Serial Nos. 10001-19999

Service Manual

THE FISHER®

600-T

CHASSIS SERIAL NUMBERS
FROM 10001 to 19999 INCLUSIVE

$2.00

FISHER RADIO CORPORATION · LONG ISLAND CITY 1 · NEW YORK

CAUTION: This is a FISHER precision high-fidelity instrument. It should be serviced only by qualified personnel — trained in the repair of transistor equipment and printed circuitry.

EQUIPMENT AND TOOLS NEEDED

The following are needed to completely test and align this high-fidelity instrument.

Test Instruments

Vacuum-Tube Voltohmmeter DC VTVM
Audio (AC) Vacuum-Tube Voltmeter (AC VTVM)
Oscilloscope (Flat to 100 kc minimum)
Audio (Sine-wave) Generator
Intermodulation Analyzer
Sweep (FM) Generator (88 to 108 mc)
Marker Generator
Multiplex Generator (preferably with RF output — FISHER Model 300 or equal).

Miscellaneous

Adjustable-Line-Voltage Transformer or line-voltage regulator
Load Resistors (2) — 8-ohm, 50-watt (or higher)
Stereo source (Turntable with stereo cartridge or Tape Deck)
Speakers (2) Full-range, for listening tests
Soldering iron (with small-diameter tip). Fully insulated from power line.

PRECAUTIONS

Many of the items below are included just as a reminder — they are normal procedures for experienced technicians. Shortcuts can be taken but often they cause additional damage — to transistors, circuit components or the printed-circuit board.

Soldering—A well-tinned, hot, clean soldering iron tip will make it easier to solder without damage to the printed-circuit board or the many many circuit components mounted on it. It is not the wattage of the iron that counts — it is the heat available at the tip. Low-wattage soldering irons will often take too long to heat a connection — pigtail leads will get too hot and damage the part. Too much heat, applied too long, will damage the printed-circuit board. Some 50-watt irons reach temperatures of 1,000° F — others will hardly melt solder. Small-diameter tips should be used for single solder connections — larger pyramid and chisel tips are needed for larger areas.

- When removing defective resistors, capacitors, etc., the leads should be cut as close to the body of the circuit component as possible. (If the part is not being returned for in-warranty factory replacement it may be cut in half — with diagonal-cutting pliers — to make removal easier.)
- Special de-soldering tiplets are made for unsoldering multiple-terminal units like IF transformers and electrolytic capacitors. By unsoldering all terminals at the same time the part can be removed with little chance of breaking the printed-circuit board.
- Always disconnect the chassis from the power line when soldering. Turning the power switch OFF is not enough. Power-line leakage paths, through the heating element, can destroy transistors.

Transistors—Never attempt to do any work on the transistor amplifiers without first disconnecting the AC-power linecord — wait until the power supply filter-capacitors have discharged.

- Guard against shorts — it takes only an instant for a base-to-collector short to destroy that transistor and possibly others direct-coupled to it. [In the time it takes for a dropped machine screw, washer or even the screwdriver, to glance off a pair of socket terminals (or between a terminal and the chassis) a transistor can be ruined.]
- DO NOT bias the base of any transistor to, or near, the same voltage applied to its collector.
- DO NOT use an ohmmeter for testing transistors. The voltage applied through the test probes may be higher than the base-emitter breakdown voltage of the transistor.

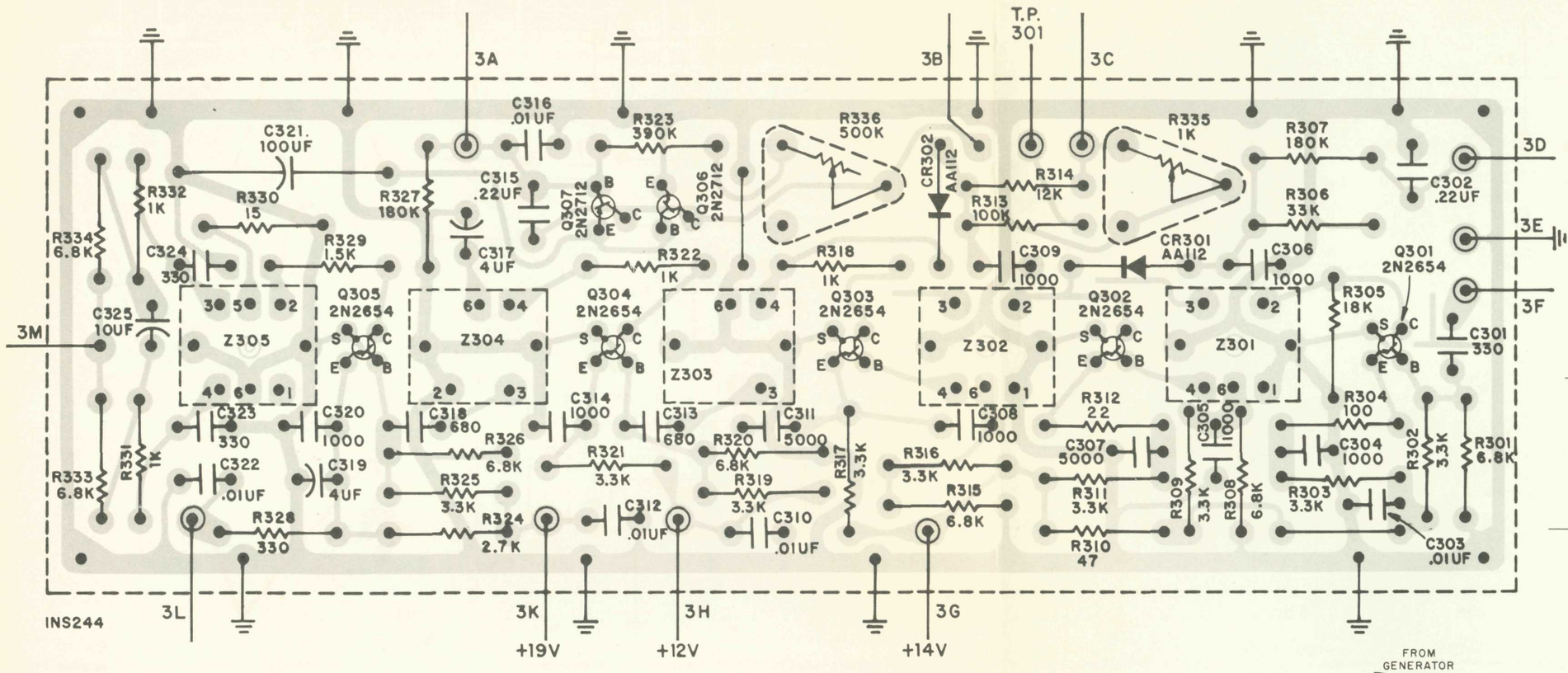
Output Stage and Driver—Replacements for output and driver transistors, if necessary, must be made from the same beta group as the original type. The beta group is indicated by a colored dot on the mounting flange of the transistor. Be sure to include this information, when ordering replacement transistors.

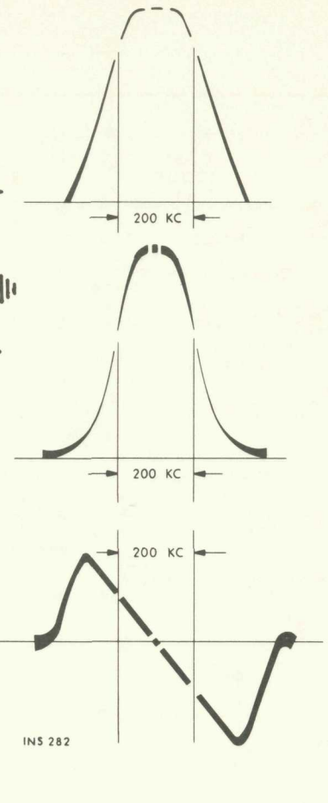
- If one output transistor burns out (open or shorts), always remove all output transistors in that channel and check the bias adjustment, the control and other parts in the network with an ohmmeter before inserting a new transistor. All output transistors in one channel will be destroyed if the base-biasing circuit is open on the emitter end.
- When mounting a replacement power transistor be sure the bottom of the flange, the mica insulator and the surface of the heat sink are free of foreign matter. Dust and grit can prevent perfect contact. This reduces heat transfer to the heat sink. Metallic particles can puncture the insulator and cause shorts — ruining the transistor.
- Silicone grease must be used between the transistor and the mica insulator and between the mica and the heat sink for best heat conduction. Heat is the greatest enemy of electronic equipment. It can shorten the life of transistors, capacitors and resistors. (Use Dow-Corning DC-3 or C20194 or equivalent compounds made for power transistor heat conduction.)
- Use care when making connections to speakers and output terminals. Any frayed wire ends can cause shorts that may burn out the output transistors — they are direct-coupled to the speakers. There is no output transformer — nothing to limit current through the transistors except the fuses. To reduce the possibility of shorts at the speakers, lugs should be used on the exposed ends — at least the ends of the stranded wires should be tinned to prevent frayed wire ends. The current in the speakers and output circuitry is quite high. Any poor contact or small-size wire, can cause power losses in the speaker system. Use 14 or 16 AWG for long runs of speaker-connecting wiring.

DC-Voltage Measurements—These basic tests of the transistor circuitry are made without the signal generator. Without any signal input measure the circut voltages — as indicated on the schematic. The voltage difference between the base and the emitter should be in the millivolt range — a sensitive DC meter is needed for these readings. A low-voltage range of 1 volt, full scale — or lower — is needed.

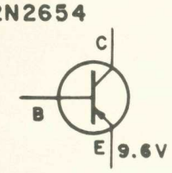
Audio-Voltage (gain) Measurements—The schematic and printed-circuit board layout diagrams are used. Input signals are injected at the proper points — found most quickly by using layout of the printed-circuit board instead of the schematic. An AUDIO (AC) VTVM connected to the test points should indicate voltages close to those values shown in the boxes on the schematic. Many of the signal levels in the input stages are only a few millivolts — they can not be read on the AC ranges supplied on most Vacuum-Tube AC/DC Volt-ohmmeters (VTVMs). Even with a 1-volt range a signal level of 100 millivolts (.1 volt) will be the first 1/10 of the meter scale. A reading of 1 millivolt (.001 volt) will hardly even move the meter needle.

P 1094 PRINTED-CIRCUIT LAYOUT

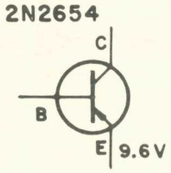




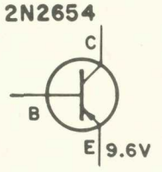
Q301 2N2654



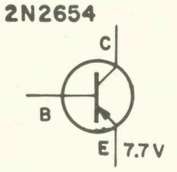
Q302 2N2654



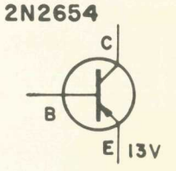
Q303 2N2654



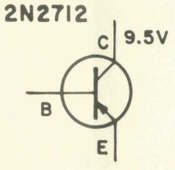
Q304 2N2654



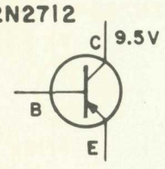
Q305 2N2654

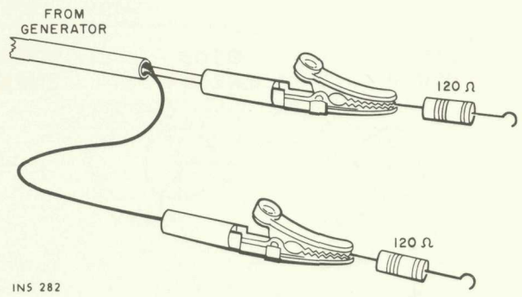


Q306 2N2712



Q307 2N2712





ALIGNMENT INSTRUCTIONS

IF ALIGNMENT (General maintenance)

Set selector switch to FM. Mono-Stereo switch to Mono. High, Low Filter and Muting switch to "OFF", Volume control to maximum C.C.W., Muting circuit is disconnected from TP-301 (Test Point) for the IF alignment.

1—Connect sweep generator output to the insulation of wire connected to front-end TP #1. Connect scope and DC VTVM in series with a 100K resistor to IF board TP-301.

2—Align Z1 (Front-end IF) top and bottom for maximum gain and a symmetrical curve.

(Adjust Sweep generator output to keep DC VTVM reading between —1.5 and —2.5V. IF response curve should look like Fig. 1.)

3—Connect scope to MPX decoder output (Left or Right), and observe Ratio detector curve should be like Fig. 3.

IF ALIGNMENT (After part replacement)

Use same switch positions as above.

1—Connect generator, set to 10.7Mc (Sweep generator with zero sweep) to the collector of Q303.

Connect DC VTVM across C-325 (Ratio detector filter) with 100 K resistor in series with each lead—**VTVM must not be grounded.**

2—Adjust Z303, Z304 top and Z305 top and bottom cover until maximum peak reading on the DC VTVM is observed.

(Adjust generator output during alignment to keep DC VTVM reading between 4 and 5.5 volts.)

3—Connect scope and DC VTVM in series with a 100K ohm resistor to TP-301.

Connect sweep generator to—point 3B of the IF amplifier board.

4—Adjust top and bottom of Z301, Z302 and top of Z303 for maximum gain and symmetrical curve.

(Adjust generator output during alignment—DC VTVM reading between —1.5 and —2.5 volts. IF curve should look like Fig. 2.)

5—Connect sweep generator output to the insulation over the TP-1 (Front-end) wire.

Adjust top and bottom of Z1 for maximum gain and symmetrical curve.

(Adjust generator output during alignment for DC VTVM reading between —1.5 and —2.5 volts. IF response curve on scope should now look like Fig. 3.)

6—Connect scope to the left (or right) MPX decoder output. Ratio detector curve should look like Fig. 3.

FM FRONT-END ALIGNMENT

a) Connect DCVTVM to TP-301. FM signal generator (with two 120 ohm composition resistors in series (Fig. 4) to the 300 ohm antenna terminals.

b) Set generator and tuner dials to 90Mc. First align the oscillator coil, then the RF transformer, for maximum reading on the VTVM.

c) Set generator and tuner dials to 106Mc. Align the oscillator-trimmer, then the RF trimmers.

d) Repeat steps (b) and (c) until tuner calibration is correct and maximum peak is reached using as little generator output signal as possible.

e) With generator and tuner dial set for 98Mc, adjust the antenna coil for maximum reading.

AUDIO AMPLIFIER

Control Positions for Tests

1—Unplug unit from AC-power line.

2—Set **Balance, Bass** and **Treble** controls to their center positions.

Press **Monitor** pushbutton in. Set **Speaker** selector to position 1. **Hi-Filter** and **Low-Filter** switches out. **Selector** switch to AUX. **Mono** switch in the out position. The impedance selector (on the rear apron of chassis) is to be set to the 8-16 ohms position.

Output Stage Balancing and IM Distortion Measurements

1—Connect an 8-ohm, 50-watt resistor across the left output terminals. In parallel to the load resistor connect the input leads of an IM (Inter-Modulation) distortion analyzer and the leads of a DC VTVM capable of reading 0.1 volt with accuracy.

2—Connect IM-analyzer generator output to the left **Monitor** input.

3—Apply AC power and rotate **Volume** control to its maximum clockwise position—full volume.

4—Increase signal input to amplifier for 40-watts output. (14.7 VAC across 8-ohm load resistor). After one full minute of warm-up time proceed to next step. ***The warm-up time is very important (to get proper balance) — the characteristics of the transistors change slightly as their internal temperature rises. A longer warm-up time will not damage the transistors. Once they are warm the tests and adjustments should be completed without delay — before they can cool off.***

5—Reduce IM-analyzer generator output for 5 watts output from amplifier (5.16 VAC across load).

6—Adjust P1 and P2 (P3 and P4 for right channel) for minimum IM distortion and zero DC voltage across the load. (IM distortion should be less than 0.8% and DC voltage lower than ±0.1 volts across the 8-ohm load. Use two screwdrivers to adjust the controls—it's faster than shifting from one control to the other.)

7—Increase signal input for 40 watts output from amplifier. IM reading should be less than 1% — DC across load should be less than ±0.3 volt.

REPEAT steps 1 through 7 (above) for **right**-channel tests.

NOTE—If any of the above instructions are different from those supplied with the IM analyzer instruction manual, it is best to follow those in the manual. If a load resistor of 50-watts rating is built into the IM analyzer, a separate load resistor is not required for the channel under test — one should be wired across the other channel as a precaution. For best results the IM range switch should be set to give a reading in the center to full-scale portion of the meter scale — this gives greater accuracy.

Harmonic Distortion Test

1—Set amplifier controls to positions indicated above (control positions).

2—Connect an audio (sine-wave) generator to the **left** AUX input. Connect the harmonic-distortion analyzer to the left speaker #1 terminals across an 8-ohm, 50-watt resistive load.

3—Apply AC power — rotate **Volume** control to its maximum clockwise position.

4—Set the frequency control of the audio generator to 20 cycles. Adjust the output level for 40 watts (17.9 VAC) across the 8-ohm load. Harmonic distortion should be less than 1%.

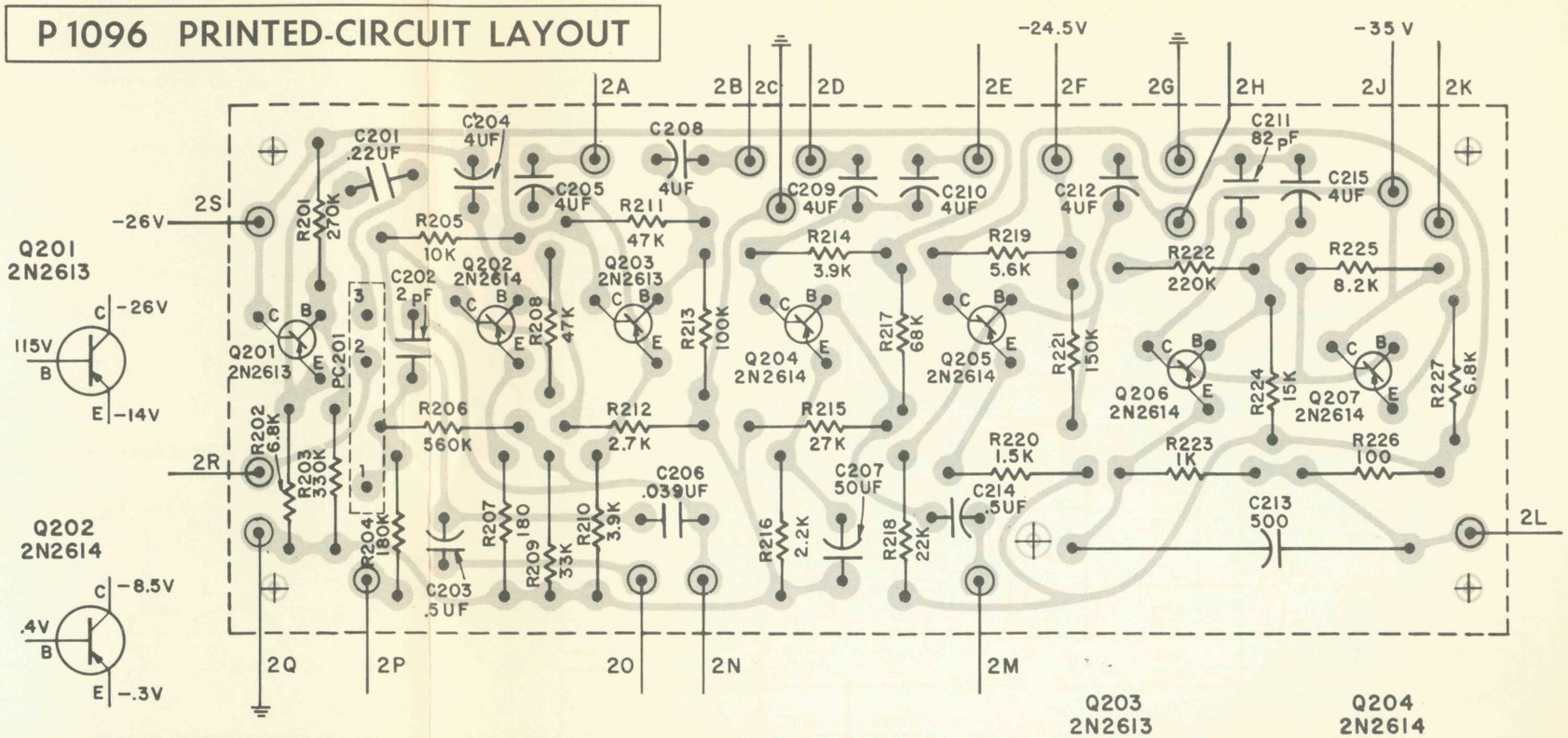
REPEAT steps above for **right**-channel harmonic-distortion measurements.

Stability Test

1—Connect audio (sine-wave) generator to the **left** AUX input. Across the **left**-speaker terminals connect an 8-ohm, 50-watt load resistor and the vertical-input leads of an oscilloscope.

2—Set amplifier controls to positions listed above (control positions).

P 1096 PRINTED-CIRCUIT LAYOUT



3—Apply AC power—rotate **Volume** control to its maximum clockwise positions — full volume.

4—Set the frequency control of the audio generator to 20 cycles. Increase the output level of the audio generator until the sine waves, as viewed on the scope, start to distort — the peaks are clipped from overdriving the amplifier. Check waveforms on scope for instability — changes in wave shape or oscillation (thicker line at a portion of the waveform).

5—Repeat the above steps using a 0.1-uf capacitor as a load. Remove the 8-ohm resistor.

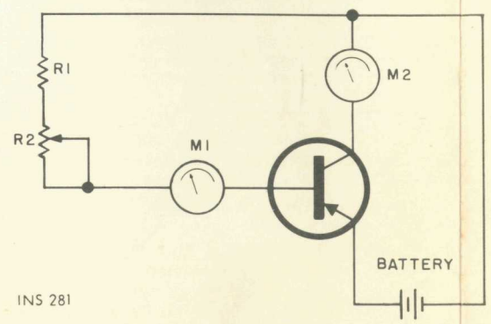
REPEAT steps 1 through 5, above, for the **right** stereo channel.

Transistor Testing

If a power-transistor tester is not available the circuit in Figure can be used to determine the DC beta of the transistors. This is not a complete test of the transistor.

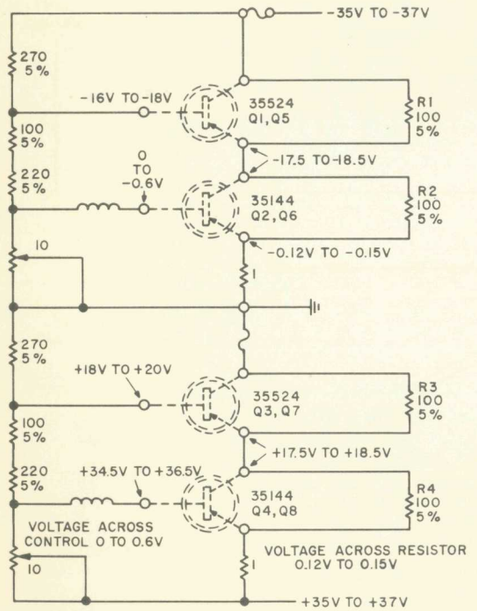
OPERATION: Connect the transistor to the test circuit. Adjust R2 for a 0.5-ampere reading on M2 in the collector circuit. The DC beta is then calculated by: $\text{DC beta} = \frac{\text{reading of M2}}{\text{reading of M1}}$

The DC beta should be between 50 and 250.



INS 281

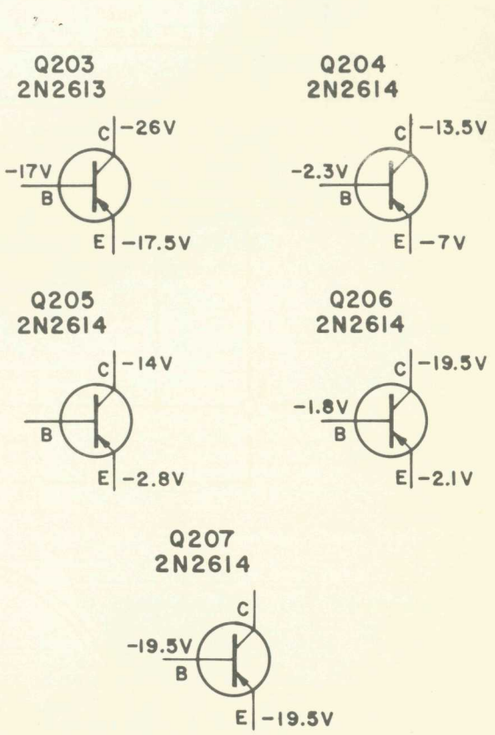
Voltage tests can be made with safety — without ruining transistors — by substituting resistors for the emitter-collector circuit of the power transistors. Voltages and resistor values are given



INS 284

NOTES:

1. VALUES MEASURED WITH DCVTVM TO GROUND, UNLESS OTHERWISE SPECIFIED.

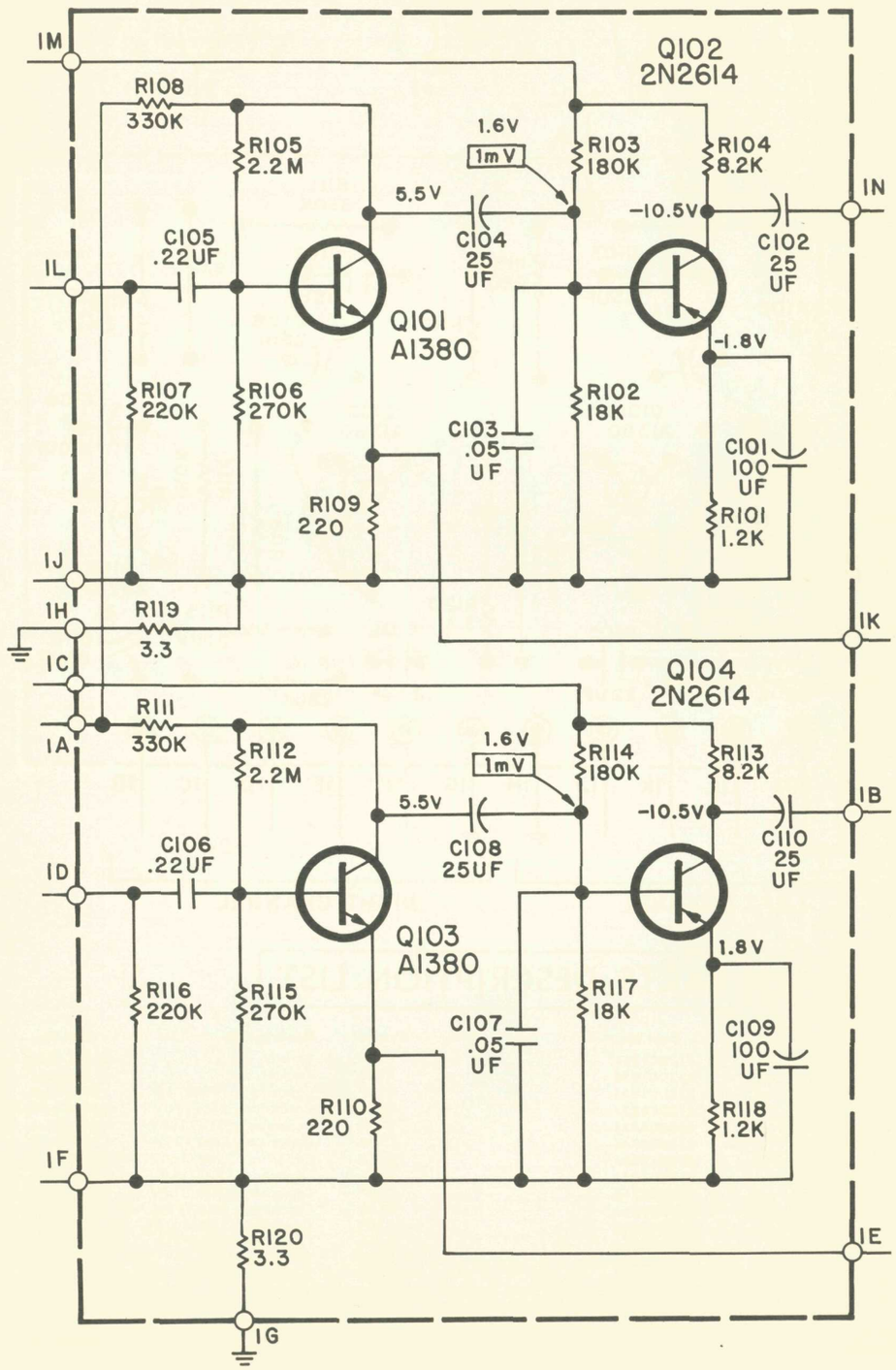


Output Stage and Driver—Replacements for output and driver transistors, if necessary, must be made from the same beta group as the original type. The beta group is indicated by a colored dot on the mounting flange of the transistor. Be sure to include this information, when ordering replacement transistors.

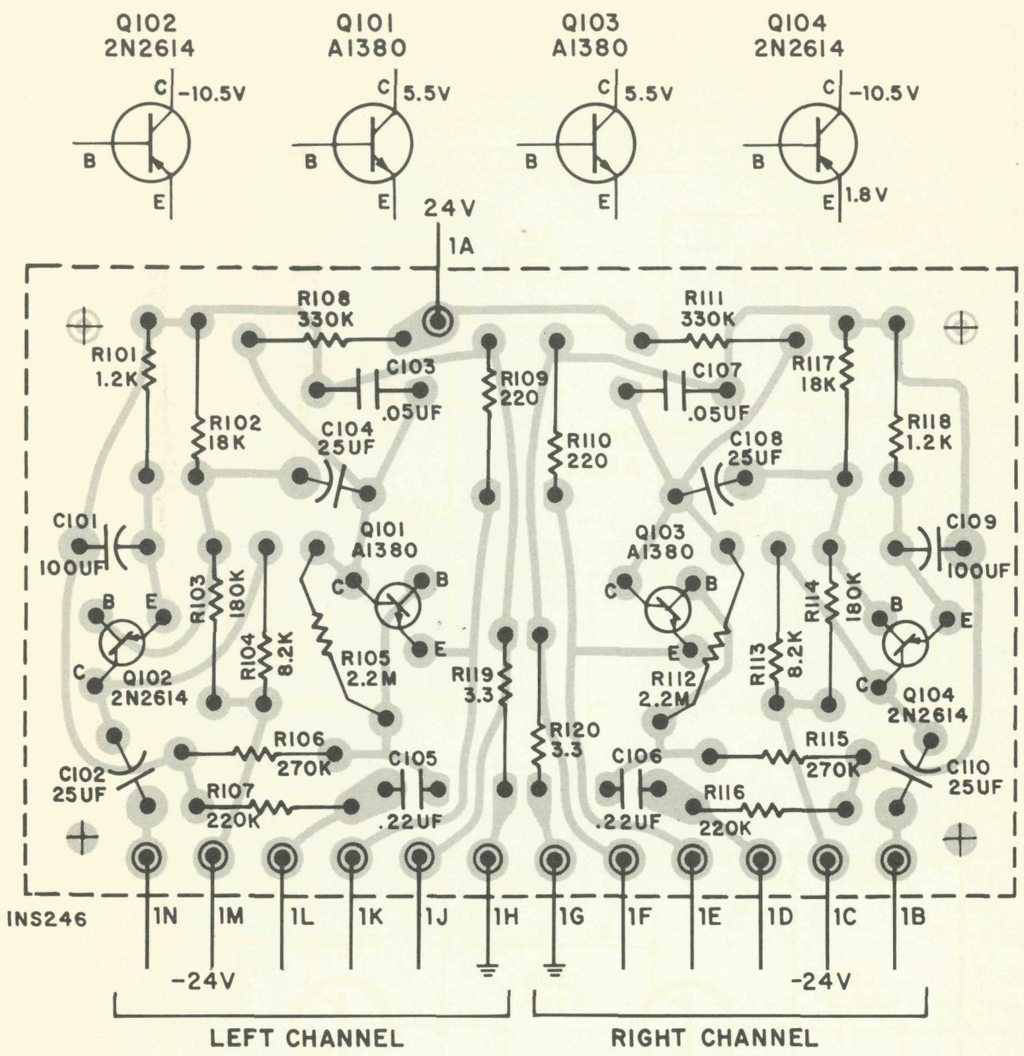
SCHEMATIC DIAGRAM

(P1095)

PREAMPLIFIER



P 1095 PRINTED-CIRCUIT LAYOUT

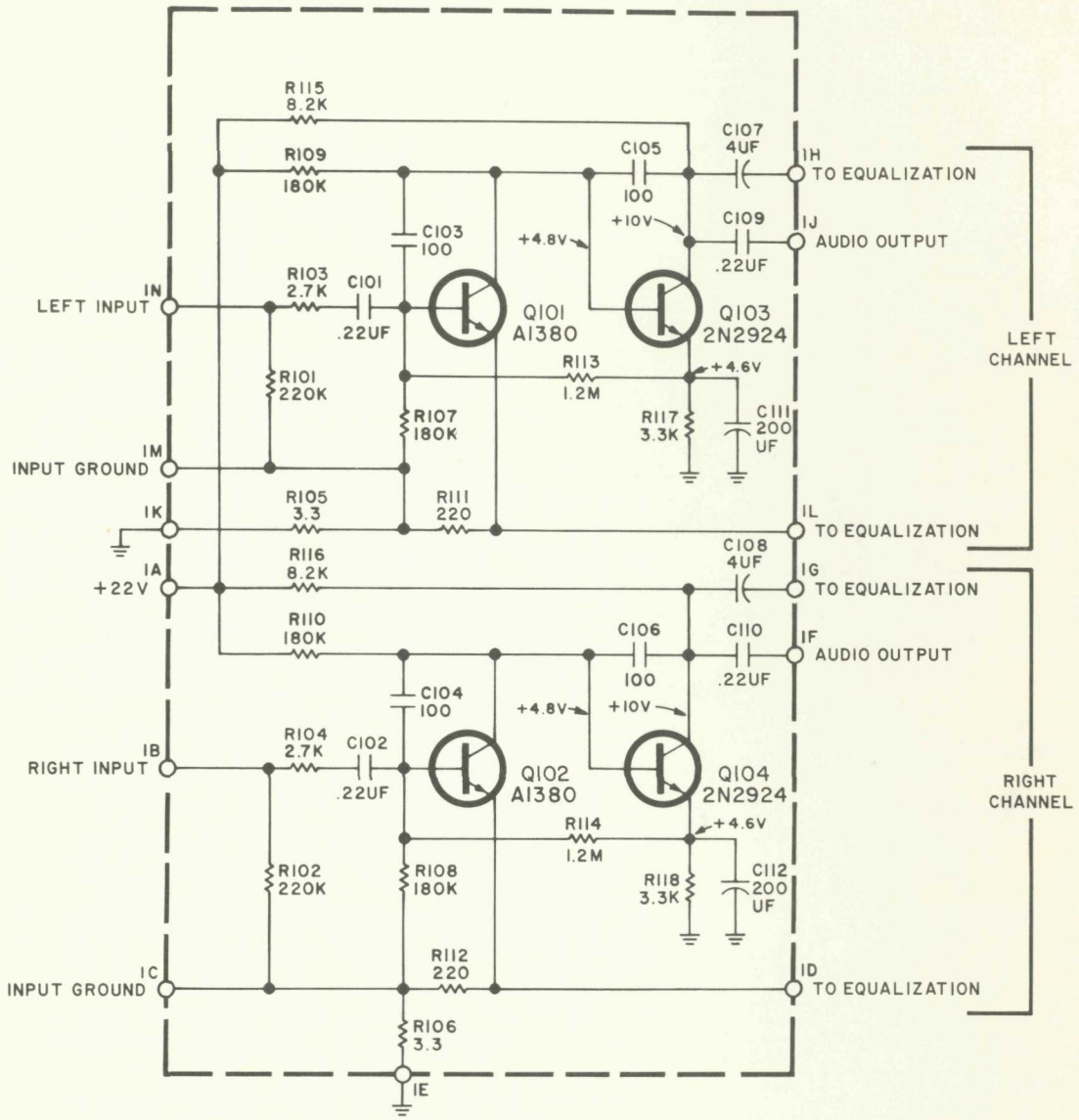


PARTS DESCRIPTION LIST

Symbol	Description	Part No.	Symbol	Description	Part No.
R101	Resistor, 1.2K	R12DC122J	R119	Resistor, 3.3	R12DC3R3J
R102	Resistor, 18K	R12DC183J	R120	Resistor, 3.3	R12DC3R3J
R103	Resistor, 180K	R12DC184J	C101	Capacitor*, 100UF/15V	C50483-5
R104	Resistor, 8.2K	R12DC822J	C102	Capacitor*, 25UF/70V	C50483-13
R105	Resistor, 2.2M	R33DC225J	C103	Capacitor, .05UF/100V	C50B572-1
R106	Resistor, 270K	R12DC274J	C104	Capacitor*, 25UF/35V	C50483-12
R107	Resistor, 220K	R12DC224J	C105	Capacitor, .22UF/160V	C50B573-3
R108	Resistor, 330K	R12DC334J	C106	Capacitor, .22UF/160V	C50B573-3
R109	Resistor, 220	R12DC221J	C107	Capacitor, .05UF/100V	C50B572-1
R110	Resistor, 220	R12DC221J	C108	Capacitor*, 25UF/70V	C50483-13
R111	Resistor, 330K	R12DC334J	C109	Capacitor*, 100UF/15V	C50483-5
R112	Resistor, 2.2M	R33DC225J	C110	Capacitor*, 25UF/35V	C50483-12
R113	Resistor, 8.2K	R12DC822J	Q101	Transistor	A1380
R114	Resistor, 180K	R12DC184J	Q102	Transistor	2N2614
R115	Resistor, 270K	R12DC274J	Q103	Transistor	A1380
R116	Resistor, 220K	R12DC224J	Q104	Transistor	2N2614
R117	Resistor, 18K	R12DC183J	——	Transistor Spacer	E50A624
R118	Resistor, 1.2K	R12DC122J	——	Printed Circuit Board	PB1095B110

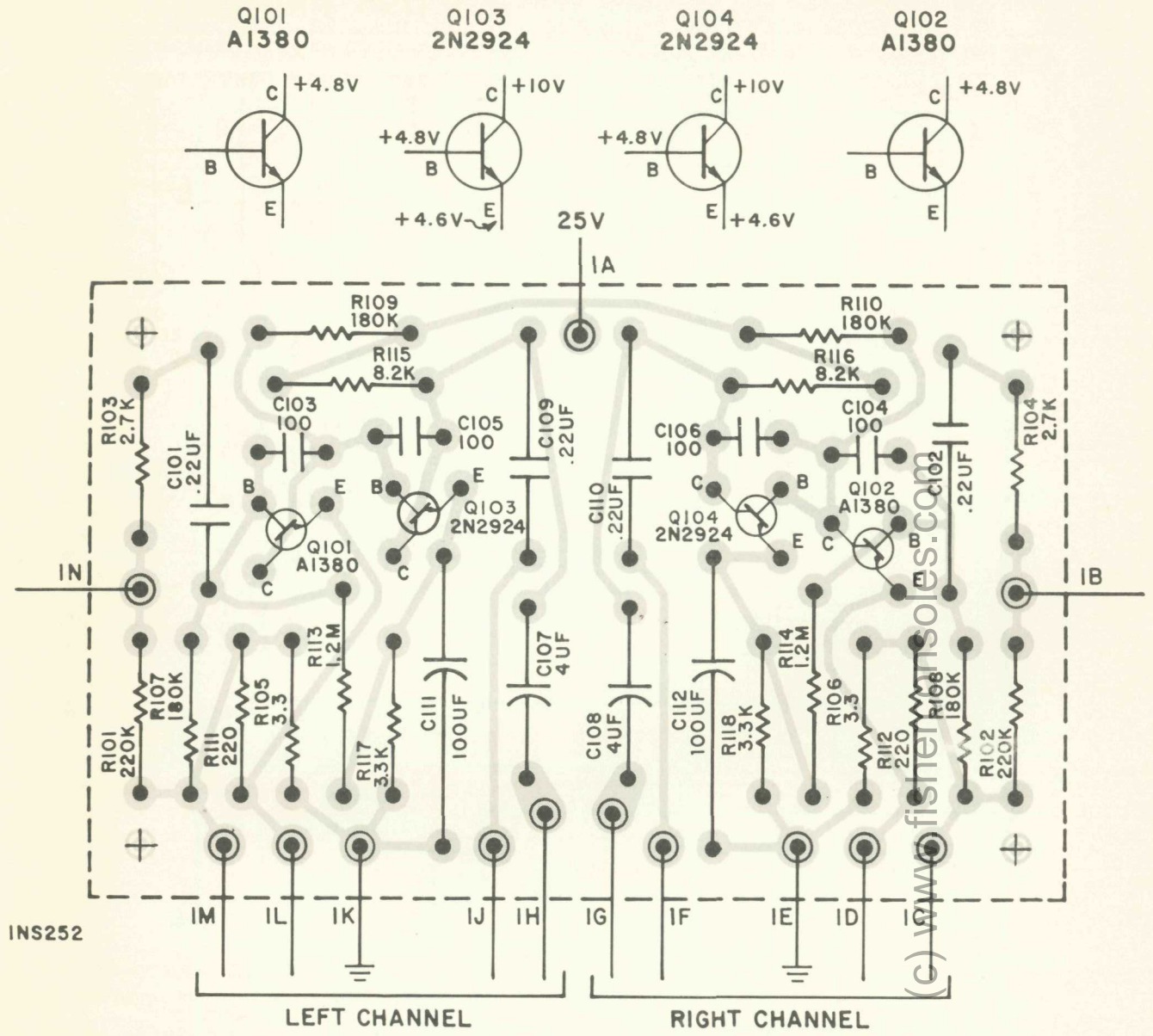
SCHEMATIC DIAGRAM

PREAMPLIFIER (P1240)



AW# 2293 A

P 1240 PRINTED-CIRCUIT LAYOUT



INS252

PARTS DESCRIPTION LIST

Symbol	Description	Part No.
R101	Resistor, 220K	R12DC224J
R102	Resistor, 220K	R12DC224J
R103	Resistor, 2.7K	R12DC272J
R104	Resistor, 2.7K	R12DC272J
R105	Resistor, 3.3	R12DC3R3J
R106	Resistor, 3.3	R12DC3R3J
R107	Resistor, 180K	R12DC184J
R108	Resistor, 180K	R12DC184J
R109	Resistor, 180K	R12DC184J
R110	Resistor, 180K	R12DC184J
R111	Resistor, 220	R12DC221J
R112	Resistor, 220	R12DC221J
R113	Resistor, 1.2M	R33DC125J
R114	Resistor, 1.2M	R33DC125J
R115	Resistor, 8.2K	R12DC822J
R116	Resistor, 8.2K	R12DC822J
R117	Resistor, 3.3K	R12DC332J
R118	Resistor, 3.3K	R12DC332J

Symbol	Description	Part No.
C101	Capacitor, .22UF/160V	C50B575-3
C102	Capacitor, .22UF/160V	C50B575-3
C103	Capacitor, 100/±10%	C50B568-3
C104	Capacitor, 100/±10%	C50B568-3
C105	Capacitor, 100/±10%	C50B568-3
C106	Capacitor, 100/±10%	C50B568-3
C107	Capacitor , 4UF/35V	C50483-1
C108	Capacitor , 4UF/35V	C50483-1
C109	Capacitor, .22UF/160V	C50575-3
C110	Capacitor, .22UF/160V	C50575-3
C111	Capacitor , 100UF/15V	C50483-5
C112	Capacitor , 100UF/15V	C50483-5
Q101	Transistor	A1380
Q102	Transistor	A1380
Q103	Transistor	2N2924
Q104	Transistor	2N2924
——	Transistor Spacer	E50A624
——	Printed Circuit Board	PB1240

P1181 MULTIPLEX DECODER TESTS

(Stereo/Mono Automatic)

- Modulate FM generator with 19 kc, ±6.5 kc deviation. (Use external modulation if necessary.)
- With the FM signal generator set for an output of 50 uV the Stereo indicator should light up. If generator output is decreased to 10 uV the indicator light should remain ON.
- Reduce FM generator output to zero and the indicator light should go OFF.
- *With FM generator set for 300 uV output tune toward the channel center frequency from a lower frequency, and then from a higher frequency. In each instance observe the FM-generator dial reading and the tuning-indicator meter reading when the relay actuates. The meter readings and the off-center frequency readings should be the same.*

TABLE 1

PREFERRED ALIGNMENT INSTRUCTIONS

(Using multiplex generator with RF and 19 kc outputs and with 1 kc modulation)

In Table 1, below, a multiplex generator with an RF output is used. This is the better method of alignment since the multiplex circuitry is connected to the tuner with which it will be used. Check the alignment of the IF stages before making multiplex adjustments. Poor IF alignment can make proper multiplex operation impossible.

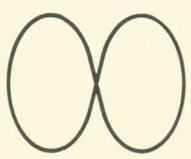
This table is based on the FISHER Model 300 multiplex generator. Another alignment procedure, for MPX generators without an RF output, is shown in Table 2.

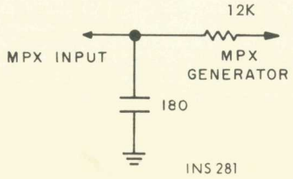
TEST EQUIPMENT: Multiplex Generator, Audio (AC) Vacuum-Tube Voltmeter (RMS type preferred), Vacuum-Tube Voltohmeter (DC VOM), Oscilloscope (100 kc minimum) with external sweep input.

WARNING: Use only the proper alignment tool to prevent core breakage.

STEPS	GENERATOR			INDICATOR	ALIGNMENT	
	CONNECTION	MODULATION	RF DEVIATION	TYPE AND CONNECTION	ADJUST	INDICATION
1	Multiplex generator RF output to antenna terminals	76 kc (connect external audio generator to SCA input of multiplex generator)	±25 kc	AC VTVM and oscilloscope vertical input to left output (terminal 4B). Connect 0.1uF capacitor from TP 404 to chassis.*	Z402	Minimum AC voltage
2	Same as Step 1	19 kc pilot only	±6.5 kc	DC VTVM on TP 403	Z401 top and bottom	Maximum voltage
3 (a)	19 kc output of generator to oscilloscope horizontal input	None	None	Vertical input of oscilloscope to TP 404. Set oscilloscope for external sweep.	Z403 bottom	Set frequency of free-running oscillator to 38 kc. Lissajous pattern (see figure 1 below), should be moving as slowly as possible.
(b)	Same	None	None	AC VTVM to TP 402	Z403 top	Maximum AC voltage
(c)	Same	None	None	Same as 3(a)	Z403 bottom	Same as 3(a)
4	Same as Step 1	Composite MPX. 1 kc on left channel only.	±75 kc	AC VTVM and oscilloscope vertical input to left channel output lug (4B)	Z401 top	Maximum voltage on AC VTVM. Clean 1 kc sine wave on oscilloscope
5	Same as Step 1	Composite MPX. 1 kc on right channel only.	±75 kc	Same as Step 4	MPX separation control (R455**)	Minimum reading on AC VTVM should be at least 33db below reading obtained in Step 4
6	Same as Step 1	Same as Step 5	±75 kc	AC VTVM and oscilloscope vertical input to left channel output lug (1S)	———	Same AC VTVM reading as obtained in Step 3 (±2db); clean 1 kc sine wave on scope
7	Same as Step 1	Composite MPX. 1 kc on left channel only.	±75 kc	Same as Step 6	MPX separation control (R455**)	Minimum reading on AC VTVM should be at least 33db below reading obtained in Step 4

* This must be used to short the 38 kc oscillator for best adjustment of SCA trap.
** Adjust for best compromise readings.





P 1181 PRINTED-CIRCUIT LAYOUT

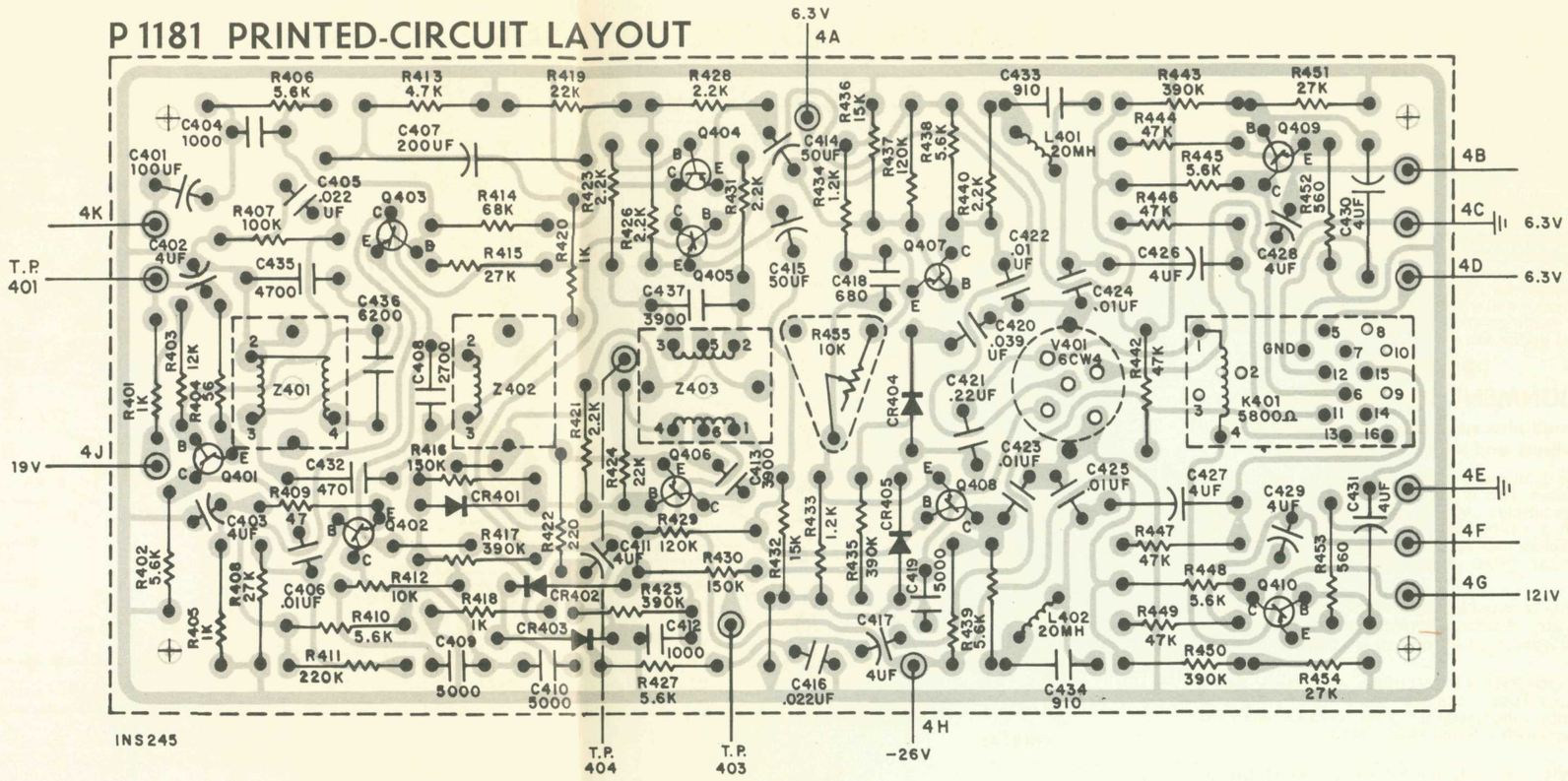


TABLE 2

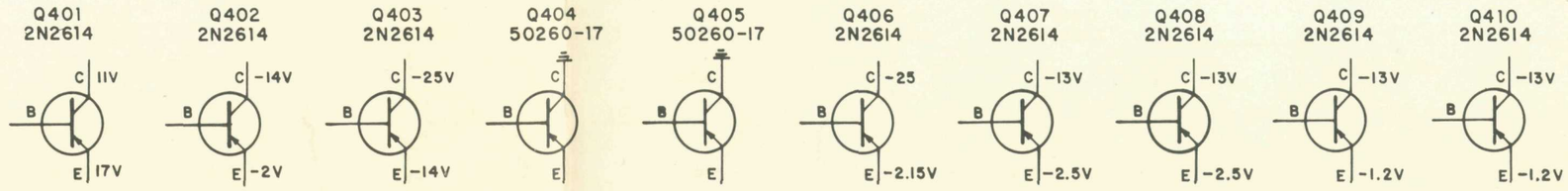
ALTERNATE ALIGNMENT INSTRUCTIONS

(For multiplex generators without an RF output)

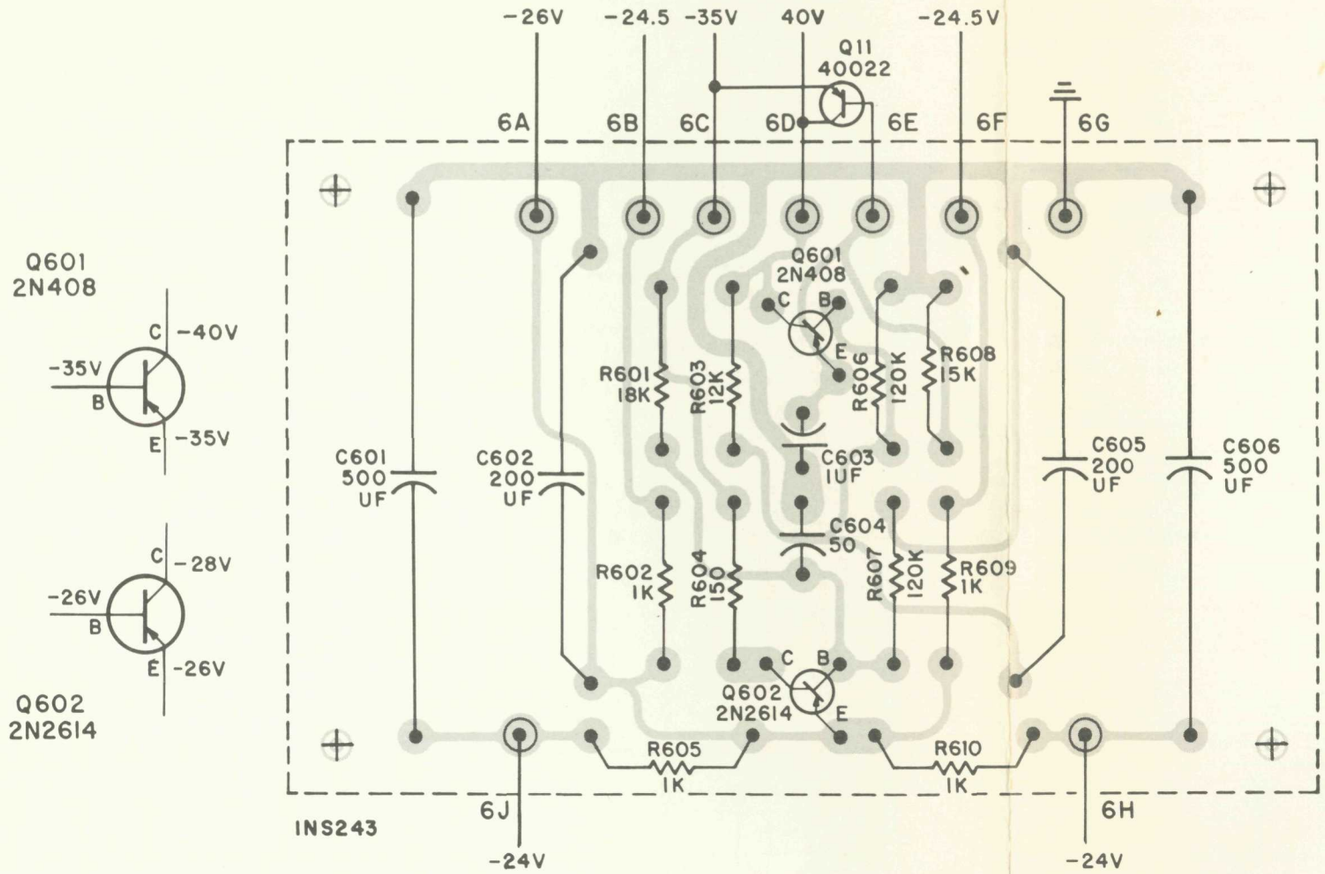
Disconnect the ratio detector from the multiplex unit before using this procedure. A low-pass filter (Figure 2) is used between the MPX generator output and the input to the multiplex circuitry. It has about the same loading effect as the output of the ratio detector in the tuner.

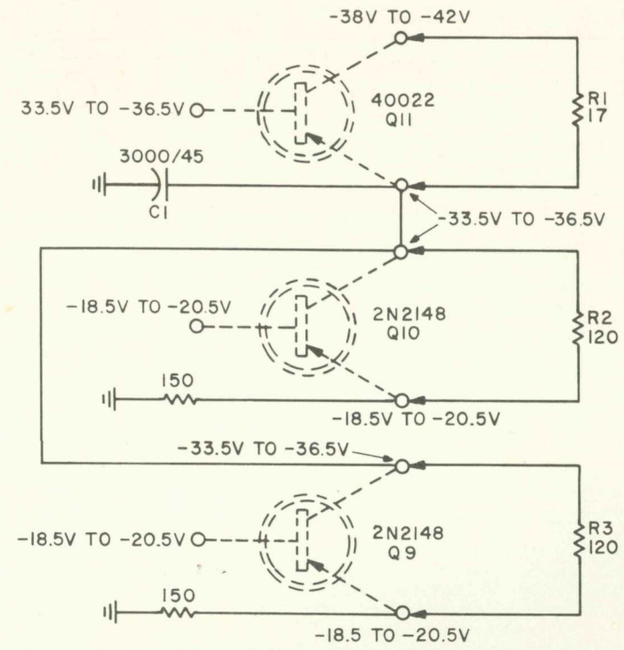
STEPS	GENERATOR			INDICATOR	ALIGNMENT	
	CONNECTION	AUDIO	LEVEL	TYPE AND CONNECTION	ADJUST	INDICATION
1	Composite output of MPX generator to input of MPX demodulator (Point 1)	19 kc pilot only	100 mV RMS 280 mV P-P)	AC VTVM to TP 403	Z401 top and bottom	Maximum reading on AC VTVM
2	19 kc output of generator to oscilloscope horizontal input. (Generator not connected to MPX section)	———	———	Vertical input of oscilloscope to TP 404. Oscilloscope set for external sweep.	Z403	Set frequency of free-running oscillator to 38 kc. Lissajous pattern (see figure 1) below, should be moving as slowly as possible.
3	Same as Step 1	1 kc on left channel only	0.7 V RMS (3.92 V P-P)	AC VTVM and oscilloscope vertical input to left channel output lug (terminal 1R)	Z401	Maximum reading on AC VTVM. Clean 1 kc sine wave on oscilloscope
4	Same as Step 1	1 kc on right channel only	Same	Same as previous step	MPX separation control (R455)	Minimum reading on AC VTVM should be at least 33db below reading in previous step
5	Same as Step 1	Same as previous step	Same	AC VTVM and oscilloscope vertical input to right channel output lug (terminal 1S)	———	Same AC VTVM reading as in Step 3 (±2db); clean 1 kc sine wave on oscilloscope
6	Same as Step 1	1 kc on left channel only	Same	Same as previous step	MPX separation control (R455)	Minimum reading on AC VTVM should be at least 33db below reading obtained in previous step

* If adjustment is required, adjust for best compromise readings in Steps 4 and 6.



P 1195 PRINTED-CIRCUIT LAYOUT





NOTES :

1. VALUES MEASURED WITH DCVTVM TO GROUND. UNLESS OTHERWISE SPECIFIED.

PARTS DESCRIPTION LIST

Symbol	Description	Part No.
R601	Resistor, 18K, ½ W	RC20BF183K
R602	Resistor, 1K, ½ W	RC20BF102K
R603	Resistor, 12K, ½ W	RC20BF123K
R604	Resistor, 150, ½ W	RC20BF151K
R605	Resistor*, 1K, ½ W	RC20BF102K
R606	Resistor, 120K, ½ W	RC20BF124K
R607	Resistor, 120K, ½ W	RC20BF124K
R608	Resistor, 15K, ½ W	RC20BF153K
R609	Resistor, 1K, ½ W	RC20BF102K
R610	Resistor*, 1K, ½ W	RC20BF102K
C601	Capacitor*, 500UF/35V	C50483-17
C602	Capacitor, 200UF/35V	C50483-7
C603	Capacitor, 1UF/70V	C50483-16
C604	Capacitor, 50UF/35V	C50483-4
C605	Capacitor, 200UF/35V	C50483-7
C606	Capacitor, 500UF/35V	C50483-17
Q601	Transistor, 2N2614	TR2N2614
Q602	Transistor, 2N2614	TR2N2614
——	Printed Circuit Board	PB1195B110
——	Transistor Base	E50A624

POWER SUPPLY TESTS

DO NOT install replacement power transistors before making all of the following tests:

- Connect power cord to AC power line of proper voltage. Check dial lights, pointer light and meter illumination light. Turn light-dimmer control and observe meter illumination. Set the dimmer control to the maximum clockwise position and the SELECTOR switch to FM.

DIODE TESTS

- With a DC VTVM read the following voltages between the points indicated and ground:

(AC Power Interlock can be defeated by slipping a large-size (10-32) binder-head machine screw into the interlock T-slot.)

Junction of CR1 and CR3	+35 to +38 volts
Junction of CR2 and CR4	—35 to —38 volts
Negative terminal of SR5	—38 to —43 volts
Positive terminal of SR6	+147 to +160 volts

TRANSISTOR TESTS

Voltage tests can be made with safety — without ruining transistors — by substituting resistors for the emitter-collector circuit of the power transistors. Voltages and resistor values are given in Figure above.

REPLACING FUSES

a. Power Fuse — To protect against line surges and other adverse conditions sometimes encountered by electronic equipment, the 600-T is fused at strategic locations. If the receiver appears to be inoperative, check to see if the dial lamps light when the Volume control is turned clockwise from the AC OFF position. If the lamps do not light, the unit may have a blown power fuse.

To replace the fuse, which is located in a black receptacle labelled F1, on the lower right-hand side of the rear panel, proceed as follows:

1. Turn the Volume control to the AC OFF position.
2. Disconnect the power cord from the wall receptacle.
3. Push the cap of the fuseholder in, and turn it counterclockwise. The cap will disengage, and you can pull it out, with the fuse remaining in its clip. Replace the fuse with a 2.5-amp Slo-Blo fuse only. Return the cap and fuse to the receptacle, and restore power to the set.

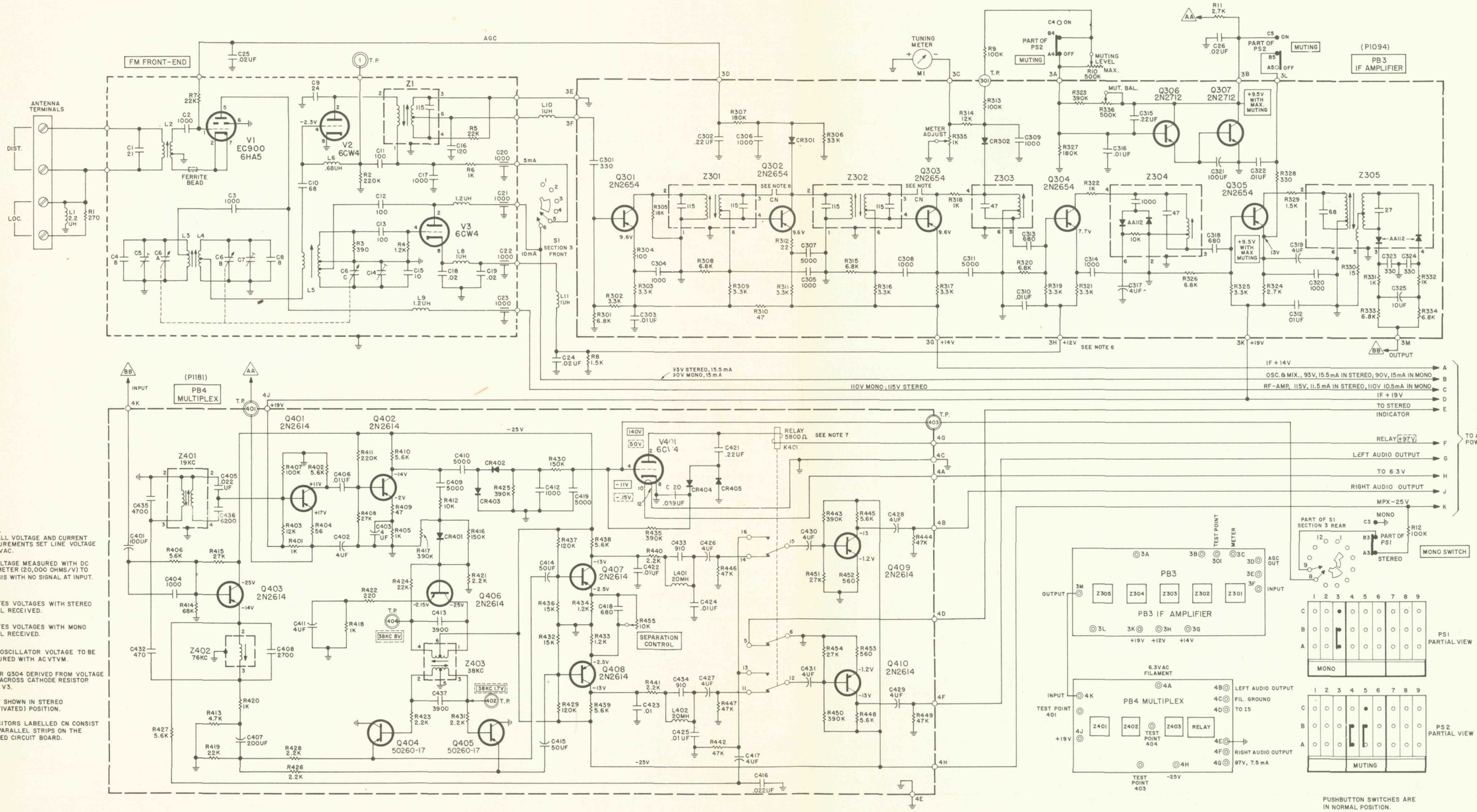
b. Speaker Fuses — If the dial is lit, yet the set does not play, *no matter what program source* (e.g., tuner, turntable, tape recorder, etc.) *is used*, it may be the result of a blown fuse in the output stage of the Power Amplifier. Power transistors could easily be destroyed if the speaker terminals were accidentally shorted to each other, or to the chassis. To protect the transistors, as well as the speakers, each output stage uses two fuses, which are located around the impedence selector switch, in receptacles labelled F2 through F5. Fuses F2 and F3 are used in the right channel; F4 and F5 protect the left channel. These fuses are precisely rated, and manufactured to function within extremely narrow tolerances. These fuses must be replaced only with fuses rated at 2 amperes. Replacement with any other type of fuse, or with Slo-Blo fuses of the same value may result in damage to the unit, and voids the warranty. If either channel (or both) is inoperative, pull the power plug from the wall receptacle and remove both fuses used in that channel. Simply push the cover of each fuseholder down, rotate it counterclockwise, and lift it from its receptacle. Replace the fuse(s) with a known good fuse (two spare speaker fuses are supplied with your set.) Additional fuses are available as Fisher Part No. F755-145 (2-amp).

Should distortion become apparent in either channel, replace one of the fuses in that channel as described above. If distortion is still apparent after restoring power to the set, replace the other fuse in the channel with the fuse removed.

MODEL 600-T

FM-Multiplex Receiver

SCHEMATIC DIAGRAM

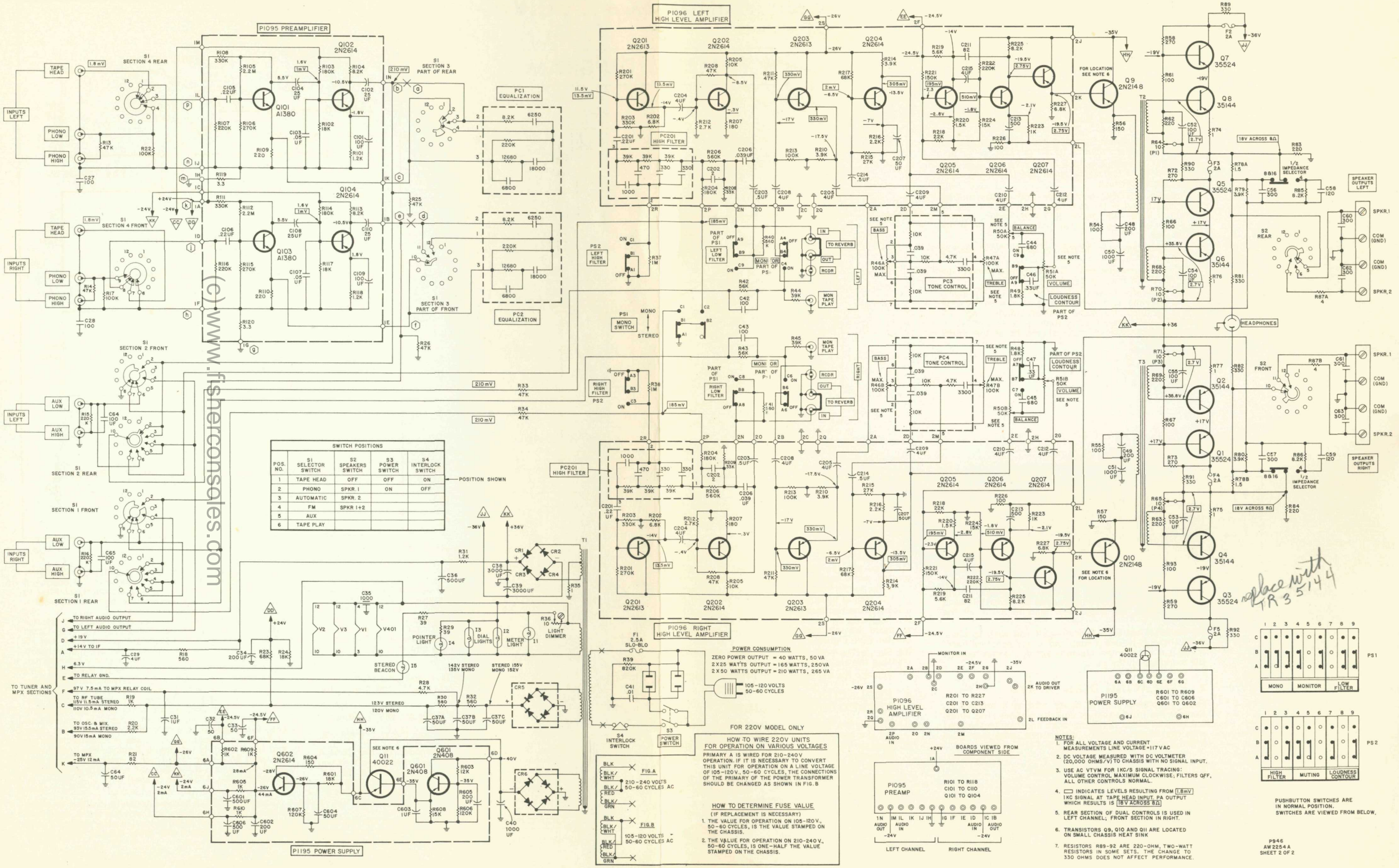


NOTES:

1. FOR ALL VOLTAGE AND CURRENT MEASUREMENTS SET LINE VOLTAGE TO 117VAC.
2. DC VOLTAGE MEASURED WITH DC VOLTMETER (20,000 OHMS/V) TO CHASSIS WITH NO SIGNAL AT INPUT.
3. [V] DENOTES VOLTAGES WITH STEREO SIGNAL RECEIVED.
4. [V] DENOTES VOLTAGES WITH MONO SIGNAL RECEIVED.
5. [CV] 38KC OSCILLATOR VOLTAGE TO BE MEASURED WITH AC VTVM.
6. B+ FOR Q304 DERIVED FROM VOLTAGE DROP ACROSS CATHODE RESISTOR R8 OF V3.
7. RELAY SHOWN IN STEREO (DEACTIVATED) POSITION.
8. CAPACITORS LABELLED CN CONSIST OF 2 PARALLEL STRIPS ON THE PRINTED CIRCUIT BOARD.

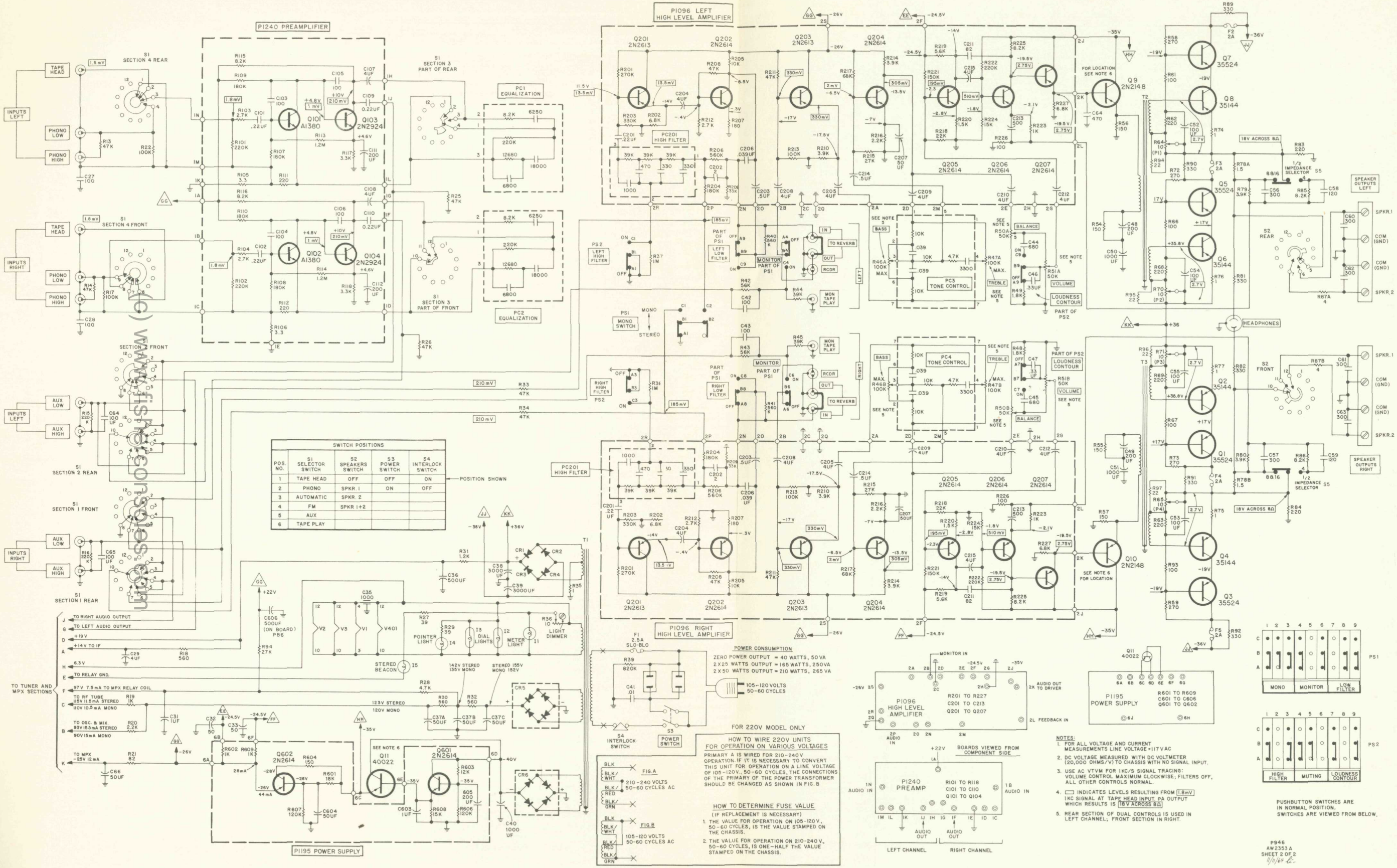
PUSHBUTTON SWITCHES ARE IN NORMAL POSITION.
SWITCHES ARE VIEWED FROM BELOW.

P946
AW 2253
SHEET 1 OF 2



NOTES:
1. FOR ALL VOLTAGE AND CURRENT MEASUREMENTS LINE VOLTAGE = 117 VAC
2. DC VOLTAGE MEASURED WITH DC VOLTMETER (20,000 OHMS/V) TO CHASSIS WITH NO SIGNAL INPUT.
3. USE AC VTVM FOR 1KC/S SIGNAL TRACING: VOLUME CONTROL MAXIMUM CLOCKWISE; FILTERS OFF, ALL OTHER CONTROLS NORMAL.
4. ▭ INDICATES LEVELS RESULTING FROM 1.8mV 1KC SIGNAL AT TAPE HEAD INPUT. PA OUTPUT WHICH RESULTS IS 18V ACROSS 8Ω.
5. REAR SECTION OF DUAL CONTROLS IS USED IN LEFT CHANNEL; FRONT SECTION IN RIGHT.
6. TRANSISTORS Q9, Q10 AND Q11 ARE LOCATED ON SMALL CHASSIS HEAT SINK
7. RESISTORS R89-92 ARE 220-OHM, TWO-WATT RESISTORS IN SOME SETS. THE CHANGE TO 330 OHMS DOES NOT AFFECT PERFORMANCE.

P946
AW2254A
SHEET 2 OF 2

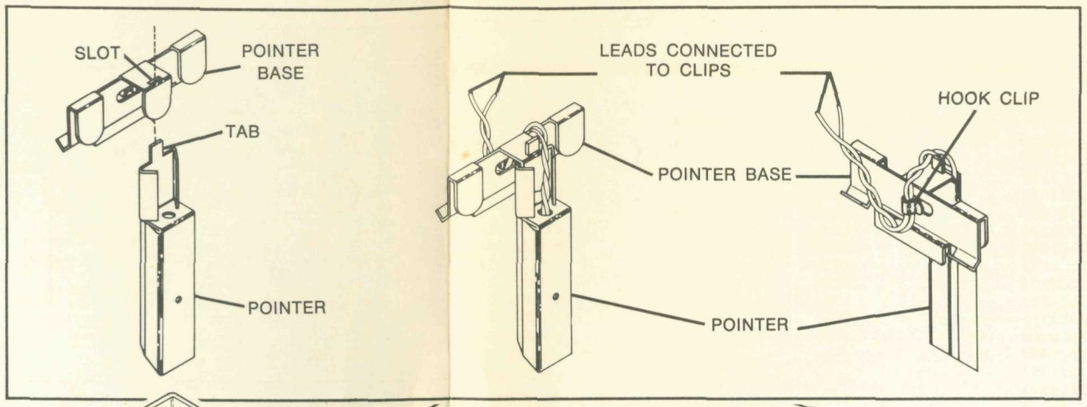


TUNING METER CALIBRATION

- Connect FM generator output leads to antenna terminals.
- Set generator output to 100 mV, ±22.5 kc deviation at 400 cps.
- Adjust meter control (on IF printed-circut board) for tuning meter indication of 4.

MUTING CONTROL ADJUSTMENT

- Connect FM generator output leads to antenna terminals and AC VTVM to right or left RCDR jack.
- Set generator and tuner to 98 mc. Modulate generator with 400 cps to ±75 kc deviation.
- Rotate muting-level (behind FISHER nameplate) to maximum counterclockwise (CCW) position.
- Set FM generator output attenuator for 8 uV and make a note of the signal amplitude (AC VTVM reading) at the RCDR jack.
- Push in MUTING pushbutton and adjust muting-level control (on IF printed-circuit board) for a reading 1 to 5 db lower than previously noted. Reduce generator output to zero — no signal (noise) should be at the RCDR jack.
- Increase generator output to 20 uV. Note reading on the AC VTVM.
- Adjust the muting-level control (behind nameplate) until AC VTVM reading decreases 1 to 3 db.
- Set generator output attenuator for 100 uV signal to the antenna terminals. Signal at the RCDR jack should be about the same level as before it was adjusted in the previous step. Reduce generator output to 10 uV. No signal or noise should be at the RCDR jacks.



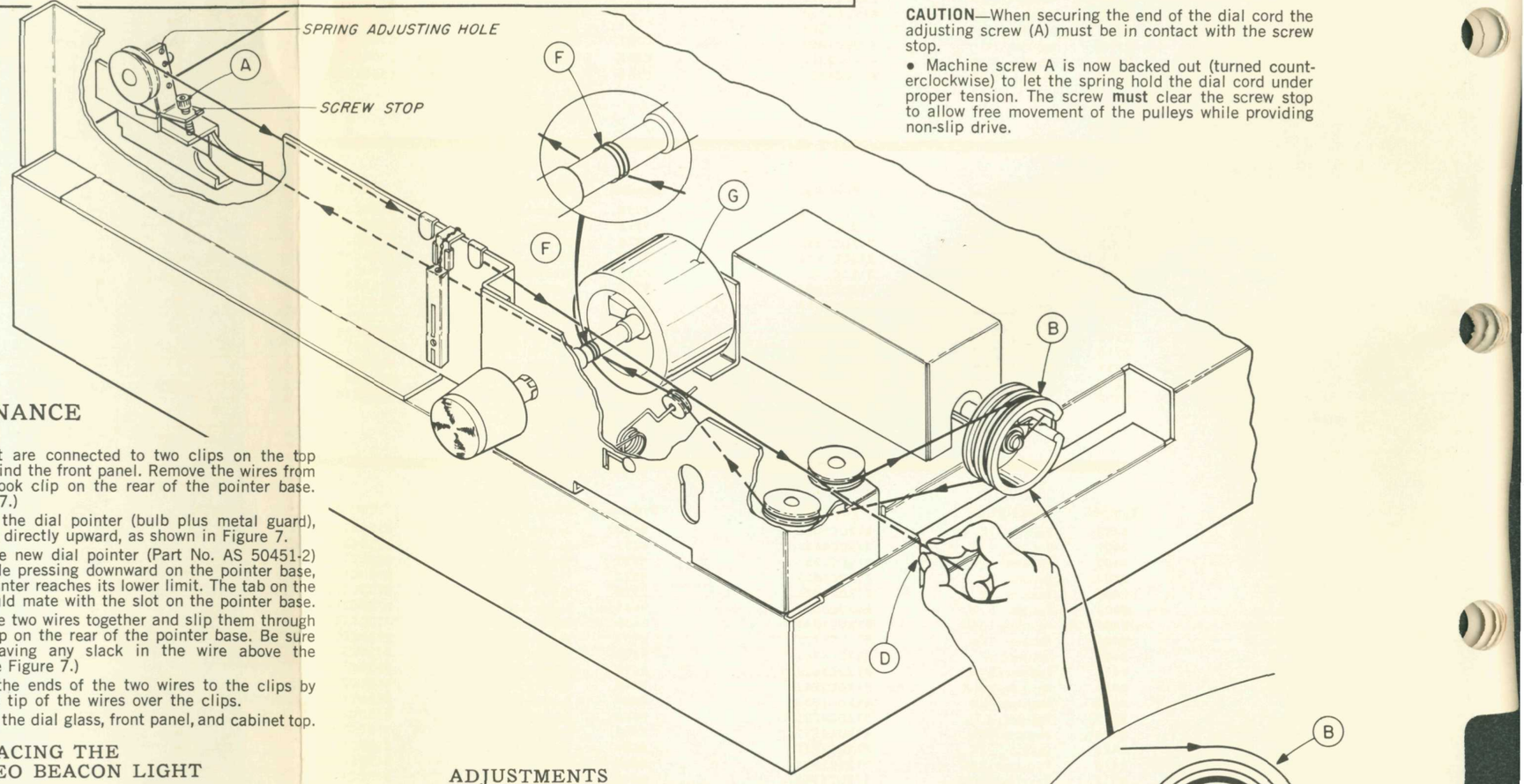


FIGURE 1

DIAL STRINGING

- Turn tension-relief screw A to maximum clockwise position. With screw A set to its maximum-IN position the dial cord can be pulled as tightly as possible (just *before securing the loose end*) without stretching the tension spring. This is not an adjustment screw. It is used only for easier dial-cord stringing.
- Rotate tuning-capacitor-drive drum B to its maximum clockwise position, as shown.
- Tie dial cord to ear C (in capacitor-drive drum) as shown in Figure 1. Dial cord goes through slot in drum and is set in the inner groove.
- Thread dial cord around pulleys (as shown) to point D.
- While holding dial cord taut with left hand, rotate the tuning-capacitor-drive drum to its maximum counterclockwise position with the right hand.
- Wrap the end of the dial cord around the body of the machine screw (E) in the hub of the drive drum and tighten. The cord goes under the flat washer.

CAUTION—When securing the end of the dial cord the adjusting screw (A) must be in contact with the screw stop.

- Machine screw A is now backed out (turned counterclockwise) to let the spring hold the dial cord under proper tension. The screw **must** clear the screw stop to allow free movement of the pulleys while providing non-slip drive.

ADJUSTMENTS

- Slippage of dial cord wrapped around drive shaft F indicates need for increased tension — move tension spring to a higher locating hole.
- If flywheel (G) does not rotate freely and smoothly, move spring to a lower locating hole.

NOTE: Nylon pulleys generally do not need lubrication. If roughness or noise occurs during tuning, silicone or other high-temperature grease may be applied to moving parts. Accumulations of dust should be removed **before** any lubricant is applied. Often cleaning will eliminate the need for lubrication.

INS230

FRONT PANEL MAINTENANCE

1. CLEANING THE DIAL GLASS

(1) *Remove the front panel. Disconnect the set from* AC power as a precaution. Remove all knobs, but not the pushbuttons. Remove the three hex nuts located at the points occupied by the Volume control, the Selector switch and the Speakers switch. Then lift off the front panel.

(2) Loosen the screws that retain the clips to the dial glass. (When you replace the dial glass, make certain to rest it by placing it firmly against the lower left-hand corner.) Swing the clips aside, and then lift off the glass.

(3) Remove lust with a dry rag. If you wish to clean more thoroughly, ***use a soap and water solution only;*** if you use any stronger cleaning agent, you may damage the markings on the glass.

2. REPLACING DIAL LAMPS

First, disconnect the AC power cord as a precaution. Remove the front panel as described above. The lamps are held in place by spring clips and can be removed with the fingers. Replace with a new lamp from your FISHER Dealer (Part Number 1-50441-1).

3. REPLACING THE DIAL POINTER LIGHT

(1) Remove the top of the metal cabinet, after loosening the screws which fasten it in place.

(2) Remove the front panel and dial glass as described in the paragraph above. The two wires from the dial pointer light are connected to two clips on the top chassis, behind the front panel. Remove the wires from the small hook clip on the rear of the pointer base. (See Figure 7.)

(3) Remove the dial pointer (bulb plus metal guard), by sliding it directly upward, as shown in Figure 7.

(4) Slide the new dial pointer (Part No. AS 50451-2) upward, while pressing downward on the pointer base, until the pointer reaches its lower limit. The tab on the pointer should mate with the slot on the pointer base.

(5) Twist the two wires together and slip them through the hook clip on the rear of the pointer base. Be sure to avoid leaving any slack in the wire above the pointer. (See Figure 7.)

(6) Secure the ends of the two wires to the clips by pressing the tip of the wires over the clips.

(7) Replace the dial glass, front panel, and cabinet top.

4. REPLACING THE STEREO BEACON LIGHT

(1) Remove the top of the metal cabinet, after loosening the screws which hold it in place.

(2) Remove the two wires of the STEREO BEACON lamp from the two clips located atop the chassis, behind the front panel.

(3) Remove the bulb (Part No. 150461-3) from the cylinder which houses the STEREO BEACON jewel, and replace it with a new bulb.

(4) Fit the ends of the two wires from the lamp over the clips.

(5) Replace the cabinet top.

PARTS DESCRIPTION LIST

CAPACITORS

10 % tolerance for all fixed capacitors, unless otherwise noted or marked GMV (guaranteed minimum value).

Symbol	Description	Part No.	Symbol	Description	Part No.
C1	Ceramic, 21pF, 5 % , N750, 1000V	C50070-32	C31	Electrolytic, 1uF, 250V	C50475-5
C2, 3	Ceramic, 1000pF, GMV, 500V	C50089-2	C32, 33	Electrolytic, 50uF, 35V	C50483-4
C4	Ceramic, 8pF, 5 % , NPO, 1000V	C50070-45	*C34	Electrolytic, 200uF, 35V	C50483-7
C5	Trimmer, 2-8uF	C662-123	C35	Ceramic, Feedthru, 1000, GMV	C592-187
C6	Tuning, Variable	C966117-1	C36	Electrolytic, 500uF, 35V	C50483-17
C7	Trimmer, 2-8uF	C662-123	C37	Electrolytic, 3-section, 50uF, 200V	C50180-70
C8	Ceramic, 8pF, 5 % , NPO, 1000V	C50070-45	C38, 39	Electrolytic, 3000uF, 40V	C50180-60BX
C9	Ceramic, 24pF, 5 % , N150, 1000V	C50070-8	C40	Electrolytic, 100uF, 50V	C50180-71
C10	Ceramic, 68pF, 5 % , N750, 1000V	C50070-35	C41	Molded, .01uF, 20 % , 600V	C2747
C11	Ceramic, 100pF, 5 % , N1500, 1000V	C50070-19	C42, 43	Ceramic, 100pF, N1500, 1000V	C50070-6
C12, 13	Ceramic, 100pF, N1500, 1000V	C50070-6	C44, 45	Ceramic, 680pF, 1000V	C50072-2
C14	Trimmer, 2-8uF	C662-123	C46, 47	Mylar, .33uF, 250V	C50633-2
C15	Ceramic, 10pF, ±.5pF, P100, 500V	CC20AJ100D5	C48, 49	Electrolytic, 200uF, 15V	C50483-13
C16	Ceramic, 120pF, N1500, 1000V	C50070-9	C50, 51	Electrolytic, 1000uF, 25V	C50483-14
C17	Ceramic, 1000pF, 1000V	C50072-3	C52, 53	Electrolytic, 100uF, 25V	C50483-6
C18, 19	Ceramic, .02uF, +80—20 % , 100V	C50095-1	C54, 55	Electrolytic, 100uF, 25V	C50483-6
C20, 21	Ceramic, Feedthru, 1000, GMV	C592-187	C56, 57	Ceramic, 300pF, 1000V	C50072-39
C22, 23	Ceramic, Feedthru, 1000, GMV	C592-187	C58, 59	Ceramic, 120pF, N1500, 1000V	C50070-9
C24, 25	Ceramic, .02uF, +80—20 % , 100V	C50095-1	C60, 61	Ceramic, 300pF, 1000V	C50072-39
C26	Ceramic, .02uF, +80—20 % , 100V	C50095-1	C62, 63	Ceramic, 300pF, 1000V	C50072-39
C27, 28	Ceramic, 100pF, GMV, N1500, 1000V	C50070-5	C64, 65	Ceramic, 100pF, N1500, 1000V	C50070-6
C29	Electrolytic, 4uF, 35V	C50483-1	C66	Electrolytic, 50uF, 35V	C50483-4

*Not used in all units.

RESISTORS AND POTENTIOMETERS

Deposited Carbon, in ohms, 5 % tolerance, 1/8-watt, unless otherwise noted. K=Kilohms, M=Megohms.

Symbol	Description	Part No.	Symbol	Description	Part No.
R1	Composition, 270, 10 % , 1/2 W	RC20BF271K	R37, 38	1M	R12DC105J
R2	220K	R12DC224J	R39	Composition, 820K, 10 % , 1/2 W	RC20BF824K
R3	390	R12DC391J	R40, 41	560K	R12DC564J
R4	1.2K	R12DC122J	R42, 43	56K	R12DC563J
R5	18K	R12DC183J	R44, 45	39K	R12DC393J
R6	1K	R12DC102J	R46, A, B	Potentiometer, 100K, Dual, Tone	R50160-155
R7	22K	R12DC223J	R47, A, B	Potentiometer, 100K, Dual, Tone	R50160-155
R8	1.5K	R12DC152J	R48, 49	1.8K	R12DC182J
R9	100K	R12DC104J	R50, 51	Potentiometer, 50K, Dual, Balance	R50160-157
R10	Potentiometer, 500K, Muting Level Control	R50150-10	R52, 53	Potentiometer, 50K, Dual, Volume	R50160-151
R11	2.7K	R12DC272J	R54, 55	150	R12DC151J
R12	Composition, 100K, 10 % , 1/2 W	RC20BF104K	R56, 57	150, 10 % , 3W	RPG3W151K
R13, 14	47K	R12DC473J	R58, 59	WW. 270, 5 % , 2W	RW200W271J
R15, 16	220K	R12DC224J	R61	W.W. 100, 5 % , 2W	RW200W101J
R17	100K	R12DC104J	R62, 63	W.W. 220, 5 % , 2W	RW200W221J
R18	Composition, 560, 10 % , 1/2 W	RC20BF561K	R64, 65	Potentiometer, 10, D.C. Balance	R50160-142-1
R19	Composition, 1K, 10 % , 1/2 W	RC20BF102K	R66, 67	W.W. 100, 5 % , 2W	RW200W101J
R20	Composition, 2.2K, 10 % , 1/2 W	RC20BF222K	R68, 69	W.W. 220, 5 % , 2W	RW200W221J
R21	Composition, 82, 10 % , 1/2 W	RC20BF820K	R70, 71	Potentiometer, 10, D.C. Balance	R50160-142-1
R22	100K	R12DC104J	R72, 73	W.W. 270, 5 % , 2W	RW200W271J
*R23	Composition, 68K, 10 % , 1/8 W	RC20BF683K	R74, 75	W.W. 1, 5 % , 3W	RL300W010J
*R24	Composition, 18K, 10 % , 1/2 W	RC20BF183K	R76, 77	W.W. 1, 5 % , 3W	RL300W010J
R25, 26	47K	R12DC473J	R78, A, B	W.W. Dual, 1.5 +1.5, 10 % , 10W	R50500-3
R27	Composition, 39, 10 % , 1/2 W	RC20BF390K	R79, 80	3.9K	R12DC392J
R28	Composition, 4.7K, 10 % , 1/2 W	RC20BF472K	R81, 82	W.W. 330, 5 % , 2W	RW200W331J
R29	Composition, 39, 10 % , 1/2 W	RC20BF390K	R83, 84	W.W. 220, 5 % , 2W	RW200W221J
R30	W.W. 560, 5 % , 2W	RW200W561J	R85, 86	8.2K	R12DC822J
R31	Composition, 1.2K, 10 % , 1/2 W	RC20BF122K	R87, A, B	W.W. Dual, 4 +4, 10 % , 10W	R50500-4
R32	W.W. 560, 5 % , 2W	RW200W561J	R89, 90	W.W. 330, 5 % , 2W	RW200W331J
R33, 34	47K	R12DC473J	R91, 92	W.W. 330, 5 % , 2W	RW200W331J
R35	W.W. 1, 5 % , 3W	RL300W010J	R93	W.W. 100, 5 % , 2W	RW200W101J
R36	Potentiometer, 10, Light Dimmer	R50160-154-1	R94	Composition, 27K, 10 % , 1/2 W	RC20BF273K

*Not used in all units.

PARTS DESCRIPTION LIST

CONTROLS

Symbol	Description	Part No.	Symbol	Description	Part No.
R10	Potentiometer, 500K, Muting Level Control	R50150-10	R70, 71	Potentiometer, 10, D.C. Balance	R50160-142-1
R36	Potentiometer, 10, Light Dimmer	R50160-154-1	S1	Switch, Selector, Input	S946-199
R46, A, B	Potentiometer, 100K, Dual, Tone	R50160-155	S2	Switch, Speakers	S946-216
R47, A, B	Potentiometer, 100K, Dual, Tone	R50160-155	S3	Switch, Power (On Volume Control)	Part of R52
R50, 51	Potentiometer, 50K, Dual, Balance	R50160-157	S4	Switch, Interlock	S946-176
R52, 53	Potentiometer, 50K, Dual, Volume	R50160-151	S5	Switch, Impedance Selector	S50200-2
R64, 65	Potentiometer, 10, D.C. Balance	R50160-142-1	PS1	Switch, P.B., Low Filter, Monitor, Mono	S946-226
			PS2	Switch, P.B., Loudness, Muting, High Filter	S946-225

COILS, CHOKES, TRANSFORMERS

Symbol	Description	Part No.	Symbol	Description	Part No.
L1	Choke, 2.2 Microhenry	L50066-6	L8, 10, 11	Choke, 1 Microhenry	L50066-2
L2	FM Antenna Coil	L966-113	L9, 12	Choke, 1.2 Microhenry	L50066-3
L3	FM RF Coil	L1034-113	T1	Transformer, Power	T946-217
L4	FM Mixer Coil	L966-115	T2	Transformer, Driver, Left Channel	T946-218-1
L5	Oscillator Coil Assembly	AS966-107	T3	Transformer, Driver, Right Channel	T946-218-2
L6	Choke, .68 Microhenry	L50066-1	Z1	FM I.F. Transformer	ZZ50210-45

MISCELLANEOUS

Symbol	Description	Part No.	Symbol	Description	Part No.
CR1, 2, 3, 4	Silicon Rectifier	SR50517	——	Knob, Volume	E50562-1
F1	Fuse, 2.5 Amp, Slo-Blo	F1077-118	——	Knob, Dual, Top, Tone Control	E50563
F2, 3, 4, 5	Fuse, 2 Amp	F775-144	——	Knob, Dual, Bottom, Tone Control	E50564
I1	Lamp, Meter, No. 1847 O.F.	I50009-8	——	Knob, Speaker Selector	E50565-1
I2, 3	Lamp, Dial	I50441-1	——	Knob, Tuning	E50565-2
I4	Lamp, Pointer, part of assembly	AS50451-2	——	Screws, For Cage & Bottom Cover	H50598-7
I5	Lamp, Stereo Beacon	I50461-3	——	Drive Wheel for Variable	E50588
PC1, 2	Printed Circuit, Equalization	PC50187-14	——	Barrier Strip, Antenna	E50596
PC3, 4	Printed Circuit, Tone	PC50489	——	Barrier Strip, Speaker	E50596
SR1	Rectifier, Selenium	SR50253-2	——	Lamp Holder, Stereo Beacon	E946-175
SR2	Rectifier, Selenium	SR50597-2	——	Insulator, Transistor Socket	
Q1, 3, 5, 7	Transistor, 35524	TR35524	——	Socket, Transistor	X50509
Q2, 4, 6, 8	Transistor, 35144	TR35144	——	Jack, Phone	J50545
Q9, 10	Transistor, 2N2148	TR2N2148	——	Nameplate Assembly, Dress Panel	AS946-228
Q11	Transistor, 40022	TR40022	——	Dial Glass	N946-203
——	Front End	P966-2	——	Meter, Tuning Indicator	M946-213
V1	Tube, EC900/6HA5	V-EC900	——	Printed Circuit Board, I.F.	PB1094
V2, 3	Nuvistor, 6CW4	V-6CW4	——	Printed Circuit Board, MPX	PB1181
——	Insert, Dress Panel, Screened (Upper)	AS946-201	——	Printed Circuit Board, Pre-Amp	PB1095 or PB1240
——	Insert, Dress Panel, Screened (Lower)	AS946-202	——	Printed Circuit Board, Audio	PB1096
——	Knob, Balance	E50561	——	Printed Circuit Board, Power Supply	PB1195

If replacement parts are out of stock, locally, they may be obtained directly from the Parts Department of FISHER Radio Corporation. They will be shipped "best way", either prepaid or C.O.D. unless otherwise specified.

For instrument-operation information and technical assistance write Richard Hamilton, Customer Service Department, FISHER Radio Corporation, Long Island City, New York 11101.

PARTS DESCRIPTION LIST

P 1094

Symbol	Description	Part No.
R301	Resistor, 6.8K	R12DC682J
R302	Resistor, 3.3K	R12DC332J
R303	Resistor, 3.3K	R12DC332J
R304	Resistor, 100	R12DC101J
R305	Resistor, 18K	R12DC183J
R306	Resistor, 33K	R12DC333J
R307	Resistor, 180K	R12DC184J
R308	Resistor, 6.8K	R12DC682J
R309	Resistor, 3.3K	R12DC332J
R310	Resistor, 47	R12DC470J
R311	Resistor, 3.3K	R12DC332J
R312	Resistor, 22	R12DC220J
R313	Resistor, 100K	R12DC104J
R314	Resistor, 12K	R12DC123J
R315	Resistor, 6.8K	R12DC682J
R316	Resistor, 3.3K	R12DC332J
R317	Resistor, 3.3K	R12DC332J
R318	Resistor, 1K	R12DC102J
R319	Resistor, 3.3K	R12DC332J
R320	Resistor, 6.8K	R12DC682J
R321	Resistor, 3.3K	R12DC332J
R322	Resistor, 1K	R12DC102J
R323	Resistor, 390K	R12DC394J
R324	Resistor, 2.7K	R12DC272J
R325	Resistor, 3.3K	R12DC332J
R326	Resistor, 6.8K	R12DC682J
R327	Resistor, 180K	R12DC184J
R328	Resistor, 330	R12DC331J
R329	Resistor, 1.5K	R12DC152J
R330	Resistor, 15	R12DC150J
R331	Resistor, 1K	R12DC102J
R332	Resistor, 1K	R12DC102J
R333	Resistor, 6.8K	R12DC682J
R334	Resistor, 6.8K	R12DC682J
R335	Vari. Resistor, 1K	R50B498-7
R336	Vari. Resistor, 500K	R50B498-9
C301	Capacitor, 330	C50B569-1
C302	Capacitor, 0.22UF/160V	C50B575-2
C303	Capacitor, 0.01UF/100V	C50B570-1
C304	Capacitor, 1000	C50B569-4
C305	Capacitor, 1000	C50B569-4
C306	Capacitor, 1000	C50B569-4
C307	Capacitor, 5000	C50B567-2
C308	Capacitor, 1000	C50B569-4
C309	Capacitor, 1000	C50B569-4
C310	Capacitor, .01UF/100V	C50B570-1
C311	Capacitor, 5000	C50B567-2
C312	Capacitor, .01UF/100V	C50B570-1
C313	Capacitor, 680	C50B569-2
C314	Capacitor, 1000	C50B569-4
C315	Capacitor, .22UF/160V	C50B575-2
C316	Capacitor, .01UF/100V	C50B570-1
C317	Capacitor*, 4UF/35V	C50483-1
C318	Capacitor, 680	C50B569-2
C319	Capacitor*, 4UF/35V	C50483-1
C320	Capacitor, 1000	C50B569-4
C321	Capacitor*, 100UF/15V	C50483-5
C322	Capacitor, .01UF/100V	C50B570-1
C323	Capacitor, 330	C50B569-1
C324	Capacitor, 330	C50B569-1
C325	Capacitor*, 10UF/35V	C50483-2
Q301	Transistor, 2N2654	TR2N2654
Q302	Transistor, 2N2654	TR2N2654
Q303	Transistor, 2N2654	TR2N2654
Q304	Transistor, 2N2654	TR2N2654
Q305	Transistor, 2N2654	TR2N2654
Q306	Transistor, 2N2712	TR2N2712
Q307	Transistor, 2N2712	TR2N2712
Z301	IF Transformer	ZZ50C210-46
Z302	IF Transformer	ZZ50C210-46
Z303	Limiter	ZZ50C210-47
Z304	Dynamic Limiter	ZZ50C210-52B
Z305	Ratio Detector	ZZ50C210-55
CR301	Diode, AA112	V50A260-16
CR302	Diode, AA112	V50A260-16
——	Printed Circuit Board	PB1094B110
——	Transistor Spacer	A50618A

P 1096

Symbol	Description	Part No.
R201	Resistor, 270K	R12DC274J
R202	Resistor, 6.8K	R12DC682J
R203	Resistor, 330K	R12DC334J
R204	Resistor, 180K	R12DC184J
R205	Resistor, 10K	R12DC103J
R206	Resistor, 560K	R12DC564J
R207	Resistor, 180	R12DC181J
R208	Resistor, 47K	R12DC473J
R209	Resistor, 33K	R12DC333J
R210	Resistor, 3.9K	R12DC392J
R211	Resistor, 47K	R12DC473J
R212	Resistor, 2.7K	R12DC272J
R213	Resistor, 100K	R12DC104J
R214	Resistor, 3.9K	R12DC392J
R215	Resistor, 27K	R12DC273J
R216	Resistor, 2.2K	R12DC222J
R217	Resistor, 68K	R12DC683J
R218	Resistor, 22K	R12DC223J
R219	Resistor, 5.6K	R12DC562J
R220	Resistor, 1.5K	R12DC152J
R221	Resistor, 100K	R12DC154J
R222	Resistor, 220K	R12DC224J
R223	Resistor, 1K	R12DC102J
R224	Resistor, 15K	R12DC153J
R225	Resistor, 8.2K, ½W	RC20BF822J
R226	Resistor, 100	R12DC101J
R227	Resistor, 6.8K, ½W	RC20BF682K
C201	Capacitor, .22UF	C50B575-2
C202	Capacitor, 2	C50B568-1
C203	Capacitor, .5UF/70V	C50483-11
C204	Capacitor*, 4UF/25V	C50483-1
C205	Capacitor*, 4UF/25V	C50483-1
C206	Capacitor, .039UF	C50B575-4
C207	Capacitor*, 50UF/10V	C50483-15
C208	Capacitor*, 4UF/25V	C50483-1
C209	Capacitor*, 4UF/25V	C50483-1
C210	Capacitor*, 4UF/25V	C50483-1
C211	Capacitor, 82	C50B568-2
C212	Capacitor*, 4UF/25V	C50483-1
C213	Capacitor, 500UF/10V	C50483-9
C214	Capacitor, .5UF/70V	C50483-11
C215	Capacitor*, 4UF/35V	C50483-1
Q201	Transistor	2N2613
Q202	Transistor	2N2614
Q203	Transistor	2N2613
Q204	Transistor	2N2614
Q205	Transistor	2N2614
Q206	Transistor	2N2614
Q207	Transistor	2N2614
——	Printed Circuit Board	PB1096-110
——	Transistor Spacer	E50A624

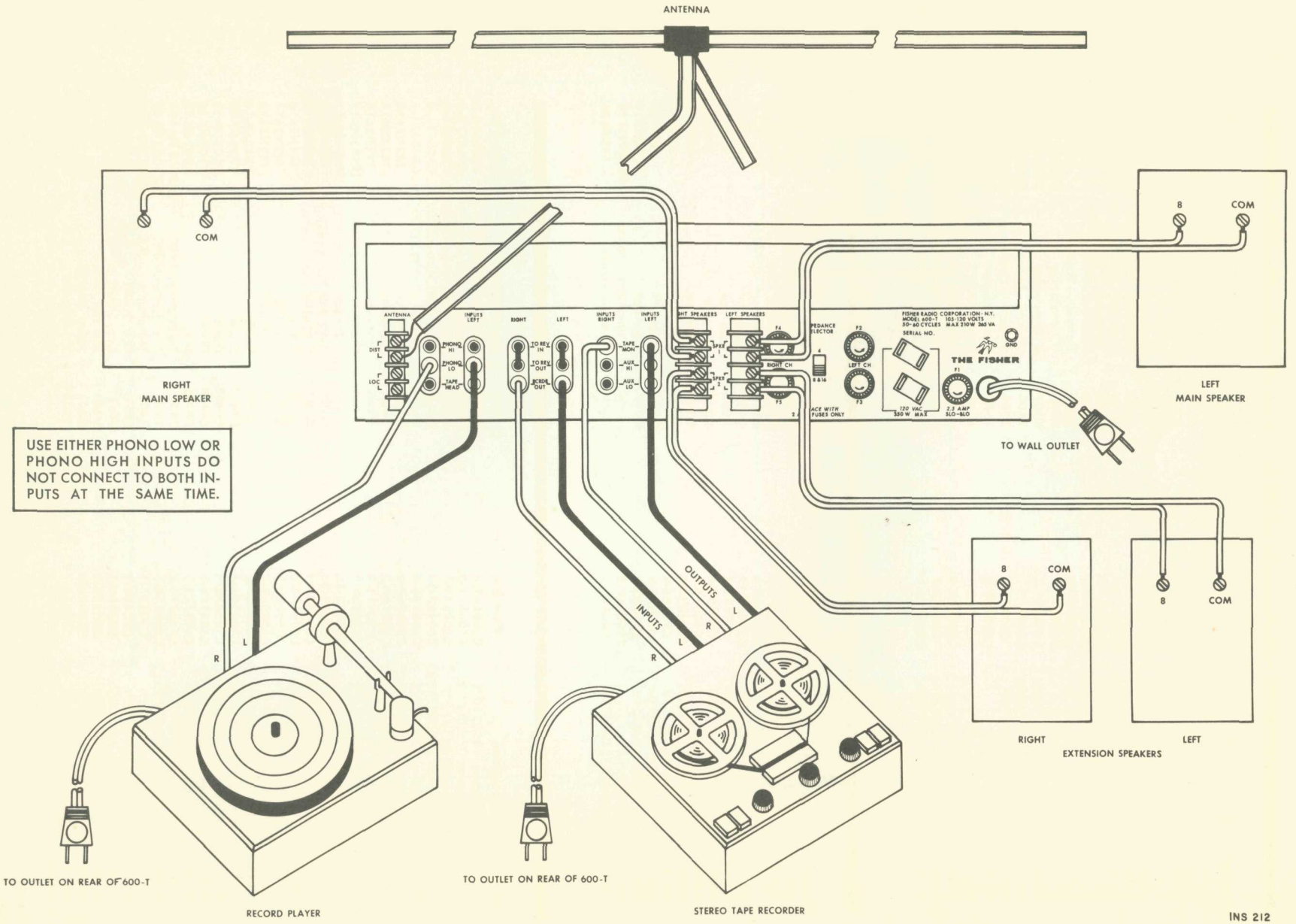
P 1181

Symbol	Description	Part No.
R401	Resistor, 1K	R12DC102J
R402	Resistor, 5.6K	R12DC562J
R403	Resistor, 12K	R12DC123J
R404	Resistor, 56	R12DC560J
R405	Resistor, 1K	R12DC102J
R406	Resistor, 5.6K	R12DC562J
R407	Resistor, 100K	R12DC104J
R408	Resistor, 27K	R12DC273J
R409	Resistor, 47	R12DC470J
R410	Resistor, 5.6K	R12DC562J
R411	Resistor, 220K	R12DC224J
R412	Resistor, 10K	R12DC103J
R413	Resistor, 4.7K	R12DC472J
R414	Resistor, 68K	R12DC683J
R415	Resistor, 27K	R12DC273J
R416	Resistor, 150K	R12DC154J
R417	Resistor, 390K	R12DC394J
R418	Resistor, 1K	R12DC102J
R419	Resistor, 22K	R12DC223J
R420	Resistor, 1K	R12DC102J
R421	Resistor, 2.2K	R12DC222J
R422	Resistor, 220	R12DC221J
R423	Resistor, 2.2K	R12DC222J
R424	Resistor, 22K	R12DC223J
R425	Resistor, 390K	R12DC394J
R426	Resistor, 2.2K	R12RC222J
R427	Resistor, 5.6K	R12DC562J
R428	Resistor, 2.2K	R12DC222J
R429	Resistor, 120K	R12DC124J
R430	Resistor, 150K	R12DC154J
R431	Resistor, 2.2K	R12DC222J
R432	Resistor, 15K	R12DC153J
R433	Resistor, 1.2K	R12DC122J
R434	Resistor, 1.2K	R12DC122J
R435	Resistor, 390K	R12DC394J
R436	Resistor, 15K	R12DC153J
R437	Resistor, 120K	R12DC124J
R438	Resistor, 5.6K	R12DC562J
R439	Resistor, 5.6K	R12DC562J
R440	Resistor, 2.2K	R12DC222J
R441	Resistor, 2.2K	R12DC222J
R442	Resistor, 47K	R12DC473J
R443	Resistor, 390K	R12DC394J
R444	Resistor, 47K	R12DC473J
R445	Resistor, 5.6K	R12DC562J
R446	Resistor, 47K	R12DC473J
R447	Resistor, 47K	R12DC473J
R448	Resistor, 5.6K	R12DC562J
R449	Resistor, 47K	R12DC473J
R450	Resistor, 390K	R12DC394J
R451	Resistor, 27K	R12DC273J
R452	Resistor, 560	R12DC561J
R453	Resistor, 560	R12DC561J
R454	Resistor, 27K	R12DC273J
R455	Vari. Resistor, 10K	R50B498-2
C401	Capacitor*, 100UF/15V	C50483-5
C402	Capacitor*, 4UF/35V	C50483-1
C403	Capacitor*, 4UF/35V	C50483-1
C404	Capacitor, 1000/10%	C50B569-3
C405	Capacitor, .022UF/5%	C50B574-3
C406	Capacitor, .01UF/5%	C50B574-1
C407	Capacitor*, 200UF/15V	C50483-13
C408	Capacitor, 2700/10%	C50B569-5
C409	Capacitor, 5000/20%	C50B567-2
C410	Capacitor, 5000/20%	C50B567-2
C411	Capacitor*, 4UF/35V	C50483-1
C412	Capacitor, 1000/10%	C50B569-3
C413	Capacitor, 3900/5%	C50B573-22
C414	Capacitor*, 50UF/10V	C50483-15
C415	Capacitor*, 50UF/10V	C50483-15
C416	Capacitor, .022UF/5%	C50B574-3
C417	Capacitor*, 4UF/35V	C50483-1
C418	Capacitor, 680/10%	C50B569-2
C419	Capacitor, 5000/20%	C50B567-2
C420	Capacitor, .039UF/10%	C50B574-4
C421	Capacitor, .22UF/5%	C50B575-3
C422	Capacitor, .01UF/5%	C50B574-1
C423	Capacitor, .01UF/5%	C50B574-1
C424	Capacitor, .01UF/5%	C50B574-1
C425	Capacitor, .01UF/5%	C50B574-1
C426	Capacitor*, 4UF/35V	C50483-1
C427	Capacitor*, 4UF/35V	C50483-1
C428	Capacitor*, 4UF/35V	C50483-1
C429	Capacitor*, 4UF/35V	C50483-1
C430	Capacitor*, 4UF/35V	C50483-1
C431	Capacitor*, 4UF/35V	C50483-1
C432	Capacitor, 470/5%	C50B573-5
C433	Capacitor, 910/5%	C50B573-6
C434	Capacitor, 910/5%	C50B573-6
C435	Cap. Silver Mica, 4700/5%	C50B571-2
C436	Cap. Silver Mica, 6200/5%	C50B571-4
C437	Cap. Silver Mica, 3900/5%	C50B571-1
Q401	Transistor	TR2N2614
Q402	Transistor	TR2N2614
Q403	Transistor	TR2N2614
Q404	Transistor	TR50260-17
Q405	Transistor	TR50260-17
Q406	Transistor	TR2N2614
Q407	Transistor	TR2N2614
Q408	Transistor	TR2N2614
Q409	Transistor	TR2N2614
Q410	Transistor	TR2N2614
CR401	Diode	V50260-10
CR402	Diode	V50260-10
CR403	Diode	V50260-10
CR404	Diode	V50260-10
CR405	Diode	V50260-10
Z401	Transformer, 19KC	ZZ50C210-49A
Z402	Transformer, 76KC	ZZ50C210-50
Z403	Transformer, 38KC	ZZ50C210-48A
L401	Coil, 20MH	L50334-2
L402	Coil, 20MH	L50334-2
V401	Nuvistor, 6CW4	V6CW4
K401	Relay, 5800Ω	K50A603
XK401	Relay Socket	X50A602-1
——	Printed Circuit Board	PB1181C110

Deposited Carbon, in ohms, 5% tolerance, ⅓-watt, unless otherwise noted. K=Kilohms, M=Megohms.

*Electrolytic type

COMPONENT CONNECTIONS

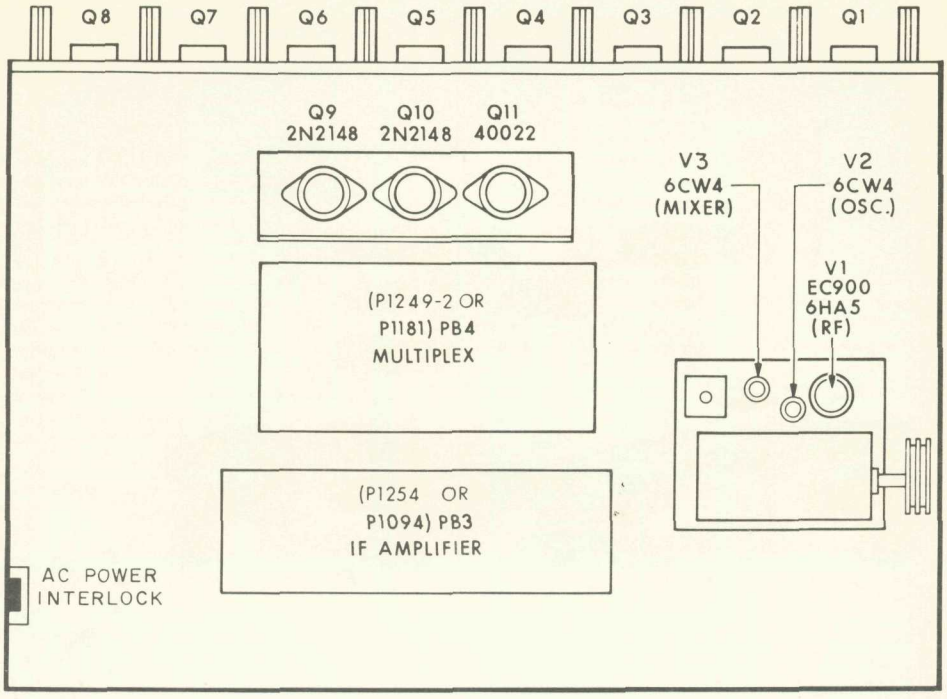


INS 212

CHASSIS LAYOUT

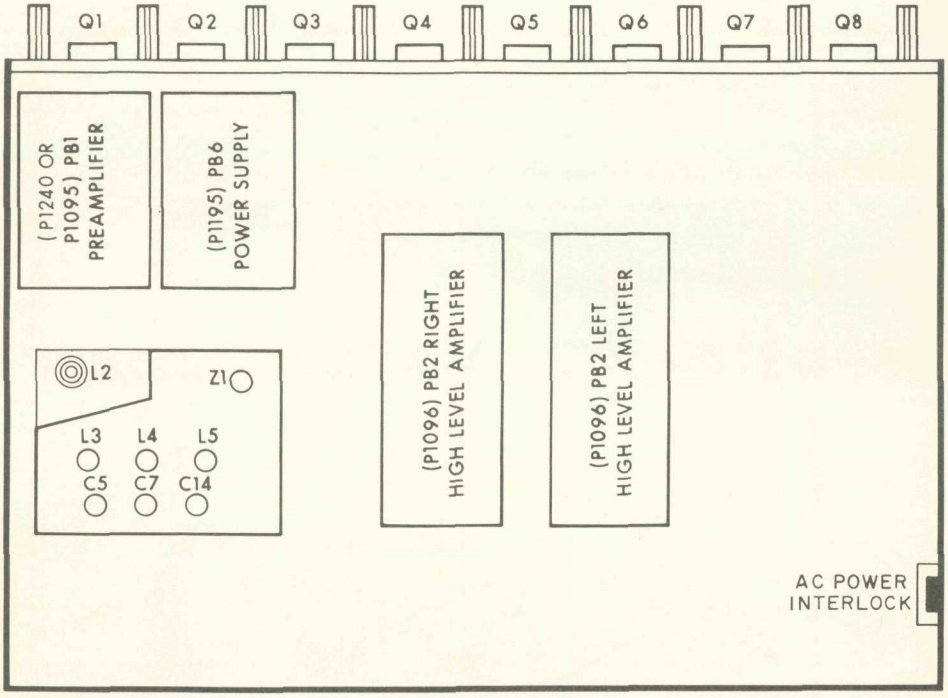
Q1, 3, 5, 7 IS 35524

Q2, 4, 6, 8 IS 35144



INS247

TOP VIEW



INS248

BOTTOM VIEW

FISHER RADIO CORPORATION · NEW YORK

MODEL 600-T

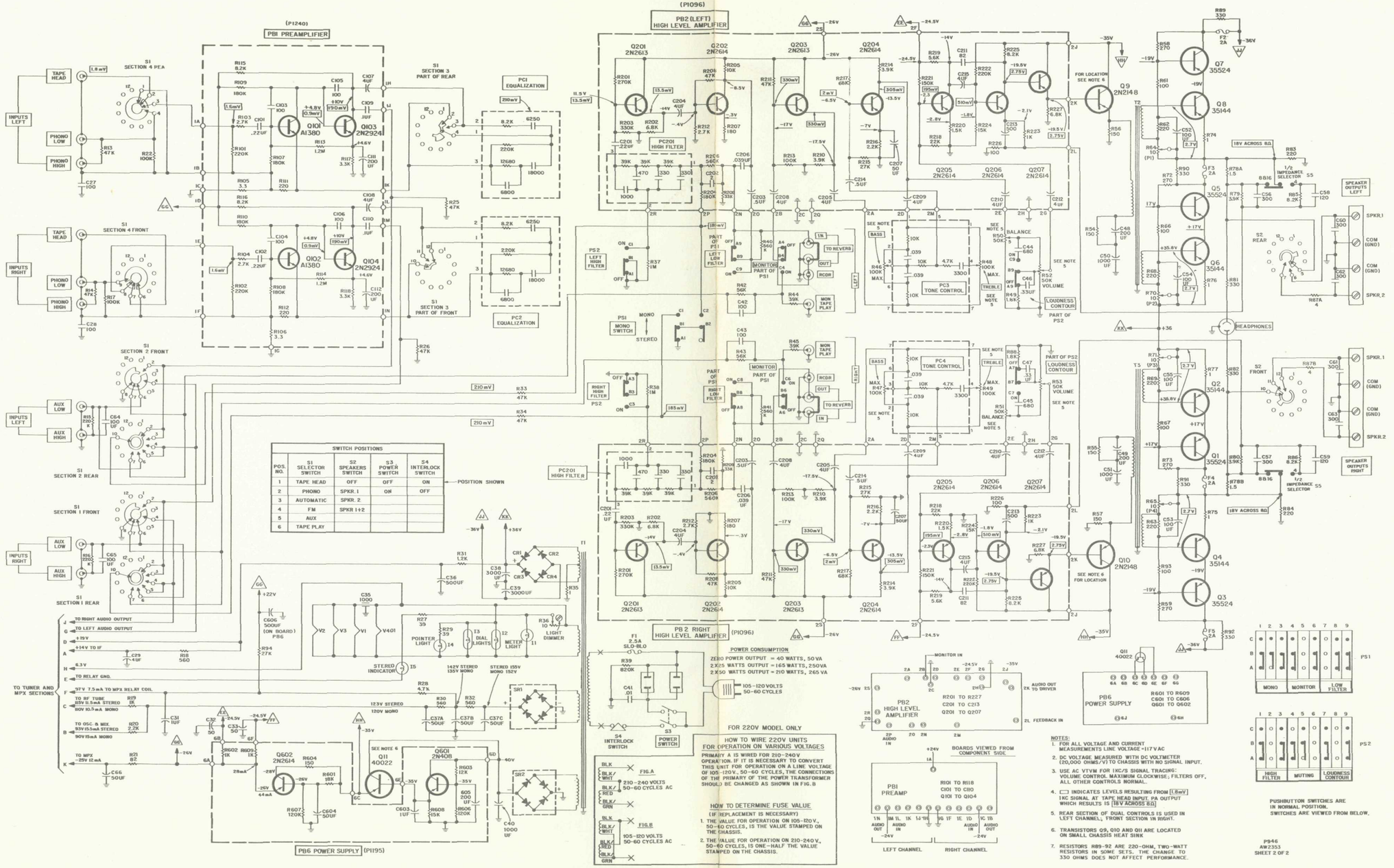
FM-Multiplex Receiver

SCHEMATIC DIAGRAM

Serial Nos. 10001-11000A

PRELIMINARY SERVICE INFORMATION

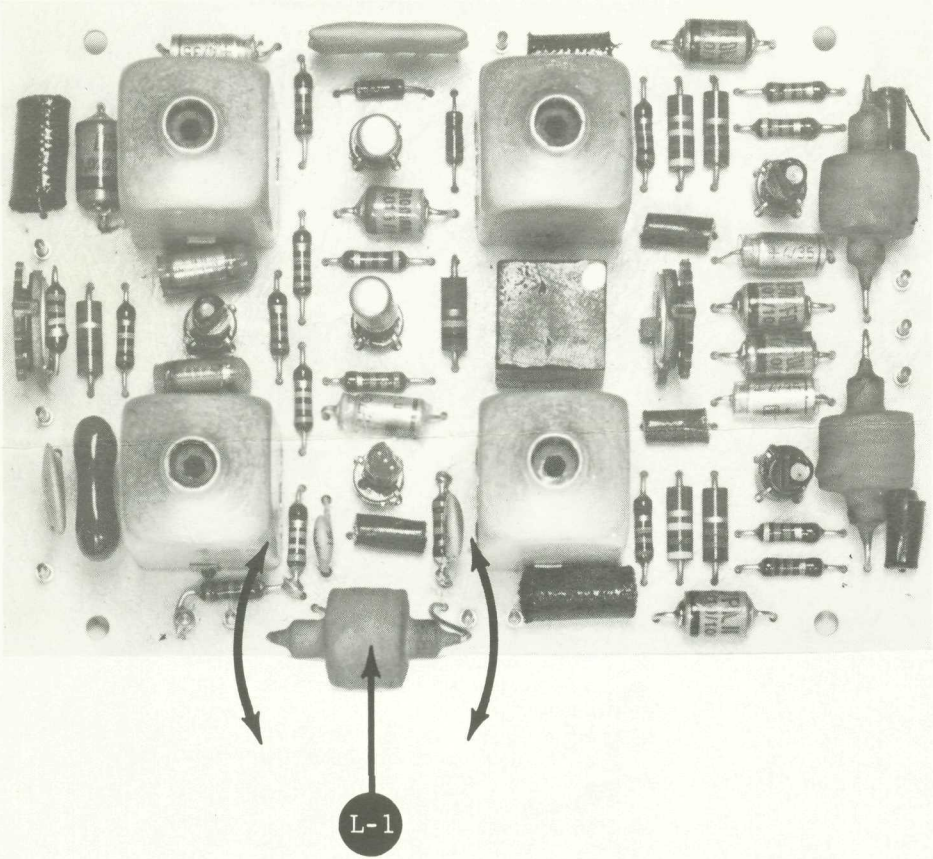
ALTERNATE SCHEMATIC



NOTES:

1. FOR ALL VOLTAGE AND CURRENT MEASUREMENTS LINE VOLTAGE = 117 V AC
2. DC VOLTAGE MEASURED WITH DC VOLTMETER (20,000 OHMS/V) TO CHASSIS WITH NO SIGNAL INPUT.
3. USE AC VTVM FOR 1KC/S SIGNAL TRACING: VOLUME CONTROL MAXIMUM CLOCKWISE; FILTERS OFF, ALL OTHER CONTROLS NORMAL.
4. ☐ INDICATES LEVELS RESULTING FROM 1.8mV 1KC SIGNAL AT TAPE HEAD INPUT. PA OUTPUT WHICH RESULTS IS 18V ACROSS 8Ω
5. REAR SECTION OF DUAL CONTROLS IS USED IN LEFT CHANNEL, FRONT SECTION IN RIGHT.
6. TRANSISTORS Q9, Q10 AND Q11 ARE LOCATED ON SMALL CHASSIS HEAT SINK
7. RESISTORS RB9-92 ARE 220-OHM, TWO-WATT RESISTORS IN SOME SETS. THE CHANGE TO 330 OHMS DOES NOT AFFECT PERFORMANCE.

600-T MULTIPLEX DECODER BOARD



SERVICE BULLETIN
MODEL 600-T

A complaint of hum, on FM or FM-Stereo, may indicate that the SCA Filter Choke has become displaced.

CHOKE L-1, in the photo below, should be re-positioned, as shown by arrows, for minimum hum pick-up.