AM/FM STEREO RECEIVER

SX-1250

<ART-158-0>

Service Manual

PIONEER®

MODEL SX-1250 COMES IN THREE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KCU	120V only	CSA (Canada) and UL (U.S.A) approved with de-emphasis selector switch (25μs/75μs)
HG	220V and 240V (Switchable)	SEMKO (Sweden), NEMKO (Norway), DEMKO (Denmark) and EI (Finland) approved
S	110V, 120V, 220V and 240V (Switchable)	General export model with de-emphasis selector switch (25μs/50μs/75μs)

When repairing S or HG type, please see the manual on page 101.

CONTENTS

1. SPECIFICATIONS

Semiconductors

FETs 5
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Diodes 60

Power Amplifier Section

Continuous Power Output from 20 Hertz to 20,000 Hertz (Both channels driven). . 160 watts per channel (8 ohms)
200 watts per channel (4 ohms)
Total Harmonic Distortion (20 Hertz to 20,000 Hertz, from AUX)
Continuous Rated Power Output. . . No more than 0.1%
80 watts per channel power output, 8 ohms . . . . . No more than 0.05%
1 watt per channel power output, 8 ohms . . . . . No more than 0.07%
Intermodulation Distortion (50 Hertz : 7,000 Hertz = 4 : 1, from AUX)
Continuous Rated Power Output. . . No more than 0.1%
80 watts per channel power output, 8 ohms . . . . . No more than 0.05%
1 watt per channel power output, 8 ohms . . . . . No more than 0.07%
Frequency Response . . . . . 5Hz to 100,000Hz $^{+0}_{-1}$dB
Input Sensitivity/Impedance
POWER AMP IN . . . . . 1 V/50k ohms
Output
Speaker . . . . . A, B, C, A+B, B+C, A+C
Headphone . . . . . Low Impedance
Damping Factor
(20Hz to 20,000Hz, 8 ohms) 30
Hum and Noise (IHF, short-circuited, A Network) . . 100dB

Preamplifier Section

Input Sensitivity/Impedance
PHONO 1 . . . . . 2.5mV/50k ohms
PHONO 2 . . . . . 2.5mV/50k ohms
MIC . . . . . 6.5mV/50k ohms
AUX . . . . . 150mV/50k ohms
TAPE PLAY 1 . . . . . 150mV/50k ohms
TAPE PLAY 2 . . . . . 150mV/50k ohms
TAPE PLAY 2 (DIN connector). . . . 150mV/50k ohms
PHONO Overload Level (T.H.D. 0.1%)
PHONO 1 . . . . . 500mV (1kHz)
PHONO 2 . . . . . 500mV (1kHz)
Output Level/Impedance
TAPE REC 1 . . . . . 150mV
TAPE REC 2 . . . . . 150mV
TAPE REC 2 (DIN connector) . . . . 30mV/80k ohms
PRE OUT . . . . . 1V/1k ohms
Total Harmonic Distortion
(20Hz ot 20,000Hz, 1V output) . . No more than 0.02%
Frequency Response
PHONO (RIAA equalization). .30Hz to 15,000Hz ±0.2dB
AUX, TAPE PLAY . . . . . 10Hz to 50,000Hz $^{+0}_{-1}$dB
Tone Control
BASS . . . . . MAIN ±10dB (100Hz)
SUB ± 5dB (50Hz)
TREBLE . . . . . MAIN ±10dB (10kHz)
SUB ± 5dB (20kHz)
Filter
LOW 30Hz (12dB/oct.)
HIGH 8kHz (12dB/oct.)
Loudness Contour (Volume control set at −40dB position) . . . . .+6dB (100Hz), +3dB (10kHz)
Hum and Noise (IHF, short-circuited, A Network, rated power)
PHONO 75dB
AUX, TAPE PLAY 90dB
Muting . . . . . −20dB

FM Section

Usable Sensitivity. . . MONO . . . 8.7dBf (3.0μV/300Ω)
STEREO. . 14.5dBf (5.8μV/300Ω)
Usable Sensitivity (IHF '58) 1.5μV
50dB Quieting Sensitivity . . . .
MONO . . . 11.5dBf (4.1μV/300Ω)
STEREO. . 36.0dBf (69μV/300Ω)
Signal-to-Noise Ratio at 65dBf . . MONO 80dB
STEREO 74dB
Distortion at 65dBf 100Hz . . . . . MONO 0.1%
STEREO 0.25%
1kHz . . . . . MONO 0.1%
STEREO 0.2%
6kHz . . . . . MONO 0.3%
STEREO 0.3%
Frequency Response . . . . . 30Hz to 15,000Hz $^{+0.3}_{-1.0}$dB
Capture Ratio 1.0dB
Alternate Channel Selectivity 83dB
Spurious Response Ratio 110dB
Image Response Ratio 110dB
IF Response Ratio 120dB
AM Suppression Ratio 60dB
Muting Threshold 13dBf (4.9μV/300Ω)
Stereo Separation . . 50dB (1kHz), 35dB (30Hz ~ 15kHz)
Subcarrier Product Ratio 74dB
SCA Rejection Ratio 74dB
Antenna Input . . . . . 300 ohms balanced
75 ohms unbalanced

AM Section

Sensitivity (IHF, Ferrite antenna) 300μV/m
(IHF, Ext. antenna) 15μV
Selectivity 40dB
Signal-to-Noise Ratio 55dB
Image Response Ratio 65dB
IF Response Ratio 85dB
Antenna . . . . . Built-in Ferrite Loopstick Antenna

Miscellaneous

Power Requirements 120V 60Hz
Power Consumption . . . . . 650W (UL, CSA)
1200W (max.)
Dimensions . . . . . 556(W) x 186.5(H) x 464.5(D) mm
21-7/8(W) x 7-3/8(H) x 18-1/4(D) in
Weight Without Package . . . . . 29.2kg (64 lb 4 oz)
With Package . . . . . 33.2kg (73 lb 1 oz)

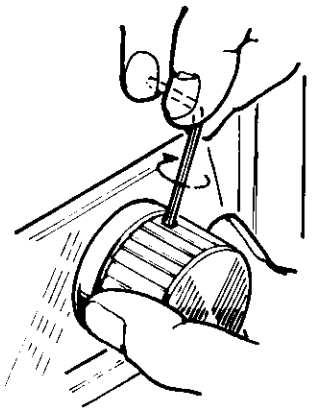
Furnished Parts

FM T-type Antenna 1
Operating Instructions 1
Hex. Wrench 1

NOTE:
Specifications and the design subject to possible modification without notice due to improvements.

HEX WRENCH

The accessory Hex. wrench is provided for removing the VOLUME and TUNING knobs, or for tightening its setscrew in the event it becomes loose.
If required, loosen the setscrew by inserting the wrench into the hole on the side of the knob and turning the wrench counterclockwise. Be particularly careful not to scratch the front panel when employing the wrench.



2. FRONT PANEL FACILITIES

FUNCTION SELECTOR BUTTONS

To select the program source, push each button as follows:

NOTE:
Only one FUNCTION button should be depressed at a time.

AM ..... For AM broadcast reception.

FM ..... For FM stereo reception. Automatically receives monophonically during FM monophonic broadcasts. The STEREO indicator lights up when the broadcast is in stereo.

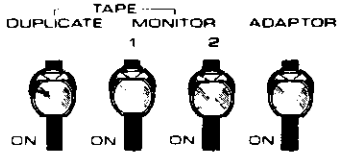
PHONO 1 ..... To operate a turntable connected to the PHONO 1 input jacks.

AUX ..... For listening to audio component (cartridge tape player, TV sound tuner, etc.) connected to the AUX input jacks.

PHONO 2/MIC. As above for PHONO 2 jacks, or for reproduction through microphones connected to the MIC jack is on the front panel. Note, when the microphone is connected to the jack the turntable connected to the PHONO2 jacks cannot be used.

TAPE DUPLICATE SWITCH

Set this switch in the ON (down) position to duplicate or edit a recorded tape using two tape decks.



TAPE MONITOR (1, 2) SWITCHES

Set these switch in the ON (down) position as follow:

1 .... With a tape deck connected to the TAPE 1 jacks (REC and PLAY), either playback or monitoring of a recording in progress are possible.

2 .... Same as in 1 above, with a tape deck connected to the TAPE 2 jacks (REC and PLAY).

For normal use, leave in the OFF (up) positions.

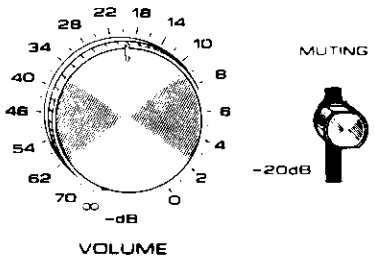
ADAPTOR SWITCH

When employing adaptor components, such as a graphic equalizer adaptor, RG processor, or Dolby NR adaptor, depress this ADAPTOR switch to ON.

VOLUME CONTROL AND AUDIO MUTING SWITCH

The extremely high power output of the SX-1250 can be finely controlled by combining the calibrated VOLUME control and the AUDIO MUTING switch.

The AUDIO MUTING switch can also be used to briefly lower the volume when changing records or tapes.



SPEAKER BUTTONS

Three sets of speaker terminals, A, B, and C, are provided on the rear panel, and the required speaker systems can be selected by depressing the SPEAKERS buttons as follows:

A ..... Speaker systems A operate
B ..... Speaker systems B operate
C ..... Speaker systems C operate

NOTES:

1. *When any two buttons (A+B, B+C, C+A) are depressed simultaneously, the corresponding pairs of speaker systems will come into operation. However, it is not possible to operate all three speaker systems at the same time, even though all the buttons are depressed.*
2. *For private listening through headphones, return all the SPEAKERS buttons to the OFF (undepressed) position.*

PHONES JACK

Accepts stereo headphones.

WARNING:
Do not plug a microphone into the PHONES jack as may damage the microphone.

POWER SWITCH

After turning this switch ON there is a delay of some 6 to 8 seconds, during which time the protection circuit operates to eliminate unpleasant noise.

TWIN BASS CONTROLS

Adjust low frequency tone.

100Hz: Adjusts frequency band below 400Hz. Control effectiveness at 100Hz is ±10dB.

50Hz: Provides additional control for the frequency band below 200Hz. Control effectiveness at 50Hz is ±5dB.

TONE SWITCH

In the OFF (up) position, this switch causes the amplifier section to operate with a flat frequency response regardless of the tone control setting.

FM TUNING METER

With the SIGNAL meter needle deflected to the right, make fine adjustment by centering the FM TUNING meter needle (indicating optimum reception).

SIGNAL METER

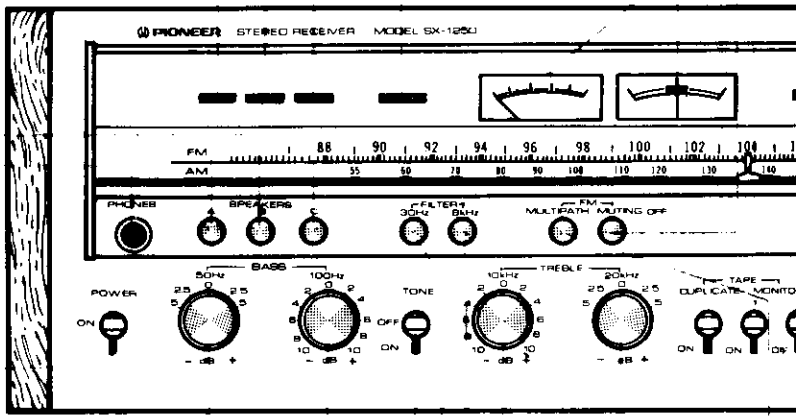
For AM and FM station tunings.

AM tuning: Tune for maximum deflection of the SIGNAL meter needle to the right.

FM tuning: Both the SIGNAL and FM TUNING meters work together. The optimum point of the SIGNAL meter needle is the same as in AM tuning. Then use the FM TUNING meters.

SPEAKER SYSTEM INDICATOR

FM STEREO INDICATOR



LOW CUT (30Hz) FILTER BUTTON

When low-pitched rumble (from turntable motor or other source) is obstrusive depress this button to provide 12dB/octave, attenuation at frequencies below 30Hz. If no interference is experienced, release this button.

HIGH CUT (8kHz) FILTER BUTTON

When high frequency scratch noise (from worn records or other source) is unpleasant, depress this button to provide 12dB/octave attenuation at frequencies above 8kHz. If there is no interference, release this button.

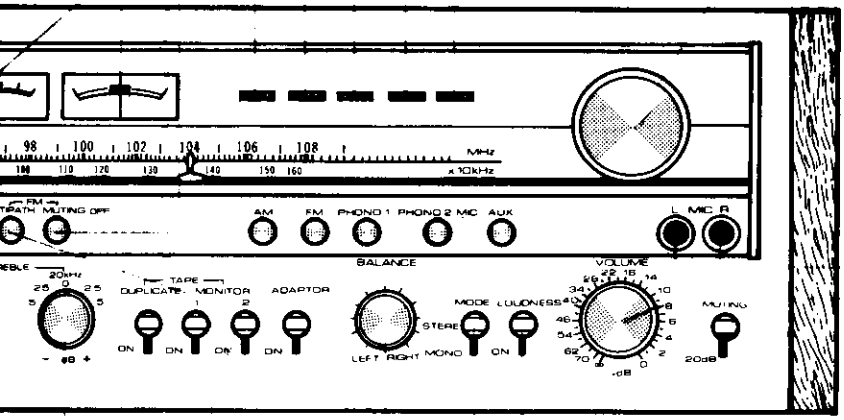
TUNING KNOB

Select the station and tune for optimum reception by observing the SIGNAL meter for AM stations, and both SIGNAL and TUNING meters for FM stations.

FM MUTING BUTTON

Leave this button undepressed (in the ON position) to suppress unpleasant interstation noise while tuning between FM stations. Low-strength signals may also be suppressed by this function, so to pick up a weak station depress this button to the OFF position.

PROGRAM SOURCE INDICATOR



FM MULTIPATH BUTTON

When selecting the best position for the FM antenna, depress this button so that multipath noise is heard from the speaker systems. To listen to FM broadcasts, release this button.

TWIN TREBLE CONTROLS

Adjusts high frequency tone.

10kHz: Adjusts frequency band above 2.5kHz. Control effectiveness at 10kHz is ±10dB.

20kHz: Provides additional control for the frequency band above 5kHz. Control effectiveness at 20kHz is ±5dB.

MIC JACKS (L and R)

For connect each channel jacks the left and right channel microphones.

NOTE:
Use the high impedance (above 20kΩ) with 6mm diam. phone plugs.

VOLUME CONTROL

Adjusts output level to speakers and headphones.
Scale is graduated in dB, and when used in conjunction with the MUTING switch, finer and wider range attenuation can be performed. See additional description on page 6.

AUDIO MUTING SWITCH — 20dB

Depress this switch to attenuate the audio output by 20dB. This convenient feature saves having to disturb the VOLUME control, for example when answering the telephone.

LOUDNESS SWITCH

Depress this switch when listening at low volume. The frequency response of the human ear varies according to the listening volume, and the depressed position compensates for hearing response by emphasizing the bass and treble.

MODE SWITCH

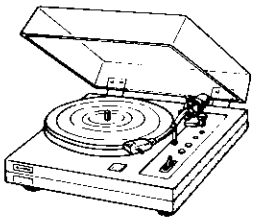
For stereo playback, leave this switch undepressed (or depress to release, if already depressed). When depressed for MONO playback, left and right channel stereo signals will be mixed to produce monophonic sound from both speaker systems.

BALANCE CONTROL

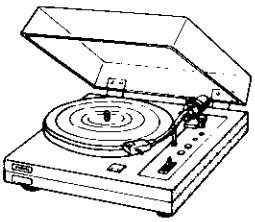
Adjusts the balance between the sound volume from the left and right speaker systems or headphones.

3. CONNECTION DIAGRAM

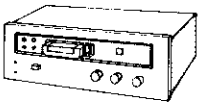
TURNTABLE



TURNTABLE



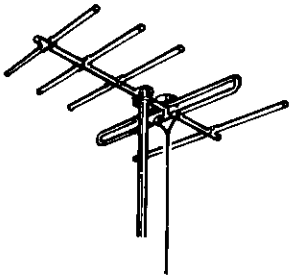
CARTRIDGE
TAPE PLAYER

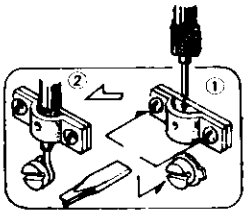


TAPE
(open-reel

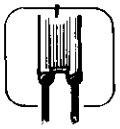
LINE
INPUT

OUTDOOR
FM ANTENNA

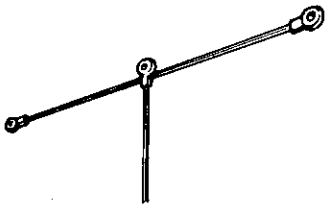




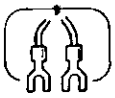
75Ω
coaxial
cable



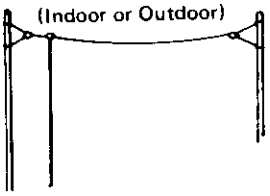
T-TYPE
FM ANTENNA

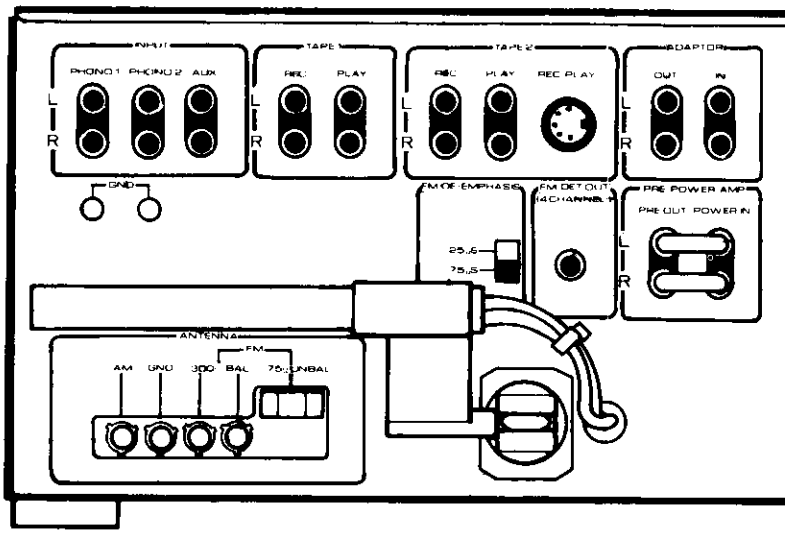


300Ω feeder

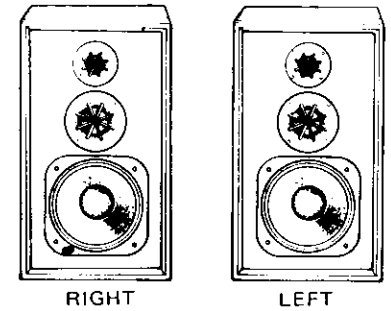


AM ANTENNA
(Indoor or Outdoor)



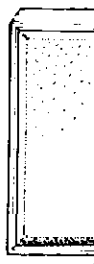


GND



RIGHT LEFT

SPEAKER SYSTEMS A



RIGHT

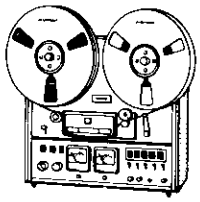
SP

FM DE-EMPHASIS SWITCH

Normally, set this switch to "75µs". Be sure to set it to "25µs" only when listening to an FM broadcast (pre-emphasis; 25µsec.) with a Dolby* system NR adaptor connected between the ADAPTOR OUT and ADAPTOR IN terminals.

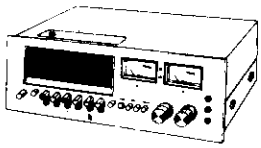
* The word "Dolby" is a trademark of Dolby Laboratories Inc.

TAPE DECK
(open-reel, cassette)



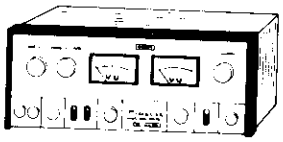
LINE INPUT LINE OUTPUT

TAPE DECK
(Open-reel, cassette)



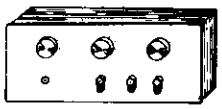
LINE INPUT LINE OUTPUT

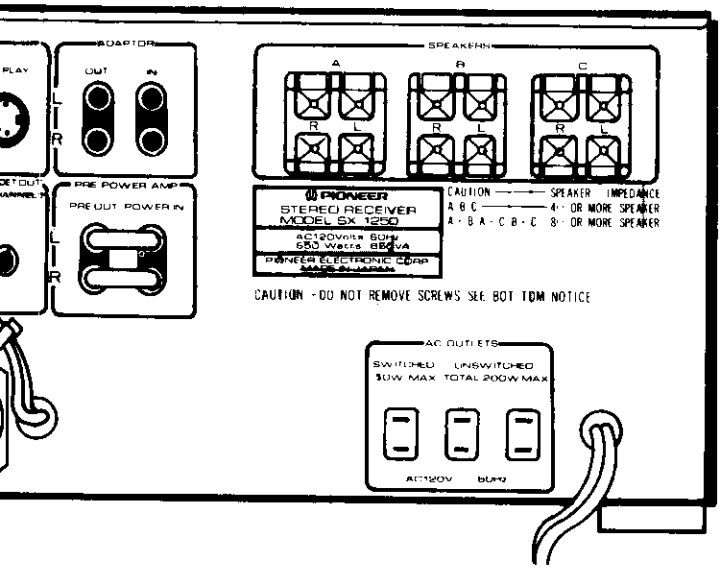
DOLBY NR ADAPTOR



LINE INPUT LINE OUTPUT

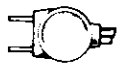
4 CHANNEL DISCRETE FM ADAPTOR

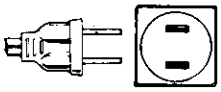




PRE/POWER AMP

The bridge connecting plugs between PRE OUT and POWER IN jacks should always be left in position in normal use. If they are disconnected or removed, no sound will come from the speakers. Always be sure to switch off the power supply before attempting to remove them.

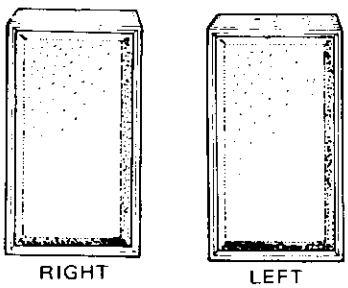




CONVENIENCE OUTLETS

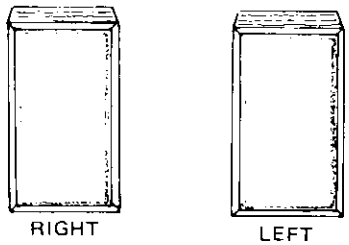
Unswitched: (200W max.) Less frequently used components, which do not require coupled power, can be plugged into either of these outlets.

Switched: (50W max.) A frequently used component (turntable, tape deck, etc.) can be plugged into this outlet. By leaving the power switch of that component in the ON position, power supply to the component will be coupled with the SX-1250 switch operation.



RIGHT LEFT

SPEAKER SYSTEMS B



RIGHT LEFT

SPEAKER SYSTEMS C

4. CIRCUIT DESCRIPTIONS

4.1 TUNER SECTION

FM Front End

The FM front end is composed of a tuning circuit employing a 5-gang variable capacitor, a 2-stage RF amplifier and mixer employing dual gate MOS FETs, and a local oscillator with buffer. An equivalent of a cascode amplifier is produced by AC grounding gate-2 of the dual gate MOS FET, allowing stable RF amplification at high gain.

The output signal of the RF amplifier is applied to gate-1 of the mixer stage MOS FET, while the local oscillator output signal is applied to gate-2. This technique minimizes input power from the local oscillator, resulting in low mutual interference even if the received signal input level is high.

A variation of a Clapp circuit forms the local oscillator. Inclusion of a buffer amplifier between local oscillator and mixer reduces local oscillator load, eliminating distortion of the oscillation waveform. Drawing effect of the local oscillator is also eliminated.

FM IF Section

Four integrated circuits (ICs) and four dual element ceramic filters compose this section. HA1201 (diagram on page 56) is a differential amplifier with a constant current source and functions as a current-limiting limiter. HA1137 (diagram on page 55) contains IF limiter amplifier, quadrature detector, meter drive and muting circuits. The detector circuit contained within this IC is not used in the SX-1250 however, and instead the IF signal is taken from the stage prior to the detector and applied to TA7061AP. This latter IC is a 3-stage differential amplifier (diagram on page 56) and its output goes to the ratio detector for FM detection.

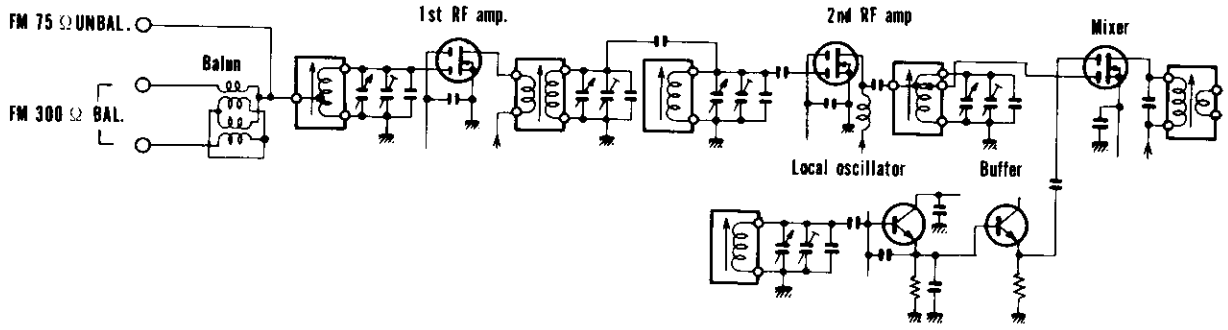


Fig. 1. Circuitry of FM front end

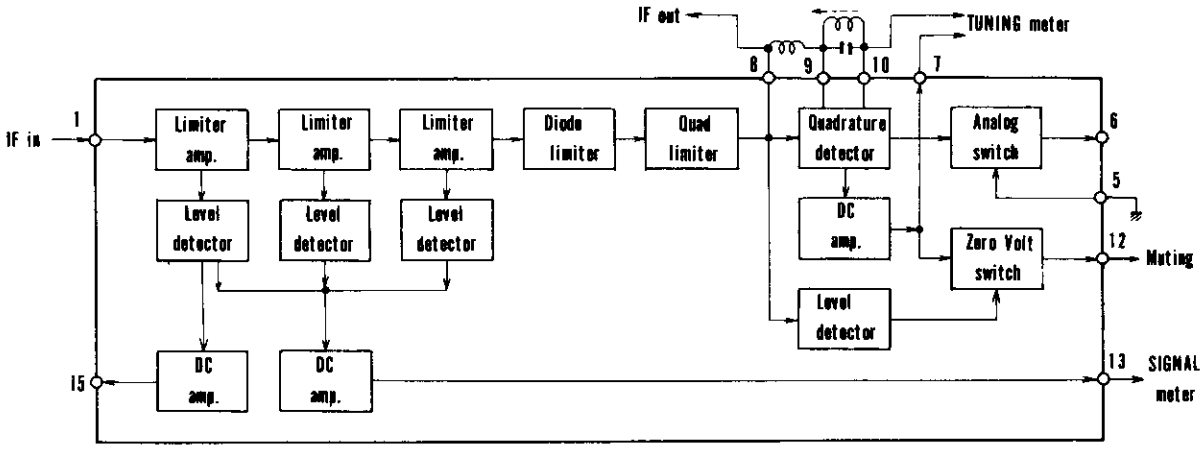


Fig. 2. Block diagram for HA1137

Multiplex Decoder

The multiplex decoder contains three sections and employs an IC (HA1196) with a block diagram as shown in Fig. 3 (see page 55 for circuit).

1. Switching Signal Generator

A PLL (phase locked loop) system is employed. 76kHz is generated by the VCO (voltage controlled oscillator: an oscillator in which frequency is controlled by a voltage) and converted into 38kHz by a frequency divider, then divided again to become 19kHz. This signal and the stereo pilot component (19kHz) of the detected signal are applied to a phase comparator where the difference between them is converted into a voltage. By feedback this voltage is applied to the VCO. And the oscillator signal is locked to the pilot signal. This loop is termed PLL and a 38kHz switching signal synchronized to the pilot signal is obtained and employed as a switching signal.

2. Automatic stereo detector

With the PLL locked to the pilot signal, the pilot signal and a 19kHz signal of the same phase are produced. A voltage is then obtained at the phase comparator that is proportional to the pilot signal amplitude. As it increases, the lamp lights and the switch becomes on. The switching signal is applied to the demodulator.

However, if the FM muting signal is also applied to pin 12, the detector circuit becomes disabled (grounded). Therefore a switching signal to the demodulator is not supplied and mono reproduction is obtained.

3. Demodulator

Two differential amplifiers are employed in a switching circuit (Fig. 4). The composite signal is applied to the base of Q3. Q1 and Q2 are alternately switched ON and OFF by the switching signal. The composite signal amplified at Q3 is demodulated by the switching of Q1 and Q2. Q6 and Q3 are loosely coupled at their emitters by R1, R2 and R3. Q6 is driven in opposite phase to Q3 and its low level composite signal output is demodulated by switching of Q4 and Q5. The demodulated signals in opposite phase are combined at the collectors of Q1 and Q2, cancelling crosstalk. Adequate current flow is required in Q3 and Q6 for low distortion. However, if the base bias voltage is raised, the voltage range available at the collector is reduced and clipping occurs (power supply voltage is limited by IC voltage requirement). For this reason, current from an external source is inserted at Q3 and Q6 collectors and become I1 and I2 in Fig. 4. The same amount of current is removed at the emitters of Q3 and Q6 to become I3 and I4 in Fig. 4. Q3 and Q6 therefore operate with adequate current and distortion in this stage is remarkably reduced. A feedback amplifier amplifies the demodulated signal to produce the IC outputs.

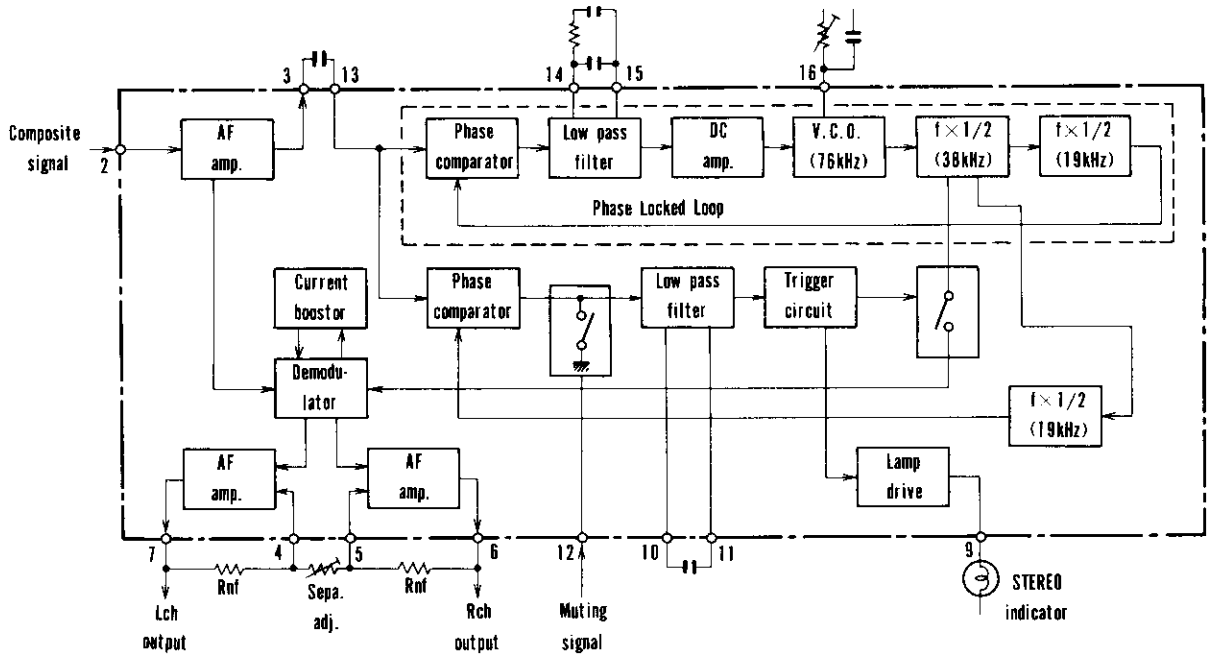


Fig. 3. Block diagram for HA1196

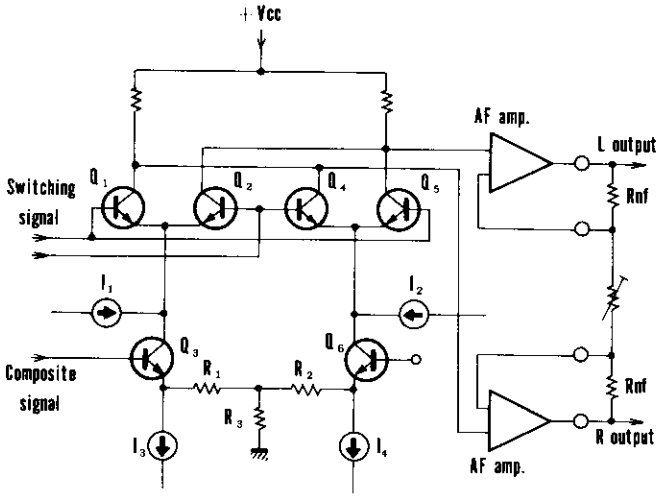


Fig. 4. Basic circuitry of demodulator

FM Muting Circuit (Fig. 5)

DC voltage emerges from pin 12 of IC (HA1137) in the event of more than ±70kHz detuning or low input level (less than 4.9μV antenna input conversion). This is employed for shorting the AF output circuit to perform muting by the reed relay.

Multipath Monitor Circuit

When multipath reflections exist in the received signal, the signal is converted into AM and PM (amplitude modulation and phase modulation) forms. Since the amplitude of the actual FM signal is fixed, by converting this AM component into a sound and listening to it, the existence (and amount) of multipath reflection can be determined. Short term level variations (audio frequency) are taken as a signal from HA1137 SIGNAL meter drive terminal (pin 13). By setting the FM MULTIPATH switch to ON during FM reception, this signal becomes connected to the audio amplifier and can be heard as a sound which indicates conditions of multipath reflection.

AM Tuner

The AM tuner employs a 3-gang variable capacitor and an IC (HA1138) with 1-stage of RF and 2-stage of IF amplification. Fig. 6 shows the HA1138 block diagram (see page 55 for circuit).

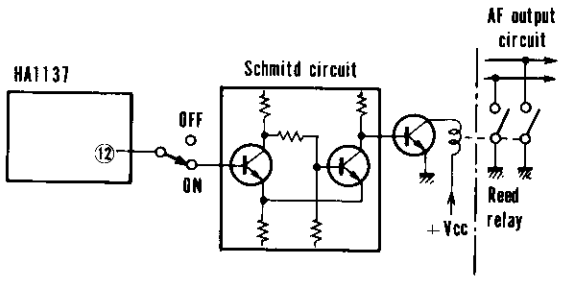


Fig. 5. Circuitry of FM muting

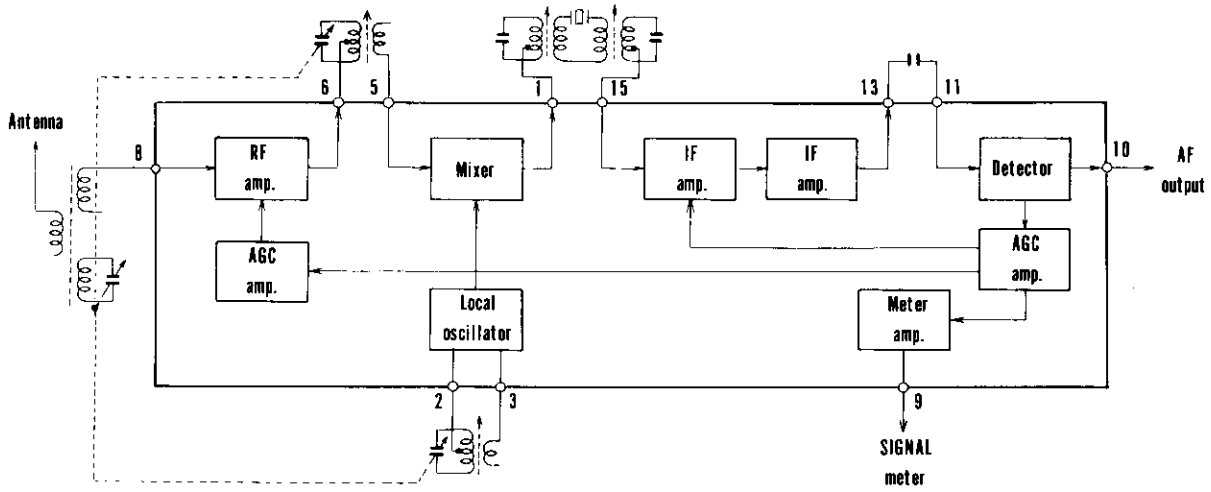


Fig. 6. Block diagram for HA1138

4.2 AUDIO SECTION

Equalizer Amplifier

The equalizer amplifier is shown in Fig. 7. The first stage (Q1 & Q2) is a PNP transistor unbalanced differential amplifier. High voltage gain is provided in the following stage (Q3) by a bootstrap circuit (C1 & R1). The output stage (Q4 & Q5) is a complementary symmetrical SEPP circuit. The high voltage utility factor of the SEPP circuit provides a high maximum output voltage. Dynamic range of the equalizer amplifier is therefore wide and overload input level at 0.1% distortion is 500mV (rms at 1kHz).

Equalizer elements (C2, C3, R2, R3) are polystyrene film capacitors with tolerances within ±1% and metal film resistors with tolerances better than ±1%. These lead to a deviation with respect to the RIAA playback standard within ±0.2dB. Due to the balanced plus and minus power supply, the input and the output points become essentially 0V, reducing click noise during FUNCTION switch operation.

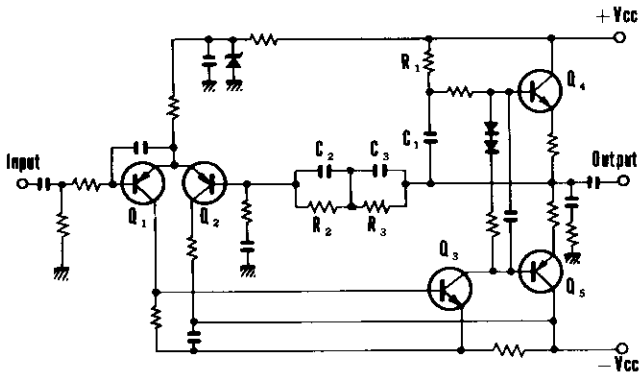


Fig. 7. Schematic diagram for Equalizer amplifier

Tape and Adaptor Circuits

With the DUPLICATE switch OFF, the program source selected by the function switches are obtained at the TAPE REC jacks (Fig. 8).

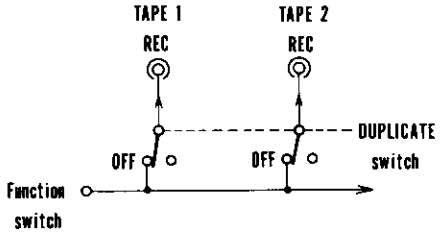


Fig. 8. TAPE REC jacks

The TAPE MONITOR 1 switch selects between the program source selected by the function switch and the input at the TAPE 1 PLAY jacks (Fig. 9). The TAPE MONITOR 2 switch selects between the signal selected by the TAPE MONITOR 1 switch and the input at the TAPE 2 PLAY jacks (Fig. 9).

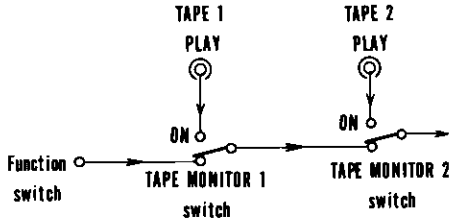


Fig. 9. Tape monitor circuit

When the DUPLICATE switch is set to ON, the TAPE 1 REC jacks are connected to the TAPE 2 PLAY jacks, and the TAPE 2 REC jacks to the TAPE 1 PLAY jacks (Fig. 10).

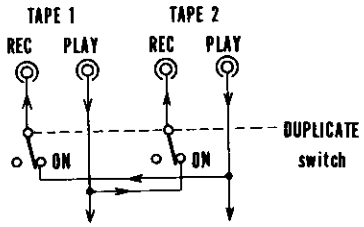


Fig. 10. Tape duplicate circuit

The signal selected by the TAPE MONITOR 2 switch appears at the ADAPTOR OUT jacks (Fig. 11). The ADAPTOR switch selects between the signal selected by the TAPE MONITOR 2 switch and the input at the ADAPTOR IN jacks (Fig. 11).

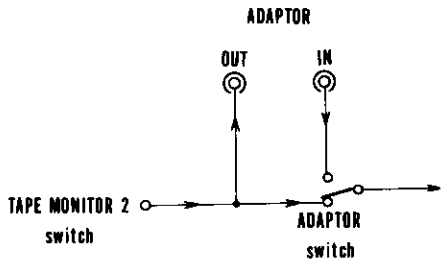


Fig. 11. ADAPTOR jacks

MODE Switch

When the MODE switch is set to the MONO position, the left and right channels are shorted in the stage following the tape and adaptor circuits.

BALANCE Control

A no-loss HB type variable resistor at center position is employed. An SEPP circuit is inserted as a buffer in the following stage.

Muting Circuit

When the MUTING switch is set to the −20dB position, the signal is attenuated by 20dB.

Loudness Circuit

This circuit is operated ON or OFF by the LOUDNESS switch and is intended to compensate for audibility characteristics of the human ear at low volumes. The VOLUME control variable resistor is tapped. Connecting a CR network at this point enhances low and high frequencies at low volumes.

Tone Controls

Twin tone controls are employed with the SX-1250. These consist of ultra-low and ultra-high (sub) controls in addition to the conventional BASS and TREBLE (main) controls.

The signal is amplified to required level by a 2-stage FET and transistor direct coupled amplifier, after which a 2-stage NFB type tone control circuit is provided. The sub controls form the first stage and the main controls form the second stage of this circuit. With NFB type tone controls, C-B feedback is applied to a single transistor amplifier. Frequency response becomes variable by providing selectivity in the feedback circuit. The basic circuit of this stage is shown in Fig. 12.

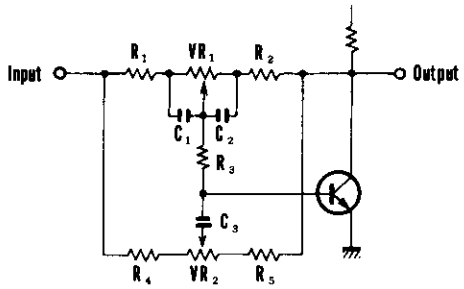


Fig. 12. Basic circuitry of NFB type tone control circuit

Midrange Operation

The C1 and C2 reactances are considerably smaller than VR1 at frequencies above midrange, effectively shorting VR1. At frequencies below midrange, C3 reactance becomes large and in effect, opens the circuit. Consequently, the circuit becomes equivalent to that shown in Fig. 13 with respect to the midrange. In this figure, the circuits parameters are not changed by any change in position of the VR1 and VR2 sliders. The NFB amount is therefore fixed and the circuit gain is also fixed without regard to VR1 and VR2 slider positions.

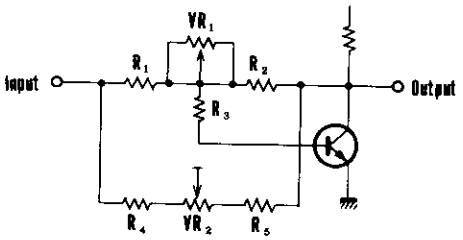


Fig. 13. Midrange operation of NFB type tone control circuit

Low Frequency Operation

The reactance of C1 and C2 increases at low frequency to form a circuit as shown in Fig. 14. This reactance increases in proportion to the frequency declines. Also, the NFB amount varies greatly according to VR1 slider position. The circuit gain at low frequencies can therefore be varied by VR1.

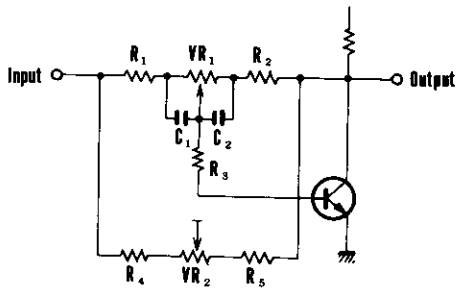


Fig. 14. Low frequency operation of NFB type tone control circuit

High Frequency Operation

The considerably smaller reactance of C1 and C2 at high frequency in comparison with VR1 effectively shorts VR1 to from an equivalent circuit such as that shown in Fig. 15. C3 reactance decreases in the same degree that the frequency increases and the NFB amount is now mainly controlled by the VR2 slider position. Consequently, the gain at high frequencies can be varied by VR2.

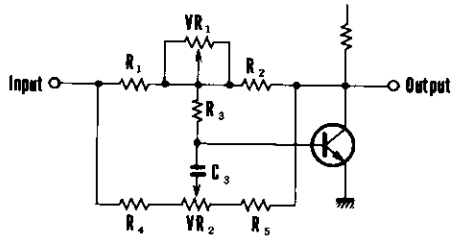


Fig. 15. High frequency operation of NFB type tone control circuit

Tone Defeat Circuit

By setting the TONE switch to OFF, the above described tone control circuit becomes bypassed.

Filter Circuits (Fig. 16)

These are NFB type active filters with −12dB/octave slopes. The circuit combines a 2-stage CR element and emitter follower. Normal function of the emitter follower is provided in the passband and by 100% NFB, gain becomes essentially "1". NFB is cancelled in the area of the cutoff frequency, composing a peak in the frequency response. This leads to improved and sharper CR filter response. In the actual circuit, CR elements for low and high filters both employ the same emitter follower and each can be selected ON-OFF.

Power Amplifier

Fig. 17 shows the power amplifier section. The input stage is composed of Q1 & Q2 differential amplifier, with the input signal applied to Q1. Q3 & Q4 differential amplifier comprise the second stage, with Q3 output composed at Q4 by Q5 & Q6 current mirror. Connecting collector and base of Q5 produces the equivalent of a diode. Q3 collector current produces a forward voltage between Q5 base and emitter, biasing Q6. R1 and R2 in this circuit are equal, while Q5 and Q6 are the same type transistors. Consequently, when voltages between bases and emitters of Q5 & Q6 are equal, current flows in these transistors also become equal. This results in equal current flows in Q3 and Q6. Mutually opposite phase signals drive Q3 and Q4, resulting in mutually opposite phase collector currents. Q4 and Q6 therefore operate as push-pull.

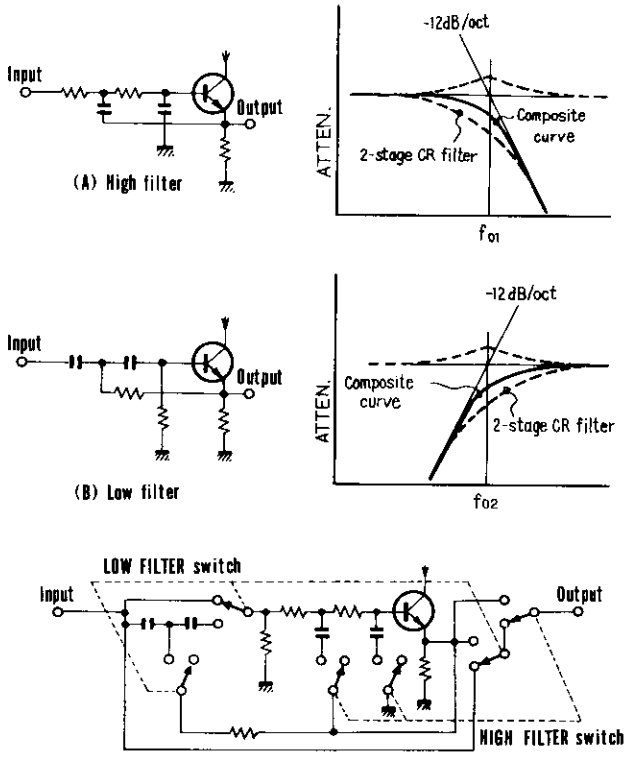


Fig. 16. Basic circuitry of filters

Power stage bias voltage is supplied by the voltage drop across D1, D2 and VR2. VR2 is a semi-fixed resistor for power stage bias adjustment, while D1 and D2 are Varistors for temperature compensation.

A 3-stage Darlington connection is employed in the power stage (Q7—Q14), with output transistors Q11—Q14 in a complementary symmetrical parallel

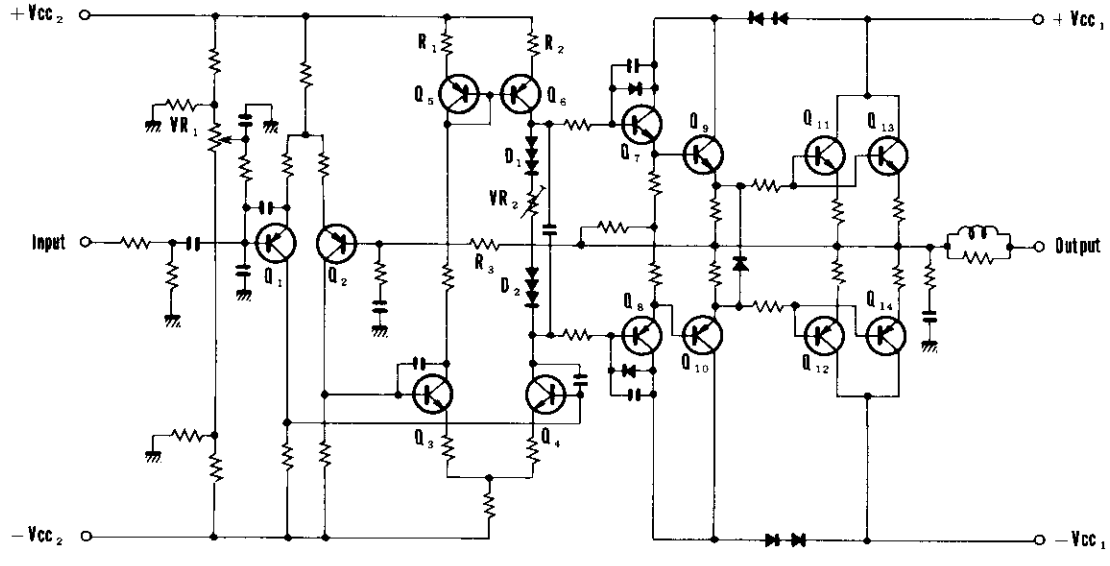


Fig. 17. Schematic diagram for power amplifier

connection. The output center point is at 0V from the balanced plus and minus power supply, while 100% DC NFB is applied to Q2 through R3. Because of this, circuit DC gain becomes 0dB and DC voltage of the output center point is determined by Q1 base voltage. VR1 is a semi-fixed resistor for fine adjustment of the center point voltage to compensate for irregularities in circuit elements.

SPEAKERS Switches

The SX-1250 is provided with 3 sets of speaker terminals (A, B, C). Since the power amplifier can become overloaded if all three sets are used simultaneously, when all 3 SPEAKERS switches are set to ON, the circuit functions as if all switches were OFF and the indicator lamps extinguish.

4.3 PROTECTION CIRCUIT

This circuit protects the power transistors in case of overload, the speakers in case of power amplifier malfunction, and also performs a muting function when the power supply is turned ON or OFF. The protection circuit is composed of three sections (Fig. 18).

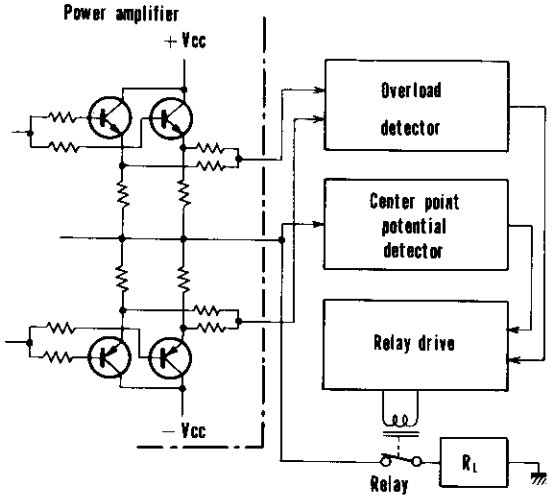


Fig. 18. Block diagram of protection circuit

1. Relay Driver Circuit (Fig. 19)

The relay which connects the output circuits is driven by this circuit. It also performs a muting function to prevent unpleasant noise during ON-OFF operation of the power supply as well as opening the output circuit on command from the detector circuits.

Muting Operation

When the power supply is turned ON, Q6 base is reverse biased through D6 and R19—R21, turning Q6 OFF. Q7 base potential rises as C4 charges through R22 & R23, and Q7 turns ON several seconds later. The collector current of Q7 then flows through the relay coil, operating the relay to turn on the power amplifier output circuit. The reverse bias of Q6 base from D6 & R19—R21 disappears when the power supply is set from ON to OFF. Q6 remains ON however, due to the residual power supply voltage. C4 very rapidly discharges, Q7 base potential drops and Q7 turns OFF. The relay releases and the power amplifier output circuit turns OFF.

Note:
Q5 is normally OFF due to base bias and does not participate in the muting operation.

Operation by Detector Circuit Command

Command from the detector circuits pass through one of D3, D4 or D5 and are applied in the form of a current flow. Q5 is normally reverse biased through R14, but when a large current flows through on of these diodes, Q5 base potential declines according to the voltage drop at R14. Q5 then becomes ON, Q6 base potential rises and Q6 becomes ON. C4 rapidly discharges and Q7 base potential drops, turning Q7 OFF. The relay releases and the power amplifier output circuit becomes cut off.

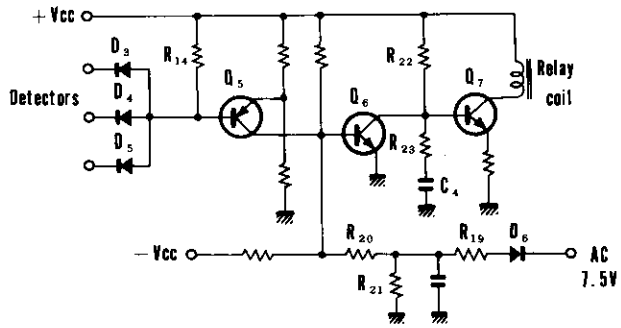


Fig. 19. Schematic diagram of relay driver circuit

2. Overload Detector Circuit

Shorting of the power amplifier load or a load impedance below the specified value causes a command to be sent to the relay drive circuit. This is illustrated in Fig. 20.

With the output stage in class B operation, when Qa is operating in the positive half cycle, Qb becomes cut off and the signal current flows as indicated by the solid arrows in Fig. 20. Point D potential at this time is the point A potential divided by R1 and R3. Also, point C potential is the point A potential divided by RE1 and RL (load). Point D is connected to Q1 base and point C to Q1 emitter through R2 and RE2. When RL is extremely small, the point C potential becomes considerably lower than point D. This potential difference forward biases Q1. Q1 turns ON and current flows in D3.

Qb operates in the negative half cycle and Qa becomes cut off. The signal flows is indicated by the broken line arrows in the center of Fig. 20. Q1 is biased by the potential difference between point C and point E. If RL is extremely small, the point C potential becomes considerably higher than that of point E. Q1 turns ON and current flows in D3.

If large current flows in Qa and Qb, Q1 becomes ON due to the RE1 and RE2 voltage drops, and current flows in D3. C1 prevents faulty operation due to external noise.

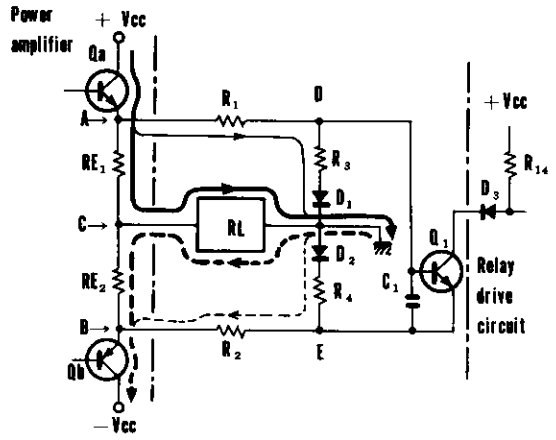


Fig. 20. Basic circuitry for overload detector

3. Center Point Potential Detector Circuit

If a DC potential is produced at the junction point of the power amplifier, a command is sent to the relay drive circuit. Fig. 21 shows this operating principle.

Q3 and Q4 compose a differential amplifier. When the same input is applied to both input terminals (Q3 and Q4 bases), no output is present. However, if there is a difference between the terminal inputs, the difference is amplified and becomes the output between the two collectors. During normal operation, an AC signal only is present at the junction point. As C2 reactance is sufficiently low, the same signal is applied to Q3 and Q4 bases, resulting in an absence of output at the collector sides.

When a DC potential is produced at the junction point, it becomes the input of Q3 only. If the voltage is negative, Q3 collector current declines And at Q4 the collector current increases and the potential drops, causing current to flow through D4.

If the DC voltage is positive, Q3 collector current increases and the potential drops, while at Q4 the collector current decreases and the potential rises. Current therefore flows through D5.

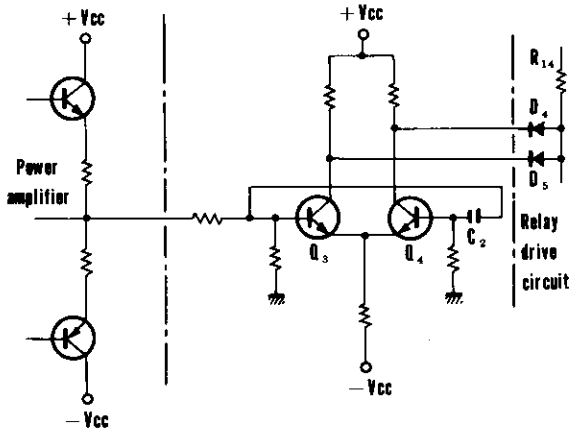


Fig. 21. Basic circuitry for center point potential detector

4.4 POWER SUPPLY CIRCUIT

All power supplied are regulated up to the power amplifier predriver stage. Independent power transformer secondary windings are employed for left and right channels in the power stage. Each channel is also supplied from an independent bridge rectifier and two 22,000μF capacitors. Position lamps are lighted by DC from a regulated power supply for stable illumination.

Inrush Current Suppressor Circuit

Ordinarily, power transformer inrush current when the power supply is turned on is opposed by DC resistance of the winding and instantaneous inductance of the air core. In the toroidal power transformer used in the SX-1250, both these factors are very low. Combined with the high charging current of the four 22,000μF capacitors in the secondary, inrush current can reach several hundred amperes. A resistors is therefore provided in series with the primary coil to suppress this inrush current to several tens of amperes. This resistor becomes shorted after power transformer excitation.

The inrush suppressor circuit is shown in Fig. 22. S1 is the POWER switch and S2 a relay contact. The Microtemp is a temperature responding fuse.

S2 is open before power is turned on, connecting the power transformer primary coil in series with R1 and the Microtemp. After power has been turned on, the relay operates when DC current is obtained from the rectifier, closing S2. If S2 fails to close, due to power supply or relay malfunction, R1 heating opens the Microtemp (109°C operating temperature), thus opening the primary circuit.

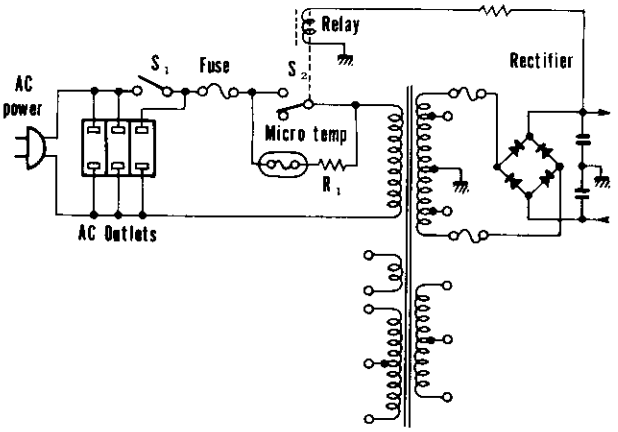
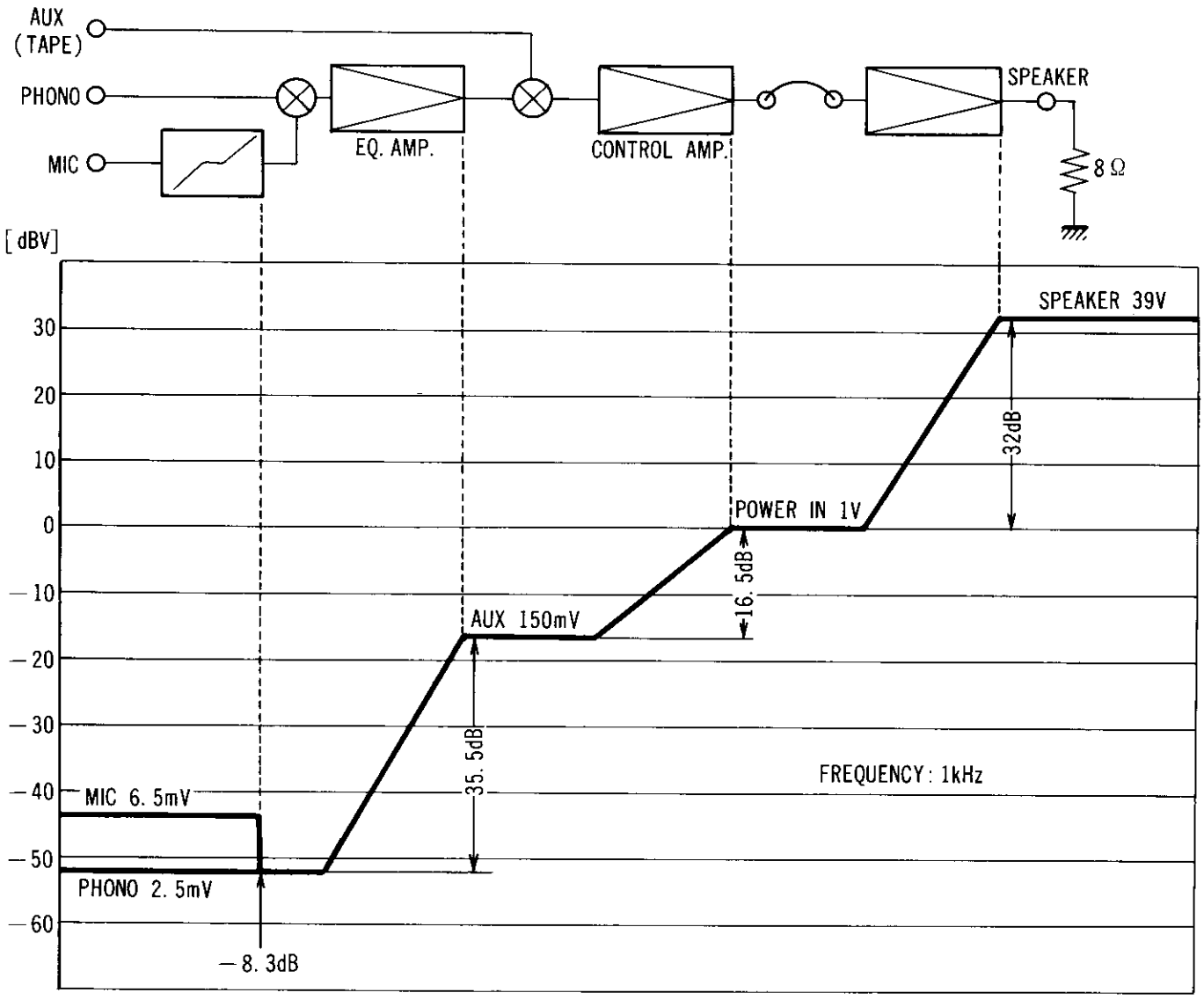
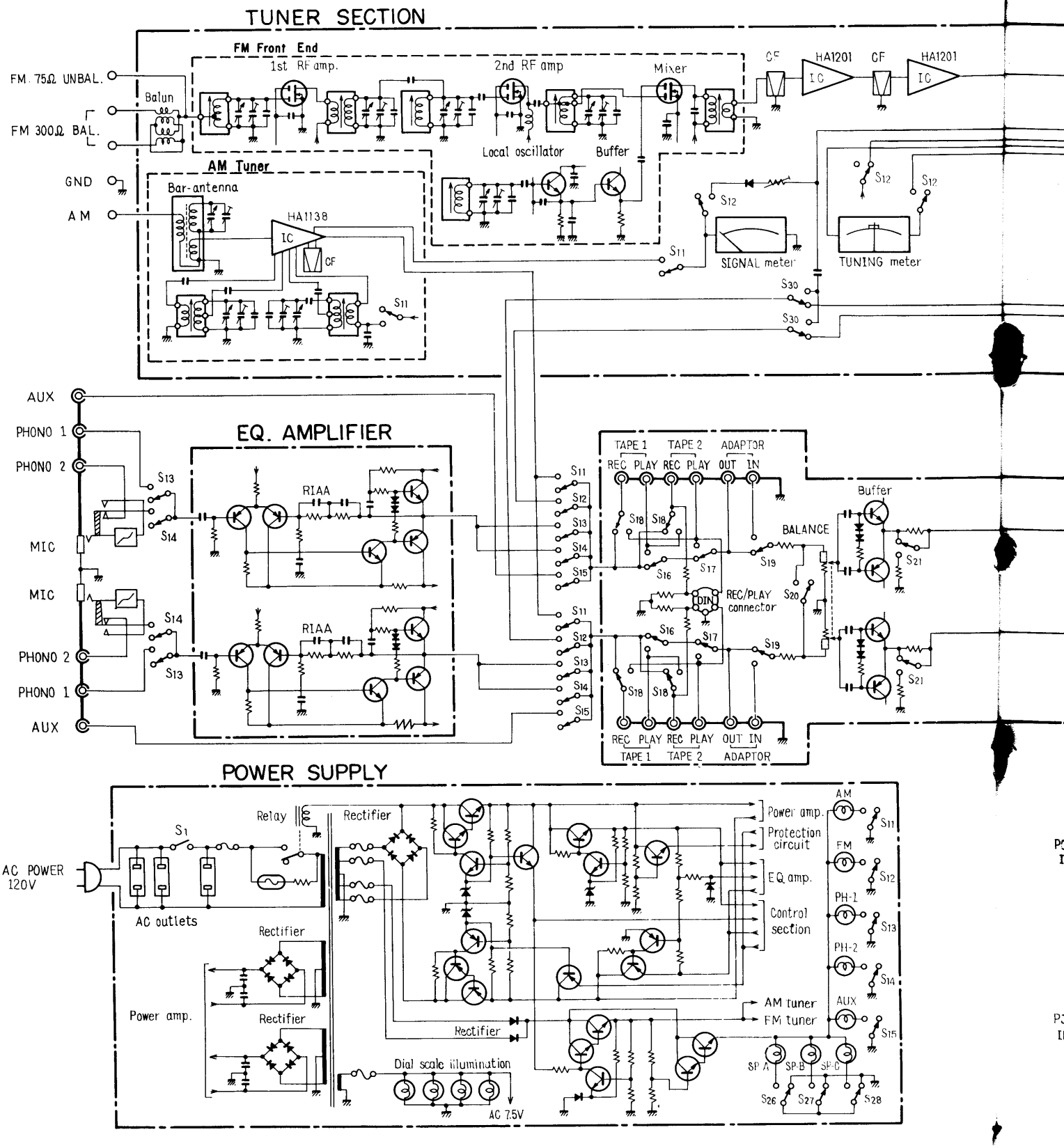


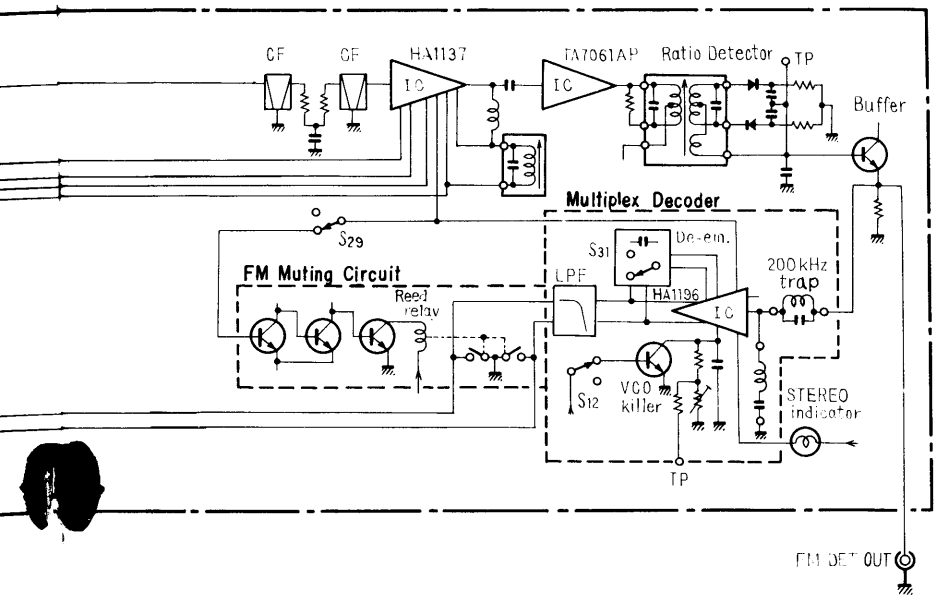
Fig. 22. Basic circuitry for inrush current suppressor

5. LEVEL DIAGRAM



6. BLOCK DIAGRAM





SWITCHES :

S1 : POWER

(FUNCTION)

S11 : AM
S12 : FM
S13 : PHONO 1
S14 : PHONO 2/MIC
S15 : AUX

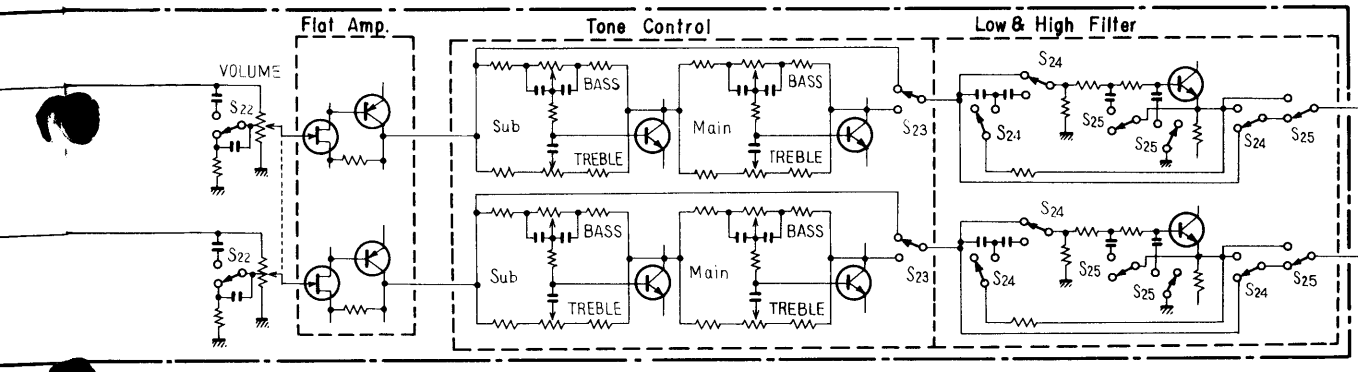
S16 : TAPE MONITOR 1
S17 : TAPE MONITOR 2
S18 : TAPE DUPLICATE
S19 : ADAPTOR
S20 : MODE
S21 : MUTING
S22 : LOUDNESS
S23 : TONE
S24 : LOW FILTER
S25 : HIGH FILTER

(SPEAKERS)

S26 : SPEAKERS A
S27 : SPEAKERS B
S28 : SPEAKERS C

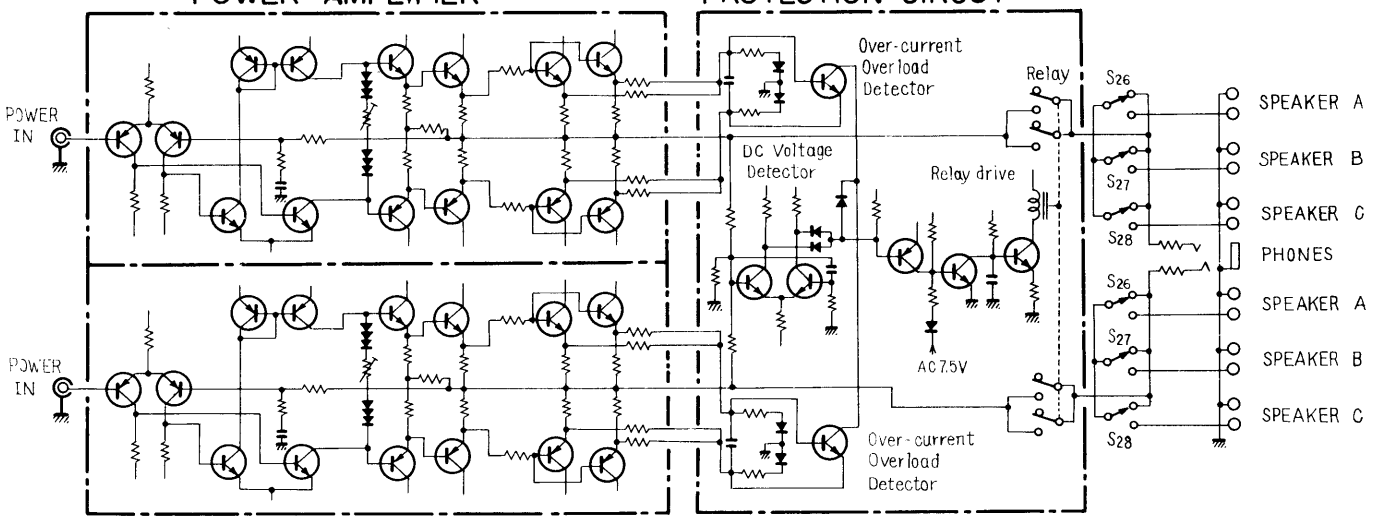
S29 : FM MUTING
S30 : FM MULTIPATH
S31 : FM DE-EMPHASIS

CONTROL SECTION



POWER AMPLIFIER

PROTECTION CIRCUT



7. DISASSEMBLY

Top Plate

Remove the six screws (A) to detach the top plate.

Wooden Cover

Remove the two screws (B) on each side of the wooden cover.

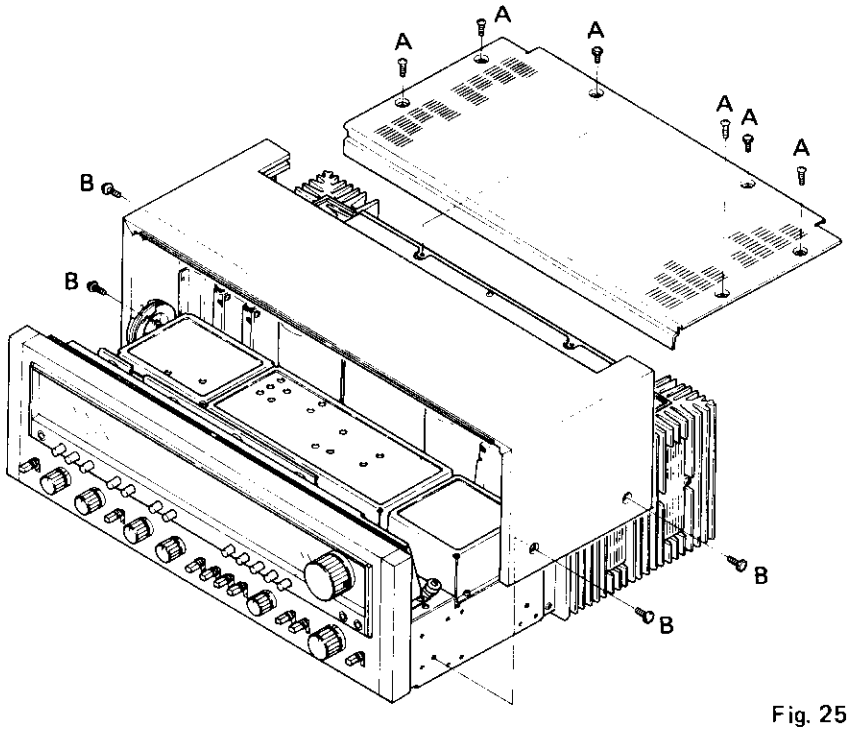


Fig. 25

Bottom Plate

Remove the fifteen screws to detach the bottom plate.

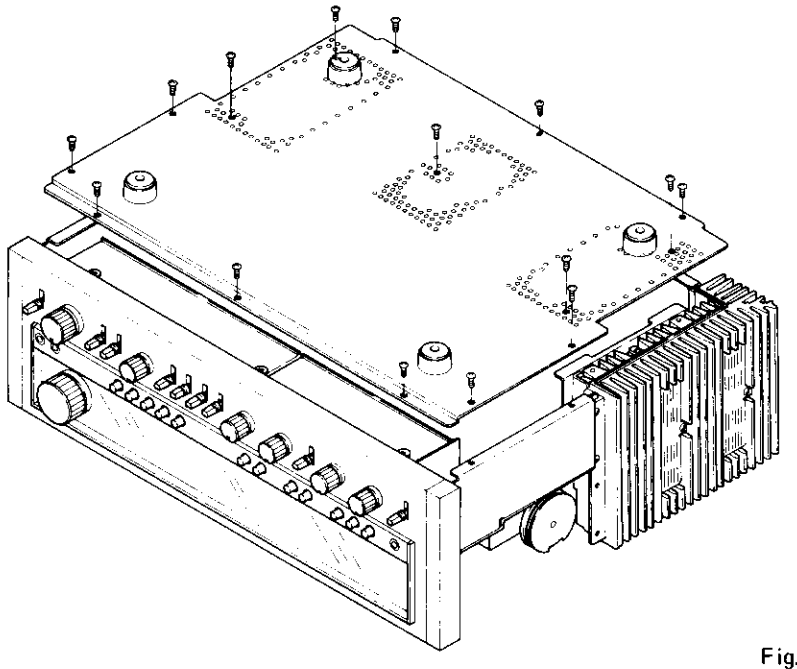


Fig. 26

Front Panel

Loosen the setscrews of TUNING and VOLUME knobs with a hexagonal wrench. Remove all the knobs by pulling. Remove the two screws from the top edge of the front panel. Remove the three nuts from the sub-tone and volume control shafts.

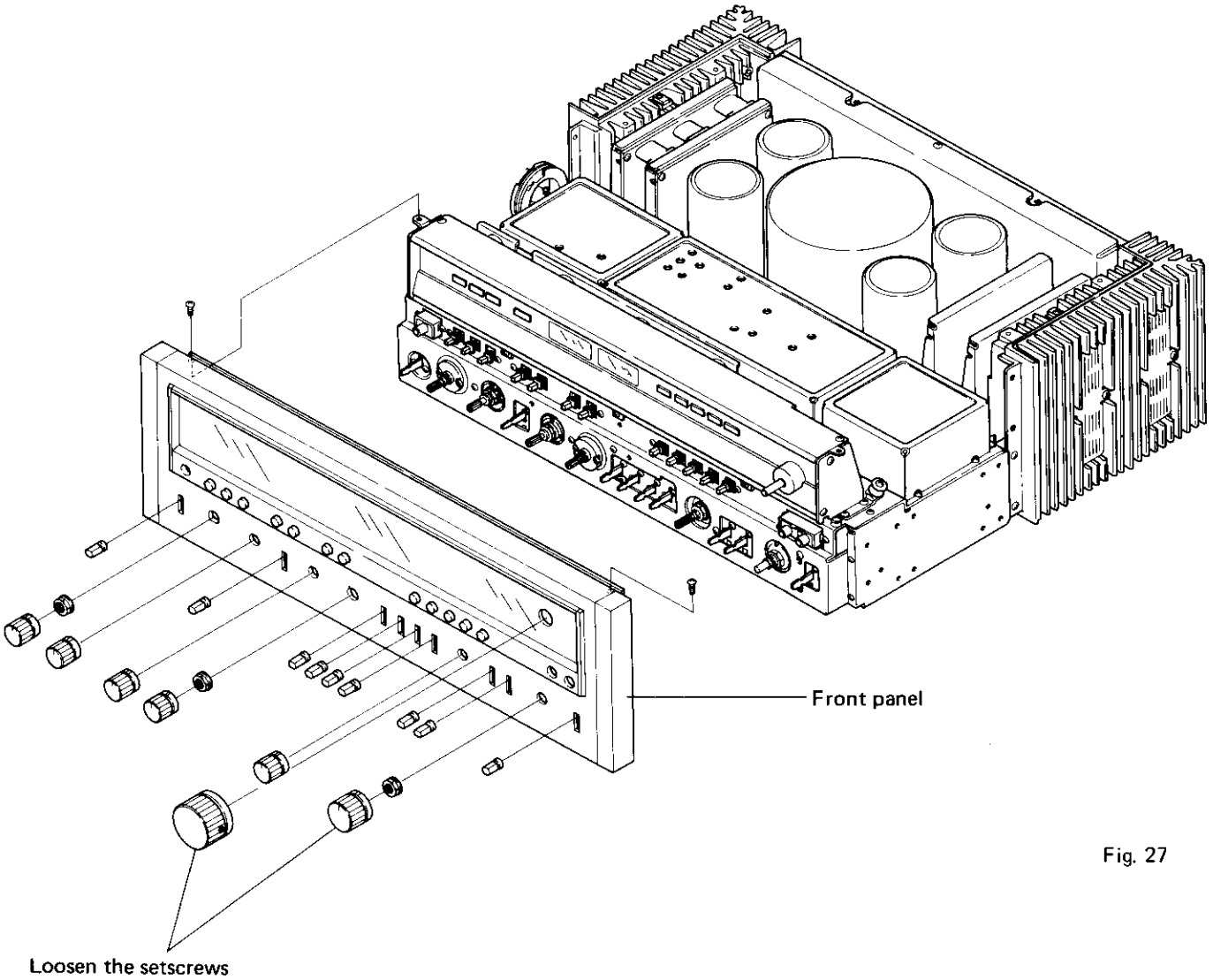


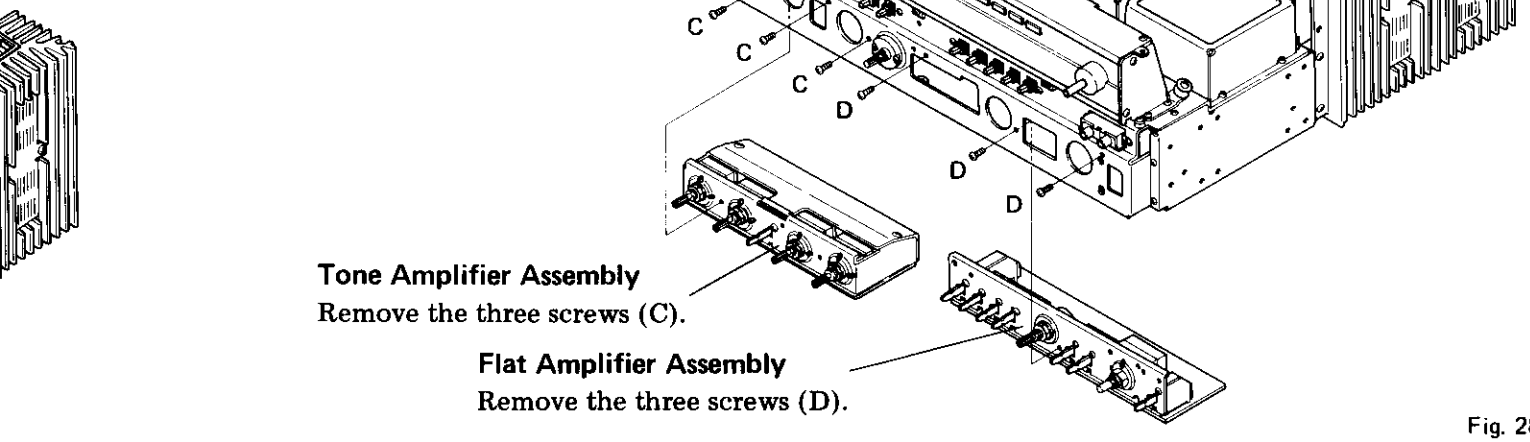
Fig. 27

Speakers Switch Assem

Remove the four screw

Filter Amplifi

Remove the t

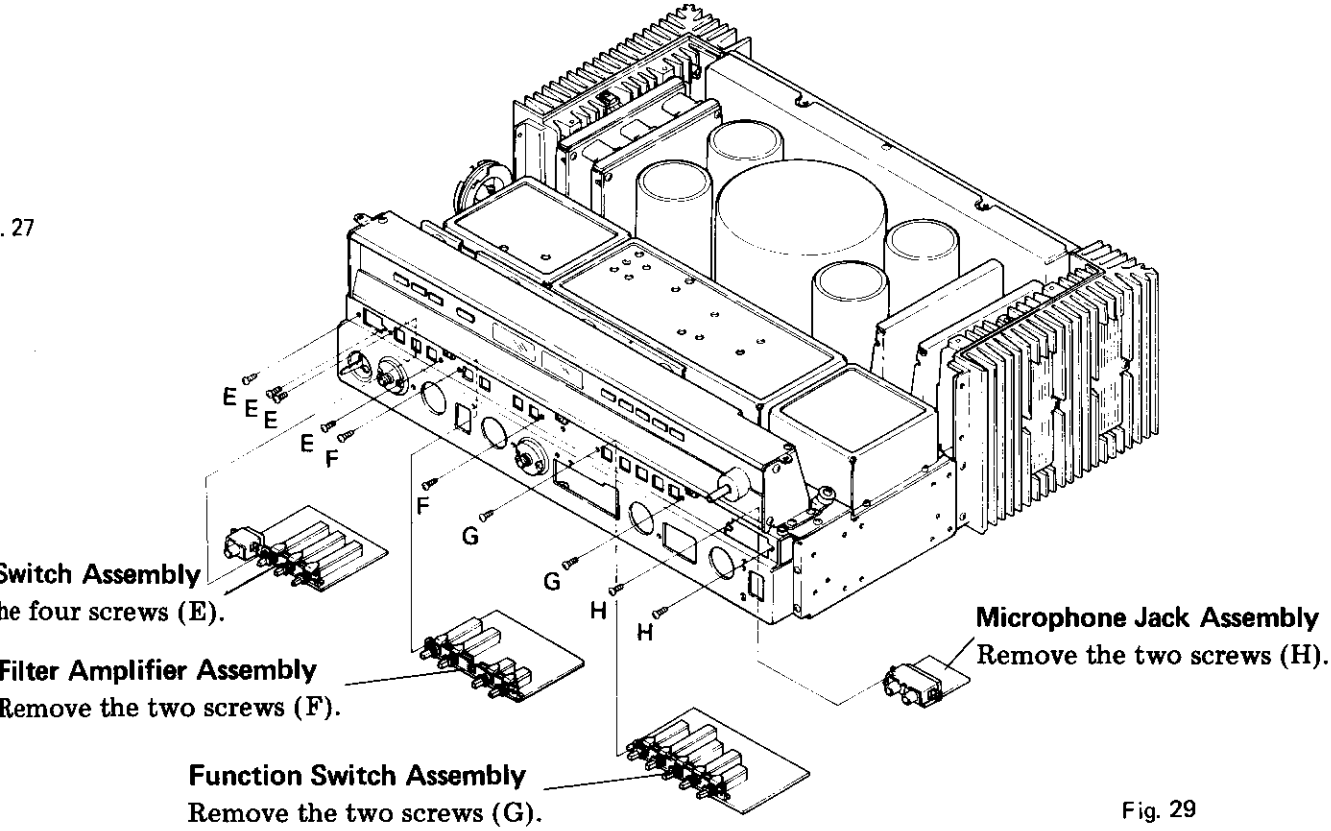


Tone Amplifier Assembly
Remove the three screws (C).

Flat Amplifier Assembly
Remove the three screws (D).

Fig. 28

. 27



Switch Assembly
he four screws (E).

Filter Amplifier Assembly
Remove the two screws (F).

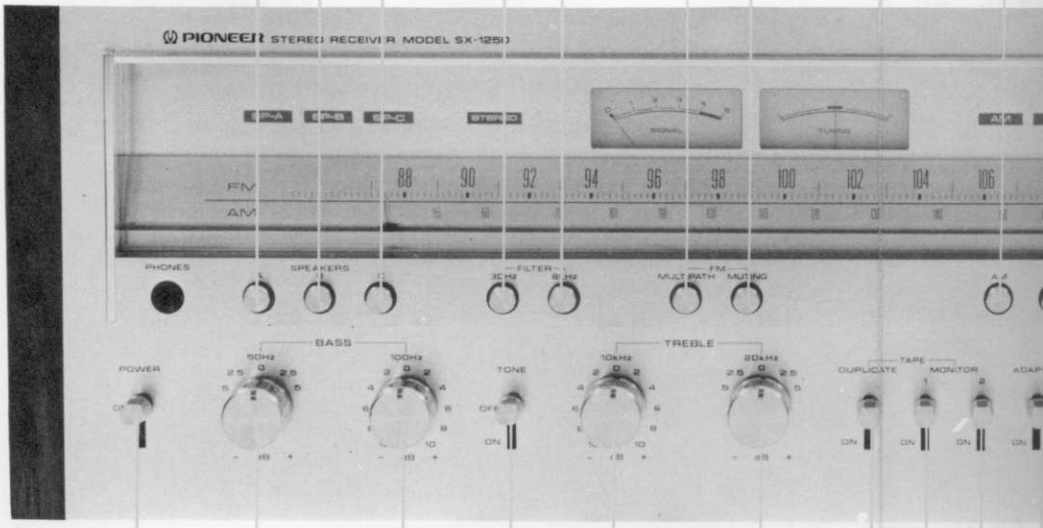
Function Switch Assembly
Remove the two screws (G).

Microphone Jack Assembly
Remove the two screws (H).

Fig. 29

8. PARTS LOCATION

8.1 FRONT PANEL VIEW



Knob (FILTER 8kHz)
AAD-114

Knob (FILTER 30Hz)
AAD-114

Knob (SPEAKERS C)
AAD-114

Knob (SPEAKERS B)
AAD-114

Knob (SPEAKERS A)
AAD-114

Knob (POWER)
AAD-113

Knob (BASS 50Hz)
AAB-100

Knob (BASS 100Hz)
AAB-100

Knob (TONE)
AAD-113

Knob (TREBLE 10kHz)
AAB-100

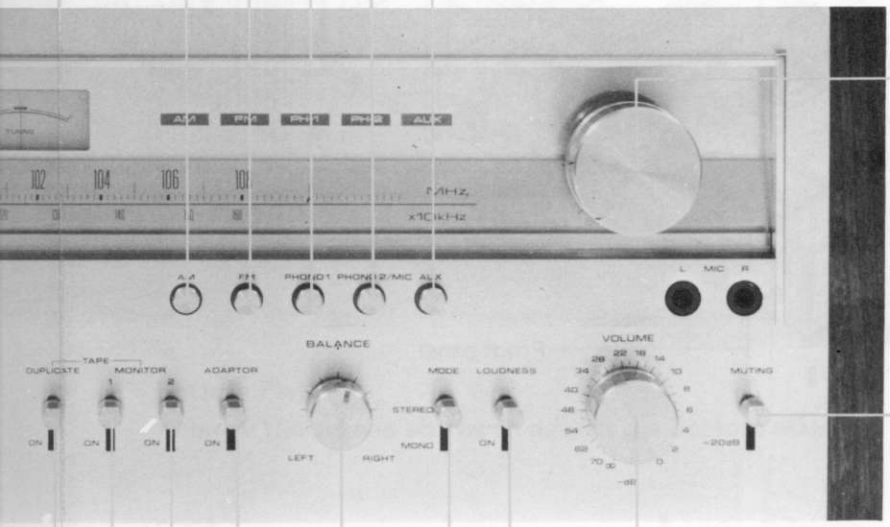
Knob (TREBLE 20kHz)
AAB-100

8kHz)

Knob (FM MULTIPATH)
AAD-114

Knob (FM MUTING)
AAD-114

Front panel assembly
ANB-386



Knob (AM)
AAD-114

Knob (FM)
AAD-114

Knob (PHONO 1)
AAD-114

Knob (PHONO 2/MIC)
AAD-114

Knob (AUX)
AAD-114

Knob (Tuning)
AAA-034

Knob (MUTING)
AAD-113

Knob (VOLUME)
AAB-104

Knob (LOUDNESS)
AAD-113

Knob (MODE)
AAD-113

Knob (BALANCE)
AAB-100

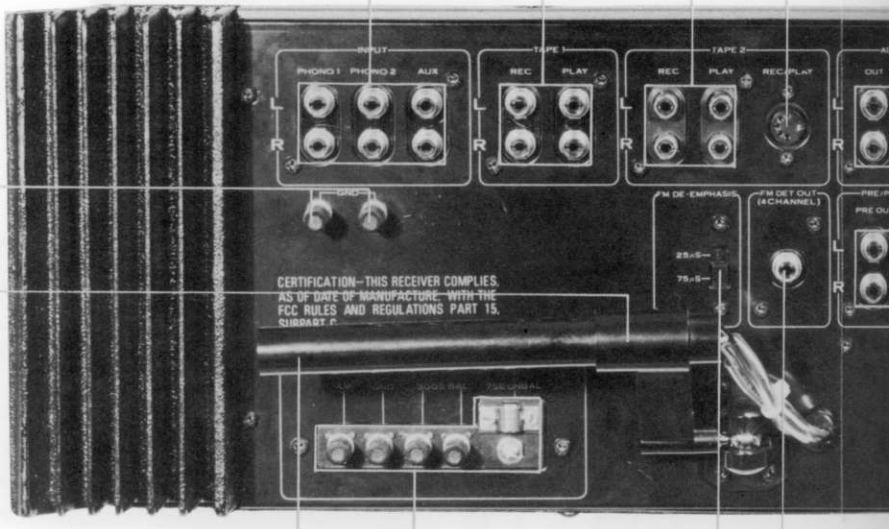
Knob (TAPE MONITOR 1)
AAD-113

Knob (ADAPTOR)
AAD-113

Knob (TAPE DUPLICATE)
AAD-113

Knob (TAPE MONITOR 2)
AAD-113

8.2 REAR PANEL VIEW



Terminal (TAPE 2)
AKB-030

Terminal (TAPE 1)
AKB-030

Terminal (INPUT)
AKB-033

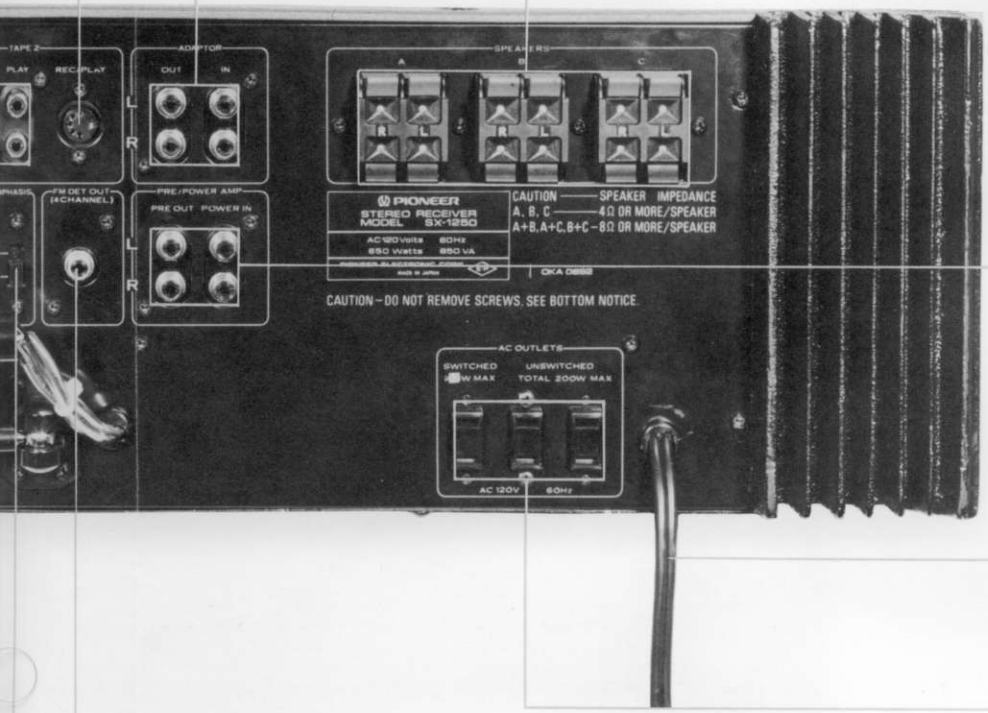
Terminal (GND)
AKE-012

Bar-antenna holder
W72-092

Ferrite bar-antenna
ATB-051

Terminal (ANTENNA)
AKA-004

Slide switch (DE-EMPHASIS)
ASH-015



Connector socket 5P (REC/PLAY)
AKP-007

Terminal (ADAPTOR)
AKB-030

Terminal (SPEAKERS)
AKE-014

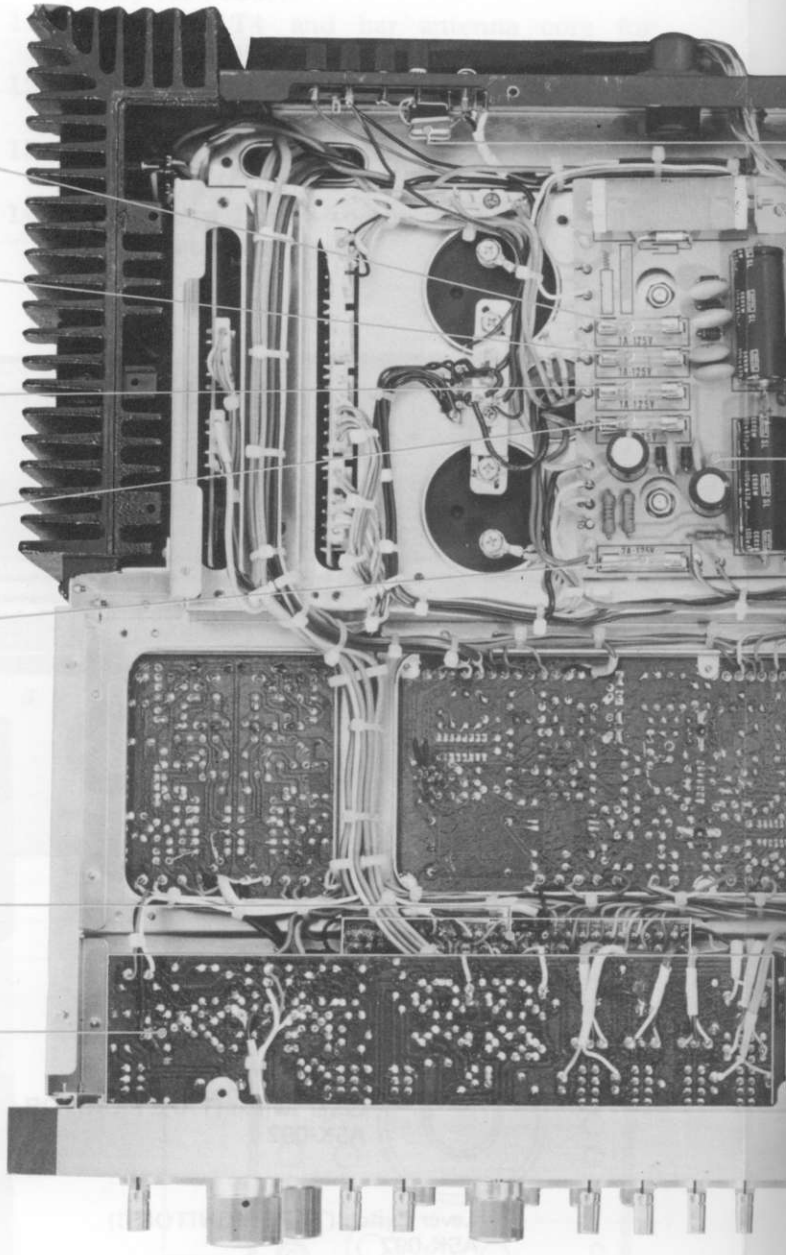
Terminal (PRE/POWER AMP)
AKB-030

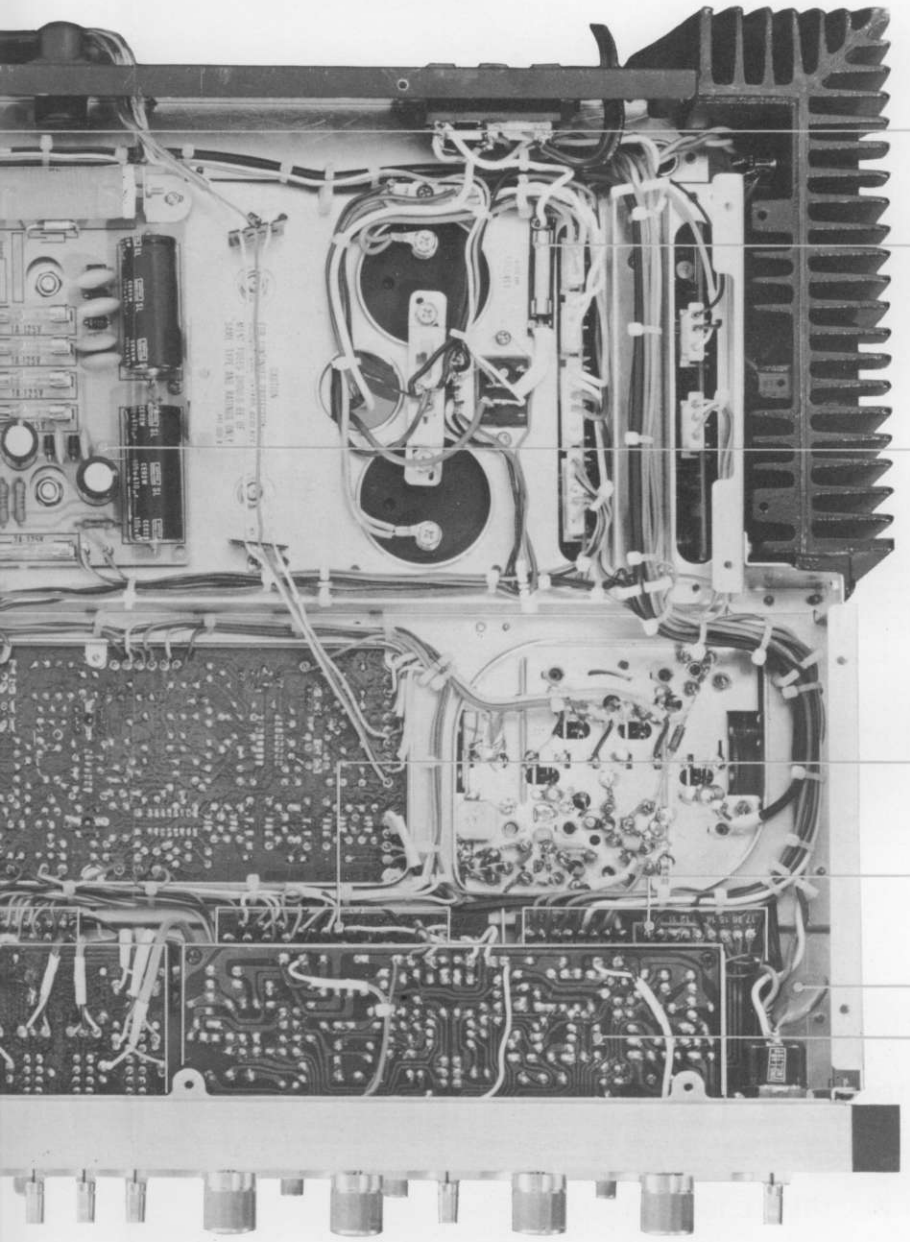
AC power cord
ADG-013

AC socket (AC OUTLETS)
AKP-005

Terminal (FM DET OUT)
AKB-019

8.4 BOTTOM VIEW





Ferrite balun
T22-025

Fuse 12A (FU6, primary)
AEK-301

Power supply assembly
AWR-107

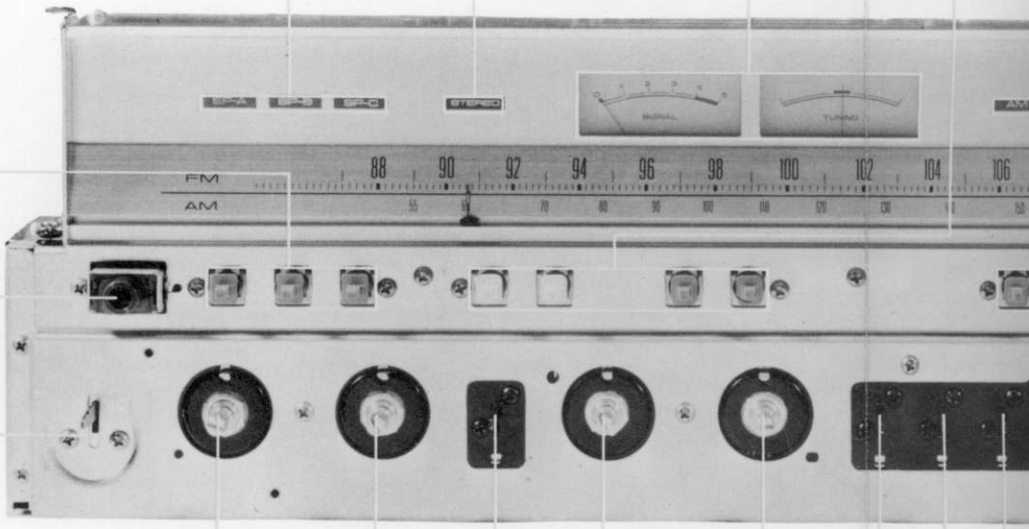
Filter amplifier assembly
AWM-089

Speakers switch assembly
AWS-095

Ceramic capacitor (0.01μF 150V)
ACG-003

Control amplifier assembly
AWG-041

8.5 FRONT VIEW



Indicator (STEREO)
AAT-028

Indicator (SP-A, SP-B, SP-C)
AAT-026

Push switch (SPEAKERS)
ASG-094

Phone jack (PHONES)
AKN-010

Lever switch (POWER)
ASK-080

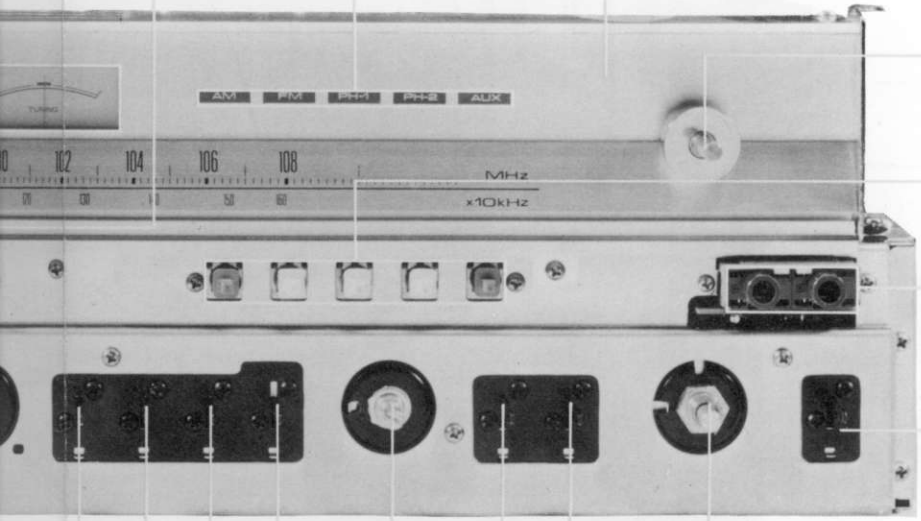
Variable resistor (102k, 5-step, BASS 50Hz)
ACV-165

Variable resistor (102.6k, 11-step, BASS 100Hz)
ACV-166

Lever switch (TONE)
ASK-090

Variable resistor (99k, 11-step, TREBLE 10kHz)
ACV-167

Variable resistor (102k, 5-step, TREBLE 20kHz)
ACV-168



Double meter (SIGNAL/TUNING)
AAW-040

Push switch (FILTER, FM MUTING, MULTIPATH)
ASG-098

Indicator
AAT-027

Dial scale plate
AAG-106

Tuning shaft assembly
AXA-111

Push switch (AM, FM, PHONOI, PHONO2/MIC)
ASG-095

Phone jack (MIC)
AKN-013

Lever switch (MUTING)
ASK-090

Variable resistor (50k, 32-step, VOLUME)
ACV-169

Lever switch (LOUDNESS)
ASK-090

Lever switch (TAPE MONITOR 2)
ASK-092

Lever switch (MODE)
ASK-090

Lever switch (TAPE MONITOR 1)
ASK-092

Variable resistor (100k-HB, BALANCE)
ACV-163

Lever switch (DUPLICATE)
ASK-084

Lever switch (ADAPTOR)
ASK-092

9. ADJUSTMENTS

9.1 AM TUNER

1. Set function switch to AM.
2. Connect AM signal generator through 1k-ohm resistor to AM antenna terminal.
3. Set DUPLICATE switch to OFF and connect an AC voltmeter to TAPE 1 REC jacks.
4. Set AM SG for 400Hz 30% modulation 100dB output.
5. Set SX-1250 dial indication and AM SG frequency for 600kHz.
6. Adjust T3 core for maximum reading on AC voltmeter.
7. Set SX-1250 dial indication and AM SG frequency for 1,400kHz.
8. Adjust TC1 for maximum reading on AC voltmeter.
9. Set AM SG for 30dB output.
10. Set SX-1250 dial indication and AM SG frequency for 600kHz.
11. Adjust T3, T4 and bar antenna core for maximum reading on AC voltmeter.
12. Set SX-1250 dial indication and AM SG frequency for 1,400kHz.
13. Adjust TC1, TC2 and TC3 for maximum reading on AC voltmeter.
14. Repeat steps 10~13 to eliminate variations in AC voltmeter readings.

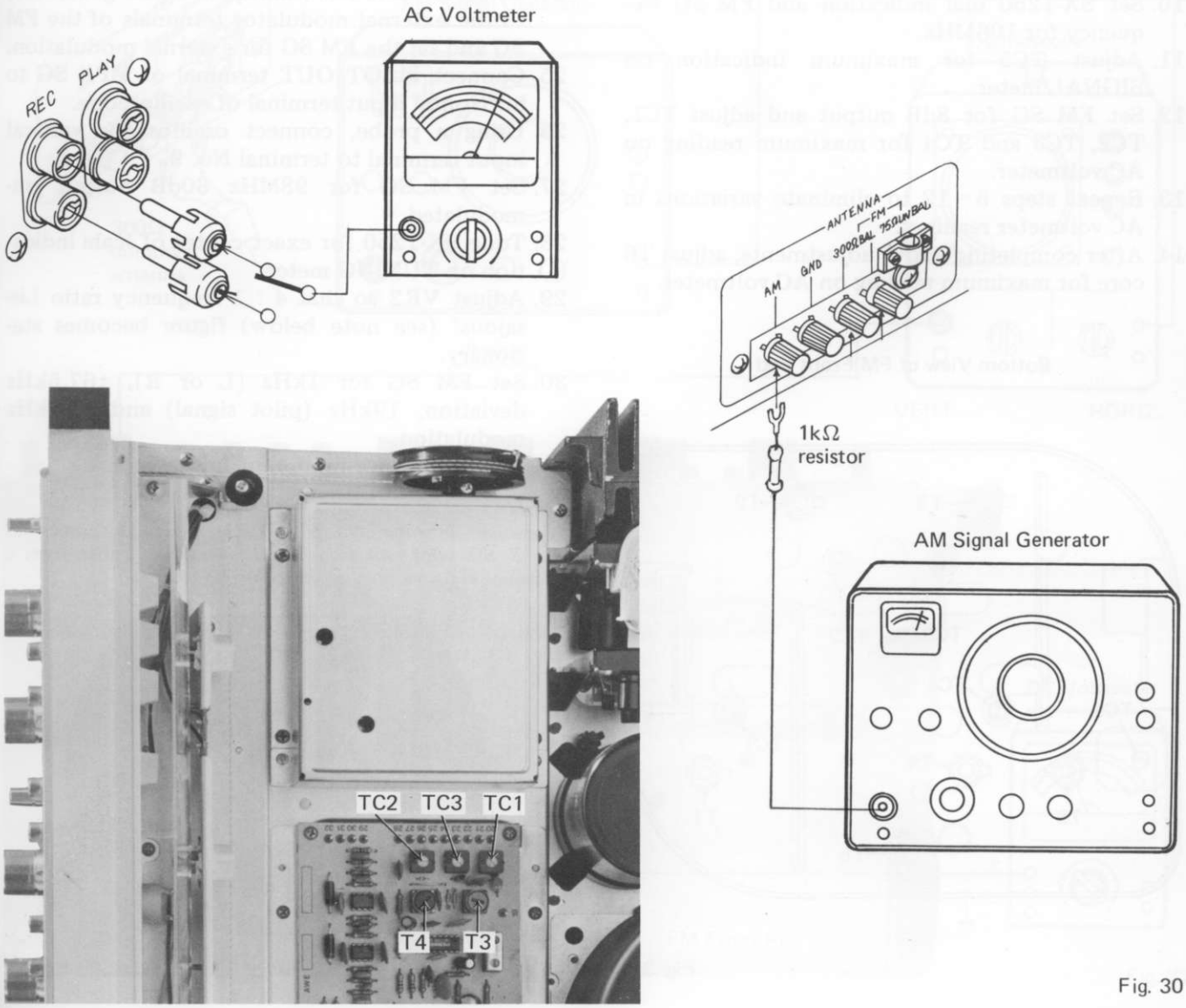


Fig. 30

9.2 FM TUNER

FM Front End

1. Set function switch to FM.
2. Set FM MUTING switch to OFF.
3. Connect FM signal generator through 300-ohm dummy load to 300 ohm FM antenna terminals.
4. Set DUPLICATE switch to OFF and connect AC voltmeter to TAPE 1 REC jacks.
5. Set FM SG for 100dB output at 400Hz and 100% modulation.
6. Set SX-1250 dial indication and FM SG frequency for 87.4MHz.
7. Adjust T5 core for maximum indication on SIGNAL meter.
8. Set FM SG for 8dB output and adjust cores of T1, T2, T3 and T4 for maximum reading on AC voltmeter.
9. Set FM SG for 100dB output.
10. Set SX-1250 dial indication and FM SG frequency for 106MHz.
11. Adjust TC5 for maximum indication on SIGNAL meter.
12. Set FM SG for 8dB output and adjust TC1, TC2, TC3 and TC4 for maximum reading on AC voltmeter.
13. Repeat steps 5～12 to eliminate variations in AC voltmeter readings.
14. After completing above adjustments, adjust T6 core for maximum reading on AC voltmeter.

Bottom View of FM Front End

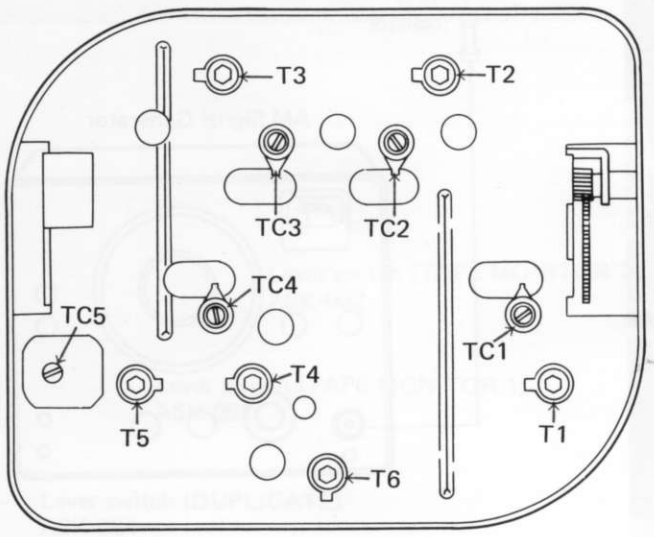


Fig. 31

Tuner Assembly

15. Connect DC voltmeter to terminal No. 43.
16. Turn VR1 and VR3 fully counter-clockwise.
17. Detune SX-1250 to where only noise is received and adjust T1 core for center of scale indication on TUNING meter.
18. Set FM SG for 98MHz 60dB output.
19. Tune SX-1250 for exact center of scale indication on TUNING meter.
20. Adjust T2 upper core for 0V (±10mV) between terminal No. 43 and ground.
21. Adjust T2 lower core for minimum distortion.
22. Repeat steps 20 — 21 several times.
23. Set FM SG for 100dB output and adjust VR1 so that SIGNAL meter indicates 4.7 on the scale.

Multiplex Decoder

24. Connect MPX SG (multiplex signal generator) to the external modulator terminals of the FM SG and set the FM SG for external modulation.
25. Connect PILOT OUT terminal of MPX SG to horizontal input terminal of oscilloscope.
26. Using a probe, connect oscilloscope vertical input terminal to terminal No. 9.
27. Set FM SG for 98MHz 60dB output unmodulated.
28. Tune SX-1250 for exact center of scale indication on TUNING meter.
29. Adjust VR2 so that 4 : 1 frequency ratio Lissajous' (see note below) figure becomes stationary.
30. Set FM SG for 1kHz (L or R), ±67.5kHz deviation, 19kHz (pilot signal) and ±7.5kHz modulation.
31. Adjust VR3 for minimum L-R crosstalk.

Note:
Signal at terminal No. 9 is 76kHz sawtooth wave and MPX SG pilot out is a 19kHz sinewave. These form a Lissajous' figure such as shown in Fig. 32.

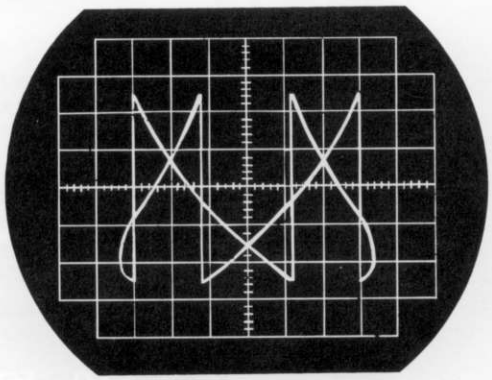


Fig. 32

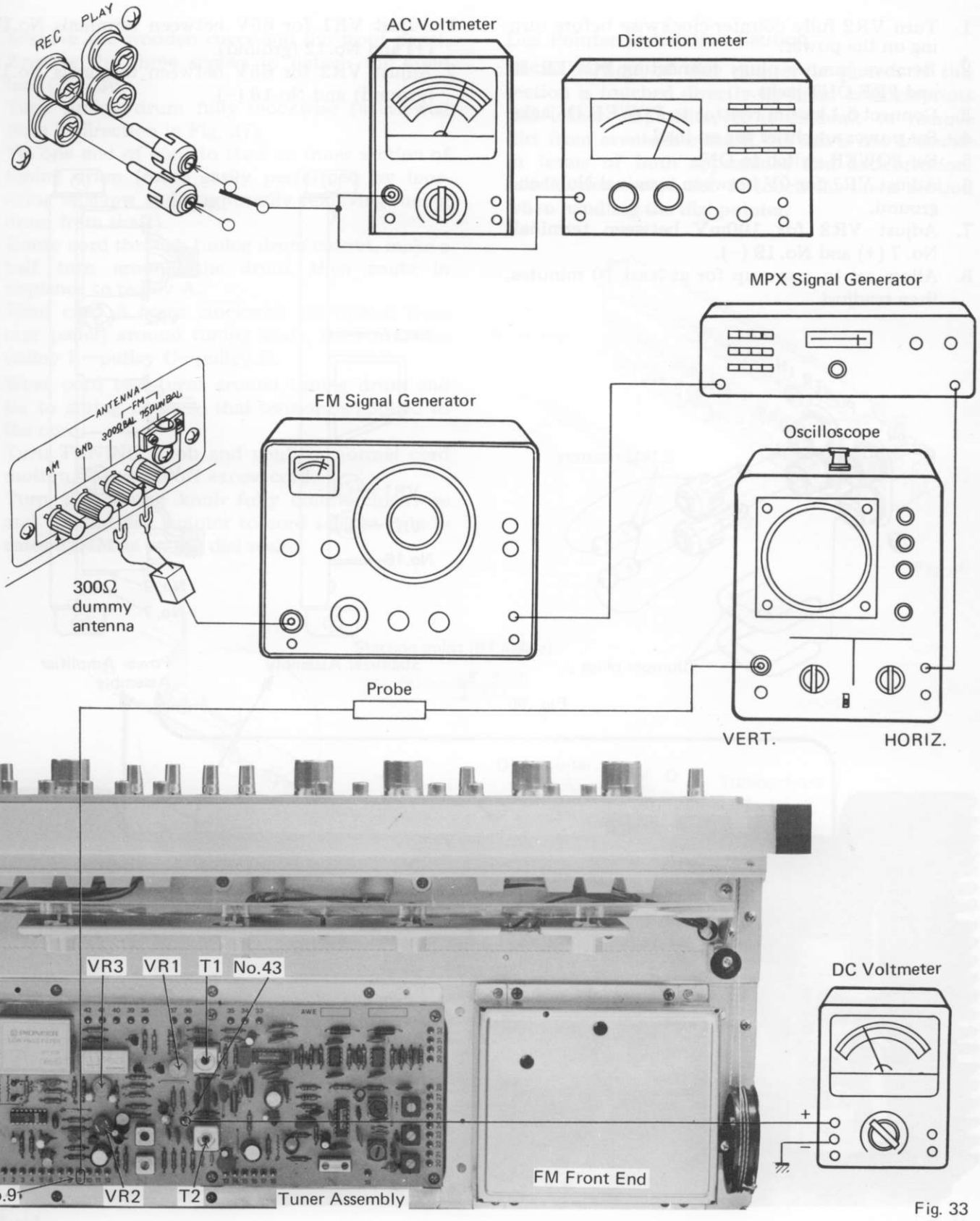

REC
PLAY
AC Voltmeter
Distortion meter
MPX Signal Generator
ANTENNA
FM
AM
GND
300ΩBAL
75ΩUNBAL
FM Signal Generator
Oscilloscope
300Ω
dummy
antenna
Probe
VERT.
HORIZ.
VR3
VR1
T1
No.43
DC Voltmeter
+
−
FM Front End
No.9
VR2
T2
Tuner Assembly

Fig. 33

9.3 POWER AMPLIFIER

1. Turn VR2 fully counter-clockwise before turning on the power.
2. Remove jumper plugs connecting POWER IN and PRE OUT jacks.
3. Connect 5.1 k-ohm resistor to POWER IN jacks.
4. Set power amplifier for no load.
5. Set POWER switch to ON.
6. Adjust VR1 for 0V between terminal No. 9 and ground.
7. Adjust VR2 for 100mV between terminals No. 7 (+) and No.19 (−).
8. Allow set to warm up for at least 10 minutes, then readjust.

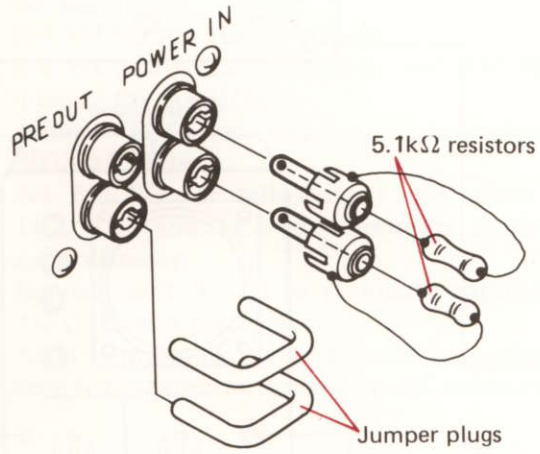
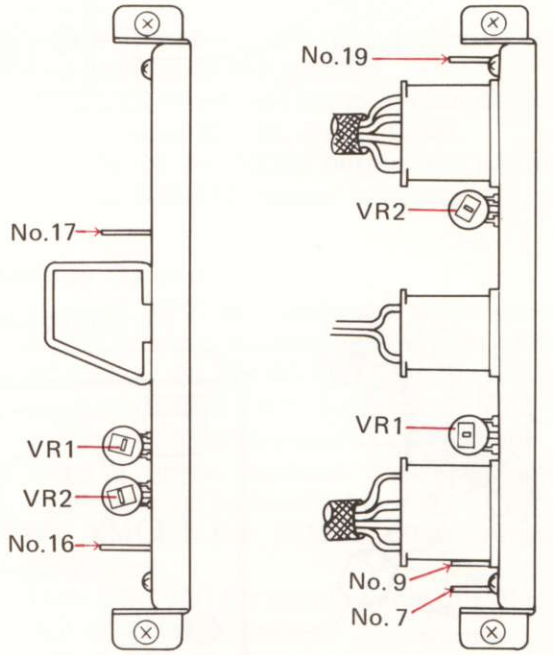


Fig. 34

9.4 STABILIZER

1. Adjust VR1 for 65V between terminals No.17 (+) and No.12 (ground).
2. Adjust VR2 for 65V between terminals No.12 (ground) and No.16 (−).



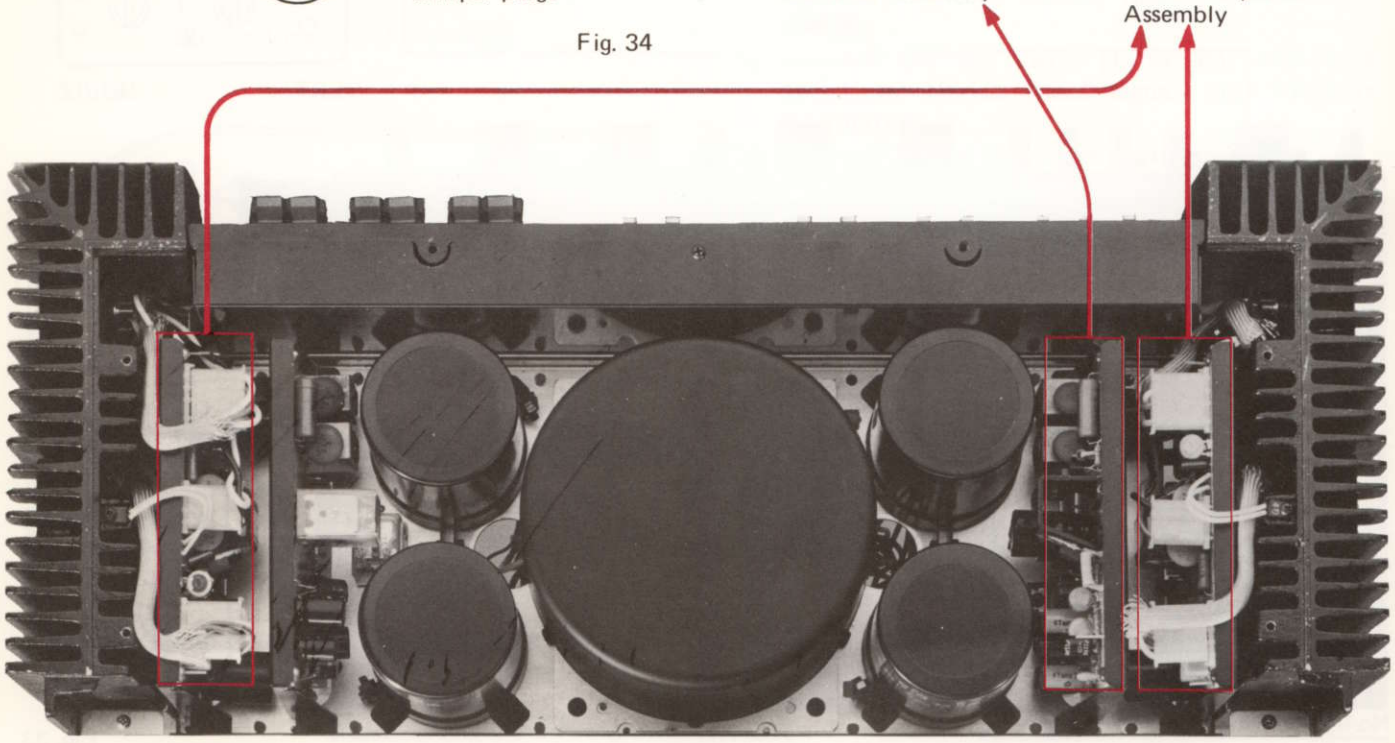


Fig. 35

10. DIAL CORD STRINGING

1. Remove the wooden cover and the front panel.
2. Remove the three screws to detach the blind sash (Fig. 36).
3. Turn tuning drum fully clockwise (as viewed from X direction in Fig. 37).
4. Tie one end of cord to stud on inner section of tuning drum (more easily performed by loosening setscrew and temporarily removing tuning drum from shaft).
5. Route cord through tuning drum cutout, make a half turn around the drum, then route in sequence to pulley A.
6. Wind cord 3 turns clockwise (as viewed from rear panel) around tuning shaft, then route to pulley B—pulley C—pulley D.
7. Wind cord two turns around tuning drum and tie to spring hook so that tension is applied to the cord.
8. Turn TUNING knob and confirm normal cord motion, then trim off excess cord.
9. Turn the tuning knob fully counterclockwise and fix the dial pointer to cord so that it indicates 87.4MHz on the dial scale.

Dial Pointer Installation Caution

Metal portion of dial pointer is plated. If this section is touched directly by hand or fingerprints and other impurities, it is difficult to remove dirt from aventurine finish. As this is not desirable in terms of both appearance and anticorrosion, take extreme care not to touch the metal section when handling the dial pointer.

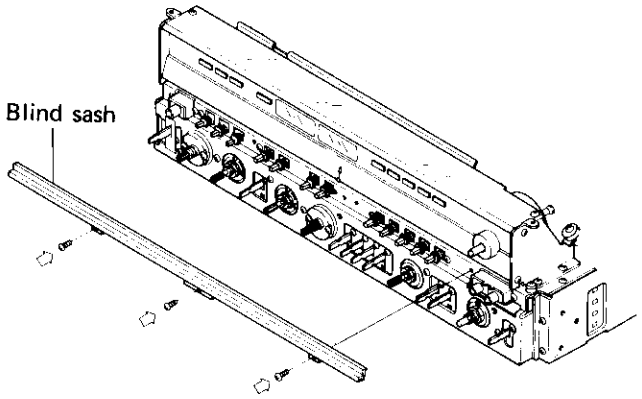


Fig. 36

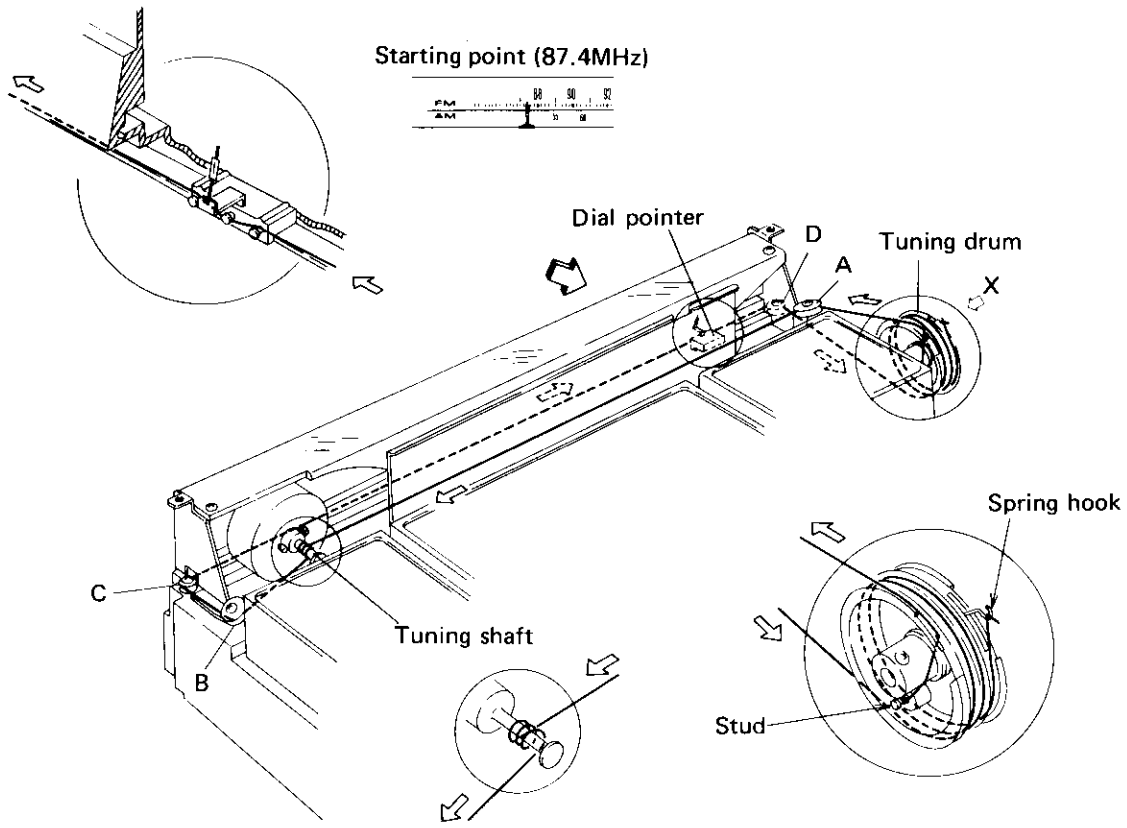


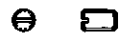
Fig. 37

11. EXPLODED VIEWS

NOMENCLATURE OF SCREWS, WASHERS AND NUTS

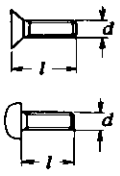
The following symbols stand for screws, washers and nuts as shown in exploded view.

Symbol	Description	Shape
RT	Brazier head tapping screw	
PT	Pan head tapping screw	
BT	Binding head tapping screw	
CT	Countersunk head tapping screw	
TT	Truss head tapping screw	
OCT	Oval countersunk head tapping screw	
PM	Pan head machine screw	
CM	Countersunk head machine screw	
OCM	Oval countersunk head machine screw	
TM	Truss head machine screw	
BM	Binding head machine screw	
PSA	Pan head screw with spring lock washer	
PSB	Pan head screw with spring lock washer and flat washer	
PSF	Pan head screw with flat washer	

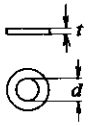
Symbol	Description	Shape
EW	E type washer	
FW	Flat washer	
SW	Spring lock washer	
N	Nut	
WN	Washer faced nut	
ITW	Internal toothed lock washer	
OTW	Outernal toothed lock washer	
SC	Slotted set screw (Cone point)	
SF	Slotted set screw (Flat point)	
HS	Hexagon socket headless set screw	
OCW	Oval countersunk head wood screw	
CW	Countersunk head wood screw	
RW	Round head wood screw	

EXAMPLE

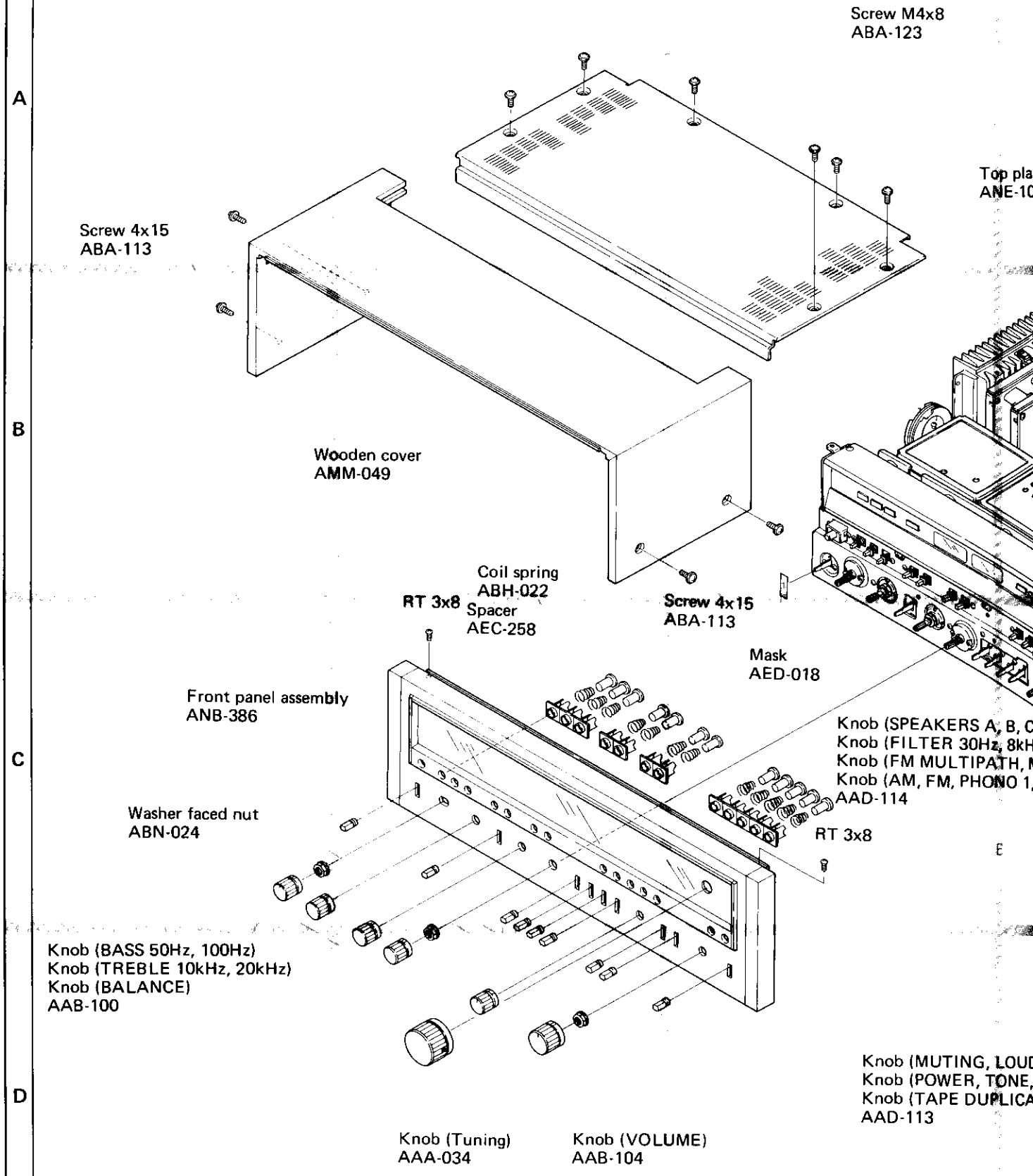
PM 3x8
- 3 — length in mm (l)
- 8 — diameter in mm (d)
- PM — Symbol



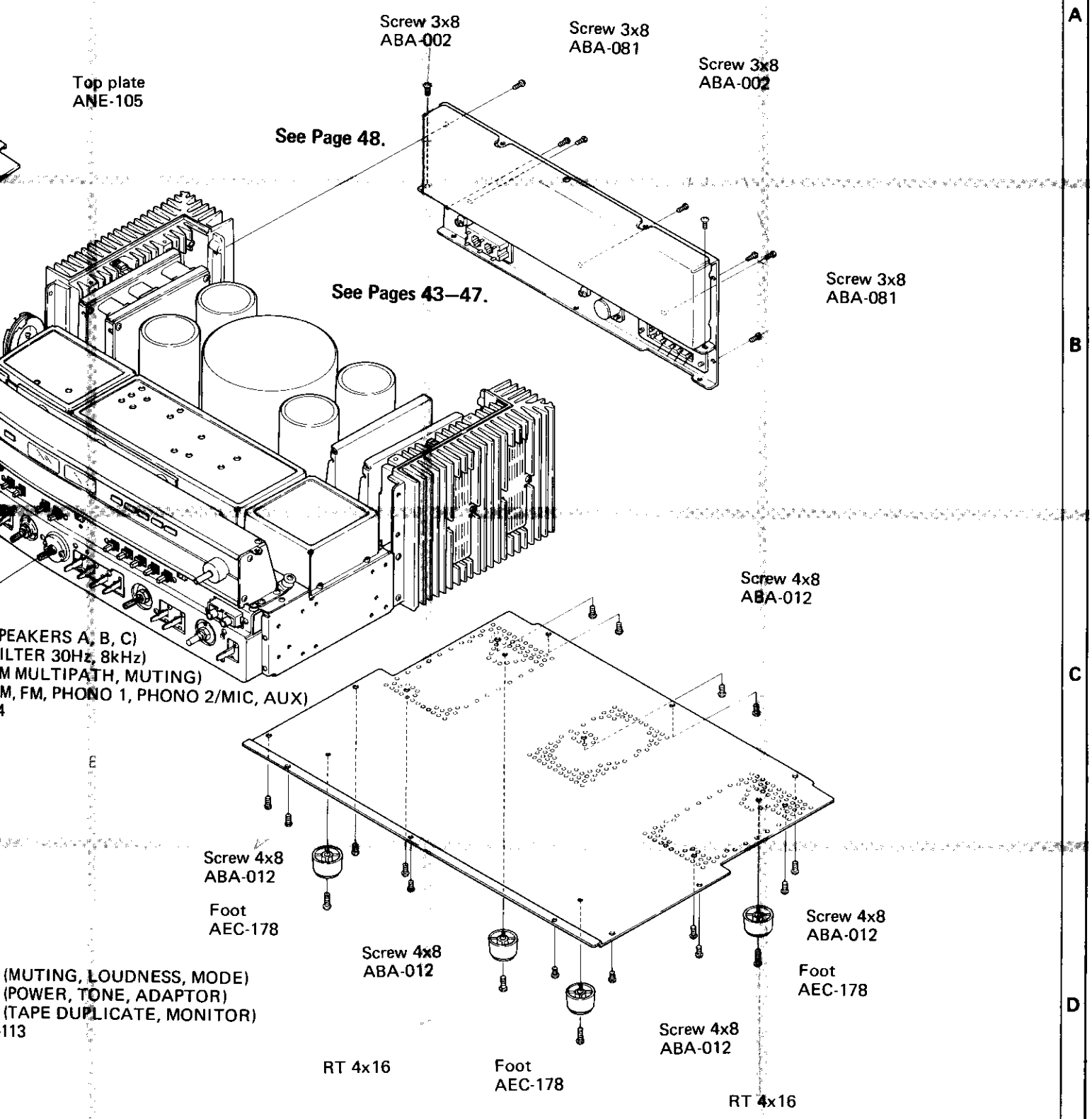
FW 9ϕx1^{t}
- 1 — thickness in mm (t)
- 9ϕ — diameter in mm (d)
- FW — Symbol



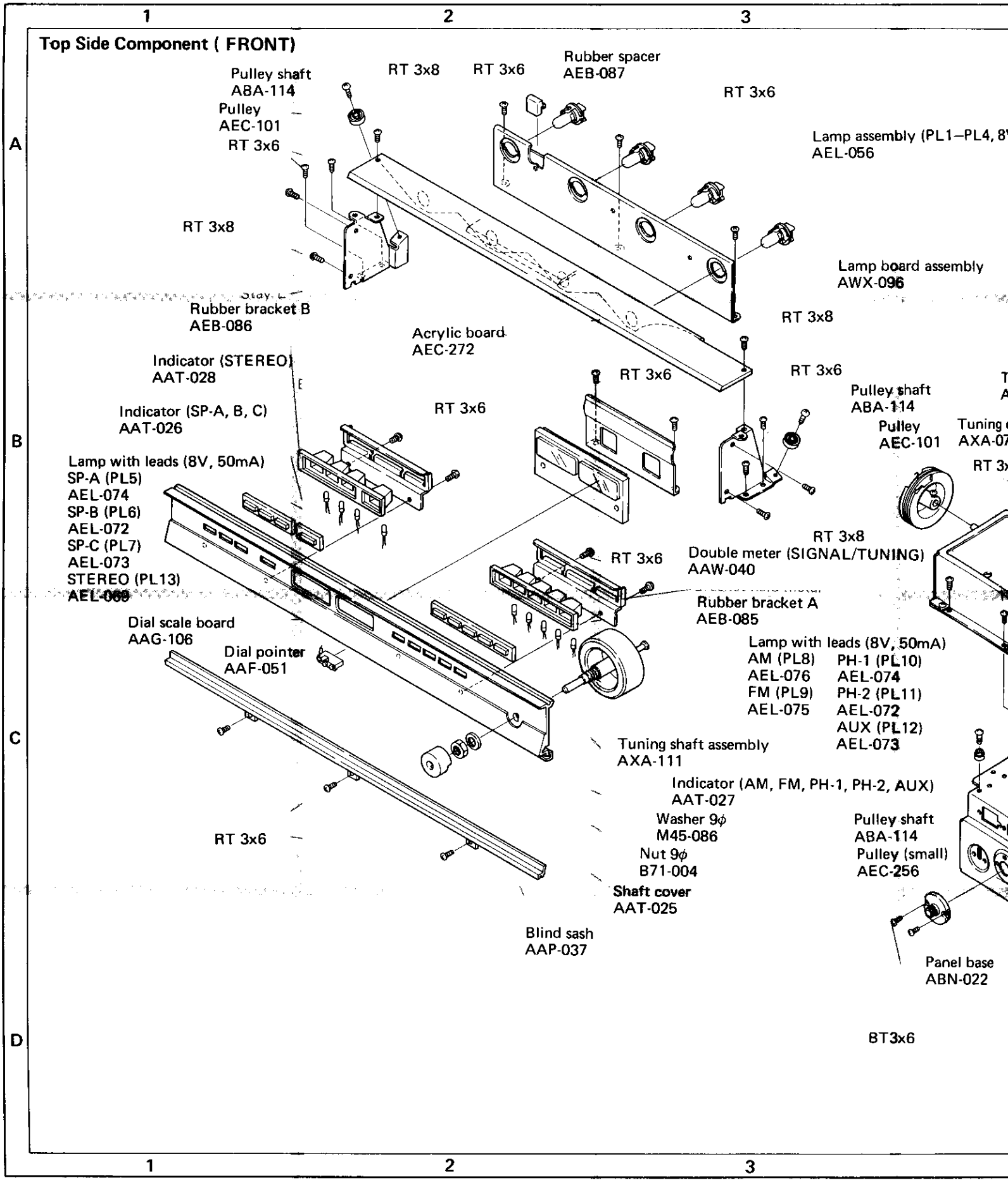
Exterior


Screw M4x8
ABA-123
Top pla
ANE-10
Screw 4x15
ABA-113
Wooden cover
AMM-049
Coil spring
ABH-022
RT 3x8
Spacer
AEC-258
Screw 4x15
ABA-113
Mask
AED-018
Front panel assembly
ANB-386
Knob (SPEAKERS A, B, C
Knob (FILTER 30Hz, 8kH
Knob (FM MULTIPATH, M
Knob (AM, FM, PHONO 1,
AAD-114
Washer faced nut
ABN-024
RT 3x8
Knob (BASS 50Hz, 100Hz)
Knob (TREBLE 10kHz, 20kHz)
Knob (BALANCE)
AAB-100
Knob (MUTING, LOUD
Knob (POWER, TONE,
Knob (TAPE DUPLICA
AAD-113
Knob (Tuning)
AAA-034
Knob (VOLUME)
AAB-104

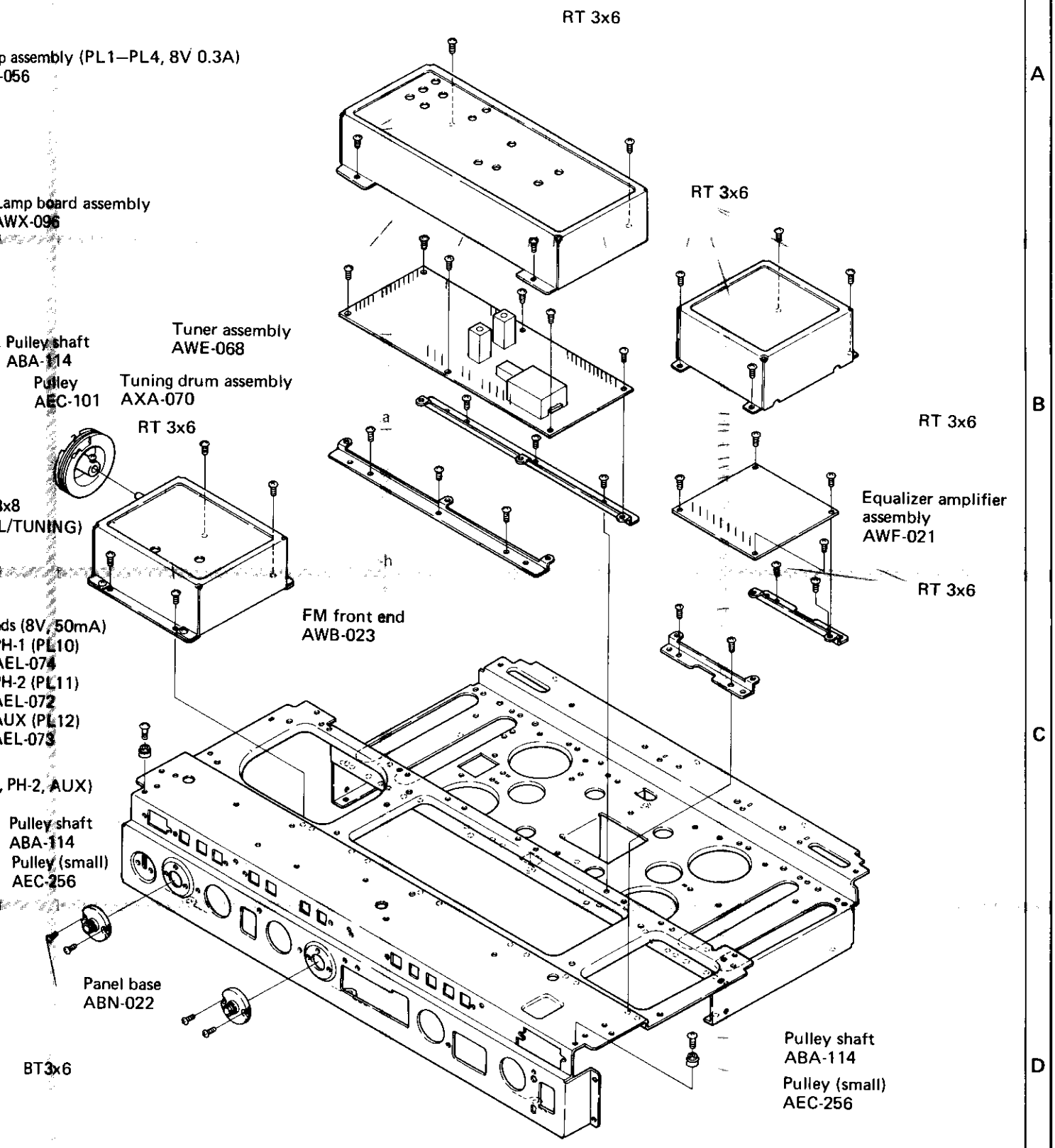
NOTE:
Parts indicated in green type cannot be supplied.



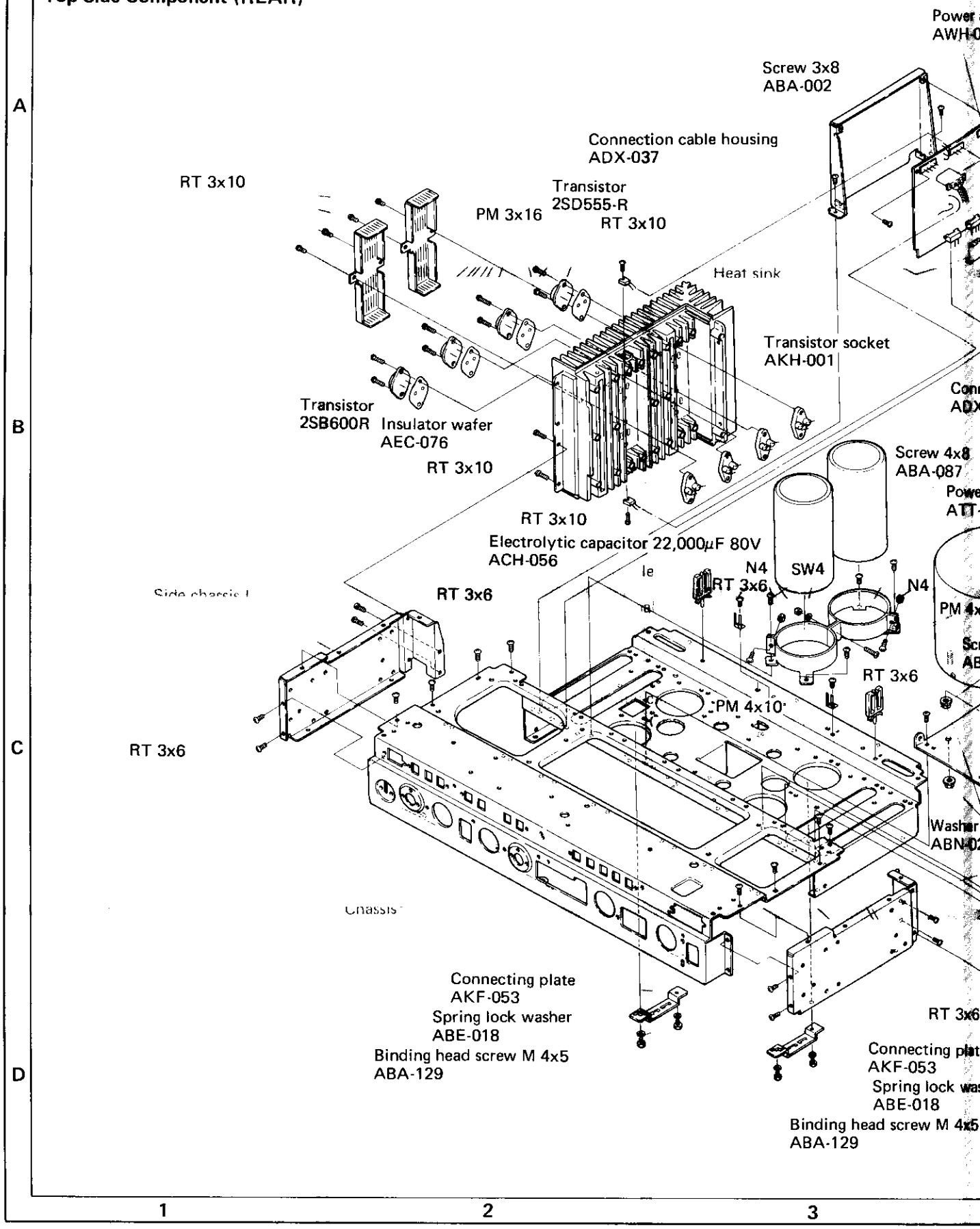
Top Side Component (FRONT)



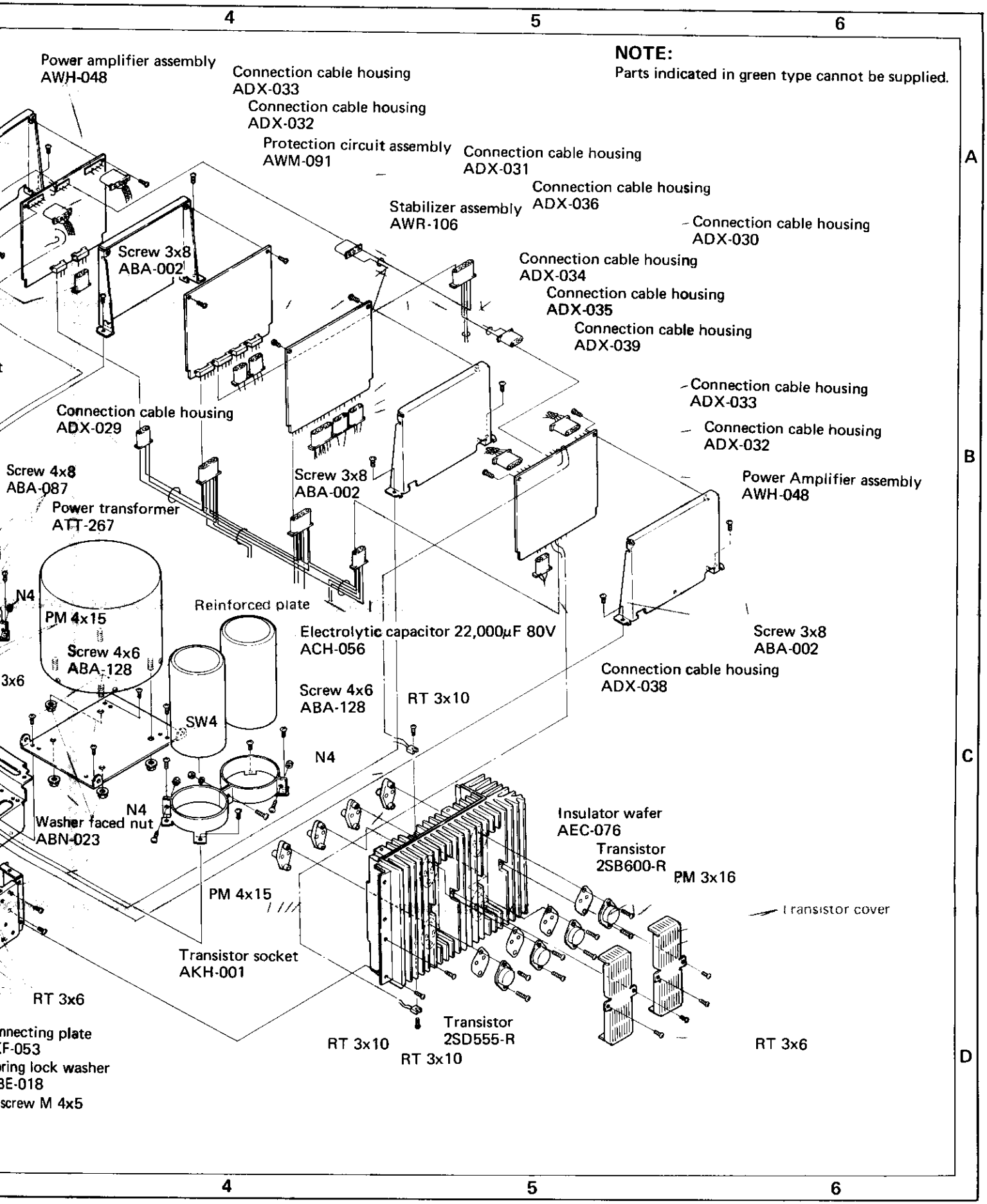
NOTE:
Parts indicated in green type cannot be supplied.



Top Side Component (REAR)

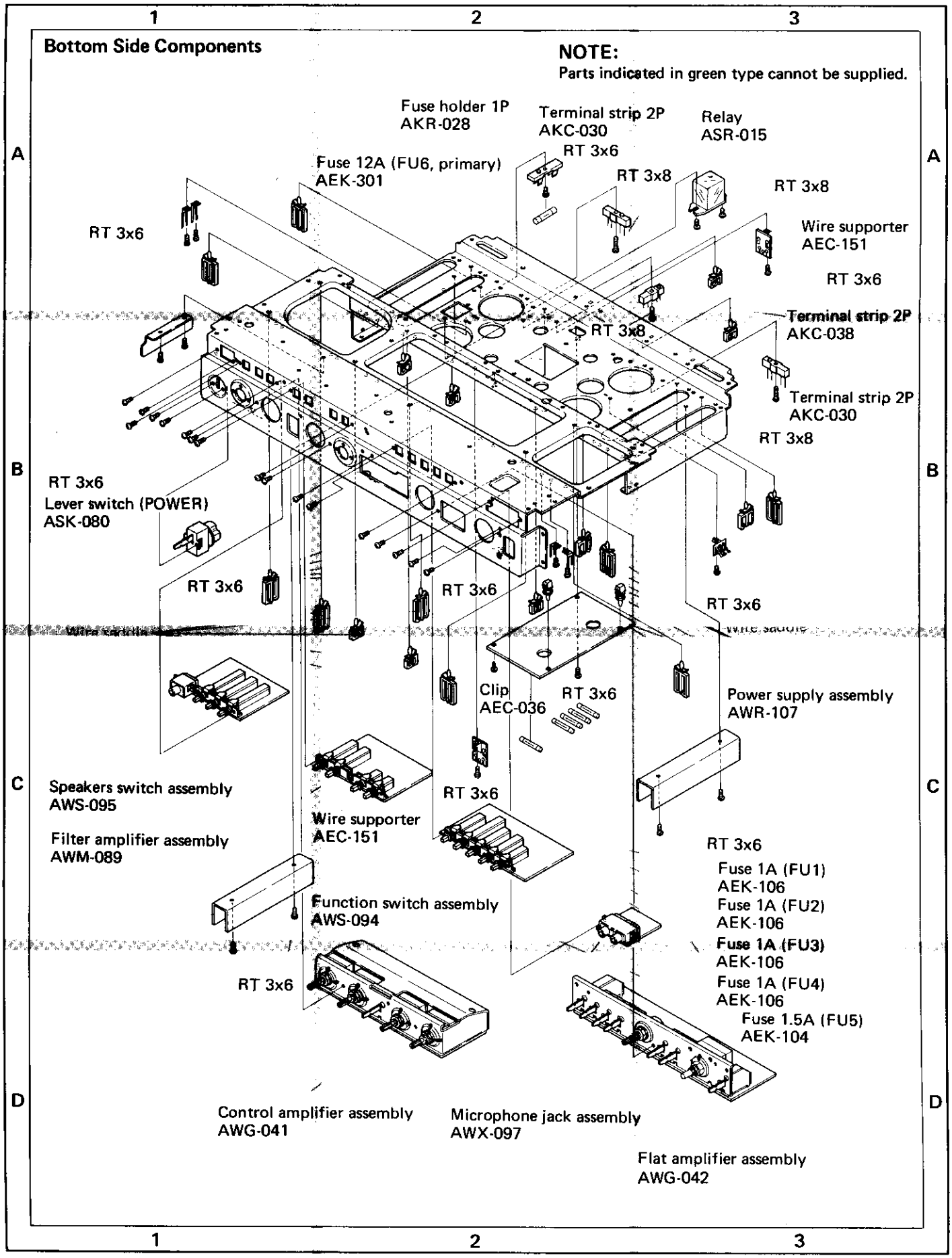


NOTE:
Parts indicated in green type cannot be supplied.



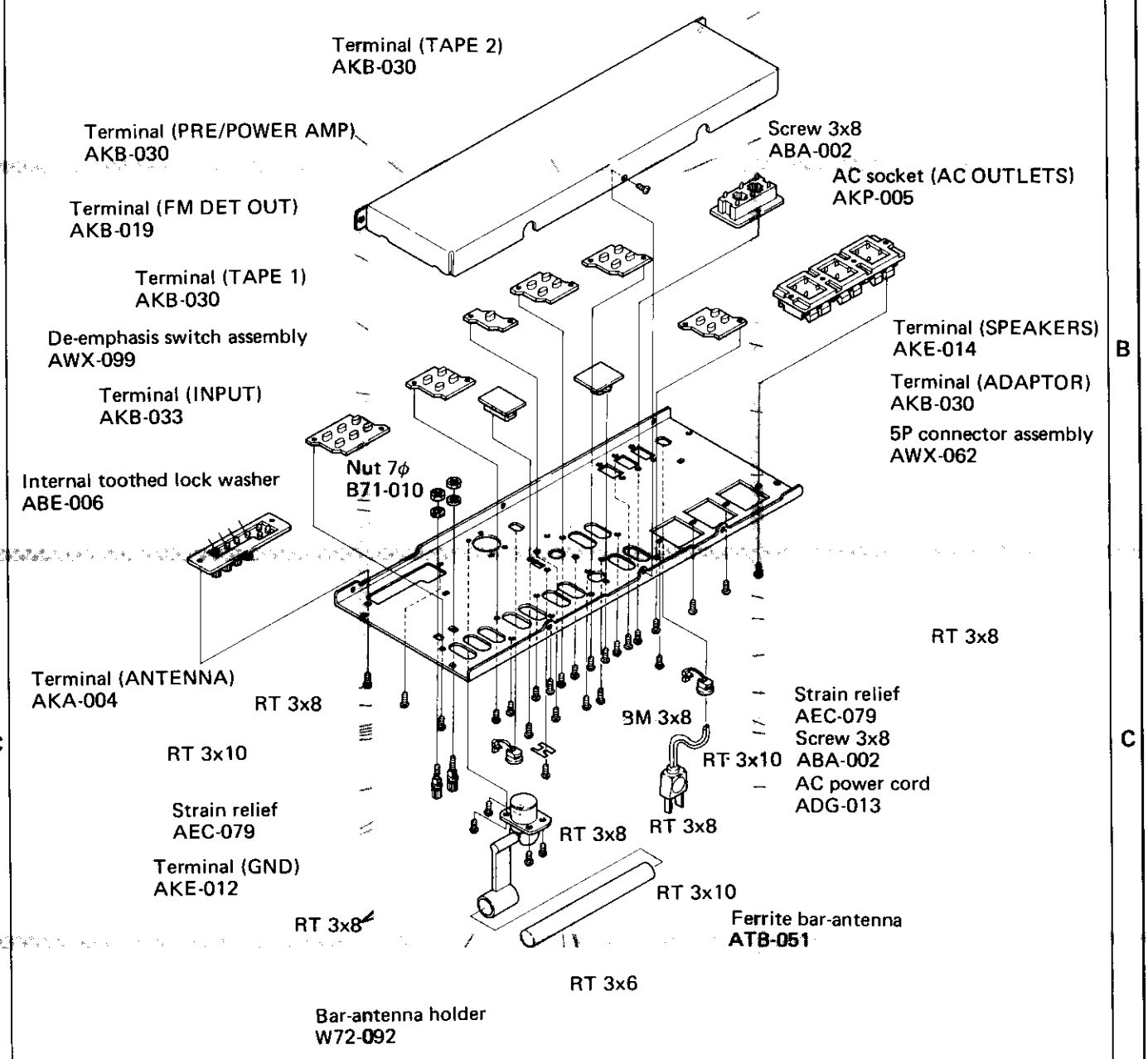
Bottom Side Components

NOTE:
Parts indicated in green type cannot be supplied.



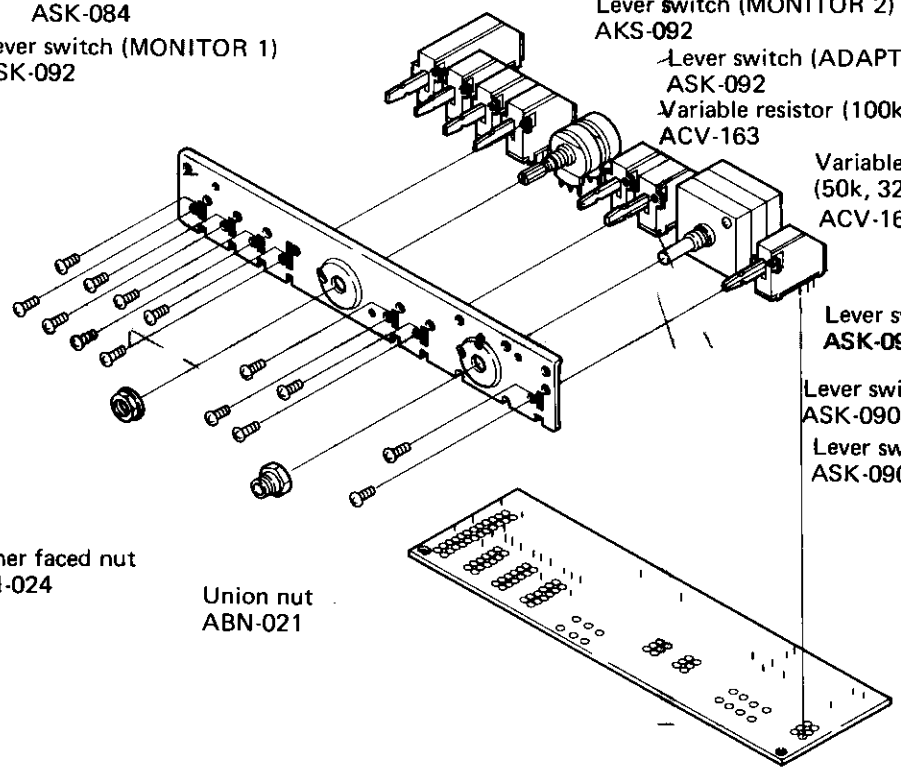
Rear Panel Component

NOTE:
Parts indicated in green type cannot be supplied.

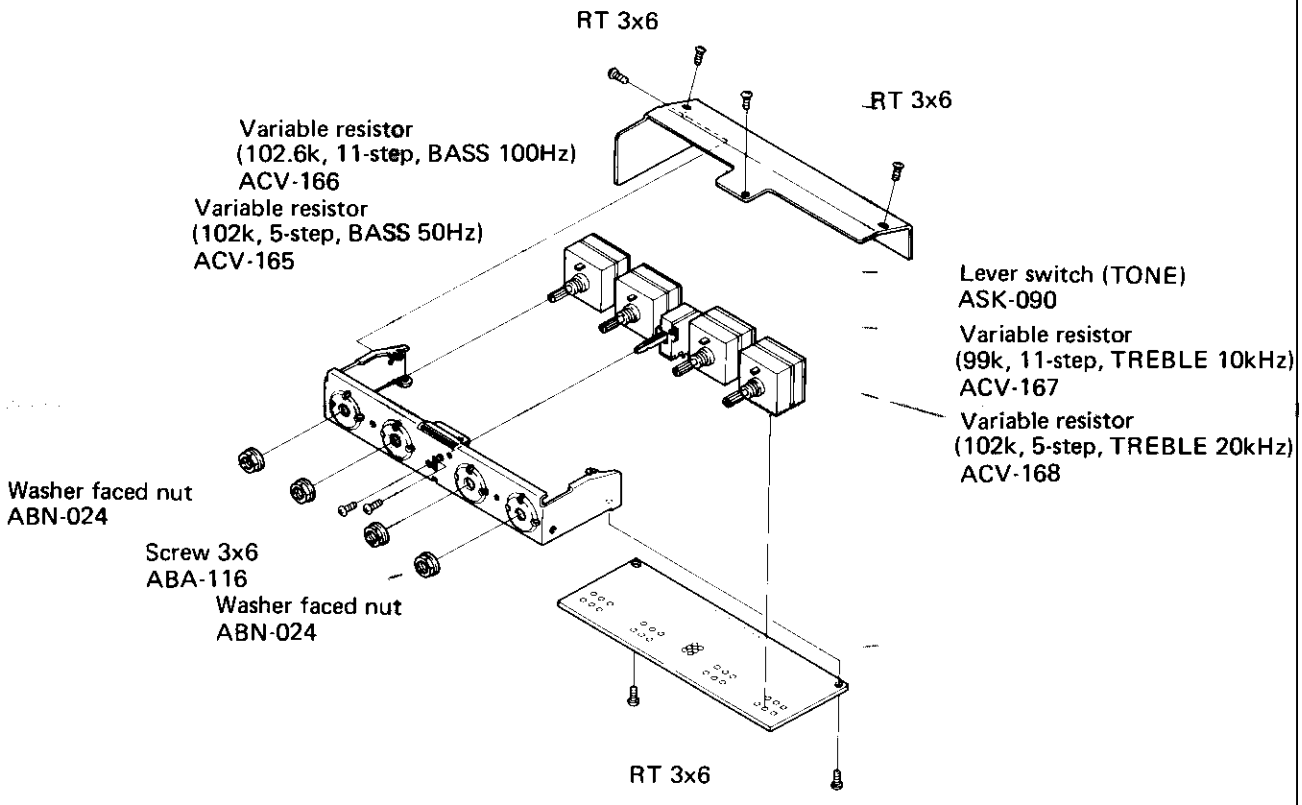


Flat Amplifier Assembly (AWG-042)

NOTE:
Parts indicated in green type cannot be supplied.

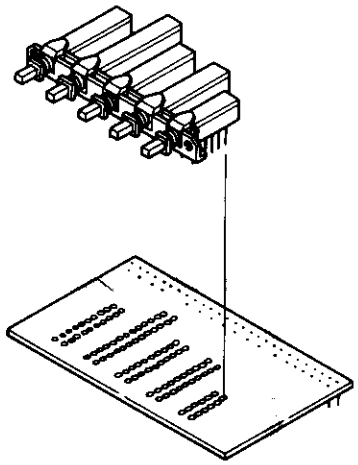


Control Amplifier Assembly (AWG-041)



Switch Assembly (AWS-094)

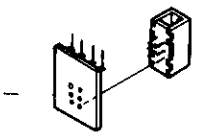
Push switch (AM, FM, PHONO 1, PHONO 2/MIC, AUX)
ASG-095



NOTE:
Parts indicated in green type cannot be supplied.

Switch Assembly (AWX-099)

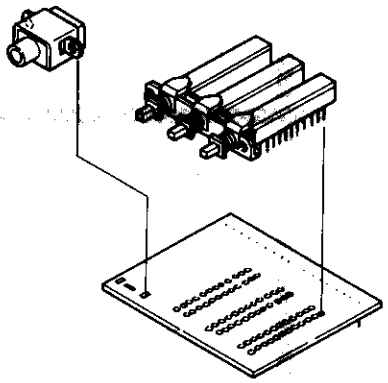
Slide switch (DE-EMPHASIS)
ASH-015



Switch Assembly (AWS-095)

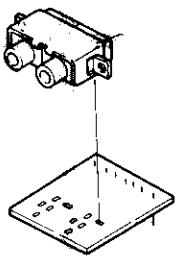
Push switch (SPEAKERS A, B, C)
ASG-094

Phone jack (PHONES)
AKN-010



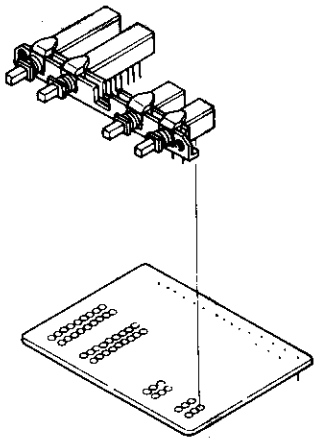
Microphone Jack Assembly (AWX-097)

Phone jack (MIC)
AKN-013



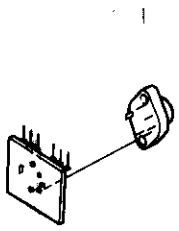
Filter Amplifier Assembly (AWM-089)

Push switch
(FILTER, FM MUTING, MULTIPATH)
ASG-098



5P Connector Assembly (AWX-062)

5P connector socket (REC/PLAY)
AKP-007



AM/FM STEREO RECEIVER

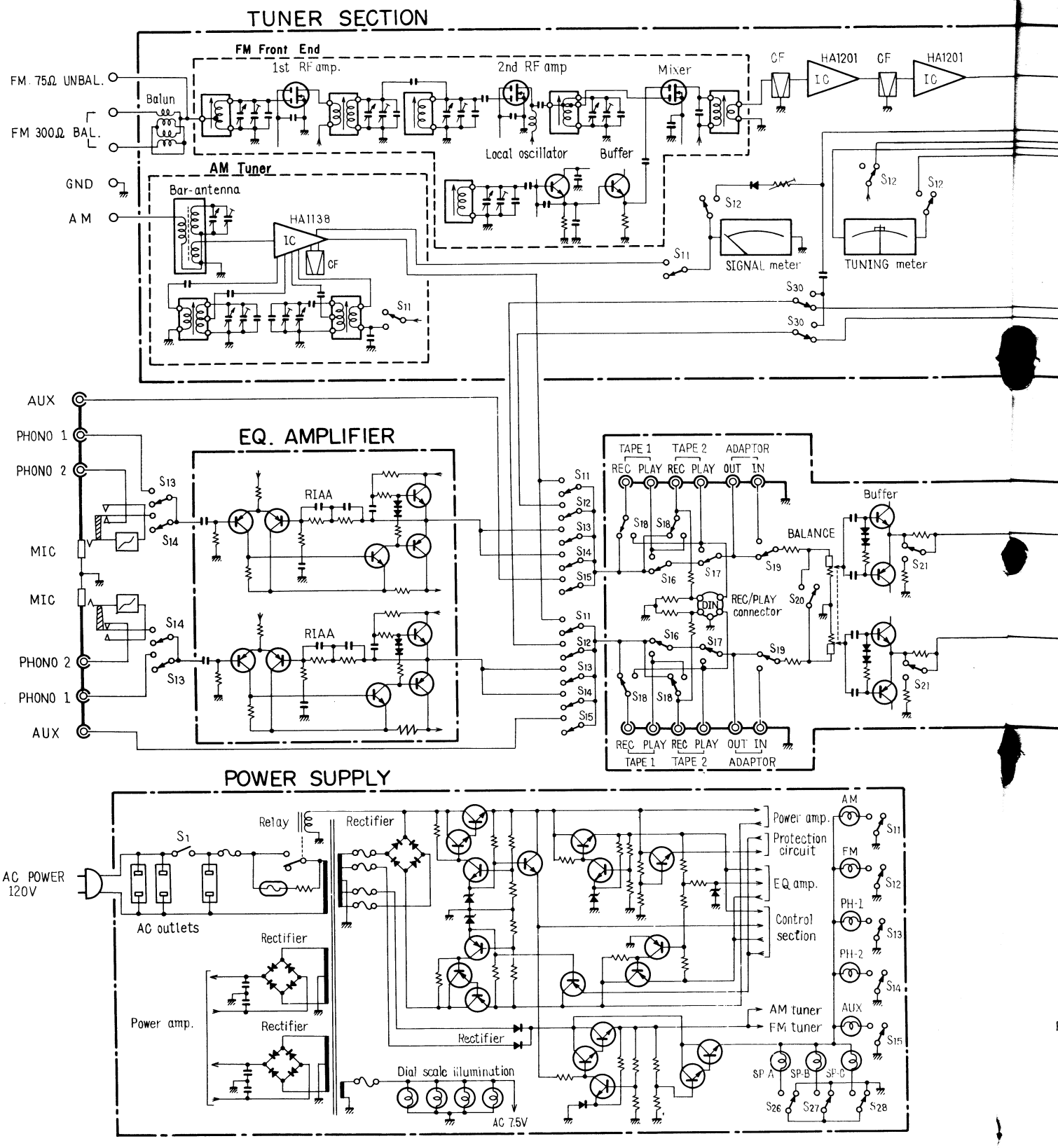
SX-1250

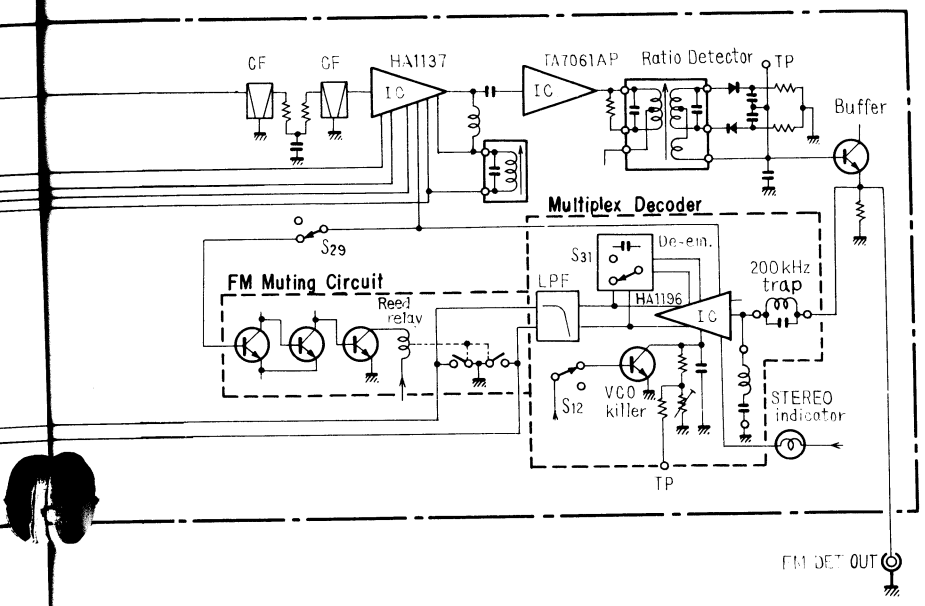
<ART-158-0>

Service Manual

PIONEER®

6. BLOCK DIAGRAM





SWITCHES :

S1 : POWER

(FUNCTION)

S11 : AM
S12 : FM
S13 : PHONO 1
S14 : PHONO 2/MIC
S15 : AUX

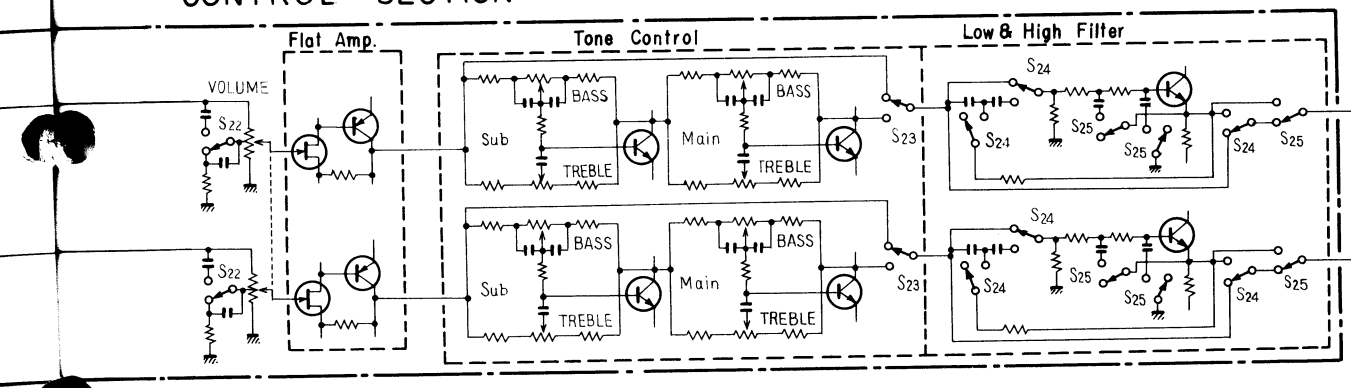
S16 : TAPE MONITOR 1
S17 : TAPE MONITOR 2
S18 : TAPE DUPLICATE
S19 : ADAPTOR
S20 : MODE
S21 : MUTING
S22 : LOUDNESS
S23 : TONE
S24 : LOW FILTER
S25 : HIGH FILTER

(SPEAKERS)

S26 : SPEAKERS A
S27 : SPEAKERS B
S28 : SPEAKERS C

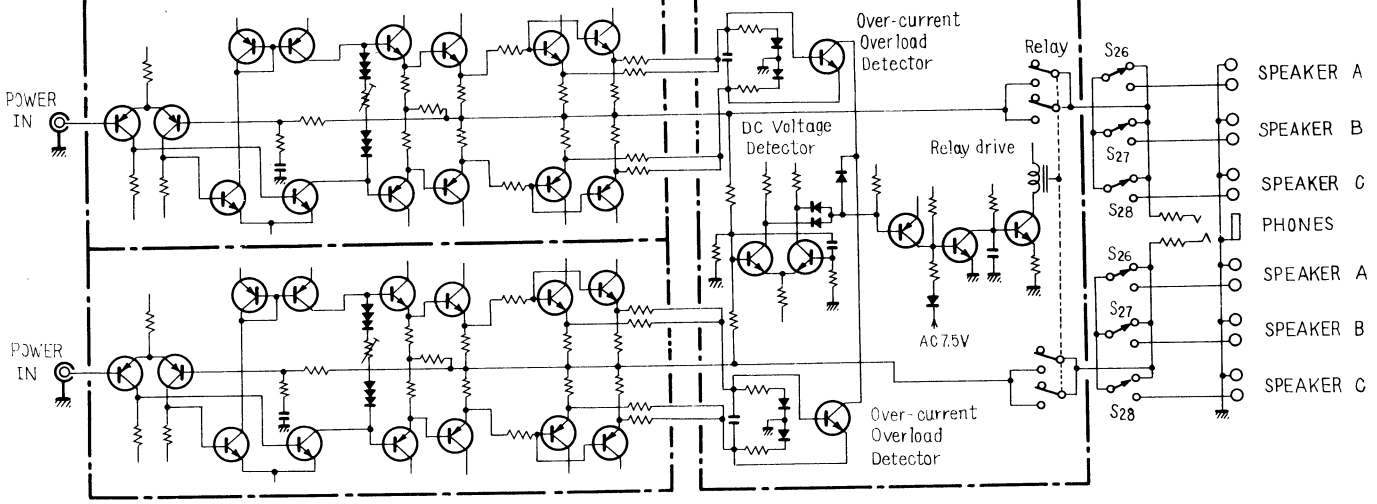
S29 : FM MUTING
S30 : FM MULTIPATH
S31 : FM DE-EMPHASIS

CONTROL SECTION

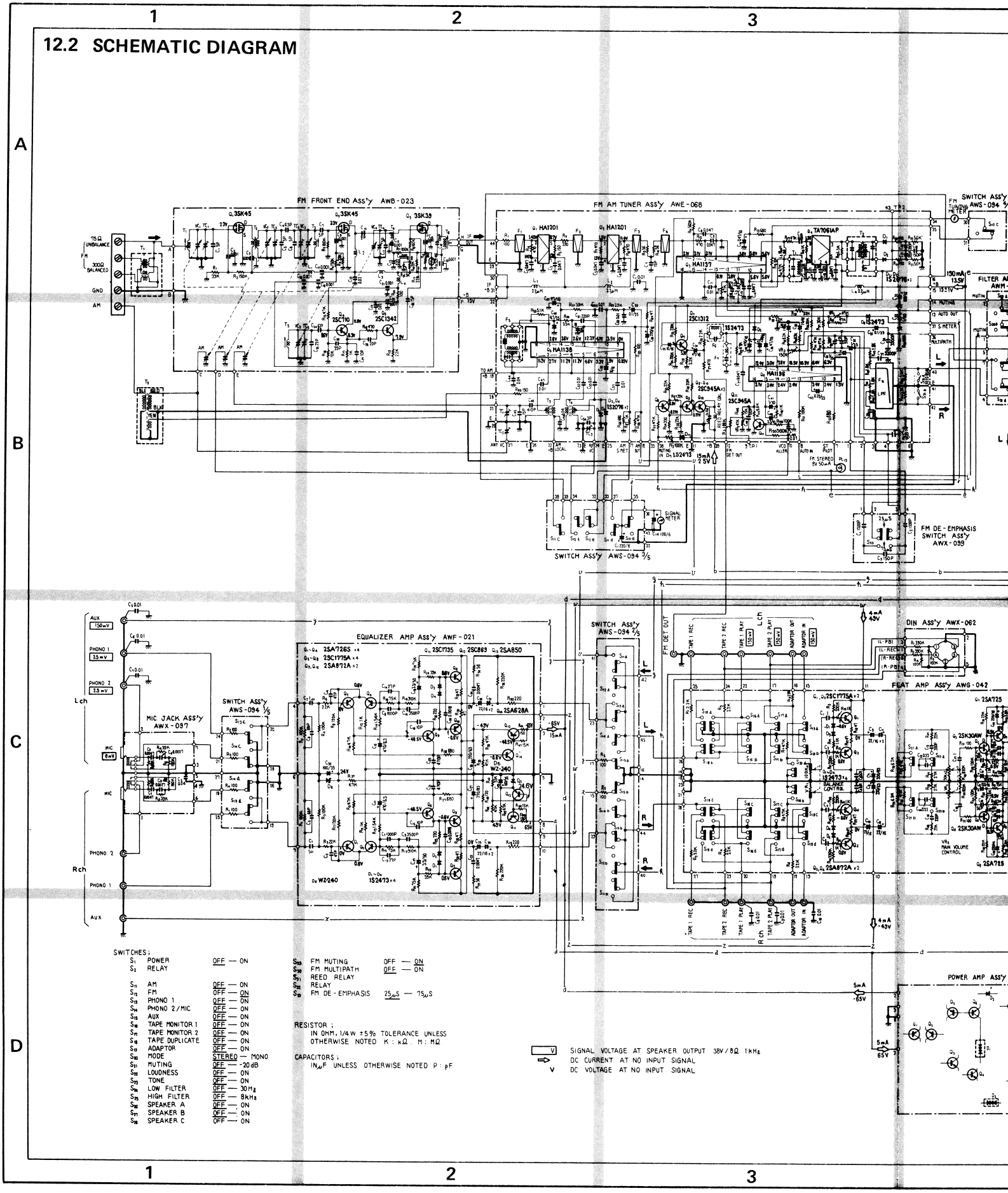


POWER AMPLIFIER

PROTECTION CIRCUT



12.2 SCHEMATIC DIAGRAM



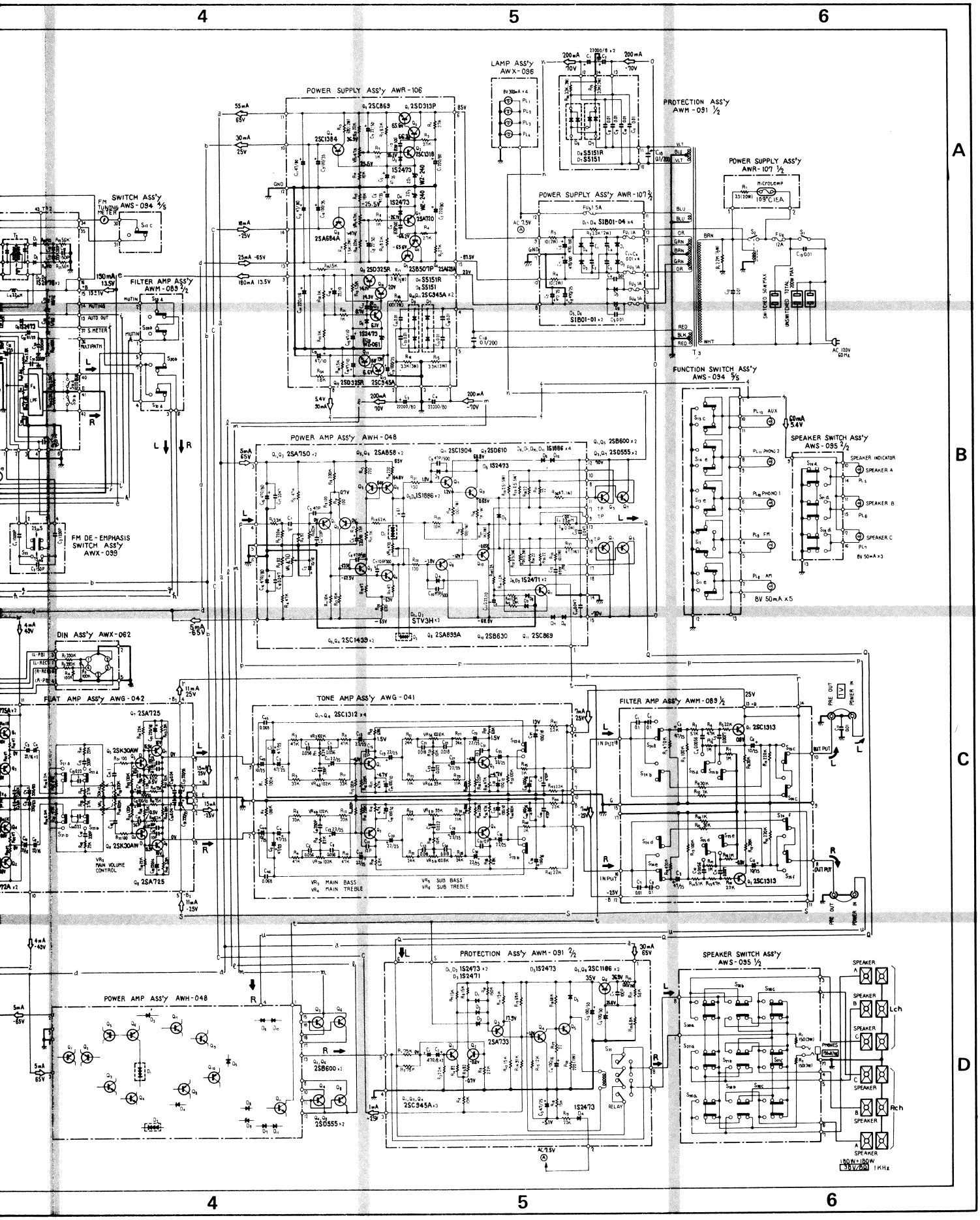
SWITCHES;

S_1	POWER	OFF — ON	
S_2	RELAY		
S_{3A}	AM	OFF — ON	
S_{3B}	FM	OFF — ON	
S_{3C}	PHONO 1	OFF — ON	
S_{3D}	PHONO 2/MIC	OFF — ON	
S_{3E}	AUX	OFF — ON	
S_{3F}	TAPE MONITOR 1	OFF — ON	
S_{3G}	TAPE MONITOR 2	OFF — ON	
S_{3H}	TAPE DUPLICATE	OFF — ON	
S_{3I}	ADAPTOR	OFF — ON	
S_{3J}	MODE	STEREO — MONO	
S_{3K}	MUTING	OFF — -20dB	
S_{3L}	LOUDNESS	OFF — ON	
S_{3M}	TONE	OFF — ON	
S_{3N}	LOW FILTER	OFF — 30Hz	
S_{3O}	HIGH FILTER	OFF — 8kHz	
S_{3P}	SPEAKER A	OFF — ON	
S_{3Q}	SPEAKER B	OFF — ON	
S_{3R}	SPEAKER C	OFF — ON	
S_{3S}	FM MUTING	OFF — ON	
S_{3T}	FM MULTIPATH	OFF — ON	
S_{51}	REED RELAY		
S_{52}	RELAY		
S_{53}	FM DE-EMPHASIS	25μS — 75μS	

RESISTOR ;
IN OHM, 1/4W ±5% TOLERANCE UNLESS OTHERWISE NOTED K : kΩ, M : MΩ

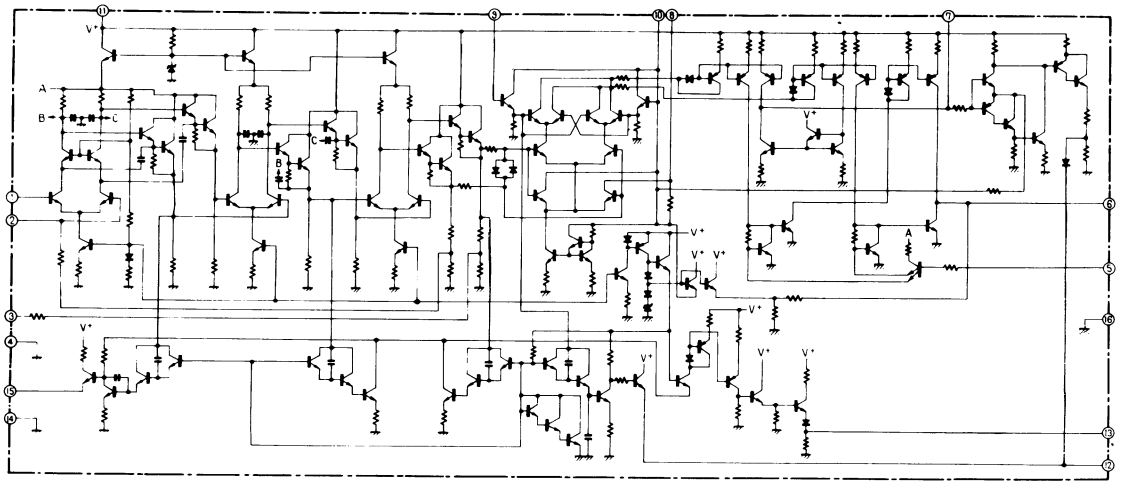
CAPACITORS ;
IN μF UNLESS OTHERWISE NOTED P : pF

V SIGNAL VOLTAGE AT SPEAKER OUTPUT 38V/8Ω 1kHz
⇨ DC CURRENT AT NO INPUT SIGNAL
V DC VOLTAGE AT NO INPUT SIGNAL

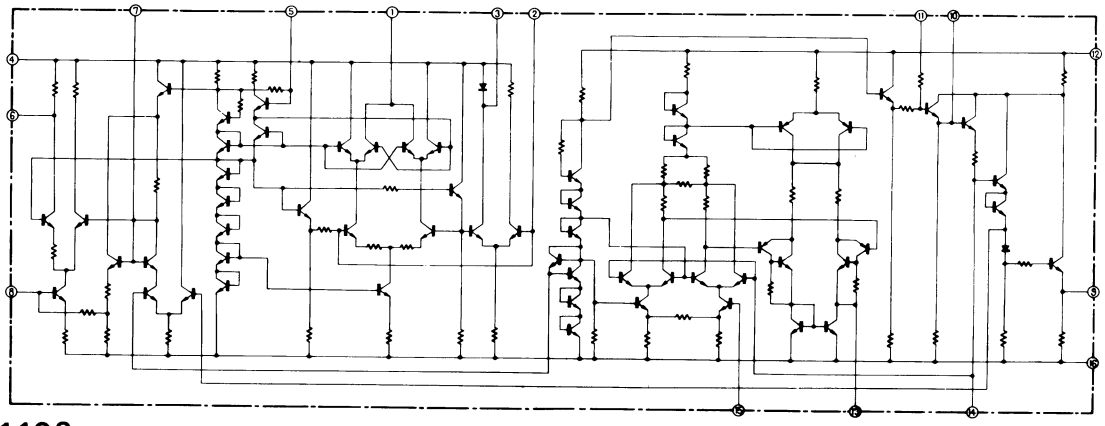

4
5
6
A
B
C
D
POWER SUPPLY ASS'y AWR-106
LAMP ASS'y AWX-096
PROTECTION ASS'y AWM-091 1/2
POWER SUPPLY ASS'y AWR-107 1/2
SWITCH ASS'y AWS-094 5/5
FM TUNING METER
FILTER AMP ASS'y AWM-089 2/2
FM DE-EMPHASIS SWITCH ASS'y AWX-099
FUNCTION SWITCH ASS'y AWS-094 5/5
SPEAKER SWITCH ASS'y AWS-095 2/2
POWER AMP ASS'y AWH-048
DIN ASS'y AWX-062
FLAT AMP ASS'y AWG-042
TONE AMP ASS'y AWG-041
FILTER AMP ASS'y AWM-089 1/2
PROTECTION ASS'y AWM-091 2/2
SPEAKER SWITCH ASS'y AWS-095 1/2
POWER AMP ASS'y AWH-048
180W+180W 8Ω 1KHz

12.3 INTERNAL CIRCUITRY OF INTEGRATED CIRCUITS

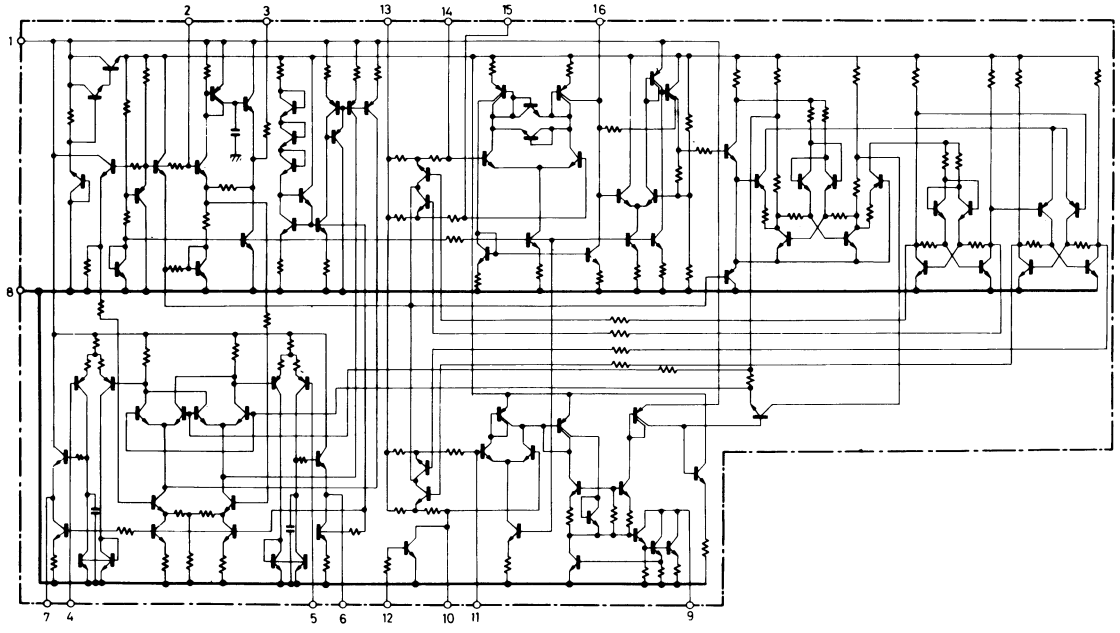
HA1137 (FM IF IC)



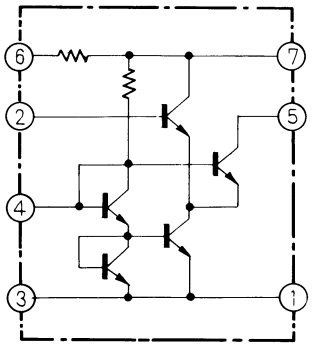
HA1138 (AM IC)



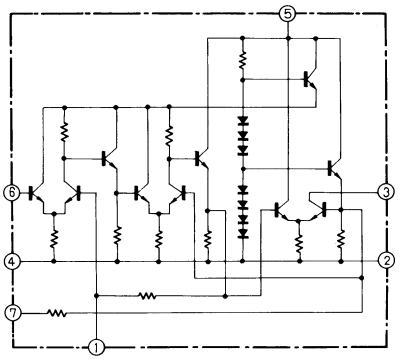
HA1196



HA1201



TA7061AP



12.4 THE CIRCUIT OF FM FRONT END (AWB-023)