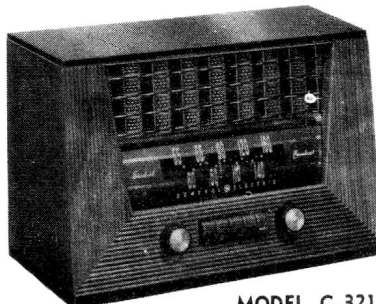


## MODEL C-321

### 6-Tube, Single Band, A-C/D-C Radio Receiver



#### SPECIFICATIONS

##### CABINET

Material ..... Wood  
 Color ..... Mahogany  
 Height ..... 9 7/16 in.  
 Width ..... 14 in.  
 Depth ..... 7 15/16 in.

##### ELECTRICAL RATING (INPUT)

Voltage ..... 105-125 volts a-c or d-c  
 Frequency (on a-c) ..... 25 to 60 cycles  
 Wattage ..... 40 watts

##### OPERATING FREQUENCIES

Broadcast band ..... 540-1600 kilocycles  
 I-F Amplifier ..... 460 kilocycles

##### POWER OUTPUT (117 VOLTS LINE)

Undistorted ..... 1.2 watts  
 Maximum ..... 1.5 watts

##### LOUDSPEAKER

Type ..... Alnico P.M.  
 Outside cone diameter ..... 5 1/4 inches  
 Voice coil impedance (400 cycles) ..... 3.5 ohms

##### TUBE COMPLEMENT

R-F amplifier ..... Type 12SK7  
 Oscillator-converter ..... Type 12SA7  
 I-F amplifier ..... Type 12SK7  
 Detector-Audio ..... Type 12SQ7  
 Power Output ..... Type 35L6GT/G  
 Rectifier ..... Type 35Z5GT/G  
 Pilot lamp ..... G.E. Type C7, 115 volt, 7 watt, clear, candelabra screw base

#### GENERAL DESCRIPTION

This receiver employs six tubes in a single band superheterodyne circuit for A.C. or D.C. operation.

The design features include a built-in loop antenna, automatic volume control, two position tone control, push button tuning, alnico permanent magnet speaker, phono jack and a large clear reading dial.

**STATION KEY ADJUSTMENTS** The stationkey adjustments are located on the bottom of the cabinet through the slots designated as "Osc." and "R-F." The extreme left trimmers in rows "Osc." and "R-F" are corresponding adjustments for the first or extreme left station key. The second set of adjustment trimmers is for the No. 2 or second key from the left; correspondingly the remaining sets of trimmers are for the station keys No. 3 and No. 4. Turn power ON and allow radio to operate 15 minutes before making the following adjustments.

#### MODEL C-321

1. List the desired station on key, then depress the "Manual" key. Tune in the station desired for the key.
2. Push in station key to be set up, to its depressed position.
3. Adjust its corresponding "Osc." adjustment for the station signal which you tuned in step 1 and which is listed for the key. Peak the adjustment for the clearest program reception.
4. Adjust corresponding "R-F" adjustment for maximum signal strength.
5. Proceed in like manner for adjustment of the remaining keys.

**Note:** Clockwise rotation of adjustment screws lowers the frequency.

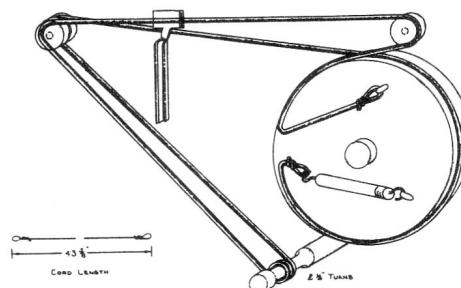


Fig. 1. — Dial Cord Stringing  
 STAGE GAINS AND VOLTAGE CHECKS

Stage gain measurements by vacuum tube voltmeter or similar measuring devices may be used to check circuit performance and isolate trouble. The gain values listed may have tolerances of 20%. Readings taken with low signal input so that AVC is not effective.

- (1) R-F Stage Gains.  
 Antenna Post to 12SK7 r-f grid ..... 3 at 1000 kc  
 12SK7 r-f grid to 12SA7 grid ..... 13 at 1000 kc  
 12SA7 grid to 12SK7 i-f grid ..... 30 at 460 kc  
 12SK7 i-f grid to 12SQ7 diode plate ..... 60 at 460 kc

- (2) Audio Gain.  
 0.10 volts at 400 cycles across volume control (R17) with control set at maximum, will give approximately 1/2 watt speaker output.

- (3) Oscillator Grid Bias.  
 D-c voltage developed across the oscillator grid leak (R4) averages 7.5 volts at 1000 kc.

- (4) Socket Pin Voltages.  
 Fig. 5 shows voltages from all tube pins to B - unless otherwise specified. Voltage readings much lower than those specified may help localize defective components or tubes.

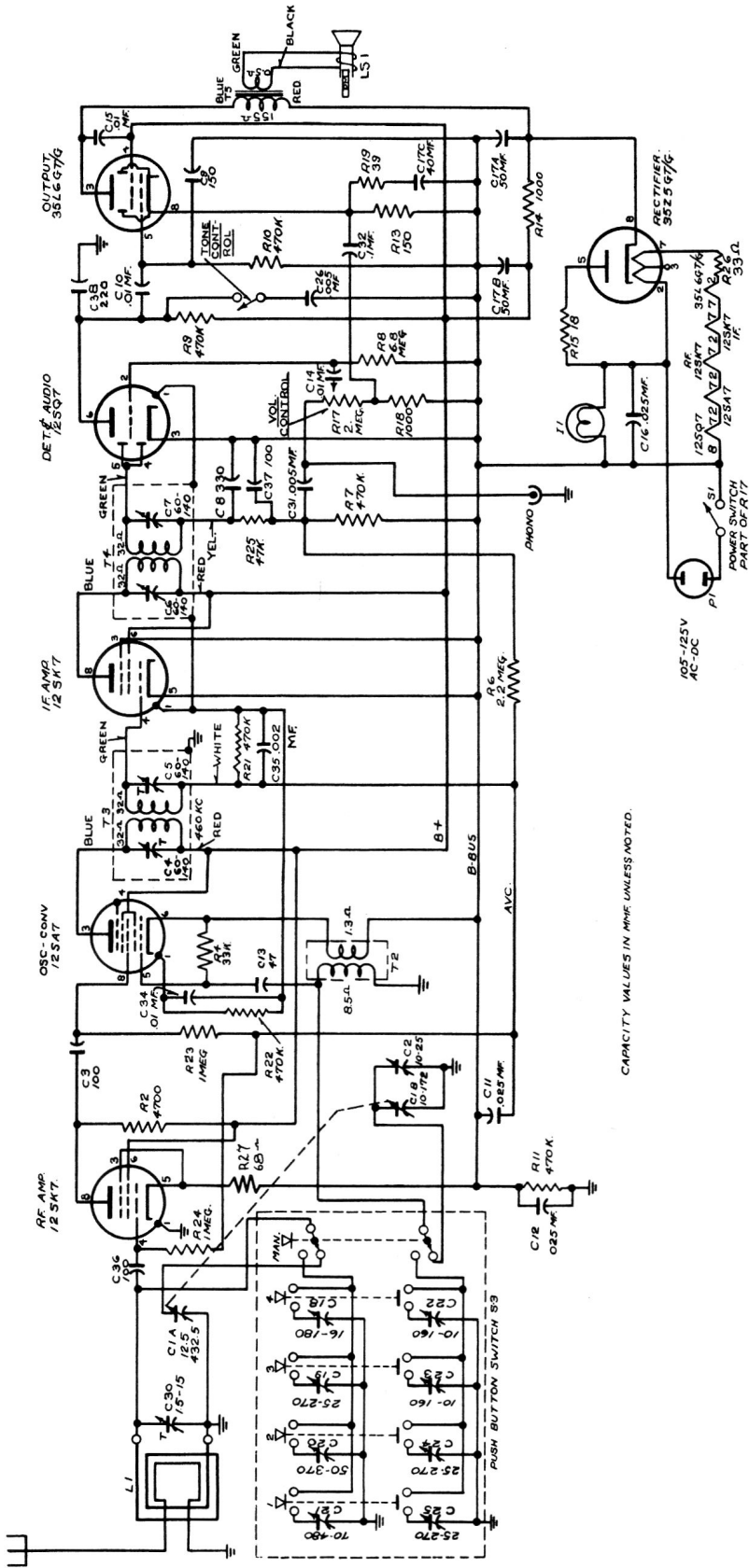


Fig. 2. — Schematic Diagram

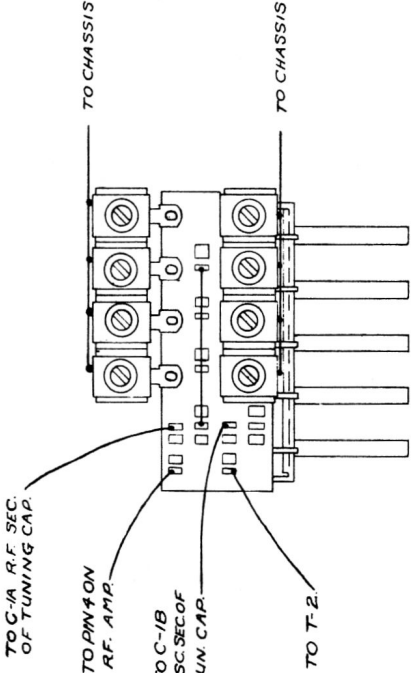


Fig. 3. — Selector Switch Diagram

## ALIGNMENT PROCEDURE

## ALIGNMENT FREQUENCIES

R-F ..... 1500 kilocycles  
 I-F ..... 460 kilocycles

## EQUIPMENT REQUIRED

1. Test oscillator with audio tone modulation.
2. A-c output meter, 1 1/2 volts full scale.
3. 0.05 mf. paper capacitor.
4. 50 mmf. mica capacitor.
5. Insulated screwdriver

## PROCEDURE - GENERAL

1. Turn dial control until pointer is as far to the left as it will go. The pointer should coincide with the first marking at the left of the scale. If it doesn't, remove chassis and slip pointer along drive cord until pointer is under reference mark when chassis is bolted in place.

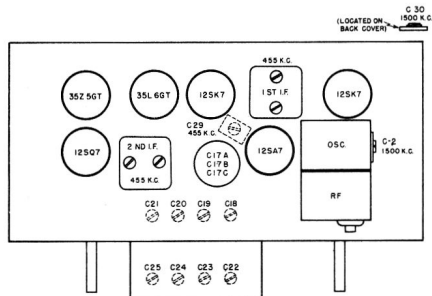


Fig. 4. — Tube and Trimmer Location

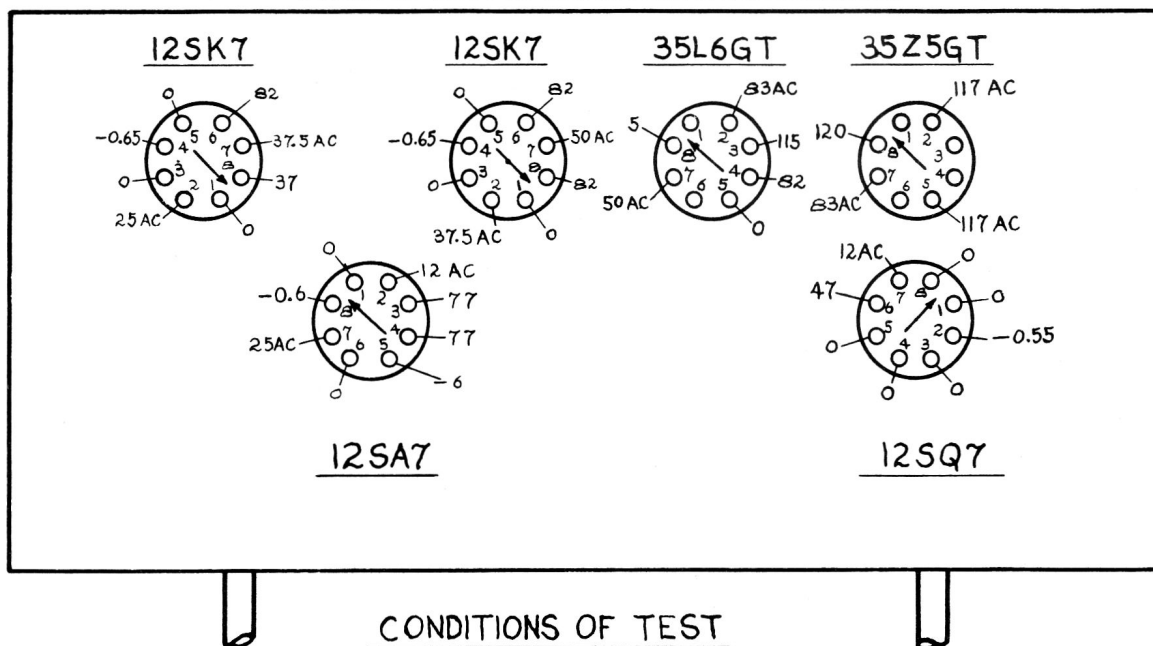
2. For i-f and r-f alignments, the output meter is connected across the loudspeaker voice coil terminals.

3. Keep radio volume control set at maximum and attenuate test oscillator signal output so that the output meter reading never exceeds 1 1/4 volts.
4. For i-f alignment, remove chassis from cabinet. For r-f alignment, the chassis should be bolted in the cabinet. Since the oscillator trimmer (C-2) is not accessible when the chassis is bolted in the cabinet, before C-2 adjustment, set pointer and test oscillator to 1500 kc and then remove chassis carefully from cabinet, so as not to disturb the setting of the dial pointer. Adjust oscillator trimmer (C-2) for maximum output and replace chassis in cabinet, then proceed with r-f trimmer (C-30) alignment.
5. Connect the capacitor as listed in column 2 between the "high side" of the test oscillator and the point of input specified. The ground terminal of the test oscillator may be connected to chassis providing an isolating transformer is used between the radio and the line input, otherwise use a suitable capacitor.

## Alignment Chart

Step	Connect Test Oscillator to	Test Osc. Setting	Pointer Setting on Radio	Adjustment for Maximum Output
1	12SK7 i-f grid in series with 0.05 mf. capacitor.	460 kc	1500 kc	2nd i-f trans. trimmers
2	12SA7 grid in series with 0.05 mf. capacitor.	460 kc	1500 kc	1st and 2nd i-f trans. trimmers
3	Ant. post in series with 50 mmf.	1500 kc	1500 kc	C2 (Osc.)
4	Ant. post in series with 50 mmf.	1500 kc	1500 kc	C30 (r-f)

## VIEWED FROM BOTTOM OF CHASSIS



## CONDITIONS OF TEST

MEASURED AT 117 VOLTS LINE ON A  
 20,000 OHMS PER VOLT METER.  
 READINGS TAKEN BETWEEN TUBE  
 PIN TERMINALS AND B-BUS  
 NO SIGNAL INPUT

Fig. 5. — Socket Voltage Diagram

## REPLACEMENT PARTS LIST

## Model C-321

Stock No.	Symbol	Description	Stock No.	Symbol	Description
<b>Receiver Assemblies</b>			<b>Receiver Assemblies (Cont'd.)</b>		
K8531703-2	L1	Beam-a-scope - Cabinet back and Antenna .....	K58J250-2		Tone switch cam .....
K12J33-304	C17A, 17B, 17C	" - Dry electrolytic - 50 mfd. - 150V .....	K65J138		" " " link .....
		50 " - 150V .....	V25J663		" control shaft clip .....
		40 " - 25V .....	V22J502		Terminal - Speaker lead term.
M29J230-3	C1A, 1B, 1C	Capacitor - Tuning .....	K8531717-3	T3	Transformer - 1st I.F. trans.
K26J419-1	C18, 19, C20, 21	Cap. trimmer strip - Station selector adjust. (R.F.) ....	K8531717-4	T4	" - 2nd I.F. "
K26J419-2	C22, 23, C24, 25	Cap. trimmer strip - Station selector adjust. (Osc.) ....	K8531646-4		" - Output .....
K58J254-3	C30	Capacitor - 1.5 - 15 mmfd. ant. trimmer .....	K63J149	R17, S1	Volume control - 2 meg. with switch .....
K26J872-3	T2	Coil - Oscillator coil .....	<b>Miscellaneous Parts</b>		
K59J323-1		Pulley - Drive cord idler pulley .....	M15J365-9		Button - Station selector button .....
K63J49-1		Stud - Idler Pulley Stud .....	K8531654		Card - Station letter card ....
K8531649-1		Socket - Pilot lamp socket ....	V61J295		Cord - Drive cord .....
UCF62064		" - Octal tube socket ....	M72J946-17		Knob - Control knob (tuning)
UCF8134		" - Phono. socket .....	M72J946-5		" - " (volume)
K63J150		Shaft - Tuning shaft .....	M72J701-5		" - Tone control wafer knob .....
1RS525C-2		Speaker - 5 1/4" P.M. less out. trans. ....	K63J779		Pointer - Dial scale pointer
M29J229-1	S3	Switch - Station selector	K8531699-1		Scale - Dial scale .....
K58J243-4	S2	P.B. Switch .....	V23J562-2		Spring - Drive cord spring ...
		Switch - Tone control .....	V24J70		" - Station selector button spring .....
			K47J454-8		Washer - Felt washer 1/2" OD.
			K47J454-3		" " " 5/8" OD.
			K47J454-7		" " " 1 3/16" OD. ....

IMPORTANT: Always quote Model No. of radio when ordering parts.

Data subject to change without notice.