

ONKYO SERVICE MANUAL

SYNTHESIZED FM STEREO/AM TUNER MODEL T-4300



Black model

BUDN, BUD	120V AC, 60 Hz
BUG	220V AC, 50Hz
BUU, BUUX	110/120/220/240V AC, 50/60Hz
BUQA, BUQB	240V AC, 50 Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK Δ 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.

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ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

FM:	
Tuning Range:	87.9-107.9MHz(200kHz steps: U.S.A model) 87.5-108.0MHz(50kHz steps: European model) 87.9-107.9MHz(200kHz steps) or 87.5-108.0MHz(50kHz steps) (Worldwide model)
Usable Sensitivity:	Mono: 11.2dBf, 1.0 μ V IHF 0.9 μ V 75ohms DIN Stereo: 2.0 μ V 75ohms Mono: 11.2dBf, 2.0 μ V IHF (120V model) Stereo: 17.2dBf, 4.0 μ V (120V model)
50dB Quieting Sensitivity:	Mono: 1.7 μ V 75ohms Stereo: 1.7 μ V 75ohms Mono: 16.1dBf, 3.5 μ V (120V model) Stereo: 36.1dBf, 35 μ V (120V model)
Capture Ratio:	1.5dB
Image Rejection Ratio:	40dB (120V model) 80dB (Other models)
IF Rejection Ratio:	90dB
Signal-to-Noise Ratio:	Mono: 73dB Stereo: 66dB
Alternate Channel	
Attenuation:	50dB IHF (\pm 400kHz) (120V model)
Selectivity:	55dB DIN (\pm 300kHz, 40kHz dev.) (Other models)
AM suppression Ratio:	50dB

Total Harmonic Distortion: Mono:	0.1%
Stereo:	0.2%
Frequency Response:	30-15, 000Hz \pm 1.5dB
Stereo Separation:	40dB at 1kHz 30dB at 70-10,000Hz
Muting Level:	2.0 μ V, 75ohm 17.2dBf, 4.0 μ V
Output Voltage:	500mV (120V model) 750mV (Other models)
AM:	
Tuning Range:	530-1710kHz(10kHz steps) (U.S.A. model) 522-1611kHz(9Hz steps) (European model) 530-1620kHz(10kHz steps) or 531-1602kHz(9kHz steps) (Worldwide model)
Usable Sensitivity:	25 μ V
Image Rejection Ratio:	40dB
IF Rejection Ratio:	40dB
Signal-to-Noise Ratio:	40dB
Harmonic Distortion:	0.8%
Output voltage:	150mV
GENERAL:	
Dimensions(W×H×D):	435 × 72 × 265mm 17-1/8" × 2-13/16" × 10-7/16"
Weight:	2.6kg., 5.7 lbs.

Specifications and features are subject to change without notice.

SERVICE PROCEDURES

1. 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 suuply cord and chassis.

Specifications: 3.3Mohm \pm 10% at 500V.

2. Memroy preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory,the power switch must be turned on and off a few times each month to keep the back-up system operative. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit.

On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

3. Voltage Selector (Back Panel)

W models are equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on. This switch is set to 220V at the factory. Voltage is changed by sliding the groove in the switch with a screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on. Models without a voltage selector can only be used in areas where the power supply is the same as that of the unit.

4. Tuning Step Frequency Switch (Back Panel)

W models are equipped with a switch for the AM (9kHz/10kHz) and FM (50kHz/100kHz) bands. The switch should be set to the proper steps for the radio broadcast frequencies in your area.

5. Changing the band step

With the exception of the models below, a BAND STEP selector switch is not provided.

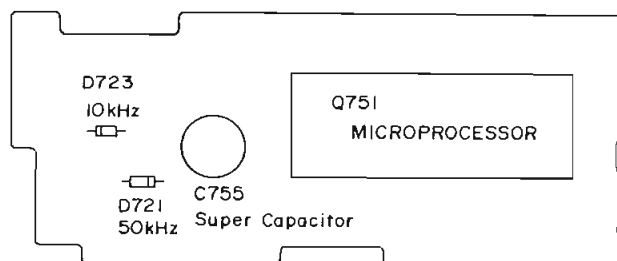
FM

MODEL	BAND STEP	D721
UD	200kHz \rightarrow 50kHz	Additional
UG/UQ	50kHz \rightarrow 200kHz	Eliminated

In D721/D723, 1SS133 (Part No. 223163) are used.

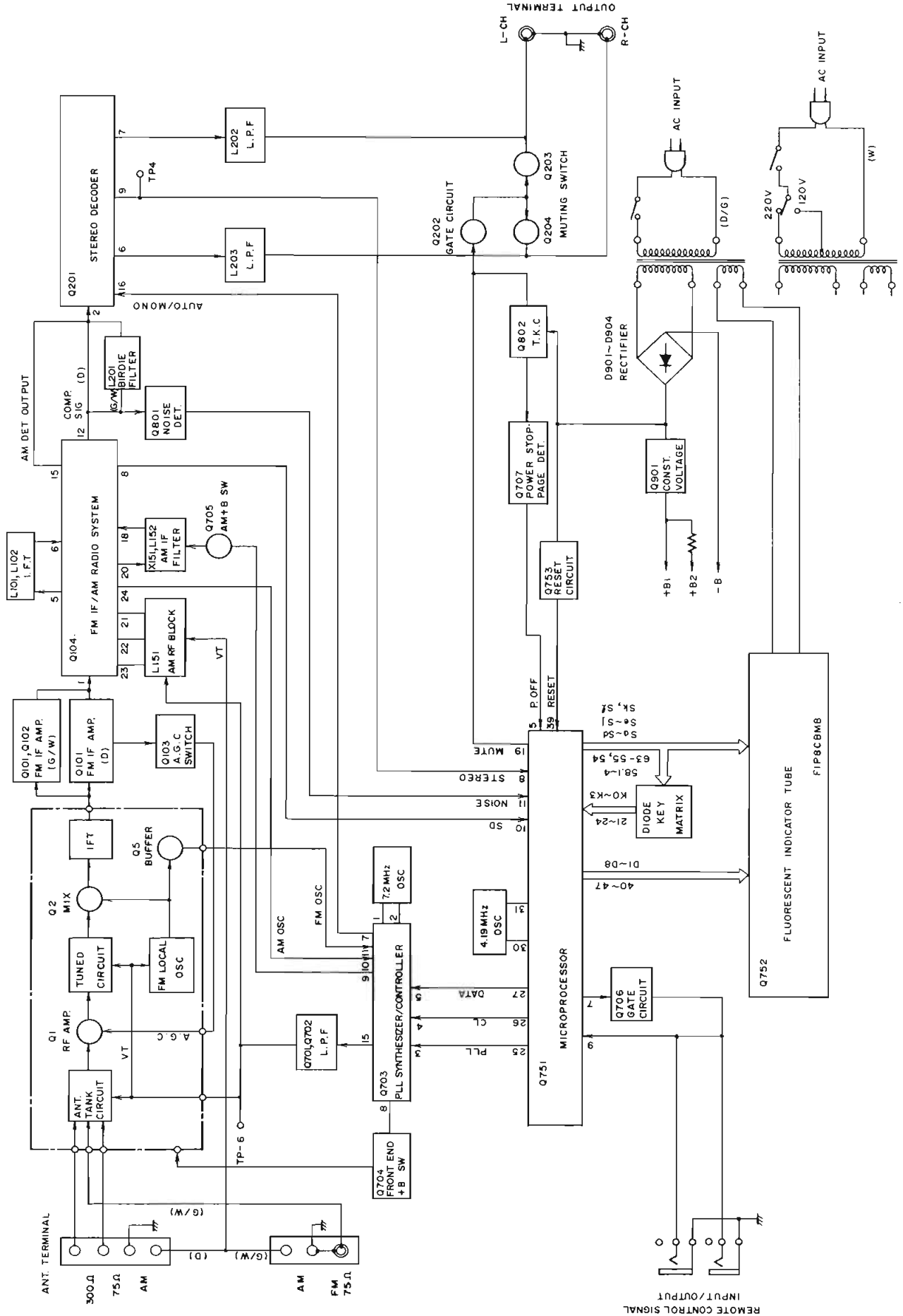
AM

MODEL	BAND STEP	D723
UD	10kHz \rightarrow 9kHz	Eliminated
UG/UQ	9kHz \rightarrow 10kHz	Additional



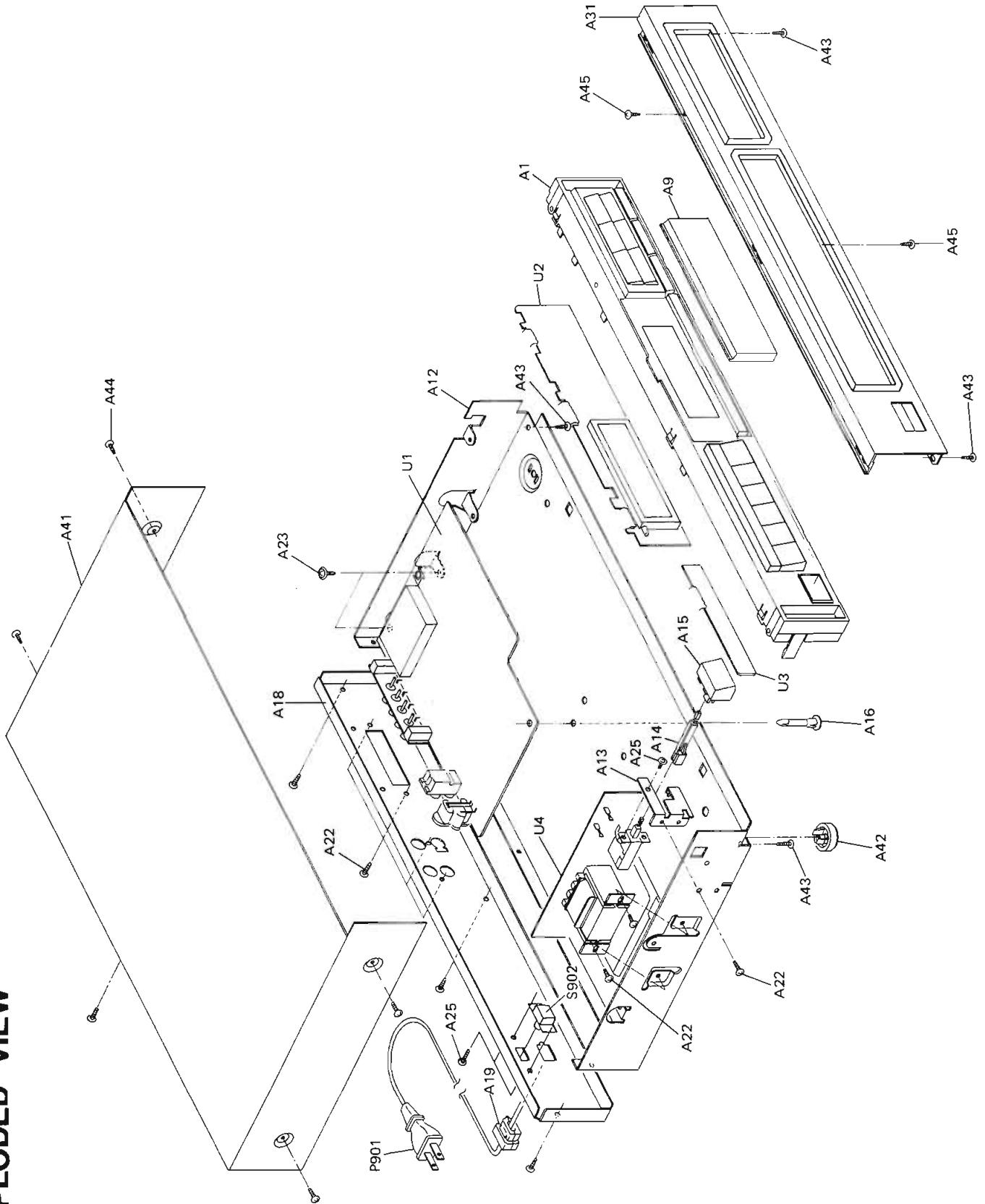
DISPLAY CIRCUIT PC BOARD

BLOCK DIAGRAM



REMOTE CONTROL SIGNAL INPUT/OUTPUT

EXPLODED VIEW



PARTS LIST

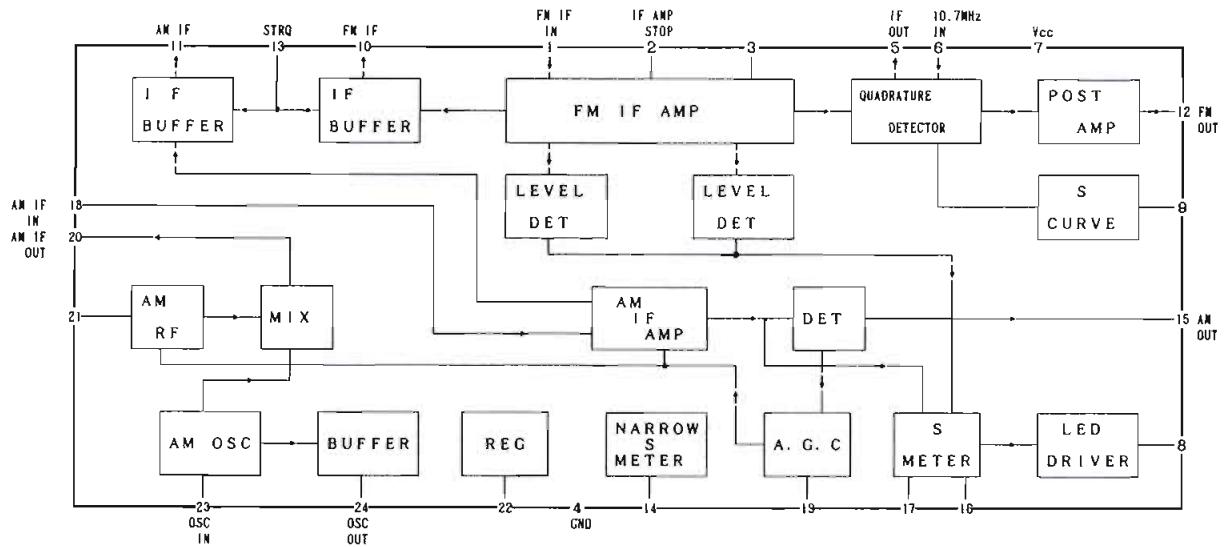
REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
A1	27110567A	Front bracket	U3	1A225588-1	NASW-3888-1, Switch pc board ass'y
A9	28191562	Clear plate	U4	1A225589-1	NAPS-3889-1, Power supply circuit pc board ass'y <D>
A12	27100116-2B	Chassis		1A225589-1A	NAPS-3889-1A, Power supply circuit pc board ass'y <G>
A13	27141254	Bracket, power		1A225589-1B	NAPS-3889-1B, Power supply circuit pc board ass'y <W>
A14	27260294	Joint, power		1A225589-1C	NAPS-3889-1C, Power supply circuit pc board ass'y <QA/QB>
A15	28324022	Knob POWER			
A16	27190511	KGLS-16R, Holder			
A18	27121350	Back panel <D>			
	27121350-1	Back panel <G>			
	27121350-3	Back panel <W>			
	27121350-4	Back panel <QA/QB>			
A19	27300750	△ Bushing(Strainrelief)			
A22	834430088	3TTS+8B(BC), Self-tapping screw			
A23	831130088	3TTW+8B, Self-tapping screw			
A25	82143006	3P+6FN(BC), Pan head screw			
A31	1A225121	Front panel ass'y			
A41	28184457	Top cover			
A42	27175217	Leg			
A43	833430080	3TTP+8P(BC), Self-tapping screw			
A44	834430088	3TTS+8B(BC), Self-tapping screw			
A45	838430088	3TTB+8B(BC), Self-tapping screw			
P901	253142A	△ AS-UC-7#18, Power supply cord <D>			
	253148	△ AS-CEE, Power supply cord <G/W>			
	253118	△ AS-SAA, Power supply cord <QA>			
	253104	△ Power supply cord <QB>			
S902	25065123	△ NSS-1258P, Voltage selector switch <W>			
U1	1A225586-1	NARF-3886-1, FM/AM tuner pc board ass'y <D>			
	1A225586-1A	NARF-3886-1A, FM/AM tuner pc board ass'y <G/OA/QB>			
	1A225586-1B	NARF-3886-1B, FM/AM tuner pc board ass'y <W>			
U2	1A225587-1	NADIS-3887-1, Display circuit pc board ass'y <D>			
	1A225587-1A	NADIS-3887-1A, Display circuit pc board ass'y <G/OA/QB>			
	1A225587-1B	NADIS-3887-1B, Display circuit pc board ass'y <W>			

NOTE: <D>: Only 120V model
 <G>: Only 220V model
 <W>: Only Worldwide model
 <QA>: Australian model
 <QB>: British model

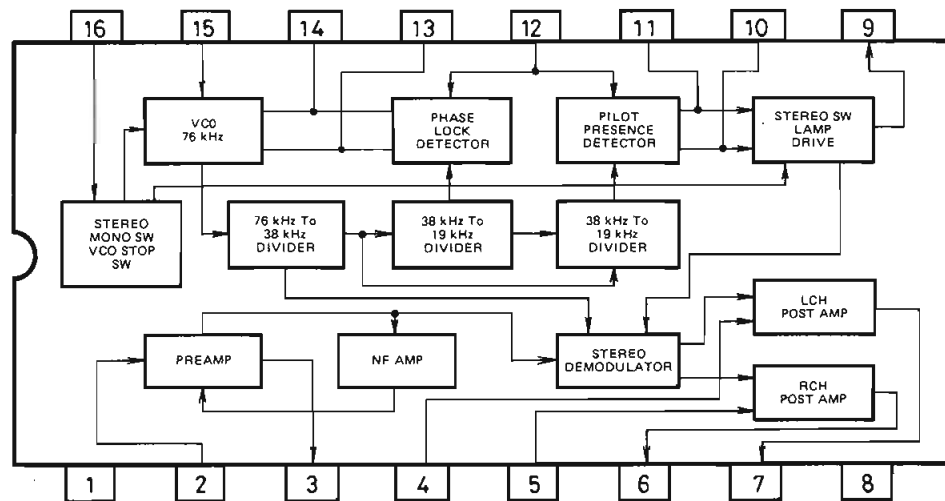
NOTE: THE COMPONENTS IDENTIFIED BY MARK △ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

BLOCK DIAGRAM OF IC

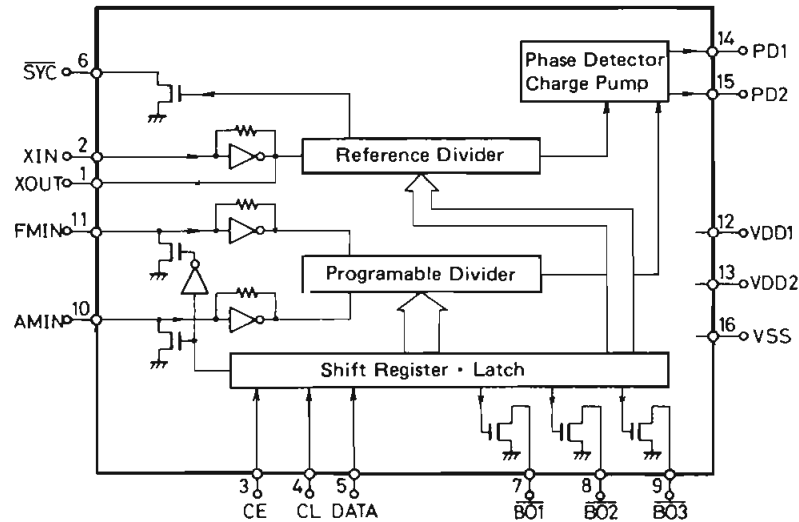
LA1266 (FM IF/AM radio system)



AN7470 (FM stereo decoder)



LM7001 (PLL frequency synthesizer)



Pin No.	Terminal	Description									
1	XOUT	Connect to the 7.2 MHz crystal oscillator.									
2	XIN										
3	CE	Chip enable terminal. Connect to the PLL terminal of microprocessor μ PD75268CW-014.									
4	CL	Serial clock input terminal. Connect to the CLOCK terminal of microprocessor μ PD75268CW-014.									
5	DATA	Serial data input terminal. Connect to the DATA terminal of microprocessor μ PD75268CW-014.									
6	SYN	Not used.									
8	BAND1	Band selector output terminal.									
9	BAND2										
		<table border="1"> <thead> <tr> <th>BAND</th> <th>BAND 1</th> <th>BAND 2</th> </tr> </thead> <tbody> <tr> <td>FM</td> <td>L</td> <td>H</td> </tr> <tr> <td>AM</td> <td>H</td> <td>L</td> </tr> </tbody> </table>	BAND	BAND 1	BAND 2	FM	L	H	AM	H	L
BAND	BAND 1	BAND 2									
FM	L	H									
AM	H	L									
7	BO1	This is the output terminal for AUTO/MONO. 'L' when AUTO.									
10	AMIN	AM local oscillator input terminal.									
11	FMIN	FM local oscillator terminal.									
12	VDD 1	Power supply terminal for back-up.									
13	VDD 2	Power supply terminal.									
14	PD1	Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided local oscillator frequency is high than the reference frequency.									
15	PD2	In the opposite case, low level is output. Floating occurs when the frequencies matched. The output is applied to the variable capacitor diode in the local oscillator through the low pass filters.									
16	Vss	Ground terminal.									

μ PD75268CW-014 (Microprocessor)

Terminal Descriptions

Pin No.	Function	Description																																																								
1-4	Sd-Sa	Segment and key scan output terminals. "H" when active.																																																								
5	POFF	This is the input terminal for detection of the stoppage of electric current. "L" when the stoppage of electric current.																																																								
6	RF IN	RF mode input terminal. (Not used.)																																																								
7	SYS OUT /SYS EN	System code output terminal. "L" when active. The initial setting input terminal when the power turns on.																																																								
8	STEREO	Stereo broadcast detection input terminal. "L" when stereo broadcast. Control of STEREO indicator.																																																								
9	SYS IN	System code input terminal. "H" when active.																																																								
10	SD	Broadcast detection input terminal. "L" when tuned. Control the stop of the auto tuning and the output TU MUT.																																																								
11	NOISE	Noise detection input terminal. "H" when active. Control the stop of the auto tuning.																																																								
12	PROTECT	Protect operation detection input terminal. "H" when active.																																																								
19	TU MUT	Muting output terminal of tuner section. "H" when active.																																																								
21-24	K0-K3	Key scan input terminals. "H" when active.																																																								
25	PLL	Output terminal to connect to the terminal CE of PLL IC(LM7001).																																																								
26	CL	Output terminal to connect to the terminal CL of PLL IC.																																																								
27	DATA	Output terminal to connect to the terminal DATA of PLL IC.																																																								
30	X1	Ceramic oscillator connection terminals for main system clock. Connect to the 4.19MHz ceramic oscillator.																																																								
31	X2																																																									
32	GND	Ground terminal.																																																								
33	XT1	Crystal oscillator connection terminal for sub-system.																																																								
34	XT2	Not used.																																																								
35-38	LEVEL1- LEVEL4	Signal strength level input terminal. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th></th> <th></th> <th colspan="4">Signal indicator</th> <th colspan="2">Output</th> </tr> <tr> <th></th> <th>Input</th> <th>1th</th> <th>2nd</th> <th>3th</th> <th>4th</th> <th>NR</th> <th>HB</th> </tr> </thead> <tbody> <tr> <td>LEVEL 1</td> <td>H</td> <td>off</td> <td>off</td> <td>off</td> <td>off</td> <td>H</td> <td>H</td> </tr> <tr> <td>LEVEL 1</td> <td>L</td> <td>on</td> <td>off</td> <td>off</td> <td>off</td> <td>H</td> <td>H</td> </tr> <tr> <td>LEVEL 1/2</td> <td>L</td> <td>on</td> <td>on</td> <td>off</td> <td>off</td> <td>L</td> <td>H</td> </tr> <tr> <td>LEVEL 1-3</td> <td>L</td> <td>on</td> <td>on</td> <td>on</td> <td>off</td> <td>L</td> <td>H</td> </tr> <tr> <td>LEVEL 1-4</td> <td>L</td> <td>on</td> <td>on</td> <td>on</td> <td>on</td> <td>L</td> <td>L</td> </tr> </tbody> </table>			Signal indicator				Output			Input	1th	2nd	3th	4th	NR	HB	LEVEL 1	H	off	off	off	off	H	H	LEVEL 1	L	on	off	off	off	H	H	LEVEL 1/2	L	on	on	off	off	L	H	LEVEL 1-3	L	on	on	on	off	L	H	LEVEL 1-4	L	on	on	on	on	L	L
		Signal indicator				Output																																																				
	Input	1th	2nd	3th	4th	NR	HB																																																			
LEVEL 1	H	off	off	off	off	H	H																																																			
LEVEL 1	L	on	off	off	off	H	H																																																			
LEVEL 1/2	L	on	on	off	off	L	H																																																			
LEVEL 1-3	L	on	on	on	off	L	H																																																			
LEVEL 1-4	L	on	on	on	on	L	L																																																			
39	RESET	Reset input terminal. "L" when active.																																																								
40-47	D1-D8	Digit output terminals. "H" when active.																																																								
54,55	S1,Sk	Segment output terminal. "H" when active.																																																								
56	VLOAD	Pull down resistor connection terminal of FIP controller/driver.																																																								
57	VPRE	Power supply terminal for output buffer of FIP controller/driver.																																																								
58-63	Sj-Se	Segment and key scan signal output terminals. "H" when active.																																																								
64	VDD	Power supply terminal. (+5V)																																																								

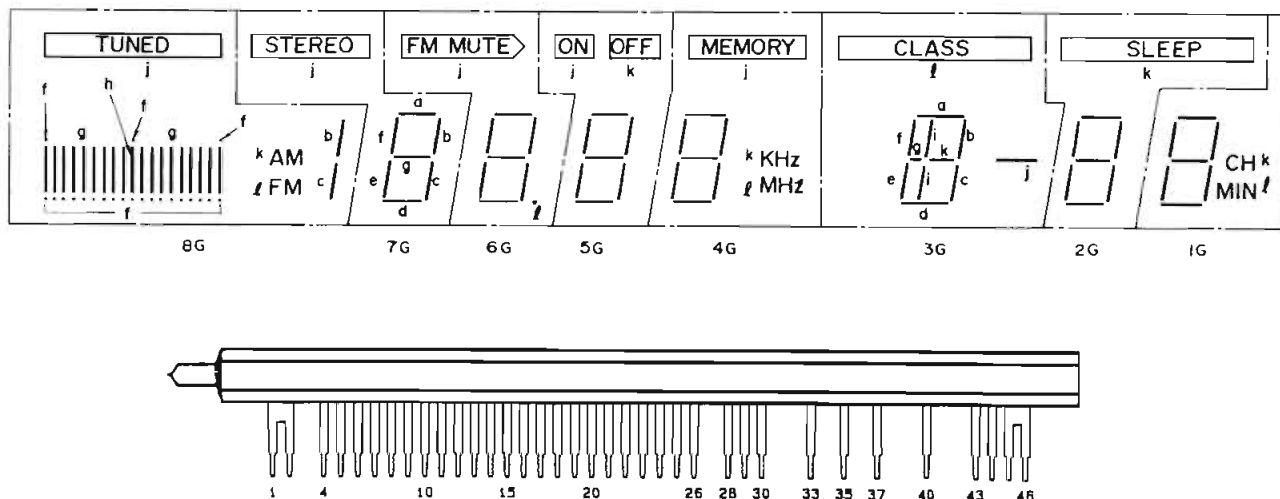
Key and Diode Matrix

	K3(#24)	K2(#23)	K1(#22)	K0(#21)
Sc(#2)			FM	AM
Sd(#1)	CLASS-D	CLASS-C	CLASS-B	CLASS-A
Se(#63)			CLASS-F	CLASS-E
Sf(#62)	UP	DOWN	MUTE/MODE	MEMORY
Sj(#58)	MODE	AM10K	BAND1	BAND0

BAND0, BAND1, AM10K (Band step setting diode matrix)

BAND0	BAND1	AM10K	REGION	FREQUENCY RANGE		CHANNEL SPACE		REFERENCE FREQUENCY	
				FM	AM	FM	AM	FM	AM
0	0	1	U.S.A.	87.9-107.9MHz	530-1710kHz	200kHz	10kHz	25kHz	10kHz
0	1	0	Europe	87.50-108.00MHz	522-1611kHz	50kHz	9kHz	25kHz	9kHz
1	x	0	Saudi Arabia	87.50-108.00MHz	522-1611kHz	50kHz	9kHz	25kHz	9kHz

FIP8CBM8 (Fluorescent indicator tube)

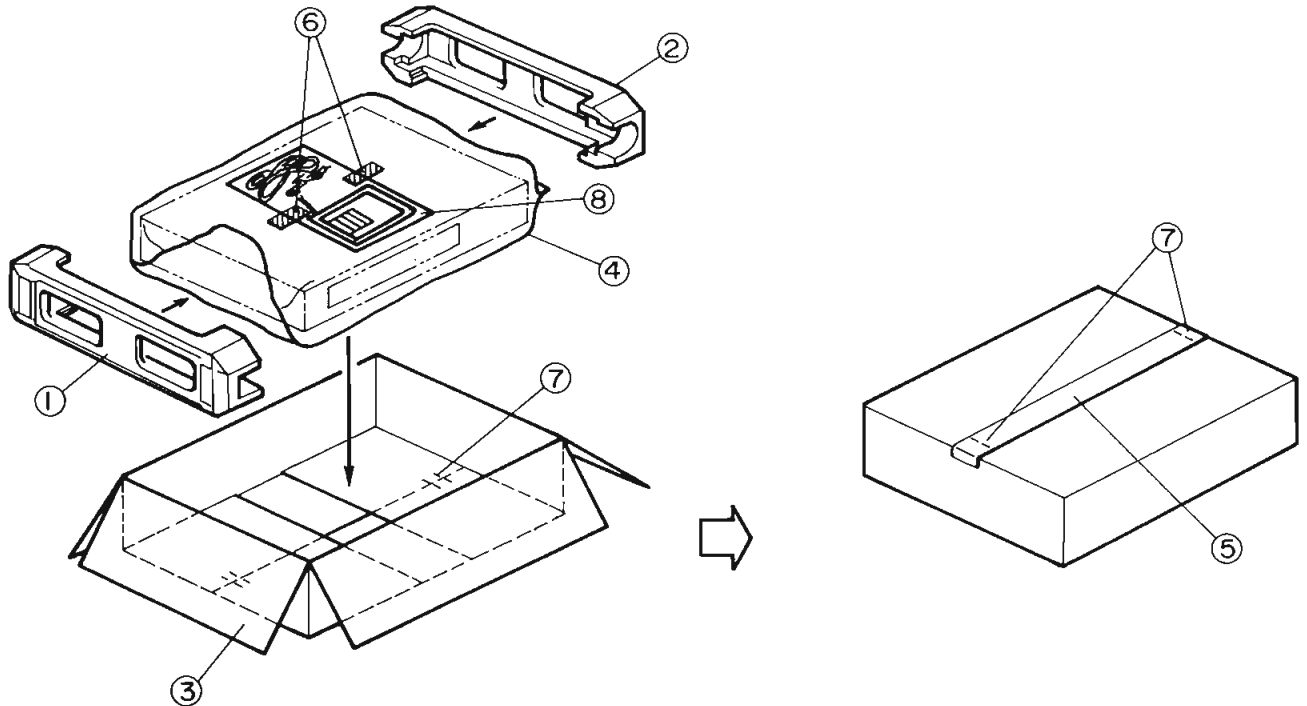


Terminal Connection

Terminal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18			
Electrode	F	F	NP	8G	P(d)	P(c)	8G	P(b)	8G	P(a)	7G	P(e)	7G	7G	P(f)	6G	P(g)	6G			
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
6G	P(h)	5G	P(i)	5G	P(j)	4G	P(k)	NP	4G	P(l)	3G	NP	NP	3G	NP	3G	NP	2G	NP	NP	2G
41	42	43	44	45	46																
NP	NP	2G	1G	F	F																

F:Filament G:Grid P:Anode NP:No Pin

PACKING VIEW



REF. NO.	PART NO.	DESCRIPTION
1	29091315	Pad L
2	29091316	Pad R
3	29052064	Master carton box
4	29100037A	650 × 500mm, Poly-vinyl bag
5	29110071-1	50 × 700 mm, Dampson tape
6	261504	30 × 300 mm, Adhesive tape
7	282301	Sealing hook
8	Accessory bag ass'y	
	120V model	
	29341522	Insutruction manual
	292064B	FM antenna
	232140	NMA-3057, AM loop antenna
	2010098	Connection cord
	2010200	Connection cord for remote control
	29365019	Warranty card
		<Only U.S.A. model>
	29358002H	Service station list
		<Only U.S.A. model>
	29100097	350 × 250mm, Poly-vinyl bag
	220/240V models	
	29341523	Insutruction manual
	292092	FM antenna
	232140	NMA-3057, AM loop antenna
	2010098	Connection cord
	2010200	Connection cord for remote control
	29100097	350 × 250mm, Poly-vinyl bag
	25060123	YAE21-0120A, FM adaptor <Only Australian model>
	Worldwide model	
	29341523	Insutruction manual
	292064B	FM antenna
	232140	NMA-3057, AM loop antenna
	2010098	Connection cord
	2010200	Connection cord for remote control
	25055018	CV-K-1, Conversion plug
	25060123	YAE21-0120A, FM adaptor
	29100097	350 × 250mm, Poly-vinyl bag

ADJUSTMENT PROCEDURES

Preparation

- **Input**
- FM mono: 1kHz, 75kHz devi., 60dB/μV (65dBf)
- FM stereo: 1kHz, L+R 67.5kHz devi.: Pilot signal 19kHz 7.5kHz devi.
- AM: 400Hz, 30% mod.,

- Reference specifications
- Tuned voltage AM 1.3±0.4V
- 530kHz(522kHz) 1.3±0.4V
- 1710kHz(1611kHz) 7.9±1.0V
- 87.5MHz(87.9MHz) 1.3±0.5V
- 108MHz(107.9MHz) 6.9±0.5V (7.2±0.5V)
- Muting level 12±2dB
- Muting width 35±10kHz
- Auto stop level AM Less than 68dB/m
- FM Less than 16dBμ
- Stereo indicator level 12±4dBμ

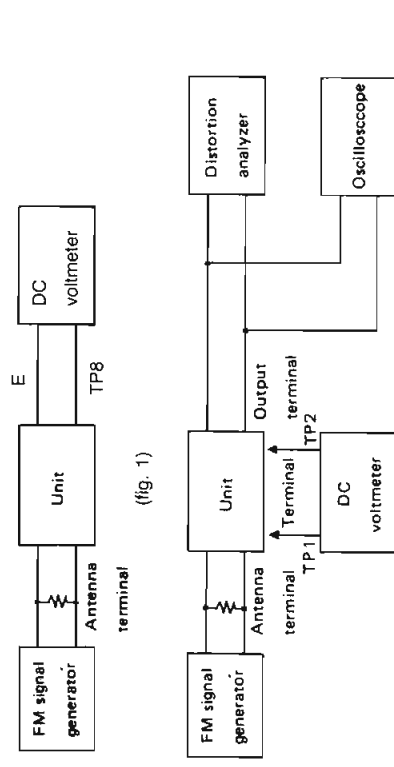
FM Section

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuned frequency	Output indicator	Adjustment point	Adjust	Remarks
Front end		Fig. 1	99.1MHz, 1kHz 75kHz devi. 25.2dBf (20dBμ)	—	99.1MHz	DC voltmeter	IF cover on front end	Maximum	
	1	Fig. 2	99.1 MHz, 1 kHz 75 kHz devi. 65 dBf (60 dB μ)	—	99.1 MHz	DC voltmeter	L101	0 ± 20 mV	MUTE/MODE switch to OFF/MONO. Repeat the steps 1 and 2 until no further adjustment is necessary.
2	L102						Minimum		
Muting Level	1	Fig. 2	99.1 MHz, 1 kHz 75 kHz devi. 17.2 dBf (12 dB μ)	—	99.1 MHz	Oscilloscope	R101	Signal	
	2							16.2 dBf (11 dB μ)	No signal
VCO		Fig. 3	99.1 MHz, 1 kHz 75 kHz devi. 65 dBf (60 dB μ)	—	99.1 MHz	Frequency counter	R201	19,000 ± 10 Hz	MUTE/MODE switch to ON/STEREO
	1							99.1 MHz, Ext. modulation 65 dBf (60 dB μ)	Minimum

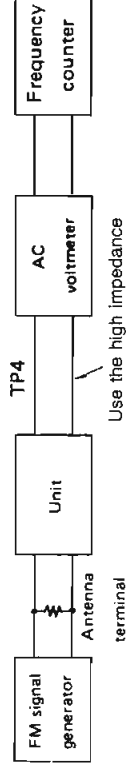
AM Section

Step	AM SG output	Tuned frequency	Output indicator	Adjust point	Adjust for
1		522 kHz (530 kHz)	Digital DC voltmeter	L151 OSC	1.3 ± 0.1V
2	603 kHz, 400 Hz 30% mod. 60 dB/m (600 kHz)	603 kHz (600 kHz)	AC voltmeter	L151 RF	Maximum
3	999 kHz, 400 Hz 30% mod. 60 dB/m (1000 kHz)	999 kHz (1000 kHz)	AC voltmeter	L152	Maximum

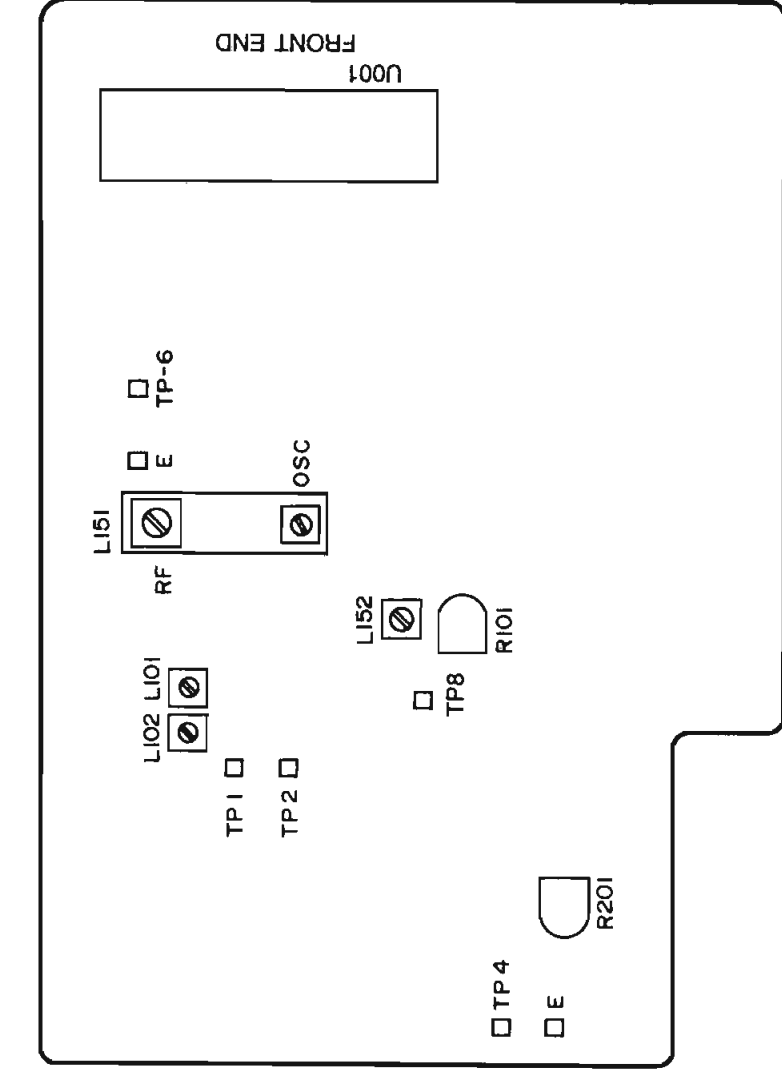
() : 10 kHz step model



(fig. 2)

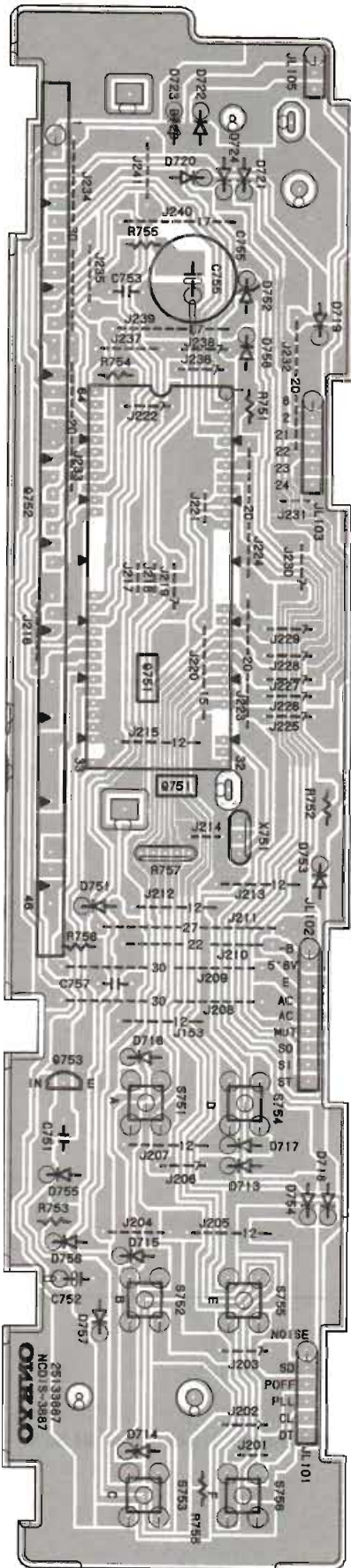


(fig. 3)

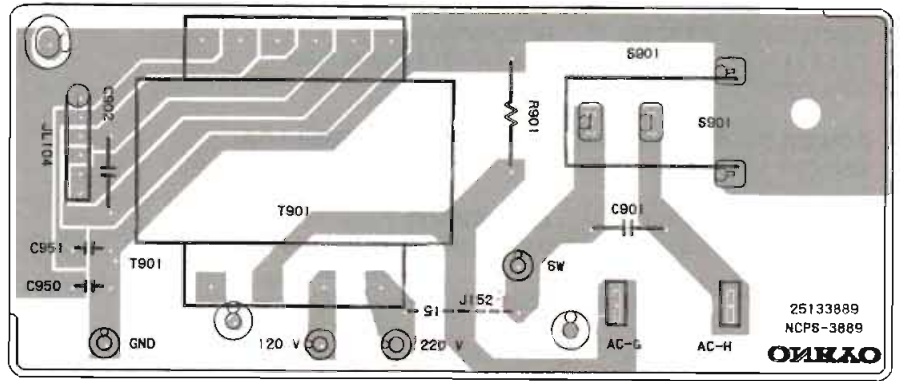


(AM)

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



DISPLAY PC BOARD



POWER SUPPLY CIRCUIT PC BOARD



SWITCH PC BOARD

PRINTED CIRCUIT BOARD PARTS LIST

DISPLAY CIRCUIT PC BOARD(NADIS-3887-1/1A/1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q751	22240337	μ PD75268CW-014
	Transistor	
Q753	221282	DTC144ES
	Fluorescent tube	
Q752	212084	FIP8CBM8
	Diodes	
D713-D720	223163	1SS133
D721	223163	1SS133 <G>
D723	223163	1SS133 <D>
D724	223163	1SS133
D751	223163	1SS133
D752	224450913	MTZ9.1C
D753-D758	223163	1SS133
	Osc. element	
X751	3010163	CST4.19MGW, Ceramic
	Capacitors	
C751, C753	375524744	0.47 μ F \pm 5%, 50V, MMT
C752	353780109	1 μ F, 50V, Elect.
C755	3000057	0.1F, 5.5V, Super
	Resistor	
R757	49163104404	100kohm \times 4, 1/10W, Network
	Switches	
S751-S756	25035548	NPS-111-S510
	Holder	
	27190659B	

NOTE: <D>: Only 120V model
 <G>: Only 220/240V models
 <W>: Only Worldwide model

SWITCH PC BOARD(NASW-3888-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
S701-S706	25035548	NPS-111-S510, Push switches
D771-D774	223163	1SS133, Diodes

POWER SUPPLY CIRCUIT PC BOARD(NAPS-3889-1/1A/1B/1C)

CIRCUIT NO.	PART NO.	DESCRIPTION
T901	2300287	△ NPT-990D, Power transformer <D>
	2300288A	△ NPT-990G, Power transformer <G>
	2300290A	△ NPT-990Q, Power transformer <Q>
	2300289A	△ NPT-990DG, Power transformer <W>
C901	3500065A	△ DE7150FZ 103PAC400V/125V, Capacitor IS
	27301216	Cover for C901 <G/W/Q>
R901	431523355	△ 3.3Mohm, 1/2W, Solid resistor <D>
S901	25035558	△ NPS-111-L52P, Power switch
	28175137	Insulated plate

NOTE: <D>: Only 120V model
 <G>: Only 220V model
 <W>: Only Worldwide model
 <Q>: Only 240V model

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

ONKYO CORPORATION

International Division: Onarimon Yuusen Bldg., 23-5, Nishi-Shimbashi 3-chome, Minato-ku,
 TOKYO 105, JAPAN Tel: 03-432-6987 Fax: 03-436-6979

ONKYO DEUTSCHLAND GMBH, ELECTRONICS

8034 München-Germering, Industriestrasse 18 West Germany. Fax: 49-89-849-3226 Telefon: (089)-84-3071

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, 4040 Neuss WEST GERMANY
 Tel: 02101 12 00 75 Fax: 02101 10 33 06