1 Mfd.	455 k.c.	No Signal 550-750 k.c.	1st I.F. Trans.	L5 & L6	Symmetrical Curve
3	Ant. Term.	200 Mmf.	600 k.c.	600 k.c.	L.F. Osc.	L3	Max. (Peak)
4	Ant. Term.	200 Mmf.	1,500 k.c.	1,500 k.c.	H.F. Osc.	C6	Max. (Peak)
5	Ant. Term.	200 Mmf.	600 k.c.	Rock Thru 600 k.c.	L.F. Osc.	L3	Max. (Peak)
6	Ant. Term.	200 Mmf.	1,500 k.c.	1,500 k.c.	Ant.	C2	Max. (Peak)

Radiotron Socket Voltages: Measured with all batteries at Normal Voltage

Radiotron	Plate	Screen Grid	Grid	Filament
1A7G Det.	80V	40	....	1.4V
1A7G Osc.	80V	..	....	1.4V
1N5G I.F.	80V	80	....	1.4V
1H5G Audio	58V	..	....	1.4V
1G4G Inverter	37V	..	-2V	1.4V
1C5G Output	78.5	80	-10V	1.4V
1C5G Output	78.5	80	-10V	1.4V

REPLACEMENT PARTS FOR MODEL B-1

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			
12723	Capacitor-56 mmfd. (C4).....	14887	Retainer-Drive shaft or pulley
12724	Capacitor-150 mmfd.(C15).....		retainer (Pkg. 20).....
14712	Capacitor-180 mmfd.(C13).....	3903	Screw-Drive cord drum set screw
30433	Capacitor-430 mmfd.(C5).....		(Pkg. 20).....
14498	Capacitor-750 mmfd.(C23).....	S-2312	Shaft-Station selector drive shaft..
13762	Capacitor-1500 mmfd.(C24).....	S-2399	Socket-3 contact speaker socket....
5107	Capacitor-.0025 mfd.(C16,C18)....	31251	Socket-Radiotron socket.....
14393	Capacitor-.01 mfd.(C14,C17,C20,C22)	14278	Socket-Phono input socket.....
4839	Capacitor-.1 mfd. (C3,C8,C19).....	31418	Spring-Drive cord tension spring
S-2408	Capacitor-20 mfd. electrolytic		(Pkg. 10).....
	capacitor (C21).....	S-2400	Switch-Radio-phonos switch (S3).....
30894	Coil-Antenna coil (L1,L2).....	32595	Shield-Radiotron shield.....
32148	Coil-Oscillator coil (L3,L4).....	14261	Transformer-1st I.F. transformer
S-2391	Condenser-2 gang variable con-		(L5,L6,C9,C10).....
	denser (C1,C2,C6,C7).....	14308	Transformer-2nd I.F. transformer
S-2393	Cord-Variable condenser drum		(L7,L8,C11,C12,C13,R5).....
	drive cord.....	S-2401	Volume control and "on-off" switch
S-2396	Dial-Station selector dial scale		(R6,S1,S2).....
	assembly.....	REPRODUCER ASSEMBLIES CRL-501-1	
S-2309	Drum-Variable condenser drive cord	S-2402	Cone-Reproducer cone and voice
	drum.....		coil (L9).....
31420	Indicator-Station selector indica-	S-2403	Plug-3 contact male plug.....
	tor pointer.....	S-2404	Reproducer-Reproducer complete.....
S-2398	Plug-2 contact male plug for	S-2405	Transformer-Output transformer (T1).
	battery cable.....	MISCELLANEOUS ASSEMBLIES	
S-1628	Plug-3 contact male plug for	S-2406	Escutcheon-Station selector
	battery cable.....		escutcheon and crystal.....
31373	Pulley-Drive cord pulley.....	14269	Knob-Tuning, volume or tone control
14076	Resistor-820 ohms, 1/4 watt (R16).		knob.....
14284	Resistor-22,000 ohms,1/10 watt(R5)	14270	Spring-Retaining spring for knob
12412	Resistor-47,000 ohms,1/4 watt(R10)		(Pkg. 10).....
13715	Resistor-68,000 ohms,1/4 watt(R2).		
12264	Resistor-220,000 ohms,1/4 watt(R1)		
11452	Resistor-470,000 ohms,1/10 watt		
	(R12).....		
12285	Resistor-470,000 ohms,1/4 watt(R14)		
13730	Resistor-1 meg. 1/4 watt(R3,R9)...		
30208	Resistor-1.2 meg. 1/4 watt (R7)...		
5028	Resistor-1.8 meg. 1/4 watt (R11)...		
5131	Resistor-2.2 meg. 1/10 watt (R8,		
	R15).....		
12679	Resistor-2.2 meg. 1/4 watt (R4)...		
30271	Resistor-4.7 meg. 1/4 watt (R13)...		



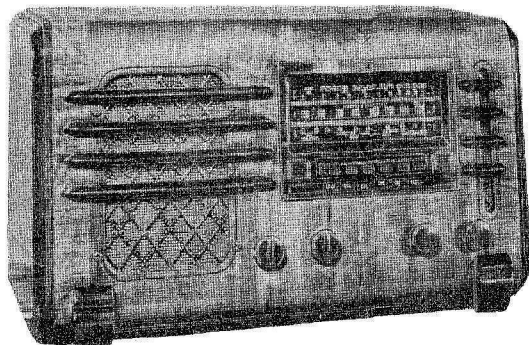
RCA Victor

MODELS B2 & B3 Battery Operated MODELS 6B2 & 6B3 Vibrator Operated

Six-Tube, Three-Band, Superheterodyne Receivers

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Models B3 and 6B3



Models B2 and 6B2

Electrical Specifications

Models B2 and B3

RADIOTRON COMPLEMENT

- | | |
|---------------|----------------------------|
| (1) Type 1N5G | R.F. Amplifier |
| (2) Type 1A7G | First Detector, Oscillator |
| (3) Type 1N5G | I.F. Amplifier |
| (4) Type 1H5G | Second Det., A.V.C., A.F. |
| (5) Type 1G4G | Driver |
| (6) Type 1G6G | Power Output |

BATTERY REQUIREMENTS

- "A" one plug-in 1½ volt battery
(Eveready A-1300 Air Cell)
or
(Eveready No. 740 Dry Battery)
"B" Two plug-in 45 volt batteries
(Eveready No. 385 or 386)

CURRENT CONSUMPTION

- "A" at 1.5 volts36 amperes
"B" at 90 volts 12 Milliamperes

POWER OUTPUT

- Undistorted4 Watts
Maximum6 Watts

Models 6B2 and 6B3

RADIOTRON COMPLEMENT

- | | |
|----------------|---------------------------|
| (1) Type 1D5GP | R.F. Amplifier |
| (2) Type 1A7G | Converter |
| (3) Type 1N5G | I.F. Amplifier |
| (4) Type 1H5G | Second Det., A.V.C., A.F. |
| (5) Type 1F5G | Driver |
| (6) Type 1J6G | Power Output |

BATTERY REQUIREMENTS

- One 6 volt Storage Battery.
Fuse Rating 3 Amperes

CURRENT CONSUMPTION

- "A" at 6 Volts 1.25 Amperes

POWER OUTPUT

- Undistorted 1.6 Watts
Maximum 2.8 Watts

LOUDSPEAKER (B3, 6B3)

- Type 8 inch, Permanent Magnet Dynamic
Voice Coil Impedance 2.2 ohms at 400 cycles

LOUDSPEAKER (B2, 6B2)

- Type 12 inch, Permanent Magnet Dynamic
Voice Coil Impedance 2.2 ohms at 400 cycles

General Description

These receivers employ a six tube, three band, superheterodyne circuit. Models B2 and B3 are battery-operated receivers using the new type 1.4 volt tubes for greater battery economy. Models 6B2 and 6B3 are vibrator-operated receivers using a combination of 1.4 volt and 2 volt tubes in an ingenious filament network operating directly from a six volt supply. Reference to the Schematic Diagrams will disclose the details of these receivers. Features of design common to these receivers include:—

Magnetite-core I.F. transformers and low frequency "A" oscillator tracking, automatic volume control, resistance coupled first audio stage and a transformer coupled driver stage to a Class B output stage, phono input socket, Radio-phono six point tone switch providing a three point tone control on radio and a three point tone control on phono, sensitive, permanent magnet dynamic loudspeaker, six mechanical type cam operated push buttons for ease in tuning, and a horizontal type glass dial.

Radiotron Socket Voltages RCA Models (B2, B3)
Measured with all batteries at Normal Voltage

Radiotron	Plate	Screen Grid	Grid	Filament
1N5G R.F.	90v	90v	....	1.4v
Conv. 1A7G Osc.	90v 79v	31v*	....	1.4v
1N5G I.F.	90v	90v	....	1.4v
1H5G Audio	35v*	....	....	1.4v
1G4G Driver	89v	89v	—4v	1.4v
1G6G Output	89/89v	....	....	1.4v

*Cannot be accurately measured with an ordinary voltmeter due to the high series resistance. All the above values hold within plus or minus 20% when measured with a 1000 ohm-per-volt meter.

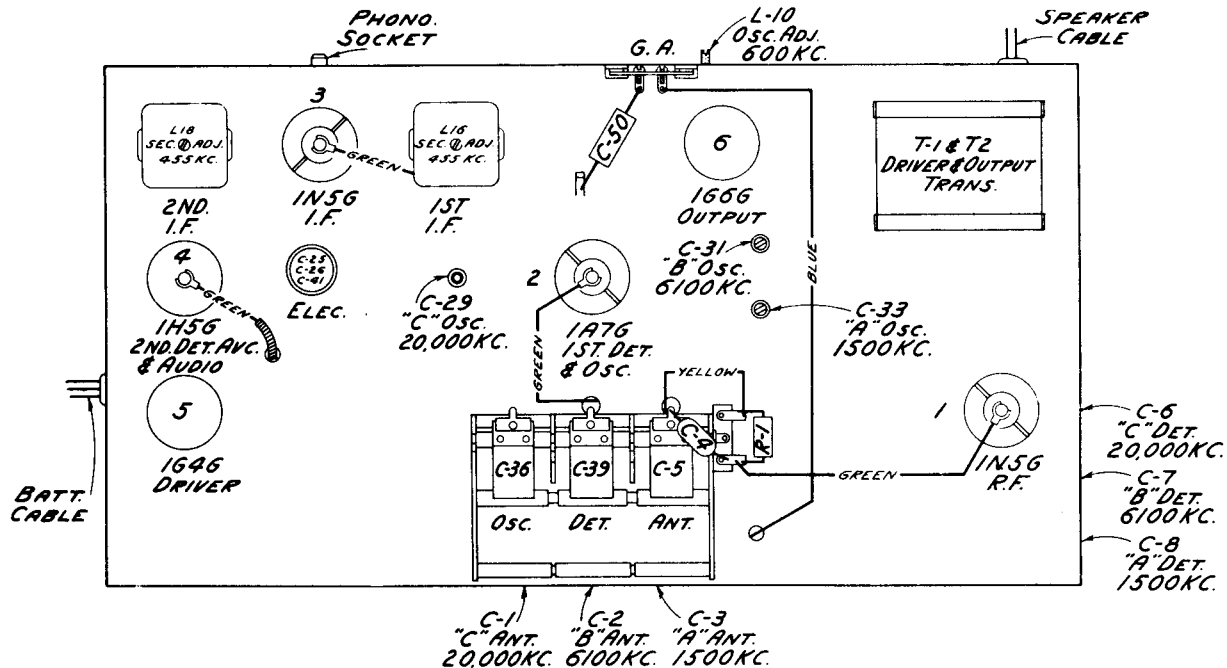
BIAS CELLS:— Four bias cells are connected in series for the purpose of supplying a bias potential to the 1G4G driver grid. Due to their construction, any attempt to measure the potential with an ordinary voltmeter should be avoided. A simple check may be made by connecting a milliammeter in the plate circuit of the 1G4G tube and note the plate current reading. Then carefully remove the cells

Radiotron Socket Voltages RCA Models 6B2, 6B3
Measured with "A" Battery at Normal Voltage

Radiotron	Plate	Screen Grid	Grid	Filament
1D5GP R.F.	91v	42*v	....	2.1v
Conv. 1A7G Osc.	91v 82v	31*v	....	1.4v
1N5G I.F.	91v	91v	....	1.4v
Det. 1H5G Audio	35*v	30v	....	1.4v
1F5G Driver	91v	91v	—4.1v	2.0v
1J6G Output	160/160v	....	—2.1v	2.0v

*Cannot be accurately measured with an ordinary voltmeter due to the high series resistance. All the above values hold within plus or minus 20% when measured with a 1000 ohm-per-volt meter.

and substitute a battery potential of 4 volts in their place and note the plate current reading on the milliammeter. If the first reading (with bias cells connected) deviates more than 40% from the latter reading (with battery connected) the cells should be replaced. A 40% difference in the plate current readings is equivalent to a change of approximately 25% in battery voltage.



Models B2, B3 Chassis Layout and Alignment Adjustments

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. 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

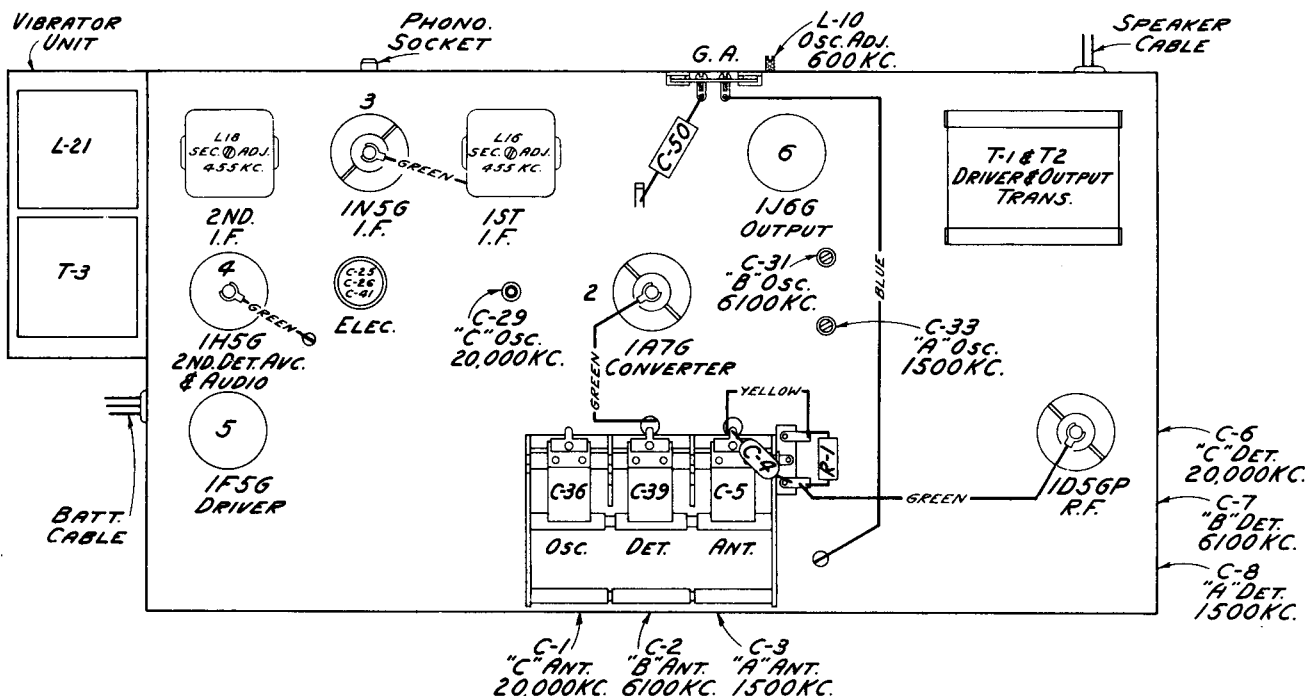
drum. The 240° mark on the drum scale must be vertical and directly above the center of the shaft of the turning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

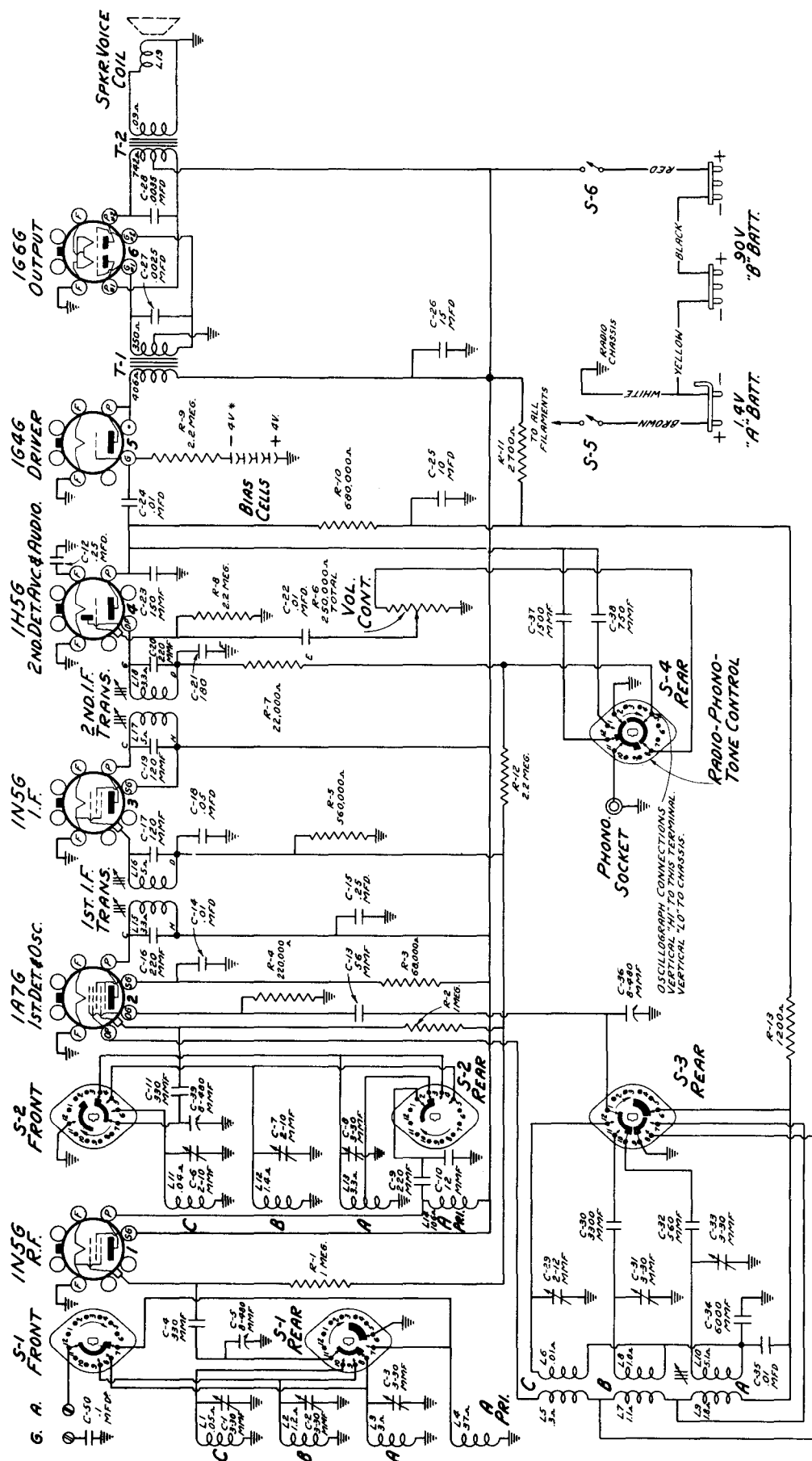
Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	1N5G I.F. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	2nd I.F. Trans.	L17 & L18
2	1A7G Det. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	1st I.F. Trans.	L15 & L16
3	Ant. Term	300 ohms	20,000 kc	"C"	20 mc (41°)	"C" Osc.	C29
4	Ant. Term	300 ohms	20,000 kc	"C"	20 mc (41°)	"C" Det.	C6
5	Ant. Term	300 ohms	20,000 kc	"C"	20 mc (41°)	"C" Ant.	C-1
6	Ant. Term	300 ohms	6,100 kc	"B"	6.1 mc (51°)	"B" Osc.	C31
7	Ant. Term	300 ohms	6,100 kc	"B"	6.1 mc (51°)	"B" Det.	C7
8	Ant. Term	300 ohms	6,100 kc	"B"	6.1 mc (51°)	"B" Ant.	C2
9	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" H-F Osc.	C33
10	Ant. Term	200 Mmfd.	600 kc	"A"	600 kc (201°)	"A" L-F Osc.	L10
11	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" Det.	C8
12	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" Ant.	C3

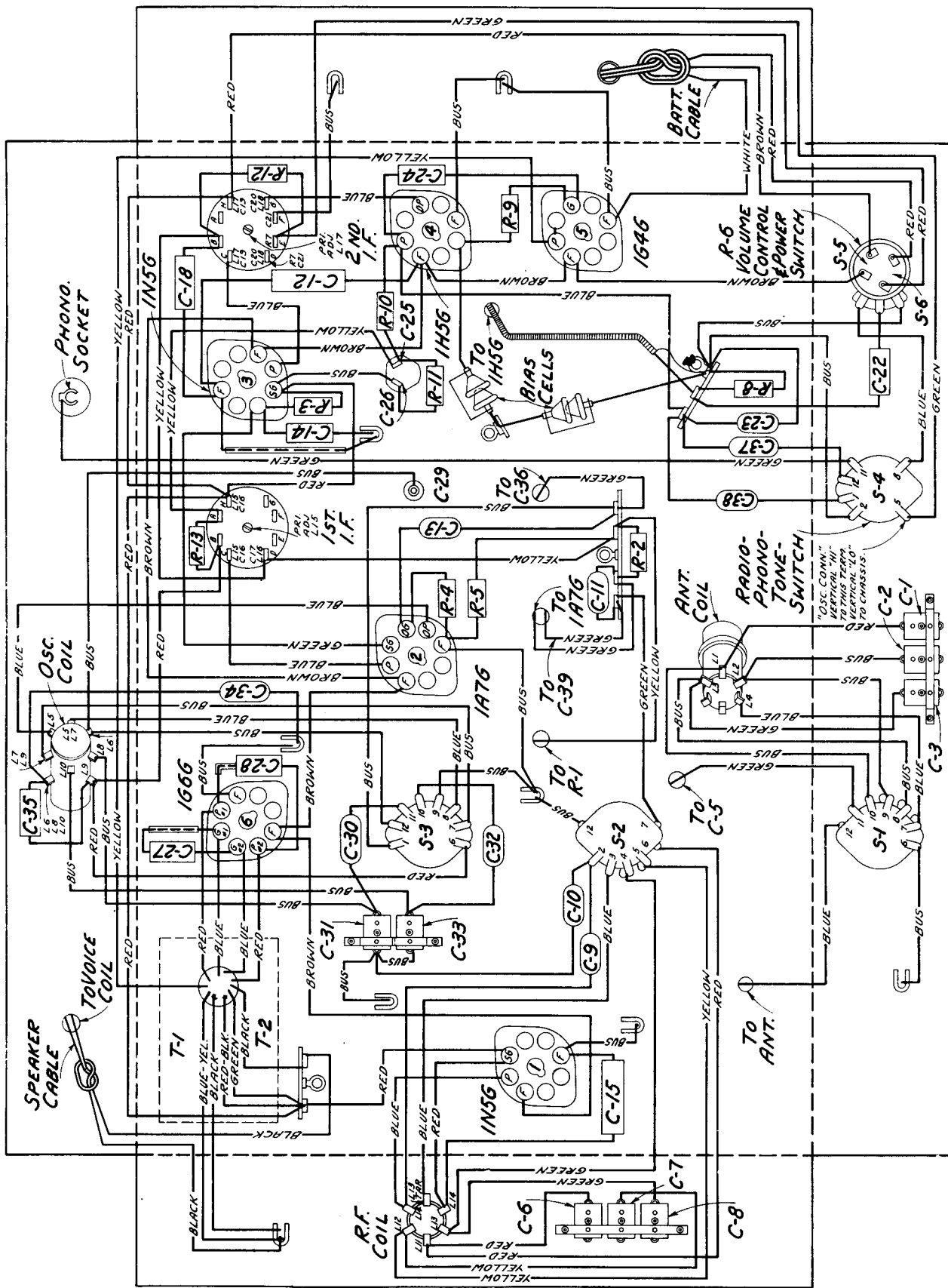
NOTE:—Align the I.F. Circuits by means of the oscillograph, for a symmetrical curve. Peak R.F. stages of all bands.



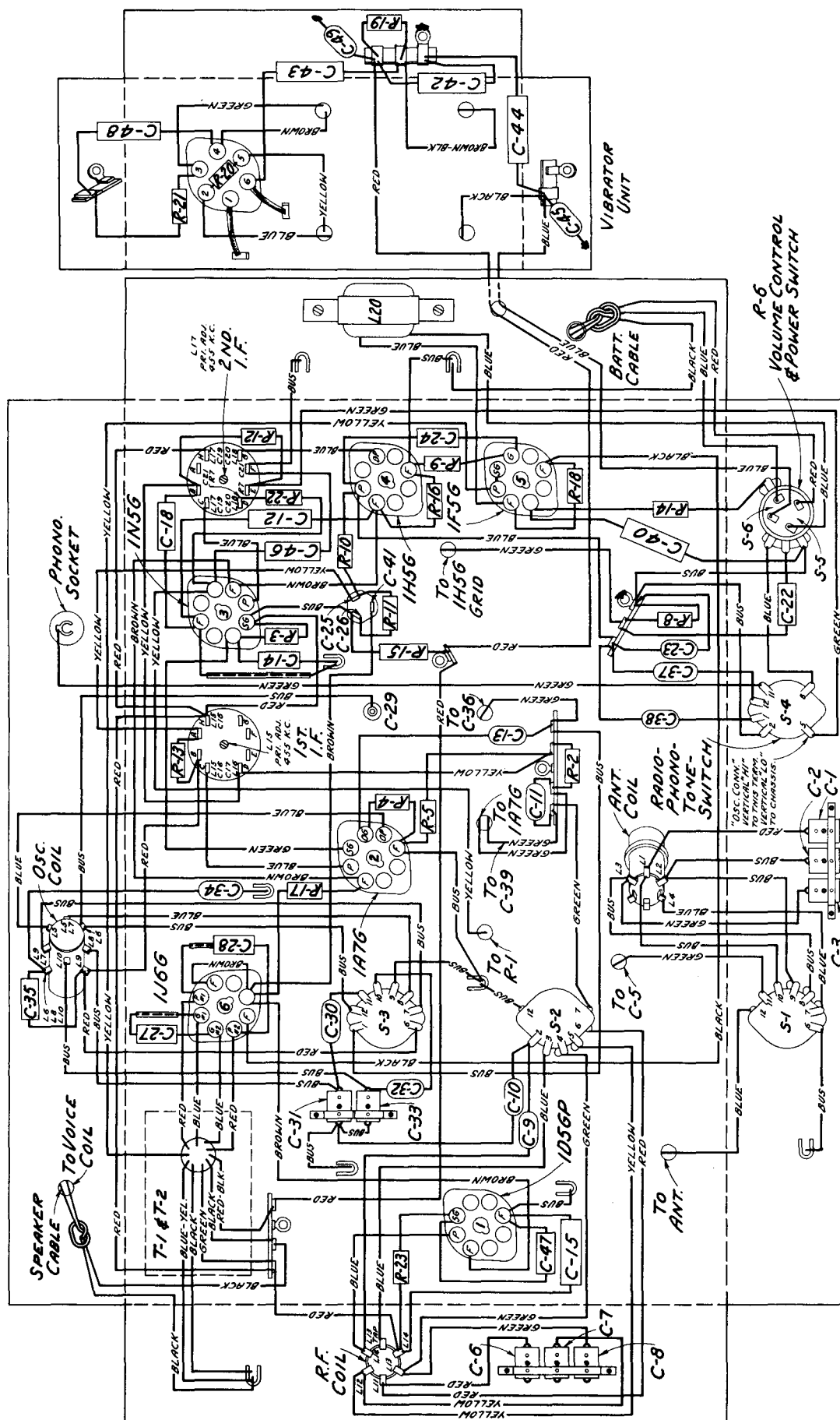
Models 6B2, 6B3 Chassis Layout and Alignment Adjustments



Schematic Circuit Diagram (Models B2, B3)



Chassis Wiring Diagram (Models B2, B3)



Chassis Wiring Diagram (Models 6B2, 6B3)

Push Button Adjustments

The push buttons should be adjusted for six favorite stations after the receiver has had a brief warm-up period.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high.

Proceed as follows:—

1. Set the accessory tone knob to "Radio" and turn the range selector to "A" band position.
2. Remove the six push buttons by inserting a small screwdriver blade in the slot provided on the under side of the button. Press the screwdriver blade upwards at the same time pull the button forward.
3. Loosen the push arm adjusting screws accessible through the push button openings.

4. Press in the tuning knob and accurately tune in the first station.

5. With station accurately tuned in, press in the first push button and tighten screw.

6. Proceed in a similar manner to adjust the remainder of the push buttons.

7. Replace push buttons by inserting in the escutcheon openings, spring side down. Press button in as far as possible to securely lock button in escutcheon.

8. Place call letter tabs in openings provided.

Note:—When difficulty is experienced in setting up the push buttons due to sticking cams, unscrew cam screw $\frac{1}{2}$ turn and rotate gang back and forth until the cam plate moves freely.

REPLACEMENT PARTS FOR MODELS B2, B3, 6B2 & 6B3

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			
S-2524	Arm-Trip arm located on range switch shaft.....	32086	Roller-Friction roller for tuning knob shaft.....
31767	Board-Ant. & Gnd. terminal board....	32595	Shield-Tube shield.....
S-2525*	Cable-Battery cable complete with plugs.....	14278	Socket-Phono input socket.....
S-2526*	Cable-Battery cable complete with clips.....	31251	Socket-Tube socket.....
12714	Capacitor-Adjustable trimmer 2-12mmfd.(C29)	31418	Spring-Drive cord tension spring (Pkg.2).....
13002	Capacitor-12 mmfd. (C10).....	S-2559	Switch-Tone & Phono switch(S4)...
12723	Capacitor-56 mmfd. (C13).....	S-2560	Switch-Range Switch(S1,S2,S3)...
12725	Capacitor-150 mmfd. (C23).....	S-2561	Transformer-1st I.F. transformer (L15,L16,C16,C17).....
12694	Capacitor-220 mmfd. (C9).....	S-2562	Transformer-2nd I.F. transformer (L17,L18,C19,C20,C21,R7)...
12952	Capacitor-330 mmfd. (C4,C11).....	S-2567	Transformer-Audio transformer pack(T1,T2).....
12537	Capacitor-560 mmfd. (C32).....	REPRODUCER ASSEMBLIES	
14498	Capacitor-750 mmfd. (C36).....	(CRL-509-1) (8")	
13762	Capacitor-1500 mmfd. (C37).....	13866	Cap-Dust cap for cone center (Pkg.5).....
S-2568	Capacitor-3,300 mmfd.(C30).....	S-2563	Cone-Reproducer cone&voice coil(L19)
S-2569	Capacitor-6000 mmfd.(C34).....	S-2564	Reproducer complete.....
5107	Capacitor-.0025 mfd. (C27).....	REPRODUCER ASSEMBLIES	
30303	Capacitor-.0035 mfd. (C28).....	(CRL-510-1) (12")	
4886	Capacitor-.05 mfd.(C18,C46).....	13866	Cap-Dust cap for cone center (Pkg.5).....
12484	Capacitor-.25 mfd. (C12,C15).....	S-2565	Cone-Reproducer cone&voice coil(L19)
14393	Capacitor-.101 mfd.(C14,C22,C24,C35,C47)	S-2566	Reproducer complete.....
11414*	Capacitor-.1 mfd. (C40).....	VIBRATOR ASSEMBLIES	
31292	Capacitor-Adjustable trimmer-two 3-30 mmfd.(C31,C33).....	(Models 6B2, 6B3)	
31400	Capacitor-Adjustable trimmer-two 2-10 mmfd. & one 3-30 mmfd.(C6,C7,C8)	12764	Capacitor-360 mmfd. (C45,C49)....
S-2550	Capacitor-Adjustable trimmer (Three 3-30 mmfd. sections).(C1,C2,C3)....	4858	Capacitor-.01 mfd.(C48).....
S-2551*	Capacitor-Electrolytic capacitor consisting of one 400 mfd., one 15 mfd., and one 10 mfd. sections (C25,C26,C41).....	12484	Capacitor-.25 mfd.(C42).....
S-2552*	Capacitor-Electrolytic capacitor consisting of one 15 mfd. section and one 10 mfd. section (C25,C26)...	12741	Capacitor-.5 mfd.(C44).....
S-2553	Coil-Antenna coil (L1,L2,L3,L4).....	S-2175	Capacitor-Electrolytic 8 mfd.(C43)
S-2554	Coil-Oscillator coil(L6,L7,L8,L9,L10)	S-2575	Resistor-100 ohm 1/4 watt(R19)...
S-2555	Coil-R.F. Coil (L11,L12,L13,L14).....	30538	Resistor-330 ohm 1/4 watt(R20)...
S-2556*	Control-Volume control & Power Switch (R6,S5,S6).....	S-1894	Resistor-5600 ohm 1/4 watt(R21)...
S-2557*	Control-Volume control & Power Switch (R6,S5,S6).....	14505	Socket-Vibrator socket.....
12681*	Cell-Bias Cell.....	32371	Transformer-Vibrator Transformer(T3)
S-2529	Cord-Variable condenser drive cord..	14309	Vibrator-Synchronous vibrator complete. (L21).....
33552	Dial-Station selector dial scale....	MISCELLANEOUS ASSEMBLIES	
S-2530	Drive-Friction drive assembly.....	S-2537	Button-Station selector push button assembly.....
34267	Drum-Dial drive drum assembly.....	14289*	Clip-"A" battery connector clips, one marked + (Pkg.2)....
S-2220*	Holder-Bias cell holder.....	S-2539	Escutcheon-Dial scale escutcheon.....
10907*	Fuse-3 ampere fuse (F1) (Pkg.2).....	S-2540	Knob-Volume, tone, range switch or tuning control knob.....
S-2531	Indicator-Station selector indicator pointer.....	S-2541	Marker-Station selector push button marker (1 set).....
S-2398*	Plug-2 contact male battery plug....	14270	Spring-Knob retaining spring (Pkg.10).....
S-1628*	Plug-3 contact male battery plug....	S-2543	Spring-Push button retaining spring (Pkg.3).....
S-2177*	Reactor-Filter reactor (L20).....	S-2542	Tool-Push button adjustment tool.....
S-2570*	Reactor-15 ohm, 1/2 watt (R18).....		
S-2571*	Resistor-47 ohm, 1/4 watt (R16).....		
12267	Resistor-1200 ohm 1/4 watt(R13).....		
S-2572	Resistor-2700 ohm 1/4 watt(R11).....		
S-2574*	Resistor-3.3 ohm flexible type (R17)...		
S-2573*	Resistor-5600 ohm, 1 watt (R14,R15)...		
12266*	Resistor-39,000 ohm, 1/4 watt (R23) ..		
13715	Resistor-68,000 ohm, 1/4 watt (R3) ..		
12264	Resistor-220,000 ohm, 1/4 watt (R4) ..		
12486	Resistor-560,000 ohm, 1/4 watt (R5) ..		
S-1896	Resistor-680,000 ohm, 1/4 watt (R10)...		
13730	Resistor-1 meg., 1/4 watt (R1,R2).....		
12679	Resistor-2.2 meg., 1/4 watt (R8, R9, R12, R22)		

Items marked thus(+) used on models B2 & B3 only. Items marked(*) used on models 6B2 & 6B3.



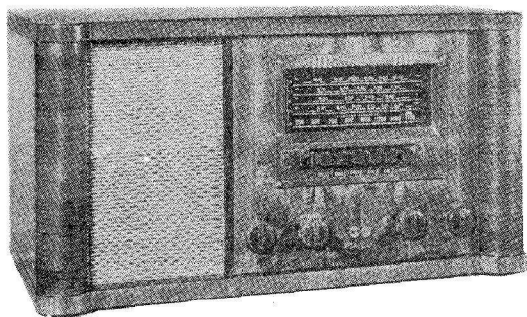
RCA Victor

MODELS B4 & B5 Battery Operated MODELS 6B4 & 6B5 Vibrator Operated

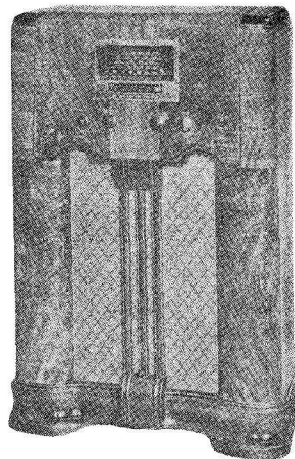
Seven-Tube, Five-Band, Superheterodyne Receivers

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Models B5 and 6B5



Models B4 and 6B4

Electrical Specifications

FREQUENCY RANGES

Standard Broadcast (A)	540-1,720 kc
"49 M" (49 Meters)	5,900-6,240 kc
"31 M" (31 Meters)	9,410-9,690 kc
"25 M" (25 Meters)	11,680-11,920 kc
"19 M" (19 Meters)	15,090-15,380 kc

Intermediate Frequency 455 kc.

RADIOTRON COMPLEMENT

- (1) Type 1D5GP R. F. Amplifier
- (2) Type 1A7G 1st Detector
- (3) Type 1E4G Oscillator
- (4) Type 1N5G I.F. Amplifier

BATTERY REQUIREMENTS (B4, B5)

"A" one 2 volt storage battery

or

one 2 volt "Aircell" battery
"B" Three Plug-in 45 volt batteries
(Eveready No. 385 or 386)

"C" one 4½ volt battery
(Eveready No. 771)

Fuse Rating ½ Ampere

CURRENT CONSUMPTION

"A" at 2 volts 0.62 Amperes
"B" at 135 volts 17 Milliamperes

POWER OUTPUT

Undistorted 1 watt
Maximum 2 watts

R-F ALIGNMENT FREQUENCIES

"49 M" (49 Meters)	6,100 kc. (osc., det., ant.)
"31 M" (31 Meters)	9,550 kc. (osc.)
"25 M" (25 Meters)	11,800 kc. (osc.)
"19 M" (19 Meters)	15,200 kc. (osc.)
"Standard Broadcast"	600 kc. (osc.), 1,500 kc. (osc., Det., Ant.)

(5) Type 1H5G 2nd Det., A.V.C. & Audio

(6) Type 1F5G Driver

(7) Type 1J6G Output

BATTERY REQUIREMENTS (6B4, 6B5)

One 6 volt storage battery

Fuse Rating 3 Amperes

CURRENT CONSUMPTION

"A" at 6 volts 1.35 Amperes

POWER OUTPUT

Undistorted 1.5 watts
Maximum 2.5 watts

LOUDSPEAKER (B5, 6B5)

Type 8 inch, Permanent Magnet Dynamic
Voice Coil Impedance 2.2 ohms at 400 cycles

LOUDSPEAKER (B4, 6B4)

Type 12 inch, Permanent Magnet Dynamic
Voice Coil Impedance 2.2 ohms at 400 cycles

Mechanical Specifications

	Models B-5, 6B-5	Models B-4, 6B-4		B-5, 6B-5 Models	B-4, 6B-4 Models
Height	12 $\frac{1}{8}$ "	39 $\frac{1}{8}$ "	Weight (Net)	27 lbs.	62 lbs.
Width	22 $\frac{1}{2}$ "	26 $\frac{1}{2}$ "	Weight (Shipping)	31 lbs.	70 lbs.
Depth	10 $\frac{7}{8}$ "	12 $\frac{1}{8}$ "			
Chassis Base Dimensions	2 $\frac{3}{4}$ " high, 12 $\frac{3}{8}$ " wide, 7 $\frac{1}{2}$ " deep				
Overall Height of Chassis	6 $\frac{3}{4}$ inches				
Operating Controls	(1) Power-volume, (2) Radio-phono tone switch, (3) Range selector, (4) Tuning				

General Description

These receivers employ a seven-tube, five band, superheterodyne chassis, the arrangement of which is shown in the Schematic Circuit Diagram. Models B4 and B5 are designed for battery operation whereas Models 6B4 and 6B5 are designed for vibrator operation using a six volt battery source. Design features include:—mechanical Push Button tuning of six favorite stations within the broadcast band, magnetite core I.F. transformers and oscillator coils, Band spread tuning of four short wave bands,

R.F. Amplifier stage with "cumulative-wound" antenna and detector "A" band coils for a high signal to noise ratio, aurally compensated volume control circuit, phono input socket, A.V.C. circuit, plunger-type air dielectric trimmer capacitors, temperature stabilized capacitors in the oscillator circuits, radio-phono tone control switch, combination of the new low-drain 1.4 volt and 2 volt tubes in an ingenious filament network, a large, easy to read dial and a dust proof, permanent magnet, dynamic loudspeaker.

**Radiotron Socket Voltages; Measured with all batteries at Normal Voltage
Models B4, B5**

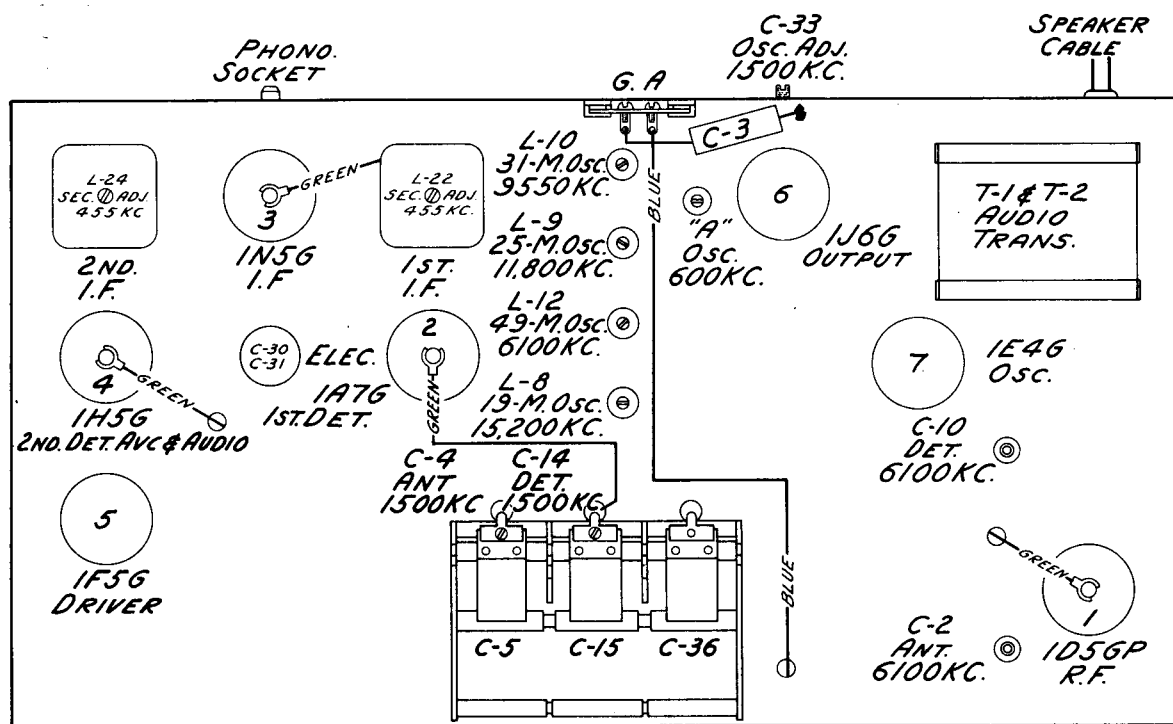
Radiotron	Plate	Screen Grid	Grid	Filament
1D5GP R.F.	90v	90v	....	2.0v
1A7G Conv.	90v	45v*	....	1.4v
1E4G Osc.	83v	....	....	1.4v
1N5G I.F.	90v	90v	....	1.4v
1H5G Audio	40v*	....	....	1.4v
1F5G Driver	90v	90v	4.5v	2.0v
1J6G Output	135v/135v	....	3.0v	2.0v

*Cannot be accurately measured with an ordinary voltmeter due to the high series resistance. All the above values hold within plus or minus 20% when measured with a 1000 ohm-per-volt meter.

**Radiotron Socket Voltages; Measured with "A" Battery at Normal Voltage
Models 6B4, 6B5**

Radiotron	Plate	Screen Grid	Grid	Filament
1D5GP R.F.	90v	47v*	....	2.0v
1A7G Conv.	90v	45v*	....	1.4v
1E4G Osc.	80v	....	....	1.4v
1N5G I.F.	90v	90v	....	1.4v
Det. 1H5G Audio	40v*	....	....	1.4v
1F5G Driver	88v	88v	4.0v	2.0v
1J6G Output	155/155v	....	2.0v	2.0v

*Cannot be accurately measured with an ordinary voltmeter due to the high series resistance. All the above values hold within plus or minus 20% when measured with a 1000 ohm-per-volt meter.



Chassis Layout and Alignment Adjustments

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

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 a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. 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 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum 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.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	1N5G I.F. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	2nd I.F. Trans.	L23 & L24
2	1A7G Det. Grid	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	1st I.F. Trans.	L21 & L22
3	Ant. Term	300 Ohms	6,100 kc	"49 M"	6.1 mc (95°)	"49M" Osc.	L12
4	Ant. Term	300 Ohms	6,100 kc	"49 M"	6.1 mc (95°)	"49M" Det.	C10
5	Ant. Term	300 Ohms	6,100 kc	"49 M"	6.1 mc (95°)	"49M" Ant.	C2
6	Ant. Term	300 Ohms	9,550 kc	"31 M"	9.55 mc (137°)	"31M" Osc.	L10
7	Ant. Term	300 Ohms	11,800 kc	"25 M"	11.8 mc (115°)	"25M" Osc.	L9
8	Ant. Term	300 Ohms	15,200 kc	"19 M"	15.2 mc (130°)	"19M" Osc.	L8
9	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" H-F Osc.	C33
10	Ant. Term	200 Mmfd.	600 kc	"A"	600 kc (201°)	"A" L-F Osc.	L14
11	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" Det.	C14
12	Ant. Term	200 Mmfd.	1,500 kc	"A"	1,500 kc (42°)	"A" Ant.	C4

NOTE:—Align the I.F. Circuits by means of the oscillograph, for a symmetrical curve. Peak R.F. stages of all bands.

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 for 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 of 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.

NOTE:—All spread band adjustments should be made with the chassis fastened in the cabinet and the pointer accurately aligned to the dial.

Push Button Adjustments

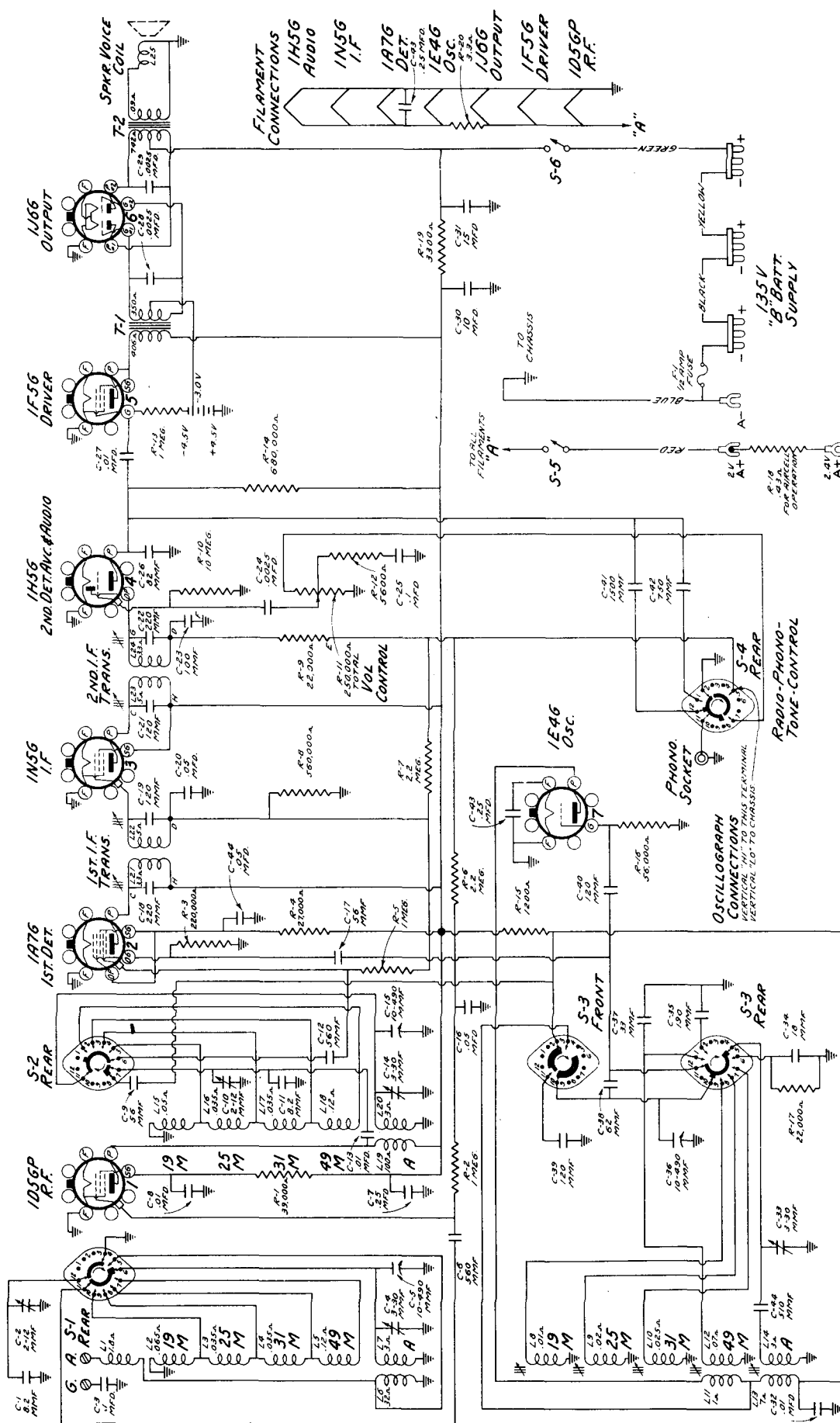
The push buttons should be adjusted for six favorite stations after the receiver has had a brief warm-up period.

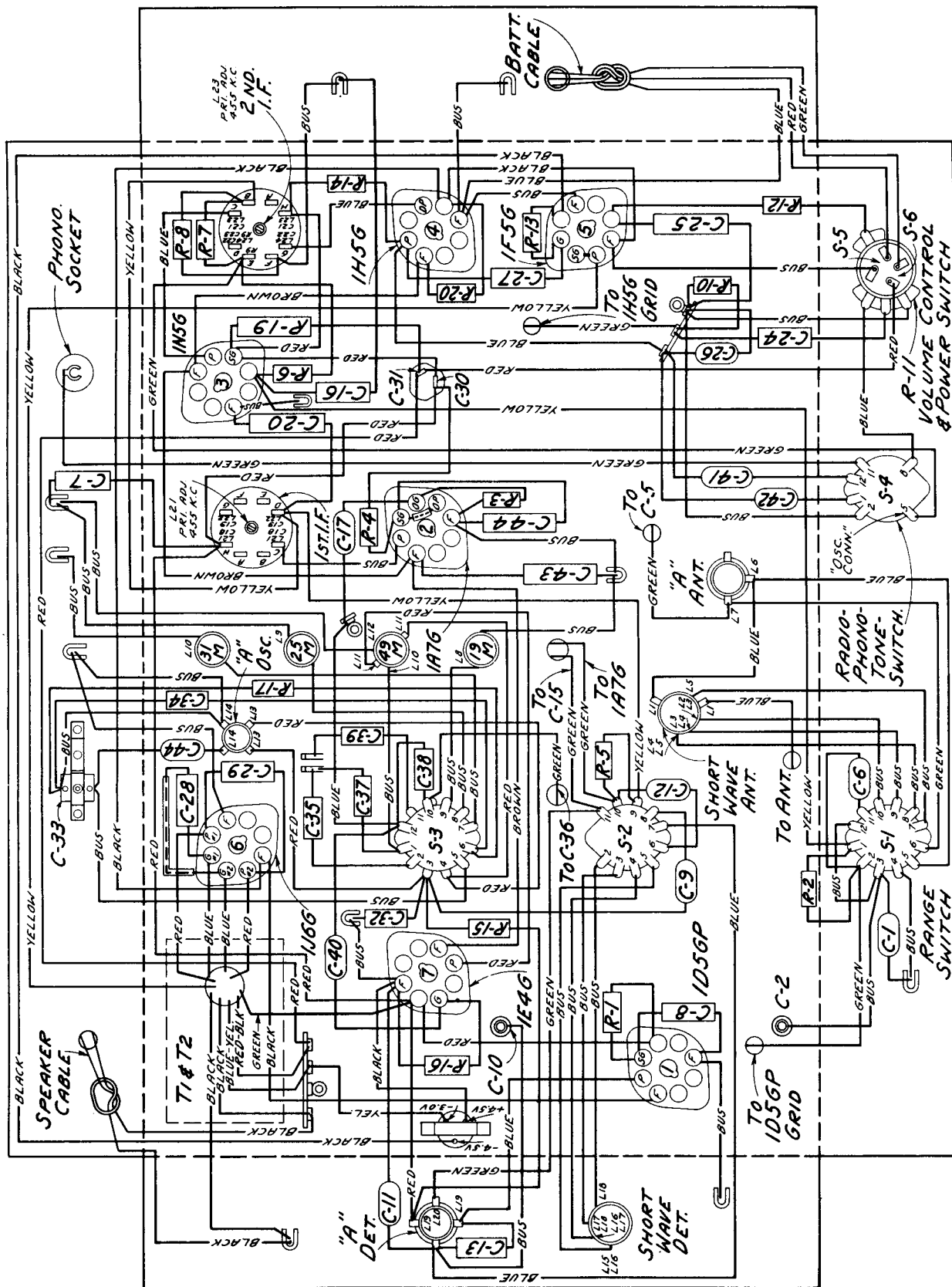
Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high.

Proceed as follows:—

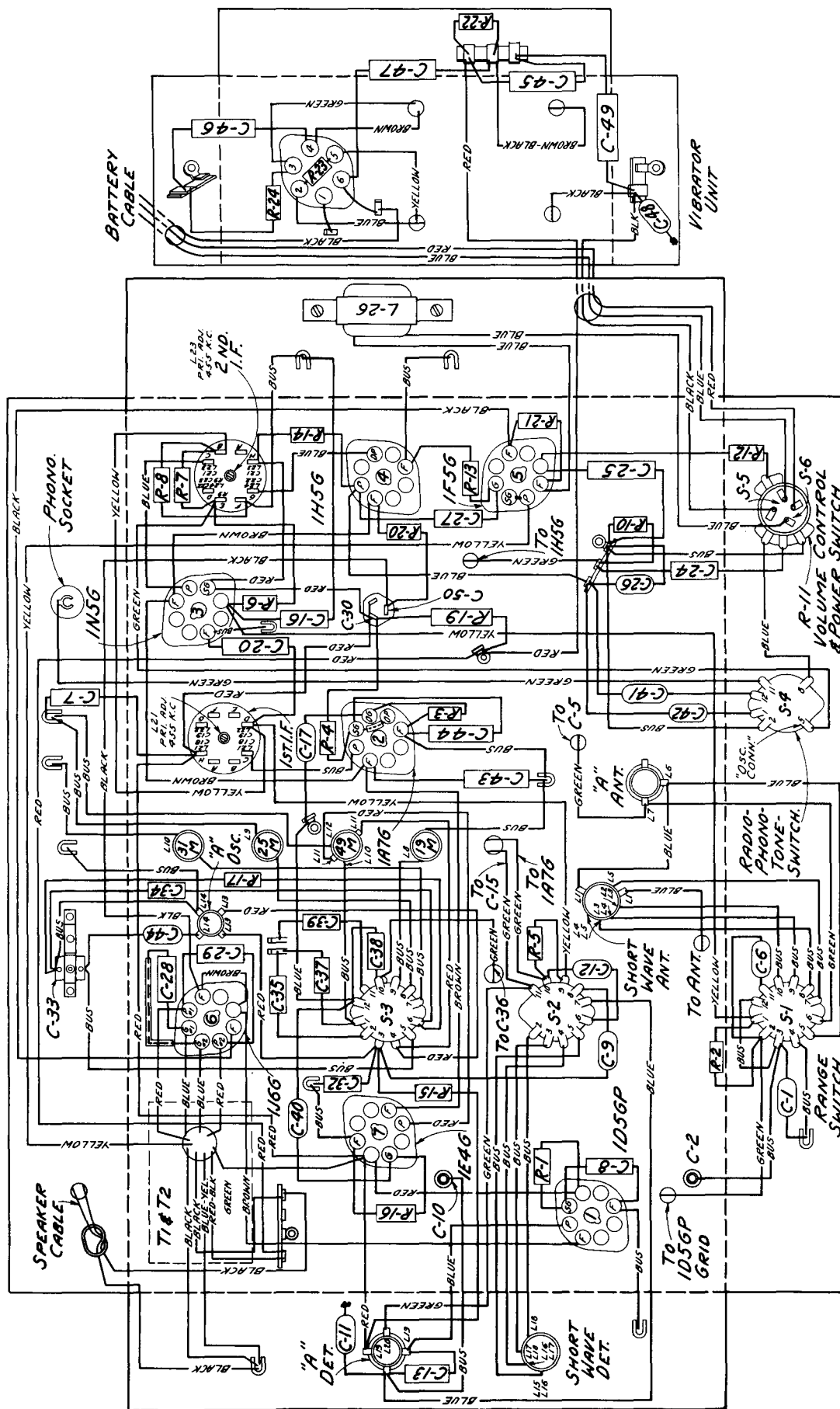
1. Set the accessory tone knob to "Radio" and turn the range selector to "A" band position.
2. Remove the six push buttons by inserting a small screwdriver blade in the slot provided on the under side of the button. Press the screwdriver blade upwards at the same time pull the button forward.
3. Loosen the push arm adjusting screws accessible through the push button openings.
4. Press in the tuning knob and accurately tune in the first station.
5. With station accurately tuned in, press in the first push button and tighten screw.
6. Proceed in a similar manner to adjust the remainder of the push buttons.
7. Replace push buttons by inserting in the escutcheon openings, spring side down. Press button in as far as possible to securely lock button in escutcheon.
8. Place call letter tabs in openings provided.

Note:—When difficulty is experienced in setting up the push buttons due to sticking cams, unscrew cam screw $\frac{1}{2}$ turn and rotate gang back and forth until the cam plate moves freely.





Chassis Wiring Diagram (B4, B5)



Chassis Wiring Diagram (6B4, 6B5)

REPLACEMENT PARTS FOR MODELS B4, 6B4, B5, 6B5

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			
S-2524	Arm-Trip arm located on range switch shaft.....	12679	Resistor-2.2 meg. 1/4 Watt (R6,R7)...
31767	Board-Ant. & Ground terminal board.	13601	Resistor-10 Meg.1/4 Watt (R10).....
*S-2609	Cable-Battery cable complete with plugs and resistor (R18).....	32086	Roller-Friction roller for tuning knob shaft.....
+S-2526	Cable-Battery cable complete with clips.....	14278	Socket-Phono input socket.....
32596	Cap-Tube shield cap for stock #32595 shield (Pkg.2).....	S-2039	Shield-Tube shield for 1D5G tube...
12714	Capacitor-Adjustable air trimmer (C2,C10).....	32595	Shield-Tube shield for 1N5G or 1A7G tube.....
S-2578	Capacitor-Adjustable trimmer (mica) (C33).....	31251	Socket-Tube socket.....
13001	Capacitor-8.2 mmfd. (C1,C11).....	31418	Spring-Drive cord tension spring (Pkg.2).....
31350	Capacitor-18 mmfd. (C34).....	S-2559	Switch-Tone & Phono switch (S4)....
31354	Capacitor-33 mmfd. (Temp.Comp.) (C37)	S-2608	Switch-Range switch (S1,S2,S3).....
12723	Capacitor-56 mmfd. (C9,C17).....	S-2561	Transformer-1st I.F. transformer (L21,L22,C18,C19).....
31349	Capacitor-62 mmfd. (C38).....	S-2562	Transformer-2nd I.F. transformer (L23,L24,C21,C22,C23,R9).....
12813	Capacitor-82 mmfd. (C26).....	S-2567	Transformer-Audio transformer pack (T1,T2).....
31352	Capacitor-120 mmfd. (C39).....	REPRODUCER ASSEMBLIES	
12724	Capacitor-120 mmfd. (C40).....	(CRL509-1) (8")	
31351	Capacitor-190 mmfd. (C35).....	13866	Cap-Dust cap for cone center (Pkg.5)
30608	Capacitor-510 mmfd. (C44).....	S-2563	Cone-Reproducer cone & voice coil (L25).....
12537	Capacitor-560 mmfd. (C6,C12).....	S-2564	Reproducer complete.....
14498	Capacitor-750 mmfd. (C42).....	REPRODUCER ASSEMBLIES	
31033	Capacitor-1500 mmfd. (C41).....	(CRL510-1) (12")	
5107	Capacitor-.0025 mfd. (C24,C28,C29)...	13866	Cap-Dust cap for cone center (Pkg.5)
14393	Capacitor-.01 mfd. (C8,C13,C27,C32)...	S-2565	Cone-Reproducer cone & voice coil (L25).....
4886	Capacitor-.05 mfd. (C16,C20).....	S-2566	Reproducer complete.....
4839	Capacitor-0.1 mfd. (C3,C25).....	VIBRATOR ASSEMBLIES	
12484	Capacitor-0.25 mfd. (C7,C43).....	Models (6B4, 6B5)	
*S-2552	Capacitor-Electrolytic capacitor consisting of one 15 mfd; and one 10 mfd. sections (C30,C31).....	12764	Capacitor-390 mmfd. (C48).....
+S-2551	Capacitor-Electrolytic capacitor consisting of one 400 mfd; one 15 mfd; and one 10 mfd; sections (C30,C31).....	4858	Capacitor-.01 mfd. (C46).....
S-2585	Coil-Antenna "A" band coil (L6,L7)...	12484	Capacitor-.25 mfd. (C45).....
S-2580	Coil-Antenna Spread Band coil (L1,L2,L3,L4,L5).....	12741	Capacitor-.5 mfd. (C49).....
S-2586	Coil-R.F. "A" Band coil (L19,L20)...	S-2175	Capacitor-Electrolytic 8 mfd. (C47)...
31266	Coil-R.F. "Spread Band" coil (L15,L16,L17,L18).....	S-2575	Resistor-100 ohm, 1/4 Watt (R22)....
32148	Coil-Oscillator "A" band coil (L13,L14).....	30538	Resistor-330 ohm, 1/4 Watt (R23)....
S-2582	Coil-19M oscillator coil (L8).....	S-1894	Resistor-5600 ohm, 1/4 Watt (R24)....
31254	Coil-25M oscillator coil (L9).....	14505	Socket-Vibrator socket.....
31255	Coil-31M oscillator coil (L10).....	32371	Transformer-Vibrator transformer (T3).....
31256	Coil-49M oscillator coil (L11,L12)...	14309	Vibrator-Synchronous vibrator complete (L27).....
S-2557	Control-Volume control & power switch (R11,S5,S6).....	MISCELLANEOUS ASSEMBLIES	
S-2529	Cord-Indicator pointer drive cord..	S-2537	Button-Station selector push button.....
S-2540	Drive-Friction drive assembly complete.....	S-2576	Dial-Glass dial scale.....
34267	Drum-Dial drive drum assembly.....	S-2539	Escutcheon-Station selector dial escutcheon.....
+10907	Fuse-3 Ampere fuse (F1) (Pkg.2)....	S-2540	Knob-Volume, tone, range or tuning control knob.....
*3748	Fuse-1/2 Ampere fuse (F1) (Pkg.2)...	S-2541	Marker-Push button call letter markers (1 set).....
*S-2610	Plug-3 contract "C" battery plug located on chassis.....	14270	Spring-Knob retaining spring (Pkg.10).....
*12827	Plug-3 contact male battery plug...	S-2543	Spring-Push button retaining spring (Pkg.13).....
+S-2177	Reactor-Filter reactor (L26).....	S-2542	Tool-Push button adjusting tool.....
S-2574	Resistor-3.3 ohm 1/2 Watt flexible (R20).....		
+S-2178	Resistor-15 ohm 1/2 Watt (R21).....		
12267	Resistor-1200 ohm, 1/4 watt (R15)...		
S-2611	Resistor-3,300 ohm, 1 Watt (R19)...		
+S-2573	Resistor-5600 ohm, 1 Watt (R12,R19)...		
13998	Resistor-22,000 ohm, 1/4 watt (R9,R17)		
S-2134	Resistor-27,000 ohm, 1/4 Watt (R4)...		
12266	Resistor-39,000 ohm, 1/4 Watt (R1)...		
12286	Resistor-56,000 ohm, 1/4 Watt (R16)		
12264	Resistor-220,000 ohm, 1/4 Watt (R3)...		
12486	Resistor-560,000 ohm, 1/4 Watt (R8)...		
S-1896	Resistor-680,000 ohm, 1/4 Watt (R14)		
12013	Resistor-1 meg. 1/10 Watt (R2,R5)...		
13730	Resistor-1 meg. 1/4 Watt (R13).....		

Items marked thus + used on Models 6B4, 6B5.

Items marked * used on Models B4, B5.



RCA Victor

MODEL BP-10, BP-10A PERSONAL RADIO

Four-Tube, Single-Band, Battery-Operated, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

Electrical and Mechanical Specifications

FREQUENCY RANGE..... 540-1,600 kc

INTERMEDIATE FREQUENCY 455 kc

TUBE COMPLEMENT

- (1) Type-1R5..... 1st Det.—Osc.
- (2) Type-1T4..... I-F Amplifier
- (3) Type-1S5..... 2nd Det., A-F, and A.V.C.
- (4) Type-1S4..... Power Output

POWER SUPPLY

Type Battery	Current Consumption
"A"—1.5 volt Eveready No. 950 }	0.25 amperes
"B"—67.5 volts Eveready No. 467 }	8.5 milliamperes

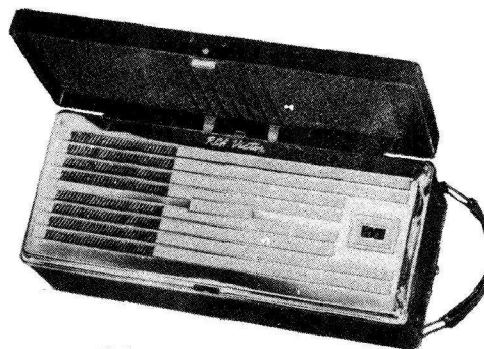
POWER OUTPUT

Undistorted.....	0.05 watts
Maximum.....	0.12 watts

LOUDSPEAKER

Type..... 3-inch permanent-magnet dynamic
V.C. Impedance..... 3 ohms at 400 cycles

Cabinet Dimensions (inches)	Height	Width	Depth
.....	3	8 $\frac{1}{2}$	3 $\frac{1}{2}$
Weight.....	3 $\frac{3}{4}$ lbs. (net)	4 $\frac{1}{2}$ lbs. (shipping)	
Tuning Drive Ratio.....			1 to 1



REPLACEMENT PARTS FOR MODELS BP-10 and BP-10A

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			
36717	Capacitor 20 mmfd.....	36069	Socket-1T4 Tube Socket.....
36715	Capacitor 50 mmfd.....	36498	Transformer-1st I.F. Transformer...
36716	Capacitor 100 mmfd.....	36499	Transformer-2nd I.F. Transformer...
12488	Capacitor 270 mmfd.....	SPEAKER ASSEMBLIES	
36163	Capacitor .001 mfd.....	39467	Cone-Speaker Cone.....
33584	Capacitor .005 mfd.....	36504	Speaker-complete (less output transformer).....
36248	Capacitor .02 mfd.....	36505	Transformer-Output.....
32787	Capacitor .05 mfd.....	MISCELLANEOUS ASSEMBLIES	
36718	Capacitor Electrolytic-10 mfd.....	36507	Bottom-Receiver Case bottom cover..
36496	Condenser-Variable tuning condenser.....	37156	Catch-Case back cover catch and rivets.....
36497	Coil-Oscillator coil.....	38205	Catch-Case front cover catch and rivets.....
36495	Control-Volume Control.....	36508	Centre-Receiver case centre strip..
36606	Core-Adjustable core and stud for osc. coil.....	37179	Clip - B + Battery clip.....
36503	Holder-Battery holder complete.....	37180	Clip - B - Battery clip.....
36501	Knob-Tuning disc.....	38207	Connector One set (2) loop contact connectors.....
36502	Knob-Volume knob.....	36509	Handle-Carrying handle and bracket.
30158	Resistor-820 ohms.....	38206	Hinge-Case front cover hinge and rivets.....
36714	Resistor-15,000 ohms.....	#38212	Lid-Lid only.....
30787	Resistor-47,000 ohms.....	38204	Loop-Antenna loop and loop cover...
3252	Resistor-100,000 ohms.....	37854	Panel-Chrome panel complete.....
30652	Resistor- 1.0 megohm.....	37857	Pin-Hinge pin and spring.....
31417	Resistor-3.3 megohm.....	S-3063	Rivet-Hinge rivets (Pkg.25).....
30931	Resistor-4.7 megohm.....	36506	Switch-Power switch.....
30992	Resistor-10. megohm.....	<u>Assemblies Peculiar to BP10-A</u>	
36500	Socket-Tube Socket.....	37811	Support - Lid support.....
S-3041	Socket-Cushion socket assembly.....		
	# Includes section of hinges, hinge pins, springs and (lid support pkg.sep.)		

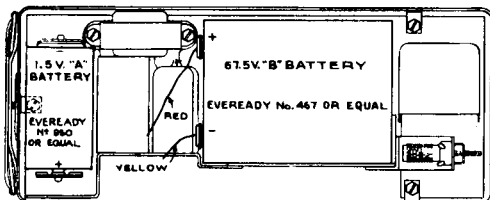
REPLACEMENT PARTS PECULIAR TO MODEL BP-10A

STOCK NO.	DESCRIPTION	LIST PRICE
S-3068	Lid-Lid only with lid support.....	\$4.45
37835	Lid-Lid and antenna with antenna cover and lid support	6.75
37854	Panel-Control Panel.....	1.45

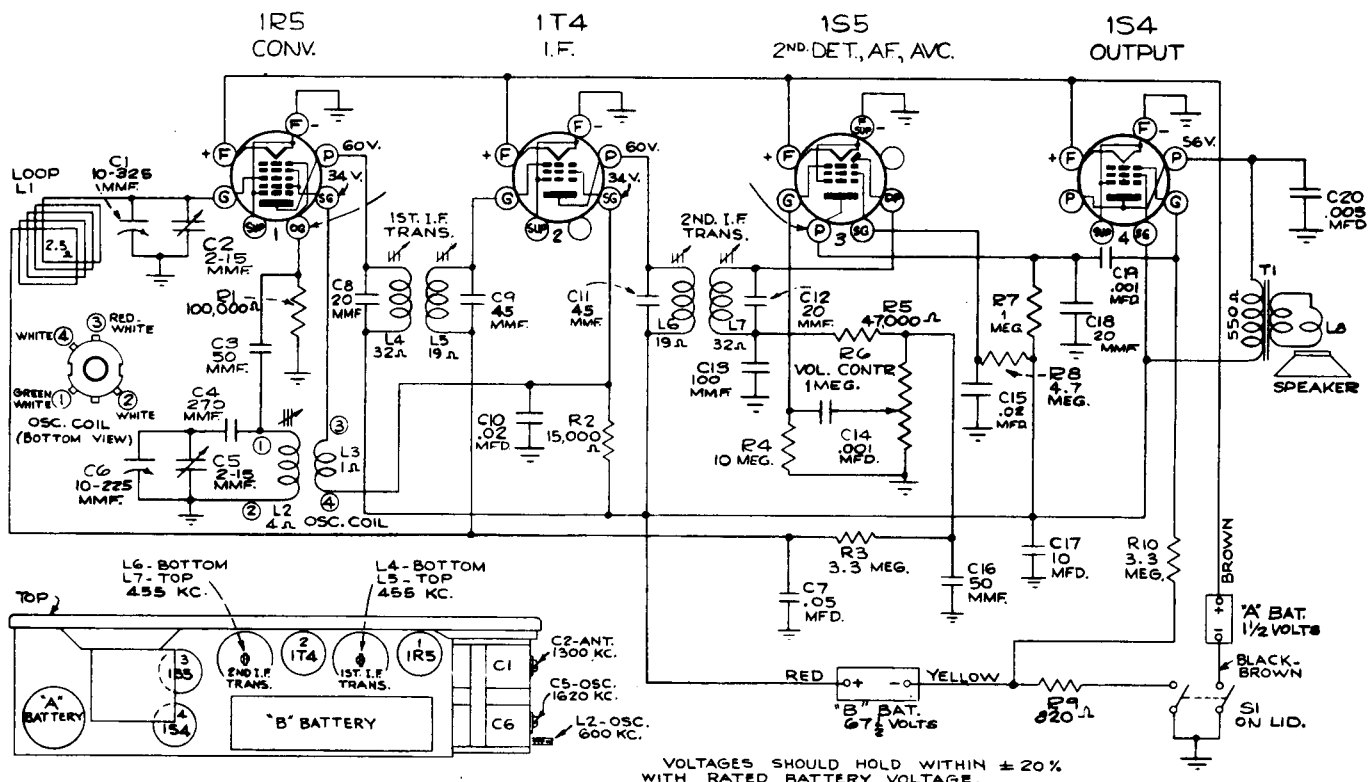
Alignment Procedure

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, keep the output as low as possible to avoid a-v-c action.



Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (ant.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	L7, L6, L5, L4 (2nd and 1st I-F transformers)
2	Radiated signal 1,620 kc	1,620 kc	Full clockwise (out of mesh)	C5 (oscillator)
3	Radiated signal 1,300 kc	1,300 kc	1,300 kc	C2 (antenna)
4	Radiated signal 600 kc	600 kc	600 kc	L2 (osc.)
5	Repeat steps 2, 3 and 4.			

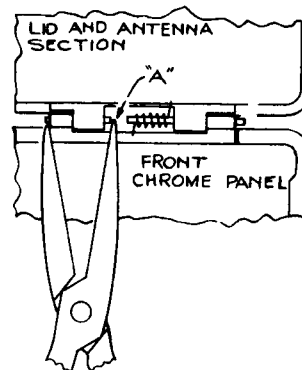


Model BP-10 Schematic Diagram

Installation instructions for lid or control Panel

First remove the three self-tapping screws that hold the chassis in the centre case, and remove the case. Unsolder the leads from the loop lugs.

- With lid closed, cut hinge pins at point "A" with sharp cutters.
- Start removal of pin sections as shown, using long-nose pliers.
- Grasp end of pin section with long-nose pliers and pull out of hinge.
- Install new lid, or new front panel, using replacement hinge pins and springs. Arrange springs as shown. Apply a small amount of cement near outer end of each pin to insure tight and permanent fit.



Replacing Lid or Control Panel



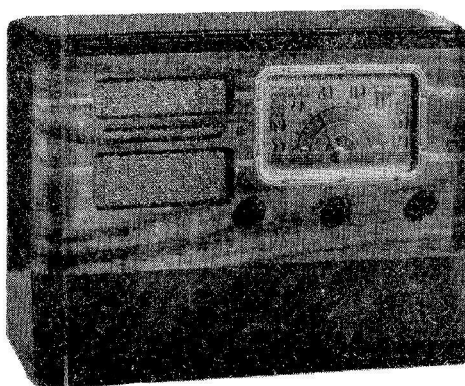
RCA Victor

MODEL B-60

Six-Tube, Single-Band, Battery Operated, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

TUBE COMPLEMENT

- | | |
|---|-------------------------------|
| (1) Type 1A7-G First Detector-Oscillator | (4) Type 1E4-G Phase Inverter |
| (2) Type 1N5-G I.F. Amplifier | (5) Type 1T5GT Power Output |
| (3) Type 1H5-G Second Det., A.F. Amp., & A.V.C. | (6) Type 1T5GT Power Output |
| Frequency Range | 540-1,720 K.C. |

POWER OUTPUT

Type Class "A-B"
 Undistorted3 watts
 Maximum4 watts

ALIGNMENT FREQUENCIES

I.F. 455 K.C.
 Ant. 1,500 K.C.
 Osc. 600 K.C., 1,500 K.C.

BATTERIES REQUIRED

One "A-B" battery pack (Eveready 748-C)
 "A" One 1.5 Volt Dry Plug-in (Eveready No. 740) or One 1.4 Volt Plug-in Aircell (Eveready No. A-1300)
 "B" Two 45 Volt Dry Plug-in "B" Batteries (Eveready No. 386)

CURRENT CONSUMPTION

"A" at 1.4 Volts3 Amps.
 "B" at 90 Volts 13 Milliamperes

LOUDSPEAKER

Type 6 inch Permanent Magnet Dynamic
 Voice Coil Impedance 3 ohms at 400 cycles

Mechanical Specifications

	Height	Width	Depth
Cabinet Dimensions	13 ⁷ / ₈ "	17 ⁵ / ₈ "	7 ³ / ₄ "
Chassis Base Dimensions	2 ¹ / ₂ "	9 ⁵ / ₈ "	4 ⁵ / ₈ "
Overall Chassis Height			5 ³ / ₄ "
Operating Controls (1) Radio-Phono-Tone Switch, (2) Power Switch-Volume, (3) Tuning			

General Description

The RCA Victor Model B-60 is a six tube, single band, battery operated receiver, housed in a table type cabinet of unusual design and beauty. Features of design include:—Magnetite core antenna, oscillator and I.F. Transformers; full, automatic volume

control circuit; resistance coupled audio network; phase inverter circuit; class "A-B" audio output stage; Radio-phonotone switch; phono input socket; power-on indicator; and a sensitive, six-inch, permanent magnet dynamic loudspeaker.

Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List.

Victrola Attachment. A jack located on the rear apron of the chassis is provided for connecting a Victrola Attachment into the audio-amplifying circuit. The cable running from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.

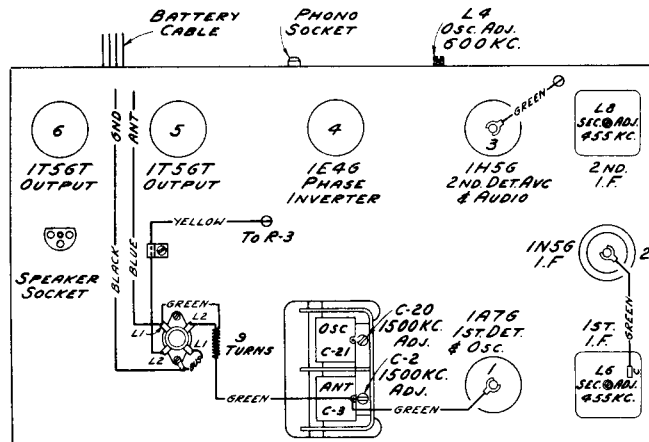


Fig. 1—Tube and Trimmer Locations

Alignment Procedure

Calibrate the tuning dial by adjusting the dial pointer to the low-frequency calibration mark on dial with the gang condenser plates in full-mesh position. This is a friction adjustment.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 3.

Cathode-ray alignment is highly preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver "G" (ground) lead for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

Order of Alignment	Test Oscillator			Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Radiotron	Dummy Antenna	Frequency Setting				
1	1N5G Grid Cap	.1 Mfd.	455 k.c.	No Signal 550-750 k.c.	2nd I.F. Trans.	L7 & L8	Symmetrical Curve
2	1A7G Det. Grid Cap	.1 Mfd.	455 k.c.	No Signal 550-750 k.c.	1st I.F. Trans.	L5 & L6	Symmetrical Curve
3	Ant. Term.	200 Mmf.	600 k.c.	600 k.c.	L.F. Osc.	L3	Max. (Peak)
4	Ant. Term.	200 Mmf.	1,500 k.c.	1,500 k.c.	H.F. Osc.	C20	Max. (Peak)
5	Ant. Term.	200 Mmf.	600 k.c.	Rock Thru 600 k.c.	L.F. Osc.	L3	Max. (Peak)
6	Ant. Term.	200 Mmf.	1,500 k.c.	1,500 k.c.	Ant.	C2	Max. (Peak)

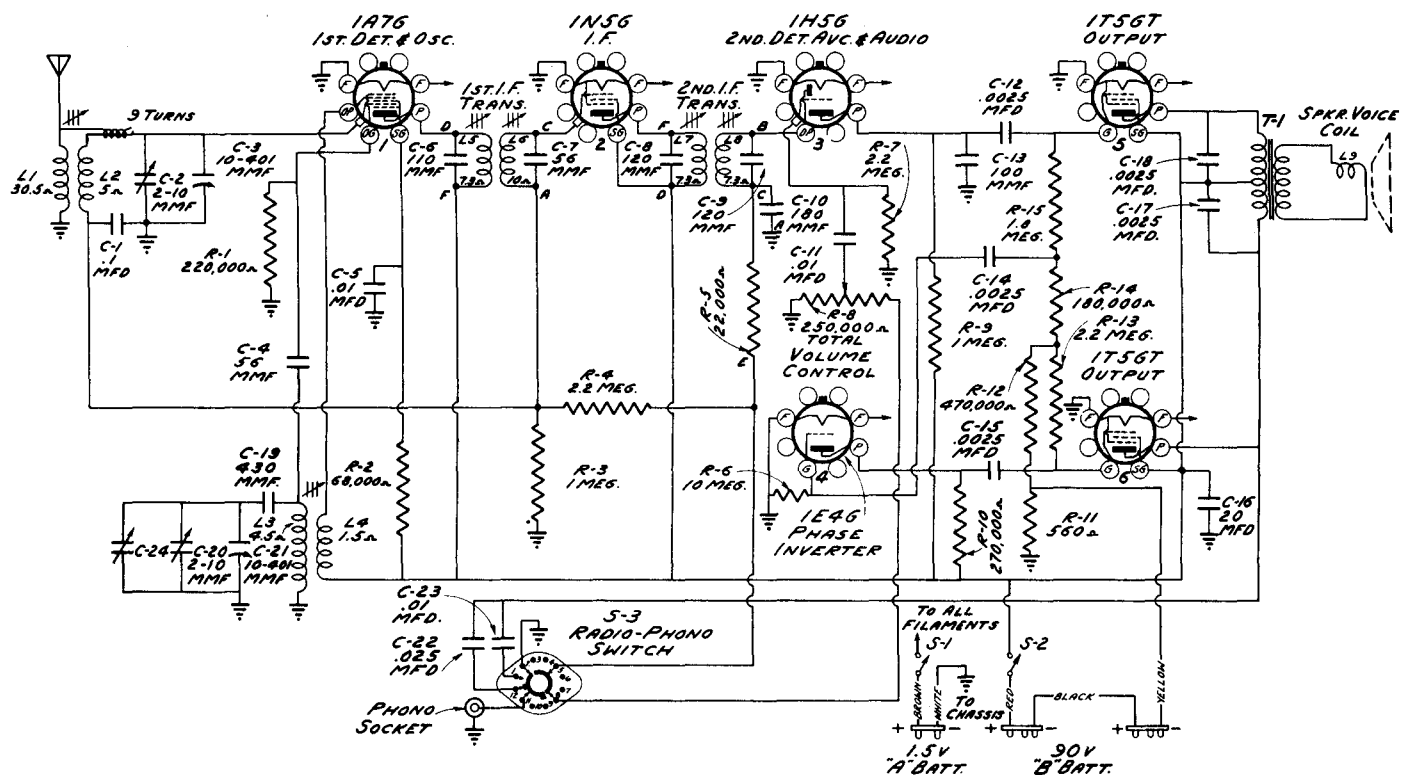


Fig. 2—Schematic Circuit Diagram

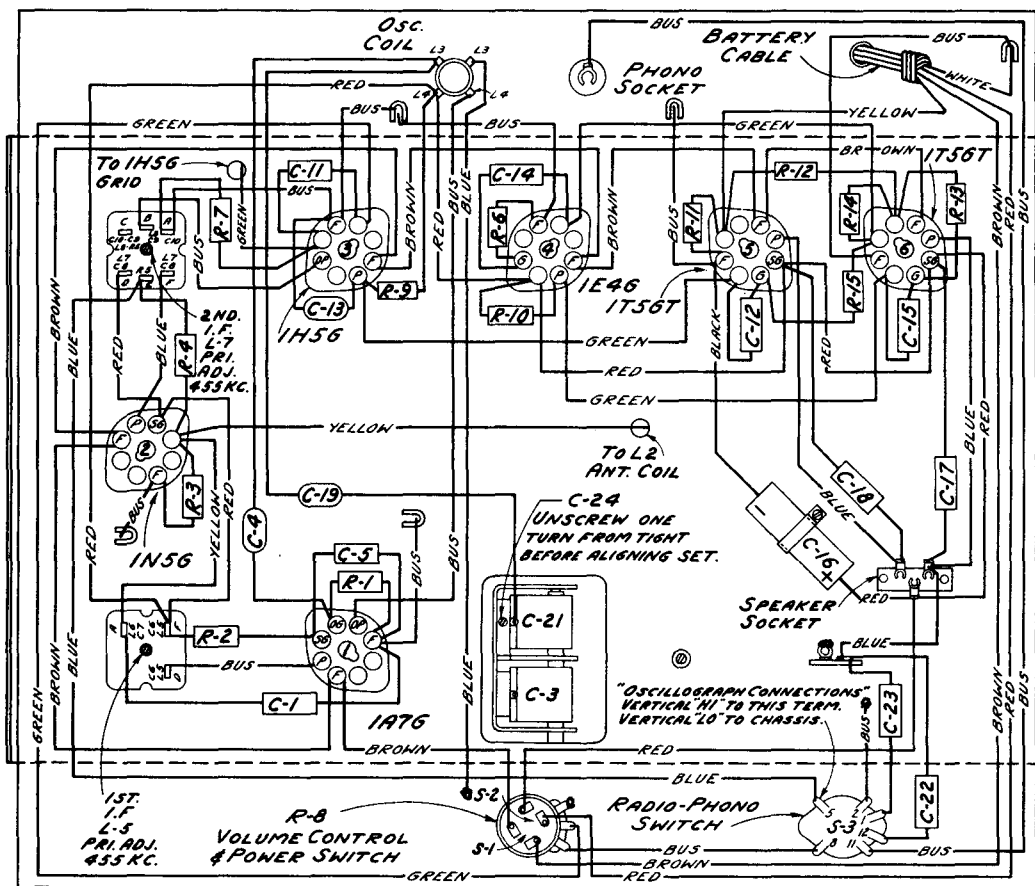


Fig. 3—Chassis Wiring Diagram

Radiotron Socket Voltages: Measured with all batteries at Normal Voltage

Radiotron	Plate	Screen Grid	Grid	Filament
1A7G Det.	82V	42V	....	1.4V
1A7G Osc.	82V	..	....	1.4V
1N5G I.F.	82V	82V	....	1.4V
1H5G Audio	60V	..	....	1.4V
1E4G Inverter	39V	..	—2V	1.4V
1T5GT Output	80V	82V	—10V	1.4V
1T5GT Output	80V	82V	—10V	1.4V

All values hold within plus or minus 20% when measured with a 1000 ohm per volt meter.

REPLACEMENT PARTS FOR MODEL B-60

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			
S-2744	Arm-Power-on indicator actuating arm and set screw.....	S-2698	Shaft-Station selector drive shaft....
S-1997	Cable-Battery cable complete with plugs.....	S-2399	Socket-3 contact speaker socket.....
12723	Capacitor-56 mmfd. (C19).....	31251	Socket-Radiotron socket.....
12720	Capacitor-100 mmfd. (C4).....	14278	Socket-Phono input socket & plate....
30433	Capacitor-430 mmfd. (C13).....	S-2119	Spring-Drive cord tension spring (Pkg.3).....
5107	Capacitor-.0025 mfd. (C12,C14,C15,C17,C18).....	S-2699	Switch-Radio phono tone switch (S3)...
4858	Capacitor-.01 mfd. (C5, C11, C23)....	14261	Transformer-1st I.F. Transformer (L5,L6,C6,C7).....
4870	Capacitor-.025 mfd. (C22).....	14308	Transformer-2nd I.F. Transformer (L7,L8,C8,C9,C10,R5).....
4839	Capacitor- 0.1 mfd. (C1).....	S-2734	Volume control and "on-off" switch (R8,S1,S2).....
S-2408	Capacitor- 20 mfd. electrolytic capacitor (C16).....	REPRODUCER ASSEMBLIES (CRL-515) (6" P.M.)	
32150	Coil-Antenna coil (L1,L2).....	32907	Cap-Dust cap for cone centre (Pkg.5)...
32148	Coil-Oscillator coil (L3,L4).....	32934	Cone-Reproducer cone & voice coil (L9)
S-2697	Condenser-2 gang variable condenser (C2,C3,C20,C21,C24).....	S-2403	Plug-3 contact male plug.....
S-2702	Cord-Drum drive cord.....	S-2736	Reproducer complete.....
S-2120	Drum-Drive cord drum & set screws....	S-2739	Transformer-Output transformer (T1)....
34378	Indicator-Station selector indicator pointer.....	MISCELLANEOUS ASSEMBLIES	
S-2745	Indicator-Power-on indicator assembly	S-2740	Dial-Station selector dial scale complete.....
32208	Plug-2 contact male plug for battery cable.....	34380	Escutcheon-Station selector dial escutcheon and crystal.....
S-1628	Plug-3 contact male plug for battery cable.....	30863	Knob-Tuning, volume or tone control knob.....
11324	Resistor-560 ohm, 1/4 watt (R11).....	30900	Spring-Knob retaining spring (Pkg. 5).....
13715	Resistor-68,000 ohm, 1/4 watt (R2)....		
S-1747	Resistor-180,000 ohm, 1/4 watt (R14)..		
12264	Resistor-220,000 ohm, 1/4 watt (R1)...		
11323	Resistor-270,000 ohm, 1/4 watt (R10)..		
12285	Resistor-470,000 ohm, 1/4 watt (R12)..		
12200	Resistor-1 meg. 1/4 watt (R3,R9).....		
5028	Resistor-1.8 meg., 1/4 watt (R4,R15)...		
12679	Resistor-2.2 meg. 1/4 watt (R7,R13)...		
13601	Resistor-10 meg. 1/4 watt (R6).....		
14887	Retainer-Drive shaft or pulley retainer (Pkg.20).....		
3903	Screw-Drive cord drum set screw (Pkg.20).....		



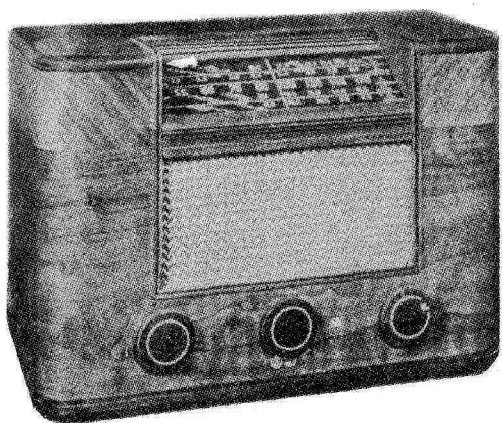
RCA Victor

MODELS B61 and B70

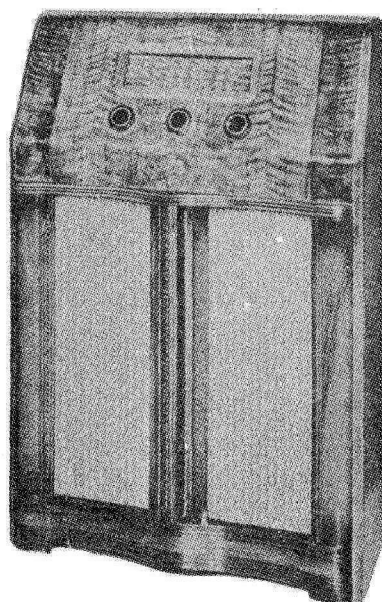
Six-Tube, Five-Band, Battery-Operated, Superheterodyne Receivers

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model B61



Model B70

Electrical and Mechanical Specifications

FREQUENCY RANGES

Standard Broadcast

("A" Band) 540-1,720 kc (555-174 m)
 Medium Wave ("B" Band) .. 3.0-9.5 mc (100-31.5 m)
 Short Wave 9.5-11.7 mc (31.5-25.6 m)
 Short Wave 11.7-15.1 mc (25.6-19.9 m)
 Short Wave 15.1-22.5 mc (19.9-13.3 m)

INTERMEDIATE FREQUENCY 455 kc

TUBE COMPLEMENT

- (1) Type-1R5 1st Det.,—Osc.
- (2) Type-1N5-G 1st I-F Amplifier
- (3) Type-1N5-G 2nd I-F Amplifier
- (4) Type-1H5-G 2nd Det., A-F, and A.V.C.
- (5) Type-1A5-G Audio Driver Amplifier
- (6) Type-1G6-G Power Output

BATTERIES REQUIRED

1—1.5 volt "A" Battery; 2—45 volt "B" Batteries

CURRENT CONSUMPTION

"A" 0.35 amperes
 "B" 14.0 milliamperes

POWER OUTPUT

Undistorted 0.55 watts
 Maximum 0.65 watts

LOUDSPEAKER (CRL515-3) (B61)

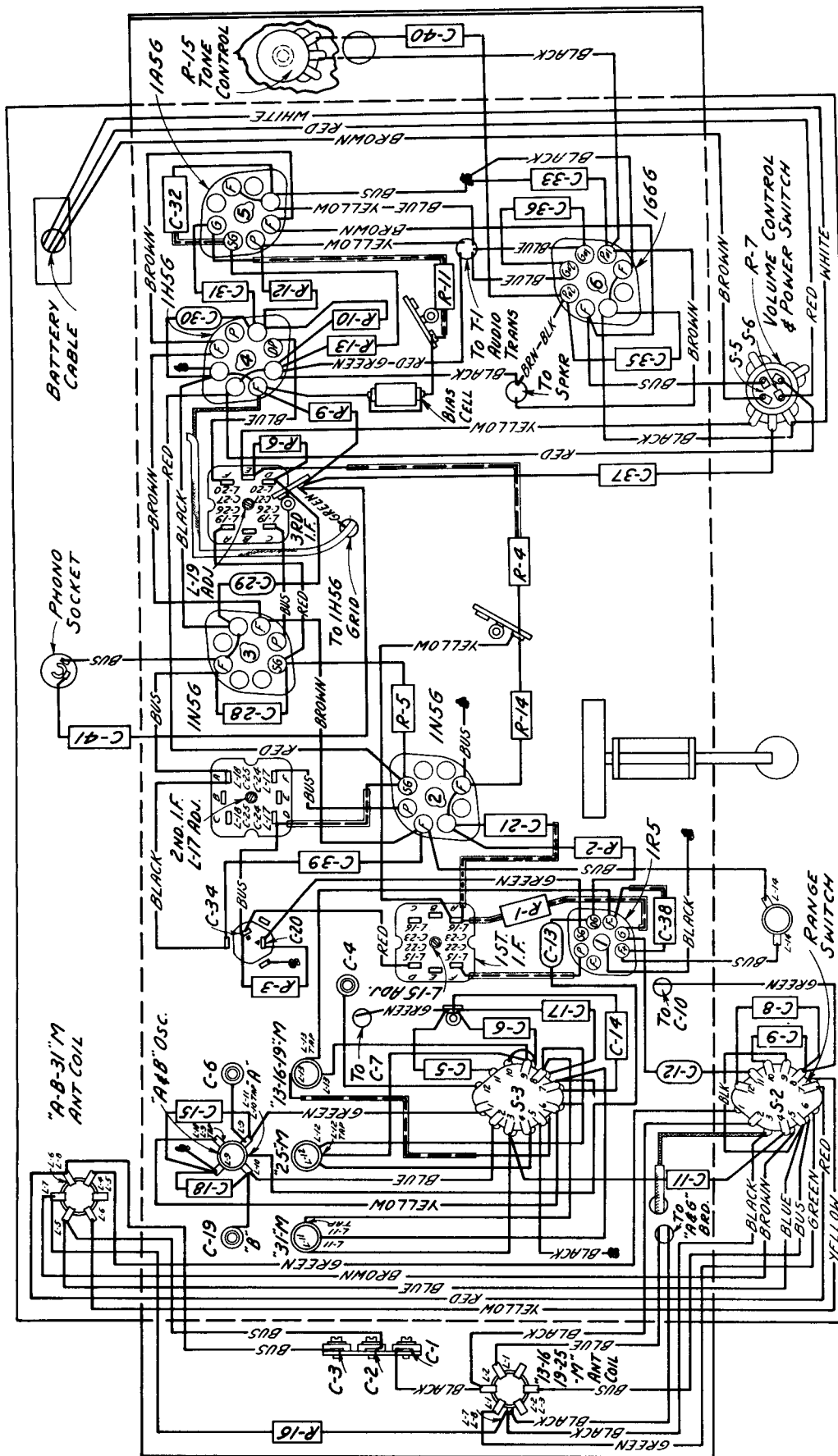
Type 6 inch permanent-magnet dynamic
 Voice Coil Impedance 3.4 ohms at 400 cycles

LOUDSPEAKER (CRL510-2) (B70)

Type 12 inch permanent magnet dynamic
 Voice Coil Impedance 3.4 ohms at 400 cycles

	Height	Width	Depth
CABINET DIMENSIONS (B61)....	11 ⁷ / ₁₆ "	16 ³ / ₈ "	7 ⁵ / ₈ "
CABINET DIMENSIONS (B70)....	37 ³ / ₁₆ "	25"	11 ⁵ / ₁₆ "

Schematic Circuit Diagram

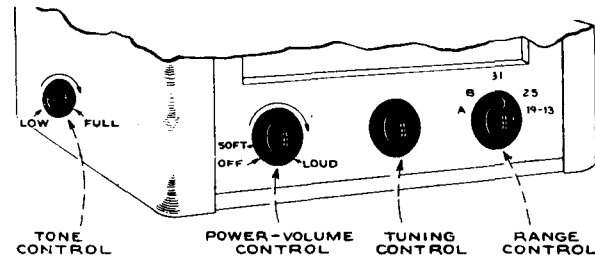


Chassis Wiring Diagram

General Description

These models employ a six tube, five band battery operated chassis which incorporates the latest developments in receiver design. Features of design include such outstanding developments as:—Low drain 1.4 volt tubes including the new type 1R5 convertor; individual oscillator coils for each band; Class B output minimizing current drain; iron core I.F. transformers and oscillator coils; Phono input socket; flywheel manual tuning; variable tone control and a large glass dial individually calibrated for each

band. Reference to the schematic circuit diagram will disclose complete details of the electrical design.



Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in 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.

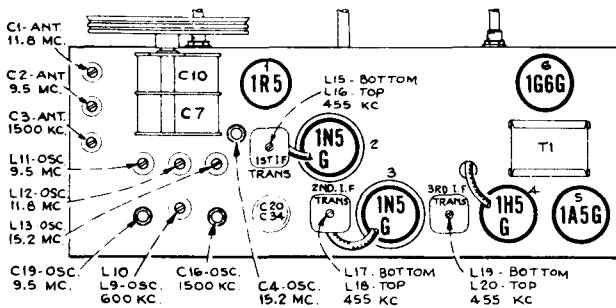
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is 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 "180°" 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 "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.



Tube and Trimmer Locations

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 of known frequency.
2. Use harmonics of the standard-broadcast range of the 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.

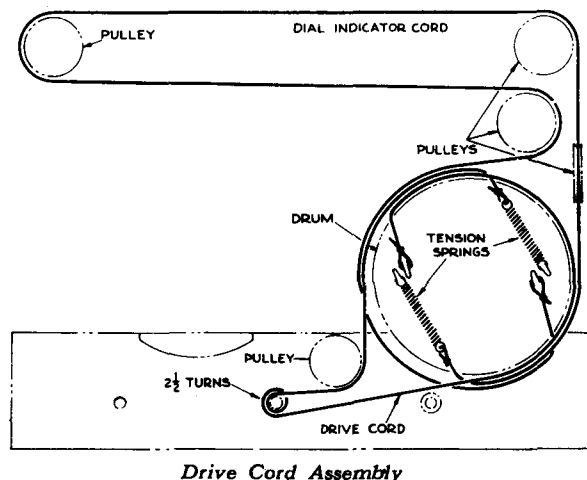
When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	1N5G —2nd I-F grid cap, in series with .01 mfd.	455 kc	A	Quiet point near 180°	L20, L19 3rd I-F transformer
2	1N5G —1st I-F grid cap, in series with .01 mfd.				L18, L17 2nd I-F transformer
3	1R5—1st Det. grid, in series with .01 mfd.				L16, L15 1st I-F transformer
4	Ant. lead in series with 300 ohms	11.8 mc	25M	138.5°	L12 (osc.) C1 (ant.)
5		15.2 mc		17°	C4 (osc.)*
6		Repeat steps 4 and 5.			
7		15.2 mc	19-13M	156°	L13 (osc.)**
8		9.5 mc	31M	156°	L11 (osc.)** C2 (ant.)
9		9.5 mc	B	11.5°	C19 (osc.)***
10	Ant. lead in series with 200 mmf.	1,500 kc	A	26°	C16 (osc.) C3 (ant.)
11		600 kc		150°	L9 (osc.) (Rock gang)
12		Repeat steps 9 and 10.			

* Use minimum capacity peak if two can be obtained. Check image to determine that C2 has been adjusted to the correct peak by tuning receiver to approximately 14.29 mc (29°) where a weaker signal should be received.

** Peak at minimum position of plunger if two peaks can be obtained.

*** Peak at minimum capacity of two peaks can be obtained.
NOTE: Oscillator tracks above signal on all bands.



Precautionary Lead Dress:

1. All leads between antenna coil and switch must be as short as possible and kept away from the oscillator coil leads and switches.
2. Tap on 19-13 meter oscillator coil to pin No. 6 on oscillator tube socket must be dressed as far away from the air trimmer as possible.
3. All oscillator coil leads must be kept apart from each other, as well as other leads and parts.
4. Oscillator grid coupling condenser must bear against parts on S3, and be kept away from the shield between S2 and S3.
5. Check for correct bias cell polarity. Do not shunt with voltmeter.
6. The speaker leads must be kept from the volume control and associated parts and leads.
7. The two paper condensers on the sides of the 2nd I-F transformers must be held close to chassis to reduce interstage coupling.

Replacement Parts for Models B61 & B70

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			
S-2973	Cable-Battery cable complete with plugs.....	36063	Control-Volume Control and power switch (R7,S5,S6).....
35642	Calibrator-Drive drum calibrator....	S-2979	Cord-Drive cord (approx. 26 in.)....
12714	Capacitor-Air trimmer-medium (C4,C16,C19).....	S-2985	Cord-Indicator drive cord (approx. 46 in.) (Model B70 only).....
34654	Capacitor-Mica trimmer comprising 3 sections of 2.5-10 mmfd. (C1,C2,C3).....	S-2980	Cord-Indicator drive cord (approx. 51 in.) (Model B61 only).....
35646	Capacitor-6 mmfd. (C18).....	35788	Core-Adjustable core & stud for A & B band osc. coil.....
36012	Capacitor-15 mmfd. (C11).....	31259	Core-Adjustable core & stud for spread band osc. coil.....
31350	Capacitor-18 mmfd. (C15).....	35627	Drum-Drive drum less calibrator dial.
13141	Capacitor-47 mmfd. silver mica (C6)...	S-2969	Flywheel-Tuning shaft & flywheel assembly.....
35644	Capacitor-47 mmfd. ceramic (C9).....	34499	Holder-Bias cell holder.....
12723	Capacitor-56 mmfd. (C13).....	5119	Plug-3 contact female speaker plug...
36072	Capacitor-66 mmfd. (C8).....	S-1628	Plug-3 contact male battery plug....
35645	Capacitor-68 mmfd. (C5).....	32208	Plug-2 contact male battery plug....
12720	Capacitor-100 mmfd. (C29,C30).....	31280	Pulley-Drive cord pulley.....
12694	Capacitor-220 mmfd. (C12).....	35630	Pulley-Drive cord pulley located between the range switch shaft & the tuning shaft.....
31433	Capacitor-560 mmfd. (C14).....	30146	Resistor-4,700 ohm, 1/4 watt (R5)....
35643	Capacitor-3,000 mmfd. (C17).....	12265	Resistor-6,800 ohm, 1/4 watt (R3)....
33806	Capacitor-.0015 mfd. (C37).....	14559	Resistor-10,000 ohm, 1/4 watt (R16)...
34459	Capacitor-.0025 mfd. (C31,C33,C35)...	13998	Resistor-22,000 ohm, 1/4 watt (R6)....
33584	Capacitor-.005 mfd. (C38).....	13715	Resistor-68,000 ohm, 1/4 watt (R13)...
30938	Capacitor-.025 mfd. (C40).....	14560	Resistor-100,000 ohm, 1/4 watt (R2)...
32787	Capacitor-.05 mfd. (C21,C28,C36)...	12285	Resistor-470,000 ohm, 1/4 watt (R10)...
4839	Capacitor-.1 mfd. (C32).....	13730	Resistor-1 meg., 1/4 watt (R1).....
12484	Capacitor-.025 mfd. (C39).....	5028	Resistor-1.8 meg., 1/4 watt (R14)....
33790	Capacitor-Electrolytic comprising two 10 mfd. sections (C20,C34)....	12679	Resistor-2.2 meg., 1/4 watt (R11,R12)...
31581	Cell-Bias cell.....	30271	Resistor-4.7 meg., 1/4 watt (R4).....
35632	Coil-A & B band antenna coil (L4,L5,L6,L7,L8).....	13601	Resistor-10 meg., 1/4 watt (R9).....
35631	Coil-Spread band antenna coil (L1,L2,L3).....	14350	Screw-No. 8-32 square head set screw for drum (Pkg.5).....
36071	Coil-Filament series choke coil (L14)	35633	Shaft-Range switch slip-on indicator shaft.....
36065	Coil-Oscillator coil - A & B bands (L9,L10).....	35637	Shaft-Tuning shaft.....
36066	Coil-Oscillator coil - 13-19 meter bands (L13).....	35787	Socket-Phono input socket.....
36067	Coil-Oscillator coil - 25 meter band (L12).....	36069	Socket-1R5 tube socket & ring.....
36068	Coil-Oscillator coil - 31 meter band (L11).....	31251	Socket-Tube socket.....
35619	Condenser-Variable tuning condenser (C7,C10).....	13638	Spring-Drive cord tension spring (Pkg.5).....
		31418	Spring-Indicator pointer drive cord spring (Pkg.3).....
		35640	Support-Drive cord pulley support with one pulley.....

Replacement Parts for Models B61 & B70 Continued

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
36064	Switch-Range switch (S1,S2,S3,S4)...		REPRODUCER ASSEMBLIES(CRL510-2)(12")
S-2975	Tone control (R15) (Model B61 only)..		(MODEL B70 ONLY)
36062	Tone control (R15) (Model B70 only)..	13866	Cap-Dust cap for cone center(Pkg.5)
36061	Transformer-Driver transformer(T1)..	S-2565	Cone-Reproducer cone & voice coil..
35636	Transformer-First I.F. transformer (L15,L16,C22,C23).....	5118	Plug-3 contact male plug.....
36070	Transformer-Second I.F. transformer (L17,L18,C24,C25).....	S-2976	Reproducer complete.....
35628	Transformer-Third I.F. transformer (L19,L20,C26,C27).....	S-2977	Transformer-Output.....
33726	Washer-"C" washer for pulley(Pkg.5).		MISCELLANEOUS ASSEMBLIES
2917	Washer-"C" washer for tuning shaft (Pkg.4).....	S-2981	Dial-Station selector dial scale...
	REPRODUCER ASSEMBLIES(CRL515-3)	35647	Frame-Dial frame complete less dial & pointer.....
	(MODEL B61 ONLY)	35648	Indicator-Station selector indicator.....
32907	Cap-Dust cap for cone centre- (Pkg.5).....	35651	Knob-Range switch knob(outer section).....
32934	Cone-Reproducer cone and voice coil.....	35652	Knob-Range switch knob(inner section).....
5118	Plug-3 contact male plug.....	35650	Knob-Tone control knob.....
S-2974	Reproducer complete.....	36038	Knob-Tuning or volume control knob.
35941	Transformer-Output.....	35653	Mounting-Complete set of hardware to mount speaker consisting of grommets, eyelets & nuts.....
		4982	Spring-Retaining spring for knob Stock #35652-(Pkg.2).....
		14270	Spring-Retaining spring for knob Stock #35650,35651,or 36073(Pkg.2)



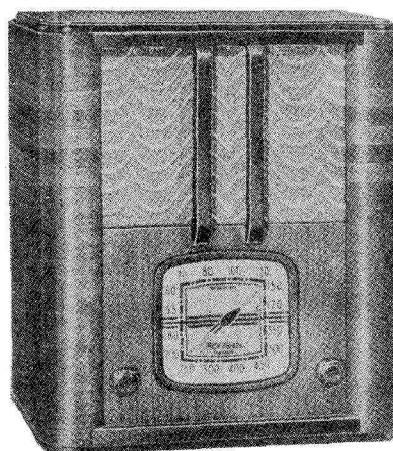
RCA Victor

MODEL B62 (COMPANION)

Four-Tube, Single-Band, Battery-Operated Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

Frequency Range 540—1,720 k.c. Alignment Frequencies 600 k.c., 1500 k.c., (osc., ant.)
Intermediate Frequency 455 k.c.

RADIOTRON COMPLEMENT

(1) Type 1A7G First Detector—Oscillator (2) Type 1N5G I. F. Amplifier
(3) Type 1H5G Second Det., A.F. and A.V.C. (4) Type 1C5G Power Output

BATTERIES REQUIRED

"A" one 1.4 Volt Air Cell or 1.5 Dry Cell; "B" two 45 Volt heavy duty "B" Batteries

CURRENT CONSUMPTION

"A" at 1.4 Volts 0.26 Volts
"B" at 90 Volts 9.6 Ma.

POWER OUTPUT

Undistorted 115 Milliwatts
Maximum 260 Milliwatts

LOUDSPEAKER

Type Permanent Magnet Dynamic
Diameter 5 inches
Voice Coil Impedance 3 Ohms at 400 Cycles

Mechanical Specifications

	Height	Width	Depth
Cabinet Dimensions	14 1/4 inches	12 3/8 inches	7 3/8 inches
Chassis Base Dimensions	2 inches	9 3/4 inches	5 5/8 inches
Overall Chassis Height			6 inches
Weight		7 3/4 lbs. (net), 10 1/2 lbs. (shipping)	
Operating Controls		(1) Power Switch—Volume; (2) Tuning	
Tuning Drive Ratio			8 to 1

General Description

This Model contains a four-tube chassis, battery operated, mounted in a table type cabinet. The superheterodyne type of circuit is employed, incorporating such features of design as the new low-drain 1.5 volt tubes thus reducing the physical size of

the batteries, magnetite core I.F. transformers, Automatic Volume Control; diode detection; resistance coupled audio system; sensitive, five-inch, permanent-magnet, dynamic loudspeaker; exceptionally low current drain; and a large, easy-to-read dial.

Service Data

The various diagrams of this booklet contain all information necessary to quickly isolate causes for defective operation if such develops. The ratings of resistors, capacitors, coils, etc., are indicated adjacent

to the symbols signifying these parts on the various diagrams. Identification titles such as R1, L1, C1, etc., provide ready reference between the illustrations and Replacement Parts List.

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointers to the horizontal position when the gang tuning-condenser plates are in full mesh.

Perform alignment in proper order, tabulated below, starting with Step No. 1 and following all operations across, then Step No. 2, etc. Adjustment locations are shown on Figures 1 and 3.

Cathode Ray Alignment is the preferable method. Connections for the oscillograph are shown in Fig. No. 3.

Output Meter Alignment.—If this method is used, connect the meter across 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 A.V.C. action.

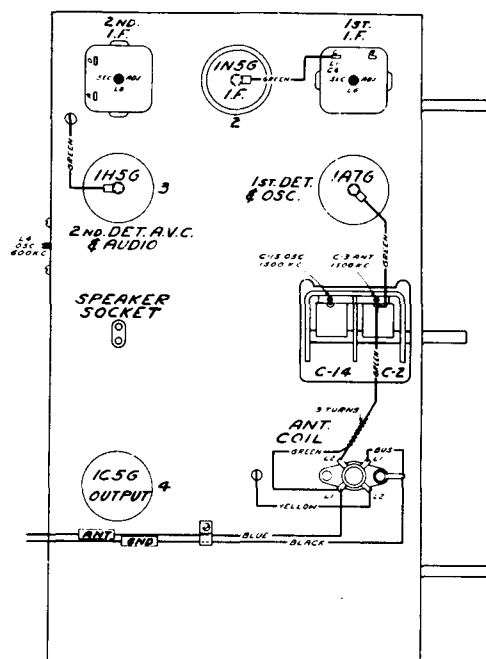


Fig. 1 Radiotron and Trimmer Locations

Alignment Procedure

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
No. 1	1N5-G I-F grid cap, in series with 0.01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F transformer)
No. 2	1A7-G 1st-det. grid cap, in series with 0.01 mfd.	455 kc		L5 and L6 (1st I-F transformer)
No. 3	Antenna lead, in series with 200 mmfd.	600 kc	600 kc	L4 (oscillator) L2 (antenna)
No. 4	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc	C15† (oscillator) C3 (antenna)

† Trimmer C16 on gang condenser should be unscrewed one complete turn from tight, before adjusting C15.

Radiotron Voltages

Readings taken with a receiver supply of 90 Volts "B" and 1.4 Volts "A".				
Radiotron	Plate	Screen Grid	Grid	Filament
(1) 1A7G Converter 1A7G Oscillator	83V 83V	45V*	—	1.4V
(2) 1N5G I.F.	83V	83V	—	1.4V
(3) 1H5G Detector and Audio	64V	—	—	1.4V
(4) 1C5G Output	80V	83V	—7.4V*	1.4V

- ### Precautionary Lead Dress
- Red lead from second i-f transformer to screen terminal of 1N5-G must be dressed close to and along edge of chassis.
 - Twisted green wire from antenna coil to gang must be 9 turns and kept clear of rotor.
 - Blue and green leads to volume control must be dressed close to chassis and between gang and front apron.

NOTE—Values with asterisk () are operating voltages in circuits with high series resistance. The actual measured value will be lower, depending on the voltmeter loading.

Measurements are made to chassis, with set tuned to a quiet point and the volume control at minimum. Values should hold within approximately plus or minus 20% with rated battery voltage.

REPLACEMENT PARTS FOR COMPANION

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			
S-1997	Cable-4 conductor battery cable complete with plugs.....	12679	Resistor-2.2 meg., 1/4 watt (R2,R7,R8)...
13307	Capacitor-56 mmfd. (C6).....	14887	Retainer-Tuning shaft retainer (Pkg.10)...
12723	Capacitor-56 mmfd. (C13).....	S-2668	Shaft-Station selector shaft.....
14262	Capacitor-110 mmfd. (C5).....	32149	Shield-Tube shield for 1N5G tube.....
12404	Capacitor-120 mmfd. (C7,C8).....	11196	Socket-Tube socket.....
12724	Capacitor-150 mmfd. (C11).....	S-2119	Spring-Drive cord tension spring (Pkg.3)...
14712	Capacitor-180 mmfd. (C9).....	14261	Transformer-1st I.F. transformer complete (L5,L6,C5,C6).....
30433	Capacitor-430 mmfd. (C17).....	14308	Transformer-2nd I.F. transformer complete (L7,L8,C7,C8,C9,R3).....
5148	Capacitor-.007 mfd. (C12).....	S-2669	Volume control and power switch (R5, S1,S2).....
14393	Capacitor-0.1 mfd. (C4,C10,C19).....	REPRODUCER ASSEMBLIES (CRL-500-1)	
4839	Capacitor-0.1 mfd. (C1).....	32907	Cap-Dust cap for cone centre (Pkg.5)....
32187	Capacitor-8 mfd. (C18).....	S-2375	Cone-Reproducer cone complete with dust cap (L9).....
32150	Coil-Antenna Coil (L1,L2).....	S-2376	Reproducer complete.....
32148	Coil-Oscillator coil (L3,L4).....	S-2377	Transformer-Output (T1).....
S-2665	Condenser-2 gang variable tuning C2,C3,C14,C15,C16).....	MISCELLANEOUS ASSEMBLIES	
S-2702	Cord-Drive cord assembly.....	30975	Crystal-Station selector dial crystal.....
S-2666	Dial-Station selector dial & Plate assembly.....	30863	Knob-Tuning or volume control knob.....
S-2120	Drum-Variable condenser drive drum & set screws.....	30886	Screw-Chassis mounting screw & washer assembly (Pkg.4).....
S-2703	Indicator-Station selector indicator pointer.....	30900	Spring-Knob retaining spring (Pkg.5)....
32208	Plug-2 prong male plug for battery cable.....		
S-1628	Plug-3 prong male plug for battery cable.....		
14076	Resistor-820 ohm, 1/4 watt (R9).....		
S-2046	Resistor-22,000 ohm, 1/10 watt (R3)...		
13715	Resistor-68,000 ohm, 1/4 watt (R1)....		
12264	Resistor-220,000 ohm, 1/4 watt (R10)...		
12200	Resistor-1 meg., 1/4 watt (R4,R6).....		



RCA Victor

MODEL 94BT-1

Four-Tube, Single-Band, Battery-Operated Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

Electrical Specifications

Frequency Range 540—1,720 k.c. Alignment Frequencies 600 k.c., 1500 k.c., (osc., ant.)
Intermediate Frequency 455 k.c.

RADIOTRON COMPLEMENT

(1) Type 1A7G First Detector—Oscillator (2) Type 1N5G I. F. Amplifier
(3) Type 1H5G Second Det., A.F. and A.V.C. (4) Type 1C5G Power Output

BATTERIES REQUIRED

"A" one 1.4 Volt Air Cell or 1.5 Dry Cell; "B" two 45 Volt heavy duty "B" Batteries

CURRENT CONSUMPTION

"A" at 1.4 Volts 0.26 Volts
"B" at 90 Volts 9.6 Ma.

POWER OUTPUT

Undistorted 115 Milliwatts
Maximum 260 Milliwatts

LOUDSPEAKER

Type Permanent Magnet Dynamic
Diameter 5 inches
Voice Coil Impedance 3 Ohms at 400 Cycles

Mechanical Specifications

	Height	Width	Depth
Cabinet Dimensions	12 $\frac{3}{8}$ inches	10 $\frac{1}{2}$ inches	6 $\frac{3}{4}$ inches
Chassis Base Dimensions	2 inches	9 $\frac{1}{4}$ inches	5 $\frac{1}{2}$ inches
Overall Chassis Height			6 inches
Weight		7 $\frac{3}{4}$ lbs. (net), 10 $\frac{1}{2}$ lbs. (shipping)	
Operating Controls		(1) Power Switch—Volume; (2) Tuning	
Tuning Drive Ratio			8 to 1

General Description

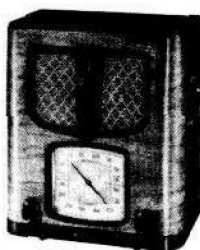
This Model contains a four-tube chassis, battery operated, mounted in a table type cabinet. The superheterodyne type of circuit is employed, incorporating such features of design as the new low-drain 1.5 volt tubes thus reducing the physical size of

the batteries, magnetite core I.F. transformers, Automatic Volume Control; diode detection; resistance coupled audio system; sensitive, five-inch, permanent-magnet, dynamic loudspeaker; exceptionally low current drain; and a large, easy-to-read dial.

Service Data

The various diagrams of this booklet contain all information necessary to quickly isolate causes for defective operation if such develops. The ratings of resistors, capacitors, coils, etc., are indicated adjacent

to the symbols signifying these parts on the various diagrams. Identification titles such as R1, L1, C1, etc., provide ready reference between the illustrations and Replacement Parts List.



Model 94BT-1

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointers to the horizontal position when the gang tuning-condenser plates are in full mesh.

Perform alignment in proper order, tabulated below, starting with Step No. 1 and following all operations across, then Step No. 2, etc. Adjustment locations are shown on Figures 1 and 3.

Cathode Ray Alignment is the preferable method. Connections for the oscillograph are shown in Fig. No. 3.

Output Meter Alignment.—If this method is used, connect the meter across 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 A.V.C. action.

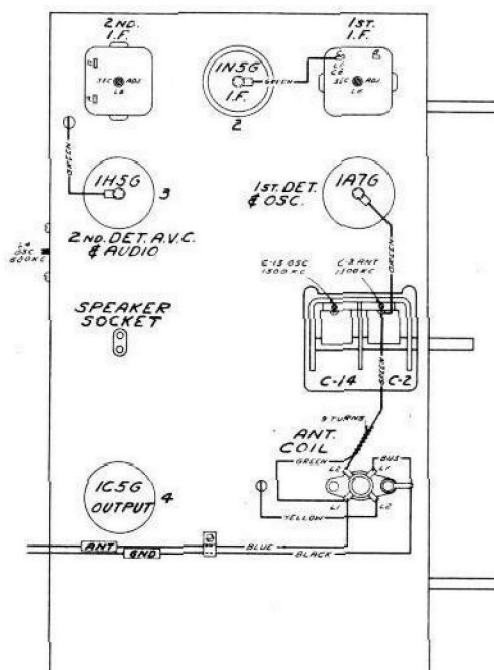


Fig. 1 Radiotron and Trimmer Locations

Alignment Procedure

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
No. 1	1N5-G I-F grid cap. in series with 0.01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F transformer)
No. 2	1A7-G 1st-det. grid cap. in series with 0.01 mfd.	455 kc		L5 and L6 (1st I-F transformer)
No. 3	Antenna lead, in series with 200 mmfd.	600 kc	600 kc	L4 (oscillator) L2 (antenna)
No. 4	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc	C15† (oscillator) C8 (antenna)

† Trimmer C16 on gang condenser should be unscrewed one complete turn from tight, before adjusting C15.

Radiotron Voltages

Readings taken with a receiver supply of 90 Volts "B" and 1.4 Volts "A".				
Radiotron	Plate	Screen Grid	Grid	Filament
(1) 1A7G Converter 1A7G Oscillator	83V 83V	45V*	—	1.4V
(2) 1N5G I.F.	83V	83V	—	1.4V
(3) 1H5G Detector and Audio	64V	—	—	1.4V
(4) 1C5G Output	80V	83V	—7.4V*	1.4V

- Precautionary Lead Dress**
1. Red lead from second i-f transformer to screen terminal of 1N5-G must be dressed close to and along edge of chassis.
 2. Twisted green wire from antenna coil to gang must be 9 turns and kept clear of rotor.
 3. Blue and green leads to volume control must be dressed close to chassis and between gang and front apron.

NOTE—Values with asterisk () are operating voltages in circuits with high series resistance. The actual measured value will be lower, depending on the voltmeter loading.

Measurements are made to chassis, with set tuned to a quiet point and the volume control at minimum. Values should hold within approximately + 20% with rated battery voltage.

REPLACEMENT PARTS FOR MODEL 94BT-1

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			
S-1997	Cable-4 conductor battery cable complete with male battery.....	12679	Resistor-2.2 meg.1/4 watt(R2,R7,R8)...
13307	Capacitor-56 mmfd. (C6).....	14887	Retainer-Knob shaft retainer(Pkg.of20)
12723	Capacitor-56 mmfd. (C13).....	S-2118	Shaft-Station selector knob shaft....
14262	Capacitor-110 mmfd. (C5).....	32149	Shield-Tube shield for 1N5G tube....
12404	Capacitor-120 mmfd. (C7,C8).....	11196	Socket-Tube socket.....
12724	Capacitor-150 mmfd. (C11).....	30956	Socket-Speaker socket.....
14712	Capacitor-180 mmfd. (C9).....	S-2119	Spring-Drive Cord Tension Spring-(Pkg.of 3).....
30433	Capacitor-430 mmfd. (C17).....	14261	Transformer-1st I.F. Transformer (L5, L6,C5,C6).....
5148	Capacitor-.007 mfd. (C12).....	14308	Transformer-2nd I.F. Transformer (L7, L8,C7,C8,C9,R3).....
14393	Capacitor-.01 mfd. (C4,C10,C19).....	30947	Volume Control and "on-off" switch (R5,S1,S2).....
4839	Capacitor-.01 mfd. (C1).....	SPEAKER ASSEMBLIES	
32187	Capacitor-.08 mfd. (C18).....	84226-3	
32150	Coil-Antenna Coil (L1,L2).....	32163	Cone-Speaker cone and voice coil(L9)...
32148	Coil-Oscillator Coil (L3,L4).....	32162	Speaker-Speaker complete.....
32147	Condenser-2 gang variable tuning condenser (C2,C3,C14,C15,C16).....	32164	Transformer-Output Transformer (T1)...
30877	Cord-Drive Cord.....	MISCELLANEOUS ASSEMBLIES	
12006	Core-Adjustable core for I.F. Transformer	30975	Crystal-Station selector dial crystal.....
32186	Dial-Dial scale and plate assembly....	14269	Knob-Tuning or volume control knob...
S-2120	Drum-Tuning condenser drive cord drum and set screws.....	30886	Screw-Chassis mounting screw and washer assembly (Package of 4).....
14635	Indicator-Station selector indicator pointer.....	14270	Spring-Retaining spring for knob (Package of 10).....
32208	Plug-2 prong male plug for battery cable.....		
S-1628	Plug-3 prong male plug for battery cable (Package of 2).....		
14076	Resistor-820 ohm,1/4 watt (R9).....		
S-2046	Resistor-22,000 ohm,1/10 watt (R3)....		
13715	Resistor-68,000 ohm,1/4 watt (R1)....		
12264	Resistor-220,000 ohm,1/4 watt (R10)...		
12200	Resistor-1 meg.,1/4 watt (R4,R6).....		



RCA Victor

MODEL NIPPERETTE

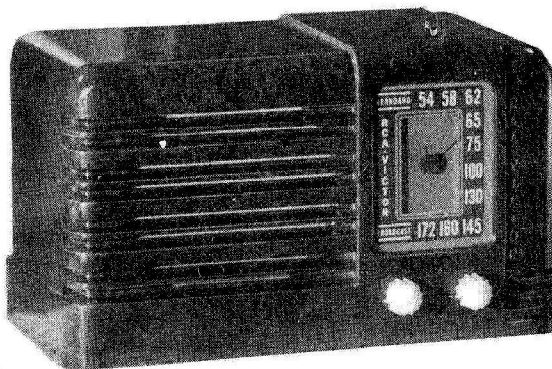
Four-Tube, Single-Band, Battery-Operated Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

General Description

The "Nipperette" is a four tube, battery operated receiver housed in a molded plastic cabinet of unusual design. Features of design include:—New low drain 1.4 volt tubes; full A.V.C. circuit; diode detection; resistance coupled audio system; sensitive, four inch, permanent magnet, dynamic loudspeaker; exceptionally low current drain and a large, easy to read dial.



Electrical Specifications

Frequency Range 540—1,720 k.c. Alignment Frequency 1500 kc., (osc., ant.)
Intermediate Frequency 455 k.c.

RADIOTRON COMPLEMENT

(1) Type 1A7GT.....First Detector—Oscillator	(2) Type 1N5GT I. F. Amplifier
(3) Type 1H5GT.....Second Det., A.F. and A.V.C.	(4) Type 1T5GT Power Output

BATTERIES REQUIRED

"A" one 1.4 Volt Air Cell or 1.5 Dry Cell; "B" two 45 Volt heavy duty "B" Batteries

CURRENT CONSUMPTION

"A" at 1.4 Volts 0.2 Amps.
"B" at 90 Volts 9.6 Ma.

POWER OUTPUT

Undistorted 100 Milliwatts
Maximum 200 Milliwatts

LOUDSPEAKER

Type Permanent Magnet Dynamic
Diameter 4 inches
Voice Coil Impedance 2.2 Ohms at 400 Cycles

Mechanical Specifications

	Height	Width	Depth
Cabinet Dimensions	5 1/8 inches	8 5/8 inches	4 1/2 inches
Weight (net)			4 3/4 lbs.
Operating Controls	(1) Power Switch—Volume; (2) Tuning		

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the vertical position when the gang tuning-condenser plates are in full mesh.

Perform alignment in proper order, tabulated on Page 4, starting with Step No. 1 and following all operations across, then Step No. 2, etc. Adjustment locations are shown on Figure 1.

Cathode Ray Alignment is the preferable method.

Connections for the oscillograph are shown in Fig. No. 2.

Output Meter Alignment.—If this method is used, connect the meter across 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 A.V.C. action.

Service Data

The various diagrams of this booklet contain all information necessary to quickly isolate causes for defective operation if such develops. The ratings of resistors, capacitors, coils, etc., are indicated adjacent

to the symbols signifying these parts on the various diagrams. Identification titles such as R1, L1, C1, etc., provide ready reference between the illustrations and Replacement Parts List.

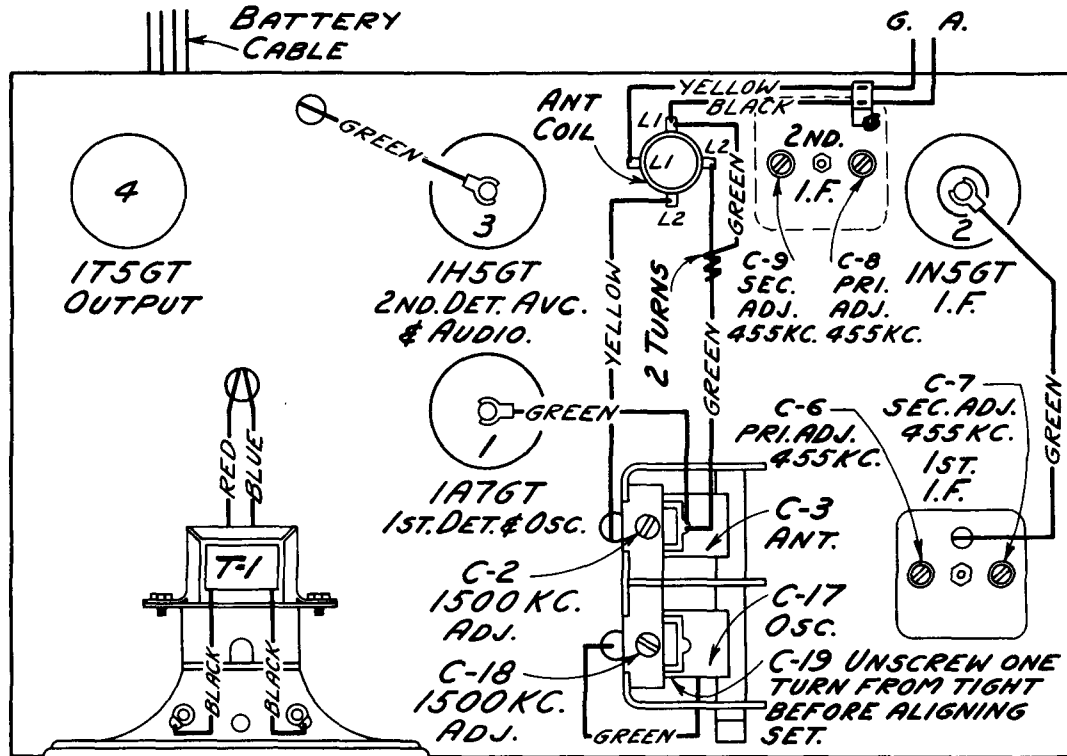


Fig. No. 1 Tube and Trimmer Locations.

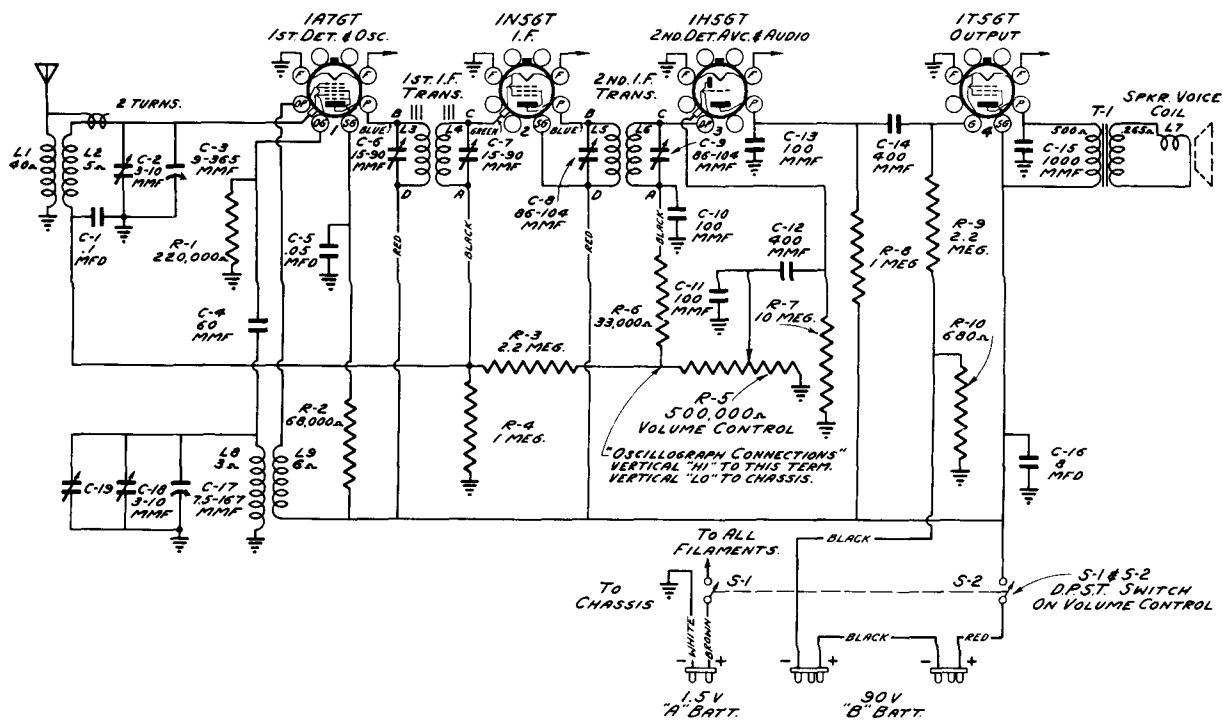


Fig No. 2 Schematic Circuit Diagram

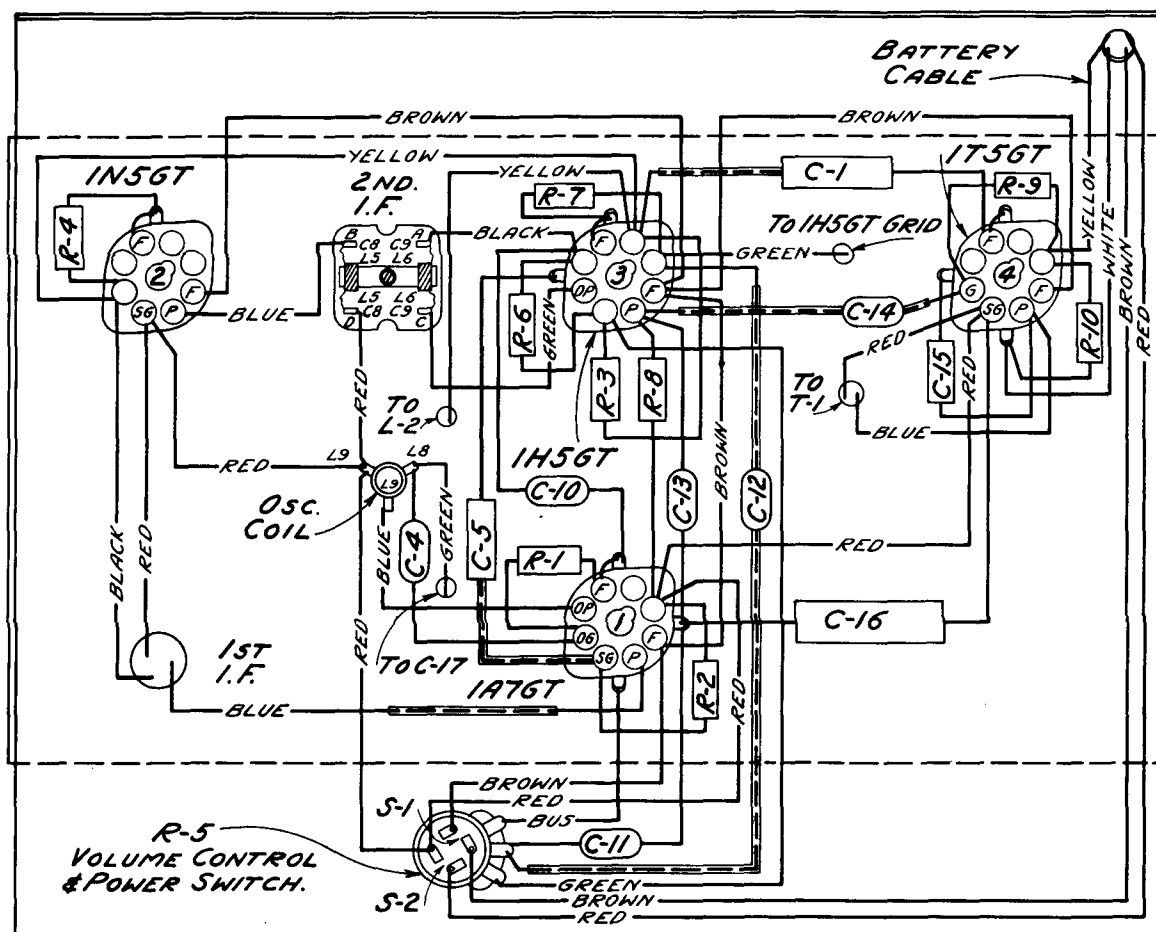


Fig. No. 3 Chassis Wiring Diagram

Alignment Procedure

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
No. 1	1N5-G I-F grid cap, in series with 0.01 mfd.	455 kc	Quiet point between 550-750 kc	C8 and C9 (2nd I-F transformer)
No. 2	1A7-G 1st-det. grid cap, in series with 0.01 mfd.	455 kc		C6 and C7 (1st I-F transformer)
No. 3	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc	C18† (oscillator) C2 (antenna)
No. 4	Antenna lead, in series with 200 mmfd.	600 kc	600 kc	C18* (oscillator) C2* (antenna)

† Trimmer C19 on gang condenser should be unscrewed one complete turn from tight, before adjusting C18.

* Rock gang in and out to obtain 600 k.c. adjustment.

Precautionary Lead Dress

1. Twisted green wire from antenna coil to gang must be 2 turns and kept clear of rotor.
2. Green lead to volume control must be dressed close to chassis.

Radiotron Voltages

Readings taken with a receiver supply of 90 Volts "B" and 1.4 Volts "A".

Radiotron	Plate	Screen Grid	Grid	Filament
(1) 1A7GT Converter 1A7GT Oscillator	83V 83V	45V*	—	1.4V
(2) 1N5GT I.F.	83V	83V	—	1.4V
(3) 1H5GT Detector and Audio	64V	—	—	1.4V
(4) 1T5GT Output	80V	83V	—7.4V*	1.4V

NOTE—Values with asterisk () are operating voltages in circuits with high series resistance. The actual measured value will be lower, depending on the voltmeter loading.

Measurements are made to chassis, with set tuned to a quiet point and the volume control at minimum. Values should hold within approximately plus or minus 20% with rated battery voltage.

REPLACEMENT PARTS FOR NIPPERETTE

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			
S-2746	Cable-Battery cable complete with plugs.....	32945	Shaft-Station selector shaft.....
13057	Capacitor-60 mmfd. (C4).....	32537	Socket-Tube socket.....
12720	Capacitor-100 mmfd. (C10, C11, C13)	30585	Spring-Drive cord tension spring (Pkg.2).....
30433	Capacitor-1000 mmfd. (C15).....	S-2749	Transformer-1st I.F. transformer (L3, L4, C6, C7).....
4886	Capacitor-.05 mfd. (C5).....	S-2750	Transformer-2nd I.F. transformer (L5, L6, C8, C9).....
4839	Capacitor-0.1 mfd. (C1).....	S-2751	Volume control and power switch (R5, S1, S2).....
33303	Capacitor-8 mfd. (C16).....	REPRODUCER ASSEMBLIES (CRL-516-1)	
32572	Coil-Antenna coil (L1, L2).....	32907	Cap-Dust cap for cone centre (Pkg.5).....
32573	Coil-Oscillator coil (L8, L9)...	S-2427	Cone-Reproducer cone assembly (L7)...
S-2747	Condenser-2 gang variable tuning condenser (C2, C3, C17, C18, C19).....	S-2753	Reproducer complete.....
S-2432	Cord-Drive Cord.....	S-2754	Transformer-Output (T-1).....
35117	Drum-Drive cord indicator drum and set screws.....	MISCELLANEOUS ASSEMBLIES	
S-2398	Plug-2 prong male battery plug.	S-2755	Cabinet-Molded plastic cabinet (Walnut).....
12827	Plug-3 prong male battery plug.	35124	Dial-Station selector glass dial scale & retainer.....
12262	Resistor-680 ohm, 1/4 watt	32571	Knob-Tuning or volume control knob
12454	Resistor-33,000 ohm, 1/4 watt (R6)	32667	Spring-Knob retaining spring (Pkg. 5).....
13715	Resistor-68,000 ohm, 1/4 watt (R2)		
12264	Resistor-220,000 ohm, 1/4 watt (R1)		
S-2496	Resistor-1 meg., 1/10 watt (R4, R8)		
12679	Resistor-2.2 meg., 1/4 watt (R3, R9).....		
13601	Resistor-10 meg., 1/4 watt (R7)...		
32943	Retainer-Dial scale retaining clip & washer (Pkg.10).....		



RCA Victor

PICK-ME-UP

Four-Tube, Single-Band, Battery-Operated, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical and Mechanical Specifications

Frequency Range..... 550-1,720 kc
Intermediate Frequency..... 455 kc

TUBE COMPLEMENT

(1) Type -1A7-G..... 1st-Det.—Osc.
(2) Type -1N5-G..... I-F Amplifier
(3) Type -1H5-G..... 2nd-Det., A-F, and A.V.C.
(4) Type -1C5-G..... Output

BATTERIES REQUIRED

"A," one 1.5 volt dry plug-type "A," 2½-in. x 2½-in. x 4-in.
(Eveready No. 742 or equivalent)
"B," two 45 volt dry plug-type "B," 2½-in. x 4-in. x 5½-in.
(Eveready No. 762 or equivalent)

CURRENT CONSUMPTION

"A," 0.24 ampere—"B," 9.0 milliamperes

POWER OUTPUT

Undistorted..... 0.10 watt
Maximum..... 0.21 watt

LOUDSPEAKER

Type..... 4-inch permanent-magnet dynamic
Voice-coil Impedance..... 2 ohms at 400 cycles

	Height	Width	Depth
Cabinet Dimensions (inches).....	9½	12½	6½
Weight—(Net) less batteries.....			6 pounds
With batteries.....			12½ pounds
Tuning Drive Ratio.....			10 to 1

REPLACEMENT PARTS

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			
S-2474	Capacitor-Adjustable trimmer 300-600 mmfd. (C6).....	13601	Resistor-10 meg., 1/4 Watt (R6)...
13057	Capacitor-60 mmfd. (C7).....	33305	Shaft-Tuning knob shaft and bushing.....
12720	Capacitor-100 mmfd. (C13,C14,C16)....	32595	Shield-Tube shield-less cap.....
30433	Capacitor-400 mmfd. (C15,C17).....	32537	Socket-Tube Socket.....
12725	Capacitor-1000 mmfd. (C18).....	30585	Spring-Drive cord spring (Pkg.2)...
4886	Capacitor-.05 mfd. (C8).....	33301	Transformer-1st I.F. transformer (L3,L4,C9,C10).....
4839	Capacitor-.01 mfd. (C1).....	33302	Transformer-Second I.F. transformer (L5,L6,C11,C12).....
33303	Capacitor-8 mfd. Electrolytic (C19).	33304	Volume control and switch (R5,S1,S2).....
S-2473	Condenser-2 gang variable tuning condenser (C2,C3,C4,C5).....	SPEAKER ASSEMBLIES	
32534	Cord-Variable condenser drive cord..	(39128-1)	
S-2423	Drum-Drive cord drum and indicator assembly.....	33058	Speaker complete.....
33300	Loop-Antenna loop complete.....	33062	Transformer-Output transformer(T1)
32208	Plug 2 contact plug for battery cable.....	MISCELLANEOUS ASSEMBLIES	
12827	Plug-3 contact plug for battery cable.....	33310	Dial-Glass Dial scale.....
12454	Resistor-33,000 ohms, 1/4 Watt (R3).	33311	Escutcheon-Dial scale escutcheon..
14076	Resistor-820 ohms, 1/4 watt (R9)....	33376	Handle-Carrying handle.....
13715	Resistor-68,000 ohms, 1/4 Watt (R2).	32571	Knob-Tuning knob.....
12264	Resistor-220,000 ohms, 1/4 Watt (R1)	33309	Knob-Volume control knob.....
13730	Resistor-1 meg., 1/4 Watt (R7).....	32667	Spring-Knob retaining spring(pkg.5
12679	Resistor-2.2 meg., 1/4 Watt (R4,R8).		

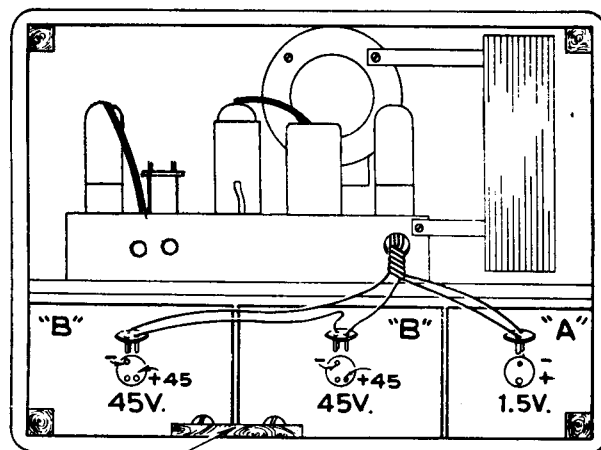
Alignment Procedure

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, keep the output as low as possible to avoid a-v-c action.

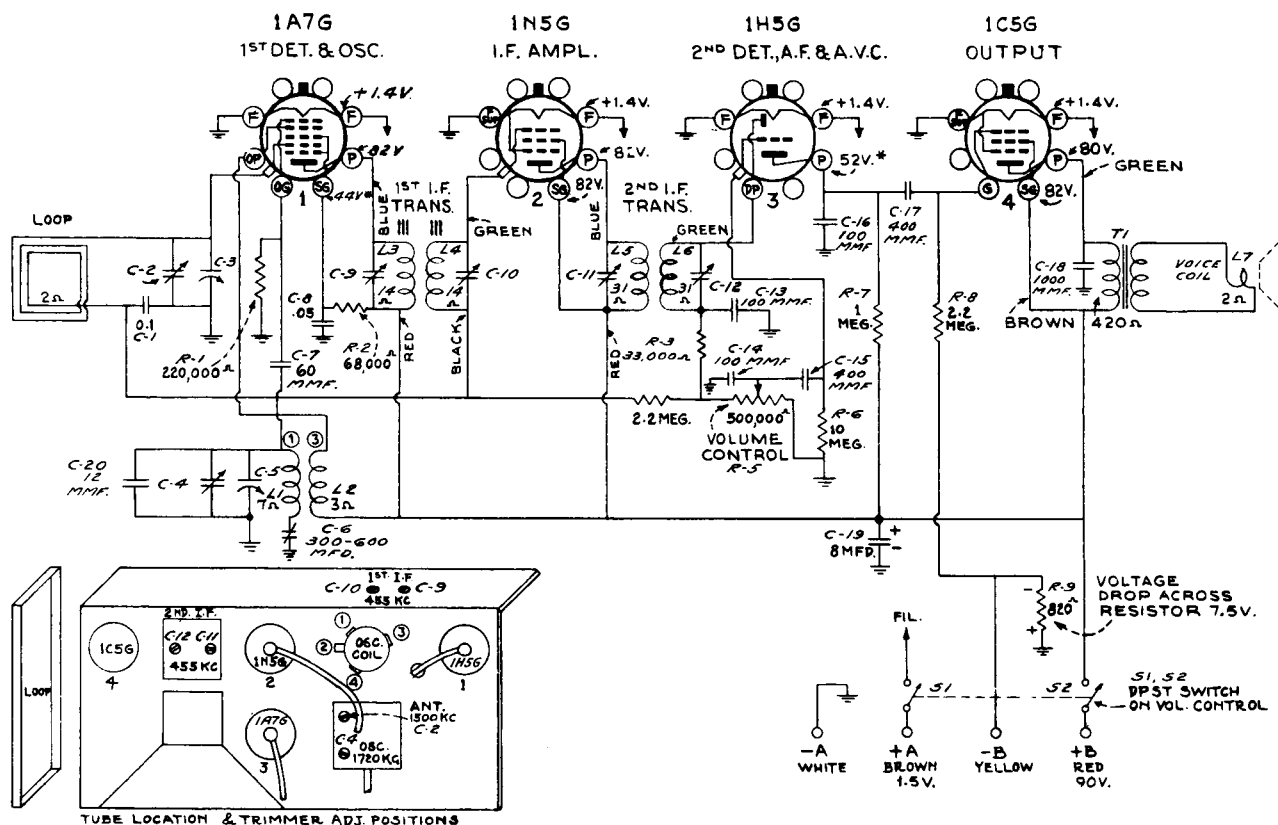
Pre-setting Dial.—With gang condenser in full mesh, the pointer should be horizontal.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1A7G 1st-Det. grid cap, in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C9 C10 C11 C12 (1st and 2nd I-F transformers)
2	Antenna coil loop by means of one turn of wire placed near loop	1,720 kc	Full clockwise (out of mesh)	C4 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C2 (antenna)



REMOVE THIS BLOCK-PLACE BATTERIES IN CABINET AS INDICATED

REAR VIEW OF CABINET SHOWING BATTERIES



Schematic Circuit Diagram

Note: Values with star (*) are operating voltages. Values not starred are actual measured voltages.

Measurements are made to chassis unless otherwise indicated, with set tuned to quiet point. Values should hold within approximately $\pm 20\%$ with rated battery voltage.



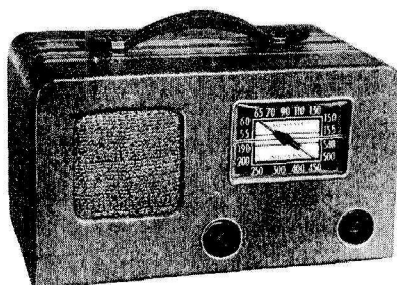
RCA Victor

PORTETTE

Four-Tube, Single-Band, Battery-Operated, Superheterodyne Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical and Mechanical Specifications

Frequency Range 550-1,560 kc
Intermediate Frequency 455 kc

TUBE COMPLEMENT

(1) Type 1A7-G 1st-Det.—Osc.
(2) Type 1N5-G I-F Amplifier
(3) Type 1H5-G 2nd-Det., A-F, and A.V.C.
(4) Type 1C5-G Output

BATTERIES REQUIRED

"A," one 1.5 volt dry plug-type "A," 2½-in. x 2½-in. x 4-in.
(Eveready No. 742)

"B," two 45 volt dry plug-type "B," 2½-in. x 4-in. x 5¼-in.
(Eveready No. 762)

CURRENT CONSUMPTION

"A" 0.24 ampere—"B," 9.0 milliamperes

POWER OUTPUT

Undistorted 0.10 watt
Maximum 0.21 watt

LOUDSPEAKER

Type 5-inch permanent-magnet dynamic
Voice-coil Impedance 2.2 ohms at 400 cycles

Cabinet Dimensions (inches) 7¾ 14 8¾
Chassis Base Dimensions (inches) 2 7¼ 5½
Over-all Chassis Height 6½ inches
Weight—Shipping weight, less batteries 12½ pounds
Net weight, with batteries 16 pounds
Tuning Drive Ratio 8 to 1

General Description

The RCA Victor Portette is a portable type, 4 tube superheterodyne battery-operated receiver.

Features of design include magnetite core I.F. transformers stabilized oscillator circuit, automatic volume control, permanent-magnet dynamic loudspeaker of the plug-in type, self-contained loop antenna, light weight long-life, plug-in batteries, low drain 1.5 volt tubes and a large easy-to-read dial. The complete receiver and battery complement is housed in a portable cabinet of modern design.

Alignment Procedure

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, keep the output as low as possible to avoid a-v-c action.

Pre-setting Dial.—With gang condenser in full mesh, the pointer should be horizontal.

Refer to "RCA Victor Service Manual" for General Alignment procedure.

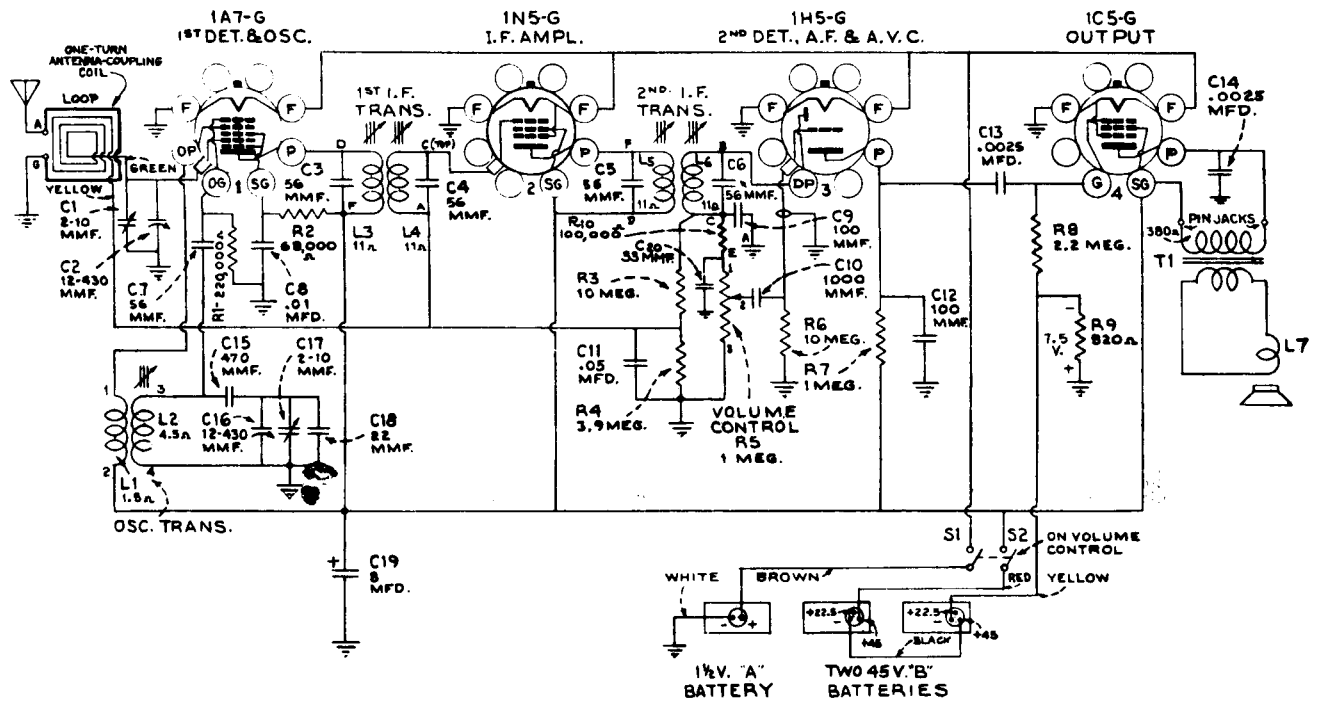
Precautionary Lead Dress.—

1. Dress speaker leads down to chassis.
2. The green lead from the loop to the antenna section of the gang should be dressed between the output and detector tube shields and pulled toward the far corner of the loop by means of the rubber band.
3. The spiral shield on the 1st-A.F. grid lead should be brought as close as possible to the grid cap.
4. Leads to the high side and tap of the volume control should be dressed down to the chassis and away from the output tube plate lead.

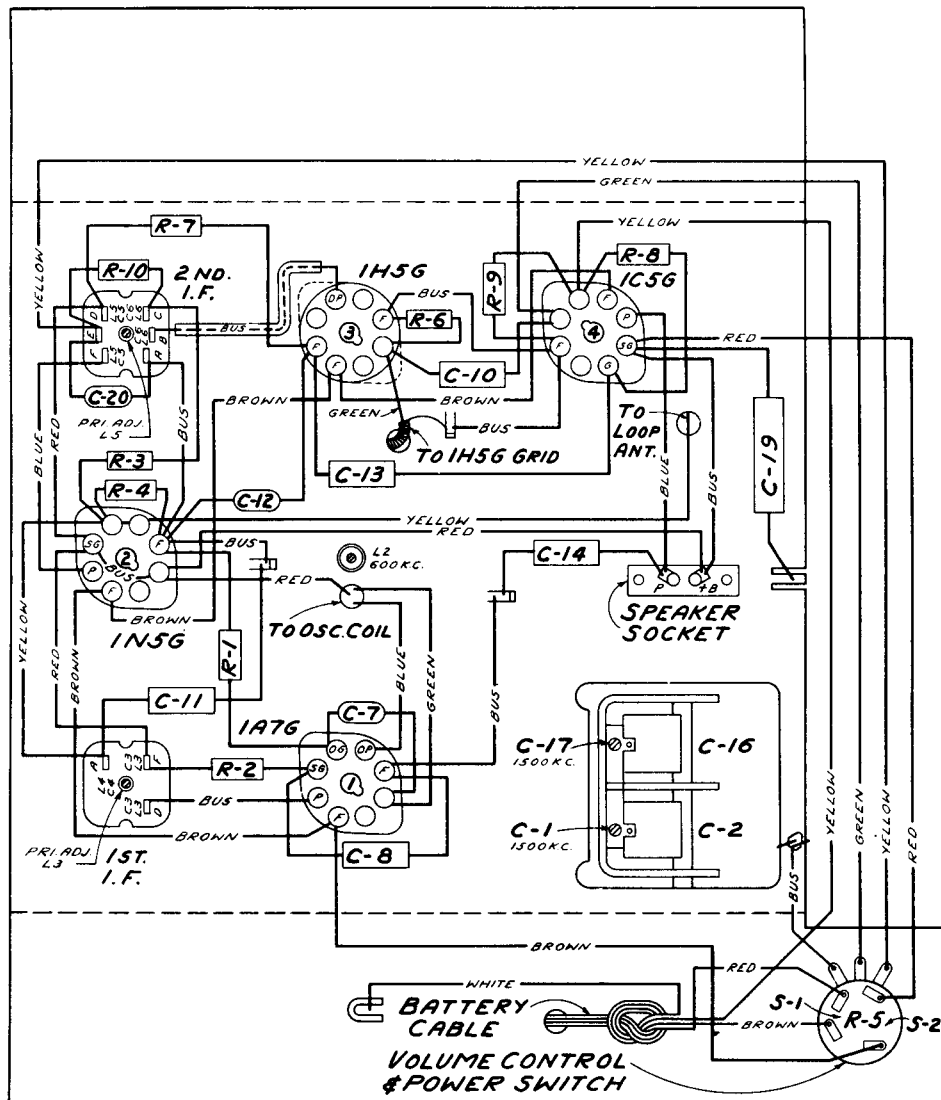
Antenna.—An antenna and ground may be connected to "A" and "G" at bottom of cabinet. If total length of antenna and lead-in is more than 150 feet, connect a 300 mmf capacitor in series with lead-in.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1N5-G grid cap, in series with .001 mfd.	455 kc	Quiet point between 550-750 kc	L5 and L6 (2nd I-F transformer)
2	1A7-G grid cap, in series with .001 mfd.	455 kc		L3 and L4 (1st I-F transformer)
3	Assemble chassis and batteries in correct position in cabinet, and fasten rear cover (loop) in place while making the following adjustments, which are accessible through holes in the bottom of the cabinet.			
4	Antenna terminal, in series with 200 mfd. Connect low side of test-osc. to "G" term.	1500 kc	1500 kc*	C17 (osc.) C1 (ant.)
5		600 kc	600 kc*	L2 (osc.) Rock in
6	Repeat steps 4 and 5.			

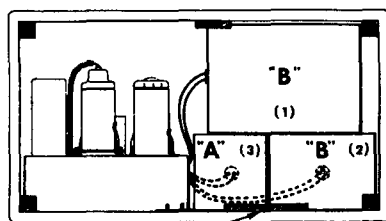
* Use bottom of "1" in "150" for 1500 kc calibration point, and use center of "0" in "60" for 600 kc calibration point.



Schematic Circuit Diagram

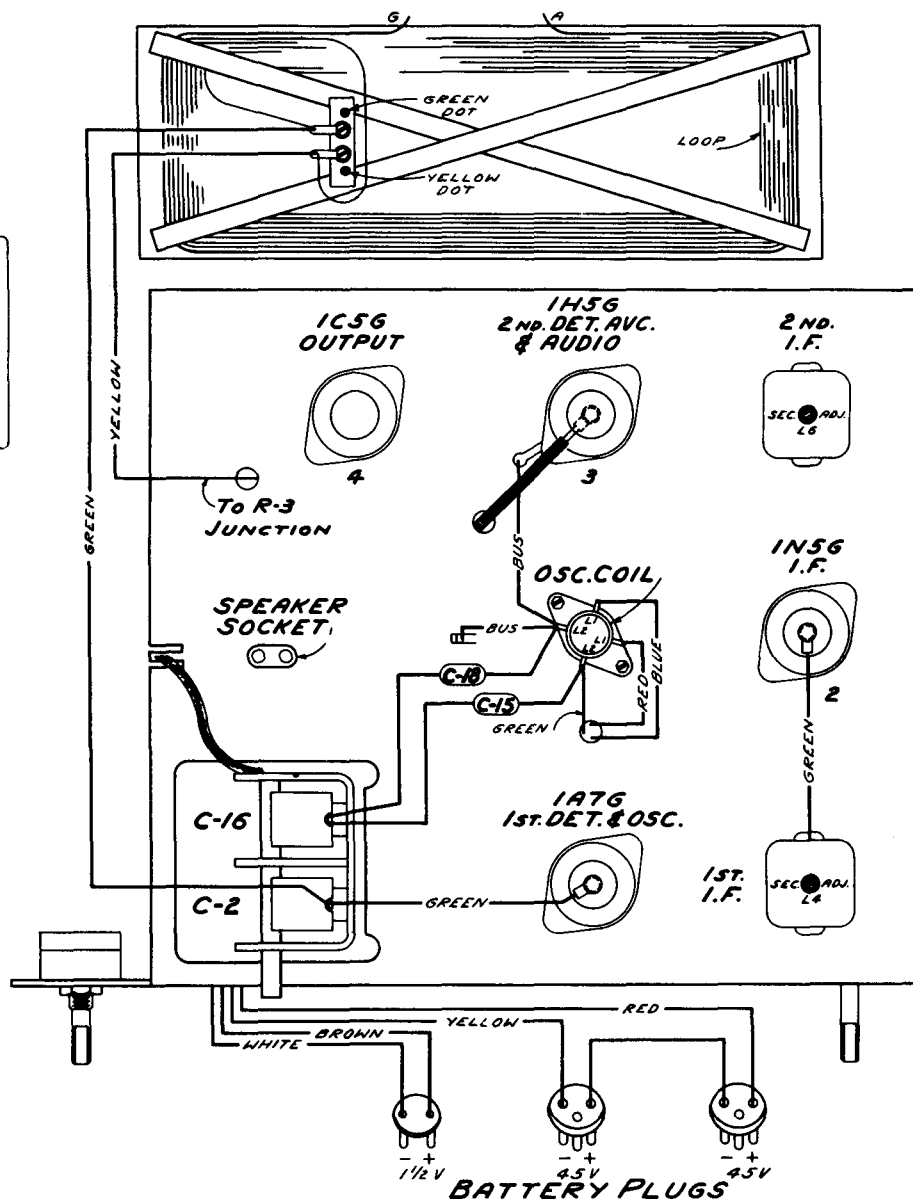


Chassis Wiring Diagram



REMOVE THIS BLOCK, PLUG IN CABLES AND PLACE BATTERIES IN CABINET AS SHOWN, IN THE ORDER INDICATED. REPLACE CLAMPING BLOCK.

Battery Arrangement



Tube and Trimmer Locations

Radiotron Socket Voltages

Type	Plate	Screen	Filament
1A7-G Det.	82V	44V*	1.4V
1A7-G Osc.	82V	—	—
1N5-G	82V	82V	1.4V
1H5-G	52V*	—	1.4V
1C5-G	80V	82V	1.4V

Note:—Values with star (*) are operating voltages. Values not starred are actual measured voltages.

Measurements are made to chassis set tuned to quiet point. Values should hold within approximately + 20% with rated battery voltages.

REPLACEMENT PARTS FOR PORTETTE

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			
S-2359	Cable-Battery cable complete with battery plugs.....	S-2364	Shaft-Dial pointer shaft and pulley
12607	Cap-Shield cap for First I.F. Transformer.....	32597	Shaft-Tuning knob shaft.....
12581	Cap-Shield cap for second I.F. Transformer.....	32595	Shield-Tube shield less cap.....
32598	Cap-Shield Cap for LH5G (Pkg.of 2)	31251	Socket-Tube socket.....
32596	Cap-Tube shield cap (Pkg.of 2)...	30956	Socket-2 contact speaker socket....
14021	Capacitor-22 mmfd. (C18).....	S-2119	Spring-Drive cord tension spring (Pkg.of 3).....
12948	Capacitor-33 mmfd. (C20).....	32263	Transformer-First I.F. Transformer (L3,L4,C3,C4).....
30949	Capacitor-56 mmfd. (C3,C4,C5,C6)...	32264	Transformer-Second I.F. Transformer (L5,L6,C5,C6,C9).....
12723	Capacitor-56 mmfd. (C7).....	32594	Volume control and power switch (R5,S1,S2).....
30904	Capacitor-100 mmfd. (C9).....	SPEAKER ASSEMBLIES	
12720	Capacitor-100 mmfd. (C12).....	84226-503	
30433	Capacitor-470 mmfd. (C15).....		
S-2360	Capacitor-1000 mmfd. (C10).....	32163	Cone-Speaker cone (L7).....
5107	Capacitor-.0025 mfd. (C13,C14)....	32162	Speaker-Speaker complete.....
14393	Capacitor-.01 mfd. (C8).....	32164	Transformer-Output transformer (T1).....
32787	Capacitor-.05 mfd. (C11).....	MISCELLANEOUS ASSEMBLIES	
32187	Capacitor- 8 mfd. electrolytic capacitor (C19).....		
32148	Coil-Oscillator coil (L1,L2).....	32602	Bezel-Dial bezel and crystal.....
32591	Condenser-2 gang variable condenser (C1,C2,C16,C17).....	S-2365	Disc-Indicator disc for escutcheon Stock #S-2366.....
S-2361	Cord-Variable condenser drive cord (19" long).....	32600	Escutcheon-Tuning knob escutcheon..
32593	Dial-Station selector dial scale.	S-2366	Escutcheon-Volume control escutcheon.....
S-2120	Drum-drive cord drum.....	32777	Handle-Carrying handle.....
32605	Indicator-Station selector indicator pointer.....	11610	Knob-Volume control or tuning knob.
32208	Plug-2 contact male plug for "A" leads.....	32604	Loop-Antenna loop complete.....
14076	Resistor-820 ohms, 1/4 watt (R9).	32601	Retainer-Knob escutcheon retainer (Pkg.of 2).....
13715	Resistor-68,000 ohms, 1/4 watt (R2).....	11349	Spring-Knob retaining spring (Pkg.of 5).....
14560	Resistor-100,000 ohms, 1/4 watt (R10).....		
12264	Resistor-220,000 ohms, 1/4 watt (R1).....		
13730	Resistor-1 meg., 1/4 watt (R7)...		
12679	Resistor-2.2 meg., 1/4 watt (R8).		
13167	Resistor-3.9 meg., 1/4 watt (R4).		
13601	Resistor-10 meg., 1/4 watt (R3, R6).....		
14887	Retainer-Tuning knob shaft retainer (Pkg.of 20).....		
3768	Screw-No.8/32x3/8 set screw for drum stock #S-2120 (Pkg.of 5)...		

Parts peculiar to Speaker marked (CRL-500-1)

S-2375	Cone - Speaker Cone (L7) - - - - -	\$3.08
S-2376	Reproducer - Reproducer complete - - - - -	7.42
S-2377	Transformer - Output Transformer (T1)- - - - -	1.61

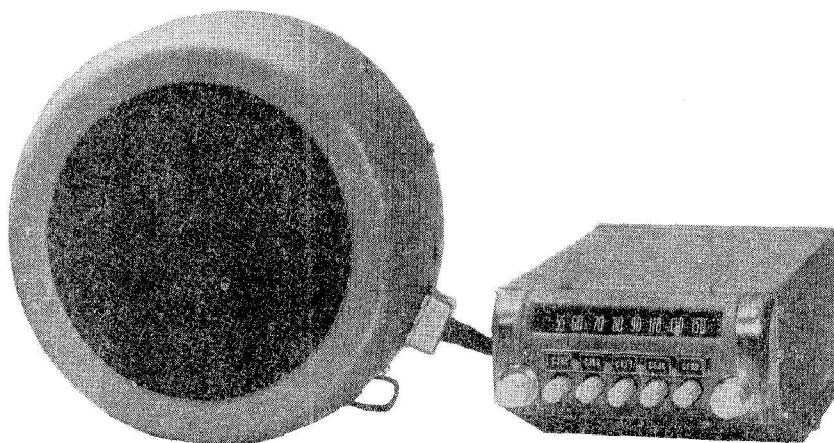


RCA Victor

COMMANDER

Seven-Tube, Push-Button, Superheterodyne Automobile Receiver
TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA • VICTOR • COMPANY • LIMITED • MONTREAL

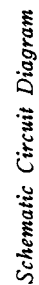


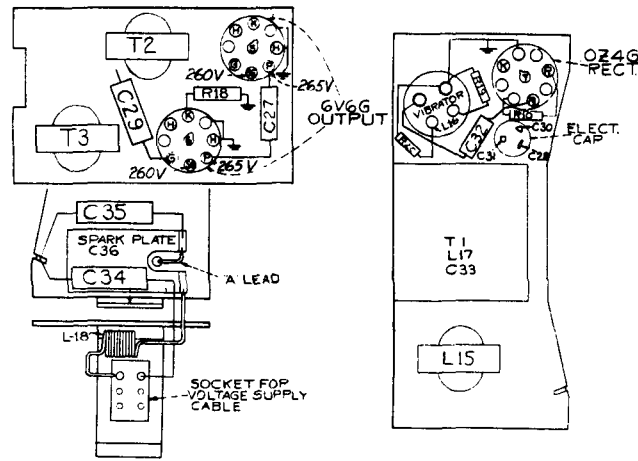
Electrical Specifications

TUBE COMPLEMENT		(4) Type-6R7.....Second Det., A-F Amp., and A.V.C.
(1) Type-6K7	R.F. Amplifier	(5) Type-6V6-G.....Power Output
(2) Type-6A8.....	First Detector—Oscillator	(6) Type-6V6-G.....Power Output
(3) Type-6SK7.....	I.F. Amplifier	(7) Type-0Z4-G.....Rectifier
Tuning Range		540 to 1,550 kc
INTERMEDIATE FREQUENCY		260 kc
POWER OUTPUT RATINGS		LOUDSPEAKER
Maximum	8 watts	Type
Undistorted	6 watts	Voice-Coil Impedance
POWER SUPPLY RATING		8 inch Permanent Magnet
Supply Voltage		3 ohms at 400 cycles
Current Drain		
Fuse Protection		
PILOT LAMP		Mazda No. 55, 6-8 volts, 0.2 ampere

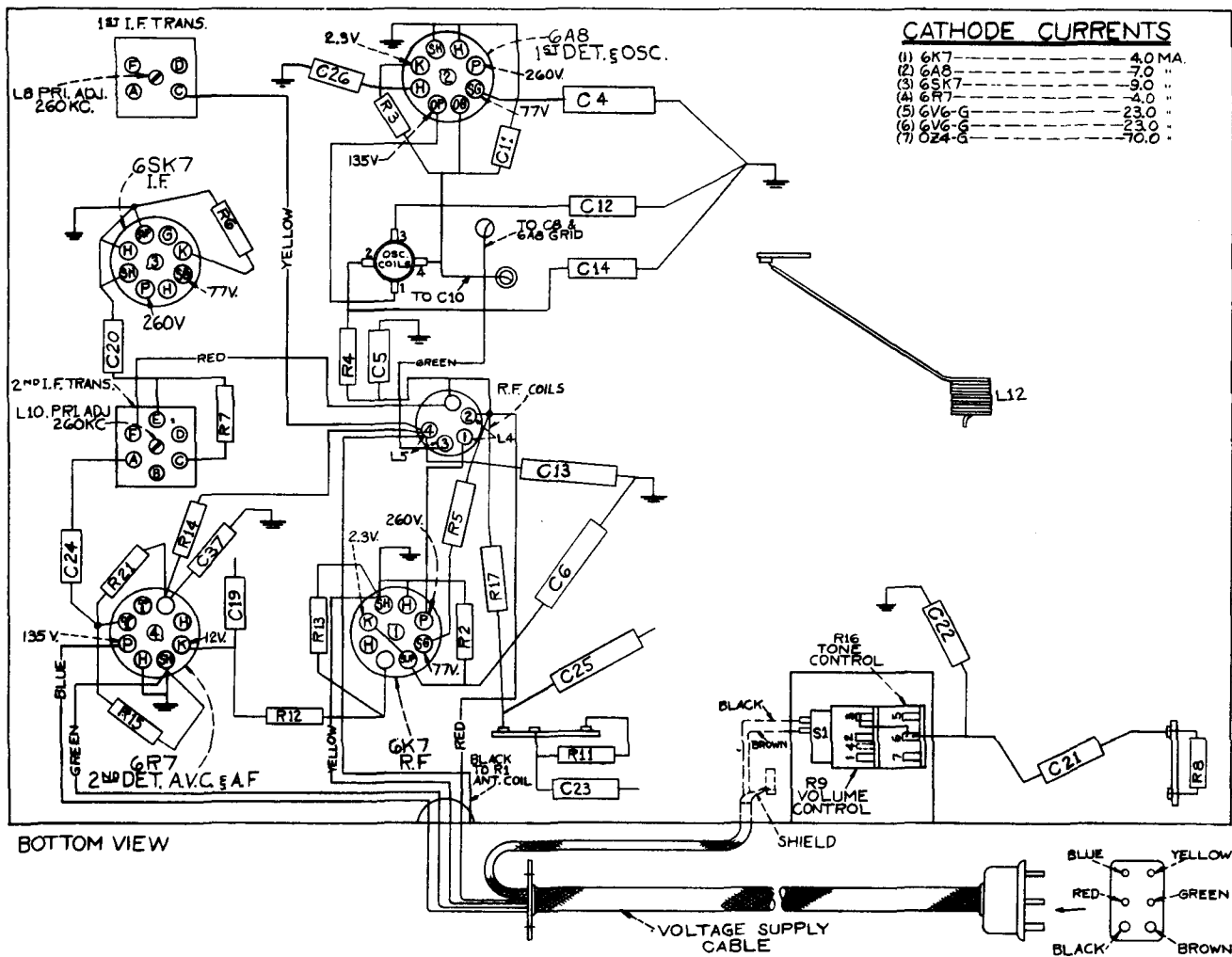
Mechanical Specifications

RECEIVER CASE DIMENSIONS	Height, 2 1/2 inches; Width, 5 7/8 inches; Depth, 9 1/4 inches
SPEAKER CASE DIMENSIONS	Diameter, 9 1/2 inches; Depth, 5 inches
OPERATING CONTROLS—(Left)—(Plastic Knob) Power-Volume; (Wing Knob) Tone; (Center)—Five Station Push Buttons; (Right)—Manual Tuning; Ratio 7 1/2 -1.	
WEIGHT	Net, 20 pounds; Shipping, 22 pounds





Power Unit Parts and Socket Voltages



Receiver Unit Parts and Socket Voltages

General Description

The RCA Victor "Commander" is a seven-tube, deluxe superheterodyne automobile receiver consisting of two units, (1) the control unit containing the tuning mechanism, R.F. and I.F. circuits; (2) the speaker unit containing the audio and power supply units, together with the loudspeaker. The output of the First Audio tube in the control unit is fed through a shielded cable to the speaker unit.

Features of design include:—Mechanical push-button tuning for five stations; an R.F. amplifier stage; delayed automatic volume control circuit; magnetite core antenna and I.F. transformers; ignition suppression filters in the antenna and power supply circuits; push-pull beam power output stage; true tone fidelity; continuously variable tone control; eight-inch loudspeaker and a full vision, edge-lighted glass dial.

Alignment Procedure

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

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are as follows: Vertical "H1" to terminal "C" on 2nd I-F transformer; vertical "O" to chassis.

Output Meter.—Connect the output meter across the speaker voice-coil and turn the receiver volume control to maximum (fully clockwise) and tone control to middle of range.

Dial Calibration.—Rotate the gang condenser to its full-mesh (maximum-capacity) position and then adjust dial scale so that the pointer is aligned to the last calibration mark at the low-frequency end of the scale.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid (No. 4 pin) in series with .01 mfd.	260 kc	No Signal 550-750 kc	L10 and L11 (2nd I-F Trans.)
2	6A8 Det. grid cap in series with .01 mfd.	260 kc		L8 and L9 (1st I-F Trans.)
3 †	* Ant. connector in series with 60 mmfd.	600 kc	600 kc	L7 (osc.)
4 †	* Ant. connector in series with 60 mmfd.	1,400 kc	1,400 kc signal	C7 (det.) C1 (ant.)
5 †	* Ant. connector in series with 60 mmfd.	600 kc	600 kc (rock)	L7 (osc.)
6 †	* Ant. connector in series with 60 mmfd.	1,400 kc	1,400 kc signal	C7 (det.) C1 (ant.)**

*Note 1.—This 60 mmfd. capacitor must be inserted at the antenna connector of the receiver. The lead from the test oscillator to the 60 mmfd. capacitor may be shielded if desired, but no shielding should be used between capacitor and antenna connector.

†Note 2.—These adjustments should be made with unit enclosed in its shielded case, through holes provided for adjustment purposes.

**Note 3.—Final adjustment of C1 must be made after the receiver has been installed and the antenna connected. See "Antenna Circuit."

Antenna Circuit

It is very important that these instructions be followed when installing this receiver.

The antenna circuit is designed to work with an antenna having a total capacity including the shielded lead-in not to exceed 150 mmf. If an antenna having a larger capacity is to be used, it will be necessary to add a capacitor in series with the lead from the antenna filter L-1 to the antenna coil terminal ("A"). Where a "Double Under the Running Board" type of antenna is to be used having a capacity of approximately 200 mmf., the capacitor added should be approximately 500 mmf. The insulated running board type having an approximate capacity of 550 mmf. will require a capacitor of approximately 150 mmf. Cars using an insulated steel top of approximately 3,500 mmf. will require a series capacitor of 150 mmf.

After installation and with antenna connected, tune in a weak station near 1,400 kc and adjust compensator trimmer C-1 for maximum signal output. This trimmer is accessible by removing plug button near antenna jack on top of receiver. If a maximum (peak) signal output cannot be obtained in the range of the antenna trimmer, the effective capacity should be checked and compensated for by varying series capacity as described above.

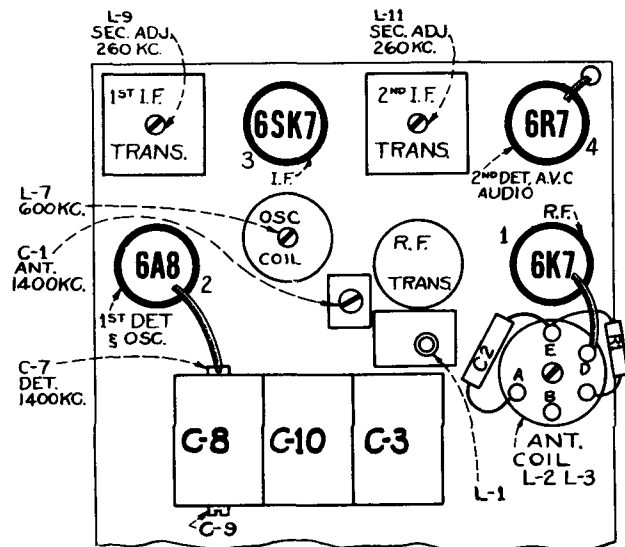


Fig. 4—Receiver Unit, Tubes and Trimmers

Service Data

Antenna Filter.—A filter is included in the antenna circuit. Being completely shielded, it prevents radiating ignition interference within the set. It also reduces the possibility of picking up vibrator interference. As shown in Figure 5, the filter unit is mounted inside a steel shell which in turn is welded to the chassis. The shielded antenna lead-in makes contact with the filter unit within the steel shell and is held in place by a bayonet type connector.

Push Button Tuning Mechanism.—The push button tuning mechanism used in this receiver is of the mechanical type, wherein the movement of the button actually turns the tuning condenser to any pre-determined setting. The movement is actuated thru a Push-Arm, Cam, Rocker Plate and Sector Gear, which meshes with a Scissors Gear directly fastened to the tuning condenser shaft. The scissors gear prevents backlash between the sector gear and the tuning condenser. Since the sector gear is mounted directly on the rocker plate shaft, the position of the rocker plate will accurately determine the position of the tuning condenser.

The cams which determine the stop points for each button are mounted on the push arms and are locked in place by the locking screws and lock-shoes, which press firmly against the cams when the locking screws are tightened. **Care should be used when locking screws are tightened not to use excessive force as the threads may become damaged or stripped.**

The mechanism should be adjusted so that when using either manual or push-button tuning, it operates positively and without backlash or bind. The following hints will be found helpful in adjusting the mechanism properly.

1. With the gang condenser in full mesh, the sector gear should have the two end teeth fully meshed in the scissor gear, as shown in Fig. 6.
2. The position of the sector gear on the rocker-plate shaft should be adjusted so that there is clearance between the rocker-plates and the frame of the push-button mechanism at both

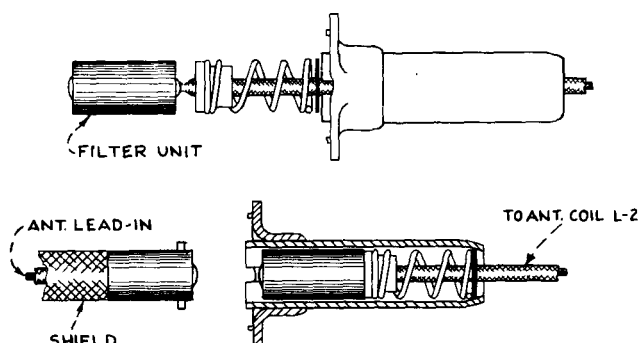


Fig. 5—Antenna Filter

extremities of gang rotation. Thus correct adjustment prevents the rotation of the gang being limited by the rocker plates touching the frame.

3. The drive cord should have $6\frac{1}{2}$ turns around the tuning shaft as shown. Three degrees of adjustment of the tension on the drive cord may be obtained by use of the three positions for connecting the drive-cord-tension spring to the drive-cord drum on the condenser shaft as shown.
4. The push-arms, rocker-plate shaft, and pulleys should be lubricated with light grease (sparingly). Care should be taken to keep the lubricant off of the drive cord.

Push Button Adjustment

The push buttons should be adjusted for five favorite stations after the receiver is installed and operating.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push buttons one-half turn.
2. Using the tuning control, accurately tune in the first station.
3. With station accurately tuned in, press the first push button fully in and then gently release so as not to jar mechanism.
4. Tighten the push button securely with fingers. Do not force with pliers.
5. Proceed in same manner to adjust the other four push buttons.

Loudspeaker

The loudspeaker cone may be centered in the usual manner with three celluloid or paper feelers after gently cutting away the front dust cover. A new cover should be cemented in place upon completion of the adjustment.

TURN FREE GEAR CLOCKWISE ONE TOOTH TO OBTAIN SCISSOR ACTION BEFORE MESHING GEAR SECTOR

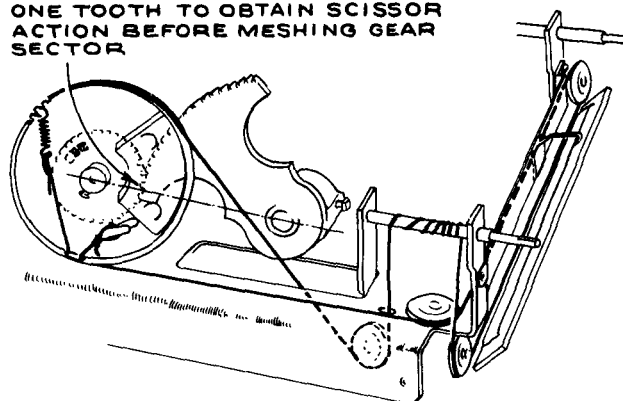


Fig. 6—Drive Cord Hookup

Replacement Parts for Model Commander Seven Tube Two Unit Automobile Receiver

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

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
CONTROL UNIT ASSEMBLIES		POWER UNIT ASSEMBLIES	
32979	Capacitor-Adjustable capacitor (C1)...	5107	Capacitor-.0025 mfd. (C27).....
31728	Capacitor-37 mmfd (C11).....	30626	Capacitor-.0075 mfd. (C32).....
12723	Capacitor-56 mmfd (C24).....	30965	Capacitor-0.25 mfd. (C29).....
30904	Capacitor-100 mmfd. (C15,C16,C17,C18)...	12741	Capacitor-0.5 mfd. (C34,C35).....
12694	Capacitor-220 mmfd. (C19,C20).....	32240	Capacitor-Electrolytic capacitor con- sisting of two 10 mfd.sections and one 20 mfd.section (C28,C30,C31).....
30433	Capacitor-470 mmfd. (C5,C26).....	30641	Lead-Ammeter lead (chassis end) com- plete with male section of fuse holder.....
33052	Capacitor-800 mmfd. (C12).....	32378	Pin-Contact pin for speaker lead(Pkg.5)
5148	Capacitor-.007 mfd. (C21).....	33064	Reactor-Filter reactor (L15).....
4937	Capacitor-.01 mfd. (C23).....	30540	Resistor-100 ohms,1/2 watt (R19,R20)...
14393	Capacitor-.01 mfd. (C2,C37).....	S-2059	Resistor-390 ohms,1 watt (R18).....
5196	Capacitor-.035 mfd. (C25).....	12695	Resistor-15,000 ohms,1/4 watt (R10)....
32787	Capacitor-.05 mfd. (C6,C13,C14,C22)...	33063	Socket-six contact female socket for control unit cable.....
4839	Capacitor-0.1 mfd. (C4).....	32299	Socket-Radiotron socket.....
31977	Coil-Antenna filter (L1).....	13686	Socket-Vibrator socket.....
S-2378	Coil-Antenna coil & core (L2,L3).....	32243	Transformer-Interstage transformer (T2)
32977	Coil-Oscillator coil less shield(L6, L7).....	S-2731	Transformer-Output transformer (T3)....
S-2379	Coil-R.F.coil-less shield (L4,L5)....	32986	Transformer-Vibrator transformer (T1, L17,C33).....
32974	Condenser-3 gang variable tuning con- denser complete with scissors gear (C3,C7,C8,C9,C10).....	13688	Vibrator-Plug-in vibrator (L16).....
32978	Control-Volume control,tone control and power switch (R9,R16,S1).....	REPRODUCER ASSEMBLIES (103736-1)	
S-2730	Cord-Indicator pointer drive cord (34" long).....	S-2505	Cone-Reproducer cone and voice coil (L14).....
S-2720	Dial-Station selector dial scale.....	S-2506	Reproducer-Reproducer complete.....
32982	Drum-Dial drive drum.....	MISCELLANEOUS ASSEMBLIES	
32290	Gear-Tuning mechanism gear sector....	S-2729	Button-Station selector push button and screw.....
32985	Indicator-Station selector indicator pointer.....	5025	Capacitor-General capacitor.....
S-2521	Lamp-Dial lamp.....	32994	Escutcheon-Station call letter es- cutcheon.....
32981	Pulley-Drive cord bracket and pulley assembly.....	5023	Fuse-15 ampere fuse (Pkg.5).....
32980	Pulley-Drive cord bracket assembly complete with two pulleys.....	4290	Insulator-Fuse holder insulating sleeve (Pkg.5).....
14439	Resistor-100 ohms,1/4 watt (R6).....	S-2722	Knob-Tone control knob.....
14561	Resistor-220 ohms,1/4 watt (R2).....	S-2723	Knob-Dummy knob.....
14720	Resistor-1000 ohms,1/4 watt (R12)....	S-2724	Knob-Tuning or volume control knob....
13716	Resistor-2,200 ohms,1/4 watt (R13)...	7766	Lead-Ammeter lead complete with clip and fuse holder.....
S-2036	Resistor-27,000 ohms,1/2 watt (R17)...	S-2149	Marker-Station call letter marker (1 set).....
12454	Resistor-33,000 ohms,1/4 watt (R7)...	33389	Mounting-Receiver mounting assembly consisting of straps, screws, washers and lockwashers.....
12266	Resistor-39,000 ohms,1/4 watt (R4,R8)	32998	Mounting-Power unit mounting assembly consisting of bolt, nut and washer assemblies.....
30434	Resistor-39,000 ohms,1 watt (R5).....	32317	Screw-Set screw for knob stock #S-2724 (Pkg.5).....
12286	Resistor-56,000 ohms,1/4 watt (R3)...	5024	Suppressor-Distributor suppressor.....
12285	Resistor-470,000 ohms,1/4 watt (R1)...	32769	Washer-Felt washer for under control knobs (Pkg.10).....
13730	Resistor-1 megohm,1/4 watt (R11,R14, R15,R21).....		
2917	Retainer-Station selector knob shaft retainer (Pkg.5).....		
13471	Ring-Retaining ring for antenna coil (Pkg.5).....		
3584	Ring-Retaining ring for R.F. coil (Pkg.5).....		
31482	Screw-No.8-32 X 1/2 in. set screw for gear stock #32290 (Pkg.5).....		
14350	Screw-No.8-32 x 3/16" set screw for drum stock #32982 (Pkg.10).....		
12533	Screw-No.8x1/4" S.T.case screws (Pkg.10).....		
32983	Shaft-Station selector knob shaft....		
3623	Shield-R.F.coil shield.....		
12883	Shield-Oscillator coil shield.....		
S-2338	Socket-Dial lamp socket.....		
32299	Socket-Octal base tube socket.....		
31615	Spring-drive cord tension spring (Pkg.5).....		
30585	Spring-Push arm tension spring (Pkg.10).....		
32990	Transformer-First I.F.transformer (L8,L9,C15,C16).....		
32991	Transformer-Second I.F.transformer (L10,L11,C17,C18).....		



RCA Victor

CRUISER

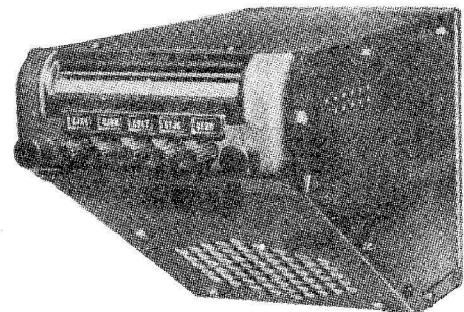
Six-Tube, Push-Button, Superheterodyne Automobile Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

General Description

The "Cruiser" is a six-tube superheterodyne receiver with loud-speaker and radio chassis in the same case. It is equipped with five push buttons, for tuning your five favorite broadcast stations, as well as the standard method of dial tuning. Adjustments for push button tuning are explained under the heading "Push Button Adjustment." The receiver is designed to be mounted under the dash panel. The operating controls are integral with the radio and speaker case.



ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS:

6K7..... R-F Amplifier
 6A8..... First Detector-Oscillator
 6SK7..... I-F Amplifier
 6SQ7... Second Detector, A-F Amplifier and A.V.C.
 6K6-G..... Output
 OZ4-G..... Rectifier
 Dial Lamp..... Mazda No. 51, 6-8 volts, 0.2 ampere

FREQUENCY RANGE..... 550-1,550 kc

ALIGNMENT FREQUENCIES:

I-F..... 260 kc
 Ant..... 1,400 kc
 Osc..... 600 kc
 Det..... 1,400 kc

OPERATING FEATURES:

Mechanical Push Button Tuning
 Independent Manual Tuning Control
 Automatic Volume Control

POWER OUTPUT:

Type..... Pentode
 Undistorted..... 1.8 watts
 Maximum..... 3.7 watts

POWER SUPPLY:

"A"..... 6.3 volt Auto Storage Battery
 "B"..... Non-Synchronous Vibrator
 Current Drain..... 6.7 amps.
 Fuse Protection..... 15 amperes

LOUDSPEAKER:

Type..... Electrodynamic
 Size..... 5 inches
 V.C. Impedance..... 2.2 ohms at 400 cycles
 Field Coil Resistance..... 4 ohms

CHASSIS FEATURES:

No. I-F Stages..... One
 Completely Shielded Antenna Filter
 Magnetite-core Adjusted Antenna, I-F Transformers
 and Oscillator
 Ignition-Noise-Suppression Filters
 Antenna Compensator Trimmer
 Illuminated Dial

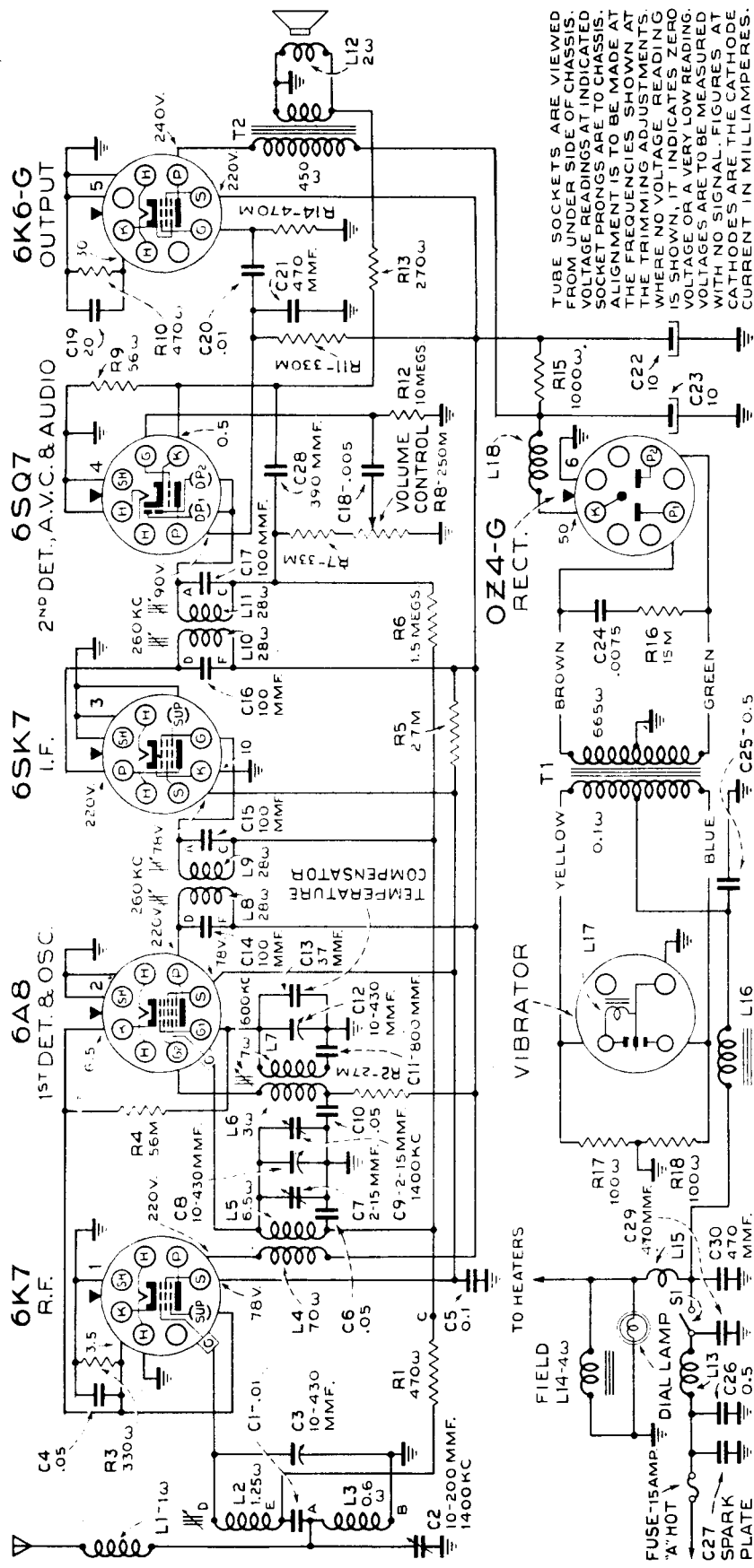
MECHANICAL SPECIFICATIONS

CONTROL OPERATION:

Turn Right (left knob). Power On: Volume Increase
 Push Button..... Signal Tuned Automatically
 Rotate (right knob)..... Signal Tuned Manually

OPERATING CONTROLS:

1. Left Knob..... On-Off Switch and Volume
 2. Push Buttons..... Station Tuning
 3. Right Knob..... Manual Tuning, Ratio 7—1



Schematic Circuit Drawing

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections. Across speaker voice coil
 Output meter readings to indicate 1 watt. 1.5 volts
 Generator ground lead connections. To chassis
 Dummy antenna value to be in series with generator output. See chart below
 Connection of generator output lead. See chart below
 Generator modulation. 30%, 400 cycles
 Position of Volume Control. Fully clockwise
 Chassis must be in its case when aligning R-F circuit.

Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connections	Adjustment Symbol	Circuit Adjusted	Approx. Microvolts
No Signal 550-750 kc	260	.01 mfd.	6SK7 Grid (No. 4 pin)	L-10, L-11	2nd I.F. Trans.	15,000
No Signal 550-750 kc	260	.01 mfd.	6A8 Grid	L-8, L-9	1st I.F. Trans.	600
600 kc	600 kc	100 mmfd.*	Antenna Connector	L-7 †	Osc.	1.3
1,400 kc Signal	1,400 kc	100 mmfd.*	Antenna Connector	C-9 † C-2 †	Det. Ant.	1
600 kc (rock)	600 kc	100 mmfd.*	Antenna Connector	L-7 †	Osc.	1.3
1,400 kc Signal	1,400 kc	100 mmfd.*	Antenna Connector	C-9 † C-2 †	Det. Ant.**	1

IMPORTANT ALIGNMENT NOTES

* Make the generator connection through a 100 mmfd. (.0001) capacity inserted at the antenna connector of the receiver. The lead from the signal generator to the 100 mmfd. capacitor may be shielded if desired, but no shielding should be used between capacitor and antenna connector.

† These adjustments should be made with unit enclosed in its shielded case, through holes provided for adjustment purposes.

** Final adjustment of C-2 must be made after the receiver has been installed and the antenna connected. See "Antenna Circuit" in "Service Hints."

Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value, to prevent the A.V.C. action of the receiver from interfering with accurate alignment.

Alignment adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular frequency should be used. Grid cap leads should remain in place during alignment.

Values shown under "Microvolts" are only approximate.

Noise Elimination:

The presence of noise is generally due to the high intensity of electrical disturbances from the car ignition system in relation to strength of desired station. The reduction of such noise should be carried out methodically by: (1) Increasing effectiveness of the antenna and providing for protection against stray pickup; (2) subduing the interference at its source; and (3) installation of filter devices to prevent transmission of interference into the receiver circuits.

Antenna—Should be located well away from engine compartment to avoid ignition disturbance, and as far as possible from front wheels to eliminate "wheel static." Lead-in should be completely shielded and shield grounded to frame of car at as many points as possible. It is very essential that the antenna be electrically "matched" to the receiver input—this is accomplished by adjustment of the antenna trimmer and the operations explained under "Antenna Circuit."

Ignition—Radio frequency interference is created in the secondary and primary ignition circuits, usually at each point where a repeating contact, or spark, is made. The most prominent sources on the average car are: (a) Distributor—add the suppressor-resistor in the center or common high-voltage lead; also have points cleaned and adjusted, if necessary; (b) Generator—connect an 0.5 mfd. shielded capacitor directly across generator output; also see that commutator is smooth and brushes properly seated for minimum sparking; (c) Gasoline Gauge—on gauges having an electrical contact, an 0.5 mfd. shielded capacitor may be required between the terminal and car frame; (d) Temperature Gauge—where a contacting device is used, interference can be eliminated with

an 0.5 mfd. capacitor connected between the circuit and car frame; (e) Spark Plugs—suppressors in leads to spark plugs may possibly be required in extreme cases of interference, on older cars, and in localities where signals are very weak; see that spark plugs are properly adjusted and are not leaky; (f) Ammeter—the supply for the receiver is usually taken from this point; a 0.5 mfd. capacitor from the "hot" lead will prevent passage of interference into the set over this circuit; (g) Dome Light—wiring to the dome light should be shielded; and an 0.5 mfd. capacitor attached between the circuit and car frame, preferably at the point where lead enters the corner post; (h) Wiring—primary and secondary ignition wiring should be physically separated; possible points of poor insulation should be checked, and all connections must be secure.

Car Chassis Bonds—Intermittent electrical connection between members of the car chassis, caused by vibration, will cause noise interference. Flexible bonding connections to the frame will correct this condition. The most sources are: (a) transmission case; (b) muffler; (c) steering column; (d) cylinder head; (e) dash controls; (f) rear springs; (g) brake cables; (h) hood cover; (i) receiver case.

Wheel Static—Interference from this source generally originates in the front wheels, and is related to road surface composition, and atmospheric conditions. Spring devices are available for attachment to the wheels for making a permanent connection between the hub and axle; these should be installed where required. The wheel bearings should be checked for proper adjustment. Patches in tires will frequently cause wheel static; exchange front and rear wheels. Be sure antenna is well separated from wheels of car.

Push Button Adjustment:

The push buttons should be adjusted for five favorite stations after the receiver is installed and operating.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push buttons one-half turn.
2. Using the tuning control, accurately tune in the first station.
3. With station accurately tuned in, press the first push button fully in and then gently release so as not to jar mechanism.
4. Tighten the push button securely with fingers. Do not force with pliers.
5. Proceed in same manner to adjust the other four push buttons.

Adjustment of Push Button Mechanism:

The mechanism should be adjusted so that when using either manual or push button tuning, it operates positively and without backlash or bind. The following hints will be found helpful in adjusting the mechanism properly.

1. With the gang condenser in full mesh, the sector gear should have the two end teeth fully meshed in the scissor gear, as shown in the illustration.
2. The position of the sector gear on the rocker-plate shaft should be adjusted so that there is clearance between the rocker-plates and the frame of the push button mechanism at both extremities of gang rotation. Thus correct adjustment prevents the rotation of the gang being limited by the rocker plates touching the frame.
3. The drive cord should have $6\frac{1}{2}$ turns around the tuning shaft as shown in the illustration. Three degrees of adjustment of the tension on the drive cord may be obtained by use of the three positions for connecting the drive-cord-tension spring to the drive-cord drum on the condenser shaft as shown.
4. The push-arms, rocker-plate shaft, and pulleys should be lubricated with light grease (sparingly). Care should be taken to keep the lubricant off of the drive cord.

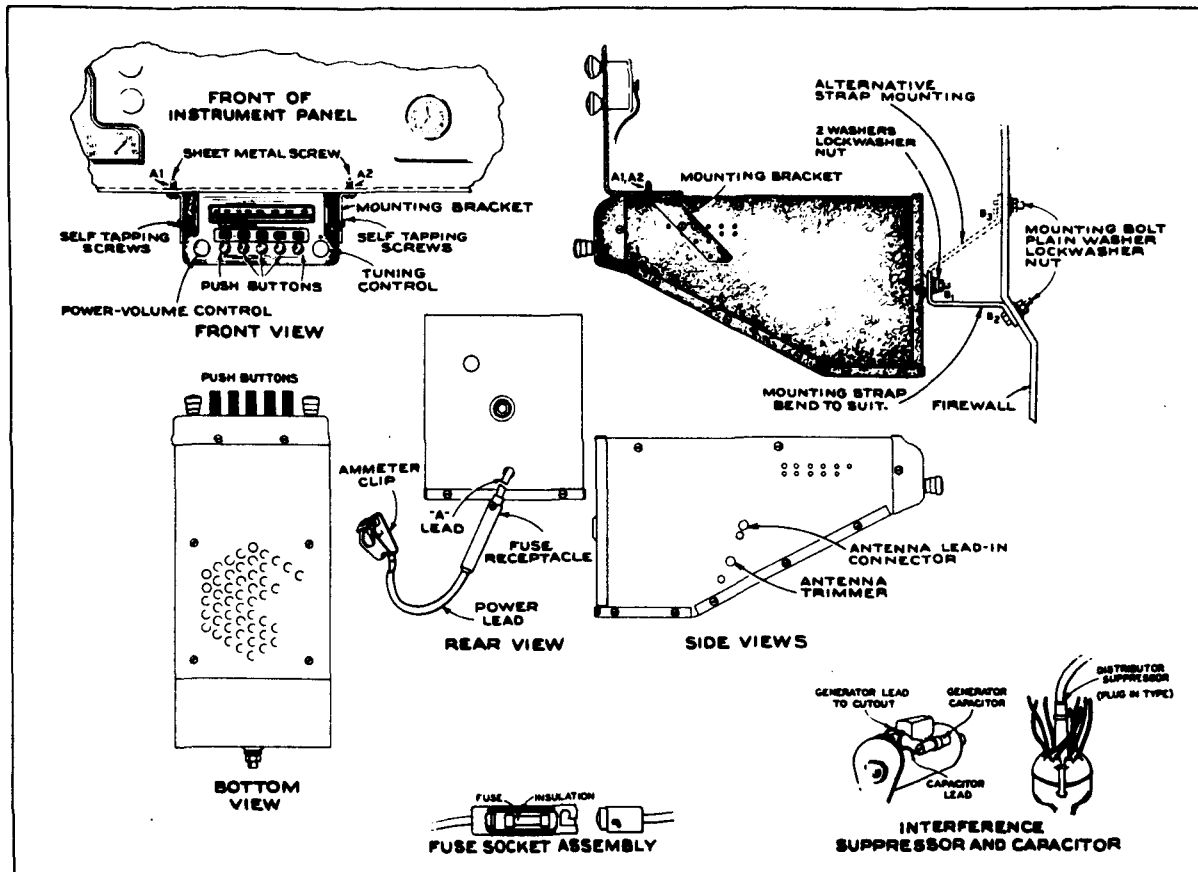
Antenna Circuit:

It is very important that these instructions be followed when installing the receiver.

The antenna circuit is designed to work with an antenna having a total capacity including the shielded lead-in not to exceed 150 mmf. If an antenna having a larger capacity is to be used, it will be necessary to add a capacitor in series with the lead from the antenna filter L-1 to the antenna coil terminal ("A"). Where a "Double Under the Running Board" type of antenna is to be used having a capacity of approximately 200 mmf., the capacitor added should be approximately 300 mmf. The insulated running board type having an approximate capacity of 550 mmf. will require a capacitor of approximately 150 mmf. Cars using an insulated steel top of approximately 3,500 mmf. will require a series capacitor of 120 mmf.

After installation and with antenna connected, tune in a weak station near 1,400 kc and adjust compensator trimmer C-2 for maximum signal output. This trimmer is accessible by removing plug button near antenna jack on side of receiver. If a maximum (peak) signal output cannot be obtained in the range of the antenna trimmer, the effective capacity should be checked and compensated for by varying series capacity as described above.

Antenna Filter.—A filter is included in the antenna circuit. Being completely shielded, it prevents radiating ignition interference within the set. It also reduces the possibility of picking up vibrator interference. As shown in Figure 4, the filter unit is mounted inside a steel shell which in turn is welded to the chassis. The shielded antenna lead-in makes contact with the filter unit within the steel shell and is held in place by a bayonet type connector.



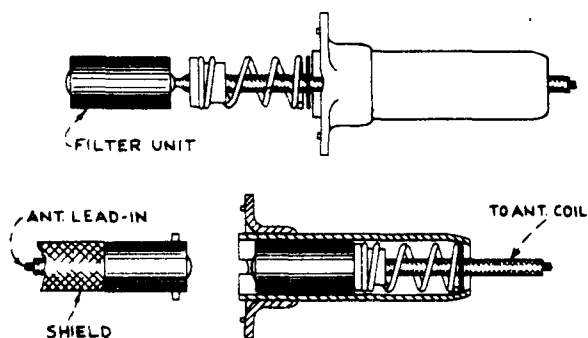
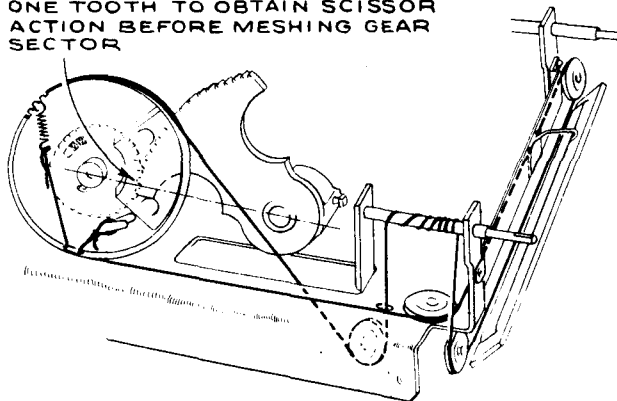


FIG. 4. ANTENNA FILTER

TURN FREE GEAR CLOCKWISE
ONE TOOTH TO OBTAIN SCISSOR
ACTION BEFORE MESHING GEAR
SECTOR



Drive Cord Hookup

Loudspeaker.—The loudspeaker voice coil should be centered in the usual manner with three narrow paper feelers, after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, taking care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambroid cement after adjustment has been completed.

REPLACEMENT PARTS FOR MODEL CRUISER

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			
32979	Capacitor-Adjustable trimmer (C2).....	3584	Ring-Retaining ring for osc.coil(Pkg.5)
31728	Capacitor-37 mmfd.temp.comp. (C13).....	14350	Screw-No.8-32x3/16 sq.hd.set screw for drum (Pkg.5).....
30904	Capacitor-100 mmfd.(C14,C15,C16,C17)...	31482	Screw-No.8-32x1/2 sq.hd.set screw for gear (Pkg.5).....
13894	Capacitor-390 mmfd.(C28).....	32983	Shaft-Drive shaft.....
30433	Capacitor-470 mmfd.(C21,C29,C30).....	32302	Shield-Antenna coil shield.....
33052	Capacitor-800 mmfd.temp.comp.(C11).....	12883	Shield-Oscillator coil shield.....
4838	Capacitor-.005 mfd. (C18).....	12493	Socket-5 prong female speaker socket.
30626	Capacitor-.0075 mfd.(C24).....	13686	Socket-Vibrator socket.....
14393	Capacitor-.01 mfd. (C1,C20).....	32299	Socket-Tube socket.....
32787	Capacitor-.05 mfd. (C4,C6,C10).....	S-2338	Socket-Dial lamp socket.....
4839	Capacitor-0.1 mfd. (C5).....	30585	Spring-Push arm tension spring(Pkg.5)
12741	Capacitor-0.5 mfd. (C26).....	31615	Spring-Drive cord tension spring (Pkg.5).....
32240	Capacitor-Electrolytic consisting of two 10 mfd.and one 20 mfd.section (C19,C22,C23).....	32990	Transformer-1st I.F. Transformer (L8,L9,C14,C15).....
31977	Coil-Antenna filter coil (L1).....	32991	Transformer-2nd I.F. Transformer (L10,L11,C16,C17).....
31601	Coil-Antenna coil-less shield (L2,L3)...	31597	Transformer-Vibrator power transformer (T1,L16,C25).....
31600	Coil-R.F.coil - less shield (L4,L5)....	13688	Vibrator-Plug-in-vibrator (L17).....
32977	Coil-Oscillator coil-less shield (L6,L7).....	33393	Volume control and power switch (R8,S1).....
32974	Condenser-3 gang variable condenser (C3,C7,C8,C9,C12).....	REPRODUCER ASSEMBLIES (84640-1)	
32634	Cord-Drive cord (34" long).....	33462	Cone-Reproducer cone and voice coil (L12).....
32982	Drum-Drive cord drum assembly.....	12567	Plug-5 prong male plug.....
32290	Gear-Tuning mechanism drive gear sector	33394	Reproducer complete.....
32984	Indicator-Station selector indicator pointer.....	33463	Transformer-Output transformer (T2)..
11765	Lamp-Dial lamp Mazda #51.....	MISCELLANEOUS ASSEMBLIES	
30641	Lead-"A" lead complete with male connector (chassis end).....	S-2687	Button-Station selector push button assembly.....
32980	Pulley-Drive cord bracket complete with two pulleys).....	5025	Capacitor-Generator capacitor.....
32981	Pulley-Drive cord pulley and bracket assembly.....	33391	Case-Receiver case complete.....
S-2216	Resistor-56 ohm,1/4 watt (R9).....	S-2688	Dial-Station selector dial scale.....
30540	Resistor-100 ohm,1/2 watt(R17,R18).....	32994	Escutcheon-Push button escutcheon...
6135	Resistor-270 ohm,-1/4 watt (R13).....	5023	Fuse-15 amp. fuse (Pkg. 5).....
13250	Resistor-330 ohm,-1/4 watt (R3).....	4290	Insulator-Fuse insulator (Pkg.10)....
30499	Resistor-470 ohm,-1/2 watt (R10).....	S-2689	Knob-Tuning or volume control knob...
S-2691	Resistor-1000 ohm,1 watt (R15).....	7766	Lead-Ammeter lead,clip and fuse holder.....
12695	Resistor-15,000 ohm,1/4 watt (R16).....	9828	Lead-Antenna lead in 36" shielded with connectors.....
12738	Resistor-27,000 ohm,1/4 watt (R2).....	31589	Marker-Station call letter marker (1 set).....
13477	Resistor-27,000 ohm,1 watt (R5).....	33389	Mounting-complete set of straps, washers nuts and bolts to mount receiver.....
12454	Resistor-33,000 ohm,1/4 watt (R7).....	32317	Screw-Set screw for knob (Pkg. 5)....
12286	Resistor-56,000 ohm,1/4 watt (R4).....	12533	Screw-Case screw (Pkg.10).....
12452	Resistor-330,000 ohm,1/4 watt (R11)...	5024	Suppressor-Distributor suppressor.....
12285	Resistor-470,000 ohm,1/4 watt (R1,R14).		
12201	Resistor-1.5 meg. 1/4 watt (R6).....		
13601	Resistor-10.0 meg. 1/4 watt (R12).....		
2917	Retainer-Drive shaft retainer (Pkg.5)...		
13471	Ring-Retaining ring for antenna coil (Pkg.5).....		



RCA Victor

IMPERIAL

Seven-Tube, Push-Button, Superheterodyne Automobile Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

TUBE COMPLEMENT

(1) Type-6K7..... R-F Amplifier
(2) Type-6A8..... First Detector—Oscillator
(3) Type-6SK7..... I-F Amplifier

(4) Type-6R7..... Second Det., A-F Amp., and A.V.C.
(5) Type-6V6-G..... Power Output
(6) Type-6V6-G..... Power Output
(7) Type-0Z4-G..... Rectifier

Tuning Range 550 to 1,550 kc

INTERMEDIATE FREQUENCY..... 260 kc

POWER OUTPUT RATINGS

Maximum..... 8 watts
Undistorted 6 watts

LOUDSPEAKER

Type..... 8 inch Electrodynamic
Voice-Coil Impedance..... 3 ohms at 400 cycles

POWER SUPPLY RATING

Supply Voltage 6.3 volts
Current Drain 8.7 amperes
Fuse Protection 15 ampere
PILOT LAMP..... 6.8 volts, 0.2 ampere

Mechanical Specifications

RECEIVER CASE DIMENSIONS..... Height, 2½ inches; Width, 5⅞ inches; Depth, 9¼ inches

SPEAKER CASE DIMENSIONS..... Diameter, 9½ inches; Depth, 5 inches

OPERATING CONTROLS..... (Left)—(Plastic Knob) Power-Volume; (Wing Knob) Tone; (Center)—Five Station Push Buttons;
(Right)—Manual Tuning; Ratio 7½ - 1.

WEIGHT..... Net, 20 pounds; Shipping, 22 pounds

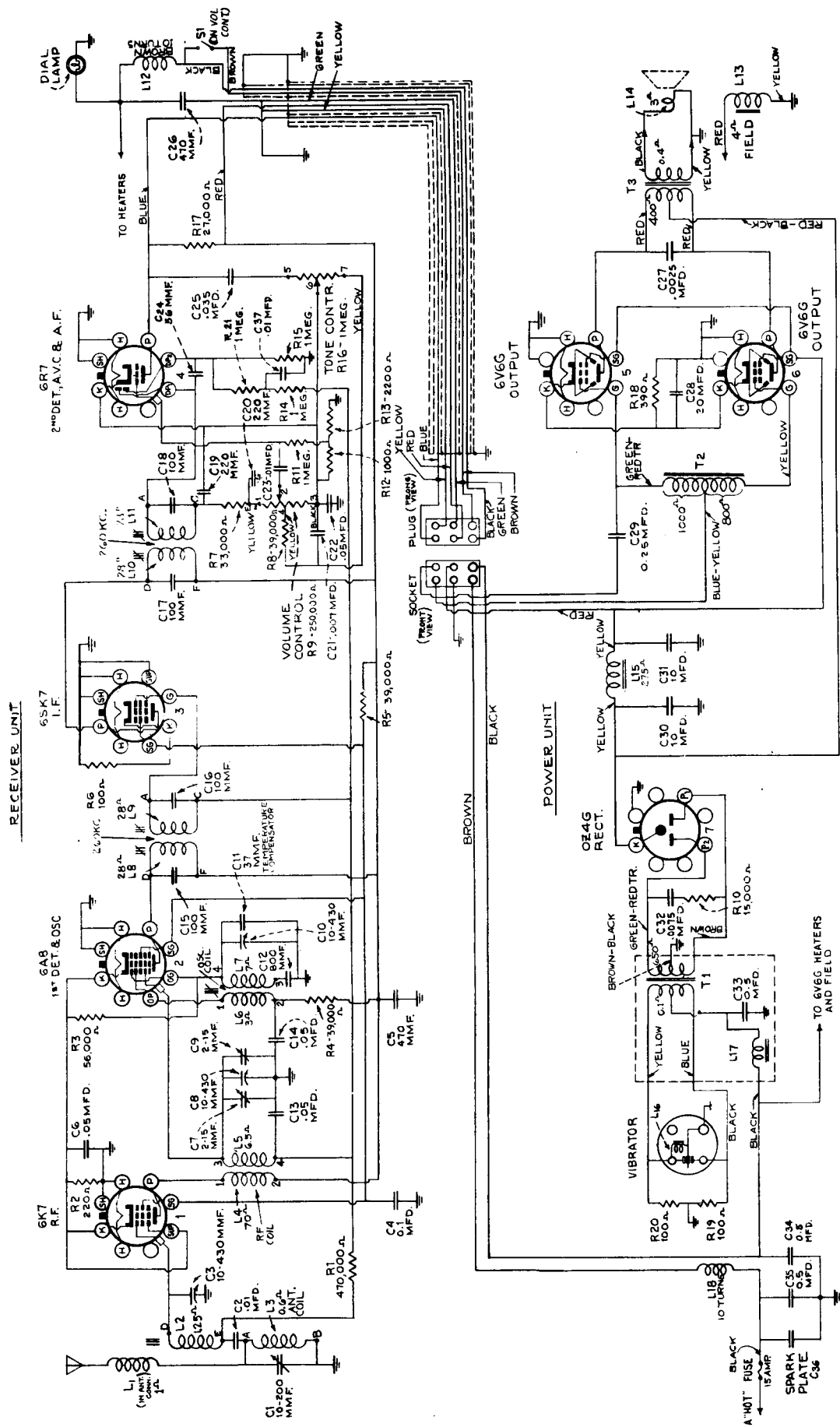


Fig. 1—Schematic Circuit Diagram

General Description

The RCA Victor "Imperial" is a seven-tube, deluxe superheterodyne automobile receiver consisting of two units, (1) the control unit containing the tuning mechanism, R.F. and I.F. circuits; (2) the speaker unit containing the audio and power supply units, together with the loudspeaker. The output of the First Audio tube in the control unit is fed through a shielded cable to the speaker unit.

Features of design include:—Mechanical push-button tuning for five stations; an R.F. amplifier stage; delayed automatic volume control circuit; magnetite core antenna and I.F. transformers; ignition suppression filters in the antenna and power supply circuits; push-pull beam power output stage; true tone fidelity; continuously variable tone control; eight-inch loudspeaker and a full vision, edge-lighted glass dial.

Alignment Procedure

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

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are as follows: Vertical "H1" to terminal "C" on 2nd I-F transformer; vertical "O" to chassis.

Output Meter.—Connect the output meter across the speaker voice-coil and turn the receiver volume control to maximum (fully clockwise) and tone control to middle of range.

Dial Calibration.—Rotate the gang condenser to its full-mesh (maximum-capacity) position and then adjust dial scale so that the pointer is aligned to the last calibration mark at the low-frequency end of the scale.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid (No. 4 pin) in series with .01 mfd.	260 kc	No Signal 550-750 kc	L10 and L11 (2nd I-F Trans.)
2	6A8 Det. grid cap in series with .01 mfd.	260 kc		L8 and L9 (1st I-F Trans.)
3†	* Ant. connector in series with 60 mmfd.	600 kc	600 kc	L7 (osc.)
4†	* Ant. connector in series with 60 mmfd.	1,400 kc	1,400 kc signal	C7 (det.) C1 (ant.)
5†	* Ant. connector in series with 60 mmfd.	600 kc	600 kc (rock)	L7 (osc.)
6†	* Ant. connector in series with 60 mmfd.	1,400 kc	1,400 kc signal	C7 (det.) C1 (ant.)**

*Note 1.—This 60 mmfd. capacitor must be inserted at the antenna connector of the receiver. The lead from the test oscillator to the 60 mmfd. capacitor may be shielded if desired, but no shielding should be used between capacitor and antenna connector.

†Note 2.—These adjustments should be made with unit enclosed in its shielded case, through holes provided for adjustment purposes.

**Note 3.—Final adjustment of C1 must be made after the receiver has been installed and the antenna connected. See "Antenna Circuit."

Antenna Circuit

It is very important that these instructions be followed when installing this receiver.

The antenna circuit is designed to work with an antenna having a total capacity including the shielded lead-in not to exceed 150 mmf. If an antenna having a larger capacity is to be used, it will be necessary to add a capacitor in series with the lead from the antenna filter L-1 to the antenna coil terminal ("A"). Where a "Double Under the Running Board" type of antenna is to be used having a capacity of approximately 200 mmf., the capacitor added should be approximately 500 mmf. The insulated running board type having an approximate capacity of 550 mmf. will require a capacitor of approximately 150 mmf. Cars using an insulated steel top of approximately 3,500 mmf. will require a series capacitor of 150 mmf.

After installation and with antenna connected, tune in a weak station near 1,400 kc and adjust compensator trimmer C-1 for maximum signal output. This trimmer is accessible by removing plug button near antenna jack on top of receiver. If a maximum (peak) signal output cannot be obtained in the range of the antenna trimmer, the effective capacity should be checked and compensated for by varying series capacity as described above.

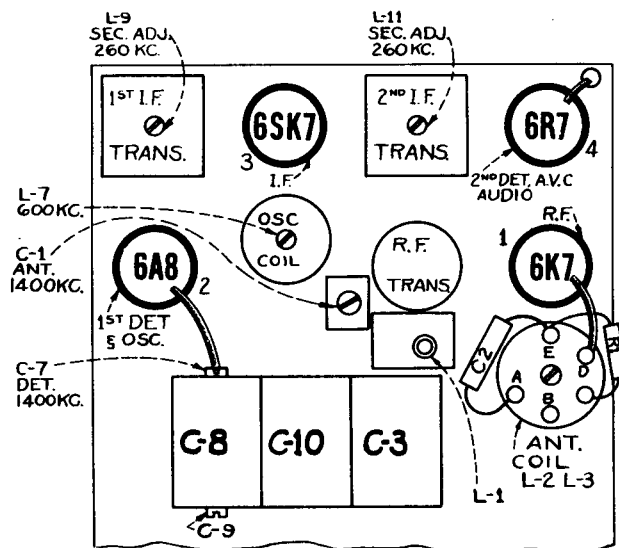


Fig. 4—Receiver Unit, Tubes and Trimmers

Service Data

Antenna Filter.—A filter is included in the antenna circuit. Being completely shielded, it prevents radiating ignition interference within the set. It also reduces the possibility of picking up vibrator interference. As shown in Figure 5, the filter unit is mounted inside a steel shell which in turn is welded to the chassis. The shielded antenna lead-in makes contact with the filter unit within the steel shell and is held in place by a bayonet type connector.

Push Button Tuning Mechanism.—The push button tuning mechanism used in this receiver is of the mechanical type, wherein the movement of the button actually turns the tuning condenser to any pre-determined setting. The movement is actuated thru a Push-Arm, Cam, Rocker Plate and Sector Gear, which meshes with a Scissors Gear directly fastened to the tuning condenser shaft. The scissors gear prevents backlash between the sector gear and the tuning condenser. Since the sector gear is mounted directly on the rocker plate shaft, the position of the rocker plate will accurately determine the position of the tuning condenser.

The cams which determine the stop points for each button are mounted on the push arms and are locked in place by the locking screws and lock-shoes, which press firmly against the cams when the locking screws are tightened. **Care should be used when locking screws are tightened not to use excessive force as the threads may become damaged or stripped.**

The mechanism should be adjusted so that when using either manual or push-button tuning, it operates positively and without backlash or bind. The following hints will be found helpful in adjusting the mechanism properly.

1. With the gang condenser in full mesh, the sector gear should have the two end teeth fully meshed in the scissor gear, as shown in Fig. 6.
2. The position of the sector gear on the rocker-plate shaft should be adjusted so that there is clearance between the rocker-plates and the frame of the push-button mechanism at both

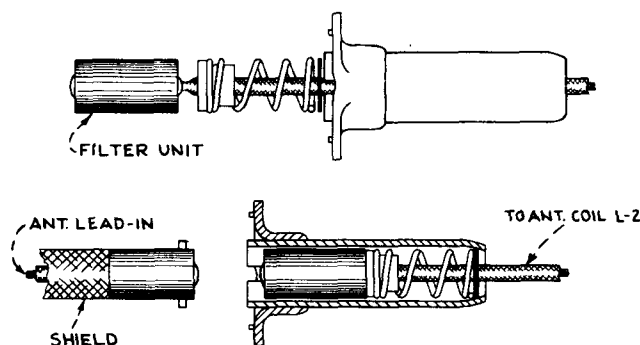


Fig. 5—Antenna Filter

extremities of gang rotation. Thus correct adjustment prevents the rotation of the gang being limited by the rocker plates touching the frame.

3. The drive cord should have $6\frac{1}{2}$ turns around the tuning shaft as shown. Three degrees of adjustment of the tension on the drive cord may be obtained by use of the three positions for connecting the drive-cord-tension spring to the drive-cord drum on the condenser shaft as shown.
4. The push-arms, rocker-plate shaft, and pulleys should be lubricated with light grease (sparingly). Care should be taken to keep the lubricant off of the drive cord.

Push Button Adjustment

The push buttons should be adjusted for five favorite stations after the receiver is installed and operating.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push buttons one-half turn.
2. Using the tuning control, accurately tune in the first station.
3. With station accurately tuned in, press the first push button fully in and then gently release so as not to jar mechanism.
4. Tighten the push button securely with fingers. Do not force with pliers.
5. Proceed in same manner to adjust the other four push buttons.

Loudspeaker

The loudspeaker cone may be centered in the usual manner with three celluloid or paper feelers after gently cutting away the front dust cover. A new cover should be cemented in place upon completion of the adjustment.

TURN FREE GEAR CLOCKWISE
ONE TOOTH TO OBTAIN SCISSOR
ACTION BEFORE MESHING GEAR
SECTOR

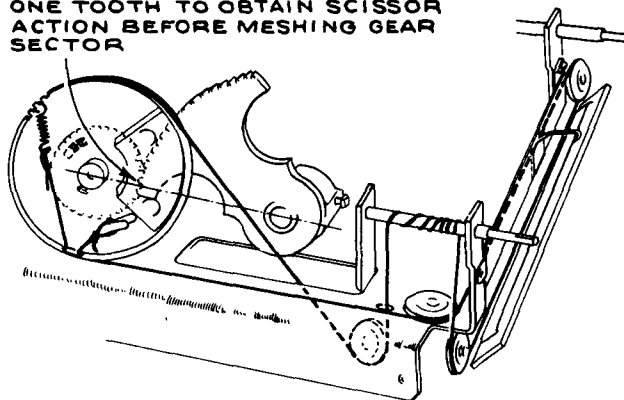


Fig. 6—Drive Cord Hookup

Replacement Parts for Model Imperial

Seven Tube Two Unit Automobile Receiver

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

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
CONTROL UNIT ASSEMBLIES			
32979	Capacitor-Adjustable capacitor (C1).	S-2338	Socket-Dial lamp socket.....
31728	Capacitor-37 mmfd. (C11).....	32299	Socket-Octal base tube socket....
12723	Capacitor-56 mmfd. (C24).....	31615	Spring-Drive cord tension spring (Pkg. of 5).....
30904	Capacitor-100 mmfd. (C15, C16, C17, C18)	30585	Spring-Push arm tension spring (Pkg. of 10).....
12694	Capacitor-220 mmfd. (C19, C20).....	32990	Transformer-First I.F. trans- former (L8, L9, C15, C16).....
30433	Capacitor-470 mmfd. (C5, C26).....	32991	Transformer-Second I.F. trans- former (L10, L11, C17, C18).....
38052	Capacitor-800 mmfd. (C12).....	POWER UNIT ASSEMBLIES	
5148	Capacitor-.007 mfd. (C21).....	5107	Capacitor-.0025 mfd. (C27).....
4937	Capacitor-.01 mfd. (C23).....	30626	Capacitor-.0075 mfd. (C32).....
14393	Capacitor-.01 mfd. (C2, C37).....	30965	Capacitor-0.25 mfd. (C29).....
5196	Capacitor-.035 mfd. (C25).....	12741	Capacitor-0.5 mfd. (C34, C35).....
32787	Capacitor-.05 mfd. (C6, C13, C14, C22).	32240	Capacitor-Electrolytic capacitor consisting of two 10 mfd. sections and one 20 mfd. section (C28, C30, C31)
4839	Capacitor-0.1 mfd. (C4).....	30641	Lead-Ammeter lead (chassis end) com- plete with male section of fuse holder.....
31977	Coil-Antenna filter (L1).....	32378	Pin-Contact pin for speaker lead (Pkg. of 5).....
S-2378	Coil-Antenna coil & core (L2, L3)....	33064	Reactor-Filter reactor (L15).....
32977	Coil-Oscillator coil less shield (L6, L7).....	30540	Resistor-100 ohms, 1/2 watt (R19, R20)
S-2379	Coil-R.F. coil-less shield (L4, L5)...	S-2059	Resistor-390 ohms, 1 watt (R18)...
32974	Condenser-3 gang variable tuning condenser complete with scissors gear (C3, C7, C8, C9, C10).....	12695	Resistor-15,000 ohms, 1/4 watt (R10)
32978	Control-Volume control, tone control and power switch (R9, R16, S1).....	33063	Socket-six contact female socket for control unit cable.....
32634	Cord-Indicator pointer drive cord (34" long).....	32299	Socket-Radiotron socket.....
S-2383	Dial- Station selector dial scale ..	13686	Socket-Vibrator socket.....
32982	Drum-Dial drive drum.....	32243	Transformer-Interstage transformer (T2).....
32290	Gear-Tuning mechanism gear sector...	32241	Transformer-Output transformer (T3)
32985	Indicator-Station selector indicator pointer.....	32986	Transformer-Vibrator transformer (T1, L17, C33).....
11765	Lamp-Dial lamp.....	13688	Vibrator-Plug-in vibrator (L16)....
32981	Pulley-Drive cord bracket and pulley assembly.....	REPRODUCER ASSEMBLIES (84567-501)	
32980	Pulley-Drive cord bracket assembly complete with two pulleys.....	33017	Cone-Reproducer cone & voice coil (L14).....
14439	Resistor-100 ohm, 1/4 watt (R6).....	32987	Reproducer-Reproducer complete....
14561	Resistor-220 ohms, 1/4 watt (R2)....	MISCELLANEOUS ASSEMBLIES	
14720	Resistor-1000 ohms, 1/4 watt (R12)...	32973	Button-Station selector push button and screw.....
13716	Resistor-2,200 ohms, 1/4 watt (R13)...	5025	Capacitor-Generator capacitor....
S-2036	Resistor-27,000 ohms, 1/2 watt (R17)...	32994	Escutcheon-Station call letter escutcheon.....
12454	Resistor-33,000 ohms, 1/4 watt (R7)...	5023	Fuse-15 Ampere fuse (Pkg. of 5)....
12266	Resistor-39,000 ohms, 1/4 watt (R4, R8).....	4290	Insulator-Fuse holder insulating sleeve (Pkg. of 5).....
30434	Resistor-39,000 ohms, 1 watt (R5)....	32996	Knob-Dummy knob.....
12286	Resistor-56,000 ohms, 1/4 watt (R3)...	32995	Knob-Tone control knob.....
12285	Resistor-470,000 ohms, 1/4 watt (R1)...	32993	Knob-Tuning or volume control knob
13730	Resistor-1 megohm, 1/4 watt (R11, R14, R15, R21).....	7766	Lead-Ammeter lead complete with clip and fuse holder.....
2917	Retainer-Station selector knob shaft retainer (Pkg. of 5).....	S-2149	Marker-Station call letter marker (1 set).....
13471	Ring-Retaining ring for antenna coil (Pkg. of 5).....	33389	Mounting-Receiver mounting assembly consisting of straps, screws, washers and lock washers.....
3584	Ring-Retaining ring for R.F. coil (Pkg. of 5).....	32998	Mounting-Power unit mounting assembly consisting of bolt, nut and washer assemblies.....
31482	Screw-No. 8-32 x 1/2 in. set screw for gear Stock #32290 (Pkg. of 5)...	32317	Screw-Set screw for knob Stock #32993 (Pkg. of 5).....
14350	Screw-No. 8-32 x 3/16 in. set screw for drum stock #32982 (Pkg. of 10)...	5024	Suppressor-Distributor suppressor.
12533	Screw-No. 8 x 1/4 in. S.T. case screws (Pkg. of 10).....	32769	Washer-Felt washer for under control knobs (Pkg. of 10).....
32983	Shaft-Station selector knob shaft.....	32976	Frame-Dial scale frame and holder.
3623	Shield-R.F. coil shield.....		
12883	Shield-Oscillator coil shield.....		



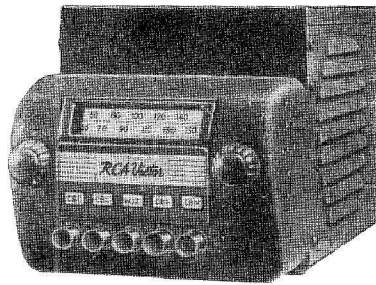
RCA Victor

ROYAL

Five-Tube, Push-Button, Superheterodyne Automobile Receiver

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

TUBE COMPLEMENT

6A8 First Detector—Oscillator
6K7 I-F Amplifier
6Q7 Second Det., A-F Amp. and A.V.C.

FREQUENCY RANGE 550-1,550 kc

POWER OUTPUT

Type Pentode
Undistorted9 watts
Maximum 3.6 watts

POWER SUPPLY

"A" 6.3 volt Auto Storage Battery
"B" Non-Synchronous Vibrator
Current Drain 6.3 amps.

CHASSIS FEATURES

No. I-F Stages One
Completely Shielded Ant. Filter
Magnetite-core Adjusted Antenna and I-F Transformers
Ignition-Noise-Suppression Filters
Antenna Compensator Trimmer
Illuminated Dial

6K6G Output
0Z4G Rectifier
Dial Lamp 6.3 volts, 0.25 ampere

ALIGNMENT FREQUENCIES

I-F 455 kc
Ant. 600 and 1,400 kc
Osc. No Adjustment

LOUDSPEAKER

Type Electrodynamic
Size 5 inches
V. C. Impedance 3.2 ohms at 400 cycles
Field Coil Resistance 5 ohms
App. Field Coil Voltage Drop 6 volts

OPERATING FEATURES

Mechanical Push Button Tuning
Independent Manual Tuning Control
Automatic Volume Control

Mechanical Specifications

OPERATING CONTROLS

1. Left Knob On-Off Switch and Volume
2. Push Buttons Station Tuning
3. Right Knob Manual Tuning, Ratio 2 1/2—1

Net Weight 8 1/2 pounds
Shipping Weight 14 pounds

CONTROL OPERATION

Turn Right Power On; Volume Increase
Push Button Signal Tuned Automatically
Rotate Signal Tuned Manually

Fig. 1—Schematic Circuit Diagram

General Description

The "Royal" is a five-tube superheterodyne receiver with loudspeaker and radio chassis in the same case. It is equipped with five push buttons, for tuning your five favorite broadcast stations, as well as the standard method of dial tuning. Adjustments for push button tuning are explained under the heading "Push Button Tuning Mechanism." The receiver is designed to be mounted under the dash panel. The operating controls are integral with the radio and speaker case.

Loudspeaker.—The loudspeaker voice coil should be centered in the usual manner with three narrow paper feelers, after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, taking care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambroid cement after adjustment has been completed.

Alignment Procedure

Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Adjustment Symbol	Circuit Adjusted
No Signal 550-750 kc	455 kc	.001 mfd.	6K7 Grid	L-10	2nd I.F. Trans.
No Signal 550-750 kc	455 kc	.001 mfd.	6A8 Grid	L-8, L-9	1st I.F. Trans.
1,400 kc	1,400 kc	.0001 mfd. †	Ant. Lead	C-3	Ant.
600 kc	600 kc	.0001 mfd. †	Ant. Lead	L-2	Ant.
1,400 kc	1,400 kc	.0001 mfd. †	Ant. Lead	C-3 *	Ant.

NOTE: No oscillator alignment adjustments are required in this receiver.

IMPORTANT ALIGNMENT NOTES.

† Make the generator connection to the receiver thru a shielded lead-in having not more than 50 mmf. (.00005) capacity with a male connector attached for connection to antenna socket. If C-2 has been changed, as outlined under "Antenna Circuit," for reason of a high capacity antenna, the Dummy Antenna should be the same value as the antenna itself.

* Re-adjust C-3 after installation as outlined under "Antenna Circuit" in "Service Data."

Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value, to prevent the A.V.C. action of the receiver from interfering with accurate alignment.

Alignment adjustment locations are shown in Figs. 2 and 3.

Only the dummy antenna indicated in the chart for any particular frequency should be used. Grid cap leads should remain in place during alignment.

Oscillator circuit alignment is not required in this receiver at either end of the band; the oscillator coil is pre-adjusted for inductance in the factory.

Since the oscillator coil is unshielded, the case has some effect on its inductance. Therefore alignment must be done either with the chassis in the case or with a steel plate (covering the bottom of chassis), substituting for the case.

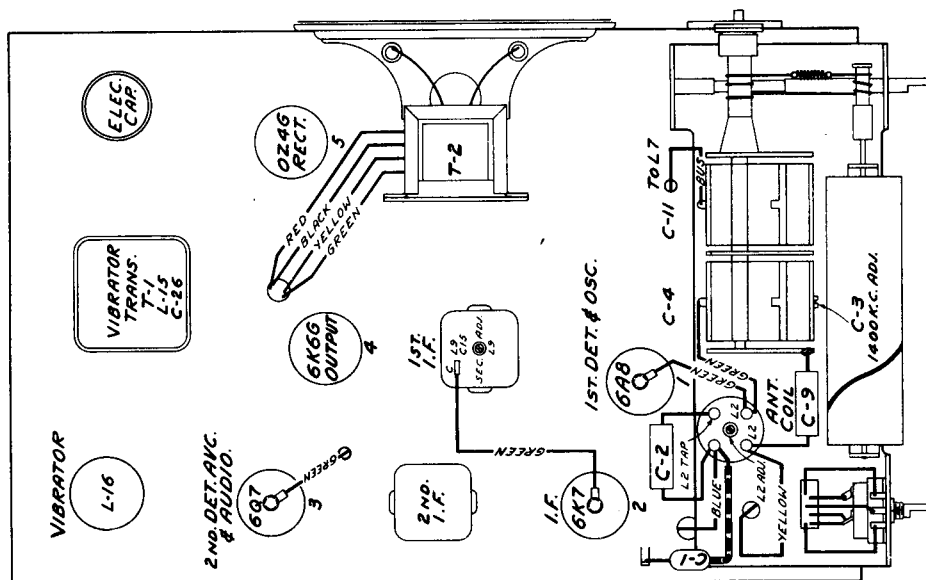


Fig. 3—Location of Parts and Alignment Adjustments

Service Data

Antenna Circuit.—The antenna circuit is designed to work with a low capacity antenna having a total capacity including the shielded lead-in not to exceed 150 mmf. If larger antennas, such as screened top or a double under the running-board having a total capacity of 200 to 550 mmf. is to be used, it will be necessary to reduce the value of the antenna coupling capacitor C-2 from .01 to approximately 200 mmf. (.0002). For even larger antennas such as insulated steel tops, a correspondingly smaller value of C-2 (approximately 125 to 150 mmf.) should be used keeping in mind to use the largest value possible with which the antenna circuit can be aligned.

After installation, and with antenna connected, tune in a weak station near 1,400 kc and adjust compensator trimmer (C-3) for maximum signal output. This trimmer is accessible by prying off the nameplate between the control knobs.

Antenna Filter.—A filter is included in the antenna circuit. Being completely shielded, it prevents radiating ignition interference within the set. It also reduces the possibility of picking up vibrator interference. As shown in Figure 4, the filter unit is mounted inside a steel shell which in turn is welded to the chassis. The shielded antenna lead-in makes contact with the filter unit within the steel shell and is held in place by a bayonet type connector.

Push Button Tuning Mechanism.—The push button tuning mechanism used in this receiver is of the mechanical type, wherein the movement of the button actually turns the tuning condenser to any pre-determined setting. The movement is actuated thru a Push-Arm, Cam, Rocker Plate and Sector Gear, which meshes with a Scissors Gear directly fastened to the tuning condenser shaft. The scissors gear prevents backlash between the sector gear and the tuning condenser. Since the sector gear is mounted directly on

the rocker plate shaft, the position of the rocker plate will accurately determine the position of the tuning condenser.

The cams which determine the stop points for each button are mounted on the push arms and are locked in place by the locking screws and lock-shoes, which press firmly against the cams when the locking screws are tightened. Care should be used when locking screws are tightened not to use excessive force as the threads may become damaged or stripped.

Adjustments for Push Button Tuning are very easily made. To adjust a push button for any station proceed as follows:

- (1) Loosen push-button, by turning it to the left.
- (2) Using the Dial Tuning Control tune in the station.
- (3) Press the push arm in as far as it will go and accurately retune station.
- (4) With the push button still held down, tighten it by turning to the right.

With the push button tight, the cam is locked in position and when the button is pushed in, the cam pressure causes the rocker plate to assume the position that tunes in the desired station.

Manual Tuning Dial.—A manual tuning knob is provided so that additional stations may be tuned in as desired. The manual tuning shaft is connected thru a cord drive to a pulley on the condenser shaft. This same cord drives the dial drum by passing over a pulley on the drum shaft. Figure 5 shows the complete cord drive assembly and the correct number of turns which the cord should be wrapped around the drive shaft and dial drum pulley. Stops are provided on the dial drum so that dial scale adjustment is made by tuning the set to the extreme ends of the band.

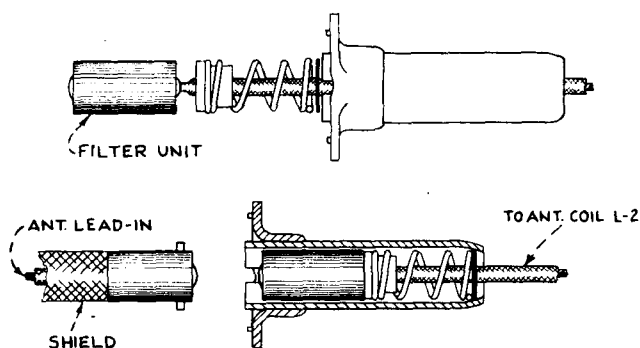


Fig. 4—Antenna Filter

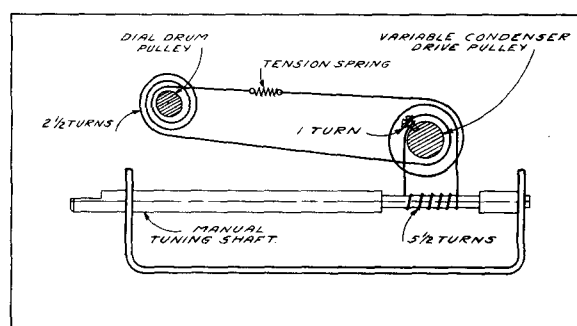


Fig. 5—Drive Cord Assembly

Radiotron Socket Voltages

Type	Plate	Screen Grid Cathode	Heater
6A8 Det.	220V	85V 1.4V	6.3V
6A8 Osc.	85V	— —	—
6K7	220V	85V 0	6.3V
6Q7	70V	— 0	6.3V
6K6G	250V	220V 12V	6.3V
0Z4G	Output voltage 225V measured from cathode to gnd.		—

Note:—The above readings were taken with volume control set at maximum, receiver tuned to a quiet point with no signal received. To duplicate the above readings use a standard 0-1 milliammeter with 10-50—150—250—500 volt ranges. All readings should hold within $\pm 20\%$ of values given.

REPLACEMENT PARTS ROYAL

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		TUNING UNIT ASSEMBLIES	
S-2301	Cap-Grid connector cap (Pkg.of 5)...	S-2346	Button-Push button and screw assembly.....
13002	Capacitor-12 mmfd. (C1).....	S-2339	Condenser-2 gang variable condenser (C3,C4,C11).....
31728	Capacitor-37 mmfd. (C12).....	32634	Cord-Variable condenser drive cord.
12405	Capacitor-47 mmfd. (C16).....	32290	Gear-Variable condenser drive gear sector-fastens on cam shaft..
13307	Capacitor-56 mmfd. (C15).....	S-2340	Indicator-Station selector indicator and drum assembly.....
14262	Capacitor-110 mmfd. (C14).....	S-2341	Pulley-Indicator drum pulley.....
13894	Capacitor-390 mmfd. (C21).....	S-2352	Pulley-Variable condenser drive cord pulley.....
30673	Capacitor-470 mmfd. (C18).....	S-2353	Push Arm-Station selector push arm assembly consisting of push arm, cam, spring, lock plate and button..
32363	Capacitor-490 mmfd. (C10).....	2917	Retainer-Station selector knob shaft retainer (Pkg.of 5).....
4838	Capacitor-.005 mfd. (C19,C22).....	31482	Screw-No.8-32x $\frac{1}{2}$ in.set screw for gear-Stock #32290 (Pkg.of 5).....
30626	Capacitor-.0075 mfd. (C25).....	S-2342	Screw-No.6-32x9/64 set screw for pulley-Stock #S-2341 (Pkg.of 5)...
14393	Capacitor-.01 mfd. (C2,C20).....	S-2343	Shaft-Station selector knob shaft..
4870	Capacitor-.025 mfd. (C9).....	S-2344	Spring-Variable condenser drive cord tension spring (Pkg.of 5)....
30882	Capacitor-.05 mfd. (C13).....	30585	Spring-Push Arm tension spring (Pkg.of 10).....
11414	Capacitor-0.1 mfd. (C29).....	SPEAKER ASSEMBLIES 84391-501	
12741	Capacitor-0.5 mfd. (C27).....	30782	Cone-Speaker cone and voice coil (L17).....
S-2356	Capacitor-Electrolytic capacitor consisting of two 10 mfd.sections & one 20 mfd. section (C23,C24,C31)...	30781	Speaker-Speaker complete.....
31596	Clip-Spring clip to hold oscillator coil (Pkg.of 5).....	30783	Transformer-Output transformer (T2)
S-2336	Coil-Antenna coil and core, less shield (L2).....	MISCELLANEOUS ASSEMBLIES	
31977	Coil-Antenna filter (L1).....	5025	Capacitor-Generator Capacitor.....
S-2337	Coil-Oscillator coil (L6,L7).....	S-2357	Dial-Station selector dial scale...
11765	Lamp-Dial Lamp.....	5023	Fuse-15 Ampere fuse (Pkg. of 5)....
30641	Lead-Ammeter lead (chassis end) complete with male section of fuse holder.....	4290	Insulator-Insulating sleeve for fuse holder (Pkg.of 10).....
30540	Resistor-100 ohms- $\frac{1}{2}$ watt (R15,R16)...	S-2355	Knob-Station selector or volume control knob.....
14561	Resistor-220 ohms- $\frac{1}{2}$ watt (R3).....	7766	Lead-Ammeter lead complete with clip and fuse holder.....
30499	Resistor-470 ohms- $\frac{1}{2}$ watt (R12).....	S-2149	Marker-Station call letter markers (1 set).....
6134	Resistor-1200 ohms-1 watt (R13).....	31652	Mounting-Receiver mounting assembly consisting of brackets, straps, washers, screws and nuts..
12695	Resistor-15,000 ohms- $\frac{1}{2}$ watt (R14)...	S-2349	Plate-Receiver name plate and escutcheon assembly.....
13669	Resistor-22,000 ohms-2 watt (R2)....	31646	Spring-Retaining spring for knob (Pkg. of 5).....
12266	Resistor-39,000 ohms- $\frac{1}{2}$ watt (R7)....	5024	Suppressor-Distributor suppressor..
12286	Resistor-56,000 ohms- $\frac{1}{2}$ watt (R4)....		
12452	Resistor-330,000 ohms- $\frac{1}{2}$ watt (R10)...		
12285	Resistor-470,000 ohms- $\frac{1}{2}$ watt (R11)...		
12679	Resistor-2.2 meg. - $\frac{1}{2}$ watt (R6).....		
13601	Resistor-10 megs. - $\frac{1}{2}$ watt (R9).....		
13471	Ring-Retaining ring for antenna coil (Pkg.of 5).....		
S-2338	Socket-Dial lamp socket.....		
31319	Socket-Radiotron socket.....		
13686	Socket-Vibrator socket.....		
14261	Transformer-First I.F.Transformer (L8,L9,C14,C15).....		
30672	Transformer-Second I.F. Transformer (L10,L11,C16).....		
31597	Transformer-Vibrator power transformer (T1,L15,C26).....		
13688	Vibrator-Plug-in vibrator complete (L16).....		
31637	Volume Control and power switch (R8,S1).....		



RCA Victor

MODEL V-1 RECORD PLAYER

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

Electrical and Mechanical Specifications

MOTOR

Type (Manual-starting) Synchronous
Turntable Speed 78 r.p.m.
Turntable Diameter 7 inches

POWER SUPPLY RATING

Rating A 105-125 volts, 60 cycles, 10 watts
Rating B 105-125 volts, 25 cycles, 10 watts

PICKUP

Type Crystal
Impedance 80,000 ohms at 1,000 cycles
Volume Control Resistance 250,000 ohms
Average Output Voltage $1\frac{1}{2}$ volts at 1,000 cycles
across 250,000 ohm load

CABINET DIMENSIONS

Height $4\frac{1}{4}$ inches
Depth $9\frac{1}{4}$ inches
Width $11\frac{3}{4}$ inches
Net Weight 6 $\frac{1}{4}$ pounds
Shipping Weight 8 $\frac{3}{4}$ pounds

General Description

The RCA Victor Record Player Model V-1 consists of a manually-operated motor turntable mechanism and a new type, light weight, crystal pickup housed in a compact, modern styled, cabinet of walnut veneer. This record player is designed to play records through the audio amplifier-loudspeaker system of practically every type of radio receiver.

Service Data

The crystal pickup unit is thoroughly sealed in a metal casing, against extreme changes of climate. The offset mounting of the crystal unit in the pickup arm insures ideal tracking between the needle and record grooves. If failure occurs due to a defective crystal unit, no attempt should be made to repair the unit, but a new replacement crystal unit should be installed.

The motor speed should be 78 r.p.m., and may be checked by placing a piece of paper between a record and the turntable, with the paper protruding beyond the edge of the record, and then counting the number of revolutions of the turntable per minute. The motor is designed to be simple and foolproof in operation. Occasionally, however, lubrication and certain adjustments may be required. The turntable is started by rotating the turntable in a clockwise direction.

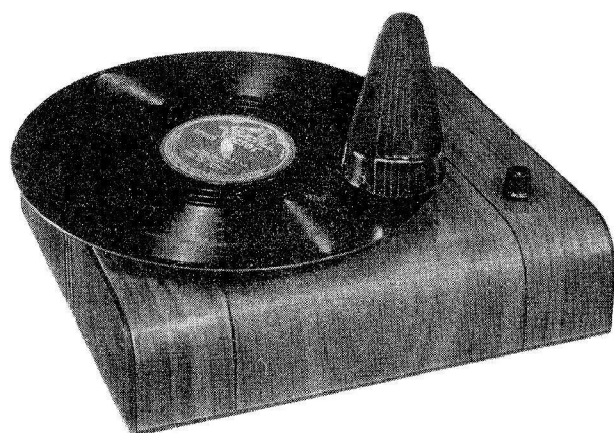
Connecting Record Player to Radio Receivers

In general, the Record Player must be used with radio receivers having at least two stages of high-gain audio amplification. The Record Player output should be connected to the grid of the first audio tube, and at the same time the output of the radio receiver portion of the chassis should be shorted or opened, to prevent radio signals being heard while the Record Player is in operation.

RECORD PLAYER REPLACEMENT PARTS FOR MODEL V-1

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

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
MOTOR ASSEMBLIES		PICKUP AND ARM ASSEMBLIES	
S-2277	Base-Motor support, damper and bearing cup assembly.....	33124	Base-Pickup arm pivot shaft and base assembly.....
31046	Bearing-Motor bearing assembly.....	33122	Crystal-Pickup crystal cartridge and needle screw.....
31041	Cap-Rubber spindle cap (Pkg.2).....	33529	Screw-Pickup needle screw.....
31047	Cushion-Rubber cushion for bearing.	33591	Shell-Pickup arm shell less base assembly.....
S-2264	Motor-Phonograph motor complete with turntable - 60 cy.....	MISCELLANEOUS ASSEMBLIES	
S-2265	Motor-Phonograph motor complete with turntable - 25 cy.....	3961	Knob-Volume control knob.....
31040	Mounting-Turntable top - rubber mountings - 60 cycle.....	S-2289	Mounting-motor mounting screw assembly - 60 cycle.....
S-2271	Retainer-Turntable retainer, washer and bearing assembly.....	S-2290	Mounting-Motor mounting screw assembly - 25 cycle.....
32076	Turntable-Finished turntable top plate only - 25 cycle.....	31048	Plug-Pickup cable plug.....
31039	Turntable-Finished turntable top plate only - 60 cycle.....	9824	Switch-Radio-Record switch and cable assembly.....
4083	Washer-Leather spacing washer (Pkg. 10).....	31052	Volume control and on-off switch (R1,S1).....
14231	Washer-Metal spacing washer (Pkg. 10).....		



Model V-1

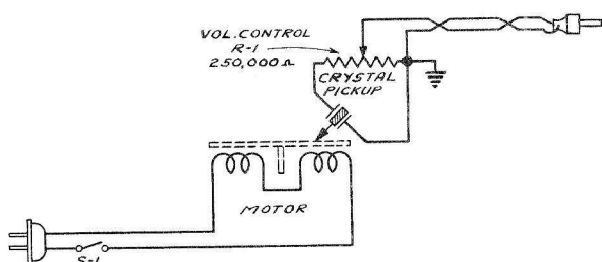


Fig. 1.

HUM AND VIBRATION

A small amount of hum when starting, decreasing to a negligible amount while running, is normal. If excessive vibration occurs either at starting or running, it may be due to one of the following:

- (1) Insufficient lubrication in outer bearing or any other failure that will cause the stator to bind.
- (2) Metal washer above the leather washer at the bottom of the main bearing. It must be below.
- (3) Leather washer not oiled. When replacing the leather washer, make sure that it is thoroughly soaked in oil.
- (4) Motor not properly supported from motor board. Unless the motor is properly supported from the motor board, vibration will be excessive.
- (5) Burrs on salient poles of rotor or stator. They should be removed with fine emery cloth.
- (6) Avoid placing the record player on top of the radio cabinet since acoustic feedback may tend to accentuate mechanical hum.

REMOVING THE ROTOR FROM THE STATOR

The rotor and turntable assembly simply rests on the ball bearing at the bottom of the vertical bearing, and may be removed by lifting out. Don't turn player upside down without holding turntable.

LUBRICATION

Both the rotor and stator have bearing surfaces about the center vertical axis. These bearings and the ball bearing at the bottom of the turntable's shaft should be oiled when ever piayer is serviced. The leather washer beneath the stator is to be pliable and soaked in light oil.

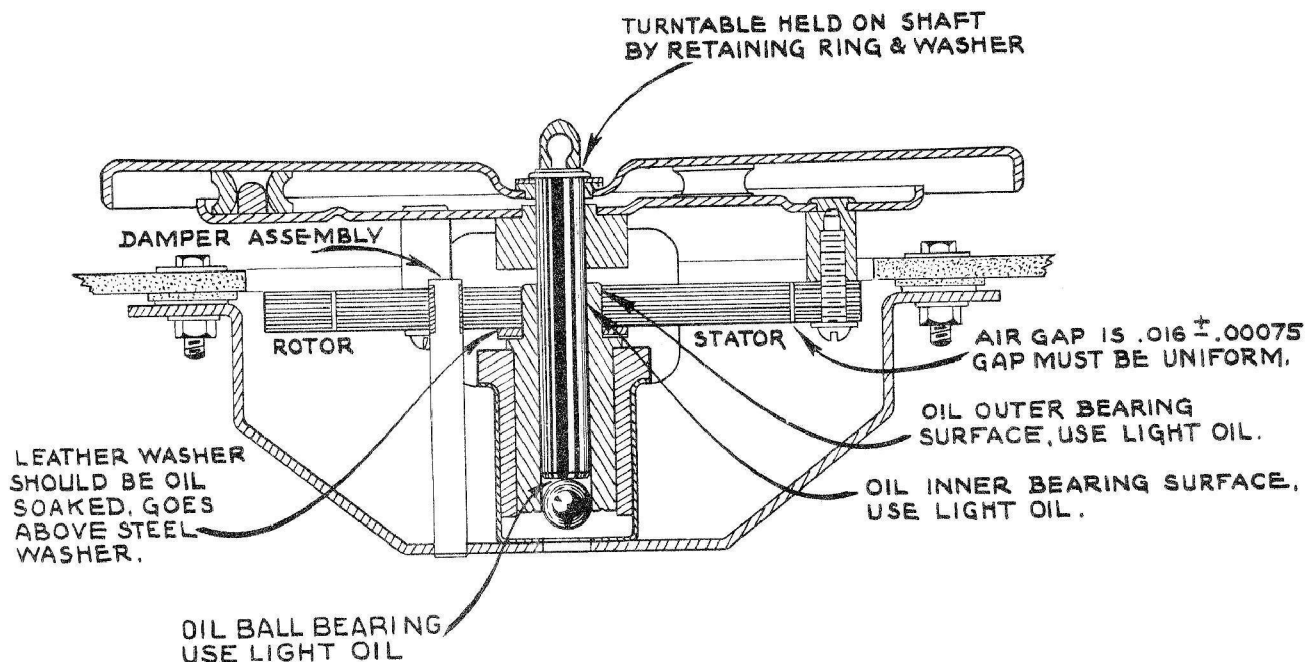


Figure 2—Motor Assembly

PHONOGRAPH MOTOR SERVICE DATA

The synchronous motor used in this instrument is designed to be simple and foolproof. Among its many features are constancy of speed, low power consumption, single moving part, ease of starting, rubber damper, ease of repair, and long life. The parts that may require attention are plainly shown by Figure 2. The motor is started by turning "on" the power switch and giving the turntable a clockwise spin with the hand. Smooth starting and running will be insured by keeping the bearings well cleaned and oiled.

ROTOR ADJUSTMENT

Use three 16-mil shims, spaced equally around the gap between rotor and stator. When rotor is suitably adjusted, securely tighten the three screws which hold the rotor to the turntable. The centering operation is very similar to that done with a dynamic speaker.

If top of rotor lamination assembly is not flush with top of stator laminations, additional steel washers should be inserted beneath the stator until it is raised to the desired level.



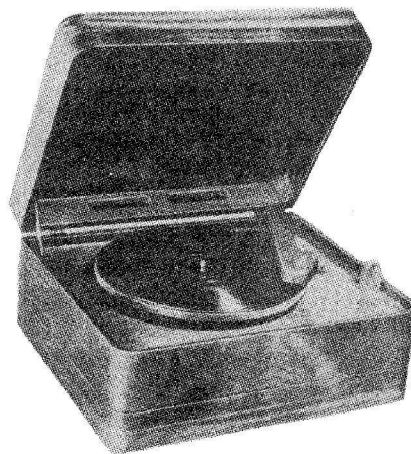
RCA Victor

MODEL V-2

RECORD PLAYER

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Model V-2

Electrical and Mechanical Specifications

MOTOR

Type Self-starting Induction
Turntable Speed 78 r.p.m.
Turntable Diameter 10 inches

POWER SUPPLY RATING

Rating A 105-125 volts, 60 cycles, 10 watts
Rating B 105-125 volts, 25 cycles, 10 watts

Pickup Crystal
Type
Impedance 80,000 ohms at 1,000 cycles
Volume Control Resistance 250,000 ohms
Average Output Voltage 1½ volts at 1,000 cycles
across 250,000 ohm load

CABINET DIMENSIONS

Height 7-13/16 inches
Depth 12-31/32 inches
Width 15¼ inches
Net Weight 12¾ pounds
Shipping Weight 18 pounds

General Description

The RCA Victor Record Player Model V-2 consists of a self-starting motor turntable mechanism, a crystal pickup, an aurally compensated volume control, and a motor switch. This record player can be adapted to play records through the audio amplifier—loudspeaker system of practically every type of radio receiver. The cabinet is of walnut veneer, and has a hinged lid, which locks in the "open" position—but should be closed while records are being played. Any record up to and including the 12-inch diameter size may be played on this instrument. An automatic switch turns the motor "off" when the end of the record has been reached.

Service Data

The crystal pickup unit is thoroughly sealed in a metal casing, against extreme changes of climate. The offset mounting of the crystal unit in the pickup arm insures ideal tracking between needle and record grooves. If failure occurs due to a defective crystal unit, no attempt should be made to repair the unit, but a new replacement crystal unit should be installed.

The motor speed should be 78 r.p.m., and may be checked by placing a piece of paper between a record and the turntable, with

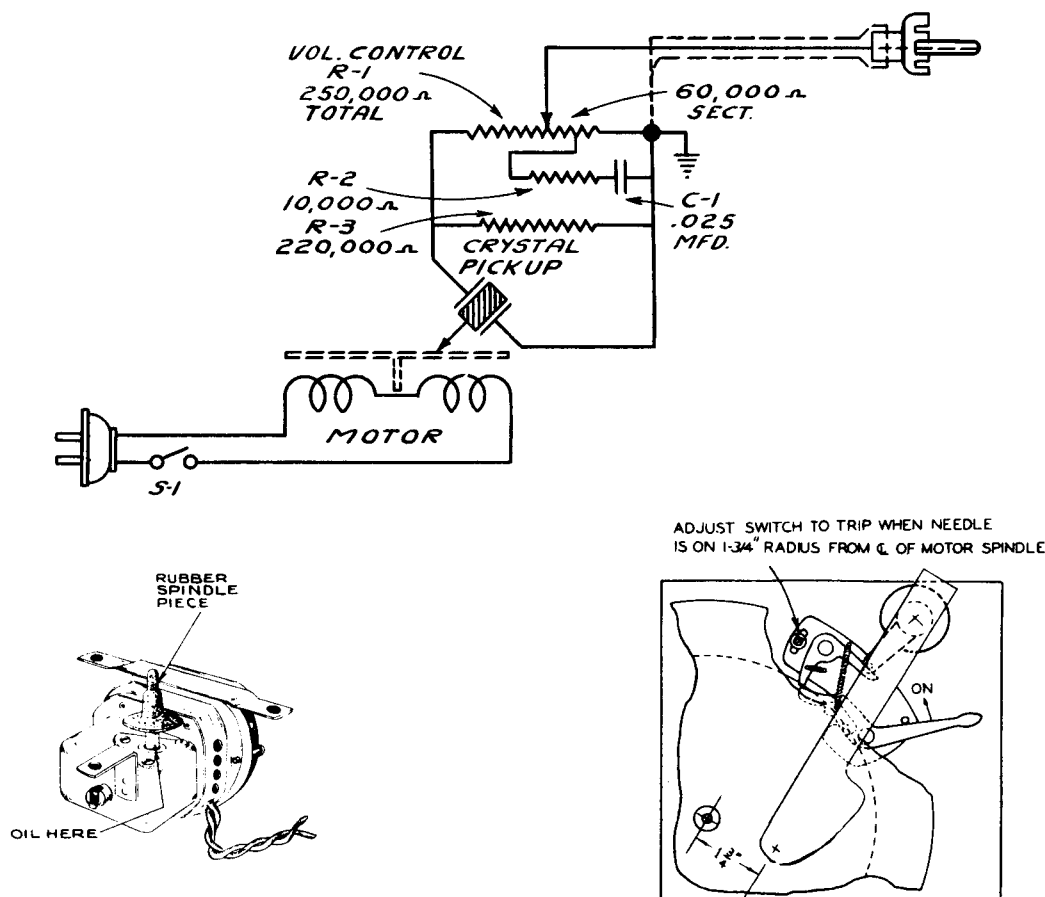
the paper protruding beyond the edge of the record, and then counting the number of revolutions of the turntable per minute. The motor is designed to be simple and foolproof in operation. Occasionally, however, lubrication and certain adjustments may be required.

The turntable is started by pushing to the rear the motor starting lever, which appears to the right of the turntable. The adjustment on the automatic motor stopping switch should be made so that the switch will snap to the "off" position when the needle in the pickup head is 1¾ inches away from the center of the turntable.

The volume control is of the potentiometer type, tapped to give aural compensation at low volume settings. The output lead from the volume control is a single shielded wire, terminating in a small, male, pin plug. This pin plug fits into the female jack receptacle on most of the RCA Victor 1939 "90" series of radio receivers.

Connecting Record Player to Radio Receivers

In general, the Record Player must be used with radio receivers having at least two stages of high-gain audio amplification. The Record Player output should be connected to the grid of the first audio tube, and at the same time the output of the radio receiver portion of the chassis should be shorted or opened, to prevent radio signals being heard while the Record Player is in operation.



Motor Lubrication.—Apply a few drops of light machine oil to the spindle bearing every six months.

The motor spindle is tapered, and a conical rubber piece fits snugly on the spindle. The hole in the turntable bushing is tapered to fit the rubber. This provides an excellent self-centering floating mounting.

A metal washer is placed on the spindle under the rubber piece. The washer has ears on the under side which fit over a pin that projects through the spindle.

The automatic stop should be adjusted so that the lever will snap to the "off" position when the pickup needle is 1 3/4 inches from the center line of the spindle.

REPLACEMENT PARTS FOR MODEL V-2 DELUXE RECORD PLAYER

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

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
MOTOR ASSEMBLIES			
S-2285	Damper-Turntable damper plate and sleeve.....	S-2410	Pickup crystal and arm assembly complete.....
32558	Motor-110 Volt, 60 cycle motor complete (M1).....	31048	Plug-Pickup cable plug.....
32638	Motor-110 volt, 25 cycle motor complete (M1).....	31160	Screw-Pickup needle screw.....
S-2409	Mounting-Motor mounting assembly consisting of screws, washers, spacers and lock washers.....	MISCELLANEOUS ASSEMBLIES	
31463	Turntable-Motor turntable.....	4870	Capacitor-.025 mfd. (C1).....
PICKUP AND ARM ASSEMBLIES		9848	Cup-Needle cup, rest and lid complete.....
31469	Base-Pickup arm pivot shaft and base assembly.....	3961	Knob-Volume control knob.....
31156	Crystal-Pickup crystal cartridge and needle screw.....	12288	Resistor-10,000 ohms, 1/4 watt (R2)
31465	Mounting-Pickup arm mounting assembly comprising rubber grommet, washer, lock washer and nut.....	12264	Resistor-220,000 ohms, 1/4 watt (R3).....
		30100	Spring-Automatic brake latch spring (Pkg. 10).....
		31155	Spring-Needle cup lid tension spring (Pkg. 10).....
		S-2278	Switch-Automatic switch and trip assembly.....
		S-2268	Switch-Motor Switch (S1).....
		9824	Switch-Phone adapter switch assembly.....
		31194	Volume Control (R1).....



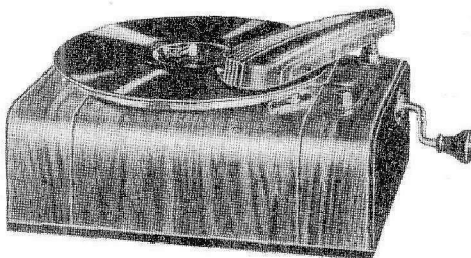
RCA Victor

MODEL V3

Victrola Attachment

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



General Description

The RCA Victor Model V-3 Victrola attachment is designed for use with a battery-operated receiver where a mechanical type unit is required having the characteristics necessary for record fidelity. The motor is of the mechanical, spring wound, variable speed type completely governed to maintain a constant

speed. The pickup assembly is of the crystal type housed in a light weight, plastic shell of modern styling. A volume control is placed across the pickup output terminals providing a means of controlling the output voltage.

Service Data

Motor.—The drive motor is of simple design and substantial construction. It should require little or no service if properly maintained. Attention to lubrication of the moving parts and occasional cleaning of the mechanism will go far to prevent faulty operation. Should it become necessary to repair the motor, the following procedure should be applied: CAUTION. —Allow the motor mechanism to run down completely before attempting adjustment, repairs, or replacements.

Removing Motor from Cabinet.—Remove the winding key. To dismount the motor, unscrew the spindle cap and remove turntable, slightly tapping the spindle while exerting an upward lift on the turntable. Loosen the screw holding the speed-regulating lever and remove the latter. The three screws holding motor to motor board should then be loosened to permit removal of motor assembly.

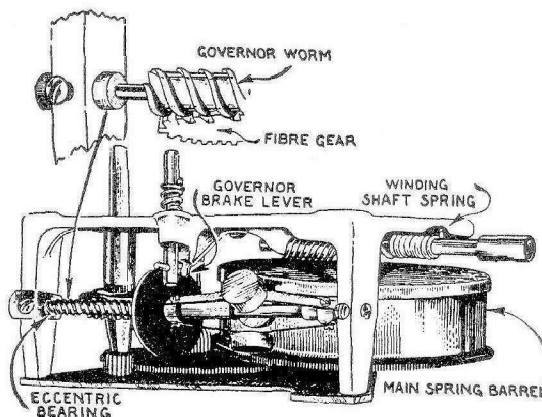
Replacing Main Spring Barrel.—In case of main spring failure, the entire spring barrel and gear should be replaced. Remove the spring-barrel spindle screw by unscrewing to right. Remove the C washer and two pillar screws holding bottom plate. Remove bottom plate, intermediate spindle shaft, and spring barrel. Reassemble parts in reverse sequence.

Winding Shaft Spring.—This spring functions as a friction ratchet. It may be removed as follows: remove pin holding winding worm on shaft; remove winding shaft; then remove screw holding spring. Replace in reverse sequence.

Governor Adjustments.—The mesh of the worm and fiber gears is adjusted by rotation of the eccentric spindle bearings. The adjustments should be made so that the worm meshes properly with the fiber gear and rotates freely without binding. The

bearings should be accurately aligned with each other. The minimum of spindle end-play which permits smooth operation should be used.

Speed Regulator Lever.—After assembly, adjust the speed regulator until the turntable rotates at 78 r. p. m.; loosen the speed regulator screw and set pointer to center of speed indicator scale; tighten screw and re-check turntable speed.



Lubrication.—All moving parts of the motor should be thoroughly cleaned and lubricated every six months to prevent excess wear and to assure proper operation. A small amount of grease should be applied to the worm gear of the governor, the gear of the winding shaft, and on the small pinion gear. All other points, including regulator friction pad, should be lubricated with light oil. All motor parts should be covered with a light film of oil to prevent rusting.

REPLACEMENT PARTS FOR MODEL V-3

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

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
MOTOR ASSEMBLIES		PICKUP ASSEMBLIES	
33682	Brake-Turntable brake complete.....	S-2451	Base-Pickup arm mounting base and pivot shaft.....
33371	Cap-Turntable spindle cap.....	33122	Crystal-Pickup crystal cartridge and needle screw.....
33366	Gear-Intermediate drive gear and shaft.....	33123	Damper-Viscoloid damper for pickup armature.....
13858	Gear-Winding worm gear-located on spring barrel shaft.....	33529	Screw-Pickup needle screw.....
13859	Gear-Winding gear-located on spring barrel shaft.....	33591	Shell-Pickup shell-less crystal unit and base.....
13857	Governor-Governor assembly complete		
33679	Indicator-Speed regulator arm & pointer.....	MISCELLANEOUS ASSEMBLIES	
33685	Key-Winding key.....	9824	Cable-Radio-Record switch and cable assembly.....
13854	Motor-Spring motor complete.....	9-2612	Control-Volume control.....
13860	Shaft-Winding key shaft & socket - less winding gear.....	33681	Escutcheon-Speed lever escutcheon.
33367	Spindle-Motor spindle & two gears assembled.....	3961	Knob-Volume control knob.....
13835	Spring-Mainspring, spring barrel and drive gear.....	31048	Plug-Male plug for pickup cable.....
33369	Turntable-Motor turntable complete.		
33372	Washer-Turntable drive washer and rubber bushing.....		
13862	Weight-Governor weight and spring..		



RCA Victor

Model VA-22 Deluxe Victrola Attachment TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

Specifications

MODEL VA-22

Victrola Attachment

Record Capacity.....Eight 10-inch or Seven 12-inch
MOTOR.....Constant-speed, self-starting
PICKUP.....Crystal
Pickup Impedance.....0.1 meg. at 1,000 cycles
Average Output.....1½ volts across 0.5 meg.

POWER SUPPLY RATINGS

A1.....105-125 volts, 60 cycles, 50 watts
A2.....105-125 volts, 25 cycles, 50 watts
CABINET DIMENSIONS.....32-in. x 19½-in. x 15½-in.
Weight, gross.....59 lbs.

General Description

Model VA-22 is a deluxe Victrola attachment incorporating the Type RP-140 automatic record changing mechanism and a compensated volume control network. Reference to the RP-140 Service Notes will disclose complete adjustment details and service hints for the automatic mechanism.

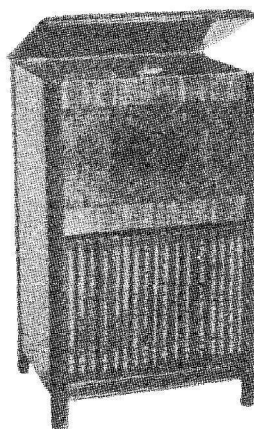
Where a receiver has a terminal board supplied for ease in connecting a record player, reference to the Service Notes will disclose full connection details for the particular model in question.

Connecting Model VA-22 to Radio Receivers

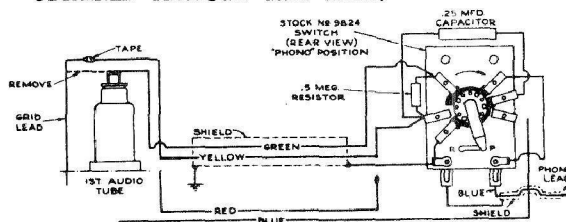
Methods of connecting the Victrola Attachment to various types of audio systems are given in the accompanying text and illustrations. The data given requires that an RCA Stock No. 9824 Radio-Phono switch be used for switching from radio to phonograph, as desired. For ease in connecting the "phono" lead to the Stock No. 9824 switch, the male plug on the end of the lead should be removed by unsoldering or by cutting it off.

1939 RCA RADIOS OF THE "90" SERIES:

Plug male connector on the end of the "phono" lead into the female connector on the receiver chassis. Push or turn the "Phono" switch to "Phono" position, and operate the Victrola Attachment according to instructions.

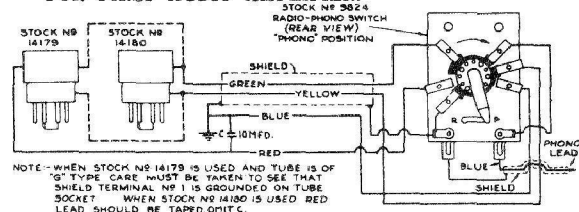


RADIO RECEIVERS WHOSE FIRST AUDIO TUBE IS OF THE GRID CAP TYPE, AND FIXED BIAS FOR TUBE IS OBTAINED THROUGH GRID LEAD.



NOTE: REMOVE BLUE AND RED LEADS, CONNECT YELLOW LEAD TO TERMINAL SHOWN.

RADIO RECEIVERS USING 6C5 OR 6J5, 6C5G OR 6J5G, TUBE FOR FIRST AUDIO AMPLIFIER.

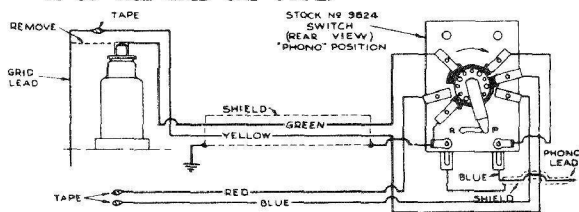


NOTE: WHEN STOCK NO 14179 IS USED AND TUBE IS OF "G" TYPE CARE MUST BE TAKEN TO SEE THAT SHIELD TERMINAL NO 1 IS GROUNDED ON TUBE SOCKET. WHEN STOCK NO 14180 IS USED RED LEAD SHOULD BE TAPED, GRIT.

Stock No. 14179 Adapter opens grid circuit, and inserts 2,700 ohm resistor in cathode of 6C5 or 6J5 tubes, for bias on Phono reproduction.

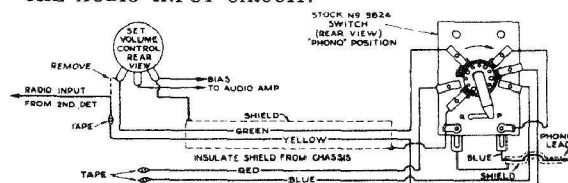
Stock No. 14180 Adapter opens grid circuit of 6C5 or 6J5 tube.

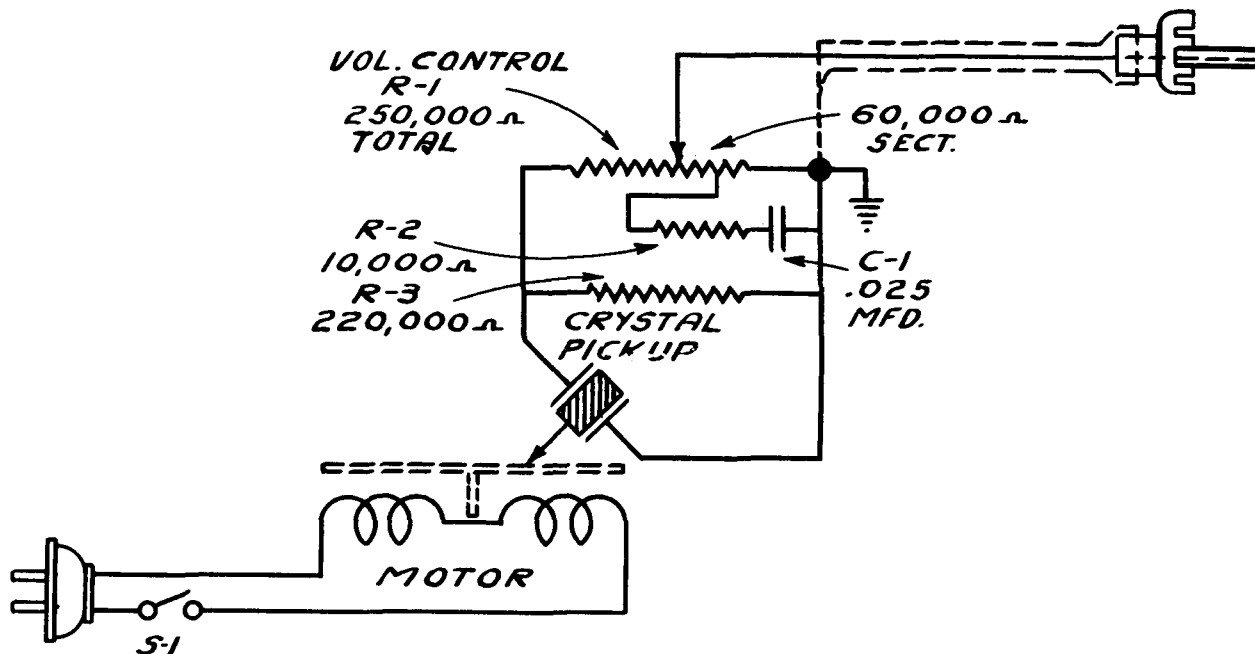
RADIO RECEIVERS WHOSE FIRST AUDIO AMPLIFIER TUBE IS OF THE GRID CAP TYPE.



NOTE: THIS METHOD FOR USE ONLY WHEN BIAS FOR THE TUBE IS OBTAINED BY MEANS OF CATHODE RESISTOR.

RADIO RECEIVERS WHERE THE VOLUME CONTROL IS IN THE AUDIO INPUT CIRCUIT.





Schematic Circuit Diagram

REPLACEMENT PARTS FOR MODEL VA-22

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

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
MISCELLANEOUS ASSEMBLIES			
33595	Cable-Shielded output cable with male plug.....	12264	Resistor-220,000 ohm, 1/4 watt (R3).....
4870	Capacitor-.025 mfd. (C1).....	4119	Screw-Knob retaining set screw (Pkg.5).....
30698	Hinge-Cabinet lid hinge.....	31470	Springs-Motorboard mounting springs, screw and washer (4 required).....
31564	Holder-Needle card holder.....	35594	Support-Cabinet lid support.....
12673	Knob-Volume control knob.....	31108	Volume Control (R1).....
14559	Resistor-10,000 ohm, 1/4 watt (R2).....		

Refer to RP-140 Service Notes for Mechanism Assemblies



RCA Victor

MODEL R-96

Three-Tube, A-C, Electric Phonograph

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical Specifications

RADIOTRON COMPLEMENT

(1) Type 6F5 Audio Voltage Amplifier

(2) Type 6F6G Power Output

(3) Type 5Y4G Rectifier

POWER SUPPLY RATINGS

Rating A 105-125 volts, 50-60 cycles, 75 watts
 Rating B 105-125 volts, 25 cycles, 75 watts

POWER OUTPUT

Undistorted 1.75 watts
 Maximum 4.5 watts

LOUDSPEAKER

Type 8-inch Electrodynamic
 Impedance (V.C.) 2.2 ohms at 400 cycles

MOTOR-BOARD

Type Manual
 Turntable Speed 78 r.p.m.
 Pickup High-impedance crystal
 Pickup Impedance 80,000 ohms at 1000 cycles

Mechanical Specifications

Height 13 ⁵/₁₆ inches
 Width 17 ⁵/₁₆ inches
 Depth 14 ³/₁₆ inches
 Weight (Net) 30 pounds
 Weight (Shipping) 36 pounds
 Chassis Base Dimensions 9 ³/₄ inches x 5 ¹/₂ inches x 2 inches
 Over-all Chassis Height 5 ³/₄ inches
 Operating Controls (1) Volume Control and Power Switch, (2) Turntable Switch

General Description

The Model R-96 Electric Phonograph consists of a three-tube audio amplifier, an eight-inch dust-proof electrodynamic loudspeaker, a constant speed motor, and a new type, balanced arm, crystal pickup, combined in a hinged-top table-type cabinet. Its

design includes a phonograph pickup jack, resistance-coupled audio system, self-starting constant-speed motor, automatic motor switch, and an aurally compensated volume control.

Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coils, transformer windings, and reactors are rated in terms of d-c resistance to permit continuity checks.

The crystal pickup unit is thoroughly sealed in a metal casing as protection against extreme changes of climate. If failure occurs due to a defective crystal unit, no attempt should be made to repair the unit, but a new replacement crystal unit should be installed.

The turntable drive is a self-starting, constant-speed, induction motor. The motor speed should be 78 r.p.m., and may be checked by placing a piece of paper between a record and the turntable, with the paper protruding beyond the edge of the record, and counting the number of revolutions of the turntable per minute while playing a record.

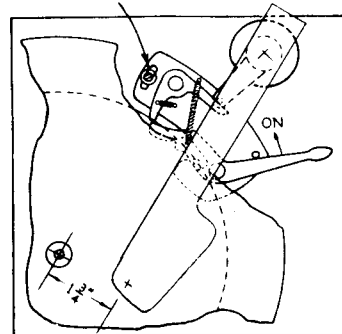
The motor spindle is tapered, and a conical rubber piece fits snugly on the spindle. The hole in the turntable bushing is tapered to fit the rubber. This provides an excellent self-centering floating mounting.

A metal washer is placed on the spindle under the rubber piece. The washer has ears on the under side which fit over a pin that projects through the spindle.

Switch lever adjustments are described in the accompanying illustration. Note that the switch lever should be adjusted so that the lever will snap to the "off" position when the pickup needle is $1\frac{3}{4}$ inches from the center-line of the spindle.

Operation.—To *start* turn on the amplifier switch, and push the turntable switch lever toward the base of the pickup arm. To *stop* move the pickup arm toward the spindle, in order to actuate the turntable switch, before returning the arm to the arm rest. Records with the standard eccentric or spiral stopping groove will automatically throw the turntable switch at the end of a record.

ADJUST SWITCH TO TRIP WHEN NEEDLE IS ON $1\frac{3}{4}$ " RADIUS FROM C. OF MOTOR SPINDLE



Adjustment of Automatic Switch

Electrical Description

The High Impedance crystal pickup is coupled to the control grid of the Type 6F5 audio amplifier tube through the aurally-compensated volume control circuit. The output of the type 6F5 is resistance-coupled to the Type 6F6G power output Pentode. The output of the Type 6F6G is fed to the loudspeaker through a step-down transformer.

A Type 5Y4G Radiotron is employed as a full-wave rectifier supplying the necessary voltages to the plates of the amplifier tubes. Figures 2 and 3 show the Schematic Diagram and Chassis Wiring diagram respectively.

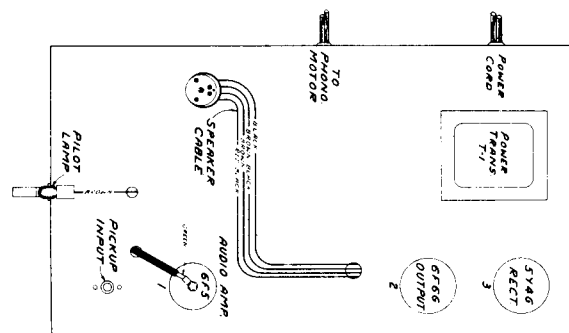


Figure 1—Radiotron Locations

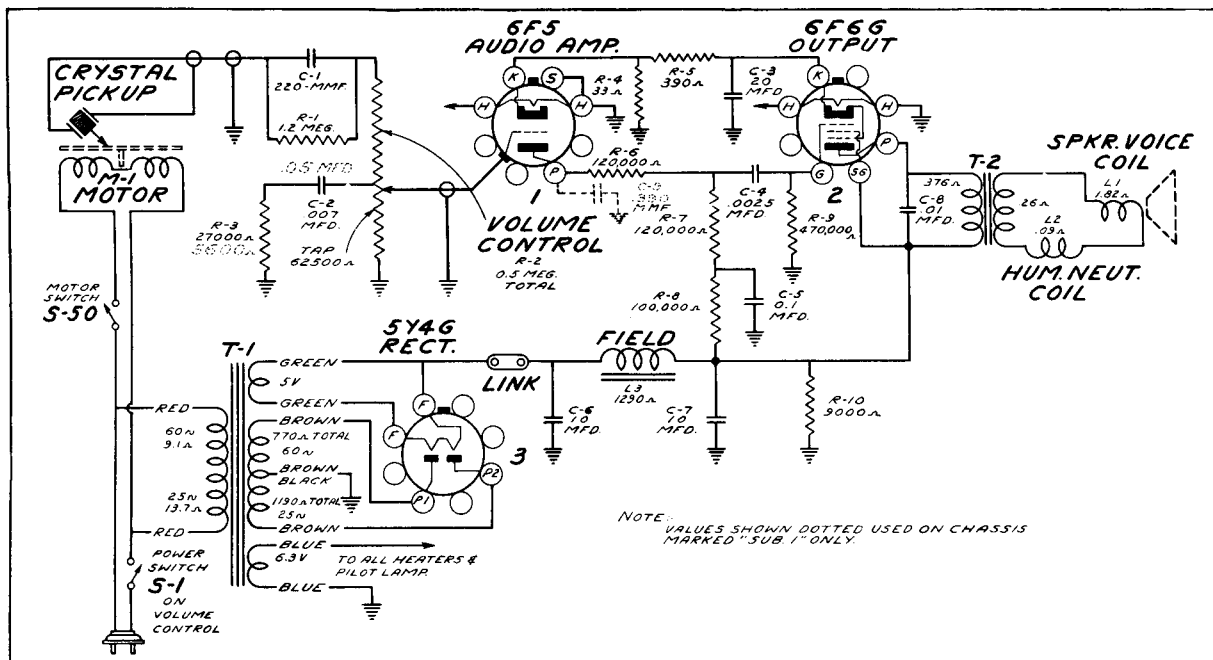


Figure 2—Schematic Circuit Diagram

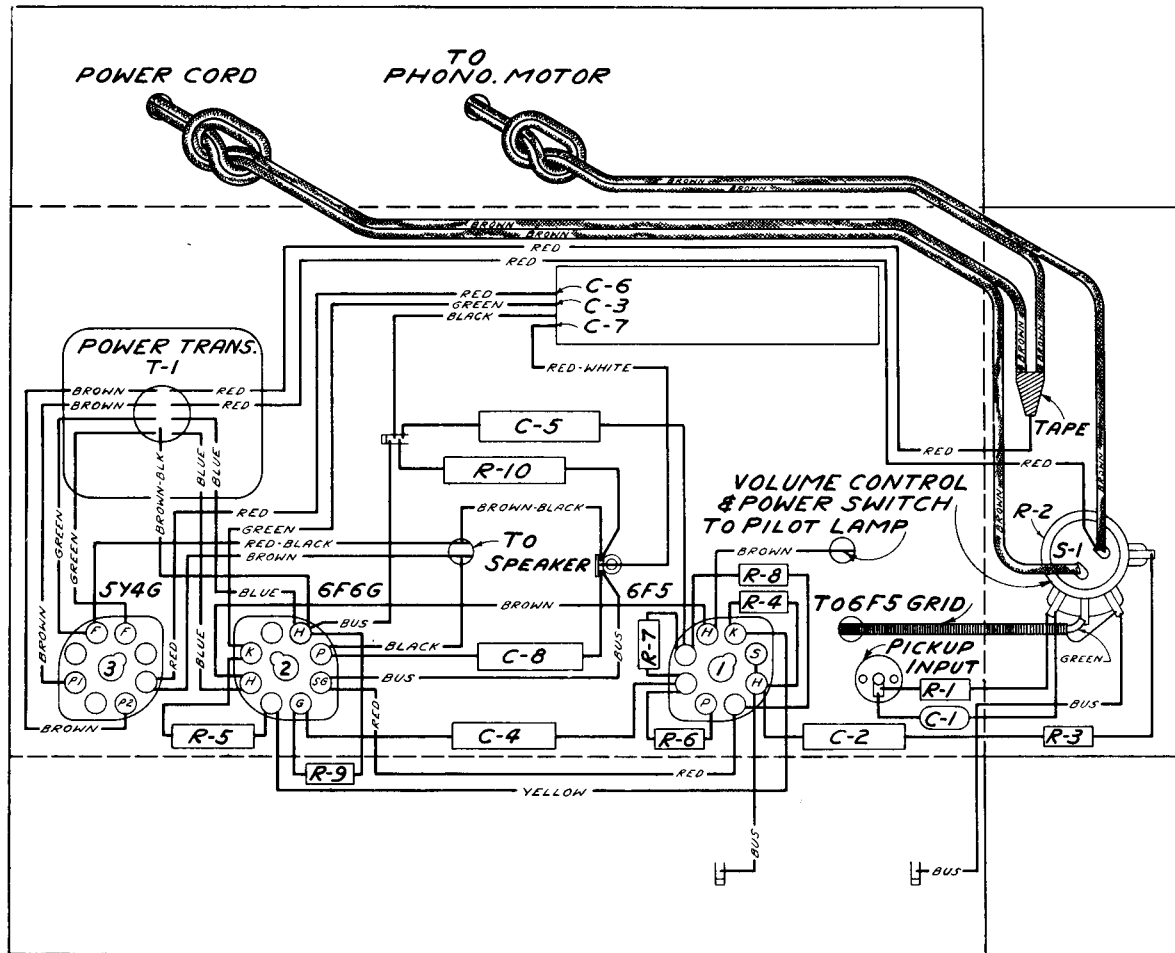


Figure 3—Chassis Wiring Diagram

Radiotron Socket Voltages

Type	Plate	Screen Grid	Control Grid	Filament
6F5	230V		—0.2V	6.3V
6F6G	250V	266V	—0.3V	6.3V
5Y4G	From Each Plate to gnd. 346V A.C.			5.0V

Note:—All the above voltage values should hold within $\pm 20\%$ when instrument is operated at its rated line voltage. To duplicate the conditions under which the voltages are measured, use a 1,000 ohm-per-volt d-c meter, having ranges of 10, 50, 250 and 500 volts. Use the nearest range above the specified measured voltage. A-C voltages were measured with a corresponding A.C. meter.

REPLACEMENT PARTS MODEL R-96

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		PICKUP ASSEMBLIES	
S-2301	Cap-Grid connector cap (Pkg.of 5)...	31050	Crystal-Pickup crystal cartridge....
12694	Capacitor-220 mmfd.(C1).....	32500	Mounting-Mounting washer and clip for pickup assembly.....
5107	Capacitor-.0025 mfd.(C4).....	31211	Pickup-Crystal pickup complete less mounting.....
5148	Capacitor-.007 mfd. (C2).....	31048	Plug-Pickup cable male plug.....
4937	Capacitor-.01 mfd. (C8).....	11547	Screw-Pickup needle screw (Pkg.10)..
4835	Capacitor-0.1 mfd. (C5).....		
S-2329	Capacitor-Electrolytic capacitor consisting of two 10 mfd.sections and one 20 mfd. section(C3,C6,C7)..	REPRODUCER ASSEMBLIES RL63H-505	
4573	Connector-Motor cable female connector.....	13866	Cap-Dust cap for reproducer cone (Pkg.of 10).....
5040	Connector-4 contact female connector for reproducer cable.....	11469	Coil-Hum neutralizing coil (L2).....
11891	Lamp-Pilot lamp.....	12012	Coil-Field coil (L3).....
14671	Resistor-33 ohms-1/4 watt (R4).....	31310	Cone-Reproducer cone and voice coil (L1).....
31388	Resistor-390 ohms-1 watt (R5).....	31302	Plug-4 contact male plug.....
S-2330	Resistor-900 ohms-15 watt (R10).....	31453	Reproducer-Reproducer complete.....
12738	Resistor-27,000 ohms-1/4 watt (R3).....	14358	Screw-Screw, washer and lock washer to hold core in yoke (Pkg.of 2)....
12263	Resistor-100,000 ohms,1/4 watt(R8).....	14355	Transformer-Output transformer (T2).....
13734	Resistor-120,000 ohms,1/4 watt (R6,R7).....	14357	Washer - Spring washer to hold field coil (Package of 5).....
11172	Resistor-470,000 ohms,1/4 watt (R9).....		
30208	Resistor-1.2 meg.-1/2 watt (R1).....	MISCELLANEOUS ASSEMBLIES	
11196	Socket-Radiotron socket.....	11762	Cup-Needle cup.....
31364	Socket-Pilot lamp socket.....	14269	Knob-Volume control knob.....
14278	Socket-Pickup socket.....	S-2328	Mounting - Motor mounting assembly consisting of mounting screws, washers, spacers and grommets sufficient for one motor.....
S-2331	Transformer-Power transformer 105/125 volt-25 cycle (T1).....	30306	Mounting - Amplifier chassis mounting assembly - (Package of 4).....
S-2332	Transformer-Power transformer 105/125 volt-80 cycle (T1).....	30100	Spring-Automatic brake latch springs - (Package of 10).....
S-2333	Volume control and switch (R2,S1)....		
MOTOR BOARD ASSEMBLIES			
S-2278	Brake-Automatic brake and switch assembly.....		
S-2285	Damper-Turntable damper plate and sleeve.....		
32558	Motor-105/120 volt-60 cycle motor less turntable and mountings.....		
32638	Motor-105/120 volt-25 cycle motor less turntable and mountings.....		
S-2268	Switch-Motor switch only (S50).....		
31463	Turntable-Motor turntable.....		

Parts peculiar to chassis marked "Sub 1"
Refer to above list for all other replacement parts.

Stock No.	Description	List Price
13894	Capacitor-390 mmfd. (C9).....	\$.49
4886	Capacitor-0.05 mfd. (C2).....	.28
S-1894	Resistor-5600 ohms, 1/4 watt (R3)....	.20



RCA Victor

RP-140

Automatic Record Changer

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL

Electrical Specifications

Type Automatic
Record Capacity Eight 10-inch or Seven 12-inch
Turntable Speed 78 R.P.M. (adjustable)
Type Pickup Crystal
Pickup Impedance 100,000 ohms at 1,000 cycles

POWER SUPPLY RATING

Rating A 115 volts 60 cycle
Rating B 115 volts 25 cycle

The RP-140 automatic record changer is used in a number of RCA Victor VR Victrola Models. Reference is made to this bulletin in the Replacement Parts Lists appearing in the Service Notes of the particular models in question.

The following service hints and adjustment details, appearing in this bulletin, should be followed to assure satisfactory operation of the mechanism.

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc., are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

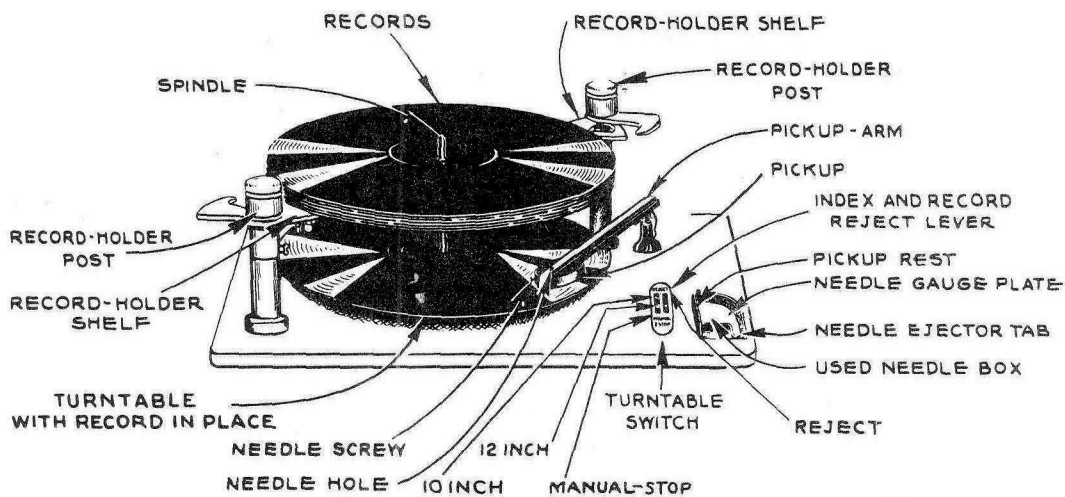
The 10 and 12 inch records must be absolutely flat for smooth operation.

A pickup shorting switch, located under the motor-board, operates when the pickup is moved outward to the pickup rest.

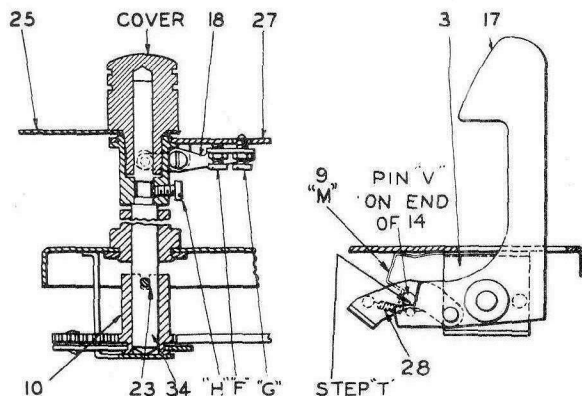
Miscellaneous Service Hints

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and the usual mis-adjustments will enable ready adjustment in most cases.

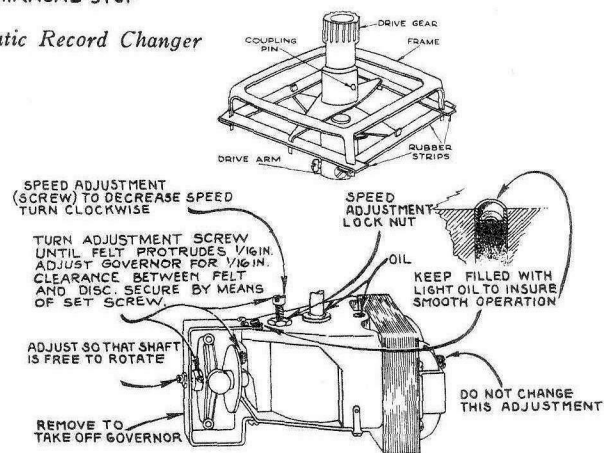
1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A".
2. Needle does not land properly on both 10 and 12 inch records — Make complete adjustments "O" and "E".
3. Needle does not land properly on 12 inch record but correct on 10 inch—Effect adjustment "E".
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B". Also, see that levers "7" and "12" are free to move without touching each other.
5. Pickup strikes lower record of stack and drags across top record on turntable—Adjust lift cable per adjustment "C".
6. Needle does not track after landing — Friction clutch "5" adjustment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pickup output cable twisted.
7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; flexible coupling between motor and changer mechanism not correctly assembled; or instrument is not being operated at normal room temperature (65° F).
9. Record knives strike edge of records—Records warped; record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H".
11. Needle lands in 10 inch position on 12 inch record or misses record when playing both types mixed —Increase tension of pickup locating lever spring "9".



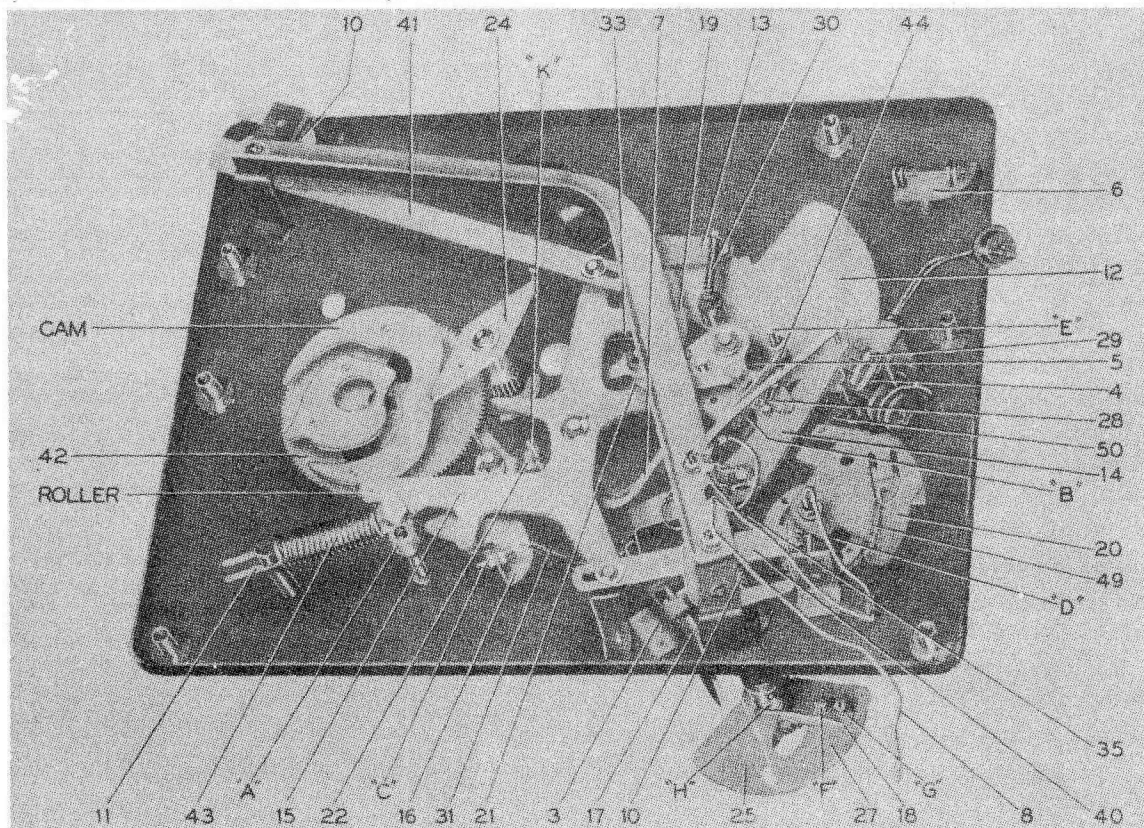
Top View of Automatic Record Changer



Details of Record Shelf Posts and Lever Assemblies



Motor Data and Coupling



Bottom View of Automatic Record Changer

NOTE: Numbers refer to parts—letters refer to adjustments.

Automatic Record Changer

(RP-140)

GENERAL INFORMATION

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc. are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

The turntable, spindle, and pinion gear are assembled by means of a 3/32 inch straight pin. This pin may be removed by gently driving with a standard pin punch.

If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

All records must be absolutely flat for smooth operation.

A pickup shorting switch, located under the motorboard, operates when the pickup is moved outward to the pickup rest.

ADJUSTMENTS

A. Main Lever.—This lever "15" is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. Rotate the turntable until the changer is out-of-cycle; and check rubber bumper bracket (A). The roller should clear the nose of the cam plate by approximately 1/16 inch.

B. Friction Clutch.—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5." If the motion of the pickup is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B." If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.

C. Pickup Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper elevation, stop the changer "in-cycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface.

D. & E. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10 inch record. Position of eccentric stud "E" governs the landing of the needle on a 12 inch record; this, however, is dependent on the proper 10 inch adjustment.

To adjust for needle landing, place 10 inch record on turntable; push index lever to reject position and return to the 10 inch position; see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is 4 7/8 inches from the nearest side of the turntable spindle; loosen the two screws "D" and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17." Leave approximately 1/32 inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone pointed screw "D."

After adjusting for needle landing on a 10 inch record, place 12 inch record on turntable; push index lever to reject

and return to 12 inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5 5/8 inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motorboard, otherwise incorrect landing may occur with 10 inch records.

F. & G. Record Separating Knife.—The upper plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the rotating record shelf "27" be accurately maintained. The spacing for the 10 inch record is nominally .055 inch, and for the 12 inch record is .075 inch.

To adjust, rotate the knife to the point of minimum vertical separation from the record shelf and turn screw and locknut "F" to give .052—.058 inch separation. Screw "G" must not be depressed during this adjustment. After setting screw "F," adjust screw "G" so that when its tip is depressed flush with top of record shelf, the vertical spacing between the knife, in its lowest rotational position, and the shelf, is .072—.078 inch.

H. Record Support Shelf.—The record shelf revolves during the change cycle to allow the lower record to drop onto the turntable. Both posts are rotated simultaneously by a gear and rack coupled to the main lever "15," and it is necessary that adjustment be such that the record is released from both shelves at the same instant. To adjust, place a 12 inch record on the turntable, rotate mechanism into cycle to the point where both separating knives have turned clockwise as far as the mechanism will turn them; lift record upward until it is in contact with both separating knives. Then loosen screws "H" and shift record shelves "27" so that the curved inner edges of the shelves are uniformly spaced approximately 1/16 inch from the record edge. Some backlash will be present in the rotation of these shelves. They should be adjusted so that the backlash permits them to move away from the record but not closer than the approximate 1/16 inch specified above. Tighten the blunt nose screw "H," run mechanism through cycle several times to check action, then tighten cone pointed screw "H."

If record shelves or knives are bent, or not perfectly horizontal, improper operation and jamming of mechanism will occur.

J. Tone Arm Rest Support (not shown).—When the changer is out-of-cycle, the front lower edge of the pickup head should be 5/16 inch above surface of motorboard. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers on underside of motor board.

The felt washer between the turntable and spindle bearing should be soaked in light engine oil whenever the turntable is removed, or as required for proper operation.

Do not allow oil or grease to come in contact with, rubber mounting of tone arm base, rubber bumper, or flexible coupling of drive motor.

REPLACEMENT PARTS FOR MODEL RP-140

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

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
PICKUP ARM ASSEMBLIES			
34011	Arm-Pickup arm shell.....	32879	Gear-Rack gear for front left hand record post (41).....
32556	Cable-Shielded pickup cable (8)...	32880	Gear-Rack gear for rear right hand record post (40).....
33905	Crystal-Pickup cartridge and needle screw.....	31121	Gear-Record post gear (10).....
34013	Pin-Used to fasten pivot arm in pickup arm shell (Pkg.5).....	33982	Guide-Main lever spring guide (11)
33529	Screw-Needle screw.....	34000	Lever-Index lever assembly (12)...
34012	Shaft-Pickup pivot shaft and pivot arm.....	31137	Lever-Index lever pawl (13).....
		34999	Lever-Locating lever and pawl assembly (14).....
MOTOR ASSEMBLIES		33985	Lever-Main lever assembly (15)....
31617	Bracket-Governor and bearing bracket.....	31140	Lever-Pickup lift cable lever and spring assembly (16).....
31624	Governor-Complete for 110 volt,25 cycle motor.....	34002	Lever-Record discriminating lever assembly (17).....
31623	Governor-Complete for 110 volt,60 cycle motor.....	31130	Lever-Record separator elevating lever and adjustment screws(18).
31448	Motor-Motor complete 25 cycle,110 volt (M1).....	34007	Lever-Mercury switch actuating lever (29).....
31163	Motor-Motor complete 60 cycle,110 volt (M1).....	31132	Lever-Trip detaining lever (19)...
30870	Plug-2 prong male A.C. plug.....	34014	Lever-Trip lever and cam assembly (20).....
31616	Screw-Rotor thrust bearing screw and nut.....	31131	Lever-Trip regulating lever (21)...
31620	Screw-Speed regulator screw and nut.....	34086	Link-Index lever link.....
31636	Spindle-Motor spindle and gear for 110 volt,25 cy.motor.....	31133	Pawl-Trip pawl assembly (22).....
31634	Spindle-Motor spindle and gear for 110 volt,60 cy.motor.....	31124	Pin-Record post drive pin (23) (Pkg.3).....
MOTORBOARD ASSEMBLIES		31535	Pin-Turntable spindle pin(Pkg.4)..
33998	Base-Pickup arm mounting base.....	4573	Plug-2 contact female A.C.plug....
33999	Cup-Used needle cup,lid and pickup arm rest (6).....	31147	Rubber-1 set of rubber strips for flexible coupling.....
33997	Escutcheon-Index escutcheon.....	31118	Screw-No.10-32 cone pointed set screw (Pkg.3).....
31150	Mounting-Pickup arm base rubber mounting complete.....	32869	Screw-No.10-32 set screw (Pkg.10).
31155	Spring-Used needle cup lid spring (Pkg.5).....	34001	Screw-Record separator elevator lever adjusting screw.....
34875	Switch-Pickup shorting switch(44).	33983	Screw-Record separator shelf elevating lever screw.....
OPERATING MECHANISM		14195	Screw-Set screw for flexible coupling (Pkg.2).....
33580	Arm-Drive arm and bushing for flexible coupling (motor end).....	31117	Screw-Trip lever and cam adjusting screw (Pkg.4).....
34009	Arm-Drive arm and gear for flexible coupling (T.T.end) (24).....	33990	Separator-Record separator knife (25).....
33984	Bracket-Pickup locating lever mounting bracket (3).....	33988	Shaft-Record post gear shaft(34)..
33987	Cam-Cam and drive gear assembly (42).....	33989	Shelf-Record Record post assembly(27)
6808	Clutch-Trip lever friction clutch assembly (5).....	31141	Spindle-Turntable spindle.....
31116	Finger-Trip lever friction finger assembly (7).....	3676	Spring-Cam pawl tension spring (Pkg.5).....
33581	Frame-Flexible coupling metal frame.....	31136	Spring-Index lever pawl spring (30) (Pkg.2).....
		32436	Spring-Locating lever and pawl spring (35) (Pkg.2).....
		32882	Spring-Main lever tension spring (43)(Pkg.2).....
		32868	Spring-Mercury switch cam spring (49) (Pkg.2).....
		3666	Spring-Pickup lift cable lever spring (31) (Pkg.3).....
		14190	Spring locating lever pawl spring (28) (Pkg.2).....
		33994	Spring-Pickup locating lever spring (9) (Pkg.2).....
		14191	Spring-Trip detaining lever spring (33) (Pkg.3).....
		34006	Support-Mercury switch support bracket and terminal board.....
		32866	Switch-Mercury switch (4).....
		34003	Turntable-Record turntable.....
		31143	Washer-Turntable shim washers one steel,one bronze,one felt.....



RCA Victor

RP152E

Automatic Record Changer

TECHNICAL INFORMATION AND SERVICE DATA

SERVICE DIVISION • RCA VICTOR COMPANY • LIMITED • MONTREAL

ELECTRICAL SPECIFICATIONS

Type Automatic
Record Capacity Eight 10 inch or Seven 12 inch
Turntable Speed 78 R.P.M. (Fixed)
Type Pickup Crystal
Pickup Impedance 100,000 ohms at 1000 cycles

POWER SUPPLY RATING

Rating A 115 volts, 60 cycle, 14 watts
Rating B 115 volts, 25 cycle, 14 watts

The RP152E automatic record changer is used in a number of Phonograph Models. Reference is made to this bulletin in the Replacement Parts List appearing in the Service Notes of the particular model in question.

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc., are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

When a record has been played the pickup moves out, another record is dropped down, and the needle is fed automatically into the starting groove of this record. If the needle fails to enter the starting groove, raise the right-hand side of the cabinet by inserting thin spacers under the feet on that side. If the needle slides over a few grooves, raise the left-hand side of the cabinet in a similar manner.

The 10- and 12-inch records must be absolutely flat for smooth operation.

A pickup shorting switch, located under the motor-board, operates when the pickup is moved outward to the pickup rest.

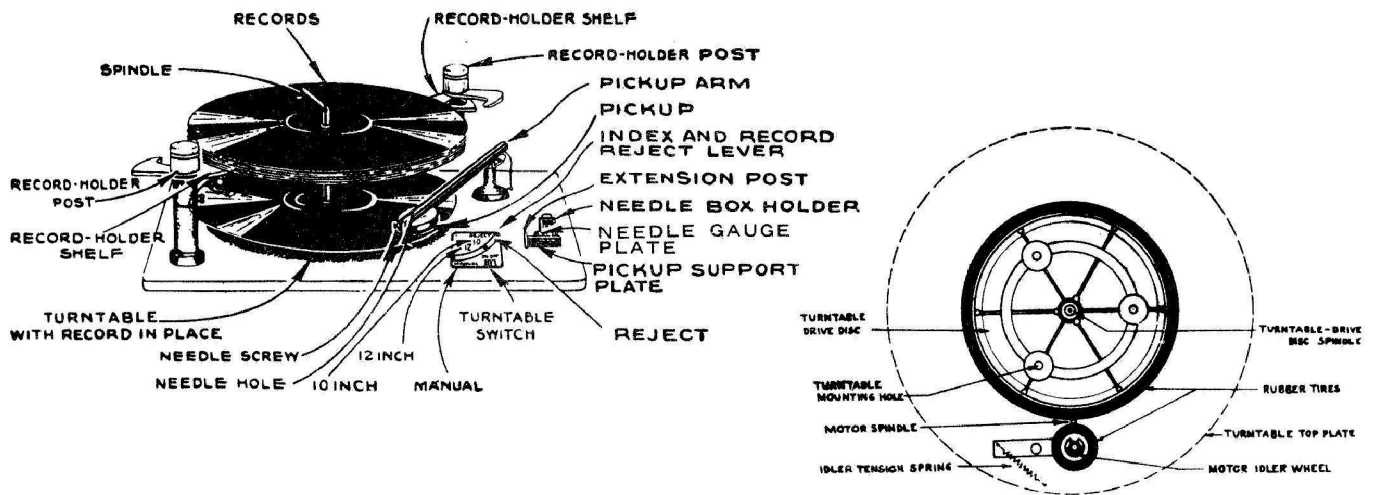
It is important that the drive motor spindle, and rubber tires on main driving disc and idler pulley be kept clean and free from oil, grease, dirt, or any foreign matter at all times. Any quick-drying naphtha is satisfactory for cleaning these parts. The drive motor bearing is lubricated from an oil well filled and sealed at the factory. It should not require lubrication in the field.

The rubber-tired drive disc is not removable from the spindle. The turntable is fastened to the driving disc by three bolts. If necessary to remove these parts the spindle drive gear set screw should first be removed. The driving disc, turntable and spindle assembly can now be lifted upward from the motorboard. If this is done, great care should be taken not to bend the spindle.

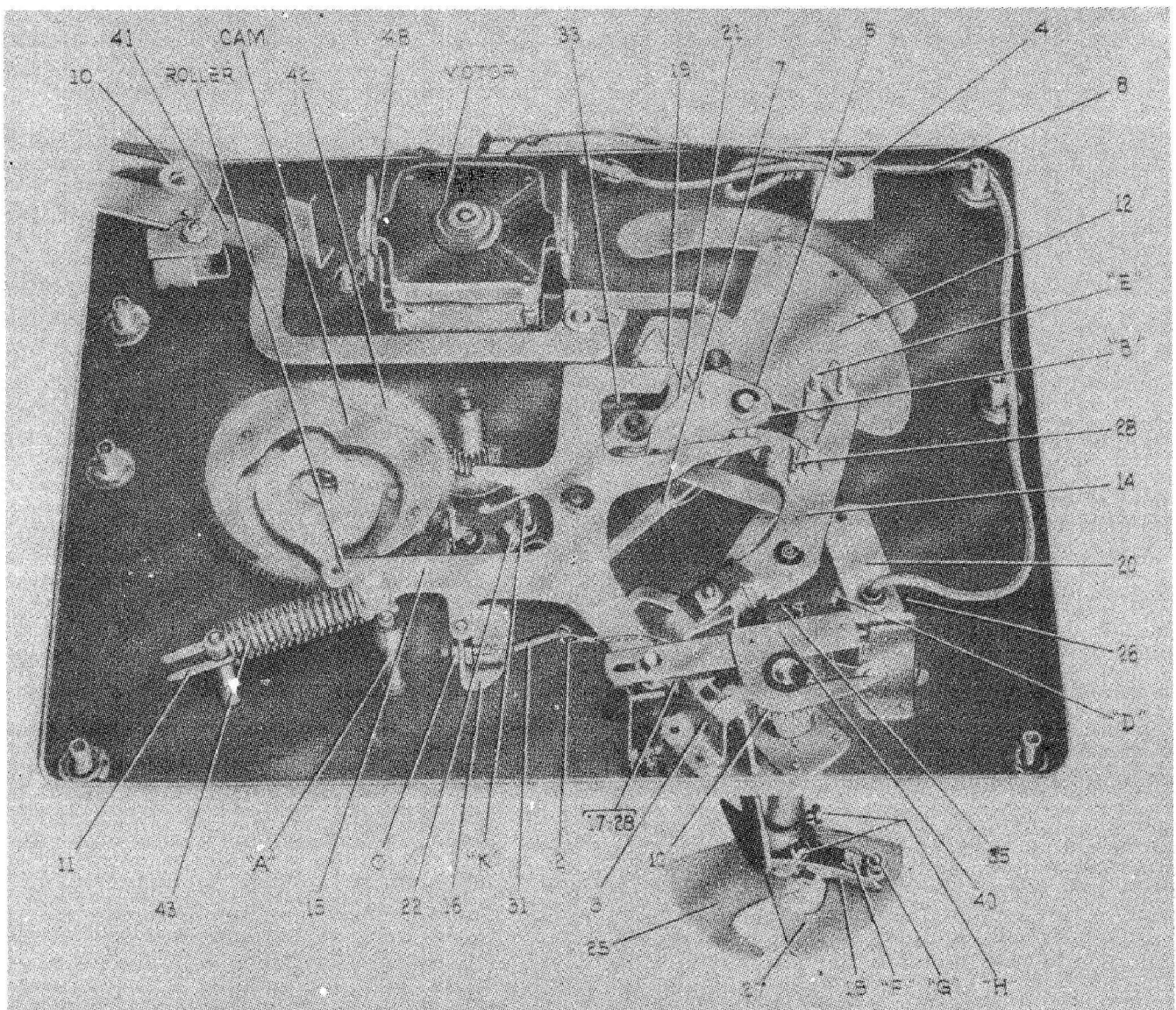
MISCELLANEOUS SERVICE HINTS

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and the usual misadjustments will enable ready adjustment in most cases.

1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A."
2. Needle does not land properly on both 10- and 12-inch records—Make complete adjustments "D" and "E."
3. Needle does not land properly on 12-inch record but correct on 10-inch—Effect adjustment "E."
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B." Also, see that levers "7" and "12" are free to move without touching each other.
5. Pickup strikes lower record of stack or drags across top record on turntable—Adjust lift cable per adjustment "C."
6. Needle does not track after landing—Friction clutch "5" adjustment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pickup output cable twisted.
7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; or instrument is not being operated at normal room temperature; oil, grease, dirt, or other foreign matter on motor spindle, main driving disc or idler pulley rubber tire. Clean with any quick drying naphtha.
9. Record knives strike edge of records—Records warped—record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H."
11. When playing both types of records mixed and needle either lands in 10-inch position on 12-inch record or misses record entirely—Increase tension of mixed record discriminating lever spring "M".



Motor Drive Details on RP-152 E.



Bottom View of RP-152 -E Automatic Record Changer
 Note: Numbers refer to parts—letters refer to adjustments.

ADJUSTMENTS

A. Main Lever.—This lever is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. Rotate the turntable until the changer is out-of-cycle; and check rubber bumper bracket (A). The roller should clear the nose of the cam plate by approximately 1/16 inch.

B. Friction Clutch.—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5". If the motion of the pickup is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B". If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.

C. Pickup Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper elevation, stop the changer "in-cycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface.

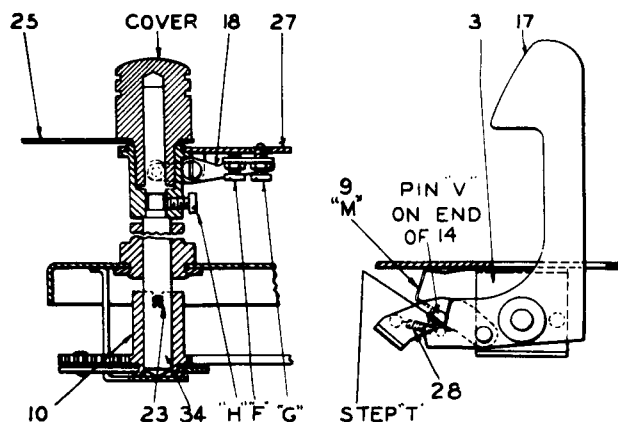
D. & E. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10-inch record. Position of eccentric stud "E" governs the landing of the needle on a 12-inch record; this, however, is dependent on the proper 10-inch adjustment.

To adjust for needle landing, place 10-inch record on turntable; push index lever to reject position and return to the 10-inch position; see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is $4\frac{7}{8}$ inches from the nearest side of the turntable spindle; loosen the two screws "D" and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17." Leave approximately 1/32-inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone pointed screw "D."

After adjusting for needle landing on a 10-inch record, place 12-inch record on turntable; push index lever to reject and return to 12-inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is $5\frac{7}{8}$ inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motorboard, otherwise incorrect landing may occur with 10-inch records.

F. & G. Record Separating Knife.—The upper plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the rotating record shelf "27" be accurately maintained. The spacing for the 10-inch record is nominally .058 inch, and for the 12-inch record is .078 inch.

To adjust, rotate the knife to the point of minimum vertical separation from the record shelf and turn screw and locknut "F" to give .055—.058 inch separation. Screw "G" must not be depressed during this adjustment. After setting screw "F," adjust screw "G" so that when its tip is depressed flush with top of record shelf, the vertical spacing between the knife, in its lowest rotational position, and the shelf, is .075—.078 inch.



H. Record Support Shelf.—The record shelf revolves during the change cycle to allow the lower record to drop onto the turntable. Both posts are rotated simultaneously by a gear and rack coupled to the main lever "15," and it is necessary that adjustment be such that the record is released from both shelves at the same instant. To adjust, place a 12-inch record on the turntable, rotate mechanism into cycle to the point where both separating knives have turned clockwise as far as the mechanism will turn them; lift record upward until it is in contact with both separating knives. Then loosen screws "H" and shift record shelves "27" so that the curved inner edges of the shelves are uniformly spaced approximately 1/16-inch from the record edge. Some backlash will be present in the rotation of these shelves. They should be adjusted so that the backlash permits them to move away from the record but not closer than the approximate 1/16 inch specified above. Tighten the blunt tipped screw "H," run mechanism through cycle several times to check action, then tighten cone tipped screw "H."

If record shelves or knives are bent, or not perfectly horizontal, improper operation and jamming of mechanism will occur.

J. Tone Arm Rest Support (not shown).—When the changer is out-of-cycle, the front lower edge of the pickup head should be 5/16 inch above surface of motorboard. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers and pulleys on underside of motorboard.

Do not allow oil or grease to come in contact with rubber bumper or rubber parts of the mechanism.

MOTOR SERVICE DATA

On the RP-152E drive motors a 0.014-inch feeler gage is recommended for centering the rotor in the field bore.

The field coils can be disassembled and reassembled if care is used in reassembling the field lamination block in a manner so that the dove tail joint will not be sprung.

When disassembling the rotor or rotor shaft bearing only, the field stacking should be held in a clamp to prevent the field springing when the bolts which hold the assembly together are loosened.

REPLACEMENT OF RUBBER TIRE

1. Remove old tire by stretching and pulling over drive disc edge.
2. Thoroughly clean drive disc to remove burrs or foreign particles.
3. Place new tire over the drive disc. Avoid any twisting or excessive stretching of the tire.
4. Roll disc and tire on a flat clean surface while simultaneously applying a slight downward pressure on the disc shaft. This will allow the tire to seat itself properly in the "V" shaped groove on the drive disc and take up for any uneven stretching of the rubber tire.
5. Clean the rubber tire with carbon tetrochloride or any quick drying naphtha.

The mechanism should be loaded with one record on the turntable to provide sufficient momentum during the record changing cycle.

If it is desired to play 10" and 12" records in mixed sequence, only flat unwarped records of uniform thickness should be used.

Replacement Parts for Model R P 152E

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

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
PICKUP AND ARM ASSEMBLIES			
36322	Arm-Pickup arm only less crystal, cable, pivot arm and shaft.....	31118	Screw No. 10-32 x 5/16 cone pointed set screw for record separator shelf ('H') (Pkg.2).....
36320	Arm-Pickup pivot arm and shaft less lift cable and rubber bushings....	32869	Screw No. 10-32 x 5/16 machine screw for record separator shelf(Pkg.10)
32635	Cable-Pickup lift cable.....	4563	Screw pickup lift cable adjusting screw(Pkg.3).....
35694	Cable-Pickup shielded cable.....	33983	Screw Record separator elevating lever point screw.....
37158	Crystal-Pickup crystal cartridge and needle screw.....	33990	Separator-Record separator knife(25)
		33988	Shaft-Record separator shaft (34)..
		33989	Shelf-Record separator rotating shelf less set screws.....
MOTOR ASSEMBLIES		33994	Spring-Flat spring for record discriminator lever (Pkg.2).....
36954	Armature-Motor armature and shaft for 25 cy. motor.....	32882	Spring-Main lever spring(43)(Pkg.2)
36255	Armature-Motor armature and shaft for 60 cy. motor.....	36580	Spring-Idler tension spring(Pkg.2).
36952	Cap-Bakelite cap for motor.....	36278	Spring-Pickup arm feed spring.....
36955	Capacitor-1.1 mfd for 60 cy. motor.	3666	Spring-Pickup lift cable spring(31)(Pkg.3).....
36951	Capacitor-1.25 mfd for 25 cy.motor (2 req'd).....	14190	Spring-Record discriminating lever pawl spring (28) (Pkg.2).....
36726	Motor-105-125 volts 25 cy.complete.	3676	Spring-Tension spring for cam pawl (Pkg.3).....
36254	Motor-105-125 volts 60 cy.complete.	32436	Spring-Tension spring for locating lever and pawl (35) (Pkg.2).....
OPERATING MECHANISM		36921	Spring-Tension spring for trip detaining lever (Pkg.4).....
10129	Ball-Steel ball for spindle shaft (Pkg.5).....	36279	Spring-Tension spring for trip pawl (Pkg.5).....
36277	Bumper-Main lever rubber bumper....	36271	Stud-No.4-40 Hex stud for trip lever clutch adj. (Pkg.2).....
33987	Cam-Cam and drive gear complete(42)	34875	Switch-Pickup shorting switch.....
36266	Clutch-Trip lever clutch less adjusting stud (5).....	37873	Tire-Rubber tire for turntable drive disc.....
36282	Disc-Turntable drive disc,rubber tire,and spindle shaft assembled-less turntable plate.....	36283	Turntable-Finished top plate only..
36265	Finger-Trip lever friction finger(7)	8078	Washer-Spring washer for record discriminator lever (Pkg.2).....
31121	Gear-Record separator shaft gear(10)	2917	Washer-Spring washer for mounting levers (Pkg.4).....
36280	Gear-Turntable shaft drive gear....	36274	Wheel-Motor idler wheel and bearing less arm.....
33982	Guide-Main lever spring guide(11)..	MOTORBOARD ASSEMBLIES	
31151	Guide-Pickup lift cable guide(spring) (2).....	36262	Cup-Used needle(insert in pickup rest).....
36273	Lever-Locating lever and pawl.....	36258	Escutcheon-Index escutcheon.....
33985	Lever Main Lever (15).....	36260	Gauge-Pickup needle gauge.....
31140	Lever Pickup lift cable lever and spring (16).....	34368	Grommet-Rubber grommet for motor mounting (Pkg.2).....
31132	Lever-Trip detaining lever (19)....	36263	Plate-Turntable shaft support and spring plate.....
31133	Pawl-Trip pawl (22).....	30870	Plug-2 contact male plug for motor leads.....
36268	Pin-Pin to fasten gear to separator shaft (23).....(Pkg.2).....	36379	Rest-Pickup arm rest.....
36267	Rack-Long arm and gear (41).....	32875	Switch-A.C. switch.....
32880	Rack-Short arm and gear (40).....		
36281	Ring-Retaining ring for set screw in turntable drive gear (Pkg.5)...		
36477	Screw-No.6-32 ball point screw for record separator elevating lever..		
36276	Screw-No.6-32 x 3/8 cup point set screw for turntable drive gear (Pkg.5).....		

S U P P L E M E N T A R Y D A T A

This section contains changes and additions to the original issues of the Service Notes which are reproduced in this volume.

Refer to the Model Index (Page 2) for reference to Service Notes and Supplementary data shown below.

(A) MODELS A-1, A-2

Additional Replacement Parts:

Stock No.
33719 Belt - Tuning unit belt and eyelet assembly
Parts peculiar to chassis stamped Sub.2
34270 Dial Scale - (Model A-1)
S-2645 Dial Scale - (Model A-2)

(B) MODEL A-8

Additional Replacement Parts:

Stock No.
S-2622 Coil-"A" band detector coil (L12, L13)
31264 Coil-Spread band antenna coil (L1, L2, L3, L4, L5)

(C) MODEL VR-3

Additional Replacement Part:

Stock No.
S-2302 Capacitor-Electrolytic capacitor comprising two 5 mfd. sections (C18, C19)

(D) MODEL VR-8

Additional Replacement Parts:

Stock No.
S-2651 Dial-Station selector dial scale
Speaker plug connections for this model are shown in Service Note for VR-10

(E) MODEL VR-50

Additional Replacement Part:

Stock No.
12478 Resistor-150,000 ohm 1/10 watt (R11)

(F) MODEL DUETTE

Additional Replacement Part:

Stock No.
35348 Capacitor-Electrolytic comprising one 30 mfd. and 20 mfd. section (C25, C30)

(G) MODEL PICK-ME-UP PORTABLE

Additional Replacement Parts:

Stock No.
S-2679 Coil-Oscillator Coil (L1, L2)
S-2643 Cone-Speaker cone (L7)

(H) MODEL PORTETTE

Additional Replacement Parts:

Stock No.
33010 Knob-Volume control or tuning knob
12827 Plug-3 contact male plug for "B" leads

(I) MODEL COMMANDER AUTO RADIO

Additional Replacement Parts:

Stock No.
35253 Cable - Power cable and plug
S-2987 Coil - Antenna Filter Coil
32989 Screen-Speaker grille screen
36161 Insert-Push arm insert

(J) MODEL CRUISER AUTO RADIO

Additional Replacement Parts:

Stock No.
S-2987 Coil - Antenna filter coil
36161 Insert-Push arm insert

(K) MODEL IMPERIAL AUTO RADIO

Additional Replacement Parts:

Stock No.
35253 Cable-Power cable and plug
32989 Screen-Speaker grille screen
36161 Insert-Push arm insert

(L) MODEL ROYAL AUTO RADIO

Additional Replacement Parts:

Stock No.
30782 Cone-Speaker cone (with fibre suspension assembly)
35913 Cone-Speaker cone (for use with metal suspension assembly)
36161 Insert-Push arm insert
Speaker Assemblies (CRL-503-2)
Peculiar to chassis stamped Sub.1)
S-2415 Coil - Field coil (L14)
S-2375 Cone-Speaker cone and voice coil (L17)
S-2416 Speaker complete
S-2417 Transformer-Output (T2)

(M) MODELS V-1 and VR-40

Additional Replacement Parts:

Stock No.
S-3038 - Set of 25 cycle Motor Coils
S-3039 - Set of 60 cycle Motor Coils

(N) MODEL RP-152E RECORD CHANGER MECHANISM

Additional Replacement Parts:

Stock No.
34550 Bushing-Rubber bushing for pickup pivot arm
32556 Cable-Shielded pickup cable and plug, connects to shorting switch
33529 Screw-Needle screw.

(O) MODEL VR-41

Additional Replacement Parts:

Stock No.
S-3261 Arm-Drive wheel arm (1 set) for 25 cycle
S-3262 Plate-Plate with turntable bearing for 25 cycle motor
S-3263 Spring-Idler tension spring for 25 cycle motor (Pkg.2)

(P) MODEL A-34

Additional Replacement Parts:

(Used on some production)

Stock No.

S-3040 Coil-Antenna coil (For use with Rodtenna)

31572 Socket-Female Socket 3 contact (For use with Rodtenna)

S-2447 Socket-A.C. Socket (Round type)

(R) MODEL VICTORETTE

Additional Replacement Parts:

Speaker Assemblies (CRL-503-1)

(Peculiar to chassis stamped (Sub.1)

Stock No.

S-2387 Coil-Field coil (L11)

S-2775 Cone-Speaker cone and voice coil (L17)

S-2388 Speaker complete

S-2389 Transformer-Output (T2)

(S) MODEL 94BT-1

Additional Replacement Parts:

Speaker Assemblies CRL-500-1

Peculiar to chassis stamped (Sub.1)

Stock No.

S-2375 Cone-Speaker cone and voice coil (L17)

S-2376 Speaker complete

S-2377 Transformer-Output (T1)

(T) MODELS A-1 and A-2 PUSH BUTTON ASSEMBLY

When trouble is experienced with Models A-1 and A-2 push button assemblies due to the rotor shaft belts breaking, the following procedure should be followed to replace the belts:-

It is advisable to replace all six belts wherever possible to eliminate possible breakage to the other belts in the near future.

Stock #33719 Belt and Eyelet Assembly is supplied in a package of two.

When renewing belts, proceed thus:-

Spread the outer yoke of assembly and remove roller. Support shaft by placing wood block under the yokes. Care should be taken to see that no strain is taken by condenser bearings. Using a small punch, drive eyelet out of roller by turning same upside down and resting on yoke. Then drive eyelet out of rotor bar.

TO ASSEMBLE:

Put eyelet through center hole of belt and insert in hole on flat side of rotor bar. Then drive supporting actuator as above. Bring loose ends of belt together to form a loop lining up two end holes. Put eyelet through the two holes (overlapped) and insert in hole on flat side of roller. Rest roller on supported yokes and drive eyelet home. Spread outer yoke to insert roller completing operation.

(V) MODEL MASTER NIPPER

Additional Replacement Parts:

Stock No.

S-2375 Cone-Speaker cone (L7)

35348 Capacitor-Electrolytic capacitor comprising one 30 mfd. section and one 20 mfd. section 60 cycle (C18, C19)

(W) MODELS ROYAL, CRUISER, IMPERIAL and COMMANDER

A Special Push-arm insert is available to take care of stripped threads on the push button mechanism on these models. This insert is identified by Stock No. 36161.

(Y) MODEL V-3

Additional Replacement Part:

Stock No.

38395 Plate - Motor bottom plate

(Z) MODEL RP-152E RECORD CHANGER

Centering Motor Rotor.

Should centering of the motor rotor be necessary it may be accomplished quickly in the following manner:-

- (1) Remove the two long machine screws and lift off plastic end cover.
- (2) Loosen the two remaining screws sufficiently to permit adjustment of stator laminations.
- (3) Insert a .014 inch shim between the rotor and each of the four stator field poles. Rotor should now be equidistant from each pole, and accurately centered.
- (4) Tighten screws and replace plastic cover.

* * * *