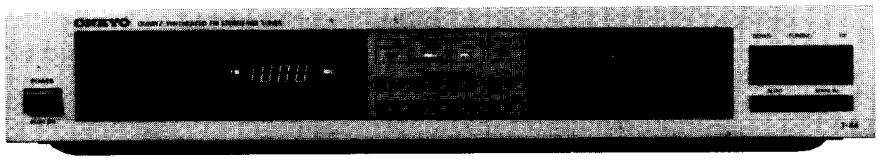
SERIAL NO. 3163

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 ⚠ 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.

ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

FM:

Tuning Range:	87.5 – 108.0 MHz (100 kHz steps)
Usable Sensitivity:	Mono: 10.8 dBf, 1.9 μV, IHF Stereo: 17.2 dBf, 4.0 μV
50 dB Quieting Sensitivity:	Mono: 16.1 dBf, 3.5 μV Stereo: 36.1 dBf, 35 μV
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 (±400 kHz)
AM Suppression Ratio:	50 dB
Total Harmonic Distortion:	Mono: 0.1% Stereo: 0.2%
Frequency Response:	30 – 15,000 Hz ±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 μV

AM:

Tuning Range:	520–1710 kHz (10 kHz steps)
Usable Sensitivity:	25 μV
Image Rejection Radio:	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 ares 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 mesurement

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

Specification; 500V, 3.3MΩ ±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.

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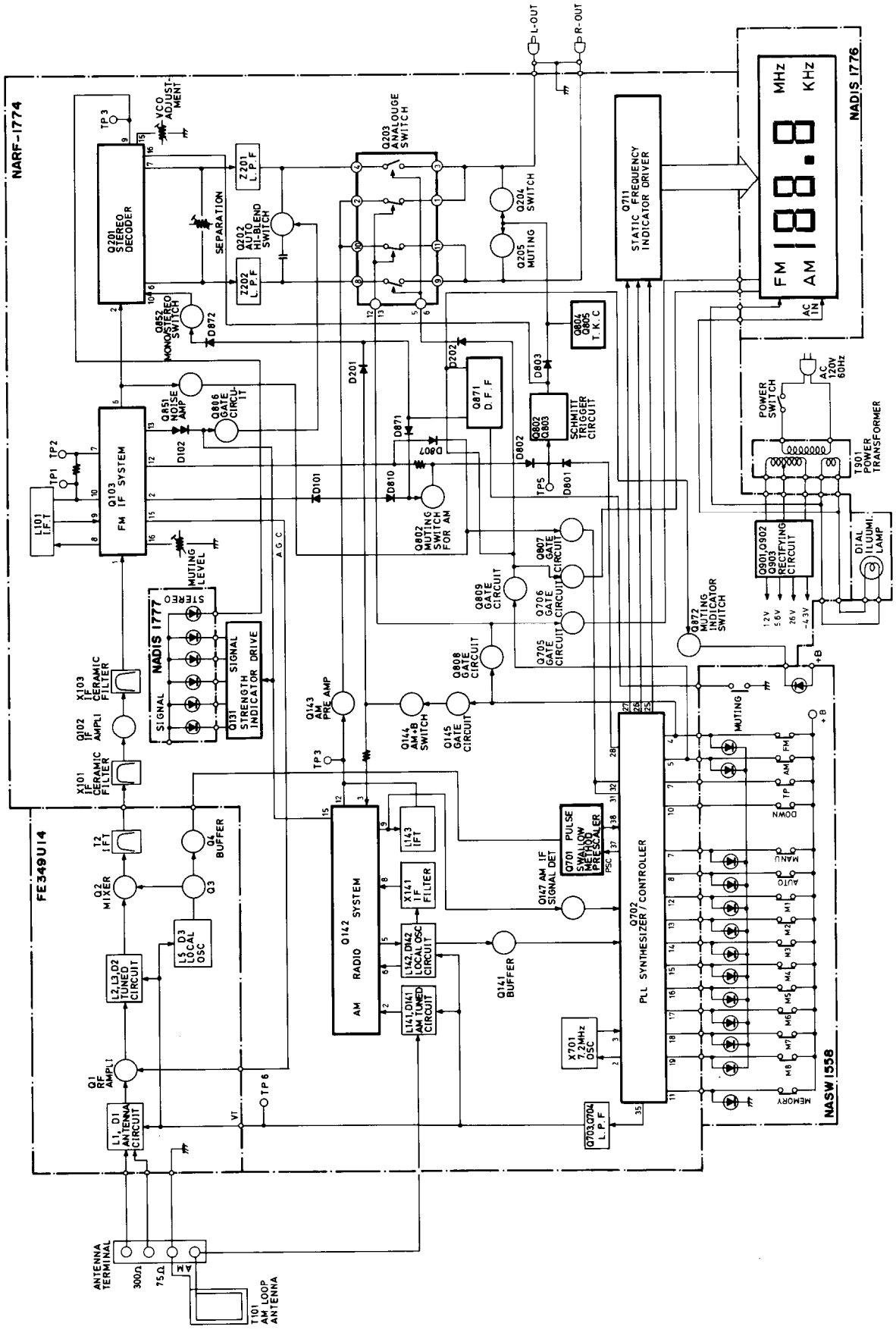
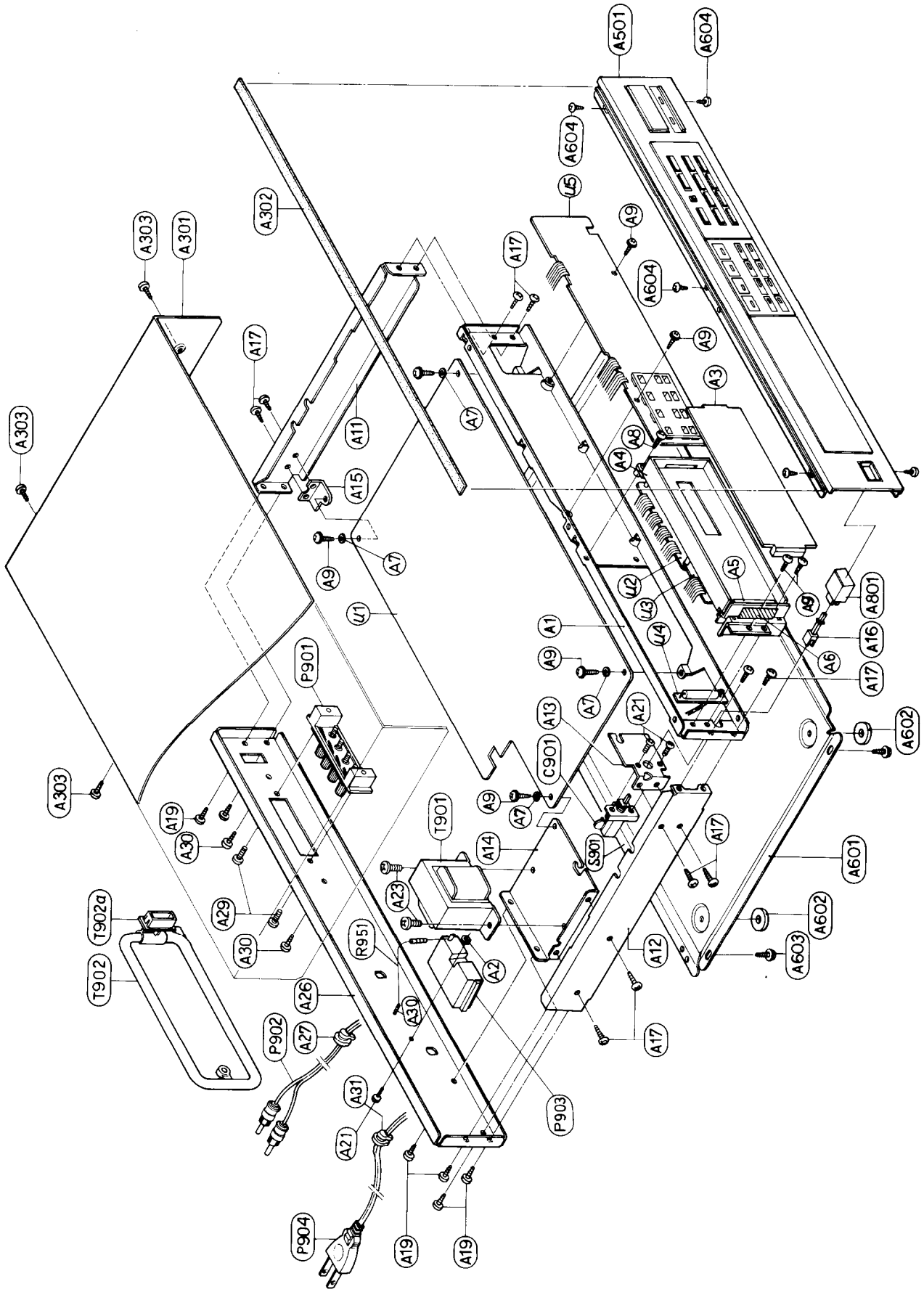
BLOCK DIAGRAM



EXPLODED VIEW



PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION
A1	27110183A	Front bracket
A2	863430	N-3F-N (BC), Nut
A3	28130198	Dial plate
A4	27190179A	Holder, lamp
A5	28140456	2x40x4mm, Cushion
A6	28140460	0.5x22x12mm, Cushion
A7	870060	Washer
A8	833430088	3TTP+8P (BC), Tapping screw
A9	831430088	3TTW+8B (BC), Tapping screw
A11	27115045H	Side bracket R
A12	27115090B	Side bracket L
A13	27140721A	Bracket, switch
A14	27130327	Bracket, power transformer
A15	27140320A	Bracket, pcb
A16	27260062	Shaft
A17	834430068	3TTS+6B (BC), Tapping screw
A19	834430068	3TTS+6B (BC), Tapping screw
A21	82143006	3P+6FN (BC), Pan head screw
A23	838440089	4TTB+8C (BC), Tapping screw
A24	27120532	Back panel
⚠ A27, A31	270025	SR-3P-4, Strainrelief
A29	834430108	3TTS+10B (BC), Tapping screw
A30	834230108	3TTS+10B (Ni), Tapping screw
A301	28184154A	Top cover
	28184200	Top cover (B)
A302	28140024	0.5x10x390mm, Cushion
A303	834430068	3TTS+6B (BC), Tapping screw

Note: (B): Only black model

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

REF. NO.	PARTS NO.	DESCRIPTION
A501	13058121	Front panel ass'y
	28191151A	Clear plate
	27215082	Decoration frame
	27140784	Bracket S for ground
	27180146	Spring
	28320886	Knob, tuning
	28320871	Knob, push
	28320935	Knob, auto/manual
	28321887	Knob, memory
	28321223	Knob, muting/mode
	13008121	Front panel ass'y (B)
	28191151A	Clear plate
	27215083	Decoration frame
	27180146	Spring
	28321226	Knob, tuning
	28321227	Knob, push
	28320935	Knob, auto/manual
	28321224	knob, muting/mode
	28321225	Knob, memory
A601	27170093B	Bottom board
A602	27175011C	Leg
A603	834430068	3TTS+6B (BC), Tapping screw
A604	838430068	3TTB+6B (BC), Tapping screw
A605	28140044	2x12x12mm, Cushion
A801	28320852	Knob, power
	28321160	Knob, power (B)
⚠ 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

REF. NO.	PARTS NO.	DESCRIPTION
⚠ T901	230683	NPT-806D, Power transformer
T902	232085	NMA-3034, AM loop antenna
T902a	27190105	Holder, antenna
U1	13058574	NARF-1774, FM/AM tuner pc board ass'y
U2	13058576	NADIS-1776, Fluorescent indicator tube pc board ass'y
U3	13058577	NADIS-1777, Signal and stereo indicator pc board ass'y
U4	13058578	NAPL-1778, Dial plate illumination lamp pc board ass'y
U5	13058558A	NASW-1558a, Switch pc board ass'y

1. Synthesizer and controller operation

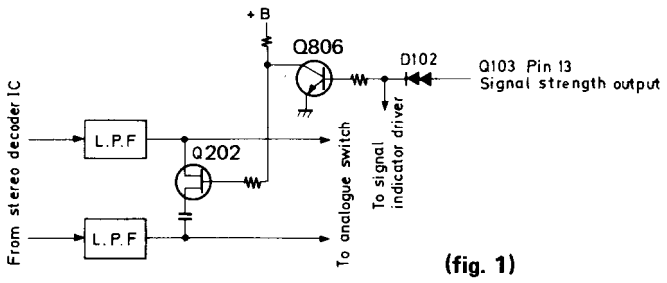
Pin No.	Symbol	Terminal	Description
1	GND	Ground	
2	XT	X'tal	Connected to the 7.2MHz crystal oscillator for the reference frequency.
3	XT		
4	FM	FM band specification input	Mutual reset type, performs switching of each band, FM/MW/LW.
5	MW	MW band specification input	
6	LW	LW band specification input	
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	0/5	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	$\overline{INH}$	Inhibit input	Operates normally at the high level. Inhibit status at the low level.
41	$\overline{INT}$	Initialize input	Operates normally at the high level. At the low level, the internal status is initialized.
42	V_{DD}	Power suuply	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 ~ 1710 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

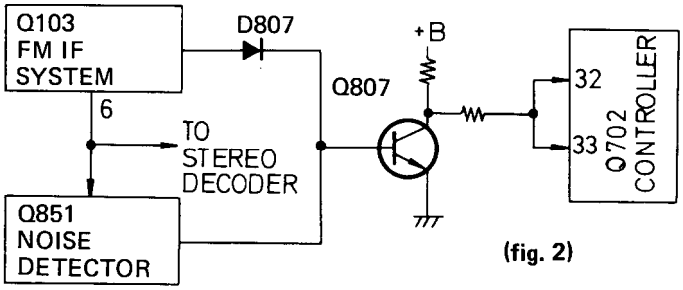
2. Auto-Hi-blend circuit



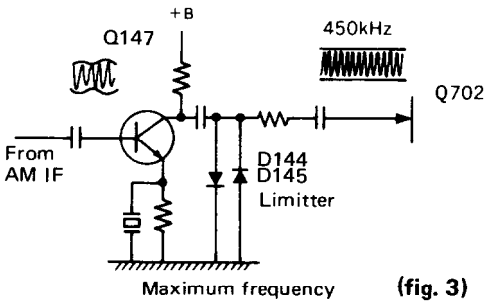
(fig. 1)

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.

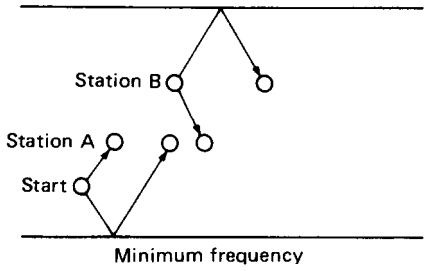
3. Auto-search tuning circuit



(fig. 2)



(fig. 3)



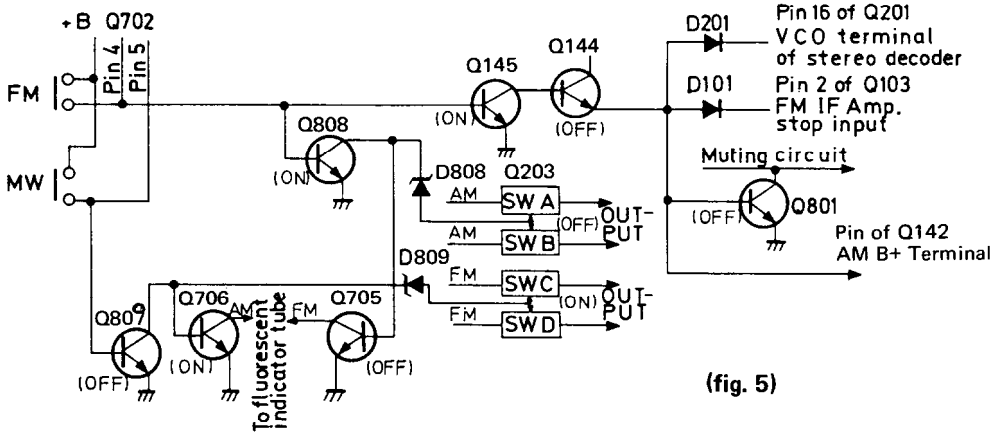
(fig. 4)

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 roached. 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

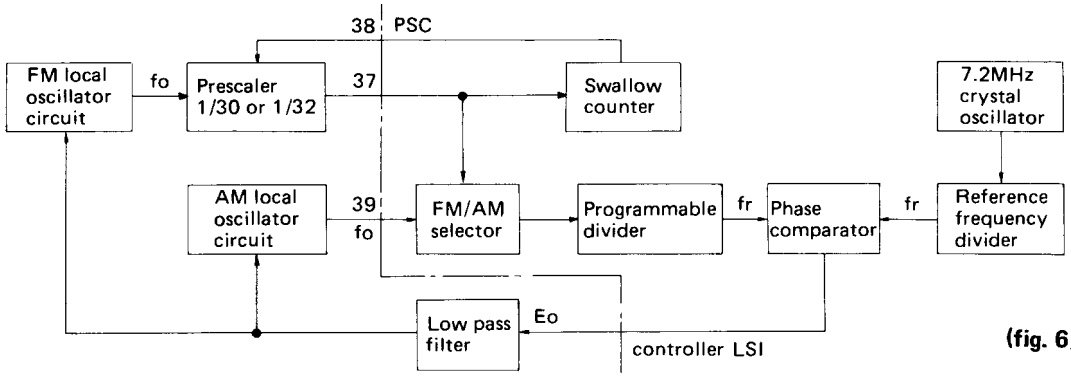


(fig. 5)

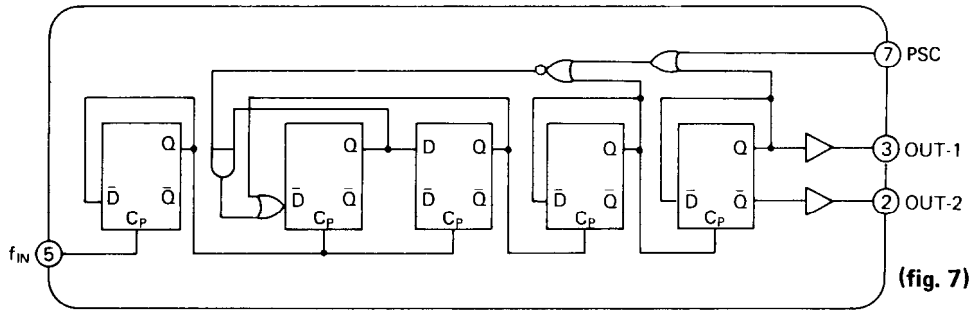
The FM/AM selector circuit is shown in the diagram. fig. 5. Pins 4 and 5 of Q702 are of the mutual reset type. For FM, pin 4 is high and pin 5 is low; for AM, pin 4 is low and pin 5 is high. Because pin 5 is high and pin 4 is low during AM reception, Q809 is on and Q808 is off, the analog switches SW1 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 parenthese 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 fv. This is applied to the phase comparator where it is comparated with frequency reference fr (10kHz). If fr and fv differ, Eo equal to the difference in frequency is output. Since error output Eo is a pulse waveform, it is passed through the low pass filter to change it into DC voltage VD, which is applied to the variable capacitor diode in the front end to change the reception frequency. This continues until fv and fr are the same and Eo = 0.

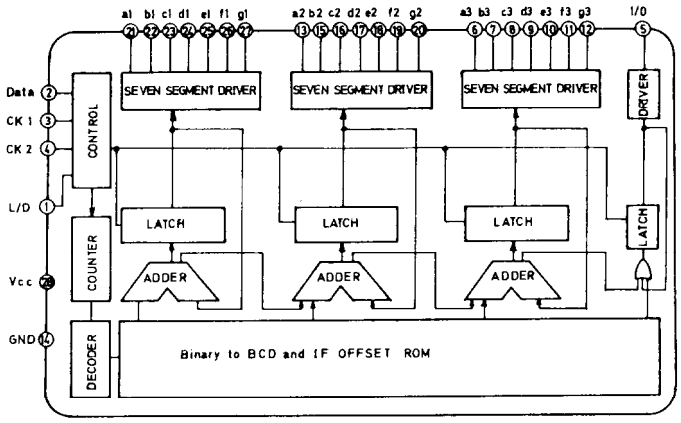
Operation during FM reception

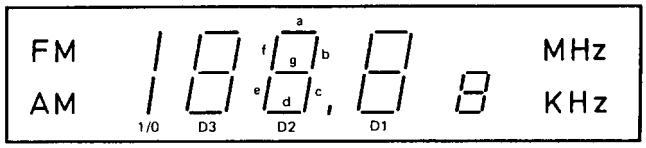
The pulse swallow method is used in the prescaler of the T-44. In this type of prescaler, a supplementary number (changed according to the program code input) and the divided reception frequency from the prescaler are combined in the control counter and the prescaler's division factor is switched 1/30 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 ot the programmable divider, but the programmable divider has en 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/Np;

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

6. Frequency indicator circuit

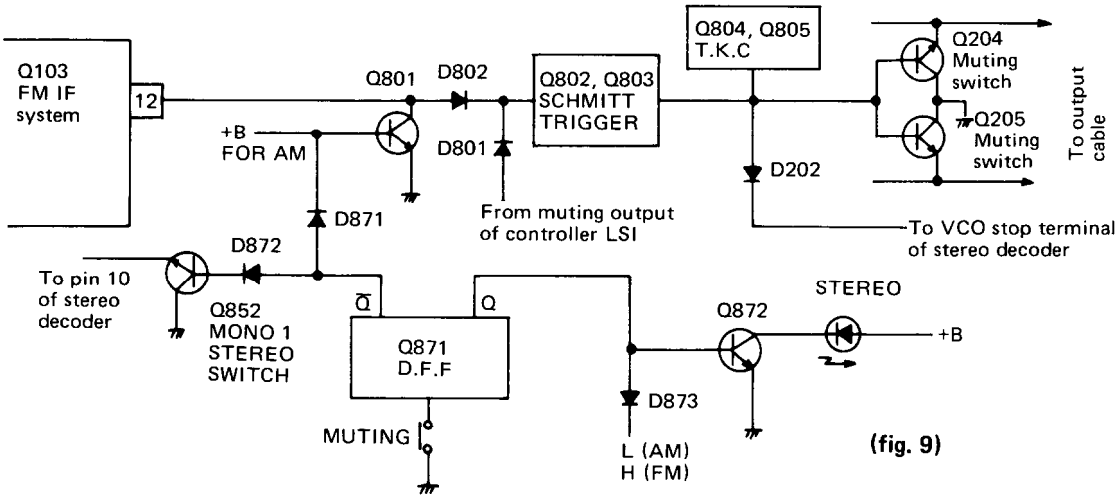




(fig. 8) TD6301AP Block diagram

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	Vcc	Power source terminal
28	Gnd	Ground

7. Muting circuit



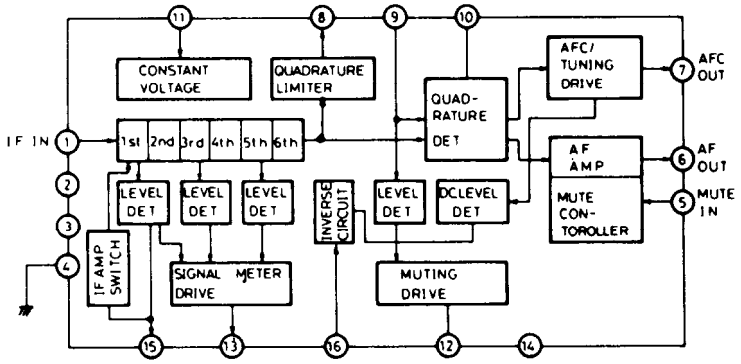
(fig. 9)

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 ±35kHz) 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;

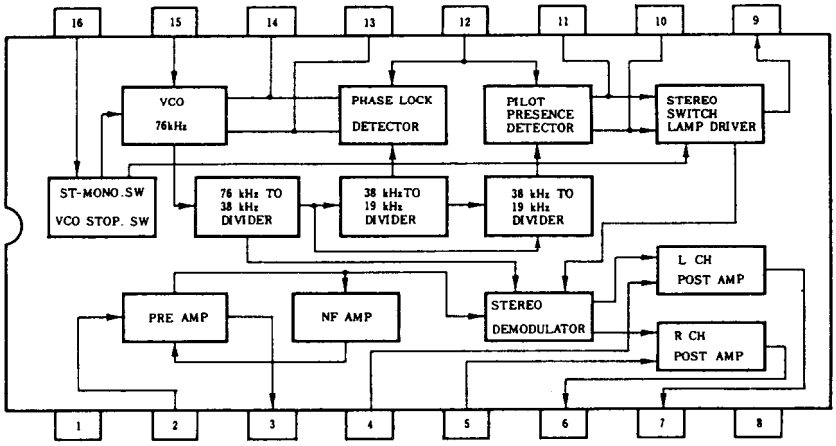
BLOCK DIAGRAM OF IC

μPC1167C2 (FM IF SYSTEM)

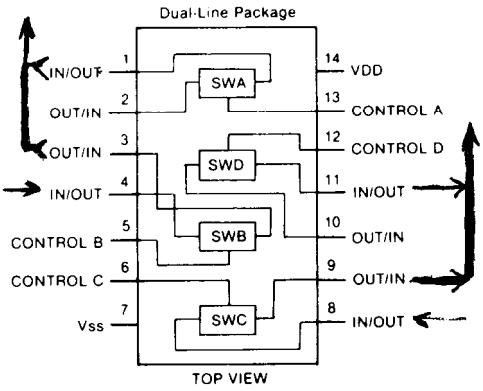


1. IF signal input
2. IF amplifier switch input
   H level: Off
5. Muting switch input
6. Composite signal output
7. AFC output
8. IF amplifier output
9. 10.7MHz input
10. Reference voltage
11. Power supply
12. Muting output
    Tuned: L level
13. Signal strength output
15. AGC output
16. Muting level

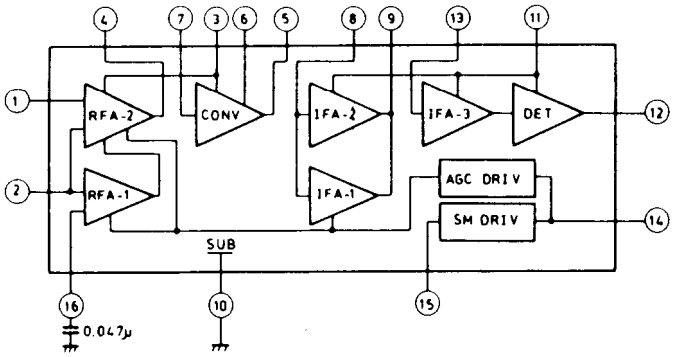
μPC1161C3 (Stereo decoder)



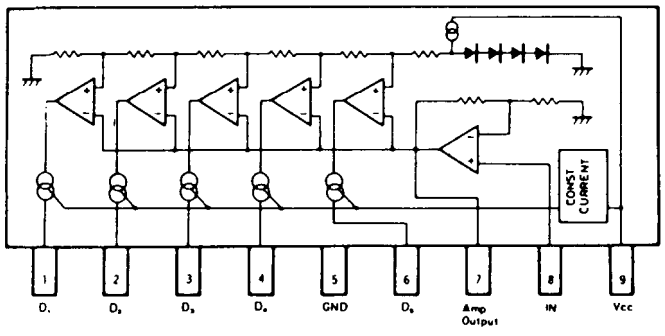
4066B (Analogue switch)



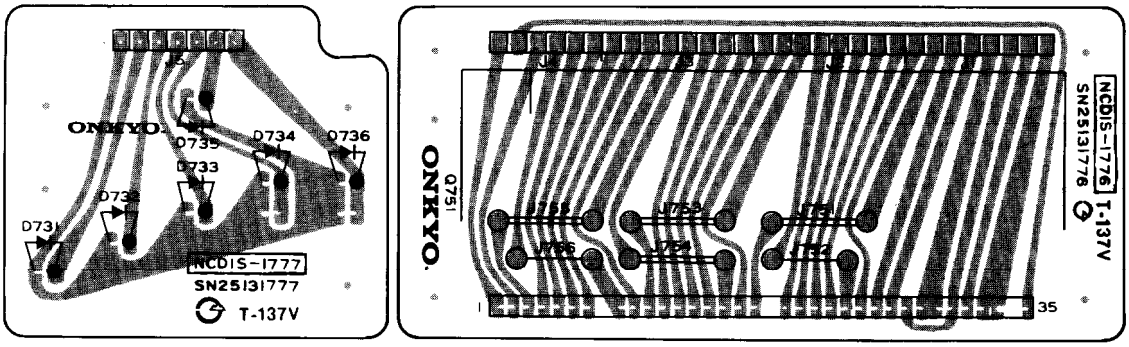
μPC1243C (AM radio system)



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)

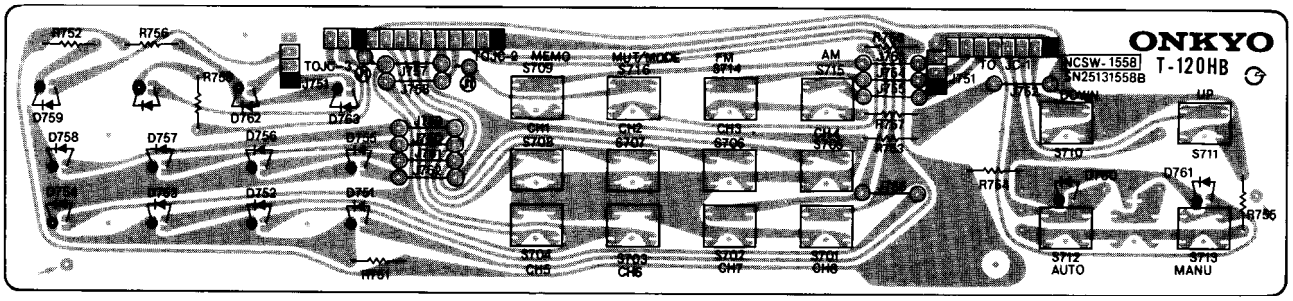
CIRCUIT NO.	PARTS NO.	DESCRIPTION
Q751	212016	FIP-7B8CS, Fluorescent indicator tube
	28140433	Cushion

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

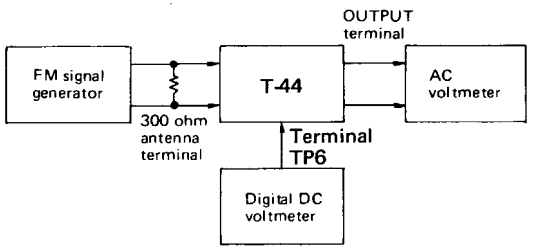
SWITCH PC BOARD ASS'Y (NASW-1558a)

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

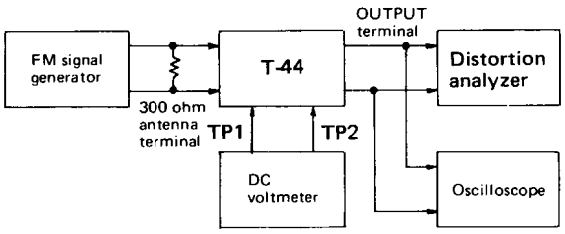
ADJUSTMENT PROCEDURES

FM section

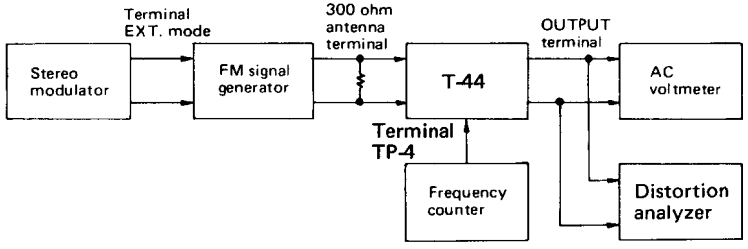
Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Turning dial setting	Output indicator	Adjustment	Adjust for	Remarks
FM RF	1	Fig. 1	—	—	88.0 MHz	Digital DC voltmeter	T1	1.4V	
	2	Fig. 1	107.9 MHz 1 kHz, 75 kHz devi.	—	107.9 MHz	AC voltmeter	TC1	Maximum output	
FM IF	1	Fig. 2	—	—	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 ± 19 Hz	Remove the frequency counter after adjustment
Separation	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
	2			R ch. 1 kHz		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		98.1 MHz 16.2 dBf (11 dB) 1 kHz, 75 kHz devi.					No output	



(fig. 1)



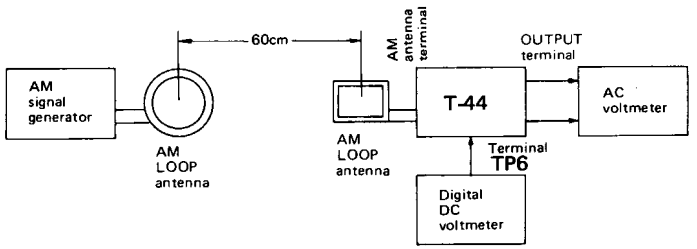
(fig. 2)

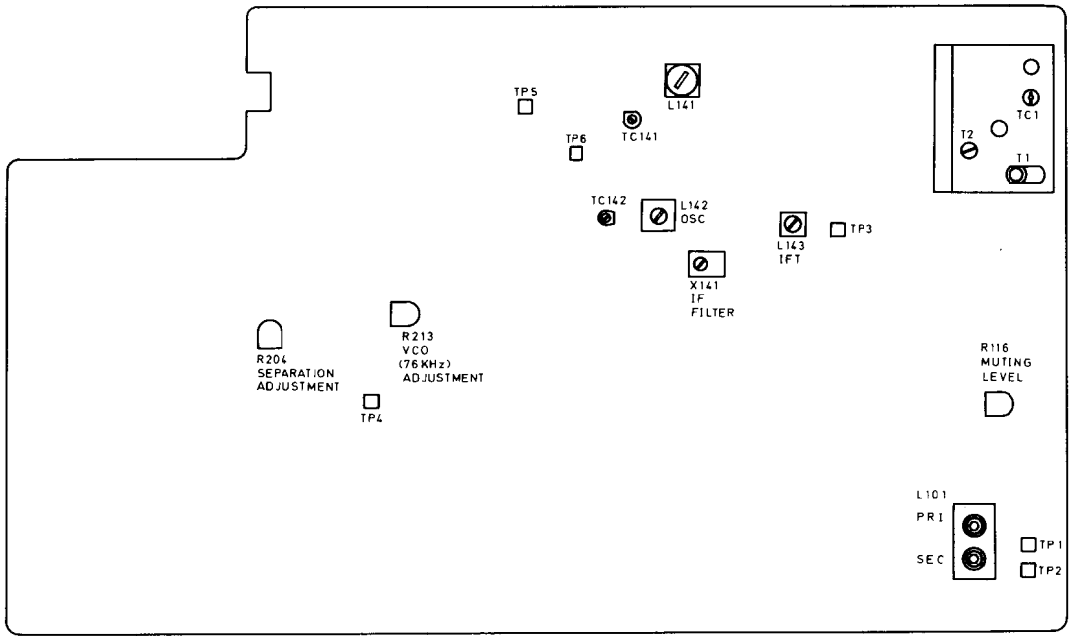


(fig. 3)

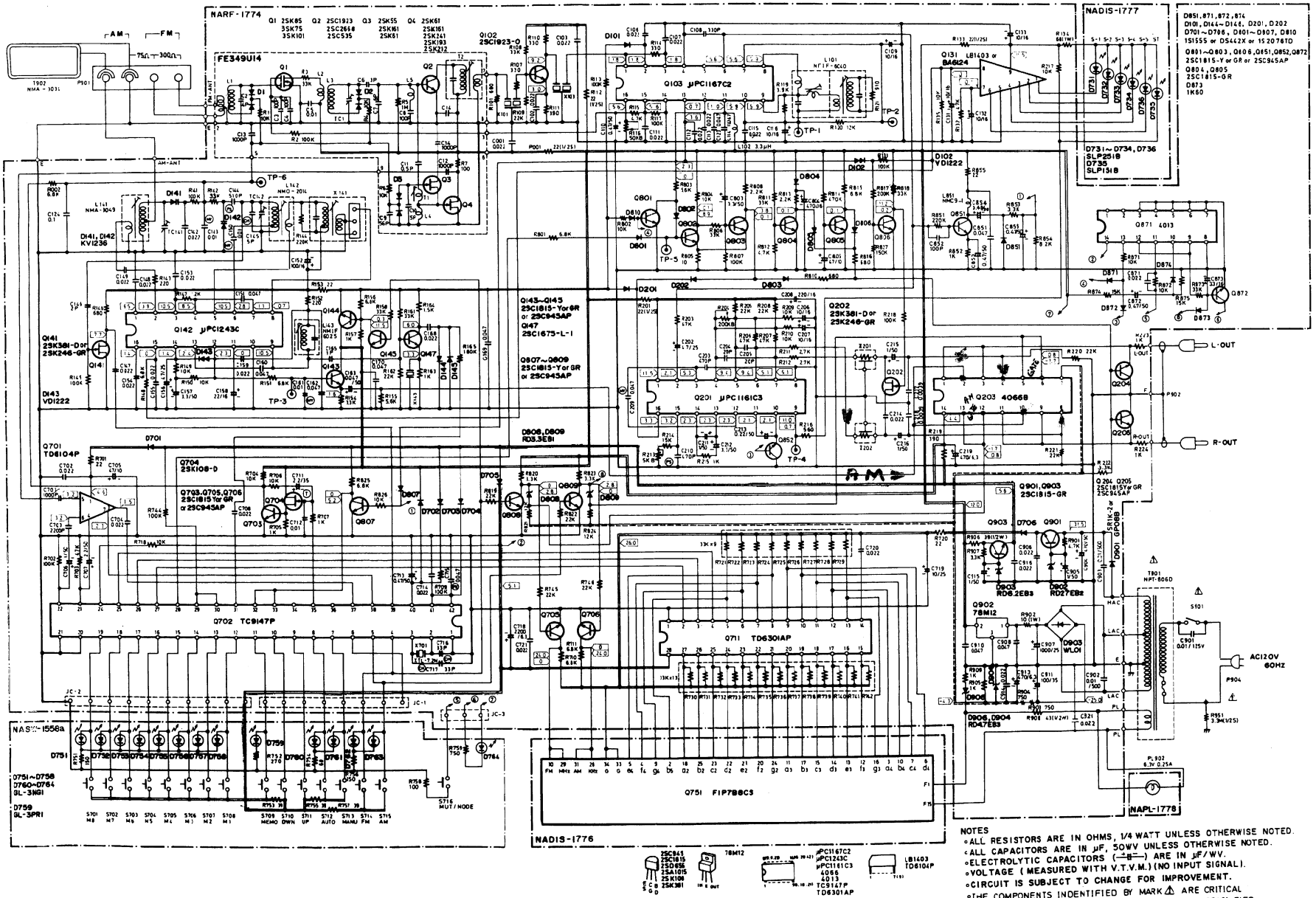
AM section

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, 1/4 WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF, 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (⊣⊢) ARE IN μF/WV.
- VOLTAGE (MEASURED WITH V.T.V.M.)(NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.
- THE COMPONENTS INDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY REPLASE ONLY WITH PART NUMBER SPACI FIED

MODEL T-44

SUBSTITUTIVE PARTS LIST

NOTE:USE THE REGULAR PARTS WHEN REPLACEMENT

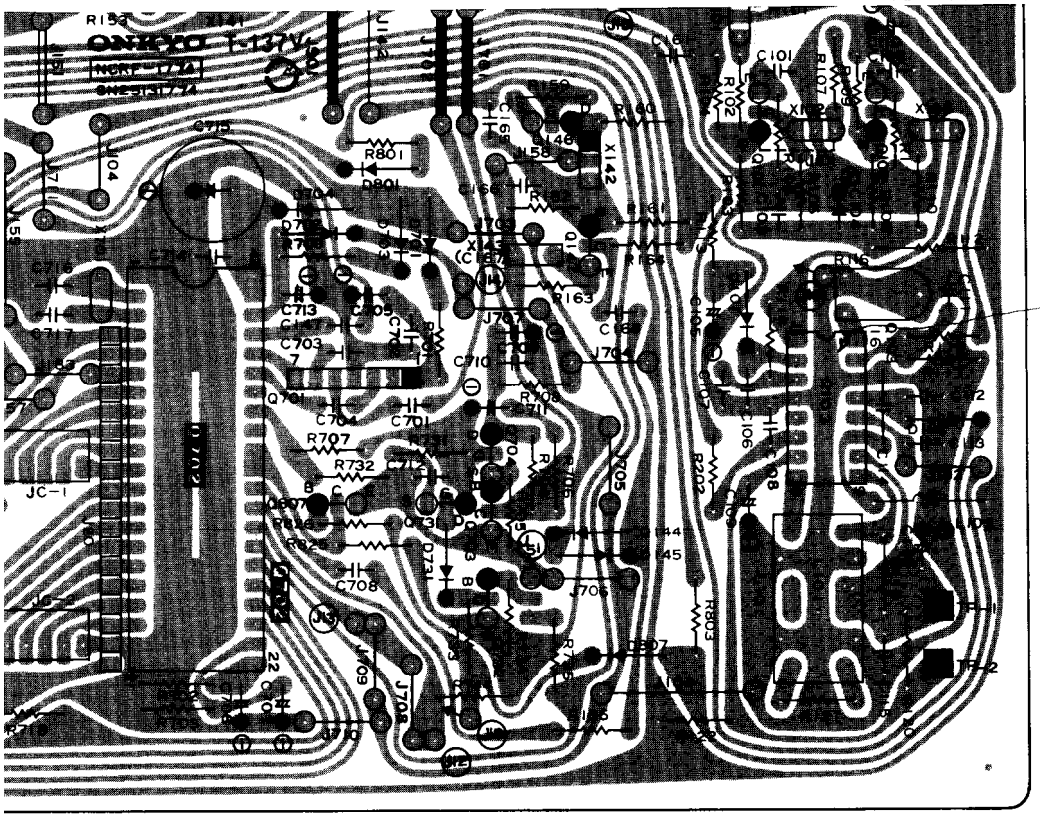
TYPE	CIRCUIT NO.	DESCRIPTION	REGULAR PARTS	SUBSTITUTIVE PARTS	APPLICATION
UD	Q103	IC	MPC1167C2	MPC1167C2(RED)	921-1520
UD	Q201	IC	MPC1161C3	MPC1161C	921-1520

MODEL T-44

SUBSTITUTIVE PARTS LIST

NOTE:USE THE REGULAR PARTS WHEN REPLACEMENT

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



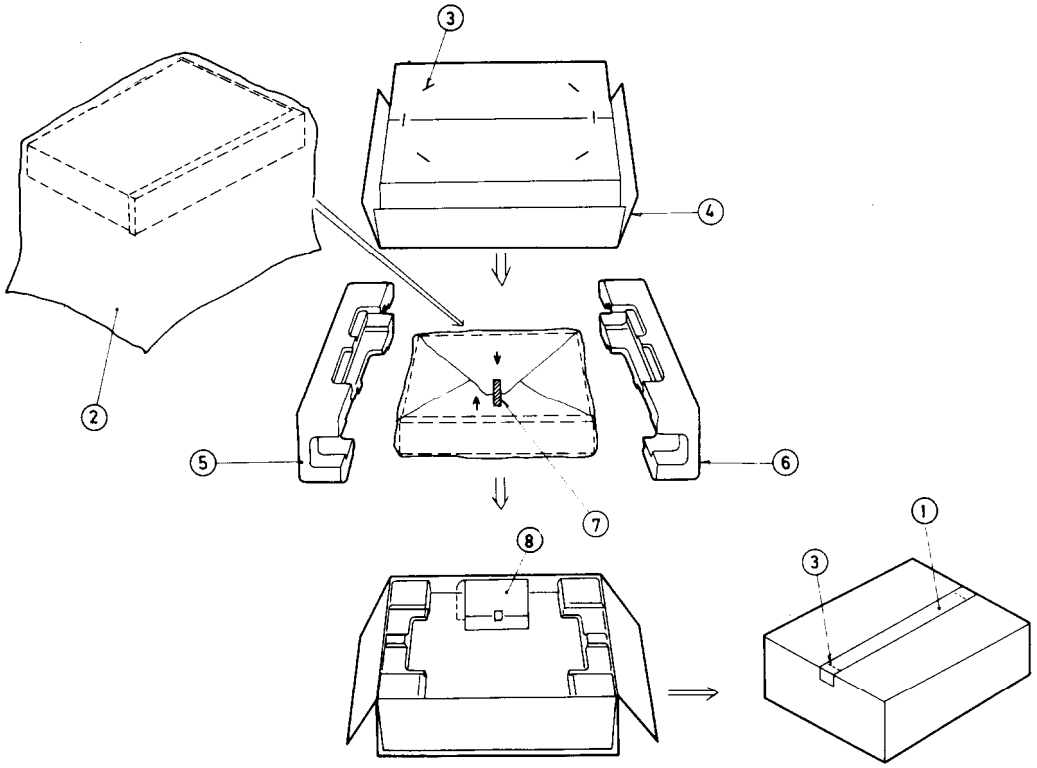
PRINTED CIRCUIT BOARD-PARTS LIST

FM/AM TUNER PC BOARD (NARF-1774)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs	
Q103	222608	μPC1167C2, FM IF system
Q131	222666 or	LB1403 or
	222670	BA6124, Signal indicator driver
Q142	222629	μPC1243C, AM radio system
Q201	222678	μPC1161C3, 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
	X'tal	
X701	3010073	XTL-7.2M
	Notch filters	
Z201, Z202	3020016	B3XN4123-32N
	Capacitors	
TC141, TC142	3060010	NTC-20P09, Trimmer
C109	352741009	10μF, 16V, Elect.
C110	352784799	0.47μF, 50V, Elect.
C116	352741009	10μF, 16V, Elect.
C131-C133	352741009	10μF, 16V, Elect.
C144	370135114	510pF ±5%, 100V, APS
C152	352741019	100μF, 16V, Elect.
C156	352750479	4.7μF, 25V, Elect.
C157	352780339	3.3μF, 50V, Elect.
C158	352742209	22μF, 16V, Elect.
C163	352784799	0.47μF, 50V, Elect.
C202	352750479	4.7μF, 25V, Elect.
C206, C207	352741009	10μF, 16V, Elect.
C208	352742219	220μF, 16V, Elect.
C210	370134714	470pF, ±5%, 100V, APS
C211	352780109	1μF, 50V, Elect.
C212	352780339	3.3μF, 50V, Elect.
C213	352782299	0.22μF, 50V, Elect.
C215, C216	352780109	1μF, 50V, Elect.
C219	352724719	470μF, 6.3V, Elect.
C705	352734709	47μF, 10V, Elect.
C706	352780109	1μF, 50V, Elect.
C707	352780229	2.2μF, 50V, Elect.
C711	395160227	2.2μF, 35V, Tantalum
C713	352784799	0.47μF, 50V, Elect.
C715	3020018	0.047F, 5V, Super
C718	352722229	2,200μF, 6.3V, Elect.
C719	352751009	10μF, 25V, Elect.
C803	352780339	3.3μF, 50V, Elect.
C804	352744719	470μF, 16V, Elect.
C805	352734709	47μF, 10V, Elect.
C853-C855	352784799	0.47μF, 50V, Elect.
C872	352784799	0.47μF, 50V, Elect.
C873	352743309	33μF, 16V, Elect.
C904	352784719	470μF, 50V, Elect.
C905	352780109	1μF, 50V, Elect.
C907	352751029	1,000μF, 25V, Elect.
C911	352761019	100μF, 35V, Elect.
C913	352724719	470μF, 6.3V, Elect.
C915	352780109	1μF, 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	33kohmx9, 1/8W, Network
R730-R742	49121333513	33kohmx13, 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, Damplon 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	Accessary 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

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