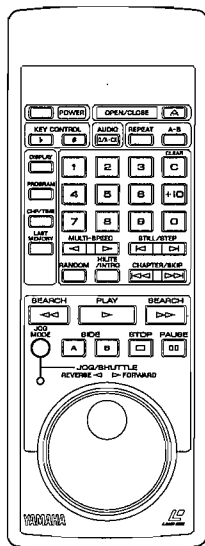
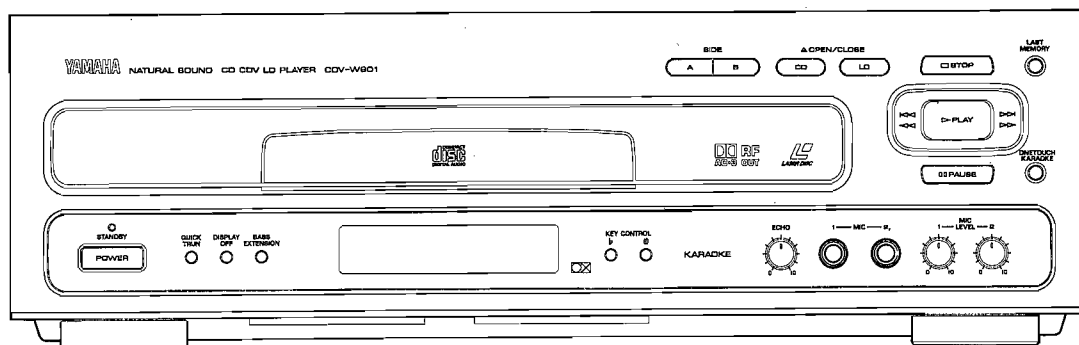


CD/CDV/LD PLAYER

CDV-W901

SERVICE MANUAL



IMPORTANT NOTICE

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

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

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

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

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

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

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CDV-W901

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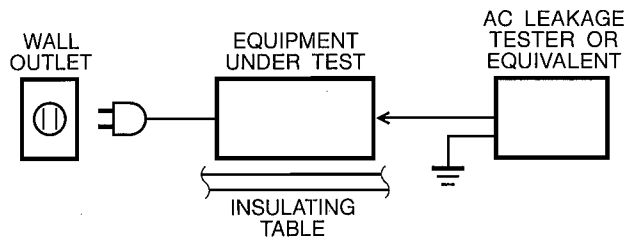
YAMAHA
 YAMAHA CORPORATION
 P.O. Box 1, Hamamatsu, Japan

1.65K-297 Printed in Japan '95.10

■ TO SERVICE PERSONNEL

Critical Components Information.

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



CAUTION: USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

THE COMPACT DISC PLAYER SHOULD NOT BE ADJUSTED OR REPAIRED BY ANYONE EXCEPT PROPERLY QUALIFIED SERVICE PERSONNEL.

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

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

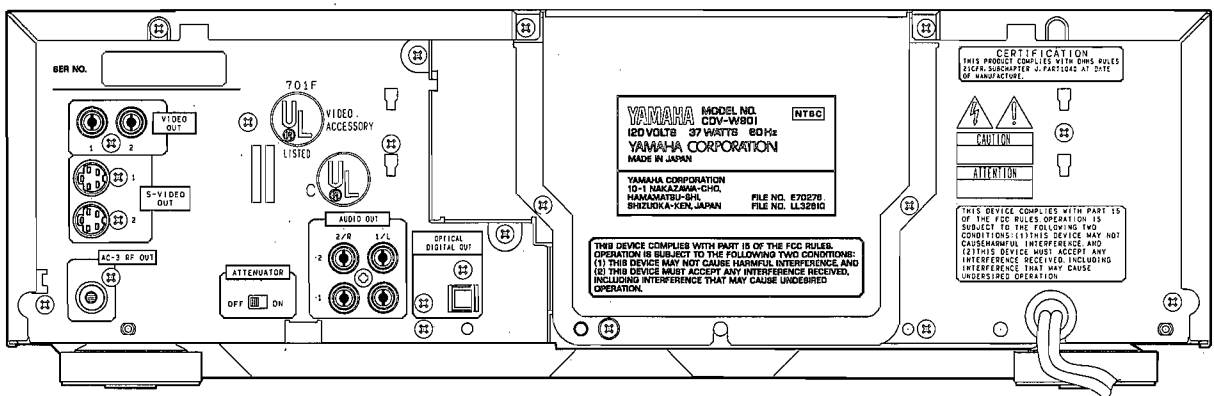
1. Laser Diode Properties

- Material : GaAlAs
- Wavelength : 780 nm
- Emission Duration : Continuous
- Laser Output : max. 44.6 μ W*

* 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.

■ REAR PANEL



■ SPECIFICATIONS

General

System LaserVision Disc system and
Compact Disc digital audio system
Laser Semiconductor laser wavelength 780 nm
Power requirement AC 120 V, 60 Hz
Power consumption 37 W
Weight 7.1kg (15 lbs 10 oz)
Dimensions 430(W) x 407(D) x 132(H)mm
16-15/16(W) x 16(D) x 5-3/16(H)in
Operating temperature +5°C ~ +35°C
(41°F ~ 95°F)
Operating humidity 5% ~ 85%
(There should be no condensation of moisture.)

Video characteristics (2 pairs)

Format NTSC specifications
Video output
Level 1 Vp-p nominal, sync. negative, terminated
Impedance 75 Ω unbalanced
Jacks RCA jacks

S VIDEO output (2 pairs)

Y output level 1 Vp-p (75Ω)
C output level 286 mVp-p (75Ω)
Jacks S VIDEO jacks

Audio characteristics (2 pairs)

Output level
During analog audio output 200 mVrms
(1 kHz, 40%)
During digital audio output 200 mVrms
(1 kHz, -20 dB)
Jacks Both RCA jacks
Number of channels 2 (Stereo)

Digital Audio Characteristics

Frequency response	4 Hz - 20 kHz
SN ratio	115 dB (EIAJ)
Dynamic range	96 dB (EIAJ)
Total harmonic distortion	Below 0.0035%
Wow and flutter	Below measurable limit (± 0.001% W.PEAK) (EIAJ)

LD is in compliance with EIAJ.

Other terminals

Control input/output Both miniature jacks
Optical digital output Optical digital jack
AC-3 RF OUT RCA jack

Accessories

Remote control unit 1
Size "AAA" (IEC R03) dry cell batteries 2
Microphone 1
Video cord 1
Audio cord 1
Operating instructions 1
Warranty card 1

NOTE :

The specifications and design of this product are subject to change without notice, due to improvement.

CLD-D604

1. DISASSEMBLY

1.1 REMOVING THE TRAY UNIT

1. Press the LD-OPEN/CLOSE button to set the tray unit to its OPEN position.
 - * When manually setting the tray unit to its OPEN position, refer to 1.2 and 1.3.
2. Pull out the tray unit while pressing the hook (A) (Fig.1-1), located on the rear right and left side of the tray unit, to the each inner side.

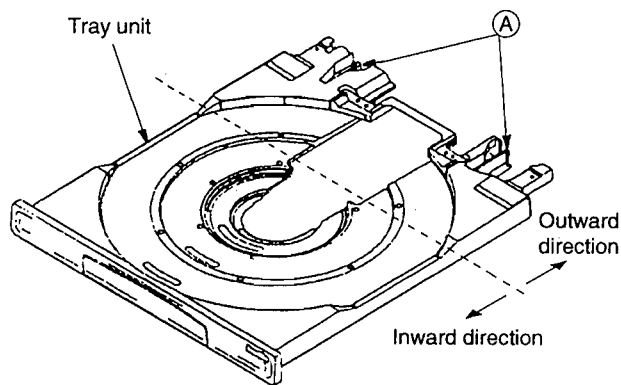


Fig. 1-1 Tray unit

1.2 MANUALLY SETTING THE TRAY UNIT TO ITS OPEN POSITION

1. Remove the clamber unit (B) (Fig. 1-2) by loosening its four screws.

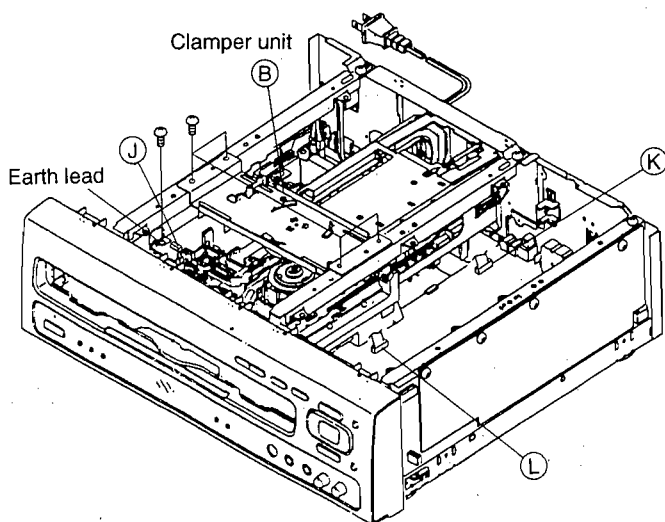


Fig. 1-2 Structure of set

2. Make sure that the position of the lens in the carriage assembly is such that the lens stops outside the position indicated by the dotted line in Fig. 1-1.

When the lens stops inside the dotted line, slowly turn the worm (Q) portion of the carriage assembly (Fig. 1-3) to move the lens in the carriage assembly until the lens is outside the position indicated by the dotted line in Fig.1-1. Perform it using the belly of a finger not to damage the worm by the nail.

Note that by not going through this process, opening the CD tray and removing the tray ASS'Y would be more time-consuming.

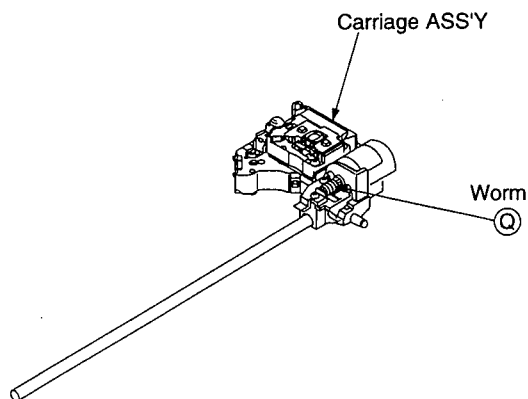


Fig. 1-3 Carriage assembly

3. Insert your hand through the bottom left side of the tray unit and turn the gear pulley (C) (Fig. 1-4) in a clockwise direction until the servo-mechanism unit (D) (Fig. 1-5) lowers. Keep turning the pulley until the tray unit starts to move towards the front.

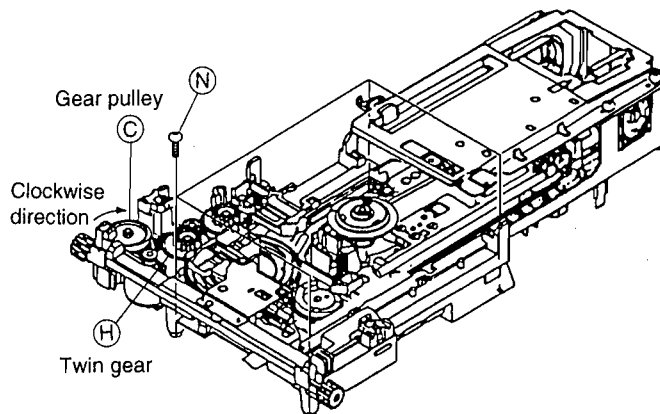


Fig. 1-4 Loading mechanism assembly

4. Slowly pull out the tray unit to the OPEN position.

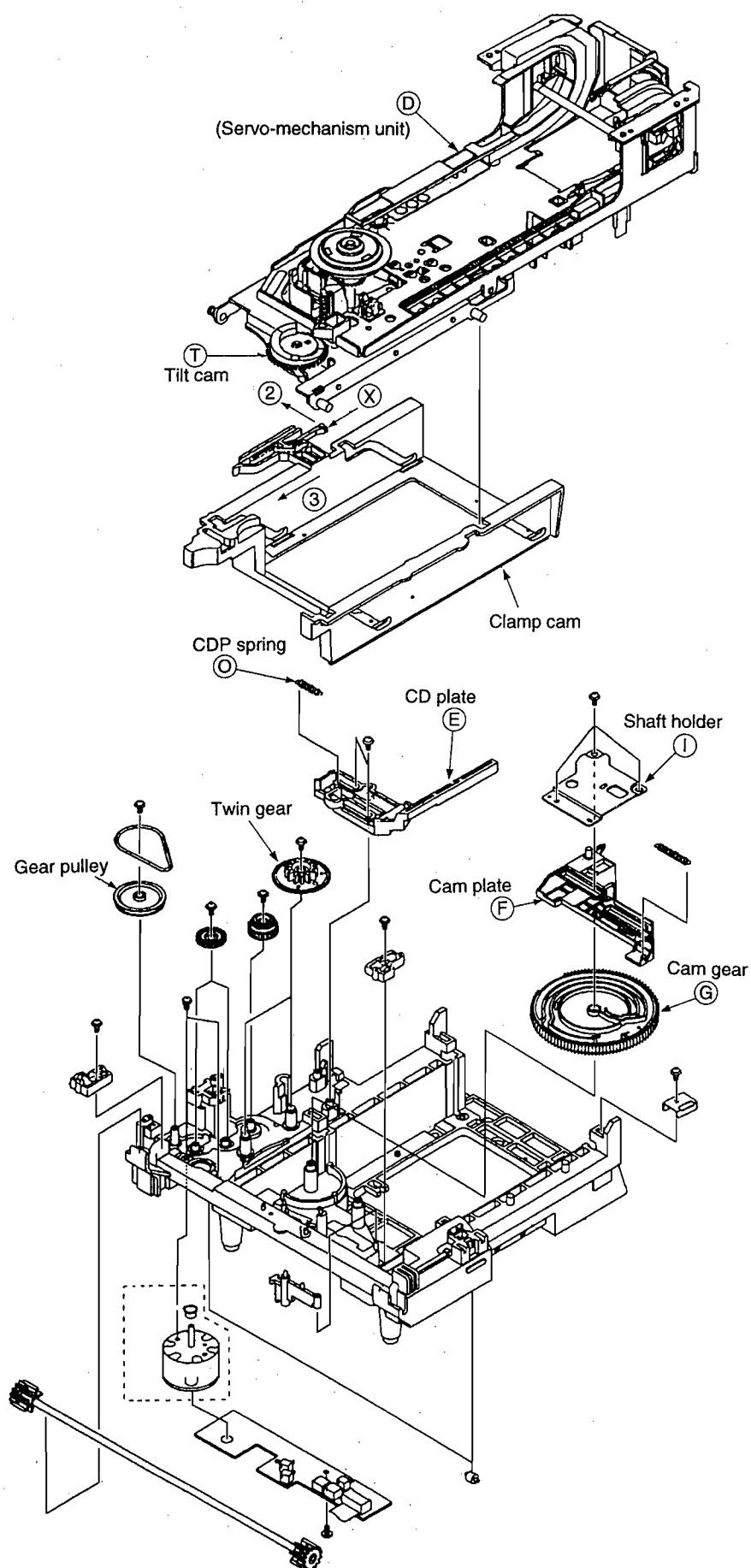


Fig. 1-5 Mechanism Section Disassembly Diagram

1.3 SETTING THE TRAY UNIT TO ITS OPEN POSITION WHEN THE CD TRAY IS COMPLETELY OR PARTIALLY OPEN

1. Remove the clamber unit ⑧ (Fig. 1-2) by loosening its four screws.
2. Slowly push in the CD tray to the CLOSE position.
3. Slowly turn the worm ⑩ portion of the carriage assembly (Fig. 1-3) to move the lens in the pickup assembly until the lens is outside the position indicated by the dotted line in Fig. 1-1.
4. Insert your hand through the bottom left side of the tray unit and turn the gear pulley ③ (Fig. 1-4) in a counterclockwise direction until the servo-mechanism unit ① (Fig. 1-5) starts to move upward. Keep turning the pulley until the clamp position is reached.
5. When the clamp position has been reached, turn the gear pulley ③ (Fig. 1-4) in a clockwise direction until the servo-mechanism unit ① lowers. Keep turning the pulley until the tray unit starts to move towards the front.
6. Slowly pull out the tray unit to the OPEN position.

1.4 REMOVING THE SERVO-MECHANISM UNIT

1. Remove the clamber unit ⑧ (Fig. 1-2) by loosening its four screws, and remove the tray unit.
2. Remove the three connectors ① to ③ (Fig. 1-2). Remove the earth lead by loosening its screw.
3. Remove the four fixing screws ④ (Fig. 1-4) of the mechanism base and remove the whole servo-mechanism unit from its casing.
4. Remove the mechanism base side of the CDP spring ⑤ (Fig. 1-5), loosen the CD plate's two screws, remove the CD plate ⑥ while bending the mechanism base.

5. Remove the two lead wire connectors from LMSB assembly at the bottom of the mechanism base ⑦.
6. Remove the lead wires from the hook ⑨ (Fig. 1-6) for the FG signal lead (yellow) wire and the carriage position detecting SW lead wire (blue) at the front of the mechanism base ⑦.
7. Remove the lead wires from the hook ⑨ for the spindle motor lead wire (green, white), the FG signal lead wire (yellow), the carriage position detecting SW lead wire (blue) and the earth lead wire (black) at the center of the mechanism base ⑦ (Fig. 1-6).
8. While pushing the cam plate ⑥ (Fig. 1-7) towards the direction of the arrow ①, turn the twin gear ④ (Fig. 1-7) in a counterclockwise direction.
9. Stop turning the twin gear ④ (Fig. 1-7) when the servo-mechanism unit ① (Fig. 1-5) has gone upward and the tilt cam ① is engaged with the cam gear ③ by three to five teeth. (Place in the same position when attaching the servo-mechanism unit.)
10. While bending the clamp cam hook ⑧ (Fig. 1-5) in the direction of the arrow ②, move the hook to its "built-in position" ⑤ (Fig. 1-5) towards the rear.
11. Lift the servo-mechanism unit ① straight up and remove the unit from the clamp cam (Fig. 1-5).

1.5 ATTACHING THE TRAY UNIT

1. Make sure that the CD plate ⑥ is positioned to the right (LD Tray mode) as in Fig. 1-7. When the CD plate ⑥ is positioned to the left (CD Tray mode) as in Fig. 1-7, perform steps 1) to 2).
- 1) Turn the power ON. Press the LD OPEN/CLOSE button while pushing cam plate ⑥ (Fig. 1-7) towards the direction of the arrow ①.
- 2) Wait until the cam gear ③ (Fig. 1-7) turns, the servo-mechanism unit ① (Fig. 1-5) goes upward, and the carriage assembly stops moving.

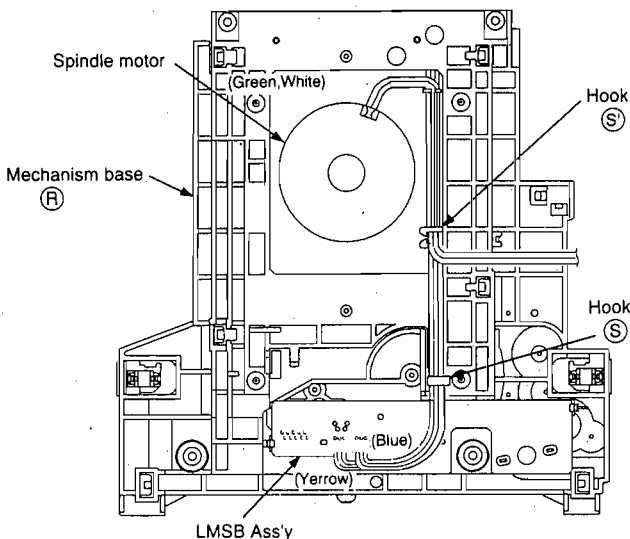


Fig. 1-6 Mechanism base the bottom side

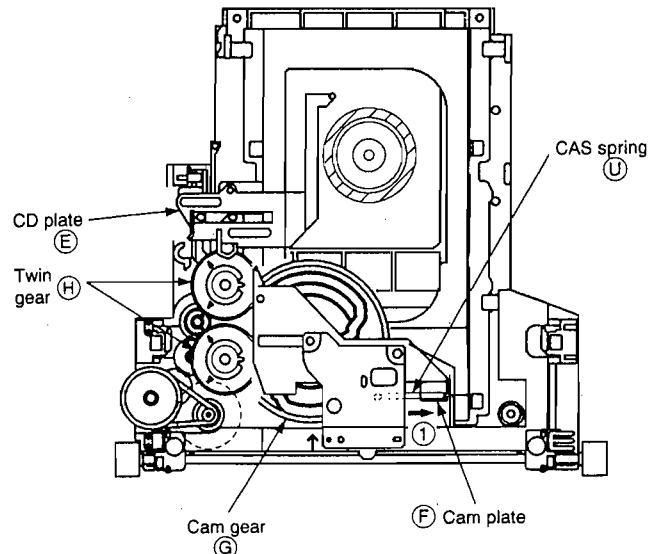


Fig. 1-7 Loading mechanism section

- Press the LD OPEN/CLOSE button to open the tray unit, or pull out the power cord from the AC outlet and turn the twin gear H (Fig. 1-4) in a clockwise direction until the cam gear G (Fig. 1-5) can no longer turn.
- Keeping the tray unit parallel with the front panel, slowly insert the tray unit through the opening of the front panel. The hook of the rear on both sides are locked in the hook of the mechanism base side at the same time. Note that if you insert the tray unit in the front panel when the tray unit and the front panel are not parallel with each other, the tray unit might get stuck while being inserted.

1.6 ATTACHING THE SERVO-MECHANISM UNIT

- Return the clamp cam and other parts to their original positions (when the servo-mechanism unit was removed).
- While turning the tilt cam T in a counterclockwise direction by three to five teeth (Fig. 1-8) in the same manner as when the tilt cam was removed, attach the servo-mechanism unit from above to the clamp cam (Fig. 1-5). Insert the lead wires to the bottom side through the opening the center of the mechanism base.
- While bending the clamp cam hook X in the direction of the arrow 2 , move the hook in the direction of the arrow 3 (Fig. 1-5).

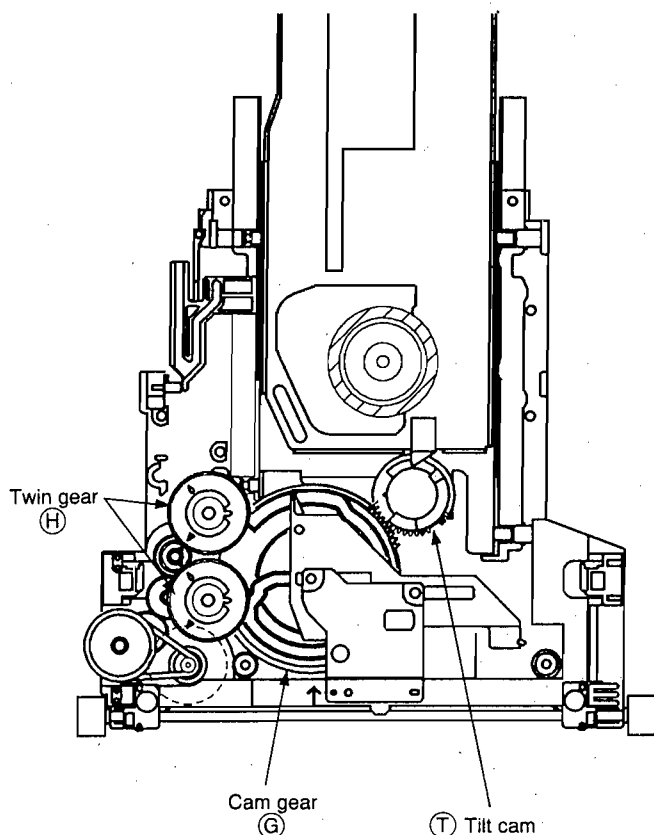


Fig. 1-8 Tilt mechanism section

- Turn the twin gear H (Fig. 1-8) in a clockwise direction until the servo-mechanism unit lowers, the cam gear G (Fig. 1-8) stops turning, and twin gear H (Fig. 1-8) runs idle.
- Hook the lead wire for the spindle motor (green, white), the lead wire for the FG signal (yellow), the lead wire for the carriage position detecting SW (blue) and the earth lead wire (black) to the hook S (Fig. 1-6) on the bottom center of the mechanism base.
- Hook the yellow and green wires to the hook S (Fig. 1-6) on the front bottom side of the mechanism base. And attach the lead wire to the each same color connector on the LMSB assembly.

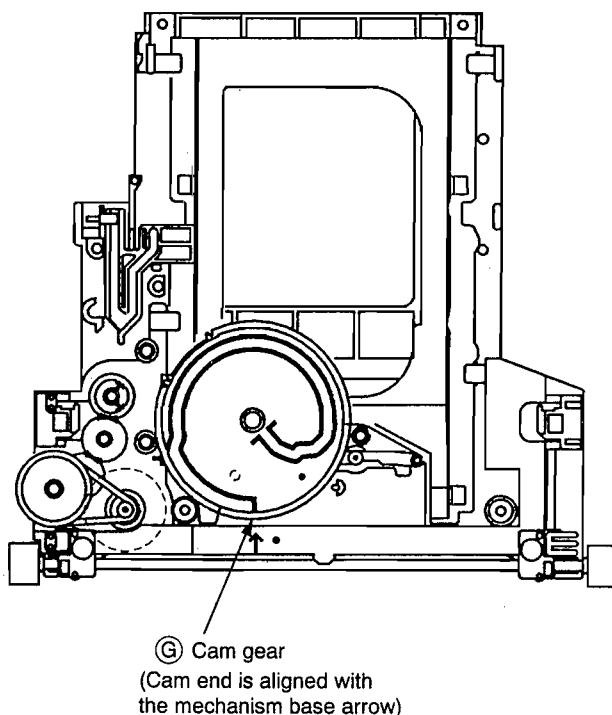


Fig. 1-9 Attach the cam gear

1.7 ATTACHING THE CAM GEAR AND CAM PLATE

- Bring the clamp cam (Fig. 1-5) close towards you (while the servo-mechanism unit is being lowered).
- Insert the cam gear G upon directing the rib of the cam gear to the arrow mark of the mechanism base as shown in Fig. 1-9.

3. Turn the cam gear ㉔ in a counterclockwise direction until the start portion of the cam gear becomes horizontal (Fig. 1-10).
4. Attach the CAS spring ㉕ (Fig. 1-10) to the cam plate ㉖ and hook the ㉗ side of the CAS spring to the hook of the mechanism base, and move the boss on the bottom center of the cam plate to the left side of the cam gear horizontal portion, attach the cam plate.
5. Fix the shaft holder ㉘ using three screws (Fig. 1-5).

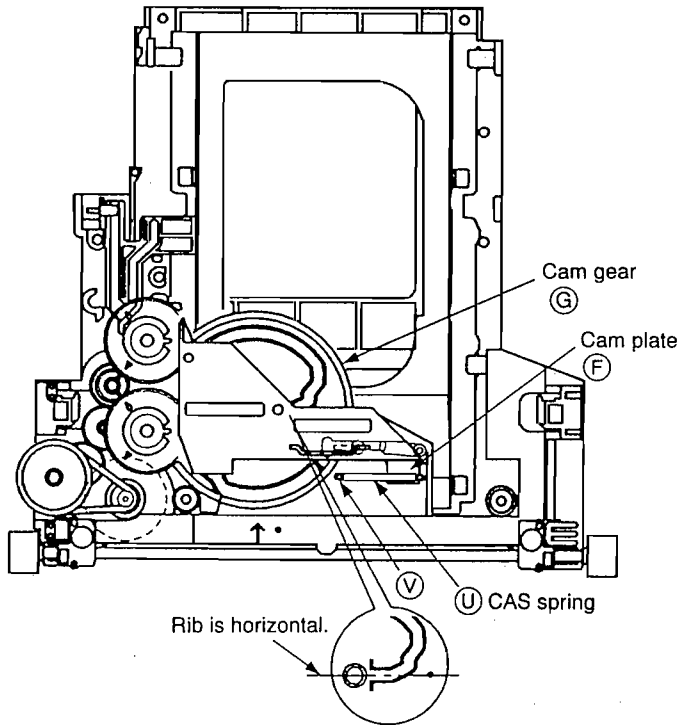


Fig. 1-10 Attach the cam plate

1.8 MATCHING THE POSITION OF THE GEARS

1. Attach the center gear ㉙, twin gears ㉚ and ㉛ in the positions indicated in Fig. 1-11.

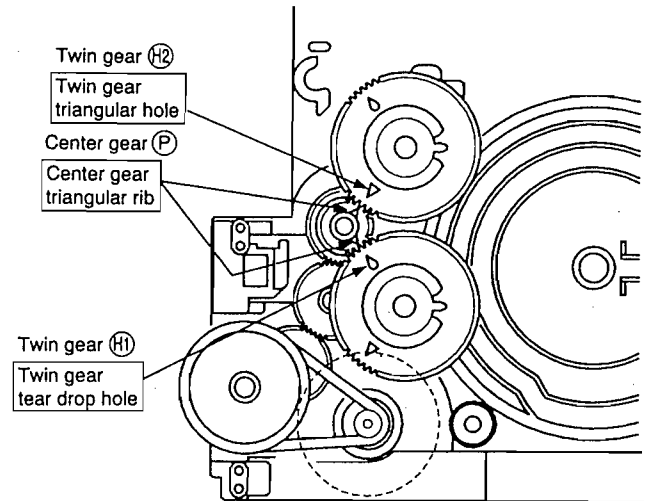


Fig. 1-11 Attach the gears

1.9 ATTACHING THE CD PLATE

1. Upon attaching the CDP spring ㉜ (Fig. 1-5) to the CD plate ㉝, attach the CD plate ㉝ (from the right side) into the position shown in Fig. 1-7
2. Fasten the CD plate by two screws.
3. Hook the free side of the CDP spring to the hook of the mechanism base.

1.10 NOTE CONCERNING CARRIAGE ASSY EXCHANGE

The carriage ASSY does not come with a flexible cable (VDA 1464) and a CA hook (VNL1641).

2. DESCRIPTION OF MECHANISM SYSTEM

2.1 OUTLINE OF MECHANISM

As shown in Fig. 2-1, the general structure of the mechanism is made up of the following five units ;

1. Clamper unit
2. Tray unit
3. Servo mechanism unit
4. Clamp cam unit
5. Loading mechanism unit

The feature of the mechanism system is that the mechanism action is completed by mounting the servo mechanism unit and the tray unit to the loading unit. The action of mechanism is roughly divided into ;

1. Tray (LD tray or CD tray) action
2. Disc clamping action
3. Tilt servo action

These actions are carried out by the driving force of the loading motor.

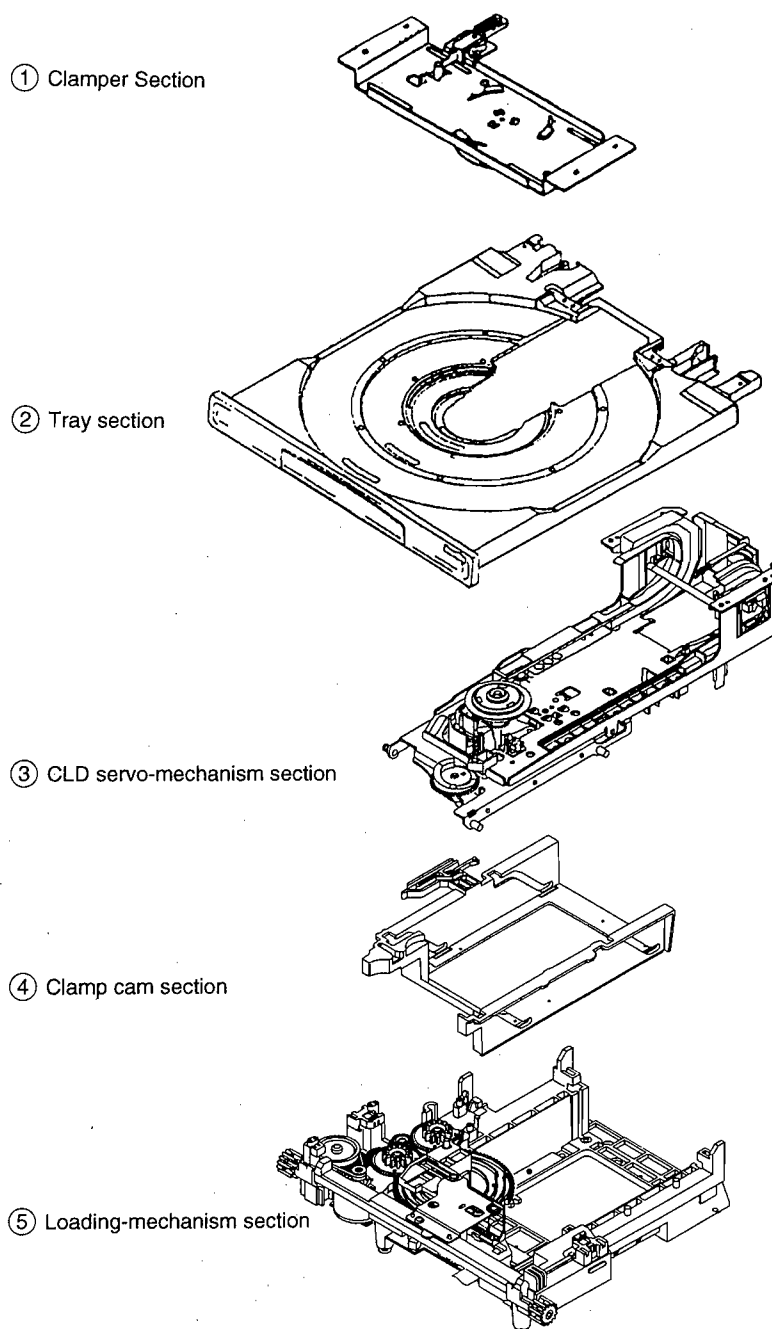


Fig. 2-1 Outline of Mechanism

2.2 STRUCTURE AND OUTLINE OF TRAYS

The feature of this equipment is adoption of a particular tray structure; the CD tray section is mounted inside the LD tray section. This enables open/close action of only the CD tray. In the LD mode, the LD and CD trays act as one body so that the operability of both the LD and CD trays can be improved. Fig. 2-2 shows the structure of the tray unit.

The changeover of tray action is made by the Lock plate assembled in the LD tray. In the CD mode, the Lock plate is made open so only the CD tray moves before and after. The structure is so designed that two trays are coupled with the Lock plate and move together in the LD mode.

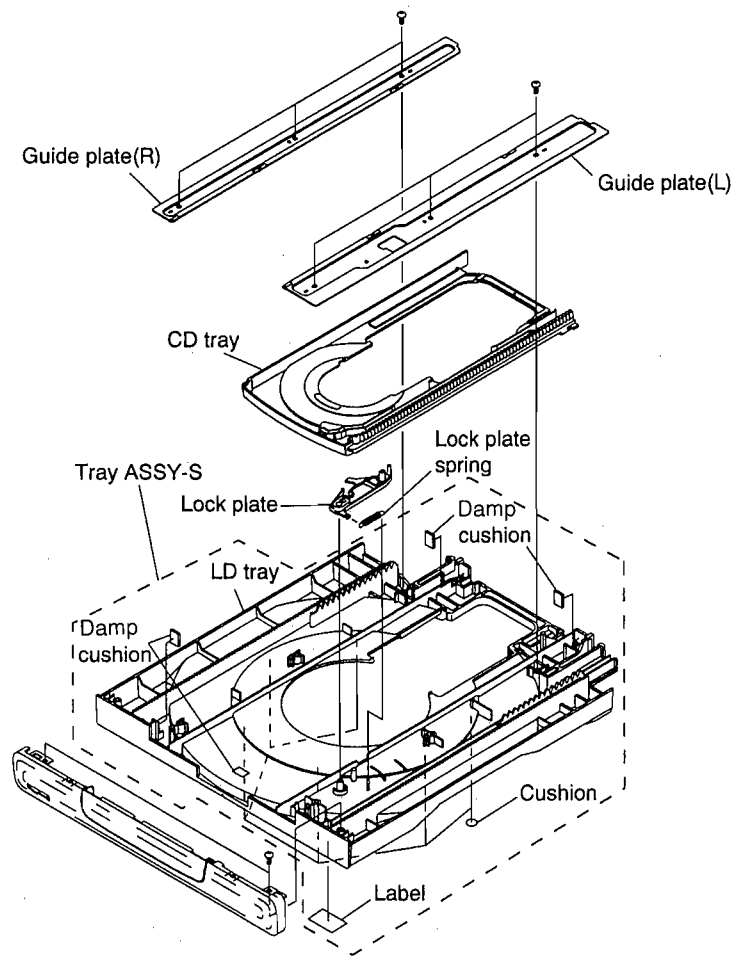


Fig. 2-2 Structure of Tray unit

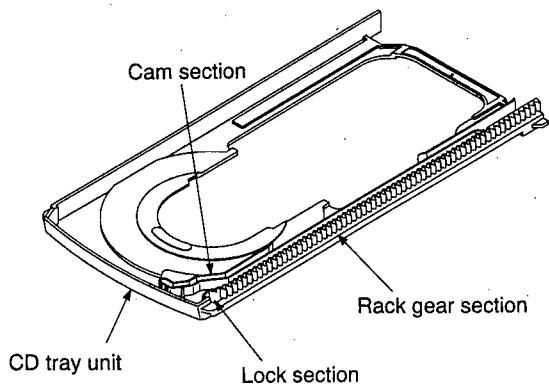


Fig. 2-3 CD Tray unit

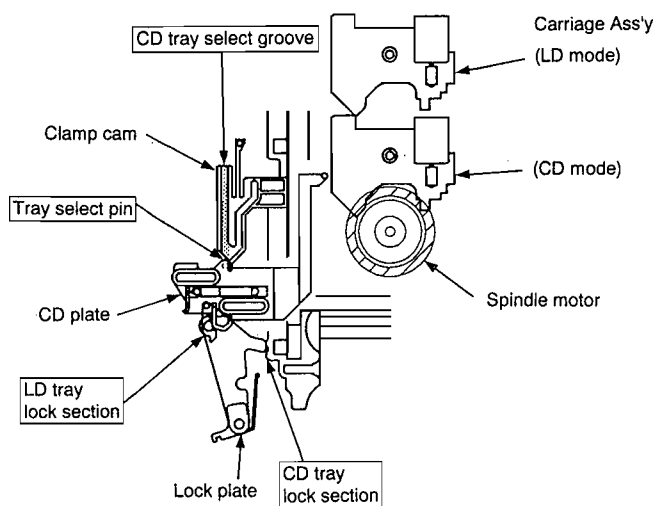


Fig. 2-4 Selection of LD tray & CD tray

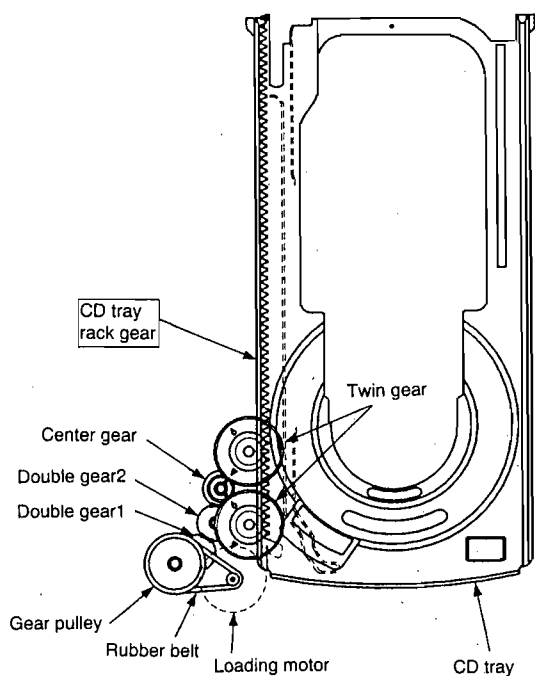


Fig. 2-5 Open/Close of Tray

2.3 ACTION OF TRAY UNIT

The tray unit of this equipment may act in two ways ; the LD and CD trays act as one body in the LD mode ; and only the CD tray performs open/close action in the CD mode.

The changeover between the two modes of tray action is made depending on whether or not the Lock plate assembled in the LD tray locks the CD tray. (refer to Fig. 2-2, Fig. 2-3)

2.4 SELECTION BETWEEN LD TRAY AND CD TRAY

The tray selecting mechanism is shown in Fig. 2-4. When the player is stopped, the mechanism is placed in the clamping state. When the CD OPEN/CLOSE button is pressed with the player stopped, the carriage ass'y to which the pickup is installed will move to the inside circumference of CD. The mechanism is put in the unclamping action and the Clamp cam will move forward. As the Clamp cam advances, the CD plate moves right until it is struck against the carriage ass'y. Then, the tray select pin of the CD plate is fit in the CD tray select groove and the CD plate is pulled back to left. Thus, the CD plate locks the LD tray and unlocks the CD tray with the Lock plate being turned left.

In this way, if the carriage ass'y having the pickup is placed in the CD inside position, the LD tray is locked and the CD tray is released. Whereas, if the carriage ass'y is placed in the LD inner position, the CD tray is locked by the Lock plate assembled in the LD tray so the LD and CD trays will move together.

2.5 TRAY OPEN/CLOSE ACTION

The drive system of Loading mechanism is shown in Fig. 2-5. The driving force from the Loading motor is transmitted to the Twin gears via the gear pulley, the double gears 1 and 2 and the center gear. The Twin gears mesh with the Rack gear located under the CD tray. The tray open/close action is carried out by the driving force thus transmitted, At this time, the Cam gear is not rotated, because the section that is not toothed faces to the Twin gears. Besides, since the stroke of the CD tray Rack gear is insufficient, making up for the stroke is done by the Twin gears.

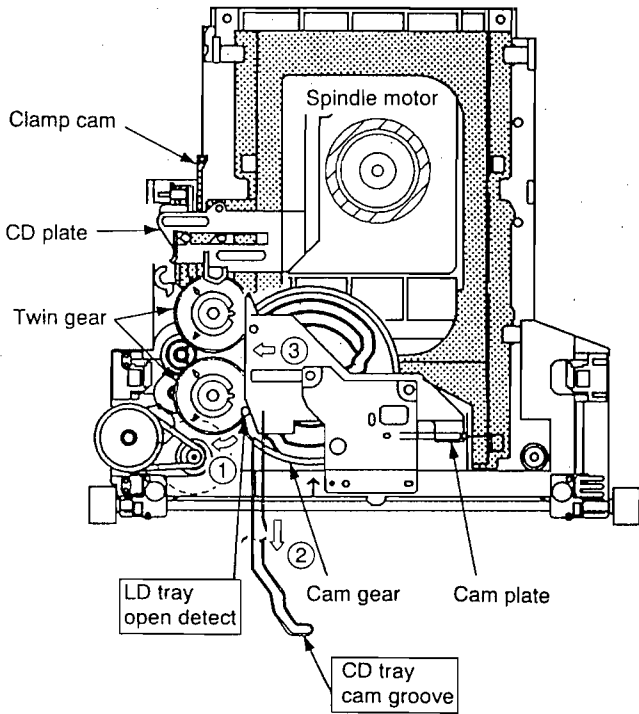


Fig. 2-6 Operation of LD tray open

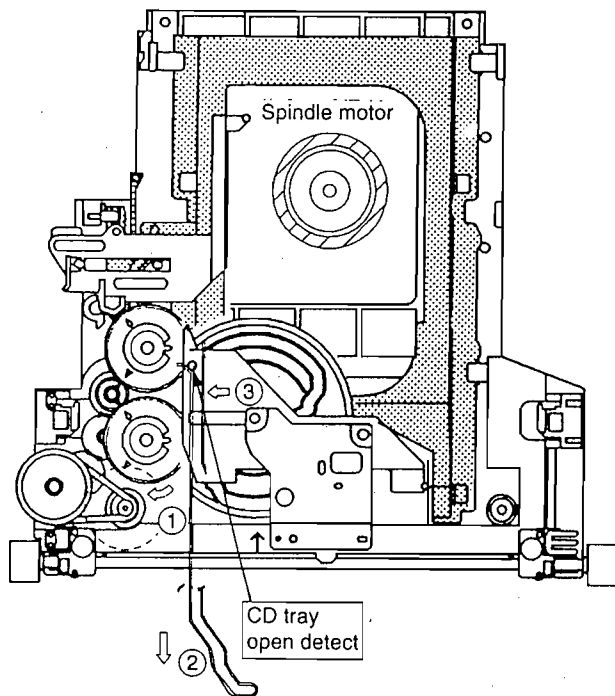


Fig. 2-7 Operation of CD tray open

The strokes for the LD and CD trays are as follows ;
 · Stroke for moving LD tray : 270mm
 · Stroke for moving CD tray : 225mm

Position detection when the tray is opened is shown in Fig. 2-6 and Fig. 2-7. The Cam plate upper boss is engaged with the cam part of the CD tray when the LD tray is activated for opening. As the LD tray moves in direction (2) shown in Fig. 2-6, the boss arrives to the end of the cam and the cam is detached from the boss. At this time, the open detection boss existing in the LD tray is put against the left side of the Cam plate and advances further. When the LD tray open detecting boss is disengaged from the left side of the Cam plate, the Cam plate slides left by means of a spring in the direction as shown by (3). When the Cam plate slides left, SW2 shown in Fig. 2-8 is turned OFF and the opening of the tray is detected, which causes the loading motor to stop.

The detection of the CD tray opening is shown in Fig. 2-7. When the CD tray starts to move in the opening direction, the Cam plate upper boss slides on the cam part of the tray. When the tray is opened, the Cam plate moves left at the end of the cam of the CD tray. Then, as in the case of the LD tray, the tray opening is detected and the Loading motor stops.

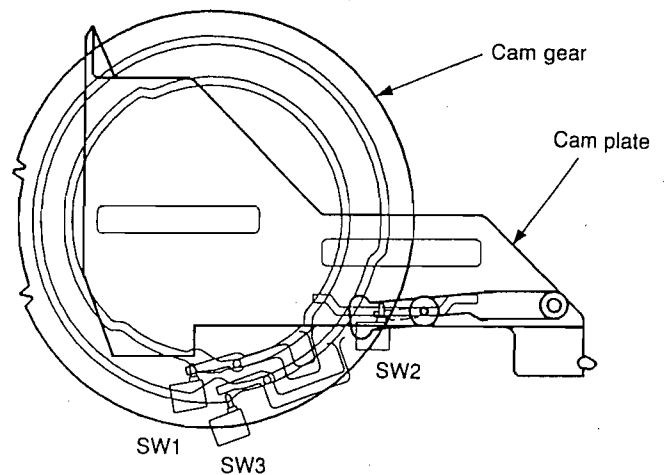


Fig. 2-8 Detection of Mechanism position

2.6 CHANGEOVER BETWEEN LOADING AND CLAMPING ACTIONS

In the loading action, the tray is driven by the Twin gears, The cam part at the bottom of the CD tray and the Cam plate upper boss get into gear so the tray will be put in place.

When the tray has been put in place, the Cam plate is pushed right by the CD tray cam and starts the sliding motion. As the Cam plate slides right, the lower pin of the Cam plate causes the Cam gear to turn clockwise, so that the Cam gear will engage with the Twin gears to drive the Cam gear (refer to Fig. 2-9).

The rotation of the Cam gear starts the clamping action. Meanwhile, the sequence of the motion is completely reversed when the tray is opened from the unclamped state. When the Cam gear turns counterclockwise and the servo mechanism goes down, the Cam plate slides left by means of a spring. The CD tray is pushed forward by the Cam plate upper boss and the CD tray cam. At this time, the Cam gear is disengaged from the Twin gears and the Rack gear part of the CD tray engages with the Twin gears to open the tray.

2.7 CLAMPING ACTION

Clamping action is started by rotation of the Cam gear caused by engagement of the Cam gear and the Twin gears, which results from the sliding motion of the Cam plate pushed at the end of loading. When the Cam gear is rotated, the boss at the lower part of the Cam gear causes the Clamp cam to move backward (refer to Fig. 2-10).

The structure is so designed that the cam at the lower part of the Cam gear can fit in section A of the Clamp cam to hold the clamping state.

Thus, the Clamp cam moves backward, so that the servo mechanism unit installed on both side cams goes up and clamps a disc.

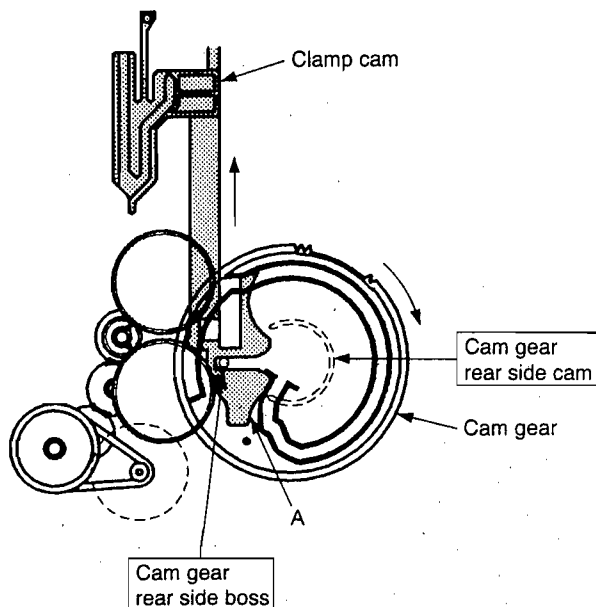


Fig. 2-10 Operation of disc clamp

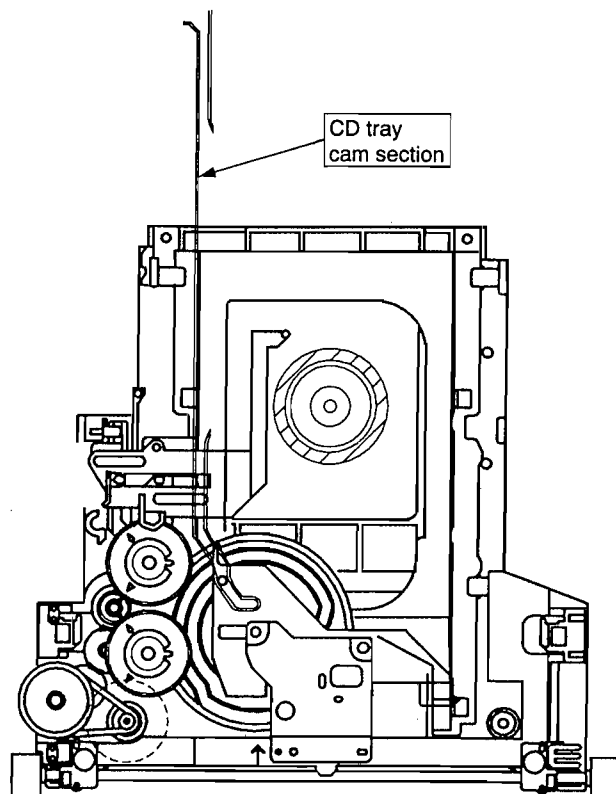


Fig. 2-9 Operation from Tray close to disc clamp & from disc unclamp to tray open

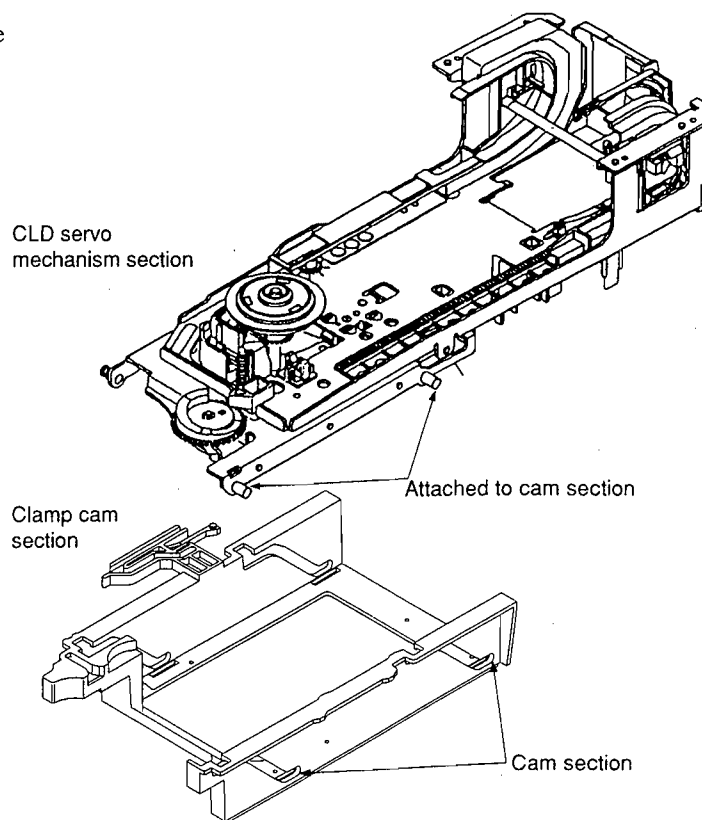


Fig. 2-11 Construction of CLD servo mechanism & Clamp cam section

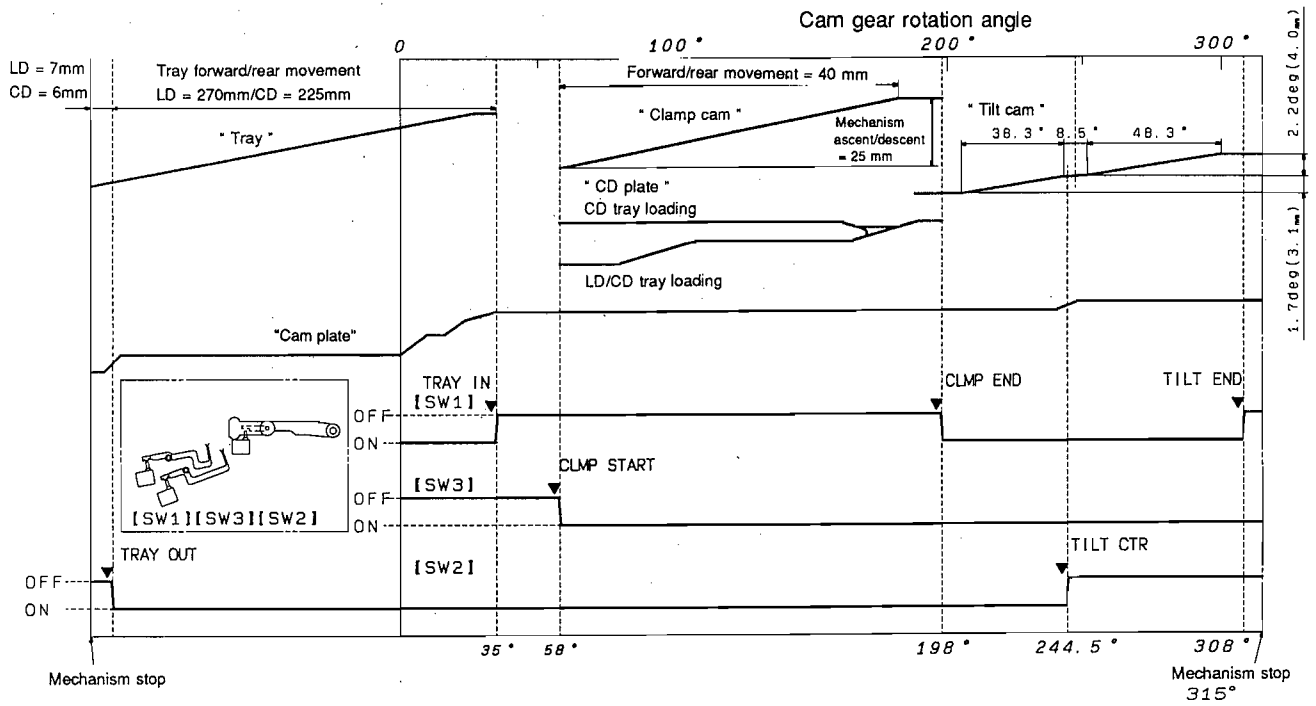


Fig. 2-12 Cam gear rotation angle and position detection

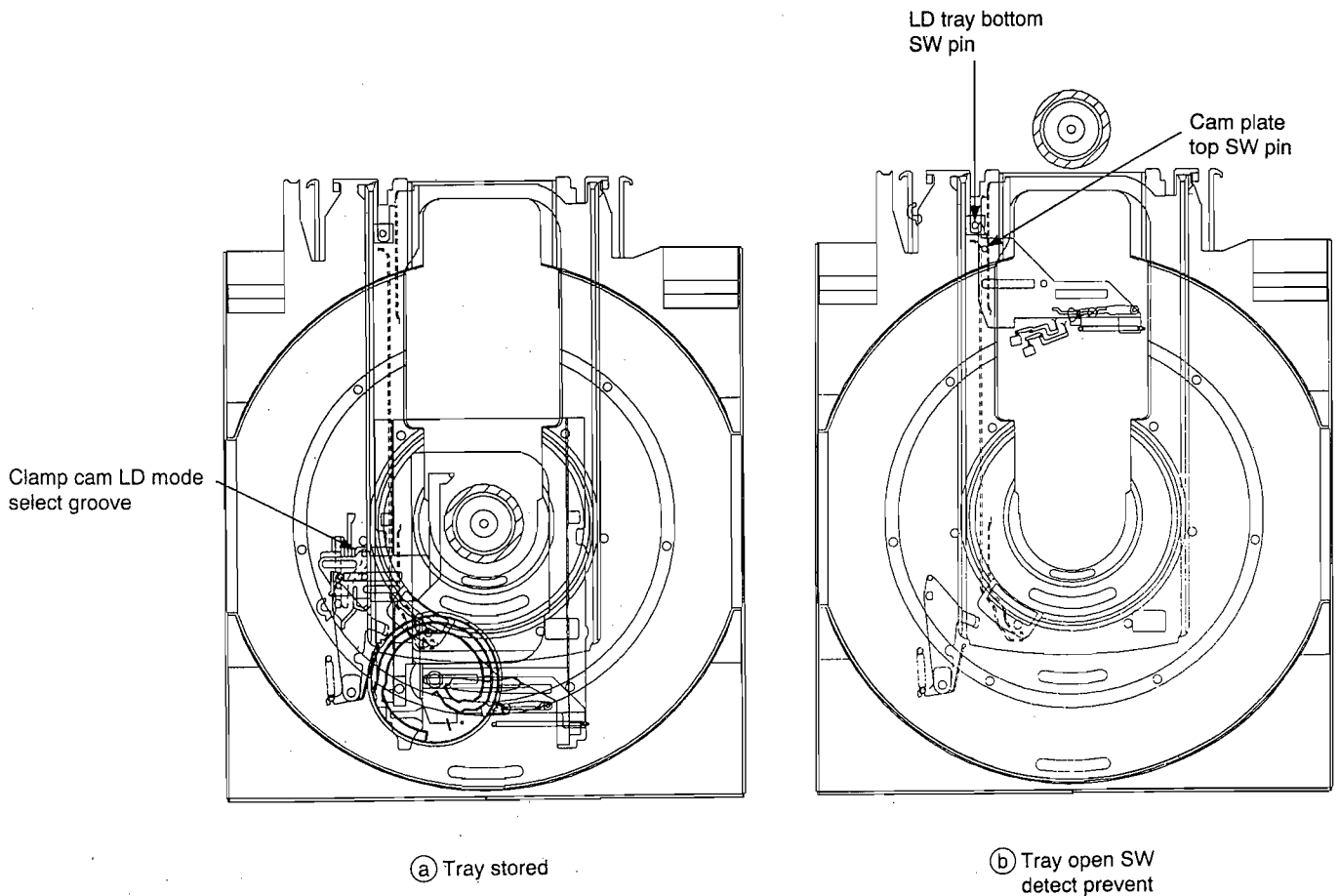
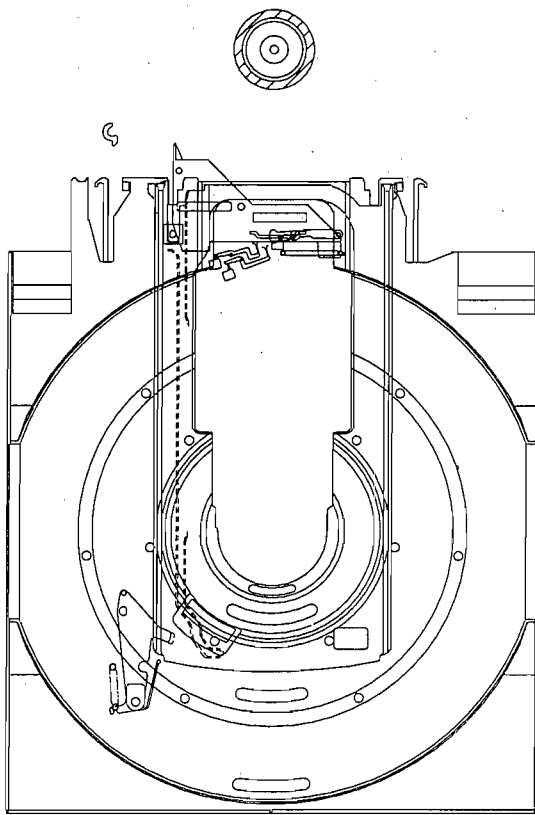
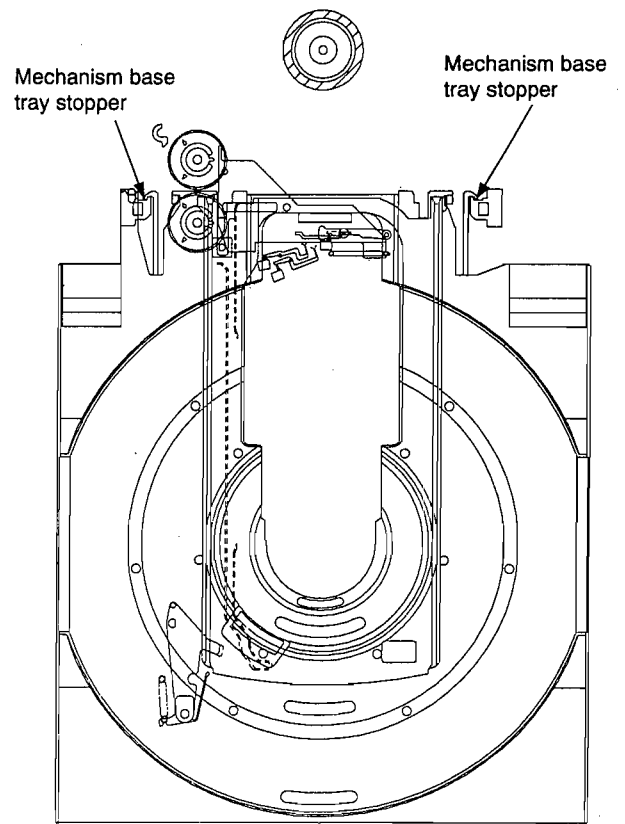


Fig. 2-13 LD Tray open — close operation summary diagram



<Tray open complete>SW detect
(SW2 : ON-OFF)

Ⓒ <Open complete>detect



Ⓓ Tray full open
(mechanical stop)

Fig. 2-13 LD Tray open — close operation summary diagram

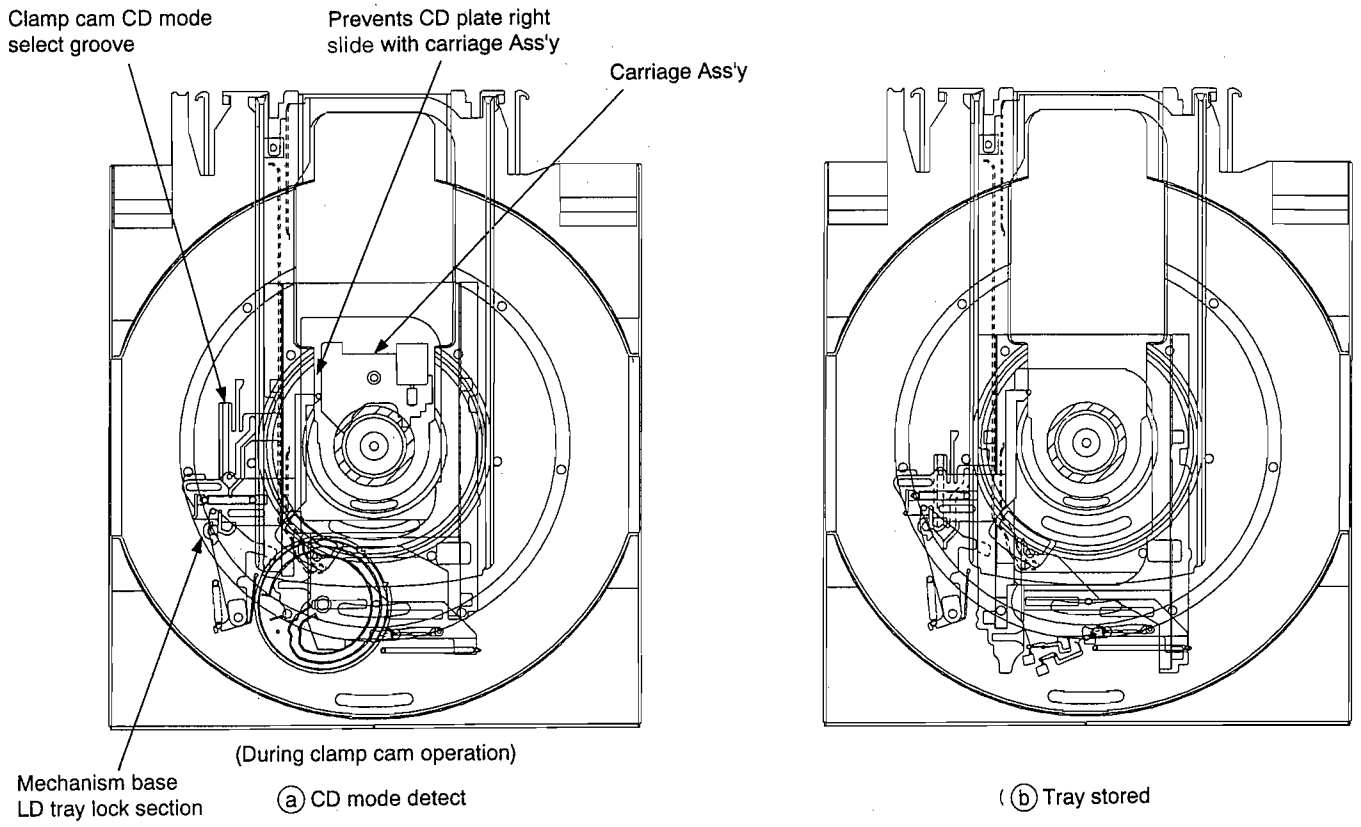


Fig. 2-14 CD Tray open — close operation summary diagram

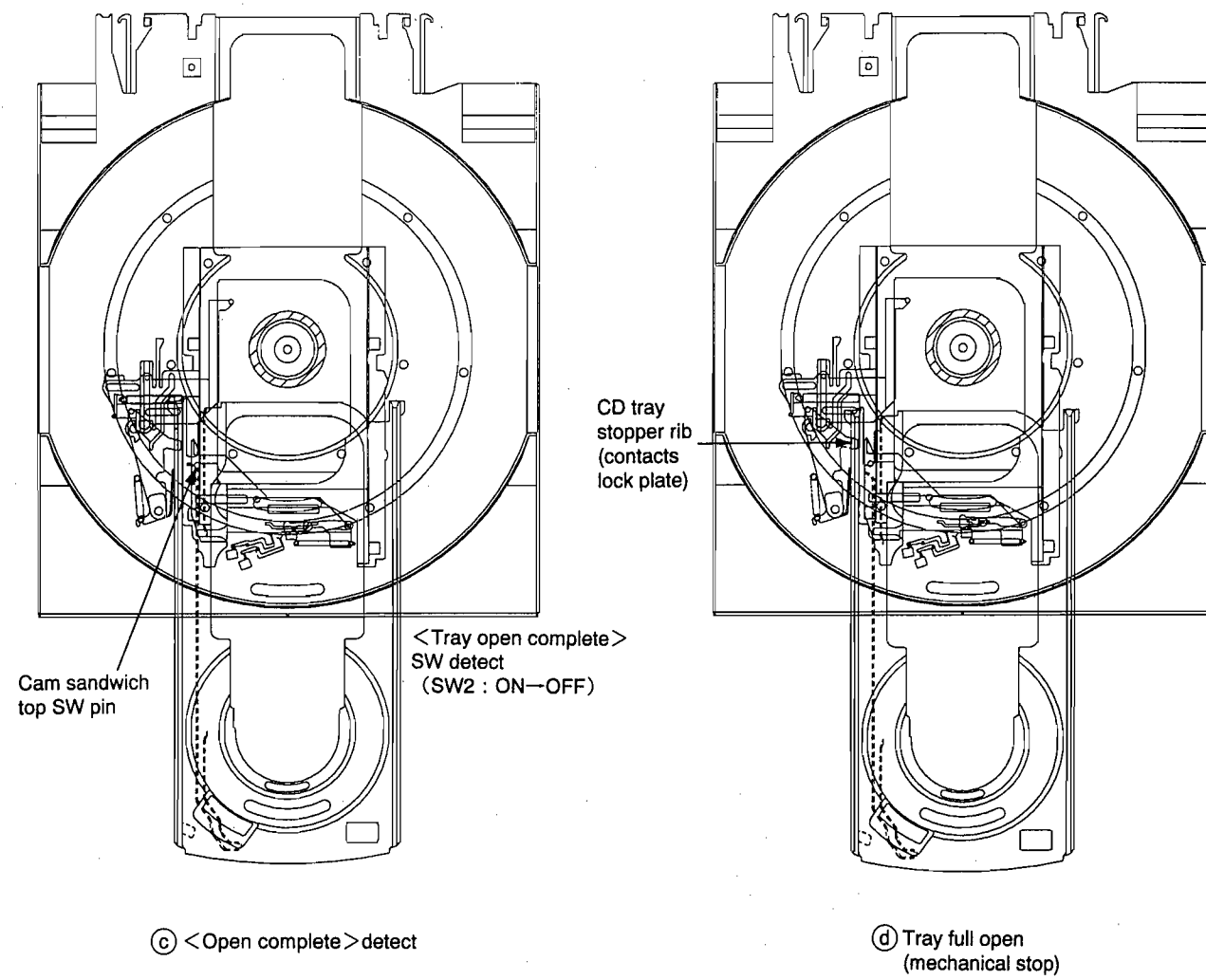


Fig. 2-14 CD Tray open - close operation summary diagram

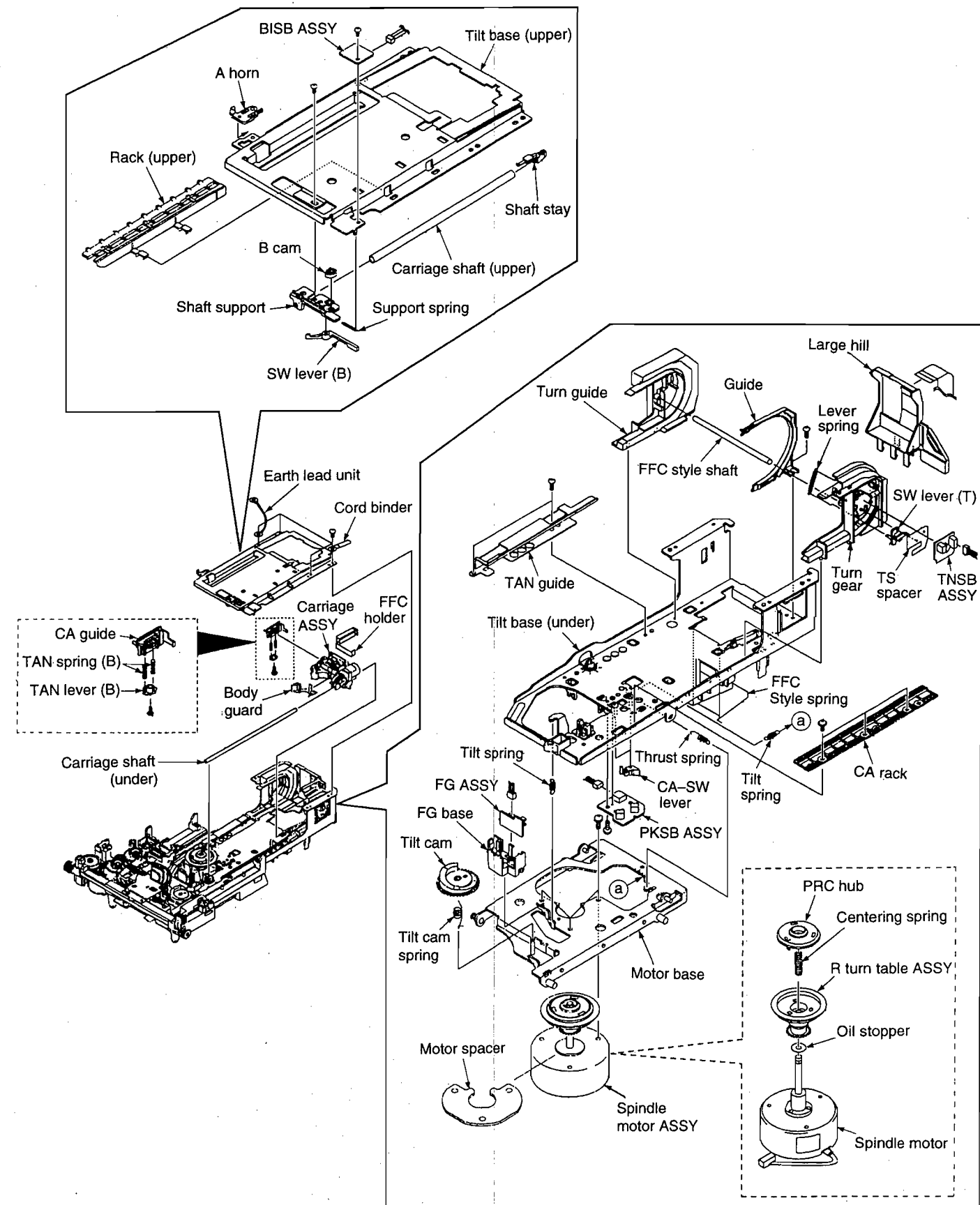
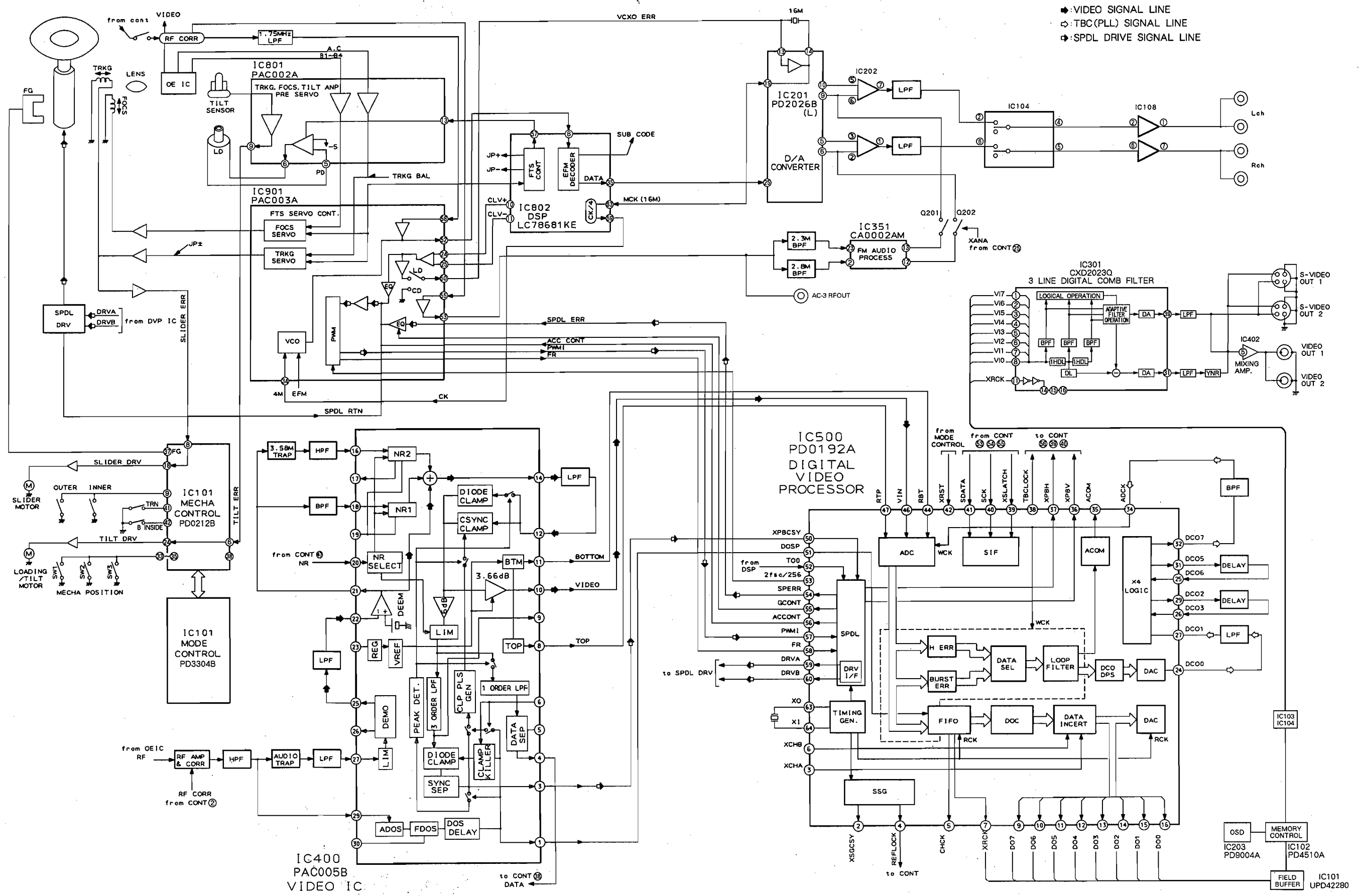


Fig. 2-15 Servo mechanism section disassembly diagram

3. BLOCK DIAGRAM



4. SYSTEM CONTROL DESCRIPTION

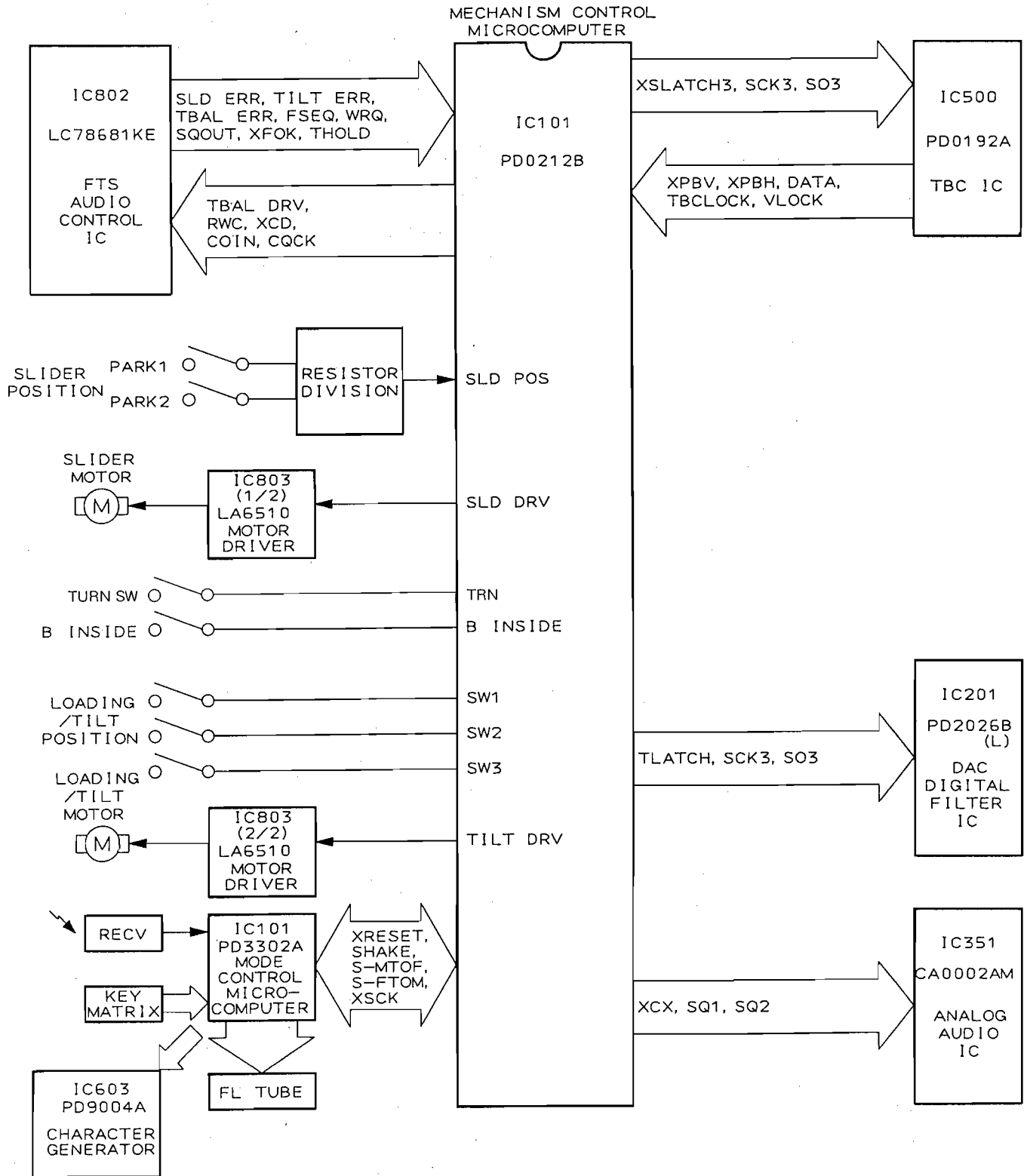


Fig. 4-1 System control block diagram

CDV-W901

4.2 INTERFACE BETWEEN MICROCOMPUTERS

This unit has an 8-bit microcomputer (IC101: PD0212B) that controls the mechanism and an 8-bit microcomputer (IC201 : PD3302A) that controls operation/display. These two

microcomputers are connected by serial interface. This communication line also uses a character generator IC (IC603 : PD9004A).

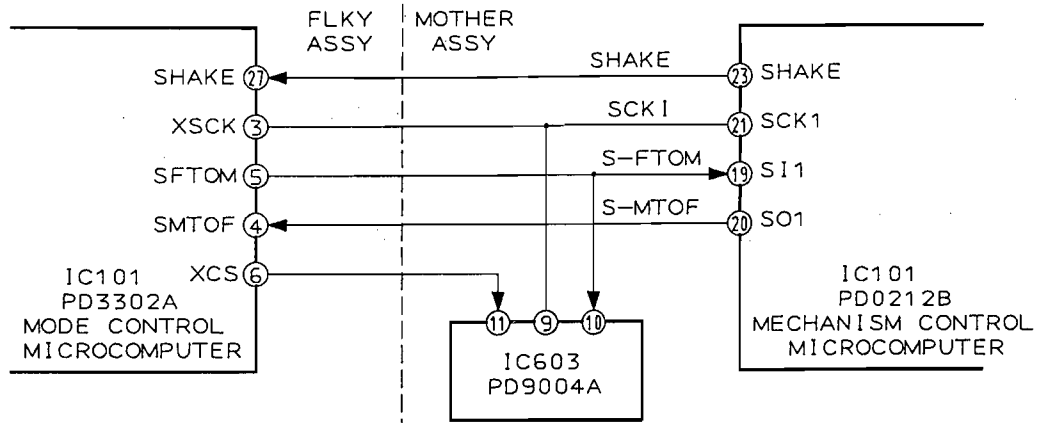


Fig. 4-2 Serial interface connection

4.3 COMMUNICATION PROCEDURE BETWEEN MICROCOMPUTERS

1. PD0212B sets SHAKE pin (23 pin) to several μ s "L" and requests PD3302A for commencement of communications.
 2. Upon receiving request for commencement of communications, PD3302A sets SHAKE pin (27 pin) to "L" and informs PD0212B that communication is possible.
 3. PD0212B switches SCK1 (21 pin), which it has been using as an input port, into output mode. PD3302A puts XSCCK (3 pin) into input mode and establishes communications line connection between microcomputers.
 4. PD0212B sends out transmission clock (562.5kHz) at 8-bits and transmits each datum in synchronization with that clock.
 5. When PD3302A receives 8-bit data, it sets SHAKE pin (27 pin) to "H" and signals that one communication has ended.
 6. PD0212B puts SCK1 (21pin) into input mode and PD3302A puts XSCCK (3 pin) into output mode and cuts off the communication line to complete one communication.
- Communication is in 10-30ms cycles and 16-byte data can be transmitted at one time.
 - Handshake is done on one line and PD0212B and PD3302A use ports that are for both input and output. Output mode is in effect only when output is "L". At other times, input mode (high impedance) is in effect. Also, before output of "L", each confirms that SHAKE is "H" before carrying out operation. This prevents crosstalk of outputs.
 - To prevent transmission error when communicating data, a check code has been added. When transmission error has been detected 16 times continuously, PD3302A outputs a reset signal to PD0212B in order to return to the initial condition. Similar resetting is also done when communication of 300ms or more cannot be carried out.

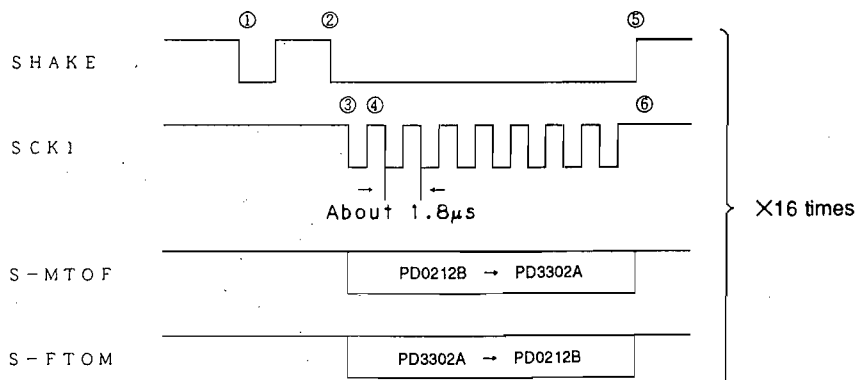


Fig. 4-3 Microcomputer-to-Microcomputer Timing Chart

4.4 OUTLINE OF MECHANISM CONTROL SYSTEM

1) Processing after power ON

After the power is turned on, reset is canceled (28 pin : L → H) and the mechanism control microcomputer (PD0212B) carries out initialization in the following order.

1. Inside RAM and ports are initialized
2. FTS - audio IC (IC802 : LC78681KE) is initialized
3. Tray position is detected
4. Communication with mode control microcomputer (PD3302A) is confirmed (If there is any abnormalities in communication, the following initialization steps are not carried out.)
5. TBC IC (IC500 : PD0192A) is initialized
6. Pickup position is initialized
7. Disc revolution is stopped
8. Loading mode is initialized

Normal operations are commenced after the above initialization procedures are completed.

2) Loading/tilt motor control

Loading/tilt motor drive is controlled by PWM signal output from the TILT DRV (24pin) of the CONT section mechanism control IC(IC101) which goes through the OP amp (IC803). The voltage impressed on the loading/tilt motor is switched by the PWM signal duty as shown below. The PWM cycle is 30msec.

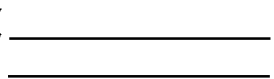
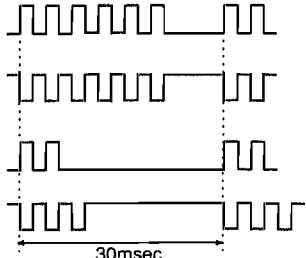
Motor operation		Duty (%)	PWM Signal waveform
Focus OFF	Stop	0	5.0V 2.5V 0V 
	Loading	80	
	Unloading	Is changed to prevent feeling/overrun. refer to Fig. 4-4-2.	
Focus ON	Large error	Tilt UP servo	
		Tilt DOWN servo	
	Small error	Tilt UP servo	
		Tilt DOWN servo	

Fig. 4-4-1

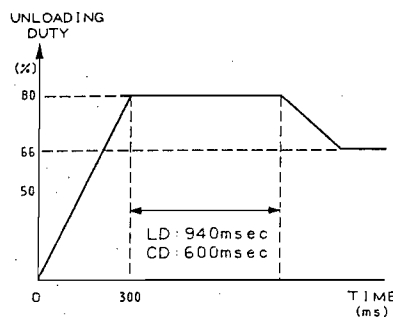


Fig. 4-4-2 Duty Changes at Unloading

●Loading/clamping operation

When the tray is opened or closed and the disc is clamped or stopped, the motor operates while detecting the position of the cam gear with the loading/tilt position detection switch which is connected to SW1 - 3 of IC101 (33-35pin).

●Tilt servo operation

Each time disc movement starts, the loading/tilt motor can be used for playing LD discs and CDV discs (video part) because of the tilt servo.

When the tilt servo is operating, the drive of the loading/tilt motor is PWM drive.

The tilt servo drives the loading/tilt motor so that the input voltage of TILT ERR of IC101 (6pin) is 2.5V.

The ON/OFF conditions for the tilt servo are as shown below.

When there is an abnormality in the disc or the tilt sensor circuit and input voltage of the TILT ERR pin does not enter the set range even if the pick up incline is more than +1.7 or -2.2 degrees, the mecha switch condition is detected and the loading motor's operation is stopped. The tilt servo switches the PWM duty between two steps according to the error value. When the error value is small (0.84V-4.35V), the duty is small and when the error value is large (0V-0.84V, 4.35V-5 V), the duty is large for PWM output. refer to Fig. 4-4-3.

Disc part	Disc movement started	At normal play
LD	ON	CAV 12" : OFF when frame number is more 48000 8" : OFF when frame number is more 20000 CLV 12" : OFF when rotation is below 776rpm at inner → outer movement OFF when rotation is below 794rpm at outer → inner movement 8" : OFF when rotation is below 1199rpm at inner → outer movement OFF when rotation is below 1244rpm at outer → inner movement
CD,CDV audio part	ON	OFF
CDV video part	ON	0:00 - outer track 2:00 (disc with 3:00 or more recording) ON

Table 1 : Tilt Servo ON/OFF Conditions

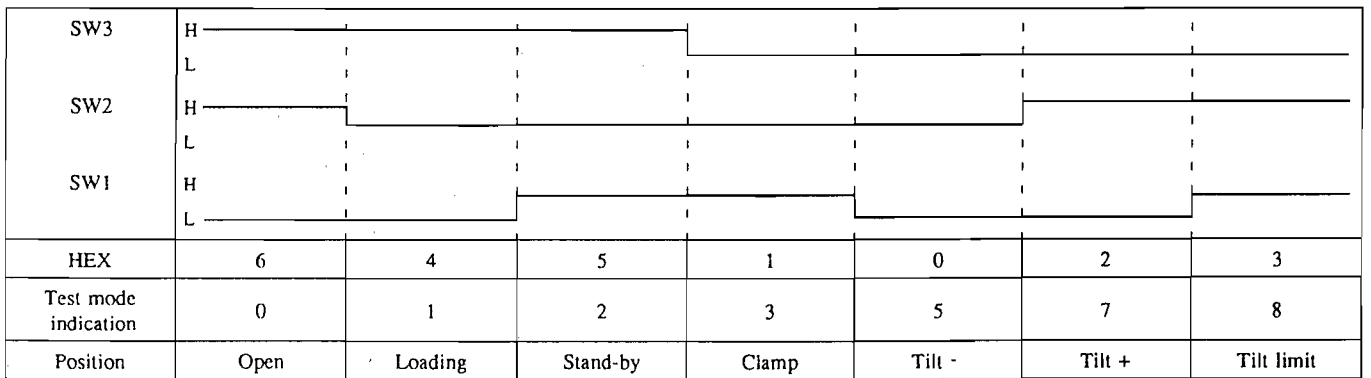


Fig. 4-4-3 Loading/Tilt Position

3) Slider Motor Control

Slider motor drive is controlled by PWM signal output from the SLD DRV pin 18 of the MOTHER ASS'Y CONT section mechanism control IC (IC101) which goes through the OP amp (IC803). The voltage impressed on the slider motor is switched by the PWM signal duty as shown below. The PWM cycle is approximately 910µsec.

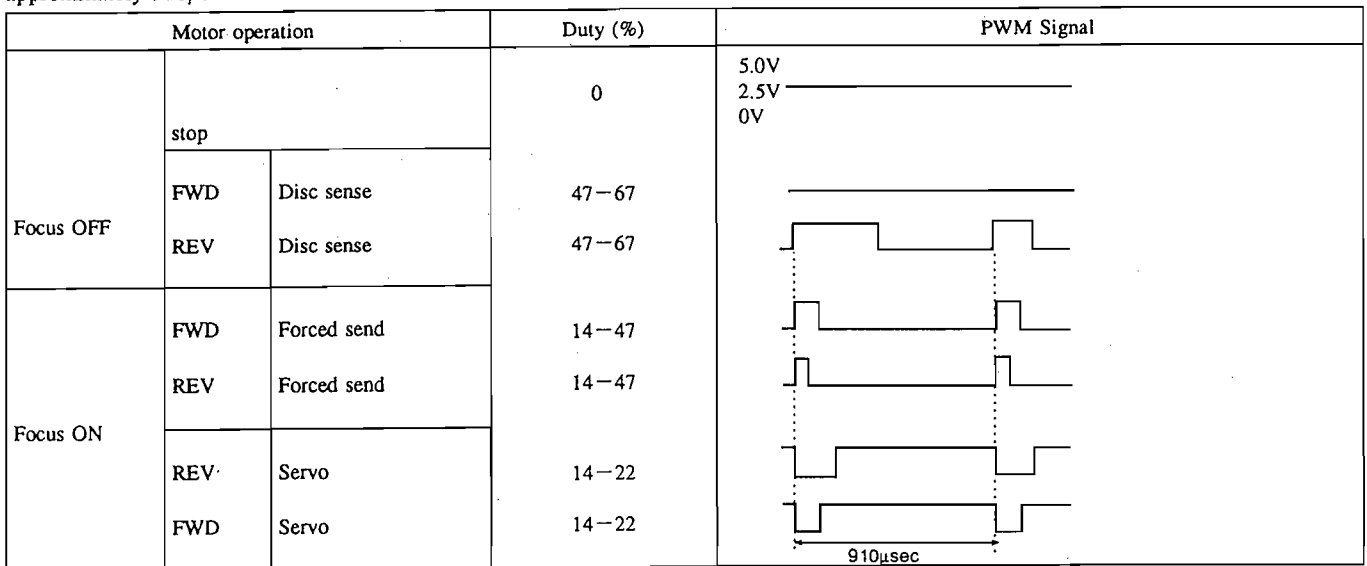


Fig. 4-4-4 Switching of Voltage Impressed on Slider Motor

The slider servo controls the slider motor so that the input voltage of the SLD ERR pin (8pin) of the mechanism control IC is the same as the voltage at STOP.

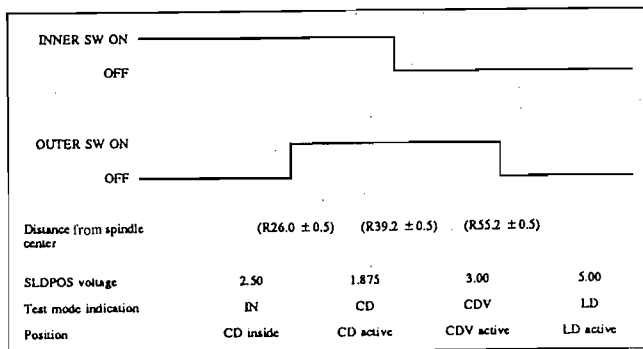


Fig. 4-4-5 Slider Position

4) Audio Control

XANA	SQ1	SQ2	Lch Line Out	Rch Line Out
L	L	L	Analog L channel	Analog R channel
	H	H	Mute	Mute
H	Following commands from microcomputer, LC78681KE carries out switching between 3 conditions.		Digital L channel	Digital R channel
			Digital L channel	Digital L channel
			Digital R channel	Digital R channel

Fig. 4-4-6

At time of CD scan and LD clear scan (in case of digital sound selection), - 12dB attenuated sound is output.

5) Clear Scan

Through scanning with DISPLAY ON, clear scanning without screen distortion can be carried out.

At time of clear scan, scan is carried out while outputting digital sound at - 12dB (same as CD scan). (sound cannot be output when analog sound is selected.) The operation principles are given below.

1. In the clear scan mode, a prescribed number of tracks can be skipped with multi-track jumping.
2. In order to match phases of REF system and SG system, the mechanism control IC (PD0212B) sends a shift enable command to the DVP IC (PD0192A) and waits until the phases match (VLOCK="H").
3. Upon receiving the shift enable command, the DVP IC first eliminates phase difference between REF - H and SG - H by either decreasing or increasing SG - H at 6 clock increments. When there is no difference between H phases, the DVP IC eliminates phase difference between REF - V and SG - V by decreasing or increasing SG - V by 7H increments. When there is no phase difference, VLOCK is set to "H".
4. When VLOCK of the mechanism control IC becomes "H", squelch is canceled and the disc picture is shown for a fixed time. Step 1 is again returned to and steps 1 to 4 are repeated.

- * For sections where disc picture is not output, a black background is displayed.
- * During clear scan, the played digital sound is output in section where disc picture is output and in section that has VLOCK.
- * REF - H, V ... H - SYNC, V - SYNC of standard video signal
- * SG - H, V ... H - SYNC, V - SYNC generated by sync generator in DVP interior
- * VLOCK ... Signal that is emitted when H, V phases of REF system and SG system match.

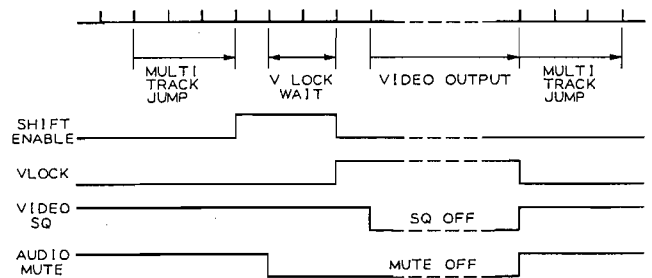


Fig. 4-4-7

● Clear Scan Timing Chart

CAV

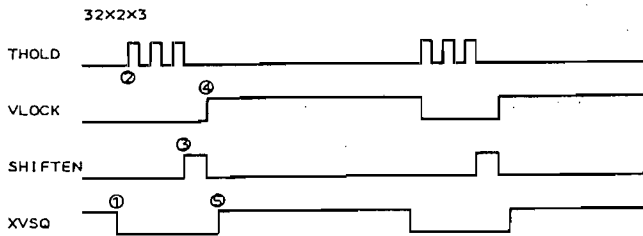


Fig. 4-4-8

- * SHIFTEN.XVSQ is serial command sent to DVP
- * The audio mute signal is put on at the same time as video squelch, but its cancellation is earlier than video squelch.

- ① : Video squelch is put on.
- ② : Multi-track jump $32 \times 2 \times 3$ is carried out.
- ③ : CLOCK, H decrease or increase is carried out to match phases of REF system and SG system. Shift enable (SHIFT EN) is ON.
- ④ : Since phases match (VLOCK="H")
- ⑤ : Video squelch is canceled and play is carried out for fixed time.

CLV : Compared with CAV, the time until phases are matched after jumping is long.

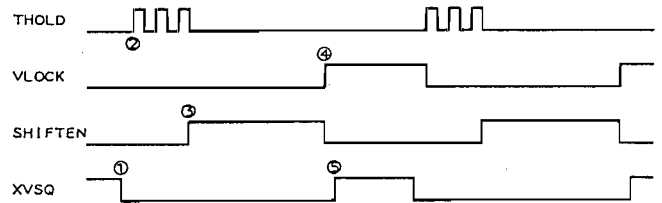


Fig. 4-4-9

6) Normal State Scan

CAV : Synchronization with play back V SYNC and multi-track jumping is carried out.

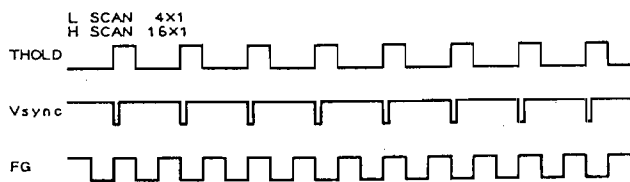


Fig. 4-4-10

CLV : FG is counted and multi-track jumping is carried out every four revolutions of inner track, three revolutions of middle track, and two revolutions of outer track.

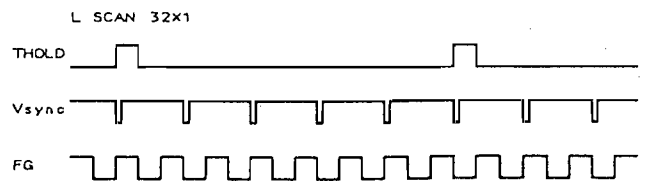


Fig. 4-4-11

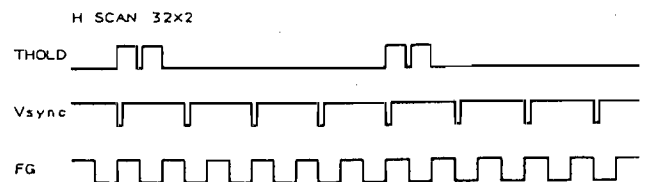


Fig. 4-4-12

7) Outline mode

The mode control microcomputer (PD3302A) stores the location and by starting with pressing the "LAST MEMORY" button twice the slider compulsory feed and few seconds play are repeated from the start of the disc (from the start of side B if the STOP mode is entered when side B is in the PLAY mode) up to about 3 minutes before the target, then finally after the address 5 seconds before the target is searched, the system shifts to normal play mode.

At the start of few seconds play, the digital audio is gradually raised and at the end the digital audio is gradually lowered.

(When analog audio is selected, this operation is not carried out and there is only sound during the few seconds play.)

Summary of operations

1. When the system goes into outline mode, the mechanism control microcomputer (PD0212B) issues the VSQ ON command to the DVP IC (PD0192A).
2. The slider is compulsory moved (31.4% duty) to the outer edge for a fixed period of time (controlled by the mode controller: about 160 msec).
During the compulsory movement of the slider to the outer edge, the tracking is OFF.
The slider is stopped and the procedure advances to Step 3.
3. The slider is set in servo move and the tracking is ON.
4. The system waits until TBCLOCK (Pin 56) goes high.
5. The mechanism controller IC issues the shift enable command to the DVP IC to align the REF and SG phases.
6. The system waits 300 msec.
As the DVP IC specification, since REFLOCK (Pin 48) stabilizes within a maximum of 300 msec, the system waits this maximum period so that the VSQ end timing is not compressed.
7. The system waits until REFLOCK goes high. Normally it goes high while the system is waiting the 300 msec.
8. The tracking is set to closed mode and the VSQ OFF command is issued to the DVP IC.
9. Play for about 1800 msec.
10. Return to step1 until the slider reaches 3 minutes before the target.
11. The system searches for the address 10 seconds before the target, then returns to normal play.

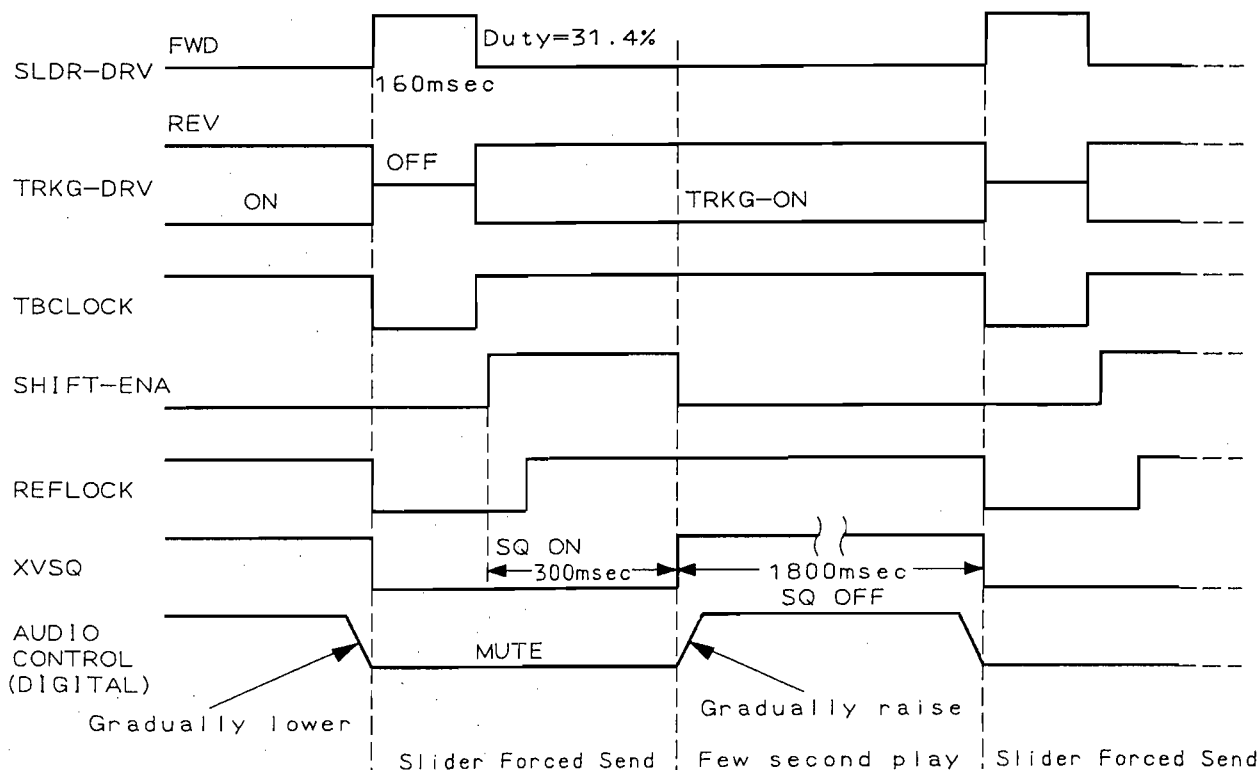
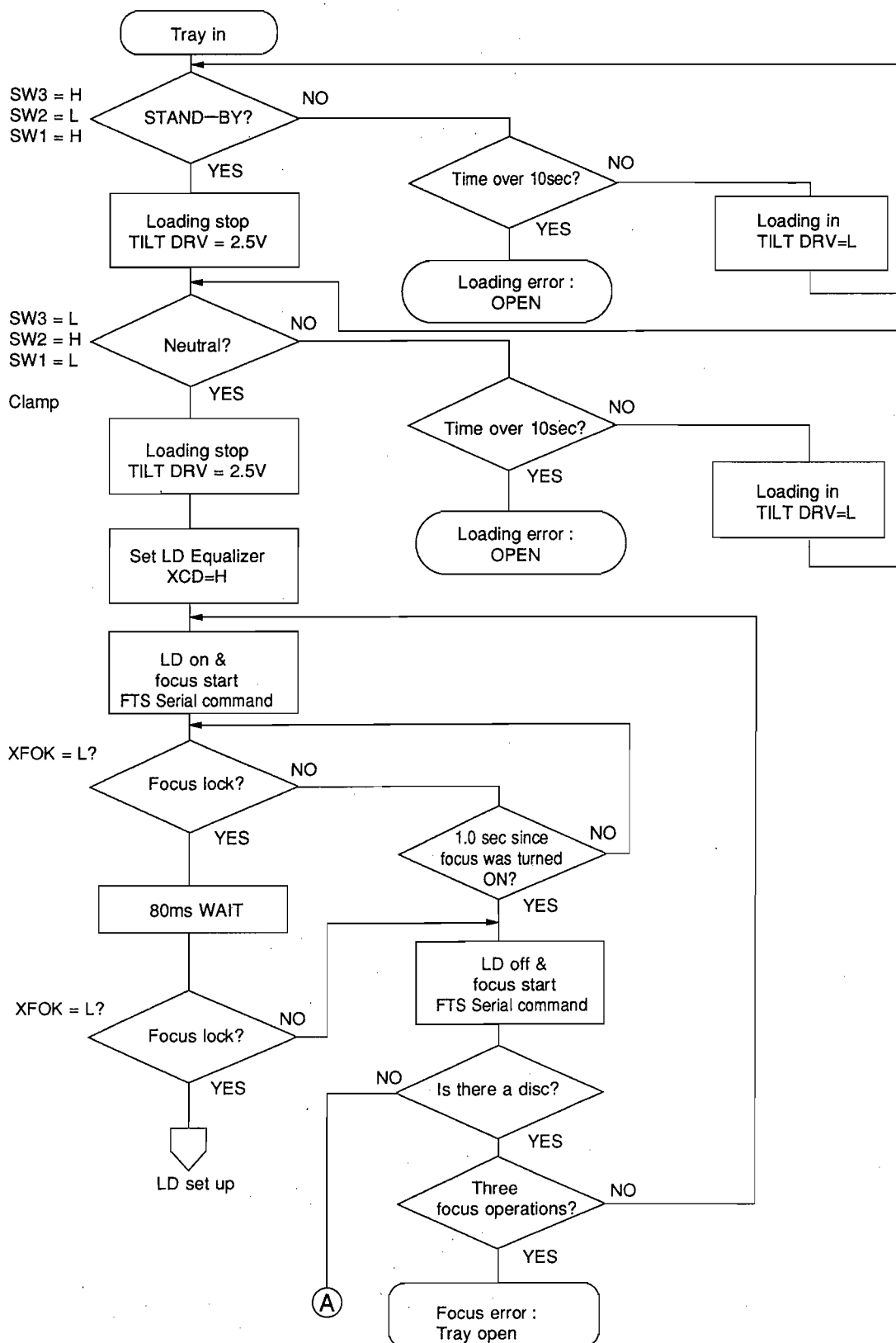


Fig. 4-4-13

4.5 FLOW CHART OF EACH OPERATION

1) From Tray Open to Tray-In Flow Chart



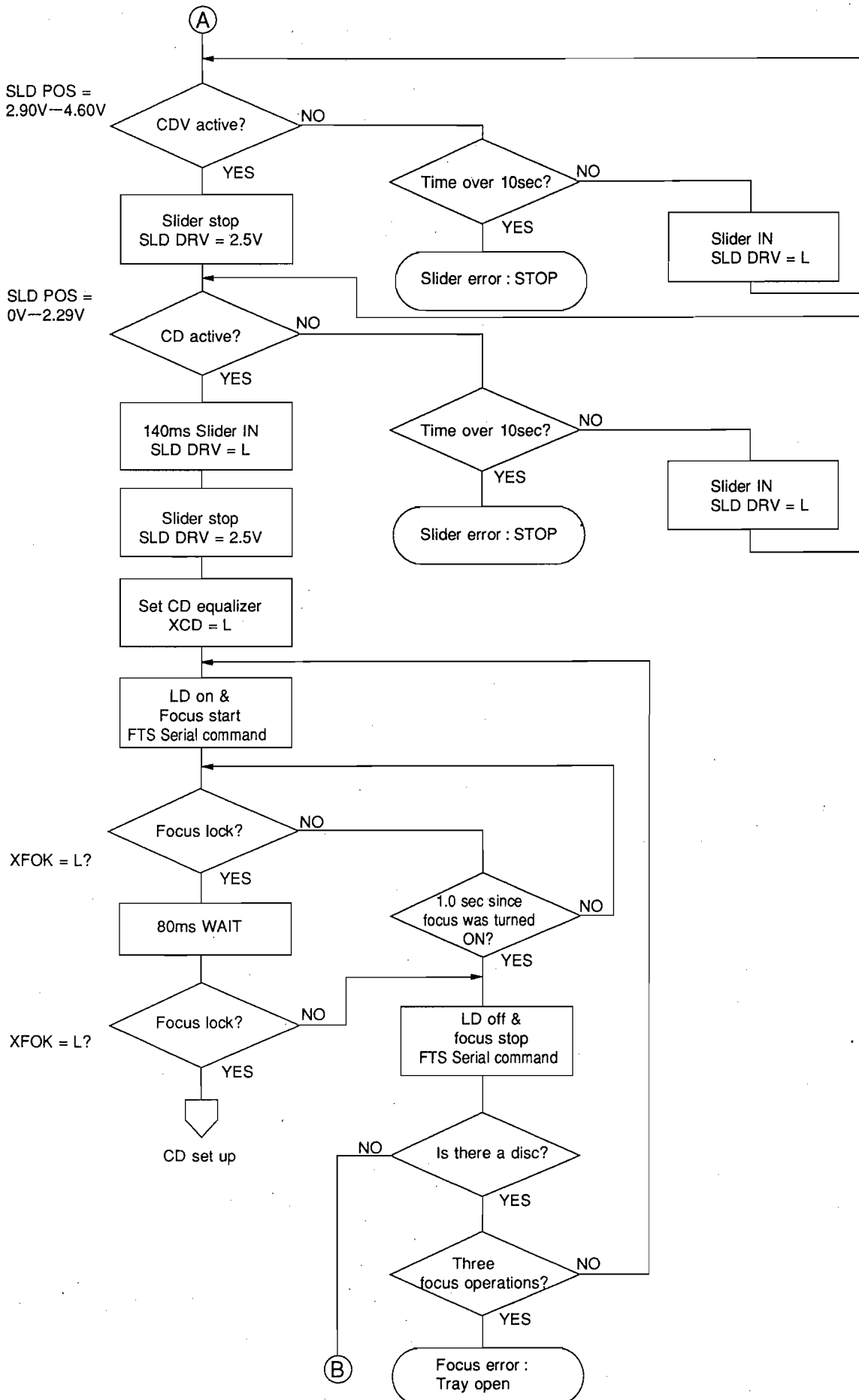
From tray open state to completion of tray-in.

If loading operation is not finished within 10 seconds, the situation is judged as abnormal and the tray is opened.

Pick up position $R \approx 65\text{mm}$ when LD FOCUS operation
R: Distance from spindle center.

When there is a disc and focus does not lock even after three focus sweeps, the situation is judged as abnormal and the tray is opened.

Fig. 4-5-1



Slider operation is stopped if it is not completed within a fixed time. After that, only OPEN key will evoke response.

Pickup position R=30mm when CD FOCUS operation.

Fig. 4-5-2

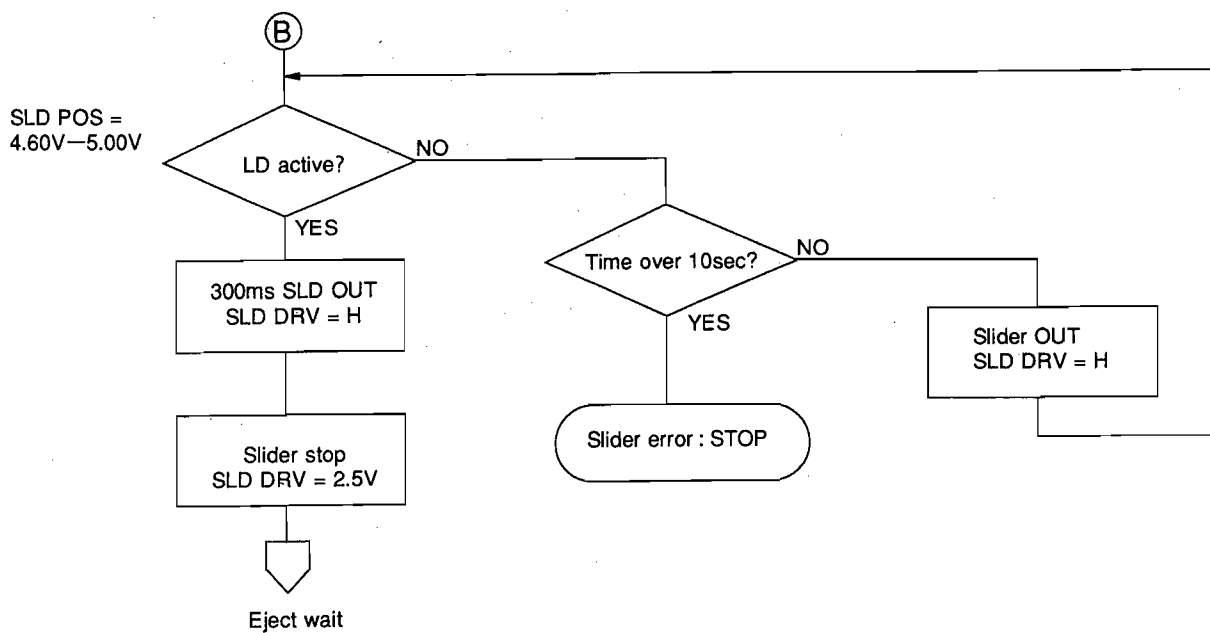
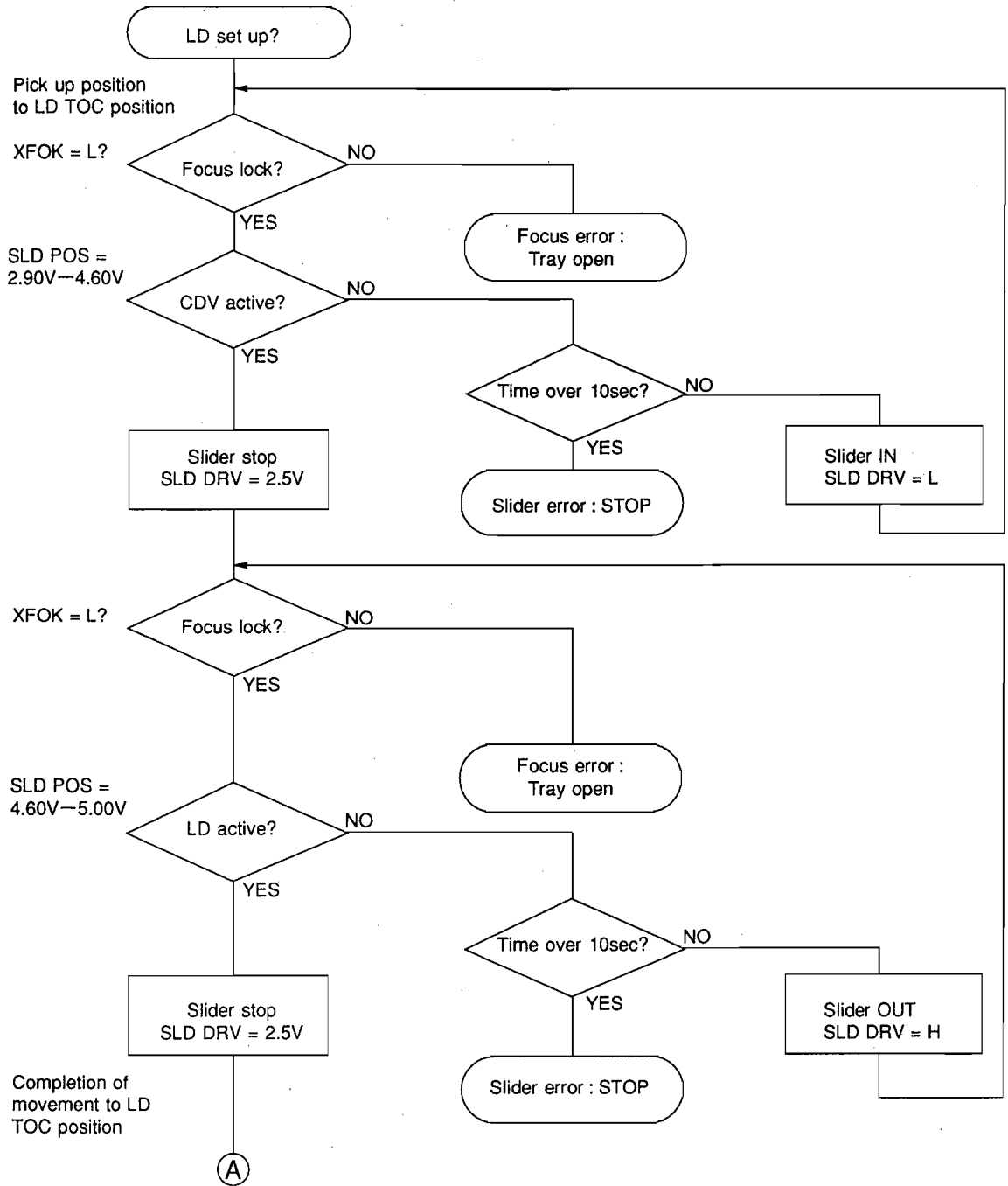


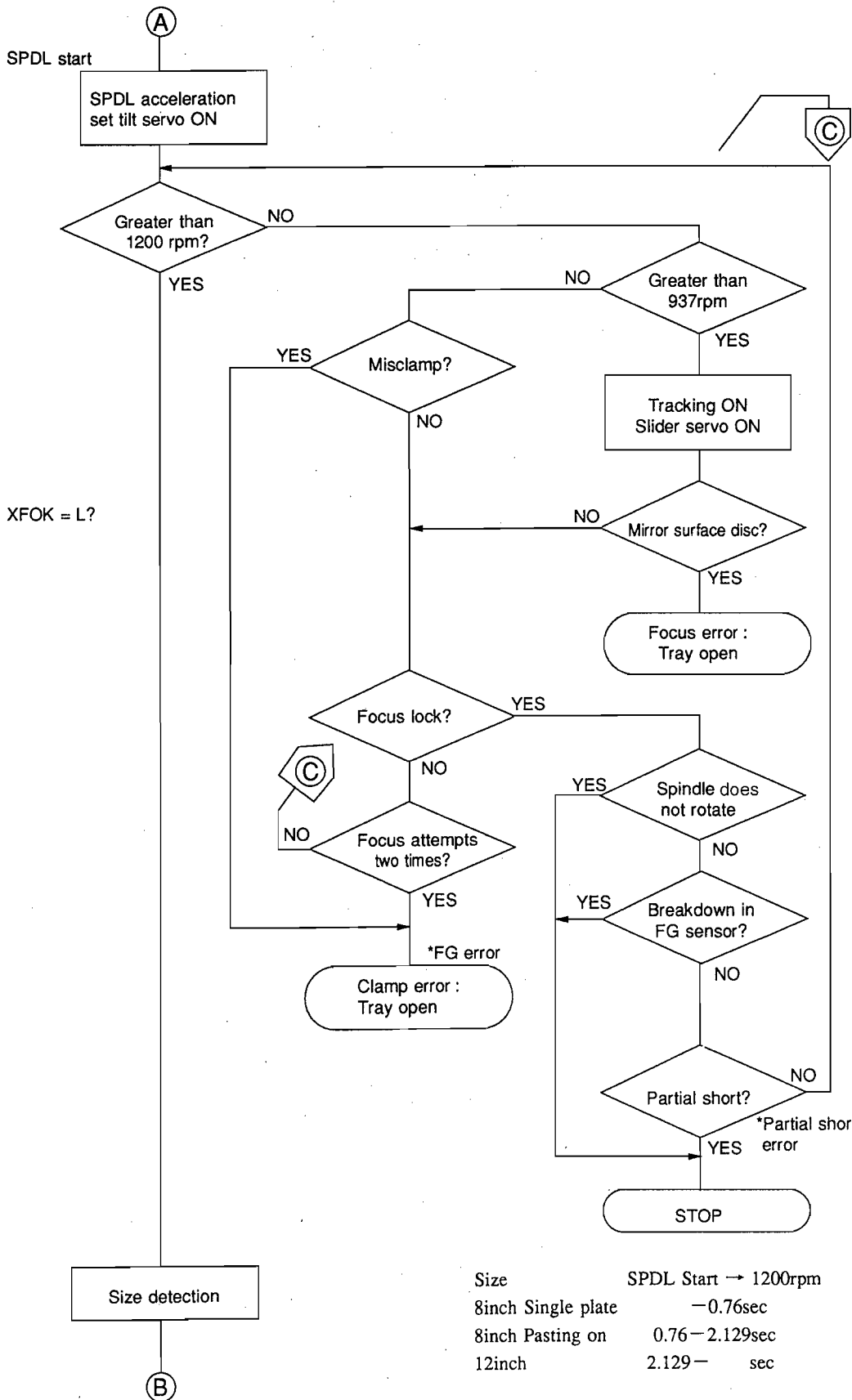
Fig. 4-5-3

2) LD Set-up Flow Chart



During movement to spindle start position, if the focus is cannot be achieved, it is determined that there are overlapping LD, CD and the tray is opened.

Fig. 4-5-4



- The tracking servo is in OFF mode until the disc rotation rate reaches 937 rpm.
- After the disc starts rotating, from 1/8th rotation until it reaches 937 rpm, if more than 512 tracks are cut across in any 1/8th rotation, the system judges the disc to be misclamped and opens the tray.
- After the tracking comes ON, if the slider continues to move with the maximum duty it reaches during searches, the system judges the disc to be a mirror disc and opens the tray.
- If at least two FG signals in a row do not come in within 800 ms of the start of disc rotation, the system judges that either there is an FG error or the disc is caught, so it brakes for 800 ms, lets the disc run free for 5200 ms, then opens the tray.
- If the rotation rate does not reach 1200 rpm within 5 seconds of the start of disc rotation, the system checks the FG. If at least 3 FG pulses do not arrive within about 0.5 second, the system treats the FG sensor as broken, lets the disc run free for about 90 seconds, then stops.
- If the rotation rate does not reach 1200 rpm within 12 seconds of the start of disc rotation, the system judges there to be a partial short (because there is excess load on the spindle motor drive system) and stops.
- If the focus is lost during startup, the system judges that the disc is either scratched or the rear side of a single plate disc and opens the tray.
- The system carries out forced acceleration until the disc rotation rate reaches 1200 rpm. The system judges the size of the disc from the time required to reach 1200 rpm.

Fig. 4-5-5

If the rotation rate is greater than 2100 rpm, the disk is judged to be a mirror surface disc and rotation stopped.

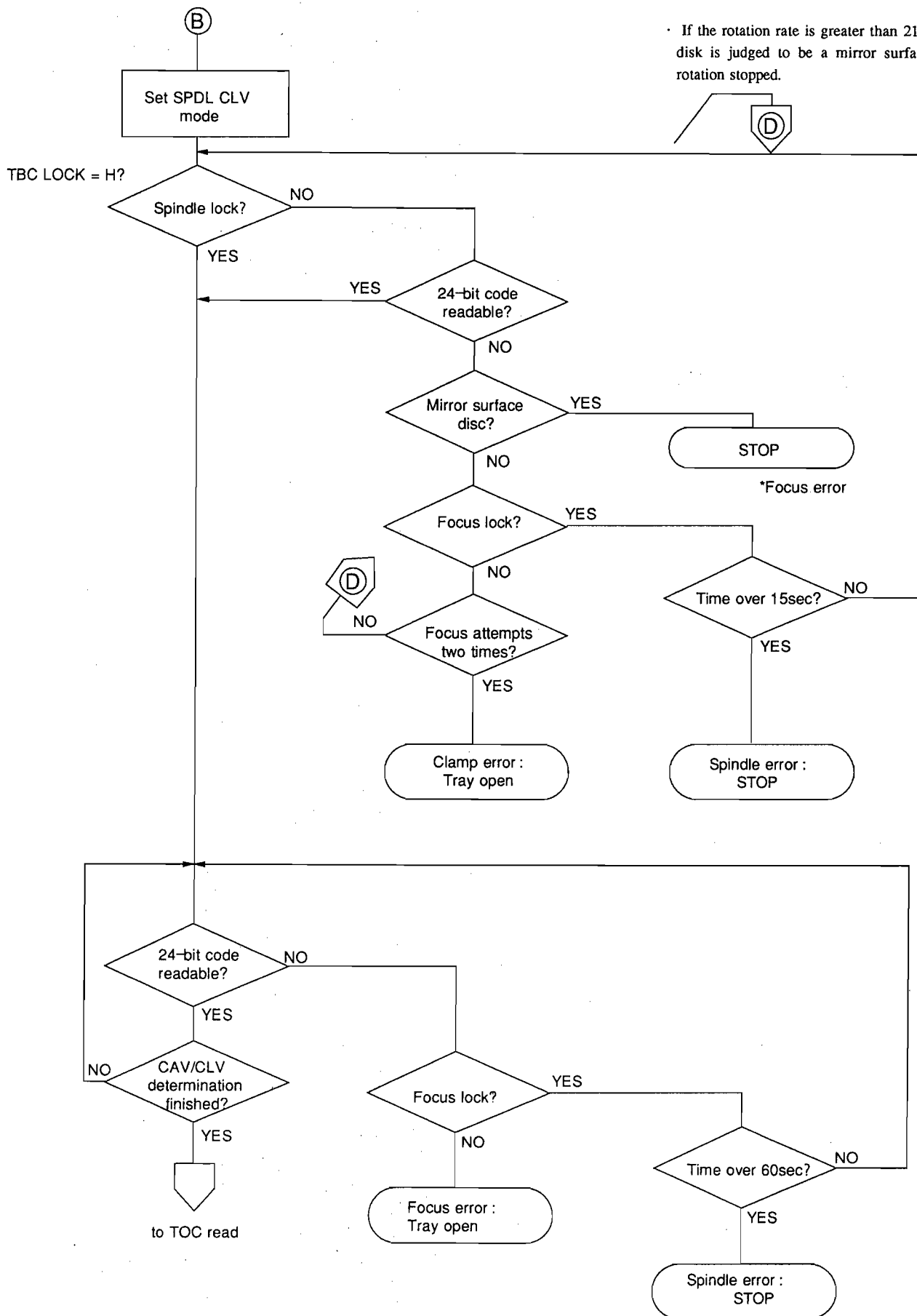
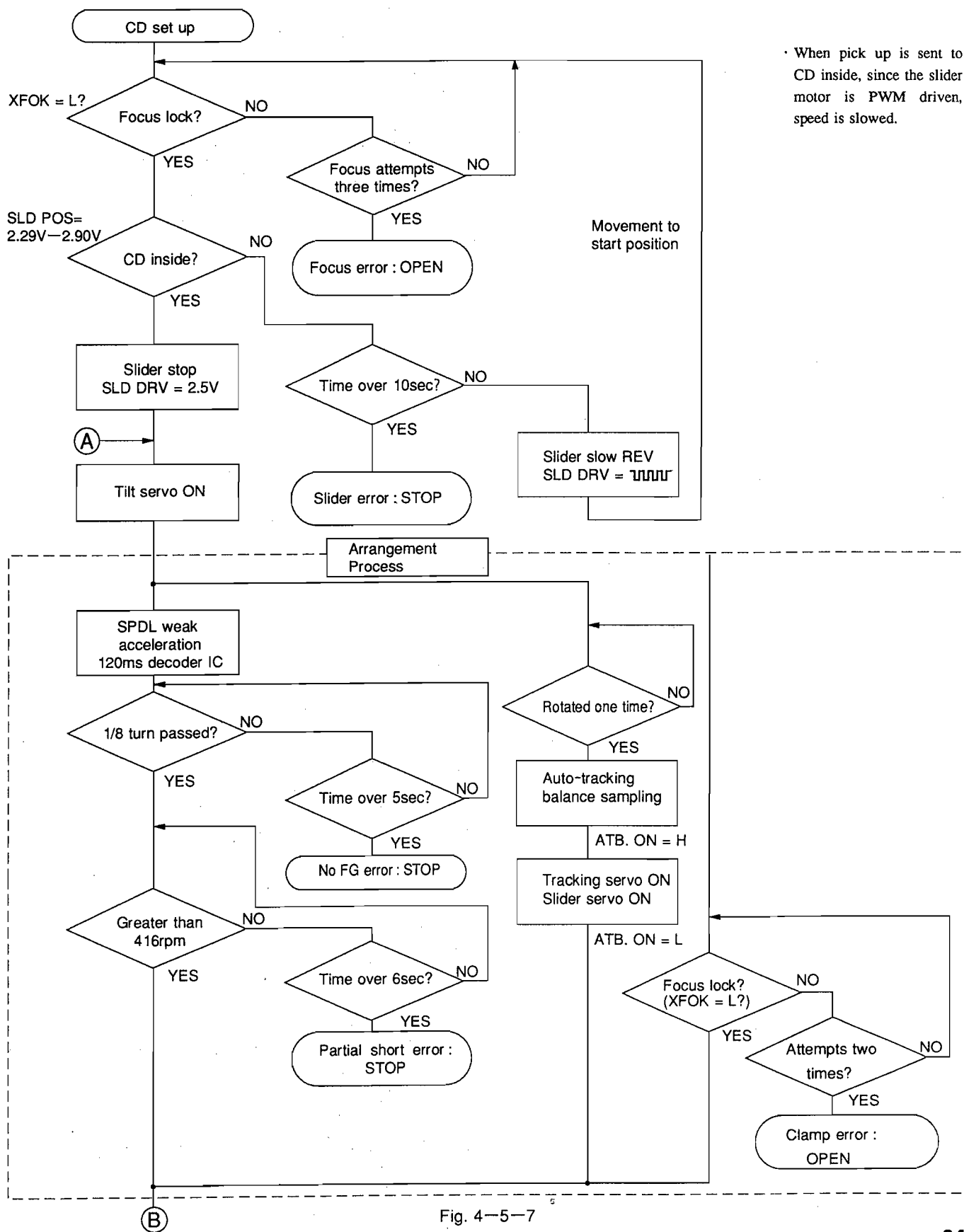


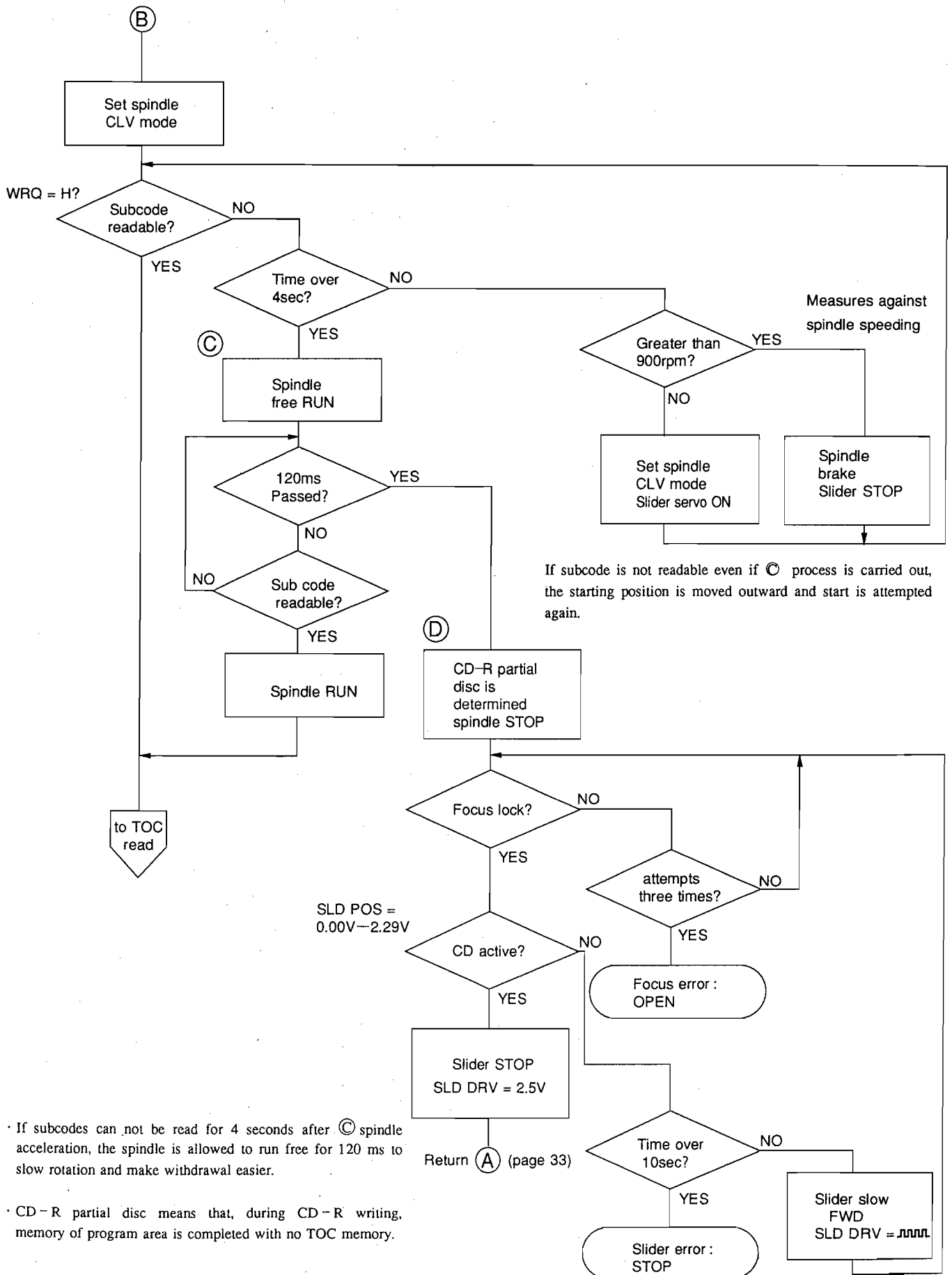
Fig. 4-5-6

3) CD Set Up Flow Chart



When pick up is sent to CD inside, since the slider motor is PWM driven, speed is slowed.

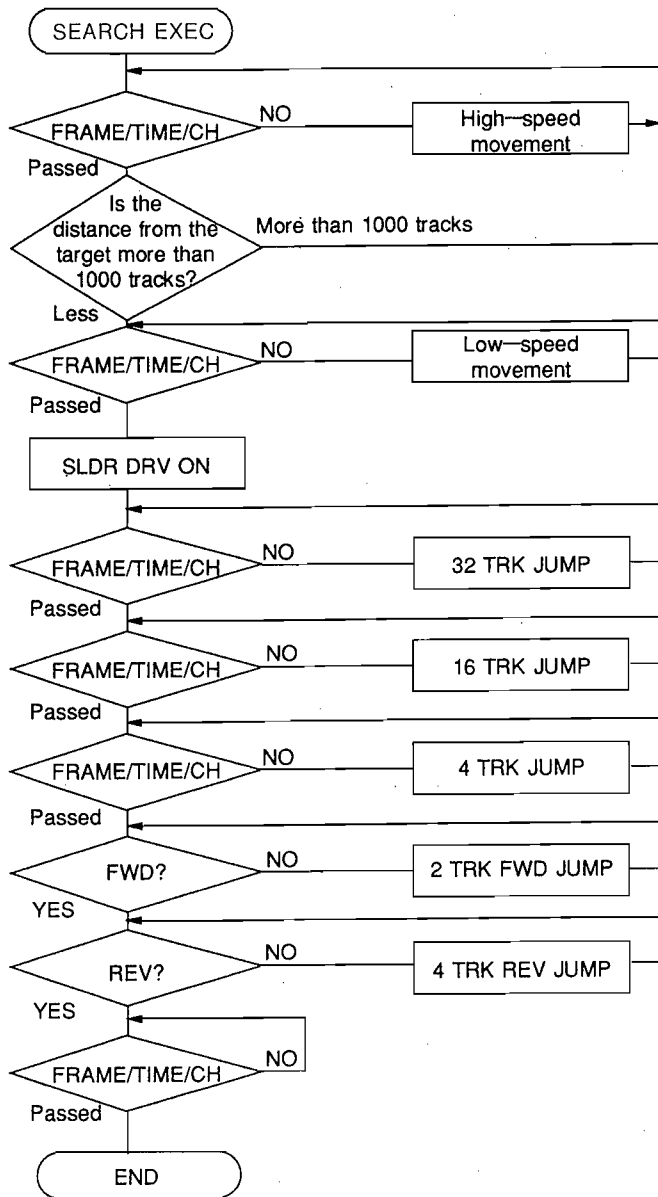
Fig. 4-5-7



• If subcodes can not be read for 4 seconds after C spindle acceleration, the spindle is allowed to run free for 120 ms to slow rotation and make withdrawal easier.

• CD-R partial disc means that, during CD-R writing, memory of program area is completed with no TOC memory.

4) Disc Search for CLV, CAV Discs Without TOC Flow Chart



Slider motor drive duty

	CAV	CLV
	47.1%	22.7%
	max	max

Slider motor drive duty

	CAV	CLV
	21.2%	14.1%
	max	max

Fig. 4-5-9

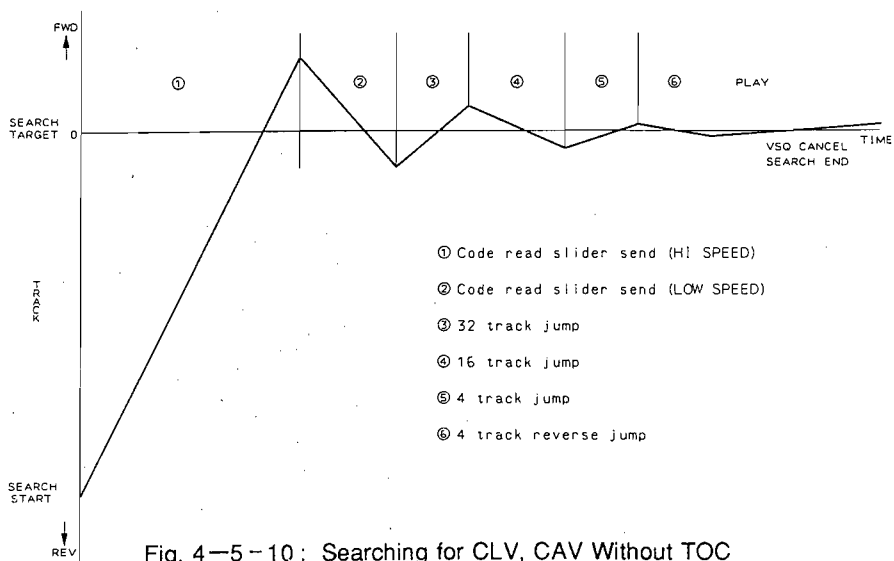


Fig. 4-5-10: Searching for CLV, CAV Without TOC

5) Disc Search for CLV With TOC Flow Chart

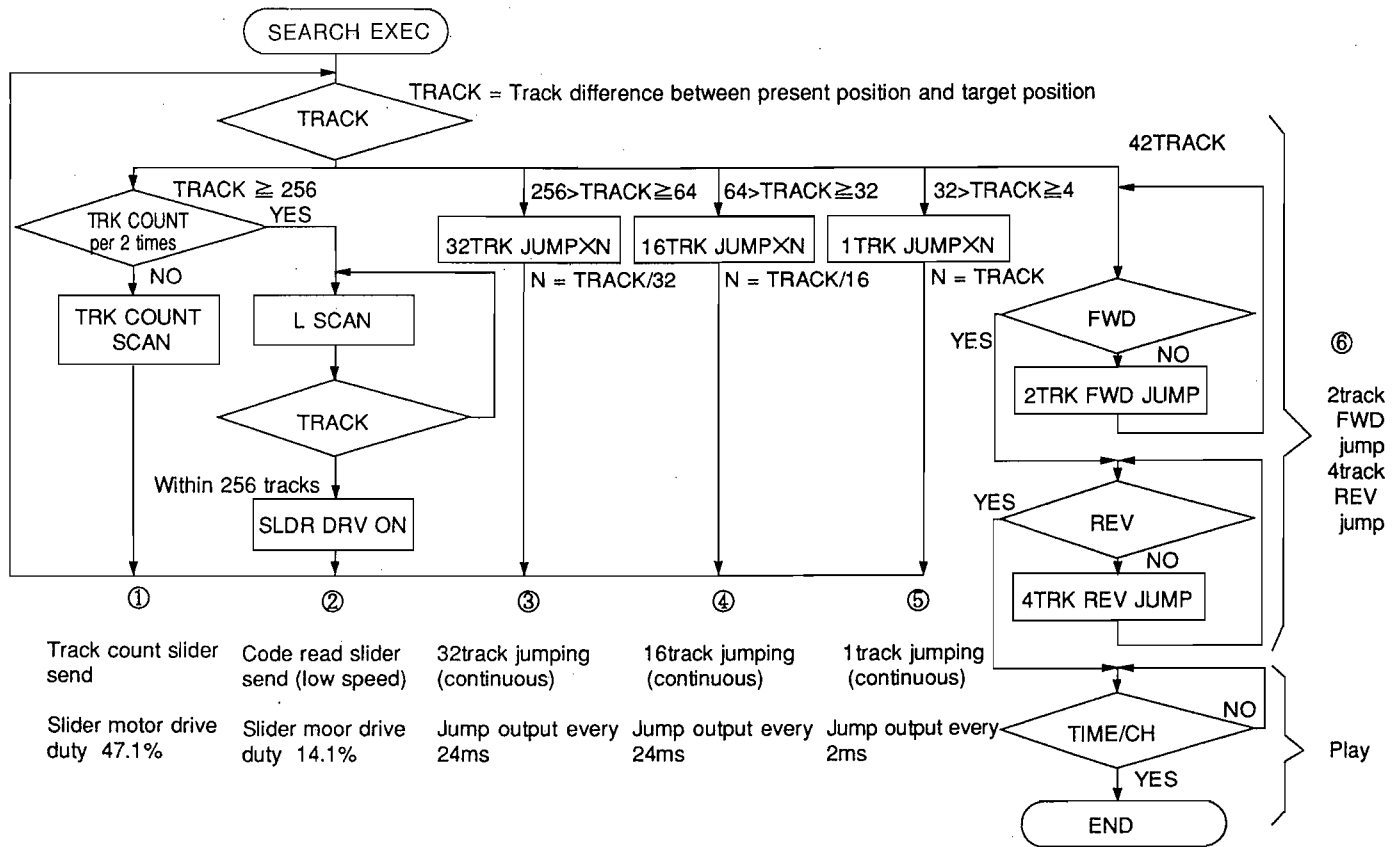


Fig. 4-5-11

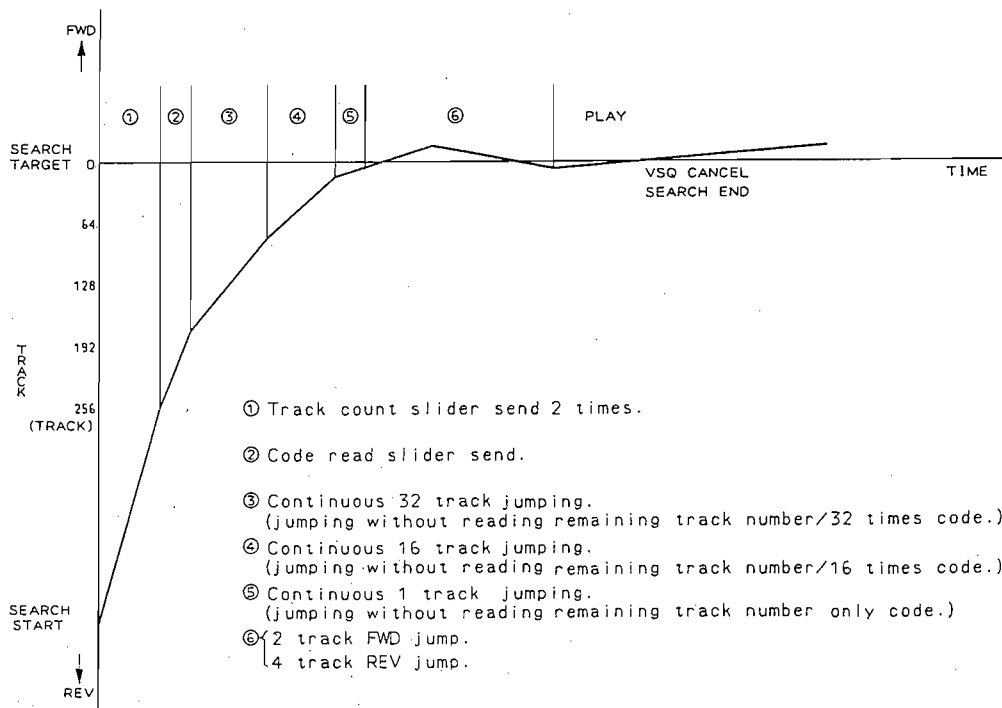


Fig. 4-5-12 Search for CLV with TOC

4.6 TABLE OF OPERATION MODES

(1) Mecha mode = 1 open mode

Mecha step	Description
0	open entry, disc status clear
1	move slider to home position
2	spindle check
3	wait for slider movement
4	loading to unload
5	wait for loading motor operation finish
6	100ms timer set
7	wait for timer
8	loading to open
9	mecha mode all end

(2) Mecha mode = 2 standby mode

Mecha step	Description
0	stop entry, disc status clear
1	move slider to home position
2	spindle check
3	wait for slider movement
4	set loading mode to standby or vertical movement
5	wait for loading motor operation finish
6	mecha mode all end

(3) Mecha mode = 3 stop mode

Mecha step	Description
0	stop entry, disc status clear
1	move slider to home position
2	spindle check
3	wait for slider movement
4	power off check
5	wait for loading motor clamp finish
6	mecha mode all end

(4) Mecha mode = 4 disc sense mode

Mecha Step	Description
0	if B-side, to step F if CD or CDV, to step 4
1	LD EQ setting, CAV setting, slider target setting
2	wait for slider movement (LD sense position)
3	wait for focus lock, when locked, confirm LD and go to mecha mode all end
4	wait for focus OFF
5	LD fix or if B-side go to step B, CD EQ setting, slider target setting
6	wait for slider movement (CD sense position)
7	wait for focus lock, when locked, confirm CD and go to mecha mode all end
8	wait for focus OFF
9	LD EQ setting, CAV setting, slider target setting
A	wait for slider movement (LD sense position)
B	if there is no CD direct, go to step E
C	wait for focus lock, when locked, confirm LD and go to mecha mode all end
D	wait for focus OFF
E	set to no disc and go to mecha mode all end
F	slider target setting, if single is confirmed, go to step 13
10	wait for slider movement (B side inside position)
11	wait for focus lock, when locked, confirm LD and go to mecha mode all end
12	wait for focus OFF
13	set to no disc and go to mecha mode all end

(5) Mecha mode = 5 set up mode

Mecha Step	Description
0	slider target setting
1	wait for slider movement (TOC position)
2	spindle start
3	wait for spindle lock, check for LD misclamp also carried out
4	fix PRD or mislock
5	with LD if in read in, read out area, go to step 6 anything else go to step 7
6	after moving slider to program area, go to step 5
7	play mode entry

(6) Mecha mode = 6 TOC read mode

Mecha Step	Description
0	TOC entry
1	read in search (slider REV sending)
2	program area search (16-track forward jump)
3	read in search (4-track REV jump)
4	wait for program area with play, 100ms timer set
5	reading 1st time TNO address
6	wait for spindle lock
7	jump back to lead-in
8	if TOC cannot be read, treat as LD without TOC and go to mecha mode all end
9	1st time initialize to 0 15 second timer setting
A	wait for TOC reading with read in if readable, end if program area, go to next
B	if subcode is readable, 32-track REV jump
C	if subcode is readable, 32-track REV jump
D	if subcode is readable, 32-track REV jump
E	if subcode is readable, 32-track REV jump
F	return to step A
10	set PRD flag, start movement to program area
11	movement play to program area, 15 second timer setting
12	REV jump from TNO = 0 to IX = 0 generate code error and end

(7) Mecha mode = 7 play mode

Mecha Step	Description
0	play mode entry

(8) Mecha mode = 8 search mode

Mecha Step	Description
0	search mode entry
1	area change (A/V change)
2	area change wait timer setting
3	wait for area change
4	TOC check & TOC data setting
5	track count search entry
6	wait for track count search
7	wait on Tracking Open
8	wait for spindle sweep
9	zig-zag search (high speed)
A	zig-zag search (low speed)
B	wait on Tracking Close
C	send 256 Track SLDR (search outside CD TOC buffers)
D	wait for end of 256 Track SLDR send
E	wait on Tracking Open
F	32-track continuous jumping
10	wait for end of 32-track continuous jumping
11	16-track continuous jumping
12	wait for end of 16-track continuous jumping
13	1-track continuous jumping
14	wait for end of 1-track continuous jumping
15	32-track jumping
16	16-track jumping
17	4-track jumping
18	jump until right before target
19	play until target
1A	search error processing
1B	restart at time of target change during search

(9) Mecha mode = 9 side A → B mode

Mecha Step	Description
0	STOP mode entry
1	side change check and disc status clear
2	direct-B mode set
3	check end wait
4	tilt wait
5	carry target set
6	turn SW check & tilt neutral set
7	tilt neutral set & timer check
8	tilt wait
9	carry target set
A	SLDR assist end check
B	10 second timer setting
C	wait that the spindle reaches side B
D	assist end job

(10) Mecha mode = A side B → A mode

Mecha Step	Description
0	STOP mode entry
1	side change check and disc status clear
2	tilt wait
3	carry target set
4	turn SW check & tilt down set
5	tilt down wait & timer check
6	tilt wait
7	carry target set
8	SLDR assist end check
9	tilt neutral set
A	loading motor move to clamp wait
B	10 second timer setting
C	wait that the spindle reaches side A
D	assist end job

(11) Mecha mode = E power off mode

Mecha Step	Description
0	stop entry, disc status clear
1	move slider to home position
2	spindle check
3	wait for slider movement
4	power off check
5	wait for loading motor clamp end
6	mecha mode all end

(12) Mecha mode = F recover mode

Mecha Step	Description
0	recover entry
1	spindle hold
2	wait for spindle lock
3	spindle stop
4	spindle stop
5	wait for spindle lock end
6	turn slider movement direction
7	timer setting
8	wait for timer & focus lock check
9	wait for timer & slider movement
A	wait for spindle lock
B	recover error
C	CD/CDV recover mode
D	wait for spindle lock
E	recover error

5. SERVOS FOR FOCS, TRKG, SLDR

5.1 FOCS SERVO SYSTEM

The focus servo's operation initiation command is sent to the DSP IC (LC78681KE) by serial data from the mecha control IC. When the DSP IC receives the command, first the FTS section C987 charge is discharged by FST signal and the object lens is lowered. Next, by a FOCS signal, it is recharged and is gradually pulled up. When focus is achieved, *FZD goes down. When this signal is received, the FOCS signal is reset and the focus servo goes on. (refer to Fig. 5-1-3 and Fig. 5-1-4) (The focus loop SW is in the PAC003A EQ section.) The operation initiation is the same as

before, but as a condition, FSUM is not used. Even the XFOK signal that goes to the mecha control IC establishes a time constant for the signal created by the FSUM in the PAC002A interior and outputs it.

There is no large difference with the former FOCS servo system, but the EQ composition has changed and the FOCS does not carry out loop switching in response to DEFECT. refer to Fig. 5-1-1 and 5-1-2 for EQ section (only TRKG system) and SW logic.

FOCS SUM is composed by the AMP in the PAC002A interior and due to the addition of the AGC circuit, the former SUM LEVEL adjustment VR has been eliminated.

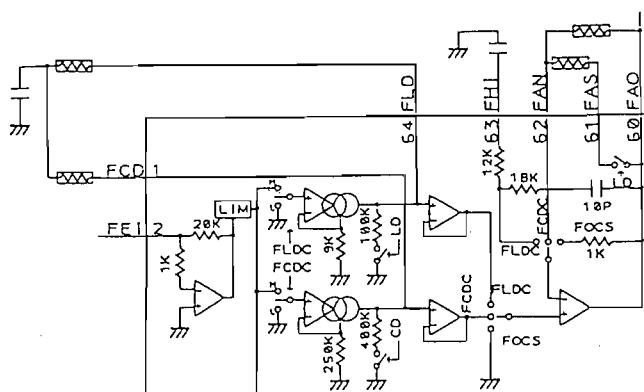


Fig. 5-1-1 FEQ. (FOCS EQUALIZER) Section Circuit

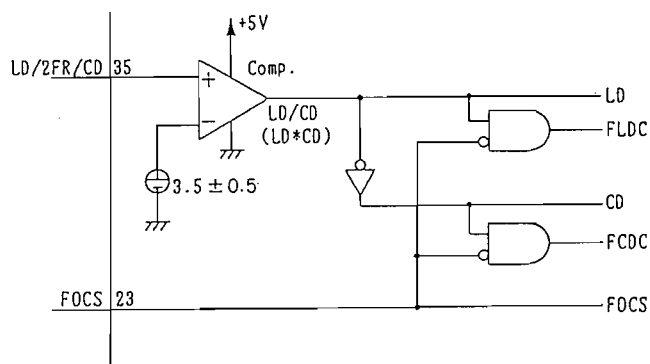


Fig. 5-1-2 FEQ. (FOCS EQUALIZER) Control Logic Circuit Diagram

Disc present

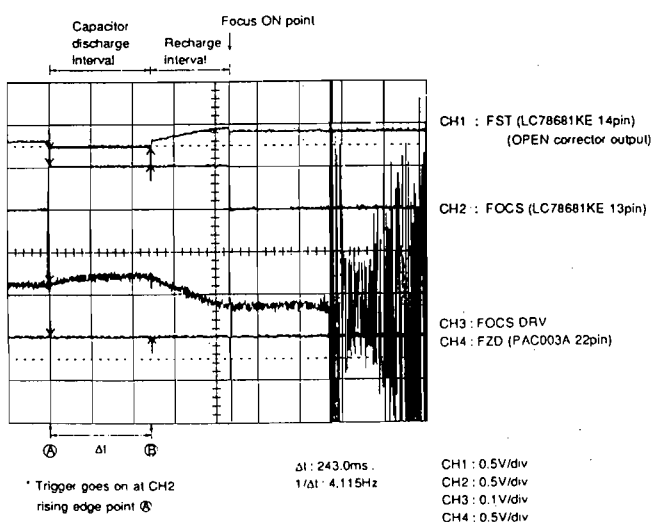


Fig. 5-1-3 FOCS Timing Chart When Disc is Present

No disc

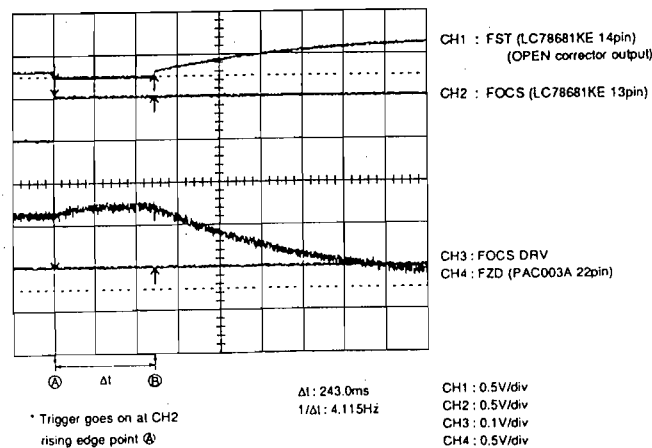


Fig. 5-1-4 FOCS Timing Chart When No Disc is Present

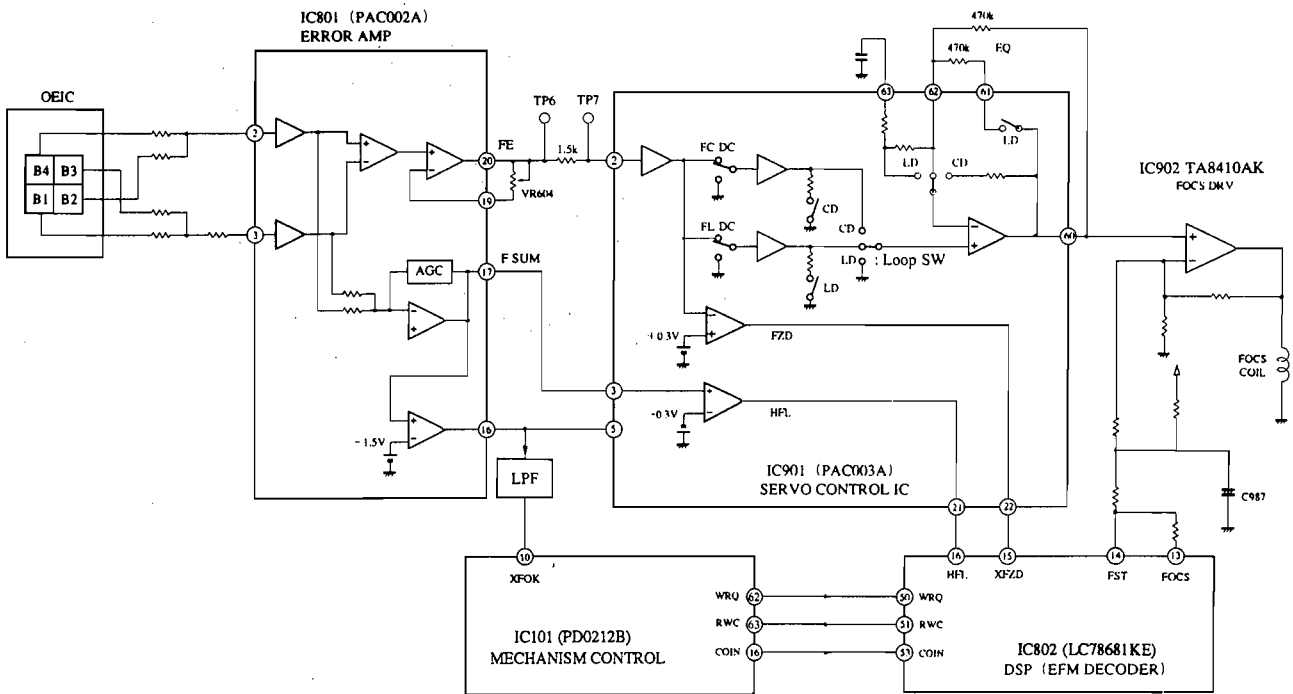


Fig. 5-1-5. FOCS SERVO BLOCK DIAGRAM

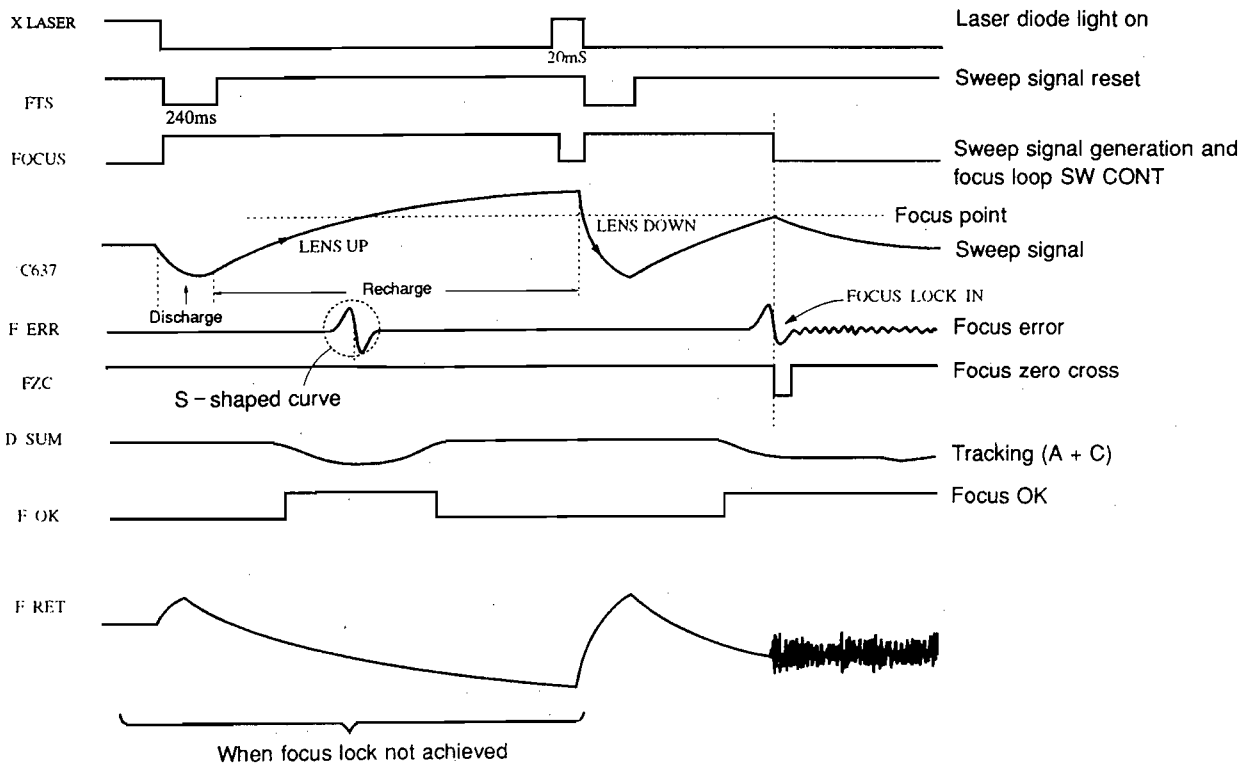


Fig. 5-1-6. FOCS SERVO TIMING CHART

5.2 TRKG SERVO DESCRIPTION

●Signal Flow

A and C output from the OEIC of the PICKUP ASSY is input into 23pin and 24pin of PAC002A and passes through the built-in TRKG error amp and is output through 22pin. PAC002A ATB (AUTO TRKG BALANCE) circuit detection and TRKG offset detection are also carried out. The TRKG error signal that is output from 22pin is input to 7pin of PAC 003A after being gain adjusted by VR603. It then goes through the EQ section and is output from 16pin. In the EQ section, for optimal trackability, interior SW are switched by the logic section signal that is composed of LD/CD, THLD, TGL, TOFF, and DEF signals. The EQ section and logic circuit are shown in Fig. 5-2-2 and 5-2-3.

●One Track Jump and Multi-Track Jump

The timing chart for each pin output signal of IC 901 (PAC 003A) at time of One track jump and multi-track jump is shown. (Fig. 5-2-1) One track jump is the same as in the former model (used PA3003), but in the case of multi-track jump, the timing for turning TRKG servo ON is not by frequency detection. Instead it is by track count detection. In other words, for 32-track jump, the old model would output 16-track portion accel and after that it would be indefinite. In this model, however, the accel outputs 18-track portion and the brake outputs 14-track portion.

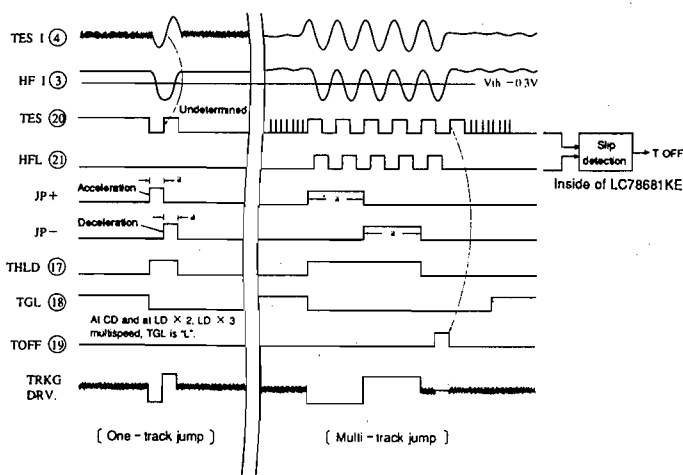


Fig. 5-2-1 Timing Chart for Each Pin Output Signal

5.3 SLIDER MOTOR CONTROL

●Signal Flow

The tracking drive signal that is output through 1pin of drive IC902 (TA8410AK) passes through LPF, is amplified by IC 903 (BA4560F). After it is subject to a level shift by the 2.5 V center, it is input to IC101 (mecha control IC) 8pin and makes SLDR ERR signal. The slider motor drive pulse that responds to that signal's level is output from 18pin and after being power amplified by drive IC803 (LA6510), it drives the slider motor.

When the pick up position is forcibly moved at time of disc determination/start, in response to slider position signal that is input to 9pin of IC101, operation is carried out while position is being detected.

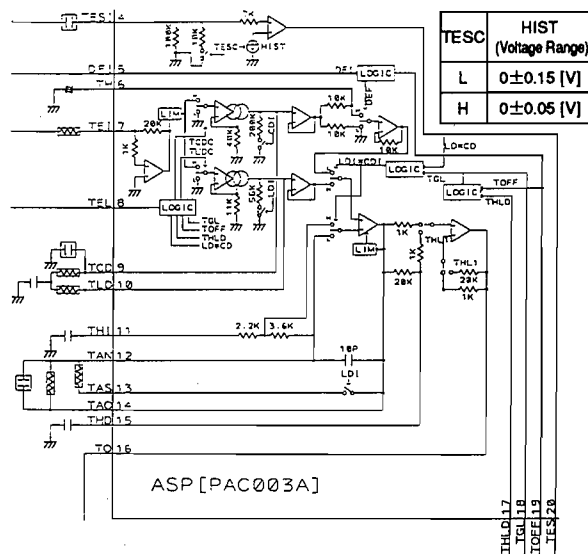


Fig. 5-2-2 TRKG EQ Section Circuit Diagram

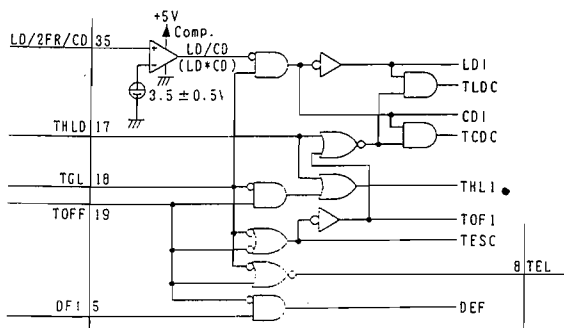


Fig. 5-2-3 TRKG EQ Control Logic Circuit Diagram

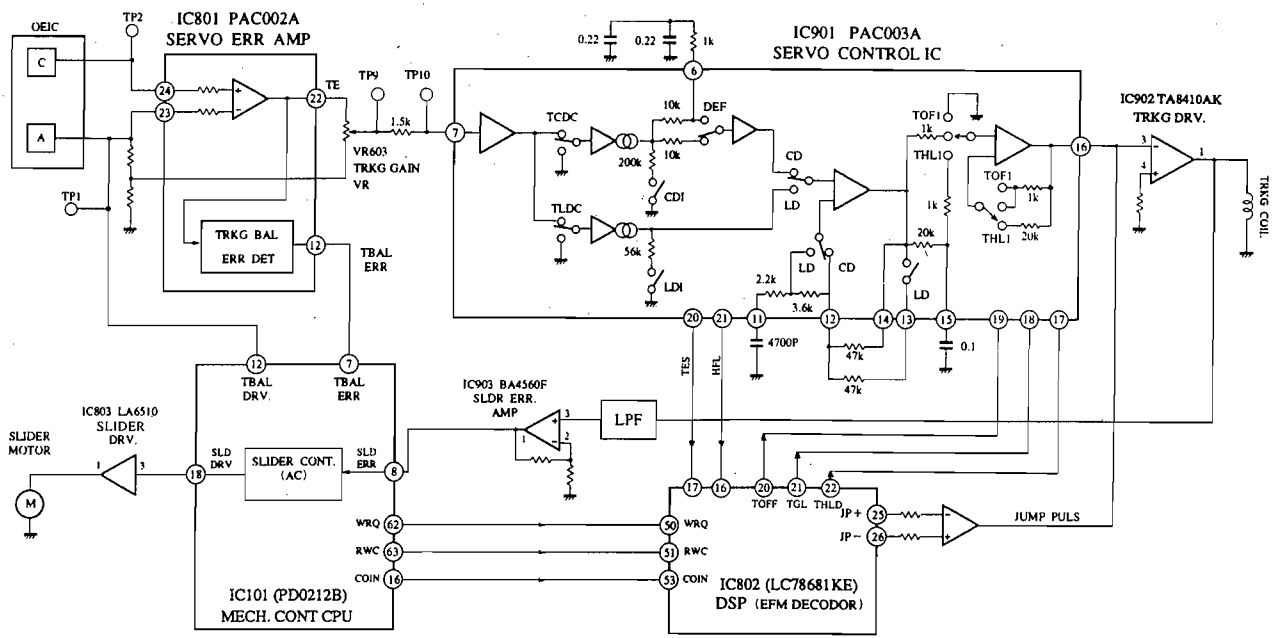


Fig. 5-2-4 TRKG and SLDR SERVO BLOCK DIAGRAM

6. VIDEO SIGNAL PROCESSING SYSTEM DESCRIPTION

6.1 RF SYSTEM

The RF signals from the pickup are amplified by the RF amp and after RF correction processing are passed through a high pass filter. Then the main line system passes through an audio carrier trap and low pass filter and is input to Pin 27 of PAC005B. The drop out RF is input to Pin 29 of PAC005B.

6.2 MAIN LINE VIDEO SYSTEM

The RF signal input to Pin 27 of PAC005B is detected and output from Pin 25. Then it passes through a low pass filter and the video level adjustment VR and is input to Pin 22.

There it passes through the inversion amp and deemphasis circuit and becomes a normal video signal (about 1Vp-p with sync tip 100% white).

The main line video signal is not output from Pin 21 but is subject to noise reduction within the IC and is output from Pin 14. Then it passes through a low pass filter, is input from Pin 12, passes through a clamp circuit and amp, is output from Pin 10, is input to Pin 46 of PD0192A, and is converted to digital data by an A/D converter. Then TBC correction is applied within PD0192A and drop outs are compensated for. Moreover, characters are inserted and 8-bit digital video signals at pins 9 to 16 are output to a 3-line digital comb filter (CXD2023Q).

6.3 DROP OUT SYSTEM

The RF signals input to Pin 29 of PAC005B have their level and frequency sensed. The drop out pulse is output from Pin 1 and dropouts are compensated for within PD0192A.

6.4 SYNC SEP. SYSTEM

The video signals input from Pin 12 of PAC005B are clamped, then passes through an amp and low pass filter, and clamped again to extract the SYNC signals.

6.5 DATA SEP. SYSTEM

The video signals input from Pin 12 of PAC005B are clamped, then passed through an amp and a low pass filter and the data is extracted. As conditions at this time, the disc rotation rate must be at least nearly normal (when DOS frequency sensing is not applied), the SYNC must be extracted, and V-SYNC must be appearing normally.

7. TBC SYSTEM DESCRIPTION

7.1 DIGITAL VIDEO PROCESSOR (PD0192A)

Time axis correction (spindle control, TBC) and video signal processing are performed by PD0192A. This IC changes some of the functions of PD0146A. The main functions of PD0192A are :

- Horizontal, vertical SYNC signal separation
- Acceleration control signal creation
- Spindle error signal creation
- Spindle driver I/F
- Digital TBC
- Color drop out compensation
- SSG (SYNC signal generator)
- Blue background generation and squelch switching
- Character insertion
- Analog audio jitter removal signal creation

7.2 SPINDLE CONTROL

The spindle control has two stages : rough servo loop A with the acceleration control signals and servo loop B with the spindle error signals. The sequence is A→B

1) Horizontal, vertical SYNC signal separation

The playback composite SYNC signal (PBCSYNC) output from PAC005B is input to Pin 50 and the horizontal SYNC signal (PBH : Pin 37) and the vertical SYNC signal (PBV : Pin 36) are separated. The horizontal SYNC signal is separated by using equivalent pulses as a mask. That mask width is 58.3 μ s when the horizontal SYNC signal SYNC detection result is OK and 47.8 μ s when the result is NG. The detection delay time T for the vertical SYNC signal is $0.5 H < T < 1H$.

2) Acceleration control signal creation

The trinary output acceleration control signal (ACCNT : Pin 56) is created from the compulsory acceleration/deceleration command from the mechanism controller (PD0212B) or from the period detection result for PBH separated from the PBC SYNC. At PD0192A, after the end of compulsory acceleration/deceleration from the mechanism controller IC, acceleration is carried out according to the PBH period detection and when the spindle is judged to be close enough to the target rotation rate, the acceleration control signal goes to high impedance. The duty ratio can be controlled with serial commands. The result is input to the PAC003A mix amp.

3) Spindle error generation

PBH separated from the PBC SYNC and the Ref H obtained from the master clock (4fsc) are compared to create the trinary output frequency/phase error (SPERR : Pin 54). However, when PBC SYNC is not reproduced normally (when motor drive is inhibited, during compulsory acceleration/deceleration, and during CLV jumps), a 50% duty signal showing zero error is output. The phase comparison range is about 120 μ sp-p (2H). The result is input to the PAC003A loop filter.

4) Spindle driver I/F

The spindle error PWM modulation signal PWMI (Pin 57) input from PAC003A and the F/R signal (Pin 58) showing the motor drive direction are converted to the spindle driver drive signals DRVA (Pin 59) and DRVB (Pin 60) with the internal logic and output.

5) Rough servo control by FG

Discs supported

CAV, CLV, and CDV-V part are supported.

The output takes the form of serial commands to the DVP.

Disc	Mode	Servo details
CAV	Starting up	Compulsory acceleration up to 1530 rpm If the spindle is not locked within a certain period of time, a sweep operation is carried out.
	After start up	If the spindle lock is lost within a certain period of time, the servo is controlled until the normal rotation rate (in this case, 1800 rpm).
CLV	Starting up	Compulsory acceleration up to 1530 rpm If the spindle is not locked within a certain period of time, a sweep operation is carried out.
	After start up	If the spindle lock is lost within a certain period of time, the servo is controlled until the normal rotation rate (the rate stored in memory by the mechanism controller). If the spindle is still not locked, a sweep operation is carried out.
	During TCS	The servo is controlled to bring the rotation within the target rotation rate range.
CDV-V	Starting up	Compulsory acceleration up to 2295 rpm If the spindle is not locked within a certain period of time, a sweep operation is carried out.
	After start up	If the spindle lock is lost within a certain period of time, the servo is controlled until the normal rotation rate (the rate stored in memory by the mechanism controller). If the spindle is still not locked, a sweep operation is carried out.

* TCS: track count search

* A sweep operation is an operation that increases and decreases the rotation rate and searches for a rate at which PH codes can be read.

LD: 600-1939 rpm

CDV: 1690-2865 rpm

Table for microcomputer ACC/BRK control during track count search

During track count searches, the microcomputer controls to bring the rotation rate within the reference rotation rate range (FG FGT value) +33% - 40%.

For search from inner edge to outer :

BRK issued until rotation rate enters range from reference rotation rate to reference rotation rate +33%

For search from outer edge to inner :

ACC issued until rotation rate enters range from reference rotation rate to reference rotation rate -40%

	Target time	FG FGT			Rotation rate		
		-40%	Reference	+33%	-40%	Reference	+33%
1	00:00 - 02:13	15H	23H	2EH	1130	1883	2504
2	02:13 - 04:53	17H	27H	33H	1014	1690	2248
3	04:53 - 07:52	1AH	2CH	3AH	899	1498	1992
4	07:52 - 11:10	1CH	30H	3FH	824	1373	1826
5	11:10 - 14:48	1FH	34H	45H	761	1268	1686
6	14:48 - 18:45	22H	39H	4BH	694	1156	1537
7	18:45 - 23:00	24H	3DH	51H	649	1081	1438
8	23:00 - 27:40	27H	42H	57H	599	999	1329
9	27:40 - 32:30	2AH	46H	5DH	565	942	1253
10	32:30 - 37:40	2DH	4BH	63H	527	879	1169
11	37:40 - 43:10	2FH	4FH	69H	500	834	1109
12	43:10 - 50:30	32H	54H	6FH	471	785	1044
13	50:30 - 58:10	36H	5AH	77H	439	732	974
14	58:10 -	39H	5FH	7EH	416	694	923

↑
The mechanism controller contains this table.

7.3 DIGITAL TBC AND VIDEO SIGNAL PROCESSING

The video signals demodulated by PAC005B then clamped are input to VIN (Pin 46) and converted from analog to digital.

From this digital video data, the fsc rate clock following the write-side video signal jitter is created by the PLL, then this is multiplied by four and used as the ADC sampling clock and the FIFO write clock. By reading with a standard 4fsc clock the digital data that was written into FIFO memory with the jitter-following clock, the time axis is corrected. Also drop outs are compensated for with the drop out detection signal (DOSP: Pin 51) input from PAC005B. Then, squelch switching and 140n shift are carried out, characters are inserted with the character data (CHA: Pin 3; CHB: Pin 6) input from PD 0198A, SYNC is inserted internally, the result is output to pins 9 to 17 of D00 to D07.

7.4 SSG

Variable-delay composite SYNC signals are output with serial commands. Using shift, reset, and other operations for trick play is supported through modes such as Jump and Scan.

8. AUDIO SYSTEM DESCRIPTION

8.1 DIGITAL AUDIO SYSTEM

The EFM signals are extracted with a 1.75MHz low pass filter, passed through the PAC003A EFM amp, and input to Pin 8 of the DSP. The data output from Pin 35 is input to Pin 25 of PD 2026B(L), digitally processed with a digital filter, and converted into analog signals with a DAC.

8.2 ANALOG AUDIO SYSTEM

The audio FM signals extracted from the 2.3MHz (L ch) and 2.8MHz (R ch) band pass filters are demodulated by CA0002 AM, then output from Pin 13 and Pin 12.

Transistors Q201 and Q202 mute the analog audio and either digital or analog audio is selected and sent to the output terminals.

9. SELF-DIAGNOSTIC FUNCTIONS

9.1 SELF-DIAGNOSTIC FUNCTIONS

The self-diagnostic functions automatically display an error code on the TV screen and front panel fluorescent display section when there is an error. The customer checks the error code and conveys it to the service personnel to make repairs more efficient.

After an error occurs, even if the error code goes off, you can display the error code again by holding down the **CLEAR** key for 10 seconds (except a loading error **L *** display). At that time, partial error is displayed with the mechanism switch information. However, if the power cord is unplugged, the error code information is lost.

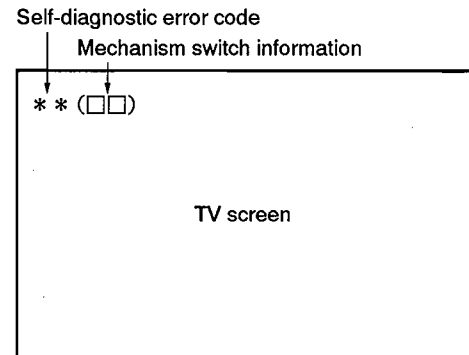


Fig. 1 TV screen display

This table explains the information for analyzing the cause when an error occurs with the CLD player.

Self-diagnostic error code	Contents	Conditions	Probable cause
H0	Spindle overcurrent detection error.	In the play state, overcurrent was detected in the spindle motor. Monitoring starts 5 seconds after the start of play or special playback mode, this error is detected if the overcurrent port is "L" for 4 seconds.	<ul style="list-style-type: none"> • Motor NG • Clamper rubbing
U0	FG abnormality error	<ol style="list-style-type: none"> ① At LD start-up, the rate of rotation calculated from the FG was less than 15 rpm for 5 consecutive seconds from the spindle run command. ② At CD start-up, there was less than 1/8th rotation even after 5 seconds had passed since the end of acceleration. ③ During play search, CD : subcodes are being read/LD : Philips codes are being read and the spindle is locked, but a state in which the rate of rotation calculated from the FG was less than 15 rpm continued for 5 seconds or more. In the above case, it is judged that an abnormality has occurred in the FG sensor and that accurate rotation rate calculation has become impossible. 	<ul style="list-style-type: none"> • FG sensor abnormality, FG signal not coming to mechanism controller • FG sensor clogged • Rubbing between FG sensor and slit • Turntable dropped • FG slit deposition NG
H1	Partial short error	<ol style="list-style-type: none"> ① At LD start-up, the speed did not reach 1200 rpm within a certain time (12 seconds) after the spindle run command. ② At CD start-up, a certain speed (313 rpm) was not reached within 6 seconds from the end of spindle acceleration. 	<ul style="list-style-type: none"> • Spindle motor NG • Commutator NG • Bearing too tight • Power supply NG
H2 A0	Power supply abnormality error	– 5V power supply abnormality detected. The power supply abnormality port is constantly monitored and if its signal stays high for about 1 second consecutively, the power supply is judged to be abnormal.	<ul style="list-style-type: none"> • – 5V not fed from SYPS assy • Parts shorted
L *	Loading error	<ol style="list-style-type: none"> ① When loading operation goes over time (approx. 10 sec.). ② When assist at disc sense entry ends and is not tilt neutral. ③ When assist at set up entry ends and is not tilt neutral. 	<ul style="list-style-type: none"> • Tilt switch 1, 2, 3 abnormal, so tilt/loading state not read in correctly • Tilt/loading mechanism mechanically locked • Drive IC NG • Power supply NG
E *	Slider error	During slider movement, a time over-run occurred (track count search 20 seconds, mandatory movement 10 seconds)	<ul style="list-style-type: none"> • Slider ceased being able to run • The slider mechanism is mechanically locked and can no longer move to its target. • Slider position switch NG • Flexible cable pulled out • Drive IC NG • Power supply abnormal
U1	Miss clamp error	<ol style="list-style-type: none"> ① During LD setup, after 1/8th rotation, the track count during 1/8 rotation exceeded 511. ② During start-up, the focus was lost once and refocusing was attempted, but the focus could not be locked. ③ Two FG pulses did not come within 800 ms from from the start of LD start-up. ④ The disc clamp operation did not end within 5 seconds. 	<ul style="list-style-type: none"> • Disc sandwiched • Disc shifted • Spindle motor NG • Disc scratched or dirty defocused during start-up • Two discs loaded • PU actuator NG • Tilt sensor NG • Tilt neutral NG (tilt base NG)

Self-diagnostic error code	Contents	Conditions	Probable cause
P *	Spindle error	① During TOC reading with an LD, the spindle servo was not locked within 60 seconds from the start of the spindle run. ② When CAV/CLV determination is not finished within 60 seconds from spindle servo lock. ③ The codes could not be read for 10 – 15 seconds consecutively for an LD or 7 – 10 seconds for a CD/CDV and the spindle servo was not locked. ④ The speed exceeded 2100 rpm during LD start up.	P0:•PH code, SUB-Q code can not be read •VCO, PLL offset out of adjustment •Disc defect P5:•PAL disc, mirror disc, etc. PLAY •No RF P6:•Spindle servo does not lock •Spindle motor NG
F *	Focus error	① "In the "no disc" state, a setup command was received from the mode controller. ② When LD is out of focus when slider is moved to starting position during set up. In case of CD/CDV is NG even after three focus tries. ③ During start-up, the maximum slider servo duty continued for 3 loops or more.	F5:•CD, LD on top of each other •LD scratched or dirty defocused during slider movement •Disc NG •Slider position switch NG F6:•Inner edge of disc scratched or dirty •Slider ran into inner edge mechanical stopper

* Besides the above errors, there is the "U2" communications error (the mode controller could not communicate normally with the mechanism controller)
 The probable cause is a defective mechanism controller, disconnected cable, etc..

- * Mechanism mode contents (meaning of * for L * etc.)
- | | | |
|----------------|----------------------------|---------------------|
| 0 : Play | 5 : Setup (rotation start) | 9 : Side A → Side B |
| 1 : Open | 6 : TOC read | A : Side B → Side A |
| 2 : Standby | 7 : Play | |
| 3 : Clamp | 8 : Search | |
| 4 : Disc.sense | | |

9.2 FORMAT OF THE MECHANISM SWITCH INFORMATION WHICH IS TRANSMITTED TO THE MODE CONTROL IN THE ERROR OCCURRENCE

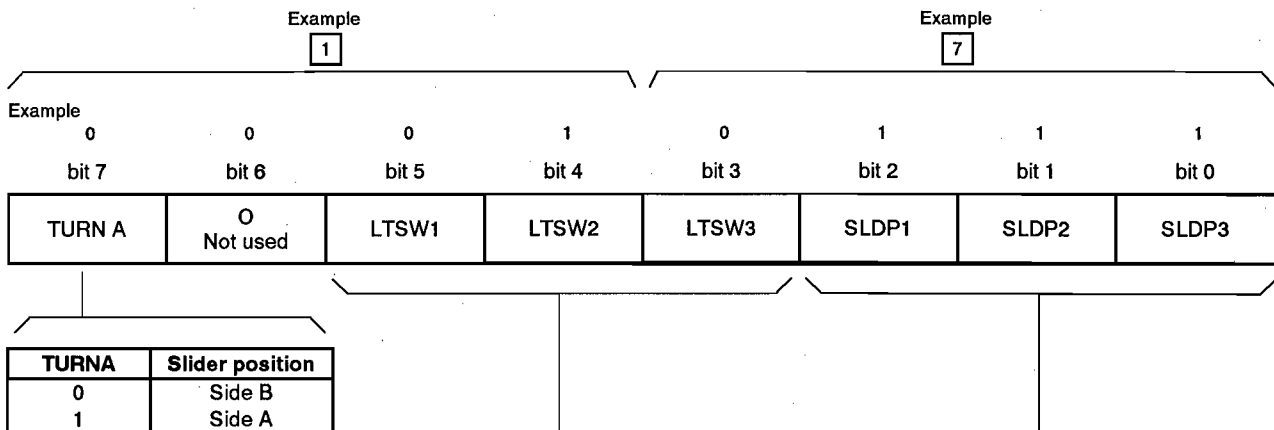
Example

• Mechanism switch information (1 7)

Mechanism control → Mode control

Communication byte address 5 (COMBUF5)

(Mode control displays this value as it is.)



Example of 1 7 is indicated as follows.

- (Slider : Side B
- Tilt : Tilt +
- Position : B-INSIDE

LTSW			Loading/tilt position
1	2	3	
0	1	1	Open (Tray open state)
0	0	1	Loading (During move the tray horizontally)
1	0	1	Standby (Tray close & spindle down state)
1	0	0	Clamp (During spindle up or down)
0	0	0	Tilt - (Clamp state)
0	1	0	Tilt + (Clamp state)
1	1	0	Tilt limit (Clamp state)

SLDP			Slider position
1	2	3	
1	0	0	CD active position
1	0	1	CDV active position
1	1	0	LD active position
0	1	1	CD inside position
1	1	1	Side B inside position

10. ADJUSTMENTS

10.1 TEST MODE

1)How to start the test mode

On the MOTHER ASSY, Short circuit the test mode JP W490 and W491, the test mode is started by pressing the power switch ON. (Fig. 1)

After confirming that all FL indicators are lit, remove test mode jumper wire and GND connection.

2)How to cancel the test mode

Turn power switch OFF.

3)Functions and key control when in test mode

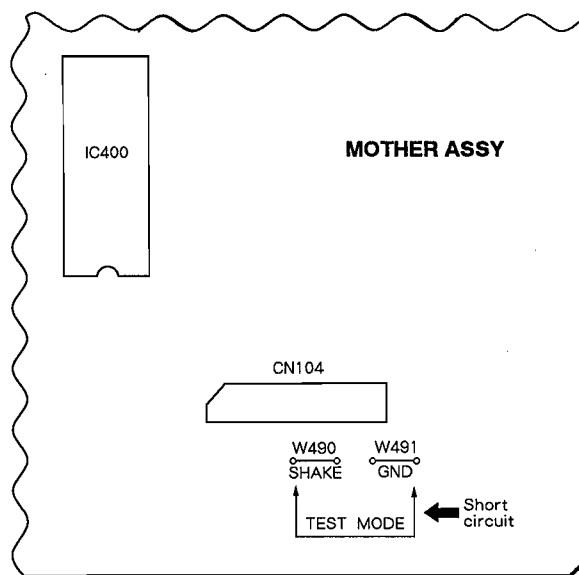


Fig. 1

Note : When you open the tray in test mode, the screen displays goes out. To display the screen again, press the **DISPLAY** key.

• Key Operation In the Test Mode

Player Status	Key Operation	Function	TV Screen Display
Tray Open	◀◀/▶▶ SKIP (Refer to Note 1)	◀◀ : Shifts the tray in the closed direction and also raises the turn table while pressing the key. ▶▶ : Shifts the tray in the open direction and also lowers the turn table while pressing the key.	
Tray Open	▶ PLAY	Clamps	
Clamp	▶ PLAY	Turns the disc through TRK Servo OFF	TRK-OFF
TRK Servo OFF	▶ PLAY	TRK Servo ON	TRK-ON
TRK Servo ON	▶ PLAY	TRK Servo OFF	TRK-OFF
TILT Neutral	RANDOM	TILT Servo ON	T-□:ON
TILT ON	▶ PLAY to STOP	TILT Neutral	T-□:N
TILT Neutral or ON	◀◀/▶▶ SKIP	Setting TILT Servo to OFF, can force TILT to move.	T-1 to T-E
Clamp	◀◀/▶▶ SCAN	Can force the slider to move	S-LD S-BIN S-CDV S-CD S-IN
Play	PAUSE	Still	
Play	■ STOP	Stop	
Stop	▲ OPEN	Open	
Play	+10 ↓ 0 to 9 ↓ ▶ PLAY	Set to SEARCH lead address input mode. Designates the SEARCH lead address through keys 0 to 9. Press the CLEAR [C] key if the designated address is incorrect. Searches the designated address upon pressing the PLAY key.	

Note 1 : Press SKIP (◀◀/▶▶) keys after the tray is set to open state by pressing OPEN (▲) key.
Because, in tray open state, pressing PLAY (▶) key causes it to set to clamp state and SKIP (◀◀/▶▶) keys can not function properly.

Table 1

• **Player Operation in the Test Mode**
(Disc tray is removed)

Operate the player by selecting a test mode function with the keys on the player or on the remote control unit.

• **CD PLAYBACK**

- ① Place the CD disc on the turn table.

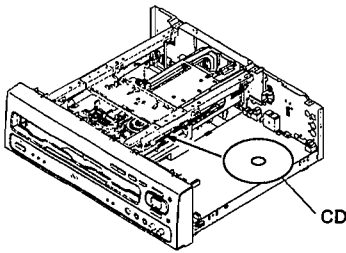


Fig. 2

- ② Press the PLAY (▶) key once.
(Twin gear starts to move.)
- ③ Push the cam plate (Fig. 3) in the direction of the arrow and wait until the CD disc is clamped.

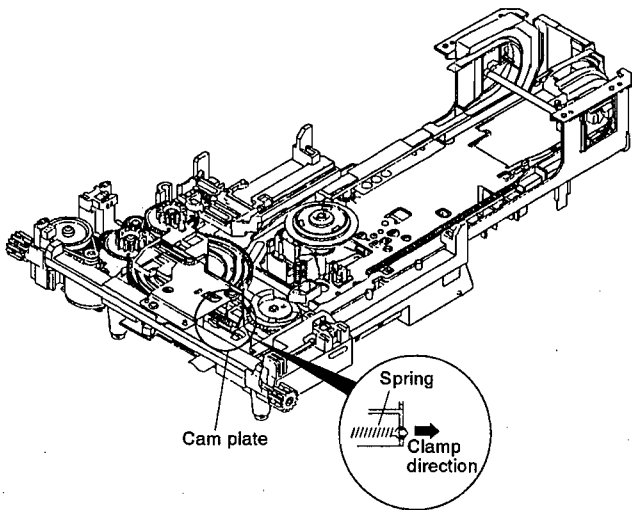
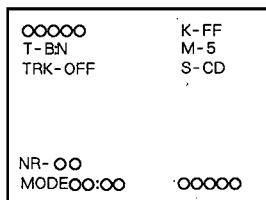


Fig. 3

- ④ Press the ◀◀ or ▶▶ keys to appear "S - CD" on the TV screen display.



TV screen display

Fig. 4

- ⑤ Press the PLAY (▶) key twice, disc will be normally played back.

• **LD PLAYBACK**

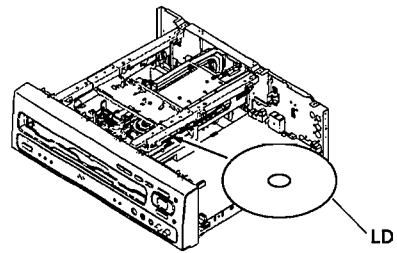
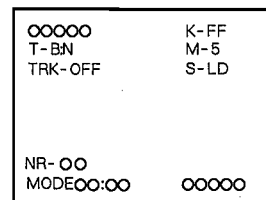


Fig. 5

- ① Press the SKIP REV (◀◀) key to raise the turn table (spindle motor section) while pressing the cam plate (Fig. 3) in the direction of the arrow. Raise it to the position where the LD disc can be easily placed on the turn table. If the turn table is raised too high, lower it with the SKIP FWD (▶▶) key.
- ② Place the LD disc on the turn table and press the PLAY (▶) key once to clamp the disc.
- ③ Press the ◀◀ or ▶▶ keys to appear "S - LD" on the TV screen display.



TV screen display

Fig. 6

- ④ Press the PLAY (▶) key twice, disc will be normally played back.

10.2 ADJUSTMENT PRECAUTIONS

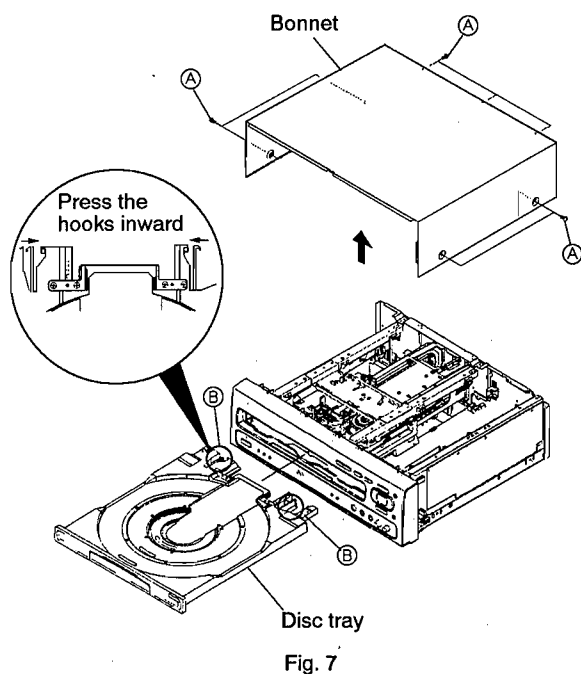
• Equipment and jigs needed for adjustment

- CD test disc (YEDS-18 : P/No. TX911730)
- LD test disc (LD-07 : P/No. TX913100)
- Medium-sized blade screwdriver
- Small blade screwdriver
- Large Phillips screwdriver
- Medium-sized Phillips screwdriver
- Two-channel oscilloscope (with delay)
- Frequency counter
- TV monitor
- Pick-up lens Cleanser P/No. TX945820
- Cleaning paper (Pick-up lens) P/No. TX945830

• Preparation for Adjustment

1. Disc tray removal

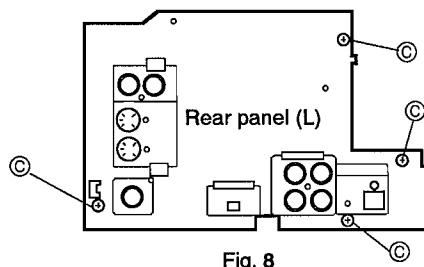
1. Remove the seven screws (A) fastening the bonnet and remove the bonnet.
2. With the power supply on, press the OPEN/CLOSE (LD) button and put the disc tray in the open position.
3. While pushing the hooks (B) on both sides of the rear of the disc tray inwards, pull out the disc tray.



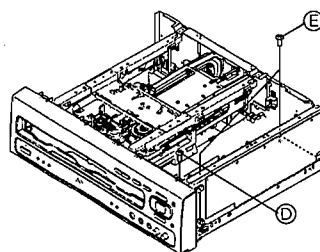
Note: The adjustments other than "Electrical Adjustments 3. PLL OFFSET Adjustment" can be carried out with the disc tray mounted.

2. Diagnostic method of MOTHER assy

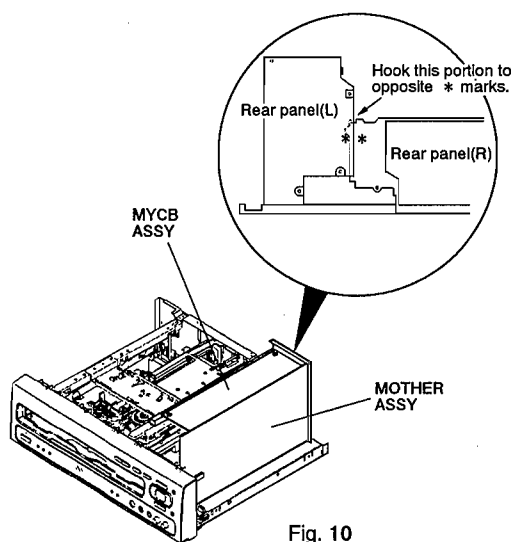
1. Remove the four screws (C) fastening the rear panel (L). (Fig. 8)



2. Remove a screw (D) fastening the front side of PCB holder. (Fig. 9)
3. Remove the two screws (E) fastening the MOTHER assy. (Fig. 9)



4. Loosen the binder for fixing flat cable in the MOTHER assy.
5. While pulling up the rear panel (L) toward the rear, MOTHER assy will be removed with the rear panel (L). Then MOTHER assy can be diagnosed by standing it as shown in Fig. 10.



Note 1: The MOTHER assy can be diagnosed with the disc tray mounted.

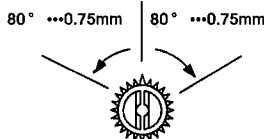
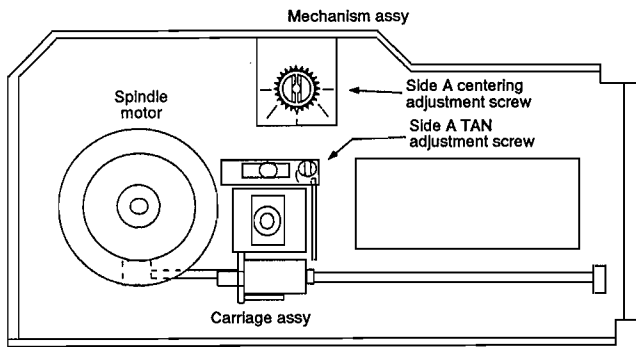
Note 2: When inserting the disc tray, please hold down the flat cable without hanging to the tray.

• Before adjusting mechanism system

• Centering adjustment screw and TAN adjustment screw

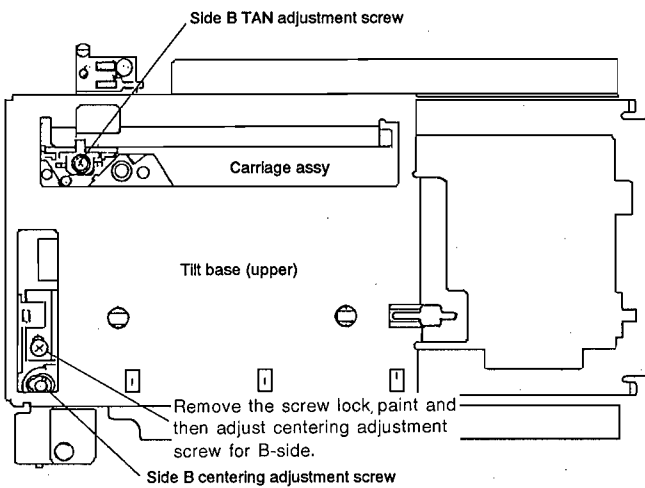
Note: Be careful not to turn centering adjustment screw and TAN adjustment screw past their adjustment range.

After the adjustments, apply the lock-tight to centering and TAN adjustment screws.



Do not turn the centering and TAN adjustment screws past their ranges, which are $\pm 0.75\text{mm}$ and $\pm 80^\circ$ from center. Apply the lock-tight after the adjustment.

Fig. 11 Mechanism assy adjustment (side A)



Centering adjustment range $\pm 90^\circ$
 TAN adjustment range \pm two turns

Fig. 12 Mechanism ass'y adjustment (side B)

• The mechanical adjustments can all be carried out with disc tray mounted.

• Notes when adjusting centering

If waveform S/N is bad and difficult to observe in "3 and 8. SPDL motor centering adjustment" use the low pass filter in diagram. (Fig. 13)

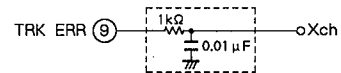


Fig. 13 Low pass filter

• Carriage assy position when adjusting centering

When moving slider to inner position to adjust the innermost track of disc during centering adjustment, be careful not to keep the mechanism stopper and carriage assy from bumping each other. (Fig. 14)

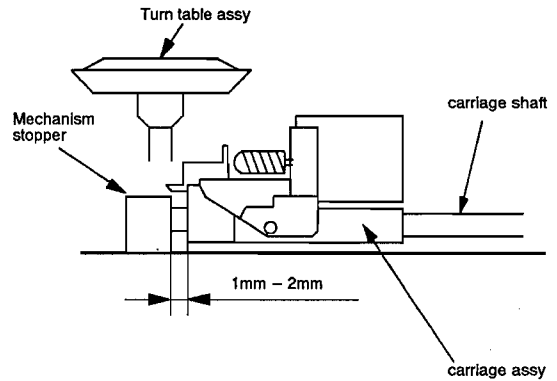


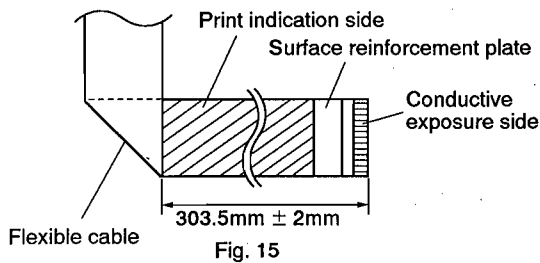
Fig. 14

• Notes when adjusting pickup assy

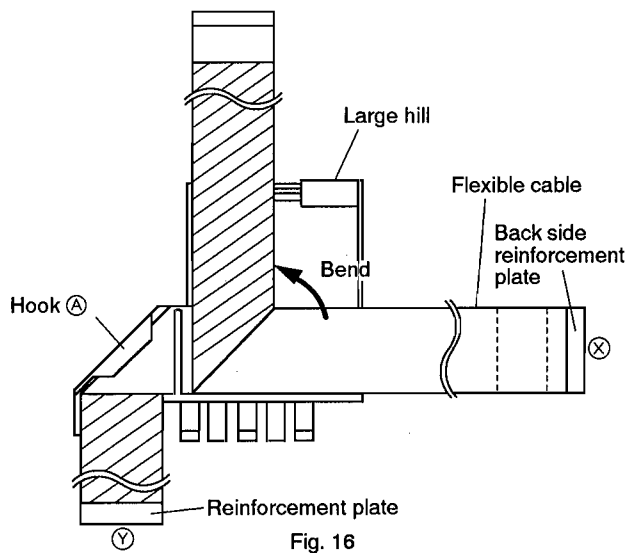
Please clean lens first when readjusting the pickup assy that is on this product. Also, when changing pickup assy, change whole carriage assy (VWT1110).

10.3 HOW TO REPLACE THE FLEXIBLE CABLE

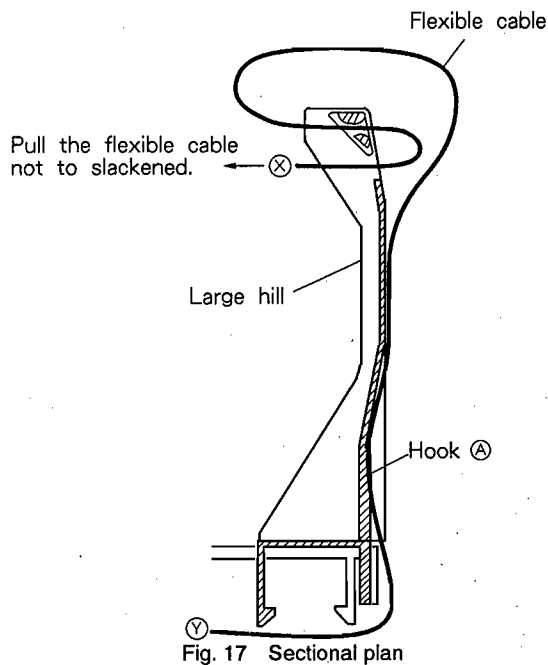
① Bend the flexible cable as shown below.



② Put the bended portion to hook (A) of the large hill.
 ③ Bend the flexible cable along the wall of large hill.



④ Pull the flexible cable not to slackened after passing the (X) edge side of flexible cable through the large hill as shown in Fig. 17.



⑤ Put the flexible cable to hook (B) after the (Y) edge side of flexible cable is bended along the hook (B) position of the tilt base (lower), then insert to connector CN103 of the MOTHER assy.

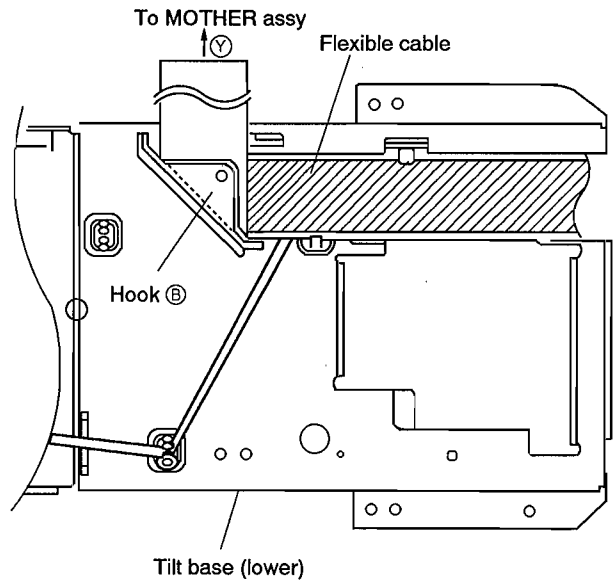


Fig. 18

⑥ Insert the (X) edge side of flexible cable to connector of the carriage assy after passing through the FFC holder.
 ⑦ Move the FFC holder to touch the connector, lock the FFC holder to turn up the flexible cable to lower side.

Caution: Be sure to insert the MOTHER assy first of all for prevent the static electricity.

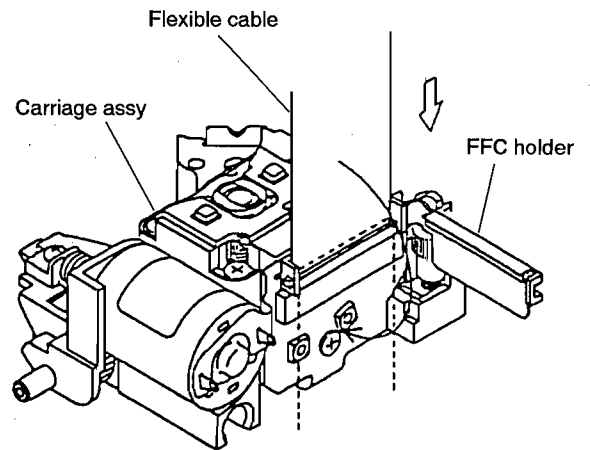


Fig. 19

10.4 ADJUSTMENT LOCATION

- VR607: Side A tilt offset adjustment
- VR608: Side B tilt offset adjustment
- VR604: Focus servo loop gain adjustment
- VR603: Tracking servo loop gain adjustment
- VC901: Master clock adjustment
- VR450: Output video level adjustment
- VR612: PLL offset adjustment
(Orderin adjustment)

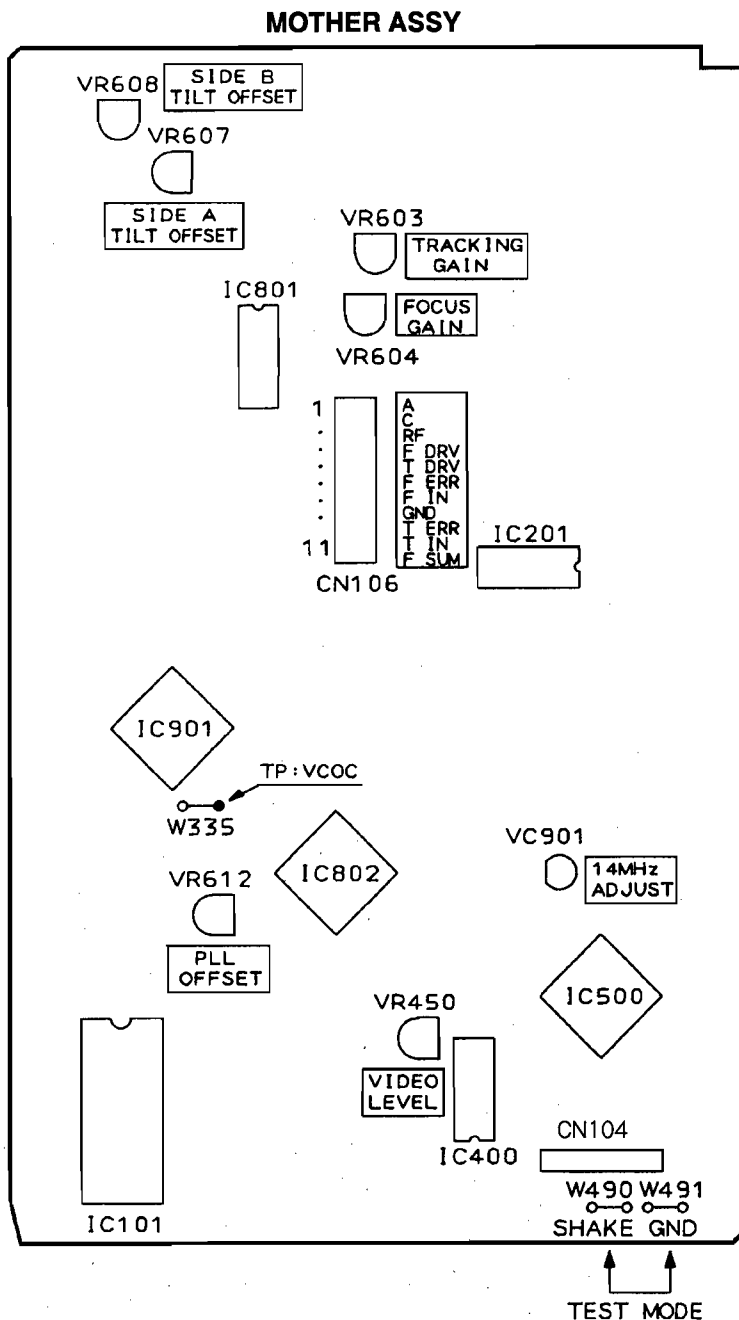


Fig. 20 Adjustment diagram of MOTHER assy

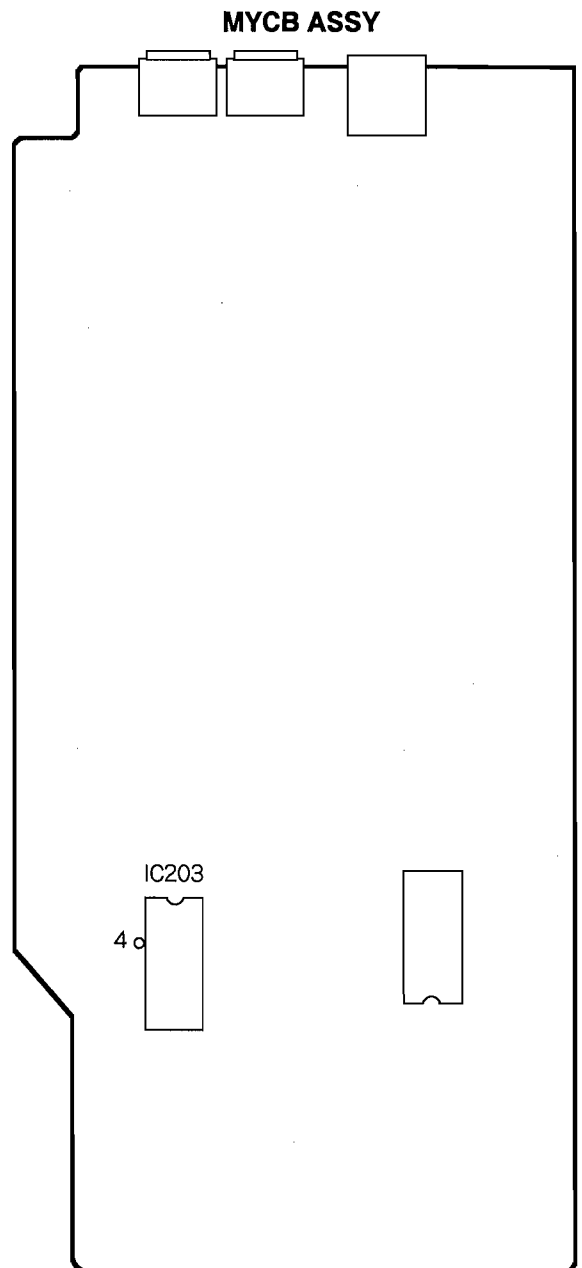


Fig. 21 Adjustment diagram of MYCB assy

10.5 ADJUSTMENT METHOD

- CD test disc (YEDS-18 ; P/No. TX911730)
- LD test disc (LD-07 ; P/No. TX913100)

• Mechanical adjustment

Step	Adjustment name	Adjustment point	Measuring point and measuring mode	Player condition	Adjustment procedure	Waveform and connection diagram
1	Tilt offset adjustment	MOTHER assy VR607, VR608 (TILT OFFSET)		Test mode Disc not installed	Check the positions of VR607 and VR608 to the mechanical center with eyes. If their positions are shifted, set to the center.	Set to the mechanical center
2	Tangential direction angle adjustment (side A)	Carriage assy TAN adjustment screw (side A)	CN106-3 (RF)	CD test disc outer track play (See position for TAN adjustment screw) TRKG-ON, TILT-ON	Adjust so that the amplitude of the RF waveform reaches its maximum and the envelope is very clear. Apply the lock-tight after the adjustment.	V:20mV/div H:1 μsec/div AC mode CN106 RF ③ Probe CH1 (10:1) Adjust until the amplitude reaches its maximum and the envelope is very clear.
3	Spindle motor centering adjustment (side A)	Mechanism assy Centering adjustment screw (side A)	CN106-9 (TRKG error)	CD test disc inner track play (CD inside position in the program area) TRKG-OFF, TILT-ON	Adjust so that the amplitude of the tracking error waveform reaches its maximum and the envelope is very clear. Apply the lock-tight after the adjustment.	V:50mV/div H:10msec/div DC mode CN106 T ERR ⑨ Probe CH1 (10:1) Adjust until the amplitude reaches its maximum and the envelope is very clear.
4	Crosstalk check and tilt offset re-adjustment (side A)	MOTHER assy VR607 (side A) (TILT OFFSET)	TV monitor Crosstalk monitor check	LD test disc #508 still TRKG-ON, TILT-ON	If the crosstalk is pronounced, adjust VR607 until the crosstalk is not noticeable.	 If the crosstalk is pronounced adjust until the crosstalk is not noticeable.
5	Focus servo loop gain adjustment	MOTHER assy VR604 (FOCUS GAIN)	CN106-6 (FOCUS error) CH2 "X-Y mode"	LD test disc (PLAY STANDBY) Short CN106-7 (FIN) and 8 (GND), then press the PLAY key (disc not turn)	Adjust VR604 until the waveform level is $4.8 \pm 0.5V$.	Y: 100mV/div DC mode X-Y mode CN106 FOCUS ERR ⑥ Probe CH1 (10:1) $4.8 \pm 0.5V$
6	Tracking servo loop gain adjustment	MOTHER assy VR603 (TRACKING GAIN)	CN106-9 (TRKG error) CH2 "X-Y mode"	LD test disc #508 still TRKG-ON, TILT-ON	Adjust VR603 until the waveform level is $2.8 \pm 0.2V$.	Y: 50mV/div DC mode X-Y mode CN106 T ERR ⑨ Probe CH1 (10:1) $2.8 \pm 0.2V$
7	Tangential direction angle adjustment (side B)	Carriage assy TAN adjustment screw (side B)	CN106-3 (RF)	LD test disc #508 still TRKG-ON, TILT-ON	Adjust so that the amplitude of the RF waveform reaches its maximum and the envelope is very clear. Apply the lock-tight after the adjustment.	V:20mV/div H:1 μsec/div AC mode CN106 RF ③ Probe CH1 (10:1) Adjust until the amplitude reaches its maximum and the envelope is very clear.
8	Spindle motor centering adjustment (side B)	Mechanism assy Centering adjustment screw (side B)	CN106-9 (TRKG error)	LD test disc #508 still TRKG-OFF, TILT-ON	Loosen a black screw beside the centering adjustment screw (side B). Adjust so that the amplitude of the tracking error waveform reaches its maximum and the envelope is very clear. After adjustment is complete, tighten the black screw and apply the lock-tight.	V:50mV/div H:10msec/div DC mode CN106 T ERR ⑨ Probe CH1 (10:1) Adjust until the amplitude reaches its maximum and the envelope is very clear.
9	Crosstalk check and tilt offset re-adjustment (side B)	MOTHER assy VR608 (side B) (TILT OFFSET)	TV monitor Crosstalk monitor check	LD test disc #508 still TRKG-ON, TILT-ON	If the crosstalk is pronounced, adjust VR608 until the crosstalk is not noticeable.	 If the crosstalk is pronounced adjust until the crosstalk is not noticeable.

(NOTE) • This adjustment can be thought to be about the same adjustment as on the manufacturing line with differing adjustment tools. Follow the adjustment procedures even for checking the adjustments.
 • When you open the tray in test mode, the screen displays goes out. To display the screen again, press the **DISPLAY** key.
 • The mechanical adjustments can be all carried out with disc tray mounted.

- CD test disc (YEDS-18 : P/No. TX911730)
- LD test disc (LD-07 : P/No. TX913100)

• Electrical adjustment

Step	Adjustment name	Adjustment point	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1	Master clock adjustment	MOTHER assy VC901	MYCB assy IC203-4 (2 fsc)	Power ON	Adjust VC901 so that frequency with power on is $7.159090\text{MHz} \pm 20\text{Hz}$. Connect video output terminal and oscilloscope. (Video output terminal is terminated with 75Ω .)	
2	Output video level adjustment	MOTHER assy VR450 (VIDEO LEVEL)	Video output terminal	Normal mode LD test disc #20, 700 still	Adjust VR450 so that level from video signal sync tip to 100% white becomes $1\text{Vp-p} \pm 5\%$. (It's possible to terminate video output terminal with 75Ω by connecting TV monitor)	
3	PLL OFFSET adjustment	MOTHER assy VR612 (PLL OFFSET)	MOTHER assy W335 (PLL OFFSET TP)	Test mode CD test disc play TRKG servo OFF/ON	Note: Before adjusting remove disc tray. With the tracking servo off, playback digital audio and roughly adjust VR612 so that the sound is audible. Connect W335 and a DC voltmeter and while playing back digital audio, switch the tracking servo on and off and adjust VR612 so that the difference between the DC voltage when the tracking servo is on and when it is off is no greater than $0 \pm 0.1\text{V}$.	

11. IC INFORMATION

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

■ PD3304B (FLKY ASSY IC101)

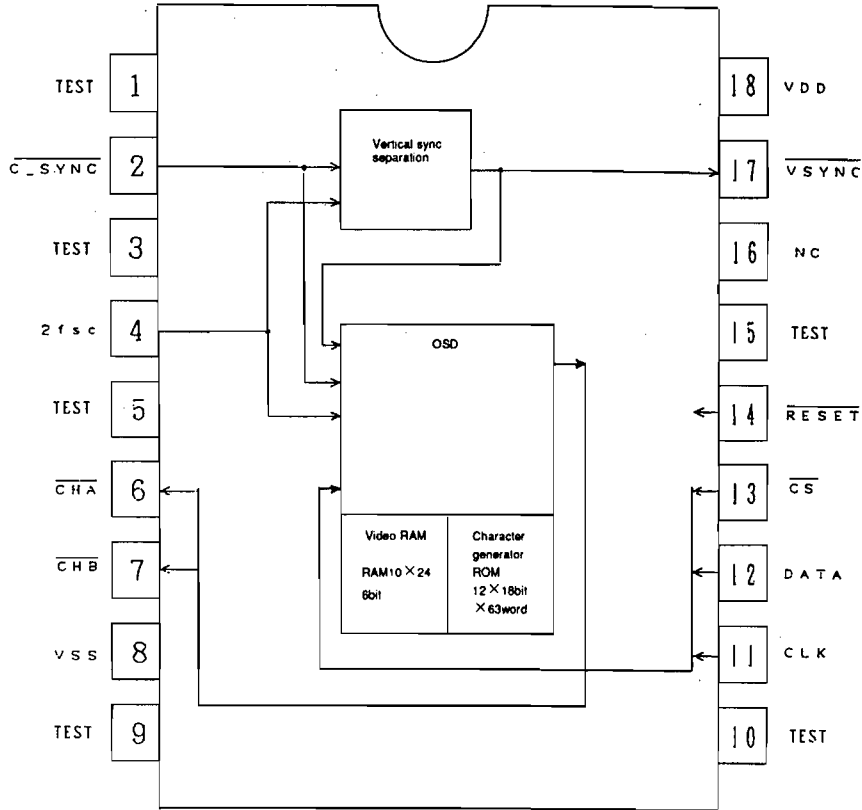
• MODE CONTROL IC

• Pin Function

No.	Mark	Pin Name	I/O	Function	No.	Mark	Pin Name	I/O	Function
1	VCC	—	I	+5V	33	P46	XMIC ON	O	MIC MIX L : ON, H : OFF
2	P90	xRESET OUT	O	Mother board reset output.	34	P45	SEG N	O	Display segment output.
3	SCK1	xS-CLOCK	I/O	Serial communication clock. (Mech. control and character generator)	35	P44	KSCAN4/SEG M	O	Key scan output / Display segment output.
4	SI1	S-MTOF	I	Serial communication data input. (Mech. control)	36	P43	KSCAN3/SEG L	O	
5	SO1	S-FTOM	O	Serial communication data output. (Mech. control and character generator)	37	P42	KSCAN2/SEG K	O	
6	P94	xCS	O	Character generator (PD0175A, PD9004A) CS output. (L : enable)	38	P41	KSCAN1/SEG J	O	
7	P95	LED(DISPOFF)	O	LED output : Display OFF indication.	39	P40	KSCAN0/SEG I	O	Display segment output.
8	P96	LED(Q TURN)	O	LED output : Quick turn indication.	40	P50	SEG H	O	
9	P97	POWCTL	O	Mother board power supply SW output.	41	P51	SEG G	O	
10	AVCC	—	I	+5V	42	P52	SEG F	O	
11	P00	KIN0	I	Key data input.	43	P53	SEG E	O	
12	P01	KIN1	I		44	P54	SEG D	O	
13	P02	KIN2	I		45	P55	SEG C	O	
14	P03	KIN3	I		46	P56	SEG B	O	
15	P04	KARXNOR	I	MIC SW L : OFF normal mode H : ON karaoke mode	47	P57	SEG A	O	
16	P05	Not used	I	GND	48	VDISP	—	I	- 27V
17	P06	ECHVOL	I	Echo volume.	49	P60	G8	O	Display grid output.
18	P07	OEMSEL	I	OEM selection port. L : PIONEER, H : YAMAHA	50	P61	G7	O	
19	AVSS	—	I	GND	51	P62	G6	O	
20	TEST	Not used	I	GND	52	P63	G5	O	
21	X2	Not used	O	NC (OPEN)	53	P64	G4	O	
22	X1	Not used	I	+5V	54	P65	G3	O	
23	VSS	GND	I	GND	55	P66	G2	O	
24	OSC1	—	I	Main system clock oscillation (8MHz)	56	P67	G1	O	
25	OSC2	—	O		57	P70	LED(LD)	O	LED output : LD indication
26	xRST	xRESET IN	I	CPU reset (L : reset)	58	P71	LED(CD)	O	LED output : CD indication
27	IRQ0	SHAKE	I/O	Mech. control serial communication requirement.	59	P72	LED(SIDE B)	O	LED output : Side B indication
28	IRQ1	SEL IR	I	Remote control input.	60	P73	LED(SIDE A)	O	LED output : Side A indication
29	P14	FSX	I	For measuring the error rate.	61	P74	BASBST1	O	Bass boost switch. (OFF : P74=H and P75=H, ON : others)
30	P15	EFLG	I	For measuring the error rate.	62	P75	BASBST2	O	Bass boost switch.
31	P16	Not used	I	GND	63	P76	XDSPCS	O	DSP (PDQ001A) CS output. (L : enable)
32	P47	DOGFOOD	O	Pulse output for watch dog.	64	P77	XDSP ON	O	DSP L : ON, H : Through

■ PD9004A (MYCB ASSY IC203)
 • OSD IC

● Block Diagram

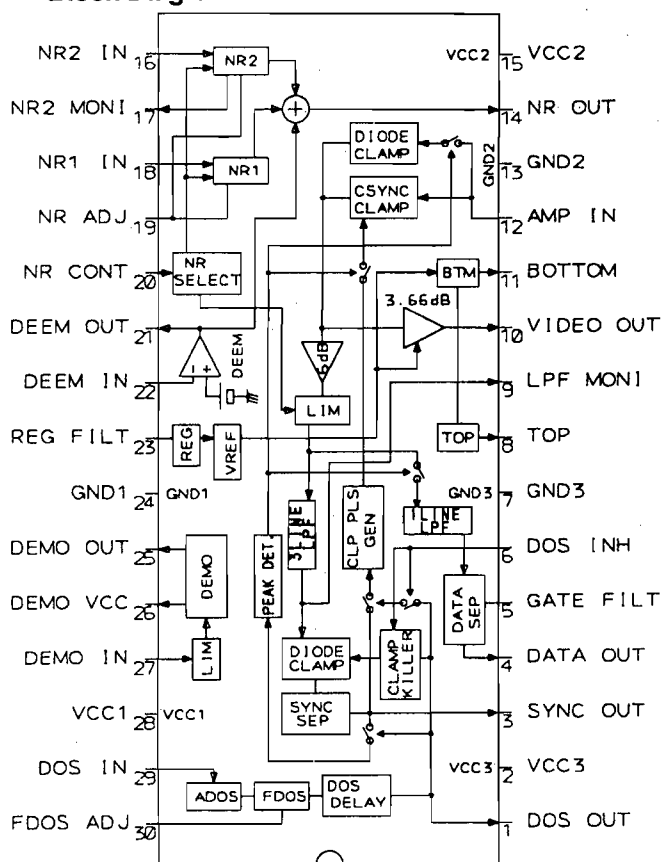


● Pin Function

Pin No	Code	I/O	Logic	Function
1	TEST	—	—	Do not connect any external components.
2	CSYNC	I	Negative	Composite sync signal input
3	TEST	—	—	Do not connect any external components.
4	2fsc	I	—	Color subcarrier frequency 2× clock input (NTSC about 7.14 MHz PAL about 8.8 MHz)
5	TEST	—	—	Do not connect any external components.
6	CHA	O	Negative	Character timing output
7	CHB	O	Negative	Blanking timing output
8	VSS	—	—	Connected to system ground
9	TEST	—	—	Do not connect any external components.
10	TEST	—	—	Do not connect any external components.
11	CLK	I	↑	Data read-in clock input pin; the data applied to the Data pin is read-in at the rising edge of the clock.
12	DATA	I	Positive	Control data input pin; the data is read-in synchronized with the clock applied to the CLK pin.
13	CS	I	Negative	Low for serial communications
14	RESET	I	Negative	Hardware reset with pull-up resistance
15	TEST	—	—	Do not connect any external components.
16	NC	—	—	Not connected
17	VSYNC	O	Negative	Signal with V sync separated from C sync
18	VDD	—	—	Power supply (+5V) pin

■ PAC005B (MOTHER ASSY IC400)
-VIDEO IC

● Block Diagram

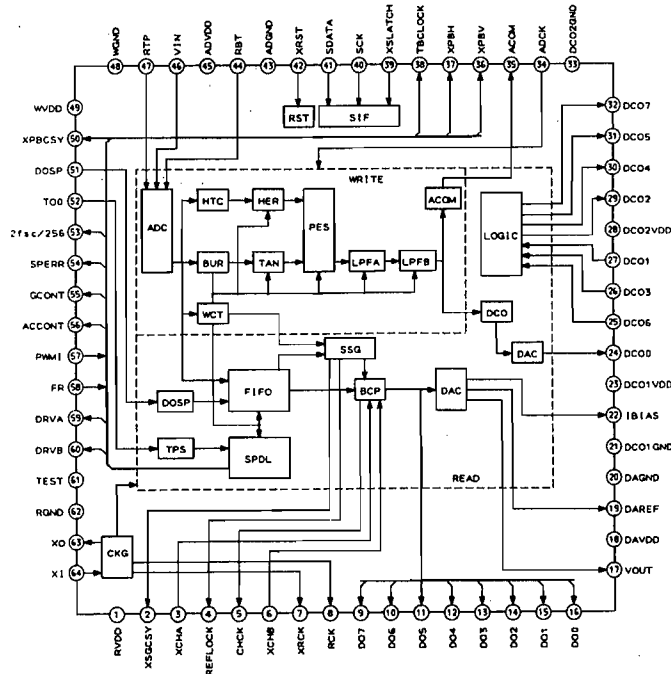


● Pin Function

No.	Pin Name	Function
1	DOS OUT	Drop out pulse output.
2	VCC3	VCC for SYNC SEP section.
3	SYNC OUT	Composite sync output.
4	DATA OUT	Data pulse output.
5	GATE FILT	Connect a capacitor for Gate - Gate.
6	DOS INH	Clamp pulse and clamp killer control.
7	GND3	GND for SYNC SEP section.
8	TOP	Reference DC (TOP) for A/D.
9	LPF MONI	Monitor the LPF for SYNC SEP.
10	VIDEO OUT	Signal output for A/D.
11	BOTTOM	Reference DC (BOTTOM) for A/D.
12	AMP IN	Sync chip clamp input.
13	GND2	GND for VIDEO.
14	NR OUT	Noise reduction output.
15	VCC2	VCC for VIDEO section.
16	NR2 IN	Signal input (2) for noise reduction.
17	NR2 MONI	Limiter output for noise reduction.
18	NR1 IN	Signal input (1) for noise reduction.
19	NR ADJ	Limiter level adjusting pin for noise reduction.
20	NR CONT	Noise reduction (1, 2) select and limiter control.
21	DEEM OUT	De-emphasis output.
22	DEEM IN	De-emphasis input.
23	REG FILT	Connect a capacitor for regulator.
24	GND1	GND for RF section.
25	DEMO OUT	Demodulation output of RF signal.
26	DEMO VCC	VCC for FM demodulation output.
27	DEMO IN	RF input for FM demodulation.
28	VCC1	VCC for RF section.
29	DOS IN	RF input for DOS.
30	FDOS ADJ	FDOS sensitivity adjustment.

PD0192A (MOTHER ASSY IC500)
• DIGITAL VIDEO PROCESSOR

• Block Diagram



• Pin Function

No.	Pin Name	Function
1	RVDD	Power pin for reference system. Connect to +5V.
2	XSGCSY	Reference composite sync. is output at negative logic. Delay can be controlled by serial command.
3	WFM	MEMSYS : 1 Field monitor output for write system. Outputs "H" when in odd field.
	XCHA	MEMSYS : 0 Character input pin. Inputs "L" during character insertion.
4	XTBCH	MEMSYS : 1 TBC H sync. output. Outputs time base-corrected (TBC) H sync. at negative logic.
	REFLOCK	MEMSYS : 0 SSG phase detection signal output. Outputs "H" when phase difference of H, V sync. between Playbacksystem (after TBC) and SSG system is small enough.
5	XTBCV	MEMSYS : 1 TBC V sync. output. Outputs time base-corrected V sync. at negative logic.
	GHCK	MEMSYS : 0 Clock output for character generator. Output 2fsc.
6	FCH	MEMSYS : 1 Field change input. Switches field of SSG when "H".
	XCHB	MEMSYS : 0 Character frame input pin. Inputs "L" when character frame is inserted.
7	XRCK	Reference CLK is reversed and output.
8	RCK	Reference CLK output.
9	DO7	Data output 7
10	DO6	Data output 6
11	DO5	Data output 5
12	DO4	Data output 4
13	DO3	Data output 3
14	DO2	Data output 2
15	DO1	Data output 1
16	DO0	Data output 0
		Outputs TBC (time base-corrected) video signal to support memory. This setting performs by serial command. DO7 is MSB, DO0 is LSB.
17	VOUT	DAC output of TBC video signal.
18	DAVDD	Power pin for D/A converter. Connect to +5V.
19	DAREF	D/A converter reference for video. Normally connect to DAGND via 0.1 μF of laminated ceramic capacitor.
20	DAGND	Ground pin for D/A converter. Connect to GND.
21	DCO1GND	Ground pin for DCO. Connect to GND.
22	IBIAS	Current setting pin of bias circuit. Normally connect to DAGND via external resistor (10k Ω).
23	DCO1VDD	Power pin for DCO. Connect to +5V.

No.	Pin Name	Function
24	DCO0	DCO output pin. ADCK is generated by multiplying this signal by 4.
25	DCO6	Waveform shaping input pin 6. Inputs signal of DCO5 output signal that is delayed 35 ns (self-biased).
26	DCO3	Waveform shaping input pin 3. Inputs signal of DCO2 output signal that is delayed 70 ns (self-biased).
27	DCO1	Waveform shaping input pin 1. Inputs DCO0 signal via band-pass filter of fsc (self-biased).
28	DCO2VDD	Power supply pin for multiplied by 4 section. Connect to +5V.
29	DCO2	Waveform shaping output pin 2. Outputs signal of waveform of DCO1 signal that is shaped.
30	DCO4	Waveform shaping output pin 4. Outputs signal of waveform of DCO3 signal that is shaped.
31	DCO5	Waveform shaping output pin 5. Outputs signal multiplied by 2.
32	DCO7	Waveform shaping output pin 7. Outputs signal multiplied by 4.
33	DCO2GND	Ground pin for multiplied by 4 section. Connect to GND.
34	ADCK	CLK input pin for write system. Inputs signal of DCO7 output signal that is filtered through 4 fsc ceramic filter. (self-biased)
35	ACOM	Jitter correction signal output for analog audio. Used to cancel the jitter of analog audio.
36	XPBV	V sync. output for playback system. Outputs signal that has V sync. separated from pin 50 (XPBCSY) signal at negative logic.
37	XPBH	H sync. output for playback system. Outputs signal that has H sync. separated from pin 50 (XPBCSY) signal at negative logic.
38	TBCLOCK	PLL LOCK detection signal output. Outputs "H" when spindle servo loop and TBC servo loop are locked.
39	XSLATCH	Serial interface latch signal input. Generates timing to latch data that was input to serial interface. (latched at L, Schmitt trigger input)
40	SCK	Serial interface CLK input. CLK input for serial interface. SDATA value is read at rising edge. (Schmitt trigger input)
41	SDATA	Serial interface data input. Inputs data to serial interface. (Schmitt trigger input)
42	XRST	System reset input. Initializes internal registers of IC at negative logic. (Schmitt trigger input)
43	ADGND	Ground pin for A/D converter. Connect to GND.
44	RBT	A/D converter bottom reference input. Inputs bottom reference voltage of A/D converter.
45	ADVDD	Power supply pin for A/D converter. Connect to +5V.
46	VIN	A/D converter input. Inputs composite video signal.
47	RTP	A/D converter top reference input. Inputs top reference voltage of A/D converter.
48	WGND	Ground pin for write system. Connect to GND.
49	WVDD	Power pin for write system. Connect to +5V.
50	XPBCSY	Composite sync. input for playback system. Inputs composite sync. for playback system at negative logic. (Schmitt trigger input)
51	DOSP	Drop out pulse input. Inputs drop out detection pulse at positive logic. (Schmitt trigger input)
52	TO0	Tracking open pulse input. Inputs tracking open pulse at positive logic. (Schmitt trigger input)
53	XI/512	Master clock 512 division output. Outputs clock of master clock (4fsc) that is divided by 512.
54	SPERR	Spindle error PFD error output. Outputs result after performing PFD on PBH and RefH at tri-state.
55	GCONT	Spindle gain control output. Outputs PWM signal according to set value (GD0 – GD3), using serial instructions.
56	ACCNT	Accelerated control output. Outputs acceleration/deceleration signal by forced acceleration/deceleration and PBH sync. frequency detection at tri-state.
57	PWMI	Spindle error PWM input. Inputs signals that have voltage compared between spindle errors that passed through a loop filter and chopping waves. (Schmitt trigger input)
58	FR	Spindle error direction component input. Inputs signals that have voltage compared between spindle errors that passed through a loop filter and target voltage. (Schmitt trigger input)
59	DRVA	Transistor control signal output pin for spindle motor drive. This setting is performed by the interface corresponding to the brush motor and brushless motor.
60	DRVB	Transistor control signal output pin for spindle motor drive. This setting is performed by the interface corresponding to the brush motor and brushless motor.
61	TEST	Input pin for IC test. Fixed to "L".
62	RGND	Ground pin for reference system. Connect to GND.
63	XO	Oscillation output. Connect the X'tal (4 fsc) for oscillation.
64	XI	Oscillation input. Connect the X'tal (4 fsc) for oscillation.

■ PD0212B (MOTHER ASSY IC101)
• MECHANISM CONTROL IC

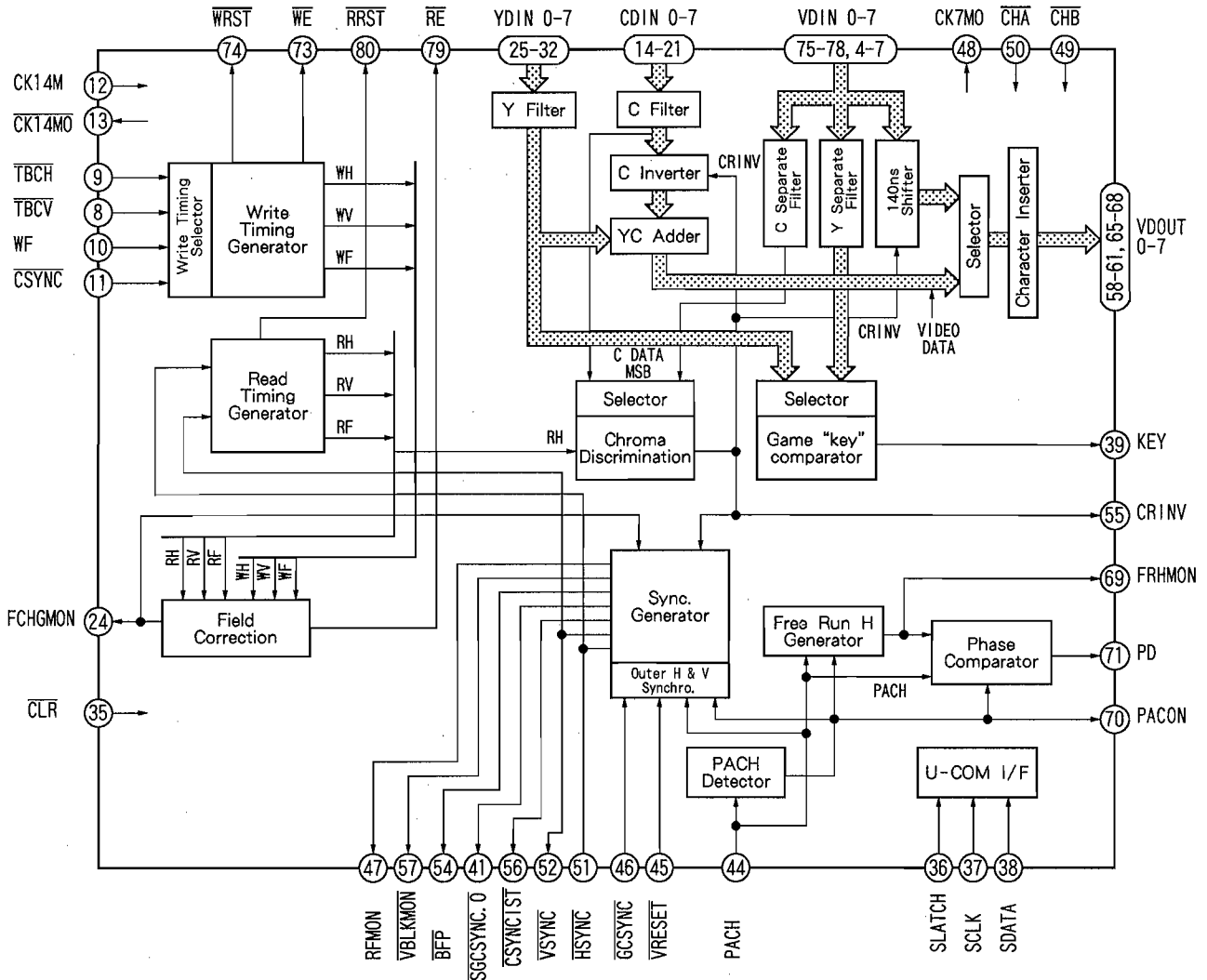
• Pin Function

No.	Pin Name	I/O	Function
1	VCC	I	Power supply pin. Apply 5V \pm 10%.
2	RFCORR	O	RF correction switch signal output. "H"=gain UP CD,CDV - A:Low, CAV inner circuit gain up, others are High.
3	MUTE	O	Audio mute control signal output of audio system. L : Release MUTE , H : MUTE
4	SRDMUTE	O	Mute control signal output for AC3. Release MUTE during playback.. L : Release MUTE, H : MUTE
5	TILT ON	O	(For debugging)Tilt operation information. H : during operation for checking tilt operation.
6	TILTERR	I A/D	This signal is A/D converted as the tilt servo control input. Control the tilt motor so that this signal becomes 2.5V.
7	TBALERR	I A/D	Tracking error balance signal input. This signal is A/D converted as the tracking offset control input.
8	SLDERR	I A/D	This signal is A/D converted as the slider servo control input. Control the tilt motor so that this signal becomes 2.5V.
9	SLDPOS	I A/D	Pickup position detection switch input. Detect the position by reading A/D input value which each switches are resistance divided.
10	XFOK	I	Focus servo lock signal input. L : Lock , H : Unlock Use for lock detection of focus servo.
11	SINGLE	I	ATT-SW of rear panel use for the single mode.This information transmit to mode control by communication. L : Single H : Normal
12	TBALDRV	O PWM	Output the tracking offset signal to PWM output, then use for auto tracking offset. 910 μ sec period, tri-state control H, L, Z
13	XCD	O	LD/CD switch signal output pin. L : CD H : LD
14	XPLAY	O	Signal output during spindle servo. L : during servo H :during acceleration, brake and stop
15	SQOUT	I	Command data input from DSP. Read out SUBQ.
16	COIN	O	Command data output to DSP.
17	CQCK	O	DSP reading/writing command clock output pin. read at rising edge.
18	SLDDRV	O PWM	Slider control signal output pin. 5V=FWD, 0V=REV, 2.5V=STOP 910 μ sec period, tri-state control H, L, Z
19	SI1	I	Data input from the mode control IC.
20	SO1	O	Serial data output to the mode control IC.
21	SCK1	I/O	Clock for serial communication with the mode control IC. Becomes input mode without communicate with the mode control IC.
22	TZC	I INT	Tracking error zero cross signal input pin. Monitor this signal when searching track count in the miss clamp detection.
23	SHAKE	I/O	Hand shake signal for data communication with the mode control IC. Each microcomputer controls input/output by bilateral data line.
24	TILTDRV	I/O	LOAD/TILT control output pin. 0.5V - tray IN, OUT/tilt DOWN, UP 2.5V - STOP Use for tilt servo that tilt drive is PWM output.
25	XANA	O	Digital/Analog audio switch signal output. L : Analog H : Digital
26	XPBV	I	Playback vertical sync. signal input of LD/CDV. L :during vertical sync.
27	CNVss	I	Ground pin for A/D conversion.
28	XRESET	I	Reset signal-input. L : Reset H : Release reset Mode control is controlled.
29	XIN	I	9MHz clock oscillation input pin.
30	XOUT	O	9MHzclock oscillation output pin.
31	N.C.	O	Not used.
32	GND	I	Ground.
33	SW1	I	Switch input for Loading/Tilt position detection
34	SW3	I	
35	SW2	I	

No.	Pin Name	I/O	Function
36	N.C.	I	Not used.
37	FG	I	Spindle motor FG signal input. 16 outputs per rotation. Used after dividing by 2 in microcomputer.
38	DATA	I	Input pin for Philips code decoder with built in mechanism controller.
39	XPBH	I	Playback H-SYNC input for Philips code decoder.
40	XPBV	I	Playback V-SYNC input for Philips code decoder.
41	TURNA	I	Turn switch input. H : side A L : side B
42	BINSIDE	I	Side B inside switch input. L : Side B inside H : others
43	MEMLAT	O	Serial control latch output of memory control IC (PD4510A). Latches at falling edge.
44	MEMORY	I	Memory yes/no determination input pin. H :memory yes L : memory no
45	DOCINH	O	Control the clamp pulse and clamp killer by tri-state values.
46	DETPOW	I	Use for power abnormal signal input port. L : Normal H : Abnormal
47	NROFF	O	Control output of the noise reduction by VDEM. L : Normal H : Not NR
48	WFM	I	Field determination signal from DVP. L : EVEN H : ODD
49	SQ1	O	Analog audio switch signal output 1/L. L : squelch OFF H : squelch ON
50	SQ2	O	Analog audio switch signal output 2/R. L : squelch OFF H : squelch ON
51	XCX	O	Analog audio CX noise reduction switch signal output. L : CX ON H : CX OFF
52	XVCECAN	O	Voice cancel output. L : CANCEL ON , H : OFF
53	SO3	O	Serial 3 data signal output. Serial signal is commoned, signal distinguish by latch signal (DVPLAT, TLAT).
54	SCK3	O	Serial 3 clock signal output.
55	DVPLAT	O	PD0192A serial latch signal output pin. Latches at falling edge.
56	TBCLOCK	I	Spindle lock signal input pin. L : Unlock , H : Lock
57	TLATCH	O	DAC & digital filter PD2026B serial control latch signal output pin. Latches at falling edge.
58	XREV	O	Side A/side B switch pin. H : side A , L : side B
59	DETAMP	I	Spindle over-current detection signal input pin. L : over current , H : Normal
60	FSEQ	I	Subcode sync. conformity detection signal input pin. L : Not conformity , H : Conformity
61	THOLD	I	Track jump accelerating/decelerating signal input pin. L : other H : accelerating/decelerating
62	WRQ	I	Subcode Q reading OK signal input pin. L : NG , H : OK This pin will be H when Subcode Q data passed by CRC check.
63	RWC	O	DSP read/write command signal output pin. L : READ H : WRITE
64	RWC2	I	Set to input port without influence when this pin short-circuit to pin 63.

PD4510A (MYCB ASSY IC102)
• MEMORY CONTROL IC

• Block Diagram



• Pin Function

No.	Pin Name	Name	I/O	Function
1	NC	No connection	—	To be an open circuit.
2	VDD	Power supply	—	Connect to +5 V power supply voltage.
3	GND	Ground	—	Connect to GND.
4	VDIN4	Video input 4	I	Inputs of the upper 4 bits of the data output from field memory. VDIN0 (pin 75) is the LSB and VDIN7 is the MSB.
5	VDIN5	Video input 5		
6	VDIN6	Video input 6		
7	VDIN7	Video input 7		
8	TBCV	TBC V sync input	I	Negative-logic input of time-base-corrected V sync from DVP. Used to control a write operation to field memory.
9	TBCH	TBC H sync input	I	Negative-logic input of time-base corrected H sync from DVP. Used to control a write operation to field memory.
10	WF	Field input of write system	I	Input of the field monitor signal from DVP, "H" for odd fields and "L" for even fields. Used to control a write operation to field memory.
11	CSYNC	Composite sync input of reference system	I	Negative-logic input of reference composite sync from DVP. Used for write control at squelch. (Switching between the reference sync and TBC sync is performed through a command input to the serial interface.)

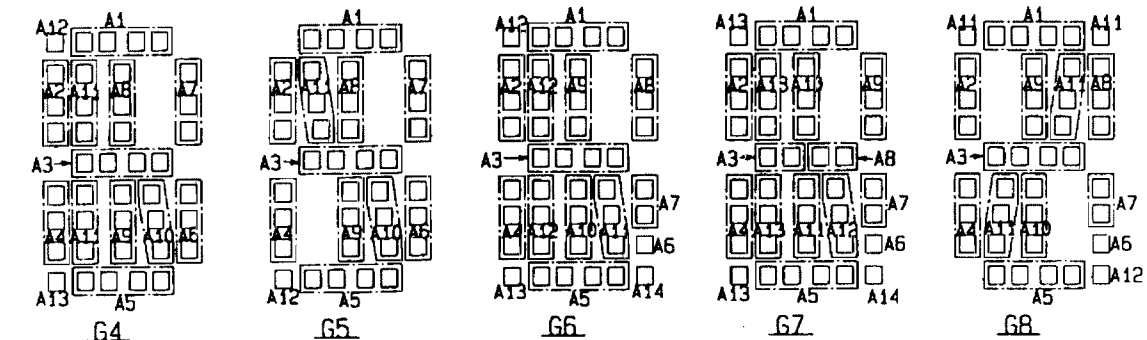
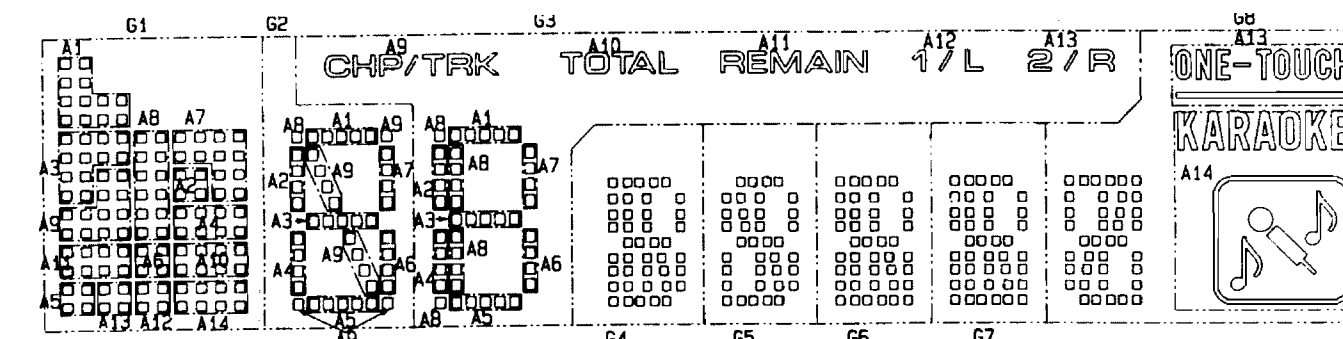
No.	Pin Name	Name	I/O	Function
12	CK14M	14MHz clock input	I	Clock input. Use the same clock as DVP. To superimpose a game picture, synchronizing with the game pack is required.
13	CK14M0	14MHz reversing clock output	O	Clock output obtained by reversing CK14M input.
14	CDIN0	Chroma data input 0	I	Inputs of the chroma data output from the Y/C separation IC. CDIN0 is the LSB and CDIN7 is the MSB. When the output data is in 9 bits or more, input the upper 8 bits. To be fixed at "L" when no Y/C separation IC is used.
15	CDIN1	Chroma data input 1		
16	CDIN2	Chroma data input 2		
17	CDIN3	Chroma data input 3		
18	CDIN4	Chroma data input 4		
19	CDIN5	Chroma data input 5		
20	CDIN6	Chroma data input 6		
21	CDIN7	Chroma data input 7		
22	GND	Ground	—	Connect to GND.
23	VDD	Power supply	—	Connect +5 V power supply voltage.
24	FCHGMON	Field change signal monitor output	O	Monitor output of a field change signal which switches an even field to an odd field in the built-in sync generator block. (Do not connect to the FCHANGE input of DVP.)
25	YDIN0	Luminance data input 0	I	Input of the luminance data output from the Y/C separation IC. YDIN0 is the LSB and YDIN7 is the MSB. When the output data is in 9 bits or more, input the upper 8 bits. To be fixed at "L" when no Y/C separation IC is used.
26	YDIN1	Luminance data input 1		
27	YDIN2	Luminance data input 2		
28	YDIN3	Luminance data input 3		
29	YDIN4	Luminance data input 4		
30	YDIN5	Luminance data input 5		
31	YDIN6	Luminance data input 6		
32	YDIN7	Luminance data input 7		
33	GND	Ground	—	Connect to GND.
34	TEST	IC test input	I	For IC testing. To be open.
35	CLR	Clear input	I	Input for IC initializing. When "L," all registers and counters in the IC are set to the default values.
36	SLATCH	Serial interface latch signal input	I	Supplies a timing to latch the data input to the serial interface. "Through" in the rise period. The register contents do not change in the L/H and fall periods.
37	SCLK	Serial interface clock input	I	Clock input for the serial interface. The value of SDATA is read at the rising edge.
38	SDATA	Serial interface data input	I	Provides the serial interface with data.
39	KEY	Luminance key signal output	O	Output of L or H level to indicate the result of comparison between the luminance level of the video data input or the luminance data input with the register contents. It will be "L" when the input is larger than the reference and "H" when smaller. Input selection and reference data can be specified by changing the register contents through the serial interface. This output is delayed for 1 clock cycle with respect to the video data output.
40	TSELECT	Test mode selection input	I	Used to select the IC test mode. To be open.
41	SGCSYNCO	Composite sync output of read system (no 140ns shift)	O	Negative-logic output of composite sync from the built-in sync generator block. (For details, see pin 53.) No 140-ns shift is performed here.
42	VDD	Power supply	—	Connect +5 V power supply voltage.
43	GND	Ground	—	Connect to GND.
44	PACH	Game pack H sync input	I	Positive-logic input of the H sync from the game pack. To be open when not synchronizing with the game pack.
45	VRESET	Game pack V reset input	I	Negative-logic input of the V reset signal from the game pack. To be open when not synchronizing with the game pack.
46	CGSYNC	Game pack composite sync input	I	Negative-logic input of composite sync from the game pack. To be open when not synchronizing with the game pack.

No.	Pin Name	Name	I/O	Function		
47	RFMON	Read field monitor output	O	Monitoring output of the field signal of the built-in sync generator block, "H" for odd fields and "L" for even fields. Fixed at "H" in vertical synchronization with the game pack.		
48	CK7MO	7MHz clock output	O	Output of the clock obtained through 2-division processing on the CK14M input. It is reset at every falling edge of H sync of the read system. (When H sync falls, this clock also falls.) Used as clock input for the OSD IC.		
49	CHB	Character frame input	I	Connect the character frame output of the OSD IC when using the character superimpose function. When this is "L" and CHA is "H", the gray level is imposed on the video data. To be open when the character superimpose function is not used.		
50	CHA	Character input	I	Connect the character output of the OSD IC when using the character superimpose function. When this is "L," the white level is imposed on the video data. To be open when the character superimpose function is not used.		
51	HSYNC	H sync output of read system	O	Negative-logic output of H sync from the built-in sync generator block. When the built-in 140-ns shift function is enabled, the output is shifted for 140 ns when the CRINV signal is "H".		
52	VSYNCO	V sync output of read system	O	Negative-logic output of V sync from the built-in sync generator block.		
53	SGCSYNCO	Composite sync output of read system	O	Negative-logic output of composite sync from the built-in sync generator block. Read control from field memory is performed using this signal as the reference. The output is delayed for 1 clock cycle with respect to the video data output. It is in synchronization with HSYNC and VSYNC. When the built-in 140-ns shift function is enabled, the output is shifted for 140 ns when the CRINV signal is "H". Synchronizing with the game pack requires signal inputs such as PACH, VRESET and CGSYNC as well as command input from the serial interface. In this case, the same 262H or 263 single field (noninterlace) mode with the composite sync of the game pack is selected. Interlace mode which uses only H sync and no V sync, can also be specified.		
54	BFP	Burst flag pulse output	O	Output of pulses to indicate the position of color burst on the video data output. It will be "L" for the position of color burst.		
55	CRINV	Chroma invert output	O	Output of the result of the chroma continuity determination on the video data input or chroma data input. When "H," chroma data of the built-in Y/C data adder is inverted, or the video data output, HSYNC and SGCSYNCO signals are shifted for 140 ns by the built-in 140-ns shift function. This can be used for equivalent functions on external devices.		
56	CSYNCO	Sync output for insertion	O	Output to insert sync on the D/A-converted video signal. It is in complete synchronization with the SGCSYNCO signal.		
57	VBLKMON	Monitor output of V blanking period	O	Negative-logic output of the V blanking period (half the H period) from the built-in sync generator block. For monitoring, but can be used on external devices.		
58	VDOU0	Video data output 0	O	Outputs of the lower 4 bits of the video data or data obtained by adding luminance data and chroma data. The output normally has a delay of 3 clock cycles with respect to the input. When the 140-ns shift function is enabled, the output is delayed for 5 clock cycles. VDOU0 is the LSB and VDOU7 (pin 68) is the MSB. Connect to the data input of the D/A converter.		
59	VDOU1	Video data output 1				
60	VDOU2	Video data output 2				
61	VDOU3	Video data output 3				
62	GND	Ground			—	Connect GND.
63	VDD	Power supply			—	Connect +5 V power supply voltage.
64	NC	No connection			—	To be an open circuit.
65	VDOU4	Video data output 4	O	Outputs of the upper 4 bits of the video data input or the data obtained by adding the luminance data and chroma data. (For details, see pins 53 through 61.)		
66	VDOU5	Video data output 5				
67	VDOU6	Video data output 6				
68	VDOU7	Video data output 7				
69	FRHMON	Free-run H sync monitor output	O	H sync monitor output of the built-in free-run H sync generator block. When the PACH signal is being supplied, this output is compared with the PACH signal. After the PACON signal is set to "L," it continues providing 910-division clocks in free-run mode as long as "L" is not input to CLR. It is not synchronized with the write or read timing. It can be used on external devices.		

No.	Pin Name	Name	I/O	Function
70	PACON	Game pack H sync detection output	O	Outputs "H" when PACH signal input is detected. For the detection, input of fifteen or more PACH pulses is required. If six or more pulses continuously fail, it is set to "L." It turns on and off the function of the built-in sync generator block to synchronize with the game pack. It is also used for VCXO on/off at external devices.
71	PD	PACH, Free-run H sync phase difference output	O	Output of L/H pulses to indicate the phase difference between the rising edge of the PACH signal and that of the H sync signal of the built-in free-run H sync generator block. An L pulse is output when PACH advances, and an H pulse when PACH follows. The pulse width indicates the phase difference. When there is no difference or when input from neither is obtained, the output is set to the high-impedance status. It can be synchronized with the game pack when connected to an external VCXO.
72	NC	No connection	—	To be open.
73	WE	Write enable output	O	Controls a write operation to field memory. "L" enables the operation and "H" disables it. Connect to the WE input of field memory.
74	WRST	Write reset output	O	Signal to initialize the write address of field memory. An L pulse for 1 clock cycle is output every other write field. Connect to the WRST input of field memory.
75	VDIN0	Video data input 0	I	Inputs of the lower 4 bits of data output of field memory. (For details, see pins 4 through 7.)
76	VDIN1	Video data input 1		
77	VDIN2	Video data input 2		
78	VDIN3	Video data input 3		
79	RE	Read enable output	O	Controls a read operation from field memory. "L" enables the operation and "H" disables it. Connect to the RE input of field memory.
80	RRST	Read set output	O	Signal to initialize the read address of field memory. An L pulse for 1 clock cycle is output every other read field. Connect to the RRST input of field memory.

12. FL INFORMATION

■ VAW1035 (FLKY ASSY V101) FL TUBE



ANODE GRID ASSIGNMENT & PIN ASSIGNMENT

	G1	G2	G3	G4	G5	G6	G7	G8
P1	A1	A1	A1	A1	A1	A1	A1	A1
P2	A2	A2	A2	A2	A2	A2	A2	A2
P3	A3	A3	A3	A3	A3	A3	A3	A3
P4	A4	A4	A4	A4	A4	A4	A4	A4
P5	A5	A5	A5	A5	A5	A5	A5	A5
P6	A6	A6	A6	A6	A6	A6	A6	A6
P7	A7	A7	A7	A7	A7	A7	A7	A7
P8	A8	A8	A8	A8	A8	A8	A8	A8
P9	A9	A9	CHP/TRK	A9	A9	A9	A9	A9
P10	A10		TOTAL	A10	A10	A10	A10	A10
P11	A11		REMAIN	A11	A11	A11	A11	A11
P12	A12		1/L	A12	A12	A12	A12	A12
P13	A13		2/R	A13	A13	A13	A13	ONE-TOUCH
P14	A14				A14	A14	A14	KARAOKE

PIN ASSIGNMENT

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Assignment	F	F	NP	NL	NL	NL	NL	G1	G2	G3	G4	G5	G6	G7	G8	P1	P2
Pin No.	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Assignment	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	NL	NL	NP	F	F

F:Filament G1-G8:Grid P1-P14:Anode NP:No pin NL:No Lead

13. SCHEMATIC AND PCB CONNECTION DIAGRAM

13.1 OVERALL CONNECTIONS, KEYB, FLKY, ECOB, MJBA, SYPS, PKSB, FG, TNSB, BISB AND LMSB ASSEMBLIES

NOTE FOR SCHEMATIC DIAGRAMS (Type 4A)

1. When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".

2. Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.

3. RESISTORS:
Unit: k Ω , M Ω , or Ω unless otherwise noted.
Rated power: 1/4W, 1/8W, 1/10W unless otherwise noted.
Tolerance: (F): $\pm 1\%$, (G): $\pm 2\%$, (K): $\pm 10\%$, (M): $\pm 20\%$ or $\pm 5\%$ unless otherwise noted.

4. CAPACITORS:
Unit: p μ F or μ F unless otherwise noted.
Ratings: capacitor (μ F) / voltage (V) unless otherwise noted.
Rated voltage: 50V except for electrolytic capacitors.

5. COILS:
Unit: mmH or μ H unless otherwise noted.

6. VOLTAGE AND CURRENT:
DC voltage (V) in PLAY mode unless otherwise noted.
DC current in PLAY mode unless otherwise noted.
Value in () is DC current in STOP mode.

7. OTHERS:
● or ○ : Adjusting point.
▲ : Measurement point.
The Δ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

8. SCH - ON THE SCHEMATIC DIAGRAM:
SCH- indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)

9. SWITCHES (Underline indicates switch position):

FLKY ASSY
S101 : POWER ONSTANDBY
S102 : QUICK TURN
S103 : DISPLAY OFF
S104 : THEATER BASS
S104 : #
S105 : \downarrow

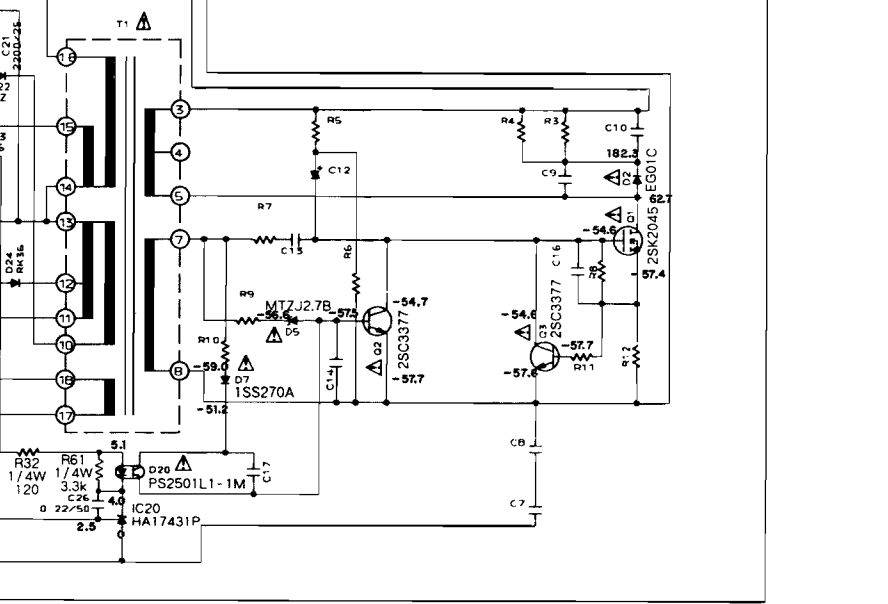
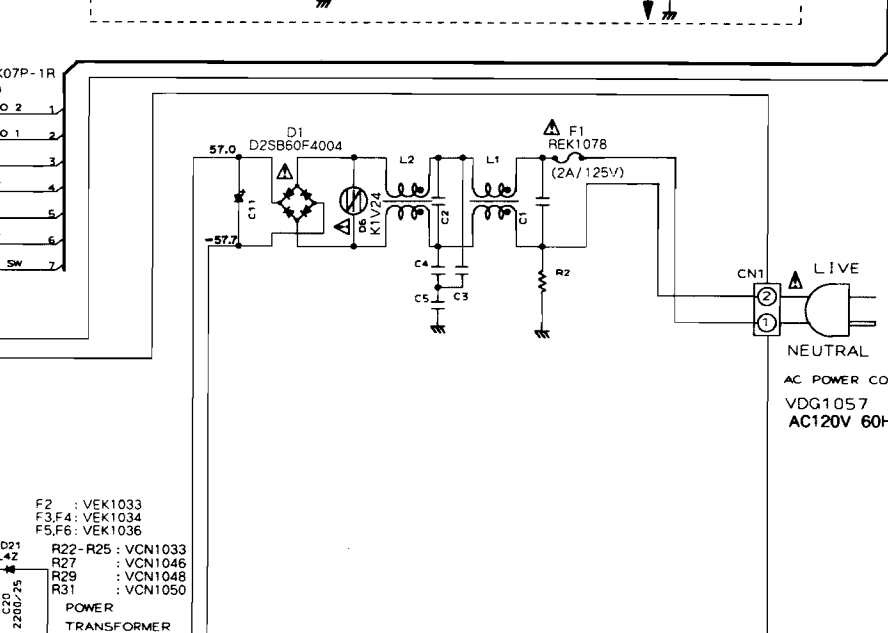
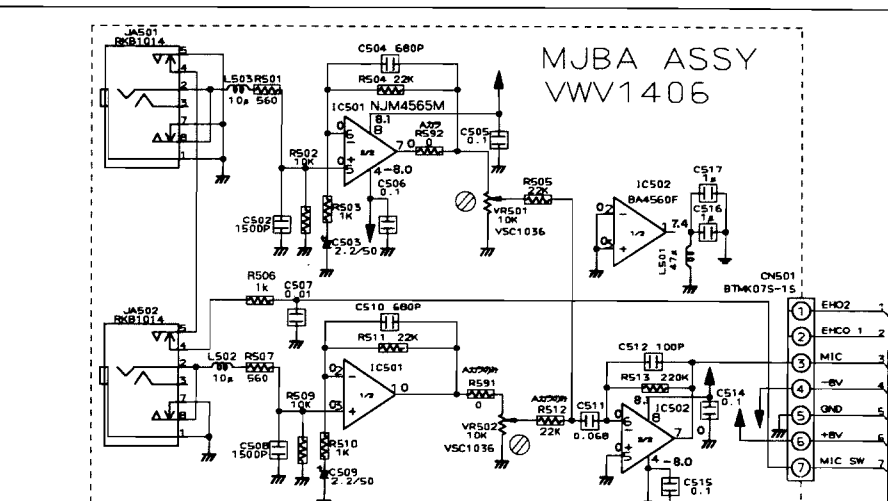
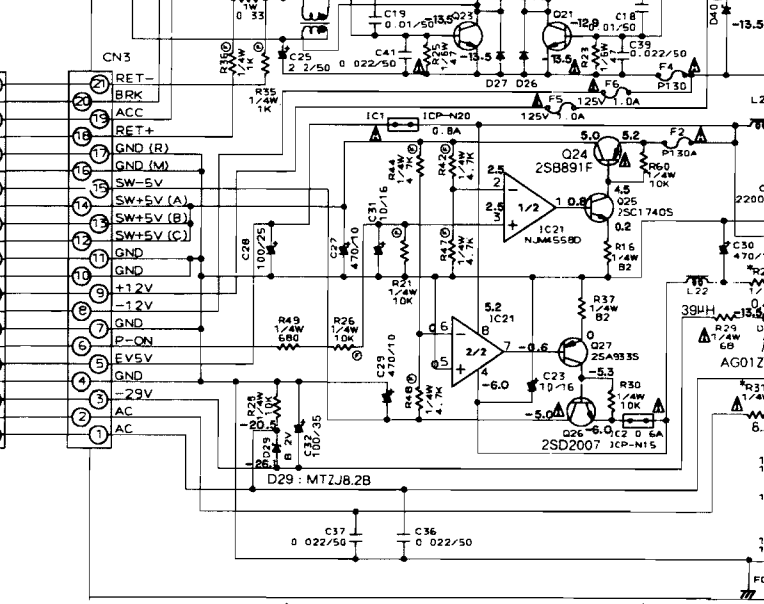
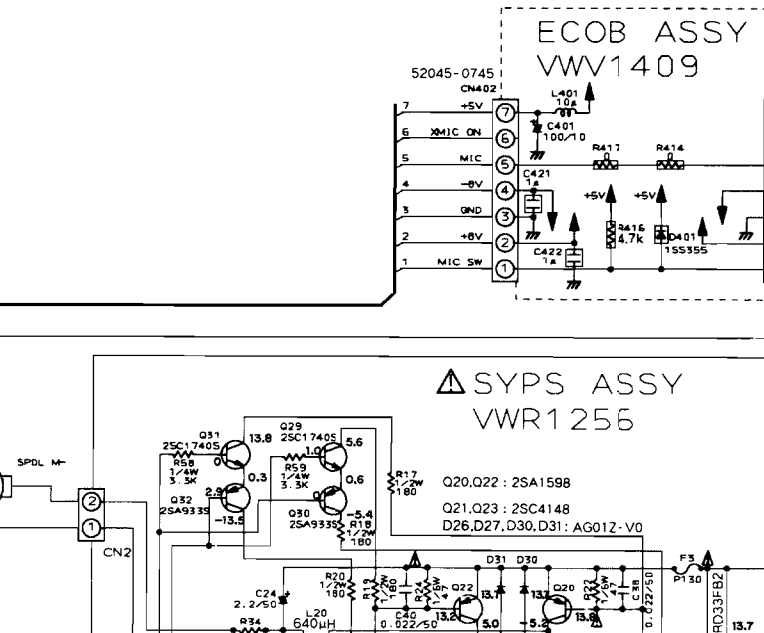
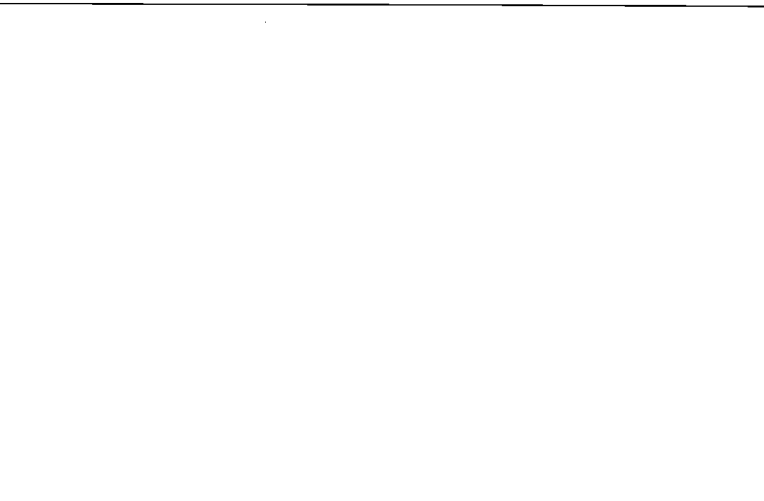
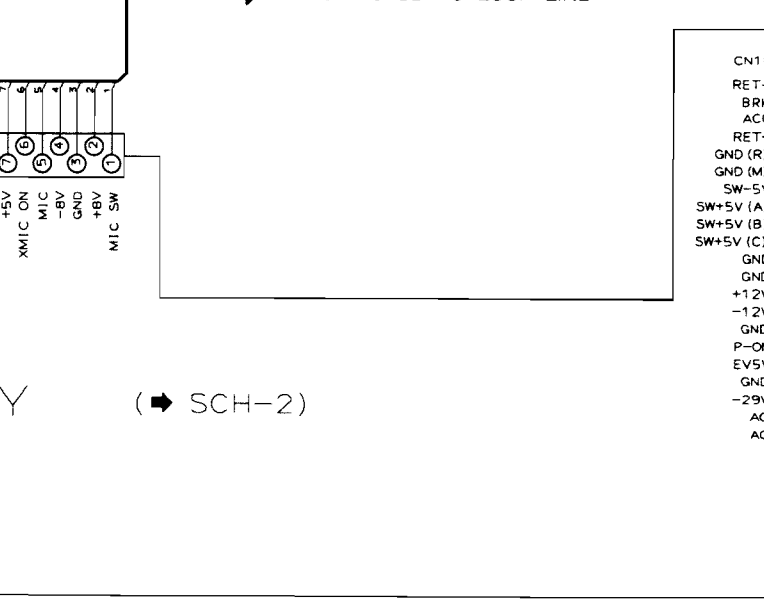
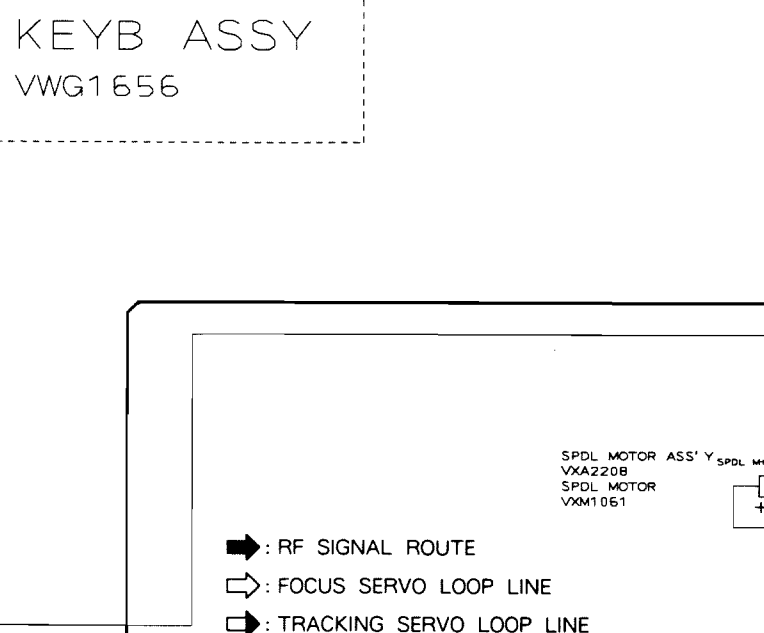
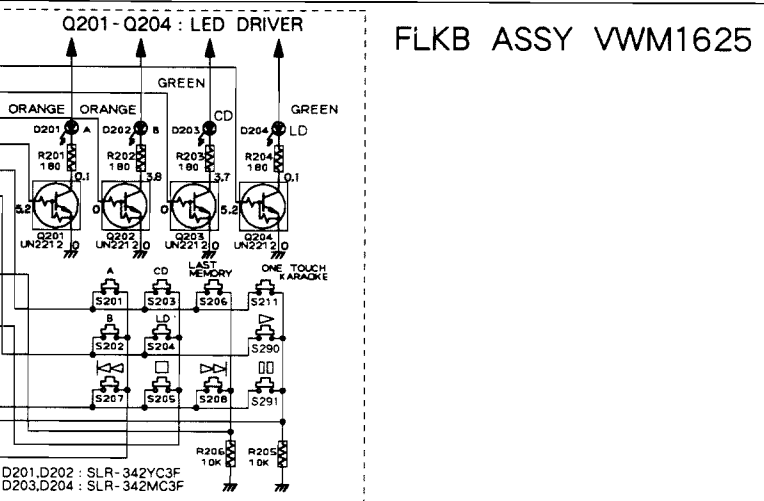
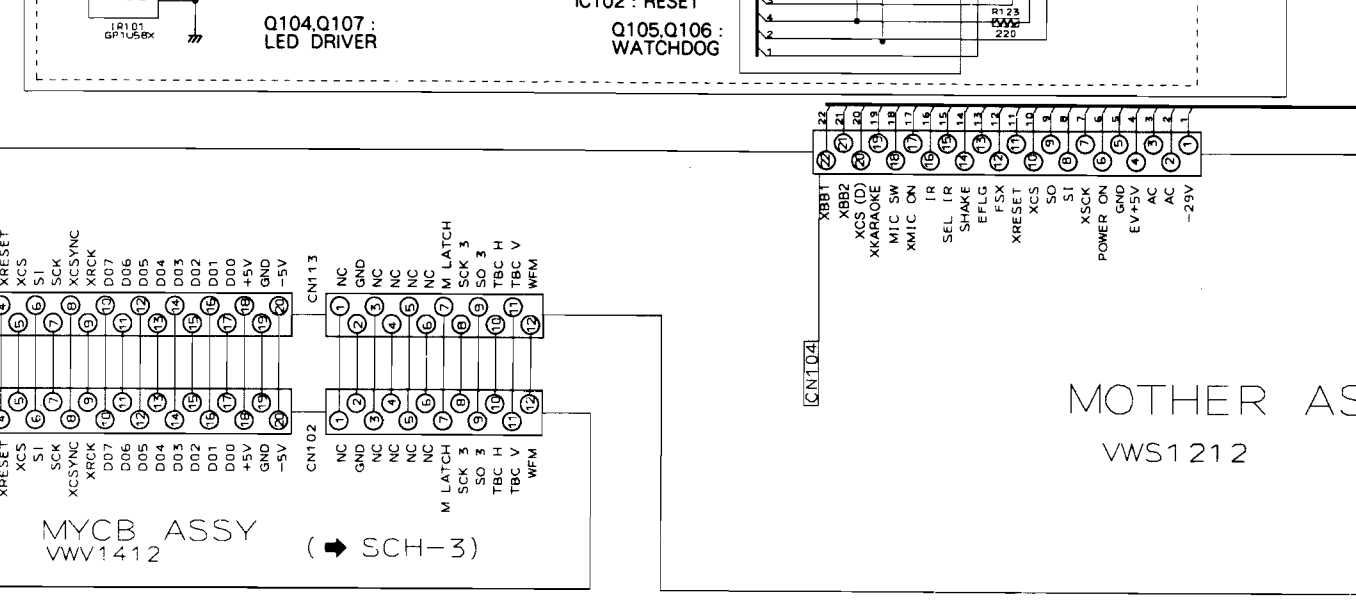
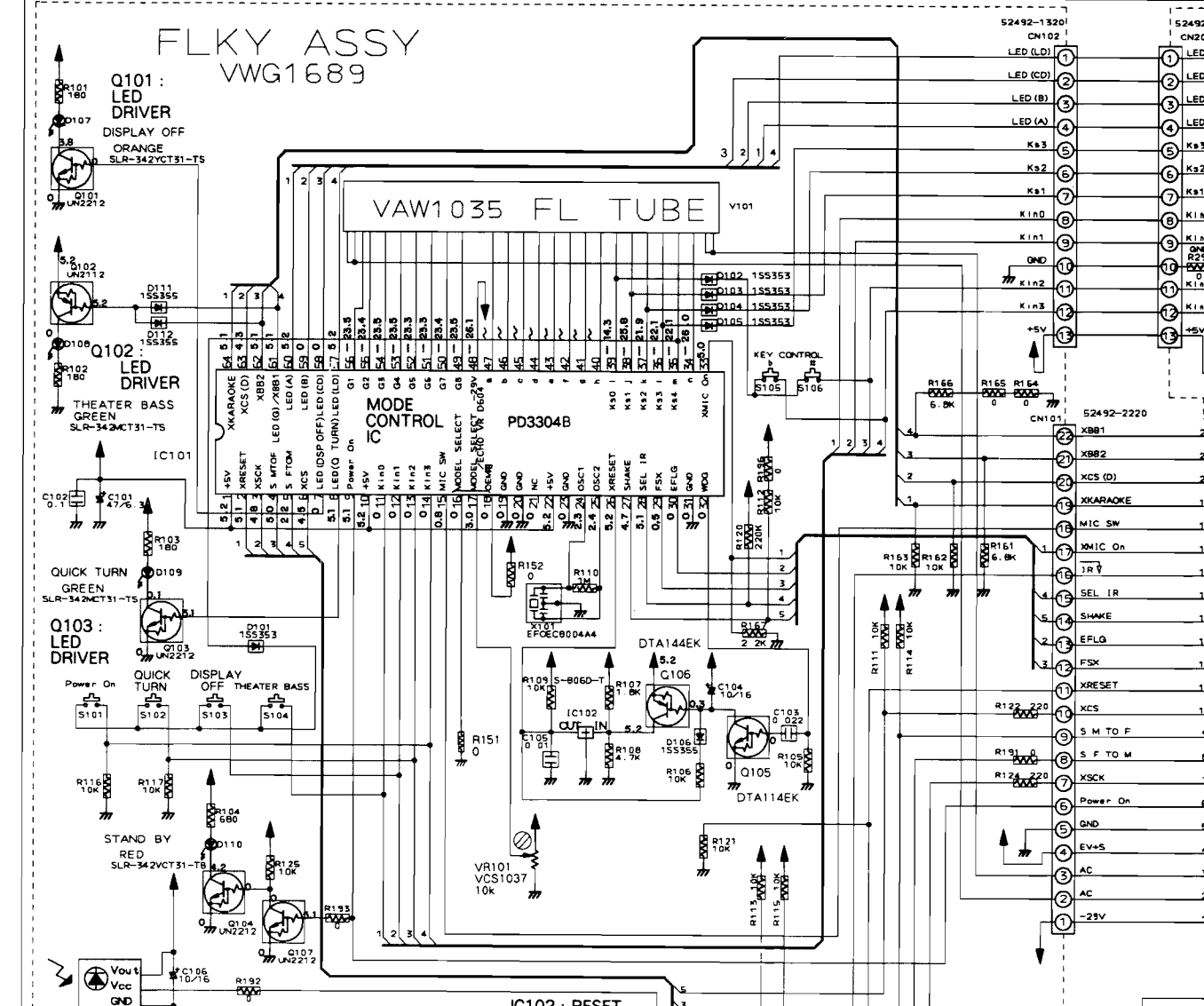
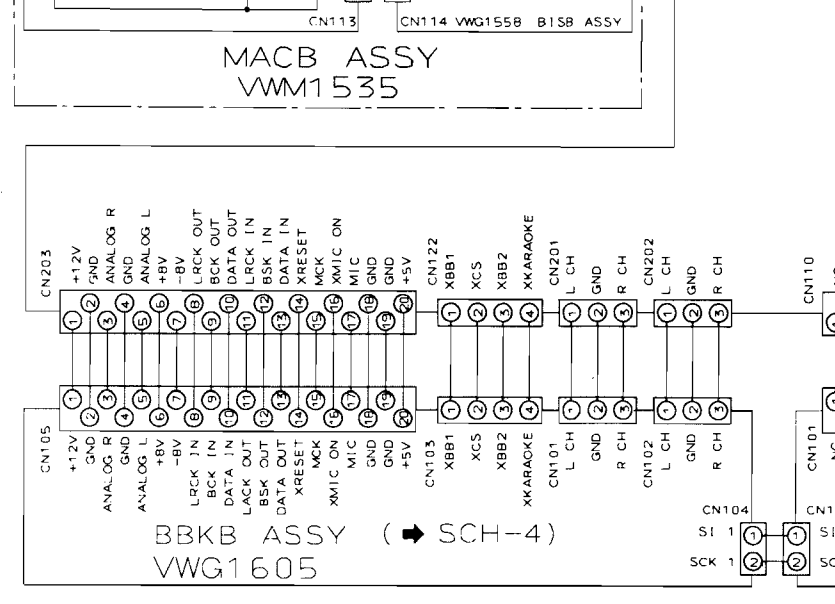
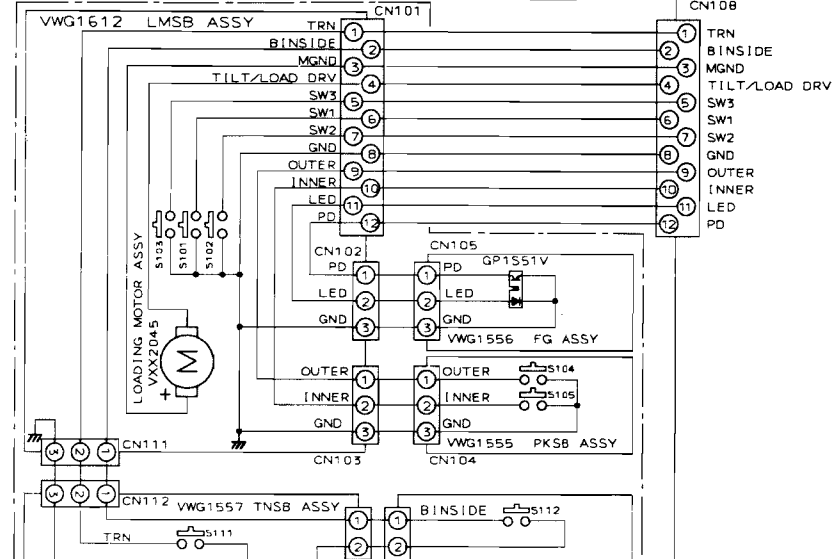
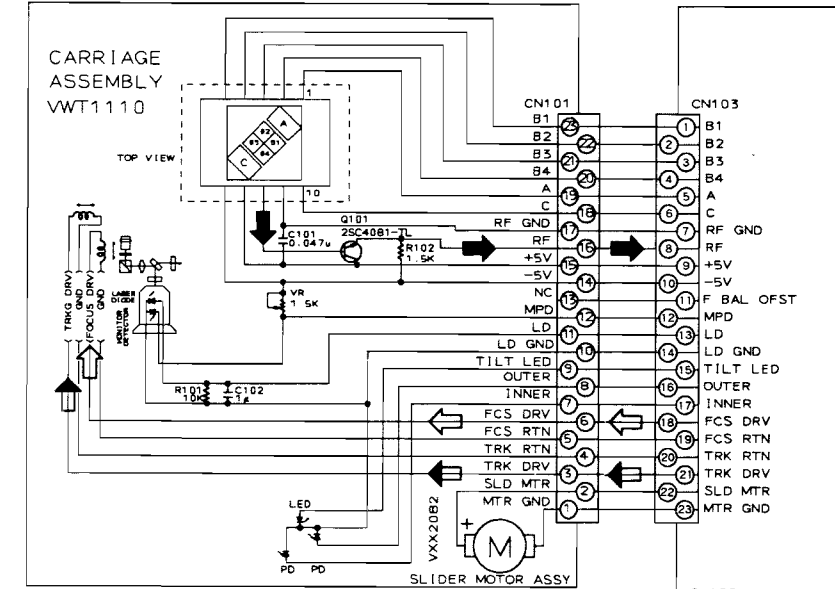
KEYB ASSY
S201 : A
S202 : B
S203 : CD
S204 : LD
S205 : #
S206 : LAST MEMORY
S207 : \leftarrow
S208 : \rightarrow
S209 : \leftarrow
S210 : \parallel
S211 : ONE TOUCH KARAOKE

LMSB ASSY
S101 : SW1
S102 : SW2
S103 : SW3

PKSB ASSY
S104 : OUTER
S105 : INNER

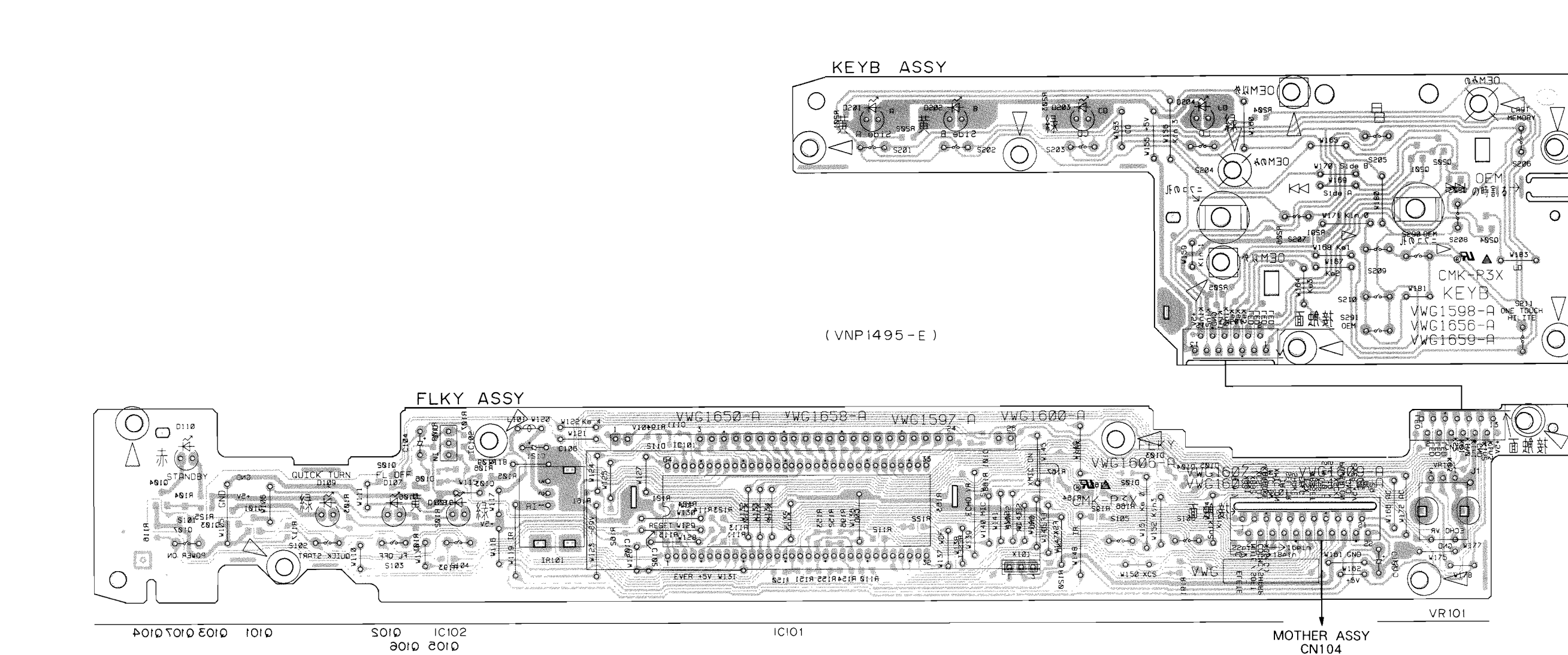
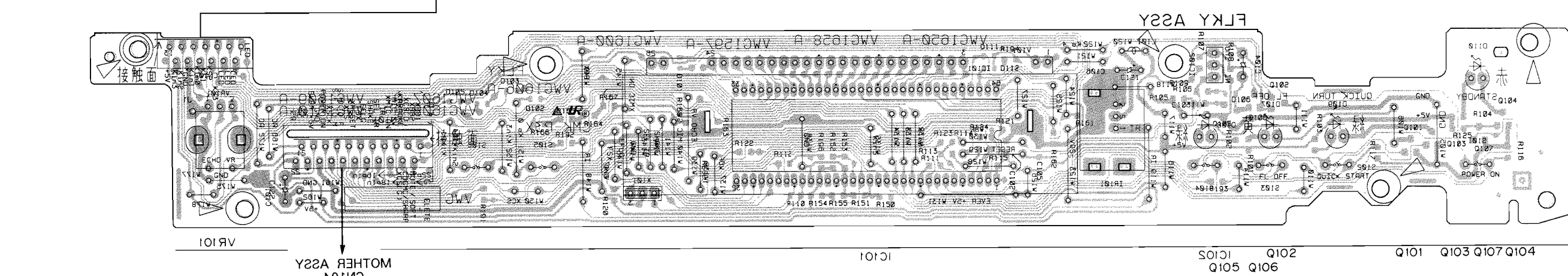
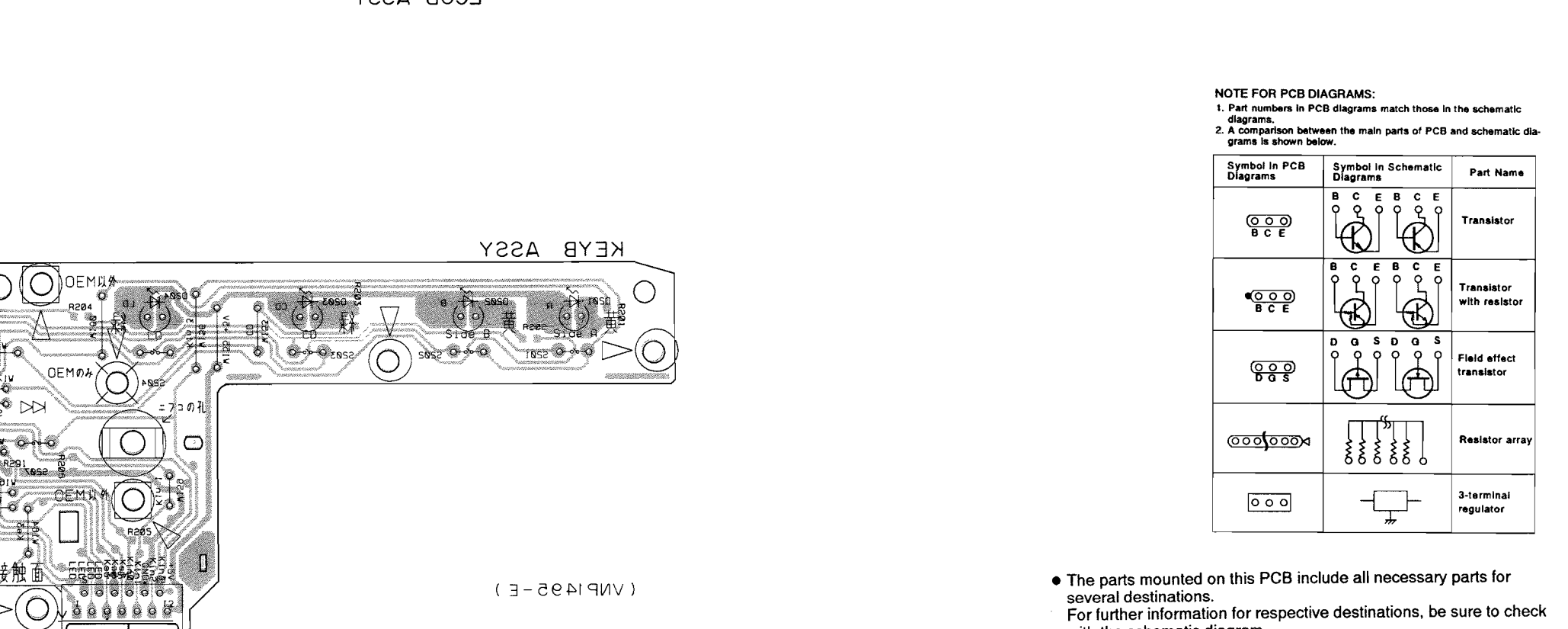
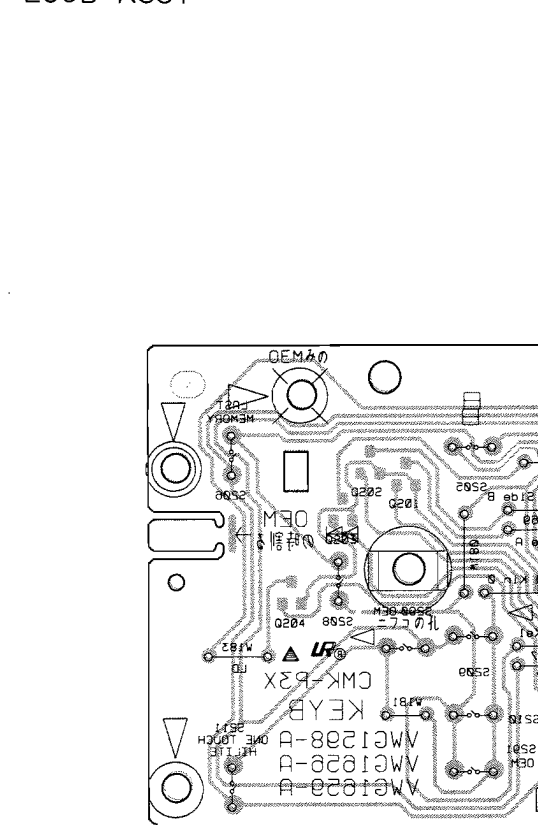
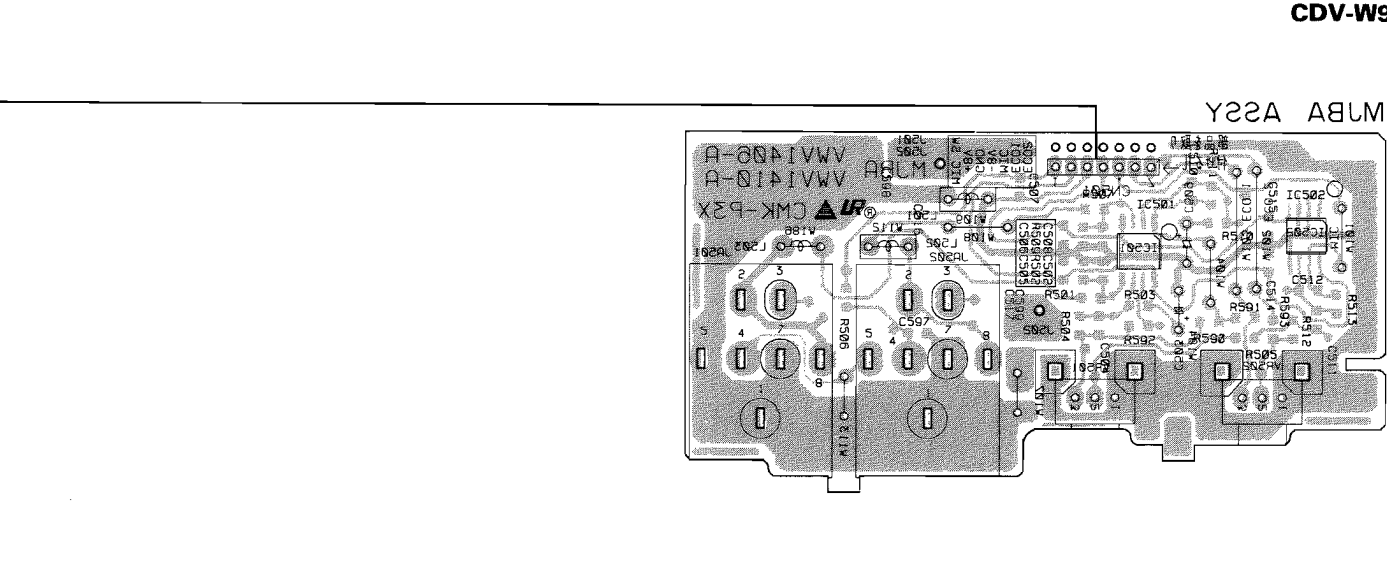
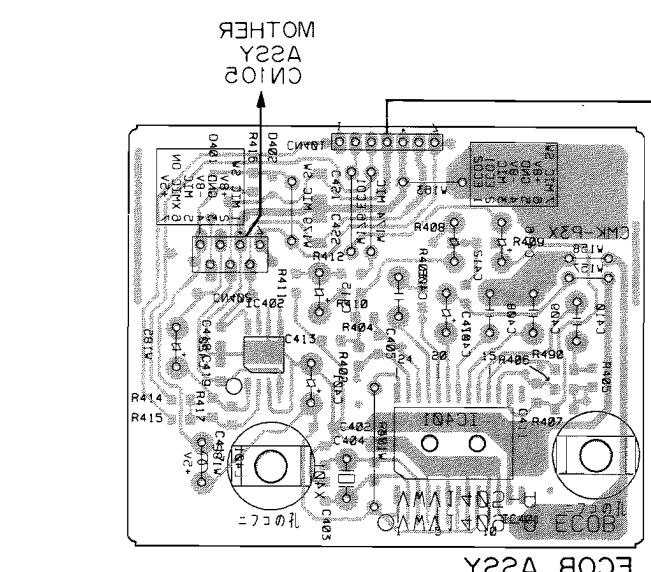
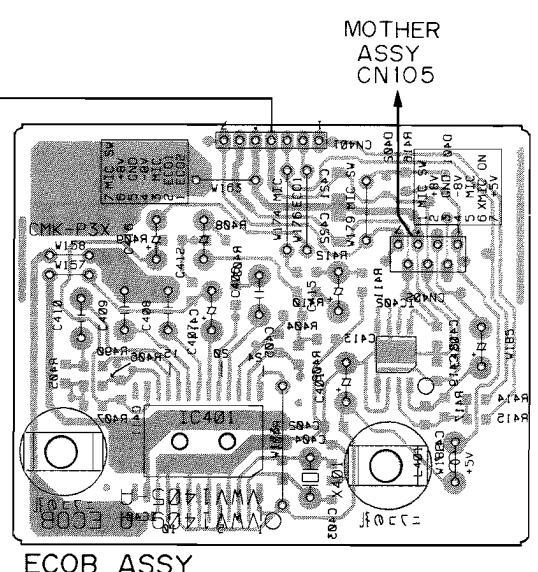
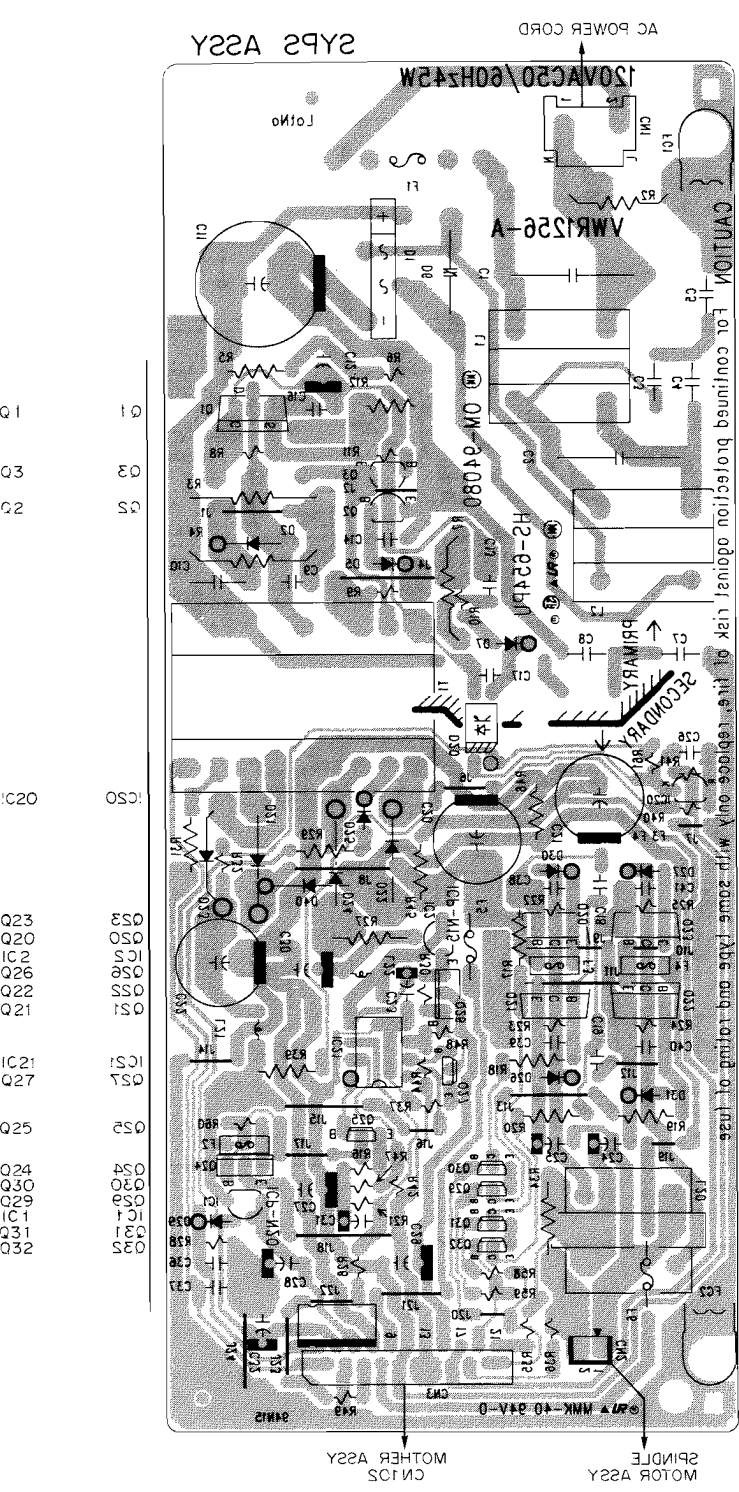
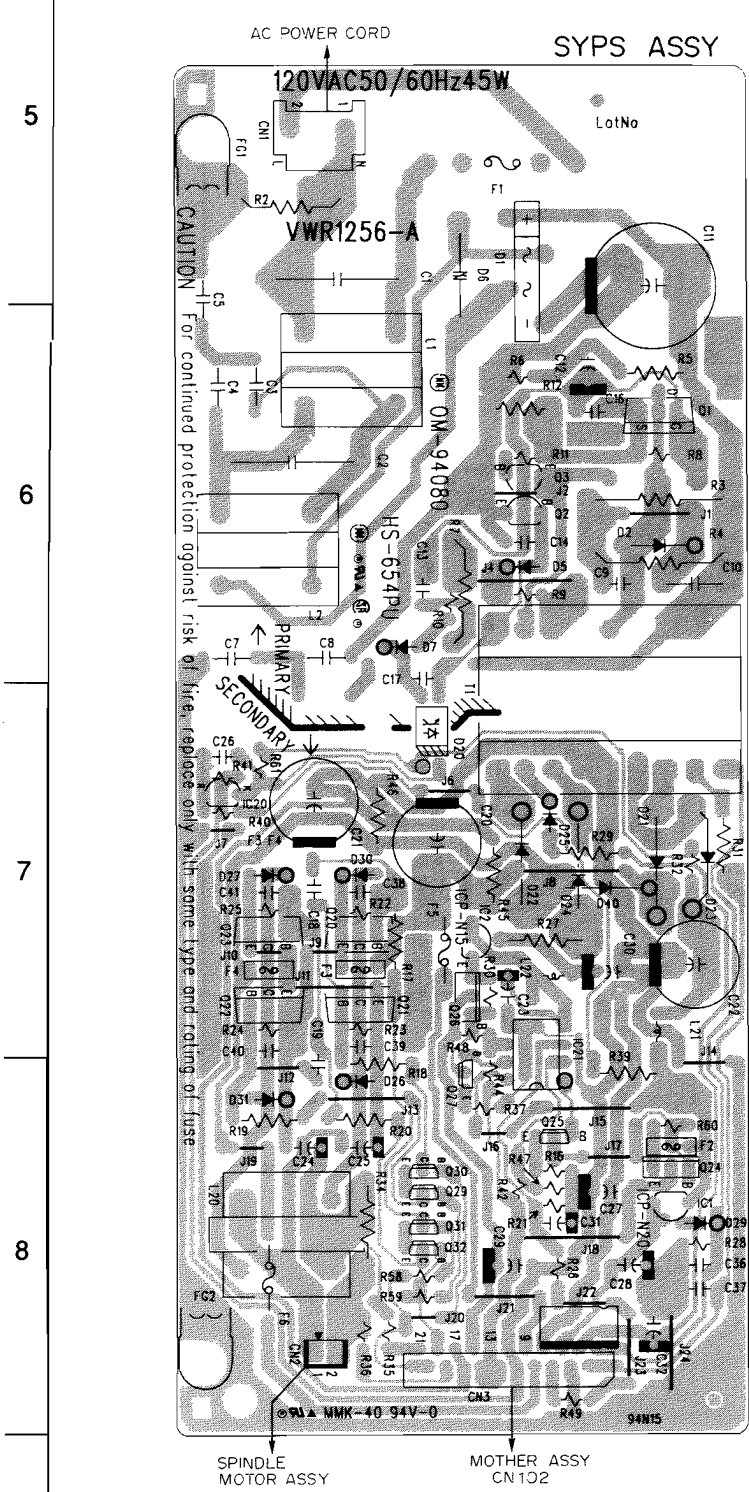
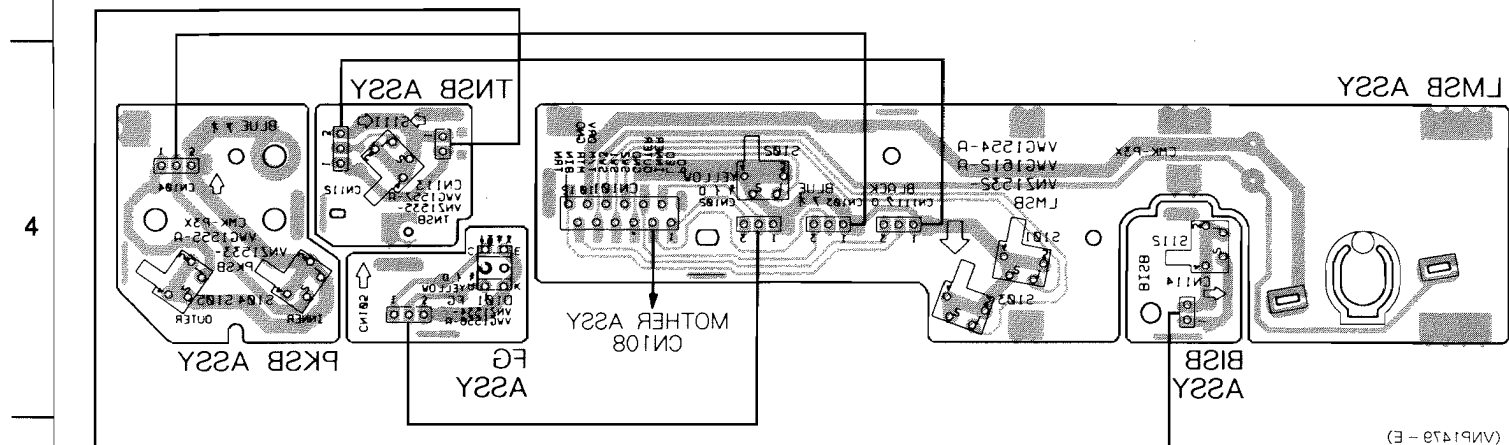
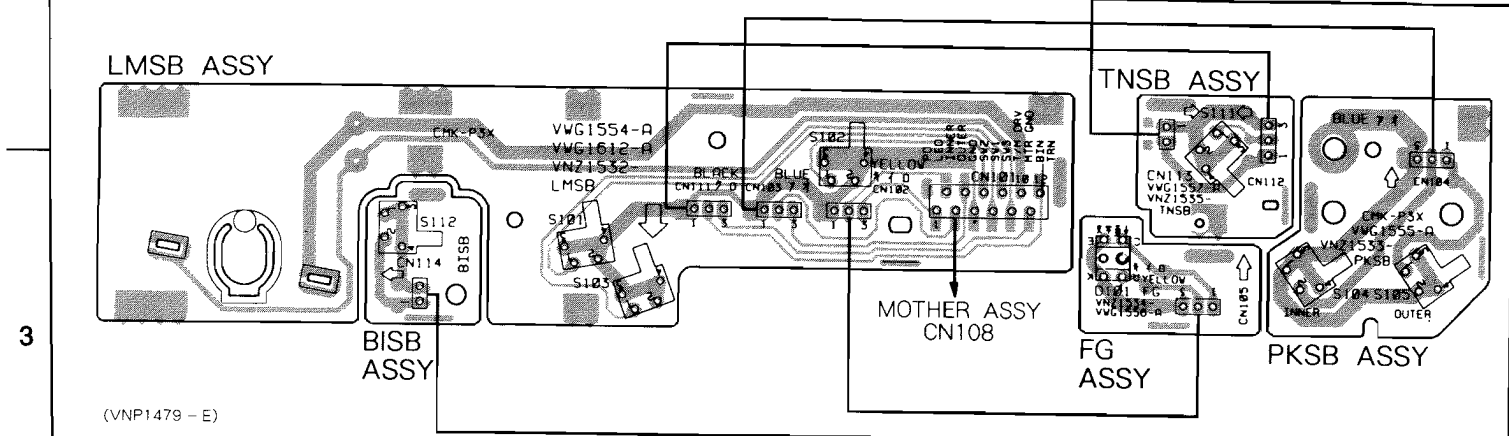
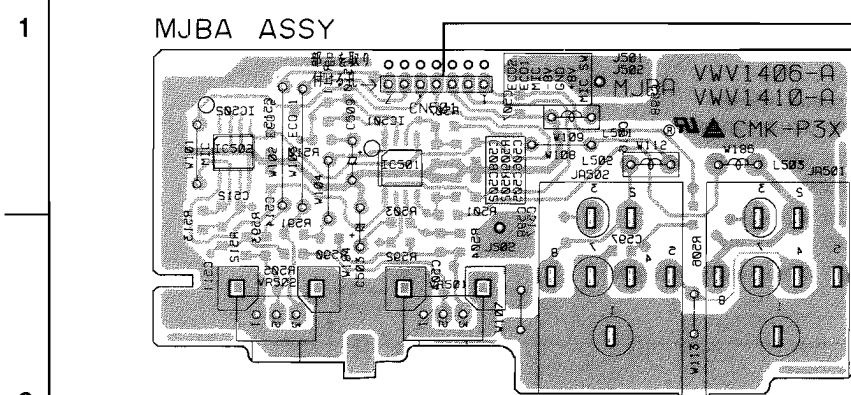
TNSB ASSY
S111 : TURN

BISB ASSY
S112 : B INSIDE



SCH-1

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATINGS ONLY.



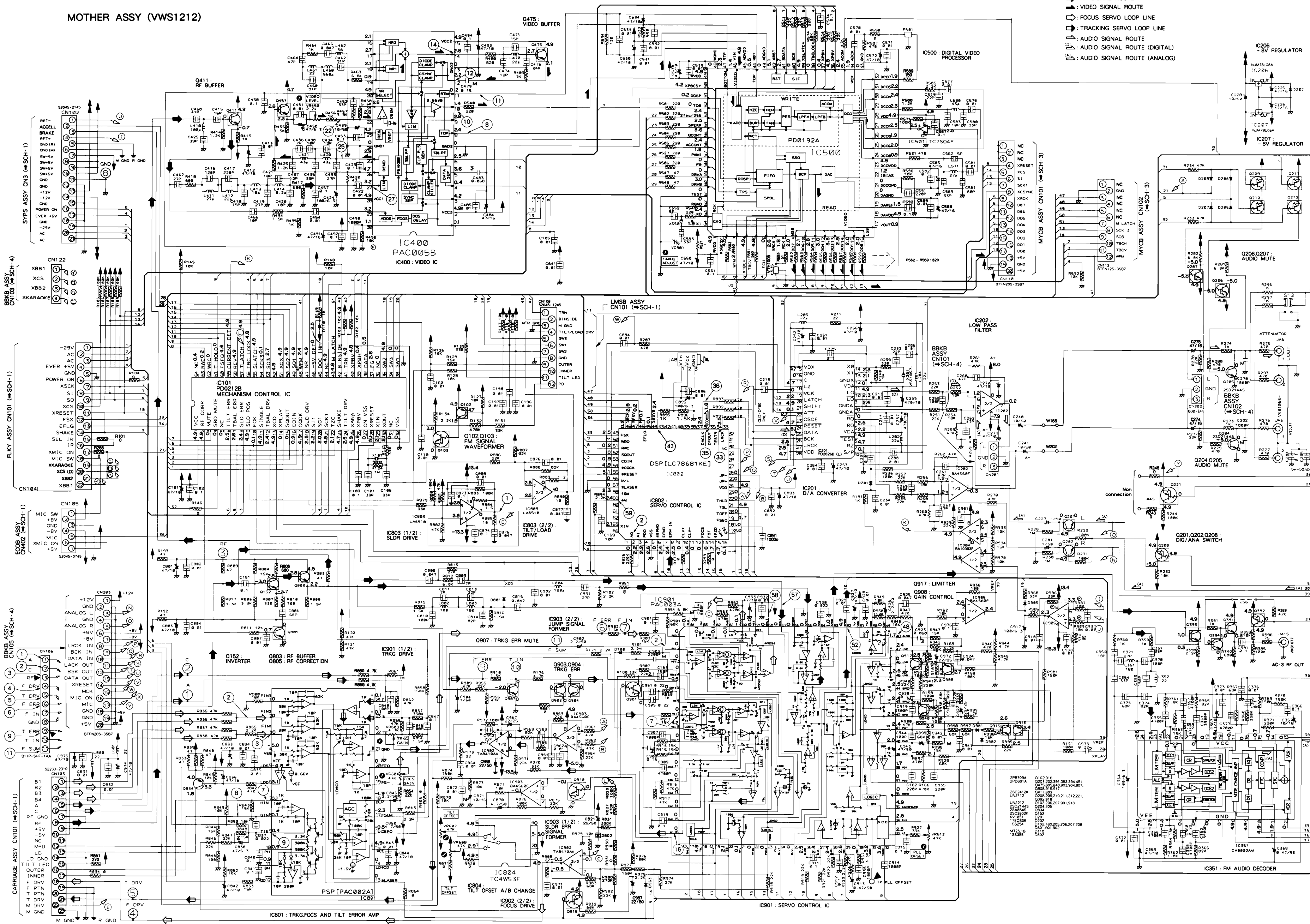
NOTE FOR PCB DIAGRAMS:
 1. Part numbers in PCB diagrams match those in the schematic diagrams.
 2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

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

MOTHER ASSY (VWS1212)

- ◆ RF SIGNAL ROUTE
- ▲ VIDEO SIGNAL ROUTE
- FOCUS SERVO LOOP LINE
- ▢ TRACKING SERVO LOOP LINE
- ⊠ AUDIO SIGNAL ROUTE
- ⊡ AUDIO SIGNAL ROUTE (DIGITAL)
- ⊣ AUDIO SIGNAL ROUTE (ANALOG)



SCH-2 MOTHER ASSY

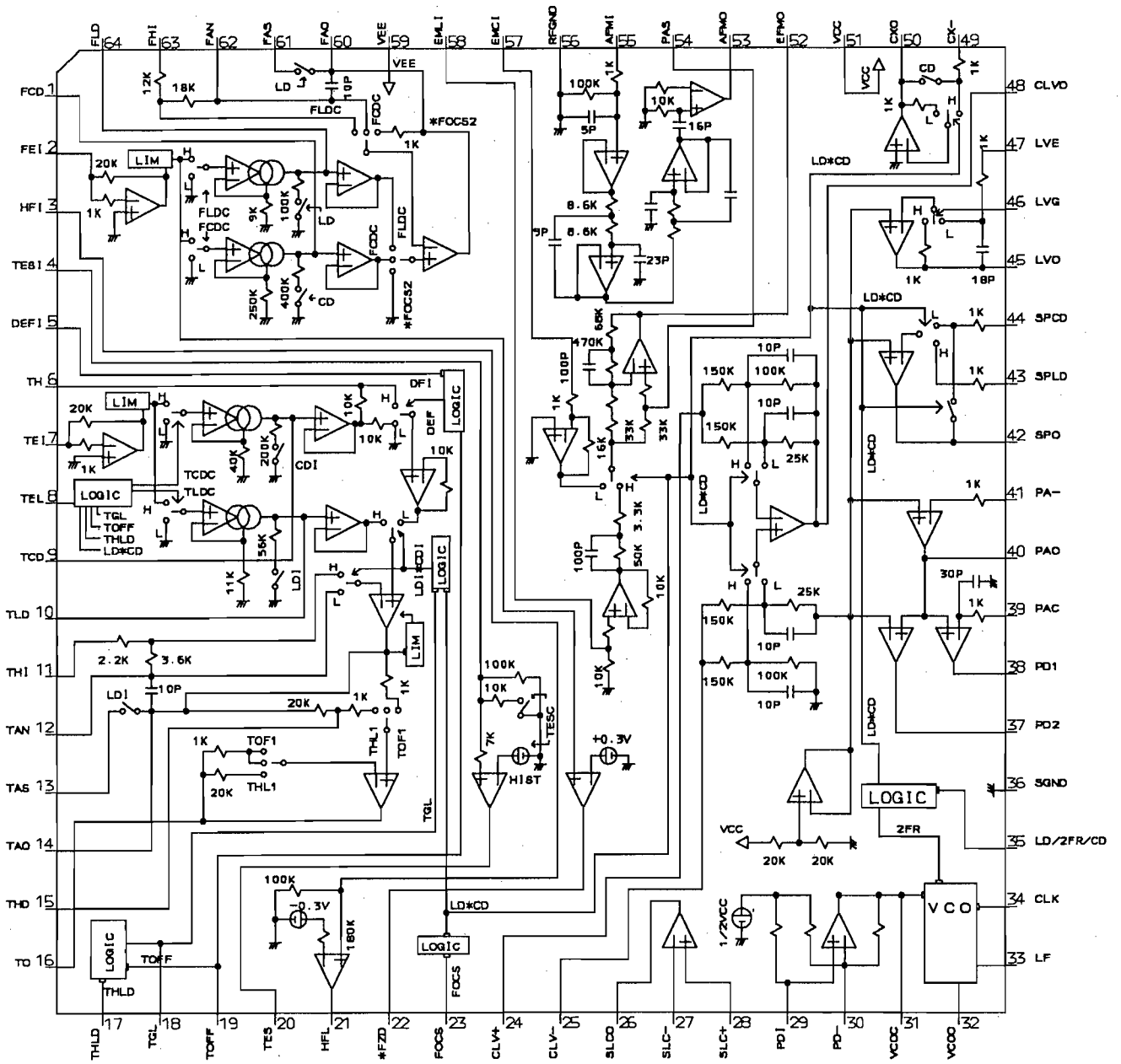
WAVEFORMS AND VOLTAGE MOTHER ASS'Y MOTHER ASS'Y

Note : (No.) in the table correspond to the pin number.

Measurement condition : In case when (D. audio) is written, at time when disc that has digital audio recording is played.

IC801(PAC002A)	IC802(LC78681KE)	IC803(LA6510)	IC901(PAC003A)	CN106	IC400 (PAC005B)
<p>(2), (3) 1mS/Div. 16mVp-p</p> <p>AC mode</p>	<p>(2) 0.1μS/Div. 4.3Vp-p</p> <p>AC mode(D.audio)</p>	<p>(1) 2mS/Div. 1.8Vp-p</p> <p>DC mode</p>	<p>(2) 0.2mS/Div. 74mVp-p</p> <p>DC mode</p>	<p>(1), (2) 5mS/Div. 65mVp-p</p> <p>DC mode</p>	<p>(10) 1.52Vp-p</p> <p>0.55V V: 20mV/Div H: 10mS/Div</p>
<p>(7), (8) 1mS/Div. 67mVp-p</p> <p>DC mode</p>	<p>(33) 10μS/Div. 4.2Vp-p</p> <p>AC mode(D.audio)</p>		<p>(7) 0.2mS/Div. 74mVp-p</p> <p>DC mode</p>	<p>(3) 0.5mS/Div. 300mVp-p</p> <p>AC mode</p>	<p>(8) (TOP) 2.4V 1.85V (11) (BOTTOM) -0.55V</p>
<p>(9) 5mS/Div. 0.1Vp-p</p> <p>DC mode</p>	<p>(35) 0.2μS/Div. 4.4Vp-p</p> <p>AC mode(D.audio)</p>		<p>(16) 0.2mS/Div. 0.61Vp-p</p> <p>DC mode</p>	<p>(4) 5mS/Div. 15Vp-p</p> <p>DC mode</p>	<p>(12) 1Vp-p</p> <p>1.65V V: 20mV/Div H: 10mS/Div</p>
	<p>(36) 0.2μS/Div. 4.5Vp-p</p> <p>AC mode(D.audio)</p>		<p>(48) 50μS/Div. 6.2Vp-p</p> <p>DC mode</p>	<p>(5) 5mS/Div. 5.8Vp-p</p> <p>DC mode</p>	<p>(14) 1Vp-p</p> <p>V: 20mV/Div H: 10mS/Div</p>
	<p>(43) 0.1μS/Div. 4.5Vp-p</p> <p>AC mode(D.audio)</p>		<p>(52) 0.2μS/Div. 2.1Vp-p</p> <p>AC mode</p>	<p>(6) 5mS/Div. 3.5Vp-p</p> <p>DC mode</p>	<p>(22) (No noise) (25) (With limiter noise)</p> <p>V: 20mV/Div Approx. H: 10mS/Div 330mVp-p</p>
	<p>(59) 0.1μS/Div. 2Vp-p</p> <p>AC mode(D.audio)</p>		<p>(57) 1mS/Div. 0.53Vp-p</p> <p>DC mode</p>	<p>(9) 5mS/Div. 1.25Vp-p</p> <p>DC mode</p>	<p>(27) Approx. 1Vp-p</p> <p>0.5mS/Div</p>
			<p>(58) 0.2mS/Div. 0.32Vp-p</p> <p>DC mode</p>	<p>(11) 10mS/Div. 1.7Vp-p</p> <p>DC mode</p>	

• The inside block diagram of IC901 (PAC003A)



A

B

C

D

E

F

G

H

MOTHER ASS'Y

• This diagram is viewed from the mounted parts side.

BBKB ASSY
CN105

MYCB ASSY
CN101

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

ECOB ASSY
CN402

1

2

3

4

5

MOTHER ASSY

BBKB ASSY
CN101

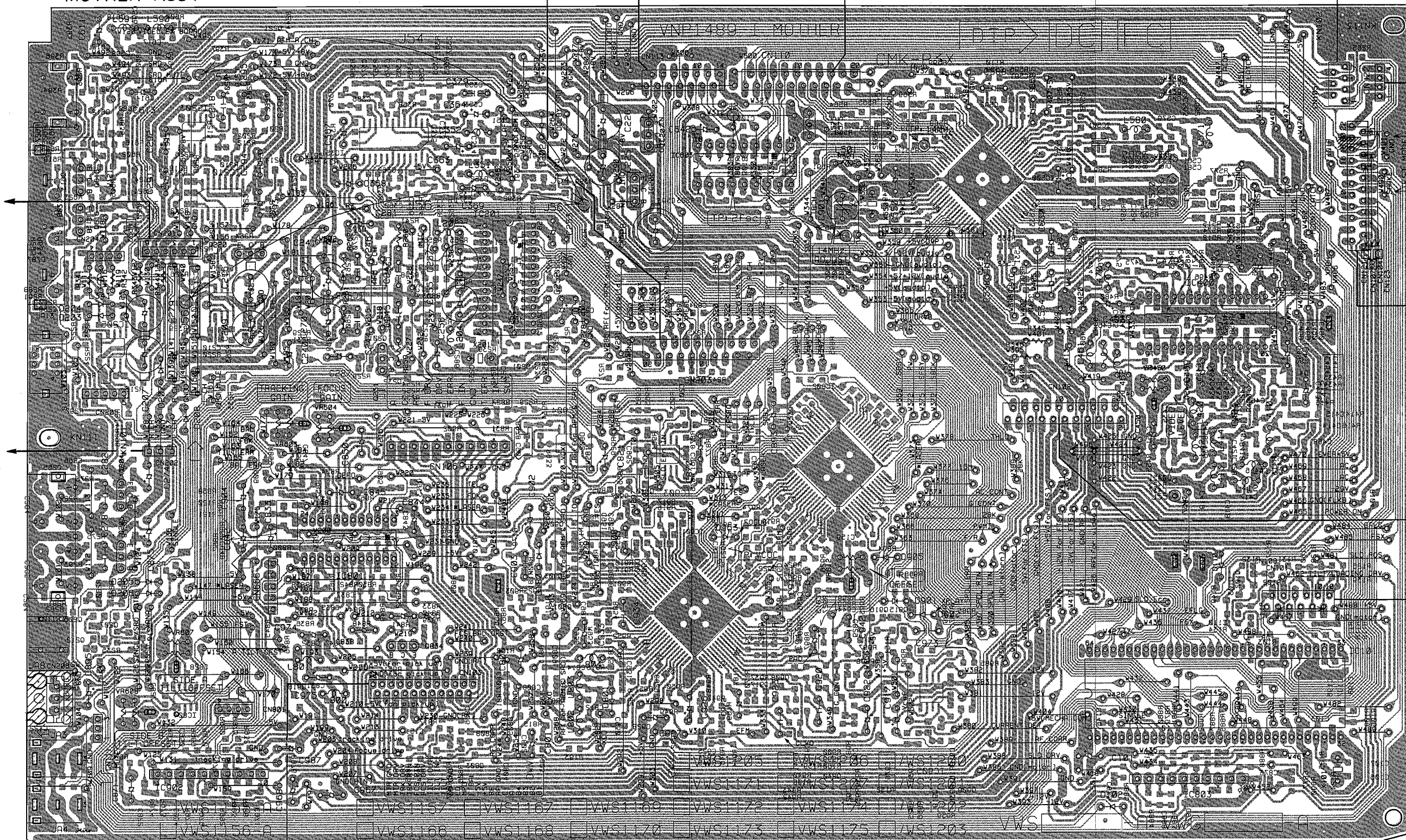
BBKB ASSY
CN102

BBKB ASSY
CN103

FLKB ASSY
CN101

SYPS ASSY
CN 3

LMSB ASSY
CN101



CARRIAGE
ASSY
CN101

VR608 VR607

VR603 VR604

VC 901
VR612

VR450

Q615 Q204 Q220

Q231 Q834

IC 201

IC 206 IC 207 IC 603

IC 400 IC 803

IC 101

Q510 Q616 Q205 O1S0 IC 902

S0S0 I0S0

IC 201

IC 206 IC 207 IC 603

IC 400 IC 803

S1S0 S834 O3A3 O0S0

S0S0 I0S0

IC 201

IC 206 IC 207 IC 603

IC 400 IC 803

O0S0 I180 O3A3 IC 101 IC 101

S0S0 I0S0

IC 201

IC 206 IC 207 IC 603

IC 400 IC 803

I1S0 S0S0 IC 803 IC 803

S0S0 I0S0

IC 201

IC 206 IC 207 IC 603

IC 400 IC 803

6

CDV-W901

A B C D E F G H

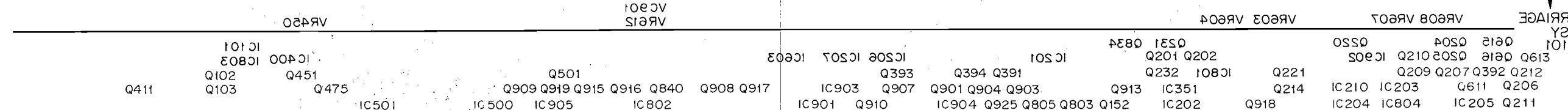
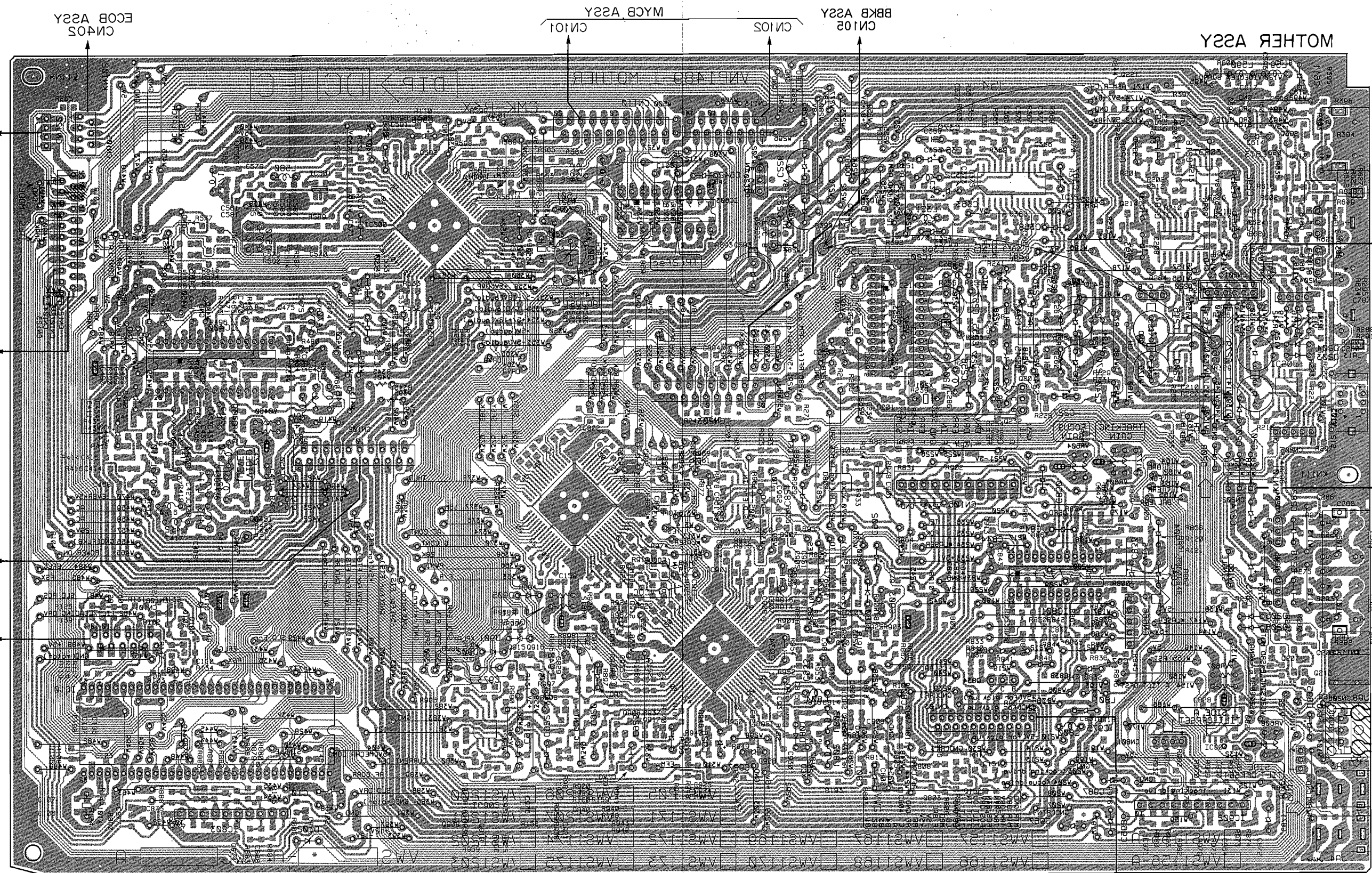
1

2

3

4

5



This diagram is viewed from the foil side.

A

B

C

D

E

CDV-W901

1

13.3 MYCB ASS'Y

2

3

4

5

6

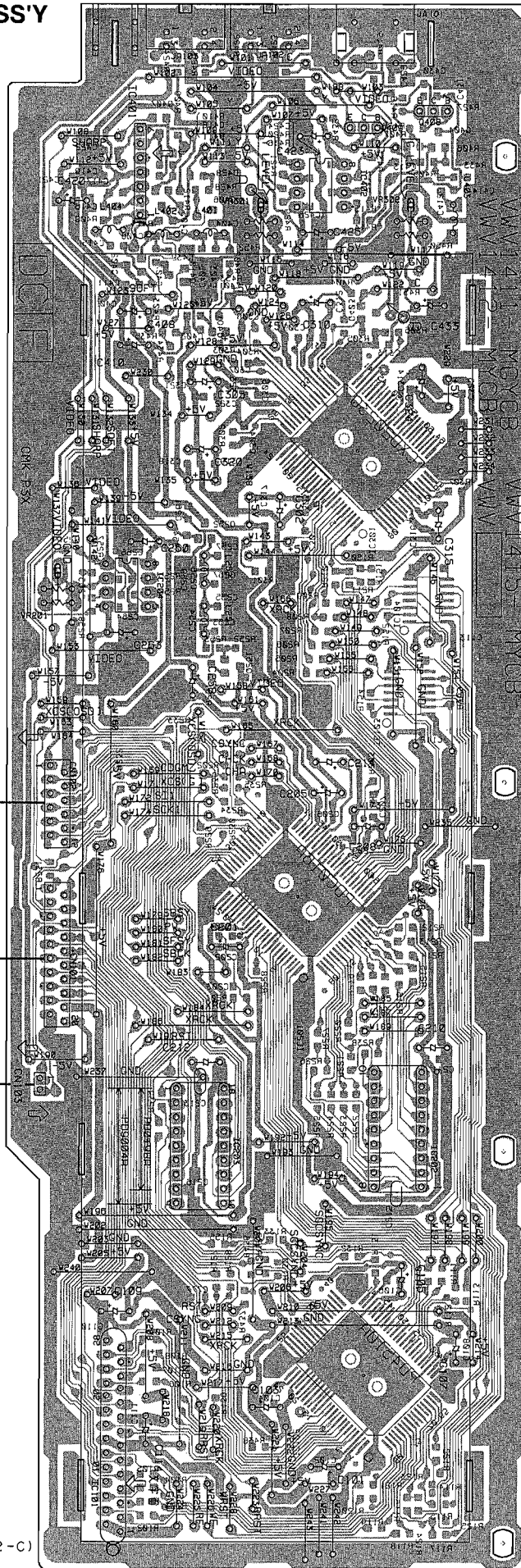
7

MOTHER
ASSY
CN113

MOTHER
ASSY
CN110

BBKB
ASSY
CN104

(VNPI502-C)



- TOP0
- Q409 P0P0
- IC401
- IC402
- VR301
- VR302
- SOP0
- OIP0
- EOP0
- IOF0
- IOECI
- SES0
- VR201
- IC204
- POICI
- IES0
- ICIO3
- IOSCI
- IC202
- IC203
- SOCI
- ICIO1

● This diagram is viewed from the mounted parts side.

A

B

C

D

E

CDV-W901

MYCB ASS'Y

1

2

3

4

5

6

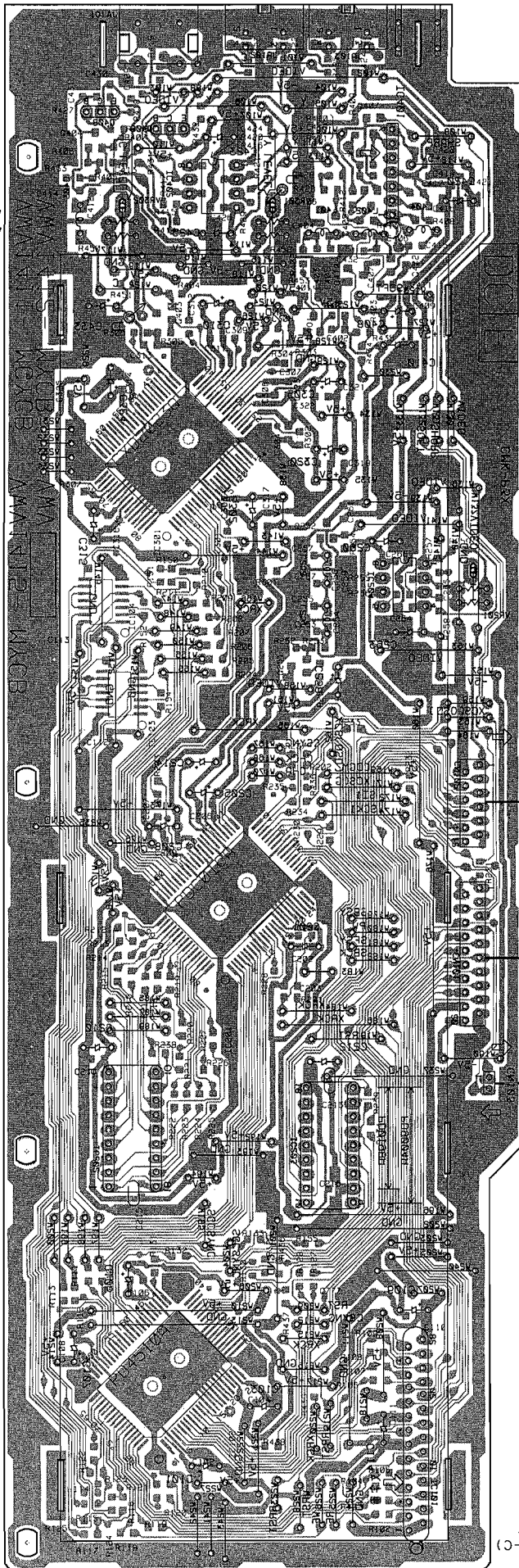
7

80P0 Q407
 Q404 80P0
 10P01
 10P01
 S0P01
 Q406
 Q405
 VR301
 S0E3V
 S0E3V
 Q402
 Q410
 Q403
 Q401

IC301
 Q252
 10S04
 IC504
 IC104
 10S04
 IC104
 Q251
 IC103

IC201
 S0S01
 IC503
 IC503

IC102
 10101



MOTHER
 ASSY
 CN113

MOTHER
 ASSY
 CN110

BBK
 ASSY
 CN104

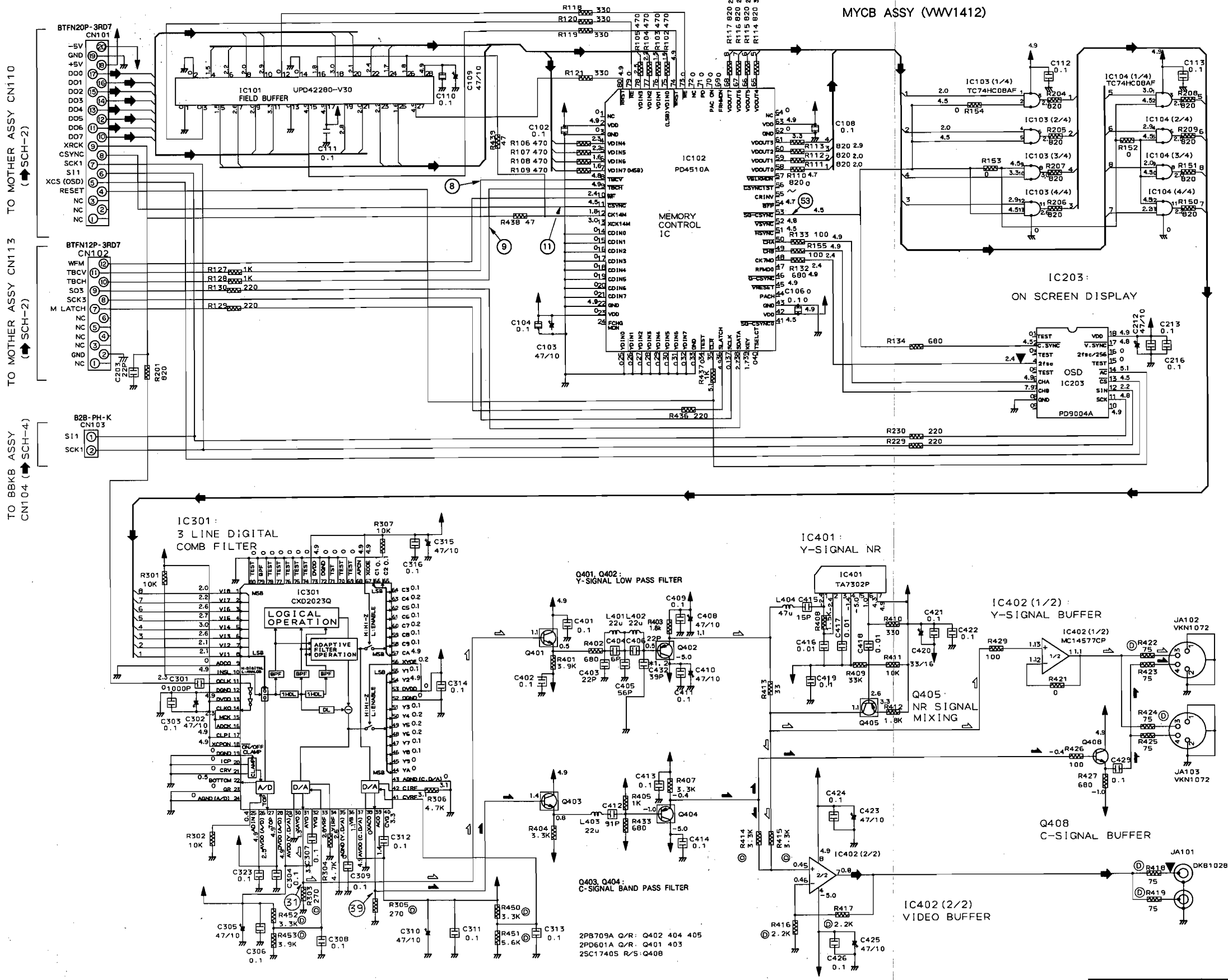
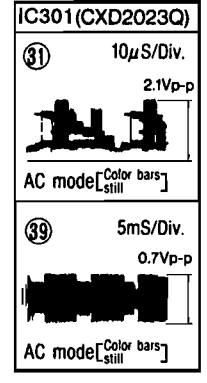
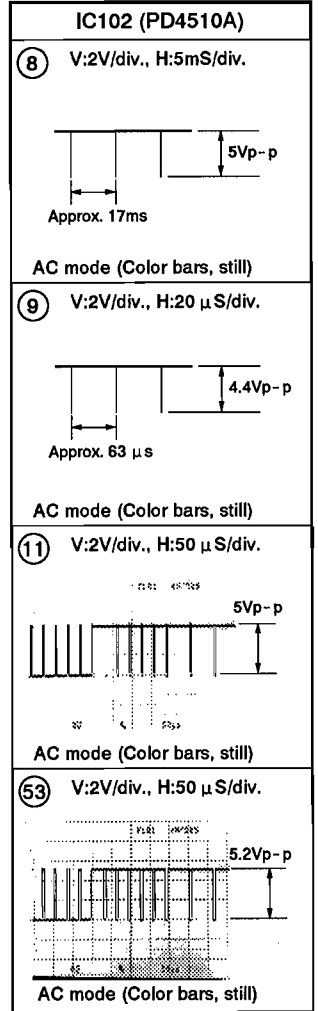
(VNP1305-C)

● This diagram is viewed from the mounted parts side.

◆ VIDEO SIGNAL LINE
 ▲ Y SIGNAL LINE
 ▲ C SIGNAL LINE

WAVEFORMS AND VOLTAGE MYCB ASSY

Note: (No.) in the table correspond to the pin number.
 Measurement condition: Where (Color bars) is written, at time when color bar screen of disc is being played. Where (Still) is written, at time of still.



MYCB ASSY
SCH-3

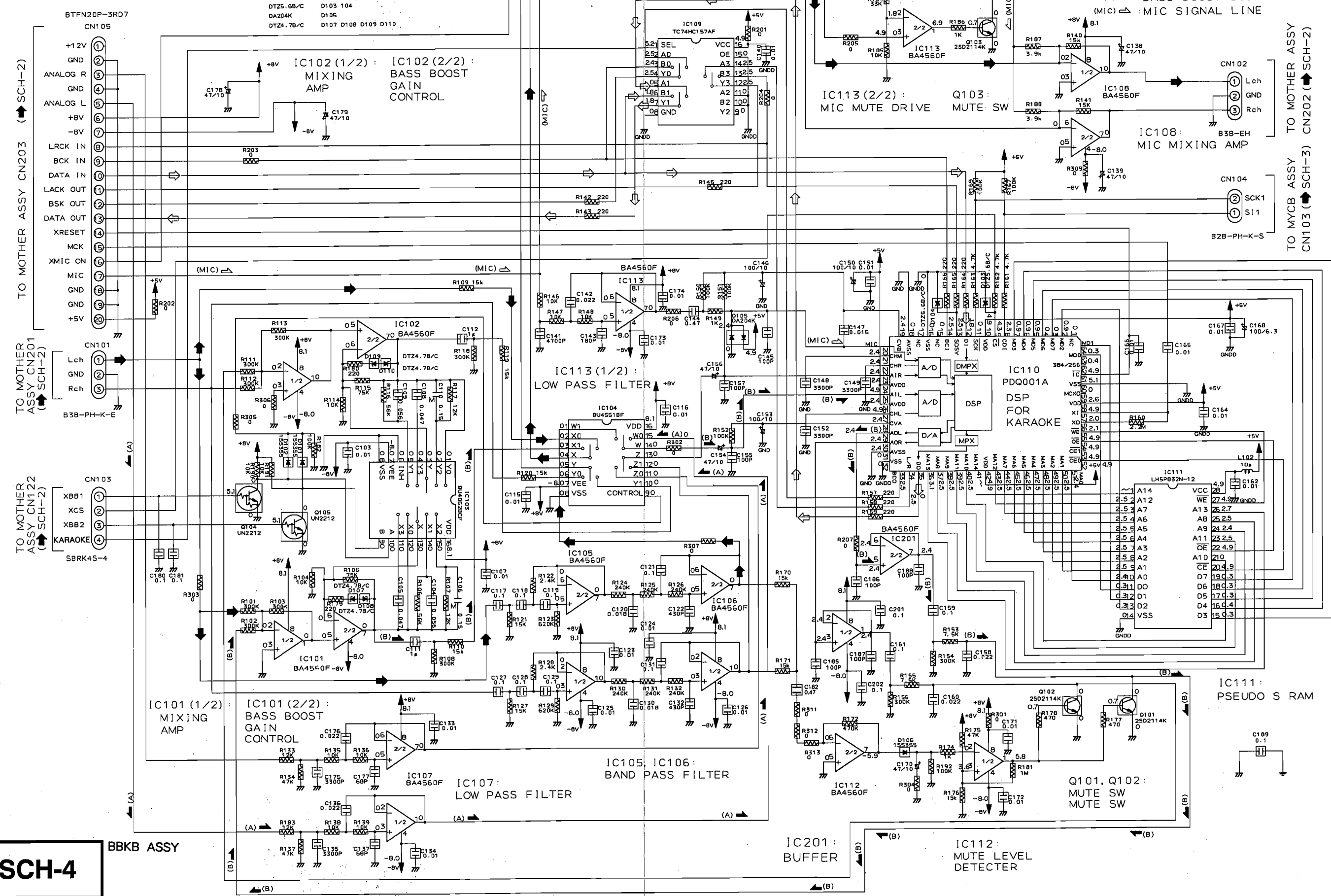
CDV-W901

13.4 BBKB ASS'Y

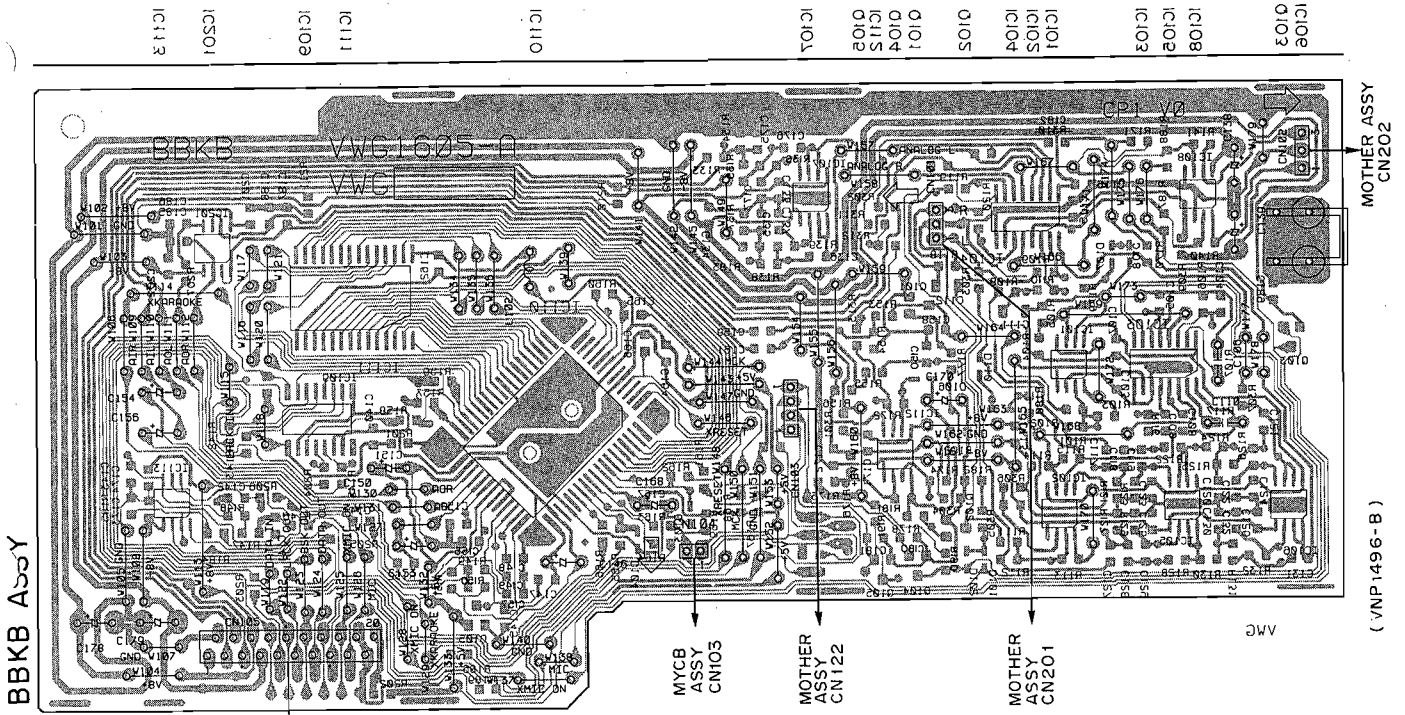
BBKB ASSY (VWG1605)

15S355 D101 102 106
 DT25.68/C D103 104
 DA204K D105
 DT24.78/C D107 D108 D109 D110

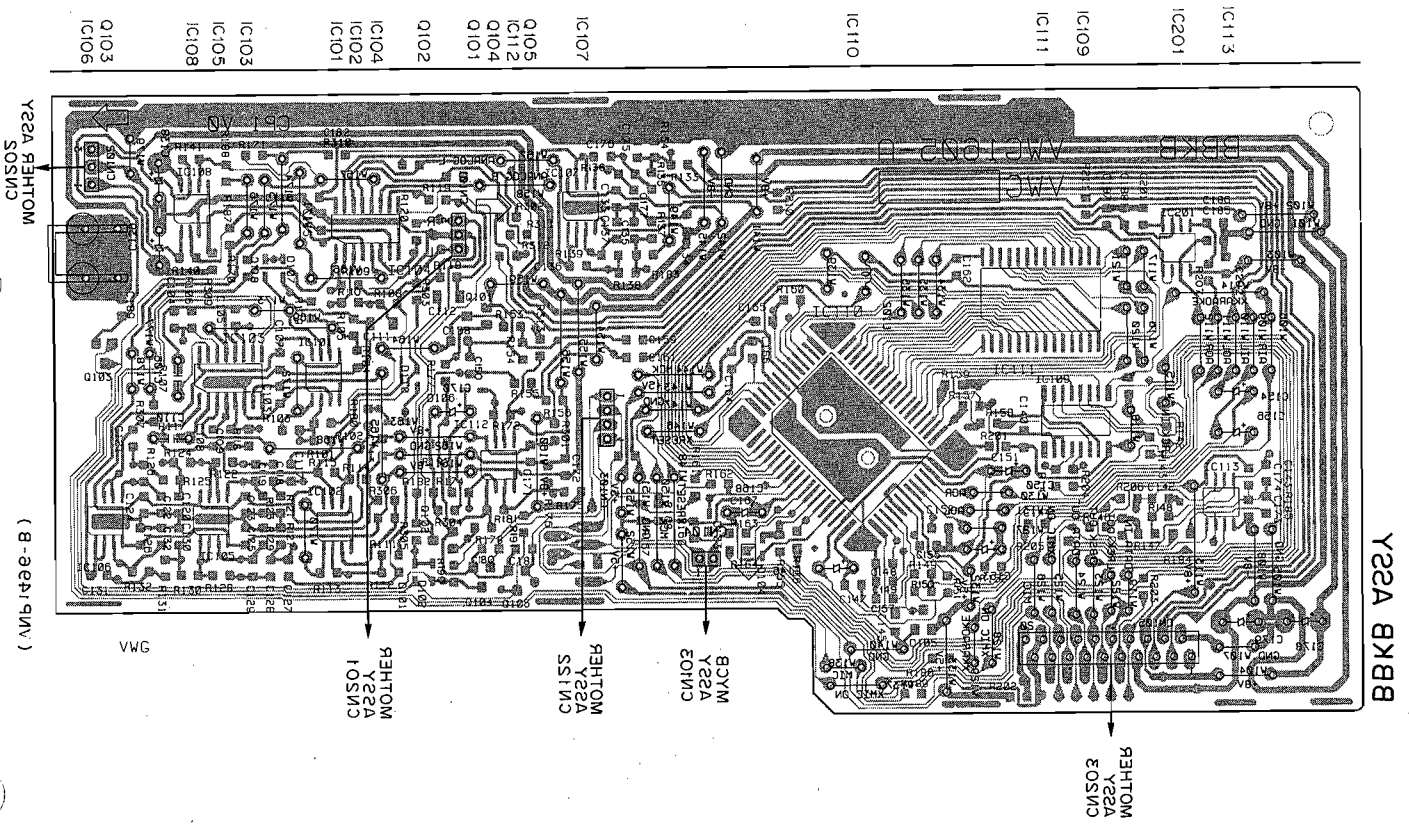
- ➔ : AUDIO SIGNAL LINE
- ◻ : AUDIO DIGITAL DATA LINE
- (A) ➔ : ANALOG AUDIO SIGNAL LINE
- (B) ➔ : BASS BOOST SIGNAL LINE
- (MIC) ➔ : MIC SIGNAL LINE



SCH-4



● This diagram is viewed from the mounted parts side.



● This diagram is viewed from the foil side.

■ WARNING

Components having special characteristics are marked Δ 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.

PARTS LIST

■ ELECTRICAL PARTS

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS :

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

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

P. C. B. BBKB

Schm Ref.	PART NO.	Description	Remarks
	NX614490	P. C. B.	BBKB
			VWG1605
C103	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C104	FX611000	C. CE. CHP	56000pF 25V CKSQYB563K25
C105	FX610990	C. CE. CHP	47000pF 25V CKSQYB473K25
C106	FX611170	C. ML. FLM	0. 15uF 50V CFTXA154J50
C107	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C108	FX610990	C. CE. CHP	47000pF 25V CKSQYB473K25
C109	FX611000	C. CE. CHP	56000pF 25V CKSQYB563K25
C110	FX611170	C. ML. FLM	0. 15uF 50V CFTXA154J50
C111	FX611070	C. CE. CHP	1uF 16V CKSYF105Z16
C112	FX611070	C. CE. CHP	1uF 16V CKSYF105Z16
C115	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C116	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C117	FX610950	C. CE. CHP	0. 1uF 50V CKSQYB104K25
C118	FX610950	C. CE. CHP	0. 1uF 50V CKSQYB104K25
C119	FX610950	C. CE. CHP	0. 1uF 50V CKSQYB104K25
C120	FX610980	C. CE. CHP	0. 018uF 50V CKSQYB183K50
C121	FX610950	C. CE. CHP	0. 1uF 50V CKSQYB104K25
C122	FX610910	C. CE. CHP	430pF 50V CCSQCH431J50
C123	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C124	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C125	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C126	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C127	FX610950	C. CE. CHP	0. 1uF 50V CKSQYB104K25
C128	FX610950	C. CE. CHP	0. 1uF 50V CKSQYB104K25
C129	FX610950	C. CE. CHP	0. 1uF 50V CKSQYB104K25
C130	FX610980	C. CE. CHP	0. 018uF 50V CKSQYB183K50
C131	FX610950	C. CE. CHP	0. 1uF 50V CKSQYB104K25
C132	FX610910	C. CE. CHP	430pF 50V CCSQCH431J50
C133	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C134	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C135	FX610190	C. CE. CHP	3300pF 50V CKSQYB332K50
C136	FX611080	C. CE. CHP	0. 022uF 50V CKSQYB223K50
C137	FX610280	C. CE. CHP	68pF 50V CCSQCH680J50
C138	FX610800	C. EL	47uF 10V CEAL470M10
C139	FX610800	C. EL	47uF 10V CEAL470M10
C140	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C141	FX610200	C. CE. CHP	4700pF 50V CKSQYB472K50
C142	FX611080	C. CE. CHP	0. 022uF 50V CKSQYB223K50
C143	FX610260	C. CE. CHP	180pF 50V CCSQCH181J50
C144	FX611060	C. CE. CHP	0. 47uF 16V CKSQYF474Z16
UIT5	FX610920	C. CE. CHP	100pF 50V CCSQSL101J50
C146	FX610430	C. EL	100uF 10V CEAS101M10
C147	FX610970	C. CE. CHP	0. 015uF 50V CKSQYB153K50
C148	FX610190	C. CE. CHP	3300pF 50V CKSQYB332K50
C149	FX610190	C. CE. CHP	3300pF 50V CKSQYB332K50
C150	FX610430	C. EL	100uF 10V CEAS101M10
C151	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C152	FX610190	C. CE. CHP	3300pF 50V CKSQYB332K50
C153	FX610430	C. EL	100uF 10V CEAS101M10
C154	FX610480	C. EL	47uF 10V CEAS470M10
C155	FX610920	C. CE. CHP	100pF 50V CCSQSL101J50
C156	FX610480	C. EL	47uF 10V CEAS470M10

* New Parts

Schm Ref.	PART NO.	Description	Remarks
C157	FX610920	C. CE. CHP	100pF 50V CCSQSL101J50
C158	FX611080	C. CE. CHP	0. 022uF 50V CKSQYB223K50
C159	FX610950	C. CE. CHP	0. 1uF 50V CKSQYB104K25
C160	FX611080	C. CE. CHP	0. 022uF 50V CKSQYB223K50
C161	FX610950	C. CE. CHP	0. 1uF 50V CKSQYB104K25
C162	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C164	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C165	FX610940	C. CE. CHP	0. 01uF 50V CKSQYB103K50
C166	FX610940	C. CE. CHP	0. 01uF 50V CKSQYB103K50
C167	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C168	FX610390	C. EL	100uF 6. 3V CEAL101M6R3
C170	FX610480	C. EL	47uF 10V CEAS470M10
C171	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C172	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C173	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C174	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C175	FX610190	C. CE. CHP	3300pF 50V CKSQYB332K50
C176	FX611080	C. CE. CHP	0. 022uF 50V CKSQYB223K50
C177	FX610280	C. CE. CHP	68pF 50V CCSQCH680J50
C178	FX610480	C. EL	47uF 10V CEAS470M10
C179	FX610480	C. EL	47uF 10V CEAS470M10
C180	FX611030	C. CE. CHP	0. 1uF 50V CKSQYF104Z50
C181	FX611030	C. CE. CHP	0. 1uF 50V CKSQYF104Z50
C182	FX611060	C. CE. CHP	0. 47uF 16V CKSQYF474Z16
C185	FX610240	C. CE. CHP	100pF 50V CCSQCH101J50
C186	FX610240	C. CE. CHP	100pF 50V CCSQCH101J50
C187	FX610240	C. CE. CHP	100pF 50V CCSQCH101J50
C188	FX610240	C. CE. CHP	100pF 50V CCSQCH101J50
C189	FX611030	C. CE. CHP	0. 1uF 50V CKSQYF104Z50
C201	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C202	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
CN101	LX609620	CN	KR B3BPHE
CN102	LX609840	CN	3P B3BEH
CN104	LX609610	CN	KR B2BPHKS
CN105	LX609700	CN	20P BTFN20P3RD7
D101	iX635430	DIODE	1SS355 1SS355
D102	iX635430	DIODE	1SS355 1SS355
D103	iX635440	DIOD. Z. CHP	DTZ5. 6B/C DTZ5. 6B/C
D104	iX635440	DIOD. Z. CHP	DTZ5. 6B/C DTZ5. 6B/C
D105	iX634230	DIODE. CHP	DA204K DA204K
D106	iX635430	DIODE	1SS355 1SS355
D107	iX634260	DIOD. Z. CHP	DTZ4. 7B/C DTZ4. 7B/C
D108	iX634260	DIOD. Z. CHP	DTZ4. 7B/C DTZ4. 7B/C
D109	iX634260	DIOD. Z. CHP	DTZ4. 7B/C DTZ4. 7B/C
D110	iX634260	DIOD. Z. CHP	DTZ4. 7B/C DTZ4. 7B/C
IC101	iX634500	IC	BA4560F BA4560F
IC102	iX634500	IC	BA4560F BA4560F
IC103	iX635090	IC	BU4052BCF BU4052BCF
IC104	iX635100	IC	BU4551BF BU4551BF
IC105	iX634500	IC	BA4560F BA4560F
IC106	iX634500	IC	BA4560F BA4560F
IC107	iX634500	IC	BA4560F BA4560F
IC108	iX634500	IC	BA4560F BA4560F

* New Parts

P. C. B. BBKB, MACB, FLKB, FLKY & MJBA

Schm Ref.	PART NO.	Description	Remarks
IC109	iX635270	IC	TC74HC157AF TC74HC157AF
IC110	iX635230	IC	PDQ001A PDQ001A
IC111	iX635120	IC	LH5P832N12 LH5P832N12
IC112	iX634500	IC	BA4560F BA4560F
IC113	iX634500	IC	BA4560F BA4560F
IC201	iX634500	IC	BA4560F BA4560F
L102	GX609190	COIL	LFA100J
Q101	iX635480	TR. CHP	2SD2114K 2SD2114K
Q102	iX635480	TR. CHP	2SD2114K 2SD2114K
Q103	iX635480	TR. CHP	2SD2114K 2SD2114K
Q104	iX635550	TR. DGT	UN2212 UN2212
Q105	iX635550	TR. DGT	UN2212 UN2212
	AX622970	SCR. TERM	VNE1948
	(NSP)	ASS'Y	MACB VVM1535
CN101	LX609480	CN	12P 520441245
D101	iX635630	PHOT. INTR	GP1S24 GP1S24
S101	KX604510	SW. PUSH	DSG1017
S102	KX604510	SW. PUSH	DSG1017
S103	KX604510	SW. PUSH	DSG1017
S104	KX604510	SW. PUSH	DSG1017
S105	KX604510	SW. PUSH	DSG1017
S111	KX604510	SW. PUSH	DSG1017
S112	KX604510	SW. PUSH	DSG1017
	NX614630	P. W. B.	(WITHOUT PARTS) VNP1479
	(NSP)	ASS'Y	FLKB VVM1625
CN201	LX609560	CN	13P 524921320
D201	iX635330	LED (ye)	SLR-342YC3F SLR342YC3F
D202	iX635330	LED (ye)	SLR-342YC3F SLR342YC3F
D203	VR745300	LED (grn)	SLR-342MC3F SLR342MC3F
D204	VR745300	LED (grn)	SLR-342MC3F SLR342MC3F
Q201	iX635550	TR. DGT	UN2212 UN2212
Q202	iX635550	TR. DGT	UN2212 UN2212
Q203	iX635550	TR. DGT	UN2212 UN2212
Q204	iX635550	TR. DGT	UN2212 UN2212
S201	KX604330	SW. TACT	RSG1030
S202	KX604330	SW. TACT	RSG1030
S203	KX604330	SW. TACT	RSG1030
S204	KX604330	SW. TACT	RSG1030
S205	KX604470	SW. TACT	RSG1034
S206	KX604330	SW. TACT	RSG1030
S207	KX604470	SW. TACT	RSG1034
S208	KX604470	SW. TACT	RSG1034
S211	KX604330	SW. TACT	RSG1030
S290	KX604330	SW. TACT	RSG1030
S291	KX604470	SW. TACT	RSG1034
	CX676210	SUPRT. PCB	VEF1040
	NX614610	P. W. B. FLKB	(WITHOUT PART) VNP1495

* New Parts

Schm Ref.	PART NO.	Description	Remarks
	NX614510	P. C. B.	FLKY VVG1689
C101	FX610810	C. EL	47uF 6.3V CEAL470M6R3
C102	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C103	FX610320	C. CE. CHP	0.022uF 50V CKSQYF223Z50
C104	FX610370	C. EL	10uF 16V CEAL100M16
C105	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C106	FX610370	C. EL	10uF 16V CEAL100M16
CN101	LX609580	CN	22P 524922220
CN102	LX609560	CN	13P 524921320
D101	iX635420	DIODE	1SS353 1SS353
D102	iX635420	DIODE	1SS353 1SS353
D103	iX635420	DIODE	1SS353 1SS353
D104	iX635420	DIODE	1SS353 1SS353
D105	iX635420	DIODE	1SS353 1SS353
D106	iX635430	DIODE	1SS355 1SS355
D107	iX635340	LED (ye)	SLR-342YCT31 SLR342YCT31
D108	iX635310	LED (grn)	SLR-342MCT31 SLR342MCT31
D109	iX635310	LED (grn)	SLR-342MCT31 SLR342MCT31
D110	iX635320	LED (rd)	SLR-342VCT31 SLR342VCT31
D111	iX635430	DIODE	1SS355 1SS355
D112	iX635430	DIODE	1SS355 1SS355
IC101	iX635190	IC	PD3304B PD3304B
IC102	iX634470	IC	S-806D, RESET S806D
Q101	iX635550	TR. DGT	UN2212 UN2212
Q102	iX635540	TR. DGT	UN2112 UN2112
Q103	iX635550	TR. DGT	UN2212 UN2212
Q104	iX635550	TR. DGT	UN2212 UN2212
Q105	iX635530	TR. DGT	DTC114EK DTC114EK
Q106	iX635520	TR. DGT	DTA144EK DTA144EK
Q107	iX635550	TR. DGT	UN2212 UN2212
S101	KX604330	SW. TACT	RSG1030
S102	KX604330	SW. TACT	RSG1030
S103	KX604330	SW. TACT	RSG1030
S104	KX604330	SW. TACT	RSG1030
S105	KX604330	SW. TACT	RSG1030
S106	KX604330	SW. TACT	RSG1030
V101	iX635680	FL. DSPLY	VAW1035 VAW1035
VR101	HX609250	VR	10KBΩ VCS1037
X101	QX600890	RSNR. CRY	EFOEC8004A4
	iX635660	L. DTCT	GP1U58X GP1U58X
	CX676420	SPACER	VEC1599
	CX678160	FL. HOLDER	VNF1087
	NX614540	P. C. B.	MJBA VVV1406
C401	FX610430	C. EL	100uF 10V CEAS101M10
C421	FX611070	C. CE. CHP	1uF 16V CKSYF105Z16
C422	FX611070	C. CE. CHP	1uF 16V CKSYF105Z16
C502	FX610960	C. CE. CHP	1500pF 50V CKSQYB152K50
C503	FX610870	C. EL	2.2uF 50V CEJA2R2M50
C504	FX611010	C. CE. CHP	680pF 50V CKSQYB681K50
C505	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25

* New Parts

P. C. B. MJBA & MOTHER

Schm Ref.	PART NO.	Description	Remarks
C506	FX610210	C. CE. CHP	0. 1uF 50V CKSQYF104Z25
C507	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C508	FX610960	C. CE. CHP	1500pF 50V CKSQYB152K50
C509	FX610870	C. EL	2. 2uF 50V CEJA2R2M50
C510	FX611010	C. CE. CHP	680pF 50V CKSQYB681K50
C511	FX611020	C. CE. CHP	68000pF 25V CKSQYB683K25
C512	FX610240	C. CE. CHP	100pF 50V CCSQCH101J50
C514	FX610210	C. CE. CHP	0. 1uF 50V CKSQYF104Z25
C515	FX610210	C. CE. CHP	0. 1uF 50V CKSQYF104Z25
C516	FX611070	C. CE. CHP	1uF 16V CKSYF105Z16
C517	FX611070	C. CE. CHP	1uF 16V CKSYF105Z16
CN401	LX609810	CN	2mm BTMK07P1R
CN402	LX609500	CN	7P 520450745
CN501	LX609720	CN	2mm BTMK07S1S
D401	iX635430	DIODE	1SS355 1SS355
IC501	iX635150	IC	NJM4565M NJM4565M
IC502	iX634500	IC	BA4560F BA4560F
J501	LX609880	JACK. PHONE	RKB1014
J502	LX609880	JACK. PHONE	RKB1014
L401	GX609190	COIL	LFA100J
L501	GX609210	COIL	LFA470J
L502	GX609190	COIL	LFA100J
L503	GX609190	COIL	LFA100J
VR501	HX609240	VR	10KBΩ VCS1036
VR502	HX609240	VR	10KBΩ VCS1036
	NX614580	P. C. B.	MOTHER VWS1212
C101	FX610480	C. EL	47uF 10V CEAS470M10
C102	FX610210	C. CE. CHP	0. 1uF 50V CKSQYF104Z25
C103	FX610210	C. CE. CHP	0. 1uF 50V CKSQYF104Z25
C105	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C106	FX610120	C. CE. CHP	33pF 50V CCSQCH330J50
C107	FX610120	C. CE. CHP	33pF 50V CCSQCH330J50
C110	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C151	FX610210	C. CE. CHP	0. 1uF 50V CKSQYF104Z25
C159	FX610070	C. CE. CHP	10pF 50V CCSQCH100D50
C160	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C161	FX610090	C. CE. CHP	150pF 50V CCSQCH151J50
C162	FX610350	C. CE. CHP	220pF 50V CCSQCH221J50
C196	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C197	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C198	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C213	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C214	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C215	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C225	FX610400	C. EL	47uF 16V CEAL470M16
C226	FX610400	C. EL	47uF 16V CEAL470M16
C227	FX610410	C. EL	1uF 50V CEAS010M50
C228	FX610420	C. EL	10uF 50V CEAS100M50
C231	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C232	FX610340	C. CE. CHP	22pF 50V CCSQCH220J50

* New Parts

Schm Ref.	PART NO.	Description	Remarks
C234	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C240	FX610420	C. EL	10uF 50V CEAS100M50
C241	FX610420	C. EL	10uF 50V CEAS100M50
C251	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C252	FX610480	C. EL	47uF 10V CEAS470M10
C253	FX610480	C. EL	47uF 10V CEAS470M10
C254	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C255	FX610490	C. EL	470uF 10V CEAS471M10
C256	FX610480	C. EL	47uF 10V CEAS470M10
C257	FX610490	C. EL	470uF 10V CEAS471M10
C258	FX610240	C. CE. CHP	100pF 50V CCSQCH101J50
C259	FX610240	C. CE. CHP	100pF 50V CCSQCH101J50
C260	FX610140	C. CE. CHP	47pF 50V CCSQCH470J50
C261	FX610140	C. CE. CHP	47pF 50V CCSQCH470J50
C262	FX610140	C. CE. CHP	47pF 50V CCSQCH470J50
C263	FX610140	C. CE. CHP	47pF 50V CCSQCH470J50
C270	FX610480	C. EL	47uF 10V CEAS470M10
C271	FX610480	C. EL	47uF 10V CEAS470M10
C274	FX610400	C. EL	47uF 16V CEAL470M16
C275	FX610400	C. EL	47uF 16V CEAL470M16
C278	FX611130	C. MYLAR	1800pF 50V CQMA182J50
C281	FX610410	C. EL	1uF 50V CEAS010M50
C282	FX611130	C. MYLAR	1800pF 50V CQMA182J50
C284	FX610210	C. CE. CHP	0. 1uF 50V CKSQYF104Z25
C285	FX610210	C. CE. CHP	0. 1uF 50V CKSQYF104Z25
C286	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C288	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C305	FX610210	C. CE. CHP	0. 1uF 50V CKSQYF104Z25
C351	FX610130	C. CE. CHP	39pF 50V CCSQCH390J50
C352	FX610100	C. CE. CHP	18pF 50V CCSQCH180J50
C353	FX610090	C. CE. CHP	150pF 50V CCSQCH151J50
C354	FX610120	C. CE. CHP	33pF 50V CCSQCH330J50
C355	FX610200	C. CE. CHP	4700pF 50V CKSQYB472K50
C356	FX610200	C. CE. CHP	4700pF 50V CKSQYB472K50
C357	FX610200	C. CE. CHP	4700pF 50V CKSQYB472K50
C358	FX610200	C. CE. CHP	4700pF 50V CKSQYB472K50
C359	FX611040	C. CE. CHP	0. 22uF 50V CKSQYF224Z25
C360	FX611040	C. CE. CHP	0. 22uF 50V CKSQYF224Z25
C361	FX610300	C. CE. CHP	3900pF 50V CKSQYB392K50
C362	FX610300	C. CE. CHP	3900pF 50V CKSQYB392K50
C363	FX610480	C. EL	47uF 10V CEAS470M10
C364	FX610430	C. EL	100uF 10V CEAS101M10
C365	FX610210	C. CE. CHP	0. 1uF 50V CKSQYF104Z25
C366	FX610210	C. CE. CHP	0. 1uF 50V CKSQYF104Z25
C367	FX610370	C. EL	10uF 16V CEAL100M16
C368	FX610510	C. EL	0. 47uF 50V CEASR47M50
C369	FX610480	C. EL	47uF 10V CEAS470M10
C370	FX610240	C. CE. CHP	100pF 50V CCSQCH101J50
C371	FX610110	C. CE. CHP	27pF 50V CCSQCH270J50
C372	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C373	FX610310	C. CE. CHP	0. 01uF 50V CKSQYF103Z50
C374	FX610160	C. CE. CHP	82pF 50V CCSQCH820J50
C375	FX610280	C. CE. CHP	68pF 50V CCSQCH680J50

* New Parts

P. C. B. MOTHER

Schm Ref.	PART NO.	Description	Remarks
C376	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C377	FX610200	C. CE. CHP	4700pF 50V CKSQYB472K50
C391	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C412	FX610400	C. EL	47uF 16V CEAL470M16
C413	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C415	FX610330	C. CE. CHP	15pF 50V CCSQCH150J50
C416	FX610250	C. CE. CHP	120pF 50V CCSQCH121J50
C417	FX610350	C. CE. CHP	220pF 50V CCSQCH221J50
C418	FX610330	C. CE. CHP	15pF 50V CCSQCH150J50
C419	FX610110	C. CE. CHP	27pF 50V CCSQCH270J50
C420	FX610070	C. CE. CHP	10pF 50V CCSQCH100D50
C421	FX610070	C. CE. CHP	10pF 50V CCSQCH100D50
C422	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C423	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C424	FX610430	C. EL	100uF 10V CEAS101M10
C425	FX610130	C. CE. CHP	39pF 50V CCSQCH390J50
C433	FX610110	C. CE. CHP	27pF 50V CCSQCH270J50
C434	FX610080	C. CE. CHP	12pF 50V CCSQCH120J50
C435	FX610120	C. CE. CHP	33pF 50V CCSQCH330J50
C436	FX610060	C. CE. CHP	7pF 50V CCSQCH070D50
C437	FX610080	C. CE. CHP	12pF 50V CCSQCH120J50
C438	FX610070	C. CE. CHP	10pF 50V CCSQCH100D50
C439	FX610370	C. EL	10uF 16V CEAL100M16
C450	FX610790	C. EL	47uF 6.3V CEALNP470M6R3
C451	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C452	FX610120	C. CE. CHP	33pF 50V CCSQCH330J50
C453	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C454	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C457	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C458	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C460	FX610290	C. CE. CHP	91pF 50V CCSQCH910J50
C462	FX610290	C. CE. CHP	91pF 50V CCSQCH910J50
C464	FX610140	C. CE. CHP	47pF 50V CCSQCH470J50
C465	FX610230	C. CE. CHP	0.047uF 25V CKSQYF473Z25
C466	FX610070	C. CE. CHP	10pF 50V CCSQCH100D50
C467	FX610110	C. CE. CHP	27pF 50V CCSQCH270J50
C468	FX610140	C. CE. CHP	47pF 50V CCSQCH470J50
C474	FX610080	C. CE. CHP	12pF 50V CKSQYF104Z25
C475	FX610330	C. CE. CHP	15pF 50V CCSQCH150J50
C476	FX610130	C. CE. CHP	39pF 50V CCSQCH390J50
C479	FX611120	C. MYLAR	0.15uF 50V CQMA154J50
C483	FX611160	C. MYLAR	0.068uF 50V CQMA683J50
C484	FX610400	C. EL	47uF 16V CEAL470M16
C485	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C490	FX610170	C. CE. CHP	1000pF 50V CKSQYB102K50
C491	FX610400	C. EL	47uF 16V CEAL470M16
C492	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C493	FX610480	C. EL	47uF 10V CEAS470M10
C494	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C530	FX610480	C. EL	47uF 10V CEAS470M10
C531	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C532	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C533	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50

* New Parts

Schm Ref.	PART NO.	Description	Remarks
C534	FX610480	C. EL	47uF 10V CEAS470M10
C538	FX610480	C. EL	47uF 10V CEAS470M10
C539	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C550	FX610480	C. EL	47uF 10V CEAS470M10
C551	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C552	FX610100	C. CE. CHP	18pF 50V CCSQCH180J50
C553	FX610120	C. CE. CHP	33pF 50V CCSQCH330J50
C561	FX610280	C. CE. CHP	68pF 50V CCSQCH680J50
C562	FX610050	C. CE. CHP	5pF 50V CCSQCH050C50
C563	FX610120	C. CE. CHP	33pF 50V CCSQCH330J50
C570	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C571	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C572	FX610480	C. EL	47uF 10V CEAS470M10
C574	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C577	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C578	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C579	FX610340	C. CE. CHP	22pF 50V CCSQCH220J50
C580	FX610120	C. CE. CHP	33pF 50V CCSQCH330J50
C581	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C582	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C583	FX610070	C. CE. CHP	10pF 50V CCSQCH100D50
C585	FX610400	C. EL	47uF 16V CEAL470M16
C587	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C588	FX610400	C. EL	47uF 16V CEAL470M16
C589	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C591	FX610350	C. CE. CHP	220pF 50V CCSQCH221J50
C592	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C641	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C801	FX610480	C. EL	47uF 10V CEAS470M10
C802	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C803	FX610480	C. EL	47uF 10V CEAS470M10
C804	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C806	FX610280	C. CE. CHP	68pF 50V CCSQCH680J50
C807	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C808	FX610230	C. CE. CHP	0.047uF 25V CKSQYF473Z25
C809	FX610060	C. CE. CHP	7pF 50V CCSQCH070D50
C810	FX610240	C. CE. CHP	100pF 50V CCSQCH101J50
C811	FX610060	C. CE. CHP	7pF 50V CCSQCH070D50
C812	FX610090	C. CE. CHP	150pF 50V CCSQCH151J50
C813	FX610340	C. CE. CHP	22pF 50V CCSQCH220J50
C814	FX610160	C. CE. CHP	82pF 50V CCSQCH820J50
C815	FX610230	C. CE. CHP	0.047uF 25V CKSQYF473Z25
C821	FX610470	C. EL	22uF 25V CEAS220M25
C831	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C832	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C833	FX610480	C. EL	47uF 10V CEAS470M10
C834	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C835	FX610310	C. CE. CHP	0.01uF 50V CKSQYF103Z50
C836	FX610400	C. EL	47uF 16V CEAL470M16
C837	FX610320	C. CE. CHP	0.022uF 50V CKSQYF223Z50
C838	FX610790	C. EL	47uF 6.3V CEALNP470M6R3
C840	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25
C841	FX610210	C. CE. CHP	0.1uF 50V CKSQYF104Z25

* New Parts

P. C. B. MOTHER

Schm Ref.	PART NO.	Description	Remarks	
C842	FX610480	C. EL	47uF	10V CEAS470M10
C843	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C844	FX610400	C. EL	47uF	16V CEAL470M16
C845	FX610850	C. EL	2.2uF	50V CEAS2R2M50
C846	FX610240	C. CE. CHP	100pF	50V CCSQCH101J50
C847	FX610210	C. CE. CHP	0.1uF	50V CKSQYF104Z25
C848	FX610240	C. CE. CHP	100pF	50V CCSQCH101J50
C850	FX610820	C. EL	4.7uF	50V CEAL4R7M50
C870	FX610820	C. EL	4.7uF	50V CEAL4R7M50
C871	FX610880	C. EL	10uF	16V VCH1152
C872	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C873	FX610210	C. CE. CHP	0.1uF	50V CKSQYF104Z25
C874	FX610210	C. CE. CHP	0.1uF	50V CKSQYF104Z25
C875	FX610230	C. CE. CHP	0.047uF	25V CKSQYF473Z25
C876	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C877	FX610230	C. CE. CHP	0.047uF	25V CKSQYF473Z25
C888	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C891	FX610170	C. CE. CHP	1000pF	50V CKSQYB102K50
C892	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C893	FX610480	C. EL	47uF	10V CEAS470M10
C894	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C895	FX610640	C. EL	100uF	6.3V CEJA101M6R3
C896	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C901	FX610210	C. CE. CHP	0.1uF	50V CKSQYF104Z25
C902	FX610850	C. EL	2.2uF	50V CEAS2R2M50
C903	FX610690	C. MYLAR	2200pF	50V CQMA22J50
C904	FX610410	C. EL	1uF	50V CEAS010M50
C905	FX611040	C. CE. CHP	0.22uF	50V CKSQYF224Z25
C907	FX610170	C. CE. CHP	1000pF	50V CKSQYB102K50
C908	FX611120	C. MYLAR	0.15uF	50V CQMA154J50
C909	FX610200	C. CE. CHP	4700pF	50V CKSQYB472K50
C910	FX610210	C. CE. CHP	0.1uF	50V CKSQYF104Z25
C911	FX610210	C. CE. CHP	0.1uF	50V CKSQYF104Z25
C912	FX610210	C. CE. CHP	0.1uF	50V CKSQYF104Z25
C913	FX610510	C. EL	0.47uF	50V CEAS47M50
C914	FX610170	C. CE. CHP	1000pF	50V CKSQYB102K50
C915	FX610210	C. CE. CHP	0.1uF	50V CKSQYF104Z25
C917	FX610640	C. EL	100uF	6.3V CEJA101M6R3
C918	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C919	FX610190	C. CE. CHP	3300pF	50V CKSQYB332K50
C920	FX611100	C. MYLAR	0.1uF	50V CQMA104J50
C921	FX610320	C. CE. CHP	0.022uF	50V CKSQYF223Z50
C922	FX610470	C. EL	22uF	25V CEAS220M25
C923	FX611160	C. MYLAR	0.068uF	50V CQMA683J50
C924	FX610230	C. CE. CHP	0.047uF	25V CKSQYF473Z25
C925	FX610230	C. CE. CHP	0.047uF	25V CKSQYF473Z25
C926	FX610850	C. EL	2.2uF	50V CEAS2R2M50
C927	FX610480	C. EL	47uF	10V CEAS470M10
C928	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C929	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C930	FX610320	C. CE. CHP	0.022uF	50V CKSQYF223Z50
C931	FX610110	C. CE. CHP	27pF	50V CCSQCH270J50
C932	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50

* New Parts

Schm Ref.	PART NO.	Description	Remarks	
C933	FX610480	C. EL	47uF	10V CEAS470M10
C934	FX611150	C. MYLAR	680pF	50V CQMA681J50
C935	FX610350	C. CE. CHP	220pF	50V CCSQCH221J50
C936	FX610170	C. CE. CHP	1000pF	50V CKSQYB102K50
C937	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C938	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C941	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C942	FX611090	C. MYLAR	0.01uF	50V CQMA103J50
C943	FX610510	C. EL	0.47uF	50V CEAS47M50
C944	FX610240	C. CE. CHP	100pF	50V CCSQCH101J50
C950	FX610340	C. CE. CHP	22pF	50V CCSQCH220J50
C951	FX611040	C. CE. CHP	0.22uF	50V CKSQYF224Z25
C961	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C962	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C964	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C967	FX610470	C. EL	22uF	25V CEAS220M25
C968	FX610540	C. EL	22uF	50V CEHAQ220M50
C971	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C972	FX610600	C. EL	22uF	10V CEANP220M10
C973	FX611140	C. MYLAR	0.22uF	50V CQMA224J50
C974	FX610480	C. EL	47uF	10V CEAS470M10
C975	FX610480	C. EL	47uF	10V CEAS470M10
C976	FX610210	C. CE. CHP	0.1uF	50V CKSQYF104Z25
C981	FX610210	C. CE. CHP	0.1uF	50V CKSQYF104Z25
C982	FX610310	C. CE. CHP	0.01uF	50V CKSQYF103Z50
C983	FX610210	C. CE. CHP	0.1uF	50V CKSQYF104Z25
C987	FX610540	C. EL	22uF	50V CEHAQ220M50
CN102	LX609530	CN	21P	520452145
CN103	LX609550	CN	23P	522332310
CN104	LX609540	CN	22P	520452245
CN105	LX609500	CN	7P	520450745
CN106	LX608810	CN	11P	B11PSHF1AA
CN108	LX609510	CN	12P	520451245
CN110	LX609710	CN	2mm	BTFN20S3SB7
CN113	LX609690	CN	12P	BTFN12S3SB7
CN201	LX609620	CN	KR	B3BPHKE
CN202	LX609840	CN	3P	B3BEH
CN203	LX609710	CN	2mm	BTFN20S3SB7
D110	VG437400	DIODE. ZENR	MTZJ5.1B 5.1V	MTZJ5.1B
D180	iX634180	DIODE	1SS254	1SS254
D201	iX635610	DIODE. VAR	KV1851	KV1851
D202	iX634150	DIODE. SHOT	11EQS06	11EQS06
D205	iX634180	DIODE	1SS254	1SS254
D206	iX634180	DIODE	1SS254	1SS254
D207	iX634180	DIODE	1SS254	1SS254
D208	iX634180	DIODE	1SS254	1SS254
D801	iX634180	DIODE	1SS254	1SS254
D802	iX635430	DIODE	1SS355	1SS355
D901	iX634180	DIODE	1SS254	1SS254
D902	iX634180	DIODE	1SS254	1SS254
D905	iX634180	DIODE	1SS254	1SS254
D963	iX634180	DIODE	1SS254	1SS254
F501	GX609240	FLTR	14.3MHz	VTF1055

* New Parts

P. C. B. MOTHER

Schm Ref.	PART NO.	Description	Remarks
F575	iX635060	FLTR	VTH1005
IC101	iX635180	IC	PD0212B PD0212B
IC201	iX633960	IC	PD2026B(L), D/A PD2026BL
IC202	iX634500	IC	BA4560F BA4560F
IC206	iX634060	IC	NJM78L08A NJM78L08A
IC207	iX634070	IC	NJM79L08A NJM79L08A
IC351	iX634100	IC	CA0002AM CA0002AM
IC400	iX635160	IC	PAC005B PAC005B
IC500	iX635170	IC	PD0192A, D-VIDE PD0192A
IC501	XJ018A00	IC	TC7S04F TC7S04F
IC801	iX634440	IC	PAC002A PAC002A
IC802	iX635110	IC	LC78681KE LC78681KE
IC803	iX634410	IC	LA6510L LA6510
IC804	XL545A00	IC	TC4W53F TC4W53F
IC901	iX634130	IC	PAC003A, SERVO PAC003A
IC902	iX635260	IC	TA8410AK TA8410AK
IC903	iX634500	IC	BA4560F BA4560F
IC904	iX634110	IC	BA10393F BA10393F
IC905	iX634500	IC	BA4560F BA4560F
J1	LX609740	CN	PF02NNC07
J6	LX608990	JACK. PIN	4P VKB1065
J8	NX614690	L. EMT	GP1F32T GP1F32T
J15	LX609860	JACK. PIN	1P VKB1077
K101	AX622740	METAL. GND	VNF1084
K102	AX622740	METAL. GND	VNF1084
L202	GX608920	COIL	LAU220J
L204	GX608920	COIL	LAU220J
L205	GX608920	COIL	LAU220J
L351	GX608840	COIL	LAU181J
L352	GX608920	COIL	LAU220J
L410	GX608830	COIL	LAU101J
L411	GX608850	COIL	LAU270J
L412	GX608920	COIL	LAU220J
L413	GX608820	COIL	LAU100J
L414	GX609180	COIL	LAU8R2J
L420	GX609170	COIL	LAU430J
L421	GX609170	COIL	LAU430J
L460	GX608980	COIL	LFA561J
L461	GX608920	COIL	LAU220J
L462	GX608890	COIL	LAU560J
L470	GX608920	COIL	LAU220J
L571	GX608850	COIL	LAU270J
L580	GX609170	COIL	LAU430J
L800	GX608920	COIL	LAU220J
L801	GX608920	COIL	LAU220J
L802	GX608840	COIL	LAU181J
L803	GX608840	COIL	LAU181J
L804	GX608840	COIL	LAU181J
Q102	iX635450	TR. CHP	2PB709A 2PB709A
Q103	iX635550	TR. DGT	UN2212 UN2212
Q152	iX634370	TR	2SC3802K 2SC3802K
Q201	iX635460	TR. CHP	2PD601A 2PD601A
Q202	iX635460	TR. CHP	2PD601A 2PD601A

* New Parts

Schm Ref.	PART NO.	Description	Remarks
Q204	iX634400	TR	2SD2144S 2SD2144S
Q205	iX634400	TR	2SD2144S 2SD2144S
Q206	iX635550	TR. DGT	UN2212 UN2212
Q207	iX635550	TR. DGT	UN2212 UN2212
Q208	iX635540	TR. DGT	UN2112 UN2112
Q209	iX635540	TR. DGT	UN2112 UN2112
Q210	iX635540	TR. DGT	UN2112 UN2112
Q211	iX635540	TR. DGT	UN2112 UN2112
Q212	iX635540	TR. DGT	UN2112 UN2112
Q221	iX635540	TR. DGT	UN2112 UN2112
Q391	iX635460	TR. CHP	2PD601A 2PD601A
Q392	iX635540	TR. DGT	UN2112 UN2112
Q393	iX635460	TR. CHP	2PD601A 2PD601A
Q394	iX635460	TR. CHP	2PD601A 2PD601A
Q411	iX634490	TR. CHP	2SC2412K 2SC2412K
Q451	iX635460	TR. CHP	2PD601A 2PD601A
Q475	iX635460	TR. CHP	2PD601A 2PD601A
Q803	iX634490	TR. CHP	2SC2412K 2SC2412K
Q805	iX635460	TR. CHP	2PD601A 2PD601A
Q834	iX635560	TR	2SA854S 2SA854S
Q840	iX635460	TR. CHP	2PD601A 2PD601A
Q901	iX635550	TR. DGT	UN2212 UN2212
Q903	iX635460	TR. CHP	2PD601A 2PD601A
Q904	iX635460	TR. CHP	2PD601A 2PD601A
Q907	iX635460	TR. CHP	2PD601A 2PD601A
Q908	iX635460	TR. CHP	2PD601A 2PD601A
Q910	iX635550	TR. DGT	UN2212 UN2212
Q915	iX635460	TR. CHP	2PD601A 2PD601A
Q916	iX635450	TR. CHP	2PB709A 2PB709A
Q917	iX635460	TR. CHP	2PD601A 2PD601A
Q918	iX635540	TR. DGT	UN2112 UN2112
R490	Vi197400	R. MTL. CHP	10KΩ 1/10W RN1/10SE103D
R879	Vi198600	R. MTL. CHP	33KΩ 1/10W RN1/10SE333D
R880	HX609130	R. MTL. CHP	100KΩ 1/10W RN1/10SE104D
R881	Vi199000	R. MTL. CHP	47KΩ 1/10W RN1/10SE473D
R882	Vi199000	R. MTL. CHP	47KΩ 1/10W RN1/10SE473D
R883	HX609130	R. MTL. CHP	100KΩ 1/10W RN1/10SE104D
R986	Vi198600	R. MTL. CHP	33KΩ 1/10W RN1/10SE333D
R987	Vi197400	R. MTL. CHP	10KΩ 1/10W RN1/10SE103D
R989	Vi197400	R. MTL. CHP	10KΩ 1/10W RN1/10SE103D
R990	Vi198600	R. MTL. CHP	33KΩ 1/10W RN1/10SE333D
S12	KX604320	SW. SLIDE	VSH1009
V901	FX609840	C. TRIM	20p VCM008
VR450	HX609280	VR	PCP1025
VR603	HX609290	VR	PCP1028
VR604	HX609300	VR	PCP1031
VR607	HX609300	VR	PCP1031
VR608	HX609300	VR	PCP1031
VR612	HX609300	VR	PCP1031
X101	QX600830	RSNR. CRYST	VSS1040
X201	QX600800	RSNR. CRYST	16MHz VSS1057
X550	QX600900	RSNR. CRYST	VSS1073
	AX622970	SCR. TERM	VNE1948

* New Parts

P. C. B. MOTHER & MYCB

Schm Ref.	PART NO.	Description	Remarks		
	CX676210	SUPRT.PCB			VEF1040
	NX614550	P. C. B.	MYCB		VWV1412
C102	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C103	FX610480	C. EL	47uF	10V	CEAS470M10
C104	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C106	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C108	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C109	FX610480	C. EL	47uF	10V	CEAS470M10
C110	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C111	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C112	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C113	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C203	FX610340	C. CE. CHP	22pF	50V	CCSQCH220J50
C212	FX610480	C. EL	47uF	10V	CEAS470M10
C213	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C216	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C301	FX610170	C. CE. CHP	1000pF	50V	CKSQYB102K50
C302	FX610480	C. EL	47uF	10V	CEAS470M10
C303	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C304	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C305	FX610480	C. EL	47uF	10V	CEAS470M10
C306	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C307	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C308	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C309	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C310	FX610480	C. EL	47uF	10V	CEAS470M10
C311	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C312	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C313	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C314	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C315	FX610480	C. EL	47uF	10V	CEAS470M10
C316	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C323	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C401	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C402	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C403	FX610340	C. CE. CHP	22pF	50V	CCSQCH220J50
C404	FX610900	C. CE. CHP	6pF	50V	CCSQCH060D50
C405	FX610150	C. CE. CHP	56pF	50V	CCSQCH560J50
C406	FX610340	C. CE. CHP	22pF	50V	CCSQCH220J50
C408	FX610480	C. EL	47uF	10V	CEAS470M10
C409	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C410	FX610480	C. EL	47uF	10V	CEAS470M10
C411	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C412	FX610290	C. CE. CHP	91pF	50V	CCSQCH910J50
C413	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C414	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C415	FX610330	C. CE. CHP	15pF	50V	CCSQCH150J50
C416	FX610310	C. CE. CHP	0.01uF	50V	CKSQYF103Z50
C417	FX610310	C. CE. CHP	0.01uF	50V	CKSQYF103Z50
C418	FX610310	C. CE. CHP	0.01uF	50V	CKSQYF103Z50

* New Parts

Schm Ref.	PART NO.	Description	Remarks		
C419	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C420	FX610860	C. EL	33uF	16V	CEAS330M16
C421	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C422	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C423	FX610480	C. EL	47uF	10V	CEAS470M10
C424	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C425	FX610480	C. EL	47uF	10V	CEAS470M10
C426	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C429	FX610210	C. CE. CHP	0.1uF	50V	CKSQYF104Z25
C432	FX610130	C. CE. CHP	39pF	50V	CCSQCH390J50
CN101	LX609700	CN	20P		BTFN20P3RD7
CN102	LX609680	CN	12P		BTFN12P3RD7
CN103	LX609610	CN	KR		B2BPHKS
IC101	iX635280	IC	uPD42280V30		UPD42280V30
IC102	iX635210	IC	PD4510A		PD4510A
IC103	XE464A00	IC	TC74HC08AF		TC74HC08AF
IC104	XE464A00	IC	TC74HC08AF		TC74HC08AF
IC203	iX635220	IC	PD9004A		PD9004A
IC301	iX635670	FLTR	3LINE D-COMB		CXD2023Q
IC401	iX635250	IC	TA7302P		TA7302P
IC402	Xi110D00	IC	MC14577CP		MC14577CP
J101	LX609850	JACK. PIN	2P		DKB1028
J102	LX609470	CN. DIN	4P		VKN1072
J103	LX609470	CN. DIN	4P		VKN1072
L401	GX609200	COIL			LFA220J
L402	GX609200	COIL			LFA220J
L403	GX609200	COIL			LFA220J
L404	GX609210	COIL			LFA470J
Q401	iX635460	TR. CHP	2PD601A		2PD601A
Q402	iX635450	TR. CHP	2PB709A		2PB709A
Q403	iX635460	TR. CHP	2PD601A		2PD601A
Q404	iX635450	TR. CHP	2PB709A		2PB709A
Q405	iX635450	TR. CHP	2PB709A		2PB709A
Q408	iX634360	TR	2SC1740S		2SC1740S
R303	HX609150	R. MTL. CHP	27Ω	1/10W	RN1/10SE271D
R304	HX609180	R. MTL. CHP	470Ω	1/10W	RN1/10SE472D
R305	HX609150	R. MTL. CHP	27Ω	1/10W	RN1/10SE271D
R306	HX609180	R. MTL. CHP	470Ω	1/10W	RN1/10SE472D
R414	HX609160	R. MTL. CHP	330Ω	1/10W	RN1/10SE332D
R415	HX609160	R. MTL. CHP	330Ω	1/10W	RN1/10SE332D
R416	HX609140	R. MTL. CHP	220Ω	1/10W	RN1/10SE222D
R417	HX609140	R. MTL. CHP	220Ω	1/10W	RN1/10SE222D
R418	HX609120	R. MTL. CHP	7.5Ω	1/10W	RN1/10SC750D
R419	HX609120	R. MTL. CHP	7.5Ω	1/10W	RN1/10SC750D
R422	HX609120	R. MTL. CHP	7.5Ω	1/10W	RN1/10SC750D
R424	HX609120	R. MTL. CHP	7.5Ω	1/10W	RN1/10SC750D
R450	HX609160	R. MTL. CHP	330Ω	1/10W	RN1/10SE332D
R451	HX609190	R. MTL. CHP	560Ω	1/10W	RN1/10SE562D
R452	HX609160	R. MTL. CHP	330Ω	1/10W	RN1/10SE332D
R453	HX609170	R. MTL. CHP	390Ω	1/10W	RN1/10SE392D
	NX614570	P. C. B.	PINJACK		VNE2021

* New Parts

P. C. B. SYPS

Schm				
Ref.	PART NO.	Description	Remarks	
	NX614640	P. C. B.	SYPS	VWR1256
^	D0001	iX635410	DIODE BRG	D2SB60F4004
^	D0002	iX635370	DIOD	EG01C
^	D0005	iX635490	DIODE. ZENR	MTZJ2.7B 2.7V
^	D0006	iX635350	THYDAC	KIV24
^	D0007	VN008700	DIODE	1SS270A
^	D0020	iX635640	PHOTO. CPL	PS2501L11M
	D0026	iX634190	DIODE	AG01Z-VO
	D0027	iX634190	DIODE	AG01Z-VO
	D0030	iX634190	DIODE	AG01Z-VO
	D0031	iX634190	DIODE	AG01Z-VO
^	F0002	KX604530	FUSE. THERM	VEK1033
^	F0003	KX604540	FUSE. THERM	VEK1034
^	F0003	KX604540	FUSE. THERM	VEK1034
^	F0006	KX604520	FUSE	VEK1036
^	F0006	KX604520	FUSE	VEK1036
^	FU001	KX604500	FUSE	2A REK1078
^	Q0001	iX635070	TR	2SK2045
^	Q0002	iX635580	TR	2SC3377
^	Q0003	iX635580	TR	2SC3377
	Q0020	iX635750	TR	2SA1598
	Q0021	iX635760	TR	2SC4148
	Q0022	iX635750	TR	2SA1598
	Q0023	iX635760	TR	2SC4148
^	R0022	HX608920	R. FUS	47Ω 1/6W VCN1033
^	R0023	HX608920	R. FUS	47Ω 1/6W VCN1033
^	R0024	HX608920	R. FUS	47Ω 1/6W VCN1033
^	R0025	HX608920	R. FUS	47Ω 1/6W VCN1033
^	R0027	HX609210	R. FUS	0.470Ω VCN1046
^	R0029	HX609220	R. FUS	68Ω VCN1048
^	R0031	HX609230	R. FUS	8.2Ω VCN1050

* New Parts

■ CHIP RESISTOR

Schm				
Ref.	PART NO.	Description	Remarks	
	RA258100	R. CAR. CHP	100K Ω	1/8W RS1/10S104J
	RD250000	R. CAR. CHP	0 Ω	1/10W RS1/10S000J
	RD253120	R. CAR. CHP	1.2 Ω	1/10W RS1/10S1R2J
	RD253150	R. CAR. CHP	1.5 Ω	1/10W RS1/10S1R5J
	RD254100	R. CAR. CHP	10 Ω	1/10W RS1/10S100J
	RD254220	R. CAR. CHP	22 Ω	1/10W RS1/10S220J
	RD254330	R. CAR. CHP	33 Ω	1/10W RS1/10S330J
	RD254470	R. CAR. CHP	47 Ω	1/10W RS1/10S470J
	RD254510	R. CAR. CHP	51 Ω	1/10W RS1/10S510J
	RD254750	R. CAR. CHP	75 Ω	1/10W RS1/10S750J
	RD255100	R. CAR. CHP	100 Ω	1/10W RS1/10S101J
	RD255120	R. CAR. CHP	120 Ω	1/10W RS1/10S121J
	RD255150	R. CAR. CHP	150 Ω	1/10W RS1/10S151J
	RD255180	R. CAR. CHP	180 Ω	1/10W RS1/10S181J
	RD255220	R. CAR. CHP	220 Ω	1/10W RS1/10S221J
	RD255270	R. CAR. CHP	270 Ω	1/10W RS1/10S271J
	RD255330	R. CAR. CHP	330 Ω	1/10W RS1/10S331J
	RD255390	R. CAR. CHP	390 Ω	1/10W RS1/10S392J
	RD255470	R. CAR. CHP	470 Ω	1/10W RS1/10S471J
	RD255560	R. CAR. CHP	560 Ω	1/10W RS1/10S561J
	RD255680	R. CAR. CHP	680 Ω	1/10W RS1/10S681J
	RD255820	R. CAR. CHP	820 Ω	1/10W RS1/10S821J
	RD256100	R. CAR. CHP	1K Ω	1/10W RS1/10S102J
	RD256120	R. CAR. CHP	1.2K Ω	1/10W RS1/10S122J
	RD256150	R. CAR. CHP	1.5K Ω	1/10W RS1/10S152J
	RD256180	R. CAR. CHP	1.8K Ω	1/10W RS1/10S182J
	RD256220	R. CAR. CHP	2.2K Ω	1/10W RS1/10S222J
	RD256240	R. CAR. CHP	2.4K Ω	1/10W RS1/10S242J
	RD256330	R. CAR. CHP	3.3K Ω	1/10W RS1/10S332J
	RD256470	R. CAR. CHP	4.7K Ω	1/10W RS1/10S472J
	RD256560	R. CAR. CHP	5.6K Ω	1/10W RS1/10S562J
	RD256680	R. CAR. CHP	6.8K Ω	1/10W RS1/10S682J
	RD256750	R. CAR. CHP	7.5K Ω	1/10W RS1/10S752J
	RD257100	R. CAR. CHP	10K Ω	1/10W RS1/10S103J
	RD257120	R. CAR. CHP	12K Ω	1/10W RS1/10S123J
	RD257150	R. CAR. CHP	15K Ω	1/10W RS1/10S153J
	RD257180	R. CAR. CHP	18K Ω	1/10W RS1/10S183J
	RD257220	R. CAR. CHP	22K Ω	1/10W RS1/10S223J
	RD257270	R. CAR. CHP	27K Ω	1/10W RS1/10S273J
	RD257330	R. CAR. CHP	33K Ω	1/10W RS1/10S333J
	RD257470	R. CAR. CHP	47K Ω	1/10W RS1/10S473J
	RD257560	R. CAR. CHP	56K Ω	1/10W RS1/10S563J
	RD257680	R. CAR. CHP	68K Ω	1/10W RS1/10S683J
	RD257750	R. CAR. CHP	75K Ω	1/10W RS1/10S753J
	RD257820	R. CAR. CHP	82K Ω	1/10W RS1/10S823J
	RD258150	R. CAR. CHP	150K Ω	1/10W RS1/10S154J
	RD258180	R. CAR. CHP	180K Ω	1/10W RS1/10S184J
	RD258220	R. CAR. CHP	220K Ω	1/10W RS1/10S224J
	RD258240	R. CAR. CHP	240K Ω	1/10W RS1/10S244J
	RD258270	R. CAR. CHP	270K Ω	1/10W RS1/10S274J
	RD258300	R. CAR. CHP	300K Ω	1/10W RS1/10S304J
	RD258330	R. CAR. CHP	330K Ω	1/10W RS1/10S334J
	RD258470	R. CAR. CHP	470K Ω	1/10W RS1/10S474J

* New Parts

Schm				
Ref.	PART NO.	Description	Remarks	
	RD258620	R. CAR. CHP	620K Ω	1/10W RS1/10S624J
	RD259100	R. CAR. CHP	1M Ω	1/10W RS1/10S105J
	RD259220	R. CAR. CHP	2.2M Ω	1/10W RS1/10S225J

* New Parts

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CDV-W901

1

EXPLODED VIEWS & PARTS LIST

EXTERIOR AND DISC TRAY SECTION

2

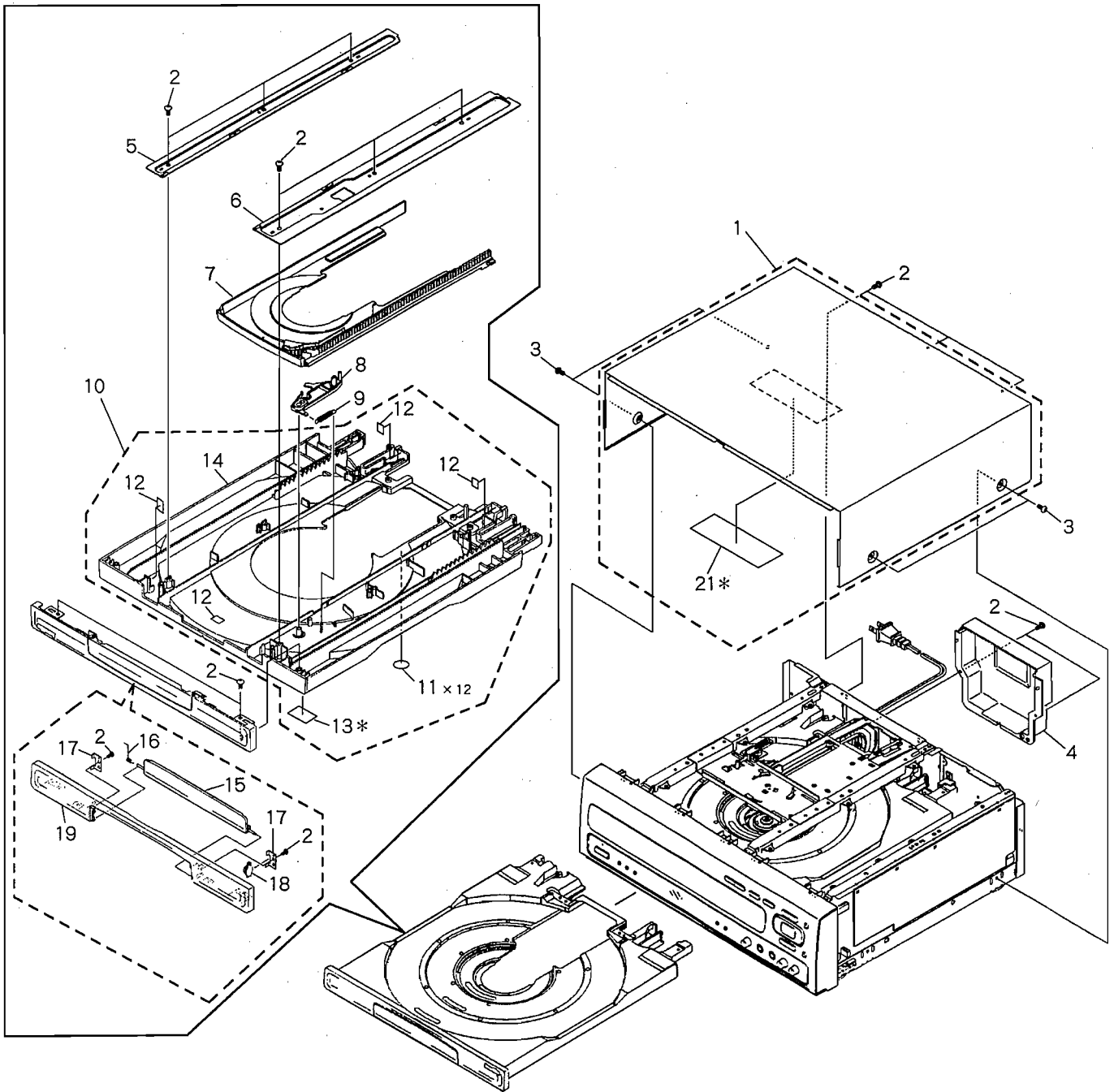
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NOTE : * marked parts are not available.

NOTE: Screws adjacent to ▼ mark on the product are used for disassembly.

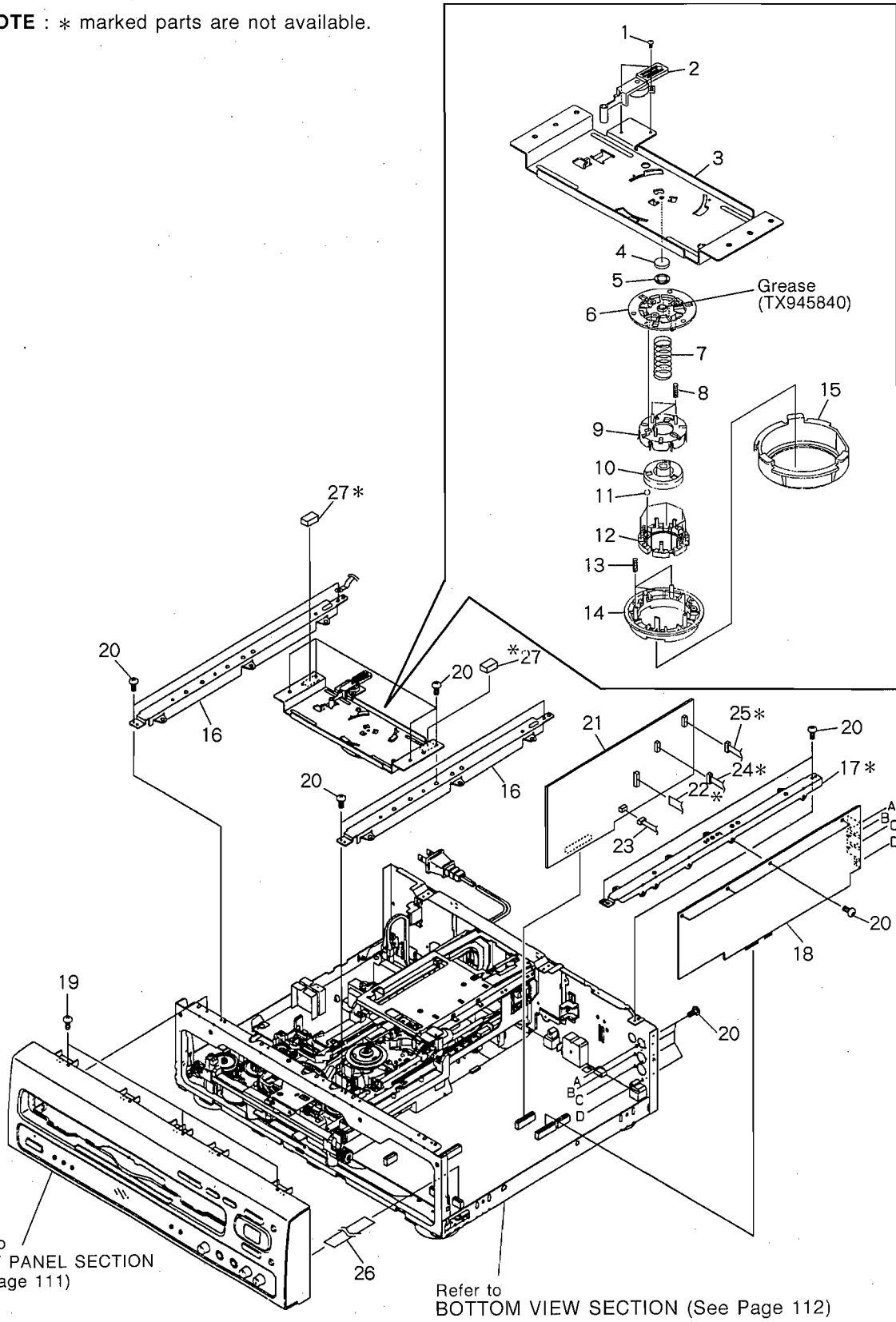
Ref. No.	PART NO.	Description	Remarks	Markets
1	CX678740	BONNET, S	VXX2339	
2	AX620950	SCREW	BBZ30P080FMC	
3	AX620960	SCREW	BCZ40P060FZK	
4	AX623180	REAR COVER	VNK3391	
5	CX678370	GUIDE PLATE	VNE1939	
6	CX678360	GUIDE PLATE	VNE1938	
7	CX678090	TRAY, CD	VNK3007	
8	AX623050	LOCK PLATE	VNL1635	
9	AX621300	SPRING, LOCK PLATE	VBH1188	
10	NX614660	TRAY ASS'Y	VXX2307	
11	CX678430	CUSHION	VEC1682	
12	CX678580	DAMP CUSHION	VEC1683	
14	NX614480	LD TRAY ASS'Y	VXA2173	
15	CX678100	CD DOOR ASS'Y	VXA2248	
16	AX622840	SPRING, DOOR	VBH1248	
17	CX678650	DOOR HOLDER	VNE1967	
18	NX613610	DAMPER ASS'Y	VXA1999	
19	CX678630	TRAY PANEL	VNK3381	
		ACCESSORIES		
	PX601880	REMOTE CONTROL UNIT	VXX2344	
	CX678800	BATTERY COVER	DNK2286	
	MX604800	VIDEO CABLE	DDE1090	
	MX604810	AUDIO CABLE	DDE1089	
		BATTERY, MANGANESE	SUM-4, AAA, R03	

* New Parts

CDV-W901

TOP VIEW SECTION

NOTE : * marked parts are not available.



Refer to FRONT PANEL SECTION (See Page 111)

Refer to BOTTOM VIEW SECTION (See Page 112)

Ref. No.	PART NO.	Description	Remarks	Markets
1	AX622920	SCREW	PBZ20P060FMC	
2	CX678130	D LEVER ASS'Y	VXA2205	
3	AX622790	CENTER PLATE	VNE1971	
4	CX676370	RUBBER SHEET	VEB1114	
5	CX676550	BALL HOLDER	VNL1663	
6	AX620530	CLAMPER HEAD	VNL1603	
7	AX620260	SPRING, LD	VBH1240	
8	AX620420	SPRING, COVER	VBH1234	
9	CX676560	BALL COVER	VNL1602	
10	AX620250	LD HUB	VNT1047	
11	AX620550	STEEL BALL	VNX1013	
12	AX620740	BALL HOLDER	VNL1616	
13	AX620540	CLAMPER SPRING	VBH1239	
14	CX676340	CLAMPER	VNL1604	
15	CX678450	CLAMPER HOLDER	VNL1680	
16	AX622780	CENTER ANGLE	VNE1965	
18	NX614550	P.C.B. ASS'Y	VWV1412	MYCB
19	AX622890	SCREW	IBZ30P080FMC	
20	AX620950	SCREW	BBZ30P080FMC	
21	NX614490	P.C.B. ASS'Y	VWG1605	BBKB
23	LX609650	CONNECTOR	PF02PPC15	
26	MX604730	FLEXIBLE CABLE	VDA1468	

* New Parts

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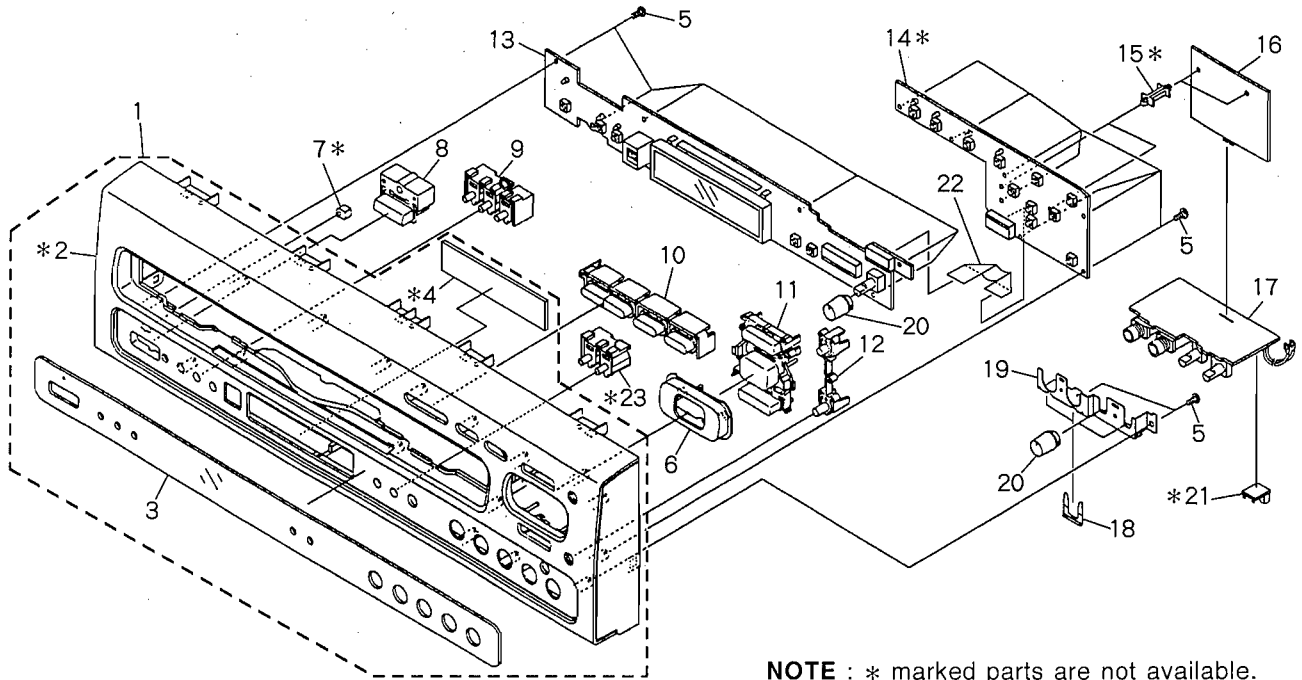
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CDV-W901

FRONT PANEL SECTION

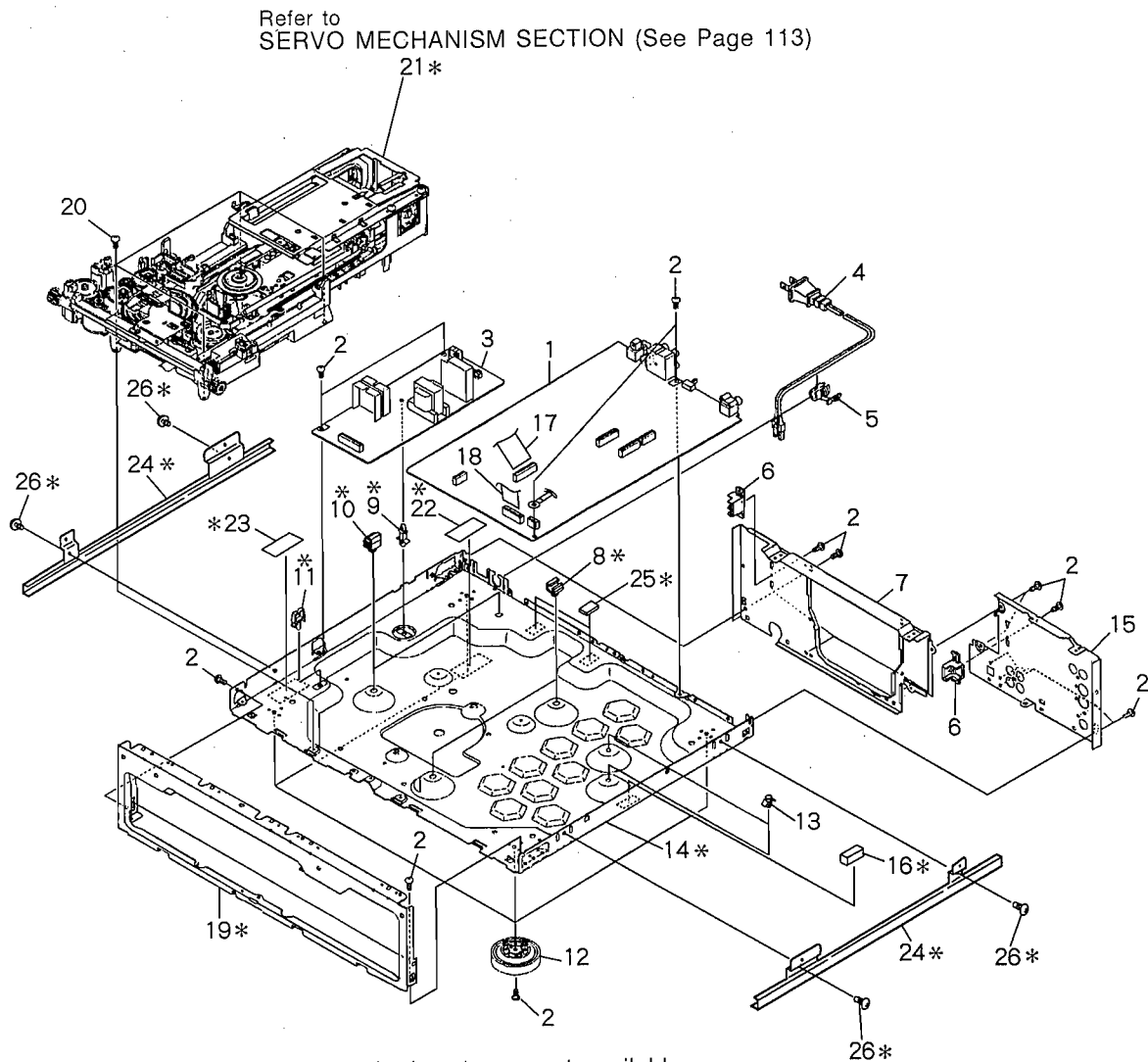


NOTE : * marked parts are not available.

Ref. No.	PART NO.	Description	Remarks	Markets
1	NX614680	FRONT PANEL ASS'Y	VXX2370	
3	CX678180	FL LENS	VEC1834	
5	AX620950	SCREW	BBZ30P080FMC	
6	CX678390	KEY A	VNK3384	
8	CX678790	POWER BUTTON	VNK3386	
9	CX678210	L KEY C	VNK3070	
10	CX678200	L KEY	VNK2987	
11	CX678750	MAIN KEY	VNK3383	
12	CX678400	KEY B	VNK3385	
13	NX614510	P.C.B. ASS'Y	FLKY	VWG1689
16	NX614470	P.C.B. ASS'Y	ECOB	VWV1409
17	NX614540	P.C.B. ASS'Y	MJBA	VWV1406
18	AX620670	SNAP PLATE	VNE1102	
19	CX678490	JACK HOLDER	VNE1966	
20	CX678670	KNOB	VNK3392	
22	MX604770	FLEXIBLE CABLE	13P	VDA1496

* New Parts

BOTTOM VIEW SECTION



Ref. No.	PART NO.	Description	Remarks	Markets
1	NX614580	P.C.B. ASS'Y	MOTHER	VWS1212
2	AX620950	SCREW		BBZ30P080FMC
3	NX614560	P.C.B. ASS'Y	SYPS	VWR1260
4	MX604840	AC POWER CORD		VDG1057
5	CB620200	AC CORD STOPPER	CM-22C	CM22C
6	CX678620	STOPPER, TRAY		VNL1657
7	AX623020	REAR PANEL (R)	(R)	VNA1621
12	AX622750	INSULATOR		PNW1912
13	CX678310	CARD SPACER		VEC1708
15	AX623030	REAR PANEL (L)	(L)	VNA1629
17	MX604720	FLEXIBLE CABLE	21P	VDA1465
18	MX604750	FLEXIBLE CABLE	22P	VDA1486
20	AX622850	SCREW		BBZ30P100FMC

* New Parts

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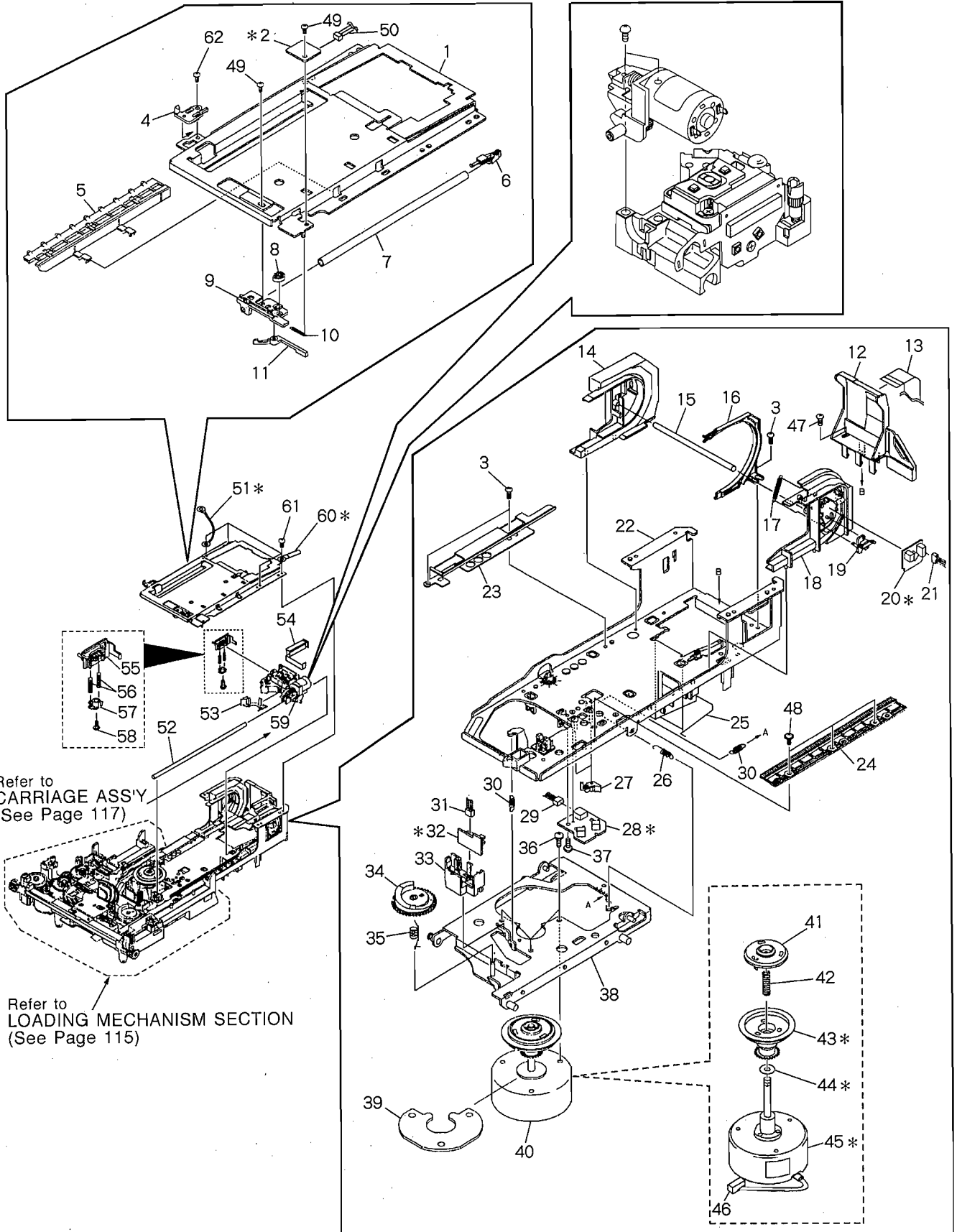
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CDV-W901

SERVO MECHANISM SECTION



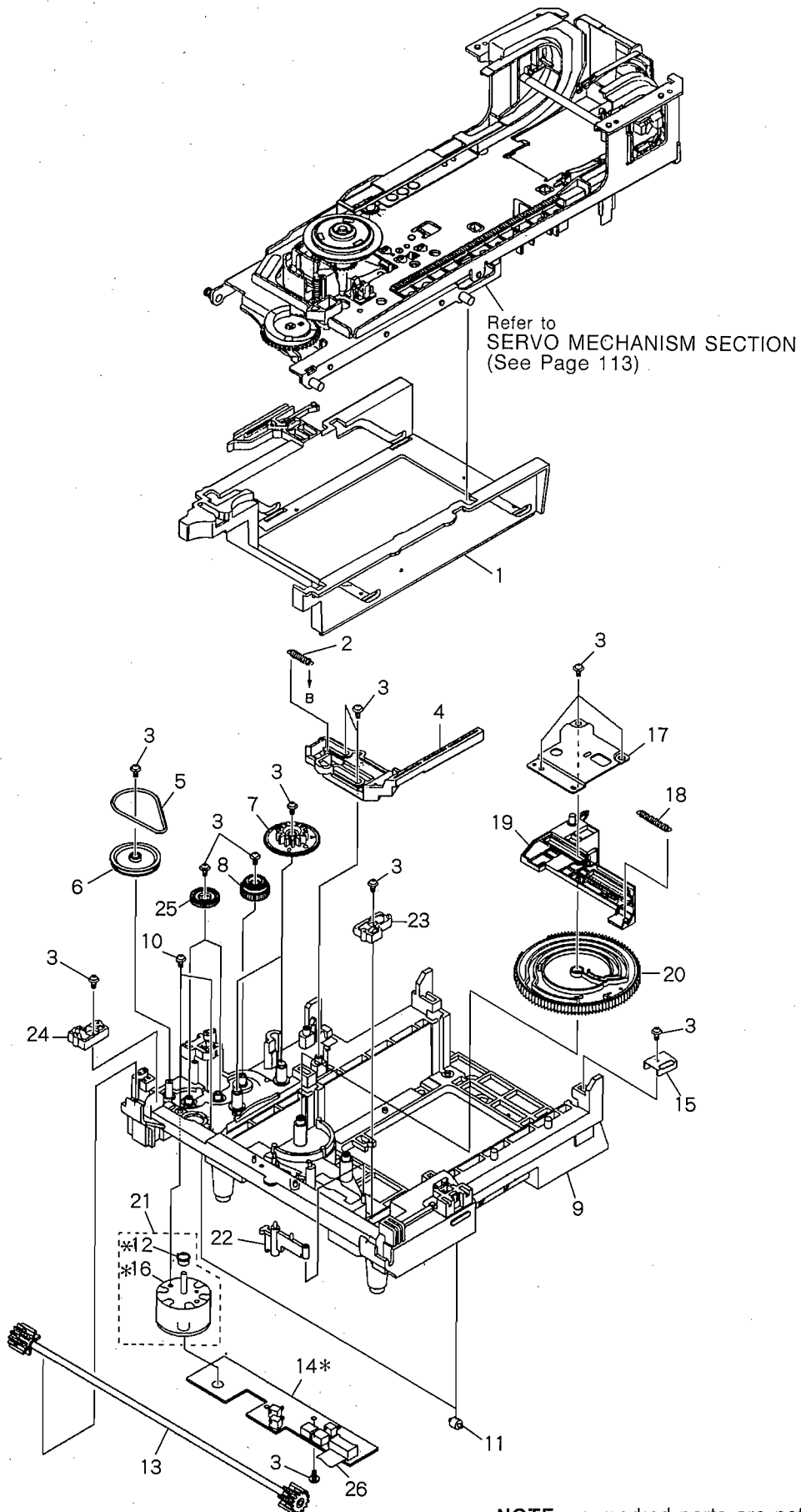
Ref. No.	PART NO.	Description	Remarks	Markets
1	CX678600	TILT BASE, UPPER		
3	AX620940	SCREW		
4	LX609460	PHONE, A		
5	CX678770	RACK, UPPER		
6	CX678460	SHAFT STAY		
7	AX622700	CARRIAGE SHAFT, UPPER	CA	
8	CX678320	CAM	B	
9	CX678470	SHAFT SUPPORT		
10	AX622760	SUPPORT SPRIN		
11	CX678270	LEVER, SW		
12	CX678760	LARGE HILL		
13	MX604760	FLEXIBLE CABLE	23P	
14	CX678550	TURN GUIDE		
15	AX622710	SHAFT	FS	
16	CX678380	GUIDE RAIL		
17	AX623040	LEVER SPRING		
18	CX678560	TURN GEAR		
19	CX678280	LEVER, SW		
21	LX609780	CONNCTOR ASS'Y, HOUSING	3P	
22	CX678590	TILT BASE		
23	CX678290	TAN GUIDE		
24	CX678080	RACK		
25	AX622720	SPRING		
26	AX622770	THRUST SPRING		
27	CX678040	LEVER, SW		
29	LX609760	CONNCTOR ASS'Y, HOUSING	3P	
30	AX622830	SPRING, TILT		
31	LX609770	CONNCTOR ASS'Y, HOUSING	3P	
33	CX678150	BASE, FG		
34	AX622810	CAM, TILT		
35	AX622820	SPRING, TILT CAM		
36	AX622940	SCREW		
37	AX622880	SCREW		
38	AX623010	MOTOR BASE		
39	AX622730	SPACER, M		
40	JX601590	MOTOR, SPINDLE		
41	NX614600	HUB		
42	AX622800	CENTERING SPRING		
46	LX609800	CONNCTOR ASS'Y, HOUSING	2P	
47	AX620940	SCREW		
48	AX622870	SCREW		
49	AX622860	SCREW		
50	LX609790	CONNCTOR ASS'Y, HOUSING	2P	
52	AX622690	CARRIAGE SHAFT, UNDER	CA	
53	AX622980	GUARD		
54	CX678140	HOLDER		
55	CX678050	GUIDE		
56	LX609640	TAN SPRING		
57	CX678300	TAN LEVER		
58	AX622960	SCREW		
59	NX614650	CARRIGE ASS'Y	ECOB	
61	AX620950	SCREW		
62	AX620900	SCREW		

*New Parts

CDV-W901

LOADING MECHANISM SECTION

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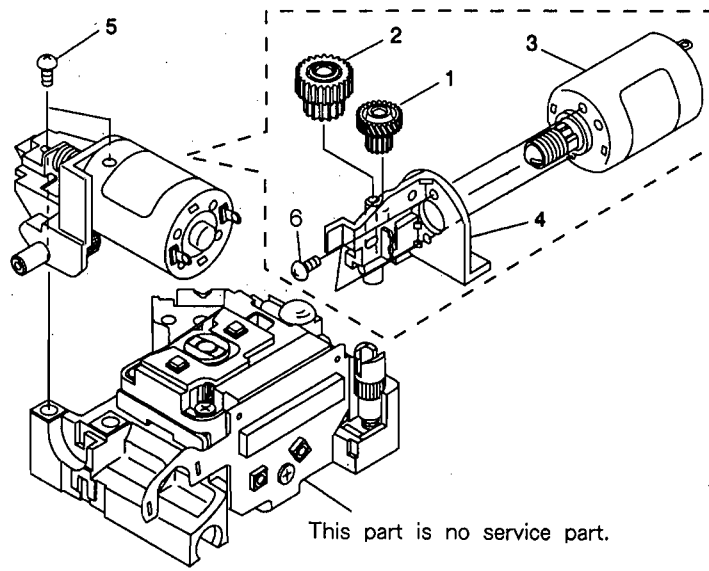


Ref. No.	PART NO.	Description	Remarks	Markets
1	CX678440	CLAMPER CAM	VNL1633	
2	AX620220	SPRING, CDP	VBH1191	
3	AX621160	SCREW WITH WASHER	Z39019	
4	CX678120	PLATE, CD	VNL1685	
5	CX676380	RUBBER BELT	VEB1184	
6	CX678420	GEAR PULLEY	VNL1662	
7	CX678610	TWIN GEAR	VNL1626	
8	CX678780	GEAR	VNL1660	
9	AX622990	MECH. BASE	VNK3239	
10	AX620970	SCREW	BMZ26P040FMC	
11	CX676620	ROLLER	VNL1042	
13	CX678480	SYNCHRO GEAR	VXA2105	
15	CX678350	CAM HOLDER	VNE2032	
17	AX623070	SHAFT HOLDER	VNE1942	
18	AX620190	SPRING, CAS	VBH1190	
19	CX678340	CAM SAND	VNL1631	
20	CX678330	CAM GEAR	VNL1625	
21	JX601610	MOTOR ASS'Y, LOADING	VXX2045	
22	CX678240	LEVER, SW	VNL1664	
23	CX678530	SLIDER	VNL1666	R
24	CX678520	SLIDER	VNL1665	L
25	CX678570	DOUBLE GEAR	VNL1661	
26	MX604740	FLEXIBLE CABLE	VDA1485	12P

* New Parts

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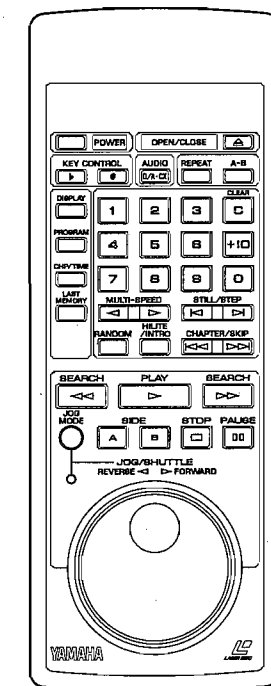
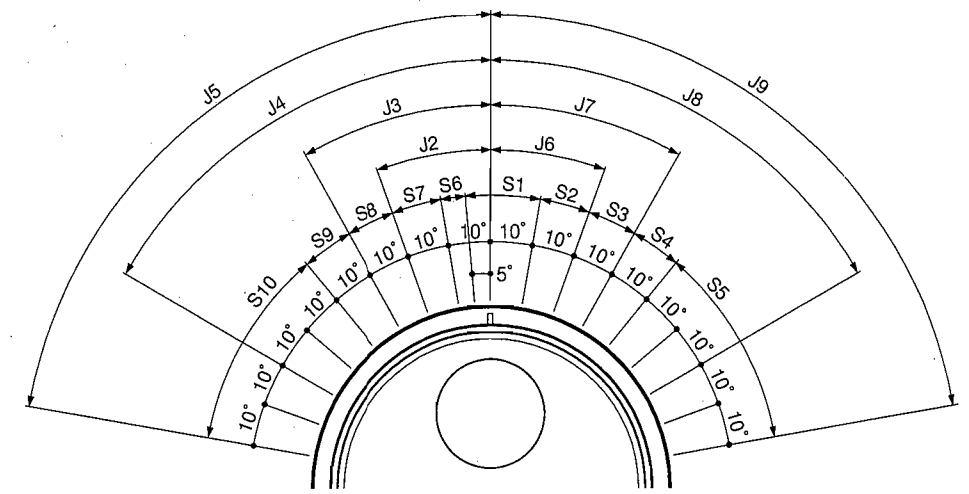
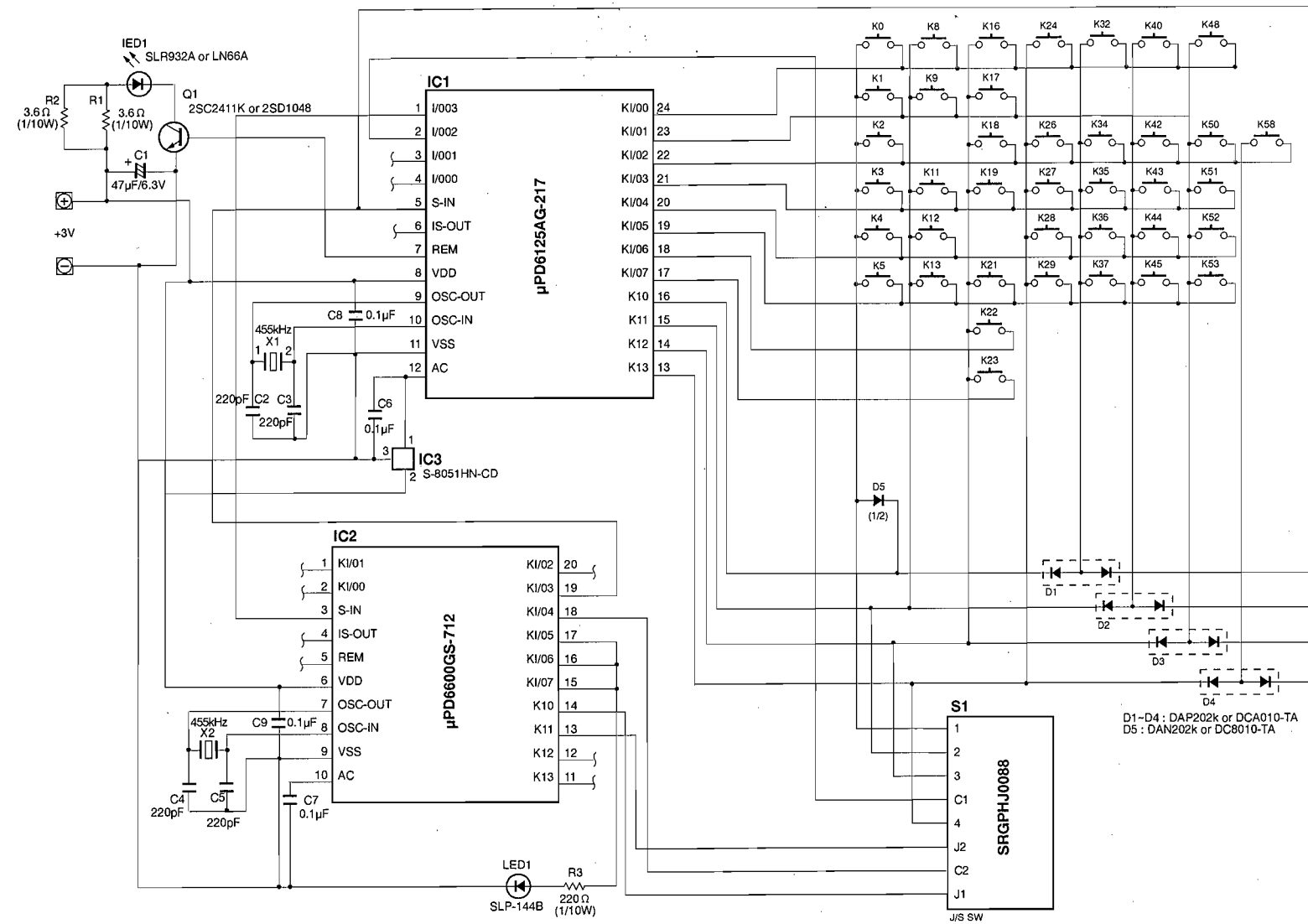
CARRIAGE ASS'Y



Ref. No.	PART NO.	Description	Remarks	Markets
	NX614650	CARRIGE ASS'Y	ECOB	VWT1110
1	CX678060	GEAR	A	VNL1638
2	CX678070	GEAR	B	VNL1639
3	JX601590	MOTOR, SPINDLE		VXA2082
4	CX678250	HOLDER		VNL1700
5	AX622910	SCREW		PBZ20P050FMC
6	AX622950	SCREW		PMZ20P030FMC

*New Parts

REMOTE CONTROL TRANSMITTER



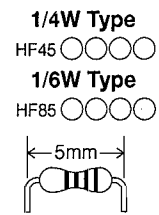
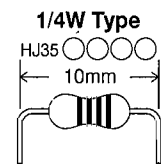
POSITION	FUNCTION	CUSTOM	DATA
J1		-	-
J2	JOG REV 0	7C	33
J3	JOG REV 1	7C	32
J4	JOG REV 2	7C	31
J5	JOG REV 3	7C	30
J6	JOG FWD 0	7C	34
J7	JOG FWD 1	7C	35
J8	JOG FWD 2	7C	36
J9	JOG FWD 3	7C	37
S1		-	-
S2	SHTL FWD 0	7C	3C
S3	SHTL FWD 1	7C	3D
S4	SHTL FWD 2	7C	3E
S5	SHTL FWD 3	7C	3F
S6		-	-
S7	SHTL REV 0	7C	3B
S8	SHTL REV 1	7C	3A
S9	SHTL REV 2	7C	39
S10	SHTL REV 3	7C	38

KEY NO.	FUNCTION	CUSTOM	DATA
K0	PAUSE	7C	5A
K1	SCAN FWD	7C	07
K2	STOP	7C	5B
K3	SIDE B	7C	4D
K4	SIDE A	7C	4C
K5	JOG MODE	-	-
K8	CHP/TRK SKIP FWD	7C	03
K9	CHP/TRK SKIP REV	7C	02
K11	PALY	7C	05
K12	HILITE/INTRO	7C	4E
K13	SCAN REV	7C	06
K16	AUDIO D/A/L/R	7C	12
K17	PROGRAM	7C	14
K18	CHAP/F.RAME, TIME	7C	15
K19	RANDOM PLAY	7C	50
K21	LAST MEMORY	7C	44
K22	KEYCON b	7C	65
K23	KEYCON #	7C	67
K24	POWER ON/OFF	7C	47

KEY NO.	FUNCTION	CUSTOM	DATA
K26	1	7C	17
K27	4	7C	1A
K28	7	7C	1D
K29	MULTI SPEED REV	7C	0E
K32	REPEAT MODE	7C	10
K34	2	7C	18
K35	5	7C	1B
K36	8	7C	1E
K37	MULTI SPEED FWD	7C	0F
K40	A-B REPEAT	7C	11
K42	3	7C	19
K44	9	7C	1F
K45	STEP REV	7C	0A
K48	OPEN/CLOSE	7C	49
K50	CLEAR	7C	5E
K51	+10	7C	5D
K52	0	7C	16
K53	STEP FWD	7C	0B
K58	DISPLAY	7C	13

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			



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YAMAHA