

# ONKYO SERVICE MANUAL

## AUDIO VIDEO CONTROL AMPLIFIER

### MODEL A-SV610PRO



#### Black model

BHMD, BHMDN, BHMDX	120V AC, 60Hz
BHMP, BHMPV	230V AC, 50Hz
BHMW, BHMWX	120/220V AC, 50/60Hz
BHMQA	240V AC, 50Hz

#### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\Delta$  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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# ONKYO

## AUDIO COMPONENTS

# SPECIFICATIONS

## AMPLIFIER SECTION

Power Output:	<b>Stereo mode</b> Front L/R channels 125 watts per channel min. RMS. at 8 ohms, both channels driven, from 20 Hz to 20,000 Hz, with no more than 0.08% total harmonic distortion. Dynamic power: 2 × 240 watts at 4 ohms 2 × 160 watts at 8 ohms
	<b>Surround mode and Multi source mode</b> Front L/R and center channels 70 watts per channel min. RMS. at 8 ohms, 1,000 Hz, with no more than 0.08% total harmonic distortion. Rear or Remote channels 20 watts per channel min. RMS. at 8 ohms, 1,000 Hz, with no more than 0.8% total harmonic distortion.
Total Harmonic Distortion:	0.08% at rated power (FRONT)
IM Distortion:	0.08% at rated power (FRONT)
Damping Factor:	60 at 8 ohms (FRONT)
Sensitivity and Impedance:	Phono: 2.5 mV/50 kohms CD/Tape Play: 150 mV/50 kohms Tape Rec: 150 mV/2.2 kohms

Phono Overload:	120 mV RMS. at 1,000 Hz, 0.5% THD.
Frequency Response:	20 to 30,000 Hz, +/-1 dB
RIAA Deviation:	20 to 20,000 Hz, +/-0.8 dB
Tone Control:	BASS: +/-10 dB at 100 Hz TREBLE: +/-10 dB at 10,000 Hz
Signal to Noise Ratio:	PHONO: 80 dB (IHF A, 5 mV input) CD/TAPE: 100 dB (IHF A)
Muting:	-∞ dB

## VIDEO SECTION

Signal sensitivity and impedance  
VIDEO input, output: 1 Vp-p, 75 ohms

## GENERAL

Dimensions (W × H × D):	455 × 170 × 388 mm 17-15/16" × 6-11/16" × 15-1/4"
Weight:	13.5 kg (29.8 lbs)

Specifications and external appearance are subject to change without notice because of product improvements.

# PRECAUTIONS

## 1. Replacing the fuses

For continued protection against risk of fire hazard, replace only with same type and same rating fuse.

Circuit No.	Part No.	Description
F901	252166Y	6.3A-UL/T-237, Primary fuse <D/W>
F902	252076	3.15A-SE-EAK, Primary fuse <P/W/Q>
F903	252075	2.5A-SE-EAK, AC outlet fuse <P>
F911, F912	252166Y	6.3A-UL/T-237, Secondary fuse <D>
F911, F912	252079	6.3A-SE-EAK, Secondary fuse <P/W/Q>

NOTE: <D>:120V model only  
<P>:230V model only  
<W>:Worldwide model only  
<Q>:240V model only

## 2. Perform a reset

This device employs a microprocessor to perform various functions and operations. If interference generated by an external power supply, radio waves, or other electrical source results in an accident which causes the specified operations and functions to operate abnormally. To perform a reset, please follow the procedure below.

1. Press and hold down the CD button, then press the POWER button.
2. "Test-" is displayed on the display for approximately 5 seconds.
3. While "Test-" is displayed, unplug the unit's power supply cord from its AC outlet, then "Test-" will disappear.
4. Preset memory and parameters stores in memory, such as surround are initialized and will return to the factory settings.

## 3. Safety-check out

(Only U.S.A. model)

After correcting the original service problem perform the following safety check before releasing the set to the customer.

Connect the insulating-resistance tester between the plug of power supply cord and terminal GND on the back panel.

Specifications: More than 10MΩ at 500V.

# ADJUSTMENT PROCEDURES

## 1. Idle Current Adjustment

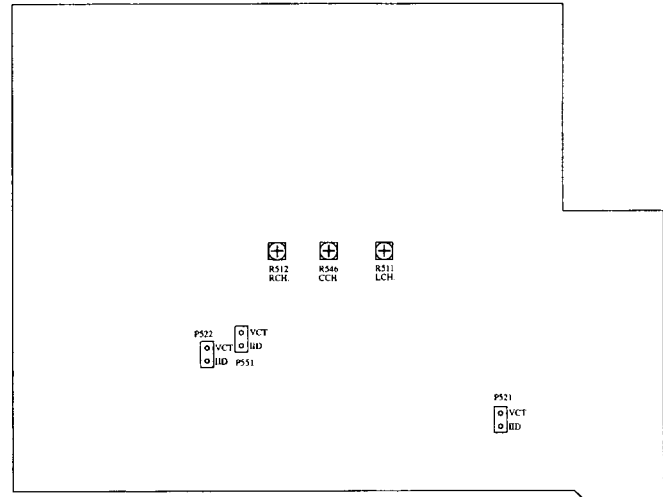
### 1) Preparation

There should be no load and no signal, the volume knob should be at the minimum position, and the speaker and power switches should be off.

### 2) Turn the power switch to on.

Adjust the trim resistors R511, R512 and R546 so that the voltage at the test points for the left, center and right channels (P521, P522 and P551) is 1.2mV to 2.2mV.

4) Five minutes later, readjust to  $5 \pm 0.5$  mV.



## 2. Checking the Operation of the Protection Circuit

### ● Preparation

Press and hold down the CD button, then press the POWER button.

"Test-" is displayed on the FL tube for approximately 5 seconds.

While "Test-" is displayed, press the VIDEO-1 button.

"Test-1-01" is displayed and the unit becomes the test mode.

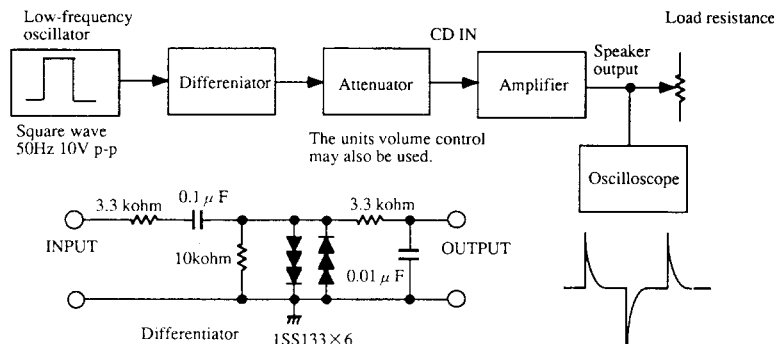
### ● Checking DC voltage detection

1) When there is no load on the amplifier, confirm that the protection circuit is triggered when a DC voltage of 1.5V to 3V is applied to the test point P621.

2) Confirm that the protection circuit is also triggered when a voltage of -1.5V to -3V is applied.

### ● Checking current detection

Apply the signal as shown below to CD terminal.



### 1. Left, right and center channel confirmation

Adjust the volume knob so that the output voltage is 35V peak for the above three channels when there is no load on the amplifier.

Connect a 2-ohm load and confirm that protection circuit is not triggered.

Connect a 1.5-ohm load and confirm that protection circuit is triggered.

### 2. Rear channel confirmation

Adjust the volume knob so that the output voltage is 15V peak for the above two channels when there is no load on the amplifier.

Connect a 2-ohm load and confirm that protection circuit is not triggered.


Connect a 1.5-ohm load and confirm that protection circuit is triggered.



# CHASSIS EXPLODED VIEW PART LIST

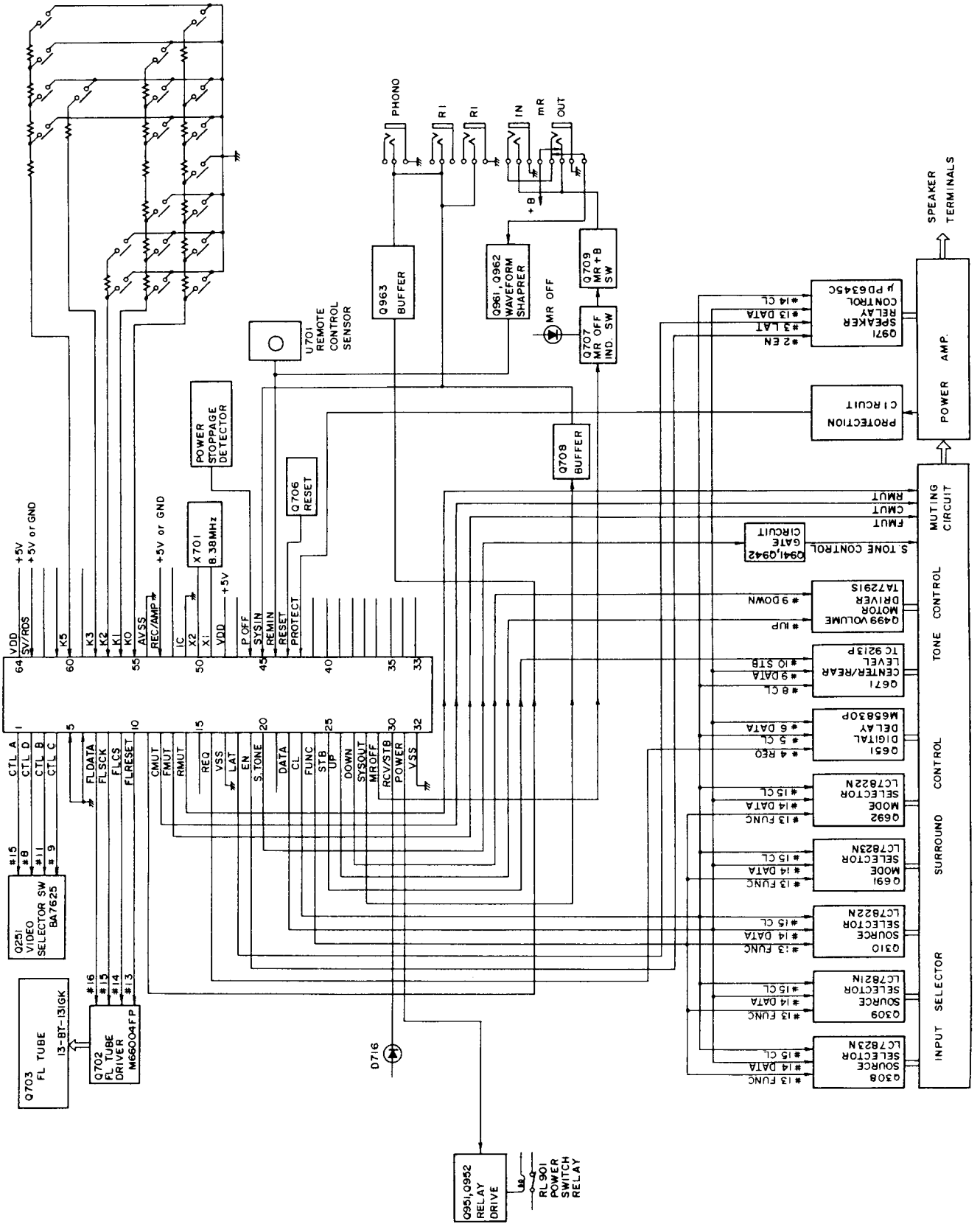
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	27121728Y	Rear panel <D>	U4	1A434595-3	AS-CEE, Power supply cord <P>	U4	1A434595-3	NAETC-4695-3,Headphone terminal pc board ass'y
	27121729Y	Rear panel <P>	U6	1A434519-1	AS-SAA,Power supply cord <Q>	U6	1A434519-1	NADIS-4719-1,Display circuit pc board ass'y
	27121730AY	Rear panel <V>	U7	1A434520-1	AS-CEE-2, Power supply cord <W>	U7	1A434520-1	NAAF-4720-1,Surround circuit pc board ass'y
	27121731Y	Rear panel <W>	U8	1A434521-1	NSCT-2P697,AC outlet <Q>	U8	1A434521-1	NAETC-4721-1,RI/MR terminal pc board ass'y
	27121732Y	Rear panel <Q>	P902,P903	253092-1A	2SC4029-R or	U9	1A434522-1	NAETC-4721-1A,RI/MR terminal pc board ass'y <P/W/Q>
2	838440109	4TTB+10C(BC),Self-tapping screw	Q505,Q506	2202662 or	2SC4029-O,Power transistors	U11	1A434502-3	NASW-4722-1,STC switch pc board ass'y
3	27130717AY	Bracket,power transformer	Q507,Q508	2202672 or	2SA1553-R or			NAPS-4702-3,Power supply circuit pc board ass'y <D>
4	27115255Y	Side bracket	Q543	2202673	2SA1553-O,Power transistors			NAPS-4702-3A,Power supply circuit pc board ass'y <P>
5	27141607AY	Retainer H		2201653,	2SC3856-O, 2SC3856-Y, 2SC3907-R or			NAPS-4702-3B,Power supply circuit pc board ass'y <W>
6	27130718AY	Bracket H		2201654,	2SC3907-O,Power transistor			NAPS-4702-3C,Power supply circuit pc board ass'y <Q>
7	27160324Y	Radiator		2202272 or	2SA1492-Y, 2SA1516-R or			NAPS-4702-3D,Power supply circuit pc board ass'y <PX>
8	27141530A	Retainer HS-2		2202273	2SA1492-P, 2SA1516-O,Power transistor			NAAF-4703-3,Rear amplifier pc board ass'y <D>
9	27141532	Retainer PD-1	Q544	2201663,	2SA1725-O, 2SA1725-Y or			NAAF-4703-3A,Rear amplifier pc board ass'y <P/W/Q>
10	27300750	Cord,bushing		2201664,	NPT-1170D,Power transformer <D>			NAAF-4704-3,Tone control circuit pc board ass'y
11	27190369	KGLS-22S,Holder		2202262 or	NPT-1170P,Power transformer <P>			NAETC-4705-3,Video circuit pc board ass'y
12	27190480	KGLS-8S,Holder		2202263	NPT-1170DG,Power transformer <W>			NAETC-4706-3,Video input terminal pc board ass'y <D>
13	27190062	KGLS-12S,Holder	Q575,Q576	2202063, or	NPT-1170Q,Power transformer <Q>			NAETC-4706-3A,Video input terminal pc board ass'y <P/W/Q>
14	801433	3SMS8W,SW+14B(BC),Sems screw		2202064 or	NAAR-4692-3,Main circuit pc board ass'y <D>			NAETC-4707-3,Tuner input terminal pc board ass'y <D>
15	834430088	3TTS+8B(BC),Self-tapping screw		2202065,	NAAR-4692-3A,Main circuit pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
16	833430080	4TTC+8C(BC),Self-tapping screw		2202053,	NAAR-4692-3B,Main circuit pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
17	830440089	3TTW+8B,Self-tapping screw		2202054 or	NAAR-4692-3,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
18	831130088	3TTS+10B(BC),Self-tapping screw	Q577,Q578	2202056 or	NAETC-4693-3,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
19	834430108	Front bracket ass'y		2202056	NAETC-4693-3A,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
20	27110765BY	Top cover	T901	2300897A	NAETC-4693-3A,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
21	28184540Y	4TTB+10C(BC),Self-tapping screw		2300898	NAETC-4693-3A,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
22	838440109	10t X 60 X 20,Cushion		2300899	NAETC-4693-3A,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
23	28141272Y	0.5 t X 390 X 10,Cushion		2300900	NAETC-4693-3A,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
24	28140546	Bottom panel	U1	1A434592-3	NAETC-4693-3,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
25	27170300AY	KGLS-18RF,Holder		1A434592-3A	NAETC-4693-3,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
26	27190926	Leg		1A434592-3B	NAETC-4693-3,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
27	27175251AY	Front panel ass'y	U2	1A434593-3	NAETC-4693-3,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
28	1A434701K	End cap L		1A434593-3A	NAETC-4693-3A,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
29	28125251Y	End cap R		1A434594-3	NAETC-4693-3A,Center speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
30	28125252Y	Clear plate	U3	1A434594-3	NAETC-4694-3,Speaker terminal pc board ass'y <D>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
31	28191653A	Back plate		1A434594-3A	NAETC-4694-3A,Speaker terminal pc board ass'y <P/W/Q>			NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
32	28133293Y	Knob VOLUME						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
33	28324775	Knob TONE						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
34	28324376A	WS-3NS,Clamp						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
35	260220	6.3A-UL/T-237,Primary fuse <D/W>						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
F901	252166Y	3.15A-SE-EAK,Primary fuse <P/W/Q>						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
F902	252076	2.5A-SE-EAK,Primary fuse <P>						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
F903	252075	6.3A-UL/T-237,Secondary fuse <D>						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
F911,F912	252166Y	6.3A-SE-EAK,Secondary fuse <P/W/Q>						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
	252079	NCFE1-322010 or						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
JL701	2041322010 or	NCFE1-322012,Flexible flat cable						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
P306	25060044	Terminal,ground						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
P901	253163Y or	AS-UC-6 #18,						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>
	253174Y	Power supply cord <D/PX>						NAETC-4707-3A,Tuner input terminal pc board ass'y <P/W/Q>

NOTE: <D>:120V model only  
<P>:230V model only  
<V>:Germany model only  
<W>:Worldwide model only  
<Q>:240V model only  
<PX>:PX model only  
<C>:Canadian model only

NOTE: THE COMPONENTS IDENTIFIED BY MARK  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

CAUTION:  
Replacement for transistor of mark \*, if necessary must be made from the same beta group (HFE) as the original type.

MICROPROCESSOR DESCRIPTIONS



## Terminal Description

Pin No.	Function	I/O	Description												
1	VCTLA	O	Video signal control A output terminal.												
2	VCTLD	O	Video signal control D output terminal.												
3	VCTLB	O	Video signal control B output terminal.												
4	VCTLC	O	Video signal control C output terminal.												
5	BAND0	I	Initializing input terminal for FM/AM band region.												
6	BAND1	I	Not used.												
7	FLDATA	O	Connect to the terminal SDATA of Fluorescent tube driver M66004FP (Q702).												
8	FLSCK	O	Connect to the terminal SCK of Fluorescent tube driver M66004FP.												
9	FLCS	O	Connect to the terminal CS of Fluorescent tube driver M66004FP.												
10	FLRESET	O	Connect to the terminal RESET of Fluorescent tube driver M66004FP.												
11	PLAYER	O	Turntable control output terminal.												
12	CMUT	O	Muting output terminal for the center amplifier.												
13	FMUT	O	Muting output terminal for the front amplifier.												
14	RMUT	O	Muting output terminal for the rear amplifier.												
15	TUMUT	O	Muting output terminal for the tuner section. Not used.												
16	REQ	O	Connect to the terminal REQ of Digital delay M65830P (Q651).												
17	VSS	-	Ground terminal												
18	LAT	O	Connect to the terminal LAT of Output extended IC $\mu$ PD6345C (Q971).												
19	EN	O	Connect to the terminal EN of Output extended IC $\mu$ PD6345C.												
20	S.TONE	O	Selective tone control output terminal.												
21	PLL	O	Connect to the terminal CE of PLL IC. Not used.												
22	DATA	O	Connect to the terminal DI of Analog switches LC7821N, LC7822N, and LC7823N, the terminal DATA of Electro volume TC9213P, the terminal DATA of Digital delay M65830P, and the terminal SIN of Output extended IC $\mu$ PD6345C.												
23	CL	O	Connect to the terminal CL of Analog switches LC7821N, LC7822N, and LC7823N, the terminal CK of Electro volume TC9213P, the terminal SCK of Digital delay M65830P, and the terminal SCK of Output extended IC $\mu$ PD6345C.												
24	FUNC	O	Connect to the terminal CE of Analog switches LC7821N, LC7822N, and LC7823N (Q309, Q310, Q692, Q308 and Q691).												
25	STB	O	Connect to the terminal STB of Electro volume TC9213P (Q671).												
26	VOLUP	O	Volume UP/DOWN control output terminal.												
27	VOLDOWN	O	<table border="1"> <thead> <tr> <th>Operation</th> <th>#27</th> <th>#26</th> </tr> </thead> <tbody> <tr> <td>Stop</td> <td>H</td> <td>H</td> </tr> <tr> <td>Volume Up</td> <td>L</td> <td>H</td> </tr> <tr> <td>Volume Down</td> <td>H</td> <td>L</td> </tr> </tbody> </table>	Operation	#27	#26	Stop	H	H	Volume Up	L	H	Volume Down	H	L
Operation	#27	#26													
Stop	H	H													
Volume Up	L	H													
Volume Down	H	L													
28	SYSOUT	O	System code output terminal.												

## VIDEO SIGNAL CONTROL OUTPUT

Input Selector

#1	#3	SOURCE
L	L	VIDEO-3
H	L	VIDEO-2
L	H	
H	H	VIDEO-1

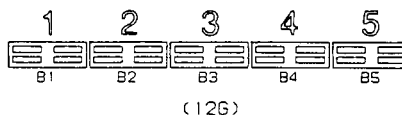
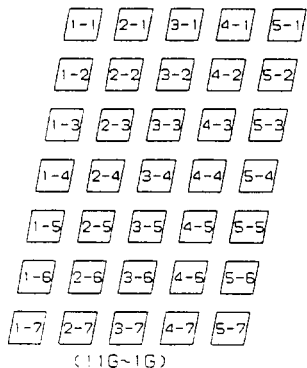
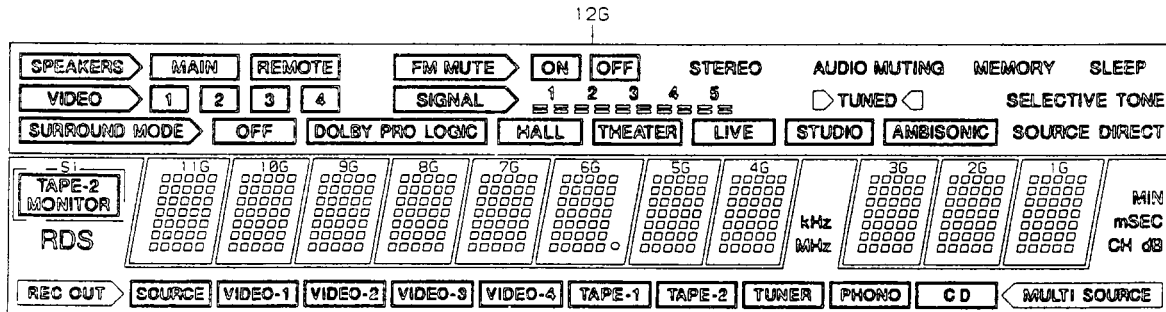
Recording Selector

#4	#2	SOURCE
L	L	VIDEO-3
H	L	VIDEO-2
L	H	
H	H	VIDEO-1
Same as #1	Same as #3	Other position
Same as #1	Same as #3	Multi mode

Pin No.	Function	I/O	Description
29	$\overline{\text{MR}}$	O	MULTI ROOM indicator control output.
30	$\overline{\text{STBY/RECV}}$	O	STAND-BY/RECEIVED indicator control output.
31	POWER	O	Power switch relay control output.
32	VSS	-	Ground terminal.
33	————	O	Not used.
34	————	O	Not used.
35	————	O	Not used.
36	————	O	Not used.
37	————	O	Not used.
38	————	O	Not used.
39	————	I	Not used.
40	————	I	Not used.
41	————	I	Not used.
42	PROTECT	I	Protection circuit operation detection input terminal.
43	$\overline{\text{RESET}}$	I	System reset input terminal.
44	$\overline{\text{REMIN}}$	I	Remote control signal input terminal.
45	$\overline{\text{SYSIN}}$	I	System code input terminal.
46	$\overline{\text{POFF}}$	I	Detection input terminal for the stoppage of electric current.
47	————	I	Not used.
48	VDD		Power supply terminal.(+5V)
49	X2		Ceramic resonator connection terminal for the main system clock .
50	X1		Connect the ceramic resonator 8.38 MHz.
51	IC		Connect to the ground terminal.
52	XT2		Not used.
53	XT1		
54	AVSS		Ground terminal of A/D converter.
55	K0	I	Operation key connection terminals.
56	K1	I	
57	K2	I	
58	K3	I	
59	K4	I	
60	K5	I	
61	————		Not used.
62	MODE	I	Initializing input terminal for Receiver or Amplifier.
63	AVDD		Analogue power supply terminal of A/D converter. (+5V)
64	AVREF		Reference voltage input terminal of A/D converter.



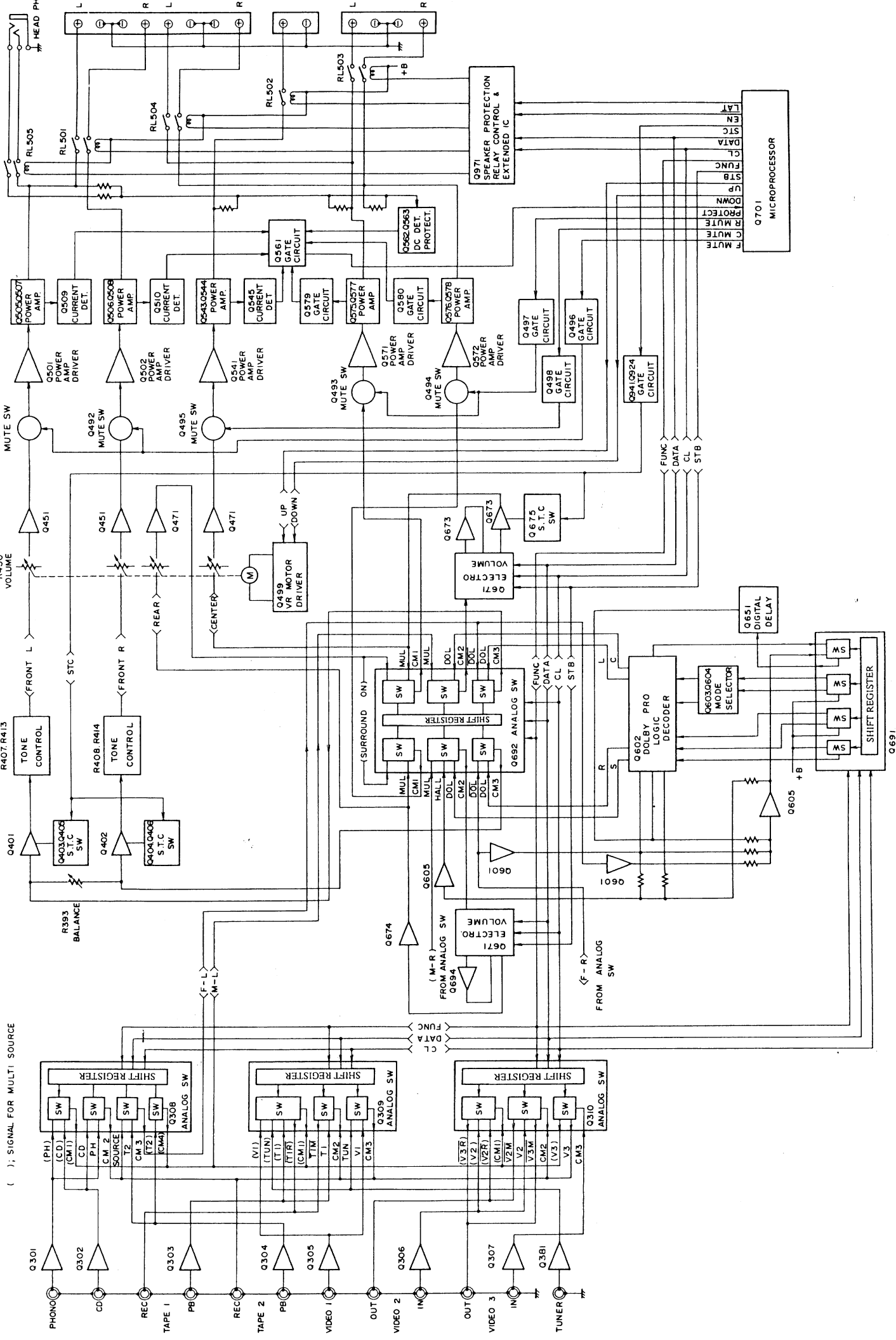
Q703  
13-BT-131GK (Fluorescent Indicator Tube)



	13G	12G	11G~7G	6G	5G~1G
P1	MIN	SLEEP	1-1	1-1	1-1
P2	mSBC	MEMORY	2-1	2-1	2-1
P3	dB	AUDIO MUTING	3-1	3-1	3-1
P4	CH	SELECTIVE TONE	4-1	4-1	4-1
P5	MULTI SOURCE	SOURCE DIRECT	5-1	5-1	5-1
P6	REC OUT	TUNED	1-2	1-2	1-2
P7	SOURCE	TUNED	2-2	2-2	2-2
P8	SOURCE	STEREO	3-2	3-2	3-2
P9	VIDEO-1	OFF (Center)	4-2	4-2	4-2
P10	VIDEO-1	ON	5-2	5-2	5-2
P11	VIDEO-2	FM MUTE	1-3	1-3	1-3
P12	VIDEO-2	AMBISONIC	2-3	2-3	2-3
P13	VIDEO-3	STUDIO	3-3	3-3	3-3
P14	VIDEO-3	LIVE	4-3	4-3	4-3
P15	VIDEO-4	THEATER	5-3	5-3	5-3
P16	VIDEO-4	HALL	1-4	1-4	1-4
P17	TAPE-1	DOLBY PRO LOGIC	2-4	2-4	2-4
P18	TAPE-1	OFF (LEFT)	3-4	3-4	3-4
P19	TAPE-2	SURROUND MODE	4-4	4-4	4-4
P20	TAPE-2	1 2 3 4 5	5-4	5-4	5-4
P21	TUNER	B5	1-5	1-5	1-5
P22	TUNER	B4	2-5	2-5	2-5
P23	PHONO	B3	3-5	3-5	3-5
P24	PHONO	B2	4-5	4-5	4-5
P25	CD	B1	5-5	5-5	5-5
P26	CD	SIGNAL	1-6	1-6	1-6
P27	kHz	REMOTE	2-6	2-6	2-6
P28	MHz	MAIN	3-6	3-6	3-6
P29	SI	SPEAKERS	4-6	4-6	4-6
P30	RDS	4	5-6	5-6	5-6
P31		3	1-7	1-7	1-7
P32		2	2-7	2-7	2-7
P33		1	3-7	3-7	3-7
P34		VIDEO	4-7	4-7	4-7
P35			5-7	5-7	5-7
P36				○	

PIN NO.	64	63	62	61	60	59	58	57
CONNECTION	F2	F2	NP	NP	P36	P35	P34	P33
PIN NO.	56	55	54	53	52	51	50	49
CONNECTION	P32	P31	P30	P29	P28	P27	P26	P25
PIN NO.	48	47	46	45	44	43	42	41
CONNECTION	P24	P23	P22	P21	P20	P19	P18	P17
PIN NO.	40	39	38	37	36	35	34	33
CONNECTION	P16	P15	P14	P13	P12	P11	P10	P9
PIN NO.	32	31	30	29	28	27	26	25
CONNECTION	P8	P7	P6	P5	P4	P3	P2	P1
PIN NO.	24	23	22	21	20	19	18	17
CONNECTION	NC	NC	NC	NC	NC	NC	NC	13G
PIN NO.	16	15	14	13	12	11	10	9
CONNECTION	12G	11G	10G	9G	8G	7G	6G	5G
PIN NO.	8	7	6	5	4	3	2	1
CONNECTION	4G	3G	2G	1G	NP	NP	F1	F1

# BLOCK DIAGRAM



A

B

C

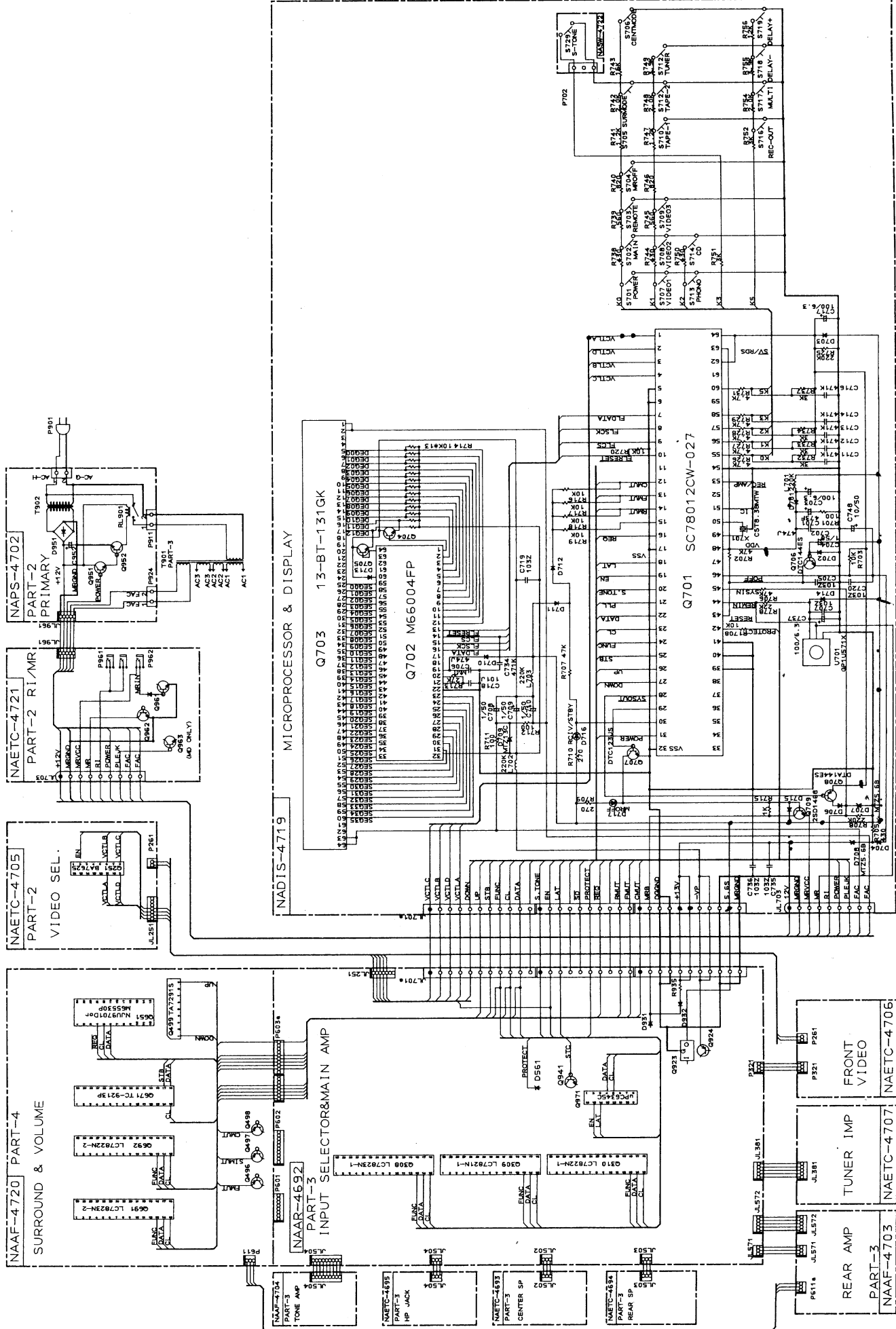
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E

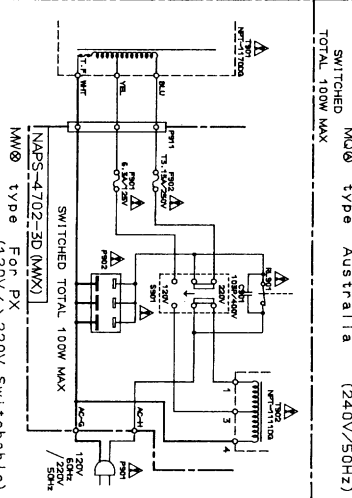
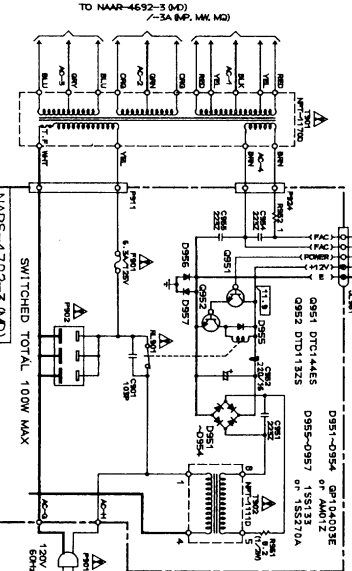
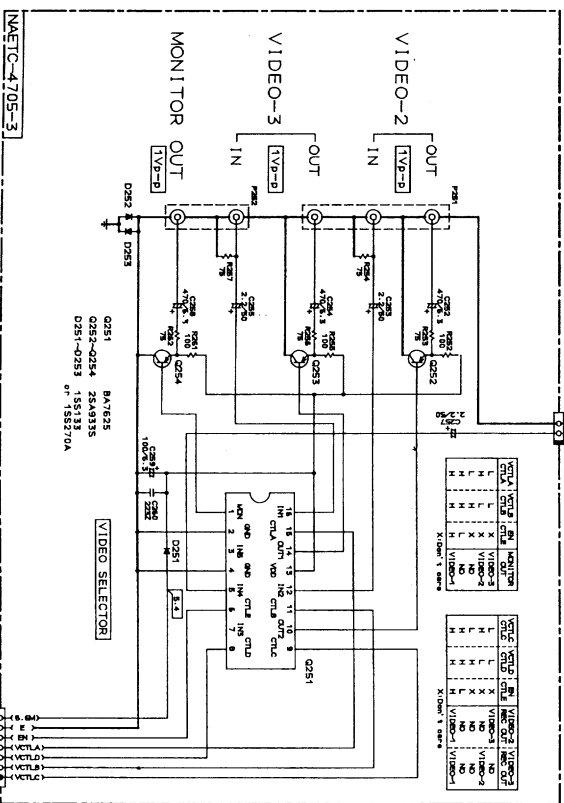
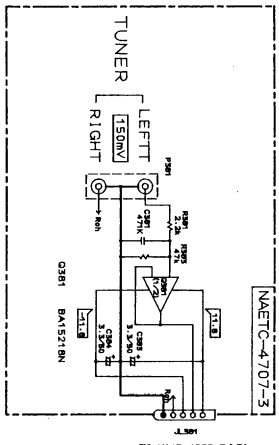
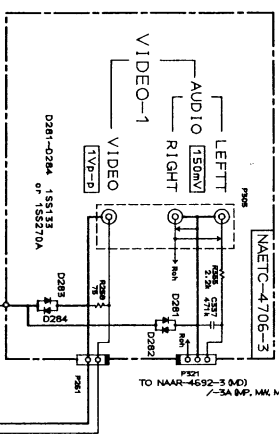
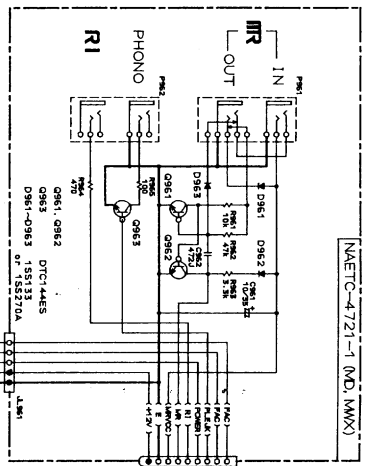
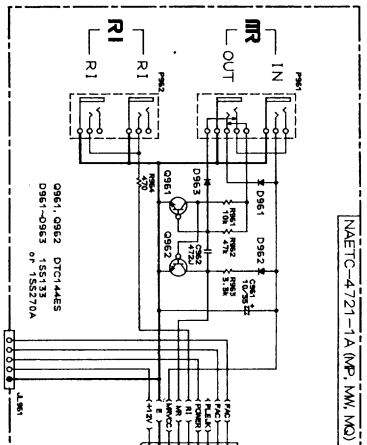
F

G

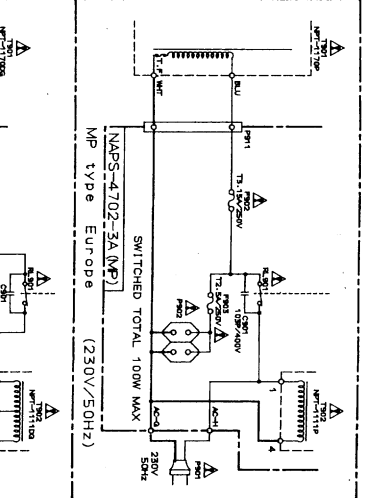
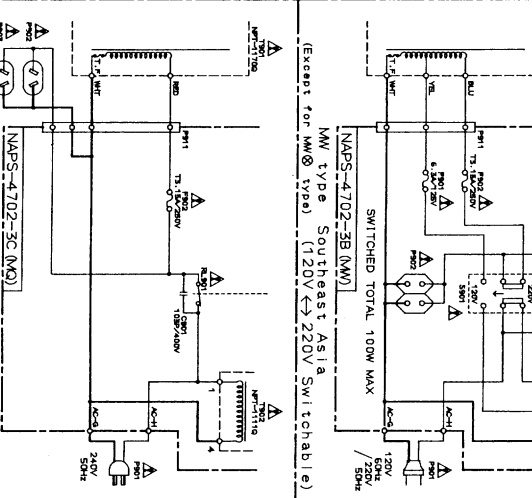
# CHEMATIC DIAGRAM PART 1 CONNECTION DIAGRAM OF MICROPROCESSOR



A B C D E F G



MD type : 120V/60Hz Area  
 MD type : U.S.A.  
 MD type : Canada  
 MP type : 230V/50Hz Area  
 MP type : Europe  
 MW type : 120V or 220V Switchable  
 MW type : Southeast Asia  
 MW type : Worldwide  
 MW type : For PX  
 MW type : Australia  
 MD type : 240V/50Hz Area  
 MD type : Australia








## PRINTED CIRCUIT BOARD – PARTS LIST






## CAUTION:

Replacement for transistor of mark \*, if necessary must be made from the same beta group (HFE) as the original type.

## MAIN CIRCUIT PC BOARD (NAAR-4692-3/3A/3B)

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs				
Q301	22240191	NJM4565D-D	D931-D934	223205 or	1SS270A or
Q302-Q307	22240247	BA15218N	D971	223163	1SS133
Q308	22240339	LC7823N		Coils	
Q309	22240280	LC7821N	L501,L502	231209S	S-0.4A
Q310	22240270	LC7822N	L541	231209S	S-0.4A
Q501,Q502	22240694Y	$\mu$ PC1342V		Capacitors	
Q541	22240694Y	$\mu$ PC1342V	C303,C304	354761009	10 $\mu$ F,35V,Elect.
Q921	222780125NEC	78M12HF	C307,C308	354721019	100 $\mu$ F,6.3V,Elect.
Q922	222790125	79M12	C309,C310	374726224	6200pF $\pm$ 5%,50V,Plastic
Q923	222780565JRC	78M56	C311,C312	374721824	1800pF $\pm$ 5%,50V,Plastic
Q971	22240211	$\mu$ PD6345C	C313,C314	354761009	10 $\mu$ F,35V,Elect.
	Transistors		C315,C316	354744709	47 $\mu$ F,16V,Elect.
Q503,Q504	2213284	2SC1740S-R	C501,C502	354761009	10 $\mu$ F,35V,Elect.
Q505,Q506	2202663 or	☆ 2SC4029-O or	C503,C504	374724714	470pF $\pm$ 5%,50V,Plastic
	2202662	☆ 2SC4029-R	C507,C508	354742219	220 $\mu$ F,16V,Elect.
Q507,Q508	2202673 or	☆ 2SA1553-O or	C515,C516	374726834	0.068 $\mu$ F $\pm$ 5%,50V,Plastic
	2202672	☆ 2SA1553-R	C517,C518	374724734	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
Q509,Q510	2211633 or	2SC2229-O or	C519-C522	354700109	1 $\mu$ F,160V,Elect.
Q545	2211634	2SC2229-Y	C527,C528	354700109	1 $\mu$ F,160V,Elect.
Q542	2213284	2SC1740S-R	C541	354761009	10 $\mu$ F,35V,Elect.
Q543	2201653,	☆ 2SC3856-O,	C542	374724714	470pF $\pm$ 5%,50V,Plastic
	2201654,	☆ 2SC3856-Y,	C544	354742219	220 $\mu$ F,16V,Elect.
	2201655,	☆ 2SC3856-P,	C548	374726834	0.068 $\mu$ F $\pm$ 5%,50V,Plastic
	2202272 or	☆ 2SC3907-R or	C549	374724734	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
	2202273	☆ 2SC3907-O	C550,C551	354700109	1 $\mu$ F,160V,Elect.
Q544	2201663,	☆ 2SA1492-O,	C554	354700109	1 $\mu$ F,160V,Elect.
	2201664,	☆ 2SA1492-Y,	C907,C908	3504259	12000 $\mu$ F,71V,Elect.
	2201665,	☆ 2SA1492-P,	C913,C914	3504213	4700 $\mu$ F,35V,Elect.
	2202262 or	☆ 2SA1516-R or	C923	354753329	3300 $\mu$ F,25V,Elect.
	2202263	☆ 2SA1516-O	C924	354761029	1000 $\mu$ F,35V,Elect.
Q561	2211792 or	2SA992-F or	C927,C928	354761009	10 $\mu$ F,35V,Elect.
	2211793	2SA992-E	C929	354751029	1000 $\mu$ F,25V,Elect.
Q924	2211455	2SA1015-GR	C931	354761009	10 $\mu$ F,35V,Elect.
Q925	2213830	DTB113ZS	C932	354762219	220 $\mu$ F,35V,Elect.
Q926	2213640	DTC123JS	C933	354782219	220 $\mu$ F,50V,Elect.
Q941	221282	DTC144ES	C936	354754719	470 $\mu$ F,25V,Elect.
Q942	2213510	DTA114ES	C971	354721019	100 $\mu$ F,6.3V,Elect.
	Diodes			Resistors	
D501-D505	223205 or	1SS270A or	R511,R512	5210261	N06HR 5KBC,Trim
D902-D904	223163	1SS133	R517-R520	452530824	8.2 ohm,1/2W,Metal
D561	224450512	MTZ5.1B	R521,R522	4000132	0.22 ohm, 5W,Metal plate
D901	22380038	RBV602	R523,R524	451730824	8.2 ohm, 2W,Metal
D911	22380048	RBA402	R525,R526	452530824	8.2 ohm,1/2W,Metal
D912,D913	223205 or	1SS270A or	R527-R532	452534794	0.47 ohm,1/2W,Metal
D926	223163	1SS133	R533,R534	442522724	2.7 kohm,1/2W,Metal oxide
D921-D925	22380046 or	AM01Z or	R539,R540	441623914	390 ohm,1W,Metal oxide
D927,D928	22380035	GP104003E	R546	5210261	N06HR 5KBC,Trim
D929	224453004	MTZ30D	R549,R550	452530824	8.2 ohm,1/2W,Metal
D930	224450913	MTZ9.1C	R551	4000132	0.22 ohm $\times$ 2,5W+5W,Metal plate
			R552	451630824	8.2 ohm,1W,Metal

NOTE: THE COMPONENTS IDENTIFIED BY MARK  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R553	452530824	8.2 ohm,1/2W,Metal
R554-R556	452534794	0.47 ohm,1/2W,Metal
R557	442522724	2.7 kohm,1/2W,Metal oxide
R921-R923	452534794	0.47 ohm,1/2W,Metal
R924	442523304	33 ohm,1/2W,Metal oxide
R927	441621804	18 ohm,1W,Metal oxide
R928	441722214	220 ohm,2W,Metal oxide
R930,R935	442522204	22 ohm,1/2W,Metal oxide
R934	442523314	330 ohm,1/2W,Metal oxide
	Relaies	
RL501	25065339	NRL-2P5A-DC24-046
RL502	25065379	NRL-1P5A-DC24-058
RL503,RL504	25065339	NRL-2P5A-DC24-046
RL505	25065470	NRL-2P1.25A-DC24-079
RL902,RL903	25065435	 NRL-1P10A-DC24-072
	25065480	 NRL-1P10A-DC24-083, (Canadian model only)
	Fuses	
F911,F912	252166Y	 6.3A-UL/T-237 <D>
	252079	 6.3A-SE-EAK <P/W/Q>
	Fuseholders	
F911A,F912A	25050065	 YSH403T
	Plugs	
P322A	25055133Y	NPLG-3P117
P601A	25055498	NPLG-8P473
P602A	25055499	NPLG-10P474
P603A	25055503	NPLG-18P478
	Terminals	
P301,P302	25045300	NPJ-6PDBL-159
P303,P304	25045303	NPJ-4PDBL-162
P501	25060125	NTM-8PDMN058
	Wire traps	
JL381	25050527	NSCT-5P350
JL401	25050531	NSCT-9P354
JL701A	25050612 or 25050705Y	NSCT-32P423 or NSCT-32P509

CENTER SPEAKER TERMINAL PC BOARD (NAETC-4693-3/3A)

CIRCUIT NO.	PART NO.	DESCRIPTION
P502	25060114	NTM-2PDML-048,Speaker terminal

SPEAKER TERMINAL PC BOARD (NAETC-4694-3/3A)

CIRCUIT NO.	PART NO.	DESCRIPTION
P503	25060161	NTM-4PDML-087,Speaker terminal


HEADPHONE TERMINAL PC BOARD (NAETC-4695-3)

CIRCUIT NO.	PART NO.	DESCRIPTION
P504	25045257	YKB26-5138,Headphone terminal

DISPLAY CIRCUIT PC BOARD (NADIS-4719-1/1A/1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Remote control sensor	
U701	24130007	GPU571X
	FL tube	
Q703	212120	13-BT-131GK
	ICs	
Q701	22240684	SC78012CW-027
Q702	22240685R9	M66004FP
	Transistors	
Q704,Q705	2213284	2SC1740S-R
Q706	221282	DTC144ES
Q707	2213640	DTC123JS
Q708	2213510	DTA114ES
Q709	2212794	2SD1468-R
	Diodes	
D701-D706	223205 or	1SS270A or
D710-D715	223163	1SS133
D707,D708	224450562	MTZ5.6B
D709	224451303	MTZ13C
D716,D717	225142	SEL2913K,LED
	Resonator	
X701	3010205	CST8.38MTW,Ceramic
	Coils	
L701-L703	233411K220	NCH-1387
	Capacitors	
C701	3000059	0.047F,5.5V,Super
C702	375524744	0.47 $\mu$ F $\pm$ 5%,50V,Plastic
C703	354721019	100 $\mu$ F,6.3V,Elect.
C704	354780109	1 $\mu$ F,50V,Elect.
C708-C710	354780109	1 $\mu$ F,50V,Elect.
C717,C731	354721019	100 $\mu$ F,6.3V,Elect.
C732,C737	354721019	100 $\mu$ F,6.3V,Elect.
C748	354761009	10 $\mu$ F,35V,Elect.
	Resistor	
R714	49163103413	10 kohm $\times$ 13,1/10W,Array
	Switches	
S701-S714	25035548	NPS-111-S510
S716-S719	25035548	NPS-111-S510
	Wire trap	
JL701B	25050578 or 25050726	NSCT-32P389 or NSCT-32P530
	Plug	
P702A	25055510Y	NPLG-3P485
	Holders	
D712A,D716A	27190843	
Q703A	27190913Y	



NOTE: THE COMPONENTS IDENTIFIED BY MARK  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

## SURROUND CIRCUIT PC BOARD (NAAF-4720-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q451,Q471	22240247 or 22240293	BA15218N or NJM4558L-D
Q499	22240239	TA7291S
Q601,Q605	22240247 or	BA15218N or
Q673,Q674	22240293	NJM4558L-D
Q602	22240683 or 22240692	NJM2177L or M69032P
Q651	22240686 or 22240687	M65830P or NJU9701D
Q671	22240266	TC9213P
Q691	22240339	LC7823N
Q692	22240270	LC7822N
	Transistors	
Q491-Q495	2213631 or	RN1241-A or
Q603,Q604	2213632	RN1241-B
Q496-Q498	2213510	DTA114ES
Q675	2213631 or 2213632	RN1241-A or RN1241-B
	Diodes	
D651,D652	223205 or 223163	1SS270A or 1SS133
	Coil	
L651	233411K220	NCH-1387
	Resonator	
X651	3010217	CST2.04MG040,Ceramic
	Capacitors	
C451,C452	354780229	2.2 $\mu$ F,50V,Elect.
C459-C462	354761009	10 $\mu$ F,35V,Elect.
C471,C472	354780229	2.2 $\mu$ F,50V,Elect.
C479-C482	354761009	10 $\mu$ F,35V,Elect.
C491-C493	354761009	10 $\mu$ F,35V,Elect.
C494	354721019	100 $\mu$ F,6.3V,Elect.
C601,C602	354761009	10 $\mu$ F,35V,Elect.
C605,C606	354761009	10 $\mu$ F,35V,Elect.
C607-C610	354781099	0.1 $\mu$ F,50V,Elect.
C613,C614	374724734	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
C615,C616	374722234	0.022 $\mu$ F $\pm$ 5%,50V,Plastic
C617-C620	354781099	0.1 $\mu$ F,50V,Elect.
C621,C622	354780479	4.7 $\mu$ F,50V,Elect.
C623-C627	354782299	0.22 $\mu$ F,50V,Elect.
C628	354761009	10 $\mu$ F,35V,Elect.
C629	354786899	0.68 $\mu$ F,50V,Elect.
C630	374724734	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
C631,C660	374725624	5600pF $\pm$ 5%,50V,Plastic
C632,C651	354780229	2.2 $\mu$ F,50V,Elect.
C634	354722219	220 $\mu$ F,6.3V,Elect.
C635	354741019	100 $\mu$ F,16V,Elect.
C636-C641	354761009	10 $\mu$ F,35V,Elect.
C642,C661	374724724	4700pF $\pm$ 5%,50V,Plastic


CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C643	354761009	10 $\mu$ F,35V,Elect.
C644	392841007	10 $\mu$ F,16V,Elect.
C647-C649	354761009	10 $\mu$ F,35V,Elect.
C653	374723924	3900pF $\pm$ 5%,50V,Plastic
C655,C659	374726834	0.068 $\mu$ F $\pm$ 5%,50V,Plastic
C656	354744709	47 $\mu$ F,16V,Elect.
C657,C658	354781099	0.1 $\mu$ F,50V,Elect.
C663,C665	354721019	100 $\mu$ F,6.3V,Elect.
C666	375524744	0.47 $\mu$ F $\pm$ 5%,50V,Plastic
C671,C672	354780229	2.2 $\mu$ F,50V,Elect.
C675,C676	354761009	10 $\mu$ F,35V,Elect.
C677,C678	354780229	2.2 $\mu$ F,50V,Elect.
C679,C680	354761009	10 $\mu$ F,35V,Elect.
C681,C682	354780109	1 $\mu$ F,50V,Elect.
C683,C684	374721034	0.01 $\mu$ F $\pm$ 5%,50V,Plastic
C685,C686	354761009	10 $\mu$ F,35V,Elect.
	Resistor	
R450	5144017Y	N16RQL50KA25F,Variable,Volume
	Sockets	
P601	25050445	NSCT-8P269
P602	25050446	NSCT-10P270
P603	25050450	NSCT-18P274
P611	2000802ULY	NSAS-6P758
	Plug	
P621	25055411	NPLG-9P393

## RI/MR TERMINAL PC BOARD (NAETC-4721-1/1A)

















CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q961,Q962	221282	DTC144ES
Q963	221282	DTC144ES <D>
	Diodes	
D961-D963	223205 or 223163	1SS270A or 1SS133
	Capacitors	
C961	354761009	10 $\mu$ F,35V,Elect.
C962	374724724	4700pF $\pm$ 5%,50V,Plastic
	Jacks	
P961	25045293	HSJ-1003-01-012
P962	25045172	HSJ-1003-01-020
	Wire trap	
JL961	25050527	NSCT-5P350

## STC SWITCH PC BOARD (NASW-4722-1)







CIRCUIT NO.	PART NO.	DESCRIPTION
S729	25035548	NPS-111-S510,Switch
P702B	25050454	NSCT-3P278,Socket

NOTE: THE COMPONENTS IDENTIFIED BY MARK  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

**POWER SUPPLY CIRCUIT PC BOARD (NAPS-4702-3/3A/3B/3C/3D)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q951	221282	DTC144ES
Q952	2213650	DTD113ZS
	Diodes	
D951-D954	22380046 or 22380035	AM01Z or GP104003E
D955-D957	223205 or 223163	1SS270A or 1SS133
	Power transformer	
T902	2300670	 NPT-1111D <D>
	2300671	 NPT-1111P <P>
	2300672	 NPT-1111DG <W>
	2300673	 NPT-1111Q <Q>
	Relay	
RL901	25065248	 NRL-1P15A-DC12-29
	Capacitors	
C901	3500065A	 DE7150FZ103PAC400/125V,IS
C952	354742219	220 $\mu$ F,16V,Elect.
	Resistor	
R951	452530824	 8.2 ohm, 1/2W, Metal
	Fuse	
F901	252166Y	 6.3A-UL/T-237 <D/W>
F902	252076	 3.15A-SE-EAK <P/W/Q>
F903	252075	 2.5A-SE-EAK <P>
	Fuseholders	
F901A	25050065	 YSH403T <D/W>
F902A	25050065	 YSH403T <P/W/Q>
F903A	25050065	 YSH403T <P>
	AC outlet	
P902	25050388	 NSCT-6P215 <D>
	25050640	 NSCT-4P451 <P/W>
	Switch	
S901	25065437	 NSS-22157P <W>

**REAR AMPLIFIER PC BOARD (NAAF-4703-3/3A)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q571,Q572	22240108	$\mu$ PC1225H
	Transistors	
Q562,Q563	2211732 or	2SC1845-F or
Q579,Q580	2211733	2SC1845-E
Q573,Q574	2213284	2SC1740S-R
Q575,Q576	2202063,	 2SC4511-O,
	2202064 or	 2SC4511-Y or
	2202066	 2SC4511-P
Q577,Q578	2202053,	 2SA1725-O,
	2202054 or	 2SA1725-Y or
	2202056	 2SA1725-P
	Coils	
L571,L572	231209S	S-0.4A

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C563	354721019	100 $\mu$ F,6.3V,Elect.
C571,C572	354761009	10 $\mu$ F,35V,Elect.
C577,C578	354721019	100 $\mu$ F,6.3V,Elect.
C585,C586	374723334	0.033 $\mu$ F $\pm$ 5%,50V,Plastic
C587,C588	374724734	0.047 $\mu$ F $\pm$ 5%,50V,Plastic
C595,C596	354761009	10 $\mu$ F,35V,Elect.
	Resistors	
R585,R586	4000131	0.22 ohm $\times$ 2,2W+2W,Metal plate
R587-R590	452530824	8.2 ohm,1/2W,Metal
R597	452530824	8.2 ohm,1/2W,Metal
	Plug	
P611A	25055234	NPLG-3P218
	Wire traps	
JL571	25050280	NSCT-3P108
JL572	25050282	NSCT-5P110

**tone CONTROL CIRCUIT PC BOARD (NAAF-4704-3)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q401,Q402	22240247 or 22240293	BA15218N or NJM4558L-D
	Transistors	
Q403-Q406	2211945	2SK246-GR
	Diodes	
D401-D404	223205 or 223163	1SS270A or 1SS133
	Capacitors	
C401,C402	354761009	10 $\mu$ F,35V,Elect.
C405,C406	354744709	47 $\mu$ F,16V,Elect.
C407,C408	374721534	0.015 $\mu$ F $\pm$ 5%,50V,Plastic
C411,C412	374721534	0.015 $\mu$ F $\pm$ 5%,50V,Plastic
C413-C416	374721044	0.1 $\mu$ F $\pm$ 5%,50V,Plastic
C417-C420	374721024	1000pF $\pm$ 5%,50V,Plastic
	Variable resistors	
R393	5104225	N11RGLC250KWT22Z,Balance
R407	5104230	N14RLC100KWT22Z,Bass
R413	5104230	N14RLC100KWT22Z,Treble

**VIDEO CIRCUIT PC BOARD (NAETC-4705-3)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q251	22240373	BA7625
	Transistors	
Q252-Q254	2213354	2SA933S-R
	Diodes	
D251	22380046 or 22380035	AM01Z or GP104003E

**CAUTION:**

Replacement for transistor of mark \*, if necessary must be made from the same beta group (HFE) as the original type.

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C253	354780229	2.2 $\mu$ F,50V,Elect.
C252,C254	354724719	470 $\mu$ F,6.3V,Elect.
C255,C256	354780229	2.2 $\mu$ F,50V,Elect.
C258	354724719	470 $\mu$ F,6.3V,Elect.
C259	354721019	100 $\mu$ F,6.3V,Elect.
	Terminals	
P251	25045299	NPJ-3PDYE-158
P252	25045395	NPJ-2PDYE-221
	Wire trap	
JL251	25050529	NSCT-7P352
	Plug	
P261A	25055132Y	NPLG-2P116

**VIDEO INPUT TERMINAL PC BOARD (NAETC-4706-3)**

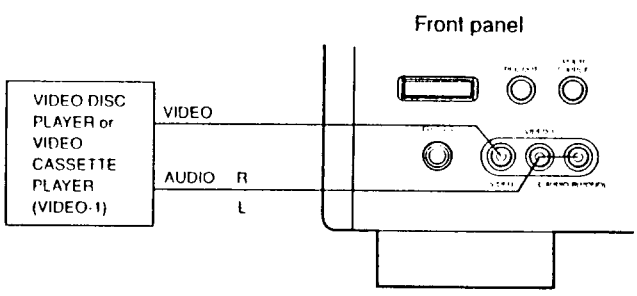
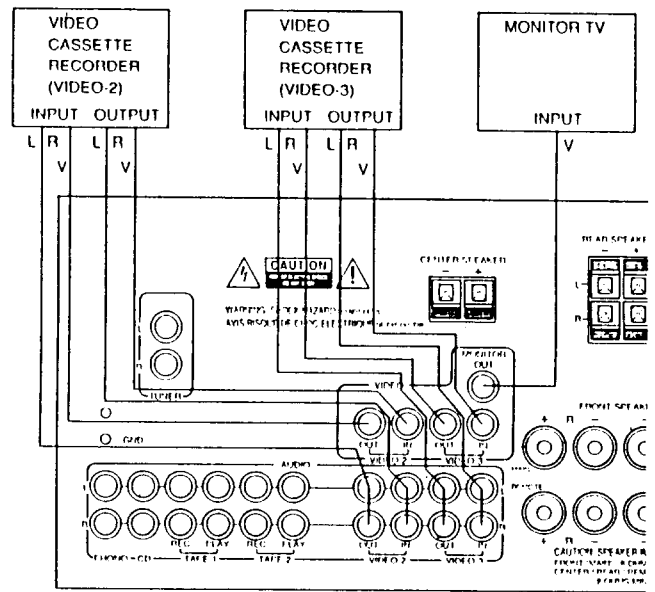
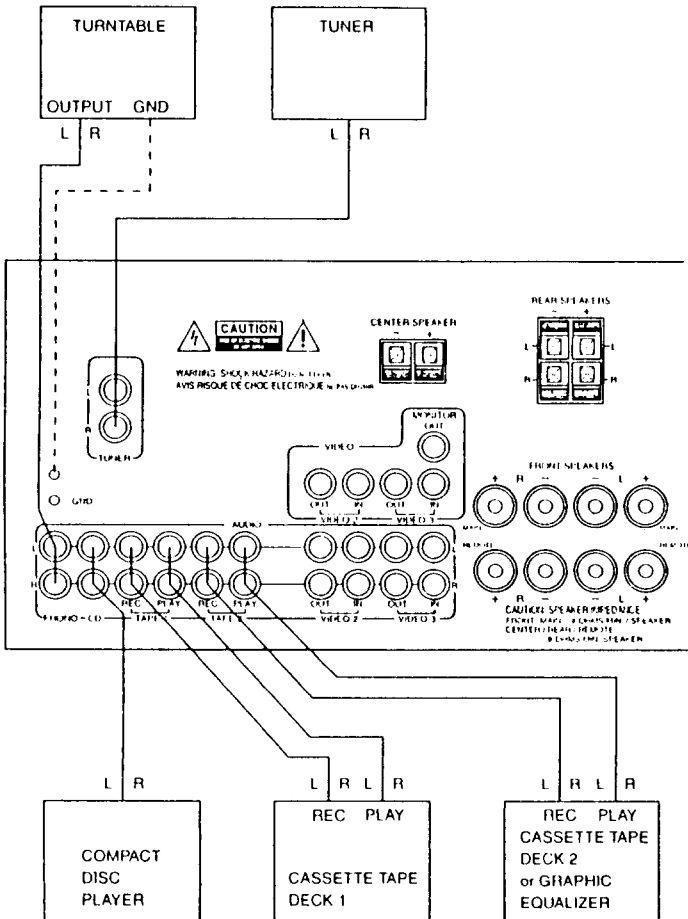
CIRCUIT NO.	PART NO.	DESCRIPTION
D281-D284	223205 or 223163	1SS270A or 1SS133,Diodes
P305	25045321	NPJ-3PDBL178,Terminal
P261	2009990281Y	NSAS-4P0409,Socket
P321	2009990125ULY	NSAS-6P0190,Socket

**TUNER INPUT TERMINAL PC BOARD (NAETC-4707-3)**

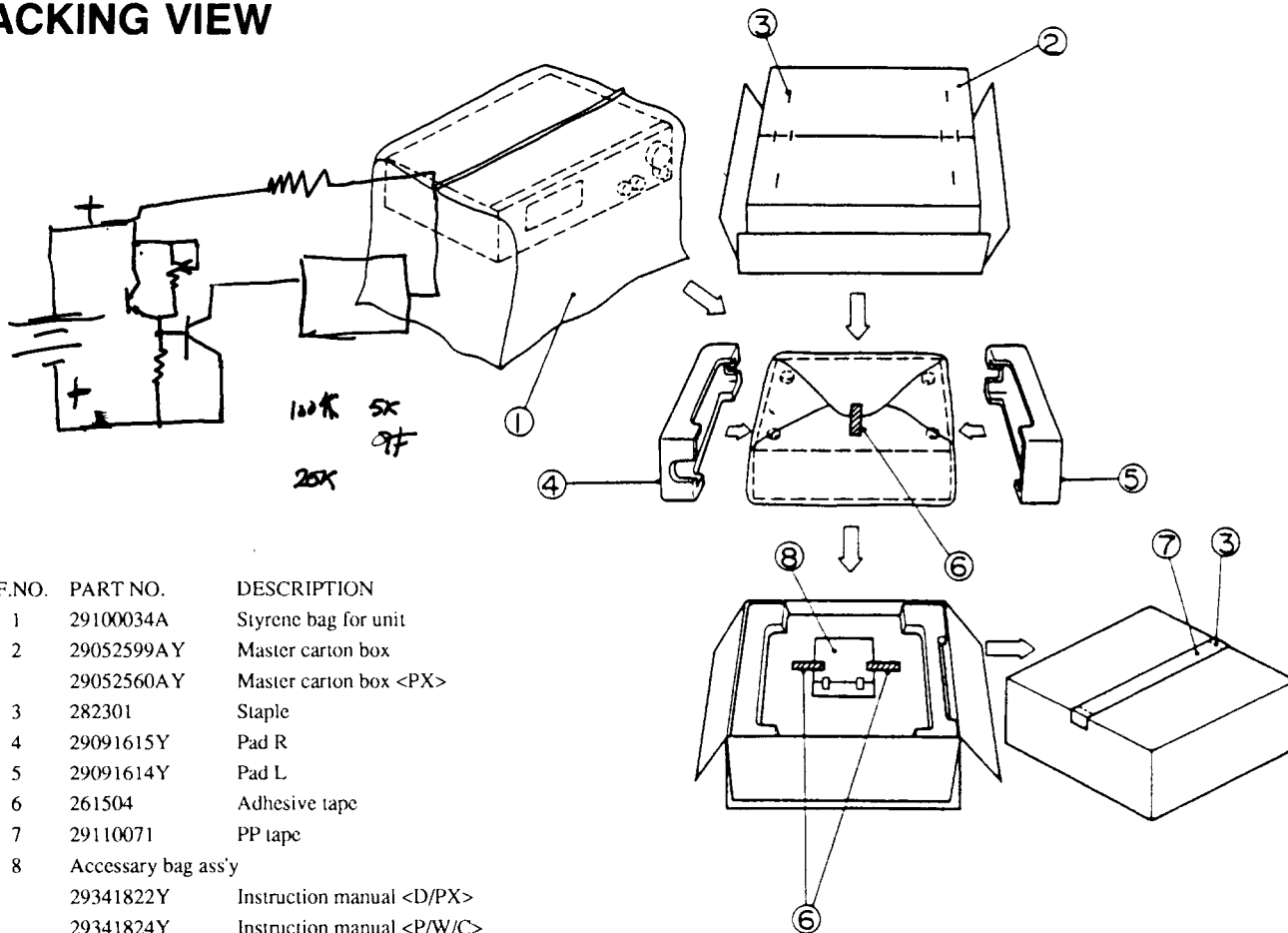
CIRCUIT NO.	PART NO.	DESCRIPTION
Q381	22240247	BA15218N,IC
C383,C384	354780339	3.3 $\mu$ F,50V,Elect. capacitors
P381	25045360	NPJ-2PDWH206,Terminal

NOTE: <D>:120V model only  
 <P>:230V model only  
 <Q>:240V model only  
 <W>:Worldwide model only

**SYSTEM CONNECTION**



# PACKING VIEW



REF.NO.	PART NO.	DESCRIPTION
1	29100034A	Styrene bag for unit
2	29052599AY	Master carton box
	29052560AY	Master carton box <PX>
3	282301	Staple
4	29091615Y	Pad R
5	29091614Y	Pad L
6	261504	Adhesive tape
7	29110071	PP tape
8	Accessory bag ass'y	
	29341822Y	Instruction manual <D/PX>
	29341824Y	Instruction manual <P/W/C>
	29341845Y	Instruction manual <W>
	2010200	Connection cord
	3010054	UM-3,Two batteries
	24140255Y	RC-255S,Remote control transmitter <D/PX>
	24140252Y	RC-252S,Remote control transmitter <P/W>
	25055018	CV-K-1,Conversion plug <W>
	25055251	CV-CP,Conversion plug <PX>
	29365019A	Warranty card <N>
	29365020H	Warranty card <V>
	29365024A	Warranty card <F>
	29365021	Warranty card <PX>
	29358002J	Service station list <N/PX>
	29100097	Styrene bag for accessory
	29100094B	Styrene bag for warranty card <V>
	29100107	Styrene bag for warranty card <F>

NOTE: <D>:120V model only  
 <P>:230V/240V models only  
 <W>:Worldwide model only  
 <N>:U.S.A. model only  
 <V>:Germany model only  
 <PX>:PX model only  
 <C>:Canadian model only  
 <F>:France model only

## ONKYO CORPORATION

International Division: Onarimon Yusen Bldg., 23-5, Nishi-Shimbashi 3-chome, Minato-ku, TOKYO 105, JAPAN Tel: 03-3432-6987 Fax: 03-3436-6979

### ONKYO U.S.A. CORPORATION

200 Williams Drive, Ramsey, N.J. 07446, U.S.A.  
 Tel: 201-825-7950 Fax: 201-825-8150

### ONKYO Europe GmbH

Hellersbergstrasse 4, W-4040 Neuss GERMANY  
 Tel: 02101 12 00 75 Fax: 02101 10 33 06 TLX: 85 17 916 ONDU D

### ONKYO FRANCE S.A.R.L.

Immeuble Le DIAMANT, Domaine Technologique De Saclay, 4 rue Rene Razel, 91892 SACLAY, FRANCE Tel: (1)69 41 35 10 Fax: (1)69 41 35 84