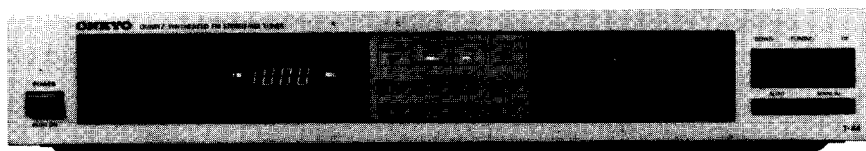


ONKYO SERVICE MANUAL

SYNTHESIZED AM/FM STEREO TUNER MODEL T-44



UD, UDN, BUD, BUDN

120V AC, 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 PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

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

SPECIFICATIONS

FM:

Tuning Range:	87.5 — 108.0 MHz (100 kHz steps)
Usable Sensitivity:	Mono: 10.8 dBf, 1.9 μ V, IHF Stereo: 17.2 dBf, 4.0 μ V
50 dB Quieting Sensitivity:	Mono: 16.1 dBf, 3.5 μ V Stereo: 36.1 dBf, 35 μ V
Capture Ratio:	1.5 dB
Image Rejection Ratio:	40 dB
IF Rejection Ratio:	90 dB
Signal-to-Noise Ratio:	Mono: 73 dB Stereo: 66 dB
Alternate Channel Att:	55 dB IHF ($\pm$ 400 kHz)
AM Suppression Ratio:	50 dB
Total Harmonic Distortion:	Mono: 0.1% Stereo: 0.2%
Frequency Response:	30 — 15,000 Hz $\pm$ 1.5 dB
Stereo Separation:	40 dB at 1 kHz 30 dB at 70—10,000 Hz
Output Voltage:	0.6V
Muting Level:	17.2 dBf, 4.0 μ V

ONKYO

AUDIO COMPONENTS

AM:

Tuning Range:	520—1710 kHz (10 kHz steps)
Usable Sensitivity:	25 μ V
Image Rejection Ratio:	40 dB
IF Rejection Ratio:	30 dB
Signal-to-Noise Ratio:	40 dB
Total Harmonic Distortion:	0.8%
Output Voltage:	150 mV

General

Power Supply:	AC120 V, 60 Hz
Semiconductors:	FETs: 6 TR: 25 ICs: 10 Diodes: 37 LEDs: 20
Dimensions (W x H x D):	418 x 73 x 269 mm (16-1/2" x 2-7/8" x 10-5/8")
Weight:	3.2 kg., 7.0 lbs.

Specifications and features are subject to change without notice.

SERVICE PROCEDURES

1. Replacing the lamp

This unit uses the lamp listed below.

circuit no.	parts no.	description
PL902	210054A	PL6.3V 250mA, dial plate illumination

2. Insulation resistance measurement

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

Specification; 500V, 3.3M Ω $\pm$ 10%

3. Handling the CMOS IC

This unit uses the CMOS ICs of Q203, Q702 and Q871.

1. All MOS devices should be store transported in materials that are somewhat conductive. MOS devices must not be inserted into conventional plastic "snow" or plastic trays.
2. All MOS devices should be placed on a grounded bench surface and operators should ground themselves prior to handling devices, since a worker can be statically charged with respect to the bench surface.
3. Nylon clothing should not be worn while handling MOS circuit.
4. When lead straightening or hand soldering is necessary, provide ground straps for the apparatus used.
5. Double check test equipment setup for proper polarity of voltage before conducting parametric or functional testing.
6. All unused device inputs should be connected to V_{DD} or V_{SS} (Ground).

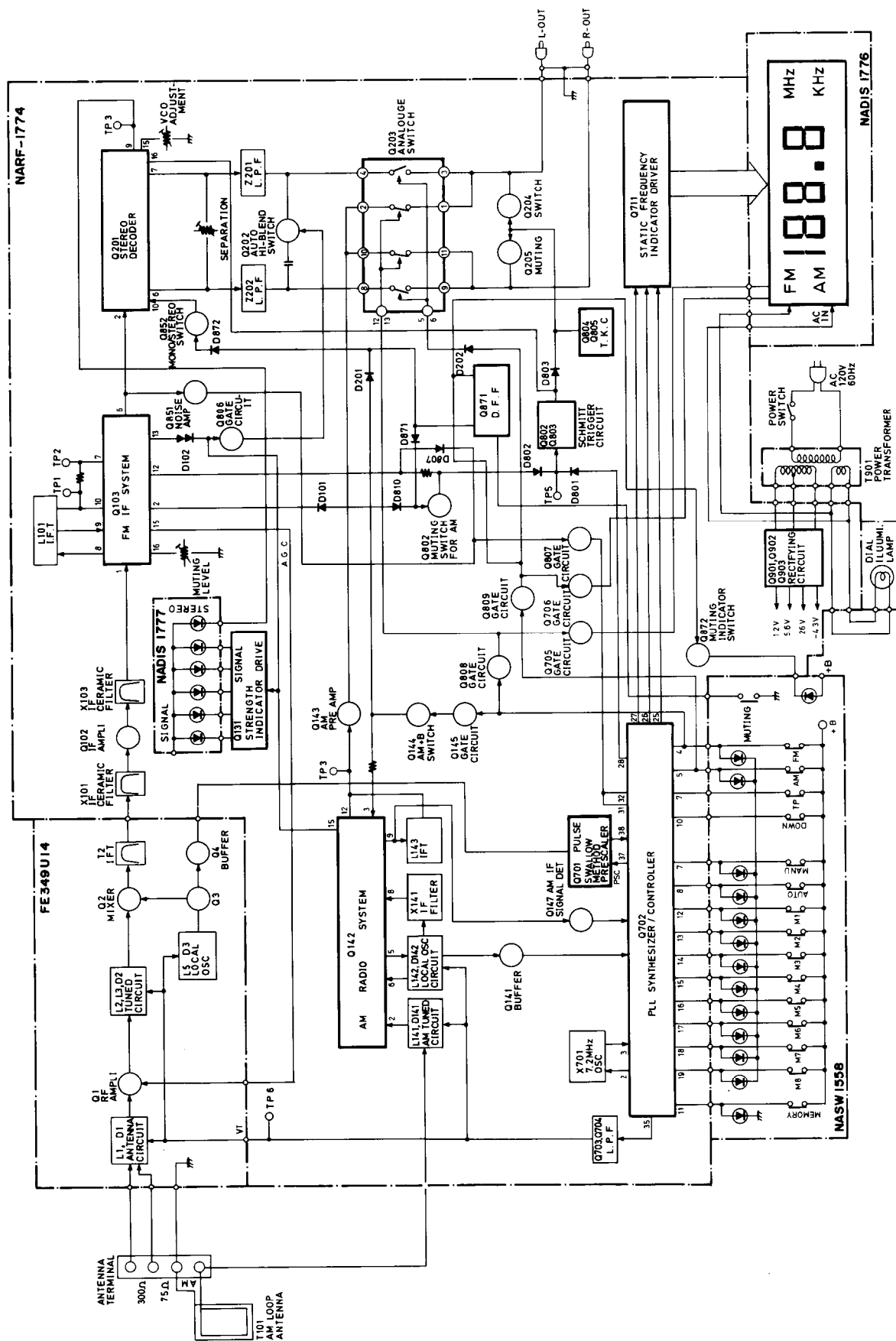
4. Memory Preservation

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 operable. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and the location 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.

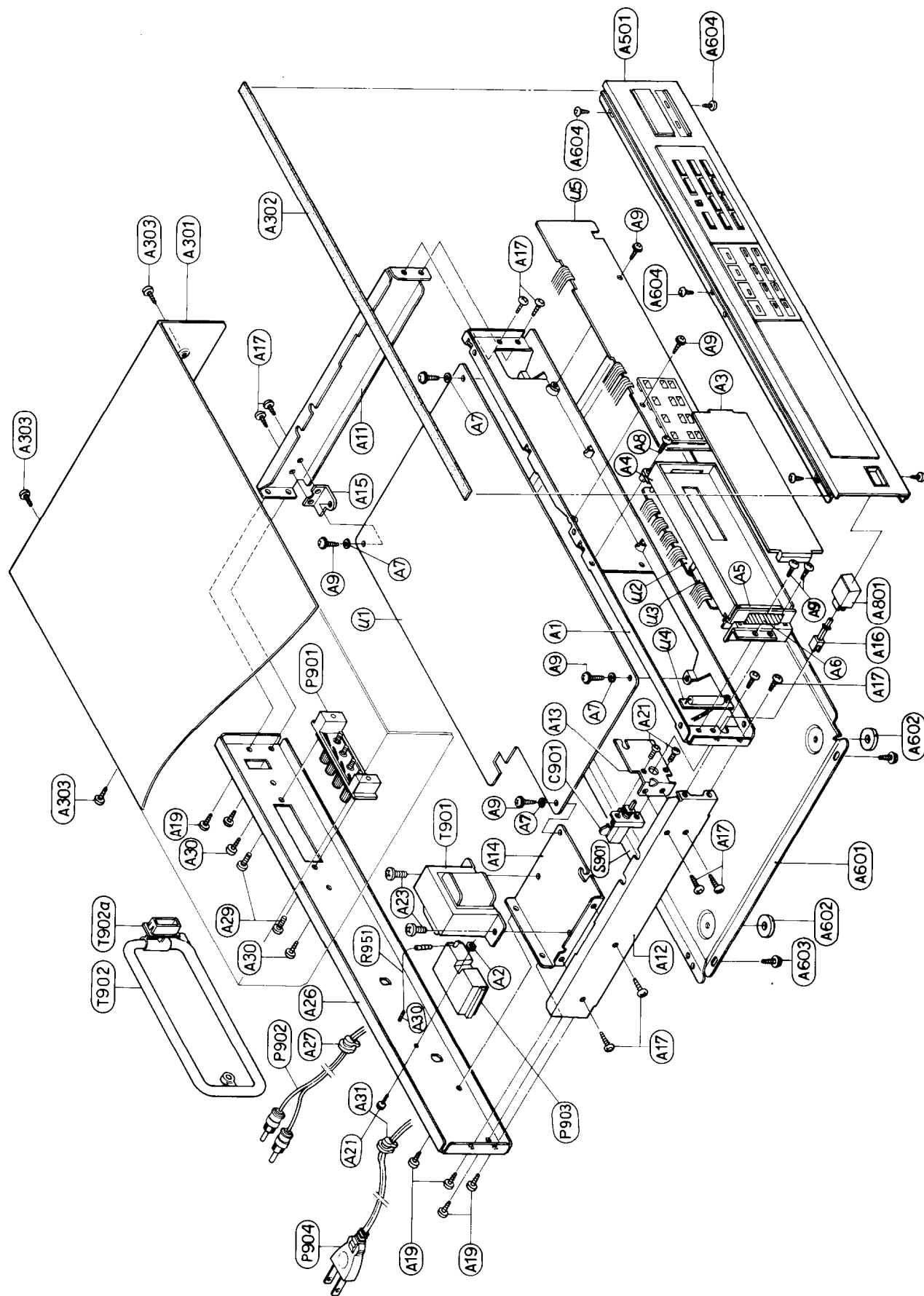
TABLE OF CONTENTS

Specifications	1
Service procedures	2
Block diagram	3
Exploded view	4
Parts list	5
Circuit descriptions	6
Block diagram of IC	11
Printed circuit board view	12
Adjustment procedures	13
Printed circuit board view	15
Schematic diagram	17
Pc board-parts list	19
Packing view	20

BLOCK DIAGRAM



EXPLODED VIEW



PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION	REF. NO.	PARTS NO.	DESCRIPTION	REF. NO.	PARTS NO.	DESCRIPTION
A1	27110183A	Front bracket	A501	13058121	Front panel ass'y	△ T901	230683	NPT-806D, Power transformer
A2	863430	N-3F-N (BC), Nut		28191151A	Clear plate	T902	232085	NMA-3034, AM loop antenna
A3	28130198	Dial plate		27215082	Decoration frame	T902a	27190105	Holder, antenna
A4	27190179A	Holder, lamp		27140784	Bracket S for ground	U1	13058574	NARF-1774, FM/AM tuner pc board ass'y
A5	28140456	2x40x4mm, Cushion		27180146	Spring	U2	13058576	NADIS-1776, Fluorescent indicator tube pc board ass'y
A6	28140460	0.5x22x12mm, Cushion		28320886	Knob, tuning	U3	13058577	NADIS-1777, Signal and stereo indicator pc board ass'y
A7	870060	Washer		28320871	Knob, push	U4	13058578	NAPL-1778, Dial plate illumination lamp pc board ass'y
A8	833430088	3TTP+8P (BC), Tapping screw		28320935	Knob, auto/manual	U5	1305858A	NASW-1558a, Switch pc board ass'y
A9	831430088	3TTW+8B (BC), Tapping screw		28321887	Knob, memory			
A11	27115045H	Side bracket R		28321223	Knob, muting/mode			
A12	27115090B	Side bracket L		13008121	Front panel ass'y (B)			
A13	27140721A	Bracket, switch		28191151A	Clear plate			
A14	27130327	Bracket, power transformer		27215083	Decoration frame			
A15	27140320A	Bracket, pcb		27180146	Spring			
A16	27260062	Shaft		28321226	Knob, tuning			
A17	834430068	3TTS+6B (BC), Tapping screw		28321227	Knob, push			
A19	834430068	3TTS+6B (BC), Tapping screw		28320935	Knob, auto/manual			
A21	82143006	3P+6FN (BC), Pan head screw		28321224	Knob, muting/mode			
A23	838440089	4TTB+8C (BC), Tapping screw		28321225	Knob, memory			
A24	27120532	Back panel	A601	27170093B	Bottom board			
△ A27, A31	270025	SR-3P-4, Strainrelief	A602	27175011C	Leg			
A29	834430108	3TTS+10B (BC), Tapping screw	A603	834430068	3TTS+6B (BC), Tapping screw			
A30	834230108	3TTS+10B (Ni), Tapping screw	A604	838430068	3TTB+6B (BC), Tapping screw			
A301	28184154A	Top cover	A605	28140044	2x12x12mm, Cushion			
	28184200	Top cover (B)	A801	28320852	Knob, power			
A302	28140024	0.5x10x390mm, Cushion		28321160	Knob, power (B)			
A303	834430068	3TTS+6B (BC), Tapping screw	△ C901	3500065A	DE7150FZ103PAC400V/125V, Capacitor IS			
			△ C901a	27300601	Cover, capacitor			
			P901	25060047	NTM-4PRMN16, Antenna terminal			
			P902	2010087	Output cable			
			△ P903	25108010	Terminal, primary, AC			
			△ P904	253099A	AS-UC-3, Power supply cable			
			△ R951	431523355	3.3Mohm, 1/2W, Solid resistor			
			△ S901	25035220	NPS-111-L184P, Power switch			

Note: (B): Only black model

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

1. Synthesizer and controller operation

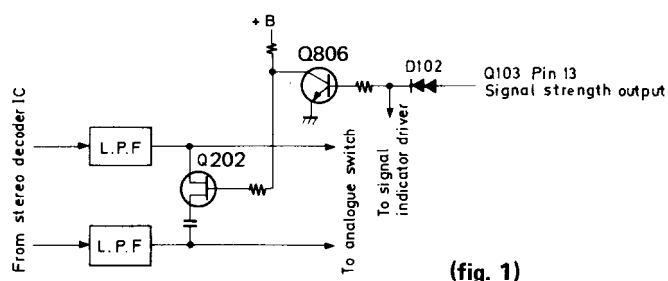
Pin No.	Symbol	Terminal	Description
1	GND	Ground	
2	XT	X'tal	Connected to the 7.2MHz crystal oscillator for the reference frequency.
3	XT		
4	FM	FM band specification input	Mutual reset type, performs switching of each band, FM/MW/LW.
5	MW	MW band specification input	
6	LW	LW band specification input	
7	MANUAL	Manual tuning mode specification input	Mutual reset type, performs auto search and manual operation mode switching during UP/DOWN tuning.
8	AUTO	Auto search tuning mode specification input	
9	UP	UP tuning key input	Connect the push key and perform UP/DOWN tuning.
10	DOWN	DOWN tuning key input	
11	STO	Memory store command input	The preset memory is set to the write mode when the key is pressed.
12-19	M1-M8	Preset memory channel specification input	Controls the write and read out of the internal 16-station preset memory along with the MC1 and MC2 input.
20	MC-1	Memory control input	Set the 16-station preset memory to the 8 FM/8 AM station mode or the FM/MW/LW 3-band 16-station random mode. The 8 FM/8 AM mode is used in this unit.
21	MC-2		
22	OSC2	AM oscillator terminal	CR connection terminal for the oscillator that determines the scan speed during the AM search mode.
23	OSC1	FM oscillator terminal	CR connection terminal for the oscillator that determines the scan speed during the FM search mode.
24	O/5	FM 50 kHz output	Output that represents the 50kHz FM band tuning step for European models. Goes to the high level for the 50 kHz setting.
25	CK2	Tuned frequency data output	Outputs the serial data and timing clock to the tuned frequency display driver.
26	CK1		
27	DATA		
28	MUTE	Muting signal output	Goes to the high level during muting output.
29	E2	Regin specification input	See table 1.
30	E1		
31	STOP 3	AM IF signal input	During AM reception, this counts the IF signal and stops auto search.
32	STOP 2	Auto search stop signal input	When the stop 1 input (pin 33) is at the high level and this terminal goes to the high level, auto search is stopped.
33	STOP 1	Scan speed slow input	When the high level is input at this terminal, the auto search speed is cut in half.

Pin No.	Symbol	Terminal	Description
34	DO1	Error output	Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided oscillation frequency is high than the reference frequency. In the opposite case, low level is output. Floating occurs when the frequencies match. The output is applied to the variable capacitor diode in the front end through low pass filter Q703 and Q704. The output from both terminals is the same, but only D01 is used.
35	D02		
36	TEST	Test terminal	Test mode at the high level.
37	FM IN	FM programmable counter input	Connect to the prescaler output (Pin3 of Q701)
38	PSC	Pulse swallow control output	Output to the control the division ratio of the prescaler.
39	AM IN	AM local oscillator signal input	Terminal for input of AM broadcast signal.
40	$\overline{\text{INH}}$	Inhibit input	Operates normally at the high level. Inhibit status at the low level.
41	$\overline{\text{INT}}$	Initialize input	Operates normally at the high level. At the low level, the internal status is initialized.
42	V _{DD}	Power supply	Device power terminal; supplies 5V during the normal operation and 2.5V from the super capacitor (C714) for memory preservation.

E1 (Pin 30)	E2 (Pin 29)	Regin	Band	Frequency range	Intermediate frequency	Scan step	Reference frequency
0	1	U.S.A	FM	87.5 ~ 108.0 MHz	+10.7 MHz	100 kHz	25 kHz
			AM1	520 ~ 1 710 kHz	+450 kHz	10kHz	10 kHz
1	1		AM2	522 ~ 1 710 kHz	+450 kHz	9kHz	9kHz
1	0	Europe	FM	87.50 ~ 108.00 MHz	+10.7 MHz	50 kHz	25 kHz
			MW	522 ~ 1611 kHz	+450 kHz	9 kHz	9 kHz
			LM	153 ~ 360 kHz	+450 kHz	1 kHz	1 kHz
0	0	Japan	FM	76.0 ~ 90.0 MHz	-10.7 MHz	100 kHz	25 kHz
			AM	522 ~ 1611 kHz	+450 kHz	9 kHz	9 kHz

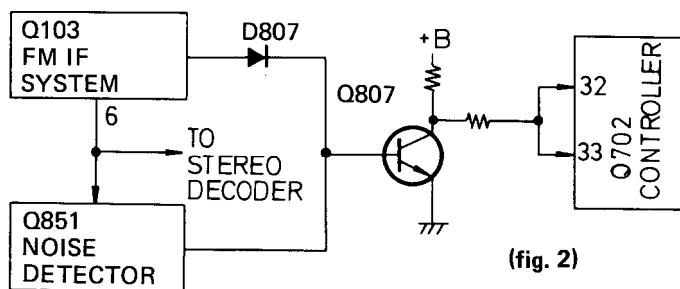
Table 1

2. Auto-Hi-blend circuit

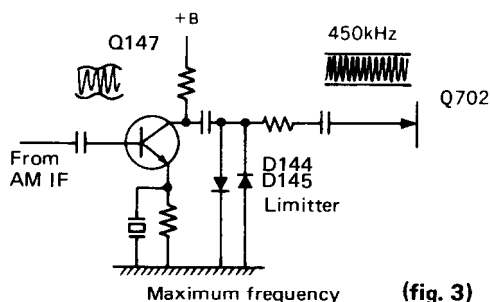


There is a 3-stage IF level detection circuit in the IC of Q103. A direct current voltage approximately proportional to the electrical field intensity is output from output pin 13. This is used to turn off Q806 and turn on Q202 when the electrical field is weak and, making use of the fact that the phase of noise components in the high range of stereo broadcasts is reversed left-right, the left and right channels are mixed in the high range to reduce noise.

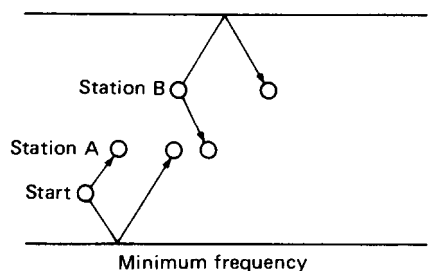
3. Auto-search tuning circuit



(fig. 2)



(fig. 3)



(fig. 4)

During FM reception, this is operated by the IF level detection and zero point detection circuits included in the FM IF system IC of Q103 and by the noise component detection circuit of Q851. When a station is tuned, the output of all outputs go to the low level so Q807 goes from on to off, causing pins 32 and 33 of the controller IC to go to the high level to complete auto search tuning.

During AM reception, the AM IF signal is taken, amplified by Q147, limited to a certain amplitude by the D144 D145 limiter circuits and auto search tuning is completed when the IF signal becomes 450 ± 3 kHz.

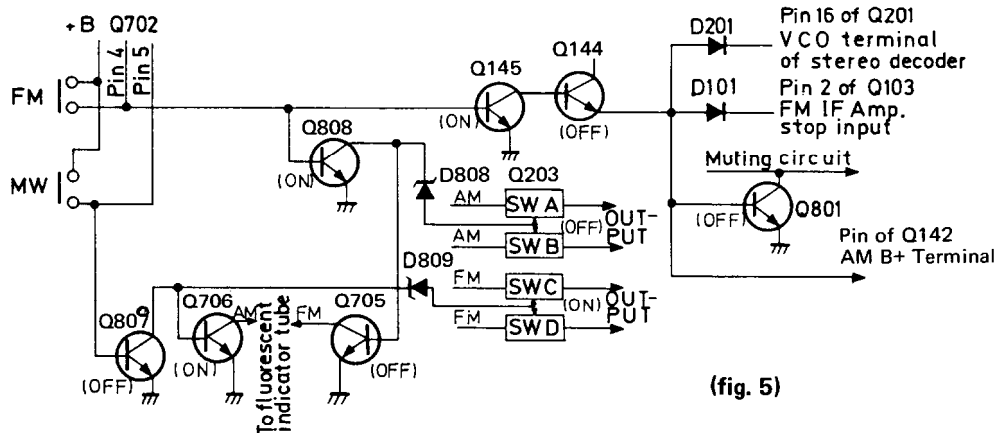
• Manual Tuning

When the UP or DOWN key is pressed, the frequency goes up or down by one step. When either key is held down, the frequency rapidly increases or decreases (scans) and stops when the key is released. When either end of the tuning range is reached, key input will no longer be received and the frequency will stop at the highest or lowest frequency.

• Auto Tuning

When the UP or DOWN key is pressed, scanning begins in the up or down direction, stopping where there is a radio station. Since auto scan is operated by a triangular wave, scanning is begun in the opposite direction the instant either end of the tuning range is reached. Also, if the UP or DOWN key is pressed when the tuned frequency is not at either end of the range, up or down scanning will begin.

4. FM/AM selector circuit

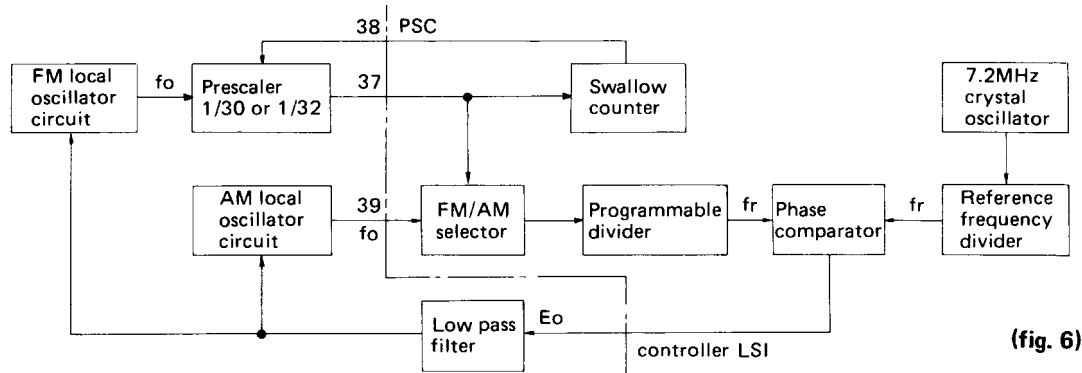


(fig. 5)

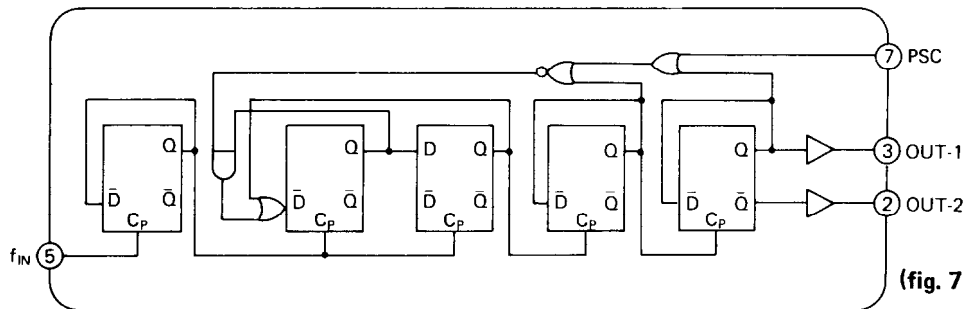
The FM/AM selector circuit is shown in the diagram. fig. 5. Pins 4 and 5 of Q702 are of the mutual reset type. For FM, pin 4 is high and pin 5 is low; for AM, pin 4 is low and pin 5 is high. Because pin 5 is high and pin 4 is low during AM reception, Q809 is on and Q808 is off, the analog switches SW1 and SW2 of Q203 are on while SW3 and SW4 are off, so an AM signal is output. Also, since Q706 goes to on and Q705 to off, the AM, kHz segments of the fluorescent display are turned on. At the same time, Q145 is turned off and Q144 turned on, so +B is supplied to the power source terminal of the radio system pin 3 of Q142.

Pin 16 of Q201 goes to the high level, the VCO oscillator stops, and pin 2 of Q103 goes to the high level so the FM IF amp is also switched off. Also, during AM reception, Q801 is turned on so the muting circuit is off. During FM reception, all of the switching transistors mentioned above perform the opposite operations to switch to the FM mode. Figures in parentheses indicate transistor operation during FM reception.

5. PLL tuned circuit



(fig. 6)



(fig. 7) TP6104P Block diagram

A block diagram of the tuned circuit of the PLL is shown in figer 6.

Operation during AM reception

The reception frequency is applied to the programmable divider where it is divided to $1/N$ and output as f_v . This is applied to the phase comparator where it is compared with frequency reference f_r (10kHz). If f_r and f_v differ, E_o equal to the difference in frequency is output. Since error output E_o is a pulse waveform, it is passed through the low pass filter to change it into DC voltage V_D , which is applied to the variable capacitor diode in the front end to change the reception frequency. This continues until f_v and f_r are the same and $E_o = 0$.

Operation during FM reception

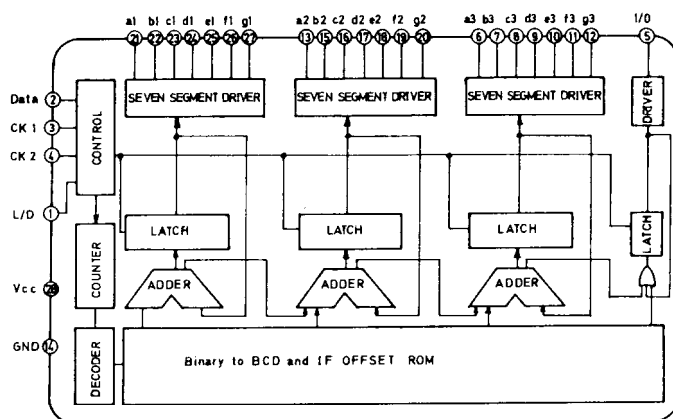
The pulse swallow method is used in the prescaler of the T-44. In this type of prescaler, a supplementary number

(changed according to the program code input) and the divided reception frequency from the prescaler are combined in the control counter and the prescaler's division factor is switched 1/30 or 1/32 according to external control (1/32 when the PSC terminal is "H" and 1/30 when it is "L").

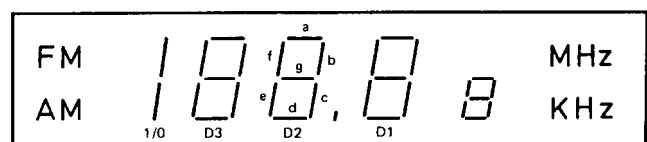
The station oscillator frequency is applied to the programmable divider, but the programmable divider has an upper frequency limit of only 30MHz, so the pulse swallow-type prescaler, which can be used up to 150 MHz, is inserted for division to $1/N_p$.

The signal is applied to the programmable divider and divided to $1/N$. The result is compared with a 25kHz frequency reference in the phase detector and the error is output as E_o until a match is obtained as in AM operation.

6. Frequency indicator circuit

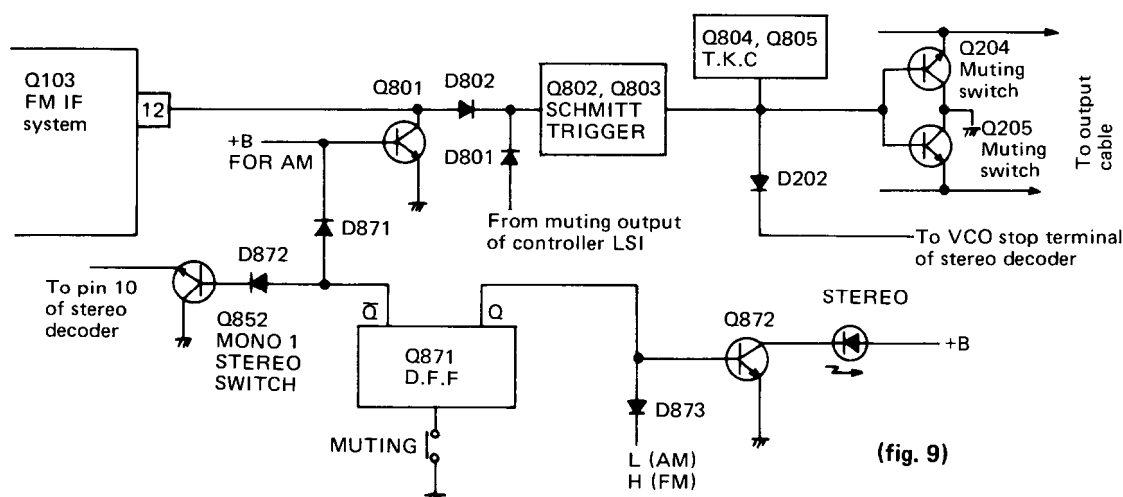


(fig. 8) TD6301AP Block diagram



Pin No.	Terminal	Description
1	L/D	Output indication switching input terminal: Fluorescent display at the low level, and LED display at the high level.
2	Data	Tuned frequency data input terminal: Input from the system controller LSI to the serial.
3,4	CK1, CK2	Tuned frequency data input control timing input terminal: Transferred simultaneously with data from the system controller LSI.
5	1/0	Segment drive output terminal: Sets the number of display digit for FM (100MHz) and AM (1,000kHz) reception.
6-12	a3-g3	Seven segment drive output terminals: Sets the number of display digit for FM(10MHz) and AM (100kHz) reception.
13, 15-20	a2-g2	Seven segment drive output terminals: Sets the number of display digit for FM (1MHz) and AM (10kHz) reception
21-27	a1-g1	Seven segment drive output terminals; set the number of display digit for FM (100kHz) and AM (1kHz) reception
14	V _{CC}	Power source terminal
28	Gnd	Ground

7. Muting circuit



The muting circuit operates in the following cases.

1. When power is turned on, the charging current goes from B+ to R814 to C805, so Q805 is cut off and Q204 and Q205 are turned on. When the voltage at both ends of C805 is more than about 0.6V, Q805 is turned on so Q204 and Q205 are turned off and muting is opened.
2. When power is turned off, Q804 turns off, the discharging current goes from C804 to R813 to D805 to Q204 and Q205 so muting is closed.
3. While pin 28 of the controller IC outputs the high level, Q204 and Q205 are turned on and muting is closed in the following cases: (1) While the manual UP/DOWN switch is being held down, (2) When a station in the

memory is recalled, and (3) While a radio station is being received using auto search tuning.

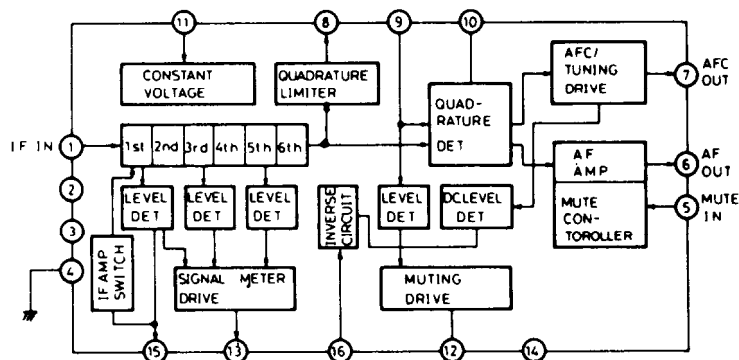
4. When an FM station is not being received (and the muting switch is on).

The IF level in the FM IF system (set at R116 so muting is opened at 17 dBf) and zero point detection circuit (tuning point ± 35 kHz) are output at pin 12 through the AND circuit. When a station is tuned, the output goes to the low level.

When output goes to the low level, Q802 is turned off, Q803 is turned on and Q204 and Q205 are turned off, so muting is opened;

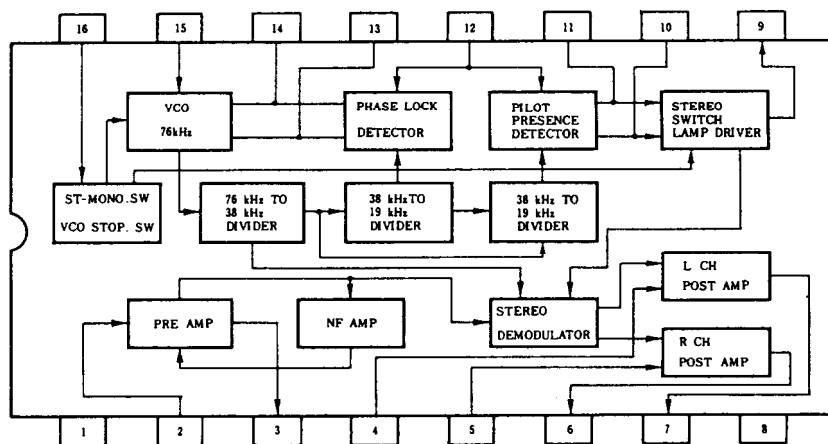
BLOCK DIAGRAM OF IC

μ PC1167C2 (FM IF SYSTEM)

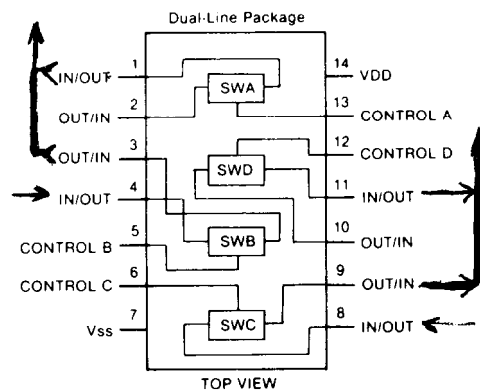


1. IF signal input
2. IF amplifier switch input
H level: Off
5. Muting switch input
6. Composite signal output
7. AFC output
8. IF amplifier output
9. 10.7MHz input
10. Reference voltage
11. Power supply
12. Muting output
Tuned: L level
13. Signal strength output
15. AGC output
16. Muting level

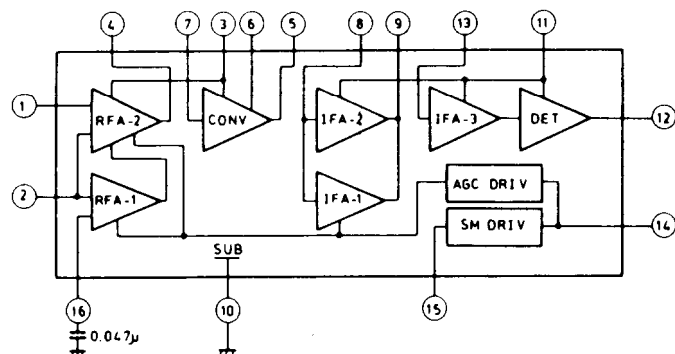
μ PC1161C3 (Stereo decoder)



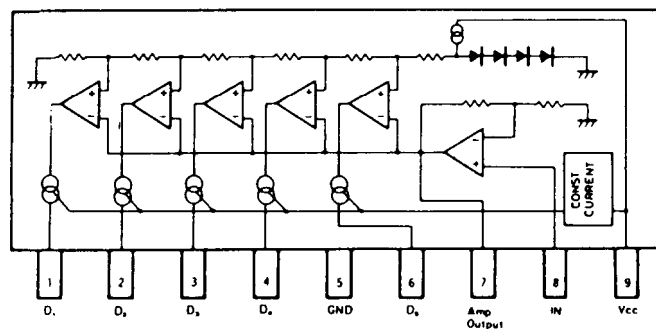
4066B (Analogue switch)



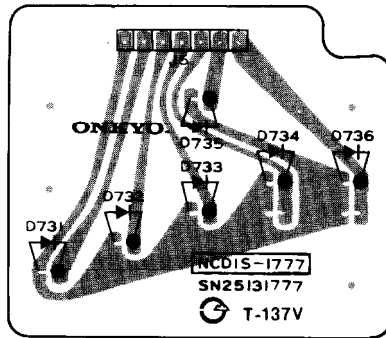
μ PC1243C (AM radio system)



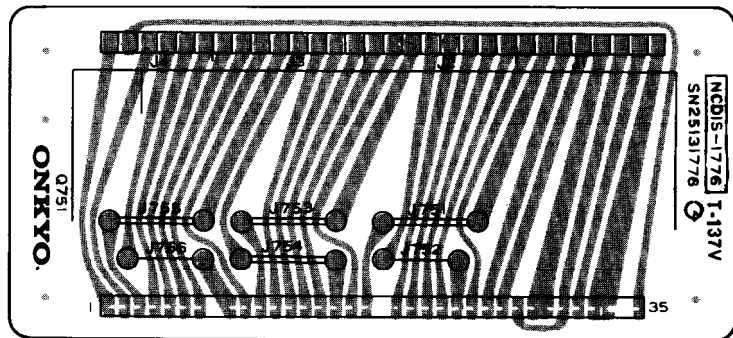
BA6124 (Signal meter drive)



PRINTED CIRCUIT BOARD VIEW FROM COMPONENT SIDE



SIGNAL AND STEREO
INDICATOR PC BOARD



FLUORESCENT INDICATOR TUBE PC BOARD

FLUORESCENT INDICATOR TUBE PC BOARD ASS'Y (NADIS-1776)

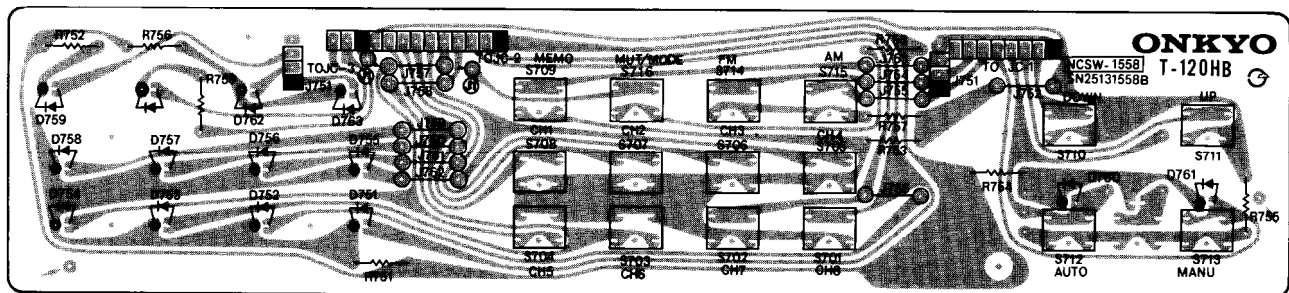
CIRCUIT NO.	PARTS NO.	DESCRIPTION
Q751	212016	FIP-7B8CS, Fluorescent indicator tube
	28140433	Cushion

SIGNAL AND STEREO INDICATOR PC BOARD ASS'Y (NADIS-1777)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
D731-D734	225047	SLP251B, LED
D735	225046	SLP151B, LED
D736	225047	SLP251B, LED

DIAL ILLUMINATION LAMP PC BOARD ASS'Y (NAPL-1778)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL902	210054A	PL6.3V, 250mA, lamp



SWITCH PC BOARD

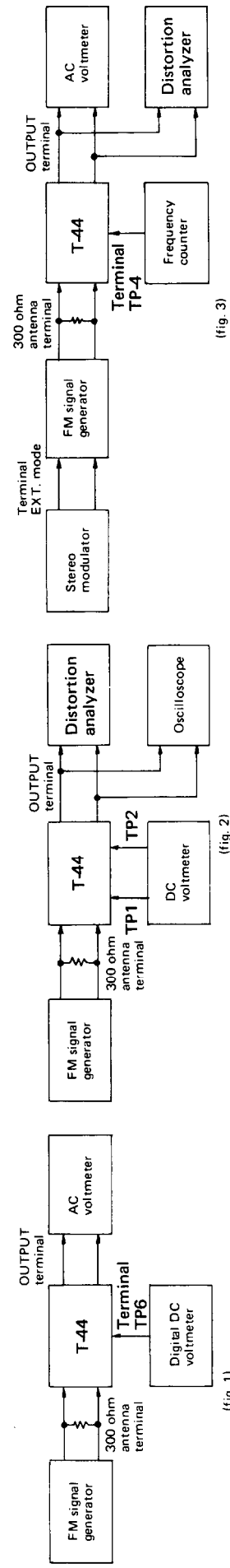
SWITCH PC BOARD ASS'Y (NASW-1558a)

CIRUCIT NO.	PARTS NO.	DESCRIPTION
D751-D758	225134	GL-3NG1, LED for stations
D759	225126	GL-3PR1, LED for memory
D760-D764	225134	GL-3NG1, LED
S701-S716	25035275	NPS-111-S239, Push switch
	27190178A	Holder, LED

ADJUSTMENT PROCEDURES

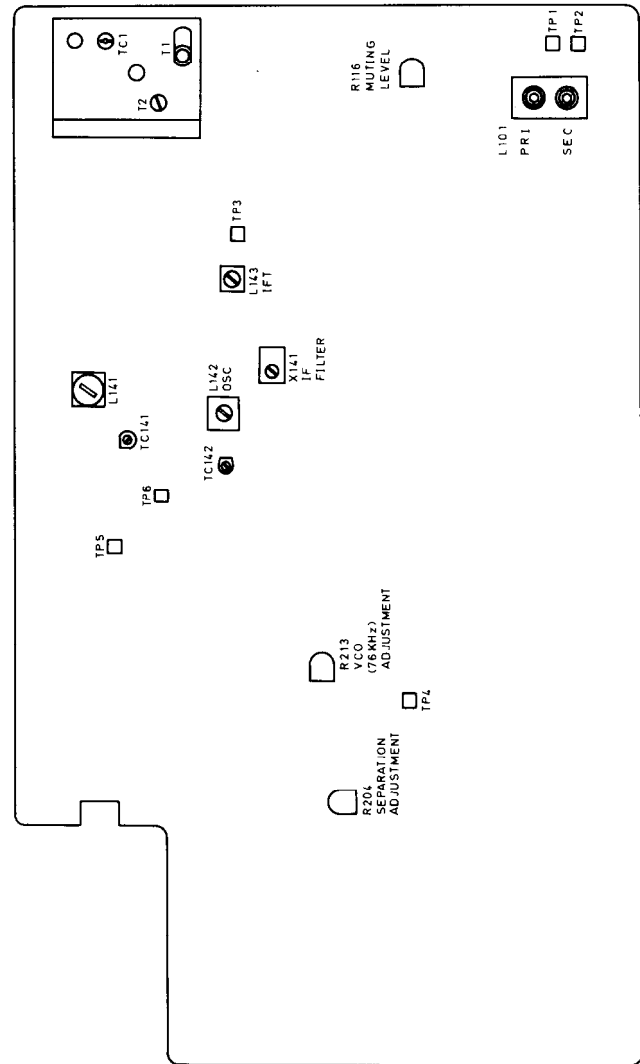
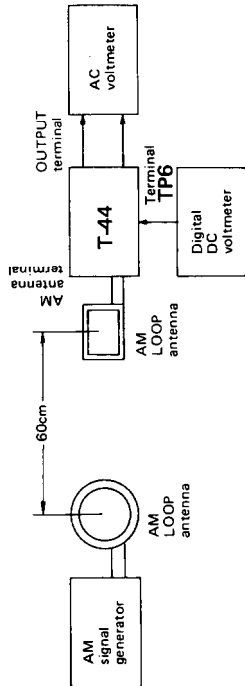
FM section

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Turning dial setting	Output indicator	Adjustment	Adjust for	Remarks
FM RF	1	Fig. 1	—	—	88.0 MHz	Digital DC voltmeter	T1	1.4V	
	2	Fig. 1	107.9 MHz 1 kHz, 75 kHz devi.	—	107.9 MHz	AC voltmeter	TC1	Maximum output	
FM IF	1	Fig. 2	—	—	No input signal	DC voltmeter	L101 Primary coil	0V	Repeat the steps 1 and 2 until no further adjustment is necessary
	2	Fig. 2	98.1 MHz 1 kHz, 75 kHz devi. 65 dBf (60 dB)	—	98.1 MHz	Distortion analyzer	L101 Secondary coil	Minimum	
VCO		Fig. 3	98.1 MHz, 1 kHz, 75 kHz devi. 65 dBf (60 dB)	—	98.1 MHz	Frequency counter	R213	19 kHz $\pm$ 19 Hz	Remove the frequency counter after adjustment
	1	Fig. 3	98.1 MHz 65 dBf (60 dB) Ext. modulation	L ch. 1 kHz	98.1 MHz	R ch. AC voltmeter	R204	Minimum	Maximum and same separation
Separation	2	Fig. 3	98.1 MHz 65 dBf (60 dB) Ext. modulation	R ch. 1 kHz	98.1 MHz	L ch. AC voltmeter		Minimum	
Distortion		Fig. 3	98.1 MHz 65 dBf (60 dB) Ext. modulation	L+R 1 kHz	98.1 MHz	Distortion analyzer	T2	Minimum	
Muting level	1	Fig. 2	98.1 MHz 17.2 dBf (12 dB) 1 kHz, 75 kHz devi.	—	98.1 MHz	Oscilloscope	R116	Signal output	Muting switch to on.
	2	Fig. 2	98.1 MHz 16.2 dBf (11 dB) 1 kHz, 75 kHz devi.	—	98.1 MHz	Oscilloscope		No output	

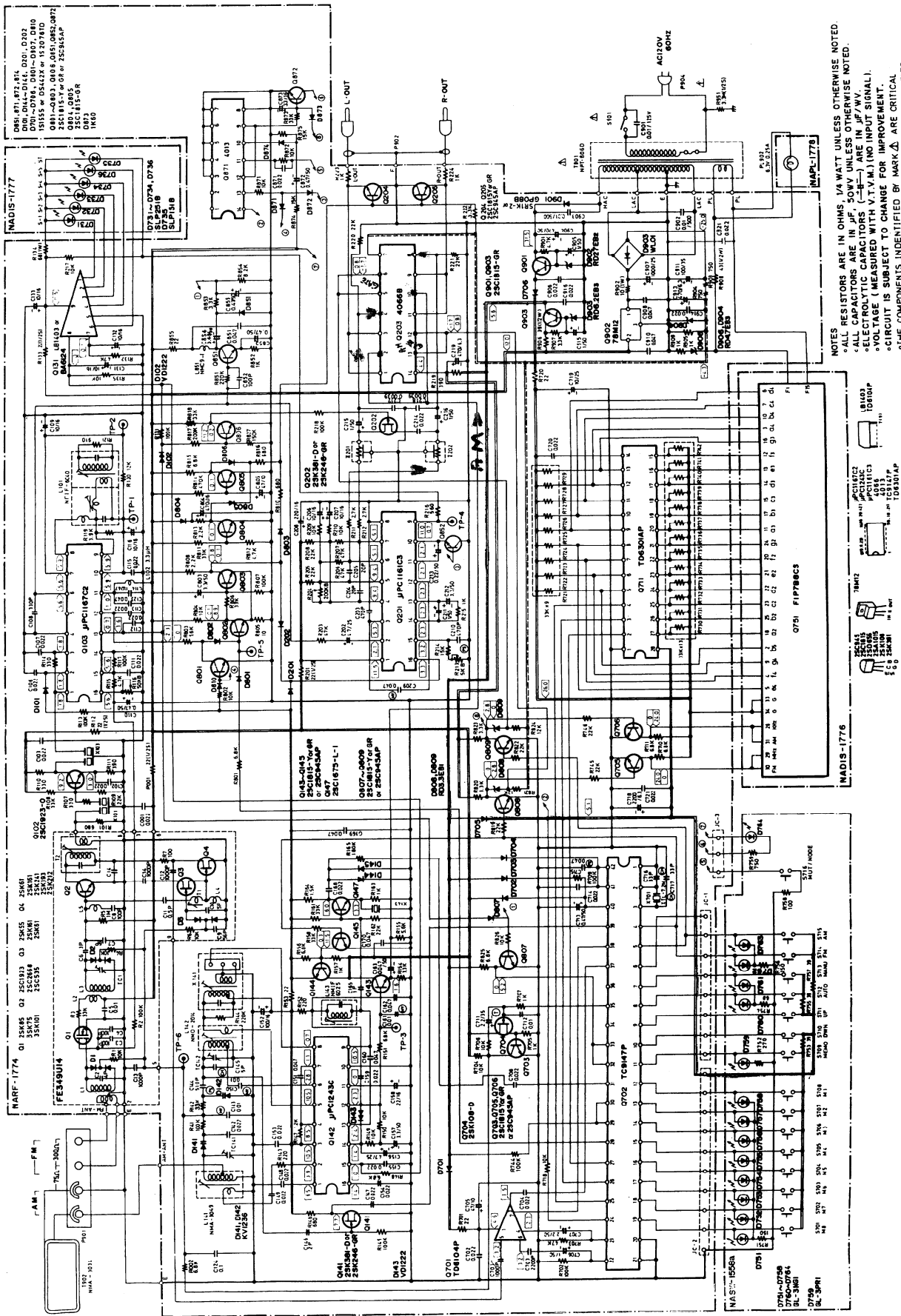


AM section

Step	AM SG output	Tuned frequency	Output indicator	Adjustment point	Adjust for	Remarks
1	1000kHz 400Hz 30% mod.	1000kHz	AC voltmeter	X141 L143	Maximum	
2		520kHz	Digital DC voltmeter	L142	0.8V	Repeat the steps 2 and 3 until no further adjustment is necessary.
3		1710kHz	Digital DC voltmeter	TC142	9.0V	
4	600kHz 400Hz 30% mod.	600kHz	AC voltmeter	L141	Maximum	Repeat the steps 4 and 5 until no further adjustment is necessary.
5	1400kHz 400Hz 30% mod.	1400kHz	AC voltmeter	TC141	Maximum	



SCHEMATIC DIAGRAM



NOTES

- ALL RESISTORS ARE IN OHMS. VA WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μ F. 50VW UNLESS OTHERWISE NOTED.
- —W— ARE IN μ F/WV.
- ELECTROLYTIC CAPACITORS (—E—) ARE IN μ F/WV.
- VOLTAGE (MEASURED WITH V.T.V.M.) (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.
- THE COMPONENTS IDENTIFIED BY MARK Δ ARE CRITICAL FOR REPAIRS. REPLACE ONLY WITH PART NUMBER SPECIFIED.

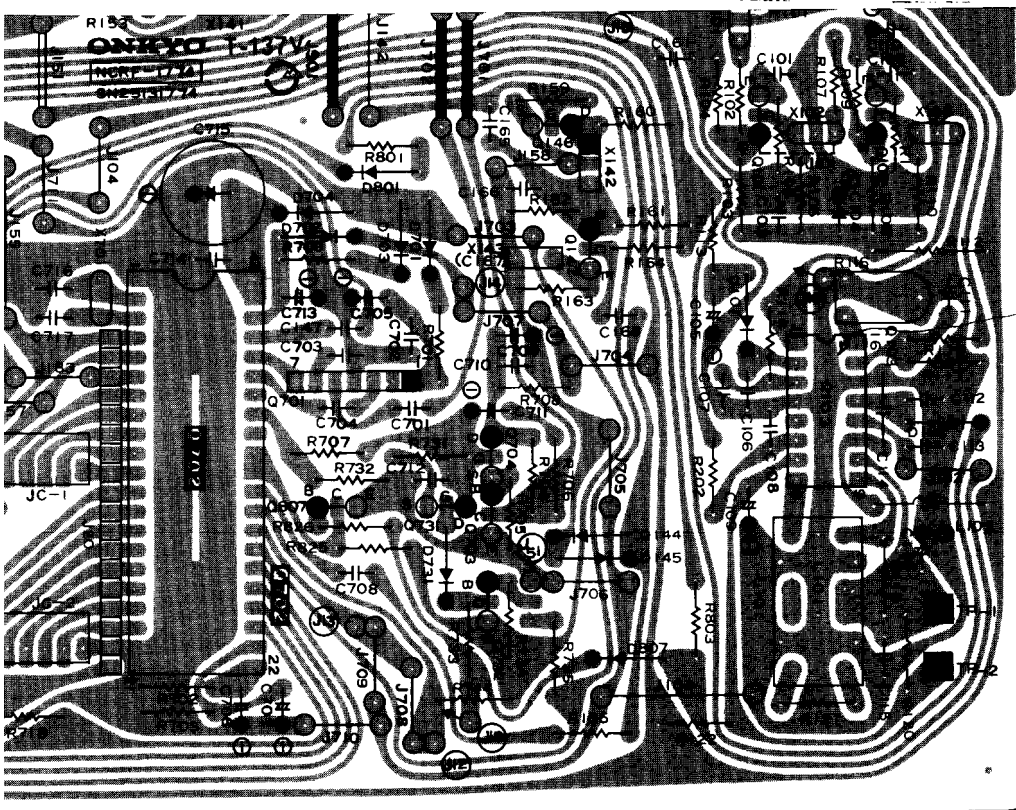
ONKYO CORPORATION

SUBSTITUTIVE PARTS LIST

TYPE	CIRCUIT NO.	DESCRIPTION	REGULAR PARTS	SUBSTITUTIVE PARTS	APPLICATION
UD	Q103	IC	MPC1167C2	MPC1167C2 (RED)	921-1520
UD	Q201	IC	MPC1161C3	MPC1161C	921-1520

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Q103
FM, I.F. SYSTEM
PIN & AUDIO OUT

PRINTED CIRCUIT BOARD-PARTS LIST

FM/AM TUNER PC BOARD (NARF-1774)

CIRCUIT NO. PARTS NO. DESCRIPTION

ICs
 Q103 222608 μ PC1167C2, FM IF system
 Q131 222666 or LB1403 or
 222670 BA6124, Signal indicator driver
 Q142 222629 μ PC1243C, AM radio system
 Q201 222678 μ PC1161C3, Stereo decoder
 Q203 222575 or TC4066BP or
 222840661 4066B, Analogue switch
 Q701 222675 TD6104P, Prescaler
 Q702 222674 TC9147P, Controller
 Q711 222673 TD6301AP, Static frequency
 indicator driver
 Q871 222840131 4013B, D flip-flop
 Q902 222780122 78M12, Constant voltage

Transistors
 Q102 2211723 2SC1923 (O)
 Q141, Q202 2212304 or 2SK381 (D) or
 2211945 2SK246 (GR), FET
 Q143-Q145 2211254, 2SC1815 (Y),
 Q204, Q205 2211255 or 2SC1815 (GR) or
 Q705, Q706 2210746 2SC945A (P)
 Q147 2210823 2SC1675 (L-1)
 Q703 2211255 2SC1815 (GR)
 Q704 2212294 2SK108 (D), FET
 Q801-Q803 2211254, 2SC1815 (Y),
 Q806-Q809 2211255 or 2SC1815 (GR) or
 2210746 2SC945A (P)
 Q804, Q805 2211255 2SC1815 (GR)
 Q851, Q852 2211255 or 2SC1815 (GR) or
 Q872 2210746 2SC945A (P)
 Q901, Q903 2211255 2SC1815 (GR)

Diodes
 D101, D144 223105, 1S1555,
 D145, D201 223133 or DS442X or
 D202 223145 1S2076TD
 D102, D143 4000068 VD1222
 D141, D142 223140 KV1236
 D701-D706 223105, 1S1555,
 D801-D807 223133 or DS442X or
 D810, D851 223145 1S2076TD
 D808, D809 2241291 RD3.3EB1
 D852, D871 223105, 1S1555,
 D872, D874 223133 or DS442X or
 223145 1S2076TD
 D873 2231031 or 1N60 (ONK) or
 223147 1N60 (FM)
 D901 223804 or SR1K-2 or
 223848 GP08B
 D902 2239792 RD27EB2
 D903 223862 WL01
 D904, D906 2239433 RD4.7EB3
 D905 2239493 RD6.2EB3

Front end
 TU001 240061 FE349U14

Transformers
 L101 233270 NFIF-6040
 L143 232095 NMIF-6025

Coils
 L102 233105 or NCCH-1005 or
 233024 NCCH-1501
 L141 232113 NMA-3049
 L142 232084 NMO-2018
 L851 233031 NMC-9-1

Ceramic filters
 X101, X103 3010071 SFE-10.7MA5 (Red), FM IF
 X141 3010075 SFL450B3, AM IF
 X143 3010076 BFU450U, AM IF

CIRCUIT NO. PARTS NO. DESCRIPTION

X701 3010073 X'tal
 Z201, Z202 3020016 Notch filters
 B3XN4123-32N

Capacitors
 TC141, TC142 3060010 NTC-20P09, Trimmer
 C109 352741009 10 μ F, 16V, Elect.
 C110 352784799 0.47 μ F, 50V, Elect.
 C116 352741009 10 μ F, 16V, Elect.
 C131-C133 352741009 10 μ F, 16V, Elect.
 C144 370135114 510pF $\pm$ 5%, 100V, APS
 C152 352741019 100 μ F, 16V, Elect.
 C156 352750479 4.7 μ F, 25V, Elect.
 C157 352780339 3.3 μ F, 50V, Elect.
 C158 352742209 22 μ F, 16V, Elect.
 C163 352784799 0.47 μ F, 50V, Elect.
 C202 352750479 4.7 μ F, 25V, Elect.
 C206, C207 352741009 10 μ F, 16V, Elect.
 C208 352742219 220 μ F, 16V, Elect.
 C210 370134714 470pF, $\pm$ 5%, 100V, APS
 C211 352780109 1 μ F, 50V, Elect.
 C212 352780339 3.3 μ F, 50V, Elect.
 C213 352782299 0.22 μ F, 50V, Elect.
 C215, C216 352780109 1 μ F, 50V, Elect.
 C219 352724719 470 μ F, 6.3V, Elect.
 C705 352734709 47 μ F, 10V, Elect.
 C706 352780109 1 μ F, 50V, Elect.
 C707 352780229 2.2 μ F, 50V, Elect.
 C711 395160227 2.2 μ F, 35V, Tantalum
 C713 352784799 0.47 μ F, 50V, Elect.
 C715 3020018 0.047F, 5V, Super
 C718 352722229 2,200 μ F, 6.3V, Elect.
 C719 352751009 10 μ F, 25V, Elect.
 C803 352780339 3.3 μ F, 50V, Elect.
 C804 352744719 470 μ F, 16V, Elect.
 C805 352734709 47 μ F, 10V, Elect.
 C853-C855 352784799 0.47 μ F, 50V, Elect.
 C872 352784799 0.47 μ F, 50V, Elect.
 C873 352743309 33 μ F, 16V, Elect.
 C904 352784719 470 μ F, 50V, Elect.
 C905 352780109 1 μ F, 50V, Elect.
 C907 352751029 1,000 μ F, 25V, Elect.
 C911 352761019 100 μ F, 35V, Elect.
 C913 352724719 470 μ F, 6.3V, Elect.
 C915 352780109 1 μ F, 50V, Elect.

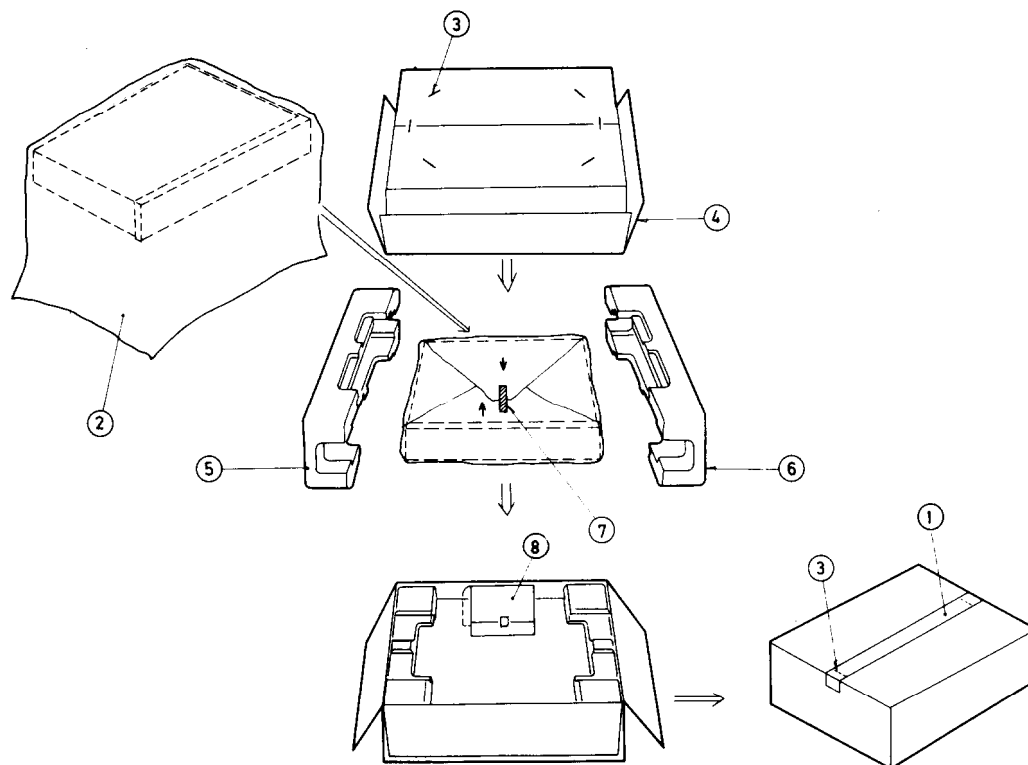
Resistors
 R001, R112 431522205 22ohm, 1/2W, Solid
 R116 5215046 N08HR50KBC, Semi-fixed
 R134 441626804 68ohm, 1W, Metal oxide film
 R133, R201 431522205 22ohm, 1/2W, Solid
 R204 5215048 N08HR200KBC, Semi-fixed
 R213 5215044 N08HR5KBC, Semi-fixed
 R721-R729 49121333509 33kohm $\times$ 9, 1/8W, Network
 R730-R742 49121333513 33kohm $\times$ 13, 1/8W, Network
 R902 441621004 10ohm, 1W, Metal oxide film
 R906 441523904 39ohm, 1/2W, Metal oxide film
 R908 441524304 43ohm, 1/2, Metal oxide film

Radiator
 27160011A

Sockets
 25050140 NJPS-3P-S
 25050145 NJPS-8P-S
 25050147 NJPS-10P-S

Holder
 27190231

PACKING VIEW



REF. NO.	PARTS NO.	DESCRIPTION
1	260012	50x580mm, Dampion tape
2	29100051	420x750mm, Poly-vinyl bag
3	282301	Sealing hook
4	29050802	Master carton box
	29050803	Master carton box (B)
5	29090533D	Pad R
6	29090532A	Pad L
7	29110032	W = 15mm, Adhesive tape
8	Accessory bag complete	
	U.S.A model	
	292064A	FM antenna
	29100006A	350x250mm, Poly-vinyl bag
	29340716	Instruction manual
	29365006-5	Warranty card
	29358002A	Service station list
	120V model	
	292064A	FM antenna
	29100006A	350x250mm, Poly-vinyl bag
	29340716	Instruction manual

Note: (B): Only black model

ONKYO CORPORATION

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Telex: 2423551 ONKYO J. Phone: 03-432-6981

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