

ONKYO SERVICE MANUAL

SYNTHESIZED FM STEREO/AM TUNER MODEL T-4711

European model(FM STEREO TUNER)

Black,Silver and Golden models

BUDN,GUDN	120V, AC,60Hz
BUP,BUPB,BUPT,SUPT,SUPB,GUPT	230V AC,50Hz
BUWT,GUWT	120/220V AC, 50/60Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK \triangle 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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SPECIFICATIONS

FM

Tuning Range: European and Worldwide models:
87.50 - 108.00 MHz (50 kHz steps)
USA and Canadian models:
87.90 - 107.90 MHz (200 kHz steps)

Usable Sensitivity: Mono: 10.3 dBf 0.9µV, 75 Ohms IHF
0.8µV, 75 Ohms DIN
Stereo: 17.2 dBf 2.0µV, 75 Ohms IHF
20µV, 75 Ohms DIN

50 dB Quieting Sensitivity: Mono: 16.1 dBf 1.7µV 75 Ohms
Stereo: 36.1 dBf 17µV 75 Ohms

Capture Ratio: 1.3 dB

Image Rejection Ratio: 100 dB

IF Rejection Ratio: 100 dB

Signal-to-Noise Ratio: Mono: 85 dB IHF
Stereo: 77 dB IHF
70 dB IHF (Narrow)

Selectivity: 70 dB DIN (±300 kHz, 40 kHz dev.)

AM Suppression Ratio: 50 dB

Total Harmonic Distortion: Mono: 0.1%
0.3% (Normal 40 kHz dev.)
Stereo: 0.2%
0.7% (Normal 40 kHz dev.)

Frequency Response: 30 - 15,000 Hz (+0.5, -1.0 dB)

Stereo Separation: 45 dB at 1 kHz
33 dB at 70 - 10,000 Hz

Output Voltage: 1.0 V

Muting Level: 17.2 dBf 2.0 µV, 75 Ohms

AM

Tuning Range: USA and Canadian models:
530 - 1710 kHz (10 kHz steps)
Asian models:
522 - 1611 kHz (9 kHz steps)
Worldwide models:
531 - 1602 kHz (9 kHz steps)
530 - 1710 kHz (10 kHz steps)

Usable Sensitivity: 25µ V

Image Rejection Ratio: 40 dB

IF Rejection Ratio: 40 dB

Signal-to- Noise Ratio: 40 dB

Total Harmonic Distortion: 0.8%

Output Voltage: 250 mV

General

Power Supply: USA and Canadian models:
AC 120V, 60Hz
European models:
AC 230V, 50Hz
Worldwide models:
AC 120V and 220 - 230V
switchable, 60/50 Hz

Dimensions (W × H × D): 435 × 91 × 373 mm
17-1/8" × 3-9/16" × 14-11/16"

Mass: 4.9 kg, 10.8 lbs.

Specifications and features are subject to change without notice.

SERVICE PROCEDURES

1. Safety-check out

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 chassis.

Specifications: More than 10MΩ at 500V.

2. Memory Preservation

This unit does not require memory preservation batteries. A Built 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 change 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.

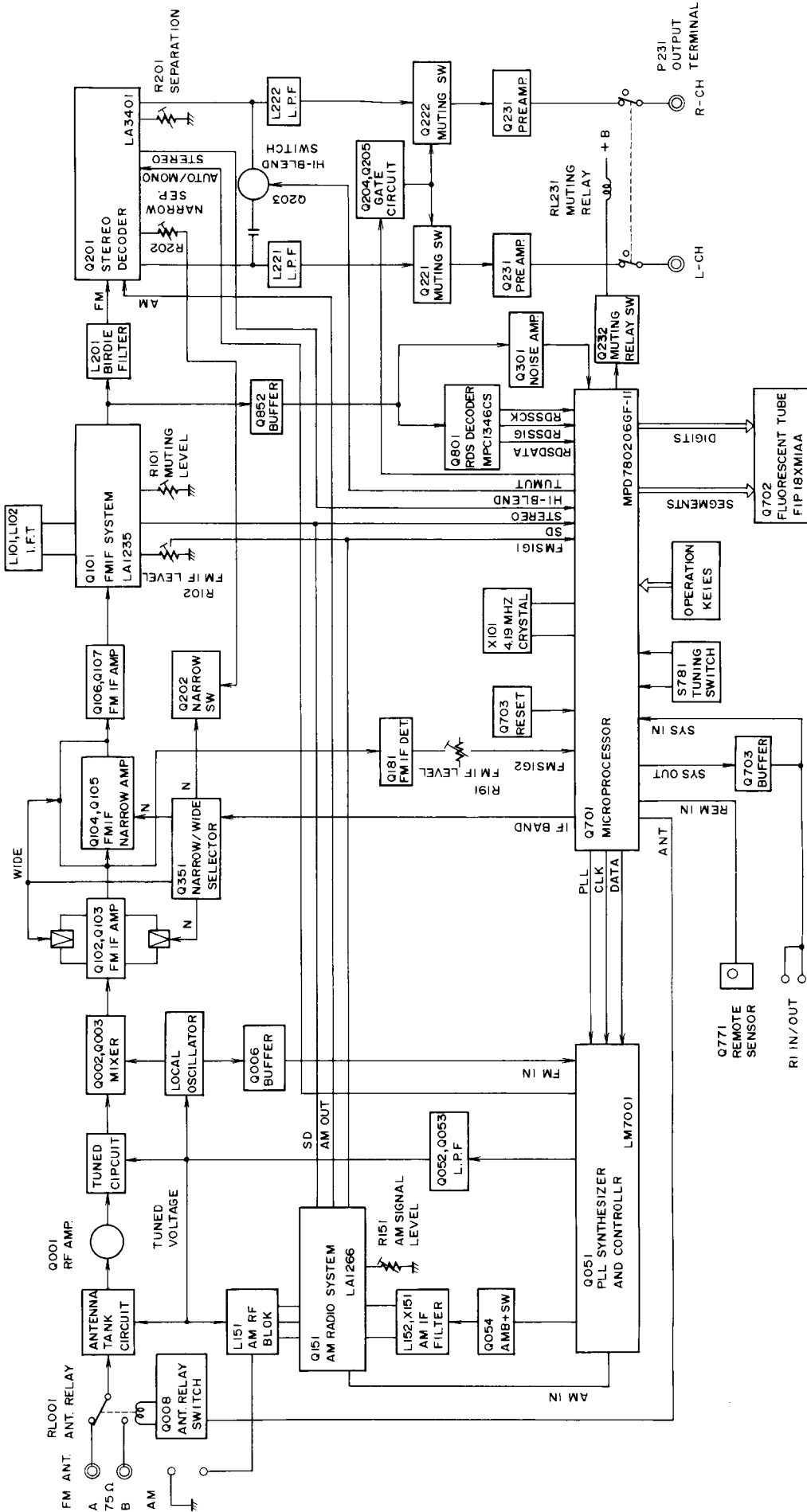
On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the is exposed to very high humidity or used in an area with an extremely humid climate.

3. Changing the FM/AM band step (Except European model)

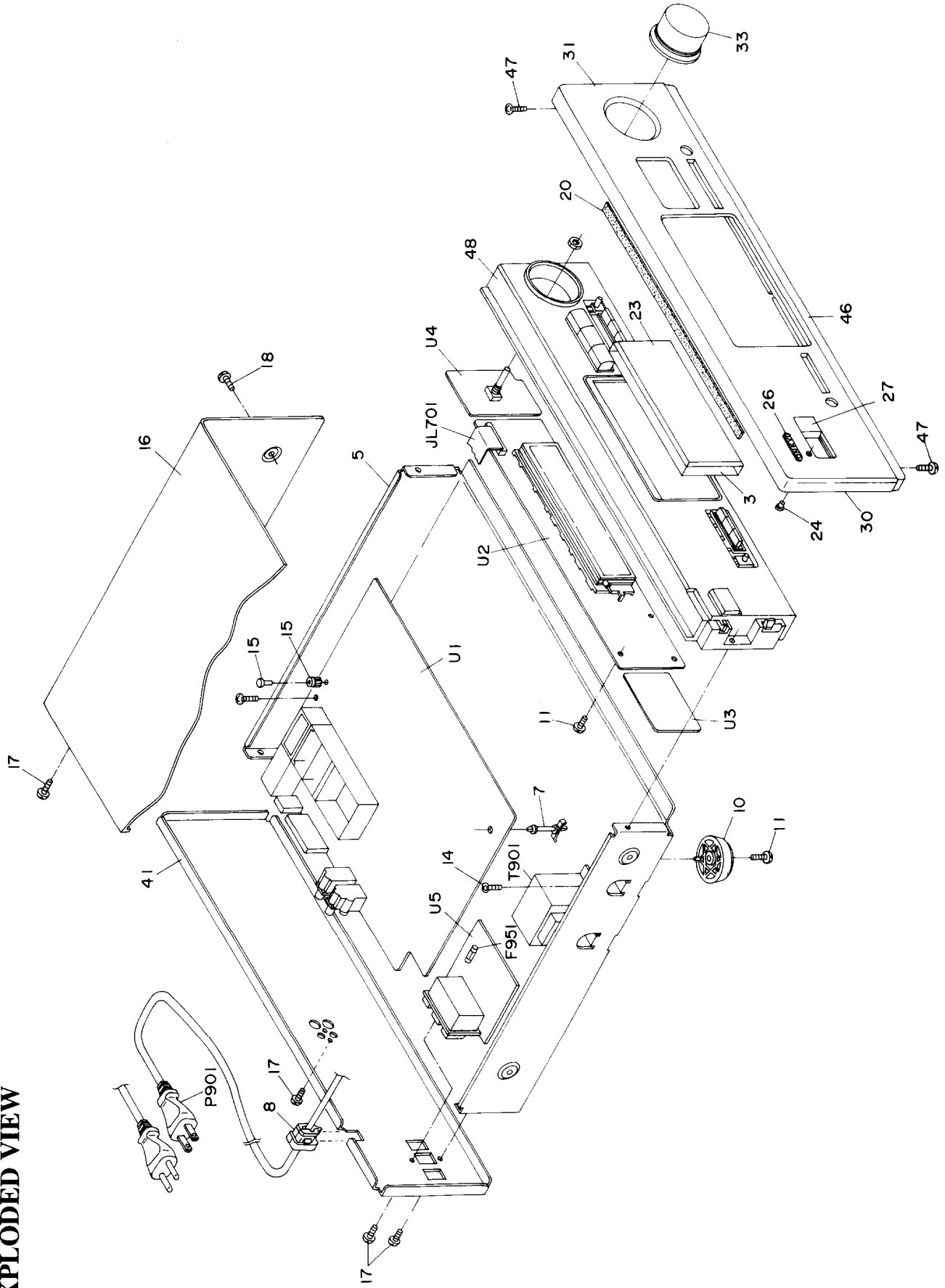
When change the band step, refer the below table.

Band step	R704	R705
Other from USA	2.7k	390
USA from other	5.6k	3.3k

BLOCK DIAGRAM



EXPLODED VIEW



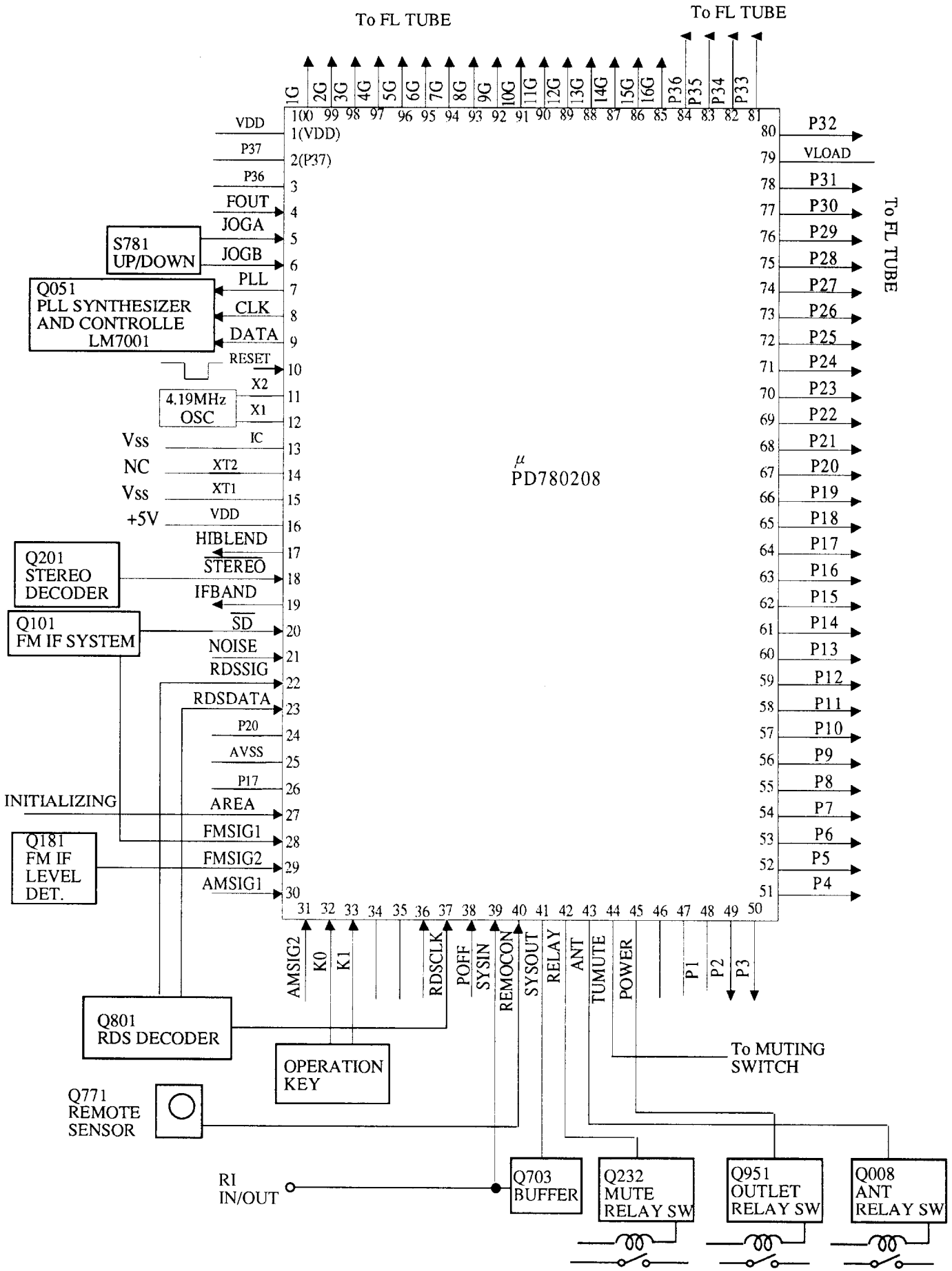
PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
3	28133349-1	Back plate 	91	260208	Wire tie
5	28133345	Back plate <S/G>	92	28175224	Isolation plate <P>
7	27100316A	Chassis	93	380011	NRP-355, Plastic rivet <P>
8	27190164	KGLS-14S,Holder	94	25060044	3*14, Terminal GND <P>
10	27300750	△ Cord bushing	95	87643010	W3x10F(BC), Washer <P>
11	27175311	Leg	F951	252077	△ 4A-SE-EAK, Fuse <P>
14	838130088	3TTB+8B,Self-tappin screw	JL701	2047302512	NCFC7-302512, Flat cable
15	830440069	4TTC+6C(BC),Self-tapping screw	P901	253192HIT	△ AS-UC-6#18-(SPT-2), AC cord <D>
16	880009	NRP-345,Plastic rivet	T901	253193HIT	△ AS-CEE, AC cord <P>
17	28184642	Top cover 		253198HIT	△ AS-BS, AC cord <PB>
18	28184643	Top cover <S>		253233KA W	△ AS-CEE-2, AC cord <W>
20	28184644	Top cover <G>		2301193	△ NPT-1270D, Power transformer <D>
21	838430088	3TTB+8B(BC),Self-tapping screw 	U1	2301194	△ NPT-1270P, Power transformer <P>
22	838230088	3TTB+8B(Ni),Self-tapping screw <S/G>		2301195	△ NPT-1270DG, Power transformer <W>
23	838440089	4TTC+8B(BC),Self-tapping screw 		1A685587-1A	NAAR-5787-1A, Main circuit pc board ass'y <P/PB>
24	838240089	4TTC+8B(Ni),Self-tapping screw <S/G>		1A685587-1B	NAAR-5787-1B, Main circuit pc board ass'y <T>
25	28141333	Cushion for flat cable		1A685587-1C	NAAR-5787-1C, Main circuit pc board ass'y <W>
26	28191731A	Clear plate		1A685587-1D	NAAR-5787-1D, Main circuit pc board ass'y <D>
27	28198839	Facet		1A685588-1A	NADG-5788-1A, Display circuit pc board ass'y <P/PB>
28	28135243	Badge 		1A685588-1B	NADG-5788-1B, Display circuit pc board ass'y <T>
29	28191730	Badge <S>		1A685588-1C	NADG-5788-1C, Display circuit pc board ass'y <W>
30	28125327A	Clear plate RE		1A685588-1D	NADG-5788-1D, Display circuit pc board ass'y <D>
31	28125329A	End cap L 		1A685589-1A	NAETC-5789-1A, Remote sensor pc board ass'y <P/PB>
32	28125331A	End cap L <S>		1A685589-1B	NAETC-5789-1B, Remote sensor pc board ass'y <T>
33	28125328A	End cap R 		1A685589-1C	NAETC-5789-1C, Remote sensor pc board ass'y <W>
34	28125330A	End cap R <S>		1A685589-1D	NAETC-5789-1D, Remote sensor pc board ass'y <D>
35	28125332A	Knob, tuning 		1A685590-1A	NASW-5790-1A, Tuning switch pc board ass'y <P/PB>
36	28325354	Knob, tuning <S>		1A685590-1B	NASW-5790-1B, Tuning switch pc board ass'y <T>
37	28325355	Knob, tuning <G>		1A685590-1C	NASW-5790-1C, Tuning switch pc board ass'y <W>
38	28325356	Knob, tuning <D>		1A685590-1D	NASW-5790-1D, Tuning switch pc board ass'y <D>
39	27122180A	Rear panel <D>		1A685591-1A	NAPS-5791-1A, Primary circuit pc board ass'y <P/PB>
40	27122181A	Rear panel <P>		1A685591-1B	NAPS-5791-1B, Primary circuit pc board ass'y <T>
41	27122182A	Rear panel <W>		1A685591-1C	NAPS-5791-1C, Primary circuit pc board ass'y <W>
42	27211785	Front panel <D/W/T>		1A685591-1D	NAPS-5791-1D, Primary circuit pc board ass'y <D>
43	27211786	Front panel <P>		1A685528-1C	NASW-5828-1C, Voltage selector pc board ass'y <W>
44	27211786	Front panel <S>			
45	27211787	Front panel <G>			
46	801525	3TTB+8B(BC),Self-tapping screw <D/P>			
47	27110937A	Front bracket <D/W/T>			
48	27110950A	Front bracket <P>			
	27110938A	Front bracket <S>			
	27110939A	Front bracket <G>			

NOTE: <D>: 120V model only
 <P>: 230V model only
 <PB>: U.K model only
 <W>: Worldwide model only
 <T>: Taiwanese model only
 : Black model only
 <S>: Silver model only
 <G>: Golden model only

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

MICROPROCESSOR-CONNECTION DIAGRAM



MICROPROCESSOR-TERMINAL DESCRIPTION

Pin No.	Terminal	Description
1	VDD	Power supply terminal (+5V)
2	P37	Not used
3	P36/BUZ	Not used
4	FOUT	Clock output terminal for frequency adjustment
5	JOGA	Jog dial connection terminal
6	JOGB	Jog dial connection terminal
7	PLL	Connect to the terminal PLL of PLL IC LM7001.
8	CLK	Connect to the terminal CL of PLL IC LM7001.
9	DATA	Connect to the terminal DATA of PLL IC LM7001.
10	RESET	Reset input terminal
11	X2	Crystal resonator connection terminal
12	X1	Connect the 4.19 MHz crystal resonator.
13	IC	Internal connection terminal
14	XT2	Not used
15	PO4/XT1	Not used
16	VDD	Power supply terminal (+5V)
17	HIBLEND	Hi-blend control output terminal
18	STEREO	Stereo broadcast detection input
19	IFBAND	IF band control output terminal
20	SD	Station detection input terminal
21	NOISE	Noise detection input terminal
22	RDSSIG	RDS signal input terminal
23	RDSDATA	RDS data input from RDS decoder
24	P20/S11	Not used
25	AVSS	Power supply terminal for A/D converter
26	P17/ANI7	Not used
27	AREA	Initializing input for FM/AM band area
28	FMSIG1	Signal strength detection input
29	FMSIG2	Signal strength detection input
30	AMSIG1	Not used
31	AMSIG2	Not used
32	K0	Operation key connection terminal pin
33	K1	Operation key connection terminal pin
34	AVDD	Power supply terminal for A/D converter
35	AVREF	Reference voltage for A/D converter
36	RDSCLK	RDS clock input terminal for RDS decoder

Pin No.	Terminal	Description
37	POFF	Current stoppage detection input terminal
38	SYSIN	System code input terminal
39	REMOCON	Remote control signal input terminal
40	Vss	Ground terminal
41	SYSOUT	System code output terminal
42	RELAY	AC outlet control terminal
43	ANT	Antenna selector output terminal
44	TUMUTE	Muting control output terminal
45	POWER	Power control output terminal
46	VDD	Power supply terminal (+5V)
47	P127/FIP52	Not used
48~78	P1~P31	Segment output terminals
79	-VP	Power supply for FL tube
80~84	P32~P36	Segment output terminals
85~100	16G~1G	Grid output terminals

Initializing

R704	R705	Region	FM	AM
3.3k	5.6k	Europe	87.50-108.00MHz(50k/25k)	522-1611kHz(9k)
10k		Worldwide	87.50-108.00MHz(50k/25k)	531-1602kHz(9k)
5.6k	3.3k	U.S.A	87.9-107.9MHz(200k/25k)	530-1710kHz(10k)

ADJUSTMENT PROCEDURES

Preparation

1. Input

FM mono: 1kHz, 40kHz devi., 60dB/ μ V
 (European model)
 1kHz, 75kHz devi., 60dB/ μ V
 (Other model)

FM stereo: 1kHz, 36kHz devi., 60dB/ μ V
 Pilot signal 19kHz 4kHz devi.
 (European model)
 1kHz, 67.5kHz devi., 60dB/ μ V
 Pilot signal 19kHz 7.5kHz devi.
 (Other model)

AM: 400Hz, 30% mod.

1. Set the operation switches to the below position.

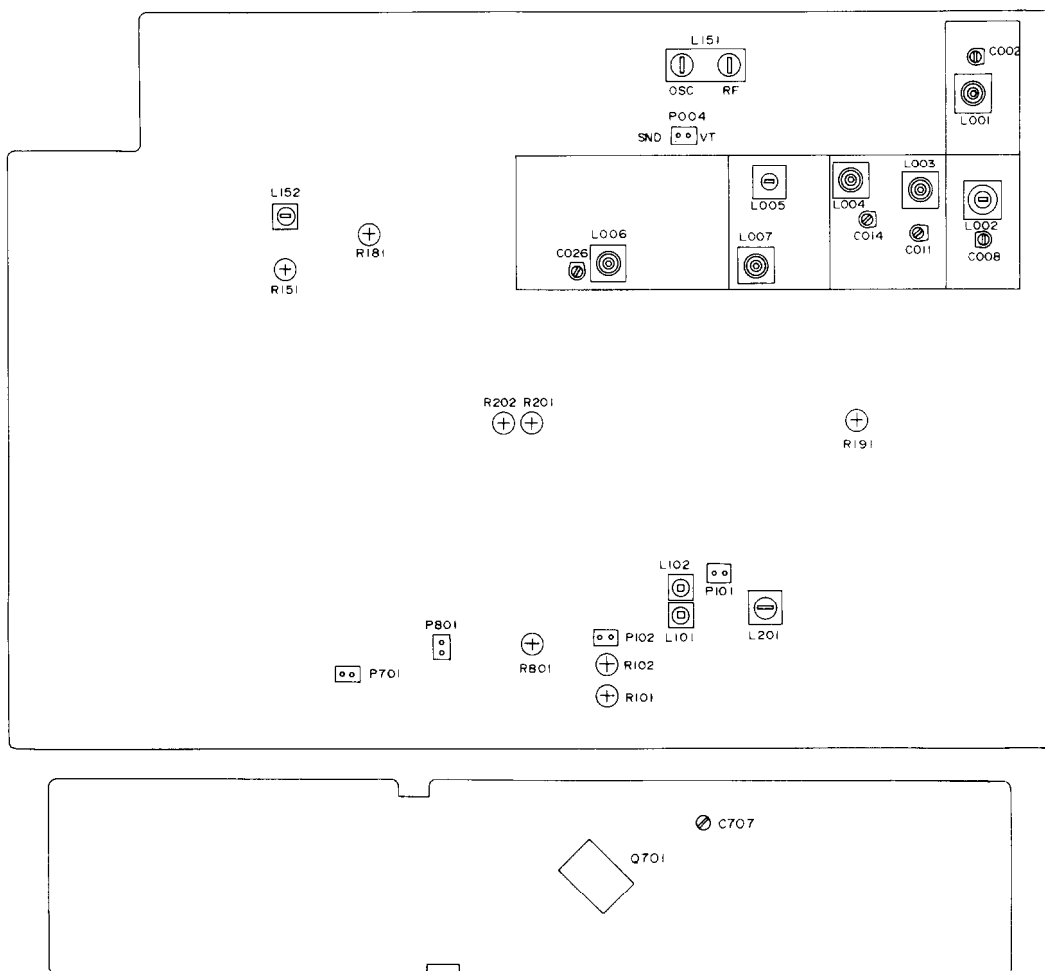
Antenna.....A, IF Band.....Normal, Hi-Blend.....Off, Mode.....Auto, Fine.....Light on

2. Hold down MEMORY key and press the STAND-BY/ON key before FM adjustment to be the unit to the test mode.

CLOCK FREQUENCY ADJUSTMENT

Connect the frequency counter to test terminal P701.

Adjust trimmer capacitor C707 so that the reading of frequency counter becomes $524,288 \pm 1$ Hz.



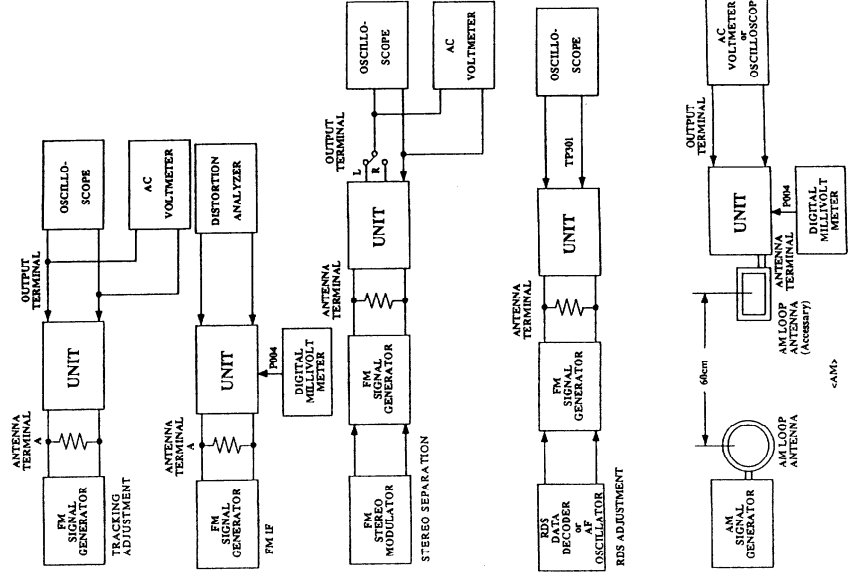
AM ADJUSTMENT

Item	Step	Connection of instrument	FM SG output	Stereo Modulator output	Tuned Frequency	Output Indicator	Adjustment point	Adjust for	Remarks
1	Tuned	Connect the DC voltmeter to the test point P004.	87.50 MHz (1 ch.)		87.50 MHz (1 ch.)	DC	L006	6.5 ± 0.2 V	(1 ch.): Channel of PRESET key Repeat the steps 2 and 3 until no further adjustment is necessary.
	Voltage		108.00 MHz (5 ch.)		108.00 MHz (5 ch.)		C026	24.0 ± 0.4 V	
			87.50 MHz		87.50 MHz		L006	4.0 ± 0.2 V	
2	Tracking	Connect the FM signal generator to Antenna terminal A.	108.00 MHz		108.00 MHz	DC	CW2, C008	Maximum	Repeat the steps 1 and 2 until no further adjustment is necessary.
			20 dB μ		20 dB μ		C011, C014	Maximum	
			87.50 MHz		87.50 MHz		L001, L002	Maximum	
3	Adjust.	Connect the DC voltmeter to the test point P102.	108.00 MHz		100.80 MHz	DC	L003, L004	Maximum	Repeat the steps 1 and 2 until no further adjustment is necessary.
			20 dB μ		20 dB μ		L007	Maximum	
			99.00 MHz		99.00 MHz		R102	50 dB	
3	Signal Meter	Connect the FM signal generator to Antenna terminal A.	99.00 MHz		99.00 MHz (3 ch.)	Signal	R191	99 dB	Press the DISPLAY key more than 1 sec. (Signal meter indication) After adjustment, press the DISPLAY key (Frequency indication)
			99.00 MHz		99.00 MHz		L101	0 ± 5 mV	
4	FM IF	Connect the DC voltmeter to test point P101 and the distortion analyzer to output terminal.	99.00 MHz		99.00 MHz (3 ch.)	DC	L102	Minimum	Repeat the steps 1 and 2 until no further adjustment is necessary.
			99.00 MHz		99.00 MHz		R101	Appear the signal on the oscilloscope.	
5	Muting level	Connect the oscilloscope to the output terminal.	99.00 MHz		99.00 MHz	Oscilloscope	R101	Maximum Separation	IF BAND: NORMAL
			22.5 kHz devi.		99.00 MHz		R201	Maximum Separation	
6	Stereo Separation	Connect the oscilloscope to the output terminal.	99.00 MHz		99.00 MHz	Oscilloscope	R202	Maximum Separation	IF BAND: NARROW
			60 dB μ Ext. mode		99.00 MHz		R801	Maximum Separation	
7	RDS	Connect the oscilloscope to the test point P801.	99.00 MHz		99.00 MHz	Oscilloscope	R801	Maximum	Repeat the steps 1 and 2 until no further adjustment is necessary.
			60 dB μ Ext. mode		99.00 MHz		R801	Maximum	

230V and Worldwide models

Step	AM SG output	Tuning Frequency	Output Indicator	Adjustment point	Adjust for
1	522kHz <530kHz> (531kHz)	Digital DC voltmeter	OSC coil on RF block L151	2.4 ± 0.1V	
2	603kHz<600kHz> 400Hz 30% mod. 60dB/m	AC voltmeter	RF coil on RF block L151	Maximum	
3	990kHz 400Hz 30% mod. 60dB/m	AC voltmeter	L152	Maximum	
4	Hold down the DISPLAY button more than 1 second to display "AM Signal".				
5	990kHz 400Hz no mod. 60dB/m	Signal Indicator	R151	60 dB	

() : Worldwide model < > : 120V model



FM ADJUSTMENT

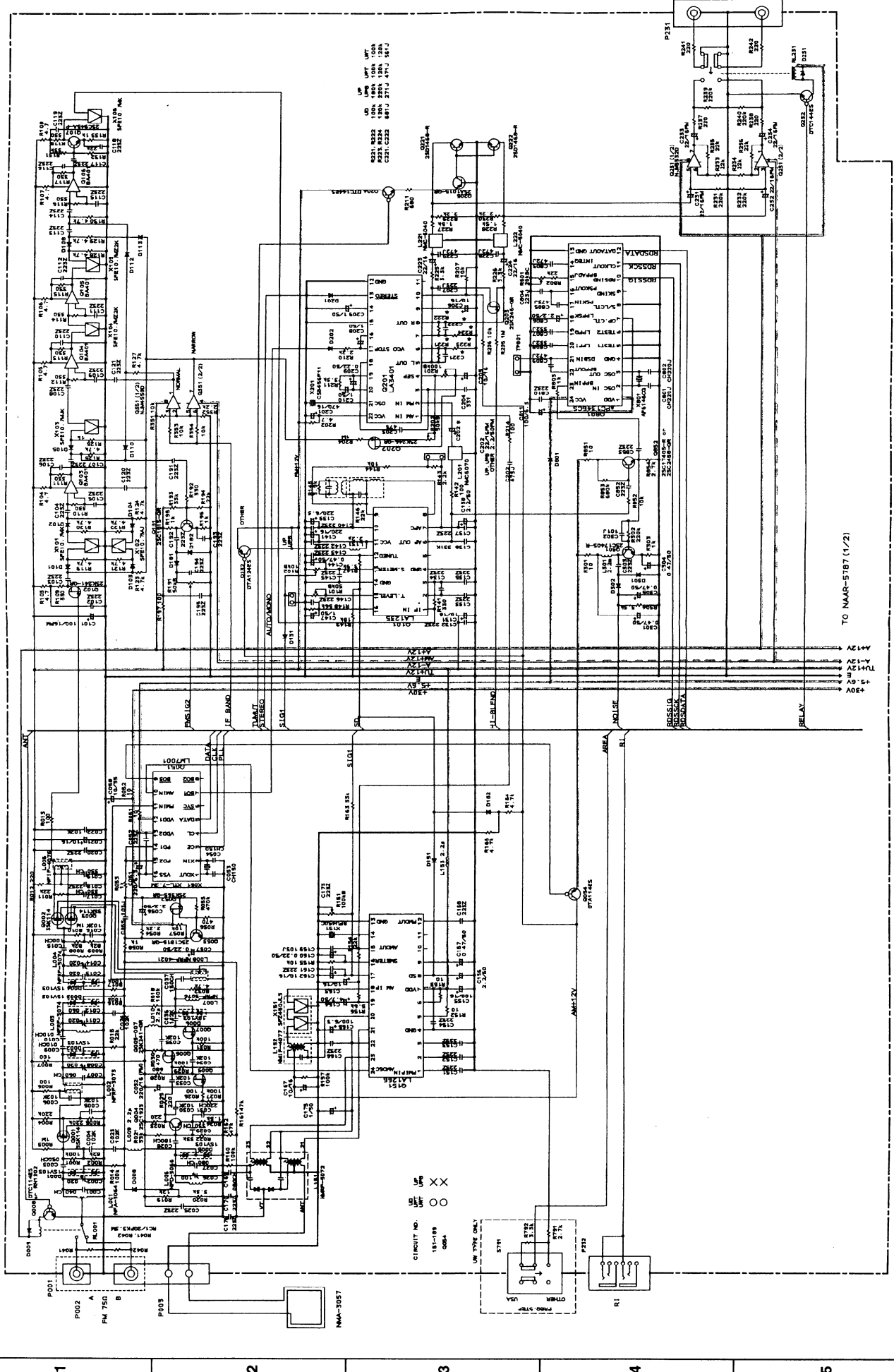
230V and Worldwide models

Item	Step	Connection of instrument	FM SG output	Stereo Modulator output	Tuned Frequency	Output Indicator	Adjustment point	Adjust for	Remarks
1	Tuned	Connect the DC voltmeter to the test point P004.	87.50 MHz (1 ch.)		87.50 MHz (1 ch.)	DC	L006	6.5 ± 0.2 V	(1 ch.): Channel of PRESET key Repeat the steps 2 and 3 until no further adjustment is necessary.
	Voltage		108.00 MHz (5 ch.)		108.00 MHz (5 ch.)		C026	24.0 ± 0.4 V	
			87.50 MHz		87.50 MHz		L006	4.0 ± 0.2 V	
2	Tracking	Connect the FM signal generator to Antenna terminal A.	108.00 MHz		108.00 MHz	DC	CW2, C008	Maximum	Repeat the steps 1 and 2 until no further adjustment is necessary.
			20 dB μ		20 dB μ		C011, C014	Maximum	
			87.50 MHz		87.50 MHz		L001, L002	Maximum	
3	Adjust.	Connect the DC voltmeter to the test point P102.	108.00 MHz		100.80 MHz	DC	L003, L004	Maximum	Repeat the steps 1 and 2 until no further adjustment is necessary.
			20 dB μ		20 dB μ		L007	Maximum	
			99.00 MHz		99.00 MHz		R102	50 dB	
3	Signal Meter	Connect the FM signal generator to Antenna terminal A.	99.00 MHz		99.00 MHz (3 ch.)	Signal	R191	99 dB	Press the DISPLAY key more than 1 sec. (Signal meter indication) After adjustment, press the DISPLAY key (Frequency indication)
			99.00 MHz		99.00 MHz		L101	0 ± 5 mV	
4	FM IF	Connect the DC voltmeter to test point P101 and the distortion analyzer to output terminal.	99.00 MHz		99.00 MHz (3 ch.)	DC	L102	Minimum	Repeat the steps 1 and 2 until no further adjustment is necessary.
			99.00 MHz		99.00 MHz		R101	Appear the signal on the oscilloscope.	
5	Muting level	Connect the oscilloscope to the output terminal.	99.00 MHz		99.00 MHz	Oscilloscope	R101	Maximum Separation	IF BAND: NORMAL
			22.5 kHz devi.		99.00 MHz		R201	Maximum Separation	
6	Stereo Separation	Connect the oscilloscope to the output terminal.	99.00 MHz		99.00 MHz	Oscilloscope	R202	Maximum Separation	IF BAND: NARROW
			60 dB μ Ext. mode		99.00 MHz		R801	Maximum Separation	
7	RDS	Connect the oscilloscope to the test point P801.	99.00 MHz		99.00 MHz	Oscilloscope	R801	Maximum	Repeat the steps 1 and 2 until no further adjustment is necessary.
			60 dB μ Ext. mode		99.00 MHz		R801	Maximum	

120V models

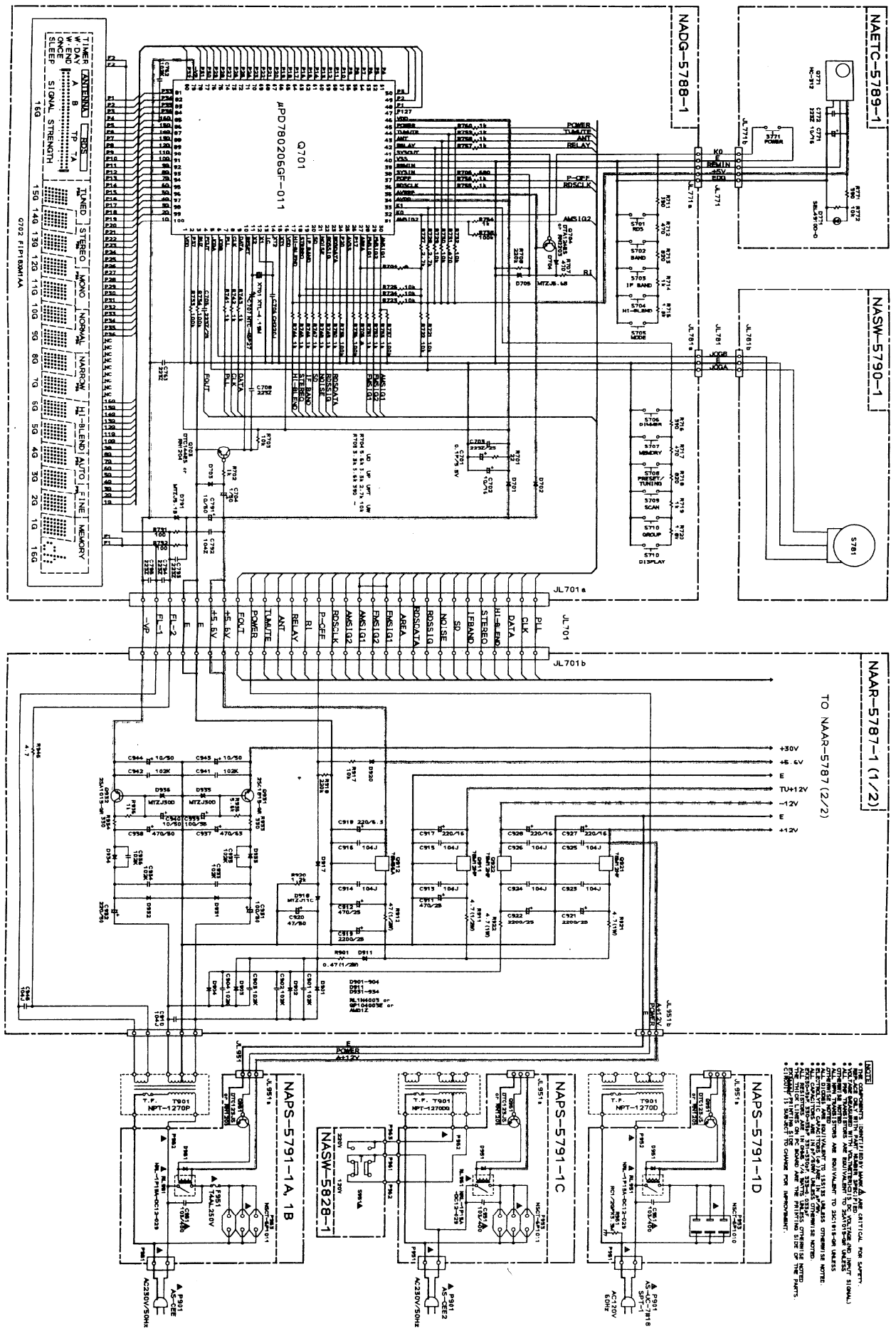
Item	Step	Connection of instrument	FM SG output	Stereo Modulator output	Tuned Frequency	Output Indicator	Adjustment point	Adjust for	Remarks
1	Tuned	Connect the DC voltmeter to the test point P004.	87.50 MHz (1 ch.)		87.50 MHz (1 ch.)	DC	L006	6.5 ± 0.2 V	(1 ch.): Channel of PRESET key Repeat the steps 2 and 3 until no further adjustment is necessary.
	Voltage		108.00 MHz (5 ch.)		108.00 MHz (5 ch.)		C026	24.0 ± 0.4 V	
			87.50 MHz		87.50 MHz		L006	4.0 ± 0.2 V	
2	Tracking	Connect the FM signal generator to Antenna terminal A.	107.9 MHz		107.90 MHz	DC	C002, C008	Maximum	Repeat the steps 1 and 2 until no further adjustment is necessary.
			20 dB μ		20 dB μ		L001, L002	Maximum	
			87.9 MHz		87.90 MHz		L003, L004	Maximum	
3	Adjust.	Connect the DC voltmeter to the test point P102.	107.9 MHz		107.90 MHz	DC	L005	Maximum	Press the DISPLAY key more than 1 sec. (Signal meter indication) After adjustment, press the DISPLAY key (Frequency indication)
			20 dB μ		20 dB μ		L007	Maximum	
			99.10 MHz		99.10 MHz (3 ch.)		R102	50 dB	
3	Signal Meter	Connect the FM signal generator to Antenna terminal A.	99.10 MHz		99.10 MHz (3 ch.)	Signal	R191	99 dB	Repeat the steps 1 and 2 until no further adjustment is necessary.
			99.10 MHz		99.10 MHz		L101	0 ± 5 mV	
4	FM IF	Connect the DC voltmeter to test point P101 and the distortion analyzer to output terminal.	99.10 MHz		99.10 MHz (3 ch.)	DC	L102	Minimum	Repeat the steps 1 and 2 until no further adjustment is necessary.
			99.10 MHz		99.10 MHz		R101	Appear the signal on the oscilloscope.	
5	Muting level	Connect the oscilloscope to the output terminal.	99.10 MHz		99.10 MHz	Oscilloscope	R101	Maximum Separation	IF BAND: NORMAL
			18 dB μ		99.10 MHz		R201	Maximum Separation	
6	Stereo Separation	Connect the oscilloscope to the output terminal.	99.10 MHz		99.10 MHz	Oscilloscope	R202	Maximum Separation	IF BAND: NARROW
			22.5 kHz devi.		99.10 MHz		R801	Maximum Separation	
7	RDS	Connect the oscilloscope to the test point P801.	99.10 MHz		99.10 MHz	Oscilloscope	R801	Maximum	Repeat the steps 1 and 2 until no further adjustment is necessary.
			60 dB μ Ext. mode		99.10 MHz		R801	Maximum	

SCHEMATIC DIAGRAM PART -1



SCHEMATIC DIAGRAM PART-2

A B C D E F G



PRINTED CIRCUIT BOARD-PARTS LIST

MAIN CIRCUIT PC BOARD (NAAR-5787-1A/1B/1C/1D)

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs			Coils and Transformers	
Q051	22240090	LM7001	L001	233487	NFA-3064, Antenna
Q101	222680	LA1235	L002	233488	NFRF-3073, RF
Q103~Q106	22240821	BA401	L003,L004	233489	NFRF-3074, RF
Q151	22240039	LA1266 <D/W/T>	L005	233441	NFIF-4076, IF
Q201	22240252	LA3401	L006	233491	NFO-3066, OSC
Q231	222902	NJM5532D-D	L007	233492A	NFRF-3076, RF
Q351	222465	NJM4558D	L008	233212	NFRF-4021, RF
Q801	22240679	μ PC1346CS	L009,L010	233454M022	NCH-1452, 022M, Chock
Q911	222780125NEC	μ PC78M12AHF	L101	233459	NFIF-4083, IF
Q912	222780565JRC	NJM78M56FA	L102	233460	NFIF-4084, IF
Q921	222780125NEC	μ PC78M12AHF	L103	233454M022	NCH-1452, 022M, Chock
Q922	222790125NEC	79M12HF	L151	232172	NMRF-5072, RF <D/W/T>
	Transistors		L152	232139	NMIF-4062, IF <D/W/T>
Q001~Q003	2212514	3SK114-Y	L153	233454M022	NCH-1452, 022M, Chock <D/W/T>
Q004	2211723	2SC1923-O	L201	233383	NMC-6070, MPX
Q005~Q007	2212195	2SK241-GR	L221,L222	233294	NMC-5040, MPX
Q008	2213290 or 2214230	DTC114ES or RN1202	L222	233294	NMC-5040, MPX
Q052	2212445	2SK365-GR	L301	231081	NCH-2129, Chock
Q053,Q191	2213284 or 2212115	2SC1740S-R or 2SC2458-GR	X051		Resonators
Q054	2213510 or 2214350	DTA114ES or RN2202 <D/W/T>	X201	3010152	XTL-7.2M, Crystal
Q102	2212195	2SK241-GR	X801	3010203	AF6146CG, Crystal
Q107	2210746	2SC945A-P			Ceramic filters
Q132	2212600 or 2214350	DTA124ES or RN2202 <D/W/T>	X101	3010041	SFE10.7MX-A
Q202,Q203	2211945	2SK246-GR	X102,X103	3010132	SFE10.7MJK-A
Q204,Q206	221282 or 2213560	DTC144ES or RN1204	X104,X105	3010130	SFE10.7MZZK-A
Q205	2213354 or 2212125	2SA933S-R or 2SA1048-GR	X106	3010041	SFE10.7MX-A, CERA FIL
Q207	2213510 or 2214350	DTA114ES or RN2202	X151	3010123	SFZ-450JL, CERA FIL <D/W/T>
Q221,Q222	2212794	2SD1468-R	X153	3010076	BFU-450C, CERA FIL <D/W/T>
Q232	2213290 or 2214230	DTC114ES or RN1202			Capacitors
Q301,Q851	2213284 or 2212115	2SC1740S-R or 2SC2458-GR	C002,C008	3060020	NTC-2P17, Trimmer
Q931	2211255	2SC1815-GR	C011,C014	3060020	NTC-2P17, Trimmer
Q932	2211455	2SA1015-GR	C021	354741009	10 μ F,16V, Elect.
	Diodes		C026	3060017	NTC-10P15, Timmer
D001~D007	223154	1SV103	C032	393142217	220 μ F,16V, Elect.
D008,D009	223205 or	1SS270A or	C051	354722219	220 μ F,6.3V, Elect.
D051	223163	1SS133	C055	374721034	0.01 μ F \pm 5%,50V, Plastic
D101~D109	223205 or	1SS270A or	C056	354780229	2.2 μ F,50V, Elect.
D191,D192	223163	1SS133	C057	354782299	0.22 μ F,50V, Elect.
D201,D202	223205 or	1SS270A or	C058	354761009	10 μ F,35V, Elect.
D231	223163	1SS133	C101	393141017	100 μ F,16V, Elect.
D301,D302	223205 or	1SS270A or	C131	354741009	10 μ F,16V, Elect.
D801	223163	1SS133	C138	354780229	2.2 μ F,50V, Elect.
D901~D904	22380260,	RL1N4003,	C139	354722219	220 μ F,6.3V, Elect.
D911	22380035 or	GP104003E or	C141	393142217	220 μ F,16V, Elect.
D931~D934	22380046	AM01Z	C144	354784799	0.47 μ F,50V, Elect.
D917,D920	223205 or 223163	1SS270A or 1SS133	C147	354780109	1 μ F,50V, Elect.
D918	224471103	MTZJ11C, Zener	C155	393141017	100 μ F,16V, Elect. <D/W/T>
D935,D936	224473004	MTZJ30D, Zener	C156	354780229	2.2 μ F,50V, Elect. <D/W/T>
D131,D151	223205 or	1SS270A or	C157	354784799	0.47 μ F,50V, Elect. <D/W/T>
D152	223163	1SS133 <D/W/T>	C159	374721034	0.01 μ F \pm 5%,50V, Plastic <D/W/T>
			C160	354782299	0.22 μ F,50V, Elect. <D/W/T>
			C162,C163	354741009	10 μ F,16V, Elect. <D/W/T>
			C164	354780479	4.7 μ F,50V, Elect. <D/W/T>
			C165	354721019	100 μ F,6.3V, Elect. <D/W/T>
			C167	354741009	10 μ F,16V, Elect. <D/W/T>
			C175	354780109	1 μ F,50V, Elect. <D/W/T>
			C201	393144717	470 μ F,16V, Elect.
			C202	374724734	0.047 μ F \pm 5%,50V, Plastic <D/W/T>
			C203	393142207	22 μ F,16V, Elect. <P>
			C203	393180227	2.2 μ F,50V, Elect. <D/W/T>

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors				
C204	374724734	0.047 μ F \pm 5%, 50V, Plastic	P232	25045330	NPJ-2PDBL184, R1
C205	374723315	330pF \pm 10%, 50V, Plastic	P231	25045341	NPJ-2PDBL192, Output
C207	354741009	10 μ F, 16V, Elect.		Plugs	
C208	374722234	0.022 μ F \pm 5%, 50V, Plastic	P004	25055038	NPLG-2P29
C209,C210	354780109	1 μ F, 50V, Elect.	P101,P102	25055038	NPLG-2P29
C211	354782299	0.22 μ F, 50V, Elect.	P701,P801	25055038	NPLG-2P29
C212	354780109	1 μ F, 50V, Elect.	JL951b	25055624	NPLG-3P586
C216	393141007	10 μ F, 16V, Elect.	P911	25055168	NPLG-5P152
C221,C222	374722715	270pF \pm 10%, 50V, Plastic <P>		Socket	
C221,C222	374724714	470pF \pm 5%, 50V, Plastic <T>	JL701b	25050862	NSCT-30P657
C221,C222	374725614	560pF \pm 5%, 50V, Plastic <W>		Switch	
C221,C222	374726814	680pF \pm 5%, 50V, Plastic <D>	S791	25065286	NSS-22112, Slide <W>
C223,C224	393142207	22 μ F, 16V, Elect.		Antenna terminals	
C225,C226	374724724	4700pF \pm 5%, 50V, Plastic	P002	25060231	NTM-1PD153 <D/W/T>
C231,C232	393141017	100 μ F, 16V, Elect.	P001	25060202	NTM-2PD124 <P>
C233-C236	393142207	22 μ F, 16V, Elect.	P003	25060117	NTM-2PDML051 <D/W/T>
C301	354741009	10 μ F, 16V, Elect.		Radiators	
C304,C305	354784799	0.47 μ F, 50V, Elect.	Q911a,Q912a	27160179	RAD-57
C803,C809	374724724	4700pF \pm 5%, 50V, Plastic	Q921a,Q922a	27160220-1	RAD51(B)
C804	374722234	0.022 μ F \pm 5%, 50V, Plastic			
C805	374724734	0.047 μ F \pm 5%, 50V, Plastic			
C806	354780229	2.2 μ F, 50V, Elect.			
C807,C808	374723324	3300pF \pm 5%, 50V, Plastic			
C910	374721044	0.1 μ F \pm 5%, 50V, Plastic			
C911,C912	393154717	470 μ F, 25V, Elect.			
C913-C916	374721044	0.1 μ F \pm 5%, 50V, Plastic			
C917	393142217	220 μ F, 16V, Elect.			
C918	393122217	220 μ F, 6.3V, Elect.			
C919	393152227	2200 μ F, 25V, Elect.			
C920	354784709	47 μ F, 50V, Elect.			
C921,C922	393152227	2200 μ F, 25V, Elect.			
C923-C926	374721044	0.1 μ F \pm 5%, 50V, Plastic			
C927,C928	393142217	220 μ F, 16V, Elect.			
C931	354781019	100 μ F, 50V, Elect.			
C932	354782219	220 μ F, 50V, Elect.			
C937	354774719	470 μ F, 63V, Elect.			
C938	354784719	470 μ F, 50V, Elect.			
C939	354761019	100 μ F, 35V, Elect.			
C940,C943	354781009	10 μ F, 50V, Elect.			
C944	354781009	10 μ F, 50V, Elect.			
C945	374721044	0.1 μ F \pm 5%, 50V, Plastic			
	Resistors				
R041,R042	431533355	3.3M Ω \pm 10%, 1/2W, Solid <D>			
R101,R102	5210262	N06HR10KBC, Trimming			
R151,R801	5210263	N06HR20KBC, Trimming <D/W/T>			
R191,R202	5210265	N06HR50KBC, Trimming			
R201	5210266	N06HR100KBC, Trimming			
R901	453534794	0.47 Ω \pm 5%, 1/2W, Metal	R764	49163103408	10K*8, 1/10W, Network
R911	453530474	4.7 Ω \pm 5%, 1/2W, Metal	R765	49163103408	10K*8, 1/10W, Network
R912	443524704	47 Ω \pm 5%, 1/2W, Metal oxide film			
R921,R922	453630474	4.7 Ω \pm 5%, 1W, Metal	S701	25035652	NPS-111-S604 <D/W/T>
	Realies		S702-S711	25035652	NPS-111-S604
RL001	25065356	NRL-1P0.1A-DC12-050, RELAY	JL701a	25050894	NSCT-30P689
RL231	25065469	NRL-2P1A-DC12-078, RELAY	JL771a	25051089	NSCT-5P876
	Shield case		JL781a	25051087	NSCT-3P874
	27150357	Front end, center		Holder	
	27301031-1	Front end	Q702a	27190981	FL tube
	27301033-1	Front end			
	Screws				
Q911b,Q912b	82143006	3P+6FN(BC), Pan head			
Q921b,Q922b	82143006	3P+6FN(BC), Pan head			

DISPLAY CIRCUIT PC BOARD (NADG-5788-1A/1B/1C/1D)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q701	22241021	MPD780206GF-011
	Fluorescent tube	
Q702	212152	FIP18XM1AA
	Transistors	
Q703	221282 or	DTC144ES or
Q703or	2213560	RN1204
Q704	2212600 or	DTA124ES or
Q704or	2213580	RN2203
	Diodes	
D701-D704	223205 or	1SS270A or
	223163	1SS133
D705	224470562	MTZJ5.6B, Zener
D791	224471203	MTZJ12C, Zener
	Resonator	
X701	3010224	XTL-4.19M, Crystal
	Capacitors	
C701	3000076	EECS5R5T104, Super
C702	354741009	10 μ F, 16V, Elect.
C704	354780109	1 μ F, 50V, Elect.
C707	3060031	NTC-45P27, Trimmer
C791	354781009	10 μ F, 50V, Elect.
	Resistors	
R764	49163103408	10K*8, 1/10W, Network
R765	49163103408	10K*8, 1/10W, Network
	Switches	
S701	25035652	NPS-111-S604 <D/W/T>
S702-S711	25035652	NPS-111-S604
	Sockets	
JL701a	25050894	NSCT-30P689
JL771a	25051089	NSCT-5P876
JL781a	25051087	NSCT-3P874
	Holder	
Q702a	27190981	FL tube

REMOTE SENSOR PC BOARD (NAETC-5789-1A/1B/1C/1D)		
CIRCUIT NO.	PART NO.	DESCRIPTION
Q771	241302	PIC-12043TH2, Remote sensor
D771	225291D	SEL4910D-D, LED
C771	354741009	10 μ F, 16V, Elec. capacitor
S771	25035652	NPS-111-S604, Push switch
JL771b	25055626	NPLG-5P588, Plug

TUNING SWITCH PC BOARD (NASW-5790-1A/1B/1C/1D)		
CIRCUIT NO.	PART NO.	DESCRIPTION
S781	25065518	RE161PVB25F, Rotary encoder
JL781b	25055624	NPLG-3P586, Plug

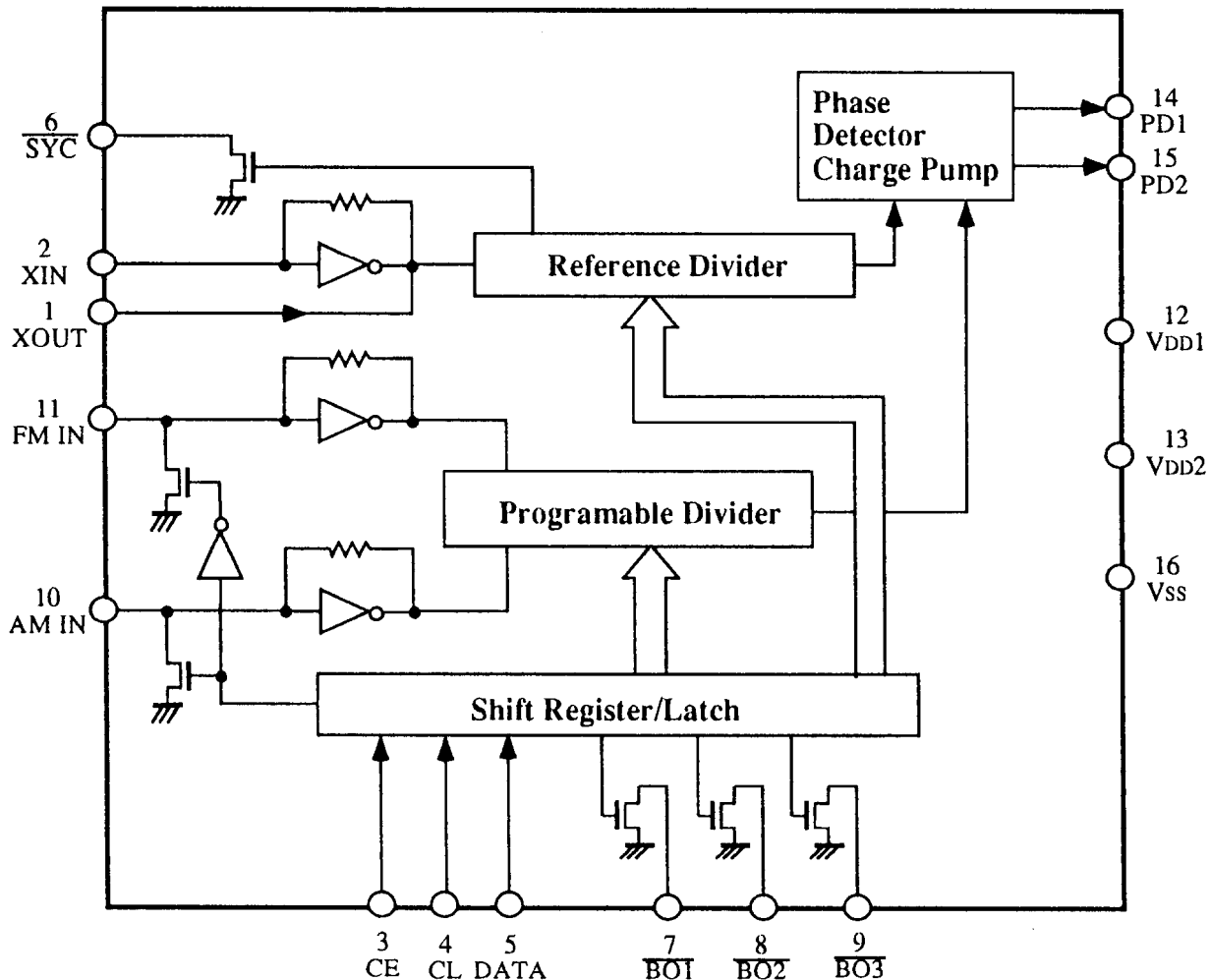
VOLTAGE SELECTOR SWITCH PC BOARD (NAPS-5828-1C)		
CIRCUIT NO.	PART NO.	DESCRIPTION
S951	25065437	! NSS-22157P, Slide switch <W>

PRIMARY CIRCUIT PC BOARD (NAPS-5791-1A/1B/1C/1D)		
CIRCUIT NO.	PART NO.	DESCRIPTION
Q951	2213640 or 2214660	DTC123JS or RN1205, Transistor
D951	223205 or 223163	1SS270A or 1SS133, Diode
C951	3500191	⚠ DE7150F103M, 1S capacitor
RL951	25065248	⚠ NRL-1P15A-DC12-29, Relay
F951a	25050065	⚠ YSH403T, Fuse holder <P/T>
JL951a	25051087	NSCT-3P874, Socket
P951	25055675	⚠ NPLG-2P631, Plug
P952	25055167	⚠ NPLG-4P151, Plug <P/D/T>
P952	25055170	⚠ NPLG-7P154, Plug <W>
P953	25051221	⚠ NSCT-6P1011, AC outlet <P/T>
P953	25051220	⚠ NSCT-6P1010, AC outlet <D/W>
R951	431533355	⚠ 3.3M Ω \pm 10%, 1/2W, Solid resistor <D>

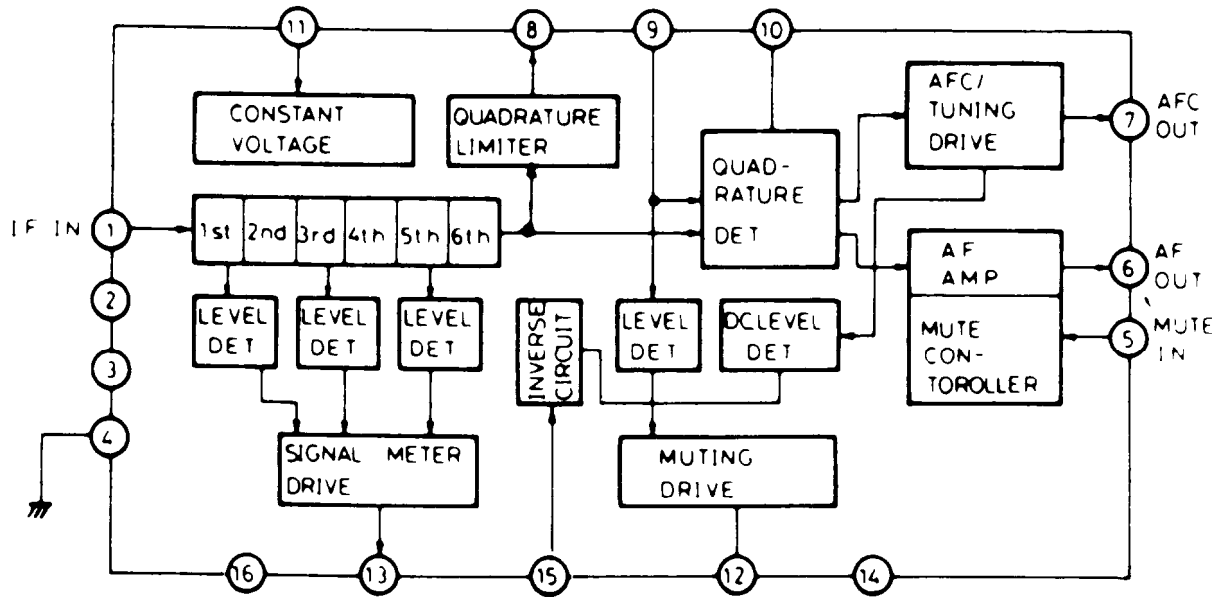
NOTE: THE COMPONENTS IDENTIFIED BY MARK
⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

IC BLOCK DIAGRAMS AND DESCRIPTIONS

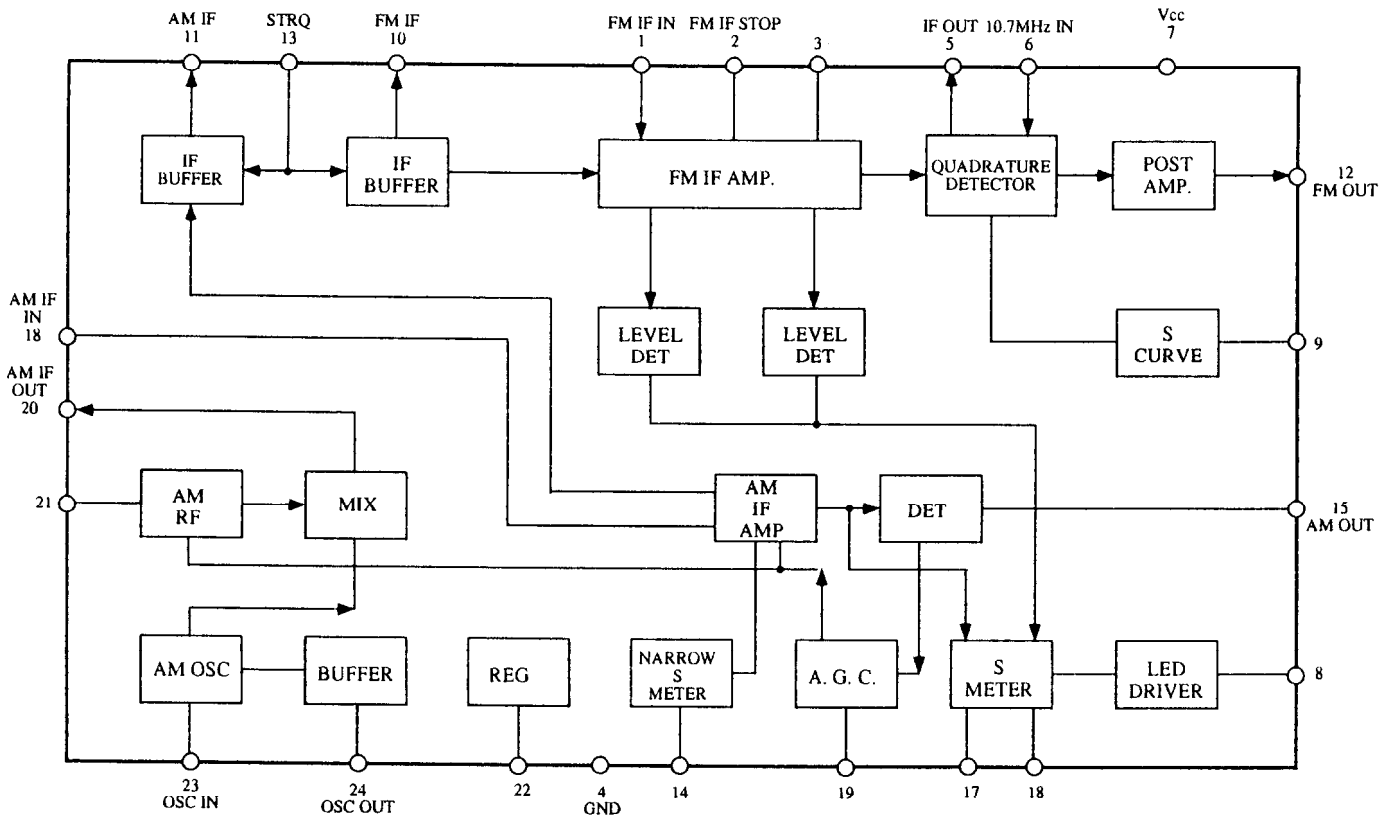
LM7001(PLL SYNTHESIZER AND CONTROLLER)



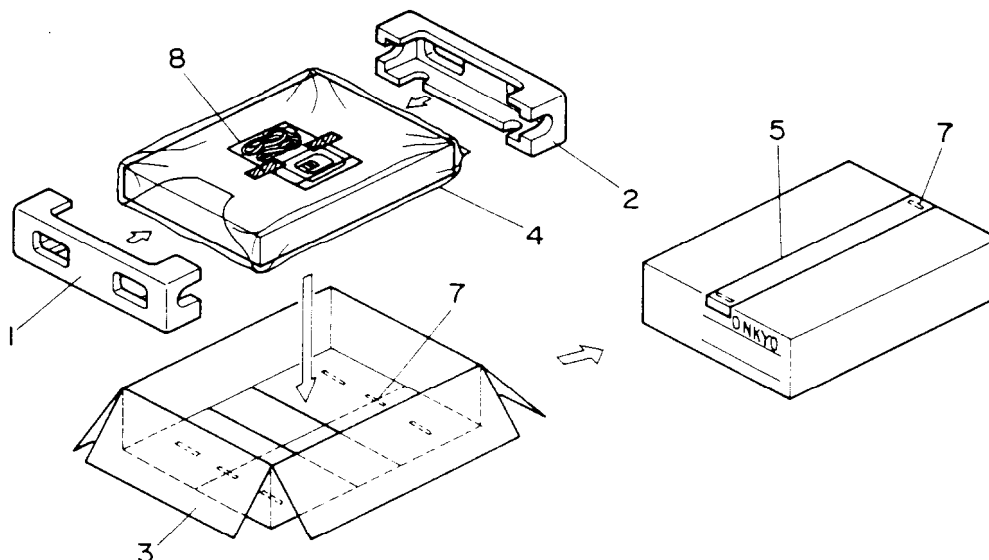
LA1235(FM IF AND AM RADIO SYSTEM)



LA1266(FM IF AND AM RADIO SYSTEM)



PACKIG VIEW



REF.NO.	PART NO.	DESCRIPTION
1	29091734	Pad L
2	29091735	Pad R
3	29053020	Carton box <D/W/T>
3	29053021	Carton box <S>
3	29053022	Carton box <G>
3	29053066	Carton box <P>
4	29100097-1AY	Poly bag
5	29110071	PP tape
7	282301	Staples
8	Accessory bag ass'y	
	292112	FM antenna
	29361970	Label UPC <BD>
	29361971	Label UPC <GD>
	2010098A	Connection cord
	2010200	Remote control cord
	232140	NMA-3057, AM loop antenna <D/T/W>
	24140315	RC-315T, Remote control
	25055018	CV-K-1, Conversion plug <W>
	25065462	YAE21-0237, FM adaptor <D/T/W>
	29342325	Instruction manual E
	29342326	Instruction manual U6 <P>
	29342328	Instruction manual U3 <T/W>
	29358002K	Service station list <D>
	29365019B	Warranty card <D>
	3010054	UM-3, Battery

NOTE: <D>: 120V model only
 <P>: 230V model only
 <PB>: U.K model only
 <W>: Worldwide model only
 <T>:Taiwanese model only
 : Black model only
 <S>: Silver model only
 <G>: Golden model only

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