TECHNICAL SERVICE MANUAL

FOR

MODEL 800-B
RADIO-PHONOGRAPH

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97B2294 7-25-46

Model 800-B Radio-Phonograph

TECHNICAL DATA

Power Requirements	117 volts AC 60 Cycles Current Consumption 197 Watts Normal-310 Watts Maximum

NOTE: Power transformers can be furnished for other voltages or frequency upon request.

Number of Tubes	24 including rectifier and voltage regulator

Circuit: Superheterodyne - 1 RF stage all bands.

3 Tuning Bands, 2 for AM, 1 for FM; 2 stage IF amplifier for AM with variable selectivity; 4 stage IF amplifier for FM with 2 limiter stages; continuously variable bass and treble controls; balanced phase inverter; inverse feedback; electro-static shielded antenna input circuit; beam power output circuit; peak noise limiter for use on SW band; variable sensitivity on AM.

RF Circuits	1 on all bands
IF Circuits	2 on AM bands with variable selectivity 4 on FM band with 2 limiter stages
Audio Circuits	4 stages 2 single stages Pushpull driver Pushpull output
Oscillator Circuit	Electron coupled Temperature compensated
Rectifier Circuits	Full wave using 2 5Y3GT tubes
Audio Power Output	25 watts undistorted 40 watts maximum
Audio Frequency Range	35 to 20,000 cycles
Overall Frequency Range - AM	35 to 8,500 cycles
Overall Frequency Range - FM	35 to 15,000 cycles
Tuning Range - AM	540 KC to 1600 KC 5.9 MC to 18.2 MC
Tuning Range - FM	88 to 108 MC

Model 800-B Radio-Phonograph

Physical Specifications

Receiver chassis dimensions (panel attached):

Width	17 1/2 inches
Depth	16 1/4 inches
Height	11 1/4 inches
Weight	44 lbs.

Power Supply chassis dimensions:

Width	16 inches
Depth	10 1/2 inches
Height	7 3/4 inches
Weight	38 1/2 lbs.

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INTRODUCTION

These instructions cover the installation, operation, and servicing of the Model 800-B Radio-Phonograph. THEY SHOULD BE STUDIED WITH GREAT CARE BEFORE THE INSTALLATION OR SERVICING OF THE EQUIPMENT IS ATTEMPTED IN ORDER THAT OPTIMUM PERFORMANCE MAY BE OBTAINED.

Section I DESCRIPTION

1.1 General

The receiver employs 24 tubes and covers the frequency range of 540-1600 KC and 5.9-18.2 MC for reception of amplitude modulated signals and 88-108 MC for reception of frequency modulated signals.

The receiver is designed for operation on a 115-120 volt, 50-60 cycle AC source. Transformers for operation on other voltages and frequencies can be supplied on request. The normal power consumption is 197 watts increasing to 310 watts momentarily while the pushbutton system is in operation.

The receiver consists of two units, interconnected by means of cables and plugs provided for this purpose. The tuning chassis contains all the RF and IF circuits used for amplitude modulation (AM) reception, the RF circuits for frequency modulation (FM) reception, and the first and second audio amplifier circuits. The power supply chassis contains the IF amplifier circuits for frequency modulation reception, the third audio amplifier circuits and the audio output circuit. It also contains all the power supply and rectifier circuits.

The receiver is provided with a motor driven pushbutton tuning system with 12 station pushbuttons provided on the front panel. Two additional pushbuttons are provided to turn the receiver ON or OFF. A receptacle is also provided at the rear of the receiver for connection of a remote control box so that the receiver may be tuned from a remote location.

1.2 Frequency Range

The receiver is provided with three frequency bands. The Standard Broadcast (BC) Band covers 540 to 1600 Kilocycles. The Shortwave (SW) Band covers 5.9 to 18.2 Megacycles which includes all the important shortwave bands. The Frequency Modulation (FM) Band covers 88 to 108 Megacycles.

1.3 Tube Complement

The receiver utilizes 24 tubes as follows:

Symbol	Type	Application	Symbol	Type	Application
V1	6SK7	AM-RF Amp.	V6	6H6	AM-2nd Det.
V2	6J5	AM-Osc.	V7	6E5	AM-Tuning Eye
V3	6SA7	AM-Mixer	V8	6E5	FM-Tuning Eye
V4	6SK7	AM-1st IF Amp.	V9	6J5	1st AF Amp.
V5	6SK7	AM-2nd IF Amp.	V10	6J5	2nd AF Amp.

Symbol	Type	Application	Symbol	Type	Application
V11	6AG5	FM-RF Amp.	V18	6H6	FM Detector
V12	6C4	FM-Osc.	V19	6SL7GT	3rd AF Amp.
V13	6AG5	FM-Mixer	V20	6L6G	Audio Output
V14	6AC7	1st FM-IF Amp.	V21	6L6G	Audio Output
V15	6AC7	2nd FM-IF Amp.	V22	VR-150/0D3	Voltage Regulator
V16	6SJ7	1st FM Limiter	V23	5Y3GT	Rectifier
V17	6SJ7	2nd FM Limiter	V24	5Y3GT	Rectifier

1.4 Power Requirements

The Model 800-B Radio-Phonograph is designed to operate from a 110-120 volt 50-60 cycle power source. Normal power consumption at 115 volts is 197 watts increasing to 310 watts momentarily when the pushbutton system is in operation. The 46 volt transformer used to drive the pushbutton tuning system is connected across the AC line at all times and consumes 4 watts in the standby position. For operation on 220 volt 50-60 cycle power source, a stepdown transformer should be used. If the line voltage fluctuates to a value higher than 120 volts, a plug-in type ballast resistor should be used between the power source and the receiver power plug. In some locations where the line voltage varies over a wide range at different times, a tapped autoformer should be used so that the input voltage can be kept between 110-120 volts.

1.5 Antenna Requirements

The Model 800-B Radio-Phonograph is designed to be used with separate antennas for AM and FM bands in order to secure maximum efficiency in locations situated remotely from transmitting stations. Provision is made at the rear of the receiver through receptacle J7 in order that a loop antenna may be used for AM reception in metropolitan areas where signal levels are high enough to override any background noise level when the receiver is operated in the high-fidelity or broad position. Either the loop antenna or the outside antenna may be selected by means of the two position switch SW1 located at the rear of the receiver. For FM reception in metropolitan areas where sufficient signal strength is obtained to permit use of a built-in antenna, a folded dipole antenna may be used in conjunction with the loop antenna for AM reception. The outside antenna used for AM reception is a double doublet with a coupling transformer attached to the antenna flat top to provide maximum transfer of energy, and a low-loss twin conductor lead-in which is coupled to the receiver through a special coupling transformer which has been designed to provide maximum signal transfer from the antenna to the receiver and at the same time providing minimum noise pickup in the antenna lead-in. The outside antenna used for FM reception is a dipole antenna with a reflector. The elements of the dipoles have been designed to provide maximum signal pickup in the FM band of 88-108 megacycles, a low-loss twin conductor lead-in is used for maximum transfer of signal from the antenna to the receiver.

1.6 Speaker Connections

A receptacle J2 is provided in the power supply chassis for connection of the loudspeaker. Several types of speakers are furnished for use with the 800-B Radio-Phonograph, the quality of reproduction and power

handling capabilities being the same for all types but the connections to the speaker plug are different and are described in Paragraph 2.2. Extension speakers of the PM type may be connected to the output circuit of receiver as long as the impedance match of the output transformer is maintained correctly. Paragraph 2.2 describes in more detail the necessary connections.

1.7 Record Player and Television Input Connections

Terminals are provided at the rear of the receiver chassis for connection of the pickup cord from the record changer to the audio circuit of the receiver. If a different pickup is used other than the one furnished with the record changer it should be a high impedance unit or a crystal cartridge. If a low impedance pickup is used it will be necessary to use a matching transformer between the pickup head and the input terminals at the receiver. The record player furnished with the Model 800-B Radio-Phonograph operates on 115 volt 60 cycle power source. If it is desired to operate from 230 volt power source or 50 cycle power source by referring to Paragraph 2.5 the necessary information can be obtained to make the changes necessary to operate the record changer properly.

Terminals are also provided at the rear of the radio receiver for connection of the audio circuit of the Model 800-B Radio-Phonograph to a television tuner so that the sound portion of the television broadcast can be reproduced by the 800-B Radio-Phonograph while the picture is reproduced by the television tuner.

Section II INSTALLATION

2.1 Unpacking Equipment

When unpacking the 800-B Radio-Phonograph, make certain that all envelopes and boxes containing instructions and hardware are removed before discarding the cartons.

2.2 Installing Loudspeaker

The loudspeaker should be fastened to the baffle board by means of the four 1" wood screws furnished with the earlier model cabinets or by means of the carriage bolts in the later models; in either case the speaker should be fastened to the baffle surface with equal pressure on all four mounting points so as not to distort the speaker frame. Caution should be taken not to tighten too much on the mounting screws. The speakers furnished with the Model 800-B Radio-Phonograph have voice coils of 8 and 16 ohms. The coaxial speaker which has a 5 inch high frequency speaker mounted axially with the 15 inch low frequency speaker has a built in crossover network which has an input impedance of 8 ohms; the voice coil leads being connected to terminals 3 and 5 of speaker plug P4. The extended range single 15" loudspeaker has a voice coil impedance of 16 ohms and is connected to terminals 1 and 5 of speaker plug P4. If more than one speaker is to be used with the 800-B Radio-Phonograph the combined impedance of the set speaker and the extension speaker or speakers must equal 8 or 16 ohms, if not, a matching

transformer must be used in order that the correct match may be kept with the receiver output transformer. If only one extra speaker is to be used with a voice coil impedance of 8 ohms and the set speaker is a coaxial type with an input impedance of 8 ohms then both speakers can be connected in series to terminals 1 and 5 of speaker plug P4. If the extension speaker voice coil is 8 ohms and the receiver speaker voice coil 16 ohms, a matching transformer having a primary impedance of 16 ohms and a secondary impedance of 8 ohms must be used; the 8 ohm secondary being connected to the extension speaker and the 16 ohm primary connected in parallel with the 16 ohm voice coil of the receiver speaker to terminals 3 and 5 of speaker plug P4. The above are only examples of the most common connections, however in some instances multiple speaker installations are desired where the power in some speakers is to be less than in others or "T" pad volume controls may be desired on extension speakers. Upon receipt by the Scott Radio Laboratories of the necessary information, any special problem on multiple speaker connections will be given our prompt attention.

2.3 Installing Power Supply

The power supply chassis should be fastened to the lower shelf of the cabinet by means of the four 1/2 inch wood screws provided. It should be fastened down in a position where the fuse receptacles and connecting cable receptacles are readily accessible. In some installations where a mechanical vibration is transferred from the pushbutton tuning transformer through the metal base of the power supply to the cabinet shelf, it may be necessary to mount the power supply on rubber washers or two rubber pads.

2.4 Installing Receiver Chassis

The Model 800-B Receiver chassis has been designed so that it can be rolled in or out of the front of the cabinet, with a latch spring arrangement which holds the receiver at a position where the front of the panel extrudes out approximately 2 inches for ease in tuning. By releasing the spring latches on both sides of the panel the receiver may be rolled out approximately 10 inches for inspection of the receiver or tube replacement. The receiver chassis should be installed in the cabinet using the following procedure:

1. Mount the front panel on the receiver as shown in Fig. 1 using the hardware furnished.

2. Next mount the latch springs on the sides of the receiver chassis as shown in Figure 1. The retaining screw which is used to center the latch spring in the slot on the side of the panel should be screwed in far enough to bring the latch spring flush with the outside of the panel. It may be necessary to adjust the screw on the latch spring further in to make the latch catch smoothly when the set is pulled out. However, DO NOT leave the latch adjustment screws sticking out beyond the sides of the panel as they may catch in the latch spring plate when the set is pushed into the cabinet.

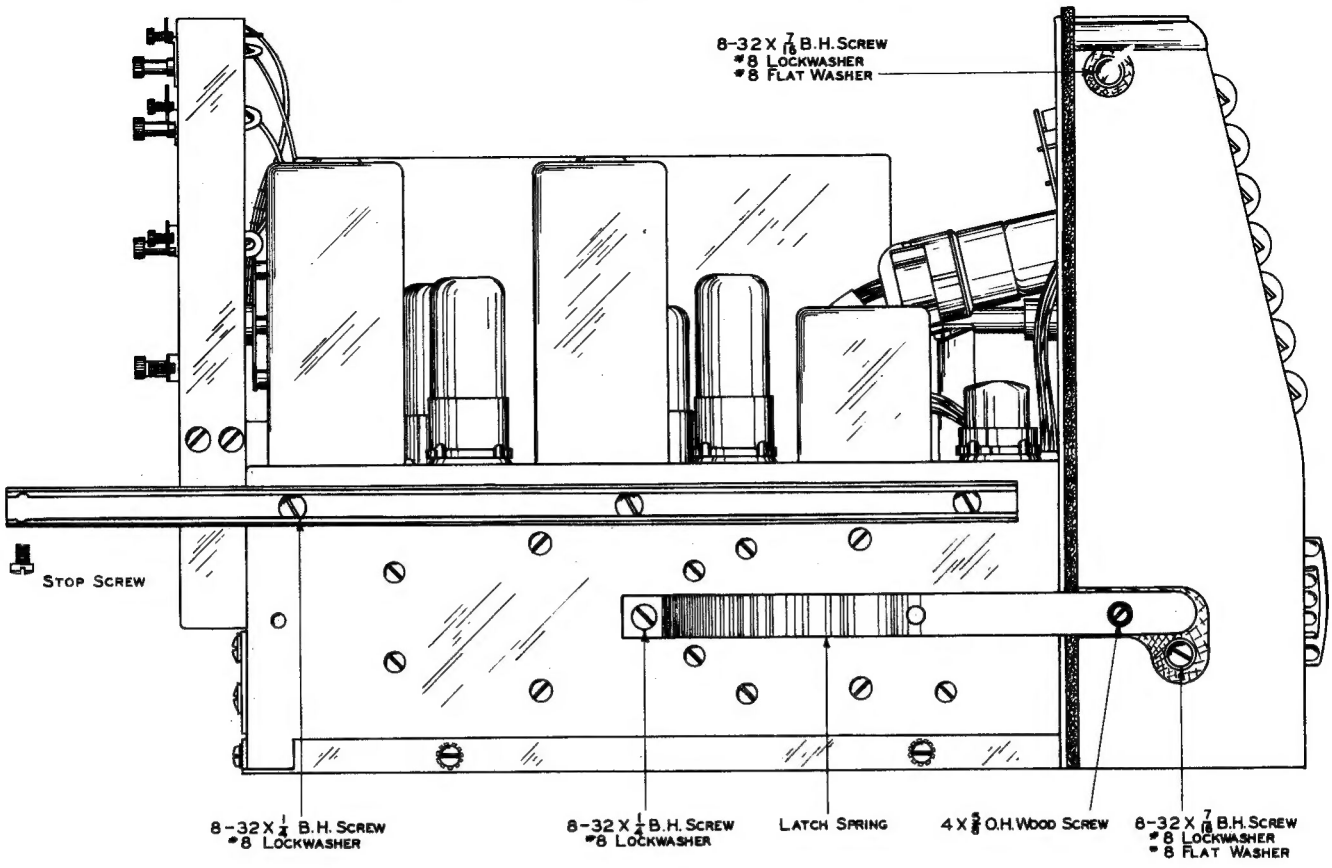


Figure 1 Slide Rail and Panel Mounting Detail

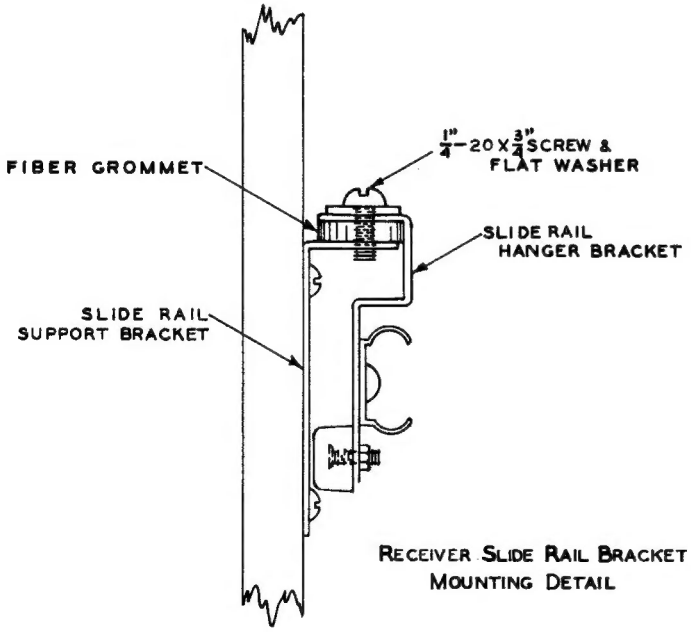


Figure 2 Slide Rail Bracket Mounting Detail

3. Mount the slide rails on the sides of the receiver chassis as shown in Figure 1 using the hardware provided for this purpose. Remove the stop screws from the ends of the rails as shown.

4. Open the door of the cabinet and slide it back inside as far as it will go.

5. Fasten the slide rail hanger brackets, which are packed with the receiver, onto the support brackets which are mounted in the cabinet, using the fiber grommets, screws and flat washers furnished with the receiver. A detail of this assembly is shown in Figure 2.

6. Insert the rails on the receiver into the slides which are mounted in the cabinet and slide the receiver back into the cabinet. If the receiver hangs too low and touches the door when pulled out, it will be necessary to shim up the hanger brackets by adding a metal washer under each fiber grommet.

7. Insert the stop screws in the ends of the rails from the bottom side.

8. Open the cable hole clamp at the back of the cabinet and lay the cables in the slot provided. The cables may then be inserted in their respective receptacles in the power supply. DO NOT force the plugs as they are polarized and will enter the receptacle in only one position.

9. Insert the screw eye furnished, under the top at the rear of the cabinet in the center of the receiver compartment and tie the connecting cables to the screw eye leaving enough slack so that the receiver will pull all the way out without pulling the cables tight. This will allow the cables to loop when the receiver is run in and out of the cabinet.

2.5 Installing the Record Changer

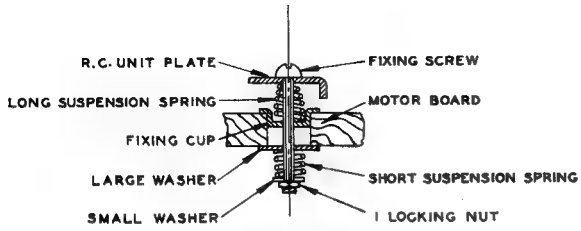
Several types of record changers are furnished for use with the 800-B Radio-Phonograph and while the method of mounting them is very similar for all types, each one requires a different cutout and location of mounting holes in the record changer mounting board. All the record changers are designed for floating spring mounting. In mounting the record changer it is not necessary to remove the drawer although it will be more convenient to do so. The back of the compartment should be removed, then take out the slide rail stop screws, the drawer can then be withdrawn from the cabinet.

Remove the spindle and the turntable. Then mount the changer with the hardware provided following the method shown in Figures 3A, 3B and 3C.

CAUTION: DO NOT LIFT THE RECORD CHANGER BY THE PICKUP ARM OR THE OVER-ARM AS UNDUE STRAIN ON THESE PARTS WILL PUT THE CHANGER OUT OF WORKING ORDER.

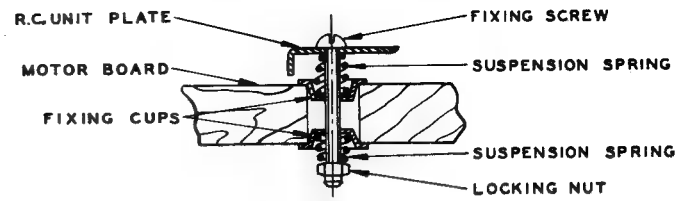
When fastening the changer down DO NOT tighten too much on the mounting springs as the changer base will rub on the mounting board producing audio feedback when the record changer is in operation.

The drawer can now be reinserted in the cabinet, feeding the record changer power cord and pickup leads through separate holes in the cabinet shelf. Put the stop screws back in the slide rails and fasten the back of the cabinet on.



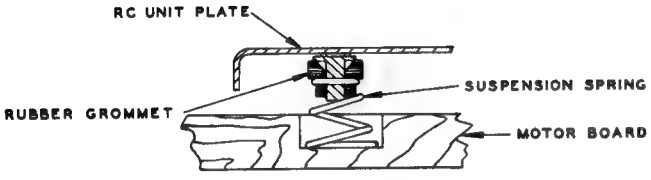
RC 60 RECORD PLAYER MOUNTING

Figure 3A



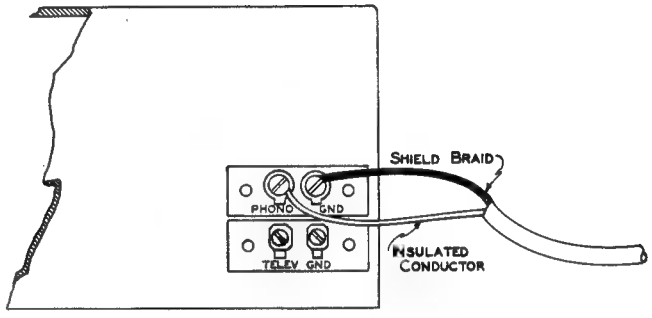
CD 40 RECORD PLAYER MOUNTING

Figure 3B



MODEL 70 RECORD CHANGER MOUNTING DETAIL

Figure 3C



RECORD PLAYER PICK-UP CONNECTIONS

Figure 4

The power cord of the record changer should be inserted in the power receptacle, which is fastened to the power supply chassis by a short cord, and the pickup cord connected to the PHONO-GND terminals at the rear of the receiver. Connect the shield braid to the GND terminal and the insulated conductor to the PHONO terminal as shown in Figure 4.

2.6 Power Connection

The Model 800-B Radio-Phonograph is designed for use on 110-120 volt 60 cycle power source. The receiver will operate on either 50 or 60 cycle power source but the record changer will run slow on 50 cycle source and it will be necessary to adjust the speed control on the RC60 and CD40 changers. The motor drive pulley will have to be changed on the Model 70 record changer. For operation from a 220 volt 50-60 cycle power source a stepdown transformer should be used.

Fuses are provided in the primary circuit of the power transformer (3 amp) and the pushbutton tuning system transformer (1 amp). Never replace these fuses with one of higher value as damage may be done to these transformers in case of a short circuit or heavy overload.

2.7 Antenna Connections

The Model 800-B Radio Receiver is designed to be used with either a straight antenna with single conductor lead-in or a doublet type antenna with 2 conductor lead-in. Separate connections are provided for antenna on AM and FM bands and for best reception a doublet type antenna should be used on the AM bands with a separate dipole antenna for the FM band as shown in Figure 5. For installations where only a double doublet antenna can be installed the FM antenna connection should be made as shown in Figure 6.

A double doublet antenna with pretuned matching transformer such as the SCOTT Double Doublet Antenna system will give maximum transfer of signal energy with greatest noise reduction on both broadcast and shortwave bands and a horizontal dipole with the flat top legs cut to the correct length for operation in the 88-108 megacycle band used with a two conductor lead-in with low-loss properties will give maximum results on the FM band.

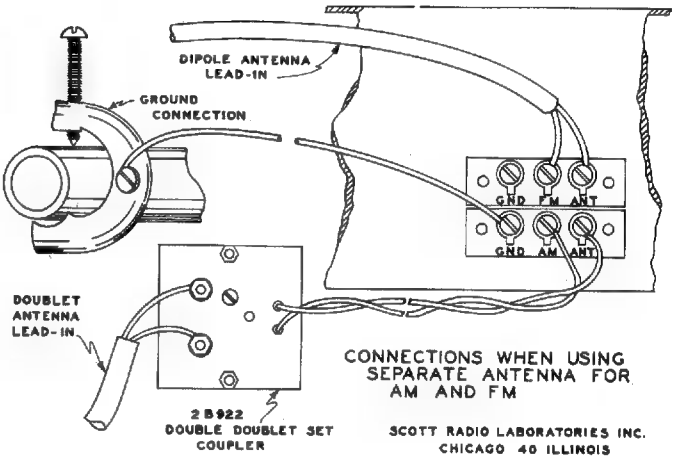
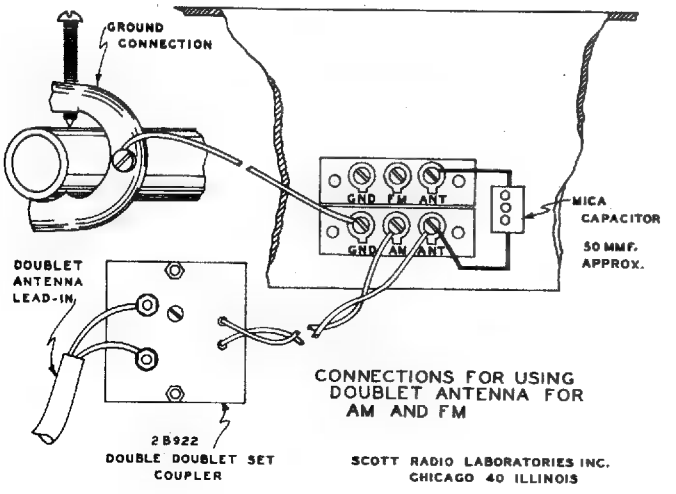


Figure 5

In installations where it is not possible to install a doublet antenna system, a single wire antenna with the flat top 60 to 75 feet long and the lead-in as short and direct as possible should be used. For FM reception a small mica capacitor of 51 MMF may be connected between the AM antenna connection and the FM antenna connection as shown in Figure 7.



A four contact receptacle is provided at the rear of the receiver chassis for using a loop antenna on the "BC" and "SW" bands in metropolitan areas where a number of powerful stations may be located. It is not recommended that a loop antenna be used for receiving distant stations. Directions for installing the loop antenna are furnished with each antenna.

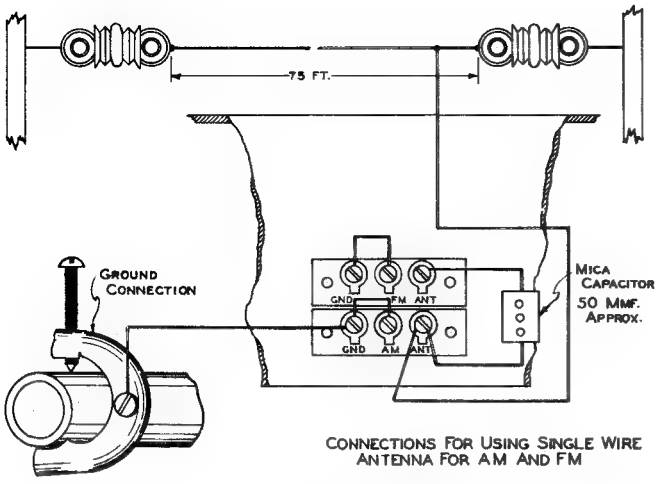


Figure 7

A two position switch with a screwdriver slot located at the left of the loop receptacle is provided so that the input circuits of the receiver may be connected to the loop antenna or an outside antenna. This switch should be set in the [redacted]-clockwise position for use with the loop antenna.

Section III OPERATION OF CONTROLS

All operating positions of the controls of the Model 800-B Radio Receiver, with the exception of the Main Tuning control are marked and indicator markings on the knobs are provided so that adjustment of the controls for various operating conditions is easily accomplished.

Six variable controls plus the Main Tuning control are provided so that maximum efficiency may be obtained at any operating condition. The functions and settings of the operating controls are listed below.

3.1 SELECTIVITY Control

The Selectivity control located at the left side of the panel has five positions marked S-M-B-PH-Tel. The S-M-B positions are effective only for AM (amplitude modulation) reception on the "BC" and "SW" bands. They designate the "Sharp", "Medium" and "Broad" condition of the AM-IF amplifier. The "S" position should be used at all times when manually tuning in stations as the IF amplifier is so broad in the "M" and "B" positions that a true resonant point cannot be obtained with the tuning eye. After the station has been tuned in properly in the "S" position the control may be advanced to the "M" or "B" position to obtain better fidelity. The Selectivity control must be set at the "M" or "B" position when tuning the receiver by pushbuttons.

When the Selectivity control is set at "PH" position it connects the record changer pickup into the audio circuit of the receiver and provides for record reproduction.

With the Selectivity control set at "Tel" position, the audio amplifier of the receiver is connected to the television input terminals at the rear of the receiver. These terminals are provided so that a television tuner may be connected to the 800-B Receiver and the audio amplifier of the receiver used for reproduction of television sound broadcasts, while the picture will be reproduced at the television tuner.

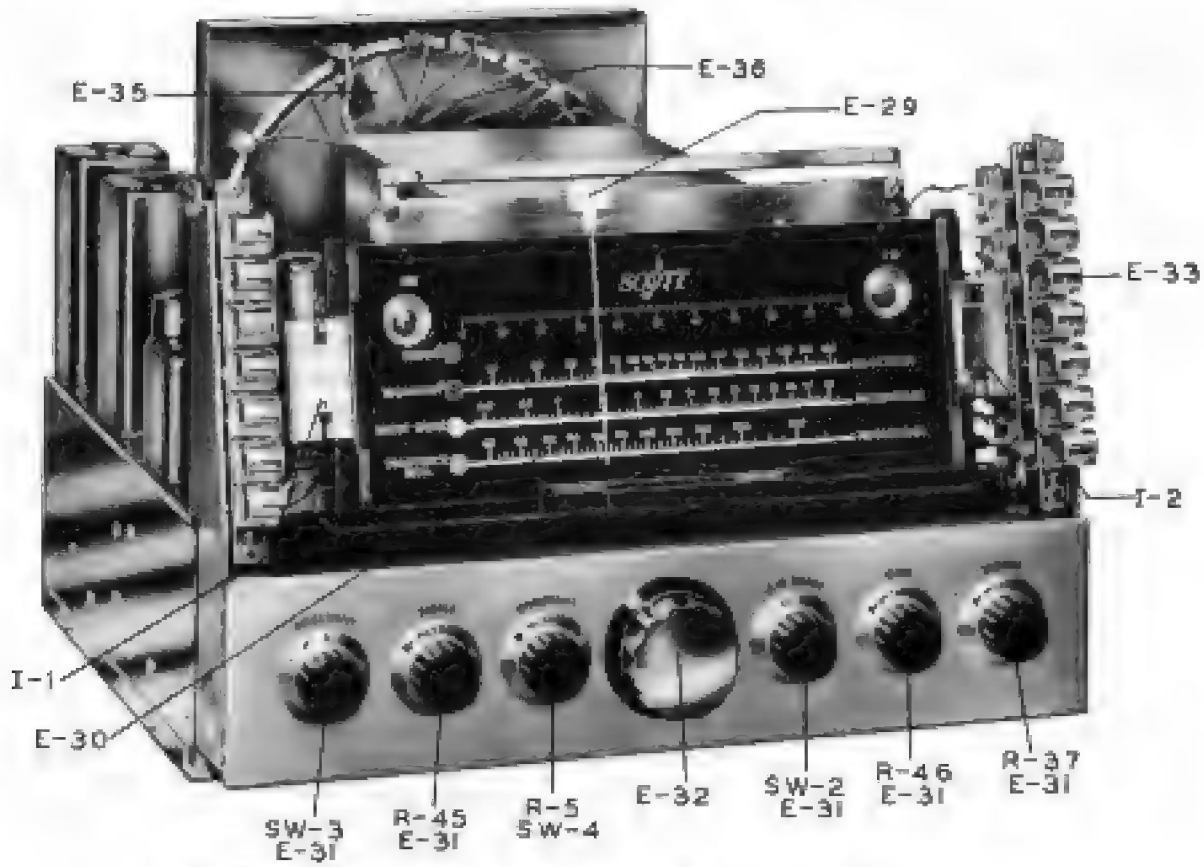


Figure 8 Front View 800-B Receiver Chassis Without Panel

3.2 TREBLE Control

The Treble control is located at the right of the Selectivity control and is provided in order that the high frequency response of the audio amplifier in the receiver may be changed to suit operating conditions and program material. Maximum high frequency response is obtained with this control set at maximum clockwise position.

3.3 SENSITIVITY Control

The Sensitivity control is located at the right of the Treble control. This control is effective only on the AM broadcast and shortwave bands and is provided to vary the sensitivity of the receiver. When manually tuning the receiver the control should be set to the position where the AM tuning eye shadow just closes or on weak stations to the point where maximum closure of the tuning eye is obtained. For maximum sensitivity when tuning in weak distant stations the control should be advanced to the point where the switch incorporated on this control just starts to throw. The switch mentioned above which is incorporated in the Sensitivity control is provided to switch the noise limiter circuit on and off. When the control is advanced to maximum clockwise rotation, the switch will throw on. The noise limiter circuit with which this switch is associated, is effective on noises which have definite peaks, such as automobile ignition, It will have very little effect on noise which is of constant amplitude. Although the switch may be turned on or off when the set is tuned to any frequency band, it is effective only on the AM shortwave band.

3.4 MAIN TUNING Control

The Main Tuning control is the large knob in the center of the panel. This control is provided for tuning the receiver to the station frequency desired.

3.5 AM-BAND SELECTOR Control

The AM-Band switch is located at the right of the Main Tuning control. This control is provided in order that either the broadcast or short-wave bands may be selected for AM reception. This control is effective only for AM reception.

3.6 BASS Control

The Bass control is located at the right of the AM-Band control. This control is provided to enable the listener to raise or lower the bass response of the receiver to suit operating conditions and program material. Maximum bass response is obtained when this control is rotated to maximum clockwise position. Turning the control counter-clockwise will reduce the bass response.

3.7 VOLUME Control

The Volume control is located at the right side of the panel. This control is provided to regulate the audio output or volume of the receiver. Maximum volume is obtained when this control is rotated to maximum clockwise position; zero output is obtained when the control is rotated to maximum counter-clockwise rotation. On standard 800-B Receivers this control will operate from minimum to maximum through an arc of 270 degrees. On receivers where remote volume control has been incorporated, the control will rotate seven complete revolutions from minimum to maximum since this control is driven by a motor controlled from the remote position, therefore when manually tuning the set it will be necessary to turn the control considerably more than is the case on the standard receiver.

3.8 Pushbutton Operation

Fourteen pushbuttons are provided on the panel of the receiver. The bottom button on the right side is provided to turn the receiver "ON" when this button is pushed in. The bottom button on the left side shuts the receiver "OFF" when pushed in. The other twelve buttons are provided for selecting stations. These twelve station selector buttons are effective only when the Selectivity control is set at "M" or "B" positions and the AM band controls set at "BC" position. A set of insert tabs listing all North American stations is included with each receiver. The sequence in which the inserts should be placed and the method of setting up the tuning system for pushbutton control is described in Section V - Adjustments.

After the pushbutton tuning system has been set up for operation as described on Page 24 when any pushbutton which has been set for an AM station is pushed the receiver will automatically switch over for reception of AM broadcast stations. When any pushbutton which has

been set up for an FM station is pushed, the receiver will automatically switch over for reception of FM stations. When manually tuning the receiver, in order to switch from AM to FM or vice-versa, it is only necessary to push any AM or FM button momentarily and the circuits will be switched automatically.

3.9 Tuning Indicators

In the upper right and left hand corners of the dial scale are located two tuning indicators which are provided to enable the operator to properly tune the receiver to resonance with the station when manually tuning. The indicator in the left hand corner is marked AM and is used only when tuning in stations on the broadcast or shortwave bands. The indicator in the right hand corner is marked FM and is used only when tuning in stations on the FM band. A control, with a screwdriver adjustment slot, located on the top of the chassis directly under the FM tuning eye, is provided so that the tuning eye shadow may be made to close on the strongest FM signal for the particular location. This adjustment will then enable the listener to accurately tune the receiver to all FM stations by watching for maximum closure of the FM tuning eye.

3.10 Tuning Dial

The three frequency bands are individually calibrated on the edge lighted glass scale. The BC band is calibrated in kilocycles with the last zero omitted on the numeral markings because of space limitations.

The SW band is calibrated in megacycles and the important bands are marked off for ease in tuning.

The FM band is calibrated in megacycles and divided in one-half megacycle divisions for help in tuning.

A scale marked off in 100 divisions located at the top of the dial face, is provided to enable the listener to log stations which may be tuned in on any of the three frequency bands and also permits setting up the pushbutton system as described on Page 24.

At the left side of the dial face are located four colored dots which are provided to indicate which frequency band the receiver is operating on and when the receiver is adjusted for record player reproduction. Each dot is illuminated by a small lamp located at the back of the dial mechanism and are automatically turned on with the setting of the controls for changing frequency bands.

Section IV CIRCUIT DESCRIPTION

4.1 General

The schematic diagram of the receiver chassis is shown in Figures 25 and 26 and the schematic diagram of the power supply chassis is shown in Figures 27 and 28. For purposes of illustration it will be assumed that the circuits are set up for reception on the Broadcast (BC) Band for AM reception.

4.2 AM-RF and Mixer Circuits

Signal input to the receiver through AM antenna connector strip E1 is connected to the primary winding of BC band antenna primary coil L1 through switch SW2A. An electrostatic shield, at ground potential, separates the secondary winding from the primary. The secondary coil L2, together with variable air capacitor C5A1 constitutes the first tuned circuit. Transfer of RF signal at the resonant frequency of this tuned circuit, from the antenna to the control grid of RF amplifier tube V1, is accomplished by inductive coupling through the antenna transformer L1, L2. Variable capacitor C5 is a three unit capacitor, each unit being split into two sections. The larger sections C5A1, C5B1 and C5C1 being used for tuning the AM-RF and oscillator circuits and the small sections C5A2, C5B2 and C5C2 being used for tuning the FM-RF and oscillator circuits. The secondary winding L2 is provided with an adjustable powdered iron core E3 for inductance trimming and a shunt connected variable capacity trimmer C1. These trimmers allow accurate alignment of the tuned circuit at both ends of the frequency band and are accessible for adjustment at the bottom of the receiver as shown in Figure 14. The high potential end of the tuned circuit is connected to the control grid of RF amplifier tube V1 through switch SW2A, switch SW1 and through coupling capacitor C3. The low potential end of the circuit is returned to chassis ground. The DC bias return from the control grid of RF amplifier tube V1 to the AVC line is closed through resistor R1. Switch SW1 located at the rear of the receiver chassis is provided so that a loop antenna, connected through loop receptacle J7, may be used in place of an outside antenna as outlined under Antenna Requirements, Paragraph 1.5.

Plate potential from the high voltage DC line is applied to the plate of RF amplifier tube V1 through filter resistor R11, bypassed to ground by capacitor C18A. One section of switch SW3A is used to cut off DC voltage from the plate and screen of RF amplifier tube V1 and the screen of mixer tube V3 when the Selectivity control is set at PHONO or TELEVISION positions in order to keep any RF signal from leaking through when using the audio amplifier of the receiver for record player reproduction or television sound broadcasts.

Screen potential is applied to RF amplifier tube V1 through filter resistor R4 bypassed to ground by capacitor C4B. Resistor R3 is connected from screen to ground to provide more stable screen potential with fluctuations in AVC voltage, this providing better AVC characteristics on strong signals. The suppressor of V1 is connected to ground. Initial grid bias is obtained by means of cathode resistor R2 bypassed by capacitor C4A. Grid bias on V1 can be increased when

full sensitivity is not required, by means of Sensitivity control R5 which also controls the bias on first IF amplifier tube V4. One side of the heater circuit of V1 is grounded at the socket.

The amplified signal from the plate of RF amplifier tube V1, is transferred to the signal grid of mixer tube V3 through RF transformer L7. The primary of L7 is untuned. The secondary winding together with variable capacitor C5C1 constitutes the second and final tuned circuit operating at signal frequency. The high potential end of the tuned circuit is connected to the signal grid of mixer tube V3 by switch SW2C, through coupling capacitor C17. The low potential end of the tuned circuit connects to ground. Adjustable iron core E7 and parallel connected trimmer capacitor C15 are provided for circuit alignment. The DC bias return from the control grid of mixer tube V3 to the AVC line is closed through resistor R8. Screen potential from the high voltage DC line is applied through resistor R12 bypassed to ground by capacitor C18B. The suppressor is internally connected to the shell of the tube. Initial bias is obtained by cathode resistor R10 bypassed by C18C.

4.3 AM-Oscillator Circuit

The AM-oscillator circuit is of the electron coupled type. The tuned circuit consists of tapped inductor L5 shunted with variable trimmer capacitor C6 and is tuned by variable capacitor C5B1 which is shunted by fixed capacitor C13 provided to increase the fixed minimum capacity of the circuit. The inductor L5 is provided with a variable iron core for inductance adjustment. Fixed capacitor C7 shunted by variable padder capacitor C8 is provided to modify the tuning of the oscillator circuit so that it will maintain a fixed frequency difference of 455 kilocycles with respect to the signal frequency circuits when the main tuning capacitor C5A1, C5B1 and C5C1 are varied from minimum to maximum capacity. On both the BC and SW-AM bands the oscillator frequency is maintained 455 kilocycles higher in frequency than the signal frequency.

The high potential end of the tuned circuit is connected to the control grid of AM oscillator tube V2, through switch SW6B mounted on the FM-AM relay K1, and through switch SW2B and fixed capacity C11. The low potential end of the coil returns to ground. The grid of V2 is returned to ground through resistor R6. The cathode of V2 is connected to the tap on inductor L5 through switch SW2B and through capacitor C14 to oscillator injector grid (Pin #5) of mixer tube V3. This grid is returned to ground through resistor R9. The plate of the oscillator tube V2 is connected to the 150 volt regulated high voltage DC line through resistor R7, bypassed by capacitor C12, and through switch SW6A on the FM-AM relay K1. This switch removes voltage from the plate of oscillator tube V2 when the receiver is adjusted for FM reception. One side of the heater of V2 is grounded at the socket.

4.4 AM-IF Amplifier Circuits - 455 Kilocycles

The signal frequency arriving at the control grid of mixer tube V3 and the oscillator frequency fed to the injector grid of this tube or mixed (or heterodyned) and the resultant difference frequency (455 kilocycles) is fed to the input of the IF amplifier.

Transfer of IF signal from the plate of the mixer tube V3 to second detector tube V9 is accomplished by inductive coupling through IF transformers T1, T2 and T3 and amplified by tube V4 and V5. The first IF transformer T1 consists of two tuned circuits, primary and secondary with the secondary circuit operating in conjunction with switch SW3A and a tapped tertiary winding to provide three degrees of selectivity by changing the co-efficient of coupling with the primary circuit. The primary and secondary windings are each tuned to 455 kilocycles by fixed capacitors C20 and C21 and adjustable iron cores E9 and E10. These iron cores are accessible for adjustment through the top of the shield can for E10 and at the bottom of the receiver for E9. The high potential end of the primary tuned circuit connects to the plate of mixer tube V3 through a shielded conductor while the low potential end connects to the high voltage DC line through resistor R13 bypassed to ground by C19. The high potential end of the secondary tuned circuit is connected to the grid of first IF amplifier tube V4 while the low potential end is connected to the AVC line through switch SW3A and resistor R16, bypassed to ground by C22. DC potential from the high voltage DC line is applied to the screen of V4 through resistor R18 bypassed to ground by C23B. Plate potential is applied through the primary tuned circuit of second IF transformer T2 and through resistor R19 bypassed to ground by C23C. Initial grid bias is obtained through resistor R17, bypassed to ground by capacitor C23A. Resistor R17 is returned to ground through sensitivity control R5 so that the bias on V4 may be increased when maximum sensitivity is not desired.

Second IF transformer T2 is similar to first IF transformer T1 in respect to design, construction and operating characteristics. Therefore except for differences in symbol designations the circuit description of first IF transformer T1 is applicable to this transformer. The low potential end of the secondary tuned circuit of T1 is returned to ground through switch SW3B. Grid bias for second IF amplifier tube V5 is obtained through resistor R22, bypassed to ground by C26A. Screen potential is applied through resistor R23, bypassed by C26B. Plate potential is applied through the primary winding of third IF transformer T3 and resistor R24, bypassed to ground by C26C.

Third IF transformer T3 consists of a tuned primary circuit and an untuned secondary. The primary circuit consists of the primary winding shunted by fixed capacitor C27 and adjustable iron core E13 which is accessible for adjustment at the bottom of the receiver. The high potential end of the secondary winding feeds the second detector diode, while the low potential end returns to ground through diode load resistors R31 and R32.

4.5 AM Second Detector Circuits

The second detector tube V6 is a twin diode tube, one section being used as a second detector diode the plate of which is connected to the high potential end of the secondary winding of T3. The cathode is connected to ground, thus the tube acts as a half wave rectifier. The voltage developed across diode load resistors R31 and R32 is filtered by resistor R34 and capacitor C29B to remove all audio components, and the resultant direct current AVC voltage is used to control the gain of amplifier tube V1, V3 and V4; the degree of control being dependent on the strength of the incoming signal.

The second section of the twin diode tube V6 is utilized as a peak noise limiter which is effective only on the AM shortwave band where interference from ignition or similar peak noise may be encountered. The audio voltage appearing at the junction of R31 and R32 as a result of the demodulating action of the second detector diode, is normally coupled to the input of the audio amplifier. When the Sensitivity control is advanced to maximum rotation, switch SW4 connects the audio input to the cathode of V6 and the noise limiter circuit is in operation.

DC potential from the AVC line is further filtered by resistor R35 and capacitor C29C and applied to the control grid of tuning eye tube V7-6E5. This DC voltage regulates the shadow angle of the tube to indicate when the receiver is tuned to resonance with the received signal.

4.6 Audio Amplifier Circuits

The 1st and 2nd audio amplifier circuits are located on the receiver chassis while the phase inverter and output amplifier are on the power supply chassis. The audio voltage developed across the diode load resistors R31 and R32 is applied to the control grid of first AF amplifier tube V9-6J5, through capacitor C30 and volume control R37.

Switch section SW6A on the FM-AM relay actuates to connect the output of either the AM detector or the FM discriminator to the audio input switch section SW3C. This switch connects the input circuit of 1st audio amplifier V9-6J5 to radio input. Phono input or television sound input, depending on the setting of the Selectivity control.

Initial bias for 1st audio amplifier V9-6J5 is obtained through resistor R38 bypassed by C31. Plate potential is applied through filter resistor R40, bypassed by 1 section of dual capacitor C33, and through load resistor R39.

Audio signal from the plate of V9 is fed through capacitor C32 to the grid of 2nd audio amplifier tube V10-6J5. The grid of V10 is returned to ground through resistor R41 and R47. Initial bias is obtained through resistor R42 bypassed by C34. Plate potential is applied through filter resistor R44, bypassed by the second section of C33; and through load resistor R43.

Signal from the plate of V10 is coupled to the grid of 3rd audio amplifier tube V19-6SL7GT, located on the power supply chassis, through capacitor C35, to terminal #3 of audio plug P2, through terminal 3 of audio receptacle J4 and through audio compensating network R80, C87.

The tone control circuit consisting of treble control R45 and associated capacitor C36; bass control R46 and associated audio choke L14, and capacitor C37. Both R45 and R46 are centertapped controls and when the controls are both set at the position of the tap the audio response curve is flat. By tuning the treble control clockwise the high frequency response is boosted and when turned counterclockwise the high frequency response is cut. When the bass control is turned clockwise the low frequency response is boosted and when turned counter clockwise it is cut; thus the frequency response of the audio amplifier can be controlled over a wide range.

The grid of 3rd audio amplifier V19A which is one section of a dual triode tube 6SL7GT, is returned to ground through R81. Capacitor C97 is used in conjunction with audio compensating network R80, C87 which is provided to compensate for loss of high frequency response in the long connecting lead from the plate of V10 to the grid of V19A. Initial bias for both sections of V19 is obtained through resistor R82 bypassed by capacitor C88. Plate potential is applied to V19A through R84 and to V19B through R83.

Audio signal from the plate of V19A is fed to the grid of audio output amplifier V20, through capacitor C89; this grid is returned to ground through R85 and R87.

Audio signal from the plate of V19B is fed to the grid of audio output amplifier V21 through capacitor C90; this grid is returned to ground through R86 and R87.

Audio voltage appearing at the junction of resistors R85, R86 and R87 is fed to the grid of V19B. Since this voltage is 180 degrees out of phase with that appearing at the grid of V19A the audio voltages appearing at the plates of V19A and V19B will be 180 degrees out of phase, thus providing push pull amplification.

Initial grid bias for V20 and V21 is obtained through resistor R88 bypassed by C91. Screen potential for V20 and V21 is applied direct from the power supply. Plate potential is applied through the centertapped primary of output transformer T8. Capacitor C92 and resistor R90 are connected in series across the plates of V20 and V21 to prevent parasitic oscillation in the output amplifier circuit.

4.7 FM-RF Oscillator and Mixer Circuits

The FM-RF amplifier, mixer and oscillator circuits are located on the receiver chassis, the FM-IF amplifier and discriminator circuits are located on the power supply chassis. Input signal from the antenna is fed through FM-antenna terminal strip E2, located at the rear of the receiver, through antenna coil L9 to the grid of FM-RF amplifier V11-6AG5 which is a miniature type tube. The secondary of antenna coil L9 is connected to the grid of V11 through a parasitic suppressor R26, the low potential end of the coil being grounded. It is tuned by variable air capacitor C5-A2. Variable trimmer capacitor C39 and adjustable iron core E14 are provided as trimmer adjustments. Shunt connected capacitor C38 is provided to increase the minimum capacity of the tuned circuit. Initial grid bias is obtained through R48 bypassed by C40. Screen potential is applied through resistor R49 bypassed by C41. Plate potential is applied through the primary of mixer coil L11 and resistor R51 which is bypassed by C47.

Signal from the plate of V11 is fed to the grid of FM-mixer tube V13-6AG5, through mixer coil L11 and parasitic suppressor R53. The secondary tuned circuit of L11 is tuned by variable air capacitor C5 and C2. Air trimmer C49 and adjustable iron core E16 are provided as trimmer adjustments while fixed capacitor C48 is provided to increase the minimum capacity of the tuned circuit. Initial bias for V13 is obtained through R54 bypassed by C45. This circuit is returned to ground through a small portion of the secondary winding of FM oscillator coil L10. This impressing a voltage on the cathode of V13

at the frequency to which the oscillator circuit is tuned. This signal which is always 10.7 megacycles lower in frequency than the signal frequency, is heterodyned or mixed with the signal frequency appearing on the grid of mixer tube V13 and the resultant frequency 10.7 megacycles appears at the plate of FM mixer tube V13.

Screen potential is applied to V13 through R55 bypassed by C51. Plate potential is applied through IF primary coil L12 and resistor R56 bypassed by C53. One side of the heater of V13 is bypassed to ground by C50.

FM oscillator tube V12-6C4 is a miniature type triode. The tuned circuit consists of FM oscillator coil L10 and variable air capacitor C5B2; variable trimmer capacitor C43 and adjustable iron core E15 are provided as trimmer adjustments. Fixed capacitor C42 is provided to increase the minimum capacity of the tuned circuit. The high potential end of L10 connects to the grid of V12 through coupling capacitor C44. The grid is returned to ground through R50. The cathode of V12 is connected to a tap on coil L10. Plate potential is applied through R52 bypassed by C46.

4.8 FM-IF Circuits

The IF signal appearing at the plate of FM mixer tube V12 is fed to the primary of 1st FM-IF transformer L12. This coil is tuned to 10.7 megacycles by capacitor C52 and adjustable iron core E17. The primary winding is then link coupled to the secondary winding, located on the power supply chassis, through FM-IF input plug P3 and jack J5 and through another small winding coupled to the secondary coil L13. The 1st FM-IF secondary coil L13 is tuned to 10.7 megacycles by capacitor C54 and adjustable iron core E20 and is connected to the grid of 1st FM-IF amplifier V14-6AC7 through parasitic suppressor R57.

Bias is obtained through R58, bypassed by C55. Screen potential is applied through R59 bypassed by C57. Plate potential is applied through the primary winding of 2nd FM-IF transformer T4 and resistor R60 bypassed by C58. One side of the heater of V14 is bypassed to ground by C56.

The primary of T4 is tuned to 10.7 megacycles by capacitor C59 and adjustable iron core E21. The primary is inductively coupled to the secondary which is tuned by capacitor C60 and iron core E22. The high potential end of the secondary connects to grid of 2nd FM-IF amplifier V15-6AC7 through capacitor C61 and parasitic suppressor R62. The low potential end returns to ground. The grid of V15 returns to ground through R61. Through the use of coupling capacitor C61 and grid leak R61 second FM-IF amplifier tube V15 will act as a limiter on extremely strong signals.

Second FM-IF amplifier V15-6AC7 is identical to first FM-IF amplifier tube; therefore except for symbol designations the circuit description is the same.

Third and fourth FM-IF transformer T5 and T6 are similar to second FM-IF transformer T4 and except for symbol designations the circuit description is the same.

The third and fourth FM-IF tubes are used as limiter amplifiers. By employing the proper plate and screen voltages and correct values of grid leak and coupling capacitors these tubes will reach full limiting action with approximately 10 microvolts input signal, effectively shunting any amplitude signals such as ignition noise or impulse interference signals. The values of grid leak and coupling capacitor used were chosen to insure fast limiting action on noises possessing a steep wave front.

4.9 FM Discriminator Circuit

The fifth FM-IF transformer or discriminator transformer is provided to couple the second limiter tube V17 to the discriminator diode V18. A phase bridge type of discriminator circuit is used with both primary and secondary circuits being tuned by air dielectric trimmers C80 and C82. The primary and secondary windings are inductively coupled so that the peaks of the discriminator are approximately 300 kilocycles apart. The discriminator is linear up to plus or minus 100 kilocycles from the IF frequency of 10.7 megacycles, in order that over-modulation beyond plus or minus 75 KC at the transmitter will not cause distortion in the receiver.

The balanced detector action of the discriminator tube diode acts to cancel any amplitude modulation present on weak signals. Signal voltage appearing across the primary of T7 is induced into the secondary of this transformer which reacts with the voltage coupled from the primary through capacitor C81 to produce frequency discriminating action. When the frequency of the signal flowing through T7 is exactly 10.7 megacycles the voltage across resistors R77 and R78 are equal and opposite. A change in the frequency in one direction produces a positive difference between the voltages across R77 and R78; a frequency change in the opposite direction produces a negative voltage difference. In this way frequency modulation of the carrier signal produces a similar audio frequency voltage across resistors R77 and R78. This audio voltage is fed to the audio amplifier input through a de-emphasis network consisting of resistor R7 and capacitor C85. RF choke L16 and capacitor C86 are provided to filter out any RF components which may be picked up in the audio input lead.

4.10 Rectifier Power Supply Circuits

The rectifier power supply of the Model 800-B Radio-Phonograph is designed to operate from a 115-120 volt 50-60 cycle AC source. The power supply chassis is provided with a 6 foot two conductor cord with plug for connection to the AC source.

One side of the primary circuit of power transformer T9 is fused with a 3 amp fuse and one side of the primary circuit of the pushbutton tuning transformer T10 is fused with a 1 amp fuse. The primary of T10 is connected across the AC line at all times so that voltage is always available to operate the AC-ON-OFF relay.

The primary circuit of the power transformer T9 is closed when the power ON-OFF relay K2 is thrown to the ON position by pushing the ON button at the front panel. One side of this primary circuit connects to terminal 10 of speaker receptacle J2. When the speaker plug P4 is inserted into the receptacle, the jumper wire between terminals 9 and

10 of the speaker plug completes the AC circuit to terminal 1 of the receiver receptacle J3 through the switch on relay K2 then back through terminal 4 of receiver receptacle J3 to the power transformer. The AC power circuit is fed through the speaker receptacle J2 so that if the speaker plug is removed when the power is on, the primary circuit is automatically broken and no damage can be done to the high voltage rectifiers. Capacitor C96 is provided to filter out any noise entering through the primary circuit of the power transformer. Receptacle J1 is provided for connection of the AC plug on the record changer. This receptacle is connected across the primary circuit of the power transformer and is active only when the receiver is turned ON.

One secondary of the power transformer furnishes high voltage for the full wave rectifier plates. Another winding furnishes filament voltage for the rectifier tubes V23 and V24. A third winding furnishes heater voltage for all tubes in the power supply chassis except the rectifiers. A fourth winding furnishes heater voltage for all tubes on the receiver chassis.

The rectified voltage from the rectifier tubes V23 and V24 is filtered by a two section filter and fed to the plate of the power output tubes V20 and V21 through the primary of output transformer T8. This voltage is also fed through terminal 2 of speaker receptacle J2 and plug P4 to the 675 ohm field of the loudspeaker; from the field it feeds back through the speaker plug and receptacle terminal 4 and fed to the plates of V19A and V19B and the screens of V20 and V21. From this point a dropping resistor R92 reduces the voltage to the proper potential for all other tubes in the receiver.

The voltage regulator tube V22-OD3 (VR-150) is included in the power supply circuit to provide stabalized voltage for the AM and FM oscillator tubes so that variations in line voltage will not affect the frequency setting of the oscillator circuits.

4.11 Loudspeaker Circuits

The loudspeaker used with the Model 800-B Radio-Phonograph may be either a coaxial type or an extended range single speaker. Both speakers have the same field characteristics. A 675 ohm series field connected to terminals 2 and 4 of speaker plug P4 and a 9000 ohm shunt field connected to terminals 4 and 6. The coaxial speaker consists of a 15 inch low frequency speaker with a 5 inch PM tweeter mounted in the center. A network is used with the high frequency tweeter so that it will reproduce only the higher frequencies. The voice coil impedance of the coaxial speaker is 8 ohms and is connected to terminals 3 and 5 of speaker plug P4. One side of the tweeter circuit is connected to terminals 7 and 8 of the speaker plug which feed through the speaker receptacle J2 to terminals 8 and 11 of the receiver power receptacle J3; then through the cable to switch SW6A on the FM-AM relay. When the switch is thrown to FM position this circuit is closed and the tweeter is effective but when the relay is thrown to AM position the tweeter circuit is open and only the 15 inch low frequency is effective. Since the low frequency speaker will reproduce all frequencies desired for AM broadcasts or record reproduction the tweeter is not used to prevent reproduction of undesirable back ground noise. The 15 inch extended range single speaker has a voice coil impedance of 16 ohms and is connected to terminals 1 and 5 of speaker plug P4, since no tweeter is used, terminals 7 and 8 are open.

4.12 Pushbutton Tuning System Circuits

The pushbutton tuning system in the Model 800-B Radio-Phonograph utilizes 14 pushbuttons, 12 of which are used for station selection and 2 being used to turn the receiver ON and OFF. Figures 29 and 30 depict the circuit diagrams of the systems used in the early models and the present models. The switches used are all single pole single throw, momentary contact pushbutton type. Seven switches are used in each gang located at the right and left side of the panel. Details on setting up and adjusting the pushbutton system are explained in Section V - Adjustments.

Each of the twelve pushbutton switches is connected by a color-coded lead to a terminal board E27 mounted on the under side of the receiver chassis. This terminal board is used as a common tie-point for wires leading to the switches, the backplate contacts and the remote box receptacle.

The backplate is the nerve center of the pushbutton tuning system. It consists of two semi-circular disks insulated from each other by a bakelite strip which has a narrow protrusion rising above the contact surfaces of the disks. The two disks are connected to the two windings of a reversible type motor which is coupled directly to the tuning shaft of the dial. The two disks which form the backplate rotor are coupled directly to the shaft of the main tuning capacitor. On the stator of the backplate are mounted twelve contact fingers with numbered, adjustable knobs. Each of these contacts are connected to a switch on the front panel as shown in Figure 9. On the early Model 800-B Receiver the backplate operates as follows, taking contact No.1 as an example. When pushbutton No. 1 is pushed the switch contacts close and potential from the 36 volt tap of pushbutton tuning transformer T10 is fed through the coil of muting relay K3 to terminal 3 of receiver power receptacle J3, then through receiver plug P1, terminal 3 to switch SW5 on the power ON-OFF relay, then to switch section SW2D of the band change control, to switch section SW3D of the selectivity control, then through lead No. 1 to the common terminal of the tuning motor. The voltage could then flow through either winding of the motor but since contact No. 1 is on the left side of the backplate rotor the voltage will be applied only to that side of the rotor through contact No. 1 to switch No. 1 then through lead No.5 and through coil L18 of the FM-AM relay to chassis ground. It is then returned to the other side of the 36 volt winding of the transformer through chassis ground. When the circuit is energized by closing a pushbutton switch as above the voltage across the coil L22 of muting relay K3 will energize the relay, closing the contacts and muting the audio circuit so that signals are not audible as the dial tunes across them. The voltage flowing through the motor winding causes it to rotate, actuating the dial mechanism and turning the backplate rotor, until the insulated segment rides under the active contact, at this instant the voltage in the circuit is interrupted and the motor stops running releasing the contacts on the muting relay. Since pushbutton No. 1 is connected to the AM common lead, the AM coil of the FM-AM relay would be energized when the circuit was closed thereby switching the AM circuits ON and making the FM circuits ineffective. If pushbutton switches 5, 6 or 7 or any switch which may be connected to the FM common lead were energized, the relay would automatically switch over as the FM coil of the relay would then be energized.

Figure 30 depicts the pushbutton tuning system used in the later model 800-B Receivers. The pushbutton switches are provided with two rows of dummy lugs, one row connected to the AM common lead, the other row connected to the FM common lead, and all that is necessary to use any pushbutton for FM or AM is to connect that switch to the corresponding common lead. It will be observed that the numbers opposite the pushbuttons have been rearranged so that they are in sequence - 1 to 12. Pushbuttons 5, 6 and 7 are still wired for FM when the receivers leave the factory as most of the FM stations are located in the center of the tuning scale but in locations where a frequency at some other part of the dial has been allocated, another pushbutton may be used by disconnecting the jumper wire of that particular switch from the AM common lead and connecting it to the FM common lead. The next item to be observed is the addition of two relays in series with the backplate rotor disk. When either of these relays are energized by voltage applied through the rotor disk, switches SW10 or SW11 are closed completing the motor circuit and turning the dial mechanism. By means of this arrangement very little current is required to pass through the backplate movable contacts thus prolonging their life. It will be noted also that the 36 volt tap of the pushbutton tuning transformer T10 is no longer required, all necessary potential being supplied from the 24 volt tap.

The pushbutton system drive motor is a 24 volt reversible type motor geared directly to the dial drive mechanism.

The power ON-OFF relay is a double solenoid relay with 1 rotary type switch section. When one of the solenoid coils is energized by pushing the ON pushbutton the relay actuates the switch to close the AC primary circuit of the power transformer and also closes the 24 volt circuit to the drive motor. When the other solenoid coil is energized by closing the OFF pushbutton, both of the above circuits are opened. Both solenoid coils operate at 24 volts AC.

The FM-AM relay is a double solenoid relay with 2 rotary type switch sections that operate 6 circuits. When one coil is energized by closing any AM pushbutton switch all circuits close to operate for AM reception, when the other solenoid coil is energized by closing any FM pushbutton switch, the circuits close to operate for FM reception. Both solenoid coils operate at 10 volts AC on the early model receivers and on all late model receivers with the relays in the drive motor circuit. The solenoid coils of the FM-AM relay operate at 22 volts AC.

The muting relay used in the 800-B Receiver is actuated by the voltage used to run the drive motor. The switch is a S.P.S.T. with contacts normally open. The coil operates on 2.4 volts AC.

The drive motor relays are identical in electrical characteristics to the muting relay although in some receivers the mechanical construction will be different.

The remote keyboard receptacle J6 is a 21 contact receptacle provided for the connection of a remote keyboard when it is desired to tune the receiver from a remote position. By means of this remote keyboard it is possible to tune in up to 12 stations, control the volume and turn the receiver ON and OFF. When the remote keyboard is to be used, a motorized volume control with the necessary connections is installed in the 800-B Receiver.

Figure 9 Front View 800-B Receiver Showing Pushbutton Sequence

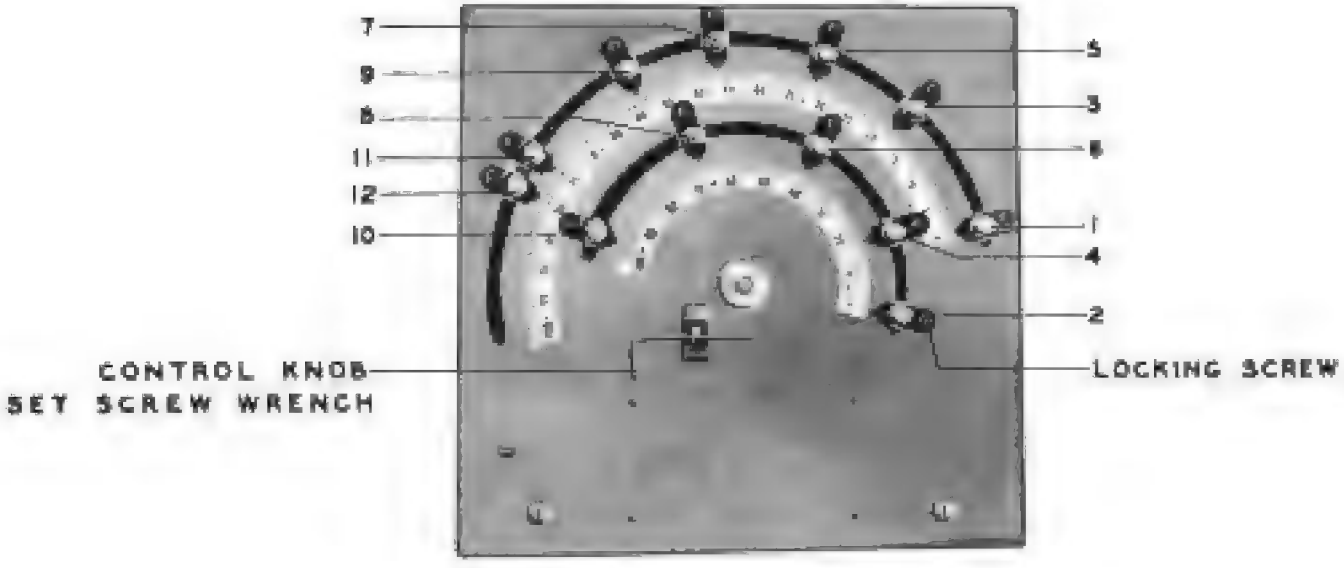


Figure 10 Back View of Pushbutton Tuning System Backplate

Section V ADJUSTMENTS

5.1 Setting up Pushbutton Tuning System

The pushbutton tuning system in the 800-B Receiver has been designed to provide maximum flexibility in order to permit setting up for 6 or more AM stations and 1 to 6 FM stations, the only limitations being the spacing of the stations on the tuning dial or the setting for an AM station falling on the same spot as that for an FM station. At the factory the receivers are wired so that 4 buttons on the left side of the panel and the 5 top buttons on the right side are wired for AM stations and the lower button on the right side with the two top buttons on the left side are wired for FM stations as shown in Figure 9. No attempt should be made to set up the pushbutton tuning system for weak distant stations as poor results will be obtained because of background noise.

The switch over from AM to FM reception is done automatically in the receiver, that is, with the receiver adjusted for pushbutton tuning, when any AM button is pushed the receiver is automatically set for AM reception and when any FM button is pushed the receiver is automatically switched for FM reception.

The pushbutton tuning drive unit is located at the rear of the receiver chassis. This unit has 12 adjustable knobs which are numbered 1 to 12. These knobs are set to the desired position by turning them clockwise or counter-clockwise with a rotary motion. They are locked in position by means of a small screw, adjacent to the knob. These small lock screws should never be tightened more than one turn past the point where the screw touches the backplate. If tightened more the setting of the knob will be changed. Two calibrated scales located below the two rows of knobs, are provided to enable setting the knobs in conjunction with the logging scale at the top of the front dial scale. Each of the pushbuttons on the front panel is wired to the corresponding knob on the backplate in the sequence shown in Figure 9. The following procedure should be followed in setting up the pushbutton tuning system.

1. Set the Selectivity control to "M" position and the AM-Band control to "BC" position.

2. Select the lowest frequency AM station to be set up and insert the tab for this station in pushbutton No. 1.

3. Tune in the desired station manually and note the setting of the dial pointer on the logging scale at the top of the dial.

4. Set knob No. 1 on the backplate to the corresponding number noted on the logging scale, and lock the knob in place by means of the small screw directly above it. CAUTION: Never tighten the small locking screw more than one turn past the point where it touches the backplate; if tightened more the setting of the knob will be changed.

5. As a check to ascertain that the knob is set correctly, manually set the dial pointer to a higher frequency, then push button No. 1 until the pointer stops and check this setting against the original reading on the log scale. Repeat this operation after

setting the dial to a lower frequency. If the both readings are higher or both readings lower than the original log scale reading for this station then the No. 1 knob must be moved slightly to correct for the error in reading. If the two readings are spaced equally one-half a division or less on both sides of the original station setting, as read on the log scale, the adjustment has been correctly made.

6. The above operation should be repeated for each pushbutton to be set up, starting with button No. 1 for the lowest frequency station and working up consecutively to button No. 12 for the highest frequency station. Pushbuttons 5, 6 and 7 can be used only for FM reception and when any of these buttons are pushed the receiver will automatically switch over to FM reception.

NOTE: The pushbutton tuning system will work only when the Selectivity control is set at "M" or "B" positions and the AM-Band control is set at "BC" position. If the pushbutton system does not work when the controls are set as above, replace the 1 amp fuse in the power supply. Refer to Figure 21 for location.

5.2 Connecting Pushbutton Switches for AM or FM Operation

When more than 3 FM stations or more than 9 AM stations are desired, by connecting the pushbutton switches as outlined below, any of the 12 pushbuttons may be set up for either an AM or FM station.

On the first Model 800-B Radio-Phonographs produced, the pushbutton switches were connected as shown in Figure 11. It will be noted that on the left hand switch gang, one side of switches 1-2-3-4-8-9 are all connected to the black AM common lead, therefore, all these switches will operate on AM stations. If it is desired to connect one or more of the switches on the left hand side for FM stations, it will be necessary to disconnect the switch or switches required from the black AM common lead and connect them over to the white FM common lead on the right hand switch.

On the right hand switch gang, one side of switches 5-6-7 are connected to the white FM common lead, therefore, these three switches are used to set up FM stations. One side of switches 10-11-12 are connected to the white-red dot AM common lead and are used to set up AM stations. In order to use anyone of these switches for an FM station, disconnect that switch from the AM common lead and connect it to the FM common lead. In this manner any one of the twelve pushbutton switches may be connected for operation on either AM or FM.

On the later Model 800-B Radio-Phonograph, the switch gangs have been provided with 2 dummy lugs on each section; one row of dummy lugs are connected to the AM common lead, the other row of dummy lugs are connected to the FM common lead and all that is necessary to connect any pushbutton for operation on AM, is to connect that switch to the AM common lug and for FM operation connect it to the FM lug. It will be noted by observing Figure 12 that the pushbuttons are now numbered in sequence 1 to 12 starting at the bottom pushbutton on the left side of the panel.

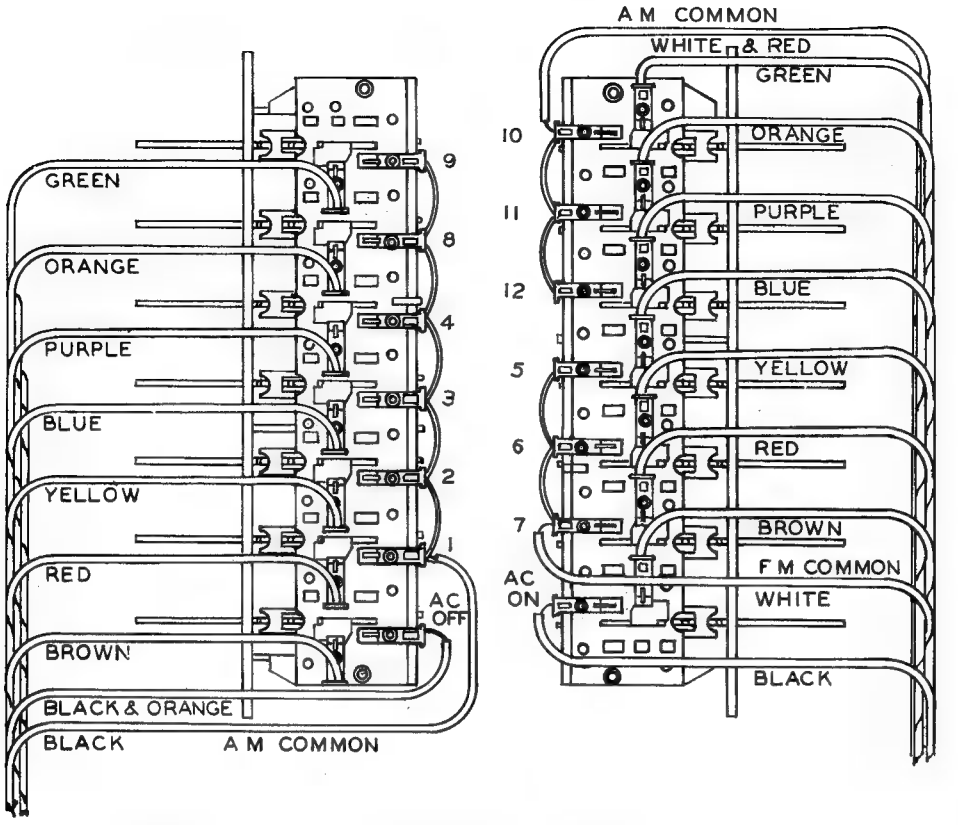


Figure 11 Pushbutton Switch Detail

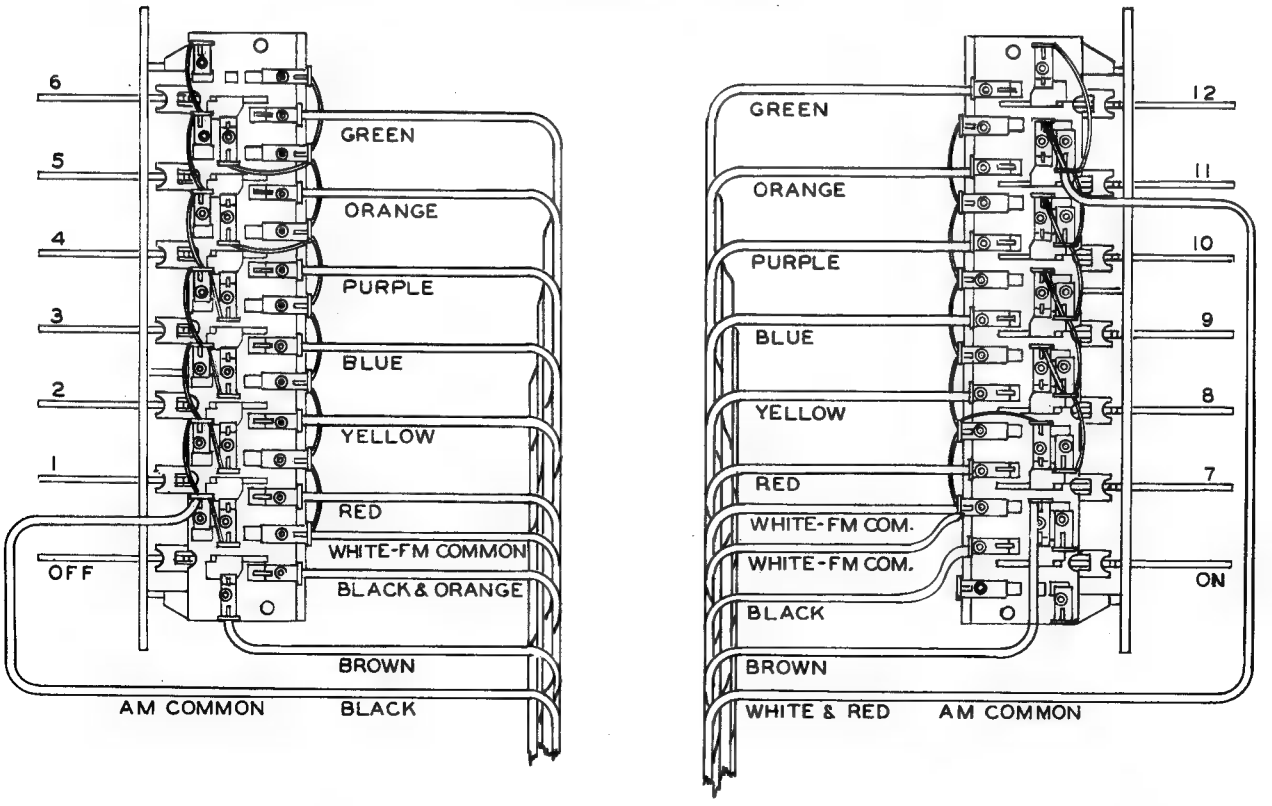


Figure 12 Pushbutton Switch Detail Modified

Table 1 Trouble Location Chart

Symptom	Cause	Remedy
Set fails to switch ON or OFF	Blown 1 amp or 3 amp fuse	Replace defective fuse
	Defective switch contacts on ON-OFF relay	Adjust contacts on switch or replace switch section
	AC ON-OFF relay inoperative	Check relay connections
		Put drop of light oil on rotor shaft bearing
Set operates but pushbutton system fails to operate	Blown 1 amp fuse	Replace defective fuse
	Defective switch contacts on ON-OFF relay	Adjust contacts on switch or replace switch section
Set weak or dead on all bands	Blown 3 amp fuse	Replace defective fuse
	Defective tube in audio amplifier or rectifier	Replace with good tube
	Defective speaker	Check continuity of voice coil
		Check continuity of field coils
		Check components and connections of network on coaxial speakers
	Socket voltages wrong	Check associated bypass capacitors
		Check associated resistors
		Check continuity of associated wiring
	Defective switch contact	Clean and adjust defective switch or replace switch section
Set weak or dead on one band only	No signal	Check all coils on specific band
		Check switch contacts on specific band
		Check all tubes used for specific band
		Check FM-AM relay

Table 1 Trouble Location Chart (Continued)

Symptom	Cause	Remedy
Noisy reception	Defective tube	Tap all tubes lightly and replace any that are noisy
	Defective component	Tap all components lightly with insulated rod. Check carefully suspected parts
	Defective antenna	Check antenna installation, lead-in and connections
Oscillation	Defective tube	Replace tubes one at a time
	Open bypass capacitor	Connect good capacitor across suspected unit temporarily Replace defective unit
Hum	Defective tube	Replace tubes one at a time
	Defective electrolytic filter capacitor	Replace defective unit
	Defective bypass capacitor	
	Transformer lamination buzz	Tighten screws on power transformer and 46 volt transformer
		Insulate 46 volt transformer from bottom cover plate with tape
		Mount power supply on rubber or felt

Section VI MAINTENANCE AND REPAIRS

6.1 General

When servicing the Model 800-B Radio-Phonograph the first step should be a complete check of all tubes. This can be accomplished easily by replacing one at a time with tubes of known good quality. All tubes which are not defective should be reinserted in the socket from which they were taken. Failure of a vacuum tube in the receiver may reduce the sensitivity, cause intermittent operation or cause the receiver to be completely inoperative.

6.2 Failure of the Receiver

In case of failure or breakdown of the receiver the fault must first be localized in one portion of the circuit, this can be accomplished by observation of some peculiar action of one of the controls or by checking the receiver against test data tabulated in Tables 2 and 3. It must be remembered that resistance or voltage checks will not positively locate certain faults. For instance, an open circuited bypass capacitor will not appear in point to point resistance tests and may introduce regeneration or oscillation in certain circuits which effect the stage gain of other circuits. Similarily, a short circuit occuring in a low resistance inductor will not appear in a point to point resistance test and if the short appears in an R.F. coil, a false indication of the necessity for realignment may result.

Bypass or filter capacitors, which develop poor internal connections or which become open-circuited, will cause decreased sensitivity and/or poor stability. An open unit can be located by temporarily connecting a good capacitor in parallel with the unit under suspicion. Failures of any bypass or filter capacitor may seriously overload resistors of associated circuits. Overloads of sufficient magnitude to permanently damage a resistor will cause the painted surface of the resistor to be scorched, making the defective unit easy to locate by visual inspection.

Loose connections, causing intermittent or noisy operation, and which cannot be found by point to point resistance tests, can usually be located by individually testing each circuit element, or by tapping or shaking the component under suspicion, when the receiver is adjusted for normal operation.

6.3 Lubrication

There are very few moving parts on the Model 800-B Radio-Phonograph that will require lubrication more often than once a year with the possible exception of the record changer and this will depend on the amount of use the record changer receives. The manufacturers recommendations on lubrication as outlined in the instruction book packed with each record changer should be followed. A drop or two of #10 oil on the receiver slide rails and record changer compartment once a year will keep these parts working smoothly. In addition a drop of #10 oil should be applied to the dial tuning shaft bearing and the FM-AM relay and power ON-OFF relay bearings.

6.4 Pushbutton Tuning System Maintenance

Although there are very few moving parts in the pushbutton tuning system which will require frequent adjustment or maintenance the following information is outlined to assist in keeping the system in good working condition.

1. Pushbutton switches

A little carbon-tetrachloride, applied with a clean cloth or a small brush while the switch is worked back and forth, will keep the contacts clean.

2. Drive motor and remote volume motor

The clutch release spring on the back of these motors at the end of the rotor shaft may need adjusting to keep the clutch from chattering. A pair of long nose pliers should be used for this adjustment. If the clutch chatters when the motor is driving the dial, apply more pressure by bending the spring in toward the motor frame. If the clutch fails to release soon enough when the backplate insulator segment reaches the contact, the disk may override the contact and start to reverse. To remedy this fault pressure on the clutch release spring should be loosened by bending the spring out slightly. These same adjustments apply to the remote volume control motor on receivers which have this motor installed.

3. FM-AM relay and power ON-OFF relay

The switch contacts on these relays should be cleaned by applying carbon-tetrachloride with a clean cloth or small brush. The contacts may need slight adjustment at times for if they are too loose, poor contact will result and some of the circuits will not work or if they are too tight the relay may stick and refuse to throw to the proper position. Caution should be exercised when adjusting these contacts in order to maintain proper contact.

4. Muting relay and motor control relays

Since these relays are of very simple construction no adjustment should ever be necessary on them, however the switch contacts may need cleaning at times and the best method of doing this is to use a narrow strip of clean cloth with a little carbon-tetrachloride, burnishing the contacts with a back and forth motion.

5. Backplate contacts and rotor disk

The backplate contacts and rotor disk will be subjected to more wear than any other part of the tuning system. Maintenance will consist essentially in keeping the contacts and rotor disk surfaces clean and maintaining proper contact between the rotor disk and the movable contacts.

In order to clean or adjust the backplate contacts it is necessary to remove the backplate and the rotor disk from the receiver as follows:

1. Remove the horseshoe clamp washer from the end of the rotor disk shaft.

2. Remove the two screws holding the bottom of the backplate to the chassis and the two screws holding the brackets of the backplate to the top of the chassis base.

3. Loosen the two set screws which hold the rotor disk to the flexible coupling.

4. Pull the backplate away from the receiver chassis and remove the rotor disk.

5. The contacts and rotor disk can be cleaned by wiping them with a clean cloth using carbon-tetrachloride. The contacts should then be adjusted so that the tip of the contact is 11/16" from the inside surface of the backplate.

   If the insulating segment is badly worn it can be easily replaced by removing the segment at the end of the insulating strip marked with the Figure 1 and replacing with a new segment.

6. The rotor disk can now be reinserted into the backplate bearing and the flexible coupling, and the backplate fastened back onto the receiver chassis. Then insert the clamp washer back onto the rotor shaft.

7. In order to properly position the rotor disk so that the original setting of the contact knobs will still be the same, proceed as follows:

   1. Set the No. 1 contact knob at the extreme end of the top slot in the backplate.

   2. Set the dial at approximately 600 kilocycles or 20 on the logging scale.

   3. Set the rotor disk so that the end with the insulated segment marked 1 is slightly above center and tighten down one of the set screws in the flexible coupling.

   4. With the receiver turned ON, press pushbutton No. 1 and run until the backplate rotor disk stops.

   5. Loosen up the set screw in the coupling being careful not to change the position of the rotor disk, then while holding the rotor disk firmly so that it will not move, turn the dial tuning knob until the dial pointer is at the extreme left side of the scale.

   6. Tighten down both set screws in the flexible coupling. The backplate will now be in the original position as set at the factory and if the contacts have not been moved all the previous contact knob settings should remain the same.

6.5 Record Changer Maintenance

For information on adjustments and lubrication the instruction manual furnished with the record changer should be consulted.

On most of the pickup cartridges furnished with the record changers, the needle is held in place by means of a set screw. If this set screw becomes loose the needle may turn sideways in the cartridge and will not seat properly in the needle groove or will sound distorted. The needle furnished is of the precious metal, long life type and if it is found necessary to replace it or if it becomes loose in the cartridge, remove the two screws holding the cartridge in the pickup arm and drop the cartridge out of the arm. The set screw can be loosened and the needle either replaced or set at the proper position again. The bent shank portion of the needle should face straight out from the pickup cartridge. Caution should be used in replacing the needle not to apply too much pressure on the set screw as this may cut through the plastic shank of the needle and ruin the reproduction.

6.6 Voltage and resistance tests

Table 2 lists the tube socket voltages for various settings of the controls. All voltages are measured between the chassis and socket terminals. Voltage measurements listed are made with a DC voltmeter of 1000 ohms per volt using the highest range scale that can be easily read. The receiver should be connected for normal operation and the controls adjusted as listed in Table 2. Line voltage should be 115 volts 50-60 cycles. Resistance measurements are listed in Table 3. All resistance measurements are made between chassis and terminals listed. The most suitable scale for the measurement being taken should be used. The receiver should be disconnected from the power source with controls adjusted as follows: Selectivity - sharp, Treble - max., Sensitivity - as listed, AM Band-as listed, Bass - max., Volume - as listed.

Table 2 Tube Socket Voltages

Terminal	Pin	Variable		Voltage DC Volts
		Symbol	Setting	
V1 Grid	4			0
Cathode	5	R5	Max.	3
	5	R5	Min.	21
Screen	6	SW6A	AM Position	85
Plate	8	SW6A	AM Position	240
V2 Grid	5			0
Cathode	8			0
Plate	3	SW6A	AM Position	130
V3 Grid #1	5			0
Cathode	6			2.5
Grid #3	8			0
Grid 2 & 4	4	SW6A	AM Position	100
Plate	3	SW6A	AM Position	240
V4 Grid	4			0
Cathode	5	R5	Max.	3.5
	5	R5	Min.	21
Screen	6	SW6A	AM Position	80
Plate	8	SW6A	AM Position	240
V5 Grid	4			
Cathode	5			3.5
Screen	6	SW6A	AM Position	75
Plate	8	SW6A	AM Position	240
V6 Cathode #1	8			0
Plate #1	5			0
Cathode #2	4			0
Plate #2	3			0
V7 Grid	3			0
Cathode	5			0
Target	4	SW6A	AM Position	240
Plate	2	SW6A	AM Position	20 *
V8 Grid	3			0
Cathode	5			0
Target	4	SW6A	FM Position	240
Plate	2	SW6A	FM Position	10 *
V9 Grid	5			0
Cathode	8			2.5
Plate	3			58
V10 Grid	5			0
Cathode	8			18
Plate	3			64

* Measured on 500 volt scale

Table 2 Tube Socket Voltages (Continued)

Terminal	Pin	Variable		Voltage DC Volts
		Symbol	Setting	
V11 Grid	1			0
Cathode	2-7			1.5
Screen	6	SW6A	FM Position	125
Plate	5	SW6A	FM Position	235
V12 Grid	6			0
Cathode	7			0
Plate	5	SW6A	FM Position	120
V13 Grid	1			0
Cathode	2-7			2.5
Screen	6	SW6A	FM Position	90
Plate	5	SW6A	FM Position	235
V14 Grid	4			0
Cathode	5			1.5
Screen	6	SW6A	FM Position	110
Plate	8	SW6A	FM Position	220
V15 Grid	4			0
Cathode	5			1.5
Screen	6	SW6A	FM Position	120
Plate	8	SW6A	FM Position	220
V16 Grid	4			0
Cathode	5			0
Screen	6	SW6A	FM Position	55
Plate	8	SW6A	FM Position	60
V17 Grid	4			0
Cathode	5			0
Screen	6	SW6A	FM Position	52
Plate	8	SW6A	FM Position	45
V18 Cathode#1	8			0
Plate #1	5			0
Cathode #2	4			0
Plate #2	3			0
V19A Grid	1			0
Cathode	3			2
Plate	2			130
V19B Grid	4			0
Cathode	6			2
Plate	5			105
V20 Grid	5			0
Cathode	8			20
Screen	4			270
Plate	3			340

Table 2 Tube Socket Voltages (Continued)

Terminal	Pin	Variable		Voltage DC Volts
		Symbol	Setting	
V21 Grid	5			
Cathode	8			
Screen	4			
Plate	3			
V22 Cathode	2			
Anode	5			
V23 Filament	2-8			
Plate	4-6			
V24 Filament	2-8			
Plate	4-6			

Table 3 Point to Point Resistance
Terminal to Chassis

Terminal	Pin	Variable		Resistance Ohms Plus or Minus 10%
		Symbol	Setting	
V1 Grid	4			1.39 megohms
Cathode	5	R5	Min.	10,560 ohms
		R5	Max.	560 ohms
Suppressor	3			0.0 ohms
Screen	6	SW6A	AM Position	7,300 ohms
	6	SW6A	FM Position	10,000 ohms
Plate	8	SW6A	AM Position	9,250 ohms
	8	SW3A	PH or Tel.	26,000 ohms
V2 Grid	5			47,000 ohms
Cathode	8	SW2B	BC Band	1 ohm
	8	SW2B	SW Band	.4 ohm
Plate	3	SW6A	AM Position	17,400 ohms
	3	SW6A	FM Position	Infinite
V3 Grid #1	5			20,000 ohms
Cathode	6			240 ohms
Grid #3	8			1.39 megohms
Grid 2 & 4	4	SW6A	AM Position	26,250 ohms
	4	SW6A	FM Position	43,000 ohms
Plate	3	SW6A	AM Position	9,250 ohms
		SW6A	FM Position	26,000 ohms
V4 Grid	4			1.134 megohms
Cathode	5	R5	Min.	10,560 ohms
	5	R5	Max.	560 ohms
Suppressor	3			0.0 ohms
Screen	6	SW6A	AM Position	108,250 ohms
	6	SW6A	FM Position	125,000 ohms
Plate	8	SW6A	AM Position	9,250 ohms
	8	SW6A	FM Position	26,000 ohms
V5 Grid	4	SW3B	Sharp (S)	0.0 ohms
		SW3B	Medium (M)	47 ohms
		SW3B	Broad (B)	47 ohms
		SW3B	PH or Tel.	Infinite
Cathode	5			560 ohms
Suppressor	3			0.0 ohms
Screen	6	SW6A	AM Position	108,250 ohms
	6	SW6A	FM Position	125,000 ohms
Plate	8	SW6A	AM Position	9,250 ohms
	8	SW6A	FM Position	26,000 ohms
V6 Cathode #1	8			0.0 ohms
Plate #1	5			9,400 ohms
Cathode #2	4			1.734 megohms
Plate #2	3			47,000 ohms

Table 3 Point to Point Resistance (Continued)
Terminal to Chassis

Terminal	Pin	Variable		Resistance Ohms Plus or Minus 10%
		Symbol	Setting	
V7 Grid	3			3.114 megohms
Cathode	5			0.0 ohms
Target	4	SW6A	AM Position	8,250 ohms
	4	SW6A	FM Position	25,000 ohms
Plate	2	SW6A	AM Position	1 megohm
	2	SW6A	FM Position	1 megohm
V8 Grid	3	R29	Min.	.47 megohms
	3	R29	Max.	.88 megohms
Cathode	5			0.0 ohms
Target	4	SW6A	AM Position	54,000 ohms
	4	SW6A	FM Position	10,000 ohms
Plate	2	SW6A	AM Position	1.054 megohms
	2	SW6A	FM Position	1.010 megohms
V9 Grid	5	R37	Min.	0.0 ohms
	5	R37	Max.	1 megohm
Cathode	8			1,300 ohms
Plate	3	SW6A	AM Position	102,250 ohms
	3	SW6A	FM Position	104,000 ohms
V10 Grid	5			110,000 ohms
Cathode	8			11,300 ohms
Plate	3	SW6A	AM Position	102,250 ohms
	3	SW6A	FM Position	104,000 ohms
V11 Grid	1			5 ohms
Cathode	2-7			150 ohms
Screen	6	SW6A	AM Position	110,000 ohms
	6	SW6A	FM Position	66,000 ohms
Plate	5	SW6A	AM Position	55,000 ohms
	5	SW6A	FM Position	11,000 ohms
V12 Grid	6			.1 megohm
Cathode	7			0.0 ohms
Plate	5	SW6A	AM Position	Infinite
	5	SW6A	FM Position	20,400 ohms
V13 Grid	1			5 ohms
Cathode	2-7			1,000 ohms
Screen	6	SW6A	AM Position	274,000 ohms
	6	SW6A	FM Position	230,000 ohms
Plate	5	SW6A	AM Position	56,400 ohms
	5	SW6A	FM Position	12,400 ohms

Table 3 Point to Point Resistance (Continued)
Terminal to Chassis

Terminal	Pin	Variable		Resistance Ohms Plus or Minus 10%
		Symbol	Setting	
V14 Grid	4			56 ohms
Cathode	5			160 ohms
Suppressor	3			0.0 ohms
Screen	6	SW6A	AM Position	110,000 ohms
	6	SW6A	FM Position	66,000 ohms
Plate	8	SW6A	AM Position	56,400 ohms
	8	SW6A	FM Position	12,400 ohms
V15 Grid	4			56 ohms
Cathode	5			160 ohms
Suppressor	3			0.0 ohms
Screen	6	SW6A	AM Position	110,000 ohms
	6	SW6A	FM Position	66,000 ohms
Plate	8	SW6A	AM Position	56,400 ohms
	8	SW6A	FM Position	12,400 ohms
V16 Grid	4			27 ohms
Cathode	5			0.0 ohms
Suppressor	3			0.0 ohms
Screen	6	SW6A	AM Position	93,000 ohms
	6	SW6A	FM Position	49,000 ohms
Plate	8	SW6A	AM Position	93,000 ohms
	8	SW6A	FM Position	49,000 ohms
V17 Grid	4			42,027 ohms
Cathode	5			0.0 ohms
Suppressor	3			0.0 ohms
Screen	6	SW6A	AM Position	15,000 ohms
	6	SW6A	FM Position	11,600 ohms
Plate	8	SW6A	AM Position	154,000 ohms
	8	SW6A	FM Position	115,000 ohms
V18 Cathode#1	8			0.0 ohms
Plate #1	5			.156 megohms
Cathode#2	4			.2 megohms
Plate #2	3			.156 megohms
V19A Grid	1			44,000 ohms
Cathode	3			1,500 ohms
Plate	2			.232 megohms
V19B Grid	4			.22 megohms
Cathode	6			1,500 ohms
Plate	5			.232 megohms
V20 Grid	5			.44 megohms
Cathode	8			250 ohms
Screen	4			12,000 ohms
Plate	3			12,680 ohms

Table 3 Point to Point Resistance (Continued)
Terminal to Chassis

Terminal	Pin	Variable		Resistance Ohms Plus or Minus 10%
		Symbol	Setting	
V21 Grid	5			.44 megohms
Cathode	8			250 ohms
Screen	4			12,000 ohms
Plate	3			12,680 ohms
V22 Cathode	2			0.0 ohms
Anode	5			15,300 ohms
V23 Filament	2-8			12,800 ohms
Plates	4-6			32 ohms
V24 Filament	2-8			12,800 ohms
Plates	4-6			35 ohms

Section VII ALIGNMENT DATA

7.1 General

Should realignment of the receiver become necessary the following data should be carefully studied before making any circuit adjustments so that correct alignment may be made quickly and accurately.

The complete alignment of the radio receiver may be divided into the following steps. The circuits should be checked in the order listed.

Amplitude Modulation Channel

1. AM-IF amplifier alignment
2. AM oscillator alignment
3. AM-RF amplifier alignment

Frequency Modulation Channel

1. FM-IF amplifier alignment
2. FM discriminator alignment
3. FM oscillator alignment
4. FM-RF amplifier alignment

The receiver must be removed from the cabinet and connected as for normal operation on the power source specified for the receiver. The bottom plates must be removed from the receiver and power supply chassis and for realignment of the FM-RF circuits, the cover over the main tuning capacitor must be removed.

7.2 AM Circuit Alignment

For alignment of the AM circuits the controls should be adjusted as follows:

1. Selectivity control set at "S" Sharp position.
2. Sensitivity control advanced to maximum point just before the noise limiter switch throws.
3. Band change control set to "BC" or "SW" band as noted.
4. Bass and treble controls set at maximum position.
5. Volume control set as noted.

7.21 AM-IF Amplifier Alignment

The intermediate frequency of the AM-IF channel is 455 kilocycles.

Tuning adjustments are provided in each transformer. These adjustments consist of adjustable powdered iron cores and are designated on the circuit diagram by symbols E9 to E13 inclusive. All adjustments for the AM-IF channel are on the receiver chassis.

An output meter must be connected across the voice coil leads of the speaker on terminals 3 and 5 of the speaker receptacle in the power supply chassis when the 15 inch Jensen coaxial speaker is used or across terminals 1 and 5 when the 15 inch Tru-sonic single speaker is used. This connection is changed for different speakers because of the difference in voice coil impedance which is 8 ohms for the Jensen coaxial speaker and 16 ohms for the Tru-sonic speaker.

The high potential lead of the signal generator should be connected to the control grid (terminal #8) of the AM mixer, tube V3-6SA7 through a .005 to .05 mfd capacitor and the ground lead of the signal generator connected to any metal part of the chassis. The volume control should be advanced to a point where the noise level of the receiver starts to indicate on the output meter.

The frequency of the signal generator should be carefully adjusted to 455 kilocycles, modulated 30% at 400 or 1000 cycles and the signal input to the mixer tube adjusted to provide a reading on the output meter. The signal input should be kept at a low level so as not to overload the second detector or audio circuits and to keep the AVC voltage as low as possible. If a high signal level is used the AVC voltage developed by the second detector may become so high as to cause the trimmer adjustments on the IF transformer to appear very broad in tuning and a false indication of true resonance will result.

Starting with the 3rd IF transformer the adjustments should be set for maximum output in the following order E13, E12, E11, E10 and E9.

The sensitivity of the IF amplifier can be checked against the following figures to ascertain that each stage is in proper working order.

Input Terminal	Signal Input Microvolts	Output Mod. On	Output Mod. Off
2nd IF V5 Grid	6000	1 volt	.1 volt or less
1st IF V4 Grid	200	1 volt	.1 volt or less
Mixer V3 Grid	35	1 volt	.1 volt or less

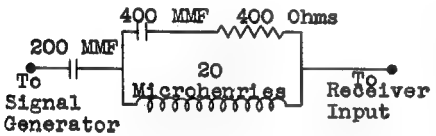
The above measurements are made at a 10 db signal to noise ratio with the output voltage shown measured across an 8 ohm voice coil. If the speaker has a 16 ohm voice coil the voltage with Mod. ON will be 1.4 volts and with Mod. OFF .14 volts.

The selectivity control should be set at "S" (Sharp) position, Sensitivity control at maximum with noise limiter switch off and Volume control at maximum. The oscillator tube V2-6J5 should be removed.

7.22 AM-RF and Oscillator Alignment

Caution: Readjustment of the oscillator circuit trimmers should not be attempted until after the need for such readjustment has been positively established. The following table gives the alignment frequency, trimmer adjustments and nominal sensitivity for the "BC" and "SW" bands. Sensitivity measurements are for a 6 db signal to noise ratio.

Band	Freq.	Adjustment			Signal Input	Output Mod.ON	Output Mod. OFF
		Osc.	Mixer	Ant.			
BC	1500 KC	C6	C15	C1	5 uv	1 Volt	.5 V or less
	1000 KC	E5			5 uv	1 Volt	.5 V or less
	600 KC	C8	E7	E3	5 uv	1 Volt	.5 V or less
SW	16 MC	C10	C16	C2	8 uv	1 Volt	.5 V or less
	6.5 MC	E6	E8	E4	8 uv	1 Volt	.5 V or less



The signal generator should be connected through a standard RMA dummy antenna to the AM antenna input terminal E1. The center terminal of E1 should be connected to the ground terminal with a short jumper wire. The controls should be set as follows:

1. Selectivity control set to "S" (Sharp) position.
2. Sensitivity control set at maximum position with noise limiter switch off.
3. Bass and treble controls set at maximum.
4. AM Band control set to band desired.
5. Volume control set as noted.

It is important that the oscillator circuits operate on the high frequency side of the signal circuits, particularly on the SW Band where the trimmer will allow the oscillator circuit to be resonated on either the high or low side of the signal circuits. When properly aligned the image will appear 910 KC lower in frequency than the signal being received and it will be considerably weaker than the signal, therefore, it will be necessary to increase the output of the signal generator in order to check the image.

The following general procedure should be employed in the alignment of the AM oscillator and RF amplifier circuits.

1. Turn dial to extreme left side of scale and make certain that the pointer lines up with the zero designation on the top logging scale

2. Set the signal generator to the high frequency alignment point of the desired band.

3. Set the dial pointer of the receiver to the high frequency alignment point of the desired band.

4. Adjust the oscillator trimmer capacitor until the signal is tuned in to resonance, then adjust the mixer and antenna circuit trimmer capacitors for maximum reading on the output meter.

5. Set the signal generator and receiver dial pointer to the low frequency alignment point.

6. Set the low frequency oscillator trimmer adjustments outlined in chart on Page 42 until the signal is tuned to resonance, then adjust the mixer and antenna adjustments for maximum output.

7. Repeat this entire alignment procedure as a final adjustment.

On the BC band an adjustment E5 is provided for alignment of the oscillator circuit at 1000 KC. This adjustment should not be altered unless the calibration of the BC Band is still off frequency after the trimmer adjustments for the high and low frequency ends of the band have been adjusted.

7.3 Frequency Modulation Circuit Alignment

7.31 FM-IF Circuit Alignment

For alignment of the FM circuits the controls should be adjusted as follows:

1. Turn receiver on and push one of the FM pushbuttons to switch the receiver over to FM reception.

2. Set bass and treble controls at maximum position.

3. Adjust volume control as noted.

7.32 FM-IF Amplifier Alignment

The intermediate frequency of the FM channel is 10.7 megacycles. Tuning adjustments are provided in each IF transformer. These adjustments consist of powdered iron cores in the IF transformer and variable air capacitors in the discriminator transformer. These adjustments are designated by symbols E17 to E26 inclusive for the IF transformers and C80 and C82 for the discriminator transformer. The 1st FM-IF transformer primary adjustment E17 is located on the receiver chassis. The other adjustments are located on the power supply chassis.

The high potential lead of the signal generator should be connected to the control grid (Pin #4) of FM mixer tube V13-6AG5 through a .01 mfd capacitor, and the ground lead connected to the chassis frame. A high resistance DC voltmeter such as the RCA Volt-ohmyst should be connected across the second limiter filter resistor R72.

Set the signal generator to 10.7 megacycles and feed in a signal with modulation OFF until the meter reads 1.5 volts.

Starting with the 4th IF transformer T6, adjust the trimmers in the following order: E26, E25, E24, E23, E22, E21, E20 and E17. Each trimmer should be adjusted for maximum meter reading, keeping the input from the signal generator at a point where not more than 1.5 volts output is obtained on the meter. It is important to keep the signal input down so that meter does not read more than 1.5 volts as above this the limiters start to level off and the IF adjustments will act very broad and cannot be set to the true resonant position.

7.33 FM Discriminator Circuit Alignment

Set the signal generator at 10.7 megacycles and connect to the grid (Pin #4) of mixer tube V13-6AG5 through a .01 mfd capacitor. Connect the Volt-ohmyst or equivalent meter to the discriminator diode output at the junction of R78 and C84 to ground. If a volt-ohmyst or equivalent meter with polarity reversing switch is not available a zero center 50-0-50 microammeter can be used.

If the discriminator is correctly aligned the meter will read zero when the signal generator is set to 10.7 megacycles. If the meter reads either plus or minus realignment is necessary. The secondary trimmer C82 at the bottom of the discriminator transformer should be detuned so that the meter reads either plus or minus. The primary trimmer C80 at the top of the transformer should then be realigned for maximum output. The secondary trimmer C82 should now be carefully adjusted for zero reading on the meter.

Next adjust the signal generator 75 KC higher in frequency or 10.775 MC and record the reading of the meter. Then set the signal generator 75 KC lower in frequency or 10.625 MC and record this reading of the meter. These two readings should be identical, if they are not a slight readjustment of the primary trimmer C80 should be made to coincide these readings at plus and minus 75 KC from 10.7 megacycles. The zero voltage setting of the secondary trimmer C82 should then be rechecked for if this adjustment is not correctly made distortion on FM signals will result.

7.34 FM-RF and Oscillator Circuit Alignment

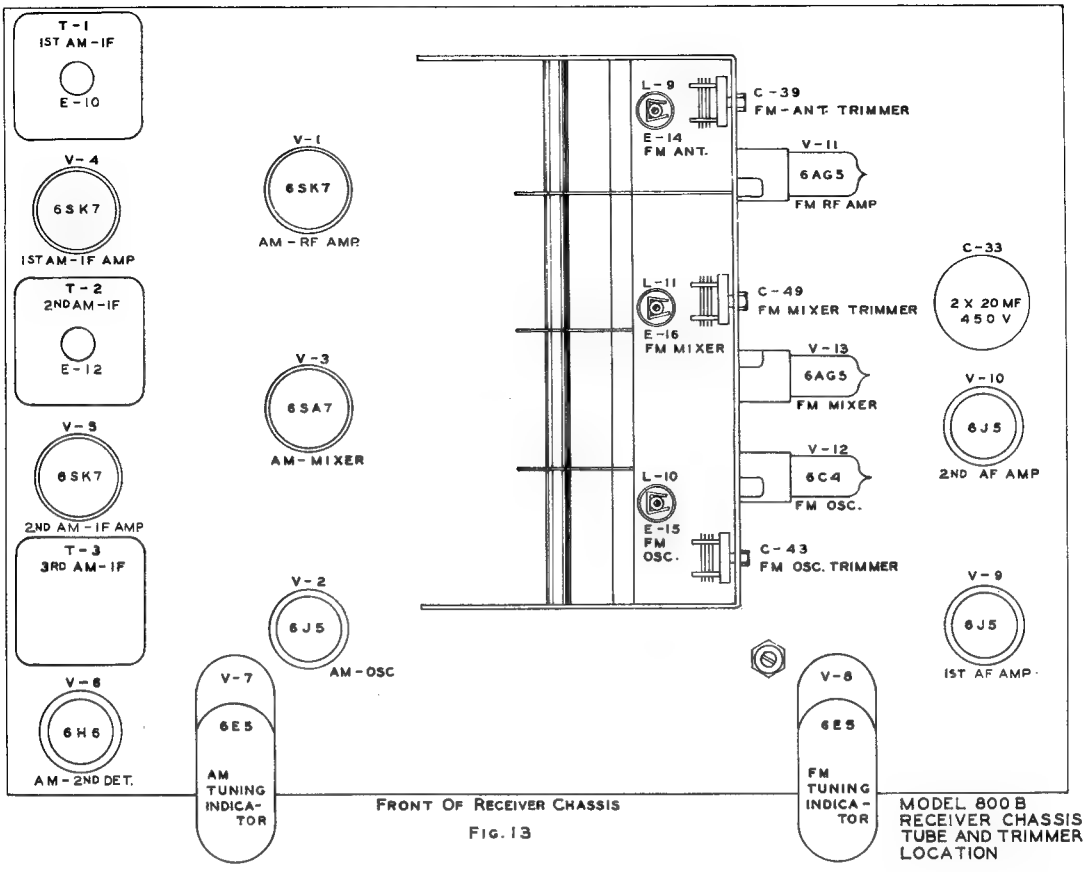
All the trimmer adjustments for the FM-RF and oscillator circuits are located on the top of the receiver chassis and it is necessary to remove the cover over the main tuning capacitor for access to these trimmer adjustments.

The signal generator should be connected to the FM antenna terminal E2 with a 50 ohm carbon resistor in series with the high potential lead of the generator and the center antenna terminal of E2 shorted to the ground terminal.

The FM oscillator circuit operates on the low side of the signal circuits and no trouble with aligning the oscillator circuit on the image should be encountered since it will be twice the IF frequency or 21.4 megacycles away from the signal frequency and the trimmer capacitor will not allow this much variation. The following chart lists the trimmer adjustments.

The high resistance DC voltmeter should be connected across the second limiter grid filter resistor R72. The sensitivity measurement given in the chart below is for 1.8 volts output as read on the high resistance DC voltmeter.

Band	Freq. MC	Adjustment			Sensitivity
		Osc.	Mixer	Ant.	
FM	106	C43	C49	C39	15 microvolts for 1.8 volts
	90	E15	E16	E14	Across limiter resistor R72



FRONT OF RECEIVER CHASSIS

FIG. 13

MODEL 800 B RECEIVER CHASSIS TUBE AND TRIMMER LOCATION

FRONT OF RECEIVER CHASSIS

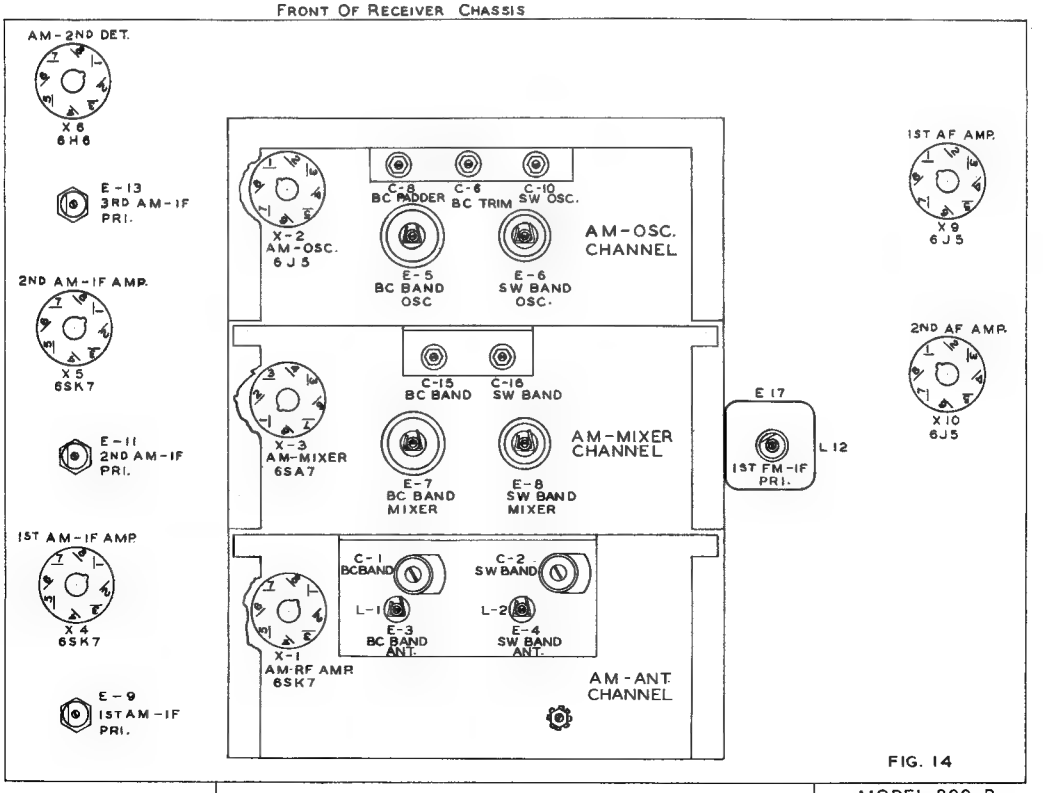
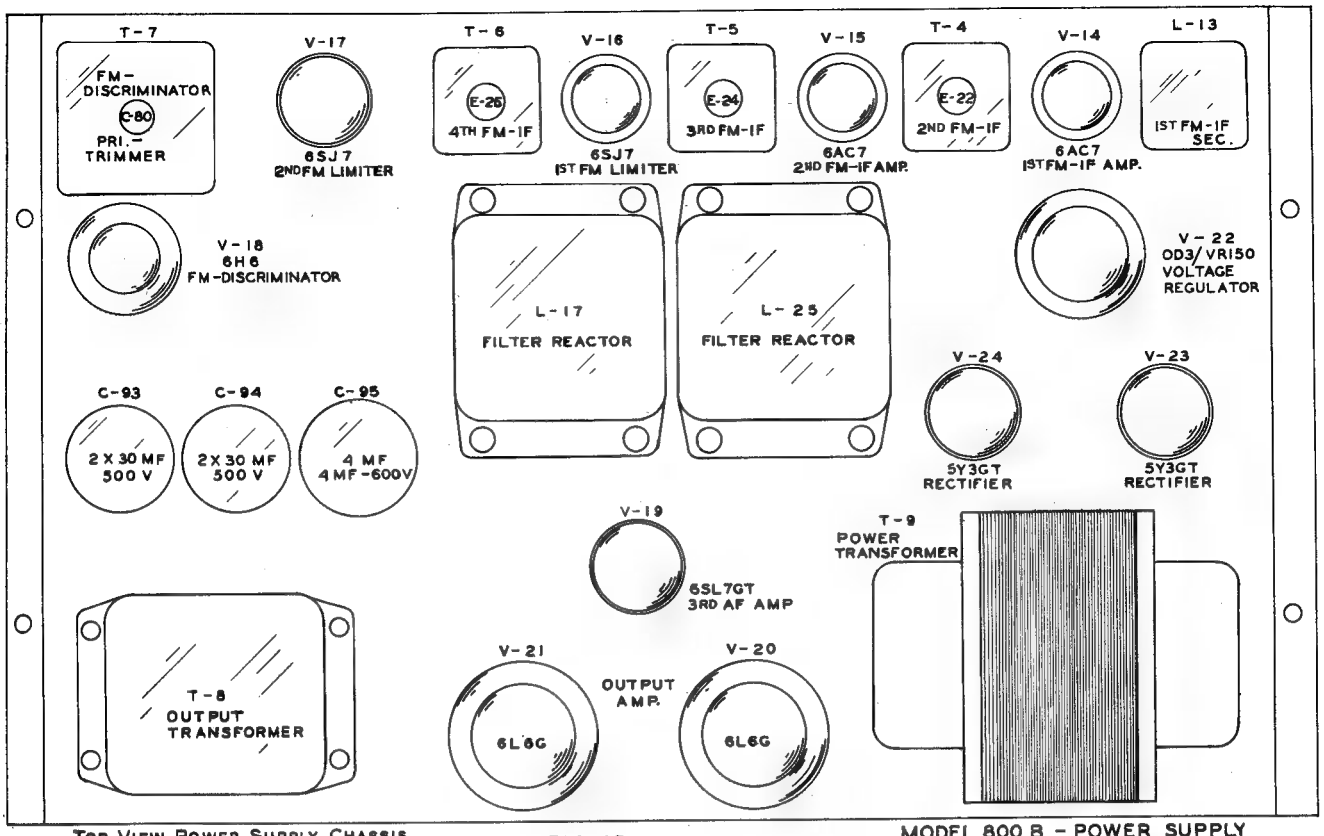


FIG. 14

BOTTOM VIEW OF RECEIVER CHASSIS

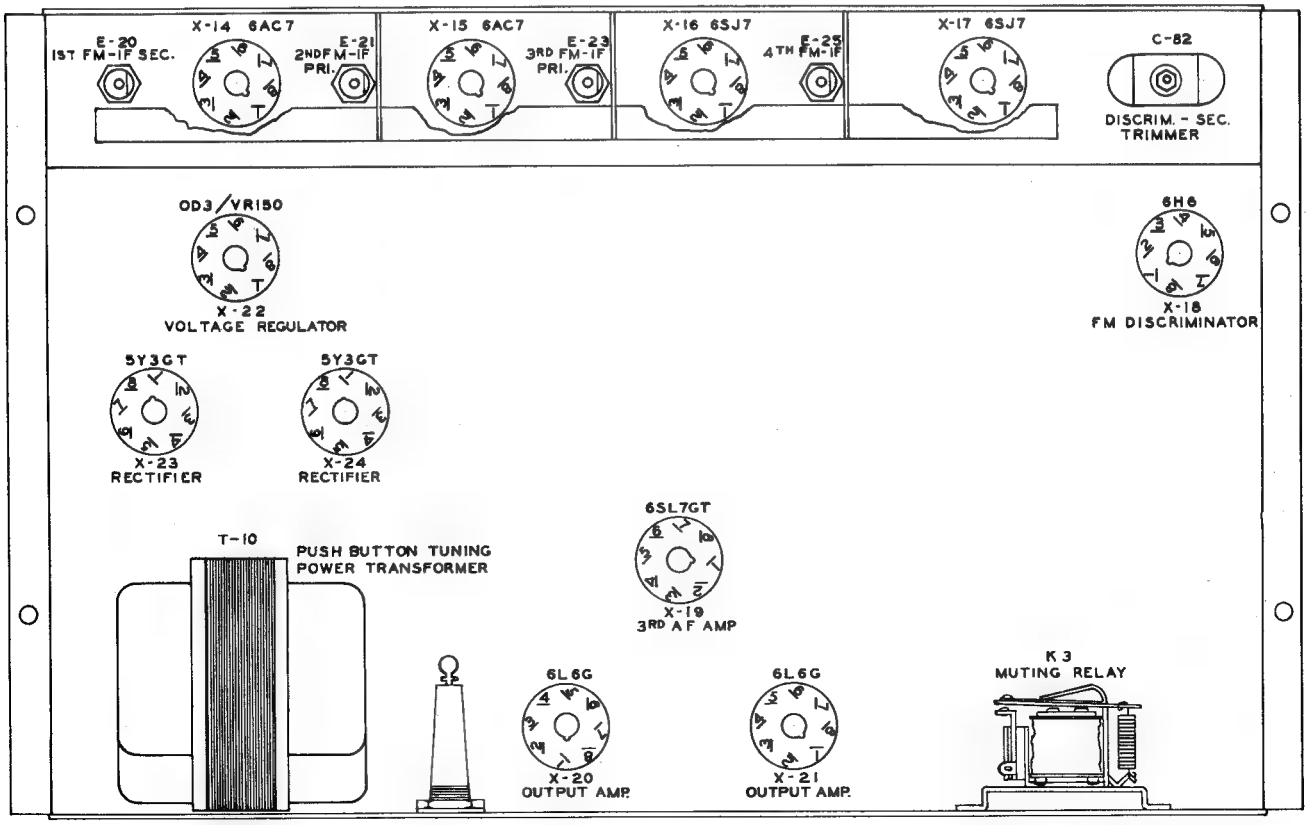
MODEL 800-B SOCKET & TRIMMER LOCATION RECEIVER CHASSIS



TOP VIEW POWER SUPPLY CHASSIS

FIG. 15

MODEL 800 B - POWER SUPPLY TUBE AND TRIMMER LOCATION



BOTTOM VIEW POWER SUPPLY CHASSIS

FIG. 16

MODEL 800 B - POWER SUPPLY SOCKET & TRIMMER LOCATION

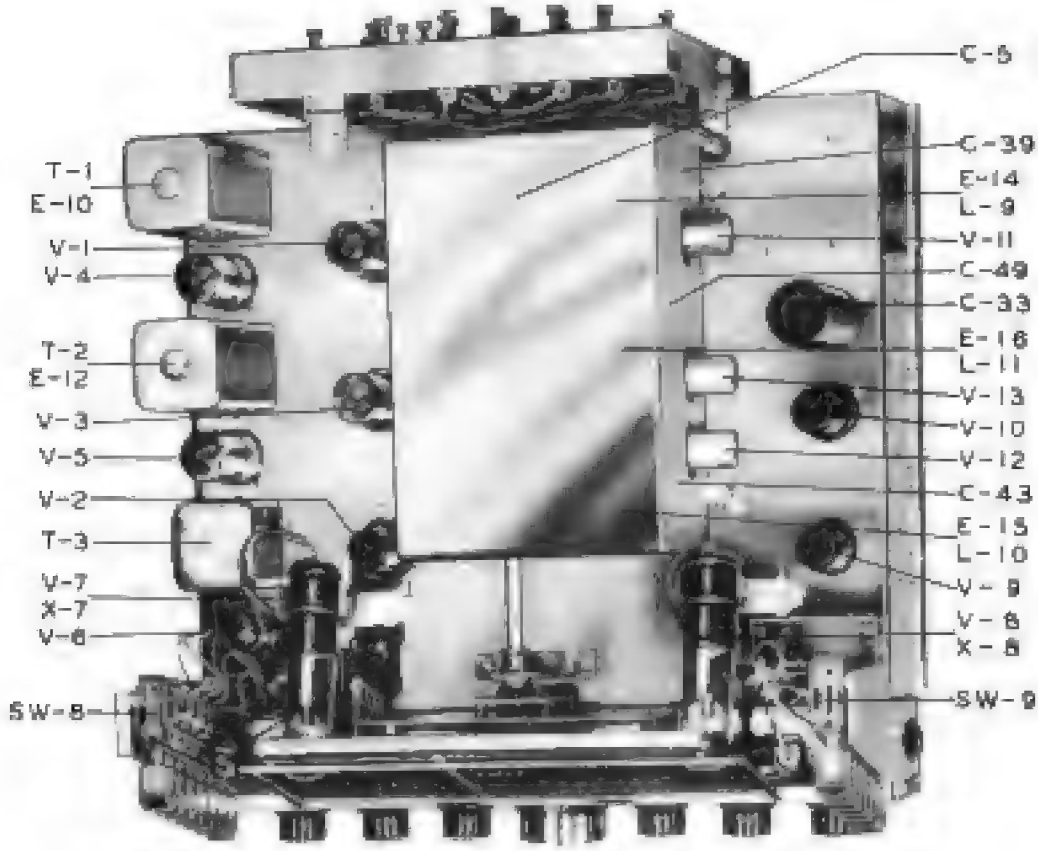


Figure 17 Top View Model 800-B Receiver Chassis

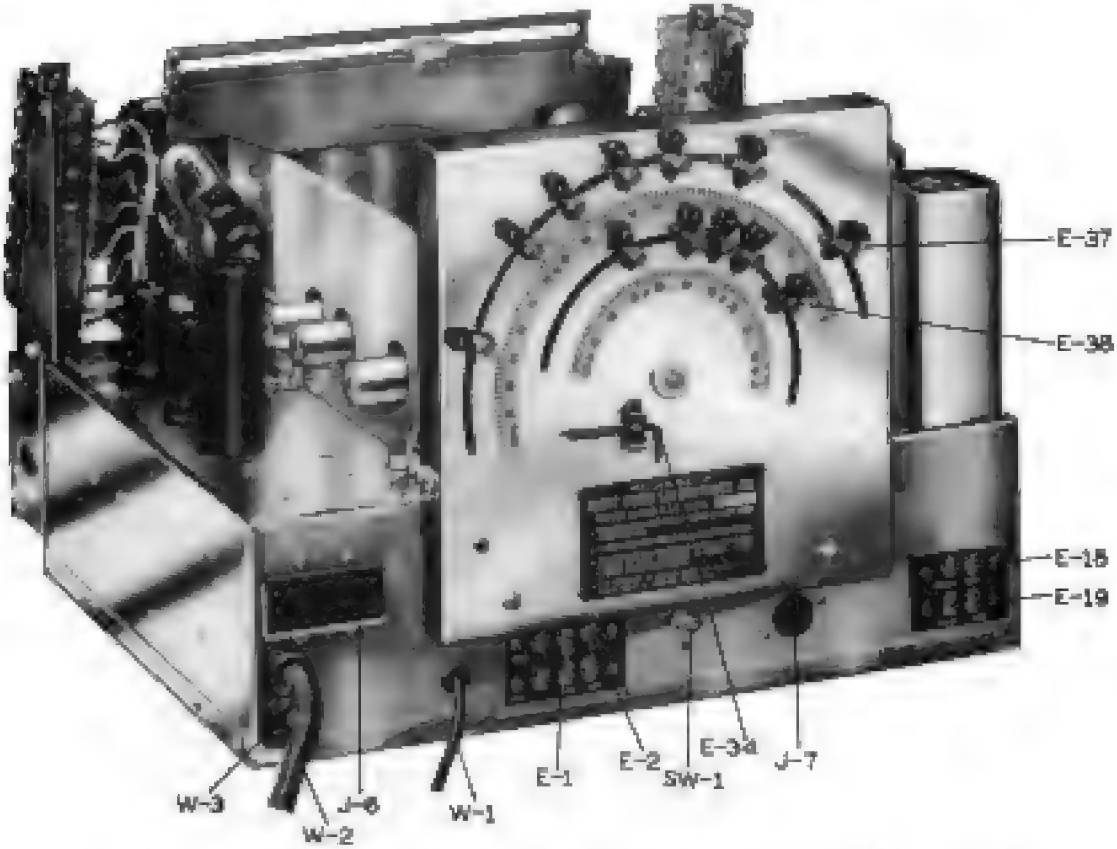


Figure 18 Rear View Model 800-B Receiver Chassis

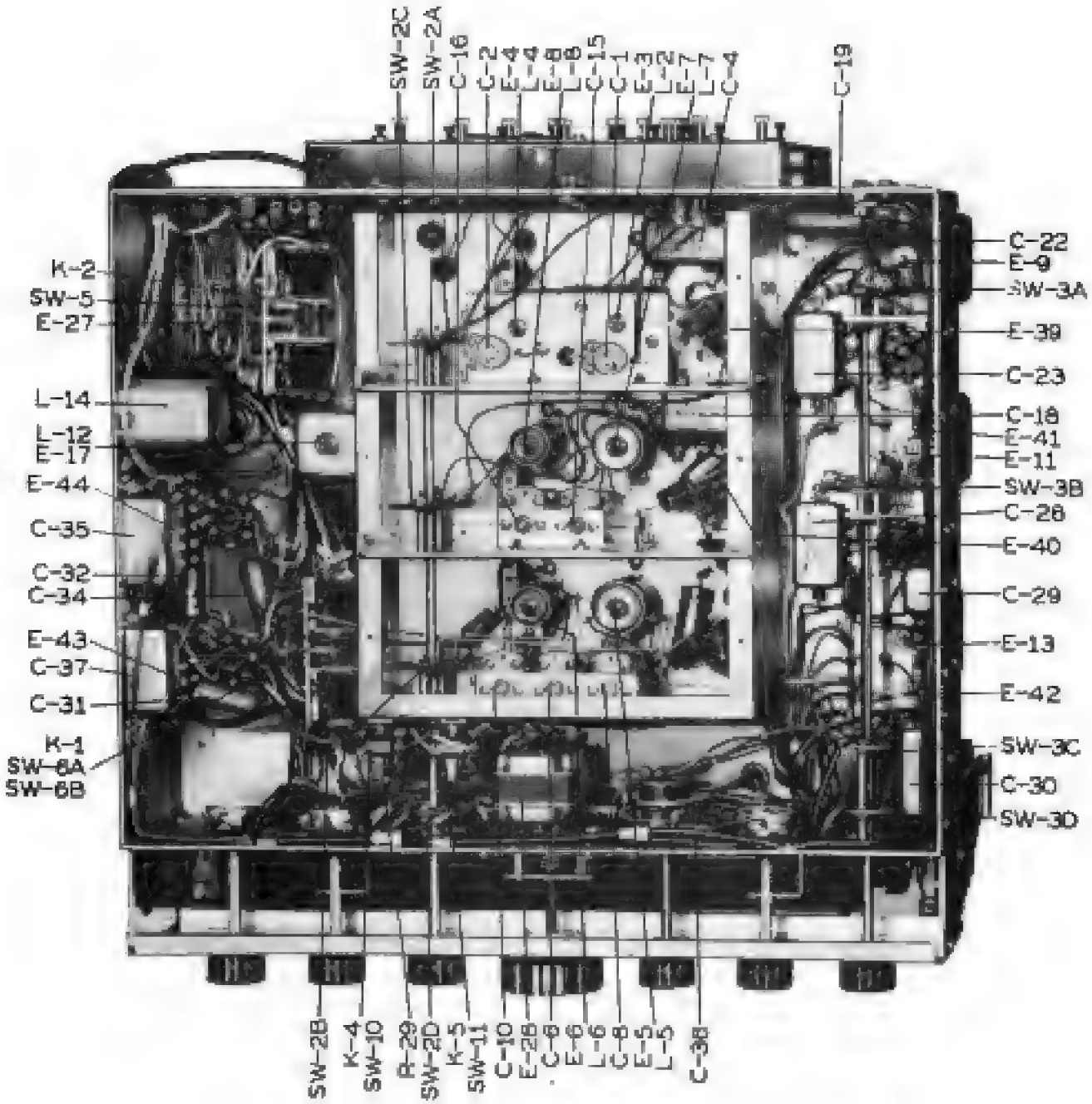


Figure 19 Bottom View Model 800-B Receiver Chassis

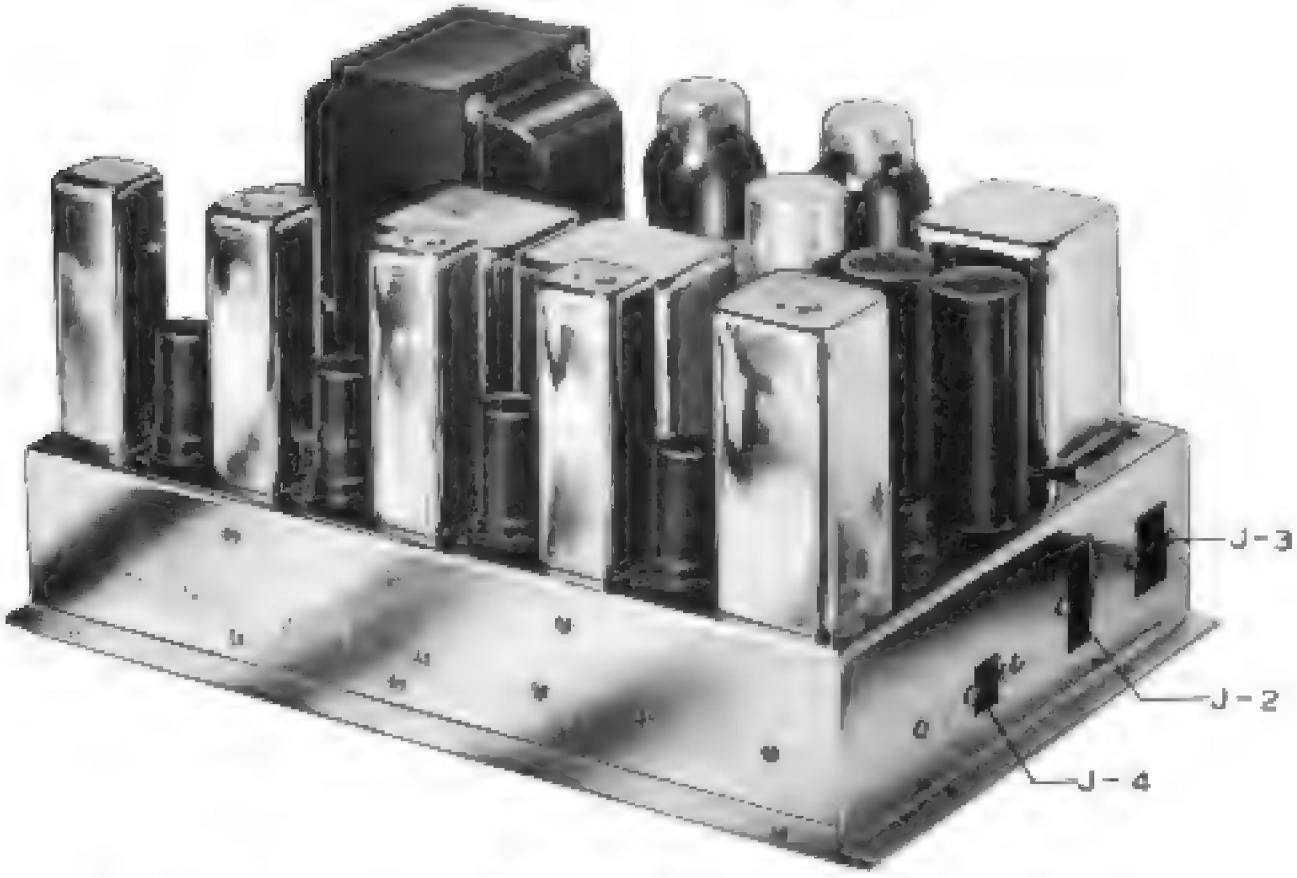


Figure 20 End View Model 800-B Power Supply Chassis

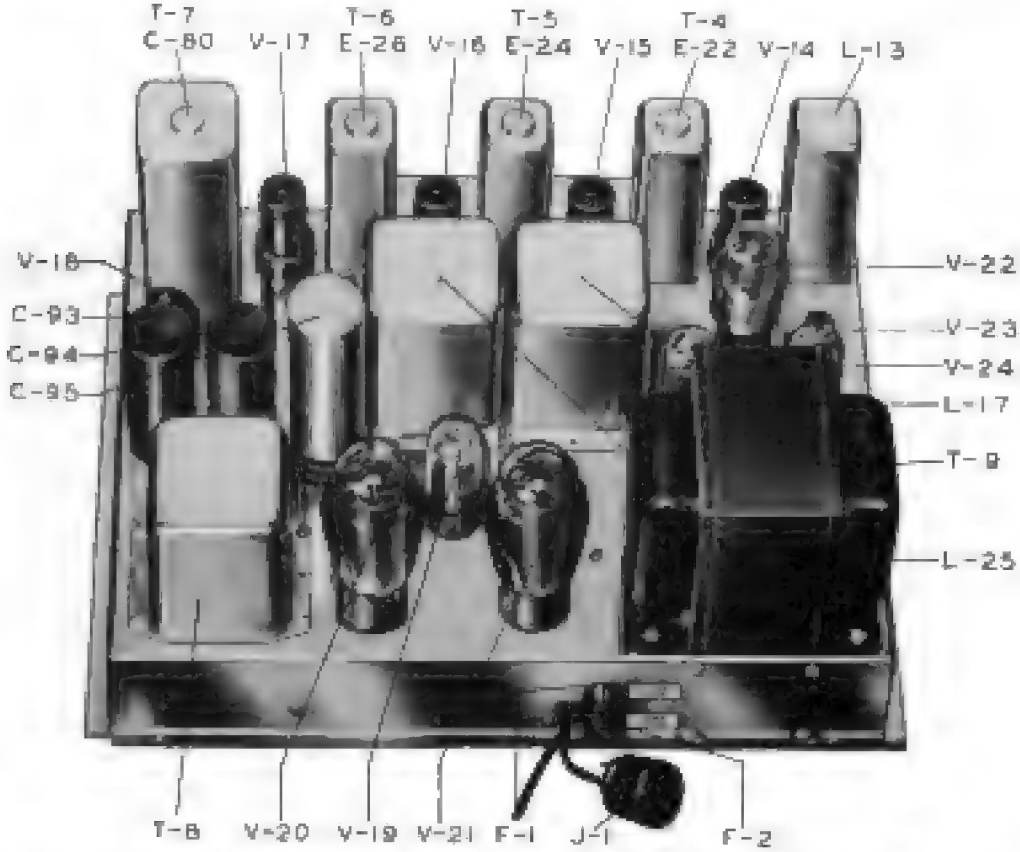


Figure 21 Top View Model 800-B Power Supply Chassis

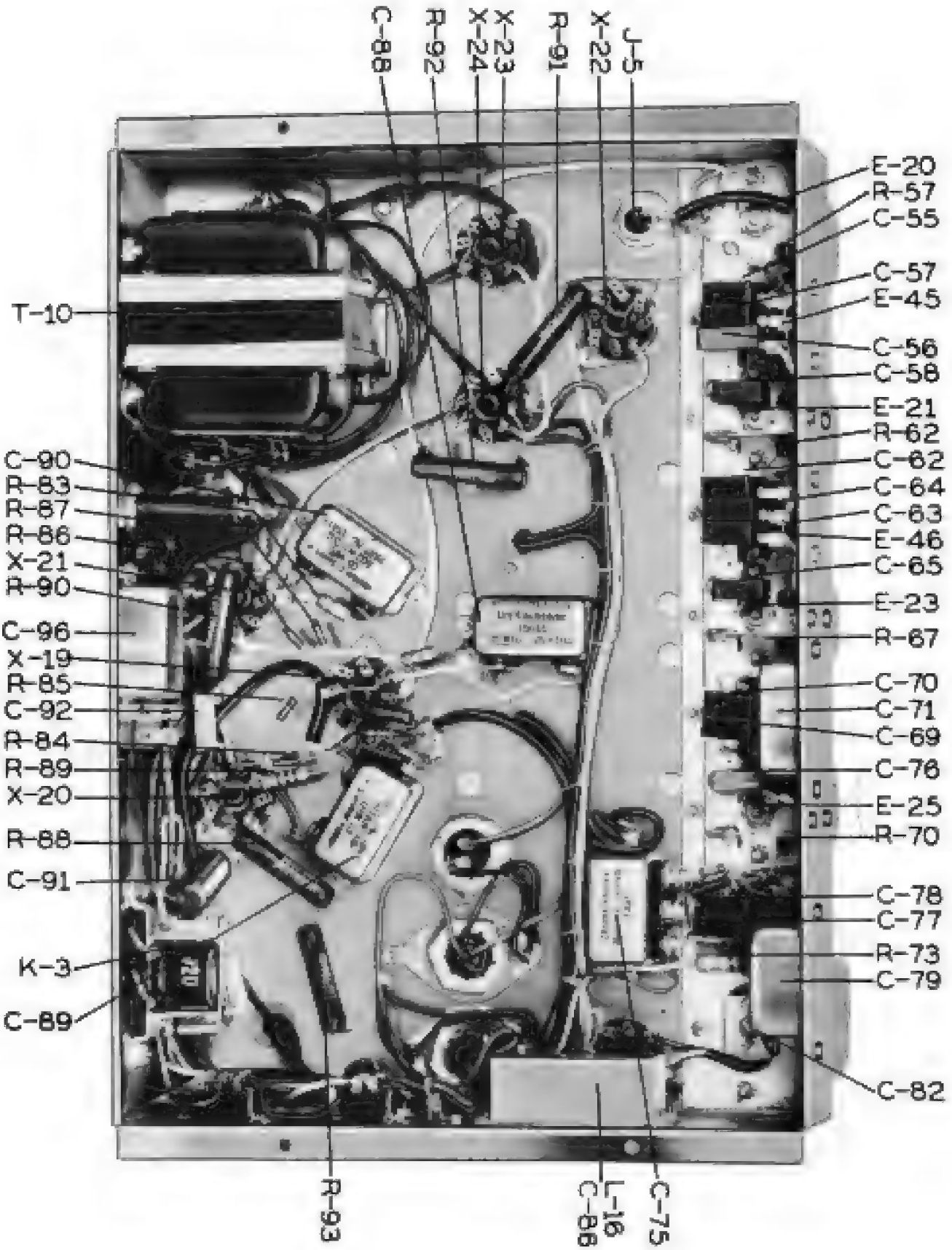


Figure 22 Bottom View Model 800-B Power Supply Chassis

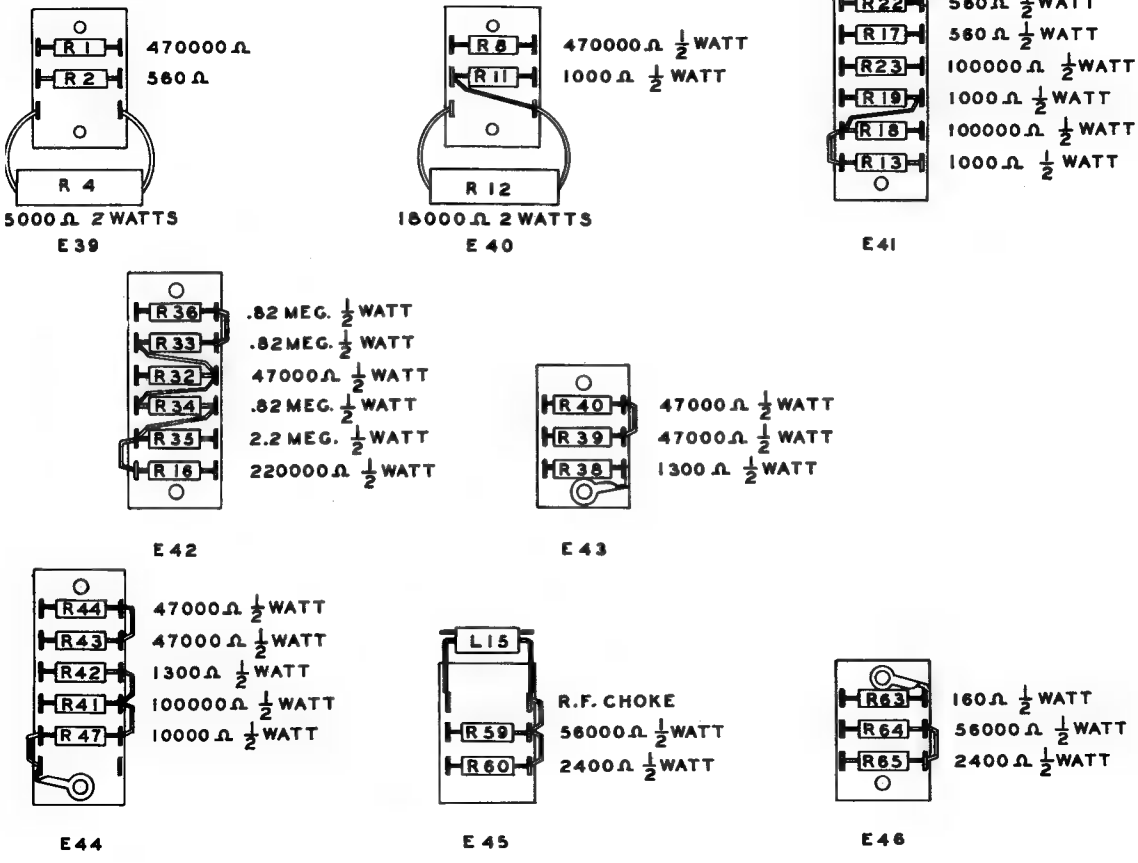
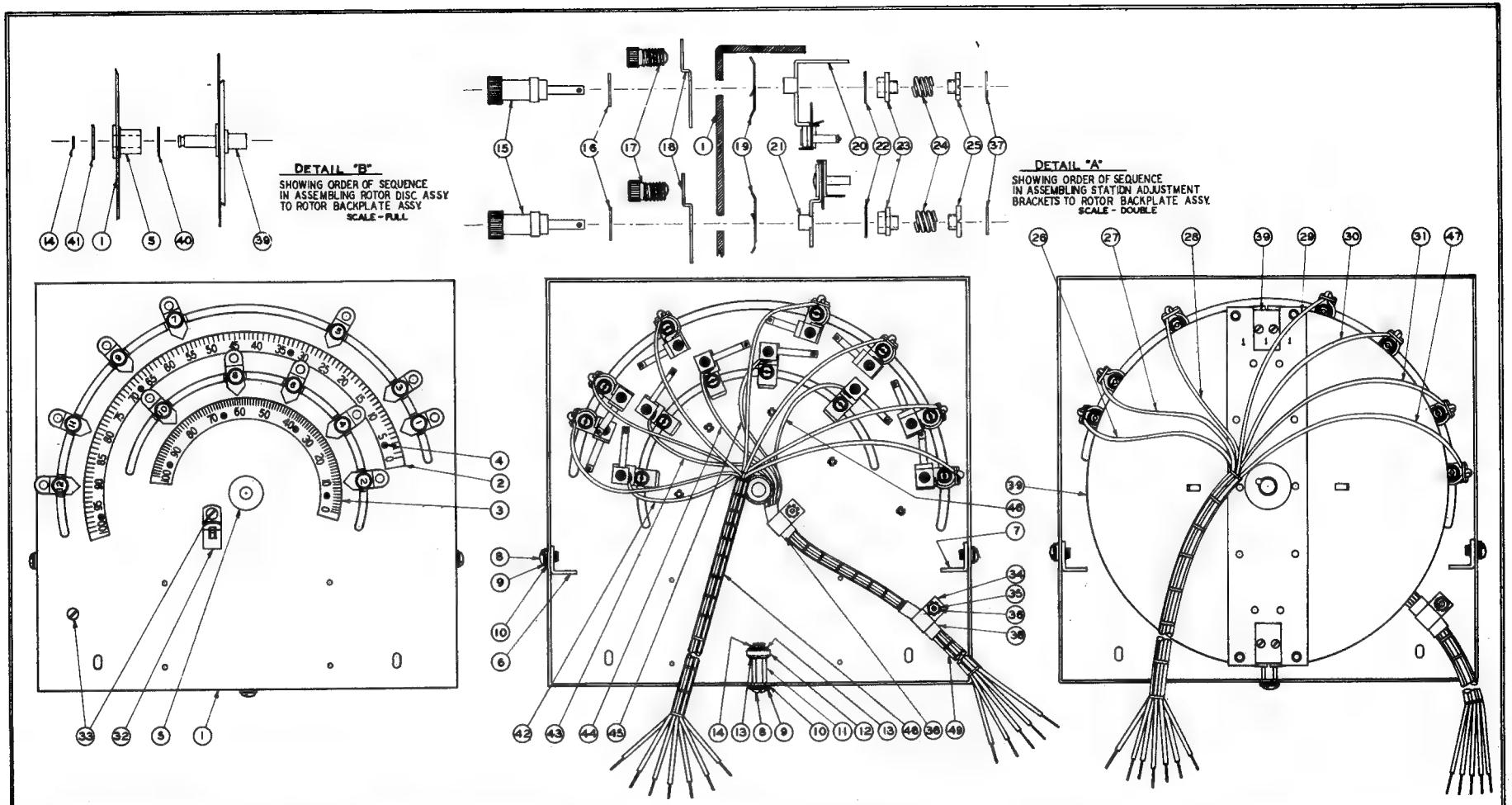


Figure 23 Resistor Terminal Strip Detail Drawings



BILL OF MATERIAL

No.	Part No.	No. Req'd	Description
1	64-B-482	1	PLATE-REMOTE TUNING BACK
2	76-B-629	1	SCALE, ROBOT (LARGE)
3	76-B-630	1	SCALE, ROBOT (SMALL)
4	33-B-862	8	EYELET (.095 DIA. X .110 X .153)
5	5-B-576	1	BEARING-BACK PLATE ROTOR
6	8-B-529	1	BRACKET-LEFT BACKPLATE MTG.
7	8-B-530	1	BRACKET-RIGHT BACKPLATE MTG.
8	77-A-450	5	SCREW 6-32 X 1/4 B.H.
9	85-A-281	5	LOCKWASHER #8 EXT. TOOTH
10	85-A-385	4	WASHER #8 FLAT
11	88-B-882	1	STUD - BACKPLATE ROLLER
12	9-B-883	1	ROLLER BACKPLATE BUSHING
13	28-A-142	2	WASHER .015"
14	85-A-261	2	WASHER - CLAMP
15	10-B-877-A	12	BUTTON-STATION LOCATING
16	85-B-563-A	12	WASHER - SPRING
17	77-B-579	12	SCREW-REMOTE LOCK
18	66-B-505	12	POINTER - STATION INDICATING
19	85-B-565-A	12	WASHER STABILIZING
20	8-B-503-A	7	BRACKET ASSY. STATN. ADJ. CONS.
21	8-B-504-A	5	BRACKET ASSY STATN ADJ. (SMALL)
22	85-B-563	12	WASHER - SPRING
23	8-B-578	12	BUSHING-BUTTON CLUTCH
24	86-B-562	12	SPRING
25	85-B-566	12	WASHER - SLOTTED
26	CABLE	1	RED WIRE
27	CABLE	1	YELLOW WIRE
28	CABLE	1	BLUE WIRE
29	CABLE	1	PURPLE WIRE
30	CABLE	1	ORANGE WIRE
31	CABLE	1	GREEN WIRE
32	119-B-809	1	CLIP
33	77-A-374	2	SCREW 6-32 X 5/16"
34	18-A-312	2	CLAMP
35	85-A-255	2	#6 LOCKWASHER EXT. TOOTH
36	59-A-177	2	NUT 6-32 X 1/4" HEX.
37	96-B-574	3"	WIRE .025 MUSIC
38	87-B-886	3"	TAPE 1 INCH SCOTCH MASK. TAPE
39	2-B-880	1	ROTOR DISC ASSY.
40	85-B-754	1	WASHER, PHOS. BRONZE
41	85-B-556	1	WASHER 4/16" DIA. X .230 X .050
42	CABLE	1	RED WIRE WITH GREEN MARKER
43	CABLE	1	YELLOW WIRE WITH GREEN MARKER
44	CABLE	1	BLUE WIRE WITH GREEN MARKER
45	CABLE	1	PURPLE WIRE WITH GREEN MARKER
46	CABLE	1	ORANGE WIRE WITH GREEN MARKER
47	CABLE	1	GREEN WIRE WITH YELLOW MARKER
48	98-B-838	1	CABLE - 7 WIRES PC. 26-31 & 47
49	86-B-838	1	CABLE - 5 WIRES PC. 42-46
50	83-B-833	1-OZ	SOLDER - .062 - 50 CORE 50-50

SCOTT RADIO LABORATORIES INC. CHICAGO ILL.

REMOTE TUNING BACKPLATE ASSY.

MATERIAL		SCALE	FULL
DATE	4-22-48 CHECKED BY	ISSUE NO.	1
DRAWN BY	APPROVED BY	PART NO.	2-B-780

Figure 24 Pushbutton Tuning Backplate Detail Drawing

Table 4 Coil Data

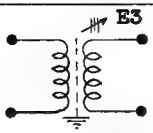
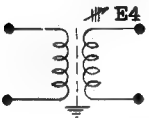
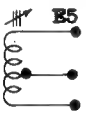
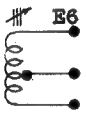
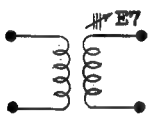
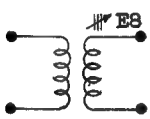
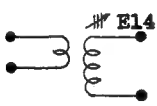
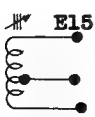
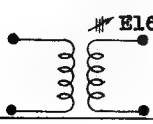
Symbol Desig.	Diagram	Description	DC Resis. Ohms
L1 L2		AM Broadcast band antenna primary coil. Part No. 20B604 AM Broadcast band antenna secondary coil. Part No. 20B605 Electrostatic shield is separate unit.	14.5 7.5
L3 L4		AM Shortwave band antenna primary coil. Part No. 20B608 AM Shortwave band antenna secondary coil. Part No. 20B609 Electrostatic shield is separate unit.	.45 .07
L5		AM Broadcast band oscillator coil Part No. 20B607	Start to tap .6 Total 3
L6		AM Shortwave band oscillator coil Part No. 20B611	Start to tap .03 Total .07
L7		AM Broadcast band mixer coil Part No. 20B606	Pri. 2.5 Sec. 7.5
L8		AM Shortwave band mixer coil Part No. 20B610	Pri. .1 Sec. .07
L9		FM Antenna coil Part No. 20B612	Pri. .04 Sec. .015
L10		FM Oscillator coil Part No. 20B614	Total.017
L11		FM Mixer coil Part No. 20B613	Pri. .07 Sec. .015

Table 4 Coil Data (Continued)

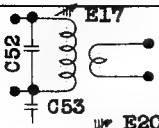
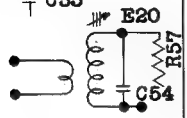
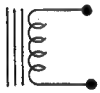
Symbol Desig.	Diagram	Description	DC Resis. Ohms
L12		1st FM-IF primary coil Part No. 20B618	Pri. .18 Sec. .06
L13		1st FM-IF secondary coil Part No. 20B619	Pri. .06 Sec. .18
L14		Bass boost choke 11 H @ 1000 CPS no DC. Laminated iron core - potted Part No. 17B591	230
L15 L16		RF choke, 2 uH @ 1000 CPS, no DC Part No. 17B761	.15
L17 L25		Filter reactor, 5 H @ 10 V 60 CPS with 220 MA DC, laminated iron core, potted. Part No. 17B492	82
L18 L19		FM-AM relay coil - operates on 10 V 60 CPS, used on all receivers to Serial 2000. Part No. 20B707	2
L18 L19		FM-AM relay coil - operates on 24 V 60 CPS, used on receivers after Serial 2000. Part No. 20B982	14
L20 L21		AC power ON-OFF relay, operates on 24 V 60 CPS, used on receivers to Serial 2000. Part No. 20B719	16
L20 L21		AC power ON-OFF relay, operates on 22 V 60 CPS, used on receivers after Serial 2000. Part No. 20B977	23
L22 L23 L24		Muting relay coil, operates on 2.4 V 60 CPS. Relay assembly Part No. 69B958	

Table 4 Coil Data (Continued)

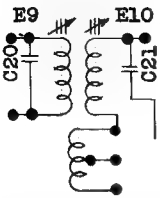
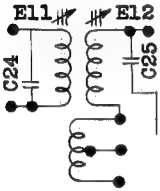
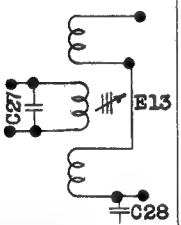
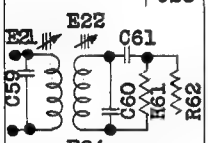
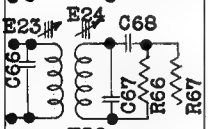
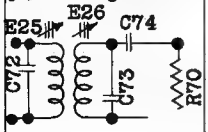
Symbol Desig.	Diagram	Description	DC Resis. Ohms
T1		1st AM-IF transformer, 455 KC, adjustable iron core on primary and secondary. Part No. 20B615	Pri. 5 Sec. 4.8 Ter. .3
T2		2nd AM-IF transformer, 455 KC, adjustable iron core on primary and secondary. Part No. 20B616	Pri. 5.2 Sec. 4.8 Ter. .3
T3		3rd AM-IF transformer, 455 KC, diode coupling transformer, adjustable iron core for primary. Part No. 20B617	Pri. 11.5 Sec. 16.5
T4		2nd FM-IF transformer, 10.7 MC, adjustable iron core primary and secondary. Part No. 20B620	Pri. .26 Sec. .26
T5		3rd FM-IF transformer, 10.7 MC adjustable iron core primary and secondary. Part No. 20B621	Pri. .26 Sec. .26
T6		4th FM-IF transformer, 10.7 MC adjustable iron core primary and secondary. Part No. 20B622	Pri. .26 Sec. .26

Table 4 Coil Data (Continued)

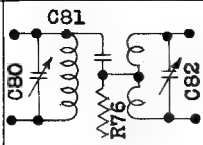
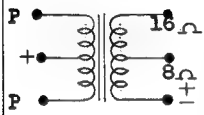
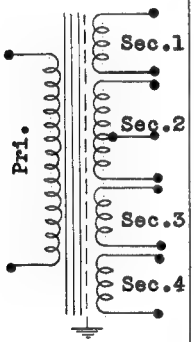
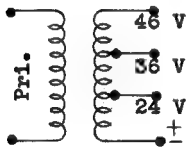
Symbol Desig.	Diagram	Description	DC Resis. Ohms
T7		FM discriminator transformer, 10.7 MC adjustable air trimmers primary and secondary. Part No. 20B623	Pri. .7 Sec. 1.3
T8		Output transformer, primary 9000 ohms @ 1000 CPS, 100 MA DC, Brown-red-brown Secondary, 16 ohms tapped at 8 ohms, 25 watts, common-black, 8 ohm black-yellow, 16 ohm yellow. Part No. 91B664	Pri. 300 Total Sec.Total .85 Sec.Tap .5
T9		Power transformer, primary - 120 V, 50-60 CPS, white and black Sec.1 - 5 V @ 4 A, blue and blue Sec.2 - 390-390 V @ 210 MA, red-red yellow-red Sec.3 - 6.3 V @ 4 A, yellow and yellow Sec.4 - 6.6 V @ 4.6 A, green and green Electrostatic shield between primary and secondaries. Part No. 91B429	Pri. 1.0 Sec.1 .7 Sec.2 68 Sec.3 .8 Sec.4 .8
T10		Pushbutton tuning system transformer Primary - 117 V 50-60 CPS, for intermittent duty Secondary - 46 V @ 2 A tapped at 36 V and 24 V Part No. 91B694	Pri. 8.2 Sec.Total 2.5 36 V Tap 2.1 24 V Tap 1.25

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
		CAPACITORS	
C1	BC Band ant. sec. trimmer	Capacitor, ceramic trimmer, 4-25 MMF, screwdriver adj.	15A21
C2	SW Band ant. sec. trimmer	Same as C1	
C3	V1, AM-RF amp. grid coupling	Capacitor, mica, 240 MMF, 10%, 500 V DC wkg., CM20 case, wire leads	15A31
C4		Capacitor, paper, .1/.1 MFD	15B796
C4A	V1, AM-RF amp. cathode bypass	20%, 600 V DC wkg., bathtub	
C4B	V1, AM-RF amp. screen bypass	can, 2 lugs, can common	
C5	Main tuning capacitor	Capacitor, variable air, 3	15B475
C5A1	AM-RF amp. tuning	gang in 4 gang frame, 2 sec-	
C5A2	FM-RF amp. tuning	tions per gang. Section 1:	
C5B1	AM-Osc. tuning	21 plates, min.cap. 8.5 MMF,	
C5B2	FM-Osc. tuning	max. cap. 410.5 MMF. Section	
C5C1	AM-mixer tuning	2: 5 plates, min. cap. 6 MMF,	
C5C2	FM-mixer tuning	max. cap. 26.4 MMF. Shaft: 3/8" dia. x 2 5/8" L at front - 3/8" dia. x 9/16" at rear	
C6	BC Band osc. trimmer	Capacitor, variable air trimmer, 3-25 MMF 7 plates, 1/4" hex shaft 1/8" L with screwdriver adj. slot	15A18
*C7	BC Band osc. fixed padder	Capacitor, silver mica, 390 MMF 5%, 500 V DC wkg., CM20 case, wire leads	15B861
C8	BC Band osc. variable padder	Capacitor, variable air trimmer, 6-75 MMF, 19 plates, 1/4" hex shaft 1/8" L with screwdriver adj.slot	15A20
C9	SW Band osc. fixed padder	Capacitor, silver mica, 4700 MMF 5%, 500 V DC wkg., CM 35 case, wire leads	15B798
C10	SW Band osc. trimmer	Same as C6	
C11	V2, AM osc. grid coupling	Capacitor, silver mica, 51 MMF 5%, 500 V DC wkg, CM20 case, wire leads	15A28
C12	V2, AM osc. plate bypass	Capacitor, paper, .05 MFD +30-10%, 600 V DC wkg., metal tubular can, insulated wire leads	15B639
C13	AM-osc. temp. compensating	Capacitor, silver ceramic, 10 MMF plus or minus 1 MMF 500 V DC wkg., temp. coeff N-750	15B804
C14	V2 cathode to V3 osc. input grid	Same as C11	

* 470 MMF Part 15A32 after Serial 1500

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	CAPACITORS (Continued)		
C15	BC Band mixer trimmer	Same as C6	
C16	SW Band mixer trimmer	Same as C6	
C17	V3 grid coupling	Same as C3	
C18		Capacitor, paper, .1/.1/.1	15A10
C18A	V1 plate filter	MFD 20%, 600 V DC wkg.,	
C18B	V3 screen filter	bathtub can, 3 lugs, can	
C18C	V3 cathode bypass	common	
C19	V3 plate bypass	Capacitor, paper, .1 MFD +30-10%, 600 V DC wkg., metal tubular case, mtg. strap, insulated wire leads both ends	15A409
C20	T1 - 1st AM-IF primary tuning	Capacitor, silver mica, 220 MMF 5%, 500 V DC wkg., CM20 case, wire leads	15A30
C21	T1 - 1st AM-IF secondary tuning	Capacitor, silver mica, 240 MMF 5%, 500 V DC wkg., CM20 case, wire leads	15B602
C22	V4 grid return filter	Same as C12	
C23		Same as C18	
C23A	V4 cathode bypass		
C23B	V4 screen bypass		
C23C	V4 plate filter		
C24	T2 - 2nd AM-IF primary tuning	Same as C21	
C25	T2 - 2nd AM-IF secondary tuning	Same as C21	
C26		Same as C18	
C26A	V5 cathode bypass		
C26B	V5 screen bypass		
C26C	V5 plate filter		
C27	T3 - 3rd AM-IF primary tuning	Capacitor, silver mica, 100 MMF 5%, 500 V DC wkg., CM20 case, wire leads	15A428
C28	V6 diode return bypass	Capacitor, mica, 51 MMF 20% 500 V DC wkg., CM20 case, wire leads	15A27
C29		Capacitor, paper,.05/.05/.05	15B599
C29A	V6 - N.L. cathode filter	MFD 20%, 600 V DC wkg., bath-	
C29B	AVC bypass	tub can, 3 lugs, can common	
C29C	AM tuning eye bypass		
C30	Volume control input coupling	Capacitor, paper, .02 MFD 20%, 600 V DC wkg., bathtub can, 2 lugs	15A12
C31	V9 - 1st AF amp. cathode bypass	Capacitor, electrolytic, 25 MFD, 25 V DC wkg., paper tubular case, wire leads	15B795
C32	V9 plate to V10 grid coupling	Same as C12	

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	CAPACITORS (Continued)		
C33 C33A C33B	V9 plate filter V10 plate filter	Capacitor, electrolytic, 20/20 MFD, 450 V DC wkg., bakelite case 1 3/8" dia. x 3 1/2" long, 3 wire leads, black common, mounts by 3/4-16 threaded bushing	15B745
C34	V10 cathode bypass	Same as C31	
C35	V10 plate coupling	Capacitor, paper, .05 MFD 20%, 600 V DC wkg., bathtub can, 2 lugs	15A13
C36	Treble control series	Capacitor, mica, .01 MFD 20%, 500 V DC wkg., CM35 case, wire leads	15A41
C37	Tone control circuit series	Capacitor, paper, .5 MF 20%, 600 V DC wkg., bathtub can, 2 lugs	15B636
C38	L9 - FM ant. secondary shunt	Capacitor, silver ceramic, 20 MMF 10%, 500 V DC wkg., insulated, wire leads	15B864
C39	L9 - FM ant. secondary trimmer	Same as C6	
C40	V11 - FM-RF amp. cathode bypass	Capacitor, mica, 390 MMF 10%, 500 V DC wkg., CM20 case, wire leads	15B799
C41	V11 - FM-RF amp. screen bypass	Same as C40	
C42	L10 - FM osc. coil shunt	Capacitor, silver ceramic, 10 MMF plus or minus 1 MMF 500 V DC wkg., insulated, wire leads	15A22
C43	L10 - FM osc. coil trimmer	Same as C6	
C44	V12 - FM osc. grid coupling	Same as C27	
C45	V13 - FM mixer cathode bypass	Same as C40	
C46	V12 - FM osc. plate bypass	Same as C40	
C47	V11 - FM-RF amp. plate filter	Same as C40	
C48	L11 - FM mixer coil shunt	Same as C42	
C49	L11 - FM mixer coil trimmer	Same as C6	
C50	V13 heater bypass	Same as C40	
C51	V13 screen bypass	Same as C40	
C52	L12 - 1st FM-IF primary tuning	Same as C27	

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	CAPACITORS (Continued)		
C53	V13 plate filter	Capacitor, mica, 6200 MMF 20%, 500 V DC wkg., CM35 case, wire leads	15A40
C54	L13 - 1st FM-IF secondary tuning	Same as C27	
C55	V14 cathode bypass	Same as C53	
C56	V14 heater bypass	Capacitor, mica .01 MFD 20% 300 V DC wkg., CM40 case, wire leads	15A427
C57	V14 screen bypass	Same as C53	
C58	V14 plate filter	Same as C53	
C59	T4 - 2nd FM-IF primary tuning	Same as C11	
C60	T4 - 2nd FM-IF secondary tuning	Same as C11	
C61	V15 grid coupling	Same as C11	
C62	V15 cathode bypass	Same as C53	
C63	V15 heater bypass	Same as C53	
C64	V15 screen bypass	Same as C53	
C65	V15 plate filter	Same as C53	
C66	T5 - 3rd FM-IF primary tuning	Same as C11	
C67	T5 - 3rd FM-IF secondary tuning	Same as C11	
C68	V16 grid coupling	Same as C11	
C69	V16 heater bypass	Same as C53	
C70	V16 screen bypass	Same as C53	
C71	V16 plate filter	Capacitor, paper, .25 MFD 20%, 600 V DC wkg., bathtub can, 2 lugs	15A14
C72	T6 - 4th FM-IF primary tuning	Same as C11	
C73	T6 - 4th FM-IF secondary tuning	Same as C11	
C74	V17 grid coupling	Same as C11	
C75		Capacitor, paper, .05/.05 MF	15A11
C75A	FM tuning eye bypass	20%, 600 V DC wkg.,bathtub	
C75B	V17 grid return bypass	can, 3 lug	
C76	B + bypass at V16 plate return	Same as C36	
C77	V17 heater bypass	Same as C53	
C78	V17 screen bypass	Same as C53	
C79		Capacitor, paper, .25/.25	15A425
C79A	V17 screen bypass	MFD, 20% 600 V DC wkg.,	
C79B	V17 plate filter	bathtub can, 2 lugs, can common	
C80	T7 primary trimmer	Same as C6	
C81	T7 primary to secondary coupling	Same as C42	

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	CAPACITORS (Continued)		
C82	T7 secondary trimmer	Same as C6	
C83	Discriminator diode filter	Same as C27	
C84	Discriminator diode filter	Same as C27	
C85	Discriminator output de-emphasis network	Capacitor, silver mica, 1300 MMF 5%, 500 V DC wkg., CM30 case, wire leads	15A415
C86	Audio input bypass at power supply	Same as C3	
C87	Audio compensating network at V19A grid	Same as C40	
C88	V19 cathode bypass	Capacitor, electrolytic, 25 MFD, 25 V DC wkg., bathtub can, 2 lugs, black negative	15A15
C89	V19A plate to V20 grid coupling	Same as C35	
C90	V19B plate to V21 grid coupling	Same as C35	
C91	V20, V21 cathode bypass	Capacitor, electrolytic, 25 MFD, 50 V DC wkg., paper tubular case, wire leads	15B638
C92	Audio output shunt	Capacitor, mica, 5000 MMF 20%, 1000 V DC wkg., bakelite case, tab terminals	15B763
C93	High voltage output filter	Capacitor, electrolytic, 30/30 MFD 450 V DC wkg., bakelite case 1 3/8" dia. x 3 1/2" long, 3 wire leads, black common, mounts by 3/4-16 threaded bushing	15B744
C94	Filter reactor output bypass	Same as C93	
C95	Filter reactor input bypass	Capacitor, paper, 4 MFD, 600 V DC wkg., metal can 1½" dia. x 4½" long, mounts by 3/4-16 threaded bushing, 2 lugs	15B481
C96	AC power input bypass	Same as C75	
C97	V19A input compensating	Capacitor, mica, 1000 MMF 10%, 500 V DC wkg., CM30 case, wire leads	15A35
	MISCELLANEOUS ELECTRICAL PARTS		
E1	AM-antenna terminal strip	Terminal strip, 3 terminals mounted on 3/4" W x 2" L bakelite strip, marked AM-ANT-GND	87B644

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	MISCELLANEOUS ELECTRICAL PARTS (Continued)		
E2	FM-antenna terminal strip	Terminal strip, 3 terminals mounted on 3/4" W x 2" L bakelite strip, marked FM-ANT-GND	87B643
E3	BC Band ant. sec., L2 inductance adj.	Powdered iron core 5/16" dia. x 1/2" L, adj. screw 6-32 x 1" L slotted at end	24A99
E4	SW Band ant. sec., L4 inductance adj.	Powdered iron core 5/16" dia. x 1/2"L, adj. screw 6-32 x 1¼" L, slotted at end	24A98
E5	BC Band oscillator, L5 inductance adj.	Same as E3	
E6	SW Band oscillator, L6 inductance adj.	Same as E3	
E7	BC Band mixer, L7 inductance adj.	Same as E4	
E8	SW Band mixer, L8 inductance adj.	Same as E3	
E9	1st AM-IF primary inductance adj.	Same as E4	
E10	1st AM-IF secondary inductance adj.	Same as E4	
E11	2nd AM-IF primary inductance adj.	Same as E4	
E12	2nd AM-IF secondary inductance adj.	Same as E4	
E13	3rd AM-IF primary inductance adj.	Same as E4	
E14	FM antenna secondary inductance adj.	Powdered iron core .274"dia. x 9/16" L, adj. screw 6-32 x 1¼"L slotted at end, iron core insulated from screw	24B758
E15	FM oscillator inductance adj.	Same as E14	
E16	FM mixer secondary inductance adj.	Same as E14	
E17	1st FM-IF primary inductance adj.	Same as E3	
E18	Phono-input terminal strip	Terminal strip, 2 terminals mounted on 3/4" W x 2 1/8"L bakelite strip, marked PHONO-GND	87A220
E19	Television input terminal strip	Terminal strip, 2 terminals mounted on 3/4"W x 2 1/8" L bakelite strip, marked TELEV-GND	87B642
E20	1st FM-IF secondary inductance adj.	Same as E3	

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	MISCELLANEOUS ELECTRICAL PARTS (Continued)		
E21	2nd FM-IF primary inductance adj.	Same as E4	
E22	2nd FM-IF secondary inductance adj.	Same as E4	
E23	3rd FM-IF primary inductance adj.	Same as E4	
E24	3rd FM-IF secondary inductance adj.	Same as E4	
E25	4th FM-IF primary inductance adj.	Same as E4	
E26	4th FM-IF secondary inductance adj.	Same as E4	
E27	Pushbutton switch cable terminal board	Terminal strip with 12 solder lugs, 1" W x2 17/32" long bakelite strip	87B546A
E28	Dial drive motor	Motor, reversible type shaded pole, operates on 24 volts 50-60 CPS	58B447
E29	Dial pointer assembly	Dial indicator pointer with guide	29B749
E30	Dial calibration scale	Calibration scale on glass plate 4½" x 11 7/32"	29B637
E31	Control knob	Plastic knob 1 1/8" dia. black with red arrow 1/4" bushing, 8-32 set screw	47B659
E32	Main tuning knob	Plastic knob 2" dia. Polished chrome finish ¼" bushing - 8-32 set screw	47B660
E33	Pushbutton	Clear plastic pushbutton 11/16" sq. with slot for station indicator tab, fits .050 x .312 flat shaft	10B735
E34	Knob set screw wrench	Wrench for #8 hollow head set screws 5/64" hex x 1 7/8" long	94B810
E35	Backplate rotor disk insulator strip	Strip, bakelite 27/32" x 9/16" x 3/16" with .040 W x .058 H, rib in center	87B560
E36	Backplate rotor disk assembly	Rotor disk assembly for pushbutton tuning system backplate	2B890
E37	Backplate contact assembly (long bracket)	Contact assembly for pushbutton tuning system backplate - long bracket	8B503A
E38	Backplate contact assembly(short bracket)	Contact assembly for pushbutton tuning system backplate - short bracket	8B504A
E39	AM-RF resistor strip assembly	Strip, bakelite 6 lugs with resistors R1, R2 and R4	87B547B

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
		MISCELLANEOUS ELECTRICAL PARTS (Continued)	
E40	Converter channel resistor strip assembly	Strip, bakelite 6 lugs with resistors R8, R11 and R12	87B547C
E41	AM-IF resistor strip assembly	Strip, bakelite 12 lugs with resistors R22, R17, R23, R19, R18 and R13	87B546C
E42	AM diode resistor strip assembly	Strip, bakelite 12 lugs with resistors R36, R33, R32, R34, R35 and R16	87B546B
E43	1st audio amp. resistor strip assembly	Strip, bakelite 6 lug with resistors R40, R39 and R38	87B547D
E44	2nd audio amp. resistor strip assembly	Strip, bakelite 12 lugs with resistors R44, R43, R42, R41 and R47	87B546D
E45	1st FM-IF resistor strip assembly	Strip, bakelite 6 lugs with resistors R59, R6 and R F choke L15	87B547E
E46	2nd FM-IF resistor strip assembly	Strip, bakelite 6 lugs with resistors R63, R64 and R65	87B547F
		FUSES	
F1	Power transformer primary fuse	Fuse, miniature cartridge, 3A, 250 V, 1/4" dia. x 1¼"L Type 3AG	37A162
F2	Pushbutton tuning transformer primary fuse	Fuse, miniature cartridge, 1A, 250 V, ¼" dia. x 1¼" L Type 3AG	37B655
		DIAL LAMPS	
I1	Dial lighting lamp	Lamp, miniature bayonet base, 6-8 V @ .150 amp. #47, brown bead	49A168
I2	Dial lighting lamp	Same as I1	
I3	Phono indicator lamp	Same as I1	
I4	BC Band indicator lamp	Same as I1	
I5	SW Band indicator lamp	Same as I1	
I6	FM Band indicator lamp	Same as I1	
		JACKS & RECEPTACLES	
J1	Record changer power receptacle	2 contact female plug with metal shield cap and cable clamp	65B840
J2	Speaker receptacle	10 contact female receptacle, 11/16" W x 1 9/16"L H.B.Jones type S-310-AB	67B542
J3	Receiver power receptacle	12 contact female receptacle, 15/16" W x 1¼" L, H.B.Jones type S-312-AB	67B541

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
		INDUCTORS & CHOKES	
L1	BC Band antenna primary coil	RF inductor, universal wound on 1" dia. x 7/8" L form	20B604
L2	BC Band antenna secondary coil	RF inductor, universal progressive wound on 1" dia. x 1½" L form, adjustable iron core	20B605
L3	SW Band antenna primary coil	RF inductor, solenoid wound on 3/4" dia. x 7/8"L form	20B608
L4	SW Band antenna secondary coil	RF inductor, solenoid wound on 3/4" dia. x 1½" L form, adjustable iron core	20B609
L5	BC Band oscillator coil	RF inductor, solenoid wound on 1" dia. x 2¼" L form, adjustable iron core	20B607
L6	SW Band oscillator coil	RF inductor, solenoid wound on 3/4" dia. x 2¼" L form, adjustable iron core	20B611
L7	BC Band mixer coil	RF transformer, primary universal wound, secondary progressive universal wound on 1" dia. x 2¼" L form, adjustable iron core	20B606
L8	SW Band mixer coil	RF transformer, primary and secondary solenoid wound on 3/4" dia. x 2¼" L form, adjustable iron core	20B610
L9	FM antenna coil	RF transformer, primary and secondary solenoid wound on ½" dia. x 2 1/8" L form, adjustable iron core	20B612
L10	FM oscillator coil	RF inductor, solenoid wound on ½" dia. x 2 1/8" L form, adjustable iron core	20B614
L11	FM mixer coil	RF transformer, primary and secondary solenoid wound on ½" dia. x 2 1/8" L form, adjustable iron core	20B613
L12	1st FM-IF primary coil	RF inductor, solenoid wound on ½" dia. x 2 1/8" L form, adjustable iron core	20B618
L13	1st FM-IF secondary coil	RF inductor, solenoid wound on 7/16" dia. x 1 3/8" L form, adjustable iron core	20B619
L14	Bass boost choke	Audio reactor, 11 H @ 1000 CPS, no DC, laminated iron core, potted	17B591
L15	V14 plate filter choke	RF choke, 40 T #26 SSE wire on 9/32" dia. x 7/8" L form wire leads	17B761

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	INDUCTORS AND CHOKES (Continued)		
L16	FM discriminator audio filter	Same as L15	
L17	High voltage filter choke	Filter reactor, 5 H @ 200 MA DC, laminated iron core, potted in chrome plated case	17B492
L18	FM-AM relay coil	Relay coil, wound on insulated copper sleeve, two terminals, 425 T #24 E wire DC resistance 2 ohm or 350 T #22 E wire, DC resistance 1 ohm, operates on 10 volts 60 CPS. Used on receivers before Serial 2000	20B707
L19	FM-AM relay coil	Same as L18	20B707
*L18	FM-AM relay coil	Relay coil, wound on insulated copper sleeve, two terminals, 800 T #30 E wire DC resistance 13 ohms, operates on 24 volts 60 CPS Used on receivers after Serial 2000	20B982
*L19	FM-AM relay coil	Same as L18	20B982
L20	AC power ON-OFF relay coil	Relay coil wound on insulated copper sleeve, two terminals, 1200 T #28 E wire, DC resistance 20 ohms or 1100 T #29 E wire, DC resistance 16 ohms,operates on 24 volts 60 CPS. Used on receivers before Serial 2000	20B719
L21	AC power ON-OFF relay coil	Same as L20	20B719
*L20	AC power ON-OFF relay coil	Relay coil wound on insulated copper sleeve, two terminals, 900 T #32 E wire, DC resistance 23 ohms operates on 24 volts, 60 CPS. Used on receivers after Serial 2000	20B977
*L21	AC power ON-OFF relay coil	Same as L20	20B977
L22	Muting relay coil	Audio muting relay coil, part of K3 assembly, operates on 2.4 volts 60 CPS	
L23	Drive motor relay coil	Same as L22. See relay K4	
L24	Drive motor relay coil	Same as L22. See relay K5	

* These coils used on FM-AM and AC relays after Serial 2000.

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	INDUCTORS AND CHOKES (Continued)		
L25	High voltage filter choke	Same as L17	
	LOUDSPEAKERS		
LS1	Loudspeaker for 800-B	Loudspeaker, coaxial type, 15 inch low frequency with 5 inch PM tweeter mounted axially, complete with crossover network and cable with 10 contact plug P-310-CCT. Field for 15 inch speaker 675 ohms series and 9000 ohms shunt. Input impedance 8 ohms	85B490
LS2	Loudspeaker for 800-B	Loudspeaker, 15" dynamic extended range. Field 675 ohm series and 9000 ohms shunt. Input impedance 16 ohms	85B909
	PLUGS		
P1	Receiver chassis power plug	Plug, 12 contact, male, metal cover with cable clamp, Type P-312-CCT	65A184
P2	Receiver chassis audio plug	Plug, 4 contact, male, metal cover with cable clamp, Type P-304-CCT complete with 4 wire cable	96B677
P3	FM-IF input plug	Plug, single contact, male Type 80M. Used on early model sets	65B656
P3	FM-IF input plug	Plug, 2 contact, male, Type MC2M. Used on later model sets	65B959
P4	Loudspeaker plug	Plug, 10 contact, male, metal cover with cable clamp, Type P-310-CCT	65A186
P5	AC power input plug	Plug, 2 contact, male, plastic shell	65B679
	RESISTORS		
R1	V1 - AM-RF grid return	Resistor, composition, .47 meg 10%, ½ watt, wire leads	70A61
R2	V1 - cathode bias	Resistor, composition, 560 ohms 10%, ½ watt, wire leads	70A46
R3	V1 - screen bleeder	Resistor, composition, 10,000 ohms 10%, ½ watt, wire leads	70A419

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	RESISTORS (Continued)		
R4	V1 - Screen filter	Resistor, composition, 15,000 ohms 10%, 2 watt, wire leads	70B818
R5	Sensitivity control	Potentiometer, wire wound, 10,000 ohms 10%, 2 watt, linear taper, shaft: ¼" dia. x 3" L, complete with SPDT switch SW4 for N.L. circuit	70B569
R6	V2 - AM osc. grid leak	Resistor, composition, 47,000 ohms 10% ½ watt, wire leads	70A54
R7	V2 plate filter	Resistor, composition, 5100 ohms 10%, 1 watt, wire leads	70B648
R8	V3 - AM mixer grid return	Same as R1	
R9	V3 - injector grid return	Resistor, composition, 20,000 ohms 5%, ½ watt, wire leads	70A52
R10	V3 cathode bias	Resistor, composition, 240 ohms 5%, ½ watt, wire leads	70A45
R11	V1 - RF amp. plate filter	Resistor, composition, 1000 ohms 10%, ½ watt, wire leads	70A47
R12	V3 screen filter	Resistor, composition, 18,000 ohms 10%, 2 watt, wire leads	70A68
R13	V3 plate filter	Same as R11	
R14	1st AM-IF secondary series	Resistor, composition, 47 ohms 10%, ½ watt, wire leads	70A420
R15	1st AM-IF secondary series	Resistor, composition, 10 ohms 10%, ½ watt, wire leads	70A42
R16	V4 - 1st AM-IF amp. grid return	Resistor, composition, .22 meg 10%, ½ watt, wire leads	70A59
R17	V4 cathode bias	Same as R2	
R18	V4 screen filter	Resistor, composition, .1 meg 10%, ½ watt, wire leads	70A58
R19	V4 plate filter	Same as R11	
R20	2nd AM-IF secondary series	Same as R14	
R21	2nd AM-IF secondary series	Same as R14	
R22	V5 - 2nd AM-IF amp. cathode bias	Same as R2	
R23	V5 screen filter	Same as R18	
R24	V5 plate filter	Same as R11	
R25	AM tuning eye target series	Resistor, composition, 1 meg 20%, ½ watt, wire leads	70A63
R26	V11 - FM-RF amp. grid series	Resistor, composition, 5 ohms 10%, ½ watt, wire leads	70B860
R27	Not used		

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	RESISTORS (Continued)		
R28	V8 FM tuning eye grid return	Same as R1	
R29	V8 FM tuning eye adj.	Potentiometer, composition, 1 meg 20%, .4 watt, shaft: ¼" dia. x 11/32" L, screwdriver slot adj. linear taper	70B568
R30	V8 FM tuning eye target series	Same as R25	
R31	AM diode load	Same as R6	
R32	AM diode filter	Same as R6	
R33	V6 noise limiter cathode filter	Resistor, composition, .82 meg 10%, ½ watt, wire leads	70B649
R34	AVC line filter	Same as R33	
R35	V7 AM tuning eye filter	Resistor, composition, 2.2 meg 20%, ½ watt, wire leads	70A64
R36	V6 noise limiter cathode bias	Same as R33	
R37	Volume control	Potentiometer, composition, 1 meg 20%, .4 watt, clockwise audio taper, shaft: ¼" dia. x 3" long	70B570
R38	V9 1st AF amp. cathode bias	Resistor, composition, 1300 ohms 5%, ½ watt, wire leads	70B650
R39	V9 plate load	Same as R6	
R40	V9 plate filter	Same as R6	
R41	V10 2nd AF amp. grid return	Same as R18	
R42	V10 cathode bias	Same as R38	
R43	V10 plate load	Same as R6	
R44	V10 plate filter	Same as R6	
R45	Treble control	Potentiometer, composition, .25 meg 20%, .4 watt, clockwise audio taper, tapped at .125 meg 20%, shaft: ¼" dia. x 3" L.	70B540
R46	Bass control	Same as R45	
R47	Tone control circuit return	Same as R3	
R48	V11 FM-RF amp. cathode bias	Resistor, composition, 150 ohms 10%, ½ watt, wire leads	70A44
R49	V11 screen filter	Resistor, composition, 56,000 ohms 10%, ½ watt, wire leads	70A55
R50	V12 FM oscillator grid return	Same as R18	
R51	V11 plate filter	Same as R11	
R52	V12 plate filter	Same as R7	

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	RESISTORS (Continued)		
R53	V13 FM mixer grid series	Same as R26	
R54	V13 cathode bias	Same as R11	
R55	V13 screen filter	Same as R16	
R56	V13 plate filter	Resistor, composition, 2400 ohms 5%, ½ watt, wire leads	70A49
R57	V14 1st FM-IF amp. grid series	Resistor, composition, 56 ohms 10%, ½ watt, wire leads	70A43
R58	V14 cathode bias	Resistor, composition, 160 ohms 5%, ½ watt, wire leads	70B654
R59	V14 screen filter	Same as R49	
R60	V14 plate filter	Same as R56	
R61	T4 secondary shunt	Resistor, composition, 27,000 ohms 10%, ½ watt, wire leads	70A418
R62	V15 2nd FM-IF amp. grid series	Same as R57	
R63	V15 cathode bias	Same as R58	
R64	V15 screen filter	Same as R49	
R65	V15 plate filter	Same as R56	
R66	T5 secondary shunt	Same as R6	
R67	V16 1st FM limiter grid series	Resistor, composition, 27 ohms 10%, ½ watt, wire leads	70B666
R68	V16 plate and screen filter	Resistor, composition, 39,000 ohms 10%, 1 watt, wire leads	70B653
R69	V8 FM tuning eye grid filter	Same as R35	
R70	V17 2nd FM limiter grid series	Same as R67	
R71	V17 grid leak	Same as R61	
R72	V17 grid return filter	Resistor, composition, 15,000 ohms 10%, ½ watt, wire leads	70A51
R73	V17 screen bleeder	Resistor, composition, 15,000 ohms 10%, 1 watt, wire leads	70B683
R74	V17 screen filter	Same as R68	
R75.	V17 plate filter	Same as R18	
R76	V18 FM discriminator filter	Same as R49	
R77	V18 diode load	Same as R18	
R78	V18 diode load	Same as R18	
R79	FM de-emphasis network	Same as R6	
R80	V19A grid series	Same as R1	
R81	V19A grid return	Same as R6	
R82	V19A, V19B cathode bias	Resistor, composition, 1500 ohms 10%, ½ watt, wire leads	70A48
R83	V19B plate load	Same as R16	
R84	V19A plate load	Same as R16	
R85	V20 grid return	Same as R16	

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
		RESISTORS (Continued)	
R86	V21 grid return	Same as R16	
R87	V19B grid return	Same as R16	
R88	V20,V21 cathode bias	Resistor, wirewound, 250 ohms 5%, 10 watt, vitreous enamel, wire leads	70A70
R89	V20 plate to V19A plate feedback	Same as R25	
R90	Audio output filter	Resistor, wirewound, 10,000 ohms 10%, 10 watt, vitreous enamel, wire leads	70B760
R91	V22 anode, dropping resistor	Resistor, wirewound, 3000 ohms 10%, 10 watt, vitreous enamel, wire leads	70B681
R92	Receiver high voltage dropping resistor	Resistor, wirewound, 300 ohms 10%, 10 watt, vitreous enamel, wire leads	70B682
R93	Speaker series field dropping resistor	Same as R91	
		SWITCHES	
SW1	Loop antenna switch	Switch, rotary, D.P.D.T., shaft: ¼" dia. x 11/32"long screwdriver slot	89B628
SW2	AM Band change switch	Switch, 4 section rotary, 2 position indent, front shaft ¼" x 2 13/16" long, shaft at rear 10½" long, ¼" dia. flat on 2 sides	89B508
SW2A	Antenna channel switch section	Switch section, 2 pole, 2 position, bakelite wafer, rotary type	89B508-2
SW2B	Oscillator channel switch section	Same as SW2A	
SW2C	Mixer channel switch section	Same as SW2A	
SW2D	Indicator lamp switch section	Switch section, 3 pole, 2 position, bakelite wafer, rotary type	89B508-1
SW3	Selectivity switch	Switch, 4 section rotary, 5 position indent, front shaft ¼" dia. x 2 13/16" long, shaft at rear 11½" long, ¼" dia. flat on two sides	89B509
SW3A	1st AM-IF Switch section	Switch section, 2 pole, 5 position, rotary type, bakelite wafer	89B509-1
SW3B	2nd AM-IF switch section	Same as SW3A	

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
		SWITCHES (Continued)	
SW3C	Phono-Radio switch section	Same as SW3A	
SW3D	Indicator lamp switch section	Same as SW3A	
SW4	Noise limiter switch	Switch, S.P.D.T. mounted on rear of sensitivity control R5, throws at maximum rotation of control	
SW5	AC power relay switch section	Switch section, 3 pole, 2 position, rotary type, bakelite wafer	89B626-1
SW6A	FM-AM relay switch top section	Switch section, 4 pole, 2 position, rotary type, bakelite wafer	89B625-1
SW6B	FM-AM relay switch bottom section	Switch section, 2 pole, 2 position, rotary type, bakelite wafer	89B625-2
SW7	Muting relay switch	Switch, S.P.S.T. mounted on relay K3	
SW8	Pushbutton switch gang	Switch, gang consisting of 7, S.P.S.T. momentary contact switches actuated by push levers	89B478
SW9	Pushbutton switch gang	Same as SW8	
SW10	Drive motor relay switch	Same as SW7. See relay K4	
SW11	Drive motor relay switch	Same as SW7. See relay K5	
		TRANSFORMERS, RF, AUDIO, POWER	
T1	1st AM-IF transformer	IF transformer, 455 KC, adjustable iron cores on primary and secondary	20B615
T2	2nd AM-IF transformer	IF transformer, 455 KC, adjustable iron cores on primary and secondary	20B616
T3	3rd AM-IF transformer	IF transformer, 455 KC, adjustable iron core on primary, secondary untuned	20B617
T4	2nd FM-IF transformer	IF transformer, 10.7 MC adjustable iron cores on primary and secondary	20B620
T5	3rd FM-IF transformer	IF transformer, 10.7 MC adjustable iron cores on primary and secondary	20B621
T6	4th FM-IF transformer	IF transformer, 10.7 MC adjustable iron cores on primary and secondary	20B622

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	TRANSFORMERS, RF, AUDIO, POWER (Continued)		
T7	FM discriminator transformer	IF transformer, 10.7 MC, primary and secondary tuned by variable air trimmers	20B623
T8	Audio output transformer	Output transformer, primary 9000 ohms @ 1000 CPS, 100 MA DC, secondary 16 ohms tapped at 8 ohms, 25 watts	91B664
T9	Power transformer	Transformer, primary 120 V 50-60 CPS. Sec. 1-5 V @ 4A. Sec.-2-390-390 V @ 210 MA. Sec. 3-6.3 V @ 4 A. Sec. 4 6.6 V @ 4.6 A. Electrostatic shield between primary and secondaries	91B429
T10	Pushbutton tuning system transformer	Transformer, primary 117 volts 50-60 CPS. Sec. 46 V @ 2.5 A, tapped at 36 V and 24 V, primary designed for intermittent duty	91B694
	VACUUM TUBES		
V1	AM-RF amplifier	Vacuum tube, 6SK7, octal base, remote cutoff pentode Heater: 6.3 V @ .3 amp	92A226
V2	AM oscillator	Vacuum tube, 6J5, octal base triode, Heater: 6.3 V @ .3 amp	92A228
V3	AM mixer	Vacuum tube, 6SA7, octal base, pentagrid converter, Heater: 6.3 V @ .3 amp	92A227
V4	1st AM-IF amp.	Same as V1	
V5	2nd AM-IF amp.	Same as V1	
V6	AM 2nd detector AVC, noise limiter	Vacuum tube, 6H6, octal base, twin diode, Heater: 6.3 V @ .3 amp.	92A229
V7	AM tuning indicator	Vacuum tube, 6E5, 6 prong base, cathode ray indicator, Heater: 6.3 V @.3 amp	92B479
V8	FM tuning indicator	Same as V7	
V9	1st audio amp.	Same as V2	
V10	2nd audio amp.	Same as V2	
V11	FM-RF amp.	Vacuum tube, 6AG5, miniature type, RF amplifier pentode, Heater: 6.3 V @ .3 amp	92B598
V12	FM oscillator	Vacuum tube, 6C4, miniature type, H.F. triode, Heater: 6.3 V @ .15 amp	92B597
V13	FM mixer	Same as V11	

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
		VACUUM TUBES (Continued)	
V14	1st FM-IF amp.	Vacuum tube, 6AC7, octal base, amplifier pentode, Heater: 6.3 V @ .45 amp	92A235
V15	2nd FM-IF amp.	Same as V14	
V16	1st FM-IF limiter	Vacuum tube, 6SJ7, octal base, sharp cutoff pentode, Heater: 6.3 V @ .3 amp	92A236
V17	2nd FM-IF limiter	Same as V16	
V18	FM discriminator	Same as V6	
V19	3rd audio amp. Phase inverter	Vacuum tube, 6SL7GT, octal base, twin triode, Heater: 6.3 V @ .3 amp	92B669
V20	Power output audio amp.	Vacuum tube, 6L6G, octal base, beam power amp., Heater: 6.3 V @ .9 amp	92A233
V21	Power output audio amp.	Same as V20	
V22	Voltage regulator	Vacuum tube, OD3-VR150/30, octal base, glow discharge voltage regulator	92A237
V23	High voltage rectifier	Vacuum tube, 5Y3GT, octal base, full wave high vacuum rectifier, filament 5 V @ 2 amp	92B480
V24	High voltage rectifier	Same as V23	
		WIRES AND CABLES	
W1	FM-IF lead	Shielded lead consisting of 7 ft RG58/u concentric line with single contact plug P3 type 80M attached. Used on early model sets.	65B656A
W1	FM-IF lead	Same as W1 above except plug is 2 contact type MC2M	65B959A
W2	Receiver power cable	Cable, 12 conductor, 2 shielded, with 12 contact plug P-312-CCT attached	96B676
W3	Audio connecting cable	Cable, 4 conductor, 2 shielded, with 4 contact P-304-CCT plug attached	96B677
		SOCKETS	
X1	Socket for V1	Socket, 8 contact octal, black bakelite type MIP-8, marked 6SK7	82B431
X2	Socket for V2	Socket, 8 contact octal, black bakelite type MIP-8, marked 6J5	82B433

Table 5
Parts List By Symbol Designation

Symbol Desig.	Function	Description	Part Number
	SOCKETS (Continued)		
X3	Socket for V3	Socket, 8 contact octal, black bakelite type MIP-8, marked 6SA7	82B432
X4	Socket for V4	Same as X1	
X5	Socket for V5	Same as X1	
X6	Socket for V6	Socket, 8 contact octal, black bakelite type MIP-8, marked 6H6	82B434
X7	Socket for V7	Socket, 6 contact, black bakelite PF-6 with metal cap	82B708
X8	Socket for V8	Same as X7	
X9	Socket for V9	Same as X2	
X10	Socket for V10	Same as X2	
X11	Socket for V11	Socket, 7 contact, miniature type with tube shield	82B663
X12	Socket for V12	Same as X11	
X13	Socket for V13	Same as X11	
X14	Socket for V14	Socket, 8 contact octal, black bakelite type MIP-8, marked 6AC7	82B438
X15	Socket for V15	Same as X14	
X16	Socket for V16	Socket, 8 contact octal, black bakelite type MIP-8, marked 6SJ7	82B439
X17	Socket for V17	Same as X16	
X18	Socket for V18	Same as X6	
X19	Socket for V19	Socket, 8 contact octal, black bakelite type MIP-8, marked 6SL7GT	82B687
X20	Socket for V20	Socket, 8 contact octal, black bakelite type MIP-8, marked 6L6G	82B436
X21	Socket for V21	Same as X2	
X22	Socket for V22	Socket, 8 contact octal, black bakelite type MIP-8, marked VR-150	82B440
X23	Socket for V23	Socket, 8 contact octal, black bakelite type MIP-8 marked 5Y3-GT	82B437
X24	Socket for V24	Same as X23	

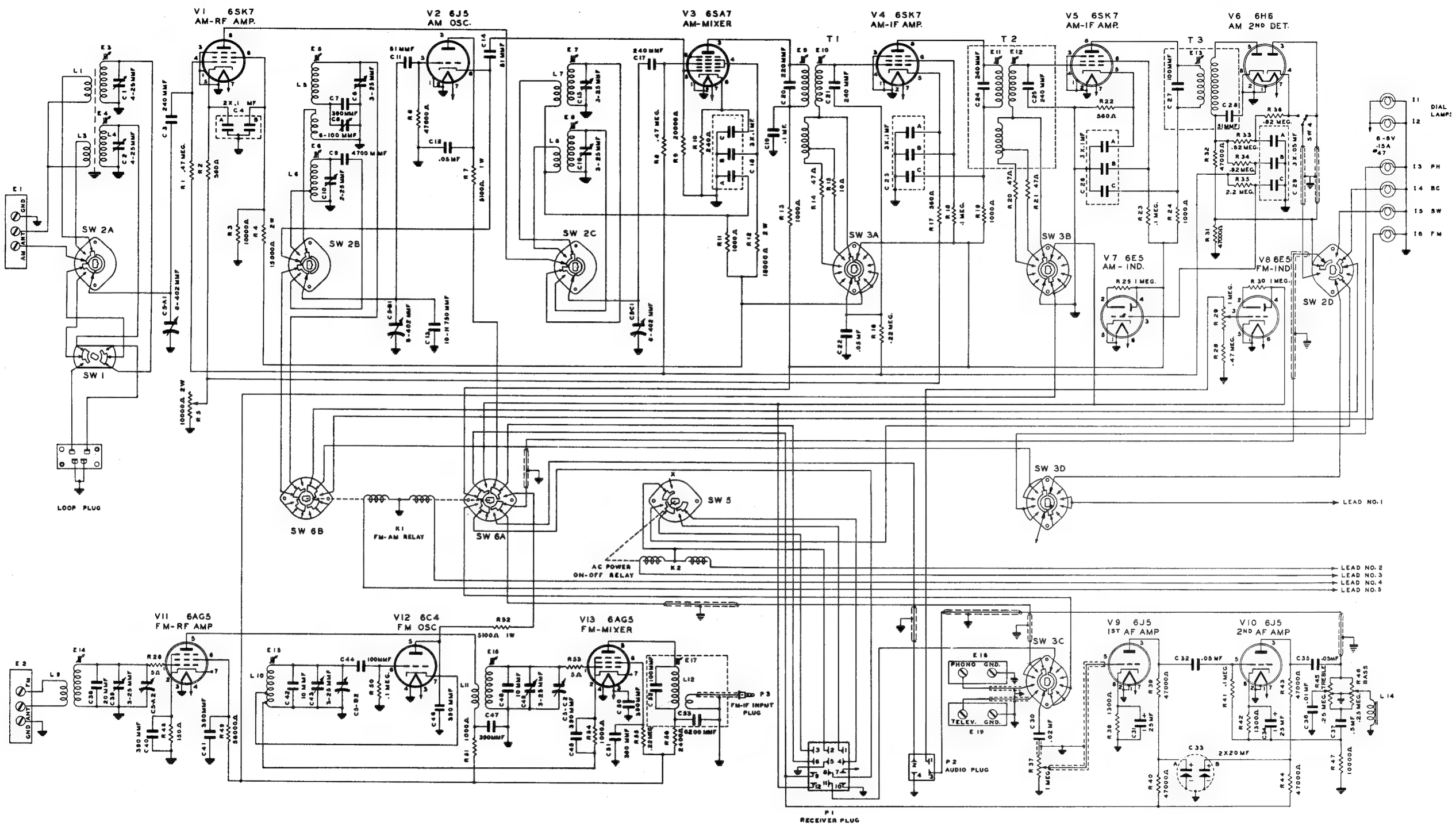
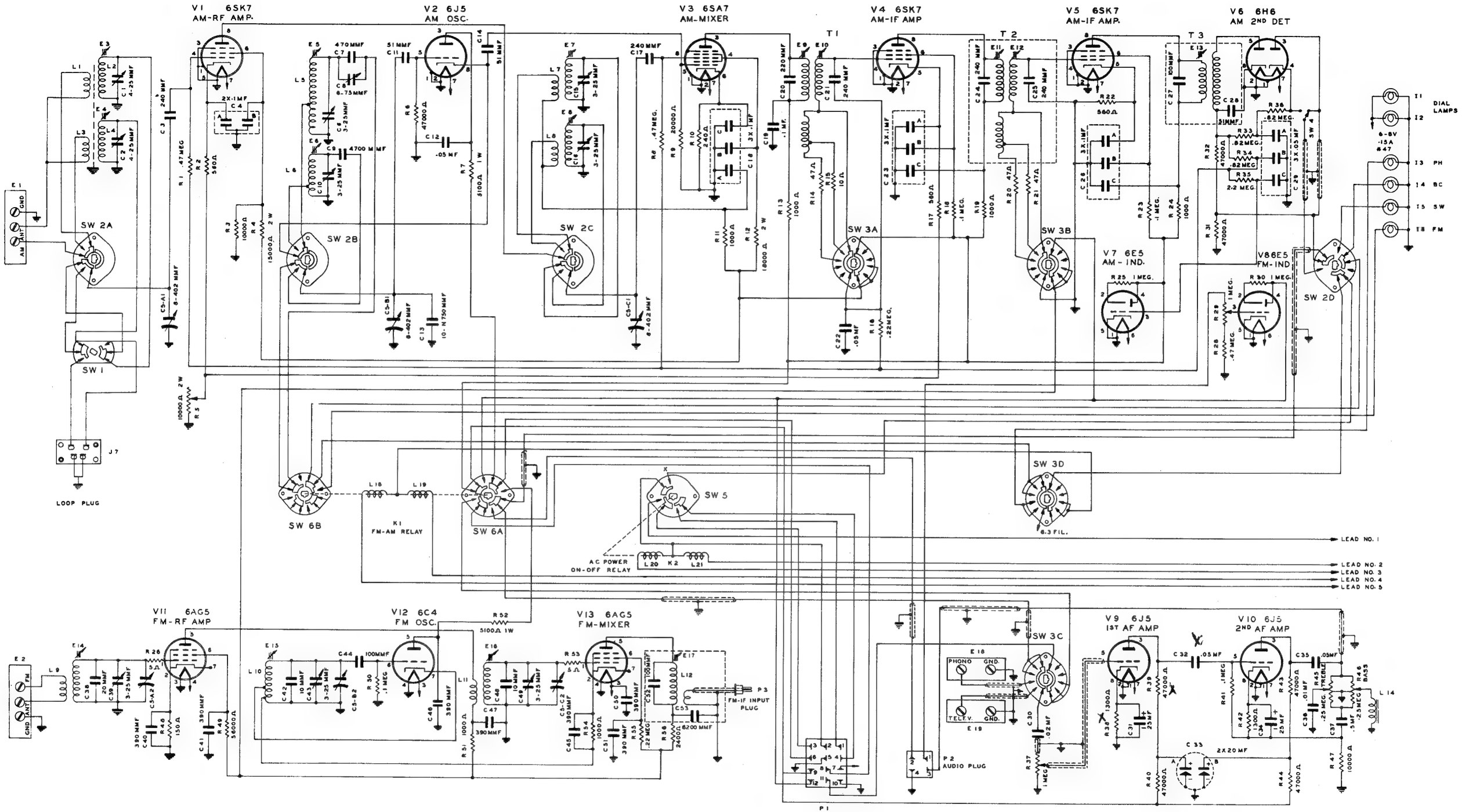


Figure 25 Schematic Diagram Model 800-B Receiver Chassis

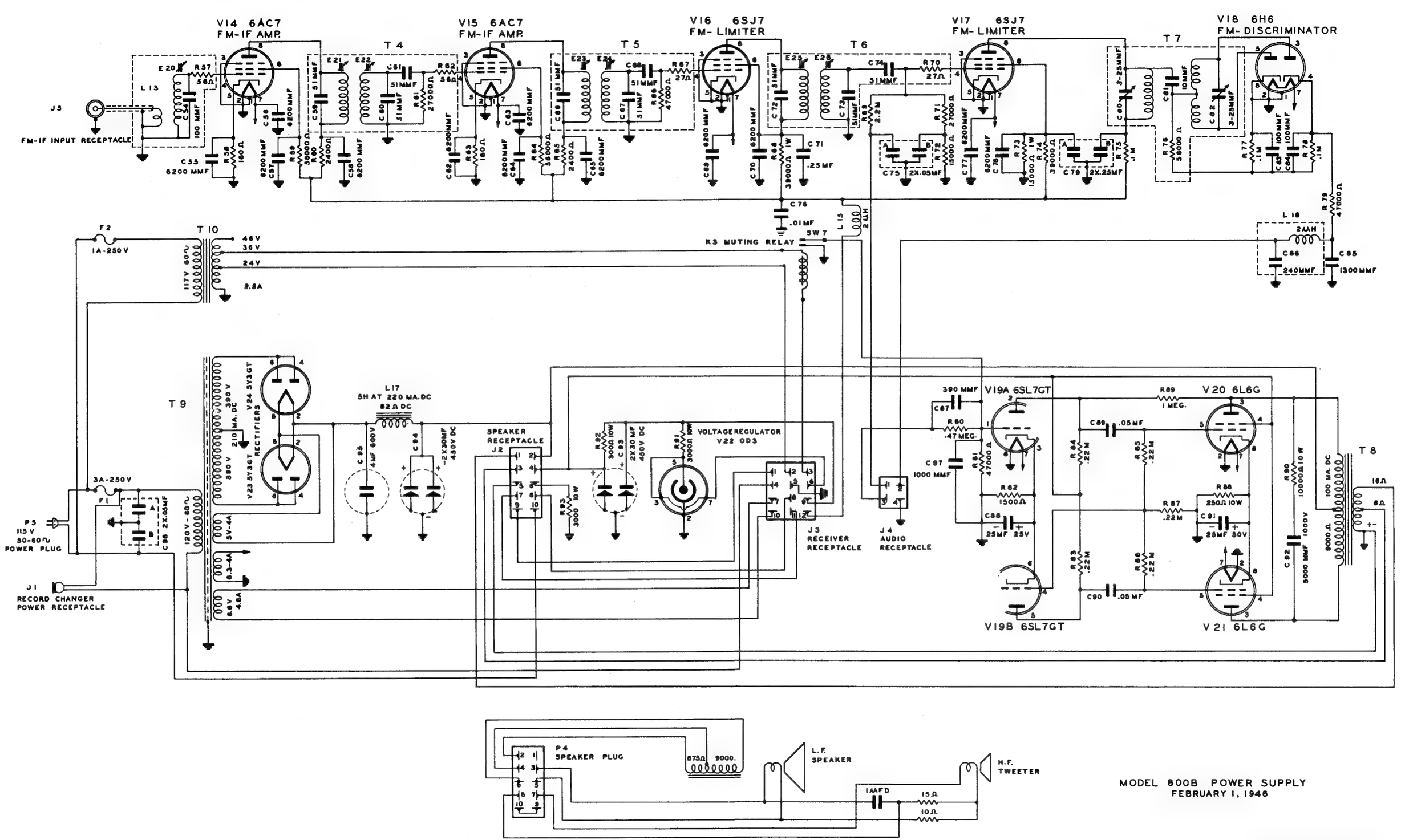


Change R 39 to 100K
C 32 to .006
R 38 to 470
For Reluctance Pickups

REVISED MODEL 800B RECEIVER CHASSIS
JUNE 25, 1948

SCOTT RADIO LABORATORIES INC.
CHICAGO 40 ILLINOIS

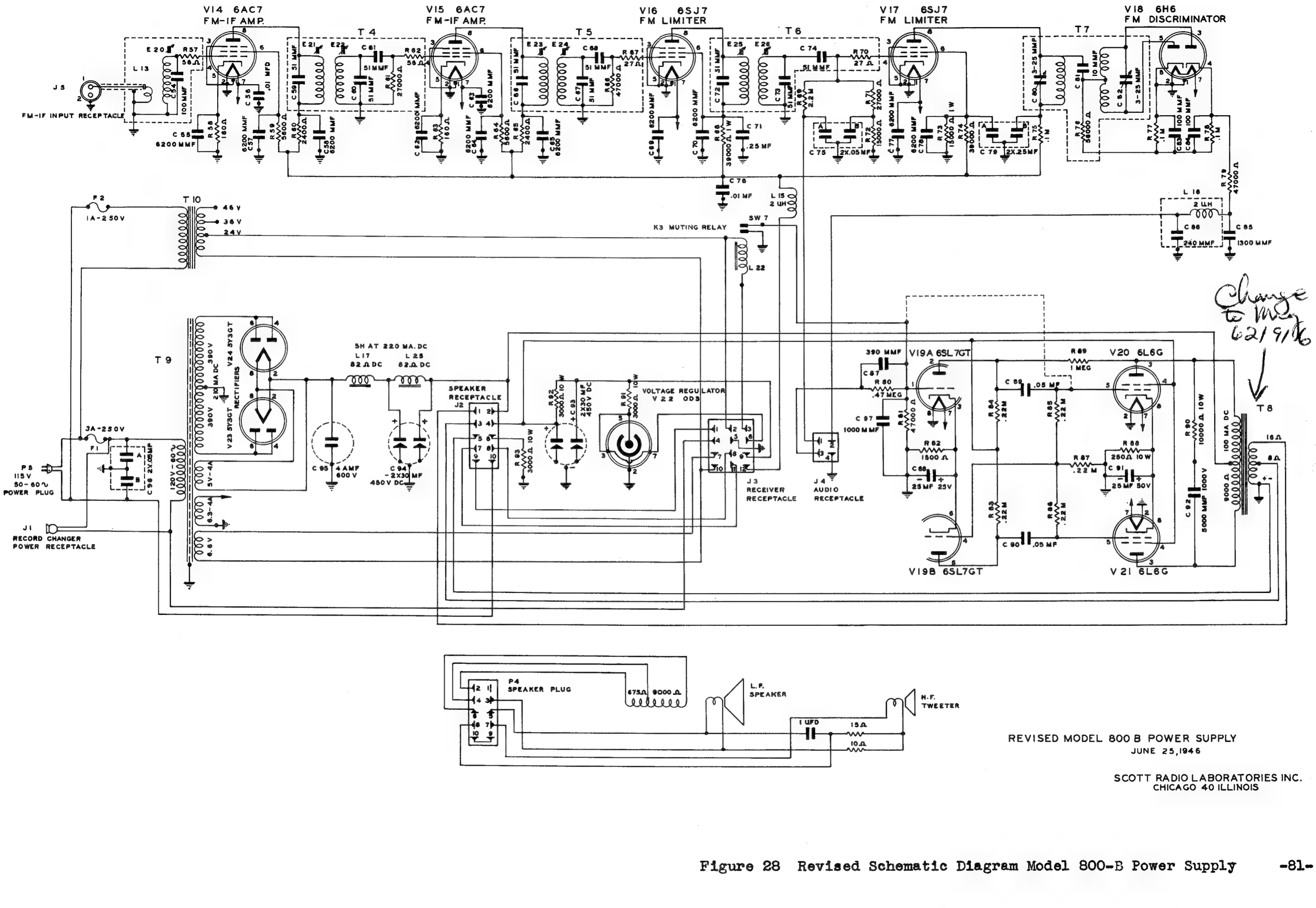
Figure 26 Revised Schematic Diagram Model 800-B Receiver Chassis



MODEL 800B POWER SUPPLY
FEBRUARY 1, 1946

SCOTT RADIO LABORATORIES INC.
CHICAGO 40 ILLINOIS

Figure 27 Schematic Diagram Model 800-B Power Supply



REVISED MODEL 800 B POWER SUPPLY
JUNE 25, 1946

SCOTT RADIO LABORATORIES INC.
CHICAGO 40 ILLINOIS

Figure 28 Revised Schematic Diagram Model 800-B Power Supply

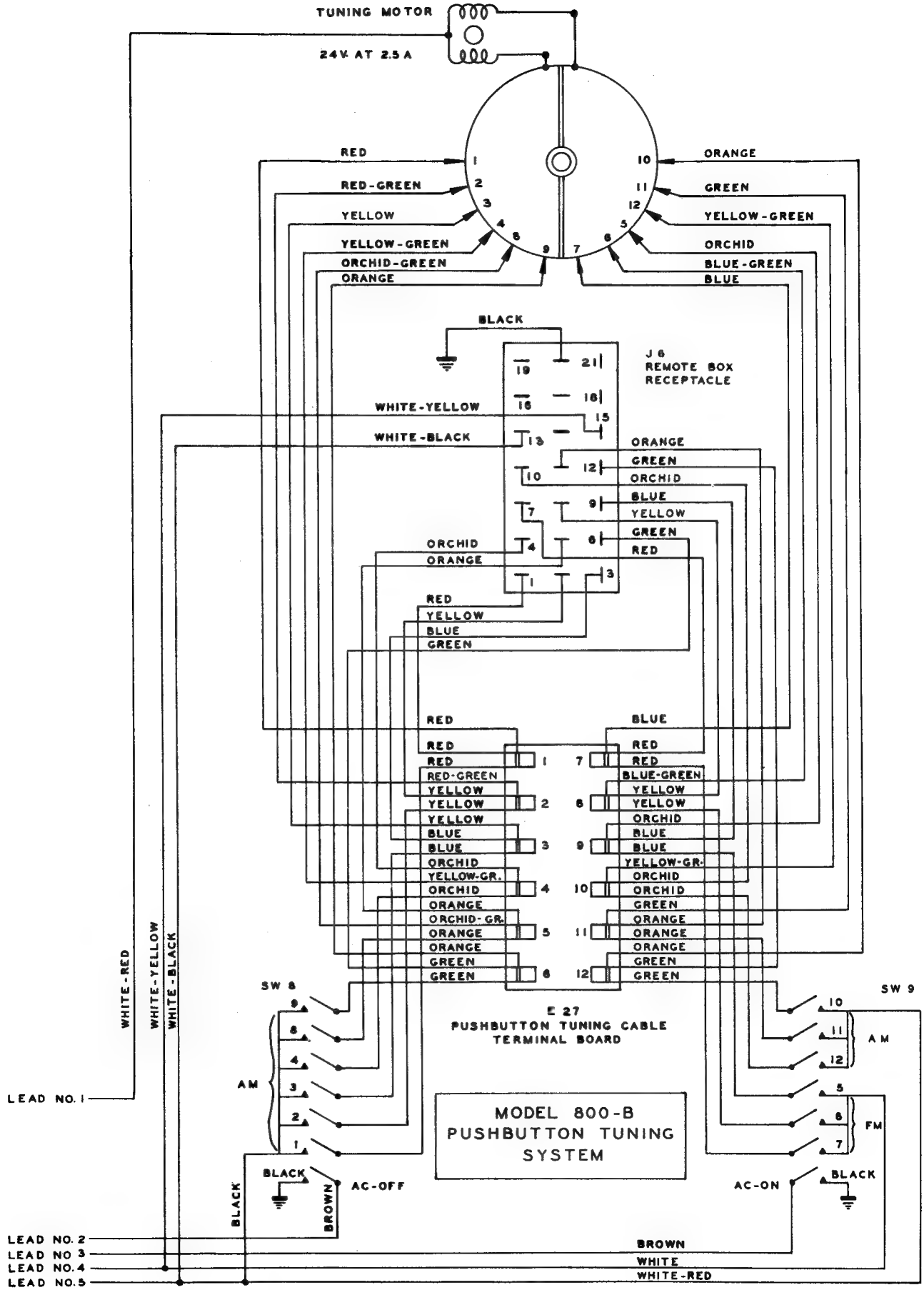


Figure 29 Schematic Diagram Pushbutton Tuning System

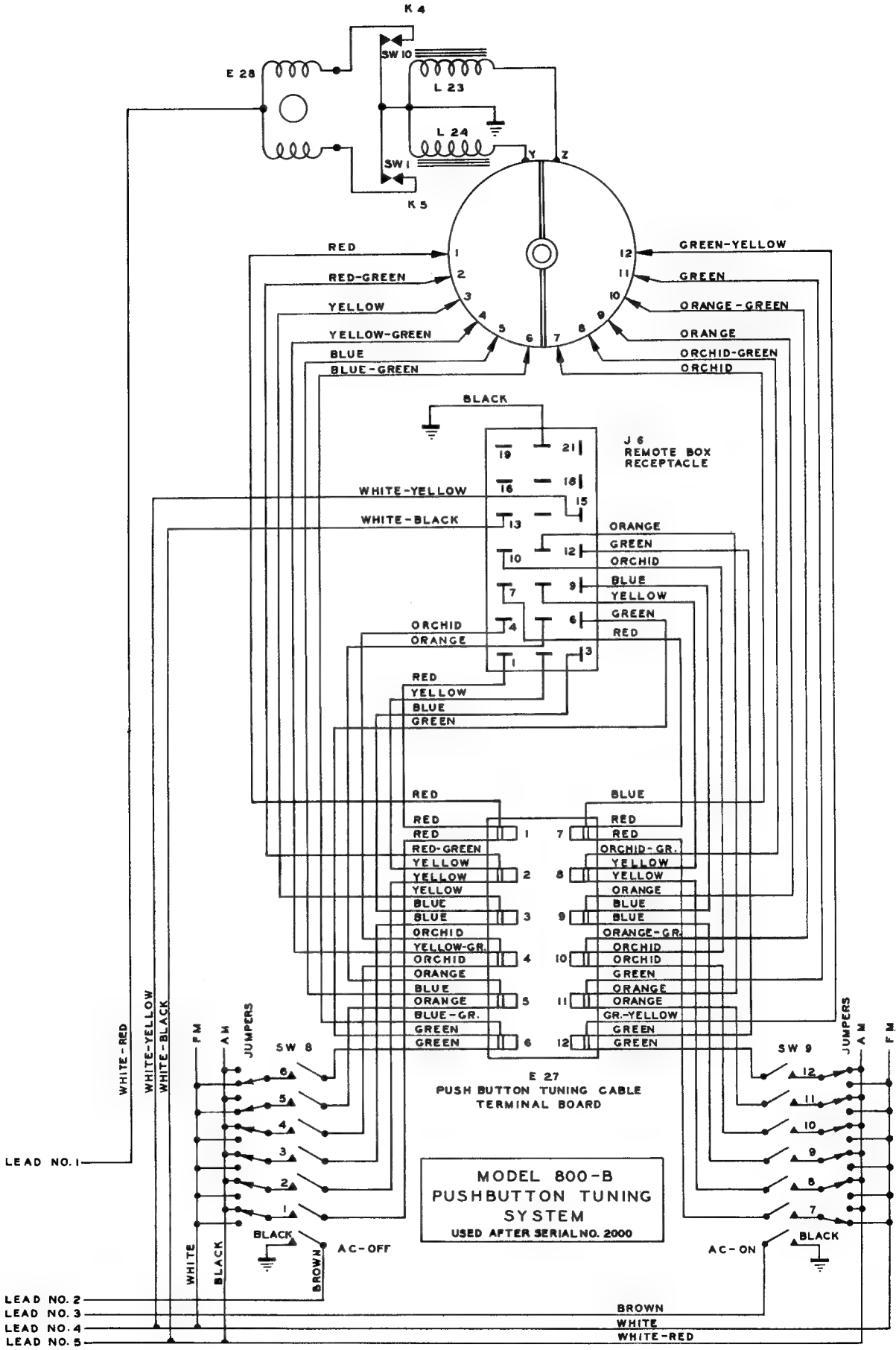


Figure 30 Revised Schematic Diagram Pushbutton Tuning System -83-

SERVICE NOTES FOR MODEL 800-B

SCOTT DEALERS:

To enable you to maintain the Model 800-B Radio Phonographs in the optimum operating condition and to correct difficulties which have arisen in the field "Service Notes" will be issued from time to time. The material is based on investigations made at the Laboratories to determine the best procedure for rectifying service difficulties which have been brought to our attention by Scott dealers and users. Of course, we offer this material for use by the dealer or service man when he deems it fully necessary to take action and it is not recommended that any modifications be made to the equipment as long as the customer is satisfied with the operation.

This data is prepared in loose-leaf form for insertion in a binder, so that we can send you information on our findings relative to the most pressing problems immediately without waiting for the preparation of a complete service manual. In the near future we plan to issue several additional notes and in a short time we expect to deal with all of those problems which are so important to you.

SERVICE NOTES FOR MODEL 800-B

THE REDUCTION OF HUM OUTPUT

In a high fidelity instrument such as the Model 800-B a very wide range of audio frequencies are reproduced and the hum problem is of special significance. Any hum voltages which reach the loudspeaker will be reproduced to a considerably greater degree than in the case of ordinary receivers having only a limited bass response. Thus, it becomes quite important that every effort be made to keep this hum at an absolute minimum. The several possibilities for hum pickup are treated in these notes. When customer complaints of an excessive hum level are experienced the following corrective measures are suggested. If the service man does not have an adequate stock of parts to make the changes which may be required, the additional parts may be procured from the Service Department, Scott Radio Laboratories, Inc., 4541 N. Ravenswood Avenue, Chicago, Ill.

Before taking any corrective measures check the wiring of the power supply, particularly the receiver receptacle J-3, to make sure that it conforms fully with the circuit diagram as furnished by the Scott Laboratories.

CONDITIONS FOR ELECTRICAL HUM AND SUGGESTED MEASURES

A. Hum present when receiver is switched on but Volume Control is adjusted for minimum output.

Elimination of Defective Components

The first step in locating the cause of hum under these conditions is to remove the 3rd audio amplifier tube V-19 (6SL7GT, located in the power supply chassis). If the hum disappears or is greatly reduced, the indicated fault lies in or ahead of this tube. If ahead of this tube it is, undoubtedly, caused by the 1st or 2nd audio amplifier tubes, V-9 (6J5) or V-10 (6J5), or their associated circuits located on the receiver chassis. If this source of hum is indicated, replace these tubes one at a time with a tube of known good quality, preferably one with a reversed coil heater which has the lowest hum pickup. If these tube replacements do not reduce the hum the 6L6 output tubes should also be replaced. If none of these tube replacements affect the hum the electrolytic capacitor C-33 which is used as a filter for the plate supply of the 1st and 2nd audio stages should be checked. It may be checked in a simple manner by bridging it temporarily with another 20 mfd., 300 to 450 volt rated capacitor, making certain that the correct polarity is observed.

If the hum is still present when the 3rd audio amplifier tube, V-19 (6SL7GT), is removed the fault may lie in a defective electrolytic filter capacitor in the high voltage supply; that is, C-93 or C-94. By shunting each capacitor with another unit of the same capacity and voltage rating, the defective unit can be easily located.

Also check the d. c. potential on each audio grid to determine whether it is excessive. A high d. c. voltage at any grid point indicates a leaky coupling condenser.

IMPROVEMENT OF FILTERING ACTION IN POWER SUPPLY

If the occasion arises where the above measures fail to improve the hum situation sufficiently to satisfy the customer, the only alternative is to provide additional filtering in the power supply. Such filtering may be essential in those localities where the A. C. power supply has a bad waveform. If the 60 cycle supply is distorted, the higher harmonics will appear particularly objectionable and may demand a greater degree of filtering. The circuit is arranged so that the additional choke serves to filter the entire supply and therfore, reduces hum from the output tubes as well as the other points of the audio amplifier. In the new arrangement two chokes part no. 17B492 are used instead of one as used in earlier layout. This additional filtering may be installed by relocating L-17 on the power supply chassis and mounting the second choke adjacent to it. The suggested arrangement and wiring diagram are shown on an attached sheet.

The following additional components are required for making this installation:

1 - Insulated wire - 4 1/4" long
1 - Single lug terminal - Part No. 90B711
1 - Filter choke - Part No. 17B492
4 - Screws - 8/32 x 3/8" long - Part No. 77A382
4 - Lockwashers - #8 - Part No. 95A251
4 - Nuts - #8 - Part No. 59A178
1 - Screw - 6/32 x 1/8" long - Part No. 77A202

The following steps may be taken for ease of installation: (Refer to Diagrams on Wiring and Schematic for Installation of Additional Filter Reactor - Model 800-B).

1. Remove 6/32 mounting screws of C-88 and R-82.
2. Remount terminal strip holding C-87 and R-80 under mounting foot of C-89.
3. Unsolder leads of L-17 and remove choke.
4. Remove one of the red leads of C-94 from #2 terminal point and connect this lead to the new single terminal point #3.
5. Drill 11 holes.
   - 8 - Clearance holes, #22 drill, for choke mtg.
   - 1 - Tapped hole for 6/32 screw.
   - 2 - 3/8" clearance holes for choke leads.
6. Mount chokes (L-17 and additional one).
7. Mount C-88 using 1/8" 6/32 screw and one of the old 6/32 screws, securing the ground lug under the unit.

8. Wire new yellow cathode lead from point #4, (the positive terminal) on C-88 to #6 pin on 6SL7 tube socket.

9. Wire short lead from 1st choke to #2 pin on 5Y3 socket. Wire long lead on 1st choke to #3 lug - also short lead from 2nd choke to #3 lug

10. Wire long lead from 2nd choke to #2 terminal lug.

B. Excessive hum with Volume Control in an advanced position and receiver switched into "Phono" or "Television" position.

A considerable improvement in the higher pitched hum level will be realized by rearranging the wiring of the "phono" and "television" input circuits and the high level audio lead running to the volume control. These leads are placed in cables in the wiring of earlier receivers, and have to be routed separately and generally isolated from other circuits to achieve the desired result. However, to avoid excessive dismantling of the receiver in the field the leads now running in the cables should be cut off and may be left in the cable while additional isolated leads are connected between the points concerned.

The following additional components are required for making this installation:

3 - Cable Clamps	- Part No.	18A312
3 - Shielded leads	- Part No.	96B962
1 - Screw - 6/32 x 1/8" long	- Part No.	77A202
3 - Lockwashers - #6	- Part No.	95A255
2 - Screws - 6/32 x 5/16" long	- Part No.	77A374
2 - Spacers - 1 1/8"	- Part No.	84A211
2 - Screws - 5/40 x 1 3/4" long	- Part No.	77B957
1 - Single lug terminal	- Part No.	90B711
2 - Nuts - 6/32	- Part No.	59A177

The following steps should be taken:

1. Disconnect ground braids and wires leading to the "phono" and "television" terminals.
2. Disconnect the other ends of these two shielded leads from switch C-3.
3. Disconnect shielded lead from C-30 coupling condenser.
4. Disconnect shielded lead from the high potential terminal of the volume control.
5. Remove short spacers from switch C-3 and substitute long spacers and screws. Reassemble using all washers and lockwashers which were used previously.
6. Add terminal #1 to chassis, mounting it under one foot of condenser C-30, or if possible drill #22 hole under C-30 as this will make wiring simpler as per diagram.
7. Add shielded lead to connect from volume control to C-30, connecting shields together at the volume control. Route lead across chassis toward the bottom edge which adjoins the bottom plates. Fasten lead under new cables clamps instead of the ones used previously. Insert one cable clamp with a short mounting screw on the left side of the chassis near the treble control.
8. Do not ground shield braid at terminal of C-30. Connect it to the added ground terminal mounted under one foot of C-30. Use this point also for connecting shields of leads coming from "phono" and "television" terminals.
9. Add new shielded leads from "phono and "television" terminals. Connect shield braids of these leads to the "ground" terminals at these points, but do not make a connection between either of these "ground" terminals and the chassis. Route leads along the lower edge of the chassis to switch C-3 using a cable clamp, fastened under one foot of the bathtub condenser C-29 to secure the cable.

C. Hum present only when a station carrier is tuned in and volume advanced.

Hum present under these conditions is generally caused by a defective tube. The most common fault being found in the second detector V-6 (6H6) when AM signals are being received or the discriminator V-18 (6H6) when FM signals are being received. The fault can be easily corrected by replacing these tubes with tubes of known good quality preferably of the metal type.

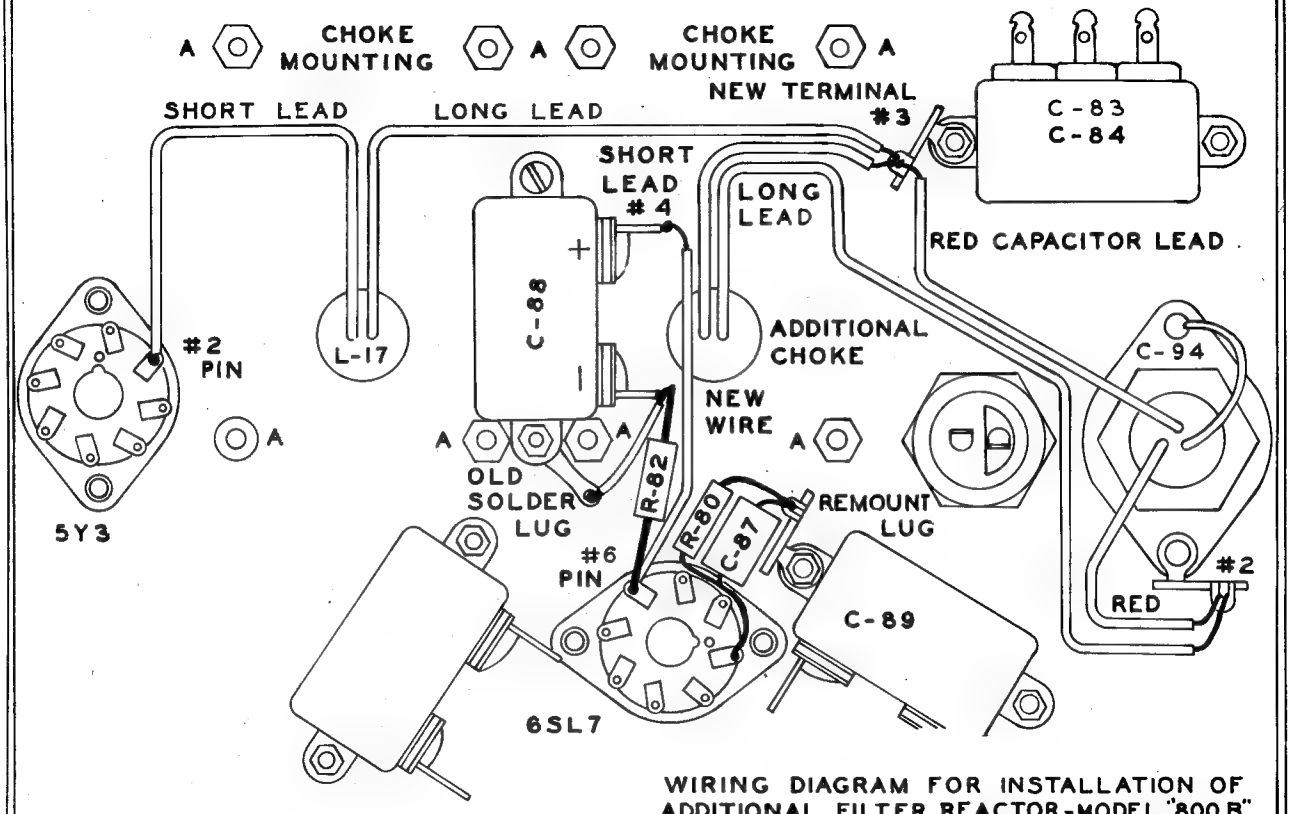
In some cases hum may be induced into the receiver from the power line. This form of pickup can usually be eliminated by employing a good ground connection between the receiver chassis and a cold water pipe or a pipe driven into the ground. Do not attempt to use the house wiring conduit or BX as a ground connection. Such an arrangement usually results in increased noise or hum pickup.

CONDITIONS FOR VIBRATIONAL OR MECHANICAL HUM AND SUGGESTED REMEDIES

A. Receiver hums when power is switched off.

In the 800-B, push-button tuning is accomplished by means of a motor driven mechanism. The transformer supplying the power for the drive motor, FM-AM changeover relay and the "power on-off" relay, is connected to the power circuit at all times. Therefore, a mechanical vibration may be heard even though the receiver is switched off. This form of hum is caused by transformer laminations vibrating against the bottom cover plate of the power amplifier.

To remedy this condition, remove the bottom plate of the power supply and apply strips of masking or adhesive tape along the bottom edge of the transformer so that the bottom plate cannot make metal to metal contact with the transformer case. In some extreme cases it may be necessary to mount the power supply on sponge rubber strips or felt bumpers in order to entirely eliminate this trouble.



WIRING DIAGRAM FOR INSTALLATION OF ADDITIONAL FILTER REACTOR-MODEL "800 B"

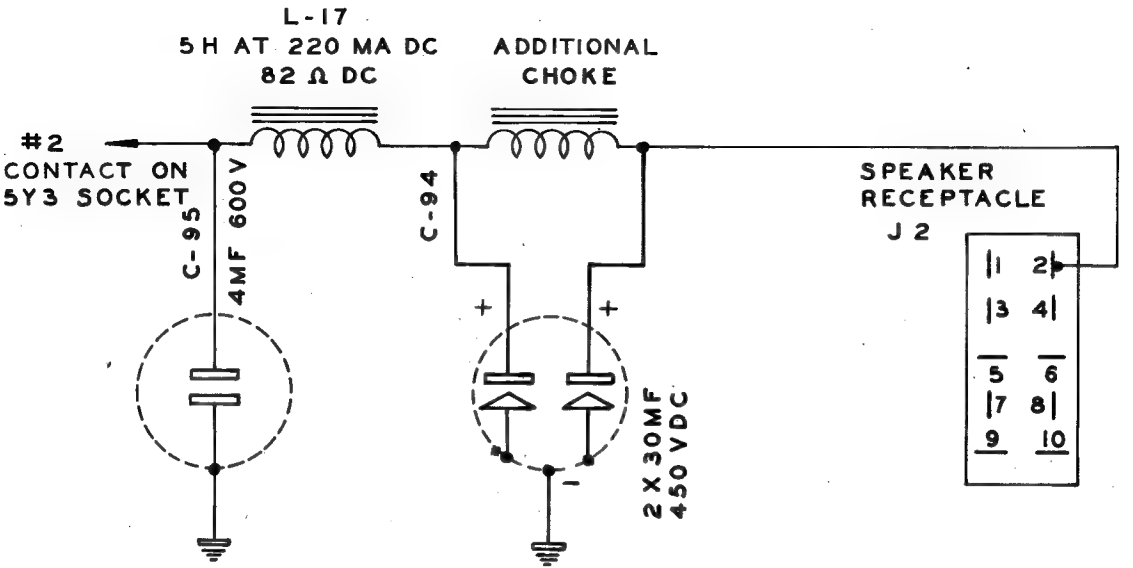
FULL

5-14-46

1

G.H.R.

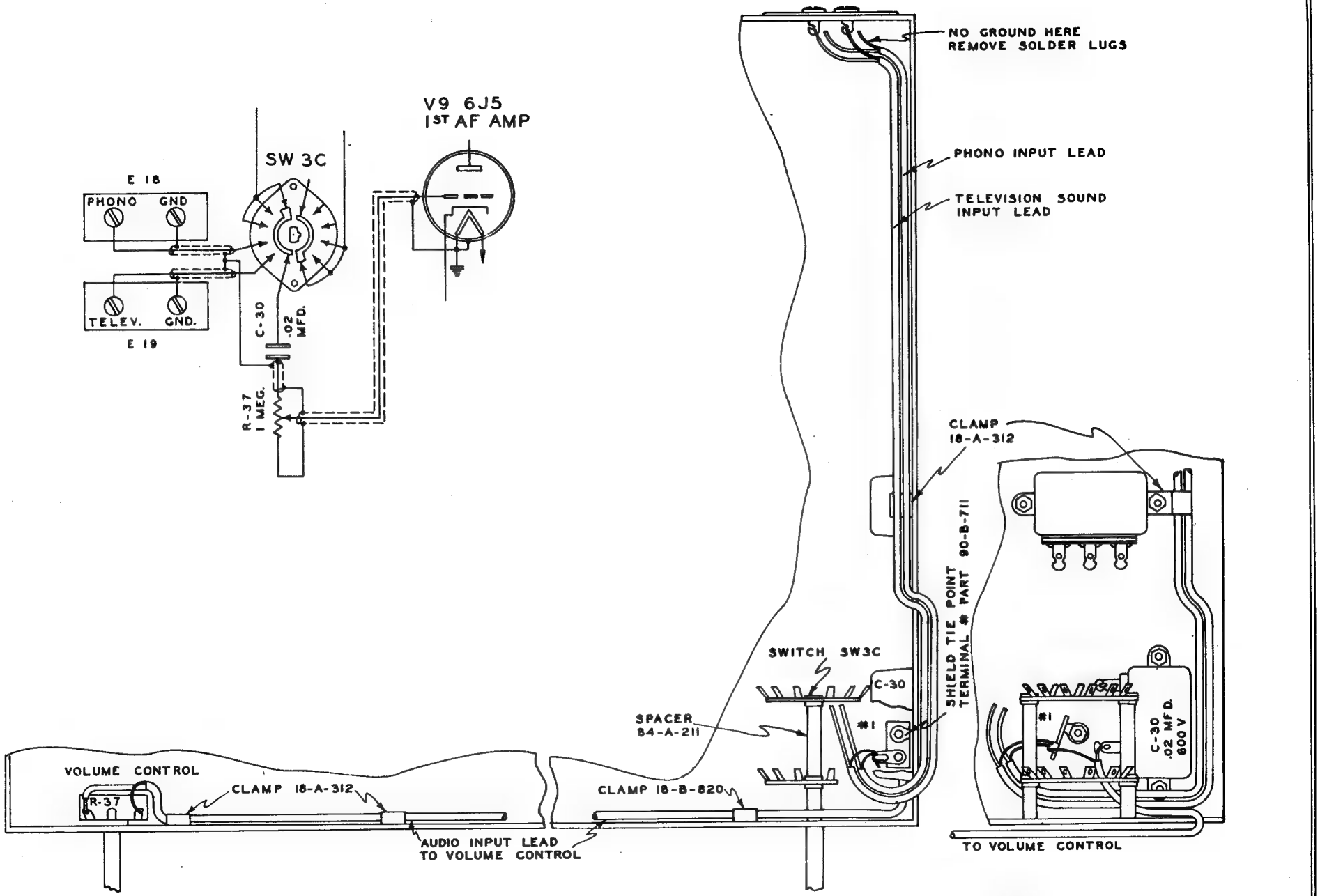
2-B-843-B



SCHEMATIC DIAGRAM FOR INSTALLATION
OF ADDITIONAL FILTER REACTOR-MODEL 800 B

5-14-46
M.L.C.

1
2-B-843-A



WIRING DIAGRAM FOR REDUCTION OF
AUDIO INPUT HUM LEVEL MODEL 800 B

FULL

5-14-46
M.L.C.

1
2-B-842-A

SCOTT RADIO LABORATORIES, INC.

SERVICE NOTES FOR MODEL 800-B AUGUST 14, 1946

ANTENNA NOTES

Now that Scott Model 800-B Radio Phonographs have been in operation in many parts of the country we feel that we should remind you of certain points about the antenna systems in order that you may obtain optimum performance. Of course, as we have mentioned in the past an outdoor installation is essential if the best performance is to be realized. In the very near future we will make available a complete built-in antenna system for AM broadcast, short-wave and FM. However, we recommend its use only in those instances where an outdoor installation is impossible. The purpose of these notes is to point out certain aspects of the outdoor antenna problem. The complete details of the built-in installation will be made available in a separate report.

Use of the Antenna Coupling Transformer

Our experience up to this time indicates that the antenna coupling transformer 2B922 should be used with all installations of the Scott Super Double Doublet to obtain full signal strength on all stations. This necessity is particularly true for those installations which are located in the more remote parts of the country where the listener must depend on many distant stations. At first it appeared that the use of the coupling transformer might result in signals which were too strong when the set was located near a powerful transmitter. However, in those cases it is best to install the coupling transformer and in addition a series resonant trap circuit across the antenna terminals to reduce the signal from the one strong station in question. For those listeners who are located near very powerful transmitters we can furnish series resonant trap circuits suitable for use in conjunction with the antenna coupling transformer, if you will advise us regarding the frequency of the nearby station. Of course, the trap is not required if the strong local station produces no undesirable effects in the reception of other stations.

Direction of Antenna Installations

Another point to remember in installing the Super Double Doublet is that it should be run broadside to the direction of the desired short-wave stations, if possible. In this country many listeners may wish to listen to European transmitters. In that event the Double Doublet should run between points North and South so that the signals arriving from the East cut across it broadside. If the listener is particularly interested in South American stations the Double Doublet should be run between points East and West, so that signals arriving from South America cut across it at right angles. Of course, one could compromise and run the antenna between points North-East, South-West or North-West, South-East with some loss in signals from either Europe or South America but without complete discrimination against either. However, most English speaking short wave stations should be received best with the antenna running from North-South, thus providing the proper broadside for Europe and the Pacific Area. We know that trees and other objects around a house will influence the location and direction of the antenna system but a special effort should be made to place it in the proper direction particularly for those listeners who are confirmed DX fans.

The FM Antenna and Its Reflector Elements

The FM Dipole and Reflector Installation is particularly desirable for the best reception of FM signals with freedom from noise and fading. It should be located in a position which is relatively clear and unobstructed, preferably not behind trees or buildings in the direction of the FM stations. An important point to remember is that the reflector elements (the dipoles which are not connected to the lead-in) should be on the side opposite to the desired stations.

The FM antenna is used with the reflector to provide a high degree of directivity on the side opposite the reflector unit. So if it should happen that you have desired FM stations in either direction it may help to remove the reflector elements and install the antenna as a simple dipole. On the other hand when more FM stations are installed and in operation you will find that in many instances they will appear to be very closely spaced on the dial. Then you will find the reflector elements to be very helpful in selecting signals from the desired direction, but always remember that the reflector elements must be located on the side of the antenna opposite to the directionof the stations. Also just as in the case of the Super Double Doublet the dipoles must be broadside to the direction of the desired stations. That is, the dipoles must point North-South for stations located to the East or West of the installation.

The main point to remember about the installation of outdoor antennas is that one can't just throw them up in the most convenient spot or with no regard to the stations which the listener might most logically prefer to hear. Here is a real opportunity to do the customer a service which will give the Scott that extra touch of performance which means so much to the critical listener.

SCOTT RADIO LABORATORIES, INC.
CHICAGO, ILLINOIS

SERVICE NOTES FOR MODEL 800-B AUGUST 14, 1946

SETTING UP PUSHBUTTON TUNING SYSTEM

The pushbutton tuning system in the 800-B Receiver has been designed to provide maximum flexibility in order to permit setting up for 5 or more AM stations and 1 to 5 FM stations, the only limitations being the spacing of the stations on the tuning dial or the setting for an AM station falling on the same spot as that for an FM station. At the factory the receivers are wired so that 4 buttons on the left side of the panel and the 5 top buttons on the right side are wired for AM stations and the lower button on the right side with the two top buttons on the left side are wired for FM stations as shown in Figure 9. No attempt should be made to set up the pushbutton tuning system for weak distant stations as poor results will be obtained because of background noise.

The switch over from AM to FM reception is done automatically in the receiver, that is, with the receiver adjusted for pushbutton tuning, when any AM button is pushed the receiver is automatically set for AM reception and when any FM button is pushed the receiver is automatically switched for FM reception.

The pushbutton tuning drive unit is located at the rear of the receiver chassis. This unit has 12 adjustable knobs which are numbered 1 to 12. These knobs are set to the desired position by turning them clockwise or counter-clockwise with a rotary motion. They are locked in position by means of a small screw, adjacent to the knob. These small lock screws should never be tightened more than one turn past the point where the screw touches the backplate. If tightened more the setting of the knob will be changed. Two calibrated scales located below the two rows of knobs, are provided to enable setting the knobs in conjunction with the logging scale at the top of the front dial scale. Each of the pushbuttons on the front panel is wired to the corresponding knob on the backplate in the sequence shown in Figure 9. The following procedure should be followed in setting up the pushbutton tuning system.

1. Set the Selectivity control to "M" position and the AM-Band control to "BC" position.

2. Select the lowest frequency AM station to be set up and insert the tab for this station in pushbutton No. 1.

3. Tune in the desired station manually and note the setting of the dial pointer on the logging scale at the top of the dial.

4. Set knob No. 1 on the backplate to the corresponding number noted on the logging scale, and lock the knob in place by means of the small screw directly above it. CAUTION: Never tighten the small locking screw more than one turn past the point where it touches the backplate; if tightened more the setting of the knob will be changed.

5. As a check to ascertain that the knob is set correctly, manually set the dial pointer to a higher frequency, then push button No. 1 until the pointer stops

and check this setting against the original reading on the log scale. Repeat this operation after setting the dial to a lower frequency. If the both readings are higher or both readings lower than the original log scale reading for this station then the No. 1 knob must be moved slightly to correct for the error in reading. If the two readings are spaced equally one-half a division or less on both sides of the original station setting, as read on the log scale, the adjustment has been correctly made.

6. The above operation should be repeated for each pushbutton to be set up, starting with button No. 1 for the lowest frequency station and working up consecutively to button No. 12 for the highest frequency station. Pushbuttons 5, 6 and 7 can be used only for FM reception and when any of these buttons are pushed the receiver will automatically switch over to FM reception.

NOTE: The pushbutton tuning system will work only when the Selectivity control is set at "M" or "B" positions and the AM-Band control is set at "BC" position. If the pushbutton system does not work when the controls are set as above, replace the 1 amp fuse in the power supply. Refer to Figure 21 for location.

CONNECTING PUSHBUTTON SWITCHES FOR AM OR FM OPERATION

When more than 3 FM stations or more than 9 AM stations are desired, by connecting the pushbutton switches as outlined below, any of the 12 pushbuttons may be set up for either an AM or FM station.

On the first Model 800-B Radio-Phonographs produced, the pushbutton switches were connected as shown in Figure 11. It will be noted that on the left hand switch gang, one side of switches 1-2-3-4-8-9 are all connected to the black AM-common lead, therefore, all these switches will operate on AM stations. If it is desired to connect one or more of the switches on the left hand side for FM stations, it will be necessary to disconnect the switch or switches required from the black AM common lead and connect them over to the white FM common lead on the right hand switch.

On the right hand switch gang, one side of switches 5-6-7 are connected to the white FM common lead, therefore, these three switches are used to set up FM stations. One side of switches 10-11-12 are connected to the white-red dot AM common lead and are used to set up AM stations. In order to use anyone of these switches for an FM station, disconnect that switch from the AM common lead and connect it to the FM common lead. In this manner any one of the twelve pushbutton switches may be connected for operation on either AM or FM.

On the later Model 800-B Radio-Phonograph, the switch gangs have been provided with 2 dummy lugs on each section; one row of dummy lugs are connected to the AM common lead, the other row of dummy lugs are connected to the FM common lead and all that is necessary to connect any pushbutton for operation on AM, is to connect that switch to the AM common lug and for FM operation connect it to the FM lug. It will be noted by observing Figure 12 that the pushbuttons are now numbered in sequence 1 to 12 starting at the bottom pushbutton on the left side of the panel.

SCOTT RADIO LABORATORIES, INC.
CHICAGO, ILLINOIS

SERVICE NOTES FOR MODEL 800-B AUGUST 9, 1946

CONTINUED NOTES ON REDUCTION OF HUM OUTPUT AND AUDIO NOISES

Further investigations of hum problems have revealed that additional steps can be taken if satisfactory hum level is not accomplished by changes recommended in previous Service Notes.

We wish to repeat that tubes are often the cause of hum. Here at the Laboratory individual tubes have developed excessive hum output after the sets passed all our tests. Therefore, be sure to select tubes having the lowest hum level by trying several 6J5 and 6SL7 tubes. Carry spare tubes with you when installing the set as some may go bad from jolting received during delivery. If the receiver has incorporated the changes covered in previous Service Notes the following additional steps may be taken:

(1) Check to determine whether the lead from muting relay K3 is connected to the 6SL7 grid pin No. 1 or the 6L6-V20 grid. If it is connected to the 6SL7 input grid, move it to the 6L6-V20 input grid. This change prevents hum in the relay lead from being amplified by the 6SL7 tube.

(2) To reduce hum to the lowest possible level the following steps may be taken:

(a) Add a 5600 ohm resistor (our Part No. 70A50, or equivalent) to the bass control circuit between the yellow leads and their terminal of the control R46. This resistor may be supported by a single lug terminal strip (our Part No. 90E711 or equivalent.) which can be mounted by a screw and nut already available near the bass control. The new resistor will be designated by the symbol R94.

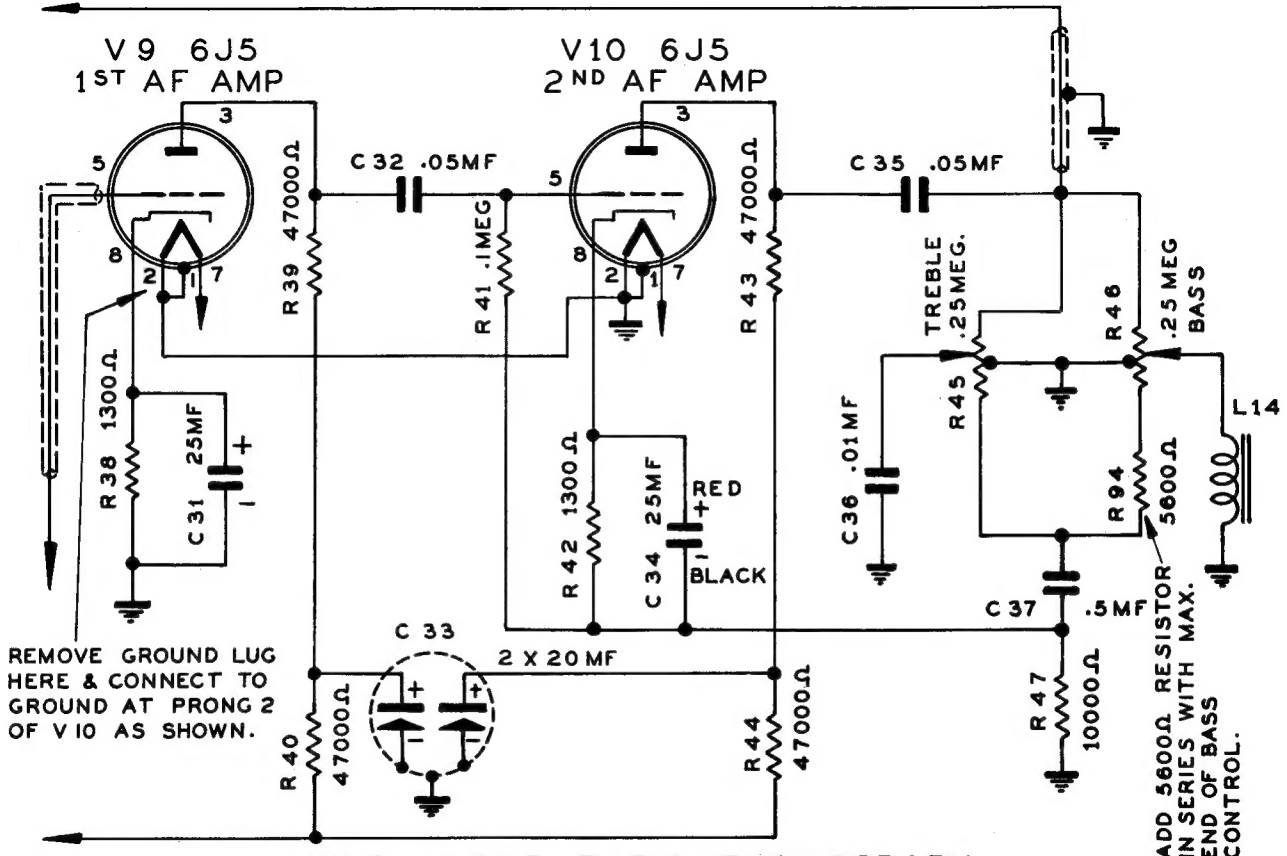
(b) Remove the direct ground lug connection from contact #2 of the 1st audio socket X9 and add a $6\frac{1}{4}$" insulated wire between the common connection of pins #1 and #2 on the 1st audio socket and the same points on the 2nd audio socket X10. This change simply grounds the 1st audio shield and filament at the 2nd audio socket instead of at the 1st audio socket.

(c) The 1st audio shielded grid lead may be shortened from $10\frac{1}{8}$" to 7" and run directly across the sockets to the volume control, instead of routing it around the chassis.

(d) Dress R80 and C87 as far as possible from heater pin #7 of the 6SL7 socket to prevent hum pickup in these components.

(3) Check the wiring of capacitor (C34), 25 mfd. 25 volt electrolytic condenser, to determine whether it is connected correctly. The positive end of this capacitor should be connected to the cathode of the 6J5 and the negative end to the junction of R42 and R47. Some sets may have gone through our inspection with this capacitor wired backwards. An incorrect connection will not show initially on electrical tests, but some hum and noise may develop from it after a period of a few weeks operation.

Items Nos. 1 and 2 will be incorporated in sets numbering Serial 3,000 up to eliminate possible trouble from these sources.



MODEL 800B RADIO-PHONOGRAPH

CIRCUIT REVISION OF CHANGES OUTLINED IN SERVICE NOTES DATED AUGUST 9 1946

SCOTT RADIO LABORATORIES INC.