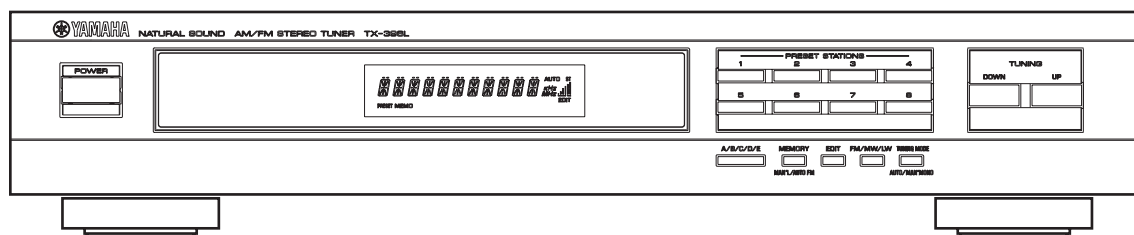


AM/FM STEREO TUNER TX-396L

SERVICE MANUAL



IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel.

It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that any service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and part replacement. Recheck all work before you apply power to the unit.

CONTENTS

TO SERVICE PERSONNEL	1	μCOM DATA	8
SPECIFICATIONS	1	DISPLAY DATA	9
INTERNAL VIEW	2	BLOCK DIAGRAM	10~11
REAR PANELS	2	PRINTED CIRCUIT BOARD	12~13
DISASSEMBLY PROCEDURES	2	SCHEMATIC DIAGRAM	14~15
ADJUSTMENTS	3~7	PARTS LIST	16~21



このサービスマニュアルは、エコマーク認定の再生紙を使用しています。
This Service Manual uses recycled paper.

100700

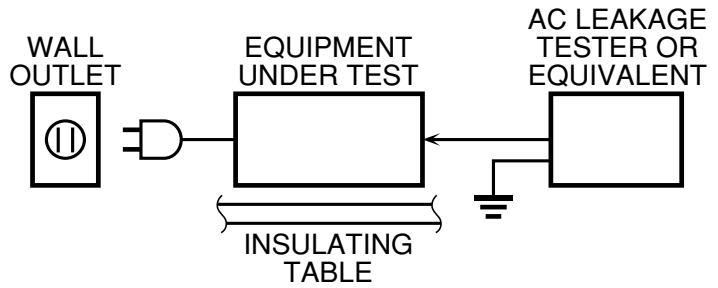


YAMAHA
YAMAHA CORPORATION
P.O.Box 1, Hamamatsu, Japan

TX-396L

■ TO SERVICE PERSONNEL

Critical Components Information.
 Components having special characteristics are marked and must be replaced with parts having specifications equal to those originally installed.



WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and /or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

■ SPECIFICATIONS

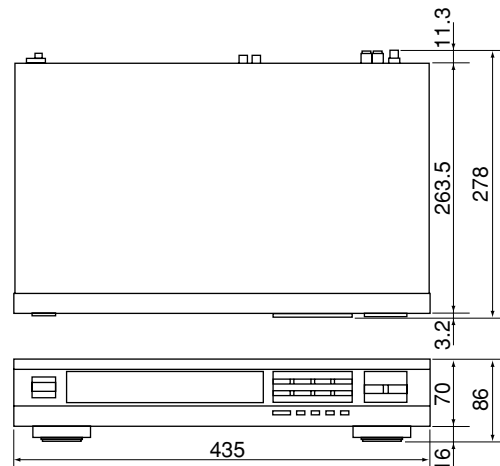
■ FM SECTION	
Tuning Range	87.50 to 108.00 MHz
50dB Quieting Sensitivity (IHF)	
Mono	1.55 μ V(15.1 dBf)
Stereo (1 kHz 100% MOD)	21 μ V(37.7 dBf)
Usable Sensitivity (DIN)	
Mono (S/N 26 dB)	0.9 μ V
Stereo (S/N 46 dB)	24 μ V
Alternate Channel Selectivity	
Selectivity (two signals) 40 kHz Dev. \pm 300 kHz	70 dB
Signal to Noise Ratio (DIN-Weighted 40 kHz)	
Mono	75 dB
Stereo	70 dB
Harmonic Distortion 1 kHz	
Mono	0.1 %
Stereo	0.2 %
Stereo Separation 1kHz (40 kHz Dev.)	50 dB
Frequency Response	
20 Hz to 15 kHz	0 \pm 0.5 dB
■ MW SECTION	
Tuning Range	531 to 1611 kHz
Usable Sensitivity	200 μ V/m
Signal to Noise Ratio	50 dB
Harmonic Distortion 1 kHz	0.3 %
■ LW SECTION	
Tuning Range	153 to 288 kHz
Usable Sensitivity	400 μ V/m
Signal to Noise Ratio	50 dB
Harmonic Distortion 1 kHz	0.3 %

■ AUDIO SECTION	
Output Level/Impedance (Fixed)	
FM 100 % MOD 1 kHz	500 mV/2.2 k Ω
MW/LW 30 % MOD 1 kHz	200 mV/2.2 k Ω
■ GENERAL	
Power Supply	AC230V, 50Hz
Power Consumption	7 W
Dimensions (W x H x D)	435 x 86 x 278mm
Weight	3.2 kg

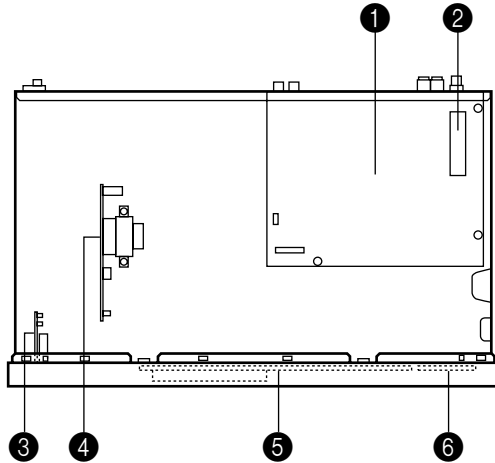
* Specifications subject to change without notice.

- **MODEL COLOR**
Black and Gold

• DIMENSIONS

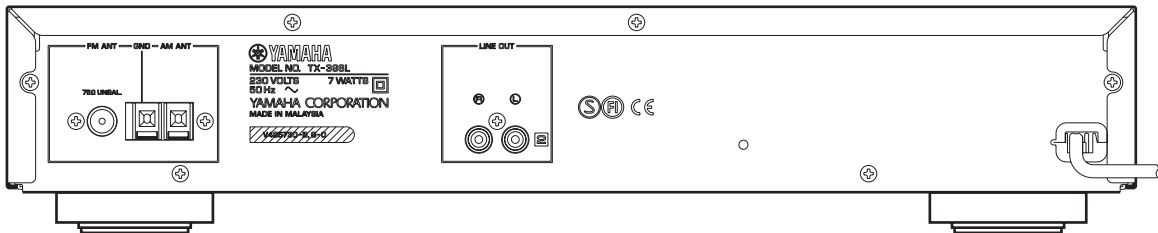


INTERNAL VIEW



- ① Tuner P. C. B. (1)
- ② Front-end pack
- ③ Operation P. C. B. (2)
- ④ Tuner P. C. B. (2)
- ⑤ Operation P. C. B. (1)
- ⑥ Operation P. C. B. (3)

REAR PANEL



DISASSEMBLY PROCEDURES

(Remove parts in the order as numbered.)

1. Removal of Top Cover

Remove 4 screws (①) and 2 screws (②) in Fig. 1.

2. Removal of Front Panel

- a. Disconnect the connectors (CB3 and CB4) in Fig. 1.
- b. Remove 2 plastic rivets (③) in Fig. 1.
- c. Remove 5 screws (④) in Fig. 1.
- d. Unhook at 2 place (⑤) in Fig. 1.

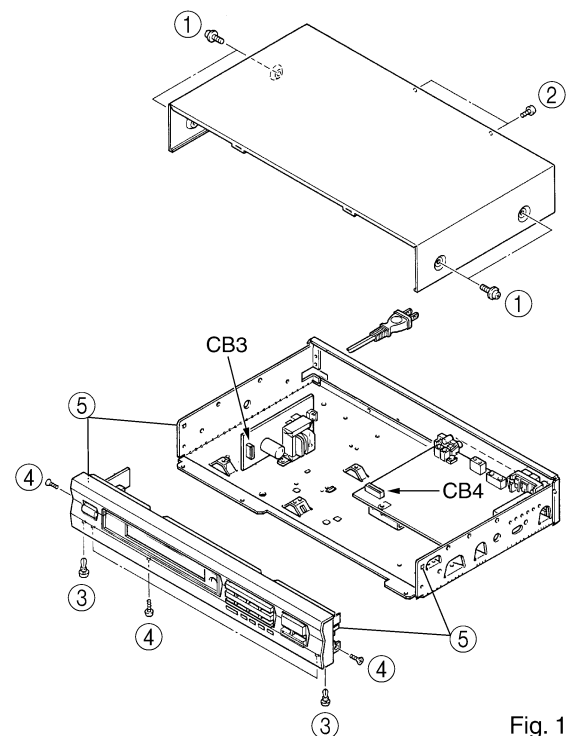


Fig. 1

ADJUSTMENTS

1. Before Adjustment

- (1)With the power turned on, wait for 5 minutes before starting adjustment so that operation becomes stable.
- (2)Adjust the OSC coil and IFT with insulated screwdriver.
- (3)Set the TUNING MODE to AUTO.
- (4)Decibel abbreviations

dB μ : Decibels above or below 1 μ V

Example :

0dB μ = 1 μ v, 60dB μ = 1 mV

X dB μ = (X + 11.2) dBf

When substituting 60 for X,

60 dB μ = 72.2 dBf

2. Measuring instrument abbreviations

FM SG : FM signal generator

SSG : Stereo signal generator

AM SG : AM signal generator

DIST. M : Distortion meter

FC : Frequency counter

ACVM : AC voltage meter

DCVM : DC voltage meter

<POWER SUPPLY CHECK>

Check that the voltage obtained across each test point and ground on the tuner circuit is as follows.

Test points	Rating or Standard
+5 V terminal	+5.6 \pm 0.5 V
-VP terminal	-23.0 \pm 1.0 V

CAUTION :

Before setting to the TEST mode, write down the user preset memory content in the table as shown below. (This is because setting to the TEST mode will cause the memory content to be the factory preset memory content, i.e. all the user preset memory content will be erased.)

<User preset memory content>

Preset keys	P1	P2	P3	P4	P5	P6	P7	P8
A								
B								
C								
D								
E								

<TEST mode>

- Turn on the POWER switch while pressing the A/B/C/D/E and FM/AM(FM/MW/LW) keys simultaneously, and the unit enters the TEST mode for the display check. After this, repeat (1) to (4).

- (1)All the segments on the display light up.
- (2)The model name, TX-396L is displayed.
- (3)The place of destination is displayed.
- (4)The μ COM-version is displayed.

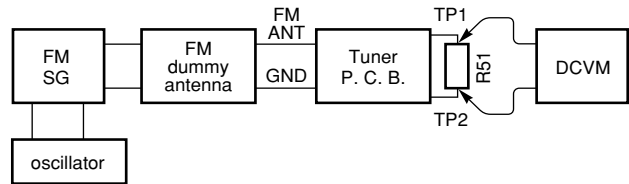
Pressing the P1 key will cause operation to start from (1). Pressing any other key will cause the mode to return to the NORMAL mode.

<Factory preset memory content>

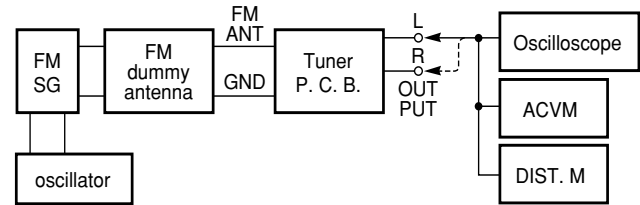
Preset	P1	P2	P3	P4	P5	P6	P7	P8
A, E	87.50	90.10	95.10	98.10	108.00	88.10	106.10	108.00
B, D	630	1080	1440	531	1611	900	1350	1404
C	153	171	225	270	288	180	207	252

<Connection Diagram (Measuring Instruments)>

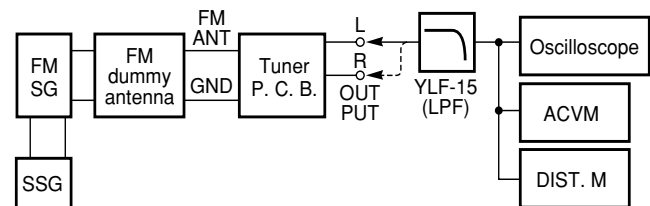
1) Discriminator balance adjustment



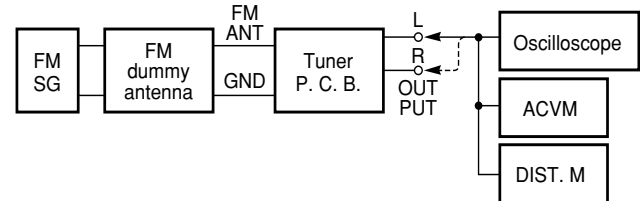
2) Monaural distortion adjustment



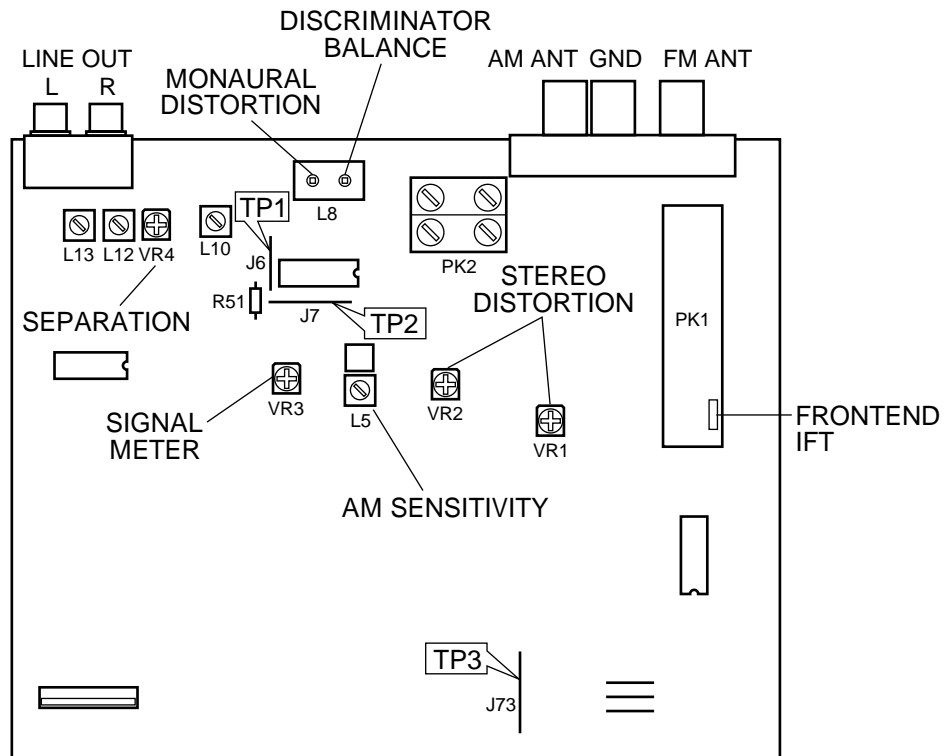
3) Stereo distortion adjustment



4) Sensitivity verification



● TEST POINTS



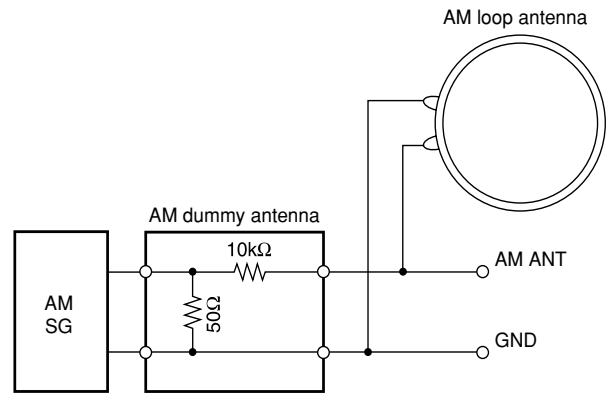
<FM TUNER SECTION>

Step	Adjustment item	Signal (ANT IN)	Reception frequency	Adjusted point	Test point	Rating
1	Rough adjustment of discriminator balance.	FM SG: 98.1 MHz 70 dB μ Modulation : 100 % Monaural : 1 kHz	Preset A-4: 98.1 MHz	L8 (right side)	TP1, TP2 (both end of R51)	DC 0 V \pm 100mV at tuning point.
2	Rough adjustment of monaural distortion.	Same as Step 1.	Same as Step 1.	L8 (left side)	OUTPUT	Minimize distortion.
3	Fine adjustment of discriminator balance.	Same as Step 1.	Same as Step 1.	L8 (right side)	TP1, TP2	DC 0 V \pm 50mV
4	Fine adjustment of monaural distortion.	Same as Step 1.	Same as Step 1.	L8 (left side)	OUTPUT	Minimize distortion. (to less than 0.7%)
5	Verification of discriminator balance.	Same as Step 1.	Same as Step 1.		TP1, TP2	DC 0 V \pm 50mV
6	Adjustment of frontend IFT.	FM SG: 98.1 MHz 30 dB μ Modulation : 100 % Monaural : 1 kHz	Same as Step 1.	Frontend IFT	TP3, GND	Adjust so that the DC voltage is maximum. CAUTION: If IFT core is turned excessively, the sensitivity reduces. (Maximum \pm 90 $^\circ$)
7	Adjustment of stereo distortion.	FM SG: 98.1 MHz 70 dB μ Modulation : 100 % Stereo L or R : 1 kHz	Same as Step 1.	VR1, VR2	OUTPUT	Minimize distortion. Tuning mode is AUTO.

Step	Adjustment item	Signal (ANT IN)	Reception frequency	Adjusted point	Test point	Rating
8	Verification of monaural distortion.	FM SG: 98.1 MHz 70 dB μ Modulation : 100 % Monaural : 1 kHz	Same as Step 1.		OUTPUT	Minimize distortion. (to less than 0.7%)
9	Verification of stereo distortion.	FM SG: 98.1 MHz 70 dB μ Modulation : 100 % Stereo L or R : 1 kHz	Same as Step 1.		OUTPUT	Minimize distortion. (to less than 1.4%) Tuning mode is AUTO.
10	Verification of sensitivity.	FM SG: 88.1/98.1/106.1 MHz Modulation : 100 % Monaural : 1 kHz	A-6: 88.1 MHz A-4: 98.1 MHz A-7: 106.1 MHz			S/N should be 30 dB at each frequency of 88.1 MHz, 98.1 MHz and 106.1 MHz. Make sure that the voltage at the ANT terminal is 7 dB μ or less.
11	Adjustment of separation.	FM SG: 98.1 MHz 70 dB μ Modulation : 100 % Stereo L or R : 1 kHz	Preset A-4: 98.1 MHz	VR4	OUTPUT	To more than 35 dB. Tuning mode is AUTO.
12	Adjustment of the signal meter.	FM SG: 98.1 MHz 45 dB μ Modulation : 30 % Monaural : 1 kHz	Preset A-4: 98.1 MHz	VR3	Signal meter	Adjust so that the signal meter is maximum at rating level.
13	Verification of the signal meter to turn off.	ANT input minimum.				Make sure that the signal meter is turned off.
14	Verification of AUTO TUNING.	FM SG: 98.1 MHz 23 dB μ Modulation : 30 % Stereo L or R : 1 kHz	Preset A-4: 98.1 MHz	Tuning buttons		Automatic reception should be available when the tuning UP or DOWN key is pressed. Stereo indicator is turned on. Audio muting should be applied during tuning.

<MW TUNER SECTION>

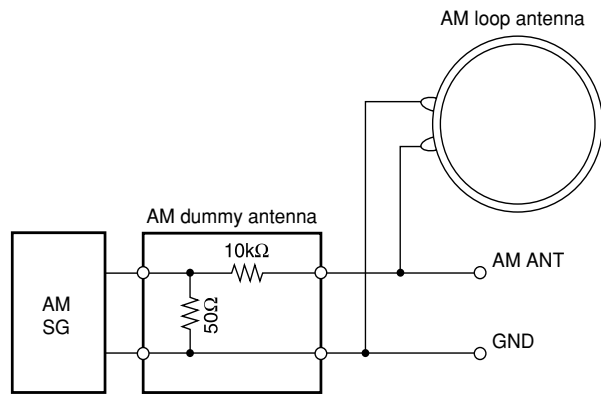
- To be adjusted after FM section adjustment.
- Use the specified dummy antenna for loop antenna.



Step	Adjustment item	Signal (ANT IN)	Reception frequency	Adjusted point	Test point	Rating
1	Adjustment of sensitivity.	AM SG: 630 kHz 50 dB μ , 1 kHz, 30% modulation	Preset B-1: 630 kHz	L5	OUTPUT	Maximize detected signal output.
2	Verification of sensitivity.	AM SG: 630 kHz/1080 kHz/ 1440 kHz 50 dB μ , 1 kHz, 30% modulation	Preset B-1: 630 kHz B-2: 1080 kHz B-3: 1440 kHz			To be less than 54 dB μ .
3	Verification of the signal meter.	AM SG: 1080 kHz 90 dB μ , ANT input 90 dB μ	Preset B-2: 1080 kHz			Make sure that the signal meter is turned on.
		ANT input -10 dB μ or less				Make sure that the signal meter is turned off.
4	Verification of auto tuning.	AM SG: 1080 kHz 60 dB μ , 1 kHz, 30% modulation	Preset B-2: 1080 kHz	Tuning button		Automatic reception should be available when the tuning UP or DOWN key is pressed. Audio muting should be applied during tuning.

<LW TUNER SECTION>

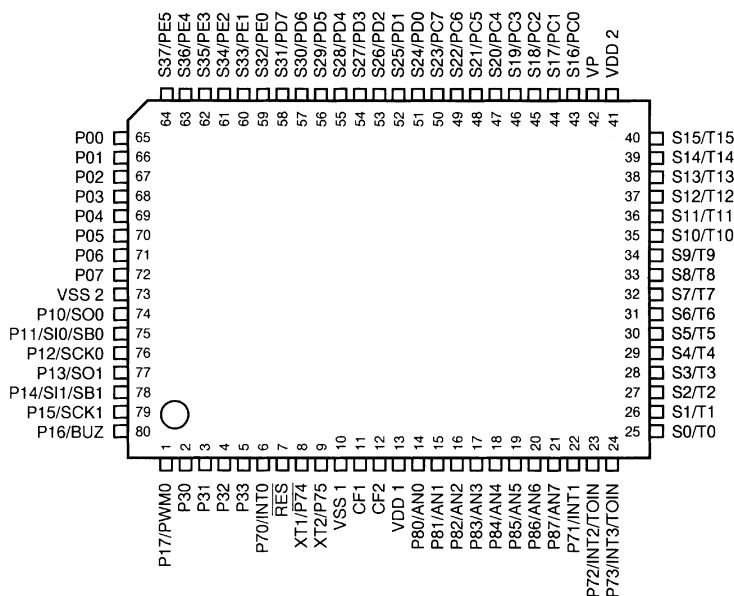
- To be adjusted after MW section adjustment.
- Use the specified dummy antenna for loop antenna.



Step	Adjustment item	Signal (ANT IN)	Reception frequency	Adjusted point	Test point	Rating
1	Verification of sensitivity.	AM SG: 171 kHz/225 kHz/270 kHz 90 dBμ, 1 kHz, 30% modulation	Preset C-2: 171 kHz C-3: 225 kHz C-4: 270 kHz		OUTPUT	To be less than 66 dBμ.
2	Verification of the signal meter.	AM SG: 225 kHz 90 dBμ, ANT input 90 dBμ	Preset B-2: 225 kHz			Make sure that the signal meter is turned on.
		ANT input -10 dBμ or less				Make sure that the signal meter is turned off.
3	Verification of auto tuning.	AM SG: 225 kHz 60 dBμ, 1 kHz, 30% modulation	Preset B-2: 225 kHz	Tuning button		Automatic reception should be available when the tuning UP or DOWN key is pressed. Audio muting should be applied during tuning.

■ μ -COM DATA

IC501 : LC866420A

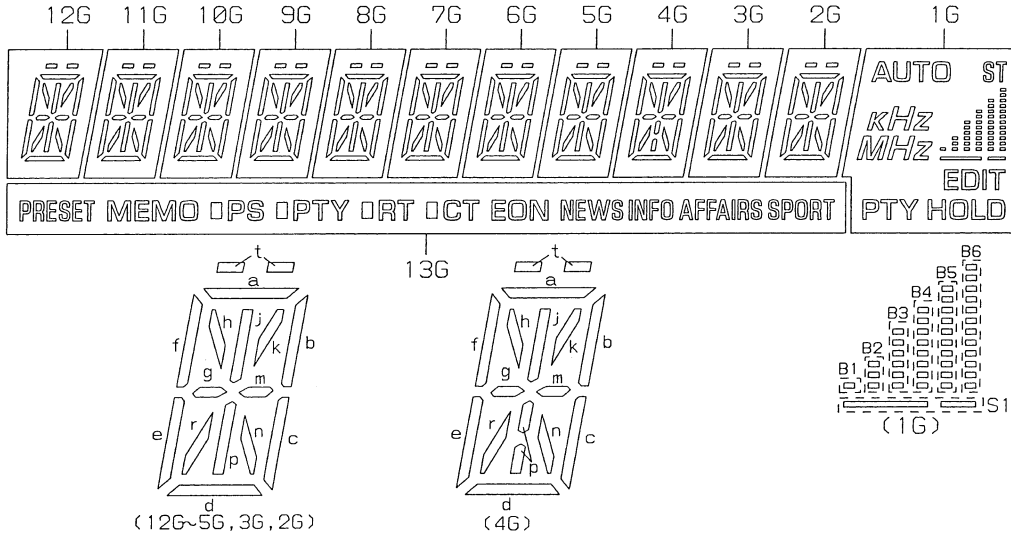
8 bit μ -COM

No.	Port	I/O	Name	Function	No.	Port	I/O	Name	Function
1	P17/PWM0	O	/MMUTE	Main mute	41	VDD2	I	VDD	+5V
2	P30	I	ROT1	Rotary encoder input	42	VP	I	VDDVPP	-24V
3	P31	I	ROT0	This input available for ROTSW=H	43	S16/PC0	O	P1	FL segment
4	P32	I	MODEL	Model 0	44	S17/PC1	O	P2	FL segment
5	P33	I	ROTSW	Rotary encoder yes(H) or no(L)	45	S18/PC2	O	P3	FL segment
6	P70/INT0	I	—	—	46	S19/PC3	O	P4	FL segment
7	/RES	I	/RESET	Reset	47	S20/PC4	O	P5	FL segment
8	/P74/XT1	I	—	—	48	S21/PC5	O	P6	FL segment
9	P75/XT2	I	—	—	49	S22/PC6	O	P7	FL segment
10	VSS1	I	GND	GND	50	S23/PC7	O	P8	FL segment
11	CF1	I	CF	6MHz	51	S24/PD0	O	P9	FL segment
12	CF2	I	CF	6MHz	52	S25/PD1	O	P10	FL segment
13	VDD1	I	VDD	+5V	53	S26/PD2	O	P11	FL segment
14	P80/AN0	ADI	KEYIN1	AD key input	54	S27/PD3	O	P12	FL segment
15	P81/AN1	ADI	KEYIN2	AD key input	55	S28/PD4	O	P13	FL segment
16	P82/AN2	ADI	KEYIN3	AD key input	56	S29/PD5	O	P14	FL segment
17	P83/AN3	ADI	METER	Signal level input	57	S30/PD6	O	P15	FL segment
18	P84/AN4	I	—	—	58	S31/PD7	O	—	—
19	P85/AN5	I	—	—	59	S32/PE0	I/O	—	—
20	P86/AN6	I	—	—	60	S33/PE1	I/O	—	—
21	P87/AN7	ADI	VER	Version input	61	S34/PE2	I/O	—	—
22	P71/INT1	I	—	—	62	S35/PE3	I/O	—	—
23	P72/INT2	I	/POWERDOWN	Power down detect	63	S36/PE4	I/O	—	—
24	P73/INT3	I	REM	REM input	64	S37/PE5	I/O	—	—
25	S0/T0	O	13G	FL segment	65	P00	O	—	—
26	S1/T1	O	12G	FL segment	66	P01	O	—	—
27	S2/T2	O	11G	FL segment	67	P02	O	—	—
28	S3/T3	O	10G	FL segment	68	P03	O	—	—
29	S4/T4	O	9G	FL segment	69	P04	O	/TMUTE	Tuner mute
30	S5/T5	O	8G	FL segment	70	P05	O	—	—
31	S6/T6	O	7G	FL segment	71	P06	O	—	—
32	S7/T7	O	6G	FL segment	72	P07	O	—	—
33	S8/T8	O	5G	FL segment	73	VSS2	I	GND	GND
34	S9/T9	O	4G	FL segment	74	P10/S00	O	—	—
35	S10/T10	O	3G	FL segment	75	P11/SI0	SIN	—	—
36	S11/T11	O	2G	FL segment	76	P12/SCK0	SCL	—	—
37	S12/T12	O	1G	FL segment	77	P13/SO1	I	PLLDAT-in	Data input from PLL
38	S13/T13	—	—	—	78	P14/SI1	O	PLLDAT-out	Data output for PLL
39	S14/T14	—	—	—	79	P15/SCK1	O	PLL-CLK	PLL clock
40	S15/T15	—	—	—	80	P16/BUZ	O	PLLCE	PLLCE

KEY INPUT

Key Input		1	2	3	4	5	6	7
Resistance (Ω)		0k	1.8k	2.7k	3.9k	6.8k	13k	39k
Extent of AD		00H~15H	16H~3DH	3EH~64H	65H~8AH	8BH~B0H	B1H~D3H	D4H~F0H
Extent of Voltage (V)		0.00~0.41	0.41~1.19	1.19~1.95	1.95~2.70	2.70~3.44	3.44~4.12	4.12~4.69
Pin No.14	KEYIN1	P3	P4	P5	P6	P7	P8	—
Pin No.15	KEYIN2	MODE	EDIT (KMODE)	MEMORY	PAGE	P1	P2	—
Pin No.16	KEYIN3	—	—	—	—	FM/AM (MW/LW)	TUNING DOWN	TUNING UP

■ DISPLAY DATA (13-BT-152GK)



PIN CONNECTION

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
CONNECTION	F1	F1	NP	P15	P14	P13	P12	P11	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1

PIN NO.	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
CONNECTION	NC	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G	NP	F2	F2

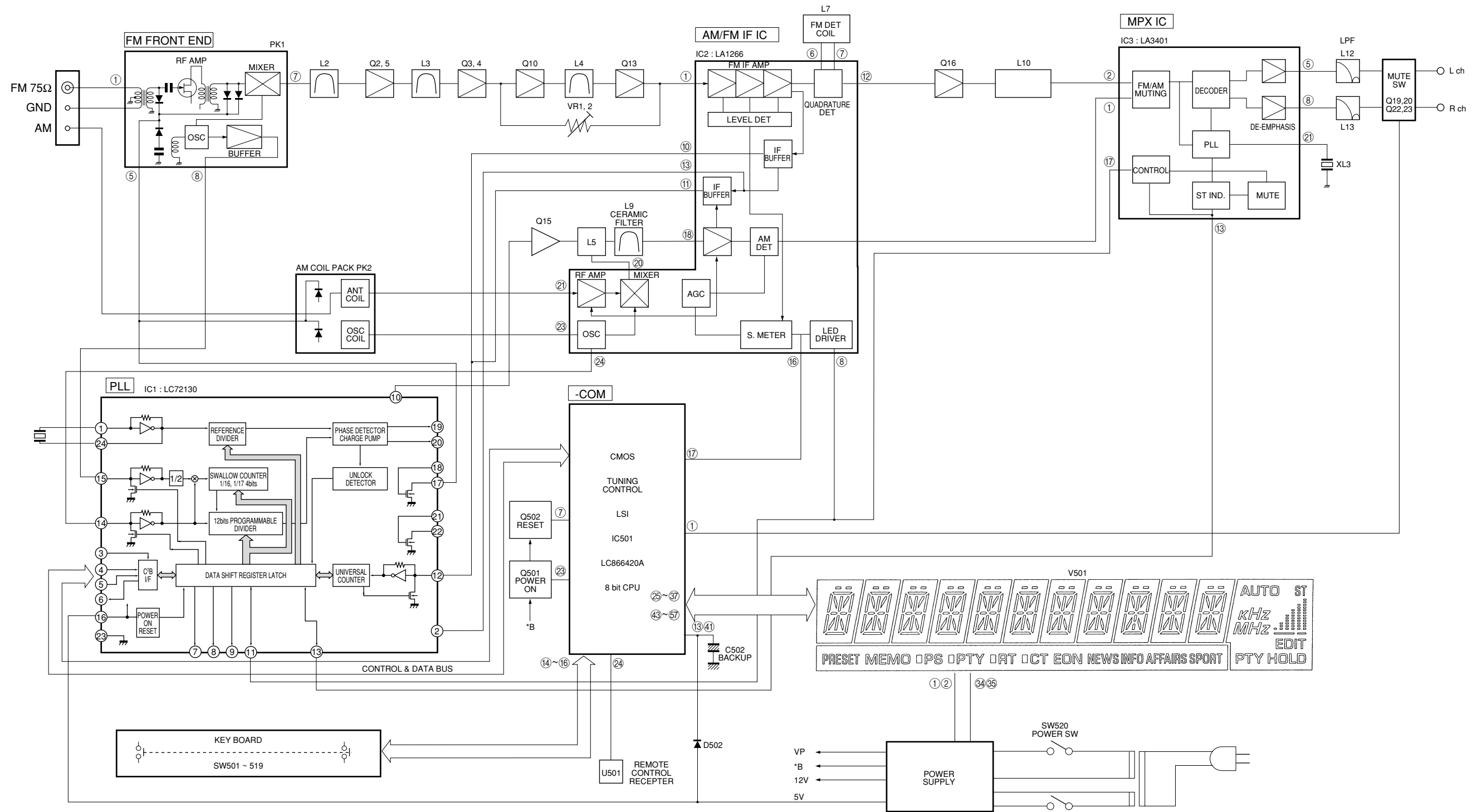
NOTE:

- 1) F1, F2 Filament
- 2) NP No pin
- 3) NC No connection
- 4) DL Datum line
- 5) 1G~13G Grid

ANODE CONNECTION

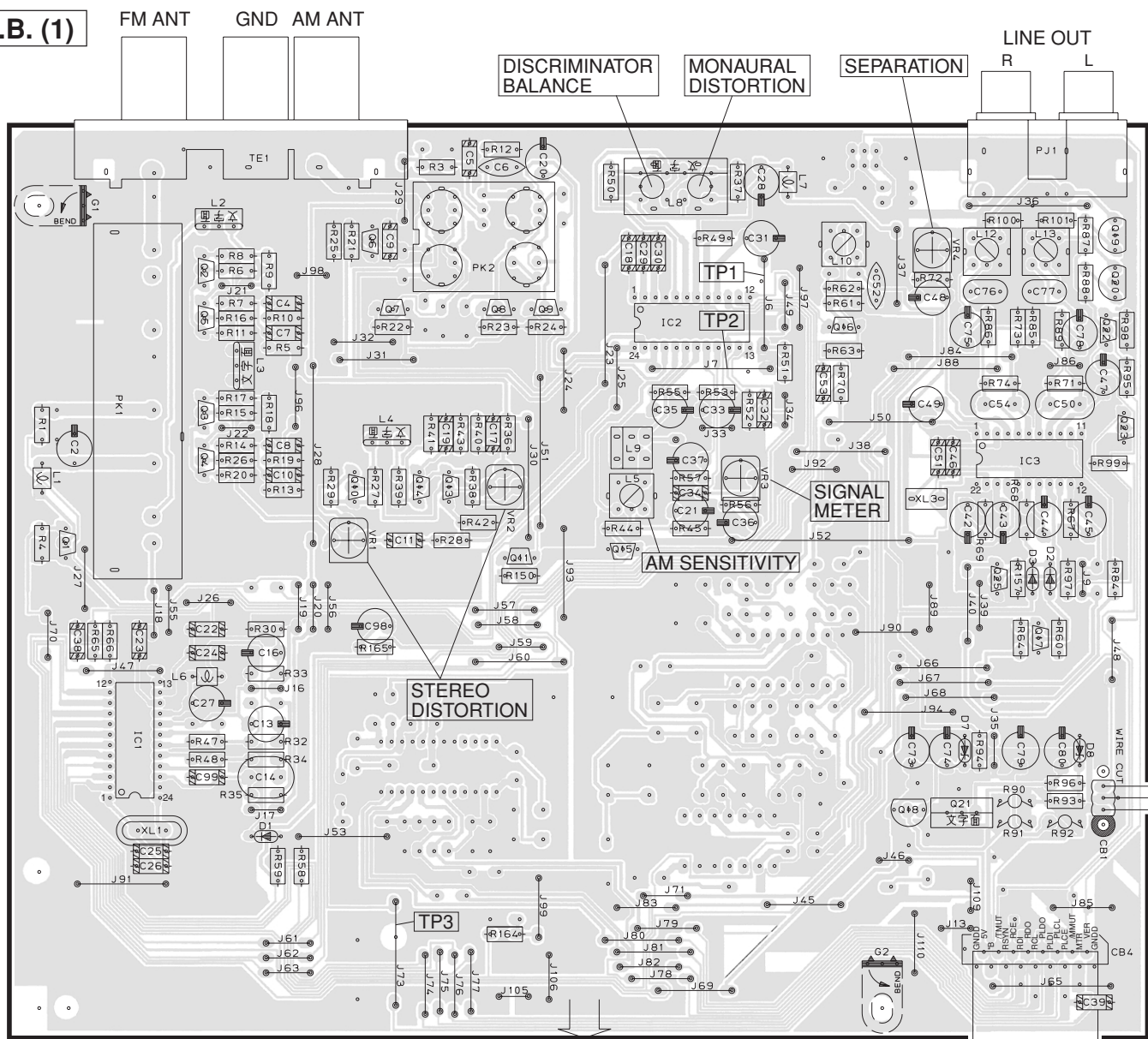
	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	PRESET	a	a	a	a	a	a	a	a	a	a	a	AUTO
P2	MEMO	b	b	b	b	b	b	b	b	b	b	b	kHz
P3	(PS)	c	c	c	c	c	c	c	c	c	c	c	MHz
P4	PS	d	d	d	d	d	d	d	d	d	d	d	ST
P5	(PTY)	e	e	e	e	e	e	e	e	e	e	e	B1
P6	PTY	f	f	f	f	f	f	f	f	f	f	f	B2
P7	(RT)	g	g	g	g	g	g	g	g	g	g	g	B3
P8	RT	h	h	h	h	h	h	h	h	h	h	h	B4
P9	(CT)	j	j	j	j	j	j	j	j	j	j	j	B5
P10	CT	k	k	k	k	k	k	k	k	k	k	k	B6
P11	EON	m	m	m	m	m	m	m	m	m	m	m	S1
P12	NEWS	n	n	n	n	n	n	n	n	n	n	n	EDIT
P13	INFO	p	p	p	p	p	p	p	p	p	p	p	PTY HOLD
P14	AFFAIRS	r	r	r	r	r	r	r	r	r	r	r	-
P15	SPORT	t	t	t	t	t	t	t	t	t	t	t	-

BLOCK DIAGRAM

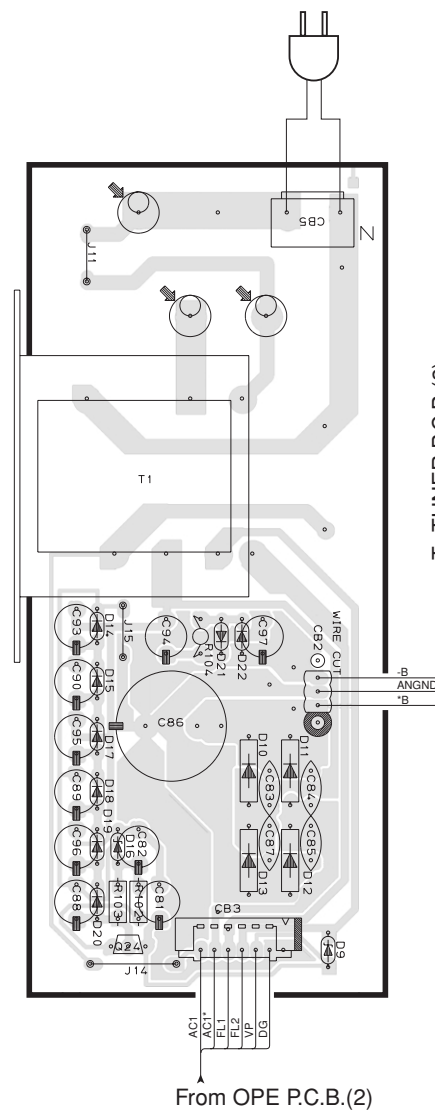


PRINTED CIRCUIT BOARD (Foil side)

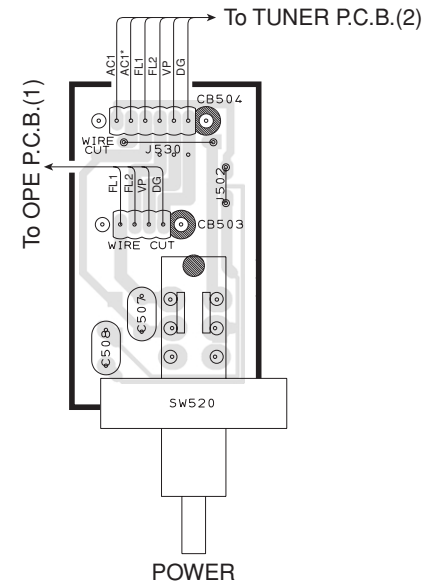
TUNER P.C.B. (1)



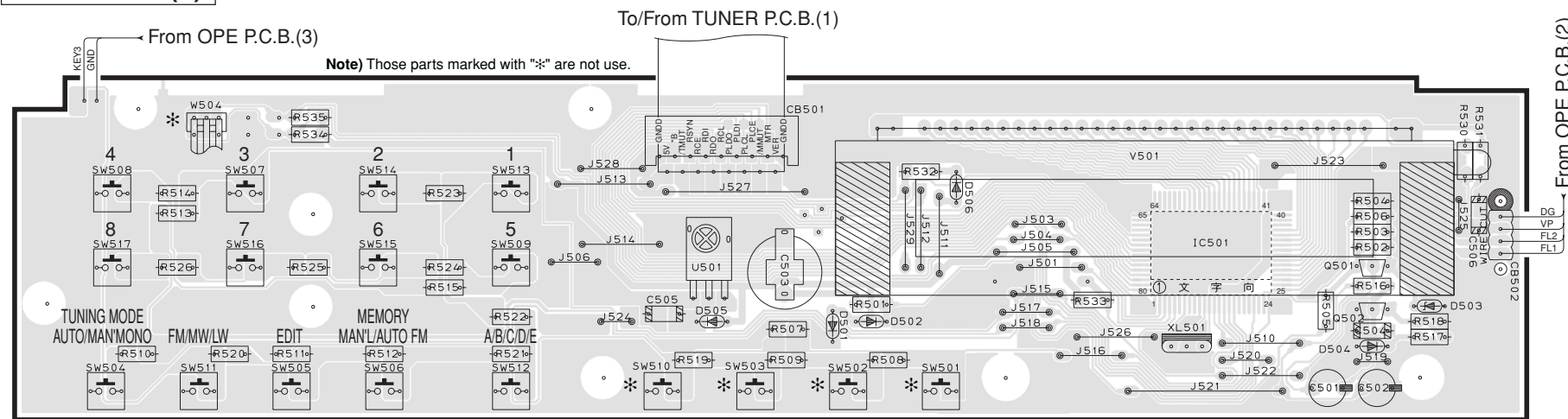
TUNER P.C.B. (2)



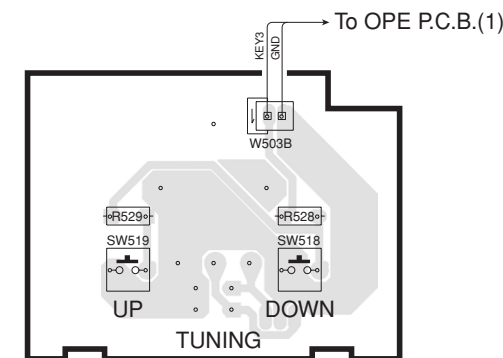
OPE P.C.B. (2)



OPE P.C.B. (1)

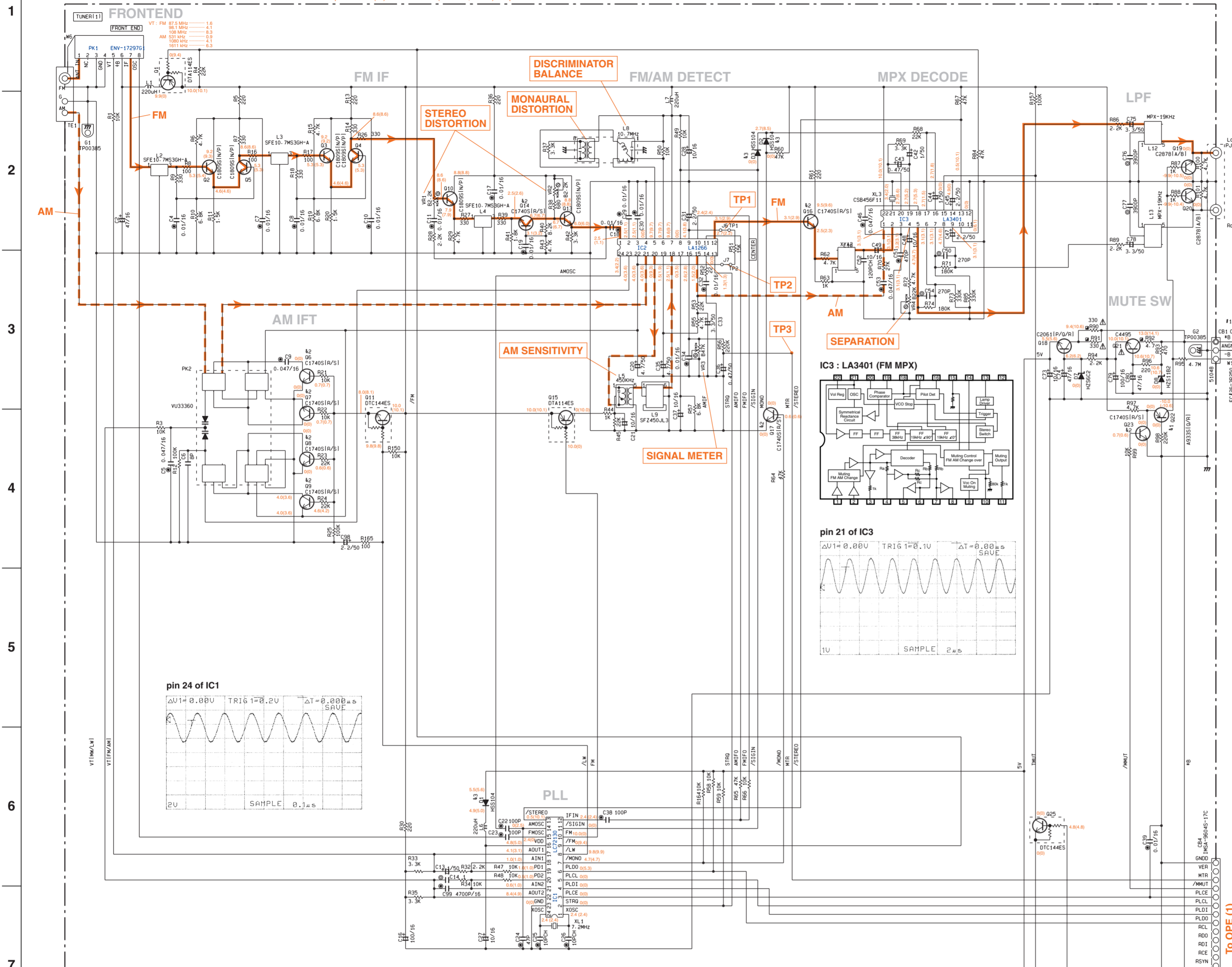


OPE P.C.B. (3)

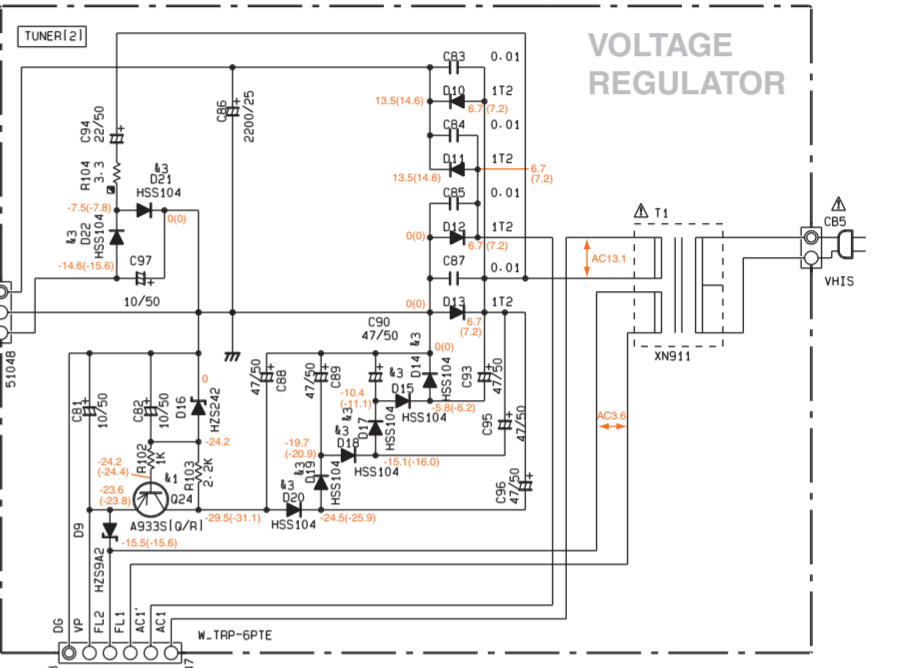


SCHEMATIC DIAGRAM

Each voltage given here represents that in the FM (98.1 MHz, STEREO) reception mode but the one in the parentheses () is that in the AM (1080 kHz, MANL) reception mode.



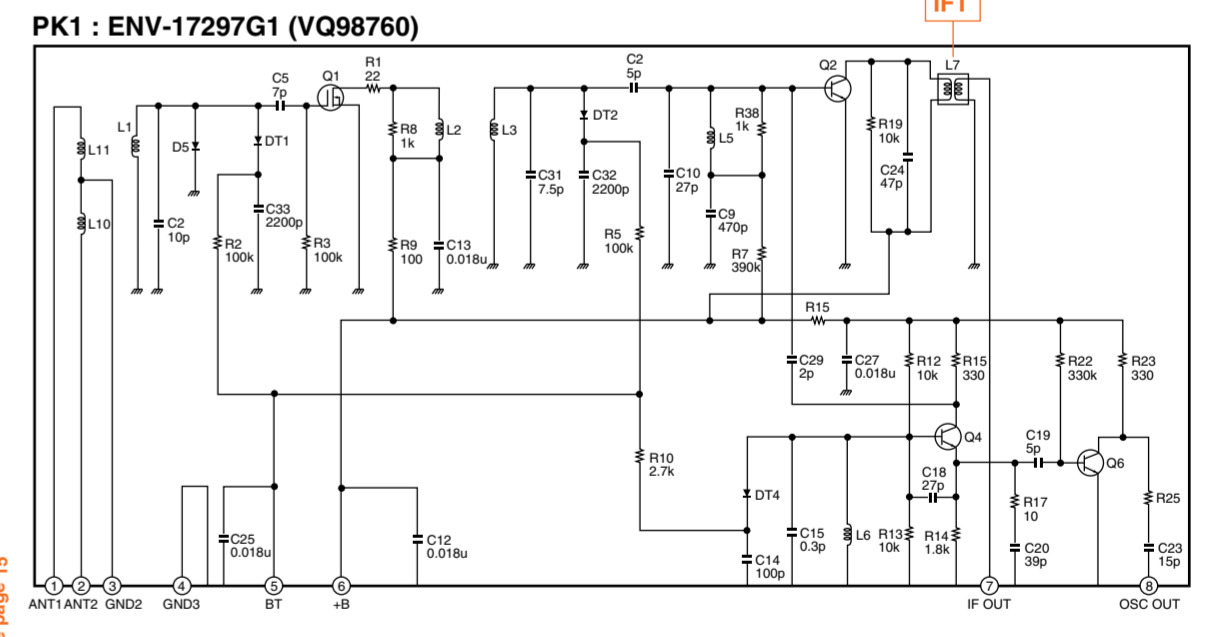
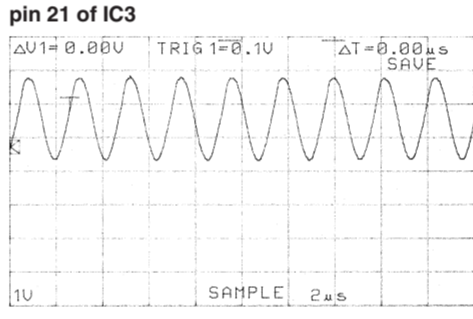
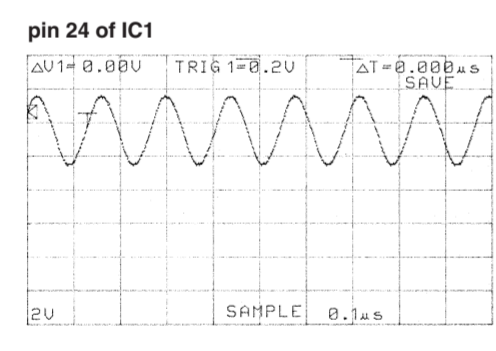
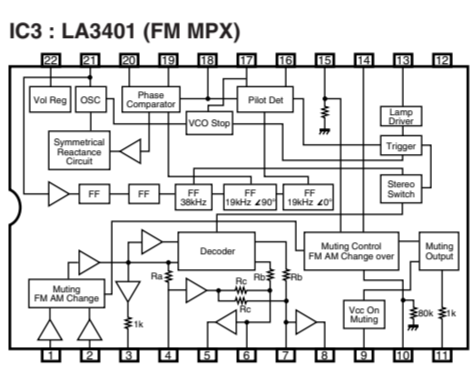
CAPACITOR		RESISTOR	
REMARKS	PARTS NAME	REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR	NO MARK	CARBON FILM RESISTOR (P=5)
⊗	TANTALUM CAPACITOR	⊗	CARBON FILM RESISTOR (P=10)
NO MARK	CERAMIC CAPACITOR	△	METAL OXIDE FILM RESISTOR
⊙	CERAMIC TUBULAR CAPACITOR	□	METAL FILM RESISTOR
○	POLYSTYRENE FILM CAPACITOR	⊠	METAL PLATE RESISTOR
○	MICA CAPACITOR	⊞	FIRE PROOF CARBON FILM RESISTOR
○	POLYPROPYLENE FILM CAPACITOR	⊞	CEMENT MOLDED RESISTOR
●	SEMICONDUCTIVE CERAMIC CAPACITOR	⊞	SEMI VARIABLE RESISTOR
		■	CHIP RESISTOR



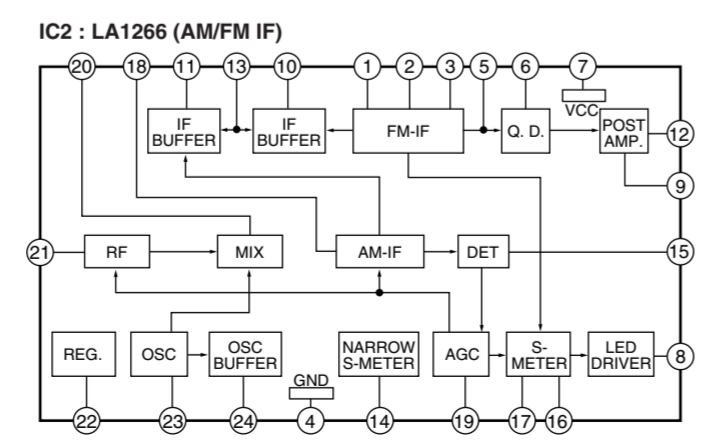
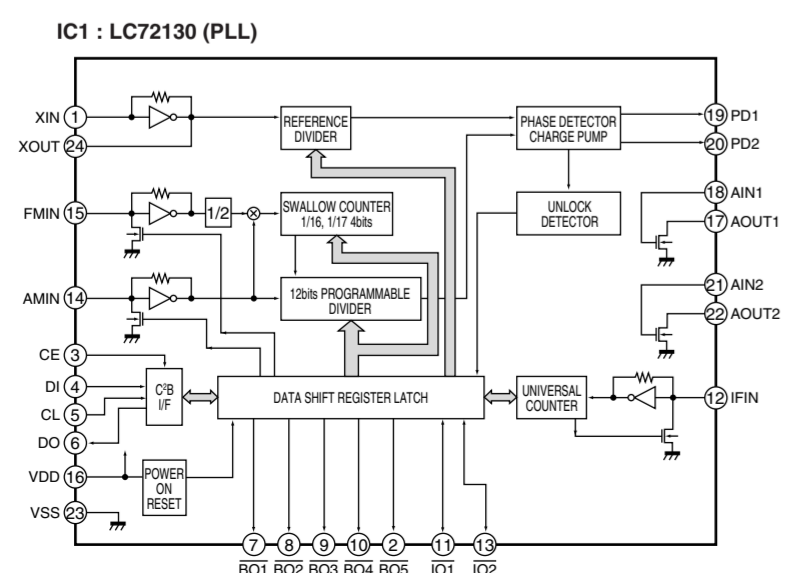
To OPE (2)
see page 15

Interchangeable Parts at Manufacture-Stage

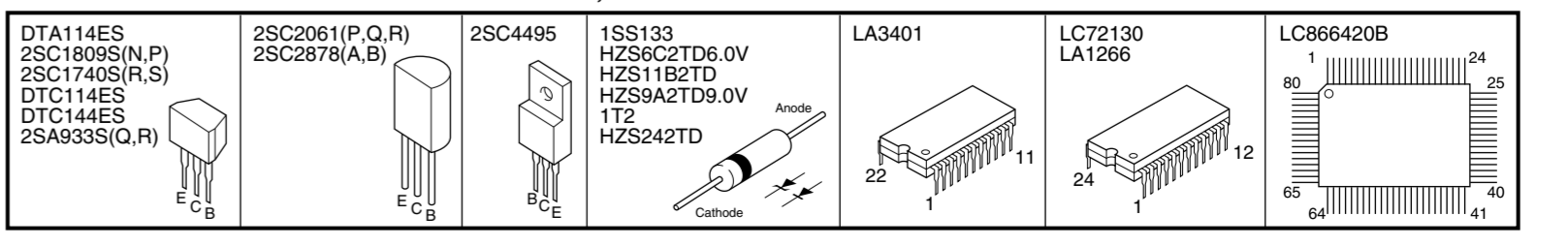
No	Mark	Reference Parts Number	Parts Name
R 165	41	922-24	2S4333S(Q/R)
C 99			2S4115S(F)
Q 28	42	06-9-14.16-17-23	2S4130S(A)(R/S)
L 13			2SC1740S(R/S)
VR 5	43	01-3-14.15-17-22	2SC2603S(F)
D 23			2SC3311A(Q/R/S)
			HSS104
			1SS133
			1SS176



To OPE (1)
see page 15

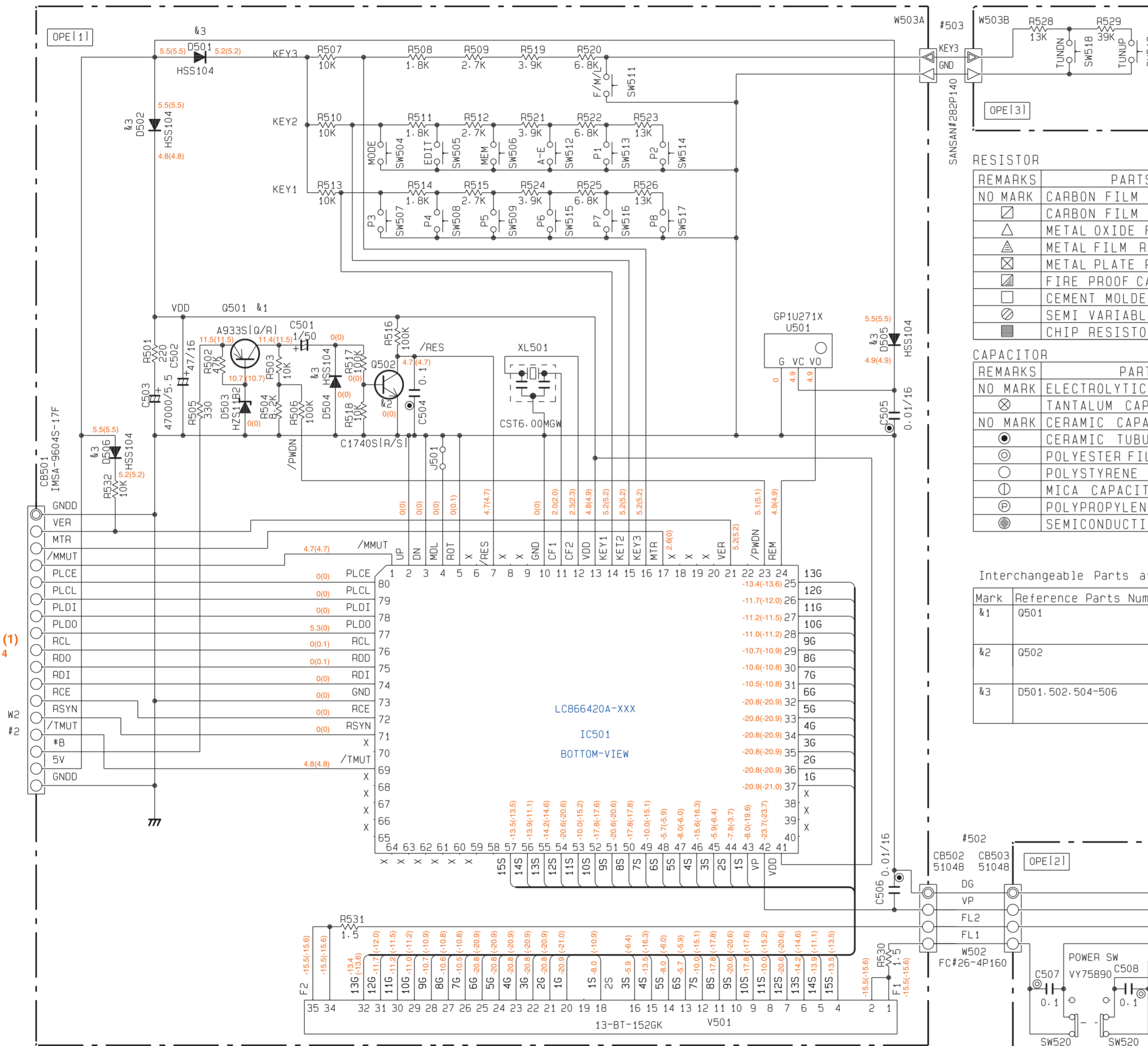


PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.



- * All voltage are measured with a 10MΩ/V DC electric volt meter.
- * Components having special characteristics are marked △, and must be replaced with parts having specifications equal to those originally installed.
- * Schematic diagram is subject to change without notice.

TX-396L
SCHEMATIC DIAGRAM



RESISTOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
☒	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
☒	METAL PLATE RESISTOR
▨	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊗	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

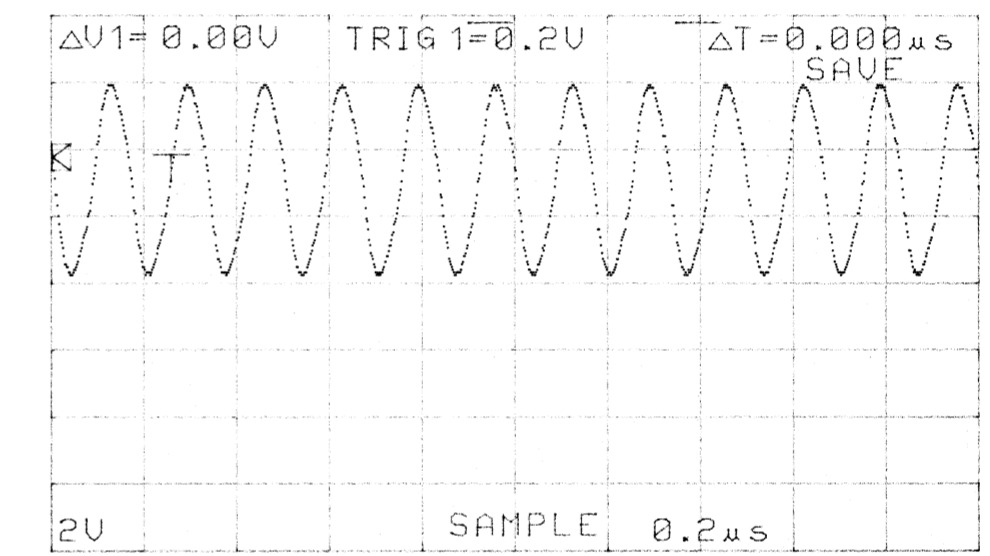
CAPACITOR

REMARKS	PARTS NAME	Symbol
NO MARK	ELECTROLYTIC CAPACITOR	⌘
⊗	TANTALUM CAPACITOR	⌘
NO MARK	CERAMIC CAPACITOR	⊖
●	CERAMIC TUBULAR CAPACITOR	⊖
⊙	POLYESTER FILM CAPACITOR	⊖
○	POLYSTYRENE FILM CAPACITOR	⊖
⊖	MICA CAPACITOR	⊖
⊕	POLYPROPYLENE FILM CAPACITOR	⊖
⊖	SEMICONDUCTIVE CERAMIC CAPACITOR	⊖

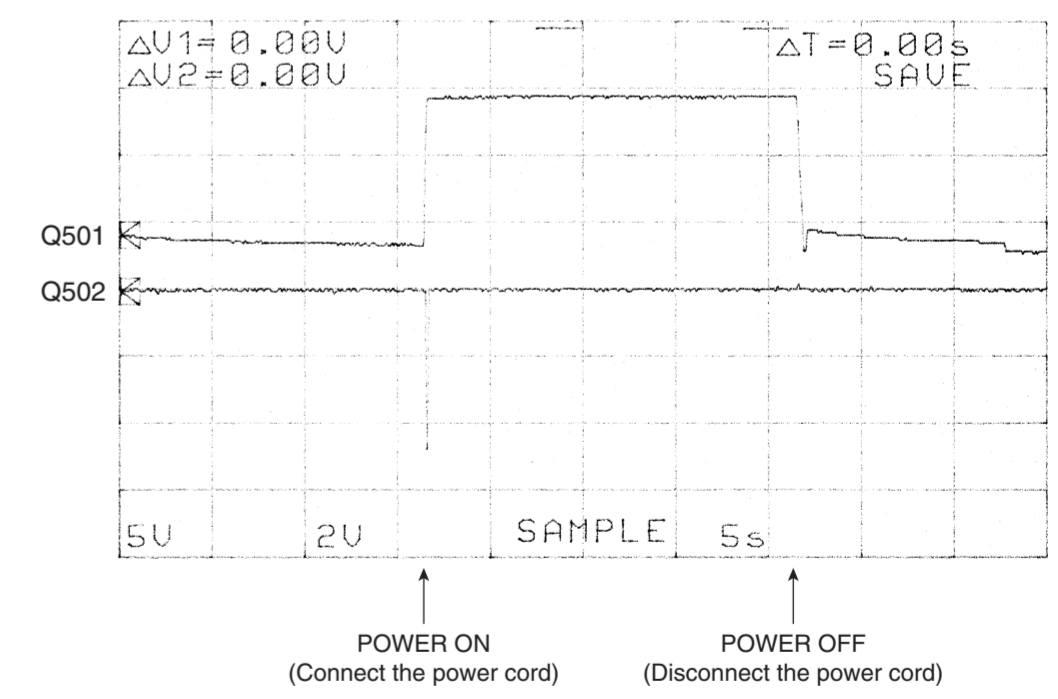
Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
&1	Q501	2SA933S(Q/R) 2SA1115(E/F) 2SA1309A(Q/R/S)
&2	Q502	2SC1740S(I/R/S) 2SC2603(E/F) 2SC3311A(Q/R/S)
&3	D501, 502, 504-506	HSS104 1SS133 1SS176

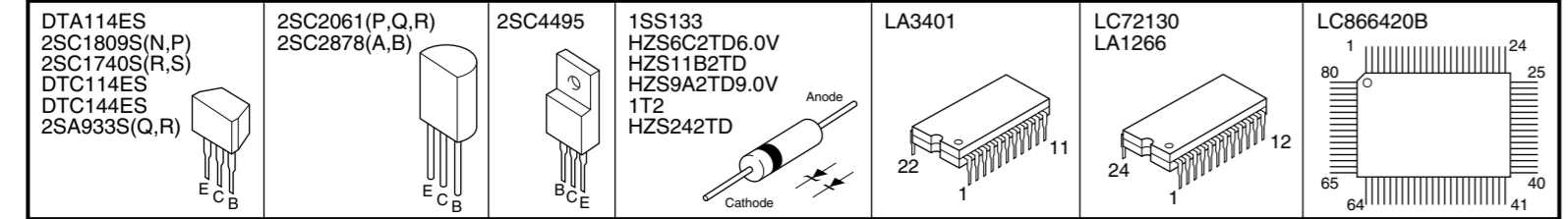
pin 12 of IC501



emitter of Q501 and collector of Q502



PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.



* All voltage are measured with a 10MΩ/V DC electric volt meter.
* Components having special characteristics are marked with a triangle and must be replaced with parts having specifications equal to those originally installed.
* Schematic diagram is subject to change without notice.

PARTS LIST

■ ELECTRICAL PARTS

■ WARNING

Components having special characteristics are marked \triangle and must be replaced with parts having specifications equal to those originally installed.

- Carbon resistors (1/6W or 1/4W) are not included in the ELECTRICAL PARTS List. For the parts No. of the carbon resistors, refer to last page.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

C.A.EL.CHP	: CHIP ALUMI.ELECTROLYTIC CAP	L.EMIT	: LIGHT EMITTING MODULE
C.CE	: CERAMIC CAP	LED.DSPLY	: LED DISPLAY
C.CE.ARRAY	: CERAMIC CAP ARRAY	LED.INFRD	: LED,INFRARED
C.CE.CHP	: CHIP CERAMIC CAP	MODUL.RF	: MODULATOR,RF
C.CE.ML	: MULTILAYER CERAMIC CAP	PHOT.CPL	: PHOTO COUPLER
C.CE.M.CHP	: CHIP MULTILAYER CERAMIC CAP	PHOT.INTR	: PHOTO INTERRUPTER
C.CE.SAFTY	: RECOGNIZED CERAMIC CAP	PHOT.RFLCT	: PHOTO REFLECTOR
C.CE.TUBLR	: CERAMIC TUBULAR CAP	PIN.TEST	: PIN,TEST POINT
C.CE.SMI	: SEMI CONDUCTIVE CERAMIC CAP	PLST.RIVET	: PLASTIC RIVET
C.EL	: ELECTROLYTIC CAP	R.ARRAY	: RESISTOR ARRAY
C.MICA	: MICA CAP	R.CAR.	: CARBON RESISTOR
C.ML.FLM	: MULTILAYER FILM CAP	R.CAR.CHP	: CHIPRESISTOR
C.MP	: METALLIZED PAPER CAP	R.CAR.FP	: FLAME PROOF CARBON RESISTOR
C.MYLAR	: MYLAR FILM CAP	R.FUS	: FUSABLE RESISTOR
C.MYLAR.ML	: MULTILAYER MYLAR FILM CAP	R.MTL.CHP	: CHIP METAL FILM RESISTOR
C.PAPER	: PAPER CAPACITOR	R.MTL.FLM	: METAL FILM RESISTOR
C.PLS	: POLYSTYRENE FILM CAP	R.MTL.OXD	: METAL OXIDE FILM RESISTOR
C.POL	: POLYESTER FILM CAP	R.MTL.PLAT	: METAL PLATE RESISTOR
C.POLY	: POLYETHYLENE FILM CAP	RSNR.CE	: CERAMIC RESONATOR
C.PP	: POLYPROPYLENE FILM CAP	RSNR.CRYS	: CRYSTAL RESONATOR
C.TNTL	: TANTALUM CAP	R.TW.CEM	: TWIN CEMENT FIXED RESISTOR
C.TNTL.CHP	: CHIP TANTALUM CAP	R.WW	: WIRE WOUND RESISTOR
C.TRIM	: TRIMMER CAP	SCR.BND.HD	: BIND HEAD B-TITE SCREW
CN	: CONNECTOR	SCR.BW.HD	: BW HEAD TAPPING SCREW
CN.BS.PIN	: CONNECTOR,BASE PIN	SCR.CUP	: CUP TITE SCREW
CN.CANNON	: CONNECTOR,CANNON	SCR.TERM	: SCREW TERMINAL
CN.DIN	: CONNECTOR,DIN	SCR.TR	: SCREW,TRANSISTOR
CN.FLAT	: CONNECTOR,FLAT CABLE	SUPRT.PCB	: SUPPORT,P.C.B.
CN.POST	: CONNECTOR,BASE POST	SURG.PRTCT	: SURGE PROTECTOR
COIL.MX.AM	: COIL,AM MIX	SW.TACT	: TACT SWITCH
COIL.AT.FM	: COIL,FM ANTENNA	SW.LEAF	: LEAF SWITCH
COIL.DT.FM	: COIL,FM DETECT	SW.LEVER	: LEVER SWITCH
COIL.MX.FM	: COIL,FM MIX	SW.MICRO	: MICRO SWITCH
COIL.OUTPT	: OUTPUT COIL	SW.PUSH	: PUSH SWITCH
DIOD.ARRAY	: DIODE ARRAY	SW.RT.ENC	: ROTARY ENCODER
DIODE.BRG	: DIODE BRIDGE	SW.RT.MTR	: ROTARY SWITCH WITH MOTOR
DIODE.CHP	: CHIP DIODE	SW.RT	: ROTARY SWITCH
DIODE.VAR	: VARACTOR DIODE	SW.SLIDE	: SLIDE SWITCH
DIOD.Z.CHP	: CHIP ZENER DIODE	TERM.SP	: SPEAKER TERMINAL
DIODE.ZENR	: ZENER DIODE	TERM.WRAP	: WRAPPING TERMINAL
DSCR.CE	: CERAMIC DISCRIMINATOR	THRMST.CHP	: CHIP THERMISTOR
FER.BEAD	: FERRITE BEADS	TR.CHP	: CHIP TRANSISTOR
FER.CORE	: FERRITE CORE	TR.DGT	: DIGITAL TRANSISTOR
FET.CHP	: CHIP FET	TR.DGT.CHP	: CHIP DIGITAL TRANSISTOR
FL.DSPLY	: FLUORESCENT DISPLAY	TRANS	: TRANSFORMER
FLTR.CE	: CERAMIC FILTER	TRANS.PULS	: PULSE TRANSFORMER
FLTR.COMB	: COMB FILTER MODULE	TRANS.PWR	: POWER TRANSFORMER ASS'Y
FLTR.LC.RF	: LC FILTER,EMI	TUNER.AM	: TUNER PACK,AM
GND.MTL	: GROUND PLATE	TUNER.FM	: TUNER PACK,FM
GND.TERM	: GROUND TERMINAL	TUNER.PK	: FRONT-END TUNER PACK
HOLDER.FUS	: FUSE HOLDER	VR	: ROTARY POTENTIOMETER
IC.PRTCT	: IC PROTECTOR	VR.MTR	: POTENTIOMETER WITH MOTOR
JUMPER.CN	: JUMPER CONNECTOR	VR.SW	: POTENTIOMETER WITH ROTARY SW
JUMPER.TST	: JUMPER,TEST POINT	VR.SLIDE	: SLIDE POTENTIOMETER
L.DTCT	: LIGHT DETECTING MODULE	VR.TRIM	: TRIMMER POTENTIOMETER

Note) Those parts marked with “#” are not included in the P.C.B. ass'y.

Schm Ref.	PART NO.	Description		
*	V4907000	P.C.B.	TUNER	
CB1	Vi878100	CN.BS.PIN	3P	
CB2	Vi878100	CN.BS.PIN	3P	
CB3	VF728300	CN	6P	
CB4	VU271700	CN	17P	
CB5	VG879900	CN.BS.PIN	2P	
C2	UR837470	C.EL	47uF	16V
C4	VF467300	C.CE.TUBLR	0.01uF	16V
C5	VJ599000	C.CE.TUBLR	0.047uF	16V
* C6	FG650800	C.CE	8pF	50V
C7	VF467300	C.CE.TUBLR	0.01uF	16V
C8	VF467300	C.CE.TUBLR	0.01uF	16V
C9	VJ599000	C.CE.TUBLR	0.047uF	16V
C10	VF467300	C.CE.TUBLR	0.01uF	16V
C11	VF467300	C.CE.TUBLR	0.01uF	16V
C13	UR866100	C.EL	1uF	50V
C14	UA656100	C.MYLAR	1uF	50V
C16	UR838100	C.EL	100uF	16V
C17	VF467300	C.CE.TUBLR	0.01uF	16V
C18	VF467300	C.CE.TUBLR	0.01uF	16V
C19	VF467300	C.CE.TUBLR	0.01uF	16V
C20	UR866470	C.EL	4.7uF	50V
C21	UR837100	C.EL	10uF	16V
C22	VF466800	C.CE.TUBLR	100pF	50V
C23	VF466800	C.CE.TUBLR	100pF	50V
C24	VF466700	C.CE.TUBLR	47pF	50V
* C25	VG273300	C.CE.TUBLR	10pF	50V
* C26	VG273300	C.CE.TUBLR	10pF	50V
C27	UR837100	C.EL	10uF	16V
C28	UR837100	C.EL	10uF	16V
C29	VF467300	C.CE.TUBLR	0.01uF	16V
C30	VF467300	C.CE.TUBLR	0.01uF	16V
C31	UR866220	C.EL	2.2uF	50V
C32	VF467300	C.CE.TUBLR	0.01uF	16V
C33	UR866330	C.EL	3.3uF	50V
C34	VF467300	C.CE.TUBLR	0.01uF	16V
C35	UR866470	C.EL	4.7uF	50V
C36	UR865470	C.EL	0.47uF	50V
C37	UR837100	C.EL	10uF	16V
C38	VF466800	C.CE.TUBLR	100pF	50V
C39	VF467300	C.CE.TUBLR	0.01uF	16V
C42	UR866100	C.EL	1uF	50V
C43	UR865470	C.EL	0.47uF	50V
C44	UR866100	C.EL	1uF	50V
C45	UR866220	C.EL	2.2uF	50V
C46	VJ599000	C.CE.TUBLR	0.047uF	16V
C47	UR866220	C.EL	2.2uF	50V
C48	UR837100	C.EL	10uF	16V
C49	UR837100	C.EL	10uF	16V
C50	UA952270	C.MYLAR	270pF	50V
C51	VF466900	C.CE.TUBLR	470pF	50V
C52	VA777400	C.CE	120pF	50V
C53	VJ599000	C.CE.TUBLR	0.047uF	16V
C54	UA952270	C.MYLAR	270pF	50V
C73	UR837100	C.EL	10uF	16V
C74	UR837470	C.EL	47uF	16V
C75	UR866330	C.EL	3.3uF	50V
C76	UA953390	C.MYLAR	3900pF	50V
C77	UA953390	C.MYLAR	3900pF	50V
C78	UR866330	C.EL	3.3uF	50V
C79	UR838100	C.EL	100uF	16V
C80	UR837470	C.EL	47uF	16V
C81	UR867100	C.EL	10uF	50V

* New Parts

Schm Ref.	PART NO.	Description		
C82	UR867100	C.EL	10uF	50V
C83	FG644100	C.CE	0.01uF	50V
C84	FG644100	C.CE	0.01uF	50V
C85	FG644100	C.CE	0.01uF	50V
C86	UJ749220	C.EL	2200uF	25V
C87	FG644100	C.CE	0.01uF	50V
C88	UR867470	C.EL	47uF	50V
C89	UR867470	C.EL	47uF	50V
C90	UR867470	C.EL	47uF	50V
C93	UR867470	C.EL	47uF	50V
C94	UR867220	C.EL	22uF	50V
C95	UR867470	C.EL	47uF	50V
C96	UR867470	C.EL	47uF	50V
C97	UR867100	C.EL	10uF	50V
C98	UR866220	C.EL	2.2uF	50V
* C99	VF467100	C.CE.TUBLR	4700pF	16V
D1	VD631600	DIODE	1SS133,176,HSS104	
D2	VD631600	DIODE	1SS133,176,HSS104	
D3	VD631600	DIODE	1SS133,176,HSS104	
D7	VM974500	DIODE.ZENR	HZS6C2TD 6.0V	
D8	VM975300	DIODE.ZENR	HZS11B2TD 11V	
D9	VM974900	DIODE.ZENR	HZS9A2TD 9.0V	
D10	VS997800	DIODE	1T2	
D11	VS997800	DIODE	1T2	
D12	VS997800	DIODE	1T2	
D13	VS997800	DIODE	1T2	
D14	VD631600	DIODE	1SS133,176,HSS104	
D15	VD631600	DIODE	1SS133,176,HSS104	
D16	VM976300	DIODE.ZENR	HZS242TD 24V	
D17	VD631600	DIODE	1SS133,176,HSS104	
D18	VD631600	DIODE	1SS133,176,HSS104	
D19	VD631600	DIODE	1SS133,176,HSS104	
D20	VD631600	DIODE	1SS133,176,HSS104	
D21	VD631600	DIODE	1SS133,176,HSS104	
D22	VD631600	DIODE	1SS133,176,HSS104	
G1	VR463400	TERM.GND	D3.5 TP00385	
G2	VR463400	TERM.GND	D3.5 TP00385	
IC1	XQ360A00	IC	LC72130	
IC2	XB760A00	IC	LA1266	
IC3	iG158100	IC	LA3401	
L1	Vi546100	COIL	220uH	
L2	GG000560	FLTR.CE	SFE10.7MS3GHY-A	
L3	GG000560	FLTR.CE	SFE10.7MS3GHY-A	
L4	GG000560	FLTR.CE	SFE10.7MS3GHY-A	
L5	VR895700	COIL.IF	450KHz	
L6	Vi546100	COIL	220uH	
L7	Vi546100	COIL	220uH	
L8	VC218600	COIL.DT.FM	10.7MHz	
L9	VC219000	FLTR.CE	SFZ450JL3	
L10	VT486800	COIL	XYA2	
L12	VQ138200	FLTR.LC	19KHz	
L13	VQ138200	FLTR.LC	19KHz	
* PJ1	VM725600	JACK.PIN	2P	
PK1	VQ987600	TUNER.PK	ENV-17297G1	
PK2	VU333600	COIL.RF.AM	940536046B	
Q1	VD678500	TR.DGT	DTA114ES	
* Q2	VR497000	TR	2SC1809S N,P	
* Q3	VR497000	TR	2SC1809S N,P	
* Q4	VR497000	TR	2SC1809S N,P	
* Q5	VR497000	TR	2SC1809S N,P	
Q6	iC174020	TR	2SC1740S R,S	
Q7	iC174020	TR	2SC1740S R,S	
Q8	iC174020	TR	2SC1740S R,S	

* New Parts

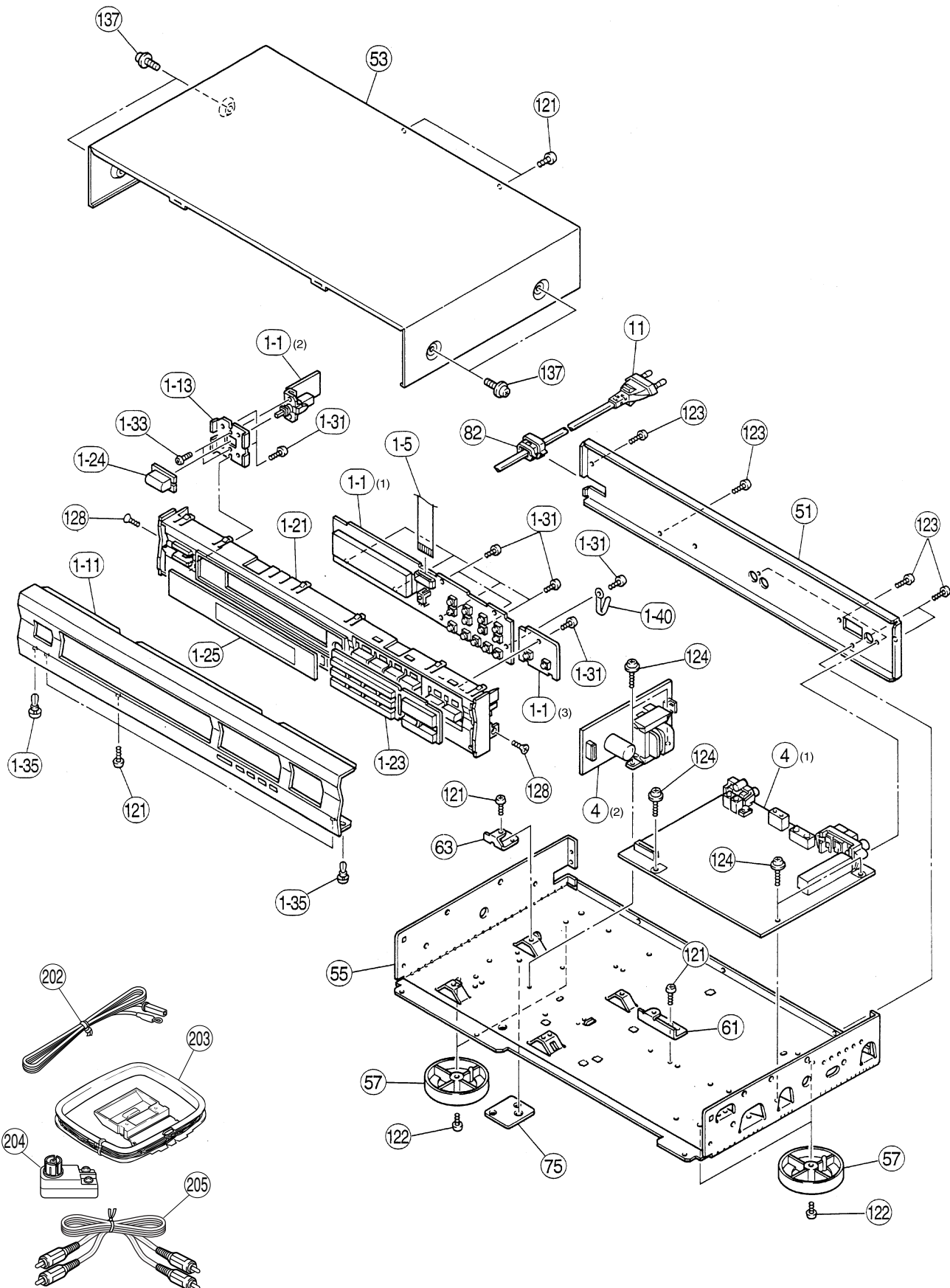
Schm Ref.	PART NO.	Description	
Q9	iC174020	TR	2SC1740S R,S
* Q10	VR497000	TR	2SC1809S N,P
Q11	VG722000	TR.DGT	DTC144ES
* Q13	VR497000	TR	2SC1809S N,P
Q14	iC174020	TR	2SC1740S R,S
Q15	VD678500	TR.DGT	DTA114ES
Q16	iC174020	TR	2SC1740S R,S
Q17	iC174020	TR	2SC1740S R,S
* Q18	iC206110	TR	2SC2061 P,Q,R
Q19	iC287820	TR	2SC2878 A,B
Q20	iC287820	TR	2SC2878 A,B
⚠ Q21	VN996900	TR	2SC4495
Q22	iA093320	TR	2SA933S Q,R
Q23	iC174020	TR	2SC1740S R,S
Q24	iA093320	TR	2SA933S Q,R
Q25	VG722000	TR.DGT	DTC144ES
⚠ R90	HV755330	R.CAR.FP	330Ω 1/4W
⚠ R91	HV755330	R.CAR.FP	330Ω 1/4W
R92	HV753470	R.CAR.FP	4.7Ω 1/4W
* R104	HV753330	R.CAR.FP	3.3Ω 1/4W
⚠ T1	XN911A00	TRANS.PWR	
TE1	VU477800	TERM.ANT	AJ-2038-040
* VR1	VJ693200	VR.TRIM	B2.2KΩ
* VR2	VJ693200	VR.TRIM	B2.2KΩ
VR3	VJ694000	VR.TRIM	B47KΩ
VR4	VJ693800	VR.TRIM	B22KΩ
XL1	VY734600	RSNR.CRYS	7.2MHz
XL3	GG000750	RSNR.CE	18.95KHz

* New Parts

Schm Ref.	PART NO.	Description	
* CB501	V4907100	P.C.B.	OPERATION
CB501	VU281700	CN	17P
CB502	Vi878200	CN.BS.PIN	4P
CB503	Vi878200	CN.BS.PIN	4P
CB504	Vi878400	CN.BS.PIN	6P
C501	UR866100	C.EL	1uF 50V
C502	UR837470	C.EL	47uF 16V
C503	VU545000	C.EL	47000uF 5.5V
C504	VJ599100	C.CE.TUBLR	0.1uF 50V
C505	VF467300	C.CE.TUBLR	0.01uF 16V
C506	VF467300	C.CE.TUBLR	0.01uF 16V
C507	UA655100	C.MYLAR	0.1uF 50V
C508	UA655100	C.MYLAR	0.1uF 50V
D501	VD631600	DIODE	1SS133,176,HSS104
D502	VD631600	DIODE	1SS133,176,HSS104
D503	VM975300	DIODE.ZENR	HZS11B2TD 11V
D504	VD631600	DIODE	1SS133,176,HSS104
D505	VD631600	DIODE	1SS133,176,HSS104
D506	VD631600	DIODE	1SS133,176,HSS104
* IC501	XY118A00	IC.CPU	LC866420B-5N84 CPU
Q501	iA093320	TR	2SA933S Q,R
Q502	iC174020	TR	2SC1740S R,S
SW504	VG392900	SW.TACT	SKHVAA
SW505	VG392900	SW.TACT	SKHVAA
SW506	VG392900	SW.TACT	SKHVAA
SW507	VG392900	SW.TACT	SKHVAA
SW508	VG392900	SW.TACT	SKHVAA
SW509	VG392900	SW.TACT	SKHVAA
SW511	VG392900	SW.TACT	SKHVAA
SW512	VG392900	SW.TACT	SKHVAA
SW513	VG392900	SW.TACT	SKHVAA
SW514	VG392900	SW.TACT	SKHVAA
SW515	VG392900	SW.TACT	SKHVAA
SW516	VG392900	SW.TACT	SKHVAA
SW517	VG392900	SW.TACT	SKHVAA
SW518	VG392900	SW.TACT	SKHVAA
SW519	VG392900	SW.TACT	SKHVAA
SW520	VY758900	SW.PUSH	PS016-PA022BA-B
U501	VU591000	L.DTCT	GP1U271X
V501	VV115200	FL.DSPLY	13-BT-152GK
* XL501	VH611900	RSNR.CE	CST6.00MGW-TF01
	VQ948800	SHEET.FL	GD
	VR380100	SPACER	FL-T6

* New Parts

EXPLODED VIEW



MECHANICAL PARTS

Ref. No.	PART NO.	Description	Remarks	Markets
* 1- 1	V4907100	P.C.B. ASS'Y	OPERATION	
1- 5	MF117160	FLEXIBLE FLAT CABLE	17P 160mm	
* 1-11	V4857100	FRONT PANEL		BL
* 1-11	V4857200	FRONT PANEL		GD
1-13	VV244200	SUPPORT	PWR	
* 1-21	V4857400	SUB PANEL		GD
1-21	VV292700	SUB PANEL		BL
* 1-23	V4857600	ESCUTCHEON		GD
1-23	VV245000	ESCUTCHEON		BL
* 1-24	V4857700	BUTTON		GD
1-24	VV501000	BUTTON	9.5x22V	BL
1-25	VV245300	SHEET, WINDOW PANEL		
1-31	EP630220	BIND HEAD P-TITE SCREW	3x8 ZMC2-BL	
1-33	EP630210	BIND HEAD S-TITE SCREW	3x6 ZMC2-BL	
1-35	VQ368600	PUSH RIVET	P3555-B	
1-40	CB836200	BINDING TIE	S-70B	
* 4	V4907000	P.C.B. ASS'Y	TUNER	
△ 11	VN363700	POWER CORD ASS'Y		(G)
△ 11	VV437300	POWER CORD ASS'Y		(B)
* 51	V4857300	REAR PANEL		
* 53	V4887400	TOP COVER		GD
53	VV245400	TOP COVER		BL
55	VQ709000	CHASSIS		
57	V0049900	LEG	D60xH16	GD
57	VQ780300	LEG	D60xH16	BL
61	VV244600	SUPPORT, PCB	PCB	
63	VZ037300	SUPPORT		
75	VY735100	SPACER		
82	V2438700	CORD STOPPER	'10P1	
121	EP600830	BIND HEAD B-TITE SCREW	3x8 FCRM3BL	
122	EP600250	BIND HEAD B-TITE SCREW	3x8 ZMC2Y	
123	VN413300	BIND HEAD BONDING B-T. SCREW	3x8 MFZN2BL	
124	VT669300	PW HEAD B-TITE SCREW	3x8-8 MFC2	
128	VF378100	FLAT HEAD SCREW	3x6 ZMC2Y	
137	21991500	PW HEAD S-TITE SCREW	4x8-10 FCRM3BL	BL
137	VD069600	PW HEAD S-TITE SCREW	4x8-10 MFNI33	GD
		ACCESSORIES		
202	VQ147100	ANTENNA, FM	1.4m	
203	VR248500	ANTENNA, AM LOOP	1.0m	
204	VE364900	ANTENNA ADAPTER	PAL 75-300Ω	(B)
205	VY952200	AUDIO CONNECTION CORD	2P 1.0m	

* New Parts

Parts List for Carbon Resistors

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ35 3100	HF85 3100	10 kΩ	HF45 7100	HF45 7100
1.8 Ω	HJ35 3180	*	11 kΩ	HF45 7110	HF45 7110
2.2 Ω	HJ35 3220	HF85 3220	12 kΩ	HJ35 7120	HF85 7120
3.3 Ω	HJ35 3330	HF85 3330	13 kΩ	HF45 7130	HF45 7130
4.7 Ω	HJ35 3470	HF85 3470	15 kΩ	HF45 7150	HF45 7150
5.6 Ω	HJ35 3560	HF85 3560	18 kΩ	HF45 7180	HF45 7180
10 Ω	HF45 4100	HF45 4100	22 kΩ	HF45 7220	HF45 7220
15 Ω	HJ35 4150	HF85 4150	24 kΩ	HF45 7240	HF45 7240
22 Ω	HF45 4220	HF45 4220	27 kΩ	HJ35 7270	HF85 7270
27 Ω	HJ35 4270	HF85 4270	30 kΩ	HF45 7300	HF45 7300
33 Ω	HF45 4330	HF45 4330	33 kΩ	HF45 7330	HF45 7330
39 Ω	HJ35 4470	HF85 4390	36 kΩ	HF45 7360	HF45 7360
47 Ω	HF45 4470	HF45 4470	39 kΩ	HF45 7390	HF45 7390
56 Ω	HF45 4560	HF45 4560	47 kΩ	HF45 7470	HF45 7470
68 Ω	HF45 4680	HF45 4680	51 kΩ	HF45 7510	HF45 7510
75 Ω	HF45 4750	HF45 4750	56 kΩ	HF45 7560	HF45 7560
82 Ω	HF45 4820	HF45 4820	62 kΩ	HF45 7620	HF45 7620
91 Ω	HF45 4910	HF45 4910	68 kΩ	HF45 7680	HF45 7680
100 Ω	HF45 5100	HF45 5100	82 kΩ	HF45 7820	HF45 7820
110 Ω	HJ35 5110	HF85 5110	91 kΩ	HF45 7910	HF45 7910
120 Ω	HF45 5120	HF45 5120	100 kΩ	HF45 8100	HF45 8100
150 Ω	HF45 5150	HF45 5150	110 kΩ	HF45 8110	HF45 8110
160 Ω	HJ35 5160	*	120 kΩ	HF45 8120	HF45 8120
180 Ω	HF45 5180	HF45 5180	150 kΩ	HF45 8150	HF45 8150
200 Ω	HF45 5200	HF45 5200	180 kΩ	HF45 8180	HF45 8180
220 Ω	HF45 5220	HF45 5220	220 kΩ	HJ35 8220	HF85 8220
270 Ω	HF45 5270	HF45 5270	270 kΩ	HF45 8270	HF45 8270
330 Ω	HF45 5330	HF45 5330	300 kΩ	HF45 8300	HF45 8300
390 Ω	HF45 5390	HF45 5390	330 kΩ	HF45 8330	HF45 8330
430 Ω	HF45 5430	HF45 5430	390 kΩ	HJ35 8390	HF85 8390
470 Ω	HF45 5470	HF45 5470	470 kΩ	HF45 8470	HF45 8470
510 Ω	HF45 5510	HF45 5510	560 kΩ	HJ35 8560	HF85 8560
560 Ω	HF45 5560	HF45 5560	680 kΩ	HJ35 8680	HF85 8680
680 Ω	HF45 5680	HF45 5680	820 kΩ	HJ35 8820	HF85 8820
820 Ω	HF45 5820	HF45 5820	1.0 MΩ	HF45 9100	HF45 9100
910 Ω	HF45 5910	HF45 5910	1.2 MΩ	HJ35 9120	*
1.0 kΩ	HF45 6100	HF45 6100	1.5 MΩ	HJ35 9150	HF85 9150
1.2 kΩ	HF45 6120	HF45 6120	1.8 MΩ	HJ35 9180	HF85 9180
1.5 kΩ	HF45 6150	HF45 6150	2.2 MΩ	HJ35 9220	HF85 9220
1.8 kΩ	HF45 6180	HF45 6180	3.3 MΩ	HJ35 9330	HF85 9330
2.0 kΩ	HJ35 6200	HF85 6200	3.9 MΩ	HJ35 9390	*
2.2 kΩ	HF45 6220	HF45 6220	4.7 MΩ	HJ35 9470	HF85 9470
2.4 kΩ	HJ35 6240	HF85 6240			
2.7 kΩ	HF45 6270	HF45 6270			
3.0 kΩ	HF45 6300	HF45 6300			
3.3 kΩ	HF45 6330	HF45 6330			
3.6 kΩ	HJ35 6360	HF85 6360			
3.9 kΩ	HF45 6390	HF45 6390			
4.7 kΩ	HF45 6470	HF45 6470			
5.1 kΩ	HF45 6510	HF45 6510			
5.6 kΩ	HF45 6560	HF45 6560			
6.8 kΩ	HF45 6680	HF45 6680			
8.2 kΩ	HF45 6820	HF45 6820			
9.1 kΩ	HF45 6910	HF45 6910			
				<p>1/4W Type HJ35 ○○○○</p> <p>1/6W Type HF85 ○○○○</p>	

* : Not available