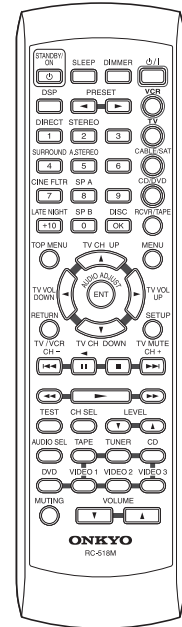
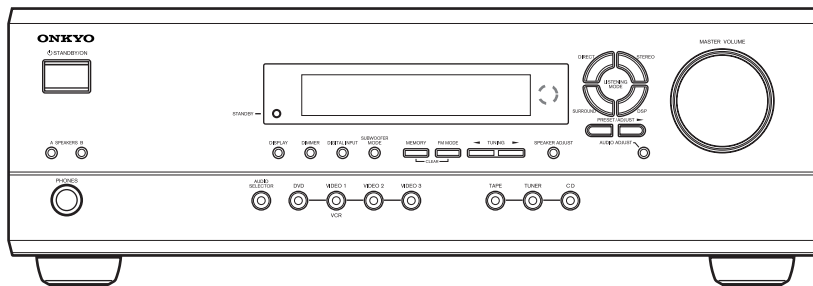


ONKYO SERVICE MANUAL


AV Receiver MODEL HT-R410



Black and Silver models

BMDD, SMDD | 120V AC, 60Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  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 PART 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.

Specifications

AMPLIFIER SECTION

Power Output (FTC Power, Rated Power)

Front L/R Speakers:	100 Watts per channel min. RMS. Into 8 ohms 2 channel driven, from 20 to 20,000 Hz with no more than 0.08% total harmonic distortion.
Center Speaker:	100 Watts min. RMS. Into 8 ohms , from 20 to 20,000 Hz with no more than 0.08% total harmonic distortion.
Surround L/R Speakers:	100 Watts per channel min. RMS. Into 8 ohms 2 channel driven, from 20 to 20,000 Hz with no more than 0.08% total harmonic distortion.
Dynamic power output (DIRECT):	230 watts × 2 at 3 ohms 170 watts × 2 at 4 ohms 115 watts × 2 at 8 ohms
Total Harmonic Distortion:	0.08% at rated power 0.08% at 1 watt output
IM Distortion:	0.08% at rated power 0.08% at 1 watt output
Damping Factor:	60 at 8 ohms
Input Sensitivity and Impedance	
DIGITAL INPUT (OPTICAL):	0.5 V _{p-p} , 75 ohms
DIGITAL INPUT (COAXIAL):	0.5 V _{p-p} , 75 ohms
LINE (CD, VIDEO 1, 2, 3, TAPE):	200 mV, 47 kohms
Multichannel Input	
(DVD FRONT L/C/R, SURR L/R):	200 mV, 47 kohms
(SUBWOOFER):	36 mV, 47 kohms
Output Level and Impedance	
Rec out (TAPE, VIDEO 1):	200 mV, 470 ohms
Pre out (SUBWOOFER):	1 V, 470 ohms
Frequency Response:	10 Hz to 100 kHz, +1/-3 dB (Direct mode)
Tone Control	
Bass:	±12 dB at 50 Hz
Treble:	±12 dB at 20 kHz
Signal-to-Noise Ratio:	CD/TAPE: 100 dB (IHF-A, Direct mode)
Muting:	-50 dB

VIDEO SECTION

Input Sensitivity and Impedance	
VIDEO (DVD, VIDEO 1, 2, 3):	1 V _{p-p} , 75 ohms
S VIDEO (DVD, VIDEO 1, 2):	1 V _{p-p} , 75 ohms (Y)
	0.28 V _{p-p} , 75 ohms (C)
Output Level and Impedance	
VIDEO (VIDEO 1, 2, MONITOR):	1 V _{p-p} , 75 ohms
S VIDEO (VIDEO 1, 2, MONITOR):	1 V _{p-p} , 75 ohms (Y)
	0.28 V _{p-p} , 75 ohms (C)

TUNER SECTION

FM	
Tuning Range:	87.5-108.0 MHz (100 kHz steps)
Usable Sensitivity	
Mono:	11.2 dBf, 1.0 μV (75 ohms, IHF) 11.2 dBf, 0.9 μV (75 ohms, DIN)
Stereo:	17.2 dBf, 2.0 μV (75 ohms, IHF) 17.2 dBf, 23 μV (75 ohms DIN)
50 dB Quieting Sensitivity	
Mono:	17.2 dBf, 2.0 μV (75 ohms)
Stereo:	37.2 dBf, 20.0 μV (75 ohms)
Capture Ratio:	2.0 dB
Image Rejection Ratio:	40 dB
IF Rejection Ratio:	90 dB
Signal-to-Noise Ratio	
Mono:	76 dB, IHF
Stereo:	70 dB, IHF
Alternate Channel Attenuation:	55 dB, IHF, ±400 kHz
Selectivity:	50 dB (DIN)
AM Suppression Ratio:	50 dB
Total Harmonic Distortion	
Mono:	0.2%
Stereo:	0.3%
Frequency Response:	30 Hz-15 kHz, ±1.0 dB
Stereo Separation:	45 dB at 1 kHz 30 dB at 100 Hz-10 kHz

AM

Tuning Range:	530-1,710 kHz (10 kHz steps)
Usable Sensitivity:	30 μV
Image Rejection Ratio:	40 dB
IF Rejection Ratio:	40 dB
Signal-to-Noise Ratio:	40 dB
Total Harmonic Distortion:	0.7%

GENERAL

Power Supply and Power Consumption:	AC 120 V, 60 Hz	4.7 A
Dimensions (W × H × D):	17-1/8" × 5-7/8" × 14-3/8"	
	435 × 150 × 365 mm	
Weight:	19.0 lbs., 8.6 kg	

REMOTE CONTROL

Transmitter:	Infrared
Signal range:	Approx. 16 ft., 5 meters
Power supply:	Two "AA" batteries (1.5 V × 2)

Specifications and features are subject to change without notice.
Power supply and voltage vary depending on the area in which the unit is purchased.

SERVICE PROCEDURES

1. Replacing the fuses



This symbol located near the fuses indicates that the fuse used is fast operating type. For continued protection against fire hazard, replace with same type fuse. For fuse rating refer to the marking adjacent to the symbol.



Ce symbole indique que le fusible utilise est a rapide. Pour une protection permanente, n'utiliser que fusibles de meme type. Ce dernier est la qu le present symbol est appse.

CIRCUIT NO.	PART NO.	DESCRIPTION
F6901,F6902	252198 or 252261	8A-UL or 8A-T/UL-ST2, Fuse
F901	252198 or 252261	8A-UL or 8A-T/UL-ST2, Fuse

2. To initialize the unit

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

To perform a result, please follow the procedure below.

- 1.Press and hold down the VIDEO-1 button, then press the STANDBY/ON button.
- 2.After "clear" is displayed, the preset memory and each mode stored in the memory, such as surround, are initialized and will return to the factory setting.

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 screw on the back panel.

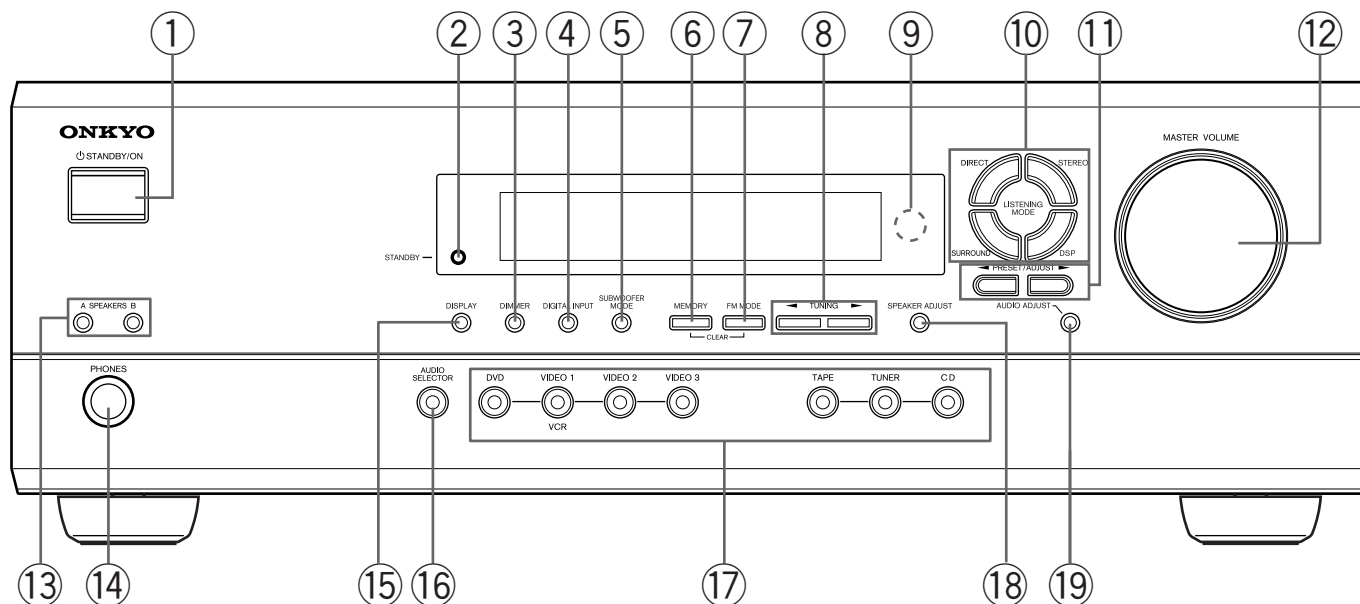
Specifications: 3.3Mohm+/-10% at 500V.

4. Memory Preservation

This unit does not require memory preservation batteries. built-in memory power back-up system preserves the contents of the memory during power failures and even when the unit is unplugged.The unit must be plugged in order to charge the back-up system.

The memory preservation period after the unit has been unplugged varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of a few weeks after the last time the unit has been unplugged.This period is shorter when the unit is exposed to a highly humid climate.

Front panel



① STANDBY/ON button

When STANDBY/ON button is pressed to ON, the display will light to show the current volume setting for about 5 seconds then show the current sound input source. Pressing the button again returns the HT-R410 to the standby state. This state turns off the display, disables control functions.

② STANDBY indicator

Lights when the HT-R410 is in the standby state and flashes when a signal is received from the remote controller.

③ DIMMER button

Press to set the brightness of the front display. The brightness changes to normal, dim and very dim.

④ DIGITAL INPUT button

When digital components are connected to the DIGITAL INPUT jacks of the HT-R410, use this button to assign the DIGITAL INPUT jacks to them according to their forms of connection.

⑤ SUBWOOFER MODE button

Press to select the subwoofer mode.

⑥ MEMORY button

This button is used to assign the radio station that is currently tuned in to a preset channel or delete a previously preset station.

⑦ FM MODE button

Press to switch the reception mode between stereo and monaural. If audio is interrupted or noise interferes with audio during FM stereo broadcasting, press this button to switch to the monaural reception mode.

⑧ TUNING ◀▶ buttons

Use these buttons to change the tuner frequency. The tuner frequency is displayed in the front display and it can be changed in 100 kHz increments for FM and 10 kHz increments for AM.

When FM is selected, you can hold down one of the TUNING ◀▶ buttons and then release it to activate the auto-search feature. It will search for a station in the direction of the button you pressed and stop when it tunes into one.

⑨ Remote control sensor

This sensor receives the control signals from the remote controller.

⑩ LISTENING MODE buttons

Press these buttons to select a listening mode for the current source.

Press the DSP button to recall the Onkyo-original DSP modes in sequence. Press the DIRECT, STEREO or SURROUND button to recall the corresponding listening mode directly.

⑪ PRESET/ADJUST ◀▶ buttons

These buttons make it possible to store desired radio stations under the desired preset numbers and recall them with an easy operation. Also, these buttons adjust the values and parameters of the mode selected using the AUDIO ADJUST, SPEAKER ADJUST or AUDIO SELECTOR button.

⑫ MASTER VOLUME dial

The MASTER VOLUME dial is used to control the volume level. Turn the dial clockwise to increase the volume level and counterclockwise to decrease it.

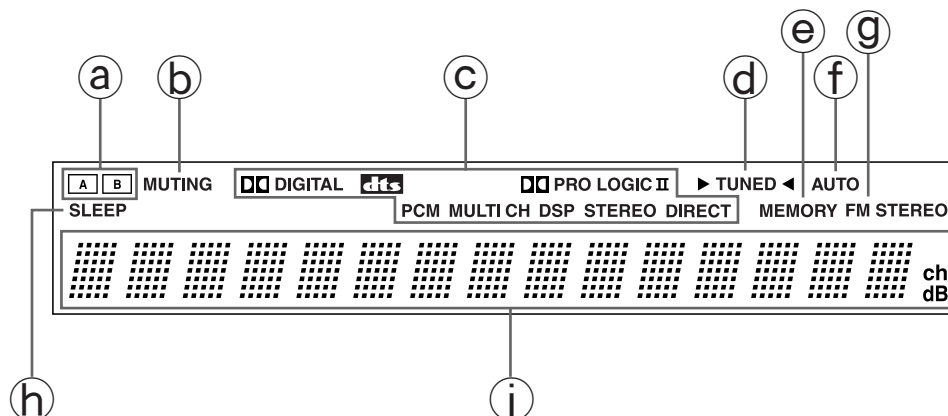
⑬ SPEAKERS A/B buttons

Press SPEAKERS A/B to turn on/off the speaker system A/B. The (SPEAKERS) A/B indicators corresponding to the selected speaker system light up. You can use SPEAKERS A and B simultaneously.

⑭ PHONES jack

This is a standard stereo jack for connecting stereo headphones. The audio for the front right and left speakers are sent to the headphone speakers.

Display



15 **DISPLAY button**

Each time you press the DISPLAY button, the display changes.

16 **AUDIO SELECTOR button**

Press to select an audio input signal format other than FM and AM. Each time this button is pressed, the setting cycles.

17 **Input selector buttons (DVD, VIDEO 1, VIDEO 2, VIDEO 3, TAPE, TUNER, and CD)**

These buttons are used to select the input source. Pressing and holding the TAPE button for about 2 seconds allows the TAPE and MD sources to be switched.

18 **SPEAKER ADJUST button**

Press to select speaker setting item.

19 **AUDIO ADJUST button**

Press to adjust bass, treble, late night function, cinema filter, Panorama, Dimension and Center Width function setting.

a **(SPEAKERS) A/B indicators**

Shows the current speaker system in use.

b **MUTING indicator**

Flashes when the mute function is active.

c **Source/Listening mode indicators**

One of these indicators lights to show the format of the current source as "PCM", "DIGITAL" or "DTS". In addition, one of the listening mode indicators "PRO LOGIC II", "MULTI CH", "DSP", "STEREO" and "DIRECT" lights according to the current listening mode.

d **TUNED indicator**

Lights up when a radio station is received.

e **MEMORY indicator**

Lights up when the MEMORY button is pressed in the radio station preset operation.

f **AUTO indicator**

Lights up to indicate auto reception mode (stereo/monaural). At this time, interstation noise will be muted (FM only). It extinguishes when the monaural reception mode is started by pressing the FM MODE button.

g **FM STEREO indicator**

Lights up when an FM stereo broadcast station is received.

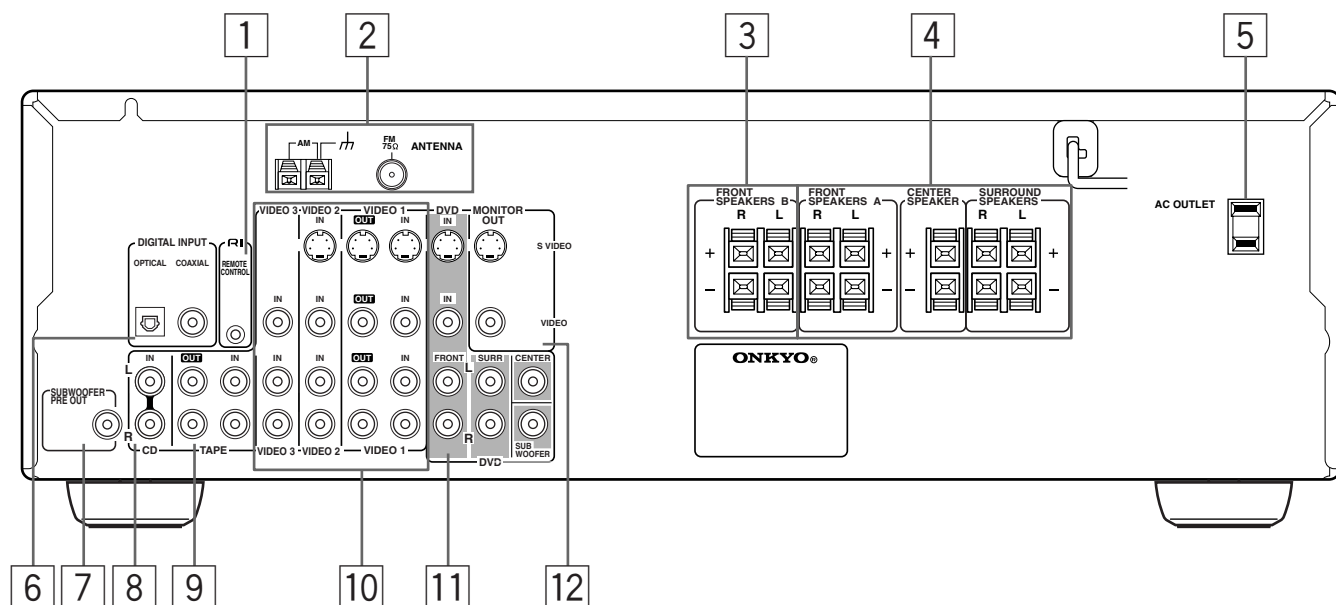
h **SLEEP indicator**

Lights up when the sleep timer is active.

i **Multi function display**

In usual operation, shows the current input source and volume. When the FM or AM input is selected, it shows the frequency and preset number. When the DISPLAY button is pressed, it shows the current input source and the listening mode.

Rear panel

**1 RI REMOTE CONTROL**

Connect the Onkyo components that have **RI** connectors such as a CD player, and cassette tape deck using the **RI** cables provided with them. When these components are interconnected, they can be controlled from the remote controller provided with the HT-R410.

For correct operation, the audio connection cables must also be connected. This applies to both remote and standard operation.

2 ANTENNA

These terminals are for connecting the FM antenna and AM antenna.

3 FRONT SPEAKERS B

These terminals are for connecting the speaker system B.

4 FRONT SPEAKERS A, CENTER SPEAKER and SURROUND SPEAKERS

These terminals are for connecting the speaker system A, including the center and surround speakers.

5 AC OUTLET

The HT-R410 is supplied with AC outlet for connecting the power cord from other devices so that their power is supplied through the HT-R410. By doing this, you can use the **STANDBY/ON** button on the HT-R410 to turn on and off the connected devices as well.

6 DIGITAL INPUT OPTICAL, COAXIAL

These are digital audio inputs. There is 1 optical jack and 1 coaxial jack. The inputs accept digital audio signals from DVD, LD, CD, or other digital source.

7 SUBWOOFER PRE OUT

This terminal is for connecting an active subwoofer.

8 CD IN

Connect the output terminal on the CD player to the CD IN L/R jacks on the HT-R410.

9 TAPE IN/OUT

Connect the output terminals (PLAY) of the cassette tape deck or MD recorder to the TAPE IN L/R jacks on the HT-R410 and the input terminals (REC) to the TAPE OUT L/R jacks.

10 VIDEO 1 IN/OUT, VIDEO 2 IN, VIDEO 3 IN

Connect the output terminals (PLAY) of the video cassette recorder to the VIDEO 1 IN L/R jacks on the HT-R410 and the input terminals (REC) to the VIDEO 1 OUT jacks.

Connect the output terminals of the video cassette player or satellite tuner to the VIDEO 2 IN or VIDEO 3 IN jacks on the HT-R410.

11 DVD

Connect the DVD player. If the DVD player has 5.1 channel output terminals, connect each terminal to the FRONT L/R, CENTER, SUBWOOFER, and SURR L/R terminals on the HT-R410. If the DVD player has only 2 channel output terminals, connect to the FRONT L/R terminals on the HT-R410.

12 MONITOR OUT

The monitor output includes both RCA type and S video configurations. This output is for connecting television monitors or projectors.

Tip

The audio input jacks of the HT-R410 do not accept direct connection of an analog turntable.

If you want to connect a turntable to the HT-R410 prepare a phono equalizer and connect it to the unused audio input jacks (IN L/R).

Refer to the instruction manuals of the phono equalizer and turntable for details.

Supplied accessories

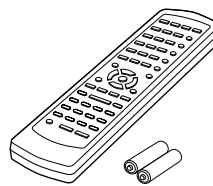
Check that the following accessories are supplied with the HT-R410.



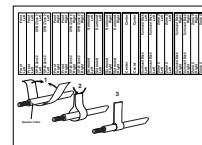
AM loop antenna × 1



FM indoor antenna × 1



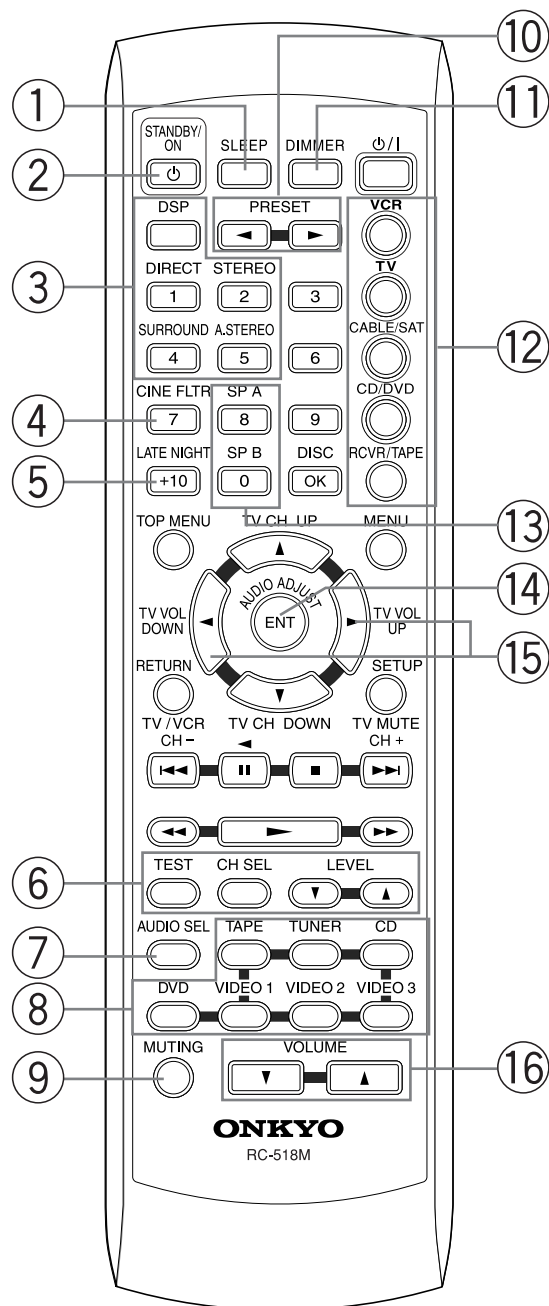
Remote controller × 1
Batteries (AA) × 2



Speaker cable label × 1

The alphabet displayed at the end of the product name found in catalogs and on the packages represents the color of this receiver. Though the color varies, the specifications and operations are the same.

Remote controller

① **SLEEP button**

For setting the sleep time.

This button is provided only on the remote controller.

② **STANDBY/ON button**

Turns on the HT-R410 or put it in standby.

③ **Listening mode buttons**

Press to change the listening mode.

④ **CINE FLTR button**

Press to activate/deactivate Cinema Filter function.

⑤ **LATE NIGHT button**

Press to change the late night setting.

⑥ **TEST/CH SEL/LEVEL ▲/▼ buttons**

For setting the output levels for each speaker.

These buttons are provided only on the remote controller.

⑦ **AUDIO SEL button**

Press to select an audio input signal format.

⑧ **INPUT SELECTOR buttons**

For selecting the input source.

⑨ **MUTING button**

Activates the mute function.

This button is provided only on the remote controller.

⑩ **PRESET ◀/▶ button**

For selecting a tuner preset channel.

⑪ **DIMMER button**

For adjusting the brightness of the front display.

⑫ **Mode buttons**

For selecting the component to be operated by the remote controller.

⑬ **SP A/SP B buttons**

Press to switch the speaker systems.

⑭ **AUDIO ADJUST button**

Press to adjust bass, treble, late night function and cinema filter function setting.

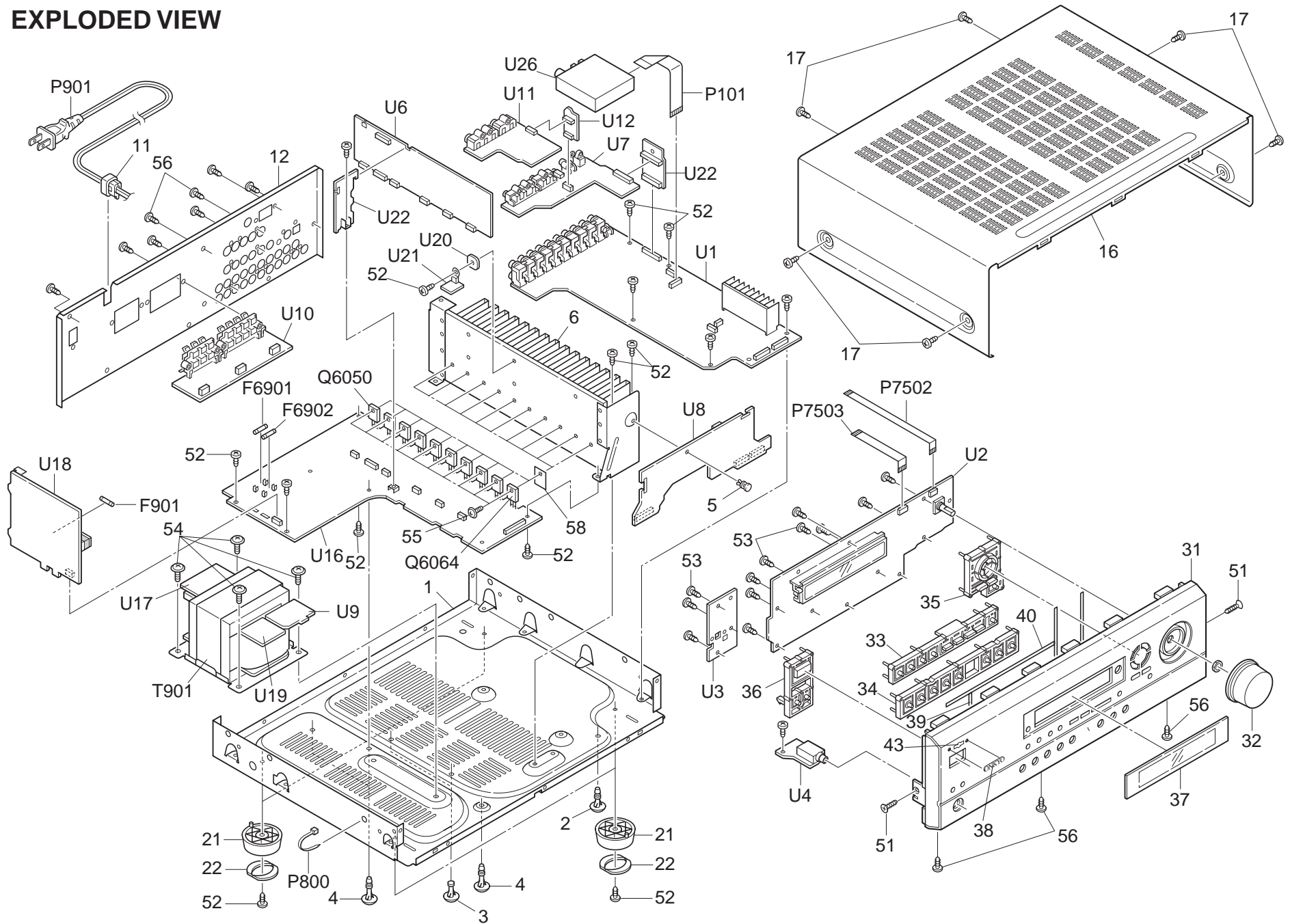
⑮ **ADJUST ◀/▶ button**

Press to adjust the values and parameters of the mode selected using the AUDIO ADJUST, SPEAKER ADJUST or AUDIO SELECTOR button.

⑯ **VOLUME ▲/▼ button**

For adjusting the volume.

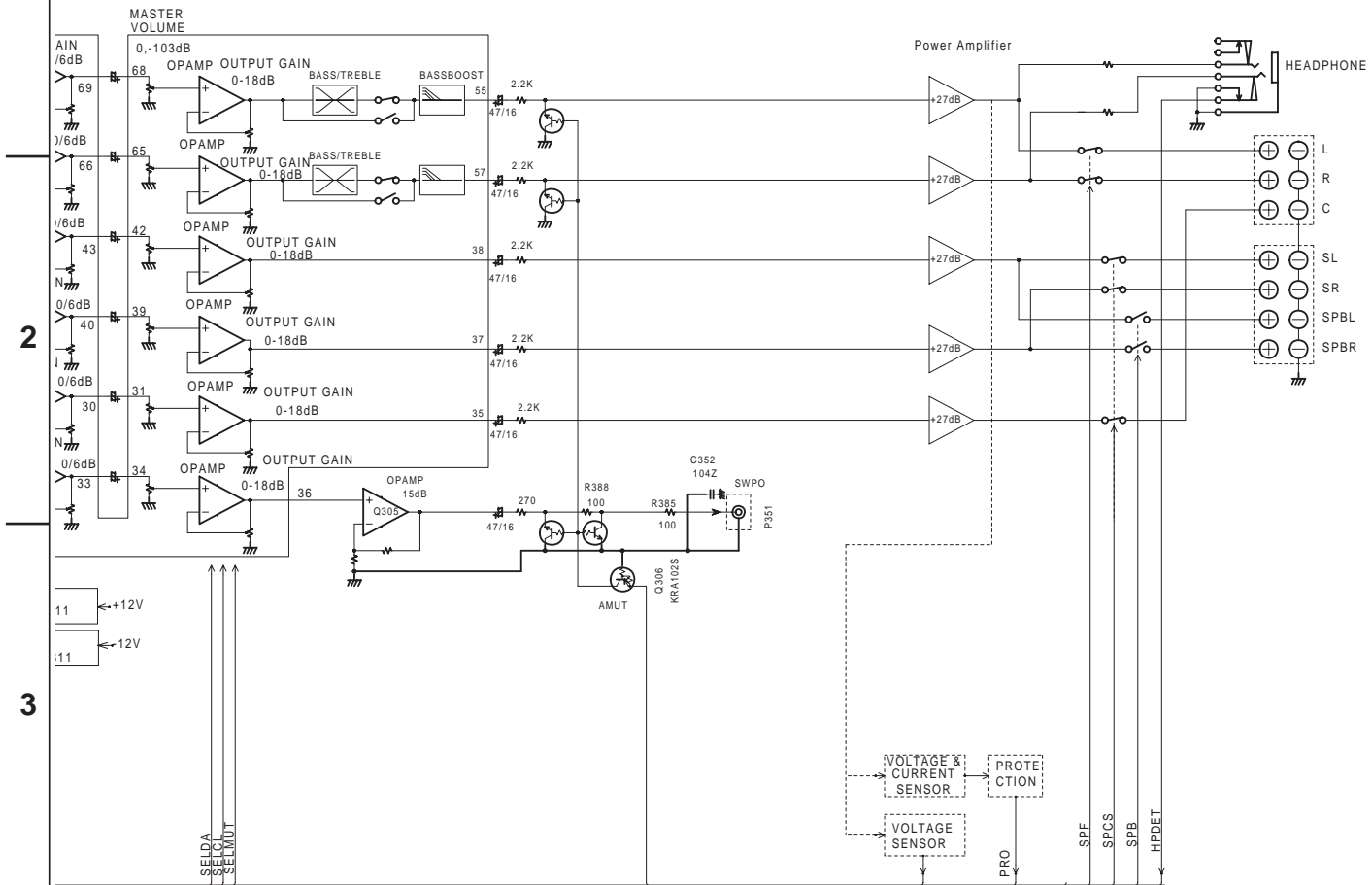
EXPLODED VIEW



A B C D

BLOCK DIAGRAM

1

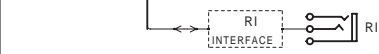
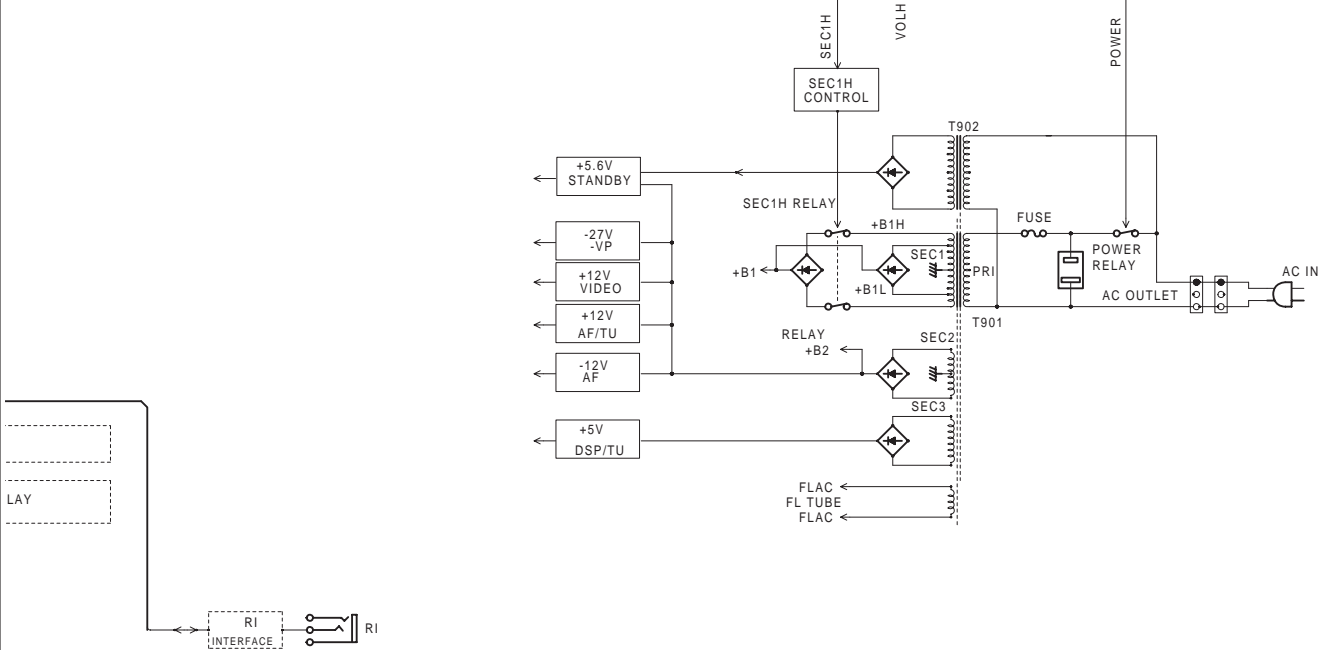


2

3

4

5



SCHEMATIC DIAGRAM 1 Display/Video sections

NADIS-7403

U2

Q7501 HNA-16MM39T

Q7502

UPD780232GC-030-8BT

Q7504

RN2403
*KRA103S

D7502 UDZ5.1B
D7503 1SS352

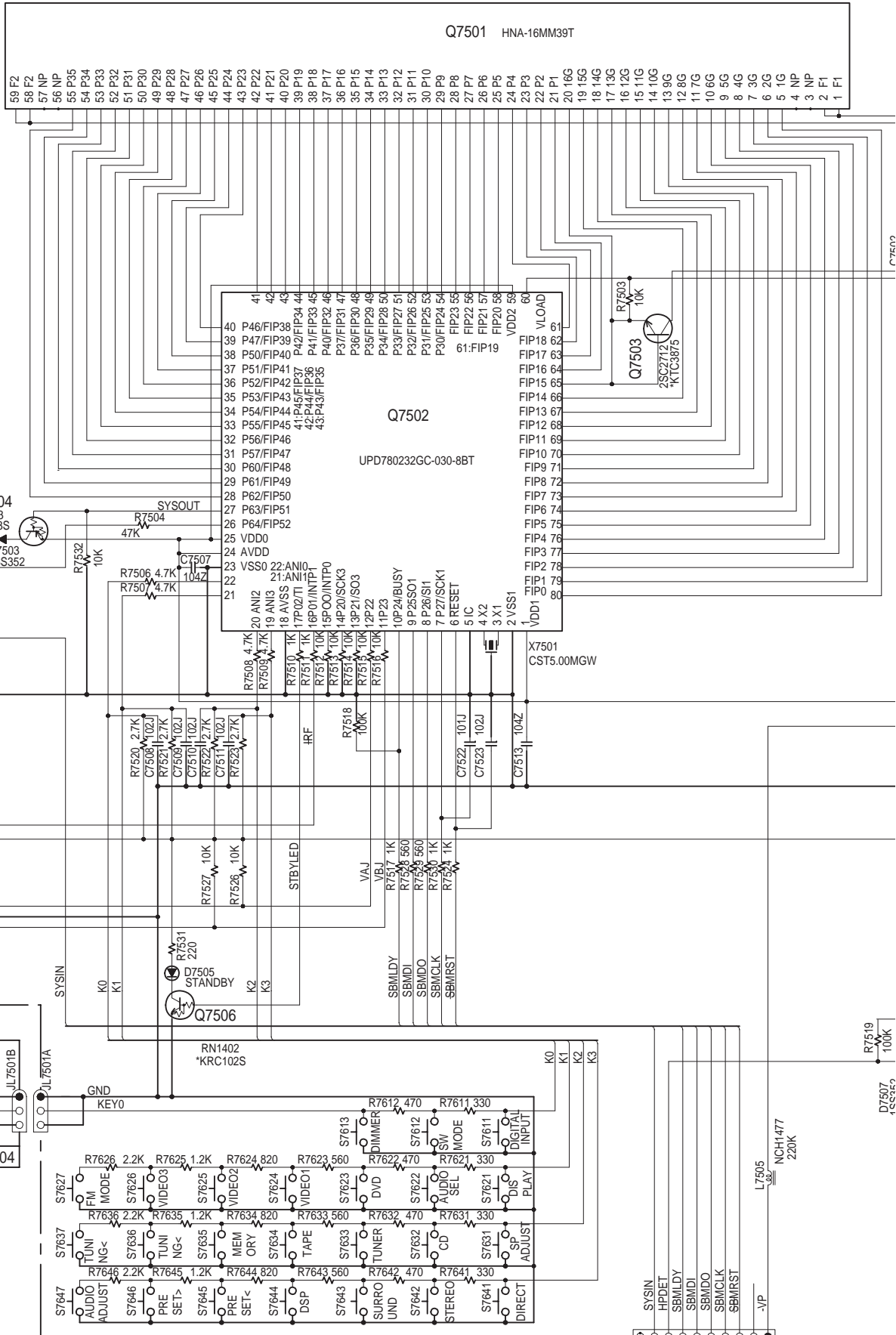
U7501 SPS4441E1

C7516 10uZ
C7515 10uZ
S7501

S7616 SP A
S7615 SP B
S7614 STANDBY
R7615 1.2K
R7614 820
R7613 560
U7501B
L7501A

U3 NASW-7404

S7627 FM MODE
S7626 VIDEO3
S7625 VIDEO2
S7624 VIDEO1
S7623 DVD
S7622 AUDIO SEL
S7621 DIS PLAY
S7620 SP ADJUST
S7619 DIRECT
S7618 AUDIO TUNING
S7617 NG<
S7616 PRE SET>
S7615 SET<
S7614 PRE ORY
S7613 TAPE
S7612 SURRO UND
S7611 STEREO
S7610 DIRECT



SCHEMATIC DIAGRAM 2 DSP/Preamplifier sections

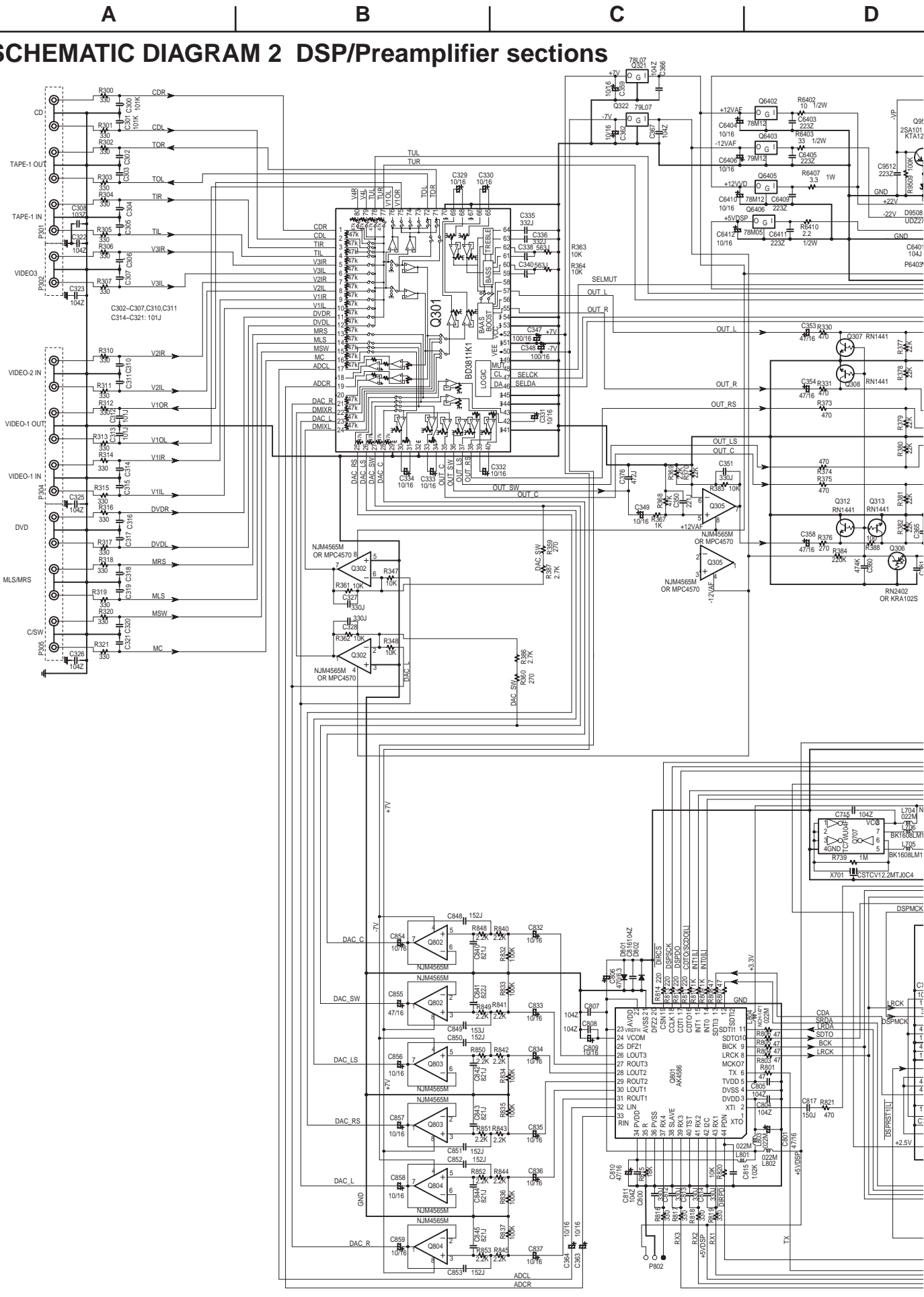
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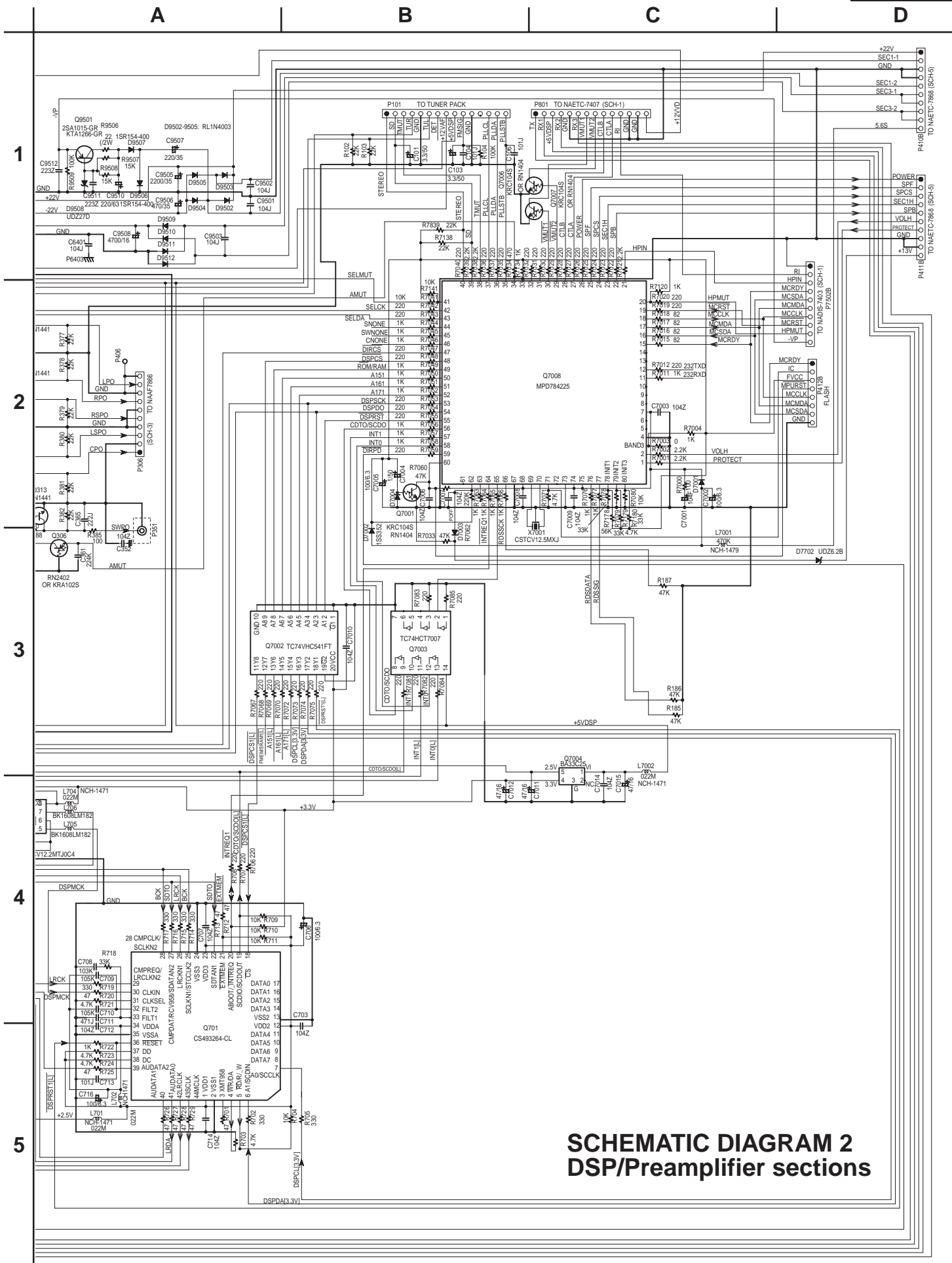
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SCHEMATIC DIAGRAM 2
DSP/Preamp sections

A

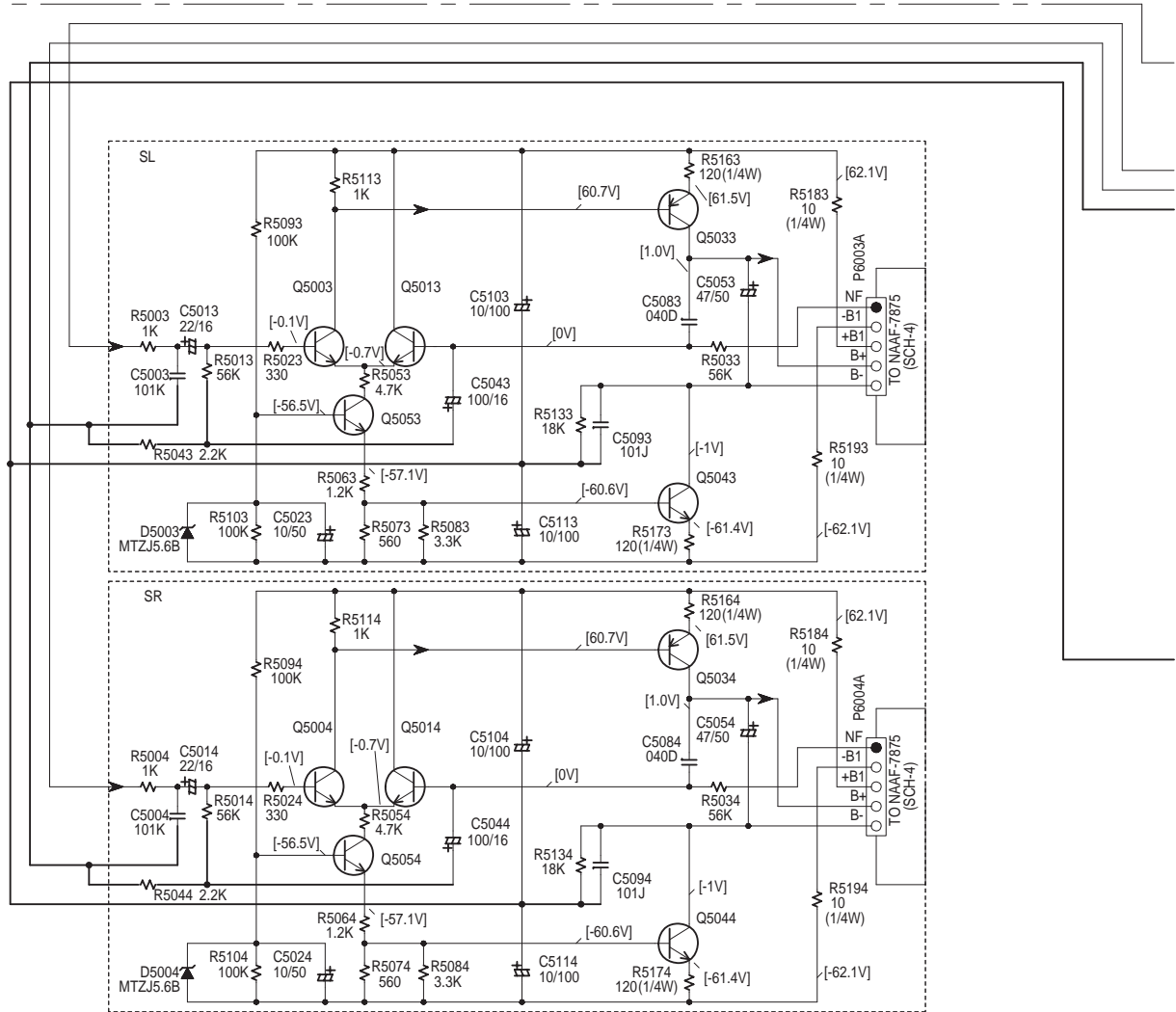
B

C

D

SCHEMATIC DIAGRAM 3 Driver section

NAAF-7866



SEMICONDUCTORS

NO.	DESCRIPTION
Q5000-04,5010-14	KTC3200-BL OR 2SC1775A-E,F OR 2SC1845-E
Q5030-34	KTA1024-Y,O OR 2SA949-Y,O
Q5040-44	KTC3206-Y,O OR 2SC2229-Y,O
Q5050-54	KTC3200-BL,GR OR 2SC1775A-E,F OR 2SC1845-E,F

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A

B

C

D

SCHEMATIC DIAGRAM 3 Driver section

U6

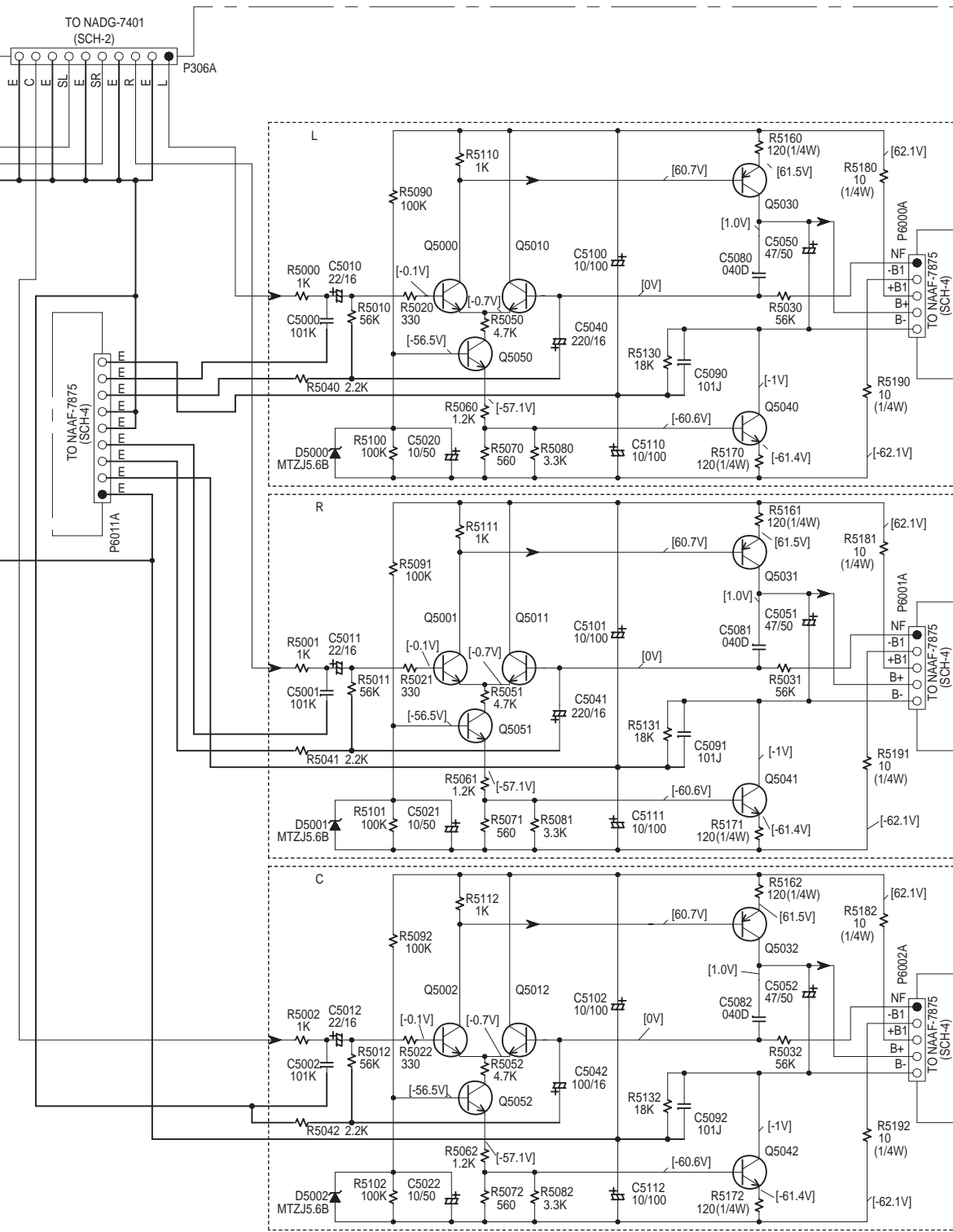
1

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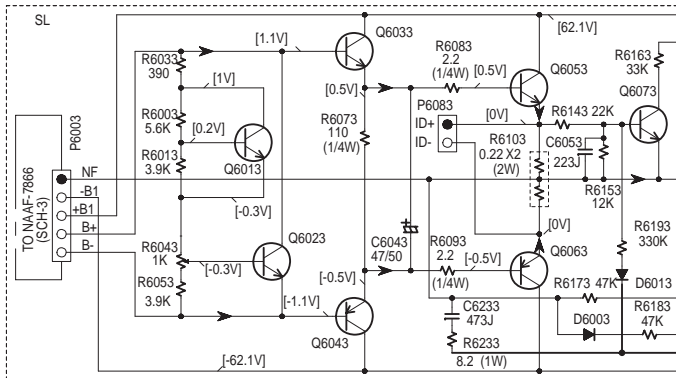
5



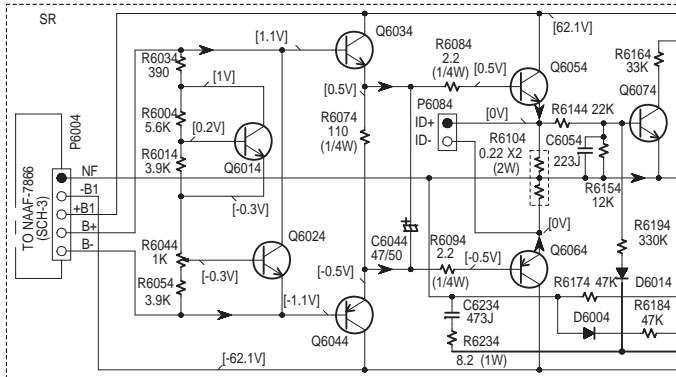
A B C D
SCHEMATIC DIAGRAM 4 Power amplifier section

NAAF-7875

1



2

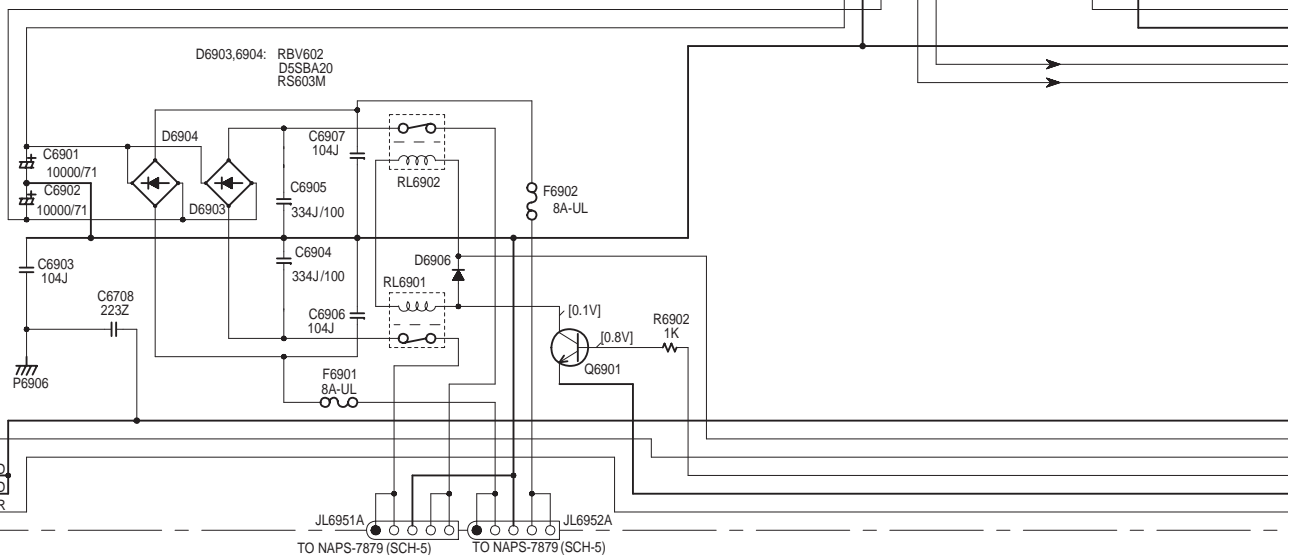


3

SEMICONDUCTORS

NO.	DESCRIPTION
Q6010-6014	2SC1740S-R,S
Q6020-6024	2SC1740S-R,S
Q6030-6034	KTD2061-Y OR 2SC5171
Q6040-6044	KTB1369-Y OR 2SA1930
Q6050-6054	KTC5242-O,R OR MN130S-Y,P,O OR 2SC5242-O,R
Q6060-6064	KTA1962-O,R OR MP130S-Y,P,O OR 2SA1962-O,R
Q6070-6074	2SC2631-R,S
Q6601-6603,Q6901	KTC3199-GR,2SC1740S-R,S,2SC2458-GR
Q6701,6702	KTC3200-BL,GR OR 2SC1775A-E,F OR 2SC1845-E,F
Q6703	KTA1268-GR,BL OR 2SA992-E,F
Q6303	KTA1267-GR OR 2SA933S-R,S

4



5

TO NAPS-7877 (SCH-5)



JL6951A TO NAPS-7879 (SCH-5) JL6952A TO NAPS-7879 (SCH-5)

TO NAAF-7866 (SCH-3)

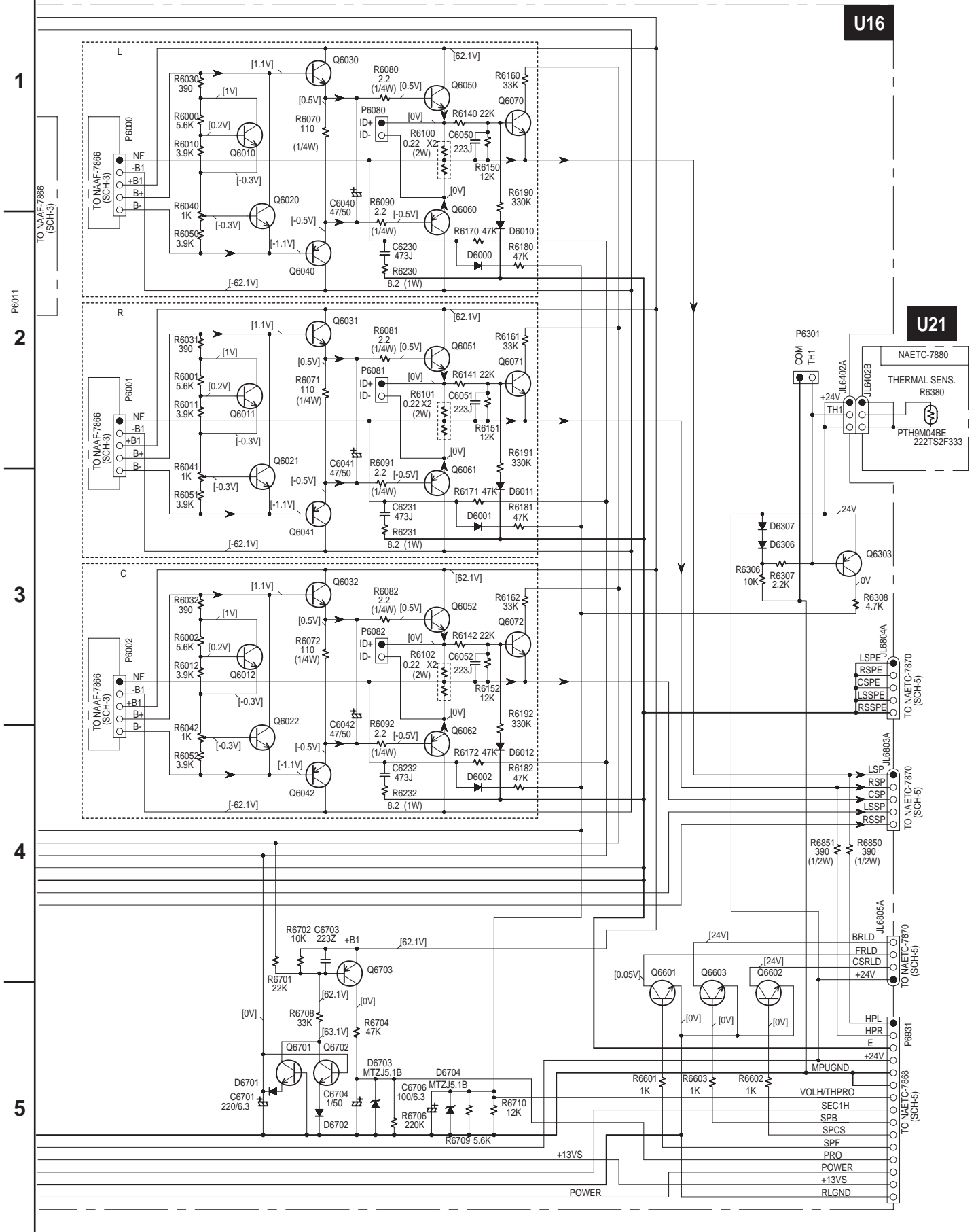
TO NAAF-7866 (SCH-3)

TO NAAF-7866 (SCH-3)

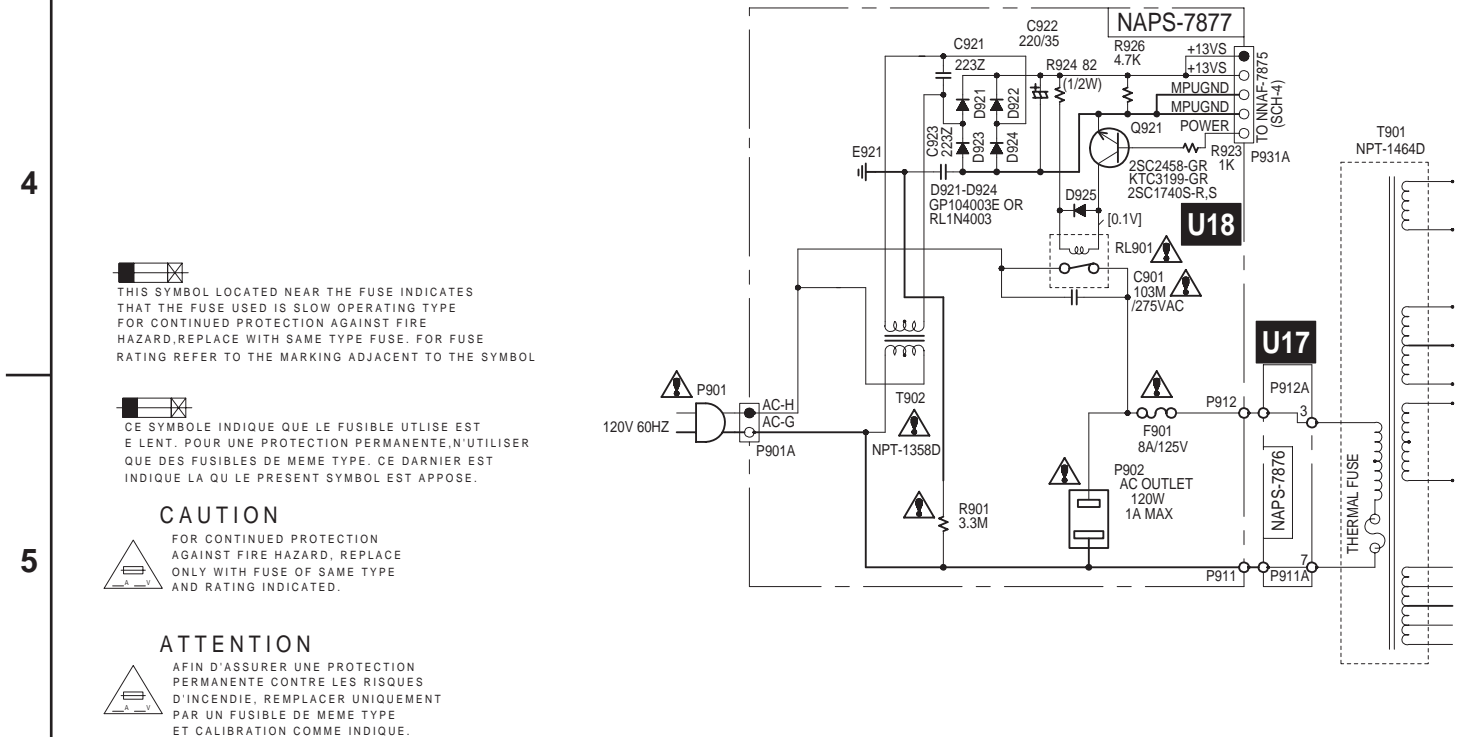
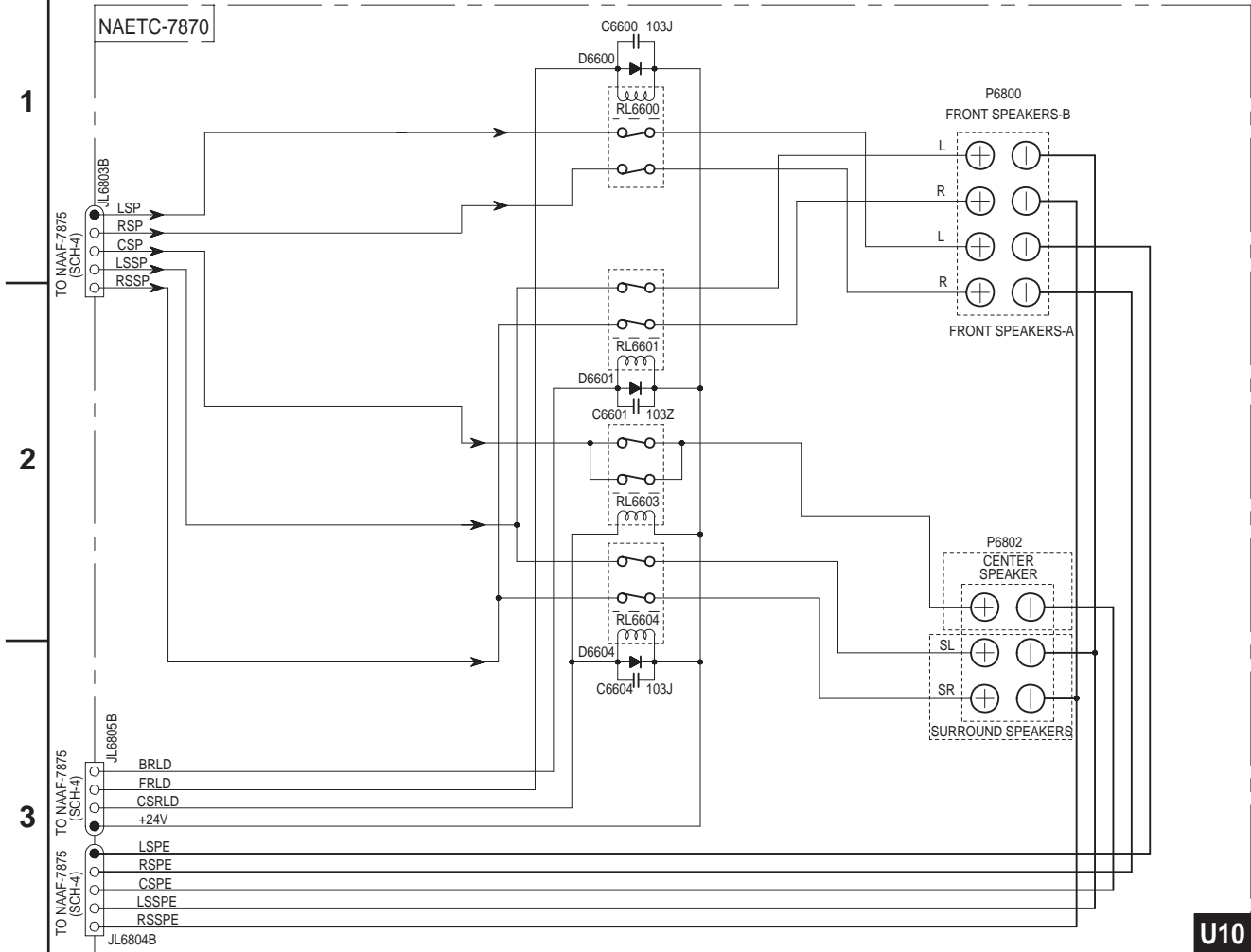
TO NAAF-7866 (SCH-3)


TO NAAF-7866 (SCH-3)


SCHEMATIC DIAGRAM 4 Power amplifier section



SCHEMATIC DIAGRAM 5 Power supply and speaker terminal sections



 THIS SYMBOL LOCATED NEAR THE FUSE INDICATES THAT THE FUSE USED IS SLOW OPERATING TYPE FOR CONTINUED PROTECTION AGAINST FIRE HAZARD. REPLACE WITH SAME TYPE FUSE. FOR FUSE RATING REFER TO THE MARKING ADJACENT TO THE SYMBOL

 CE SYMBOLE INDIQUE QUE LE FUSIBLE UTILISE EST E LENT. POUR UNE PROTECTION PERMANENTE, N'UTILISER QUE DES FUSIBLES DE MEME TYPE. CE DERNIER EST INDIQUE LA QU LE PRESENT SYMBOLE EST APPOSE.

CAUTION

FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH FUSE OF SAME TYPE AND RATING INDICATED.

ATTENTION

AFIN D'ASSURER UNE PROTECTION PERMANENTE CONTRE LES RISQUES D'INCENDIE, REMPLACER UNIQUEMENT PAR UN FUSIBLE DE MEME TYPE ET CALIBRATION COMME INDIQUE.

A B C D
SCHEMATIC DIAGRAM 5 Power supply and speaker terminal sections

1





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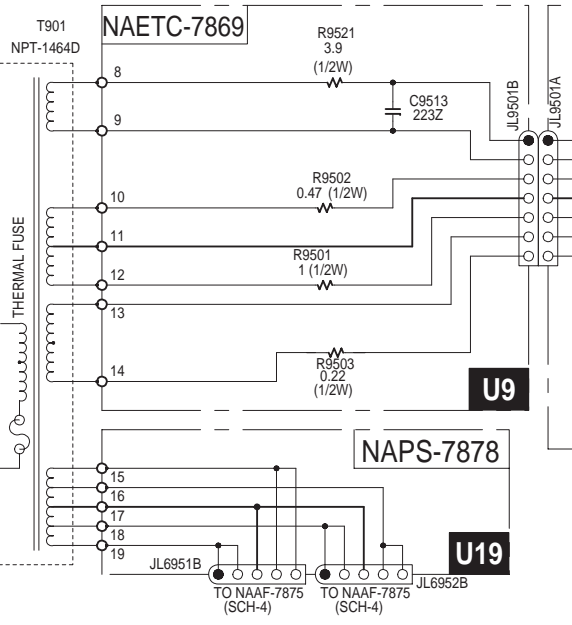
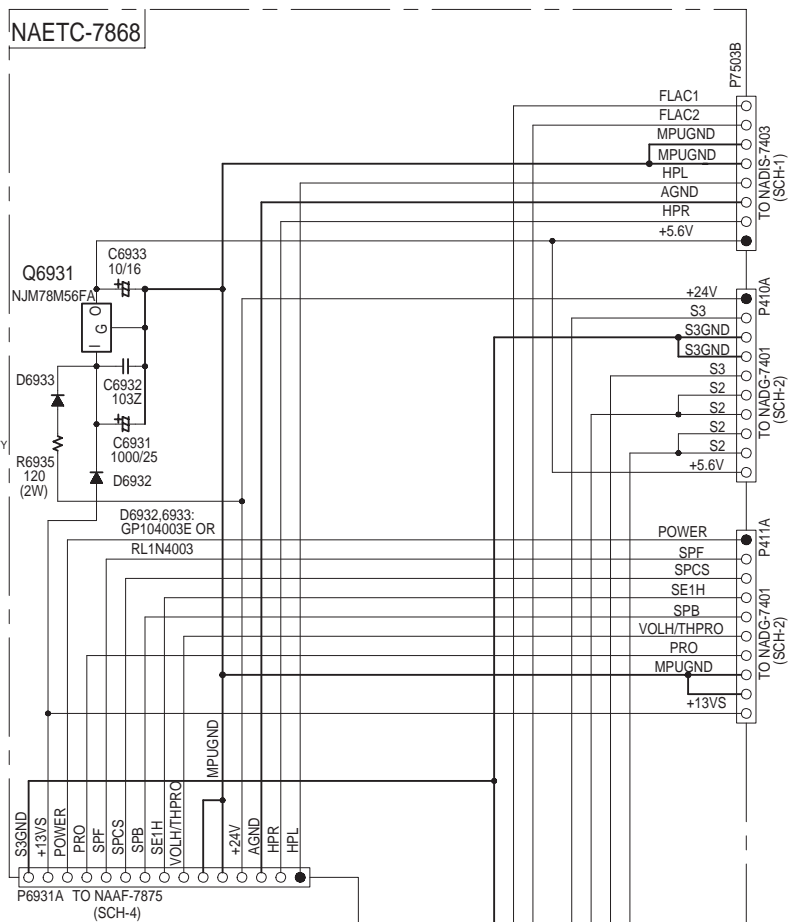
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4

5

NOTE

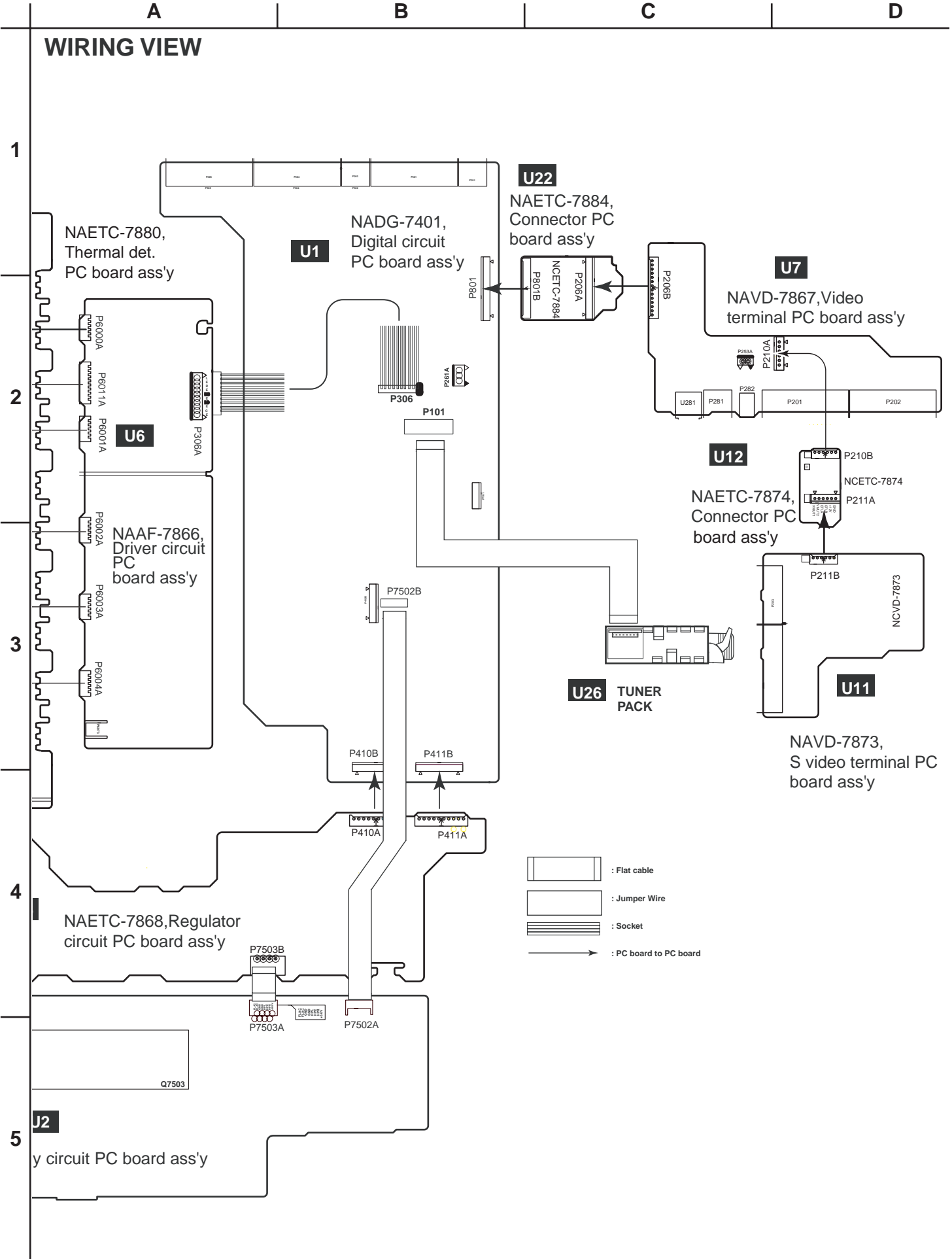
- THE COMPONENTS IDENTIFIED BY MARK  ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- ELECTROLYTIC CAPACITORS () ARE IN uF/WV.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED.
EX) 030x3pF 330x33pF 33x330pF 333x0.033uF
- ALL RESISTORS ARE IN OHMS 1/4WATTS UNLESS OTHERWISE NOTED.
- THE THICK LINES ON PC BOARD ARE THE PRINTING SIDE OF THE PARTS.
EX)  PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.
-  IS DC VOLTAGE, AT NO INPUT SIGNAL.



U8

U9

U19



A

B

C

D

PRINTED CIRCUIT BOARD VIEW 3 FROM SOLDERING SIDE

Driver section

U6 Driver circuit PC board ass'y (NAAF-7866)

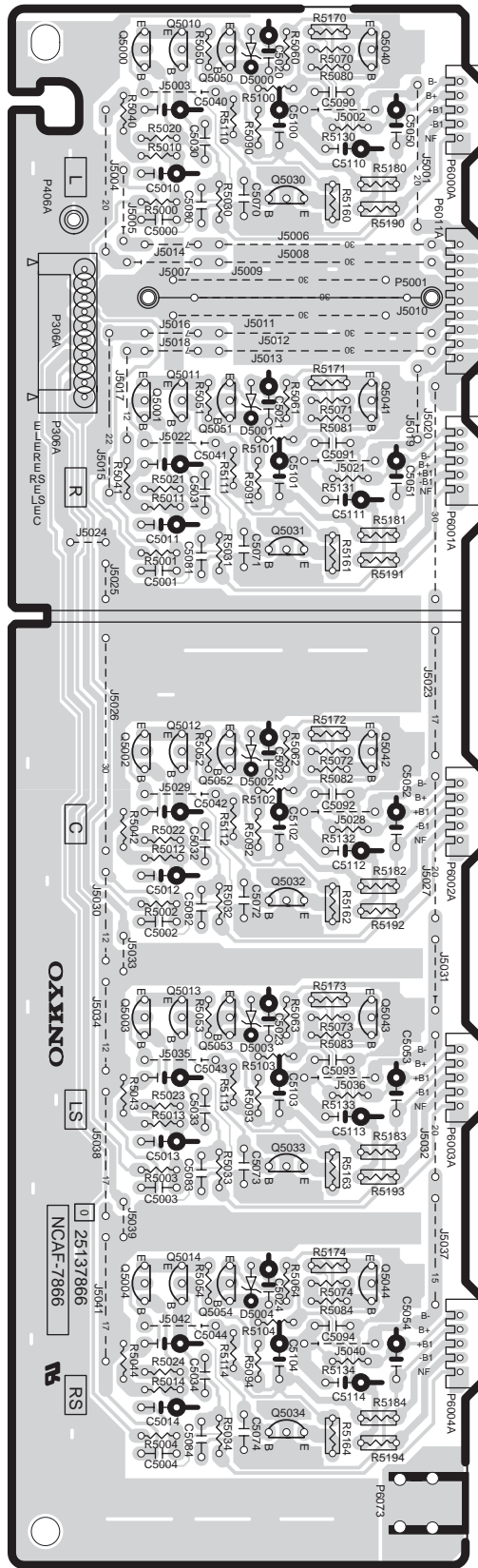
1

2

3

4

5



A

B

C

D

PRINTED CIRCUIT BOARD VIEW 4 FROM SOLDERING SIDE

Power amplifier section

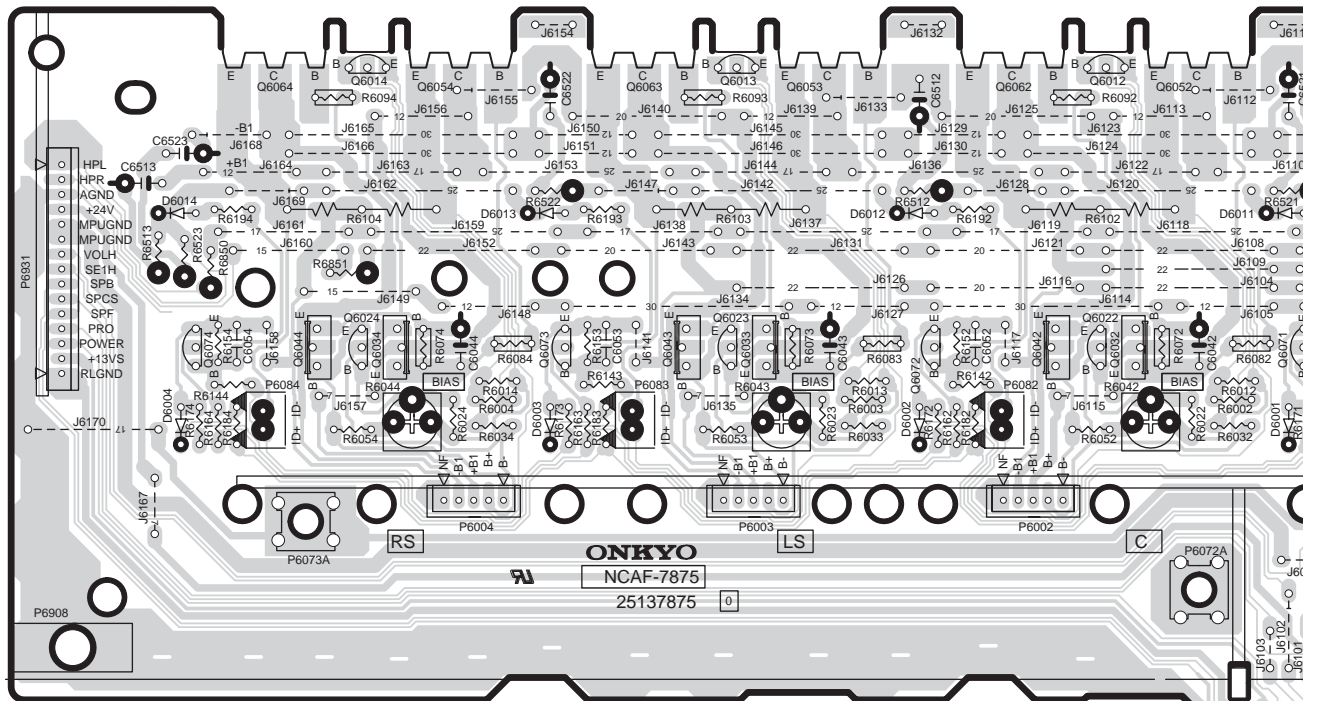
1

2

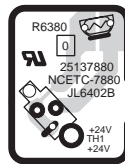
3

4

5



U16 Power amplifier PC board ass'y
(NAAF-7875)



U21 Thermal detector PC board ass'y
(NAETC-7880)

P6905

A

B

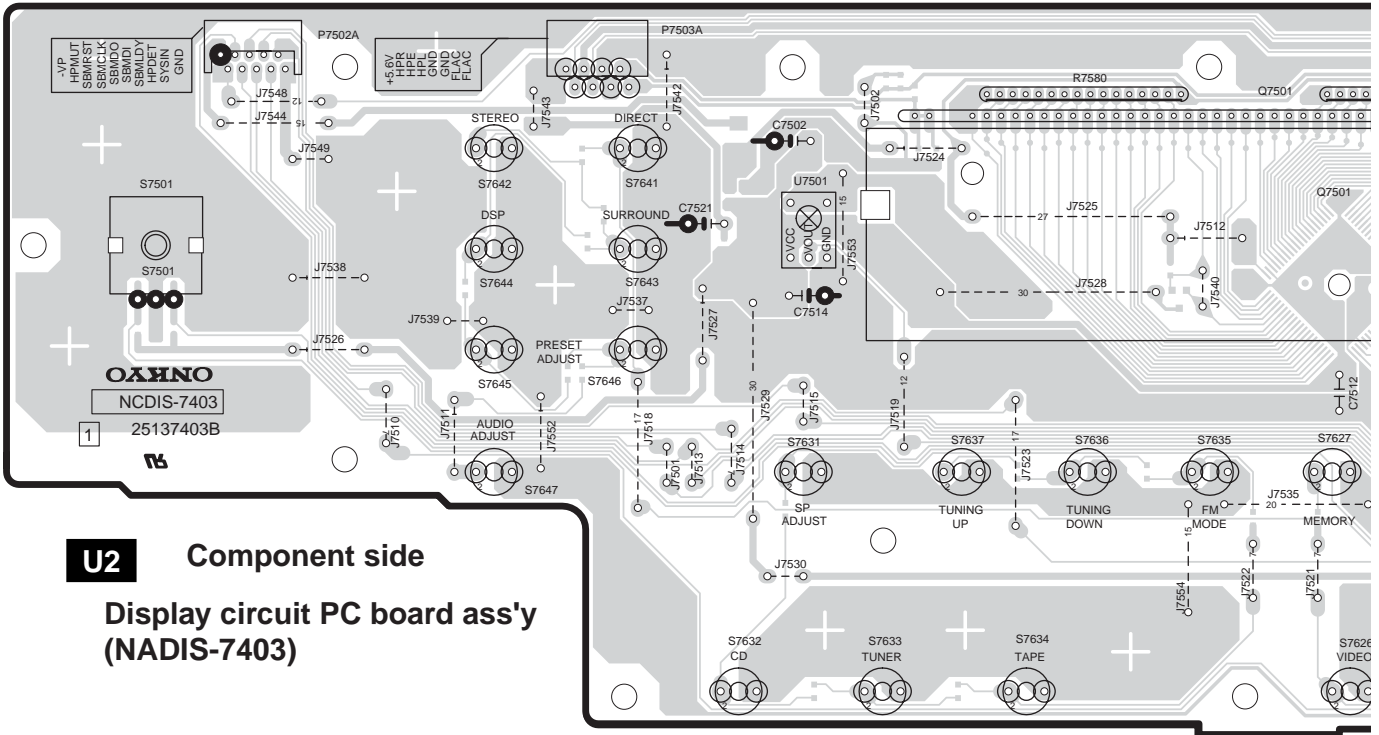
C

D

PRINTED CIRCUIT BOARD VIEW 1 FROM SOLDERING SIDE

Front panel section

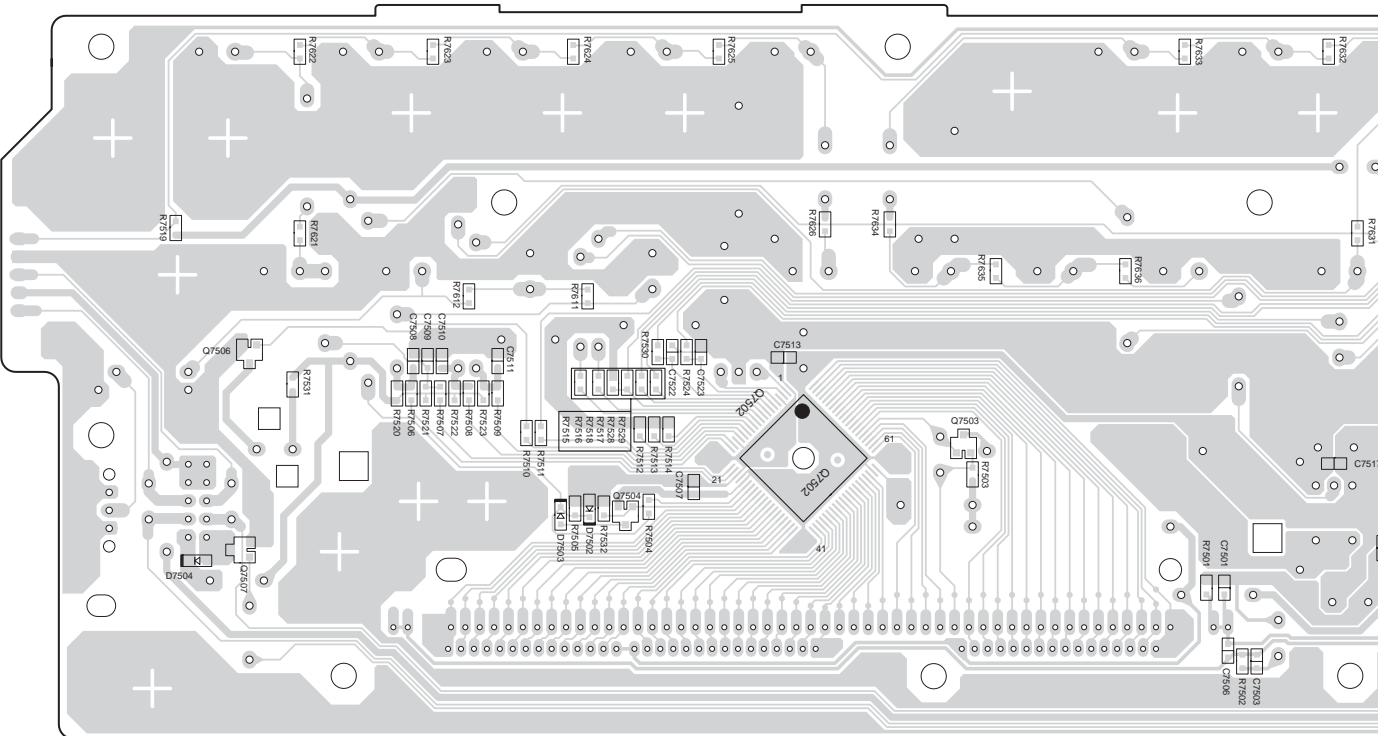
1



2

U2 Component side
 Display circuit PC board ass'y
 (NADIS-7403)

3



4

5

A

B

C

D

PRINTED CIRCUIT BOARD 2

1

U1

NADG-7401,DSP circuit PC board

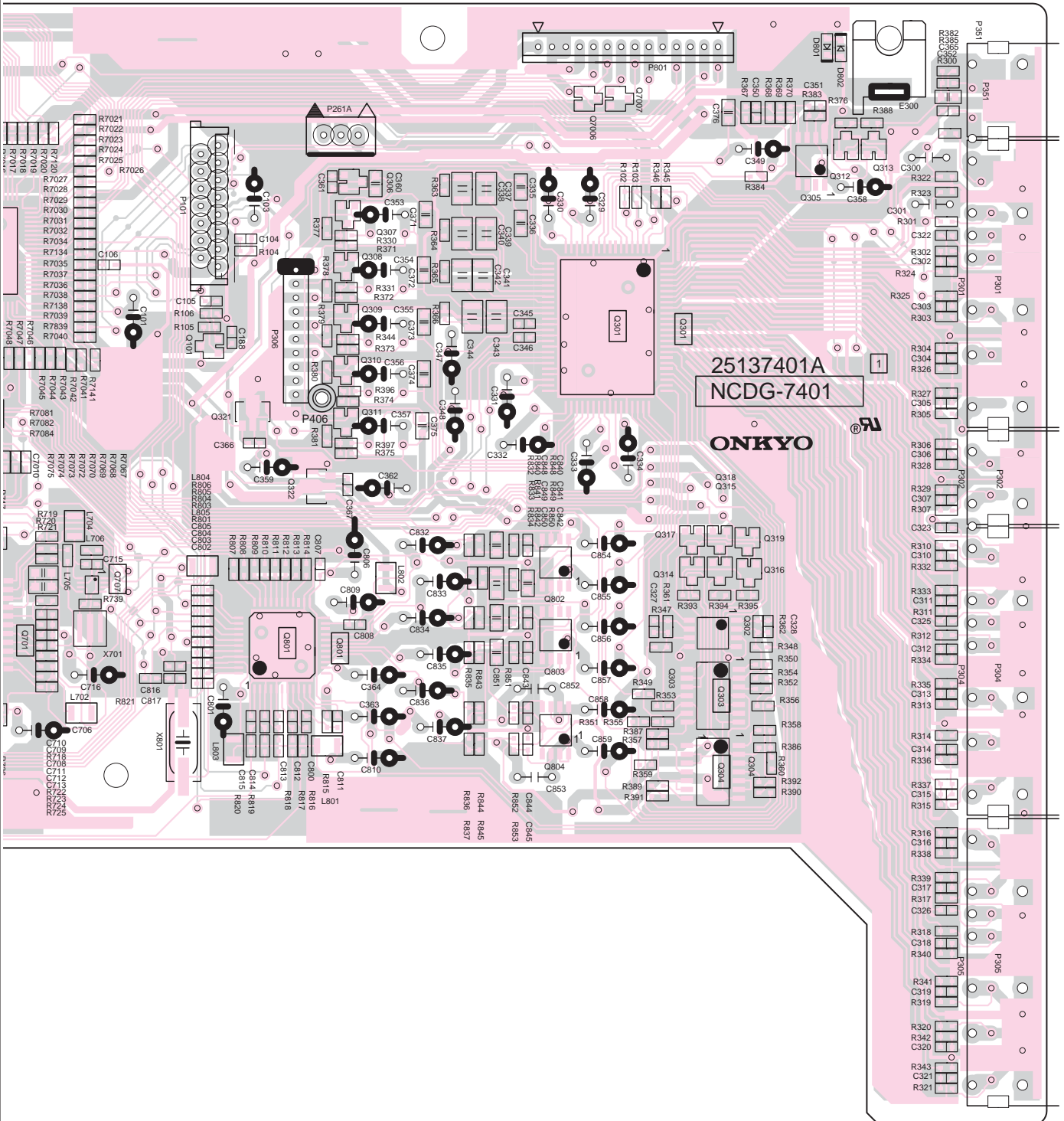
Pink:Parts and Copper foil side
Black:Copper foil side

2

3

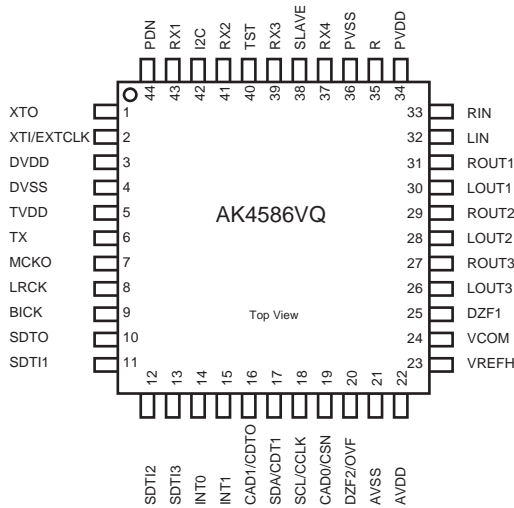
4

5

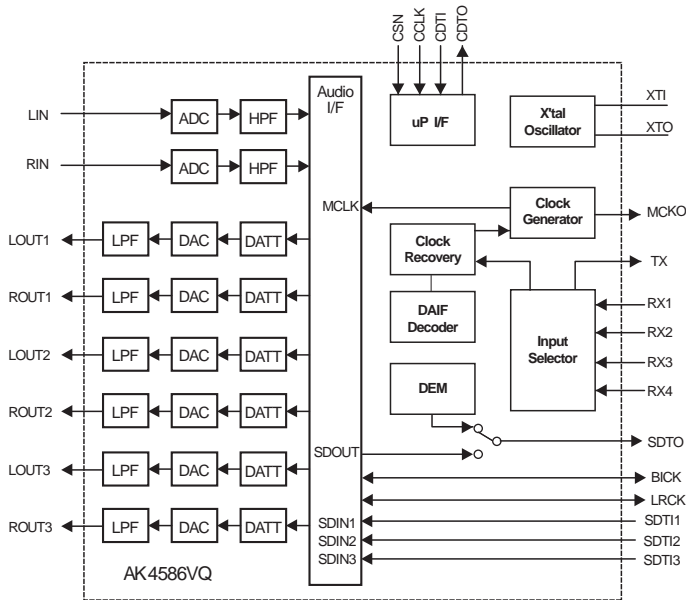


IC BLOCK DIAGRAMS AND DESCRIPTIONS

AK4586VQ(96kHz 6ch CODEC)



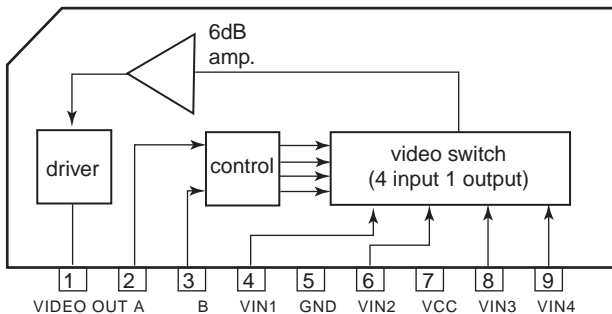
Pin Layout



Block diagram

No.	Name	I/O	Description
1	XTO	O	Crystal oscillator output pin
2	XTI	I	Crystal oscillator input pin
3	EXTCLK	I	Master clock input pin
4	TVDD	-	Power supply pin for output buffer. 2.7V to 5.5V
4	DVSS	-	Digital ground pin
5	DVDD	-	Power supply pin for digital section. 4.5V to 5.5V
6	TX	O	Transmitter channel output pin
7	MCKO	O	Master clock output pin
8	LRCK	I/O	Input/Output channel clock pin
9	BICK	I/O	Audio serial data clock pin
10	SDTO	O	Audio serial data output pin
11	SDTI1	I	Audio serial data input pin for DAC1
12	SDTI2	I	Audio serial data input pin for DAC2
13	SDTI3	I	Audio serial data input pin for DAC3
14	INT0	O	Interrupter pin 0
15	INT1	O	Interrupter pin 1
16	CDTO	O	Control data output pin (Serial mode)
16	CADI	I	Chip address pin 1 (Bus mode)
17	CDTI	I	Control data input pin (Serial mode)
17	SDA	I/O	Control data input/output pin (Bus mode)
18	CCLK	I	Control data clock pin (Serial mode)
18	SCL	I	Control data clock pin (Bus mode)
19	CSN	I	Chip select pin (Serial mode)
19	CAD0	I	Chip address pin 0 (Bus mode)
20	DZF2	O	Zero input detection pin 2
20	OVF	O	Overflow detection pin for analog input
21	AVSS	-	Analog ground pin
22	AVDD	-	Power supply pin for analog section. 4.5V to 5.5V
23	VREFH	I	Reference voltage input pin, AVDD
24	VCOM	O	Common voltage output pin, AVDD/2
25	DZF1	O	Zero input detection pin 1
26	LOUT3	O	DAC 3 left channel analog output pin
27	ROUT3	O	DAC 3 right channel analog output pin
28	LOUT2	O	DAC 2 left channel analog output pin
29	ROUT2	O	DAC 2 right channel analog output pin
30	LOUT1	O	DAC 1 left channel analog output pin
31	ROUT1	O	DAC 1 right channel analog output pin
32	LIN	I	Left channel analog input pin
33	RIN	I	Right channel analog input pin
34	PVDD	-	PLL power supply pin. 4.5V to 5.5V
35	R	-	External resistor connection pin
36	PVSS	-	PLL ground pin
37	RX4	I	Receiver channel input pin 4
38	SLAVE	I	Slave mode pin
39	RX3	I	Receiver channel input pin 3
40	TST	I	Test pin
41	RX2	I	Receiver channel input pin 2
42	I2C	I	Serial control mode select pin. Serial at H.
43	RX1	I	Receiver channel input pin 1
44	PDN	I	Power down and reset pin

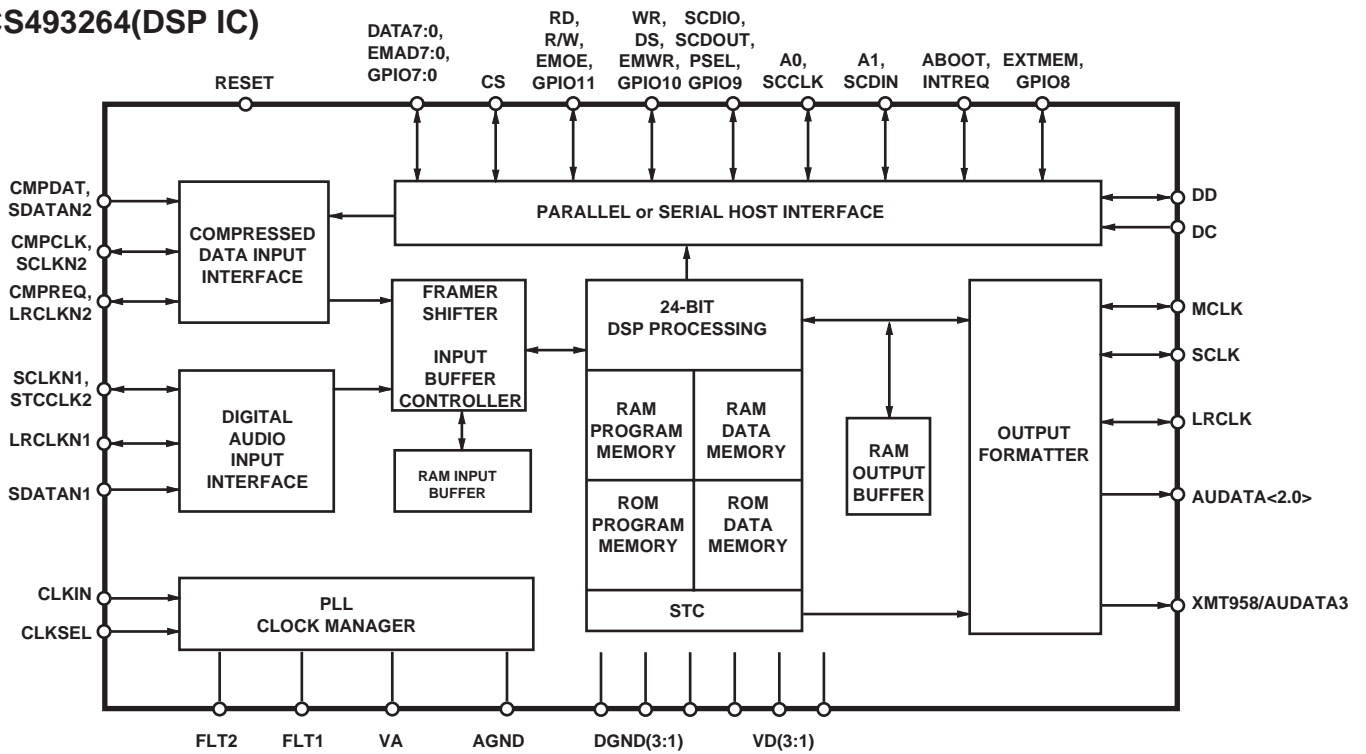
LA7956(Video Switch)



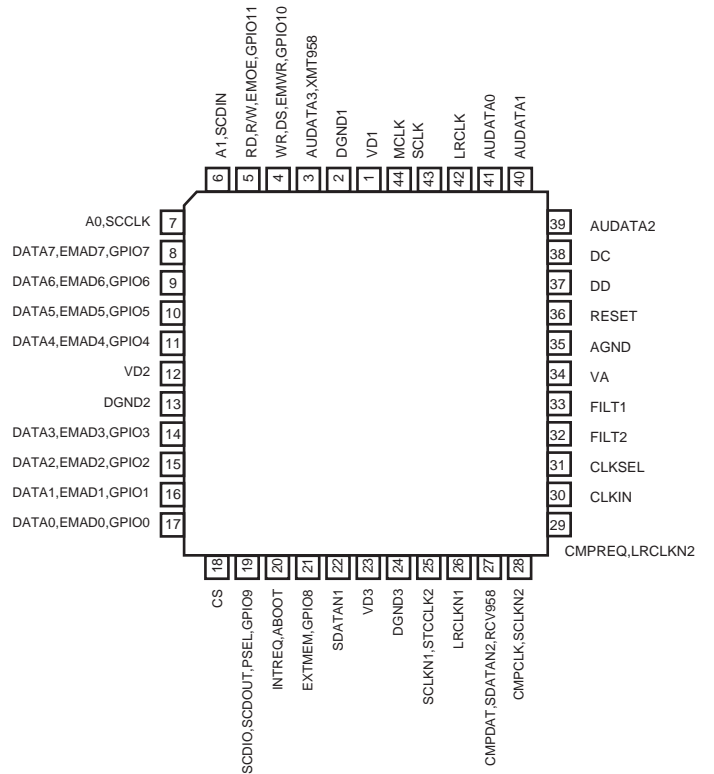
S2	S3	VIN1	VIN2	VIN3	VIN4
(2 pin)	(3 pin)	(4 pin)	(6 pin)	(8 pin)	(9 pin)
H	H	ON	OFF	OFF	OFF
L	H	OFF	ON	OFF	OFF
H	L	OFF	OFF	ON	OFF
L	L	OFF	OFF	OFF	ON

IC BLOCK DIAGRAMS AND DESCRIPTIONS

CS493264(DSP IC)

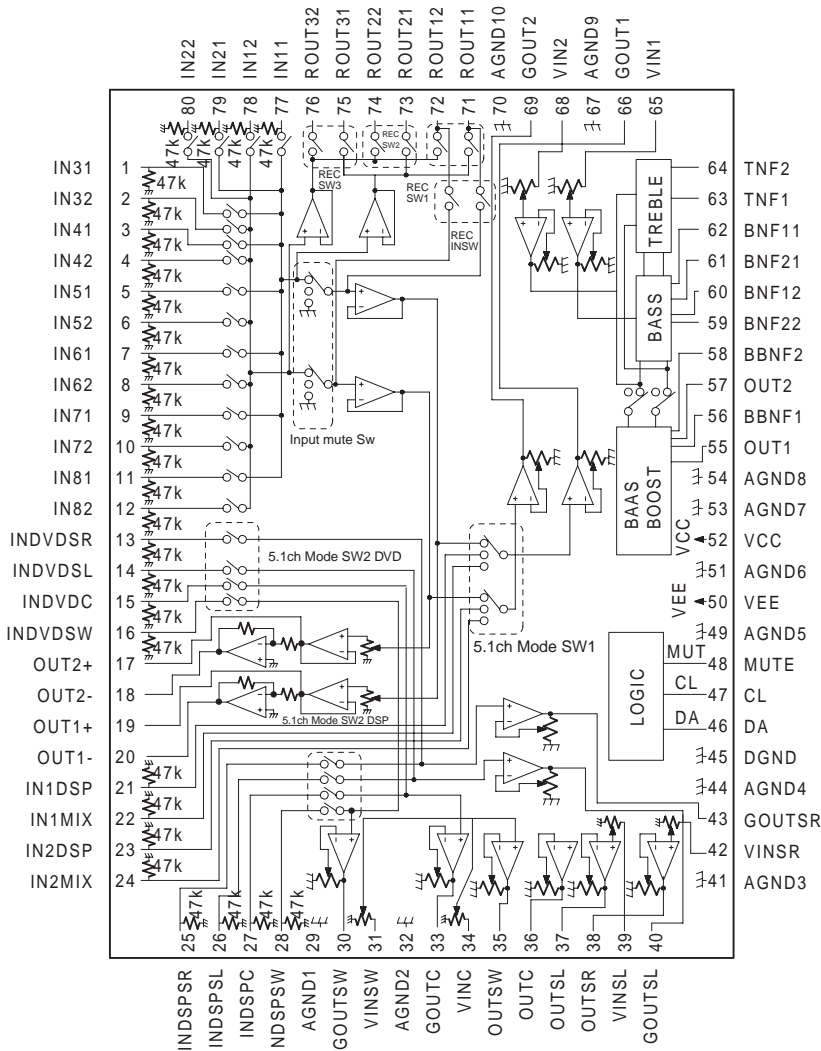


No.	Symbol	Description
1	VD1	Digital positive supply
2	DGMD1	Digital supply ground
3	AUDATA3,XMT958	SPDIF transmitter output. Digital audio output.
4	WR,DS,EMWR,GPIO10	Host write strobe or host data strobe or external memory write enable or general purpose input & output number 10.
5	RD,R/W,EMOE,GPIO11	Host parallel output enable or host parallel R/W or external memory output enable or general purpose input & output number 11.
6	A1,SCDIN	Host address bit one or SPI serial control data input.
7	A0,SCCLK	Host parallel address bit zero or serial control port clock.
8	DATA7	In parallel host mode these pins provide a bi-directional data bus. If a serial host mode is selected, these pins can provide a multiplexed address and data bus for connecting an 8-bit external memory. Otherwise, in serial data host mode, these pins can act as general-purpose input or output pins that can be individually configured by this DSP.
9	DATA6	
10	DATA5	
11	DATA4	
12	VD2	Digital positive supply
13	DGND2	Digital supply ground
14	DATA3	In parallel host mode these pins provide a bi-directional data bus. If a serial host mode is selected, these pins can provide a multiplexed address and data bus for connecting an 8-bit external memory. Otherwise, in serial data host mode, these pins can act as general-purpose input or output pins that can be individually configured by this DSP.
15	DATA2	
16	DATA1	
17	DATA0	
18	CS	Host parallel chip select, host serial SPI chip select pin.
19	SCDIO,SCDOUT,PSEL,GPIO8	Serial control port data input and output, parallel port type select pin.
20	INTREQ,ABOOT	Control port interrupt request, automatic boot enable
21	EXTMEM	External memory chip select or general purpose input & output number pin
22	SDATAN1	PCM audio data input number one
23	VD3	Digital positive supply
24	DGND3	Digital supply ground
25	SCLK1,STCLK2	PCM audio data input bit clock
26	LRCLKN1	PCM audio input sample rate clock
27	CMPDAT,ECV958,SDATAN2	PCM audio data input number two.
28	CMPCLK,SCLKN2	PCM audio input bit clock
29	CMPREQ,LRCLKN2	PCM audio input sample rate clock
30	CLKIN	Master clock input pin
31	CLKSEL	DSP clock select pin
32	FILT2	Connect to an external filter for phase-locked loop.
33	FILT1	Connect to an external filter for phase-locked loop.
34	VA	Analog positive supply.
35	AGND	Analog supply ground/
36	RESET	Master reset input
37	DD	These pins are reserved and should be pulled up with an external 4.7k resistors.
38	DC	
39	AUDATA2	Digital audio output 2.
40	AUDATA1	Digital audio output 1.
41	AUDATA0	Digital audio output 0.
42	LRCLK	Audio output sample rate clock
43	SCLK	audio output bit clock
44	MCLK	Audio master clock



IC BLOCK DIAGRAMS AND DESCRIPTIONS

BD3811K1(6ch Volume with 8ch input selector)

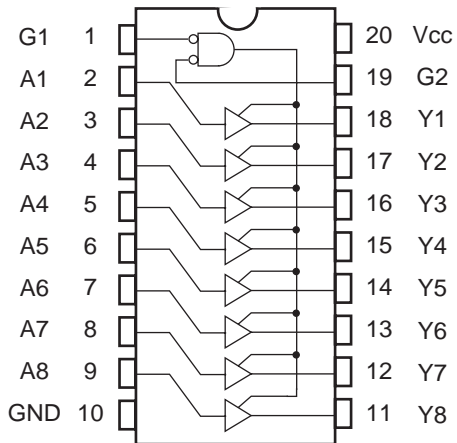


No.	Terminal	Description
26	INDSPSL	DSP surround Lch input terminal
27	INDSPC	DSP center input terminal
28	INDSPSW	DSP sub woofer input terminal
29	AGND1	Analog ground terminal
30	GOUTSW	Sub woofer input gain output terminal
31	VINSW	Sub woofer volume input terminal
32	AGND2	Analog ground terminal
33	GOUTC	Center input gain out put terminal
34	VINC	Center volume input terminal
35	OUTSW	Sub woofer output terminal
36	OUTC	Center output terminal
37	OUTSL	Surround Lch output terminal
38	OUTSR	Surround Rch output terminal
39	VINSL	Surround Lch volume input terminal
40	GOUTSL	Surround Lch input gain output terminal
41	AGND3	Analog ground terminal
42	VINSR	Surround Rch volume input terminal
43	GOUTSR	Surround Rch input gain output terminal
44	AGND4	Analog ground terminal
45	DGND	Ground terminal for comparator
46	DA	Serial data and latch input terminal
47	CL	Serial clock input terminal
48	MUTE	Mute terminal
49	AGND5	Analog ground terminal
50	VEE	(-) Power supply terminal
51	AGND6	Analog ground terminal
52	VCC	(+) Power supply terminal
53	AGND7	Analog ground terminal
54	AGND8	Analog ground terminal
55	OUT1	1ch output terminal
56	BBNF1	1ch bass boost filter terminal
57	OUT2	2ch output terminal
58	BBNF2	2ch bass boost filter terminal
59	BNF22	2ch bass filter terminal 2
60	BNF12	2ch bass filter terminal 1
61	BNF21	1ch bass filter terminal 2
62	BNF11	1ch bass filter terminal 1
63	TNF1	1ch treble filter terminal 1
64	TNF2	2ch treble filter terminal 1
65	VIN1	1ch(Lch) volume input terminal
66	GOUT1	1ch(Lch) input gain output terminal
67	AGND9	Analog ground terminal
68	VIN2	2ch(Rch) volume input terminal
69	GOUT2	2ch(Rch) input gain output terminal
70	AGND10	Analog ground terminal
71	ROUT11	1ch recording input/output terminal 1
72	ROUT12	2ch recording input/output terminal 1
73	ROUT21	1ch recording output terminal 2
74	ROUT22	2ch recording output terminal 2
75	ROUT31	1ch recording output terminal 3
76	ROUT32	2ch recording output terminal 3
77	IN11	1ch input terminal 1
78	IN12	2ch input terminal 1
79	IN21	1ch input terminal 2
80	IN22	2ch input terminal 2

No.	Terminal	Description
1	IN31	1ch input terminal 3
2	IN32	2ch input terminal 3
3	IN41	1ch input terminal 4
4	IN42	2ch input terminal 4
5	IN51	1ch input terminal 5
6	IN52	2ch input terminal 5
7	IN61	1ch input terminal 6
8	IN62	2ch input terminal 6
9	IN71	1ch input terminal 7
10	IN72	2ch input terminal 7
11	IN81	1ch input terminal 8
12	IN82	2ch input terminal 8
13	INDVDSR	DVD surround Rch input terminal
14	INDVDSL	DVD surround Lch input terminal
15	INDVDC	DVD center input terminal
16	INDVDSW	DVD sub woofer input terminal
17	OUT2(+)	2ch (+) A/D output terminal
18	OUT2(-)	2ch (-) A/D output terminal
19	OUT1(+)	1ch (+) A/D output terminal
20	OUT1(-)	1ch (-) A/D output terminal
21	IN1DSP	1ch DSP input terminal
22	IN1MIX	1ch DSP MIX input terminal
23	IN2DSP	2ch DSP input terminal
24	IN2MIX	2ch DSP MIX input terminal
25	INDSPSR	DSP surround Rch input terminal

IC BLOCK DIAGRAMS AND DESCRIPTIONS

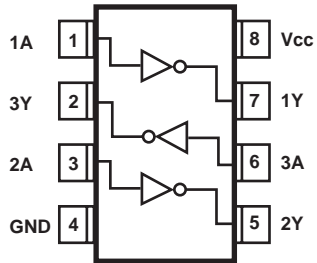
TC74VHC541FT(Octal bus buffer)



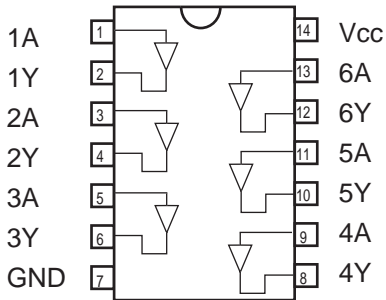
INPUTS			OUTPUT
$\overline{G1}$	$\overline{G2}$	An	
H	X	X	Z
X	H	X	Z
L	L	H	H
L	L	L	L

X :Don't care
Z :High impedance

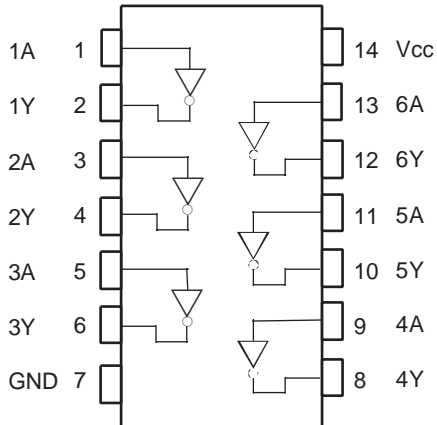
TC7WU04FU(Triple inverter)



TC7HTC7007AF(Hex buffer)



74HCU04F(Hex Inverter)



(TOP VIEW)

Truth table

A	Y
L	H
H	L

MAIN MICROPROCESSOR-CONNECTION DIAGRAM

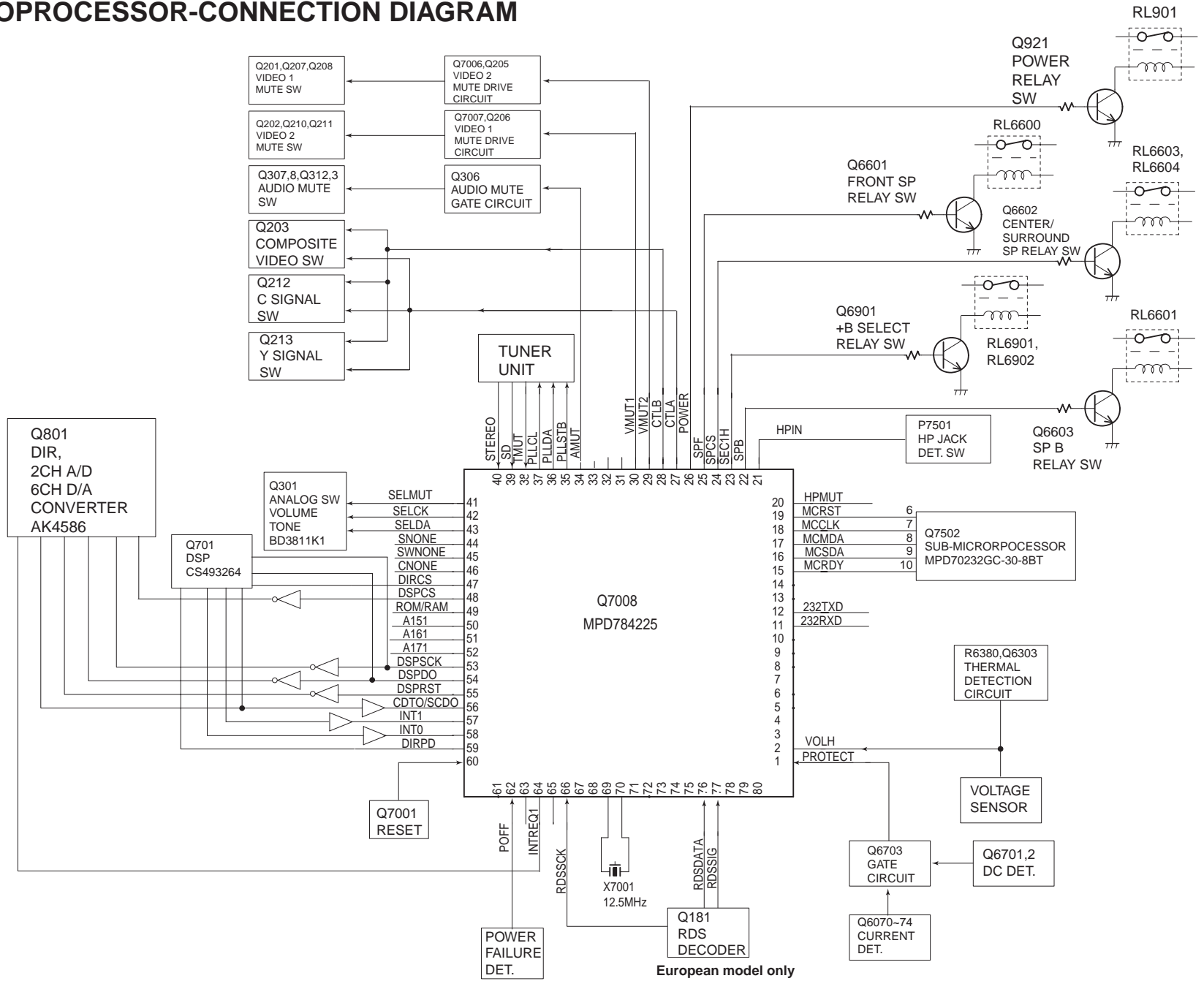
1

2

3

4

A B C D E



European model only

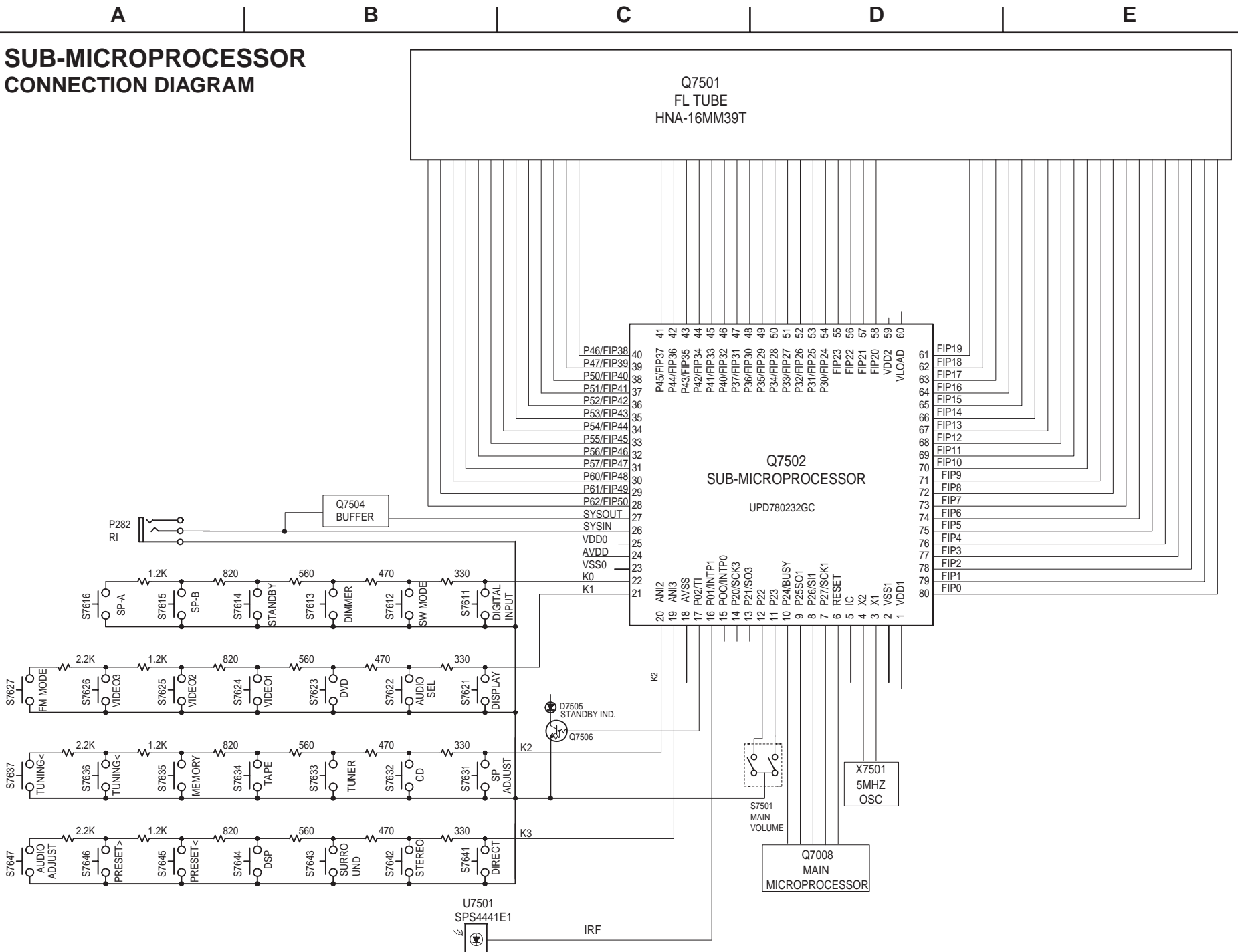
SUB-MICROPROCESSOR CONNECTION DIAGRAM

1

2

3

4



TERMINAL DESCRIPTION

MAIN MICROPROCESSOR

No.	Terminal	I/O	Description
1	PROTECT	I	Protection circuit detection input terminal
2	VOLH	I	Power amplifier voltage detection terminal.
3	BAND	I	Region setting input terminal.
11	232TXD		Not used.
12	232RXD		Not used.
15	MCRDY	I	Data ready detection input terminal from the sub microprocessor.
16	MCSDa	I	Data input terminal from the sub microprocessor.
17	MCMDA	O	Data output terminal to the sub microprocessor.
18	MCCLK	O	Serial clock output terminal to the sub microprocessor
19	~MCRST	O	Reset signal output terminal to the sub microprocessor
20	HPMUT	O	Muting control output terminal for headphone amplifier.
21	HPIN	I	Input terminal to detect the connection of headphone
22	SPBRL	O	Speaker B relay control output terminal.
23	SEC1H	O	Voltage +/-B control output terminal.
24	SPAC SRL	O	Speaker relay control output terminal for center and surround channels
25	SPAFRL	O	Speaker relay A control output terminal for front channels
26	POWERRL	O	Power source relay control output terminal
27	VCTRLA	O	Control signal A output terminal for the video selector switch
28	VCTRLB	O	Control signal B output terminal for the video selector switch
29	VMUT2	O	Muting control output terminal for the video section 2
30	VMUT1	O	Muting control output terminal for the video section 1
34	AMUT	O	Audio muting control output terminal
35	PLLSTB	O	Strobe signal output terminal to PLL IC
36	PLLSDO	O	Serial data output terminal to PLL IC
37	PLLCLK	O	Serial clock output terminal to PLL IC
38	TUMUT	O	Muting control output terminal for the tuner section
39	~SD	I	Broadcast detection input terminal more than a muting level.
40	~STEREO	I	FM stereo broadcast detection input terminal
41	SELMUT	O	Muting control output terminal for selector, volume and tone IC BD3811.
42	SELCLK	O	Serial clock output terminal of IC BD3811.
43	SELSDO	O	Serial data and latch signal output terminal for IC BD3811
44	SNONE	O	Not used.
45	SWNONE	O	Not used.
46	CNONE	O	Not used.
47	~DIRCS	O	Chip select signal output terminal to DIR IC AK4586
48	~DSPCS	O	Chip select signal output terminal to DSP IC.
49	~ROM/RAM	O	ROM/RAM select terminal. Not used.
50	ADDR151	O	DSP boot ROM address 15 select terminal. Not used.
51	ADDR161	O	DSP boot ROM address 16 select terminal. Not used.
52	ADDR171	O	DSP boot ROM address 17 select terminal. Not used.
53	DSPCLK	O	Serial clock output terminal for DIR and DSP ICs.
54	DSPSDO	O	Serial data output terminal for DIR and DSP ICs.
55	~DSPRST	O	Reset signal output terminal to DSP IC.
56	CDTO/SCDO	I	Serial data input terminal from DIR and DSP ICs.
57	INT1	I	Input terminal to detect the status of DIR IC.
58	INT0	I	Input terminal to detect the unlock of DIR IC.
59	~DIRPD	O	Power down terminal to DIR and CODEC ICs.
60	RESET	I	Reset input terminal
62	POFF	I	Power failure detection input terminal
64	~INTREQ/~ABOOT	I/O	Interrupter input terminal from DSP IC.
66	~RDSCCLK	I	RDS clock input terminal (European model only)
69	X2		Connect the ceramic oscillator 12.5MHz.
70	X1		Connect the ceramic oscillator 12.5MHz.
71	TEST/VPP		Test terminal.
72	XT2		Not used.
73	XT1		Not used.
76	RDS DATA	I	Data input terminal of RDS broadcast (European model only)
77	RDSSIG	I	Input terminal to check the signal of RDS broadcast (European model only)

TERMINAL DESCRIPTION

SUB MICROPROCESSOR

Pin No.	Symbol	I/O	Description	Pin No.	Symbol	I/O	Description
1	VDD		Power supply terminal. Connect to 5V.	41	P22	O	Segment output terminal of P22.
2	VSS		Ground terminal.	42	P21	O	Segment output terminal of P21.
3	X1		Ceramic oscillator connection terminals for main system.	43	P20	O	Segment output terminal of P20.
4	X2		Connect the 5MHz ceramic oscillator between #3 and #4.	44	P19	O	Segment output terminal of P19.
5	IC/VPP		Internal connection terminal	45	P18	O	Segment output terminal of P18.
6	~RESET	I	System reset signal input terminal.	46	P17	O	Segment output terminal of P17.
7	SUBCL/SCK	I	Clock input terminal to transmit the signal from main microprocessor.	47	P16	O	Segment output terminal of P16.
8	SUBDO/SDI	I	Data input terminal to transmit the signal from main microprocessor.	48	P15	O	Segment output terminal of P15.
9	SUBDI/SDD	O	Data output terminal to transmit the signal to main microprocessor.	49	P14	O	Segment output terminal of P14.
10	SUBLDY	O	Data ready output terminal to transmit to the main microprocessor.	50	P13	O	Segment output terminal of P13.
11	VBJ	I	Pulse input terminal from the rotary encoder of volume.	51	P12	O	Segment output terminal of P12.
12	VAJ	I	Pulse input terminal from the rotary encoder of volume.	52	P11	O	Segment output terminal of P11.
13	SSCBJ	I	Not used.	53	P10	O	Segment output terminal of P10.
14	SSCAJ	I	Not used.	54	P9	O	Segment output terminal of P9.
15	~IRIN	I	Not used.	55	P8	O	Segment output terminal of P8.
16	~IRF	I	Signal input terminal from the remote controller.	56	P7	O	Segment output terminal of P7.
17	STBYLED	O	Standby LED control output terminal.	57	P6	O	Segment output terminal of P6.
18	AVSS		Ground terminal for A/D converter.	58	P5	O	Segment output terminal of P5.
19	K3	I	Operation key connection terminal.	59	VDD2		Power supply terminal. Apply +5V.
20	K2	I	Operation key connection terminal.	60	VLOAD		Negative power supply terminal of FL controller.
21	K1	I	Operation key connection terminal.	61	P4	O	Segment output terminal of P4.
22	K0	I	Operation key connection terminal.	62	P3	O	Segment output terminal of P3.
23	VSS0		Ground terminal	63	P2	O	Segment output terminal of P2.
24	AVDD		Power supply terminal for A/D converter.	64	P1	O	Segment output terminal of P1.
25	VDDD		Power supply terminal. Apply +5V.	65	16G	O	Grid output terminal of 16G.
26	~SYSIN	I	System code input terminal.	66	15G	O	Grid output terminal of 15G.
27	~SYSOUT	O	System code output terminal.	67	14G	O	Grid output terminal of 14G.
28	P35	O	Segment output terminal of P35.	68	13G	O	Grid output terminal of 13G.
29	P34	O	Segment output terminal of P34.	69	12G	O	Grid output terminal of 12G.
30	P33	O	Segment output terminal of P33.	70	11G	O	Grid output terminal of 11G.
31	P32	O	Segment output terminal of P32.	71	10G	O	Grid output terminal of 10G.
32	P31	O	Segment output terminal of P31.	72	9G	O	Grid output terminal of 9G.
33	P30	O	Segment output terminal of P30.	73	8G	O	Grid output terminal of 8G.
34	P29	O	Segment output terminal of P29.	74	7G	O	Grid output terminal of 7G.
35	P28	O	Segment output terminal of P28.	75	6G	O	Grid output terminal of 6G.
36	P27	O	Segment output terminal of P27.	76	5G	O	Grid output terminal of 5G.
37	P26	O	Segment output terminal of P26.	77	4G	O	Grid output terminal of 4G.
38	P25	O	Segment output terminal of P25.	78	3G	O	Grid output terminal of 3G.
39	P24	O	Segment output terminal of P24.	79	2G	O	Grid output terminal of 2G.
40	P23	O	Segment output terminal of P23.	80	1G	O	Grid output terminal of 1G.

EXPLODED VIEW-PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
1	27100416A	Chassis
2	27190503A	KGLS-8RT,Holder
3	27190813	KGPS-10RF,Holder
4	27190428A	KGLS-10RT,Holder
5	880009	NRP-345,Plastic rivet
6	27160511	Heat sink
11	27300750	! Bushing, cord
12	27123086	Rear panel
16	28184831	Top cover
	28184856	Top cover <S>
17	838430088	3TTB+8B(BC),Self-tapping screw
	838930088	3TTB+8B(UN),Self-tapping screw <S>
21	27175319B	Leg
22	28141494	Cushion
31	27212483C	Front panel
	27212484C	Front panel <S>
32	28325641	Knob, volume
	28325642	Knob, volume <S>
33	28326050	Knob, mode
	28326051	Knob, mode <S>
34	28326053	Knob, selector
	28326054	Knob, selector <S>
35	28326056A	Knob PRE
	28326057A	Knob PRE <S>
36	28326047	Knob, power
	28326048	Knob, power <S>
37	28191957	Clear plate
	28191958	Clear plate <S>
38	28135244	Badge
	28135245	Badge <S>
39	29110170	Tape CU
40	29110171	Tape CU
41	29110161	Tape
42	29110172	Tape CU
43	27141873	Retainer
44	29363194	Label
51	835430088	3TTF+8B(BC),Self-tapping screw
52	838130088	3TTB+8B, Self-tapping screw
53	838430108	3TTB+10B(BC), Self-tapping screw
54	830440089	4TTC+8C(BC), Self-tapping screw
55	801433	3SMS8W.SW+14B(BC), Special screw
56	838430088	3TTB+8B(BC), Self-tapping screw
57	831430088	3TTW+8B(BC), Self-tapping screw
58	223024	! AC238,Isolated sheet
F6901,F6902	252198 or	! 8A-UL or
	252261	! 8A-T/UL-ST2, Fuse
F901	252198 or	! 8A-UL or
	252261	! 8A-T/UL-ST2, Fuse
P101	2047151512	NCFC7-151512,Flexible cable
P7502	2045102012	NCFC5-102012,Flexible cable
P7503	2047081012	NCFC7-081012, Flexible cable
P7504	1F999018UL	Fastening cable ass'y
P800	260208	Wire tie

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

: Black model
 <S>: Silver model

REF. NO.	PART NO.	DESCRIPTION
P901	253332HIT or	! AS-UC-2 or
	253333VOL	! AS-UC-2, Power supply cord
Q6050,Q6051	2202843,	* 2SC5242-O,
	2202842,	* 2SC5242-R,
	2203684,	* MN150S-Y,
	2203686 or	* MN150S-P or
	2203683	* MN150S-O,Transistor
Q6052~Q6054	2203563,	* KTC5242-O,
	2203562,	* KTC5242-R,
	2203664,	* MN130S-Y,
	2203666,	* MN130S-P,
	2203663,	* MN130S-O,
	2202843 or	* 2SC5242-O or
	2202842	* 2SC5242-R,Transistor
Q6060,Q6061	2202833,	* 2SA1962-O,
	2202832,	* 2SA1962-R,
	2203694,	* MP150S-Y,
	2203696 or	* MP150S-P or
	2203693	* MP150S-O,Transistor
Q6062~Q6064	2203553,	* KTA1962-O,
	2203552,	* KTA1962-R,
	2203674,	* MP130S-Y,
	2203676,	* MP130S-P,
	2203673,	* MP130S-O,
	2202833 or	* 2SA1962-O or
	2202832	* 2SA1962-R,Transistor
T901	2301681	! NPT-1464D,Power transformer
U1	1A974501-2B	NADG-7401-2B,Digital circuit PC board ass'y
U2	1A970503-2E	NADIS-7403-2E,Display circuit PC board ass'y
U3	1A970504-2E	NASW-7404-2E,Standby switch PC board ass'y
U4	1A970505-2E	NAETC-7405-2E,Headphone terminal PC board ass'y
U6	1A974566-1B	NAAF-7866-1B,Driver circuit PC board ass'y
U7	1A974567-1B	NAVD-7867-1B,Video terminal PC board ass'y
U8	1A974568-1B	NAETC-7868-1B,Regulator circuit PC board ass'y
U9	1A974569-1B	NAETC-7869-1B,Secondary terminal A PC board ass'y
U10	1A974570-1B	NAETC-7870-1B,Speaker terminal PC board ass'y
U11	1A974573-1B	NAVD-7873-1B,S video terminal PC board ass'y
U12	1A974574-1B	NAETC-7874-1B,Connector PC board ass'y
U16	1A978575-1B	NAAF-7875-1B,Power amplifier PC board ass'y
U17	1A978576-1B	NAPS-7876-1B,Terminal PC board ass'y
U18	1A978577-1B	NAPS-7877-1B,Primary circuit PC board ass'y
U19	1A978578-1B	NAPS-7878-1B,Secondary circuit PC board ass'y
U20	1A978579-1B	NAETC-7879-1B,PC board for holder
U21	1A978580-1B	NAETC-7880-1B,Thermal detector PC board ass'y
U22	1A978584-1B	NAETC-7884-1B,Connector PC board ass'y
U26	240146,	FAE385-A02F,
	240134A or	TFCE1U114B or
	240138A	ENG06501QR,Tuner unit

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CAUTION: Replacement for transistor of mark *, if necessary
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the original type.

PACKING-PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
71	29092087A	Pad
72	29100034-1A	850*650,Polybag
73	29095906	Sheet
74	29110149	Tape,cellophane
75	29110148	PP tape
76	29054017	Carton box
76	29054018	Carton box <S>
77	29363340	Label UPC
77	29363341	Label UPC <S>
78	29100201	350*200*W250,Polybag
81	29363059A	Label, cable
82	29343469	Instruction manual
83	29343470	Instruction manual, digest
84	24140518	RC-518M,Remote controller
85	3010054	R6/AA(UM-3), Battery
86	232140	NMA-3057, AM antenna
87	292142	FM antenna
88	29365090A	Warranty card

: Black model

<S>: Silver model

PRINTED CIRCUIT BOARD-PARTS LIST

Digital circuit PC board (NADG-7401-2B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q301	22241761R3	BD3811K1
Q302,Q305	22241383R2,	NJM4565M-D,
Q802~Q804	22240489R1NE or	MPC4570G2-T1(MST) or
	22240581R2	NJM4565M
Q7002	22274541ER2TO or	TC74VHC541FT or
	22274541IR2TI	SN74AHC541PWR
Q7003	222740077R2TO	TC74HCT7007AF
Q7004	22241778R2	BA33C25FP
Q7008	22241967R3	MPD784225GC-218-8BT
Q701	22241762R2	CS493264
Q707	22240935R2	TC7WU04FU
Q801	22241620R3	AK4586
Q321	222780073R2	78L07(SMT)
Q322	222790073R2	79L07(SMT)
Q6402,Q6405	222780125	78M12HF
Q6403	222790125	79M12HF
Q6406	222780055	78M05HF
	Transistors	
Q306	2214530R2 or	RN2402 or
	2216220R2	KRA102S
Q307,Q308	2215410R2	RN1441
Q312,Q313	2215410R2	RN1441
Q7001,Q7006	2214490R2 or	RN1404 or
Q7007	2216210R2	KRC104S
Q9501	2211455	2SA1015-GR
	Diodes	
D7001~D7004	223234R2 or	1SS352 or
D801,D802	223269R2	1SS355
D7702	224550620R2,	UDZS6.2B,
	224490620R2 or	UDZ6.2B or
	224660624R2	HZU6.2B
D9502~D9507	22380260,	RL1N4003,
D9509~D9512	22380032 or	1SR139-100 or
	22380035	GP104003E
D9508	224552700R2,	UDZS27B,
	224492700R2 or	UDZ27B or
	224662704R2	HZU27B

Coils

L7001	231237K470R2 or 233533K470R2	NCH-1479 or NCH-1587-470K
L7002,L701	231237M022R2 or	NCH-1471 or
L702,L704	233533K022R2	NCH-1587-022K
L705,L706	230958R1	BK1608LM182-T
L801-L804	231237M022R2 or 233533K022R2	NCH-1471 or NCH-1587-022K

Oscillators

X7001	3010361R2	CSTCE12M5G52-R0,Ceramic
X701	3010324R2	CSTCV12.2MTJ0C4,Ceramic

Capacitors

C101,C103	394680337 or 394780337	3.3uF,50V or 3.3uF,50V,Elect.
C300,C301	374721015	100pF+/-10%,50V,Plastic
C329-C334	393341007	10uF,16V,Elect.
C335,C336	373043324R2	ECHU16V-332J,Chip film
C338,C340	373045634R2	ECHU16V-563J,Chip film
C347,C348	394641017 or 394741017	100uF,16V or 100uF,16V,Elect.
C349	393341007	10uF,16V,Elect.
C353,C354	393344707	47uF,16V,Elect.
C358	393344707	47uF,16V,Elect.
C359,C362	394641007 or	10uF,16V or
C6404,C6406	394741007	10uF,16V,Elect.
C363,C364	393341007	10uF,16V,Elect.
C6401	374721044	0.1uF+/-5%,50V,Plastic

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C6410,C6412	394641007 or 394741007	10uF,16V or 10uF,16V,Elect.
C7001	3000078, 3000120 or 3000121	DX-5R5L104, FMC0H104Z or SCDA5R5104A,Super
C7002,C7005	394621017 or	100uF,6.3V or
C706,C716	394721017	100uF,6.3V,Elect.
C7004	394680107 or 394780107	1uF,50V or 1uF,50V,Elect.
C7011,C7012	394644707 or	47uF,16V or
C7015	394744707	47uF,16V,Elect.
C801,C810	394644707 or 394744707	47uF,16V or 47uF,16V,Elect.

C806	394624717 or 394724717	470uF,6.3V or 470uF,6.3V,Elect.
C809	394641007 or 394741007	10uF,16V or 10uF,16V,Elect.
C832~C837	393341007	10uF,16V,Elect.
C841	373048224R2	ECHU16V-822J,Chip film
C849	373041534R2	ECHU16V-153J,Chip film
C852,C853	374721524	1500pF+/-5%,50V,Plastic
C854	393341007	10uF,16V,Elect.
C855	393344707	47uF,16V,Elect.
C856~C859	393341007	10uF,16V,Elect.
C9501~C9503	374721044	0.1uF+/-5%,50V,Plastic
C9505	394662227 or 394762227	2200uF,35V or 2200uF,35V,Elect.
C9506	394664717 or 394764717	470uF,35V or 470uF,35V,Elect.
C9507	394662217 or 394762217	220uF,35V or 220uF,35V,Elect.
C9508	394644727 or 394744727	4700uF,16V or 4700uF,16V, Elect.
C9510	394672217	220uF,63V,Elect.

Resistors

R6402	442521004F	RS1/2WBJ-10,Metal oxide
R6403	442523304F	RS1/2WBJ-33,Metal oxide
R6407	452630334F	RNU1WCJ-3.3,Metal
R6410	453530224	RNU1/2WCJ-2.2,Metal
R9506	443522204	RS1/2WBJ-22,Metal oxide

Terminals

P301,P304	25045571 or 25045300	NPJ-6PDRW386 or NPJ-6PDBL159
P302	25045333	NPJ-2PDBL185
P305	25045697	NPJ-6PWRLGGP493
P351	25045720	NPJ-1PDP510

Sockets

P101	25052211 or 25052024	NSCT-15P2108 or NSCT-15P1811
P7502B	25052576R2	NSCT-10P2473
P306	2009990717UL	NSAS-20P1004

Plugs

P410B,P411B	25055706	NPLG-10P662
P412B	25055704	NPLG-8P660
P801	25055710	NPLG-14P666

	Heat sink	
Q6402B	27160526	RAD-183
	Screws	
Q6402A,Q6405A	82143010	3P+10FN(BC),Pan head
Q6406A	82143010	3P+10FN(BC),Pan head

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Display circuit PC board (NADIS-7403-2E)

CIRCUIT NO.	PART NO.	DESCRIPTION
	FL tube	
Q7501	212229	HNA-16MM39T
	IC	
Q7502	22241571R3	MPD780232GC-030-8BT
	Transistors	
Q7503	2216175R2 or 2213145R2	KTC3875-GR or 2SC2712-GR
Q7504	2216230R2 or 2214540R2	KRA103S or RN2403
Q7506	2216190R2 or 2214470R2	KRC102S or RN1402
	Diodes	
D7501	224550820R2, 224490820R2 or 224660824R2	UDZS8.2B, UDZ8.2B or HZU8.2B
D7502	224550510R2, 224490510R2 or 224660514R2	UDZS5.1B, UDZ5.1B or HZU5.1B
D7503,D7507	223269R2 or 223234R2	1SS355 or 1SS352
D7505	225290	SEL4110R, LED
	Sensor	
U7501	241341	SPS-444-1-E1,Remote
	Oscillator	
X7501	3010242	CST5.00MGW,Ceramic
	Coils	
L7504,L7505	231237K220R2	NCH-1477

Capacitors		
C7502	355783309	33uF,50V,Elect.
C7514	394621017 or 394721017	100uF,6.3V or 100uF,6.3V,Elect.
C7521	355722219	220uF,6.3V,Elect.
Switches		
S7501	25065627	EC12E2425,Rotary encoder
S7611-S7613	25035718,	NPS-111-S681,
S7621-S7627	25035699 or	NPS-111-S662 or
S7631-S7637	25035714	NPS-111-S677
S7641-S7647	25035718, 25035699 or 25035714	NPS-111-S681, NPS-111-S662 or NPS-111-S677
Sockets		
JL7501A	25051107	NSCT-3P894
JL7502A	25051109	NSCT-5P896
P7502A	25051892 or 25052477	NSCT-10P1679 or NSCT-10P2374
P7503A	25052054 or 25051852	NSCT-8P1841 or NSCT-8P1639
Holder		
Q7501A	27190989A	(FL)

Standby switch PC board (NASW-7404-2E)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Switches	
S7614-S7616	25035718, 25035699 or 25035714	NPS-111-S681, NPS-111-S662 or NPS-111-S677
	Socket	
JL7501B	25051107	NSCT-3P894

Headphone terminal PC board (NAETC-7405-2E)

CIRCUIT NO.	PART NO.	DESCRIPTION
P7501	25045724	YKB21-5005,Headphone
JL7502B	25051109	NSCT-5P896,Socket

Driver circuit PC board (NAAF-7866-1B)

CIRCUIT NO.	PART NO.		DESCRIPTION
	Transistors		
Q5000~Q5004	2215896,	*	KTC3200-BL,
Q5010~Q5014	2210755,	*	2SC1775A-E,
	2210756 or	*	2SC1775A-F or
	2211733	*	2SC1845-E
Q5030~Q5034	2215844,		KTA1024-Y,
	2211353,		2SA949-O,
	2211354 or		2SA949-Y or
	2215843		KTA1024-O
Q5040~Q5044	2215854,		KTC3206-Y,
	2211633,		2SC2229-O,
	2211634 or		2SC2229-Y or
	2215853		KTC3206-O
Q5050~Q5054	2215896,		KTC3200-BL,
	2210755,		2SC1775A-E,
	2210756,		2SC1775A-F,
	2211732,		2SC1845-F,
	2211733 or		2SC1845-E or
	2215895		KTC3200-GR
	Diodes		
D5000~D5004	224470562		MTZJ5.6B
	Capacitors		
C5000~C5004	374721015		100pF+/-10%,50V,Plastic
C5010~C5014	393342207		22uF,16V,Elect.
C5020~C5024	394681007		10uF,50V,Elect.
C5040~C5044	393342217		220uF,16V,Elect.
C5050~C5054	394684707		47uF,50V,Elect.
C5100~C5104	394691007		10uF,100V,Elect.
C5110~C5114	394691007		10uF,100V,Elect.
	Resistors		
R5160~R5164	415471214		R25J-120,NF carbon
R5170~R5174	415471214		R25J-120,NF carbon
R5180~R5184	415471004		R25J-10,NF carbon
R5190~R5194	415471004		R25J-10,NF carbon
	Sockets		
P6000A~P6004A	25052288		NSCT-5P2185
P6011A	25052292		NSCT-9P2189
	Plug		
P306A	25055374		NPLG-10P357

Vidoe terminal PC board (NAVD-7867-1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q203	22241759	LA7956
Q281	222740046R2	74HCU04F
	Transistors	
Q201,Q202	2213631 or 2213632	RN1241-A or RN1241-B
Q204	2215995 or 2213354	KTA1267-GR or 2SA933S-R
Q205,Q206	2215770 or 2213510	KRA102M or DTA114ES
	Photo coupler	
U281	24120101	TORX179L
	Coils	
L281,L282	233454K220 or 233526K220	NCH-1452 220K or NCH-1561 220K
L283	233454M022 or 233526K022	NCH-1452 022M or NCH-1561 022K
	Capacitors	
C201,C202	394680227 or	2.2uF,50V or
C204,C217	394780227	2.2uF,50V,Elect.
C203,C205	394644717 or 394744717	470uF,16V or 470uF,16V,Elect.
C221	394644707	47uF,16V,Elect.
C285,C288	394624707	47uF,6.3V,Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
	Terminals	
P201,P202	25045299	NPJ-3PDYE158
P281	25045473	NPJ-1PDBL291
P282	25045696	LGY2502-0200C
	Socket	
P206B	25051239	NSCT-14P1029
	Plug	
P210A	25055702	NPLG-6P658

Regulator circuit PC board (NAETC-7868-1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q6931	222780565JRC	NJM78M56FA
	Diodes	

D6932,D6933	22380260 or 22380035	RL1N4003 or GP104003E
	Capacitors	
C6931	394651027S	CE04W25V-1000M(VR)
C6933	394641007	10uF,16V,Elect.
	Resistor	
R6935	441721214F	RS2WBJ-120,Metal oxide
	Sockets	
JL9501A	25051111	NSCT-7P898
P410A,P411A	25051235	NSCT-10P1025
P6931A	25051240	NSCT-15P1030
P7503B	25052241, 25051312, 25051852 or 25052054	NSCT-8P2138, NSCT-8P1101, NSCT-8P1639 or NSCT-8P1841

Secondary terminal A PC board (NAETC-7869-1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R9501	453530104	RNU1/2WCJ-1,Metal
R9502	453534794	RNU1/2WCJ-0.47,Metal
R9503	453532294	RNU1/2WCJ-0.22,Metal
R9521	453530394	RNU1/2WCJ-3.9,Metal
	Socket	
JL9501B	25051111	NSCT-7P898

Speaker terminal PC board (NAETC-7870-1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Diodes	
D6600,D6601	223163,	1SS133,
D6604	223205 or 223222	1SS270A or WG713A
	Capacitors	
C6600,C6604	374721034	0.01uF+/-5%,50V,Plastic
	Relays	
RL6600,RL6601	25065563,	NRL-2P5A-DC24-129,
RL6603,RL6604	25065517 or 25065586	NRL-2P5A-DC24-098 or NRL-2P5A-DC24-142
	Terminals	
P6800	25060323	NTM-8PDML254
P6801	25060335	NTM-6PDML266
	Sockets	

JL6803B,JL6804B	25050269	NSCT-5P97
JL6805B	25050268	NSCT-4P96

S video terminal PC board (NAVD-7873-1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Ics	
Q212,Q213	22241759	LA7956
	22241759	LA7956
	Transistors	
Q207,Q208	2213631 or	RN1241-A or
Q210,Q211	2213632	RN1241-B
Q209	2215995 or	KTA1267-GR or
	2213354	2SA933S-R
CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C207,C209	394680227 or	2.2uF,50V or
C213	394780227	2.2uF,50V,Elect.
C211,C215	394644717 or	470uF,16V or
	394744717	470uF,16V,Elect.
C223,C225	394644707 or	47uF,16V or
	394744707	47uF,16V,Elect.
	Sockets	
P203	25051748	NSCT-8P1535
P204	25051568	NSCT-12P1355
P211B	25051231	NSCT-6P1021

Connector PC board (NAETC-7874-1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
P210B	25051231	NSCT-6P1021,Socket
P211A	25055702	NPLG-6P658,Plug

Power amplifier PC board (NAAF-7875-1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q6010~Q6014	2213284 or	2SC1740S-R or
Q6020~Q6024	2213285	2SC1740S-S
Q6030~Q6034	2203434 or	KTD2061-Y or
	2203010	2SC5171
Q6040~Q6044	2203424 or	KTB1369-Y or
	2203000	2SA1930
Q6070~Q6074	2214984 or	2SC2631-R or
	2214985	2SC2631-S

Q6303	2215995, 2213354 or 2213355	KTA1267-GR, 2SA933S-R or 2SA933S-S
Q6601~Q6603 Q6901	2215864, 2212115, 2213284 or 2213285	KTC3199-GR, 2SC2458-GR, 2SC1740S-R or 2SC1740S-S
Q6701,Q6702	2215896, 2210755, 2210756, 2211732, 2211733 or 2215895	KTC3200-BL, 2SC1775A-E, 2SC1775A-F, 2SC1845-F, 2SC1845-E or KTC3200-GR
Q6703	2215885, 2211792, 2211793 or 2215886	KTA1268-GR, 2SA992-F, 2SA992-E or KTA1268-BL
Diodes		
D6000~D6004	223163,	1SS133,
D6010~D6014	223205 or	1SS270A or
D6306,D6307	223222	WG713A
D6701,D6702	223163,	1SS133,
D6906	223205 or 223222	1SS270A or WG713A
D6703,D6704	224470512	MTZJ5.1B
D6903,D6904	22380130, 22380038 or 22380274	D5SBA20, RBV602 or RS603M-B42
Capacitors		
C6040~C9044	394684707	47uF,50V,Elect.
C6050~C6054	374722234	0.022uF+/-5%,50V,Plastic
C6230~C6234	374724734	0.047uF+/-5%,50V,Plastic
C6701,C6706	394621017 or 394721017	100uF,6.3V or 100uF,6.3V,Elect.
C6704	394680107	1uF,50V,Elect.
C6708	374722234	0.022uF+/-5%,50V,Plastic
C6901,C6902	3504384	CE69W71V10000M,Elect.
C6903	374721044	0.1uF+/-5%,50V,Plastic
C6904,C6905	374723344	0.33uF+/-5%,50V,Plastic
C6906,C6907	374721044	0.1uF+/-5%,50V,Plastic

CIRCUIT NO.	PART NO.	DESCRIPTION
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Resistors		
R6040~R6044	5210258	N06HR1KBC,Trimming
R6070~R6074	415471114	R25J-110,NF carbon
R6080~R6084	415470224	R25J-2.2,NF carbon
R6090~R6094	415470224	R25J-2.2,NF carbon
R6100~R6104	4800071, 4000131 or 4500027	RSS2WK-0.22, RGC22-0.22 OHMK or MPC708-2WK-0.22,Metal plate
R6230~R6234	453630824	RNU1WCJ-8.2,Metal
R6850,R6851	443523914 443523914	RS1/2WBJ-390,Metal oxide RS1/2WBJ-390,Metal oxide

Relays		
RL6901,RL6902	25065561, 25065508, 25065515 or 25065526	NRL-1P5A-DC12-127, NRL-1P10A-DC12-093, NRL-1P5A-DC12-096 or NRL-1P5A-DC12-102

Fuse holders		
F6901A,F6901B	25052133	! NSCT-1P2031
F6902A,F6902B	25052133	! NSCT-1P2031

Sockets		
JL6402A	25051087	NSCT-3P874
JL6803A,JL6804A	25051109	NSCT-5P896
JL6805A	25051108	NSCT-4P895
JL6951A,JL6952A	25051109	NSCT-5P896

Plugs		
P6000-P6004	25056010	NPLG-5P0960
P6011	25056014	NPLG-9P0964
P6080~P6084	25055038	NPLG-2P29
P6301	25055038	NPLG-2P29
P6931	25055711	NPLG-15P667
P931	25055701	NPLG-5P657

Primary circuit PC board (NAPS-7877-1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistor	
Q921	2215864, 2212115, 2213284 or 2213285	KTC3199-GR, 2SC2458-GR, 2SC1740S-R or 2SC1740S-S
	Diodes	
D921~D924	22380260 or 22380035	RL1N4003 or GP104003E

D925	223163, 223205 or 223222		1SS133, 1SS270A or WG713A
Power transformer			
T902	2301381	!	NPT-1358D
Capacitors			
C901	3500196S	!	RE275V-103M
C922	394662217		220uF,35V,Elect.
Resistors			
R901	4000206S or 431533355	! !	RD1/2SPH-3.3M or RC1/2GFKUL-3.3M,Solid
R924	443528204		RS1/2WBJ-82,Metal oxide
Relay			
RL901	25065561, 25065508, 25065515 or 25065526	! ! ! !	NRL-1P5A-DC12-127, NRL-1P10A-DC12-093, NRL-1P5A-DC12-096 or NRL-1P5A-DC12-102
Fuse holders			
F901A,F901B	25052133	!	NSCT-1P2031
Sockets			
P902	25051571	!	NSCT-2P1358
P931A	25051230		NSCT-5P1020
Plug			
P901A	25055675 or 25056028	! !	NPLG-2P631 or NPLG-2P0978
Label			
F901C	29360842		Fuse

Secondary circuit PC board (NAPS-7878-1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
JL6951B,JL6952B	25051109	NSCT-5P896,Socket

Thermal detector PC board (NAETC-7880-1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
R6380	4000153	PTH9M04BF222TS2F333,Thermistor
JL6402B	25051087	NSCT-3P874,Socket

Connector PC board (NAETC-7884-1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
P206A	25055710	NPLG-14P666
P801B	25051239	NSCT-14P1029

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 (h_{FE}) as
the original type.

ADJUSTMENT AND CONFIRMATION PROCEDURES 1

Idling current adjustment

Before Idling adjustment, turn the trimming resistors R6040,R6041,R6042,R6043 and R6044 to counter clockwise. Connect the DC voltmeter to sockets P6080,P6081,P6082,P6083 and P6084.

After turn POWER to ON, adjust the trimming resistors R6040, R6041 and R6042 so that the reading of voltmeter becomes 2.5 mV. (Front and Center channels)

Adjust the trimming resistors R6043 and R6044 so that the reading of voltmeter becomes 1.5 mV. (Surround channels)

After adjustment, attach the top cover.

Confirm the voltage of points above after about five minutes.

Front and center channels

When less than 7.0 mV, readjust the resistors above so that the voltage becomes 7.0 mV.

When 7.0 mV to 9.0 mV, you are not necessary to adjust.

When more than 9.0 mV, readjust the resistors above so that the voltage becomes 9.0 mV.

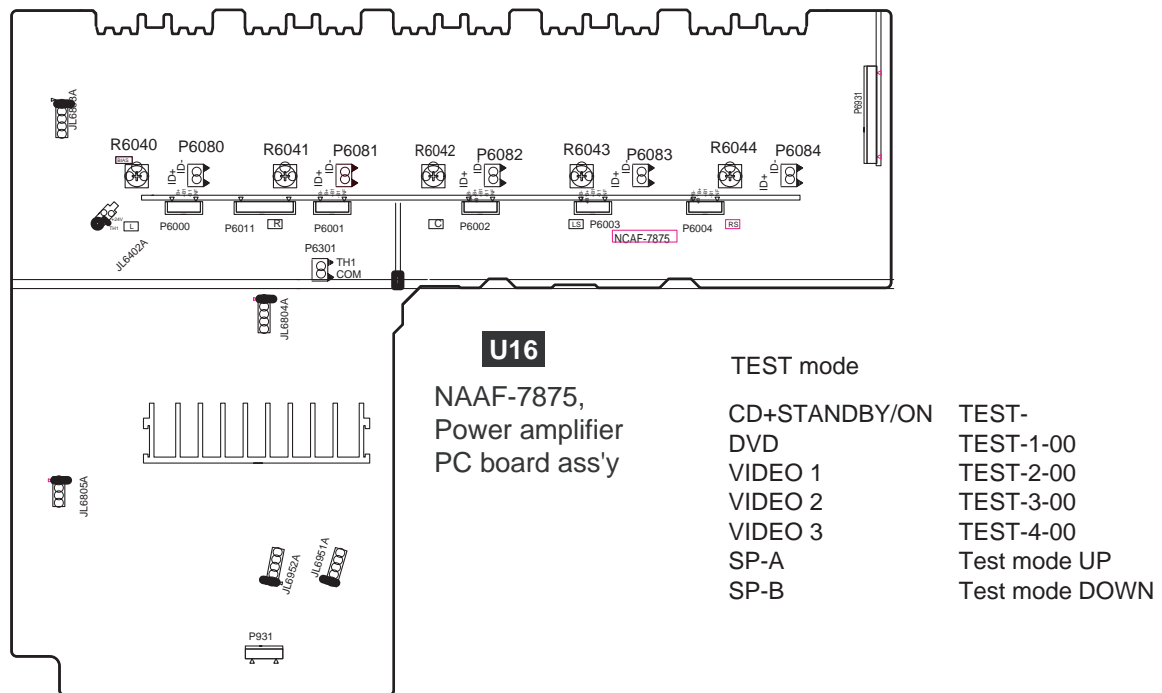
Surround channels

When less than 4.0 mV, readjust the resistors above so that the voltage becomes 4.0 mV.

When 4.0 mV to 6.0 mV, you are not necessary to adjust.

When more than 6.0 mV, readjust the resistors above so that the voltage becomes 6.0 mV.

Note: No load and No signal



Confirmation of protection circuit

1. Confirmation of operation of speaker relay

Confirm that the speaker relays turn ON approximate. 5 seconds after the power switch is turned ON.

Confirm that the speaker relays turn OFF immediately after the power switch is turned OFF.

2. Confirmation of DC detection circuit

Press and hold down CD button, then press STANDBY/ON button to display "TEST-" on FL tube.

Then press DVD button to display "TEST-1-00".

Apply DC 1.5 to 3V to Multi-channel INPUT terminal with no load.

Confirm that the speaker relay turns OFF.

Apply DC -1.5 to -3V to DVD INPUT terminal with no load.

Confirm that the speaker relay turns OFF.

Caution: Don't apply DC voltage more than 1 sec..

ADJUSTMENT AND CONFIRMATION PROCEDURES 2

3. Confirmation of Current detection circuit

Set the unit to "TEST-1-00".

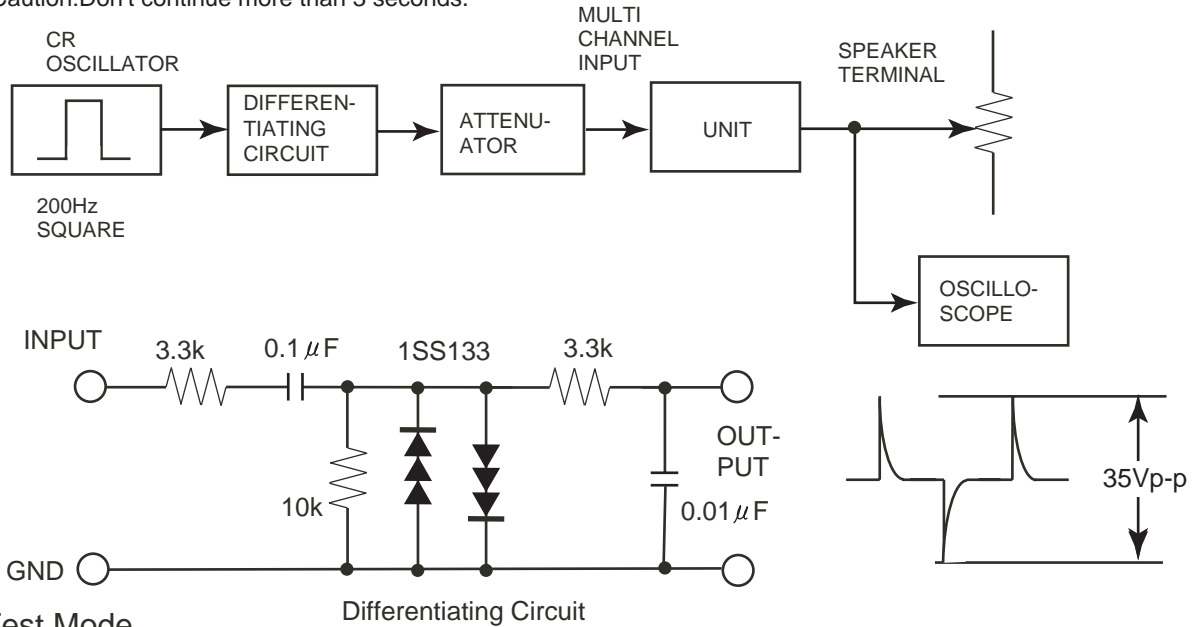
Connect the differentiating circuit and apply the 200Hz square signal to MULTI CHANNEL INPUT terminal of each channel.

Adjust the attenuator or Volume so that the output level becomes 35V p-p.

Confirm that the speaker relay does not turn OFF when a 4.0 ohm load is connected.

Confirm that "Protect" indicator lights on when a 2 ohm load is connected.

Caution: Don't continue more than 3 seconds.

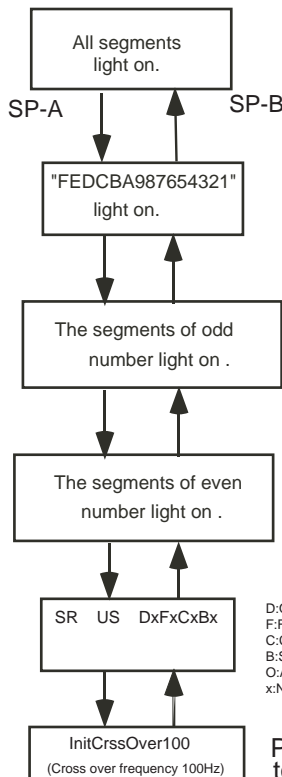


Test Mode

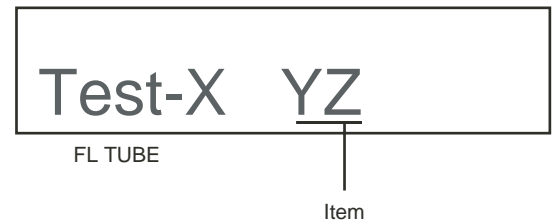
1. Turn POWER button on.
2. Press and hold down CD button, then press STANDBY/ON button.
3. After "TEST-" on the FL tube is displayed, press CD button to set the unit to the test mode of FL tube.

Note: DVD:TEST-1 VIDEO 1 :TEST-2 SP-A: UP
VIDEO 2 :TEST-3 VIDEO 3:TEST-4 SP-B: DOWN

Test mode of FL tube



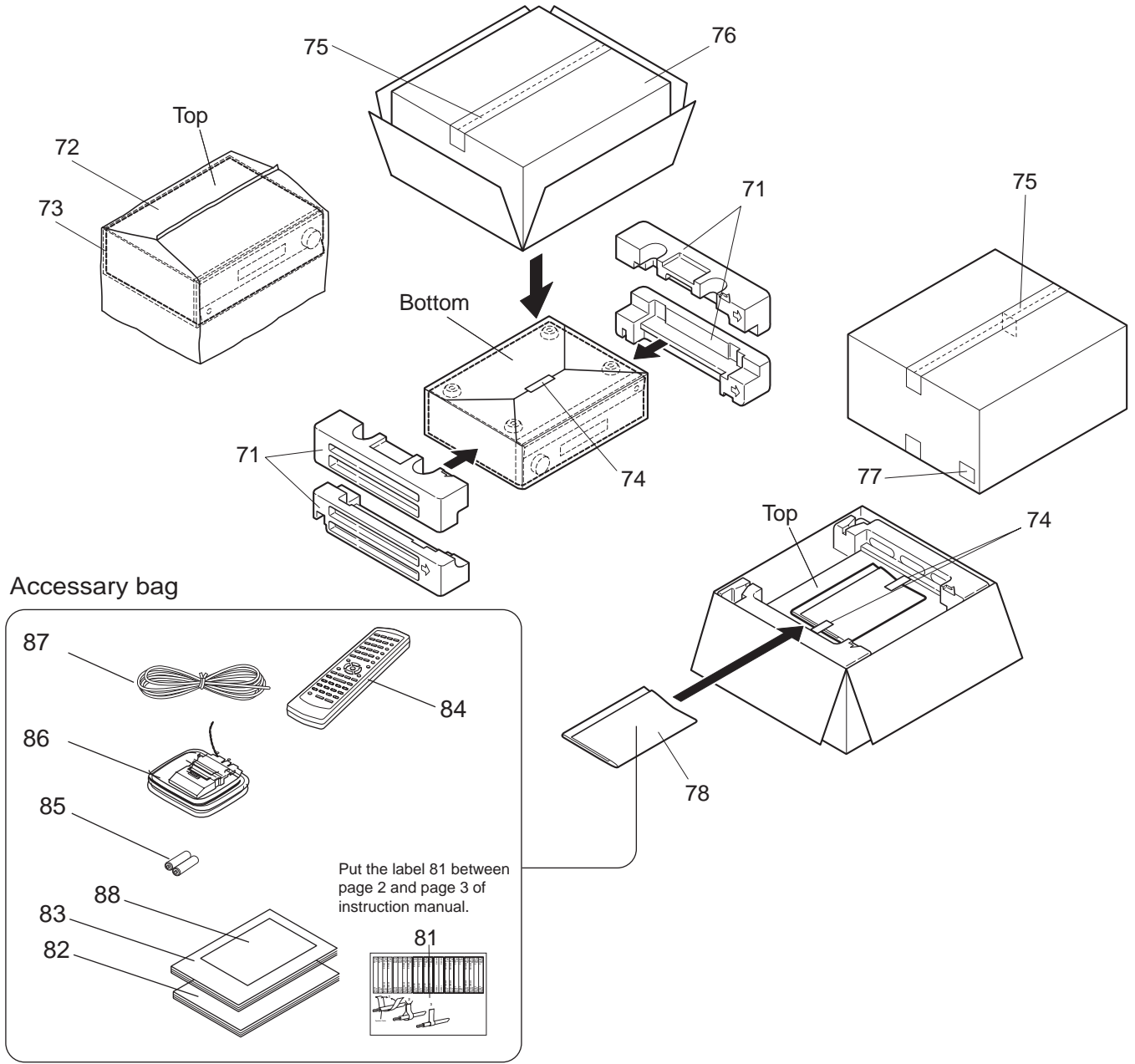
Press POWER button to finish the test mode of FL tube.



Confirmation of voltage sensor

1. Set the unit to TEST-3-2.
2. Apply the signal 1kHz, -15dBV to the MULTI-CH input. Confirm that the FM STEREO is displayed. Confirm the all channels except SUBWOFFER.
3. When connect the resistor 2.7 kohm/1 W between the terminals COM and TH1 of P6301, confirm that "FM STEREO" light on.
Note: No input signal.
4. When set the unit to "TEST-4-30, confirm that the speaker relays of RL6901 and RL6902 turn off.
Note: No input signal.

PACKING PROCEDURES



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