

ONKYO SERVICE MANUAL

QUARTZ SYNTHESIZED TUNER AMPLIFIER MODEL TX-810



Black model

BHUD, BHUDN	120V AC, 60Hz
BHUG	220V AC, 50Hz
BHUQA	240V AC, 50Hz
BHUW	120 or 220V AC, 50/60Hz

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

AMPLIFIER SECTION

Power output:	45 watts per channel,min RMS,at 8 ohms, both channels driven,from 40Hz to 20kHz, with no more than 0.1% THD.
Music Power Output:	2 ×130 watts at 4 ohms,1kHz (DIN) 2 ×80 watts at 8 ohms,1kHz (DIN)
Continuous Power Output:	2 ×70 watts at 4 ohms,1kHz (DIN) 2 ×55 watts at 8 ohms,1kHz (DIN)
Total Harmonic Distortion:	0.1% at 1 watt output
IM Distortion:	0.1% at 1 watt output
Damping Factor:	35 at 8 ohms
Frequency Response:	20-30,000Hz ± 1dB
RIAA Deviation:	20-20,000Hz ± 0.8dB
Sensitivity and Impedance:	Phono: 2.5mV/50kohms CD/Tape Play: 150mV/50kohms Tape Rec: 150mV/3.5kohms (Phono)
Phono overload:	120mV RMS at 1kHz,0.1% THD
Signal-to-Noise Ratio:	Phono: 85dB(at 10mV input, A weighted) 75dB(IHF A-202) Tape: 95dB(A weighted) 80dB(IHF A-202)
Tone Controls:	Bass: ± 10dB at 100Hz Treble: ± 10dB at 10kHz

TUNER SECTION

FM:

	-G/W/Q models-	-120V model-
Tuning Range:	87.50-108.00MHz(50kHz steps)	87.9-107.9MHz(200kHz steps)
Usable Sensitivity:	Mono: 12.4dBf, 2.3μV, IHF 1.2 μV, 75 ohms DIN Stereo: 2.5 μV,75 ohms	Mono: 12.4dBf, 2.3μV Stereo: 19.2dBf, 5.0μV
50dB Quieting Sensitivity:	Mono: 2.2 μV,75 ohms Stereo: 22μV,75 ohms	Mono: 18.2dBf, 4.5μV Stereo: 38.2dBf, 45 μV
Capture Ratio:	1.5dB	1.5dB
Image Rejection Ratio:	85dB	40dB
IF Rejection Ratio:	90dB	90dB
Signal-to-Noise Ratio:	Mono: 70dB Stereo: 65dB	Mono: 70dB Stereo: 65dB
Selectivity:	50dB DIN (±300kHz,40kHz Devi.)	55dB
ACA:	50dB	50dB
AM Suppression Ratio:	50dB	50dB
Harmonic Distortion:	Mono: 0.15% Stereo: 0.30%	Mono: 0.15% Stereo: 0.30%
Frequency Response:	30-15,000Hz ±1.5dB	30-15,000Hz ±1.5dB
Stereo Separation:	40dB at 1kHz 30dB at 100-10,000Hz	40dB at 1kHz 30dB at 100-10,000Hz
Muting level:	17.2dBf, 2μV,75 ohms	17.2dBf, 4μV
Stereo Threshold:	17.2dBf, 2μV,75 ohms	17.2dBf, 4μV

AM:

Tuning Range:	522-1,611kHz(9kHz steps)	520-1,620kHz(10kHz steps)
Usable Sensitivity:	30μV	30μV
Image Rejection Ratio:	40dB	40dB
IF Rejection Ratio:	40dB	40dB
Signal-to-Noise Ratio:	40dB	40dB
Harmonic Distortion:	0.8%	0.8%

GENERAL

Dimensions(W×H ×D):	435×110×317mm 17-1/8" ×4-5/16"×12-1/2"	435×110×317mm 17-1/8" ×4-5/16"×12-1/2"
Weight:	7.0kg.,15.4lbs.	7.0kg.,15.4lbs.

Specifications and features are subject to change without notice.

SERVICE PROCEDURES

1.Replacing the fuses

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

D (120V) model

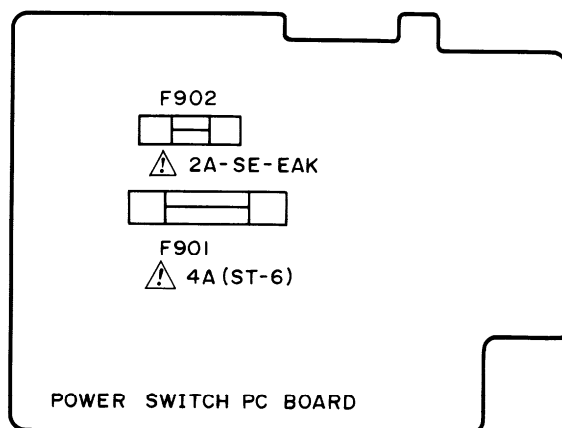
Circuit no.	Part no.	Description
F901	252049	4A(ST-6),Primary

G (220V) and Q (240V) models

Circuit no.	Part no.	Description
F902	252074	2A-SE-EAK,Primary
F9 1,F922	252070	1A-SE-EAK,Secondary

W (Worldwide) model

Circuit no.	Part no.	Description
F901	252049	4A(ST-6),Primary
F902	252074	2A-SE-EAK,Primary



2.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.

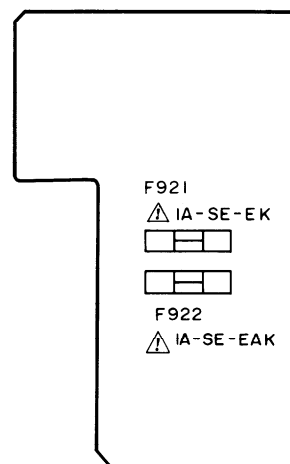
Connect the insulating-resistance tester between the plug of power supply cord and nickel screw on the back panel.

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

3.Change of voltage

Worldwide models are equipped with a voltage selector to conform with local power supplies. This switch is located on the back panel. 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 the 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.



TUNER AND SELECTOR SWITCH PC BOARD

4.Step band selector switch

Worldwide models are equipped with a step band selector switch. This switch is located on the back panel. This switch is set to 50kHz (FM) and 9kHz (AM) at the factory, but may have to be reset to 100kHz and 10kHz depending on the area where the unit is used.

De-emphasis	FM step	AM step
Europe: 50 μ sec	50kHz	9kHz
U.S.A.: 75 μ sec	100kHz	10kHz

5.Changing the band step

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

(FM)

MODEL	BAND STEP	D758, J763	R117
UD	200kHz \rightarrow 50kHz	Additional	15k Ω \rightarrow 30k Ω
UG/UQ	50kHz \rightarrow 200kHz	Eliminated	30k Ω \rightarrow 15k Ω

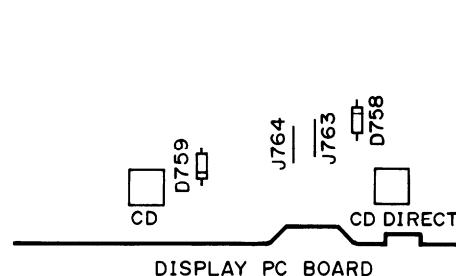
(AM)

BAND STEP	D759, J764
10kHz \rightarrow 9 kHz	Additional
9 kHz \rightarrow 10kHz	Eliminated

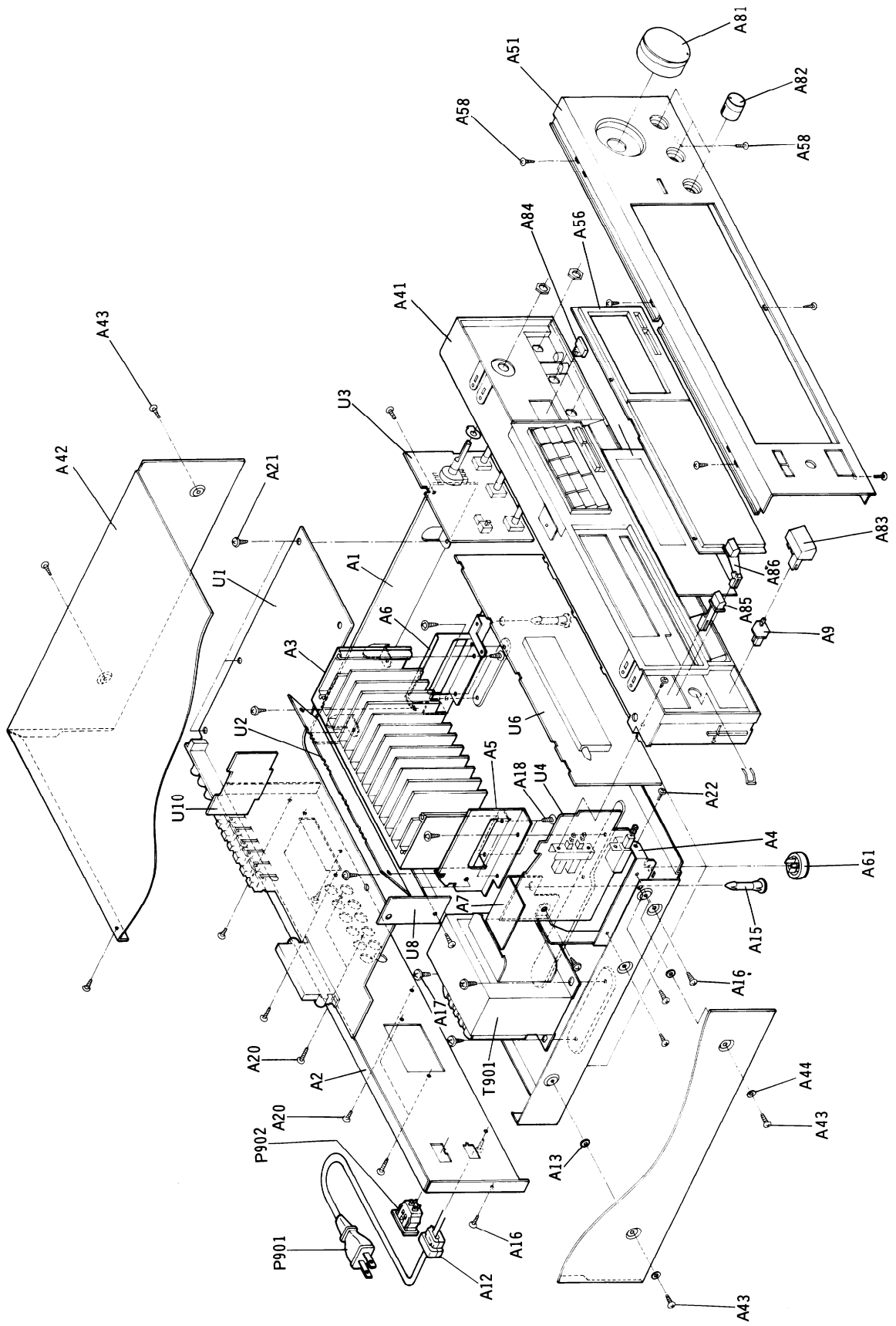
In D758/9 1SS133 (Part No. 223163) is used. In J763/4, a jumper lead must be inserted. R117, with the muting amplitude determined, is on the back panel side of the tuner circuit printed circuit board assembly test points TP-1 and TP-2.

6.Memory 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.



EXPLODED VIEW



PARTS LIST

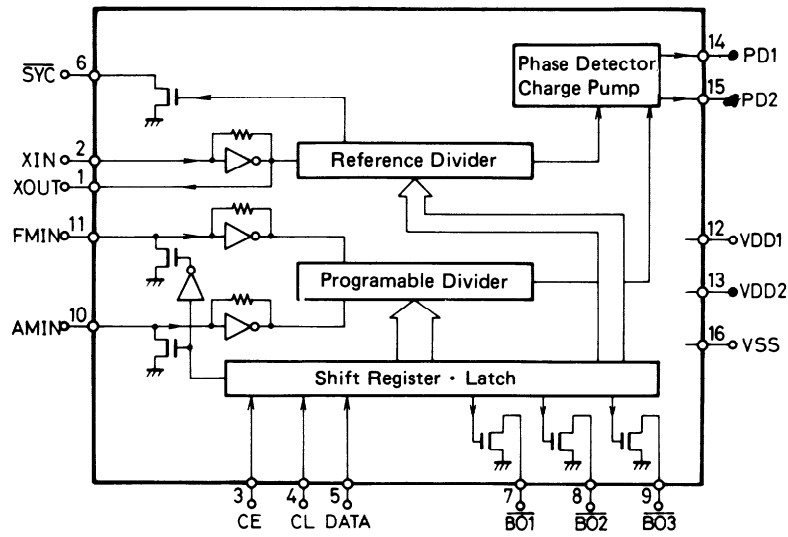
REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
A1	27100158	Chassis	P901	253123,	AS-UC-6#18,Power supply cord <D>	U7	1A087549-1	NASW-3249-1,Band selector switch
A2	27121088A	Back panel <D>		253136,				pc board ass'y <W>
	27121089	Back panel <G>		253140 or		U8	1A086550-1	NAETC-3250-1,Pc board for holder
	27121091	Back panel <W>		253146		U10	1A073554-2	NAAF-3054-2,Equalizer amplifier pc board ass'y <D>
A3	27121153	Back panel <Q>		253128B or	AS-CEE,Power supply cord <G/W>		1A086554-3	NAAF-3054-3,Equalizer amplifier pc board ass'y <G/W/Q>
A4	27160224	Radiator		253130A				
A4	27141247	Bracket POWER		253118	AS-SAA,Power supply cord <Q>			
A5	27141248	Bracket LH	P902	25050290	NSCT-2P118T,AC outlet <D>			
A6	27141249	Bracket RH	Q521,Q522	2201783,	☆2SC3854-O,			
A7	28175152	Insulated plate		2201784 or	2SC3854-Y or			
A9	27273097	Joint		2201786	2SC3854-P,Power transistors			
A10	28133196B	Back plate	Q523,Q524	2201773,	☆2SA1490-O,			
A12	27300750	Strainrelief		2201774 or	2SA1490-Y or			
A13	27270147	Spacer		2201776	2SA1490-P,Power transistors			
A15	27190266	KGLS-12R,Holder			CAUTION:Replacement of transistor of mark ☆, if necessary, must be made from the same beta group (H _{FE}) as the original type.			
A16	834430088	3TTS+8B(BC),Tapping screw	S903	25065123	NPS-1258P,Voltage selector switch <W>			
A17	830440089	4TTC+8C(BC),Tapping screw	T901	2300198A	NPT-955D,Power transformer <D>			
A18	838440089	4TTB+8C(BC),Tapping screw		2300199A	NPT-955G,Power transformer <G>			
A19	834430128	3TTS+12B(BC),Tapping screw		2300200A	NPT-955DG,Power transformer <W>			
A20	834430108	3TTS+10B(BC),Tapping screw		2300201A	NPT-955Q,Power transformer <Q>			
A21	831130088	3TTW+8B,Tapping screw	U1	1A086543-1	NAAR-3243-1,Tuner and selector switch pc board ass'y <D>			
A22	82143006	3P+6FN(BC), Pan head screw		1A086543-1A	NAAR-3243-1A, Tuner and selector switch pc board ass'y <G/Q>			
A23	833430080	3TTP+8P(BC),Tapping screw		1A087543-1B	NAAR-3243-1B, Tuner and selector switch pc board ass'y <W>			
A41	27110412B	Front bracket ass'y		1A086544-1	NAAF-3244-1,Power amplifier pc board ass'y			
A42	28184391	Top cover	U2		NAAF-3245-1,Tone control circuit pc board ass'y <D/W>			
A43	834430088	3TTS+8B(BC),Tapping screw	U3	1A086545-1	NAAF-3245-1A, Tone control circuit pc board ass'y <D/W>			
A44	8700048	3 × 8 × 0.8t,Nylon washer		1A086545-1A	NAAF-3245-1A, Tone control circuit pc board ass'y <G/W>			
A51	1A087121	Front panel ass'y		1A086546-1	NASW-3246-1,Power/Speaker switch pc board ass'y <D>			
A56	28191460	Clear plate		1A086546-1A	NASW-3246-1A, Power/Speaker switch pc board ass'y <G/W>			
A58	833430080	3TTP+8P(BC),Tapping screw	U4		NASW-3246-1,Power/Speaker switch pc board ass'y <D>			
A61	27175142	Leg		1A086546-1A	NASW-3246-1A, Power/Speaker switch pc board ass'y <G/W>			
A81	28323308	Knob VOLUME		1A086546-1B	NASW-3246-1B, Power/Speaker switch pc board ass'y <W>			
A82	28323310	Knob TONE		1A086548-1	NADIS-3248-1,Display circuit pc board ass'y <D>			
A83	28323241	Knob POWER		1A086548-1A	NADIS-3248-1A, Display circuit pc board ass'y <G/Q>			
A84	28323312	Knob PUSH		1A087548-1B	NADIS-3248-1B, Display circuit pc board ass'y <W>			
A85	28323314	Knob SPEAKER A						
A86	28323316	Knob SPEAKER B						
A91	831130088	3TTW+8B,Tapping screw for band switch pc board <W>						
A92	82143006	3P+6FN(BC),Pan head screw for S903 <W>						
F901	252049	4A(ST-6),Primary fuse <D/W>	U6	1A086548-1	NADIS-3248-1,Display circuit pc board ass'y <D>			
F902	252074	2A-SE-EAK,Primary fuse <G/W/Q>						
F921,F922	252070	1A-SE-EAK,Secondary fuse <G/Q>						

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

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

BLOCK DIAGRAM OF IC

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 LC6568H-3643.
4	CL	Serial clock input terminal. Connect to the CLOCK terminal of LC6568H-3643.
5	DATA	Serial data input terminal. Connect to the DATA terminal of LC6568H-3643.
6	SYN	Not used.
7	$\overline{BO1}$	Phono control signal output terminal. "L" when phono.
8	$\overline{BO2}$	FM control signal output terminal. "L" when FM.
9	$\overline{BO3}$	AM control signal output terminal. "L" when AM.
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.

LC6568H-3643 (Microprocessor)

Terminal Descriptions

Pin No.	Terminal	Description
1	D1	These are the digit and key scan signal terminals. "H" when active.
2	D2	
3	D3	
4	D4	
5	D5	
6	D6	
7	D7	
8	D8	
9	DISPLAY	Display output terminal."H" when active.
10	K0	These are the input terminal for key return signal source and diode matrix."H" when active.
11	K1	
12	K2	
13	K3	
14	AUTO STOP	Auto stop signal input terminal.Auto tuning stops when this terminal becomes the high level.
15	STEREO	This is the input terminal for detection of the stereo broadcast."L" when active.
16	PROTECT	This is the detection terminal for protection circuit.The speaker relay turns off when this terminal becomes the high level.
17	POWER OFF	This is the input terminal for detection of the stoppage of electric current."L" when the stoppage of electric current.
18	RELAY	This is the output terminal for control of the speaker relay."L" when active.
19	SEL MUTE	This is the muting output terminal when the selector key is operated."H" when active.
20	TU MUTE	This is the output terminal for muting control of tuner section."L" when active.
21	AUTO/MONO	This is the AUTO/MONO switching output terminal. "H" when AUTO.
22	VDP	These are the output terminal for control of video signal.
23	VCR	
24	MUTING	This is the output terminal for muting control. "L" when active.
25	POWER	This is the output terminal for power source.It is "H" for power on.
26	CD DC	This is the output terminal for control of CD direct. "H" when active.
27	CD D	This is the output terminal for indication of CD. "L" when active.
28	DX	This is the output terminal for indication of DX. "L" when active.
29	LOCAL	This is the output terminal for indication of LOCAL. "L" when active.
30	TEST	Test terminal.Connect to the ground.
31	Vss	Ground terminal.
32	X1	Connect to the 4.00MHz ceramic oscillator.
33	X2	
34	RESET	This is the input terminal for reset. "L" when active
35	PLL	Connect to the terminal CE of PLL IC(LM7001).
36	DATA	This is the serial data output terminal.Connect to the terminal DATA of PLL IC and terminal DI of analog switch.
37	CLOCK	This is the serial clock output terminal.Connect to the terminal CI of PLL IC and terminal CL of analog switch.
38	SEL	Connect to terminal SEL of analog switch(LC7821).
39	SYSTEM IN	This is the input terminal for system code. "H" when active.
40	SYSTEM OUT	This is the input terminal for system code. "L" when active.
41	MONO	This is the output terminal for indication of MONO. "L" when active.
42	AUTO	This is the output terminal for indication of AUTO. "L" when active.
43	TAPE 2	This is the output terminal for indication of TAPE 2 "L" when active.
44	TAPE 1	This is the output terminal for indication of TAPE 1 "L" when active.
45	VREF	This is the input terminal for comparator reference voltage.
46	S IN	This is the signal strength input terminal.
47	TUNER	This is the output terminal for indication of TUNER. "L" when active.
48	PHONO	This is the output terminal for indication of PHONO. "L" when active.
49	CD	This is the output terminal for indication of CD. "L" when active.

Pin No.	Terminal	Description
50	RF IN	This is the input terminal for control of AGC. "H" when active.
51	VP	Pull-down resistor connection terminal of FIP controller/driver.
52 53 54 55 56 57 58 59 60 61 62 63	Sa Sb Sc Sd Se Sf Sg Sh Si Sj Sk Sl	These are the output terminal for segment signal. "L" when active.
64	VDD	This is the device power source terminal. At the time of operation, the supply is 5V. The internal data memory (RAM) is maintained by means of the super capacitor.

Key and diode matrix

	D1 (1)	D2 (2)	D3 (3)	D4 (4)	D5 (5)	D6 (6)	D7 (7)
K3(13)	P4	P8	MEMORY	CD DIRECT	AM	TAPE 2	SYSTEM
K2(12)	P3	P7	SHIFT	AUTO/MONO	FM	TAPE 1	MODE
K1(11)	P2	P6	P10	UP	PHONO	VCR	AM9K
K0(10)	P1	P5	P9	DOWN	CD	VDP	FM50K
							Diode matrix

FM50K (FM band setting)

FM50K	Region	Frequency range	Channel space	Reference frequency	IF frequency
1	Europen	87.50 ~ 108.00MHz	50kHz	25kHz	10.7MHz
0	U.S.A.	87.9 ~ 107.9MHz	200kHz	25kHz	10.7MHz

AM9

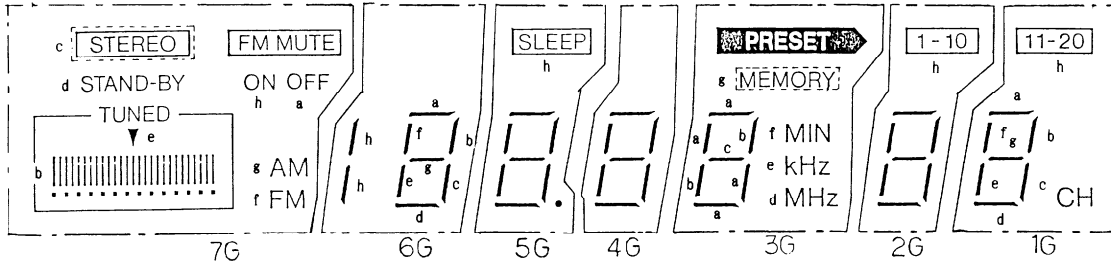
AM9K	Region	Frequency range	Channel space	Reference frequency	IF frequency
1	Europen	522 ~ 1611 kHz	9kHz	9kHz	450kHz
0	U.S.A.	530 ~ 1620 kHz	10kHz	10kHz	450kHz

Connection of fluorescent tube and microprocessor

	D7(7)	D6(6)	D5(5)	D4(4)	D3(3)	D2(2)	D1(1)
Sa(52)	OFF	a	a	a		a	a
Sb(53)	TUNED	b	b	b		b	b
Sc(54)	STEREO	c	c	c		c	c
Sd(55)	STANDBY	d	d	d	MHz	d	d
Se(56)	SEARCH	e	e	e	kHz	e	e
Sf(57)	FM/FM MUTE	f	f	f	MIN	f	f
Sg(58)	AM	g	g	g	MEMORY	g	g
Sh(59)	ON		SLEEP		A	B	

FIP10BBMB(Fluorescent tube)

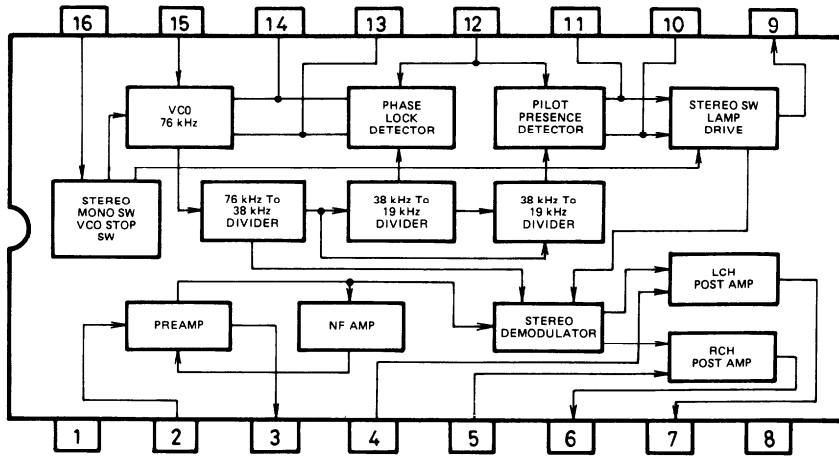
TERMINAL CONNECTION



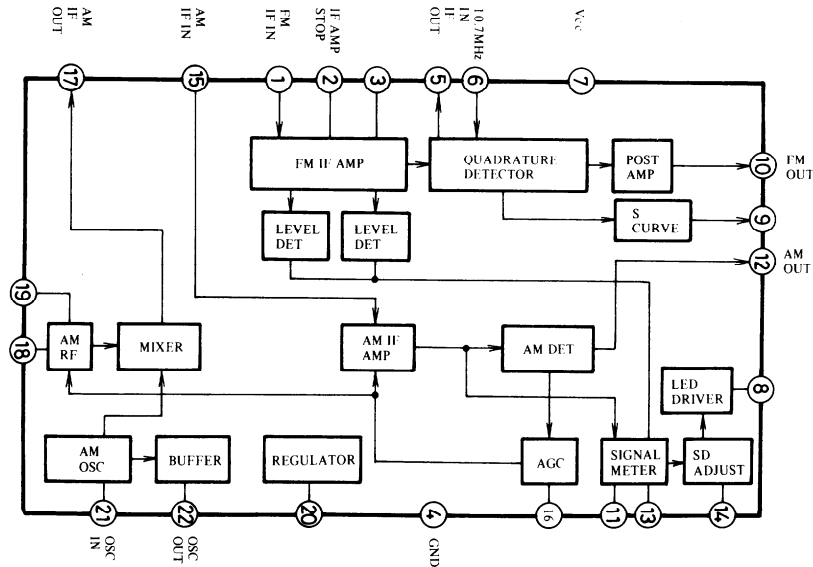
TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ELECTRODE	F	F	7G	P (S4)	P (i)	P (h)	7G	P (g)	P (S3)	P (S2)	7G	NC	6G	NP	NP	6G	NP	NP	5G	NP
TERMINAL NO.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	
ELECTRODE	NP	4G	NC	3G	NP	NP	P (f)	3G	P (e)	P (d)	2G	P (c)	P (b)	P (a)	1G	P (S1)	NP	F	F	

Notes F: Filament NP: No Pin
 G: Grid NC: No Connection
 P: Anode

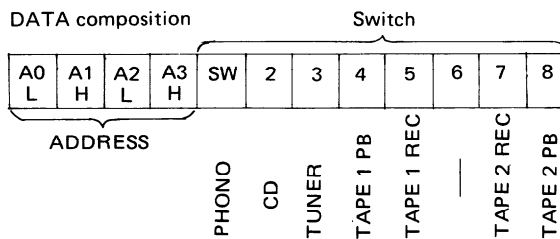
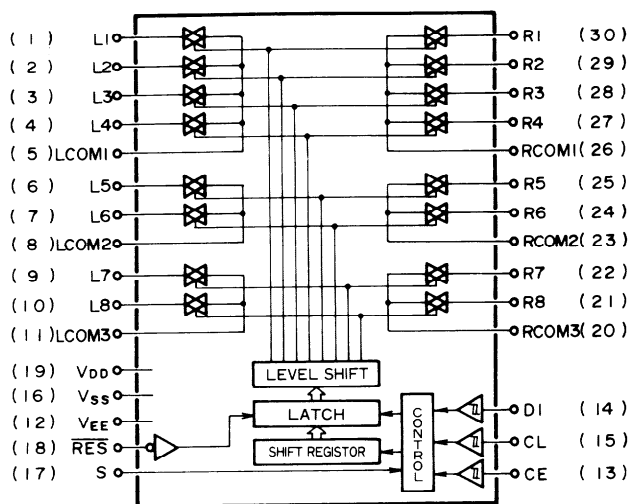
μPC1161C3 (FM stereo decoder)



LA1266 (FM IF/AM radio system)



LC7821 (Analog switch)



The source becomes ON when the bit of switch becomes high.

PHONO sw1/5/7 H sw2/3/4/8 L

Pin No.	Terminal	Description	Pin No.	Terminal	Description
1	PHONO	Input/output terminals of audio signal of left channel. Control to the inside analog switch at the serial data.	16	Vss	Ground terminal.
2	CD		17	S	Selector terminal.
3	TUNER		18	RES	Reset terminal. When power is turned ON, the condition of the analog switch is not determined, but when this terminal is "L", all analog switches are OFF.
4	TAPE PB		19	VDD	Power supply terminal. (+12V)
5	L COM 1		20	R COM 3	Input/output terminals of audio signal of right channel. Control to the inside analog switch at the serial data.
6	TAPE 1 REC		21	TAPE 2 PB	
7	—		22	TAPE 2 REC	
8	L COM 2		23	R COM 2	
9	TAPE 2 REC		24	—	
10	TAPE 2 PB		25	TAPE 1 REC	
11	L COM 3		26	R COM 1	
12	Vss	27	TAPE 1 PB		
13	CE	28	TUNER		
14	D1	29	CD		
15	CL	30	PHONO		

ADJUSTMENT PROCEDURES

Preparation

• Input

FM mono: 1 kHz, 75kHz devi., 60dB/μV

FM stereo: 1kHz, L+R 67.5kHz devi.: Pilot signal 19kHz
7.5kHz devi.

AM: 400Hz, 30% mod.,

• Output

Connect the non-inductive type resistor of 8 ohms to the speaker terminals A of left and right channels unless otherwise noted.

Amplifier section

1. Idling current adjustment

Connect the DC voltmeter to the terminals IID and VCT on the power amplifier and power supply pc board.

Adjust the semi-fixed resistors R549 and R550 so that the indication of voltmeter is 7.5 ± 0.5mV.

Notes: VOLUME Maximum, Open load,
Adjust after switching on for 6 minutes.

• Standard knob position

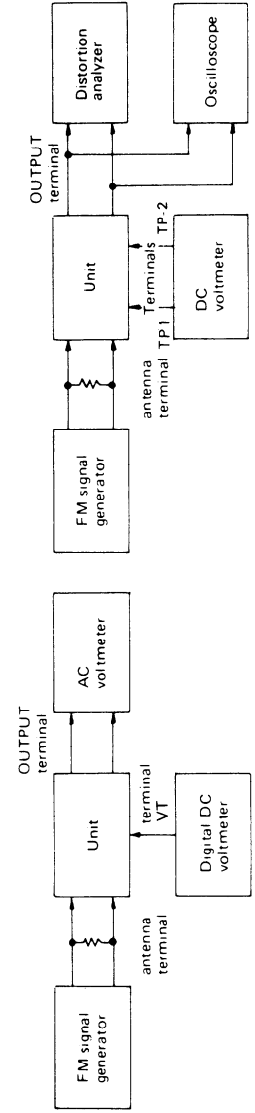
- INPUT SELECTOR. CD
- TAPE MONITOR SOURCE
- LOUDNESS. OFF
- VOLUME Maximum
- BASS/TREBLE/BALANCE. Center
- SPEAKER A
- SELECTIVE TONE CONTROL. OFF

Reference specifications

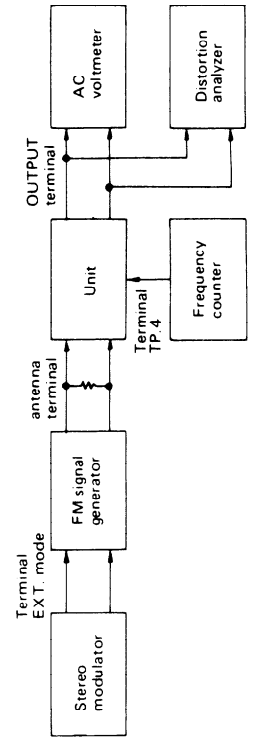
Tuned voltage	AM 520kHz(U.S.A. model)	1.5 ± 0.4V	Muting width	(U.S.A. model)	65 ± 15kHz
	522kHz(European model)	1.5 ± 0.4V		(European model)	35 ± 10kHz
	1611kHz(U.S.A. model)	7.6 ± 1.0V	Muting level	FM 14 ± 3 dB	
	1620kHz(European model)	7.6 ± 1.0V	Auto stop level	AM Less than 72dB/m	
FM	87.9 MHz(U.S.A. model)	2.0 ± 0.5V	Stereo indicator level	FM Less than 18dB μ	
	87.50MHz(European model)	2.0 ± 0.5V		14 ± 4dB μ	
FM	107.9 MHz(U.S.A. model)	7.6 ± 0.5V			
	108.00MHz(European model)	7.6 ± 0.5V			

FM section

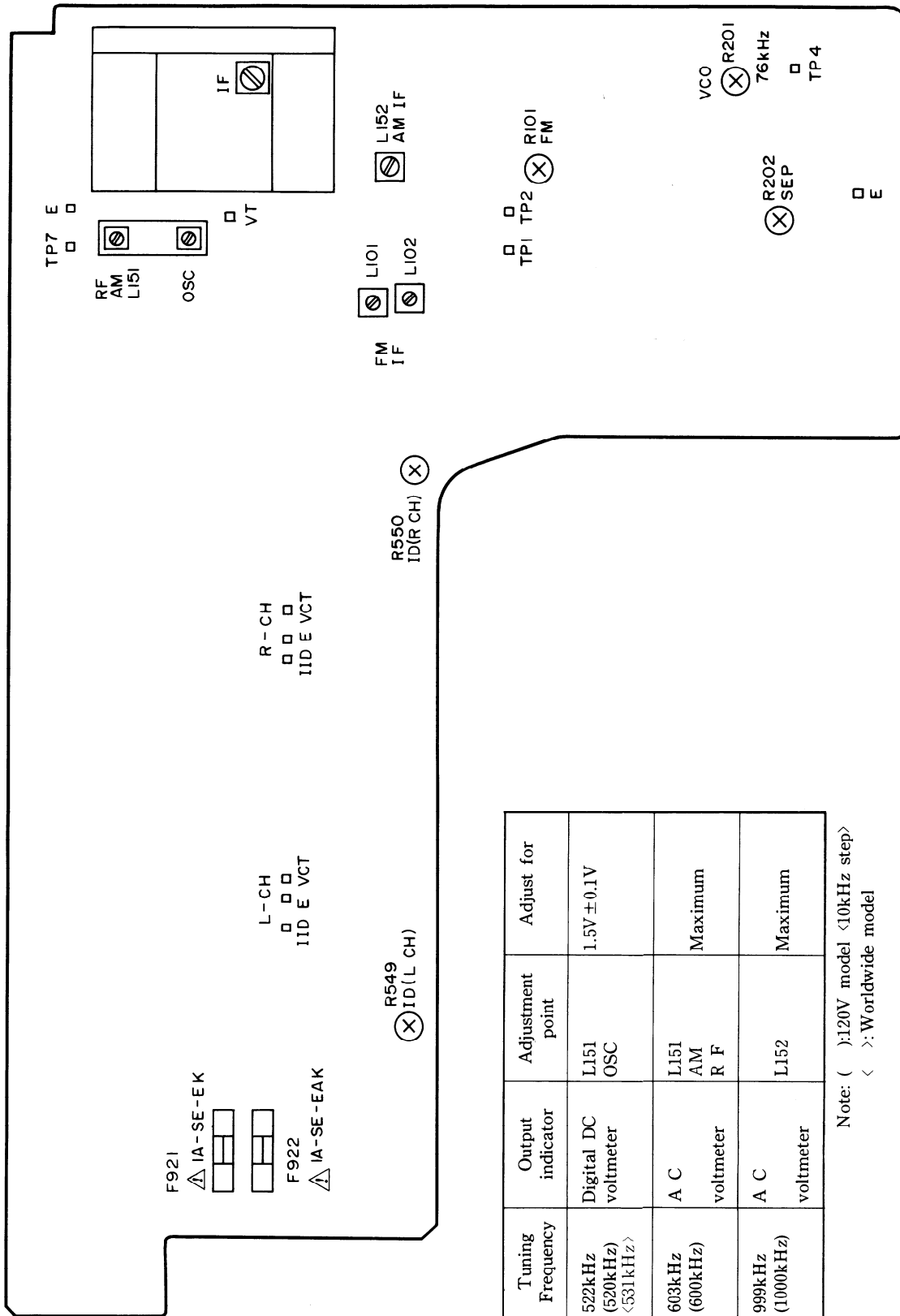
Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuning frequency	Output indicator	Adjustment point	Adjust for	Remarks
I F	1	Fig.2	99.1MHz 1kHz,75kHz devi. 65dBf(60dB)	—	99.1MHz	DC voltmeter	L101	0 ± 20mV	Set the muting switch to OFF. Repeat the steps 1 and 2 until no further adjustment is necessary.
	2								
Tuning indicator level	1	Fig.2	99.1MHz 1kHz,75kHz devi. 19.2dBf(14dB)	—	99.1MHz	TUNED indicator	R101	Light on	
	2								
V C O		Fig.3	99.1MHz 1kHz,75kHz devi. 65dBf(60dB)	—	99.1MHz	Frequency counter	R201	19kHz ± 10Hz	Set the muting switch to ON.
Stereo distortion		Fig.3	99.1MHz Ext. modulation 65dBf(60dB)	L+R 1kHz 67.5kHz devi.	99.1MHz	Distortion analyzer	IF on front end	Minimum	
		Fig.3	99.1MHz Ext. modulation 65dBf(60dB)	Lch. 1kHz Rch. 1kHz	99.1MHz	Rch. AC voltmeter Lch. AC voltmeter	R202	Minimum Minimum	Maximum and same separation



<Fig.1> Confirmation of tuned voltage



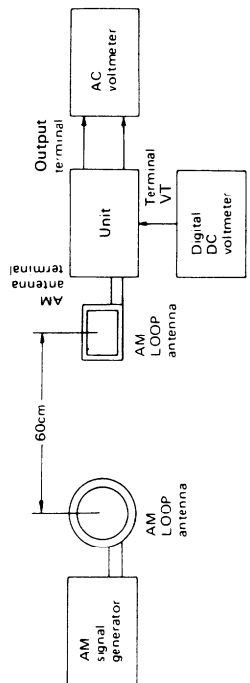
<Fig.3>



AM section

Step	AM SG output	Tuning Frequency	Output indicator	Adjustment point	Adjust for
1	—	522kHz (520kHz) <531kHz>	Digital DC voltmeter	L151 OSC	1.5V ± 0.1V
2	603kHz, 60dB/m (600kHz) 400Hz 30% mod.	603kHz (600kHz)	A C voltmeter	L151 AM R F	Maximum
3	999kHz, 30dB/m (1000kHz) 400Hz 30% mod.	999kHz (1000kHz)	A C voltmeter	L152	Maximum

Note: () : 120V model <10kHz step>
< > : Worldwide model



TONE CONTROL CIRCUIT PC BOARD

EQUALIZER AMPLIFIER PC BOARD

TONE CONTROL CIRCUIT PC BOARD
(NAAF-3245-1/1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
		ICs
Q401-Q404	22240050	μ PC4570C
		Capacitors
C401,C402	354780479	4.7 μ F,50V,Elect.
C405,C406	354780479	4.7 μ F,50V,Elect.
C407,C408	354780339	3.3 μ F,50V,Elect.
C409,C410	354780109	1 μ F,50V,Elect.
C421,C422	354780339	3.3 μ F,50V,Elect.
C423,C424	354741009	10 μ F,16V,Elect.
		Resistors
R413,R414	5104229	N14RHC100KWT22Z,Variable,BASS
R427,R428	5104229	N14RHC100KWT22Z,Variable, TREBLE
R433,R434	5104227A	N16RGH100KA25Z,Variable, VOLUME
R435,R436	5104228	N11RHC250KWT22Z,Variable, BALANCE
		Switch
S401	25035588	NPS-142-L550,Selector
		Sockets
P402	2000765	NSAS-6P721
P403	2000556	NSAS-6P512

EQUALIZER AMPLIFIER PC BOARD
(NAAF-3054-2/3)

CIRCUIT NO.	PART NO.	DESCRIPTION
		IC
Q071	22240050	μ PC4570C
		Capacitors
C071,C072	354780229	2.2 μ F,50V,Elect.
C077,C078	354721019	100 μ F,6.3V,Elect.
C083,C084	354780229	2.2 μ F,50V,Elect.
C085,C086	354742219	220 μ F,16V,Elect.
		Plug
P071	25055334	NPLG-9P317


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

POWER AMPLIFIER PC BOARD

POWER AMPLIFIER PC BOARD(NAAF-3244-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q513,Q514	2211255	2SC1815-GR
Q517,Q518	2211654 or 2211653	2SC2235-Y or 2SC2235-O
Q519,Q520	2211644 or 2211643	2SA965-Y or 2SA965-O
Q521,Q522	2201783, 2201784 or 2201786	☆2SC3854-O, 2SC3854-Y or 2SC3854-P
Q523,Q524	2201773, 2201774 or 2201776	☆2SA1490-O, 2SA1490-Y or 2SA1490-P

CAUTION: Replacement for transistor of mark☆, if necessary, must be made from the same beta group (H_{FE}) as the original type.

Ex. 2SA1490-O 2SC3854-O


Q525,Q526	2211732 or 2211733	2SC1845-F or 2SC1845-E
	Diodes	
D501,D502	4000068 or 4000120	VD1222 or KB-265

CIRCUIT NO. PART NO. DESCRIPTION

	Resistors	
R527,R528	442522714	270ohm,1/2W,Metal oxide film
R529,R530	441620104	1ohm,1W,Metal oxide film
R531-R534	4500009	0.47ohm,2W,Metal plate
	Terminals	
	25060118	NTM-1S52(for leg of power transistor)

DISPLAY CIRCUIT PC BOARD(NADIS-3248-1/1A/1B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q752	22240153	LC6568H-3643
	Transistors	
Q753-Q755	2211255	2SC1815-GR
	Fluorescent tube	
Q751	212053	FIP10BBMB
	Diodes	
D751-D756	223163	1SS133
D758,D759	223163	1SS133 <G/W>
D760,D763	223163 -	1SS133
D761	224650472	HZ4.7EB2
D765,D766	224650623	HZ6.2EB3 or
	224150623	05AZ6.2Z

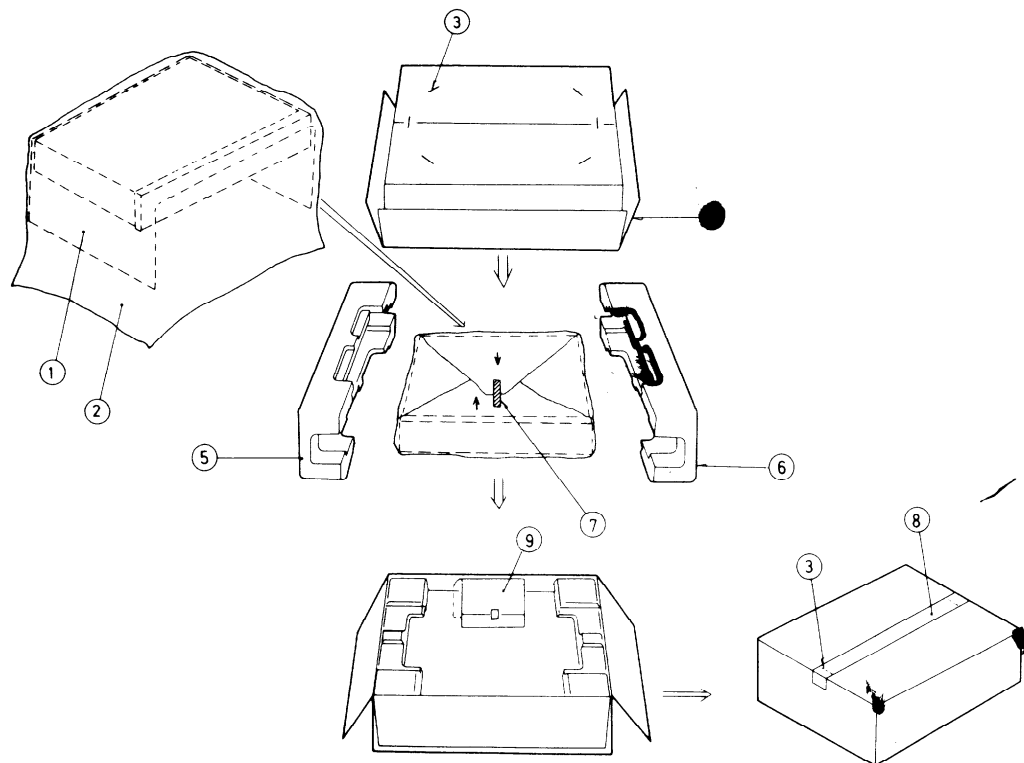
PRINTED CIRCUIT BOARD-PARTS LIST

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
	Coils			Resistors	
L103	233105	NCH-1005	R101	5210067	N06HR33KBD,Semi-fixed
L105	233383	NMC-6070 <G/W>	R201	5210062	N06HR4.7KBD,Semi-fixed
L151	232146	NMRF-7049	R202	5210074	N06HR470KBD,Semi-fixed
L201,L202	233291	NMC-5039 <G/W>	R521,R522	442522204	22ohm,1/2W,Metal oxide film
L501,L502	231001	S1.3B	R523,R524	442521214	120ohm,1/2W,Metal oxide film
	Transformers		R543,R544	442520824	8.2ohm,1/2W,Metal oxide film
L101	233394	NFIF-4068	R547,R548	442520474	4.7ohm,1/2W,Metal oxide film
L102	233395	NFIF-4069	R549,R550	5210064	N06R10KBD,Semi-fixed
L152	232139	NFIF-4062	R563	442521814	180ohm,1/2W,Metal oxide film
	X'tal		R911-R914	441623914	390ohm,1W,Metal oxide film
X701	3010073	XTL-7.2M	R921,R922	442520104	1ohm,1/2W,Metal oxide film <D/W>
	Ceramic filters		R923	442522204	22ohm,1/2W,Metal oxide film
X101,X102	3010071	SFE10.7MA5 <D>	R924	441626814	680ohm,1W,Metal oxide film
X101	3010070	SFE10.7MS3GYA <G/W>	R925	441621204	12ohm,1W,Metal oxide film
X102	3010043	SFE10.7MM <G/W>	R951	442521014	100ohm,1/2W,Metal oxide film
X152	3010123	STZ450JL		Fuses	
X153	3010076	BFU-450C	F921,F922	252070	1A-SE-EAK <G>
	Capacitors			Fuseholders	
C002	354780339	3.3 μ F,50V,Elect.	25050065	YSH403T <G>	
C106	354742209	22 μ F,16V,Elect.		Relay	
C107	354784799	0.47 μ F,50V,Elect.	RL501	25065275	NRL-2P5A-DC12-38
C112	354741009	10 μ F,16V,Elect.		Terminals	
C113	354782299	0.22 μ F,50V,Elect.	P301,P302	25045213	NPJ-6PDBL-92,Input/Tape output terminals
C114	354780229	2.2 μ F,50V,Elect.	P501	25060093	NTM-8PDML34,Speaker
C153,C155	354741009	10 μ F,16V,Elect.	P911	25060085	NTM-4PDMN29,Antenna <D>
C156,C157	354741009	10 μ F,16V,Elect.		25060087	NTM-2PDMN31,Antenna <G/W>
C160	354782299	0.22 μ F,50V,Elect.		Sockets	
C201	354780479	4.7 μ F,50V,Elect.		25050268	NSCT-4P96
C205,C206	354741009	10 μ F,16V,Elect.		25050270	NSCT-6P98
C208,C209	354780109	1 μ F,50V,Elect.		25050273	NSCT-9P101
C213	354782299	0.22 μ F,50V,Elect.		Radiator	
C214	354780339	3.3 μ F,50V,Elect.		27160229	
C215	354780109	1 μ F,50V,Elect.			
C216	370134714	470pF \pm 5%,100V,APS			
C217	354744719	470 μ F,16V,Elect.			
C218	354784799	0.47 μ F,50V,Elect.			
C331	354780229	2.2 μ F,50V,Elect.			
C332,C333	354780339	3.3 μ F,50V,Elect.			
C501,C502	354781009	10 μ F,50V,Elect.			
C509,C510	354722219	220 μ F, 6.3V,Elect.			
C531-C534	354780339	3.3 μ F,50V,Elect.			
C552	354722219	220 μ F, 6.3V,Elect.			
C553,C554	354780109	1 μ F,50V,Elect.			
C555	354741009	10 μ F,16V,Elect.			
C702	354780109	1 μ F,50V,Elect.			
C707	354741009	10 μ F,16V,Elect.			
C710	354721019	100 μ F, 6.3V,Elect.			
C911,C912	335251039	0.01 μ F,500V,Ceramic			
C913,C914	3504207	6.800 μ F,50V,Elect.			
C915,C916	354761019	100 μ F,35V,Elect.			
C917,C918	354742219	220 μ F,16V,Elect.			
C921,C922	335251039	0.01 μ F,500V,Ceramic			
C923,C924	354761019	100 μ F,35V,Elect.			
C925	354752229	2200 μ F,25V,Elect.			
C926	354761019	100 μ F,35V,Elect.			
C928	354781009	10 μ F,50V,Elect.			
C951	354741009	10 μ F,16V,Elect.			

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

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

PACKING VIEW



REF. NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	29095012-1	500 × 800mm,Protection sheet		220V model	
2	29100034	650 × 850mm,Poly-vinyl bag		292092	FM antenna
3	282301	Sealing hook		29341239A	Instruction manual
4	29051669	Master carton box		232140	NMA-3057,AM loop antenna
5	29091242	Pad R		29100006A	250 × 350mm,Poly-vinyl bag
6	29091241	Pad L		240V model	
7	261504	W=15mm,Adhesive tape		292092	FM antenna
8	260012	W=50mm,Damplon tape		29341239A	Instruction manual
9	Accessory bag ass'y			232140	NMA-3057,AM loop antenna
	120V model			25060123	FM antenna adaptor
	292064B	FM antenna		29100006A	250 × 350mm,Poly-vinyl bag
	29341238	Instruction manual		Worldwide model	
	232140	NMA-3057,AM loop antenna		292064B	FM antenna
	29100006A	250 × 350mm,Poly-vinyl bag		29341239A	Instruction manual
	29358002E	Service station list (only U.S.A. model)		232140	NMA-3057,AM loop antenna
	29365019	Warranty card (Only U.S.A. model)		25060123	FM antenna adaptor
				25055018	CV-K-1,Conversion plug
				29100006A	250 × 350mm,Poly-vinyl bag

ONKYO CORPORATION

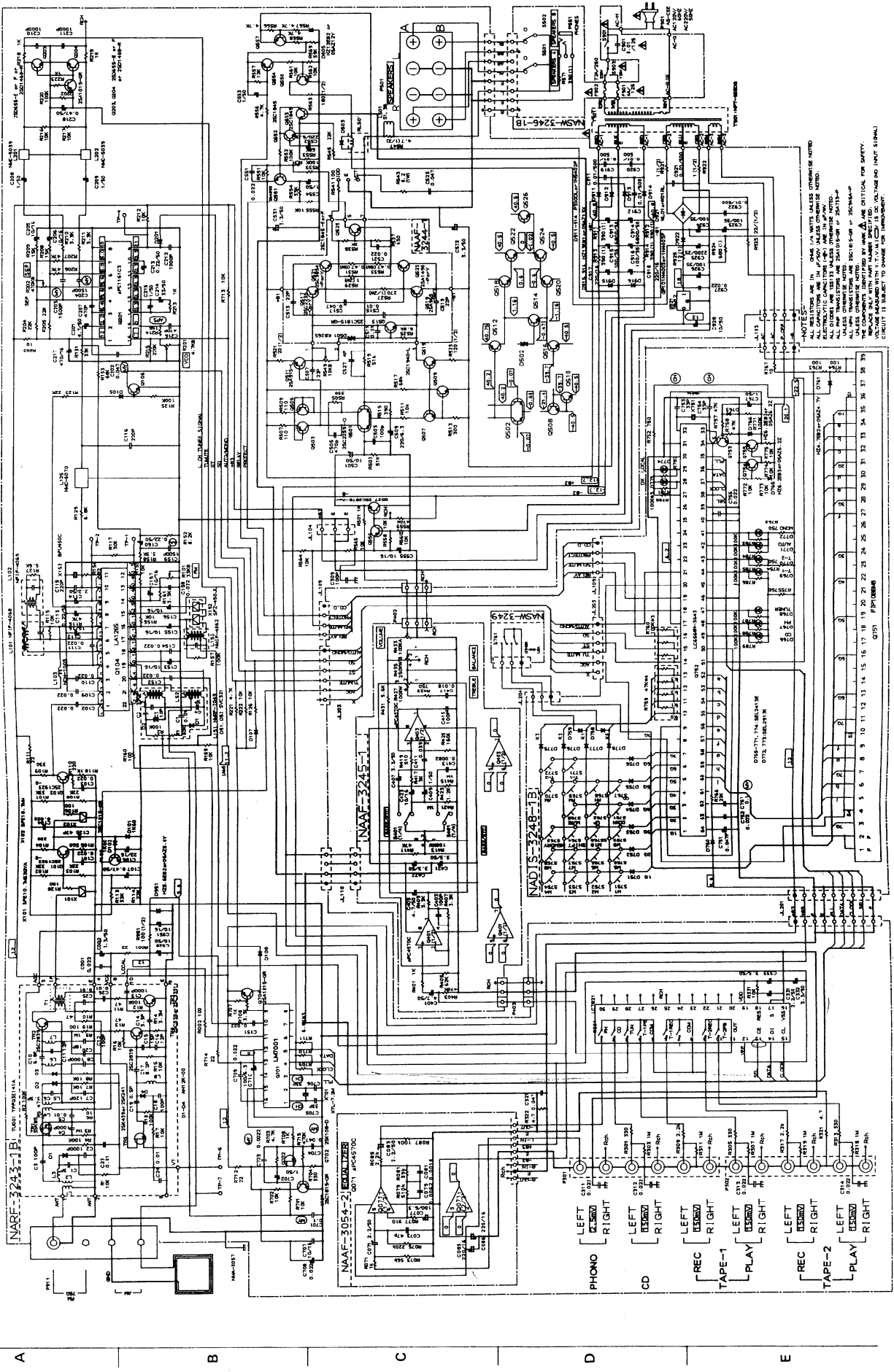
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SCHEMATIC DIAGRAM

—WorldWide Model—



NOTES:
 ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
 ALL ELECTRICAL COMPONENTS ARE TO BE USED AS SPECIFIED.
 ALL WIRE TRANSISTORS ARE TO BE USED AS SPECIFIED.
 ALL WIRE TRANSISTORS ARE TO BE USED AS SPECIFIED.
 THE COMPONENTS IDENTIFIED BY AN "A" ARE CRITICAL FOR SAFETY.
 REPAIRS AND PARTS MUST BE IDENTIFIED BY "A" (INPUT SIGNAL).
 CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

SCHEMATIC DIAGRAM

-120V MODEL-

