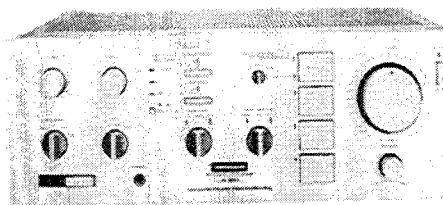


Service Manual

**CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS**



**ORDER NO.
ARP-349-0**

STEREO AMPLIFIER

A-80

MODEL A-80 COMES IN FIVE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
HE	AC220V, 240V (switchable)	European continent model
HB	AC220V, 240V (switchable)	United Kingdom model
S	AC110V, 120V, 220V, 240V (switchable)	General export model
S/G	AC110V, 120V, 220V, 240V (switchable)	U.S. Military model
HEZ	AC220V, 240V (switchable)	West Germany model

- This service manual is applicable to the HE type.
For servicing of the HB, S and S/G types, please refer to the page 39-40.
For HEZ type, please refer to the additional service manual (ARP-351-0).
- Ce manuel d'instruction se réfère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en español.

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1. SPECIFICATIONS

Amplifier Section

Continuous Average Power Output is 150 watts* per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.003% total harmonic distortion.**

Continuous Power Output at 1 kHz
(both channel driven)

T.H.D. 0.003%, 8 ohms 150 watts per channel
T.H.D. 1%, 8 ohms 220 watts per channel (Din)

Music Power Output at 1 kHz (both channel driven)

S model

T.H.D. 1%, 8 ohms 313 watts per channel

Total Harmonic Distortion (20 Hertz to 20,000 Hertz, 8 ohms, from CD/AUX 1)

continuous rated power output **No more than 0.003%
75 watts per channel power output **No more than 0.003%

Intermodulation Distortion (50 Hertz: 7,000 Hertz = 4 : 1, 8 ohms, from CD/AUX 1)

continuous rated power output No more than 0.003%

Damping Factor (20 Hertz to 20,000 Hertz, 8 ohms) 80
Input (Sensitivity/Impedance)

PHONO MM 2.5 mV/50 kilohms
PHONO MC 0.25 mV/40 ohms,
0.15 mV/3 ohm MC transformer
TUNER, CD/AUX1, AUX2, TAPE PLAY 1, 2
..... 150 mV/50 kilohms

Phono Overload Level (T.H.D. 0.003%, 1 kHz)

PHONO MM 300 mV
PHONO MC 18 mV

Output (Level/Impedance)

TAPE REC 1,2 150 mV/2.2 kilohms
SPEAKERS OFF, A or B, A and B

Frequency Response

PHONO MM (RIAA Equalization)
..... 20 Hz to 20,000 Hz \pm 0.2 dB
TUNER, CD/AUX1, AUX2, TAPE PLAY 1, 2
..... 5 Hz to 100,000 Hz \pm 3 dB

Tone Control

BASS \pm 10 dB (100 Hz)
TREBLE \pm 10 dB (10 kHz)

Filter

LOW (SUBSONIC) 15 Hz (6 dB/oct.)

Hum and Noise (IHF, short circuited A network)

PHONO MM 89 dB
PHONO MC 75 dB (3/40 ohms)
TUNER, CD/AUX1, AUX2, TAPE PLAY 1, 2 109 dB

Hum and Noise (DIN, continuous rated power output/50 mW)

PHONO MM 74 dB/61 dB
TUNER, CD/AUX 1, AUX 2, TAPE PLAY 1, 2
..... 88 dB/62 dB

Muting - 20 dB

Miscellaneous

Power Requirements

HE model a.c. 220 V \sim , 50/60 Hz
S, S/G models
..... \sim a.c. 110 V/120 V/220 V/240 V (switchable) 50/60 Hz
HB model a.c. 240 V \sim , 50/60 Hz

Power Consumption

HE model 1,000 W (max.)
S, S/G models 300 W (max.)
HB model 1,000 W (max.)

Dimensions 420(W) x 150(H) x 420 (D) mm
16-9/16(W) x 5-7/8(H) x 16-9/16(D) in

Weight (without package) 16.8 kg (37lb 1oz)

Furnished Parts

Operating Instructions 1

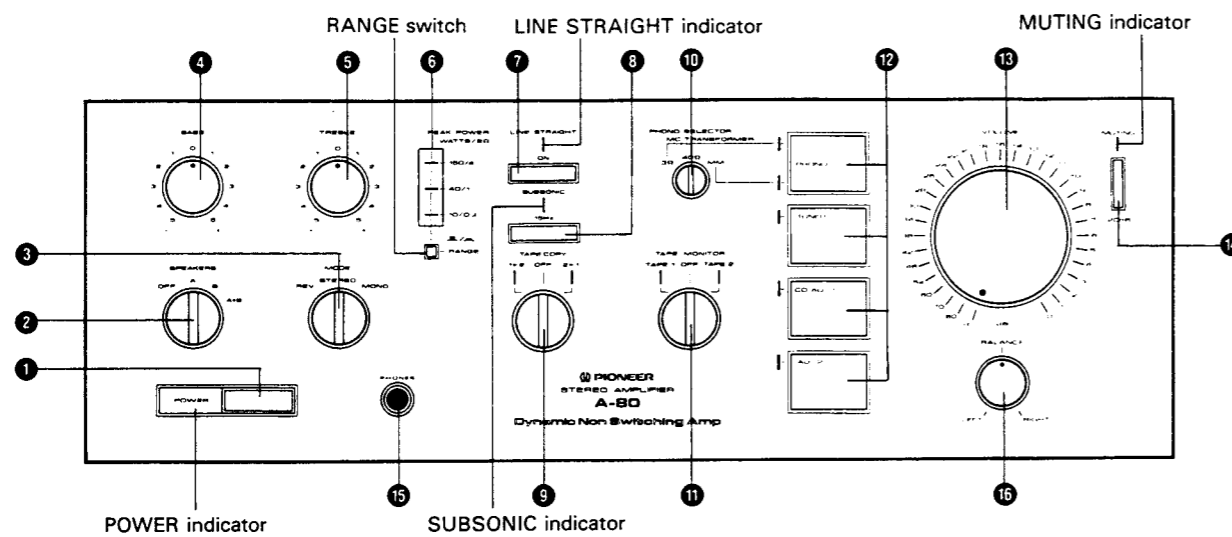
*Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifier.

**Measured by Shibasoku 725 Automatic Distortion Analyzer

NOTE:

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

2. FRONT PANEL FACILITIES



1 POWER SWITCH

Power is supplied to the stereo amplifier when the switch is depressed and the POWER indicator changes from red to green. The power is turned off when the switch is released to the OFF position.

2 SPEAKERS SELECTOR

- OFF There is no output signal from either A or B output terminals. Set in this position when listening through the headphones.
- A Sound is heard from the speakers connected to output A terminals.
- B Sound is heard from the speakers connected to output B terminals.
- A + B Sound is heard from the speakers connected to both A and B terminals.

3 MODE SELECTOR

This is used to select the mode.

- REV: Set here to reverse the left channel and right channel stereo input signals and listen in stereo.
- STEREO: Set here for ordinary stereo listening.
- MONO: Set here to mix the left and right channel stereo input signals and hear them in mono through both the left and right speakers.

NOTE:
The MODE selector does not function when the LINE STRAIGHT switch is in ON position

4 BASS CONTROL

Adjusts the bass tone. Before adjusting the control, depress the LINE STRAIGHT switch to OFF position. When the control is turned to the plus side (clockwise), the bass is emphasised. Conversely, when turned to the minus side (anti-clockwise), the bass is attenuated.

NOTE:
The BASS control does not operate if the LINE STRAIGHT switch is ON.

5 TREBLE CONTROL

Adjusts the treble tone. Before adjusting the control, depress the LINE STRAIGHT switch to OFF position. When the control is turned to the plus side (clockwise), the treble is emphasized. Conversely, when turned to the minus side (counter-clockwise), the treble is attenuated.

NOTE:
The TREBLE control does not operate if the LINE STRAIGHT switch is ON.

6 PEAK POWER WATTS/8 Ω INDICATOR

This indicates the output level at 6 stages, when speakers with a nominal impedance of 8 ohm are connected to the speaker terminals. The RANGE switch operates as follows.

- : When released, it indicates the high level output (150, 40, 10) in watts.
- : When depressed, it indicates the low level output (4, 1, 0.3) in watts.

7 LINE STRAIGHT SWITCH

When the switch is depressed to OFF position (the Line Straight Indicator goes out), the signal from the input terminals passes through the mode selector and tone control circuits and the tone quality can be adjusted using the TREBLE and BASS controls. When the switch is depressed once again to the ON position (the Line Straight Indicator lights up), the signal from the input terminals is sent directly to the power amplifier, without passing through the mode selector and tone control circuits and a flat frequency response is obtained.

8 SUBSONIC FILTER SWITCH

When the switch is depressed to the ON position, the subsonic filter with the 15 Hz cut-off frequency operates. The subsonic filter attenuates frequencies lower than 15 Hz with a 6 dB/oct slope and can be used therefore to suppress the ultra-low range noise, which is generated by record warp and other factors. This noise cannot actually be heard by the ear, but it can cause intermodulation distortion and even damage to the speaker systems. When playing badly warped records, this switch can be used to good effect.

9 TAPE COPY SWITCH

Use this switch when copying a tape, using 2 tape decks.

- 1 ► 2 Set to this position when copying a tape (recording) from tape deck 1 to 2.
- OFF Set to this position when not copying. Leave in the OFF position normally.
- 2 ► 1 Set to this position when copying a tape (recording) from tape deck 2 to 1.

10 PHONO SELECTOR

To play a record on the turntable, adjust to either MC or MM, depending on the cartridge being used. When using an MC (Moving Coil) Cartridge, position at MC (40 Ω or 3 Ω). When using an MM (Moving Magnet) Cartridge, position at MM. (See the cartridge instruction manual for details of the MC Cartridge impedance).

11 TAPE MONITOR SWITCH

Used to play back a tape or monitor a recording.

- TAPE 1 : Set to this position to play back a tape or monitor a recording on the tape deck connected to TAPE 1 PLAY terminal.
- OFF : Set to this position if not playing back a tape or monitoring a recording.
- TAPE 2 : Set to this position to play back a tape or monitor a recording on the tape deck connected to TAPE 2 PLAY terminals.

NOTE:
Simultaneous playback or monitoring on TAPE 1 and TAPE 2 are not possible.

12 FUNCTION SWITCHES

These are used to select the program source. At the left of each switch is a Function indicator, which lights up when the corresponding function has been selected.

- PHONO : Depress when playing records on a turntable connected to the PHONO terminals.
- TUNER : Depress when listening to a broadcast on a tuner connected to the TUNER terminals.
- CD/AUX 1, Depress when listening to the sound from a stereo component connected to CD/AUX 1 or AUX 2 terminals.

NOTE:
Since the TAPE MONITOR switch has priority over the Function switches, set the TAPE MONITOR switch to OFF.

13 VOLUME CONTROL

This is used to adjust the volume of sound heard through the speakers or headphones. The scale shows the amount of attenuation in dB. No sound is heard when the control is set at "∞". Turn slowly in a clockwise direction (◯).

14 MUTING - 20 dB SWITCH

The volume is attenuated by 20 dB when this switch is depressed to the ON position (MUTING indicator lights up). The switch can be used effectively when the stylus descends onto the record during record play, when the sound is to be turned down temporarily and when you want to adjust the sound precisely as you listen to a program source under low sound level conditions.

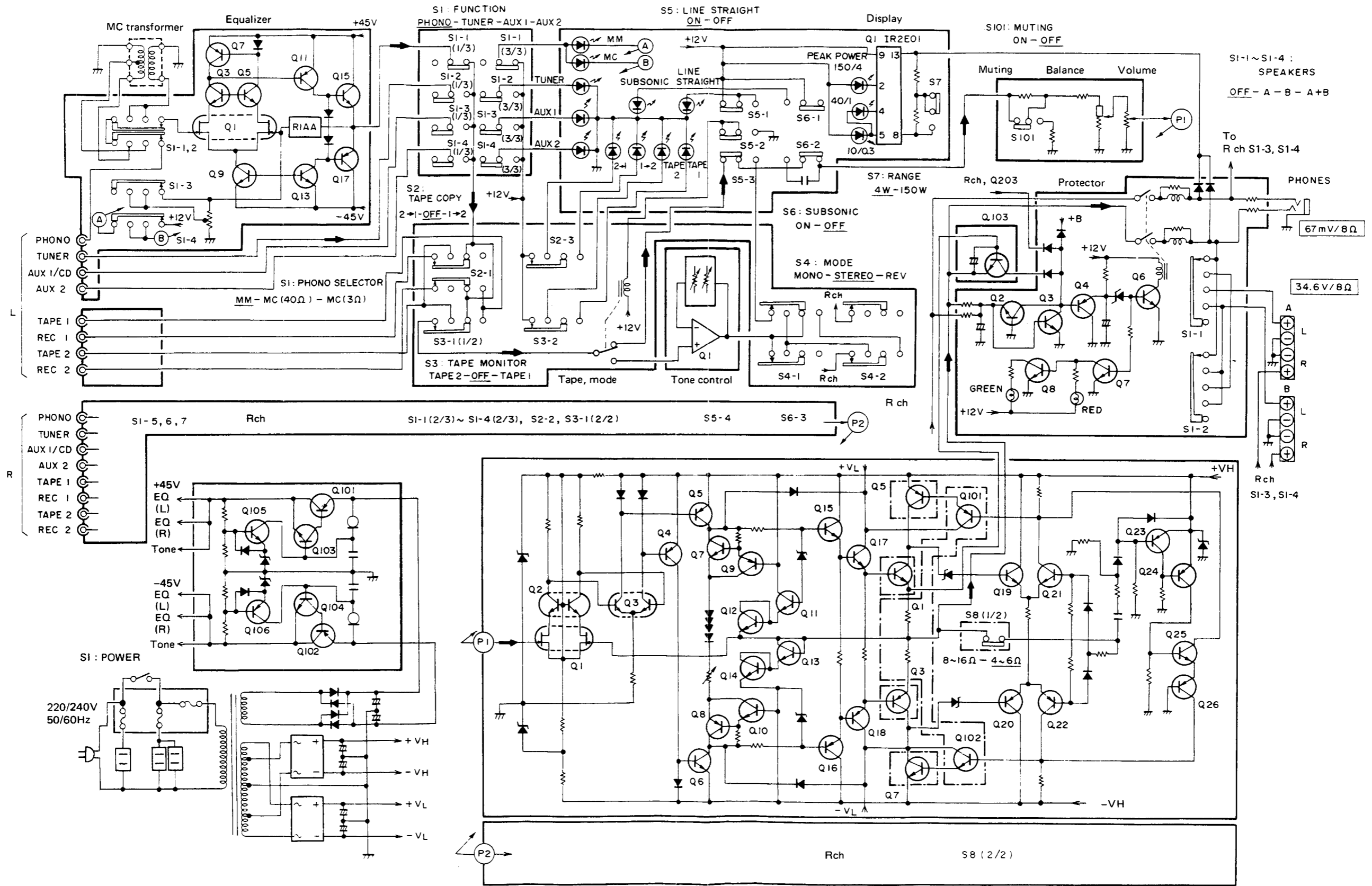
15 PHONES TERMINAL

Connect the plug on your headphones to this terminal. To listen to a program source through the headphones, set the SPEAKERS selector to OFF.

16 BALANCE CONTROL

Normally left in the central position. Used to adjust the balance of sound from the left and right channels. When the right side is too heavy, turn to the left; when the left side is too heavy, turn to the right.

3. BLOCK DIAGRAM



A

B

C

D

A

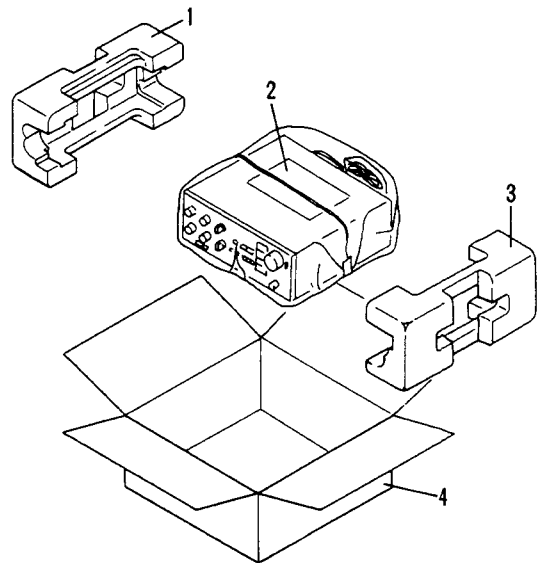
B

C

D

6. PACKING

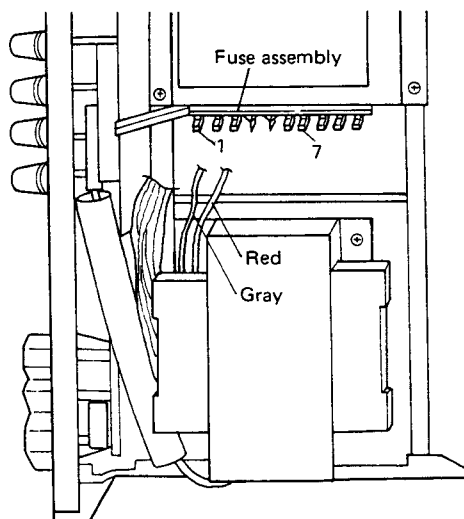
Mark	No.	Part No.	Description
	1.	AHA-328	Side pad L
	2.	ARE-087	Operating instructions (English, German, French, Italian)
	3.	AHA-329	Side pad R
	4.	AHE-251	Packing case



Line Voltage Selection

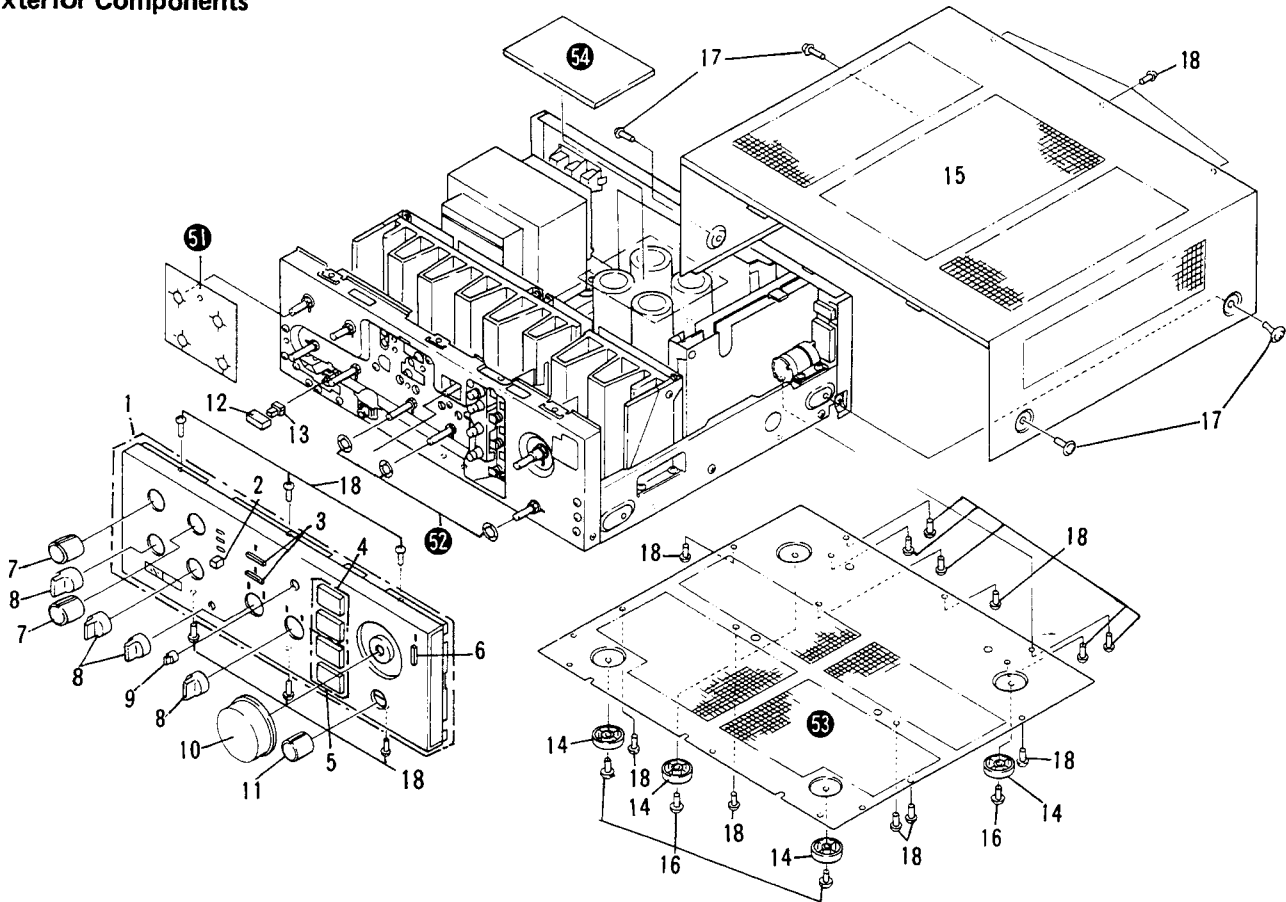
Line voltage can be chosen by connecting transformer cords as shown below. After reconnection, stick line voltage label on the rear panel.

Line voltage	Color of cord	Terminal	Label
220 V	Red	7	AAX-193
	Gray	1	
240 V	Red	1	AAX-192
	Gray	7	



7. EXPLODED VIEWS AND PARTS LIST

Exterior Components



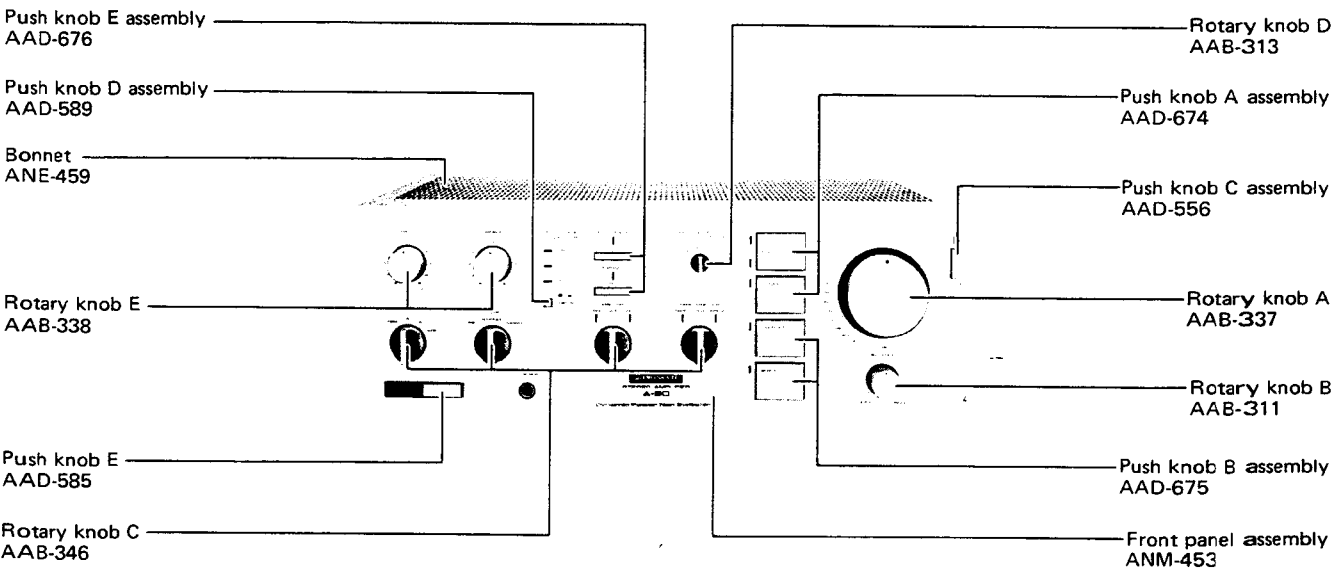
- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.
★★ GENERALLY MOVES FASTER THAN ★.
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	ANM-453	Front panel assembly (2 – 6 included)		11.	AAB-311	Rotary knob B
	2.	AAD-589	Push knob D assembly		12.	AAD-585	Push knob E
	3.	AAD-676	Push knob E assembly		13.	AEC-800	Flexible ring
	4.	AAD-674	Push knob A assembly		14.	AEC-613	Bumper
	5.	AAD-675	Push knob B assembly		15.	ANE-459	Bonnet
	6.	AAD-556	Push knob C assembly		16.	VTZ40P080FMC	Screw (4 x 8)
	7.	AAB-338	Rotary knob E		17.	FBT40P080FCR	Screw (4 x 8)
	8.	AAB-346	Rotary knob C		18.	BBZ30P080FZK	Screw (3 x 8)
	9.	AAB-313	Rotary knob D		51.		Masking sheet A
	10.	AAB-337	Rotary knob A		52.		Masking sheet
					53.		Bottom plate
					54.		Cushion

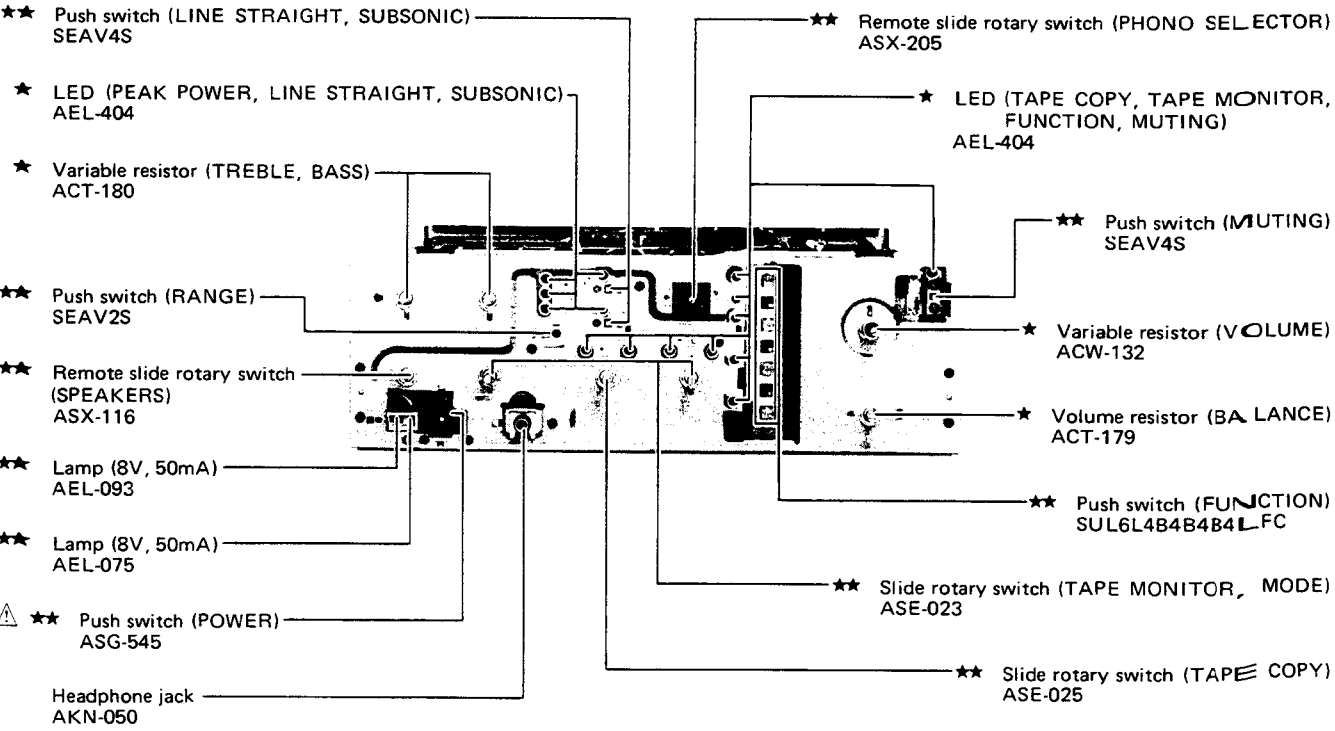
5. PARTS LOCATION

- Parts without part number cannot be supplied.
- The **⚠** mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.
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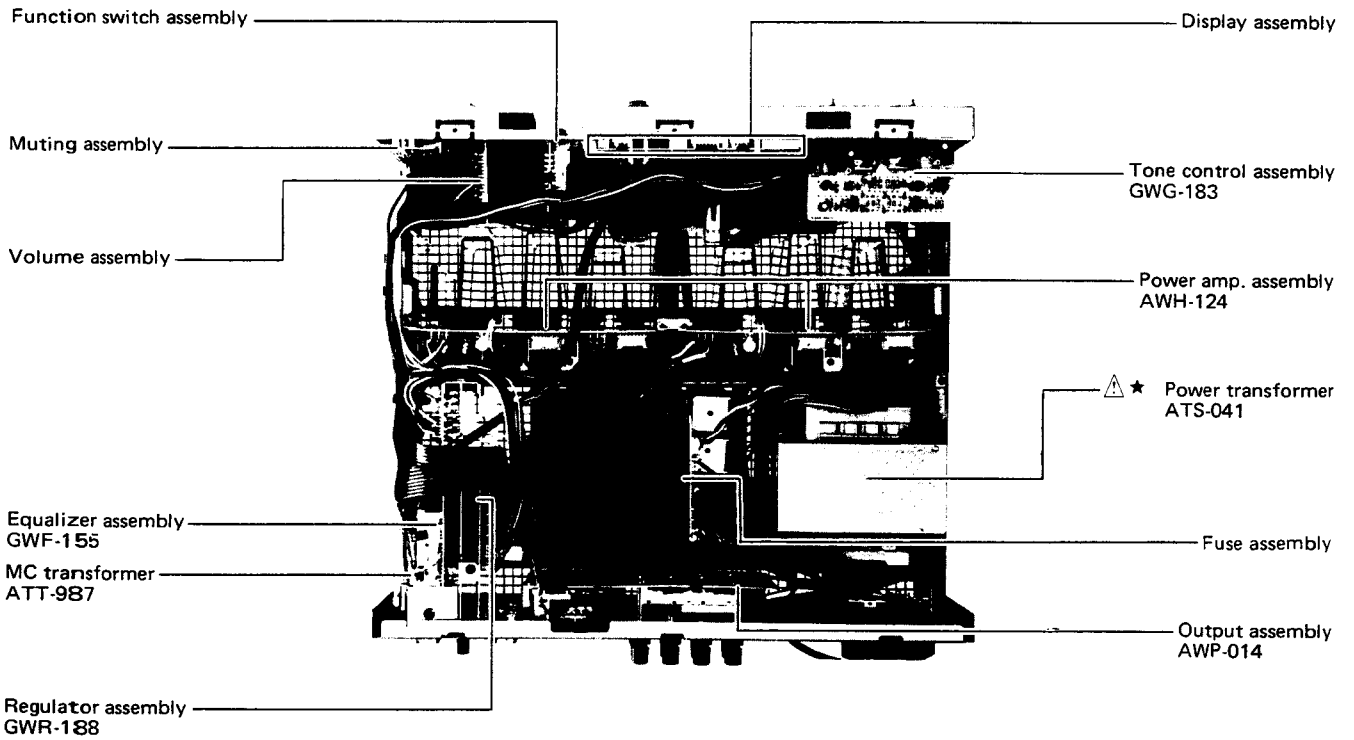
Front Panel View



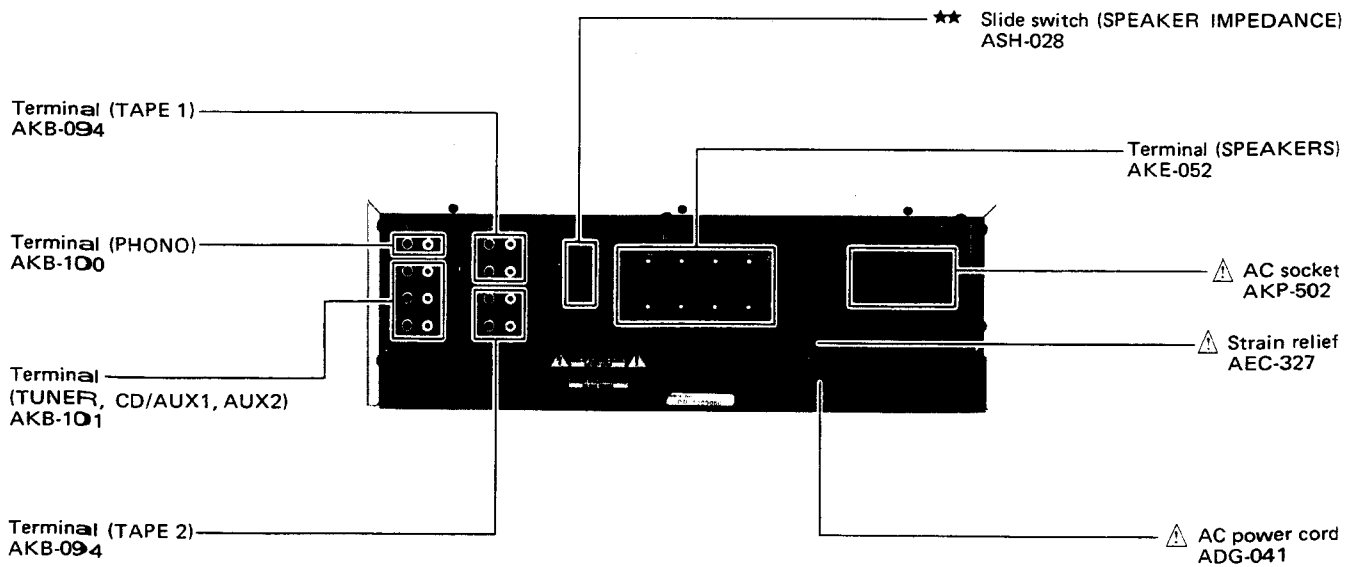
Front View



Top View



Rear View



4. CIRCUIT DESCRIPTIONS

4.1 OUTLINE OF COMPONENT CIRCUITS

Equalizer Amplifier

With a switchable gain equalizer used jointly in the MC transformer, the step-up ratio of the transformer is lowered, thereby obtaining better high region response and less noise. The resultant signal-to-noise ratio is 76dB (for an MC input of $150\mu\text{V}$).

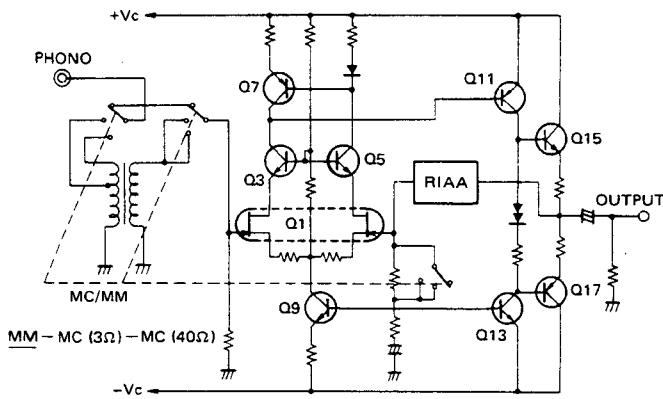


Fig. 4-1 Equalizer circuit

Tone Control

The differential single-stage NFB type circuit ensures a high maximum input at high-voltage drive. Both the tone control and mode switching circuits are bypassed when the LINE STRAIGHT switch is on.

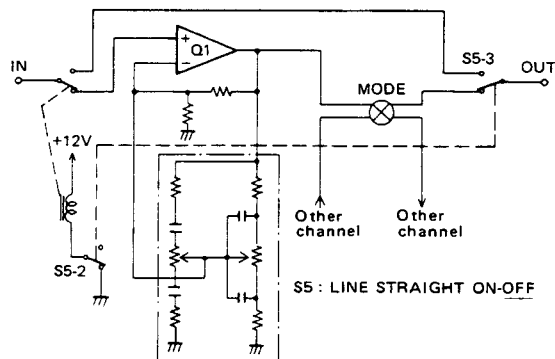


Fig. 4-2 Tone control and line straight

Power Amplifier

A differential two-stage input, a current mirror push-pull predriver, and a three-stage Darlington connection output have minimized distortion, while a dynamic power supply section assures the amplifier of higher efficiency.

Protector Circuit

In addition to standard protector circuit features including a bridge-type overload detector, a DC voltage detector, and relays designed to delay contact when the power is switched on and to cut the power line immediately when the power is switched off, an overcurrent protector circuit and clipper circuit have been used in the power amplifier stage.

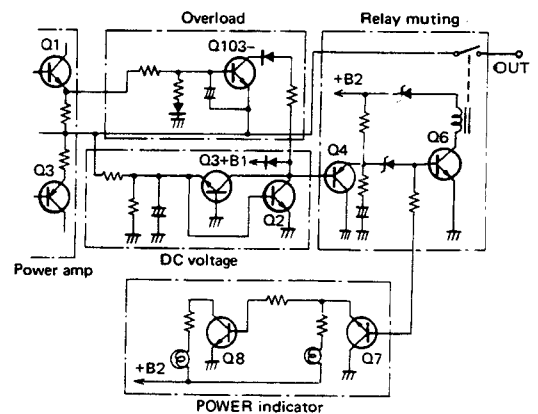


Fig. 4-3 Protection circuit

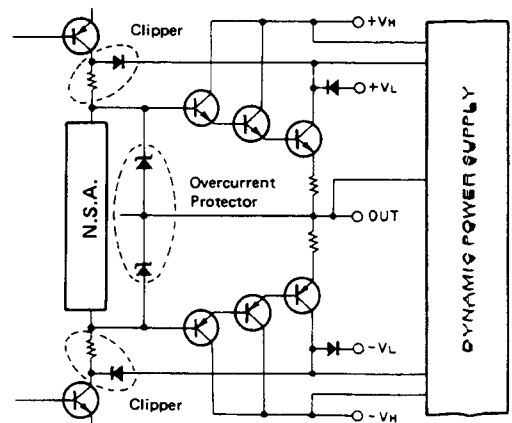


Fig. 4-4 Overcurrent protector and clipper

4.2 DYNAMIC POWER SUPPLY CIRCUIT

The dynamic power supply system featured in the final stage of the A-80 power amplifier varies the voltage applied to the power transistor in accordance to the signal level. The result is reduced heat loss and higher efficiency.

Operating Principles

The basic circuitry is outlined in Fig. 4-5. There are two V_H and V_L power lines. The signal output v_o is compared with final stage power voltage v_a by differentiator, v_a being obtained by controlling V_H . With the v_a input applied to the differentiator being offset by E_s (several volts), the v_a waveform is traced, v_a being several volts larger than v_o . If, however, v_o is less than $V_L - E_s$, v_a is fixed at the V_L level (see Fig. 4-6).

The purpose of the high-region ON circuit is to avoid irregularities from occurring where v_a can no longer follow v_o at high signal frequencies, and to prevent high-speed continuous operation in the control transistor. That is, when high frequency signals appear at the output, the control transistors (Q3 and Q4) are turned fully on, and v_a is fixed at the V_H level.

A-80 Dynamic Power Supply Circuit

The overall circuit structure is outlined in Fig. 4-7. V_L is fixed so as to obtain the rated output (150W) for a 4Ω load, and the high region ON circuit is designed to operate at frequencies above 3kHz. The SPEAKER IMPEDANCE switch set to the $4\Omega \sim 6\Omega$ position fixes the power supply to the final stage transistor at the V_L level.

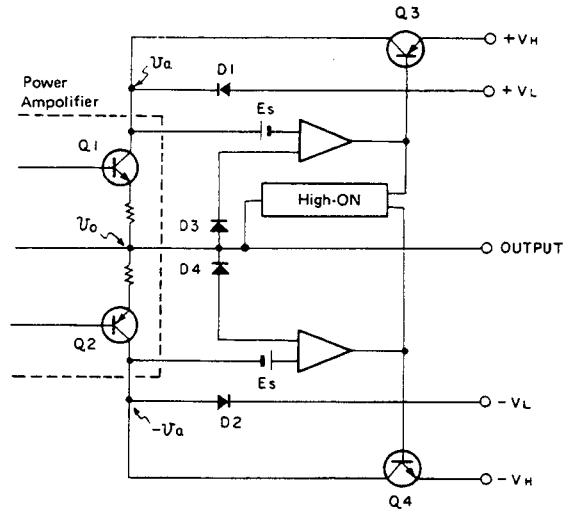


Fig. 4-5 Basic circuitry

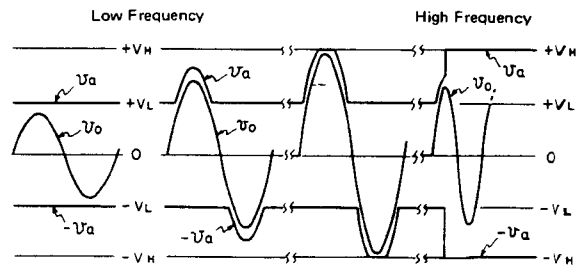


Fig. 4-6 Operating waveforms

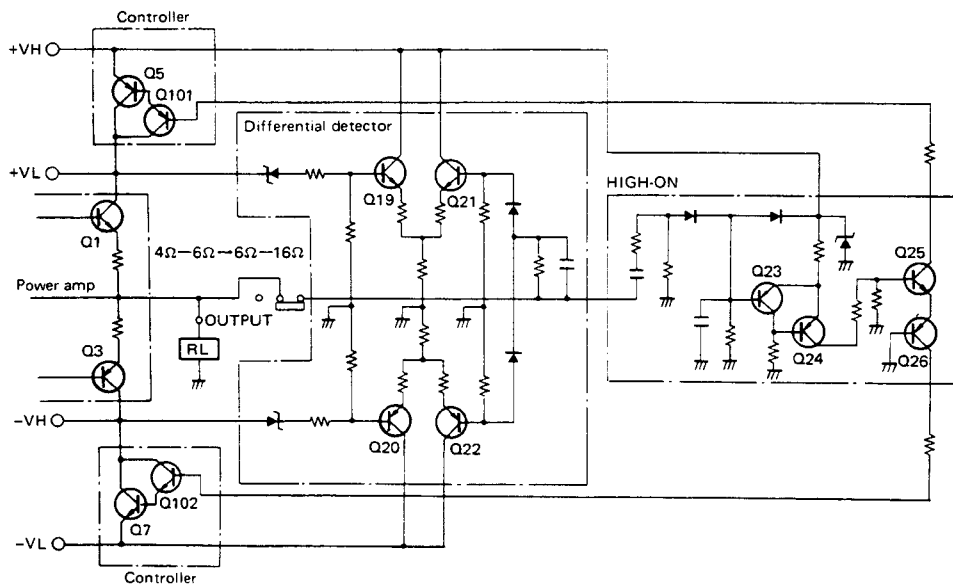
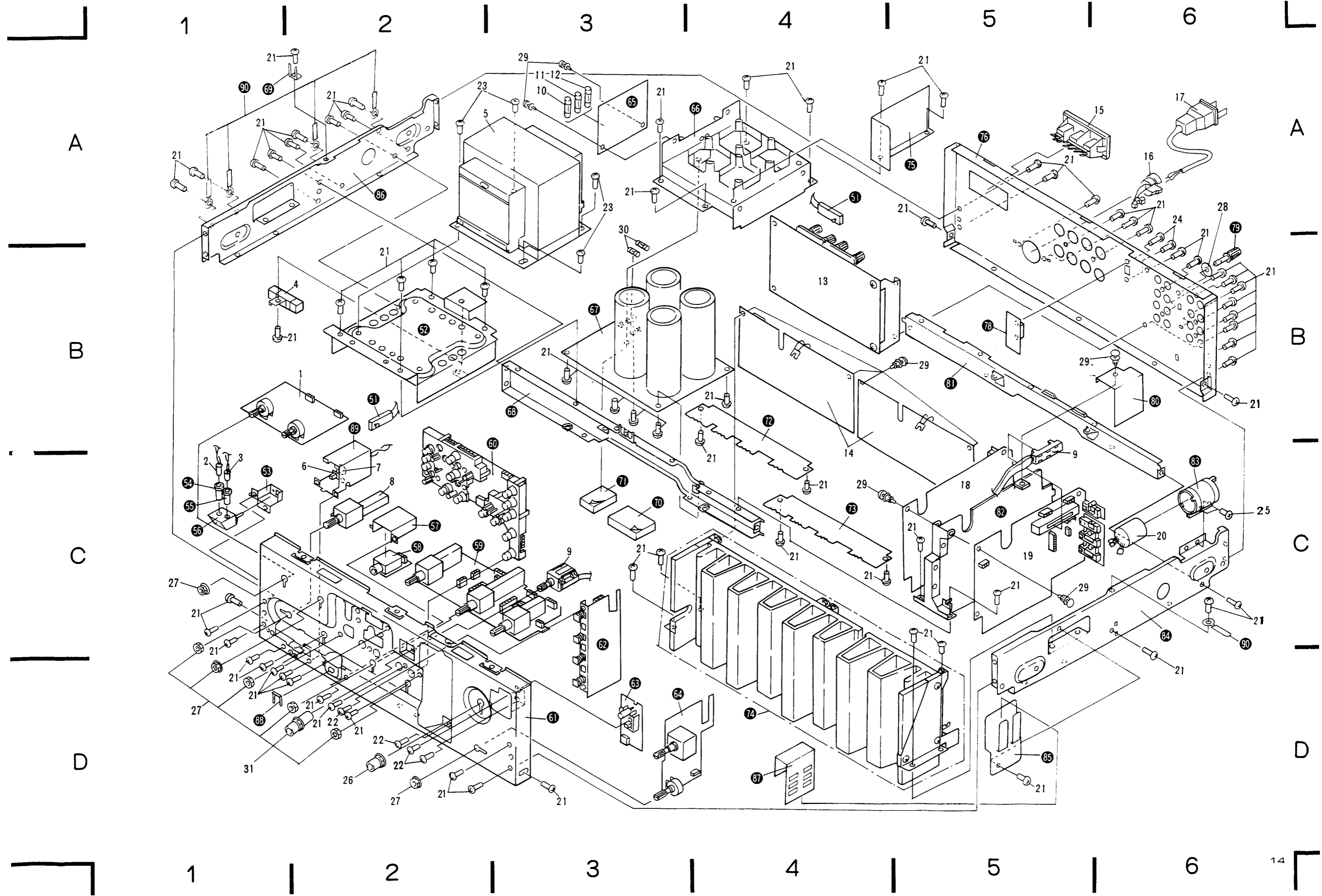
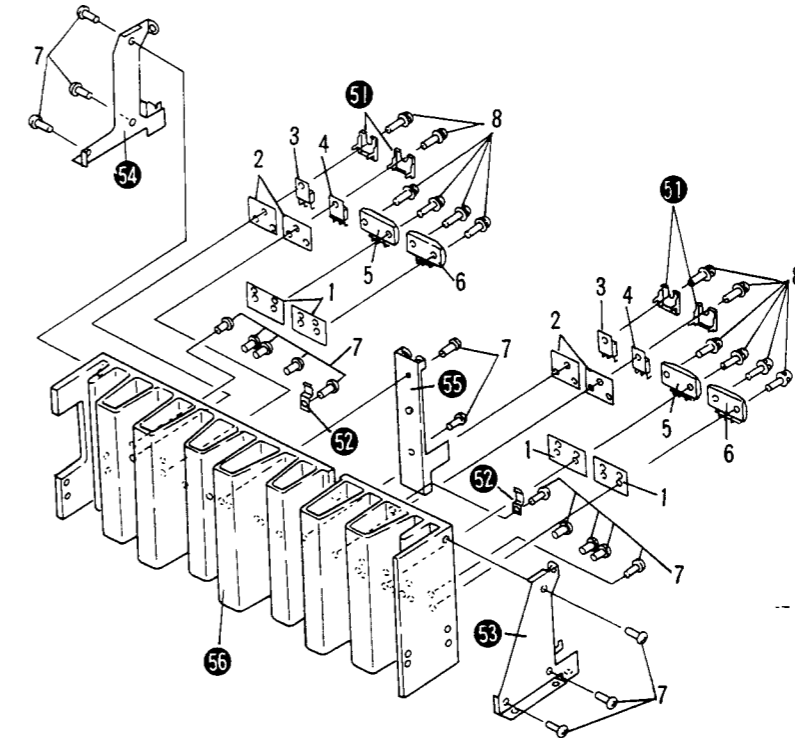


Fig. 4-7 Dynamic power supply circuit of A-80



- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks ****** and *****.
**** GENERALLY MOVES FASTER THAN ***
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Heat Sink Assembly



Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	GWG-183	Tone control assembly		61.		Front stay
**	2.	AEL-093	Lamp (8V, 50mA)		62.		Function switch assembly
**	3.	AEL-075	Lamp (8V, 50mA)		63.		Muting assembly
	4.	ACN-144	Wir wound resistor		64.		Volume assembly
Δ *	5.	ATS-041	Power transformer (220/240V)		65.		Fuse assembly
Δ **	6.	ASG-545	Push switch (POWER)		66.		Capacitor holder
Δ	7.	ACE-501	Ceramic capacitor (0.01/AC 250V)		67.		Power supply assembly
**	8.	ASX-116	Remote slide rotary switch		68.		Center frame
**	9.	ASX-205	Remote slide rotary switch		69.		Ground terminal
Δ **	10.	AEK-404	Fuse (T6.3A)		70.		Cushion A
Δ **	11.	AEK-407	Fuse (T0.4A)		71.		Cushion B
Δ **	12.	AEK-036	Fuse (T0.2A)		72.		Output A assembly
	13.	AWP-014	Output assembly		73.		Output B assembly
Δ	14.	AWH-124	Power amp. assembly		74.		Heat sink assembly
Δ	15.	AKP-502	AC socket		75.		Shield plate C
Δ	16.	AEC-327	Strain relief		76.		Rear panel
Δ	17.	ADG-041	AC power cord		77.		.....
	18.	GWR-188	Regulator assembly		78.		Switch assembly
	19.	GWF-155	Equalizer assembly		79.		Ground terminal
	20.	ATT-987	MC transformer		80.		Shield plate B
	21.	BBZ30P080FZK	Screw (3 x 8)		81.		Rear frame
	22.	VMZ30P060FMC	Screw (3 x 6)		82.		PWB holder A
	23.	VTZ40P120FMC	Screw (4 x 12)		83.		MC transformer holder
	24.	PMZ30P060FZB	Screw (3 x 6)		84.		Side frame R
	25.	VBZ30P100FMC	Screw (3 x 10)		85.		Wire guide
	26.	ABN-028	Nut		86.		Side frame L
	27.	ABN-048	Nut		87.		Fiber sheet
	28.	WA35F100N080	Washer		88.		Mounting plate
	29.	AEC-510	Nylon rivet		89.		Power switch holder
Δ **	30.	AEK-402	Fuse (T1A)		90.		Binder
	31.	ABN-077	Nut				
	51.		Remote wire				
	52.		Transformer frame				
	53.		Rubber holder				
	54.		Lamp cap (green)				
	55.		Lamp cap (red)				
	56.		Lamp holder A				
	57.		Shield cover				
	58.		Headphone jack assembly				
	59.		Tape, mode assembly				
	60.		Display assembly				

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	AEP-017	Insulating sheet		51.		Transistor holder
	2.	AEC-818	Insulating sheet		52.		Varistor holder
Δ **	3.	2SC2579	Power transistor		53.		Heat sink holder R
Δ **	4.	2SA1104	Power transistor		54.		Heat sink holder L
Δ **	5.	2SA1295-0* (2SA1295-Y*)	Power transformer		55.		PWB holder B
					56.		Heat sink
Δ **	6.	2SC3264-0* (2SC3264-Y*)	Power transformer				
			* The hfe value should be the same.				
	7.	BBZ30P080FZK	Screw (3 x 8)				
	8.	ABA-276	Screw				

8. P.C.BOARDS CONNECTION DIARAM

A

EQUALIZER ASS'Y
GWF-155

REGULATOR ASS'Y
GWR-188

FUNCTION SWITCH ASS'Y

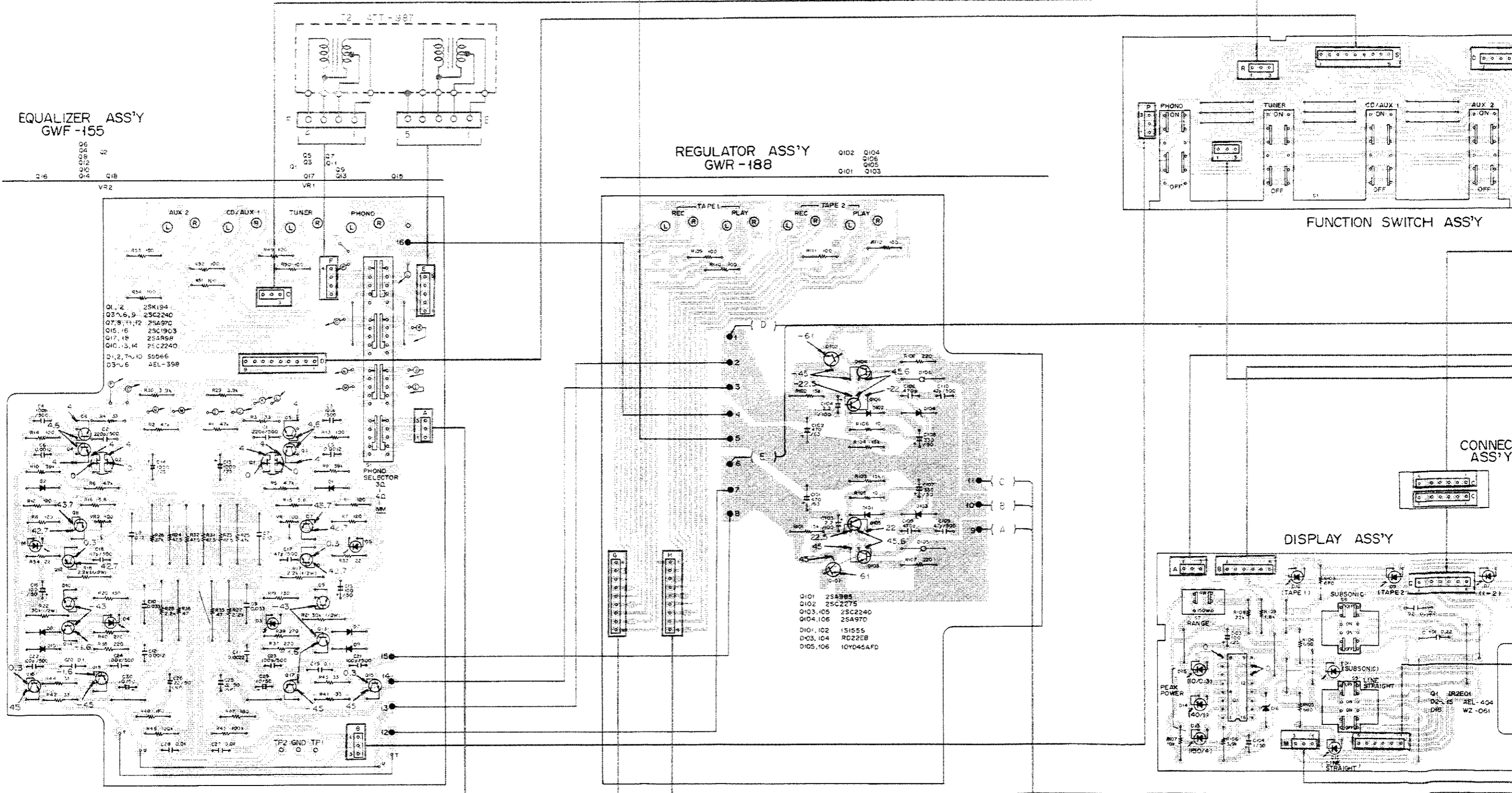
CONNECT ASS'Y

DISPLAY ASS'Y

B

C

D



7

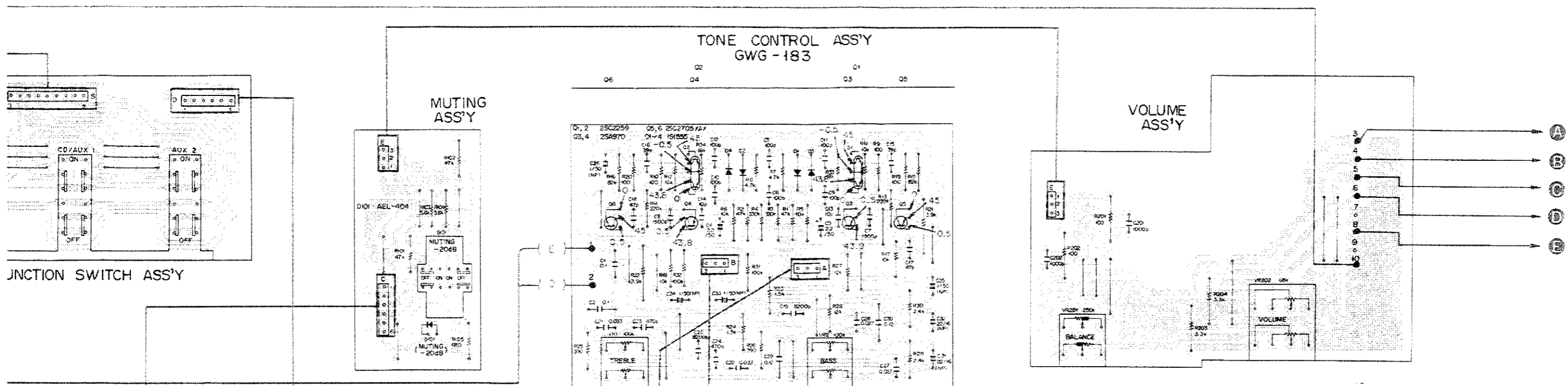
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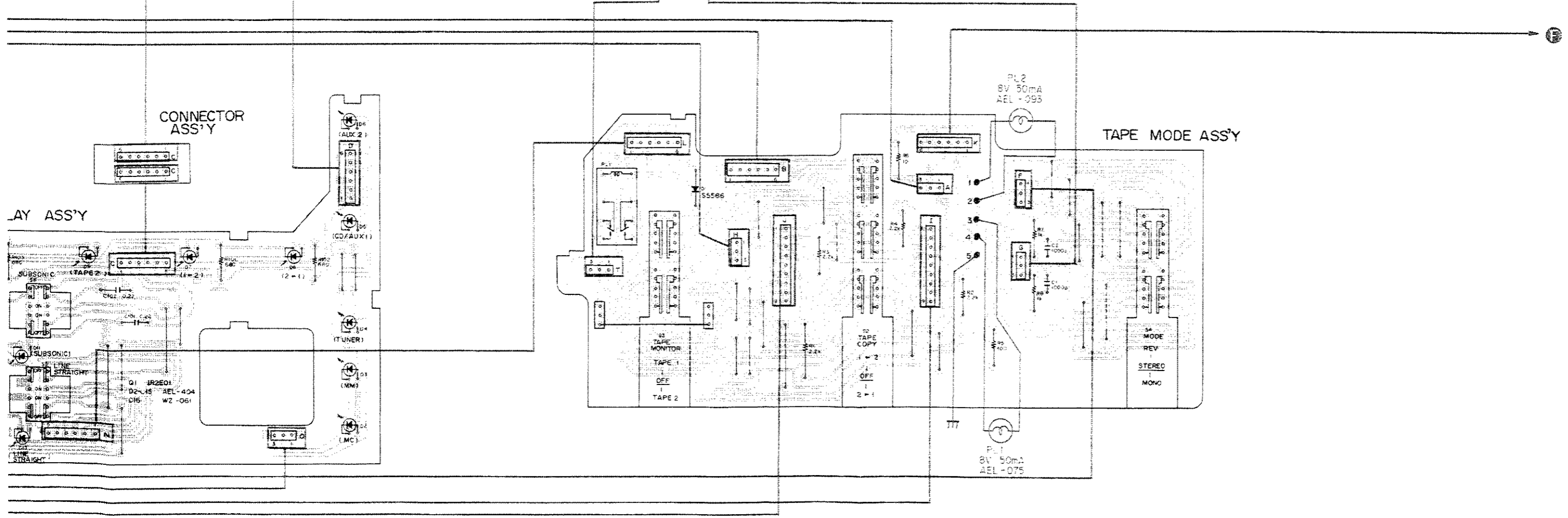


A

B

C

D



1

2

3

4

5

6

A

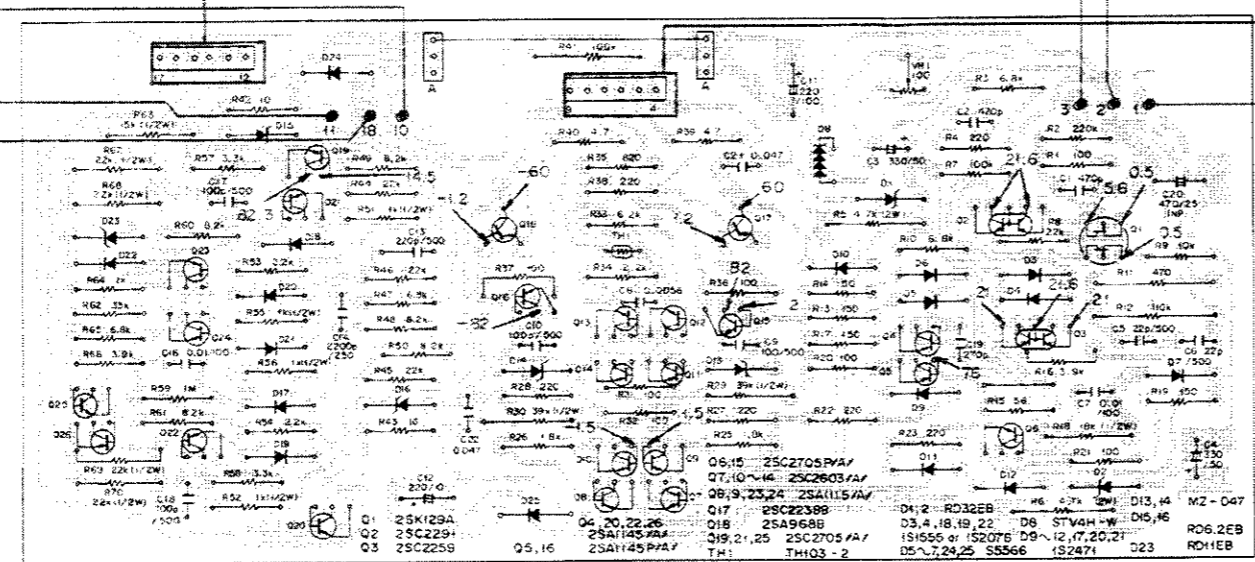
B

C

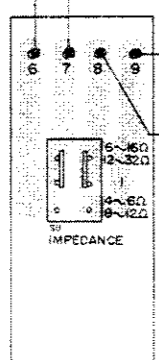
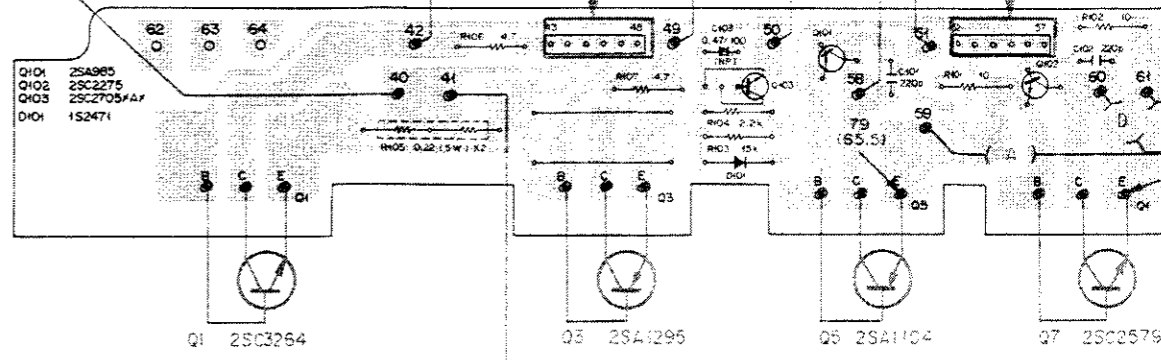
D

POWER AMP ASS'Y (L)
AWH-124

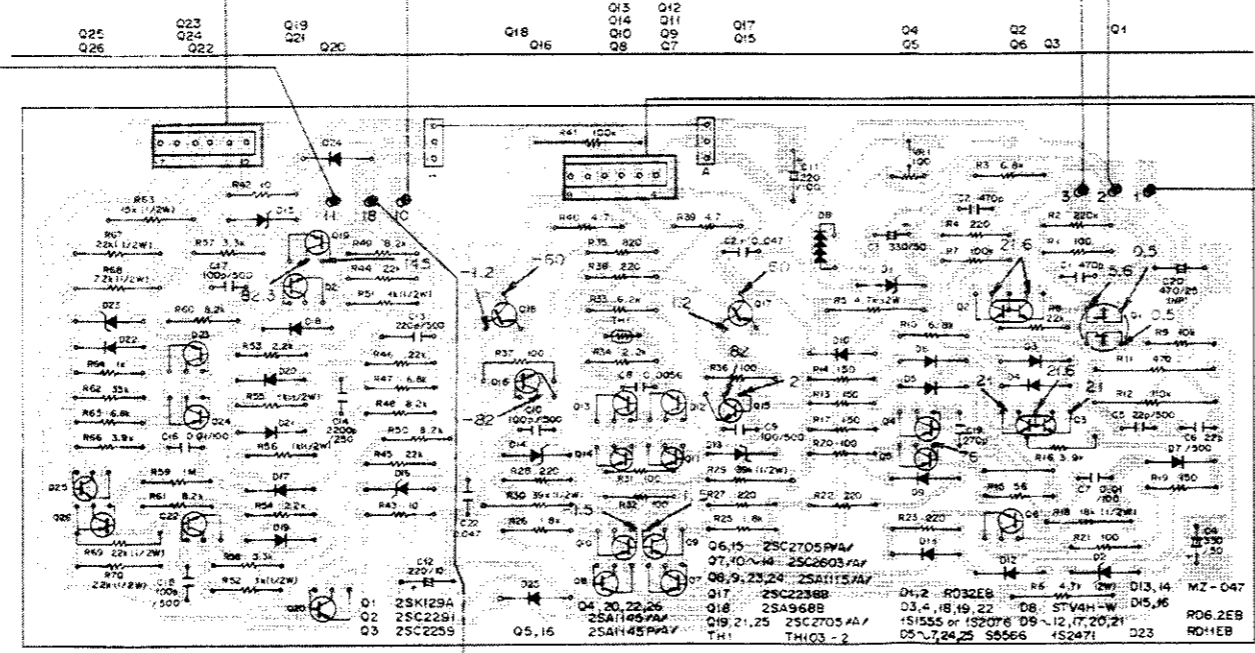
Q25 Q26 Q23 Q22 Q21 Q20 Q19 Q18 Q16 Q13 Q12 Q11 Q10 Q9 Q8 Q7 Q17 Q15 Q4 Q5 Q2 Q3 Q1



OUTPUT (A) ASS'Y



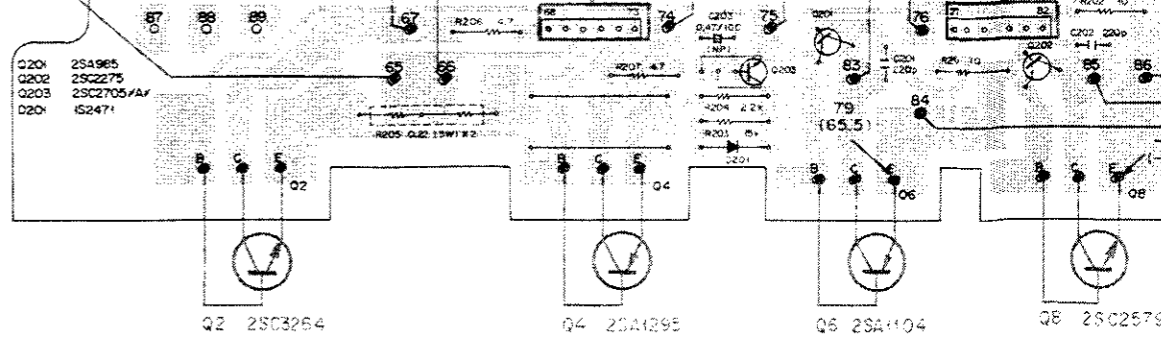
SWITCH ASS'Y



POWER AMP ASS'Y (R)
AWH-124

Q25 Q26 Q23 Q22 Q21 Q20 Q19 Q18 Q16 Q13 Q12 Q11 Q10 Q9 Q8 Q7 Q17 Q15 Q4 Q5 Q2 Q3 Q1

OUTPUT (B) ASS'Y



1

2

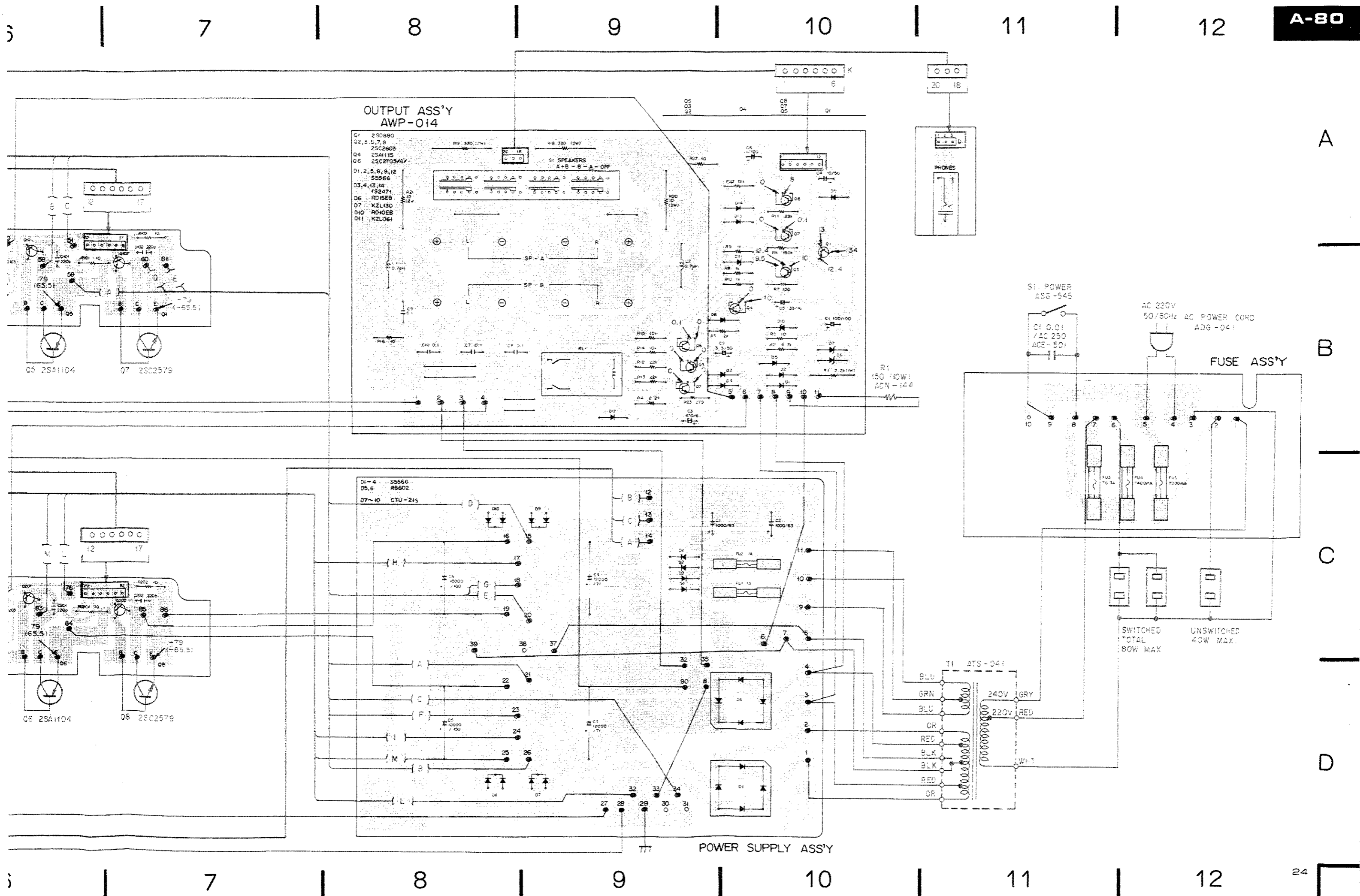
3

4

5

6

6



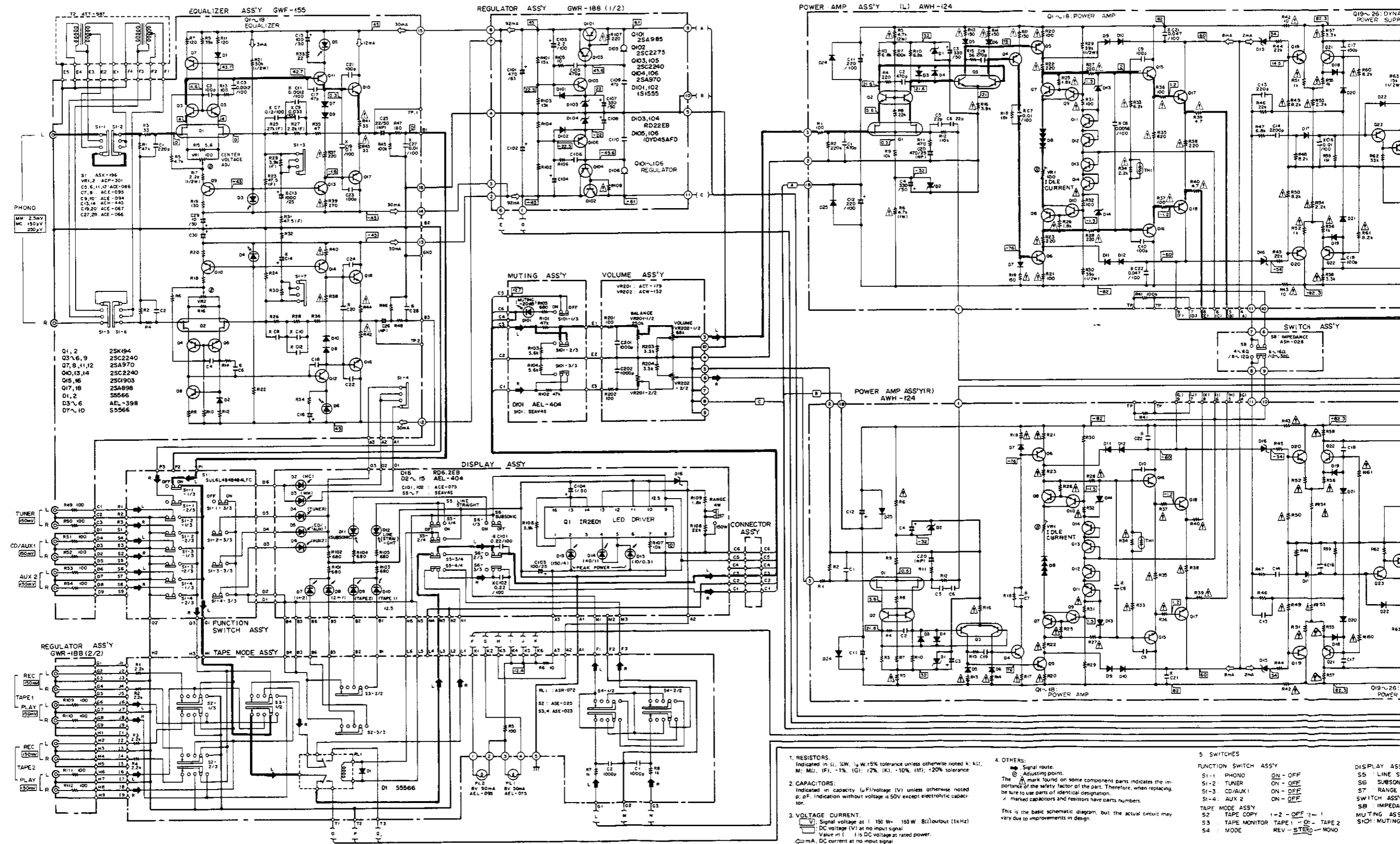
A

B

C

D

9. SCHEMATIC DIAGRAM



A

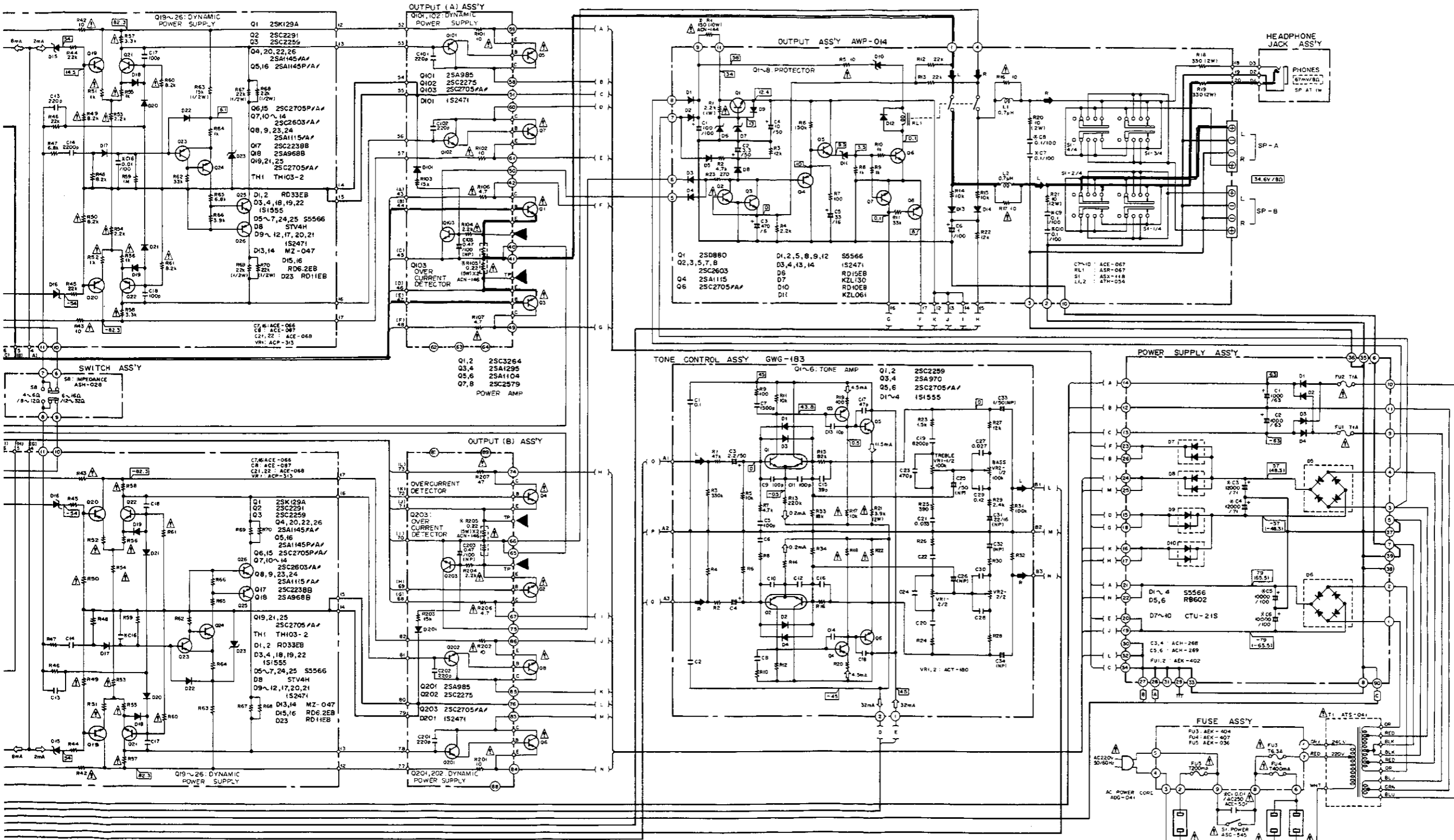
B

C

D

- RESISTORS:**
Indicated in Ω, 1/2W, 1/4W: 5% tolerance unless otherwise noted; k: 1k; M: 1M; (F): 1%; (G): 2%; (K): 10%; (M): 20% tolerance.
- CAPACITORS:**
Indicated in capacity (μF)/voltage (V) unless otherwise noted; p: pF. Indication without voltage is 50V except electrolytic capacitor.
- VOLTAGE CURRENT:**
V: Signal voltage at (150W - 150W 8Ω) output (1kHz)
DC: DC voltage (V) at no input signal
Value in () is DC voltage at rated power.
mA: DC current at no input signal
- OTHERS:**
Signal route
Adjusting point
The mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
marked capacitors and resistors have parts numbers.
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.
- SWITCHES**
FUNCTION SWITCH ASS'Y
S1-1 PHONO ON - OFF
S1-2 TUNER ON - OFF
S1-3 CD/AUX1 ON - OFF
S1-4 AUX 2 ON - OFF
TAPE MODE ASS'Y
S2 TAPE COPY 1-2 - OFF 2-1
S3 TAPE MONITOR TAPE 1 - ON - TAPE 2
S4 MODE REV - STEREO - MONO
DISPLAY ASS'Y
S5 LINE STR
S6 SUBSONIC
S7 RANGE
SWITCH ASS'Y
S8 IMPEDANCE
S10: MUTING ()

NOTE:
The indicated semiconductors are representative ones only.
Other alternative semiconductors may be used and are listed in the parts list.



A

B

C

D

ITCHES
ON SWITCH ASSY
PHONO ON - OFF
TUNER ON - OFF
CD/AUX1 ON - OFF
AUX 2 ON - OFF
MODE ASSY
TAPE COPY 1-2 - OFF - 2-1
TAPE MONITOR TAPE 1 - OFF - TAPE 2
MODE REV - STEREO - MONO

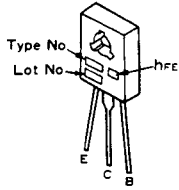
DISPLAY ASSY
S5 LINE STRAIGHT ON - OFF
S6 SUBSONIC ON - OFF
S7 RANGE 150W - 4W
SWITCH ASSY
S8 IMPEDANCE 6~16Ω/2~32Ω - 4~6Ω/8~12Ω
MUTING ASSY
S10 MUTING (-20dB) ON - OFF

OUTPUT ASSY
S1 SPEAKERS OFF - A - B - A+B
EQUALIZER ASSY
S1 PHONO SELECTOR 3Ω - 4Ω - MM
OUTSIDE OF P.C BOARDS
S1 POWER ON - OFF

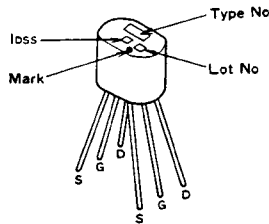
The underlined indicates the switch position.

External Appearances of transistors and IC's

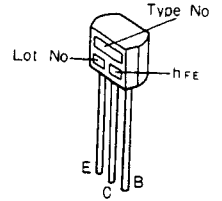
**2SA898
2SC1903**



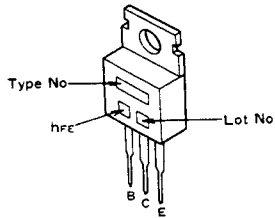
2SK194



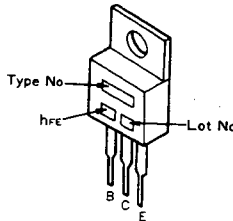
**2SA1115
2SC2603**



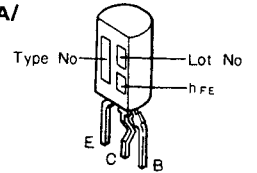
**2SA968B
2SC2238B
2SD880**



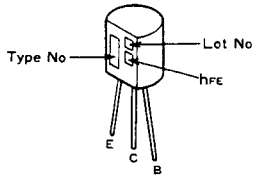
**2SA985
2SC2275**



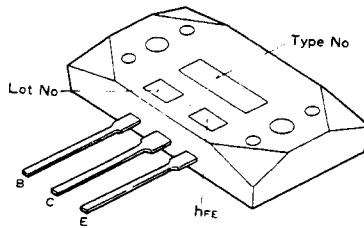
**2SA1145/A/
2SC2705/A/**



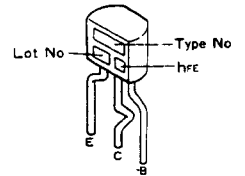
**2SA970
2SC2240**



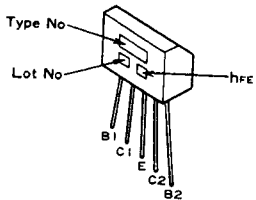
**2SA1295
2SC3264**



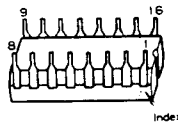
**2SA1115/A/
2SC2603/A/**



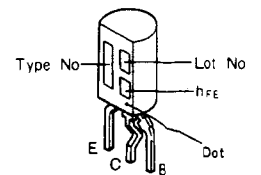
2SC2259



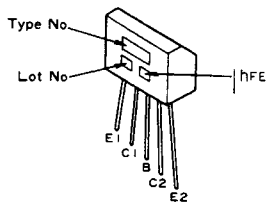
IR2E01



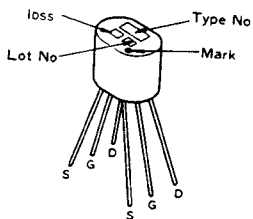
**2SC2705P/A/
2SA1145P/A/**



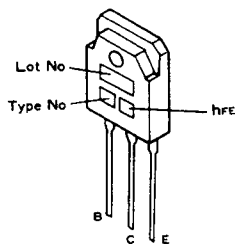
2SC2291



2SK129A



**2SA1104
2SC2579**



10. ELECTRICAL PARTS LIST

NOTES:

- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	56 x 10 ¹	561	.....	RD½PS	561J
47kΩ	47 x 10 ³	473	.....	RD½PS	473J
0.5Ω	0R5	.....	.....	RN2H	0R5K
1Ω	010	.....	.....	RS1P	010K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	562 x 100	5621	RN½SR	5621F
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- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.
★★ GENERALLY MOVES FASTER THAN ★.
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

P.C. BOARD ASSEMBLIES

Mark	Part No.	Symbol & Description
	AWH-124	Power amp. assembly
	GWF-155	Equalizer assembly
	GWR-188	Regulator assembly
	AWP-014	Output assembly
	GWG-183	Tone control assembly
	Non supply	Muting assembly
	Non supply	Volume assembly
	Non supply	Headphone jack assembly
	Non supply	Output A assembly
	Non supply	Output B assembly
	Non supply	Power supply assembly
	Non supply	Fuse assembly
	Non supply	Function switch assembly
	Non supply	Tape, mode assembly
	Non supply	Display assembly
	Non supply	Switch assembly

FUSES, LAMPS

Mark	Part No.	Symbol & Description
★★	AEL-075	PL1 Lamp (8V, 50mA, white)
★★	AEL-093	PL2 Lamp (8V, 50mA, black)
Δ ★★	AEK-404	FU3 Fuse (T6.3A)
Δ ★★	AEK-402	FU1, 2 Fuse (T1A)
Δ ★★	AEK-407	FU4 Fuse (T0.4A)
Δ ★★	AEK-036	FU5 Fuse (T0.2A)

SWITCHES

Mark	Part No.	Symbol & Description
★★	ASX-116	S3 Remote slide rotary switch (SPEAKERS)
★★	ASX-205	S2 Remote slide rotary switch (PHONO SELECTOR)
Δ ★★	ASG-545	S1 Push switch (POWER)

OTHERS

Mark	Part No.	Symbol & Description
Δ ★	ATS-041	T1 Power transformer (220/240V)
	ATT-987	T2 MC transformer
Δ	ACE-501	C1 Capacitor (0.01/AC 250V)
Δ	ACN-144	R1 Wire wound resistor (150/10W)
Δ	AKP-502	AC socket
Δ	ADG-041	AC power cord
Δ	AEC-327	Strain relief

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
Δ ★★	2SC3264-0* (2SC3264-Y*)	Q1, Q2 Power transistor
Δ ★★	2SA1295-0* (2SA1295-Y*)	Q3, Q4 Power transistor
		* hfe value should be the same.
Δ ★★	2SC2579	Q7, Q8 Power transistor
Δ ★★	2SA1104	Q5, Q6 Power transistor

Function Switch Assembly

Mark	Part No.	Symbol & Description
★★	SUL6L4B4B4LFC	S1 Push switch (FUNCTION)

Switch Assembly

Mark	Part No.	Symbol & Description
★★	ASH-028	S8 (SPEAKER IMPEDANCE)

Power Amp. Assembly (AWH-124)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SK129A	Q1
★★	2SC2291	Q2
★★	2SC2259	Q3
★★	2SC2603/A/-E* (2SC2603/A/-F*)	Q7, Q10
★★	2SA1115/A/-E (2SA1115/A/-F*)	Q8, Q9 * hfe value should be the same.
★★	2SC2603/A/	Q11-Q14
★★	2SA1115/A/	Q23, Q24
★★	2SC2705/A/	Q19, Q21, Q25
★★	2SA1145/A/	Q4, Q20, Q22, Q26
★★	2SA968B-O* (2SA968B-Y*)	Q18
★★	2SC2238B-O* (2SC2238B-Y*)	Q17 * hfe value should be the same.
★★	2SC2705P/A/-O* (2SC2705P/A/-Y*)	Q6, Q15
★★	2SA1145P/A/-O* (2SA1145P/A/-Y*)	Q5, Q16 * hfe value should be the same.
★	1S1555 (US1035)	D3, D4, D18, D19, D22
★	S5566	D5 - D7, D24, D25
★	1S2471	D9 - D12, D17, D20, D21
★	MZ-047	D13, D14
★	RD32EB (HZ32EB)	D1, D2
★	RD6.2EB (HZ6.2EB)	D15, D16
★	STV4H	D8
★	RD11EB (HZ11EB)	D23
	TH103-2	TH1

CAPACITORS

Mark	Part No.	Symbol & Description
	CQSH 471K 50	C1, C2
	ACE-066	C7, C16 Mylar (0.01/100V)
	CQMA 22K 250	C14

Mark	Part No.	Symbol & Description
	ACE-068	C21, C22 Mylar (0.047/100V)
	CQSH 271K 50	C19
	CMA 220J 500	C5, C6
	ACE-087	C8 Mylar (0.0056/100V)
	CMA 101J 500	C9, C10, C17, C18
	CMA 221J 500	C13
	CEA 331M 50L	C3, C4
	CEA 221M 100L	C11, C12
	CEXANP 471M 25	C20

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	ACP-313	VR1 Semi-fixed (100)
⚠	RS2L □□□J	R6, R16
⚠	RS2P472J	R5
	RDH1/4P □□□F	R11, R12
	RD1/2PS □□□J	R18, R29, R30, R63, R67 - R70
⚠	RD1/2PSF □□□J	R51, R52, R55, R56
⚠	RD1/4PMFL □□□J	R25, R26, R33 - R35, R49, R50, R57, R58, R60, R61
⚠	RS1L222J	R53, R54
⚠	RFA1/4PS □□□J	R13, R14, R17, R19 - R23, R27, R28, R31, R32, R36 - R40, R42, R43
	RD1/4PM □□□J	Other resistors

OTHERS

Mark	Part No.	Symbol & Description
	PBZ30P060FMC	Screw (3 x 6)

Equalizer Assembly (GWF-155)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SK194	Q1, Q2
★★	2SC2240	Q3 - Q6, Q9, Q10, Q13, Q14
★★	2SA970	Q7, Q8, Q11, Q12
★★	2SC1903-B* (2SC1903-V*)	Q15, Q16
★★	2SA898-B* (2SA898-V*)	Q17, Q18 * hfe value should be the same.
★	S5566	D1, D2, D7 - D10
★	AEL-398	D3 - D6

SWITCH

Mark	Part No.	Symbol & Description
★★	ASX-196	S1 Slide switch (PHONO SELECTOR)

CAPACITORS

Mark	Part No.	Symbol & Description
	ACE-086	C5, C6, C11, C12 Mylar (0.0012/100V)
	ACE-095	C7, C8 Polypropylene (0.12/100V)
	ACE-094	C9, C10 Polypropylene (0.033/100V)
	ACE-067	C19, C20 Mylar (0.1/100V)
	ACE-066	C27, C28 Mylar (0.01/100V)
	CMA 221J 500	C1, C2
	CMA 101J 500	C3, C4
	CMA 470J 500	C17, C18
	CMA 101J 500	C21 – C24
	CEXANP 220M 50	C25, C26
	ACH-445	C13, C14 Electrolytic (1000/25V)
	CEA 101M 50L	C15, C16
	CEXA 100M 50	C29, C30

RESISTORS

Note : When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	ACP-301	VR1, VR2
	RD1/2PS □□□J	R17, R18, R21, R22
	RDH1/4P □□□F	R23 – R28, R31, R32
	RDH1/4P470J	R35, R36
△	RFA1/4PS □□□J	R37 – R44
	RD1/4PM □□□J	Other resistors

Regulator Assembly (GWR-188)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SA985	Q101
★★	2SC2275	Q102
★★	2SC2240	Q103, Q105
★★	2SA970	Q104, Q106
★	1S1555 (US1035)	D101, D102
★	RD22EB (HZ22EB)	D103, D104
★	10YD45AFD	D105, D106

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 471M 63L	C101, C102
	CEA 2R2M 100L	C103, C104
	CEA 331M 50L	C107, C108
	CQSH 471K 50	C105, C106
	CMA 470J 500	C109, C110

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
△	RFA1/4PS2221J	R107, R108
	RD1/4PM □□□J	Other resistors

OTHERS

Mark	Part No.	Symbol & Description
	AKB-094	Terminal (TAPE1, TAPE2)
	PBZ30P060FMC	Screw (3 x 6)

Output Assembly (AWP-014)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SD880	Q1
★★	2SC2603	Q2, Q3, Q5, Q7, Q8
★★	2SA1115	Q4
★★	2SC2705/A/	Q6
★	S5566	D1, D2, D5, D8, D9, D12
★	1S2471	D3, D4, D13, D14
★	RD15EB (HZ15EB)	D6
★	KZL130	D7
★	RD10EB (HZ10EB)	D10
★	KZL061	D11

SWITCH

Mark	Part No.	Symbol & Description
★★	ASX-118	S1 Side switch (SPEAKERS)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 101M 100L	C1
	CEA 3R3M 50L	C2
	CEA 471M 6L	C3
	CEA 100M 50L	C4
	CEA 330M 16L	C5
	CEA 010M 100L	C6
	ACE-067	C7 – C10 Mylar (0.1/100V)

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
⚠	RS1L222J	R1
⚠	RD1/4PMFL100J	R16, R17
⚠	RS2P □□□J	R18 – R21
⚠	RFA1/4PS □□□J	R5, R23
	RD1/4PM □□□J	Other resistors

OTHERS

Mark	Part No.	Symbol & Description
	AKE-052	Speaker terminal SP
★★	ASR-067	RL1
	VB230P080FMC	Screw (3 x 8)
	PBZ30P060FMC	Screw (3 x 6)

Display Assembly

Mark	Part No.	Symbol & Description
★★	IR2E01	Q1
★	RD6.2EB (HZ6.2EB)	D16
★	AEL-404	D2 – D15
★★	SEAV4S	S5, S6 Push switch (SUBSONIC) (LINE STRAIGHT)
★★	SEAV2S	S7 Push switch (RANGE)
	CEA 101M 25L	C103
	CEA 010M 50L	C104
	ACE-075	C101, C102 Mylar (0.22/100V)
	RD1/4PM □□□J	All resistors
	VMZ 30P060FMC	Screw (3 x 6)

Tape, Mode Assembly

Mark	Part No.	Symbol & Description
★	S5566	D1
★★	ASE-025	S2 Slide rotary switch
★★	ASE-023	S3, S4 Slide rotary switch
★★	ASR-072	RL1 Relay
	CKDYB 102K 50	C1, C2
	RD1/4PMFL101J	R5
	RD1/4PM □□□J	Other resistors

Volume Assembly

Mark	Part No.	Symbol & Description
	CQSH 102K 50	C201, C202
★	ACT-179	VR201 Variable 250k (BALANCE)
★	ACW-132	VR202 Variable 68k (VOLUME)
	RD1/4PM □□□J	Other resistors

Muting Assembly

Mark	Part No.	Symbol & Description
★	AEL-404	D101
★★	SEAV4S	S101 Push switch (MUTING)
	RD1/4PM □□□J	All resistors

Headphone Jack Assembly

Mark	Part No.	Symbol & Description
	AKN-050	Headphone jack (PHONES)

Tone Control Assembly (GWG-183)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SC2259	Q1, Q2
★★	2SA970	Q3, Q4
★★	2SC2705/A/	Q5, Q6
★	1S1555 (US1035)	D1 – D4

CAPACITORS

Mark	Part No.	Symbol & Description
	CQMA 104K 50	C1, C2
	CEANL 2R2M 50	C3, C4
	CEANP 010M 50	C25, C26, C33, C34
	CEANP 220M 16	C31, C32
	CQMA 822K 50	C19, C20
	CQMA 273K 50	C27, C28
	CQMA 333K 50	C21, C22
	CQMA 124K 50	C29, C30
	CCDSL 100D 50	C13, C14
	CCDSL 470J 50	C17, C18
	CCDSL 101J 50	C5, C6, C9 – C12
	CKDYB 471K 50	C23, C24
	CKDYB 152K 50	C7, C8
	CCDSL 390J 50	C15, C16

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	ACT-180	VR1, VR2 Variable 100 k (BASS, TREBLE)
⚠	RD1/4PM242J	R29
⚠	RS2L392J	R21, R22
⚠	RD1/4PMF103J	R17, R18
	RD1/4PM □□□J	Other resistors

Power Supply Assembly

Mark	Part No.	Symbol & Description
★	S5566	D1 – D4
★	CTU-21S	D7 – D10
★	RB602	D5, D6
	ACH-268	C3, C4 Electrolytic (12000/71V)
	ACH-269	C5, C6 Electrolytic (10000/100V)
	CEA 102M 63L	C1, C2
	VBZ 30P160FMC	Screw (3 x 16)

Output A Assembly

Mark	Part No.	Symbol & Description
★★	2SA985	Q101
★★	2SC2275	Q102
★★	2SC2705/A/	Q103
★	1S2471	D101
	CMA 221J 500	C101, C102
	CEANP R47M 100	C103
⚠	ACN-146	R105 Wire wound (0.22/5W X2)
⚠	RFA1/4PS□□□J	R101, R102, R106, R107
	RD1/4PM153J	R103
⚠	RD1/4PMFL222J	R104

Output B Assembly

Mark	Part No.	Symbol & Description
★★	2SA985	Q201
★★	2SC2275	Q202
★★	2SC2705/A/	Q203
★	1S2471	D201
	CMA 221J 500	C201, C202
	CEANP R47M 100	C203
⚠	ACN-146	R205 Wire wound (0.22/5W X2)
⚠	RFA1/4PS□□□J	R201, R202, R206, R207
	RD1/4PM153J	R203
⚠	RD1/4PMFL222J	R204

11. ADJUSTMENTS

Idle Current Adjustment

1. Turn the VOLUME control down to minimum volume, and switch the LINE STRAIGHT switch on.
2. Rotate VR1 and VR2 counter clockwise.
3. Switch the power on with no input and no load applied to the unit.
4. Adjust VR1 to obtain a reading of 22mV \pm 10mV between TP1 (+) and TP2 (-).
5. Repeat the above operation for other channel assemblies.
6. Readjust after aging for at least 10 minutes.

Reference:

Center DC output voltage tolerance: 0V \pm 100mV.

Equalizer Amplifier Adjustment

1. Short circuit the PHONO terminals.
2. Adjust VR1 to reduce the TP1 voltage to at least \pm 100mV.
3. Also adjust VR2 to reduce the TP2 voltage to at least \pm 100mV.

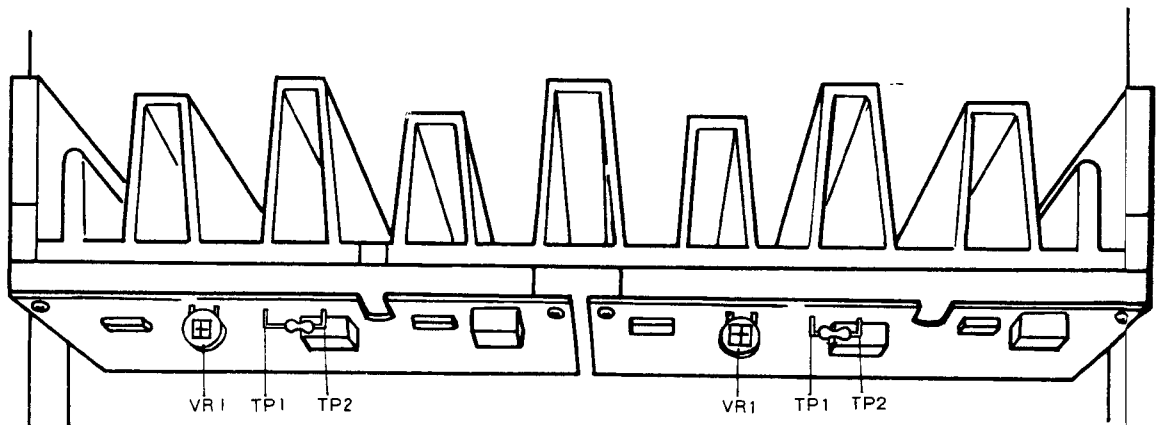


Fig. 11-1 Adjusting points (power amplifier)

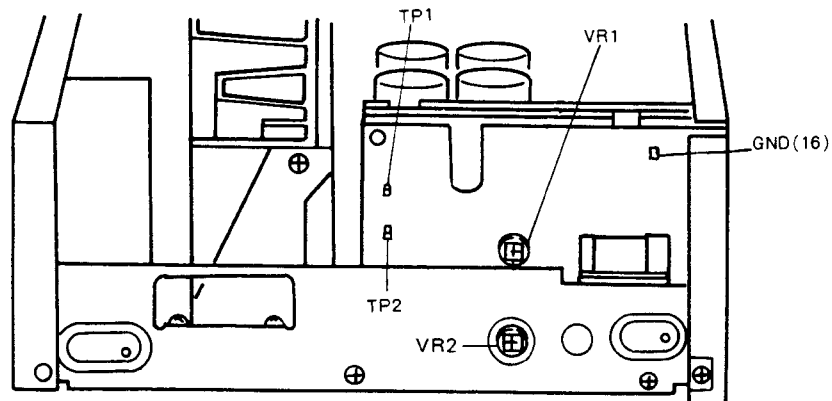


Fig. 11-2 Adjusting points (equalizer)

11. RÉGLAGE

Réglage des courants dévattés

1. Régler le potentiomètre de volume (VOLUME) au minimum et placer le commutateur de ligne directe (LINE STRAIGHT).
2. Tourner VR1 et VR2 dans le sens des aiguilles d'une montre.
3. Allumer l'appareil, toutes les connexions étant débranchées.
4. Régler VR1 afin d'obtenir une lecture de $22\text{mV} \pm 10\text{mV}$ entre TP1 (+) et TP (-).
5. Recommencer les réglages ci-dessus pour les autres canaux.
6. Recommencer les réglages après avoir laissé l'appareil en fonction pendant au moins 10 minutes.

Référence:

Tolérance de la tension de sortie centrale CC: $0\text{V} \pm 100\text{mV}$.

Réglage de l'amplificateur égaliseur

1. Mettre les bornes PHONO en court-circuit.
2. Régler VR1 afin d'abaisser la tension au niveau de TP1 à au moins $\pm 10\text{mV}$.
3. Régler aussi VR2 afin d'abaisser la tension au niveau de TP2 à au moins $\pm 100\text{mV}$.

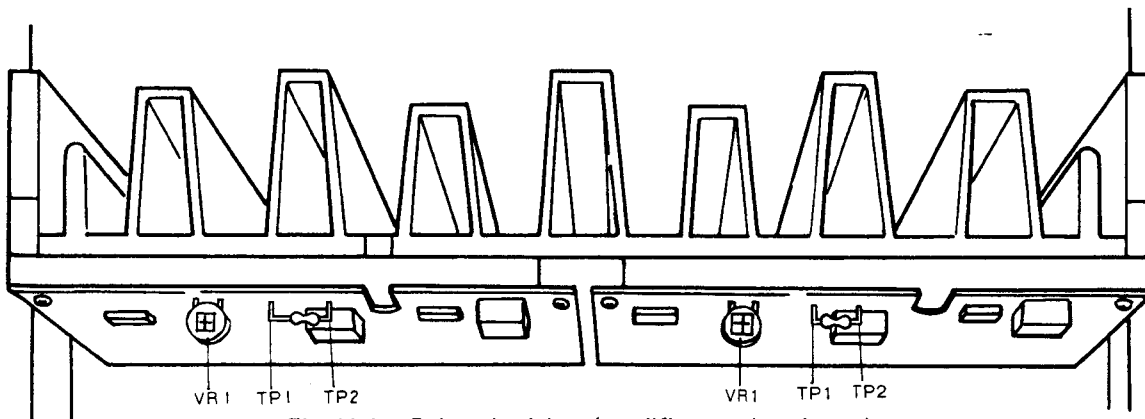


Fig. 11-1 Points de réglage (amplificateur de puissance)

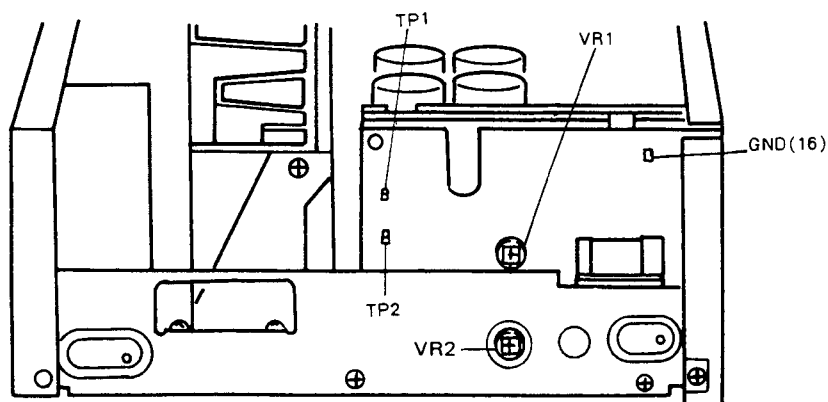


Fig. 11-2 Points de réglage (égalisateur)

11. AJUSTE

Ajuste de la corriente reactiva

1. Girar al control VOLUME al nivel mínimo de volumen y activar el interruptor LINE STRAIGHT.
2. Girar VR1 y VR2 hacia la izquierda.
3. Conectar la alimentación sin carga y sin entrada aplicadas al aparato.
4. Ajustar VR1 para obtener una indicación de $22\text{mV} \pm 10\text{mV}$ entre TP1 (+) y TP2 (-).
5. Repetir la operación de arriba para conjuntos de otros canales.
6. Reajustar después de haber transcurrido por lo menos 10 minutos.

Referencia:

Tolerancia de tensión de salida de CC central: $0\text{V} \pm 100\text{mV}$.

Ajuste del amplificador ecualizador

1. Cortocircuitar los terminales PHONO.
2. Ajustar VR1 para reducir la tensión de TP1 a $\pm 100\text{mV}$ por lo menos.
3. Ajustar también VR2 para reducir la tensión de TP2 a $\pm 100\text{mV}$ por lo menos.

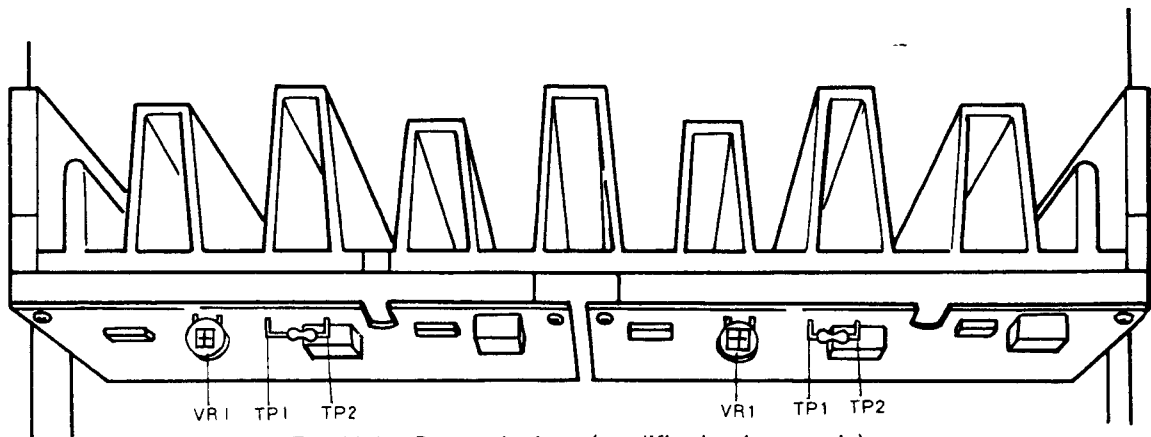


Fig. 11-1 Puntos de ajuste (amplificador de potencia)

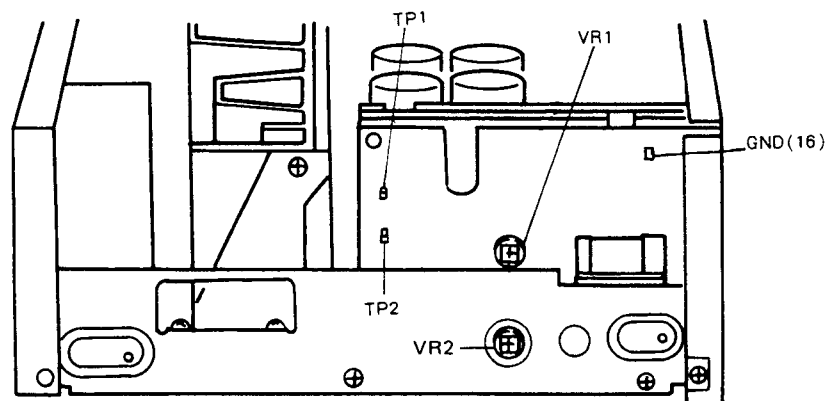


Fig. 11-2 Puntos de ajuste (ecualizador)

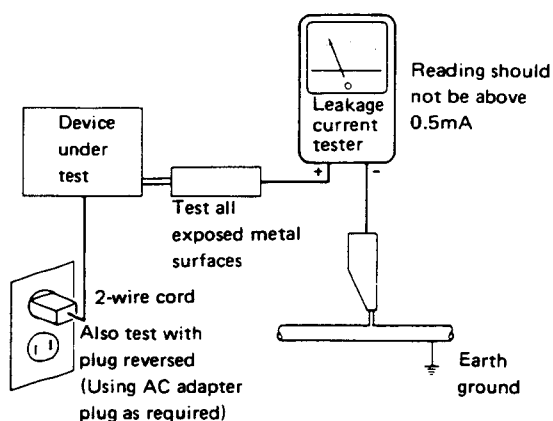
12. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

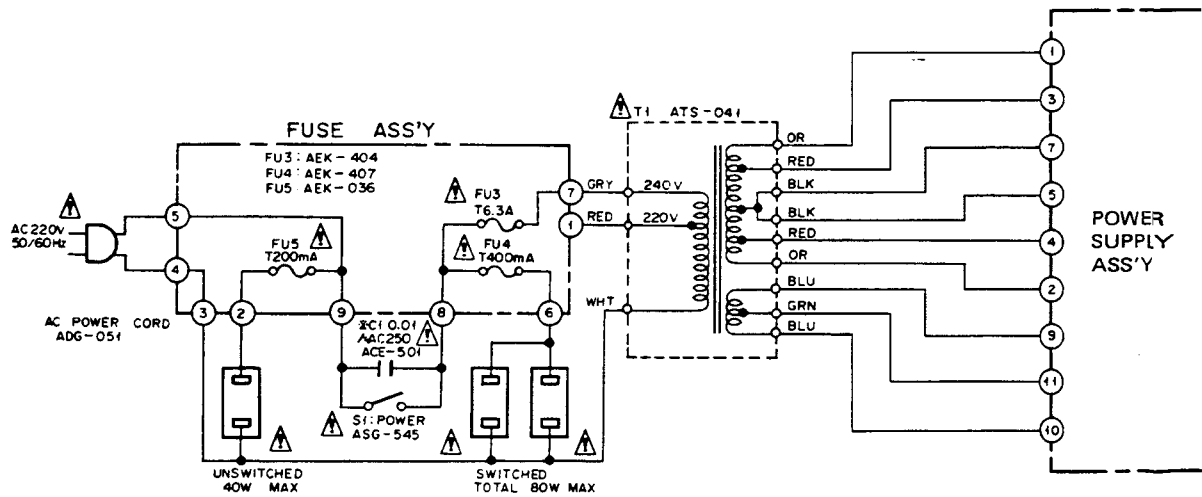
13. FOR HB TYPE

The A-80/HB type is the same as the HE type with the exception of the following sections.

Contrast of Miscellaneous Parts

Mark	Symbol & Description	Part No.	
		HE type	HB type
⚠ ⚠	AC socket	AKP-502	AKP-505
	AC power cord	ADG-041	ADG-051
	Operating instructions (English, German, French, Italian)	ARE-087	.....
	(English)	.....	ARB-575

POWER SUPPLY CIRCUIT FOR HB TYPE



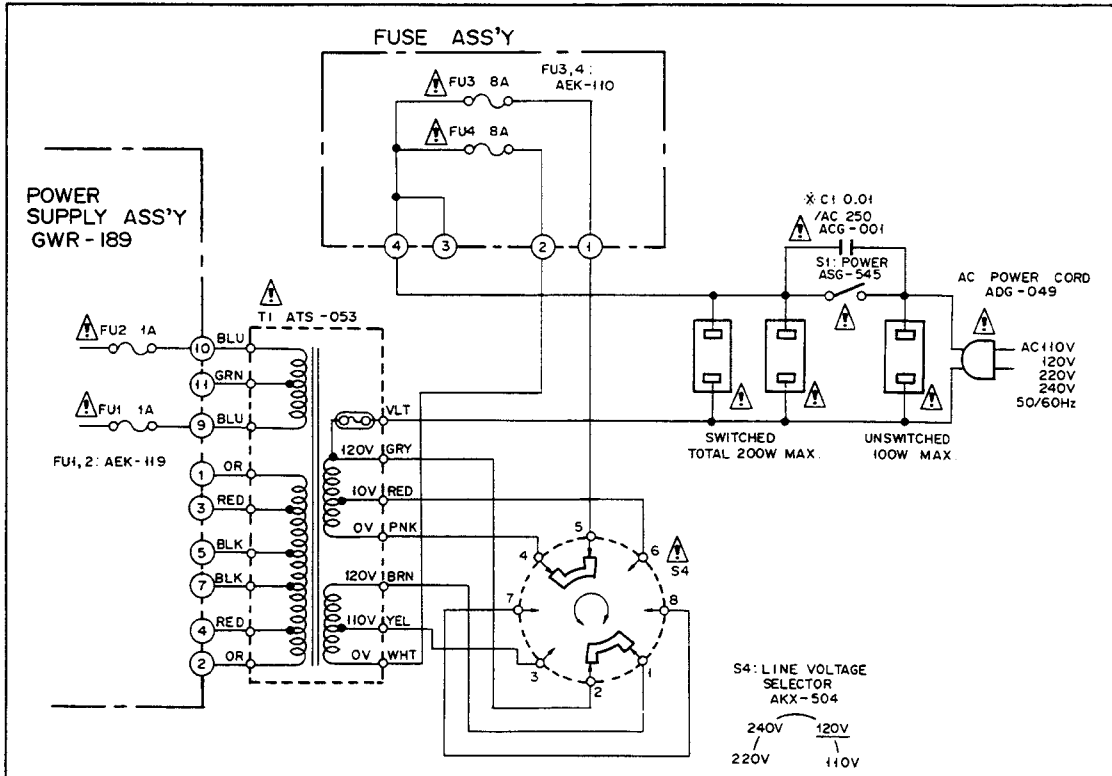
14. FOR S AND S/G TYPES

The A-80/S and S/G are the same as the HE type with the exception of the following sections.

Contrast of Miscellaneous Parts

Mark	Symbol & Description	Part No.			Remarks
		HE type	S type	S/G type	
⚠ ★	T1 Power transformer (220/240V) (110/120/220/240V)	non supply	non supply	same as S type	
		ATS-041	.....	.....
⚠ ★★	FU1, FU2 Fuse (T1A) (1A/125V)	AEK-402	.....	.....
		.....	AEK-119	AEK-119
⚠ ★★	FU3, FU4 Fuse (8A/125V)	.....	AEK-110	AEK-110
⚠ ★★	FU3 Fuse (T6.3A)	AEK-404	.....	.....
⚠ ★★	FU4 Fuse (T0.4A)	AEK-407	.....	.....
⚠ ★★	FU5 Fuse (T0.2A)	AEK-036	.....	.....
⚠ ★★	S4 Line voltage selector Screw (3 x 8)	.....	AKX-504 BBZ30P080FZK	AKX-504 BBZ30P080FZK
⚠	AC socket	AKP-502	AKP-501	AKP-501	
⚠	AC power cord	ADG-041	ADG-049	ADG-049	
	Operating instructions (English, French, German, Italian)	ARE-087	.....	.....
	(English)	.....	ARB-575	ARB-575
	Packing case	AHE-251	AHE-251	AHE-260	

POWER SUPPLY CIRCUIT FOR S AND S/G TYPES



Fuse Assembly

