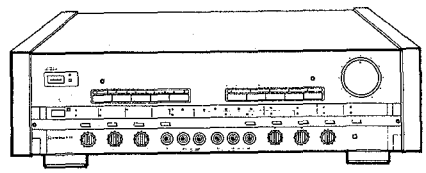
PIONEER®

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS



ORDER NO.
ARP1205-A

STEREO CONTROL AMPLIFIER

C-90(BK)

- This service manual is applicable to the C-90 (BK)/S/G and KU types.
- As to the KU type please refer to page 49.
- The video circuit and remote control circuit are build in on the C-90 (BK)/KU, S/G types.

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1. SPECIFICATIONS

Amplifier section

Rated power
20 Hz—20 kHz, 0.01% ..... 8 V
Harmonic distortion
20 Hz—20 kHz, 1 V 0.002%
Cross modulation distortion
(50 Hz: 7 kHz = 4 : 1, 1 V) 0.002%
Input terminals (sensitivity/impedance)
PHONO MM ..... 2.5 mV/50 kΩ
PHONO MC ..... 250 μV/40 Ω
125 μV/3 Ω
TUNER, CD, TAPE PLAY, ADAPTOR ..... 150 mV/50 kΩ
Output terminals (output level/output impedance)
TAPE REC ..... 150 mV/1 kΩ
PRE OUT ..... 1 V/600 Ω
Frequency response
PHONO MM 20 Hz—20 kHz ..... ±0.2 dB
TUNER, CD, AUX, 20 Hz—20 kHz ..... +0 dB
−0.1 dB
Tone control
BASS ..... ±9 dB, 100 Hz
TREBLE ..... ±9 dB, 10 kHz
Filter
LOW (SUBSONIC) ..... 7 Hz, 6 dB/oct
HIGH ..... 10 kHz, 6 dB/oct
MUTING ..... −20 dB
SN ratio (short-circuit, A network)
PHONO MM ..... 96 dB
PHONO MC ..... 86 dB
TUNER, CD, TAPE PLAY, ADAPTOR ..... 109 dB

Video section

Video (Base Band)
Input terminals (sensitivity/impedance)
VDP, VCR 1, 2, 3, ADAPTOR, TV TUNER
..... 1 Vp-p/75 Ω unbalanced
Output terminals (Output level/impedance)
VCR 1, 2, 3, ADAPTOR, REC MONITOR
..... 1 Vp-p/75 Ω unbalanced
DG 2%
DP ..... 2°
Frequency response 10 Hz — 10 MHz ..... +0 dB
−3 dB
Noise level ..... −60 dB or less
Sharpness 2 MHz ..... +6 dB
Detail 0.5 MHz ..... ±3dB
Maximum input level ..... 2 Vp-p

Power section, other

Power requirements
U.S. model ..... AC 120 V, 60 Hz
Other models ..... ~AC 110 V/120 V/220 V/240 V
(switchable), 50/60 Hz
Power consumption
U.S. model ..... 40 W
Other models ..... 40 W
AC outlets
Power switch linked ..... 500 W
Power switch linked (x 2: remote control lable)
..... 500 W
External dimensions ..... 457(W) x 405(D) x 125(H) mm
18 (W) x 16 (D) x 5 (H) in
Weight ..... 9.7 kg
(21 lb 6 oz)

Accessories

Remote control unit 1
Batteries (R03/UM-4) 2
Pin-plug cord 1
Operating Instructions 1

The specifications and appearance noted above are subject to change without notice due to improvements.

2. FRONT PANEL FACILITIES

FRONT PANEL

VIDEO INPUT selector switch/indicator

Use to select the video component for playback.

[VDP]— To play back the video disc player connected to the rear panel VDP terminals.

[VCR 1]— To play back the VCR connected to the rear panel VCR 1 terminals.

[VCR 2]— To play back the VCR connected to the front panel VCR 2 terminals.

[VCR 3]— To play back the VCR connected to the rear panel VCR 3 terminals.

[TV tuner]—To use the TV tuner connected to the rear panel TV TUNER terminals.

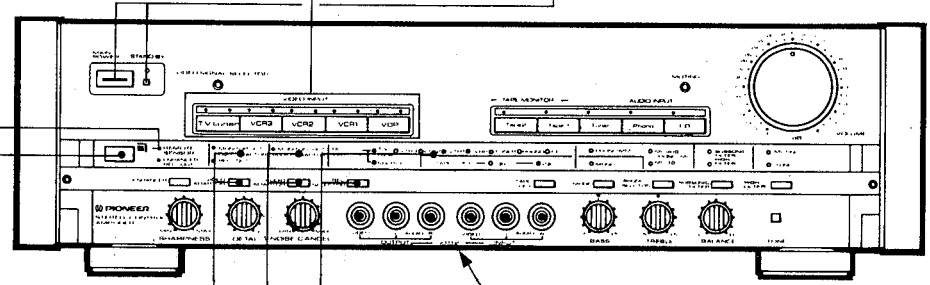
The red indicators light during audio playback, while the green indicators light during video playback.
This switch is interlocked with the AUDIO INPUT selector.

MAIN POWER switch

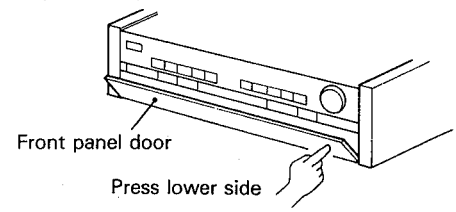
STAND-BY switch/indicator

- When the power switch is in the ON position, power can be turned ON/OFF to the amplifier and to the rear panel REMOTE CONTROL power outlets.
- Power is turned ON/OFF alternately with each press of the switch; when in the OFF (stand-by) position, the indicator will light (when in the ON position, the indicator will flash, then go out).
- The accessory remote control unit can be used to turn this switch ON/OFF, with the result that the remote con trol unit can be used from the listening position to control power not only to the amplifier, but also to those components connected to the rear panel REMOTE CONTROL power outlets.
- When not using the amplifier for an extended period of time, be sure to set the main power switch to the OFF position.

REMOTE SENSOR/indicator



To open front panel door



AUDIO ADAPTOR switch/indicator

Normally leave in the OFF position.
Set to ON when using the audio adaptor component connected to the rear panel adaptor terminals AUDIO IN/OUT (indicator lights).

REC SELECTOR switch/indicator

Use to select the playback source component used when performing audio and video recording on VCR's 1, 2, and 3. The audio and video signals (in the case of a video component), or audio signals (in the case of an audio component) from the selected component will be output from the VCR 1,2,3 REC terminals. When set to SOURCE, the signals selected with the audio or video input selector switch will be output.
When performing video recording, the built-in enhancer function can be used to enhance the quality of the recorded video signals (see the instructions regarding the enhancer switch and picture enhancement). The enhanced picture can be monitored on the color monitor connected to the rear panel REC MONITOR terminal.

VIDEO ADAPTOR switch/indicator

Set to the ON position when using the component connected to the rear panel ADAPTOR terminals VIDEO IN and OUT.
MONITOR OUT lights:
The image enhanced with the adaptor component can be played back on the color monitor or TV connected to the MONITOR OUT terminal or RF MODULATOR terminal.
REC OUT lights:
The image enhanced with the adaptor component can be played back on the color monitor connected to the REC MONITOR terminal or the VIDEO OUT terminal of VCR 1—3.

NOTE:
No signal is output to the REC terminal of the input component selected with the recording selector switch. For example, when REC SELECTOR is used to select VCR 1, no signal will be output to the REC terminal of VCR 1.

VIDEO SIGNAL SELECTOR switch

Use to switch the video component's video signal regardless of the position of the input selector switch. The video indicators (green) above the input selector switch will light in order.
Even when listening to an audio component (record player, tuner, etc.), this switch can be used to perform video recording and playback while continuing to listen to the audio component playback.

AUDIO INPUT selector switch/indicator.

Use to select the audio component for playback (the indicator will light).
[CD]: For compact disc player.
[Phono]: For turntable.
[Tuner]: For listening to FM/AM broadcasts with a tuner.
[Tape 1]: To use the tape deck connected to the rear panel Tape 1 terminals.
[Tape 2]: To use the tape deck connected to the rear panel Tape 2 terminals.

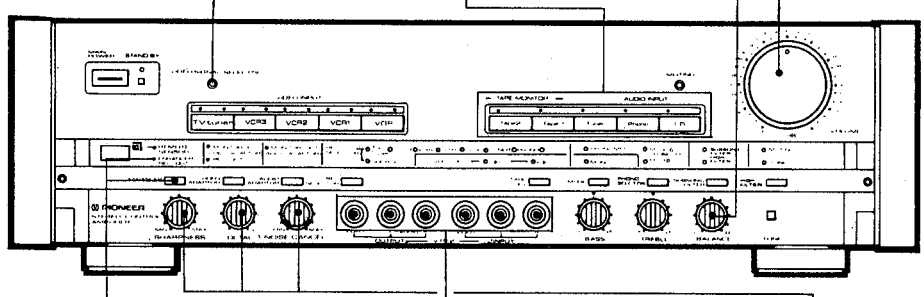
The Tape 1 and Tape 2 switches go ON or OFF alternately each time they are pressed, independently of the other switches.

BALANCE control

Normally leave in the center position. Use to adjust the balance of sound from right and left channels.

VOLUME control

Use to adjust the sound volume. At the [∞] position, sound will not be heard, while at the [0] position, sound volume will be at its maximum.



Video compensation controls

Use these compensation controls after pressing the ENHANCER switch so that the indicator lights.
[SHARPNESS]: Use to sharpen hazy image contours.
[DETAIL]: Use to compensate for flat image detail.
[NOISE CANCEL]: Use to reduce noticeable video noise.

The video image compensated with these controls can be viewed on a TV monitor connected to the rear panel REC MONITOR or MONITOR OUT terminals.

ENHANCER switch/indicator

When performing VCR recording, the built-in enhancer allows you to compensate the recorded picture quality. Press the switch so that the indicator lights, then adjust the image quality using the video compensation controls.

VCR 2 front panel terminals

Use to connect a second video cassette recorder.
[INPUT]
VIDEO: For video input (connect to VCR's video output terminal).
AUDIO: For audio input (connect to VCR's audio output terminals).
[OUTPUT]
VIDEO: For video output (connect to VCR's video input terminals).
AUDIO: For audio output (connect to VCR's input terminals).

NOTE:

- *When using the video compensation controls, perform compensation based on the quality of the playback image. If too much compensation is applied, black and white stripes may appear in contour areas. As a result, the image should be adjusted to the optimum quality while viewing the results on a color TV monitor connected.*
- *To view the enhanced image on the color monitor connected to the MONITOR OUT terminal, select the playback source with the recording selector switch, and use the video input selector switch to select the component being used for video recording.*

TAPE COPY switch/indicator

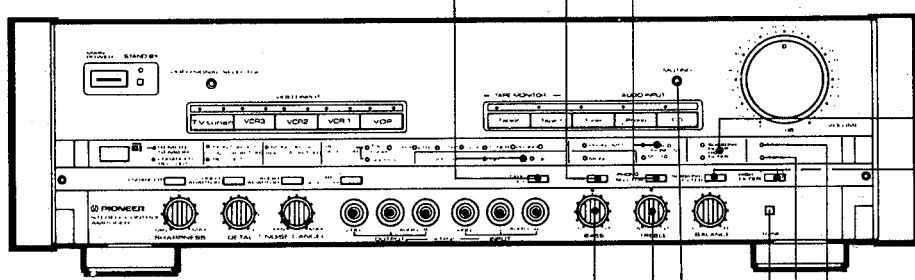
Use when performing tape copying between the tape decks connected to the TAPE 1, and TAPE 2 terminals.
1►2: To copy the Tape 1 playback onto Tape 2.
2►1: To copy the Tape 2 playback onto Tape 1.

Cartridge selector switch/indicator (PHONO SELECTOR):

Set in accordance with the type of cartridge used on your record player (the corresponding indicator will light).
[MM]——— Set here when using a moving magnet cartridge, or a high-output (1mV or more) moving coil (MC) cartridge.
[MC 40 Ω]—— Set here when using a moving coil cartridge with impedance of 40 ohms.
[MC 3 Ω]——— Set here when using a MC cartridge with impedance of 3 ohms.

MODE selector switch

Use to select the stereo or monaural audio playback mode. Normally, this switch is not used.
When the monaural playback mode is selected, press this switch; the MODE MONO indicator will light.



TONE switch/indicator

[ON]— The TONE indicator lights, and audio inputs from all components are played back after passing through the tone control circuits. In this condition, the tone controls (BASS, TREBLE) can be used to adjust sound quality.
[OFF]— The TONE indicator goes out, and signals are played back without passing through the tone control circuits.

MUTING switch/indicator

Use to temporarily reduce the sound volume to 1/10th normal. The muting function is on when the MUTING indicator lights. Press the switch again to turn the muting function off and return the sound volume to the normal level.

Tone controls

These controls can be used only when the TONE indicator is lighted.
[BASS]— Use to adjust low frequency sounds. The central [0] indicates the standard (flat) position. When the control is rotated to the right, low-frequency sounds are augmented; when rotated to the left, low-frequency sounds are attenuated.
[TREBLE]— Use to adjust high-frequency sounds. The central [0] indicates the standard (flat) position. When the control is rotated to the right, high-frequency sounds are augmented; when rotated to the left, high-frequency sounds are attenuated.

SUBSONIC FILTER switch/indicator

When the switch is pressed to the ON position, the indicator lights and the subsonic filter acts to cut out all frequencies below 7 Hz.

HIGH FILTER switch/indicator

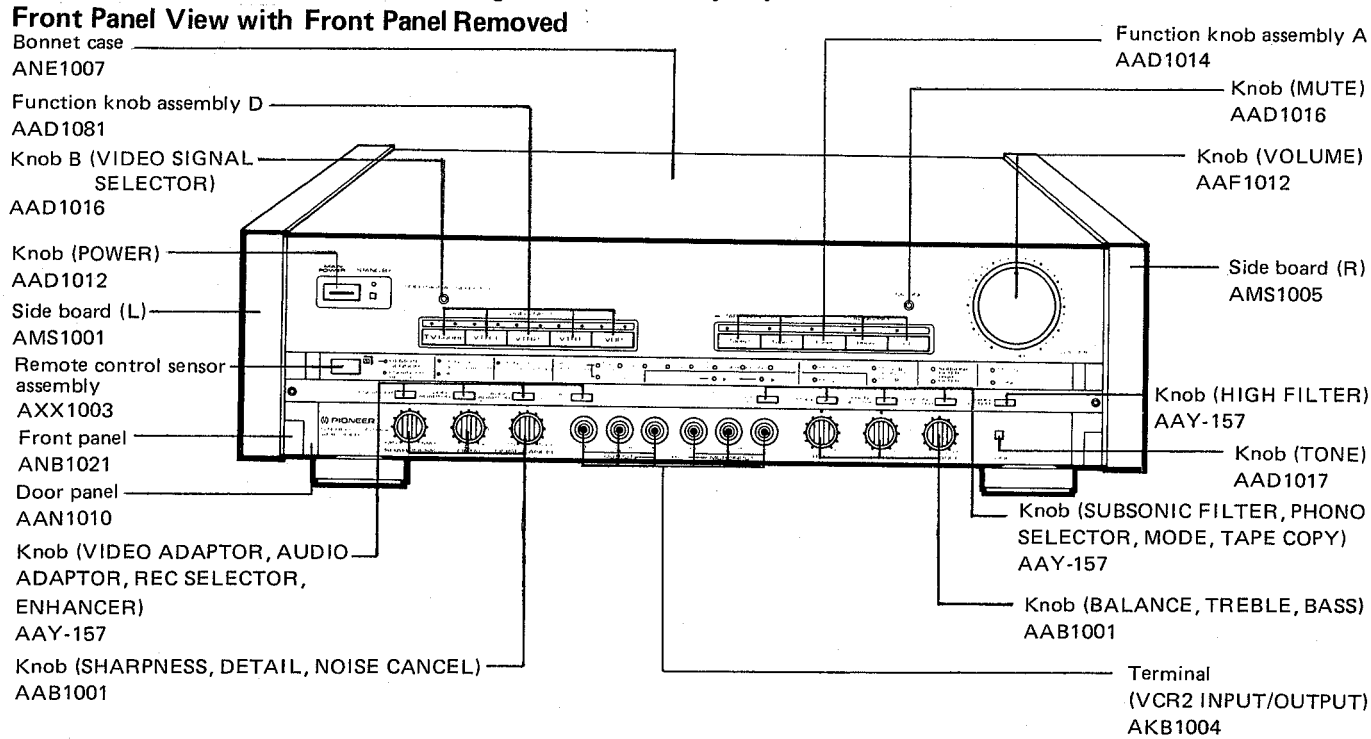
When the switch is pressed to the ON position, the indicator lights and the high-cut filter acts to eliminate all frequencies above 10 kHz.

3. PARTS LOCATION

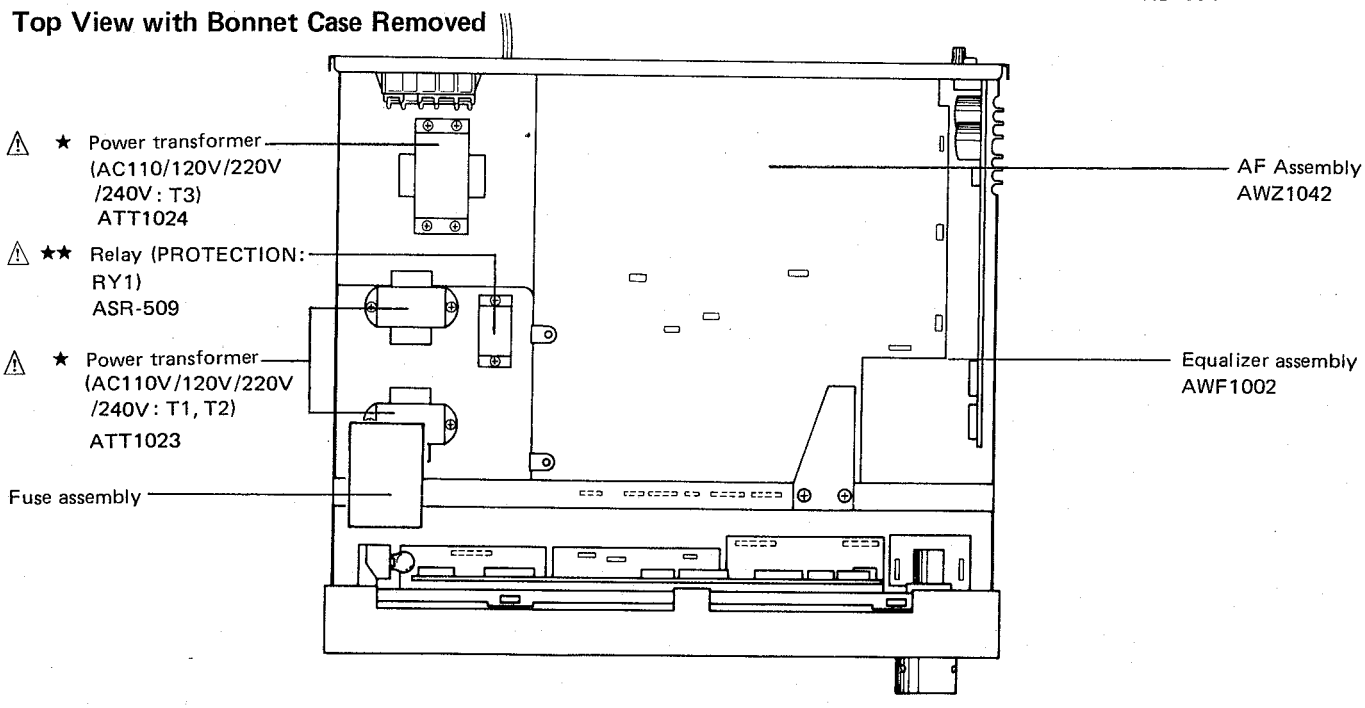
NOTES:

- *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.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

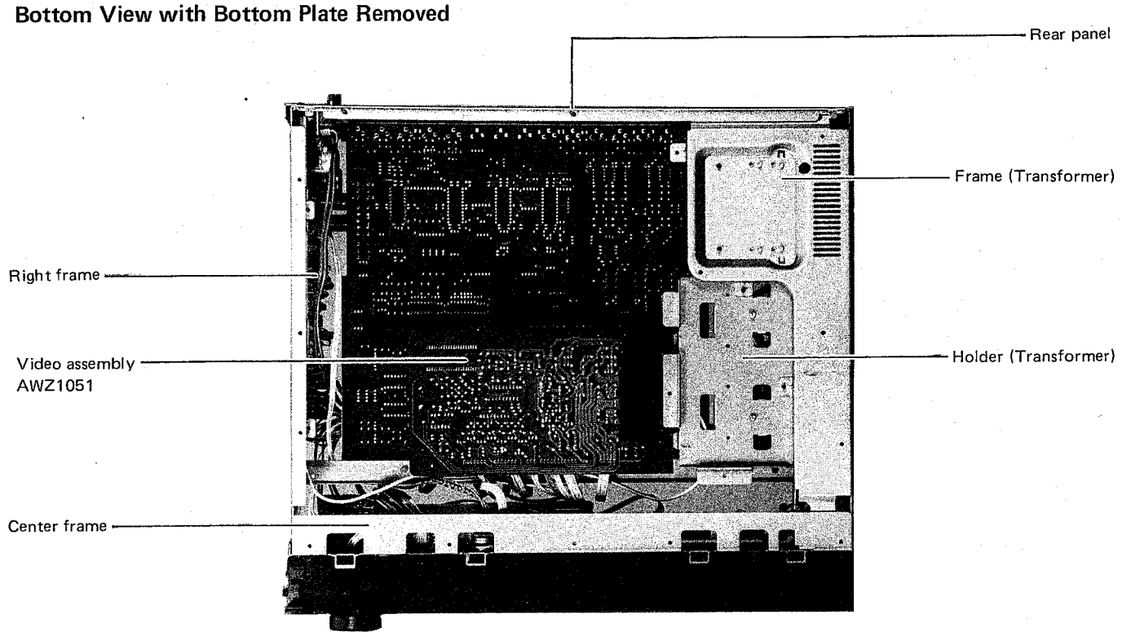
Front Panel View with Front Panel Removed



Top View with Bonnet Case Removed



Bottom View with Bottom Plate Removed

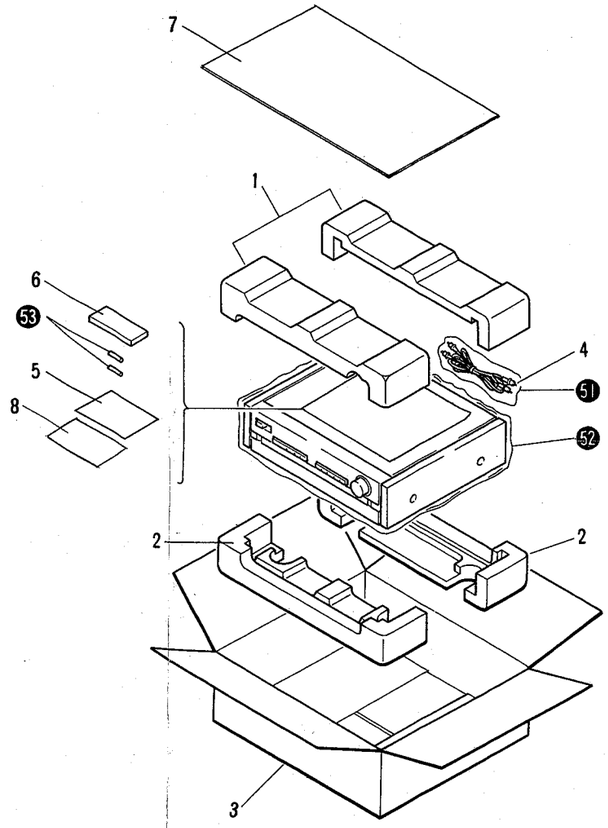


Rear Panel View

4. PACKING

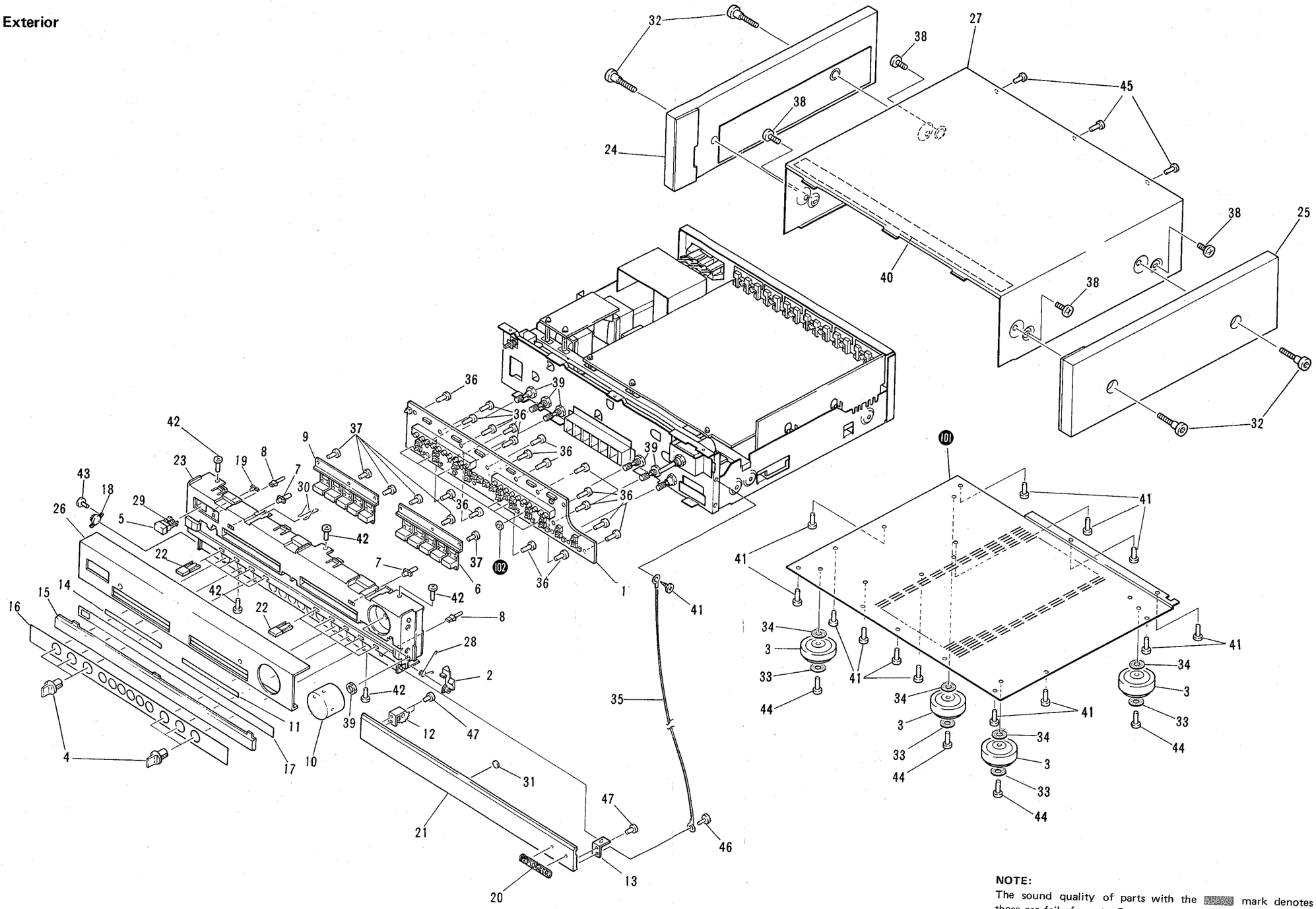
Parts List of Packing

Mark	No.	Part No.	Description
	1	AHA1003	Top pad
	2	AHA1004	Bottom pad
	3	AHD1121	Packing case
	4	ADE1013	Connection cord with plug
	5	ARB1034	Operating instruction
	6	AXD1009	Remote control unit
	7	AHB1008	Spacer
	8	ARH1030	Note sheet
	51		Vinyl bag
	52		Sheet
	53		Battery



EXPLODED VIEWS AND PARTS LIST

Exterior



NOTE:
The sound quality of parts with the ▒▒▒ mark denotes that these are failsafe parts. Be sure that the designated parts are in the positions prescribed.

s List of Exterior

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.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

No.	Part No.	Description
1	AWZ1056	Switch A assembly
2	AMR1020	Hook
3	AMR1047	Leg assembly
4	AAB1001	Knob (BALANCE, TREBLE, BASS, SHARPNESS, DETAIL, NOISE CANCEL)
5	AAD1012	Knob (POWER)
6	AAD1014	Function knob assembly (A)
7	AAD1016	Knob (MUTE, VIDEO SIGNAL SELECTOR)
8	AAD1017	Knob (TONE, LOUDNESS)
9	AAD1081	Function knob assembly (D)
10	AAF1012	Knob (VOLUME)
11	AAK1023	Indicator sheet A
12	AAK1024	Arm L
13	AAK1025	Arm R
14	AAK1061	Indicator sheet C
15	AAK1139	Acrylic panel
16	AAK1137	Hear sheet
17	AAK1138	Sheet panel
18	ANZ-255	Dumper assembly
19	AAK1075	Lens
20	AAM1001	Name plate
21	AAN1010	Door panel
22	AAY-157	Knob (ADAPTOR, TAPE COPY, MODE, PHONO SELECTOR, SUBSONIC FILTER, HIGH FILTER, VIDEO, AUDIO, REC SELECTOR, ENHANCER)
23	AMB1049	Panel base
24	AMS1001	Side board L
25	AMS1005	Side board R
26	ANB1021	Front panel
27	ANE1007	Bonnet case
28	ABH1004	Hook spring
29	ABH1005	Coil spring
30	ABH1011	Earth spring
31	AED1008	Door cushion
32	ABA1002	Decorative screw
33	ABE1002	Washer
34	ABE1005	Washer
35	ADH1003	Wire (EARTH)

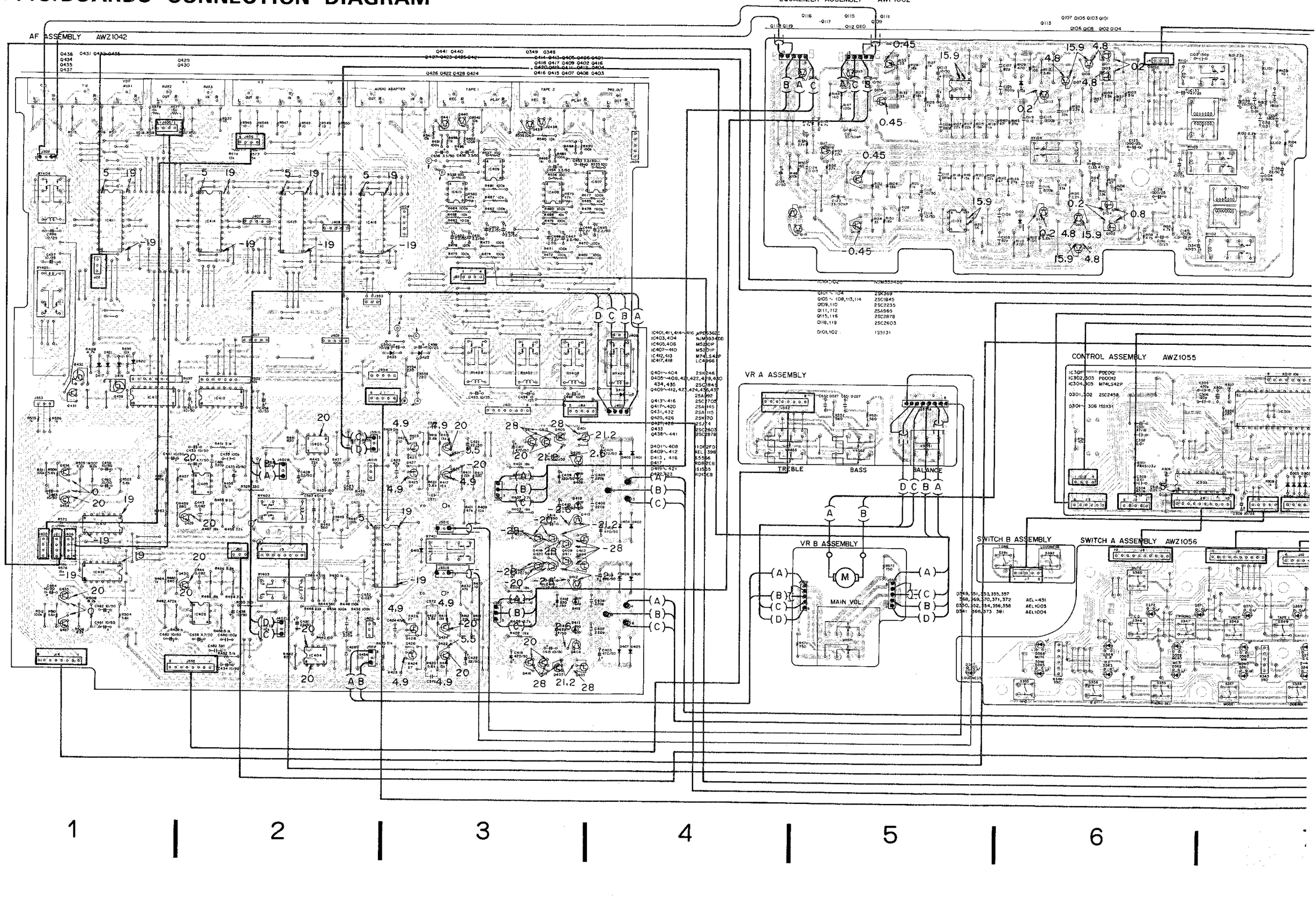
Key	No.	Part No.	Description
	36	BBZ26P080FMC	Screw
	37	BBZ30P080FZK	Screw
	38	FBT40P080FZK	Screw
	39	NK90FUC	Nut
	40	AED1007	Sheet
	41	ABA1009	Screw
	42	ABA1011	Screw
	43	PTZ20P060FMC	Screw
	44	ABA1007	Screw
	45	ABA1006	Screw
	46	PMZ30P060FZB	Screw
	47	PMZ30P050FZB	Screw
	101		Bottom plate
	102		Spacer ring

Parts List of Interior

Mark	No.	Part No.	Description
	1	AWZ1042	AF assembly
	2	AWZ1051	VIDEO assembly
	3	AWZ1055	Control assembly
⚠	4	ACG-502	Capacitor (C1~C3) (POWER, 0.01/400V)
⚠ ★	5	ATT1023	Power transformer (T1, T2) (AC110V/120V/220V/240V)
⚠ ★	6	ATT1024	Power transformer (T3) (AC110/120V/220V/240V)
	7	AKM-050	Short pin plug
⚠	8	AKP-515	AC socket (AC OUTLET, 3P)
⚠ ★★	9	ASG-553	Switch (POWER, S1)
⚠ ★★	10	ASR-509	Relay (RY1, PROTECTION)
	11	AXX1003	Remote control sensor assembly
	12	.....	.....
⚠	13	AEP-113	Strain relief
	14	AWF1002	Equalizer assembly
	15	AAK1071	Blind sheet
	16	ABA1004	Screw
	17	ABA1006	Screw
	18	.....	.....
	19	ABA1009	Screw
	20	.....	.....
	21	ABE1001	Washer
	22	.....	.....
	23	ABN-028	Nut
	24	ABN-050	Boss
⚠	25	ADG-077	AC power cord
	26	.....	.....
	27	.....	.....
	28	.....	.....
	29	NK70FUC	Nut
	30	NK90FUC	Nut
	31	.....	.....
	32	.....	.....
	33	.....	.....
	34	VMZ30P060FCU	Screw
	35	WA33F120K050	Washer
	36	WG70FUC	Washer
⚠ ★★	37	AKX-507	Line voltage selector (S2) (110V/120V/220V/240V)
⚠ ★★	38	AKX1004	Line voltage selector (S3) (110V—120V/220V—240V)
	39	ANG1077	Terminal holder
	40	ACN1010	Wire wound resistor (R1, 56Ω/10W)
★	41	S5566	Diode (D1)

Mark	No.	Part No.	Description
	101		VR A assembly
	102		VR B assembly
	103		Fuse assembly
	104		Terminal assembly
	105		VR assembly
	106		SW B assembly
	107		Cushion rubber
	108		Terminal (EARTH)
	109		Transformer frame
	110		Right frame
	111		Rear panel
	112		Panel stey
	113		P.C.B. holder
	114		Transformer holder
	115		Volume holder
	116		Lead wire
	117		Center frame
	118		Shield cover
	119		Damper plate A
	120		Damper plate B
	121		P.C.B. holder B
	122		Cushion rubber
	123		P.C.B. support
	124		Pin grommet
	125		P.C.B. support
	126		P.C.B. holder C

6. P.C.BOARDS CONNECTION DIAGRAM



VIDEO ASSEMBLY AWZ1051

TERMINAL ASSEMBLY

REMOTE CONTROL SENSOR ASSEMBLY

VR ASSEMBLY

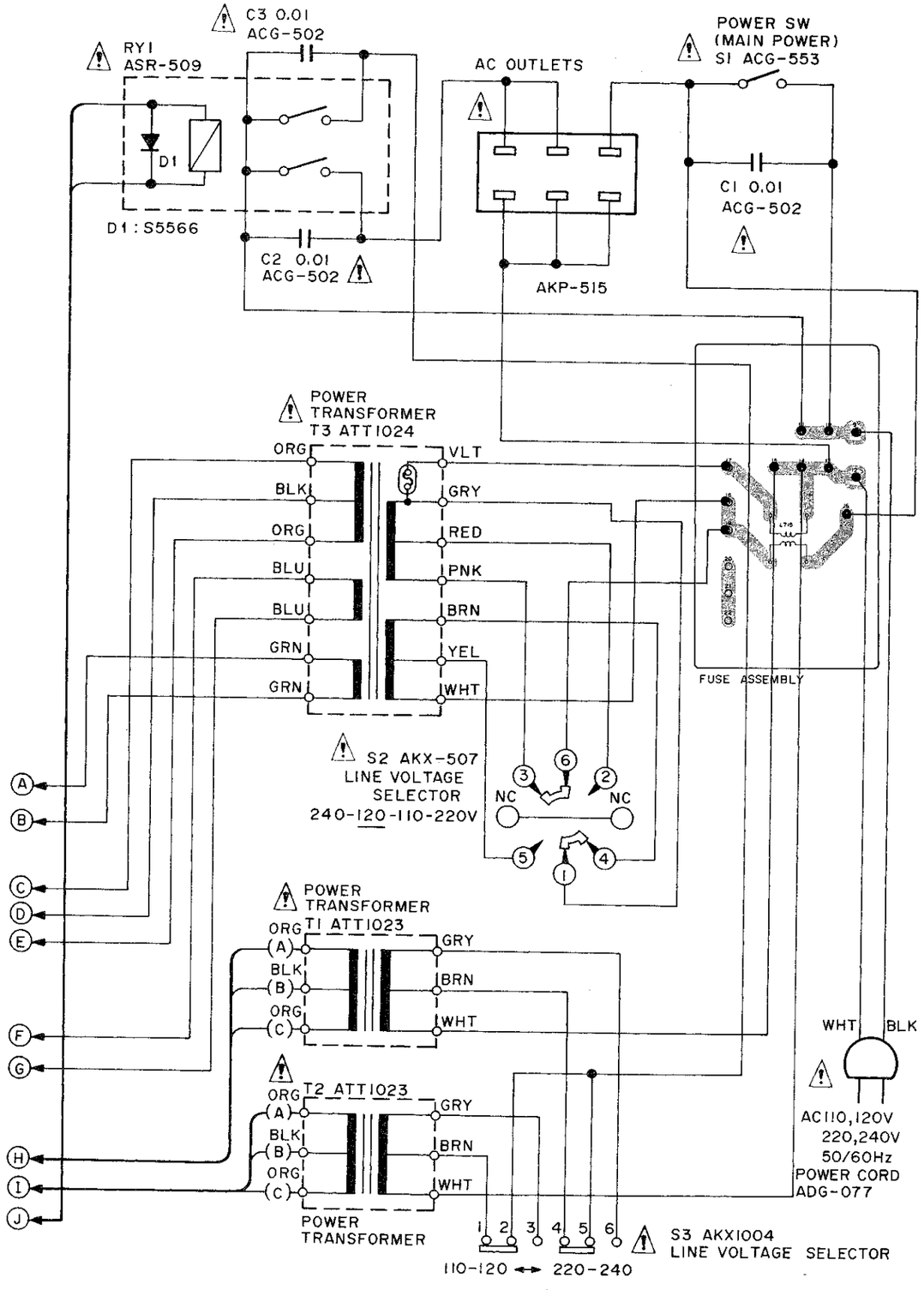
AWZ1055

AWZ1056

IC701 – 706	TC4066BP
IC707	TC4011BP
IC708	LC7570
IC709	P0001A
IC710	TC4069UBP
Q701,703,705, 707, 709,711	2SK246
Q702	2SC2705
Q704	2SA1145
Q716	RN1201
Q708,742	2SA985A
Q706,710,712	2SD836A
Q717,719,723 – 725, 737,743,748,750, 753 – 760, 761 – 765 767 – 774, 776 – 779, 786	2SC2603
Q714,715,718,726,720, 729 – 736,747,749, 751,752,766,781,783 785	2SA1115
Q728,738,740,746	2SC3400
Q739,745	2SA1346
Q741	2SC2275
Q744,780,782,784,713	2SC2878
Q721,722	RN1203
Q787,788	RN2203
D701 – 708,715 – 718, 747	S5566
D709,710	RD6.8ESB2
D711	RD6.8EB
D712,743	RD6.2EB
D713,714	RD13EB
D721 – 723	RD18EB
D724 – 726,731 – 733, 735 – 742,744,745, 748,749,751,752	1SS131
D729	RD3.0ESB1
D730	RD3.3ESB1
D734	RD3.9EB
D750	RD5.6ESB2
D753	RD2.7ESB

7 8 9 10 11 12

A B C D



External Appearance of Transistors and ICs

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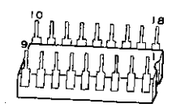

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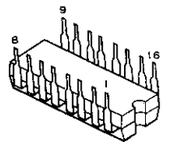

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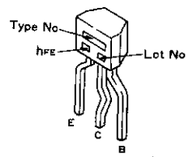
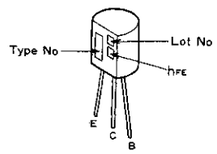
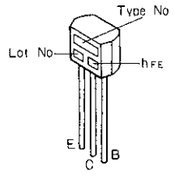


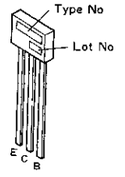
2SC2705
2SA1145
2SC2878



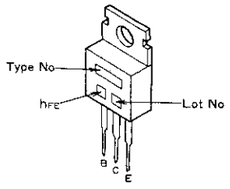
2SC2603
2SA1115



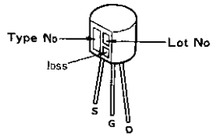
2SA1346
2SC3400



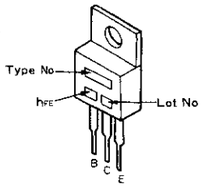
2SD836A



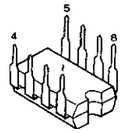
2SK246



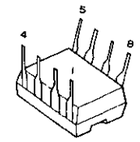
2SC2275
2SA985A



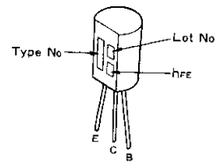
M5210P



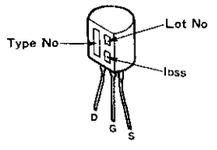
M5201P



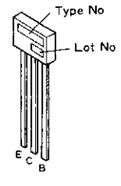
2SC1845
2SA992



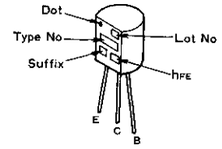
2SK170
2SJ74



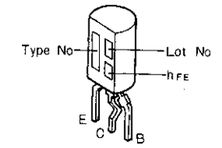
RN1201
RN1203
RN2203



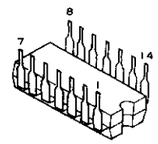
2SK369



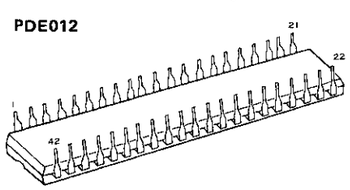
2SC2235
2SA965



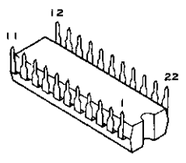
TC4069UBP
TC4011BP
TC4066BP
LC4966



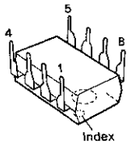
PDE012



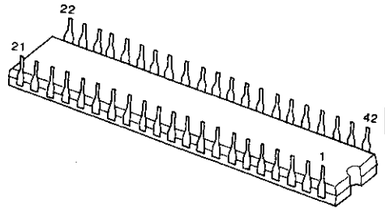
UPD6362C



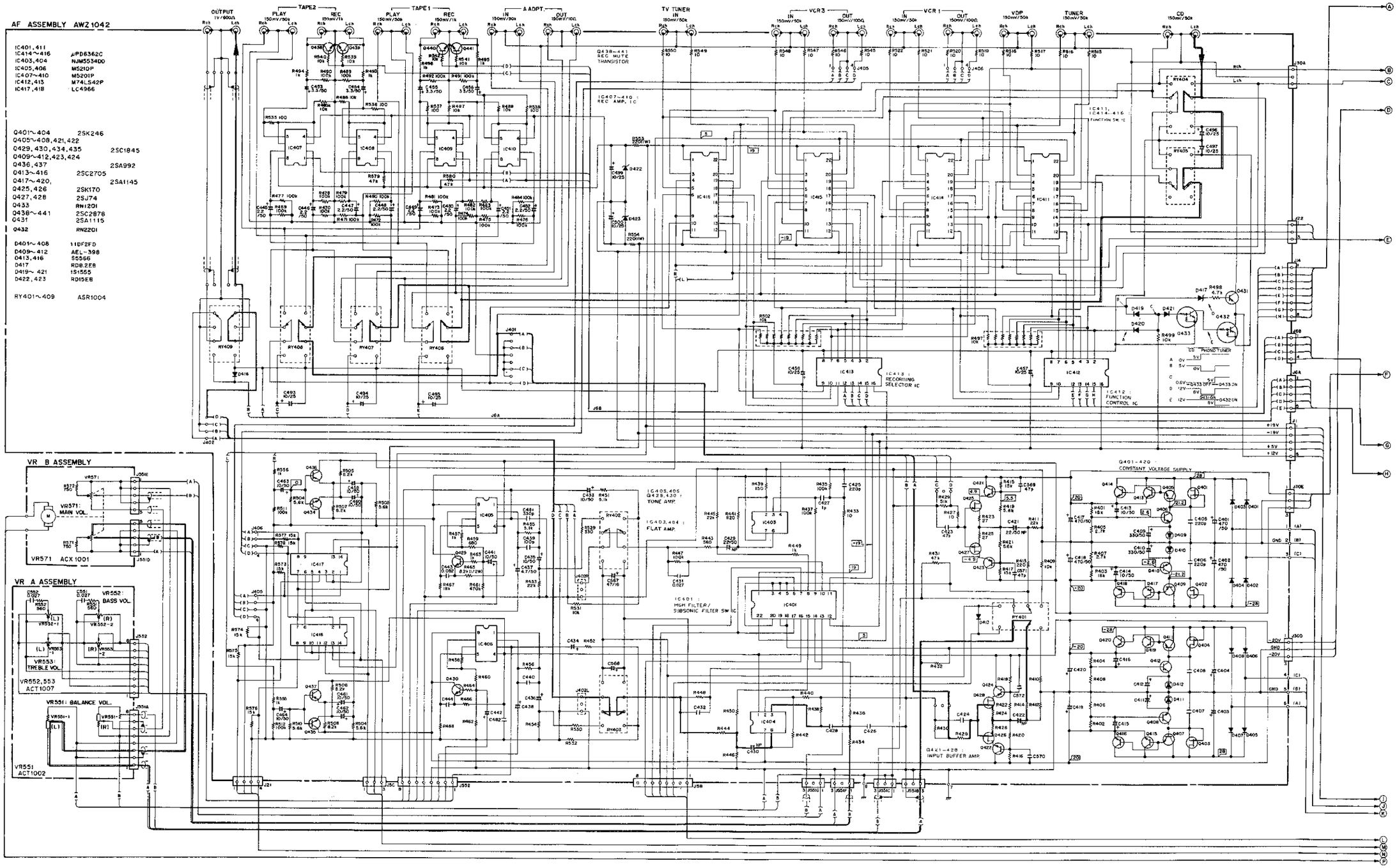
NJM5534DD

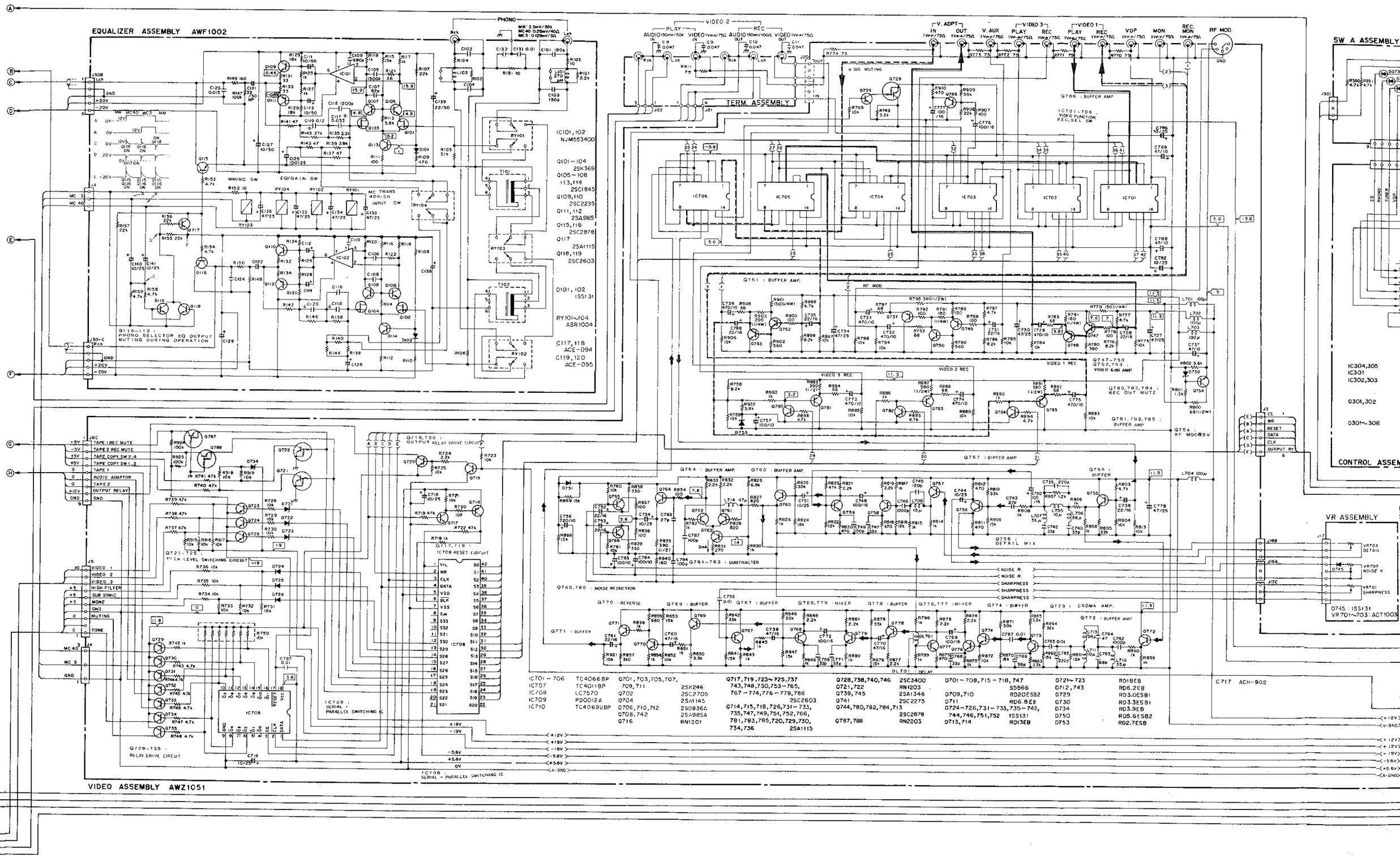


LC7570



7. SCHEMATIC DIAGRAM




EQUALIZER ASSEMBLY AWF1002
PHONO
MM : 2.5mV/50k
MC 40 : 0.25mV/40Ω
MC 3 : 0.125mV/3Ω
MM MC40 MC3
EQ/GAIN SW
MC TRANS 40Ω/3Ω
INPUT SW
MM/MC SW
IC101,102 NJM553400
Q101~104 2SK369
Q105~108 113,116 2SC1845
Q109,110 2SC2235
Q111,112 2SA965
Q115,116 2SC2878
Q117 2SA1115
Q118,119 2SC2603
D101,102 1SS131
RY101~104 ASR1004
C117,118 ACE-094
C119,120 ACE-095
Q118~119 : PHONO SELECTOR EQ OUTPUT MUTING DURING OPERATION
TERM. ASSEMBLY
V SIG MUTING
IC701~706 VIDEO FUNCTION REC,SEL SW
Q786 : BUFFER AMP
Q751 : BUFFER AMP.
RF MOD
VIDEO 3 REC
VIDEO 2 REC
VIDEO 1 REC
Q747~750 Q752,753 : VIDEO 6dB AMP.
Q780,782,784 : REC OUT MUTE
Q781,783,785 : BUFFER AMP
Q754 : RF MOD/B5V
Q757 : BUFFER AMP
Q764 : BUFFER AMP
Q760 : BUFFER AMP
Q755 : BUFFER
Q756 : DETAIL MIX
Q761~763 : SUBTRACTER
Q765,766 : NOISE REDUCTION
Q770 : REVERSE
Q769 : BUFFER
Q767 : BUFFER
Q768,779 : MIXER
Q778 : BUFFER
Q776,777 : MIXER
Q774 : BUFFER
Q773 : CROMA AMP.
Q772 : BUFFER AMP
Q771 : BUFFER
DL701 : DELAY
NOISE R.
SHARPNESS
Q719,720 : OUTPUT RELAY DRIVE CIRCUIT
Q717,718 : IC708 RESET CIRCUIT
Q721~725 : Hi Lo LEVEL SWITCHING CIRCUIT
Q729~735 : RELAY DRIVE CIRCUIT
IC709 : SERIAL → PARALLEL SWITCHING IC
IC708 : SERIAL → PARALLEL SWITCHING IC
VIDEO ASSEMBLY AWZ1051
SW A ASSEMBLY
CONTROL ASSEMBLY
VR ASSEMBLY
VR703 DETAIL
VR702 NOISE R
VR701 SHARPNESS
D745 : 1SS131
VR701~703 : ACT1003
C717 ACH-902
IC701~706 TC4066BP
IC707 TC4011BP
IC708 LC7570
IC709 PD0012A
IC710 TC4069UBP
Q701,703,705,707, 709,711 2SK246
Q702 2SC2705
Q704 2SA1145
Q706,710,712 2SD836A
Q708,742 2SA985A
Q716 RN1201
Q717,719,723~725,737 743,748,750,753~765, 767~774,776~779,786 2SC2603
Q714,715,718,726,731~733, 735,747,749,751,752,766, 781,783,785,720,729,730, 734,736 2SA1115
Q728,738,740,746 2SC3400
Q721,722 RN1203
Q739,745 2SA1346
Q741 2SC2275
Q744,780,782,784,713 2SC2878
Q787,788 RN2203
D701~708,715~718,747 S5566 RD20E5B2 RD6.8E8 1SS131 RD13EB
D709,710 D711 D724~726,731~733,735~742, 744,746,751,752 D713,714
D721~723 D712,743 D729 D730 D734 D750 D753
RD18EB RD6.2EB RD3.0ES81 RD3.3ES81 RD3.9EB RD5.6ES82 RD2.7ES8

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

SW A ASSEMBLY AWZ1056

SW B ASSEMBLY

CONTROL ASSEMBLY AWZ1055

IC304,305 M74LS42P
IC301 PDE012
IC302,303 PDO012A

0301,302 2SC2458

D301~306 1SS131

D349,351,353,355,357,368~372 AEL-451
D341~348,359~366,373~381 AEL1004
D350,352,354,356,358 AEL1005
S341~362 ASG-711

IC301 : μ-COM

IC302~305 : LED DRIVE

S391: ASG-711

5.SWITCH & RELAY

AF ASSEMBLY			
RY401	MUTING	ON - OFF	
RY402,403	TONE	ON - OFF	
RY404	FUNCTION	CD - PHONO	
RY405	FUNCTION	ON - OFF	
RY406	TAPE 1	ON - OFF	
RY407	ADAPTOR	ON - OFF	
RY408	TAPE 2	ON - OFF	
RY409	OUTPUT	ON - OFF	
EQUALIZR ASSEMBLY			
RY101	MM / MC	MM - MC	
RY102	MM / MC	MM - MC	
RY103	MC40 / MC3	40Ω - 3Ω	
RY104	MM / MC	MM - MC	
OTHERS			
S1	POWER	ON - OFF	
S2	VOLTAGE SELECTOR	240-120-110-220	
S3	VOLTAGE SELECTOR	110/120 - 220/240	
RY1	POWER	ON - OFF	

The underlined indicates the swich position

D1 : S5566

VR ASSEMBLY

D745 : 1SS131
VR701~703 : ACT1003

REMOTE CONTROL SENSOR ASSEMBLY

AXX1003

IC707 : REMOTE CONTROL PRIORITY SEQUENCING CIRCUIT

Q714~716 : V POWER OFF CIRCUIT

Q738~742 : MOTOR DRIVE CIRCUIT

Q744 : V POWER MUTE

IC710 : N-COM RESET AND BACK UP TRIGGER

Q711,712 : +12V POWER for VIDEO CIRCUIT

Q709,710 : +12V POWER

Q705~708 : ±5V POWER

Q701~704 : ±19V POWER

C717 ACH-902

FUSE ASSEMBLY

POWER TRANSFORMER

AC 110,120,220,240V 50/60 Hz

S3 AXX1004 110/120 ⟷ 220/240 LINE VOLTAGE SELECTOR

S2 AKX-507 LINE VOLTAGE SELECTOR 240-120-110-220

A

B

C

D

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 × 10¹*	*561*	*RD¼PS 5 6 1 J*
47kΩ	*47 × 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 × 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.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Miscellaneous Parts

P.C. BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
	Equalizer assembly	AWF1002
	AF assembly	AWZ1042
	Video assembly	AWZ1051
	Control assembly	AWZ1055
	Switch A assembly	AWZ1056
	VR A assembly	Non supply
	VR B assembly	Non supply
	Fuse assembly	Non supply
	Terminal assembly	Non supply
	VR assembly	Non supply
	Switch B assembly	Non supply

OTHERS

Mark	Symbol & Description	Part No.
⚠	C1, C2, C3 Power capacitor (0.01μF/400V)	ACG-502
⚠ ★★	S1 Push switch (POWER)	ASG-553
⚠ ★★	RY1 Relay (PROTECTION)	ASR-509
⚠ ★	T1, T2 Power transformer (AC110V/120V/220V/240V)	ATT1023
⚠ ★	T3 Power transformer (AC110V/120V/220V/240V)	ATT1024
⚠ ★★	S2 Line voltage selector (AC110V/120V/220V/240V)	AKX-507
⚠ ★★	S3 Line voltage selector (AC110V–120V/220V–240V)	AKX1004
	Short pin plug	AKM-050
⚠	AC socket (3P) (AC OUTLETS)	AKP-515
	Remote control sensor assembly	AXX1003
⚠	AC power cord	ADG-077
⚠	Strain relief	AEP-113
	R1 Wire wound resistor (56Ω/10W)	ACN1010
★	D1 Diode	S5566
	C8–C11	CKDYF473Z50

EQUALIZER Assembly (AWF1002)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC101, IC102	NJM5534DD
★★	Q101–Q104	2SK369
★★	Q105–Q108, Q113, Q114	2SC1845
★★	Q109, Q110	2SC2235
★★	Q111, Q112	2SA965
★★	Q115, Q116	2SC2878
★★	Q117	2SA1115
★★	Q118, Q119	2SC2603
★	D101, D102	1SS131

COILS AND TRANSFORMERS

Mark	Symbol & Description	Part No.
	L101, L102 Inductor (270μH)	ATH-132
	T101, T102 MC Transformer	ATV1002

RELAIES

Mark	Symbol & Description	Part No.
★★	RY101–RY104 Relay (MM/MC, MC40Ω/3Ω)	ASR1004

CAPACITORS

Mark	Symbol & Description	Part No.
	C101, C102	CMA181J500
	C103, C104	CMA151J500
	C105, C106	CQSXA152J160
	C107, C108	CMA820J500
	C109, C110	CQSXA681J160

Mark	Symbol & Description	Part No.
	C111–C114, C127, C128	CEYA100M50
	C115, C116	CQSXA122J160
	C117, C118 (0.03μF/100V)	ACE-094
	C119, C120 (0.12μF/100V)	ACE-095
	C121, C122	CEYANP330M50
	C123, C124	CQMXA153J100
	C125, C126	CEXA102M25
	C131, C132	CKCYF103Z50
	C133–C136	CEAS470M25
	C138, C139	CEYA220M50
	C140, C141	CEAS100M25

RESISTORS

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

Mark	Symbol & Description	Part No.
	R135, R136–R138, R141, R142, R145, R146	RDR1/2PM□□□J
	R151, R152	RD1/4PM100J
	R153–R159	RD1/8PM□□□J
	Other resistors	RDR1/4PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	Terminal 2P (PHONO)	AKB1001

AF Assembly (AWZ1042)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC417, IC418 E-SW IC	LC4966
★★	IC407–IC410 OP-AMP IC	M5201P
★★	IC405, IC406 OP-AMP IC	M5210P
★★	IC412, IC413 LOGIC IC	M74LS42P
★★	IC403, IC404	NJM5534DD
★★	IC401, IC411, IC414–IC416 E-SW IC	μPD6362C
★★	Q417–Q420	2SA1145
★★	Q409–Q412, Q423, Q424, Q436, Q437	2SA992
★★	Q405–Q408, Q421, Q422, Q429, Q430, Q434, Q435	2SC1845
★★	Q413–Q416	2SC2705
★★	Q438	2SC2878
★★	Q427, Q428	2SJ74
★★	Q425, Q426	2SK170
★★	Q401–Q404	2SK246
★★	Q431	2SA1115
	Q432	RN2201
	Q433	RN1201

Mark	Symbol & Description	Part No.
★	D409–D412 LED	AEL-398
★	D422, D423	RD15EB
★	D417, D418	RD8.2EB
★	D413, D416	S5566
★	D419–D421	1S1555
★	D401–D408	11DF2FD

RELAIES

Mark	Symbol & Description	Part No.
★★	RY401–RY409 Relay (MUTING, TONE, INPUT, CD, PHONO, TAPE1, ADAPTOR, TAPE2, OUTPUT)	ASR1004

CAPACITORS

Mark	Symbol & Description	Part No.
	C427, C428 (1μF)	ACE-217
	C496, C497, C457, C458, C493–C495, C499, C500	CEAS100M25
	C409–C412	CEXA331M50
	C401–C404, C417–C420	CEXA471M50
	C421, C422, C429, C430	CEYANP220M50
	C413–C416, C433–C436, C441, C442, C459–C464	CEAY100M50
	C445–C452	CEYA2R2M50
	C453–C456	CEYA3R3M50
	C437, C438	CEYA4R7M50
	C481, C482	CKDYB331K50
	C439, C440	CMA101J500
	C405–C408, C425, C426	CMA221J500
	C569–C572	CMA470J500
	C423, C424	CMA470J500
	C443, C444	CQMA823J50
	C431, C432	CQMXA273J100
	C567, C568	CEAS470M16
	C415–C418	CMA470J500

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.
	R497 Resistor array	RA8S103J
	R502 Resistor array	RA9S103J
	R465, R466	RD1/2PM822J
	R535–R538, R493–R496, R485–R488, R499, R500, R539–R542, R469–R484, R489–R492, R498, R501, R579, R580	RD1/8PM□□□J
	R555, R556	RD1/4PM102J
	R553, R554	RS1LMF221J
	Other resistors	RDR1/4PM□□□J

OTHERS

Mark	Symbol &
	Terminal 4
	Terminal 6
	Terminal 6
	Terminal 6

VIDEO Assemb

SEMICONDUCTO

Mark	Symbol &
★★	IC708 FI
★★	IC709 O
★★	IC707 L
★★	IC701–IC
★★	IC710 L
★★	Q714, Q71
	Q733, Q73
	Q751, Q75
	Q720, Q72
★★	Q739, Q74
★★	Q708, Q74
★★	Q741
★★	Q704
★★	Q717, Q71
	Q743, Q74
	Q761–Q76
	Q774, Q77
★★	Q702
★★	Q744, Q78
★★	Q728, Q73
★★	Q706, Q71
★★	Q701, Q70
	Q711
★★	Q721, Q72
★★	Q716
★★	Q787, Q78
★	D713, D71
★	D721–D7
★	D709, D71
★	D729
★	D730
★	D750
★	D712, D74
★	D711
★	D701–D70
	D718, D74
★	D724–D72
	D738, D73
	D751, D75
	D734
	D752

OTHERS

Mark	Symbol & Description	Part No.
	Terminal 4P (VCR1/ADAPTOR/ TAPE1)	AKB-115
	Terminal 6P (TV TUNER/VCR3)	AKB-117
	Terminal 6P (CD/TUNER/VDP)	AKB1002
	Terminal 6P (TAPE2/OUTPUT)	AKB1005

VIDEO Assembly (AWZ1051)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC708 FL STATIC DRIVER IC	LC7570
★★	IC709 OUTPUT EXPANDER IC	PD0012A
★★	IC707 LOGIC	TC4011BP
★★	IC701–IC706 LOGIC IC	TC4066BP
★★	IC710 LOGIC IC	TC4069UBP
★★	Q714, Q715, Q718, Q726, Q731–Q733, Q735, Q747, Q749, Q785, Q751, Q752, Q766, Q781, Q783, Q720, Q729, Q730, Q734, Q736	2SA1115
★★	Q739, Q745	2SA1346
★★	Q708, Q742	2SA985A
★★	Q741	2SC2275
★★	Q704	2SA1145
★★	Q717, Q719, Q723–Q725, Q737, Q743, Q748, Q750, Q753–Q760, Q761–Q765, Q767–Q771, Q772–Q774, Q776–Q779, Q786	2SC2603
★★	Q702	2SC2705
★★	Q744, Q780, Q782, Q784, Q713	2SC2878
★★	Q728, Q738, Q740, Q746	2SC3400
★★	Q706, Q710, Q712	2SD836A
★★	Q701, Q703, Q705, Q707, Q709, Q711	2SK246
★★	Q721, Q722	RN1203
★★	Q716	RN1201
★★	Q787, Q788	RN2203
★	D713, D714	RD13EB
★	D721–D723	RD18EB
★	D709, D710	RD20ESB2
★	D729	RD3.0ESB1
★	D730	RD3.3ESB1
★	D750	RD5.6ESB2
★	D712, D743	RD6.2EB
★	D711	RD6.8EB
★	D701–D708, D715, D716, D717, D718, D747	S5566
★	D724–D726, D731–D733, D735–D738, D739–D742, D744, D746, D751, D752	1SS131
	D734	RD3.9EB
	D752	RD2.7ESB

COIL

Mark	Symbol & Description	Part No.
	L701–L704 Inductor (100μH)	ATH-050
	L712 Inductor (5.6μH)	ATH-065
	L708 Inductor (15μH)	ATH-075
	L705, L711 Inductor (10μH)	ATH-078
	L714 Inductor (47μH)	ATH-082
	L710 Inductor (33μH)	ATH-100
	L706, L707, L713 Inductor (56μH)	ATH-104
	L716, L717 Inductor (1mH)	ATH-098

CAPACITORS

Mark	Symbol & Description	Part No.
	C717 (0.047F/5.5V)	ACH-902
	C745	CCCCH121J50
	C740, C742	CCCCH330J50
	C764	CCCCH470J50
	C763	CCCCH680J50
	C749, C787	CCCSL101J50
	C739, C785	CCCSL221J50
	C747, C759, C768, C771	CCCSL330J50
	C766	CCCSL390J50
	C743	CCCSL270J50
	C781	CEAS010M50
	C718, C719, C723, C744, C751, C754, C792, C796	CEAS100M25
	C708–C710, C724, C725, C757, C783, C784, C756	CEAS101M10
	C748, C750, C769, C772, C776, C777	CEAS101M16
	C703–C706, C712, C713	CEAS101M25
	C711	CEAS102M25
	C728, C731, C735, C738, C752, C753, C761, C786	CEAS220M16
	C722	CEAS220M50
	C780	CEAS4R7M50
	C737, C741, C788, C789	CEAS470M10
	C758, C760, C770	CEAS470M16
	C727, C730, C734, C778	CEAS470M25
	C729, C732, C733, C736, C773, C774, C775, C726	CEAS471M10
	C701, C702	CEAS471M35
	C746, C762, C790	CKDYF102Z50
	C797	CKDYF103Z50
	C755, C765, C767, C782	CKCYF103Z50
	C720, C721	CKCYF473Z50
	C714	CEAS332M25
	C709	CEAS471M10
	C791	CEAS102M6
	C707	CEHAQ101M10
	C715, C716	CEHAQ101M25
	C793	CCCSL270J50
	C794	CCCSL101J50

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.
	R750 Resistor array	RA7S103J
	R701, R795, R883, R887, R891, R800, R835	RD1/2PM□□□J
	R779, R789, R901, R781, R791, R903	RD1/4PM□□□J
	R867, R913, R914	RFA1/4PS330J
	R912, R904	RFA1/4PS4R7J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	Terminal 1P (MONITOR OUT)	AKB-133
	Terminal 3P (VDP/VCR1/VCR3/ TV TUNER/ADAPTOR/ REC MONITOR)	AKB-134
	Terminal mini (CONTROL)	AKN-207
	Terminal DIN 5P (RF MOD OUT)	AKP-081
	D701 Delay line	ATL-034

Control Assembly (AWZ1055)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC304, IC305 LOGIC IC	M74LS42P
★★	IC301	PDE012
★★	IC302, IC303 OUTPUT EXPANDER IC	PD0012A
★★	Q301, Q302	2SC2458
★	D301–D306	1SS131

COIL

Mark	Symbol & Description	Part No.
	L301 Inductor (1mH)	ATH-098

CAPACITORS

Mark	Symbol & Description	Part No.
	C306	CCDCH121J50
	C301, C304	CEANL470M16
	C307–C310	CEAS100M25
	C302, C303	CKDYB103K50
	C305	CKDYB471K50
	C311, C312	CKDYF103Z50

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.
	R301 Resistor array	RA4S103J
	R310 Resistor array	RA8S103J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
★	X301 Ceramic resonator (400kHz)	ASS-046

Switch A Assembly(AWZ1056)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D349, C351, D353, D355, D357, D368–D372 LED (TV-TUNER, VCR2, VDP, VCR1, TAPE2, TAPE1 TUNER, PHONO, CD, VCR3)	AEL-451
★	D341–D348, D359–D366, D373–D381 LED (MC, MM, MONO, HIGH CUT FILTER, SUBSONIC FILTER, TONE, MUTE, STAND-BY, REMOTE, TAPE COPY, V-ADAPTER, ENHANCER, CD, TUNER, PHONO, VDP, VCR1, 2, 3, V-AUX, SOURCE)	AEL1004
★	D350, D352, D354, D356, D358 LED (TV TUNER, VCR1, VCR2, VCR3, VDP)	AEL1005

SWITCHES

Mark	Symbol & Description	Part No.
★★	S341–S362 Tact switch (INPUT, TAPE MONITOR, ADAPTOR, HIGH CUT FILTER SUBSONIC FILTER, MODE, TAPE COPY, PHONO SEL, MUTE, STAND-BY)	ASG-711

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.
	R342, R343 Resistor array	RA4S391J
	R346 Resistor array	RA5S391J
	R341, R344, R345, R347–R351	RD1/8PM□□□J

VR A Assembly

CAPACITORS

Mark	Symbol & Description	Part No.
	C551, C552	CQMXA273J100

RESISTORS

Mark	Symbol & Description	Part No.
★	VR551 Variable resistor (50kΩB) (BALANCE)	ACT1002
★	VR552, VR553 Variable resistor (10kΩ)(BASS, TREBLE)	ACT1007
	R551, R552	RDR1/4PM561J

VR B Assembly

RESISTORS

Mark	Symbol & Description	Part No.
★	VR571 Variable resistor (15kΩ) (MAIN VOLUME)	ACX1001
	R571, R572	RDR1/4PM751J

FUSE Assembly

COIL

Mark	Symbol & Description	Part No.
	L715 Line filter	ATF-163

Terminal Assembly

RESISTOR

Mark	Symbol & Description	Part No.
	R911	RD1/8PM750J

OTHERS

Mark	Symbol & Description	Part No.
	Terminal 1P (VCR2 INPUT/OUTPUT)	AKB1004

VR Assembly

SEMICONDUCTOR

Mark	Symbol & Description	Part No.
★	D745	1SS131

RESISTORS

Mark	Symbol & Description	Part No.
★	VR701, VR702, VR703 Variable resistor (1kΩB) (SHARPNESS, DETAIL, NOISE CANCEL)	ACT1003

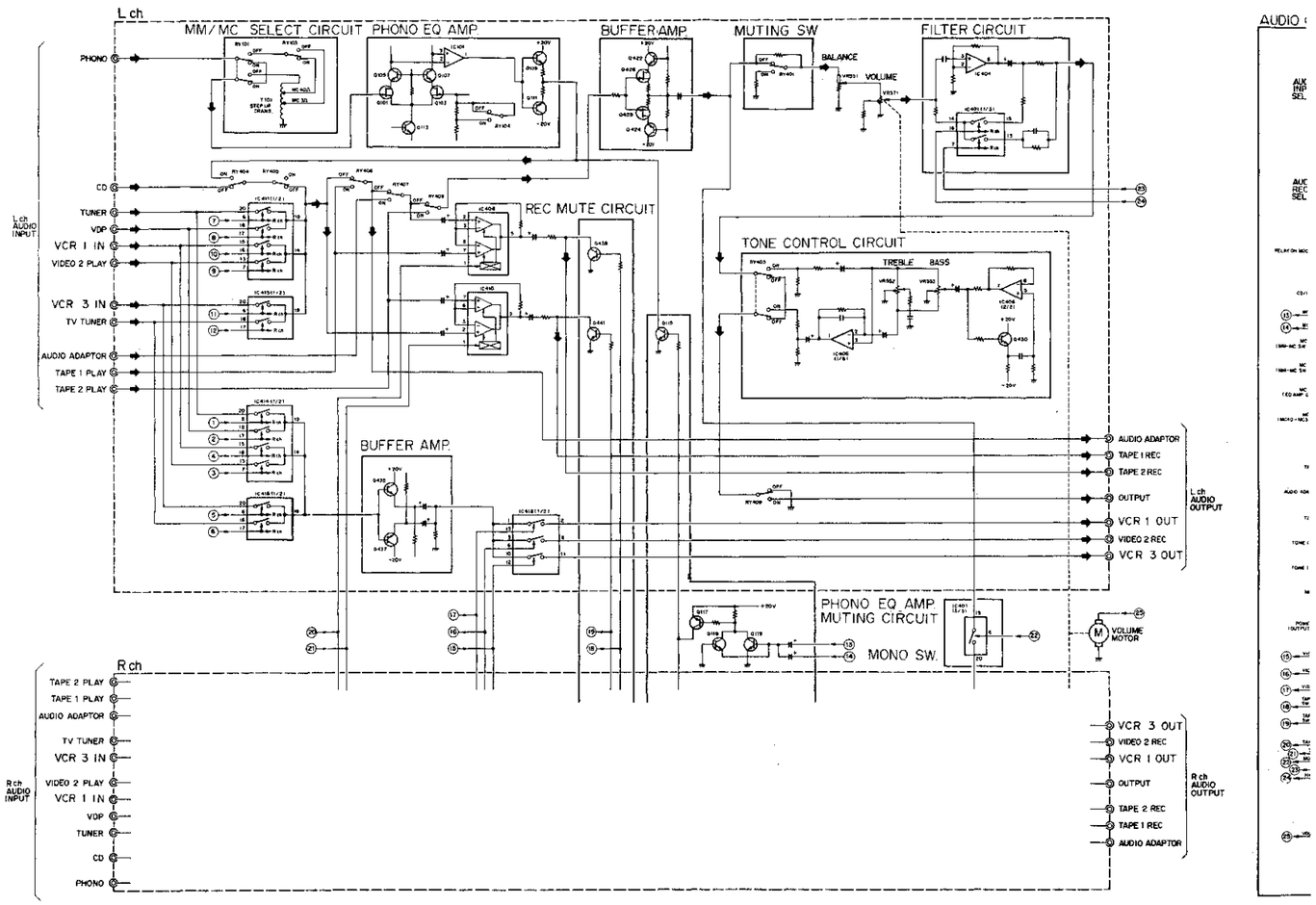
Switch B Assembly

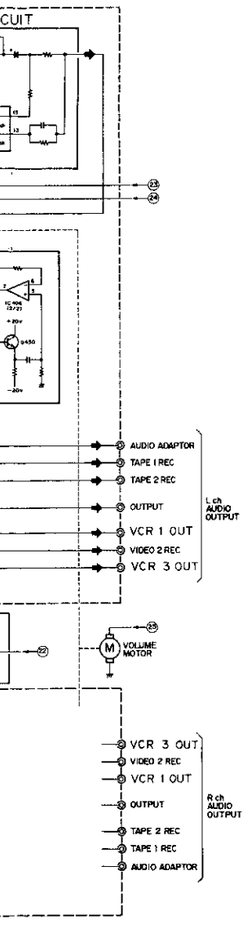
SWITCH

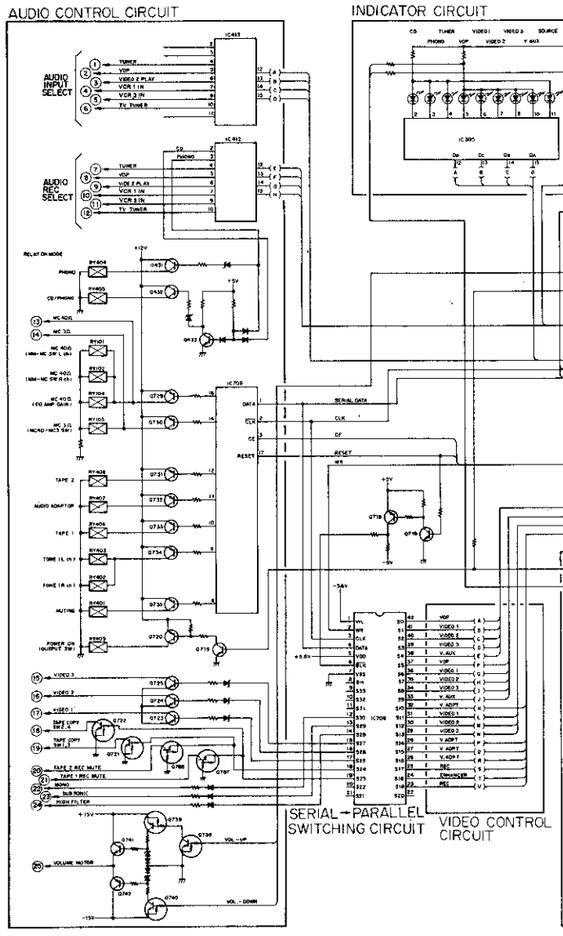
Mark	Symbol & Description	Part No.
★★	S391 Tact switch (TONE)	ASG-711

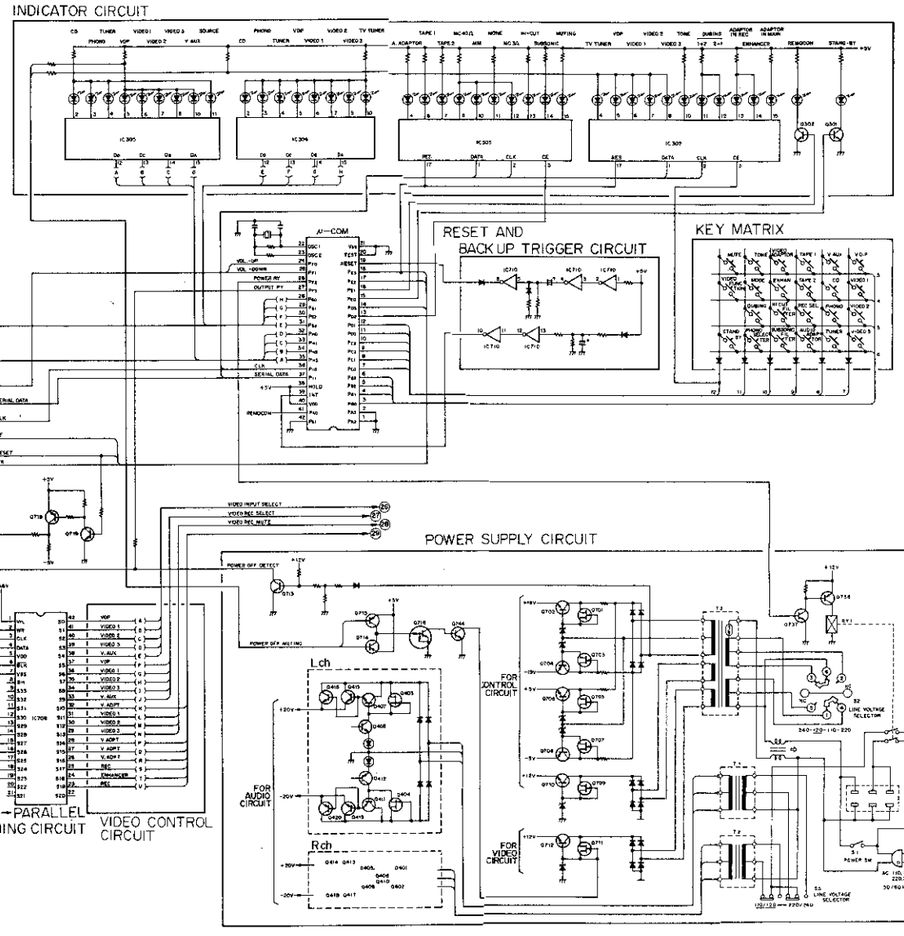
9. BLOCK DIAGRAM

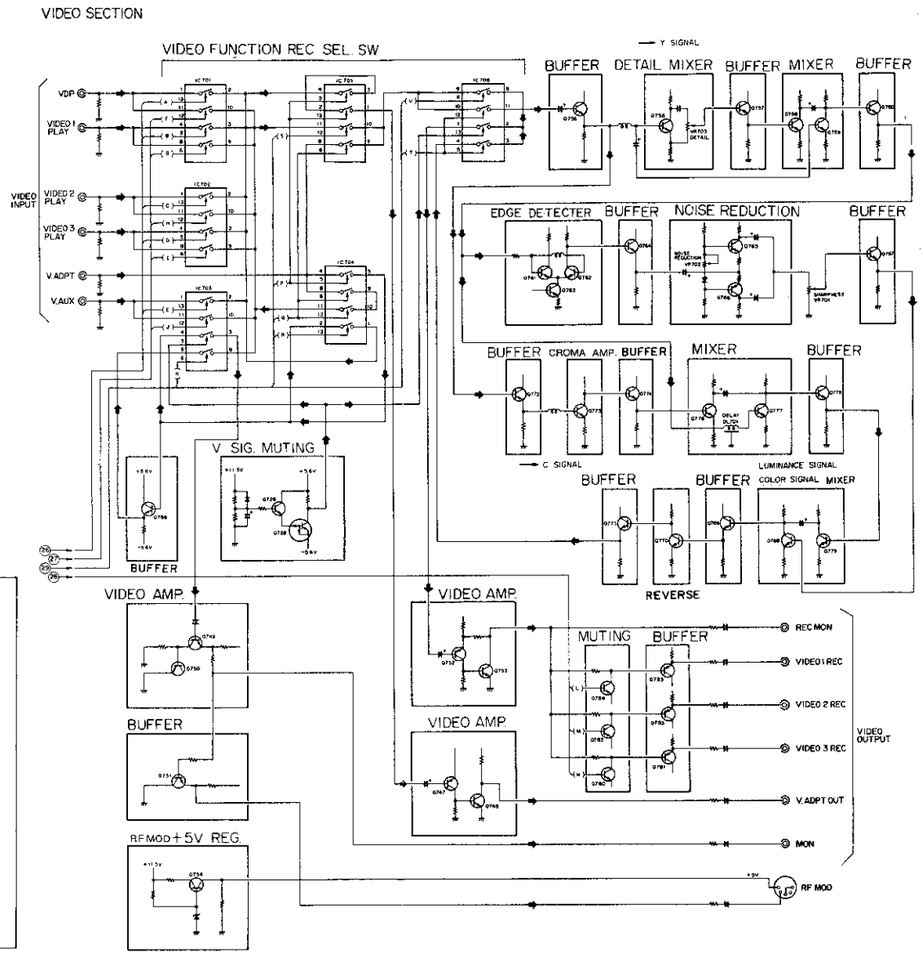
AUDIO SECTION



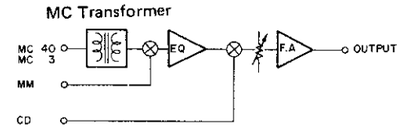


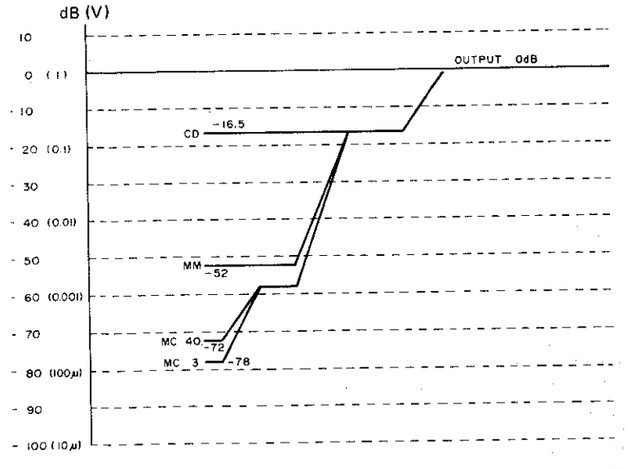






Level Diagram (Frequency: 1kHz, Voltage level display for each stage)





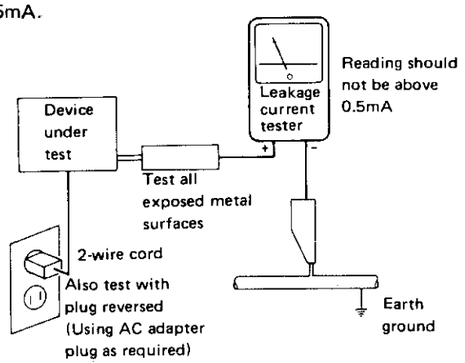
0. SAFETY INFORMATION

SAFETY PRECAUTIONS

The following check should be performed for the ntinued protection of the customer and service tech-cian.

AKAGE CURRENT CHECK

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

11. CIRCUIT DESCRIPTIONS

11.1 BLOCK DIAGRAM EXPLANATION

- A step up transformer is installed in the previous stage as the EQ amp section for MC response.
- The INPUT SELECTOR enables recording on TAPE 2 of signals routed through the AUDIO ADAPTER between TAPE 1 and 2.
- Due to aciton of the BUFFER amp which receives signals at high impedance and outputs at low impedance there is no effect transmitted to the connecting BAL VOL, MAIN VOL of the next stage.
- MUTING is fixed at -20dB (Resistance divider system).
- The FLAT amp has an input sensitivity of 150 mV and output GAIN is 16.5dB. The amp is a DC couple type DC amp (output is C couple).
- The SUBSONIC and HIGH FILTER are each set for 6dB/OCT according to the CR. f_c is 10 Hz and 10kHz respectively.
- TONE has a 100Hz, 10kHz turnover frequency. It is a positive phase amp of 0dB GAIN.
- OUTPUT MUTING switches off the output at the time of power ON/OFF.

11.2 EQ AMP SECTION

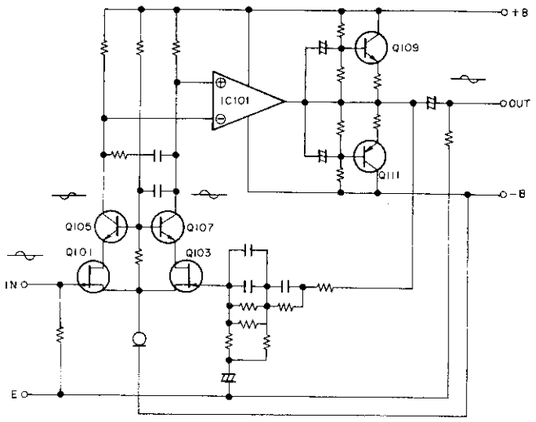


Fig. 11-1 EQ Amp Section

The EQ amp section comprises the differential FET input section, the OP amp voltage amplifier section, the SEPP output section and the feedback circuit (RIAA) of CR.

The FET differential input section receives signals directly by DC couple. Reverse output from the input section is transmitted to the reverse input of the OP amp. The non-reversible output is applied to non-reverse input, amplified and applied to the SEPP output section. The output stage contains class A circuitry to drive the low impedance feedback circuit and give low distortion output.

11.3 FLAT AMP.

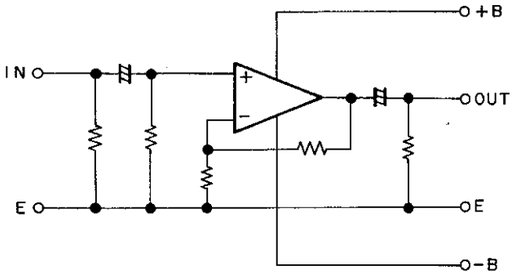


Fig. 11-2 FLAT Amp Section

The FLAT amp is basically the same as the EQ amp. Differences are due to there being no SEPP output and no differential FET input. The resistance value of the feedback circuit is also different. The resistance of the FLAT amp feedback circuit isn't of the same low value as for the EQ amp so it has sufficient drive for the OP amp and gives low distortion. The FLAT amp is a DC construction.

11.4 TONE AMP SECTION

The TONE amp section is the same as the A-150D.

12. IC DES

■ μPD6362C (C MO
Electron Switch

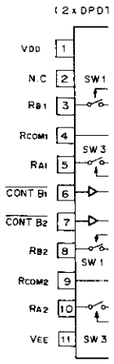


Fig. 12-1 μPD636
distribu

Chart 12-1 μPD6362C

Control Input		
CONT A	H	
	L	
CONT B	H	
	L	

(Note)
H : High level.
L : Low level.

■ NJM5534DD (Ope

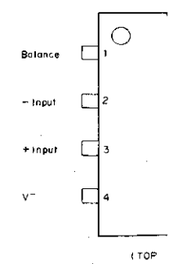


Fig. 12-2 Pin distri

12. IC DESCRIPTIONS

■ μPD6362C (C MOS) Electron Switch

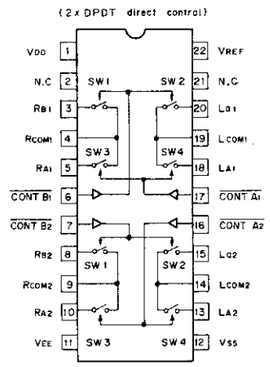


Fig. 12-1 μPD6362C Block diagram with pin distribution

Chart 12-1 μPD6362C Truth Value Chart

Control Input		SW1, SW2	SW3, SW4
$\overline{CONT\ A}$	H	–	OFF
	L	–	ON
$\overline{CONT\ B}$	H	OFF	–
	L	ON	–

(Note)
H : High level.
L : Low level.

■ NJM5534DD (Operation amp IC)

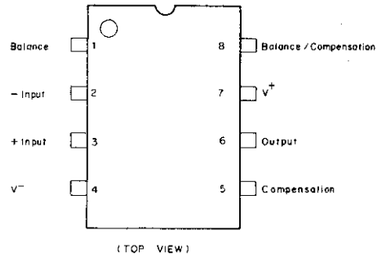
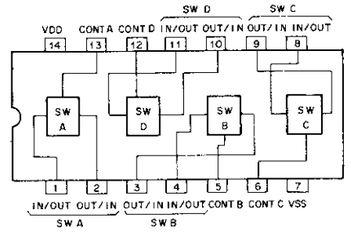


Fig. 12-2 Pin distribution chart for NJM5534DD

■ LC4966 (C MOS) Logic bilateral switch



Control input for the switch is ON with H levels.

Fig. 12-3 LC4966 Block diagram

■ LC7570 (C MOS) Display storage tube static driver

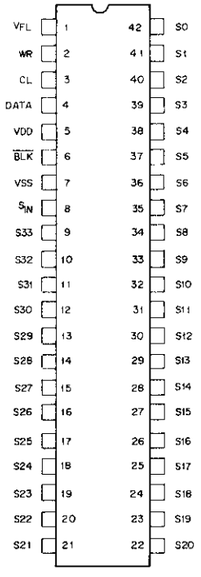


Fig. 12-4 LC7570 Pin distribution chart

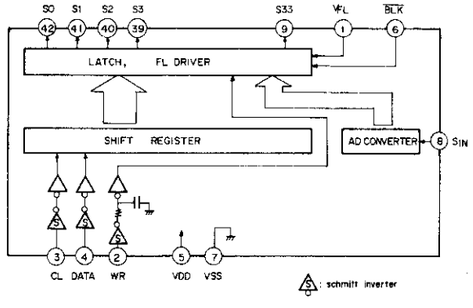


Fig. 12-5 LC7570 Block diagram

■ PD0012A Output Expander

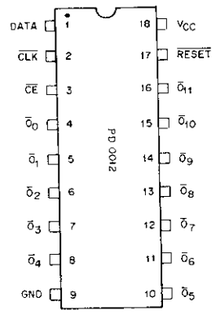


Fig. 12-6 PD0012A Pin distribution chart

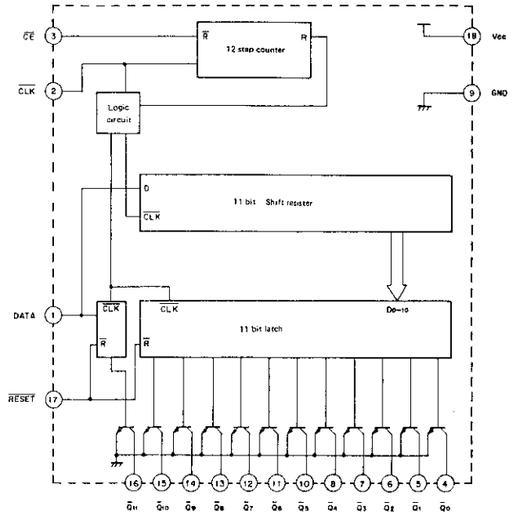


Fig. 12-7 PD0012A Block diagram

Chart 12-2 Pin Names for PD0012A

No.	Code	Function	No.	Code	Function
1	DATA	Data Input	10	$\overline{O_5}$	Data Output
2	$\overline{CLK}$	Clock Input	11	$\overline{O_6}$	Data Output
3	$\overline{CE}$	Counter Reset Input	12	$\overline{O_7}$	Data Output
4	$\overline{O_0}$	Data Output	13	$\overline{O_8}$	Data Output
5	$\overline{O_1}$	Data Output	14	$\overline{O_9}$	Data Output
6	$\overline{O_2}$	Data Output	15	$\overline{O_{10}}$	Data Output
7	$\overline{O_3}$	Data Output	16	$\overline{O_{11}}$	Data Output
8	$\overline{O_4}$	Data Output	17	$\overline{RESET}$	Latch Reset Input
9	GND	Earth Terminal	18	Vcc	Power Terminal

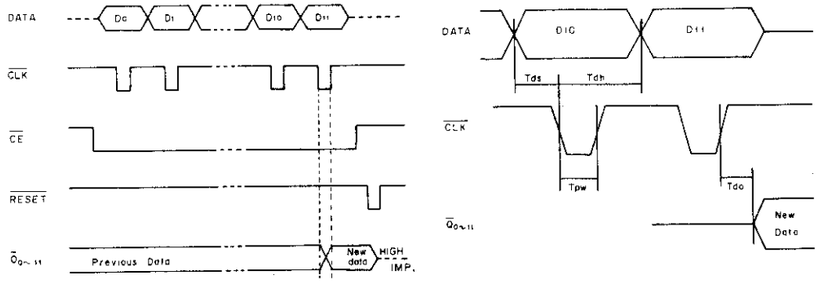


Fig. 12-8 Input data timing chart

■ PD5039 (Remote Control IC)

1. Terminal Functions

Chart 12-3 PD5039 Terminal functions

NO.	Terminal Designation	I/O	Function	NO.	Terminal	I/O	Function
1	Vss	—	Connection to GND.	17	NC	—	———
2	TEST	I	Test pin Vss connection.	18	E_3	I	KEY SCAN return INPUT.
3	AC	I	Reset pin Routed to Vss via C.	19	E_2	I	
4	OSC IN	I	Connection to ceramic.	20	E_1	I	
5	OSC OUT	0	vibrator. 480kHz	21	E_0	I	
6	D_0	I	A/V switching port.	22	F_7	0	
7	D_1	I	*Version switching port.	23	F_6	0	
8	H_0	I	KEY SCAN return INPUT.	24	F_5	0	KEY SCAN OUTPUT.
9	H_1	I		25	F_4	0	
10	H_2	I		26	F_3	0	
11	H_3	I		27	F_2	0	
12	G_0	I		28	F_1	0	
13	G_1	I		29	F_0	0	
14	G_2	I		30	J	0	———
15	G_3	I		31	C	0	Remote control signal OUTPUT.
16	NC	—	———	32	V_{DD}	—	+3V connection.

* D1 port (PD5039 No. 7 pin) is L (GND) for the C-90 (BK).

2. PD5039 OUTPUT Format

Chart 12-4 PD5039 OUTPUT Format

AUDIO/VIDEO SELECTOR SW A (AUDIO)				AUDIO/VIDEO SELECTOR SW V(VIDEO)			
KEY NO.	Component code	HEX CODE	Designation	KEY NO.	Component code	HEX CORD	Designation
K1	A5	1C	POWER ON/OFF (AMP)	K1	A5	1C	POWER ON/OFF (AMP)
K2	—	—	———	K2	—	—	———
K3	AB	1C	POWER ON/OFF (VCR)	K3	AB	1C	POWER ON/OFF (VCR)
K4	AA	1C	POWER ON/OFF (TV)	K4	AA	1C	POWER ON/OFF (TV)
K5	A5	0D	VDP (AMP)	K5	A5	0D	VDP (AMP)
K6	A5	4C	CD (AMP)	K6	A5	4C	CD (AMP)
K7	A5	4E	TAPE 1 (AMP)	K7	A5	4E	TAPE 1 (AMP)
K8	A5	1D	TAPE 2 (AMP)	K8	A5	1D	TAPE 2 (AMP)
K9	A5	0F	VCR 1 (AMP)	K9	A5	0F	VCR 1 (AMP)
K10	A5	4D	PHONO (AMP)	K10	A5	4D	PHONO (AMP)
K11	A5	54	VIDEO SELECTOR (AMP)	K11	A5	54	VIDEO SELECTOR (AMP)
K12	A5	54	VIDEO SELECTOR (AMP)	K12	A5	54	VIDEO SELECTOR (AMP)
K13	A5	0E	VCR 2 (AMP)	K13	A5	0E	VCR 2 (AMP)
K14	A5	47	TUNER (AMP	K14	A5	47	TUNER (MP)
K15	A5	12	MUTING (AMP)	K15	A5	12	MUTING (AMP)
K16	A5	12	MUTING (AMP)	K16	A5	12	MUTING (AMP)
K17	A5	46	VCR 3 (AMP)	K17	A5	46	VCR 3 (AMP)
K18	A5	0C	TV TUNER (AMP)	K18	A5	0C	TV TUNER (AMP)
K19	A5	0B	VOLUME – (AMP)	K19	A5	0B	VOLUME – (AMP)
K20	A5	0A	VOLUME + (AMP)	K20	A5	0A	VOLUME + (AMP)
K21	A4	13	TUNER BAND (TUNER)	K21	A4	13	TUNER RAND (TUNER)
K22	A4	1E	TUNER MPX (TUNER)	K22	AA	1E	TV MPX (TV)
K23	A4	11	TUNER CH – (TUNER)	K23	AA	11	TV CH – (TV)
K24	A4	10	TUNER CH + (TUNER)	K24	AA	10	TV CH + (TV)
K25	AA	0D	VDP (TV)	K25	AA	0D	VDP (TV)
K26	AA	0C	TV (TV)	K26	AA	0C	TV (TV)
K27	AA	0B	VOLUME – (TV)	K27	AA	0B	VOLUME – (TV)
K28	AA	0A	VOLUME + (TV)	K28	AA	0A	VOLUME + (TV)
K29	A3	16	■ (STOP) (PL)	K29	A3	16	■ (STOP) (PL)
K30	A3	17	▶ (PLAY) (PL)	K30	A3	17	▶ (PLAY) (PL)
K31	A2	11	⏮ (CD)	K31	A8	11	⏮ (VDP)
K32	A2	10	⏭ ⏭ (CD)	K32	A8	10	⏭ (VDP)
K33	A2	16	■ (STOP) (CD)	K33	A8	16	■ (STOP) (VDP)
K34	A2	18	⏸ (PAUSE) (CD)	K34	A8	18	⏸ (VDP)
K35	—	—	———	K35	—	—	———
K36	A2	17	▶ (PLAY) (CD)	K36	A8	17	▶ (PLAY) (VDP)
K37	A1	14	● (REC) (CD)	K37	AB	14	● (REC) (VCR)
K38	A1	12	O (REC MUTE) (CT)	K38	AB	12	
K39	A1	11	◀◀ (REW) (CT)	K39	AB	11	◀◀ (REW) (VCR)
K40	A1	10	▶▶ (FF) (CT)	K40	AB	10	▶▶ (FF) (VCR)
K41	A1	16	■ (STOP) (CT)	K41	AB	16	■ (STOP) (VCR)
K42	A1	18	⏸ (PAUSE) (CT)	K42	AB	18	⏸ (PAUSE) (VCR)
K43	A1	15	◀ (REV) (CT)	K43	AB	15	
K44	A1	17	▶ (FWD) (CT)	K44	AB	17	▶ (PLAY) (VCR)

■ PDE012 (Microprocessor)

1. Terminal Functions

Chart 12-5 PDE012 Terminal Functions

Pin No.	Terminal	Function	I/O	Act.
40	V_{DD}	+5V application terminal.	–	–
39	INT	Interrupt (Mains power ON/OFF detection).	I	L
38	HOLD	Hold (Holds on V_{DO}).	I	L
19	REST	Reset signal INPUT.	I	L
20	TEST	LSI test terminal (GND).	I	–
21	Vss	GND	–	–
41	PA_0	Remote control INPUT terminal.	I	–
42	PA_1	DISCRIMINATION set terminal; H → C-90 L → C90 (with V) (L → Model with V); Used on overseas models.	I	–
1	PA_2	Vacant terminal GND.	I	–
2	PA_3			
3	PB_0	KEY SCAN INPUT terminal.	I	L
4	PB_1			
5	PB_2			
6	PB_3			
7	PC_0	KEY SCAN OUTPUT terminal.	0	
8	PC_1			
9	PC_2			
10	PC_3			
11	PD_0			
12	PD_1	For use with EXPANDER CE Terminal (LED display No. 1).		
13	PD_2	EXPANDER CE Terminal (LED display No. 2).	0	L
14	PD_3	EXPANDER CE Terminal (Ry drive).	0	L
15	PE_0	Standby LED flash terminal.	0	H
16	PE_1	Remote control flashing indicator terminal.	0	H
17	PE_2	Peripheral IC RESET terminal.	0	L
18	PE_3	FL DRIVER WR terminal.	0	H
24	PF_0	VOLUME UP terminal.	0	H
25	PF_1	VOLUME DOWN terminal.	0	H
26	PF_2	MAIN POWER Ry drive terminal.	0	H
27	PF_3	OUTPUT Ry drive terminal.	0	H
28	PG_0	TTL IC INPUT terminal For function switching.	0	H
29	PG_1			
30	PG_2			
31	PG_3			
32	PH_0	TTL IC INPUT terminal For Rec. Sel. switching.		
33	PH_1			
34	PH_2			
35	PH_3			
36	PI_0	Serial DATA transmission CLOCK OUTPUT terminal.	0	I
37	PI_1	Serial DATA OUTPUT terminal.	0	H
22	OSC1	400kHz Seller's Lock connection terminal.	–	–
23	OSC2			

2. Key Matrix

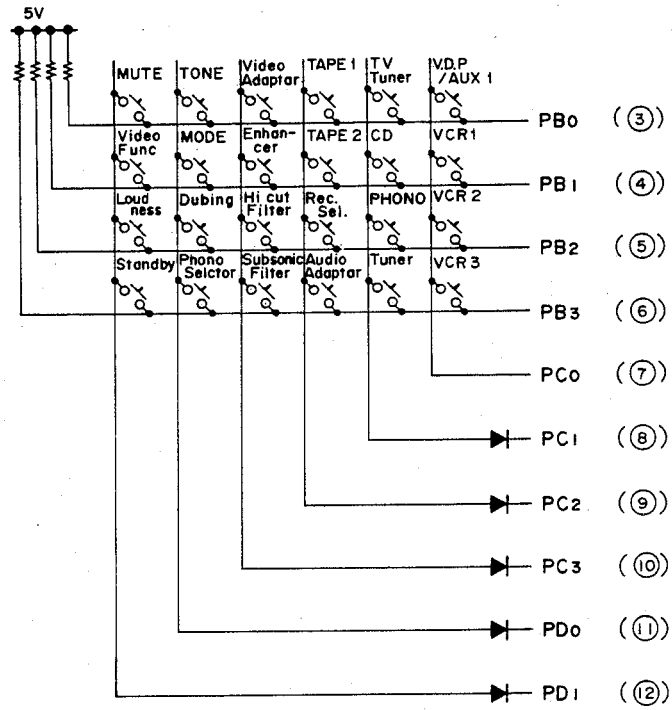


Fig. 12-9 Key Matrix

Chart 12-6 Key Matrix

Designation	Operation
VDP/AUX 1	PG terminal PG terminal 0100 (B) OUTPUT. The video signal is switched through LC7570.
VCR 1/AUX 2	PG terminal PG terminal 0101 (B) OUTPUT. The video signal is switched through LC7570.
VCR 2/AUX 3	PG terminal PG terminal 0110 (B) OUTPUT. The video signal is switched through LC7570.
VCR 3	PG terminal PG terminal 0111 (B) OUTPUT. The video signal is switched through LC7570.
TV–TUNER	PG terminal PG terminal 1000 (B) OUTPUT. The video signal is switched through LC7570.
CD	PG terminal PG terminal 0011 (B) OUTPUT. The video signal is switched off through LC7570.
Phono	PG terminal PG terminal 0001 (B) OUTPUT. The video signal is switched off through LC7570.
Tuner	PG terminal PG terminal 0010 (B) OUTPUT. The video signal is switched off through LC7570.
Tape 1	Each key pressed uses PD0012A, RY (Relay), switches LED OFF/ON.
Tape 2	
Rec. Sel.	Increments for 0001~1001 (B) to PH terminal and their output. The video signal is switched through LC7570.
Audio Adaptar	OFF/ON switching at PD0012A.
Video Adaptar	Sequential switching of OFF/IN MAIN/IN REC through LC7570.
Enhancer	Sequential switching of OFF/IN REC through LC7570.
Hicut Filter	Sequential switching of OFF/ON through LC7570.
Subsonic Filter	Sequential switching of OFF/ON through LC7570.
Tone	Sequential switching of OFF/ON through PD0012A.
Mode	Sequential switching of STEREO/MONO through LC7570.
Dubing	Sequential switching of OFF/1 → 2/2 → 1 through LC7570.
Phono Selector	Sequential switching of MM/MC40Ω/MC3Ω through PD0012A.
Mute	Sequential switching of OFF/ON through PD0012A.
Video Function	Sequential transmission of the Video signal only through LC7570.
Loudness	Sequential switching of OFF/ON through PD0012A.
Stand-by	Output of 1(B) ⟷ 0(B) each time PF2 is pressed.

3. Remote Control KEY CODE Functions

Chart 12-7 Remote Control KEY CODE Functions

KEY Function	HEX Code		Operation
VOL+	A5	0A	OUTPUT of 1(B) to PF0.
VOL−	A5	0B	OUTPUT of 1(B) to PF1.
T V	A5	0C	OUTPUT of 1000(B) to PG.
V.D.P.	A5	0D	OUTPUT of 0100(B) to PG.
VCR 2	A5	0E	OUTPUT of 0100(B) to PG.
VCR 1	A5	0F	OUTPUT of 0101(B) to PG.
MUTE	A5	12	Switching OFF/ON of MUTE through PD0012A.
ON	A5	1A	OUTPUT of 1(B) to PF2.
OFF	A5	1B	OUTPUT of 0(B) to PF2.
ON/OFF	A5	1C	OUTPUT OF 1(2) ⟷ 0(2) to PF2 each time the key is pressed.
TAPE 2	A5	1D	Switching OFF/ON of Tape 2 through PD0012A.
VCR 3	A5	46	OUTPUT of 0111(B) to PG.
TUNER	A5	47	OUTPUT of 0011(B) to PG.
CD	A5	4C	OUTPUT of 0001(B) to PG.
PHONO	A5	4D	OUTPUT of 0010(B) to PG.
TAPE 1	A5	46	Switching OFF/ON of TAPE 1 through PD0012A.
MUTE ON	A5	57	Switching ON of MUTE through PD0012A.
MUTE OFF	A5	5C	Switching OFF of MUTE through PD0012A.
V. FUNC	A5	5D	Transmission of the Video signal only, each time the key is pressed.
A. FUNC	A5	5E	Increments and output of 0001(B) ~ 1000(B) to PG each time the key is pressed.

4. Peripheral IC Connections Chart

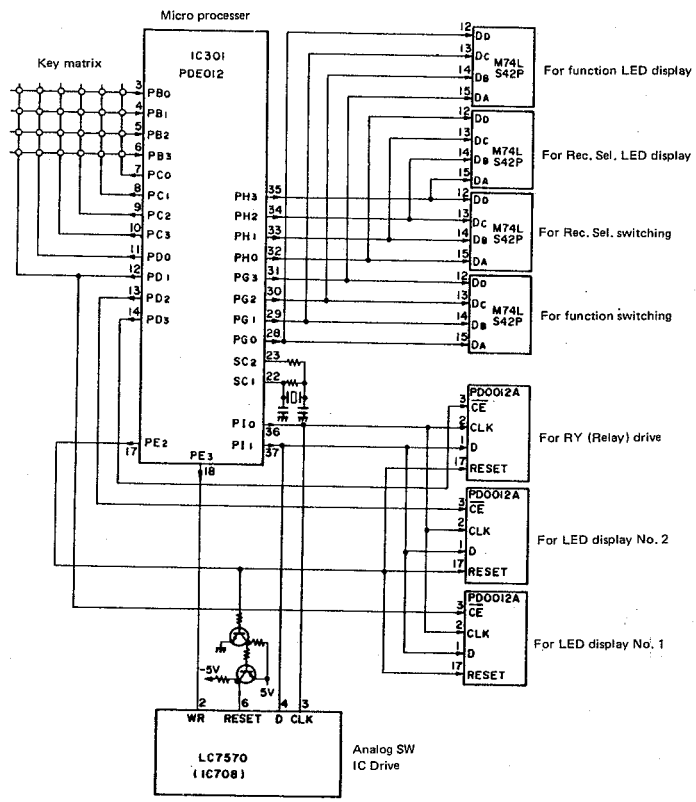


Fig. 12-10 PDE012 Peripheral IC Connections Chart

5. Peripheral IC DATA Transmission Format

PD0012A (Output Expander IC)

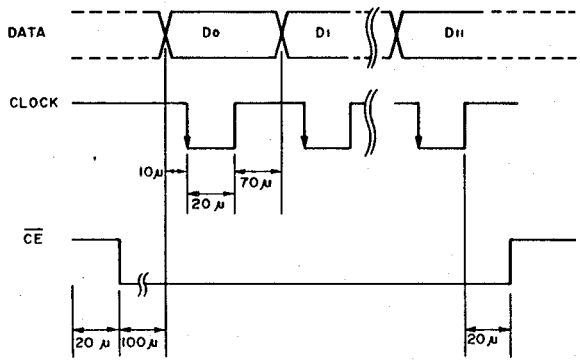
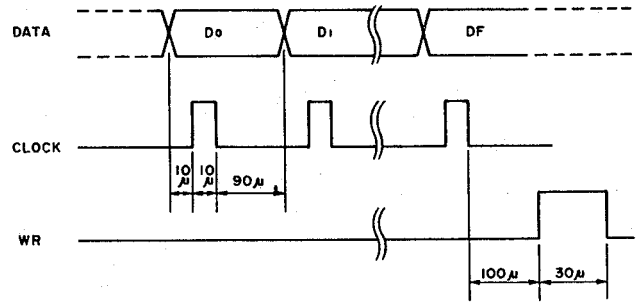


Fig. 12-11 PD0012A DATA Transmission Format

LC7570 (Analog switch IC drive)



Unit SEC. Values shown in MIN

Fig. 12-12 LC7570 DATA Transmission Format

6. Peripheral IC OUTPUT Connections Chart (Chart 12-8)

PD0012A

LED Display No. 1

Terminal		Connection	
4	O_0	TV. TUNER	LED
5	O_1	V.D.P.	LED
6	O_2	VCR 1	LED
7	O_3	VCR 2	LED
8	O_4	VCR 3	LED
10	O_5	TONE	LED
11	O_6	Dubing 1→2	LED
12	O_7	Dubing 2→1	LED
13	O_8	V Adp. in Rec	LED
14	O_9	Enhancer	LED
15	O_{10}	V. Adp. in Main	LED
16	O_{11}	———	

LED Display No. 2

Terminal		Connection	
4	O_0	A. Adp	LED
5	O_1	———	
6	O_2	TAPE 1	LED
7	O_3	TAPE 2	LED
8	O_4	MC 40Ω	LED
9	O_5	MM	LED
10	O_6	MONO	LED
11	O_7	MC 3Ω	LED
12	O_8	Hicut Filter	LED
13	O_9	Subsonic Filter	LED
14	O_{10}	Mute	LED
15	O_{11}	Loudness	LED

RY Driver

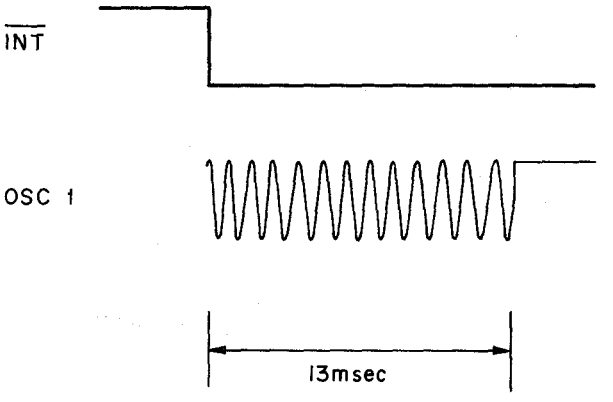
Terminal		Connection	
4	O_0	———	
5	O_1	———	
6	O_2	MUTE	Ry
7	O_3	LOUDNESS	Ry
8	O_4	TONE	Ry
10	O_5	TAPE 1	Ry
11	O_6	A. Adp.	Ry
12	O_7	TAPE 2	Ry
13	O_8	———	
14	O_{90}	MC 3Ω	Ry
15	O_{10}	———	
16	O_{11}	MC 40Ω	Ry

Chart 12-9 LC7570

Terminal		Connection
42	S_0	VDP Video signal switch.
41	S_1	VCR 1 Video signal switch.
40	S_2	VCR 2 Video signal switch.
39	S_3	VCR 3 Video signal switch.
38	S_4	TV TUNER Video signal switch.
37	S_5	V. Rec. Sel. VDP switch.
36	S_6	V. Rec. Sel. VCR 1 switch.
35	S_7	V. Rec. Sel. VCR 2 switch.
34	S_8	V. Rec. Sel. VCR 3 switch.
33	S_9	V. Rec. Sel. TV TUNER switch.
32	S_{10}	V. Rec. Sel. Source switch.
31	S_{11}	VCR 1 V LOOP CUT switch.
30	S_{12}	VCR 2 V LOOP CUT switch.
29	S_{13}	VCR 3 V LOOP CUT switch.
28	S_{14}	V Adp SW1 switch.
27	S_{15}	V Adp SW2 switch.
26	S_{16}	V Adp SW3 switch.

Terminal		Connection
25	S_{17}	V Adp SW4 switch.
24	S_{18}	Enhancer SW1 switch.
23	S_{19}	Enhancer SW2 switch.
22	S_{20}	Enhancer SW3 switch.
21	S_{21}	Dubbing SW1 switch.
20	S_{22}	Dubbing SW2 switch.
19	S_{23}	Dubbing SW3 switch.
18	S_{24}	Dubbing SW4 switch.
17	S_{25}	VCR 1 A LOOP CUT SW switch.
16	S_{26}	VCR 2 A LOOP CUT SW switch.
15	S_{27}	VCR 3 A LOOP CUT SW switch.
14	S_{28}	High-cut Filter SW switch.
13	S_{29}	Subsonic Filter SW switch.
12	S_{30}	Mode SW switch.
11	S_{31}	———
10	S_{32}	———
9	S_{33}	———

7. Back-up



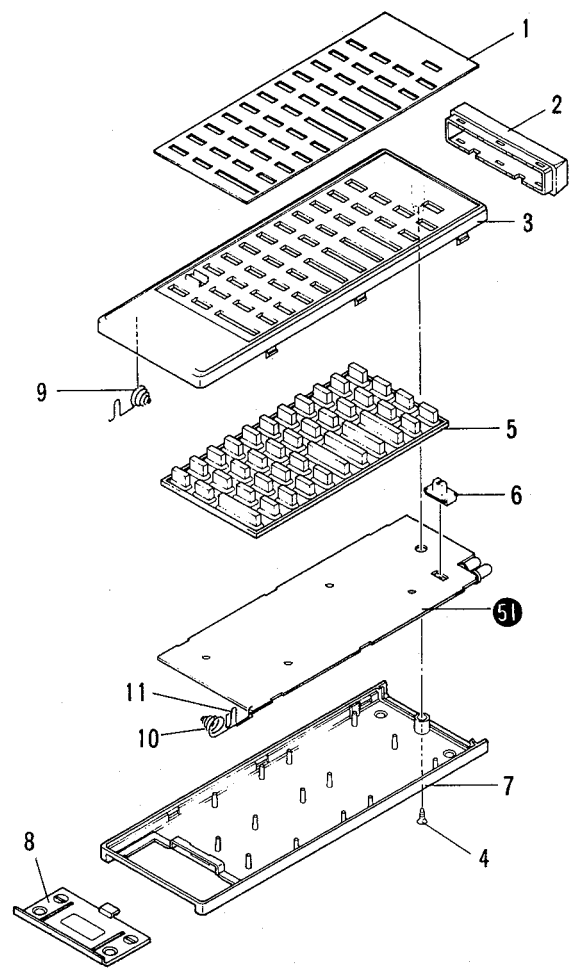
13. REMOTE CONTROL SECTION

13.1 EXPLODED VIEWS AND PARTS LIST

NOTES:

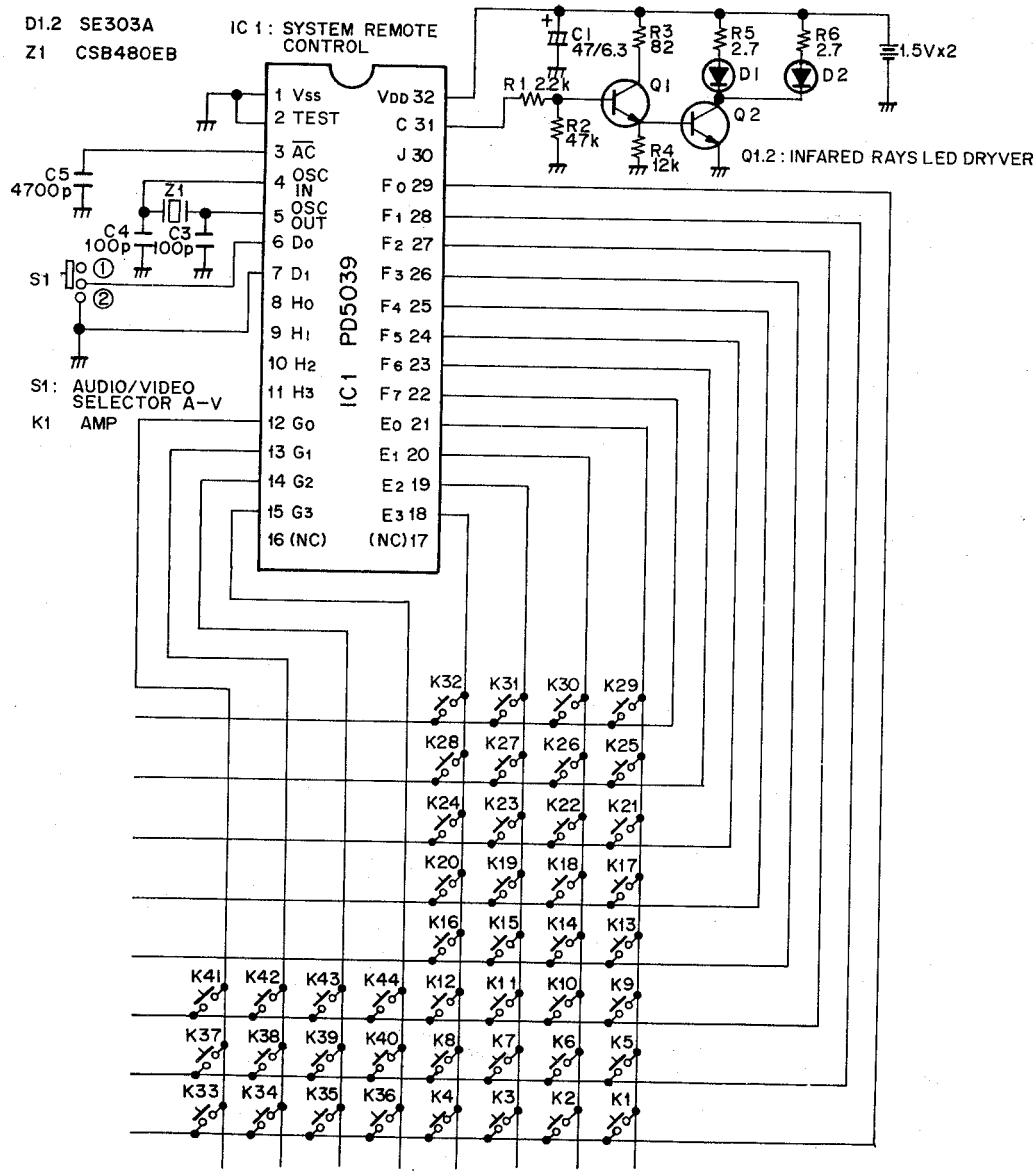
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by" ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Mark	No.	Part No.	Description
	1	AZA1035	Plate
	2	AZN1200	Filter
	3	AZH1018	Upper case A
	4	AZB1057	Screw
	5	AZA1033	Rubber switch
	6	AZS1021	Slide knob
	7	AZH1016	Under case B (Bottom case)
	8	AZH1017	Battery case C
	9	AZK1022	Battery spring (A)
	10	AZK1023	Battery spring (B)
	11	AZK1021	Battery terminal
	51		P.C. Board assembly



13.2 SCHEMATIC DIAGRAM

Q1 2SC2021
Q2 2SC2673
D1.2 SE303A
Z1 CSB480EB



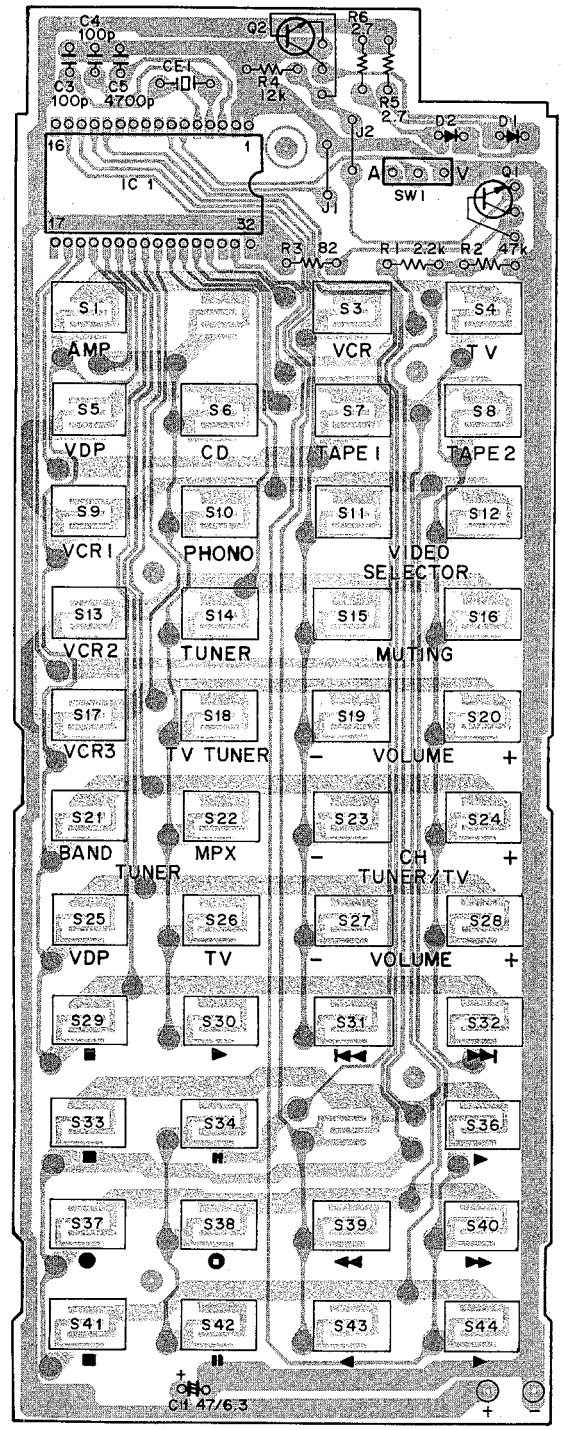
Key No.	SW No.
K1	S1
K2	—
K3	S3
K4	S4
K5	S5
K6	S6
K7	S7
K8	S8
K9	S9
K10	S10
K11	S11
K12	S12
K13	S13
K14	S14
K15	S15
K16	S16
K17	S17
K18	S18
K19	S19
K20	S20
K21	S21
K22	S22
K23	S23
K24	S24
K25	S25
K26	S26
K27	S27
K28	S28
K29	S29
K30	S30
K31	S31
K32	S32
K33	S33
K34	S34
K35	—
K36	S36
K37	S37
K38	S38
K39	S39
K40	S40
K41	S41
K42	S42
K43	S43
K44	S44

1. RESISTORS:
   Indicated in Ω, 1/4W, and 1/8W, ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance
2. CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE, CURRENT:
   V : Signal voltage at 250 W + 250 W, 8Ω output (1 kHz)
   : DC voltage (V) at no input signal Value in ( ) is DC voltage at rated power.
4. 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 unmbers.
   The underlined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

THE UNDERLINED INDICATES THE SWITCH POSITION

13.3 P.C. BOARD PATTERNS



13.4 ELECTRICAL PARTS LISTS

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 × 10¹*	*561*	*RD¼PS [5][6][1] J*
47kΩ	*47 × 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 × 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.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

P.C. Board Assembly

SEMICONDUCTOR

Mark	Symbol & Description	Part No.
★★	IC1	PD5039
★★	Q1	2SC2021
★★	Q2	2SC2673
★	D1, D2 LED (INFARED RAYS)	SE303A

SWITCH

Mark	Symbol & Description		Part No.
★★	SW1	Slide switch (VIDEO/AUDIO)	SSSS21507A

CAPACITOR

Mark	Symbol & Description	Part No.
	C1	CEJA470M6
	C3, C4	CCDSL101J50
	C5	CKDYB472K50

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.
	R1–R6	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description		Part No.
★	X1	Ceramic resonator	CSB480EB

14. FOR KU TYPE

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 × 10¹*	*561*	*RD¼PS 5 6 1 J*
47kΩ	*47 × 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 × 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.
- *Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

The C-90 [BK]/KU type is the same as the C-90 [BK]/S/G type with the exception of the following sections.

Mark	Symbol & Description		Part No. C-90 [BK]/S/G type	Part No. C-90 [BK]/KU type	Remarks
⚠ ★	T1, T2	Power transformer (AC110V/120V/220V/240V)	ATT1023	.....	
⚠ ★	T1, T2	Power transformer (AC120V)	.....	ATT1025	
⚠ ★	T3	Power transformer (AC110/120V/220V/240V)	ATT1024	.....	
⚠ ★	T3	Power transformer (AC120V)	.....	ATT1026	
⚠ ★★	S2	Line voltage selector (AC110V/120V/220V/240V)	AKX-507	.....	
⚠ ★★	S3	Line voltage selector (AC110V–120V/220V–240V)	AKX1004	.....	
		Terminal (2P)	.....	Non supply	
		Packing case	AHD1121	AHD1151	
		Spacer (for packing)	AHB1008	.....	
	R1	Wire wound resistor (56Ω/10W)	ACN1010	.....	
		Side board	AMS1005	AMS1002	
		Note sheet	ARH1030	.....	
		Washer	ABE-053	.....	

• Schematic Diagram