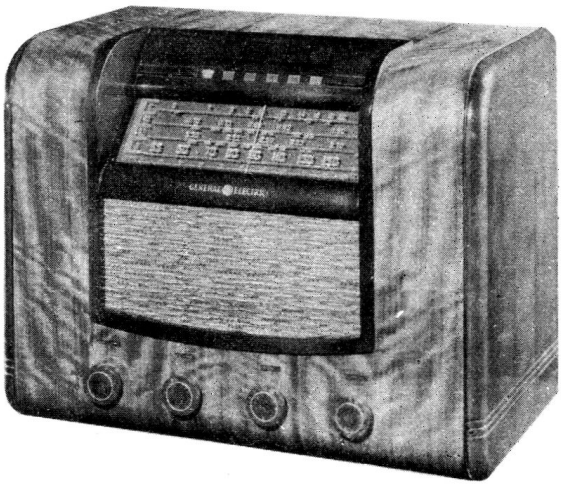
MODEL KL-60

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



Electrical and Mechanical Specifications

FREQUENCY RANGES

Standard Broadcast "A"	540-1570 k.c.
Short Wave "C"	5700-20,000 k.c.
31 Meter Spread Band	9,450-9,700 k.c.
25 Meter Spread Band	11,680-11,920 k.c.
Intermediate Frequency	455 k.c.

TUBE COMPLEMENT

(1) TYPE-6SK7	R.F. Amplifier
(2) TYPE-6SA7	First Detector—Oscillator
(3) TYPE-6SK7	Intermediate Amplifier
(4) TYPE-6SQ7	Second-Detector, A.V.C., and A-F Amplifier
(5) TYPE-6F6G	Power Output
(6) TYPE-5Y4-G	Full-Wave Rectifier
Pilot Lamp (2)	Mazda 51, 6.3 volts, 0.2 amp.

POWER OUTPUT RATING

Undistorted	2 watts
Maximum	4.5 watts

LOUDSPEAKER

Type CRL-526-1	6-inch Electrodynamic
Voice-Coil Impedance	3.8 ohms at 400 cycles

POWER SUPPLY RATINGS

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

CABINET DIMENSIONS

Height	12 13/16 inches
Width	16 1/2 inches
Depth	9 1/16 inches

Tuning Drive cord length 49"—Ratio 12 to 1

General Description

Model KL60 is a six tube, four band, table type superheterodyne receiver with six station keys, designed to cover the standard broadcast range, and three short wave bands. Features of design include:—built in loop antenna for broadcast reception; removable capacity type short wave antenna; magnetite-core I.F. transformers and oscillator coils; automatic volume control; three position tone control; edge lighted straight line dial; phono input socket and a 6 inch dustproof Electrodynamic loudspeaker.

Miscellaneous Service Data

CAPACITY TYPE SHORT-WAVE ANTENNA:—

To obtain best results this antenna should be removed from the cabinet, the wire unwound, dropped to the floor and the form replaced in its receptacle.

RECORD PLAYER ATTACHMENT:—

A jack is provided on the rear of the keyboard switch for connection of a Record Player attachment. The cable from the attachment should be terminated in a Stock No. 31048 plug to fit the jack.

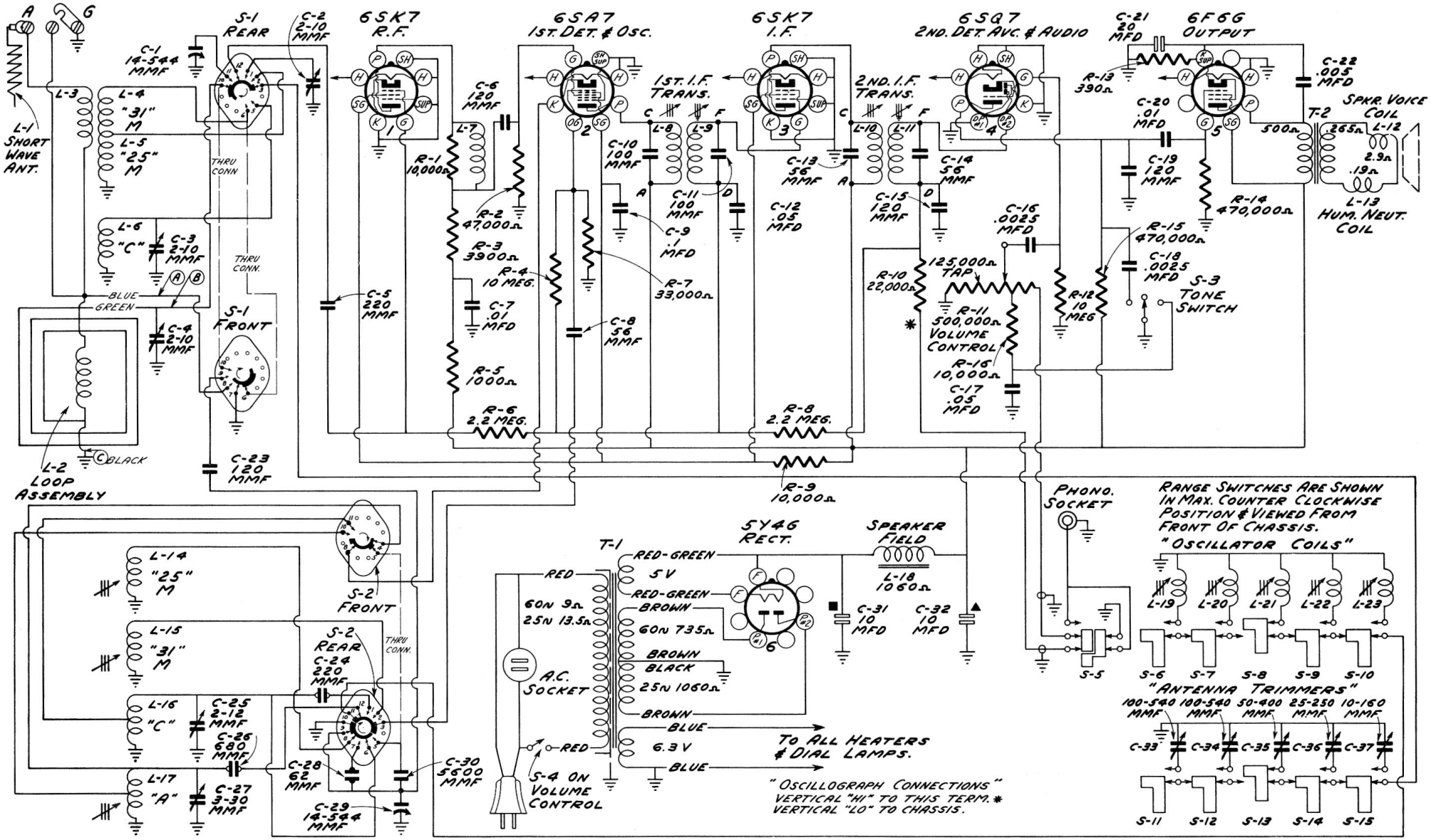


Figure 1.—Schematic Circuit Diagram.

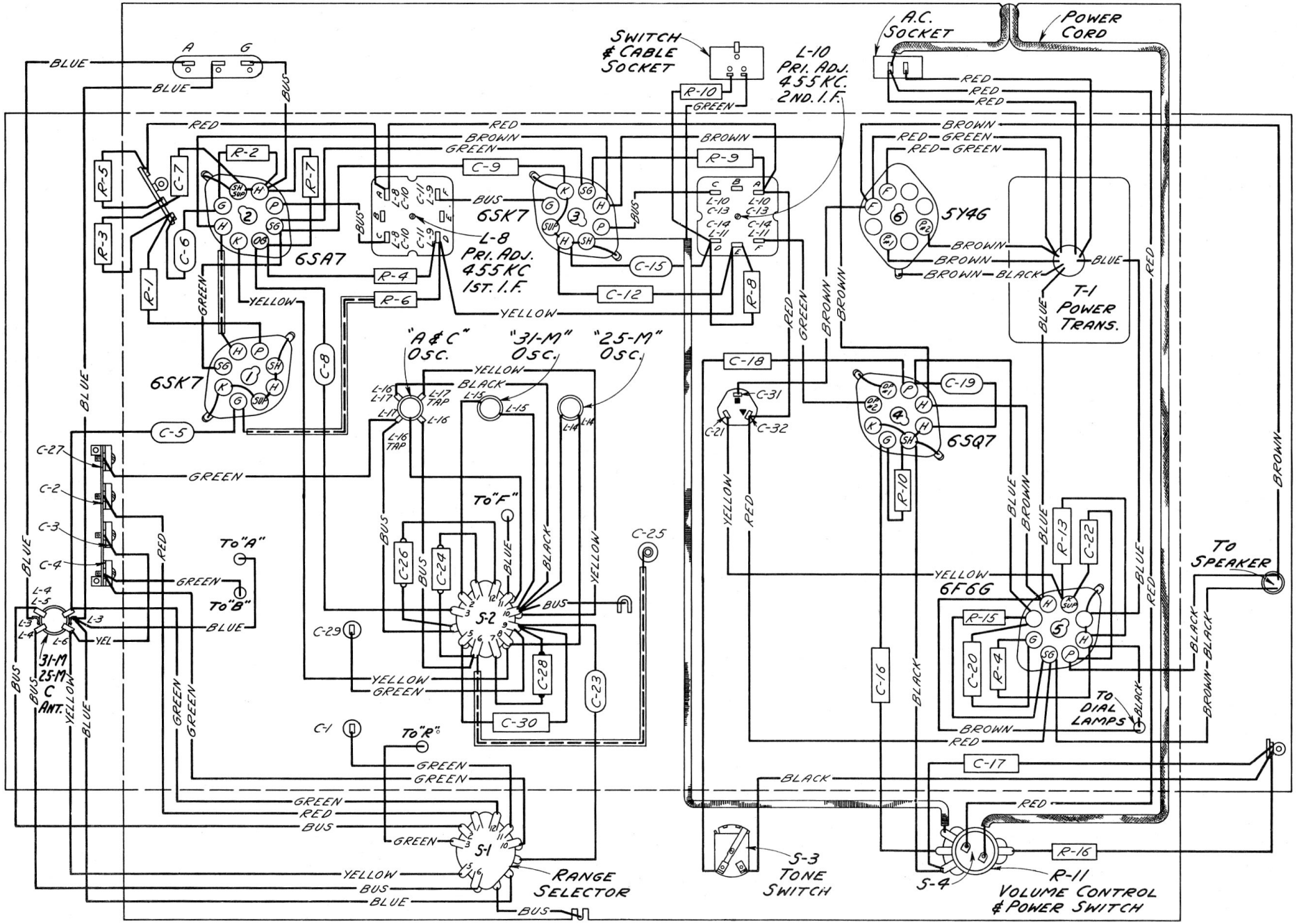


Figure 2.—Chassis Wiring Diagram.

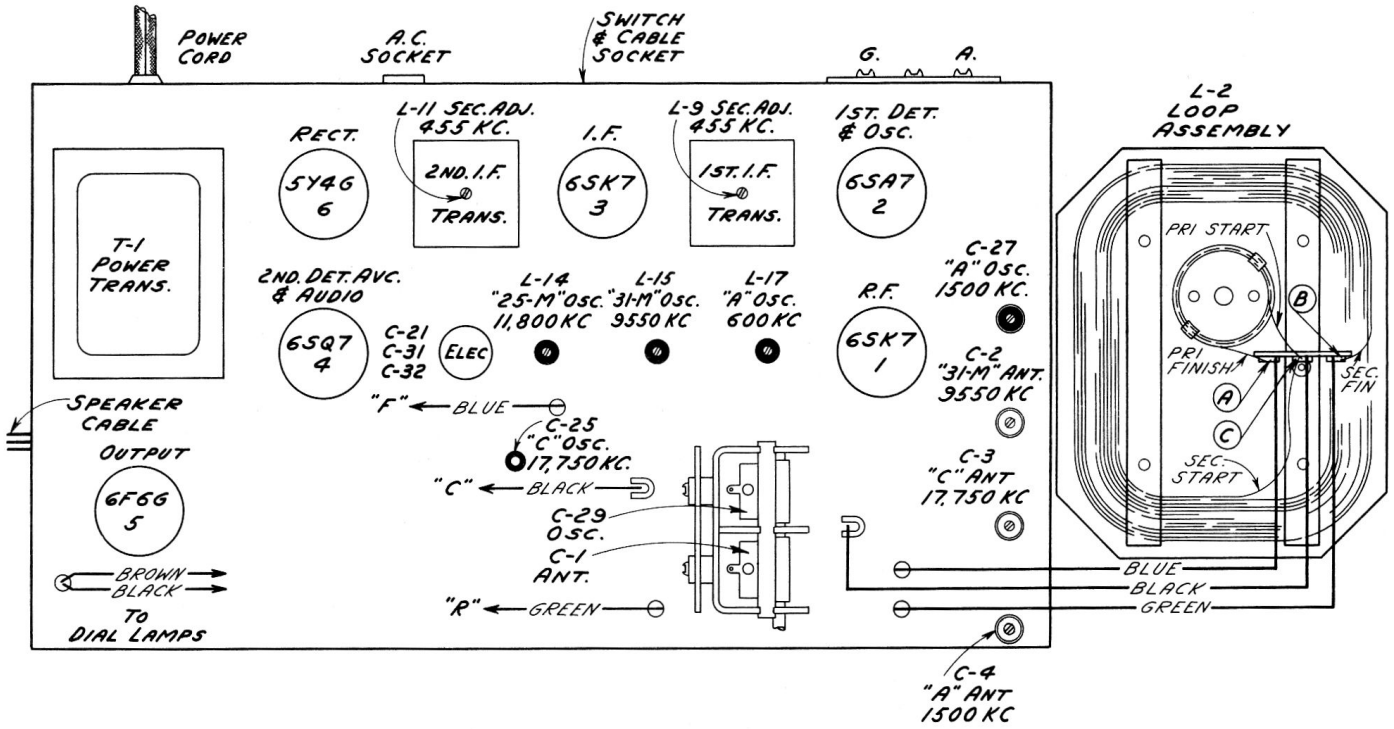


Figure 3.—Tube and Trimmer Locations.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in 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 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 180° degree mark on the drum scale must be in a vertical position when the plates are fully meshed. The drum is held to the shaft by means of 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.

Alignment Chart

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	Grid Pin #4 6SK7 I.F.	.01 mfd.	455 k.c.	"A"	No Signal 550-750 k.c.	2nd I.F. Trans.	L10 & L11
2	Grid Pin # 8 6SA7 Con.	.01 mfd.	455 k.c.	"A"	No Signal 550-750 k.c.	1st I.F. Trans.	L8 & L9
3	*Radiated	signal	600 k.c.	"A"	600 k.c. 147°	"A" L.F. Osc.	L17
4	*Radiated	signal	1500 k.c.	"A"	1500 k.c. 19.5°	"A" H.F. Osc.	C27
5	*Radiated	signal	1500 k.c.	"A"	1500 k.c. 19.5°	"A" Ant.	C4
6	Ant. terminal	300 ohms	17750 k.c.	"C"	17750 k.c. 28.5°	"C" Osc.	C25
7	Ant. terminal	300 ohms	17750 k.c.	"C"	17750 k.c. 28.5°	"C" Ant.	C3
8	Ant. terminal	300 ohms	9550 k.c.	31 M	9550 k.c. 103.5°	31M Osc.	L15
9	Ant. terminal	300 ohms	9550 k.c.	31 M	9550 k.c. 103.5°	31M Ant.	C2
10	Ant. terminal	300 ohms	11800 k.c.	25 M	11800 k.c. 89.5°	25M Osc.	L14

All adjustments indicated above except operations three, four, five and six 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 L17, C27 and C4.**

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 claibrator (G.E. 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 final spread band adjustments should be made with the chassis fastened in the cabinet and the pointer accurately aligned to the dial.

Radiotron Socket Voltages

Type	Function	Plate	Screen Grid	Cathode	Heater
6SK7	R.F. Amplifier	200 V	100 V	—	6.3
6SA7	Converter	250 V	100 V	—	6.3
6SK7	I.F. Amplifier	250 V	100 V	—	6.3
6SQ7	2nd Det. A.V.C. Audio	65 V	—	—	6.3
6F6G	Power Output	232 V	250 V	14	6.3
5Y4G	A.C. Voltage per plate 310 V		310 V		5.0

Above values hold within plus or minus 20% when measured with a 1000 ohm per volt meter on a line voltage of 115 volts.

* Actual measured voltage may be lower, depending on the voltmeter loading.

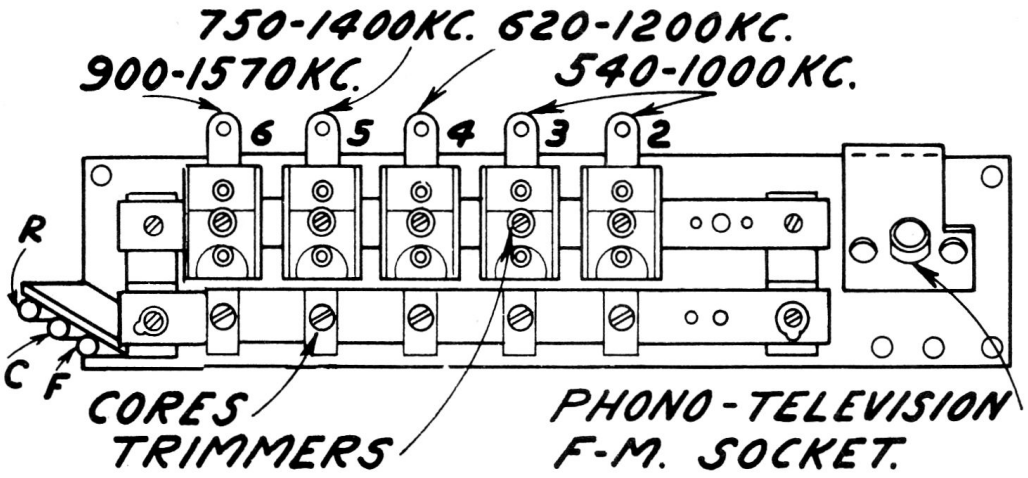


Fig. 4

Keyboard Adjustment

The Station Keys 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 key 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 inaudable due to reception conditions a test oscillator should be substituted for the station signal.

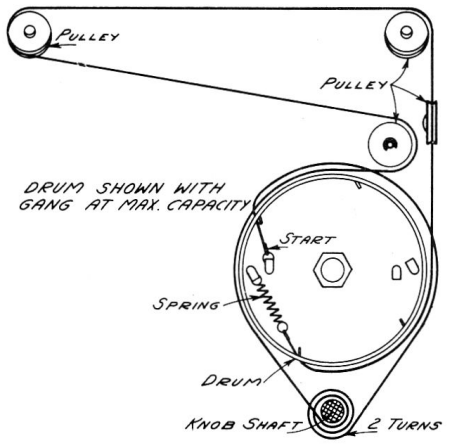


Figure 5.—Dial Drive Cord.

REPLACEMENT PARTS —— MODEL KL60

STOCK NO.	DESCRIPTION	
	RECEIVER ASSEMBLIES	
34025	Board-Ant.and Ground Terminal Board	
S-3119	Capacitor-Adjustable trimmer bank comprising one of 3-30 mmfd,and three of 2-10 mmfd.(C2,C3,C4,C27)	
12714	Capacitor-Adj.Trimmer 2-12 mmfd. (C25).....	
12723	Capacitor- 56 mmfd.(C8).....	
S-3123	Capacitor- 62 mmfd.(Temp.Comp.) (C28).....	
12724	Capacitor-120 mmfd.(C6,C15,C19,C23)	
12694	Capacitor-220 mmfd.(C5).....	
S-2895	Capacitor-220 mmfd.(Close Tol.) (C24).....	
S-2988	Capacitor-680 mmfd.(Close Tol.) (C26).....	
13895	Capacitor-5600 mmfd.(C30).....	
34459	Capacitor-.0025 mfd.(C16,C18).....	
33584	Capacitor-.005 mfd. (C22).....	
4937	Capacitor-.01 mfd. (C7,C20).....	
32787	Capacitor-.05 mfd. (C12,C17).....	
4839	Capacitor-.1 mfd. (C9).....	
32240	Capacitor-Electrolytic comprising one section of 20 mfd. & two sections of 10 mfd.(C21,C31,C32).	
35876	Coil-Coupling Coil (L7,R1).....	
S-3289	Coil-Antenna Coil (L3,L4,L5,L6).....	
S-3290	Coil-"A" & "C" Oscillator(L16,L17).	
S-3291	Coil-31 M band Oscillator (L15)....	
S-3292	Coil-25 M band Oscillator (L14)....	
S-3149	Condenser-Two gang tuning condenser (C1,C29).....	
S-3383	Cord-Indicator pointer drive cord..	
35627	Drum-Drive cord drum assembly.....	
35648	Indicator-Station selector indicator pointer.....	
11765	Lamp-Dial lamp Mazda #51.....	
S-3288	Loop-Antenna Loop assembly (L2)....	
S-3105	Loop-Short Wave capacity antenna (L1).....	
5119	Plug-3 contact female speaker plug.	
35641	Pulley-Dial cord pulley.....	
33726	Retainer-Drive shaft "C" Washer (Pkg.5).....	
34373	Retainer-Pulley "C" Washer (Pkg.5).	
31388	Resistor-390 ohm-1 watt (R13).....	
14720	Resistor-1000 ohm-1/4 watt (R5)....	
30694	Resistor-3900 ohm-1/2 watt (R3)....	
14559	Resistor-10,000 ohm-1/4 watt (R16).	
S-2587	Resistor-10,000 ohm-4 watt wire-wound (R9).....	
13998	Resistor-22,000 ohm-1/4 watt(R10)..	
12454	Resistor-33,000 ohm-1/4 watt(R7)...	
12412	Resistor-47,000 ohm-1/4 watt(R2)...	
12285	Resistor-470,000 ohm-1/4 watt (R14,R15).....	
12679	Resistor-2.2 megohm-1/4 watt(R6,R8)	
13601	Resistor-10. megohm -1/4 watt (R4,R12).....	

STOCK NO.	DESCRIPTION	
S-3155	Shaft-Station selector drive shaft	
S-2824	Socket-A.C. Socket.....	
31364	Socket-Dial lamp socket.....	
36422	Socket-Keyboard cable socket.....	
31319	Socket-Tube socket.....	
30585	Spring-Dial cord spring (Pkg.2)..	
S-3286	Switch-Range switch (S1,S2).....	
S-3285	Switch-Tone switch (S3).....	
35636	Transformer-1st I.F.Transformer (L8,L9,C10,C11).....	
35628	Transformer-2nd I.F.Transformer (L10,L11,C13,C14).....	
S-2548	Transformer-Power 110/125 volt, 50/60 cycle (T1).....	
33618	Transformer-Power 110/125 volt, 25/60 cycle (T1).....	
S-3295	Volume Control & Power switch (R11,S4).....	
	SPEAKER ASSEMBLIES (CRL 526-1)	
32907	Cap-Dust cap for cone centre (Pkg.5).....	
S-2463	Coil-Field coil (L18).....	
35441	Cone-Speaker Cone & Voice Coil (L12,L13).....	
5118	Plug-Three contact male plug.....	
S-3293	Speaker complete.....	
S-2377	Transformer Output (T2).....	
	KEYBOARD ASSEMBLY	
S-3241	Cable-Shielded phono cable less plug.....	
S-2908	Capacitor-Trimmer capacitor bank (C33 to C37).....	
35803	Coil-Oscillator coil (L19 to L23)	
32641	Plug-3 prong male plug for Phono Cable.....	
31347	Socket-Phono input socket.....	
S-2911	Switch- Keyboard Switch Assembly (S5 to S10).....	
	MISCELLANEOUS ASSEMBLIES	
S-3296	Dial-Station selector dial scale.	
S-3103	Knob-Volume or tuning control....	
S-3294	Knob-Tone or range switch.....	
S-3227	Key-Station selector push key....	
S-2909	Marker-Keyboard call letter marker (1 set).....	
30900	Spring-Knob retaining spring (Pkg.5).....	
S-3313	Spring-Push key retaining spring (Pkg.5).....	
S-2542	Tool-Keyboard set-up tool.....	

THIS C.G.E. MODEL KL-60 IS THE SAME AS THE 1946 C.G.E. MODEL KM-60