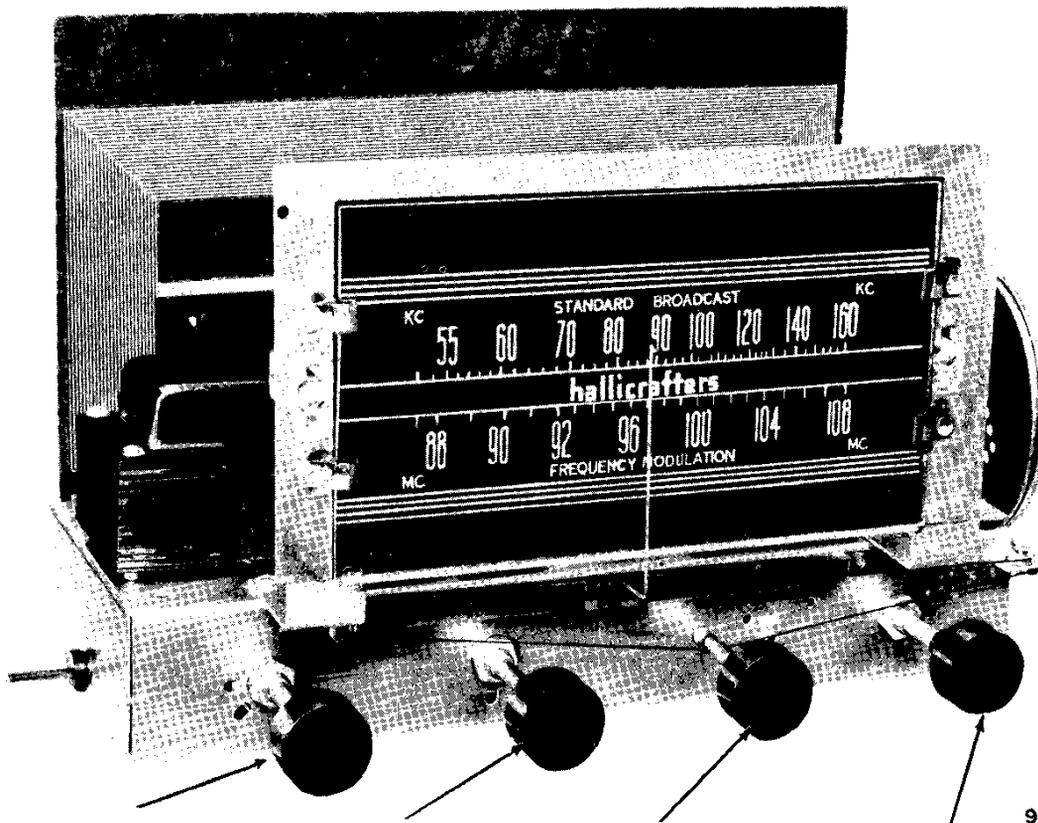


## OPERATION



92X1269

This is a combination power switch and tone control. In the OFF position the receiver is completely turned off. To turn on the receiver, turn the control to the right. The power switch will click and the dial light will illuminate the dial face indicating that the receiver is receiving power from the wall outlet. After tuning in the station this control is again adjusted for the desired tonal response. Turning the control clockwise decreases the bass response.

**VOLUME** - Turn this control clockwise to increase volume and counter-clockwise to decrease volume.

**TUNING** - The tuning control "tunes in" either AM (Standard Broadcast) or FM (Frequency Modulation) stations depending upon the setting of the range switch. The standard broadcast band dial is calibrated so that a zero must be added to the number appearing on the dial to obtain the station frequency in kilocycles. The frequencies of the FM stations are shown directly in megacycles. The frequencies of local stations are generally listed in local newspapers, AM stations in kilocycles and FM stations in megacycles. Tune for the clearest reception to obtain top performance from your receiver.

This is the combination range and operation switch. In the FM (Frequency Modulation) position, the receiver tunes the 88 to 108 megacycle FM band; in the AM (Standard Broadcast) position, the receiver operates as a regular broadcast receiver tuning the frequency range 540 to 1600 kilocycles. To use the receiver as a record player, set this switch at PHONO and operate the volume and tone controls as for normal radio reception.

MODEL ST-74

## DESCRIPTION

The model ST-74 receiver is a superheterodyne receiver covering the standard broadcast (540 kc - 1600 kc) and FM broadcast (88 mc-108 mc) services. The receiver is supplied in chassis form for custom installations.

A shielded connector and power receptacle located on the rear apron of the chassis permit the attachment of a record player for recorded entertainment.

To place the receiver in operation it is merely necessary to connect the antenna and speaker and plug the power plug into the wall outlet. Refer to the installation details that follow, especially to the paragraph on "Power Source", before connecting the receiver to the wall outlet to avoid unnecessary and perhaps costly repairs.

## INSTALLATION

**UNPACKING** - Check all shipping instruction tags carefully before removing them.

**LOCATING** - When locating and mounting the receiver give careful consideration to ventilation. Avoid warm locations such as are found near radiators, or hot air registers. Carefully avoid dead air spaces in the installation.

**ANTENNA** - The receiver is equipped with a built in loop antenna for local reception on both the FM (frequency modulation) and AM (standard broadcast) bands. Due to the directional effect of a loop antenna, it may be necessary to rotate the receiver slightly to obtain optimum performance from all of the broadcasting stations. In general, however, the receiver may be placed in operation without further antenna considerations.

Where receiving conditions are poor and maximum antenna pickup is required, antenna terminals have been provided for an outdoor antenna system.

**Standard Broadcast Antenna** - When required, a single wire approximately 25 to 50 feet long may be connected to the terminal marked **EXTERNAL BROADCAST ANTENNA**, located at the rear of the receiver, to improve reception in the standard broadcast band (540-1600 kc). This wire may be concealed in the room or erected outside the building as desired.

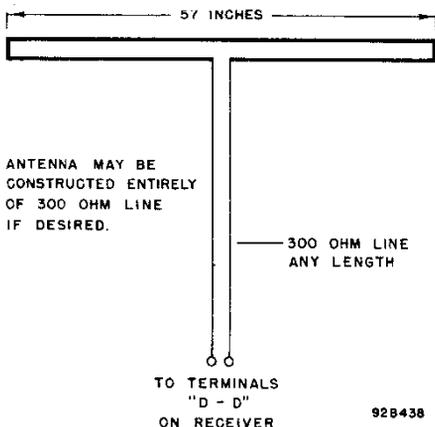


Fig. 2. Folded doublet antenna details.

**POWER SOURCE** - The receiver operates from a 105-125 V. 60 cycle AC (Alternating current) power source only. The receiver will not operate from a DC (Direct Current) or 25 cycle AC source directly. If in doubt as to the voltage and frequency rating of your power source, contact the local power company representative to avoid costly repairs. The normal power consumption for this receiver is 60 watts.

**RECORD PLAYER CONNECTION** - A shielded type receptacle, accessible at the rear chassis apron, is provided to accommodate a record player pickup cable connector. Any record player employing a crystal cartridge or high level magnetic pickup in its tone arm may be used with the receiver. An a-c receptacle is also provided to accommodate the power plug on the record player. The record player is automatically shut off with the receiver when using this power outlet.

**FM Broadcast Antenna** - Where receiving conditions demand more signal pickup on the FM band than provided by the built in loop, an FM band antenna may be erected and its transmission line connected to the two terminals marked "D-D" located on the rear apron of the receiver chassis. The receiver is designed to operate with any FM band antenna using a 300-ohm transmission line.

The simplest antenna which will provide satisfactory FM reception is the folded doublet. This antenna may be constructed of 300-ohm transmission line available at most radio supply houses. Cut and solder the transmission line conductors together as shown in Fig. 2.

Satisfactory reception may be obtained by concealing the antenna under the rug, along the molding, or along the back of a cabinet. If receiving conditions are poor in the particular location, it may be desirable to erect the antenna outdoors as high as practical. In either case the reception will be best when the antenna runs at right angles to the direction of reception.

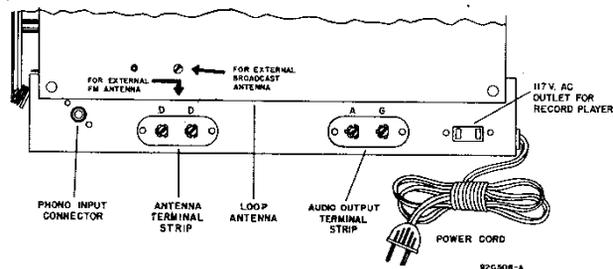


Fig. 3. Antenna & record player connections

**SERVICE**

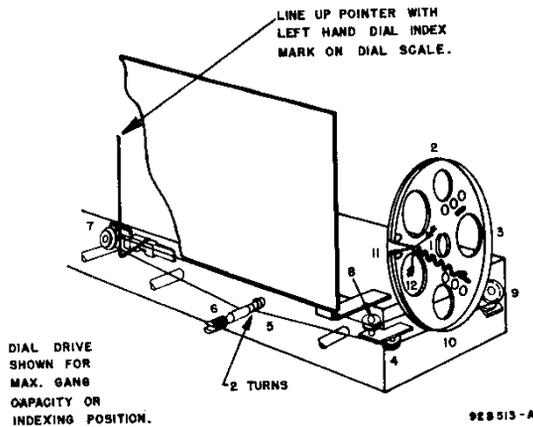
**GENERAL SPECIFICATIONS**

Tubes . . . . .	Six plus rectifier	Tuning . . . . .	Manual
High Impedance Output		Frequency Range . . .	Broadcast 540 kc - 1600 kc Frequency Modulation 88 mc - 108 mc
Antenna . . . . .	Built-in loop type Antenna. Provisions for external antenna.	Intermediate Frequency.	455 kc/10.7 mc
Phono Input . . . . .	High impedance	Power Supply . . . . .	105-125 V. 60 cycles AC
		Power Consumption . .	60 watts

**TUBE REPLACEMENT** - The tube types and their relative position in the receiver are shown in the illustration, Fig. 5. When installing a replacement tube, insert the center guide pin into the center hole of the tube socket; rotate the tube until the key on the guide pin drops into the notch in the socket hole; and push down until the base of the tube rests firmly on the socket. A slightly different technique must be used on the miniature tubes. They have seven small pins which have to be lined up with the socket holes before pushing the tube into the socket. Handle all tubes with care as they are considered fragile and do not tolerate much mechanical abuse.

**DIAL LAMP REPLACEMENT** - Refer to Fig. 5. for the location of the two dial lamps. To replace a defective dial lamp, unclip the dial lamp socket by compressing the side springs. The socket and defective lamp may then be brought out into the open for service. Replace defective lamps with 6-8 V. Mazda #44 (Blue bead) or equivalent.

**RESTRINGING DIAL CORD**



Restring the dial drive with a 48-inch length of 20 lb. test dial cord. Tie one end to the tension spring and follow the stringing sequence outlined in Fig. 1. Stretch the tension spring and tie the end of the cord securely to the spring as shown.

Set the tuning condenser at maximum capacity (closed), attach the dial pointer to the drive string and line it up with the left hand index mark on the dial scale.

Fig. 4. Dial cable stringing procedure

**ALIGNMENT**

- |                                   |                   |   |           |
|-----------------------------------|-------------------|---|-----------|
| Generator connection . . . . .    | See chart         | Electronic voltmeter connection . . . . . | See chart |
| Generator ground . . . . .        | To chassis        | Volume control position. . . . .          | Maximum   |
| Output meter connection . . . . . | Across voice coil | Tone control position . . . . .           | Optional  |

The standard RMA dummy specified in the alignment chart consists of a 200 mmf condenser in series with a 20 uh r-f choke which is shunted by a 400 mmf condenser in series with a 400 ohm carbon resistor.

MODEL ST-74

**ALIGNMENT CHART**

Dummy Step	Antenna Coupling	Signal Generator Frequency	Radio Range Switch Position	Radio Dial Setting	Adjust	Remarks	
1.	.01 mfd. cap.	To stator plates of high cap. mixer section	455 kc	2	1000 kc	A,B,C,D	Adjust for max. audio output at voice coil. Keep audio output below 50 mw to avoid AVC action.
2.	.01 mfd. cap.	To stator plates of low cap. mixer section	10.7 mc (No modulation)	1	100 mc	E,F,G,H	Adjust for max. DC voltage between pin #7 of the 6AL5 and chassis. Connect a 500,000 ohm resistor in series with voltmeter probe. Use just enough signal generator output to obtain approx. 2 volts at the electronic voltmeter.
<p>3. After completing the adjustments required by step 2, detune the signal generator on each side of 10.7 mc and note the generator dial or frequency reading for one half of the DC voltage measured by the electronic voltmeter. Use just enough signal generator output to obtain a maximum of 2 volts at the center frequency of the IF channel. Set the signal generator frequency at the midpoint of the two readings obtained above and align the FM detector transformer as follows:</p>							
<p>4. Without changing the setup, adjust the primary of the FM detector transformer (I) for maximum DC voltage. Disconnect the electronic voltmeter probe and reconnect it to the junction of R24 and R25 using the 500,000-ohm resistor as before for isolation. Adjust the secondary of the FM detector (J) for the null or zero DC voltage. This completes the IF amplifier adjustment.</p>							
5.	Std. RMA dummy	To BC antenna terminal on back of loop.	1500 kc	2	1500 kc	*K,L	Adjust for max. audio output as in step 1.
			600 kc	2	600 kc	*M	
6.	300-ohm carbon resistor	To terminals "D-D" on rear chassis apron. Connect resistor to high side or ungrounded terminal	108 mc	1	108 mc	*N,O	Adjust for max. DC voltage as in step 2.

\*Calibration adjustment.

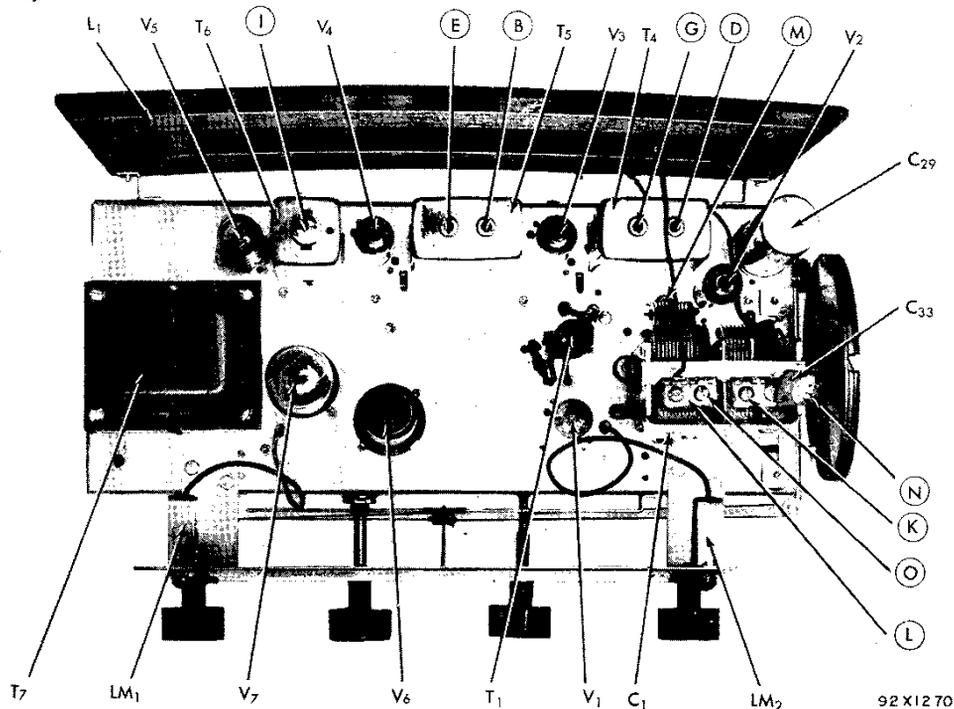


Fig. 5. Top view, alignment, adjustments and component location.

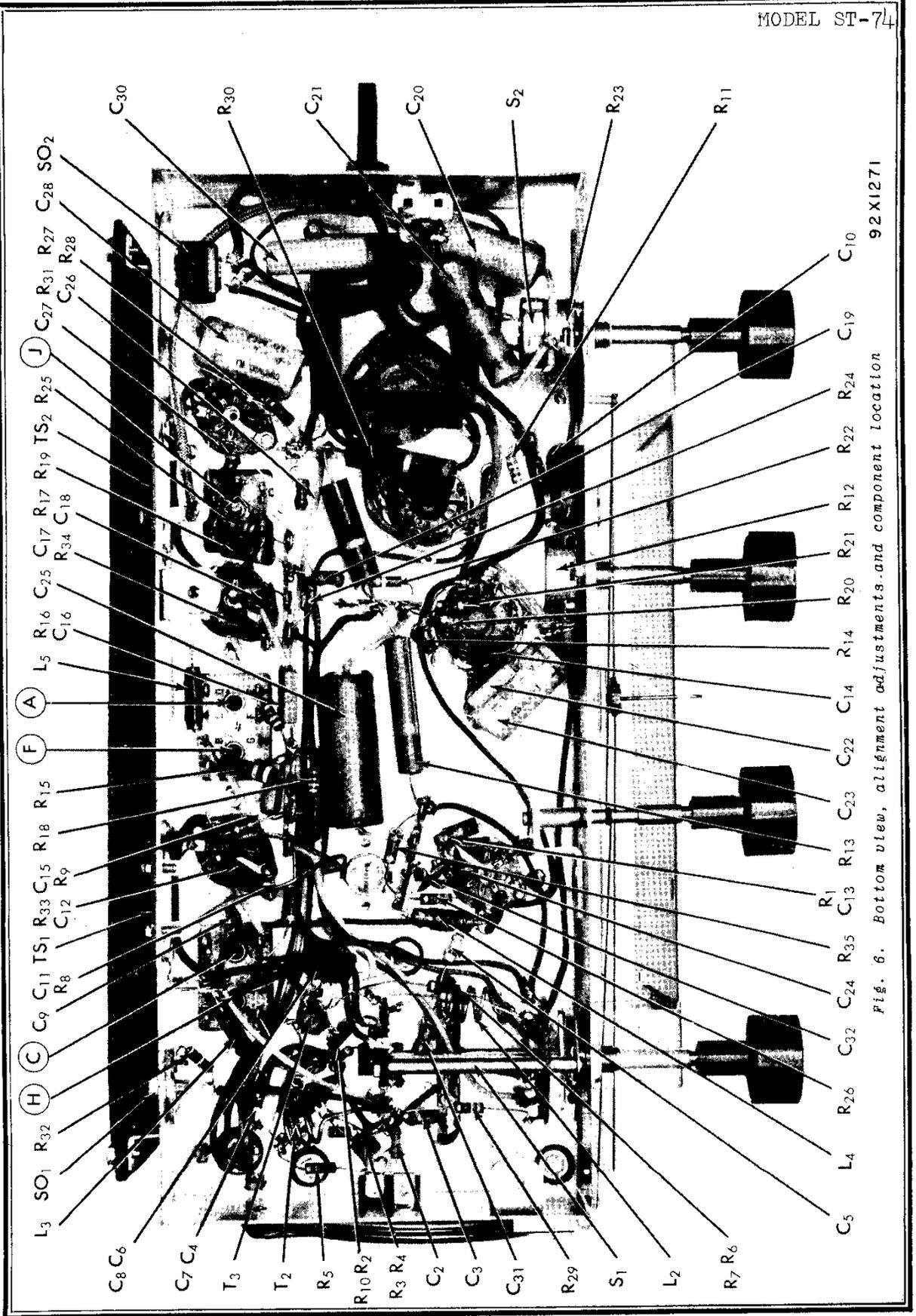
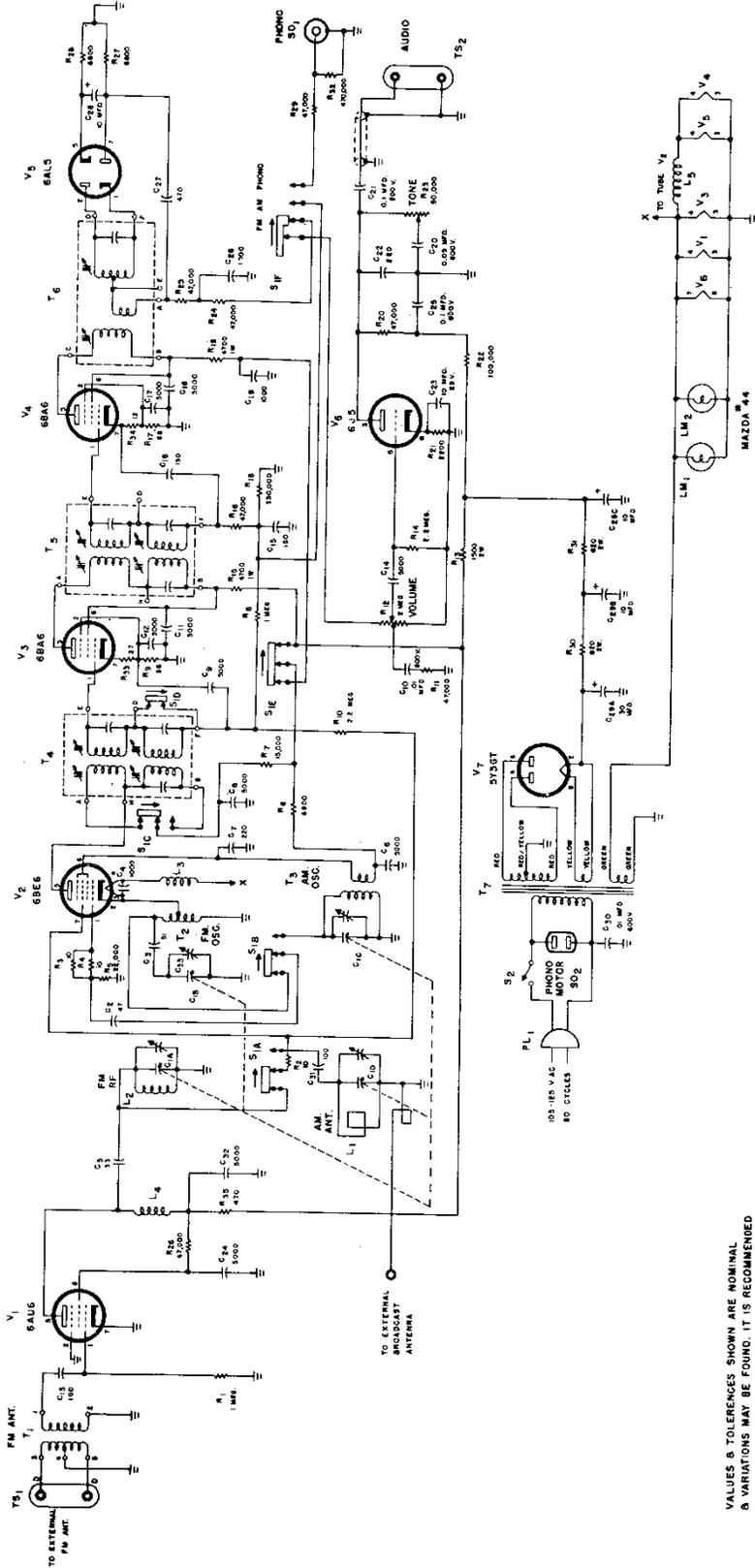


Fig. 6. Bottom view, alignment adjustments and component location 92X1271

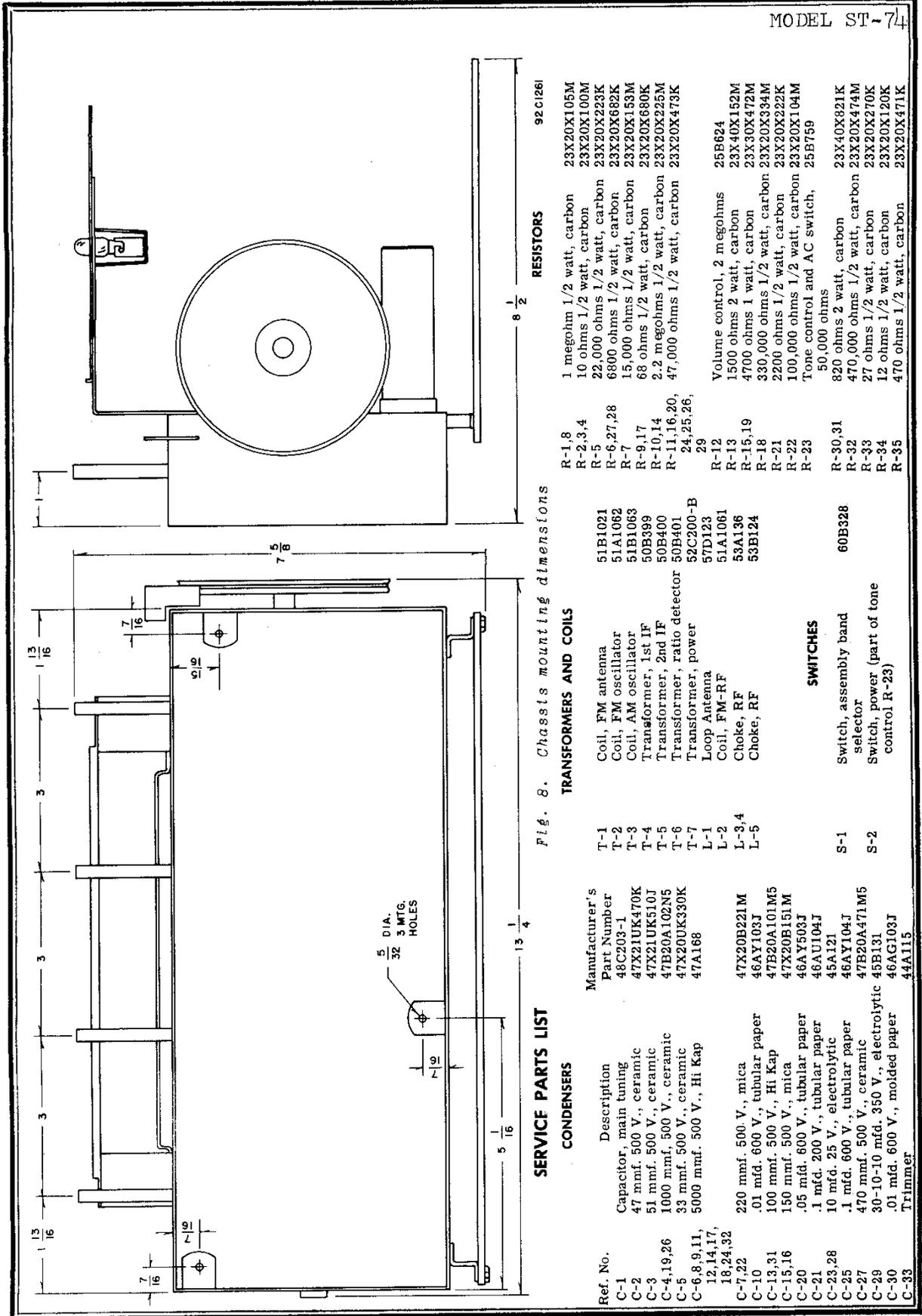
MODEL ST-74



800334-A

Fig. 7. Schematic Diagram

- VALUES & TOLERANCES SHOWN ARE NOMINAL  
 & VARIATIONS MAY BE FOUND. IT IS RECOMMENDED  
 THAT THE VALUE OF ANY REPLACEMENT CORRESPOND  
 TO THE NOMINAL VALUE OF THE PART BEING REPLACED.
- NOTES -  
 RESISTOR VALUES ARE IN OHMS.  
 RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED.  
 CAPACITOR VALUES ARE IN MMF. UNLESS OTHERWISE SPECIFIED.  
 RANGE SWITCH S-1 SHOWN IN FM. POSITION.
- LAST CAPACITOR SYMBOL — C-33  
 LAST RESISTOR SYMBOL — R-35



**SERVICE PARTS LIST**

**CONDENSERS**

Ref. No.	Description	Manufacturer's Part Number
C-1	Capacitor, main tuning	48C203-1
C-2	47 mmf. 500 V., ceramic	47X21UK470K
C-3	51 mmf. 500 V., ceramic	47X21UK510J
C-4,19,26	1000 mmf. 500 V., ceramic	47B20A102N5
C-5	33 mmf. 500 V., ceramic	47X200K330K
C-6,8,9,11,12,14,17,18,24,32	5000 mmf. 500 V., Hi Kap	47A168
C-7,22	220 mmf. 500 V., mica	47X20B221M
C-10	.01 mfd. 600 V., tubular paper	46AY103J
C-13,31	100 mmf. 500 V., Hi Kap	47B20A101M5
C-15,16	150 mmf. 500 V., mica	47X20B151M
C-20	.05 mfd. 600 V., tubular paper	46AY503J
C-21	.1 mfd. 200 V., tubular paper	46AU104J
C-23,28	10 mfd. 25 V., electrolytic	45A121
C-25	.1 mfd. 600 V., tubular paper	46AY104J
C-27	470 mmf. 500 V., ceramic	47B20A471M5
C-29	30-10-10 mfd. 350 V., electrolytic	45B131
C-30	.01 mfd. 600 V., molded paper	46AG103J
C-33	Trimmer	44A115

**TRANSFORMERS AND COILS**

T-1	Coil, FM antenna	51B1021
T-2	Coil, FM oscillator	51A1062
T-3	Coil, AM oscillator	51B1063
T-4	Transformer, 1st IF	50B399
T-5	Transformer, 2nd IF	50B400
T-6	Transformer, ratio detector	50B401
T-7	Transformer, power	52C200-B
L-1	Loop Antenna	57D123
L-2	Coil, FM-RF	51A1061
L-3,4	Choke, RF	53A136
L-5	Choke, RF	53B124
S-1	Switch, assembly band selector	60B328
S-2	Switch, power (part of tone control R-23)	

**Fig. 8. Chassis mounting dimensions**

**RESISTORS**

R-1,8	1 megohm 1/2 watt, carbon	23X20X105M
R-2,3,4	10 ohms 1/2 watt, carbon	23X20X100M
R-5	22,000 ohms 1/2 watt, carbon	23X20X223K
R-6,27,28	6800 ohms 1/2 watt, carbon	23X20X682K
R-7	15,000 ohms 1/2 watt, carbon	23X20X153M
R-9,17	68 ohms 1/2 watt, carbon	23X20X680K
R-10,14	2.2 megohms 1/2 watt, carbon	23X20X225M
R-11,16,20,24,25,26,29	47,000 ohms 1/2 watt, carbon	23X20X473K
R-12	Volume control, 2 megohms	25B624
R-13	1500 ohms 2 watt, carbon	23X40X152M
R-15,19	4700 ohms 1 watt, carbon	23X30X472M
R-18	330,000 ohms 1/2 watt, carbon	23X20X334M
R-21	2200 ohms 1/2 watt, carbon	23X20X222K
R-22	100,000 ohms 1/2 watt, carbon	23X20X104M
R-23	Tone control and AC switch, 50,000 ohms	25B759
R-30,31	820 ohms 2 watt, carbon	23X40X821K
R-32	470,000 ohms 1/2 watt, carbon	23X20X474M
R-33	27 ohms 1/2 watt, carbon	23X20X270K
R-34	12 ohms 1/2 watt, carbon	23X20X120K
R-35	470 ohms 1/2 watt, carbon	23X20X471K

