



RCA Victor

MODEL VRA-241

Eleven-Tube, Six-Band, A-C, Superheterodyne Radio Phonograph Combinations

TECHNICAL INFORMATION AND SERVICE DATA

— 1946 No. 11 —

SERVICE DIVISION • RCA VICTOR COMPANY LIMITED • MONTREAL



Electrical and Mechanical Specifications

FREQUENCY RANGE

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 455 k.c.

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycle, 190 watts
Rating B	105-125 volts, 25-60 cycle, 190 watts

LOUDSPEAKERS

Type CRL-529-1	Electrodynamic 12 inch
Type RL71A-4	Permanent Magnet Dynamic 12 inch
Voice Coil Impedance (both) at 400 C.P.S.	2.2 ohms

CABINET DIMENSIONS (inches)

	Height	Width	Depth
VRA-241	36 $\frac{1}{2}$	38	19

RADIOTRON COMPLEMENT

(1) Type 6SK7	R.F. Amplifier
(2) Type 6SA7	First Detector-Oscillator
(3) Type 6SK7	Intermediate Amplifier
(4) Type 6H6	2nd Det. and A.V.C.
(5) Type 6SF5	1st A. F. Amplifier
(6) Type 6U5	Tuning Indicator
(7) Type 6AD7G	Phase Inverter & Output
(8) Type 6F6G	Power Output
(9) Type 6F6G	Power Output
(10) Type 6F6G	Power Output
(11) Type 5U4G	Full Wave Rectifier

POWER OUTPUT

Undistorted	20 watts
Maximum	24 watts

PHONOGRAPH

Type (RP160C)	Automatic
Record Capacity	Twelve 10 inch or Ten 12 inch
Turntable Speed	78 R.P.M.

PICKUP

Type	Crystal
Pickup Impedance	75,000 ohms at 1,000 cycles
Motor	Self starting, constant-speed, induction type

General Description

RCA Victor Model VRA-241 is a DeLuxe radio phonograph combination housed in console cabinets of exceptional beauty. The receiver employs an eleven tube, six band, superheterodyne circuit, the arrangement of which is shown in the schematic circuit diagram. Features of design include: Adjustable loop antenna; High gain R.F. Stage; Stabilized oscillator circuit; Magnetite core I.F. Transformers; Magnetite core oscillator coils; Automatic volume control circuit;

Tuning indicator tube; Illuminated band indicator; Full range variable tone control; Push button tuning of seven Standard Broadcast stations by means of preset oscillator coils; Push-Pull Parallel output stage; Two 12 inch dust proof dynamic loudspeakers. The phonograph consists of Type RP160C Automatic record changer mechanism and a crystal pickup.

Reference to the RP160C Service Notes will disclose adjustment details and a parts list.

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; 2nd detector and A.V.C. stage. An audio circuit comprising a driver stage operating into an inverter is used to develop the high signal voltage required to obtain full output from the push-pull parallel output tubes; 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 capacitors for tuning the oscillator coils. Antenna and detector 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.

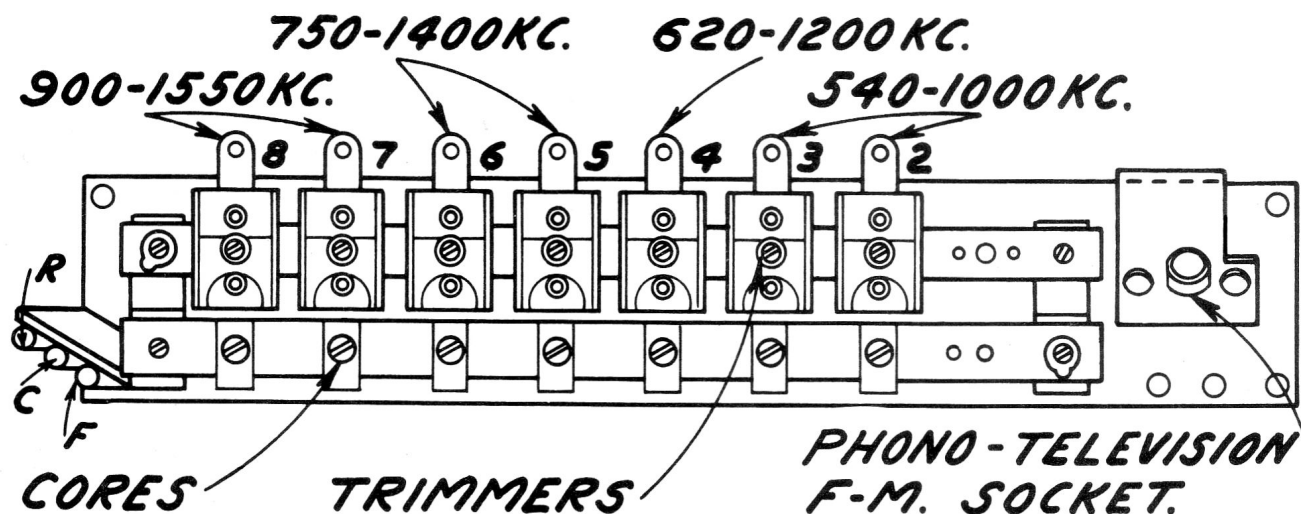


Fig. 1

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 1, 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.

Button No. 1 is used for Phonograph operation only.

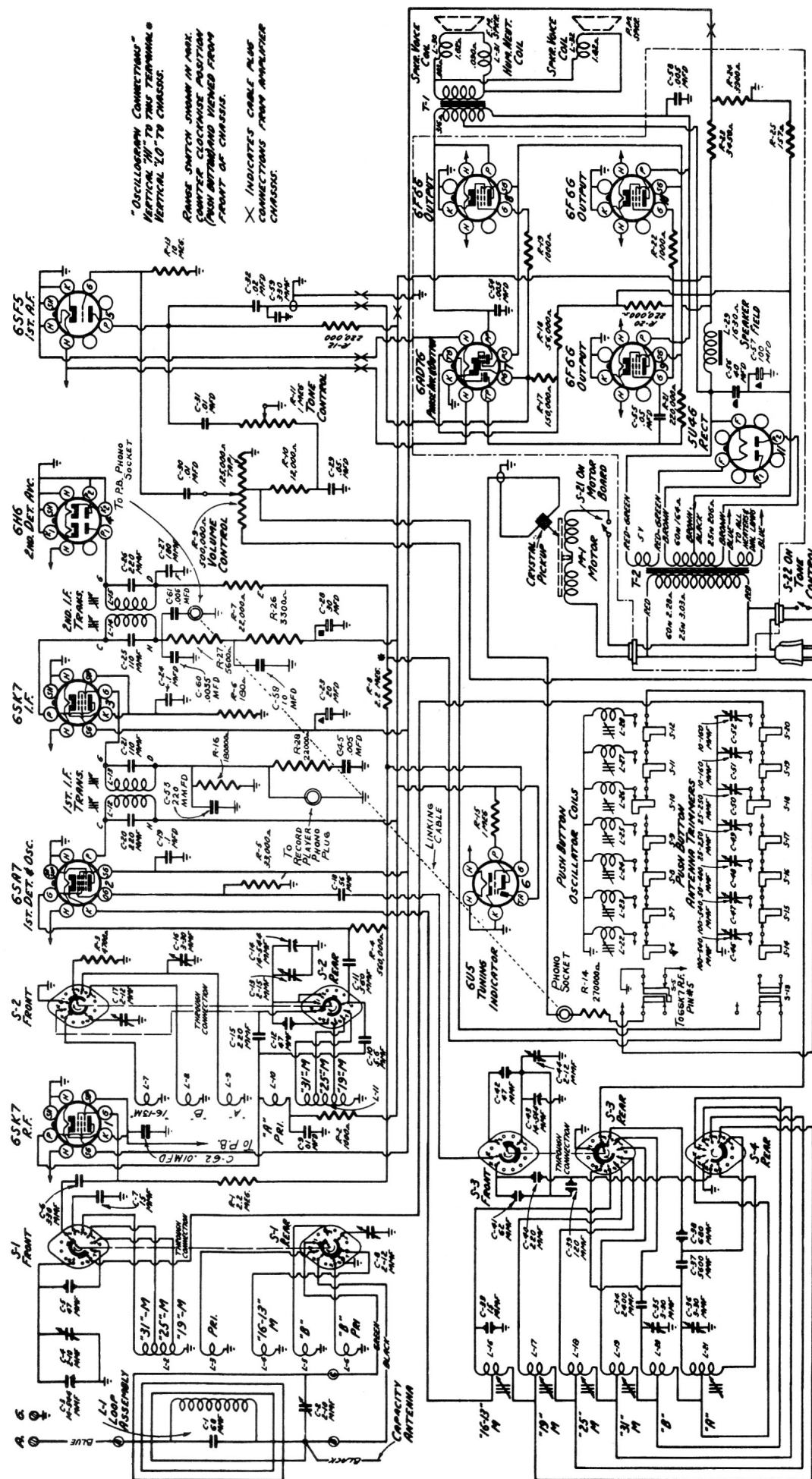


Fig. 2—Schematic Circuit Diagram

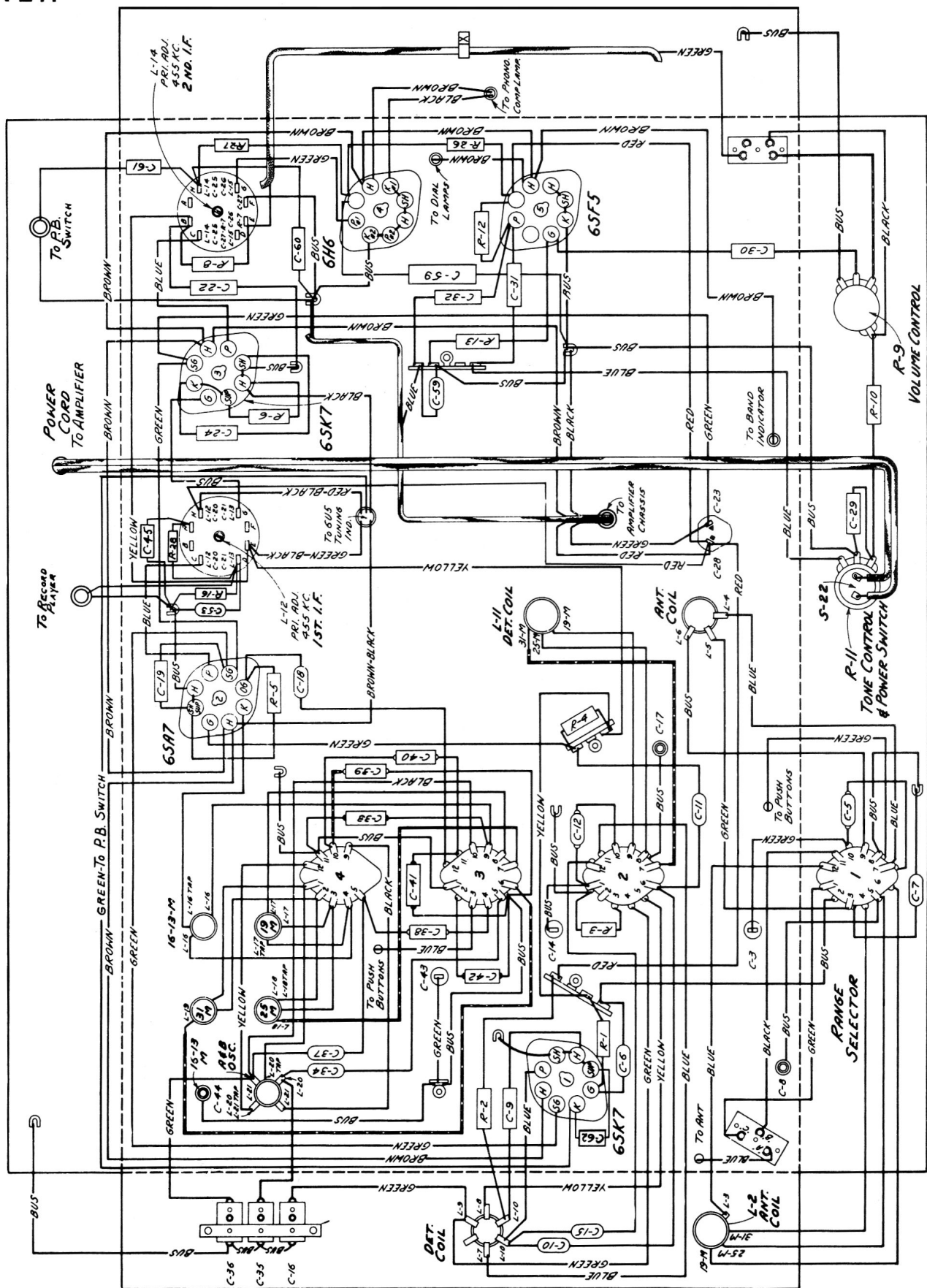


Fig. 3—Chassis Wiring Diagram

Radiotron Socket Voltages

Type	Circuit	Plate	Screen Grid	Cathode	Heater
6SK7	R.F.	190 v.	85 v.	—	6.3 v. A.C.
6SA7	Converter	190 v. 8	85 v.	—	6.3 v. A.C.
6SK7	I.F.	190 v.	85 v.	—	6.3 v. A.C.
6SF5	1st Audio	95 v.	—	—	6.3 v. A.C.
6AD7G	(Inverter & Output)	288 v.	188 v.	18 v.	6.3 v. A.C.
6F6G	Output	288 v.	188 v.	18 v.	6.3 v. A.C.
6F6G	Output	288 v.	188 v.	18 v.	6.3 v. A.C.
6F6G	Output	288 v.	188 v.	18 v.	6.3 v. A.C.
5U4G	Rectifier	366 A.C. Volts per plate		Rectified output 290 volts Heater 5. v. A.C.	

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.

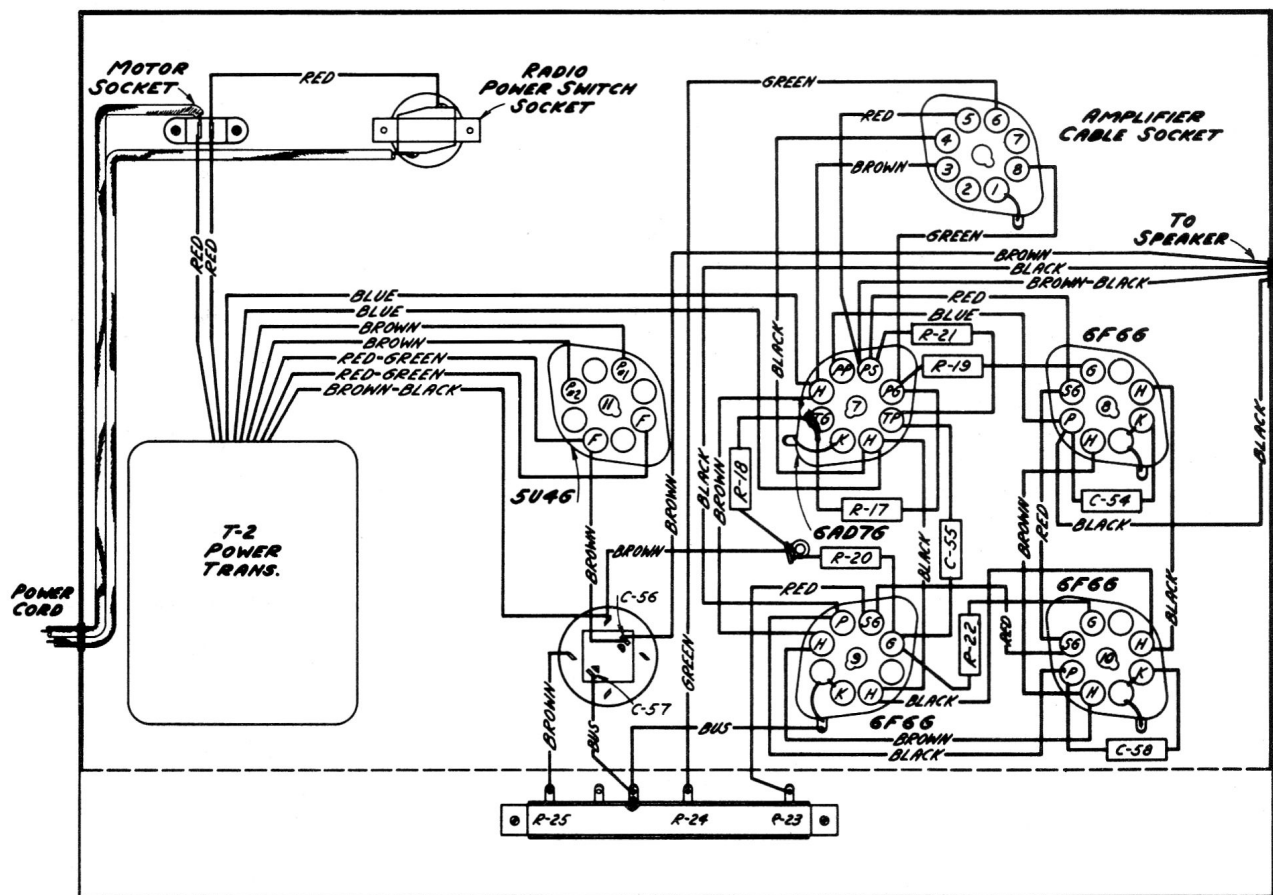
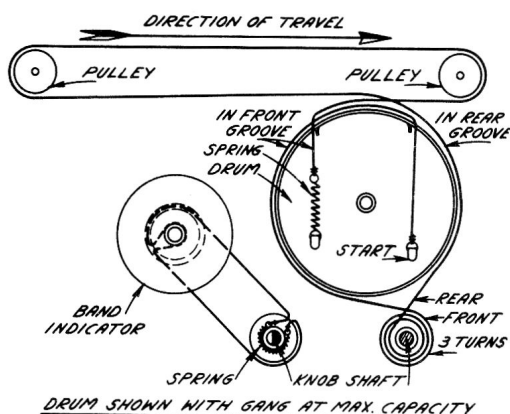


Fig. 6—Amplifier Wiring Diagram

Service Data



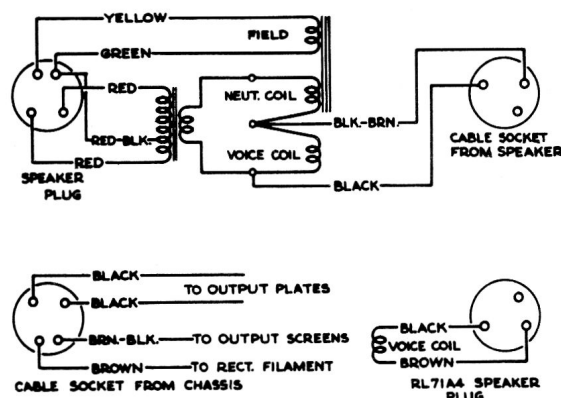
Drive Cords

Synchronizing Speakers.—In order to get correct tone quality from the dual-speakers used in this model, it is essential that the two speakers be so connected that the diaphragms of both work in unison or synchronism. If the terminals of one speaker are reversed the tone of the set will be flat.

To test for proper connections, turn on receiver with volume down and connect the terminals of a 1½-volt dry cell across the voice coil-terminals of either one of the speakers. If the diaphragms move in or out together at the instant of contact, the speaker connections are O.K. If one moves out and the other moves in, they are bucking, and the voice coil leads of one of the speakers should be reversed.

The movement of the diaphragms may be observed visually or by placing the finger-tips on each cone to feel the movement.

Adjusting Speaker Cone.—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.



Connections and Colours of Loudspeaker and 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-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-beating against standard broadcast stations.

REPLACEMENT PARTS FOR MODEL VRA-241

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 & Ground Terminal Board.....	35017	Capacitor-Electrolytic one section 20 mfd., one section 30 mfd. (C23,C28).....
12714	Capacitor-Adjustable trimmer 2-12 mfd. (C8,C17,C44).....	S-2878	Coil-Antenna "B", 16-13 M. Bands (L4,L5,L6).....
34783	Capacitor-Adjustable trimmer capacitor bank C16,C35,C36.....	S-2878	Coil-Antenna coil 31-25-19 M. Bands (L2,L3).....
12814	Capacitor-5.6 mmfd (C10).....	S-2879	Coil-R.F.Coil "A", "B" 16-13 M. Bands (L7,L8,L9,L10).....
12896	Capacitor-15 mmfd. (C7).....	S-2880	Coil-R.F.Coil 31-25-19 M Bands (L11).....
36012	Capacitor-15 mmfd. (Temp.Comp.)(C33)	S-2881	Coil-Oscillator coil 19 M Bands (L17).....
S-3008	Capacitor-47 mmfd.(Close Tol.) (C5,C47).....	S-2882	Coil-Oscillator coil 25 M Bands (L18).....
35644	Capacitor-47 mmfd.(Temp.Comp.)C42.....	S-2883	Coil-Oscillator coil 31 M Bands (L19).....
12723	Capacitor-56 mmfd.(" ")(C18)	S-2884	Coil-Oscillator coil 16-31 M Bands (L16).....
S-3123	Capacitor-62 mmfd.(" ")(C41)	S-2885	Coil-Oscillator coil "A" and "B" Bands (L20,L21).....
39624	Capacitor-68 mmfd.(On Loop Ant.) (C1).....	S-2898	Condenser-3 Gang Variable Condenser (C3,C4,C13,C14,C43).....
S-3100	Capacitor-120 mmfd.(Close Tol.)(C39)	S-2897	Cord-Indicator pointer drive cord 53.5 Lg.....
12694	Capacitor-220 mmfd.(" ")(C15)	32634	Cord-Band indicator drive cord....
S-2895	Capacitor-220 mmfd.(" ")(C40)	31273	Drum-Drive cord drum assembly....
12952	Capacitor-330 mmfd.(" ")(C6,C59).....	S-2927	Drum-Band indicator drive cord drum.....
12537	Capacitor-560 mmfd.(Close Tol.)(C11)	S-2886	Indicator-Station selector indicator pointer.....
S-2988	Capacitor-680 mmfd.(" ")(C38)		
12951	Capacitor-2400 mmfd.(" ")(C34)		
13895	Capacitor-5600 mmfd.(" ")(C37)		
14393	Capacitor-.01 mfd.(C9,C30,C31).....		
36248	Capacitor-.02 mfd. (C32).....		
32787	Capacitor-.05 mfd. (C22,C29).....		
4839	Capacitor-.1 mfd. (C19,C24).....		

All parts and prices subject to change or withdrawal without notice.

REPLACEMENT PARTS FOR MODEL VRA-241-Cont'd

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

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
S-2928	Indicator-Band indicator Ass.....		SPEAKER ASSEMBLIES
31480	Lamp -Dial lamp Mazda #47.....		(12" Electrodynamic CRL 529-1)
5117	Lamp-Phono compartment Lamp		
	Mazda #55.....	13867	Cap-Speaker cone dust cap(Pkg.5)..
S-3415	Plug-Chassis amplifier connector	S-3376	Coil-Field coil (L29).....
	cable plug 8 pin.....	36145	Cone-Speaker cone and voice coil
30870	Plug-Pilot lamp connector plug		(L30).....
	(Male 2 pin).....	5039	Plug-4 prong male plug.....
31280	Pulley-Drive cord pulley.....	S-3377	Speaker-complete.....
30929	Resistor-270 ohm 1/2 watt (R6)...	36371	Transformer-Output (T1).....
14720	Resistor-1000 ohm-1/4 watt (R2)...		SPEAKER ASSEMBLIES
30146	Resistor-4700 ohm-1/4 watt (R3)...		(RL 71A-4 Permanent Magnet
30436	Resistor-12,000 ohm-1/4 watt(R10)		Dynamic)
30685	Resistor-33,000 ohm-1/4 watt(R5)...	13867	Cap-Speaker cone and dust cap
14583	Resistor-220,000 ohm-1/4 watt(R12)		(Pkg.5).....
12486	Resistor-560,000 ohm-1/4 watt(R4)	36145	Cone-Speaker cone and voice coil
13730	Resistor-1. megohm-1/10 watt(R15)		(L32).....
12679	Resistor-2.2 megohm-1/4 watt(R1,	5118	Plug-3 contact Male Plug.....
	R3).....	36372	Speaker complete.....
30992	Resistor-10. megohm-1/4 watt.....		AUTOMATIC RECORD CHANGER PICKUP & MECHANISM
35969	Retainer-Drive cord Pulley Re-		REFER TO RP160-C Service Note for
	tainer-(Pkg.5).....		Pickup and Mechanism Replacement
S-2888	Shaft-Station selector drive shaft		Parts and Service Details.
31364	Socket-Dial lamp socket.....		PUSH BUTTON ASSEMBLY
36422	Socket-Loop Antenna socket (3		
	contact).....	S-3409	Cable-shielded cable less plug....
30868	Socket-Pilot lamp connector sock-	30303	Capacitor-.0035 mfd. (C53).....
	et (2 contact).....	5148	Capacitor-.007 mfd. (C45).....
38853	Socket-Push button cable socket	S-2930	Capacitor-Trimmed-Bank (C46,C52)..
	(4 contact).....	35803	Coil-Oscillator coil (L22 to L28).
31251	Socket-Socket-Tube socket.....	35871	Core-Oscillator coil core.....
30585	Spring-Band indicator drive cord	S-3179	Plug-4 pin cable plug.....
	spring (Pkg.2).....	30651	Resistor-270,000 ohm 1/2 watt
13638	Spring-Drive cord tension spring		(R14,R16).....
	(Pkg.2).....	14278	Socket-Phono input socket.....
S-2929	Switch-Range switch(S1,S2,S3,S4).	S-3049	Switch-Push button switch only S5
S-2892	Tone control and power switch		to S20.....
	(R11,S22).....		MISCELLANEOUS ASSEMBLIES
S-2899	Transformer-1st I.F.Transformer		
	(L12,L13,C20,C21).....	35883	Button-Station selector push
S-2900	Transformer-2nd I.F.Transformer		button.....
	(L14,L15,C25,C27,R7).....	S-2913	Dial-Station selector dial scale..
S-2906	Volume Control (R9).....	36246	Holder-Needle package holder.....
		13103	Jewel-Compartment lamp jewel.....
	AMPLIFIER ASSEMBLIES	34489	Knob-Volume,tone,range or tuning
33640	Capacitor-.005 mfd.(C54,C58)....		knob.....
32787	Capacitor-.05 mfd. (C55).....	S-3410	Loop-Antenna loop assembly.....
35016	Capacitor-Electrolytic,one sec-	36149	Marker-Push button call letter
	tion 40 mfd.one section 100 mfd.		markers.....
	(C56,C57).....	32641	Plug-Loop Antenna plug.....
14720	Resistor-1000 ohm 1/4 watt	14270	Spring-Knob retaining spring(Pkg.
	(R19,R22).....		2).....
30650	Resistor-56,000 ohm 1/4 watt(R18)	34053	Spring-Push button retaining spring
14020	Resistor-150,000 ohm 1/4 " (R17)		(Pkg.5).....
14583	Resistor-220,000 ohm 1/4 " (R20,R21).....	S-2542	Tool-Push button set-up tool.....
36618	Resistor-Wirewound voltage divide		
	(R23,R24,R25).....		
S-2824	Socket-A.C. Outl.t.....		
S-3414	Socket-Power switch socket.....		
5040	Socket-Speaker connector socket		
	(4 contact).....		
31319	Socket-Tube socket.....		
S-3393	Transformer Power-115 volts,T2,		
	50/60 cycle.....		
36977	Transformer-Power 115 volts,		
	25/60 cycle (T2).....		

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