



RCA Victor

MODEL VR-245

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

TECHNICAL INFORMATION AND SERVICE DATA

1946 No. 6

SERVICE DIVISION

RCA VICTOR COMPANY LIMITED

MONTREAL



Electrical and Mechanical Specifications

FREQUENCY RANGES

Standard Broadcast (A)	540-1,570 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.

Intermediate Frequency	455 k.c.
Tuning Drive Ratio	12:1

RADIOTRON COMPLEMENT

(1) Type-6SA7	First Detector-Oscillator
(2) Type-6SK7	Intermediate Amplifier
Pilot Lamps (2)	

R. F. ALIGNMENT FREQUENCIES

31 M (31 Meters)	9,550 k.c. (osc., ant.)
25 M (25 Meters)	11,800 k.c. (osc.)
19 M (19 Meters)	15,200 k.c. (osc.)
Standard Broadcast (A)	1,500 k.c. (osc., ant.)

(3) Type-6SQ7	2nd Det., A. V. C. & A. F.
(4) Type-6F6G	Power Output
(5) Type-5Y4G	Full Wave Rectifier
	Mazda No. 51, 6.3 volts, 0.2 amp.

POWER SUPPLY RATINGS

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

POWER OUTPUT

Undistorted	2 watts
Maximum	4.5 watts

LOUDSPEAKER (Elliptical)

Type	6"x9" Electrodynamic
Impedance (V.C.)	4.5 ohms at 400 cycles

CABINET DIMENSIONS

Height	14 $\frac{5}{16}$ inches
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PHONOGRAPH

Turntable Speed	78 R.P.M.
Pickup	Crystal; 100,000 ohms at 1,000 cycles
Average Output	1 $\frac{1}{2}$ volts at 1,000 cycles across $\frac{1}{2}$ meg.

Width	20 $\frac{3}{8}$ inches
Depth	13 $\frac{1}{2}$ inches

General Description

The Model VR-245 is a table Phonograph Radio Combination, employing a five-tube, four band superheterodyne circuit, the arrangement of which is shown in the Schematic Circuit Diagram.

Features of the Design include, loop antenna as the first tuned circuit; three Spread Bands; Magnetite core oscillator coils; Temperature stabilized capacitors in

the Oscillator circuit resulting in less frequency drift; Magnetite Core; I. F. Transformers; Automatic two position Tone Control circuit; Dust-proof electrodynamic loudspeaker; and a large edge lighted dial individually calibrated for each band.

Features of the Phonograph include a new light weight crystal Pickup; a rim drive constant speed Motor, with automatic Stop Start Switch.

Circuit Arrangement

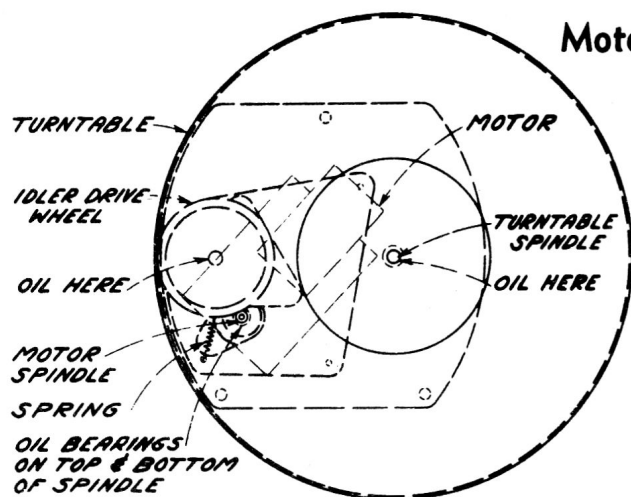
The circuit consists of a first detector (oscillator) stage incorporating the Loop Antenna as the first tuned circuit; I.F. amplifier stage; second detector, A.V.C. and first Audio stage; single pentode output operating in Class A-B; and a well regulated power supply.

The Loop Antenna used in the first tuned stage is in the circuit on the "A" band; 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 both I.F. Transformers are resonated by magnetite cores and are adjusted by adjustable capacitors to tune to 455 K.C.

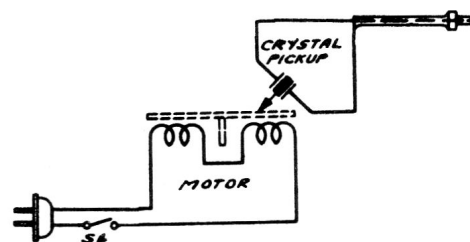
The Audio circuit is a conventional resistance-coupled stage.



Motor Top View

Phonograph Motor Service Data:—

The phonograph motor is of the self starting synchronous type and operates the turntable through friction drive between the motor drive spindle and the rubber tired idler on the rim of the turntable.



Motor & Pickup Circuit

The motor should be lubricated once or twice a year by placing a few drops of S. A. E. 20 (or equivalent) on the turntable spindle and saturating the oil retaining felt pads on the motor shaft with S. A. E. 10 oil. **Caution—The motor drive spindle and the rubber tire on the idler must be kept clean and entirely free from oil and grease at all times.**

Service Data—Crystal Pickup

The Crystal Pickup unit is thoroughly sealed in a metal casing, against extreme changes of climate. The offset pickup arm ensures ideal tracking of Needle in the Record grooves. If failure occurs due to a defective crystal, no attempt should be made to repair the unit,

but a new replacement crystal cartridge should be installed. To replace Crystal:— Remove two fillister head screws, lift crystal cartridge from arm, remove female cable plug from the Crystal. The arm uses a removable type needle.

RADIOTRON SOCKET VOLTAGES

Type	Plate	Screen Grid	Control Grid	Cathode	Heater
6SA7 Conv.	270V	100V			6.4V
6SK7 I.F.	275V	100V			6.4V
6SQ7 Audio	80V				6.4V
6F6G Output	250V	260V		16V	6.4V
5Y4G Rectifier	Transformer A.C. output measured from each plate to chassis			345V A.C.	5.0V

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

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph should be made to the chassis and the green lead on the volume control.

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 180° 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 condenser gang, and bend the wire so that it points to the 180° 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 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-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.

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 final adjustments should be made with the chassis fastened in the cabinet and the pointer accurately aligned to the dial.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	Control Grid 6SK7	.1 Mfd.	455 k.c.	"A"	No Signal 550-750 k.c.	2nd I.F. Transformer	C11 & C12
2	Control Grid 6SA7	.1 Mfd.	455 k.c.	"A"	550-750 k.c.	1st I.F. Transformer	C8 & C9
3	Ant. Terminal	300 Ohms	1,500 k.c.	"A"	1,500 k.c. 22°	"A" Osc.	C25
4	Radiated signal *	—	1,500 k.c.	"A"	1,500 k.c. 22°	"A" Ant.	C1
5	Ant. Terminal	300 Ohms	15,200 k.c.	19 M	15,200 k.c. 93°	19 M Osc.	L11
6	Ant. Terminal	300 Ohms	11,800 k.c.	25 M	11,800 k.c. 82°	25 M Osc.	L12
7	Ant. Terminal	300 Ohms	9,550 k.c.	31 M	9,550 k.c. 104°	31 M Osc.	L13
8	Ant. Terminal	300 Ohms	9,550 k.c.	31 M	9,550 k.c. 104°	31 M Ant.	C4

All adjustments indicated above except operation 4, are made with antenna link in the open position.

*Radiation loop comprising two turns of wire 18 inches in diameter should be connected to test oscillator and placed approximately 4 feet from receiver before adjusting C1.

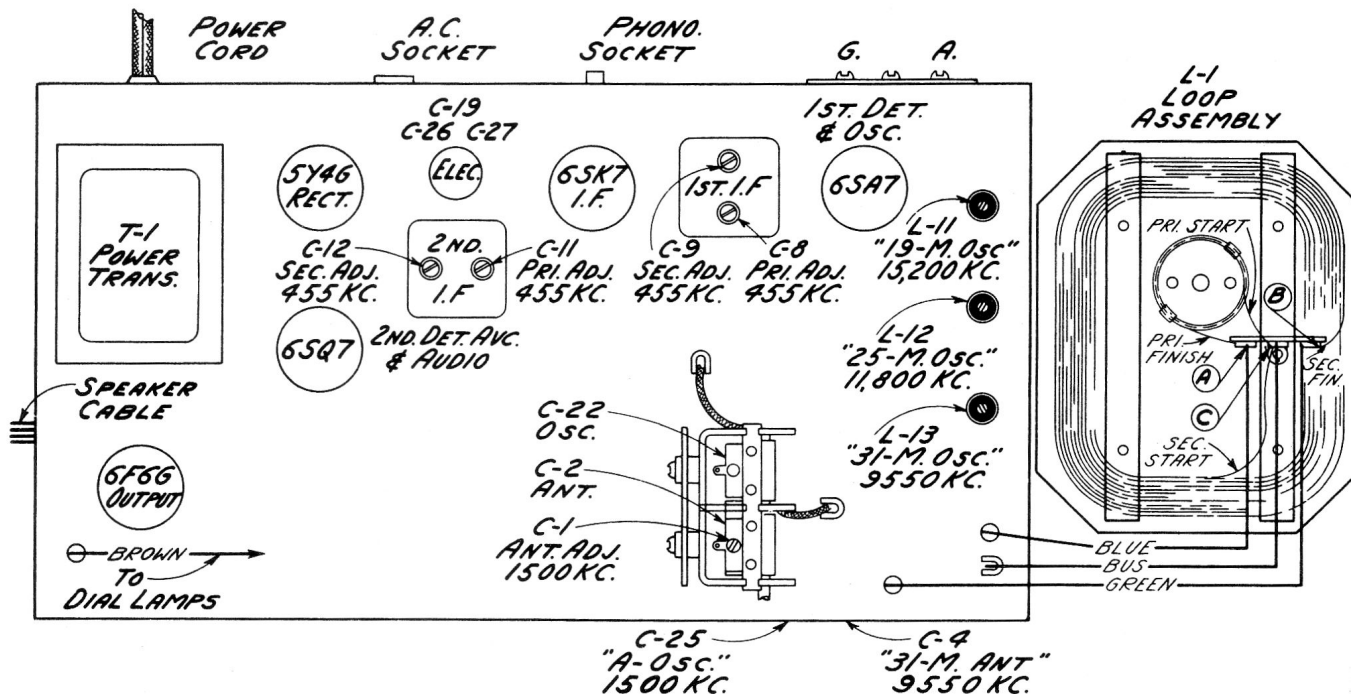


Figure 1—Chassis Layout and Alignment Adjustments

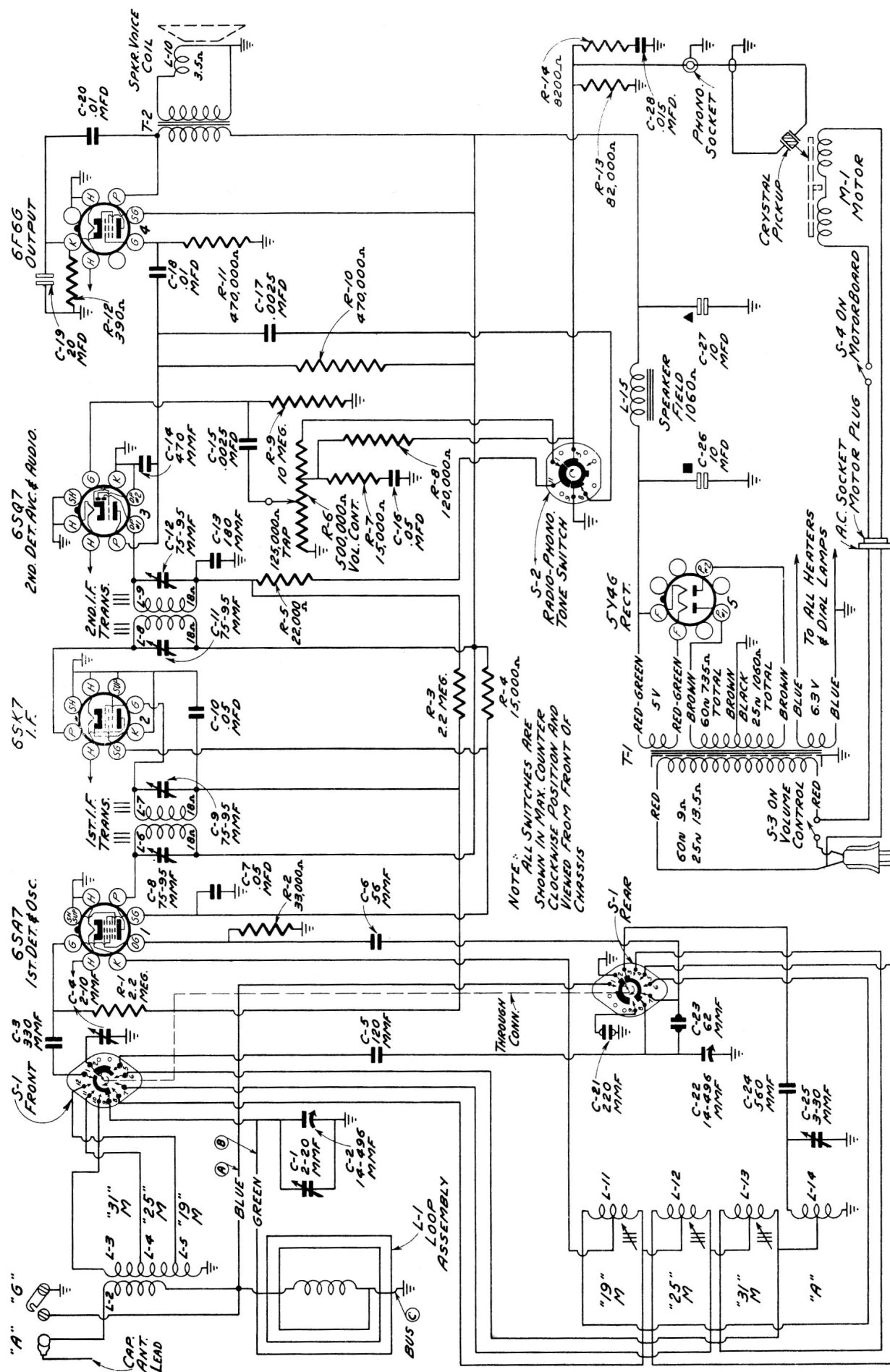


Figure 2—Schematic Circuit Diagram

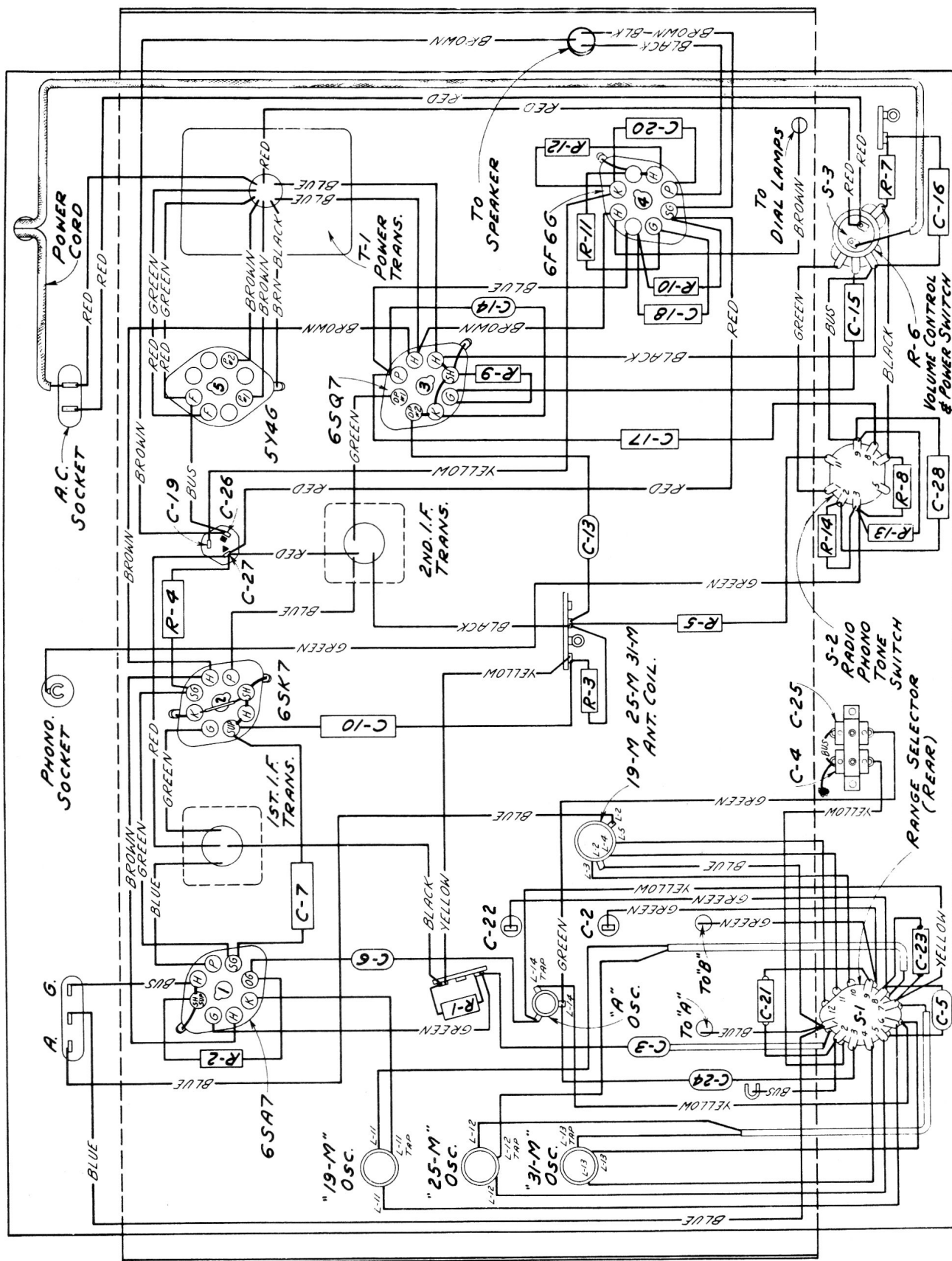


Figure 3—Chassis Wiring Diagram

REPLACEMENT PARTS FOR MODEL VR-245

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		RECEIVER ASSEMBLIES - Cont'd.
34025	Board-Ant. & Ground terminal board		
S-3099	Capacitor, Adjustable trimmer bank comprising one of 2-10 mmfd. one of 3-30 mmfd. (C4, C25).....	S-3239	Transformer, 1st I.F. (L6, L7, C8, C9)...
12723	Capacitor, 56 Mmfd. (C6).....	S-3240	Transformer, 2nd I.F. (L8, L9, C11, C12)...
S-3123	Capacitor, 62 Mmfd. (C23) (Temp. Comp)	S-2457	Transformer, 110-125 volt 60 cycle power (T1).....
12724	Capacitor, 120 Mmfd. (C5).....	33618	Transformer, 110-125 volt 25 cycle power (T1).....
13003	Capacitor, 180 Mmfd. (C13).....	S-3150	Volume Control & Switch (R6, S3).....
S-2895	Capacitor, 220 Mmfd. (C21) (Close Tol)		
12952	Capacitor, 330 Mmfd. (C3).....		SPEAKER ASSEMBLIES
30433	Capacitor, 470 Mmfd. (C14).....		
12537	Capacitor, 560 Mmfd. (C24).....	31825	Cap, dust cap for cone centre (Pkg. 5).
5107	Capacitor, .0025 Mfd. (C15, C17)....	S-3311	Cone, speaker cone & voice coil (L10).
33584	Capacitor, .01 Mfd. (C18, C20).....	5118	Plug-3 contact male connector plug..
11315	Capacitor, .015 Mfd. (C28).....	S-3231	Speaker, complete (L10, L15, T2).....
32787	Capacitor, .05 Mfd. (C7, C10, C16)....	S-3312	Transformer, output (T2).....
32240	Capacitor, Electrolytic-comprising two sections of 10 mfd; one section of 20 mfd. (C19, C26, C27)...		
S-3109	Coil, Antenna, 19, 25, 31 meter band (L2, L3, L4, L5).....		MOTOR ASSEMBLIES
S-3111	Coil, Oscillator "A" band (L14)....	S-3077	Motor-110 volt, 60 cycle complete (M1)
S-3114	Coil, Oscillator 19M band (L11)....	S-3078	Motor-110 volt, 25 " " (M1)
S-3112	Coil, Oscillator 25M band (L12)....	4577	Plug, 2 contact male motor plug.....
S-3113	Coil, Oscillator 31M band (L13)....	S-3079	Spindle, turntable spindle.....
S-3149	Condenser, two gang tuning condenser (C1, C2, C22).....	S-3080	Spring, drive wheel tension spring (Pkg. 2).....
32634	Cord, drive cord.....	S-3081	Turntable (9" dia).....
35627	Drum, drive cord drum.....	S-3082	Wheel, rubber tired drive wheel.....
S-3152	Indicator-station selector indicator pointer.....		AUTOMATIC SWITCH ASSEMBLY
11765	Lamp, dial lamp Mazda #51.....	38996	Cam, Cam ass'y comprising main & auxiliary cam, hub & set screw....
S-3108	Loop Antenna, loop assembly.....	4319	Screw, set screw for cam hub (Pkg. 2).
S-3178	Pulley, dial cord pulley (Pkg. 2).	36521	Spring, actuating lever tension spring (Pkg. 2).....
31388	Resistor, 390 ohms, 1 watt (R12)....	S-3500	Switch, contact & plunger (S4).....
14250	Resistor, 8,200 ohms, 1/4 watt (R14)		PICKUP ARM ASSEMBLY
36714	Resistor, 15,000 ohms 1/4 " (R7)	S-3459	Arm-pickup arm.....
33489	Resistor, 15,000 ohms 2.5 " (W.W) (R4)...	S-3511	Base-Pickup arm base & pivot & base..
30492	Resistor, 22,000 ohms 1/4 watt (R5)	S-3461	Crystal-Pickup crystal cartridge....
30685	Resistor, 33,000 ohms 1/4 watt (R2)	31054	Grommet-Pickup base rubber grommet..
14023	Resistor, 82,000 ohms 1/2 watt (R13)	S-3462	Screw-Pickup needle screw (Pkg. 2)...
13734	Resistor, 120,000 ohms 1/4 " (R8)	S-3465	Screw- " crystal retaining screw (Pkg. 10).
30648	Resistor, 470,000 ohms 1/4 " (R10, R11).....	S-3466	Spring-Pickup cable retaining spring
12679	Resistor, 2.2 Megohms 1/4 watt (R1, R3)		MISCELLANEOUS ASSEMBLIES
30992	Resistor, 10 Megohms 1/4 watt (R9)...	S-3148	Dial Scale.....
33726	Retainer "C" washer for drive shaft (Pkg. 5).....	S-3184	Knob-Range Switch.....
34373	Retainer "C" for pulleys (Pkg. 5)...	S-3086	Knob-Phono radio tone switch.....
S-3155	Shaft-station selector drive shaft	S-3101	Knob-Tuning.....
S-2824	Socket-A.C. socket.....	S-3102	Knob-Volume Control.....
31364	Socket, dial lamp socket.....	30900	Spring-Knob retaining spring (Pkg. 5).
35787	Socket, phono input socket.....	S-3463	Support-Pickup arm support.....
34723	Socket, speaker cable connector...		
31319	Socket, tube socket.....		
30585	Spring-Drive cord tension spring (Pkg. 2).....		
S-3151	Switch, range switch (S1).....		
S-3232	Switch, phono radio tone switch (S2)		

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