Service Manual

DVD-10s

DVD Player

CONTENTS

For Schematic Diagrams and Mounting Diagrams, see the separate volume.

Nakamichi

1. GENERAL

1.1. Product Code

V676

1.2. Destinations

AUS, CAN, CH, DA, EP, HK, JPN, KR, OTR, TW, UK, USA

Black version: USA, CAN, JPN, EP, DA, UK, AUS
Champagne Gold version:
OTR, HK, CH, TW, KR

Abbreviations

AUS	— Australia	CAN	— Canada
CH	— China	DA	— South America
EP	— Europe	HK	— Hong Kong
JPN	— Japan	KR	— Korea
OTR	— Other	TW	— Taiwan
UK	— United Kingdom		
USA	— U.S.A.		

1.3. Cautions/Warnings

(1) Product Safety Notice

Parts marked with the symbol ⚠ in the schematic diagram have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer. It is recommended that the unit be operated from a suitable DC supply or batteries during initial check-out procedures.

(2) Leakage Current Check/Resistance Check

Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamp, or if the resistance from chassis to either side of the power cord is less than 240 k ohms, the unit is defective.
WARNING — DO NOT return the unit to the customer until the problem is located and corrected.

1.4. Cautions/Warnings

(1) Protection of Eyes from Laser Beam

To protect eyes from invisible laser beam during servicing, ***DO NOT LOOK AT THE LASER BEAM.***

(2) Laser Caution

CAUTION
Adjusting the knobs, switches, and controls, etc. or taking actions not specified herein may result in a harmful emission of laser beams. This CD Changer must be adjusted and repaired only by qualified service personnel.

OBSERVERA!
Sådana inställningar av rattarna, omkopplarna eller övriga kontrollknappar som inte är beskriva i bruksanvisningen kan resultera i farlig laserutstrålning. Justering eller reparation av denna kompaktskivspelare skall endast utföras av kvalificerad servicepersonal.

OBS!
Indstilling af knapper, omskiftere og øvrige kontrolknapper, som ikke følger den i brugsanvisningen beskrevne måde, kan resultere i farlig laserudstråling. Justering eller reparation af denno CD-afspiller må kun udføres af kvalificeret servicepersonale.

OBS!
Justering av ratt, brytere og kontroller andre enn de som er beskrevet her, kan resultere i farlig laserbestråling. Justering eller reparasjon av denne kompaktdiskspilleren ma bare utføres av kvalifiserte fagfolk.

HUOMAUTUS
Jos nuppeja, kytkimiä ja säätimiä ym, säädetään tai laitetta käytetään toisella tavalla kuin on selostettu, tuloksena saattaa olla vaarallista lasersäteiden vuotoa. CD-soittimen säätö ja korjaus on jätettävä aina asiantuntevan huoltoteknikon tehtäväksi.

ADVERSEL: USYNLIG LASERSTRÅLING VED ÅBNING. UNDGÅ UDSAETTELSE FOR STRÅLING.

VARO!: AVATTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

VARNING — OSYNLIG LASERSTRÅLNING NAR DENNA DEL ÄR ÖPPNAD. BETRAKTA EJ STRÅLEN.

CLASS 1
LASER PRODUCT

THIS COMPACT DISC PLAYER IS CLASSIFIED AS A CLASS 1 LASER PRODUCT.
THE CLASS 1 LASER PRODUCT LABEL IS LOCATED ON THE REAR EXTERIOR.

1.5. Precautions

PRECAUTIONS

Precautions in Repairing:

1. Do not apply excessive pressure on the mechanical parts (moving parts), including the Pickup Block, as extremely high mechanical precision is required in these parts.
2. When soldering the microprocessor and signal processing ICs, use a ceramic soldering iron or a soldering iron whose metal part is grounded since they are not resistant to static electricity.
3. When removing the solder or soldering the laser shorting lands for the Pickup Block, use a ceramic soldering iron or a soldering iron whose metal part is grounded since the laser diode is not resistant to static electricity.

Precautions when handling the Mechanism Block:

1. Do not loosen any screws in the Pickup Block.
2. Do not adjust any screws in the Mechanism Block except for "Tilt Adjust Screws", as they are adjusted precisely at the factory.
3. Replacement of the Pickup Block is impossible. Always replace the Traverse Ass'y when the Pickup Block is needed to be replaced.
4. Do not touch the lens or lens holder of the Pickup Block.
5. The Guide Rails of the Pickup Block are greased. Take care when handing.
6. When you try to slide the Pickup Block, do not press or pull it directly. Always turn the drive gears with your fingers.
7. Be sure that the anti-slipping rubber on the turntable is clean. If there is dust or it is greasy, clean the part with the liquid that contains 50% each of alcohol and water.
8. When removing the Mechanism P.C.B. Ass'y, you need to shortcircuit the laser diode shorting lands beforehand. Follow the instructions shown in "2.6. Mechanism P.C.B. Ass'y" on page 8.

1.6. New/Former Models

There are two types of Models, new ones and former ones, as shown in the following table.

	New Type	Former Type
Serial Nos.	V676.01501 - 01700 V676.02901 - 03400 V676.04801 - 05300 V676.05301 -	V676.01001 - 01500 V676.01701 - 02900 V676.03401 - 04735
Main P.C.B. Ass'y	Main P.C.B. Ass'y (C3) - CB00667A	Main P.C.B. Ass'y (M3) -- Not supplied
Mechanism P.C.B. Ass'y	Mechanism P.C.B. Ass'y (C3) - CB00687A	Mechanism P.C.B. Ass'y (M3) -- Not supplied

Note that the new Main P.C.B. Ass'y and new Mechanism P.C.B. Ass'y are not compatible with the former ones. Further, the former Main P.C.B. Ass'y and former Mechanism P.C.B. Ass'y are not supplied. Therefore, follow the following instructions when replacing the former Main P.C.B. Ass'y or former Mechanism P.C.B. Ass'y.

● How to replace the former type Main P.C.B. Ass'y/Mechanism P.C.B. Ass'y

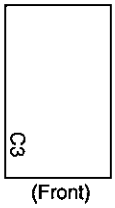
	Main P.C.B. Ass'y		Mechanism P.C.B. Ass'y
When former type **Main P.C.B. Ass'y** is replaced with new type one.	Replace with the new one (CB00667A), since the former type one is not supplied. (Ref. No. 32 on page 16)		Replace with the new one (CB00687A) at the same time. (Ref. No. 31 on page 16) or Change the location of the chip resistor R80 on the former Mechanism P.C.B. Ass'y (M3) as shown in **Fig. 1.1** on the next page.
When former type **Mechanism P.C.B. Ass'y** is replaced with new type one. Choose (1) or (2).	(1) or	Replace with the new one (CB00667A) at the same time.	Replace with the new one (CB00687A), since the former type one is not supplied.
	(2)	Use the former type one as it is. (However, you need to modify the new Mechanism P.C.B. Ass'y (C3).)	Replace with the new one (CB00687A), since the former type one is not supplied. Further, to use with the former type Main P.C.B. Ass'y (M3), change the location of the chip resistor R81 on the Mechanism P.C.B. Ass'y (C3) as shown in **Fig. 1.2** on the next page.

●How to identify the type

You can see the labeled letters on the P.C.B. by removing the Top Cover.

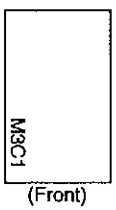
(1) Main P.C.B. Ass'y

New type one:



"**C3**" is labeled on the silk pattern side.

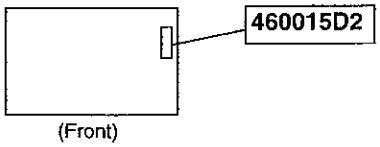
Former type one:



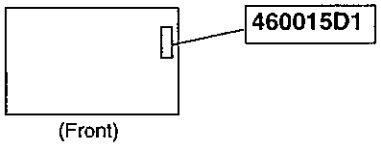
"**M3C1**" is labeled on the silk pattern side.

(2) Mechanism P.C.B. Ass'y

New type one:



Former type one:



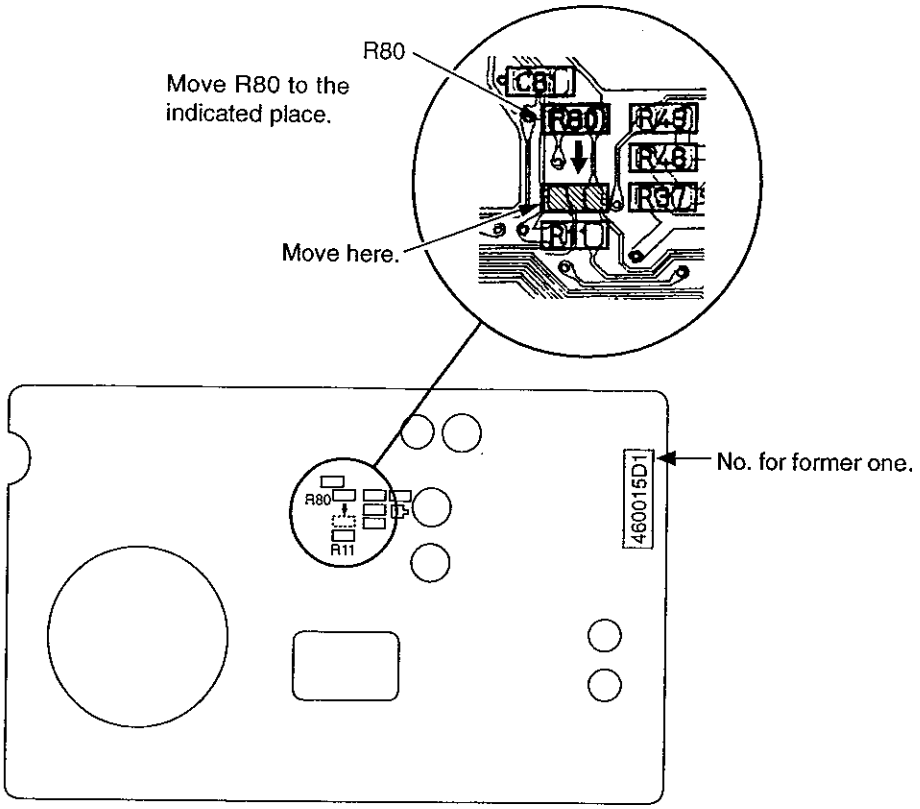


Fig. 1.1 Modification on **Former Mechanism P.C.B. Ass'y (M3)**
(When used together with the New Main P.C.B. Ass'y (C3))

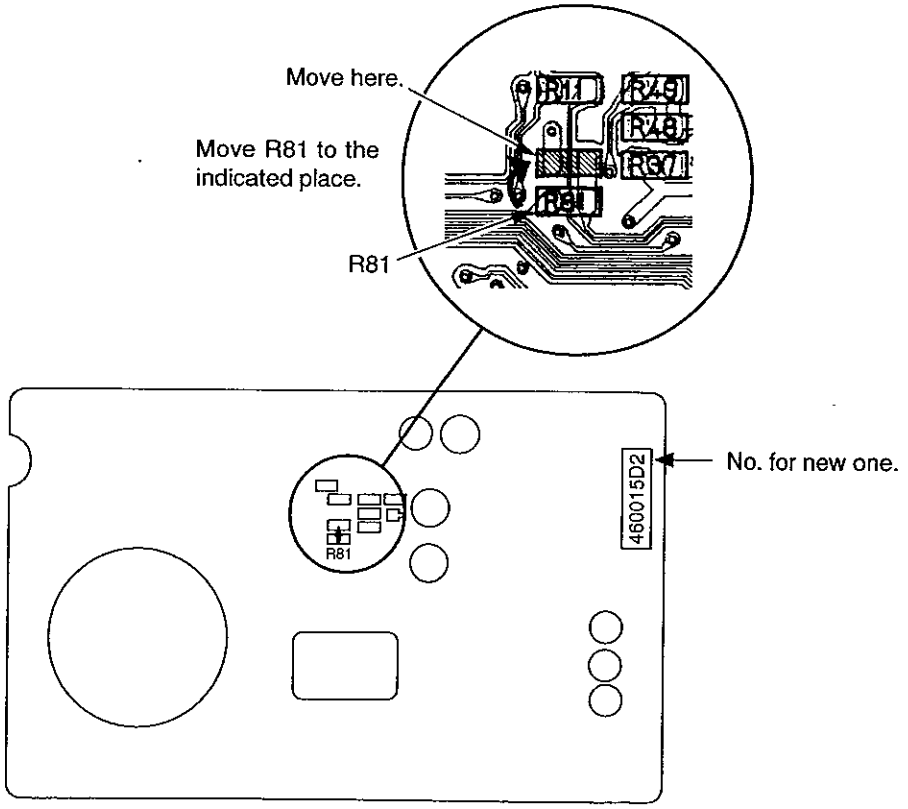


Fig. 1.2 Modification on **New Mechanism P.C.B. Ass'y (C3)**
(When used together with the Former Main P.C.B. Ass'y (M3))

2. REMOVAL PROCEDURES

• Location of Major Parts

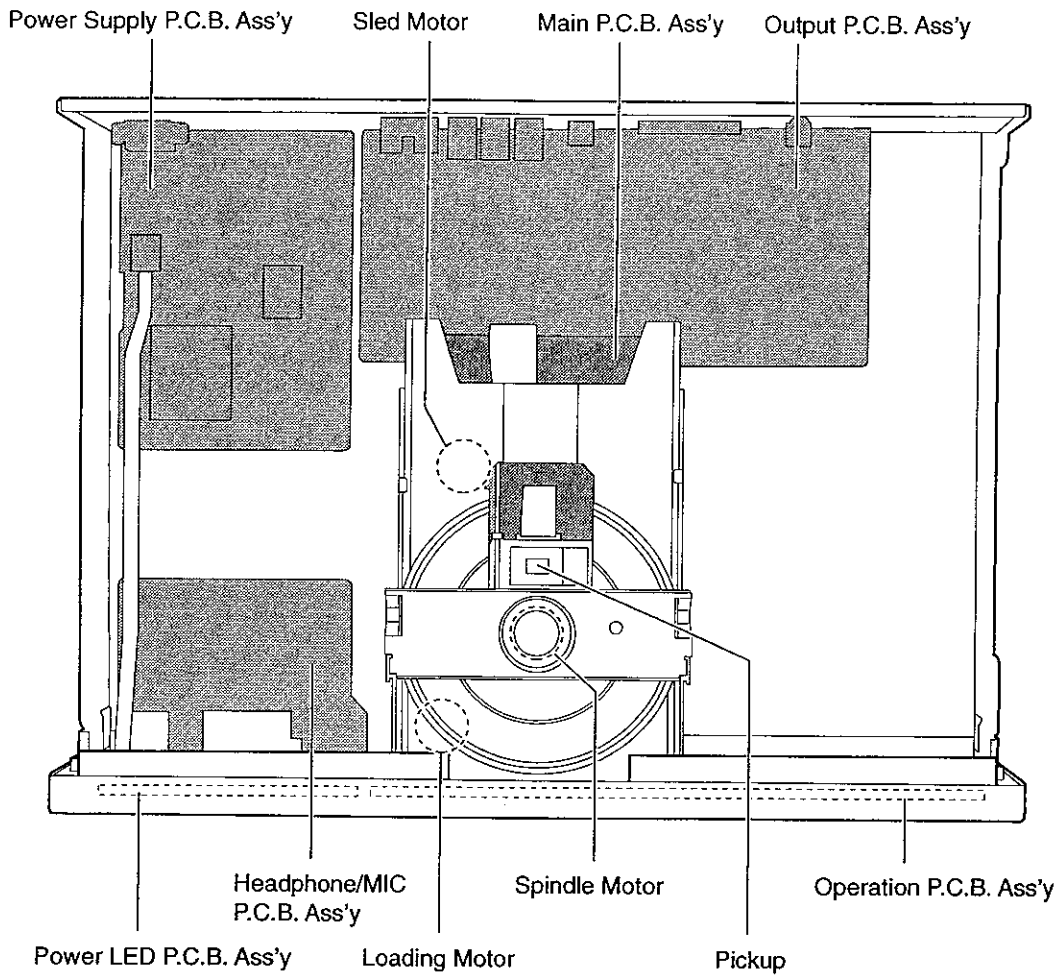


Fig. 2.1 Top View

• **Removal Procedures**

2.1. Upper Cover

Refer to Fig. 2.2.

(1) Remove the five screws and detach the Upper Cover from the unit.

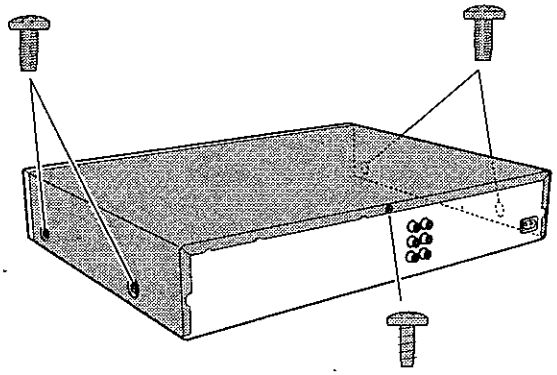


Fig. 2.2

2.2. Front Panel Block

(1) Press the **EJECT/LOAD** button with the power turned ON. The Disc Tray will be ejected.
Note: After ejecting the Disc Tray, turn OFF the power and disconnect the power cord from the unit.

(2) Remove the Tray Panel from the Disc Tray by pulling it upward.

(3) Remove the three screws on the bottom. See Fig. 2.3.1.

(4) Remove the two screws on both sides of the unit. See Fig. 2.3.1.

(5) Disconnect the flat cable from the P702 connector on the Output P.C.B. Ass'y. See Fig. 2.3.2.

(6) Release the tabs on both sides of the unit and remove the Front Panel Block by gently pulling it forward. The Power Button will be disengaged from the Power Joint.

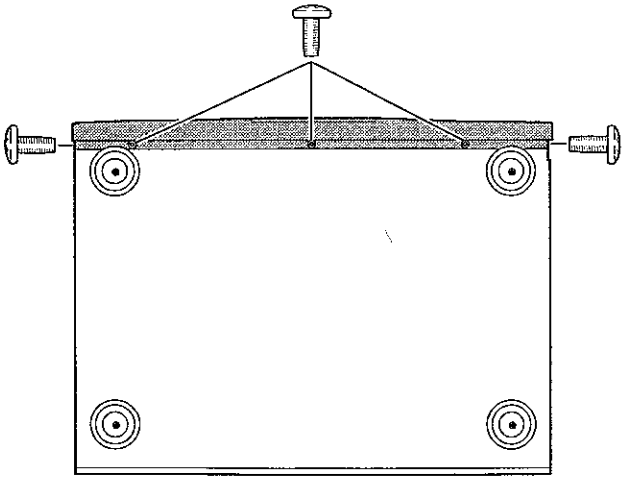


Fig. 2.3.1

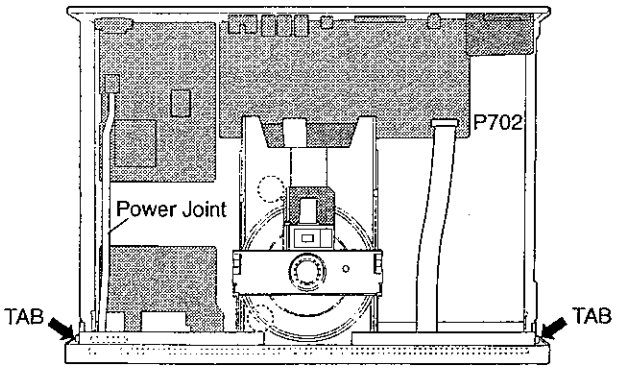


Fig. 2.3.2

2.3. Disc Tray

Refer to Fig. 2.4.

(1) Remove the Front Panel Block referring to item 2.2.

(2) Gently pull out the Disc Tray until it stops.

(3) While pinching both stopper tabs inward with your finger tips, gently pull out the Disc Tray from the unit.

● **When Installing the Disc Tray**

(1) Move the Slider UD to the left. (It will automatically return to the right a little.)

(2) While aligning both side grooves of the Disc Tray with the rails of unit, gently insert the Disc Tray into the unit.

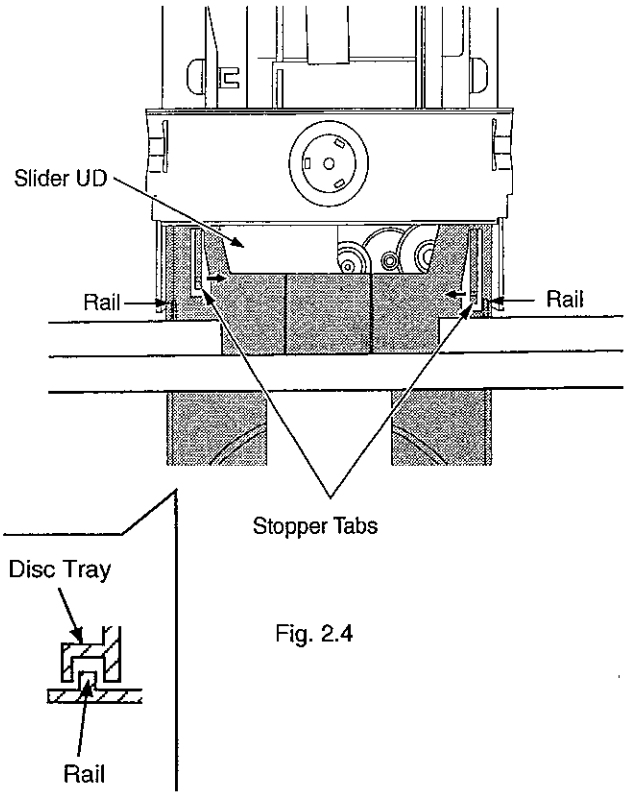


Fig. 2.4

2.4. DVD Mechanism Block

See Fig. 2.5.

(1) Remove the Disc Tray referring to item 2.3.
(2) Disconnect the two flat cables from the connectors P803 and P804 on the Main P.C.B. Ass'y.
(3) Disconnect the cable from the connector P807 on the Main P.C.B. Ass'y.
(4) Remove the four screws and detach the DVD Mechanism Block.

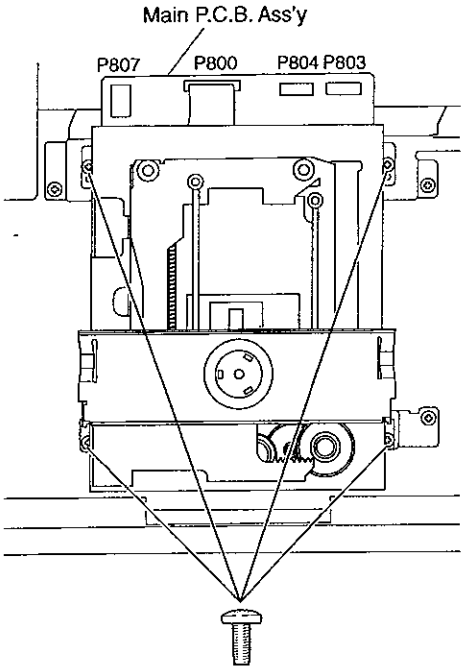


Fig. 2.5

2.5. Main P.C.B. Ass'y

(1) Remove the DVD Mechanism Block referring to item 2.4.
(2) Disconnect the flat cable from the connector P800 on the Main P.C.B. Ass'y. See Fig. 2.5.
(3) Remove the four screws and detach the Main P.C.B. Ass'y from the DVD Mechanism Block. See Fig. 2.6.

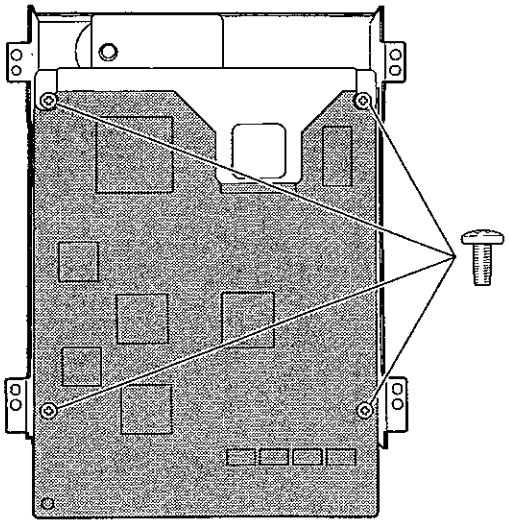


Fig. 2.6 Bottom View

2.6. Mechanism P.C.B. Ass'y

(1) Remove the Main P.C.B. Ass'y referring to item 2.5.
(2) Short the laser diode shorting lands (2 places) on the flexible cable of the Pickup Block. See Fig. 2.7.1.

NOTE: Use the ceramic soldering iron or the soldering iron whose metal part is grounded.

CAUTION: Do not disconnect the flexible cable from the connector P200 on the Mechanism P.C.B. Ass'y unless the laser diode shorting lands (2 places) are shorted.

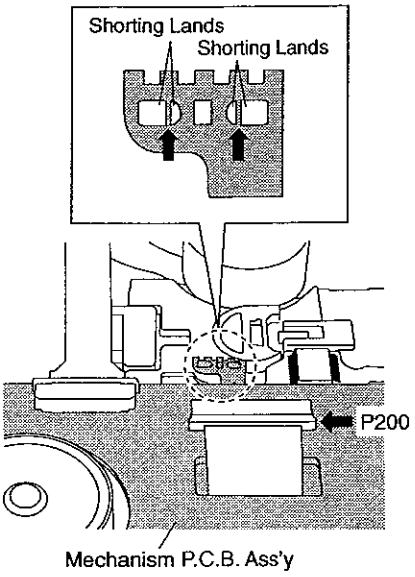


Fig. 2.7.1 Bottom View

(3) Carefully disconnect the two cables from the connectors P400, P500 and P600, and the two flat cables from the connectors P100, P200 and P300 on the Mechanism P.C.B. Ass'y. See Fig. 2.7.2.
(4) Remove the two screws and detach the Mechanism P.C.B. Ass'y from the Traverse Mechanism.

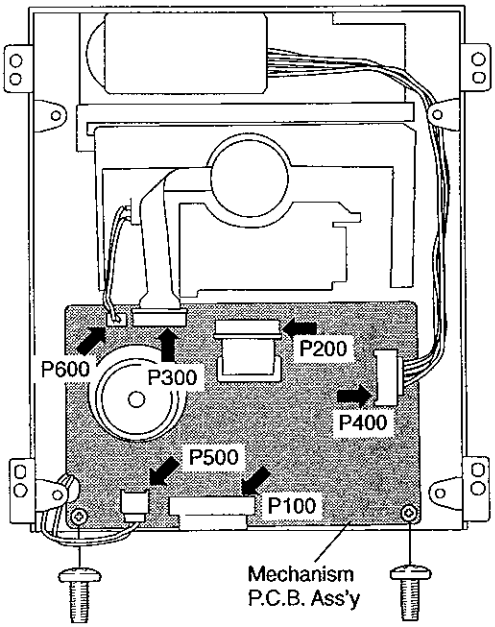


Fig. 2.7.2 Bottom View

● **Note on Installing the Mechanism P.C.B. Ass'y**
Remove the solder on the laser diode shorting lands (2 places) with the soldering iron after connecting all connectors to the Mechanism P.C.B. Ass'y.
Use the ceramic soldering iron or the soldering iron whose metal part is grounded.

2.7. Traverse Ass'y
See Fig. 2.8.
(1) Remove the Main P.C.B. Ass'y referring to item 2.6.
(2) Remove the two screws and detach the Clamper Block by turning it toward the front.
(3) Using tweezers, release the four retaining hooks of the Traverse Ass'y from the rubber Insulators and remove the Traverse Ass'y.
NOTE: Pay special attention so as not to damage the rubber insulators.

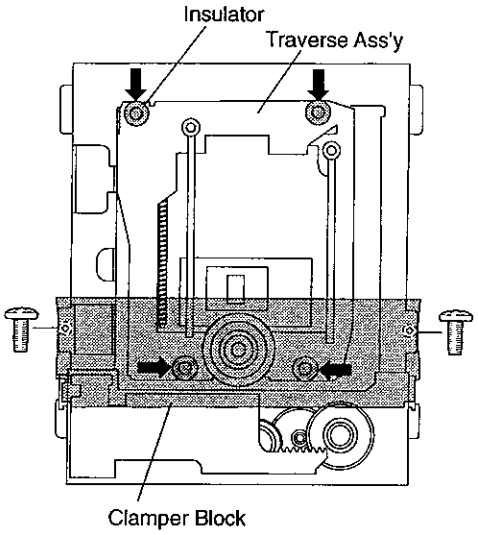


Fig. 2.8

2.8. Spindle Motor
(1) Remove the Main P.C.B. Ass'y referring to item 2.5.
(2) Disconnect the connector P300 on the Mechanism P.C.B. Ass'y. See Fig. 2.7.2.
(3) Insert a Philips screwdriver into the turntable hole and remove the two screws that retain the Spindle Motor (Motor CDS8A50T30-A/TT). Refer to Fig. 2.9.

● **Note on Installing the Spindle Motor**
Perform the Tilt Adjustment.
- For new Models:
See item 3.2.3. "DVD Tilt Adjustment" on page 11.
- For former Models:
See item 3.3.1. "DVD Tilt Adjustment" on page 12.

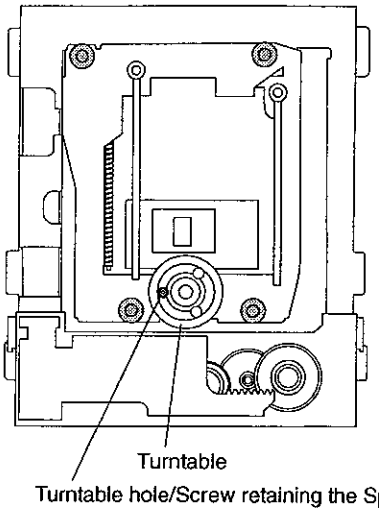
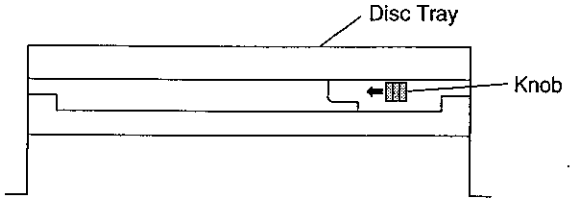


Fig. 2.9

2.9. Pickup Block
Replacement of the Pickup Block is not recommended because its azimuth adjustment is very critical and requires a special jig.
In case if the Pickup Block replacement is necessary, always replace the entire Traverse Ass'y.

How to Manually Open the Disc Tray of the Mechanism Block Ass'y
(The Front Panel Block has to be removed.)
Push the knob on the front right of the Mechanism Block Ass'y to the left.
Then, the Disc Tray is unlocked and comes out a little.
Draw the Disc Tray to open it.



[Front View]

3. ADJUSTMENTS

● **Measuring Instruments and Jigs**

(1) DC Voltmeter
(2) Oscilloscope (40 MHz or more)
(3) A-BEX DVD Vertical Deviation Test Disc TDV-532 (DA09205A)
(4) Laser Power Meter

3.1. Parts Location for Adjustments

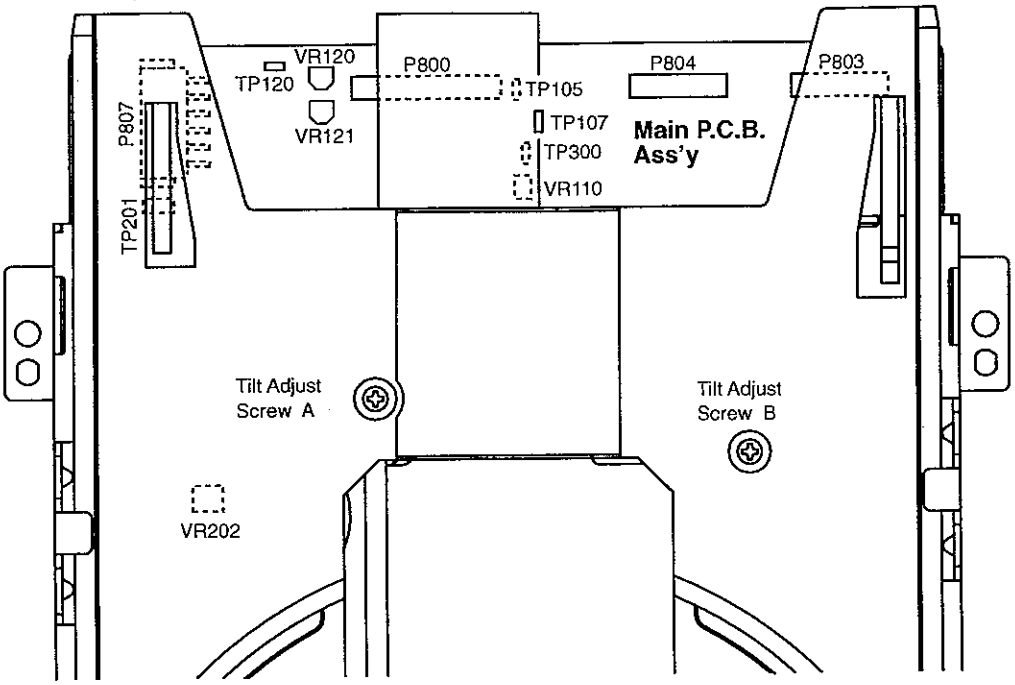


Fig. 3.1.1 Parts Location for **New** Model

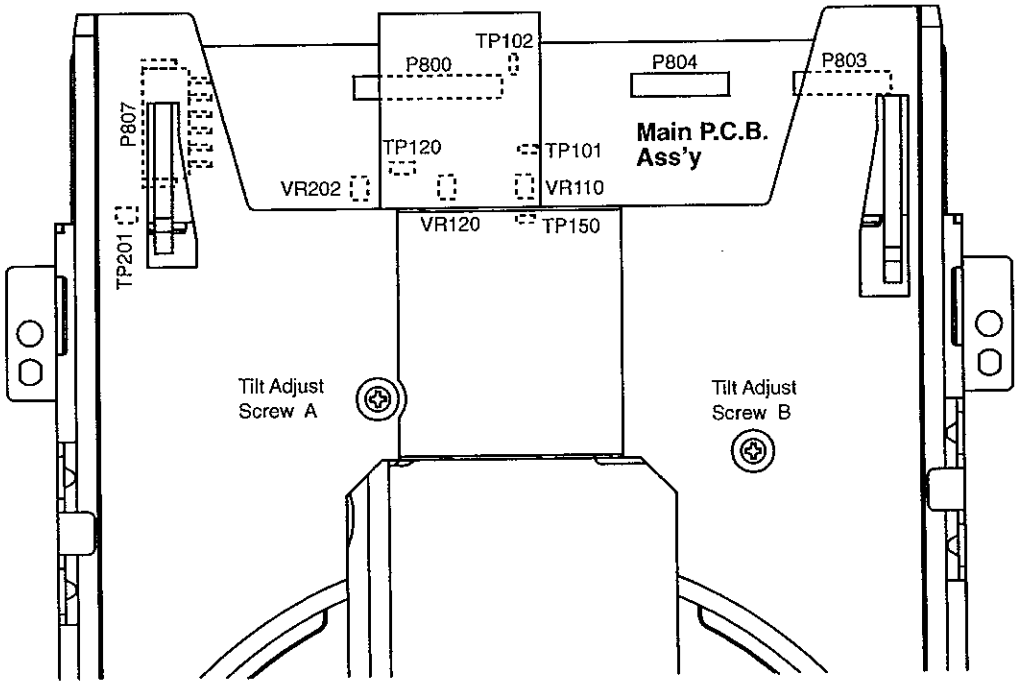


Fig. 3.1.2 Parts Location for **Former** Model

For New Models (For serial Nos., see "1.6. New/Former Models" on page 4.)

3.2. Adjustment Procedures (For New Models)

All VRs and test points are located on the Main P.C.B. Ass'y. See **Fig. 3.1.1** for parts location.

WARNING
To protect eyes from invisible laser beam during servicing, ***DO NOT LOOK AT THE LASER BEAM.***

3.2.1. DSRF Adjustment

NOTE: Adjust only if the unit does work properly after IC201 on the Main P.C.B. Ass'y has been replaced with new one. Otherwise, this adjustment is not necessary since it is precisely adjusted at the factory.

(1) Roughly adjust **VR202** so that the unit can normally play back an ordinary DVD disc.
(2) Slowly turn **VR202 clockwise** until the position were an error occurs. Memorize this position.
(3) Next, turn **VR202 counterclockwise** until the position were an error occurs. Again, memorize this position.
(4) Set **VR202** to the center position of the points memorized in (2) and (3).

3.2.2. AS Adjustment

NOTE: No disc is required for this adjustment.

(1) Connect a DC voltmeter between **TP120 (AS)** (+ terminal) and **TP107 (VREF)** (– terminal).
(2) While pressing and holding both **STOP** and **PAUSE** buttons on the unit, turn on the power.
The unit will enter the test mode and the following message will appear on the display.
TEST MODE
(3) Press the **STOP** button three times to light the following message on the display.
LD TEST CD
(4) Adjust **VR121** to obtain **0 ± 10 mV DC** on the DC voltmeter.
(5) Press the **STOP** button three time to light the following message on the display.
LD TEST DVD
(6) Adjust **VR120** to obtain **0 ± 10 mV DC** on the DC voltmeter.
(7) Turn off the power.

3.2.3. Tilt Adjustment

(1) Connect an oscilloscope between **TP201** (+ terminal) and **TP105** (A.GND) (– terminal).
Set it to "DC input" mode.
(2) Play back the DVD Vertical Deviation Test Disc TDV-532 (DA09205A) and press the **F.F.** (>) button repeatedly until the pickup block reaches the outermost position (Chapter 16) of its movable range.
(3) Press the **PAUSE** button to pause the test disc. (The disc keeps turning.)
(4) Adjust the **Screw A** and **Screw B** alternately so that both AC and DC levels of the waveform are minimum. (The DC level should be less than 1.8 V and the AC component should be minimum.)

NOTE: When the Spindle Motor is replaced, the tilt adjustment should be performed for proper performance.

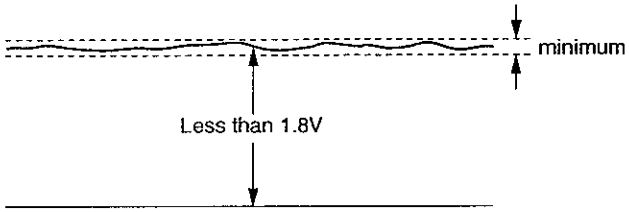


Fig. 3.2

3.2.4. Tracking Error Adjustment

(1) Connect an oscilloscope between **TP300** (TE) (+ terminal) and **TP105** (A.GND) (– terminal).
Set it to "DC input" mode.
(2) While pressing and holding both **F.F.** (>) and **DIMMER** button on the unit, turn on the power.
The unit will enter the test mode and the following message will appear on the display.
TEST MODE
(3) Without loading a CD, read the DC level on the oscilloscope.
(4) Load a 12-cm CD and press the **ZOOM** button on the remote control unit.
(5) Adjust **VR110** so that the center level of the AC component of the waveform is the same level as read in (3).

3.3. Adjustment Procedures (For Former Models)

All VRs and test points are located on the Main P.C.B. Ass'y. See **Fig. 3.1.2** for parts location.

WARNING
To protect eyes from invisible laser beam during servicing, ***DO NOT LOOK AT THE LASER BEAM.***

3.3.1. Tilt Adjustment

(1) Connect an oscilloscope between **TP201** (+ terminal) and **TP102** (D.GND) (– terminal).
Set it to "DC input" mode.
(2) Play back the DVD Vertical Deviation Test Disc TDV-532 (DA09205A) and press the **F.F.** (>) button repeatedly until the pickup block reaches the outermost position (Chapter 16) of its movable range.
(3) Press the **PAUSE** button to pause the test disc. (The disc keeps turning.)
(4) Adjust the **Screw A** and **Screw B** alternately so that both AC and DC levels of the waveform are minimum. (The DC level should be less than 1.8 V and the AC component should be minimum.)

NOTE: When the Spindle Motor is replaced, the tilt adjustment should be performed for proper performance.

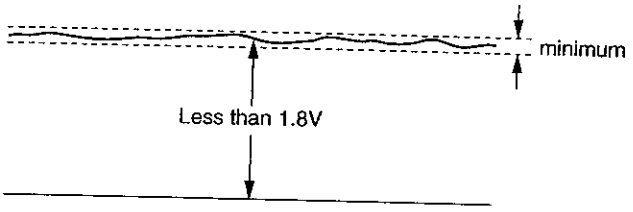


Fig. 3.3

3.3.2. Slice Level Adjustment

(1) Connect an oscilloscope between **TP201** (+ terminal) and **TP102** (D.GND) (– terminal).
Set it to "DC input" mode.
(2) Play back an ordinary DVD (Single sided, one layer) and press the **F.F.** (>) button repeatedly until the pickup block reaches almost the center position of its movable range.
(3) Adjust **VR202** to obtain minimum DC level on the oscilloscope.
(The DC level should be less than 1.8 V.)

3.3.3. CD Tracking Balance Adjustment

(1) Connect an oscilloscope between **TP150** (TE) (+ terminal) and **TP102** (D.GND) (– terminal).
Set it to "DC input" mode.
(2) Set **VR110** approximately at its mechanical center position.
(3) Play back an ordinary CD, and then pause it.
NOTE: If the CD does not start playing, turn the VR110 within ±15 degrees and tray to play back the CD. If the CD does not still start playing, turn VR110 within ±30 degrees and play the CD.
(4) Adjust **VR110** so that the level A and level B of the waveform are equal.

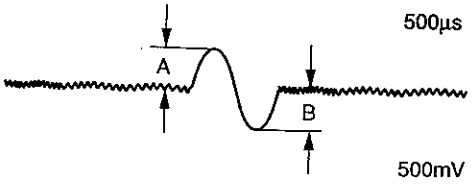


Fig. 3.4

3.3.4. AS Adjustment

NOTE: No disc is required for this adjustment.
(1) Connect a DC voltmeter between **TP120** (+ terminal) and **TP102** (D.GND) (– terminal).
(2) While pressing and holding both **STOP** and **PAUSE** buttons on the unit, turn on the power.
The unit will enter the test mode and the following message will appear on the display.
TEST MODE
(3) Press the **STOP** button twice to light the following message on the display.
LD TEST DVD
(4) Adjust **VR120** to obtain **3.65 V to 3.85 V DC** on the DC voltmeter.
(5) Press the **STOP** button once to light the following message on the display.
LD TEST CD
(6) Check that the reading on the DC voltmeter is in the following range:

"Value in (4)" +50/–0 mV

If satisfactory result is not obtained, repeat (3) to (6).
(7) Turn off the power.

Common to New and Former Models

3.4. Laser Power Check

WARNING
To protect eyes from invisible laser beam during servicing, ***DO NOT LOOK AT THE LASER BEAM.***

NOTES:
1. The pickup incorporates two laser diodes (one for DVD and the other for CD). So, you need to check for both laser diodes.
2. Two check methods are introduced; using a laser power meter and using a DC voltmeter to measure the laser current.

- The former method is easier to check the laser power. On the other hand, when you measure the voltages across the chip resistors with a DC voltmeter, you need to solder lead wires to the chip resistors on the Mechanism P.C.B. Ass'y beforehand.

3.4.1. Laser Power Check Using a Laser Power Meter

(1) While pressing and holding both **STOP** and **PAUSE** buttons on the unit, turn on the power.
The unit will enter the test mode and the following message will appear on the display.
TEST MODE
(2) Put a laser power meter on the pickup lens.
(3) Press the **STOP** button twice to light the following message on the display.
LD TEST DVD
(4) Read the power meter. (LPdvd)
(5) Press the **STOP** button once to light the following message on the display.
LD TEST CD
(6) Read the power meter. (LPcd)
(7) Be sure that the laser diodes are normal from the following table.
(8) Turn off the power

[Laser Power Reference]

	DVD (LPdvd)	CD (LPcd)
Typical value	0.5 - 1.1 mW	0.07 to 0.3 mW

Laser Power Meter Settings:
- For DVD -- WAVE: HeNe, RANGE: 1 mW
- For CD -- WAVE: Diode, RANGE: 0.3 mW

NOTE: If the reading is widely out of the above range, the pickup will be defective and the Traverse Ass'y must be replaced with new one.

3.4.2. Laser Power Check Using a DC Voltmeter

Preparation to check:
Solder the lead wires to the following resistors on the Mechanism P.C.B. Ass'y. You will need to remove the Mechanism P.C.B. Ass'y to solder the lead wires. (Refer to "2.6. Mechanism P.C.B. Ass'y" on page 8.)
- R40 (For DVD laser diode)
- R44 (For CD laser diode)

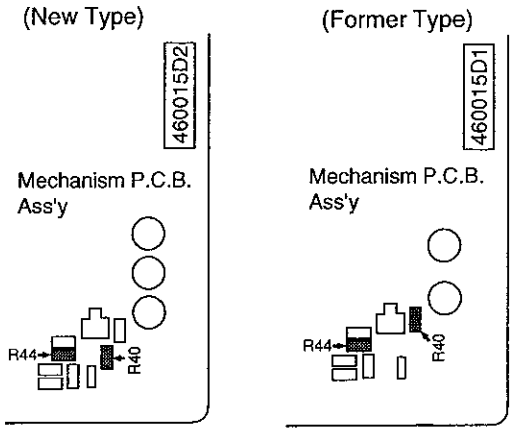


Fig. 3.5 Location of R40 and R44

Check Procedure:
(1) While pressing and holding both **STOP** and **PAUSE** buttons on the unit, turn on the power.
The unit will enter the test mode and the following message will appear on the display.
TEST MODE
(2) Press the **STOP** button twice to light the following message on the display.
LD TEST DVD
(3) Connect a DC voltmeter across R40 and read the voltage. Vdvd (mV)
Calculate the laser current (Idvd) from the following:
I dvd (mA) = Vdvd (mV)/27 (ohm)
(4) Press the **STOP** button once to light the following message on the display.
LD TEST CD
(5) Connect a DC voltmeter across R44 and read the voltage. Vcd (mV)
Calculate the laser current (Icd) from the following:
I cd (mA) = Vcd (mV)/4.7 (ohm)
(6) Be sure that the laser diodes are normal from the following table. Then, turn off the power.

[Laser Current Reference]

	DVD (Idvd)	CD (Icd)
Typical value	40 mA	35 mA
Maximum value	60 mA	55 mA

NOTE: If the reading exceeds the maximum value, the pickup will be defective and the Traverse Ass'y must be replaced with new one.

4. MECHANISM ASS'Y AND PARTS LIST

4.1. Synthesis

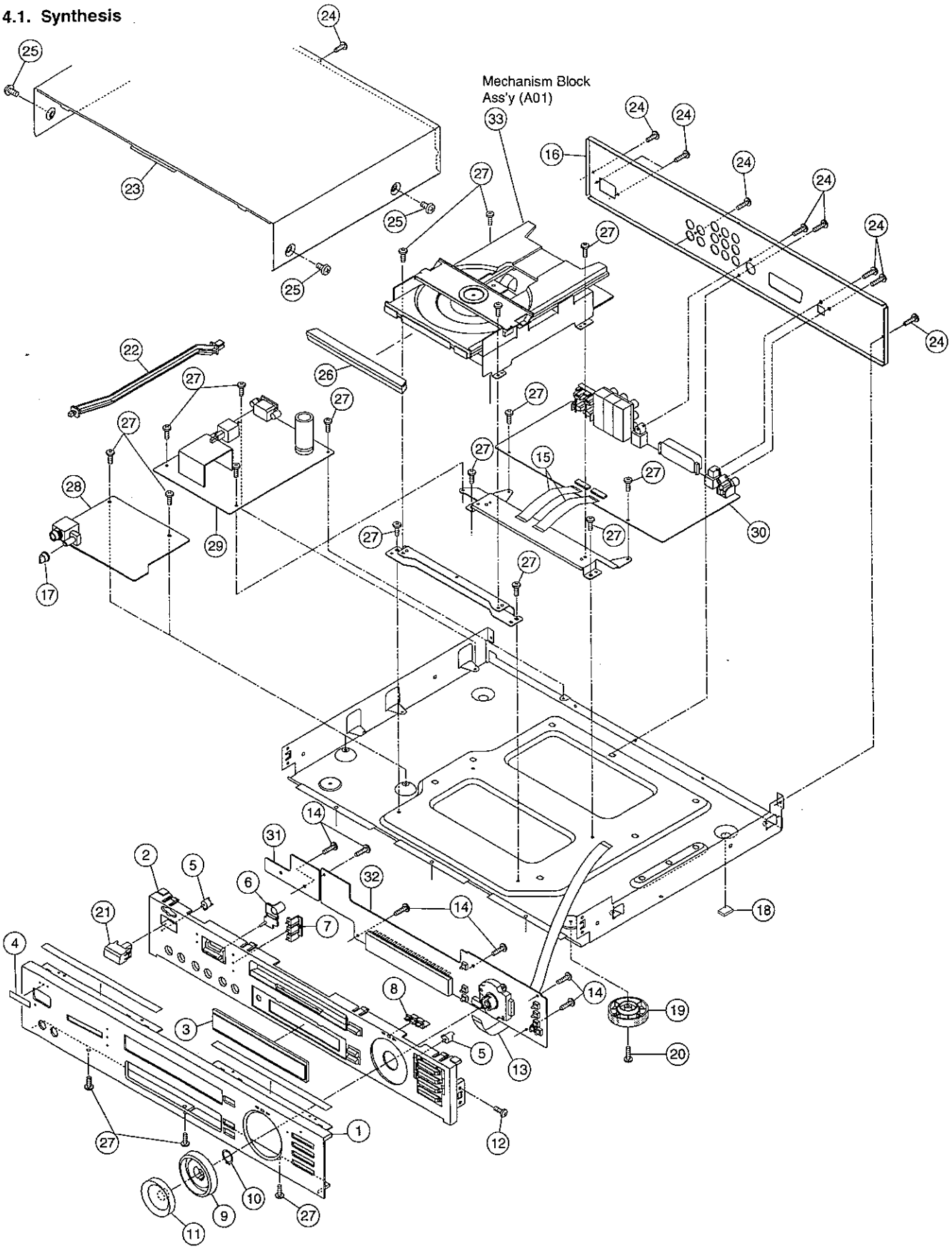


Fig. 4.1

Accessories

Schematic Ref. No.	Part No.	Description
—	0F05640A	Carton Box
—	0F05641A	Packing
—	0F05639A	Poly Cover
—	0D07259A	Owner's Manual (Japanese)
—	0D07260A	Owner's Manual (English)
—	0D07261A	Owner's Manual (French)
—	0D07262A	Owner's Manual (German)
—	0D07263A	Owner's Manual (Spanish)
—	0D07264A	Owner's Manual (China)
—	DG05609A	Remote Unit RC-10Sv
—	0B85744A	Cord 21P YAF11-0642 1.5M (EP, UK Only)
—	0B85745A	Cord R-C275VP (Except EP,UK)
—	0D07241A	AC Cord 200S Kp-211Ks15C B J (JPN, DA, OTR)
	0D07238A	AC Cord 200SKP10WKS15WNISPT2 BA (USA, CAN, TW)
—	0D07245A	AC Cord 200SKP561KS15F A S (AUS)
—	0D07239A	AC Cord 200SKP419CKS15F A V (EP)
—	0D07242A	AC Cord MP5004A (HK, UK)
—	0D07243A	AC Cord 200SKP10M KS15F B GB (CH)
—	0D07244A	AC Cord MP2217 (KR)

For recommended spare parts list, see 6 "RECOMMENDED SPARE PARTS LIST".

4.1. Synthesis

Schematic Ref. No.	Part No.	Description
	—	**Synthesis**
01	0H08858A	Panel Front-10S (BK) (USA, CAN, JPN, EP, DA, UK, AUS)
	0H08859A	Panel Front-10S (CG) (OTR, HK, CH, TW, KR)
02	0H08861A	Panel Inner (BK) (USA, CAN, JPN, EP, DA, UK, AUS)
	0H08862A	Panel Inner (CG) (OTR, HK, CH, TW, KR)
03	0H08860A	Window FLD
04	0H08848A	Name Plate -Black (USA, CAN, JPN, EP, DA, UK, AUS)
	0H08849A	Name Plate -Gray (OTR, HK, CH, TW, KR)
05	0H08850A	Lens Power
06	0H08851A	Lens VS
07	0H08852A	Lens (B)
08	0H08853A	Lens Jog/Shuttle
09	0H08854A	Shuttle Ring(N)-BK (USA, CAN, JPN, EP, DA, UK, AUS)
	0H08855A	Shuttle Ring(N)-CG (OTR, HK, CH, TW, KR)
10	0E04266A	Ring C STW-19
11	0H08856A	Knob Jog (N)-BK (USA, CAN, JPN, EP, DA, UK, AUS)
	0H08857A	Knob Jog (N)-CG (OTR, HK, CH, TW, KR)
12	0E04259A	ST 3x6 +BID BNI (USA, CAN, JPN, EP, DA, UK, AUS)
	0E04260A	ST3X6 +BID NI3 (OTR, HK, CH, TW, KR)
13	0B85743A	Cord FFC BD P1.0 L230 16P
14	0E04262A	BT3X8 +BID BZN
15	0B85741A	Cord FFC BD P0.5 L70 24P
16	0H08834A	Panel Rear DVD-10S (JPN)
	0H08835A	Panel Rear DVD-10S (EP, UK)
	0H08836A	Panel Rear DVD-10S (DA, OTR, HK, CH, TW, KR, AUS)
	0H08833A	Panel Rear DVD-10S (USA, CAN)
17	0H08837A	Knob Level (BK) (USA, CAN, JPN, EP, DA, UK, AUS)
	0H08838A	Knob Level (CG) (OTR, HK, CH, TW, KR)
18	0J08650A	Cushion Foot 12x12x2
19	0H08839A	Foot(B)
20	0E04261A	ST3x10 +BID CMT
21	0H08840A	Button Power (BK) (USA, CAN, JPN, EP, DA, UK, AUS)
	0H08841A	Button Power (CG) (OTR, HK, CH, TW, KR)
22	0J08651A	Joint Power
23	0H08842A	Cover Upper (BK) (USA, CAN, JPN, EP, DA, UK, AUS)
	0H08843A	Cover Upper (CG) (OTR, HK, CH, TW, KR)
24	0E04262A	BT3x8 +BID BZN (USA, CAN, JPN, EP, DA, UK, AUS)
	0E04263A	BT3x8 +BID NI3 (OTR, HK, CH, TW, KR)
25	0E04264A	ST4x6 +BID BZN (USA, CAN, JPN, EP, DA, UK, AUS)
	0E04265A	ST4x6 +BID NI3 (OTR, HK, CH, TW, KR)
26	HA08572A	Panel Tray (BK) Part (USA, CAN, JPN, EP, DA, UK, AUS)
	HA08573A	Panel Tray (CG) Part (OTR, HK, CH, TW, KR)
27	0E04251A	ST3x6 +BID CMT
28	BK10477A	Headphone/MIC P.C.B. Ass'y
29	BK10447A	Power Supply P.C.B. Ass'y (Except USA, CAN, TW)
	BK10449A	Power Supply P.C.B. Ass'y (USA, CAN, TW)
	BK10448A	Power Supply P.C.B. Ass'y (KR)
30	BK10451A	Output P.C.B. Ass'y (JPN)
	BK10452A	Output P.C.B. Ass'y UL (Except JPN, EP, UK)
	BK10450A	Output P.C.B. Ass'y (EP, UK)
⁄31	BK10476A	Power LED P.C.B Ass'y
⁄32	BK10453A	Operation P.C.B. Ass'y
33	CA09490A	Mechanism Block Ass'y (Except USA, CAN)
	CA09489A	Mechanism Block Ass'y (USA, CAN)

4.2. Mechanism Block Ass'y (A01)

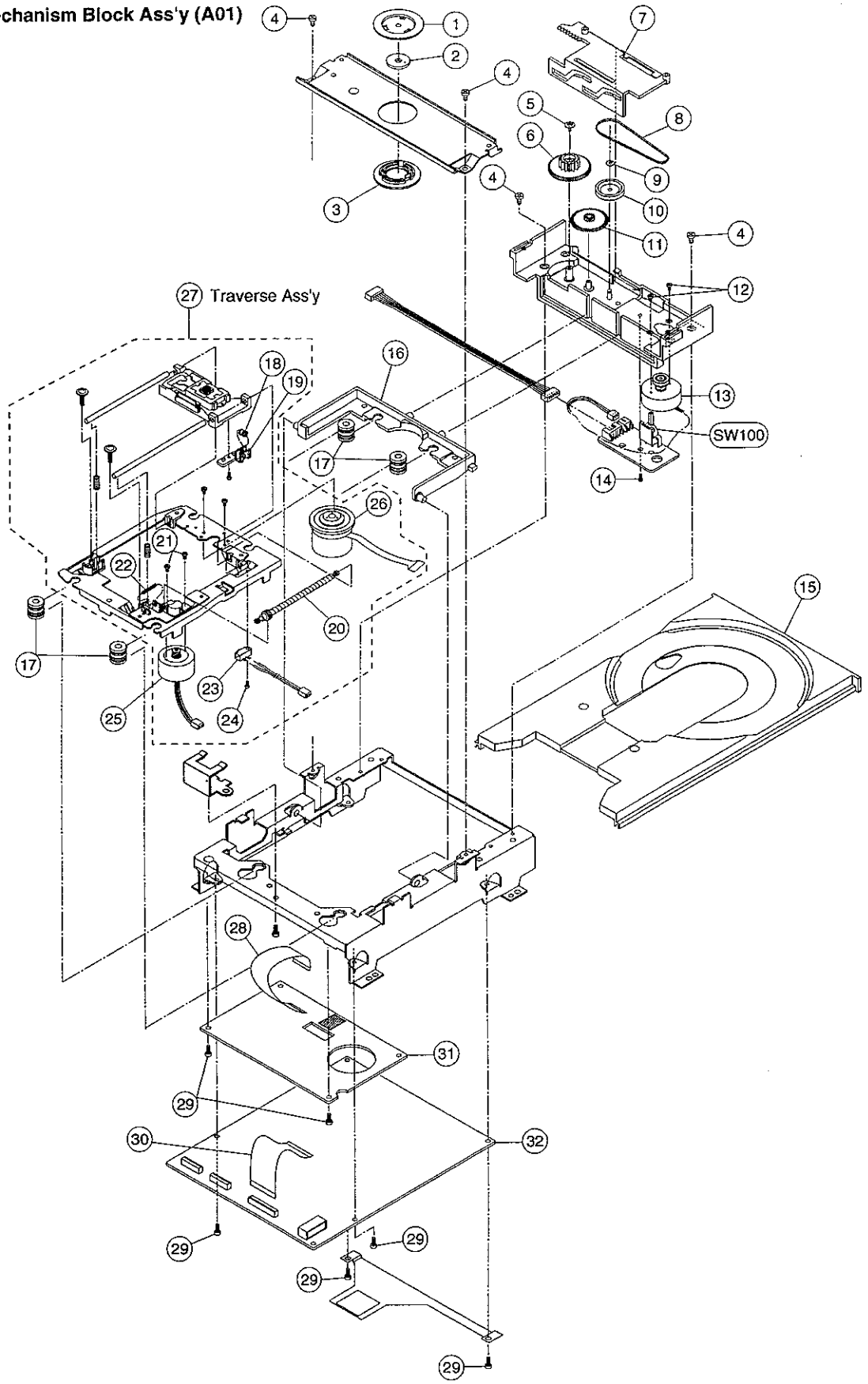


Fig. 4.2

4.2. Mechanism Block Ass'y (A01)

Schematic Ref. No.	Part No.	Description
A01	**CA09490A**	**Mechanism Block Ass'y (Except USA, CAN)**
	CA09489A	**Mechanism Block Ass'y (USA, CAN)**
01	0C10554A	Plate Clamp
02	0C10555A	Magnet
03	0C10553A	Disc Clamp
04	0E04255A	ST2.6x6 + Pan CMT
05	0E04253A	PT2x5 + Pan CMT
06	0C10545A	Gear Load 2
07	0C10548A	Slider UD
08	0C10547A	Belt Loading
09	0E04252A	C.Washer 2.1x5x5
10	0C10544A	Pulley Gear
11	0C10543A	Gear Load 1
12	0E04247A	M1.7x2.5 +Pan BZN
13	CA09493A	Loading Motor Ass'y
14	0E04254A	BT3x8 +BID CMT
15	0C10557A	Disc Tray
16	0C10551A	Holder Traverse
17	0C10552A	Insulator
18	0C10526A	Sp Push Hook
19	0C10535A	Hook L.S
20	CA09487A	Shaft Screw Ass'y
21	0E04248A	M1.7x3.5 +Pan CMT
22	0C10524A	SP Push L.S
23	0B70304A	SW Micro MPU10420MLB0
24	0E04249A	ST2x8 +BID CMT
25	CA09488A	Sled Motor Ass'y
26	0B90969A	Motor CDS8A50T30-A/TT
27	CA09494A	Traverse Ass'y TKM-002 ✓
28	0B85702A	FFC 30P L50S3 P0.5
29	0E04251A	ST3x6 +BID CMT
30	0B85703A	FFC 40P L70 P0.5
31	BK10454A	Mechanism P.C.B. Ass'y (C3)
32	BK10455A	Main P.C.B. Ass'y (C3) ✓
SW100	0B70306A	SW Lever MXS01070MLB0

5. ELECTRICAL PARTS LIST

NOTE: Mayjor electrical parts are shown in the parts list.

5.1. Main P.C.B. Ass'y
5.1.1. New Main P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	BK10455A	**Main P.C.B. Ass'y (C3) (For New Models)**
IC100	0B13171A	IC CYC11AP000* (Hercules)
IC110	0B13179A	IC NJM4558M
IC111	0B13179A	IC NJM4558M*
IC120	0B13169A	IC BU4011BFV-E2*
IC121	0B13170A	IC BU4S81-TR*
IC201	0B13172A	IC CYC12MP000* (Lion)
IC202	0B13190A	IC TC7SHU04FU*
IC203	0B13179A	IC NJM4558M*
IC300	0B13177A	IC MN67700VRZB*
IC311	0B13190A	IC TC7SHU04FU*
IC490	0B13165A	IC MN66261
IC500	0B13173A	IC CYC13DD000* (Mermaid)
IC501	0B13175A	IC HY628100ALG-55*
IC502	0B13174A	IC HY57V161610DTC*
IC503	0B13183A	IC TC74VHC00FT*
IC550	0B13185A	IC TC74VHC157FTEL*
IC600	BA10459A	IC MB90F574APFV-G AK-SYS4
IC602	BA10460A	IC MX29F1610MC-12-NC090303
IC603	0B13176A	IC M24C16-MN6T*
IC605	0B13183A	IC TC74VHC00FT*
IC606	0B13189A	IC TC74VHCT245AFT*
IC607	0B13187A	IC TC74VHC574FTEL*
IC610	0B13191A	IC TC7W04FUTE12L*
IC611	0B13183A	IC TC74VHC00FT*
IC612	0B13193A	IC TC7WH74FUTE12L*
IC613	0B13184A	IC TC74VHC08FTEL*
IC614	0B13188A	IC TC74VHC86FT*
IC700	0B13195A	IC ZIVA-3-PEO*
IC701	0B13174A	IC HY57V161610DTC*
IC702	0B13174A	IC HY57V161610DTC*
IC703	0B13192A	IC TC7WH157FU*
IC800	0B13182A	IC SM8701BM-ET*
IC801	0B13194A	IC TC7WU04FUTE12L*
IC802	0B13190A	IC TC7SHU04FU*
IC803	0B13194A	IC TC7WU04FUTE12L*
IC850	0B13167A	IC ADV7172 KST*
IC901	0B13168A	IC BA05FP-E2*
IC911	0B13180A	IC PCM1735E/2K*
IC931	0B13180A	IC PCM1735E/2K*
IC951	0B13180A	IC PCM1735E/2K*
IC971	0B13180A	IC PCM1735E/2K*
IC991	0B13231A	IC TC74HC4053AFT*
TR100	0B13161A	DTR UMG4N-TR*
TR101	0B13161A	DTR UMG4N-TR*
TR102	0B13161A	DTR UMG4N-TR*
TR103	0B13161A	DTR UMG4N-TR*
TR104	0B13161A	DTR UMG4N-TR*
TR105	0B13161A	DTR UMG4N-TR*
TR106	0B13161A	DTR UMG4N-TR*
TR110	0B13163A	FET 2SK880*-TE85L
TR111	0B13163A	FET 2SK880*-TE85L
TR112	0B13162A	FET 2SK2145*-TE85L
TR117	0B13160A	DTR DTC144TUA*
TR167	0B13154A	DTC FMY4A-T148*
TR170	0B13160A	DTR DTC144TUA*
TR171	0B13156A	DTC UMX3N-TR*
TR172	0B13196A	TR 2SA1576A*-Q,R,S
TR190	0B13159A	DTR DTC144EUA*
TR200	0B13197A	TR 2SC4081*-R,S
TR201	0B13197A	TR 2SC4081*-R,S
TR202	0B13197A	TR 2SC4081*-R,S
TR300	0B13158A	DTR DTA144EUA*
TR490	0B13159A	DTR DTC144EUA*
TR491	0B13160A	DTR DTC144TUA*
TR500	0B13160A	DTR DTC144TUA*
TR600	0B13159A	DTR DTC144EUA*
TR801	0B13196A	TR 2SA1576A*-Q,R,S
TR802	0B13196A	TR 2SA1576A*-Q,R,S
TR804	0B13196A	TR 2SA1576A*-Q,R,S
TR805	0B13196A	TR 2SA1576A*-Q,R,S
TR806	0B13196A	TR 2SA1576A*-Q,R,S
D101	0B13151A	DI 1SS355TE-17*
D103	0B13151A	DI 1SS355TE-17*
D190	0B13151A	DI 1SS355TE-17*
D191	0B13152A	DI DA204U-T106*
D193	0B13151A	DI 1SS355TE-17*
D300	0B13151A	DI 1SS355TE-17*
D301	0B13151A	DI 1SS355TE-17*
D500	0B13151A	DI 1SS355TE-17*
D501	0B13151A	DI 1SS355TE-17*
D850	0B13153A	DI UMN11N-TN*
D901	0B13153A	DI UMN11N-TN*
D902	0B13151A	DI 1SS355TE-17*
D903	0B13151A	DI 1SS355TE-17*
X301	0B90966A	XTAL CX-16F 40MHZ*
X601	0B90964A	XTAL CCR4.0MC3T*
X800	0B90965A	XTAL CX-11F 27MH*
VR110	0B30229A	SVR MVR32 222*
VR120	0B30229A	SVR MVR32 222*
VR121	0B30229A	SVR MVR32 222*
VR202	0B30230A	SVR MVR32 223*

For recommended spare parts list, see 6 "RECOMMENDED SPARE PARTS LIST".

5.1.2. Former Main P.C.B. Ass'y (M3C1)

Schematic Ref. No.	Part No.	Description
	—	**Main P.C.B. Ass'y (M3C1) (For Former Models)**
IC100	—	IC AN8824FBP
IC101	0B13179A	IC NJM4558M*
IC110	0B10811A	IC.NJM4560M
IC111	0B13179A	IC NJM4558M*
IC112	0B13170A	IC BU4S81*-TR
IC120	0B13169A	IC BU4011BFV*-E2
IC121	0B13170A	IC BU4S81*-TR
IC200	—	IC AN8623FBQ
IC250	2B10237A	IC EL5244C
IC300	0B13177A	IC MN67700VRZB*
IC311	0B13190A	IC TC7SHU04FU*
IC490	0B13165A	IC MN66261
IC500	0B13173A	IC CYC13DD000* (Mermaid)
IC501	0B13175A	IC HY628100ALG-55*
IC502	0B13174A	IC HY57V161610DTC*
IC503	0B13183A	IC TC74VHC00FT*
IC504	2B10219A	IC TC7W32FUTE12L
IC505	2B10233A	IC TC74VHC161FTEL
IC506	0B13183A	IC TC74VHC00FT*
IC550	0B13185A	IC TC74VHC157FTEL*
IC600	BA10459A	IC MB90F574APFV-G AK-SYS4
IC602	BA10460A	IC MX29F1610MC-12-NC090303
IC603	0B13176A	IC M24C16-MN6T*
IC605	0B13183A	IC TC74VHC00FT*
IC606	0B13189A	IC TC74VHCT245AFT*
IC607	0B13187A	IC TC74VHC574FTEL*
IC610	0B13191A	IC TC7W04FUTE12L*
IC611	0B13183A	IC TC74VHC00FT*
IC612	0B13193A	IC TC7WH74FUTE12L*
IC613	0B13184A	IC TC74VHC08FTEL*

Schematic Ref. No.	Part No.	Description
IC614	0B13188A	IC TC74VHC86FT*
IC700	0B13195A	IC ZIVA-3-PEO*
IC701	0B13174A	IC HY57V161610DTC*
IC702	0B13174A	IC HY57V161610DTC*
IC703	0B13192A	IC TC7WH157FU*
IC800	0B13182A	IC SM8701BM-ET*
IC801	0B13194A	IC TC7WU04FUTE12L*
IC802	0B13190A	IC TC7SHU04FU*
IC803	0B13194A	IC TC7WU04FUTE12L*
IC850	0B13167A	IC ADV7172* KST
IC853	2B10145A	IC XC62FP3302PR
IC901	0B13168A	IC BA05FP*-E2
IC911	0B13180A	IC PCM1735E/2K*
IC931	0B13180A	IC PCM1735E/2K*
IC951	0B13180A	IC PCM1735E/2K*
IC971	0B13180A	IC PCM1735E/2K*
IC991	0B13231A	IC TC74HC4053AFT*
TR100	0B13161A	DTR UMG4N-TR*
TR101	0B13161A	DTR UMG4N-TR*
TR102	0B13161A	DTR UMG4N-TR*
TR103	0B13161A	DTR UMG4N-TR*
TR104	0B13161A	DTR UMG4N-TR*
TR105	0B13161A	DTR UMG4N-TR*
TR106	0B13161A	DTR UMG4N-TR*
TR107	0B13197A	TR 2SC4081*-R,S
TR108	0B13197A	TR 2SC4081*-R,S
TR110	0B13163A	FET 2SK880-TE85L*
TR111	0B13163A	FET 2SK880-TE85L*
TR112	0B13162A	FET 2SK2145-TE85L*
TR117	0B13160A	DTR DTC144TUA*
TR140	2B10171A	TR C.DTA144TUA
TR167	0B13154A	DTC FMY4A-T148*
TR190	0B13159A	DTR DTC144EUA*
TR200	0B13197A	TR 2SC4081*-R,S
TR300	0B13158A	DTR DTA144EUA*
TR490	0B13159A	DTR DTC144EUA*
TR491	0B13160A	DTR DTC144TUA*
TR500	0B13160A	DTR DTC144TUA*
TR600	0B13159A	DTR DTC144EUA*
TR801	0B13196A	TR 2SA1576A*-Q,R,S
TR802	0B13196A	TR 2SA1576A*-Q,R,S
TR804	0B13196A	TR 2SA1576A*-Q,R,S
TR805	0B13196A	TR 2SA1576A*-Q,R,S
TR806	0B13196A	TR 2SA1576A*-Q,R,S
D101	0B13151A	DI 1SS355TE*-17
D103	0B13151A	DI 1SS355TE*-17
D190	0B13151A	DI 1SS355TE*-17
D191	0B13152A	DI DA204U*-T106
D193	0B13151A	DI 1SS355TE*-17
D300	0B13151A	DI 1SS355TE*-17
D301	0B13151A	DI 1SS355TE*-17
D500	0B13151A	DI 1SS355TE*-17
D501	0B13151A	DI 1SS355TE*-17
D850	0B13153A	DI UMN11N*-TN
D901	0B13153A	DI UMN11N*-TN
D902	0B13151A	DI 1SS355TE*-17
D903	0B13151A	DI 1SS355TE*-17
X301	0B90966A	XTAL CX-16F 40MHZ*
X601	0B90964A	XTAL CCR4.0MC3T*
X800	0B90965A	XTAL CX-11F 27MH*
VR110	0B30229A	SVR MVR32 222*
VR120	0B30229A	SVR MVR32 222*
VR202	2B20044A	SVR MVR32 471*

5.2. Output P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	BK10451A	**Output P.C.B. Ass'y (JPN)**
	BK10452A	**Output P.C.B. Ass'y UL (Except JPN, EP, UK)**
	BK10450A	**Output P.C.B. Ass'y (EP, UK)**
IC200	0B13229A	IC NJM4580M*
IC201	0B13229A	IC NJM4580M*
IC202	0B13229A	IC NJM4580M*
IC203	0B13229A	IC NJM4580M*
IC204	0B13229A	IC NJM4580M*
IC205	0B13226A	IC M5218AFP*-73A (EP,UK Only)
IC206	0B13233A	IC TC7SET08FT*
IC207	0B13232A	IC TC74HCU04AF*
IC461	0B13223A	IC BA7666FS-E2*
IC700	0B13225A	IC M38022* M4-467
IC719	0B13235A	IC XC61AN4002MR*
IC901	0B13230A	IC TC4053BF* (EP,UK Only)
IC903	0B13222A	IC BA7660FS-E2*
TR100	0B13245A	TR 2SA1037AK*-R,S
TR102	0B13212A	DTR DTA143ZKA*
TR103	0B13214A	DTR DTC143ZKA*
TR105	0B13245A	TR 2SA1037AK*-R,S
TR106	0B13212A	DTR DTA143ZKA*
TR107	0B13212A	DTR DTA143ZKA*
TR114	0B13212A	DTR DTA143ZKA*
TR115	0B13212A	DTR DTA143ZKA*
TR116	0B13212A	DTR DTA143ZKA*
TR178	0B13245A	TR 2SA1037AK*-R,S
TR179	0B13248A	TR 2SD2114K*
TR208	0B13212A	DTR DTA143ZKA*
TR209	0B13248A	TR 2SD2114K*
TR210	0B13248A	TR 2SD2114K*
TR300	0B13248A	TR 2SD2114K*
TR301	0B13248A	TR 2SD2114K*
TR302	0B13248A	TR 2SD2114K*
TR303	0B13248A	TR 2SD2114K*
TR304	0B13248A	TR 2SD2114K*
TR305	0B13248A	TR 2SD2114K*
TR306	0B13248A	TR 2SD2114K*
TR307	0B13248A	TR 2SD2114K*
TR401	0B13245A	TR 2SA1037AK*-R,S
TR402	0B13245A	TR 2SA1037AK*-R,S
TR403	0B13245A	TR 2SA1037AK*-R,S
TR404	0B13247A	TR 2SC2412K*-R,S
TR405	0B13247A	TR 2SC2412K*-R,S
TR406	0B13247A	TR 2SC2412K*-R,S
TR441	0B13247A	TR 2SC2412K*-R,S
TR442	0B13247A	TR 2SC2412K*-R,S
TR443	0B13214A	DTR DTC143ZKA* (JPN Only)
TR501	0B13245A	TR 2SA1037AK*-R,S (EP, UK Only)
TR502	0B13245A	TR 2SA1037AK*-R,S
TR503	0B13245A	TR 2SA1037AK*-R,S
TR507	0B13247A	TR 2SC2412K*-R,S (EP, UK Only)
TR508	0B13247A	TR 2SC2412K*-R,S
TR509	0B13247A	TR 2SC2412K*-R,S
TR602	0B13247A	TR 2SC2412K*-R,S
TR801	0B13243A	TR 2SD2097-Q,R,S
TR802	0B13241A	TR 2SB1326-Q,R
TR803	0B13214A	DTR DTC143ZKA*
TR806	0B13212A	DTR DTA143ZKA*
TR902	0B13214A	DTR DTC143ZKA* (EP, UK Only)
TR904	0B13247A	TR 2SC2412K*-R,S (EP, UK Only)
TR921	0B13214A	DTR DTC143ZKA* (EP, UK Only)
TR922	0B13214A	DTR DTC143ZKA* (EP, UK Only)
TR923	0B13245A	TR 2SA1037AK*-R,S (EP, UK Only)
TR937	0B13248A	TR 2SD2114K* (EP, UK Only)
TR938	0B13248A	TR 2SD2114K* (EP, UK Only)
D100	0B13151A	DI 1SS355TE-17*
D101	0B13151A	DI 1SS355TE-17*
D105	0B13151A	DI 1SS355TE-17*
D106	0B13151A	DI 1SS355TE-17*
D107	0B13151A	DI 1SS355TE-17*

Schematic Ref. No.	Part No.	Description
D110	0B13151A	DI 1SS355TE-17*
D111	0B13151A	DI 1SS355TE-17*
D118	0B13151A	DI 1SS355TE-17*
D119	0B13151A	DI 1SS355TE-17*
D122	0B13151A	DI 1SS355TE-17*
D123	0B13151A	DI 1SS355TE-17*
D130	0B13151A	DI 1SS355TE-17*
D131	0B13151A	DI 1SS355TE-17*
D134	0B13151A	DI 1SS355TE-17*
D135	0B13151A	DI 1SS355TE-17*
D138	0B13151A	DI 1SS355TE-17*
D150	0B13151A	DI 1SS355TE-17*
D151	0B13151A	DI 1SS355TE-17*
D179	0B13151A	DI 1SS355TE-17*
D908	0B13255A	ZD UDZS6.2BTE-17* (EP, UK Only)
D909	0B13254A	ZD UDZ12BTE-17* (EP, UK Only)
J300	0B85710A	OPT S. GP1F32T
J901	0B85725A	Socket YKF41-5021 (EP, UK Only)
L200	0B50402A	Trans Pulse TC-1027-04
PJ300	0B85709A	J.Pin T7036-AABB (EP, UK Only)
PJ300A	0B85740A	J.Pin T6634-AADB (Except EP, UK)
PJ301	0B85708A	J.Pin HSP-244V10
PJ303	0B85707A	J.Pin HSP-241V1OG
P302	0B85705A	DIN.J HDC-050A 4P
X722	0B90978A	XTAL CCR8.0MC5T*

5.3. Power Supply P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	BK10447A	**Power Supply P.C.B. Ass'y (Except USA, CAN, TW)**
	BK10449A	**Power Supply P.C.B. Ass'y (USA, CAN, TW)**
	BK10448A	**Power Supply P.C.B. Ass'y (KR)**
IC501	0B13219A	IC STR-F6672
IC551	0B13215A	IC KA431AZTA
IC553	0B13216A	IC KA78R33
IC555	0B13218A	IC NJM79M09FA
IC556	0B13217A	IC NJM78M09FA
T501	0B50401A	Trans D6003KALL
TR550	0B13208A	DTR DTC143ZS
TR551	0B13241A	TR 2SB1326-Q,R
TR558	0B13208A	DTR DTC143ZS
TR559	0B13208A	DTR DTC143ZS
TR560	0B13241A	TR 2SB1326-Q,R
D502	0B13201A	DI 1SS133T-77
D504	0B13201A	DI 1SS133T-77
D508	0B13200A	DI 1N4006-N02
D509	0B13200A	DI 1N4006-N02
D510	0B13200A	DI 1N4006-N02
D511	0B13200A	DI 1N4006-N02
D553	0B13203A	DI AK03V0
D555	0B13202A	DI 1SS244T-77
D556	0B13205A	D Schot.FMB-G14L 40/5.0A
D557	0B13206A	DI RK16LF-C1
D558	0B13204A	DI AK06V0 60/0.7A
D559	0B13204A	DI AK06V0 60/0.7A
D564	0B13252A	ZD MTZJ5.1C
L500	0B50399A	Coil LF LF-4ZA-E263 26.0MH
L501	0B50400A	Coil LF LU-8SA-V102 1.0MH
L551	0B50394A	Coil PC7 330K
L553	0B50392A	Coil EL0606RA 330K
L554	0B50392A	Coil EL0606RA 330K
L556	0B50394A	Coil PC7 330K
L557	0B50391A	Coil EL0606RA 101K
R504	0B21718A	RF RDF16S1 681J
R505	0B21721A	RF RSSX1YVTPA R36J
R508	0B21717A	RF RDF16S1 5R6J
R512	0B21719A	RF RSS1YVTPA 683J
R553	0B21720A	RF RSSX R75J(2W)
C509	0B42937R	CC CD85 E102M400V
C511	0B42937R	CC CD85 E102M400V
C512	0B42937R	CC CD85 E102M400V
C513	0B42990A	CM MKPR46KI104M
C514	0B42991A	CM MKPR46KI224M
F500	0B90972A	FU T3.15A/250V(219
FR551	0B21723A	RFU RF25SCVTP R24K
FR552	0B21723A	RFU RF25SCVTP R24K
FR554	0B21722A	RFU RF25SCVTP R10K
FR555	0B21724A	RFU RF25SCVTP R75K
FR556	0B21725A	RFU RF25SVTP 220J
P500A	0B90970A	AC Inlet M1932 (Except USA, CAN, TW)
P500B	0B90979A	AC Inlet M1934 (USA, CAN, TW)
PH500	0B13238A	PHT C. PF5001-BCD
PH501	0B13239A	PHT C. PS2561-1-V
SW500	0B70307A	SW SDKLA10200

5.4. Mechanism P.C.B. Ass'y

5.4.1. New Mechanism P.C.B. Ass'y (C3)

Schematic Ref. No.	Part No.	Description
	BK10454A	**Mechanism P.C.B. Ass'y (For C3M1 Main) (For New Models)**
IC1	0B13221A	IC BA6859AFP*-E2
IC2	0B13220A	IC BA5938FM*-E2
IC3	0B13179A	IC NJM4558M*
IC4	0B13228A	IC NJM2904M*
TR1	0B13159A	DTR DTC144EUA*
TR31	0B13246A	TR 2SB1132*-P,Q,R
TR32	0B13246A	TR 2SB1132*-P,Q,R
TR33	0B13196A	TR 2SA1576A*-Q,R,S
TR34	0B13196A	TR 2SA1576A*-Q,R,S
TR35	0B13197A	TR 2SC4081*-R,S
TR36	0B13213A	DTR DTC114TUA*
TR37	0B13197A	TR 2SC4081*-R,S
TR38	0B13211A	DTR DTA114EUA*
D11	0B13151A	DI 1SS355TE*-17
D31	0B13151A	DI 1SS355TE*-17
D32	0B13151A	DI 1SS355TE*-17
D33	0B13253A	ZD UDZ10BTE*-17
P100	0B85720A	Socket 40FLZ-RSM1*-RTB
P200	0B85719A	Socket 30FLS-RSM1*-TB
P300	0B85722A	Socket SFW11R*-1STE1

5.4.2. Former Mechanism P.C.B. Ass'y (M3)

Schematic Ref. No.	Part No.	Description
	—	**Mechanism P.C.B. Ass'y (For M3C1 Main) (For Former Models)**
IC1	0B13221A	IC BA6859AFP*-E2
IC2	0B13220A	IC BA5938FM*-E2
IC3	0B13179A	IC NJM4558M*
IC4	0B13228A	IC NJM2904M*
TR1	0B13159A	DTR DTC144EUA*
TR31	0B13246A	TR 2SB1132*-P,Q,R
TR32	0B13246A	TR 2SB1132*-P,Q,R
TR33	0B13196A	TR 2SA1576A*-Q,R,S
TR34	0B13196A	TR 2SA1576A*-Q,R,S
TR35	0B13159A	DTR DTC144EUA*
TR36	0B13213A	DTR DTC114TUA*
TR37	0B13197A	TR 2SC4081*-R,S
TR38	0B13211A	DTR DTA114EUA*
TR39	0B13211A	DTR DTA114EUA*
TR40	0B13197A	TR 2SC4081*-R,S
TR41	0B13197A	TR 2SC4081*-R,S
D11	0B13151A	DI 1SS355TE*-17
D31	0B13151A	DI 1SS355TE*-17
D32	0B13151A	DI 1SS355TE*-17
D33	0B13253A	ZD UDZ10BTE*-17
P100	0B85720A	SO 40FLZ-RSM1*-RTB

Schematic Ref. No.	Part No.	Description
P200	0B85719A	SO 30FLS-RSM1*-TB
P300	0B85722A	SO SFW11R*-1STE1

5.5. Operation P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	BK10453A	**Operation P.C.B. Ass'y**
IC100	0B13234A	IC UPD16311GC-AB6*
IC101	0B13224A	IC BU2092F*
TR101	0B13244A	TR 2SD2144S-U,V,W
TR102	0B13207A	DTR DTA143ES
TR103	0B13210A	DTR DTC144TS
D100	0B13201A	DI 1SS133T-77
D101	0B13201A	DI 1SS133T-77
D102	0B13201A	DI 1SS133T-77
D103	0B13201A	DI 1SS133T-77
D105	0B13251A	ZD MTZJ4.7C
D106	0B13250A	ZD MTZJ2.0B
D120	0B13236A	LED SEL5821ATP15
D121	0B13236A	LED SEL5821ATP15
D122	0B13236A	LED SEL5821ATP15
D123	0B13236A	LED SEL5821ATP15
D124	0B13236A	LED SEL5821ATP15
D125	0B13236A	LED SEL5821ATP15
D126	0B13236A	LED SEL5821ATP15
FL100	0B90976A	LCD 13-BT-160GK
P102	0B85723A	Socket 16-FMZ-ST
PH100	0B13240A	PHT S. GP1U261X
SW100	0B70305A	SW Rotary Encoder MXS00380ZMB4
SW101	0B70308A	SW Tact SKHVBE
SW102	0B70308A	SW Tact SKHVBE
SW103	0B70308A	SW Tact SKHVBE
SW104	0B70308A	SW Tact SKHVBE
SW105	0B70308A	SW Tact SKHVBE
SW106	0B70308A	SW Tact SKHVBE
SW107	0B70308A	SW Tact SKHVBE
SW120	0B70308A	SW Tact SKHVBE
SW121	0B70308A	SW Tact SKHVBE

5.6. Power LED P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	BK10476A	**Power LED P.C.B Ass'y**
D201	0B13237A	LED SML78423CTP15
D204	0B13236A	LED SEL5821ATP15
D206	0B13249A	ZD MTZJ2.0A

5.7. Headphone/MIC P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	BK10477A	**Headphone/MIC P.C.B.Ass'y**
IC303	0B13226A	IC M5218AFP*-73A
TR301	0B13242A	TR 2SC3576
TR302	0B13242A	TR 2SC3576
TR303	0B13242A	TR 2SC3576
TR304	0B13242A	TR 2SC3576
TR305	0B13209A	DTR DTC144ES
L303	0B50393A	Coil LAP02TA 101J
L304	0B50393A	Coil LAP02TA 101J
VR302	0B30231A	VR RK09K12A L20
PJ301	0B90975A	J.PH HTJ-064-05AG

6. RECOMMENDED SPARE PARTS LIST

No.	Part No.	Description
1	CA09494A	Traverse Ass'y TKM-002
2	CA09493A	Loading Motor Ass'y
3	0B90969A	Motor CDS8A50T30-A/TT
4	CA09488A	Sled Motor Ass'y
5	0B50401A	Transformer Power D6003KALL
6	0B50402A	Transformer Pulse TC-1027-04
7	0B13205A	D SCHOT.FMB-G14L 40/5.0A
8	0B13204A	DI AK06V0 60/0.7A
9	0B13206A	DI RK16LF-C1
10	0B13203A	DI AK03V0
11	0B13202A	DI 1SS244T-77
12	0B13152A	DI DA204U-T106*
13	0B13153A	DI UMN11N-TN*
14	0B13151A	DI 1SS355TE-17*
15	0B13201A	DI 1SS133T-77
16	0B13253A	ZD UDZ10BTE-17*
17	0B13254A	ZD UDZ12BTE-17*
18	0B13255A	ZD UDZS6.2BTE-17*
19	0B13249A	ZD MTZJ2.0A
20	0B13250A	ZD MTZJ2.0B
21	0B13251A	ZD MTZJ4.7C
22	0B13252A	ZD MTZJ5.1C
23	0B90972A	FUSE 219 T 250V 3.15A
24	0B13168A	IC BA05FP-E2*
25	0B13220A	IC BA5938FM-E2*
26	0B13221A	IC BA6859AFP-E2*
27	0B13222A	IC BA7660FS-E2*
28	0B13223A	IC BA7666FS-E2*
29	0B13169A	IC BU4011BFV-E2*
30	0B13170A	IC BU4S81-TR*
31	0B13171A	IC CYC11AP000* (HERCULES)
32	0B13172A	IC CYC12MP000* (LION)
33	0B13173A	IC CYC13DD000* (MERMAID)
34	0B13174A	IC HY57V161610DTC*
35	0B13175A	IC HY628100ALG-55*
36	0B13215A	IC KA431AZTA
37	0B13216A	IC KA78R33
38	0B13176A	IC M24C16-MN6T*
39	0B13225A	IC M38022* M4-467
40	0B13226A	IC M5218AFP-73A*
41	BA10459A	IC MB90F574APFV-G AK-SYS4
42	0B13165A	IC MN66261
43	0B13177A	IC MN67700VRZB*
44	BA10460A	IC MX29F1610MC-12-NC090303
45	0B13228A	IC NJM2904M*
46	0B13229A	IC NJM4580M*
47	0B13180A	IC PCM1735E/2K*
48	0B13182A	IC SM8701BM-ET*
49	0B13219A	IC STR-F6672
50	0B13230A	IC TC4053BF*
51	0B13231A	IC TC74HC4053AFT*
52	0B13232A	IC TC74HCU04AF*
53	0B13183A	IC TC74VHC00FT*
54	0B13184A	IC TC74VHC08FTEL*
55	0B13185A	IC TC74VHC157FTEL*
56	0B13187A	IC TC74VHC574FTEL*
57	0B13188A	IC TC74VHC86FT*
58	0B13189A	IC TC74VHCT245AFT*
59	0B13233A	IC TC7SET08FT*
60	0B13190A	IC TC7SHU04FU*
61	0B13192A	IC TC7WH157FU*
62	0B13193A	IC TC7WH74FUTE12L*
63	0B13191A	IC TC7W04FUTE12L*
64	0B13234A	IC UPD16311GC-AB6*
65	0B13235A	IC XC61AN4002MR*
66	0B13195A	IC ZIVA-3-PEO*
67	0B90964A	XTAL CCR4.0MC3T*
68	0B90978A	XTAL CCR8.0MC5T*
69	0B90965A	XTAL CX-11F* 27MH
70	0B90966A	XTAL CX-16F* 40MHZ
71	0B90976A	LCD FL 13-BT-160GK
72	0B21717A	RF RDF16S1 5R6J
73	0B21718A	RF RDF16S1 681J
74	0B21722A	RFU RF25SCVTP R10K
75	0B21723A	RFU RF25SCVTP R24K
76	0B21724A	RFU RF25SCVTP R75K
77	0B21725A	RFU RF25SVTP 220J
78	0B21720A	RF RSSX R75J (2W)
79	0B21719A	RF RSS1YVTPA 683J
80	0B21721A	RF RSSX1YVTPA R36J
81	0B70306A	SW LEVER MXS01070MLB0 1-01-02S
82	0B70304A	SW MICRO MPU10420MLB0
83	0B70307A	SW PUSH SDKLA10200 01-1
84	0B70305A	SW ROTARY ENCODER MXS00380ZMB4
85	0B70308A	SW TACT SKHVBE T05
86	0B13238A	PHT C. PF5001-BCD
87	0B13239A	PHT C. PS2561-1-V
88	0B13244A	TR 2SD2144S-U,V,W
89	0B13246A	TR 2SB1132*-P,Q,R
90	0B13211A	DTR DTA114EUA*
91	0B13212A	DTR DTA143ZKA*
92	0B13158A	DTR DTA144EUA*
93	0B13213A	DTR DTC114TUA*
94	0B13214A	DTR DTC143ZKA*
95	0B13159A	DTR DTC144EUA*
96	0B13160A	DTR DTC144TUA*
97	0B13154A	DTC FMY4A-T148*
98	0B13161A	DTR UMG4N-TR*
99	0B13156A	DTC UMX3N-TR*
100	0B13207A	DTR DTA143ES
101	0B13208A	DTR DTC143ZS
102	0B13209A	DTR DTC144ES
103	0B13210A	DTR DTC144TS
104	0B13162A	FET 2SK2145*-TE85L
105	0B13163A	FET 2SK880*-TE85L
106	0C10547A	Belt Loading
107	BK10455A	Main P.C.B. Ass'y (C3)
108	BK10451A	Output P.C.B. Ass'y (JPN)
109	BK10452A	Output P.C.B. Ass'y (EXCEPT JPN,EP,UK)
110	BK10450A	Output P.C.B. Ass'y (EP,UK)
111	BK10454A	Mechanism P.C.B. Ass'y (C3)
112	BK10447A	Power Supply P.C.B. Ass'y (Except USA,CAN,TW)
113	BK10449A	Power Supply P.C.B. Ass'y (USA,CAN,TW)
114	BK10448A	Power Supply P.C.B. Ass'y (KR)
115	BK10453A	Operation P.C.B. Ass'y
116	BK10477A	Headphone/MIC P.C.B. Ass'y
117	BK10476A	Power LED P.C.B. Ass'y

7. IC BLOCK DIAGRAMS

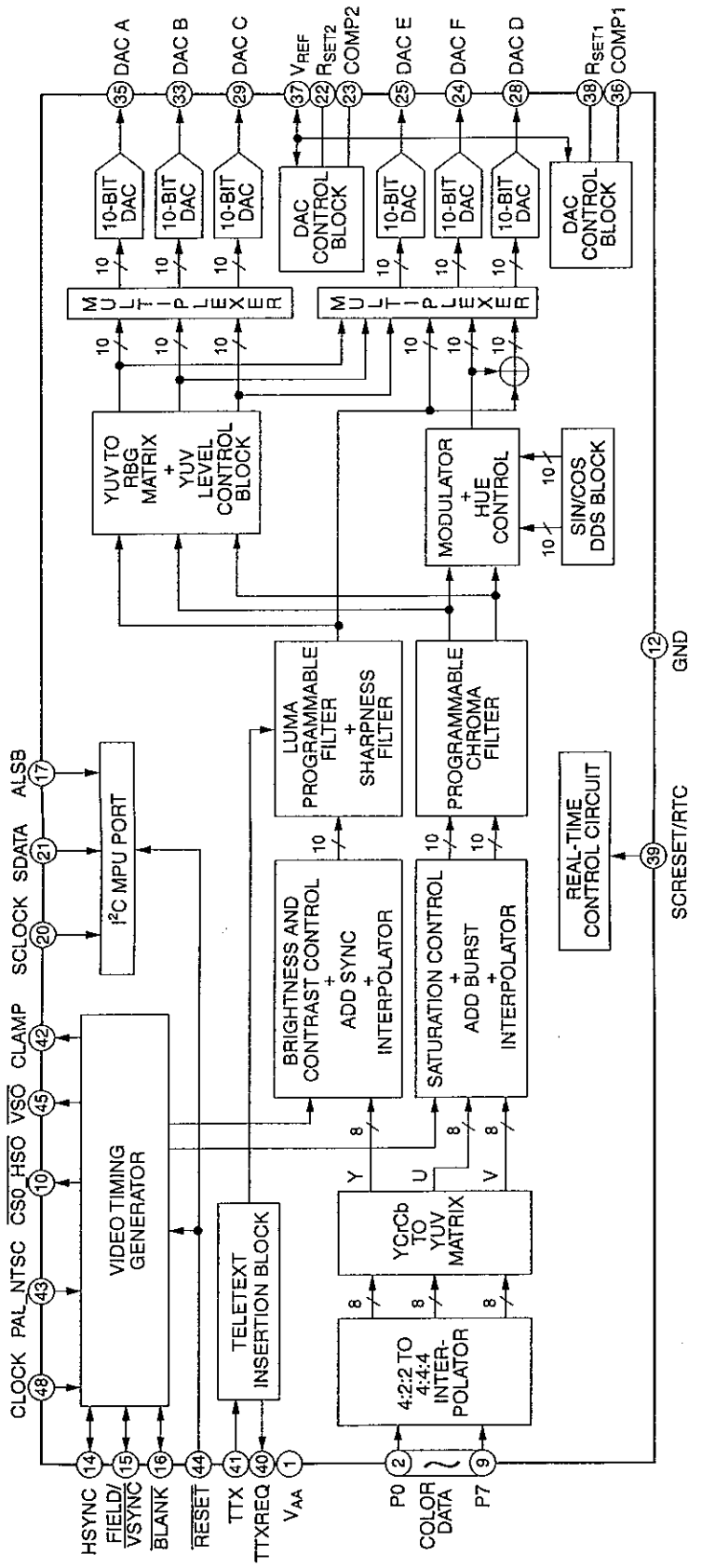


Fig. 7.1 Video Signal Decoder ADV7172 (IC850 on Main P.C.B. Ass'y)

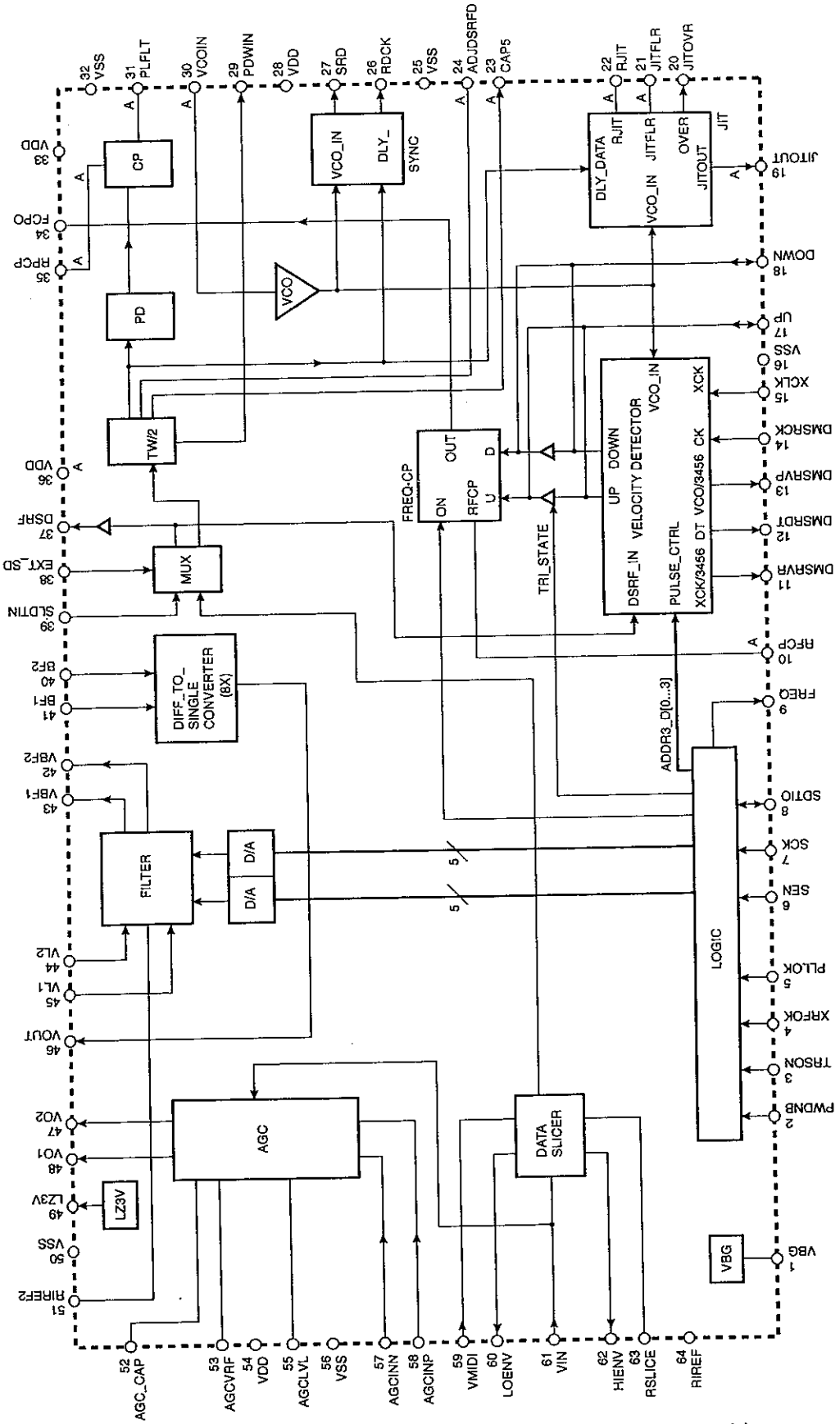


Fig. 7.2 Read Channel CYC12MP000(LION) (IC201 on Main P.C.B. Ass'y)

CYC12MP000 (LION) (Read channel) (IC201 on the Main P.C.B. Ass'y)

Pin No.	Port Name	I/O	FUNCTION
1	VBG	O	Band gap reference voltage output.
2	PWDNB	I	Power on mode control input. (Normal: H)
3	TRSON	I	Traverse servo on. (H: tracking servo on, L: off)
4	XRFOK	I	Drop out input. (H: drop out, L: normal)
5	PLLOK	I	PLL mode selection. (H: phase pull in, L: frequency pull in)
6	SEN	I	Serial port enable input.
7	SCK	I	Serial port clock input.
8	SDTIO	I/O	Serial port data input/output.
9	FREQ	O	Frequency mode test pin.
10	RFCP	–	Frequency mode current setting pin.
11	DMSRVR	O	Reference clock / 3456 output.
12	DMSRDT	O	Serial data output for speed control.
13	DMSRVP	O	VCO / 3456 output.
14	DMSRCK	I	Serial clock input for speed control.
15	XCLK	I	Reference clock input for velocity detection (27 MHz).
16,25,32,50,56	Vss	–	Ground pin.
17	UP	I/O	Tri-state I/O pin (not used).
18	DOWN	I/O	Tri-state I/O pin (not used).
19	JITOUT	O	PLL jitter output. Jitter is converted to voltage and send to output.
20	JITOVR	O	Jitter over output (L: normal, H: jitter over).
21	JITFLR	–	Filter terminal for PLL jitter detection.
22	RJIT	–	Resister terminal for jitter detection.
23	CAP5	–	TW/2 test pin.
24	ADJDSRFD	–	TW/2 half window adjust pin.
26	RDCK	O	Synchronized clock output.
27	SRD	O	Synchronized data output.
28,33,36,54	VDD	–	LVD & digital section power supply.
29	PDWIN	O	TW/2 half window test pin.
30	VCOIN	I	VCO input pin. The voltage level of this pin controls the frequency of VCO.
31	PLFLT	–	Phase control charge pump output / VCO input.
34	FCPO	–	Capacitor connecting pin for frequency control loop.
35	RPCP	–	Phase mode current setting terminal.
37	DSRF	O	Sliced data test pin.
38	EXT_SD	I	MUX selection control pin. (L: normal mode, H: select SLDTIN as PLL input for testing.)
39	SLDTIN	I	PLL test data input.
40	BF2	I	Differential to single converter input 2.
41	BF1	I	Differential to single converter input 1.
42	VBF2	O	Buffered filter output 2 (nominal output : 50 mVp-p).
43	VBF1	O	Buffered filter output 1 (nominal output : 50 mVp-p).
44	VL2	I	Filter input 2.
45	VL1	I	Filter input 1.
46	VOUT	O	D/S converter output (VOUT = Vbf2 _ Vbf1) x 10 + LZ3V.
47	VO2	O	Differential AGC output 2.
48	VO1	O	Differential AGC output 1.
49	LZ3V	O	Reference voltage output (3V).
51	RIREF2	–	Filter & equalizer reference current setting resistor pin.
52	AGC_CAP	–	AGC loop setting terminal.
53	AGCVRF	–	AGC output reference voltage pin.
55	AGCLVL	–	AGC output level reference voltage pin.

Pin No.	Port Name	I/O	FUNCTION
57	AGCINN	I	AGC negative signal input.
58	AGCINP	I	AGC positive signal input.
59	VMIDI	I	Data slicer comparator positive input test pin.
60	LOENV	O	Data slicer negative envelope output pin.
61	VIN	I	Data slicer input.
62	HIENV	O	Data slicer positive envelope output pin.
63	RSLICE	–	Data slicer internal bias current setting resistor pin.
64	RIREF	–	Reference current setting resistor pin.

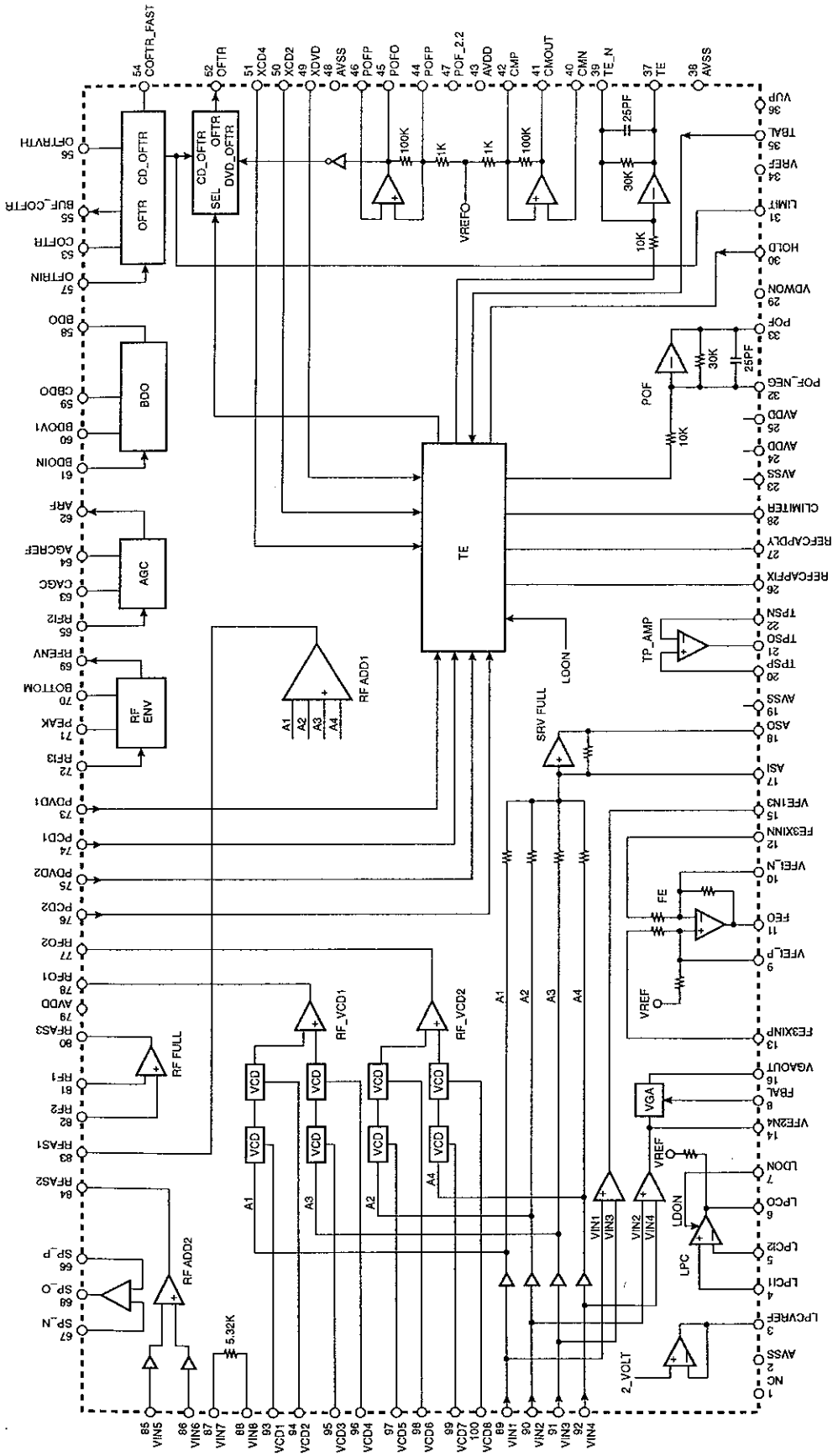


Fig. 7.3 DVD Pre-amp IC CYC11AP000 (IC100 on Main P.C.B. Ass'y)

CYC11AP000 (DVD Pre AMP) (IC100 on the Main P.C.B. Ass'y)

Pin No.	Port Name	I/O	FUNCTION
1	NC	-	No connection.
2,19,23,38,48	AVSS	-	Ground pin.
3	LPCVREF	O	LPC (laser power control) reference voltage output.
4	LPCI1	I	LPC (laser power control) non-inverting input pin.
5	LPCI2	I	LPC (laser power control) inverting input pin.
6	LPCO	O	LPC (laser power control) output.
7	LDON	I	LPC (laser power control) on/off control (H: LD on, L: LD off).
8	FBAL	I	Focus balance control input.
9	VFEI_P	I	Focus AMP positive input pin.
10	VFEI_N	I	Focus AMP negative input pin.
11	FEO	O	Focus error output pin.
12	FE3XINN	I	Focus AMP negative input pin.
13	FE3XINP	I	Focus AMP positive input pin.
14	VFE2N4	O	Vin2, Vin4 summing output.
15	VFE1N3	O	Vin1, Vin3 summing output.
16	VGAOUT	O	Focus balance AMP output.
17	ASI	I	Servo full addition AMP inverting input.
18	ASO	O	Servo full addition AMP output.
20	TPSP	I	OP-AMP non-inverting input.
21	TPSO	O	OP-AMP output.
22	TPSN	I	OP-AMP inverting input.
24,25,43,79	AVDD	-	+5 V power supply pin.
26	REFCAPFIX	-	Fixed delay capacitor connecting pin.
27	REFCAPDLY	-	Variable delay capacitor connecting pin.
28	CLIMITER	-	Phase error limit capacitor connecting pin.
29	VDOWN	O	Low reference voltage output (nominal: 1.25V).
30	HOLD	I	Select TE detection method. (L: TE detection method, H: improved method)
31	LIMIT	-	Phase error limit capacitor connecting terminal.
32	POF_NEG	I	POF AMP negative input pin.
33	POF	O	TE (tracking error) phase off-track voltage output.
34	VREF	O	Reference voltage output (nominal: 2.5V).
35	TBAL	I	Tracking balance control pin (nominal input range: 2.5V ± 1.25V).
36	VUP	O	High reference voltage output (nominal: 3.75V).
37	TE	O	TE (tracking error) AMP output.
39	TE_N	I	TE (tracking error) AMP inverting input.
40	CMN	I	Comparator inverting input.
41	CMOUT	O	Comparator output.
42	CMP	I	Comparator non inverting input.
44	POFP	I	POF non inverting input.
45	OFTR_2	O	CD off-track analog output.
46	POFN	I	POF inverting input.
47	POF_2.2	O	2.2 V reference voltage output.
49	XDVD	I	DVD control pin.
50	XCD2	I	CD 2X control pin.
51	XCD4	I	CD 4X control pin.
52	OFTR	O	Off track detect output pin.
53	COFTR	-	OFTR AMP filtering capacitor connecting pin.
54	COFTR_FAST	-	OFTR AMP timing capacitor connecting pin.
55	BUF_COFTR	O	Buffered output of OFTR AMP.
56	OFTRVTH	-	OFTR AMP threshold voltage setting pin.

Pin No.	Port Name	I/O	FUNCTION
57	OFTRIN	I	OFTR AMP input pin.
58	BDO	O	BDO (black drop out) AMP output pin.
59	CBDO	-	BDO (black drop out) AMP filtering capacitor connecting pin.
60	BDOV1	-	BDO (black drop out) AMP connecting pin.
61	BDOIN	I	BDO (black drop out) AMP input pin.
62	ARF	O	AGC (automatic gain control) AMP output pin.
63	CAGC	-	AGC (automatic gain control) loop setting capacitor connecting pin.
64	AGCREF	-	Reference current setting resistor connecting pin.
65	RFI2	I	AGC (automatic gain control) AMP input pin.
66	SP_P	I	Spare amplifier positive input pin.
67	SP_N	I	Spare amplifier negative input pin.
68	SP_O	O	Spare amplifier output pin.
69	RFENV	O	RF envelope output pin.
70	BOTTOM	-	Bottom hold capacitor connecting pin.
71	PEAK	-	Peak hold capacitor connecting pin.
72	RFI3	I	RF envelope input pin.
73	PDVD1	I	DVD tracking phase difference input pin 1.
74	PCD1	I	CD tracking phase difference input pin 1.
75	PDVD2	I	DVD tracking phase difference input pin 2.
76	PCD2	I	CD tracking phase difference input pin 2.
77	RFO2	O	RF phase difference output pin 2.
78	RFO1	O	RF phase difference output pin 1.
80	RFAS3	O	RF full addition AMP output pin.
81	RF1	I	RF full addition AMP input pin 1.
82	RF2	I	RF full addition AMP input pin 2.
83	RFAS1	O	RF addition AMP output pin 1.
84	RFAS2	O	RF addition AMP output pin 2.
85-88	VIN5-VIN8	I	External PD input pins.
89-92	VIN1-VIN4	I	Internal PD input pins.
93-100	VCD1-VCD8	-	Phase delay capacitor connecting pins.

MB90F574 (CPU/System control MI-COM) (IC600 on the Main P.C.B. Ass'y)

Pin No.	Port Name	I/O	FUNCTION
1	RDX	O	System bus read strobe signal output.
2	WEX	O	System bus lower 8 bit write strobe signal output.
3	BOOT	O	Ziva MI-COM transmission control output.
4	CDLOW	O	Disc judge output.
5	LD.SW1	O	Laser control output 1.
6	RDY	I	System bus ready input.
7	LD.SW2	O	Laser control output 2.
8,54,94	Vcc	–	+5 V power supply pin.
9-11,21,23, 56	N.C	–	No connection.
12	OPE.DOUT	I	Serial data input from the output control MI-COM.
13	OPE.DIN	O	Serial data output to the output control MI-COM.
14	OPE.CLK	I	Serial clock input from the output control MI-COM.
15	SLI.LV	O	PWM output for data slice level control of the read channel MI-COM.
16	L.M.V.C	O	PWM output for disc changer tray rotation control.
17	XAVRST	O	Reset control output for the Ziva-3 MI-COM.
18	SYS.XBSY	O	Serial data ready/busy output to the output control MI-COM.
19	DVD.L	O	DVD/CD laser select control output.
20	SUBQ	I	CD-DSP Q data input.
22	SQCK	O	Clock output for CD-DSP Q data.
24	CRCOK	I	Sector ID error O.K. input.
25	XCHANGER	I	Disc changer operation setting pin. (Not used)
26	XDAMUTE0	O	Audio section mute control output. (L: mute on)
27	ICESEL	O	IEC958 digital out select output. (L: Ziva, H: CD)
28	XDAMUTE1	O	Audio section mute control output. (L: mute on)
29	CLKSEL1	O	Clock generator SRO control output. (L: normal, H: double)
30	CLKSEL2	O	Clock generator FSO control output. (L: 48 kHz, H: 44.1 kHz)
31	SYSRST	O	System reset output.
32	DRPOUT	I	Drop out input.
33,63,91,119	Vss	–	Ground pin.
34	C	–	Capacitor connecting pin.
35	PAL/NTSC	O	Video decoder PAL/NTSC select output.
36	ENRST	O	Video encoder IC reset output.
37	XDARST	O	DAC reset output.
38	DVcc	–	+5 V power supply pin for digital circuit.
39	DVss	–	Ground pin for digital circuit.
40	FCSBAL	I	Focus balance adjustment input.
41	TRKBAL	I	Tracking balance adjustment input.
42	Avcc	–	+5 V power supply pin for analog circuit.
43	AVRH	I	Connect to +5 V.
44	AVRL	I	Connect to ground.
45	Avss	–	Ground pin for analog circuit.
46	TE	I	A/D input for disc judge signal 1 (Tracking error).
47	RFENV	I	A/D input for disc judge signal 2 (RF envelope).
48	FE	I	A/D input for disc judge signal 3 (Focus error).
49	JIT.OUT	I	A/D input for jitter out.
50	DASW1	O	Audio DAC L/R channel input data select control output.
51	DACML	O	Audio DAC serial latch output.
52	DACMC	O	Audio DAC serial clock output.
53	DACMD	O	Audio DAC serial data output.
55	DASW0	O	Audio DAC mix channel input data select control output.
57	DEC.CS	O	Ziva MI-COM chip select output.

Pin No.	Port Name	I/O	FUNCTION
58	XDACS1	O	Audio DAC (L/R) chip select output.
59	XDACS2	O	Audio DAC (SL/SR) chip select output.
60	XDACS3	O	Audio DAC (C/SUBW) chip select output.
61	XDACS0	O	Audio DAC (MIXL/MIXR) chip select output.
62	CHG.V.C	O	Disc changer motor control output.
64	DISC.CHK	I	Disc judge assist.
65	XMULTI	I	2 CH/XMULTICH setting control input.
66	DASW2	O	Four audio DAC test mode input data select.
67	AVRTM	I	ECC interruption request input (end of output stream of 2060 bytes data) .
68,69	DGND	–	Ground for digital section.
70	SDA(I2C)	I/O	Serial data in/out from/to EEP-ROM & video encoder.
71	SCL	O	Serial clock output to the EEP-ROM & video encoder.
72	STAT	I	CD-DSP status input.
73	X0A	I	Not used.
74	X1A	O	Not used.
75	XSRTM	I	ECC interruption request input (end of block signal).
76	XINT.DEC	I	Interruption request from the Ziva MI-COM.
77	XINT.SER	I	Interruption request from the servo MI-COM.
78	OPEN-SW	I	Disc tray open detect input pin.
79	CLOSE-SW	I	Disc tray close detect input pin.
80	CLAMP-SW	I	Disc changer tray position detect input pin. (Not used)
81	PHOT-IN	I	Disc changer tray position detect photo sensor input pin. (Not used)
82	LOAD.F	O	Loading motor direction control outputs.
83	LOAD.R		
84	CHG.M.R	O	Disc changer motor control output. (Not used)
85	CHG.M.L		
86	HSTX	I	hardware standby pin. (Pulled up)
87-89	MD0-MD2	I	Bus mode setting pins.
(90)	RSTOUT	I	Reset signal input from the output control MI-COM.
92	X0	I	4 MHz crystal connecting pin.
93	X1	O	
95-102	HAD00-HAD07	I/O	System bus serial data/address I/O pins.
103-116	HA08-HA21	O	System bus address output pins.
117,118	HA22,HA23	O	System bus address output pins for chip select circuit.
120	ALE	O	System bus address latch enable output.

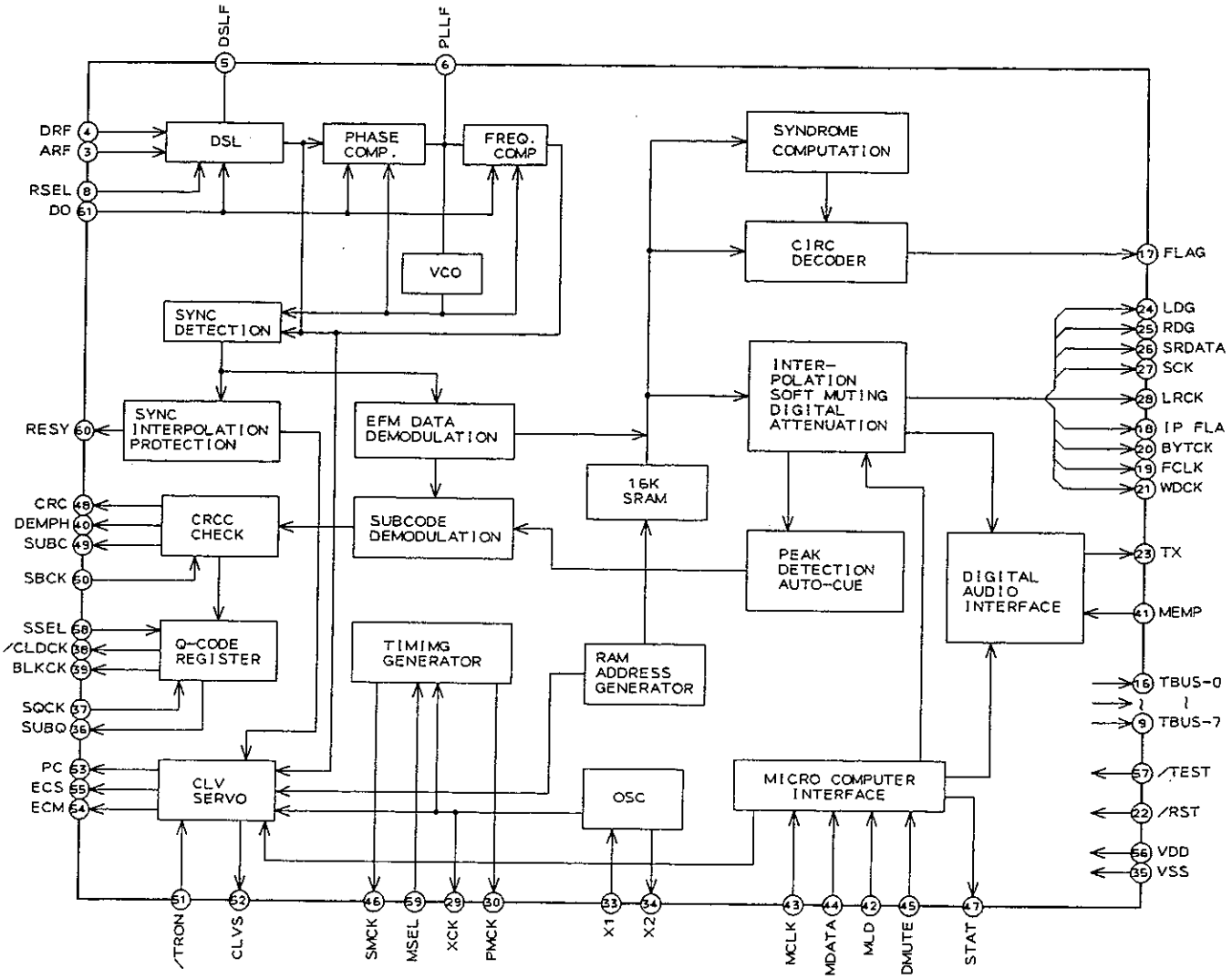


Fig. 7.4 CD Signal Processor MN66261 (IC490 on the Main P.C.B. Ass'y)

MN66261 (CD Signal Processor) (IC490 on the Main P.C.B. Ass'y)

Pin No.	Port Name	I/O	FUNCTION
1	Avss	-	Ground pin for DSL, PLL circuit.
2	IREF	I	Reference current input pin.
3	ARF	I	RF signal input pin.
4	DRF	-	Bias pin for DSL.
5	DSLF	O	Loop filter pin for DSL.
6	PLLF	I/O	Loop filter pin for PLL.
7	Avdd	-	+5V Power supply pin for DSL, PLL.
8	RSEL	-	RF signal polarity setting pin. (Brightness level: H → RSEL: H)
9-16	TBUS0 - 7	O	Test pins. Normally, these pins are open circuit.

Pin No.	Port Name	I/O	FUNCTION
17	FLAG	O	Flag output pin.
18	IPFLAG	O	Interpolation flag pin. (H: interpolate)
19	FCLK	O	Frame clock output (from crystal OSC). (fCLK =7.35 kHz, 14.7 kHz when dubble speed)
20	BYTCK	O	Byte clock out.
21	WDCK	O	Word clock out.
22	/RST	I	Reset input pin (L: reset).
23	TX	O	Digital audio interface output.
24	LDG	O	L-CH deglitch signal output.
25	RDG	O	R-CH deglitch signal output.
26	SRDATA	O	Serial data output.
27	SCK	O	Bit clock output for SRDATA.
28	LRCK	O	Left-right discrimination clock output.
29	XCK	O	Crystal OSC clock output (fXCK = 16.9344 MHz).
30	PMCK	O	1/192 counted down clock signal from the crystal OSC. (fPMCK = 88.2 kHz)
31	CSEL	I	Crystal OSC frequency select pin. (L: 16.9344 MHz, H: 33.8688 MHz)
32	PSEL	-	Test pin (normally, open circuit).
33	X1	I	Crystal connecting pin. (f = 16.9344 MHz or 33.8688 MHz)
34	X2	O	Crystal connecting pin. (f = 16.9344 MHz or 33.8688 MHz)
35	Vss	-	Ground pin.
36	SUBQ	O	Subcode Q output.
37	SQCK	I	External clock input for Subcode Q register.
38	/CLDCK	O	Subcode frame clock signal output. (fCLDCK = 7.35 kHz in normal playback)
39	BLKCK	O	Subcode block clock signal. (fBLOCK = 75 Hz in normal playback)
40	DEMPH	O	De-emphasis control output. (H: de-emphasis on)
41	MEMP	I	Emphasis signal input for digital audio interface.
42	MLD	I	MI-COM command LOAD signal input. (L: LOAD)
43	MCLK	I	MI-COM command CLOCK signal input. (Data will be latched with rising edge of the pulse)
44	MDATA	I	MI-COM command DATA input.
45	DMUTE	I	Muting input.
46	SMCK	O	1/2 counted down crystal OSC signal output when MSEL = H. 1/4 counted down crystal OSC signal output when MSEL = L.
47	STAT	O	Status signal output (CRC, CUE, CLVS, TTSTOP, FCLV, SQOK).
48	CRC	O	Subcode CRC check output. (H: OK, L: no good)
49	SUBC	O	Subcode serial output data.
50	SBCK	I	Clock input for subcode serial output.
51	/TRON	I	Tracking servo on signal. (L: tracking on)
52	CLVS	O	Spindle servo phase synchronization judge output. (H: CLV, L: rough servo)
53	PC	O	Spindle motor on signal (L = on).
54	ECM	O	Spindle motor drive signal output (forced mode, 3-state).
55	ECS	O	Spindle motor drive signal output (servo error signal, 3-state).
56	Vdd	-	+5V power supply.
57	/TEST	I	Test pin (normally, H).
58	SSEL	I	Output mode select pin for SUBQ pin. (H: Q-code buffer is used)
59	MSEL	I	Output frequency select pin for SMCK pin. (H: SMCK = 8.4672 MHz, L: 4.2336 MHz)
60	RESY	O	Re-synchronization signal of the frame synchronization signal. (H: synchronized, L: not synchronized)
61	DO	I	Drop out signal (H: drop out)
62	EFM	O	EFM signal output.
63	PCK	O	PLL extraction clock output. (fPCK = 4.3218 MHz in normal playback)
64	PDO	O	Phase comparison signal between EFM and PCK signal.

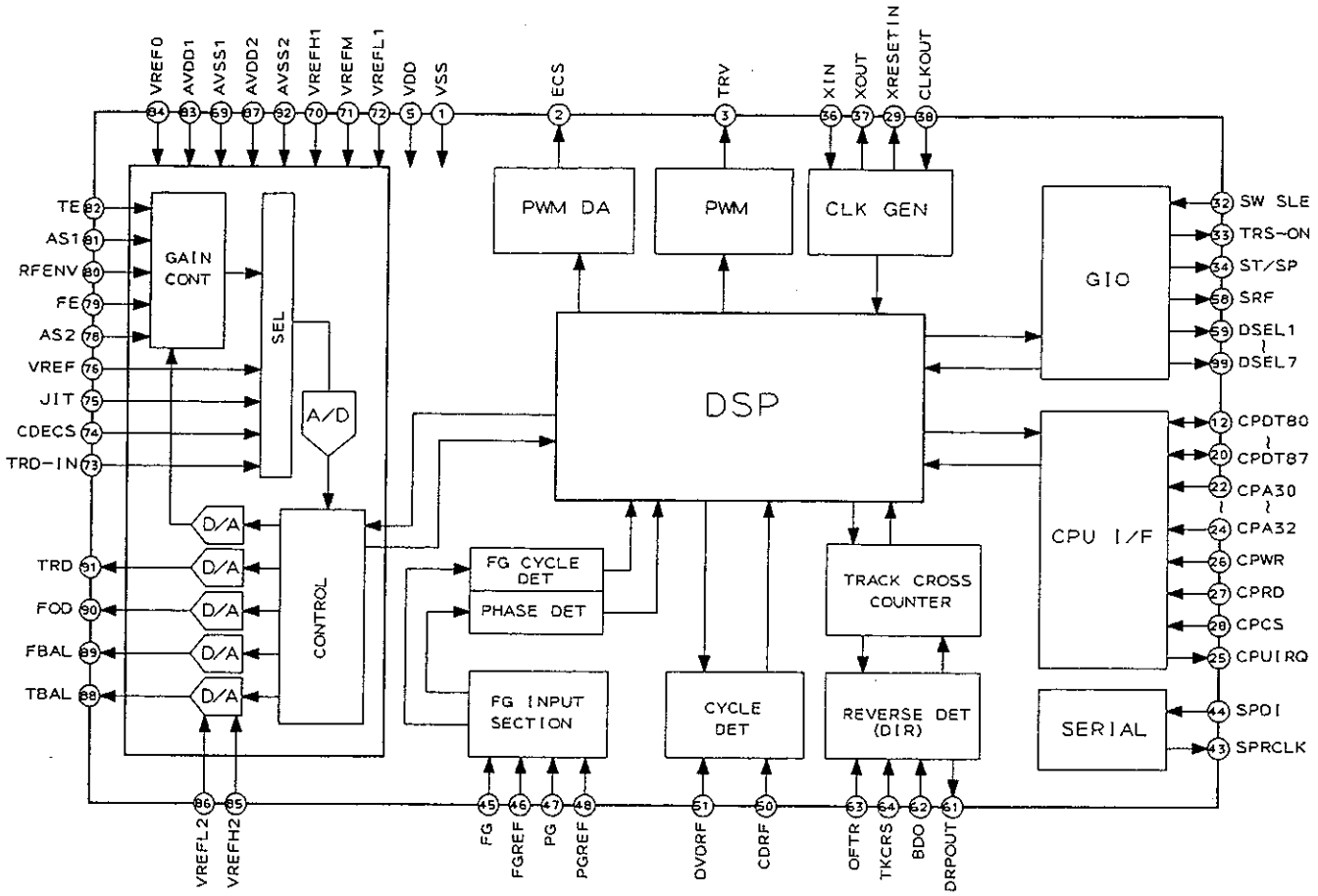


Fig. 7.5 Servo Processing IC MN67700 (IC300 on the Main P.C.B. Ass'y)

MN67700 (Servo Processing IC) (IC300 on the Main P.C.B. Ass'y)

Pin No.	Port Name	I/O	FUNCTION
1	Vss	-	Ground pin for digital circuit.
2	ECS	O	Spindle motor drive signal output.
3	TRV	O	Traverse (sled motor) drive signal output.
4,6-11	N.C	-	No connection.
5,21,39,55	Vdd	-	Power supply for digital circuit.
12-15,17-20	CPDT80-87	I/O	CPU I/F data I/O pins.
16,35,60	Vss	-	Ground for digital circuit.
22-24	CPA30-32	I	CPU I/F address input pins.
25	CPUIRQ	O	CPU interruption signal output.
26	CPWR	I	CPU I/F write strobe input pin.
27	CPRD	I	CPU I/F read strobe input pin.
28	CPCS	I	CPU I/F chip select input pin.
29	XRESETIN	I	Reset signal input. (L: reset)
30	CRCOK	I	ID check signal input pin from the DEM/ECC MI-COM.
31	GIO01	-	No connection.
32	SW SLE	I	Traverse innermost position detect signal input.
33	TRS-ON	O	Tracking servo on signal. (H: tracking servo on)
34	ST/SR	O	Spinidle motor drive (start/stop) control output (H: start).
35	Vss	-	Ground for digital circuit.

Pin No.	Port Name	I/O	FUNCTION
36	XIN	I	Crystal connecting pin (40 MHz).
37	XOUT	O	Crystal connecting pin (40 MHz).
38	CLKOUT	O	Clock output (1/2 counted down of the crystal OSC).
40	SPEN	O	Serial enable output pin.
41	SPWCLK	O	Serial write signal synchronization clock.
42	SPDO	O	Serial data output pin.
43	SPRCLK	O	Serial clock output pin.
44	SPDI	I	Serial data input pin.
45	FG	I	FG (frequency generator) signal input pin.
46	FGREF	I	FG (frequency generator) reference signal input pin.
47	PG	I	PG (pulse generator) signal input pin. (VCO/3456 XCK = 27 MHz)
48	PGREF	I	PG (pulse generator) reference signal input pin. (XCK/3456 XCK = 27 MHz)
49,56,57,77	N.C	-	No connection.
50	CDRF	I	CD-RF signal input.
51	DVDRF	I	DVD-RF signal input.
52-54	MON0-2	O	Internal monitoring signal.
58	SRF	O	Head AMP gain select control.
59,66,95-99	DSEL1-7	O	VCD setting pins.
61	DRPOUT	O	Drop out signal output. (H: drop out)
62	BDO	I	Black drop out signal input. (H: black drop out)
63	OFTR	I	Off track signal input. (H: off track)
64	TKCRS	I	Track cross signal input pin.
65	RSV1	I	Test pin (normally open).
67	RSVO	I	Test pin (normally open).
68	TESTA	I	Test mode setting pin (normally open).
69	Avss1	I	Ground for analog circuit.
70	VREFH1	I	AD high level reference voltage input pin (3.75 V).
71	VREFM	I	AD middle reference voltage input pin (2.5 V).
72	VREFL1	I	AD low level reference voltage input pin (1.25 V).
73	TRD-IN	I	Tracking drive voltage input pin. (This pin is connected to 91 pin.)
74	CDECS	I	CD spindle motor drive signal input.
75	JIT	I	Jitter level signal input.
76	VREF	I	Reference voltage input.
78	AS2	I	PD all addition signal input.
79	FE	I	Focus error signal input.
80	RFENV	I	RF envelope signal input.
81	AS1	I	Addition signal of inner 4 divided PD.
82	TE	I	Tracking error signal input.
83	AVdd1	I	Power supply for analog circuit.
84	VREF0	I	Analog reference voltage input (2.5 V).
85	VREFH2	I	Analog high level reference voltage input pin (3.75 V).
86	VREFL2	I	Analog low level reference voltage input pin (1.25 V)
87	AVdd2	I	Power supply for analog circuit.
88	TBAL	O	Tracking balance adjust output.
89	FBAL	O	Focus balance adjust output.
90	FOD	O	Focus drive signal output.
91	TRD	O	Tracking drive signal output.
92	AVss2	I	Ground pin for analog circuit.
93	TESTD	I	Test mode setting pin (normally open).
94	MINTST	I	Test mode setting pin (normally open).
100	PWMCTL	I	PWM output control signal input (normal: L)

CYC13D000 (DVD Sync/ECC/Formatter) (IC500 on the Main P.C.B. Ass'y)

Pin No.	Port Name	I/O	FUNCTION
1,12,26,35,46, 52,63,73,81, 95,105,118, 131,142,156, 170,182,195	VSS1-18	–	Ground pins.
2	SEL0	–	Test mode select pins.
3	SEL1		
4-6,8,10,10 11,14-22,28 29,116,117 119,125,126 132,171-174 194,197-206	TEST9-46	–	Test mode output pins. (Leave them open)
7	AVRTM	O	End of output stream of 2060 bytes data to CSS.
9	XSRTM	O	End of block signal.
13,25,33,45,53, 62,72,140,157, 169,196,208	VDD5-1to 5-12	–	+5 V power supply pin.
23	MLD	O	Microprocessor command load signal for CD-DA section. (L: load).
24	MCLK	O	Microprocessor command clock signal for CD-DA section. (data is atched on rising edge)
25	VDD5-2	–	+5 V power supply pin.
26	VSS3	–	Ground pin.
27	MDATA	O	Microprocessor command data for CD-DA section.
30	DEMPH	I	De-emphasis control input (H: on).
31	DMUTE	O	Muting output for CD-DA section.
32	STAT	I	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQOK) from CD-DA, STAT also goes to CPU.
34	PLLCLK	I	27 MHz clock input pin.
36	CHNDATA	I	Inverted bit data, which is changed on the falling edge of PLLCLK.
37	SDTIO	I/O	Serial bit data I/O.
38	ASPSCK	O	296ns clock (27 MHz/8) output.
39	SEN	O	High enable CPU to write data to 8 read-channel registers.
40	PLLOK	O	DVD frame sync (H: O.K)
41	LDON	O	Turn on the Laser diode.
42	XDVD	O	DVD mode control output.
43	XCD2	O	2X CD mode control output.
44	XCD4	O	4X CD mode control output.
47-51,54-56	SRMDT0-7	I/O	SRAM data bus.
57-61,64-71 74-77	SRMADR0-16	O	SRAM address bus.
78	XSRMCE	O	Chip enable signal to SRAM.
79	XSRMOE	O	Output enable signal to SRAM.
80	XSRMWE	O	Write enable signal to SRAM.
83-90	SDMDT0-7	I/O	SDRAM data bus.
91-93 96-103,106	SDMADR0-11	O	SDRAM address bus.
107	$\overline{\text{SDMRAS}}$	O	SDRAM row address strobe output.
108	$\overline{\text{SDMCAS}}$	O	SDRAM column address strobe output.
109	$\overline{\text{SDMWE}}$	O	SDRAM write enable output.

Pin No.	Port Name	I/O	FUNCTION
110	SDMDQML	O	SDRAM lower byte input/output mask.
111	SDMCLK	O	Clock signal output to SDRAM.
112	SDMCS	O	SDRAM chip select control.
113	SDMDQML	O	SDRAM upper byte input/output mask.
115	SDMCKE	O	SDRAM clock enable.
120	XDSCO	O	Chip select signal to the SERVO MI-COM.
121	CRCOK	O	Sector IDs are O.K.
122-124	CPUADR0-2	O	(Video/Audio) HAL [2:0], V/A decoder, CPU address bus.
127-130 133-139 143-147	CPUADT0-15	I/O	CPU address/data bus.
141	XRESET	I	Global reset input.
148-152	CPUADT16-20	I	CPU address bus.
153	XALE	I	Address latch enable input.
154	XRE	I	Read strobe.
155	XINTO	O	ECC interrupt request.
158	XWEH	I	Write strobe signal.
159	XWAIT	O	CPU wait state control.
168	XHSTCS	O	Decipher chip select.
176	STENABLE	I	Stream data request.
177-181 185-187	STD0-7	O	Output stream data bus.
183	GENCLK	I	27 MHz clock input.
188	STCLK	O	Output stream data transfer clock, falling edge active, 6.75 MHz.
189	STVALID	O	Output stream data valid.
190	XVCS	O	Latched video decoder chip select.
191	XVDS	O	CPU read/write strobe.
192	HRXW	O	CPU write strobe, XWEH
193	ASCK	O	Latched audio decoder chip select.
207	SELCPU	I	1: data corresponds to CPUADT15-8. 0: data corresponds to CPUADT7-0.

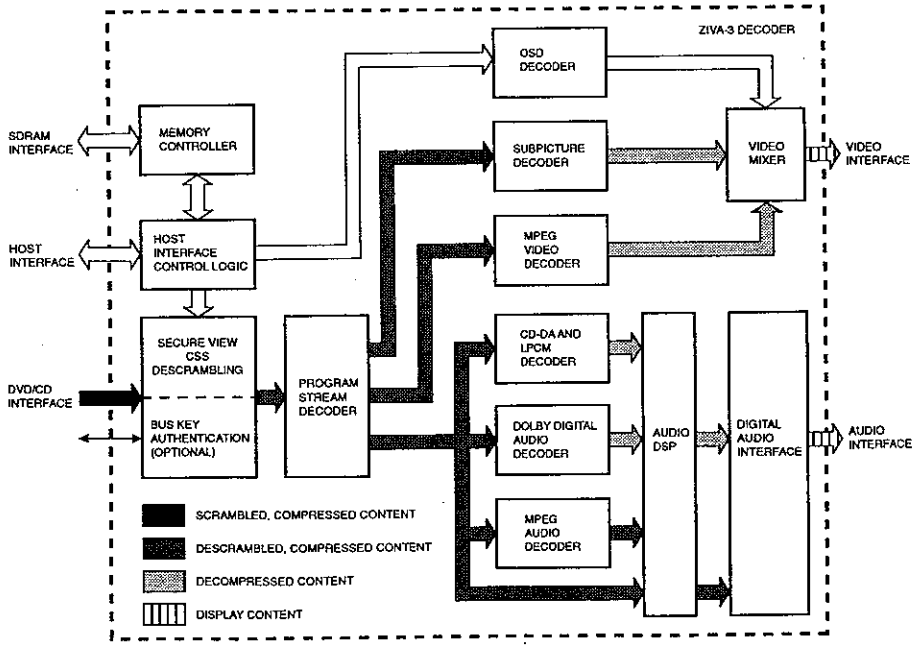


Fig. 7.6 Advanced DVD decoder with integrated Audio DSP ZIVA3 (IC700 on the Main P.C.B. Ass'y)

ZIVA-3 (Advanced DVD decoder with integrated Audio DSP)

Pin No.	Port Name	I/O	FUNCTION
1,52,129 133,138,141 147,153,156 174,190	PIO0-10	I/O	Programmable I/O pins.
2-4,6,8-11	HDATA0-7	I/O	8 bit bi-directional host data bus.
5,12,17,27 36,40,47,55 61,65,69,75 81,87,91.95 101,107,113 117,123,134 149,160,181 193	VDD1-29	–	+3.3 V power supply pins.
7,14,19,29 38,42,49,57 63,67,71,77 83,89,93,97 103,109,115 119,125,136 146,151,162 170,183,195 199	VSS1-29	–	Ground pins.
13	$\overline{\text{RESET}}$	I	Hardware reset pin.
15	$\overline{\text{WAIT/DTACK}}$	O	Transfer not complete / data acknowledge.
16	INT	O	Host interrupt.
21-26,28,30	HDATA8-15	I/O	Programmable I/O pins. Input mode after reset.
31-35,37,39 41,43-46	HADDR12-23	I/O	Programmable I/O pins. Output mode after reset.
51,130	NC	–	No connection.
53,54,56,58 59,60,62,64 66,68,70,72 73,74,76,78	MDATA0-15	I/O	Memory data.
79	LDQM	O	SDRAM LDQM.
80	UDQM	O	SDRAM UDQM.
82	$\overline{\text{MWE}}$	O	SDRAM write enable.
84	SD-CLK	O	SDRAM system clock.
85	$\overline{\text{SD-CAS}}$	O	Active low SDRAM column address.
86	SD-RAS	O	Active low SDRAM row address.
88,90	SDCS0,1	O	Active low SDRAM bank select.
92	EDO-CAS	O	EDO column address (not used).
94	EDO-RAS	O	EDO row address (not used).
96,98-100 102,104-106 108,110-112	MADDR0-11	O	Memory address output.
114,115,116 120-122,124 126,127	HADDR3-11	O	Memory address output (not used).
128	ROM-CS	O	Not used.

Pin No.	Port Name	I/O	FUNCTION
131,132,135 137,139,140 142,143,145	VDDA-F	–	Connect to +3.3 V power supply line.
148,150,152 154,155	VDATA0-7	O	Video data bus.
157	HSYNC	I/O	Horizontal sync.
158	VSYNC	I/O	Vertical sync.
159	DA-IEC	O	Bit stream data in IEC-1937 or PCM data out in IEC-958 format.
161,163-165	DA-DATA0-3	O	PCM data out, eight channels. Serial audio samples relative to DA-BCK clock.
166	DA-LRCK	O	PCM left/right clock. Identifies the channel for each audio sample.
167	DA-BCK	O	PCM bit clock output.
169	DA-XCK	I/O	Audio master frequency clock.
171	DAI-DATA	I	PCM input DATA (not used).
172	DAI-LRCK	I	PCM input LRCK (not used).
173	DAI-BCK	I	PCM input BCK (not used).
175	CLKSEL	I	Clock select pin. (H: internal, L: external)
176	A-VDD	–	+3.3 V power supply for analog section.
177	VCLK	O	Video clock. (27 MHz)
178	SYSCLK	I	System clock input. Decoder requires an external 27 MHz TTL oscillator.
179	A-VSS	–	Analog ground for PLL.
180	DVD-DATA0 /CD-DATA	I	Serial CD data.
182	DVD DATA1 /CD LRCK	I	DVD DATA1 input or CD-LRCK input.
184	DVD-DATA2 /CD BCK	I	DVD DATA2 input or CD bit clock input.
185	DVD-DATA3 /CD-C2PO	I	DVD DATA3 input. Asserted HIGH indicates a corrupted byte.
186-189	DVD-DATA4-7 CDG 4-7	I	DVD parallel compressed data from DVD DSP or CDG-SDATA/ VSFY/S0S1/SCLK signal input.
191	VREQUEST	O	Video request. Decoder asserts VREQUEST to indicate that the video input buffer has available space.
192	VSTROBE	I	Video strobe signal input.
194	AREQUEST	O	Audio request. Decoder asserts AREQUEST to indicate that the audio input buffer has available space.
196	V-DACK	I	Video data acknowledge (in synchronous mode). Asserted when DVD is valid.
198	A-DACK	I	Audio data acknowledge.
200	ERROR	I	Error in input data. If error signal is not available from the DSP, it must be grounded.
202-204	HADDR0-2	I	Host address bus. 3-bit address bus selects one of eight host interface registers.
205	DTACKSEL	I	Tie HIGH to select WAIT signal, LOW to select DTACK signal. (Motorola 68 K mode)
206	CS	I	Host chip select. Host asserts CS to select the decoder for a read or write operation.
207	R/W	I	Read/write strobe in M mode. Write strobe in I mode. Host asserts R/W LOW to select write and LOW to select read.
208	RD	I	Read strobe in I mode. Must be held HIGH in M mode.

8. SPECIFICATIONS

Discs played

DVD video disc	12 cm single-sided, single layer
	12 cm single-sided, double layer
	12 cm double-sided, single layer
	12 cm double-sided, double layer (one layer per side)
	8 cm single-sided, single layer
	8 cm single-sided, double layer
	8 cm double-sided, single layer
	8 cm double-sided, double layer (one layer per side)
Compact disc (CD-DA, Video CD)	12 cm, 8 cm

Video system ..... NTSC (525/60)/PAL (625/50)

Audio system .....
Linear PCM audio
MPEG 1/2 audio
Dolby Digital
DTS audio (Digital output only)

Video Output

Line output level	1.0 Vp-p/75Ω, unbalanced
	Pin Jack × 2
S output level	Y output: 1.0 Vp-p/75Ω, unbalanced
	C output: 0.286 Vp-p/75Ω (NTSC)
	0.3 Vp-p/75Ω (PAL)
	4 pin mini DIN × 1
Component output level	Y output: 1.0 Vp-p/75Ω, unbalanced
	C_R output: 0.7 Vp-p/75Ω unbalanced
	C_B output: 0.7 Vp-p/75Ω unbalanced
	Pin Jack × 1 system

Audio output

Audio output	2.0 Vrms/10 kΩ
	Pin Jack × 1 system
Dolby Digital 5.1 ch output	Pin Jack × 1 system

Digital audio output

Optical digital output	Optical connector × 1
Coaxial output	RCA Pin × 1

DVD linear audio characteristics

Frequency response	4 Hz-22 kHz (Fs = 48 kHz)
	4 Hz-44 kHz (Fs = 96 kHz)
S/N ratio	100 dB (Fs = 48 kHz, 24 bit PCM)
Dynamic range	100 dB (Fs = 48 kHz, 24 bit PCM)
Total harmonic distortion	0.0025% (Fs = 48 kHz, 24 bit PCM)

CD audio characteristics

Frequency response	4 Hz-20 kHz (EIAJ)
S/N ratio	100 dB (EIAJ)
Dynamic range	100 dB (EIAJ)
Total harmonic distortion	0.003% (EIAJ)
Pickup	Wavelength: 655 nm (DVD) Wavelength: 790 nm (CD)
Headphone out	φ6.3 headphone jack
Power requirements	120V AC, 60 Hz[*1] / 110-240V AC, 50/60 Hz[*2,3] / 220V AC, 60Hz[*4]
Power consumption	19 W (standby mode = 0.7 W[*1], power off = 0 W) 20 W (standby mode = 1.3 W[*2,3,4], power off = 0 W)
Operation temperature	5°C-35°C
Operation humidity range	5%-90% (no condensation)
Dimensions	430 (W) × 88 (H) × 310 (D) mm (excluding protrusions)
Weight	3.4 kg[*1,2] 3.5 kg[*3,4]
Supplied accessories	AC power cable × 1 Audio/video cable × 1 Remote control unit × 1 Batteries × 2

*1 For U.S.A. and Canada
*2 For Australia
*3 For Southeast Asia, Hong Kong
*4 For Korea

- Manufactured under license from Dolby Laboratories Licensing Corporation.
- "DOLBY", "Pro Logic", and the double-D symbol are trademarks of Dolby Laboratories.
- "DTS" is a trademark of Digital Theater Systems, INC.
- For improvement purposes, specifications and design are subject to change without notice.

Nakamichi Corporation	1-153 Suzukicho, Kodaira, Tokyo 187-8501, Japan Phone: 81 (42) 346-3103 Fax: 81 (42) 344-0802
Nakamichi America	955 Francisco St., Torrance, CA 90502 Phone: 1 (310) 538-8150 Fax: 1 (310) 324-7614
Nakamichi Asia	8/F The Grande Bldg., 398 Kwun Tong Rd., Kowloon, Hong Kong Phone: 852-2357-6690 Fax: 852 -2357-6697
Nakamichi Europe	8th Floor, Hayes Gate House, 27 Uxbridge Road Hayes, Middlesex, UB4 OJN, England Phone: 44-181-581-9191 Fax: 44-181-581-9153
Web Site	http://www.nakamichi.com

0Q06263A (1/2)

G-000403A Printed in Japan