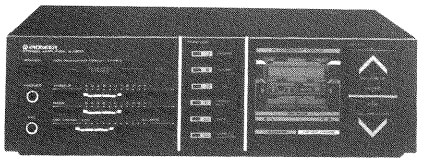
PIONEER

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS



ORDER NO.
ARP-648-0

STEREO AMPLIFIER

A-X900

This service manual is applicable to the KU type.

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QUESTIONNAIRE

MODEL _____

One Model per questionnaire

Dear Servicer,

Thank you for your cooperation in the post-sale service of Pioneer products.

This questionnaire is used as a tool to improve the serviceability of our products and service manuals. Please evaluate this model and service manual by answering the following questions. Your ideas may be realized in our future products. Your answers will be appreciated. Thank you.

PIONEER ELECTRONIC CORP.

T. Nakagawa, Manager, Service Section, International Division

1. SERVICING EVALUATION	Circle applicable number:	Good		Fair		Poor
a. Disassembly/Re-assembly:		1	2	3	*4	*5
b. Circuit Checks:		1	2	3	*4	*5
c. Replacement of Parts:		1	2	3	*4	*5
d. Adjustment (s):		1	2	3	*4	*5

* If (4) or (5) was circled, please be specific.

e. Your advice, opinion or ideas related to servicing this product.

2. SERVICE MANUAL EVALUATION

a. Circuit & Mechanism Description

b. Circuit Diagram

3. OTHER

Please describe other areas of servicing which you may find difficult.

Completed by : Date :

Company Name :

Address :

City/State/Zip :

Please send this form filled to the distributor in your country.

1. SPECIFICATIONS

Amplifier Section

Continuous average power output is 75 watts* per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.07% total harmonic distortion.

Input (Sensitivity/Impedance)
- PHONO ..... 2.5 mV/50 kΩ
- TUNER, CD, TAPE PLAY, VIDEO/AUX ADAPTOR ..... 150 mV/50 kΩ

Phono Overload Level (T.H.D. 0.1%, 1 kHz) ..... 75 mV

Output (Level/Impedance)
- TAPE REC ..... 150 mV/2.2 kΩ

Frequency Response
- PHONO (RIAA Equalization) ..... 20 Hz to 20 kHz ±0.3 dB
- TUNER, CD, VIDEO/AUX, TAPE PLAY, ADAPTOR..... 20 Hz to 70 kHz ±2 dB

Tone Control
- BASS ..... ±10 dB (100 Hz)
- TREBLE ..... ±10 dB (10 kHz)

Muting ..... −20 dB

Loudness Control (Volume control set at −40 dB position)
- 100 Hz ..... +7 dB
- 10 kHz ..... +4 dB

Hum and Noise (IHF, short circuited, A network)
- PHONO ..... 80 dB
- CD, VIDEO/AUX, ADAPTOR, TUNER, TAPE PLAY ..... 97 dB

Miscellaneous

Power Requirements
- KU model ..... AC 120 V, 60 Hz

Power Consumption
- KU model ..... 130 W

Dimensions ..... 320 (W) x 98 (H) x 221(D) mm
12-5/8 (W) x 3-7/8 (H) x 8-3/4 (D) in

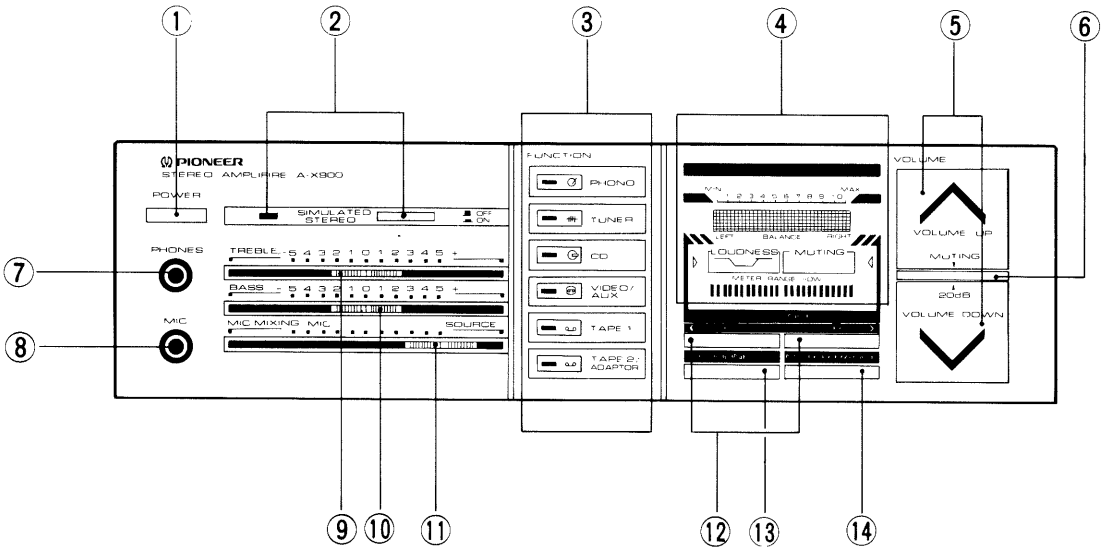
Weight (without package) ..... 6.1 kg (13 lb 7 oz)

Furnished Part

Operating Instructions 1

NOTE:
- *Specifications and design subject to possible modification without notice due to improvements.*
- **Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Claims for Amplifier.*

2. FRONT PANEL FACILITIES



① POWER switch

Press to turn power to the unit ON and OFF.
Depressed position (ON):
Power is supplied to the unit.
Released position (OFF):
Power to the unit is disconnected.

② SIMULATED STEREO/indicator

The indicator lights when switched ON. Monophonic input is converted into output with stereo effect and sound is produced from both left and right speakers. Even monophonic sound can be given a feeling of "presence." Use when listening to output from mono video cassette recorders, and FM or AM mono broadcasts.

NOTE:
When using monophonic equipment (only one output jack) use a mono-stereo adaptor plug and connect to both the left and right input jacks.

③ FUNCTION switches/indicators

[PHONO] — Press when listening to record playback on a turntable.
[TUNER] — Press when listening to AM or FM broadcasts with a tuner.
[CD] — Press when listening to a compact disc playback with a CD player.
[VIDEO/AUX] — Press when listening to programs from a component connected to the VIDEO/AUX terminals.
[TAPE 1] — Press when listening to tape playback with a tape deck.
[TAPE 2/ADAPTOR] — Press when using a component (sound processor, graphic equalizer) connected to the TAPE 2/ADAPTOR terminals. Also can be used during tape playback when a tape deck is connected to these terminals.

NOTE:
When a component is not connected to the TAPE 2/ADAPTOR terminals, or when the component connected is not being used, be sure to set the (TAPE 2/ADAPTOR) switch to the OFF position (the indicator will go out). If set to the ON position, no sound will be heard.

④ FLUORESCENT DISPLAY

[VOLUME/BALANCE] — Normally (VOLUME) indicates the sound volume. The larger the numbers, the larger the sound volume. When the BALANCE switch is pressed, the display's function switches to indicating the right/left balance of sound (after a few seconds, the display will automatically switch back to its volume function).
[LOUDNESS] — Lights when the LOUDNESS switch is set to the ON position.
[MUTING] — Lights when the MUTING switch is set to the ON position.
[LEVEL METER] — Indicates output level. The meter range is variable and may be set to 10 W or to 110 W using the Meter Range Selector switch.

⑤ VOLUME switches

These are used for controlling the sound volume.
[VOLUME UP] — Increases the sound volume.
[VOLUME DOWN] — Decreases the sound volume.

⑥ MUTING switch

Use to temporarily cut sound volume.
When pressed ON, the control display's MUTING indicator will light, and sound volume will be cut by 20 dB. When set to OFF, the sound will return to its previous volume.

⑦ PHONES jack

When using headphones, insert their plug into this jack. The sound from the speakers will automatically be disconnected.

⑧ MIC jack

When using a microphone, insert its plug into this jack.

⑨ TREBLE tone control

Use for adjusting the high-frequency tone.
The central "0" position is the flat (normal) position. When moved to the right, high-frequency tones are emphasized; when moved to the left, high-frequency tones are deemphasized.

⑩ BASS tone control

Use to adjust the low-frequency tone. The central "0" position is the flat (normal) position. When moved to the right, low-frequency tones are emphasized; when moved to the left, low- frequency tones are deemphasized.

⑪ MIC MIXING

Use to adjust the sound balance between the microphone connected to the MIC jack, and components (tuner, tape deck, turntable, CD player, etc.) connected to the rear panel.
When the control is moved to the MIC side, the sound from the microphone will be at a maximum, while the sound from the other components will not be heard.
When moved to the SOURCE side, the sound from components will be at a maximum, and the microphone sound will not be heard.

NOTE:
When performing playback of source components only, leave the control set to the SOURCE side.

⑫ BALANCE switches

Normally, set so that the control display's BALANCE function indicates at the center position. (When L and R are pressed simultaneously, the balance will be adjusted to the center position.) If the sound heard from the speakers appears to be too loud on one side, adjust as follows: If the right side is too loud, press L. If the left side is too loud, press R.

⑬ LOUDNESS switch

Press when listening at a low volume level.
When pressed ON, the control display's LOUDNESS indicator will light. Very low- and very high-frequency sounds will be augmented, thus giving a more powerful sound quality even at low listening levels.

⑭ METER RANGE selector switch

The control display meter range indication may be set to either 10 W or 110 W.
Normally, set to 110 W and when listening at low volume levels, set to 10 W.

When the power to the unit is turned OFF, a built-in microcomputer automatically memorizes the positions of the following switches, and will maintain that memory for approximately 1 week when the unit is not used. As a result, when the power is turned ON, the previously set switch positions will be set again automatically.

- FUNCTION switches
- VOLUME switch
- LOUDNESS switch
- MUTING switch
- BALANCE switches

If the unit is not used for more than one week, the memorized positions will be cancelled, and the following positions will be set:

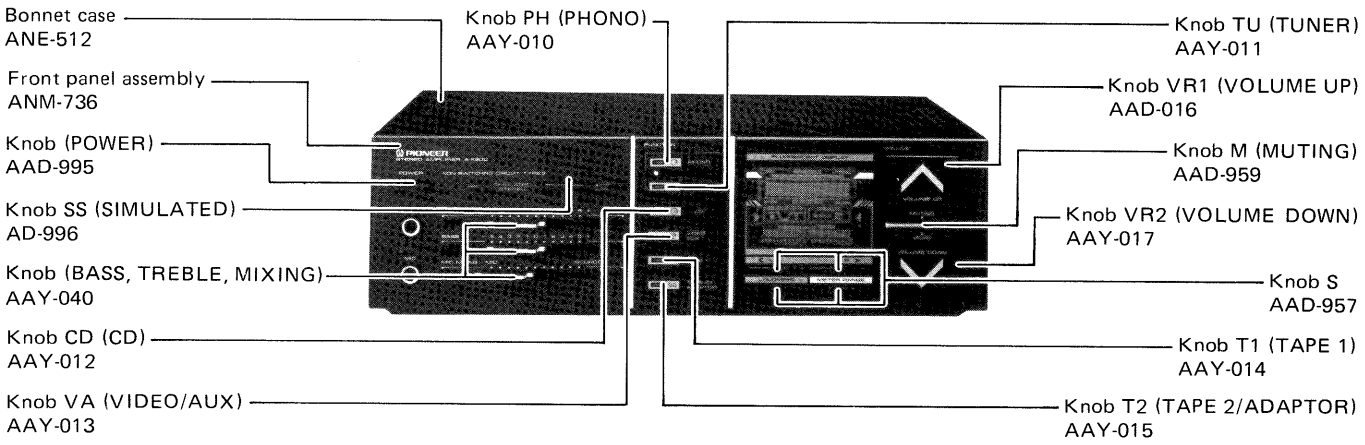
- VOLUME switch — Minimum
- LOUDNESS switch, MUTING switch — OFF
- BALANCE switches — Center

3. PARTS LOCATION

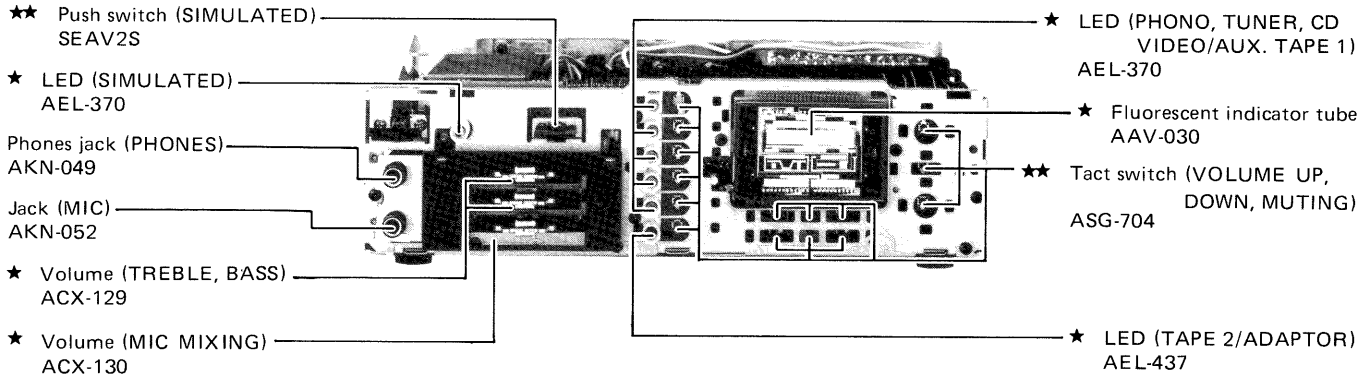
NOTES:

- *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 ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

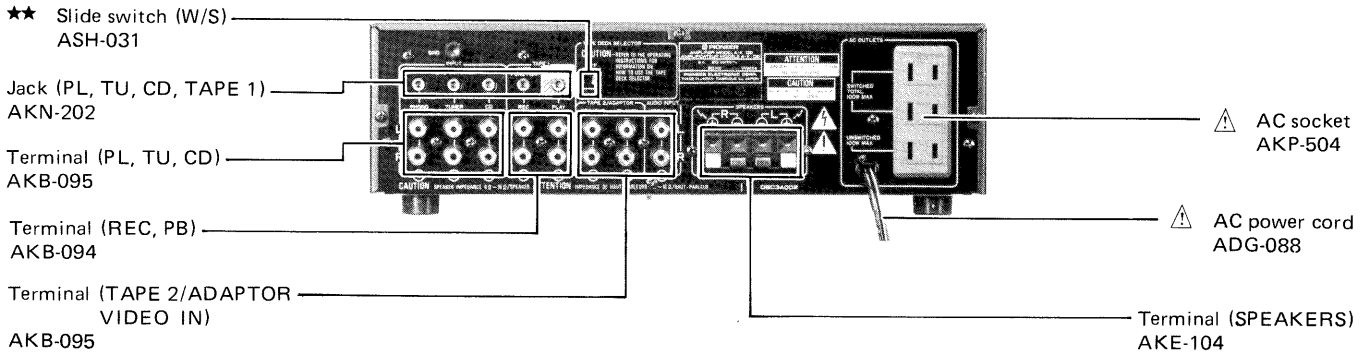
Front panel view



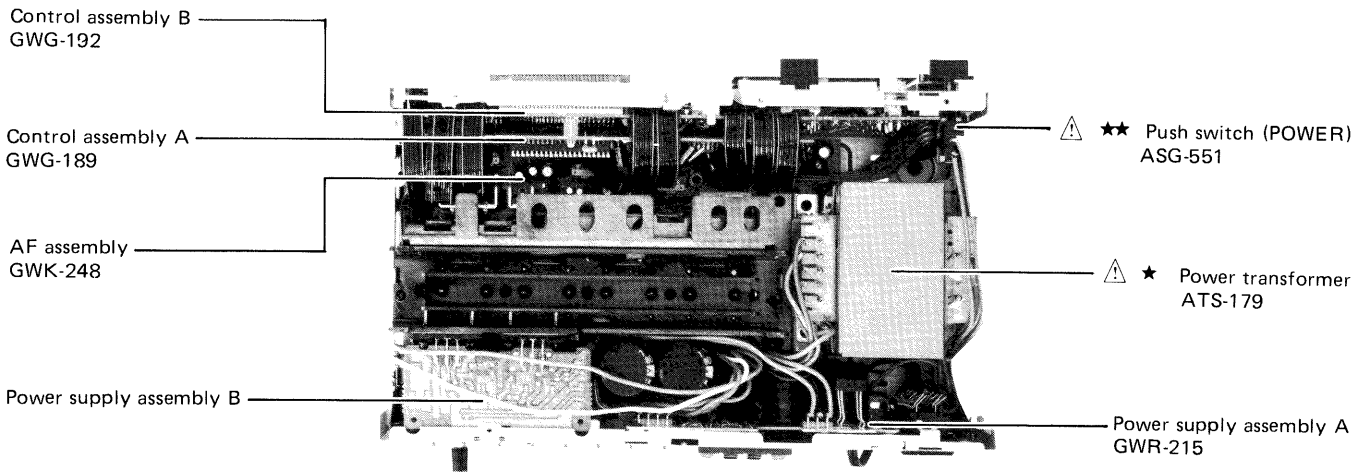
Front View with Panel Removed



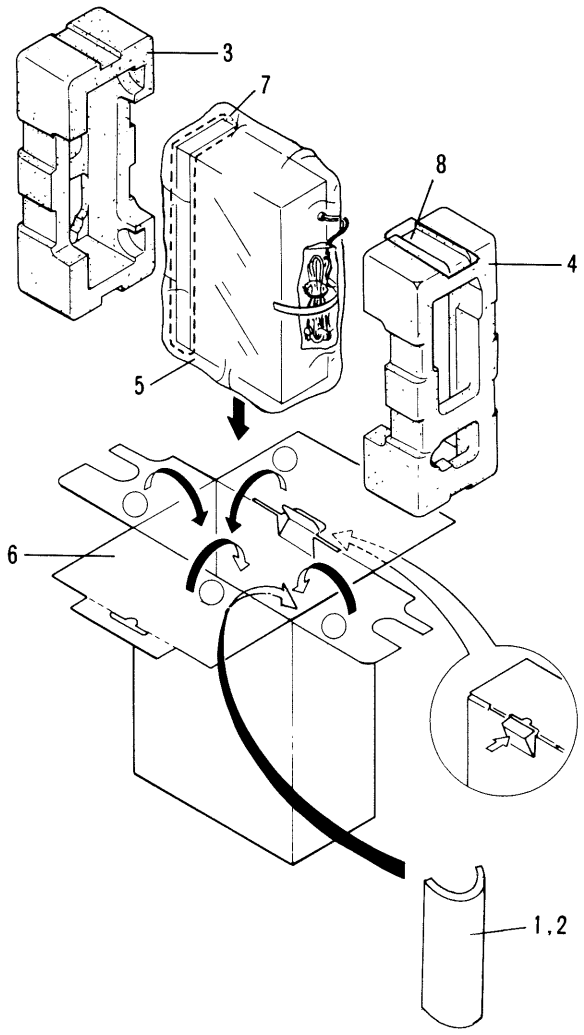
Rear Panel View



Top View

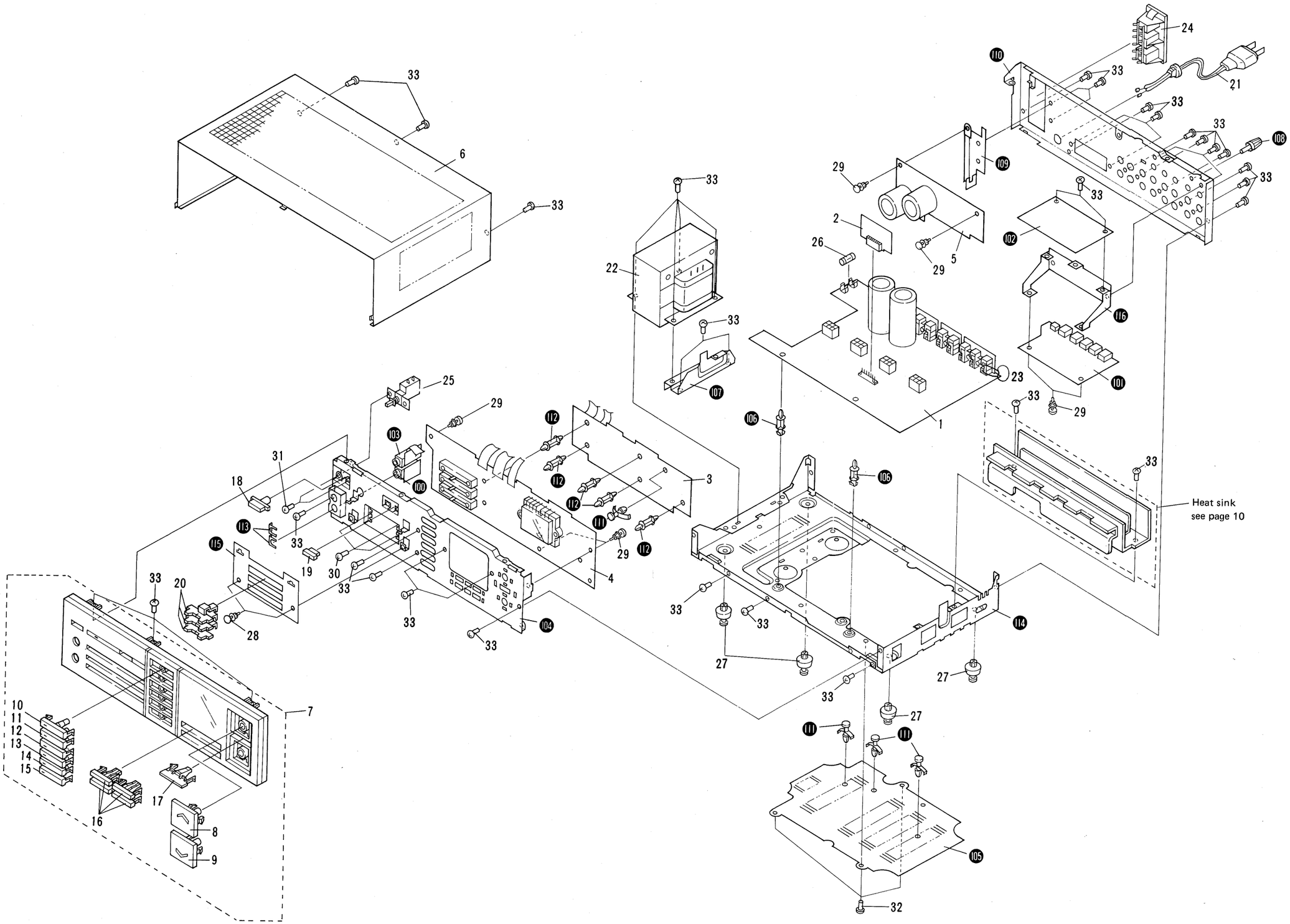


4. PACKING



Mark	No.	Part No.	Symbol & Description
	1	ARB-646	Operating instructions
	2	ARH-072	Sub instructions
	3	AHA-324	Front pad
	4	AHA-325	Rear pad
	5	AHG-125	Bag
	6	AHE-477	Packing case
	7	AHG-125	Sheet
	8	AHG-099	Vinyl pouch

5. EXPLODED VIEW



NOTES:

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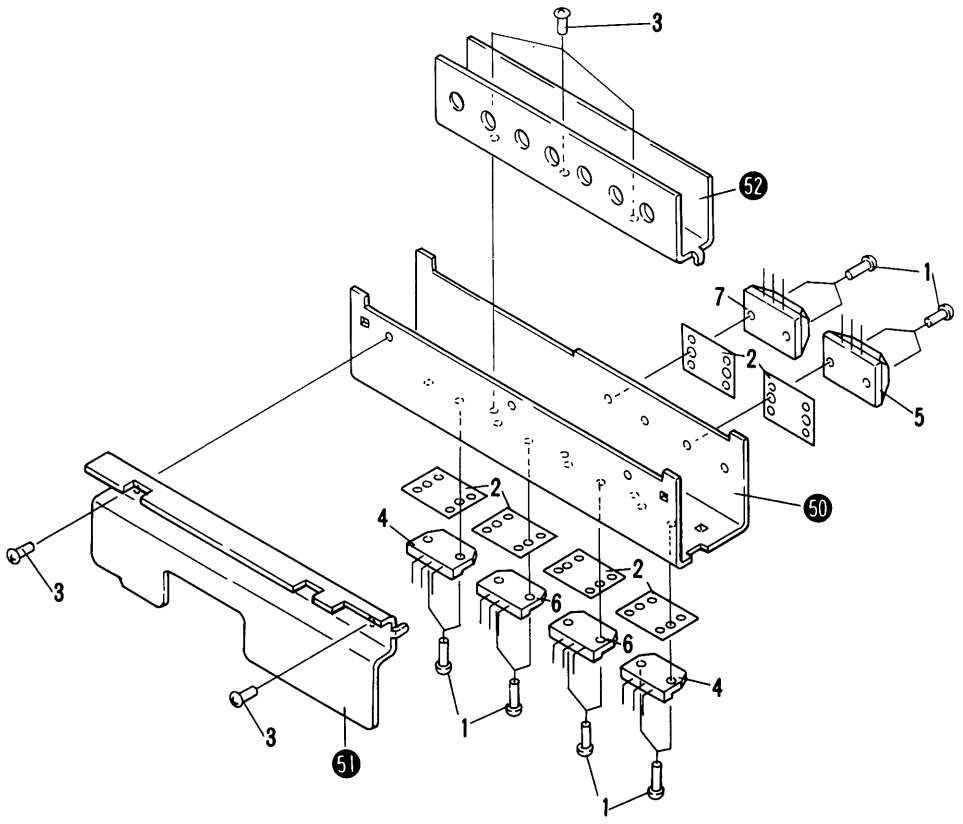
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ *GENERALLY MOVES FASTER THAN* ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Symbol & Description
	1	GWK-248	AF assembly
	2	GWY-139	Driver assembly
	3	GWG-189	Control assembly A
	4	GWG-192	Control assembly B
	5	GWR-215	Power supply assembly A
	6	ANE-512	Bonnet case
	7	ANM-736	Front panel assembly
	8	AAY-016	Push knob VR1 (VOLUME UP)
	9	AAY-017	Push knob VR2 (VOLUME DOWN)
	10	AAY-010	Push knob PH (PHONO)
	11	AAY-011	Push knob TU (TUNER)
	12	AAY-012	Push knob CD (CD)
	13	AAY-013	Push knob VA (VIDEO/AUX)
	14	AAY-014	Push knob T1 (TAPE 1)
	15	AAY-015	Push knob T2 (TAPE 2/ ADAPTOR)
	16	AAD-957	Push knob S
	17	AAD-959	Push knob M
	18	AAD-995	Power knob
	19	AAD-996	Push knob SS
	20	AAY-040	Slide knob
⚠	21	ADG-088	AC power cord
⚠ ★	22	ATS-179	Power transformer
	23	CKDYF473Z50	Ceramic capacitor (C2)
⚠	24	AKP-504	AC socket
⚠ ★★	25	ASG-551	Push switch (S1)
⚠ ★★	26	AEK-308	Fuse (FU1)
	27	AEP-016	Leg assembly
	28	AEC-471	Rivet
	29	AEC-510	Rivet
	30	VMZ30P060FMC	Screw (3x6)
	31	VBZ30P060FMC	Screw (3x6)
	32	PMZ20P030FZK	Screw (2x3)
	33	BBZ30P080FZK	Screw (3x8)

Mark	No.	Part No.	Symbol & Description
	100		Mic jack assembly
	101		Mini jack assembly
	102		Power supply assembly B
	103		Phone jack assembly
	104		Panel stay
	105		Bottom plate
	106		Holder
	107		Heat sink holder
	108		Terminal (GND)
	109		PCB holder B
	110		Rear panel
	111		Print spacer
	112		PCB holder
	113		Mount plate
	114		Chassis
	115		Blind sheet
	116		PCB holder A

Heat sink

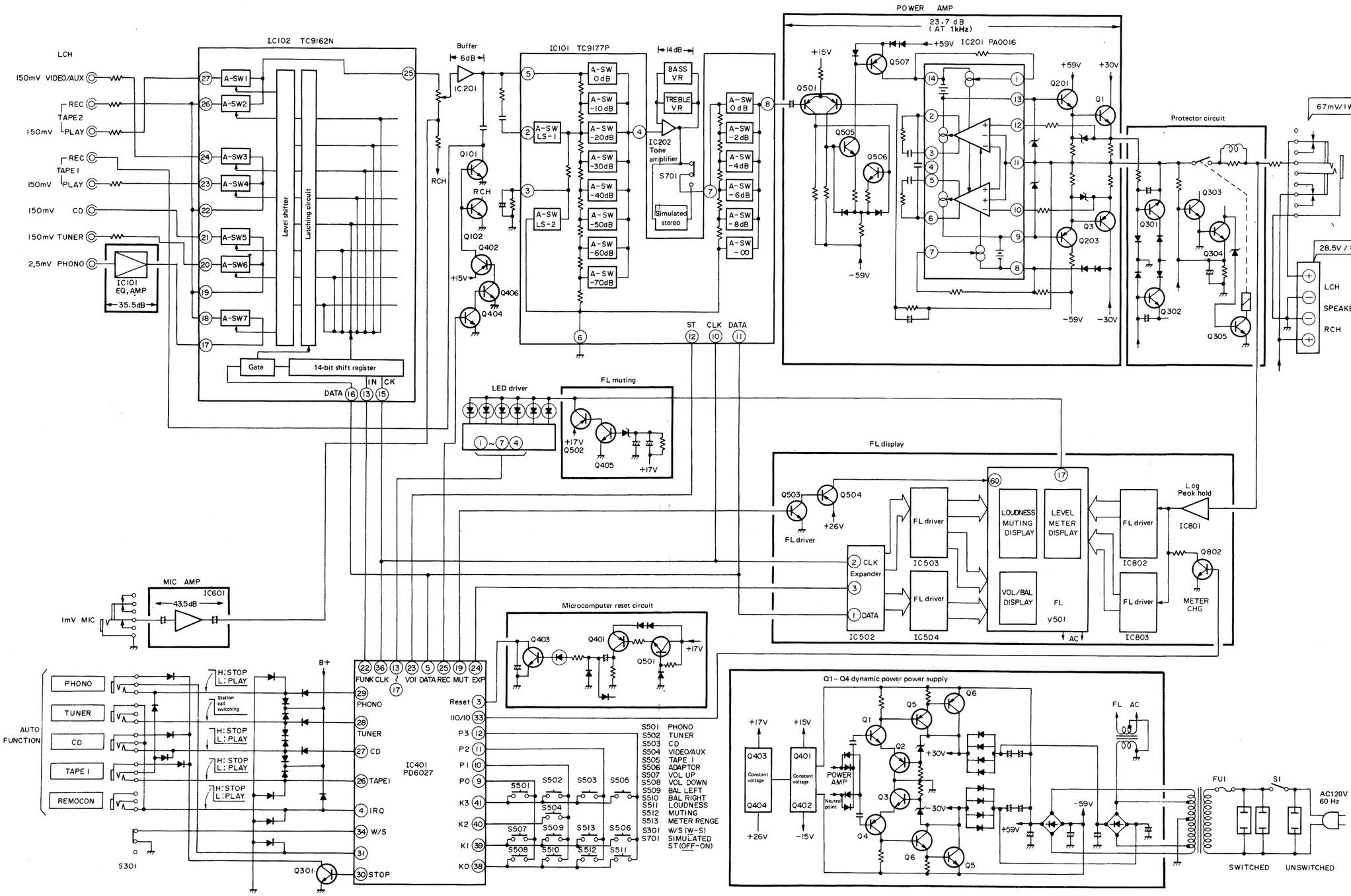


Mark	No.	Part No.	Symbol & Description
	1	ABA-258	Screw
	2	AEC-942	Mica sheet
	3	BBZ30P080FZK	Screw (3x8)
★★	4	2SA1215(A)-O/P/Y/*	Q3, Q4, Power transistor
★★	5	2SA1216	Q6
★★	6	2SC2921(A)-O/P/Y/*	Q1, Q2, Power transistor
★★	7	2SC2922	Q5

*hfe should have the same value

50		Heat sink
51		Sub heat sink A
52		Sub heat sink B

6. BLOCK DIAGRAM



7. CIRCUIT DESCRIPTIONS

Function Switching

If one of the switches S501 thru S506 in Fig. 7.6 is pressed, the PD6027 microcomputer (IC401) detects which switch has been pressed, and by controlling the TC9162N electronic switch (IC102), switches the unit to the selected function.

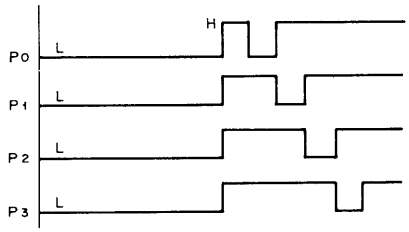


Fig. 7-1

Key scanning is started only when one of the keys in the matrix is pressed. P0 thru P3 are all at L level before any key is pressed, but are switched to H level once a key is pressed. At the same time, a microcomputer reads which key has been pressed at K0 thru K3, and then decides whether the pressed key is a function key or a volume key. If a function key, the current function position is compared with the pressed function. If this comparison shows that the two are different functions, function data corresponding to the pressed key is passed to the TC9162N. The configuration of this data is outlined in Fig. 7.2.

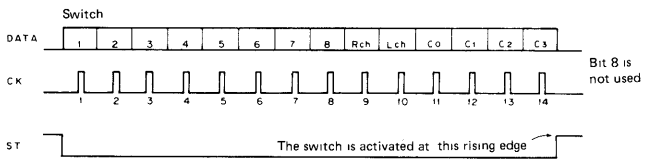


Fig. 7-2

The data consists of 14 bits with bits 1 thru 7 corresponding to PHONO, TUNER, CD, etc., and the bit for the switch to be switched on is switched to H level. Bits 9 and 10 are the left and right channel selector bits, while bits 11 thru 14 are TC9162N code bits.

Volume Control

Volume control operations involve the use of a microcomputer (IC401) combined with the TC9177P electronic volume control (IC101) as indicated in Fig. 7.7.

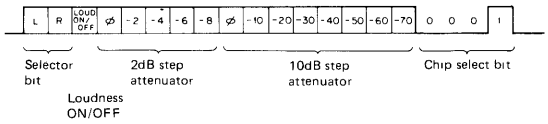


Fig. 7-3

20-Bit serial data corresponding to the pressed key and the current volume level is passed from the microcomputer for both left and right channels in that order. TC9177P (IC101) stores the 20 bits of data in a 20-bit shift register, and then activates each switch by strobe signal to achieve the selected degree of attenuation.

If bit 3 of the data is switched to H level, LS-1 is switched on and LS-2 is switched off resulting in the loudness being switched on to achieve a loudness effect if the volume level is less than -20dB.

Muting

TC9177P (IC101) attenuation is changed by 20dB by data similar to the VR control data.

Volume UP & DOWN Switches

Pressing the UP (S507) or DOWN (S508) switch continuously results in continuous volume changes. The DOWN switch, however, is set to change the volume at a faster rate.

The volume level can be controlled in 2dB steps from 0dB to 76dB, and down to — infinity in 40 steps.

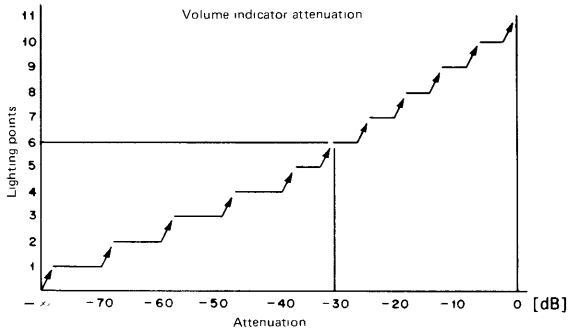


Fig. 7-4

L and R Balance Switches

Pressing the L (S509) or R (S510) balance switch once results in the display being switched to a balance display. Pressing either switch continuously results in continuous switching operation, and pressing both together results in the balance being set to center.

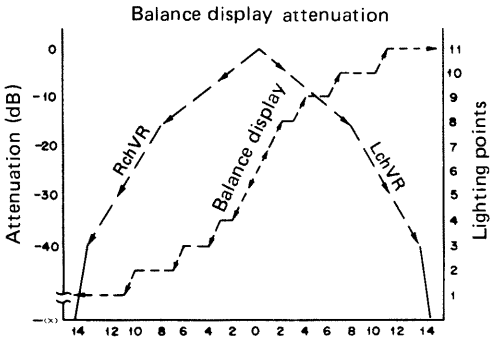


Fig. 7-5

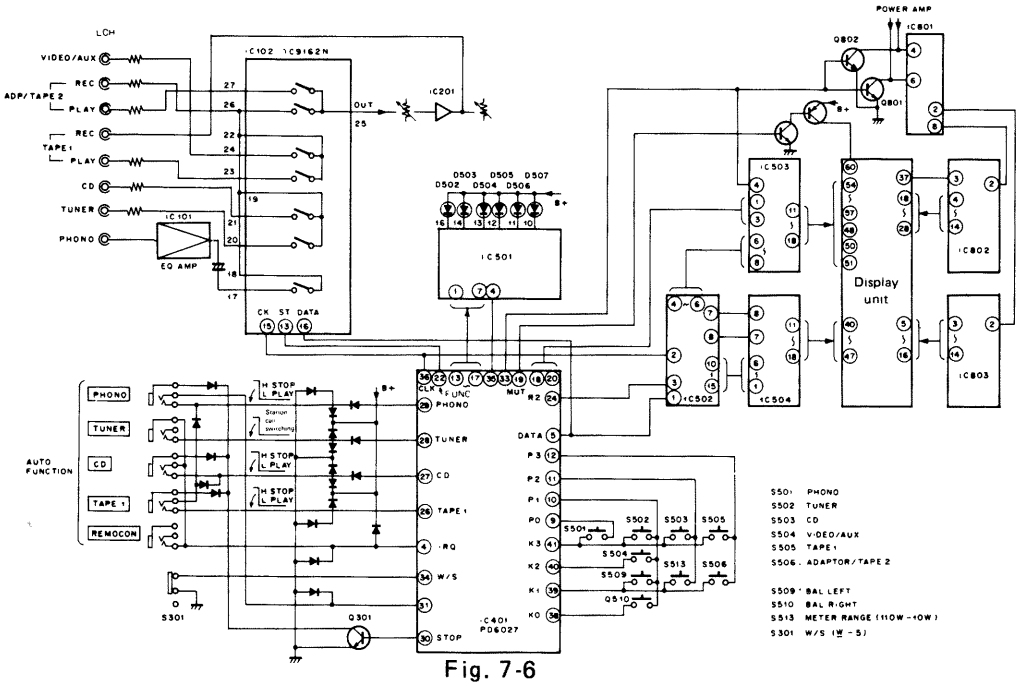


Fig. 7-6

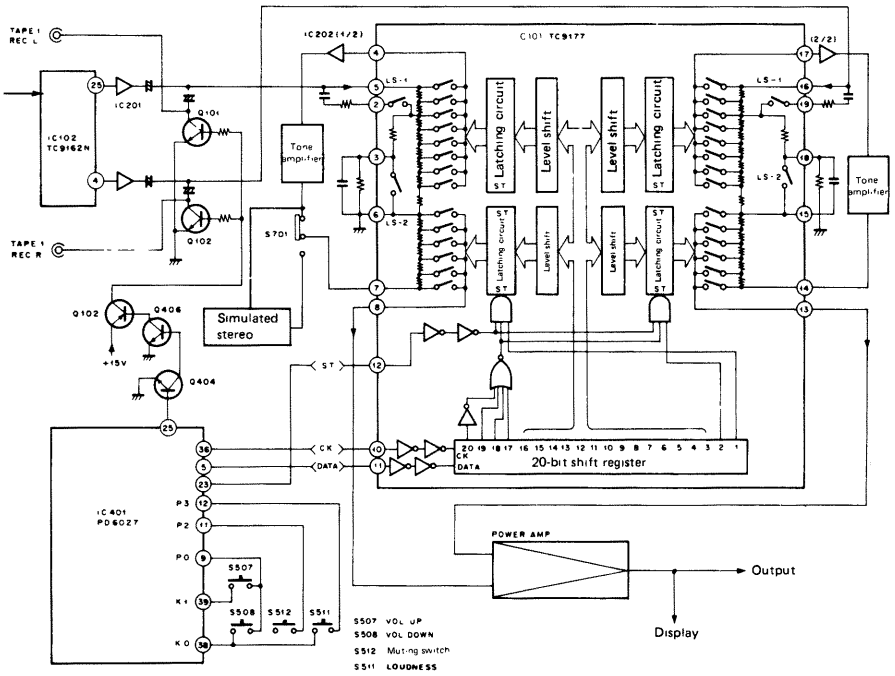


Fig. 7-7

Automatic Function Switching

If audio components featuring "one-touch auto-play" functions are connected to the relevant PHONO (PL), TUNER (TX), CD, or TAPE1(CT) "AUTO FUNCTION" terminal on the rear panel of the A—X900, the function is switched automatically to the operated component.

When the PLAY or STATION CALL switch of the component connected to the PHONO, TUNER, CD, or TAPE1 terminal is switched on, the generated L level signal is passed to the microcomputer which in turn passes corresponding data to the function switch (TC9162N) to effect the actual switching operation.

Stop Signal

When a function is switched by automatic function switching or amplifier function switching, an H level signal is generated at pin 30 of the microcomputer. Q301 is thus turned on, and auto stop output signals are passed to PL, CD, and CT.

Double Deck and Single Deck Switching

S301 is switched according to whether the tape deck connected to TAPE1 is a double or single deck. When a double deck is used, S301 is switched on resulting in pin 25 of the microcomputer remaining at H level. Q404 is thus turned on, and Q406 then Q102 are turned off. When Q101 and Q102 are both turned off, REC1 is switched on.

When S301 is off, pin 25 of the microcomputer is switched to H or L level depending on whether or not function has been switched to TAPE1. If the function has been switched to TAPE1, pin 25 is switched to L level, resulting in Q101 and Q102 being turned on and REC1 being switched off. When the function is switched to other positions, the reverse occurs.

Remote Control Terminal

The photosensitive section of the remote control mechanism is located in the tuner. Upon reception of a remote control signal in the tuner, a VR UP, DOWN, muting, VIDEO/AUX, or turntable start/stop signal is decoded by the microcomputer. Remote control signals for CD or TAPE1 are passed direct from the tuner.

Microcomputer Reset Circuit

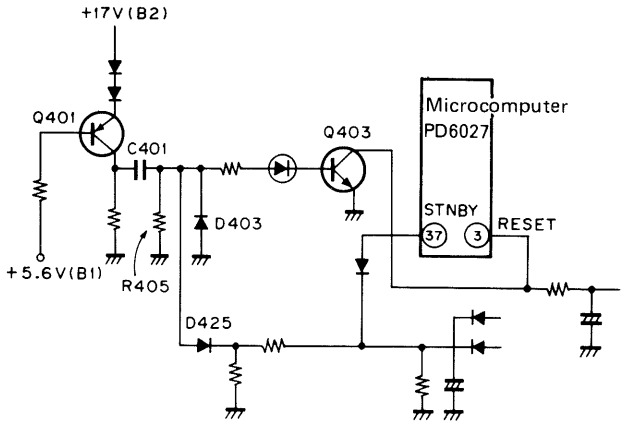


Fig. 7-8

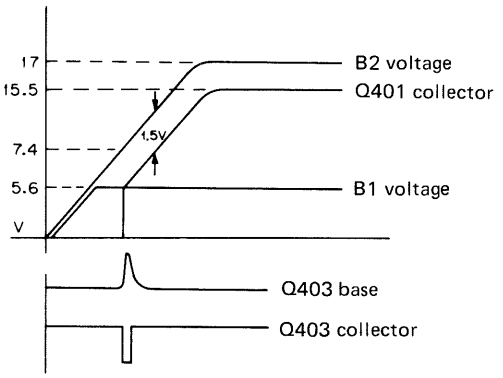


Fig. 7-8-1

The microcomputer reset circuit is outlined in Fig. 7.8.

When the power is switched on, and the Q401 base voltage (B_1) is increased to 5.6V with the emitter voltage (B_2) in excess of 7.4V, Q401 is turned on and the collector voltage is gradually increased to 15.5V. The Q401 output is differentiated by C401/R405 and then inverted by Q403 to obtain the reset signal.

D425 has been inserted in the circuit to prevent Q403 cut-off at the same time the power is switched off in order to prevent the memory from being switched off by reset circuit misoperation if the power switch is switched on and off in quick succession. The reset signal resets the microcomputer once clock oscillation (3.84 MHz) has been commenced when the STANDBY pin (No.37) voltage is increased after the power is switched on.

PD6027 Functions

Pin No.	Pin Name	Function		Active
1	EX	3.84 MHz resonator is connected between these pins.		
2	X			
3	RESET	Positive power supply (VDD) connection		L
4	IRQ	Remote control signal input		L
5	SO	Serial data output to PD0012, TC9177P, and TC9162N.		
6	SI	NC		
7	SC/TO			
8	TC			
9	P_ϕ	Output of key matrix drive signals		L
10	P_1			L
11	P_2			L
12	P_3			L
13	O_ϕ	Indicator outputs	TAPE 1	H
14	O_1		CD	H
15	O_2		TUNER	H
16	O_3		PHONO	H
17	O_4		TAPE 2	H
18	O_5		LOUDNESS	H
19	O_6		MUTING	H
20	O_7		BARANCE	H
21	V_{SS}	GND		
22	R_ϕ	Strobe outputs	TC9162N	L
23	R_1		TC9177P	L
24	R_2		PD0012	L
25*	R_3	REC OUT switch (output switched on)		H
26	R_4	Auto function input	TAPE 1	L
27	R_5		CD	L
28	R_6		TUNER	L
29	R_7		PHONO	L
30*	R_8	Output of auto stop signals		H
31	R_9	Output of turntable remote control signal		L
32	R_ϕ	Indicator outputs	VOLUME	H
33	R_{11}		110W meter range	H
34	R_{12}	Double cassette deck selector input		L
35	R_{13}	Indicator output VIDEO/AUX		H
36	R_{14}	Serial data clock		
37	STBY	Back-up mode starter input		L
38	K_ϕ	Key inputs		L
39	K_1			L
40	K_2			L
41	K_3			L
42	VDD	5 V		

***Pin No. 25.**

The R12 pin is at H level. Pin 25 is switched to L level when TAPE1 function is selected, but is switched to H level in other function positions, and R12 remains at H level.

***Pin No. 30**

Switched to H level for 100msec immediately following function switching.

8. 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 10¹*	*561*	*RD¼PS* 5 6 1 *J*
47kΩ	*47 x 10³*	*473*	*RD¼PS* 4 7 3 *J*
0.5Ω	*0R5*		*RN2H* 0 R 5 *K*
1Ω	*010*		*RS1P* 0 1 0 *K*

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

5.62kΩ	*562 x 10¹*	*5621*	*RN¼SR* 5 6 2 1 *F*

- *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 ★.*

  ★★ GENERALLY MOVES FASTER THAN ★.

  This classification shall be adjusted by each distributor because it depends on model number , temperature, humidity, etc.

P.C. BOARDS ASSEMBLIES

Mark	Symbol & Description	Part No.
	AF Assembly	GWK-248
	Driver Assembly	GWY-139
	Control Assembly A	GWG-189
	Control Assembly B	GWG-192
	Power supply Assembly A	GWR-215
	Power supply Assembly B	
	Microphone Jack Assembly	
	Mini-jack Assembly	
	Headphones Assembly	

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q1, Q2	2SC2921(A)-O/P/Y*
★★	Q3, Q4	2SA1215(A)-O/P/Y*
★★	Q5	2SC2922
★★	Q6	2SA1216

*hfe of Q1 - Q4 should have the same value

OTHERS

Mark	Symbol & Description	Part No.
⚠	C2 Ceramic Capacitor	CKDYF473Z 50
⚠ ★	T1 Power Transformer	ATS-179
⚠	AC socket (3P)	AKP-504
⚠ ★★	S1 Push Switch (Power)	ASG-551
⚠ ★★	FU1 Fuse (5A)	AEK-308
⚠	Power Cord	ADG-088
	Mica Sheet	AEC-942

AF Assembly (GWK-248)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC101	NJM2043DD
★★	IC201, IC202	PA0016
★★	IC102	TC9162N
★★	Q203, Q204	2SA968–O/Y* (2SA985A-Q/R)
★★	Q402	2SB750A
★★	Q303, Q304	2SC1740S (2SC2603)
★★	Q201, Q202	2SC2238–O/Y* (2SC2275A-Q/R)
★★	Q301, Q302	2SC2705
	Q401, Q403	2SD836A
★★	Q305	2SD438–F
★★	Q404	2SD438

*hfe of Q201 - Q204 should have the same value.

Mark	Symbol & Description	Part No.
★	D201 – D204	KZL056
★	D305	KZL140
⚠ ★	D401	RB602
★	D406, D407	RD16EB (HZ16EB)
★	D408	RD18EB (HZ18EB)
★	D207 – D210	RD2.7EB (HZ2.7EB)
★	D404	RD22EB (HZ22EB)
★	D409	RD27EB (HZ27EB)
⚠ ★	D402, D403	S5566 (11E2)
⚠ ★	D410, D411	30D2FC
★	D412	US1035 (1S1555)
★	D205, D206, D211, D212, D308, D309	1S2471

COILS & TRANSFORMER

Mark	Symbol & Description	Part No.
	L301, L302	ATH-053
⚠ ★	T401 (Heater transformer)	ATS-140

RELAY

Mark	Symbol & Description	Part No.
	RY301	ASR-107 (ASR-109)

CAPACITORS

Mark	Symbol & Description	Part No.
	C401, C402 (6800/71V)	ACH-265
	C203, C204, C219 – C222	CCDSL 101J 50
	C207 – C210	CCDSL 101K 500
	C103, C104, C215, C216	CCDSL 151J 50
	C211 – C214	CCDSL 680J 50
	C301, C302	CEANP 2R2M 50
	C309	CEAR 47M 100L
	C403, C404	CEA 4R7M 50L
	C113, C114, C405, C406	CEA 100M 50L
	C105, C106	CEA 101M 10L
	C308	CEA 101M 25L
	C223, C224	CEA S221M 35
	C416	CEA 101M 50L
	C111, C112	CEA 2R2M 50L
	C409 – C411, C414	CEA 470M 25F
	C412	CEA 470M 50L
	C307	CEA 471M 6L
	C201, C202	CEXA 100M 50
	C205, C206	CEXA 101M 25
	C101, C102	CEXA 2R2M 50
	C413	CKDYB 222K 50
	C407, C408	CKDYB 222K 500
	C310, C311	CKDYB 332K 50
	C415	CKDYF 473Z 50
	C115	CKDYF 103Z 50
	C217, C218	CMA 020D 500
	C303 – C306	CQMA 104K 50
	C107, C108	CQMA 222J 50
	C419, C420	CQMA 473K 50
	C109, C110	CQMA 822J 50

RESISTORS

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

Mark	Symbol & Description	Part No.
	R243 – R246 (0.22 Ω 2W)	ACN-131
⚠	R404, R406	RD1/4PMFL 100J
	R408	RD1/4PMFL4R7J
	R205 – R212, R217, R218, R227, R228, R231 – R234, R305, R306	RD1/4PM □□□J
⚠	R311, R312, R413, R414	RFA1/4PS 100J
⚠	R310	RFA1/4PS 101J
⚠	R239, R240, R241	RFA1/4PS 221J
⚠	R235 – R238, R403	RFA1/4PS 4R7J
⚠	R410	RFA1/4PS 471J
	R317, R318	RS1PMF 151J
	R315, R316	RS1PMF 181J
	R314	RS1PMF 272J
	R313	RS1PMF 332J
	R401	RS1PMF 682J
	Other Resistors	RD1/8PM □□□J
	R412	RD1/4PMF470J (SI-A3401B)

OTHERS

Mark	Symbol & Description	Part No.
	Terminal 4P	AKB-094
	Terminal 6P	AKB-095
	4P Speaker Terminal	AKE-104
	Transistor Socket	AKH-017
	Screw	PBZ30P060FMC

Driver Assembly (GWY-139)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q507, Q508	2SA1145
★★	Q501, Q502	2SA979
★★	Q503 – Q506	2SC1845
★	D501 – D508	US1035

CAPACITORS

Mark	Symbol & Description	Part No.
	C503, C504	CMA 101J 500
	C505, C506	CQMA 222J 50

RESISTORS

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

Mark	Symbol & Description	Part No.
⚠	R519, R520	RD1/4PMFL 272J
⚠	R511, R512	RFA1/4PS 271J
⚠	R513, R514	RFA1/4PS 820J
	Other Resistors	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	9P Socket	AKP-046

HEADPHONES ASSEMBLY

Mark	Symbol & Description	Part No.
	Headphones Jack	AKN-049

CONTROL ASSEMBLY A (GWG-189)

SEMI-CONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC401	PD6027
★★	IC101	TC9177P
★★	Q404, Q406, Q403	RN1203
★★	Q402	RN2203
★★	Q401	2SA933S (2SA1115)
★★	Q405	2SC1740S (2SC2603)
★★	Q101, Q102	2SC2878
★	D401	AEL-437
★	D405	KZL083
★	D403, D404, D406 – D426	US1035 (1S1555)

CAPACITORS

Mark	Symbol & Description	Part No.
	C403 (10/100V)	ACH-902
	C404, C405	CCDCH 270J 50
	C105, C106	CCDSL 151J 50
	C406, C401	CEAR 22M 50L
	C107 – C110, C113, C114	CEA 100M 50L
	C402	CEA 3R3M 50L
	C111, C112	CEA 4R7M 50L
	C408	CEA 470M 10L
	C407	CKDYF 103Z 50
	C101, ~~C102~~	CKDYF 473Z 50
	C102	CEA10/M25L (SI-A39018)
	C103, C104	CQMA 333K 50
	C409, C410	CCDSL 221J 50
	C115	CKDYB 471K 50

RESISTORS

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

Mark	Symbol & Description	Part No.
	R438	RD1/4PM 103J
	Other Resistors	RD1/8PM □□□J
	R115	~~RD1~~/4PM100J

OTHERS

Mark	Symbol & Description	Part No.
★	X401 (Resonator)	ASS-034

Control Assembly B (GWG-192)

SEMI-CONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC802, IC803	HA12010
★★	IC503, IC504	M54562P
★★	IC201, IC202, IC601	NJM4558DXC
★★	IC502	PD0012
★★	IC801	TA7318P
★★	IC501	TD62504P
★★	Q503	RN1203 (2SC3400)
★★	Q504	RN2203 (2SA1346)
★★	Q502	2SA1115 (2SA933S)
★★	Q801, Q802	2SC1740S
★★	Q701, Q702	2SC2240 (2SC2240)
★★	Q501	2SD438
★	D503 – D507, D702	AEL-370
★	D502	AEL-404
★	D501	KZL061
★	D701	RD15EB (HZ15EB)

SWITCHES

Mark	Symbol & Description	Part No.
★★	S501 – S513 Tact switch	ASG-704
★★	S701 Push switch	SEAV 2S

CAPACITORS

Mark	Symbol & Description	Part No.
	C605	CCDSL 181J 50
	C209, C210	CCDSL 270J 50
	C201, C202	CCDSL 680J 50
	C211, C212	CEA 2R2M 50L
	C601	CEJANL 0R1M 50
	C604	CEJANL 2R2M 50
	C603, C704	CEJANL 4R7M 50
	C804	CEJAR 47M 50
	C805, C806	CEJA 0R1M50
	C801	CEJA 330M 25
	C217	CEXA 100M 50
	C701	CEA 4R7M 50
	C203, C204	CEXA 100M 50
	C703	CKDYB 331K 50
	C802, C803	CKDYB 332K 50
	C218, C606	CKDYF 103Z 50
	C501	CKDYX 473M 25
	C205, C206	CQMA 122K 50
	C702	CQMA 123K 50
	C215, C216	CQMA 124K 50
	C213, C214	CQMA 273K 50
	C602	CQMA 103K 50
	C207, C208	CQMA 562K 50

RESISTORS

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

Mark	Symbol & Description	Part No.
★	VR202, VR203 (BASS TREBLE)	ACX-129
★	VR201 (MIC MIXING)	ACX-130
	R801	RD1/2PM 122J
	R507	RD1/2PM 681J
⚠	R502	RFA1/4PS 4R7J
★	VR801, VR802 (semi-fixed)	VRTB6VS 222
	R701	RD1/4PM □□□J
	Other Resistors	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
★	V501	AAV-030

MICROPHONE JACK ASSEMBLY

Mark	Symbol & Description	Part No.
	Microphone jack Assembly	AKN-052

Mini-Jack Assembly

SEMI-CONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q301	2SC1740S
★	D301 – D305	US1035

SWITCH

Mark	Symbol & Description	Part No.
★★	S301 Slide switch (W-S)	ASH-031

RESISTORS

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

Mark	Symbol & Description	Part No.
	All resistors	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	Mini-jack	AKN-202

Power Supply Assembly A (GWR-215)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q1, Q3	2SC2362
★★	Q2, Q4	2SA1016
★	D1 – D4	S5566
★	D5, D6	US1035 (1S1555)
⚠ ★	D7	RB602
★	D8, D9	KZL110

CAPACITORS

Mark	Symbol & Description	Part No.
⚠	C1 (0.01/150 V)	ACG-019
⚠	C2, C3 (4700/35V)	ACH-253
	C10, C11	CKDYB 391K 50

RESISTORS

Mark	Symbol & Description	Part No.
	R1, R4, R9, R12	RD1/8PM 223J
	R2, R3, R10, R11	RD1/8PM 103J
⚠	R5, R8	RD1/4PMF 102J
⚠	R6, R7	RFA1/4PS 100J

Power Supply Assembly B

SEMI-CONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q5	2SA968(A)-O/Y (2SA985-Q/R)
★★	Q6	2SC2238(A)-O/Y (2SC2275-Q/R)
★	D10 – D13	CTU-21S/A/

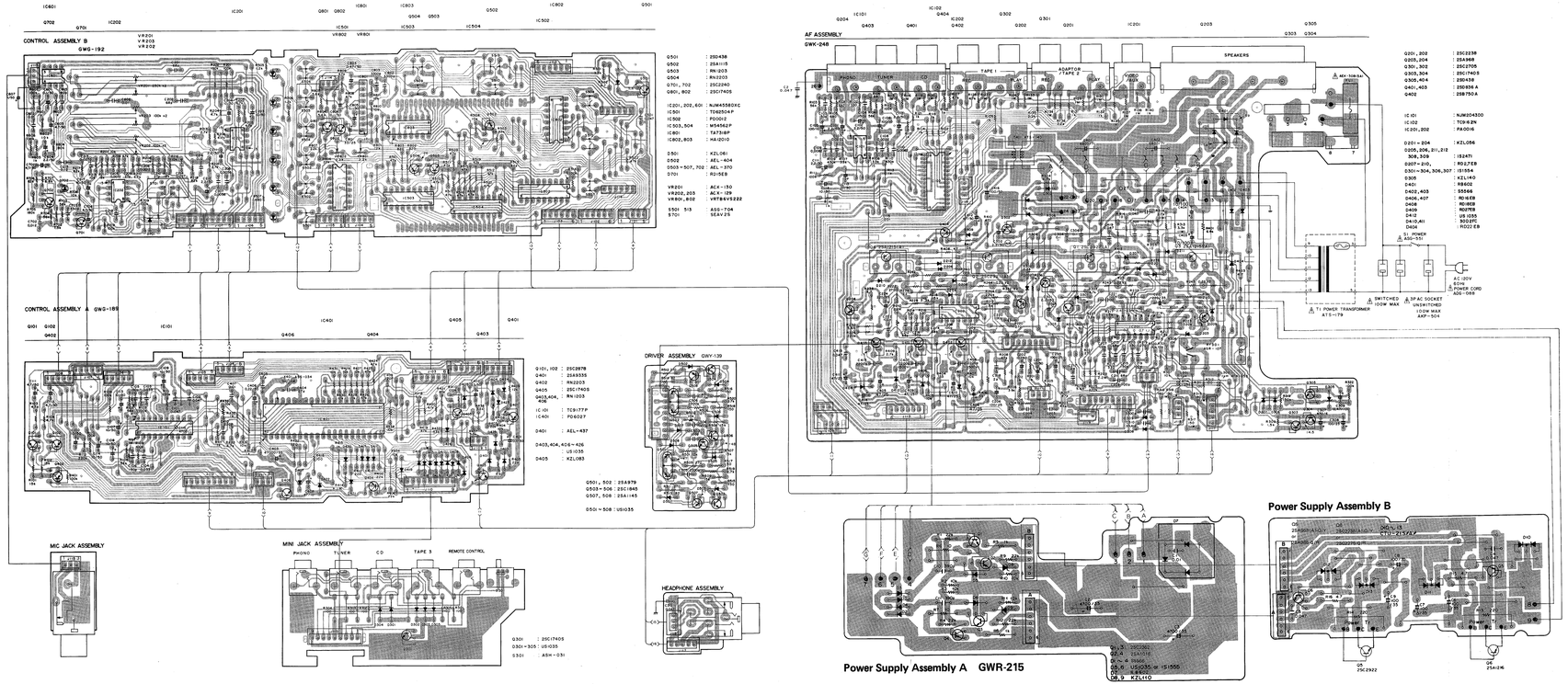
CAPACITORS

Mark	Symbol & Description	Part No.
	C6 – C9	CEA 101M 35L
	C4, C5	CKDYF 473Z 50

RESISTORS

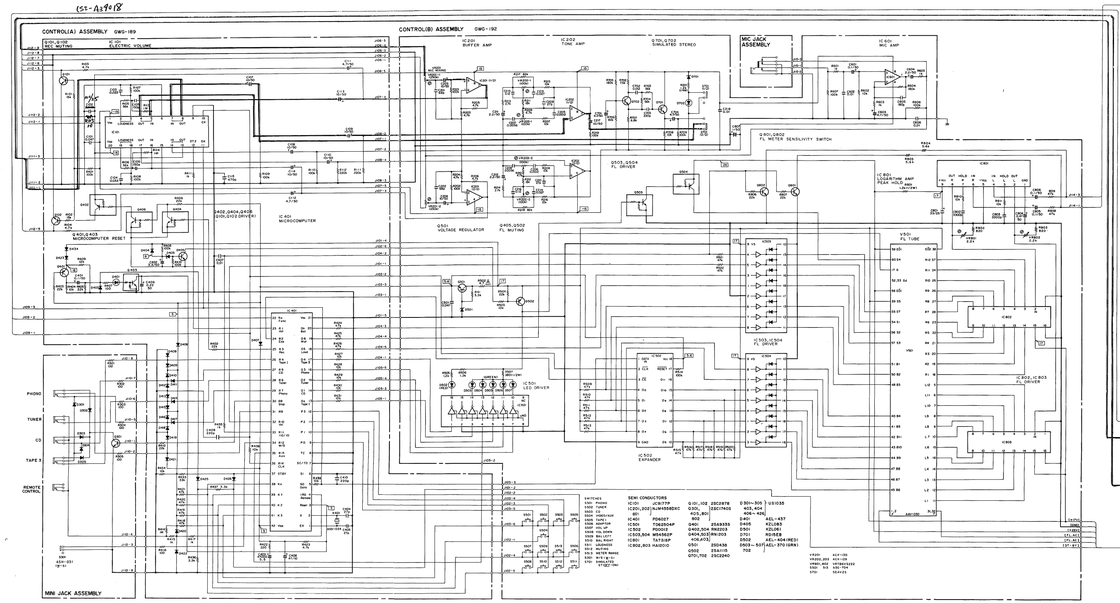
Mark	Symbol & Description	Part No.
⚠	R13, R14	RFA1/4PS 221J
⚠	R15, R16	RFA1/4PS 4R7J

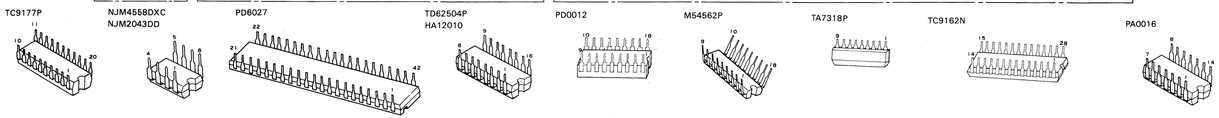
9. P.C.BOARDS CONNECTION DIAGRAM

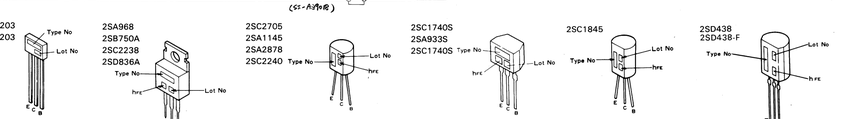


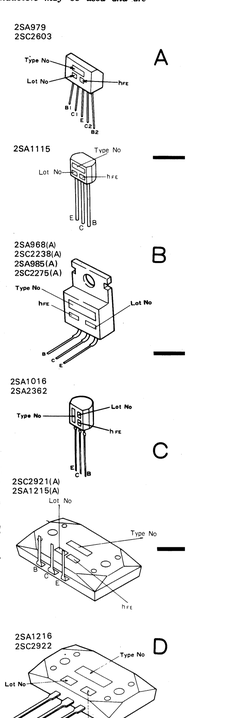
10. SCHEMATIC DIAGRAM

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





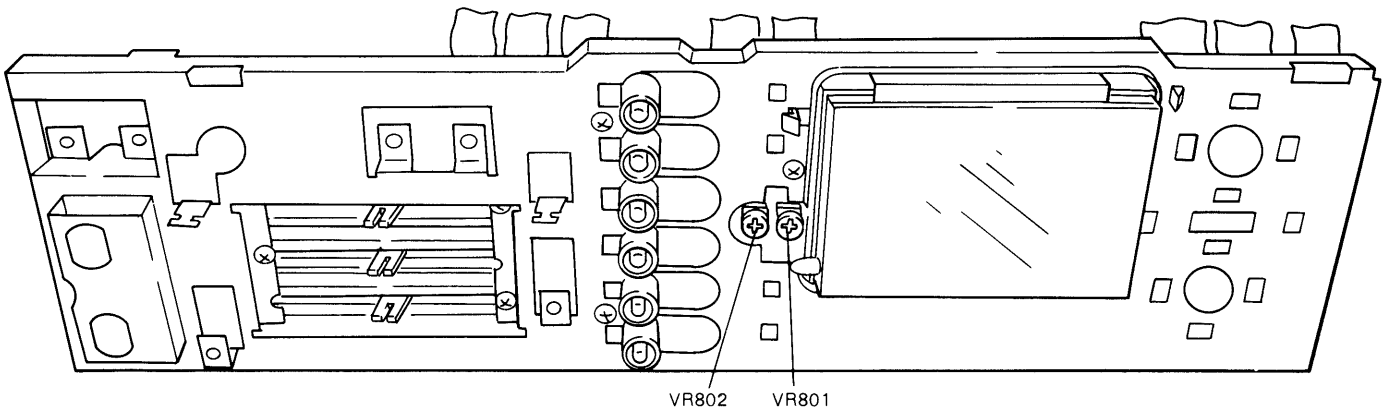




11. ADJUSTMENTS

Meter Sensitivity Adjustment

1. Remove the front panel.
2. With a meter range of 110W, apply a 1kHz sine-wave signal to the AUX input terminals, and adjust the input level to obtain a voltage of 16.4V at the output terminals.
3. Adjust VR801 (right channel) and VR802 (left channel) so that 11 points light up in the level meter without 12 points (maximum number of points) lighting up.
4. Then with the meter range set to 10W, check that all 12 points light up.



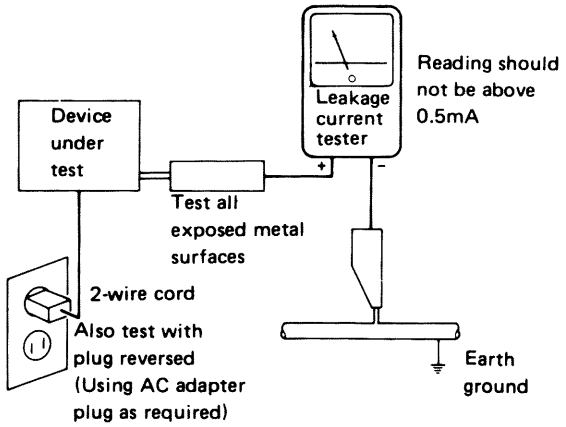
12. SAFETY INFORMATION

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 dose 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.