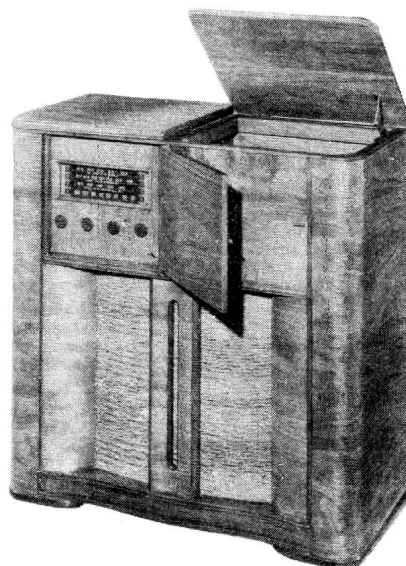


MODEL KL-7

Seven-Tube, Four-Band, A-C Superheterodyne Radio with Automatic Phonograph



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
(3) Type-6SQ7	2nd Det., A. V. C. & A. F.

Pilot Lamps (3)	(4) Type-6AD7G	Inverter Power Output
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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	3.5 watts
Maximum	5.0 watts

LOUDSPEAKER (CRL-523)

Type	12" Electrodynamic
Impedance (V.C.)	2.4 ohms at 400 cycles

CABINET DIMENSIONS

Height	36 $\frac{1}{2}$ inches
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R. F. ALIGNMENT FREQUENCIES

Standard Broadcast (A)	1,500 k.c. (osc., ant.)
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.)

(5) Type-6F6G	Power Output
(6) Type-5Y4G	Full Wave Rectifier
(7) Type 6U5	Tuning Tube
	Mazda No. 55, 6.3 volts, 0.4 amp.

PHONOGRAPH

Type	Automatic
Record Capacity	Eight 10-inch or Seven 12-inch
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	36 inches
Depth	16 $\frac{1}{4}$ inches

General Description

The Model KL7 Console type Radio Phonograph employs a seven tube, four band superheterodyne circuit, the arrangement of which is shown in the Schematic Circuit Diagram. Features of design include:— Loop antenna as the first tuned circuit; three spread bands; stabilized oscillator circuit resulting in less frequency drift; magnetite core I.F. transformers; magnetite core oscillator coils; automatic volume control; two

position tone control circuit; inverter push pull output stage; dust proof electrodynamic loudspeaker; temperature stabilized capacitors in the oscillator circuits; and a large, edge lighted dial individually calibrated for each band. Features of the Phonograph include crystal pickup and an automatic record changing mechanism.

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; push pull pentode output stage; 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.

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-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 (GE 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 Pin No. 4	.1 Mfd.	455 k.c.	"A"	No Signal 550-750 k.c.	2nd I.F. Transformer	C11 & C12
2	Control Grid 6SA7 Pin No. 8	.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.	C27
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.	L12
6	Ant. Terminal	300 Ohms	11,800 k.c.	25 M	11,800 k.c. 82°	25 M Osc.	L13
7	Ant. Terminal	300 Ohms	9,550 k.c.	31 M	9,550 k.c. 104°	31 M Osc.	L14
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.

Chassis Layout and Alignment Adjustments

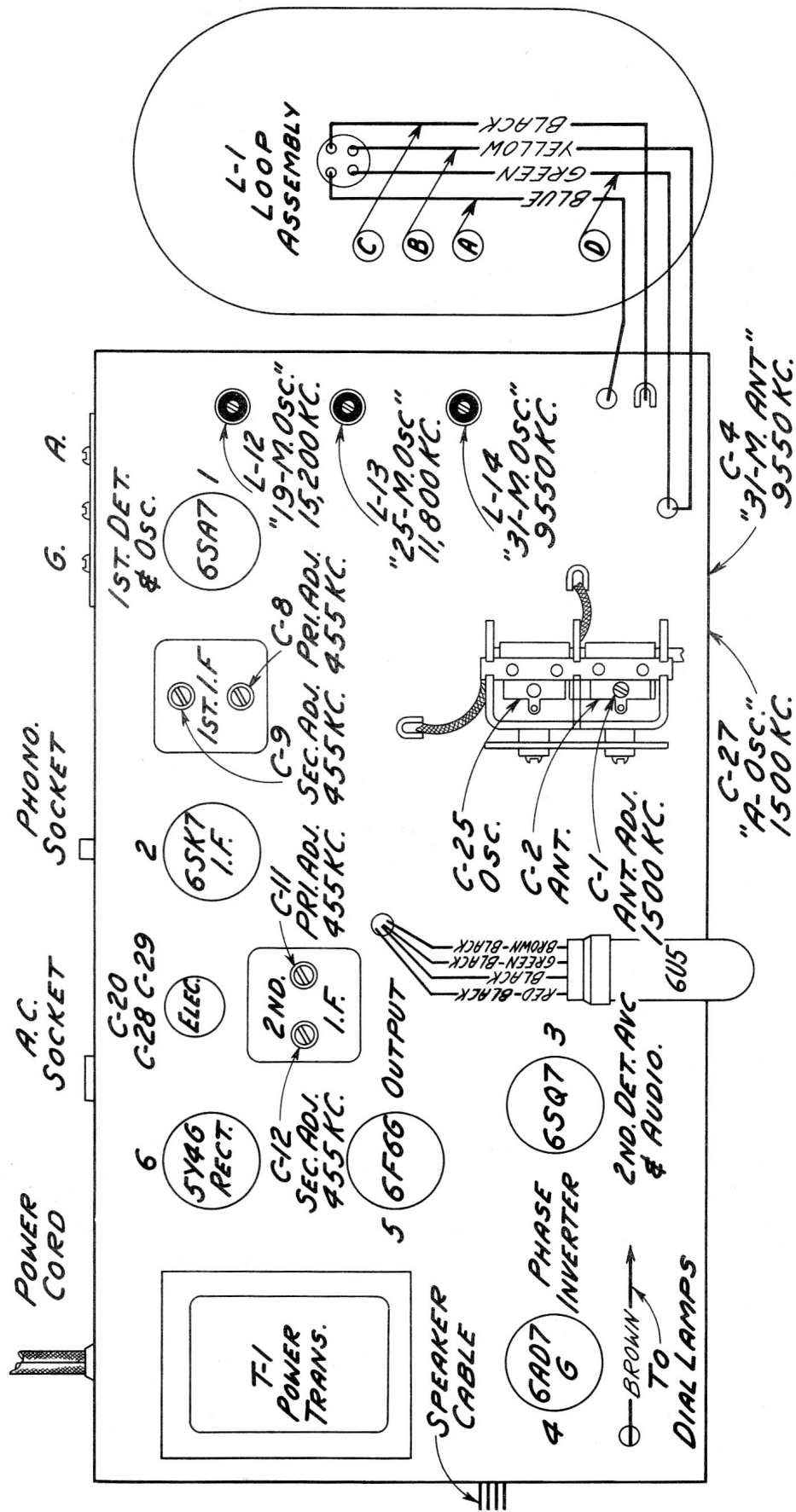


Figure 1

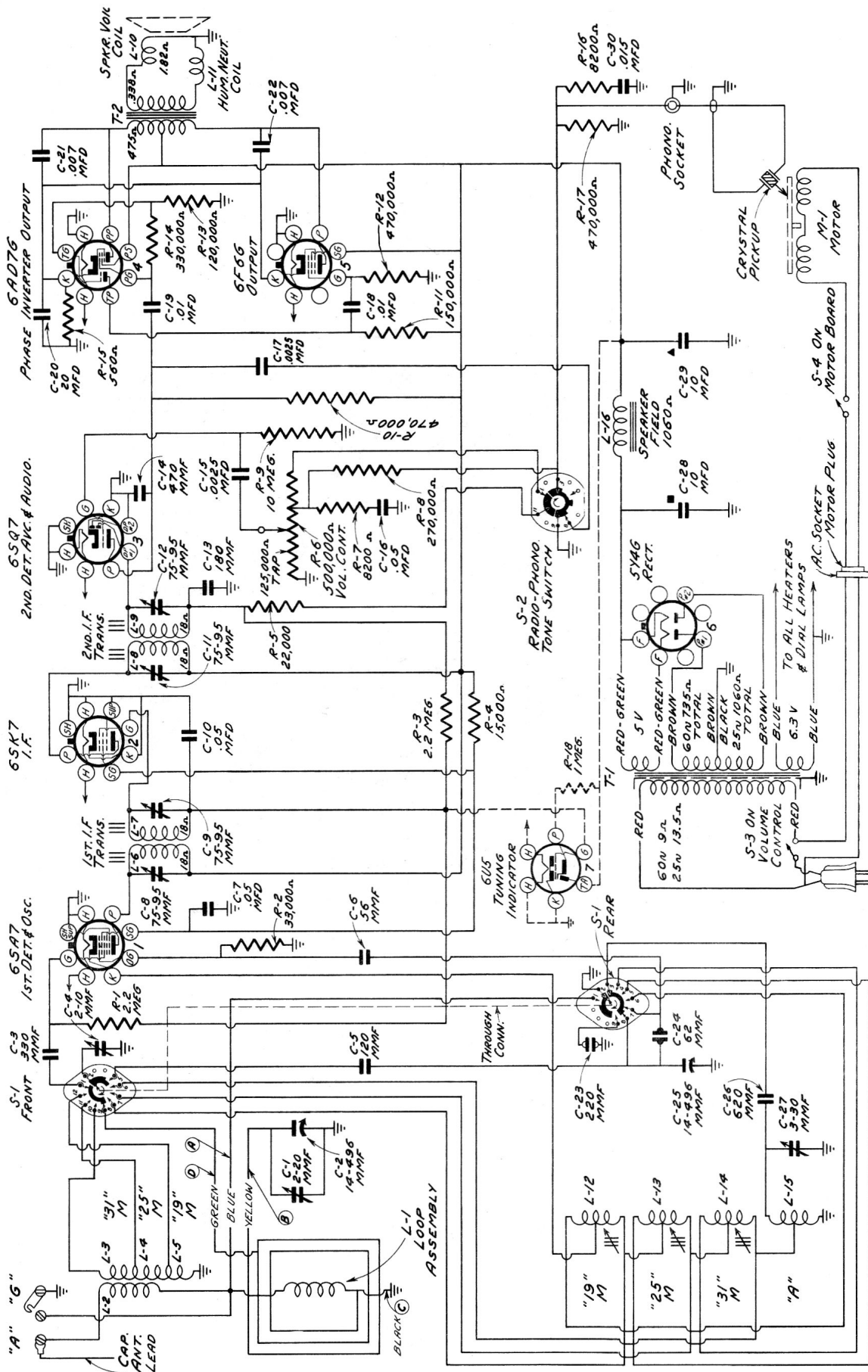


Figure 2—Schematic Circuit Diagram

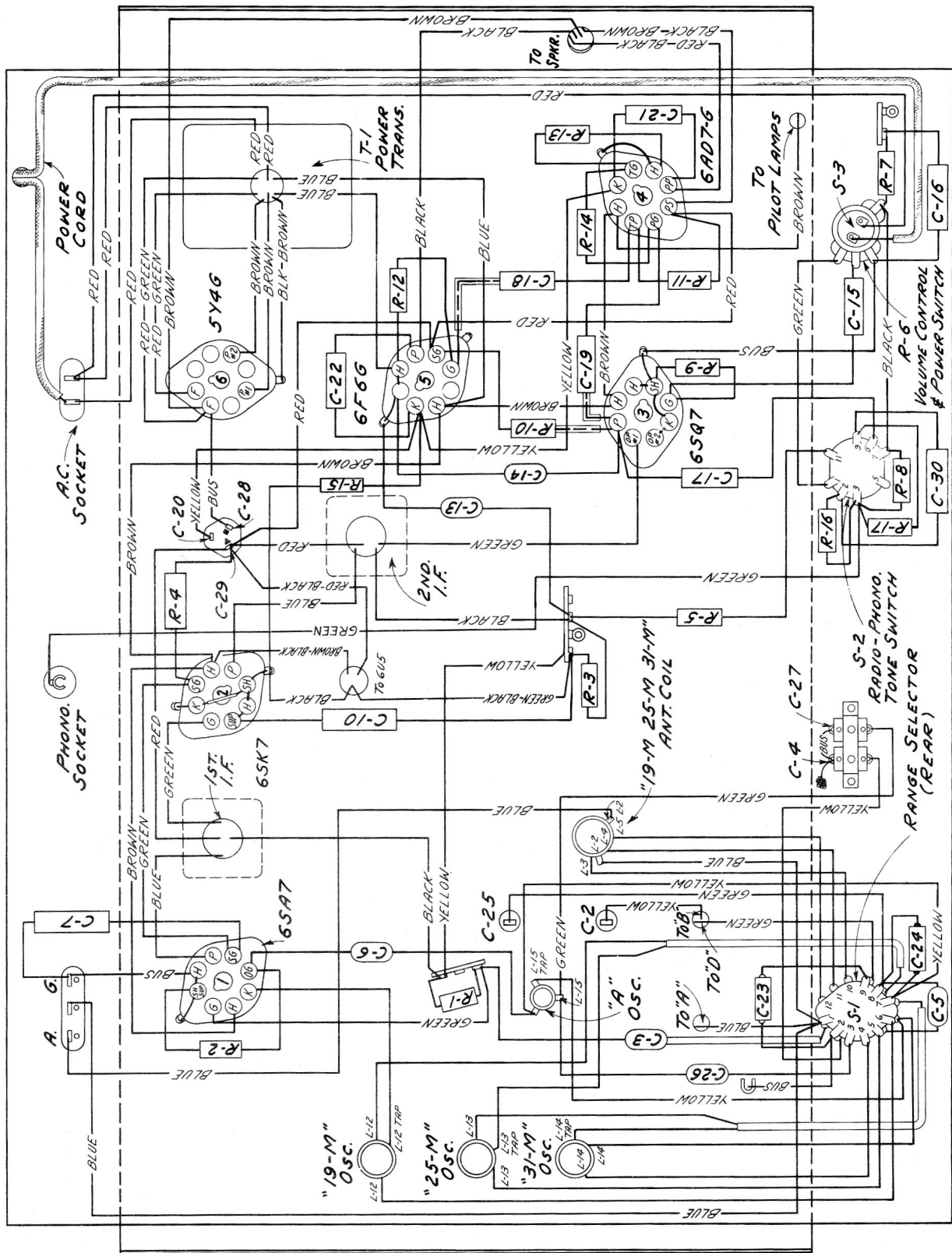


Figure 3—Chassis Wiring Diagram

RADIOTRON SOCKET VOLTAGES

Type	Function	Plate	Screen Grid	Cathode	Heater
6SA7	Det.	290 V	105 V		6.4 V
	Osc.			2.3 V	
6SK7	I.F.	290 V	105 V		6.4 V
6SQ7	2nd Det. Audio & A.V.C.	80*V			6.4 V
6AD7G	Inverter	285 V		24 V	6.4 V
	Output	285 V	290 V	24 V	6.4 V
6F6-G	Output	285 V	290 V	24 V	6.4 V
5Y4-G	Rectifier	Measured Across C-28		370 V	5.0 V

Rectifier A.C. Voltage per plate 350

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 115 volts. All voltages are measured to chassis.

* Cannot be accurately measured with an ordinary voltmeter.

REPLACEMENT PARTS — MODEL KL7

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
RECEIVER ASSEMBLIES		30992	Resistor-10 megohms-1/4 watt(R9)...
34025	Board-Antenna and Ground Terminal Board.....	33726	Retainer-"C" washer for drive shaft (Pkg.5).....
S-3099	Capacitor-Adjustable trimmer bank (C4,C27).....	34373	Retainer-"C" washer for pulleys (Pkg.5).....
12723	Capacitor- 56 mmfd. (C6).....	S-3155	Shaft-Station selector drive shaft.
S-3123	Capacitor- 62 mmfd. (Temp.comp.) (C24).....	S-2824	Socket-A.C. Socket.....
12724	Capacitor-120 mmfd. (C5).....	31364	Socket-Dial Lamp socket.....
13003	Capacitor-180 mmfd. (C13).....	14278	Socket-Phono input socket.....
S-2895	Capacitor-220 mmfd. (Close Tol.)(C23)	5040	Socket-Speaker cable connector(female)
12952	Capacitor-330 mmfd. (C3).....	31319	Socket-Tube socket.....
30433	Capacitor-470 mmfd. (C14).....	30585	Spring-Drive cord tension spring (Pkg.2).....
31381	Capacitor-620 mmfd. (C26).....	S-3151	Switch-Range Switch (S1).....
34459	Capacitor-.0025 mfd. (C15,C17).....	S-3232	Switch-Phono Radio, tone switch(S2).
5148	Capacitor-.007 mfd. (C21,C22).....	S-3239	Transformer-1st I.F. Transformer (L6,L7,C8,C9).....
4937	Capacitor-.01 mfd. (C18,C19).....	S-3368	Transformer-2nd I.F. Transformer (L8,L9,C11,C12).....
11315	Capacitor-.015 mfd. (C30).....	S-2457	Transformer-Power 105/125 volt, 60 cycle (T1).....
32787	Capacitor-.05 Mfd. (C7,C10,C16)...	33618	Transformer-Power 105/125 volt, 25/60 cycle (T1).....
32240	Capacitor-Electrolytic, comprising 2 sections of 10 mfd. and one of 20 mfd. (C20,C28,C29).....	S-3150	Volume Control and Power Switch (R6,S3).....
S-3109	Coil-Antenna 19,25 and 31 M bands (L2,L3,L4,L5).....	AUTOMATIC RECORD CHANGER MECHANISM	
S-3111	Coil-Oscillator "A" band (L15).....	REFER TO RP152-E Service Notes for Replacement Parts & Service Details.	
S-3114	Coil-Oscillator 19M band (L12).....	SPEAKER ASSEMBLIES (CRL-523 - 12")	
S-3112	Coil-Oscillator 25M band (L13).....	31825	Cap-Dust cap for cone centre(Pkg.5)
S-3113	Coil-Oscillator 31M band (L14).....	S-2458	Coil-Field Coil (L16).....
S-3149	Condenser-2 gang tuning Condenser(C1,C2,C25)	31275	Cone-Speaker cone and voice coil(L10)
32634	Cord-Drive Cord.....	5039	Plug-4 contact male plug.....
35627	Drum-Drive Cord drum.....	S-3036	Speaker complete.....
S-3152	Indicator-Station selector indicator pointer.....	S-2934	Transformer-Output (T2).....
5117	Lamp-Dial lamp Mazda #55.....	MISCELLANEOUS ASSEMBLIES	
S-3179	Plug-4 contact male loop plug.....	S-3154	Dial-Dial Scale.....
S-3178	Pulley-Dial cord pulley (Pkg.2).....	36246	Holder-Needle Package holder.....
30735	Resistor-560 ohm 1 watt (R15).....	13103	Jewel-Indicator light jewel.....
14075	Resistor-8200 ohm, 1/4 watt (R16,R7)..	S-3243	Knob-Phono Radio tone switch knob..
33489	Resistor-15,000 ohm, 2.5 watt (R4)...	S-3159	Knob-Range switch knob.....
13998	Resistor-22,000 ohm 1/4 watt (R5)...	S-3103	Knob-Tuning or volume knob.....
12454	Resistor-33,000 ohm 1/4 watt (R2)...	S-3161	Loop-Loop antenna assembly (L1)....
13734	Resistor-120,000 ohm, 1/4 watt (R13)..	S-3180	Socket-Loop socket (on loop).....
30493	Resistor-150,000 ohm, 1/2 watt (R11)...	30900	Spring-Knob retaining spring(Pkg.5)
30651	Resistor-270,000 ohm 1/4 watt (R8)...		
14983	Resistor-330,000 ohm 1/4 watt (R14)...		
30648	Resistor-470,000 ohm 1/4 watt (R10,R12,R17).....		
12013	Resistor-1 megohm 1/10 watt (R18)...		
12679	Resistor-2.2 megohms-1/4 watt (R1,R3)		