

Service Manual

PIONEER®
The Art of Entertainment

KEH-2300R/X1MA/EW



ORDER NO.
CRT1782

HIGH POWER CASSETTE PLAYER WITH RDS TUNER

KEH-2300R X1MA/EW, X1M/EW
KEH-2300R X1IN/EW
KEH-2100R X1MA/GR, X1M/GR
KEH-2100R X1IN/GR
KEH-2400R X1MA/IT, X1M/IT
KEH-2400R X1IN/IT

NOTE:

- See the separate manual CX-644(CRT1800) for the cassette mechanism description.
- The cassette mechanism assy employed in this model is one of X-2M series.
- For the service mentioned in this manual, the special tools GGD1056, and GGD1100 have to be used. See the sections and "Adjustment" on how to use these tools.
- The models referred to as an "EW model" in this manual are the models KEH-2300R/X1MA/EW, KEH-2300R/X1M/EW, or KEH-2300R/X1IN/EW.
- The models referred to as an "GR model" in this manual are the models KEH-2100R/X1MA/GR, KEH-2100R/X1M/GR, or KEH-2100R/X1IN/GR.
- The models referred to as an "IT model" in this manual are the models KEH-2400R/X1MA/IT, KEH-2400R/X1M/IT, or KEH-2400R/X1IN/IT.

CONTENTS

1. SPECIFICATIONS.....	2	8. BLOCK DIAGRAM	17
2. OPERATIONS AND CONNECTION	2	9. CONNECTION DIAGRAM	20
3. DISASSEMBLY	5	10. SCHEMATIC CIRCUIT DIAGRAM	23
4. ADJUSTMENT.....	6	11. CIRCUIT DIAGRAM AND PATTERN	26
5. IC INFORMATION.....	7	12. EXPLODED VIEW AND PARTS LIST	31
6. LCD.....	12	13. PACKING METHOD	36
7. ELECTRICAL PARTS LIST	13		

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O.Box 1760, Long Beach, CA 90801-1760 U.S.A.
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE.LTD. 501 Orchard Road, #10-00, Lane Crawford Place, Singapore 0923

1. SPECIFICATIONS

General

Power source	14.4 V DC (10.8 — 15.1 V allowable)
Grounding system	Negative type
Max. current consumption	8.5 A
Dimensions (chassis)	178 (W) × 50 (H) × 160 (D) mm
(front face)	188 (W) × 58 (H) × 19 (D) mm
Weight	1.2 kg

Amplifier

Maximum power output	35 W × 4
Continuous power output	22 W × 4 (DIN45324, +B = 14.4 V)
Load impedance	4 Ω (4 — 8 Ω allowable)
Tone controls (bass)	±12 dB (100 Hz)
(treble)	±12 dB (10 kHz)
Loudness contour	+10 dB (100 Hz), +7 dB (10 kHz) (Volume: -30 dB)

Tape player

Tape	Compact cassette tape (C-30 — C-90)
Tape speed	4.76 cm/sec. (+0.14 cm/sec., -0.05 cm/sec.)
Fast forward/rewind time	Approx. 90 sec. for C-60
Wow & flutter	0.13 % (WRMS)
Frequency response	40 — 14,000 Hz (±3 dB)
Stereo separation	45 dB
Signal-to-noise ratio	52 dB (IEC-A network)

FM tuner

Frequency range	87.5 — 108 MHz
Usable sensitivity	11 dBf (1.0 μV/75 Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity	16 dBf (1.7 μV/75 Ω, mono)
Signal-to-noise ratio	70 dB (IEC-A network)
Distortion	0.3 % (at 65 dBf, 1 kHz, stereo)
Frequency response	30 — 15,000 Hz (±3 dB)
Stereo separation	40 dB (at 65 dBf, 1 kHz)

MW tuner

Frequency range	531 — 1,602 kHz
Usable sensitivity	18 μV (25 dB) (S/N: 20 dB)
Selectivity	50 dB (±9 kHz)

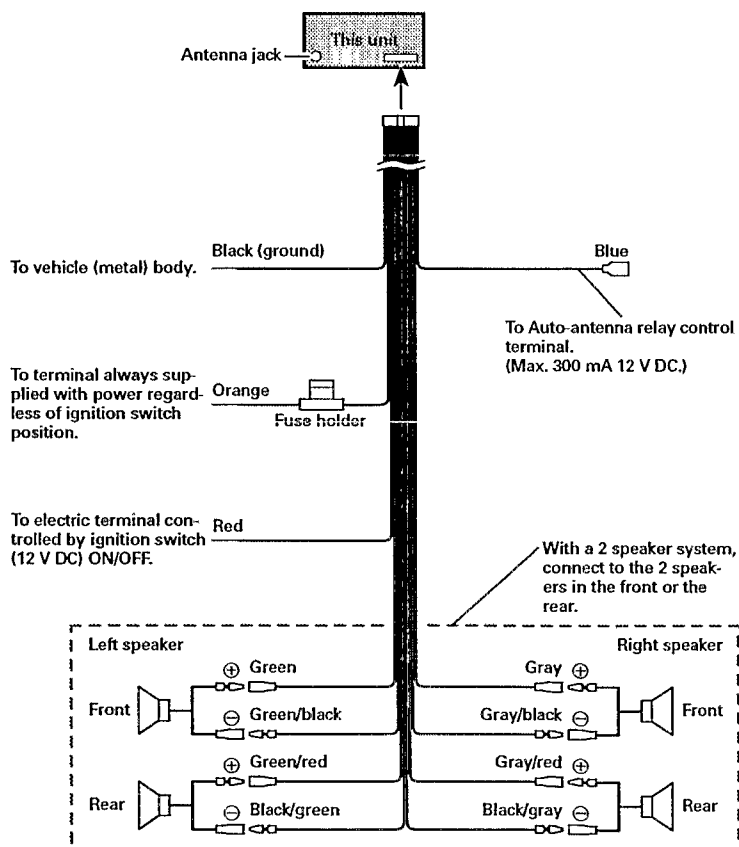
LW tuner

Frequency range	153 — 281 kHz
Usable sensitivity	30 μV (30 dB) (S/N: 20 dB)
Selectivity	50 dB (±9 kHz)

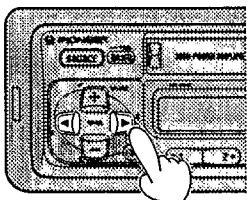
Note:

Specifications and design are subject to possible modification without notice due to improvements.

2. OPERATIONS AND CONNECTION

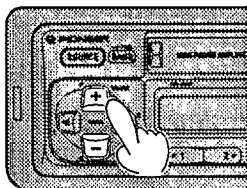


Bass/Treble



Press the [▶] button when in the Bass mode, and the Treble mode "TRE" is indicated in the display. Press the [◀] button when in the Treble mode, and the display changes to "BAS" indicating that you have switched to the Bass mode.

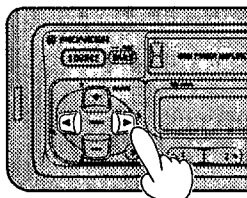
Adjusting Bass/Treble



[+]: Boosts
[-]: Attenuates
(When in the Bass mode, the display shows "BAS -6" ~ "BAS +6". When in the Treble mode, it shows "TRE -6" ~ "TRE +6".)

Loudness

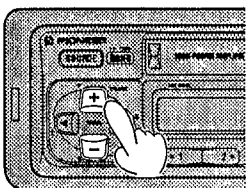
This function enhances both the high and low ranges of sound to give even more power to output at low volume.



Press the [▶] button to turn Loudness ON, "LOUD ON" appears in the display. Press the [◀] button to turn Loudness OFF, "LOUD OFF" appears in the display.

[▶]: On
[◀]: Off

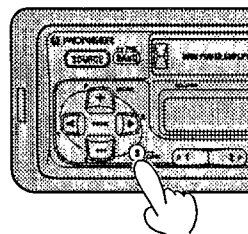
Volume



Pressing the [+] button increases the volume, while the [-] button decreases it. (Display shows "VOL 00" ~ "VOL 30".)
• When driving your vehicle, be sure to keep the volume of the unit set low enough to allow you to hear sounds coming from outside.

Adjusting Volume and Tone

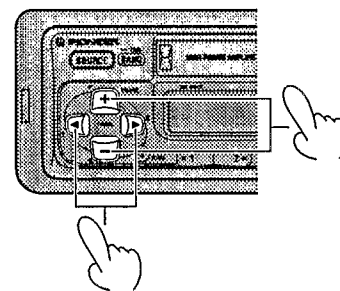
Mode Selection



Each press of the [S] button changes the mode as follows:
Fader adjustment (FAD) → Tone adjustment (BAS) → Loudness (LOUD) → Volume adjustment (VOL)

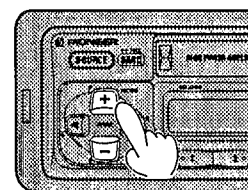
- Fader, Balance, Bass and Treble settings stop temporarily at the center position.
- If no operations are performed within 8 seconds, adjustment modes are cancelled. Make adjustments within 8 seconds.

Fader/Balance



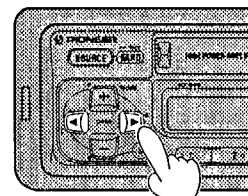
Press the [◀] or [▶] button when in the Fader mode, and the Balance mode "BAL" is indicated in the display. Press the [+] or [-] button when in the Balance mode, and the display changes to "FAD", indicating that you have switched to the Fader mode.

Fader



[+]: Raises front speaker volume while decreasing rear speaker volume
[-]: Raises rear speaker volume while decreasing front speaker volume
(Display shows "FAD F15" ~ "FAD R15".)
• Please set "FAD 0" when using 2 speaker system.

Balance

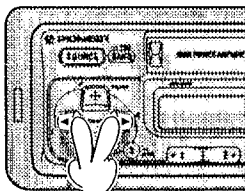


[▶]: Shifts the balance to the right speaker
[◀]: Shifts the balance to the left speaker
(Display shows "BAL L9" ~ "BAL R9".)

Using the Radio

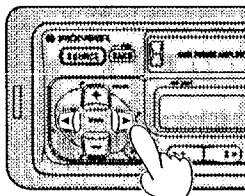
Manual Tuning

1.



Press both [◀] and [▶] buttons at same time.
("MANU" lights in the display.)

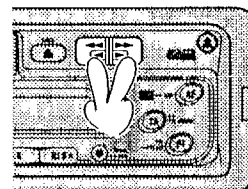
2.



[◀]: Use to select lower frequencies.
[▶]: Use to select higher frequencies.
Continue pressing the button to move up or down continuously through frequencies.
• Tuning moves up or down in 50 kHz steps for FM, 9 kHz steps for MW and 1 kHz steps for LW.

Using the Tape Deck

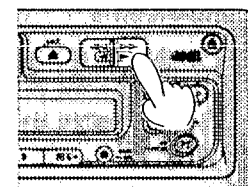
To Change Sides



Press the [◀◀] and [▶▶] buttons at the same time.

Fast Forward/Rewind

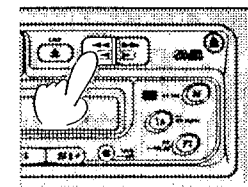
Fast forward



Press the button for the same direction as the tape play indicator.

TAPE 1111

Rewind



Press the button for the opposite direction as the tape play indicator.

TAPE 1111

- " {--} " will flash when the tape is fast forwarding or rewinding.

3. DISASSEMBLY

● Removing the Case(not shown)

1. Remove the two screws and, then remove the case.

● Removing the Cassette Mechanism Unit(not shown)

1. Remove the four screws.
2. Disconnect the connector.
3. Remove the cassette mechanism unit.

● Removing the Grille Assy(Fig.1)

1. Disconnect the two stoppers indicated by arrows.
2. Remove the grille assy.

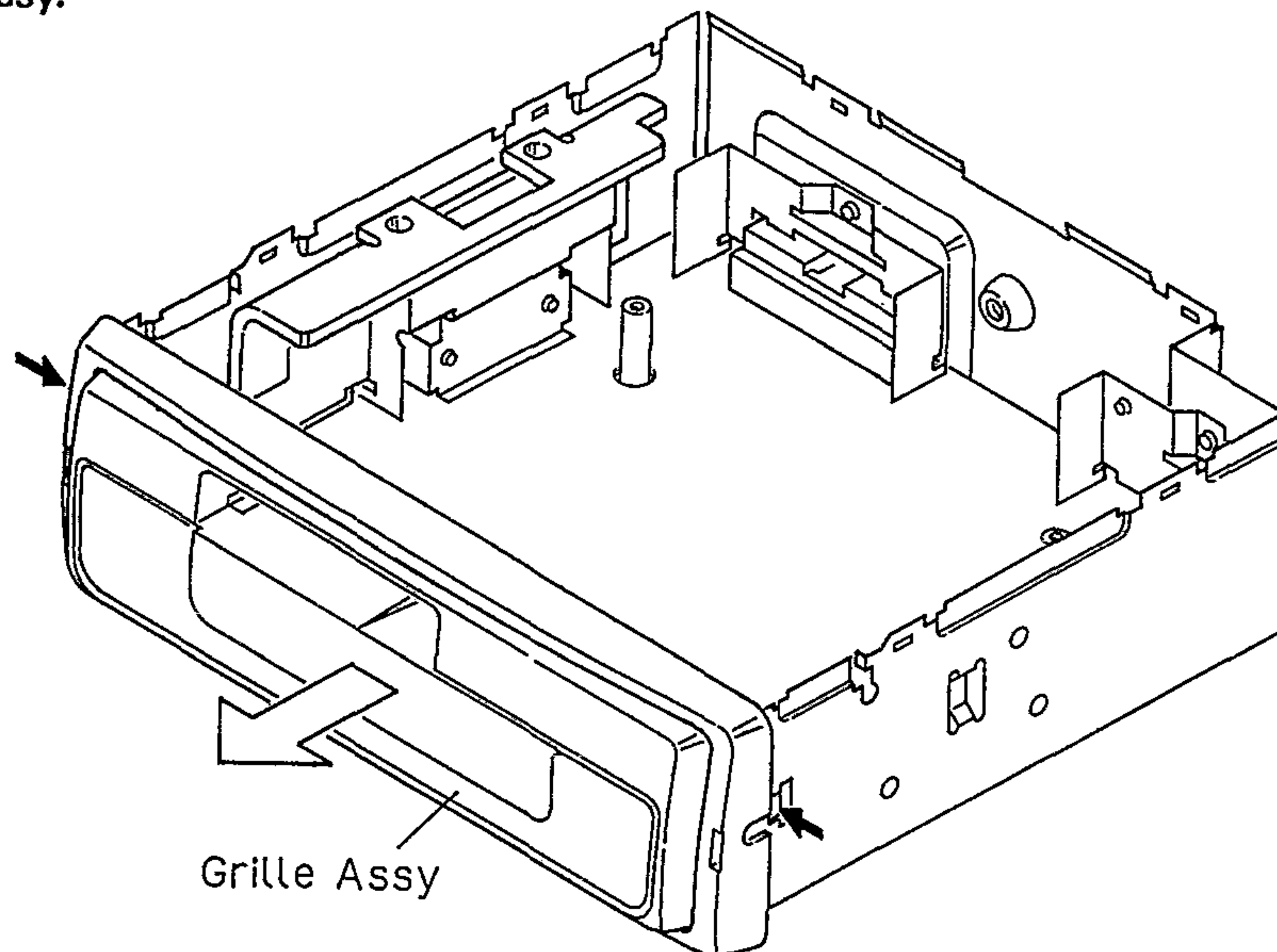


Fig.1

● Removing the Chassis Unit(Fig.2)

1. Remove the three screws A and two screws B.
2. Unbend the tabs at four locations indicated by arrows until straight.
3. Remove the chassis unit.

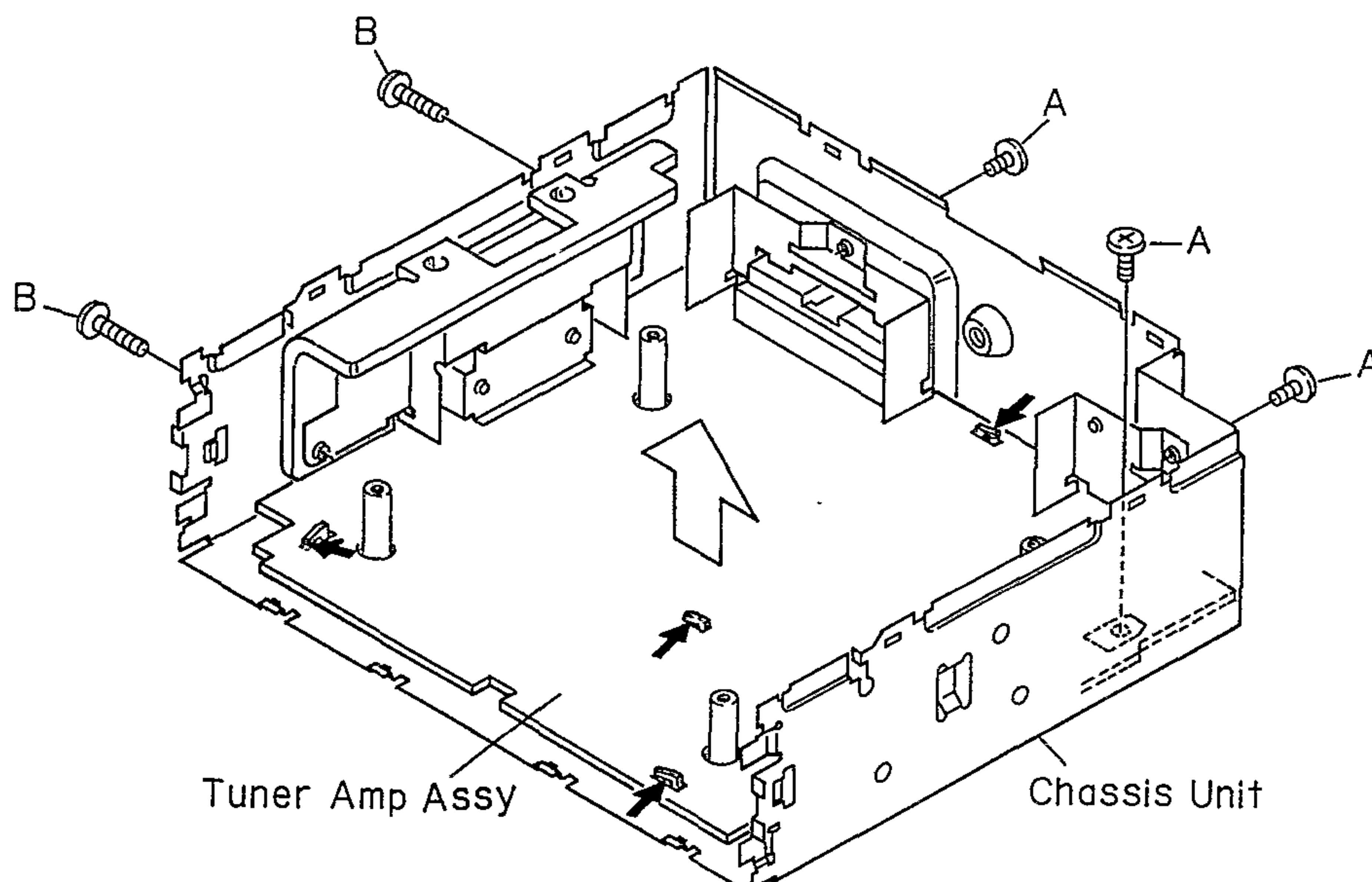


Fig.2

4. ADJUSTMENT

● Connection Diagram

NOTE:

Select C1 so that total capacity of 80pF is attained from the direction of the receiver jack.
Z: Output impedance of SSG.

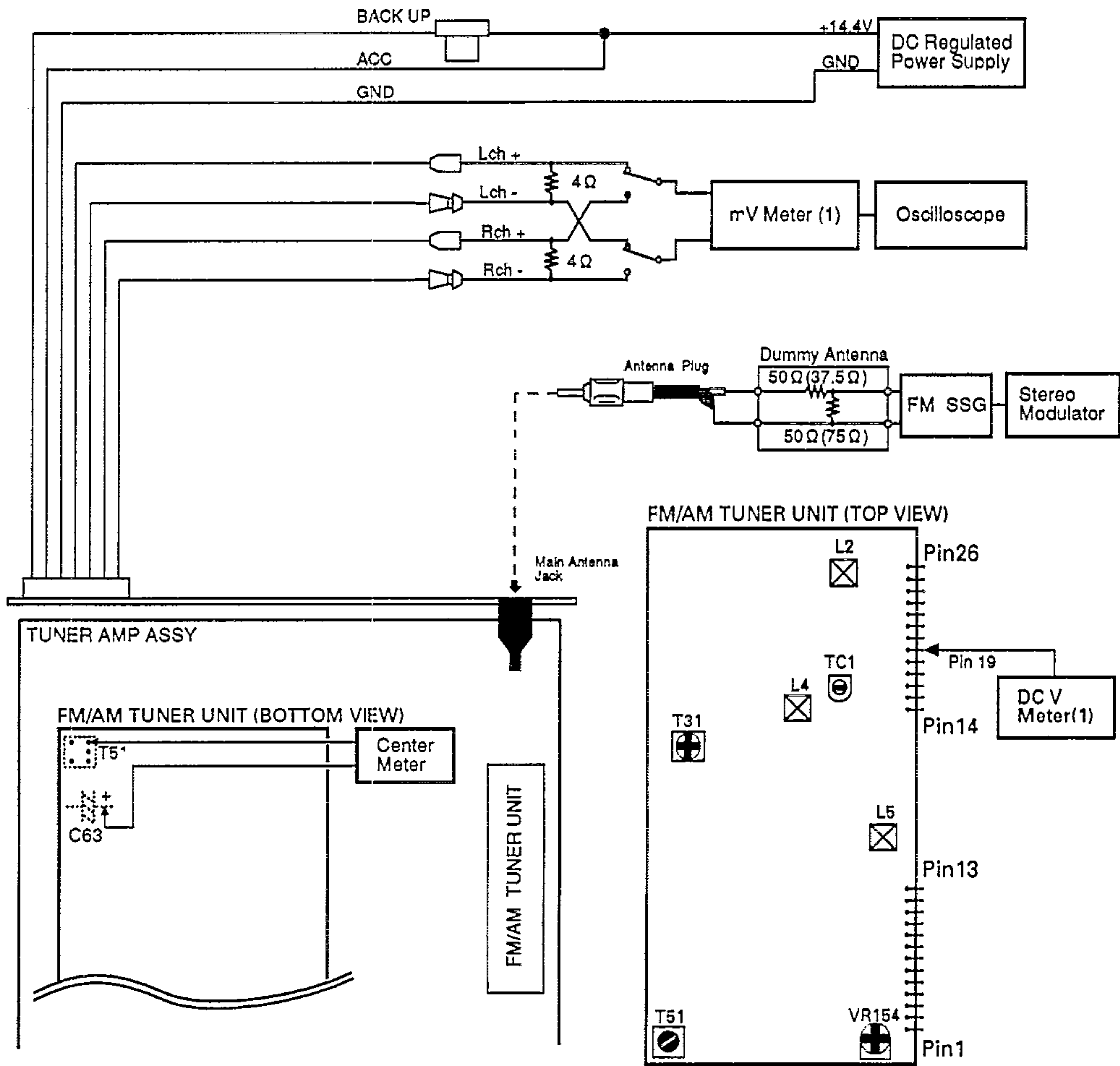


Fig.3

FM ADJUSTMENT

Modulation M:MONO MOD., 400Hz 30%(22.5kHz Dev.)

S1:STEREO MOD., 1kHz, L or R=30%(20.25kHz+7.5kHz Dev.)

NOTE:Before proceeding to further adjustments after switching power ON, let the tuner run for ten minutes to allow the circuits to stabilize.

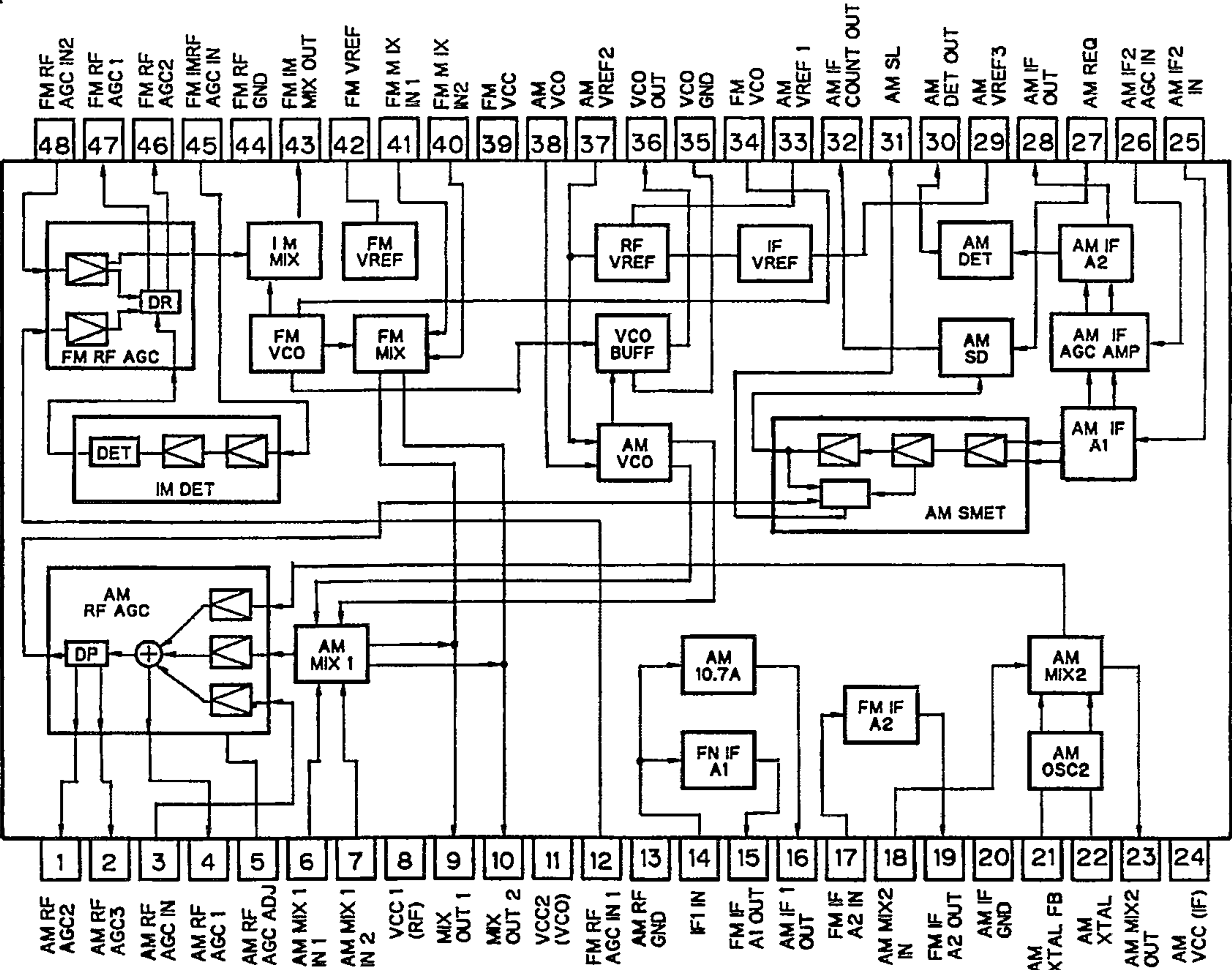
	No.	FM SSG		Displayed Frequency(MHz)	Adjustment Point	Adjustment Method (Switch Position)
		Frequency(MHz)	Level(dBf)			
TUN Volt	1	.....	.....	108.0	L5	DC V Meter(1) : 6V
IF	1	98.1 M	60	98.1	T51	Center Meter : 0
ANT Coil	1	98.1 M	5	98.1	L2	mV Meter(1) : Maximum
RF Coil	1	98.1 M	5	98.1	L4	mV Meter(1) : Maximum
Image	1	129.3 M	60—80	107.9	TC1	mV Meter(1) : Minimum
IFT	1	98.1 M	5	98.1	T31	mV Meter(1) : Maximum (STEREO MODE)
ARC	1	98.1 S1	39	98.1	VR154	mV Meter(1) : Separation 5dB (STEREO MODE)

● For Repair of the Key Board Unit, Use the Extension-Cord Tool GGD1056.

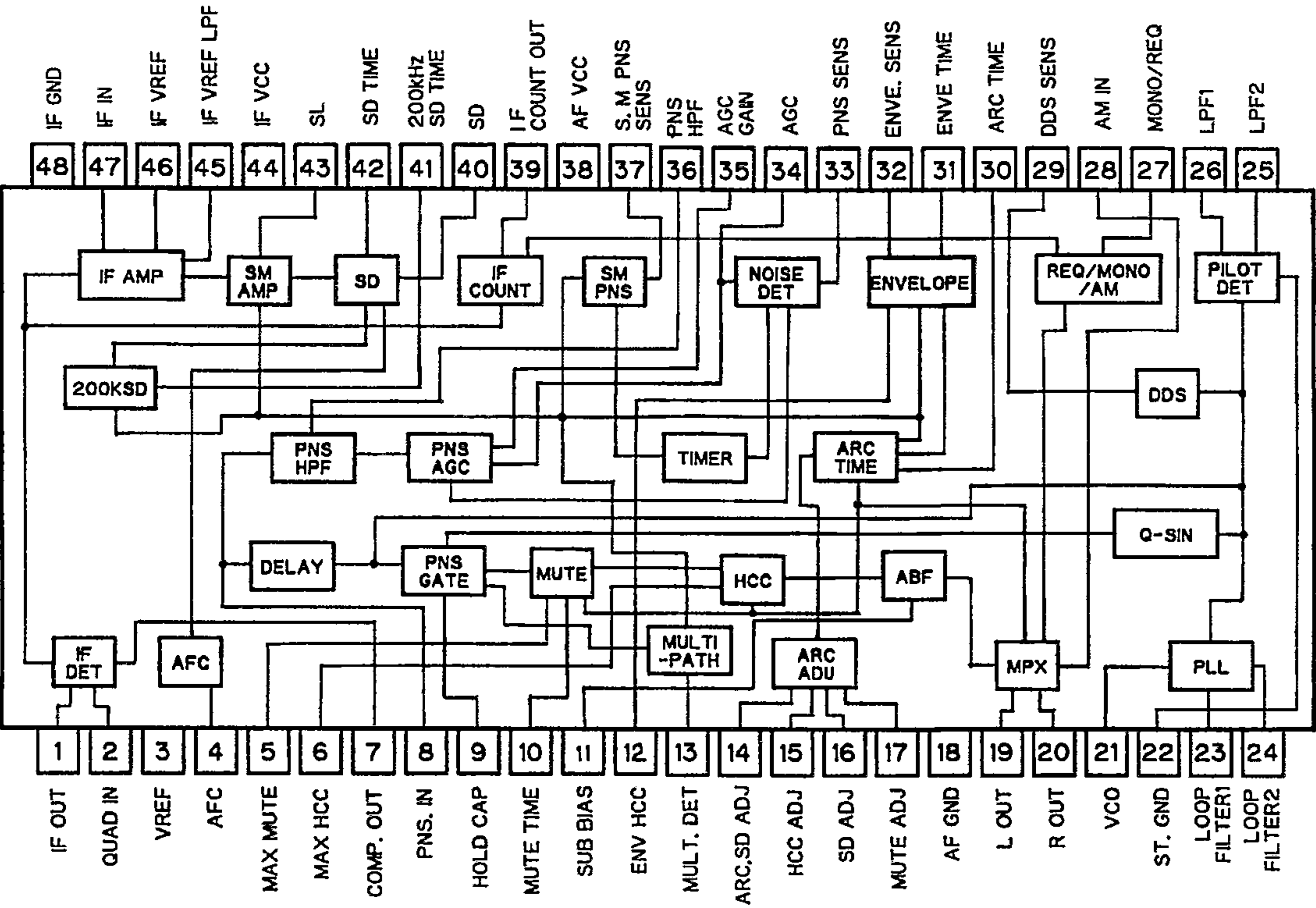
● For Repair of the Cassette Mechanism Unit, Use the Extension-Cord Tool GGD1100.

5. IC INFORMATION

PA4023A



PA4024A



● Pin Functions(PD4638A)

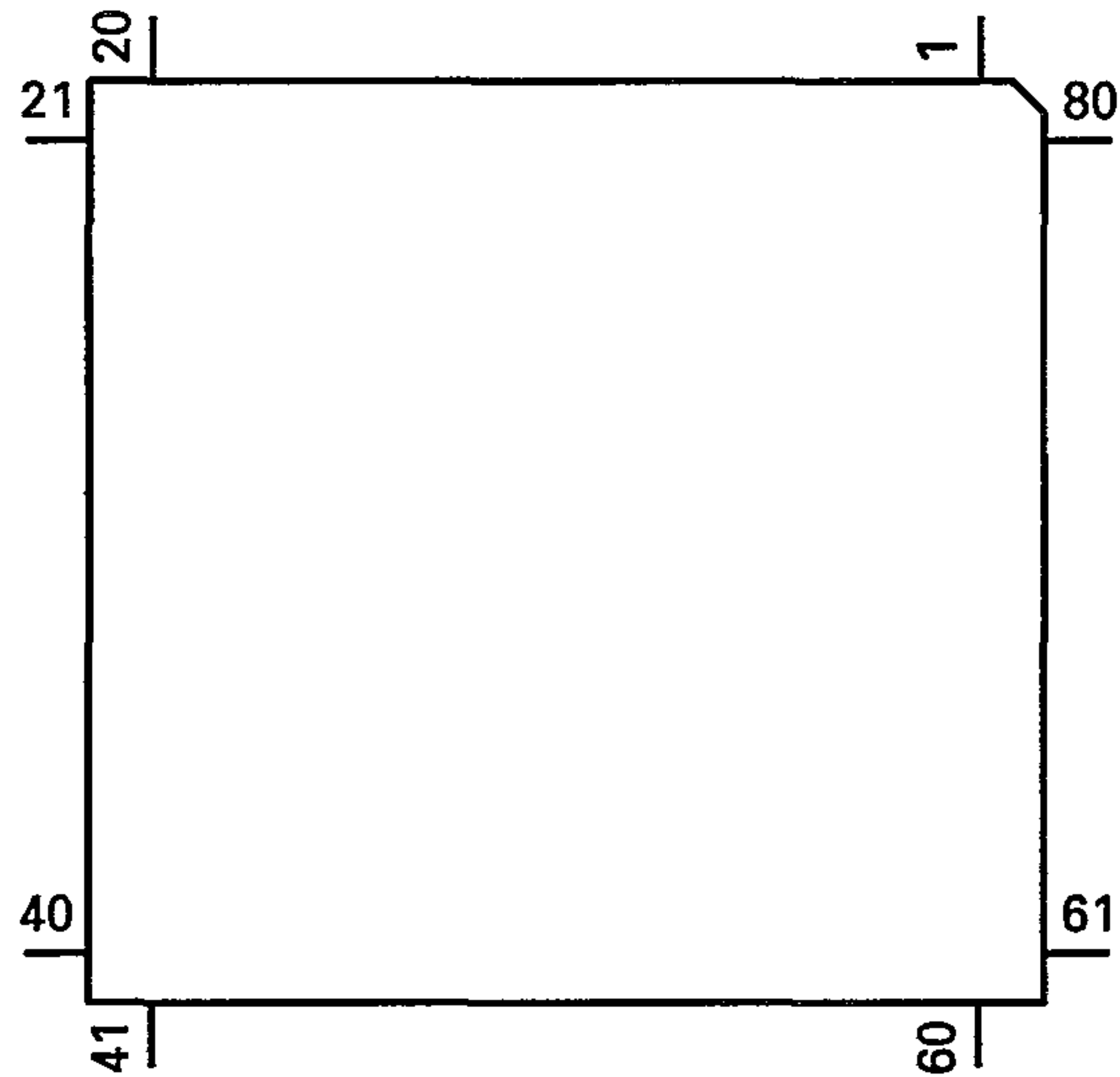
Pin No.	Pin Name	I/O	Format	Function and Operation
1-3	NC			Not used
4	AVss			GND
5	NC			Not used
6	ST	I		FM stereo input
7	AVREFO			GND
8	KYDT	I		Key data input
9	DPDT	O	C	Display data output
10	SWVDD	O	C	Grille power supply control output
11	PDI	I		Data input for PLL IC
12	PDO	O	C	Data output for PLL IC
13	PCK	O	C	PLL clock output
14	PCE	O	C	PLL chip enable output
15	CURRO	O		Tuner voltage control output
16	TSI	I		Test program serial input
17	TSO	O		Test program serial output
18	TCK	O		Test program serial clock
19	SD	I		SD input
20	MUTCNT	I		NF mute control input
21-24	NC			Not used
25	RDSLK	I		RDS LK signal input
26	RDT	I		RDS demodulation data input
27	NC			Not used
28	MD	I		Modulation detect input
29	DRST	O	C	Decoder reset output
30	RECIVE	O	C	During RDS data reception output
31	CORR	O	C	Error output
32	ERROR	O	C	Disapprove of error correction output
33	GND			GND
34	VDT	O	C	Data output for electronic volume
35	VCK	O	C	Clock output for electronic volume
36	VST	O	C	Strobe pulse output for electronic volume
37	NC			Not used
38	MUTE	O	C	Synthesis mute output
39-41	NC			Not used
42	DKOUT	O		DK interrupt output
43,44	NC			Not used
45	PEE	O	C	PEE sound output
46	AM	O	C	AM power control output
47	MCPW			Mechanism power
48	SYSPW	O	C	System power supply control output
49	PCL	O	C	Clock adjustment output
50	ILMPW	O		Illumination power supply control output
51	FM	O	C	FM power control output
52	ADPW	O	C	A/D converter voltage output
53	MCMUTE	I	C	Cassette mechanism mute input
54	N/R	I		Forward reverse input
55	TAPLD	I		Tape loading input
56-59	NC			Not used
60	RST	I		System reset
61	LDET	I		PLL clock sense input
62	RCK	I		RDS demodulation clock input
63	DSENS	I		Grille detach sense
64	ASENS	I		ACC power sense input
65	BSENS	I		Back up power sense input
66	CLOCK	I		Clock input
67	EJECT	I		Eject key input pin
68	VDD			Power supply
69	X1			Crystal oscillator connection pin
70	X2			Crystal oscillator connection pin

Pin No.	Pin Name	I/O	Format	Function and Operation
71	GND			GND
72	NC			Not used
73	TESTIN	I		Test program mode input
74	AVDD			Positive power supply terminal for analog circuit
75	AVREF	I		A/D converter reference voltage
76	SL	I		SD level input from tuner
77	COMP	O	C	CD compression ON/OFF output
78	NL	I		Noise level input
79	TL	I		Trigger level input
80	MODEL1	I		Model terminal difference

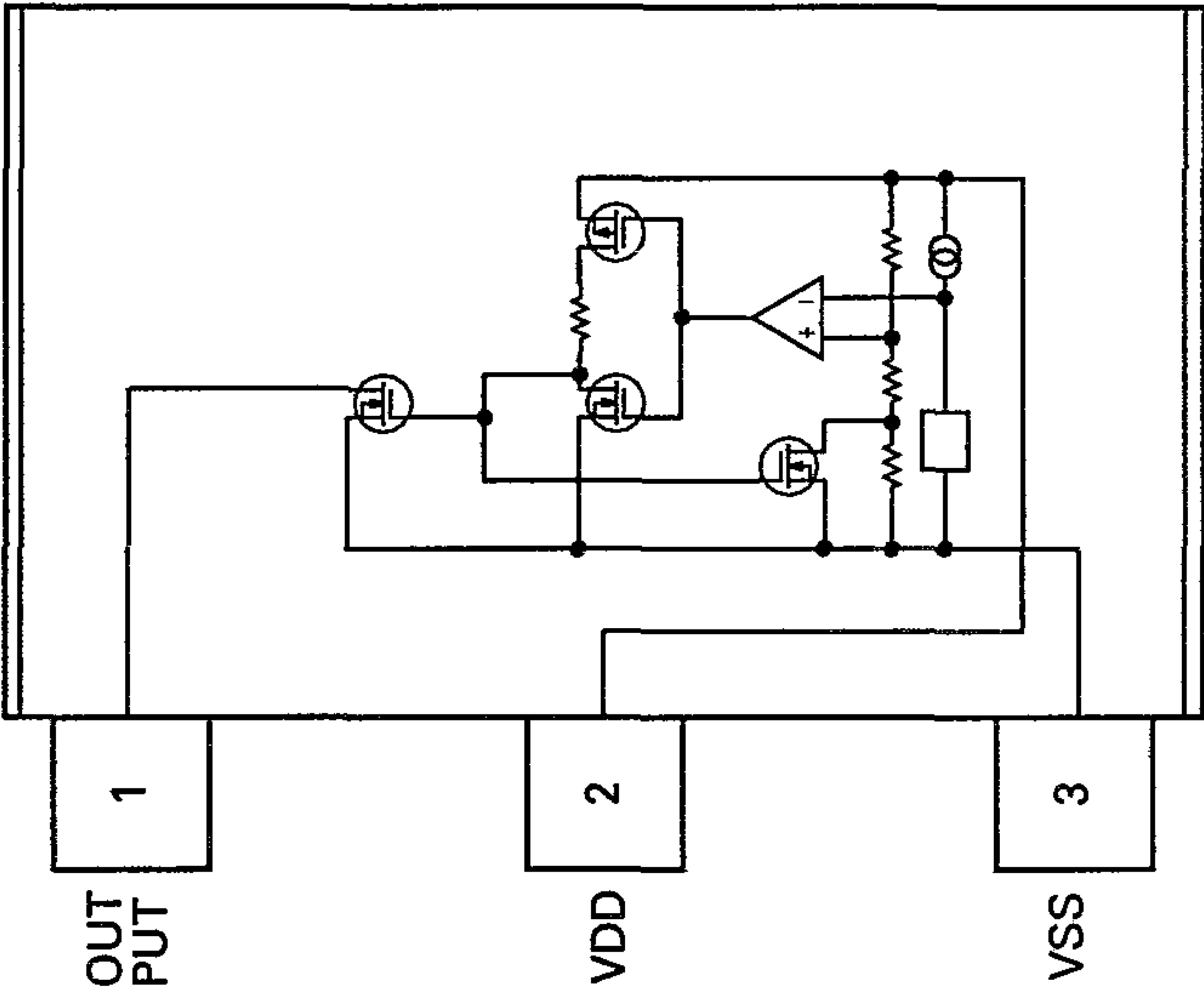
Format	Meaning
C	C MOS

IC's marked by* are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

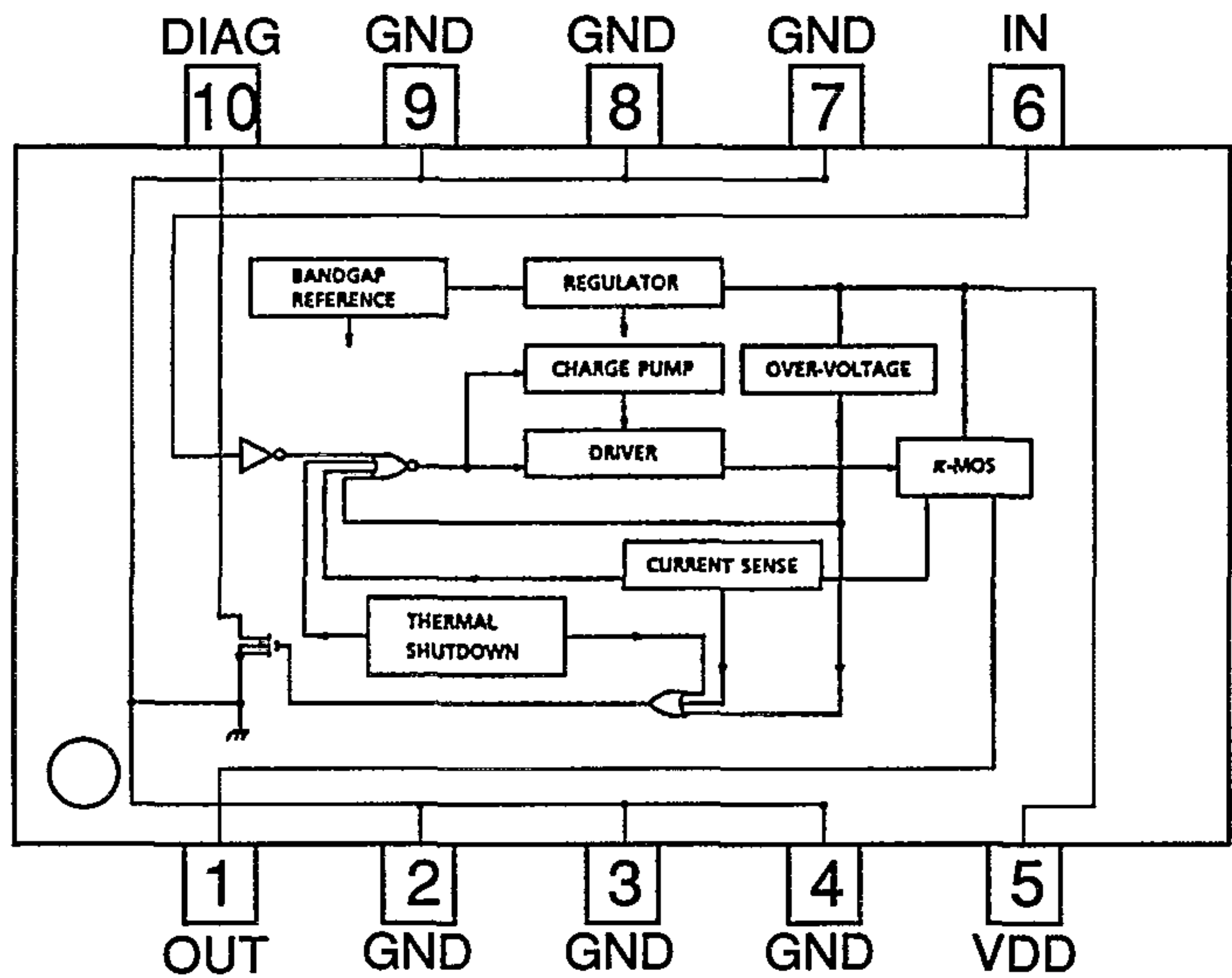
*PD4638A



S-80734AN



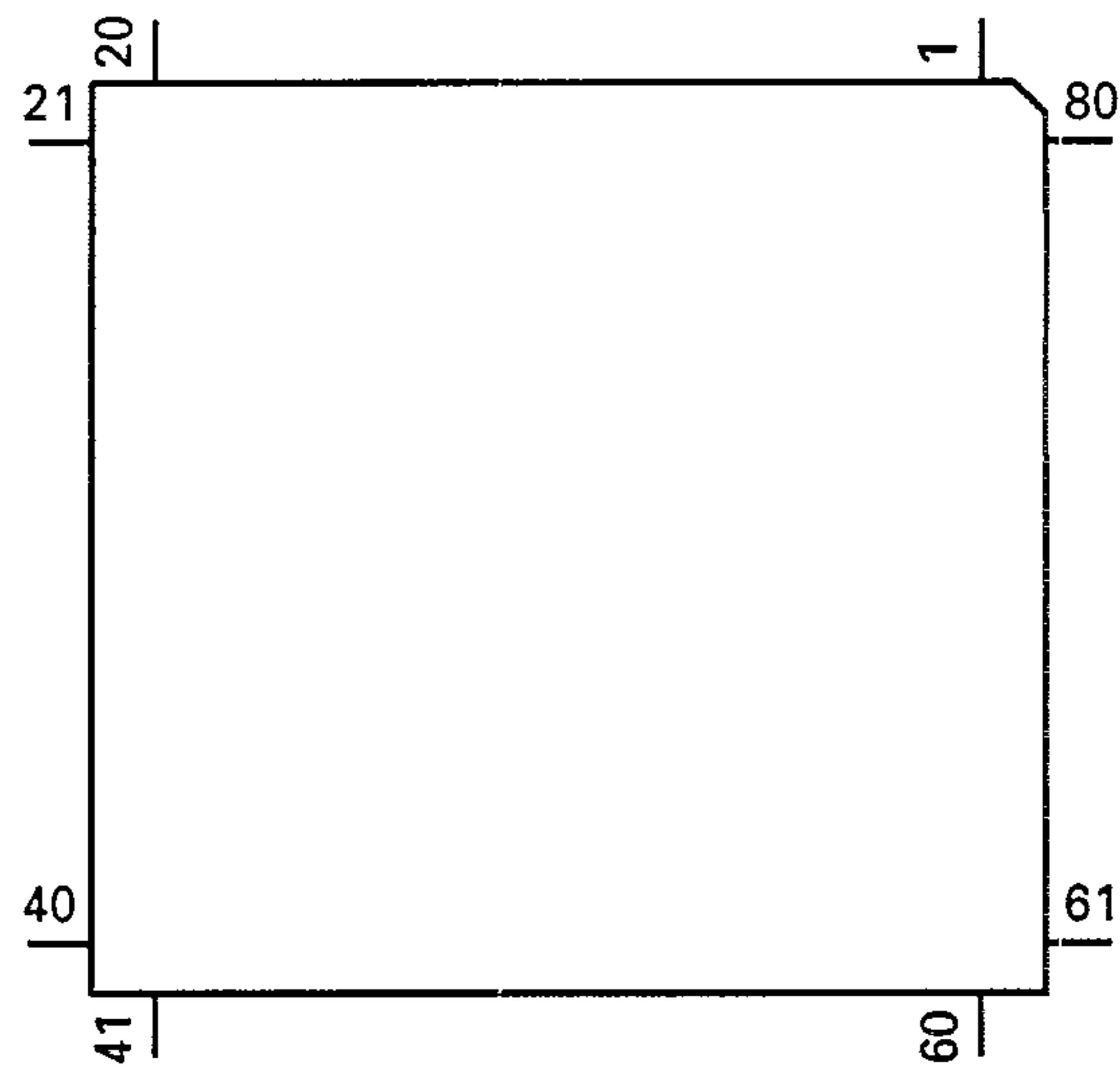
TPD1018F



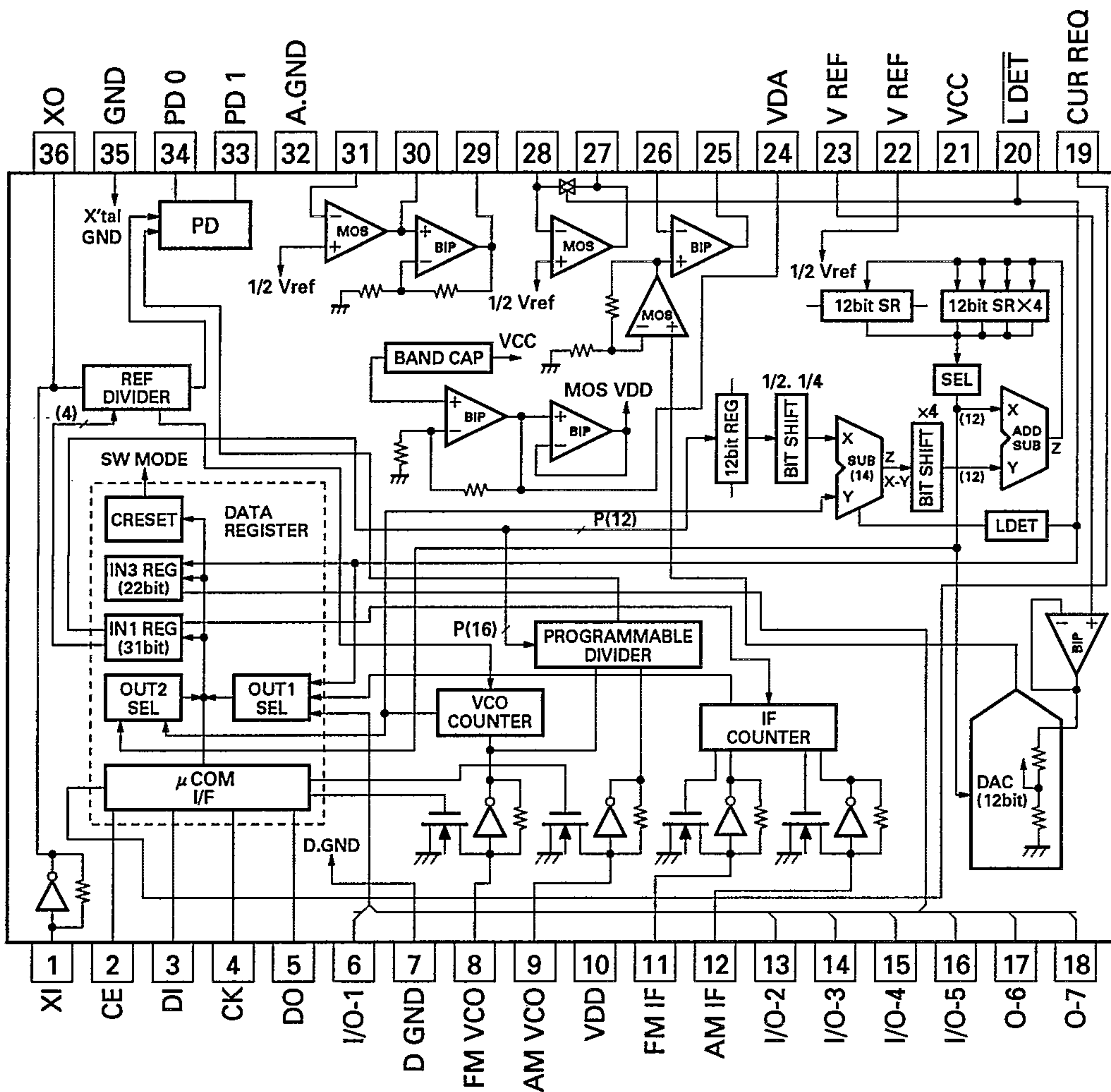
● Pin Functions(PD6173A)

Pin No.	Pin Name	I/O	Function and Operation
1	VSS		GND
2	X1		Crystal oscillator connection pin
3	X0		Crystal oscillator connection pin
4	NC		Not used
5	MOD1	I	Operation mode appointment input
6	MOD0	I	Operation mode appointment input
7	NC		Not used
8	KYDT	I	Key data input
9	DPDT	I	Display data input
10	VDD		Power supply
11,12	NC		Not used
13	KD4	I	Key return input 4
14	KD3	I	Key return input 3
15	KD2	I	Key return input 2
16	KD1	I	Key return input 1
17	NC		Not used
18-22	KST5-1	I	Key strobe input
23	VDD		Power supply
24-31	GND		GND
32-39	NC		Not used
40-73	SEG33-0	O	Segment driver output
74-77	COM3-0	O	Common driver output
78	VDD		Power supply
79-80	NC		Not used

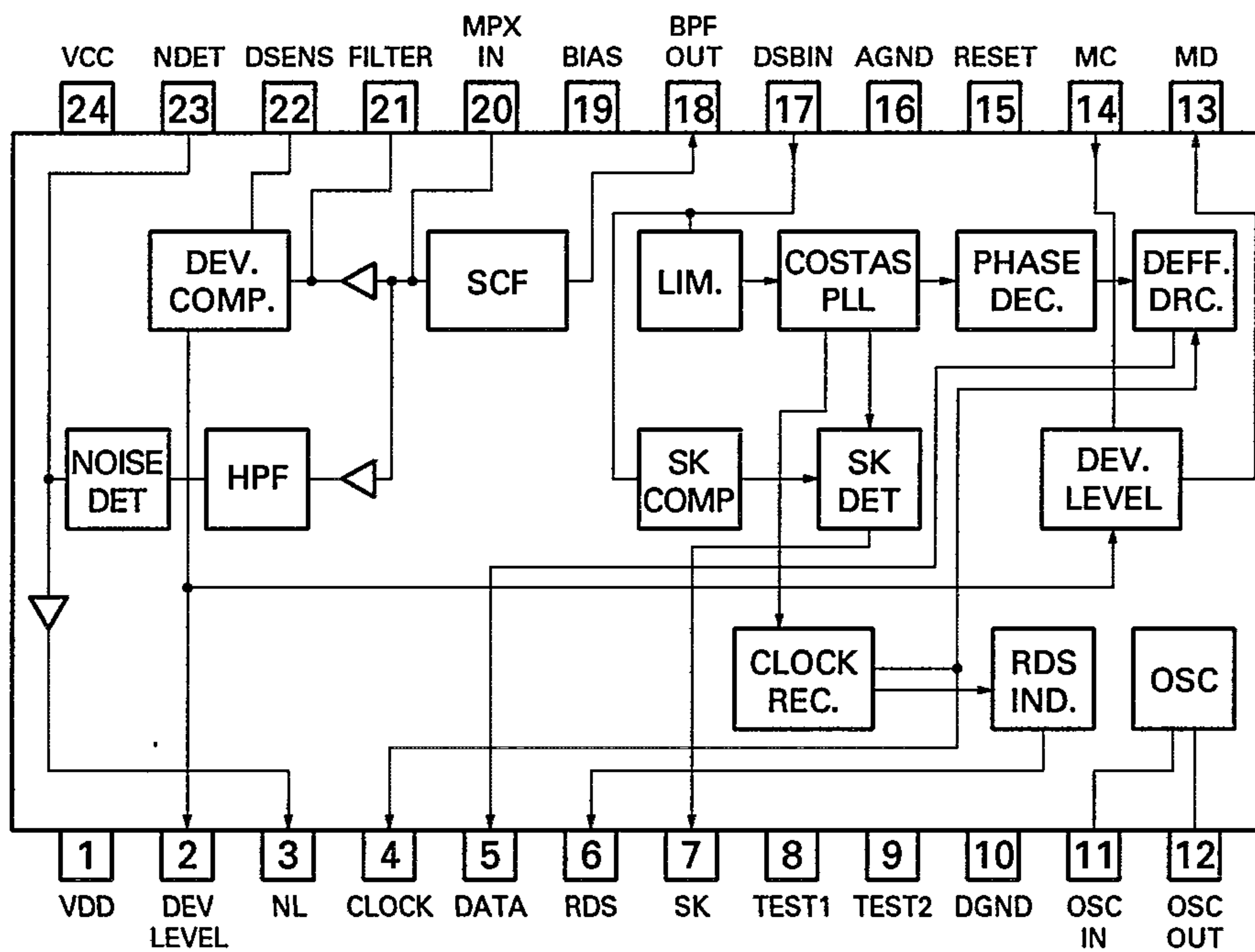
*PD6173A



PM2004A



PM4006A



7. ELECTRICAL PARTS LIST

NOTE:

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/OSOOOJ,RS1/OOSOOOJ

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

====Circuit Symbol & No. Part	Name=====	Part No.	====Circuit Symbol & No. Part	Name=====	Part No.
Unit Number : CWE1416(EW,IT model)			R 61		RS1/16S392J
Unit Name : FM/AM Tuner Unit			R 62 152		RS1/16S393J
			R 101		RS1/16S272J
MISCELLANEOUS			R 102		RS1/16S682J
			R 103		RS1/16S333J
IC 1		PA4023A			
IC 2		PA4024A	R 104		RS1/16S334J
Q 1 31 165 202		2SC2412KLN	R 105		RS1/16S683J
Q 2 154 203		DTC124EU	R 107		RS1/16S222J
Q 3		3SK263	R 151		RS1/16S222J
			R 154 239		RS1/16S104J
Q 201		2SK932			
D 4		1SV251	R 155		RS1/16S273J
D 5 7 8		KV1410	R 156		RS1/16S243J
D 6 201 202		MA157	R 157		RS1/16S203J
D 231		SVC253	R 160		RS1/16S222J
			R 161		RS1/16S563J
L 2 4	Coil	CTC1108			
L 3	Inductor	LCTB2R2K2125	R 162		RS1/16S105J
L 5	Coil	CTC1107	R 163		RS1/16S222J
L 6	Inductor	LCTBR15K1608	R 203		RS1/16S225J
L 51	Ferri-Inductor	LAU150K	R 204		RS1/16S103J
			R 206		RS1/16S220J
L 201	Ferri-Inductor	LAU4R7K			
L 202	Ferri-Inductor	LAU330K	R 207		RS1/16S101J
L 203	Inductor	CTF1287	R 208 217		RS1/16S102J
L 208	Inductor	LAU121K	R 209		RS1/16S471J
L 231	Inductor	LAU3R3J	R 214		RS1/16S822J
			R 231		RS1/16S272J
T 31	Coil	CTE1116			
T 51	Coil	CTC1136	R 232		RS1/16S473J
TC 1	Trimmer	CCL1042	R 237		RS1/16S103J
CF 51 52 53	Ceramic Filter	CTF1292	R 238		RS1/16S104J
CF 232	Ceramic Filter	CTF1348	R 240		RS1/16S332J
			R 241		RS1/16S202J
X 151	Ceramic Resonator 920.5kHz	CSS1365			
X 231	Crystal Resonator 10.26MHz	CSS1111	R 244		RS1/16S103J
VR 154	Semi-fixed 68kΩ(B)	CCP1211			
AR 1	Capacitor with Discharge Gap	DSP-201M			
RESISTORS			CAPACITORS		
			C 1		CCSQCH060D50
R 1	RS1/16S0R0J		C 2		CCSRCH020C50
R 4	RS1/16S154J		C 4		CCSRCH820J50
R 5	RS1/16S391J		C 6		CCSRCH820J50
R 6 10 202	RS1/16S223J		C 8 18 25 31 52 59 62 105 107 213		CKSRYB103K25
R 7 243 247	RS1/16S123J				
			C 9 34 56 152 160 241		CKSQYB104K16
R 8 17	RS1/16S332J		C 10		CCSRCH0R5C50
R 9	RS1/16S473J		C 11		CEA010M50LL
R 11	RS1/16S124J		C 12 13 17 19 20		CKSRYB222K50
R 13	RS1/16S563J		C 14		CCSRCH220J50
R 15	RS1/16S271J				
			C 16		CCSRCH080D50
R 16	RS1/16S104J		C 21		CEA100M16LL
R 18	RS1/16S332J		C 22		CCSRTH090D50
R 31	RS1/16S470J		C 23		CCSRTH120J50
R 32 215	RS1/16S822J		C 24		CCSRCH471J50
R 33	RS1/16S822J				
			C 32		CKSQYB472K50
R 34 35	RS1/16S331J		C 33		CCSRCH050C50
R 51	RS1/16S271J		C 36		CCSRRH201J50
R 52	RS1/16S560J		C 51		CKSRYB223K25
R 55	RS1/16S102J		C 54		CCSRCH470J50
R 56	RS1/16S823J				

KEH-2300R,2100R,2400R

====Circuit Symbol & No. Part Name=====				Part No.	====Circuit Symbol & No. Part Name=====				Part No.
C	55			CKSQYB223K25	RESISTORS				
C	57			CKSRYB472K50					
C	58	234		CEA330M10LL	R	1			RS1/16S0R0J
C	61			CCSRCH270J50	R	4			RS1/16S154J
C	63			CEAR15M50LL	R	5			RS1/16S391J
					R	6	10	202	RS1/16S223J
C	101			CEA100M10NPLL	R	7	247		RS1/16S123J
C	102			CKSRYB182K50					
C	103			CKSRYB682K25	R	8	17		RS1/16S332J
C	104			CEA2R2M50LL	R	9			RS1/16S473J
C	106			CCSRCH151J50	R	11			RS1/16S124J
					R	13			RS1/16S563J
C	151			CKSRYB472K50	R	15			RS1/16S271J
C	153	157		CEA3R3M50LL					
C	154			CKSQYB104K16	R	16			RS1/16S104J
C	158			CKSYB474K16	R	18			RS1/16S332J
C	159			CEA220M6R3LL	R	31			RS1/16S470J
					R	32	215		RS1/16S822J
C	161	209		CKSQYB104K16	R	33			RS1/16S822J
C	162			CEA3R3M50LL					
C	163			CKSRYB102K50	R	34	35		RS1/16S331J
C	170	202		CCSRCH100D50	R	51			RS1/16S271J
C	201	250		CCSRCH471J50	R	52			RS1/16S560J
					R	55			RS1/16S102J
C	203	235		CKSRYB332K50	R	56			RS1/16S823J
C	204	205	236	CKSQYB473K16					
C	206	233		CKSQYB104K16	R	61			RS1/16S392J
C	207			CCSRCH560J50	R	62	152		RS1/16S393J
C	211			CCSRCH101J50	R	101			RS1/16S272J
					R	102			RS1/16S682J
C	212			CEA470M6R3LL	R	103			RS1/16S333J
C	216			CCSRCH101J50					
C	217			CEA1R5M50LL	R	104			RS1/16S334J
C	219			CCSRCH471J50	R	105			RS1/16S683J
C	220	230		CKSRYB103K25	R	107			RS1/16S222J
					R	151			RS1/16S222J
C	231			CCSRCH330J50	R	154			RS1/16S104J
C	232			CCSRCH150J50					
C	237			CCSRCH180J50	R	155			RS1/16S273J
C	239			CKSRYB472K50	R	156			RS1/16S243J
C	240	242		CEAR47M50LL	R	157			RS1/16S203J
					R	160			RS1/16S222J
C	243			CEAR33M50LL	R	161			RS1/16S563J
C	245			CKSRYB123K25					
C	246			CKSQYB473K16	R	162			RS1 16S105J
					R	163			RS1/16S222J
					R	203			RS1/16S225J
					R	204			RS1/16S103J
					R	206			RS1/16S220J
Unit Number : CWE1420(GR model)									
Unit Name : FM/AM Tuner Unit									
MISCELLANEOUS					R	207			RS1/16S101J
IC	1			PA4023A	R	208	217		RS1/16S102J
IC	2			PA4024A	R	214			RS1/16S822J
Q	1	31	165	2SC2412KLN	R	231			RS1/16S272J
Q	2	154		DTC124EU	R	237			RS1/16S103J
Q	3			3SK263					
					R	238			RS1/16S104J
D	4			1SV251	R	240			RS1/16S332J
D	5	7	8	KV1410	R	241			RS1/16S202J
D	6			MA157	CAPACITORS				
L	2	4		CTC1108	C	1			CCSQCH060D50
L	3			LCTB2R2K2125	C	2			CCSRCH020C50
					C	4			CCSRCH820J50
L	5			CTC1107	C	6			CCSRCH820J50
L	6			LCTBR15K1608	C	8	18	25	31
L	51			LAU150K				52	59
T	31			CTE1116				62	105
T	51			CTC1136				107	
					C	9	34	56	152
TC	1			CCL1042	C	10			160
CF	51	52	53	CTF1292	C	11			CKSQYB104K16
X	151			CSS1365	C	12	13	17	19
X	231			CSS1111	C	14			20
VR	154			CCP1211					CKSRYB222K50
									CCSRCH220J50
					C	16			CCSRCH080D50
AR	1			DSP-201M	C	21			CEA100M16LL
					C	22			CCSRTH090D50
					C	23			CCSRTH120J50
					C	24			CCSRCH471J50

====Circuit Symbol & No. Part Name=====										Part No.	====Circuit Symbol & No. Part Name=====										Part No.		
C	32									CKSQYB472K50	L	502									Ferri-Inductor	LAU101K	
C	33									CCSRCH050C50	L	601	602								Ferri-Inductor	LAU150K	
C	36									CCSRRH201J50	L	603									Ferri-Inductor	LAU101K	
C	51									CKSRYB223K25	L	701									Ferri-Inductor	LAU101K	
C	54									CCSRCH470J50	L	951									Choke Coil 600H	CTH1159	
C	55									CKSQYB223K25	X	501									Crystal 7.200MHz	CSS1379	
C	57									CKSRYB472K50	X	601									Ceramic Resonator 4.194MHz	CSS1047	
C	58									CEA330M10LL	X	701									Crystal 4.332MHz	CSS1056	
C	61									CCSRCH270J50	VR	701									Volume 10kΩ(B)	CCP1208	
C	63									CEAR15M50LL											FM/AM Tuner Unit	CWE1416	
C	101									CEA100M10NPLL	RESISTORS												
C	102									CKSRYB182K50													
C	103									CKSRYB682K25	R	251	252									RS1/10S273J	
C	104									CEA2R2M50LL	R	253										RD1/10S470J	
C	106									CCSRCH151J50	R	254										RD1/4PU470J	
											R	255	256									RS1/10S472J	
C	151									CKSRYB472K50	R	257	258									RS1/10S104J	
C	153	157								CEA3R3M50LL													
C	154									CKSQYB104K16	R	259										RS1/10S333J	
C	158									CKSYB474K16	R	260										RD1/4PU333J	
C	159									CEA220M6R3LL	R	261										RS1/10S0R0J	
											R	451										RD1/4PU0R0J	
C	161									CKSQYB104K16	R	452	508	643								RD1/4PU0R0J	
C	162									CEA3R3M50LL													
C	163									CKSRYB102K50	R	453	473									RD1/4PU272J	
C	170									CCSRCH100D50	R	454										RS1/10S272J	
C	207									CCSRCH560J50	R	457	458									RS1/10S272J	
											R	459	460									RS1/10S151J	
Unit Number : CWM4468(EW,IT model)											R	461											RS1/10S101J
Unit Name : Tuner Amp Assy																							
MISCELLANEOUS											R	462											RS1/10S101J
											R	463	464	557								RD1/4PU221J	
											R	465	466	649								RD1/4PU104J	
IC	251									LA3161P	R	467	606	608	629	644						RD1/4PU223J	
IC	451									SN761025DL	R	468	555	559	620	628						RD1/4PU103J	
IC	501									PM2004A													
IC	551									PAL003A	R	471	472	511	513	515	530	650	951	952		RD1/4PU472J	
IC	601									PD4638A	R	500										RD1/4PU332J	
											R	501										RD1/4PU222J	
IC	602									S-80734AN	R	502	503									RD1/4PU392J	
IC	701									PM4006A	R	504										RD1/4PU152J	
IC	952									TPD1018F													
Q	501	601	602	603	610					2SC1740S	R	505										RD1/4PU103J	
Q	504									DTC143EK	R	506										RD1/4PU561J	
											R	507										RD1/4PU472J	
Q	552									DTC124ES	R	509										RD1/4PU682J	
Q	606									2SC1740S	R	510										RS1/10S682J	
Q	611	612								2SD1468S													
Q	613									2SC1740S	R	514										RD1/4PU562J	
Q	702									2SC1740S	R	516										RD1/4PU473J	
											R	518										RD1/4PU562J	
Q	704									DTC124TS	R	519	521	604	605	607	609	613	616	619	632	RD1/4PU473J	
Q	951									2SD1859	R	520										RS1/8S104J	
Q	954	963								2SA933S													
Q	958									2SB1242	R	522	523	524	525	527	528	601	615			RD1/4PU102	
Q	959									DTC143TS	R	526										RD1/10S102J	
											R	529										RD1/4PU473J	
Q	960									2SD2395	R	532	533	610	611	612	614	645	956			RD1/4PU222J	
Q	961									2SB1243	R	534										RD1/4PU393J	
Q	962									DTC143ES													
Q	964	966								DTC114ES	R	535										RS1/10S105J	
Q	965									2SA1674	R	536										RS1/8S104J	
											R	537										RS1/8S104J	
D	251	501	502	601	604	608	609	610	611	612	1SS270	R	538									RD1/4PU103J	
D	606	614									HZS7LA1	R	539									RD1/4PU562J	
D	607										HZS7LC3												
D	613	616	617								1SS133	R	541									RD1/4PU681J	
D	615										HZS9LA2	R	542									RD1/4PU102J	
												R	544									RD1/4PU102J	
D	701										1SS270	R	545									RS1/10S272J	
D	951	952	953	955	961						1SR139-200	R	556									RD1/4PU153J	
D	954										HZS6LB2												
D	960										HZS9LB3	R	558	975								RD1/4PU101J	
L	501									Ferri-Inductor	LAU2R2K	R	602									RD1/4PU124J	
												R	603	625	630							RD1/4PU472J	
												R	617	648	701	702	703	704	709	966	972	974	RD1/4PU102J
												R	634	635	637	639	640	955	971	973	976		RD1/4PU473J

====Circuit Symbol & No. Part Name=====	Part No.
R 641	RD1/4PU223J
R 642	RS1/10S223J
R 651 652	RS1/10S224J
R 653 654	RS1/10S222J
R 655	RS1/10S224J
R 656	RD1/4PU473J
R 657	RS1/10S473J
R 705	RS1/10S102J
R 706	RD1/4PU0R0J
R 707	RD1/4PU333J
R 713	RD1/4PU103J
R 957	RS1/10S2R2J
R 963 964	RD1/4PU1R5J
R 965	RS1/10S472J
R 967	RD1/4PU471J
R 977	RD1/4PU122J
CAPACITORS	
C 251 252	CCSQSL681J50
C 253 254	CEA2R2M50LS2
C 255 256 955	CEA101M10LL
C 257 258 475 476	CKSQYB333K25
C 259 220 μ F 10V	CCH1014
C 451 452 473 474 480 605	CEA2R2M50LL
C 453 454	CEA010M50LL
C 455 471 472 507 516 953	CKSQYB102K50
C 457	CEA470M10LL
C 458 558 702 706 710	CKSQYB104K16
C 459 460 465 466 479 557	CEA100M16LL
C 461 462	CKSQYB822K50
C 463 464 567	CEA010M50LL
C 467 468	CKSQYB152K50
C 469 470	CKSQYB183K25
C 477 478 536 601 604 611	CCSQSL101J50
C 481 527	CKSQYB332K50
C 501	CEAR47M50LL
C 502	CKLSR473K16
C 503 505 514 530 531 535 961 963	CKSQYB103K25
C 504 506 4.7 μ F/16V	CCH1250
C 508	CEA100M16LS2
C 510	CKSQYB103K25
C 511 532	CEA220M6R3LS2
C 512	CKSQYB103K25
C 515	CEA220M6R3LL
C 517 518	CCSQCH150J50
C 519 520 956	CKSQYB473K16
C 524	CCSQCH101J50
C 525	CKSQYB103K25
C 526	CKSQYB223K25
C 533 534	CKSQYB223K25
C 537	CKSQYB471K50
C 538	CKSYB223K25
C 539	CKSQYB104K16
C 540 541	CKSQYB103K25
C 551 552 553 554 556	CEAR22M50LL
C 555	CEA330M10LL
C 602 701	CEA4R7M35LL
C 606	CKSYB104K16
C 608	CKSQYB224K16
C 609 610	CEA010M50LL
C 613	CKSQYB223K25
C 614	CEA010M50LL
C 615	CKSQYB102K50
C 703 704	CCSQCH220J50
C 705	CKSQYB472K50
C 707	CKSYB105K16
C 708	CKSYB104K16
C 709	CKSQYB222K50

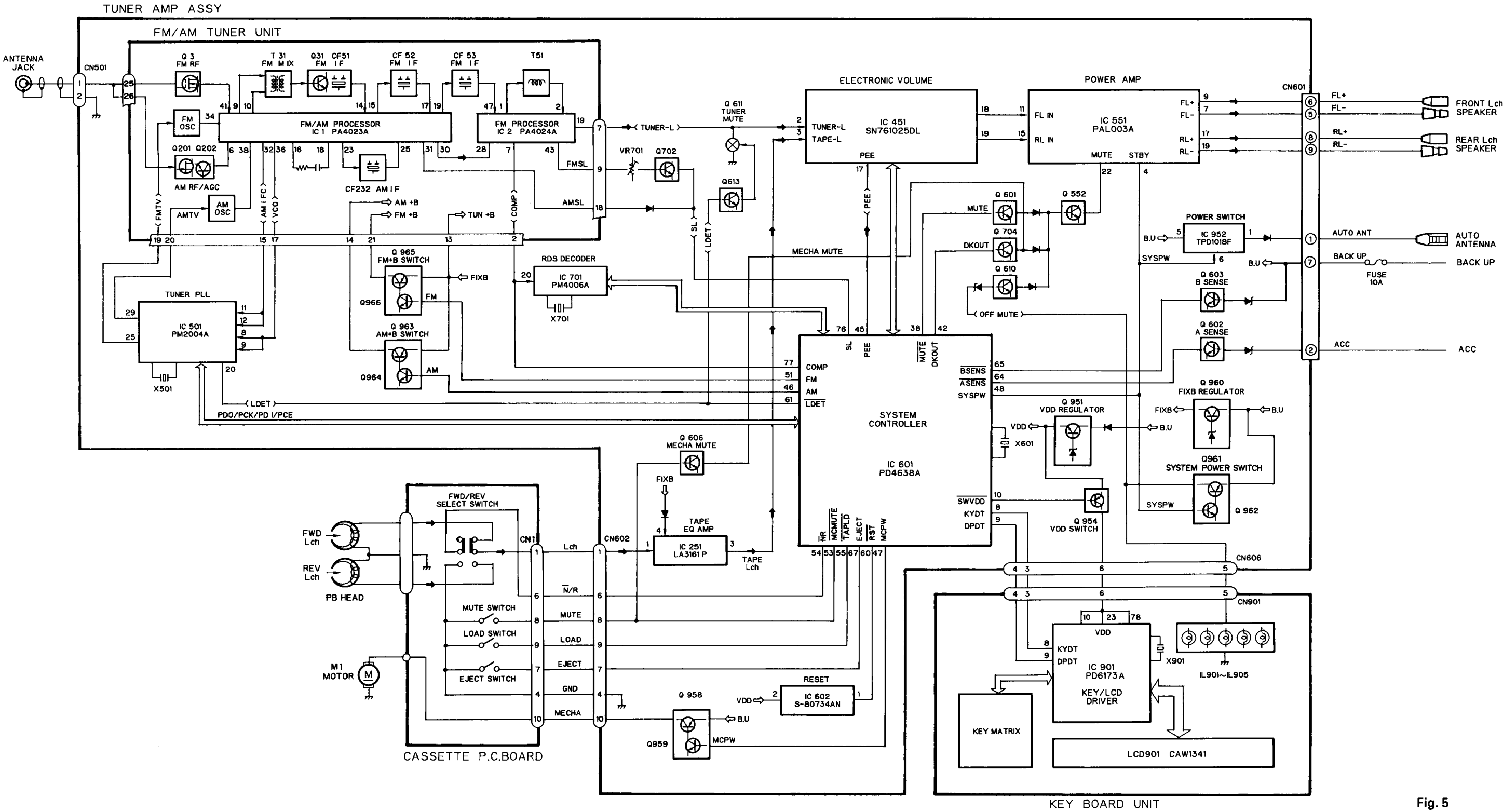
====Circuit Symbol & No. Part Name=====	Part No.
C 712	CKSQYB104K50
C 713	CEA4R7M35LS
C 714	CCSQSL101J50
C 951 3300 μ F 16VDC	CCH1018
C 952	CEAS331M16
C 959 100 μ F 16VDC	CCH1179
C 960	CEAS221M10
C 962 330 μ F 10VDC	CCH1181
Unit Number : CWM4470(EW,GR model) : CWM4648(IT model)	
Unit Name : Key Board Unit	
MISCELLANEOUS	
IC 901	PD6173A
D 901	STZ6R2N
L 901 Inductor	LAU101K
X 901 Ceramic Resonator 4.97MHz	CSS1312
IL 901 902 903 904 905 Lamp 14V 40mA (EW,GR)	CEL1418
IL 901 902 903 904 905 Lamp 14V 40mA (IT)	CEL1447
LCD901 LCD	CAW1341
RESISTORS	
R 901 902	RS1/10S222J
R 903	RS1/10S472J
CAPACITORS	
C 901	CEA100M16LL
C 902	CKSQYB103K25
Unit Number :	
Unit Name : Cassette P.C.Board	
S 1 Switch(Load)	ESN1016
S 2 Switch(Muto)	ESN1017
S 3 Switch(FWD/REV)	ESH1006
S 4 Switch(Eject)	ESG1002
R 1	RD1/4HM472J
Miscellaneous Parts List	
M 1 Motor Unit	EXA1444
HD 1 Head Assy	EXA1443

• The GR model (Tuner Amp Assy) Parts Lists enumerate the parts which differ from those enumerated in the EW,IT model (Tuner Amp Assy) Parts List only. The parts other than those enumerated in the former identical with those in the latter, to which you are requested to refer, accordingly. The EW,IT model (Tuner Amp Assy) Parts List is given on page 13.

Unit Number : CWM4468(EW,IT model) CWM4649(GR model)
Unit Name : Tuner Amp Assy

Circuit Symbol & No.	EW,IT model	GR model
	Part No.	Part No.
Q963	2SA933S	.....
Q964	DTC114ES	.....
D502	1SS270	.....
R502,503	RD1/4PU392J	.....
R504	RD1/4PU152J	.....
R505	RD1/4PU103J	.....
R538	RD1/4PU103J	.....
R544	RD1/4PU102J	.....
R631	.....	RD1/4PU473J
R632,971	RD1/4PU473J	.....
R972	RD1/4PU102J	.....
C501	CEAR47M50LL	.....
C502	CKLSR473K16	.....
C503,512,525,530	CKSQYB103K25	.....
C504	CCH1250	.....
C520	CKSQYB473K16	.....
C536	CCSQSL101J50	.....

8. BLOCK DIAGRAM



● Add on page 6(Adjustment)

Modulation S2:STEREO MOD., 1kHz, L or R=60%(40.50kHz+7.5kHz Dev.)

RDS SL ADJUSTMENT						
	No.	FM SSG		Displayed	Adjustment	Adjustment Method
		Frequency(MHz)	Level(dBf)	Frequency(MHz)	Point	(Switch Position)
	1	104.0 S2	35	104.0	VR701	DC V Meter(2) : 1.75V±0.05V

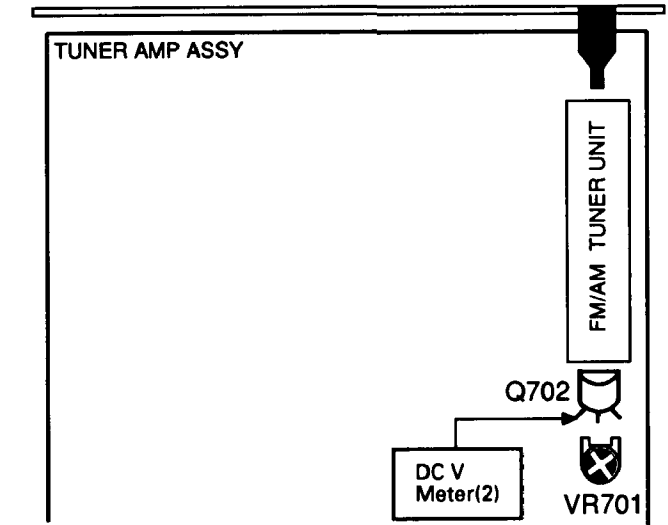
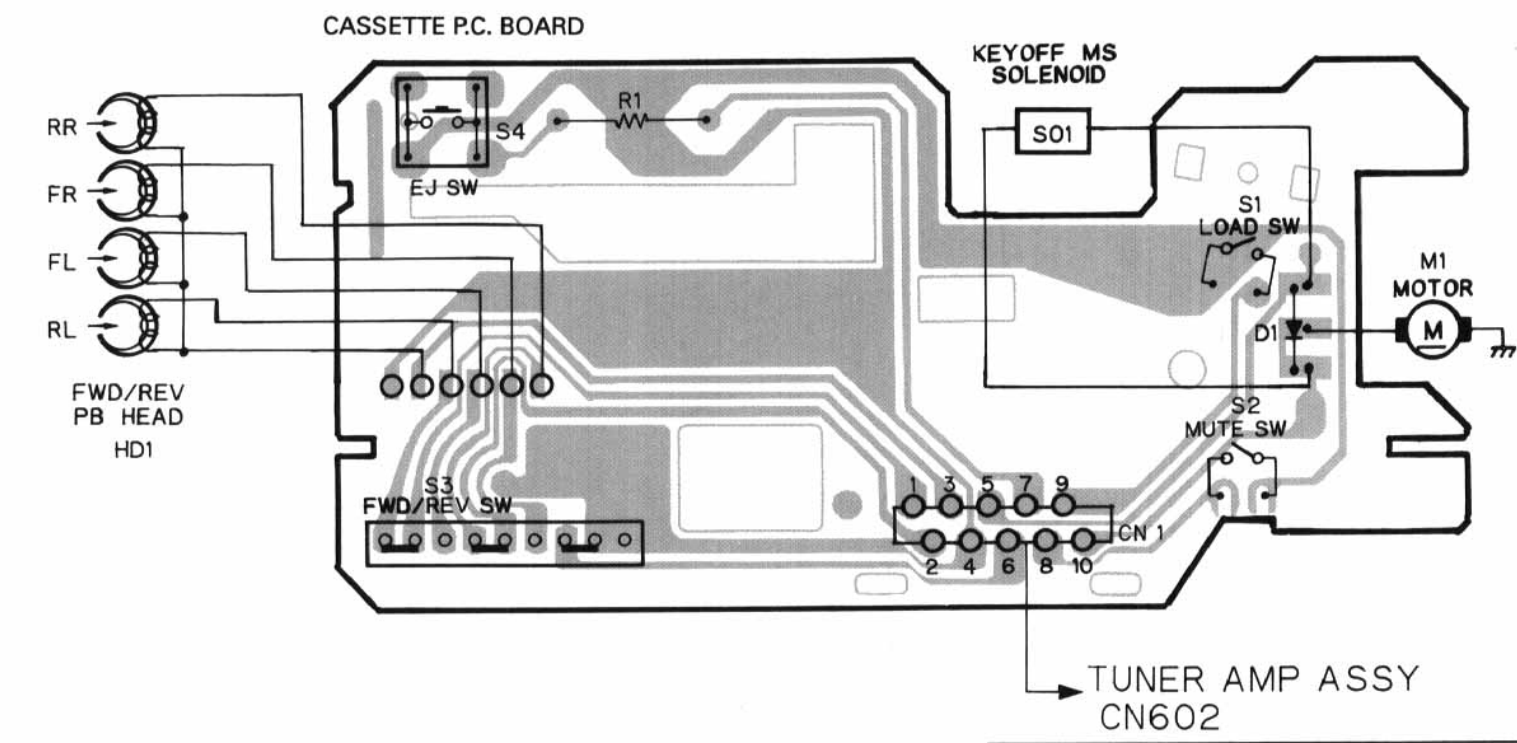
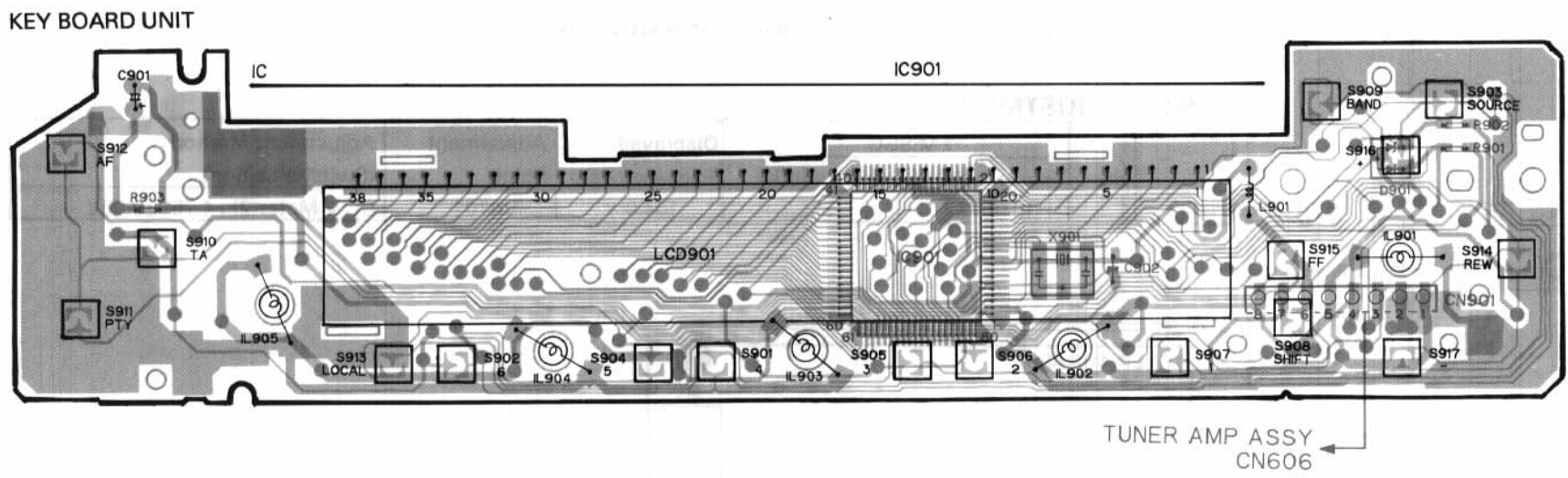
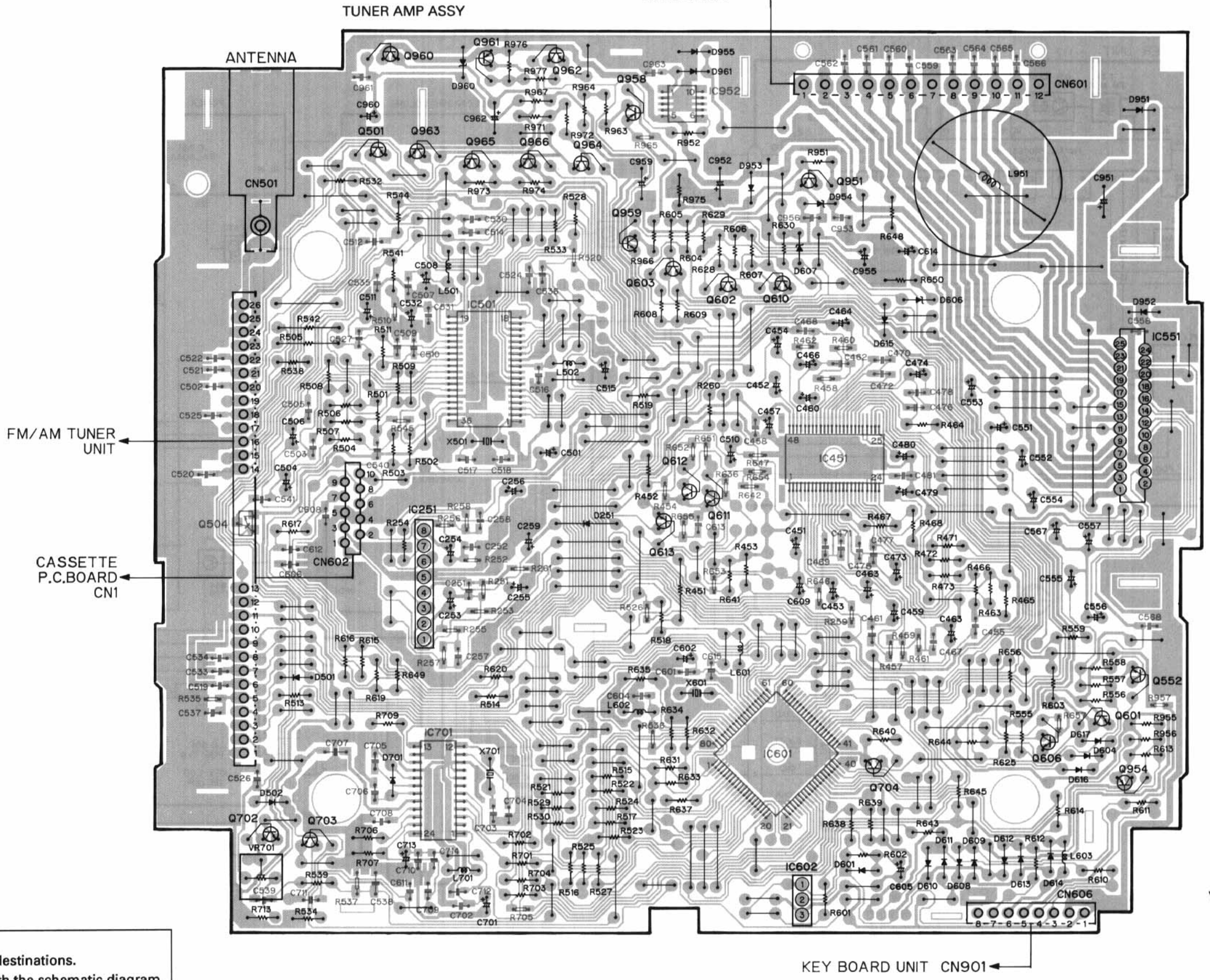


Fig. 5

9. CONNECTION DIAGRAM



NOTE:
The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.



ADJ	IC, Q
	Q960 Q961 Q962
	Q958 IC952
	Q501 Q963
	Q965 Q966 Q964
	Q951
	Q959
	Q603
	Q602 Q610
	IC501
	IC551
	IC451
	Q612 Q611
	Q504
	Q613
	IC251
	Q552
	Q601
	IC601 Q606
	Q704 Q954
	IC701
	Q702 Q703
VR701	IC602

Fig. 6

10. SCHEMATIC CIRCUIT DIAGRAM

TUNER AMP ASSY

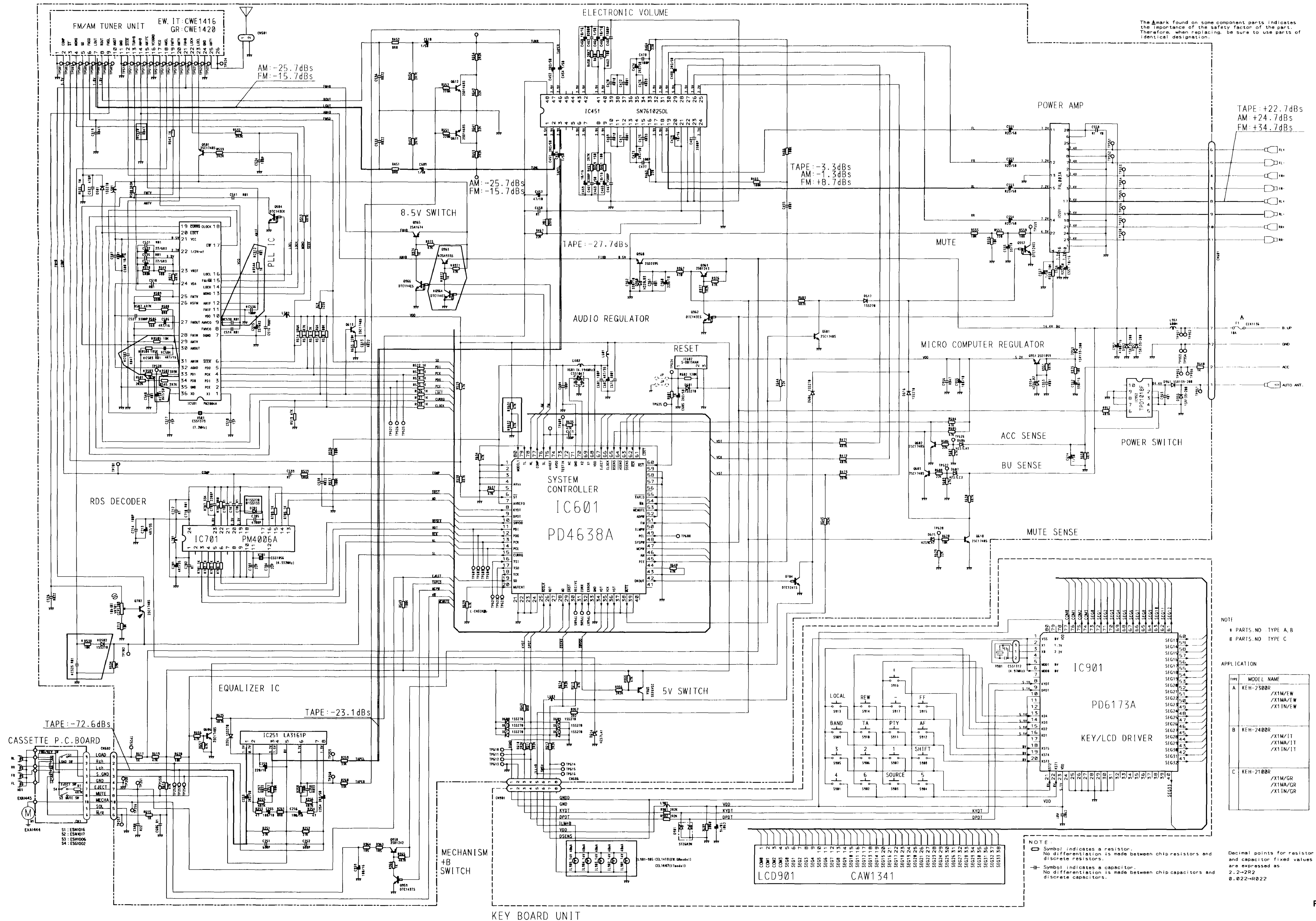
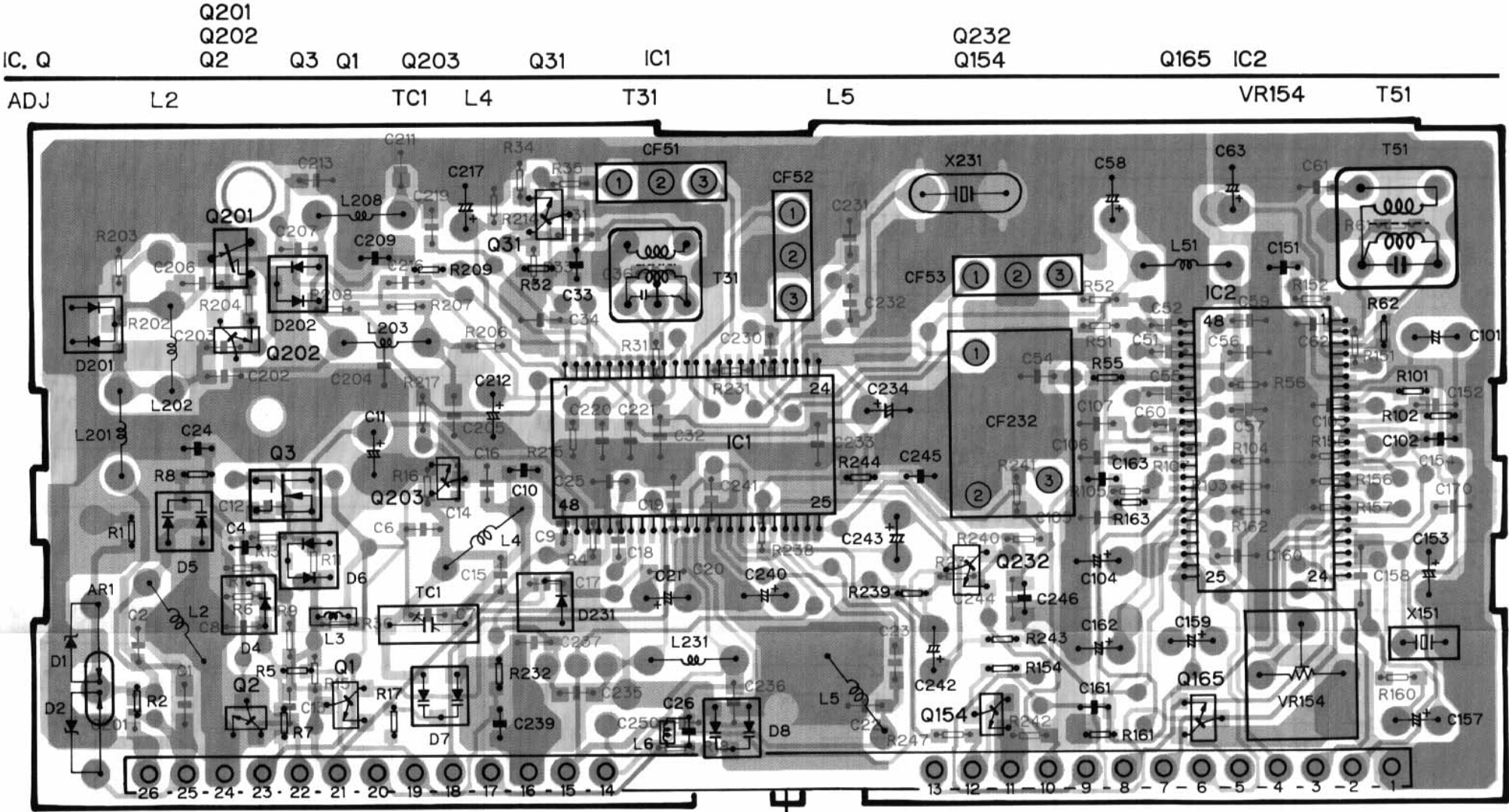


Fig. 7

11. CIRCUIT DIAGRAM AND PATTERN

11.1 FM/AM TUNER UNIT

● Connection Diagram



TUNER AMP ASSY

NOTE:
The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.

Fig. 8

● Circuit Diagram(EW, IT Model)

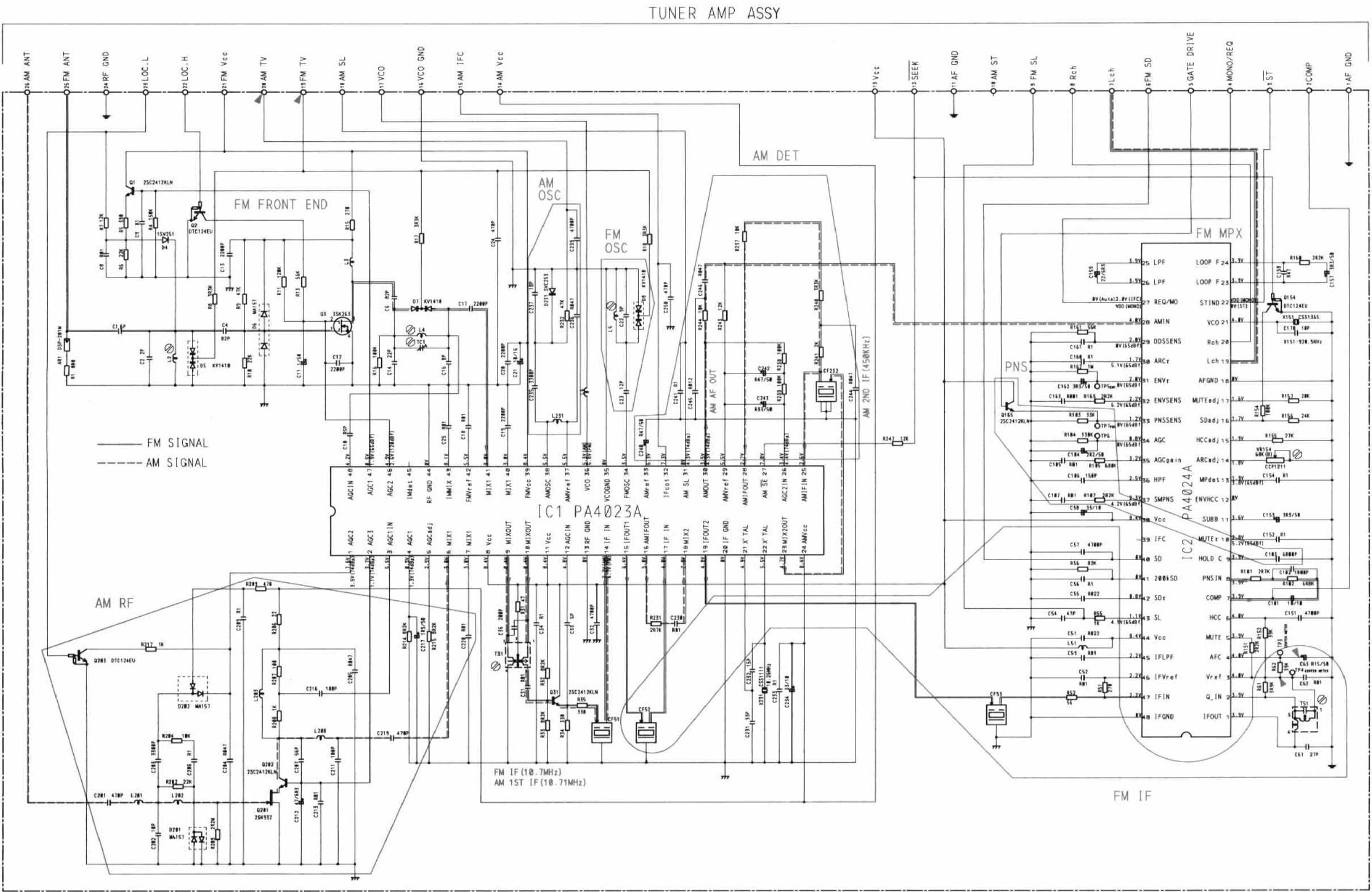


Fig. 9

12. EXPLODED VIEW AND PARTS LIST

12.1 CHASSIS

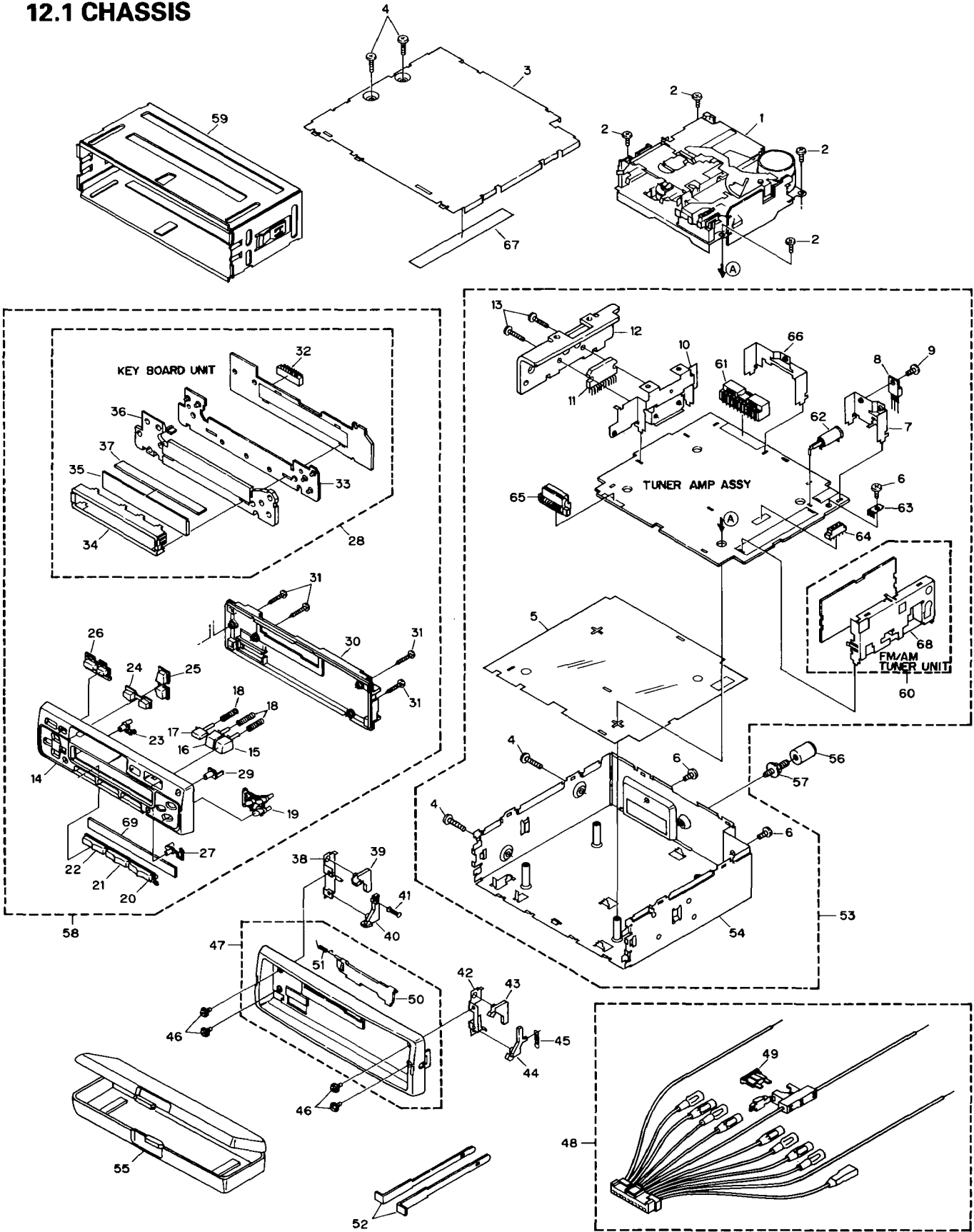


Fig. 11

NOTE:

● Parts marked by " *" are generally unavailable because they are not in our Master Spare Parts List.

● Parts List(EW model)

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Cassette Mechanism Unit	EXK3455	36	Plate	CNV4444
2	Screw	BSZ26P050FMC	37	Connector	CNV4443
3	Case	CNB1997	38	Bracket	CNC6135
4	Screw	BSZ30P100FMC	39	Arm	CNV4358
5	Insulator	CNM4559	40	Arm	CNV4359
6	Screw	BSZ30P050FMC	41	Spring	CBH1834
7	Holder	CNC6215	42	Bracket	CNC6136
8	Transistor(Q960)	2SD2395	43	Arm	CNV4438
9	Screw	BSZ26P060FMC	44	Arm	CNV4437
10	Holder	CNC6216	45	Spring	CBH1835
11	IC(IC551)	PAL003A	46	Screw	PMS20P030FZK
12	Heat Sink	CNC6217	47	Panel Unit	CXA8449
13	Screw	BSZ26P140FMC	48	Cord Assy	CDE4849
14	Grille	CNS3766	49	Fuse	CEK1136
15	Button(FF)	CAC4533	50	Door	CAT1719
16	Button(REW)	CAC4532	51	Spring	CBH1838
17	Button(EJECT)	CAC4531	52	Handle	CNC5395
18	Spring	CBH1836	53	Tuner Amp Assy	CWM4468
19	Button(AF,TA,PT)	CAC4598	54	Chassis Unit	CXA8594
20	Button(5,6)	CAC4602	55	Detach Case	CNS3860
21	Button(3,4)	CAC4601	56	Bush	CNV3930
22	Button(1,2)	CAC4600	57	Screw	CBA1304
23	Button(SHIFT,CLOCK)	CAC4599	58	Detach Grille Assy	CXA8445
24	Button(◀,▶)	CAC4537	59	Holder	CNC5394
25	Button(+,-)	CAC4536	60	FM/AM Tuner Unit	CWE1416
26	Button(SOURCE,BAND)	CAC4538	61	Plug(CN601)	CKM1226
27	Button(LOCAL,BSM)	CAC4603	62	Antenna Jack(CN501)	CKX1006
28	Key Board Unit	CWM4470	63	Terminal	CKF1059
29	Button(DETACH)	CAC4539	64	Connector(CN602)	CKS3362
30	Cover	CNS3767	65	Connector(CN606)	CKS2884
31	Screw	BPZ20P120FZK	66	Holder	CNC6214
32	Connector(CN901)	CKS2883	67	Insulator	CNM4759
33	Rubber	CNV4429	68	Holder	CNC6429
34	Holder	CNC6230	69	Cushion	CNM4869
35	LCD	CAW1341			

12. EXPLODED VIEW AND PARTS LIST

12.1 CHASSIS

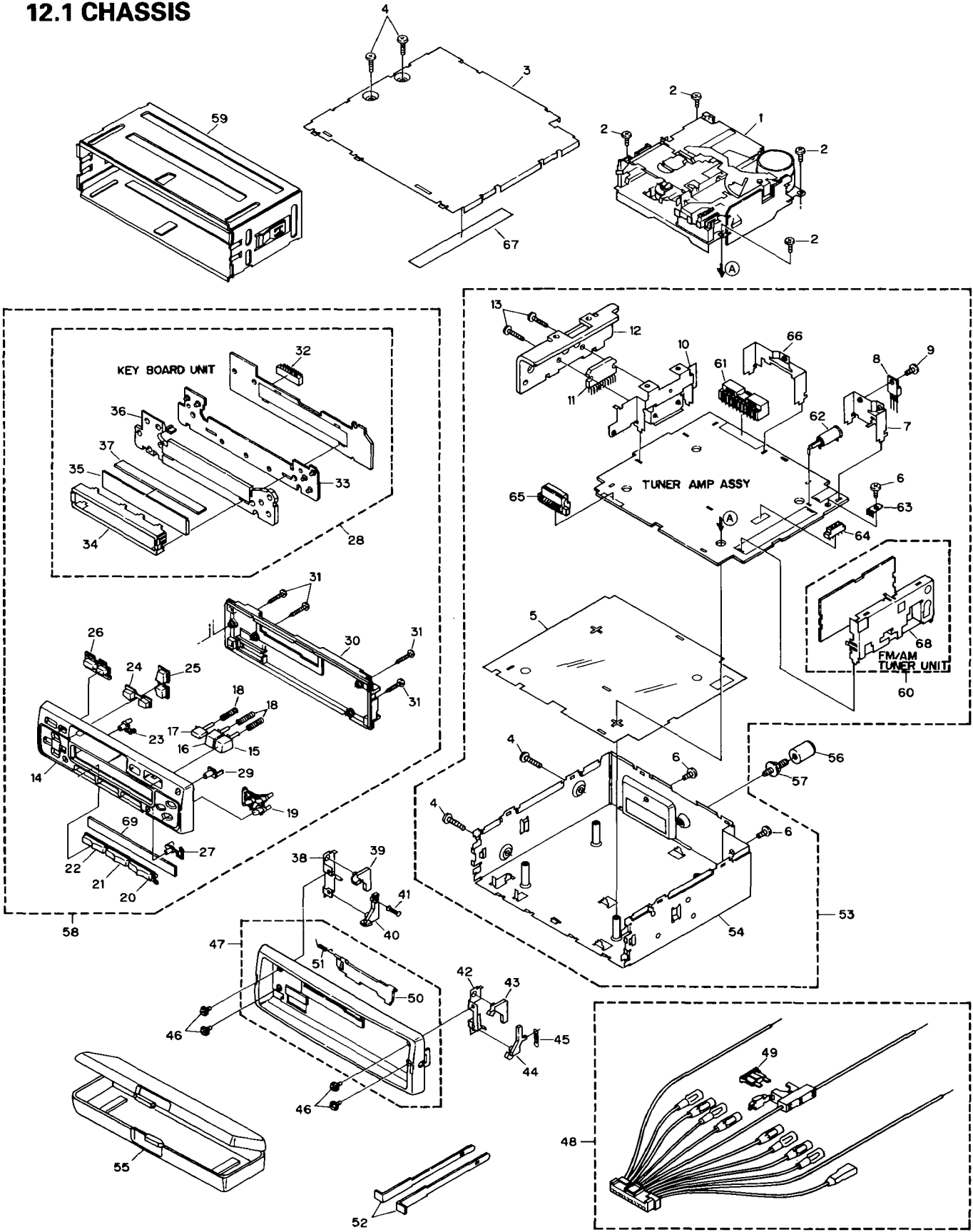


Fig. 11

NOTE:

● Parts marked by " * " are generally unavailable because they are not in our Master Spare Parts List.

● Parts List(EW model)

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Cassette Mechanism Unit	EXK3455	36	Plate	CNV4444
2	Screw	BSZ26P050FMC	37	Connector	CNV4443
3	Case	CNB1997	38	Bracket	CNC6135
4	Screw	BSZ30P100FMC	39	Arm	CNV4358
5	Insulator	CNM4559	40	Arm	CNV4359
6	Screw	BSZ30P050FMC	41	Spring	CBH1834
7	Holder	CNC6215	42	Bracket	CNC6136
8	Transistor(Q960)	2SD2395	43	Arm	CNV4438
9	Screw	BSZ26P060FMC	44	Arm	CNV4437
10	Holder	CNC6216	45	Spring	CBH1835
11	IC(IC551)	PAL003A	46	Screw	PMS20P030FZK
12	Heat Sink	CNC6217	47	Panel Unit	CXA8449
13	Screw	BSZ26P140FMC	48	Cord Assy	CDE4849
14	Grille	CNS3766	49	Fuse	CEK1136
15	Button(FF)	CAC4533	50	Door	CAT1719
16	Button(REW)	CAC4532	51	Spring	CBH1838
17	Button(EJECT)	CAC4531	52	Handle	CNC5395
18	Spring	CBH1836	53	Tuner Amp Assy	CWM4468
19	Button(AF,TA,PT)	CAC4598	54	Chassis Unit	CXA8594
20	Button(5,6)	CAC4602	55	Detach Case	CNS3860
21	Button(3,4)	CAC4601	56	Bush	CNV3930
22	Button(1,2)	CAC4600	57	Screw	CBA1304
23	Button(SHIFT,CLOCK)	CAC4599	58	Detach Grille Assy	CXA8445
24	Button(◀,▶)	CAC4537	59	Holder	CNC5394
25	Button(+,-)	CAC4536	60	FM/AM Tuner Unit	CWE1416
26	Button(SOURCE,BAND)	CAC4538	61	Plug(CN601)	CKM1226
27	Button(LOCAL,BSM)	CAC4603	62	Antenna Jack(CN501)	CKX1006
28	Key Board Unit	CWM4470	63	Terminal	CKF1059
29	Button(DETACH)	CAC4539	64	Connector(CN602)	CKS3362
30	Cover	CNS3767	65	Connector(CN606)	CKS2884
31	Screw	BPZ20P120FZK	66	Holder	CNC6214
32	Connector(CN901)	CKS2883	67	Insulator	CNM4759
33	Rubber	CNV4429	68	Holder	CNC6429
34	Holder	CNC6230	69	Cushion	CNM4869
35	LCD	CAW1341			

- The GR model and IT model Parts Lists enumerate the parts which differ from those enumerated in the EW model Parts List only. The parts other than those enumerated in the former are identical with those in the latter, to which you are requested to refer, accordingly. The EW model Parts List is given on page 31.

Mark	No.	Description	EW model	GR model	IT model
			Part No.	Part No.	Part No.
	14	Grille	CNS3766	CNS3789	CNS3783
	15	Button(FF)	CAC4533	CAC4533	CAC4615
	16	Button(REW)	CAC4532	CAC4532	CAC4614
	17	Button(EJECT)	CAC4531	CAC4531	CAC4613
	19	Button(AF,TA,PT)	CAC4598	CAC4598	CAC4604
	20	Button(5,6)	CAC4602	CAC4602	CAC4608
	21	Button(3,4)	CAC4601	CAC4601	CAC4607
	22	Button(1,2)	CAC4600	CAC4600	CAC4606
	23	Button(SHIFT,CLOCK)	CAC4599	CAC4599	CAC4605
	24	Button(◀,▶)	CAC4537	CAC4537	CAC4611
	25	Button(+,-)	CAC4536	CAC4536	CAC4610
	26	Button(SOURCE,BAND)	CAC4538	CAC4538	CAC4713
	27	Button(LOCAL,BSM)	CAC4603	CAC4603	CAC4609
	28	Key Board Unit	CWM4470	CWM4470	CWM4648
	29	Button(DETACH)	CAC4539	CAC4539	CAC4612
	30	Cover	CNS3767	CNS3767	CNS3822
	47	Panel Unit	CXA8449	CXA8449	CXA8604
	53	Tuner Amp Assy	CWM4468	CWM4649	CWM4468
	54	Chassis Unit	CXA8594	CXA8378	CXA8918
	58	Detach Grille Assy	CXA8445	CXA8660	CXA8658
	60	FM/AM Tuner Unit	CWE1416	CWE1420	CWE1416

12.2 CASSETTE MECHANISM UNIT

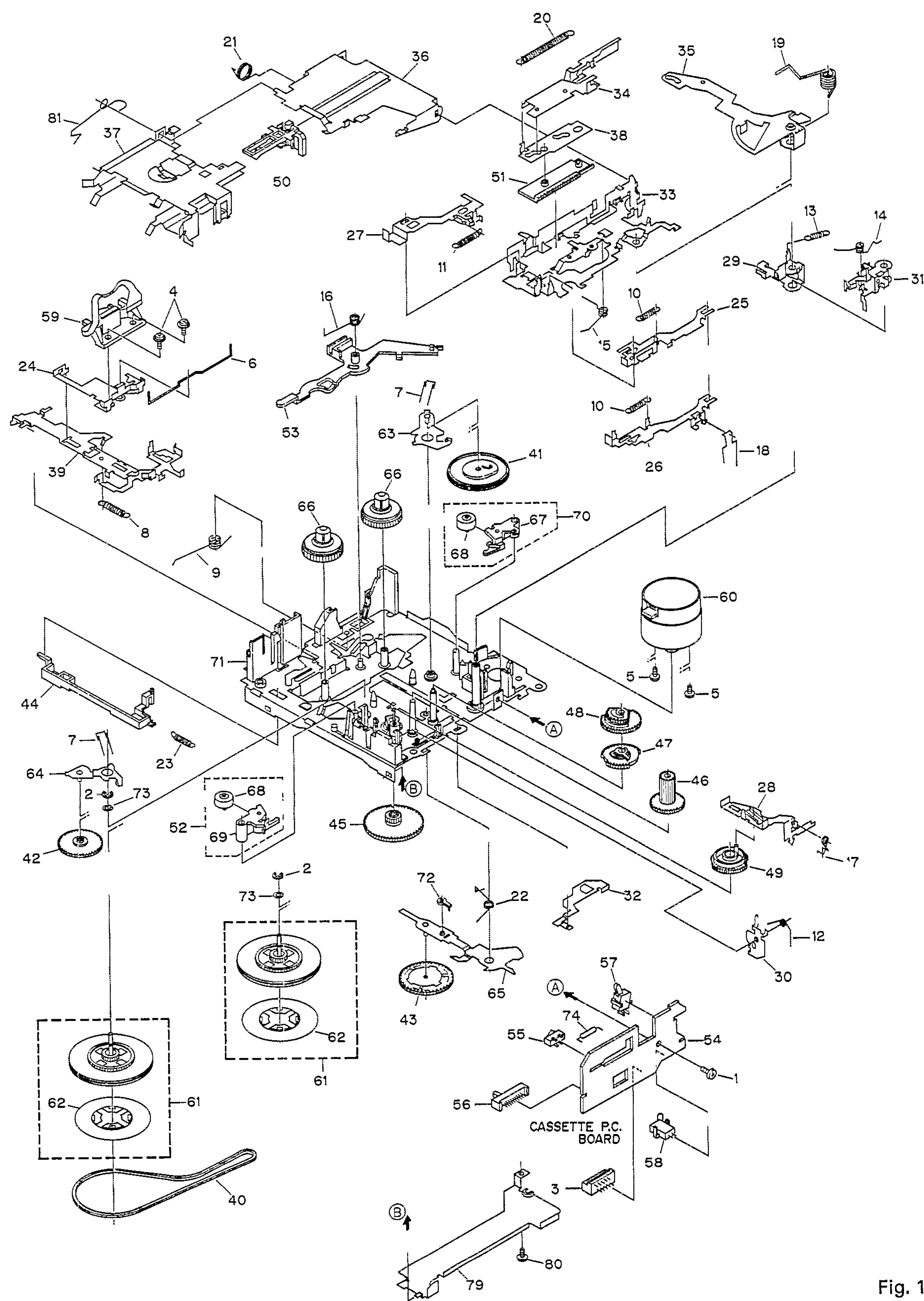


Fig. 12

● Parts List

Mark No.	Description	Part No.
1	Screw	BSZ23P050FMC
2	Washer	CBG1003
3	Connector(CN1)	CKS2829
4	Screw(M2x5)	EBA1028
5	Screw(M2x2.5)	EBA1037
6	Spring	EBH1554
7	Spring	EBH1555
8	Spring	EBH1556
9	Spring	EBH1557
10	Spring	EBH1558
11	Spring	EBH1559
12	Spring	EBH1560
13	Spring	EBH1561
14	Spring	EBH1562
15	Spring	EBH1563
16	Spring	EBH1564
17	Spring	EBH1565
18	Spring	EBH1566
19	Spring	EBH1567
20	Spring	EBH1568
21	Spring	EBH1569
22	Spring	EBH1571
23	Spring	EBH1579
24	Head Base	ENC1428
25	Lever	ENC1429
26	Lever	ENC1430
27	Lever	ENC1431
28	Lever	ENC1432
29	Arm	ENC1433
30	Arm	ENC1434
31	Arm	ENC1435
32	Arm	ENC1451
33	Bracket	ENC1437
34	Lever	ENC1438
35	Arm	ENC1439
36	Frame	ENC1440
37	Holder	ENC1441
38	Lever	ENC1446
39	Lever	ENC1450
40	Belt	ENT1027

Mark No.	Description	Part No.
41	Gear	ENV1469
42	Gear	ENV1470
43	Gear	ENV1471
44	Lever	ENV1472
45	Gear	ENV1474
46	Gear	ENV1475
47	Gear	ENV1476
48	Gear	ENV1477
49	Gear	ENV1478
50	Lever	ENV1480
51	Lever	ENV1487
52	Roller Unit	EXA1461
53	Arm	ENV1489
54	P.C.Board	ENP1148
55	Switch(Eject)(S4)	ESG1002
56	Switch(FWD/REV)(S3)	ESH1006
57	Switch(Load)(S1)	ESN1016
58	Switch(Mute)(S2)	ESN1017
59	Head Assy(HD1)	EXA1443
60	Motor Unit(M1)	EXA1444
61	Flywheel Unit	EXA1468
62	Plate	ENC1423
63	Arm Unit	EXA1447
64	Arm Unit	EXA1448
65	Arm Unit	EXA1449
66	Reel Unit	EXA1450
67	Pinch Holder	ENV1466
68	Pinch Roller	ENV1488
69	Pinch Holder	ENV1467
70	Roller Unit	EXA1460
71	Chassis Unit	EXA1465
72	Service Arm	EXX1048
73	Washer	HBF-179
74	Resistor(R1)	RD1/4HM472J
75-78	.....	
79	Cover	ENC1452
80	Screw	BSZ23P050FMC
81	Spring	EBH1585

13. PACKING METHOD

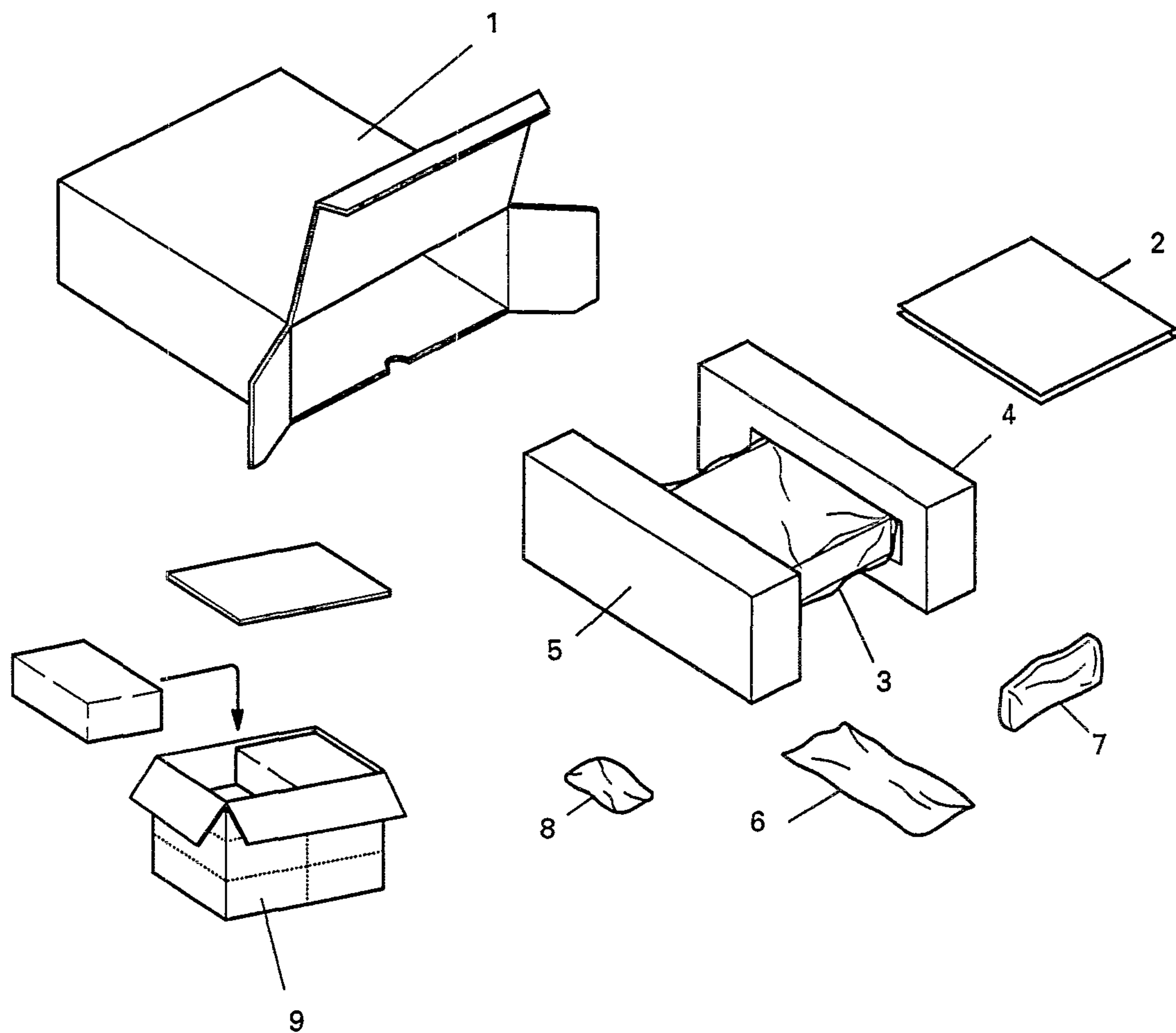


Fig.13

● Parts List

Mark No.	Description	*:Non Spare Parts Part No.
1	Carton (KEH-2300R/X1MA/EW)	CHG2858
	Carton (KEH-2100R/X1MA/GR)	CHG2859
	Carton (KEH-2400R/X1MA/IT)	CHG2860
2-1	Owner's Manual (KEH-2300R/X1MA/EW)	CRD1924
	Owner's Manual (KEH-2100R/X1MA/GR)	CRD1927
2-2	Owner's Manual (KEH-2300R/X1MA/EW) (KEH-2400R/X1MA/IT)	CRD1925

Mark No.	Description	Part No.
* 2-3	Warranty Card	CRY1087
* 2-4	Passport	CRY1013
3	Polyethylene Bag	CEG-162
4	Protector	CHP1774
5	Protector	CHP1775
6	Cord Assy	CDE4849
7	Case	CNB1997
8	Accessory Assy	CEA1917
9	Contain Box (KEH-2300R/X1MA/EW)	CHL2858
	Contain Box (KEH-2100R/X1MA/GR)	CHL2859
	Contain Box (KEH-2400R/X1MA/IT)	CHL2860

- The KEH-2300R/X1M/EW and KEH-2300R/X1IN/EW Parts Lists enumerate the parts which differ from those enumerated in the KEH-2300R/X1MA/EW Parts List only. The parts other than those enumerated in the former are identical with those in the latter, to which you are requested to refer, accordingly. The KEH-2300R/X1MA/EW Parts List is given on page 36.

● Parts List

Mark	No.	Description	KEH-2300R/X1MA/EW	KEH-2300R/X1M/EW	KEH-2300R/X1IN/EW
			Part No.	Part No.	Part No.
	1	Carton	CHG2858	CHG2861	CHG2862
	9	Contain Box	CHL2858	CHL2861	CHL2862

- The KEH-2400R/X1M/IT and KEH-2400R/X1IN/IT Parts Lists enumerate the parts which differ from those enumerated in the KEH-2400R/X1MA/IT Parts List only. The parts other than those enumerated in the former are identical with those in the latter, to which you are requested to refer, accordingly. The KEH-2400R/X1MA/IT Parts List is given on page 36.

● Parts List

Mark	No.	Description	KEH-2400R/X1MA/IT	KEH-2400R/X1M/IT	KEH-2400R/X1IN/IT
			Part No.	Part No.	Part No.
	1	Carton	CHG2860	CHG2865	CHG2866
	9	Contain Box	CHL2860	CHL2865	CHL2866

- The KEH-2100R/X1M/GR and KEH-2100R/X1IN/GR Parts Lists enumerate the parts which differ from those enumerated in the KEH-2100R/X1MA/GR Parts List only. The parts other than those enumerated in the former are identical with those in the latter, to which you are requested to refer, accordingly. The KEH-2100R/X1MA/GR Parts List is given on page 36.

● Parts List

Mark	No.	Description	KEH-2100R/X1MA/GR	KEH-2100R/X1M/GR	KEH-2100R/X1IN/GR
			Part No.	Part No.	Part No.
	1	Carton	CHG2859	CHG2863	CHG2864
	9	Contain Box	CHL2859	CHL2863	CHL2864

● Owner's Manual

Part No.	Model	Language
CRD1924	EW model	English,Spanish
CRD1927	GR model	French,German,Italian
CRD1925	EW model, IT model	French,German,Italian,Dutch

● Accessory Assy

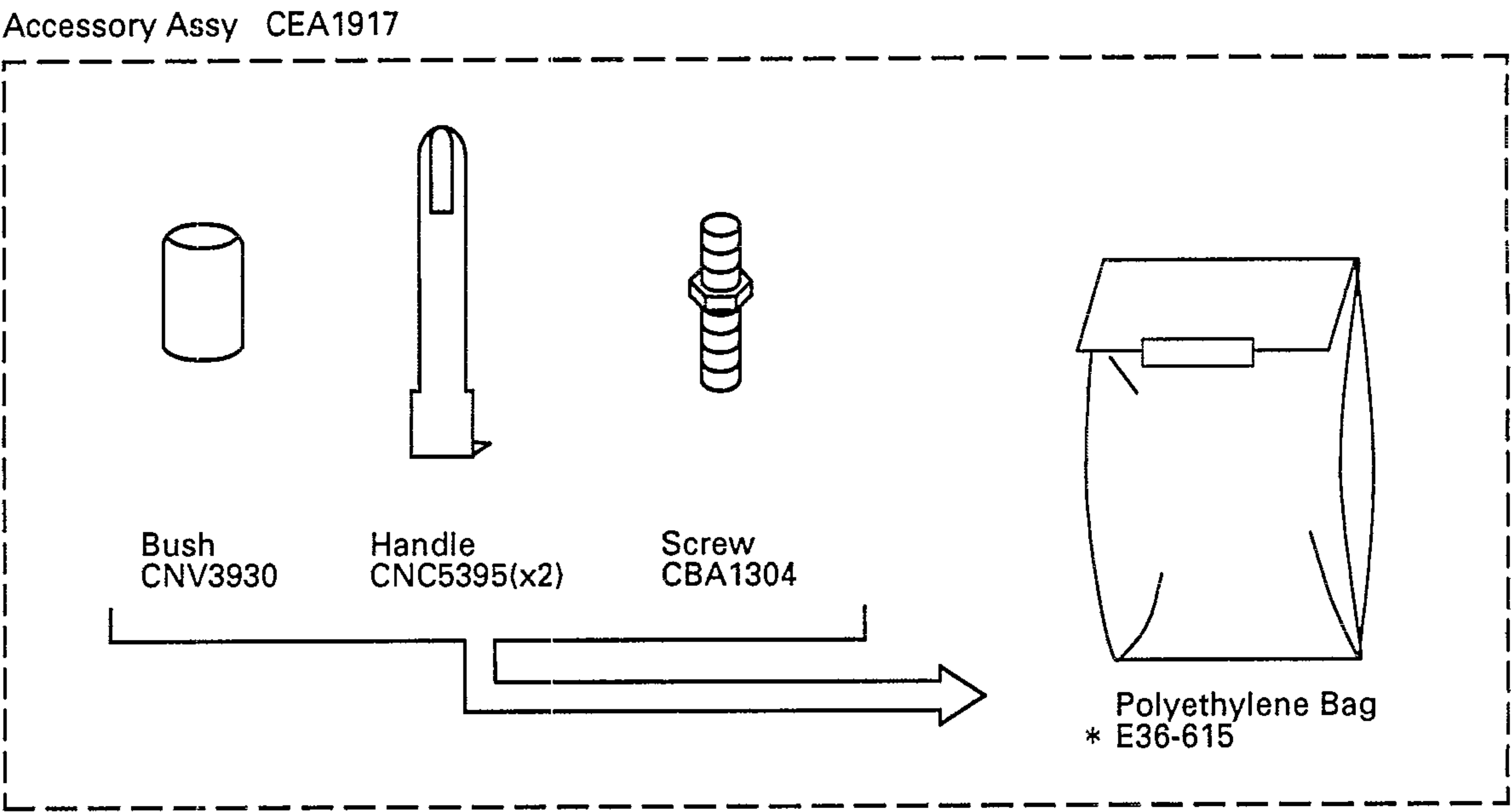


Fig.14