MINI COMPONENT SYSTEM

CRX-E150/NX-E150

SERVICE MANUAL

CRX-E150

IMPORTANT NOTICE

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

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

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

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

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

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

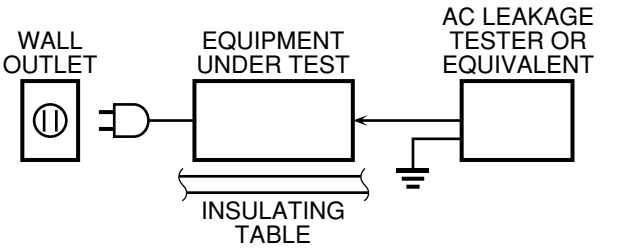
■ CONTENTS

100744

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

■ TO SERVICE PERSONNEL

1. Critical Components Information
   Components having special characteristics are marked ⚠ 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 ohm shunted by 0.15μF.
- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in bot polarities.

"CAUTION"
"F400: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 1.25A, 125V FUSE."
"F600: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 1.6A, 125V FUSE."

CAUTION
F400: REPLANCE WITH SAME TYPE 1.25A, 125V FUSE.
F600: REPLANCE WITH SAME TYPE 1.6A, 125V FUSE.

ATTENTION
F400: UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE DE 1.25A, 125V.
F600: UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE DE 1.6A, 125V.

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.

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 readjustment, disassembly or repair of 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 key 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 set, 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.

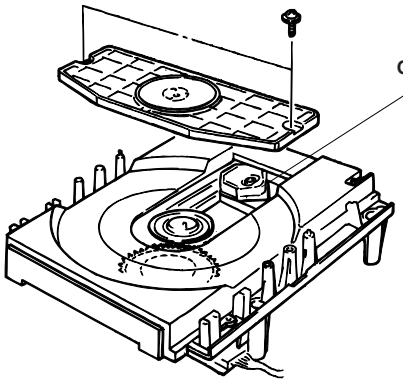
PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

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

1. Laser Diode Properties
   - Material : GaAlAs
   - Wavelength : 780 nm
   - Emission Duration : Continuous
   - Laser Output : max. 44.6 μW*

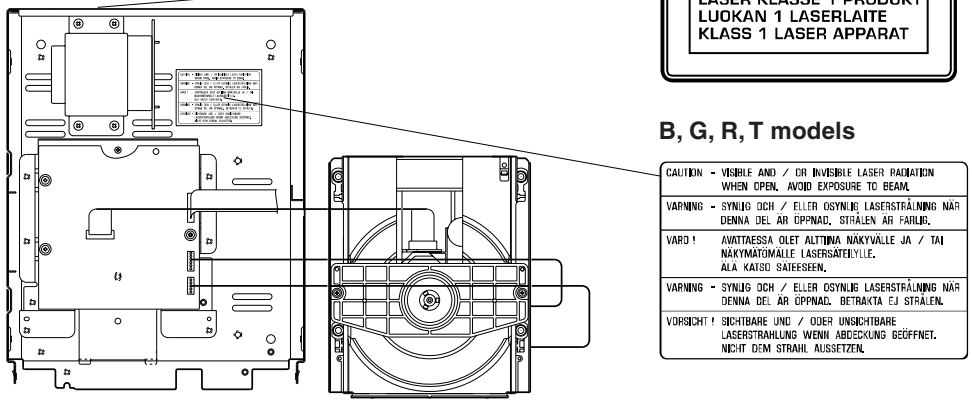
   * This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.

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.



The label is under the MAIN (1) P.C.B..

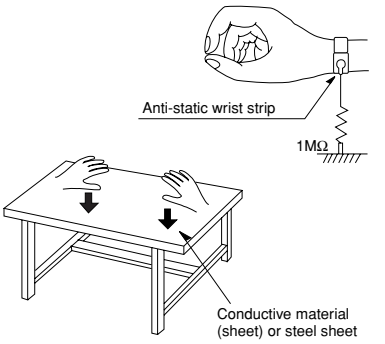
■ PREVENTION OF ELECTRO STATIC DISCHARGE

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor “chip” components. The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static (ESD protected)” can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES divice, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the antistatic wrist strap to discharge the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed and ground the sheet.

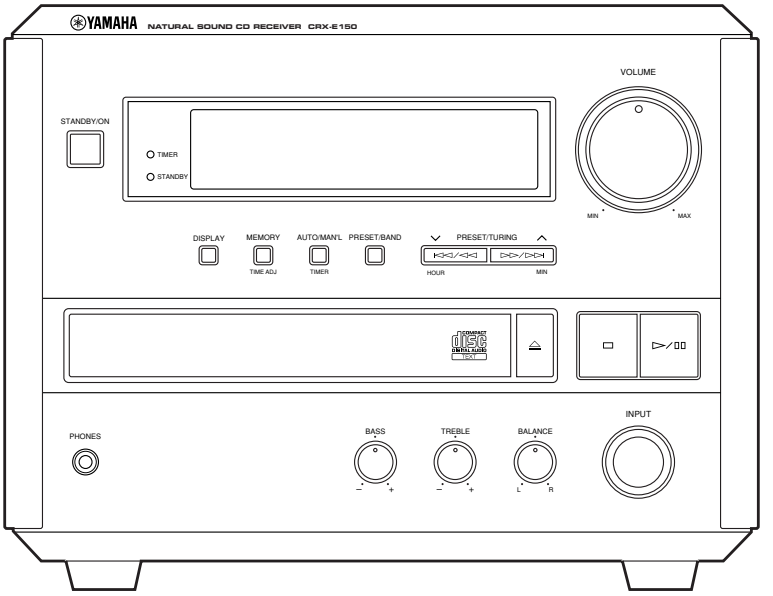


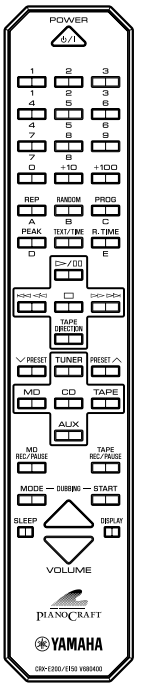
Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So take care not to let your clothes touch the optical pickup.

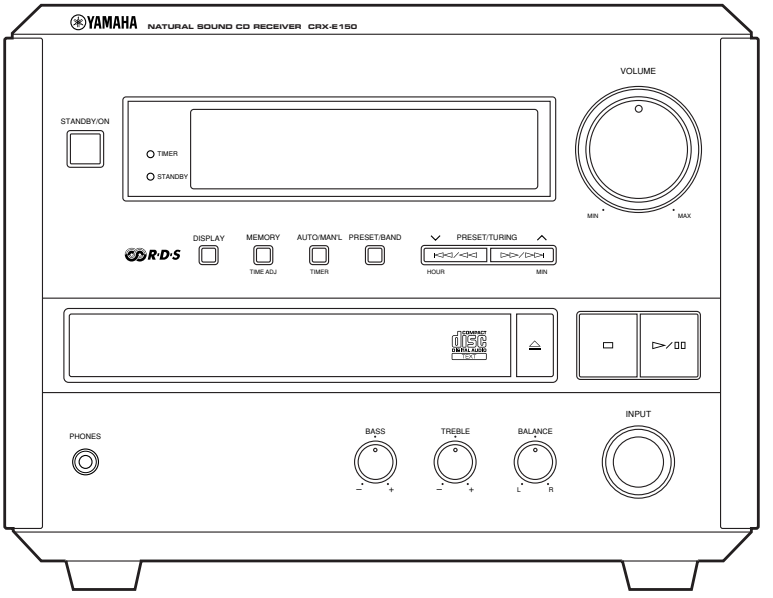
■ FRONT PANELS

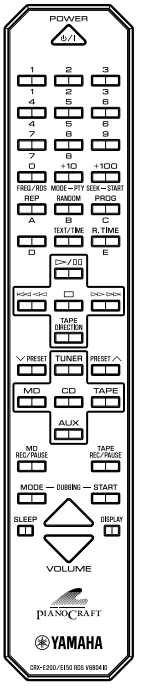
U, C, A, R, T models





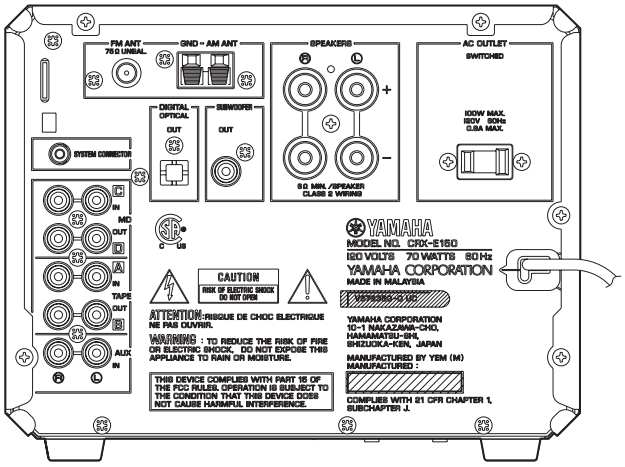
B, G models



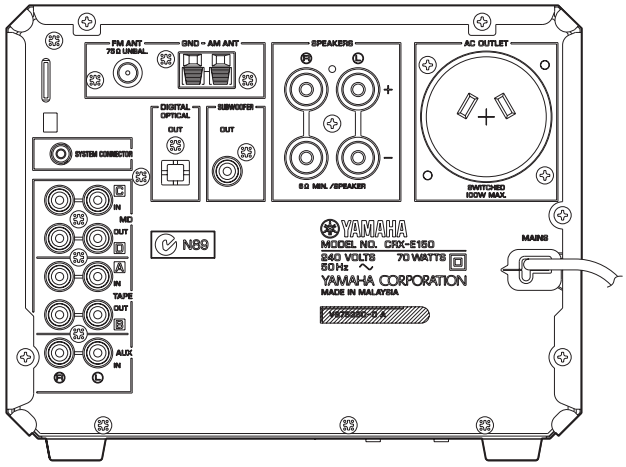


■ REAR PANELS

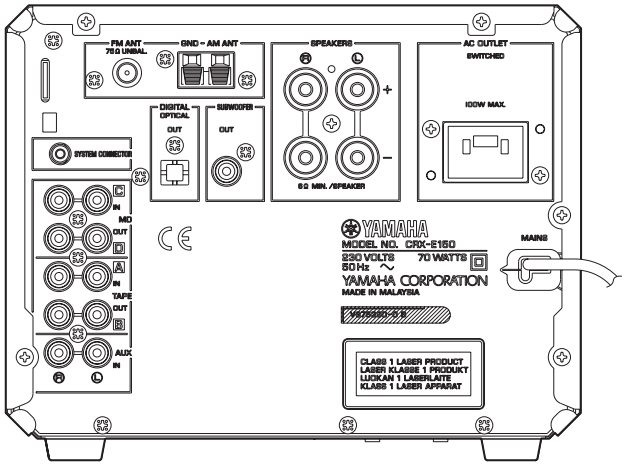
U, C models



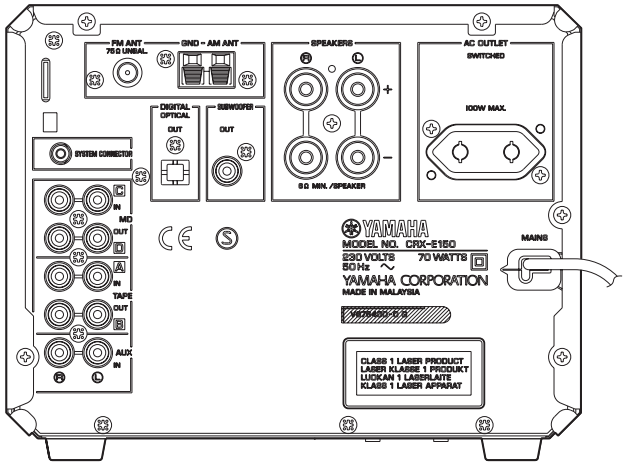
A model



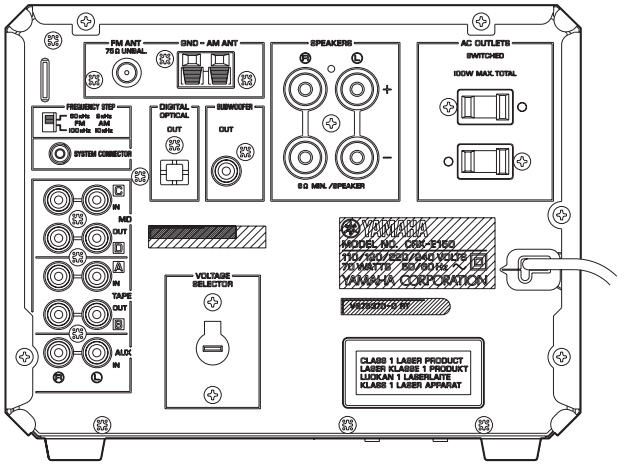
B model



G model



R, T models



■ SPECIFICATIONS

■ Audio Section

Minimum RMS Output Power per Channel (Power Amp. Section)
(1 kHz, 0.1% THD, 6 ohms)
SP OUT L/R ..... 25W + 25W

Maximum Power per Channel (EIAJ) [R model]
(1 kHz, 10% THD, 6 ohms)
SP OUT L/R ..... 30W + 30W

Dynamic Power Per Channel (IHF)
SP OUT L/R
6 ohms ..... 35W + 35W
4 ohms ..... 40W + 40W
2 ohms ..... 45W + 45W

DIN Standard Output Power Per Channel
SP OUT L/R (1 kHz, 1% THD, 4 ohms)
[G model] ..... 28W + 28W

Dynamic Headroom
6 ohms
[U, C models] ..... 1.46 dB

IEC Power Per Channel
SP OUT L/R (1 kHz, 0.1% THD, 6 ohms)
[G model] ..... 25W + 25W

Power Band Width
(0.1% THD, 12.5W/6 ohms)
SP OUT L/R ..... 10 Hz to 50 kHz

Damping Factor
SP OUT L/R (20 Hz to 20 kHz, 6 ohms) ..... 60 or more

Input Sensitivity / Input Impedance
MD ..... 170 mV / 47 k-ohms
TAPE ..... 170 mV / 47 k-ohms
AUX ..... 170 mV / 47 k-ohms

Maximum Input Signal Level
MD, etc. (1 kHz, 0.5% THD) ..... 3.0 V

Output Level / Output Impedance
REC OUT (MD, TAPE) ..... 170 mV / 1.2 k-ohms
SUBWOOFER (50 Hz) ..... 2.0 V/1.2 k-ohms

Headphone Jack Rated Output / Impedance
MD, etc. 1 kHz, 170 mV, 6 ohms ..... 0.35 V / 270 ohms

Frequency Response
MD, etc. to SP OUT (20 Hz to 20 kHz) ..... 0 ± 0.5 dB

Total Harmonic Distortion
(20 Hz to 20 kHz, 12.5 W / 6 ohms)
MD, etc. to SP OUT ..... 0.04% or less

Signal to Noise Ratio (IHF-A network)
MD, etc. (Input shorted) to SP OUT
150 mV ..... 93 dB or more
250 mV ..... 98 dB or more

Residual Noise (IHF-A netwok)
SP OUT L/R ..... 100 μV or less

Channnel Separation
(Vol: MAX)
MD, etc. (Input 5.1 k-ohms terminated, 1 kHz) ..... 60 dB or more
MD, etc. (Input 5.1 k-ohms terminated, 10 kHz) ..... 45 dB or more

Tone Control Characteristics
BASS: Boost/Cut ..... ±10 dB (50 Hz)
Turnover Frequency ..... 350 Hz
TREBLE: Boost/Cut ..... ±10 dB (20 kHz)
Turnover Frequency ..... 3.5 kHz

Filter Characteristics
SUBWOOFER (L.P.F.) ..... fc = 150 Hz, 6 dB/oct.

■ FM Section

Tuning Range
[U, C models] ..... 87.5 to 107.9 MHz
[A, B, G models] ..... 87.50 to 108.00 MHz
[R, T models] ..... 87.5 to 108.0 / 87.50 to 108.00 MHz

Usable Sensitivity (IHF)
Mono ..... 1.0 μV (11.2 dBf)

Alternate Channel Selectivity
at 400 kHz ..... 70 dB

Signal to Noise Ratio (IHF)
Mono / Stereo ..... 76 dB / 70 dB

Harmonic Distortion
(1 kHz)
Mono/Stereo ..... 0.2 / 0.3 %

Stereo Separation
1 kHz ..... 45 dB

Frequency Response
20 Hz to 15 kHz ..... +0.5 / -2 dB

Antenna Input
..... 75 ohms unbalanced

■ AM Section

Tuning Range
[U, C models] ..... 530 to 1,710 kHz
[A, B, G models] ..... 531 to 1,611 kHz
[R, T models] ..... 530 to 1,710 / 531 to 1,611 kHz

Usable Sensitivity
..... 300 μV/m

Antenna
..... Loop Antenna

■ CD Section

Output Level
1 kHz, 0dB ..... 2.0 ± 0.5 Vrms

Signal to Noise Ratio (EIAJ)
..... 100 dB or more

Dynamic Range
..... 96 dB or more

Harmonic Distortion + Noise
1 kHz ..... 0.006% or less

Frequency Response
2 Hz to 20 kHz ..... 0 ± 0.5 dB

■ General

Power Supply
[U, C models] ..... AC 120 V, 60 Hz
[A model] ..... AC 240 V, 50 Hz
[B, G models] ..... AC 230 V, 50 Hz
[R, T models] ..... AC 110/120/220/240 V, 50/60 Hz

Power Consumption
[U, C models] ..... 70 W
[A, B, G, R, T models] ..... 70 W

Standby Power Consumption
[U, C models] ..... 1.4 W
[A, B, G models] ..... 1.5 W

Maximum Power Consumption
(2ch Drive, 1 kHz, 10% THD, 6 ohms)
[R, T models] ..... 145 W

AC Outlets
1 switched outlet
[U, C, A, B, G models] 100W
2 switched outlets
[R, T models] ..... 100W max., total

Dimensions (W x H x D)
..... 217 x 168 x 312 mm (8-9/16" x 6-5/8" x 12-5/16")

Weight
..... 5.0 kg (11 lbs.)

Finish
..... Gold Color [U, C, A, B, G, R, T models]
..... Silver Color [U, B, G models]

Accessories
Remote Control Transmitter, Manganese batteries x 4, Indoor FM antenna, AM loop antenna

■ SPEAKER Section (NX-E150)

Type
..... 2 Way Bass-reflex Magnetic Shielding Type

Driver
Woofer ..... 11cm (4-1/2") Cone Type
Tweeter ..... 2.5cm (1") Dome Type

Frequency Response
..... 60 Hz to 28 kHz

Impedance
..... 6 ohms

Nominal Input
..... 40 W

Maximum Input
..... 110 W

Sensitivity
..... 85 dB/2.83V/m

Crossover Frequency
..... 3 kHz

Input Terminal
..... Screw/Banana Type

Dimensions (W x H x D)
..... 165 x 255 x 183 mm (6-1/2" x 10" x 7-3/16")

Weight
..... 3.3 kg (7 lbs. 4 oz.)

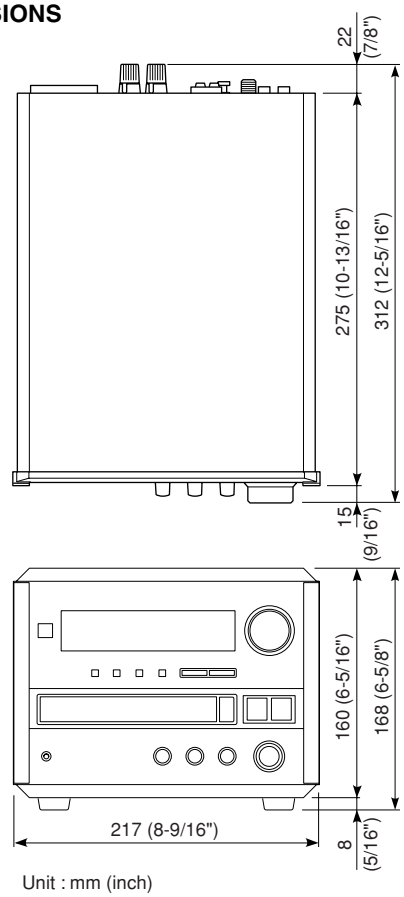
Finish
..... High Gloss Piano Finish, Cherry

Accessories
..... Speaker Cord (4m) x 2

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

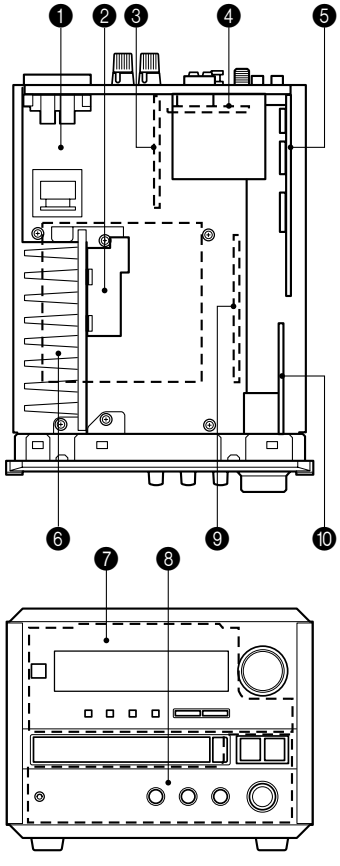
U ..... U.S.A. model
A ..... Australian model
G ..... European model
T ..... China model
C ..... Canadian model
B ..... British model
R ..... General model

• DIMENSIONS



Unit : mm (inch)

■ INTERNAL VIEW



❶ MAIN (1) P.C.B.
❷ MAIN (3) P.C.B.
❸ MAIN (4) P.C.B.
❹ MAIN (5) P.C.B. [R, T models only]
❺ INPUT (1) P.C.B.
❻ CD P.C.B.
❼ OPERATION P.C.B.
❽ INPUT (2) P.C.B.
❾ MAIN (2) P.C.B.
❿ INPUT (3) P.C.B.

■ DISASSEMBLY PROCEDURES

(Remove parts in the order as numbered.)
Disconnect the power plug from the AC outlet.

1. Removal of Top Cover

a. Remove 4 screws (①) and 5 screws (②) in Fig. 1.
b. Lift the Top Cover at the rear and move it rear-ward slantingly.

2. Removal of Front Panel Unit

a. Disconnect cables from Connectors (CB752, CB415, CB407, CB305, CB302) in Fig. 2.
b. Remove 3 screws (③) and 3 screws (④) in Fig. 1.
c. Remove the Front Panel Unit forward in Fig. 1.

3. Removal of Tuner

a. Disconnect a cable from Connector (CB303) in Fig. 2.
b. Remove 3 screws (⑤) and then remove the Tuner in Fig. 3.

4. Removal of MAIN (1) P.C.B.

a. Disconnect cables from Connectors (CB413, CB403, CB401) in Fig. 2.
b. Remove the cap (⑥) from the Digital Output Terminal in Fig. 3.
c. Remove 3 screws (⑦), 1 screw (⑧) and 2 screws (⑨) in Fig. 3.
d. Remove 1 screw (⑩) and 5 screws (⑪) and then remove the MAIN (1) P.C.B. in Fig. 3.

5. Removal of CD Mechanism Unit

a. Disconnect the cable from the Connector (CB601) in Fig. 4.
b. Remove 2 screws (⑫) and 2 screws (⑬) in Fig. 4. and then remove the Frame/P.C.B..
c. Remove 4 screws (⑭) and then remove the CD Mechanism Unit in Fig. 4.

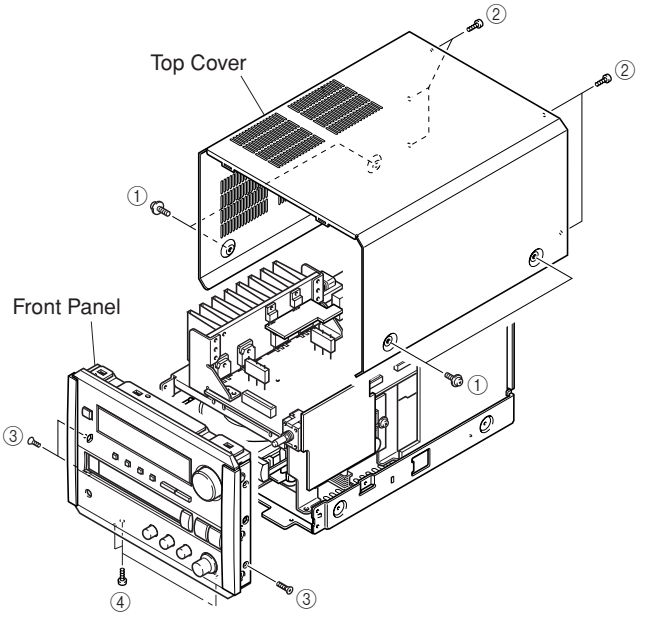


Fig. 1

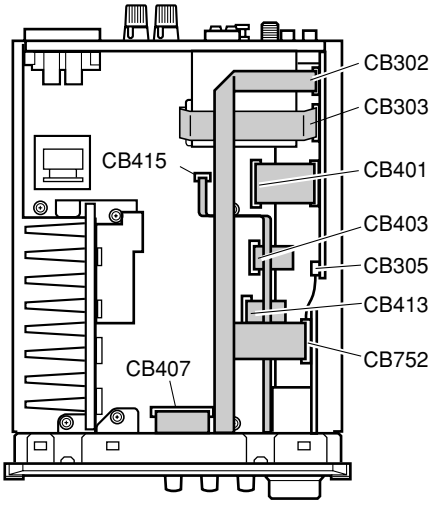


Fig. 2

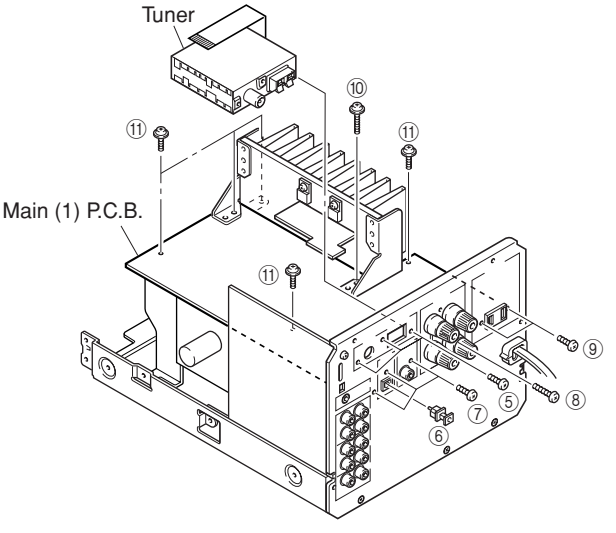


Fig. 3

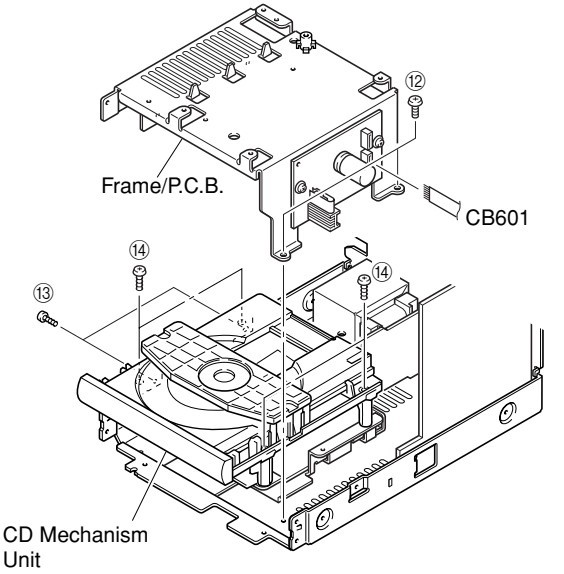


Fig. 4

6. Removal of Tray Unit

a. Remove 2 screws (⑮) and then remove the Chucking Unit in Fig. 5.
b. Remove 1 hook and then remove the Stopper Pin in Fig. 5.
c. Rotate the Drive Gear and then open the Tray Unit in Fig. 5.
d. Detach the Stoppers on both sides and then pull out the Tray in Fig. 5.

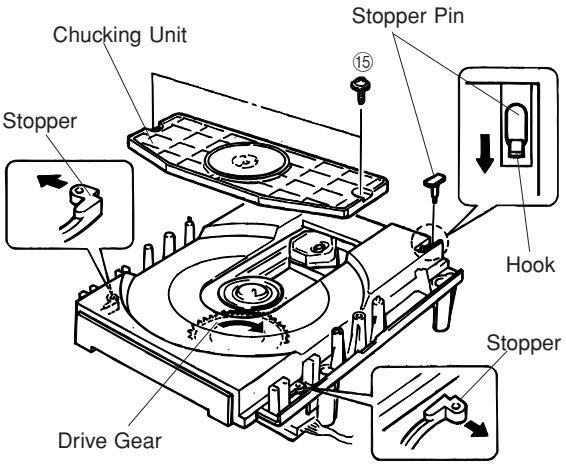


Fig. 5

7. Removal of Pick-up Head

a. Remove 2 screws (⑯) in Fig. 6.
b. Remove the Pick-up Cable in Fig. 6.
c. Remove 4 screws (⑰) and then remove the Drive Unit in Fig. 6.
d. Remove the Gear A in Fig. 7.
e. Pull out the Sled Shaft in Fig. 7.
f. Remove the Pick-up Head.

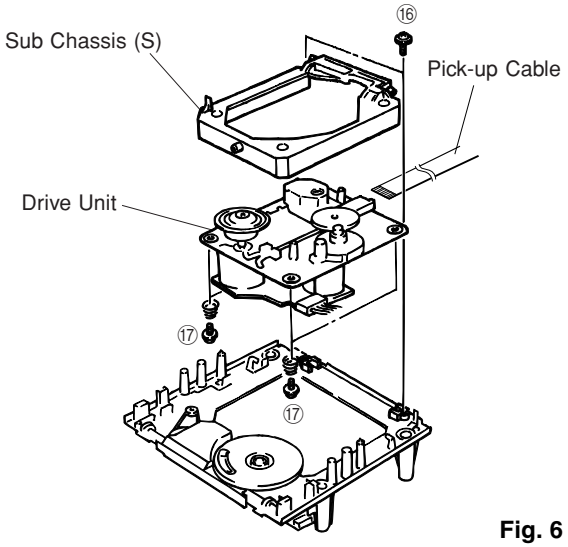


Fig. 6

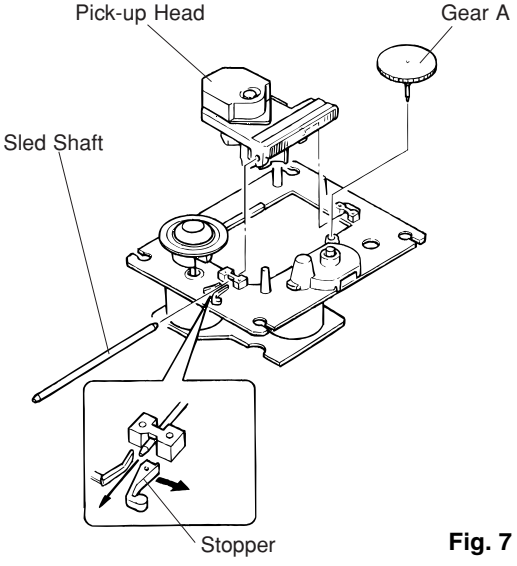
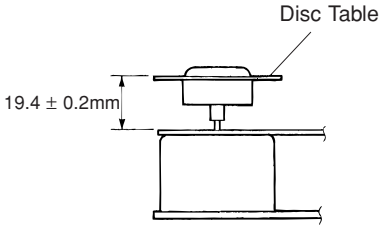


Fig. 7

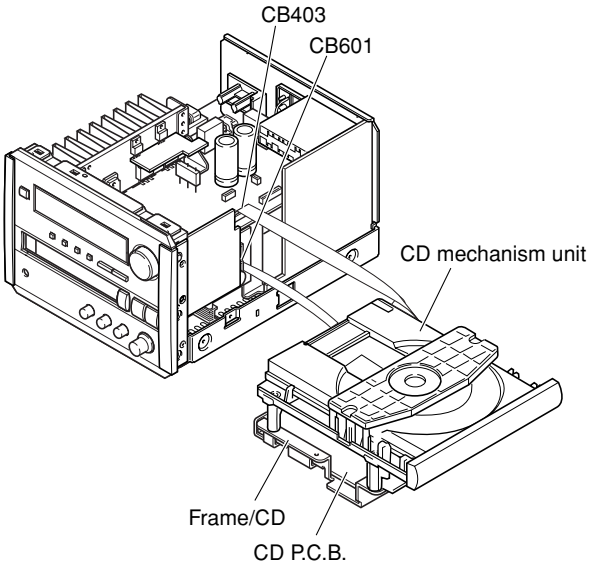
Check that the disc table height is as specified below.



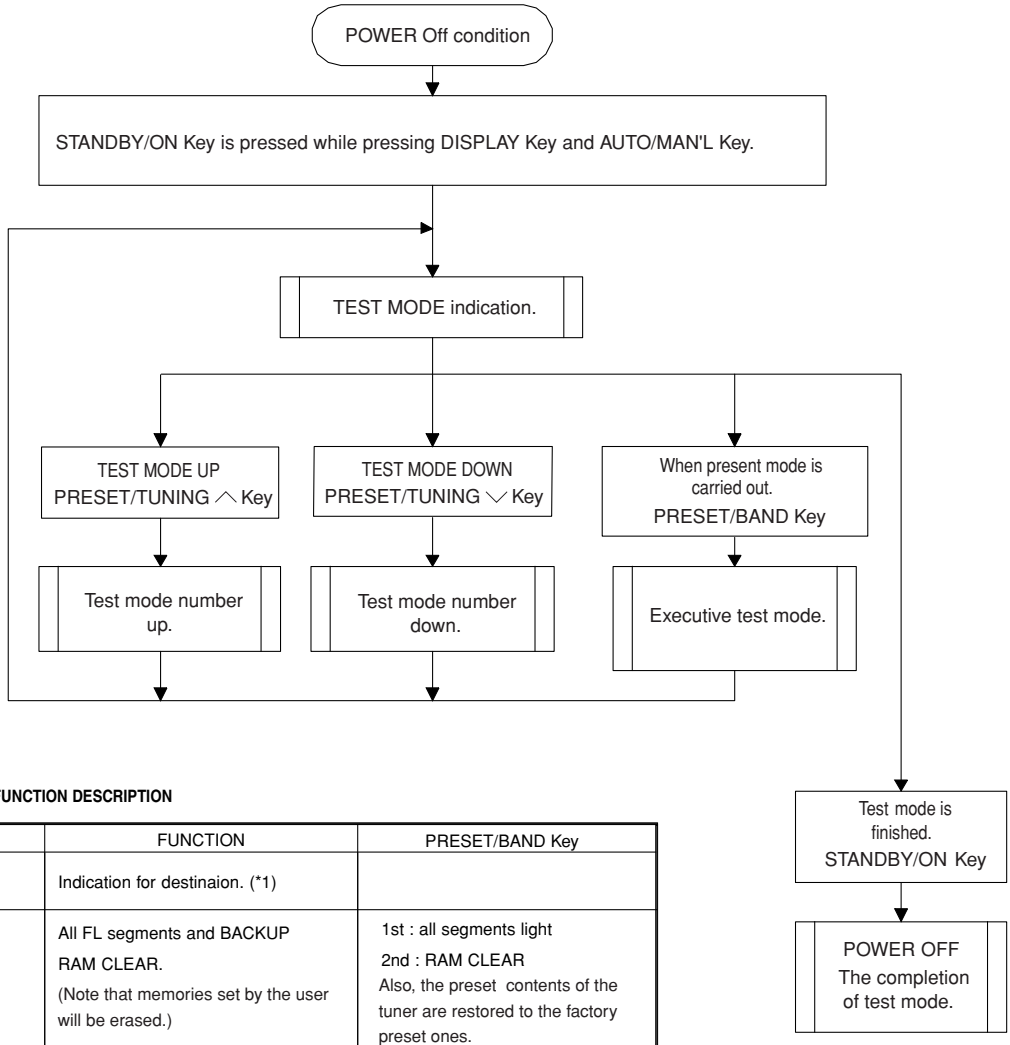
■ CD MECHANISM UNIT OPERATION CHECK

Refer to the DISASSEMBLY PROCEDURES and the EXPLODED VIEW.

1. Disconnect the power plug from the AC outlet.
2. Remove the top cover.
3. Remove the front panel unit.
4. Remove the tuner.
5. Remove the MAIN (1) P.C.B.
6. Remove the frame/P.C.B.
7. Remove the CD mechanism unit.
8. Remove the CD P.C.B.
9. Remove the frame/CD.
10. Attach the CD P.C.B. and the CD mechanism unit to the frame/CD.
11. Attach the frame/P.C.B.
12. Attach the MAIN (1) P.C.B.
13. Attach the tuner.
14. Attach the front panel unit.
15. Connect all detached cables to the respective connectors.
16. Connect the power cord to the AC outlet.
17. Press the STANDBY/ON key to switch on the power.
18. Check the operation of the CD mechanism.



■ TEST MODE

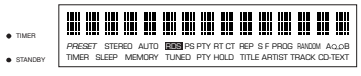


TEST PROGRAM MODE FUNCTION DESCRIPTION

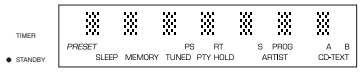
DISPLAY	FUNCTION	PRESET/BAND Key
ex. 01 DEST-B, G	Indication for destinaion. (*1)	
02 FL+CLEAR	All FL segments and BACKUP RAM CLEAR. (Note that memories set by the user will be erased.)	1st : all segments light 2nd : RAM CLEAR Also, the preset contents of the tuner are restored to the factory preset ones.
03 FL CHECK	All FL segments and circuit board short circuit inspection.	1st : all segments light 2nd : Even-numbered segments and even numbered digits are turned on. 3rd : Odd -numbered segments and odd-numbered digits are turned on.
ex. 04 Ver-A1.02 04 '01.01.17	Version information of the microcomputer software. (*2) The date of the microcomputer software. (*2)	It is changed to the date indication. It is changed to version indication.
ex. 05 SUM[7470]	The calculation of SUM is done and indicated after that. (*2)	Re-calculation
06 PrCan-OFF 06 PrCan-ON	The cancel of ALL protection.	ON/OFF
07 Pr!C_P_T_	The confirmation of protection. _ (Mark): normal x (Mark): The protection works. [C: Amp. current P: Power voltage T: Thermo]	The cancel of x.
✳ 08 RemoCorrR	ROM collection data (remote controller) reception/data writing.	Writing start. (After the data reception)

FL CHECK

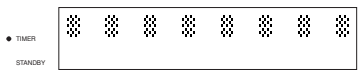
1st



2nd



3rd



✳: Not available

(*1)

DESTINATION	R (AM9k/FM:50k)	R (AM10k/FM100k)	A	B,G	U,C	J
Display	R9k	R10k	A	B, G	U, C	J

(*2) Contents of indication change by the microcomputer software.

CAUTION : When executing Test mode No. 2 RAM CLEAR, be sure to write down the preset memory contents of the tuner, using a table like the one shown below. Execution of RAM CLEAR will set the memory contents of the tuner back to the factory preset state which means that all the memories preset by the user will be erased.

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

● FACTORY PRESET

BAND	MARKETS		PRESET No.							
			1	2	3	4	5	6	7	8
FM (MHz)	U, C, R	(100k/10k)	98.1	95.1	87.5	101.5	107.9	88.1	106.1	107.9
	A, B, G, R,	(50k/9k)	98.10	95.10	87.50	101.50	108.00	88.10	106.10	107.90
AM (kHz)	U, C, R	(100k/10k)	630	1080	1400	530	1710	900	1350	1440
	A, B, G, R	(50k/9k)	630	1080	1404	531	1611	900	1350	1440

NOTE 1) PRESET PAGE ..... A : FM B : AM C : FM D : AM E : FM

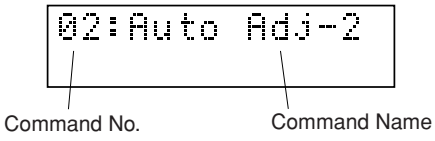
■ CD TEST MODE

Press the ”STANDBY/ON” key while pressing the ”STOP” key and the ”PLAY/PAUSE” key simultaneously, and TEST MODE will be activated.
On the FL display, an opening message appears for a few seconds.

● **Test Mode Function List of Panel keys**

PANEL KEY	FUNCTION
▷▷/▷▷| (SKIP/SEARCH)	Increase the test command number.
|◁◁/◁◁ (SKIP/SEARCH)	Decrease the test command number.
OPEN/CLOSE	Execute the test command selected with the SKIP/SEARCH keys
PLAY/PAUSE	Plays if focus servo is effective. TRON, MUTE OFF.
STOP	All stop. (Focus, spindle, feed, laser, tray, etc.) Initializes FL display

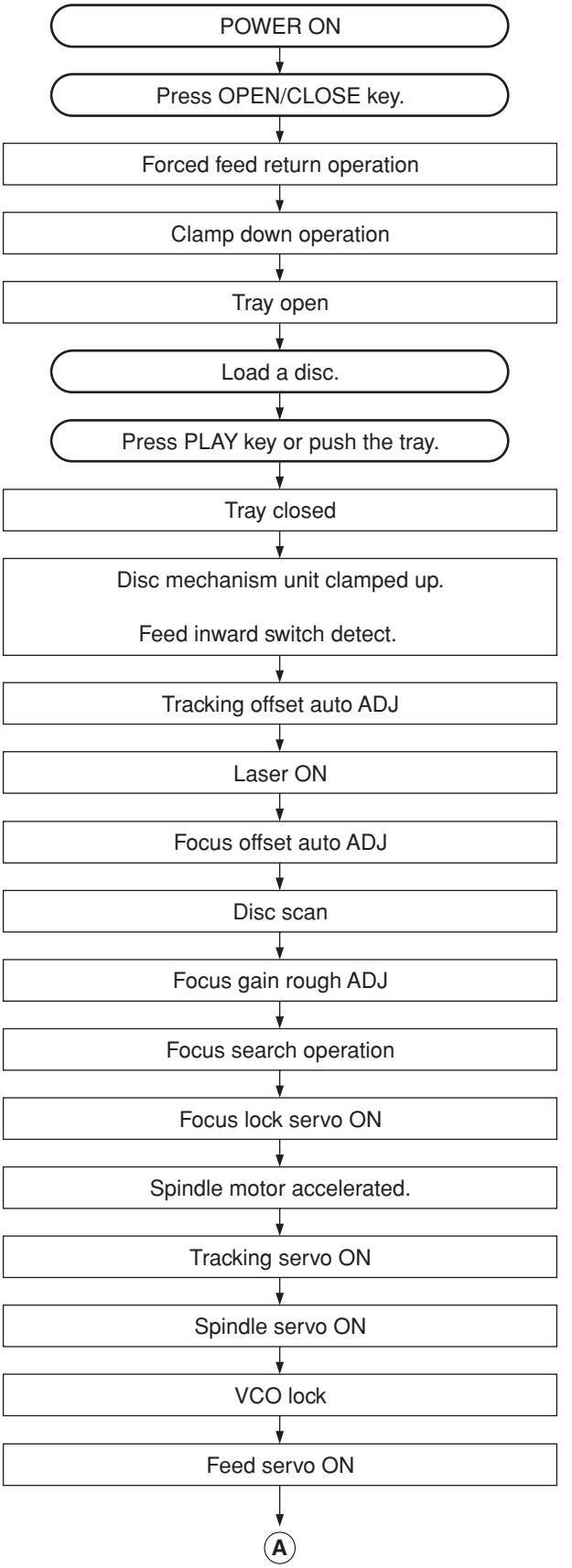
Sample of display of test command



The functions corresponded to the test command numbers are as follows.

Command No.	Command Name	FUNCTION
00	Open/Close	Open/close the tray.
01	Auto Adj-1	Auto adjustment mode 1 (TR offset, FO offset, adjustment).
02	Auto Adj-2	Auto adjustment mode 2 (FO rough gain, TR balance, TR rough gain adjustment).
03	Auto Adj-3	Auto adjustment mode 3 (FO fine gain adjustment, TR fine gain adjustment, FO balance).
04	Traverse Rev	Move traverse reverse till the inner SW turns on.
05	Traverse Fwd	Move traverse forward.
06	Traverse Stp	Stop traverse.
07	SP Accel	Accelerate spindle.
08	SP Brake	Decelerate spindle.
09	SP Servo On	Spindle servo on.
10	SP Servo Off	Spindle free (servo off).
11	SP Stop	Stop spindle.
12	Focus Search	FO on, TR off. (Enter focus search if focus servo is off.)
13	Trk&Trv Off	FO on, TR off, TV off.
14	1Kick Rev	Reverse 1 track kick continuously.
15	1Kick Fwd	Forward 1 track kick continuously.
16	10Kick Rev	Reverse 10 tracks kick continuously.
17	10Kick Fwd	Forward 10 tracks kick continuously.
18	30Kick Rev	Reverse 30 tracks kick continuously.
19	30Kick Fwd	Forward 30 tracks kick continuously.
20	150Kick Rev	Reverse 150 tracks kick continuously.
21	150Kick Fwd	Forward 150 tracks kick continuously.
22	Product Mode	Enter product mode.
23	Error Msg	
24	Test Repeat	Test repeat starts.
25	Test Coef	Servo coefficient display/Test
26	Mute On/Off	LINE MUTE ON/OFF
27	FcsGain High	Focus gain high.
28	"FcsGain Norm"	Focus gain low.
29	DSL FBX1	not for service.
30	DSL Hold	not for service.

■ CD STANDARD OPERATION CHART



If a disc is not loaded, “No Disc” appears on the FL display.

“01 OPEN” appears on the FL display.

“TRV” signal is output until detection of LIMIT switch.

Stop after detection of LOADING switch.

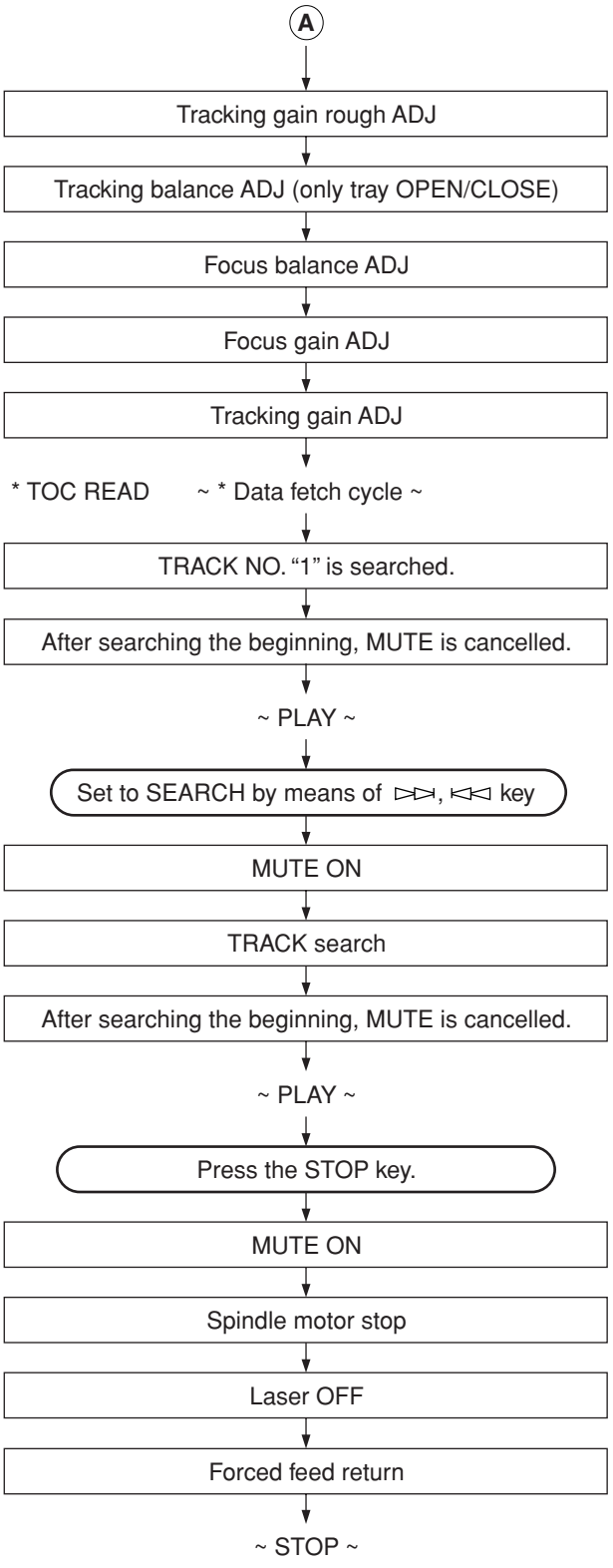
Proceeds to next step after detection of LOADING switch.

if $\overline{\text{FLSW}}$ (IC103, 8 pin) = “L”
Proceeds To Next Step.

LD (IC105, 2 pin) = “L”

$\overline{\text{FLOCK}}$ (IC102, 11 pin) = “H” → “L”

$\overline{\text{TLCOK}}$ (IC102, 12 pin) = “H” → “L”



: MUTE (IC103, 56 pin) = “L” → “H”
“0:00” appears in the time indicator.

: MUTE (IC103, 56 pin) = “H” → “L”

: MUTE (IC103, 56 pin) = “L” → “H”
“0:00” appears in the time indicator.

: MUTE (IC103, 56 pin) = “H” → “L”

: LD (IC105, 2 pin) = “L” → “H”

: $\overline{\text{FLSW}}$ (IC103, 8 pin) = “L”

■ CD ERROR MESSAGE

(1) If a CD error occurs, an error message can be displayed by holding down the “MEMORY” key and pressing the “PRESET/BAND” key.

(2) Shown below is an example of display. (“E-73” as an example)

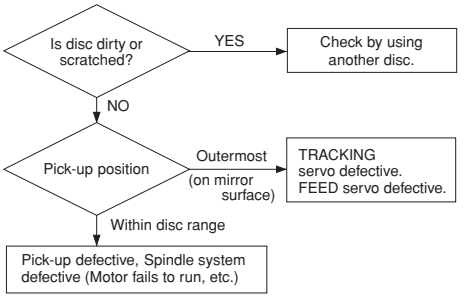
(3) Listed in the table below are error messages.

● **Error Messages List**

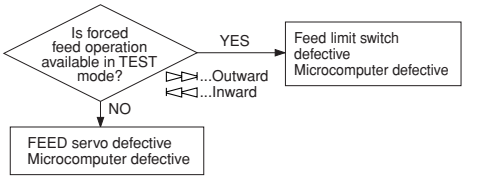
Error No.	Status	Contents
E-10	PLAY	CD fails in the disc data reading after the state shift.
E-20	SCAN	
E-30	PAUSE	
E-70	SEARCH	
E-11	PLAY	CD fails in the disc data reading.
E-21	SCAN	
E-31	PAUSE	
E-73	LOAD	CD fails in the TOC data reading
E-04	LOAD, SEARCH	Tracking servo is not effective at the DISC MOTOR SERVO PLL.
E-14	LOAD, SEARCH	Disc motor servo PLL is not effective.
E-35		CD fails in FOCUS SEARCH.
E-06	SEARCH, PLAY, PAUSE	CD fails in escaping from the LEAD-IN area.
E-47	SEARCH	The inner limit switch does not operate at the FEED INNER CONTROL.
E-57	STOP	
E-77	LOAD, EJECT	
E-18	PLAY	CD fails in recovery from the FOCUS OUT.
E-28	SCAN	
E-38	PAUSE	
E-48	SEARCH	
E-68	LOAD	
E-AC		Close switch does not operate at the TRAY CLOSE CONTROL.
E-AD		Open switch does not operate at the TRAY OPEN CONTROL.
MN ERR		MN35511 does not give response of SENSE with resetting.

1) Error Code Troubleshooting

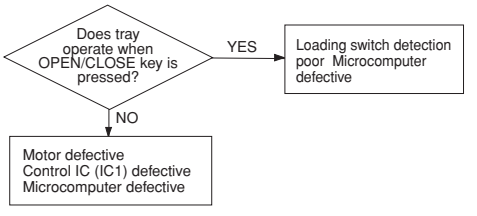
Error code **X0** , **X1** , **73** ..... Data cannot be read.



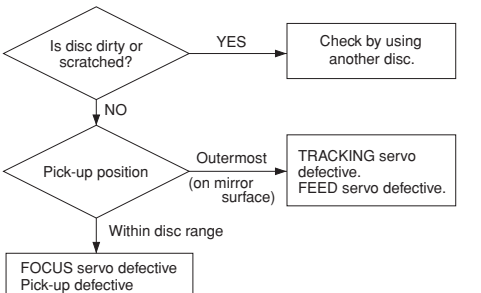
Error code **X7** ..... FEED operation defective. (Limit switch fails)



Error codes **AC** , **AD** ..... Poor tray loading operation.

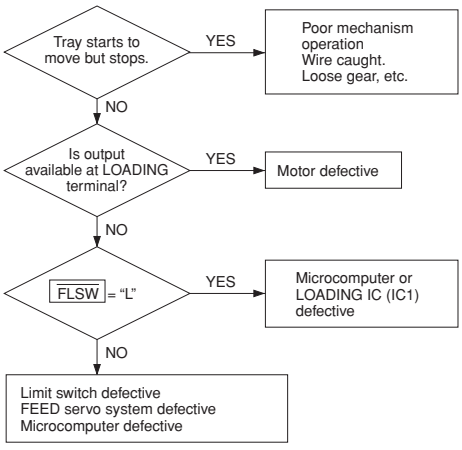


Error code **X8** ..... Focus drops.



2) Troubleshooting from System Malfunctions

a) Tray fails to come out/go in.

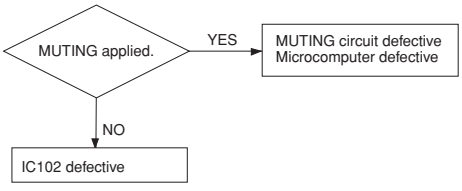


When tray fails to close completely (when it stops midway)

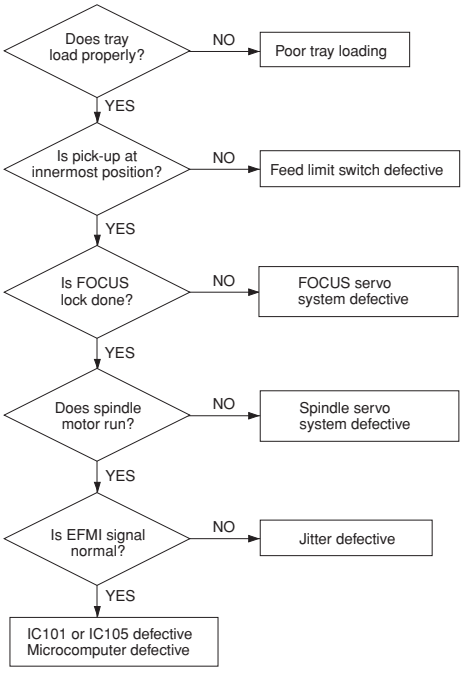
[Corrective measure]

1) Turn ON the power and open the tray.
* If it failed to open (head and tray contacting each other), open it after removing the chucking unit.
2) Turn OFF the power and force the tray to go in fully and close.
3) With the power turned ON, open and close the tray to check if the tray closes completely.

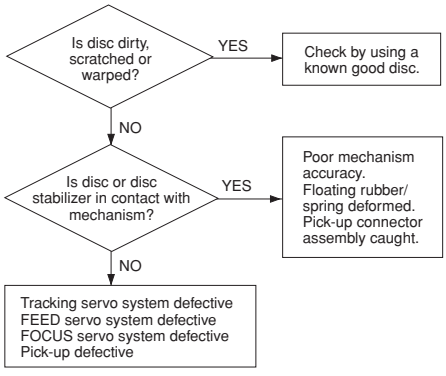
b) No sound generated, Sound cut during play. (but time display advances properly)



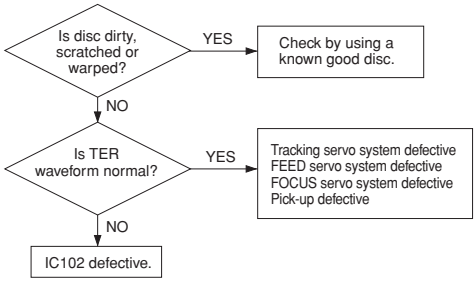
c) Operates as if no disc loaded. (although loaded)



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



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



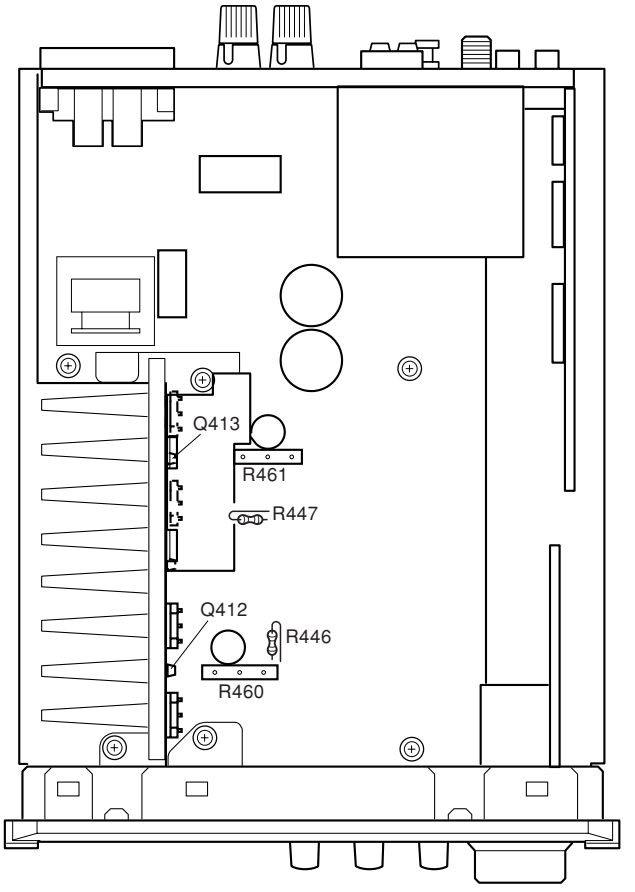
■ AMP ADJUSTMENTS

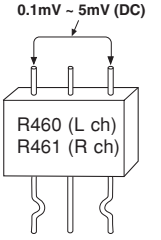
● Confirmation of Idling Current

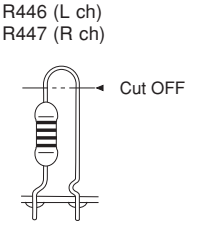
1) No signal applied.
2) Non-loaded condition.
3) Aging is not neccessary.

Item	Test Point	Rating (DC)	Note
MAIN L	R460 (Between terminal)	0.1mV—5mV	If the measured voltage exceeds 5mV, cut the lead wire of R446 (L ch) or R447 (R ch) and then check again if each measured value satisfies the rating.
MAIN R	R461 (Between terminal)		

* Confirm that the idling current is 0.25mV — 15mV after 60 minutes.







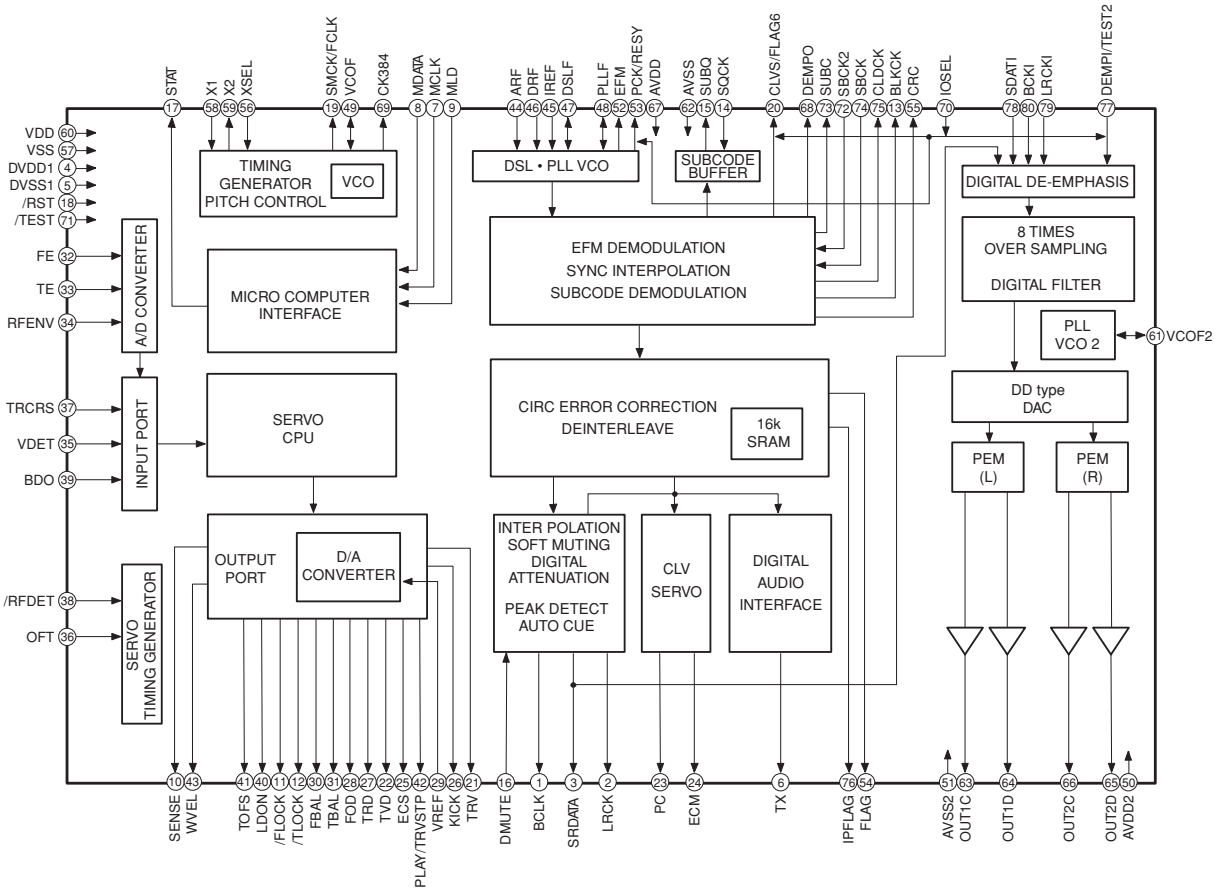
Note)

- If R446 (L ch) or R447 (R ch) have already been cut off and idling current does not flow, reconnect R446 (680 ohms) or R447 (680 ohms).
- Q412 and Q413 are transistors for temperature correction. Apply silicone grease to the contact surface with the heat sink.

■ IC DATA

IC102 : MN35511AL

Signal Processor & Controller



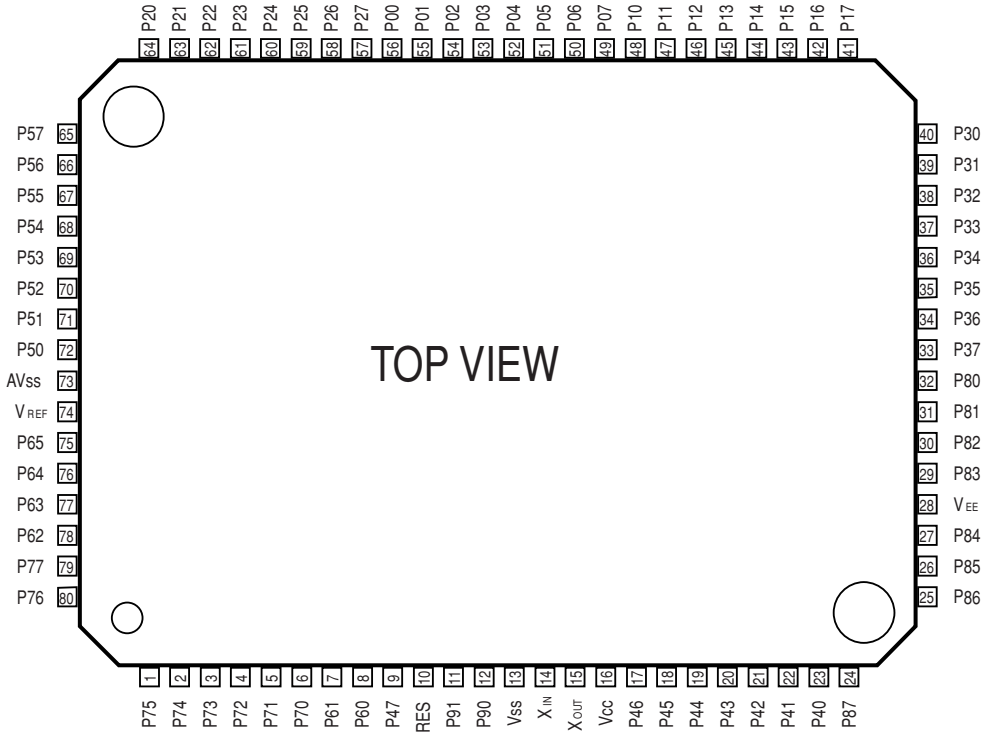
IC102 : MN35511AL
Pin Description

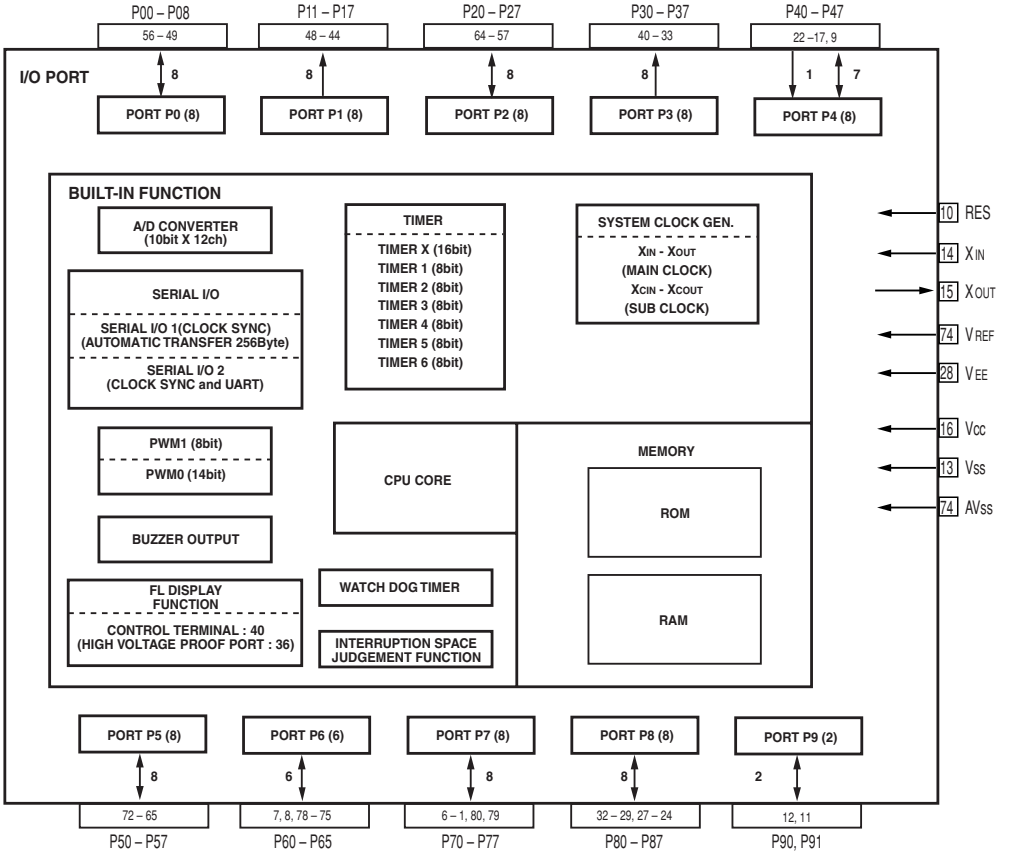
Pin No.	Name	I/O	Function	
1	BCLK	O	Bit clock output for SR DATA	(NC)
2	LRCK	O	L/R identification signal output	(NC)
3	SRDATA	O	Serial data output	(NC)
4	DVDD1	I	Power supply for digital circuit	(+5)
5	DVSS1	I	GND for digital circuit	(GND)
6	TX	O	Digital, audio, interface output signal	
7	MCLK	I	Microprocessor 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	$\overline{\text{FLOCK}}$	O	Focus servo drawing signal (L : when drawn)	
12	$\overline{\text{TLOCK}}$	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	$\overline{\text{RST}}$	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)	(GND)
36	OFT	I	Off track signal input (H : OFF TRACK)	
37	TRCRS	I	Track cross signal input (analog input)	
38	$\overline{\text{RFDET}}$	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)	(NC)
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	

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

Pin No.	Name	I/O	Function
47	DSLF	I/O	Loop filter terminal for DSL
48	PLLF	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)
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
64	OUT1D	O	PEM output terminal 1D
65	OUT2D	O	PEM output terminal 2D
66	OUT2C	O	PEM output terminal 2C
67	AVDD1	I	Power supply terminal for audio DAC
68	DEMPO	O	Deemphasis detect signal output (NC)
69	CK384	O	384fs clock output (At the CK384 pin, output does not stop while /RST=L.) (NC) Xtal system when command is defaulted. Signal processing system when command is switched
70	IOSEL	I	Mode selecting terminal (+5)
71	$\overline{\text{TEST}}$	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	$\overline{\text{CLDCK}}$	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	DEMPI /TEST2	I	When IOSEL=H, L : NORMAL H : TEST2 (GND) Emphasis control in accordance with DEMP0 When IOSEL=L, external DEMP1 input terminal For emphasis control, DEMP0, OR of DEMP1, DEMP1, forced OFF or forced ON is selected by command. When command is defaulted, DEMP0 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)

IC103 : M38B59MFH
8 bit μ-COM



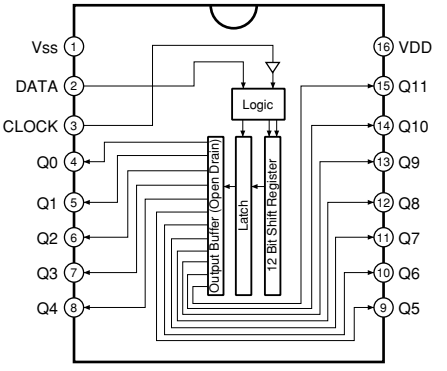


IC103 : M38B59MFH
Pin Description

No.	Port	Name	I/O	Function
1	P75	/OPSW	I	Opened state of tray sensing switch input. Opened state at "L"
2	P74	/CLSW	I	Closed state of tray sensing switch input. Opened state at "L"
3	P73	TROP	O	Tray open/close signal output
4	P72	TRCL		Tray close control signal [NC]
5	P71	STAT	I	Servo status signal
6	P70	/FLOCK	I	Focus servo lock
7	P61	/TLOCK	I	Tracking servo lock
8	P60	FLSW	I	Feed origin switch input. Feed origin at "L".
9	P47	/CLDCK	I	Servo/CLDCK signal input
10	RES	RESET	I	Reset input
11	P91	LDREF		LH5347w9 LD Ref control
12	P90			[NC]
13	VSS			[GND]
14	XIN	XIN	I	Ceramic oscillator (4 MHz)
15	XOUT	XOUT		
16	VCC	VCC		+5V
17	P46			[NC]
18	P45			[NC]
19	P44			[NC]
20	P43			[NC]
21	P42	(INT3)		[NC]
22	P41	(INT1) BLKCK	I	Q-code reading OK signal
23	P40	(INT0)/CS	I	Display data auto transmission initialize start signal
24	P87	BUSY	O	Display data auto transmission waiting request signal
25	P86	LASER		Laser On/Off
26	P85			[NC]
27	P84			[NC]
28	VEE	VEE		[GND]
29	P83			[NC]
30	P82			[NC]
31	P81			[NC]
32	P80			[NC]
33	P37	PON	O	Servo LSI power ON
34	P36		O	[NC]
35	P35	/DMUTE	O	Digital Mute
36	P34	MLD	O	µ-com command store request
37	P33		O	[NC]
38	P32		O	[NC]
39	P31		O	[NC]
40	P30		O	[NC]
41	P17		O	[NC]
42	P16		O	[NC]
43	P15		O	[NC]
44	P14		O	[NC]
45	P13		O	[NC]
46	P12	FEOFO		Feed servo off signal output
47	P11	DRV	O	Servo driver on
48	P10	FCSG	O	Focus gain high
49	P07		O	[NC]
50	P06		O	[NC]
51	P05			[NC]
52	P04			[NC]
53	P03			[NC]
54	P02	/MNRST		Servo LSI reset signal
55	P01			[NC]

No.	Port	Name	I/O	Function
56	P00	MUTE		Line Mute
57	P27			[NC]
58	P26			[NC]
59	P25			[NC]
60	P24			[NC]
61	P23			[NC]
62	P22			[NC]
63	P21			[NC]
64	P20			[NC]
65	P57	SQCK	O	Serial clock to servo LSI (Qcode)
66	P56	MCLK	O	Serial clock to servo LSI (Command)
67	P55	SOUT	O	Serial out to servo LSI (Command)
68	P54	SIN	I	Serial in from servo LSI (Qcode, SENSE)
69	P53	SBCK2	O	Serial clock to servo LSI (CD = Text)
70	P52	/DCLK	I	Serial clock from system ucom (display data auto transmission)
71	P51	DSO	O	Serial data to system μ-com (Display data)
72	P50	SUBC	I	Serial in from servo LSI (CD-TEXT)
73	AVSS	AVSS		[GND]
74	VREF	VREF		+5V
75	P65	SYSOUT	O	System command out
76	P64		I	System command in
77	P63	/SYS	O	Serial 1 → RCV system transmission
78	P62	/TXT	O	Serial 1 → CD-Text reading
79	P77	/CMDSEL	O	Serial 2 → μ-com command
80	P76	/OSEL	O	Serial 2 → Q-code reading

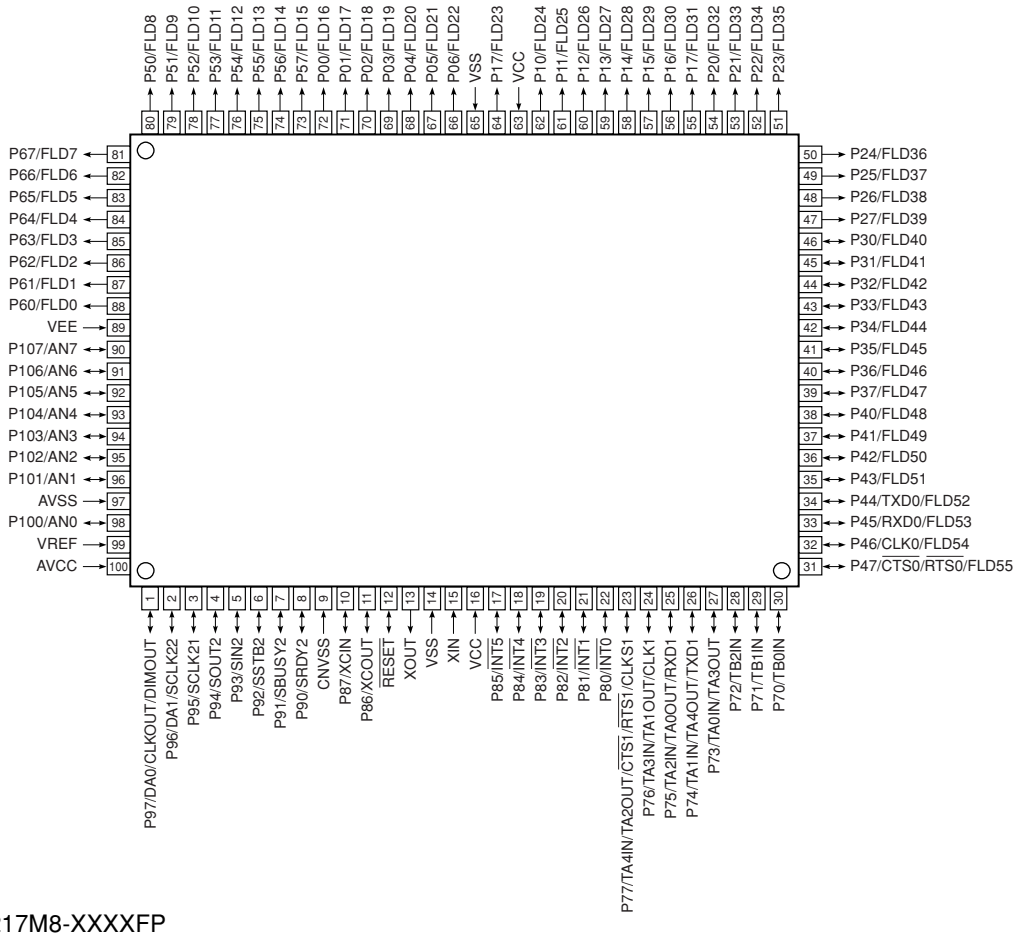
IC201 : BU2090F
Serial In/Parallel Out Driver



IC201 : BU2090F
Pin Description

No.	Name	Function	
1	VSS		
2	DATA		
3	CLOCK		
4	Q0	CD μ-com reset out	[0: RESET]
5	Q1	Timer LED out	[0: ON, 1: OFF]
6	Q2	Stand-by LED out	[0: ON, 1: OFF]
7	Q3	Motor VR down out	[1: DOWN]
8	Q4	Motor VR up out	[1: UP]
9	Q5	Power relay (Power ON) out	[0: ON, 1: OFF]
10	Q6	Speaker relay out	[0: ON, 1: OFF]
11	Q7		
12	Q8		
13	Q9		
14	Q10		
15	Q11		
16	VDD		

IC202 : M30217M8-XXXXFP
16 bit μ-COM



IC202 : M30217M8-XXXXFP
Pin Description

No.	PORT	Name	IN/OUT	Function	
1	P97	Mut. A	OUT	AMP MUTE OUT	[0: MUTE ON]
2	P96	DO_BU	OUT	Expansion Port (BU2090) DATA OUT	
3	P95	CLK_CD	S-CLK	CD indication system control CLK OUT	[Serial I/O-2]
4	P94	DO_CD	S-OUT	CD indication system control DATA OUT	[Serial I/O-2]
5	P93	DI_CD	S-IN	CD indication system control DATA IN	[Serial I/O-2]
6	P92	CLK-BU	OUT	Expansion Port (BU2090) CLOCK OUT	
7	P91	ENC. B	IN	Rotary encoder-B IN	[Pull-up resistor]
8	P90	ENC. A	IN	Rotary encoder-A IN	[Pull-up resistor]
9	CNVSS	CNVss	-	Connected to VSS (GND) via resistor (5.1kohms)	
10	P87	Xin	-	32.768KHz IN	(Feedback resistor included)
11	P86	Xout	-	32.768KHz OUT	(Feedback resistor included)
12	RESET	Reset	-	RESET	[0:RESET]
13	XOUT	10Xout	-	10MHz OUT	(Feedback resistor included)
14	VSS	Vss	-	GND	
15	XIN	10Xin	-	10MHz IN	(Feedback resistor included)
16	VCC	Vcc	-	Power supply +5V	[Backup capacitor required]
17	P85	Sys O	OUT	System control OUT	
18	P84	Sys I	IN	System control IN	
19	P83	BUSY		CD indication system control BUSY IN	[0: Communication, 1: BUSY]
20	P82	Pro I	IN	Amplifier current detect IN (protection)	[1:Abnormality exists]
21	P81	Rem	INT-IN	Remote control IN	
22	P80	PD	INT-IN	Power-down DC detect IN	[0:POWER DOWN]

No.	PORT	Name	IN/OUT	Function	
23	P77	CE	OUT	C2B(LC72131/LC72720/LC78211)CE OUT	[1:DATA transmission]
24	P76	CLK	S-CLK	LC72131/LC72720/LC78211 CLK OUT	(Serial I/O-1)
25	P75	DAT I	S-IN	LC72131/LC72720 DATA IN	(Serial I/O-1)
26	P74	DAT O	S-OUT	LC72131/LC72720/LC78211 DATA OUT	(Serial I/O-1)
27	P73	ST/MO	IN	STEREO/MONO IN (TUNER)	[0:STEREO]
28	P72	Mut T	OUT	Tuner MUTE OUT (TUNER)	[1:MUTE ON]
29	P71	Sta	IN	STATION IN (TUNER)	[0:Station exists]
30	P70	CEO	OUT	CE OUT to EEPROM	[1:DATA transmission (EEPROM)]
31	P47	BUO	OUT	BUSY OUT from built-in flush ROM	
32	P46	CLKO	S-CLK	CLK OUT from built-in flush ROM to CLK IN/EEPROM	[Serial I/O-0]
33	P45	DATI	S-IN	DATA IN from DATA IN/EEPROM to built-in flush ROM	[Serial I/O-0]
34	P44	DATO	S-OUT	DATA OUT from built-in flush ROM to DATA OUT/EEPROM	[Serial I/O-0]
35	P43	HP	IN	Head phone detect IN	[0:SP 1:HP]
36	P42	DIG 16	OUT	DIGIT 16 (16G)	[VEE external pull-down]
37	P41	DIG 15	OUT	DIGIT 15 (15G)	[VEE external pull-down]
38	P40	DIG 14	OUT	DIGIT 14 (14G)	[VEE external pull-down]
39	P37	DIG 13	OUT	DIGIT 13 (13G)	[VEE external pull-down]
40	P36	DIG 12	OUT	DIGIT 12 (12G)	[VEE external pull-down]
41	P35	DIG 11	OUT	DIGIT 11 (11G)	[VEE external pull-down]
42	P34	DIG 10	OUT	DIGIT 10 (10G)	[VEE external pull-down]
43	P33	DIG 9	OUT	DIGIT 9 (9G)	[VEE external pull-down]
44	P32	DIG 8	OUT	DIGIT 8 (8G)	[VEE external pull-down]
45	P31	DIG 7	OUT	DIGIT 7 (7G)	[VEE external pull-down]
46	P30	DIG 6	OUT	DIGIT 6 (6G)	[VEE external pull-down]
47	P27	DIG 5	OUT	DIGIT 5 (5G)	[VEE external pull-down]
48	P26	DIG 4	OUT	DIGIT 4 (4G)	[VEE external pull-down]
49	P25	DIG 3	OUT	DIGIT 3 (3G)	[VEE external pull-down]
50	P24	DIG 2	OUT	DIGIT 2 (2G)	[VEE external pull-down]
51	P23	DIG 1	OUT	DIGIT 1 (1G)	[VEE external pull-down]
52	P22	SEG 1	OUT	SEGMENT 1 (P1)	[VEE external pull-down]
53	P21	SEG 2	OUT	SEGMENT 2 (P2)	[VEE external pull-down]
54	P20	SEG 3	OUT	SEGMENT 3 (P3)	[VEE external pull-down]
55	P17	SEG 4	OUT	SEGMENT 4 (P4)	(VEE internal pull-down)
56	P16	SEG 5	OUT	SEGMENT 5 (P5)	(VEE internal pull-down)
57	P15	SEG 6	OUT	SEGMENT 6 (P6)	(VEE internal pull-down)
58	P14	SEG 7	OUT	SEGMENT 7 (P7)	(VEE internal pull-down)
59	P13	SEG 8	OUT	SEGMENT 8 (P8)	(VEE internal pull-down)
60	P12	SEG 9	OUT	SEGMENT 9 (P9)	(VEE internal pull-down)
61	P11	SEG 10	OUT	SEGMENT 10 (P10)	(VEE internal pull-down)
62	P10	SEG 11	OUT	SEGMENT 11 (P11)	(VEE internal pull-down)
63	VCC	Vcc	-	Power supply +5V	[Back-up capacitor]
64	P07	SEG 12	OUT	SEGMENT 12 (P12)	(VEE internal pull-down)
65	VSS	Vss	-	GND	
66	P06	SEG 13	OUT	SEGMENT 13 (P13)	(VEE internal pull-down)
67	P05	SEG 14	OUT	SEGMENT 14 (P14)	(VEE internal pull-down)
68	P04	SEG 15	OUT	SEGMENT 15 (P15)	(VEE internal pull-down)
69	P03	SEG 16	OUT	SEGMENT 16 (P16)	(VEE internal pull-down)
70	P02	SEG 17	OUT	SEGMENT 17 (P17)	(VEE internal pull-down)
71	P01	SEG 18	OUT	SEGMENT 18 (P18)	(VEE internal pull-down)
72	P00	SEG 19	OUT	SEGMENT 19 (P19)	(VEE internal pull-down)
73	P57	SEG 20	OUT	SEGMENT 20 (P20)	(VEE internal pull-down)
74	P56	SEG 21	OUT	SEGMENT 21 (P21)	(VEE internal pull-down)
75	P55	SEG 22	OUT	SEGMENT 22 (P22)	(VEE internal pull-down)
76	P54	SEG 23	OUT	SEGMENT 23 (P23)	(VEE internal pull-down)
77	P53	SEG 24	OUT	SEGMENT 24 (P24)	(VEE internal pull-down)

No.	PORT	Name	IN/OUT	Function	
78	P52	SEG 25	OUT	SEGMENT 25 (P25)	(VEE internal pull-down)
79	P51	SEG 26	OUT	SEGMENT 26 (P26)	(VEE internal pull-down)
80	P50	SEG 27	OUT	SEGMENT 27 (P27)	(VEE internal pull-down)
81	P67	SEG 28	OUT	SEGMENT 28 (P28)	(VEE internal pull-down)
82	P66	SEG 29	OUT	SEGMENT 29 (P29)	(VEE internal pull-down)
83	P65	SEG 30	OUT	SEGMENT 30 (P30)	(VEE internal pull-down)
84	P64	SEG 31	OUT	SEGMENT 31 (P31)	(VEE internal pull-down)
85	P63	SEG 32	OUT	SEGMENT 32 (P32)	(VEE internal pull-down)
86	P62	SEG 33	OUT	SEGMENT 32 (P33)	(VEE internal pull-down)
87	P61	SEG 34	OUT	SEGMENT 34 (P34)	(VEE internal pull-down)
88	P60	SEG 35	OUT	SEGMENT 35 (P35)	(VEE internal pull-down)
89	VEE	– VP	–	P0, P1, P5, P6 pull-down resistor voltage input	[~(Vcc -43)V]
90	P107	ZEN	A-D IN	Pull down to GND via resistor	
91	P106	TH	A-D IN	Heat sinking plate temperature detect IN	[1:Abnormality exists]
92	P105	Pro PS	A-D IN	Power voltage detect IN (protection)	[0 — VREF]
93	P104	Fan fe	A-D IN	Connected to VSS (GND) via resistor (10 kohms)	
94	P103	Des	A-D IN	Destination select input (TUNER)	[Pull-up at 10kΩ → VREF]
95	P102	KEY 2	A-D IN	KEY 2 input	[Pull-up at 10kΩ → VREF]
96	P101	KEY 1	A-D IN	KEY 1 input	[Pull-up at 10kΩ → VREF]
97	AVSS	AVss	–	Connected to VSS(GND)	
98	P100	KEY 0	A-D IN	KEY 0 input	[Pull-up at 10kΩ → VREF]
99	VREF	Vref	–	A-D, D-A reference voltage input	[— VCC]
100	AVCC	AVcc	–	Connected to VCC terminal (+5V)	

● KEY INPUT (A-D) PULL UP RESISTOR 10kΩ

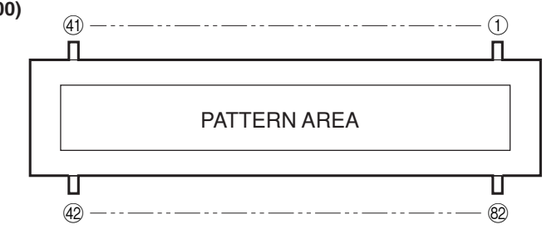
Ω	0	+2k	+1.8k	+2.4k	+3.9k	+5.6k	+10k	+24k
V	0 — 0.556	— 1.111	— 1.667	— 2.222	— 2.778	— 3.333	— 3.889	— 4.444
KEY 0 (98pin)	POWER	PRESET/TUNING ∧	PRESET/TUNING ∨	OPEN/CLOSE	NO KEY	NO KEY	NO KEY	NO KEY
KEY 1 (96pin)	PRESET/BAND	AUTO/MAN'L TIMER	STOP	NO KEY	NO KEY	NO KEY	NO KEY	NO KEY
KEY 2 (95pin)	DISPLAY	MEMORY TIME ADJ	PLAY/PAUSE	NO KEY	NO KEY	NO KEY	NO KEY	NO KEY

● TUNER MARKET SELECT IN (94 pin, A-D) PULL UP RESISTOR 10kΩ

Ω	0	2k	3.9k	10k	16k	27k
V	0 — 0.556	— 1.111	— 1.667	— 2.778	— 3.333	— 4.100
Market	R model (50k / 9k)	R model (100k / 10k)	A model	U, C models	J model	B, G models

■ DISPLAY DATA

● V301 : 16-BT-84GN (V6253100)



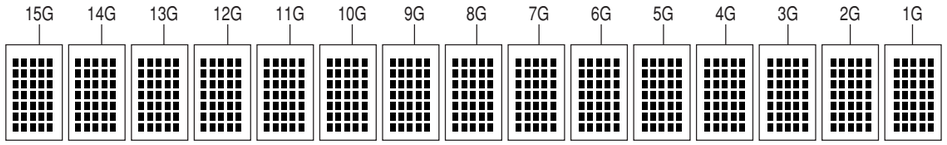
● PIN CONNECTION

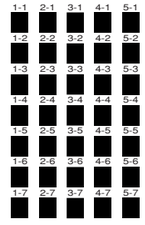
Pin No.	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Connection	F2	F2	NP	NP	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	NP	NP	F1	F1

Pin No.	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82
Connection	F2	F2	NP	NP	12G	13G	14G	15G	16G	IC NX	NX	NX	NX	NX	NX	NX	NX	NX	NX	NX	NX	NX	NX	NX	NX	P35	P34	P33	P32	P31	P30	P29	P28	P27	P26	P25	P24	P23	NP	NP	F1	F1

Note : 1) F1, F2 ..... Filament 2) NP ..... No pin 3) IC ..... Internal connection (IC pin should be electrically open on the PC board)
4) Pin No. 37 and 51 are connected internally 5) NX ..... No extend pin 6) DL ..... Datum Line 7) 1G ~ 16G ..... Grid

● GRID ASSIGNMENT





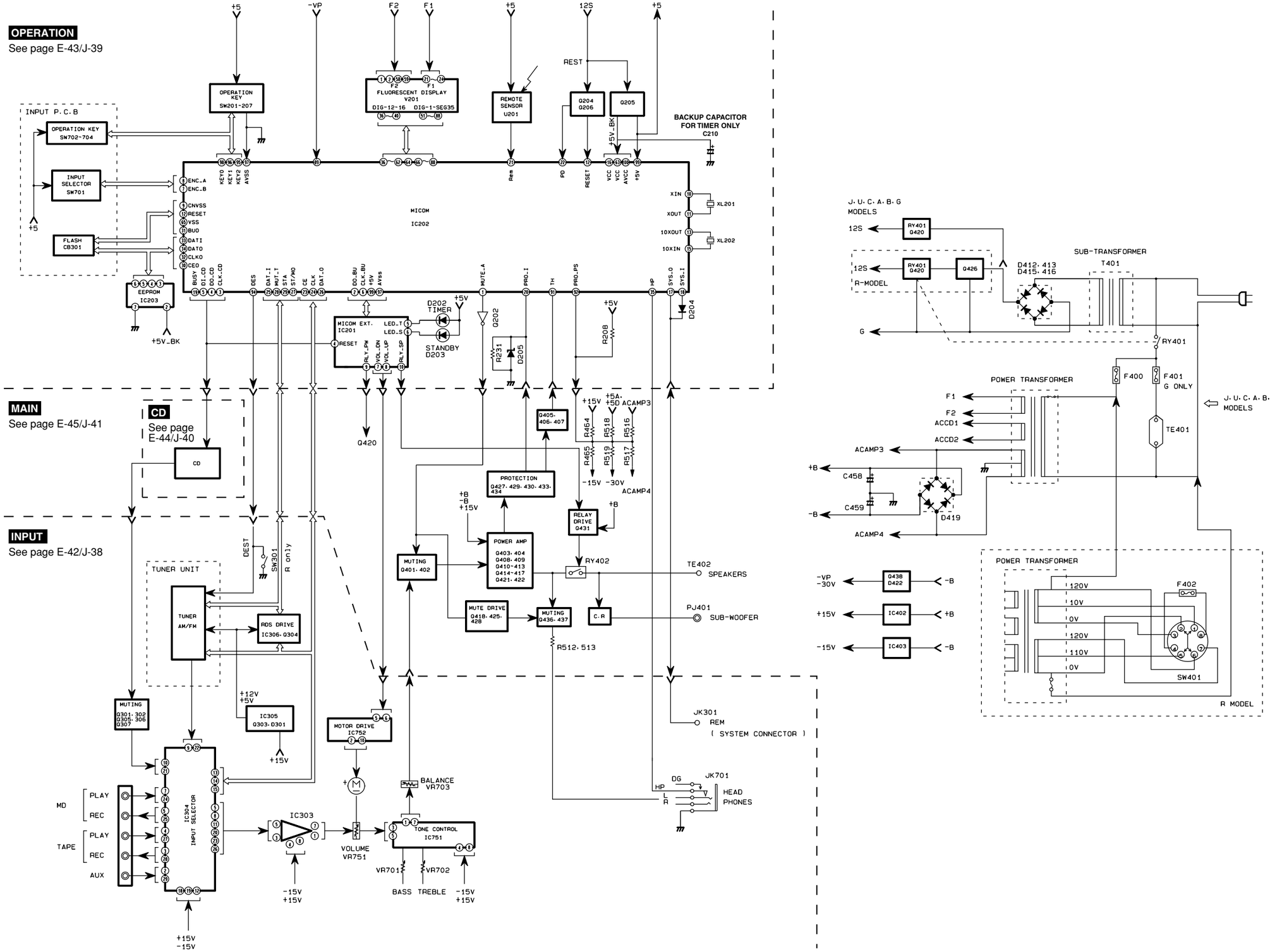
(15G~1G)

● ANODE CONNECTION

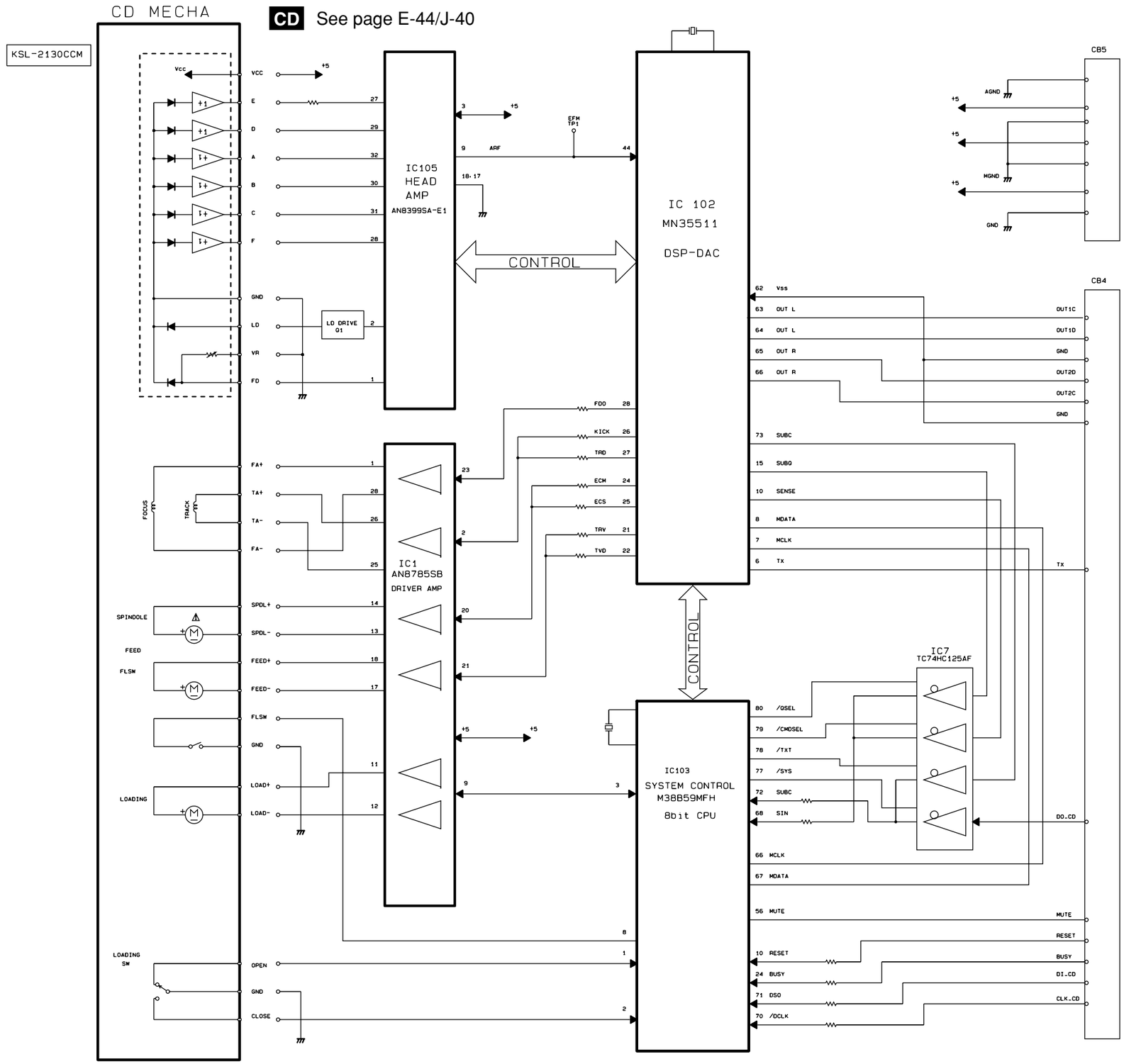
	16G	15G~1G
P1	*PRESET*	1-1
P2	STEREO	2-1
P3	TUNED	3-1
P4	AUTO	4-1
P5	MEMORY	5-1
P6	RDS	1-2
P7	PS	2-2
P8	PTY	3-2
P9	RT	4-2
P10	CT	5-2
P11	PTY HOLD	1-3
P12	TIMER	2-3
P13	SLEEP	3-3
P14	–	4-3
P15	–	5-3
P16	–	1-4
P17	–	2-4
P18	–	3-4

	16G	15G~1G
P19	–	4-4
P20	–	5-4
P21	–	1-5
P22	–	2-5
P23	–	3-5
P24	REP	4-5
P25	S	5-5
P26	F	1-6
P27	PROG	2-6
P28	RANDOM	3-6
P29	A	4-6
P30	OO	5-6
P31	B	1-7
P32	TITLE	2-7
P33	ARTIST	3-7
P34	TRACK	4-7
P35	CD-TEXT	5-7

■ BLOCK DIAGRAM (1/2)



■ BLOCK DIAGRAM (2/2)

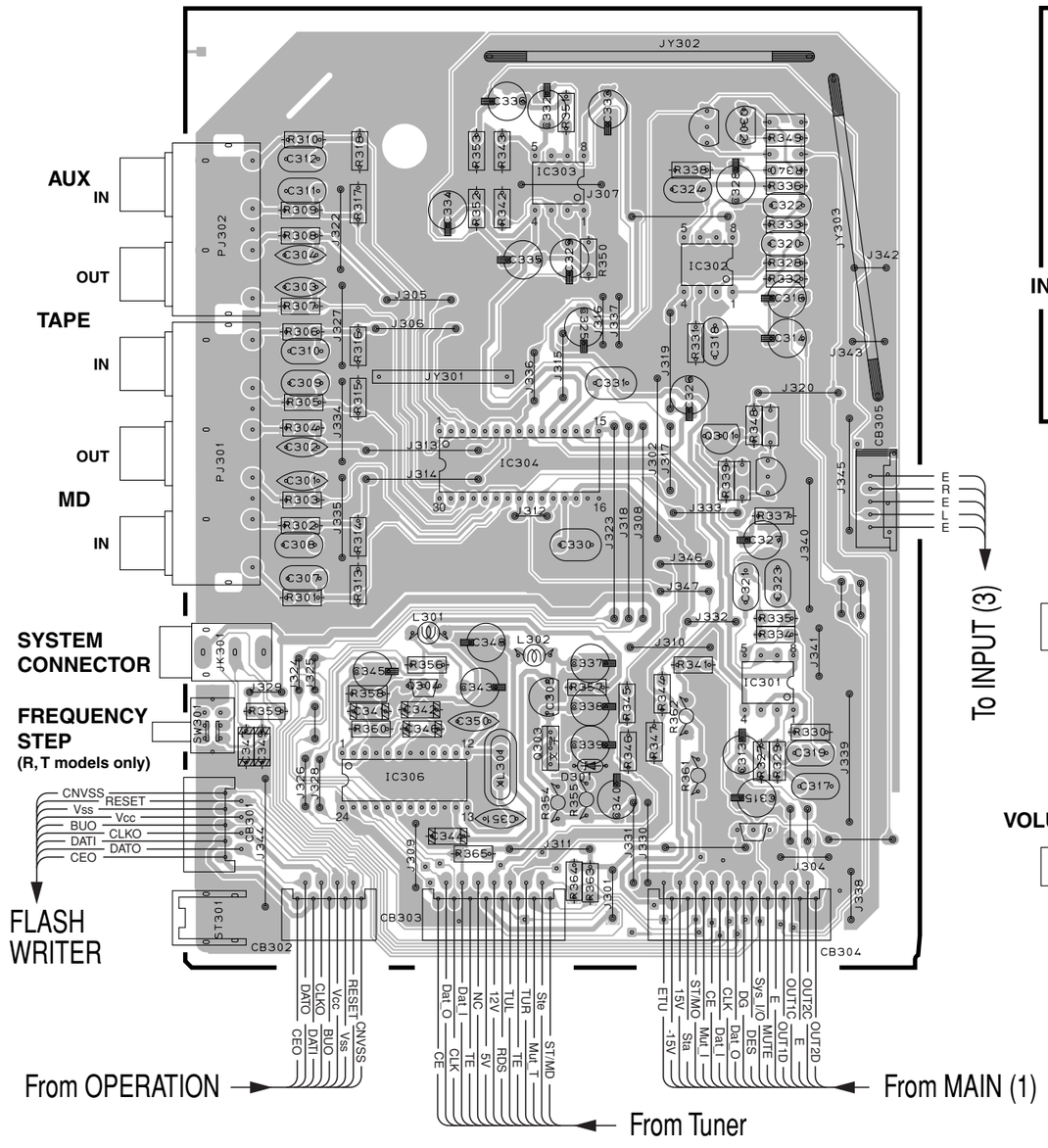


■ PRINTED CIRCUIT BOARD (Foil side)

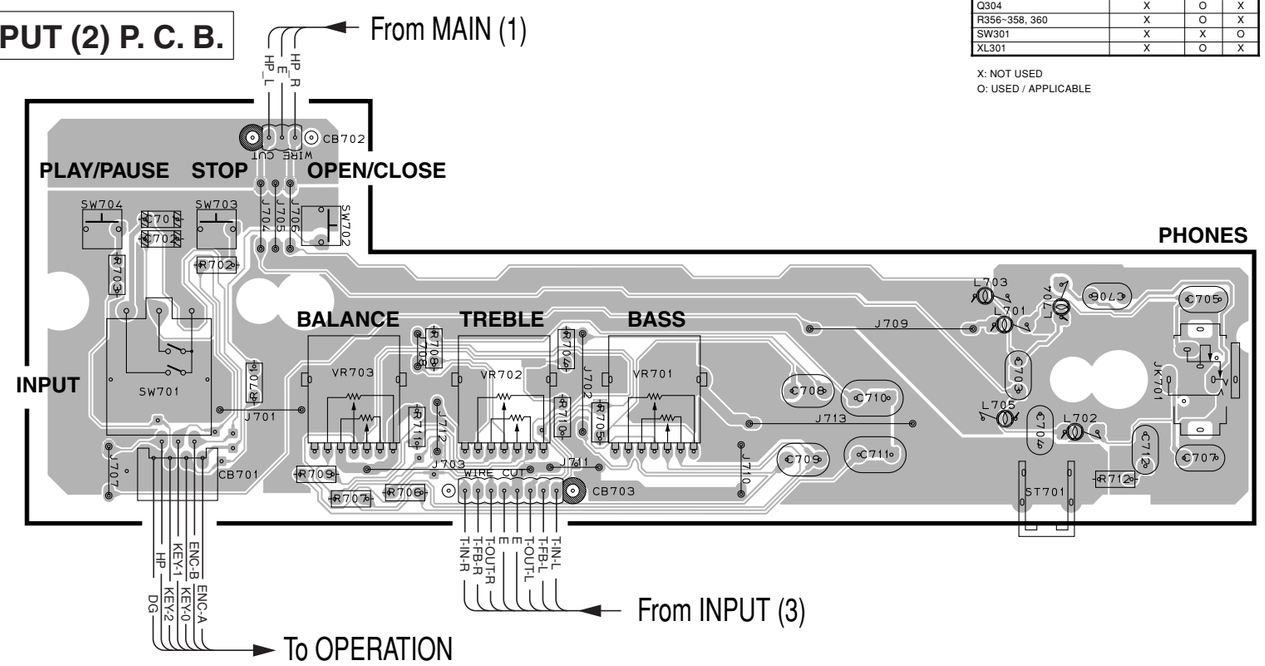
Circuit No.	J, U, C, A	B, G	R, T
C341~346, 348, 350~351	X	O	X
IC306	X	O	X
L301, 302	X	O	X
Q304	X	O	X
R356~358, 360	X	O	X
SW301	X	X	O
XL301	X	O	X

X: NOT USED
O: USED / APPLICABLE

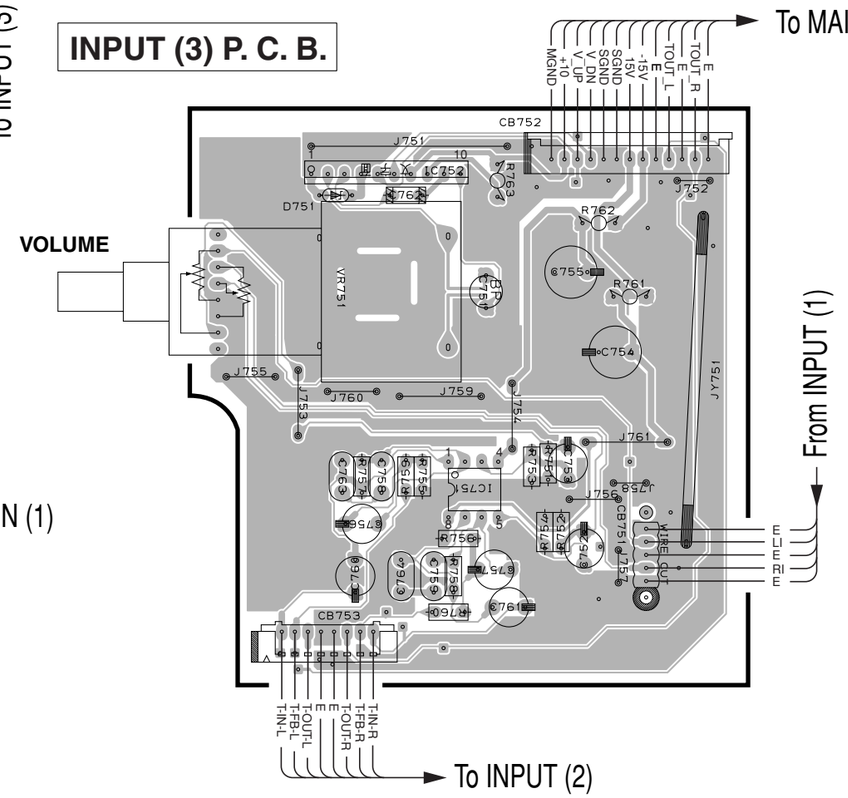
INPUT (1) P. C. B.



INPUT (2) P. C. B.



INPUT (3) P. C. B.



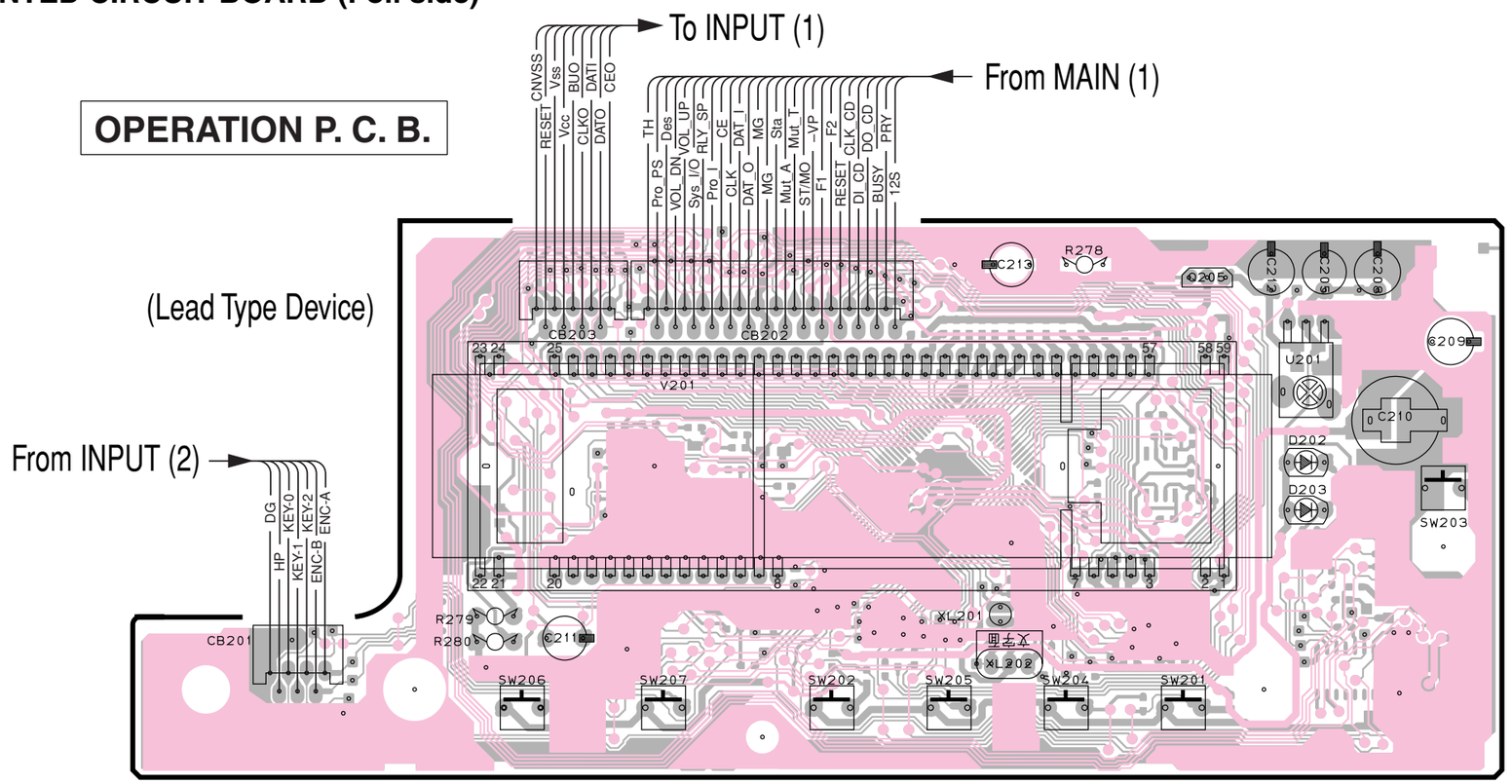
• **Semiconductor Location**

Ref. No.	Location
D301	C5
D751	F5
IC301	D4
IC302	D3
IC303	C2
IC304	C3
IC305	C4
IC306	B5
IC751	G6
IC752	F5
Q301	D3
Q302	D2
Q303	C5
Q304	C4

■ PRINTED CIRCUIT BOARD (Foil side)

OPERATION P. C. B.

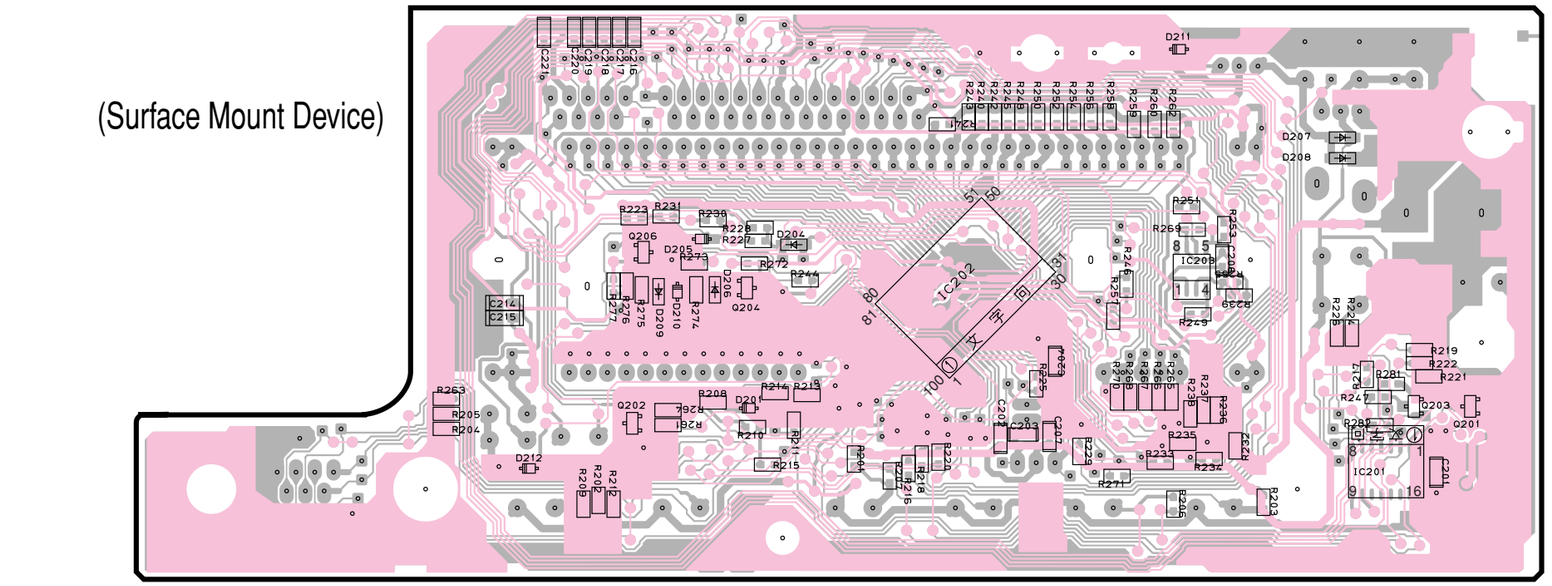
(Lead Type Device)



^ PRESET/ v TUNING **PRESET/ BAND** **AUTO/ MAN'L** **MEMORY** **DISPLAY**

MIN **HOUR** **TIMER** **TIME ADJ**

(Surface Mount Device)

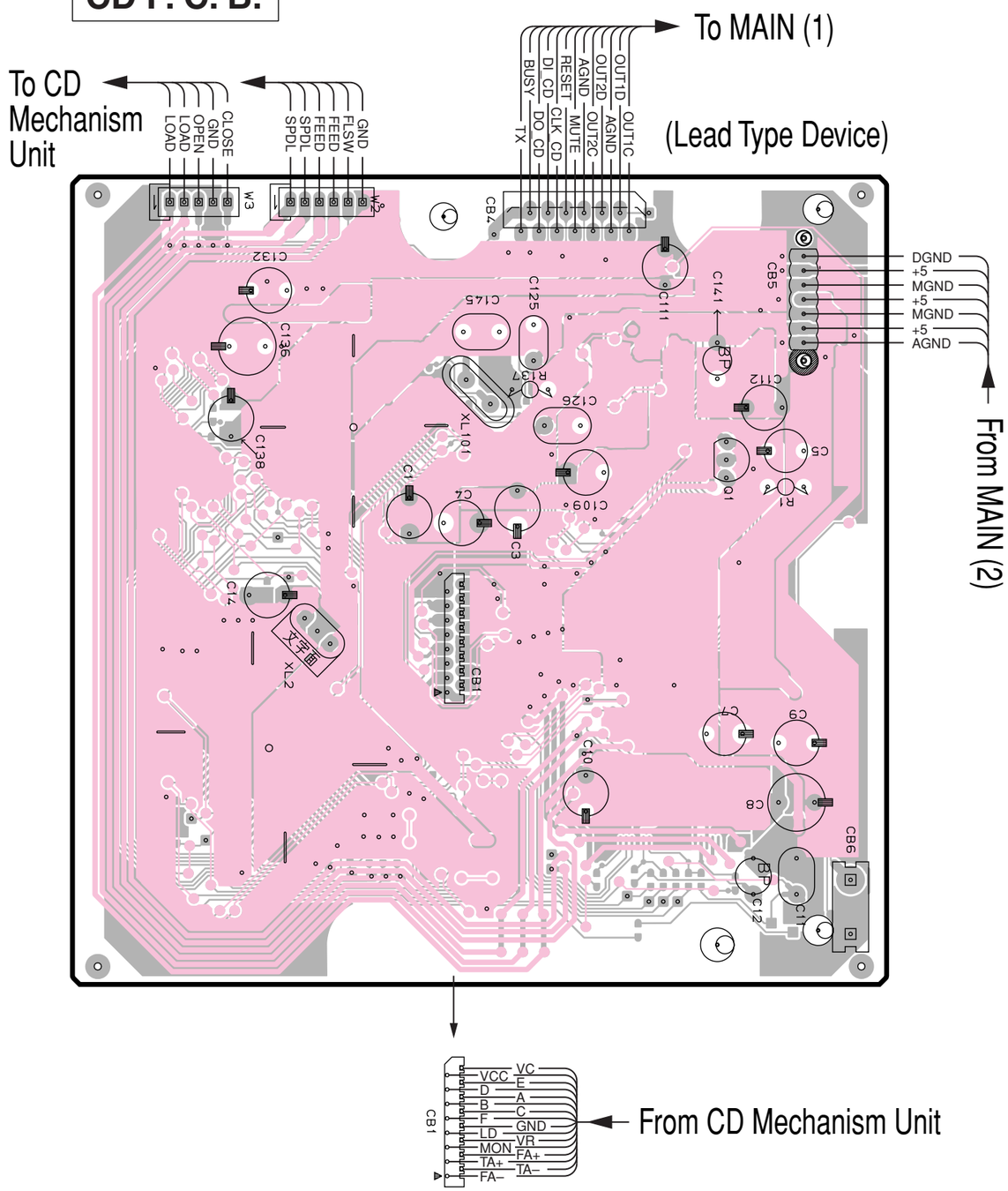


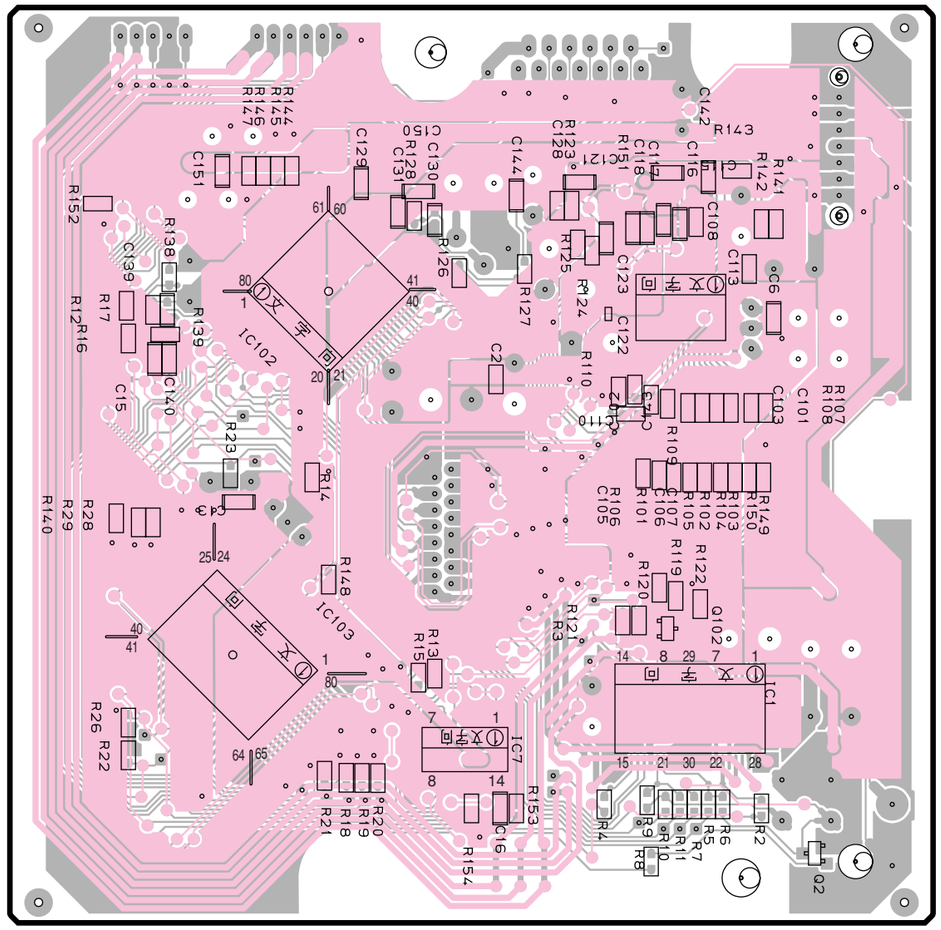
• Semiconductor Location

Ref. No.	Location
D201	D6
D202	F3
D203	F3
D204	D6
D205	D6
D206	D6
D207	F5
D208	F5
D209	D6
D210	D6
D211	F5
D212	C7
IC201	G7
IC202	E6
IC203	F6
Q201	G6
Q202	D7
Q203	G6
Q204	D6
Q205	F2
Q206	D6

■ PRINTED CIRCUIT BOARD (Foil side)

CD P. C. B.





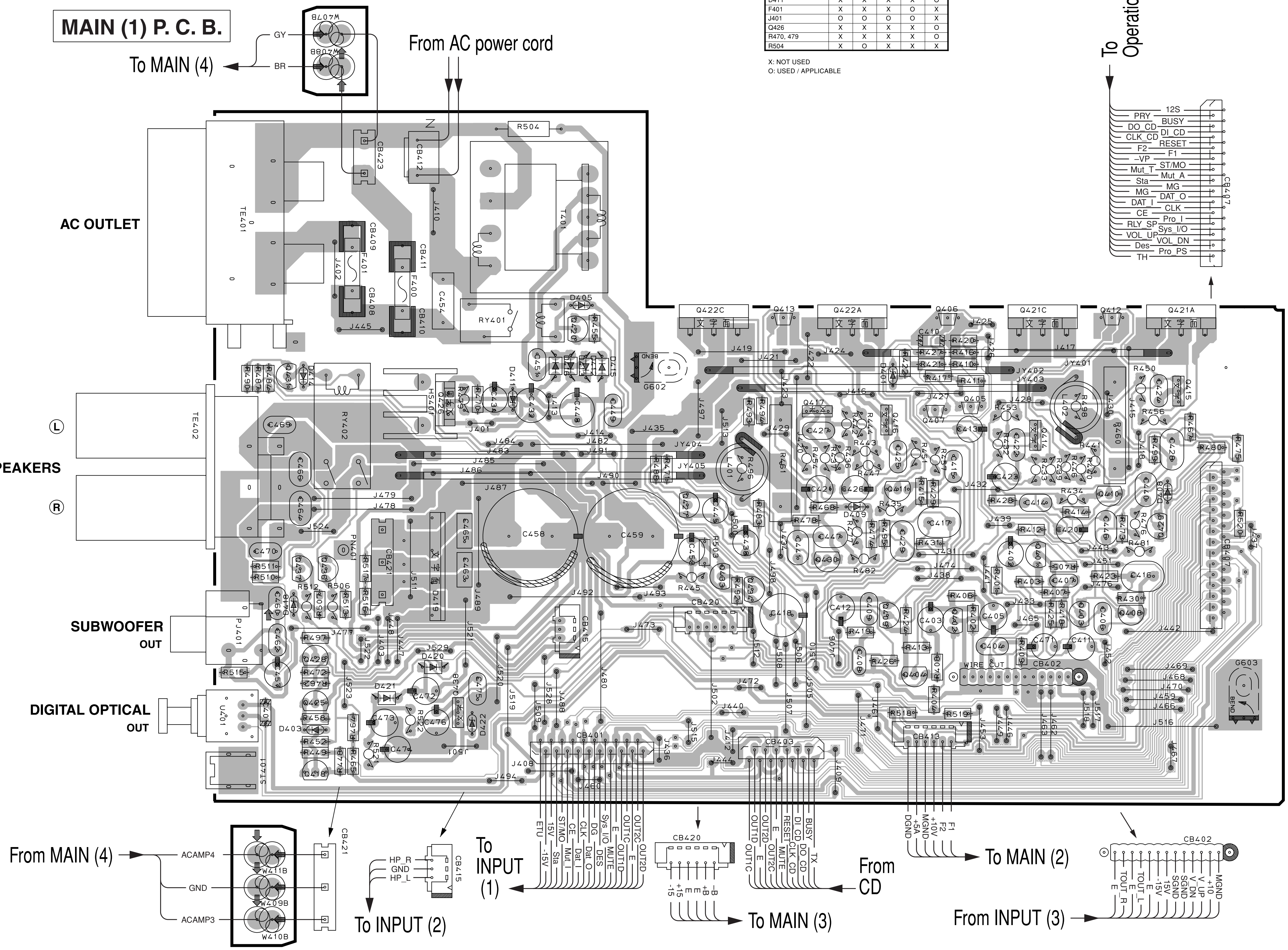
• Semiconductor Location

Ref. No.	Location
IC1	H5
IC7	G5
IC102	G3
IC103	F5
IC105	H4
Q1	D4
Q2	I6
Q102	H5

■ PRINTED CIRCUIT BOARD (Foil side)

Circuit No.	J	U, C	A, B	G	R, T
C434	X	X	X	X	O
C464, 466, 469, 470	X	X	O	O	X
CB408, 409	X	X	X	O	X
D411	X	X	X	X	O
F401	X	X	X	O	X
J401	O	O	O	O	X
Q426	X	X	X	X	O
R470, 479	X	X	X	X	O
R504	X	O	X	X	X

X: NOT USED
O: USED / APPLICABLE



• Semiconductor Location

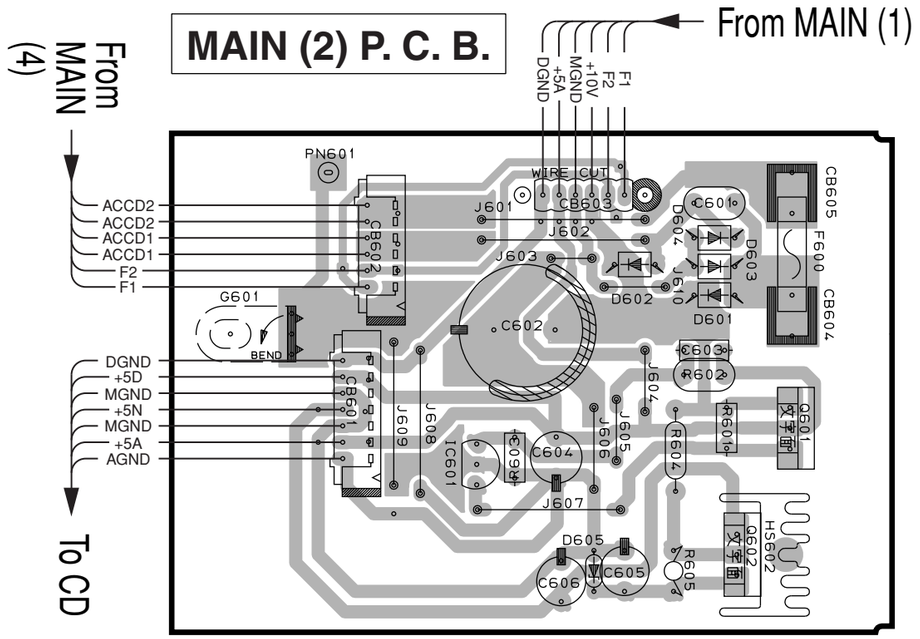
Ref. No.	Location
D401	F4
D403	C6
D405	D3
D408	H4
D409	F4
D411	D4
D412	E4
D413	D4
D414	C4
D415	E4
D416	D4
D418	C5
D419	D5
D420	D5
D421	C6
D422	D6
Q401	G5
Q402	G5
Q403	H5
Q404	G5
Q405	G4
Q406	G3
Q407	G4
Q408	H5
Q409	F5
Q410	H4
Q411	F4
Q412	H3
Q413	F3
Q414	G4
Q415	H4
Q416	F4
Q417	F4
Q418	C6
Q420	D3
Q421A	H3
Q421C	G3
Q422A	F3
Q422C	E3
Q425	C6
Q426	D4
Q427	E4
Q428	C5
Q429	H5
Q430	F5
Q431	C4
Q433	E5
Q434	F5
Q436	C5
Q437	C5
Q438	D6

■ PRINTED CIRCUIT BOARD (Foil side)

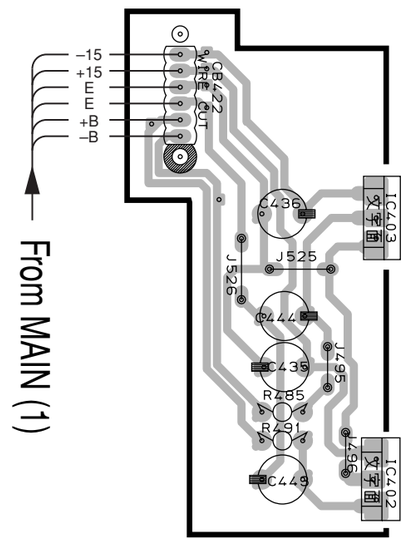
Circuit No.	J, U, C, A, B, G	R, T
CB404, 405	X	O
F402	X	O
SW401	X	O
W401~406	X	O

X: NOT USED
O: USED / APPLICABLE

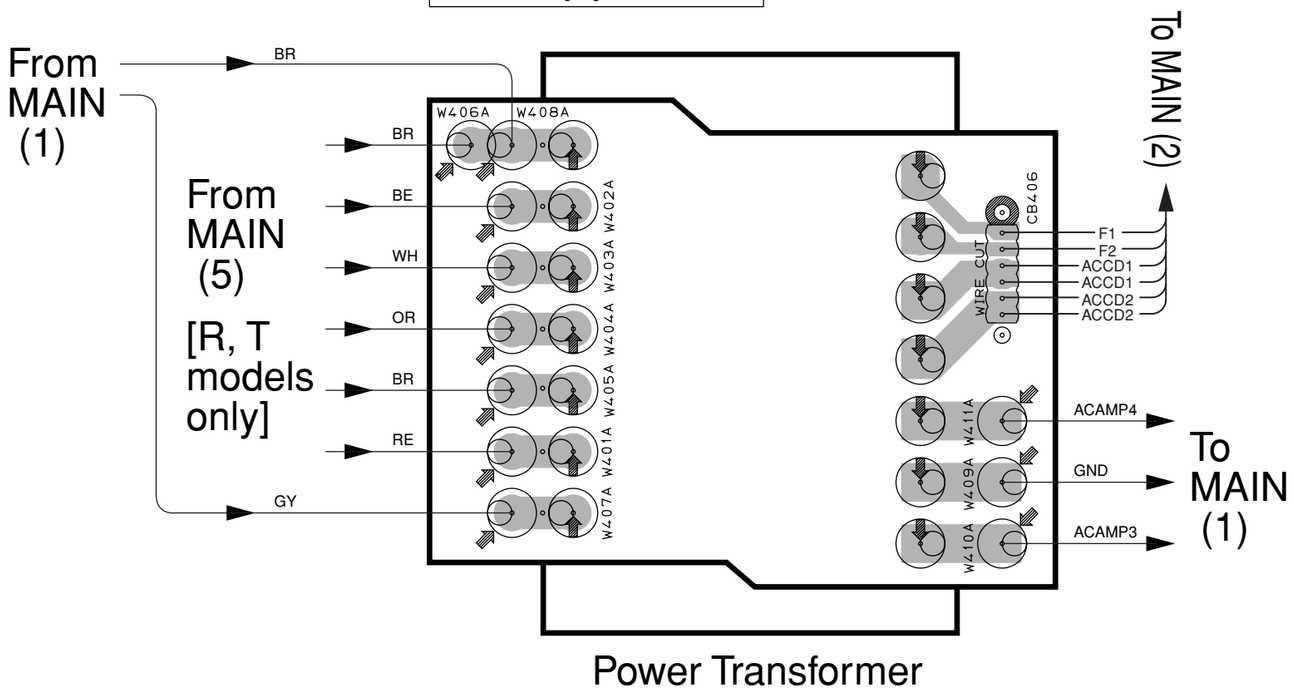
MAIN (2) P. C. B.



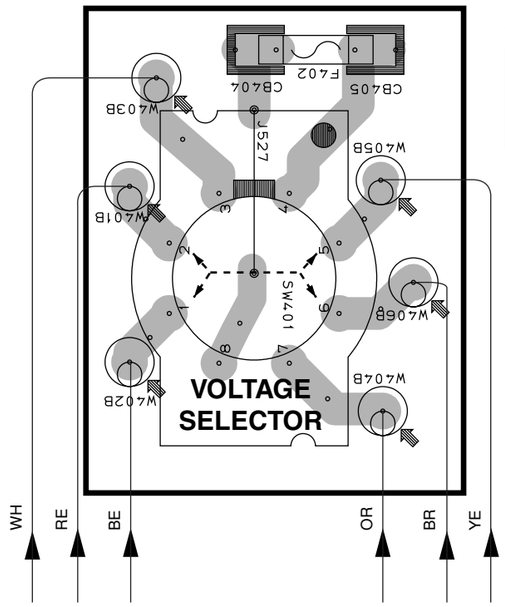
MAIN (3) P. C. B.



MAIN (4) P. C. B.



MAIN (5) P. C. B. (R, T models only)



VOLTAGE SELECTOR

240V	1-2/5-6
220V	2-3/6-7
110V	3-4/7-8
120V	4-5/8-1

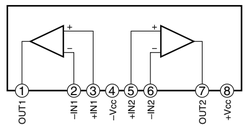
• Semiconductor Location

Ref. No.	Location
D601	D2
D602	D2
D603	D2
D604	D2
D605	C3
IC402	G4
IC403	G3
IC601	C3
Q601	D3
Q602	D3

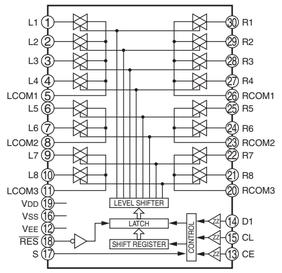
■ SCHEMATIC DIAGRAM (INPUT)

Interchangeable Parts at Manufacture-Stage		
Mark	Reference Parts Number	Parts Name
k1	Q301, 302, Q305-Q306	2878 A-B 1915 (F) S-T
k2	Q304	1740S A-S 2603 E-F 3311A Q-R-S
k3		
k4		
k5		

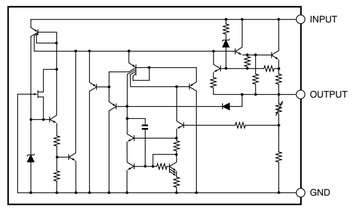
IC301~303, 751: NJM2068D-D
Dual OP-Amp.



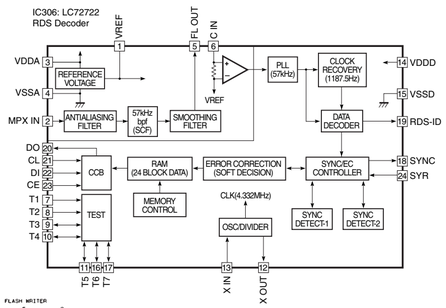
IC304: LC78211
Analog Function Switch



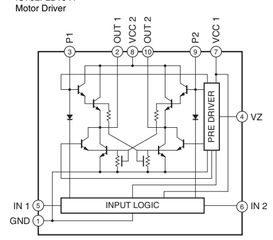
IC305: NJM78L05A-T3
Voltage Regulator



IC306: LC72722
RDS Decoder



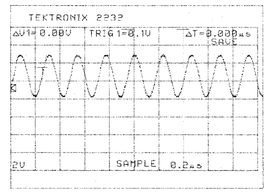
IC752: LB1641
Motor Driver



S		J	U-C	R-T	A	B-G
1	R356	x	x	x	x	HF45522 220
2	R357	x	x	x	x	HF45610 1K
3	R358	x	x	x	x	HF45647 4.7K
4	R359	HF45716 16K	HF45710 10K	HF45620 2K	HF45639 3.9K	HF45727 27K
5	R360	x	x	x	x	HF45810 100K
6	L301-L302	x	x	x	x	VU88950 220uH
7	C341	x	x	x	x	VG27860 330P
8	C342- C344	x	x	x	x	VJ59910 0.1
9	C343-C345 C348	x	x	x	x	UR81747 47/6.3
10	C346	x	x	x	x	VG27880 560P
11	C350-C351	x	x	x	x	VA76110 27PCH
12	Q304	x	x	x	x	IC17402 C1740S(R/S)
13	XL301	x	x	x	x	V393090 4.332MHz
14	IC306	x	x	x	x	XY534A0 LC72722
15	SW301	x	x	V362430	x	x
16						
17						
18						

x: NOT USED
O: USED / APPLICABLE

Point ① Pin 12 of IC306



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

● 電圧は、内部抵抗10MΩの電圧計で測定したものです。
● ! 印のある部品は、安全性確保部品を示しています。部品の交換が必要な場合、パーツリストに記載されている部品を使用してください。
● 本回路図は標準回路図です。改良のため予告なく変更することがございます。

NOTICE (model)
(J)····· JAPANESE
(U)····· U.S.A
(C)····· CANADIAN
(R)····· GENERAL
(A)····· AUSTRALIAN
(B)····· BRITISH
(G)····· EUROPEAN
(T)····· CHINA
(L)····· SINGAPORE

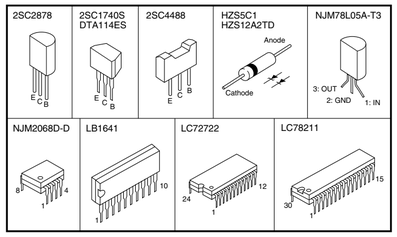
RESISTOR

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

CAPACITOR

REMARKS	PARTS NAME	
NO MARK	ELECTROLYTIC CAPACITOR	ELECTRO
⊗	TANTALUM CAPACITOR	
NO MARK	CERAMIC CAPACITOR	NON-POLAR
⊛	CERAMIC TUBULAR CAPACITOR	
◎	POLYESTER FILM CAPACITOR	
○	POLYSTYRENE FILM CAPACITOR	
ⓘ	MICA CAPACITOR	
ⓟ	POLYPROPYLENE FILM CAPACITOR	
●	SEMICONDUCTIVE CERAMIC CAPACITOR	

PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS.



■SCHEMATIC DIAGRAM (OPERATION)

FLUORESCENT DISPLAY

µ-COM

IC202

M30217M8

EEPROM

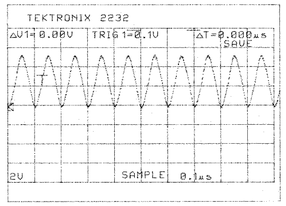
REMOTE SENSOR

OPERATION KEY

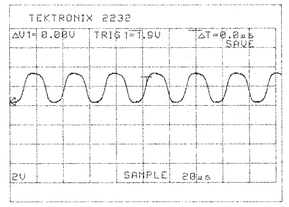
Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
‡1	U201	PIC-28143THS (GP1U271X)
‡2	D203	(SLR-325VC) (SLR-305VCA47 RED)
‡3		
‡4		
‡5		

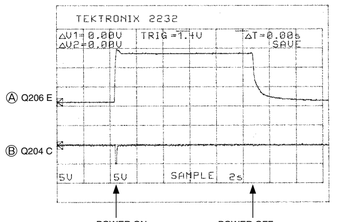
Point ① Pin 13 of IC202



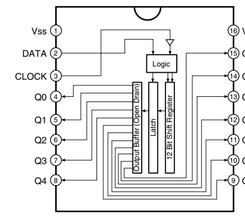
Point ② Pin 11 of IC202



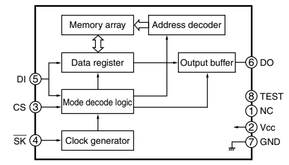
Point ③ emitter of Q206
and collector of Q204



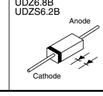
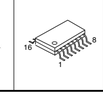
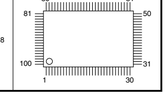
IC201: BU2090F
Serial In/Parallel Out Driver



IC203 : S-29390AFJA
CMOS 4kbit Serial EEPROM



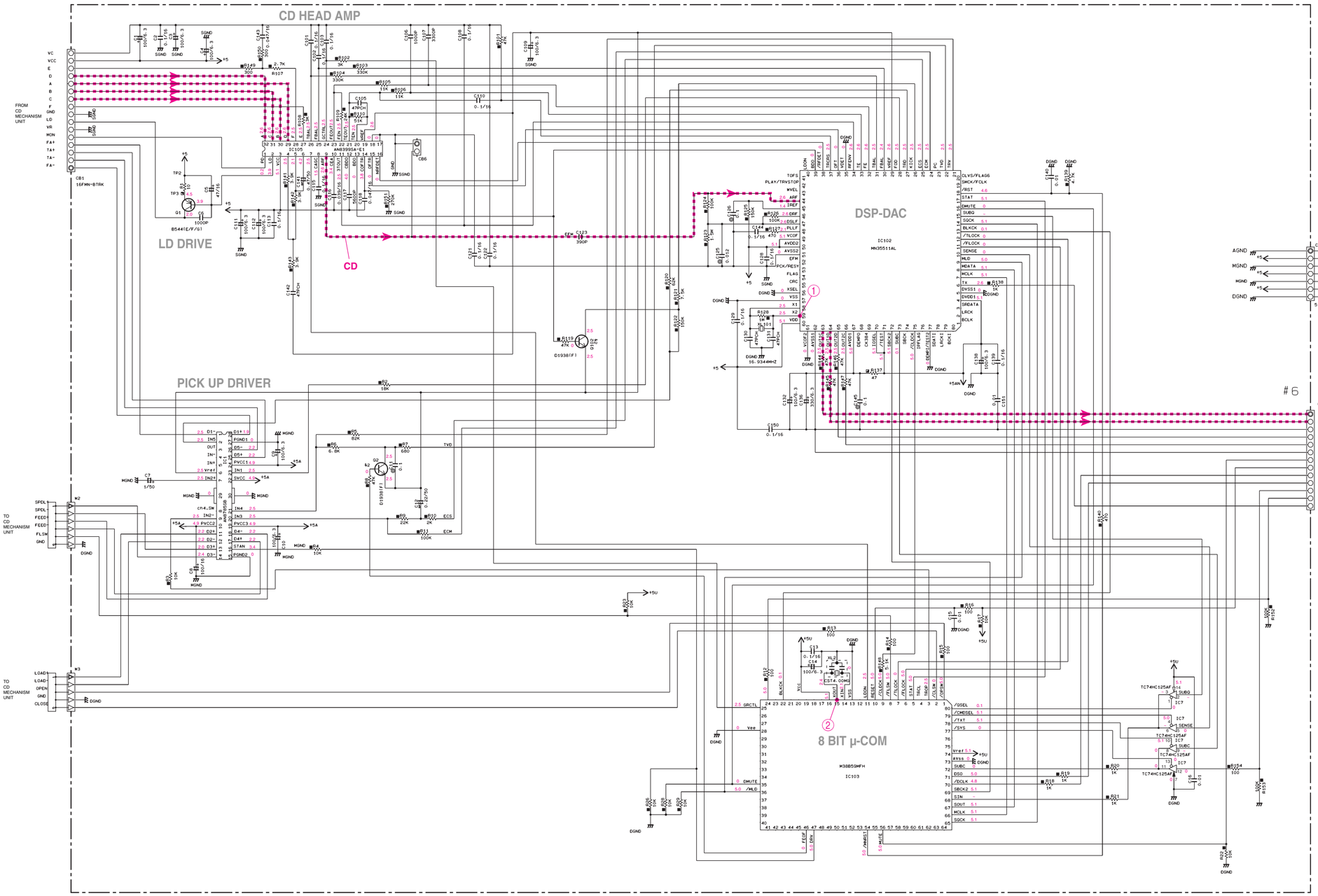
PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS.

2SC4481	2SA1037K DTA144EKA	1SS355 UDZ5.1B UDZ6.8B UDZS6.2B	S-29390AFJA	BU2090F	M30217M8-AXXXFP
					

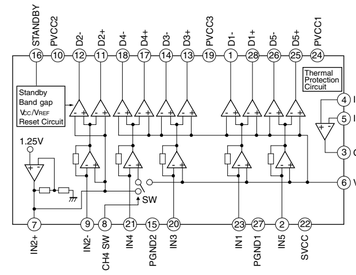
★ All voltage are measured with a 10M /V DC electric volt meter.
★ Components having special characteristics are marked ! and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

● 電圧は、内部抵抗10MΩの電圧計で測定したものです。
● !印のある部品は、安全性確保部品を示しています。部品の交換が必要な場合、パーツリストに記載されている部品を使用してください。
● 本回路図は標準回路図です。改良のため予告なく変更することがございます。

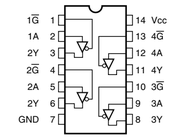
■SCHEMATIC DIAGRAM (CD)



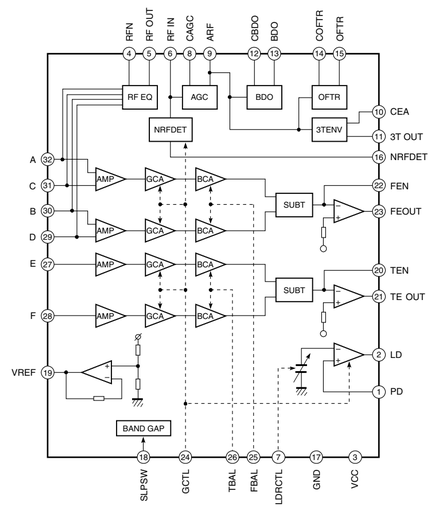
IC1: AN8785SB
5-Channel Power OP-Amp System Driver



IC7: TC74HC125AF
Quad Bus Buffer



IC105: AN8399SA-E1
CD Head Amp.

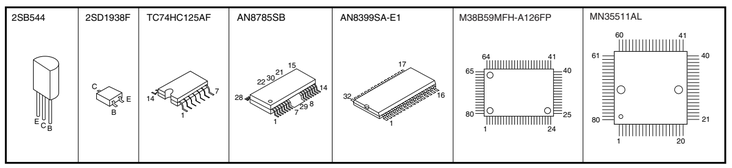


NOTICE (model)
(U)····· JAPANESE
(U)····· U.S.A
(C)····· CANADIAN
(R)····· GENERAL
(A)····· AUSTRALIAN
(B)····· BRITISH
(G)····· EUROPEAN
(T)····· CHINA
(L)····· SINGAPORE

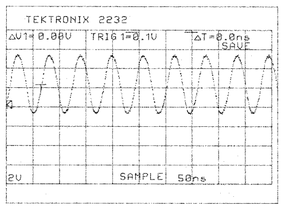
Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
▲1	IC7	XQ248A0
		XU529A0

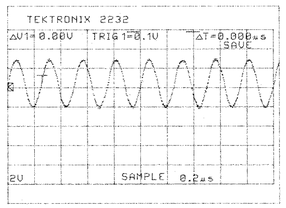
PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS.



Point ① Pin 59 of IC102



Point ② Pin 15 of IC103



RESISTOR

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

CAPACITOR

REMARKS	PARTS NAME	
NO MARK	ELECTROLYTIC CAPACITOR	⫴
⊘	TANTALUM CAPACITOR	
NO MARK	CERAMIC CAPACITOR	⫿
◉	CERAMIC TUBULAR CAPACITOR	
◎	POLYESTER FILM CAPACITOR	
○	POLYSTYRENE FILM CAPACITOR	
Ⓘ	MICA CAPACITOR	
Ⓟ	POLYPROPYLENE FILM CAPACITOR	
◉	SEMICONDUCTIVE CERAMIC CAPACITOR	

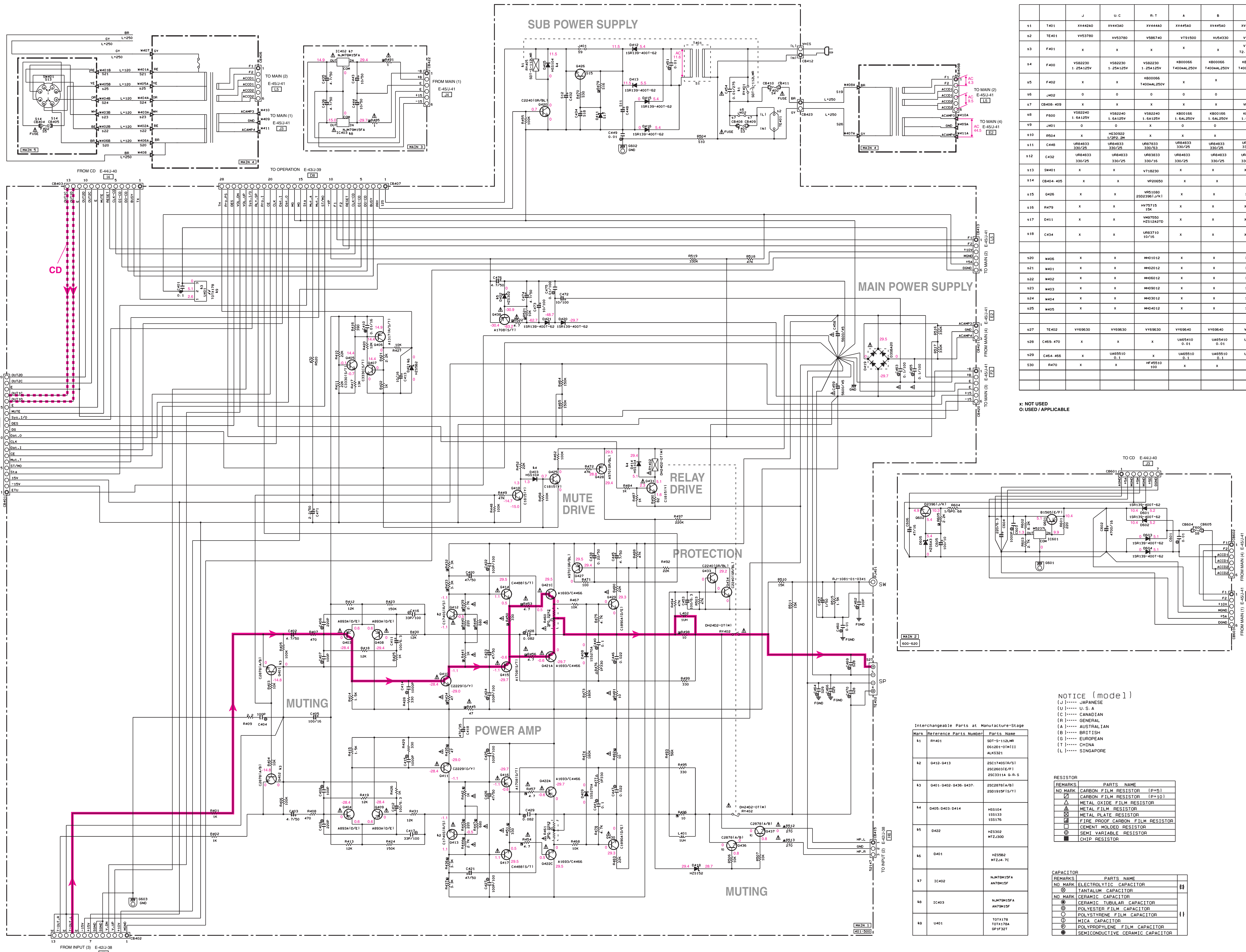
★ All voltage are measured with a 10M /V DC electric volt meter.
★ Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

● 電圧は、内部抵抗10MΩの電圧計で測定したものです。
● ⚠印のある部品は、安全性確保部品を示しています。部品の交換が必要な場合、パーツリストに記載されている部品を使用してください。
● 本回路図は標準回路図です。改良のため予告なく変更することがございます。

■SCHEMATIC DIAGRAM (MAIN)

VOLTAGE SELECTOR

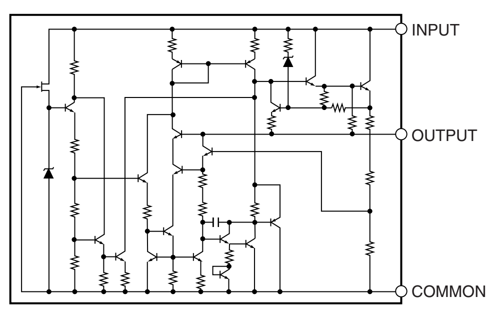
240V	1-2/5-6
220V	2-3/6-7
110V	3-4/7-8
120V	4-5/8-1



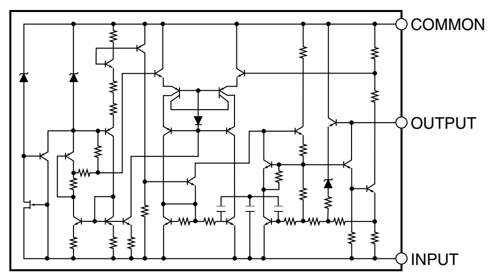
		J	U.C	R.T	A	B	G
s1	T401	XV442A0	XV443A0	XV444A0	XV445A0	XV445A0	XV445A0
s2	TE401	VV53780	VV53780	V586740	VT91500	VU54330	VV53740
s3	F401	x	x	x	x	x	VT94290 T2.5AH250V
s4	F400	VS82230 1.25A125V	VS82230 1.25A125V	VS82230 1.25A125V	KB00066 T400mAL250V	KB00066 T400mAL250V	KB00066 T400mAL250V
s5	F402	x	x	KB00066 T400mAL250V	x	x	x
s6	J402	0	0	0	0	0	x
s7	CB408.409	x	x	x	x	x	VP20650
s8	F600	VS82240 1.6A125V	VS82240 1.6A125V	VS82240 1.6A125V	KB00166 1.6AL250V	KB00166 1.6AL250V	KB00166 1.6AL250V
s9	J401	0	0	x	0	0	0
s10	R504	x	HG30922 1/2P2.2M	x	x	x	x
s11	C448	UR84833 330/25	UR84833 330/25	UR87833 330/63	UR84833 330/25	UR84833 330/25	UR84833 330/25
s12	C432	UR84833 330/25	UR84833 330/25	UR83833 330/16	UR84833 330/25	UR84833 330/25	UR84833 330/25
s13	SW401	x	x	V718230	x	x	x
s14	CB404.405	x	x	VP20650	x	x	x
s15	Q426	x	x	VR51080 2SD2396(J/K)	x	x	x
s16	R479	x	x	HV75715 15K	x	x	x
s17	D411	x	x	VM97550 HZS12A2TD	x	x	x
s18	C434	x	x	UR83710 10/16	x	x	x
s20	W406	x	x	MH01012	x	x	x
s21	W401	x	x	MH02012	x	x	x
s22	W402	x	x	MH06012	x	x	x
s23	W403	x	x	MH09012	x	x	x
s24	W404	x	x	MH03012	x	x	x
s25	W405	x	x	MH04012	x	x	x
s27	TE402	VY69630	VY69630	VY69630	VY69640	VY69640	VY69640
s28	C469.470	x	x	x	UA65410 0.01	UA65410 0.01	UA65410 0.01
s29	C464.466	x	UA65510 0.1	x	UA65510 0.1	UA65510 0.1	UA65510 0.1
S30	R470	x	x	HF45510 100	x	x	x

x: NOT USED
O: USED / APPLICABLE

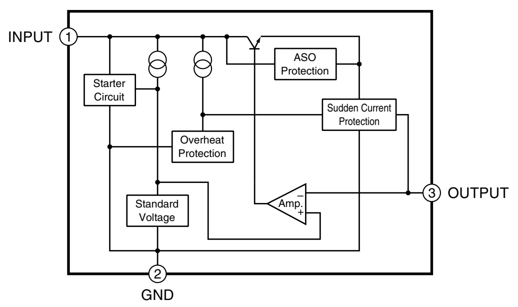
IC402: NJM78M15FA
Voltage Regulator



IC403: NJM79M15FA
Voltage Regulator



IC601: M5237L
Regulator



Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
&1	RY401	SDT-S-112LMR DG12D1-O(M)II ALKS321
&2	Q412.Q413	2SC1740S(R/S) 2SC2603(E/F) 2SC3311A Q.R.S
&3	Q401.Q402.Q436.Q437.	2SC2878(A/B) 2SD1915F(S/T)
&4	D405.D403.D414	HSS104 1SS133 1SS176
&5	D422	HZS302 MTZJ30D
&6	D401	HZS5B2 MTZJ4.7C
&7	IC402	NJM78M15FA AN78M15F
&8	IC403	NJM79M15FA AN79M15F
&9	U401	TOTX178 TOTX178A GP1F32T

NOTICE (model)
(J)····· JAPANESE
(U)····· U.S.A
(C)····· CANADIAN
(R)····· GENERAL
(A)····· AUSTRALIAN
(B)····· BRITISH
(G)····· EUROPEAN
(T)····· CHINA
(L)····· SINGAPORE

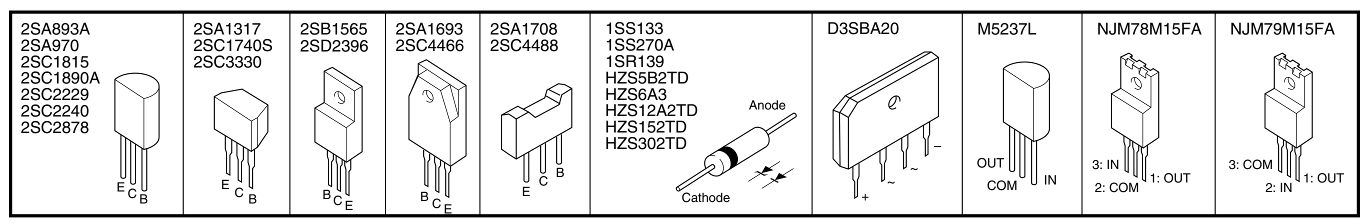
RESISTOR

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

CAPACITOR

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
◉	CERAMIC TUBULAR CAPACITOR
◎	POLYESTER FILM CAPACITOR
○	POLYSTYRENE FILM CAPACITOR
⦶	MICA CAPACITOR
Ⓟ	POLYPROPYLENE FILM CAPACITOR
⊜	SEMICONDUCTIVE CERAMIC CAPACITOR

PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS.

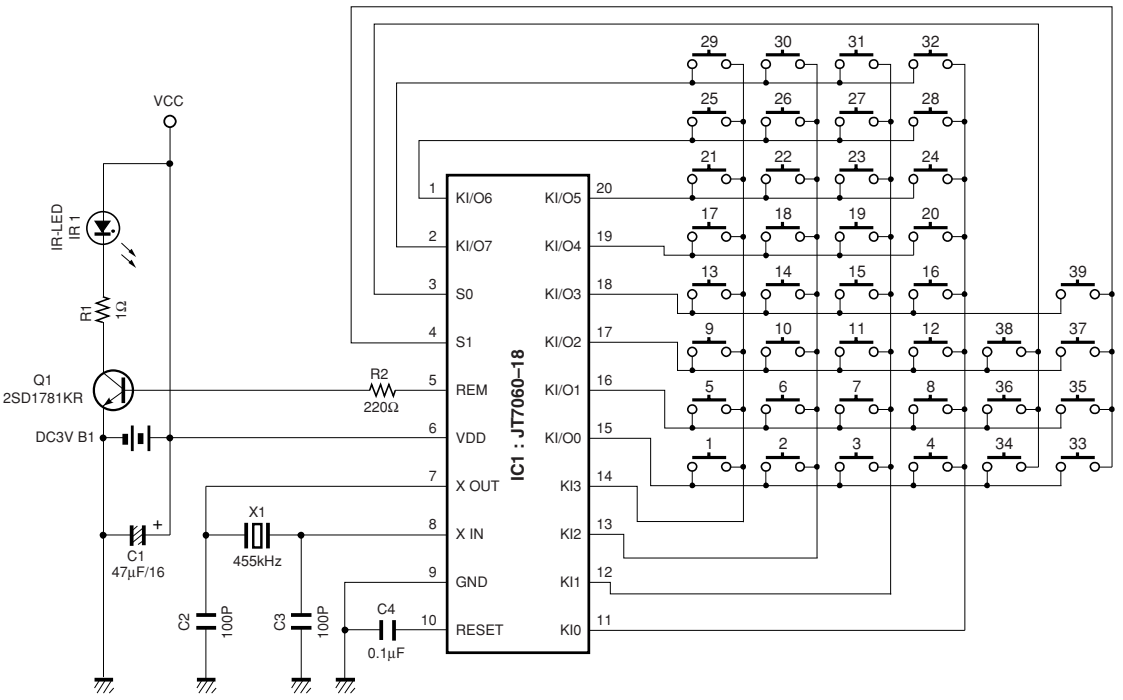


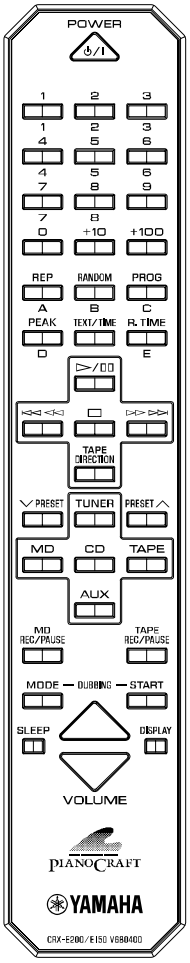
★ All voltage are measured with a 10M /V DC electric volt meter.
★ Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

● 電圧は、内部抵抗10MΩの電圧計で測定したものです。
● ⚠印のある部品は、安全性確保部品を示しています。部品の交換が必要な場合、パーツリストに記載されている部品を使用してください。
● 本回路図は標準回路図です。改良のため予告なく変更することがございます。

REMOTE CONTROL TRANSMITTER

■ SCHEMATIC DIAGRAM





TRANSMISSION FORMAT: NEC-FORMAT
CUSTOM CODE (HEX): 78

Key No.	Key Name	Data Code (HEX)	Key No.	Key Name	Data Code (HEX)
1	POWER	0F	21	⏮ ◁◁	04
2	1	11	22	⏹	01
3	2	12	23	▷▷ ⏭	03
4	3	13	24	TAPE DIRECTION	43
5	4	14	25	∨ PRESET	1C
6	5	15	26	TUNER	4B
7	6	16	27	PRESET ∧	1B
8	7	17	28	MD	57
9	8	18	29	CD	4A
10	9	19	30	TAPE	41
11	0 (FREQ/RDS)	10	31	AUX	49
12	+10 (MODE)	1A	32	MD REC/PAUSE	58
13	+100 (START)	1D	33	TAPE REC/PAUSE	46
14	REP (A)	0C	34	MODE	05
15	RANDOM (B)	07	35	START	06
16	PROG (C)	0B	36	SLEEP	4F
17	D	09	37	VOLUME ∧	1E
18	TEXT/TIME	0A	38	DISPLAY	4E
19	R. TIME (E)	08	39	VOLUME ∧	1F
20	▷/⏸	02			

PARTS LIST

■ ELECTRICAL PARTS

■ WARNING

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

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

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

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

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

P.C.B. INPUT

	Schm Ref.	PART NO.	Description			Markets
*		V7353800	P.C.B.	INPUT		UC
*		V7353900	P.C.B.	INPUT		RT
*		V7354000	P.C.B.	INPUT		A
*		V7354100	P.C.B.	INPUT		BG
*	CB301	VU280900	CN	9P SE 9604S		
*	CB302	VU280900	CN	9P SE 9604S		
*	CB303	VU281500	CN	15P SE 9604S		
	CB304	VU282000	CN	20P		
	CB305	VK026400	CN.BS.PIN	5P		
*	CB701	VU280700	CN	7P SE 9604S		
	CB702	Vi878100	CN.BS.PIN	3P		
	CB703	Vi878600	CN.BS.PIN	8P		
	CB751	Vi878300	CN.BS.PIN	5P		
*	CB752	VK027200	CN	13P		
	CB753	VK025200	CN.BS.PIN	8P		
	C301	FG651470	C.CE	47pF	50V	
	C302	FG651470	C.CE	47pF	50V	
	C303	FG651470	C.CE	47pF	50V	
	C304	FG651470	C.CE	47pF	50V	
	C307	UA652100	C.MYLAR	100pF	50V	
	C308	UA652100	C.MYLAR	100pF	50V	
	C309	UA652100	C.MYLAR	100pF	50V	
	C310	UA652100	C.MYLAR	100pF	50V	
	C311	UA652100	C.MYLAR	100pF	50V	
	C312	UA652100	C.MYLAR	100pF	50V	
	C313	UR866220	C.EL	2.2uF	50V	
	C314	UR866220	C.EL	2.2uF	50V	
	C315	UR866220	C.EL	2.2uF	50V	
	C316	UR866220	C.EL	2.2uF	50V	
	C317	UA652560	C.MYLAR	560pF	50V	
	C318	UA652560	C.MYLAR	560pF	50V	
	C319	UA652120	C.MYLAR	120pF	50V	
	C320	UA652120	C.MYLAR	120pF	50V	
*	C321	UA654180	C.MYLAR	0.018uF	50V	
*	C322	UA654180	C.MYLAR	0.018uF	50V	
	C323	UA653220	C.MYLAR	2200pF	50V	
	C324	UA653220	C.MYLAR	2200pF	50V	
	C325	VG287600	C.EL	100uF	25V	
	C326	VG287600	C.EL	100uF	25V	
	C327	UR837220	C.EL	22uF	16V	
	C328	UR837220	C.EL	22uF	16V	
	C329	UR837100	C.EL	10uF	16V	
	C330	UA655100	C.MYLAR	0.1uF	50V	
	C331	UA655100	C.MYLAR	0.1uF	50V	
	C332	UR837100	C.EL	10uF	16V	
	C333	VG287600	C.EL	100uF	25V	
	C334	VG287600	C.EL	100uF	25V	
	C335	UR847100	C.EL	10uF	25V	
	C336	UR847100	C.EL	10uF	25V	
	C337	UR837100	C.EL	10uF	16V	
	C338	UR837100	C.EL	10uF	16V	
	C339	UR837100	C.EL	10uF	16V	
	C340	UR837100	C.EL	10uF	16V	
	C341	VG278600	C.CE.TUBLR	330pF	50V	BG
	C342	VJ599100	C.CE.TUBLR	0.1uF	50V	BG
	C343	UR817470	C.EL	47uF	6.3V	BG
	C344	VJ599100	C.CE.TUBLR	0.1uF	50V	BG
	C345	UR817470	C.EL	47uF	6.3V	BG
	C346	VG278800	C.CE.TUBLR	560pF	50V	BG
	C347	VF466800	C.CE.TUBLR	100pF	50V	
	C348	UR817470	C.EL	47uF	6.3V	BG
	C349	VF467300	C.CE.TUBLR	0.01uF	16V	
	C350	VA761100	C.CE	27pF	50V	BG

* New Parts

	Schm Ref.	PART NO.	Description			Markets
	C351	VA761100	C.CE	27pF	50V	BG
	C701	VG278900	C.CE.TUBLR	680pF	50V	
	C702	VG278900	C.CE.TUBLR	680pF	50V	
	C703	UA653100	C.MYLAR	1000pF	50V	
	C704	UA654100	C.MYLAR	0.01uF	50V	
	C705	UA654100	C.MYLAR	0.01uF	50V	
	C706	UA654100	C.MYLAR	0.01uF	50V	
	C707	UA654100	C.MYLAR	0.01uF	50V	
	C708	UA655120	C.MYLAR	0.12uF	50V	
	C709	UA655120	C.MYLAR	0.12uF	50V	
	C710	UA654330	C.MYLAR	0.033uF	50V	
	C711	UA654330	C.MYLAR	0.033uF	50V	
	C712	UA654100	C.MYLAR	0.01uF	50V	
	C751	UN866100	C.EL	1uF	50V	
	C752	UR866220	C.EL	2.2uF	50V	
	C753	UR866220	C.EL	2.2uF	50V	
	C754	VG287800	C.EL	330uF	16V	
	C755	VG287800	C.EL	330uF	16V	
	C756	UR866220	C.EL	2.2uF	50V	
	C757	UR866220	C.EL	2.2uF	50V	
	C758	UA652100	C.MYLAR	100pF	50V	
	C759	UA652100	C.MYLAR	100pF	50V	
	C760	UR837470	C.EL	47uF	16V	
	C761	UR837470	C.EL	47uF	16V	
	C762	VF467300	C.CE.TUBLR	0.01uF	16V	
	C763	UA652100	C.MYLAR	100pF	50V	
	C764	UA652100	C.MYLAR	100pF	50V	
	D301	VM975500	DIODE.ZENR	HZS12A2TD	12V	
	D751	VP642400	DIODE.ZENR	HZS5C1	5.0V	
	IC301	XA987A00	IC	NJM2068D-D		
	IC302	XA987A00	IC	NJM2068D-D		
	IC303	XA987A00	IC	NJM2068D-D		
	IC304	XP894A00	IC	LC78211		
	IC305	XJ757A00	IC	NJM78L05A-T3		
	IC306	XY534A00	IC	LC72722		BG
	IC751	XA987A00	IC	NJM2068D-D		
	IC752	XF494A00	IC	LB1641		
	JK301	VJ726800	JACK.MNI			
	JK701	V3589000	JACK.MNI	HTJ-035-18EBGT		
	L301	VU889500	COIL	220uH		BG
	L302	VU889500	COIL	220uH		BG
	L701	V4769500	FER.BEAD	RH03506BT-B-1B		
	L702	V4769500	FER.BEAD	RH03506BT-B-1B		
	L703	V4769500	FER.BEAD	RH03506BT-B-1B		
	L704	V4769500	FER.BEAD	RH03506BT-B-1B		
	L705	V4769500	FER.BEAD	RH03506BT-B-1B		
	PJ301	VU857800	JACK.PIN	6P		
	PJ302	VJ696300	JACK.PIN	4P		
	Q301	iC287820	TR	2SC2878 A,B		
	Q302	iC287820	TR	2SC2878 A,B		
⚠	Q303	VP872700	TR	2SC4488 S,T		
	Q304	iC174020	TR	2SC1740S R,S		BG
	Q305	iC287820	TR	2SC2878 A,B		
	Q306	iC287820	TR	2SC2878 A,B		
	Q307	VD678500	TR.DGT	DTA114ES		
⚠	R354	HV753470	R.CAR.FP	4.7Ω	1/4W	
	R355	HV755560	R.CAR.FP	560Ω	1/4W	
⚠	R361	HV753220	R.CAR.FP	2.2Ω	1/4W	
⚠	R362	HV753220	R.CAR.FP	2.2Ω	1/4W	
	R761	HV754100	R.CAR.FP	10Ω	1/4W	
	R762	HV754100	R.CAR.FP	10Ω	1/4W	
	R763	HV754100	R.CAR.FP	10Ω	1/4W	
	ST301	V4040500	SCR.TERM	M3		

* New Parts

P.C.B. INPUT, P.C.B. OPERATION & P.C.B. CD

	Schm Ref.	PART NO.	Description		Markets
	ST701	V4040500	SCR.TERM	M3	
	SW301	V3624300	SW.SLIDE	SS029-P022MJB-PA6	RT
	SW701	VT140300	SW.RT.ENC	EC16B12204	
	SW702	V2014900	SW.TACT	EVQ21304M	
	SW703	V2014900	SW.TACT	EVQ21304M	
	SW704	V2014900	SW.TACT	EVQ21304M	
	VR701	V3555600	VR	B20KΩ	
	VR702	V3555700	VR	W25KΩ	
	VR703	V3555800	VR	MN100KΩ	
*	VR751	V7375500	VR.MTR	A100KΩ RK16812MG	
	XL301	V3930900	RSNR.CRYS	4.332MHz	BG
! *		V7337500	P.C.B.	GD:OPERATION	
*	CB201	VU280700	CN	7P SE 9604S	
	CB202	VU282800	CN.BS.PIN	28P	
*	CB203	VU280900	CN	9P SE 9604S	
	C201	US135100	C.CE.CHP	0.1uF 16V	
	C202	US061220	C.CE.M.CHP	22pF 50V	
	C203	US061220	C.CE.M.CHP	22pF 50V	
	C204	US135100	C.CE.CHP	0.1uF 16V	
	C205	UM397100	C.EL	10uF 16V	
	C206	US135100	C.CE.CHP	0.1uF 16V	
	C207	US135100	C.CE.CHP	0.1uF 16V	
	C208	UM388100	C.EL	100uF 10V	
	C209	UM388100	C.EL	100uF 10V	
	C210	VU545000	C.EL	47000uF 5.5V	
	C211	UM416100	C.EL	1uF 50V	
	C212	UM388100	C.EL	100uF 10V	
	C213	UM416220	C.EL	2.2uF 50V	
	C214	UB045100	C.CE.M.CHP	0.1uF 50V	
	C215	UB045100	C.CE.M.CHP	0.1uF 50V	
	C216	US061330	C.CE.M.CHP	33pF 50V	
	C217	US061330	C.CE.M.CHP	33pF 50V	
	C218	US061330	C.CE.M.CHP	33pF 50V	
	C219	US061330	C.CE.M.CHP	33pF 50V	
	C220	US061330	C.CE.M.CHP	33pF 50V	
	C221	US061330	C.CE.M.CHP	33pF 50V	
	D201	VU171900	DIODE.ZENR	UDZ5.1B 5.1V	
	D202	VR711400	LED(gr)	SLR-325MC	
	D203	VS132300	LED(re)	SLR-325VCT31	
	D204	VT332900	DIODE	1SS355	
	D205	VU171900	DIODE.ZENR	UDZ5.1B 5.1V	
	D206	VT332900	DIODE	1SS355	
	D207	VT332900	DIODE	1SS355	
	D208	VT332900	DIODE	1SS355	
	D209	VT332900	DIODE	1SS355	
	D210	VU172200	DIODE.ZENR	UDZ6.8B 6.8V	
	D211	VU172100	DIODE.ZENR	UDZS6.2B 6.2V	
	D212	VU171900	DIODE.ZENR	UDZ5.1B 5.1V	
*	IC201	XZ492A00	IC	BU2090F-E2	
*	IC202	XZ985A00	IC.CPU	M30217M8-A102FP CP	
	IC203	XY887A00	IC	S-29390AFJA EEPROM	
	Q201	VV655300	TR.DGT	DTA144EKA	
	Q202	VV556500	TR	2SA1037K Q,R,S	
	Q203	VV655300	TR.DGT	DTA144EKA	
	Q204	VV655700	TR.DGT	DTC144EKA	
	Q205	VR412800	TR	2SC4481 T,U	
	Q206	VV556500	TR	2SA1037K Q,R,S	
	R278	HV756220	R.CAR.FP	2.2KΩ 1/4W	
	R279	HV755100	R.CAR.FP	100Ω 1/4W	
	R280	HV755100	R.CAR.FP	100Ω 1/4W	

	Schm Ref.	PART NO.	Description		Markets
	SW201	V2014900	SW.TACT	EVQ21304M	
	SW202	V2014900	SW.TACT	EVQ21304M	
	SW203	V2014900	SW.TACT	EVQ21304M	
	SW204	V2014900	SW.TACT	EVQ21304M	
	SW205	V2014900	SW.TACT	EVQ21304M	
	SW206	V2014900	SW.TACT	EVQ21304M	
	SW207	V2014900	SW.TACT	EVQ21304M	
	U201	V3872300	L.DTCT	PIC-28143TH5	
*	V201	V6253100	FL.DSPLY	16-BT-84GN	
	XL201	VQ328900	RSNR.CRYS	32.768KHz	
	XL202	VQ791000	RSNR.CE	10MHz	
		VR519500	SHEET.FL	GD	
!		V3688300	SHEET.FL	SI	
		V3747400	SPACER.FL	T4x6x18	
		V3747500	SUPRT		
*		V7354200	P.C.B.	CD	
	CB1	V2731000	CN.FMN	16P	
	CB4	VU271300	CN	13P	
	CB5	Vi878500	CN.BS.PIN	7P	
	CB6	LA002000	TERM.WRAP	2P	
	C1	UM388100	C.EL	100uF 10V	
	C2	US135100	C.CE.CHP	0.1uF 16V	
	C3	UM388100	C.EL	100uF 10V	
	C4	UM388100	C.EL	100uF 10V	
	C5	UR837470	C.EL	47uF 16V	
	C6	US063100	C.CE.M.CHP	1000pF 50V	
	C7	UM416100	C.EL	1uF 50V	
	C8	UM398100	C.EL	100uF 16V	
	C9	UM388100	C.EL	100uF 10V	
	C10	UM388100	C.EL	100uF 10V	
	C11	UA655100	C.MYLAR	0.1uF 50V	
*	C12	VS949200	C.EL	0.22uF 50V	
	C13	US135100	C.CE.CHP	0.1uF 16V	
	C14	UM388100	C.EL	100uF 10V	
	C15	US064100	C.CE.M.CHP	0.01uF 50V	
	C16	US064100	C.CE.M.CHP	0.01uF 50V	
	C101	US135100	C.CE.CHP	0.1uF 16V	
	C102	US135100	C.CE.CHP	0.1uF 16V	
	C103	US135100	C.CE.CHP	0.1uF 16V	
	C105	US061470	C.CE.M.CHP	47pF 50V	
	C106	US063100	C.CE.M.CHP	1000pF 50V	
	C107	US063330	C.CE.M.CHP	3300pF 50V	
	C108	US135100	C.CE.CHP	0.1uF 16V	
	C109	UM388100	C.EL	100uF 10V	
	C110	US135100	C.CE.CHP	0.1uF 16V	
	C111	UM388100	C.EL	100uF 10V	
	C112	UM388100	C.EL	100uF 10V	
	C113	US135100	C.CE.CHP	0.1uF 16V	
	C115	US135100	C.CE.CHP	0.1uF 16V	
*	C116	US034390	C.CE.M.CHP	0.039uF 16V	
	C117	US063560	C.CE.CHP	5600pF 50V	
	C118	US034470	C.CE.M.CHP	0.047uF 16V	
	C121	US135100	C.CE.CHP	0.1uF 16V	
	C122	US135100	C.CE.CHP	0.1uF 16V	
	C123	US062390	C.CE.CHP	390P 50V	
	C125	UA654120	C.MYLAR	0.012uF 50V	
	C126	UA655100	C.MYLAR	0.1uF 50V	
	C128	US135100	C.CE.CHP	0.1uF 16V	
	C129	US135100	C.CE.CHP	0.1uF 16V	
	C130	US061470	C.CE.M.CHP	47pF 50V	

* New Parts

* New Parts

P.C.B. CD & P.C.B. MAIN

	Schm Ref.	PART NO.	Description		Markets
	C131	US061470	C.CE.M.CHP	47pF 50V	
*	C132	V6923400	C.EL	100uF 6.3V	
	C136	V6295600	C.EL	330uF 6.3V	
	C138	UM388100	C.EL	100uF 10V	
	C139	US135100	C.CE.CHP	0.1uF 16V	
	C140	US064100	C.CE.M.CHP	0.01uF 50V	
*	C141	VS118600	C.EL	0.47uF 50V	
	C142	US061470	C.CE.M.CHP	47pF 50V	
	C143	US034470	C.CE.M.CHP	0.047uF 16V	
	C144	US135100	C.CE.CHP	0.1uF 16V	
	C145	UA655100	C.MYLAR	0.1uF 50V	
	C150	US135100	C.CE.CHP	0.1uF 16V	
	C151	US064100	C.CE.M.CHP	0.01uF 50V	
	IC1	XZ370A00	IC	AN8785SB-E1 DRIVER	
	IC7	XQ248A00	IC	TC74HC125AF BUS BU	
	IC102	XW915A00	IC	MN35511AL	
*	IC103	X0218A00	IC.CPU	M38B59MFH-A126FP	
*	IC105	X0071A00	IC	AN8399SA-E1	
	Q1	iB054430	TR	2SB544 D,E,F,G	
	Q2	VZ725900	TR	2SD1938F S,T	
	Q102	VZ725900	TR	2SD1938F S,T	
	R1	HV754100	R.CAR.FP	10Ω 1/4W	
	R137	HV754470	R.CAR.FP	47Ω 1/4W	
	XL2	VE906000	RSNR.CE	4MHz	
	XL101	VJ719800	RSNR.CRYS	16.9344MHz	
*		V7335800	P.C.B.	MAIN	UC
* *		V7335900	P.C.B.	MAIN	RT
* *		V7336000	P.C.B.	MAIN	A
* *		V7336100	P.C.B.	MAIN	B
*		V7336200	P.C.B.	MAIN	G
	CB401	VU272000	CN	20P	
	CB402	Vi879100	CN.BS.PIN	13P	
	CB403	VU271300	CN	13P	
	CB404	VP206500	HOLDER.FUS	EYF-52BCT	RT
	CB405	VP206500	HOLDER.FUS	EYF-52BCT	RT
	CB406	Vi878400	CN.BS.PIN	6P	
	CB407	VU272800	CN.BS.PIN	28P	
	CB408	VP206500	HOLDER.FUS	EYF-52BCT	G
	CB409	VP206500	HOLDER.FUS	EYF-52BCT	G
	CB410	VP206500	HOLDER.FUS	EYF-52BCT	
	CB411	VP206500	HOLDER.FUS	EYF-52BCT	
	CB412	VG879900	CN.BS.PIN	2P	
	CB413	VF728300	CN	6P	
	CB415	VK024700	CN.BS.PIN	3P	
	CB420	VF728300	CN	6P	
	CB421	LA002320	TERM.WRAP	3P	
	CB422	Vi878400	CN.BS.PIN	6P	
	CB423	LA002000	TERM.WRAP	2P	
	CB601	VK025100	CN.BS.PIN	7P	
	CB602	VF728300	CN	6P	
	CB603	Vi878400	CN.BS.PIN	6P	
	CB604	VP206500	HOLDER.FUS	EYF-52BCT	
	CB605	VP206500	HOLDER.FUS	EYF-52BCT	
	C401	VJ599100	C.CE.TUBLR	0.1uF 50V	
	C402	UR866470	C.EL	4.7uF 50V	
	C403	UR866470	C.EL	4.7uF 50V	
	C404	UA652100	C.MYLAR	100pF 50V	
	C405	VG287600	C.EL	100uF 25V	
	C406	UA652220	C.MYLAR	220pF 50V	
	C407	VQ645600	C.MYLAR	100pF 50V	

	Schm Ref.	PART NO.	Description		Markets
	C408	VQ645600	C.MYLAR	100pF 50V	
	C409	UA652220	C.MYLAR	220pF 50V	
	C410	VF467300	C.CE.TUBLR	0.01uF 16V	
*	C411	VQ568900	C.EL	100uF 6.3V	
*	C412	VQ568900	C.EL	100uF 6.3V	
	C413	UR837100	C.EL	10uF 16V	
	C414	UA653100	C.MYLAR	1000pF 50V	
	C415	UA653100	C.MYLAR	1000pF 50V	
*	C416	V5690200	C.PP	33pF 100V	
*	C417	V5690200	C.PP	33pF 100V	
	C418	VG289700	C.EL	470uF 35V	
	C420	UR867470	C.EL	47uF 50V	
	C421	UR867470	C.EL	47uF 50V	
	C422	VR325000	C.MYLAR	100pF 100V	
	C423	UR867470	C.EL	47uF 50V	
	C424	VR325000	C.MYLAR	100pF 100V	
	C425	VR325000	C.MYLAR	100pF 100V	
	C426	UR867470	C.EL	47uF 50V	
	C427	VR325000	C.MYLAR	100pF 100V	
	C428	UA654820	C.MYLAR	0.082uF 50V	
	C429	UA654820	C.MYLAR	0.082uF 50V	
	C432	UR838330	C.EL	330uF 16V	RT
	C432	UR848330	C.EL	330uF 25V	UCABG
	C434	UR837100	C.EL	10uF 16V	RT
	C435	UR866470	C.EL	4.7uF 50V	
	C436	UR866470	C.EL	4.7uF 50V	
	C438	UR865220	C.EL	0.22uF 50V	
	C440	VE326000	C.MYLAR.ML	0.1uF 50V	
	C441	VE326000	C.MYLAR.ML	0.1uF 50V	
	C443	UR867100	C.EL	10uF 50V	
	C444	UR867100	C.EL	10uF 50V	
	C445	UR866470	C.EL	4.7uF 50V	
	C446	UA654220	C.MYLAR	0.022uF 50V	
	C447	UA654220	C.MYLAR	0.022uF 50V	
	C448	UR848330	C.EL	330uF 25V	UCABG
	C448	UR878330	C.EL	330uF 63V	RT
	C449	UA654100	C.MYLAR	0.01uF 50V	
	C451	UA654100	C.MYLAR	0.01uF 50V	
	C453	UR818100	C.EL	100uF 6.3V	
⚠	C454	V6185300	C.CE.SAFTY	0.01uF 275V	
	C457	UR866100	C.EL	1uF 50V	
* ⚠	C458	V7600600	C.EL	5600uF 45V	
* ⚠	C459	V7600600	C.EL	5600uF 45V	
	C460	UA654100	C.MYLAR	0.01uF 50V	
	C462	UA652100	C.MYLAR	100pF 50V	
⚠	C463	VS745400	C.POL.MTL	0.1uF 100V	
	C464	UA655100	C.MYLAR	0.1uF 50V	UCABG
	C464	UA655100	C.MYLAR	0.1uF 50V	
⚠	C465	VS745400	C.POL.MTL	0.1uF 100V	
	C466	UA655100	C.MYLAR	0.1uF 50V	UCABG
	C466	UA655100	C.MYLAR	0.1uF 50V	
	C469	UA654100	C.MYLAR	0.01uF 50V	ABG
	C470	UA654100	C.MYLAR	0.01uF 50V	ABG
	C471	UR866220	C.EL	2.2uF 50V	
	C472	UR897100	C.EL	10uF 100V	
	C473	UR897100	C.EL	10uF 100V	
	C474	UR866470	C.EL	4.7uF 50V	
	C475	VR324600	C.MYLAR	0.01uF 100V	
	C476	UR866470	C.EL	4.7uF 50V	
	C601	UA654100	C.MYLAR	0.01uF 50V	
	C602	UR739470	C.EL	4700uF 16V	
	C603	UA653100	C.MYLAR	1000pF 50V	
	C604	VG286300	C.EL	220uF 10V	

* New Parts

* New Parts

P.C.B. MAIN

	Schm Ref.	PART NO.	Description		Markets
	C605	UR828100	C.EL	100uF 10V	
	C606	UR837470	C.EL	47uF 16V	
	D401	VM974100	DIODE.ZENR	HZS5B2TD 5.0V	
	D403	VD631600	DIODE	1SS133,176	
	D405	VD631600	DIODE	1SS133,176	
	D408	VN008700	DIODE	1SS270A	
	D409	VN008700	DIODE	1SS270A	
	D411	VM975500	DIODE.ZENR	HZS12A2TD 12V	RT
	D412	VU264200	DIODE	1SR139-400	
	D413	VU264200	DIODE	1SR139-400	
	D414	VD631600	DIODE	1SS133,176	
	D415	VU264200	DIODE	1SR139-400	
	D416	VU264200	DIODE	1SR139-400	
	D418	VM975800	DIODE.ZENR	HZS152TD 15V	
⚠	D419	VN011300	DIODE.BRG	D3SBA20 4A 200V	
	D420	VU264200	DIODE	1SR139-400	
	D421	VU264200	DIODE	1SR139-400	
	D422	VM976500	DIODE.ZENR	HZS302TD 30V	
	D601	VU264200	DIODE	1SR139-400	
	D602	VU264200	DIODE	1SR139-400	
	D603	VU264200	DIODE	1SR139-400	
	D604	VU264200	DIODE	1SR139-400	
	D605	VP642500	DIODE.ZENR	HZS6A3 6.0V	
* ⚠	F400	KB000660	FUSE	400mA 250V	ABG
⚠	F400	VS822300	FUSE	1.25A 125V	UCRT
⚠	F401	VT942900	FUSE	TH2.5A 250V	G
* ⚠	F402	KB000660	FUSE	400mA 250V	RT
	F600	KB001660	FUSE	T1.6A 250V	ABG
	F600	VS822400	FUSE	1.6A	UCRT
	G601	VR463400	TERM.GND	D3.5	
	G602	VR463400	TERM.GND	D3.5	
	G603	VR463400	TERM.GND	D3.5	
	HS401	V2984900	HEAT.SINK	PUH16-25	RT
	HS601	Vi835500	HEAT.SINK	PH-0124S-B	
	HS602	V6792900	HEAT.SINK	MES1525S	
⚠	IC402	XJ603A00	IC	NJM78M15FA	
⚠	IC403	XG505A00	IC	NJM79M15FA	
	IC601	XQ667A00	IC	M5237L	
	L401	V2604200	COIL	1uH	
	L402	V2604200	COIL	1uH	
	PJ401	VV306800	JACK.PIN	1P	
	PN401	V3750200	PIN	L=70	
	PN601	V3750200	PIN	L=70	
	Q401	iC287820	TR	2SC2878 A,B	
	Q402	iC287820	TR	2SC2878 A,B	
⚠	Q403	VP883000	TR	2SA893A D,E	
⚠	Q404	VP883000	TR	2SA893A D,E	
	Q405	VC218900	TR	2SC3330 R,S,T	
	Q406	VC218700	TR	2SA1317 R,S,T	
	Q407	VC218900	TR	2SC3330 R,S,T	
⚠	Q408	VP883000	TR	2SA893A D,E	
⚠	Q409	VP883000	TR	2SA893A D,E	
⚠	Q410	VR325600	TR	2SC2229 O,Y	
⚠	Q411	VR325600	TR	2SC2229 O,Y	
⚠	Q412	iC174020	TR	2SC1740S R,S	
⚠	Q413	iC174020	TR	2SC1740S R,S	
⚠	Q414	VP872700	TR	2SC4488 S,T	
⚠	Q415	VP872600	TR	2SA1708 S,T	
⚠	Q416	VP872600	TR	2SA1708 S,T	
⚠	Q417	VP872700	TR	2SC4488 S,T	
	Q418	iC1815I0	TR	2SC1815 Y	
	Q420	iC224030	TR	2SC2240 GR,BL	
* ⚠	Q421A	iX633320	TR	2SA1693 O,P,Y	

	Schm Ref.	PART NO.	Description		Markets
* ⚠	Q421C	iX633330	TR	2SC4466 O,P,Y	
* ⚠	Q422A	iX633320	TR	2SA1693 O,P,Y	
* ⚠	Q422C	iX633330	TR	2SC4466 O,P,Y	
	Q425	iC1815I0	TR	2SC1815 Y	
	Q426	VR510800	TR	2SD2396 J,K	RT
	Q427	iA097030	TR	2SA970 GR,BL	
	Q428	iA097030	TR	2SA970 GR,BL	
	Q429	VP883100	TR	2SC1890A D,E	
⚠	Q430	VP883100	TR	2SC1890A D,E	
⚠	Q431	iC1815I0	TR	2SC1815 Y	
	Q433	iC224030	TR	2SC2240 GR,BL	
	Q434	iC224030	TR	2SC2240 GR,BL	
	Q436	iC287820	TR	2SC2878 A,B	
	Q437	iC287820	TR	2SC2878 A,B	
⚠	Q438	VP872600	TR	2SA1708 S,T	
	Q601	VS883300	TR	2SB1565 E,F	
	Q602	VR510800	TR	2SD2396 J,K	
	R432	HV756330	R.CAR.FP	3.3KΩ 1/4W	
	R433	HV756330	R.CAR.FP	3.3KΩ 1/4W	
⚠	R434	HV754470	R.CAR.FP	47Ω 1/4W	
⚠	R435	HV754470	R.CAR.FP	47Ω 1/4W	
	R436	HV756330	R.CAR.FP	3.3KΩ 1/4W	
	R437	HV756330	R.CAR.FP	3.3KΩ 1/4W	
⚠	R439	HV756270	R.CAR.FP	2.7KΩ 1/4W	
	R440	HV755220	R.CAR.FP	220Ω 1/4W	
⚠	R441	HV756100	R.CAR.FP	1KΩ 1/4W	
⚠	R442	HV756100	R.CAR.FP	1KΩ 1/4W	
	R443	HV755220	R.CAR.FP	220Ω 1/4W	
⚠	R444	HV756270	R.CAR.FP	2.7KΩ 1/4W	
⚠	R445	HV754470	R.CAR.FP	47Ω 1/4W	
⚠	R446	HV755680	R.CAR.FP	680Ω 1/4W	
⚠	R447	HV755680	R.CAR.FP	680Ω 1/4W	
⚠	R450	HV755330	R.CAR.FP	330Ω 1/4W	
⚠	R451	HV755330	R.CAR.FP	330Ω 1/4W	
⚠	R453	HV753470	R.CAR.FP	4.7Ω 1/4W	
⚠	R454	HV753470	R.CAR.FP	4.7Ω 1/4W	
⚠	R456	HV753470	R.CAR.FP	4.7Ω 1/4W	
⚠	R457	HV753470	R.CAR.FP	4.7Ω 1/4W	
⚠	R460	VU981700	R.MTL.PLAT	0.22Ω+0.22 3W	
⚠	R461	VU981700	R.MTL.PLAT	0.22Ω+0.22 3W	
	R476	VP940700	R.MTL.OXD	330Ω 1W	
	R477	VP940700	R.MTL.OXD	330Ω 1W	
	R479	HV757150	R.CAR.FP	15KΩ 1/4W	RT
⚠	R481	HV754100	R.CAR.FP	10Ω 1/4W	
⚠	R482	HV754100	R.CAR.FP	10Ω 1/4W	
⚠	R485	HV753100	R.CAR.FP	1Ω 1/4W	
⚠	R491	HV753100	R.CAR.FP	1Ω 1/4W	
	R496	HV754100	R.CAR.FP	10Ω 1/4W	
	R498	HV754100	R.CAR.FP	10Ω 1/4W	
⚠	R512	VY716000	R.MTL.OXD	270Ω 1W	
⚠	R513	VY716000	R.MTL.OXD	270Ω 1W	
	R521	HV757100	R.CAR.FP	10KΩ 1/4W	
⚠	R522	HV753470	R.CAR.FP	4.7Ω 1/4W	
	R604	Vi868300	R.FUS	0.68Ω 1/6W	
	R605	HV756220	R.CAR.FP	2.2KΩ 1/4W	
	RY401	V2712300	RELAY	DC SDT-S-112LMR	
⚠	RY402	V6322600	RELAY	DC DH24D2-0T(M)-SL	
	ST401	V4040500	SCR.TERM	M3	
	SW401	V7182300	VOLT.SELCT	R8140213	RT
	T401	XV443A00	TRANS.PWR		UC
	T401	XV444A00	TRANS.PWR		RT
	T401	XV445A00	TRANS.PWR		ABG
	TE401	VV537800	OUTLET.AC	1P	UC

* New Parts

* New Parts

P.C.B. MAIN & Chip Resistors

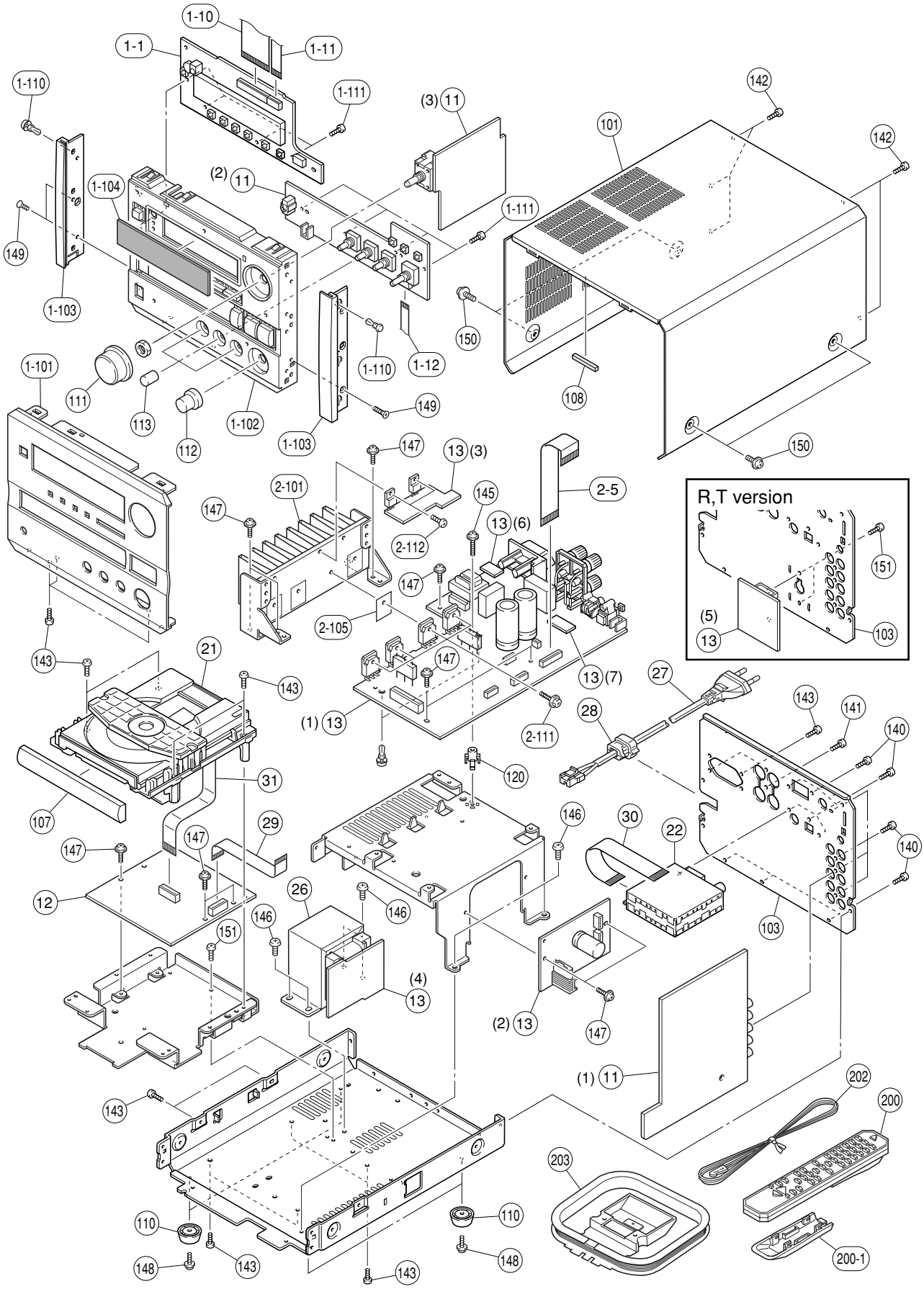
Schm Ref.	PART NO.	Description		Markets	
TE401	V5867400	OUTLET.AC	2P AC-182-GB-11V	RT	
TE401	VT915000	OUTLET.AC	2P	A	
TE401	VU543300	OUTLET.AC	1P	B	
TE401	VV537400	OUTLET.AC	1P	G	
TE402	VY696300	TERM.SP	4P	UCRT	*
TE402	VY696400	TERM.SP	4P	ABG	
U401	VT707200	L.EMIT	TOTX178		
	EP600830	SCR.BND.HD	3x8 MFC2BL		

* New Parts

Schm Ref.	PART NO.	Description			Markets	
	RD354470	R.CAR.CHP	47Ω	1/16W		
	RD355100	R.CAR.CHP	100Ω	1/10W		
	RD355220	R.CAR.CHP	220Ω	1/10W		
	RD355270	R.CAR.CHP	270Ω	1/10W		
	RD355300	R.CAR.CHP	300Ω	1/10W		
	RD355390	R.CAR.CHP	390Ω	1/10W		
	RD355470	R.CAR.CHP	470Ω	1/10W		
	RD355680	R.CAR.CHP	680Ω	1/10W		
	RD356100	R.CAR.CHP	1KΩ	1/10W		
	RD356180	R.CAR.CHP	1.8KΩ	1/10W		
	RD356200	R.CAR.CHP	2KΩ	1/10W		
	RD356220	R.CAR.CHP	2.2KΩ	1/10W		
	RD356270	R.CAR.CHP	2.7KΩ	1/10W		
	RD356300	R.CAR.CHP	3KΩ	1/10W		
	RD356390	R.CAR.CHP	3.9KΩ	1/10W		
	RD356470	R.CAR.CHP	4.7KΩ	1/10W		
	RD356510	R.CAR.CHP	5.1KΩ	1/10W		
	RD356560	R.CAR.CHP	5.6KΩ	1/10W		
	RD356680	R.CAR.CHP	6.8KΩ	1/10W		
	RD356750	R.CAR.CHP	7.5KΩ	1/10W		
	RD357100	R.CAR.CHP	10KΩ	1/10W		
	RD357110	R.CAR.CHP	11KΩ	1/10W		
	RD357180	R.CAR.CHP	18KΩ	1/10W		
	RD357220	R.CAR.CHP	22KΩ	1/10W		
	RD357240	R.CAR.CHP	24KΩ	1/10W		
	RD357470	R.CAR.CHP	47KΩ	1/10W		
	RD357510	R.CAR.CHP	51KΩ	1/10W		
	RD357620	R.CAR.CHP	62KΩ	1/10W		
	RD357820	R.CAR.CHP	82KΩ	1/10W		
	RD358100	R.CAR.CHP	100KΩ	1/10W		
	RD358150	R.CAR.CHP	150KΩ	1/10W		
	RD358220	R.CAR.CHP	220KΩ	1/10W		
	RD358270	R.CAR.CHP	270KΩ	1/16W		*
	RD358330	R.CAR.CHP	330KΩ	1/16W		
	RD359100	R.CAR.CHP	1MΩ	1/10W		
	RD359150	R.CAR.CHP	1.5MΩ	1/10W		

* New Parts

■ EXPLODED VIEW



■ MECHANICAL PARTS

	Ref. No.	PART NO.	Description		Remarks	Markets
! *	1-1	V7337500	P.C.B. ASS'Y	GD:OPERATION	GD	
*	1-10	MF128100	FLEXIBLE FLAT CABLE	28P 100mm P=1.25		
*	1-11	MF109300	FLEXIBLE FLAT CABLE	9P 300mm P=1.25		
*	1-12	MF107120	FLEXIBLE FLAT CABLE	7P 120mm P=1.25		
*	1-101	V6761300	FRONT PANEL		GD	UCRTA
*	1-101	V6761800	FRONT PANEL-RDS		GD	BG
*	1-101	V6761100	FRONT PANEL		SI	U
*	1-101	V6761700	FRONT PANEL-RDS		SI	BG
*	1-102	V6762200	SUB PANEL		GD	
*	1-102	V6762100	SUB PANEL		SI	
*	1-103	V6762300	PANEL/SIDE			
*	1-104	V6765300	SHEET			
	1-110	VQ368600	PUSH RIVET	P3555-B		
	1-111	VF617600	PAN HEAD P-TITE SCREW	2.6x8 MFC2BL		
	2-5	MF120100	FLEXIBLE FLAT CABLE	20P 100mm		
*	2-101	V6761900	HEAT SINK			
	2-105	VV849300	SHEET	19x24		
	2-111	VK173200	SCREW, TRANSISTOR	3x15 SP MFC2		
	2-112	EP600250	BIND HEAD B-TITE SCREW	3x8 MFZN2Y		
*	11	V7353800	P.C.B. ASS'Y	INPUT		UC
*	11	V7353900	P.C.B. ASS'Y	INPUT		RT
*	11	V7354000	P.C.B. ASS'Y	INPUT		A
*	11	V7354100	P.C.B. ASS'Y	INPUT		BG
*	12	V7354200	P.C.B. ASS'Y	CD		
*	13	V7335800	P.C.B. ASS'Y	MAIN		UC
*	13	V7335900	P.C.B. ASS'Y	MAIN		RT
*	13	V7336000	P.C.B. ASS'Y	MAIN		A
*	13	V7336100	P.C.B. ASS'Y	MAIN		B
*	13	V7336200	P.C.B. ASS'Y	MAIN		G
	21	VZ573200	CD MECHANISM UNIT	KSL-2130CCM		
	22	V6782300	AM/FM TUNER	TFCE1U115A U,C		UCRT
	22	V6782400	AM/FM TUNER	TFCE1E317A A,B,G		ABG
* ⚠	26	XZ791A00	POWER TRANSFORMER			UC
* ⚠	26	XZ792A00	POWER TRANSFORMER			RT
* ⚠	26	XZ793A00	POWER TRANSFORMER			A
* ⚠	26	XZ794A00	POWER TRANSFORMER			BG
⚠	27	V2363800	POWER CORD ASS'Y			UC
⚠	27	VZ542500	POWER CORD ASS'Y			RT
⚠	27	V2296800	POWER CORD ASS'Y			A
⚠	27	VV437300	POWER CORD ASS'Y			B
⚠	27	VN363700	POWER CORD ASS'Y			G
	28	V2438700	CORD STOPPER	10P1		
	29	MF113180	FLEXIBLE FLAT CABLE	13P 180mm		
	30	MF115140	FLEXIBLE FLAT CABLE	15P 140mm		
*	31	V7256000	CONNECTOR, FLAT CABLE	16P 100mm P=1.00		
*	101	V6766400	TOP COVER		GD	
*	101	V6764900	TOP COVER		SI	
*	103	V6763500	REAR PANEL			UC
*	103	V6763700	REAR PANEL			RT
*	103	V6763800	REAR PANEL			A
*	103	V6763900	REAR PANEL			B
*	103	V6764000	REAR PANEL			G
	107	V3810900	LID, CDX		GD	

* New Parts

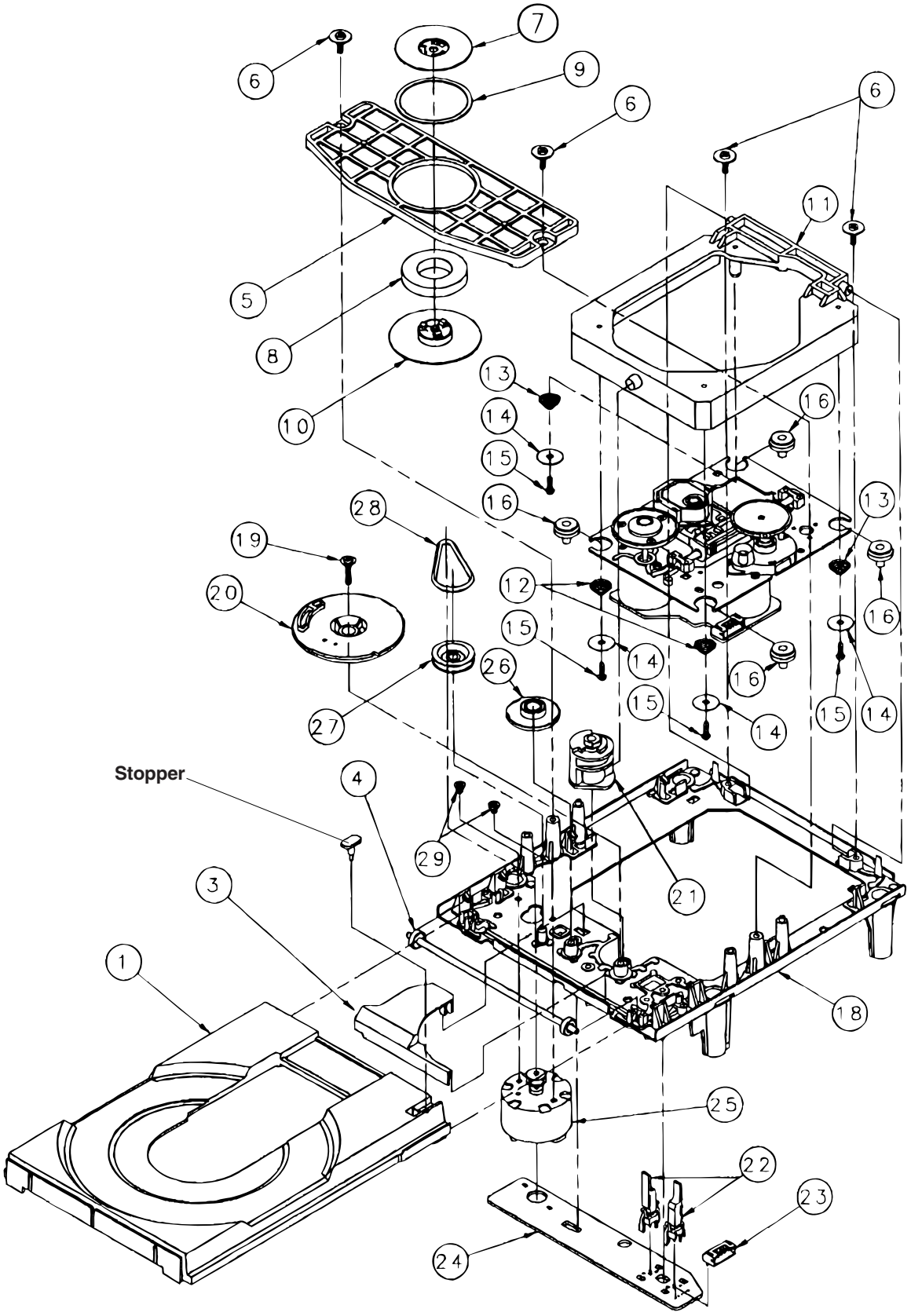
	Ref. No.	PART NO.	Description			Remarks	Markets
	107	V3687200	LID, CDX			SI	
	108	VP857700	DAMPER	4x6x5			
	110	V3688500	LEG	M0080-M0			
	111	V6746300	KNOB	D30		GD	
	111	V6746200	KNOB	D30		SI	
*	112	V6762500	KNOB/D14.5			GD	
*	112	V6762400	KNOB/D14.5			SI	
	113	V3811300	KNOB	D10		GD	
	113	V3687800	KNOB	D10		SI	
	120	VR264400	SPACER	H8			
	140	VN413300	BIND HEAD BONDING B-T. SCREW	3x8	MFZN2BL		
	141	VY731200	BONDING HEAD TAPPING SCREW	3x10	MFNI33		
	142	EP600830	BIND HEAD B-TITE SCREW	3x8	MFC2BL		
	143	EP600250	BIND HEAD B-TITE SCREW	3x8	MFZN2Y		
	145	VT669400	PW HEAD B-TITE SCREW	3x15-8	MFC2		
	146	V2728500	BIND HEAD S-TITE SCREW	4x7	MFZN2BL		
	147	VT669300	PW HEAD B-TITE SCREW	3x8-8	MFC2		
	148	EL300650	PW HEAD B-TITE SCREW	3x8-8	MFCR3BL		
	149	EP600790	FLAT HEAD B-TITE SCREW	3x8	MFZN2BL		
	150	VY712800	PW HEAD B-TITE SCREW	3x8-8	MFNI33		
	151	EP630210	BIND HEAD S-TITE SCREW	3x6	MFZN2BL		
		V3688300	SHEET. FL	SI		SI	
			ACCESSORIES				
! *	200	V6804000	REMOTE CONTROL TRANSMITTER	CRX-E200/E150		RC-7060-01-0018	UCRAT
*	200	V6804100	REMOTE CONTROL TRANSMITTER	CRX-E200/E150 RDS		RC-7060-01-0019	BG
	200-1	AAX13340	LID	BLJYE 60050001		60050001	
	202	V6267000	ANTENNA, FM	1.4m 1pc			UCRT
	202	VQ147100	ANTENNA, FM	1.4m 1pc			ABG
	203	VR248500	ANTENNA, AM LOOP	1.0m 1pc			
			BATTERY, MANGANESE	SUM-3,AA,R06			

* New Parts

! : Note on the Operation P.C.B.

Of the Operation PCB part Nos., only the gold (GD) type part Nos. are included in the table.
The only different part between the silver (SI) and gold (GD) type parts is the sheet/FL that is attached to the fluorescent character display tube. When a SI type Operation PCB becomes necessary, order a GD type Operation PCB and a SI type sheet/FL (V3688300) and replace the sheet/FL of the GD type Operation PCB with the SI type sheet/FL.

■ EXPLODED VIEW (CD Mechanism Unit)



* The stopper is not supplied with the tray as a spare part.
When replacing the tray, keep the removed stopper and reuse it.
Should it be lost and a new one be necessary, order service part ⑱ Main Chassis (S) and remove the stopper only from it and use it as a spare part.

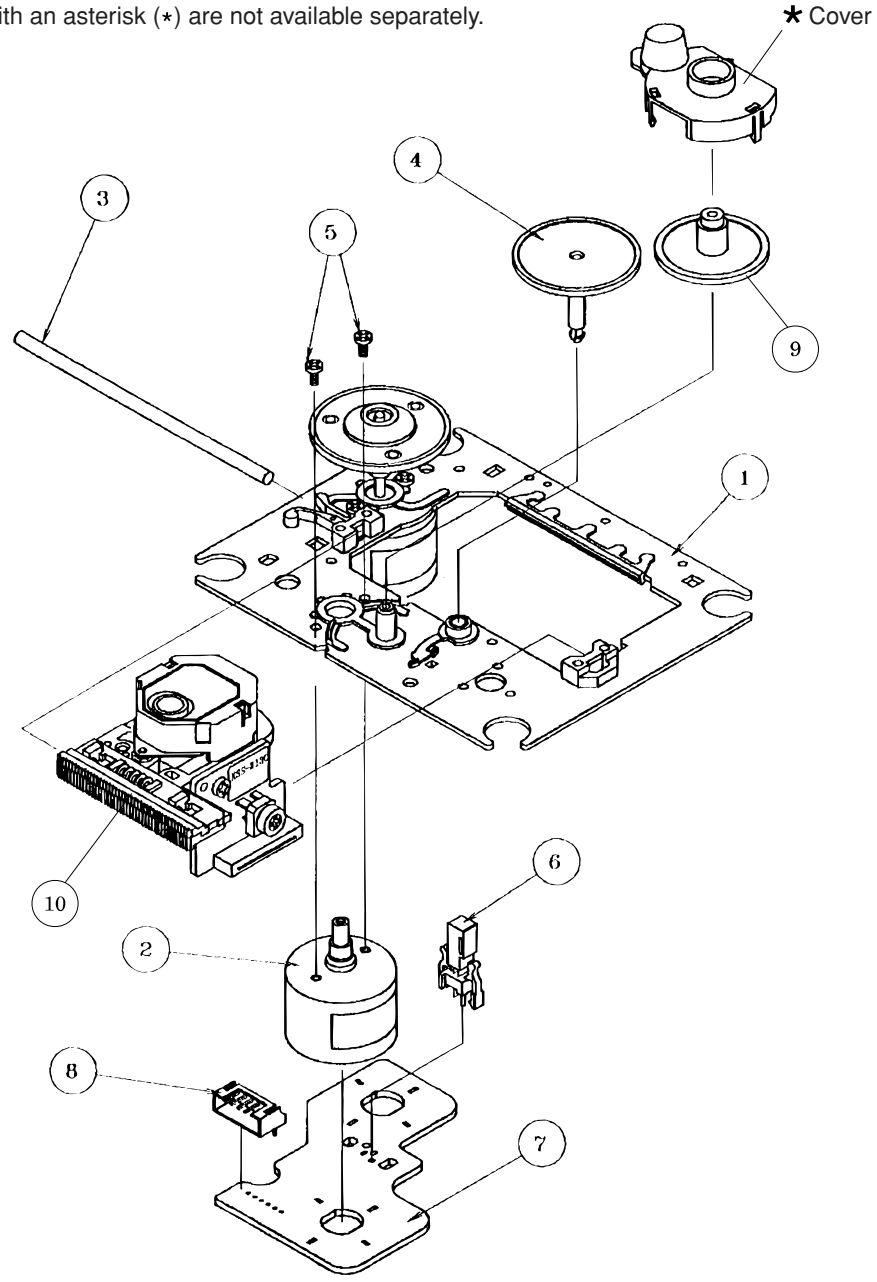
■ MECHANICAL PARTS (CD Mechanism Unit)

Ref. No.	PART NO.	Description		Remarks	Markets
	VZ573200	CD MECHANISM UNIT	KSL-2130CCM		
1	CX680620	TRAY (C)	2130	264629001	
3	CX675250	GEAR COVER (S)		262554401	
4	CX675210	TRAY GEAR (S)		262553501	
5	AX619150	CHUCKING PLATE (S)		262554601	
6	EX602890	BW HEAD P-TITE SCREW	2.6x7	262629401	
7	BX602660	CHUCKING YOKE (S)		262553701	
8	NX610570	MAGNET ASS'Y		145249321	
9	CX675240	DAMPER (S)		262554102	
10	NX636010	CHUCKING PULLEY		264629101	
11	AX624650	SUB CHASSIS ASS'Y (S)		264628801	
12	AX624640	COIL, SPRING (F)		264723601	
13	AX624630	COIL, SPRING (R)		262723501	
14	AX624660	WASHER	2130	264628901	
15	EX604270	P-TITE SCREW	2.6x10	768513511	
16	AX624620	INSULATOR		262723401	
18	AX619160	MAIN CHASSIS (S),OUTSERT		262555206	
19	VH554700	BW HEAD P-TITE SCREW	2.6x16	331950151	
20	CX675270	DRIVE GEAR (S)		262554701	
21	CX675260	CONTROL CAM (S)		262554504	
22	KX604780	LEAF SWITCH		169266711	
23	LX608390	CONNECTOR PIN	5P	156472111	
24	NX613050	PWB,LOADING (S)		164052311	
25	JX601470	LOADING MOTOR ASS'Y		X26251171	
26	CX675200	CENTER GEAR (S)		262527402	
27	CX675220	LOADING PULLEY (S)		262553602	
28	CX610840	BELT,LOADING MOTOR		365338700	
29	EX602880	SCREW	2.6x2.5	262527901	

* New Parts

■ EXPLODED VIEW (Drive Unit)

Note: The parts marked with an asterisk (*) are not available separately.

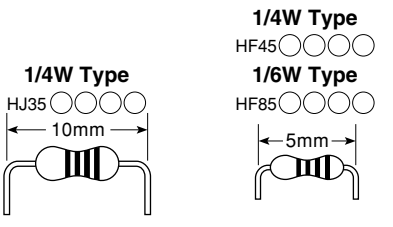


Ref. No.	PART NO.	Description		Remarks	Markets
⚠ 1	NX635420	MOTOR CHASSIS ASS'Y	(MB)	X26258771	
2	CX679710	MOTOR GEAR ASS'Y		X26257691	
3	AX623980	SLED SHAFT		262690801	
4	CX679720	GEAR,A (S)		262690701	
5	EA020036	PAN HEAD SCREW	2x3 MFZN2Y	762125515	
6	KX604660	LEAF SWITCH		157208511	
7	NX613040	PWB,MOTOR	MOTOR 6P	163967812	
8	LX610120	CONNECTOR PIN	6P	156472211	
9	CX680030	GEAR		262700301	
10	NX636020	OPTICAL HEAD		KSM213C	

※ New Parts

Parts List for Carbon Resistors

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



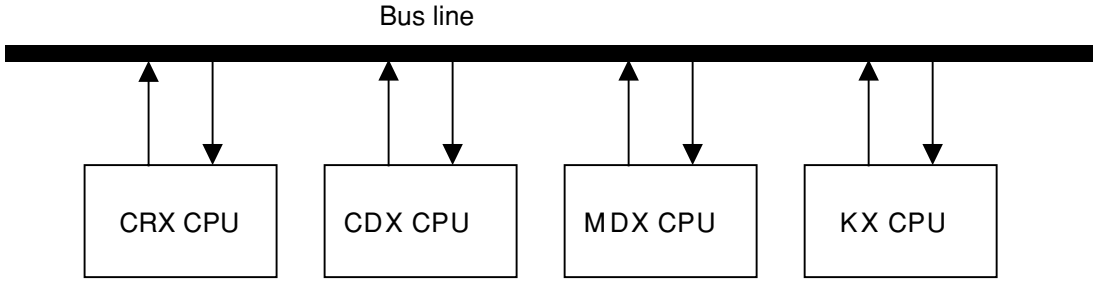
※ : Not available

SYSTEM CONTROL

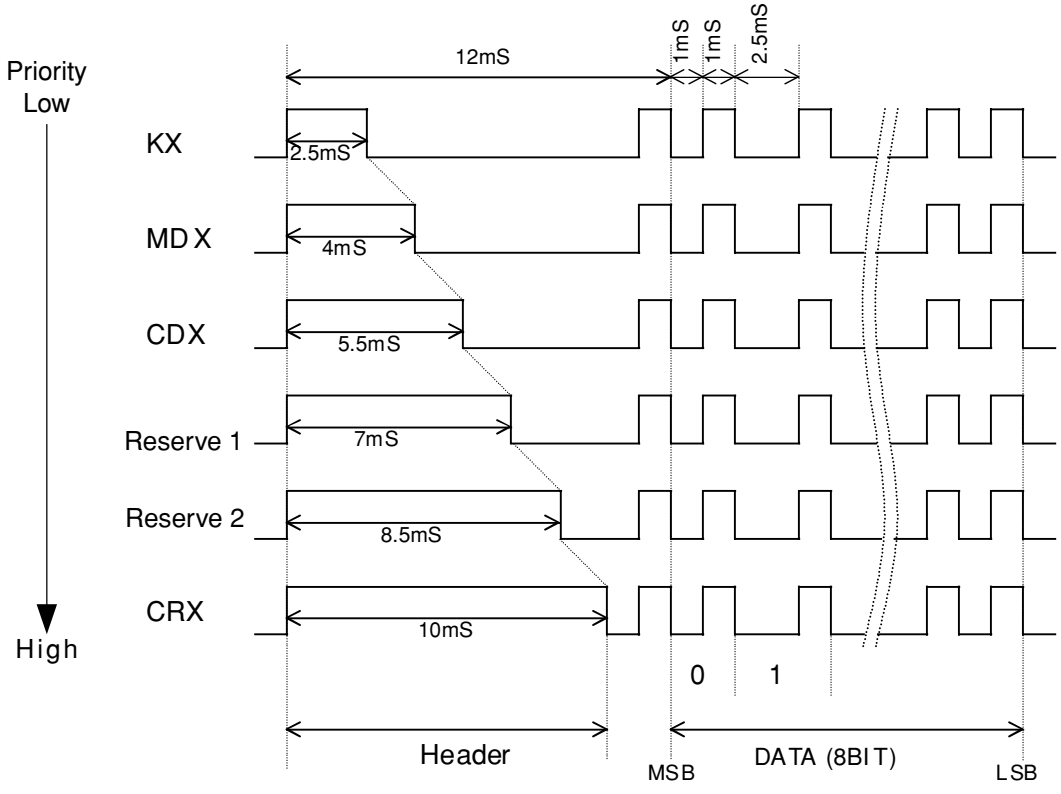
Features

- One bus line controls all the units.
- Units are connected in series, using monaural mini jacks.
- Units can be connected in any order

Description of Operation

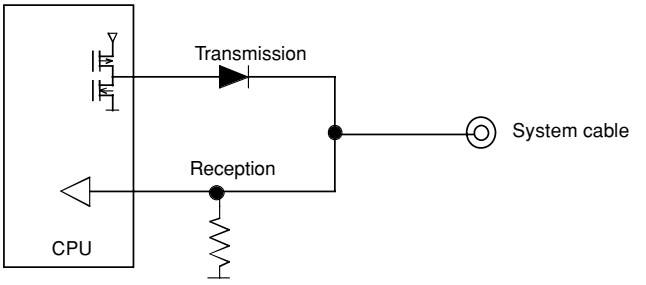


Serial Data Format



Note) When transmitting a data following the previous data, leave at least 2mS space between them. (at least 4mS only when transmitting the CD text data)

Microprocessor peripheral circuit

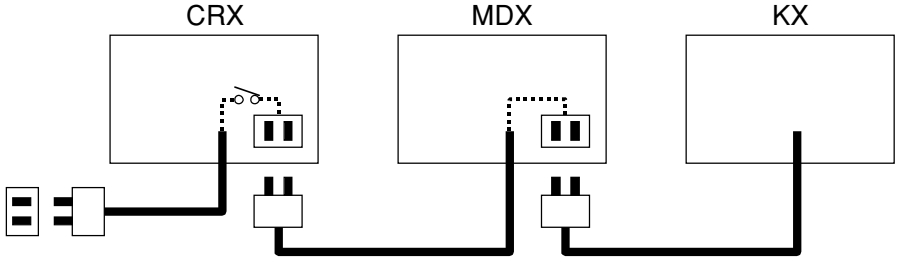


Description of data transmission and reception

① Although there is only 1 bus line, prepare special ports for data transmission and reception at each CPU.
② The bus data consists of a header and data (8 bits). CPU receives and transmits at a 0.5mS or less timer interruption.
③ The header is used to identify the model and to prevent butting by changing the length for each unit.
④ At each CPU, data transmission and reception are carried out independently. Before transmitting the data, be sure to check the reception status. If the data is being received, wait until the data has been received and then transmit the data.
⑤ When the data transmission is completed, each CPU also checks the received data. If the header of the received data does not agree with its own head, the data may have been overlapped by that of the other model. In such case, stop the data transmission and restart it after confirming that the the data transmission of other model has been completed. This means that the unit with a longer header has a higher priority.

Description of main system operation

1) POWER ON/OFF processing [(1) to (4)]



• The power cord of each unit is connected to the AC outlet in series and switched on and off through the CRX relay.
• Turning off the CRX power switch will turn off the power to other units (primary connection) but turning off the power switch of any other unit will turn off the secondary connection of each unit only (i.e., the microprocessor remains on).
• Each unit has a backup function to save the secondary connection status when unplugged (taking use of a unit alone into consideration)
• The indicators of units are turned on after a dimmer level signal is fed from CRX so that they light up simultaneously when the CRX power switch is turned on. However, as the indicator of a unit does not light up when the unit is used alone in this setting, the indicator is forced to turn on when 2 seconds have elapsed without a dimmer level signal being fed (and the power for the backup function is turned on).
• Make sure that the power off processing of each unit has been completed before turning off the power by using the CRX relay.

2) FUNCTION [(5) to (6)]
• No source other than that selected by the input selector will be reproduced.
• The functions are selected automatically to be suitable for the source to be reproduced.
• Selecting the functions is prohibited during recording.

3) TIMER operation [(7) to (8)]
• TIMER PLAY to start reproduction at a specified time
• TIMER REC to start recocording at a specified time

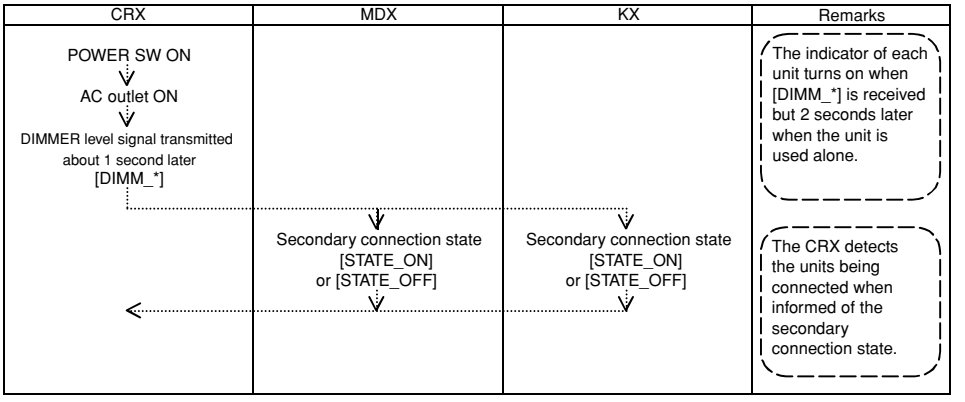
4) AUTO POWER ON [(9)]
If the power of the connected units has been turned off while the CRX power is on and when a key involving reproduction is pressed, the power is turned on automatically.

5) CD TEXT compatible
When recording the contents of the CD TEXT compatible CD into an MD in the SYNCHRONOUS or EDIT mode, the text data is recorded as well although limited up to 127 characters of the track name only for SYNCHRONOUS recording, and names of the disc, artist and track for EDIT recording.

6) Dimmer
There are 7 dimmer level settings. The dimmer level data is transmmitted from the CRX when the power is turned on. The dimmer level is “0” when a unit is used alone.

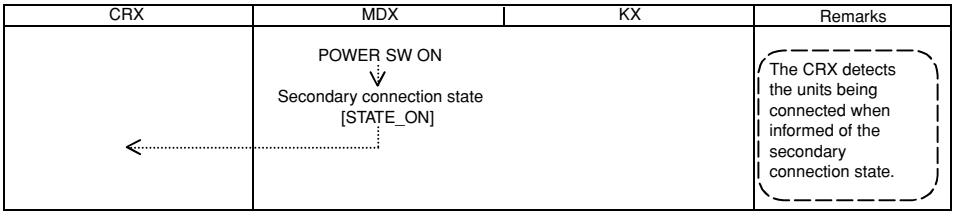
(1) POWER ON PROCESSING (CRX)

When the power is turned on at the CRX, the relay of the AC outlet is turned on to supply power to each unit.
Each unit informs the CRX of its status when started (secondary connection status).



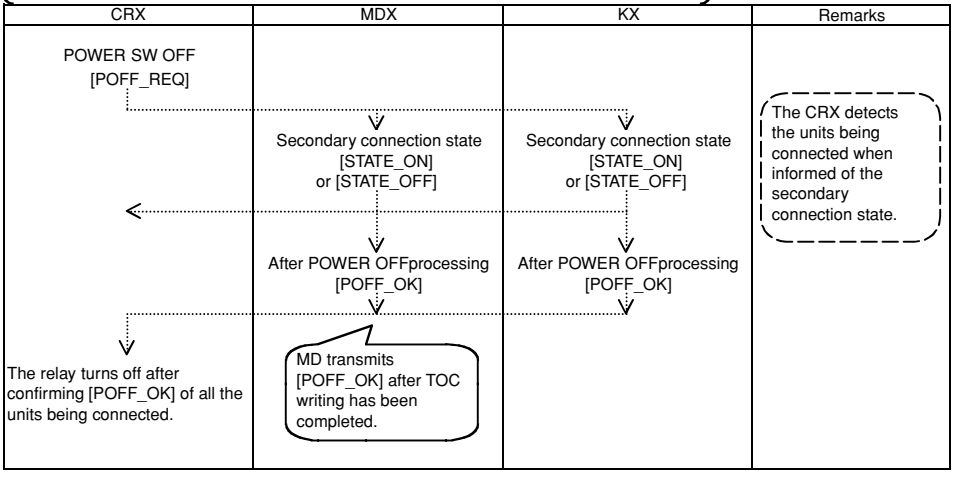
(2) POWER ON PROCESSING (except CRX)

When the power is turned on at a unit other than the CRX, the unit informs the CRX of the status then.



(3) POWER OFF PROCESSING (CRX)

The CRX turns off the AC outlet when the power off processing of each unit has been completed.



(4) POWER OFF processing (except CRX)

When the power is turned off at a unit other than the CRX, the unit informs the CRX of the status when the power off processing has been completed.

CRX	MDX	KX	Remarks
	POWER OFF ↓ After POWER OFF processing Secondary connection state [STATE_OFF]		The CRX detects the units being connected when informed of the secondary connection state.
←			

(5) FUNCTION selection

When the CRX function is selected, the unit in the PLAY mode will be stopped.

CRX	MDX	KX	Remarks
FUNCTION selection [FUNC_CD] or [FUNC_MD] or [FUNC_TAPE] or [FUNC_TU] or [FUNC_AUX]			When MD or TAPE is in RECORD mode, or in EDIT mode, it is prohibited to select functions.
↓	↓	↓	
	Stop when FUNC≠ MD and in PLAY mode [STOP]	Stop when FUNC≠ TAPE and in PLAY mede [STOP]	
←	←	←	

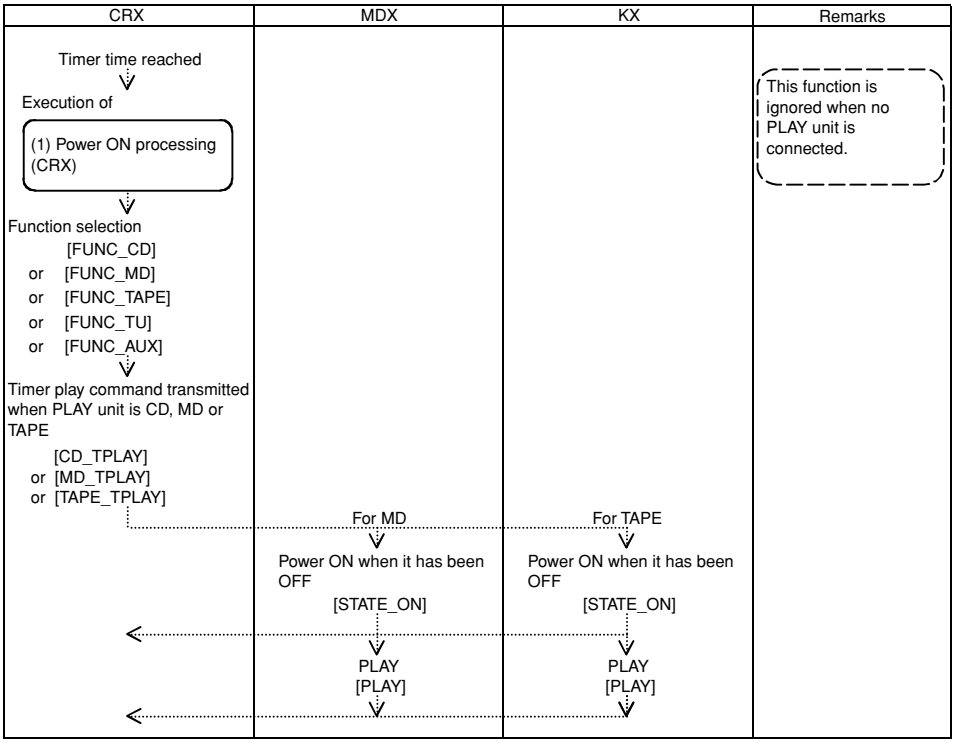
(6) AUTO FUNCTION

When each unit is set to the PLAY mode, the CRX selects the function to be suitable for that.

CRX	MDX	KX	Remarks
	PLAY START [PLAY]	PLAY START [PLAY]	
↓	↓	↓	
When FUNC≠ PLAY FUNCTION selection [FUNC_CD] or [FUNC_MD] or [FUNC_TAPE] or [FUNC_TU] or [FUNC_AUX]			Same function as (5) FUNCTION selection.
↓	↓	↓	
	Stop when FUNC≠ MD and in PLAY mode [STOP]	Stop when FUNC≠ TAPE and in PLAY mode [STOP]	
←	←	←	

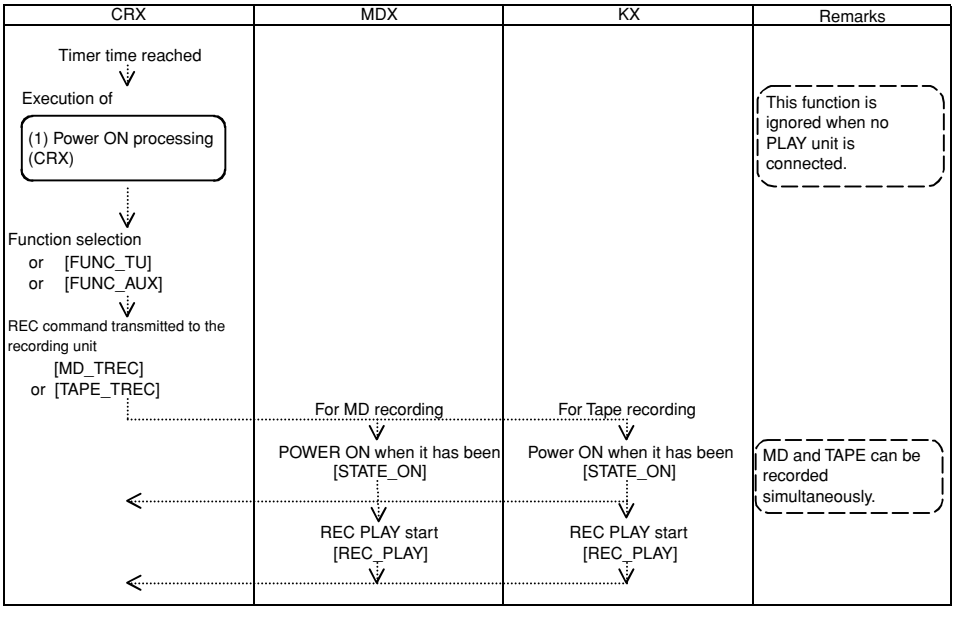
(7) TIMER PLAY

Timer play by built-in timer



(8) TIMER REC

Timer recording by built-in timer



(9) AUTO POWER ON

Function to turn ON the power without using the power switch on the unit other than the CRX

CRX	MDX	KX	Remarks
	Auto power ON applicable key input ↓ When in the power OFF state Secondary connection state [STATE_ON] ↓ Operation according to the input key	Auto power ON applicable key input ↓ When in the power OFF state Secondary connection state [STATE_ON] ↓ Operation according to the input key	

System Control Bus Data Table

FUNCTION		CRX	CODE	MDX	CODE	KX	CODE
Secondary connection ON				STATE_ON	01	STATE_ON	01
Secondary cary connection OFF				STATE_OFF	02	STATE_OFF	02
Power OFF request		POFF_REQ	D0				
End of power OFF processing				POFF_OK	03	POFF_OK	03
STATE request		STATE_REQ	D1				
Auto power OFF request				APOFF_REQ	04	APOFF_REQ	04
Auto power OFF cancel				APOFF_CL	05	APOFF_CL	05
Timer operation	Timer PLAY request(CD)	CD_TPLAY	D2				
	Timer PLAY request(MD)	MD_TPLAY	D3				
	Timer PLAY request(TAPE)	TAPE_TPLAY	D4				
	Timer REC request(MD)	MD_TREC	D5				
	Timer REC request(TAPE)	TAPE_TREC	D6				
FUNCTION selection		FUNC_CD	D7				
		FUNC_MD	D8				
		FUNC_TAPE	D9				
		FUNC_TU	DA				
		FUNC_AUX	DB				
PLAY operation				PLAY	06	PLAY	06
STOP operation				STOP	07	STOP	07
PAUSE				PAUSE	08		
REC PAUSE operation				REC_PAUSE	09	REC_PAUSE	09
REC PLAY operation				REC_PLAY	0A	REC_PLAY	0A
Dimmer level	0	DIMM_0	E0				
	-1	DIMM_1	E1				
	-2	DIMM_2	E2				
	-3	DIMM_3	E3				
	-4	DIMM_4	E4				
	-5	DIMM_5	E5				
	-6	DIMM_6	E6				
EDIT related operation	EDIT mode	EDIT C→T	EA				
		EDIT(TR1) C→T	EB				
		EDIT C→M	EC				
		EDIT(TR1) C→M	ED				
		EDIT M→T	EE				
		EDIT T→M	EF				
	Track no change			TNO_CHG	0B		
	"A" side tape end					TAPE_END	0B
	CD open wait						
CD text related operation	Disc name end						
	Disc name end						
	Artist name start						
	Artist name end						
	Track name start						
	Track name end						
	Text data protect						
	Reception OK			GET_OK	0C		
	Reception NG			GET_NG	0D		
	Text data						
	Number of characters(0 to127)						

Function		CRX	CODE	MDX	CODE	KX	CODE
Remote control	CD	CD_STOP	80				
		CD_PLAY/PAUSE	81				
		CD_EJECT	82				
		CD_SKIP+	83				
		CD_SKIP-	84				
		SEARCH+	85				
		SEARCH-	86				
		SEACH_END	87				
		CD_RANDOM	88				
		CD_TIME	89				
		CD_PRG	8A				
		CD_RPT	8B				
		TAPE	8C				
		PEAK SEARCH	8D				
		CD_0	90				
		CD_1	91				
		CD_2	92				
		CD_3	93				
		CD_4	94				
		CD_5	95				
		CD_6	96				
		CD_7	97				
		CD_8	98				
		CD_9	99				
		CD_10	9A				
	MD	MD_STOP	A0				
		MD_PLAY/PAUSE	A1				
		MD_EJECT	A2				
		MD_SKIP+	A3				
		MD_SKIP-	A4				
		SEARCH+	A5				
		SEARCH-	A6				
		SEACH_END	A7				
		MD_RANDOM	A8				
		MD_TIME	A9				
		MD_PRG	AA				
		MD_RPT	AB				
		MD_REC PAUSE	AC				
		MD_0	B0				
		MD_1	B1				
		MD_2	B2				
		MD_3	B3				
		MD_4	B4				
		MD_5	B5				
		MD_6	B6				
		MD_7	B7				
		MD_8	B8				
		MD_9	B9				
		MD_10	BA				
		MD_+100	BB				
	TAPE	TAPE_STOP	C0				
		TAPE_PLAY	C1				
		TAPE_EJECT	C2				
		TAPE_FF	C3				
		TAPE_REW	C4				
		TAPE_PAUSE	C5				
		TAPE_DIR	C6				

Reception status of operation switches during recording

(*=AUX or TUNER)

Unit	SW	EDIT or EDIT(TR-1) RECORDING				SYNCHRONOUS or MANUAL RECORDING							
		C→T	C→M	M→T	T→M	C→T	C→M	M→T	T→M	C→T,M	*→M	*→T	*→T,M
CRX	POWER	O	O	O	O	O	O	O	O	O	O	O	O
	FUNCTION	X	X	X	X	X	X	X	X	X	X	X	X
CD	POWER	O	O	O	O	O	O	O	O	O	O	O	O
	EJECT	X	X	O	O	O	O	O	O	O	O	O	O
	PLAY	X	X	X	X	O	O	X	X	O	X	X	X
	STOP	O	O	X	X	O	O	X	X	O	X	X	X
	SKIP	X	X	X	X	O	O	X	X	O	X	X	X
	SEARCH	X	X	X	X	O	O	X	X	O	X	X	X
MD	POWER	O	O	O	O	O	O	O	O	O	O	O	O
	EJECT	O	X	X	X	O	O	O	O	O	O	O	O
	PLAY	X	X	X	X	X	X	O	X	X	X	X	X
	STOP	X	O	O	O	X	O	O	O	O	O	X	O
	SKIP	X	X	X	X	X	X	O	X	X	X	X	X
	SEARCH	X	X	X	X	X	X	O	X	X	X	X	X
	REC	X	X	X	X	X	O	X	O	O	O	X	O
TAPE	POWER	O	O	O	O	O	O	O	O	O	O	O	O
	EJECT	X	O	X	X	O	O	O	O	O	O	O	O
	PLAY	X	X	X	X	X	X	X	O	X	X	X	X
	STOP	O	O	O	O	O	O	O	O	O	O	O	O
	FF/REW	X	O	X	X	O	O	O	O	O	O	O	O
	REC	X	X	X	X	O	X	O	X	O	X	O	O

Principle of switch rec operation reception

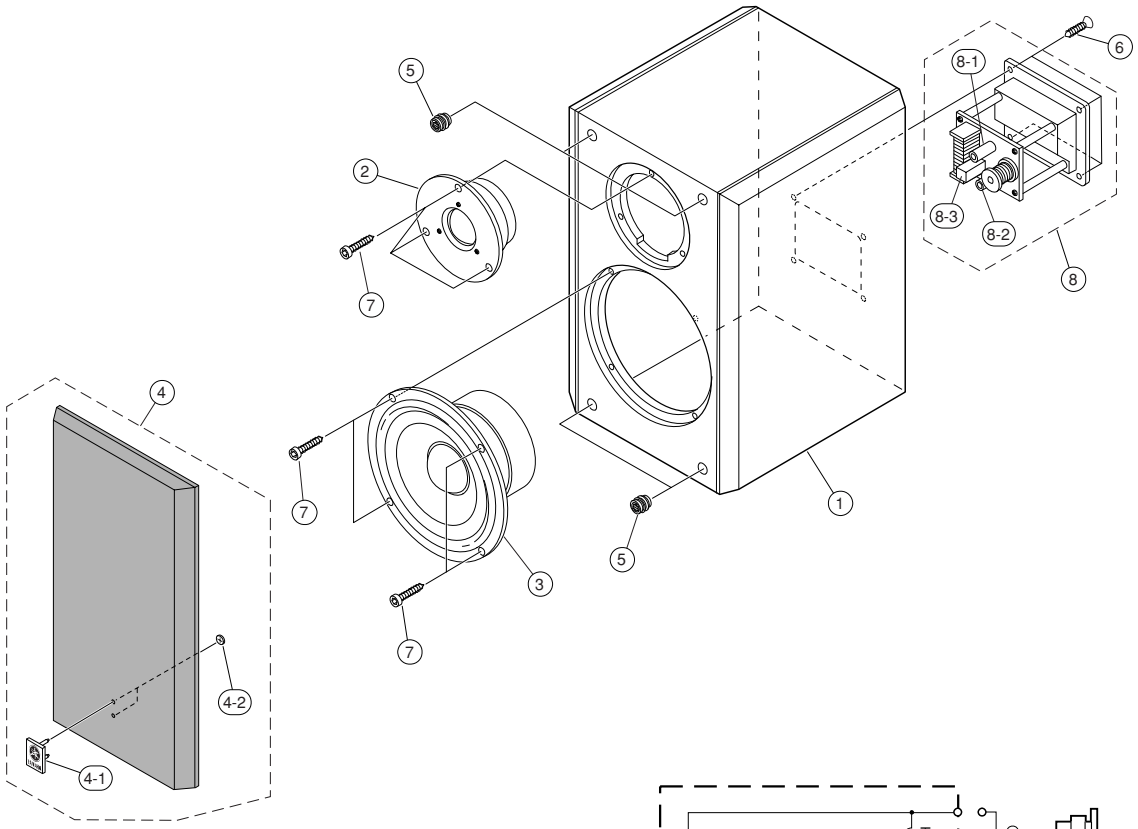
- The POWER SW has priority regardless of any other conditions.
- During EDIT recording, no switch operation other than discontinuing the EDIT function (STOP SW of recording and reproduction units) is received. However, if it is clear that the switch operation would not affect the EDIT function, it will be accepted.
- During SYNCHRONOUS or MANUAL recording, the switch operation of the recording and reproduction units is accepted but switch operation of other units that would affect recording are not accepted.

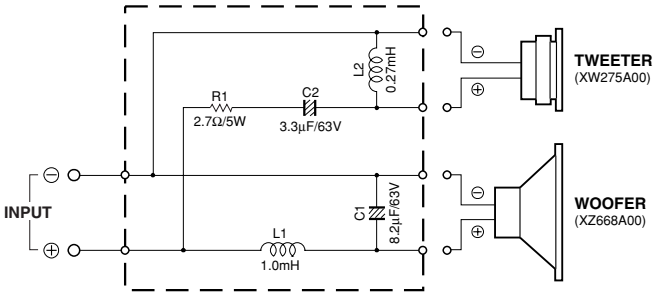
AUTO POWER ON RECEPTION SW

(This switch can turn on the power instead of the POWER SW when the secondary switch has been turned off.)

Unit	SW
CD	EJECT
	PLAY
MD	EJECT
	PLAY
TAPE	EJECT
	PLAY

NX-E150





	Ref. No.	PART NO.	Description		Remarks	Markets
*	1	AAX24090	CABINET ASS'Y	BL	001 00000010	
*	1	AAX27870	CABINET ASS'Y	CH	001 00000012	
	2	XW275A00	DRIVER	2.5cm 5Ω	XR02502701	
*	3	XZ668A00	DRIVER	11.5cm 6Ω	007 C08154BQ	
*	4	AAX24100	FRONT GRILLE ASS'Y		073 00100001	
	4-1	V2192200	EMBLEM			
	4-2	VP161000	PUSH NUT	SPN1.5		
*	5	AAX24170	HOLDER		054 00100011	
	6	EM030180	FLAT HEAD TAPPING SCREW	3.5x20 MFZN2BL	7002792002	
*	7	AAX24140	HEXAGON SOCKET TAPPING SCREW	4x25 MFZN2BL	025 00540250	
*	8	AAX24150	NETWORK ASS'Y		011 07205116	
*	8-1	AAX24130	CAPACITOR	8.2uF 63V	013 08210010	
*	8-2	AAX24120	CAPACITOR	3.3uF 63V	013 03310001	
*	8-3	AAX24180	RESISTOR	2.7Ω 5W	015 02700501	
			ACCESSORIES			
		AAX07730	SPEAKER CORD ASS'Y	4.0m 2pcs/set	6200038201	

* New Parts