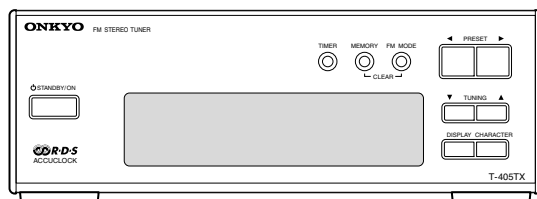


ONKYO® SERVICE MANUAL

Ref. No . 3680

052001


STEREO TUNER MODEL T-405TX



Silver models

SUPT	230V AC,50Hz
SUDT	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 PART NUMBER 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®
IMAGINATIVE SIGHT & SOUND

SPECIFICATIONS

FM

Tuning Range:

87.90 - 107.90 MHz, 200 kHz steps
(U.S. & Canadian models)

87.50 - 108.00 MHz, 50 kHz steps
(Other area models)

Usable Sensitivity:

Mono : 12.8 dBf 1.2 μ V, 75 Ohms IHF

Stereo: 19.2 dBf 2.5 μ V, 75 Ohms IHF

50dB Quieting Sensitivity:

Mono : 18.0 dBf 2.2 μ V, 75 Ohms

Stereo: 38.0 dBf 22 μ V, 75 Ohms

Capture Ratio : 1.5 dB

Image Rejection Ratio : 85 dB

IF Rejection Ratio : 90 dB

Signal-to-Noise Ratio : Mono: 73 dB IHF

Stereo: 66 dB IHF

Selectivity :50 dB DIN (\pm 300 kHz, 40 kHz dev)

AM Suppression Ratio :50 dB

Total Harmonic Distortion : Mono: 0.5%

Stereo: 0.8%

Frequency Response :30 - 15,000 Hz (\pm 1.5 dB)

Stereo Separation :40 dB at 1 kHz

30 dB at 70 - D 10,000 Hz

Output Level : 0.5 V (U.S. & Canadian models)

0.75 V (Other area models)

Muting Level : 17.2 dBf 2.0 μ V, 75 Ohms

AM

Tuning Range :

530 - 1,710 kHz, 10 kHz steps

Usable Sensitivity : 30 μ V

Image Rejection Ratio 30 dB

IF Rejection Ratio : 40 dB

Signal-to-Noise Ratio : 40 dB

Total Harmonic Distortion : 0.8%

Output Level: 0.15 V

General

Power Supply :

AC 120 V, 60 Hz

AC 230-240 V, 50 Hz

Power Consumption : 9 W

Dimensions (W x H x D) :

205 x 76 x 279 mm

8-1/16" x 3" x 11"

Weight : 1.7 kg, 3.7 lbs.

AM reception is available only on the U.S. and Canadian models.

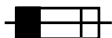
Specifications and external appearance are subject to change without notice as a result of product improvement.

SERVICE PROCEDURES

1. Replacing the fuse



This symbol located near the fuses indicates that the fuse used is fast operating type. For continued protection against fire hazard, replace with same type fuse. For fuse rating refer to the marking adjacent to the symbol.



Ce symbole indique que le fusible utilise est a rapide. Pour une protection permanente, n'utiliser que fusibles de meme type. Ce dernier est la qu le present symbol est appse.

CIRCUIT NO.	PART NO.	DESCRIPTION
F901	252075	2.5A-SE-EAK,Fuse

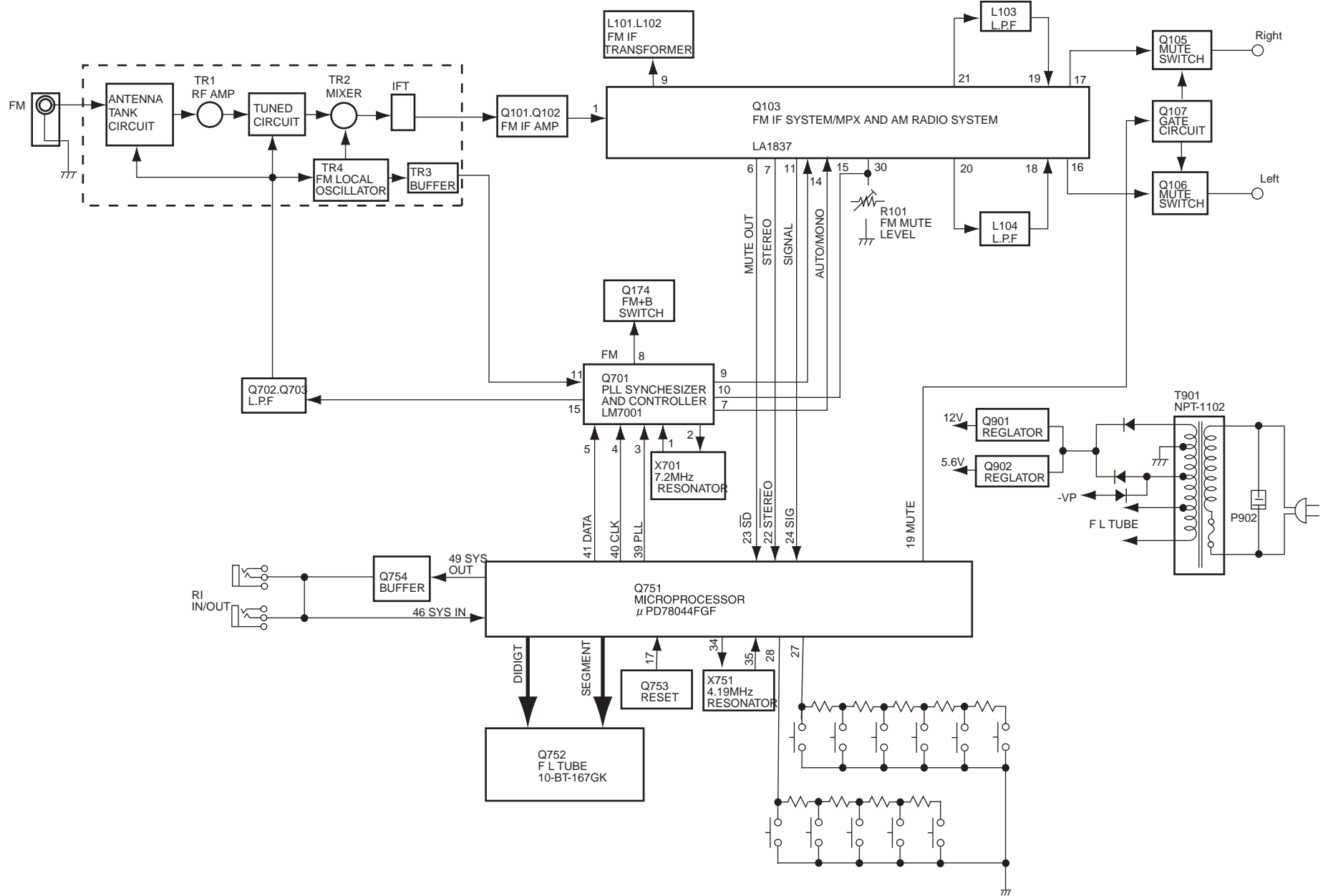
2. To initialize the unit

This device employs a microprocessor to perform various functions and operations. If interference generated by an external power supply, radio wave, or other electrical source results in accident which causes the specified operations and functions to operate abnormally.

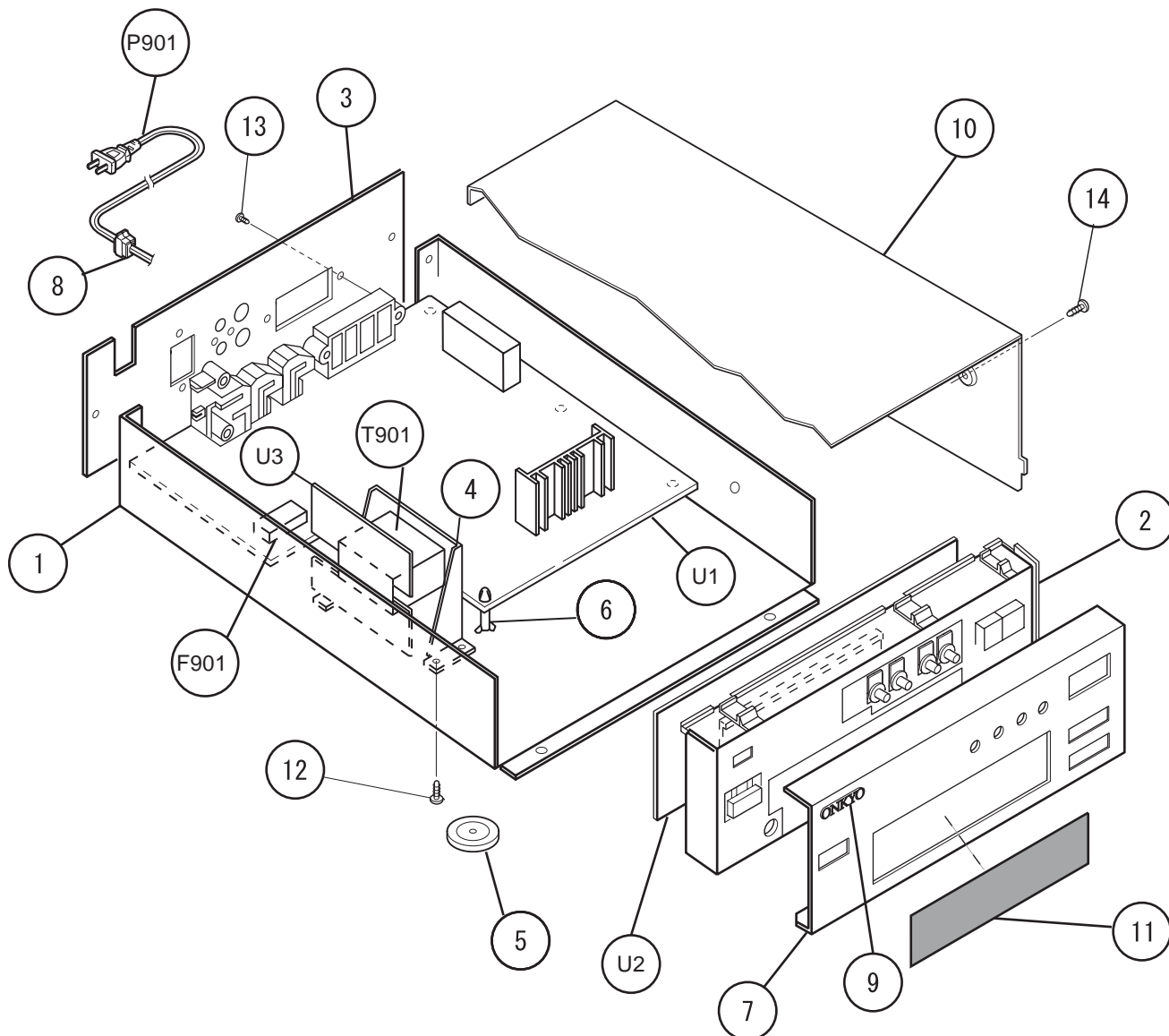
To perform a result, please follow the procedure below.

1. Set the unit to the standby mode
2. Press and hold down the MEMORY button, then press the DISPLAY button.
3. The segments of the F.L.tube light on and the unit is set to the test mode.
4. 'Clear' is displayed when the power switch is pressed in the state of the test mode and the memory is cleared.

BLOCK DIAGRAM



EXPLODED VIEW



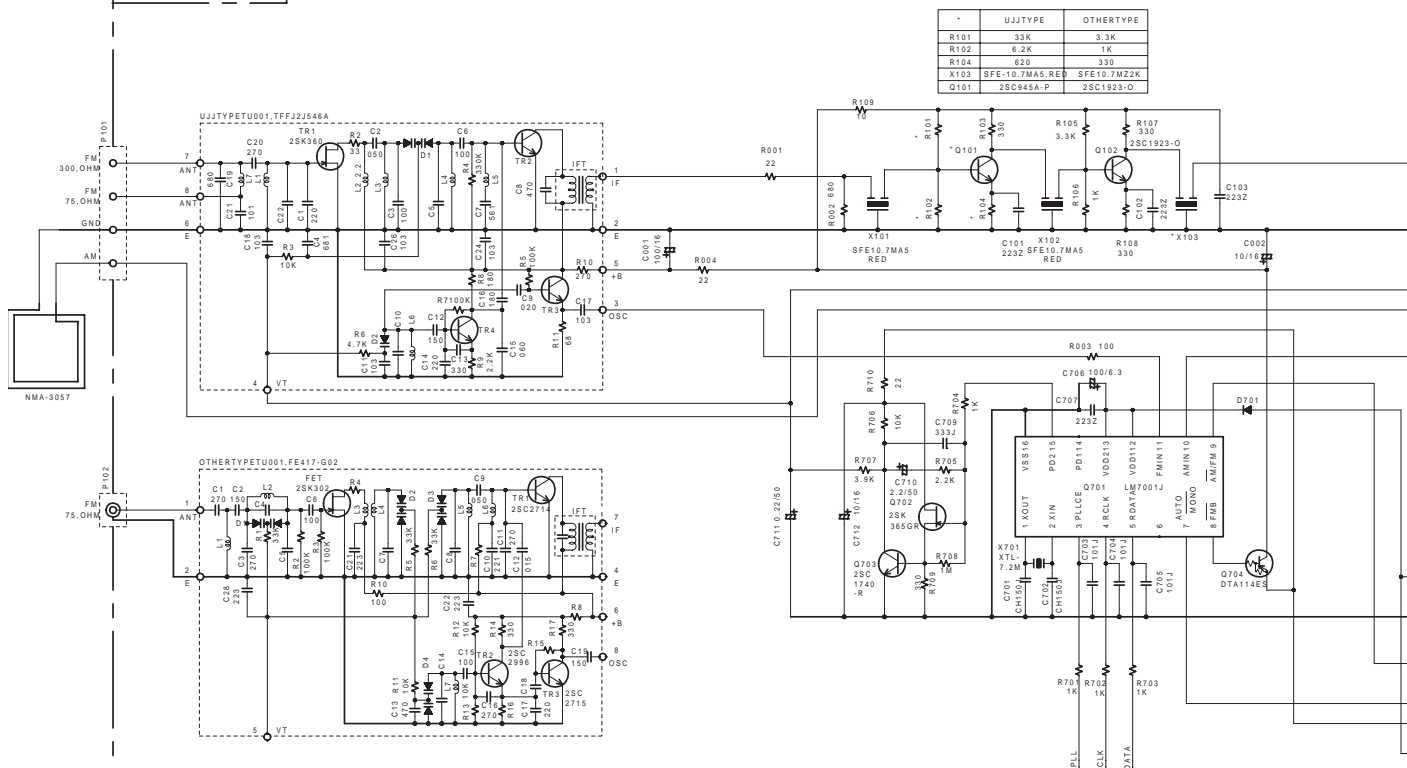
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
U1	1A907530-4C	NARF-6130-4C,Main circuit PC board ass'y <P>	1	27100337	Chassis
	1A907530-4D	NARF-6130-4D,Main circuit PC board ass'y <D>	2	27111039B	Front bracket
U2	1A907531-4C	NADIS-6131-4C,Display PC board ass'y <P>	3	27122847	Rear panel <P>
	1A907531-4D	NADIS-6131-4D,Display PC board ass'y <D>		27122848	Rear panel <D>
U3	1A907533-4C	NAPS-6133-4C,Power Transformer PC board ass'y <P>	4	27141695A	T,Retainer
	1A907533-4D	NAPS-6133-4D,Power Transformer PC board ass'y <D>	5	27175323	Leg
T901	⚠ 2300636	NPT-1102D,Power transformer <D>	6	27190524	KGLS-14RF,Holder
	⚠ 2300637	NPT-1102P,Power transformer <P>	7	27212313	Front panel
F901	⚠ 252075	2.5A-SE-EAK,Fuse <P>	8	⚠ 27300750	Bushing
P901	⚠ 253193HIT	AS-CEE,Power supply cord <P>	9	28135247Y	Badge
	⚠ 253277MIL	AS-UC-2#18,Power supply cord <D>	10	28184705-1	Cover
			11	28191800C	Clear plate
			12	838130088	3TTB+8B,Self tapping screw
			13	838430088	3TTB+8B(BC),Self tapping screw
			14	838930088	3TTB+8B(UN),Self tapping screw

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

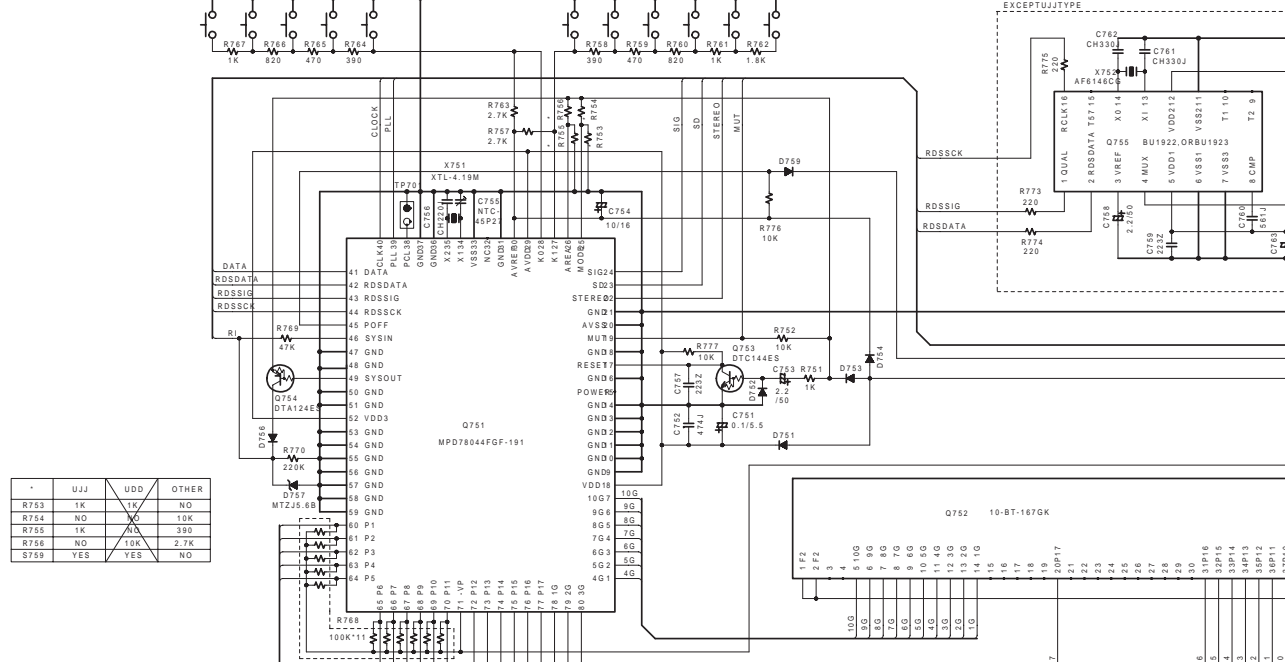
NOTE : <P> 230V model only
<D> 120V model only

SCHEMATIC DIAGRAM

NARF-6130

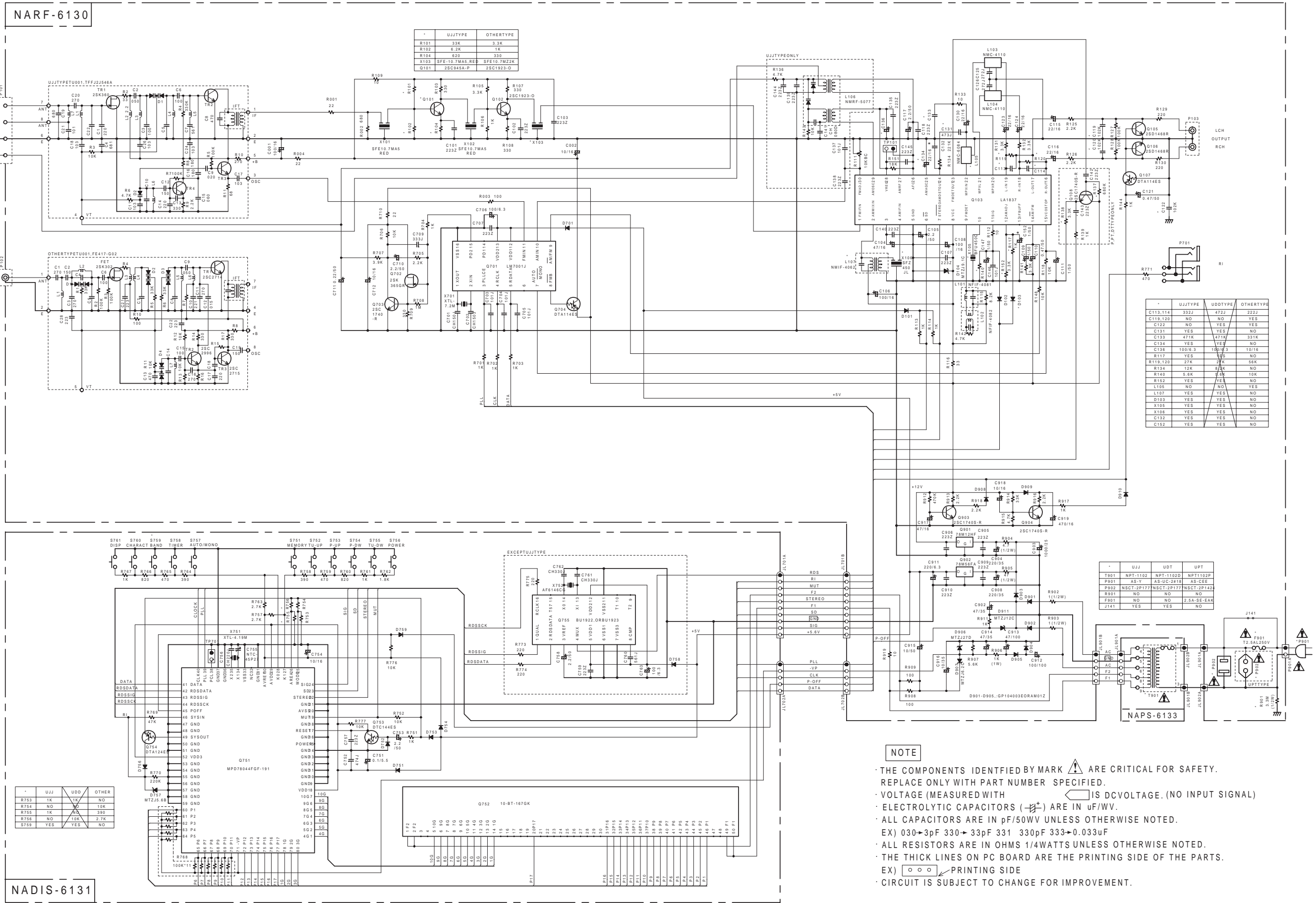


NADIS-6131



NADIS-6131

SCHEMATIC DIAGRAM



	UJJTYPE	OTHEATYPE
R101	33K	3.3K
R102	6.2K	1K
R104	220	330
X103	SFE10.7MA5 RED	SFE10.7M22K
Q101	2SC945A-P	2SC1923-O

	UJJTYPE	UDDTYPE	OTHEATYPE
C113,114	332J	472J	222J
C119,120	NO	NO	YES
C132	NO	YES	YES
C131	YES	YES	NO
C133	471K	471K	331K
C134	YES	YES	YES
C136	100J6.3	100J7.3	10J18
R117	YES	YES	NO
R119,120	27K	27K	56K
R134	12K	27K	NO
R140	5.6K	27K	10K
R152	YES	YES	YES
L105	NO	YES	NO
L107	YES	YES	NO
D103	YES	YES	NO
X105	YES	YES	NO
X106	YES	YES	NO
C132	YES	YES	NO
C152	YES	YES	NO

	UJJ	UDT	UPT
T001	NPT-1102	NPT-1102D	NPT1102P
P001	AS-Y	AS-UC-2P18	AS-CEE
R002	NSCT-2P177	NSCT-2P177	NSCT-2P142
R001	NO	NO	NO
F001	NO	NO	2.5A-SE-EAK
J141	YES	YES	NO

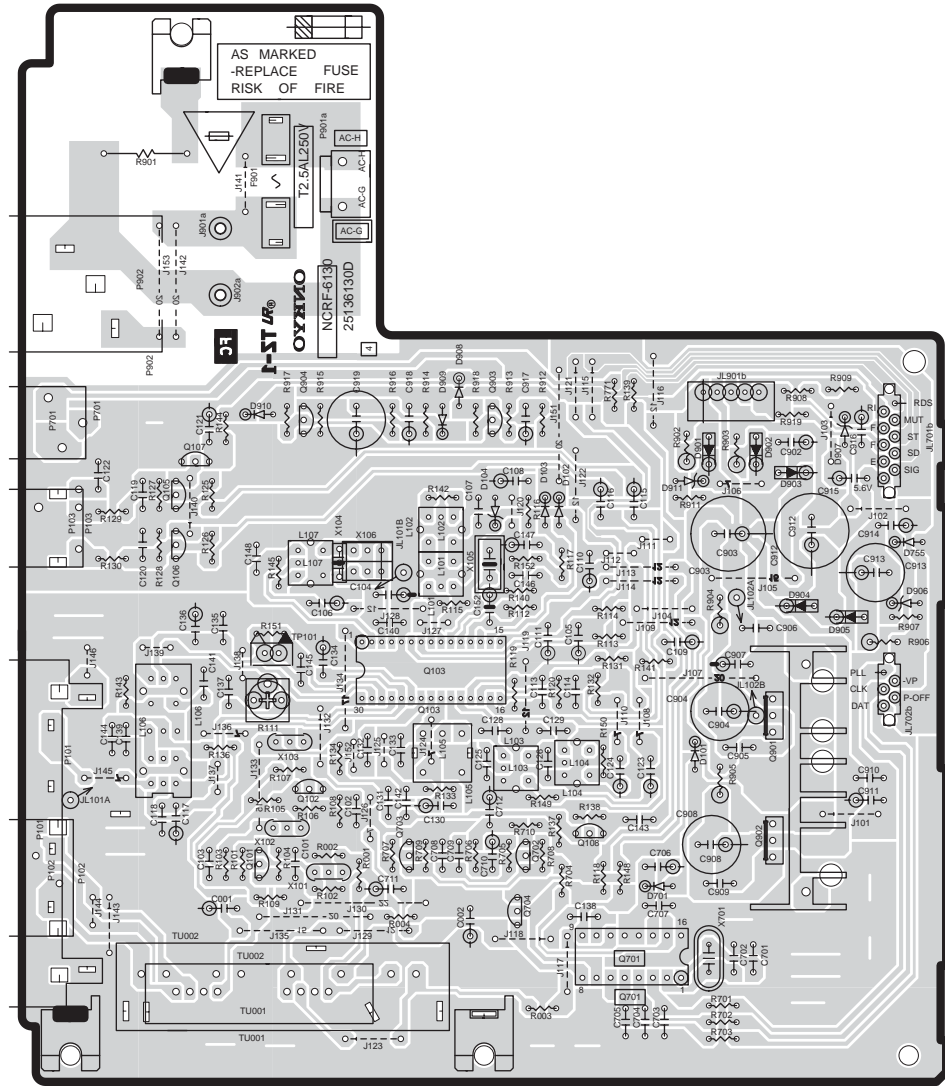
	UJJ	UDD	OTHER
R753	1K	1K	NO
R754	NO	NO	10K
R755	1K	NO	330
R756	NO	10K	2.7K
S758	YES	YES	NO

NOTE

- THE COMPONENTS IDENTIFIED BY MARK ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE (MEASURED WITH IS DC VOLTAGE. (NO INPUT SIGNAL)
- ELECTROLYTIC CAPACITORS () ARE IN uF/WV.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED.
- EX) 030→3pF 330→33pF 331 330pF 333→0.033uF
- ALL RESISTORS ARE IN OHMS 1/4WATTS UNLESS OTHERWISE NOTED.
- THE THICK LINES ON PC BOARD ARE THE PRINTING SIDE OF THE PARTS.
- EX) PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

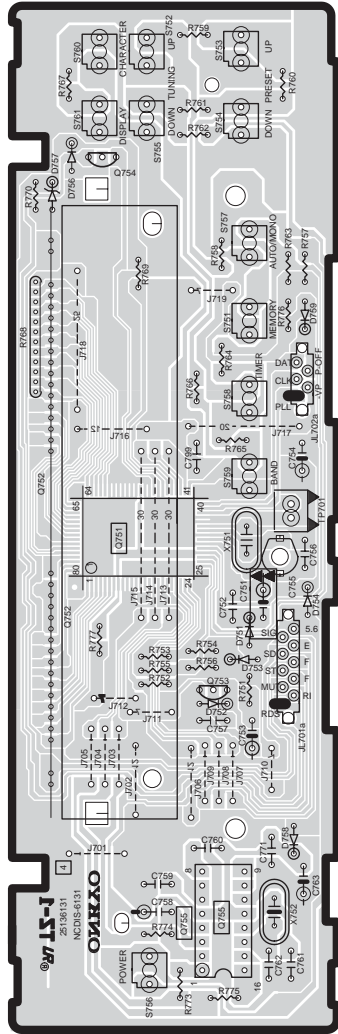
NADIS-6131

PRINTED CIRCUIT BOARD VIEW FROM SOLDERING SIDE

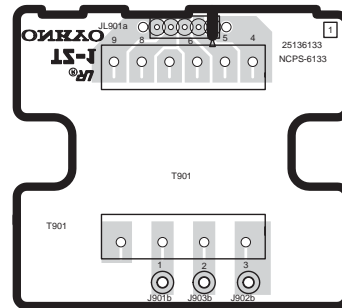


MAIN CIRCUIT PC BOARD (NARF-6130)

PRINTED CIRCUIT BOARD VIEW FROM SOLDERING SIDE




DISPLAY PC BOARD (NADIS-6131)



POWER TRANSFORMER PC BOARD (NAPS-6133)

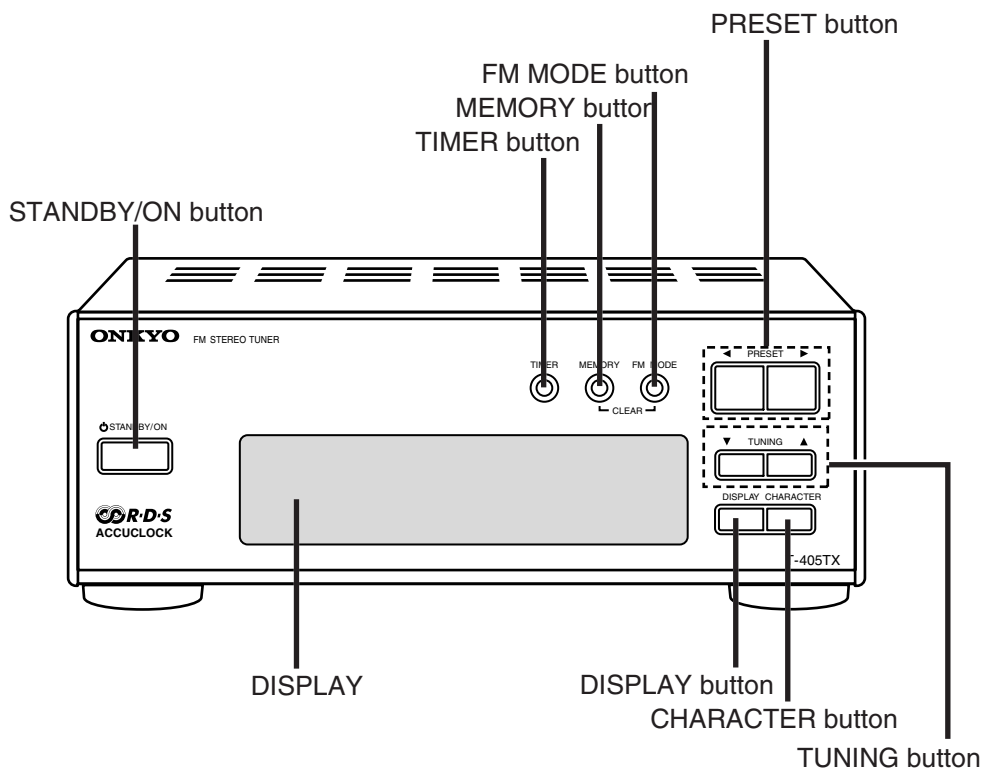
PRINTED CIRCUIT BOARD-PARTS LIST

MAIN CIUCUIT PC BOARD(NARF-6130-4C/4D)			CIRCUIT NO.	PART NO.	DESCRIPTION
CIRCUIT NO.	PART NO.	DESCRIPTION		Resistors	
	Front end		R902,R903	453530104	1 Ω ±5%,1/2W,Metal oxide
TU001	240102	FE417-G02	R904	453530474	4.7 Ω ±5%,1/2W,Metal oxide
	ICs		R905	443524704	47 Ω ±5%,1/2W,Metal oxide
Q103	22241151	LA1837	R906	443621024	1k Ω ±5%,1W,Metal oxide
Q701	22241076	LM7001J		Sockets	
Q901	222780125	78M12HF	JL701B	25051094	NSCT-10P881
Q902	222780565JRC	NJM78M56FA	JL702B	25051089	NSCT-5P876
	Transistors		JL901B	25050269	NSCT-5P97
Q101,Q102	2211723	2SC1923-O	P902	25051637	NSCT-2P1424 <P>
Q105,Q106	2212794 or	2SD1468-R or	P902	25051990	NSCT-2P1777 <D>
	2215024	2SD1468S-R		Plugs	
Q107,Q704	2213510 or	DTA114ES or	TP101	25055038	NPLG-2P29
	2215770	KRA102M	P901A	25055675	NPLG-2P631
Q108,Q703	2213284	2SC1740S-R		Terminals	
Q702	2212445	2SK365-GR	P102	25060231	NTM-1PD153
Q903,Q904	2213284	2SC1740S-R	P103	25045333	NPJ-2PDBL185
	Diodes		P701	25045330	NPJ-2PDBL184
D101,D102	223205 or	1SS270A or		Fuse holders	
D701,D908	223163	1SS133	F901A	25050065	! YSH403T <P>
D104	224470913	MTZJ9.1C		Heat sink	
D901-D905	22380035 or	GP104003E or	Q901A	27160209	RAD-67
	22380046	AM01Z		Self tapping screw	
D906	224472704	MTZJ27D	Q901B	838430107	3TTB+10S(BC)
D907	224470623	MTZJ6.2C			
D909,D910	223205 or	1SS270A or			
	223163	1SS133			
D911	224471203	MTZJ12C			
	Coils				
L103,L104	233528	NMC-4110			
L105	233471Y	NMC-6084			
	Ceramic filters				
X101,X102	3010071	SFE-10.7MA5 RED			
X103	3010130	SFE10.7MZ2K			
	Oscillator				
X701	3010141	XTL-7.2M			
	Transformers				
L101	233457	NFIF-4081			
L102	233458	NFIF-4082			
	Capacitors				
C001,C106	354741019	100 μ F ,16V,Elect.			
C002,C136	354741009	10 μ F ,16V,Elect.			
C104,C917	354744709	47 μ F ,16V,Elect.			
C105,C117	354780229	2.2 μ F ,50V,Elect.			
C108	354741019	100 μ F ,16V,Elect.			
C109,C111	354780109	1 μ F ,50V,Elect.	X751	3010224	XTL-4.19M
C110,C121	354784799	0.47 μ F ,50V,Elect.	X752	3010203	AF6146CG
C113,C114	374722224	ECQ-B50V-222J		Capacitors	
C115,C116	354742209	22 μ F ,16V,Elect.	C751	3000078	DX-5R5L104
C123,C124	354742209	22 μ F ,16V,Elect.	C752	375524744	MMT50V-474J
C125,C126	374722724	ECQ-B50V-272J	C753,C758	355780226	2.2 μ F ,50V,Elect.
C130	354742209	22 μ F ,16V,Elect.	C754	355741009	10 μ F ,16V,Elect.
C147	354780109	1 μ F ,50V,Elect.	C755	3060031	NTC-45P27
C706	354721019	100 μ F ,6.3V,Elect.	C760	374725614	ECQ-B50V-561J
C709	374723334	ECQ-V50V-333J	C763	355721019	100 μ F ,6.3V,Elect.
C710	354780229	2.2 μ F ,50V,Elect.		Push switches	
C711	354782299	0.22 μ F ,50V,Elect.	S751-S758	25035652	NPS-111-S604
C712,C918	354741009	10 μ F ,16V,Elect.	S760,S761	25035652	NPS-111-S604
C902,C914	354764709	47 μ F ,35V,Elect.		Sockets	
C903	354751029	1000 μ F ,25V,Elect.	JL701A	25051094	NSCT-10P881
C904,C908	354762219	220 μ F ,35V,Elect.	JL702A	25051089	NSCT-5P876
C911	354722219	220 μ F ,6.3V,Elect.		Plug	
C912	354791019	100 μ F ,100V,Elect.	TP701	25055038	NPLG-2P29
C913	354794709	47 μ F ,100V,Elect.		Holder	
C915	354781009	10 μ F ,50V,Elect.	Q752A	27190943	(FL)
C916	354761009	10 μ F ,35V,Elect.			
C919	354744719	470 μ F ,16V,Elect.			
	Resistors				
R111	5210262	N06HR10KBC,Trimming			
R901	431533355	RC1/2GFKUL-3.3M,Solid	JL901A	25051109	NSCT-5P896

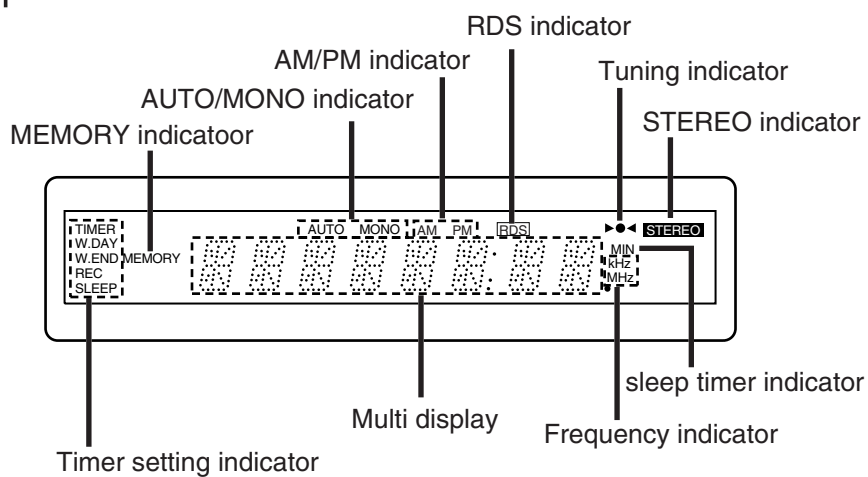
NOTE : THE COMPONENTS IDENTIFIED BY MARK  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK . REPLACE ONLY WITH PART NUMBER SPECIFIED.

CONTROL POSITIONS AND NAME

FRONT PANEL



DISPLAY



ADJUSTMENT PROCEDURES

Preparation

Input

FM mono: 1kHz, 75kHz devi., 60dB / μ V

FM stereo: 1kHz, 67.5kHz devi., 60dB / μ V

Pilot signal: 19kHz, 7.5kHz devi.

AM: 400Hz, 30% mod.

1. Clock adjustment

Connect the frequency counter to the test point TP701.

Set the unit to standby.

Press and hold down MEMORY button, then press DISPLAY button. (The all segments on the fluorescent tube light on)

Adjust the trimming capacitor C755 so that the indication of frequency counter becomes $524.288\text{kHz} \pm 1\text{Hz}$.

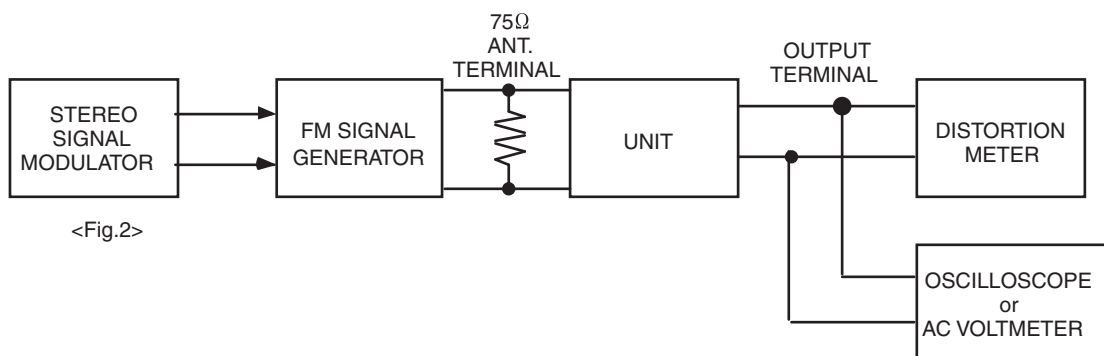
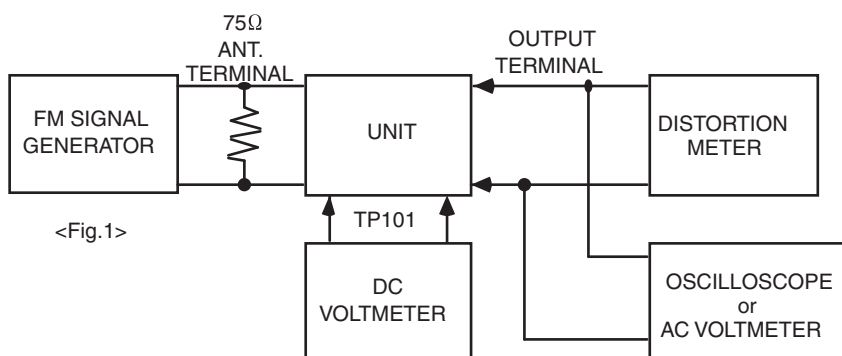
Afer adjustment, turn POWER switch to OFF.

2. FM Adjustment

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuning frequency	Output indicator	Adjustment point	Adjust for	Remarks
FM IF/RF	1	Fig.1	98.1MHz 1kHz 75kHz devi. 65dBf (60dB)	—	98.1MHz	DC voltmeter	L101	$0 \pm 20\text{mV}$	FM MUTE/MODE switch: ON/STEREO Repeat the steps 1 and 3 until no further adjustment is necessary.
	AC voltmeter					IFT on the front end	Maximum		
	Distortion analyzer					L102	Minimum		
Stereo Distortion		Fig.2	98.1MHz Ext. mod.	Channel L or R 1kHz	98.1MHz	Distortion analyzer	IFT on the front end	Minimum	Don't turn more than $\pm 180^\circ$.
Muting Level		Fig.1	98.1MHz 19.2dBf (14dB)	—	98.1MHz	Oscilloscope or TUNING indicator	R111	Signal output or light on	

Reference Specification (Other models)
 FM tuned voltage: 87.5MHz ~ 108.0MHz
 $1.8 \pm 0.5\text{V} \sim 7.8 \pm 0.5\text{V}$

ADJUSTMENT POINT

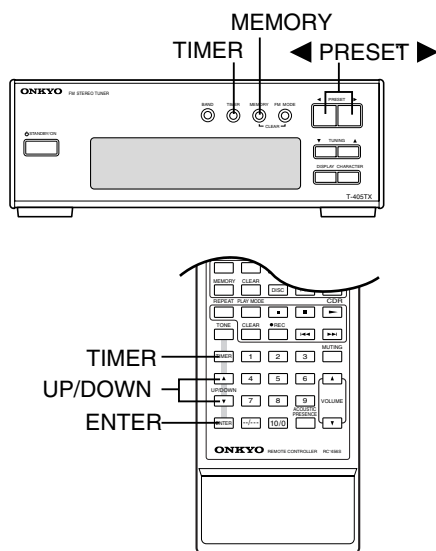


Using the timer

The T-405TX features a Timer function that enables you to start playing or recording a specified component at a specified time. To use this function, you need to configure a system that includes an ONKYO amplifier A-905TX connected to the T-405TX and other components via **RI** REMOTE CONTROL jacks.

Button and modes for the Timer function

The following button and setting modes are used to operate the Timer function. You can use the remote controller (that comes with the ONKYO amplifier A-905TX), as well as the front panel of the T-405TX.



Timer setting modes

WEEKDAY This mode enables you to listen to a specified component at a designated timer on weekdays. You can change the day of the week in DAY SET mode.

WEEKEND This mode enables you to listen to a specified component at a designated time on weekends. You can change the day of the week in DAY SET mode. You can define the same day of the week as both WEEKDAY and WEEKEND. To set two Programs for one day, specify the same day of the week as WEEKDAY and WEEKEND and set the time for each program.

TIMER button

Use this button to select a timer mode. The timer mode will change each time you press this button.

PRESET (◀/▶) buttons (T-405TX), or
UP/DOWN (▲/▼) button (Remote controller)

Use these buttons to select the details of the mode or to change values.

MEMORY button (T-405TX), or
ENTER button (Remote controller)

Use this button to enter the selected mode or numbers.

REC

This mode enables you to record your favorite broadcasting program(s) starting at a designated time. You can select from NEXT, the day of the week, and EVERYDAY. Except for EVERYDAY, the unit performs the timer recording once at the designated time.

DAY SET

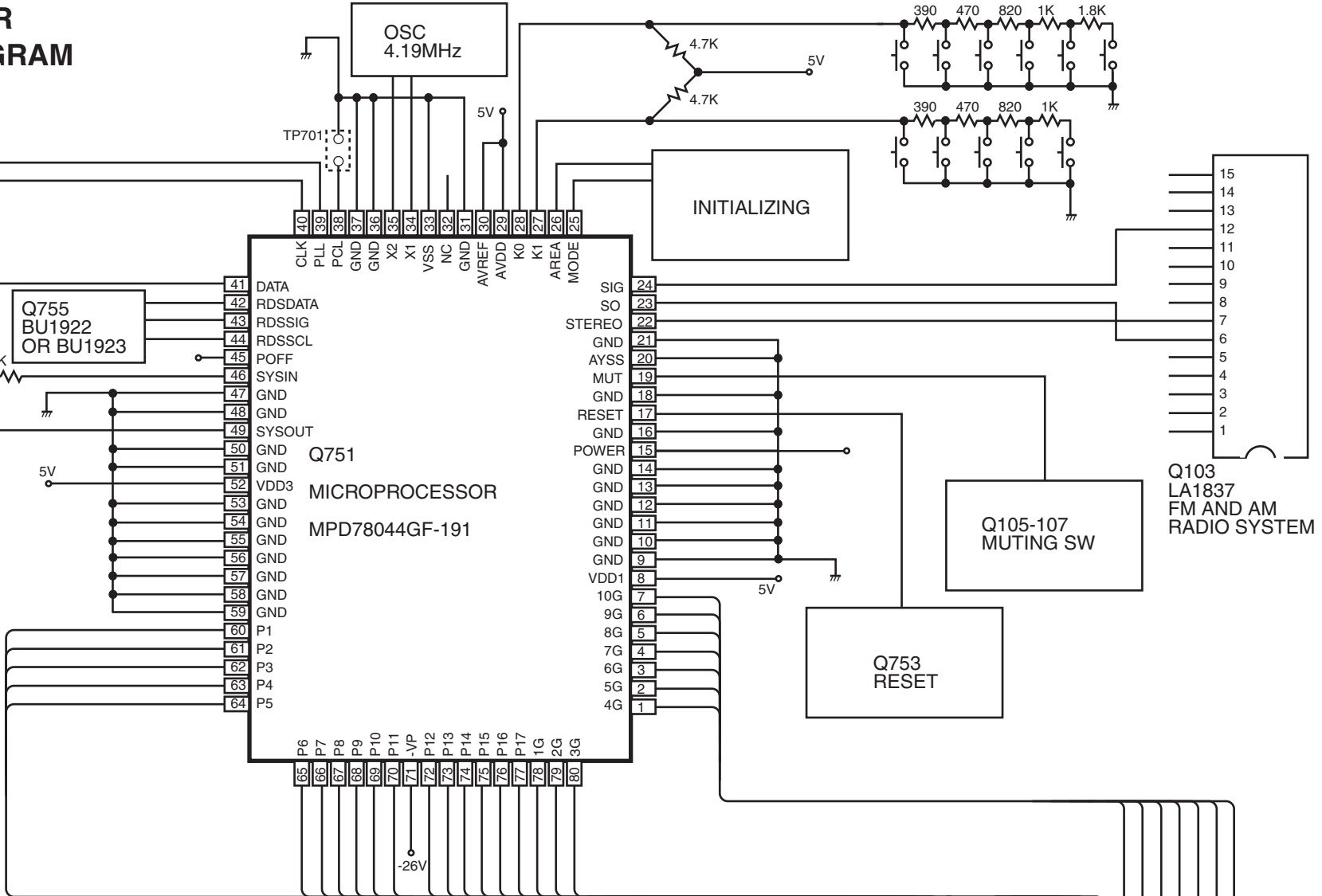
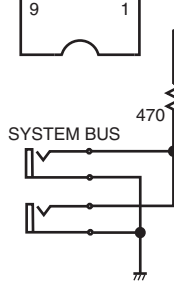
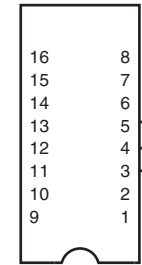
This mode enables you to change the day setting (definition) of WEEKDAY or WEEKEND.

ADJUST

This mode enables you to set and adjust the clock. If you have adjusted the clock, you do not need to set it again.

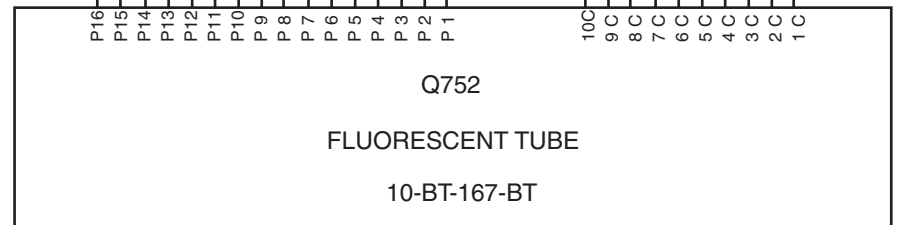
MICROPROCESSOR CONNECTION DIAGRAM

Q701
LM7001
PLL SYNTHESIZER
AND
CONTROLLER



OPERATION KEY

K 0	MEMORY	TU-UP	P-UP	P-DW	TU-DW	POWER
K 1	FM MODE	TIMER	BAND	CHARACT	DISPLAY	



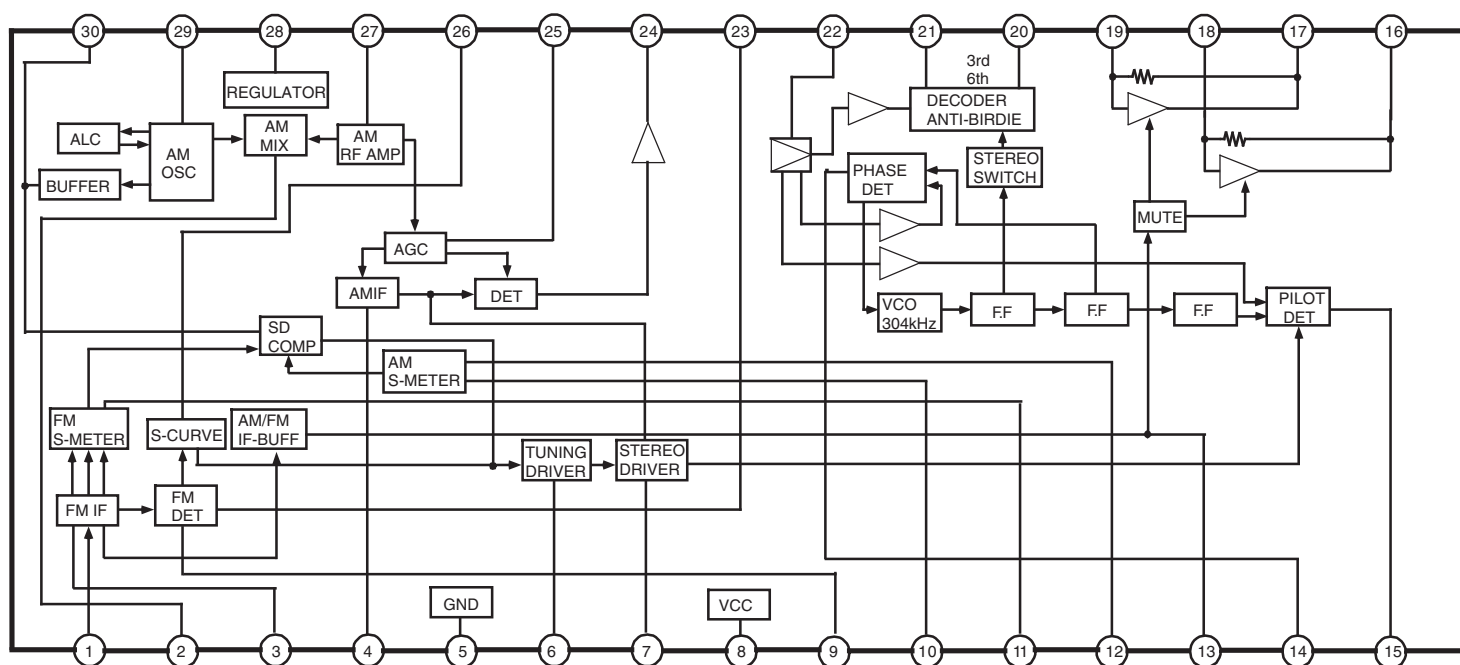
MICROPROCESSOR TERMINAL DISCRIPTIONS

Pin No.	Function	Description	Pin No.	Function	Description
1	4G	Grid output pin	42	RDSDATA	Data input pin from RDS decoder
2	5G		43	RDSSIG	Signal input pin from RDS decoder
3	6G		44	RDSSCK	Clock input pin from RDS decoder
4	7G		45	POFF	Power failure detector input pin
5	8G		46	SYSIN	System code input pin
6	9G		48	IC	Internal conecctionpin
7	10G		49	SYSOUT	System code output pin
8	VDD	Positive power supply pin(+5V)	52	VDD	Positive power supply pin(+5v)
15	POWER	Power source control pin	60	P1	Segment output pin
17	RESET	System reset pin	61	P2	
19	TUMUT	Muting control output pin	62	P3	
20	AVSS	Ground voltage pin for A/D converter	63	P4	
22	STEREO	Stereo broadcast detection input	64	P5	
23	SD	Broadcast detection input	65	P6	
24	SIGNAL	Signal strength level input pin	66	P7	
25	MODE	Initializing pin for RDS broadcast	67	P8	
26	AREA	Initializing pin for band area	68	P9	
27	K1	Key input pin	69	P10	
28	K0		70	P11	
29	AVDD	Analog power supply pin for A/D converter	71	VLOAD	Pull-down resistor connection pin
30	AVREF	Reference voltage pin for A/D converter	72	P12	Segment output pin
31	XT1	Crystal connection pins for subsystem clock	73	P13	
32	XT2	Not used	74	P14	
33	VSS	Ground	75	P15	
34	X1	Crystal connection pins for main system clock	76	P16	
35	X2	Connect the cwramic oscillator 4.19MHz	77	P17	
38	FOUT	Frequency output pin for adjustment	78	1G	
39	PLL CE	Chip enable output pin for PLL IC	79	2G	
40	CLK	Clock output pin for PLL IC	80	3G	
41	DATA	Data output pin for PLL IC			

The pin number not written is ground.

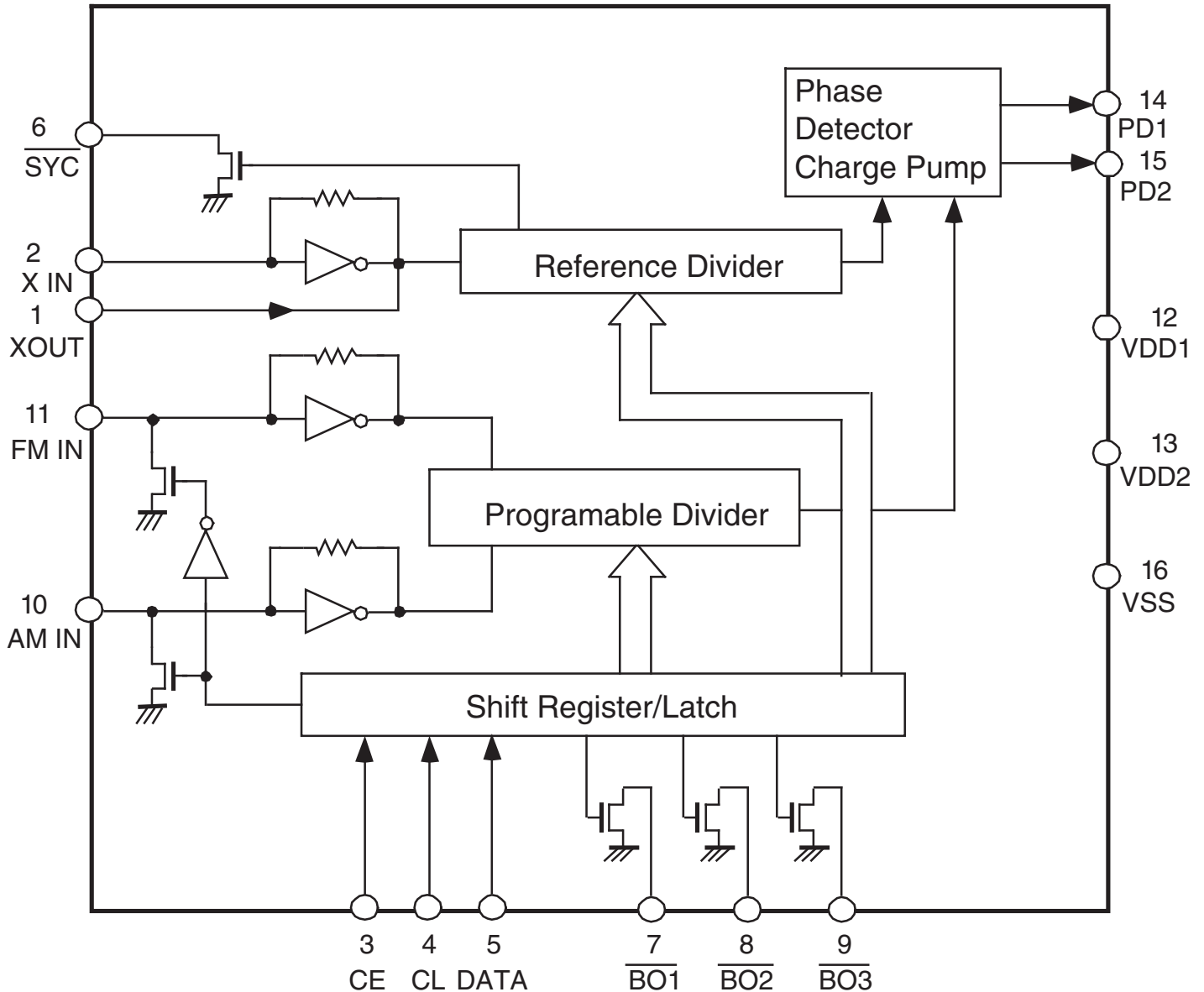
IC BLOCK DIAGRAM

Q103:LA1837



IC BLOCK DIAGRAM

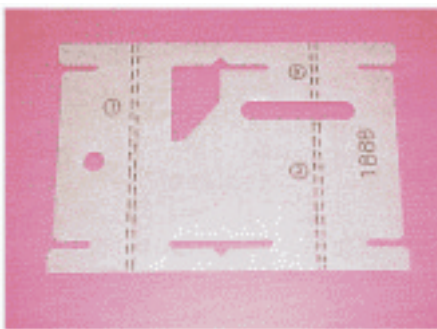
Q701:LM7001J



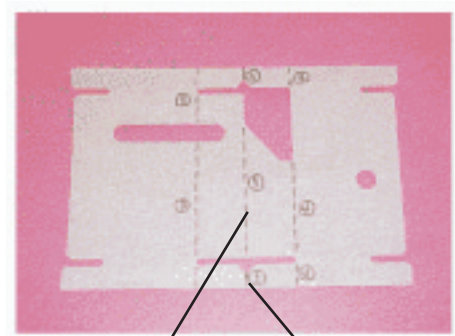
Pin No.	Terminal	Description
1	XOUT	Connect the 7.2MHz crystal resonator.
2	XIN	
3	CE	Chip enable terminal. Connect to the terminal PLL of microprocessor.
4	CL	Serial clock input terminal. Connect to the terminal CLK of microprocessor.
5	DATA	Serial clock input terminal. Connect to the terminal DATA of microprocessor.
6	SNY	Not used.
7	BO1	Auto/Mono control terminal.
8	BAND1	Band selector output terminal. Low level at FM.
9	BAND2	Band selector output terminal. Low level at AM.
10	AMIN	AM local oscillator input terminal.
11	FMIN	FM local oscillator input terminal.
12	VDD1	Power source terminal for back-up.
13	VDD2	Power source terminal .
14	PD1	Phase comparator output terminal.
15	PD2	Phase comparator output terminal.
16	VSS	Ground terminal

PACKING PROCEDURES

1.Assembling of Pad A
Procedures : ① to ⑤



- - - - - : Inside
————— : Outside

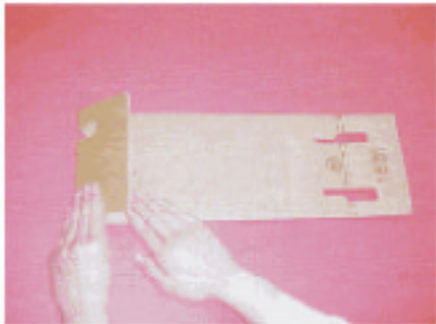
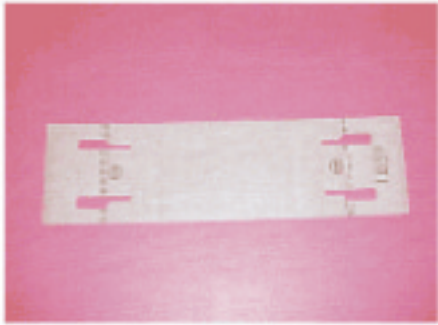


Inside Outside



2.Assembling of Pad B

Procedures : ① to ④

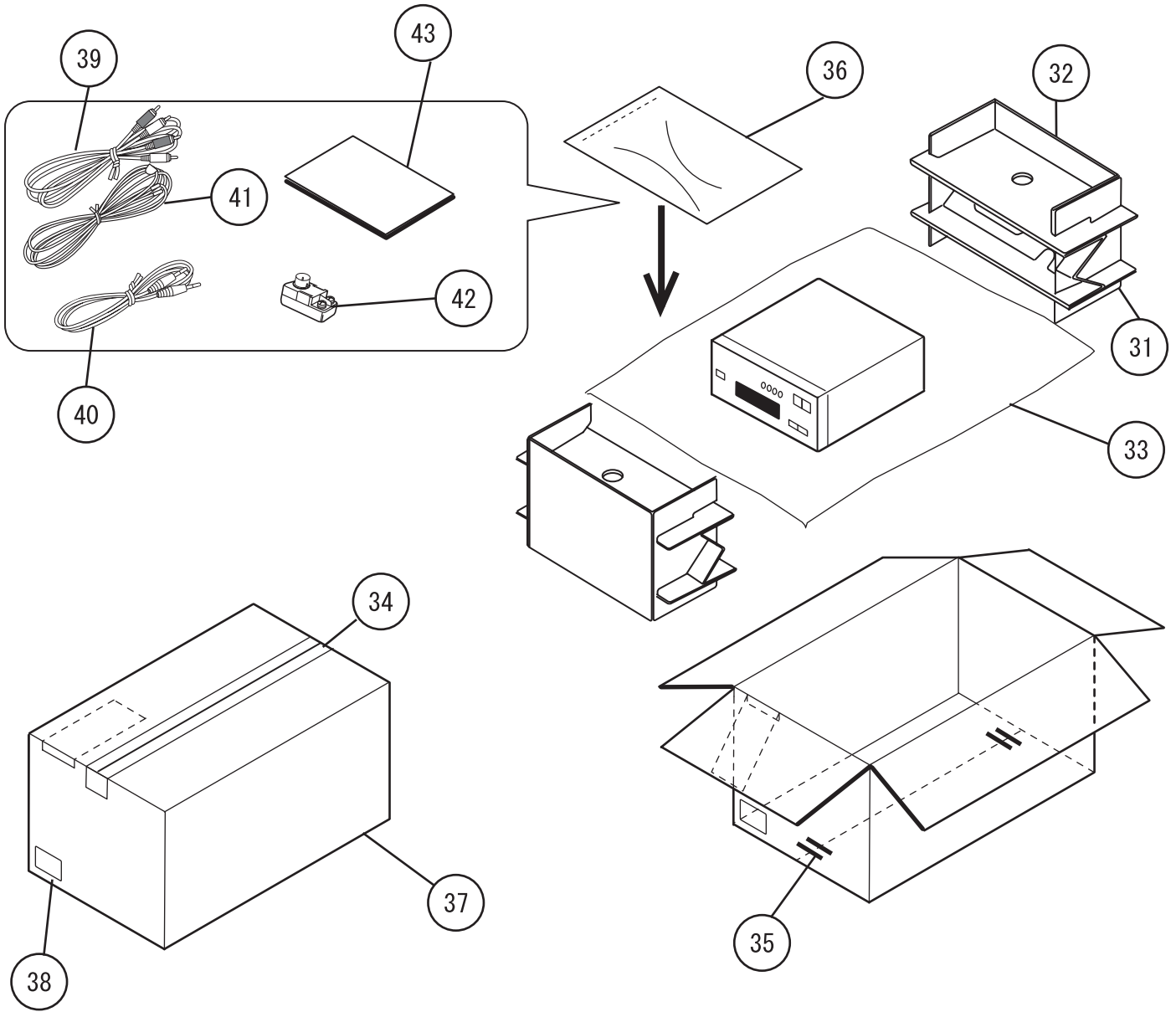


3.Insertion

Insert Pad A to Pad B.



PACKING VIEW



REF.NO.	PART NO.	DESCRIPTION
31	29091888	Pad A
32	29091889	Pad B
33	29095835	0.515*650*550,Sheet
34	29110071	PP tape
35	282301	Staple
36	29100180	D240*W250,Polybag
37	29053738	Carton
38	29362841	Label EAN
39	2010376	Audio connection cable
40	2010375	Remote control cable
41	292116	FM-antenna
42	25065462	YAE21-0237,FM antenna adapter
43	29343092	Instruction manual E
	29343093	Instruction manual CT

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