

THE
FISHER



T. M. REG.

SERVICE AND
MAINTENANCE
NOTES

MODELS 60, 61, 65

COMPRISING:
60-R TUNER
60-A AMPLIFIER
60-AP POWER SUPPLY

FISHER RADIO CORPORATION
NEW YORK, N. Y.

GENERAL INFORMATION

THE FISHER Custom Sixty has been designed for those desiring an FM-AM receiver of professional quality. It comprises a two-band superheterodyne circuit and employs completely independent RF and IF channels for AM and FM. There are three stages of IF and a ratio detector on FM, one stage of IF on AM and a tuned RF stage ahead of the first detector on both AM and FM. Automatic Frequency Control (AFC) is incorporated on FM to assure accurate tuning and complete freedom from drift. The Fisher Custom Sixty is supplied with built-in FM and AM antennas. Terminals are also provided for connection of external antennas, where the latter are desirable. The external FM antenna input is designed to operate either with 300-ohm balanced lead-in or 72-ohm coaxial shielded lead-in.

The sixty-watt audio amplifier employs push-pull parallel power output to assure extremely low distortion even at high power. The carefully designed flywheel tuning mechanism is unexcelled in simplicity and ease of station selection. The slide rule dial glass has large, easy-to-read numerals, edge lighted. There are individual channel indicator lights. Receptacles are available for instant connection of the FISHER Dynamic Range Expander. An auxiliary input receptacle is furnished for connection to the sound channel of a television receiver, microphone pre-amplifier, etc. The receiver is connected to this jack when the Channel Selector Switch is turned to the "TV" position. An AC receptacle mounted on the rear apron of the chassis supplies current for the operation of a Television Receiver when the Channel Selector Switch is turned to the "TV" position.

OPERATING INSTRUCTIONS ANTENNAS

The built-in FM antenna is of the folded dipole type and is satisfactory in most urban locations. Where reception is desired either from weak or remote FM stations, we recommend the use of the specially matched, FISHER FM Antenna System.

The AM antenna consists of a loop mounted inside the speaker compartment. It is the only antenna required for reception of local broadcast stations, except where the receiver is used in unusually noisy locations or at a distance from broadcasting centers. In the event that an outside antenna is required, we recommend the use of THE FISHER Noise-Reducing Antenna System. This system offers optimum efficiency in bringing, from the roof to the receiver, the signal available in the location in which the receiver is to be used. CAUTION: NEVER disconnect the AM loop antenna plug, *whether or not the receiver is used with an external antenna.*

ON-OFF SWITCH

The On-Off Switch and the Bass Tone Control are regulated by the same knob. When turning the set on continue the rotation of the knob to that point which gives the desired degree of bass intensity. For further details see "Bass Tone Control."

TONE CONTROLS

TREBLE TONE CONTROL. This control can be used to regulate brilliance. For a more intimate tone, turn to left; for brighter tone, turn to right. Set it at the point you find most pleasing, for the particular program being played.

BASS TONE CONTROL. Should be set to minimum (extreme left) on male speaking voice. For music, according to personal taste. When playing music at low volumes, the usual loss in bass intensity (due to one's inherently reduced hearing efficiency at low volumes) can be compensated for by turning the control clockwise to the desired degree.

THE FISHER DYNAMIC RANGE EXPANDER (Optional Equipment)

THE FISHER Dynamic Range Expander is designed to restore to records the full accents and crescendos of the original performance, usually monitored out of the recording at the time it was made, because of the limited dimensions of the groove. Turn the control to the right, to the desired degree. It will then operate automatically. The main volume control should be set at that point where, with the amount of expansion produced, the maximum volume will be within the desired limit. NOTE: If the Expander is purchased after the delivery of the original set, it can be instantly connected. Simply remove the jumper that will be found on the two receptacles marked "Expander" on the rear apron of the chassis. Connect the input of the Expander to the receptacle on the chassis marked "Expander Input"; connect the output of the Expander to the receptacle on the chassis marked "Expander Output."

CHANNEL SELECTOR SWITCH

Turn Channel Selector knob to the desired channel whether Broadcast, FM, Phonograph, or Television Sound input. Lights on the dial scale indicate the channel to which the knob is set.

AUTOMATIC FREQUENCY CONTROL ON FM

THE FISHER FM Receiver is equipped with an Automatic Frequency Control, designed to simplify tuning. You will find that when the dial pointer is brought within the vicinity of the desired channel, the station will automatically lock in and remain correctly tuned. It cannot drift out. The control regulating the range of lock-in is located on the rear apron of the chassis and is pre-set at our laboratories. In some locations, however, where a weak station is separated from a strong station by only two channels, the latter will tend to operate the control circuit and make it difficult to bring in the weak station. Should this occur, turn the Automatic Frequency Control (knurled brass shaft on the rear apron of the chassis) counter clockwise to the degree necessary to eliminate the above condition.

ALIGNMENT PROCEDURE AM IF ALIGNMENT

NOTE: For the following IF and RF adjustments the signal generator should be readjusted as necessary to maintain the output below 2 volts across the voice coil.

1. With the Selector Switch in the Broadcast position, set the tuning capacitor for maximum capacity.
2. Feed a 455 Kc amplitude modulated signal to the signal grid of the 6BE6 converter tube (pin 7 of V-9) through a 0.1 mfd capacitor.
3. Set the Volume Control at maximum.
4. Connect an output meter across the speaker voice coil.
5. Adjust the top and bottom cores of the 1st and 2nd IF transformers (Z-5 and Z-6) for maximum. If noise causes excessive meter deflection, the Volume Control should be turned down slightly.

BROADCAST ALIGNMENT

1. With the tuning capacitor completely closed, set the pointer to the index mark on the dial. (The first graduation mark appearing at the extreme left of the dial scale markings.)
2. Connect an amplitude modulated signal generator to the AM antenna terminals. A 200 mmfd capacitor should be inserted between the "high" side of the generator lead and the antenna terminal.

3. Set the dial and signal generator to 1400 Kc.
4. Adjust the Broadcast oscillator, RF and antenna coil trimmers (C-43, C-41 and C-36 respectively) for maximum.
5. Set the dial and signal generator to 600 Kc.
6. Adjust the Oscillator, RF and antenna coil cores (L-9, L-8 and L-7 respectively) for maximum.
7. Reset the dial and signal generator to 1400 Kc and repeat step 4 if necessary.

FM DETECTOR ALIGNMENT

NOTE: For all of the following IF and RF adjustments the output of the signal generator should be readjusted as necessary to maintain the voltage at test point A (shown on schematic) between 8 and 9 volts dc.

1. Rotate the Selector Switch to the FM position.
2. Connect an electronic voltmeter between the chassis and the positive side of the 4 mfd electrolytic capacitor, C34. (Test point A on the schematic diagram.)
3. Feed an unmodulated 10.7 Mc signal through a .1 mfd capacitor to the 6BA6 FM detector-drive grid (pin 1 on V-6.)
4. Tune the FM detector primary (bottom of Z-4) for maximum.
5. Disconnect the electronic voltmeter from the 4 mfd capacitor and connect to the FM detector audio output (test point B on schematic diagram.)
6. Tune the FM detector secondary (top of Z-4) for zero.

FM IF ALIGNMENT

1. Feed an unmodulated 10.7 Mc signal through a 500 to 1000 mmfd capacitor to the grid of the RF amplifier tube (pin 1 of V-1.)
2. Connect the electronic voltmeter to test point A as in step 2 above.
3. Align the top and bottom cores of the 1st, 2nd and 3rd IF coils (Z-1, Z-2 and Z-3 respectively) for maximum.

FM RF ALIGNMENT

NOTE: For the following adjustments the AFC circuit should be disabled by turning the AFC control (R-13) fully counter-clockwise.

1. Set the dial to 106 Mc.
2. Feed a 106 Mc unmodulated signal to the 300-ohm FM antenna terminals with a 120 ohm composition resistor connected in series with each lead of the signal generator.
3. Connect the electronic voltmeter to test point A.
4. Adjust the oscillator, RF and antenna trimmers (C-12, C-7 and C-3 respectively) for maximum. For optimum adjustment rock the tuning capacitor back and forth while adjusting the RF trimmer.

NOTE

THE FOLLOWING ADJUSTMENTS HAVE BEEN MADE AT THE FACTORY AND SELDOM REQUIRE REALIGNMENT EXCEPT WHEN COILS AND COMPONENTS IN THE FM RADIO-FREQUENCY SECTION HAVE BEEN REPLACED.

5. Set the signal generator to 90 Mc and tune the receiver for maximum as indicated on the electronic voltmeter.
6. If the dial calibration is off more than .2 Mc at 90 Mc, set the dial to 90 Mc and adjust the core in the FM oscillator coil (L-4) for maximum.
7. Adjust the core in the antenna coil (L-1) and spread or compress the RF coil (L-3) for maximum.
8. Reset the dial and signal generator to 106 Mc and repeat step 4.
9. Set the signal generator to 90 Mc and tune the receiver for maximum. If calibration has shifted as a result of step 8, repeat steps 6, 7 and 8.
10. If the receiver was badly out of alignment, step 9 may have to be repeated more than once.

AUDIO AMPLIFIER ADJUSTMENTS BIAS ADJUSTMENT

1. Turn volume control fully counter clockwise.
2. Insert DC milliammeter between center tap (pin 2) of output transformer and high voltage supply (red wire).
3. Adjust the bias control (R-19) so that the plate current is exactly .135 amperes.

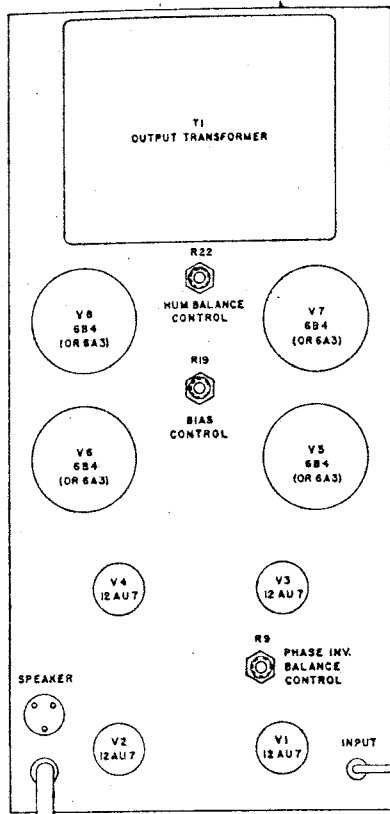
HUM BALANCE ADJUSTMENT

1. Turn volume control fully counter clockwise.
2. Connect an audio vacuum tube voltmeter, such as Hewlett-Packard 400A, across the speaker jack.
3. Vary hum balance control (R-22) for minimum reading on output meter. Occasionally a distinct null point may not be found; in this event interchanging 6B4 tubes will cure this condition. In extreme cases it may be necessary to select 6B4 tubes.

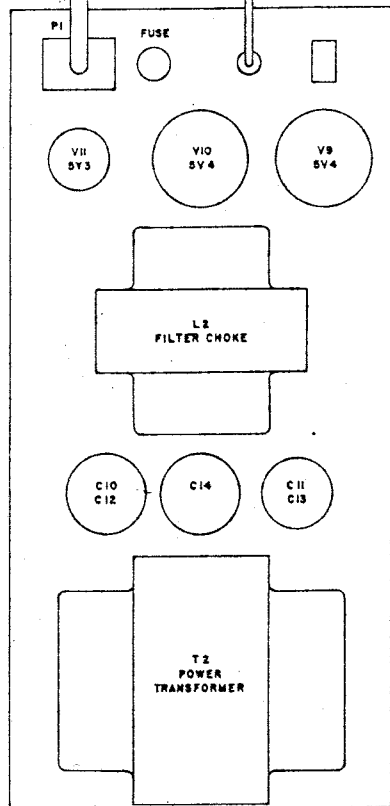
PHASE-INVERTER BALANCE ADJUSTMENT

This adjustment is only required when components in the phase-inverter circuit are replaced and should never be attempted unless a low distortion audio generator and either a wave analyzer or distortion analyzer are available.

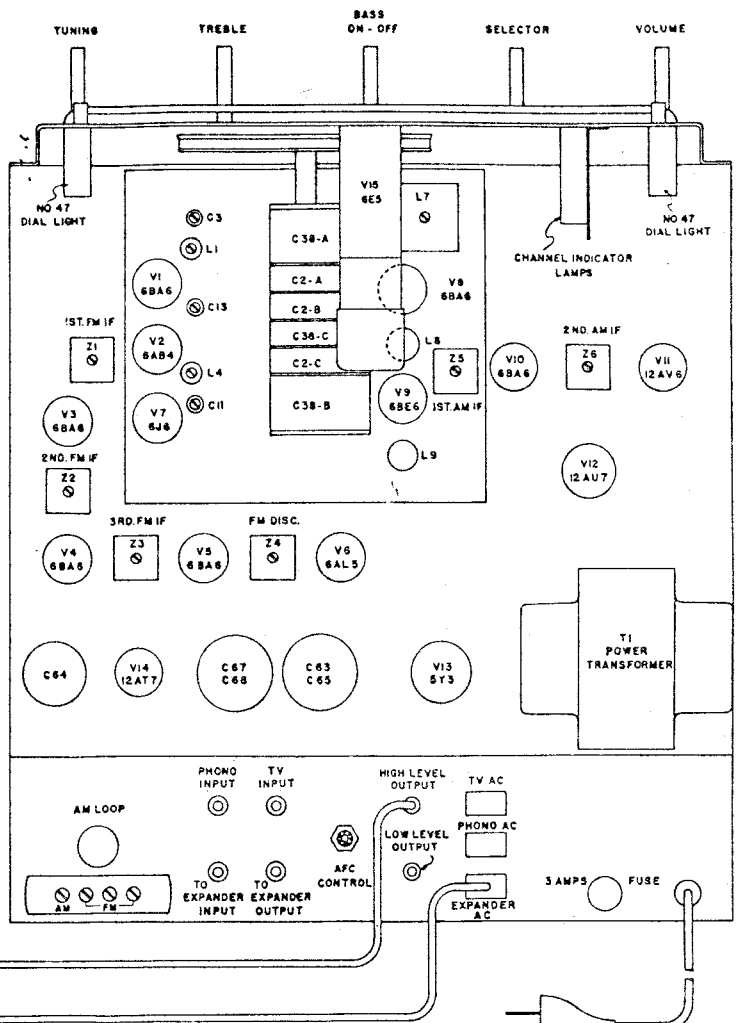
1. Disconnect audio amplifier input from tuner chassis and feed the audio generator directly into the amplifier input (J1).
2. Disconnect the speaker and connect a 16 ohm 20 watt resistor across the 16 ohm amplifier output (pins 2 and 3 on jack J2.)
3. Connect wave analyzer or distortion analyzer across 16 ohm resistor.
4. Set the audio generator attenuator so that the amplifier produces 10 watts output (12.7 volts rms) across the 16 ohm resistor.
5. Tune the wave analyzer to the second harmonic of 1000 cps or if a distortion analyzer is used, tune it for minimum reading at 1000 cps.
6. Adjust the phase-inverter balance control for minimum distortion.



AMPLIFIER

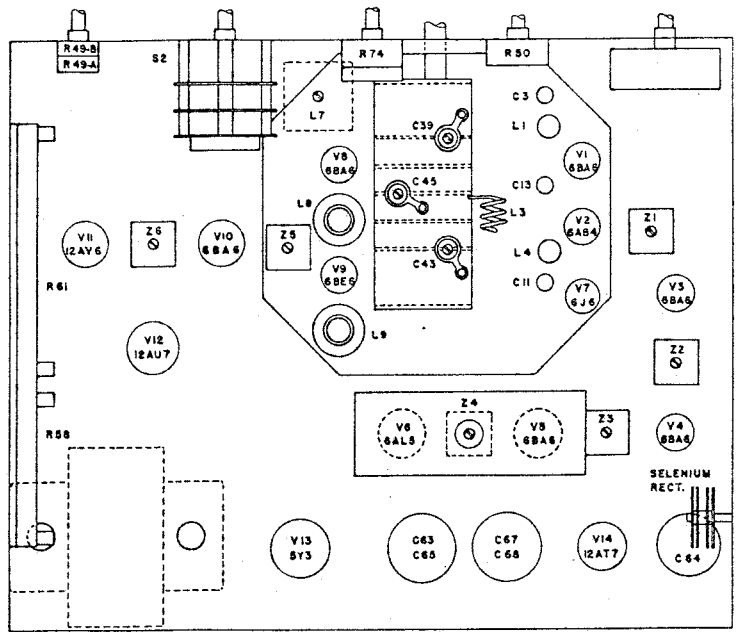


POWER SUPPLY



TOP VIEW OF RECEIVER

TO AC LINE
105-125 V
50-60 ~



BOTTOM VIEW OF RECEIVER

LOCATION OF MAJOR COMPONENTS

SPECIFICATIONS

BAND
FREQUENCY MODULATION
STANDARD BROADCAST

TUNING RANGE
88 MC TO 108 MC
540 KC TO 1600 KC

INTERMEDIATE FREQUENCY
10.7 MC
455 KC

RADIO: 105 TO 125 VOLTS AC 50/60 CYCLES 330 WATTS
PHONOGRAPH: 105 TO 125 VOLTS AC 60 CYCLES 17 WATTS
50 CYCLES AVAILABLE

TUBE COMPLEMENT

| TUNER | | | AMPLIFIER | | |
|--------|-------|---------------------------------|-----------|--------------|------------------------------|
| SYMBOL | TYPE | FUNCTION | SYMBOL | TYPE | FUNCTION |
| V1 | 6BA6 | FM RF AMPLIFIER | V1 | 12AU7 | AF AMPLIFIER, PHASE INVERTER |
| V2 | 6AB4 | FM CONVERTER | V2 | 12AU7 | PUSH-PULL AMPLIFIER |
| V3 | 6BA6 | FM 1ST. IF AMPLIFIER | V3 | 12AU7 | CATHODE COUPLED DRIVER |
| V4 | 6BA6 | FM 2ND. IF AMPLIFIER | V4 | 12AU7 | CATHODE COUPLED DRIVER |
| V5 | 6BA6 | FM 3RD. IF AMPLIFIER | V5 | 6B4 (OR 6A3) | AUDIO POWER AMPLIFIER |
| V6 | 6AL5 | FM DETECTOR | V6 | 6B4 (OR 6A3) | AUDIO POWER AMPLIFIER |
| V7 | 6J6 | FM OSCILLATOR AND AFC | V7 | 6B4 (OR 6A3) | AUDIO POWER AMPLIFIER |
| V8 | 6BA6 | AM RF AMPLIFIER | V8 | 6B4 (OR 6A3) | AUDIO POWER AMPLIFIER |
| V9 | 6BE6 | AM OSCILLATOR AND CONVERTER | | | |
| V10 | 6BA6 | AM IF AMPLIFIER | | | |
| V11 | 12AV6 | AM DETECTOR & 1ST. AF AMPLIFIER | | | |
| V12 | 12AU7 | CATHODE FOLLOWER OUTPUT | | | |
| V13 | 5Y3 | FULL WAVE RECTIFIER | | | |
| V14 | 12AT7 | PHONO PRE-AMPLIFIER | | | |
| V15 | 6E5 | TUNING INDICATOR | | | |

| POWER SUPPLY | | |
|--------------|------|---------------------|
| SYMBOL | TYPE | FUNCTION |
| V9 | 5V4 | FULL WAVE RECTIFIER |
| V10 | 5V4 | FULL WAVE RECTIFIER |
| V11 | 5Y3 | FULL WAVE RECTIFIER |

102-E

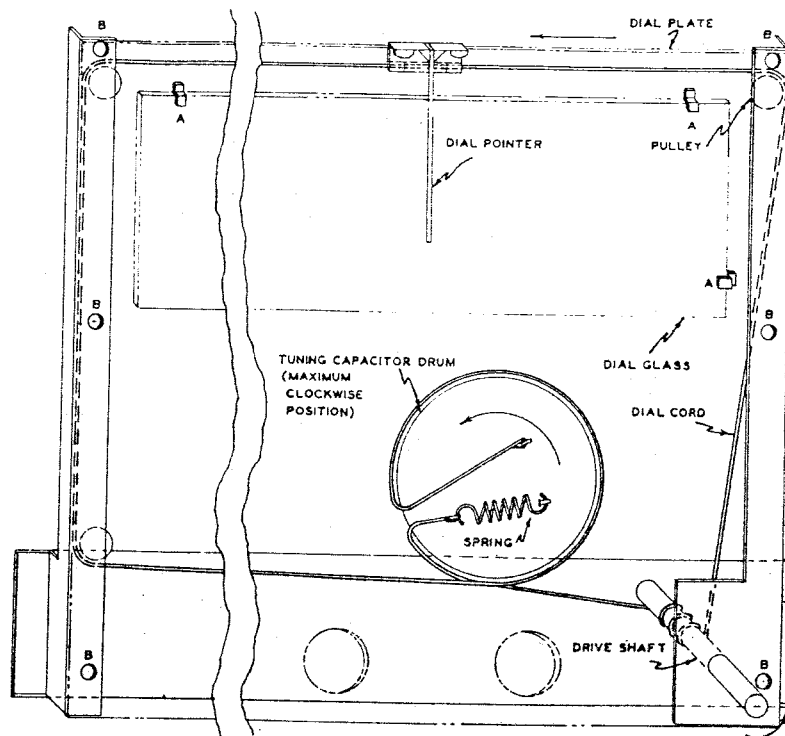
SPECIFICATIONS AND TUBE COMPLEMENT

INSTRUCTIONS FOR REPLACEMENT OF DIAL CORD

1. REMOVE FOUR BAND INDICATOR LAMPS FROM BRACKET MOUNTED ON DIAL PLATE.
2. REMOVE DIAL LAMPS LOCATED AT EACH SIDE OF DIAL SCALE.
3. SLIDE TUNING EYE TUBE FREE OF CLIPS.
4. REMOVE THREE DIAL GLASS CLIPS (ONLY THOSE LABELED "A" IN ILLUSTRATION).
5. REMOVE DIAL PLATE BY UNSCREWING SIX HEXAGONAL SELF-TAPPING SCREWS (LABELED "B") HOLDING DIAL PLATE TO CHASSIS.
6. REMOVE OLD DIAL CORD AND RESTRING WITH NEW AS SHOWN IN ILLUSTRATION.
7. MOUNT DIAL PLATE ON CHASSIS.
8. RESTORE THE TUNING EYE TUBE, BAND INDICATOR LIGHTS AND DIAL LIGHTS.
9. REPLACE DIAL GLASS CLIPS. THE TWO UPPER CLIPS SHOULD ENCIrcLE THE DIAL CORD AND THE THIRD CLIP SHOULD ENCIrcLE THE WIRES TO THE DIAL LIGHT.
10. MOUNT DIAL POINTER AND WITH VARIABLE CAPACITOR FULLY CLOSED, CENTER POINTER OVER INDEX MARK ON DIAL.

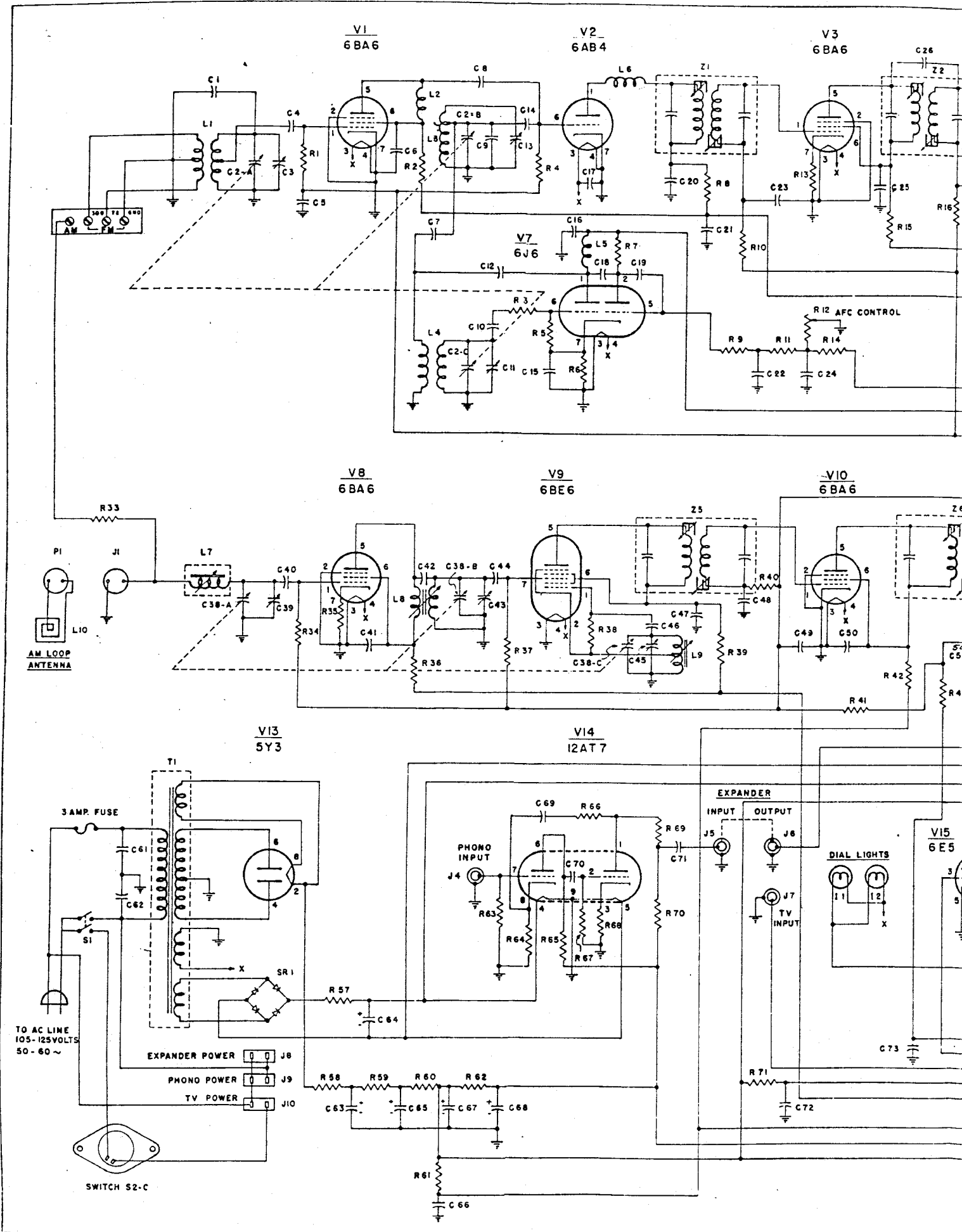
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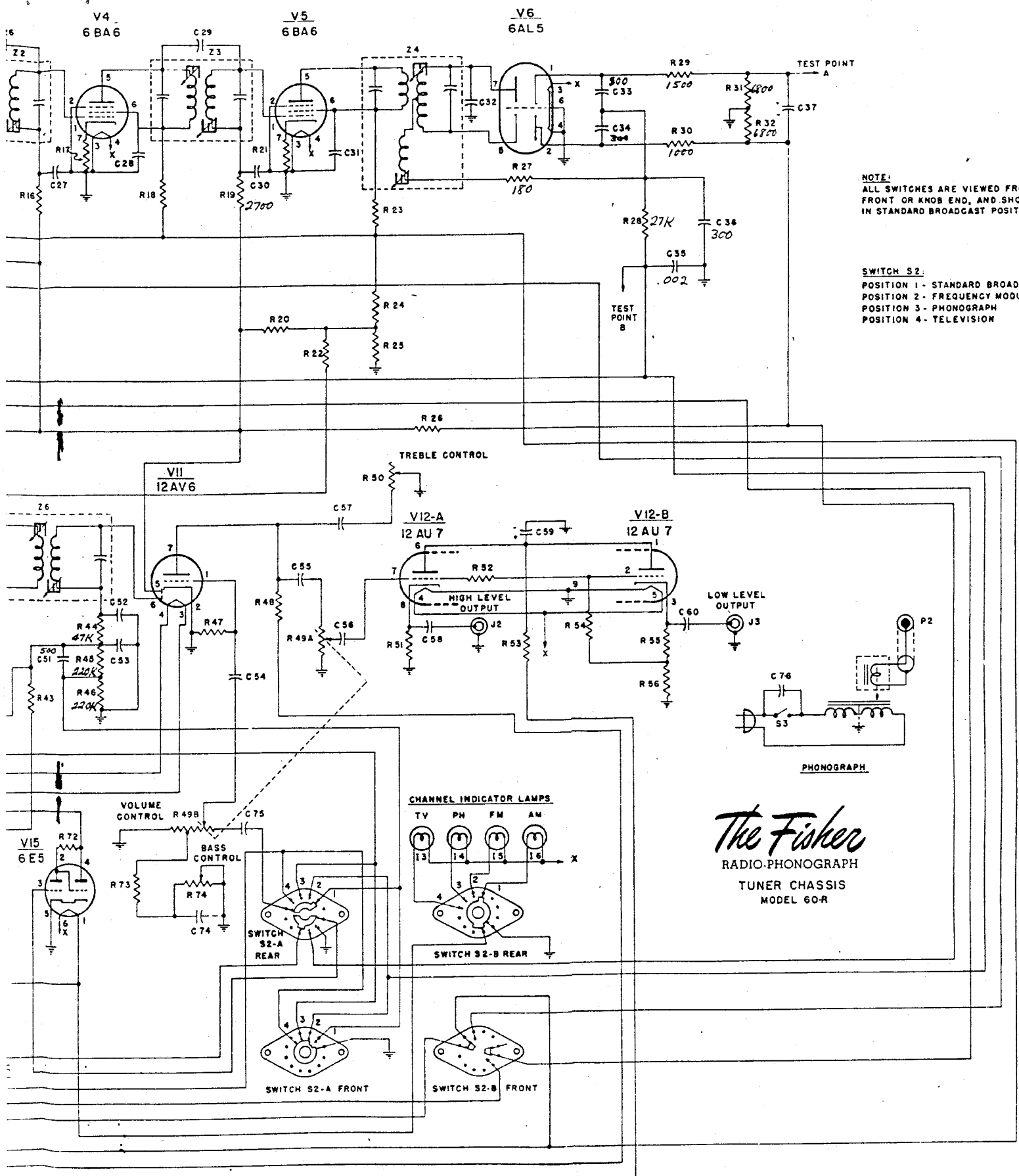
USE ONLY DIAL CORD (PART NO. A1374) OBTAINABLE FROM FISHER RADIO CORPORATION.



102-F

DIAL STRINGING INSTRUCTIONS



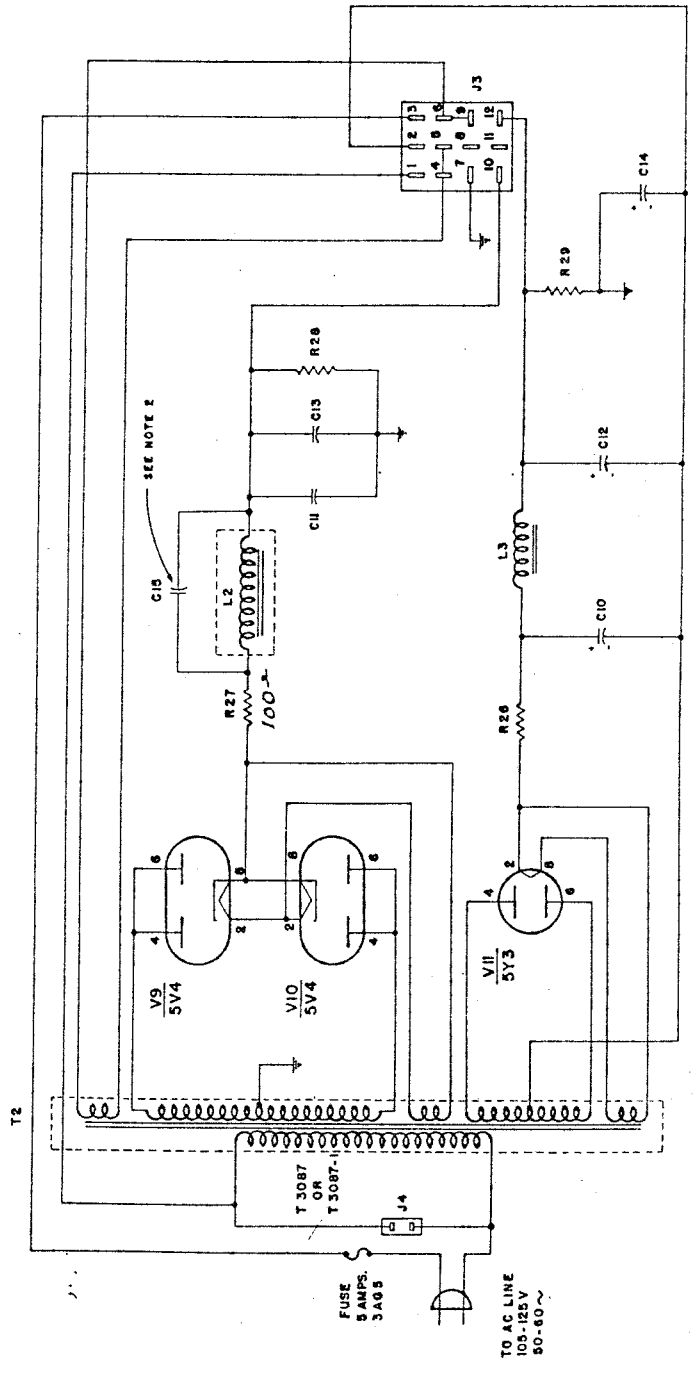
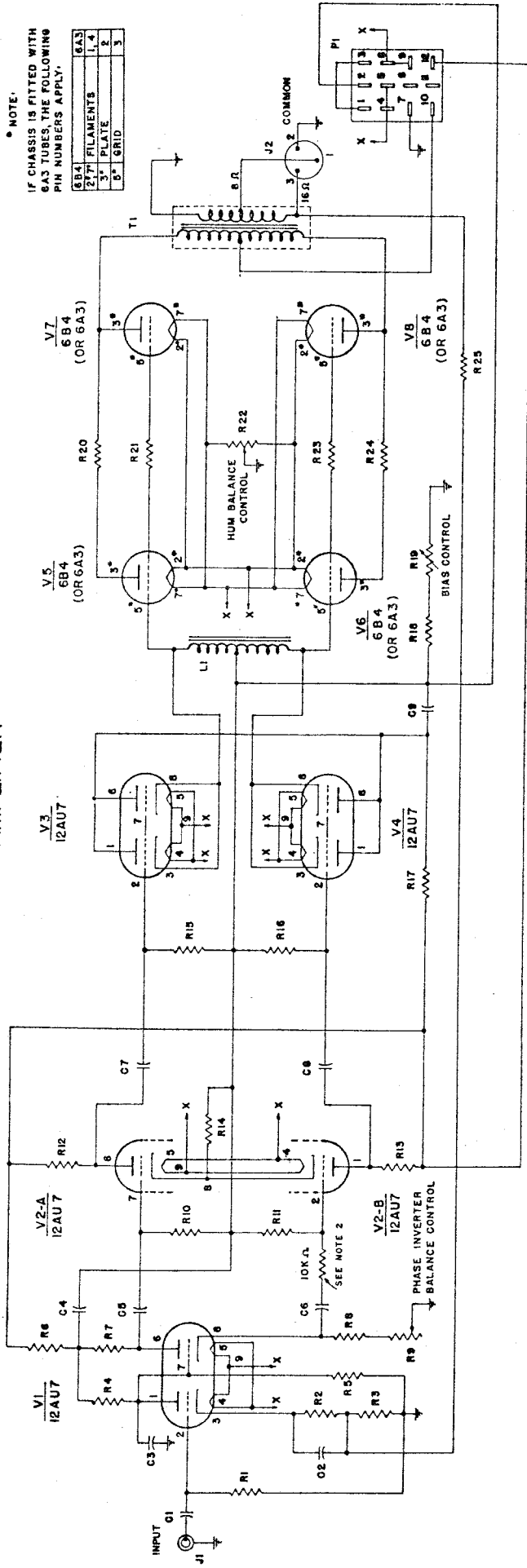


NOTE:
 ALL SWITCHES ARE VIEWED FROM
 FRONT OR KNOB END, AND SHOWN
 IN STANDARD BROADCAST POSITION:

SWITCH S2:
 POSITION 1 - STANDARD BROADCASTS
 POSITION 2 - FREQUENCY MODULAT
 POSITION 3 - PHONOGRAPH
 POSITION 4 - TELEVISION

The Fisher
 RADIO-PHONOGRAPH
 TUNER CHASSIS
 MODEL 60-R

AMPLIFIER

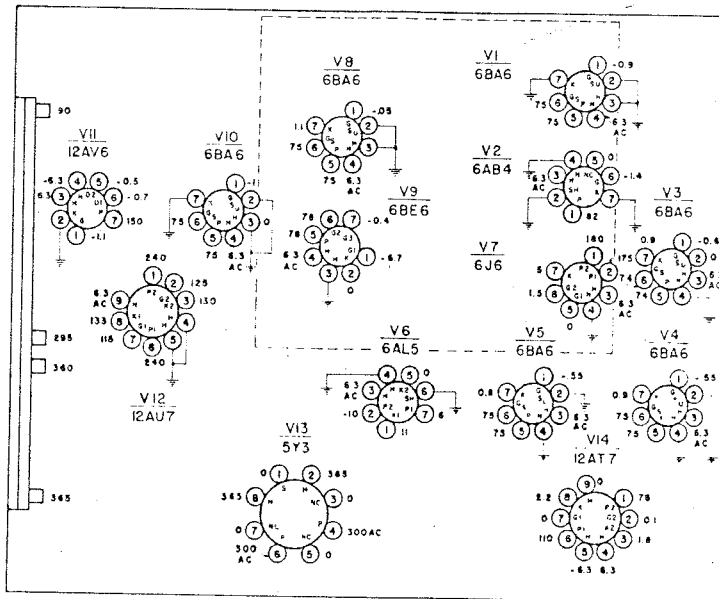


NOTES:
1. WHEN SUPPLIED WITH POWER TRANSFORMER T3087-1, R27 IS OMITTED. R28 IS 20KΩ-20W.
2. PRESENT IN SOME MODELS

The Fisher
RADIO-PHONOGRAPH

AMPLIFIER
MODEL 60A
POWER SUPPLY
MODEL 60AP

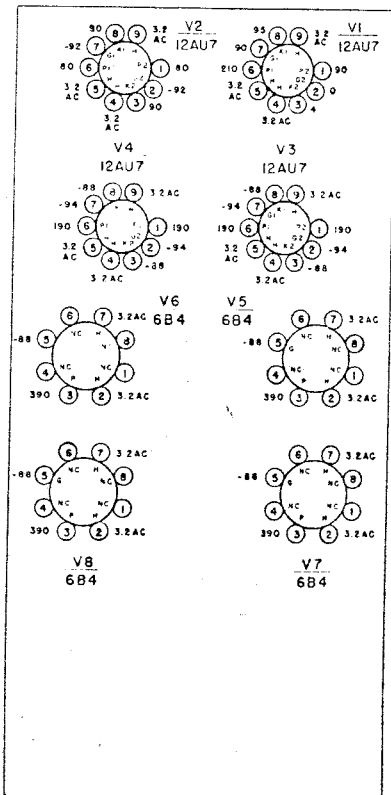
POWER SUPPLY



TUNER

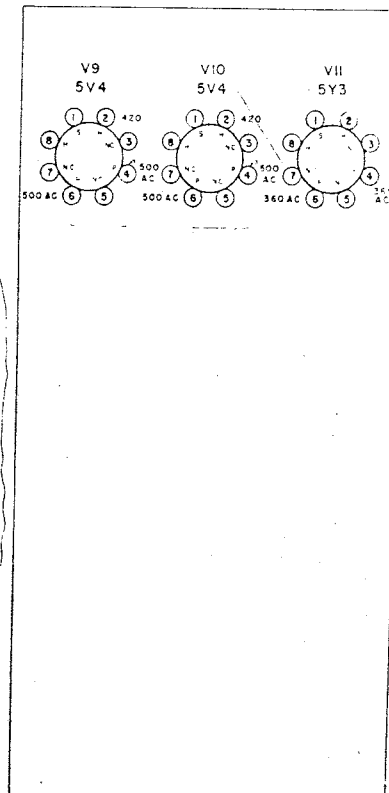
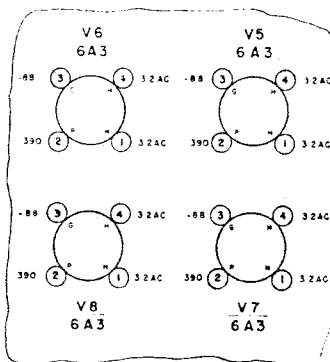
NOTES

1. ALL VOLTAGES ARE TO BE MEASURED WITH AN ELECTRONIC VOLTMETER
2. ALL VOLTAGE READINGS ARE D.C. TO CHASSIS UNLESS OTHERWISE SPECIFIED
3. LINE VOLTAGE 117 VOLTS 60 CYCLES
4. BANDSWITCH S1 TO BE IN BROADCAST POSITION WITH DIAL SET AT 1000 KC FOR ALL TUBES EXCEPT V1, V2, AND V7 WHICH ARE MEASURED WITH BANDSWITCH IN F.M. POSITION
5. VOLUME CONTROL TO BE SET IN EXTREME COUNTER-CLOCKWISE POSITION



AMPLIFIER

NOTE:
IF CHASSIS IS FITTED WITH
6A3 TUBES, USE THIS CHART



POWER SUPPLY

VOLTAGE REFERENCE CHART

PARTS DESCRIPTION LIST

TUNER CHASSIS, MODEL 60-R

| Symbol | DESCRIPTION | Part No. | Symbol | DESCRIPTION | Part No. |
|------------|--------------------------------------------|----------------|--------|--------------------------------------------|----------|
| C1 | Capacitor, Ceramic: 10 mmfd; NPO | C-1317 | C64 | Capacitor, Electrolytic: 500 mfd; 15 V | C-3073 |
| C2a, b, c | Capacitor, Variable: FM Section | C-2965 | C65 | Capacitor, Electrolytic: 40 mfd; 450 V | C-1798 |
| C3 | Capacitor, Trimmer: 1 - 8 mmfd | C-2970 | C66 | Capacitor, Molded Tubular: .1 mfd; 400 V | C-1102 |
| C4 | Capacitor, Ceramic: 500 mmfd | C-1315 | C67 | Capacitor, Electrolytic: 40 mfd; 450 V | C-1798 |
| C5 | Capacitor, Ceramic: .005 mfd | C-2146 | C68 | Capacitor, Electrolytic: 40 mfd; 450 V | C-1798 |
| C6 | Capacitor, Ceramic: .005 mfd | C-2146 | C69 | Capacitor, Mica: .003 mfd; 300 V | C-1219 |
| C7 | Capacitor, Ceramic: 2.2 mmfd | C-3039 | C70 | Capacitor, Paper Tubular: .002 mfd; 600 V | C-1890 |
| C8 | Capacitor, Ceramic: 4.7 mmfd | C-1779 | C71 | Capacitor, Molded Tubular: .1 mfd; 400 V | C-1102 |
| C9 | Capacitor, Ceramic: 2.2 mmfd | C-3039 | C72 | Capacitor, Molded Tubular: .1 mfd; 400 V | C-1102 |
| C10 | Capacitor, Ceramic: 47 mmfd; NPO | C-2147 | C73 | Capacitor, Molded Tubular: .022 mfd; 400 V | C-2946 |
| C11 | Capacitor, Trimmer: 1 - 8 mmfd | C-2970 | C74 | Capacitor, Molded Tubular: .022 mfd; 400 V | C-2946 |
| C12 | Capacitor, Ceramic: 500 mmfd | C-1315 | C75 | Capacitor, Molded Tubular: .1 mfd; 400 V | C-1102 |
| C13 | Capacitor, Trimmer: 1 - 8 mmfd | C-2970 | C76 | Capacitor, Molded Tubular: .01 mfd; 400 V | C-1109 |
| C14 | Capacitor, Ceramic: 1500 mmfd | C-1314 | R1 | Resistor, Composition: 470,000 ohms; ½ W | R-1836 |
| C15 | Capacitor, Ceramic: .005 mfd | C-2146 | R2 | Resistor, Composition: 1000 ohms; ½ W | R-1577 |
| C16 | Capacitor, Ceramic: .005 mfd | C-2146 | R3 | Resistor, Composition: 10 ohms; ½ W | R-1807 |
| C17 | Capacitor, Ceramic: .005 mfd | C-2146 | R4 | Resistor, Composition: 1 megohm; ½ W | R-1732 |
| C18 | Capacitor, Ceramic: 24 mmfd; NPO | C-1781 | R5 | Resistor, Composition: 22,000 ohms; ½ W | R-1736 |
| C19 | Capacitor, Ceramic: 10 mmfd; NPO | C-1317 | R6 | Resistor, Composition: 330 ohms; ½ W | R-1790 |
| C20 | Capacitor, Ceramic: .005 mfd | C-2146 | R7 | Resistor, Composition: 3300 ohms; 1 W | R-2415 |
| C21 | Capacitor, Ceramic: .005 mfd | C-2146 | R8 | Resistor, Composition: 2700 ohms; ½ W | R-1738 |
| C22 | Capacitor, Mica: 100 mmfd; 500 V | C-1318 | R9 | Resistor, Composition: 220 ohms; ½ W | R-1733 |
| C23 | Capacitor, Ceramic: .005 mfd | C-2146 | R10 | Resistor, Composition: 2700 ohms; ½ W | R-1738 |
| C24 | Capacitor, Molded Tubular: .047 mfd; 400 V | C-2944 | R11 | Resistor, Composition: 100,000 ohms; ½ W | R-1583 |
| C25 | Capacitor, Ceramic: .005 mfd | C-2146 | R12 | Potentiometer, Composition: 2.5 megohms | R-2403 |
| C26 | Capacitor, Ceramic: 1 mmfd | C-1786 | R13 | Resistor, Composition: 100 ohms; ½ W | R-2408 |
| C27 | Capacitor, Ceramic: .005 mfd | C-2146 | R14 | Resistor, Composition: 470,000 ohms; ½ W | R-1836 |
| C28 | Capacitor, Ceramic: .005 mfd | C-2146 | R15 | Resistor, Composition: 1000 ohms; ½ W | R-1577 |
| C29 | Capacitor, Ceramic: 1 mmfd | C-1786 | R16 | Resistor, Composition: 2700 ohms; ½ W | R-1738 |
| C30 | Capacitor, Ceramic: .005 mfd | C-2146 | R17 | Resistor, Composition: 100 ohms; ½ W | R-2408 |
| C31 | Capacitor, Ceramic: .005 mfd | C-2146 | R18 | Resistor, Composition: 1000 ohms; ½ W | R-1577 |
| C32 | Capacitor, Ceramic: 1 mmfd | C-1786 | R19 | Resistor, Composition: 2700 ohms; ½ W | R-1738 |
| C33 | Capacitor, Mica: 300 mmfd; 500 V | C-1789 | R20 | Resistor, Composition: 6.8 megohms; ½ W | R-2431 |
| C34 | Capacitor, Mica: 300 mmfd; 500 V | C-1789 | R21 | Resistor, Composition: 100 ohms; ½ W | R-2408 |
| C35 | Capacitor, Mica: .002 mfd; 500 V | C-1265 | R22 | Resistor, Composition: 18 megohms; ½ W | R-3009 |
| C36 | Capacitor, Mica: 300 mmfd; 500 V | C-1789 | R23 | Resistor, Composition: 1000 ohms; ½ W | R-1577 |
| C37 | Capacitor, Electrolytic: 4 mfd; 250 V | C-1886 | R24 | Resistor, Composition: 4700 ohms; 1 W | R-2418 |
| C38a, b, c | Capacitor, Variable: AM Section | C-2965 | R25 | Resistor, Composition: 4700 ohms; 1 W | R-2418 |
| C39 | Capacitor, Trimmer | Part of C-2965 | R26 | Resistor, Composition: 2.2 megohms; ½ W | R-1734 |
| C40 | Capacitor, Mica: 300 mmfd; 500 V | C-1789 | R27 | Resistor, Composition: 180 ohms; ½ W | R-1782 |
| C41 | Capacitor, Molded Tubular: .01 mfd; 400 V | C-1109 | R28 | Resistor, Composition: 27,000 ohms; ½ W | R-2171 |
| C42 | Capacitor, Ceramic: 1 mmfd | C-1786 | R29 | Resistor, Composition: 1500 ohms; ½ W | R-1741 |
| C43 | Capacitor, Trimmer | Part of C-2965 | R30 | Resistor, Composition: 1000 ohms; ½ W | R-1577 |
| C44 | Capacitor, Mica: 300 mmfd; 500 V | C-1789 | R31 | Resistor, Composition: 6800 ohms; ½ W | R-1973 |
| C45 | Capacitor, Trimmer | Part of C-2965 | R32 | Resistor, Composition: 6800 ohms; ½ W | R-1973 |
| C46 | Capacitor, Mica: 300 mmfd; 500 V | C-1789 | R33 | Resistor, Composition: 1000 ohms; ½ W | R-1577 |
| C47 | Capacitor, Molded Tubular: .022 mfd; 400 V | C-2946 | R34 | Resistor, Composition: 1 megohm; ½ W | R-1732 |
| C48 | Capacitor, Molded Tubular: .022 mfd; 400 V | C-2946 | R35 | Resistor, Composition: 120 ohms; ½ W | R-1330 |
| C49 | Capacitor, Molded Tubular: .047 mfd; 400 V | C-2944 | R36 | Resistor, Composition: 1000 ohms; ½ W | R-1577 |
| C50 | Capacitor, Ceramic: .005 mfd | C-2146 | R37 | Resistor, Composition: 470,000 ohms; ½ W | R-1836 |
| C51 | Capacitor, Ceramic: 500 mmfd | C-1315 | R38 | Resistor, Composition: 22,000 ohms; ½ W | R-1736 |
| C52 | Capacitor, Mica: 100 mmfd; 500 V | C-1318 | R39 | Resistor, Composition: 1000 ohms; ½ W | R-1577 |
| C53 | Capacitor, Mica: 100 mmfd; 500 V | C-1318 | R40 | Resistor, Composition: 1 megohm; ½ W | R-1732 |
| C54 | Capacitor, Molded Tubular: .022 mfd; 400 V | C-2946 | R41 | Resistor, Composition: 2.2 megohms; ½ W | R-1734 |
| C55 | Capacitor, Molded Tubular: .047 mfd; 400 V | C-2944 | R42 | Resistor, Composition: 1000 ohms; ½ W | R-1577 |
| C56 | Capacitor, Molded Tubular: .022 mfd; 400 V | C-2946 | R43 | Resistor, Composition: 2.2 megohms; ½ W | R-1734 |
| C57 | Capacitor, Molded Tubular: .01 mfd; 400 V | C-1109 | R44 | Resistor, Composition: 47,000 ohms; ½ W | R-1580 |
| C58 | Capacitor, Molded Tubular: .1 mfd; 400 V | C-1102 | R45 | Resistor, Composition: 220,000 ohms; ½ W | R-1624 |
| C59 | Capacitor, Electrolytic: 20 mfd; 450 V | C-3132 | R46 | Resistor, Composition: 220,000 ohms; ½ W | R-1624 |
| C60 | Capacitor, Molded Tubular: .1 mfd; 400 V | C-1102 | R47 | Resistor, Composition: 18 megohms; ½ W | R-3009 |
| C61 | Capacitor, Molded Tubular: .01 mfd; 400 V | C-1109 | R48 | Resistor, Composition: 47,000 ohms; ½ W | R-1580 |
| C62 | Capacitor, Molded Tubular: .01 mfd; 400 V | C-1109 | R49a | Potentiometer, Composition: 500,000 ohms | M-161 |
| C63 | Capacitor, Electrolytic: 40 mfd; 450 V | C-1798 | R49b | Potentiometer, Composition: 500,000 ohms | M-162 |

PARTS DESCRIPTION LIST

| Symbol | DESCRIPTION | Part No. |
|----------|-----------------------------------------------------------|-----------------|
| R50 | Potentiometer, Composition: 1 megohm | R-2815-2 |
| R51 | Resistor, Composition: 47,000 ohms; 1/2 W | R-1580 |
| R52 | Resistor, Composition: 1 megohm; 1/2 W | R-1732 |
| R53 | Resistor, Composition: 10,000 ohms; 1/2 W | R-1531 |
| R54 | Resistor, Composition: 39,000 ohms; 1/2 W | R-1938 |
| R55 | Resistor, Composition: 1500 ohms; 1/2 W | R-1741 |
| R56 | Resistor, Composition: 47,000 ohms; 1/2 W | R-1580 |
| R57 | Resistor, Wirewound: 5 ohms; 10 W | R-2732 |
| R58, R61 | Resistor, Wirewound: 50 ohms; 10 W and 3500 ohms; 15 W | R-2967 |
| R59 | Resistor, Wirewound: 500 ohms; 10 W | R-1841 |
| R60 | Resistor, Wirewound: 500 ohms; 10 W | R-1841 |
| R62 | Resistor, Composition: 22,000 ohms; 1/2 W | R-1736 |
| R63 | Resistor, Composition: 1 megohm; 1/2 W | R-1732 |
| R64 | Resistor, Composition: 2200 ohms; 1/2 W | R-1737 |
| R65 | Resistor, Composition: 100,000 ohms; 1/2 W | R-1583 |
| R66 | Resistor, Composition: 120,000 ohms; 1/2 W | R-2212 |
| R67 | Resistor, Composition: 2.2 megohms; 1/2 W | R-1734 |
| R68 | Resistor, Composition: 1000 ohms; 1/2 W | R-1577 |
| R69 | Resistor, Composition: 47,000 ohms; 1/2 W | R-1580 |
| R70 | Resistor, Composition: 22,000 ohms; 1/2 W | R-1736 |
| R71 | Resistor, Wirewound: 7000 ohms; 5 W | R-2241 |
| R72 | Resistor, Composition: 1 megohm; 1/2 W | R-1732 |
| R73 | Resistor, Composition: 10,000 ohms; 1/2 W | R-1531 |
| R74 | Potentiometer, Composition: 250,000 ohms | R-2815-3 |
| I1 | Lamp, Dial | I-2148 |
| I2 | Lamp, Dial | I-2148 |
| I3 | Lamp, Dial | I-2148 |
| I4 | Lamp, Dial | I-2148 |
| I5 | Lamp, Dial | I-2148 |
| I6 | Lamp, Dial | I-2148 |
| J1 | Jack: 2 Female Contacts | J-2070 |
| J2 | Jack, Phono: 1 Female Contact | J-1030 |
| J3 | Jack, Phono: 1 Female Contact | J-1030 |
| J4 | Jack, Phono: 1 Female Contact | J-1030 |
| J5 | Jack, Phono: 1 Female Contact | J-1030 |
| J6 | Jack, Phono: 1 Female Contact | J-1030 |
| J7 | Jack, Phono: 1 Female Contact | J-1030 |
| J8 | Jack, Line: 2 Female Contacts | J-1152 |
| J9 | Jack, Line: 2 Female Contacts | J-1152 |
| J10 | Jack, Line: 2 Female Contacts | J-1152 |
| L1 | Coil: FM Antenna | L-3041 |
| L2 | Choke: RF | L-1600 |
| L3 | Coil: FM RF | L-3042 |
| L4 | Coil: FM Oscillator | L-3043 |
| L5 | Choke: RF | L-1600 |
| L6 | Coil: Peaking | L-3011 |
| L7 | Coil: Loop Loading | L-2966 |
| L8 | Coil: BC RF | L-2960 |
| L9 | Coil: BC Oscillator | L-2961 |
| L10 | Loop: AM Antenna | LA-3004 |
| P1 | Plug: 2 Male Contacts | P-2072 |
| P2 | Plug: 1 Male Contact | P-1031 |
| S1 | Switch: AC Line | Part of R-2815- |
| S2 | Switch: Band Selector | S-2958 |
| T1 | Transformer: Power | T-3096 |
| Z1 | Transformer: FM IF | ZZ-2988 |
| Z2 | Transformer: FM IF | ZZ-2987 |
| Z3 | Transformer: FM IF | ZZ-2987 |
| Z4 | Transformer: FM Detector | ZZ-2986 |
| Z5 | Transformer: AM IF | ZZ-2985 |
| Z6 | Transformer: AM IF | ZZ-2984 |

AMPLIFIER, MODEL 60-A POWER SUPPLY, MODEL 60-AP

| Symbol | DESCRIPTION | Part No. |
|--------|-----------------------------------------------------------------------------------------------------|--------------------------|
| C1 | Capacitor, Molded Tubular: .1 mfd; 400 V | C-1102 |
| C2 | Capacitor, Electrolytic: 100 mfd; 6 V | C-1022 |
| C3 | Capacitor, Mica: 510 mmfd; 500 V | C-1791 |
| C4 | Capacitor, Electrolytic: 40 mfd; 450 V | C-1798 |
| C5 | Capacitor, Molded Tubular: .047 mfd; 400 V | C-2944 |
| C6 | Capacitor, Molded Tubular: .047 mfd; 400 V | C-2944 |
| C7 | Capacitor, Molded Tubular: .1 mfd; 400 V | C-1102 |
| C8 | Capacitor, Molded Tubular: .1 mfd; 400 V | C-1102 |
| C9 | Capacitor, Electrolytic: 40 mfd; 450 V | C-1798 |
| C10 | Capacitor, Electrolytic: 40 mfd; 450 V | C-1798 |
| C11 | Capacitor, Electrolytic: 40 mfd; 450 V | C-1798 |
| C12 | Capacitor, Electrolytic: 40 mfd; 450 V | C-1798 |
| C13 | Capacitor, Electrolytic: 40 mfd; 450 V | C-1798 |
| C14 | Capacitor, Electrolytic: 150 mfd; 200 V | C-3137 |
| R1 | Resistor, Composition: 1 megohm; 1/2 W | R-1732 |
| R2 | Resistor, Composition: 2200 ohms; 1/2 W | R-1737 |
| R3 | Resistor, Composition: 27 ohms; 1/2 W | R-3124 |
| R4 | Resistor, Composition: 100,000 ohms; 1/2 W | R-1583 |
| R5 | Resistor, Composition: 470,000 ohms; 1/2 W | R-1836 |
| R6 | Resistor, Composition: 2200 ohms; 1/2 W | R-1737 |
| R7 | Resistor, Composition: 47,000 ohms; 1/2 W | R-1580 |
| R8 | Resistor, Composition: 39,000 ohms; 1/2 W | R-1938 |
| R9 | Potentiometer, Composition: 25,000 ohms | R-3108 |
| R10 | Resistor, Composition: 1 megohm; 1/2 W | R-1732 |
| R11 | Resistor, Composition: 1 megohm; 1/2 W | R-1732 |
| R12 | Resistor, Composition: 100,000 ohms; 1/2 W | R-1583 |
| R13 | Resistor, Composition: 100,000 ohms; 1/2 W | R-1583 |
| R14 | Resistor, Composition: 2200 ohms; 1/2 W | R-1737 |
| R15 | Resistor, Composition: 470,000 ohms; 1/2 W | R-1836 |
| R16 | Resistor, Composition: 470,000 ohms; 1/2 W | R-1836 |
| R17 | Resistor, Wirewound: 3500 ohms; 5 W | R-3090 |
| R18 | Resistor, Wirewound: 3500 ohms; 5 W | R-3090 |
| R19 | Potentiometer, Wirewound: 1500 ohms | R-2399 |
| R20 | Resistor, Composition: 100 ohms; 1/2 W | R-2408 |
| R21 | Resistor, Composition: 10 ohms; 1/2 W | R-1807 |
| R22 | Potentiometer, Wirewound: 50 ohms | R-2399 |
| R23 | Resistor, Composition: 10 ohms; 1/2 W | R-1807 |
| R24 | Resistor, Composition: 100 ohms; 1/2 W | R-2408 |
| R25 | Resistor, Composition: 470 ohms; 1/2 W | R-1740 |
| R26 | Resistor, Wirewound: 50 ohms; 5 W | R-3093 |
| R27 | Resistor, Wirewound: 100 ohms; 10 W | R-3119 |
| R28 | Resistor, Wirewound: 20,000 ohms; 20 W or 10,000 ohms; 20 W (see note on amplifier schematic) | R-3112 |
| R29 | Resistor, Wirewound: 15,000 ohms; 10 W | R-1112 R-1175 |
| J1 | Jack, Phono: 1 Female Contact | J-1030 |
| J2 | Jack: 3 Female Contacts | J-1589 |
| J3 | Jack: 12 Female Contacts | J-1255 |
| J4 | Jack, Line: 2 Female Contacts | J-1152 |
| L1 | Choke, Audio | L-3086 |
| L2 | Choke, Swinging | L-3083 |
| L3 | Choke, Filter | L-3084 |
| P1 | Plug: 12 Male Contacts | P-1256 |
| T1 | Transformer: Output | T-3088 |
| T2 | Transformer: Power | T-3087 or T-3087-1 |