

COMPACT DISC PLAYER

CDC-697

SERVICE MANUAL

IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

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

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

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

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

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

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This Service Manual uses recycled paper.



■ TO SERVICE PERSONNEL

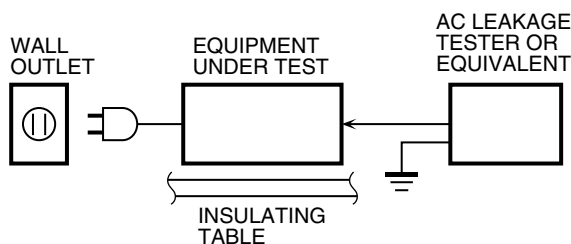
1. Critical Components Information

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

2. Leakage Current Measurement (For 120V Models Only)

When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohms shunted by 0.15 μ F.



- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.

WARNING: CHEMICAL CONTENT NOTICE!

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

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

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

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

About Lead Free Solder

All of the P.C.B.s installed in this unit and solder joints are soldered using the lead free solder.

Among some types of lead free solder currently available, it is recommended to use one of the following types for the repair work.

- Sn + Ag + Cu (tin + silver + copper)
- Sn + Cu (tin + copper)
- Sn + Zn + Bi (tin + zinc + bismuth)

Caution:

As the melting point temperature of the lead free solder is about 30°C to 40°C (50°F to 70°F) higher than that of the lead solder, be sure to use a soldering iron suitable to each solder.

WARNING: Laser Safety

This product contains a laser beam component. This component may emit invisible, as well as visible radiation, which may cause eye damage. To protect your eyes and skin from laser radiation, the following precautions must be used during servicing of the unit.

- 1) When testing and/or repairing any component within the product, keep your eyes and skin more than 30 cm away from the laser pick-up unit at all times. Do not stare at the laser beam at any time.
- 2) Do not attempt to readjust, disassemble or repair the laser pick-up, unless noted elsewhere in this manual.
- 3) CAUTION: Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Laser Emitting conditions:

- 1) When the Top Cover is removed, and the STANDBY/ON SW is turned to the "ON" position, the laser component will emit a beam for several seconds to detect if a disc is present. During this time (5-10 sec.) the laser may radiate through the lens of the laser pick-up unit. Do not attempt any servicing during this period!

If no disc is detected, the laser will stop emitting the beam. When a disc is loaded, you will not be exposed to any laser emissions.

- 2) The laser power level can be adjusted with the VR on the pick-up PWB, however, this level has been set by the factory prior to shipping from the factory. Do not adjust this laser level control unless instruction is provided elsewhere in this manual. Adjustment of this control can increase the laser emission level from the device.

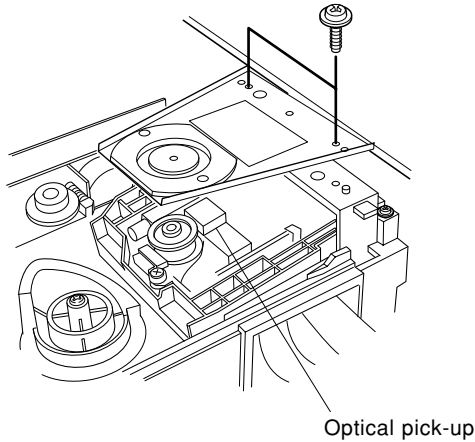
PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to carefully follow the instructions below when servicing.

1. Laser Diode Properties

- Material : GaAlAs
- Wavelength : 790 nm
- Emission Duration : Continuous
- Laser Output : . 1.23 mW (max.)

2. When checking the laser diode emission, keep your eyes more than 30 cm away from the objective lens.



VARO! : AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASER-SÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

VARNING! : OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

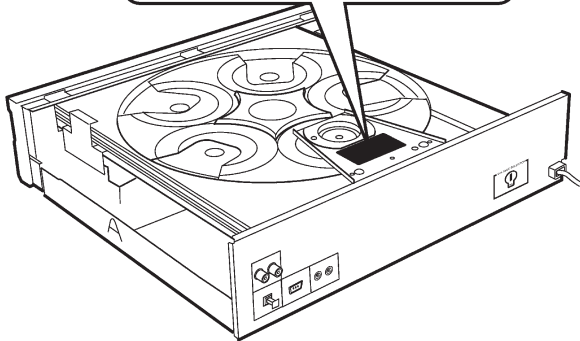
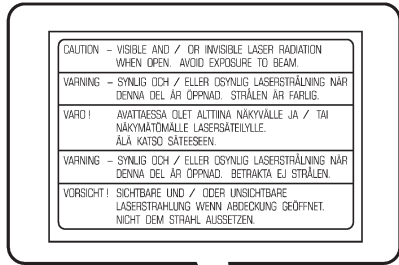
WARNING

CAUTION

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

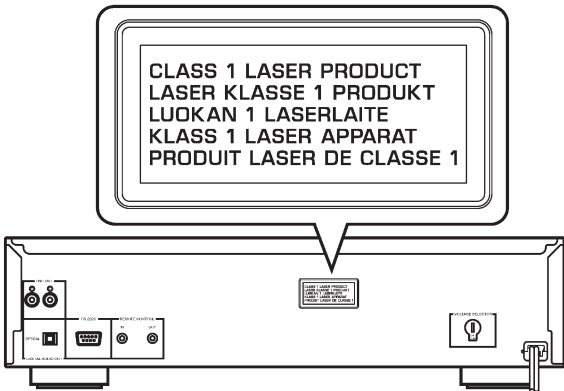
VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA
OLET ALTTIINA NÄKYMÄTTÖMÄLLE
LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

VARNING!
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR
ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD.
BETRAKTA EJ STRÅLEN.



(Example: R model)

CAUTION
VISIBLE AND INVISIBLE LASER RADIATION WHEN
OPEN. AVOID EXPOSURE TO BEAM.



(Example: R model)

■ PREVENTION OF ELECTROSTATIC DISCHARGE

The laser diode in the DVD mechanism may be damaged due to static electricity from clothes or the human body. Use caution to prevent electrostatic damage when servicing or handling the DVD-mechanism.

1. Grounding for electrostatic damage prevention

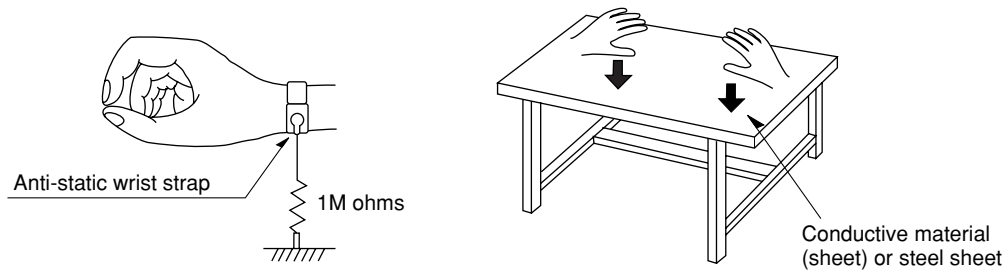
Some devices, such as the DVD player, use an optical pickup (laser diode) that will be damaged by static electricity in the working environment. Only attempt service after ensuring that all grounding procedures have been completed.

1. Worktable grounding

Put a grounded conductive material (sheet) or iron sheet on the area where the optical pickup is placed.

2. Human body grounding

Use an anti-static wrist strap to discharge the static electricity from your body.

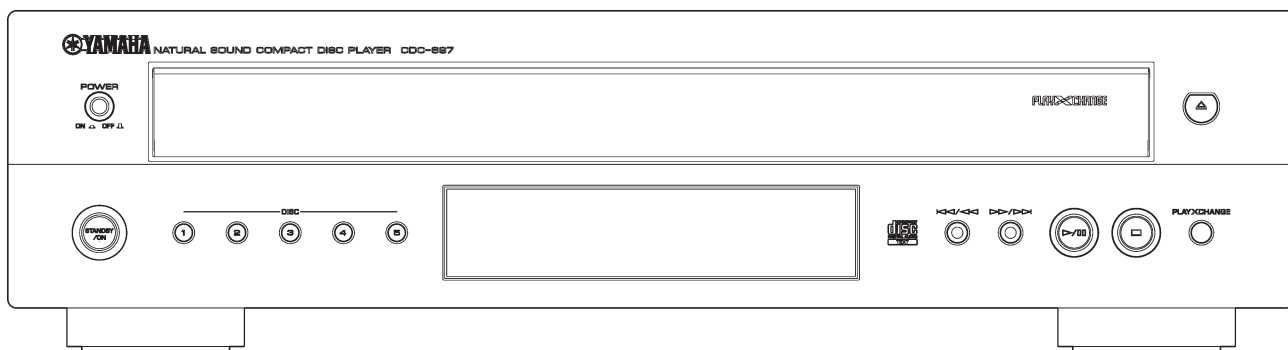


2. Handling Precautions for DVD mechanism

1. Handle the DVD mechanism gently, as it is an extremely high-precision assembly.
2. The flexible cable lines may break if an excessive force is applied to it. Use caution when handling the cable.
3. The semi-fixed resistor for laser power adjustment should not be adjusted. Do not turn the resistor.

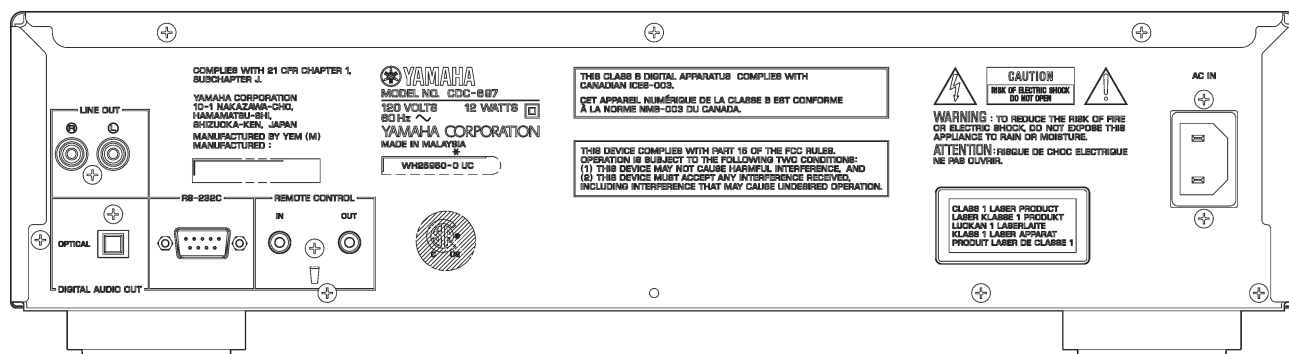
■ FRONT PANEL

CDC-697 (U, C, R, T, A, B, G, L models)

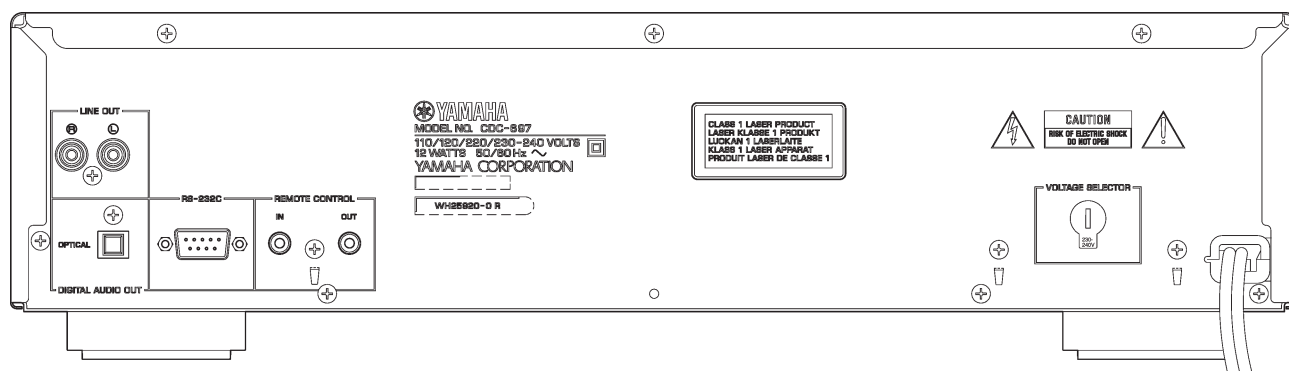


■ REAR PANELS

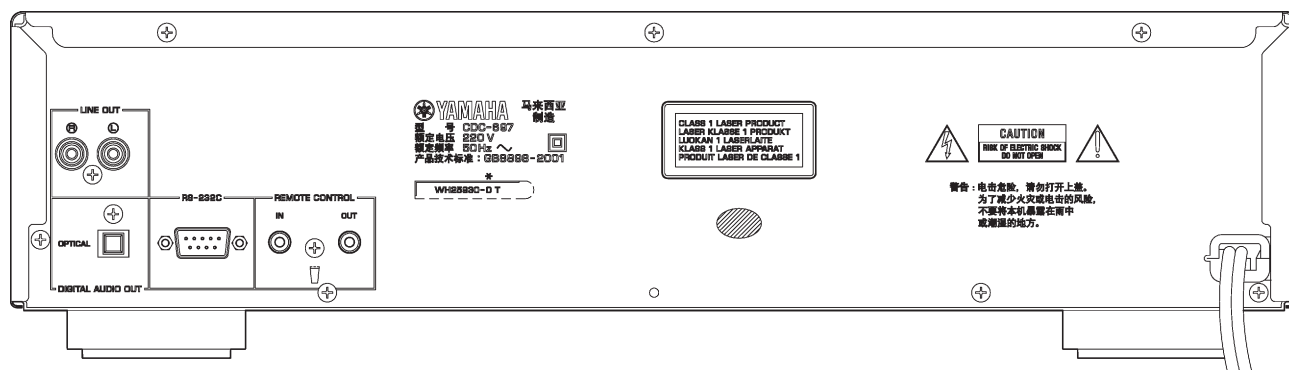
CDC-697 (U, C models)



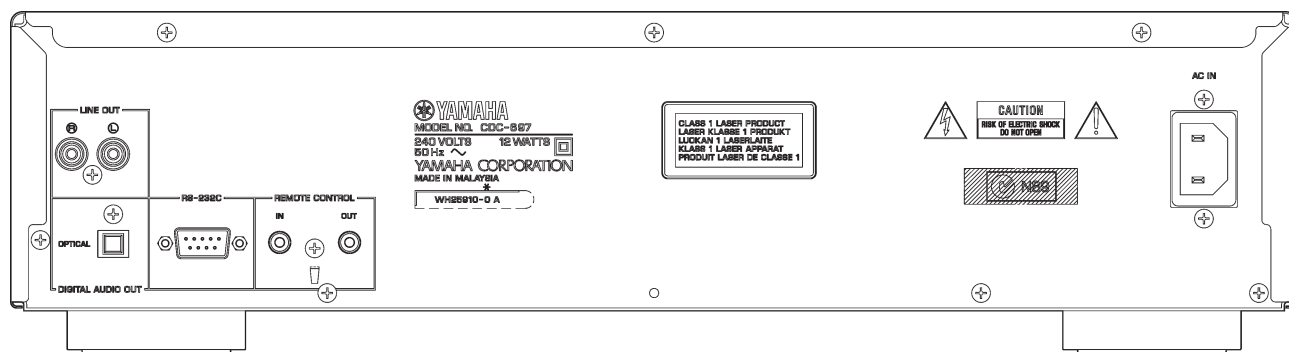
CDC-697 (R model)



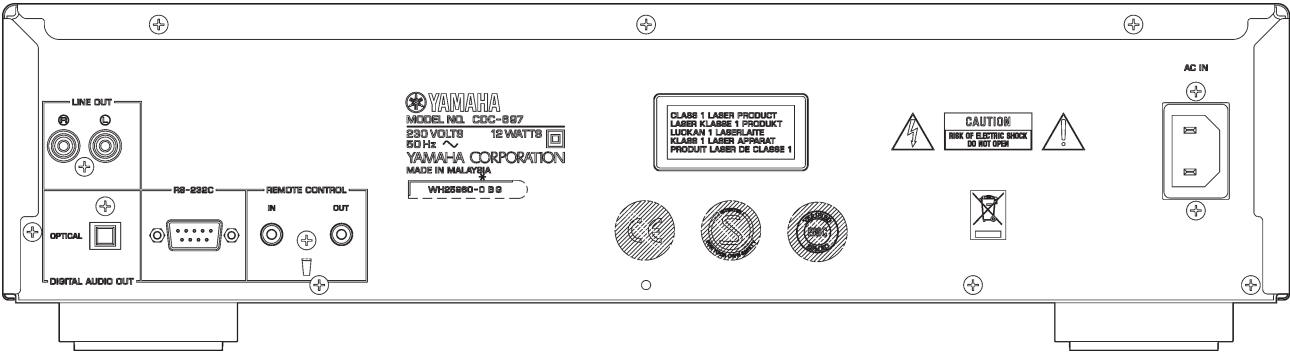
CDC-697 (T model)



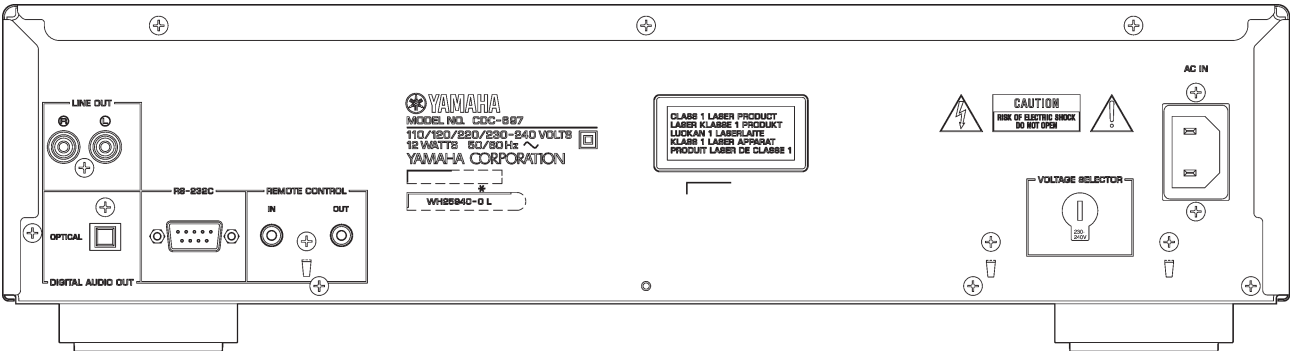
CDC-697 (A model)



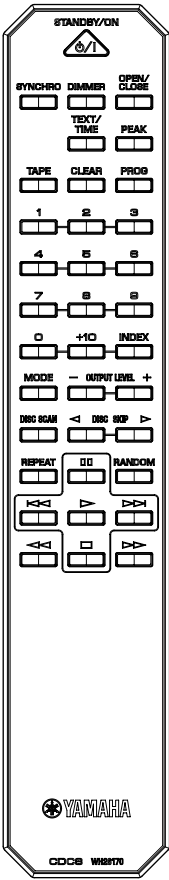
CDC-697 (B, G models)



CDC-697 (L model)



REMOTE CONTROL PANEL



Caution for moving this unit

- When moving this unit, first remove all discs from the disc tray and close the tray by pressing the **OPEN/CLOSE** button, and then switch off the power after you confirm that the front panel display indicates as follows.



Never switch off the power if the front panel display is not pictured as above, otherwise the unit will break down during moving because the internal mechanism is not locked.

This unit is not disconnected from the AC power source as long as it is connected to the wall outlet, even if this unit itself is turned off. This state is called the standby mode. In this state, this unit is designed to consume a very small quantity of power.

DANGER

When this unit is plugged to the wall outlet, do not place your eyes close to the opening of the disc tray and other openings to look into inside.

WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

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

■ SPECIFICATIONS

■ Audio Section

Output Level (1 kHz, 0 dB)	2 ±0.5 V
Signal to Noise Ratio	106 dB or more
Dynamic Range	96 dB or more
Harmonic Distortion + Noise (1 kHz)	0.003 % or less
Frequency Response (2 to 20 kHz)	±0.5 dB

■ General

Power Supply

U, C models	AC 120 V, 60 Hz
R, L models	AC 110/120/220/230-240 V, 50/60 Hz
T model	AC 220 V, 50 Hz
A model	AC 240 V, 50 Hz
B, G models	AC 230 V, 50 Hz

Power Consumption 12 W

Dimensions (W x H x D) 435 x 116 x 403
(17-1/8" x 4-9/16" x 15-7/8")

Weight 5.5 kg (12 lbs. 2 oz.)

Finish

Black color	U, C, R, T, A, B, G models
Titanium color	G, L models

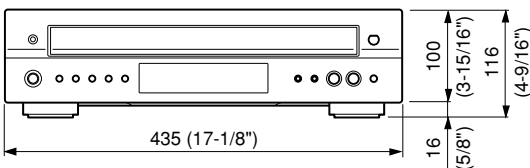
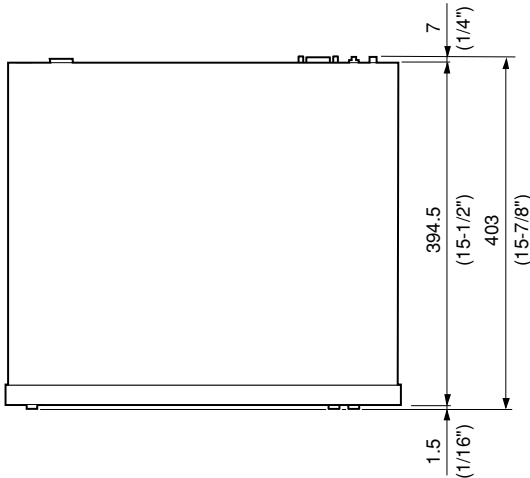
Accessories

Remote control x 1, Batteries (UM-3) x 2, Power cable x 1 (U, C, A, B, G models), Audio pin cable x 1

* Specifications are subject to change without notice due to product improvements.

U	 U.S.A. model	C	 Canadian model
R	 General model	T	 Chinese model
A	 Australian model	B	 British model
G	 European model	L	 Singapore model

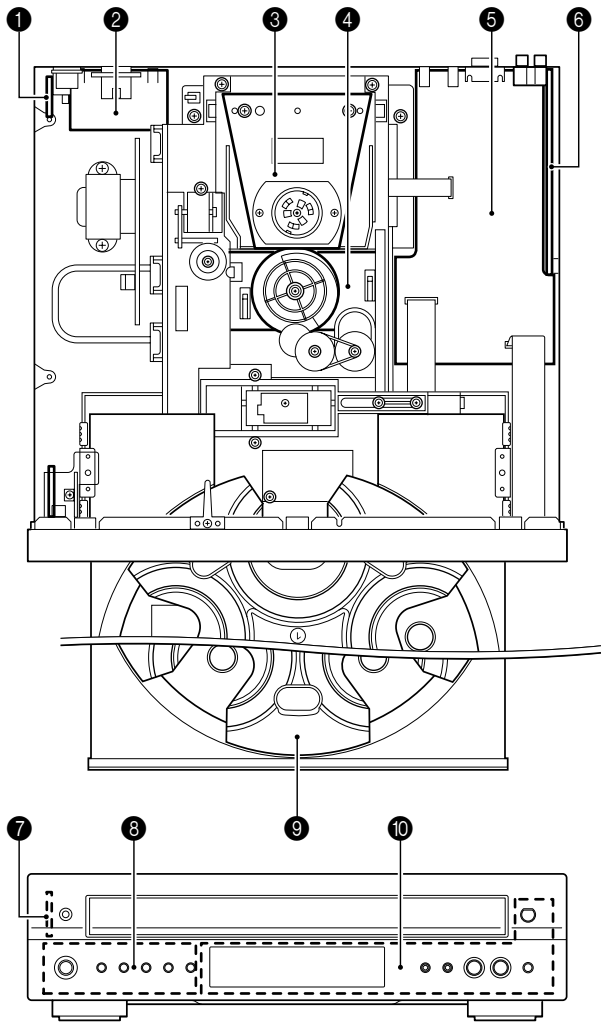
• DIMENSIONS



Unit: mm (inch)

■ INTERNAL VIEW

- ① MAIN (7) P.C.B. (U, C, A, B, G models)
- ② MAIN (2) P.C.B. (R, L models)
- ③ CLAMP ASS'Y
- ④ CM-230A UNIT
- ⑤ MAIN (1) P.C.B.
- ⑥ MAIN (6) P.C.B.
- ⑦ MAIN (5) P.C.B.
- ⑧ MAIN (3) P.C.B.
- ⑨ TRAY ASS'Y
- ⑩ MAIN (4) P.C.B.



■ DISASSEMBLY PROCEDURES

(Remove parts in the order as numbered.)

1. Removal of Top Cover

- Remove 4 screws (①) and 3 screws (②). (Fig. 1)
- Lift the top cover at the rear and move it rearward slantingly.

2. Removal of Clamp Ass'y

- Remove 2 screws (③). (Fig. 1)
- Remove clamp ass'y. (Fig. 1)

3. Removal of Tray Ass'y

- Remove 1 screw (④). (Fig. 1)
- Turn gear/L0. (Fig. 2) Counter clockwise gradually until immediately before the tray starts to move and stop it there.

CAUTION: Gear/L0, if turned counter clockwise continuously, will mesh with the gear of the tray and the tray will come out. When removing the tray, use care so that gear/L0 will not mesh with the gear of the tray.

- Pull out the tray ass'y.

4. Removal of Table

- Remove 1 screw (⑤) and then remove the support/T. (Fig. 1)
- Remove the plate/table. (Fig. 1)
- Remove 1 screw (⑥) and then take off the table. (Fig. 1)

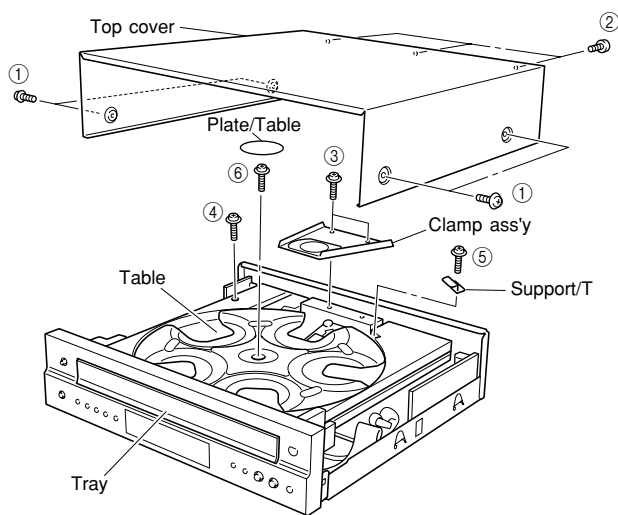


Fig. 1

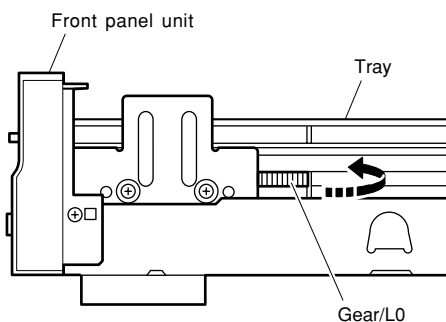


Fig. 2

• Precaution for installation of the Tray Ass'y.

On tray ass'y setting.

Check the direction of marking "▲" on gear according to this drawing.

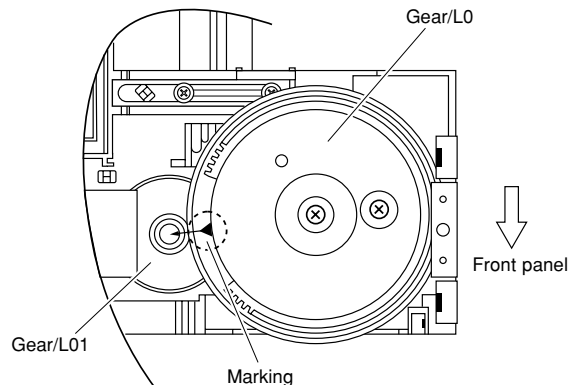


Fig. A

• IMPORTANCE: Installation of Table.

Install the table according to the following procedure.

- Slide the lever so that the gear/RT1 becomes free. (Fig. B-1)
- With the "▲" mark on the gear/RT1 aligned with the same mark on the tray, lock it with the lever. (Fig. B-1)
- Install the table by aligning it to the thick line on "/" mark. (Fig. B-2)

* Check that the Table is locked after installation.

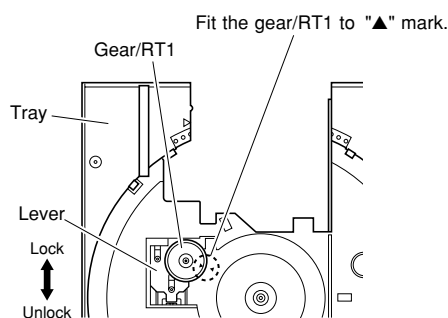


Fig. B-1

Fit the table to the thick line on "/" mark.

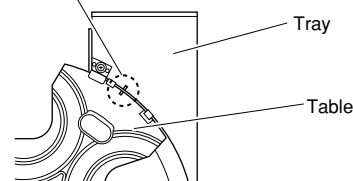


Fig. B-2

CM-230A unit can not be removed without removing the Front Panel Unit.

5-A. Removal of Front Panel Unit

- Remove CB200 and CB304. (Fig. 4)
- Remove 2 screws (⑦), 3 screws (⑧) and 1 screw (⑨). (Fig. 3)
- Remove the front panel unit. (Fig. 3)

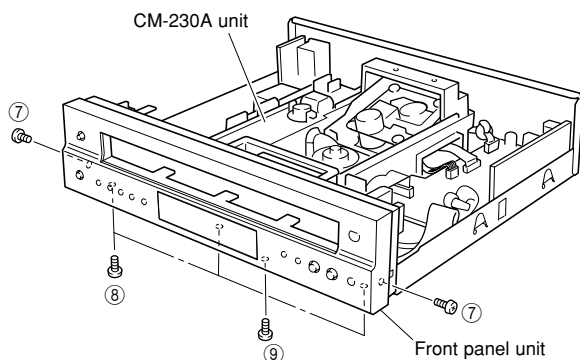


Fig. 3

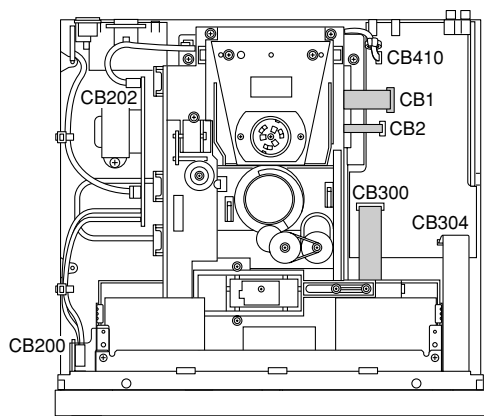


Fig. 4

5-B. Removal of CM-230A Unit

- Remove 5 screws (⑩). (Fig. 5)
- Remove CB1, CB2 and CB300. (Fig. 4)
- Take the CM-230A unit out slowly. (Fig. 5)

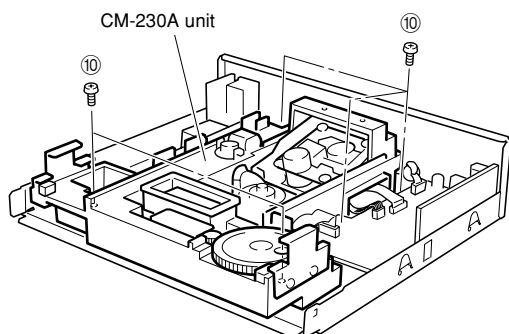


Fig. 5

6. Removal of PU Mechanism Unit

- Remove 2 screws (⑪) and then remove the PU unit ass'y. (Fig. 6)

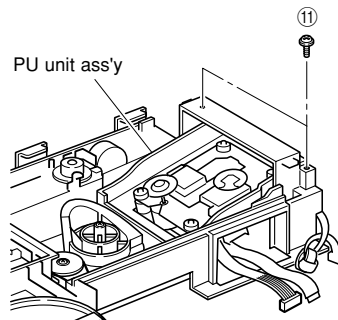


Fig. 6

- Remove 4 screws (⑫) and then remove the PU mechanism unit. (Fig. 7)

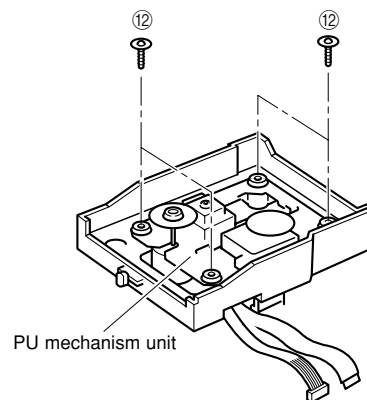


Fig. 7

• Operation Check Procedure

- Disassembly
 - Remove the top cover.
 - Remove the clamp ass'y.
 - Remove the stabilizer from the holder.

Turn the plate clockwise by 30° while holding the stabilizer, and the plate will come off. Remove the stabilizer from the holder.

- Clamp the disc by using the stabilizer.
- Set to the TEST mode and check for any faulty conditions.

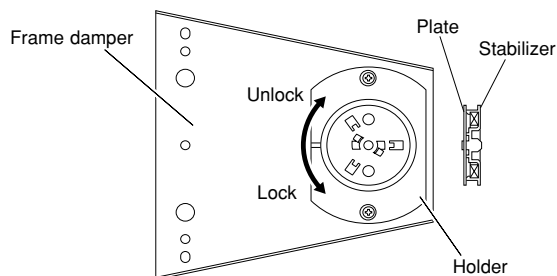


Fig. C

• **When checking the P.C.B.:**

- a. Remove the top cover.
- b. Remove the tray ass'y.
- c. Remove 3 screws (①) and 2 jack screws (②). (Fig. 1)
- d. Remove 1 screw (③), 1 screw (④) and 1 push rivet. (Fig. 2)
- e. Spread a cloth over the main chassis. (Fig. 2)
- f. Put the MAIN (1) and MAIN (6) P.C.B.s on end. (Fig. 2)
- g. Connect the ground point of MAIN (6) P.C.B. to rear panel by using ground lead. (Fig. 2)

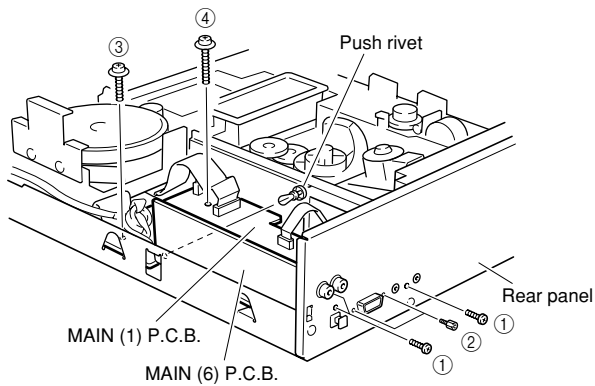


Fig. 1

CAUTION: The ground point must be connected to rear panel to keep the circuit in normal operation when MAIN (6) P.C.B. is removed from rear panel.

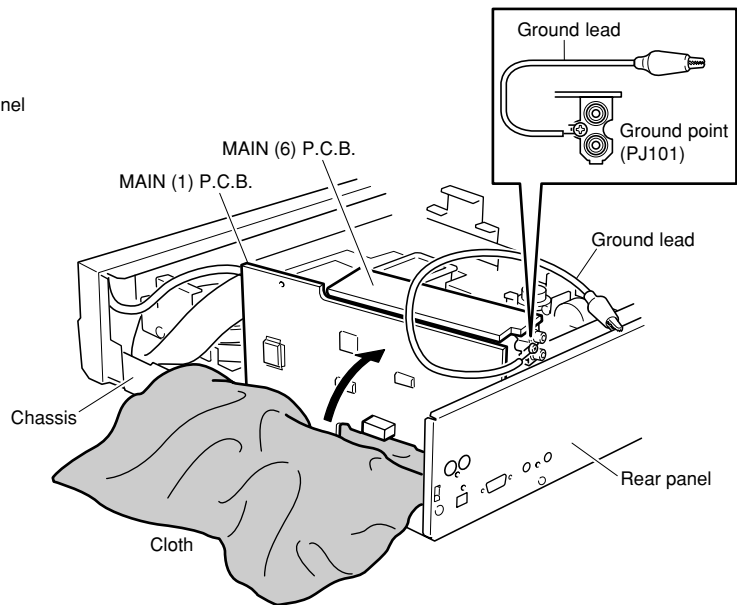


Fig. 2

- h. Remove 5 screws (⑤) and 1 screw (⑥). (Fig. 3)
- i. Remove the front panel from the chassis.

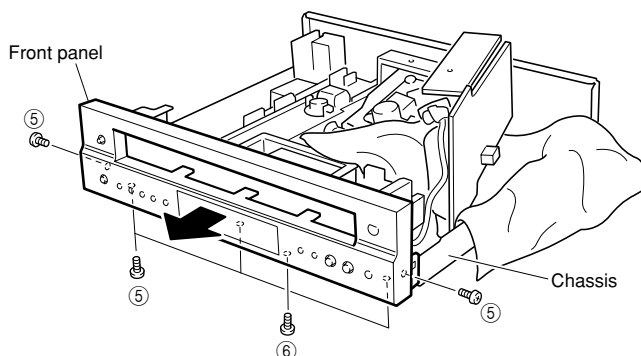
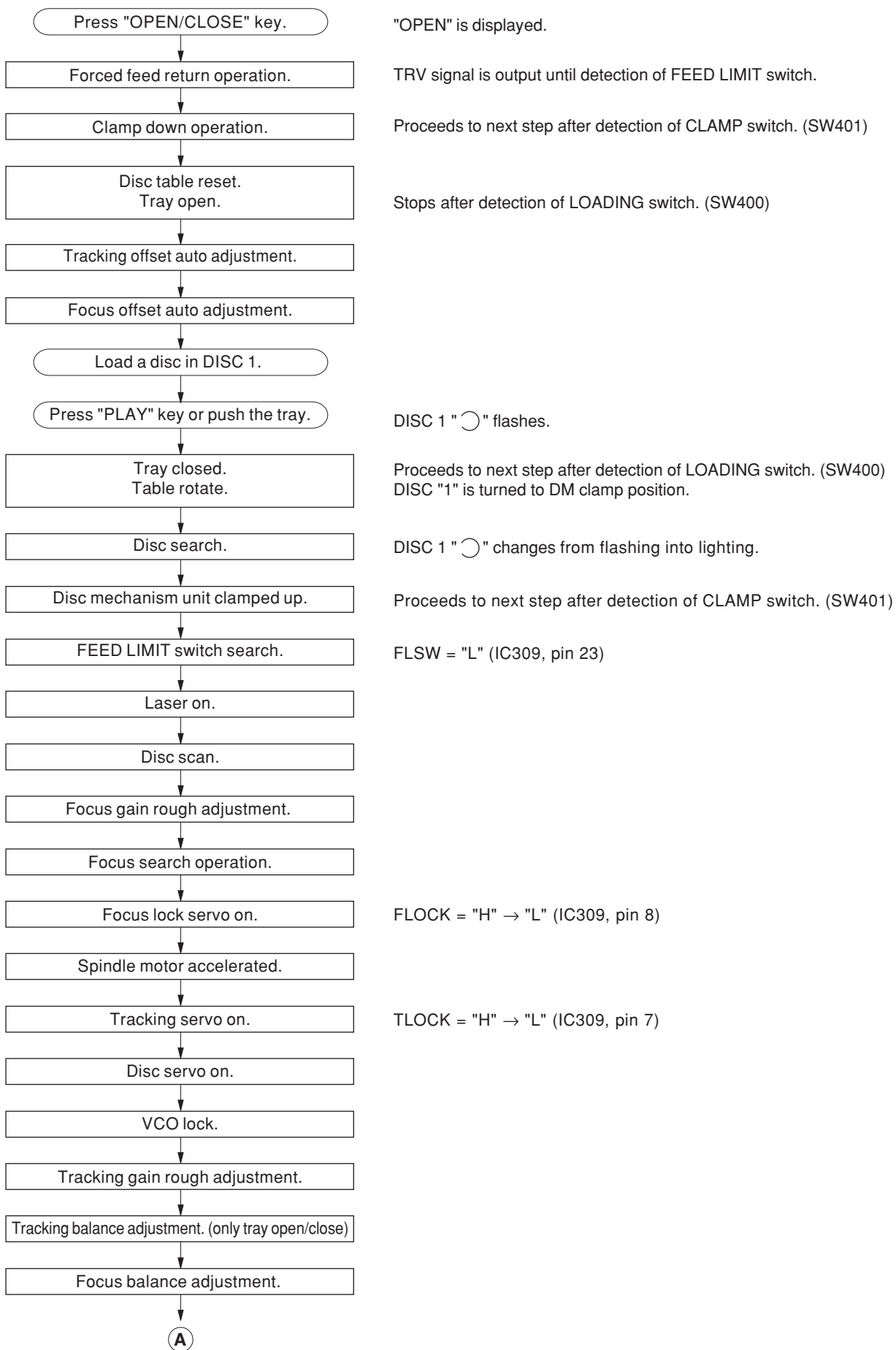
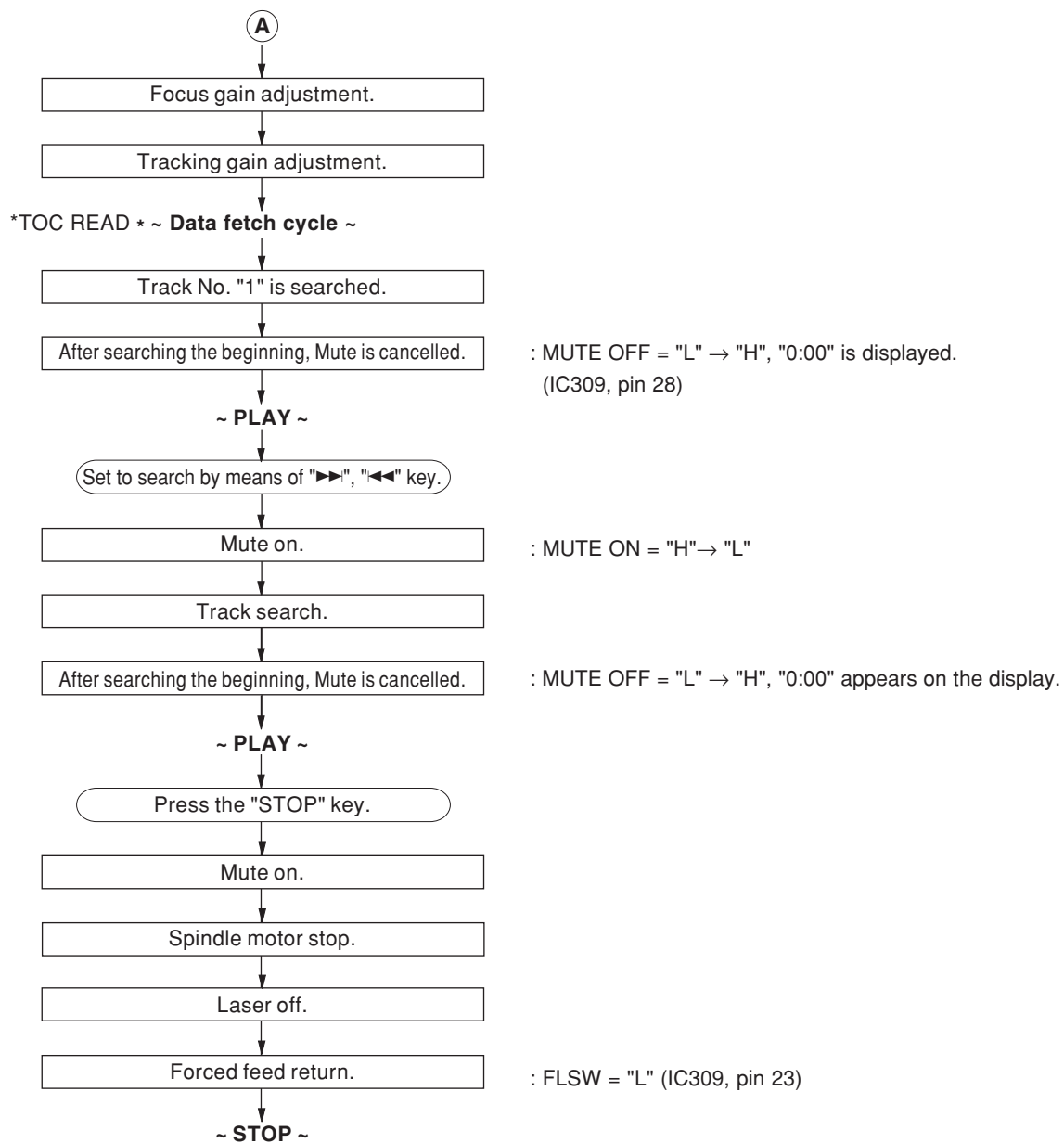


Fig. 3

■ STANDARD OPERATION CHART

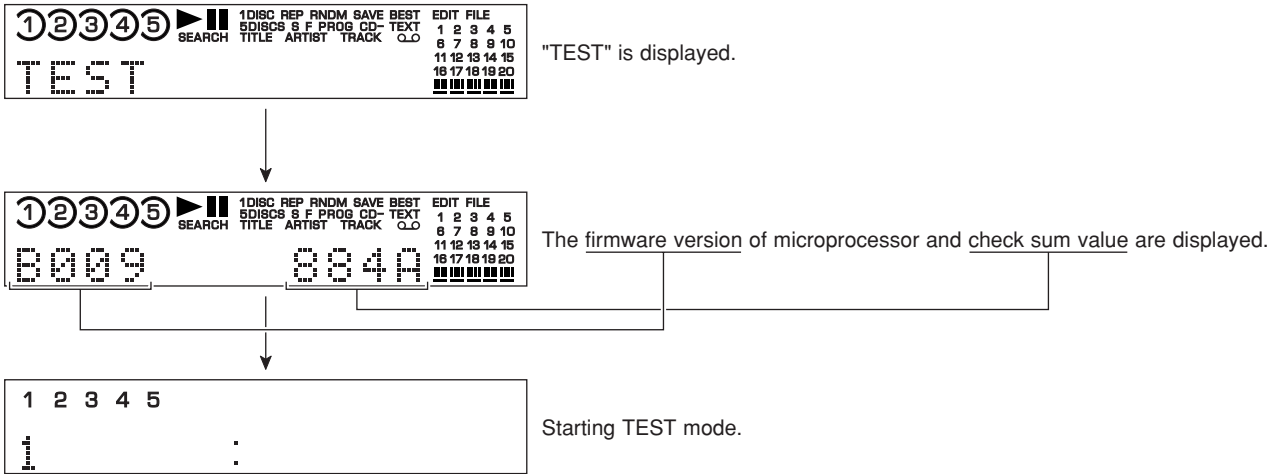




■ TEST MODE

• Starting TEST mode

Test mode is started when the power is turned on while the “PLAY/PAUSE” and “STOP” keys on the panel are simultaneously pressed and held.
When the test mode is started, as shown below is displayed.



NOTE: To fully operate all test modes the remote control must be used.

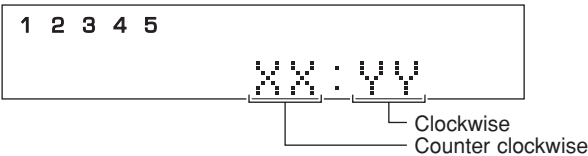
• Function List of Panel Keys

Note: “traverse servo” means the same as “feed servo”.

Panel key	Function
OPEN/CLOSE	Tray open/close.
PLAYXCHANGE	Rotating the mode of coefficients. (Coefficient mode → Coefficient setting → Product mode) Pressing twice will set to the product mode.
PLAY/PAUSE	Plays if focus servo is effective. TRON, MUTE OFF.
STOP	All stop. (Focus, spindle, feed, laser, tray, etc..) Initializes FL display.
◀◀ SKIP	Backward traverse move. (If inner SW turns on, traverse is stopped.) (Coefficient set up mode: upper digit down.)
▶▶ SKIP	Forward traverse move. (Coefficient set up mode: upper digit up.)
DISC 1	Returns to product mode. (Tray and table inoperative.)
DISC 2	Adjustment mode 1 (TR-offset, FO-offset, FO-rough gain adjustment.)
DISC 3	Adjustment mode 2 (TR-balance, TR-rough gain adjustment.)
DISC 4	Adjustment mode 3 (FO-fine gain, TR-fine gain, FO-balance adjustment.)
DISC 5 (Note 1)	Measure the rotating time of the table (rotate slow).

(Note 1) Measure the rotating time of the table (rotate fast/rotate slow).

- Display for time mesurement.
The time display shows the time for 1 rotation of the table.
The unit of time is 0.1 second (rotate fast) or 1 second (rotate slow).



- When the disc table is not positioned correctly, be sure to turn the disc table one full rotation by using the “DISC SKIP ◀” or “DISC SKIP ▶” keys on the remote control unit before canceling the TEST mode.

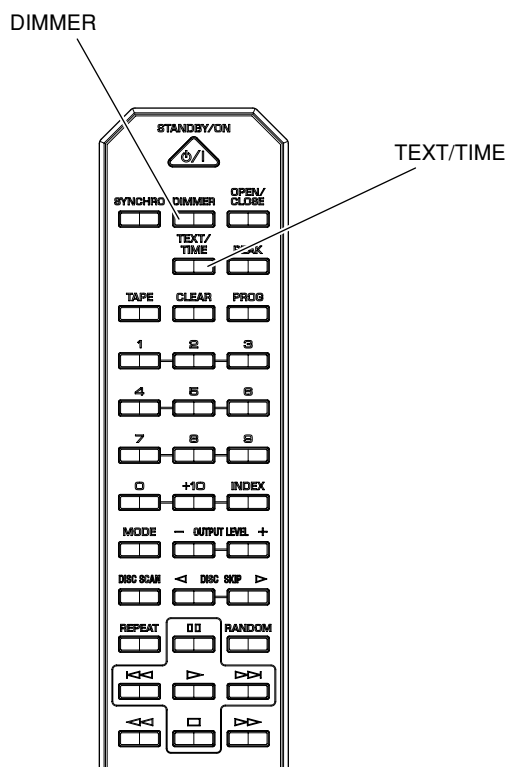
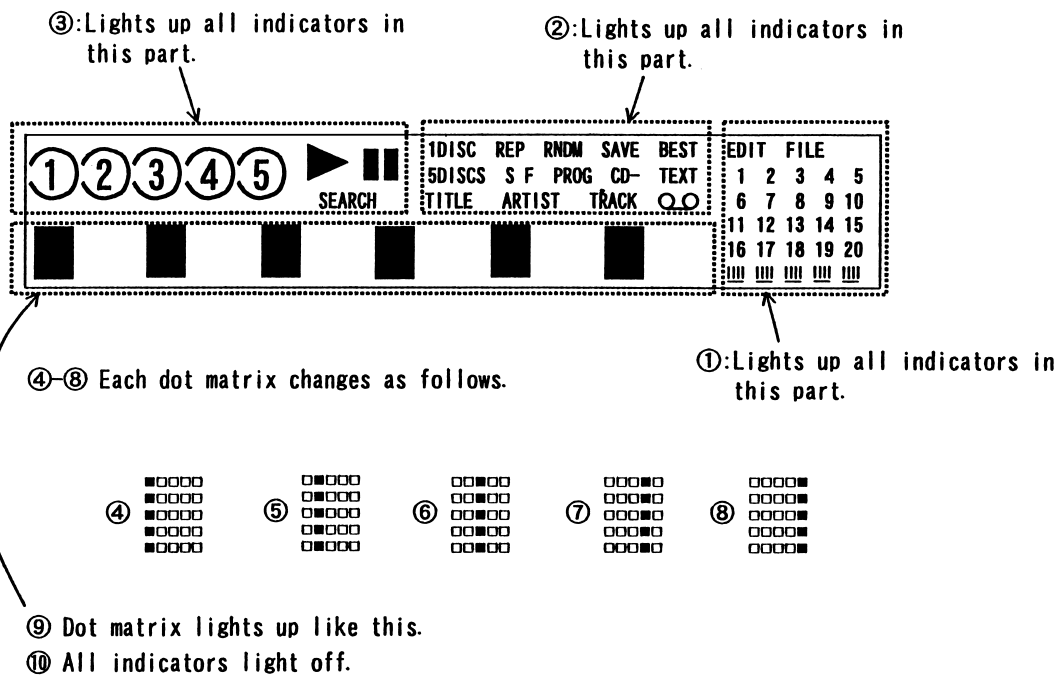
• Function List of Remote Control Transmitter

CUSTOM CODE = (79)x

Code	Key	Function
00	MODE	Traverse stop.
01	OPEN/CLOSE	Tray open/close.
02	PLAY	PLAY (FOON, TRON, TVON (FEON), SPON)
04	◀◀ SKIP	Backward traverse move. (If inner SW turns on, traverse is stopped.) (Coefficient set up mode: upper digit down.)
05	◀◀ SEARCH	Clamp down. (Coefficient set up mode: lower digit down.)
06	▶▶ SEARCH	Clamp up. (Coefficient set up mode: lower digit up.)
07	▶▶ SKIP	Forward traverse move. (Coefficient set up mode: upper digit up.)
08	REPEAT	FOON, TROF (Enter focus search if focus servo is off.)
0A	TEXT/TIME (Note 2)	Checks FL display.
0B	INDEX	FOON, TROF, TVOF (FEOF) (Enter focus search if focus servo is off.)
0C	PROG	Rotates or accelerates spindle.
0D	CLEAR	Decelerates spindle.
10	0	Backward 150 TRACK KICK continuously.
11	1	Returns to product mode. (Tray and Table inoperative.)
12	2	Adjustment mode 1 (TR-offset, FO-off set, FO-rough gain adjustment.)
13	3	Adjustment mode 2 (TR-balance, TR-rough gain adjustment.)
14	4	Adjustment mode 3 (FO-fine gain, TR-fine gain, FO-balance adjustment.)
15	5	Forward 1 TRACK KICK continuously.
16	6	Backward 1 TRACK KICK continuously.
17	7	Forward 30 TRACK KICK continuously.
18	8	Backward 30 TRACK KICK continuously.
19	9	Forward 150 TRACK KICK continuously.
1A	+10	Enter coefficient set up mode.
1B	RANDOM	SPON (Spindle servo on.)
1C	OUTPUT LEVEL –	Output level down. (Coefficient set up mode: address down.)
1D	OUTPUT LEVEL +	Output level up. (Coefficient set up mode: address up.)
1E	DIMMER (Note 2)	Checks FL display.
4F	DISC SKIP ▶	DISC SKIP + (Clockwise)
50	DISC SKIP ◀	DISC SKIP – (Counterclockwise)
53	DISC SCAN (Note 1)	Measure the rotating time of the table (rotate fast).
55	PAUSE	FOON, TROF, TVOF (FEOF) (Enter focus search if focus servo is off.)
56	STOP	All stop. (Focus, spindle, traverse, laser, tray, etc..)
57	TAPE	Spindle free. (off)
58	SYNCHRO	Backward traverse move.

(Note 2) Checks FL display.

Display changes as follows (①→②→...→⑩) as you press the key.



■ ERROR MESSAGES

When stopped by any cause, press "STOP" key of the remote control while pressing and holding the "STOP" key on the main unit. The operation mode turns to the mode allowing the display of messages.

The unit hold the latest error message in microprocessor. So even if stopped with no error, the unit can display the latest error message with same operation.

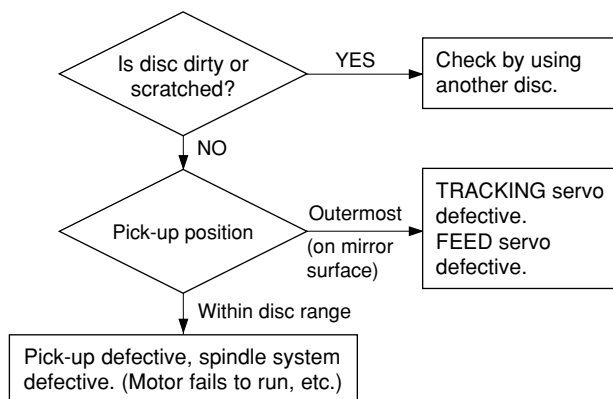
Error message	Description
E - x 0	Data cannot be read after finishing search.
E - x 1	Data cannot be read during PLAY (x = 0), PAUSE (x = 3) or SCAN (x = 2).
E - 7 1	At the start, tracking servo is not effective.
E - 7 2	At the start, spindle servo PLL is not effective.
E - 7 3	At the start, data can not read.
E - x 4	Close switch does not work with tray closed.
E - x 5	Open switch does not work with tray opened.
E - x 6	Table does not turn.
E - x 7	Traverse (Feed) inner circumference switch does not work.
E - x 8	Recovery action fails after focus drop.
E - x 9	Clamp down switch does not work.
E - x A	Clamp up switch does not work.
E r r	IC3 does not give response of SENSE, with resetting by the microprocessor.

* **Meaning of each state ("x"):**

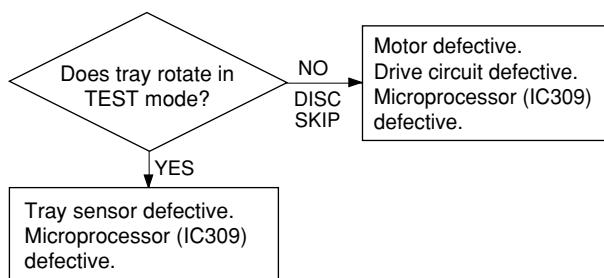
- (x = 0) PLAY
- (x = 2) SCAN
- (x = 3) PAUSE
- (x = 4) PEAK SEARCH
- (x = 5) SEARCH
- (x = 6) DISC SCAN
- (x = 7) START
- (x = 8) STOP
- (x = 9) DISC SEARCH
- (x = -) EJECT
- (x = C) NO DISC

1) Error Code Troubleshooting.

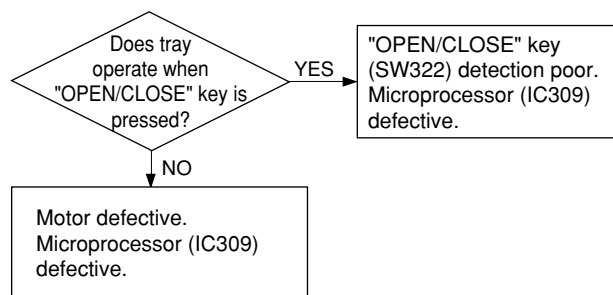
Error codes **x0**, **x1**, **73** ...Data cannot de read.



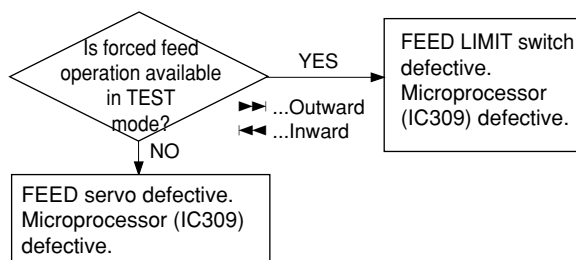
Error code **x6** Poor table rotation.



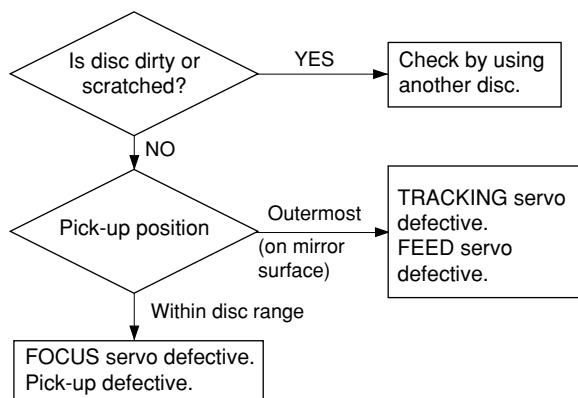
Error codes **x4**, **x5** ... Poor tray loading operation.



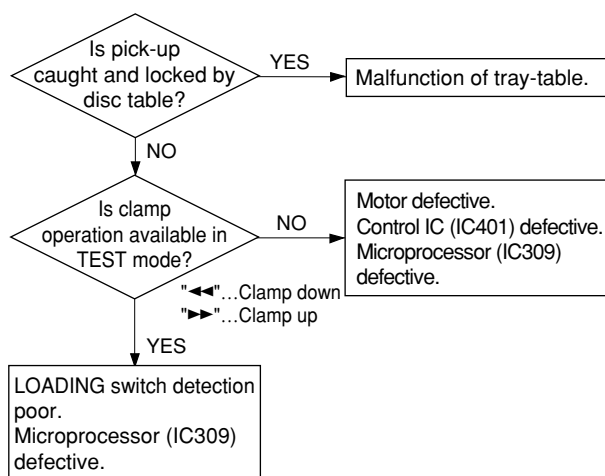
Error code **x7** FEED operation defective. (FEED LIMIT switch fails.)



Error code **x8** Focus drops.

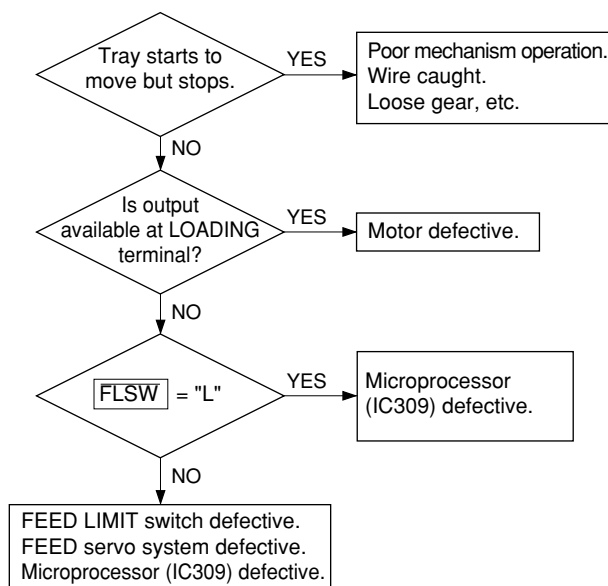


Error codes **x9**, **xA** Poor clamp operation.

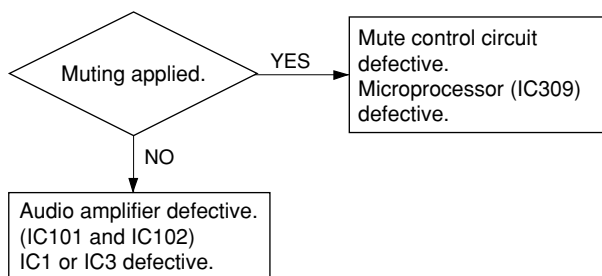


2) Troubleshooting from system malfunctions.

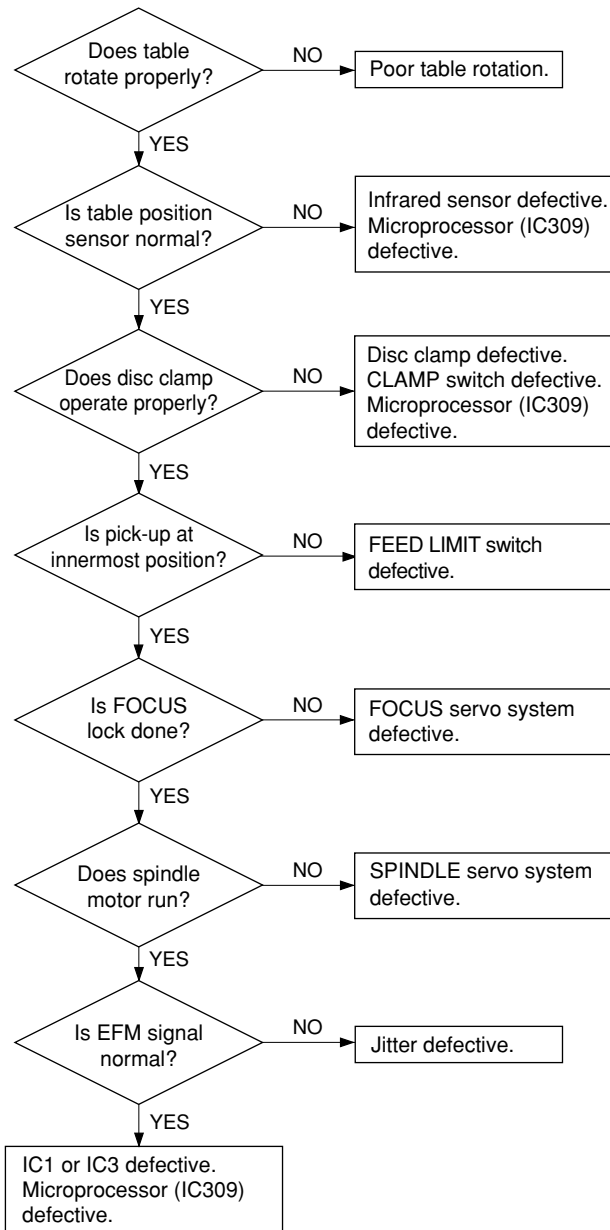
a) Tray fails to come out/go in.



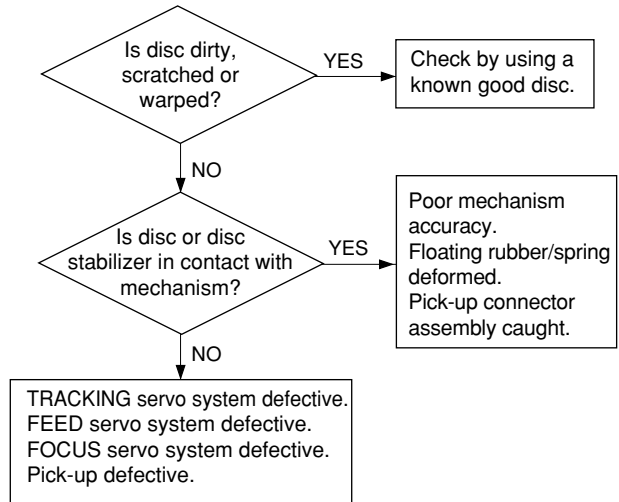
b) No sound generated, sound cut during play. (but time display advanced properly)



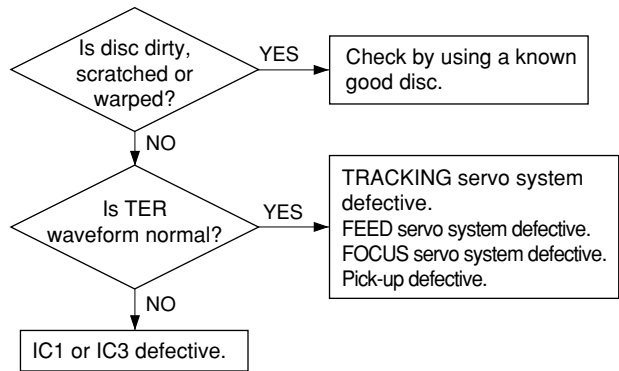
**c) Operates as if no disc loaded.
(although loaded)**



**d) Sound skips.
(Time display fails to advance properly)**

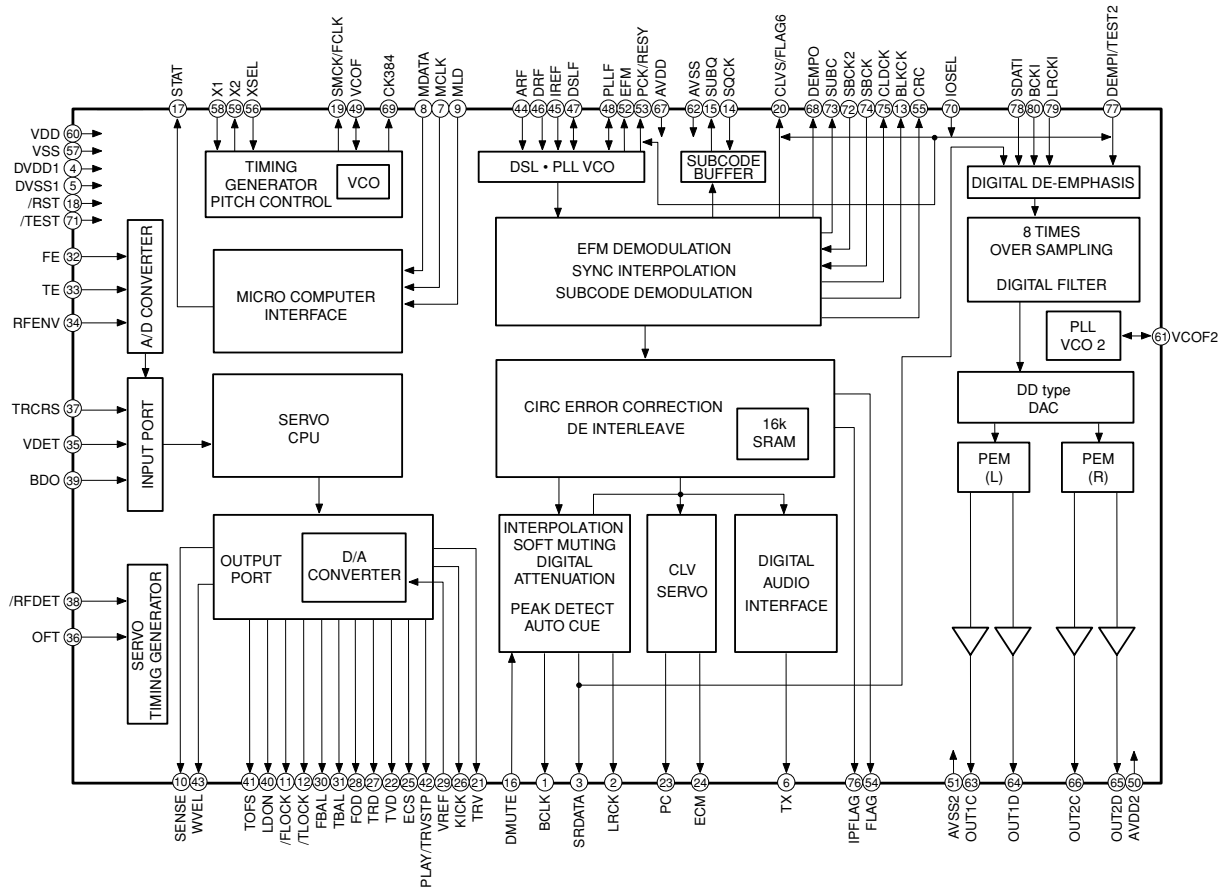


**e) No search provided.
(Sound skipped after search)**



IC DATA

IC3 : MN35511AL (MAIN P.C.B.)
Signal processor and controller



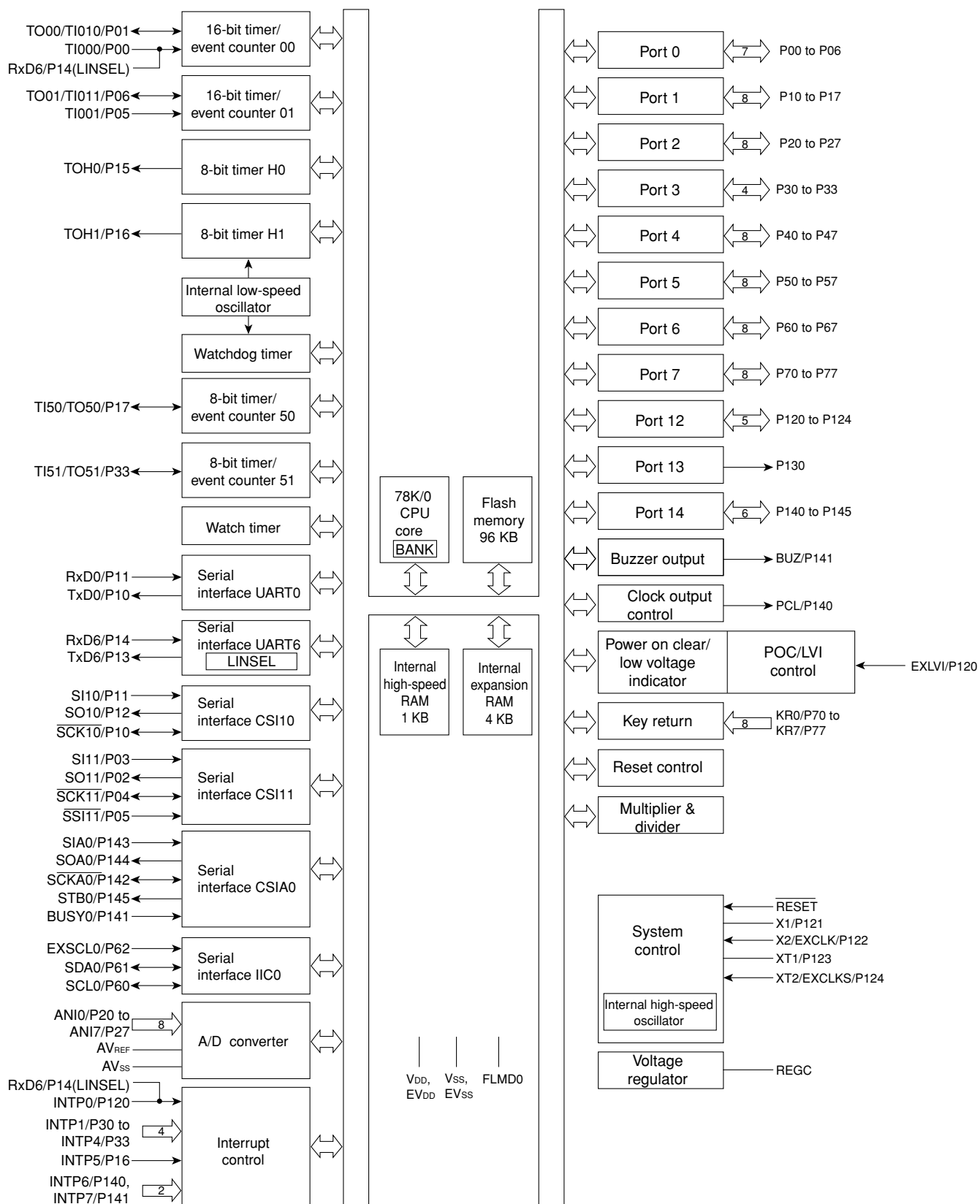
Pin no.	Name	I/O	Function
1	BCLK	O	Bit clock output for SR DATA
2	LRCK	O	L/R identification signal output
3	SRDATA	O	Serial data output
4	DVDD1	I	Power supply for digital circuit (+5)
5	DVSS1	I	GND for digital circuit
6	TX	O	Digital, audio, interface output signal
7	MCLK	I	Microprocessor command clock signal input (data latched at leading edge)
8	MDATA	I	Microprocessor command data input
9	MLD	I	Microprocessor command load signal input (L: LOAD)
10	SENSE	O	Sense signal output (OFT, FESL, NACEND, NAJEND, SFG, NWTEND)
11	FLOCK	O	Focus servo drawing signal (L: when drawn)
12	TLOCK	O	Tracking servo drawing signal (L: when drawn)
13	BLKCK	O	Sub code block clock signal (BLKCK=75Hz)
14	SQCK	I	Clock input for sub-code Q register
15	SUBQ	O	Sub-code Q code output
16	DMUTE	I	Muting input (H: MUTE)
17	STAT	O	Status signal (CRC, STCNT, CLVS, TTSTOP, SQOK, RESY, FCLV, FLAG6, SENSE, /FLOCK, /RFDET, /TLOCK)
18	RST	I	Reset input (L: RESET)
19	SMCK/ FCLK	O	4.2336MHz clock signal output SMCK when command is defaulted. (Note 1) SMCK (8.4672MHz), FCLK (7.35kHz) or "L" fixed is selected when command is switched. (NC)
20	CLVS/ FLAG6	O	With command defaulted: CLVS when IOSEL=H, FLAG6 when IOSEL=L These settings can be reversed by command (FLAG6 when IOSEL=H). (NC)
21	TRV	O	Traverse (Feed) forced feed output 3-State
22	TVD	O	Traverse (Feed) drive output
23	PC	O	Spindle motor ON signal L: ON (default) (NC)
24	ECM	O	Spindle motor drive signal (forced mode output) 3-State
25	ECS	O	Spindle motor drive signal (servo error signal output)
26	KICK	O	Kick pulse output 3-State
27	TRD	O	Tracking drive output
28	FOD	O	Focus drive output
29	VREF	I	Reference voltage for DA output block (TVD, ECS, TRD, FOD, FBAL, TBAL)
30	FBAL	O	Focus balance adjustment output
31	TBAL	O	Tracking balance adjustment output
32	FE	I	Focus error signal input (analog input)
33	TE	I	Tracking error signal input (analog input)
34	RFENV	I	RF envelope signal input (analog input)
35	VDET	I	Oscillation detect signal input (H : DETECT)
36	OFT	I	Off track signal input (H: OFF TRACK)
37	TRCRS	I	Track cross signal input (analog input)
38	RFDET	I	RF detect signal input (L: DETECT)
39	BDO	I	Drop out signal input (H: DROP OUT)
40	LDON	O	Laser ON signal output (H: ON)
41	TOFS	O	Tracking offset adjustment output (NC)
42	PLAY/TRVSTOP	O	Switched by command. PLAY (Play signal output) when command is defaulted. (NC)
43	WVEL	O	Double speed status signal output (H: double speed) (NC)
44	ARF	I	RF signal input
45	IREF	I	Reference current input terminal
46	DRF	I	Bias terminal for DSL
47	DSLIF	I/O	Loop filter terminal for DSL
48	PLLIF	I/O	Loop filter terminal for PLL
49	VCOF	I/O	Loop filter terminal for VCO (+5)
50	AVDD2	I	Power supply for analog circuit (for AD of DSL, PLL, DA output blocks) (+5)

Pin no.	Name	I/O	Function
51	AVSS2	I	GND for analog circuit (for AD of DSL, PLL, DA output blocks) (GND)
52	EFM	O	EFM signal output (NC)
53	PCK/ RESY	O	With command defaulted: PLL extract clock output PCK when IOSEL=H, frame re-synchronous signal RESY when IOSEL=L These settings can be reversed by command (RESY when IOSEL=H). (NC)
54	FLAG	O	Flag signal output (NC)
55	CRC	O	Sub-code CRC check result output (H: OK, L: NG) (NC)
56	XSEL	I	L: Normal mode (GND) H: • For internal master clock, VCO2 output clock for jitter adsorbing PLL is used instead of Xtal oscillation output (X2). • VCO2 is always fixed to oscillation mode regardless of VCO2 oscillation stop command or resetting (/RST=L) and Xtal oscillation is stopped.
57	VSS	I	GND for oscillation circuit
58	X1	I	Crystal oscillation circuit input terminal
59	X2	O	Crystal oscillation circuit output terminal
60	VDD	I	Power supply for oscillation circuit (+5)
61	VCOF2	O	PLL loop filter terminal for jitter adsorption (GND)
62	AVSS1	O	GND for audio DAC
63	OUT1C	O	PEM output terminal 1C (NC)
64	OUT1D	O	PEM output terminal 1D (NC)
65	OUT2D	O	PEM output terminal 2D (NC)
66	OUT2C	O	PEM output terminal 2C (NC)
67	AVDD1	I	Power supply terminal for audio DAC
68	DEMPO	O	De-emphasis detect signal output
69	CK384	O	384fs clock output (At the CK384 pin, output does not stop while /RST=L.) Xtal system when command is defaulted. Signal processing system when command is switched (NC)
70	IOSEL	I	Mode selecting terminal (+5)
71	TEST	I	Test mode setting terminal (Normal: H) (+5)
72	SBCK2	I	Sub-code data read clock input
73	SUBC	O	Sub-code serial output (SBCK effective) when command is defaulted. PACK data usable (SBCK2 effective) when command is switched
74	SBCK	I	Clock input for sub-code serial output (with pull-up resistor) (NC)
75	CLDCK	O	Sub-code frame clock signal output when command is defaulted (fCLDCK=7.35kHz) PACK synchronous signal when command is switched
76	IPFLAG	O	Interpolation flag signal output (H: INTERPOLATION) (NC)
77	DEMP1 /TEST2	I	When IOSEL=H, L: NORMAL H: TEST2 (GND) Emphasis control in accordance with DEMPO When IOSEL=L, external DEMP1 input terminal For emphasis control, DEMPO, OR of DEMP1, DEMP1, forced OFF or forced ON is selected by command. When command is defaulted, DEMPO and OR of DEMP1
78	SDATI	I	SRDATA input (effective only when IOSEL=L) (NC)
79	LRCKI	I	LRCK input (effective only when IOSEL=L) H: Lch data, L: Rch data (NC)
80	BCKI	I	BCK input (effective only when IOSEL=L) (NC)

(Note 1) At the SMCK/FCLK pin, output does not stop while /RST=L.

IC309 : μ PD78F0546 (MAIN P.C.B.)
Microprocessor

* No replacement part available.



Pin	Pin function	Function	Signal name	Detail of function	Port type	I/O
1	P120/INTP0/EXLVI	INTP0	REM	Remote control signal input	CMOS	I
2	P47	P47	OPSW	Tray OPEN SW	CMOS	I
3	P46	P46	CLSW	Tray CLOSE SW	CMOS	I
4	P45	P45	TBL_POS	Table position	CMOS	I
5	P44	P44	/RST	MN35511 system reset L: reset	CMOS	O
6	P43	P43	DMUTE	MN35511 digital mute H: mute	CMOS	O
7	P42	P42	/TLOCK	Tracking lock L: pull-in state	CMOS	I
8	P41	P41	/FLOCK	Focus lock L: pull-in state	CMOS	I
9	P40	P40			CMOS	OL
10	/RESET	/RESET	/RESET	Reset		I
11	P124/XT2/EXCLKS	P124	DOWNSW	Cramp down SW	CMOS	I
12	P123/XT1	P123	UPSW	Cramp up SW	CMOS	I
13	FLMD0			Flash ROM writing pull-in		
14	P122/X2/EXCLK/OCD0B	X2		Oscillator input		
15	P121/X1/OCD0A	X1		Oscillator output		
16	REGC			Inner voltage regulator output		
17	Vss	Vss				
18	Evss	Evss				
19	VDD	VDD				
20	EVDD	EVDD				
21	P60/SCL0	P60	EEPCK	I2C EEPROM clock	OD	O
22	P61/SDA0	P61	EEPDT	I2C EEPROM data	OD	I/O
23	P62/EXSCL0	P62	FLSW	Inner feed limit SW	OD	I
24	P63	P63			OD	OL
25	P33/TI51/TO51/INTP4	P33			CMOS	OL
26	P64	P64	GCTRL	RF amp (AN8882) gain control	CMOS	O
27	P65	P65			CMOS	OL
28	P66	P66	MUTE	Analog (audio) mute	CMOS	O
29	P67	P67			CMOS	OL
30	P77/KR7	P77			CMOS	OL
31	P76/KR6	P76			CMOS	OL
32	P75/KR5	P75			CMOS	OL
33	P74/KR4	P74			CMOS	OL
34	P73/KR3	P73			CMOS	OL
35	P72/KR2	P72	STBY	Standby control output H: power on	CMOS	O
36	P71/KR1	P71			CMOS	OL
37	P70/KR0	P70			CMOS	OL
38	P06/TI011/TO01	P06			CMOS	OL
39	P05/TI001/SSI11	P05	RTS	RS-232C RTS	CMOS	O
40	P32/INTP3/OCD1B	INTP3	CTS	RS-232C CTS	CMOS	I
41	P31/INTP2/OCD1A	INTP2	/CLDCK	MN35511 sub-code frame clock input	CMOS	I
42	P50	P50	CE	FL driver (M66003) chip select	CMOS	O
43	P51	P51	/BLK	FL driver (M66003) reset	CMOS	O
44	P52	P52			CMOS	OL
45	P53	P53			CMOS	OL
46	P30/INTP1	INTP1	PSW	Power switch	CMOS	I
47	P17/TI50/TO50	P17			CMOS	OL
48	P16/TOH1/INTP5	TOH1	TBL_R	TABLE DRIVE RIGHT (PWM/PORT)	CMOS	O
49	P15/TOH0	TOH0	TBL_L	TABLE DRIVE LEFT (PWM/PORT)	CMOS	O
50	P14/RxD6	P14	RXD	RS-232C receive data	CMOS	RXD
51	P13/TxD6	P13	TXD	RS-232C transmit data	CMOS	TXD
52	P12/SO10	P12			CMOS	OL
53	P11/SI10/RxD0	SI10	SUBQ	MN35511 sub-code Q data	CMOS	SI
54	P10/SCK10/TxD0	SCK10	SQCK	MN35511 sub-code Q register clock	CMOS	SCKO
55	P54	P54	MLD	MN35511 command strobe	CMOS	O
56	P55	P55			CMOS	OL
57	P56	P56	FEED OFF	AN8882 gain control	CMOS	OL
58	P57	P57			CMOS	OL
59	AVREF	AVREF				
60	Avss	Avss				

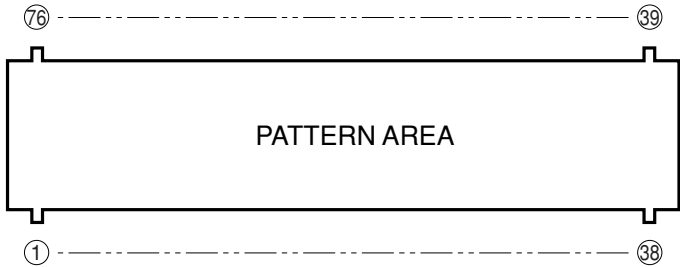
Pin	Pin function	Function	Signal name	Detail of function	Port type	I/O
61	ANI7/P27	ANI7	/PDN	Power down detect	CMOS	I
62	ANI6/P26	ANI6	KEY1	Front Panel Key A/D 1	CMOS	I
63	ANI5/P25	ANI5	KEY0	Front Panel Key A/D 0	CMOS	I
64	ANI4/P24	P24			CMOS	OL
65	ANI3/P23	P23	CLOSE	CLOSE	CMOS	O
66	ANI2/P22	P22	OPEN	OPEN	CMOS	O
67	ANI1/P21	P21	CL_DOWN	CLAMP drive down	CMOS	O
68	ANI0/P20	P20	CL_UP	CLAMP drive up	CMOS	O
69	P130	P130	/STAN	AN4801 Standby	CMOS	O
70	P04//SCK11	SCK11	MCLK	MN35511, M66003 command clock	CMOS	SCKO
71	P03/SI11	SI11	SENSE	MN35511 SENSE input	CMOS	SI
72	P02/SO11	SO11	MDATA	MN35511, M66003 command data	CMOS	SO
73	P01/TI010/TO00	P01			CMOS	OL
74	P00/TI000	P00			CMOS	OL
75	P145/STB0	P145			CMOS	OL
76	P144/SOA0	P144	STAT	MN35511 status signal	CMOS	I
77	P143/SIA0	SIA0	SUBC	MN35511 sub-code input	CMOS	SI
78	P142//SCKA0	SCKA0	SBCK2	MN35511 sub-code data read clock	CMOS	SCKO
79	P141/BUZ/BUSY0/INTP7	P141			CMOS	OL
80	P140/PCL/INTP6	INTP6	BLKCK	MN35511 sub-code block	CMOS	I

Key input(A-D) pull-up resistance 10 k-ohms

Ohm	0	+ 1.2k	+ 1.2k	+ 1.8k	+ 2.7k	+ 3.3k
V	− 0.26	− 0.75	− 1.22	− 1.76	− 2.28	− 2.75
Key0 (63pin ANI5)	PLAY/PAUSE	DISC 1	DISC 2	DISC 3	DISC 4	DISC 5
Key1 (62pin ANI6)	OPEN/CLOSE	PLAYXCHANGE	STOP	SKIP+/SEARCH+	SKIP-/SEARCH-	—

■ DISPLAY DATA

● V300 : 15-ST-54GN (WH406200)



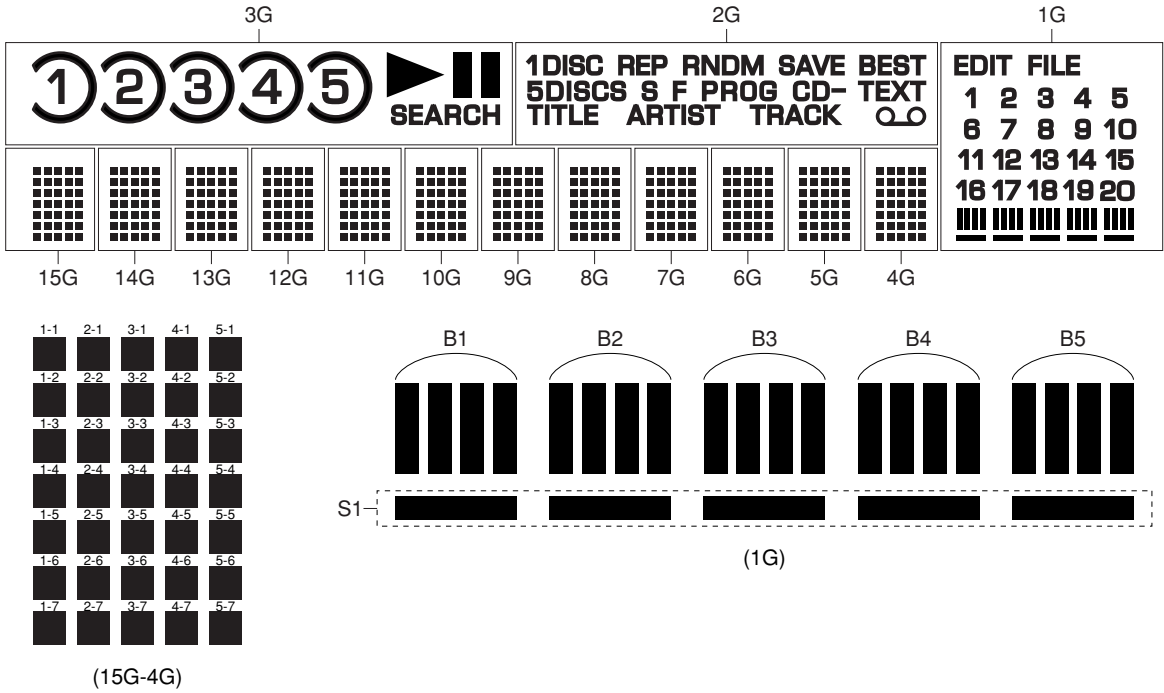
● PIN CONNECTION

Pin No.	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51
Connection	F1	F1	NP	NP	IC	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	NX	NX	NX	NX	P13	P14	P15	P16	P17
Pin No.	50	49	48	47	46	45	44	43	42	41	40	39														
Connection	P18	P19	P20	P21	P22	P23	P24	P25	NP	NP	F2	F2														

Pin No.	31	32	33	34	35	36	37	38																						
Connection	P29	P28	P27	P26	NP	NP	F2	F2																						
Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Connection	F1	F1	NP	NP	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	NX	NX	NX	NX	IC	2G	1G	P35	P34	P33	P32	P31	P30

Note : 1) F1, F2 Filament pin 2) NP No pin 3) NX No extend pin 4) IC Internal connection 5) 1G-15G Grid

● GRID ASSIGNMENT

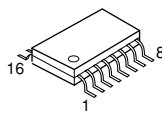
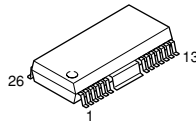
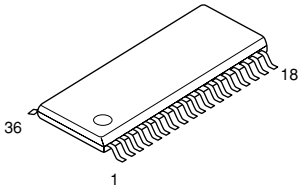
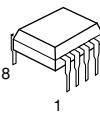
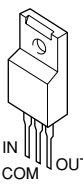
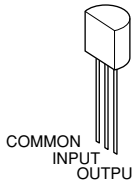
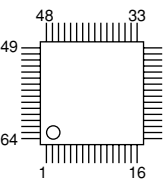
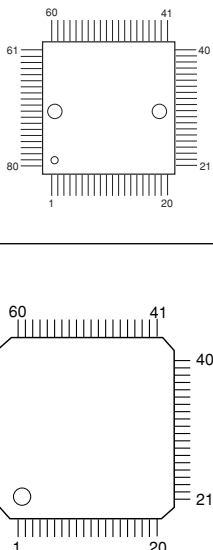
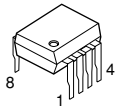
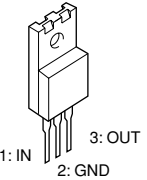
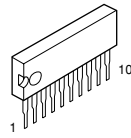
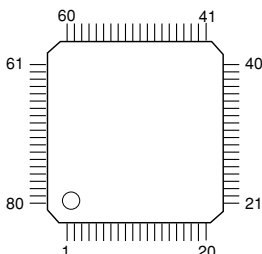


● ANODE CONNECTION

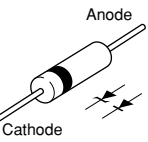
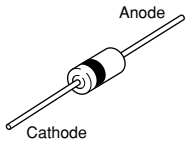
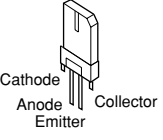
	15G-4G	3G	2G	1G
P1	1-1	1	TITLE	1
P2	2-1	(1)	ARTIST	2
P3	3-1	2	TRACK	3
P4	4-1	(2)		4
P5	5-1	3	5DISCS	5
P6	1-2	(3)	S	6
P7	2-2	4	F	7
P8	3-2	(4)	PROG	8
P9	4-2	5	CD-	9
P10	5-2	(5)	TEXT	10
P11	1-3	SEARCH	1DISC	11
P12	2-3		REP	12
P13	3-3		RNDM	13
P14	4-3	-	SAVE	14
P15	5-3	-	BEST	15
P16	1-4	-	-	16
P17	2-4	-	-	17
P18	3-4	-	-	18
P19	4-4	-	-	19
P20	5-4	-	-	20
P21	1-5	-	-	EDIT
P22	2-5	-	-	FILE
P23	3-5	-	-	B1
P24	4-5	-	-	B2
P25	5-5	-	-	B3
P26	1-6	-	-	B4
P27	2-6	-	-	B5
P28	3-6	-	-	S1
P29	4-6	-	-	-
P30	5-6	-	-	-
P31	1-7	-	-	-
P32	2-7	-	-	-
P33	3-7	-	-	-
P34	4-7	-	-	-
P35	5-7	-	-	-

PIN CONNECTION DIAGRAMS

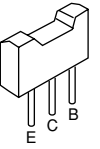
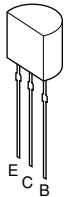
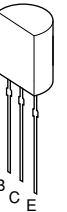
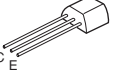
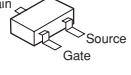
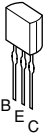
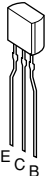
ICs

ADM202JRN-REEL7	AN4801SB	AN8882SB	BD4243G-TR	
				
BR24L01AF-WE2	KIA7805API KIA7812API	KIA79S05P-AT	M66003-0131FP	MN35511AL
				
NJM2068D-D	NJM78M05FA	LB6510	μPD78F0546	
				

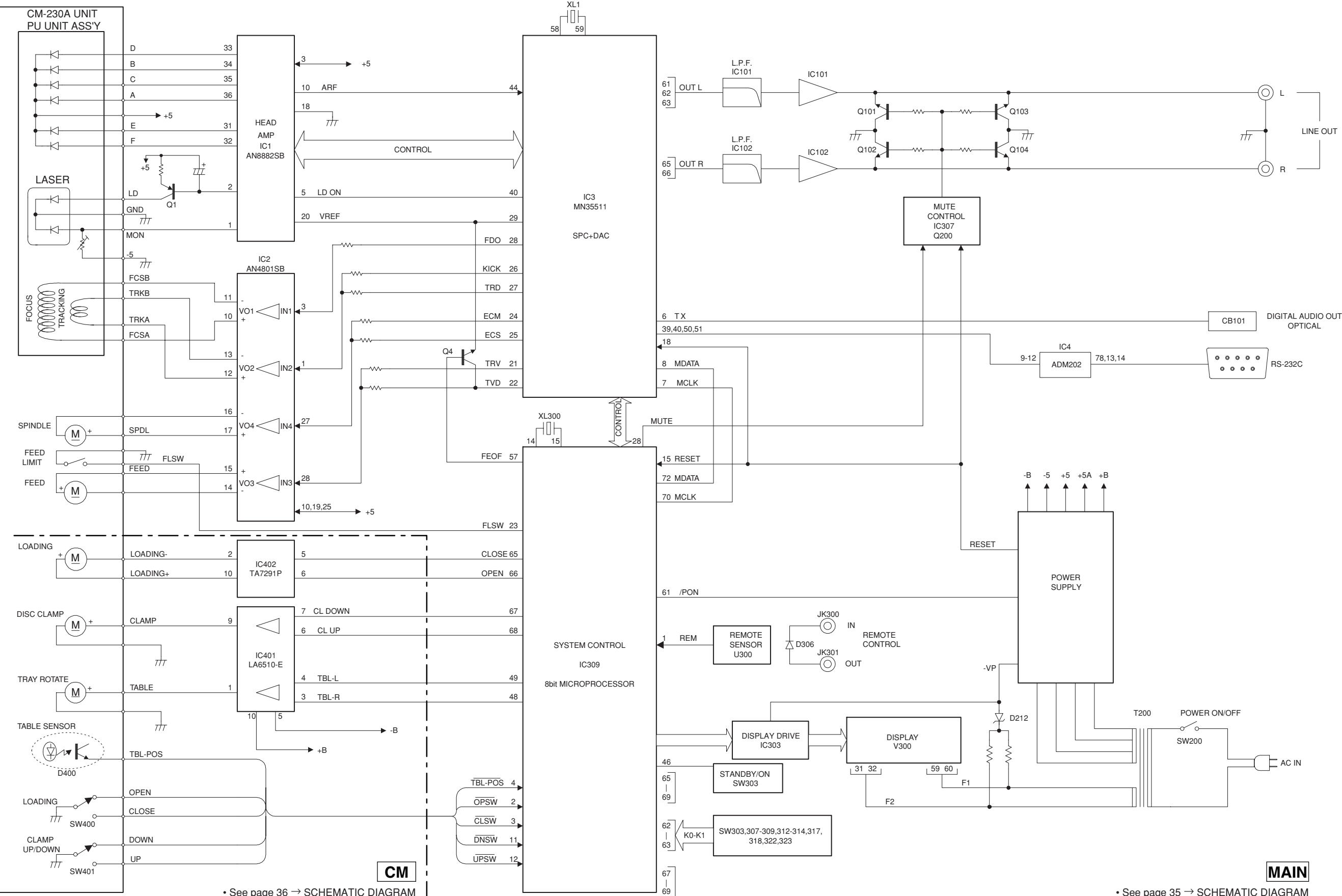
Diodes

1SS133,176 1T2 MTZJ5.6B MTZJ6.2B MTZJ30B	HZS7B2TD	ON1024
		

Transistors

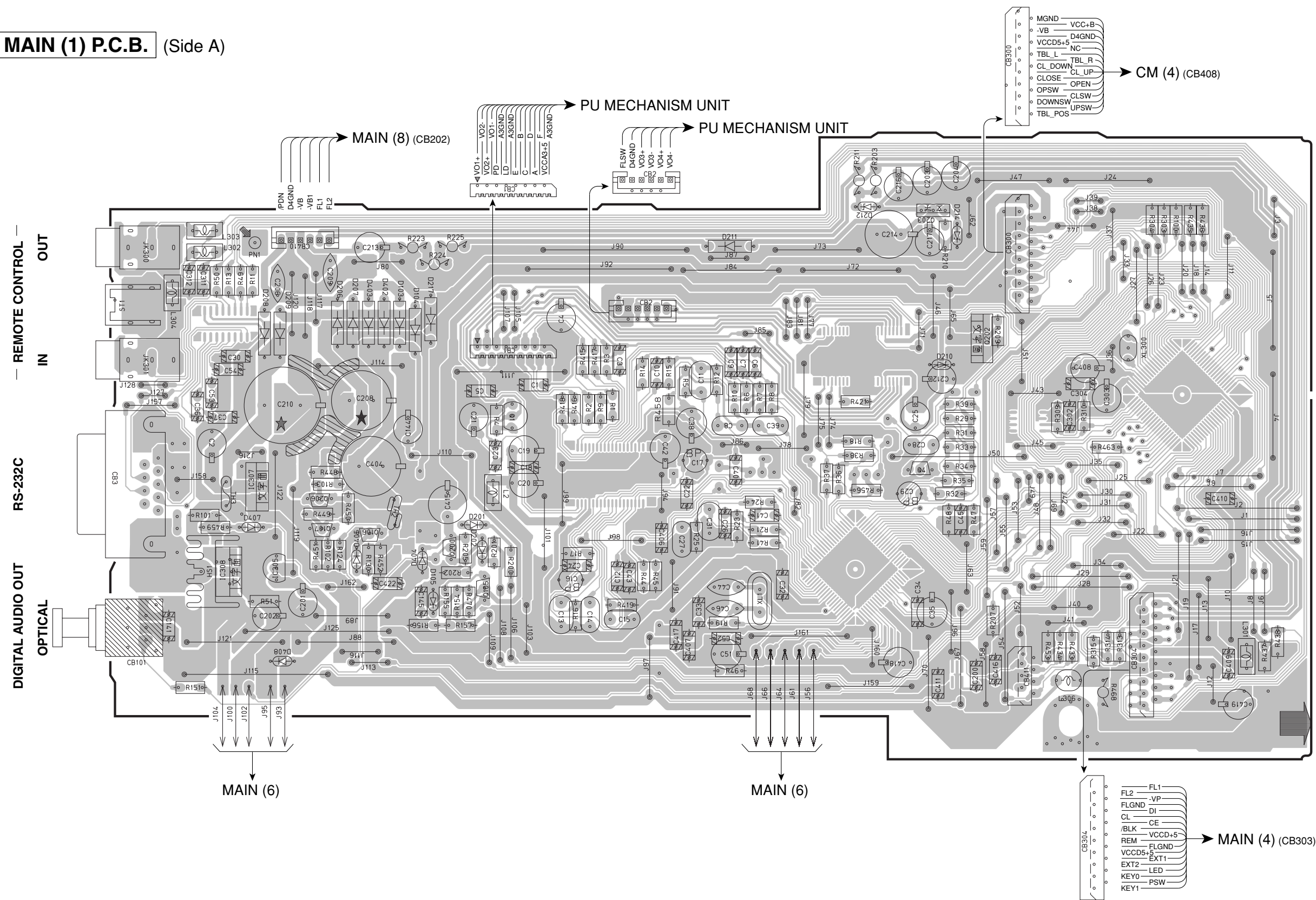
2SA1708	2SA933S	2SB544	2SC1740S	RSR025N03 RST025P03TL
				
2SD2394	2SD1915F			
				

■ BLOCK DIAGRAM



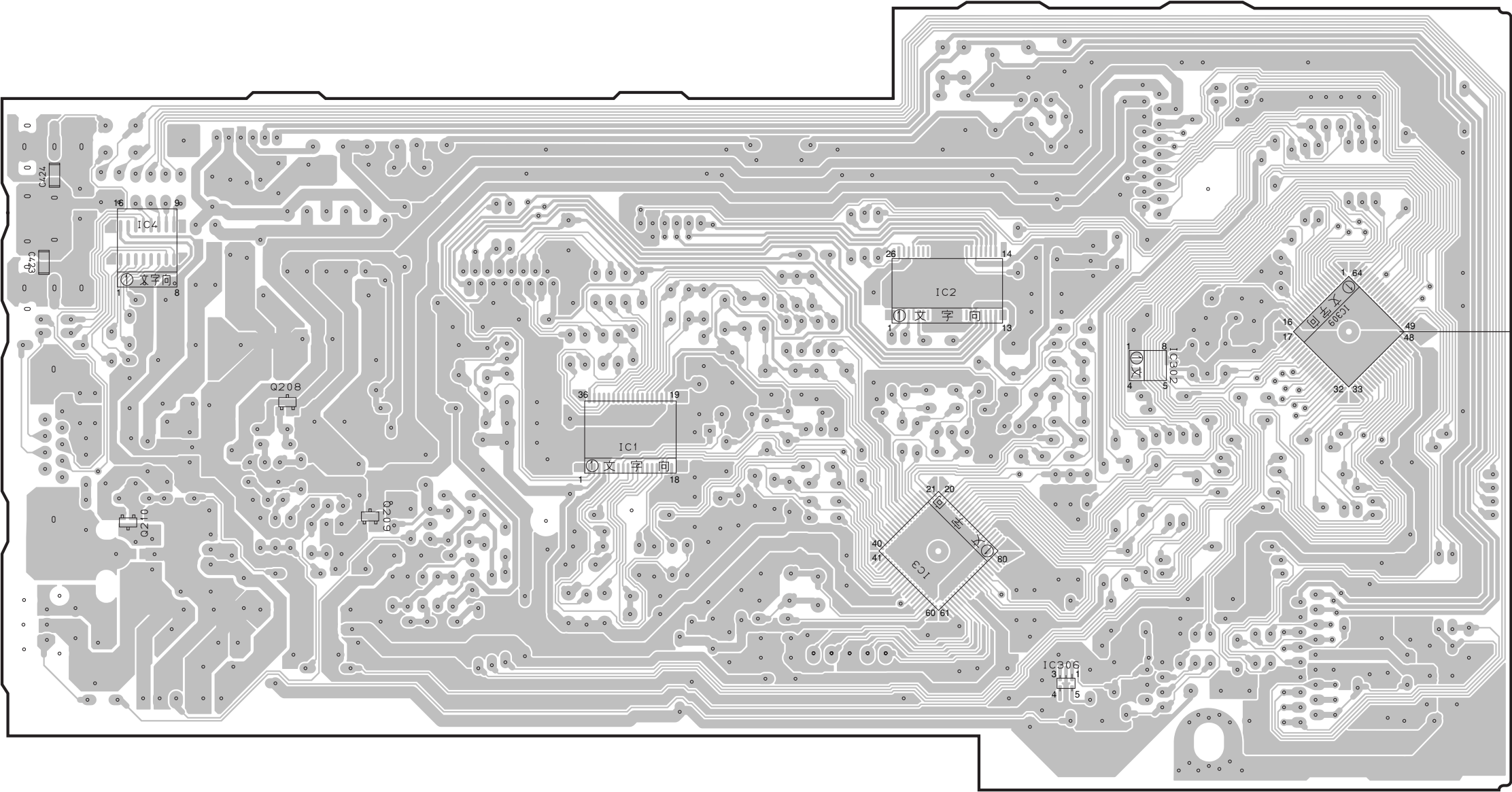
• See page 36 → SCHEMATIC DIAGRAM

• See page 35 → SCHEMATIC DIAGRAM



Ref no.	Location
D103	D3
D104	D3
D105	D5
D201	D4
D202	D4
D206	C3
D207	C3
D208	C3
D209	C3
D210	G3
D211	F3
D212	F3
D214	G3
D217	D3
D402	D3
D403	C3
D404	D5
D405	C5
D407	C4
D408	C5
IC305	C5
IC307	C4
IC308	C4
Q1	D4
Q4	G4
Q105	D5
Q106	D4
Q107	C4
Q200	D4
Q202	G3
Q203	G3
Q206	C4

MAIN (1) P.C.B. (Side B)



No replacement part available.

• Semiconductor Location

Ref no.	Location
IC1	E4
IC2	E3
IC3	F5
IC4	B3
IC302	G4
IC306	G5
IC309	H3
Q208	C4
Q209	D4
Q210	B4

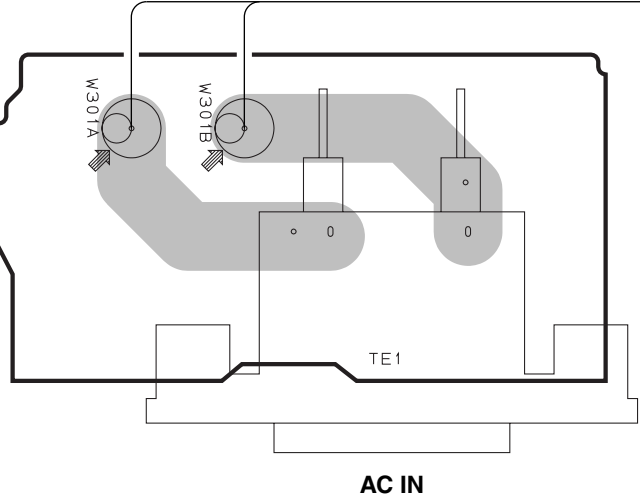
30

1

MAIN (7) P.C.B. (Side A)

U, C, A, B, G models

2



3

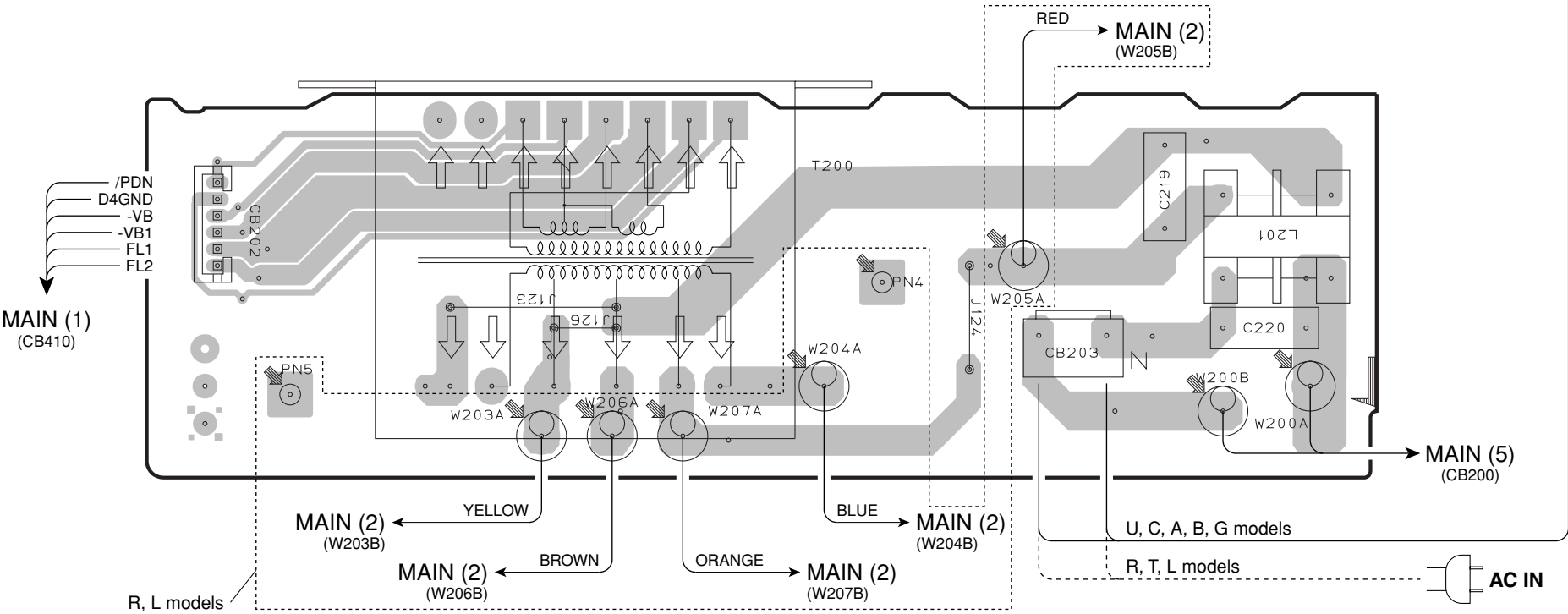
4

Circuit No.	U, C	R	T	A	B, G	L
J123	X	O	O	X	X	O
J124	O	X	O	O	O	X
J126	O	X	X	O	O	X
TE1	O	X	X	O	O	X

X : NOT USED
O : USED/APPLICABLE

MAIN (8) P.C.B. (Side A)

5



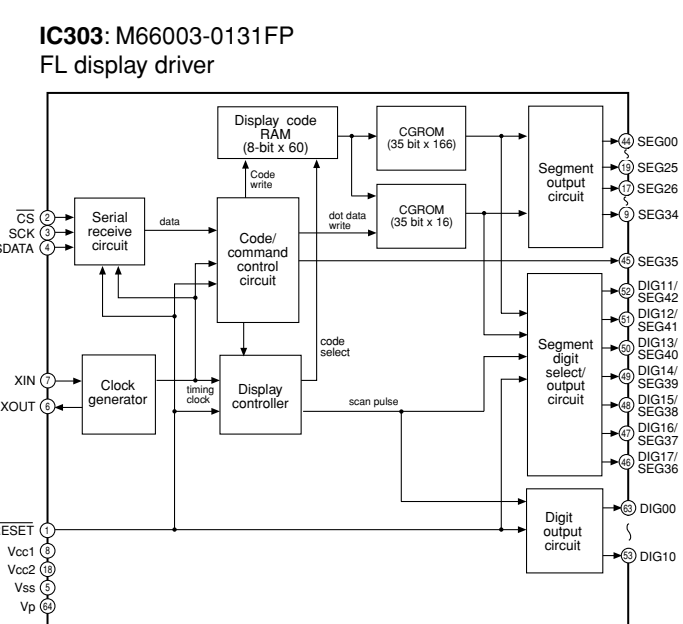
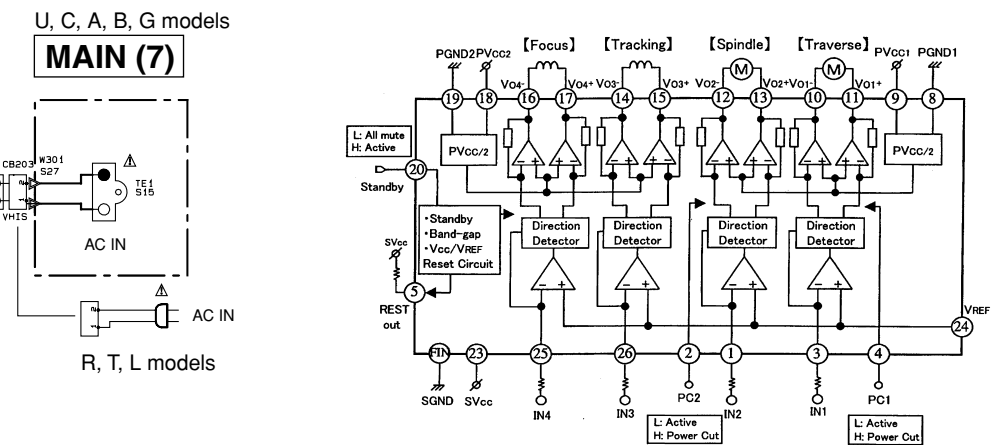
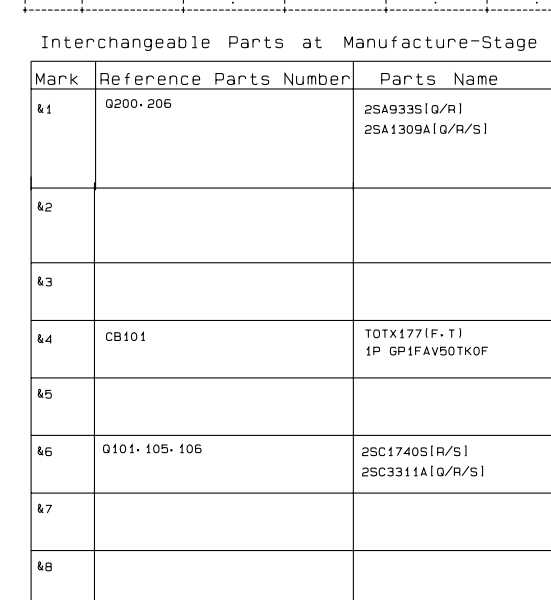
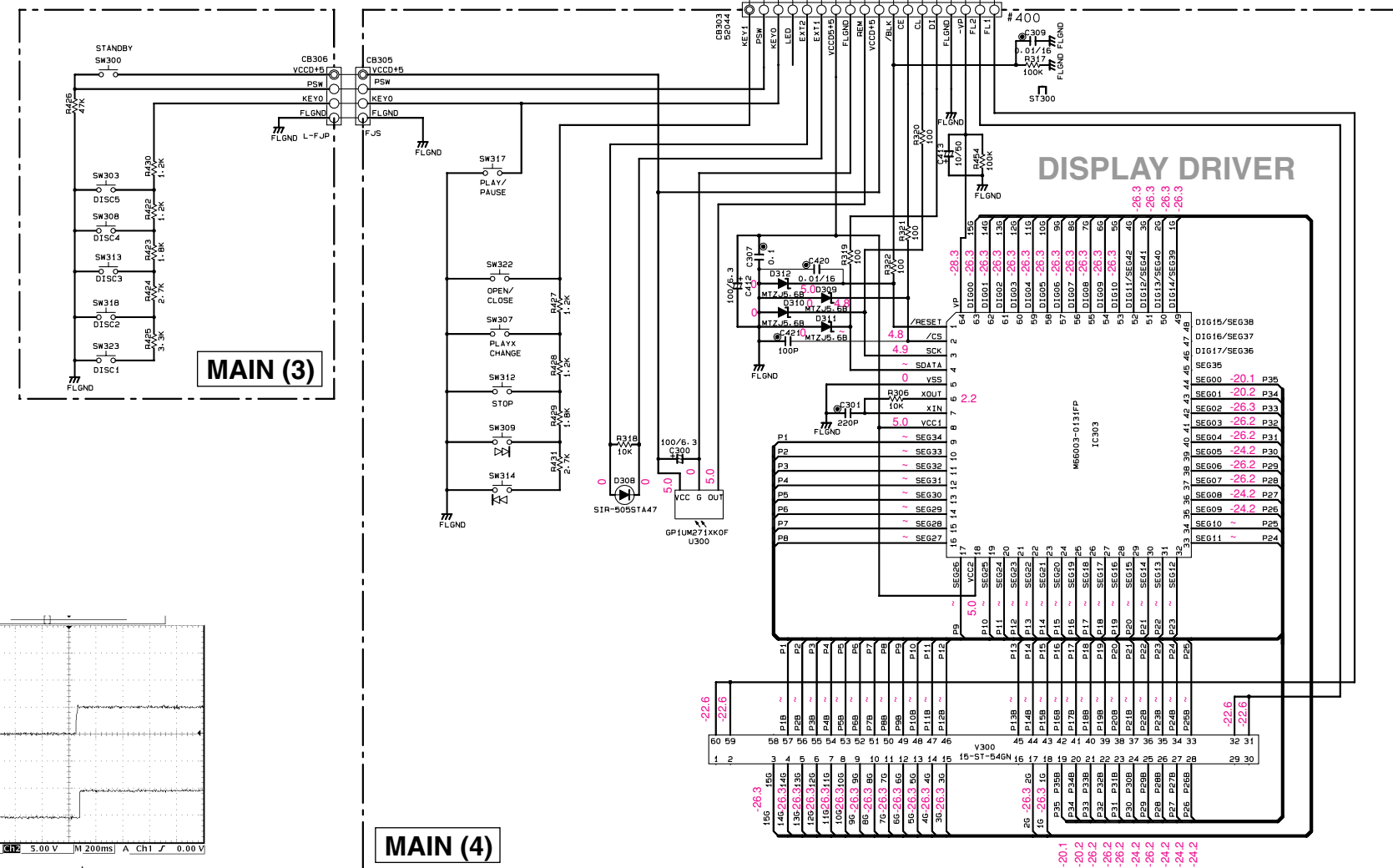
6

7

MEMO

MEMO

To PU mechanism unit
 To PU mechanism unit (Spindle and Feed motors)
 NOTICE (model)
 (J)..... JAPAN
 (U)..... U. S. A
 (C)..... CANADA
 (R)..... GENERAL
 (T)..... CHINA
 (K)..... KOREA
 (A)..... AUSTRALIA
 (B)..... BRITISH
 (G)..... EUROPE
 (L)..... SINGAPORE
 (E)..... SOUTH EUROPE
 (V)..... TAIWAN



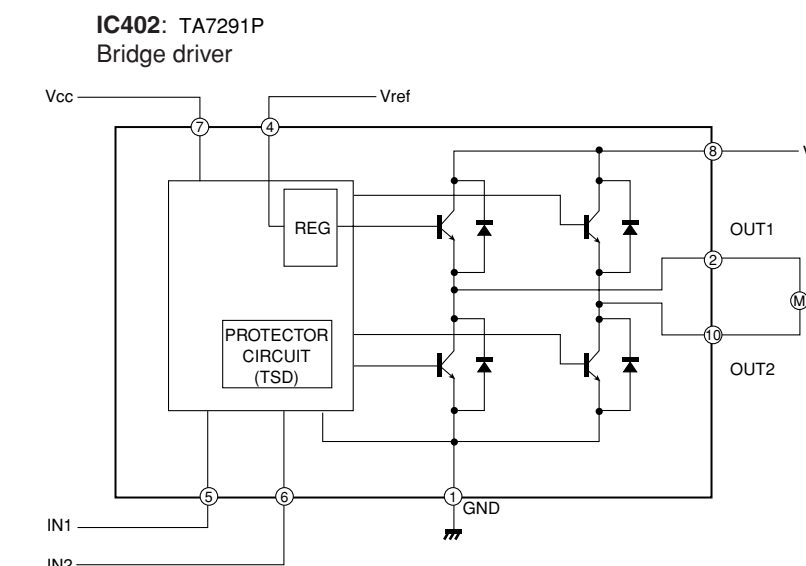
35

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356[illegible]

10

36



■ REPLACEMENT PARTS LIST

• ELECTRICAL COMPONENT PARTS

WARNING

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

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

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

P.C.B. MAIN

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Ref. No.	Part No.	Description		Markets
	WH461400	P. C. B.	MAIN	UC
	WH461500	P. C. B.	MAIN	R
	WH461700	P. C. B.	MAIN	T
	WH461600	P. C. B.	MAIN	A
	WH461800	P. C. B.	MAIN	BG
	WH461900	P. C. B.	MAIN	L
CB1	V2731000	CN. FMN	16P	
CB2	VB390200	CN. BS. PIN	6P	
CB3	V6509500	SOCKET	9P SE 3170	
CB101	WE715800	L. DTCT	1P TOTX177(F, T)	
CB200	VP245600	CN	2P	
CB202	VB390200	CN. BS. PIN	6P	
CB203	VG879900	CN. BS. PIN	2P	
CB300	VM973500	CN. BS. PIN	17P	
CB303	VQ044800	CN. BS. PIN	18P	
CB304	VP573800	CN. BS. PIN	18P	
CB305	VS839500	CN	4P	
CB306	VS839400	CN. BS. PIN	4P	
CB410	VB390200	CN. BS. PIN	6P	
CB411	VQ047100	CN. BS. PIN	7P	
C1	VJ599100	C. CE. TUBLR	0.1uF 50V	
C2	UR237470	C. EL	47uF 16V	
C3	VJ599000	C. CE. TUBLR	0.047uF 16V	
C4	UR818100	C. EL	100uF 6.3V	
C5-7	VJ599100	C. CE. TUBLR	0.1uF 50V	
C8	UA653100	C. MYLAR	1000pF 50V J	
C9	VJ599100	C. CE. TUBLR	0.1uF 50V	
C10	VG278400	C. CE. TUBLR	220pF 50V	
C11	UA655100	C. MYLAR	0.1uF 50V J	
C12	VG278400	C. CE. TUBLR	220pF 50V	
C13	UA655100	C. MYLAR	0.1uF 50V J	
C14-15	UA653120	C. MYLAR	1200pF 50V J	
C16	UN865470	C. EL	0.47uF 50V	
C17	UN866470	C. EL	4.7uF 50V	
C18	VJ599100	C. CE. TUBLR	0.1uF 50V	
C19	V4749000	C. EL	150uF 6.3V	
C20	UR818100	C. EL	100uF 6.3V	
C21	UR837470	C. EL	47uF 16V	
C22	VJ599100	C. CE. TUBLR	0.1uF 50V	
C23	VF467000	C. CE. TUBLR	1000pF 50V	
C24	VJ599100	C. CE. TUBLR	0.1uF 50V	
C25	UR818100	C. EL	100uF 6.3V	
C26	VJ599100	C. CE. TUBLR	0.1uF 50V	
C27	UA654120	C. MYLAR	0.012uF 50V J	
C28	UA653100	C. MYLAR	1000pF 50V J	
C29	UN865100	C. EL	0.10uF 50V	
C30	VJ599100	C. CE. TUBLR	0.1uF 50V	
C31	UA655100	C. MYLAR	0.1uF 50V J	
C32-34	VJ599100	C. CE. TUBLR	0.1uF 50V	
C35	V4749000	C. EL	150uF 6.3V	
C36-37	VJ599100	C. CE. TUBLR	0.1uF 50V	
C38	V4749000	C. EL	150uF 6.3V	
C39	UA653330	C. MYLAR	3300pF 50V J	
C40	VJ599100	C. CE. TUBLR	0.1uF 50V	
C41	VG278700	C. CE. TUBLR	390pF 50V	
C42	V4749000	C. EL	150uF 6.3V	
C43	VJ599100	C. CE. TUBLR	0.1uF 50V	
C44	VA761400	C. CE	47pF 50V	
C45	VJ599100	C. CE. TUBLR	0.1uF 50V	
C46	VA761400	C. CE	47pF 50V	

* New Parts

Ref. No.	Part No.	Description		Markets
C47-50	UR866100	C. EL	1uF 50V	
C51	UR818470	C. EL	470uF 6.3V	
C52-54	VJ599100	C. CE. TUBLR	0.1uF 50V	
C101	UA652100	C. MYLAR	100pF 50V J	
C102-103	V4850700	C. MYLAR	560pF 50V	
C104	UA652100	C. MYLAR	100pF 50V J	
C106	UA654180	C. MYLAR	0.018uF 50V J	
C107	VG287300	C. EL	22uF 50V	
C108	UR818100	C. EL	100uF 6.3V	
C109-110	V2680700	C. MYLAR	3300pF 50V	
C111	UR818100	C. EL	100uF 6.3V	
C112	VG287300	C. EL	22uF 50V	
C113	UA654180	C. MYLAR	0.018uF 50V J	
C115-116	UA653100	C. MYLAR	1000pF 50V J	
C141	VJ599100	C. CE. TUBLR	0.1uF 50V	
C144	UR847100	C. EL	10uF 25V	
C145	VJ599100	C. CE. TUBLR	0.1uF 50V	
C200	VG279400	C. CE. TUBLR	2200pF 16V	
C201-202	VG286200	C. EL	100uF 10V	
C203-204	UR866470	C. EL	4.7uF 50V	
C206	FG644100	C. CE	0.01uF 50V	
C208	UR249220	C. EL	2200uF 25V	
C209	FG644100	C. CE	0.01uF 50V	
C210	UR249470	C. EL	4700uF 25V	
C212	UR828100	C. EL	100uF 10V	
C213	UR867470	C. EL	47uF 50V	
C214	UR878100	C. EL	100uF 63V	
C216-217	UR866470	C. EL	4.7uF 50V	
C218-220	V6185300	C. CE. SAFTY	0.01uF 275V	
C300	UM388100	C. EL	100uF 10V	
C301	VG278400	C. CE. TUBLR	220pF 50V	
C302	VJ599100	C. CE. TUBLR	0.1uF 50V	
C303	UR818100	C. EL	100uF 6.3V	
C304	VJ599100	C. CE. TUBLR	0.1uF 50V	
C307	VJ599100	C. CE. TUBLR	0.1uF 50V	
C309	VF467300	C. CE. TUBLR	0.01uF 16V	
C311-312	VJ599100	C. CE. TUBLR	0.1uF 50V	
C404	UR249220	C. EL	2200uF 25V	
C406	VJ599100	C. CE. TUBLR	0.1uF 50V	
C407	VG279200	C. CE. TUBLR	1500pF 16V	
C408	UR866100	C. EL	1uF 50V	
C409	VF467000	C. CE. TUBLR	1000pF 50V	
C410-411	VJ599100	C. CE. TUBLR	0.1uF 50V	
C412	UM388100	C. EL	100uF 10V	
C413	UM417100	C. EL	10uF 50V	
C415	UR819100	C. EL	1000uF 6.3V	
C416	VF467300	C. CE. TUBLR	0.01uF 16V	
C417	VJ599100	C. CE. TUBLR	0.1uF 50V	
C418	V4749000	C. EL	150uF 6.3V	
C419	UR818470	C. EL	470uF 6.3V	
C420	VF467300	C. CE. TUBLR	0.01uF 16V	
C421	VF466800	C. CE. TUBLR	100pF 50V	
C422	VJ599100	C. CE. TUBLR	0.1uF 50V	
C423-424	US064100	C. CE. CHP	0.01uF 50V B	
D103-104	VS997800	DIODE	1T2	
D105	VM974700	DIODE. ZENR	HZS7B2TD 7.0V	
D201-202	VD631600	DIODE	1SS133, 176	
D206-209	VS997800	DIODE	1T2	
D210	VG437700	DIODE. ZENR	MTZJ5. 6B 5.6V	
D211	VS997800	DIODE	1T2	

* New Parts

P.C.B. MAIN and P.C.B. CM

Ref. No.	Part No.	Description	Markets
D212	VG437700	DIODE. ZENR MTZJ5. 6B 5.6V	
D214	VG443300	DIODE. ZENR MTZJ30B 30V	
D217	VS997800	DIODE 1T2	
D308	V2598200	LED SIR-505ST	
D309-312	VG437700	DIODE. ZENR MTZJ5. 6B 5.6V	
D402-403	VS997800	DIODE 1T2	
D404-405	VD631600	DIODE 1SS133, 176	
D407-408	VD631600	DIODE 1SS133, 176	
IC1	XW249A00	IC AN8882SB	
IC2	XZ555A00	IC AN4801SB CD DRIVER	
IC3	XW915A00	IC MN35511AL	RL
IC4	XW863A00	IC ADM202JRN-REEL7	
IC101-102	XA987A00	IC NJM2068D-D	
IC302	X6206A00	IC BR24L01AF-WE2	
IC303	X6386A00	IC M66003-0131FP	
IC305	X8006A00	IC KIA79S05P-AT	
IC306	X8003A00	IC BU4243G-TR	
IC307	XJ604A00	IC NJM78M05FA	
IC308	X4928A00	IC KIA7805API 5V	
JK300-301	WE260000	JACK. MNI LGY6501-0900FC	RL
PJ101	VV411100	JACK. PIN 2P	
PN1	V9637500	PIN L=70 #18	
PN4-5	V9637500	PIN L=70 #18	
Q1	iB054430	TR 2SB544 D, E, F, G	
Q4-104	VK432900	TR 2SD1915F S, T	
Q105-107	iC174020	TR 2SC1740S QRS	
Q200	iA093320	TR 2SA933S Q, R	
Q202	VS883400	TR 2SD2394 E, F	
Q203	VP872600	TR 2SA1708 S, T	
Q206	iA093320	TR 2SA933S Q, R	RL
Q208	WF764200	FET RSR025N03	
Q209-210	WH628700	FET RSR025P03TL	
R203	HV755100	R. CAR. FP 100 Ω 1/4W	
R211	HV755100	R. CAR. FP 100 Ω 1/4W	
R223-225	HV755120	R. CAR. FP 120 Ω 1/4W	
R468	HV754100	R. CAR. FP 10 Ω 1/4W	
ST1	V4040500	SCR. TERM M3	
ST2-3	V4040500	SCR. TERM M3	
ST300	V4040500	SCR. TERM M3	
SW200	V4466400	SW. PUSH SDKLA1-AP1 TV-5	RL
SW201	WH813600	VOLT. SELCT VSA-14-3	
SW300	V4757100	SW. TACT EVQ11A	
SW303	V4757100	SW. TACT EVQ11A	
SW307-309	V4757100	SW. TACT EVQ11A	
SW312-314	V4757100	SW. TACT EVQ11A	
SW317-318	V4757100	SW. TACT EVQ11A	
SW322-323	V4757100	SW. TACT EVQ11A	
T200	X7999A00	TRANS. PWR	
T200	X8001A00	TRANS. PWR	
T200	X8000A00	TRANS. PWR	UC RTL A BG L UCABG
T200	X8002A00	TRANS. PWR	
T200	X8001A00	TRANS. PWR	
TE1	WB782600	AC INLET R-30190 (26)	
TH2	VV456400	SW. POLY RXEF075 0.75A 72V	
TH3	VV457600	SW. POLY RUE090 0.90A 30V	
U300	V8444900	L. DTCT GP1UM271XK	
V300	WH406200	FL. DSPLY 15-ST-54GN	
XL1	VJ719800	RSNR. CRYST 16.9344MHz	
XL300	WA674700	RSNR. CE 16MHz CSTLS16MOX51	

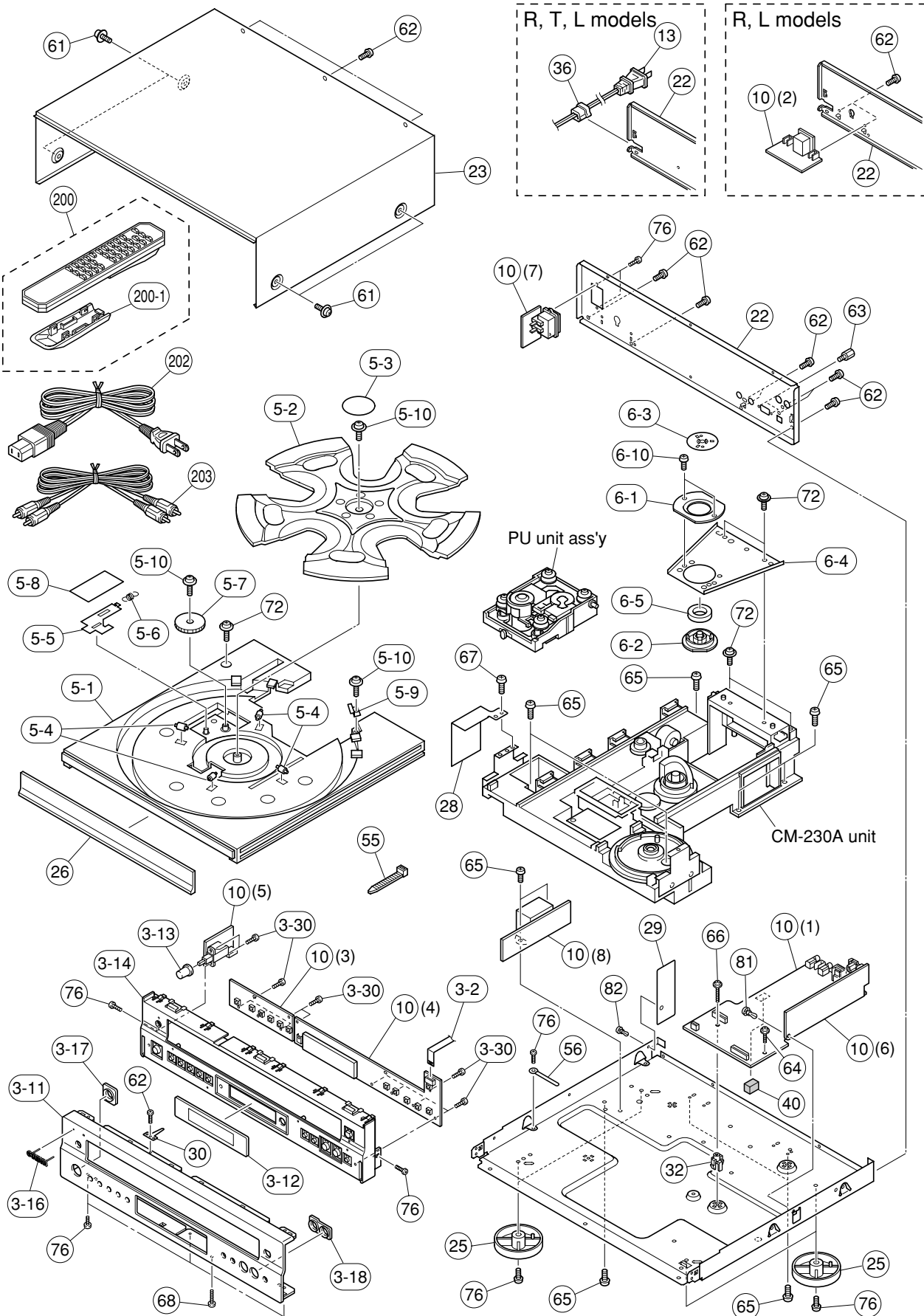
* New Parts

Ref. No.	Part No.	Description	Markets
	V3393500	SHEET. FL	
	V3747500	SUPRT	
	WE774000	SCR. BND. HD 3x6 MFZN2W3	
	WH526300	SPACER. FL 6x12 t=4	
	WH462300	P. C. B.	CM
CB400-404	VB858200	CN. BS. PIN 3P	
CB405-407	VB858100	CN. BS. PIN 2P	
CB408	VF982300	CN. BS. PIN 17P	
C400-401	VJ599100	C. CE. TUBLR 0.1uF 50V	
C402-403	VF467000	C. CE. TUBLR 1000pF 50V	
C404	VJ599100	C. CE. TUBLR 0.1uF 50V	
C408	UR848100	C. EL 100uF 25V	
D400	V2363400	PHOT. INTR ON1024	
D401	VG438000	DIODE. ZENR MTZJ6. 2B 6.2V	
IC401	XF947A00	IC LA6510	
IC402	XK583A00	IC TA7291P	
R406	HV753100	R. CAR. FP 1 Ω 1/4W	
R413	HV753100	R. CAR. FP 1 Ω 1/4W	
SW400-401	Vi294000	SW. LEVER SSCF21	

* New Parts

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OVERALL ASS'Y



	Ref. No.	Part No.	Description		Remarks	Markets
	3-2	MF118200	FLEXIBLE FLAT CABLE	18P 200mm P=1.25		
*	3-11	WH256600	FRONT PANEL		BL	
*	3-11	WH256700	FRONT PANEL		TI	
*	3-12	WH267500	SHEET WINDOW			
	3-13	V6876100	BUTTON D5	POWER ON/OFF	BL	
	3-13	V8540300	BUTTON D5	POWER ON/OFF	TI	
*	3-14	WH257300	SUB PANEL		BL	
*	3-14	WH257400	SUB PANEL		TI	
	3-16	V6034100	EMBLEM			
*	3-17	WH257500	ESCUTCHEON PW	STANDBY/ON	BL	
*	3-17	WH257600	ESCUTCHEON PW	STANDBY/ON	TI	
*	3-18	WH409700	ESCUTCHEON	PLAY/STOP	BL	
*	3-18	WH409800	ESCUTCHEON	PLAY/STOP	TI	
	3-30	WF821100	PAN HEAD P-TIGHT SCREW	2. 6x8 MFZN2W3		
	5-1	VZ761500	TRAY	B		
	5-2	V2430500	TABLE C			
*	5-3	WG968300	PLATE TABLE			
	5-4	VS037300	ROLLER			
	5-5	VV014400	LEVER	PO		
	5-6	VS036900	SPRING RT			
	5-7	VZ761800	GEAR RT			
	5-8	VS037900	SHEET TRAY	B		
	5-9	V3316800	SUPPORT TR			
*	5-10	WH292100	PW HEAD P-TIGHT SCREW	3x8-10 MFZN2W3		
	6-1	V2430700	HOLDER CLAMPER C			
	6-2	VL782500	STABILIZER			
	6-3	VS500400	PLATE	STABILIZER		
	6-4	VZ762600	FRAME CLAMPER			
	6-5	VQ930900	MAGNET	DH29. 6x18x3. 6FMS		
	6-10	WE936300	BIND HEAD B-TIGHT SCREW	3x6 MFZN2W3		
*	10	WH461400	P. C. B. ASS' Y	MAIN		UC
*	10	WH461500	P. C. B. ASS' Y	MAIN		R
*	10	WH461700	P. C. B. ASS' Y	MAIN		T
*	10	WH461600	P. C. B. ASS' Y	MAIN		A
*	10	WH461800	P. C. B. ASS' Y	MAIN		BG
*	10	WH461900	P. C. B. ASS' Y	MAIN		L
⚠	13	WC992700	POWER CABLE	2m		R
⚠	13	WB120600	POWER CABLE	2m		T
⚠	13	VN363600	POWER CABLE	2m		L
*	22	WH259500	REAR PANEL			UC
*	22	WH259200	REAR PANEL			RL
*	22	WH259300	REAR PANEL			T
*	22	WH259100	REAR PANEL			A
*	22	WH259600	REAR PANEL			BG
*	23	WH257000	TOP COVER		BL	
*	23	WH257100	TOP COVER		TI	

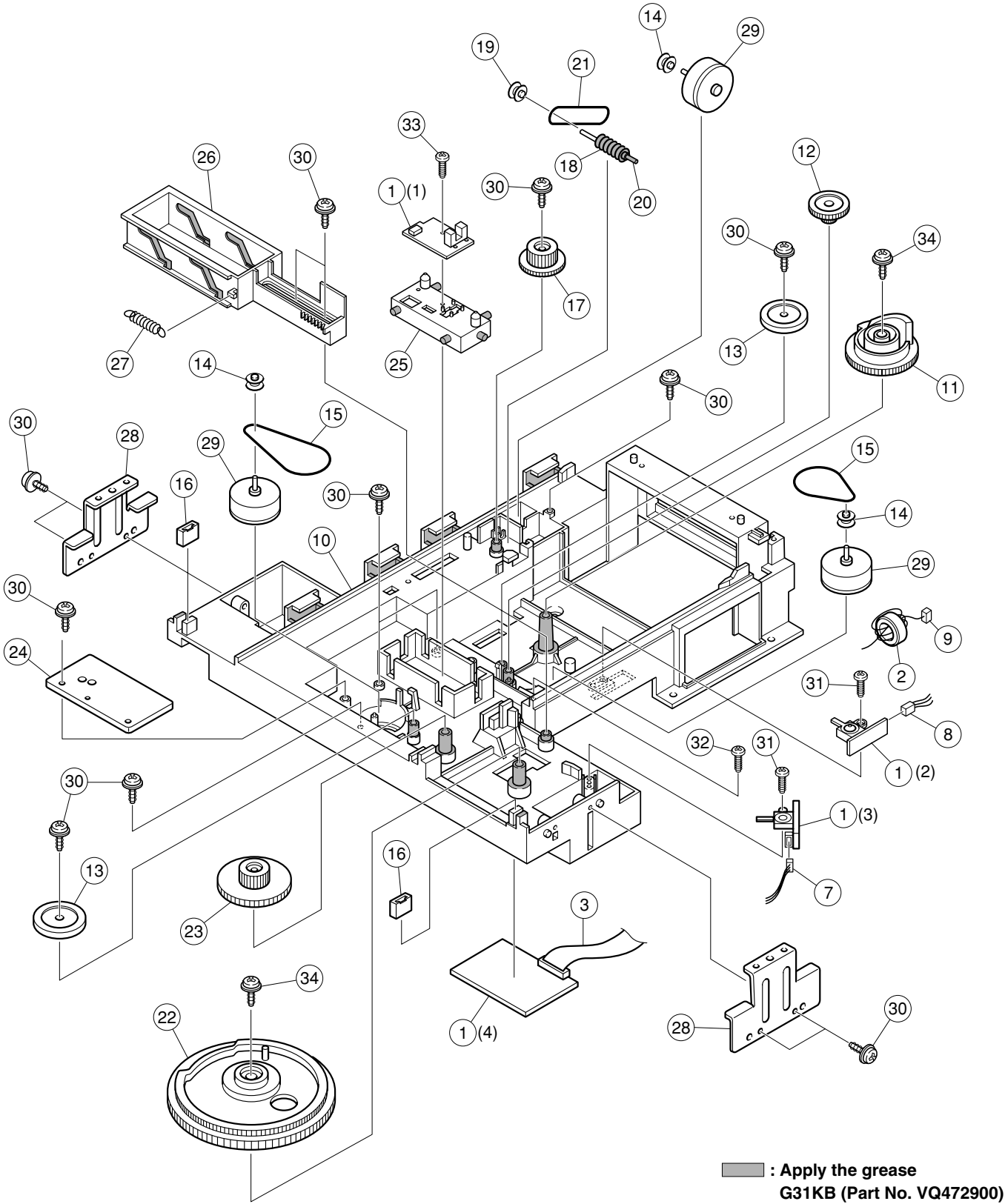
※ New Parts

	Ref. No.	Part No.	Description		Remarks	Markets
	25	VQ780300	LEG	D60xH16		
*	26	WH256800	LID CDC		BL	
*	26	WH256900	LID CDC		TI	
*	28	WH257200	BARRIER POWER			
*	29	WJ070300	BARRIER INLET			UCABG
	30	VQ775900	EARTH PLATE			
	32	VR264400	SPACER	H8		
	36	V2438700	CORD STOPPER	10P1		RTL
	40	VZ544200	SPACER	T13x10x20		
	55	VU590000	BINDING TIE	CBTD001B		
	56	WD397500	BINDING TIE	MSF-085		
	61	VH313200	PW HEAD S-TIGHT SCREW	4x8-10 MFN13BL	BL	
	61	VD069600	PW HEAD S-TIGHT SCREW	4x8-10 MFN133	TI	
	62	WE774100	BIND HEAD BONDING B-T. SCREW	3x8 MFZN2B3		
	63	V6509600	JACK SCREW	SS6-A47511848		
	64	WF002600	PW HEAD B-TIGHT SCREW	3x8 MFZN2W3		
	65	WF821300	BIND HEAD S-TIGHT SCREW	4x7 MFZN2W3		
	66	VT669400	PW HEAD B-TIGHT SCREW	3x15-8 MFC2		
	67	WE936300	BIND HEAD B-TIGHT SCREW	3x6 MFZN2W3		
	68	WF303500	BIND HEAD SCREW	3x14 MFZN2B3		
*	72	WH292000	PW HEAD P-TIGHT SCREW	3x12-10 MFZN2W3		
	76	WE774300	BIND HEAD B-TIGHT SCREW	3x8 MFZN2W3		
	81	VQ368600	PUSH RIVET	P3555-B		
	82	WG432900	PUSH RIVET	P3535		UCABG
			ACCESSORIES			
*	200	WH261700	REMOTE CONTROL	CDC8	RC7060-01-35	
	200-1	AAX13340	BATTERY COVER		60050001	
⚠	202	V7704800	POWER CABLE	2m 1pc		UC
⚠	202	WB750900	POWER CABLE	2m 1pc		A
⚠	202	WB751000	POWER CABLE	2m 1pc		B
⚠	202	V7704900	POWER CABLE	2m 1pc		G
	203	VY952200	AUDIO PIN CABLE	2P 1.0m 1pc		
			BATTERY	UM-3 2pcs		
			SERVICE PARTS			
		VQ472900	GREASE	FL01L G-31KB		
		AAX01170	GREASE	MOLYKOTE PG-663		

※ New Parts

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CM-230A UNIT



Ref. No.	Part No.	Description	Remarks	Markets
		CM-230A UNIT		
* 1	WH462300	P.C.B. ASS'Y	CM	
2	V6660800	FERRITE CORE	F5 T19x10x10	
* 3	WH954100	FLEXIBLE FLAT CABLE	17P 110mm P=1.25	
7	V3175700	CONNECTOR ASS'Y	3P 220mm	
8	V3175900	CONNECTOR ASS'Y	3P 220mm	
9	MF706450	IDC CABLE ASS'Y	6P 450mm C&C	
10	VZ760500	CHASSIS CM		
11	VZ760600	CAM CL		
12	VS035400	GEAR CL2		
13	VS036100	GEAR PULLEY		
14	VS036200	PULLEY		
15	VQ776900	BELT	V	
16	VQ775500	DAMPER TRAY		
17	VS035800	GEAR WW		
18	VS035700	GEAR		
19	V2009500	PULLEY RT		
20	VS036600	SHAFT 2		
21	VS036500	BELT RT		
22	VZ760700	GEAR L0		
23	VS035300	GEAR L01		
* 24	WH533200	SHEET BELT		
25	VZ761000	HOLDER SENSOR		
26	VZ761200	CAM SLIDE		
27	VS036800	SPRING CAM		
28	VS037400	SUPPORT TRAY		
29	VM444200	MOTOR	RF-500TB-14415	
* 30	WH292100	PW HEAD P-TIGHT SCREW	3x8-10 MFZN2W3	
* 31	WH292200	PAN HEAD P-TIGHT SCREW	2.6x8 MFZN2W3	
* 32	WH412000	BIND HEAD SCREW	2.6x5 MFZN2W3	
33	WE774800	BIND HEAD P-TIGHT SCREW	3x8 MFZN2W3	
* 34	WH292000	PW HEAD P-TIGHT SCREW	3x12-10 MFZN2W3	

* New Parts

1

• PA UNIT ASS'Y

2

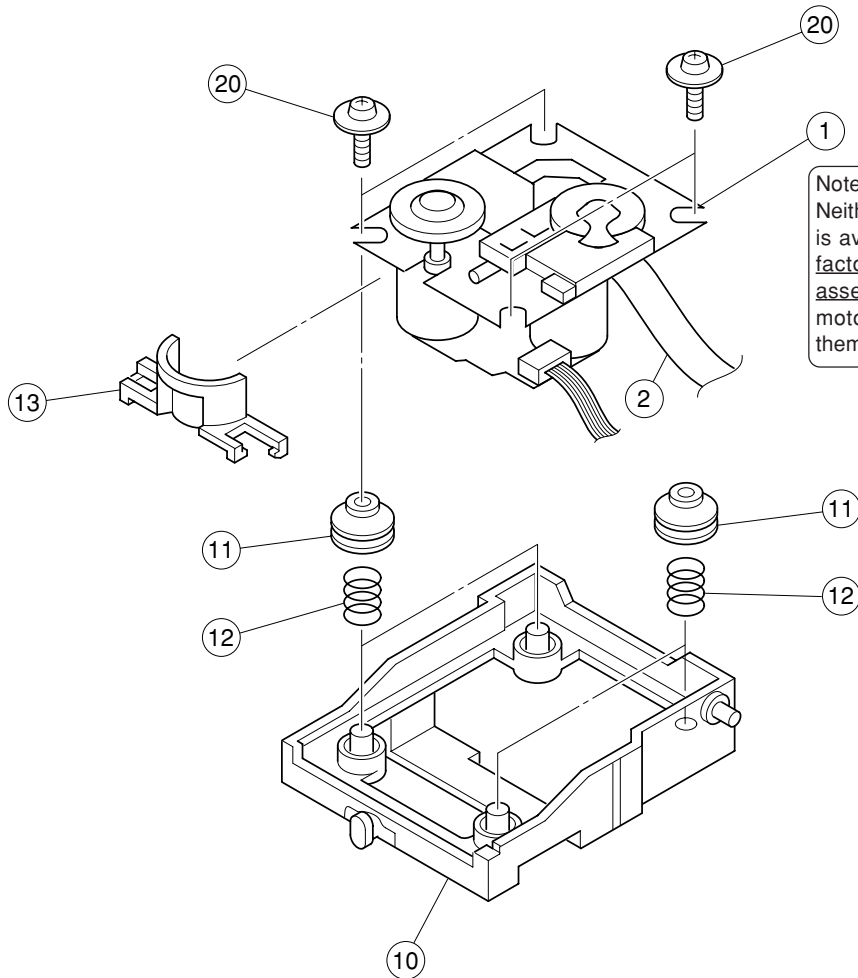
3

4

5

6

7



Note :
Neither the pick-up head nor the spindle motor is available independently because they are factory-adjusted for the optimum level after assembly. If the pick-up head or the spindle motor must be replaced, be sure to replace them together as a unit.

Ref. No.	Part No.	Description	Remarks	Markets
1	WH611000	PU UNIT ASS'Y		
2	WH538800	PU MECHANISM UNIT	DA11T3CNF	
10	V2430600	FLEXIBLE FLAT CABLE	16P 230mm P=1.0	
11	V2430800	HOLDER PU/C		
12	VQ386500	DAMPER CDC		
13	V2480800	SPRING		
20	WH292300	BARRIER PU		
		PW HEAD P-TIGHT SCREW	2.6x8-12 MFZN2W3	

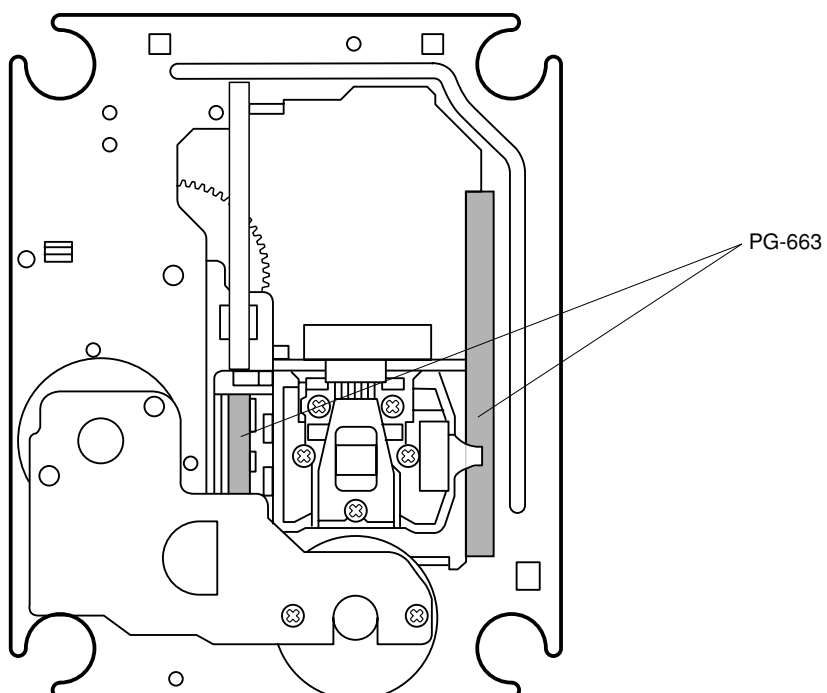
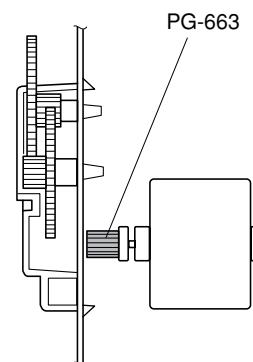
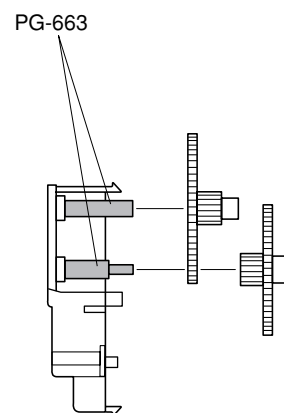
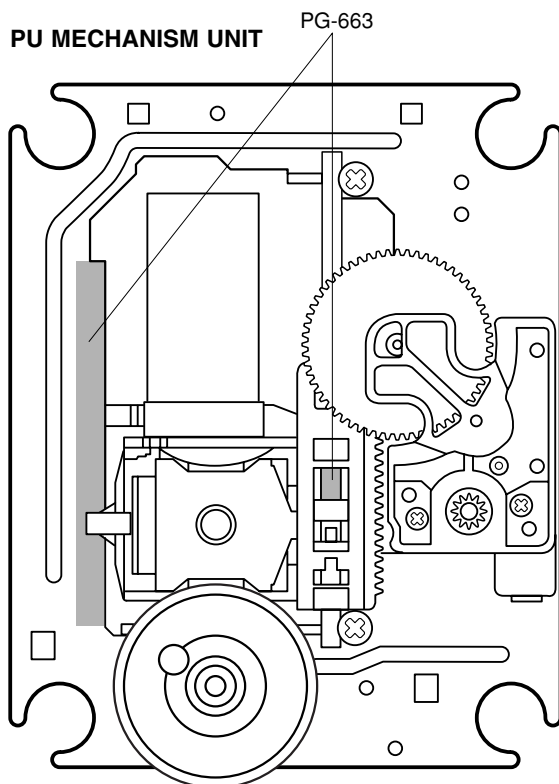
* New Parts

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GREASE APPLICATION DIAGRAM

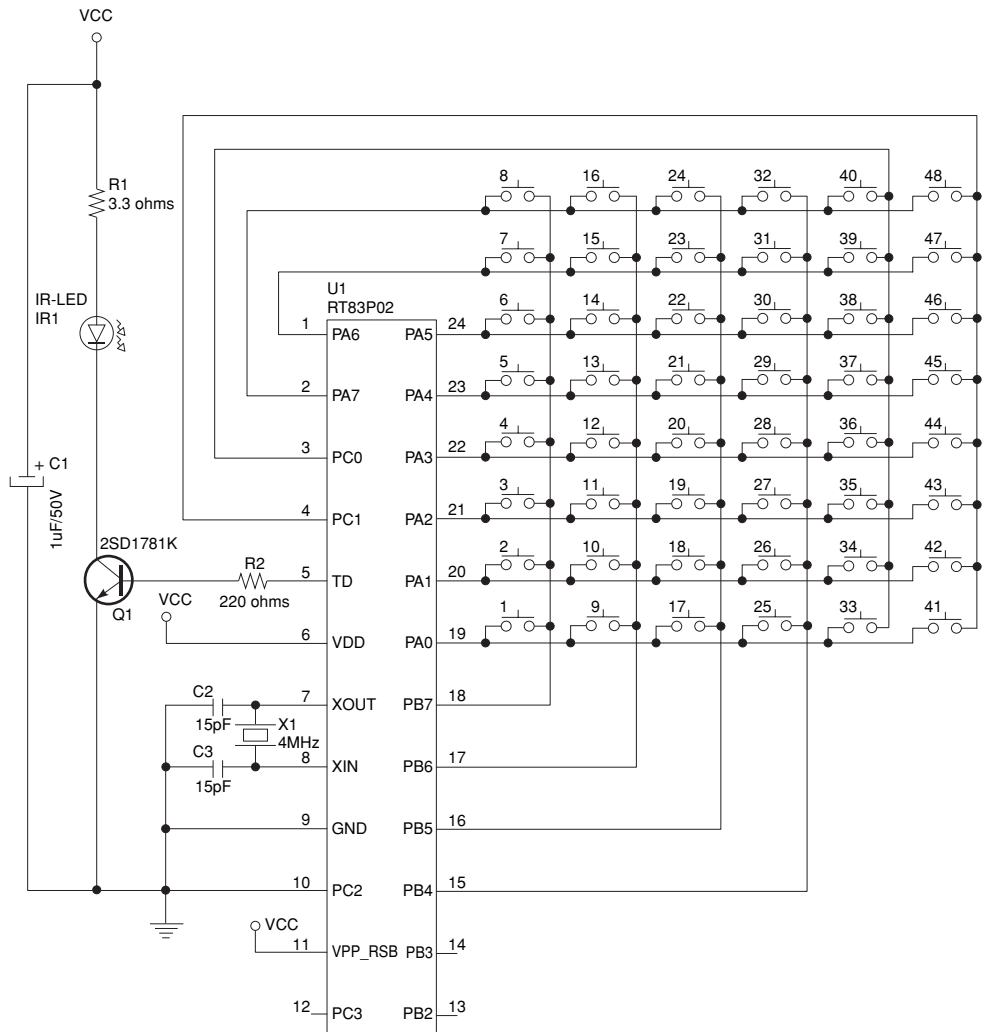
Apply the grease

Molykote PG-663 (Part No. AAX01170)



■ REMOTE CONTROL

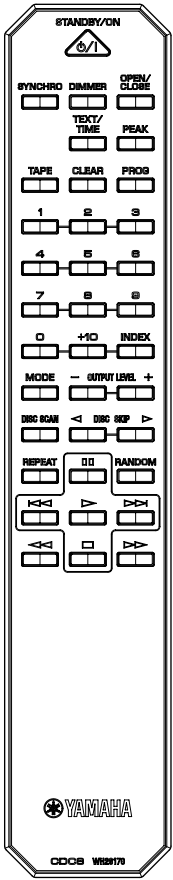
• SCHEMATIC DIAGRAM



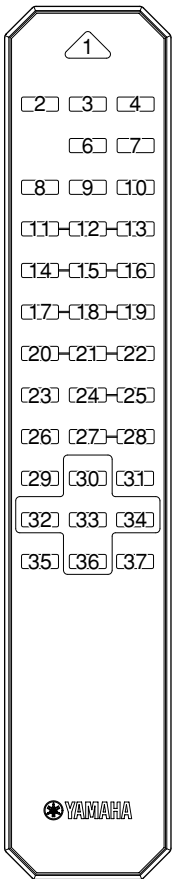
• KEY CODE

Key No.	Function	Custom	Data	Key No.	Function	Custom	Data
1	STANDBY/ON	79	60	20	0	79	10
2	SYNCHRO	79	58	21	+10	79	1A
3	DIMMER	79	54	22	INDEX	79	0B
4	OPEN/CLOSE	79	01	23	MODE	79	00
5	-	79	0F	24	OUTPUT LEVEL -	79	1C
6	TEXT/TIME	79	0A	25	OUTPUT LEVEL +	79	1D
7	PEAK	79	5D	26	DISC SCAN	79	53
8	TAPE	79	57	27	DISC SKIP ◀	79	50
9	CLEAR	79	0D	28	DISC SKIP ▶	79	4F
10	PROG	79	0C	29	REPEAT	79	08
11	1	79	11	30	■	79	55
12	2	79	12	31	RANDOM	79	1B
13	3	79	13	32	◀◀	79	04
14	4	79	14	33	▶	79	02
15	5	79	15	34	▶▶	79	07
16	6	79	16	35	▶▶▶	79	05
17	7	79	17	36	■	79	56
18	8	79	18	37	▶▶▶	79	06
19	9	79	19	38	-	79	1E

• PANELS



• KEY LAYOUT



Parts List for Carbon Resistors

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

1/4W Type

HJ35 ○○○○

10mm

1/4W Type

HF45 ○○○○

1/6W Type

HF85 ○○○○

5mm

* : Not available