CFD-V27

SERVICE MANUAL

E Model

Ver 1.1 2000. 08
With SUPPLEMENT-1 (9-926-997-81)

CD Section	Model Name Using Similar Mechanism	CFD-V17
	CD Mechanism Type	KSM-213CDM
	Optical Pick-up Name	KSS-213CDM
Tape deck Section	Model Name Using Similar Mechanism	CFD-V17
	Tape Transport Mechanism Type	MF-V10-117

SPECIFICATIONS

CD player section

System	Compact disc digital audio system
Laser diode properties	Material: GaAlAs Wavelength:780 nm Emission duration : Continuous Laser output : Less than 44.6 µW (This output is the value measured at a distance of about 200 mm from the objective lens surface on the optical pick-up block with 7 mm aperture.)
Spindle speed	200 r/min (rpm) to 500 r/min (rpm) (CLV)
Number of channels	2
Frequency response	20 – 20,000 Hz + 1/-2 dB
Wow and flutter	Below measurable limit

Radio section

Frequency range	FM : 87.6 – 108 MHz AM : 530 –1,710 kHz
Aerials	FM : Telescopic antenna AM : Built-in ferrite bar aerial

Cassette-corder section

Recording system	4 -track 2 channel stereo
Fast winding time	Approx. 120 s (sec.) with Sony cassette C-60
Frequency response	TYPE I (normal) : 70 – 10,000 Hz

General

Speakers	Full range : 10 cm dia., 3.2 Ω, cone type (2)
Outputs	Headphones jack (stereo minijack) For 16 – 68 Ω impedance headphones
Power output	2.3 W + 2.3 W (at 3.2 Ω, 10 % harmonic distortion)
Power requirements	For CD radio cassette-corder : 120V AC, 60 Hz 9V DC, 6 size D (R 20) batteries
Power consumption	AC 20W
Battery life	For CD radio cassette-corder:

FM recording
Sony R20P : approx. 13.5 h
Sony alkaline LR20 : approx. 20 h
Tape playback
Sony R20P : approx. 7.5 h
Sony alkaline LR20 : approx. 15 h
CD playback
Sony R20P : approx. 2.5 h
Sony alkaline LR20 : approx. 7 h

Dimensions	Approx. 420 × 165 × 256 mm (w/h/d) (16 5/8 × 6 1/2 × 10 1/8 inches) (incl. projecting parts)
Mass	Approx. 4.1 kg (9 lb. 1 oz) (incl. batteries)
Supplied accessories	AC power cord (1)

Design and specifications are subject to change without notice.

CD RADIO CASSETTE-CORDER

MICROFILM

SONY®

TABLE OF CONTENTS

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1
SERVICE NOTES

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

The following caution label is located inside the unit.

CAUTION	;	INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ADVARSEL	;	USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDS ÆTTELSE FOR STRÅLING.
VARO!	;	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA LASERSÄTEILYLLE.
VARNING	;	LASERSTRÅLING NÄR DENNA DEL ÄR OPPNÅD OCH SPÄRREN ÄR URXOPPLAD.
ADVARSEL	;	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

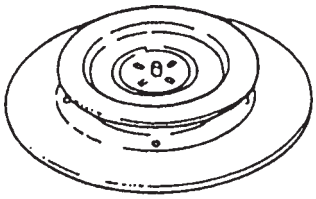
The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc., on clothing and the human body.
During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

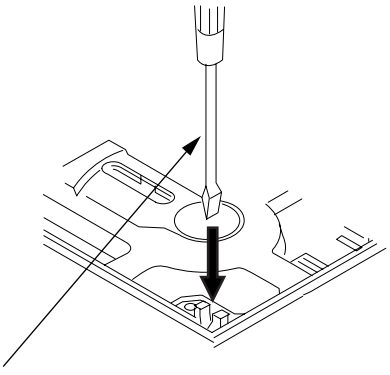
CHUCK PLATE JIG ON REPAIRING

On repairing CD section, playing a disc without the CD lid, use Chuck Plate Jig.
• Code number of Chuck Plate Jig : X-4918-255-1



LASER DIODE AND FOCUS SEARCH OPERATION CHECK

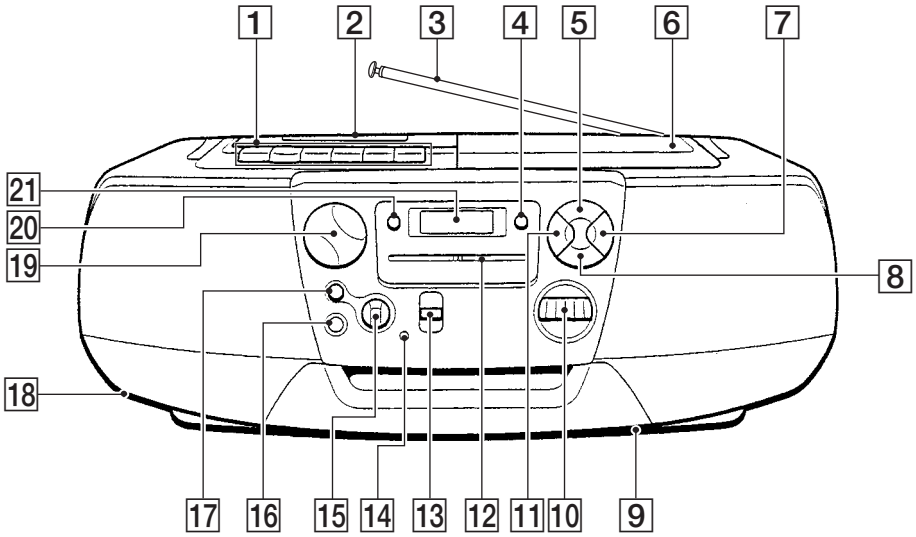
1. Press CD open knob.
2. Open the lid for CD.
3. Push on SWITCH (S801) as following figure.
4. Confirm the laser diode emission while observing the objecting lens. When there is no emission, Auto Power Control circuit or Optical Pick-up is broken.
   Objective lens moves up and down once for the focus search.



Insert a precision screw driver and push SWITCH(S801)

SECTION 2
GENERAL

LOCATION AND FUNCTION OF CONTROLS
MAIN UNIT



1 Tape operation buttons
- ● button
- ▷ button
- ◀◀ button
- ▶▶ button
- ■, ⏏ button
- ❚❚ button

2 CASSETE LID
3 FM rod antenna
4 DISPLAY ENTER button
5 CD ▶❚❚ button
6 CD ⏏ PUSH OPEN/CLOSE button
7 CD ▶▶❙ button
8 CD ■ button
9 Battery compartment
10 TUNE knob
11 CD ❙◀◀ button
12 DIAL
13 FUNCTION switch
14 OPR/BATT indicator
15 TONE knob
16 ∩ Phones jack
17 MEGA BASS knob
18 AC IN Socket
19 VOLUME knob
20 PLAY MODE button
21 Information display

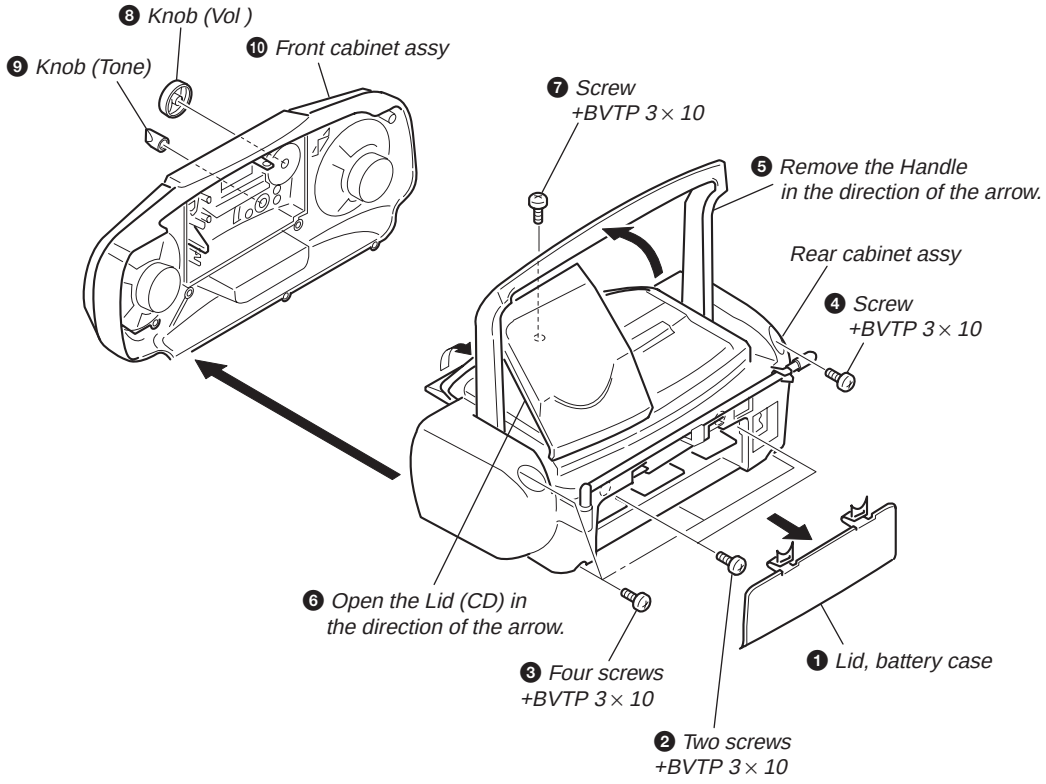
SECTION 3
DISASSEMBLY

• The equipment can be removed using the following procedure.

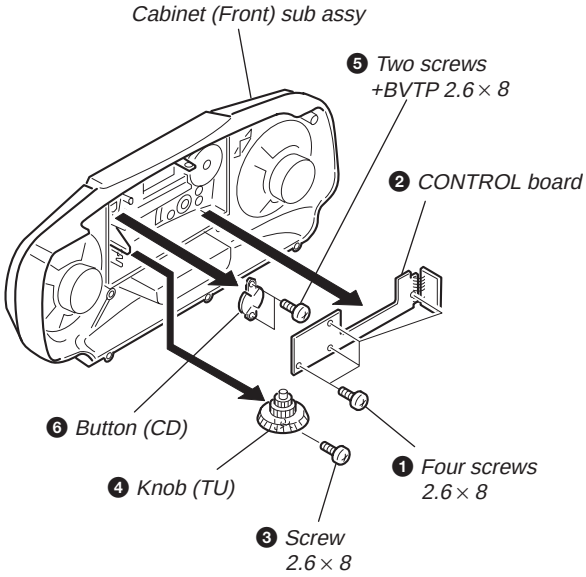
Set → *Front cabinet assy* → *Cabinet (upper) assy* → *Inlet, power, battery, half battery board*
Control board
Main board → *Mechanism deck, optical pick-up section*

Note : Follow the disassembly procedure in the numerical order given.

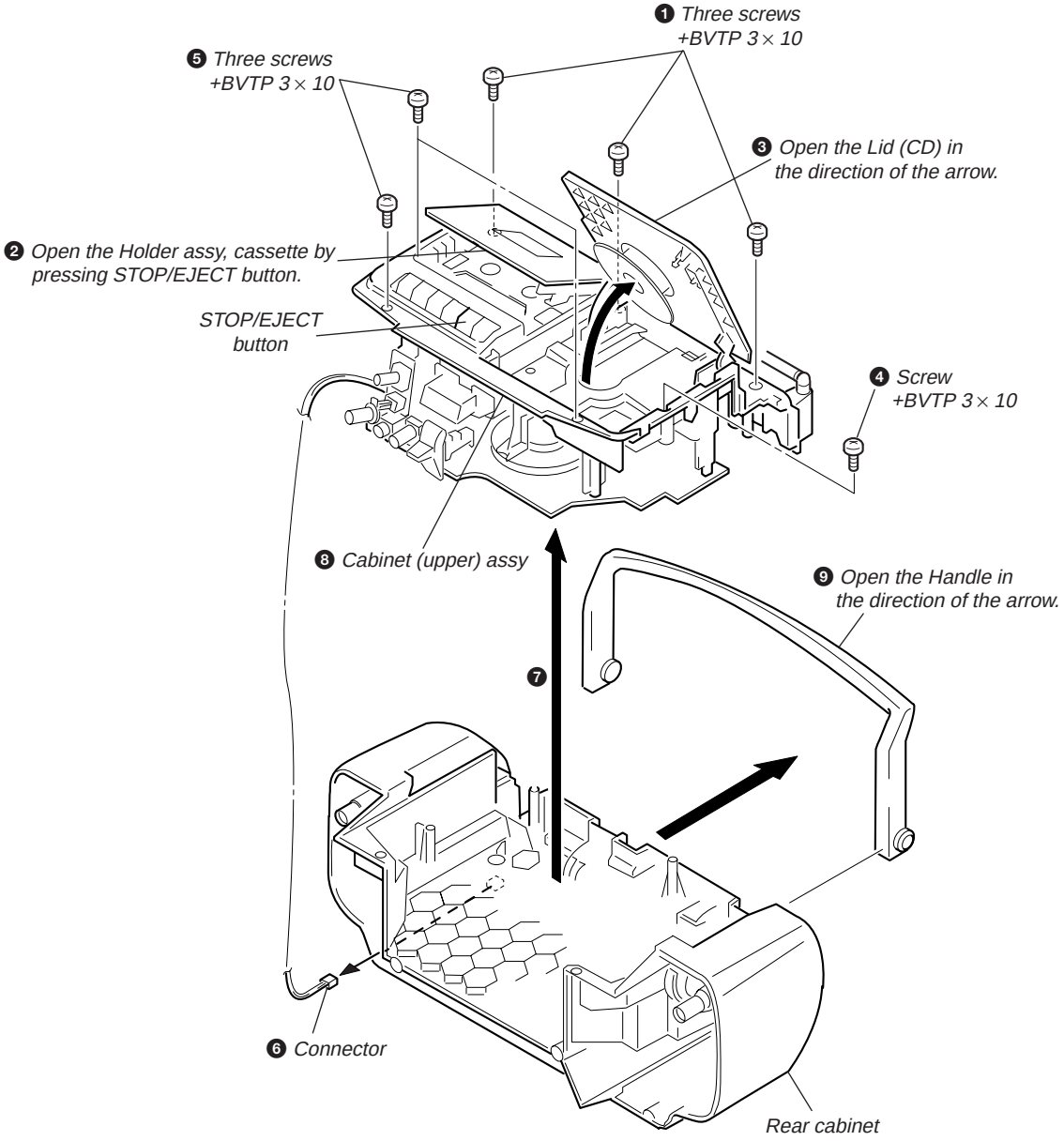
3-1. FRONT CABINET ASSY



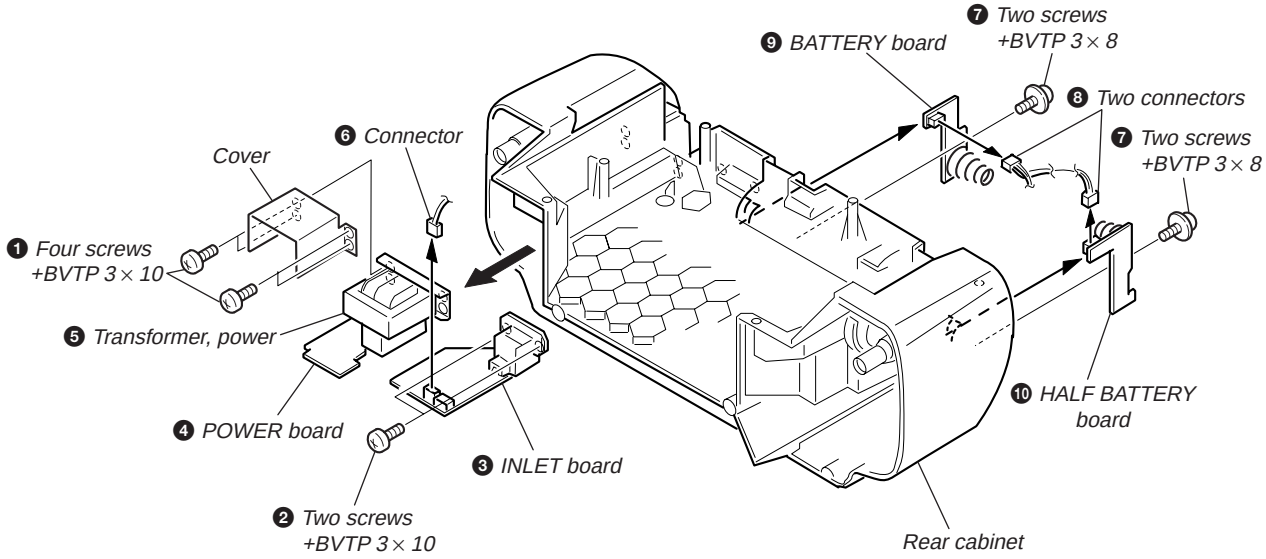
3-2. CONTROL BOARD



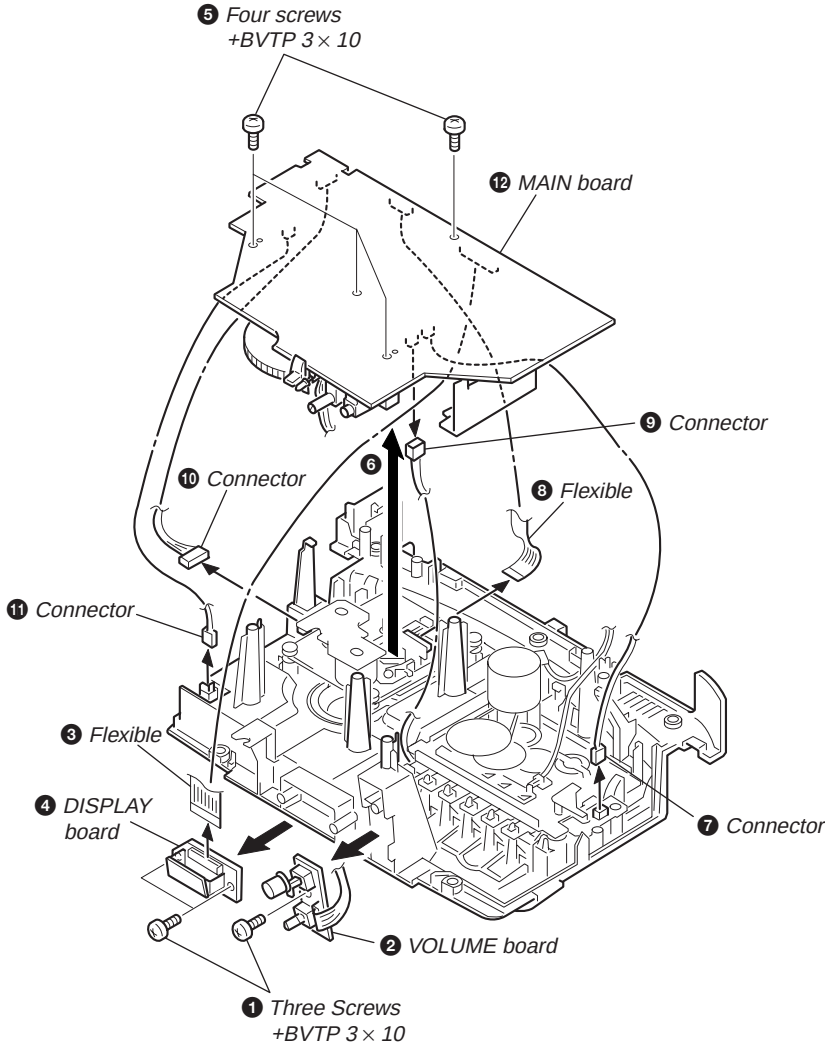
3-3. CABINET (UPPER) ASSY



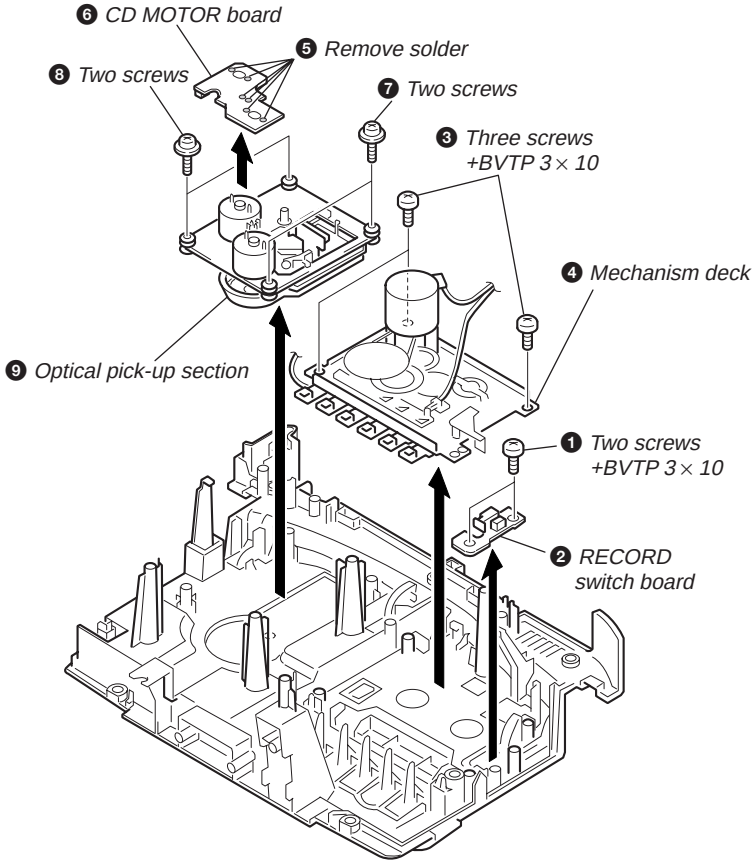
3-4. INLET, POWER, BATTERY, HALF BATTERY BOARD



3-5. MAIN BOARD



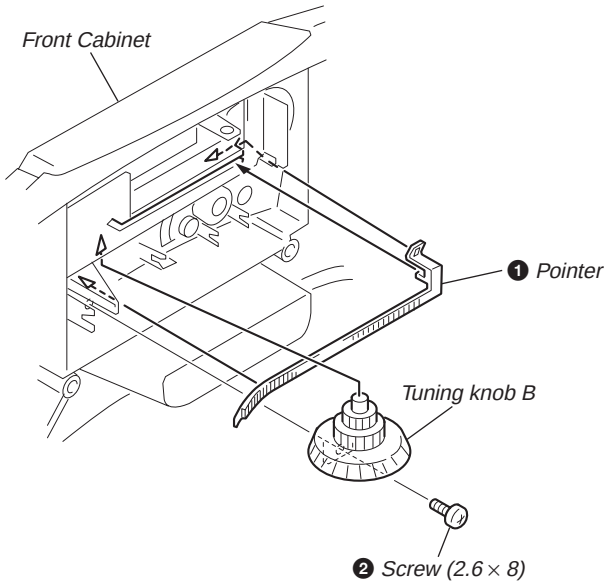
3-6. MECHANISM DECK, OPTICAL PICK-UP SECTION



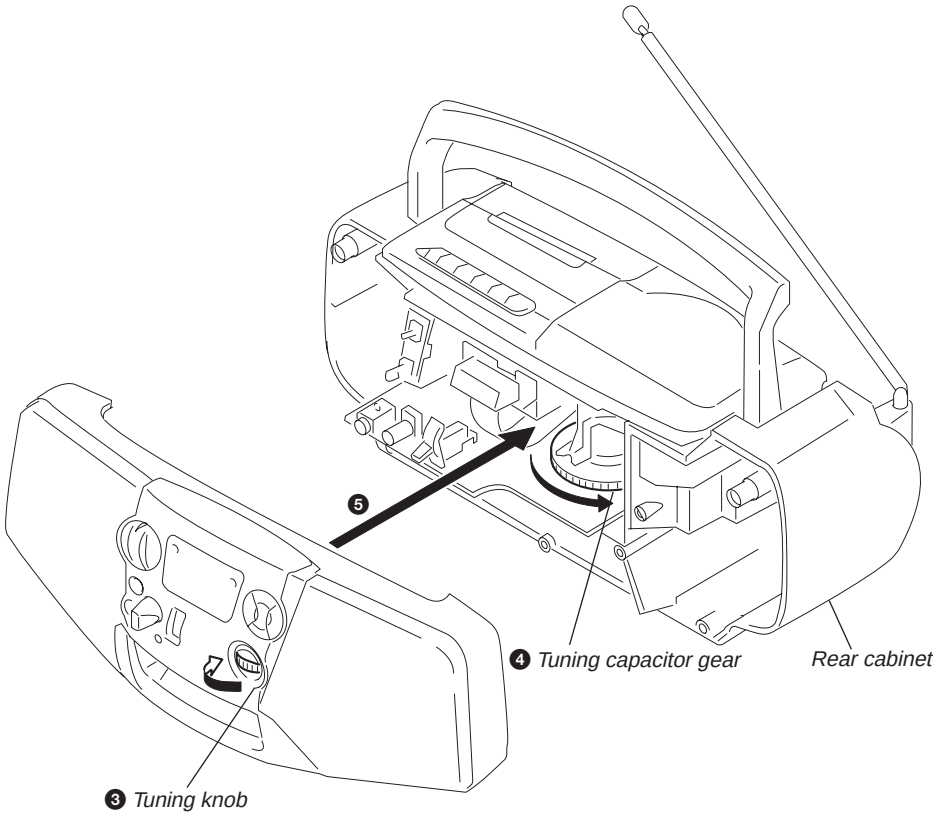
SECTION 4
DIAL POINTER INSTALLATION

Note : Follow the installation procedure in the numerical order given.

❶ Align the pointer with the groove of front cabinet and insert it as shown in the illustration.
❷ Align Tuning knob with front cabinet and fasten the screw.



❸ Turn the Tuning knob in the direction of the arrow as shown in the illustration until pointer agrees with scale " 0 " (at leftmost end of scale).
❹ Turn the tuning capacitor gear fully in the direction of the arrow as shown in the illustration.
❺ Fasten the front cabinet and rear cabinet with the screws.



SECTION 5
ADJUSTMENTS

5-1. MECHANICAL ADJUSTMENT

PRECAUTION

1. Clean the following parts with a denatured-alchool-moistened swab:
   record/playback head, pinch roller
   erase head, rubber belts
   capstans
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.

Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	18 – 60 g•cm (0.25 – 0.83 oz•inch)
FWD back tension		1.0 – 5.0 g•cm (0.014 – 0.069 oz•inch)
Fast Forward	CQ-201B	45 – 95 g•cm (0.62 – 1.32 oz•inch)
Rewind		45 – 95 g•cm (0.62 – 1.32 oz•inch)

Tape Tension Measurement

Torque Meter	Meter Reading
CQ-403A	more than 60 g (more than 2.12 oz)

5-2. ELECTRICAL ADJUSTMENT

TAPE RECODER SECTION 0dB = 0.775V

Standard output level

Output	HP OUT
Load impedance	32 Ω
Output signal level	0.25 V (–10 dB)

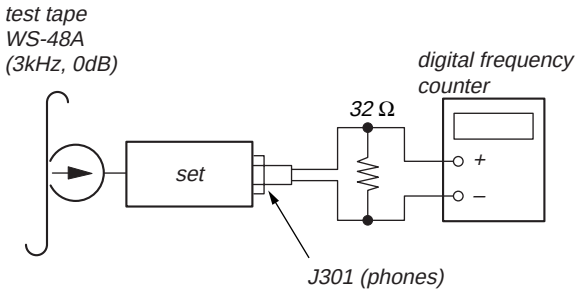
Test tape

Test Tape	Signal	Used for
WS-48A	3 kHz, 0 dB	Tape speed adjustment
P-4-A063	6.3 kHz, –10 dB	Head azimuth adjustment.

Tape Speed Adjustment

Procedure :

Mode : Playback



Adjustment Value : normal tape speed

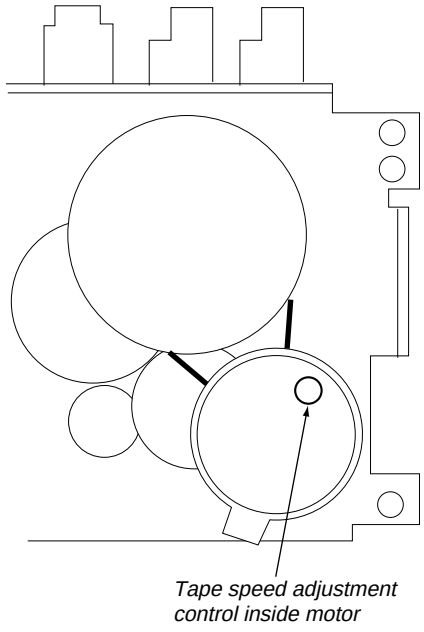
Adjust the tape speed adjustment control inside motor, so that the frequency counter reading becomes 3,000 Hz.

Specification Value :

Digital frequency counter
2,910 – 3,090Hz

Frequency difference between the beginning and the end of the tape should be within 1.5% (45 Hz).

Adjustment Location :



5-3. TUNER SECTION

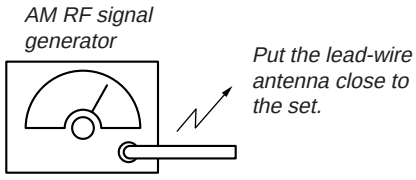
0 dB = 1 µV

• Switch Location

VOLUME : MAX
MEGA BASS : OFF
PRESET SOUND MODE : OFF

AM SECTION

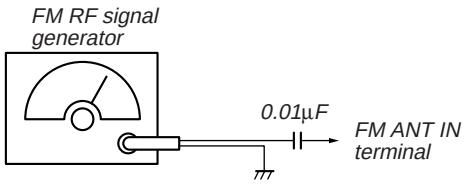
BAND : AM
Signal generator



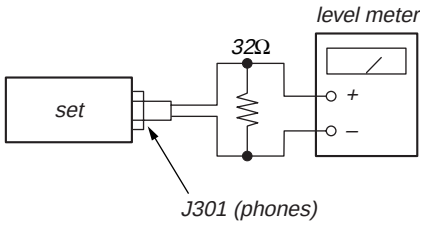
30% amplitude modulation by 400Hz signal.
Output level : as low as possible

FM SECTION

BAND : FM
Signal generator



75kHz (100%) amplitude modulation by 1kHz signal.
Output level : as low as possible



- Repeat the procedures in each adjustment several times for the maximum level meter indication.
- The frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

AM IF ADJUSTMENT	
Adjust for a maximum reading on level meter.	
T2	455 kHz

AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L3	620 kHz
CT3	1,400 kHz

AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L4	520 kHz
CT4	1,780 kHz

FM IF ADJUSTMENT	
Adjust for a maximum reading on level meter.	
T1	10.7 MHz

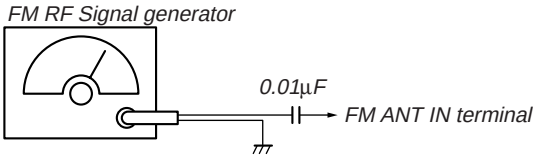
FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L1	86.5 MHz
CT1	109.5 MHz

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L2	86.5 MHz
CT2	109.5 MHz

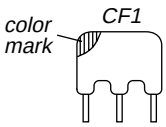
Adjustment Location : Main board (See page 13)

FM VCO Adjustment

Procedure :



Carrier frequency : 98MHz
IF frequency : According to the color of CF1.
Modulation : no modulation
Output level : 0.1V (100dB)

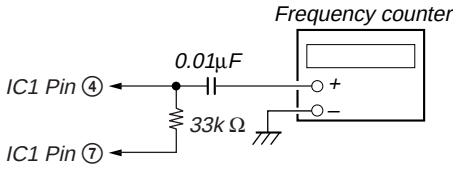


BLACK	10.64MHz
BLUE	10.67MHz
RED	10.70MHz
ORANGE	10.73MHz
WHITE	10.76MHz

1. Connect frequency counter to the positions shown below.
2. Tune the set to 98MHz.
3. Adjust RV1 so that the frequency counter reading becomes 76,000 Hz.

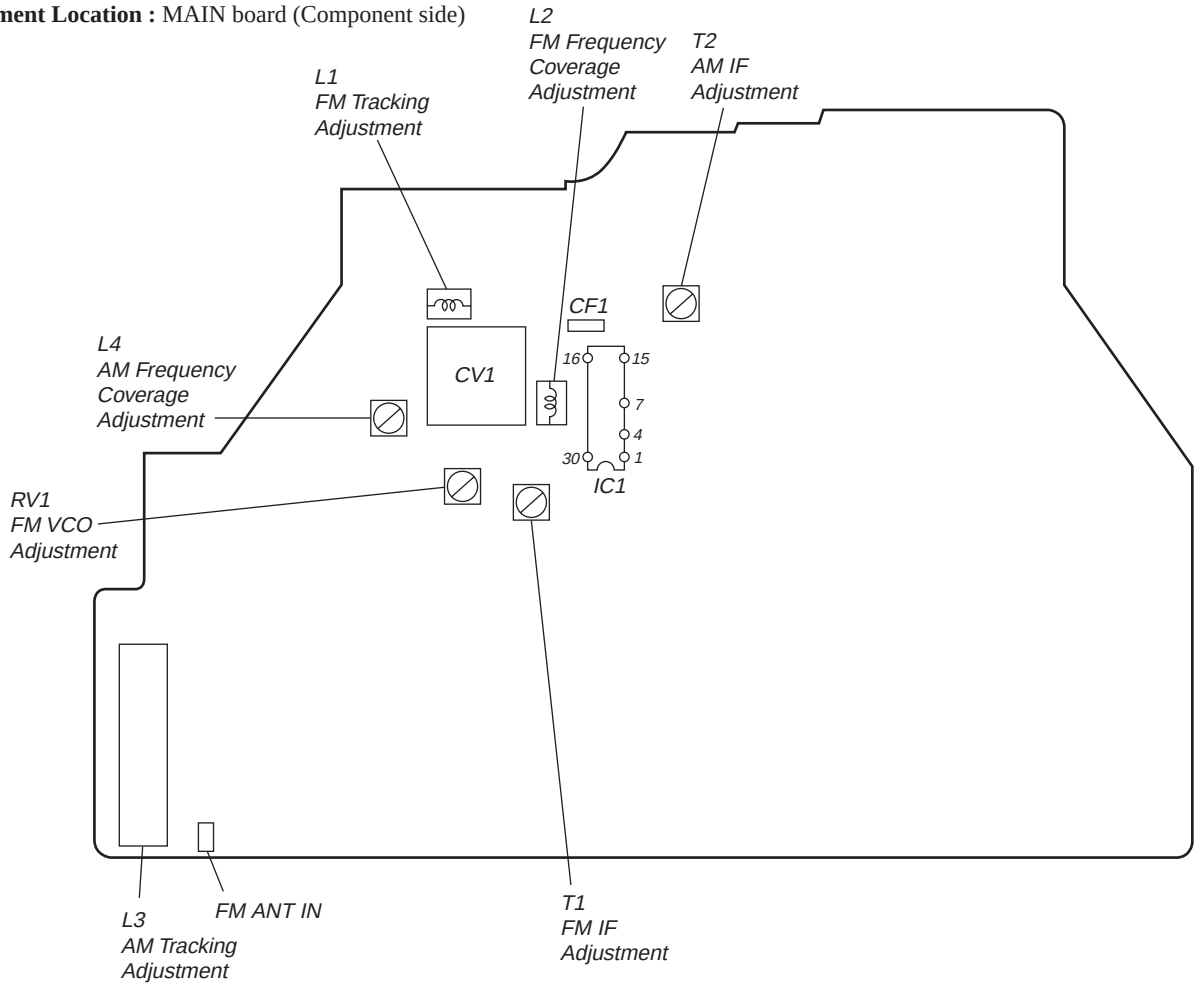
Specification Value :

Frequency counter
75,800 – 76,200 Hz

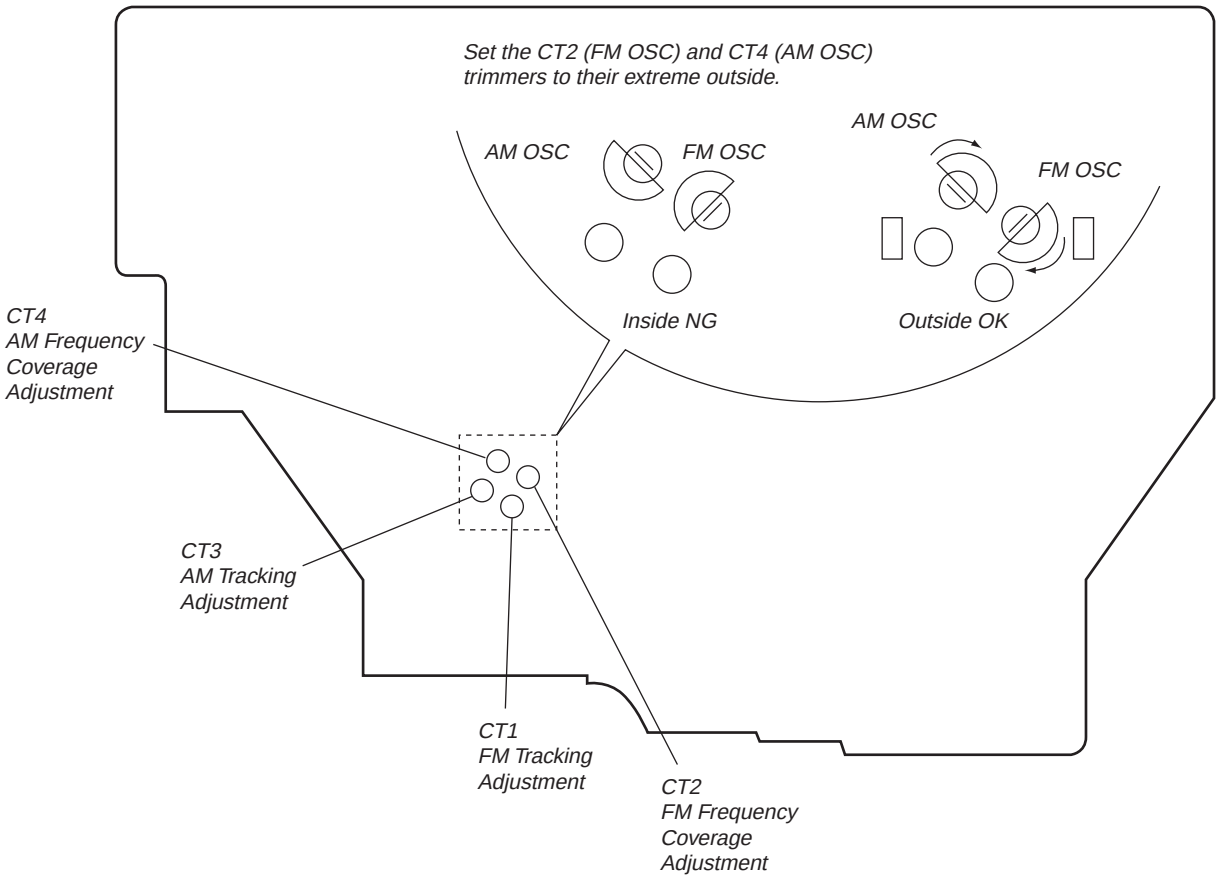


Adjustment Location : MAIN board (See page 13)

Adjustment Location : MAIN board (Component side)



Adjustment Location : MAIN board (Conductor side)



CD SECTION

Notes on Check

1. Perform the traverse check in the CD test mode.
   After check, be sure to exit the test mode.
2. Perform check in the order given.
3. Use the disc (YEDS-18, Parts No. 3-702-101-01) only when so indicated.

Before Check

Put the set into test mode and perform the following checks.
Repair if there are any problems.

• Sled Motor Check

Press ▶▶I , I◀◀ keys and confirm that the Optical pick-up moves smoothly from the innermost to outermost circumference and back smoothly and with no catching or abnormal noises.
(Cancellation of BTL mute)
▶▶I : Optical pick-up moves to the outer circumference.
I◀◀ : Optical pick-up moves to the inner circumference.

• Focus Search Check

1. Press the CD ▶II key. (Focus search operation is performed continuously.)
2. Look at the Optical pick-up objective lens and confirm that it moves up and down smoothly, with no catching or abnormal noises.
3. Press ■ button.
   Confirm that focus search operation stops. If it does not, press ■ button again longer.

How to Enter the Set into Test Mode

1. Set the function switch to power off.
2. Set the function switch to CD while I◀◀ key and ■ key pressing.
   The set is into CD test mode (88 is displayed).
3. Turn the power off to release test mode.

How to Exit the Test Mode

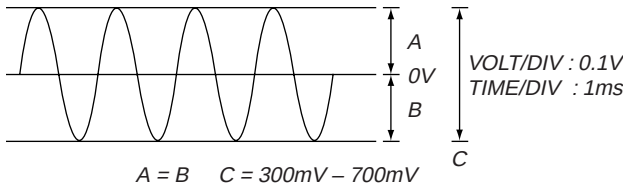
Turn the POWER OFF.

TRAVERSE Check

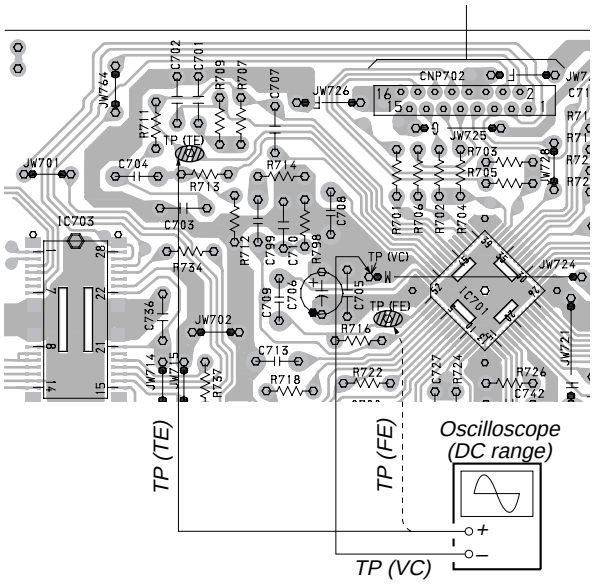
This check is to be done when the optical pick-up block is replaced.

Check Procedure:

1. Connect the oscilloscope to test point TP (VC) and TP (TE) on MAIN board.
2. Put the set into test mode.
3. Optical pick-up setting to the center by ▶▶I or I◀◀ button pushing.
4. Insert disk (YEDS-18) and press ▶II button.
5. Check that the oscilloscope traverse waveform is symmetrical, as shown in the figure below.
6. Release test mode after adjustment is completed.



[MAIN BOARD] (Conductor side)



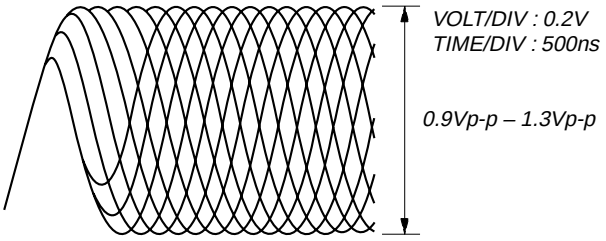
Focus Bias Check

This check is to be done when the optical block replaced.

Check Procedure:

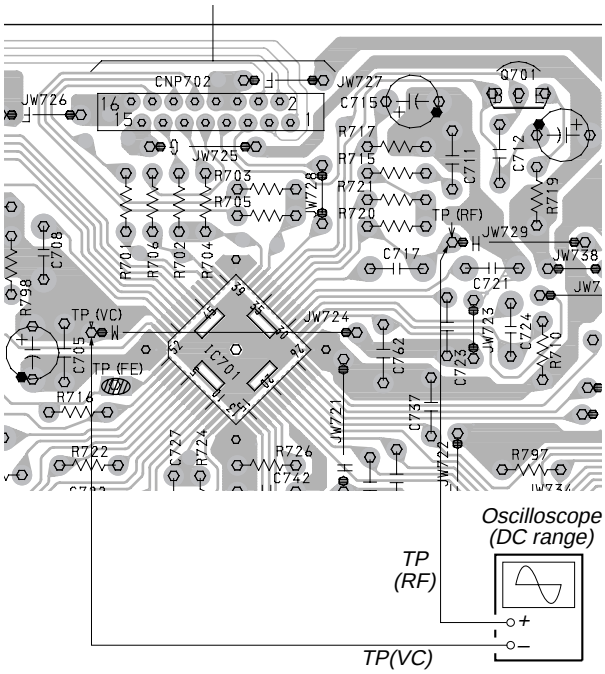
1. Connect the oscilloscope to test point TP (VC) and TP (RF) on MAIN board.
2. Put the set into test mode.
3. Opitical pick-up setting to the center by + or – button pushing.
4. Insert disk (YEDS-18) and press ▶II button.
5. Press the MODE button. (Tracking servo ON)
6. Check that the oscilloscope wavewform is as shown in the figure below (eye pattern).
   A good eye pattern means that the diamond shape (◊) in the center of the waveform can be clearly distinguished.
7. Release test mode after adjustment is completed.

• RF signal reference waveform (eye pattern)



When observing the eye pattern, set the oscilloscope for AC range and raise vertical sensivity.

[MAIN BOARD] (Conductor side)



5-4. REFERENCE

Focus/Tracking Gain Check

Adjustment Location : MAIN board (Component side)

(See page 16)

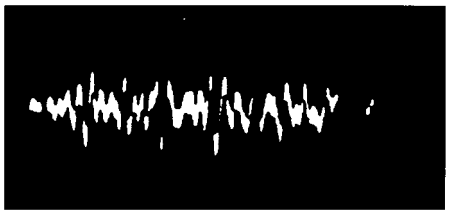
A frequency response analyzer is necessary in order to perform this check exactly.
However, this gain has a margin, so even if it is slightly off, there is no problem.
Focus/Tracking gain determines the pick-up follow-up (vertical and horizontal) relative to mechanical noise and mechanical shock when the 2-axis device operate.

Symptoms \ Gain	Focus	Tracking
• The time until music starts becomes longer for STOP ➡ CD ▶II or automatic selection (◀◀ , ▶▶ buttons pressed). (Normally takes about 2 seconds.)	low	low or high
• Music does not start and disc continues to rotate for STOP ➡ CD ▶II or automatic selection (◀◀ , ▶▶ buttons pressed.)	—	low
• Sound is interrupted during PLAY. Or time counter display stops progressing.	—	low
• More noise during 2-axis device operation.	high	high

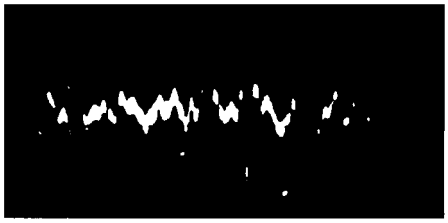
Check Procedure:

1. Keep the set horizontal.
2. Inset disk (YEDS-18) and press ▶II button.
3. Connect an oscilloscope to TP (FE) and TP (VC) on the MAIN board.
4. Check that the waveform is as shown in the figure below. (Focus waveform)

• Good Example



• Incorrent Examples (DC level changes more than on adjusted waveform)

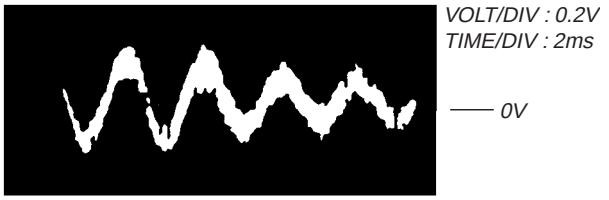


low focus gain

high focus gain

5. Connect an oscilloscope between TP (TE) and TP (VC).
6. Insert disc (YEDS-18) and press the CD ▶II button.
7. Check that the waveform is as shown in the figure below. (tracking waveform)

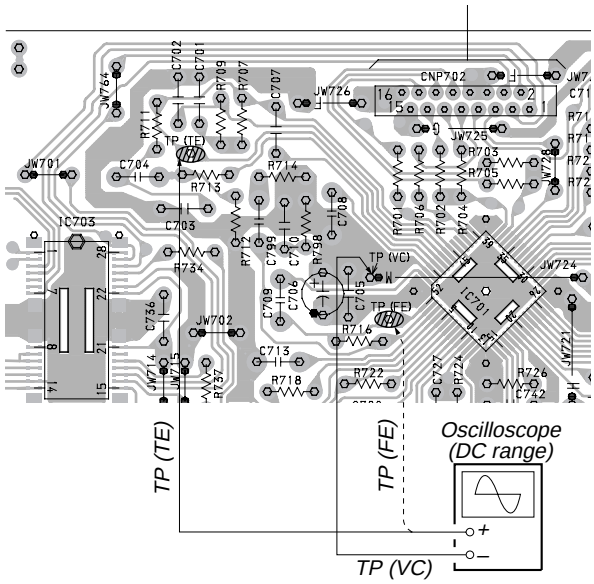
• Incorrect Examples (Fundamental wave appears)



low tracking gain

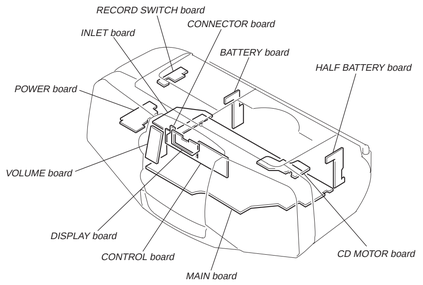
high tracking gain
(high fundamental wave than for low gain)

[MAIN BOARD] (Conductor side)

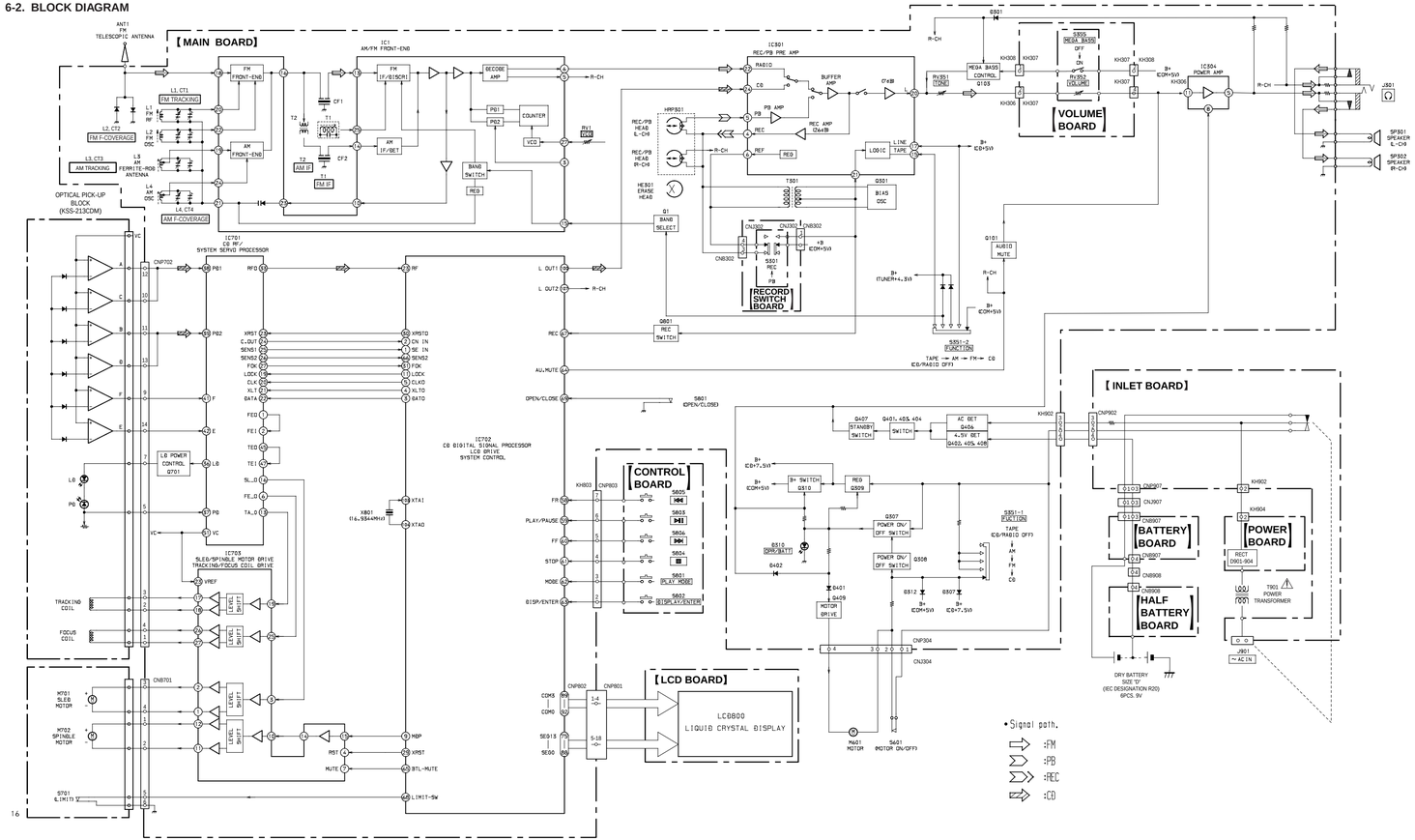


SECTION 6
DIAGRAMS

6-1. CIRCUIT BOARDS LOCATION



6-2. BLOCK DIAGRAM



Note on Printed Wiring Board:
- ○—— : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ▒▒▒ : Pattern from the side which enables seeing.

Note on Schematic Diagrams:
- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- ⚠ : nonflammable resistor.
- ▭ : panel designation.
- ▬ : adjustment for repair.
- B+ : B+ Line.
- Power voltage is dc 9 V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

– For Radio, TAPE section MAIN (1/2) –
no mark : PLAY (TAPE SECTION)
CD STOP
( ) : REC (TAPE SECTION)
[ ] : FM (RADIO SECTION)
< > : AM (RADIO SECTION)
– For CD Section MAIN (2/2) –
no mark : CD PLAY
TAPE STOP

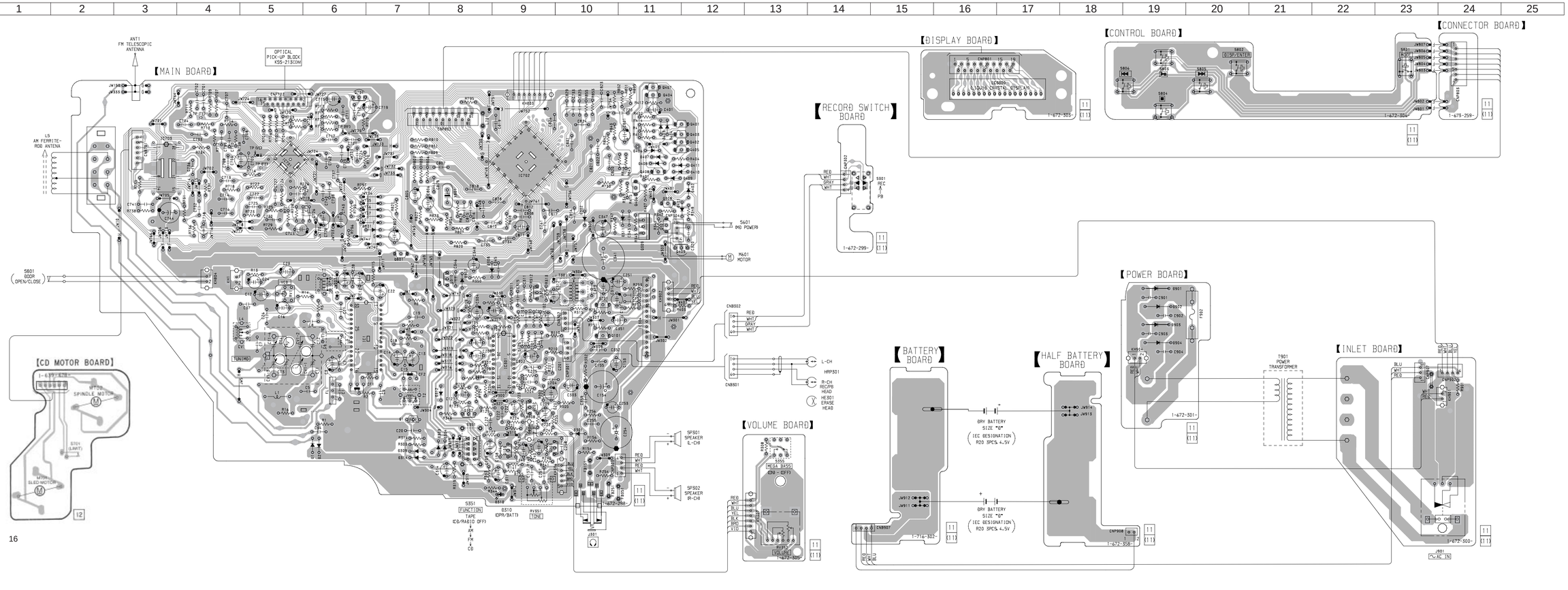
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  - ⇨ : FM
  - ⇨ : PB
  - ⇨ : REC
  - ⇨ : CD

6-3. PRINTED WIRING BOARD

• Refer to page 20 for Note on Printed Wiring Board. • Refer to page 17 for IC Circuit Board Location.

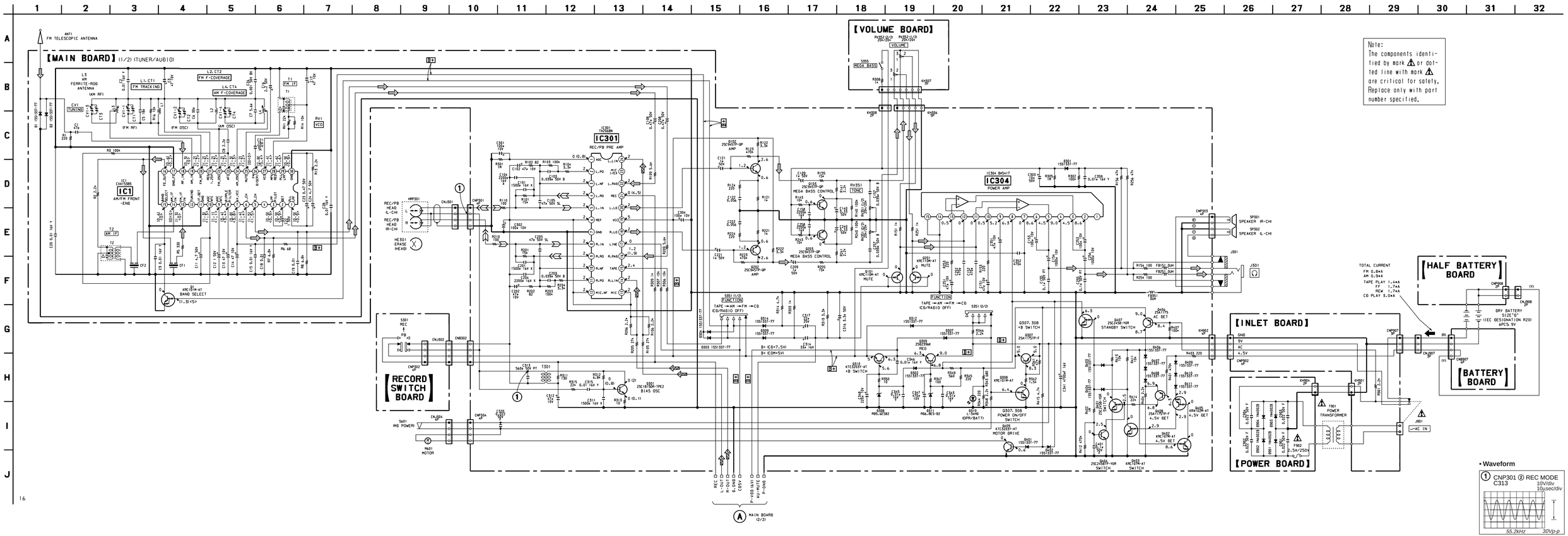
• **Semiconductor Location**

Ref. No.	Location
D1	G-6
D2	G-6
D301	G-10
D302	D-10
D303	G-8
D304	G-8
D307	E-8
D308	D-8
D309	G-7
D310	H-9
D312	F-8
D311	D-11
D314	G-7
D401	C-11
D402	C-12
D403	B-11
D404	B-11
D406	C-11
D407	C-11
D408	C-11
D409	C-12
D410	C-12
D411	C-12
D801	D-7
IC1	F-7
IC301	F-9
IC304	E-11
IC701	C-5
IC702	C-9
IC703	C-3
Q1	G-7
Q101	F-10
Q102	G-8
Q103	G-9
Q201	E-10
Q202	G-9
Q203	G-9
Q301	E-9
Q307	D-11
Q308	C-11
Q309	D-11
Q310	E-8
Q401	B-12
Q402	B-12
Q403	B-12
Q404	B-11
Q405	C-12
Q406	C-11
Q407	B-11
Q408	C-11
Q409	D-12
Q701	B-6
Q801	D-7



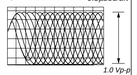
6-4. SCHEMATIC DIAGRAM – MAIN SECTION (1/2) –

• Refer to page 20 for Note on Schematic Diagram. • Refer to page 35 for IC Block Diagrams.

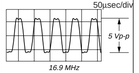


• **Waveform**

② IC701 ⑯ RFO 0.2V/div 0.5µsec/div

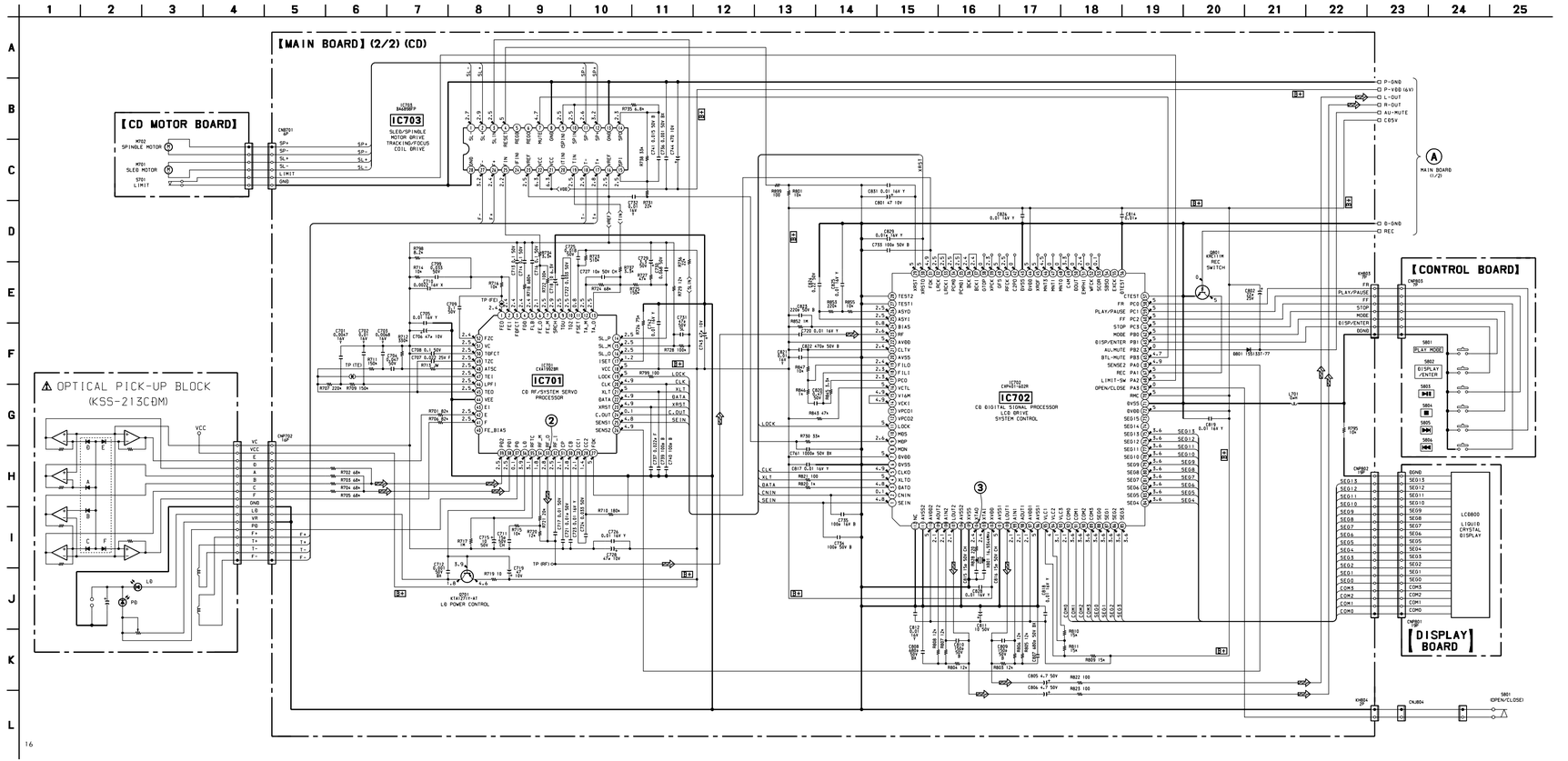


③ IC702 ⑭ XTAO 2V/div 50µsec/div



6-5. SCHEMATIC DIAGRAM – MAIN SECTION (2/2) –

• Refer to page 20 for Note on Schematic Diagram. • Refer to page 35 for IC Block Diagrams.



6-6. IC PIN FUNCTION DESCRIPTION

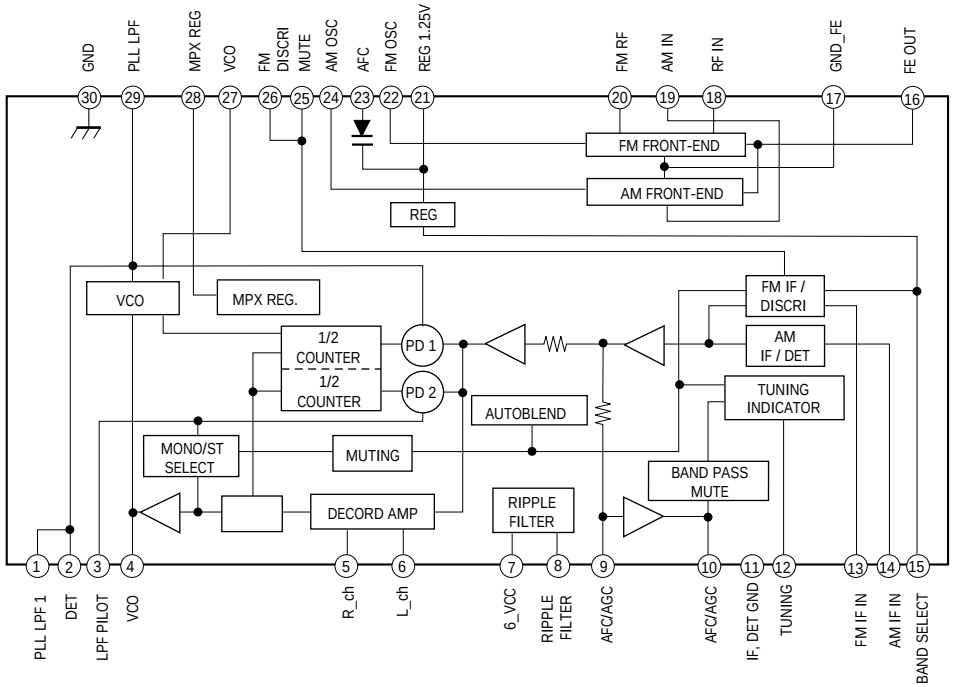
IC702 CD DIGITAL SIGNAL PROCESSOR, LCD DRIVE, SYSTEM CONTROL (CXP401-602R)

Pin No.	Pin name	I/O	Description
1	SEIN	I	CD SENS input.
2	CNIN	I	CD SENS input.
3	DATO	O	CD DSP command data output.
4	XLTO	O	Latch output.
5	CLKO	O	Clock output for CD DSP command.
6	DV_{SS}	–	Digital ground.
7	DV_{DD}	–	Digital power supply (+5V).
8	MON	–	Not used (Open).
9	MDP	O	Spindle motor drive control.
10	MDS	–	Not used (Open).
11	LOCK	O	Lock signal output.
12	VPCO2	–	Not used (Open).
13	VPCO1	–	Not used (Open).
14	VCKI	–	Not used (Connect to ⑮ pin).
15	V16M	–	Not used (Connect to ⑭ pin).
16	VCTL	–	Not used (“H” level).
17	PCO	O	Decoder PLL phase comparator output.
18	FILI	I	Decoder PLL filter input.
19	FILO	O	Decoder PLL filter output.
20	AV_{SS}	–	Analog ground.
21	CLTV	I	Decoder PLL VCO control voltage input.
22	AV_{DD}	–	Analog power supply (+5V).
23	RF	I	CD RF signal input.
24	BIAS	I	Playback EFM asymmetry current constant input.
25	ASYI	I	Playback EFM asymmerty comparater voltage input.
26	ASYO	O	Playback EFM full swing output.
27	TEST1	I	Test terminal (Fixed at “L”).
28	TEST2	I	Test terminal (Fixed at “L”).
29	XRST	I	CD reset input.
30	XRSTO	O	CD reset output. “L” : Reset
31	FOK	I	FOK signal input.
32	LRCK	O	L/R clock signal output. (Connect to ㉝ pin)
33	LRCKI	I	L/R clock signal input. (Connect to ㉜ pin)
34	PCMD	O	PCM data output. (Connect to ㉟ pin)
35	PCMDI	I	PCM data input. (Connect to ㉞ pin)
36	BCK	O	Bit clock signal output. (Connect to ㊲ pin)
37	BCKI	I	Bit clock signal input. (Connect to ㊱ pin)
38	GTOP	–	Not used (Open).
39	XPCK	–	Not used (Open).
40	GFS	–	Not used (Open).
41	RFCK	–	Not used (Open).
42	C2PO	–	Not used (Open).
43	DV_{SS}	–	Digital ground.
44	DV_{DD}	–	Digital power supply (+5V).
45	XROF	–	Not used (Open).

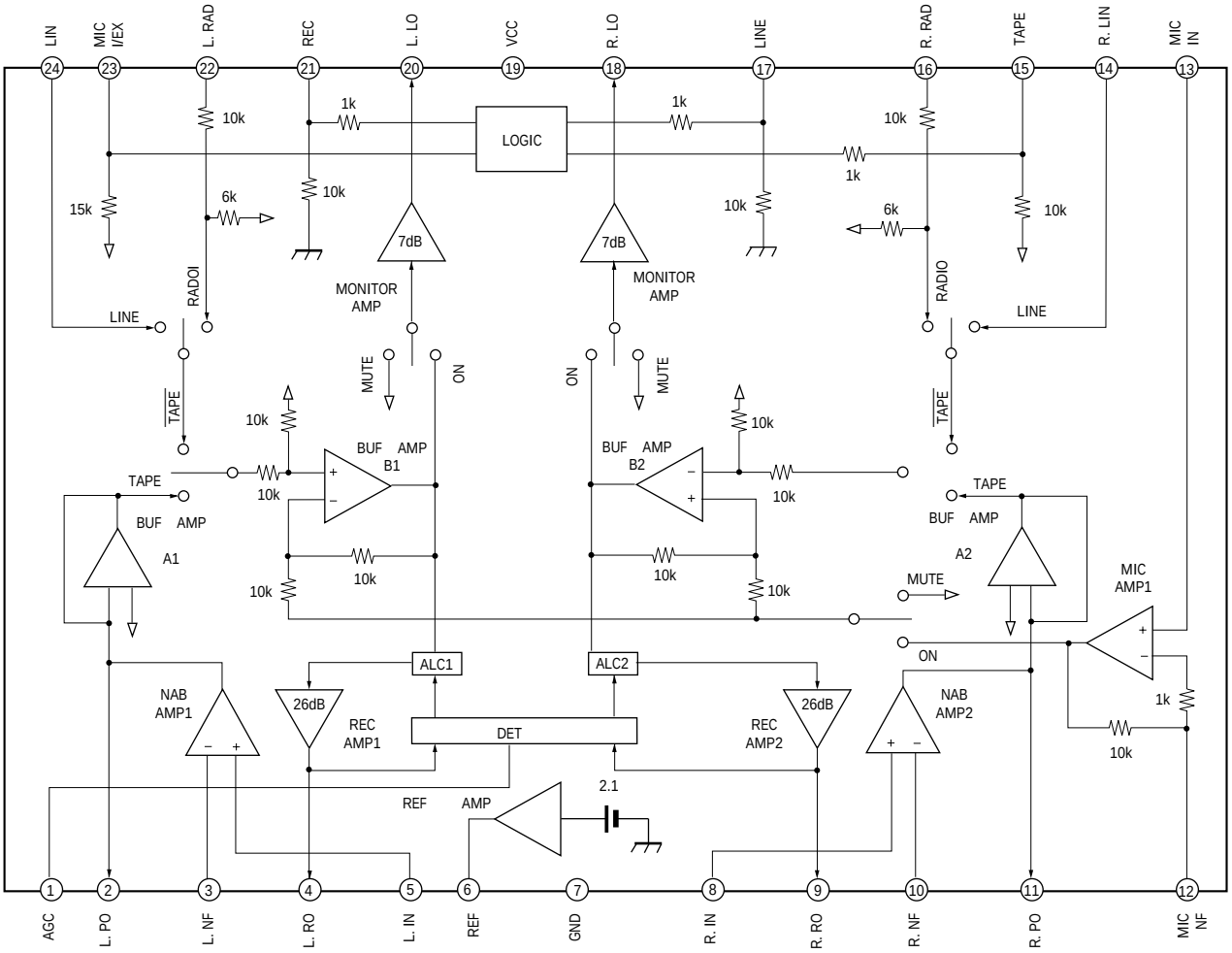
Pin No.	Pin name	I/O	Description
46	MNT3	–	Not used (Open).
47	MNT1	–	Not used (Open).
48	MNT0	–	Not used (Open).
49	C4M	–	Not used (Open).
50	DOUT	–	Not used (Open).
51	EMPHI	–	Not used (Open).
52	WFCK	–	Not used (Open).
53	SCOR	–	Not used (Open).
54	SBSO	–	Not used (Open).
55	EXCK	–	Not used (Open).
56	DTEST	I	Test terminal (Fixed at “L”).
57	CTEST	I	Test terminal (Fixed at “L”).
58	FR	I	⏮ key input.
59	PLAY/PAUSE	I	⏯ key input.
60	FF	I	⏭ key input.
61	STOP	I	■ key input.
62	MODE	I	PLAY MODE key input.
63	DISP/ENTER	I	DISPLAY/ENTER key input.
64	AU MUTE	O	Audio mute signal output.
65	BTL MUTE	O	BTL mute signal output.
66	SENCE2	I	CD SENCE input.
67	REC	I	Function REC input.
68	LIMIT SW	I	LIMIT switch input.
69	OPEN/CLOSE	I	CD door open/close switch input.
70	RMC	–	Not used (Fixed at “H”).
71	DV_{SS}	–	Digital ground.
72	DV_{DD}	–	Digital power supply (+5V).
73	SEG 15	–	Not used (Open).
74	SEG 14	–	Not used (Open).
75 – 88	SEG 0 – 13	O	LCD segment output.
89 – 92	COM 0 – 3	O	LCD common output.
93 – 95	VCL 1 – 3	I	LCD drive device voltage input.
96	$AV_{SS}1$	–	Analog ground.
97	$AV_{DD}1$	–	Analog power supply (+5V).
98	AOUT1	O	Audio output.
99	AIN1	I	Audio input.
100	LOUT1	O	L-CH audio output.
101	$AV_{SS}1$	–	Analog ground.
102	XV_{DD}	–	Oscillator power supply (+5V).
103	XTAI	I	Oscillator connect terminal (16.9344MHz).
104	XTAO	O	Oscillator connect terminal (16.9344MHz).
105	XV_{SS}	–	Oscillator ground.
106	$AV_{SS}2$	–	Analog ground.
107	LOUT2	O	R-CH audio output.
108	AIN2	I	Audio input.
109	AOUT2	O	Audio output.
110	$AV_{DD}2$	–	Digital power supply (+5V).
111	$AV_{SS}2$	–	Ground terminal.
112	NC	–	Not used (Connect to ground).

• IC BLOCK DIAGRAMS (MAIN SECTION)

IC1 CXA1238S

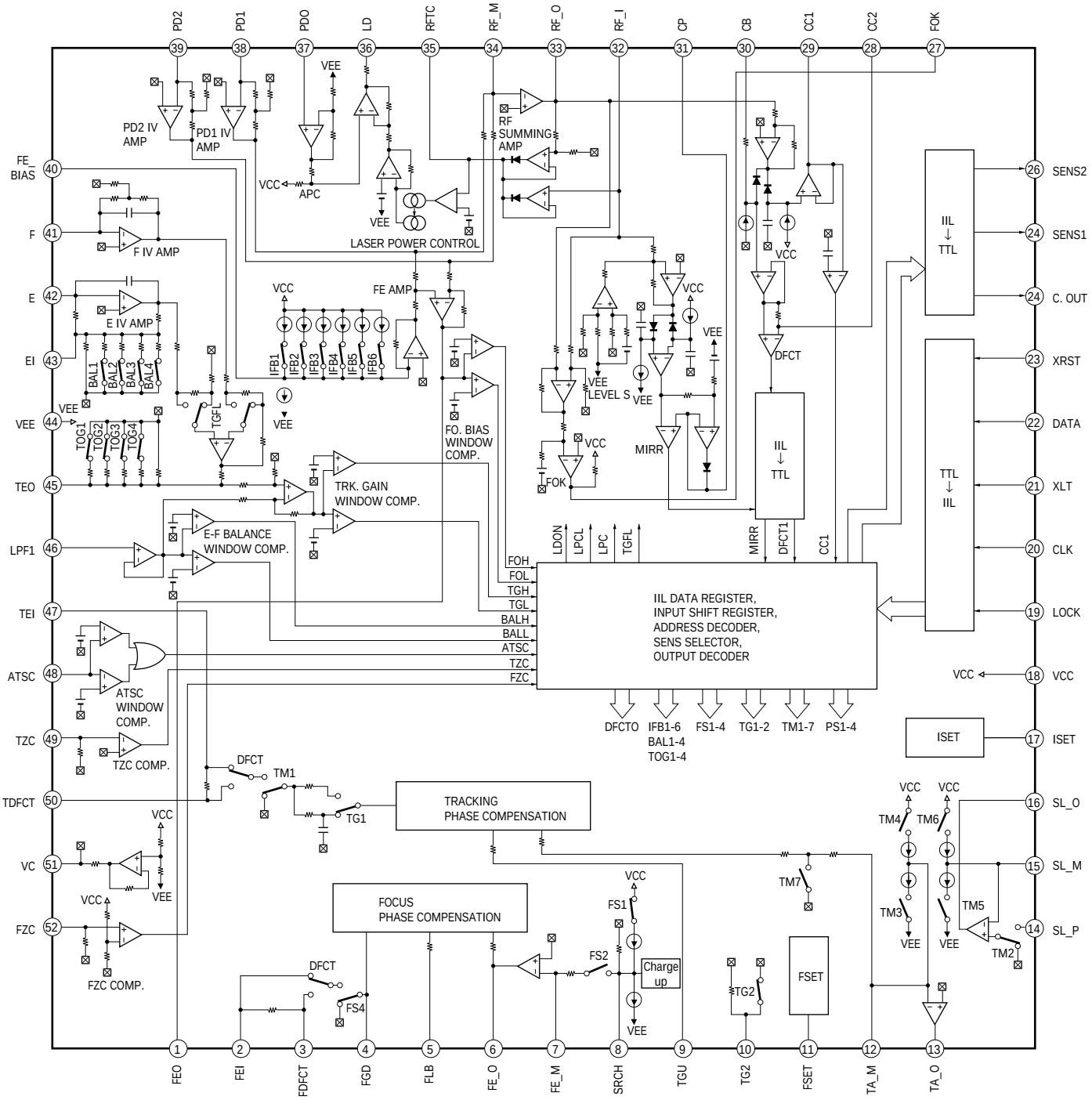


IC301 TA2068N

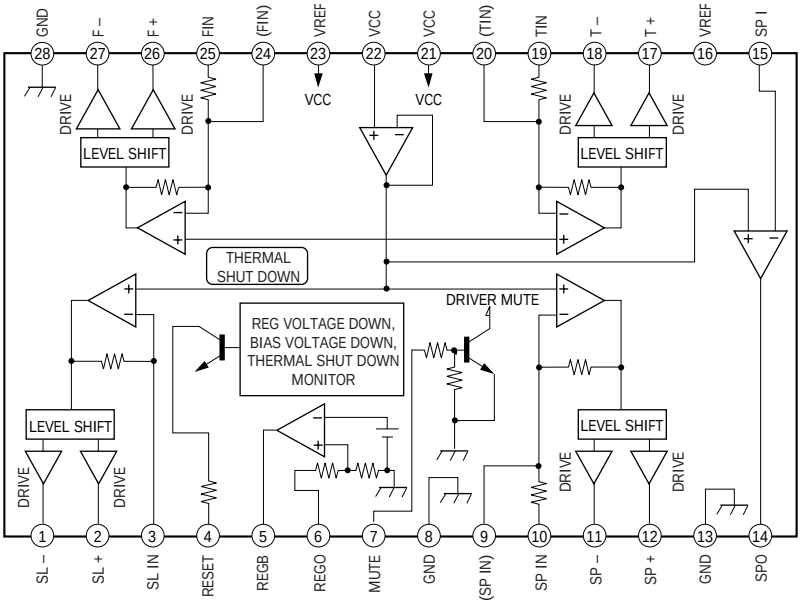


• IC BLOCK DIAGRAMS (CD SECTION)

IC701 CXA1992BR



IC703 BA6898FP



SECTION 7
EXPLODED VIEWS

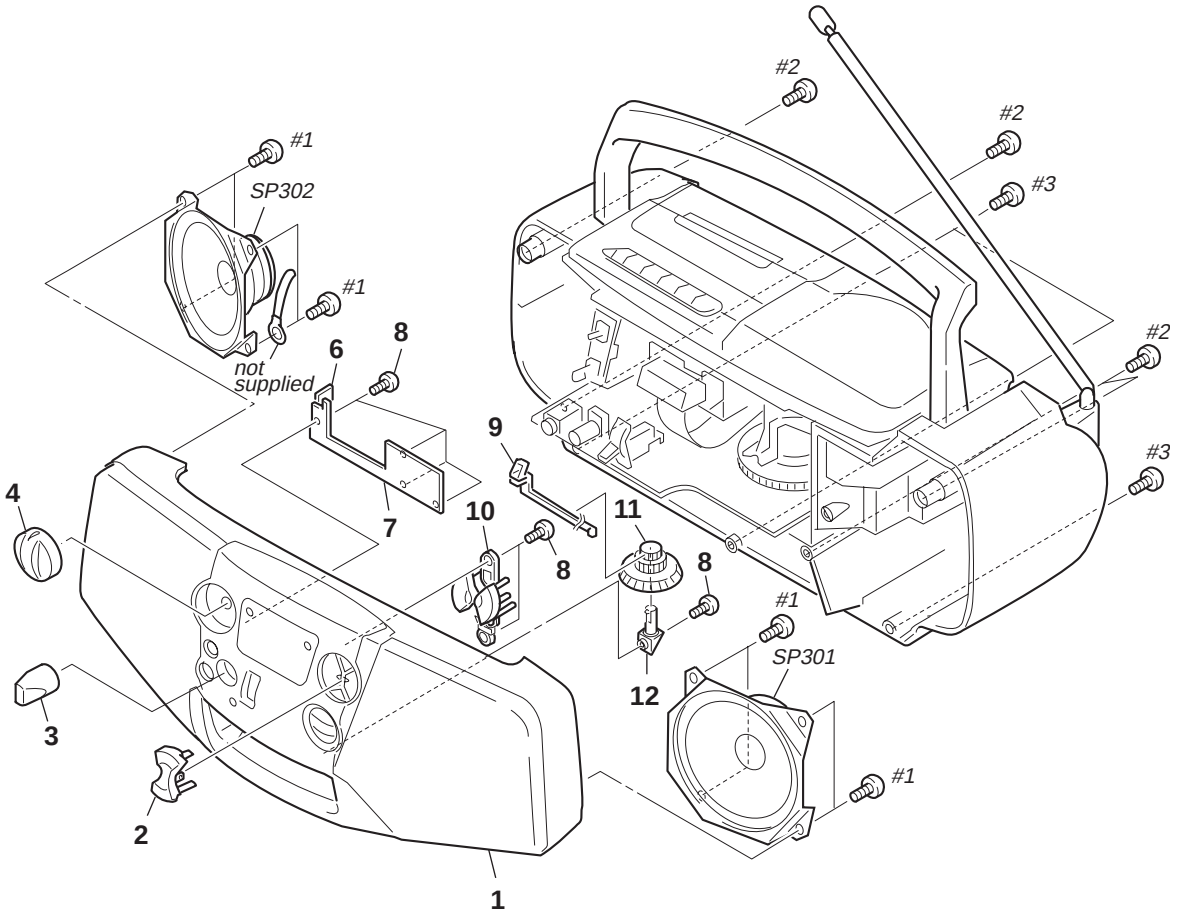
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  KR : Korean model
  SP : Singapore model

When indicating parts by reference number, please include the board name.

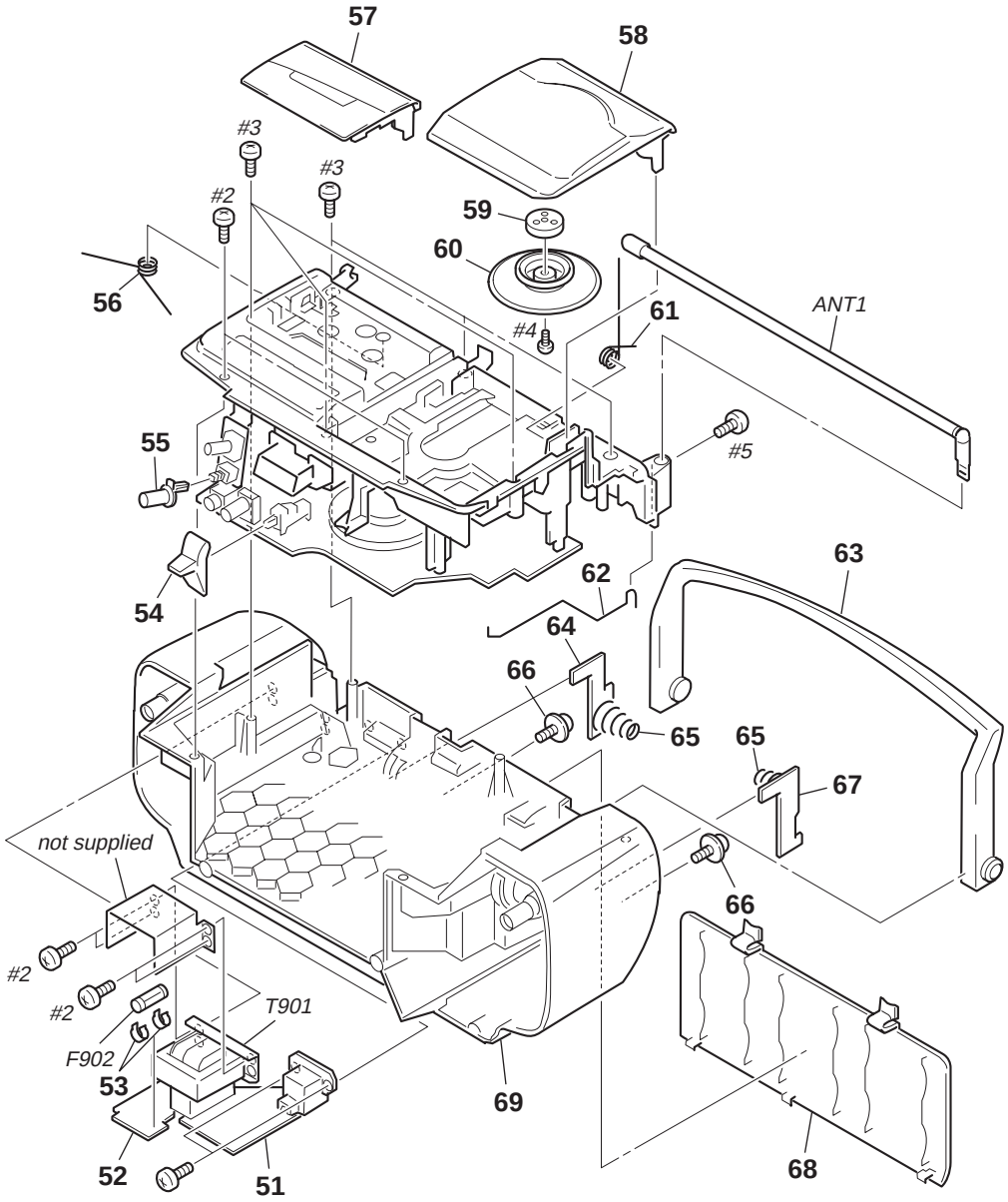
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

7-1. FRONT CABINET SECTION



Ref. No.	Part No.	Description	Remarks
1	X-3377-857-1	CABINET (FRONT) SUB ASSY(KR)	
1	X-3377-859-1	CABINET (FRONT) SUB ASSY(SP)	
2	3-031-547-11	BUTTON (CD) (PLAY/STOP)	
3	3-018-837-41	KNOB (TONE)	
4	3-031-549-11	KNOB (VOL)	
* 6	1-673-259-11	CONNECTOR BOARD	
* 7	1-672-304-11	CONTROL BOARD	
8	4-951-620-01	SCREW (2.6 × 8), +BVTP	
9	3-031-551-01	POINTER	
10	3-031-548-11	BUTTON (CD) (AMS)	
11	3-031-552-11	KNOB (TU)	
12	3-031-558-01	SHAFT (TU)	
SP301	1-529-340-11	SPEAKER R-ch (10cm)	
SP302	1-529-340-11	SPEAKER L-ch (10cm)	

7-2. REAR CABINET SECTION

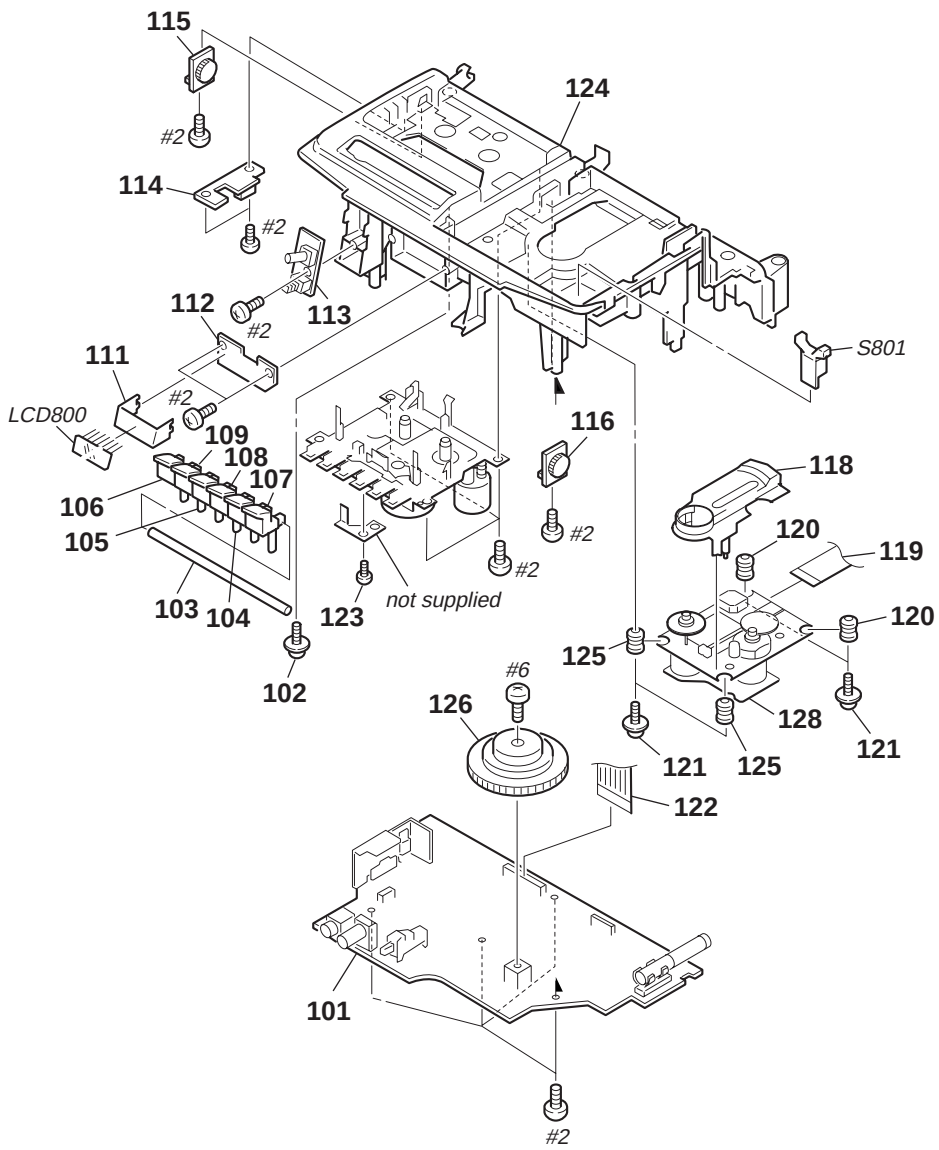


Ref. No.	Part No.	Description	Remarks
* 51	1-672-300-11	INLET BOARD	
* 52	1-672-301-11	POWER BOARD	
53	1-533-233-31	HOLDER, FUSE	
54	3-031-570-11	KNOB (FUNCTION)	
55	3-031-550-01	BUTTON (MEGA BASS)	
56	3-031-561-01	SPRING, CASSETTE UP	
57	X-3376-881-1	HOLDER ASSY, CASSETTE	
58	3-031-538-11	LID (CD)	
59	1-452-899-11	MAGNET	
60	3-019-395-01	PLATE, CHUCKING	
61	3-031-562-01	SPRING (CD)	

Ref. No.	Part No.	Description	Remarks
62	3-031-564-01	TERMINAL (ANT)	
63	3-031-540-11	HANDLE	
* 64	1-672-302-11	BATTERY BOARD	
65	3-028-154-01	TERMINAL (–), BATT	
66	4-960-167-01	SCREW (3 × 8)(DIA. 10), +WH	
* 67	1-672-358-11	HALF BATTERY BOARD	
68	3-926-244-51	LID, BATTERY CASE	
69	3-031-536-81	CABINET (REAR)	
ANT1	1-501-883-21	ANTENNA, TELESCOPIC	
⚠F902	1-532-286-11	FUSE, TIME LAG (2.5A/250V)	
⚠T901	1-433-578-11	TRANSFORMER, POWER	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

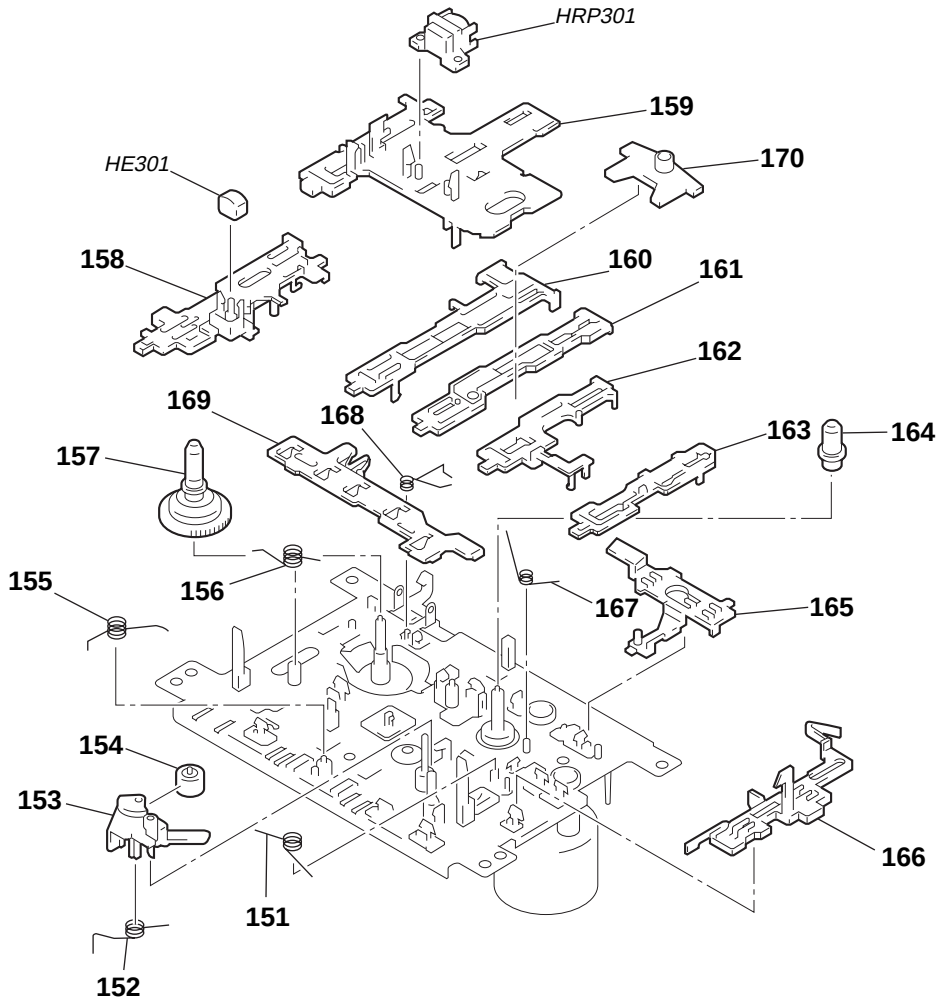
7-3. UPPER CABINET SECTION



Ref. No.	Part No.	Description	Remarks
* 101	A-3321-916-A	MAIN BOARD, COMPLETE	
102	4-960-167-01	SCREW (3 × 8)(DIA.10), +WH	
103	3-031-560-01	SHAFT (MD)	
104	3-031-545-11	BUTTON (STOP)	
105	3-031-543-11	BUTTON (REW)	
106	3-031-541-11	BUTTON (REC)	
107	3-031-546-11	BUTTON (PAUSE)	
108	3-031-544-11	BUTTON (FF)	
109	3-031-542-11	BUTTON (PLAY)	
111	3-018-845-01	HOLDER (406), LCD	
* 112	1-672-303-11	DISPLAY BOARD	
* 113	1-672-305-11	VOLUME BOARD	
* 114	1-672-299-11	RECORD SWITCH BOARD	
115	3-922-112-21	DAMPER	

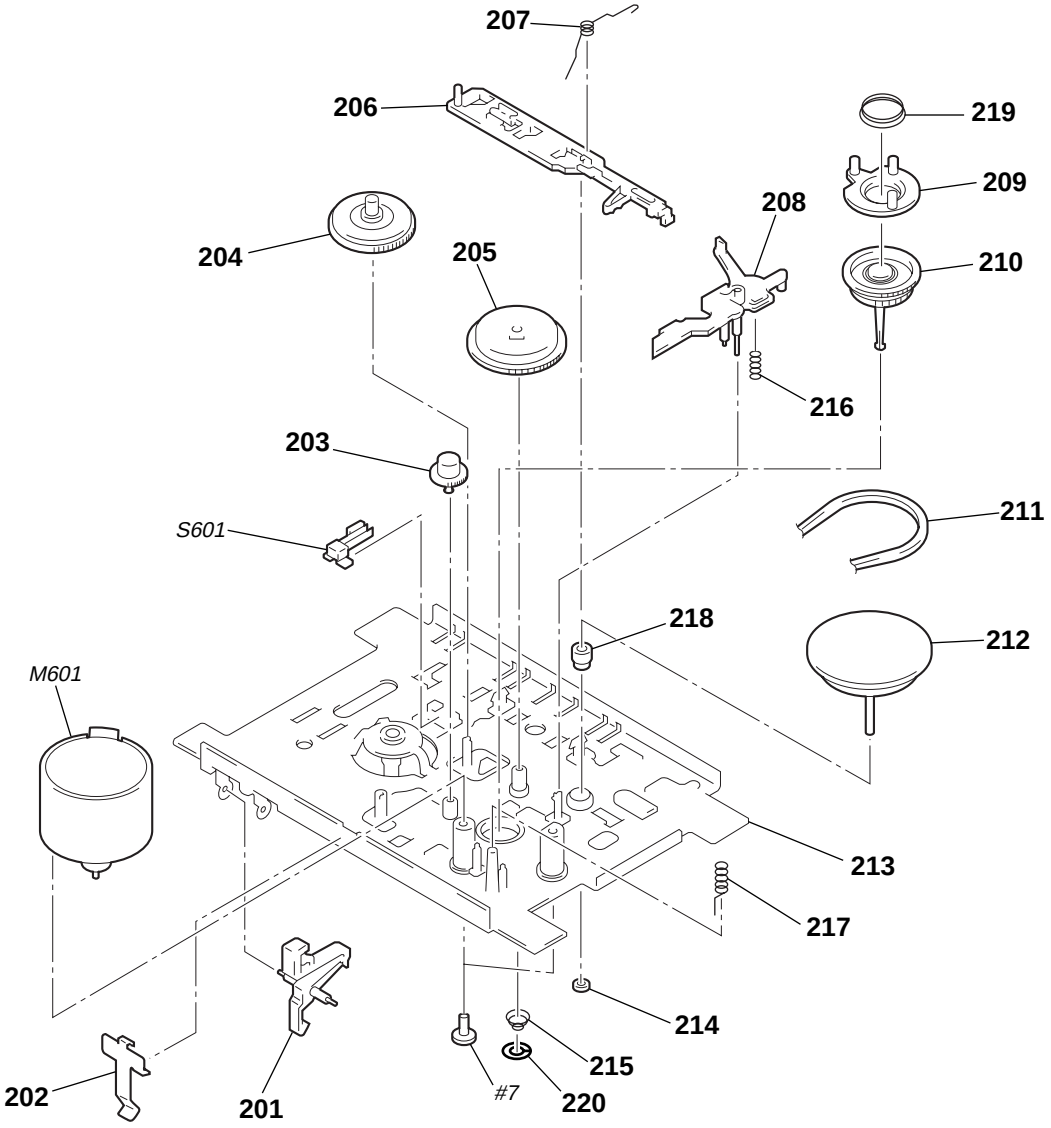
Ref. No.	Part No.	Description	Remarks
116	3-922-112-31	DAMPER	
118	3-923-736-01	COVER, CD	
119	1-777-955-11	WIRE (FLAT TYPE) (16 CORE)	
120	3-910-095-31	RUBBER, VIBRATION PROOF	
121	3-921-725-01	SCREW (2.6 × 10), +PWH	
122	1-773-116-11	WIRE (FLAT TYPE) (19 CORE)	
123	4-951-620-01	SCREW (2.6 × 8), +BVTP	
124	3-031-537-11	CABINET (UPPER)	
125	3-910-095-21	RUBBER, VIBRATION PROOF	
126	3-031-559-01	GEAR (PVC 2 BAND)	
128	1-639-678-12	CD MOTOR BOARD	
LCD800	1-801-913-11	DISPLAY PANEL, LIQUID CRYSTAL	
S801	1-692-960-11	SWITCH, PUSH (1 KEY)	

7-4. MECHANISM DECK SECTION (1)
(MF-V10-117)



Ref. No.	Part No.	Description	Remarks
151	3-933-010-01	SPRING (S/P), TORSION	
152	3-933-025-01	SPRING (P), TORSION	
153	3-933-026-01	LEVER (P)	
154	3-933-024-01	ROLLER, PINCH	
155	3-933-019-01	SPRING (F/R), TORSION	
156	3-933-028-01	SPRING (FWD), TORSION	
157	3-933-016-01	GEAR (S REEL)	
158	3-008-590-01	SLIDER (REC)	
159	3-008-592-01	BASE (H), HEAD	
* 160	3-008-588-01	SLIDER (REW)	
* 161	3-008-589-13	SLIDER (FF)	
* 162	3-008-587-01	SLIDER (STOP)	
* 163	3-008-591-01	SLIDER (PAUSE)	
164	3-933-004-01	CLAW, REEL	
* 165	3-933-021-01	SLIDER (FRP)	
* 166	3-933-006-01	SLIDER (EJECT)	
167	3-934-833-01	SPRING (FRP)	
168	3-022-794-02	SPRING (BT)	
169	3-933-007-01	PLATE, LOCK	
* 170	3-012-114-01	LEVER (FR)	
HE301	1-543-876-11	HEAD (ERASE)	
HRP301	1-500-454-11	HEAD, MAGNETIC(RECORD/PLAYBACK)	

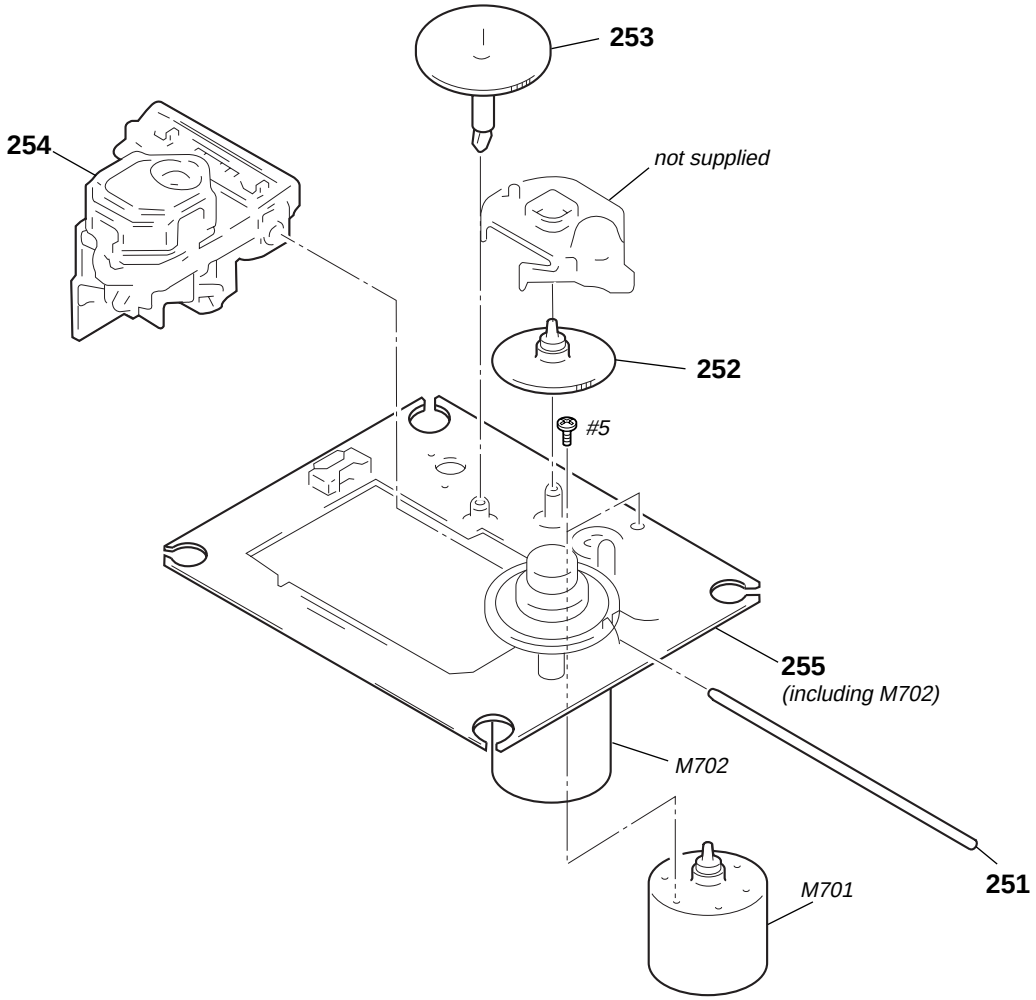
7-5. MECHANISM DECK SECTION (2)
(MF-V10-117)



Ref. No.	Part No.	Description	Remarks
201	3-933-029-01	LEVER, ERASING PREVENTION	
202	3-933-182-01	SPRING, CASSETTE	
203	3-932-995-01	GEAR (MID)	
204	X-3371-667-1	CLUTCH ASSY	
205	3-932-997-01	GEAR (CAM)	
* 206	3-932-999-01	SLIDER (SW)	
207	3-932-998-01	SPRING (GROUND), TORSION	
208	3-009-648-01	LEVER (S.OFF)	
209	3-936-438-01	LEVER (K)	
210	X-3373-572-1	REEL ASSY (N), T	
211	3-933-020-01	BELT	

Ref. No.	Part No.	Description	Remarks
212	X-3372-924-1	FLYWHEEL ASSY	
213	3-932-993-01	CHASSIS, OUTSERT	
214	3-343-358-01	RING, RETAINING	
215	3-933-005-01	SPRING (CAM), COMPRESSION	
216	3-939-383-02	SPRING, COMPRESSION	
217	3-937-760-01	SPRING (GROUND), COMPRESSION	
218	3-934-336-01	BEARING	
219	3-009-650-02	SPRING (K), COMPRESSION	
220	3-016-349-01	WASHER	
M601	A-3320-446-A	MOTOR ASSY (LOADING) (WITH PULLEY)	
S601	1-762-679-11	SWITCH, LEAF (MD POWER)	

7-6. OPTICAL PICK-UP SECTION (KSM-213CDM)



Ref. No.	Part No.	Description	Remarks
251	2-626-908-01	SHAFT, SLED	
252	2-627-003-02	GEAR (B)(RP)	
253	2-626-907-01	GEAR (A)(S)	

Ref. No.	Part No.	Description	Remarks
⚠254	8-848-483-05	OPTICAL PICK-UP KSS-213CDM	
255	X-2626-202-1	CHASSIS ASSY (MB)(RP),MOTOR(SPINDLE) (INCLUDING M702)	
M701	X-2625-769-1	GEAR ASSY (MB)(RP),MOTOR (SLED)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SECTION 8
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- Abbreviation
  KR : Korea model
  SP : Singapore model
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
*	1-639-678-12	CD MOTOR BOARD	
		**********	
		< CONNECTOR>	
CNP707	1-564-722-11	PIN, CONNECTOR (SMALL TYPE) 6P	
		< SWITCH >	
S701	1-572-085-11	SWITCH, LEAF (LIMIT)	
**********			
*	1-673-259-11	CONNECTOR BOARD	
		**********	
		< CONNECTOR >	
* CNP803	1-785-673-11	PIN, CONNECTOR (L) 7P	
**********			
*	1-672-304-11	CONTROL BOARD	
		**********	
		< SWITCH >	
S801	1-762-798-11	SWITCH, KEYBOARD (MODE)	
S802	1-762-798-11	SWITCH, KEYBOARD (DISPLAY/ENTER)	
S803	1-762-798-11	SWITCH, KEYBOARD (PLAY)	
S804	1-762-798-11	SWITCH, KEYBOARD (STOP)	
S805	1-762-798-11	SWITCH, KEYBOARD (FR)	
S806	1-762-798-11	SWITCH, KEYBOARD (FF)	
**********			
*	1-672-302-11	BATTERY BOARD	
		**********	
	3-028-154-01	TERMINAL (–), BATT	
**********			
*	1-672-358-11	HALF BATTERY BOARD	
		**********	
	3-028-154-01	TERMINAL (–), BATT	
		< CONNECTOR >	
* CNP908	1-785-668-11	PIN, CONNECTOR (L) 2P	
**********			

Ref. No.	Part No.	Description		Remarks
*	1-672-301-11	POWER BOARD		
		**********		
		< CAPACITOR >		
C901	1-101-005-00	CERAMIC	0.022uF	50V
C902	1-101-005-00	CERAMIC	0.022uF	50V
C903	1-101-005-00	CERAMIC	0.022uF	50V
C904	1-101-005-00	CERAMIC	0.022uF	50V
		< DIODE >		
D901	8-719-063-79	DIODE 1N4002B		
D902	8-719-063-79	DIODE 1N4002B		
D903	8-719-063-79	DIODE 1N4002B		
D904	8-719-063-79	DIODE 1N4002B		
		< FUSE >		
⚠F902	1-532-286-11	FUSE ,TIME LAG (2.5A/250V)		
		< FUSE HOLDER >		
FH901	1-533-233-31	HOLDER, FUSE		
FH902	1-533-233-31	HOLDER, FUSE		
		< CABLE HOLDER >		
* KH904	1-573-287-11	HOLDER, CABLE 2P		
**********				
*	1-672-299-11	RECORD SWITCH BOARD		
		**********		
		< CONNECTOR >		
* CNP302	1-785-656-11	PIN, CONNECTOR 4P		
		< SWITCH >		
S301	1-762-565-11	SWITCH, SLIDE (REC/PB)		
**********				

Ref. No.	Part No.	Description	Remarks
*	1-672-305-11	VOLUME BOARD **********	
		< CABLE HOLDER >	
* KH307	1-568-135-21	HOLDER, CABLE 7P	
		< RESISTOR >	
R308	1-249-417-11	CARBON 1K 5% 1/4W F	
		< VARIABLE RESISTOR >	
RV352	1-225-764-11	RES, VAR, CARBON (VOLUME)	
		< SWITCH >	
S355	1-762-950-11	SWITCH, PUSH (1 KEY)(MEGA BASS)	
**********			
*	1-672-303-11	DISPLAY BOARD **********	
	3-018-845-01	HOLDER (406), LCD	
		< CONNECTOR >	
CNP801	1-695-380-31	PIN, CONNECTOR (PC BOARD) 19P	
		< LIQUID CRYSTAL DISPLAY >	
LCD800	1-801-913-11	DISPLAY PANEL, LIQUID CRYSTAL	
**********			
*	1-672-300-11	INLET BOARD **********	
		< CONNECTOR >	
* CNP902	1-785-670-11	PIN, CONNECTOR (L) 4P	
* CNP907	1-785-655-11	PIN, CONNECTOR 3P	
		< JACK >	
J901	1-526-838-11	INLET, AC 2P	
		< CABLE HOLDER >	
* KH901	1-573-287-11	HOLDER, CABLE 2P	
		< RESISTOR >	
R901	1-249-421-11	CARBON 2.2K 5% 1/4W F	
**********			

Ref. No.	Part No.	Description	Remarks
*	A-3321-916-A	MAIN BOARD, COMPLETE **********	
	7-621-775-20	SCREW +B 2.6 × 5	
	7-685-647-79	SCREW +BVTP 3 × 10 TYPE2 N-S	
		< CAPACITOR >	
C1	1-162-215-31	CERAMIC 47PF 5% 50V	
C2	1-162-306-11	CERAMIC 0.01uF 20% 16V	
C3	1-104-664-11	ELECT 47uF 20% 10V	
C5	1-162-205-31	CERAMIC 18PF 5% 50V	
C6	1-102-962-00	CERAMIC 30PF 5% 50V	
C7	1-162-196-31	CERAMIC 5.6PF 10% 50V	
C8	1-162-191-31	CERAMIC 2.2PF 10% 50V	
C9	1-162-306-11	CERAMIC 0.01uF 20% 16V	
C11	1-126-963-11	ELECT 4.7uF 20% 50V	
C12	1-124-903-11	ELECT 1uF 20% 50V	
C13	1-104-664-11	ELECT 47uF 20% 10V	
C14	1-104-664-11	ELECT 47uF 20% 10V	
C15	1-162-306-11	CERAMIC 0.01uF 20% 16V	
C16	1-126-961-11	ELECT 2.2uF 20% 50V	
C17	1-104-664-11	ELECT 47uF 20% 10V	
C18	1-127-876-21	CERAMIC 0.01uF 10% 50V	
C19	1-127-876-21	CERAMIC 0.01uF 10% 50V	
C20	1-162-306-11	CERAMIC 0.01uF 20% 16V	
C21	1-162-205-31	CERAMIC 18PF 5% 50V	
C22	1-124-903-11	ELECT 1uF 20% 50V	
C23	1-124-902-00	ELECT 0.47uF 20% 50V	
C24	1-126-963-11	ELECT 4.7uF 20% 50V	
C26	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C28	1-162-306-11	CERAMIC 0.01uF 20% 16V	
C101	1-162-301-11	CERAMIC 0.0015uF 20% 16V	
C102	1-104-664-11	ELECT 47uF 20% 10V	
C103	1-127-883-21	CERAMIC 0.039uF 10% 50V	
C104	1-162-302-11	CERAMIC 0.0022uF 0% 16V	
C105	1-162-215-31	CERAMIC 47PF 5% 50V	
C108	1-124-902-00	ELECT 0.47uF 20% 50V	
C109	1-124-903-11	ELECT 1uF 20% 50V	
C121	1-124-903-11	ELECT 1uF 20% 50V	
C122	1-127-885-21	CERAMIC 0.056uF 10% 50V	
C140	1-124-252-00	ELECT 0.33uF 20% 50V	
C151	1-104-664-11	ELECT 47uF 20% 10V	
C152	1-162-290-31	CERAMIC 470PF 10% 50V	
C153	1-124-443-00	ELECT 100uF 20% 10V	
C154	1-124-473-11	ELECT 1000uF 20% 10V	
C155	1-136-165-00	FILM 0.1uF 5% 50V	
C157	1-127-883-21	CERAMIC 0.039uF 10% 50V	
C158	1-162-302-11	CERAMIC 0.0022uF 20% 16V	
C201	1-162-301-11	CERAMIC 0.0015uF 20% 16V	
C202	1-104-664-11	ELECT 47uF 20% 10V	
C203	1-127-883-21	CERAMIC 0.039uF 10% 50V	
C204	1-162-302-11	CERAMIC 0.0022uF 20% 16V	
C205	1-162-215-31	CERAMIC 47PF 5% 50V	
C208	1-124-902-00	ELECT 0.47uF 20% 50V	
C209	1-124-903-11	ELECT 1uF 20% 50V	
C221	1-124-903-11	ELECT 1uF 20% 50V	
C222	1-127-885-21	CERAMIC 0.056uF 10% 50V	

MAIN

Ref. No.	Part No.	Description			Remarks
C240	1-124-252-00	ELECT	0.33uF	20%	50V
C251	1-104-664-11	ELECT	47uF	20%	10V
C252	1-162-290-31	CERAMIC	470PF	10%	50V
C253	1-124-443-00	ELECT	100uF	20%	10V
C254	1-124-473-11	ELECT	1000uF	20%	10V
C255	1-136-165-00	FILM	0.1uF	5%	50V
C257	1-127-883-21	CERAMIC	0.039uF	10%	50V
C258	1-162-302-11	CERAMIC	0.0022uF	20%	16V
C301	1-124-443-00	ELECT	100uF	20%	10V
C302	1-124-443-00	ELECT	100uF	20%	10V
C303	1-124-907-11	ELECT	10uF	20%	50V
C304	1-124-443-00	ELECT	100uF	20%	10V
C311	1-162-301-11	CERAMIC	0.0015uF	20%	16V
C312	1-104-664-11	ELECT	47uF	20%	10V
C313	1-137-431-11	FILM	560PF	5%	50V
C314	1-104-663-11	ELECT	33uF	20%	16V
C315	1-162-306-11	CERAMIC	0.01uF	20%	16V
C316	1-126-962-11	ELECT	3.3uF	20%	50V
C317	1-126-233-11	ELECT	22uF	20%	50V
C320	1-101-005-00	CERAMIC	0.022uF		50V
C341	1-126-937-11	ELECT	4700uF	20%	16V
C343	1-162-306-11	CERAMIC	0.01uF	20%	16V
C345	1-162-306-11	CERAMIC	0.01uF	20%	16V
C346	1-162-306-11	CERAMIC	0.01uF	20%	16V
C347	1-126-925-11	ELECT	470uF	20%	10V
C348	1-104-666-11	ELECT	220uF	20%	10V
C351	1-104-664-11	ELECT	47uF	20%	10V
C352	1-162-290-31	CERAMIC	470PF	10%	50V
C359	1-162-306-11	CERAMIC	0.01uF	20%	16V
C401	1-124-903-11	ELECT	1uF	20%	50V
C701	1-162-600-11	CERAMIC	0.0047uF	20%	16V
C702	1-162-306-11	CERAMIC	0.01uF	20%	16V
C703	1-162-305-11	CERAMIC	0.0068uF	20%	16V
C704	1-137-374-11	FILM	0.047uF	5%	50V
C705	1-162-306-11	CERAMIC	0.01uF	20%	16V
C706	1-104-664-11	ELECT	47uF	20%	10V
C707	1-161-494-00	CERAMIC	0.022uF		25V
C708	1-136-165-00	FILM	0.1uF	5%	50V
C709	1-136-165-00	FILM	0.1uF	5%	50V
C710	1-162-302-11	CERAMIC	0.0022uF	20%	16V
C711	1-162-203-31	CERAMIC	15PF	5%	50V
C712	1-162-294-31	CERAMIC	0.001uF	10%	50V
C713	1-136-165-00	FILM	0.1uF	5%	50V
C714	1-136-165-00	FILM	0.1uF	5%	50V
C715	1-124-907-11	ELECT	10uF	20%	50V
C716	1-136-165-00	FILM	0.1uF	5%	50V
C717	1-130-483-00	MYLAR	0.01uF	5%	50V
C718	1-131-377-00	TANTALUM	10uF	10%	10V
C719	1-104-664-11	ELECT	47uF	20%	10V
C720	1-162-306-11	CERAMIC	0.01uF	20%	16V
C721	1-130-483-00	MYLAR	0.01uF	5%	50V
C722	1-130-489-00	MYLAR	0.033uF	5%	50V
C723	1-162-306-11	CERAMIC	0.01uF	20%	16V
C724	1-130-489-00	MYLAR	0.033uF	5%	50V
C725	1-130-486-00	MYLAR	0.018uF	10%	50V
C726	1-162-306-11	CERAMIC	0.01uF	20%	16V
C727	1-162-199-31	CERAMIC	10PF	5%	50V
C728	1-104-664-11	ELECT	47uF	20%	10V
C729	1-126-962-11	ELECT	3.3uF	20%	50V
C730	1-130-493-00	MYLAR	0.068uF	5%	50V

Ref. No.	Part No.	Description			Remarks
C731	1-162-215-31	CERAMIC	47PF	5%	50V
C732	1-162-306-11	CERAMIC	0.01uF	20%	16V
C733	1-162-282-31	CERAMIC	100PF	10%	50V
C734	1-162-282-31	CERAMIC	100PF	10%	50V
C735	1-162-282-31	CERAMIC	100PF	10%	50V
C736	1-162-294-31	CERAMIC	0.001uF	10%	50V
C737	1-161-494-00	CERAMIC	0.022uF		25V
C739	1-162-282-31	CERAMIC	100PF	10%	50V
C740	1-162-282-31	CERAMIC	100PF	10%	50V
C741	1-127-878-21	CERAMIC	0.015uF	10%	50V
C742	1-162-306-11	CERAMIC	0.01uF	20%	16V
C743	1-104-664-11	ELECT	47uF	20%	10V
C744	1-126-925-11	ELECT	470uF	20%	10V
C761	1-162-294-31	CERAMIC	0.001uF	10%	50V
C799	1-130-489-00	MYLAR	0.033uF	5%	50V
C801	1-104-664-11	ELECT	47uF	20%	10V
C802	1-126-233-11	ELECT	22uF	20%	50V
C805	1-126-963-11	ELECT	4.7uF	20%	50V
C806	1-126-963-11	ELECT	4.7uF	20%	50V
C807	1-162-292-31	CERAMIC	680PF	10%	50V
C808	1-162-292-31	CERAMIC	680PF	10%	50V
C809	1-162-284-31	CERAMIC	150PF	10%	50V
C810	1-162-284-31	CERAMIC	150PF	10%	50V
C811	1-124-907-11	ELECT	10uF	20%	50V
C812	1-162-306-11	CERAMIC	0.01uF	20%	16V
C814	1-162-306-11	CERAMIC	0.01uF	20%	16V
C815	1-162-203-31	CERAMIC	15PF	5%	50V
C816	1-162-203-31	CERAMIC	15PF	5%	50V
C817	1-162-306-11	CERAMIC	0.01uF	20%	16V
C818	1-162-306-11	CERAMIC	0.01uF	20%	16V
C819	1-162-306-11	CERAMIC	0.01uF	20%	16V
C820	1-137-194-81	FILM	0.47uF	5%	50V
C821	1-162-306-11	CERAMIC	0.01uF	20%	16V
C822	1-162-290-31	CERAMIC	470PF	10%	50V
C823	1-162-286-21	CERAMIC	220PF	10%	50V
C824	1-136-169-00	FILM	0.22uF	5%	50V
C825	1-162-306-11	CERAMIC	0.01uF	20%	16V
C826	1-162-306-11	CERAMIC	0.01uF	20%	16V
C828	1-162-306-11	CERAMIC	0.01uF	20%	16V
C829	1-162-306-11	CERAMIC	0.01uF	20%	16V
C831	1-162-306-11	CERAMIC	0.01uF	20%	16V

< CERAMIC FILTER >

CF1	1-760-738-61	FILTER, CERAMIC (FM IF)
CF2	1-577-072-11	FILTER, CERAMIC (AM IF)

< CONNECTOR >

* CNP301	1-785-656-11	PIN, CONNECTOR 4P
* CNP303	1-785-656-11	PIN, CONNECTOR 4P
* CNP304	1-785-656-11	PIN, CONNECTOR 4P
CNP702	1-770-646-11	CONNECTOR, FFC/FPC 16P
CNP802	1-695-342-31	PIN, CONNECTOR (PC BOARD) 19P

< VARIABLE CAPACITOR >

CV1	1-141-561-11	CAP, VAR
CT1-4	1-141-561-11	CAP, VAR (INCLUDING CV1)

Ref. No.	Part No.	Description	Remarks
		< DIODE >	
D1	8-719-991-33	DIODE 1SS133T-77	
D2	8-719-991-33	DIODE 1SS133T-77	
D301	8-719-991-33	DIODE 1SS133T-77	
D302	8-719-991-33	DIODE 1SS133T-77	
D303	8-719-991-33	DIODE 1SS133T-77	
D304	8-719-991-33	DIODE 1SS133T-77	
D307	8-719-991-33	DIODE 1SS133T-77	
D308	8-719-109-89	DIODE RD5.6ESB2	
D309	8-719-991-33	DIODE 1SS133T-77	
D310	8-719-059-97	LED L-34HD	
D311	8-719-109-97	DIODE RD6.8ES-B2	
D312	8-719-991-33	DIODE 1SS133T-77	
D314	8-719-991-33	DIODE 1SS133T-77	
D401	8-719-991-33	DIODE 1SS133T-77	
D402	8-719-991-33	DIODE 1SS133T-77	
D403	8-719-991-33	DIODE 1SS133T-77	
D404	8-719-991-33	DIODE 1SS133T-77	
D406	8-719-991-33	DIODE 1SS133T-77	
D407	8-719-991-33	DIODE 1SS133T-77	
D408	8-719-991-33	DIODE 1SS133T-77	
D409	8-719-991-33	DIODE 1SS133T-77	
D410	8-719-991-33	DIODE 1SS133T-77	
D411	8-719-991-33	DIODE 1SS133T-77	
D801	8-719-991-33	DIODE 1SS133T-77	
		< FERRITE BEAD >	
FB151	1-412-911-11	FERRITE 0uH	
FB251	1-412-911-11	FERRITE 0uH	
FB351	1-412-911-11	FERRITE 0uH	
		< IC >	
IC1	8-752-050-20	IC CXA1238S	
IC301	8-759-264-71	IC TA2068N	
IC304	8-759-426-51	IC BA5417	
IC701	8-752-082-14	IC CXA1992BR	
IC702	8-752-891-81	IC CXP401-602R	
IC703	8-759-473-42	IC BA6898FP	
		< FERRITE BEAD >	
JW303	1-412-911-11	FERRITE 0uH	
		< JACK >	
J301	1-568-267-11	JACK (HEADP0HONES)	
		< CABLE HOLDER >	
* KH306	1-565-386-11	HOLDER, CABLE 5P	
* KH308	1-573-287-11	HOLDER, CABLE 2P	
* KH803	1-568-135-21	HOLDER, CABLE 7P	
* KH804	1-573-287-11	HOLDER, CABLE 2P	
* KH902	1-565-385-11	HOLDER, CABLE 4P	
		< COIL >	
L1	1-406-999-11	COIL, AIR-CORE	
L2	1-416-570-11	COIL, AIR-CORE	
L3	1-501-841-11	ANTENNA, FERRITE-ROD (MW)	
L4	1-406-040-00	COIL (AM OSC)	
L701	1-412-911-11	FERRITE 0uH	

Ref. No.	Part No.	Description	Remarks
		< TRANSISTOR >	
Q1	8-729-036-57	TRANSISTOR KRC101M-AT	
Q101	8-729-036-80	TRANSISTOR KRC110M	
Q102	8-729-194-57	TRANSISTOR 2SC945-P	
Q103	8-729-194-57	TRANSISTOR 2SC945-P	
Q201	8-729-036-80	TRANSISTOR KRC110M	
Q202	8-729-194-57	TRANSISTOR 2SC945-P	
Q203	8-729-194-57	TRANSISTOR 2SC945-P	
Q301	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q307	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q308	8-729-036-57	TRANSISTOR KRC101M-AT	
Q309	8-729-021-82	TRANSISTOR 2SD2396K	
Q310	8-729-036-86	TRANSISTOR KTC3203Y-AT	
Q401	8-729-036-77	TRANSISTOR KRC107M	
Q402	8-729-036-77	TRANSISTOR KRC107M	
Q403	8-729-036-77	TRANSISTOR KRC107M	
Q404	8-729-230-45	TRANSISTOR 2SC2458-YGR	
Q405	8-729-037-29	TRANSISTOR KRA102M	
Q406	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q407	8-729-036-77	TRANSISTOR KRC107M	
Q408	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q409	8-729-036-86	TRANSISTOR KTC3203Y-AT	
Q701	8-729-037-13	TRANSISTOR KTA1271Y	
Q801	8-729-036-67	TRANSISTOR KRC111M-AT	
		< RESISTOR >	
R1	1-247-815-91	CARBON 220 5% 1/4W	
R2	1-249-421-11	CARBON 2.2K 5% 1/4W	F
R3	1-249-441-11	CARBON 100K 5% 1/4W	
R5	1-249-411-11	CARBON 330 5% 1/4W	
R6	1-249-403-11	CARBON 68 5% 1/4W	F
R7	1-249-427-11	CARBON 6.8K 5% 1/4W	F
R8	1-249-427-11	CARBON 6.8K 5% 1/4W	F
R13	1-249-421-11	CARBON 2.2K 5% 1/4W	F
R14	1-249-429-11	CARBON 10K 5% 1/4W	
R16	1-249-429-11	CARBON 10K 5% 1/4W	
R101	1-249-431-11	CARBON 15K 5% 1/4W	
R102	1-249-404-00	CARBON 82 5% 1/4W	F
R103	1-249-441-11	CARBON 100K 5% 1/4W	
R104	1-247-843-11	CARBON 3.3K 5% 1/4W	
R105	1-249-434-11	CARBON 27K 5% 1/4W	
R106	1-249-421-11	CARBON 2.2K 5% 1/4W	F
R109	1-249-426-11	CARBON 5.6K 5% 1/4W	
R110	1-247-807-31	CARBON 100 5% 1/4W	
R121	1-249-417-11	CARBON 1K 5% 1/4W	F
R122	1-247-843-11	CARBON 3.3K 5% 1/4W	
R123	1-247-895-91	CARBON 470K 5% 1/4W	
R124	1-247-815-91	CARBON 220 5% 1/4W	
R140	1-249-441-11	CARBON 100K 5% 1/4W	
R141	1-249-421-11	CARBON 2.2K 5% 1/4W	F
R143	1-249-429-11	CARBON 10K 5% 1/4W	
R151	1-249-417-11	CARBON 1K 5% 1/4W	F
R153	1-247-815-91	CARBON 220 5% 1/4W	
R154	1-247-807-31	CARBON 100 5% 1/4W	
R155	1-249-431-11	CARBON 15K 5% 1/4W	
R156	1-249-437-11	CARBON 47K 5% 1/4W	

MAIN

Ref. No.	Part No.	Description			Remarks
R201	1-249-431-11	CARBON	15K	5%	1/4W
R202	1-249-404-00	CARBON	82	5%	1/4W F
R203	1-249-441-11	CARBON	100K	5%	1/4W
R204	1-247-843-11	CARBON	3.3K	5%	1/4W
R205	1-249-434-11	CARBON	27K	5%	1/4W
R206	1-249-421-11	CARBON	2.2K	5%	1/4W F
R209	1-249-426-11	CARBON	5.6K	5%	1/4W
R210	1-247-807-31	CARBON	100	5%	1/4W
R221	1-249-417-11	CARBON	1K	5%	1/4W F
R222	1-247-843-11	CARBON	3.3K	5%	1/4W
R223	1-247-895-91	CARBON	470K	5%	1/4W
R224	1-247-815-91	CARBON	220	5%	1/4W
R240	1-249-441-11	CARBON	100K	5%	1/4W
R241	1-249-421-11	CARBON	2.2K	5%	1/4W F
R243	1-249-429-11	CARBON	10K	5%	1/4W
R251	1-249-417-11	CARBON	1K	5%	1/4W F
R253	1-247-815-91	CARBON	220	5%	1/4W
R254	1-247-807-31	CARBON	100	5%	1/4W
R255	1-249-431-11	CARBON	15K	5%	1/4W
R256	1-249-437-11	CARBON	47K	5%	1/4W
R301	1-247-903-00	CARBON	1M	5%	1/4W
R302	1-249-441-11	CARBON	100K	5%	1/4W
R303	1-249-417-11	CARBON	1K	5%	1/4W F
R305	1-247-903-00	CARBON	1M	5%	1/4W
R306	1-249-429-11	CARBON	10K	5%	1/4W
R307	1-249-429-11	CARBON	10K	5%	1/4W
R309	1-249-417-11	CARBON	1K	5%	1/4W F
R311	1-247-810-11	CARBON	130	5%	1/4W
R312	1-249-427-11	CARBON	6.8K	5%	1/4W F
R313	1-249-393-11	CARBON	10	5%	1/4W F
R314	1-249-425-11	CARBON	4.7K	5%	1/4W F
R315	1-247-863-91	CARBON	22K	5%	1/4W
R319	1-249-425-11	CARBON	4.7K	5%	1/4W F
R341	1-249-437-11	CARBON	47K	5%	1/4W
R342	1-249-419-11	CARBON	1.5K	5%	1/4W F
R343	1-249-415-11	CARBON	680	5%	1/4W F
R344	1-247-815-91	CARBON	220	5%	1/4W
R345	1-247-815-91	CARBON	220	5%	1/4W
R346	1-249-421-11	CARBON	2.2K	5%	1/4W F
R347	1-247-807-31	CARBON	100	5%	1/4W
R348	1-249-421-11	CARBON	2.2K	5%	1/4W F
R349	1-249-414-11	CARBON	560	5%	1/4W F
R350	1-249-393-11	CARBON	10	5%	1/4W F
R401	1-247-895-91	CARBON	470K	5%	1/4W
R402	1-247-903-00	CARBON	1M	5%	1/4W
R403	1-247-815-91	CARBON	220	5%	1/4W
R404	1-249-421-11	CARBON	2.2K	5%	1/4W
R407	1-249-441-11	CARBON	100K	5%	1/4W
R411	1-249-429-11	CARBON	10K	5%	1/4W
R412	1-247-895-91	CARBON	470K	5%	1/4W
R413	1-249-429-11	CARBON	10K	5%	1/4W
R414	1-247-863-91	CARBON	22K	5%	1/4W
R415	1-249-425-11	CARBON	4.7K	5%	1/4W F
R701	1-249-440-11	CARBON	82K	5%	1/4W
R702	1-249-439-11	CARBON	68K	5%	1/4W
R703	1-249-439-11	CARBON	68K	5%	1/4W
R704	1-249-439-11	CARBON	68K	5%	1/4W
R705	1-249-439-11	CARBON	68K	5%	1/4W
R706	1-249-440-11	CARBON	82K	5%	1/4W
R707	1-247-887-00	CARBON	220K	5%	1/4W
R709	1-247-883-00	CARBON	150K	5%	1/4W
R710	1-247-885-00	CARBON	180K	5%	1/4W
R711	1-247-883-00	CARBON	150K	5%	1/4W
R712	1-247-891-00	CARBON	330K	5%	1/4W
R714	1-249-429-11	CARBON	10K	5%	1/4W
R715	1-249-429-11	CARBON	10K	5%	1/4W
R716	1-249-429-11	CARBON	10K	5%	1/4W
R717	1-247-903-00	CARBON	1M	5%	1/4W
R718	1-247-899-11	CARBON	680K	5%	1/4W
R719	1-249-393-11	CARBON	10	5%	1/4W F
R720	1-249-430-11	CARBON	12K	5%	1/4W
R721	1-247-862-11	CARBON	20K	5%	1/4W
R722	1-249-441-11	CARBON	100K	5%	1/4W
R723	1-247-896-11	CARBON	510K	5%	1/4W
R724	1-249-439-11	CARBON	68K	5%	1/4W
R725	1-247-883-00	CARBON	150K	5%	1/4W
R726	1-247-876-11	CARBON	75K	5%	1/4W
R727	1-249-437-11	CARBON	47K	5%	1/4W
R728	1-249-441-11	CARBON	100K	5%	1/4W
R729	1-249-430-11	CARBON	12K	5%	1/4W
R730	1-249-435-11	CARBON	33K	5%	1/4W
R731	1-247-863-91	CARBON	22K	5%	1/4W
R734	1-247-843-11	CARBON	3.3K	5%	1/4W
R735	1-249-427-11	CARBON	6.8K	5%	1/4W F
R736	1-247-863-91	CARBON	22K	5%	1/4W
R737	1-247-843-11	CARBON	3.3K	5%	1/4W
R738	1-249-435-11	CARBON	33K	5%	1/4W
R795	1-249-429-11	CARBON	10K	5%	1/4W
R798	1-249-428-11	CARBON	8.2K	5%	1/4W F
R799	1-247-807-31	CARBON	100	5%	1/4W
R801	1-249-429-11	CARBON	10K	5%	1/4W
R803	1-249-430-11	CARBON	12K	5%	1/4W
R804	1-249-430-11	CARBON	12K	5%	1/4W
R805	1-249-430-11	CARBON	12K	5%	1/4W
R806	1-249-430-11	CARBON	12K	5%	1/4W
R807	1-249-430-11	CARBON	12K	5%	1/4W
R808	1-249-430-11	CARBON	12K	5%	1/4W
R809	1-249-431-11	CARBON	15K	5%	1/4W
R810	1-249-431-11	CARBON	15K	5%	1/4W
R811	1-249-431-11	CARBON	15K	5%	1/4W
R820	1-249-417-11	CARBON	1K	5%	1/4W F
R821	1-247-807-31	CARBON	100	5%	1/4W
R822	1-247-807-31	CARBON	100	5%	1/4W
R823	1-247-807-31	CARBON	100	5%	1/4W
R828	1-247-815-91	CARBON	220	5%	1/4W
R843	1-249-437-11	CARBON	47K	5%	1/4W
R845	1-247-843-11	CARBON	3.3K	5%	1/4W
R846	1-249-417-11	CARBON	1K	5%	1/4W F
R847	1-249-429-11	CARBON	10K	5%	1/4W
R852	1-247-903-00	CARBON	1M	5%	1/4W
R853	1-247-887-00	CARBON	220K	5%	1/4W
R855	1-249-429-11	CARBON	10K	5%	1/4W
R899	1-247-807-31	CARBON	100	5%	1/4W

< VARIABLE RESISTOR >

RV1	1-228-995-00	RES, ADJ, METAL 22K
RV351	1-225-438-11	RES, VAR, CARBON 20K/20K (TONE)

Ref. No.	Part No.	Description	Remarks
		< SWITCH >	
S351	1-571-345-11	SWITCH, LEVER SLIDE (FUNCTION)	
		< TRANSFORMER >	
T1	1-409-944-11	COIL (DET)	
T2	1-416-522-11	COIL (IFT)	
T301	1-416-041-11	TRANSFORMER, BIAS OSCILLATION	
		< VIBRATOR >	
X801	1-760-793-11	VIBRATOR, CERAMIC (16.9344 MHz)	
**********			
		MISCELLANEOUS	
		**********	
59	1-452-899-11	MAGNET	
119	1-777-955-11	WIRE (FLAT TYPE) (16 CORE)	
122	1-773-116-11	WIRE (FLAT TYPE) (19 CORE)	
ANT1	1-501-883-21	ANTENNA, TELESCOPIC	
HE301	1-543-876-11	HEAD (ERASE)	
HRP301	1-500-454-11	HEAD,CERAMIC(RECORD/PLAYBACK)	
M701	X-2625-769-1	GEAR ASSY (MB)(RP),MOTOR (SLED)	
S601	1-762-679-11	SWITCH, LEAF (MD POWER)	
S801	1-692-960-11	SWITCH, PUSH (1 KEY)	
SP301	1-529-340-11	SPEAKER R-ch (10cm)	
SP302	1-529-340-11	SPEAKER L-ch (10cm)	
⚠T901	1-433-578-11	TRANSFORMER, POWER	
**********			
		ACCESSORIES&PACKING MATERIALS	
		**********	
⚠	1-776-985-11	CORD, POWER (KR)	
⚠	1-783-878-11	CORD, POWER (SP)	
	3-865-316-31	MANUAL, INSTRUCTION (ENGLISH/SPANISH)	
	3-865-316-41	MANUAL, INSTRUCTION (FRENCH/GERMAN) (KR)	
	3-865-326-41	MANUAL, INSTRUCTION (KOREAN) (KR)	
**********			
		HARDWARE LIST	
		**********	
#1	7-685-647-79	SCREW +BVTP 3 × 10 TYPE2 N-S	
#2	7-685-647-14	SCREW +BVTP 3 × 10 TYPE2 N-S	
#4	7-621-770-87	SCREW +B 2.6 × 5	
#5	7-682-548-04	SCREW +B 3 × 8	
#6	7-621-775-20	SCREW +B 2.6 × 5	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-926-997-11

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Personal A&V Products Company

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Published by Quality Engineering Dept.
(Shinagawa)

CFD-V27

SONY

E Model

SERVICE MANUAL

2000. 08

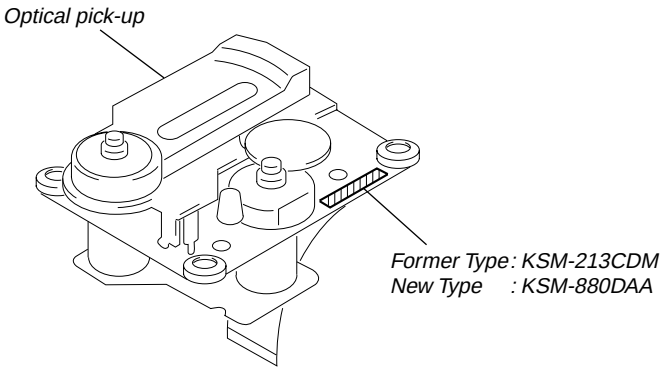
SUPPLEMENT-1

File this supplement with the Service Manual.

Subject : **1. Circuit Boards change**
• IC microcomputer change
2. Optional pick up block change

(ECN-RCA00675)

How to distinguish the sets
You can distinguish the sets by the type name printed on the optical pick-up block.



SECTION 1
ADJUSTMENT

TABLE OF CONTENTS

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

(Page 14,15) ☛ : Changed portion

CD SECTION

Notes on Check

1. Perform the traverse check in the CD test mode.
   After check, be sure to exit the test mode.
2. Perform check in the order given.
3. Use the disc (YEDS-18, Parts No. 3-702-101-01) only when so indicated.

Before Check

Put the set into test mode and perform the following checks.
Repair if there are any problems.

• Sled Motor Check

Press ▶▶I , I◀◀ keys and confirm that the Optical pick-up moves smoothly from the innermost to outermost circumference and back smoothly and with no catching or abnormal noises.
(Cancellation of BTL mute)
▶▶I : Optical pick-up moves to the outer circumference.
I◀◀ : Optical pick-up moves to the inner circumference.

• **Focus Search Check**

1. Press the CD ▶II key. (Focus search operation is performed continuously.)
2. Look at the Optical pick-up objective lens and confirm that it moves up and down smoothly, with no catching or abnormal noises.
3. Press ■ button.
   Confirm that focus search operation stops. If it does not, press ■ button again longer.

How to Enter the Set into Test Mode

1. Set the function switch to power off.
2. ☛ Set the function switch to CD while MODE key and ▶▶I key pressing.
   The set is into CD test mode (88 is displayed).
3. Turn the power off to release test mode.

How to Exit the Test Mode

Turn the POWER OFF.

(Page 1) ☛ :Changed portion

CD Section	Model Name Using Similar Mechanism	NEW
	CD Mechanism Type	KSM-880DAA
	Optical Pick-up Name	———
Tape deck Section	Model Name Using Similar Mechanism	CFD-V17
	Tape Transport Mechanism Type	MF-V10-117

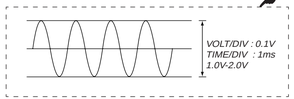
SECTION 2
DIAGRAMS

TRAVERSE Check

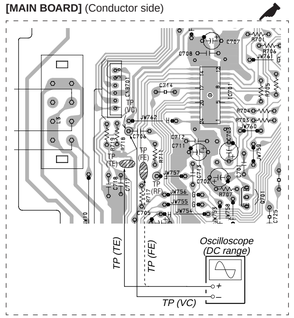
This check is to be done when the optical pick-up block is replaced.

Check Procedure:

1. Connect the oscilloscope to test point TP (VC) and TP (TE) on MAIN board. Insert disk (YEDS-18).
2. Put the set into test mode.
3. Optical pick-up setting to the center by ▶▶I or I◀◀ button pushing.
4. Press ▶II button.
5. Check that the oscilloscope traverse waveform is symmetrical, as shown in the figure below.
6. Release test mode after adjustment is completed.



[MAIN BOARD] (Conductor side)



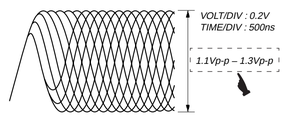
Focus Bias Check

This check is to be done when the optical block replaced.

Check Procedure:

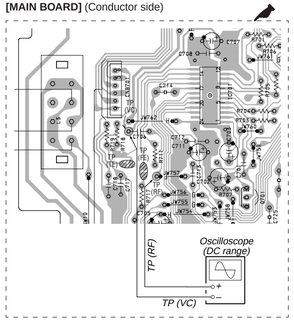
1. Connect the oscilloscope to test point TP (VC) and TP (RF) on MAIN board. Insert disk (YEDS-18).
2. Put the set into test mode.
3. Optical pick-up setting to the center by + or – button pushing.
4. Press the ▶II button and press the DISPLAY ENTER button. (Tracking servo ON)
5. Check that the oscilloscope wavewform is as shown in the figure below (eye pattern).
   A good eye pattern means that the diamond shape (◊) in the center of the waveform can be clearly distinguished.
6. Release test mode after adjustment is completed.

• RF signal reference waveform (eye pattern)

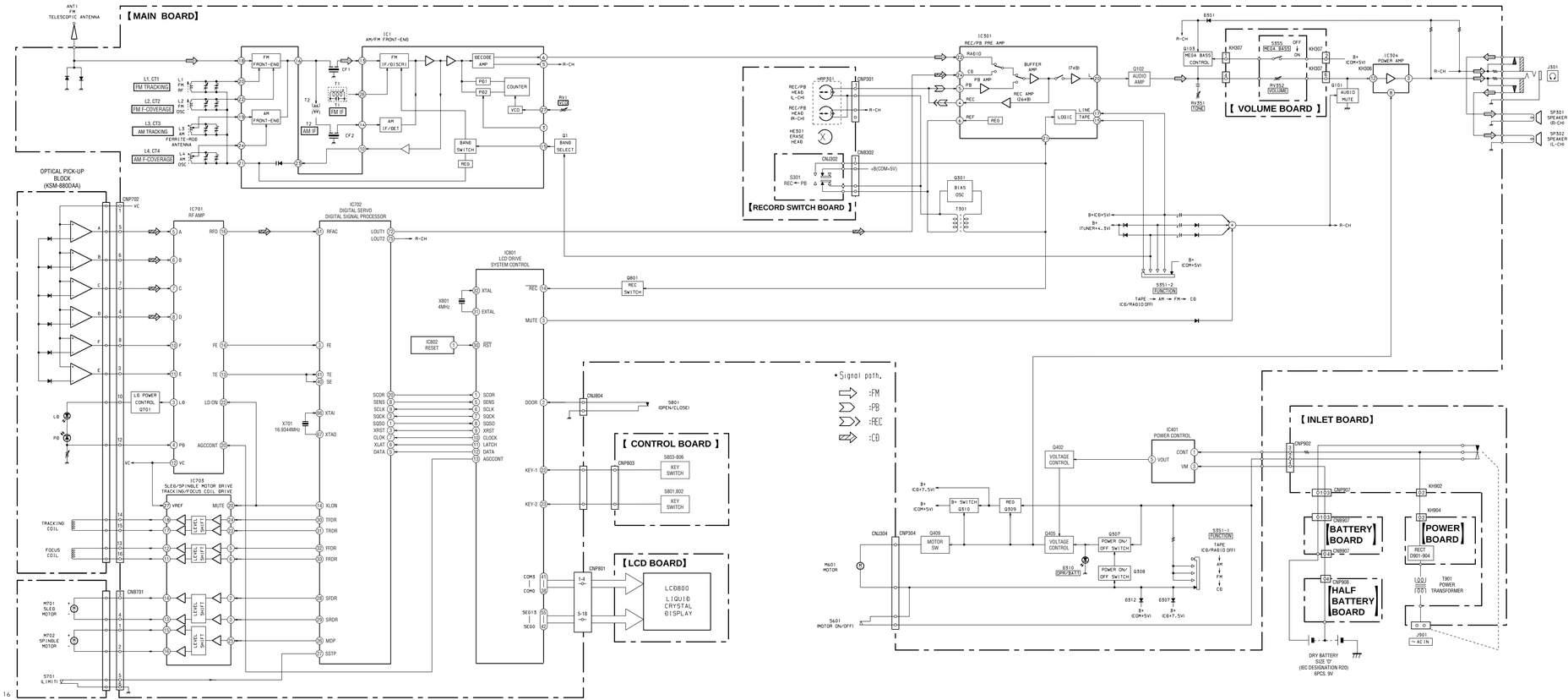


When observing the eye pattern, set the oscilloscope for AC range and raise vertical sensivity.

[MAIN BOARD] (Conductor side)



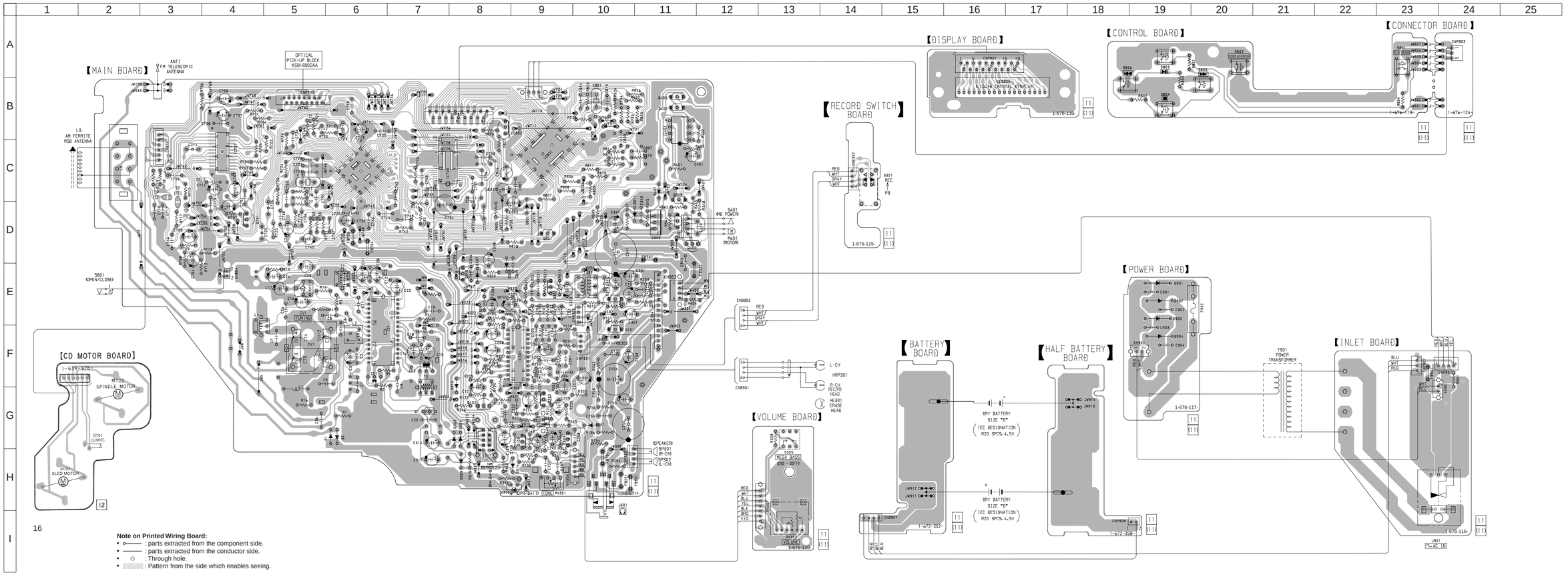
2-1. BLOCK DIAGRAM



2-2. PRINTED WIRING BOARD

• **Semiconductor Location**

Ref. No.	Location
D1	G-6
D2	G-6
D301	G-10
D303	G-8
D304	G-8
D307	E-8
D308	E-9
D309	H-8
D310	H-9
D312	F-8
D311	D-11
D314	H-9
D401	C-11
D801	D-9
D901	E-19
D902	E-19
D903	E-19
D904	F-19
IC1	F-7
IC201	F-9
IC304	E-11
IC401	B-11
IC701	C-4
IC702	C-6
IC703	C-8
IC801	C-9
IC802	B-9
Q1	G-7
Q101	F-10
Q102	G-8
Q103	G-9
Q201	E-10
Q202	G-9
Q203	G-9
Q301	E-9
Q307	D-11
Q308	C-11
Q309	D-11
Q310	E-8
Q401	B-11
Q402	B-11
Q405	B-11
Q409	D-12
Q701	D-4
Q801	D-9

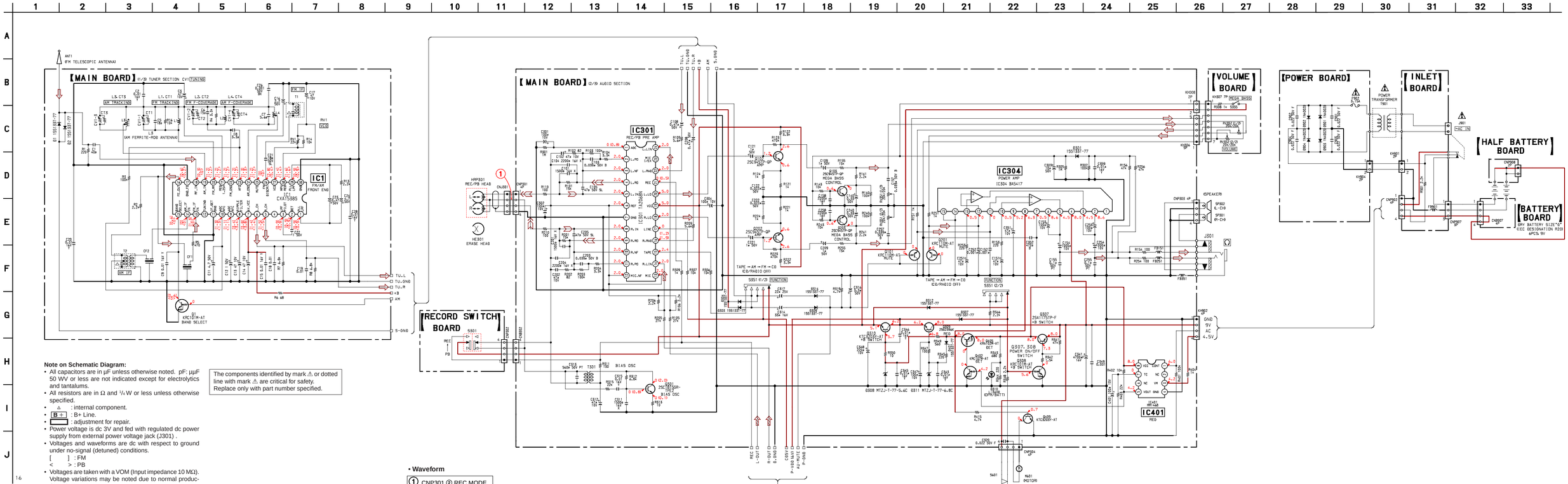


Note on Printed Wiring Board:

- ——— : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ○ : Through hole.
- ▒▒▒ : Pattern from the side which enables seeing.

2-3. SCHEMATIC DIAGRAM MAIN SECTION

• Refer to page 22 for IC Block Diagrams.



Note on Schematic Diagram:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- △ : internal component.
- B + : B+ Line.
- ▭ : adjustment for repair.
- Power voltage is dc 3V and fed with regulated dc power supply from external power voltage jack (J301) .
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  [ ] : FM
  < > : PB
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
- Signal path.
  ⇨ : FM
  ➡ : AM
  ⇨ : PB
  ⇨ : REC
  ⇨ : CD

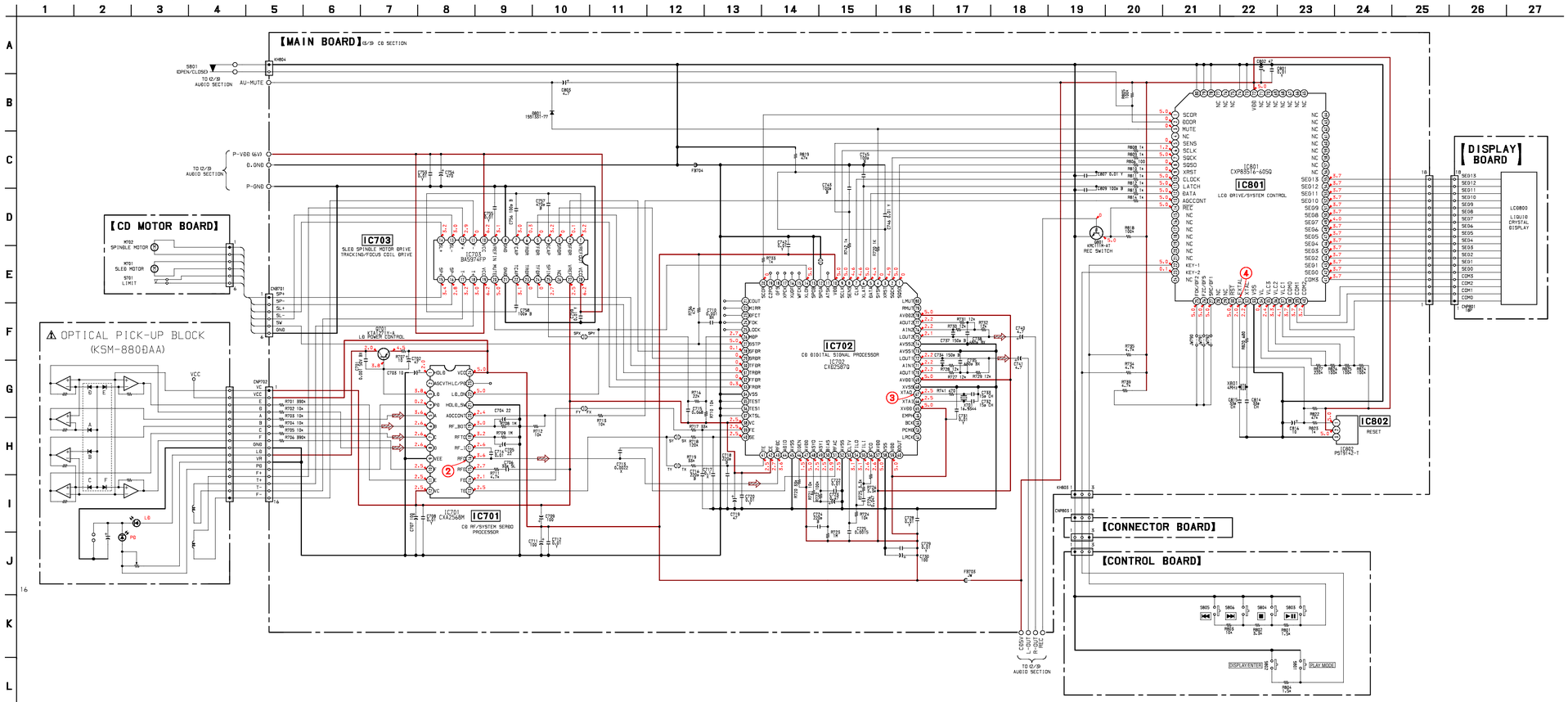
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

• **Waveform**

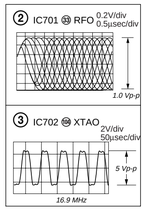
① CNP301 ⓡ REC MODE
10V/div
10µsec/div
55.2kHz 30Vp-p

2-4. SCHEMATIC DIAGRAM MAIN SECTION

• Refer to page 7 for Printed Wiring Board. • Refer to page 22 for IC Block Diagrams.



• Waveforms



Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- B+ : B+ Line.
- : adjustment for repair.
- Power voltage is dc 3V and fed with regulated dc power supply from external power voltage jack (J301) .
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  [ ] : FM
  < > : PB
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
- Signal path.
  : FM
  : AM
  : PB
  : REC
  : CD

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

2-5. IC PIN FUNCTION DESCRIPTION

• MAIN BOARD IC702 CXD2587Q CD DIGITAL SIGNAL PROCESSOR

Pin No.	Pin Name	I/O	Description
1	SQSO	O	SubQ 80 bit and PCM peak, level data output. CD TEXT data output
2	SQCK	I	Clock input for SQSO read out
3	XRST	I	System reset Resets at "L"
4	SYSM	I	Mute input Mutes at "H"
5	DATA	I	Serial data input from CPU
6	XLAT	I	Latch input from CPU Latches the serial data by trailing
7	CLK	I	Serial data transfer clock input from the CPU
8	SENS	O	SENS output. Outputs to the CPU
9	SCLK	I	Clock input for SENS serial data reading
10	VDD	—	Digital power supply
11	ATSK	I/O	Input/output for anti-shock (Not used)
12	SPOA	I	Micro processing extension interface (input A)
13	SPOB	I	Micro processing extension interface (input B)
14	XLON	O	Micro processing extension interface (output) "H" when resetting
15	WFCK	O	WFCK output (Not used)
16	XUGF	O	XUGF output. MNT1, RFCK output by switching of command (Not used)
17	XPCK	O	XPCK output. MNT0 output by switching of command (Not used)
18	GFS	O	GFS output. MNT3, XROF output by switching of command (Not used)
19	C2PO	O	C2PO output. GTOP output by switching of command (Not used)
20	SCOR	O	"H" output when the sub-code sync S0 or S1 is detected
21	COUT	I/O	Truck number counting signal input/output
22	MIRR	I/O	Mirror signal input/output
23	DFCT	I/O	Defect signal input/output
24	FOK	I/O	Focus OK signal input/output
25	LOCK	I/O	Samples the GFS at 460 Hz. "H" output when the GFS is "H". "L" output when the GFS is "L" continuously three times
26	MDP	O	Or, input when LKIN = "1". Servo control output of spindle motor
27	SSTP	I	Disc innermost circumference detection signal input
28	SFDR	O	Sled drive output
29	SRDR	O	Sled drive output
30	TFDR	O	Tracking drive output
31	TRDR	O	Tracking drive output
32	FFDR	O	Focus drive output
33	FRDR	O	Focus drive output
34	VSS	—	Digital GND
35	TEST	I	Terminal for TEST Normally GND
36	TES1	I	Terminal for TEST Normally GND
37	XTSL	I	X'tal selection input terminal "L" when X'tal is 16.9344 MHz. "H" when X`tal is 33.8688 MHz
38	VC	I	Center point voltage input
39	FE	I	Focus error signal input
40	SE	I	Sled error signal input
41	TE	I	Tracking error input
42	CE	I	Center point servo analog input
43	RFDC	I	RF signal input
44	ADIO	O	Terminal for TEST Do not connect anything (Not used)
45	AVSS	—	Analog ground

Pin No.	Pin Name	I/O	Description
46	IGEN	I	Constant-current input for OP amplifier
47	AVDD	—	Analog power supply
48	ASYO	O	EFM full swing output ("L" = Vss, "H" = VDD)
49	ASYI	I	Asymmetry comparator voltage input
50	BIAS	I	Asymmetry circuit constant-current input
51	RFAC	I	EFM signal input
52	AVSS	—	Analog ground
53	CLTV	I	VCO1 control voltage input for frequency-multiplication
54	FILO	O	Filter output for master PLL (Sleeve = digital PLL)
55	FILI	I	Filter input for master PLL
56	PCO	O	Charge pump for master PLL
57	AVDD	—	Analog power supply
58	VSS	—	Digital ground
59	VDD	—	Digital power supply
60	DOUT	O	Digital Out output terminal (Not used)
61	LRCK	O	D/A interface LR clock output f = Fs (Not used)
62	PCMD	O	D/A interface Serial data output (2`s COMP, MSB fast) (Not used)
63	BCK	O	D/A interface Bit clock output (Not used)
64	EMPH	O	"H" output when the playback disc is emphasis ON. "L" output when emphasis OFF (Not used)
65	XVDD	—	Power supply for master clock
66	XTAI	I	Crystal oscillation circuit input terminal. When the master clock is input from the outside, input from this terminal
67	XTAO	O	Crystal oscillation circuit output terminal
68	XVSS	—	Ground terminal for master clock
69	AVDD1	—	Analog power supply
70	AOUT1	O	L-ch: analog output terminal
71	AIN1	I	L-ch: OPAMP input terminal
72	LOUT1	O	L-ch/LINE output terminal
73	AVSS1	—	Analog ground
74	AVSS2	—	Analog ground
75	LOUT2	O	R-ch: LINE output terminal
76	AIN2	I	R-ch: OPAMP input terminal
77	AOUT2	O	R-ch: analog output terminal
78	AVDD2	—	Analog power supply
79	RMUT	O	R-ch/"O" detection flag (Not used)
80	LMUT	O	L-ch/"O" detection flag (Not used)

Note) • The PCMD is 2`s complement output of the MSB first.

• The GTOP is to monitor the protection status of the frame sync. ("H": sync protection window open)

• The XUGF is the frame sync obtained by the EFM signal and negative pulse. Signal before sync protection

• The XPCK is the inverted signal of the EFM PLL clock. The PLL is made so that the trailing edge and the changing point of the EFM signal agree.

• The GFS becomes "H" when the frame sync and inner protection timing agrre.

• The RFCK is the signal of 136 !!s cycle from the X`tal accuracy.

• The C2PO is the signal to indicate the error status of the data.

• The XROF is the signal when the 16K RAM exceeds the jitter margin of +/- 4frames.

Combination of MONITOR output

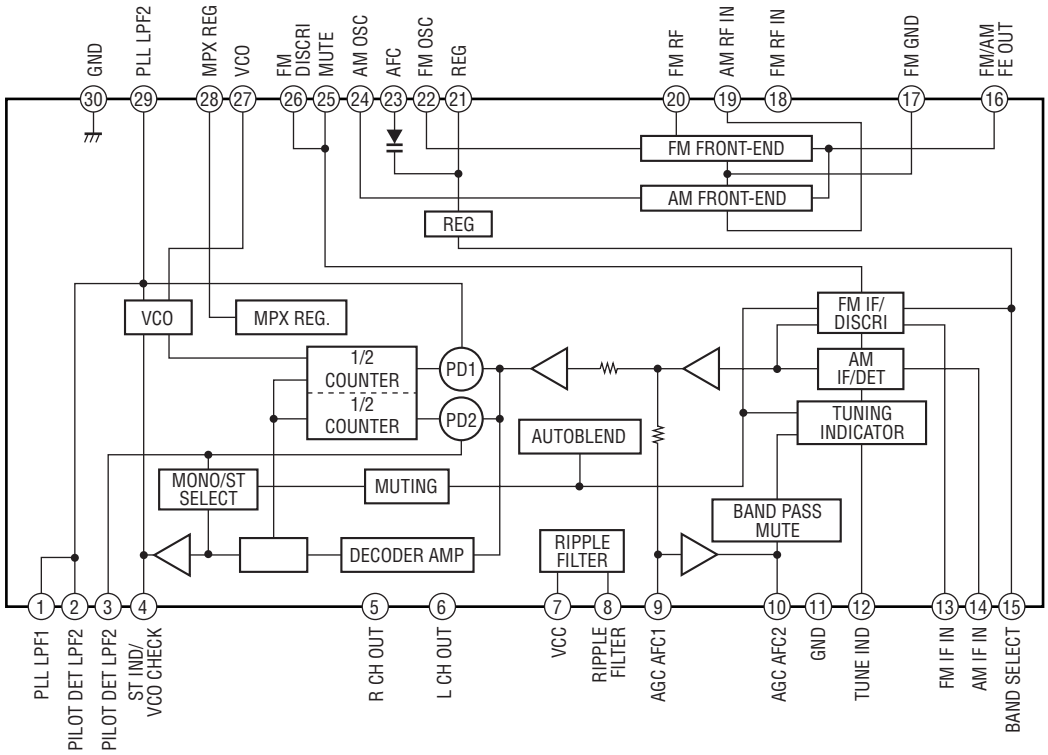
COMMANDBIT		OUTPUT DATA			
MTSL1	MTSL0				
0	0	XUGF	XPCK	GFS	C2PO
0	1	MNT1	MNT0	MNT3	C2PO
1	0	RFCK	XPCK	XROF	GTOP

• MAIN BOARD IC801 CXP83516-605Q LCD DRIVE/SYSTEM CONTROL

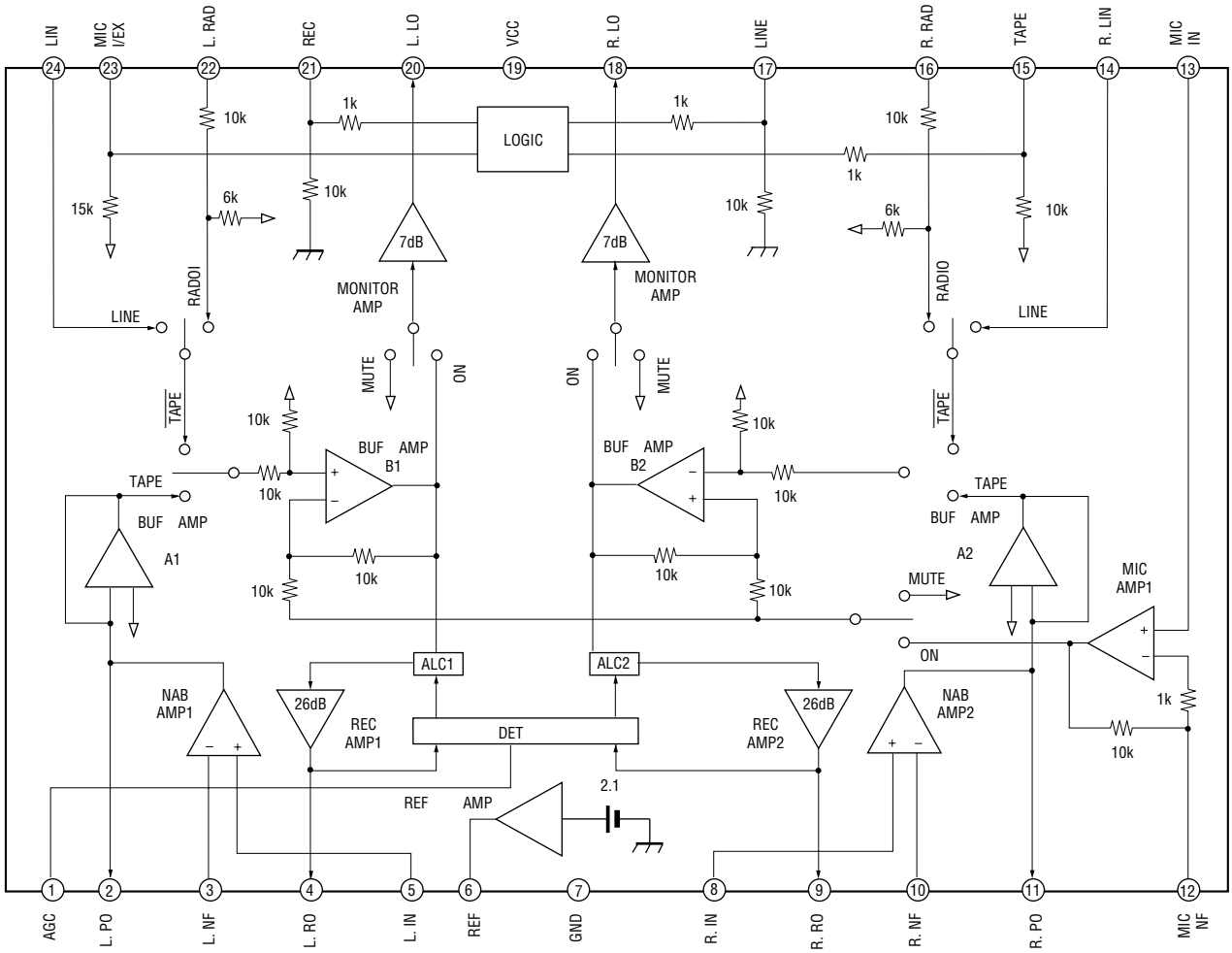
Pin No.	Pin Name	I/O	Description
1	SCOR	I	Sub-code sync detection signal
2	DOOR	I	CD lid detection H: OPEN L: CLOSE
3	MUTE	O	Audio signal MUTE H: MUTE ON L: MUTE OFF
4	NC	—	Not used (OPEN)
5	SENS	I	SENS signal
6	SCLK	O	SENS serial data reading clock
7	SQCK	O	Clock for SQSO reading
8	SQSO	I	SUB-Q serial data
9	XRST	O	System reset
10	CLOCK	O	Serial data transfer clock
11	LATCH	O	Latches the serial data by trailing
12	DATA	O	Serial data
13	AGCCONT	O	ON/OFF control of LPC
14	$\overline{\text{REC}}$	I	TAPE recording detection L:REC
15–21	NC	—	Not used (OPEN)
22	KEY-1	I	AD processing (PLAY/PAUSE, STOP, AMS+, AMS-)
23	KEY-2	I	AD processing (MODE, DISP/ENT)
24	NC	—	Not used (OPEN)
25	FOK/DF2	—	Not used
26	FZC/DFS	—	Not used
27	SRC/DF1	—	Not used
28	NC	—	Not used (OPEN)
29	NC	—	Not used (OPEN)
30	$\overline{\text{RST}}$	I	Micro processing reset L: reset
31	EXTAL	I	4. 19 MHz
32	XTAL	O	4. 19 MHz
33	Vss	—	Ground
34	VL	O	Bias control for LCD
35–37	VLC3–1	—	Bias power supply for LCD
38–41	COM0–3	O	Common signal output for LCD
42–55	SEG0–13	O	Segment signal output for LCD
56–71	NC	—	Not used (OPEN)
72	VDD	—	Positive power supply +5V
73, 74	NC	—	Not used (Connected to ground.)
75–77	NC	—	Not used (OPEN)
78–80	NC	—	Not used (Connected to ground.)

2-5. IC BLOCK DIAGRAMS

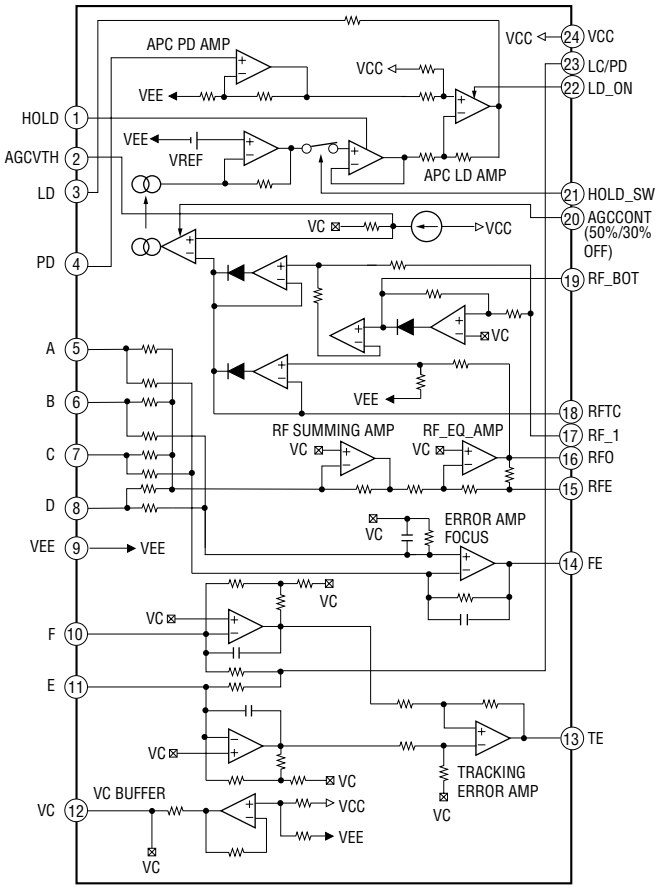
IC1 CXA1238S



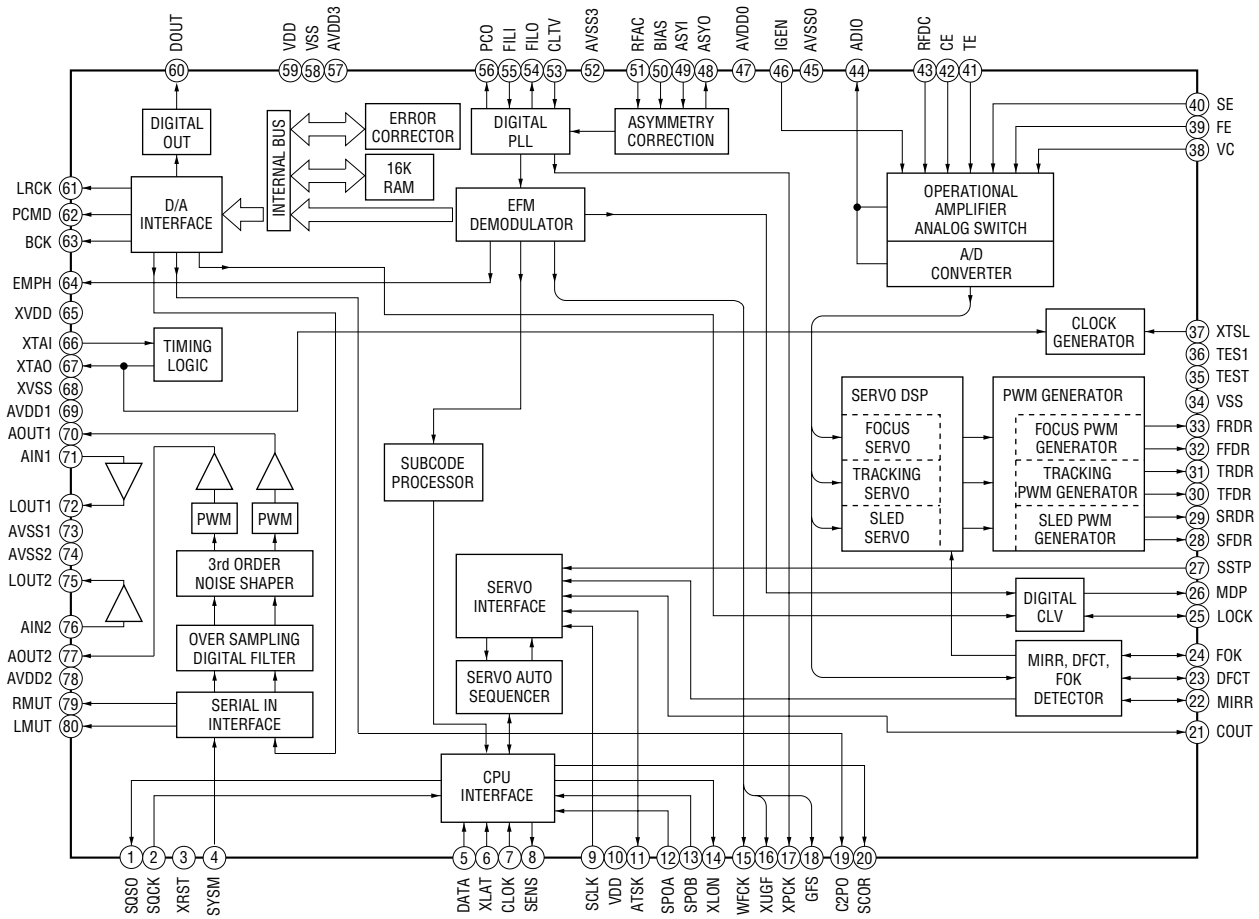
IC301 TA2068N



IC701 CXA2568M



IC702 CXD2587Q



SECTION 3
EXPLODED VIEWS

• DIFFERENT PARTS LIST

Page	Ref.No.	Before Change			After Change		
		Part No.	Description	Remarks	Part No.	Description	Remarks
38	* 6	1-673-259-11	CONNECTOR BOARD		1-676-124-11	CONNECTOR BOARD	
	* 7	1-672-304-11	CONTROL BOARD		1-676-119-11	CONTROL BOARD	
39	* 51	1-672-300-11	INLET BOARD		1-676-116-11	INLET BOARD	
	* 52	1-672-301-11	POWER BOARD		1-676-117-11	POWER BOARD	
40	* 112	1-672-303-11	DISPLAY BOARD		1-676-118-11	DISPLAY BOARD	
	* 113	1-672-305-11	VOLUME BOARD		1-676-120-11	VOLUME BOARD	
	* 114	1-672-299-11	RECORD SWITCH BOARD		1-676-115-11	RECORD SWITCH BOARD	

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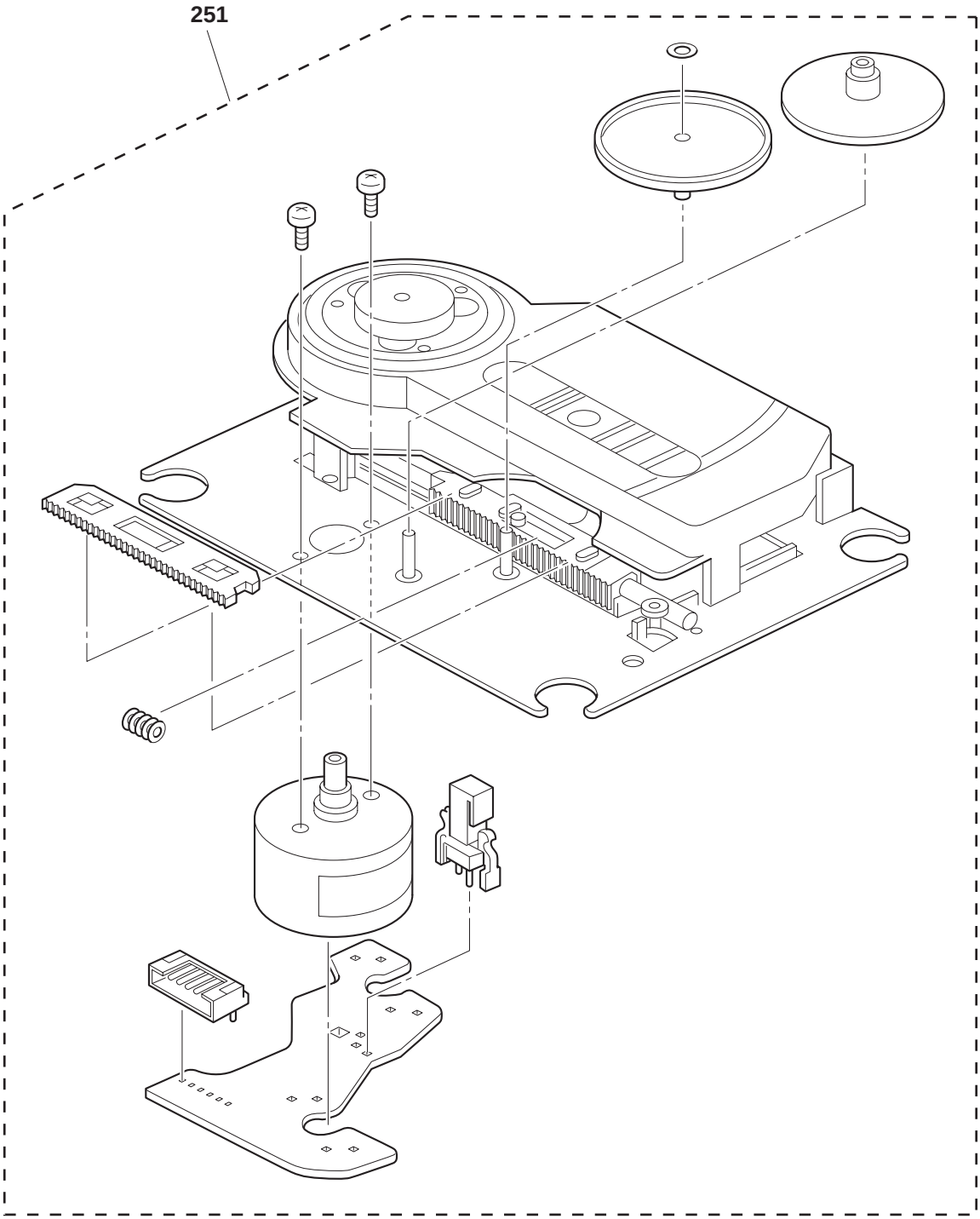
7-6. OPTICAL PICK-UP SECTION (KSM-880DAA)



Ref. No.	Part No.	Description	Remarks
⚠251	8-820-095-04	OPTICAL PICK-UP BLOCK (KSM-880DAA)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SECTION 4
ELECTRICAL PARTS LIST

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
*	1-672-302-11	BATTERY BOARD	
		**********	
	3-028-154-01	TERMINAL (-), BATT	
**********			
	1-639-678-12	CD MOTOR BOARD	
		**********	
		< CONNECTOR >	
CNP707	1-564-722-11	PIN, CONNECTOR (SMALL TYPE) 6P	
		< SWITCH >	
* S701	1-572-085-11	SWITCH, LEAF (LINIT)	
**********			
	1-676-124-11	CONNECTOR BOARD	
		**********	
		< CONNECTOR >	
* CNP803	1-785-669-11	PIN, CONNECTOR (PC BOARD) 3P	
**********			
*	1-676-119-11	CONTROL BOARD	
		**********	
	3-831-441-11	CUSHION (B)	
		< RESISTOR >	
R801	1-249-419-11	CARBON 1.5K 5% 1/4W F	
R802	1-247-843-11	CARBON 3.3K 5% 1/4W	
R803	1-249-429-11	CARBON 10K 5% 1/4W	
R804	1-249-419-11	CARBON 1.5K 5% 1/4W F	
		< SWITCH >	
S801	1-762-798-11	SWITCH, KEYBOARD (MODE)	
S802	1-762-798-11	SWITCH, KEYBOARD (DISPLAY/ENTER)	
S803	1-762-798-11	SWITCH, KEYBOARD (PLAY)	
S804	1-762-798-11	SWITCH, KEYBOARD (STOP)	
S805	1-762-798-11	SWITCH, KEYBOARD (FR)	
S806	1-762-798-11	SWITCH, KEYBOARD (FF)	
**********			
*	1-676-118-11	DISPLAY BOARD	
		**********	
	3-018-845-01	HOLDER (406), LCD	
		< CONNECTOR >	
CNP801	1-695-380-31	PIN, CONNECTOR (PC BOARD) 19P	
		< LIQUID CRYSTAL DISPLAY >	
LCD800	1-801-913-11	DISPLAY PANEL, LIQUID CRYSTAL	
**********			
*	1-672-358-11	HALF BATTERY BOARD	
		**********	
	3-028-154-01	TERMINAL (-), BATT	
		< CONNECTOR >	
* CNP908	1-785-668-11	PIN, CONNECTOR (PC BOARD) 2P	
**********			
*	1-676-116-11	INLET BOARD	
		**********	
* CNP902	1-785-670-11	PIN, CONNECTOR (PC BOARD) 4P	
* CNP907	1-785-655-11	PIN, CONNECTOR (PC BOARD) 3P	
		< FERRITE BEAD >	
FB901	1-410-397-21	FERRITE BEAD INDUCTOR	
		< JACK >	
⚠J901	1-526-838-11	INLET, AC 2P (AC IN)	
		< HOLDER >	
* KH901	1-573-287-11	HOLDER, CABLE 2P	
		< RESISTOR >	
R901	1-249-421-11	CARBON 2.2K 5% 1/4W F	
**********			
*	A-3321-916-A	MAIN BOARD, COMPLETE	
		**********	
	3-031-559-01	GEAR (PVC 2 BAND)	
	3-031-570-11	KNOB (FUNCTION)	
	7-621-775-20	SCREW +B 2.6X5	
	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	

Ref. No.	Part No.	Description			Remarks
		< CAPACITOR >			
C1	1-162-215-31	CERAMIC	47PF	5%	50V
C2	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C3	1-104-664-11	ELECT	47uF	20.00%	10V
C5	1-162-205-31	CERAMIC	18PF	5%	50V
C6	1-102-962-00	CERAMIC	30PF	5.00%	50V
C7	1-162-196-31	CERAMIC	5.6PF	10.00%	50V
C8	1-162-191-31	CERAMIC	2.2PF	10.00%	50V
C9	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C11	1-126-963-11	ELECT	4.7uF	20.00%	50V
C12	1-124-903-11	ELECT	1uF	20.00%	50V
C13	1-104-664-11	ELECT	47uF	20.00%	10V
C14	1-104-664-11	ELECT	47uF	20.00%	10V
C15	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C16	1-126-961-11	ELECT	2.2uF	20.00%	50V
C17	1-104-664-11	ELECT	47uF	20.00%	10V
C18	1-127-876-31	CERAMIC	0.01uF	10%	50V
C19	1-127-876-31	CERAMIC	0.01uF	10%	50V
C20	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C21	1-162-205-31	CERAMIC	18PF	5%	50V
C22	1-124-903-11	ELECT	1uF	20.00%	50V
C23	1-124-902-00	ELECT	0.47uF	20%	50V
C24	1-126-963-11	ELECT	4.7uF	20.00%	50V
C26	1-162-294-31	CERAMIC	0.001uF	10%	50V
C28	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C101	1-162-301-11	CERAMIC	0.0015uF	20.00%	16V
C102	1-104-664-11	ELECT	47uF	20.00%	10V
C103	1-127-883-31	CERAMIC	0.039uF	10%	50V
C104	1-162-302-11	CERAMIC	0.0022uF	20.00%	16V
C105	1-162-215-31	CERAMIC	47PF	5%	50V
C108	1-124-902-00	ELECT	0.47uF	20%	50V
C109	1-124-903-11	ELECT	1uF	20.00%	50V
C121	1-124-903-11	ELECT	1uF	20.00%	50V
C122	1-127-885-31	CERAMIC	0.056uF	10%	50V
C140	1-124-252-00	ELECT	0.33uF	20%	50V
C151	1-104-664-11	ELECT	47uF	20.00%	10V
C152	1-162-290-31	CERAMIC	470PF	10%	50V
C153	1-104-665-11	ELECT	100uF	20.00%	10V
C154	1-126-767-11	ELECT	1000uF	20.00%	10V
C155	1-136-165-00	FILM	0.1uF	5.00%	50V
C157	1-127-883-21	CERAMIC	0.039uF	10%	50V
C158	1-162-302-11	CERAMIC	0.0022uF	20.00%	16V
C201	1-162-301-11	CERAMIC	0.0015uF	20.00%	16V
C202	1-104-664-11	ELECT	47uF	20.00%	10V
C203	1-127-883-31	CERAMIC	0.039uF	10%	50V
C204	1-162-302-11	CERAMIC	0.0022uF	20.00%	16V
C205	1-162-215-31	CERAMIC	47PF	5%	50V
C208	1-124-902-00	ELECT	0.47uF	20%	50V
C209	1-124-903-11	ELECT	1uF	20.00%	50V
C221	1-124-903-11	ELECT	1uF	20.00%	50V
C222	1-127-885-31	CERAMIC	0.056uF	10%	50V
C240	1-124-252-00	ELECT	0.33uF	20%	50V
C251	1-104-664-11	ELECT	47uF	20.00%	10V
C252	1-162-290-31	CERAMIC	470PF	10%	50V
C253	1-104-665-11	ELECT	100uF	20.00%	10V
C254	1-126-767-11	ELECT	1000uF	20.00%	10V
C255	1-136-165-00	FILM	0.1uF	5.00%	50V
C257	1-127-883-31	CERAMIC	0.039uF	10%	50V
C258	1-162-302-11	CERAMIC	0.0022uF	20.00%	16V
C301	1-104-665-11	ELECT	100uF	20.00%	10V
C302	1-104-665-11	ELECT	100uF	20.00%	10V
C303	1-126-964-11	ELECT	10uF	20.00%	50V
C304	1-104-665-11	ELECT	100uF	20.00%	10V
C311	1-162-301-11	CERAMIC	0.0015uF	20.00%	16V
C312	1-104-664-11	ELECT	47uF	20.00%	10V
C313	1-107-737-11	MYLAR	560PF	5.00%	50V
C314	1-104-663-11	ELECT	33uF	20.00%	16V
C315	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C316	1-126-962-11	ELECT	3.3uF	20.00%	50V
C317	1-126-233-11	ELECT	22uF	20%	50V
C320	1-101-005-00	CERAMIC	22000PF	50V	
C341	1-126-937-11	ELECT	4700uF	20.00%	16V
C343	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C345	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C346	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C347	1-104-665-11	ELECT	100uF	20.00%	10V
C348	1-104-666-11	ELECT	220uF	20.00%	10V
C351	1-104-664-11	ELECT	47uF	20.00%	10V
C352	1-162-290-31	CERAMIC	470PF	10%	50V
C359	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C401	1-104-665-11	ELECT	100uF	20.00%	10V
C701	1-162-294-31	CERAMIC	0.001uF	10%	50V
C702	1-104-664-11	ELECT	47uF	20.00%	10V
C703	1-126-964-11	ELECT	10uF	20.00%	50V
C704	1-126-233-11	ELECT	22uF	20%	50V
C705	1-126-233-11	ELECT	22uF	20%	50V
C706	1-162-211-31	CERAMIC	33PF	5%	50V
C707	1-104-665-11	ELECT	100uF	20.00%	10V
C708	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C709	1-104-665-11	ELECT	100uF	20.00%	10V
C710	1-162-294-31	CERAMIC	0.001uF	10%	50V
C711	1-104-665-11	ELECT	100uF	20.00%	10V
C712	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C713	1-162-302-11	CERAMIC	0.0022uF	20.00%	16V
C714	1-130-483-00	MYLAR	0.01uF	5%	50V
C715	1-130-493-00	MYLAR	0.068uF	5%	50V
C716	1-162-286-21	CERAMIC	220PF	10.00%	50V
C717	1-162-851-11	CERAMIC	0.1uF	10.00%	16V
C718	1-162-286-21	CERAMIC	220PF	10.00%	50V
C719	1-104-664-11	ELECT	47uF	20.00%	10V
C720	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C722	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C723	1-124-902-00	ELECT	0.47uF	20%	50V
C724	1-162-286-21	CERAMIC	220PF	10.00%	50V
C725	1-137-365-11	MYLAR	0.0015uF	5.00%	50V
C726	1-130-491-00	MYLAR	0.047uF	5%	50V
C728	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C729	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C730	1-104-665-11	ELECT	100uF	20.00%	10V
C731	1-162-306-11	CERAMIC	0.01uF	20.00%	16V
C732	1-162-203-31	CERAMIC	15PF	5.00%	50V
C733	1-162-203-31	CERAMIC	15PF	5.00%	50V
C734	1-162-284-31	CERAMIC	150PF	10.00%	50V
C735	1-162-292-31	CERAMIC	680PF	10%	50V
C737	1-162-284-31	CERAMIC	150PF	10.00%	50V
C738	1-162-292-31	CERAMIC	680PF	10%	50V

MAIN

Ref. No.	Part No.	Description			Remarks
C740	1-126-963-11	ELECT	4.7uF	20.00% 50V	
C741	1-126-963-11	ELECT	4.7uF	20.00% 50V	
C742	1-162-306-11	CERAMIC	0.01uF	20.00% 16V	
C743	1-162-282-31	CERAMIC	100PF	10% 50V	
C745	1-162-282-31	CERAMIC	100PF	10% 50V	
C746	1-162-306-11	CERAMIC	0.01uF	20.00% 16V	
C753	1-162-306-11	CERAMIC	0.01uF	20.00% 16V	
C754	1-126-925-11	ELECT	470uF	20.00% 10V	
C755	1-162-306-11	CERAMIC	0.01uF	20.00% 16V	
C756	1-162-282-31	CERAMIC	100PF	10% 50V	
C757	1-162-290-31	CERAMIC	470PF	10% 50V	
C758	1-162-282-31	CERAMIC	100PF	10% 50V	
C759	1-162-306-11	CERAMIC	0.01uF	20.00% 16V	
C801	1-162-306-11	CERAMIC	0.01uF	20.00% 16V	
C802	1-104-664-11	ELECT	47uF	20.00% 10V	
C803	1-126-233-11	ELECT	22uF	20% 50V	
C807	1-162-306-11	CERAMIC	0.01uF	20.00% 16V	
C809	1-162-282-31	CERAMIC	100PF	10% 50V	
C814	1-128-803-11	CERAMIC	33PF	5% 50V	
C815	1-128-803-11	CERAMIC	33PF	5% 50V	
C816	1-126-964-11	ELECT	10uF	20.00% 50V	
		< FILTER >			
CF1	1-760-738-61	FILTER, CERAMIC			
CF2	1-577-072-11	FILTER, CERAMIC			
		< CONNECTOR >			
* CNP301	1-785-656-11	PIN, CONNECTOR (PC BOARD) 4P			
* CNP303	1-785-656-11	PIN, CONNECTOR (PC BOARD) 4P			
* CNP304	1-785-656-11	PIN, CONNECTOR (PC BOARD) 4P			
CNP702	1-770-646-11	CONNECTOR, FFC/FPC 16P			
CNP802	1-695-342-31	PIN, CONNECTOR (PC BOARD) 19P			
		< TRIMMER >			
CT1-4	1-141-561-11	CAP, VAR			
		< VARIABLE CAPACITOR >			
CV1	1-141-561-11	CAP, VAR (TUNING)			
		< DIODE >			
D1	8-719-991-33	DIODE 1SS133T-77			
D2	8-719-991-33	DIODE 1SS133T-77			
D301	8-719-991-33	DIODE 1SS133T-77			
D303	8-719-991-33	DIODE 1SS133T-77			
D304	8-719-991-33	DIODE 1SS133T-77			
D307	8-719-991-33	DIODE 1SS133T-77			
D308	8-719-109-90	DIODE RD5.6ESB3			
D309	8-719-991-33	DIODE 1SS133T-77			
D310	8-719-038-29	LED SLP-181B-51 (OPR/BATT)			
D311	8-719-109-98	DIODE RD6.8ES-B3			
D312	8-719-991-33	DIODE 1SS133T-77			
D314	8-719-991-33	DIODE 1SS133T-77			
D801	8-719-991-33	DIODE 1SS133T-77			
		< FERRITE BEAD >			
FB301	1-412-911-11	FERRITE	0UH		
FB302	1-412-911-11	FERRITE	0UH		
FB704	1-412-911-11	FERRITE	0UH		

Ref. No.	Part No.	Description				Remarks
		< IC >				
IC1	8-752-050-20	IC CXA1238S				
IC301	8-759-264-71	IC TA2068N				
IC304	8-759-426-51	IC BA5417				
IC401	8-759-646-86	IC MM1468XD				
IC701	8-752-085-50	IC CXA2568M				
IC702	8-752-386-85	IC CXD2587Q				
IC703	8-759-549-27	IC BA5974FP				
IC801	8-752-906-19	IC CXP83516-605Q				
IC802	8-759-648-11	IC PST9142-T				
		< JACK >				
J301	1-568-267-11	JACK (🎧)				
		< HOLDER >				
* KH306	1-565-386-11	HOLDER, CABLE 5P				
		< COIL >				
L1	1-406-999-11	COIL, AIR-CORE				
L2	1-416-570-11	COIL, AIR-CORE				
L3	1-501-841-11	ANTENNA, FERRITE-ROD (MW)				
L4	1-406-040-00	COIL (OSC)				
		< TRANSISTOR >				
Q1	8-729-029-92	TRANSISTOR	DTC143ESA			
Q101	8-729-029-94	TRANSISTOR	DTC143TSA			
Q102	8-729-194-57	TRANSISTOR	2SC945-P			
Q103	8-729-194-57	TRANSISTOR	2SC945-P			
Q201	8-729-029-94	TRANSISTOR	DTC143TSA			
Q202	8-729-194-57	TRANSISTOR	2SC945-P			
Q203	8-729-194-57	TRANSISTOR	2SC945-P			
Q301	8-729-281-53	TRANSISTOR	2SC1815-GR			
Q307	8-729-119-76	TRANSISTOR	2SA1175-HFE			
Q308	8-729-029-92	TRANSISTOR	DTC143ESA			
Q309	8-729-021-82	TRANSISTOR	2SD2396K			
Q310	8-729-011-92	TRANSISTOR	2SC2001TP-K1K2			
Q402	8-729-036-77	TRANSISTOR	KRC107M			
Q405	8-729-029-21	TRANSISTOR	DTA114ESA-TP			
Q409	8-729-011-92	TRANSISTOR	2SC2001TP-K1K2			
Q701	8-729-037-13	TRANSISTOR	KTA1271Y			
Q801	8-729-036-67	TRANSISTOR	KRC111M-AT			
		< RESISTOR >				
R1	1-249-409-11	CARBON	220	5%	1/4W	F
R2	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R3	1-249-441-11	CARBON	100K	5%	1/4W	
R5	1-249-411-11	CARBON	330	5%	1/4W	
R6	1-249-403-11	CARBON	68	5%	1/4W	F
R7	1-249-427-11	CARBON	6.8K	5%	1/4W	F
R8	1-249-427-11	CARBON	6.8K	5%	1/4W	F
R13	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R14	1-249-429-11	CARBON	10K	5%	1/4W	
R16	1-249-429-11	CARBON	10K	5%	1/4W	
R101	1-249-431-11	CARBON	15K	5%	1/4W	
R102	1-249-404-00	CARBON	82	5%	1/4W	F
R103	1-249-441-11	CARBON	100K	5%	1/4W	
R104	1-247-843-11	CARBON	3.3K	5%	1/4W	
R105	1-249-434-11	CARBON	27K	5%	1/4W	

Ref. No.	Part No.	Description			Remarks
R106	1-249-421-11	CARBON	2.2K	5%	1/4W F
R109	1-249-426-11	CARBON	5.6K	5%	1/4W
R110	1-247-807-31	CARBON	100	5%	1/4W
R121	1-249-417-11	CARBON	1K	5%	1/4W F
R122	1-247-843-11	CARBON	3.3K	5%	1/4W
R123	1-247-895-91	CARBON	470K	5%	1/4W
R124	1-249-409-11	CARBON	220	5%	1/4W F
R140	1-249-441-11	CARBON	100K	5%	1/4W
R141	1-249-421-11	CARBON	2.2K	5%	1/4W F
R143	1-249-429-11	CARBON	10K	5%	1/4W
R151	1-249-417-11	CARBON	1K	5%	1/4W F
R153	1-249-409-11	CARBON	220	5%	1/4W F
R154	1-247-807-31	CARBON	100	5%	1/4W
R155	1-249-431-11	CARBON	15K	5%	1/4W
R156	1-249-437-11	CARBON	47K	5%	1/4W
R201	1-249-431-11	CARBON	15K	5%	1/4W
R202	1-249-404-00	CARBON	82	5%	1/4W F
R203	1-249-441-11	CARBON	100K	5%	1/4W
R204	1-247-843-11	CARBON	3.3K	5%	1/4W
R205	1-249-434-11	CARBON	27K	5%	1/4W
R206	1-249-421-11	CARBON	2.2K	5%	1/4W F
R209	1-249-426-11	CARBON	5.6K	5%	1/4W
R210	1-247-807-31	CARBON	100	5%	1/4W
R221	1-249-417-11	CARBON	1K	5%	1/4W F
R222	1-247-843-11	CARBON	3.3K	5%	1/4W
R223	1-247-895-91	CARBON	470K	5%	1/4W
R224	1-249-409-11	CARBON	220	5%	1/4W F
R240	1-249-441-11	CARBON	100K	5%	1/4W
R241	1-249-421-11	CARBON	2.2K	5%	1/4W F
R243	1-249-429-11	CARBON	10K	5%	1/4W
R251	1-249-417-11	CARBON	1K	5%	1/4W F
R253	1-249-409-11	CARBON	220	5%	1/4W F
R254	1-247-807-31	CARBON	100	5%	1/4W
R255	1-249-431-11	CARBON	15K	5%	1/4W
R256	1-249-437-11	CARBON	47K	5%	1/4W
R301	1-247-903-00	CARBON	1M	5%	1/4W
R302	1-249-441-11	CARBON	100K	5%	1/4W
R305	1-247-903-00	CARBON	1M	5%	1/4W
R306	1-249-429-11	CARBON	10K	5%	1/4W
R307	1-249-429-11	CARBON	10K	5%	1/4W
R309	1-249-417-11	CARBON	1K	5%	1/4W F
R311	1-247-810-11	CARBON	130	5%	1/4W
R312	1-249-427-11	CARBON	6.8K	5%	1/4W F
R313	1-249-393-11	CARBON	10	5%	1/4W F
R315	1-249-433-11	CARBON	22K	5%	1/4W
R319	1-249-425-11	CARBON	4.7K	5%	1/4W F
R341	1-249-437-11	CARBON	47K	5%	1/4W
R342	1-249-419-11	CARBON	1.5K	5%	1/4W F
R343	1-249-415-11	CARBON	680	5%	1/4W F
R344	1-249-409-11	CARBON	220	5%	1/4W F
R345	1-249-409-11	CARBON	220	5%	1/4W F
R346	1-249-421-11	CARBON	2.2K	5%	1/4W F
R347	1-247-807-31	CARBON	100	5%	1/4W
R348	1-249-421-11	CARBON	2.2K	5%	1/4W F
R349	1-249-414-11	CARBON	560	5%	1/4W F
R350	1-249-393-11	CARBON	10	5%	1/4W F
R401	1-249-441-11	CARBON	100K	5%	1/4W
R402	1-249-429-11	CARBON	10K	5%	1/4W
R403	1-249-433-11	CARBON	22K	5%	1/4W
R404	1-249-417-11	CARBON	1K	5%	1/4W F

Ref. No.	Part No.	Description			Remarks
R415	1-249-425-11	CARBON	4.7K	5%	1/4W F
R701	1-247-893-11	CARBON	390K	5%	1/4W
R702	1-249-429-11	CARBON	10K	5%	1/4W
R703	1-249-429-11	CARBON	10K	5%	1/4W
R704	1-249-429-11	CARBON	10K	5%	1/4W
R705	1-249-429-11	CARBON	10K	5%	1/4W
R706	1-247-893-11	CARBON	390K	5%	1/4W
R707	1-249-393-11	CARBON	10	5%	1/4W F
R708	1-247-903-00	CARBON	1M	5%	1/4W
R709	1-247-903-00	CARBON	1M	5%	1/4W
R710	1-249-429-11	CARBON	10K	5%	1/4W
R711	1-249-425-11	CARBON	4.7K	5%	1/4W F
R712	1-249-429-11	CARBON	10K	5%	1/4W
R713	1-249-429-11	CARBON	10K	5%	1/4W
R716	1-249-433-11	CARBON	22K	5%	1/4W
R717	1-249-435-11	CARBON	33K	5%	1/4W
R718	1-247-881-00	CARBON	120K	5%	1/4W
R719	1-249-435-11	CARBON	33K	5%	1/4W
R720	1-249-435-11	CARBON	33K	5%	1/4W
R721	1-249-429-11	CARBON	10K	5%	1/4W
R722	1-249-441-11	CARBON	100K	5%	1/4W
R723	1-247-903-00	CARBON	1M	5%	1/4W
R724	1-249-429-11	CARBON	10K	5%	1/4W
R725	1-247-843-11	CARBON	3.3K	5%	1/4W
R726	1-247-843-11	CARBON	3.3K	5%	1/4W
R727	1-249-430-11	CARBON	12K	5%	1/4W
R728	1-249-430-11	CARBON	12K	5%	1/4W
R729	1-249-430-11	CARBON	12K	5%	1/4W
R730	1-249-430-11	CARBON	12K	5%	1/4W
R731	1-249-430-11	CARBON	12K	5%	1/4W
R732	1-249-430-11	CARBON	12K	5%	1/4W
R733	1-249-417-11	CARBON	1K	5%	1/4W F
R734	1-249-425-11	CARBON	4.7K	5%	1/4W F
R735	1-249-425-11	CARBON	4.7K	5%	1/4W F
R736	1-249-437-11	CARBON	47K	5%	1/4W
R739	1-249-425-11	CARBON	4.7K	5%	1/4W F
R741	1-249-413-11	CARBON	470	5%	1/4W F
R742	1-249-417-11	CARBON	1K	5%	1/4W F
R805	1-249-441-11	CARBON	100K	5%	1/4W
R806	1-247-807-31	CARBON	100	5%	1/4W
R808	1-249-417-11	CARBON	1K	5%	1/4W F
R809	1-249-417-11	CARBON	1K	5%	1/4W F
R810	1-249-417-11	CARBON	1K	5%	1/4W F
R811	1-249-417-11	CARBON	1K	5%	1/4W F
R812	1-249-417-11	CARBON	1K	5%	1/4W F
R813	1-249-417-11	CARBON	1K	5%	1/4W F
R814	1-249-417-11	CARBON	1K	5%	1/4W F
R818	1-249-441-11	CARBON	100K	5%	1/4W
R819	1-249-437-11	CARBON	47K	5%	1/4W
R820	1-249-415-11	CARBON	680	5%	1/4W F
R822	1-249-437-11	CARBON	47K	5%	1/4W
R823	1-249-417-11	CARBON	1K	5%	1/4W F
R824	1-249-441-11	CARBON	100K	5%	1/4W
R825	1-249-441-11	CARBON	100K	5%	1/4W
R826	1-249-441-11	CARBON	100K	5%	1/4W
R827	1-247-887-00	CARBON	220K	5%	1/4W

MAIN | POWER | RECORD SWITCH | VOLUME

Ref. No.	Part No.	Description	Remarks
		< VARIABLE RESISTOR >	
RV1	1-228-995-00	RES, ADJ, METAL22K	
RV351	1-225-438-11	RES, VAR, CARBON 20K/20K (TONE)	
		< SWITCH >	
S351	1-572-300-11	SWITCH, LEVER SLIDE (FUNCTION)	
		< TRANSFORMER >	
T1	1-409-944-11	COIL (DET)	
T2	1-416-522-11	COIL (IFT)	
T301	1-416-041-11	TRANSFORMER, BIAS OSCILLATION	
		< VIBRATOR >	
X701	1-760-793-11	VIBRATOR, CERAMIC 19.9344MHz	
X801	1-781-668-11	VIBRATOR, CERAMIC 4MHz	
**********			
*	1-676-117-11	POWER BOARD	
		**********	
	1-533-233-31	HOLDER, FUSE	
		< CAPACITOR >	
C901	1-101-005-00	CERAMIC 22000PF 50V	
C902	1-101-005-00	CERAMIC 22000PF 50V	
C903	1-101-005-00	CERAMIC 22000PF 50V	
C904	1-101-005-00	CERAMIC 22000PF 50V	
		< DIODE >	
D901	8-719-063-79	DIODE 1N4002B	
D902	8-719-063-79	DIODE 1N4002B	
D903	8-719-063-79	DIODE 1N4002B	
D904	8-719-063-79	DIODE 1N4002B	
		< FUSE >	
⚠F902	1-532-464-31	FUSE TL 2.5A/250V	
		< HOLDER >	
* KH904	1-573-287-11	HOLDER, CABLE 2P	
**********			

Ref. No.	Part No.	Description	Remarks
*	1-676-115-11	RECORD SWITCH BOARD	
		**********	
		< CONNECTOR >	
* CNP302	1-785-656-11	PIN, CONNECTOR (PC BOARD) 4P	
		< SWITCH >	
S301	1-762-565-11	SWITCH, SLIDE (REC/PB)	
**********			
*	1-676-120-11	VOLUME BOARD	
		**********	
		< HOLDER >	
* KH307	1-568-135-21	HOLDER, CABLE 7P	
		< RESISTOR >	
R308	1-249-417-11	CARBON 1K 5% 1/4W F	
		< VARIABLE RESISTOR >	
RV352	1-225-764-12	RES, VAR, CARBON 20K/20K (VOLUME)	
		< SWITCH >	
S355	1-762-950-11	SWITCH, PUSH (1 KEY) (MEGA BASS)	
**********			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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