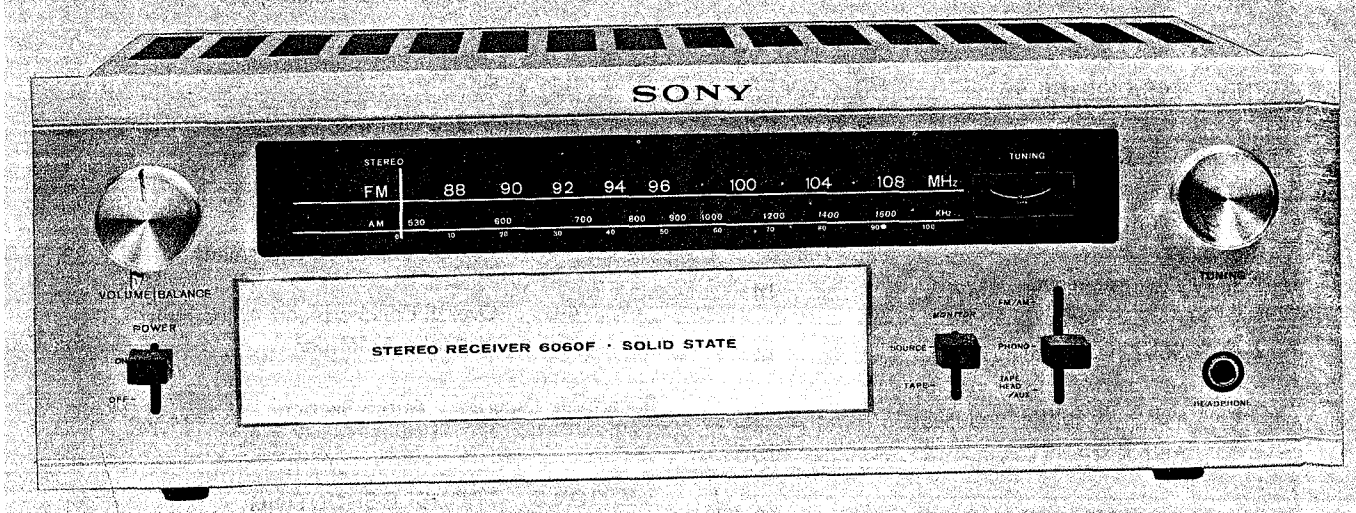
STR-6060FW



Specifications

Dynamic Power Output:	110 watts both channels, 8 ohms
Rated Output:	45 watts per channel, 8 ohms
Semiconductor Complement:	62 all silicon transistors (include 2 FET) 39 diodes
Power Consumption:	Approx 35 watts at zero signal Approx 275 watts at max output
Power Requirement:	110, 117, 220, 240 V AC 50/60 Hz
Dimensions:	17-3/8" x 5-15/16" x 13-3/16" (w.h.d) (440mm x 150mm x 350mm)
Weight:	29 pounds net
Optional Accessory:	Oiled Walnut Cabinet TAC-5E (18-1/2"(w) x 6-1/8"(h) x 14"(d))

SONY®

SERVICE MANUAL

TABLE OF CONTENTS

Page

Specifications 1

SECTION 1 GENERAL DESCRIPTION 3

Block Diagram ..... 9 - 10

Level Diagram ..... 11 - 12

SECTION 2 DISASSEMBLY

2-1 Top Cover and Bottom Plate 13
2-2 Front Panel 13
2-3 Front Panel Assembly 14
2-4 Sub-Chassis Shields 14
2-5 Power Amplifier and Heat Sink Block 15
2-6 Pilot Lamp Replacement 16
2-7 Switch and Control Replacement.. 17
2-8 Tuning Meter Replacement 17
2-9 Volume/Balance Control Replacement 17
2-10 Dial Cord Stringing 18

Chassis Layout 20

SECTION 3 TEST AND ALIGNMENT

3-1 Front End Alignment 21
3-2 FM Discriminator Adjustment 23
3-3 AM IF Alignment 25
3-4 AM Tuner Frequency Coverage and Tracking Alignment 26

Schematic Diagram Tuner Section ..... 28 - 29

WARNING 30

Page

SECTION 4 OVERALL ADJUSTMENT AND TESTS

4-1 Monaural Distortion 31
4-2 Muting Circuit Adjustment 31
4-3 Tuning Meter Adjustment 32
4-4 Dial Pointer Calibration 32
4-5 Stereo Distortion 32
4-6 Channel Separation 32
4-7 Power Amplifier Adjustment ... 33
4-8 Overall Checkout and Adjustment of Audio Amplifier 37

Schematic Diagram Audio Section ..... 34 - 35

SECTION 5 TROUBLE SHOOTING 38

Mounting Diagram

Front End Section (FAF-010A) ..... 39 - 40
FM IF Section ..... 41 - 42
Limiter and Discriminator Section .... 43 - 44
MPX Decoder Section ..... 45 - 46
AM CP·IF Section ..... 47 - 48
Preamplifier Section ..... 49 - 50
Power Amplifier Section ..... 51 - 52
Thermo-compensation Diode 52
Tone Control Section 53
Protection Circuit Board ..... 54 - 55
Power Supply Section 56

Schematic Diagram

(New) FM Front End Section ..... 57 - 58 (FAF-010B)

Mounting Diagram

(New)FM Front End Section ..... 59 - 60 (FAF-010B)

Exploded View ..... 61 - 69

SECTION 1
GENERAL DESCRIPTION

SPECIFICATIONS

FM Tuner Section

Tuning Range:	87 - 108 MHz
Usable Sensitivity:	1.8 microvolts, IHF
S/N Ratio:	65 dB
Capture Ratio:	1.5 dB
Selectivity:	80 dB, IHF
Antenna:	300 ohm balanced 75 ohm unbalanced
Frequency response:	20 - 15,000 Hz ±1 dB
Image Rejection:	80 dB
IF Rejection:	90 dB
Spurious Rejection:	90 dB
AM Suppression:	50 dB
Muting Level:	5 microvolts
Harmonic Distortion:	Mono, 0.3%, Stereo, 0.5%
FM Stereo Separation:	Better than 40 dB at 1 kHz
Stereo, Automatic switching level:	5 microvolts
SCA Suppression:	50 dB
19 kHz, 38 kHz Suppression:	55 dB

AM Tuner Section

Tuning Range:	530 - 1,605 kHz
Sensitivity:	160 microvolts, built-in antenna 10 microvolts, external antenna
S/N Ratio:	50 dB at 5 millivolts input
Antenna:	Built-in ferrite bar antenna and external terminal
Image Rejection:	55 dB at 600 kHz 43 dB at 1,400 kHz
IF Rejection:	38 dB at 1,000 kHz
Harmonic Distortion:	1.5% at 5-millivolt input

Amplifier Section

Dynamic Power output:	110 watts both channels, 8 ohms
Rated Output:	45 watts per channel, 8 ohms
Speaker Output Impedance:	Accepts for 4, 8, 16 ohms
Harmonic Distortion:	Less than 0.2% at rated output Less than 0.08% at 0.5 watts
Intermodulation Distortion:	Less than 0.2% at rated output Less than 0.15% at 0.5 watts
Frequency response:	AUX. TAPE, 20Hz - 60kHz (+0, -3dB) PHONO, RIAA Standard±1.5dB TAPE HEAD NAB Standard + 1.5 dB
Input Sensitivity:	AUX. TAPE: 180 mV, 100K ohms, PHONO: 2.1 mV, 47 K ohms, TAPE HEAD: 1.5 mV, 200K ohms
S/N Ratio:	AUX. TAPE, 100 dB PHONO, 70 dB TAPE HEAD, 60 dB
Recording Output:	160 millivolts, 100k ohms
Headphone Output:	Accepts all low and high Impedance Headphones
Tone Control:	Bass, ±10 dB at 100 Hz Treble, ±10 dB at 10 kHz

General

Semiconductor Complement:	62 all silicon transistors (include 2 FET) 39 diodes
Power Consumption:	Approx 35 watts at zero signal Approx 275 watts at max output
AC Outlet:	Unswitched 300 watts maximum
Dimensions:	17-3/8" x 5-15/16" x 13-3/16" (w.h.d) (440mm x 150mm x 350mm)
Weight:	29 pounds net
Optional Accessory:	Oiled Walnut Cabinet TAC-5E (18-1/2"(w) x 6-1/8"(h) x 14" (d))

This manual provides service information for the SONY Model STR-6060FW AM/FM Stereo receiver.

GENERAL INFORMATION

Tuner

Field effect transistors (are employed in the tuner to) provide excellent sensitivity and noise figure and high overload capacity. A FET in the FM local oscillator provides drift-free operation, eliminating the need for automatic frequency control.

Eight IF stages using six piezoelectric resonators ensure high sensitivity, sharp skirt response, and essentially flat response within the selected channel. This results in excellent adjacent-channel rejection and low distortion on FM broadcasts. An electronic switching system is incorporated into the multiplex section to switch the receiver to stereo or mono

automatically, according to the signal transmitted. The muting circuit (FM) eliminates interstation noise to provide smooth and quiet tuning.

Two piezoelectric resonators are used in the AM tuner section for high sensitivity and adjacent channel rejection.

Control Amplifier

All controls are designed and placed for maximum operating convenience. Secondary controls are located under the hinged front panel. The amplifier delivers up to 110 watts of transient power (55 watts per channel) to an 8 ohm load, measured according to IHF standards. It consists of a flat amplifier, and a power amplifier with an effective power transistor protection circuit.

All equalization, filtering, and tone control functions are performed by passive R-C networks, with feedback-stabilized three-transistor amplifier between them for isolation and gain.

Circuit Description

The following describes the functions of all stages and controls. The description follows the signal path and lists stages by the transistor symbol number at the left margin. Refer to the block diagram on page 9-10 and the schematic diagram on page 28-29, 34-35.

Front-End Section

Stage/Control	Function
Balun L801	Matches either 75-ohm coaxial cable or 300-ohm twin lead to the tuner's input stage.
RF Amplifier Q101	This RF amplifier is designed to provide stable amplification, sharp selectivity at FM broadcast frequencies, and optimum noise figure. Field-effect transistors are ideally suited for this job as they have characteristics similar to that of triodes, and in addition have wide dynamic range. This results in very low cross modulation products. The RF stages employ common-gate circuits (similar to grounded-grid circuits.) Triple-tuned coupling is employed between Q101 and Q102 to provide sharp selectivity, and the winding of L101 is tapped down to match the low input impedance of the common-gate stage.
Local Oscillator Q103	Supplies injection signals to the mixer via L105. The circuit is a Hartley type with feedback applied to the gate through L105. Since temperature changes have little effect on the FET local oscillator, the AFC circuit is eliminated.
Mixer Q102	RF signals and local-oscillator signals are heterodyned in the gate-source junction of Q102 to produce the 10.7 MHz output.
IF Amplifier Q104	IFT101 is a tuned transformer for 10.7 MHz and its low impedance output winding supplies link coupling to the IF AMP Q104.

IF Section

	Function
IF Amplifiers Q201, 202 203, 204 205, 206	These IF stages are basically RC coupled amplifiers that provide essentially flat response. The selectivity of this section is determined by four solid-state filters in the interstage coupling paths. These filters each have four-section solid-state filters that operate in "trapped-energy" modes and have sharp skirt selectivity and flat response inside the pass band. These filters determine overall selectivity in the tuner.
Diode Limiters D201, 202 203, 204 205, 206	Limiting is accomplished by diode pairs, connected in parallel and poled in opposite directions. The diodes conduct when the input signal exceeds the barrier potential of about 0.6 volts. Thus, signal is limited in both directions to 1.2 volts peak-to-peak. The diodes provide symmetrical limiting.
IF Output Q207	Signal at the base of Q207 has had all amplitude variations removed by the preceding limiters, and selected signals have been

Stage/Control	Function
	passed by the solid-state filters.
Q207	Provides power to drive the ratio detector.
Muting Circuit Q209, 210, 211 CF207, D209	The IF signal is extracted from the collector of Q204 and amplified by Q209 (Buffer Amplifier.) Then the signal is passed through solid-state filter CF207 and rectified by D209 to drive the muting circuit. With the muting switch IN, FM signals of average strength keep Q210 normally saturated, cutting off Q211 and maintaining normal operation. Weak station and interstation noises can not produce d-c voltage at the base of Q210 to hold it in conducting. That causes the Q210 to cut off, saturating Q-208. Accordingly audio output is grounded. With the muting switch OUT, Q210 is kept saturated by placing its base at B+. This cuts off Q211, lifting audio output off ground regardless of the strength of the FM signal. RV 202 adjusts the muting level.
Ratio Detector D207, 208 RV201	T201, T202 and diodes D207, D208, form a balanced ratio detector that transforms the frequency-modulated signal into an audio signal. Output appears across R244. RV201 compensates the forward resistance difference between D207 and D208.
Tuning Meter	A null-type meter connected across the balanced output of the ratio detector is used as a tuning indicator. This meter can be switched to indicate AM tuning also.
Emitter Follower Q209	Supplies demodulated signals to the MPX decorder circuit.

MPX Decoder Section

	Function
Q401	This stage serves two functions. The composite stereo signal is extracted from its emitter circuit, and the 19 kHz pilot signal is taken from a tuned circuit, in the collector circuit.
19 kHz Amplifier Q402	The 19 kHz pilot signal, separated by the tuned coupling circuits between Q401 and Q402, is amplified by Q402 to drive the frequency doubler.
Frequency Doubler D401, 402	Signals developed at the collector of Q402 are transformer-coupled to a full-wave rectifier D401, 402. The output of this rectifier is not filtered, and produce two positive pulses for each input cycle. Thus the 19 kHz frequency is effectively doubled by D401 and D402. However, the waveform is not sinusoidal at the base of Q403.
38 kHz Amplifier Q403	The 38 kHz pulses produced by D401, 402 are amplified by Q403. The tank circuit in the collector circuit of Q403 is tuned to 38 kHz to restore the sinusoidal waveshape to the signal. This signal is transformer coupled to the bridge-type demodulator to supply sampling drive for the demodulator.
Multiplex Demodulator D403, 404 405, 406	The demodulator circuit employs diodes in a balanced bridge arrangement. This system has the advantage of cancelling residual components of RF (actually 38 kHz and some 19 kHz as well as higher-order harmonics of these frequencies.) "L" and "R" components are developed at each side of the bridge as the result of the synchronous demodulator, when the tuner operates in the stereo mode. In the mono mode, D403 and D406 are forward biased and are merely small resistances. Under this condition, the monaural signal is applied to both "L" and "R" audio-amplifiers respectively.

Stage/Control	Function
De-emphasis, C411, 412	These capacitors are selected to provide the necessary roll-off at high audio frequencies to compensate for pre-emphasis at the transmitter.
Audio Pre-amplifier Q404, 405 406, 407	Demodulated "L" and "R" signals are amplified enough to drive following preamplifiers by these direct-coupled two-stage amplifiers.
Channel Separation Adj. RV401	The network that connects the emitters of Q404 and Q405 provides a form of negative feedback between left and right channels. Any residual "L" signals in the "R" channel are cancelled out by the inverted "L" signal from the "L" channel. The same is true of residual "R" signals in the "L" channel. RV-401 is therefore set for maximum channel separation.
Twin T Filter	Eliminates the carrier component (38 kHz) to prevent carrier leak.
Pilot and SCA Filters L403, 404	The composite signal fed to the demodulator is coupled from the emitter of Q401 through to antiresonant circuits consisting of C427/L403 and C428/L404. The first of these is tuned to 19 kHz to eliminate the pilot carrier. The second tank tunes to 67 kHz to eliminate the SCA signal.
Noise Amplifier Q408, 409	A two-transistor circuit is employed to prevent the stereo indicator from lighting on interstation noise. Noise signals above 19 kHz are extracted at the emitter of Q401 and applied to the base of Q408. The coupling circuit, R452 and C429, filters out audio and 19 kHz components so that the input signal is primarily high-frequency noise. This noise signal is amplified by Q408 to drive voltage doubler D407, 408. When interstation noise is received, the DC output of D407/408 forces Q409 into conduction. This, in turn, cuts off Q402, preventing amplification of the incoming signal and, therefore, operation of the stereo indicator circuit, Q410, 411. When a stereo signal is received, the signal-to-noise ratio is increased, reducing the noise signal at the base of Q408. Q409 will be cut off and Q402 will conduct, enabling the stereo indicator circuits to operate.
Stereo Indicator Mono/Stereo Switching Circuit Q410, 411 PL806	With the MODE switch is set to STEREO/FM AUTO, stereo indicator will light when an FM stereo signal is received. When a stereo signal is applied to the MPX decorder, 38 kHz pulses are produced at the output of the frequency doubler. The only d-c component of these pulses is fed to the base of Q410, putting it into conduction. This in turn makes Q411 into saturation, lighting the indicator lamp. As the collector of Q411 is connected to the center of the switching transformer L406 through R463, 416, the bias voltage to D403, 406 is eliminated automatically at stereo mode.

AM Tuner Section

Stage/Control	Function
Local Oscillator Q304	Supplies injection signals to the mixer via L301 and C301. The circuit is a modified Hartley circuit with feedback applied to the emitter through L304.
Mixer Q301	RF signals and local-oscillator signals are heterodyned in the base-emitter junction of Q301 to produce the 455 kHz output. IFT301 is a tuned transformer for 455 kHz and its low impedance output winding supplies link coupling to IF AMP Q302.
IF Amplifier Q302	This stage is basically an RC coupled amplifier that provides essentially flat response. The

Stage/Control	Function
	selectivity of this section is determined by two solid-state filters in the interstage coupling paths. The filters provide extremely sharp skirt selectivity and flat response inside the passband.
IF Amplifier Q303	Provides the power to drive diode detector, D301.
AGC Circuit R321, C316	The DC component of detector output (D301) is fed back to the Mixer and IF amplifier stages through R321, C316 to control IF amplifier gain.

Audio Amplifier Section

	Function
Equalizing Amplifier R622, C610, R621 (L) R722, C710 R721 (R) (NAB Head EQ.) R619, C609 R618, C608 (L) R719, C709, R718, C708 (R) (RIAA EQ.)	Equalization is achieved by the negative feedback loop containing these components. In the AUX position of the Function Switch, feedback is applied through R620 to provide a flat response in the Equalizing Amplifier. Should replacement be necessary, make sure that the same component values are used.
Equalizing Amplifier Q601, 602 (L) Q701, 702 (R)	This stage is a direct coupled amplifier which amplifies the small signal produced by a moving magnet or moving coil cartridge, tape head, tape deck, tuner or the signals applied to the AUX input jack, to the level required at the input of the flat amplifier. In addition, RIAA and NAB equalization is accomplished in this section when the Function Switch, S4 is in the PHONO or TAPE HEAD positions, respectively.
Flat Amplifier Q603, 604 605 (L) Q703, 704, Q705 (R)	This direct-coupled 3-stage amplifier increases the signal to the level required at the input of the power amplifier.

Stage/Control	Function
	Negative feedback is applied to produce flat, stable response and proper output impedance for the tone control

Power Amplifier Section

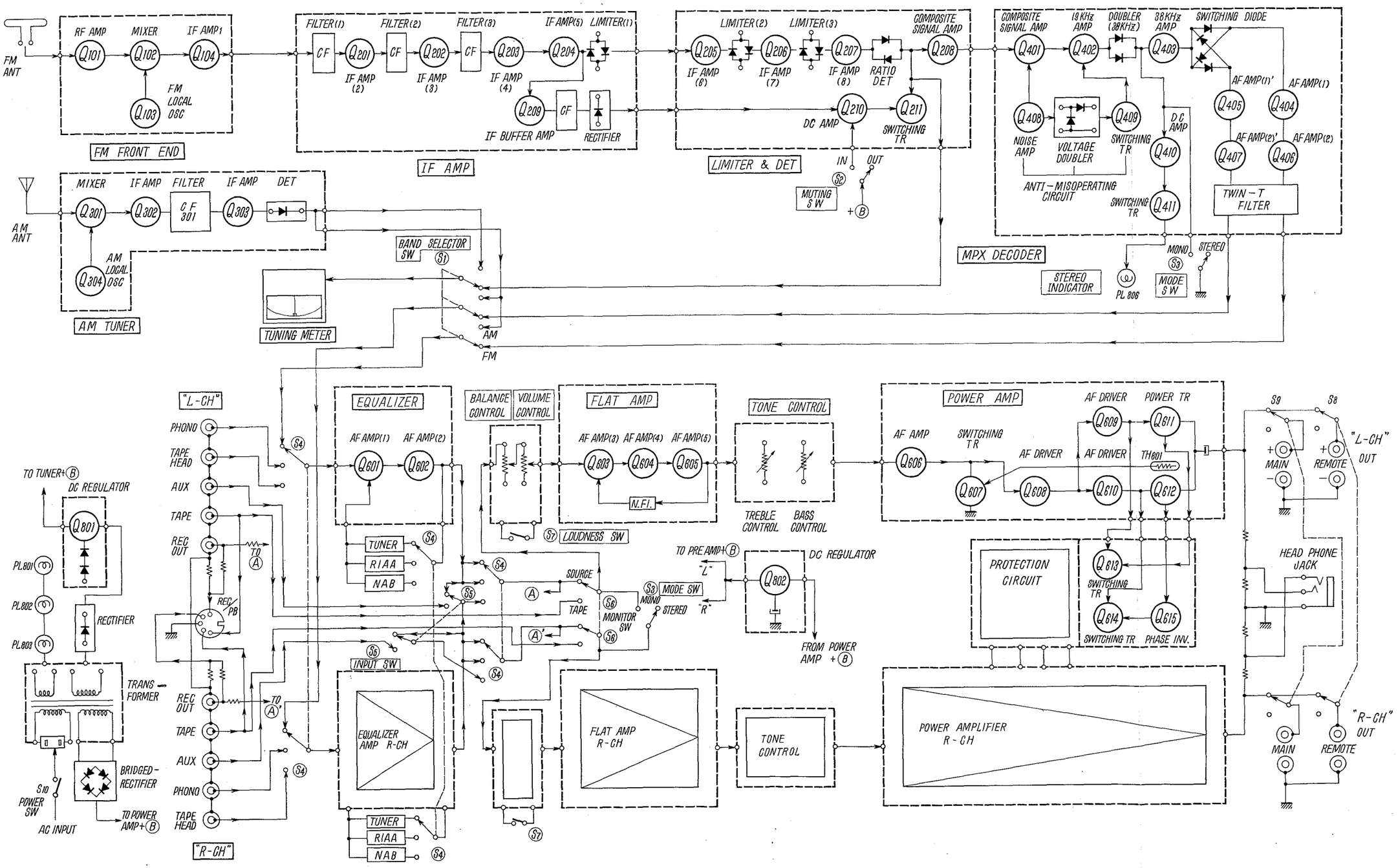
	Function
Voltage Amplifier Q606 (L) Q706 (R)	Resistance-coupled amplifier inserted to provide not only proper matching between tone control and driver stages but also for obtaining a large enough amplification to power the driver stage.
Driver Q608 (L) Q708 (R)	Amplifies the signal to the level required at the power output stages. The voltage drop across D601 - 605/D701 - 705 provides the small amount of forward bias required for "AB" operation of the complementary pairs of output transistors.
Complementary Drivers Q609, 610 (L) Q709, 710 (R)	These transistors operate as emitter followers to provide the current swings demanded of the output stages and also provide the necessary phase inversion.

Protection Circuits

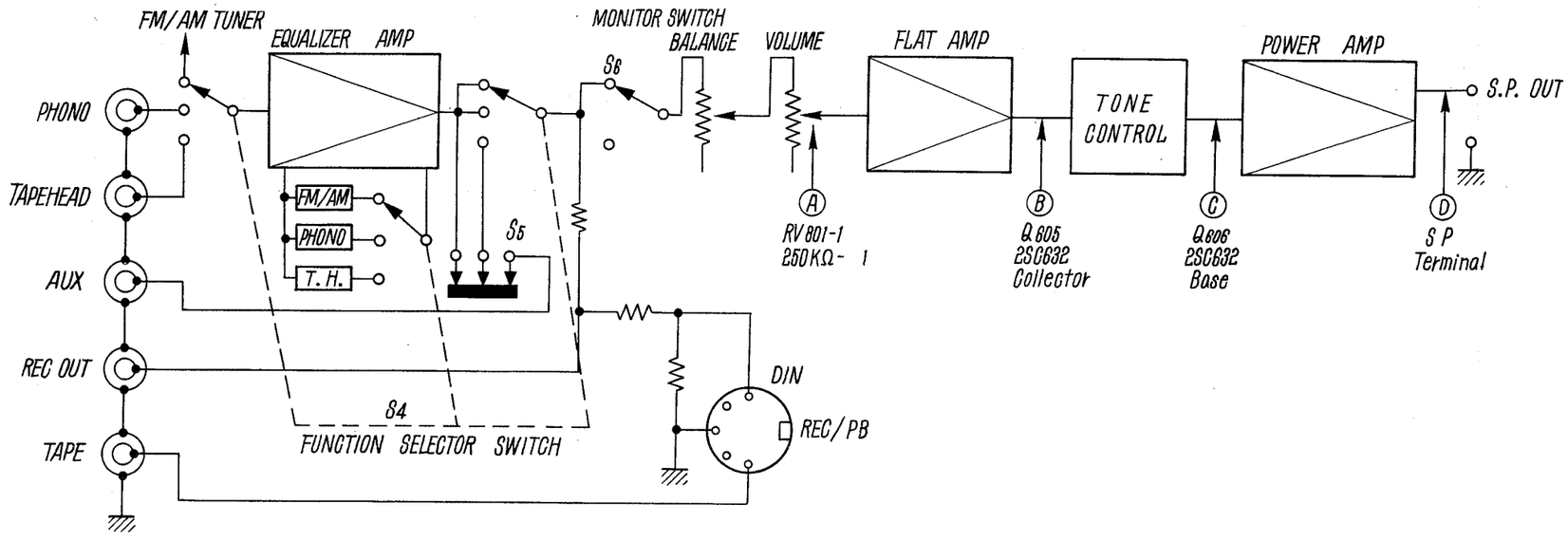
Driver Limiter Q607, TH601(L) Q707, TH701(R)	The voltage at the anode of D808 is fed through thermistor TH601/701 to bias Q607 at cutoff. Excessive heat generated by the output transistors is sensed by the thermistor. The resistance of the thermistor decreases (due to its negative temperature coefficient) and forces Q607/707 into saturation, shorting the output of the voltage amplifiers to ground.
Driver Limiter Q613 (L) Q713 (R)	Q613/713 limits the positive-going half cycle drive voltage applied to the base of Q609/709 when the output terminal is shorted and excessive current flows in output transistors Q611 /711.

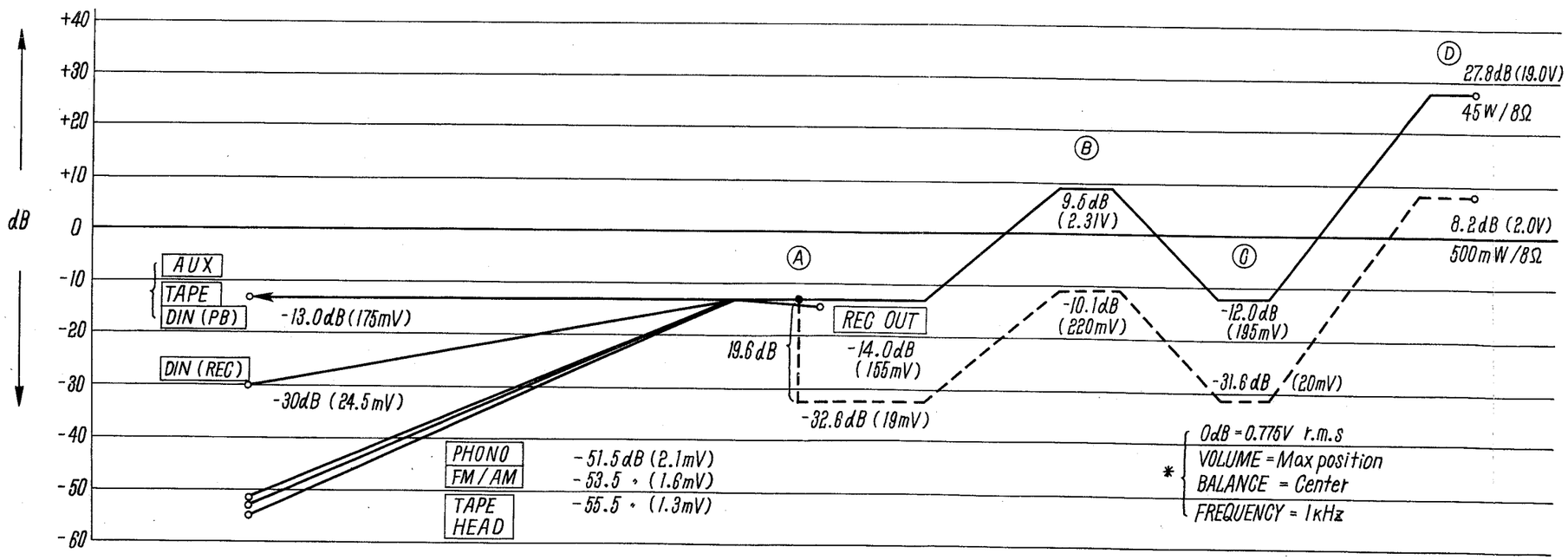
Stage/Control	Function
Driver Limiter Q614, 615 (L) Q714, 715 (R)	These transistors limit the drive voltage during the negative-going half cycle when the output terminal is shorted to reduce excessive current in output transistors Q612/712. The above driverlimiters operate as follows. If the output terminal is shorted and excessive current flows in Q611/711 during the positive half cycle, the excessive current produces a large voltage drop across R611/761 emitter resistor. This voltage is applied to the base of Q613/713, putting it into conduction. Since the collector and emitter of Q613 /713 is connected between the base of Q609/709 (driver) and the center line, the input driving voltage is reduced. Similarly, during the negative half cycle, excessive current through Q612/712 produces a voltage drop across R622/762 which is applied to the phase inverter Q615/715. This turns on Q614/714, reducing the input driving voltage to Q610/710.
AC Balance Adj. RV601 (L) RV701 (R)	Supplies bias voltage to Q608/ 708 and determines the center line voltage. Minimum harmonic distortion at rated output is adjusted by RV601/701.
DC Bias Adj. RV602 (L) RV702 (R)	Determines the current through Q611, 612/711, 712 at zero signal. By adjusting this resistor, the cross-over distortion, which occurs in the nonlinear region of the power transistor when small signals are applied can be eliminated.
Electronic Filter for Preamplifier Q802	Q802 serves as an electronic filter to supply 78 volts to the preamplifier sections. R805 determines the conduction of Q802 and therefore output voltage. The filter capacitors in the base circuit of Q802 act as the equivalent of very much larger capacitors across the output.
Powr Amplifiers Q611, 612 (L) Q711, 712 (R)	Push-pull power output transistors. Output is coupled to the speakers through C631 (L) and C731 (R).
Rectifiers D801 - 804	Diodes D801 - 804 form a full-wave bridge rectifier to supply B+ to all stages.
DC Regulated Power Supply for Tuner Section Q801	Q801 serves as a series regulator and electronic filter to supply 15 volts to the AM/FM tuner and Multiplex Decorder Sections. A constant voltage is maintained at the base of Q801 by zener diodes D806, 807.

Block Diagram



Level Diagram





SECTION 2

DISASSEMBLY

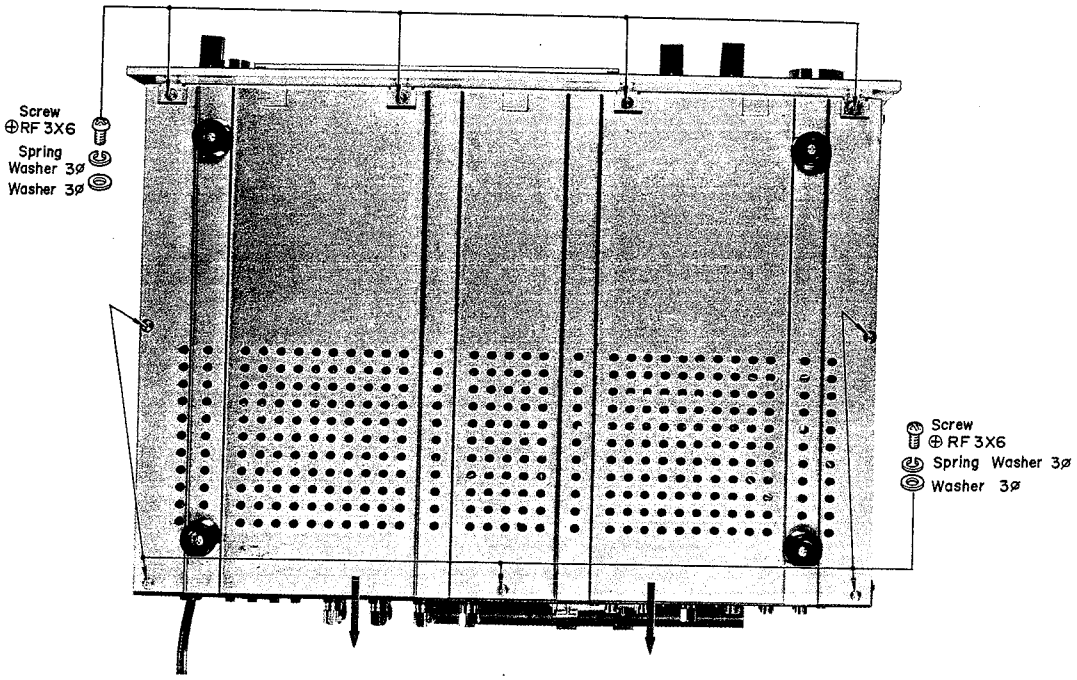


Fig. 2-1

2-1. Removal of Top Cover and Bottom Plate

(a) Remove the two machine screws at each side of the receiver and lift the top cover straight up.

(b) Remove the five Phillips-head screws at the bottom of the receiver and pull the bottom plate towards the rear of the tuner. See Fig. 2-1.

2-2. Front Panel Removal

(a) Remove the top cover.

(b) Remove all control knobs. Tuning, Volume Control and Lid for control panel can be removed by loosening the slotted set screws and pulling the knobs straight out. The Power, Monitor and Mode switch knobs are simply pulled off. See Fig. 2-2.

(c) Remove the four Phillips-head screws (+ RF 4ϕx6) behind the top edge of the Front Panel assembly (The vertical bracket that mounts the dial and tuning meters.) See Fig. 2-3.

(d) Turn the receiver over and remove the four Phillips-heads screws (+ RF 3ϕx6) at the front-bottom edge of the chassis. See Fig. 2-1. This frees the front panel.

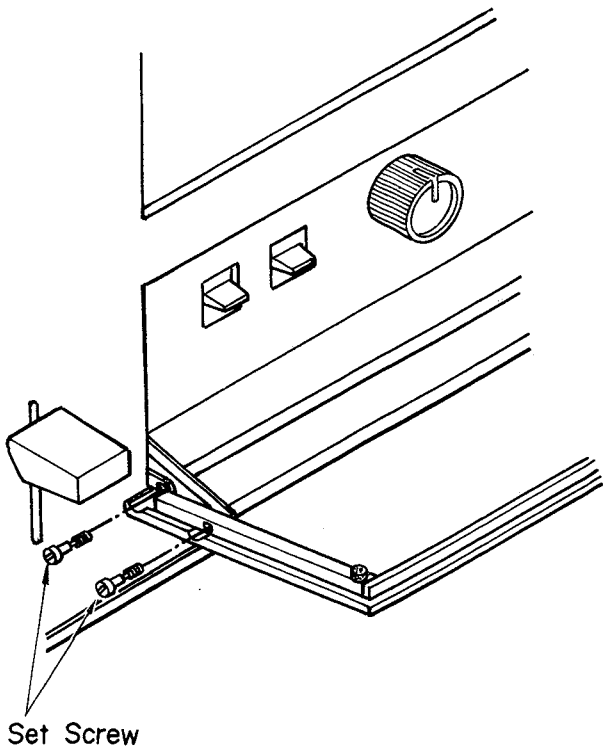


Fig. 2-2

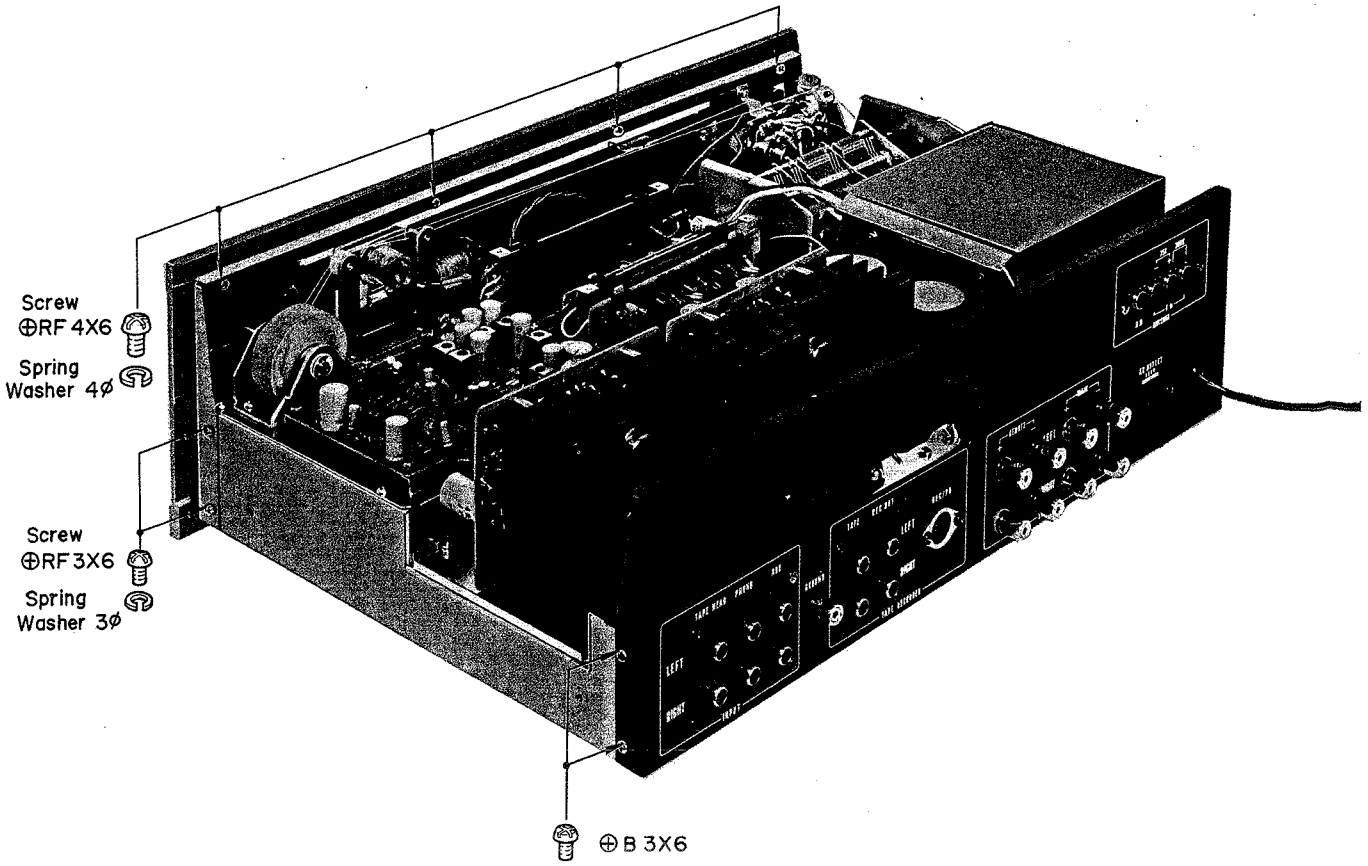


Fig. 2-3

2-3. Removal of the Front Panel Assembly

The Front Panel Assembly is the vertical bracket at the front of the receiver.

(a) Remove the cover and bottom plate. See Fig. 2-1.
It is not necessary to remove the knobs of Front Panel except tuning, volume and balance control knobs.

(b) Remove the two machine screws (+ B 3ϕx6) on both sides of chassis. See Fig. 2-3

(c) Remove the three Phillips-head screws (+ RF 3ϕx6) from the Volume/Balance Control Bracket. See Fig. 2-4.

(d) The Front Panel Assembly is now free, and can be tilted forward and down as shown in Fig. 2-5. Place protective pads under the Front Panel to keep it from being scratched.

2-4. Removal of Sub-Chassis Shields

(a) Remove the cover and bottom plate.

(b) To remove the shield cover for the Front End section, remove two Phillips-head screws (+ RF 3ϕx6) and lift off. See Fig. 2-6.

(c) To remove the shield cover on the IF-Detector section, remove four Phillips-head screws (+ RF 3ϕx6) and lift off the shield cover. See Fig. 2-6.

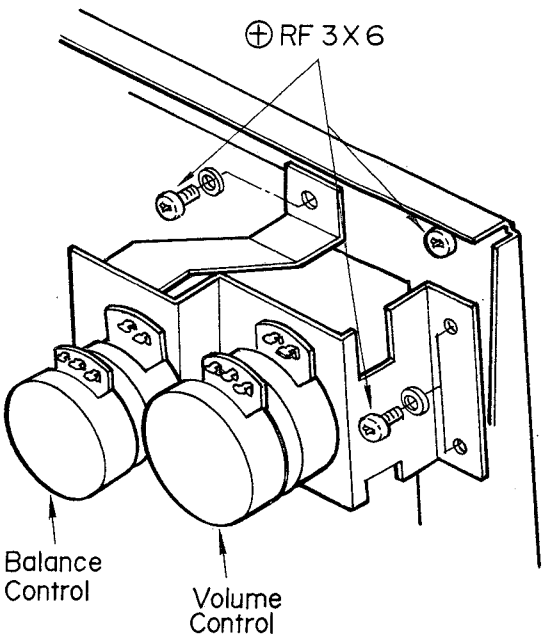


Fig. 2-4

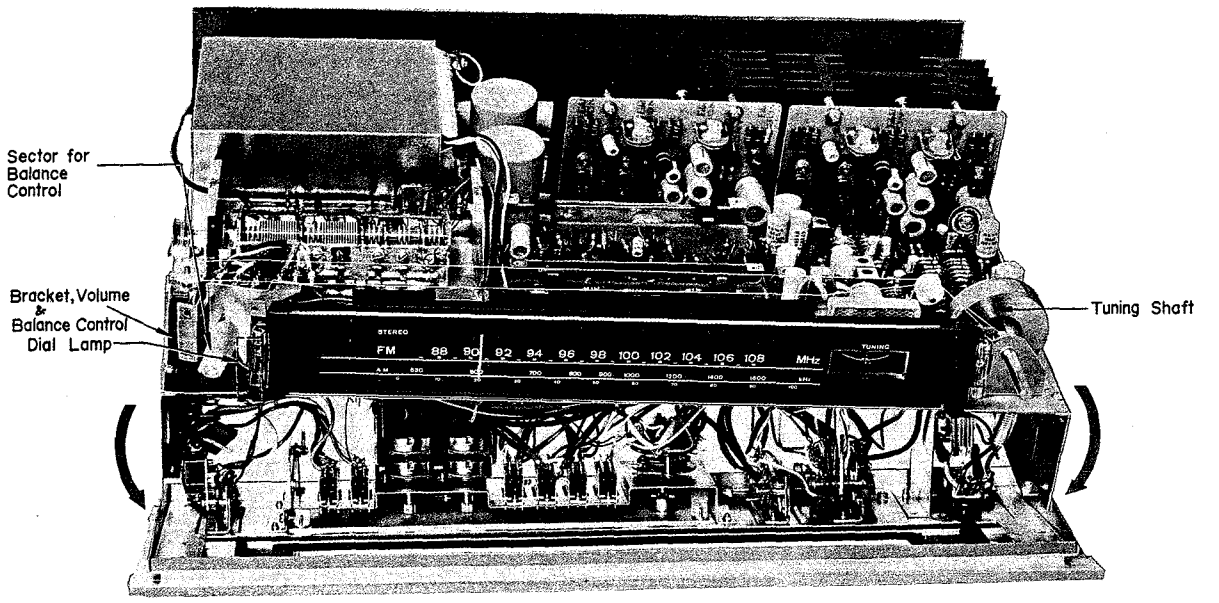


Fig. 2-5

2-5. Removal of Power Amplifier & Heat Sink Block

(a) Remove the cover plate.

(b) Remove six Phillips-head screws(+ RF 3φx6) from power amplifier and heat sink block. See Fig. 2-7.

(c) This block can now be tilted and released from the chassis. See Fig. 2-8.

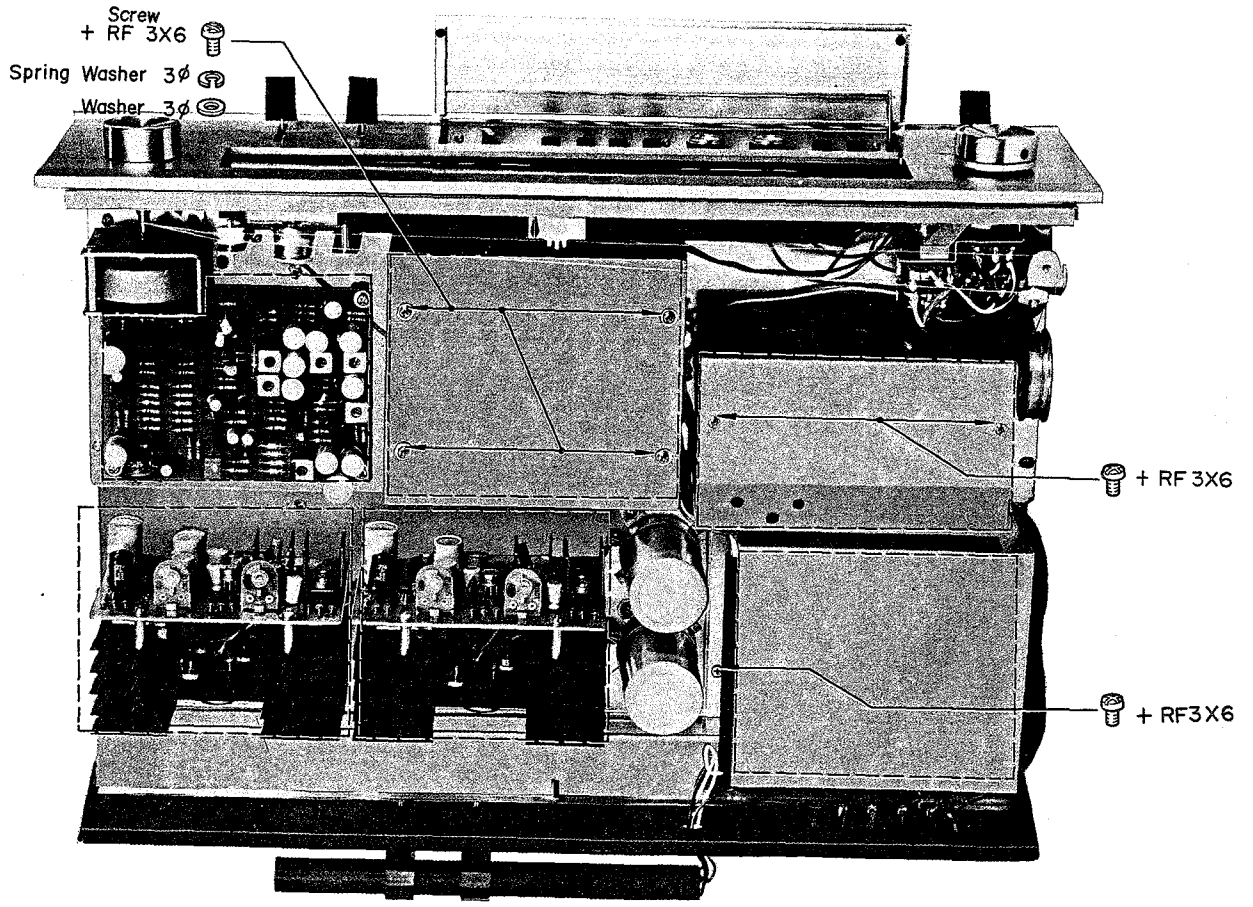


Fig. 2-6

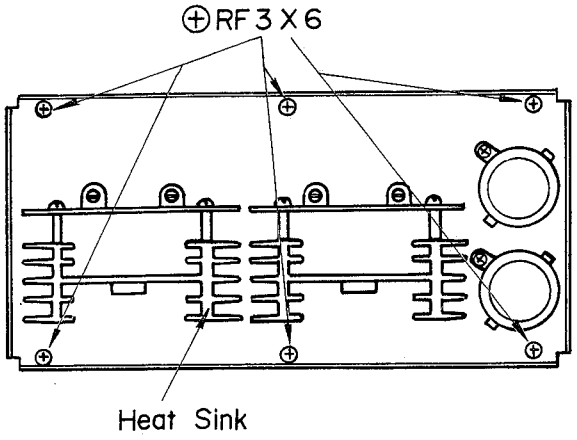


Fig. 2-7

2-6. Pilot Lamp Replacement

(a) Unplug the AC power cord.

(b) Remove the top cover. See Section 2-1.

Meter Lamp

(a) Remove the shield cover on the IF-Detector section.

(b) Grasp the lamp socket with a pair of pliers and slide it off the lamp socket bracket. See Fig. 2-9.

(c) Unscrew the pilot lamp from the socket and install the repalcement.

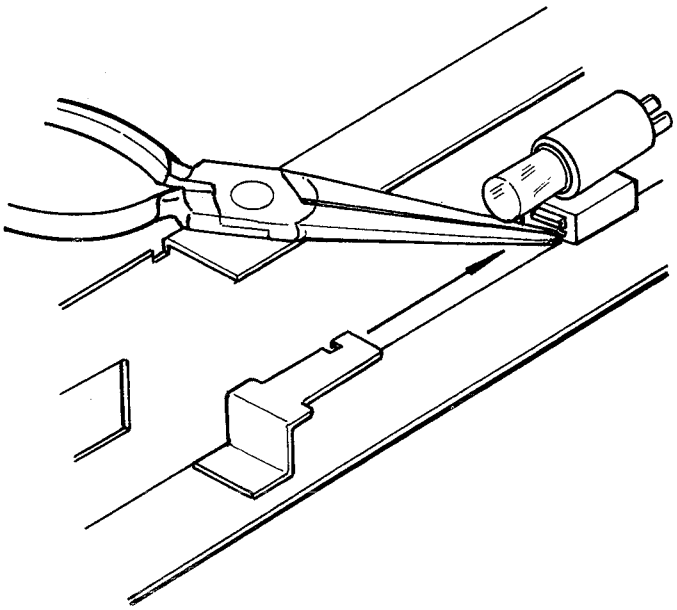


Fig. 2-9

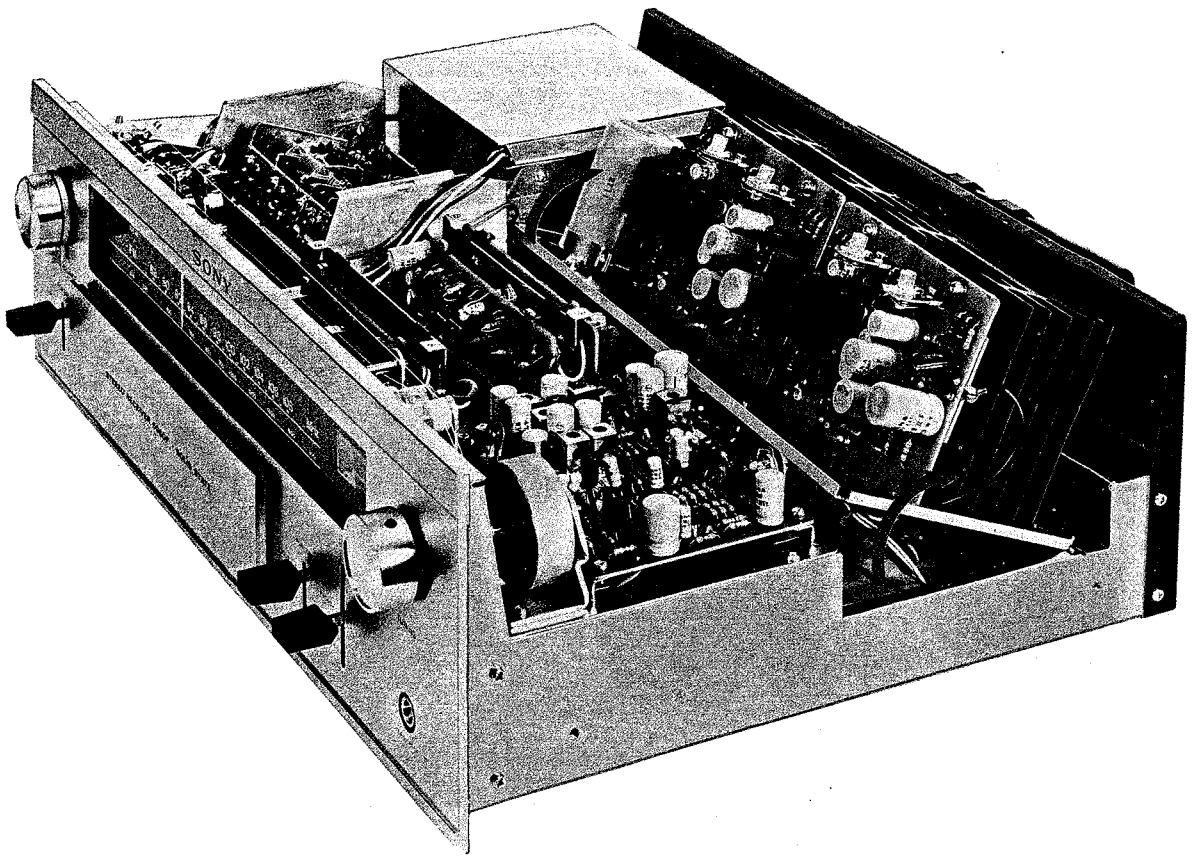


Fig. 2-8

FM, AM and Stereo Indicating Lamps

(a) Pull the lamp out of the mounting bracket with a pair of tweezers.
(b) Unsolder the leads of lamps and install the replacement.

Dial Lamps

(a) Remove the Cover, Control Knobs and Front Panel. See Sections 2-1, 2-2.
(b) Pry out the lamp as you would a cartridge fuse.
(c) Push the replacement lamp into the clip.

2-7. Switch and Control Replacement

(a) Remove the cover and bottom plate. See Section 2-1.
(b) Remove the Front Panel. See Section 2-2.
(c) Take off the decoration plate of control panel, by removing five screws (+ RF 2.6x6). See Fig. 2-10.
(d) Tone controls or FM/AM switch can be removed by pulling the knob off and loosening the hex nut that secures the control to the Front Panel Assembly.

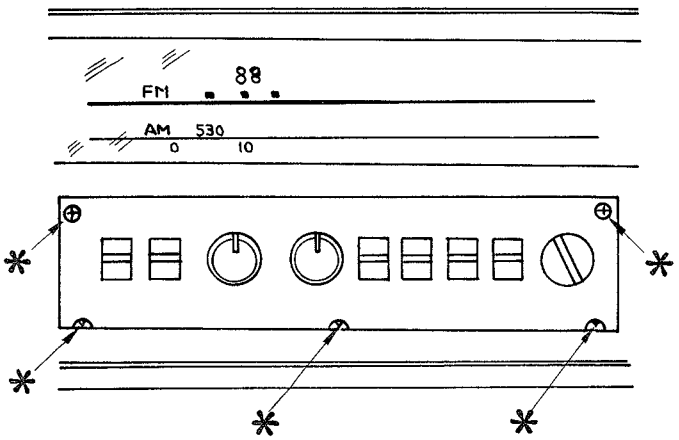


Fig. 2-10

2-8. Tuning Meter Replacement

(a) Remove the cover.
(b) Remove the two Phillips-head self tapping screws (+RF 3φx6) that secure the dial cord pulley bracket to the chassis as shown in Fig. 2-11.
(c) Remove the two Phillips-head screws from the tuning meter holder. The meter will come free. Special care should be taken not to hook the dial cord in executing the foregoing procedures.

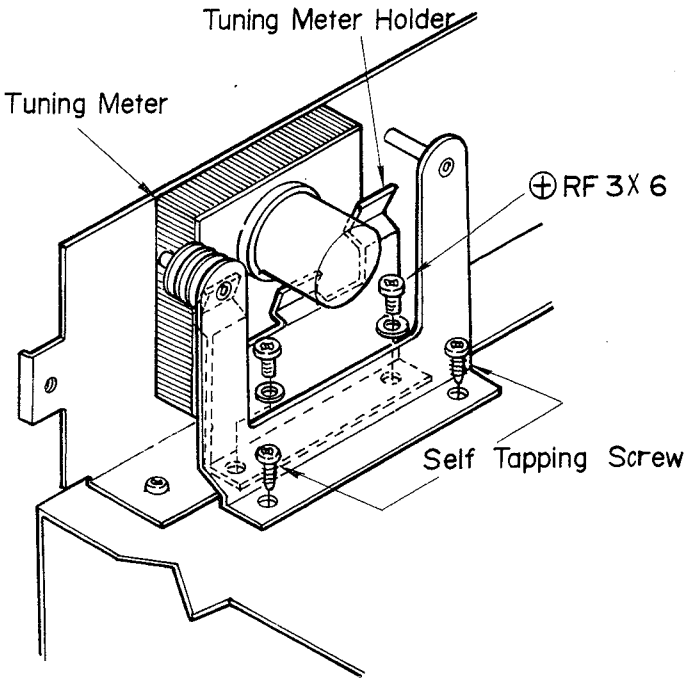


Fig. 2-11

2-9. Volume/Balance Control Replacement

Preparation

Remove the Front Panel Assembly. See Section 2-3.

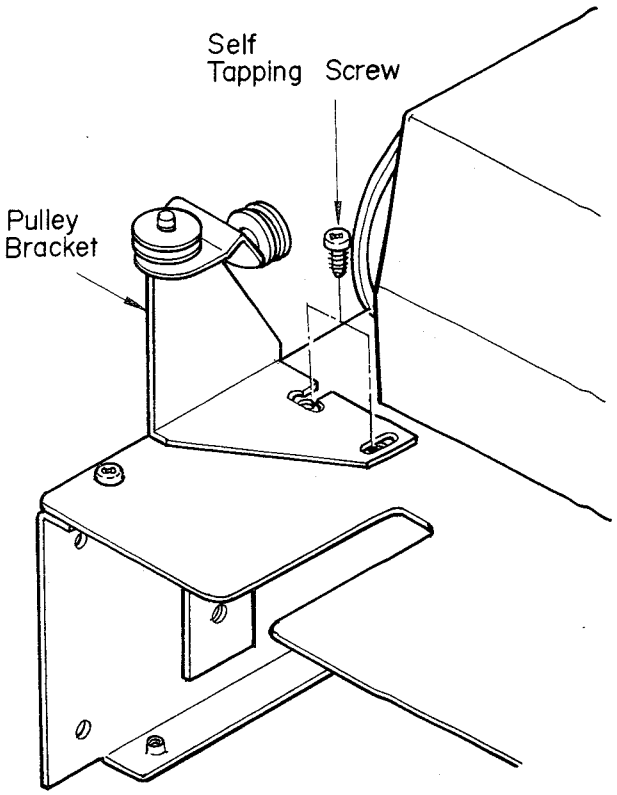


Fig. 2-12

Remove the bracket for dial cord pulley by loosening two self tapping screws as shown in Fig. 2-12. Do not twine dial cord, otherwise you have to string the dial cord again.

Volume Control Replacement

(1) As the sector is in gear with the balance control shaft to provide proper lever action, set the sector at the position as shown in Fig. 2-13, then pull it straight out.

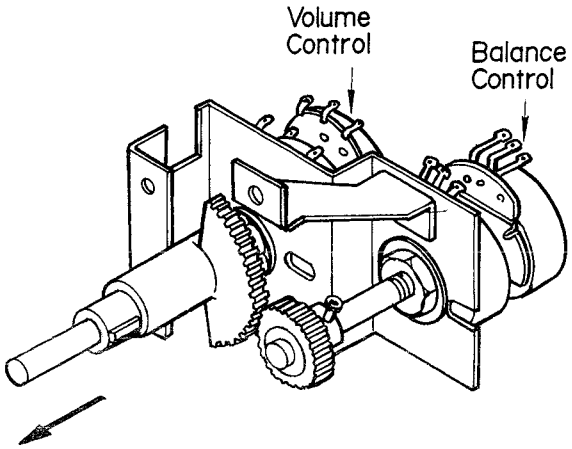


Fig. 2-13

(2) Remove the hexnut screw that secures volume control.

(3) To reassemble, reverse the foregoing procedures.

Balance Control Replacement

(1) Take off the sector first, then remove the gear by loosening two set screws.

(2) Remove the hexnut screw that secures balance control.

(3) To reassemble the balance control lever, setting of sector and gear is needed.
Follow the next procedures.

(4) Mount the balance control on the bracket. Do not tighten the hexnut firmly.

(5) Turn the balance control shaft fully clockwise and install the gear.

(6) Install the sector on to the volume control shaft and turn the sector fully counterclockwise but set it at the position having a little clearance between sector end and bracket, then move the balance control itself to be in gear with the sector as shown in Fig. 2-14.

(7) Tighten the hexnut of balance control.

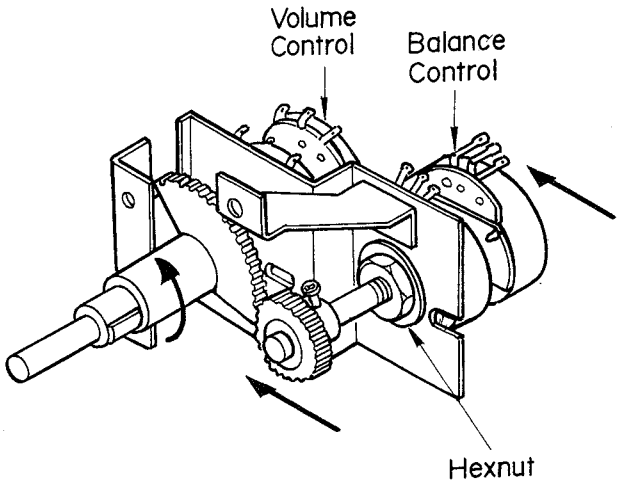


Fig. 2-14

2-10. Dial Cord Stringing

Preparation

Remove the Front Panel Assembly. See Section 2-3.

(a) Cut a 59-inch (1500 mm) length of dial cord.

(b) Rotate the tuning capacitor drive drum fully counterclockwise.

(c) Tie the cord to one end of the spring and hook the other end of the spring to the drive drum as shown in Fig. 2-15.

(d) Run the dial cord through the slot in the rim of the drive drum and position the cord close to the rear edge of the drum.

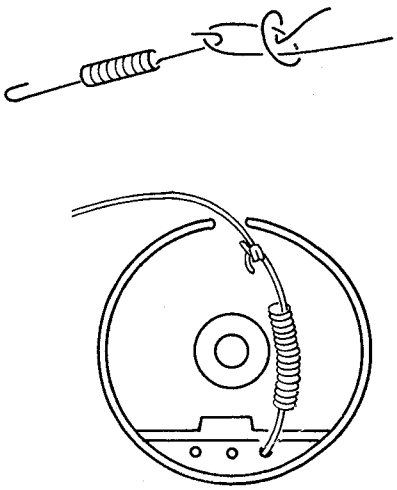


Fig.2-15

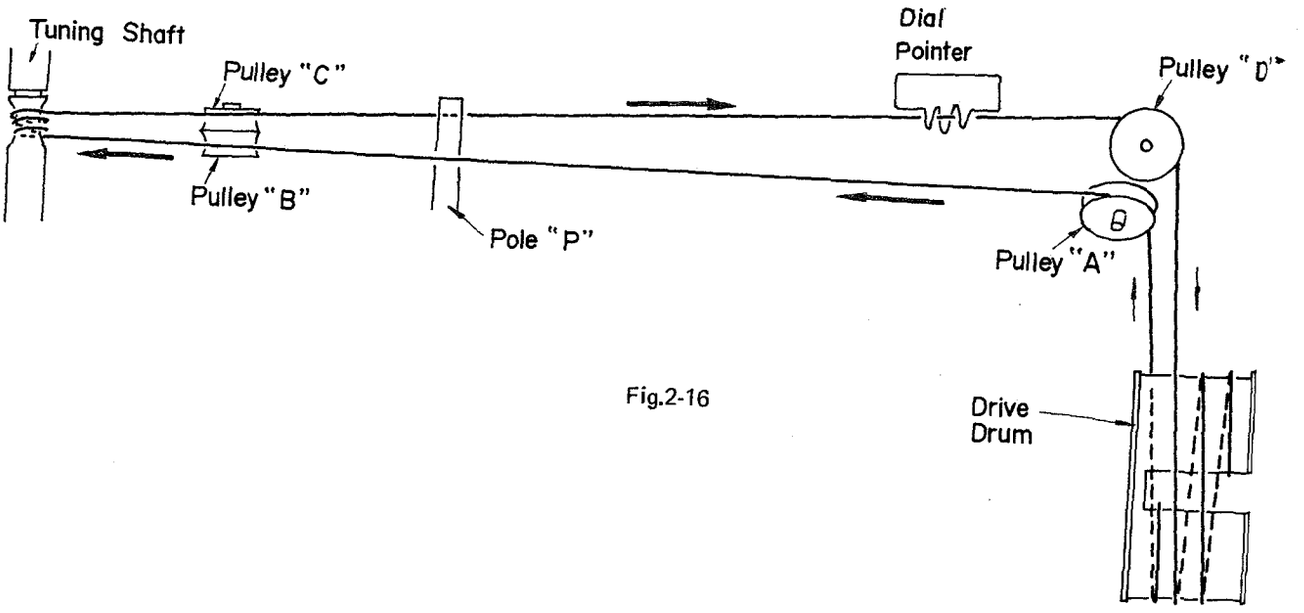


Fig.2-16

(e) Make half counterclockwise turn around the drum then run the cord cover pulley A and B, passing above the pole "P". See Fig. 2-16.

(f) Make two and half clockwise turns around the tuning shaft, then run the cord around pulleys C and D. See Fig. 2-17.

(g) Pull the dial cord taut and wrap two full counterclockwise turns around the drive drum. Pass the cord through the slot and attach the spring eyelet as shown in Fig. 2-18.

(h) Tighten the cord, then squeeze the eyelet so that the spring is under tension.

(i) Put the dial pointer in place and run the dial cord over and under the tabs at the rear of the dial pointer.

(j) When dial cord stringing is completed and the tuning system checks out mechanically, put a drop of contact cement on the eyelet and at the point where the cord runs over the tabs of the dial pointer. See Section 4. Overall Adjustments, for the method of accurately locating the dial pointer.

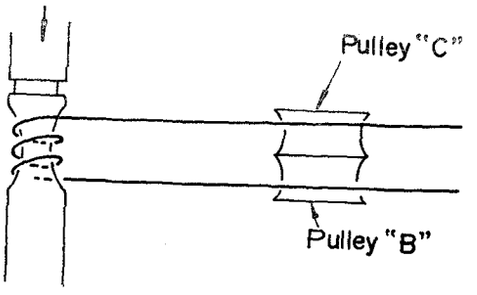


Fig.2-17

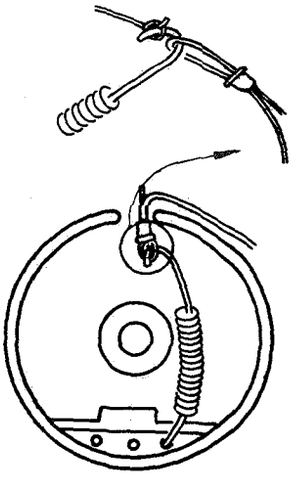
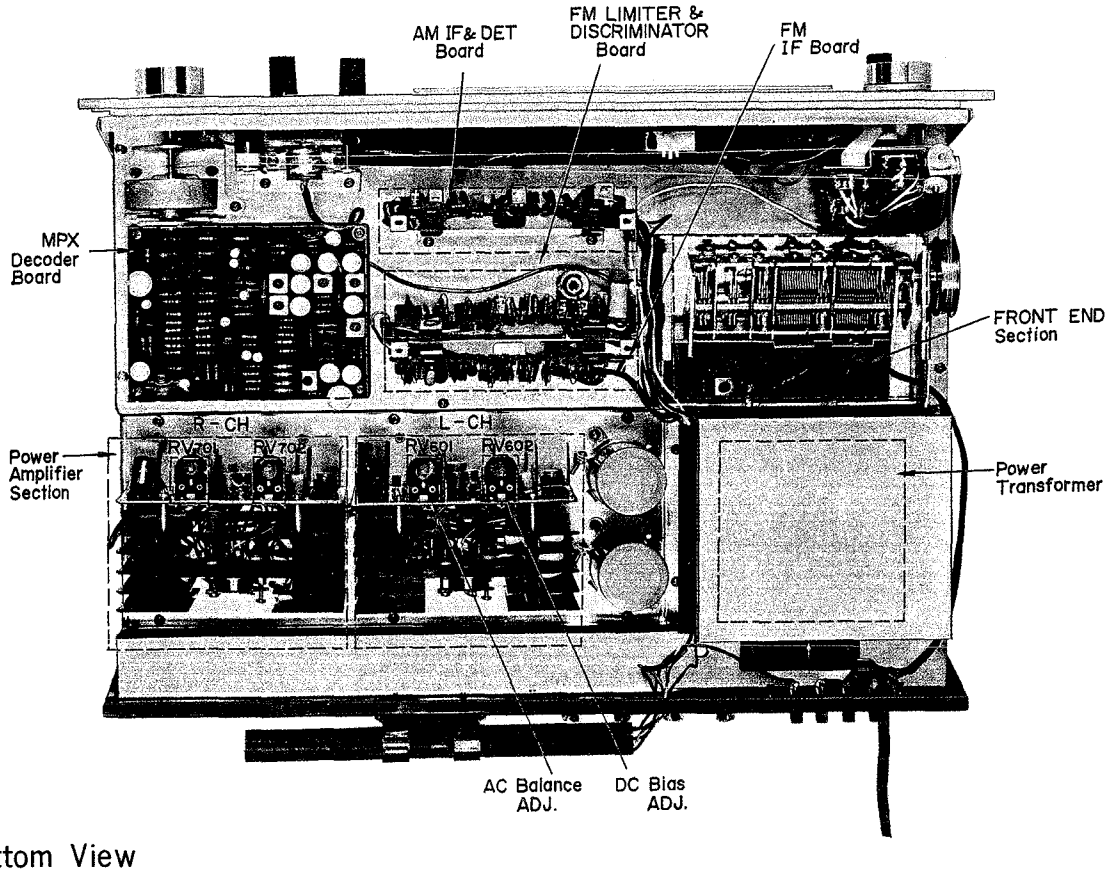


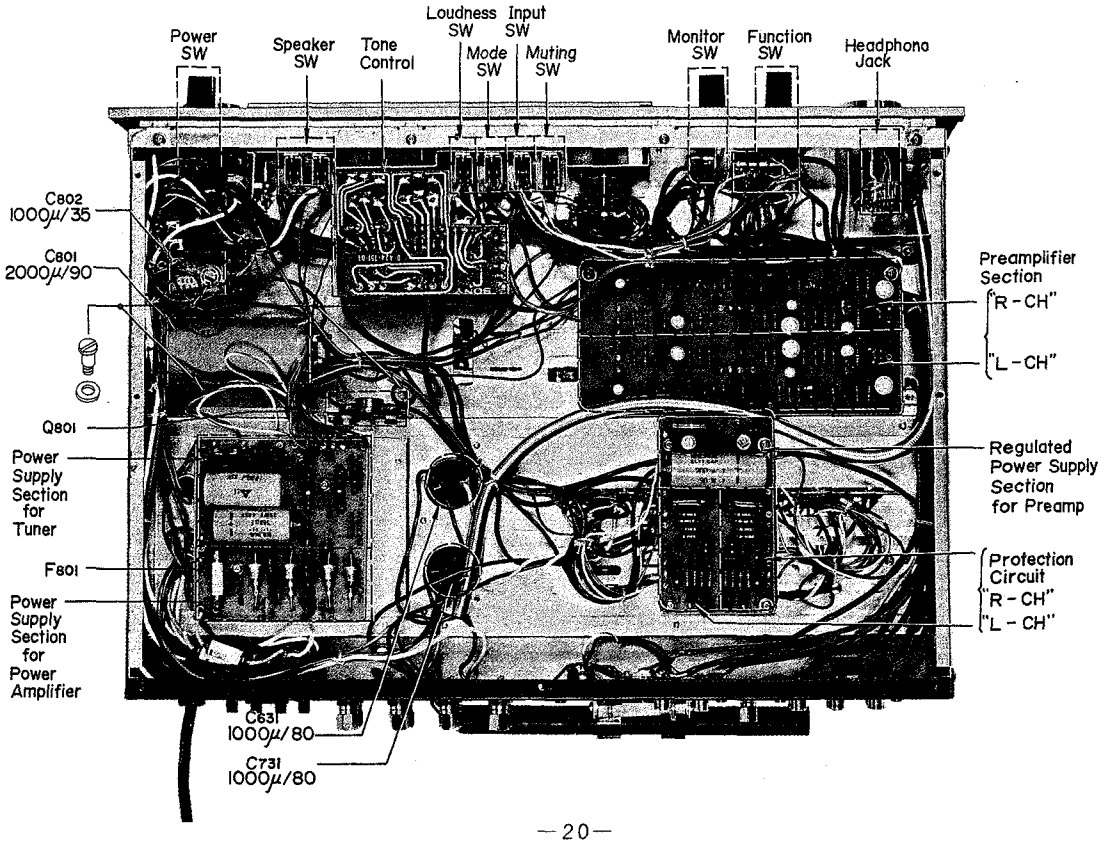
Fig. 2-18

Chassis Layout

Top View



Bottom View



SECTION 3

TEST AND ALIGNMENT

FM SECTION

General Never attempt alignment of Front End **Section except frequency coverage and dial calibration adjustment.**

Factory adjustments are extremely stable and should not be reset except in unusual circumstances. Alignment need not be performed when Front End FET's have been replaced as changes in FET parameters have little effect upon tuning.

In case of RF stage adjustment being required, ask a completed unit to the nearest SONY service station. Please take care of the package when returning the faulty unit because the risk of damage in transit is too high and we would not be able to assume liability in the event of such damage.

3-1. Front End Alignment

Note: IF alignment must be performed before starting this procedure.

Equipment Requirements:

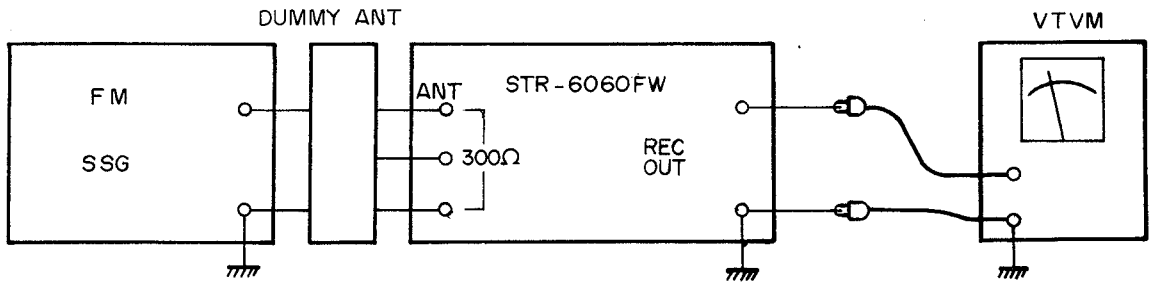
(1) A FM Standard Signal Generator.
If there is no FM Signal Generator, off-the-air-signal of the lowest and highest local stations will be acceptable.
(2) Dummy Antenna See Fig. 3-2.
(3) AC VTVM
(4) Alignment Tools

Preparation

(1) Remove the top cover.
(2) Connect the equipments as shown in Fig. 3-1.
(3) Set the controls as follows:

BAND SELECTOR	FM
MODE SWITCH	MONO
MUTING SWITCH	OUT

(4) Follow procedure's as given in table 1.



Front End Alignment Test Set-Up

Fig. 3-1

TABLE 1

Frequency Coverage Adjustment

Coupling between Front End and S.S.G.	S.S.G. frequency and output level	Tuning Capacitor	AC VTVM connection	Adjust	Indication
Dummy Antenna Fig. 3-2	86 MHz 400 Hz 30% Mod. 20 dB/μ	Maximum Capacitance position	REC OUT J605	OSC Coil L105	Maximum VTVM reading
Same as above	109.5 MHz 400 Hz 30% Mod. 20 dB/μ	Minimum Capacitance position	Same as above	OSC Trimmer CT105	Same as above

Note: Repeat the foregoing procedures several times until accurate dial calibration is observed.

Suggestion

Accurate dial calibration or tracking can be performed also by utilizing off-the-air-signals of local FM stations as follows.

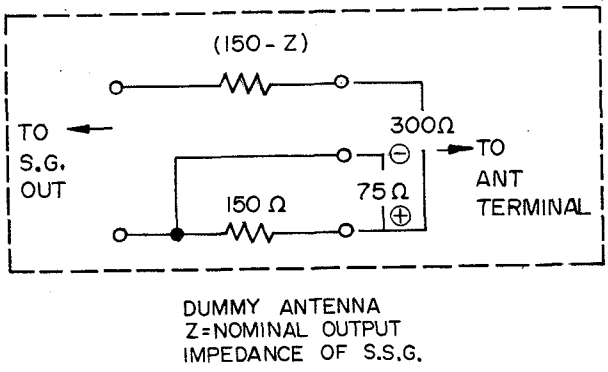
Procedure

(1) Tune the set to the lowest frequency station.

(2) Check that the pointer stays on the dial within a limit of ±100kHz from the carrier frequency of that station. If the dial deviation exceeds the above mentioned limit, adjust the local oscillator coil L105 slightly until optimum dial calibration is obtained.

Note: Do not turn the core 1/2 or more at once.

(3) Tune the set to the highest frequency station. If the dial calibration error is not negligible, adjust local oscillator trimmer CT105 to make dial deviation to minimum.



DUMMY ANTENNA
Z=NOMINAL OUTPUT
IMPEDANCE OF S.S.G.

Fig. 3-2

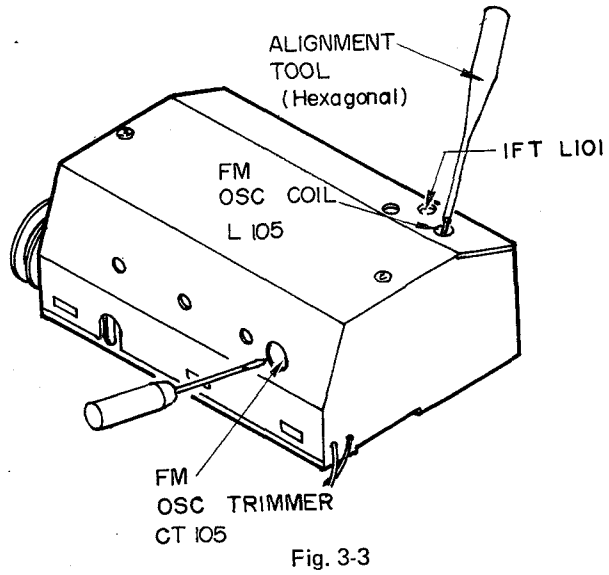
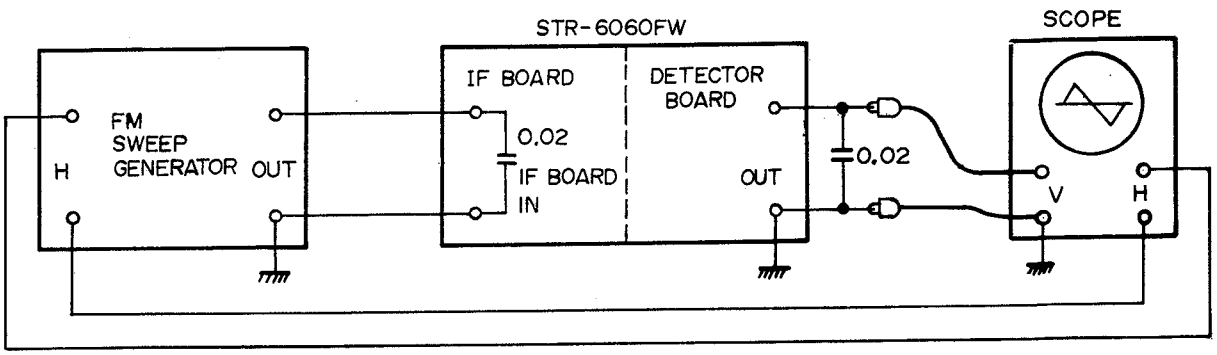


Fig. 3-3



Discriminator Adjustment Test Set-Up

Fig. 3-4

3-2. FM Discriminator Adjustment

Caution: This is a preadjustment procedure for discriminator section. To obtain optimum operation of the discriminator, follow the overall adjustment procedure described on page 31.

Equipment Requirements:

(1) VHF Sweep Generator
Center Frequency – 8 to 12 MHz (variable)
Sweep width – 1 MHz or more (variable)
Output impedance – 75 or 50 ohms

(2) Oscilloscope
Vertical sensitivity – at least 5 mV/cm
CRT diameter – 5" or more

(3) Ceramic Capacitor – 0.02μF

(4) Alignment Tools

Preparation

(1) Remove the shield cover from the Limiter/ Detector Section.

(2) Unsolder input cable from FM IF board and output cable from discriminator board.

(3) Solder a 0.02μF capacitor across the input terminal of the FM IF board.

(4) Solder a 0.02μF capacitor across the output terminal of discriminator.

(5) Set the Sweep Generator output 20 dB/μ.

Procedures

(1) With the equipments connected as shown in Fig. 3-4 adjust scope controls to provide a visible indication.

Caution: Many "S" curves will be observed on the scope according to varying the center frequency of sweep generator ±2-3 MHz. The real "S" curve has the largest amplitude.

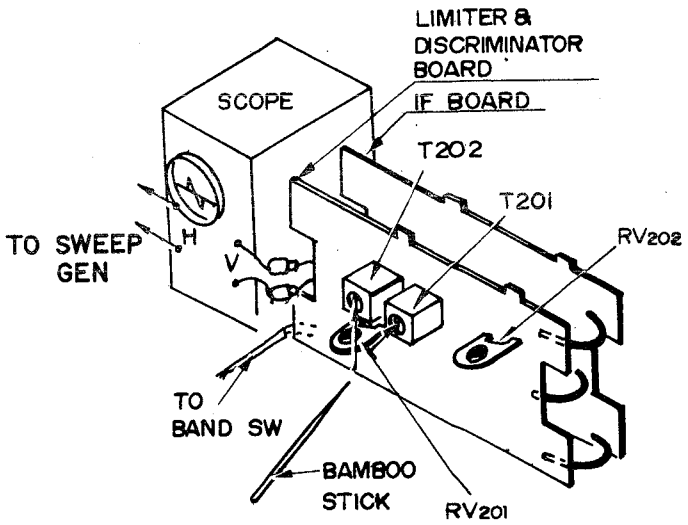


Fig. 3-5

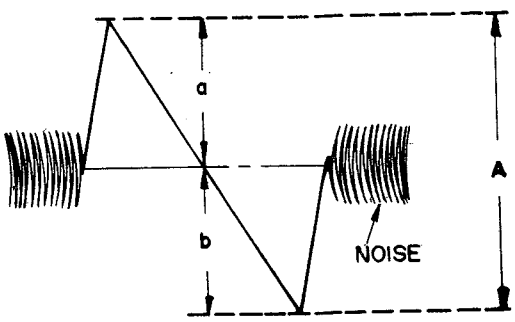


Fig. 3-6

(2) Turn discriminator transformer T202 core (blue) by bamboo stick to obtain "S" curve response shown at Fig. 3-5, 3-6.

(3) Turn T201 core (pink) by bamboo stick to obtain maximum response.

(4) Detune the T202 core to obtain maximum positive and negative output as shown in Fig. 3-7.
Adjust RV201 (dc balance) to obtain equal response when the core is peaked to provide either maximum negative or positive output.

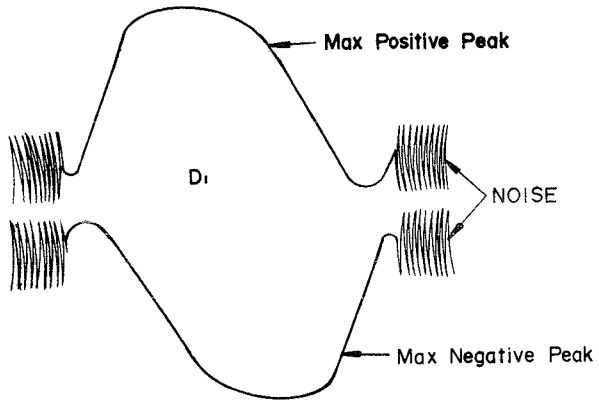
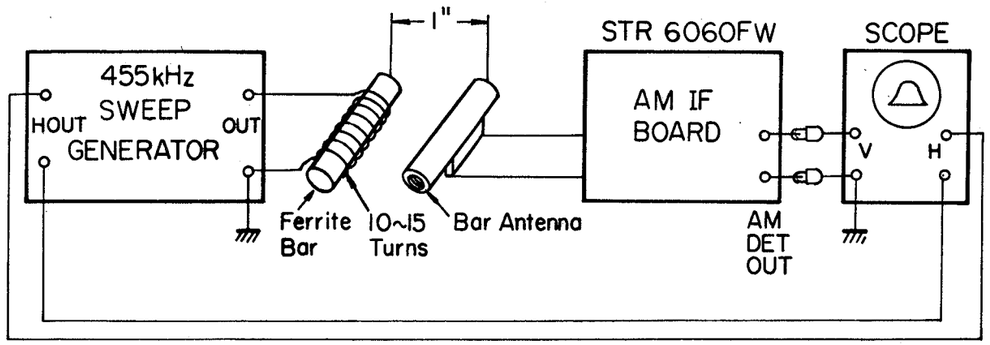


Fig. 3-7

(5) Reset the core of T202 to equalize negative and positive peaks: a=b=½A. See Fig. 3-6.

(6) Disconnect the sweep generator and make sure that the scope displays only noise. Adjust T201 core to make the Tuning Meter indicate the null point (center scale).



AM IF Adjustment Test Set-UP.

Fig. 3-8

AM SECTION

3-3. AM IF Alignment

Equipment Requirements

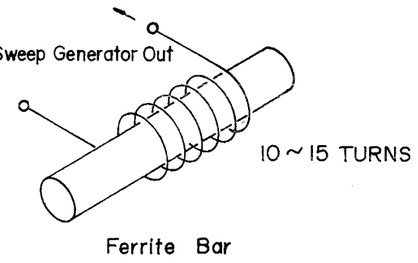
(1) 455kHz Sweep Generator
Center frequency 455 kHz
Sweep Width ±35 kHz (variable)
Output Impedance—Less than 300 ohms
(2) Radiating Antenna—See Fig. 3-9.
(3) Oscilloscope
Vertical Sensitivity —at least 0.1 V/cm
CRT Diameter —3" or more
(4) Alignment Tools

Preparation

(1) Remove the shield cover from the IF amplifier and Discriminator section.
(2) Unsolder the output cable from AM IF board.

Procedure

(1) With the equipment connected as shown in Fig. 3-8, adjust the sweep generator output as low as possible and set scope controls to provide a visible indication.
(2) Adjust IFT 301 to obtain flat top and maximum symmetrical response. See Fig. 3-10.



Ferrite Bar

Fig. 3-9

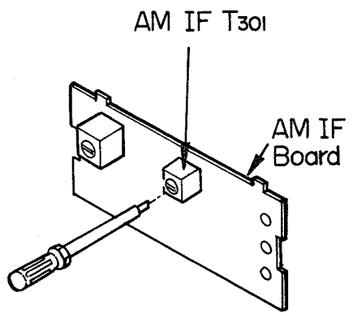


Fig. 3-10

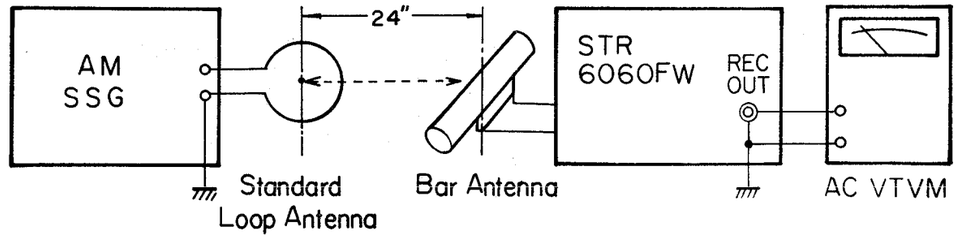
3-4. AM Tuner Frequency Coverage and Tracking Alignment

Equipment Requirements

(1) A Standard AM Signal Generator.
If there is no AM Signal Generator, off-the-air-signal of the lowest and highest local stations will be acceptable.
(2) Radiating Antenna —Standard Loop Antenna (50 ohms unbalanced)
(3) AC VTVM or Oscilloscope capable of indicating rms voltage 0.1 V or less.
(4) Alignment tools

Preparation

(1) Remove the shield cover from IF and Discriminator section.
(2) With the equipment connected as shown in Fig. 3-11, follow procedures as given in table 2.



AM Tuner Alignment Test Set-UP.

Fig. 3-11

TABLE 2

Frequency Coverage and Tracking Adjustment

Adjustment	SSG Coupling	SSG Freq.	Tuning Capacitor	Connect VTVM	Adjust	Remarks
Frequency Coverage	Loop Antenna	520 kHz 1 kHz 30% Mod. Output level (66 dB)	Maximum Capacitance position	REC OUT J605 (J705)	OSC Coil L304 Fig. 3-12	Adjust to obtain maximum response
		1680 kHz Same as above	Minimum Capacitance position	Same as above	OSC Trimmer CT302 Fig. 3-13	Same as above

* Repeat the foregoing procedure two or three times until sufficient response is obtained.

3-4. AM Tuner Frequency Coverage and Tracking Alignment

Equipment Requirements

(1) A Standard AM Signal Generator.
If there is no AM Signal Generator, off-the-air-signal of the lowest and highest local stations will be acceptable.

(2) Radiating Antenna — Standard Loop Antenna (50 ohms unbalanced)

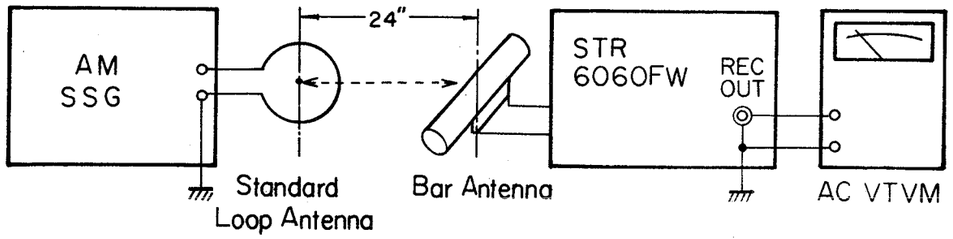
(3) AC VTVM or Oscilloscope capable of indicating rms voltage 0.1 V or less.

(4) Alignment tools

Preparation

(1) Remove the shield cover from IF and Discriminator section.

(2) With the equipment connected as shown in Fig. 3-11, follow procedures as given in table 2.



AM Tuner Alignment Test Set-UP.

Fig. 3-11

TABLE 2

Frequency Coverage and Tracking Adjustment

Adjustment	SSG Coupling	SSG Freq.	Tuning Capacitor	Connect VTVM	Adjust	Remarks
Frequency Coverage	Loop Antenna	520 kHz 1 kHz 30% Mod. Output level (66 dB)	Maximum Capacitance position	REC OUT J605 (J705)	OSC Coil L304 Fig. 3-12	Adjust to obtain maximum response
		1680 kHz Same as above	Minimum Capacitance position	Same as above	OSC Trimmer CT302 Fig. 3-13	Same as above

* Repeat the foregoing procedure two or three times until sufficient response is obtained.

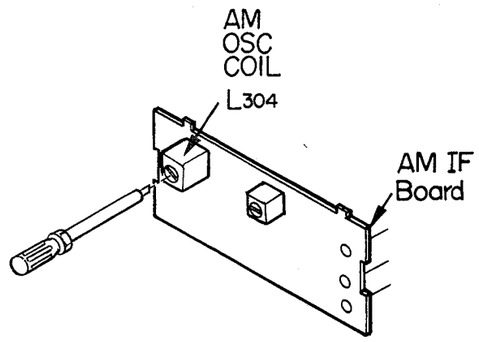


Fig. 3-12

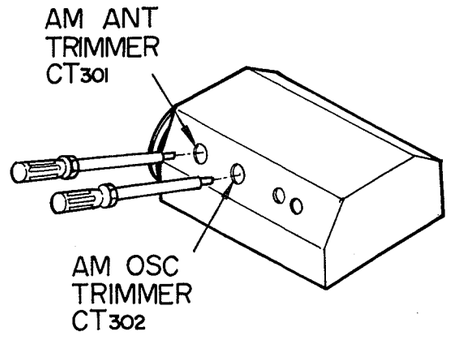


Fig. 3-13

Frequency Coverage and Tracking Adjustment

Adjustment	SSG Coupling	SSG Freq.	Tuning Capacitor	Connect VTVM	Adjust	Remarks
Tracking	Loop Antenna	620 kHz 1 kHz 30% Mod. Output level as law as possible	Tune to 620 kHz signal	REC OUT	Position of Bar Antenna Coil L301 Fig. 3-14	Adjust to obtain maximum response
		1400 kHz Same as above	Tune to 1400 kHz signal	Same as above	Antenna Trimmer CT301 Fig. 3-13.	Same as above

* Repeat the foregoing procedure two or three times until proper tracking is obtained.

Note: Accurate dial calibration or tracking is obtained by utilizing off the air signals of local AM stations as described in FM Front End section alignment.

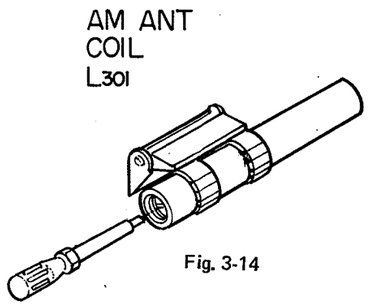
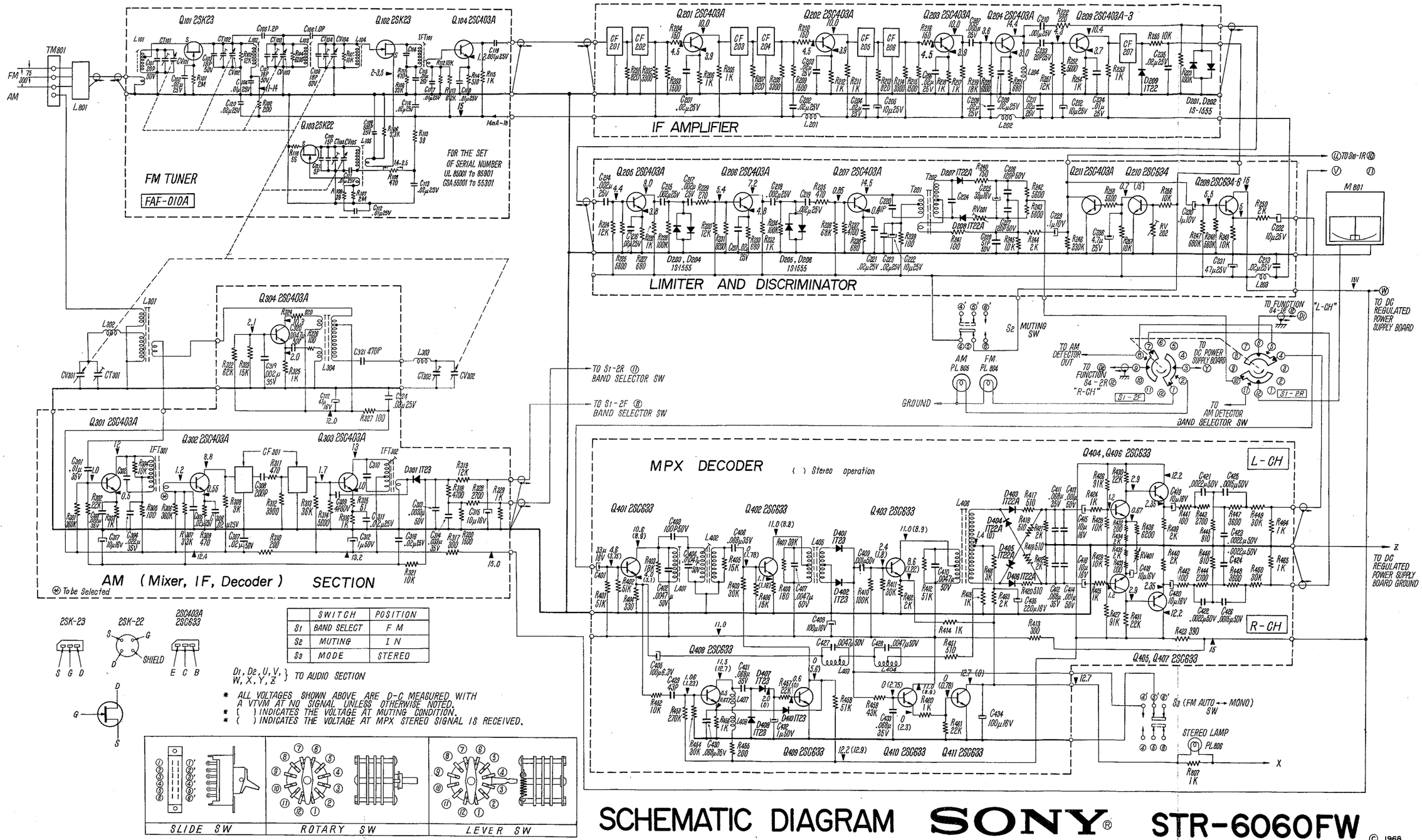


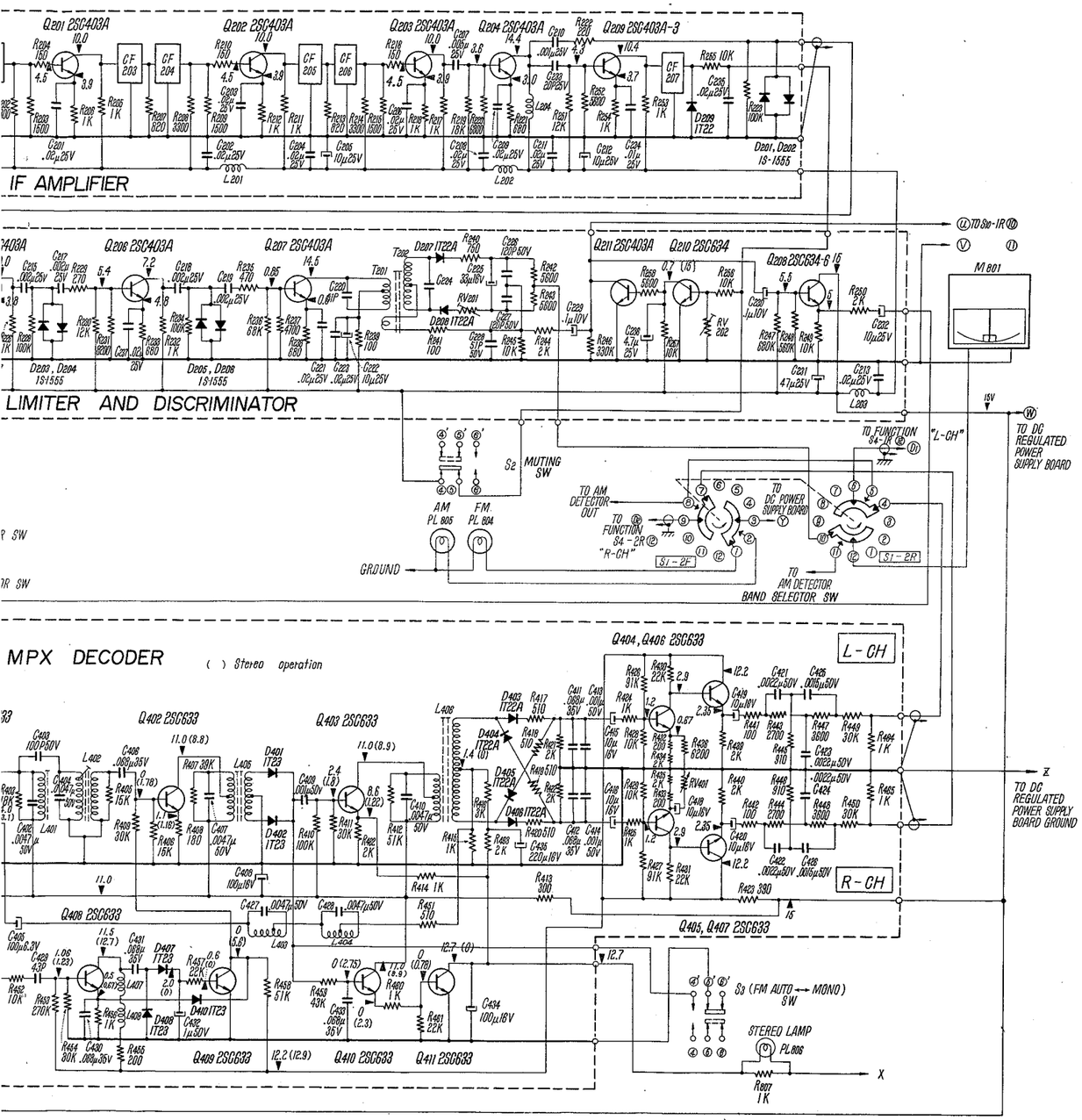
Fig. 3-14

Tuner Section



	SWITCH	POSITION
S1	BAND SELECT	F M
S2	MUTING	I N
S3	MODE	STEREO

SCHEMATIC DIAGRAM SONY® STR-6060FW



WARNING

The STR-6060FW is a precision instrument. It should be serviced only by qualified service personnel trained in the service of high-quality instruments of this type.

HEMATIC DIAGRAM SONY® STR-6060FW

SECTION 4

OVERALL ADJUSTMENTS AND TESTS

These "touch-up" adjustments ensure optimum performance. They also assist in localizing troubles.

Equipment Requirements

(1) Standard FM Signal Generator
(2) MPX Stereo Signal Generator
(3) Audio Oscillator
(4) Distortion Meter with AC VTVM
(5) Dummy Antenna See Fig. 3-2.
(6) Oscilloscope
(7) Alignment Tools

4-1. Monaural Distortion

(1) Connect the equipment as shown in Fig. 4-1.
(2) Set FM Signal Generator frequency to 98 MHz, 400 Hz, 100% modulation.
Output level: 60 dB/μ
(3) Tune the receiver to 98 MHz and adjust IFT101 slightly for minimum distortion.

4-2. Muting Circuit Adjustment

This Muting Circuit is designed to operate according to the input signal strength.

(1) With the equipment connected as shown in Fig. 4-1, set the FM signal generator as follows: 98 MHz, 400 Hz, 100% modulation, output level 25dB/μ.
(2) Turn RV202 fully clockwise. See Fig. 4-2.
(3) Set the MUTING switch to IN, tune the receiver and adjust RV202 until the muting circuit just starts to operate.

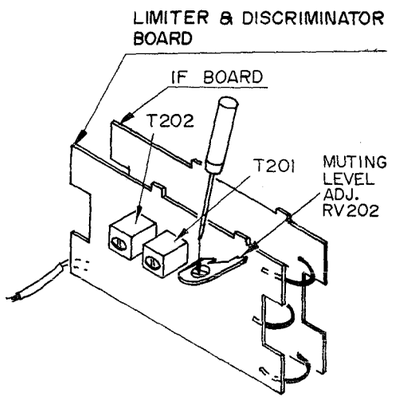
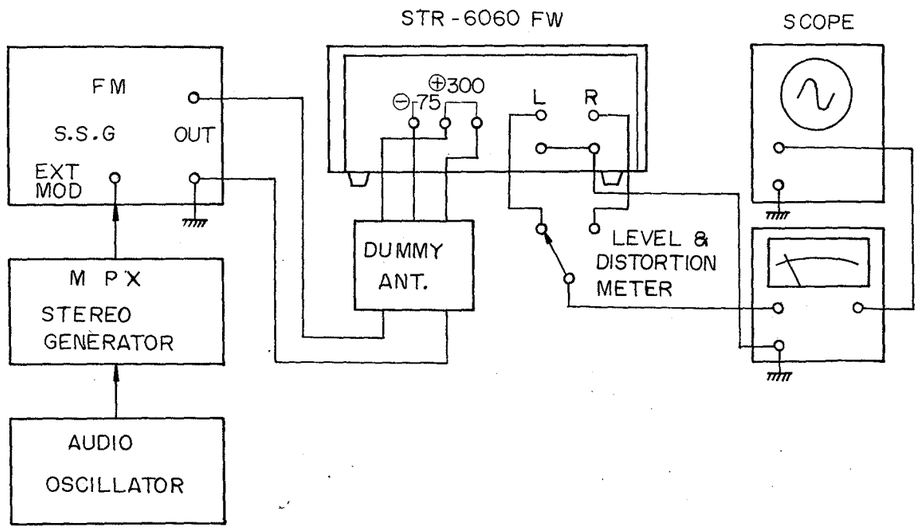


Fig. 4-2



Over-All Checkout and Adjustment Test Set-UP

Fig. 4-1

4-3. Tuning Meter Adjustment

(1) With the equipment connected as shown in Fig. 4-1, detune the receiver.
(2) Confirm that the pointer of the meter stays on the null point; if it does not, adjust the core of T201 on the limiter detector board. The tuning meter check should be done before proceeding to the next section.

4-4. Dial Pointer Calibration

This procedure should be done after replacement of local oscillator transistor or dial cord.

(1) Connect the equipment as shown in Fig. 4-1.
(2) Set the signal generator to 98 MHz (crystal calibrated) 400 Hz 100% modulation, output 20 dB/μ.
(3) Set the MUTING switch to OUT.
(4) Tune the receiver precisely to the 98 MHz signal.
(5) Confirm that the pointer is set to the 98 MHz dial position; if it is not, reset the pointer as required.

4-5. Stereo Distortion

(1) Connect equipment as shown in Fig. 4-1. Set the signal generator as follows:
98 MHz Output 60 dB/μ
Modulation:
Main channel (L or R, 400 Hz) 45% (33.75 kHz)
Sub channel (38 kHz) 45% (33.75 kHz)
Pilot signal (19 kHz) 10% (7.5 kHz)
(2) Check distortion in each channel
Adjust L406 (switching transformer) in the Multiplex Decoder Board to obtain minimum distortion.

4-6. Channel Separation

(1) With the equipment connected as shown in Fig. 4-1, set the signal generator to 98 MHz, output 60 dB/μ.
Modulation:
Same as described in Stereo Distortion Procedure.
(2) Check channel separation as follows:
Record the output level of the left channel when the MPX generator input selector is set to the left channel.
Switch the input selector to the right channel, and check the residual signal in the left channel.
The signal-to-residual ratio represents the separation. Adjust RV401 (Separation Adj.) to get minimum residual level on the Multiplex Decoder board.

4-7. Power Amplifier Adjustment

Note: To simplify the following discussion, only channel 1 (left) and its related circuitry will be described. Channel 2 (right) is identical except for reference symbol numbers.

Equipment Requirements

(1) A DC voltmeter capable of indicating 100 mV full scale or less.
(2) An 8 ohm, 50 W dummy load.
(3) An oscilloscope for monitoring.
(4) An attenuator (characteristic impedance 600 ohms, unbalanced.)
(5) An audio oscillator with stable output.
(6) A 600 ohm, 1/4 W resistor.
(7) A variable transformer

Caution: **To avoid accidental power transistor damage, increase the AC line voltage gradually, using the variable transformer, while checking the voltage across R663 (R763) that should not exceed 12mV.**

Preparation

Set the controls as follows:

Tone Control ..... Flat (center position)
Balance Control .... Center position
Mode Switch ..... STEREO
Loudness Control ... OUT
Monitor Switch ..... TAPE
Function Switch..... Any position
Volume Control .... Fully counterclockwise

The equipment is connected as shown in Fig. 4-3.

(A) DC Bias Adjustment

NOTE: Serious deficiencies in performance, such as thermal runaway of power transistors, will result if this adjustment is set improperly.

Step 1: Connect the DC voltmeter across R663 on the power amplifier board as shown in Fig. 4-4.

Step 2: Turn on the power switch and adjust RV602 to obtain a 12 mV reading on the meter.

(B) AC Balance Adjustment

NOTE: Serious deficiencies in harmonic distortion at high levels will result if this adjustment is set improperly.

Step 1: With the equipment connected as shown in Fig. 4-3, and POWER switch is in the ON

cted as shown in
nerator as follows:
iodulation, output

se. See Fig. 4-2.

to IN, tune the
? until the muting
te.

DISCRIMINATOR

RD

)PE

4-3. Tuning Meter Adjustment

(1) With the equipment connected as shown in Fig. 4-1, detune the receiver.
(2) Confirm that the pointer of the meter stays on the null point; if it does not, adjust the core of T201 on the limiter detector board. The tuning meter check should be done before proceeding to the next section.

4-4. Dial Pointer Calibration

This procedure should be done after replacement of local oscillator transistor or dial cord.

(1) Connect the equipment as shown in Fig. 4-1.
(2) Set the signal generator to 98 MHz (crystal calibrated) 400 Hz 100% modulation, output 20 dB/μ.
(3) Set the MUTING switch to OUT.
(4) Tune the receiver precisely to the 98 MHz signal.
(5) Confirm that the pointer is set to the 98 MHz dial position; if it is not, reset the pointer as required.

4-5. Stereo Distortion

(1) Connect equipment as shown in Fig. 4-1. Set the signal generator as follows:
98 MHz Output 60 dB/μ
Modulation:
Main channel (L or R, 400 Hz)
45% (33.75 kHz)
Sub channel (38 kHz) 45% (33.75 kHz)
Pilot signal (19 kHz) 10% (7.5 kHz)
(2) Check distortion in each channel
Adjust L406 (switching transformer) in the Multiplex Decoder Board to obtain minimum distortion.

4-6. Channel Separation

(1) With the equipment connected as shown in Fig. 4-1, set the signal generator to 98 MHz, output 60 dB/μ.
Modulation:
Same as described in Stereo Distortion Procedure.
(2) Check channel separation as follows:
Record the output level of the left channel when the MPX generator input selector is set to the left channel.
Switch the input selector to the right channel, and check the residual signal in the left channel.
The signal-to-residual ratio represents the separation. Adjust RV401 (Separation Adj.) to get minimum residual level on the Multiplex Decoder board.

4-7. Power Amplifier Adjustment

Note: To simplify the following discussion, only channel 1 (left) and its related circuitry will be described. Channel 2 (right) is identical except for reference symbol numbers.

Equipment Requirements

(1) A DC voltmeter capable of indicating 100 mV full scale or less.
(2) An 8 ohm, 50 W dummy load.
(3) An oscilloscope for monitoring.
(4) An attenuator (characteristic impedance 600 ohms, unbalanced.)
(5) An audio oscillator with stable output.
(6) A 600 ohm, 1/4 W resistor.
(7) A variable transformer

Caution: **To avoid accidental power transistor damage, increase the AC line voltage gradually, using the variable transformer, while checking the voltage across R663 (R763) that should not exceed 12mV.**

Preparation

Set the controls as follows:

Tone Control .....Flat (center position)
Balance Control .... Center position
Mode Switch ..... STEREO
Loudness Control ... OUT
Monitor Switch ..... TAPE
Function Switch..... Any position
Volume Control .... Fully counterclockwise

The equipment is connected as shown in Fig. 4-3.

(A) DC Bias Adjustment

NOTE: Serious deficiencies in performance, such as thermal runaway of power transistors, will result if this adjustment is set improperly.

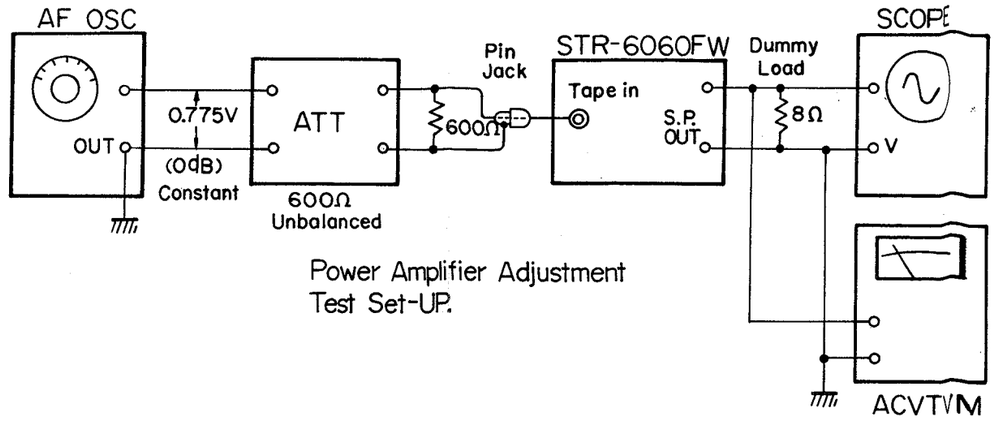
Step 1: Connect the DC voltmeter across R663 on the power amplifier board as shown in Fig. 4-4.

Step 2: Turn on the power switch and adjust RV602 to obtain a 12 mV reading on the meter.

(B) AC Balance Adjustment

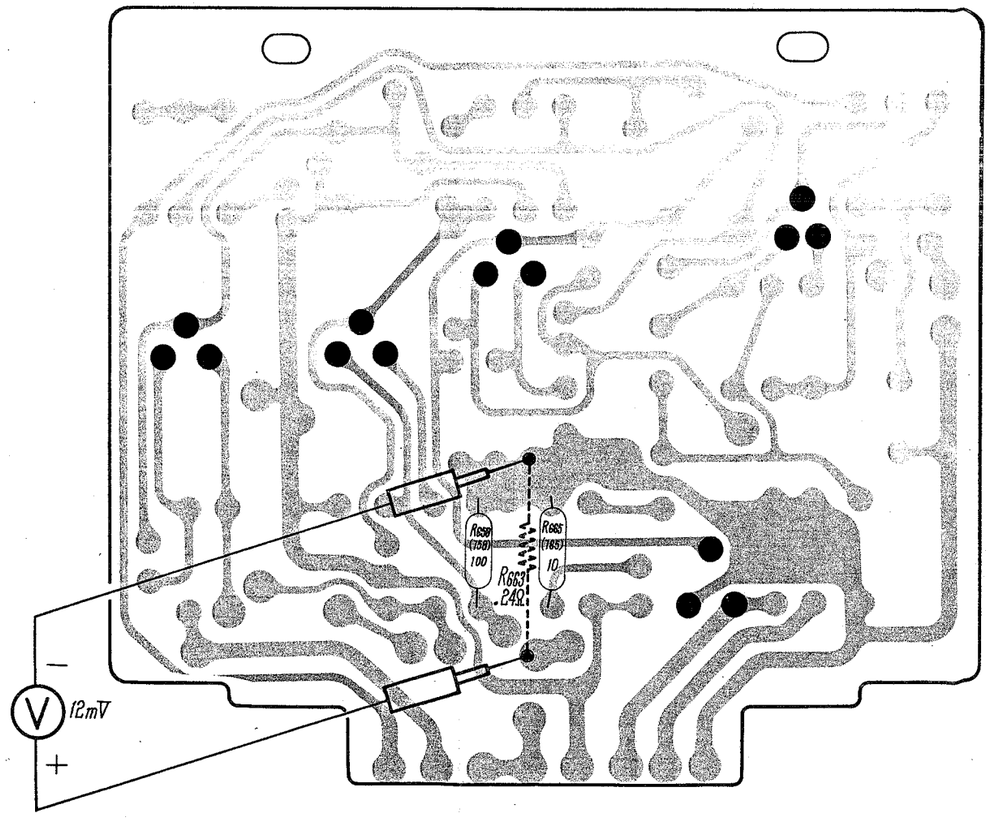
NOTE: Serious deficiencies in harmonic distortion at high levels will result if this adjustment is set improperly.

Step 1: With the equipment connected as shown in Fig. 4-3, and POWER switch is in the ON



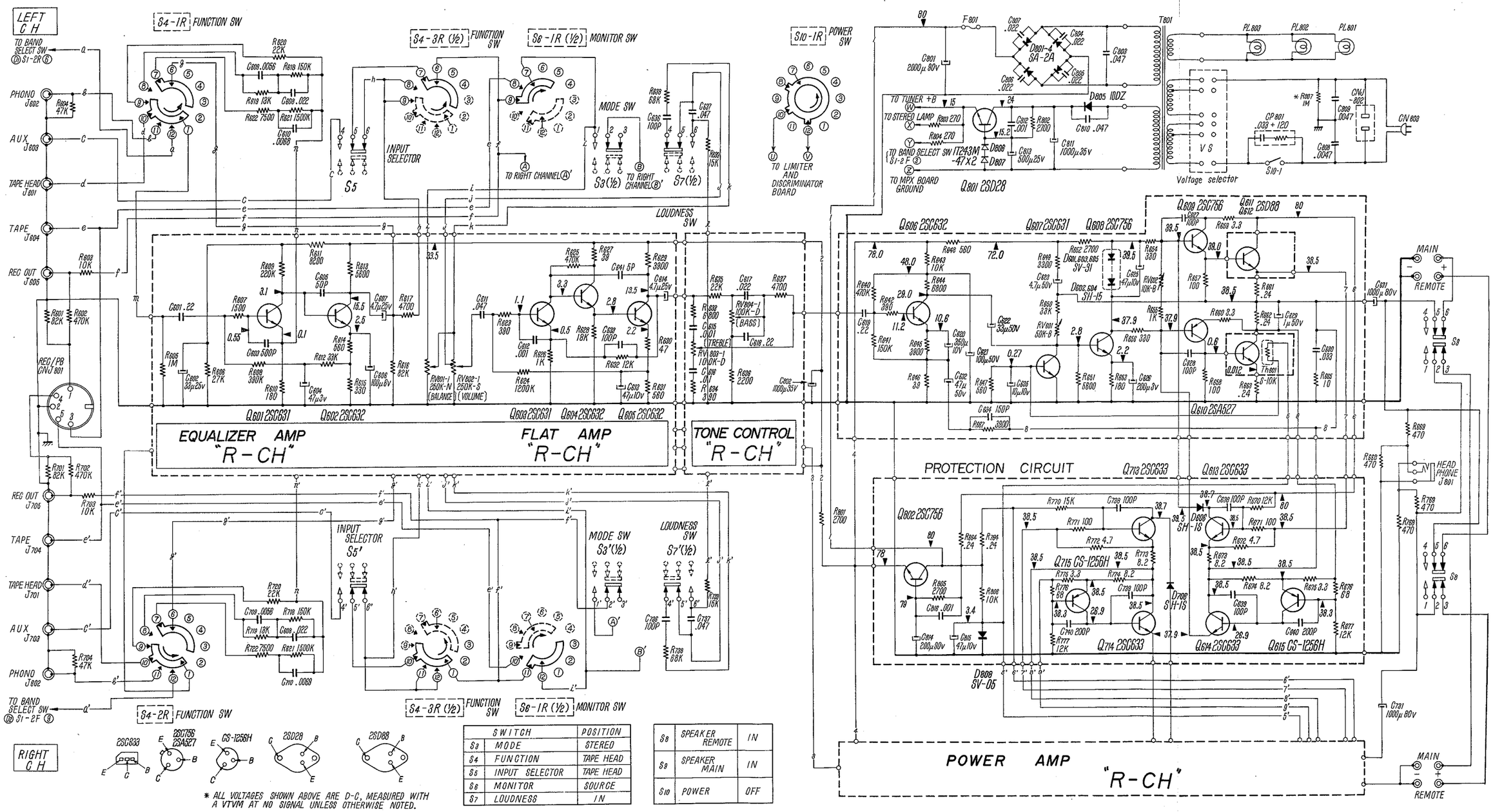
Power Amplifier Adjustment
Test Set-UP.

Fig. 4-3



Schematic Diagram

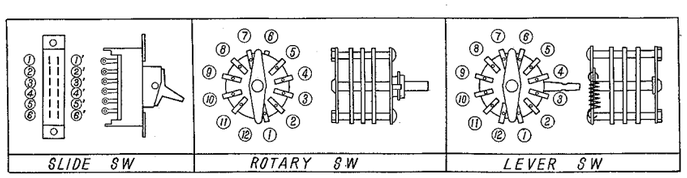
Audio Section



SWITCH		POSITION
S3	MODE	STEREO
S4	FUNCTION	TAPE HEAD
S6	INPUT SELECTOR	TAPE HEAD
S8	MONITOR	SOURCE
S7	LOUDNESS	IN

S8	SPEAKER REMOTE	IN
S9	SPEAKER MAIN	IN
S10	POWER	OFF

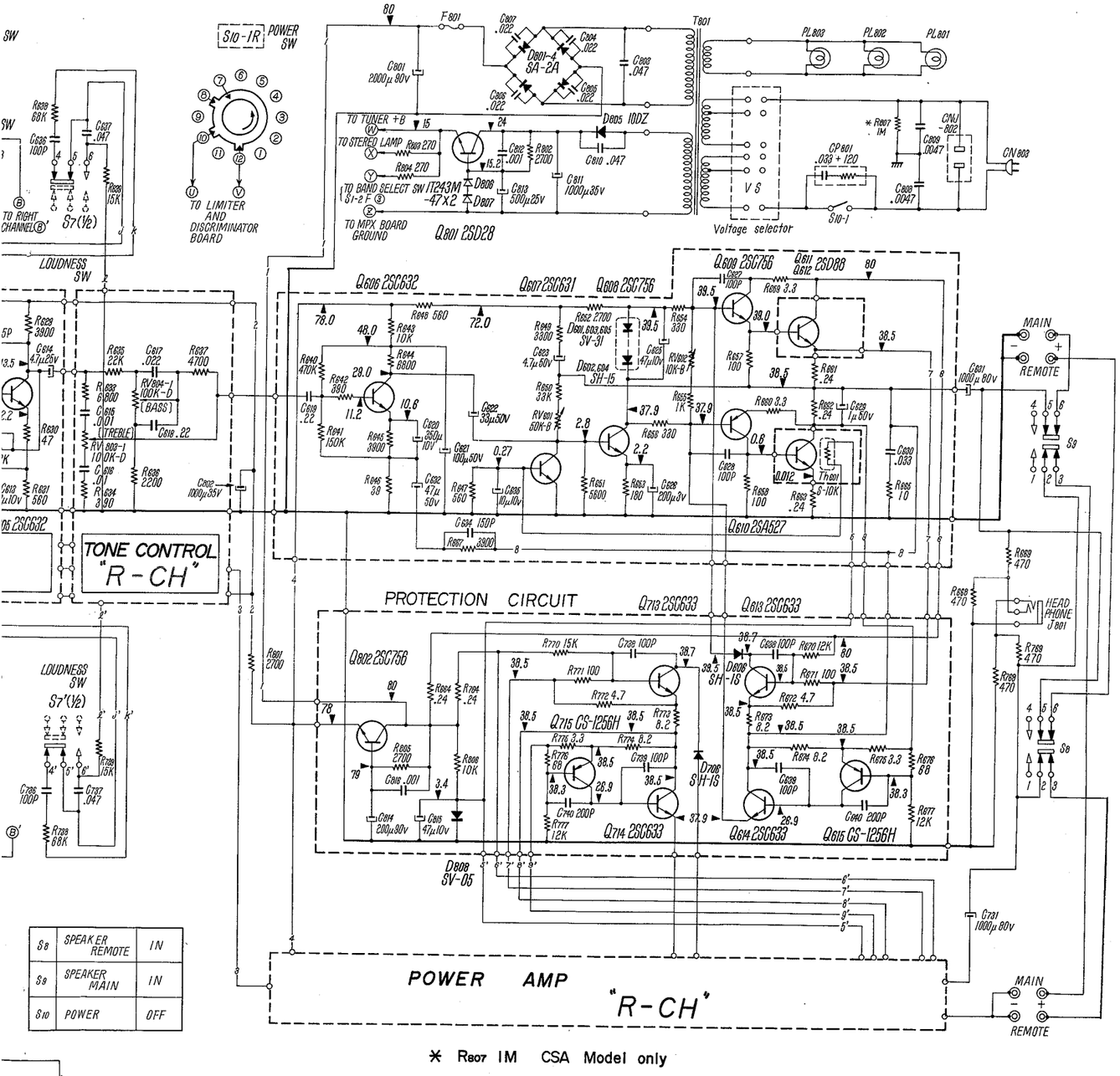
* ALL VOLTAGES SHOWN ABOVE ARE D-C, MEASURED WITH A VTVM AT NO SIGNAL UNLESS OTHERWISE NOTED.



* R807 1M CSA Model only

SCHEMATIC DIAGRAM

SONY® STR-6060FW



S8	SPEAKER REMOTE	IN
S9	SPEAKER MAIN	IN
S10	POWER	OFF

* R807 1M CSA Model only

SCHEMATIC DIAGRAM
SONY® STR-6060FW

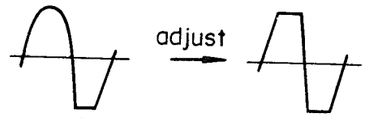


Fig. 4-5

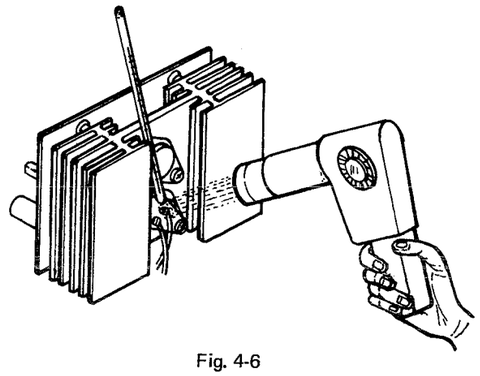


Fig. 4-6

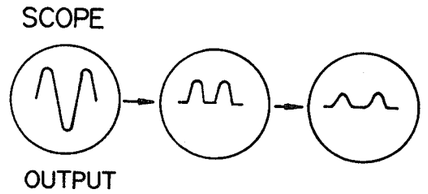


Fig. 4-7

position, Feed a 1 kHz, 0 dB signal to the "TAPE" input terminal through the attenuator.

Step 2: Turn the volume control gradually and watch the waveform on the oscilloscope. Adjust RV601 to obtain such output waveform that the positive and negative peaks are clipped at the same time when increasing the volume control as shown in Fig. 4-5.

(C) *Terminal Sensitive Protection Circuit Check*

Step 1: With the equipment connected as shown in Fig. 4-3. Feed a 1 kHz signal to the TAPE input terminal through the attenuator.

Step 2: Increase signal level to obtain 500 mW output (2.0 V rms with an 8 ohm load).

Step 3: Insert a thermometer between the power transistor and the thermistor. Heat the thermistor and transistor gradually using a heat blower, as shown in Fig. 4-6.
A conventional hair dryer is acceptable.

Step 4: Confirm that the output of the amplifier is decreased when temperature reaches 148°F ±9°F. See Fig. 4-7.
If the protection circuit does not operate properly, check the related circuitry.

4-8. Overall Checkout and Adjustment of Audio Amplifier

Equipment Requirements

(1) An AC VTVM capable of indicating rms voltages. (Maximum sensitivity should be less than 10 mV.)
(2) An audio oscillator with stable output from 10 Hz to 100 kHz. Harmonic distortion must be less than 0.03%. Output impedance 600Ω.
(3) An 8 ohm, 50W dummy load and speaker for audible monitoring.
(4) An oscilloscope for monitoring.
(5) An attenuator (characteristic impedance 600 ohms, unbalanced) capable of attenuating signal level 60 dB or more.
(6) A 600 ohm, 1/4 W resistor.
(7) A distortion meter.

(A) Harmonic Distortion Check

Preparation: Set the controls as follows:

TONE CONTROL····· Flat (center position)
BALANCE CONTROL·· Center position
MODE SWITCH ····· STEREO
FUNCTION ····· Any position
MONITOR SWITCH···· TAPE
LOUDNESS CONTROL. OUT

Step 1: With the equipment connected as shown in Fig. 4-8 , feed a 1 kHz, −10 dB signal to TAPE input (J604) (0 dB = 0.775V rms) through the attenuator and read the harmonic distortion on the distortion meter.

Electrical Specification:

Better than 0.2% at 45 W output
" " 0.2% at 1 W output

(B) Signal-to-Noise Ratio

Preparation: Set the controls as follows:

TONE CONTROL ····· Flat(center position)
BALANCE CONTROL··· Center position
MODE SWITCH ····· STEREO
LOUDNESS CONTROL·· OUT
MONITOR SWITCH ····· SOURCE
FUNCTION SWITCH·····PHONO

Step 1: With the equipment connected as shown in Fig. 4-8 , feed a 1 kHz, −47 dB signal to PHONO input (J602) through the attenuator.

Step 2: Adjust the volume control to obtain 45 W output, and record the output level on the VTVM. Short the input terminal with a jumper lead and record the residual output level. The ratio of the 45 W output level to the residual output level is the rated signal-to-noise ratio.

Electrical Specification:

Better than 60 dB.
Difference between L and R channels should be less than 6 dB.

(C) Sensitivity

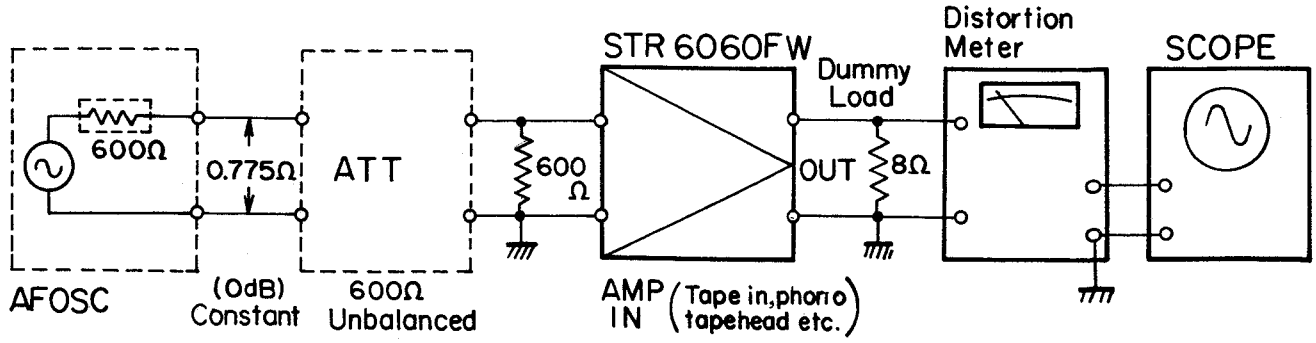
Preparation: Set the controls as follows.

TONE CONTROLS ... Flat(center position)
BALANCE CONTROL .. Center position
MODE SWITCH..... STEREO
LOUDNESS CONTROL . OUT
VOLUME CONTROL ... Fully clockwise

Step 1: With the equipment connected as shown in Fig. 4-8, feed a 1 kHz signal and note the input level which produces a 45 W output for each input terminal, respectively.

Electrical Specifications:

PHONO ····· 51 ±3 dB
TAPE HEAD ····· 55 ±3 dB
TAPE ····· 13 dB ±2 dB



Overall Check-Out and Adjustment Test Set-UP

Fig. 4-8

SECTION 5

TROUBLE SHOOTING

General:

The most effective trouble shooting method is signal tracing. That is, apply a standard RF or audio signal at the antenna or input terminals and trace the signal through the amplifier chains using an AC VTVM or calibrated oscilloscope. Normal values of signal voltages are shown on the level diagram.

The faulty stage usually precedes the point at which an abnormal signal voltage is found. However, signal loss can also result from a short or low impedance at the point where low signal voltage is found.

When the defective stage has been localized, check DC voltages in the stage. Most current failures will affect resistance checks to localize the fault to a component.

In performing voltage check or tracing signal level by dc or ac VTVM, test leads must touch the component lead after removing the printed board from chassis.

Your time will be saved by reforming test leads of your equipment to touch the leads of capacitors, transistors or resistors directly from component side of printed circuit board as shown.

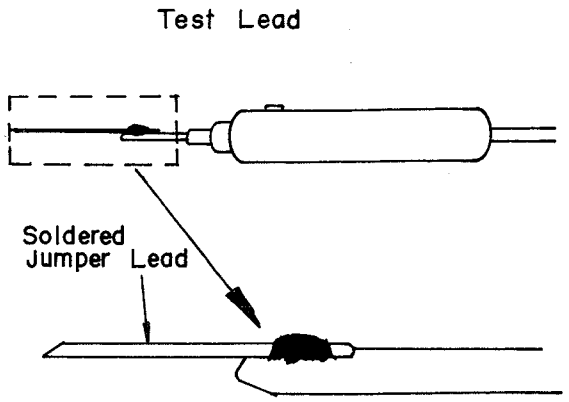


Fig. 5-1

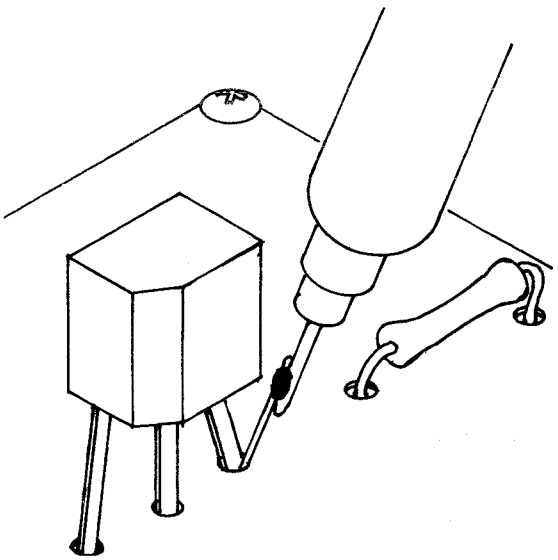


Fig. 5-2

Locating the Trouble

Common sense goes a long way in helping to narrow down the trouble area. STR-6060 FW consists of separate tuner, preamplifier and power amplifier.

If the system operates poorly from the tuner position and well from the player, the faultiness is obviously in the tuner.

If it works poorly from both tuner and record player, the trouble is in the preamp or power amplifier.

If the tape recorder line output can be temporarily fed directly to the power amplifier and both channels are all right, the preamplifier is at fault.

The method of interchange of channels is a effective way to find out the trouble in preamplifier and power amplifier. Assume the left phono channel isn't working and it has determined that the trouble is either in the cartridge or the phono section of the amplifier.

If the right section of the cartridge is connected to the left phono input and operates satisfactorily, this points out the blame on the cartridge; otherwise the left phono section of the amplifier is to blame.

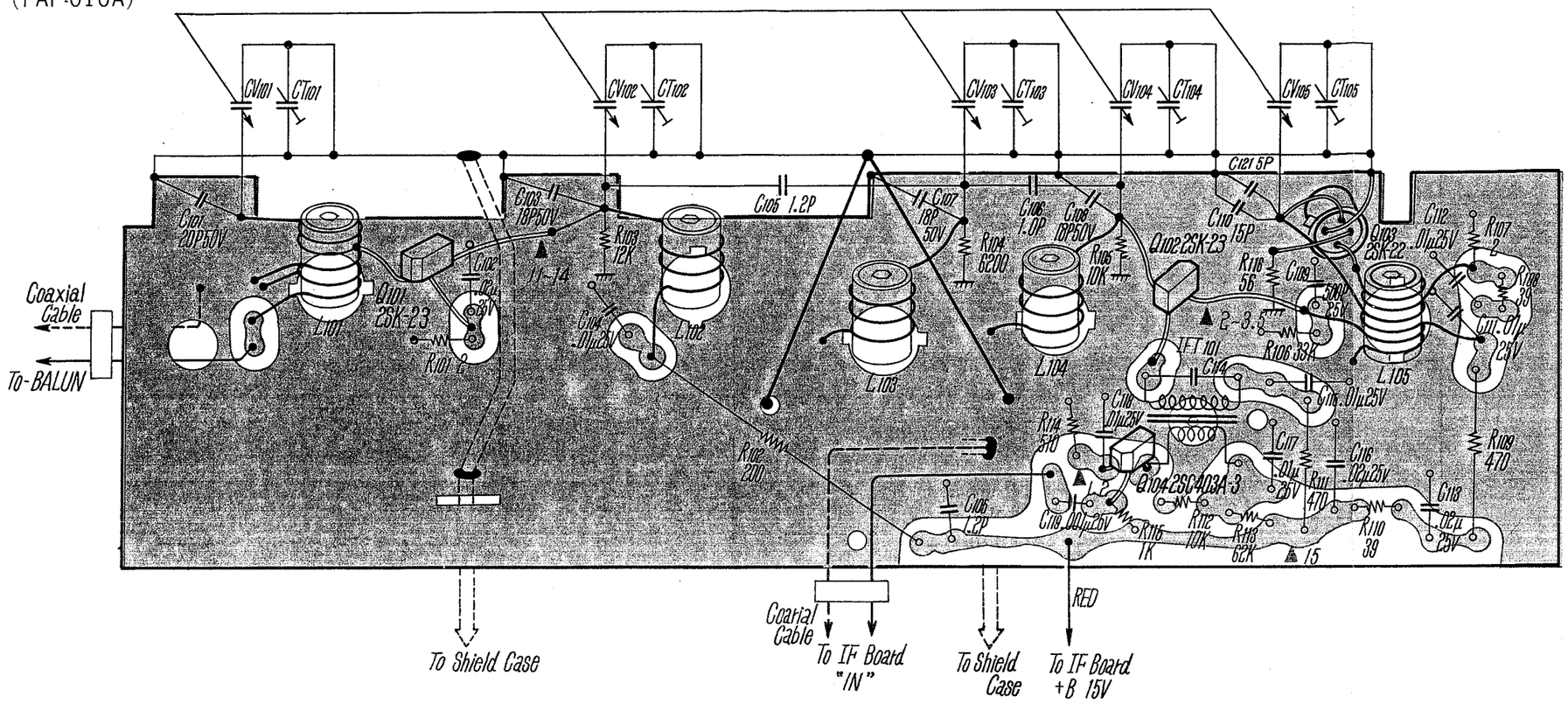
The foregoing procedures will be able to apply on power amplifier section either.

Mounting Diagram

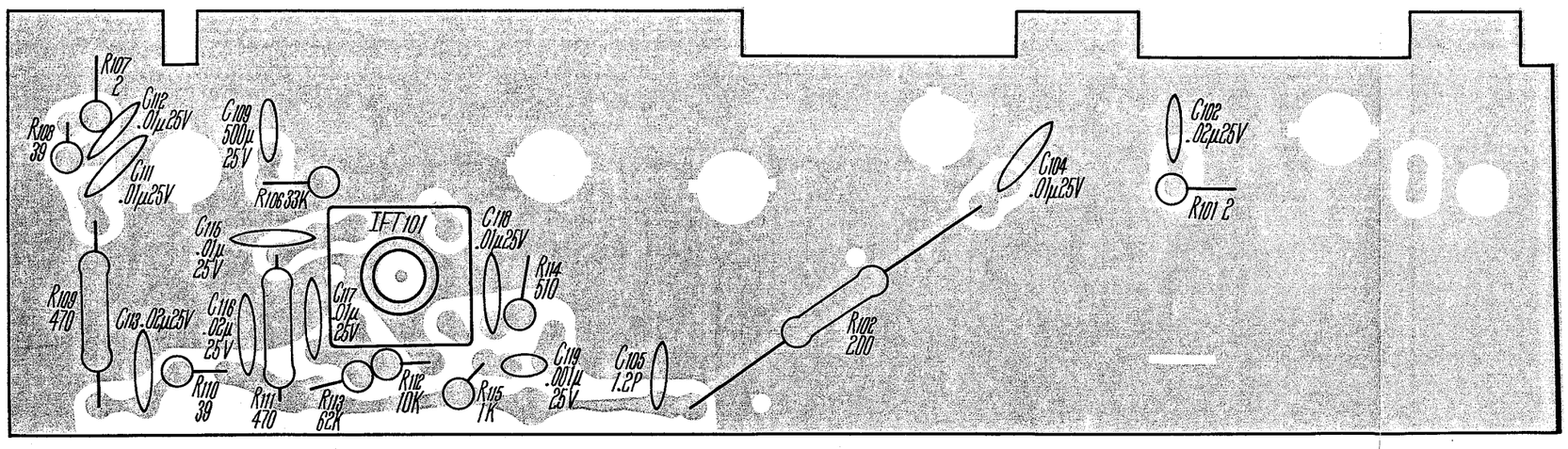
FM Front End Section (FAF-010A)

—Conductor Side—

For the sets with
serial number
UL model : 85001 to 85901
CSA model : 55001 to 55301



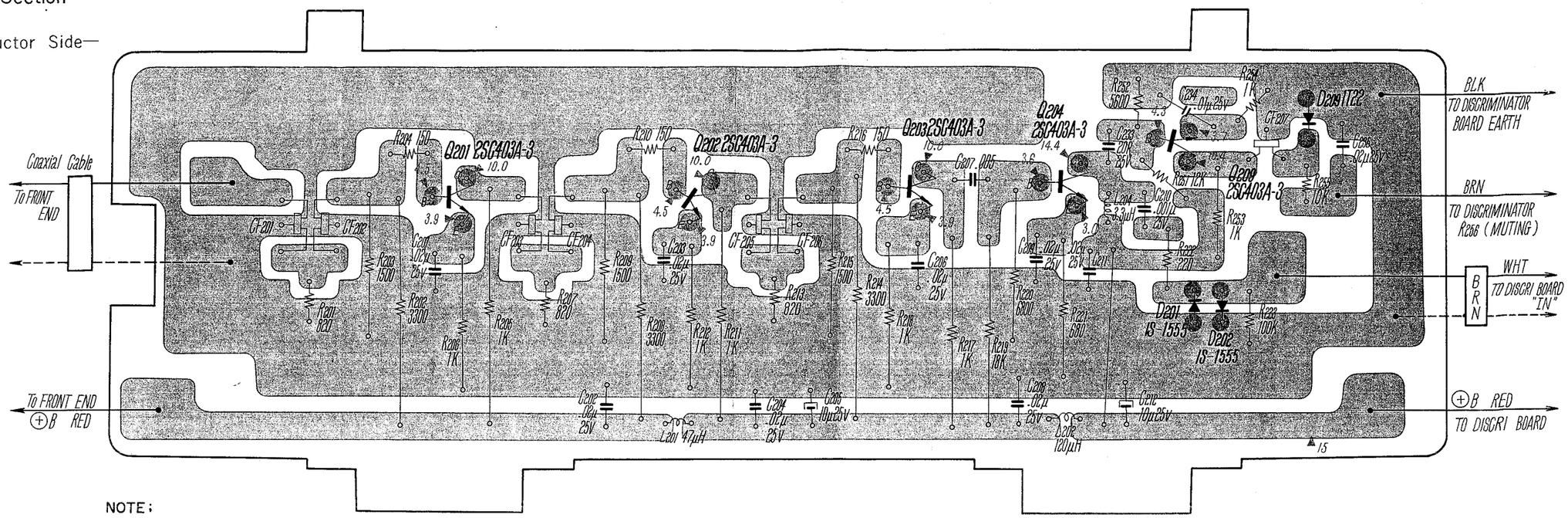
—Component Side—



Mounting Diagram

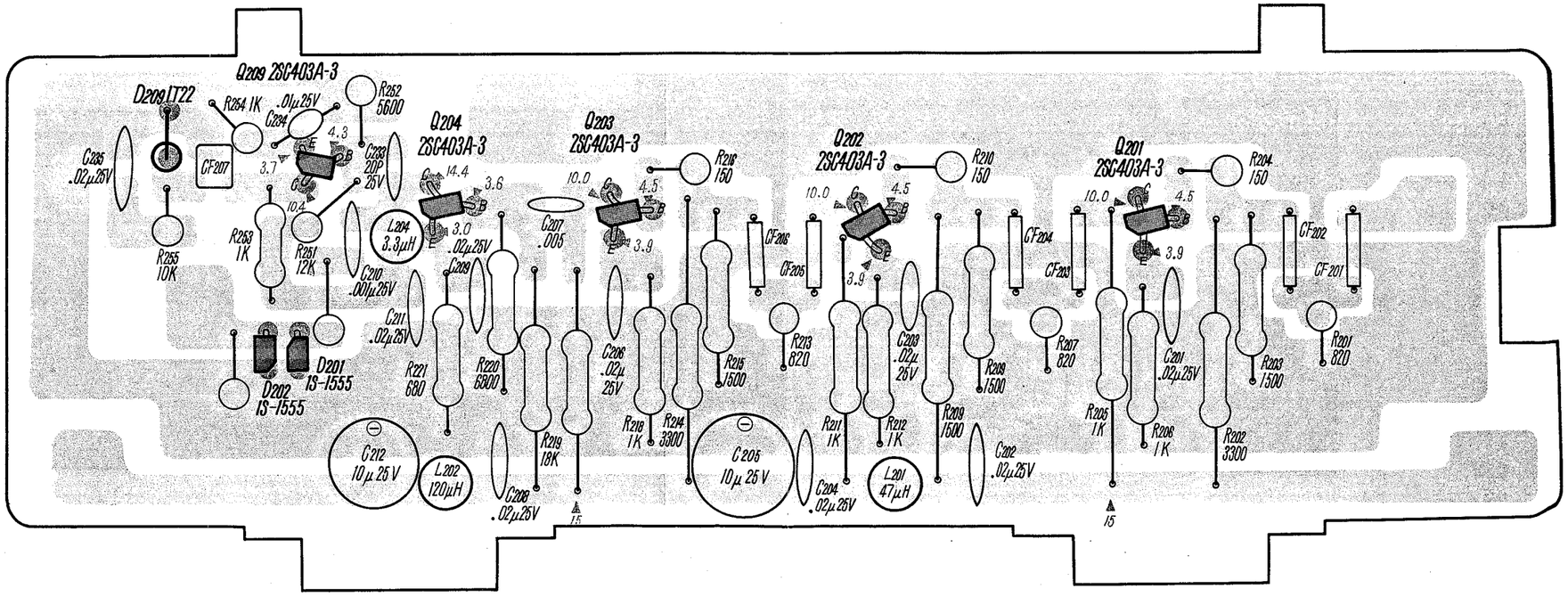
FM IF Section

—Conductor Side—



NOTE;
DIODES 1T243 ARE EMPLOYED AS D201~D206 FOR THE SETS OF SERIAL NUMBER 80001 TO 80101.

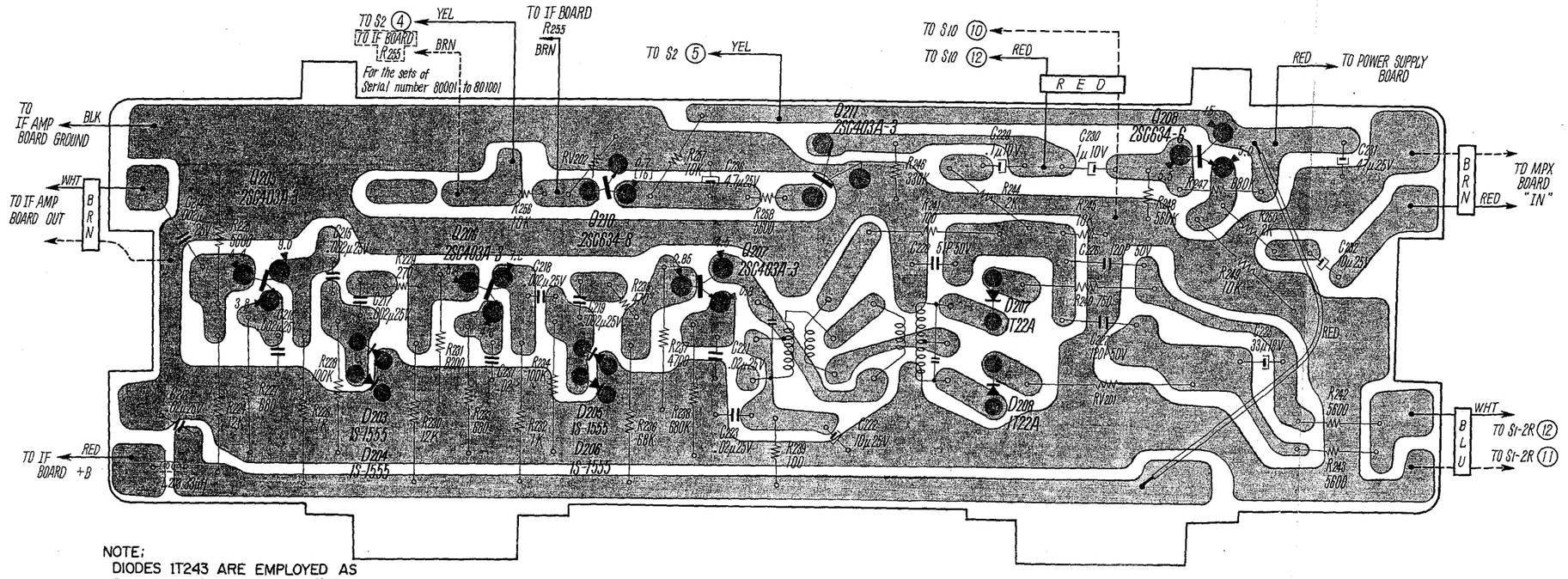
—Component Side—



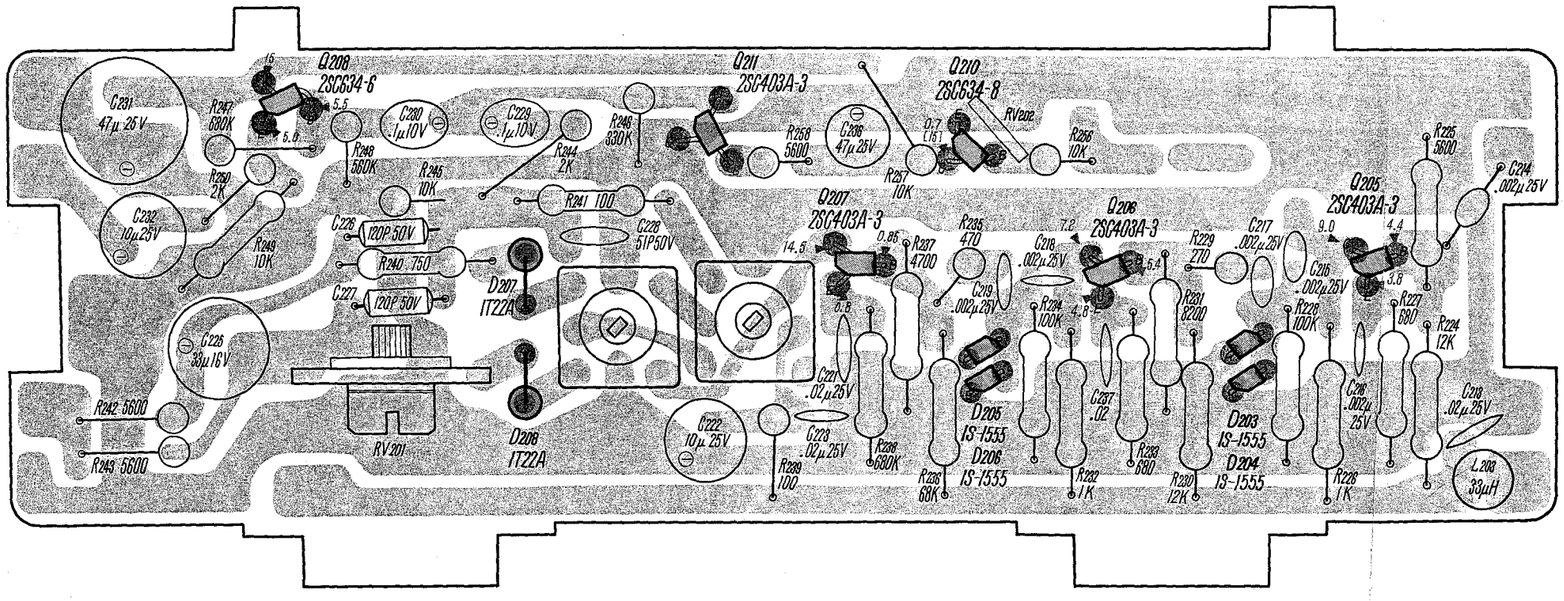
Mounting Diagram

Limiter and Discriminator Section

—Conductor Side—



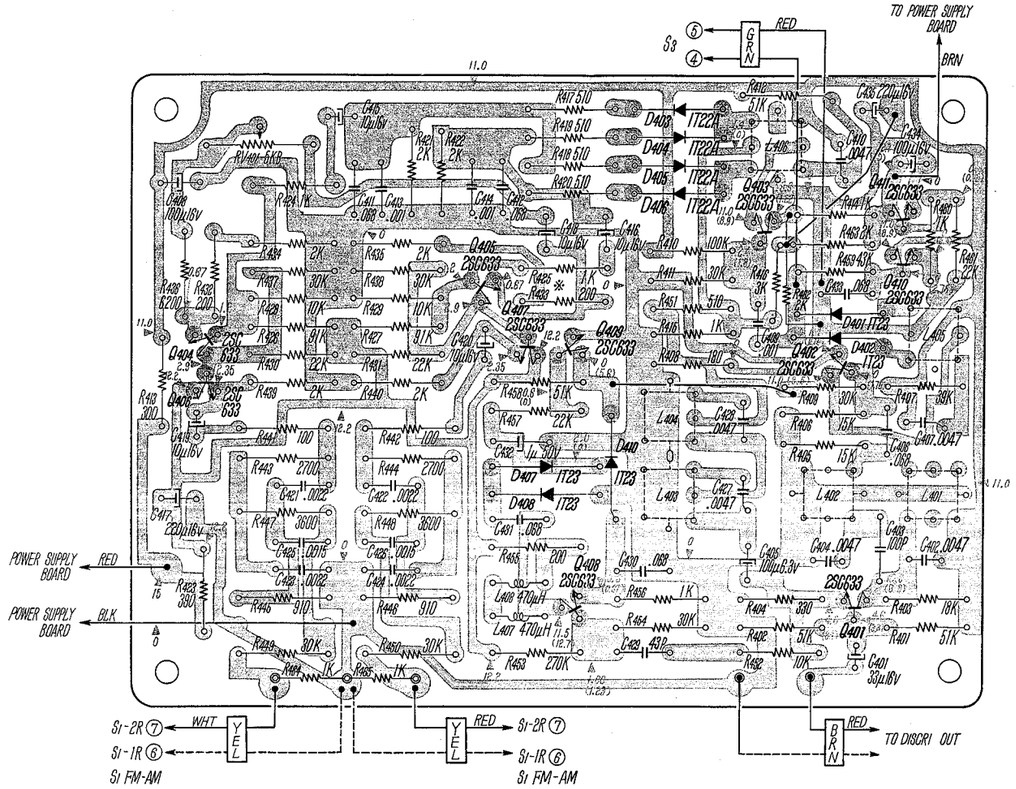
—Component Side—



Mounting Diagram

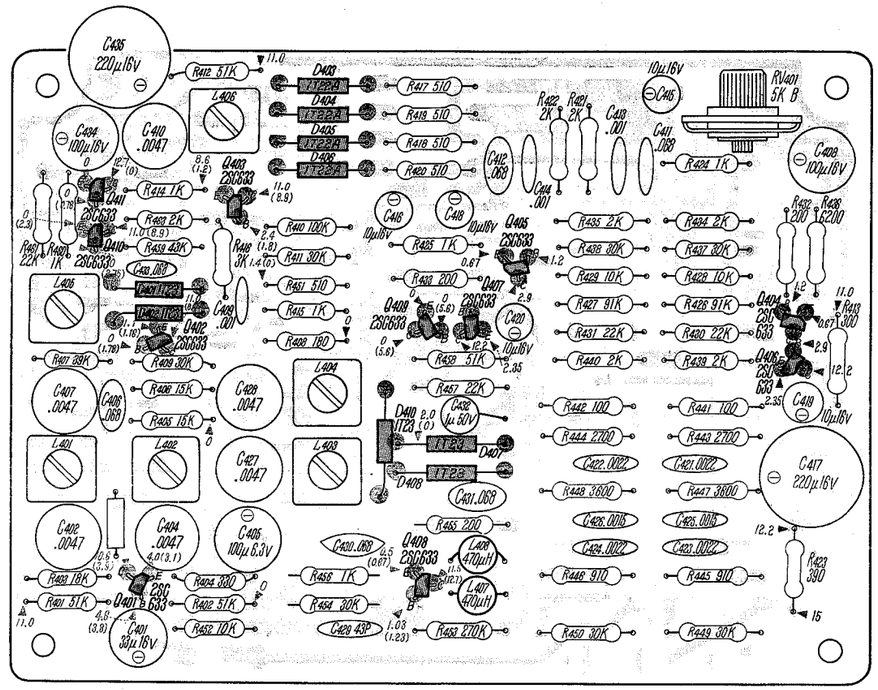
MPX Decoder Section

—Conductor Side—



Note : ( ) Stereo Signal in.

—Component Side—

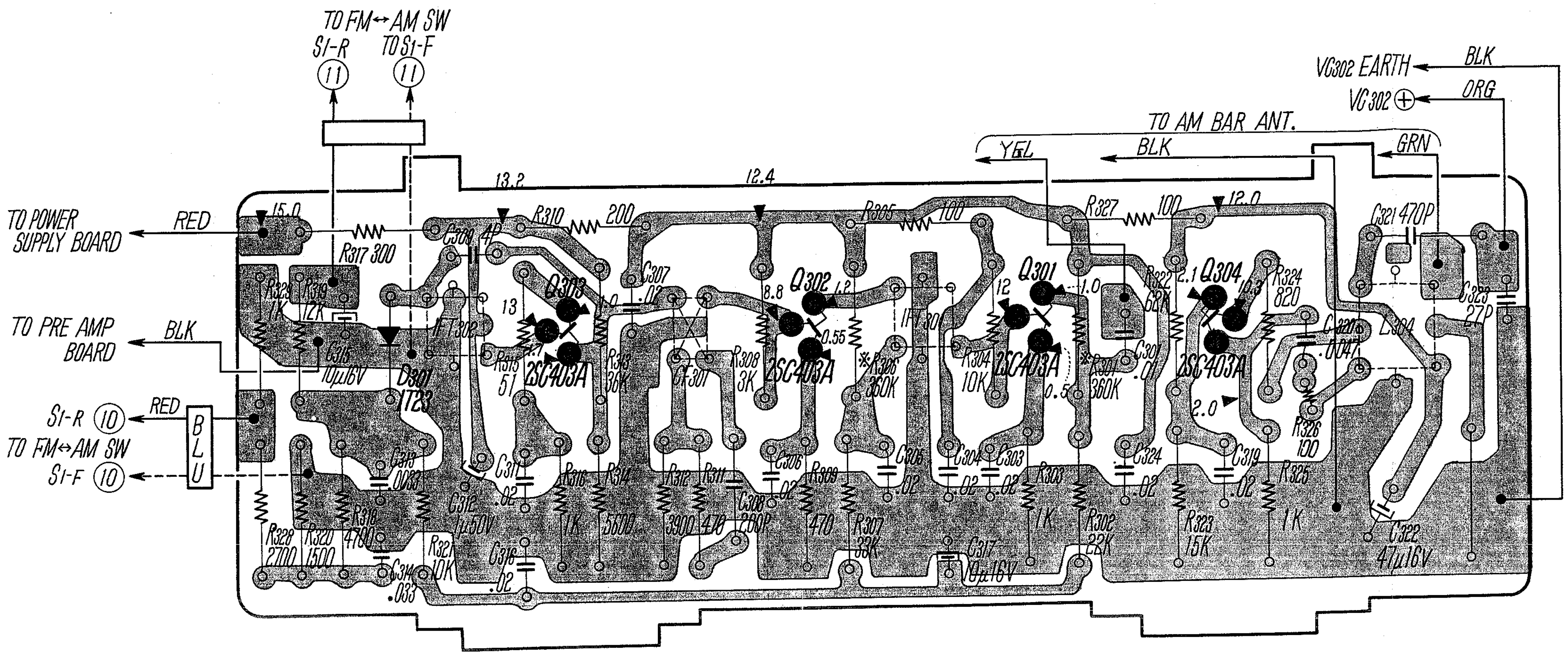


 STR-6060FW

Mounting Diagram

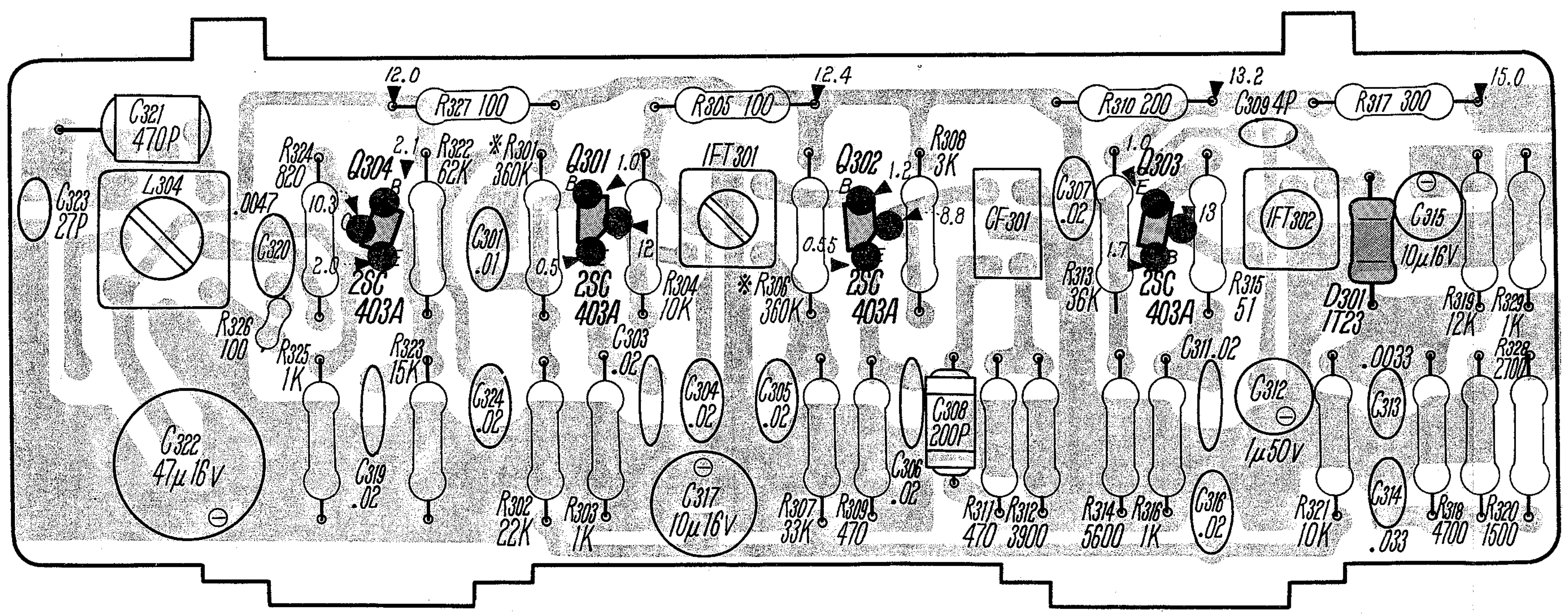
AM CP.IF Section

—Conductor Side—



※ To be Selected

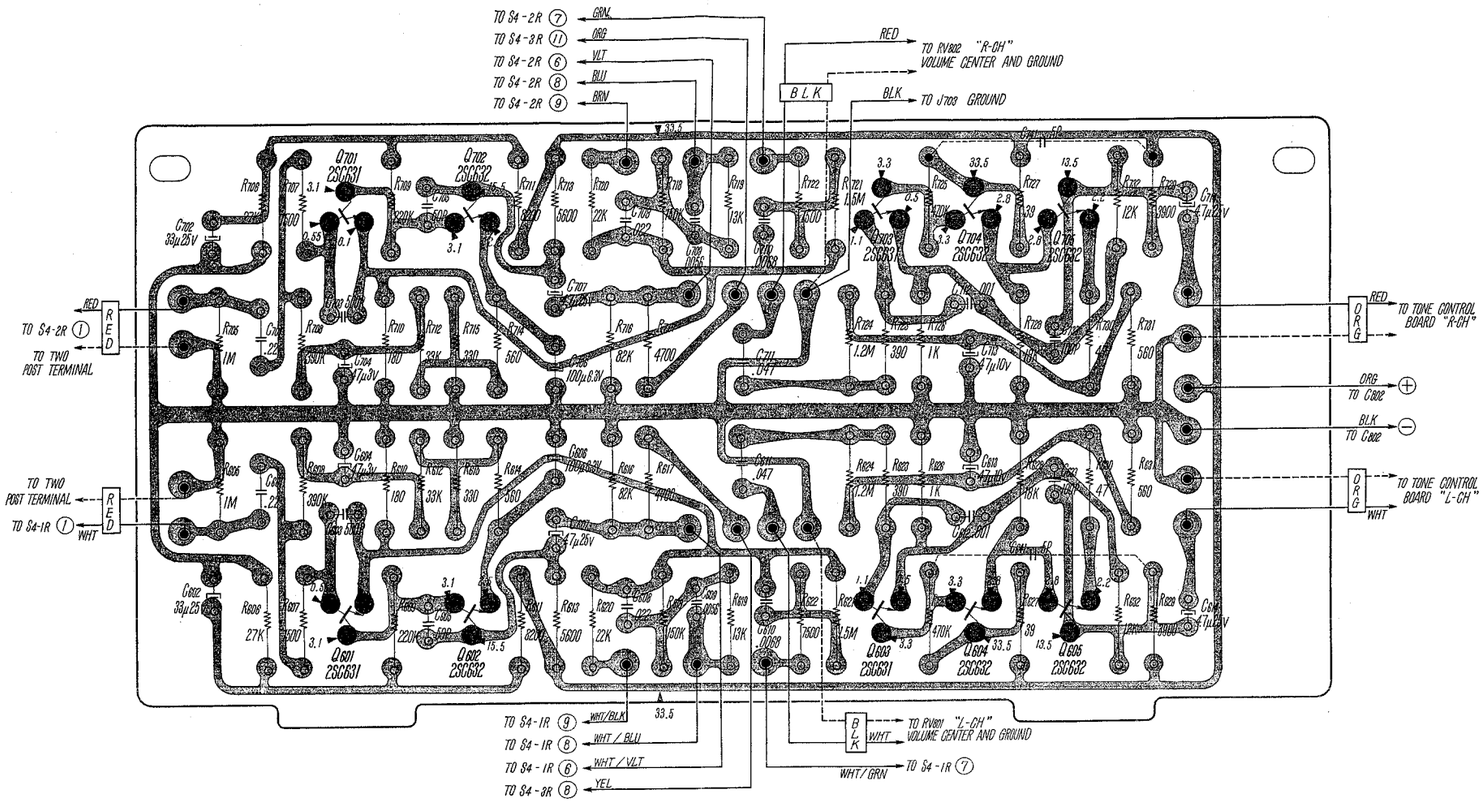
—Component Side—



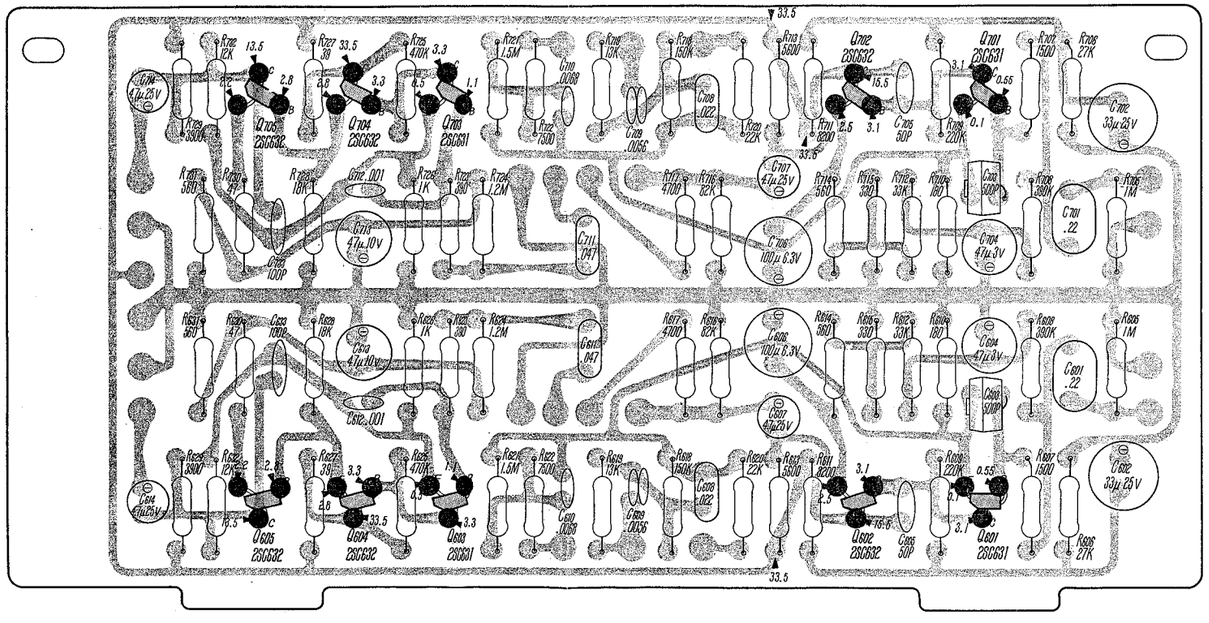
Mounting Diagram

Preamplifier Section

—Conductor Side—



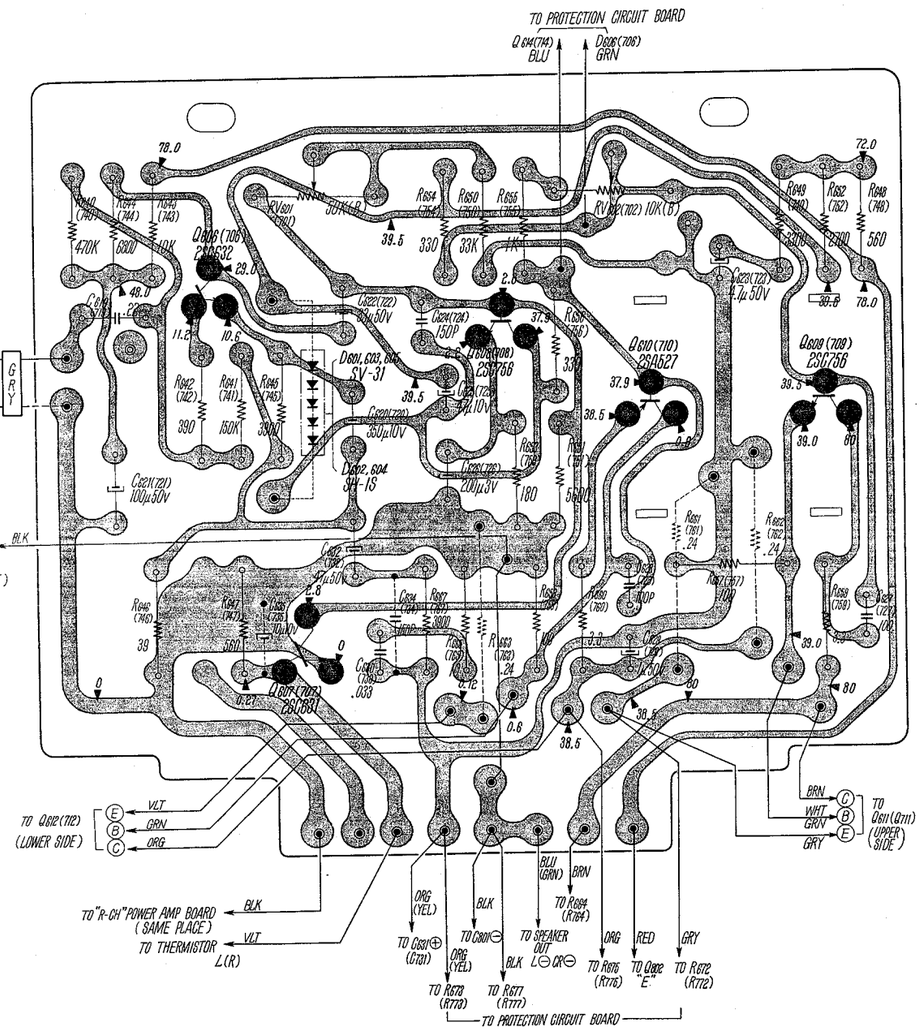
—Component Side—



Mounting Diagram

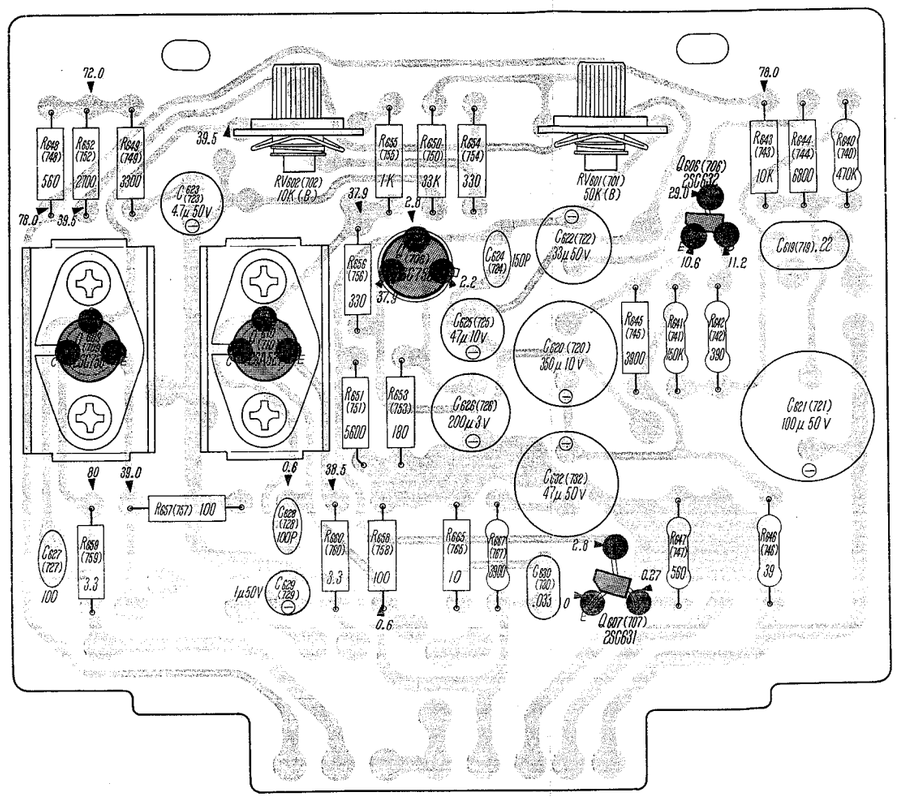
Power Amplifier Section

—Conductor Side—



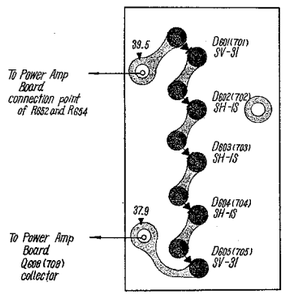
Mounting Diagram

—Component Side—

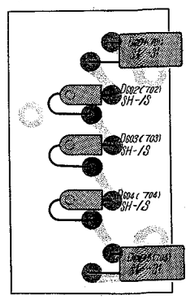


Thermo-Compensation Diode

—Conductor Side—



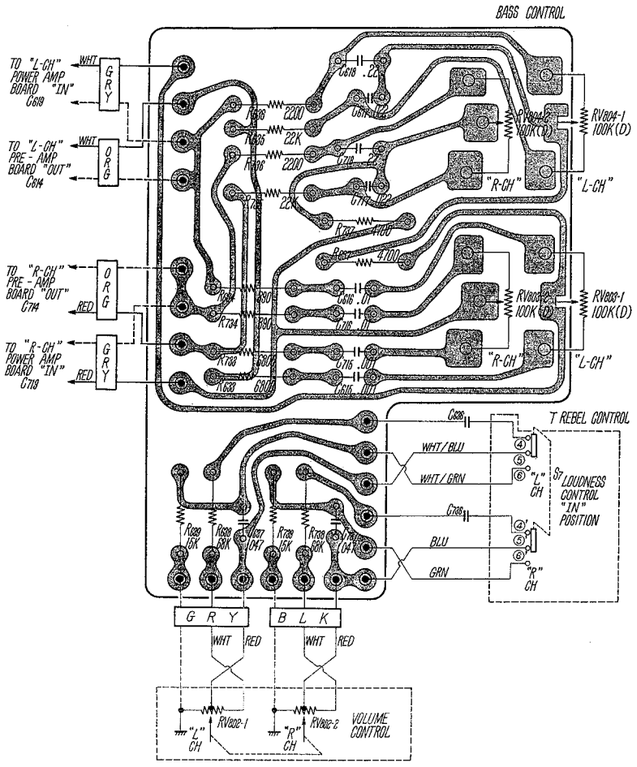
—Component Side—



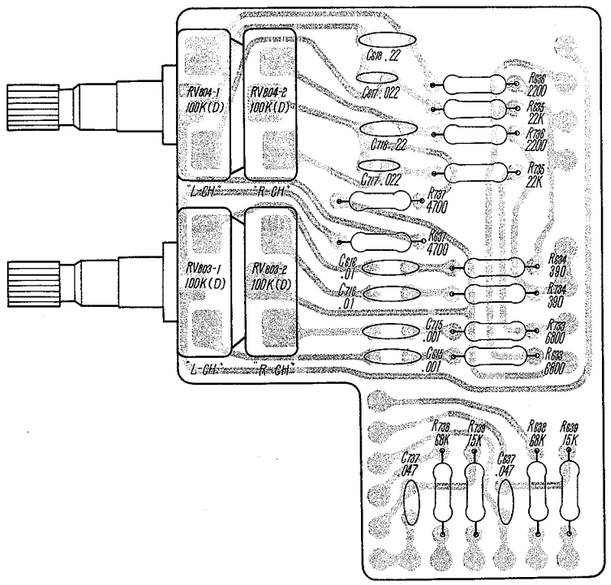
Mounting Diagram

Tone Control Section

—Conductor Side—



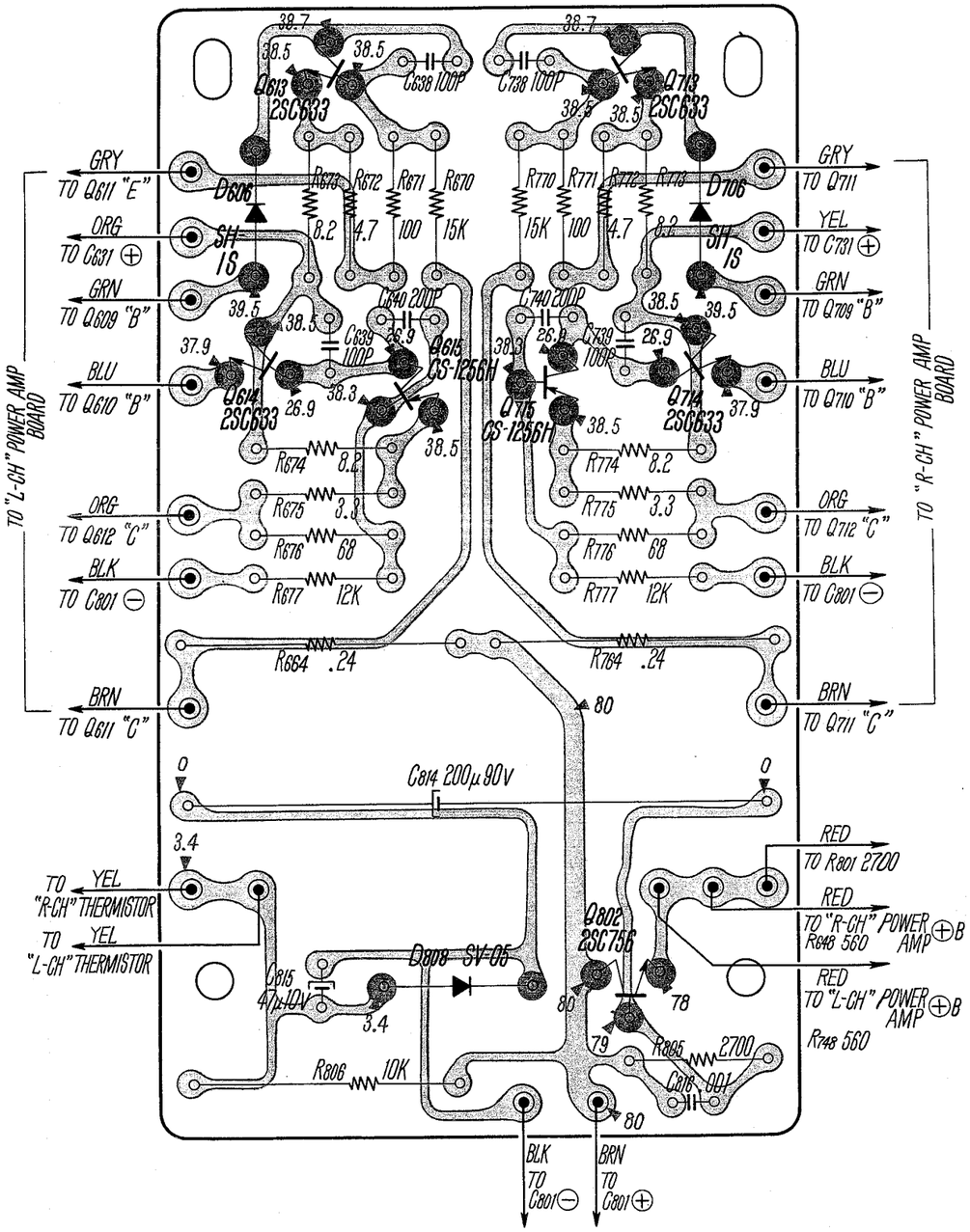
—Component Side—



Mounting Diagram

Protection Circuit Board

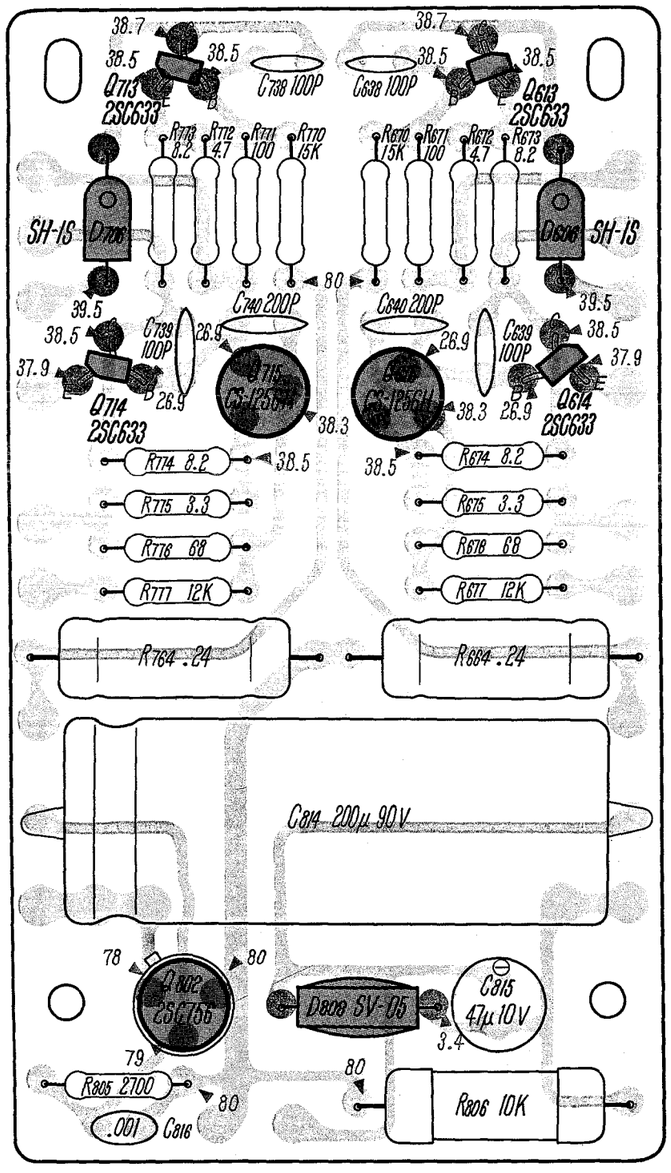
—Conductor Side—



Mounting Diagram

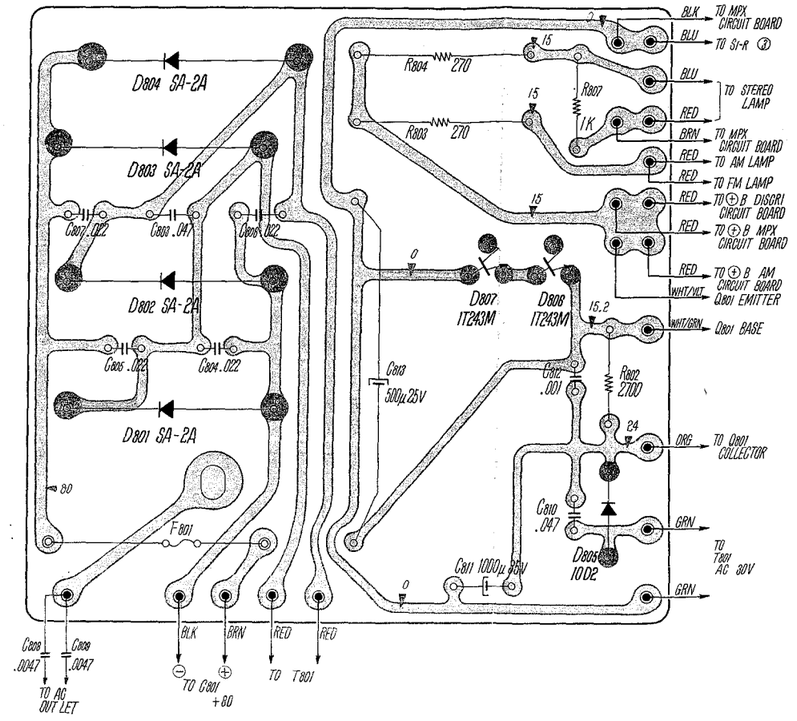
Protection Circuit Board

—Component Side—

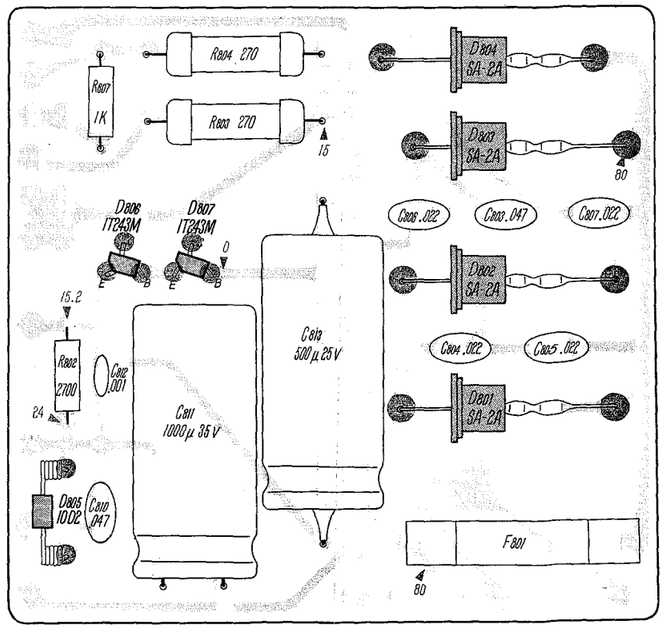


Mounting Diagram

Power Supply Section —Conductor Side—



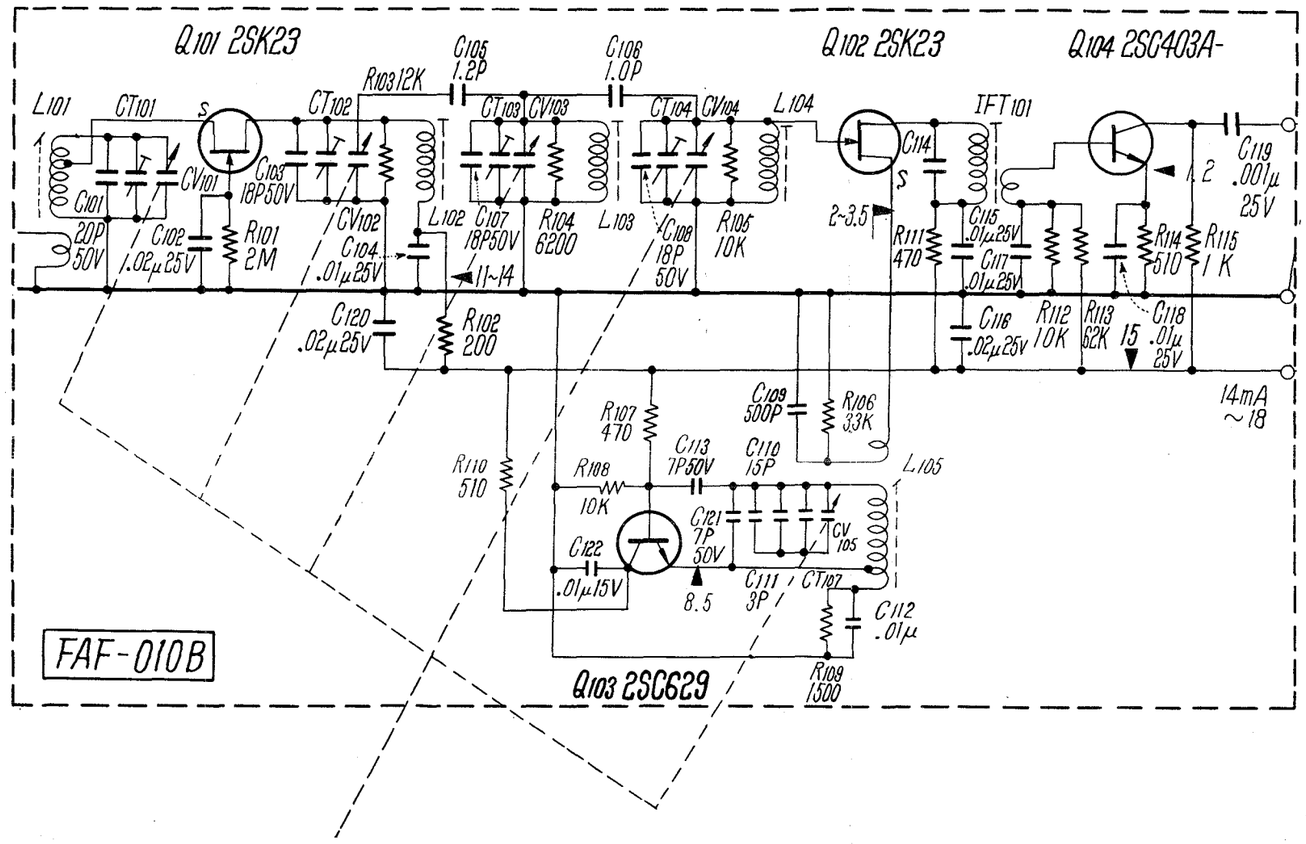
—Component Side—



Schematic Diagram

FM Front End Section (FAF-010B)

For the sets with serial number
UL model : 85902 and later
CSA model : 55302 and later
GENERAL EXPORT model : 75001 and later

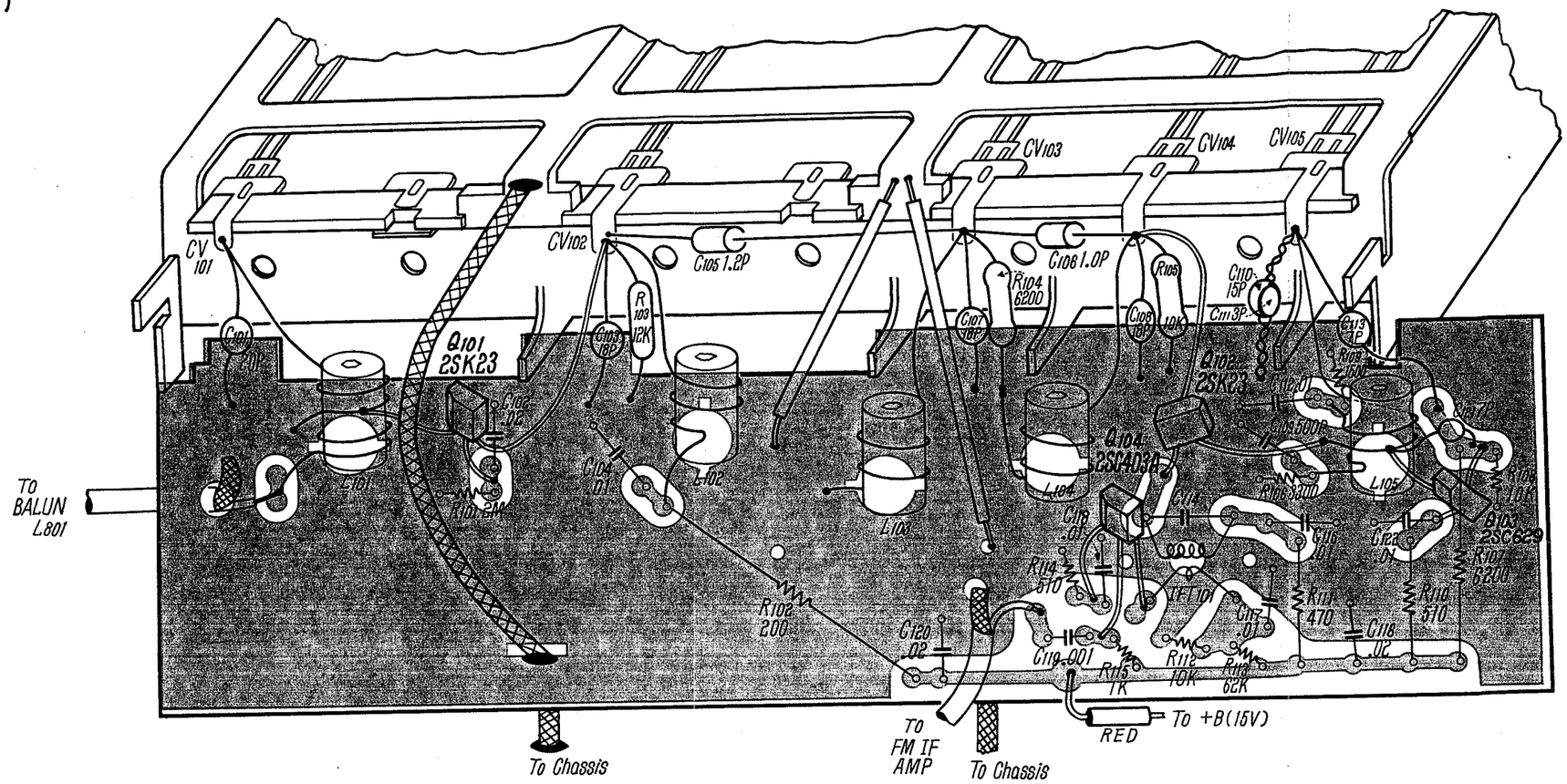


Mounting Diagram

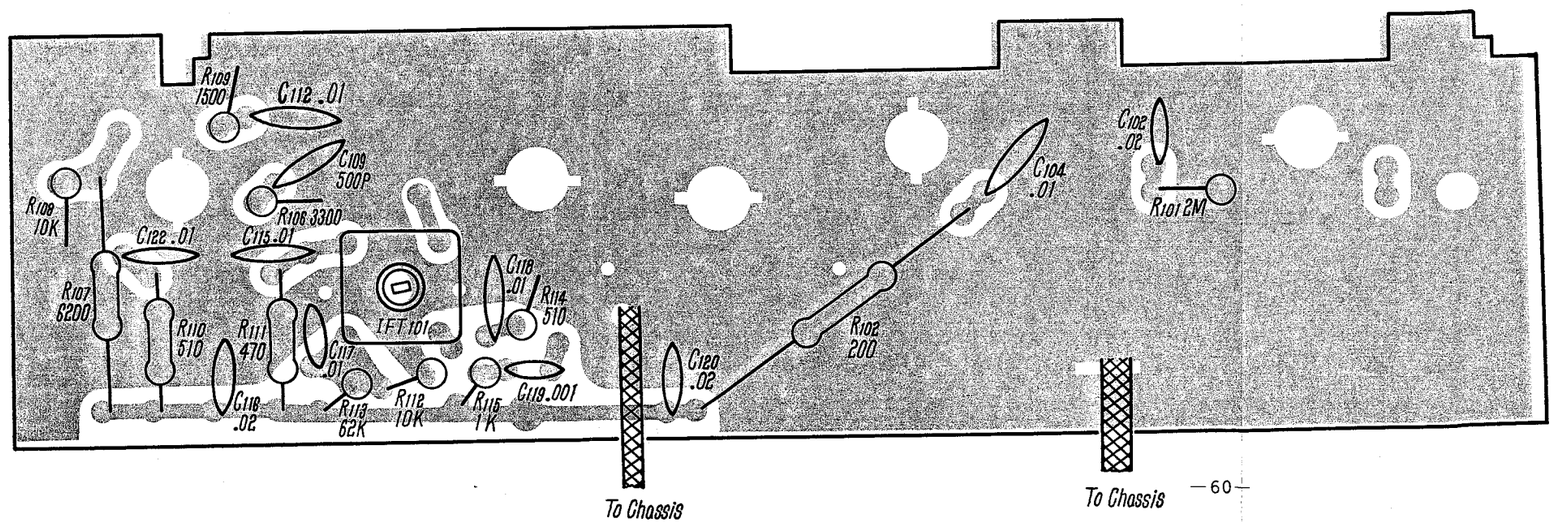
FM Front End Section (FAF-010B)

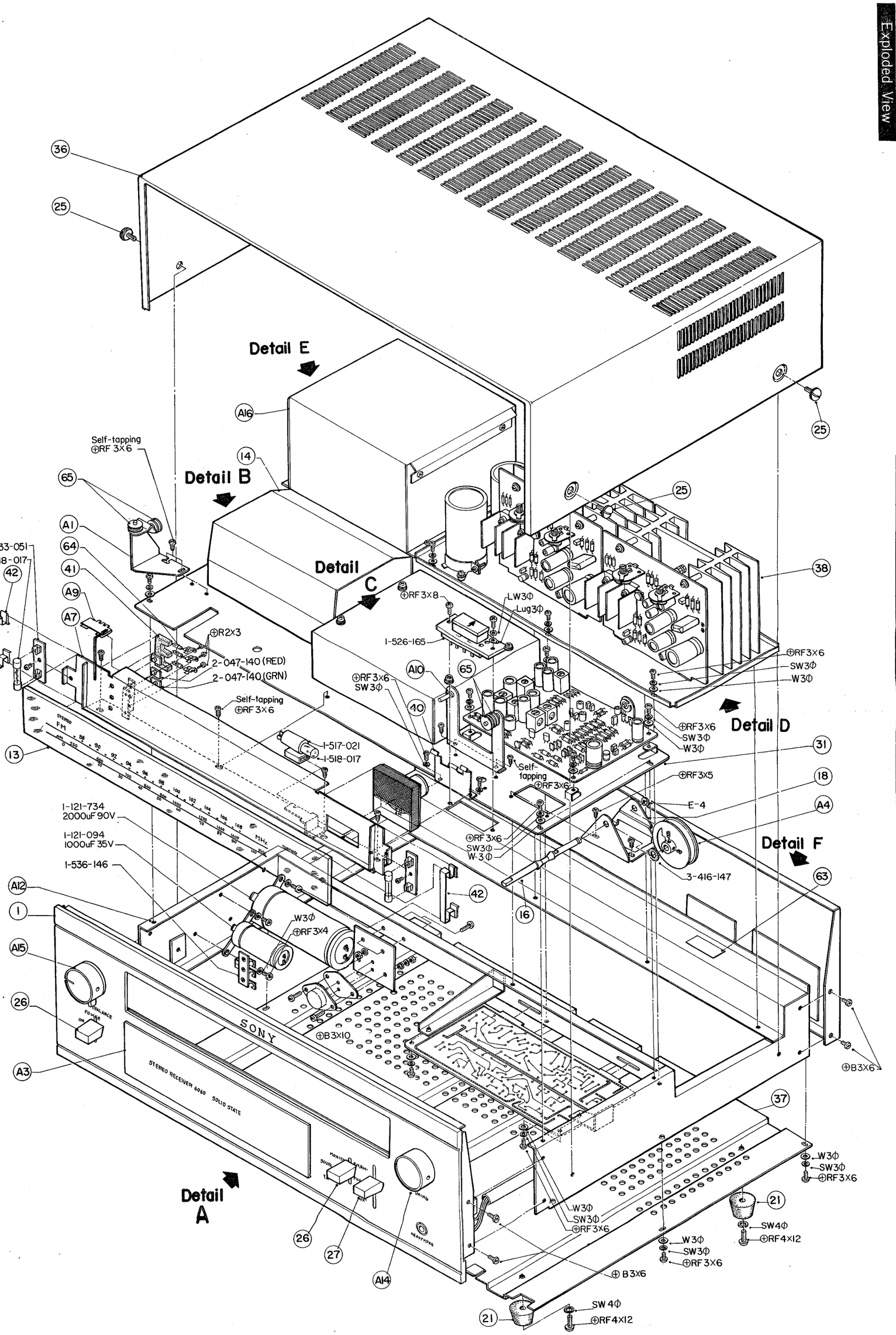
—Conductor Side—

For the sets with serial number
UL model:
85902 and later
CSA model:
55302 and later
GENERAL EXPORT model:
75001 and later



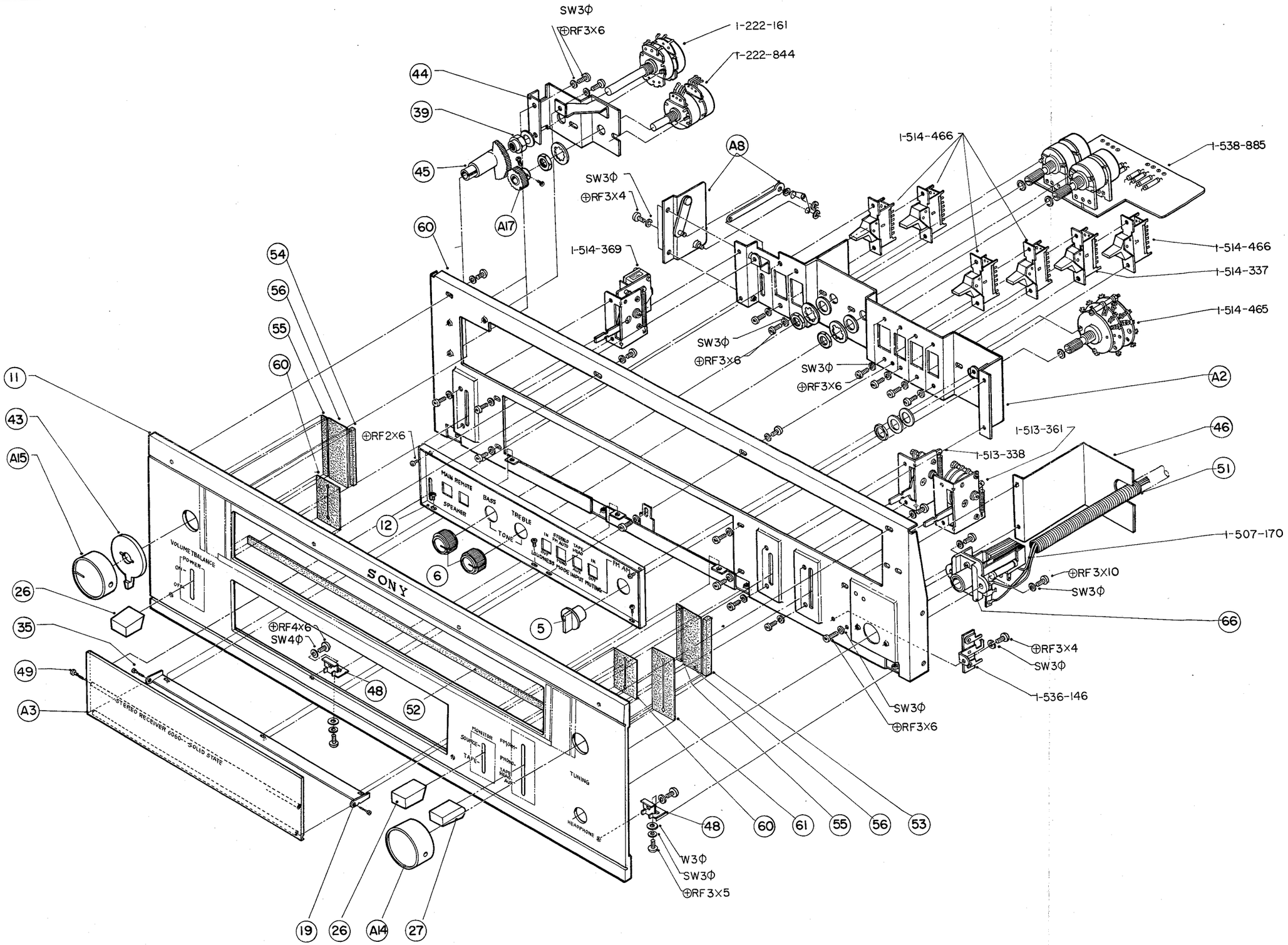
—Component Side—




36
25
Detail E
A16
Self-tapping ⊕RF 3X6
14
65
Detail B
A1
64
41
A9
A7
1-533-051
1-518-017
42
⊕R2X3
2-047-140 (RED)
2-047-140 (GRN)
Self-tapping ⊕RF 3X6
13
1-517-021
1-518-017
1-121-734 2000uF 90V
1-121-094 1000uF 35V
1-536-146
A12
1
A15
26
A3
W3Φ ⊕RF3X4
⊕B3X10
SONY
STEREO RECEIVER 6060 SOLID STATE
Detail A
26
27
A14
Detail C
⊕RF 3X8
LW3Φ
Lug3Φ
1-526-165
A10
65
⊕RF3X6 SW3Φ
40
25
38
⊕RF3X6
SW3Φ
W3Φ
Detail D
⊕RF3X6
SW3Φ
W3Φ
31
Self-tapping ⊕RF3X6
⊕RF3X5
18
E-4
A4
⊕RF3X6
SW3Φ
W3Φ
Detail F
3-416-147
63
42
16
⊕B3X6
37
W3Φ
SW3Φ
⊕RF3X6
21
SW4Φ
⊕RF4X12
W3Φ
SW3Φ
⊕RF3X6
⊕B3X6
21
SW4Φ
⊕RF4X12

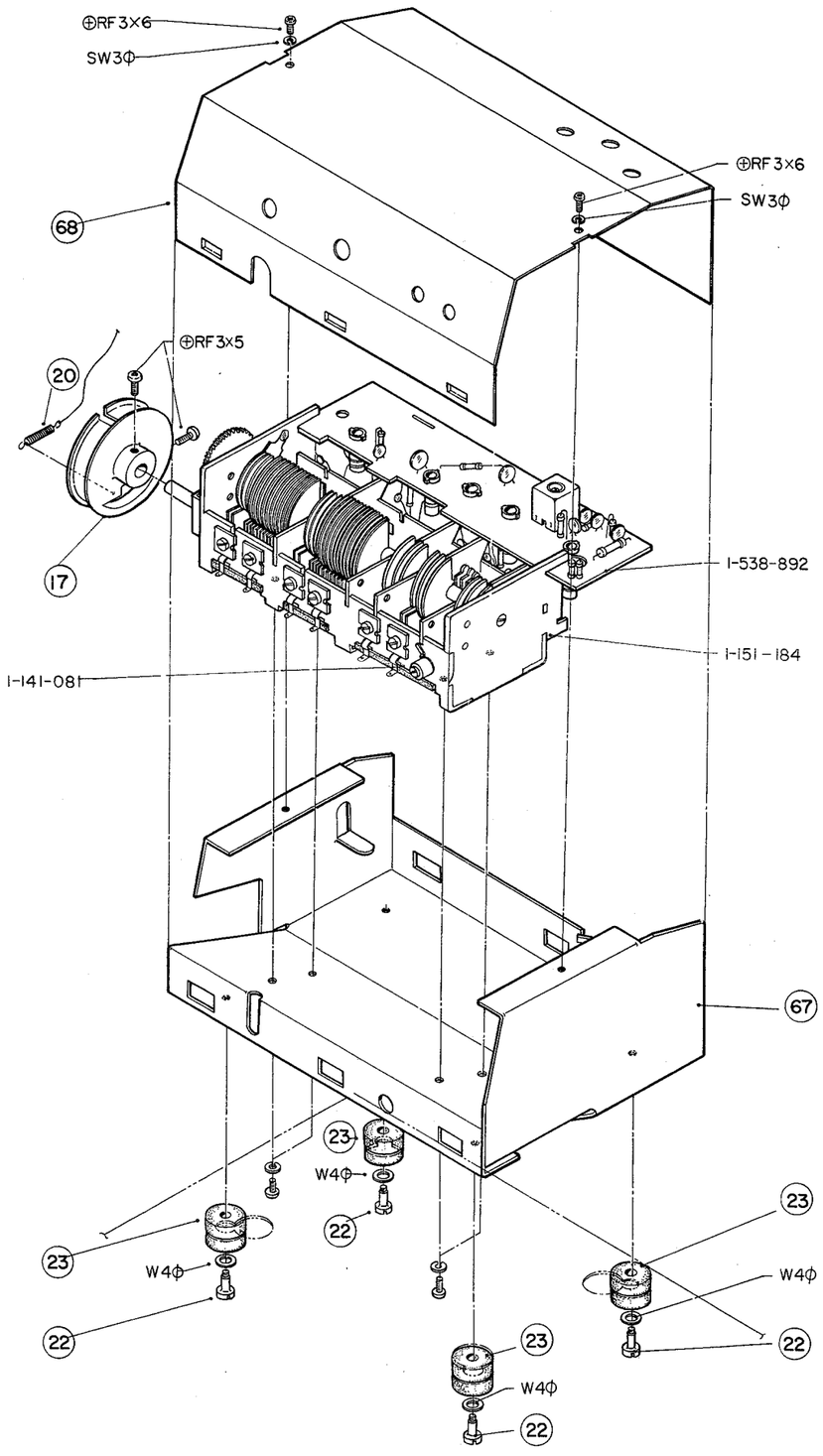
Exploded View

Detail A



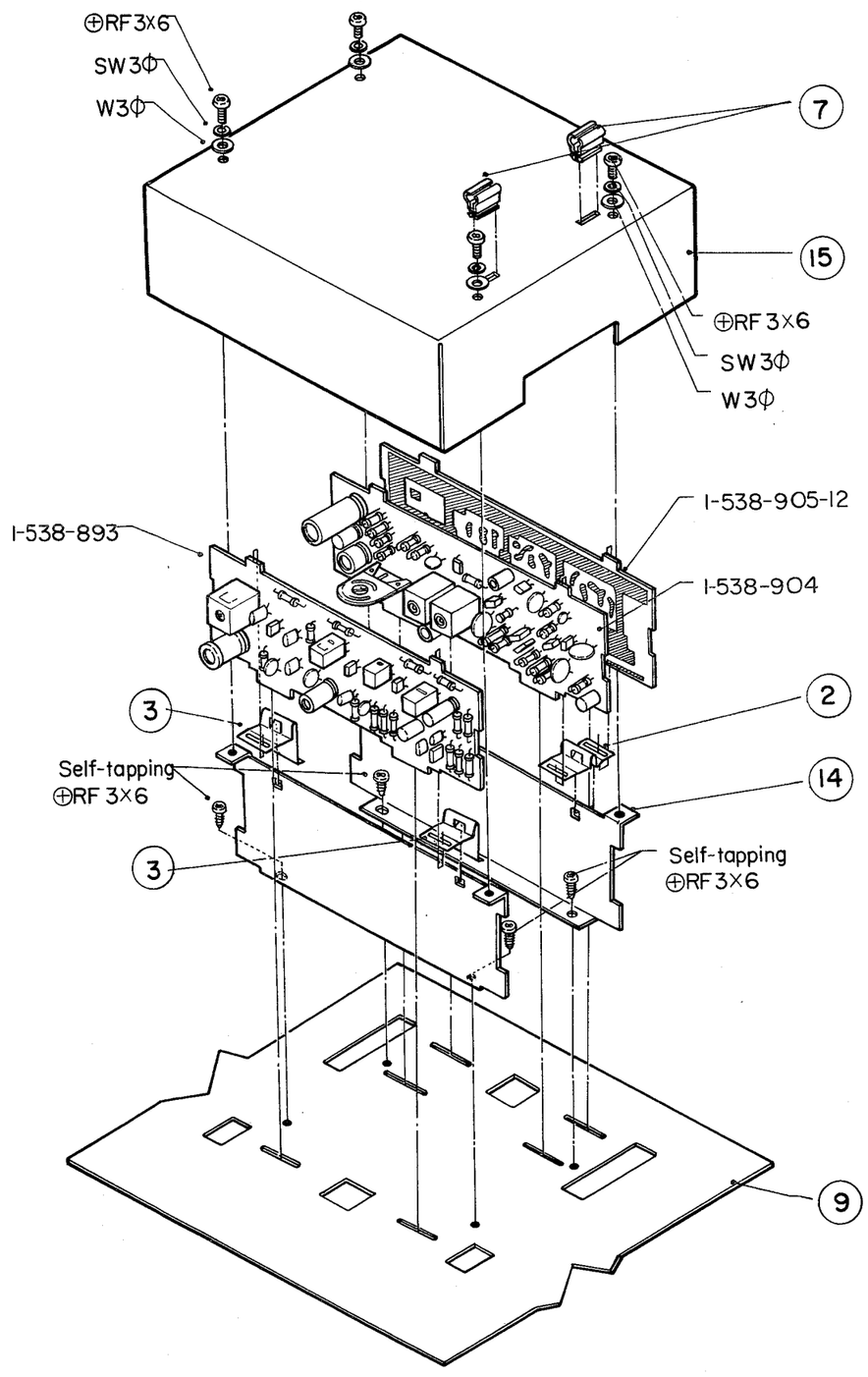
Exploded View

Detail B



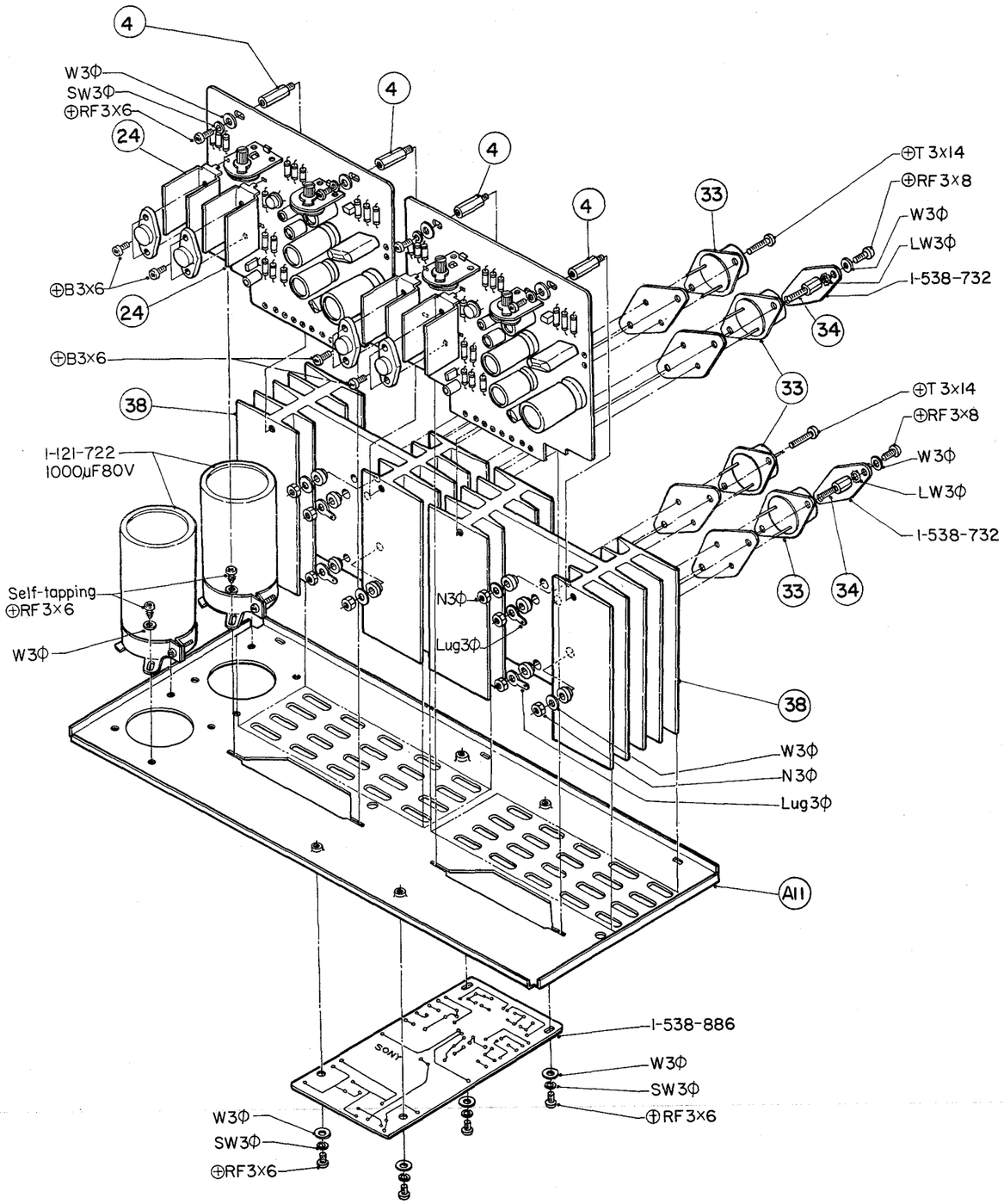
Exploded View

Detail C



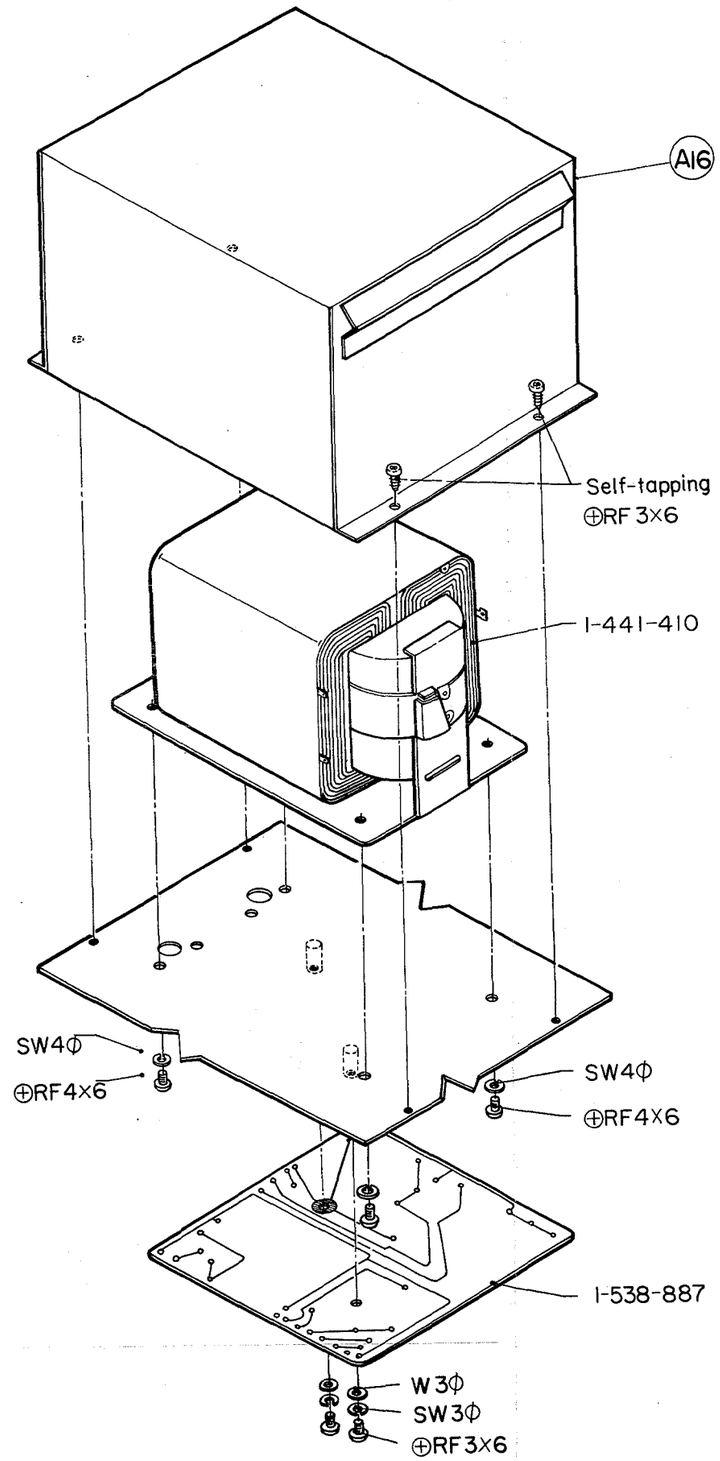
Exploded View

Detail D



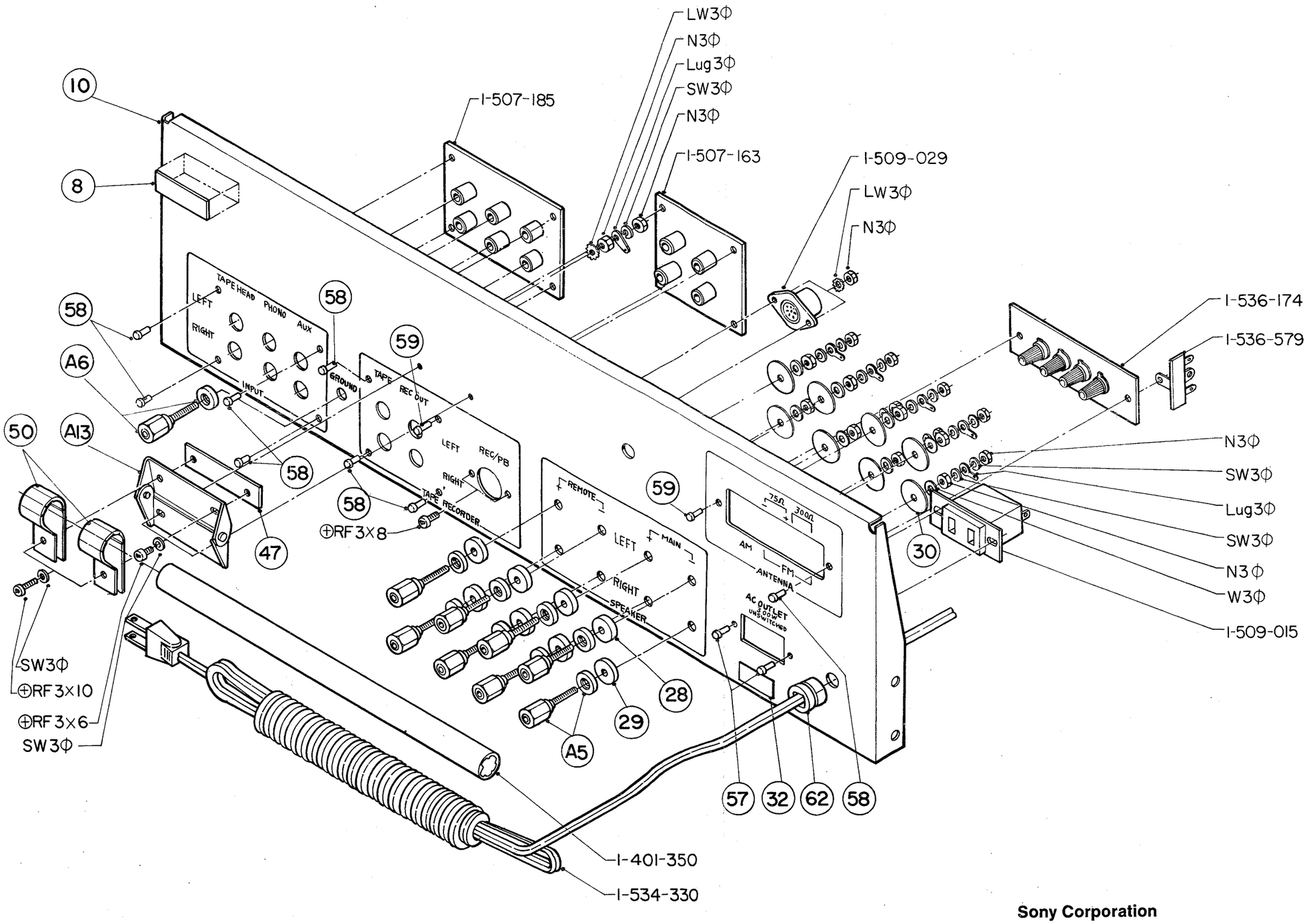
Exploded View

Detail E



Exploded View

Detail F



9-958-263-01

78I0407-6
Printed in Japan