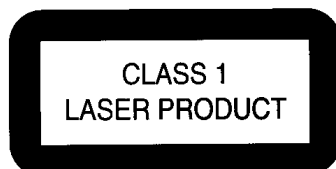


## Car CD Changer 22RC047/00

# Service Manual



12 V

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## 1. SPECIFICATIONS

|                    |   |                                                                  |
|--------------------|---|------------------------------------------------------------------|
| Operating voltage  | : | 11 – 16VDC<br>(14.4VDC nom.)                                     |
| Frequency response | : | 20 – 20,000 Hz<br>(± 0.3dB)                                      |
| DAC resolution     | : | 1 bit per channel                                                |
| Bus interface      | : | D <sup>2</sup> B                                                 |
| Crosstalk L<>R     | : | ≤ -80dB                                                          |
| S/N ratio          | : | ≥ 96dB (weighted)                                                |
| Distortion         | : | ≤ 0.02% (at 1kHz)                                                |
| Wow and flutter    | : | unmeasurable                                                     |
| Oversampling       | : | 8 times                                                          |
| Output voltage     | : | 700mV                                                            |
| Data – Track mute  | : | 83 dB (weighted)                                                 |
| Anti-shock memory  | : | 3 seconds                                                        |
| Disc change times  | : | < 12sec<br>(to next/previous)<br>< 13sec<br>(to last/first disc) |
| Operating position | : | -10° -Horiz.-+30°                                                |
| Weight             | : | 1.5 kg                                                           |
| Dimensions (HxWxD) | : | 58x178x188 mm<br>(incl. front panel)                             |

## 2. SERVICE

### **IMPORTANT !!**

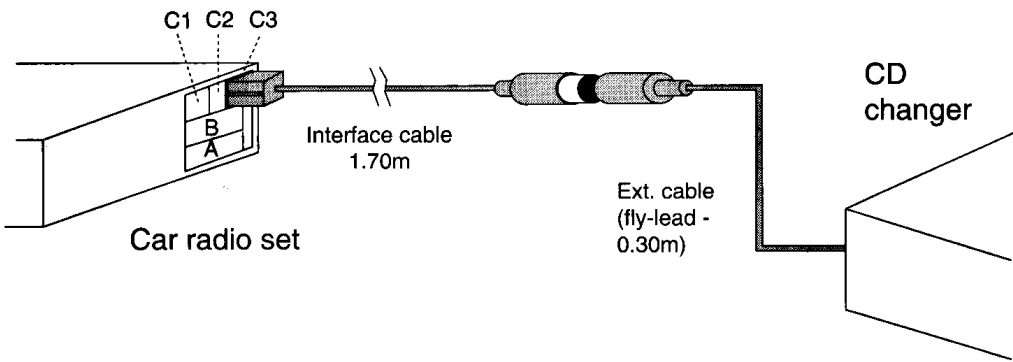
- When disassembling, ALWAYS protect the pick-up unit against ESD damage by closing the solder connection of the pick-up unit on the flexible foil PCB!  
(See also the repair notes and disassembly procedures described in this manual.)
- New pick-up units are supplied with CLOSED solder connections on the flexible foil PCB.  
Do NOT forget to REMOVE the solder connection AFTER replacing the unit!

### 2.1 Service hints

- To prevent magazine check (duration approx. 35 sec.), insert the magazine and press the 'Eject' button SIMULTANEOUSLY. In that case disc no.1 is loaded and the set comes into 'Standby' mode.
- Use 'home-made' extension cables of approx. 30 cm to get access to the bottom (solder side) of the main PCB for measuring purposes. To make these cables, the following parts can be ordered and used for making the extension cables:  
CP802 – 4822 320 12463  
FPC783 – 4822 320 12429  
FPC801 – 4822 320 12462
- The set also can operate without cover, but take care of the following measures:
  - ABSOLUTELY NEVER PERMIT LASER BEAMS TO ENTER THE EYES !!
  - DO NOT EXPOSE THE SET TO BRIGHT (SUN)LIGHT !!

3. INTERFACE CABLE CONNECTIONS

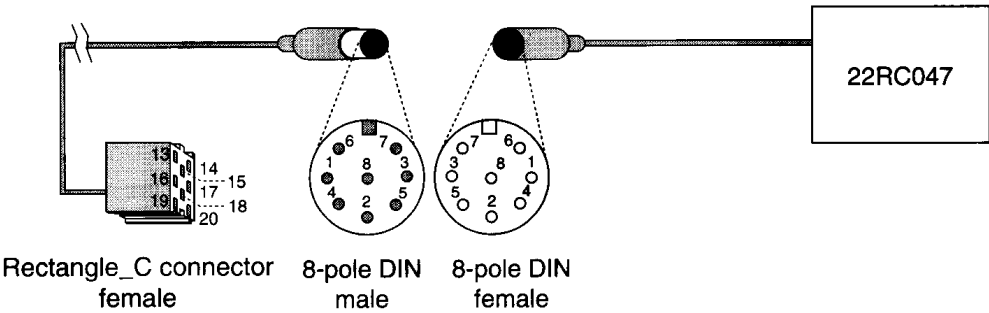
The figures on this page show the interface- and fly-lead cables of the 22RC047.



For radio sets with a C\_10 (10-pole) connector, use the interface cable with service code: **4822 320 12002**.

3.1 Interface cable

The figure below shows the pin layout of the connections of the interface cable. All connections here are seen from the *front* side of the connectors.



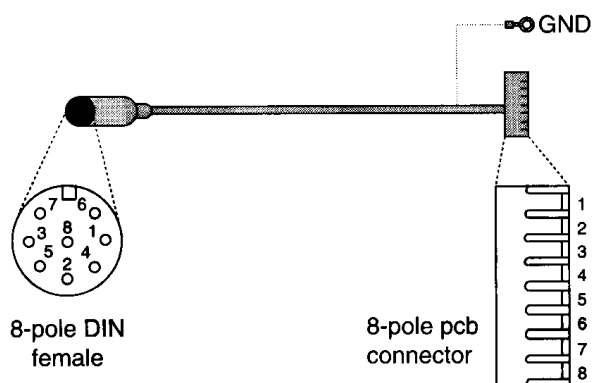
RECTANGLE\_C3 CONNECTOR

| Pin      | Signal            |
|----------|-------------------|
| 13       | D <sup>2</sup> B+ |
| 14       | D <sup>2</sup> B- |
| 15       | BUS_GND           |
| 16       | +12V PERM.        |
| 17       | +12V SW.          |
| 18       | SIGN_GND          |
| 19       | L_CH              |
| 20       | R_CH              |
| (SHIELD) | (GND)             |

8-POLE DIN CONNECTOR (MALE/FEMALE)

| Pin      | Signal            |
|----------|-------------------|
| 1        | +12V SW.          |
| 2        | +12V PERM.        |
| 3        | GND               |
| 4        | D <sup>2</sup> B- |
| 5        | D <sup>2</sup> B+ |
| 6        | R_CH              |
| 7        | L_CH              |
| 8        | SIGN_GND          |
| (SHIELD) | GND               |

### 3.2 DIN-1 fly-lead cable



8-POLE DIN CONNECTOR (FEMALE)

| Pin      | Signal            |
|----------|-------------------|
| 1        | +12V SW.          |
| 2        | +12V PERM.        |
| 3        | GND               |
| 4        | D <sup>2</sup> B- |
| 5        | D <sup>2</sup> B+ |
| 6        | R_CH              |
| 7        | L_CH              |
| 8        | SIGN_GND          |
| (SHIELD) | GND               |

8-POLE PCB CONNECTOR

| Pin     | Signal            |
|---------|-------------------|
| 1       | +12V SW.          |
| 2       | +12V PERM.        |
| 3       | GND               |
| 4       | D <sup>2</sup> B- |
| 5       | D <sup>2</sup> B+ |
| 6       | R_CH              |
| 7       | L_CH              |
| 8       | SIGN_GND          |
| EYE LUG | GND               |

## 4. OPERATION

### 4.1 Introduction

Here a brief operation instruction of the 22RC047 CD changer follows. Following this procedure strictly will prevent unnecessary operation problems.

The figures which the description refers to are all on this page.

### 4.2 Loading the magazine

- Slide a CD (with the label facing *upwards*) into one of the slots.
- Up to 4 discs can be loaded.
- For 8cm CD's, use an adapter which conforms to CD standards.
- Please pay attention to the following:  
Be sure to attach the disc properly to the catches provided on the adapter; if the disc is not attached correctly, it may come free inside the magazine or play mechanism, causing the CD changer inoperative.
- *Under NO circumstances load an empty 8cm adapter into the magazine. The adapter will remain in the mechanism and will block the unit.*

### 4.3 Magazine insertion

- Press the 'EJECT' button to open the front (fig. i).
- *Hold the magazine the correct way up with the rounded side facing the opening of the CD changer.*
- Gently push the magazine into the opening of the CD changer, until you feel a click (fig. ii).
- Close the front to prevent dust and dirt from entering the CD changer.
- If the front is opened by pressing the 'EJECT' button, the CD changer will stop playing.
- While the front is open, the CD changer will *not* accept commands from the radio.
- If you close the front, the CD changer will continue operation.
- For security reasons you should *always* close the front while driving.

### 4.4 Magazine check procedure

After insertion of the magazine, the CD changer performs a magazine check to check which slots are filled with CD's and whether the CD's are put in correctly.

This procedure can be bypassed by inserting the magazine and pushing the 'EJECT' button *simultaneously*.

### 4.5 Eject procedure

- Press the 'EJECT' button *once* to open the front.
- Press the 'EJECT' button a *second* time to have the magazine ejected.
- Carefully take out the magazine and close the front.

### 4.6 Unloading the magazine

- Pull the white lever at the front of the magazine (fig. iii).
- Carefully remove a CD from the magazine.

### 4.7 Care of discs (fig. iv)

- Avoid making fingerprints on the CD.
- Put the CD back in its box immediately after removing it from the magazine
- Do *not* expose the CD to heat or direct sunlight.

#### 4.8 Reset function (fig. v)

In case that the CD changer does not operate correctly, the CD changer circuits can be reset in the following way:

- Take a pen or an other object with a thin point and briefly press the 'RESET' button located under the 'EJECT' button.

#### 4.9 Display

The front of the CD changer displays the following information (fig. vi):

**DISC 1** ● (● = LED on):

The CD (in this case CD1) is currently played.

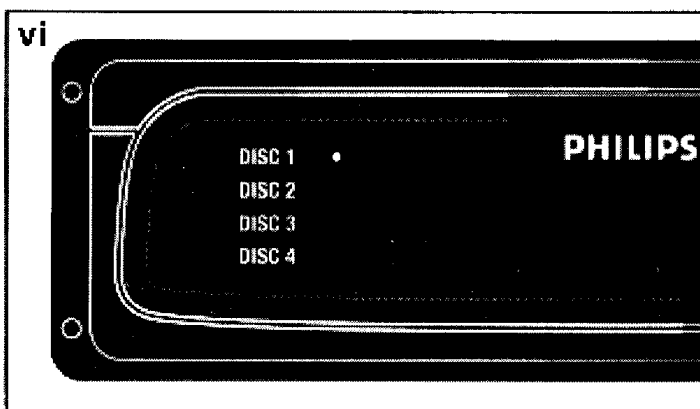
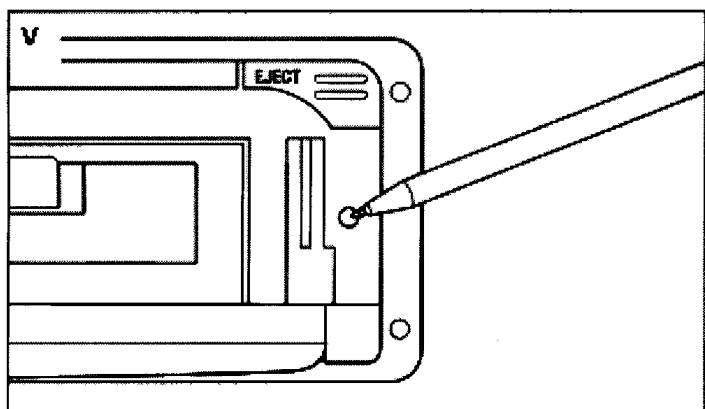
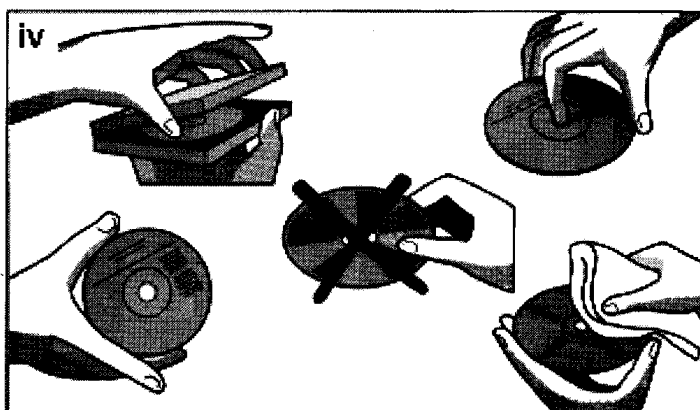
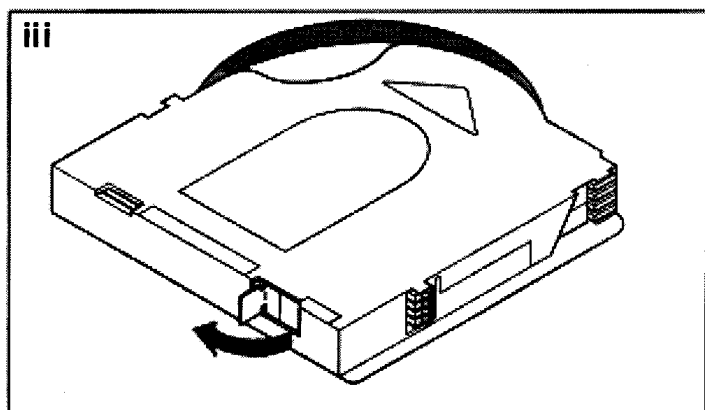
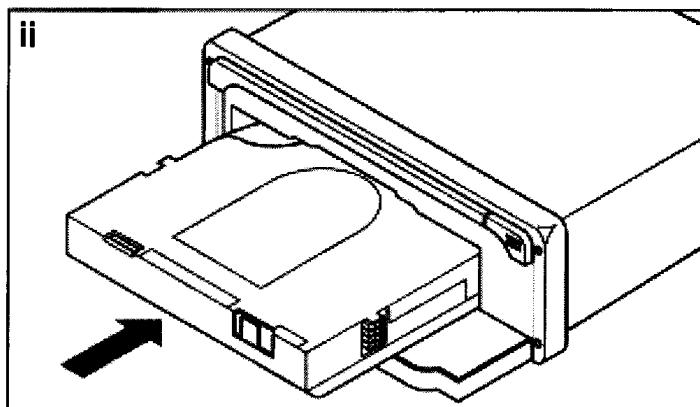
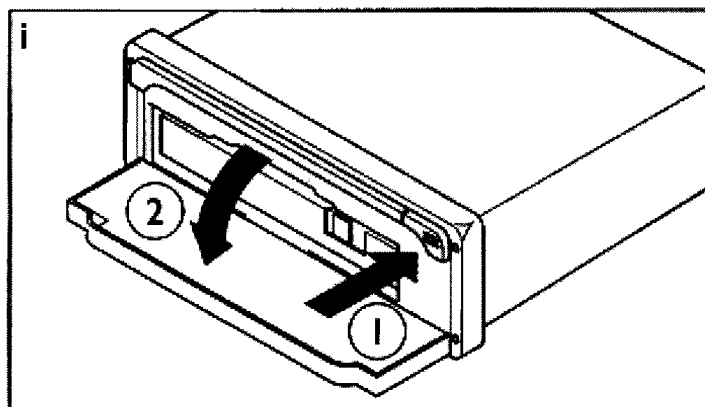
**DISC 1** ○ (○ = LED off):

The CD (in this case CD1) is present in the magazine.

**DISC 1** ✱ ('DISC 1' does not light / ✱ = LED (next to 'DISC 1') flashes):

The radio set and/or the car ignition are switched off.

When the 'EJECT' button is pressed for more than 2 seconds, the flashing LED is switched off. It is re-activated automatically after switching the radio set or CD changer on or off.



## 5. FUNCTION EXPLANATION

This part gives a summarized description of the mechanical operation of the CD changer.

The figures in this part clarify the function of the different parts.

For more details and to locate the exact position of the parts, refer to the exploded views on the last pages of this manual.

### 5.1 Function of motors

1. Spindle motor (pos. C24).

This is a brushless motor which has the disc rotated.

2. Feed motor (pos. C42).

- Moves pick-up unit (pos. C36), when a CD is played and during track change or jump.
- Moves the hook of 'disc chuck' mechanism (pos. C21/29/30/38) which centres and clamps the disc on the spindle.

3. Rotary motor (pos. C74).

This motor moves the arm (pos. C19) with the pick-up unit inwards or outwards the CD magazine.

4. Magazine elevator motor (pos. C62).

With help of this motor the magazine is opened or closed respectively just before loading or just after unloading of the selected disc, to make it the pick-up assy possible to reach the disc concerned.

5. Elevator motor (pos. C11).

The elevator motor moves the elevator chassis assy (pos. C52) upwards or downwards, dependent on which disc is selected.

The magazine lock (pos. C53/58) is released by the elevator (motor) during 'Eject' procedure.

### 5.2 Loading procedure

1. After magazine insertion:

- a) 'Magazine On' switch (pos. S782) becomes activated.
- b) Elevator chassis assy and arm of p.u. moves to disc1, controlled by elevator motor.

2. Disc1 is loaded:

- a) Magazine is opened by slides pos. C61/70 which in their turn are controlled by the magazine elevator motor.
- b) Rotary motor moves the arm into the magazine.
- c) Mag. elevator motor and slides bring the magazine into the 'Hold' position.
- d) Disc is chucked and clamped by the chuck mechanism which is controlled by the feed motor.
- e) Magazine is brought into the 'In' position by the slides and mag. elevator motor.
- f) Spindle motor starts to rotate and the disc is played.

### 5.3 Disc change procedure

1. Spindle motor stops.
2. Magazine is brought into 'Hold' position by mag. elevator motor.
3. Chuck mechanism releases the disc.
4. Magazine is brought into 'Open' position by mag. elevator motor.
5. Arm of p.u. moves outwards.
6. Magazine is brought into 'Closed' position by mag. elevator motor.
7. Elevator moves to the position of the disc to be played now.
8. Now this disc is loaded (see 'Loading procedure').

## 5.4 Eject procedure

1. Steps '1' until '6' (see 'Disc change procedure') are carried out first.
2. The elevator moves to the 'Eject' (beyond 'Disc4') position.
3. The magazine lock is unlocked and the magazine comes out of the changer unit.

## 5.5 Detailed explanation of switch / sensor functions

This section explains each action by using which switch or sensor.

1. Feed motor.  
Condition:
  - Disc chucking release position
  - Disc chucking position
  - 'Chuck off' switch (part of pick-up) is ON
  - 'Chuck off' switch is OFF;
  - 'Inside track' switch (part of spindle motor assy) is OFF;
  - TOC (Table of contents) is read from disc
2. Rotary motor.  
Condition:
  - Move arm inside magazine
  - Move arm outside magazine
  - 'Rotary In' switch (pos. S752) is ON
  - 'Rotary Out' switch (pos. S751) is ON
3. Magazine elevator motor.  
Condition:
  - 'Close' position
  - 'Open' / 'Hold' position
  - 'Magazine Out' switch (pos. S753) is ON
  - 'Magazine sensor' (pos. SEN751) is ON
  - Detecting 'Open' and 'Hold' position is carried out by counting the number of pulses coming from the 'Magazine sensor';
  - 'Open' position: magazine opening has maximum size to have the arm come in;
  - 'Hold' position: the selected disc rests on the spindle and is in condition to have been chucked
  - 'Magazine In' switch (pos. S754) is ON;
  - Disc is lifted from its carrier and is chucked and ready for play.
  - 'In' position
4. Elevator motor.  
Condition:
  - 'Disc 4' position
  - 'Disc 1/2/3' position
  - 'Eject' position
  - 'Elevator sensor' (pos. SEN781) is ON;
  - 'Low (Eject)' switch (pos. S781) is ON;
  - This position is the elevator reference point.
  - Number of disc is determined by counting the pulses coming from the 'Elevator sensor'
  - Elevator moves beyond 'Disc 4' position during 'Elevator sensor' and 'Low (Eject)' are both ON;
  - Magazine is ejected and 'Magazine On' switch (pos. S782) comes into OFF position



MAGAZINE SENSOR (POS. S751)

MAGAZINE OUT SWITCH (POS. S753)

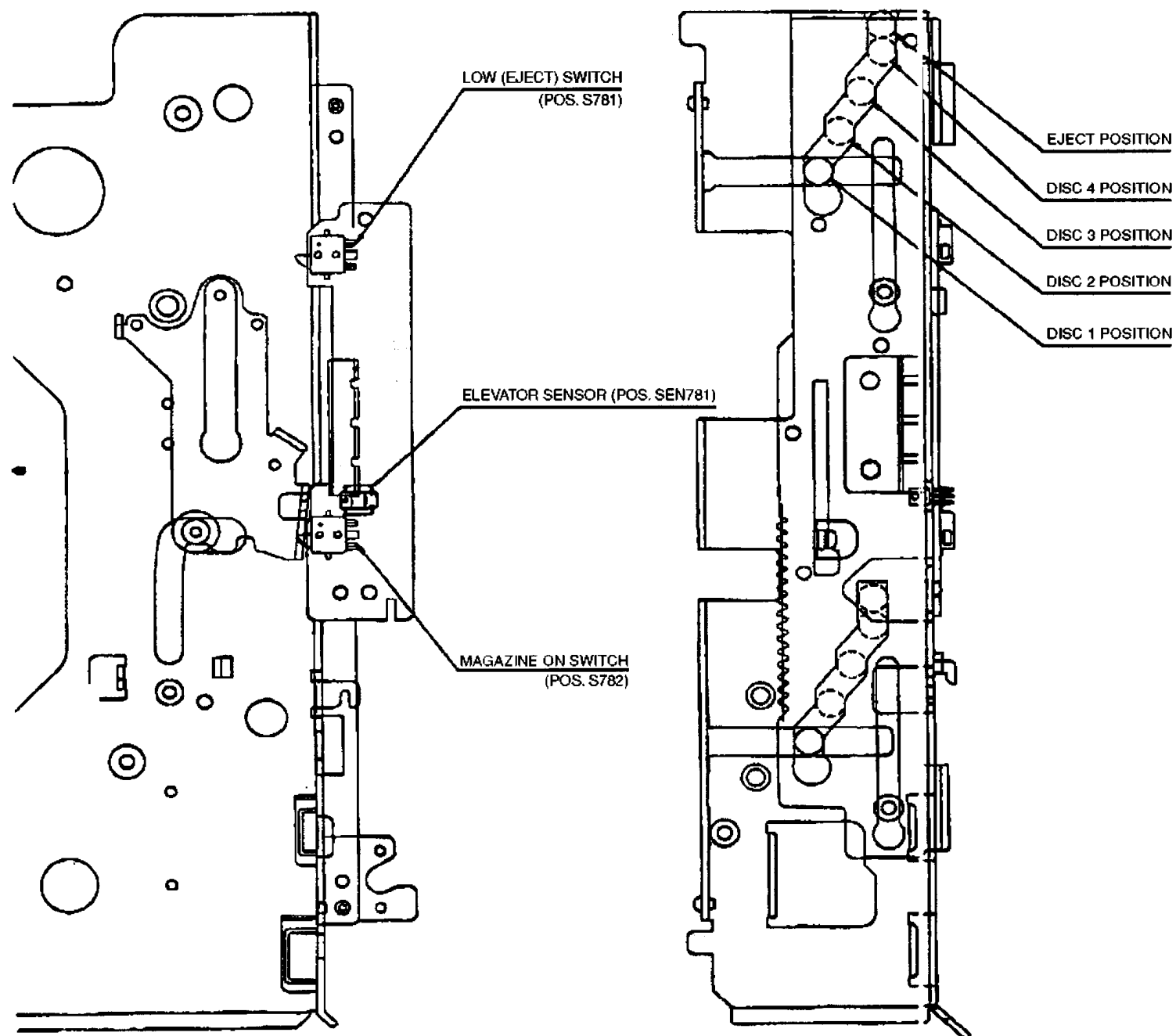
MAGAZINE IN SWITCH (POS. S754)

INSERT  
IN THIS DIRECTION

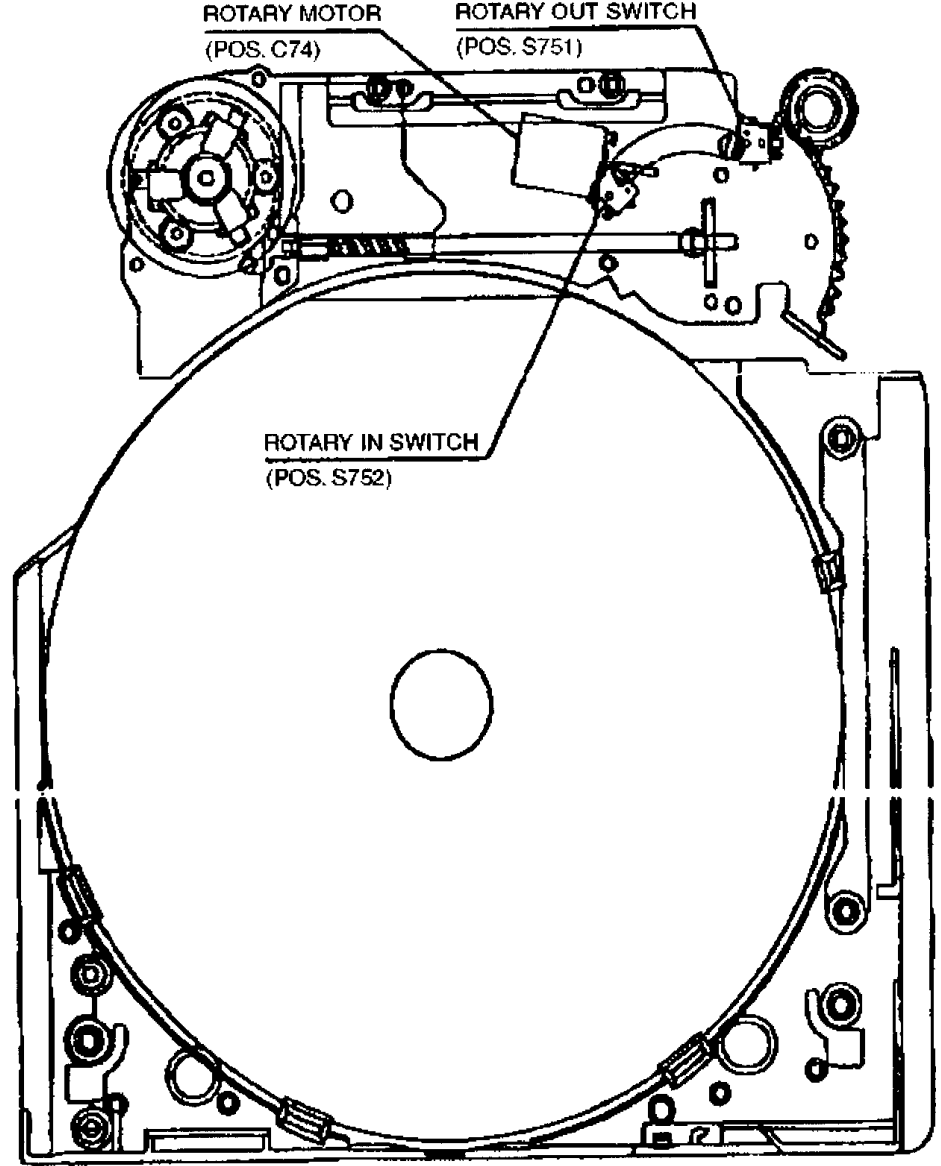
.COMPACT  
disc  
DIGITAL AUDIO

MAGAZINE ELEVATOR MOTOR (POS. C62)

MAGAZINE HOLDER



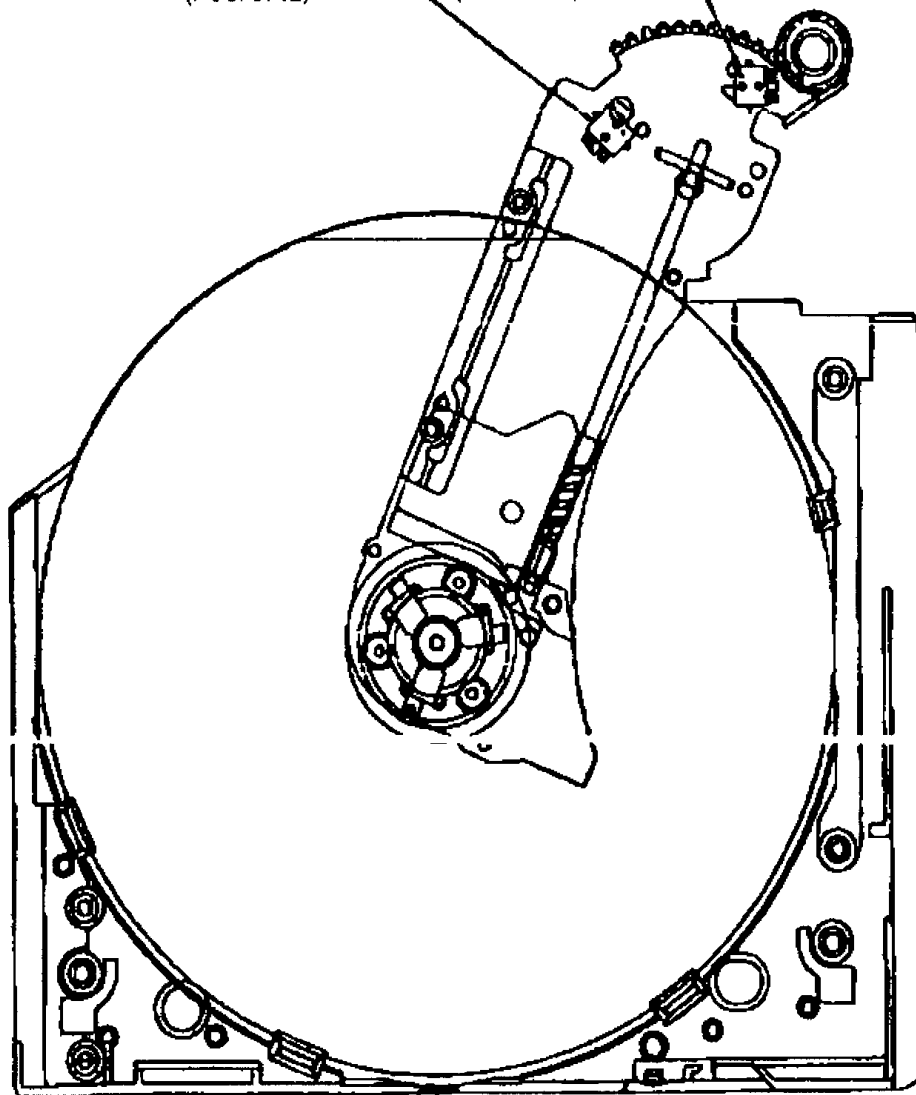
ELEVATOR



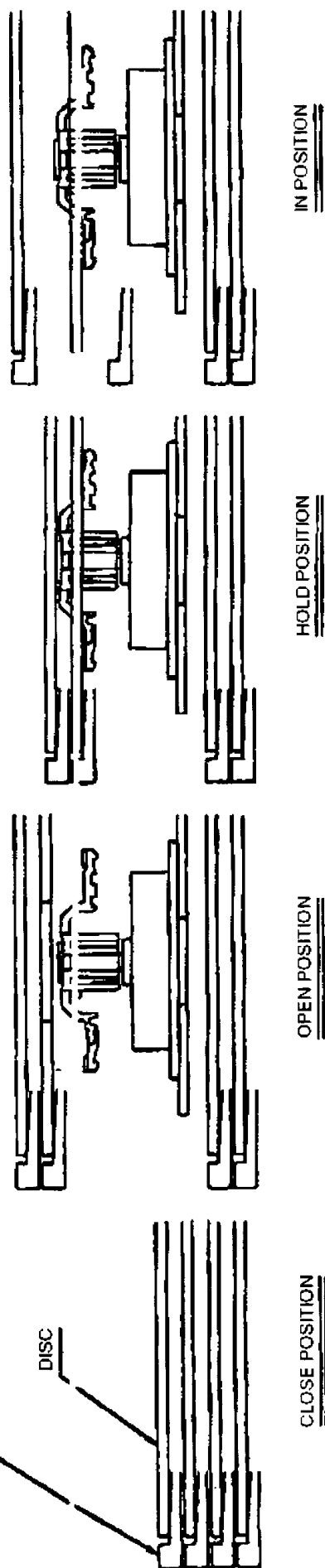
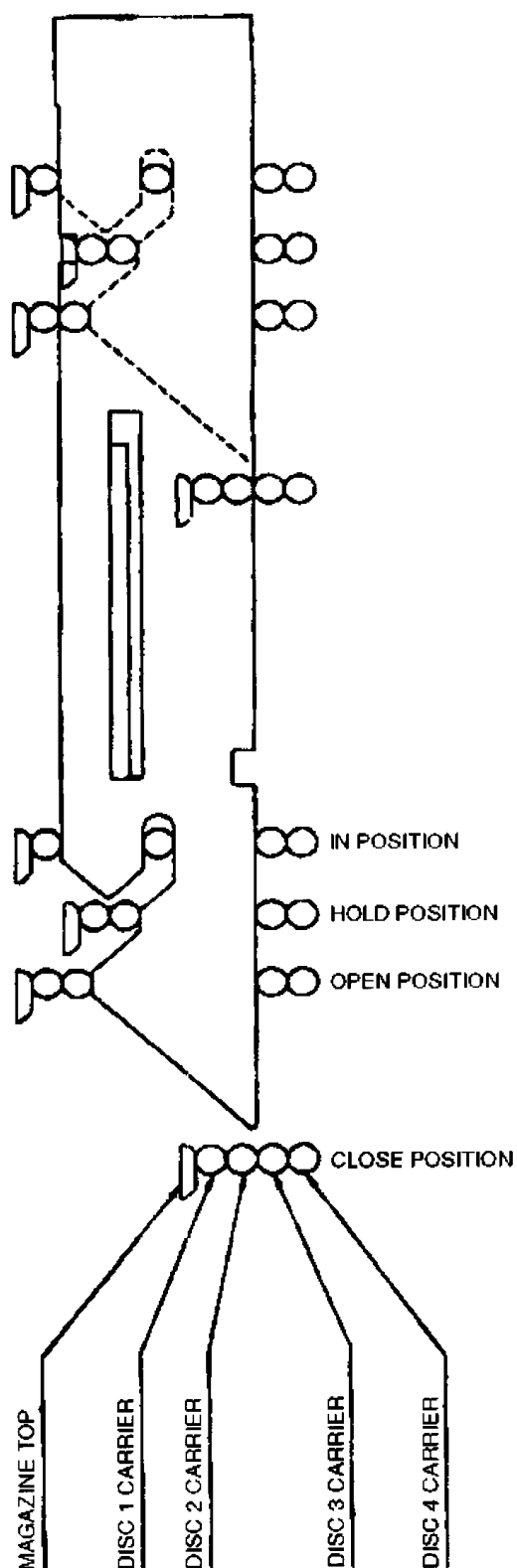
ROTARY (ARM) OUT POSITION

ROTARY IN SWITCH  
(POS. S752)

ROTARY OUT SWITCH  
(POS. S751)



ROTARY (ARM) IN POSITION



MAGAZINE ELEVATOR

FEED MOTOR (POS. C42)

DISC CHUCK RELEASE POSITION

INSIDE TRACK SWITCH

SPINDLE MOTOR (POS. C24)

CHUCK-OFF SWITCH

PICK-UP UNIT (POS. C36)

DISC CHUCK POSITION

## 5.6 Function explanation

### 1. APC (Auto laser power control)

This is the circuit to control laser power of pickup, and laser ON/OFF is set by command from micro computer.

### 2. RF Amplifier (I pattern output)

This inputs pickup photo diode output current (A+C) to FIN2 (1pin), and (B+D) to FIN1 (2 pin). Input current is IV-converted, and output to RFSM (41 pin) of RFSM amplifier output by way of AGC circuit. Self-contained AGC circuit has variable range of  $\pm 3\text{dB}$ , and the time constant can be varied by outside-fixed condenser of PH1 (60 pin). This also controls bottom level of EFM signal (RFSM output), and this response can be varied by outside-fixed condenser of BH1 (61 pin). Central gain of AGC variable range is set by resistance value between RFSM (41 pin) and RFS-(42 pin).

### 3. SLC (Slice level control)

SLC makes duty of EFM signal which is input to DSP 50%. This judges duty, and decides DC level by integrating EFMO signal which is output from DSP.

### 4. Focus servo

Focus error signal can be gained by detecting the difference between (A+C) and (B+D), which is (B+D)-(A+C), and it is sent to FE (20 pin). Focus error signal gain is set by resistance value between FE (20 pin) and FE- (21 pin). FA amplifier is phase compensating Amplifier, and the equalizer curve is set by outside-fixed capacitor and resistance. Besides, this amplifier has muting function. FD amplifier has the following functions; phase compensating circuit, focus search signal synthesis, and offset canceling. Focus search starts by F-SEARCH command, and generates ramp wave shape by inner clock. Focus error signal by this wave shape detects infocus condition (focus zero cross), and turns on focus servo. Ramp wave shape amplitude is set by resistance between FD (16 pin) and FD-(17 pin).

### 5. Tracking servo

This inputs pickup photo diode output current to E (3 pin) and F (4 pin). Input current is IV-converted, and output to TE (7 pin) by way of VCA circuit for balance adjustment and VCA circuit for follow-up to RFAGC circuit. Tracking error gain is set by resistance between TE- (6 pin) and TE (7 pin).

TOFF amplifier just after TE (7 pin) turns off servo by TOFF signal from DSP.

TH amplifier varies servo response characteristic by TGL signal from DSP, or by THLD signal of inside formation by detecting JP signal. When DEFECT is detected, inside mode changes into THLD. This can be avoided by causing short circuit in DEF (49 pin) to "L"=GND. In case of detection, gain can be automatically up by configuring outside DCI (9 pin) band pass filter which picks up only shock element out of tracking error signals and putting it in.

TO amplifier has the function of synthesizing JP pulse and canceling tracking offset. JP pulse is set by JP (14 pin) (THLD is detected inside).

### 6. Sled servo

SLEQ (28 pin) sets response characteristic. Amplifier after SLEQ (28 pin) has muting function, and mutes SLOF (38 pin) by "H" or SLED OFF command. Sled feed is operated by means of current input to SL (30 pin) and SL+ (31 pin), that is, by connecting to output port of micro computer by resistance and setting feeding gain by the resistance value.

### 7. Spindle servo

This configures, together with DSP, servo circuit to keep disc linear velocity at a scheduled level. This receives signal from DSP by CV- (39 pin) and CV+ (40 pin), and sets equalizer characteristic by SP (23 pin), SP- (36 pin) and SPD (27 pin) which output to SPD (27 pin). SPG (25 pin) is set by resistance with which amplifier gain of 12 cm mode is connected to standard voltage.

### 8. TES, HFL (Traverse signal)

In transferring pickup from inner track to outer track, EF output from pickup should be so connected that HFL and TES have phase relation as shown in the figure below. TES comparator has about  $\pm 100\text{mV}$  hysteresis at -polarity comparator against TES input. To pickup exclusively necessary signals out of TE signals, band pass filter is configured outside.

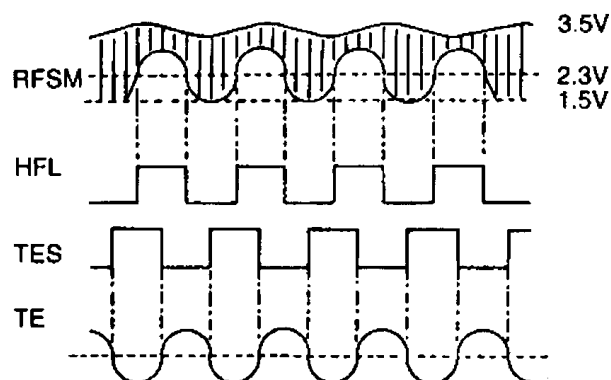


Fig. 8.1

### 9. DRF (Beam level judgement)

DRF becomes "H", when EFM signal (RFSM output) is held at peak value by capacitor of PH1 (60 pin) and peak value of RFSM gets over 2.1V. Condenser of PH1 (60 pin) is related to setting both DRF constant when detected and RFAGC response.

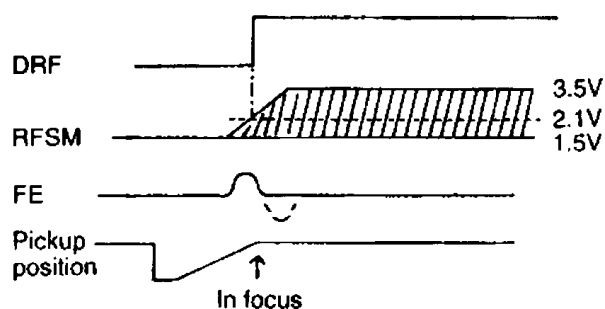


Fig. 8.2

### 10. In-focus judgement

This detects DEF+0.2V of focus error signal S curve, and then judges focus zero cross (being in focus) when S curve becomes REF.

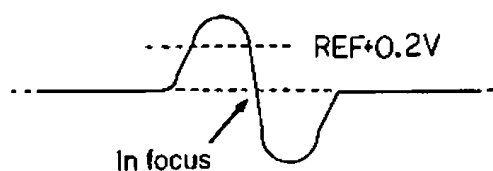


Fig. 8.3

### 11. DEFECT

This normally maintains mirror surface level by capacitor of LF2 (59 pin), and when lack of EFM signal (RFSM output) gets over 0.35V, outputs "H" to DEF (49 pin). When DEF (49 pin) becomes "H", tracking servo changes into THLD mode.

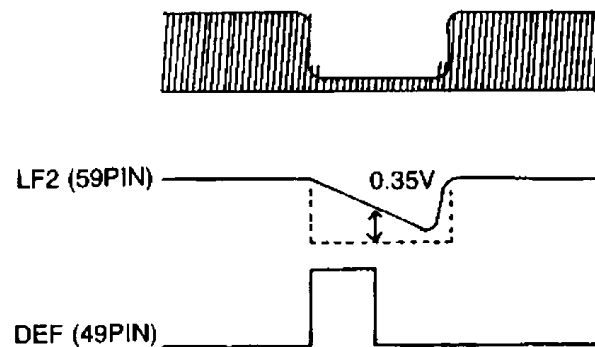


Fig. 8.4

### 12. Reset circuit

When Vcc gets over about 2.8V, Power on Reset is canceled.



## 6. NOTES REGARDING COMPACT DISC PLAYER REPAIRS

### 6.1 Preparations

1. Compact disc players incorporate a great many LCD as well as the pickup (laser diode). These components are sensitive to, and easily affected by, static electricity. If such static electricity is high voltage, components can be damaged, and for that reason components should be handled with care.
2. The pickup is composed of many optical components and other high-precision components. Care must be taken, therefore, to avoid repair or storage where the temperature of humidity is high, where strong magnetism is present, or where there is excessive dust.

### 6.2 Notes for repair

1. Before replacing a component part, first disconnect the power supply lead wire from the unit.
2. All equipment, measuring instruments and tools must be grounded.
3. The workbench should be covered with a conductive sheet and grounded. When removing the laser pickup from its conductive bag, do not place the pickup on the bag. ( This is because there is the possibility of damage by static electricity.)

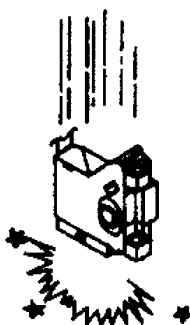
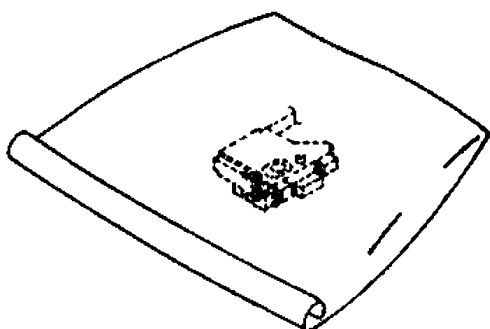
## 7. NOTES REGARDING HANDLING OF THE PICKUP

### 7.1 Notes for transport and storage

1. In retaining the product, high temperature, high humidity and dusty circumstances must be avoided. After taking it out of packing box, never leave it at the place where dust can occur. (Take every possible preventive means against dust.)
2. The pickup should always be left in its conductive bag until immediately prior to use.
3. As this is minutely adjusted, be careful never give it any shock from drop or careless handling.

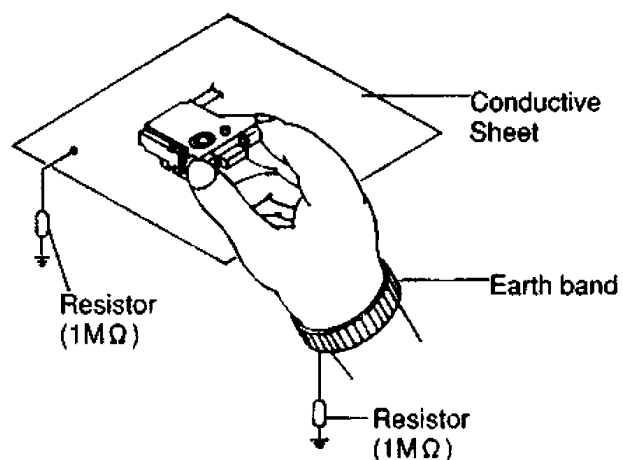
Storage in conductive bag

Drop impact



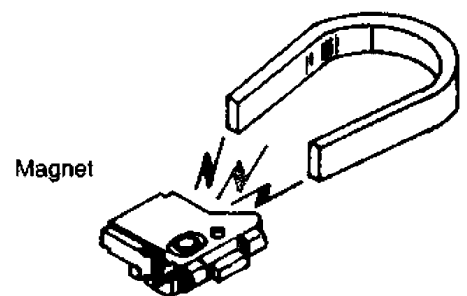
4. To prevent AC leakage, the metal part of the soldering iron should be grounded.
5. In removing short circuit solder of LASER PICKUP, use ceramic heater type of soldering iron.
6. Workers should be grounded by a earth band (1 MΩ).
7. Care should be taken not to permit the laser pickup to come in contact with clothing, in order to prevent static electricity changes in the clothing to escape from the earth band.
8. The laser beam from the pickup should NEVER be directly facing the eyes or bare skin.

### Countermeasure of electrostatic

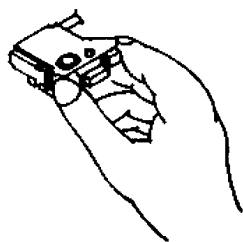


### 7.2 Repair notes

1. The pickup, incorporates a strong magnet, and so should never be brought close to magnetic materials.

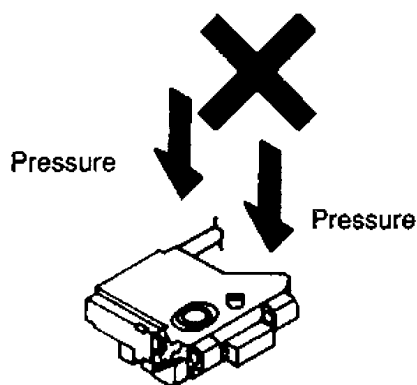


2. The pickup should always be handled correctly and carefully, taking care to avoid external pressure and impact. If it is subjected to strong pressure or impact, the result may be an operational malfunction and/or damage to the printed circuit board.



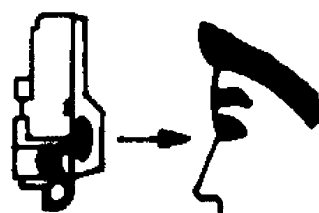
How to hold the pickup

Grabbing print circuit board or pulling connecting wire causes function deterioration or failure. Be sure to hold the whole housing.



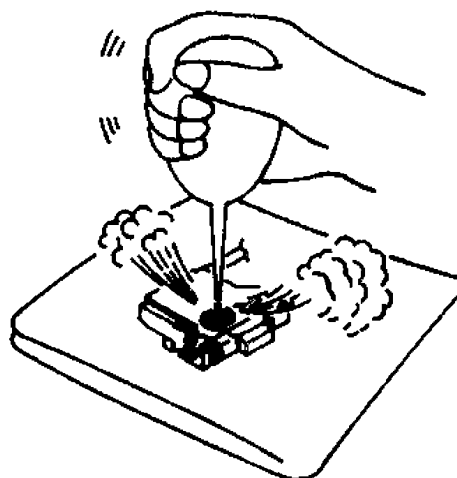
3. If LASER PICKUP or MECHA ASSY is set or reset with power supplied, LASER DIODE or PHOTO DETECTOR is damaged. Be sure to turn off power supply switch before setting or resetting LASER PICKUP or MECHA ASSY.
4. To prevent LASER DIODE or PHOTO DETECTOR from being deteriorated or damaged by static electricity, be sure to thoroughly practice earthing as a preventive means against damage from static electricity.
5. Take every possible means against damage of LASER DIODE or PHOTO DETECTOR from overcurrent or overvoltage. (Example-Use power source equipped with current limiter.)
6. If fingerprint or any other foreign material is attached on objective lens, the function is extremely deteriorated. Be sure never to touch objective lens. Particularly, be very careful in removing or fitting lens cover.

7. PICKUP is a single part, and very minutely adjusted as such. Therefore, never touch any of adjustment points, fixing screws or print circuit board of PICKUP.
  - a. If you touch partially fixed volume soldered on circuit board (beam quantity adjusting volume), emitted beam quantity (RF LEVEL) can change. Never touch partially fixed volume.
  - b. If there occurs even a very small shift in the circuit board fixture position, the function greatly changes. In handling LASER PICKUP, be very careful to hold metal part of housing (HOUSING).
8. If metal part of adjusting rod or driver touches circuit board when power is supplied, it can cause failure. Be careful.
9. Laser beam may damage the eyes! Absolutely never permit laser beams to enter the eyes! Also NEVER switch ON the power to tire laser output part (lens, etc.) of the pickup if it is damaged.



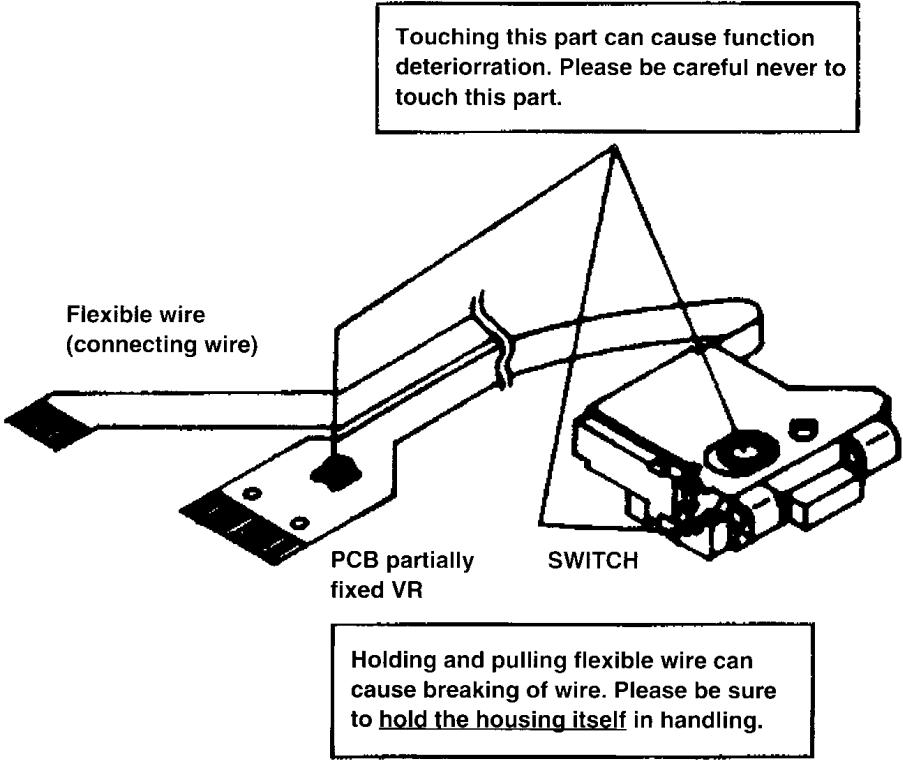
NEVER look directly at the laser beam, and don't let contact fingers or other exposed skin.

10. Cleaning the lens surface  
If there is dust on the lens surface, the dust should be cleaned away by using an air brush (such as used for camera lens). The lens is held by a delicate spring.

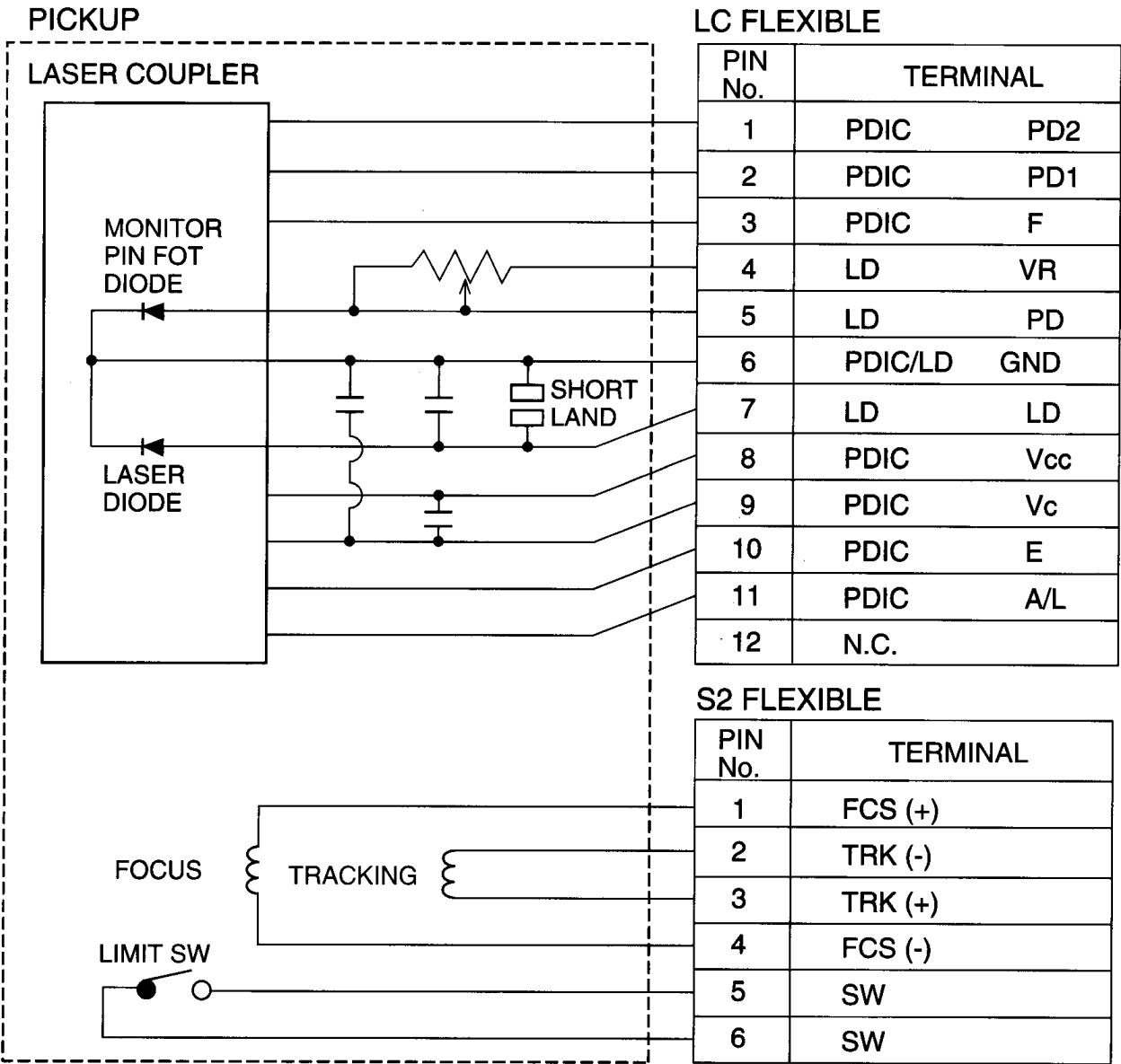


Conductive Sheet

11. Never attempt to disassemble the pickup.



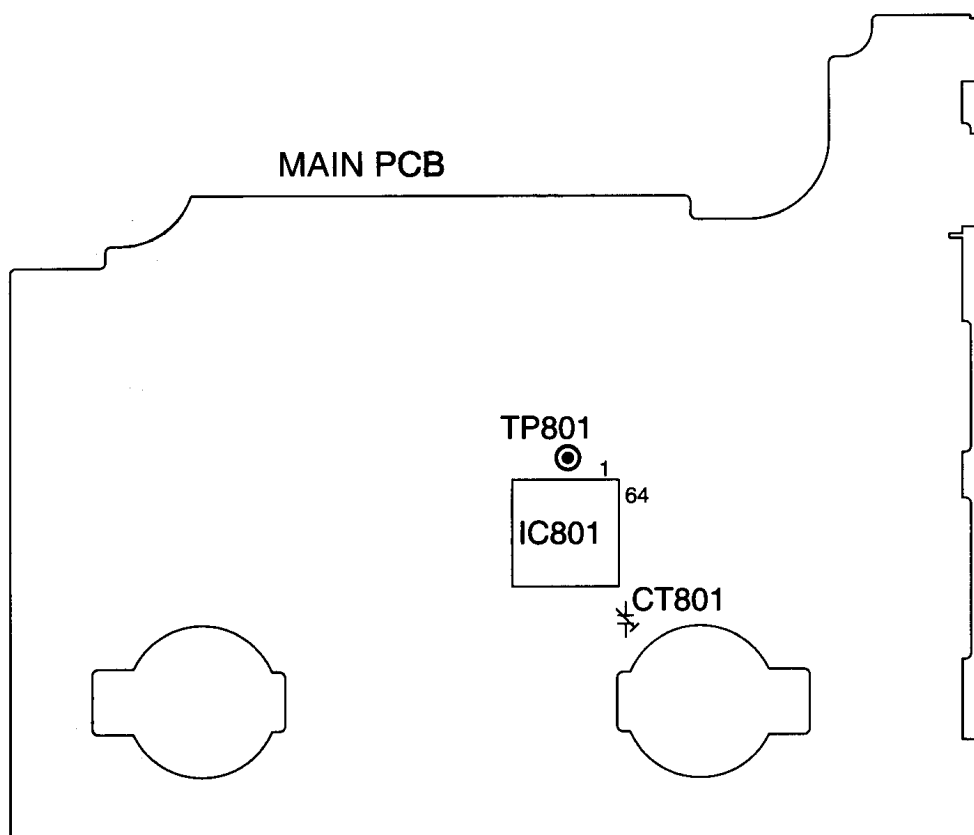
8. PICKUP DETAIL



## 9. ADJUSTMENT PROCEDURES

### 9.1 Clock adjustment

Connect the frequency counter between TP801 and GND while pushing M1 key with setting movement mode (OFF indication), then adjust the frequency around 1048.552 to 1048.600Hz. The adjustment is performed via CT801.



## **10. DISASSEMBLY**

### **10.1 Chassis, top**

1. Undo the (A) screw that holds the CHASSIS, TOP. Push up the four hooks with tweezers, for example, and the CHASSIS, TOP comes off.

### **10.2 Assy, panel, front**

1. Undo the four (B) screws that hold the ASSY, PANEL, FRONT and the CHASSIS. Remove the FPC and the socket, and the ASSY, PANEL, FRONT comes off.

### **10.3 CD changer mechanism**

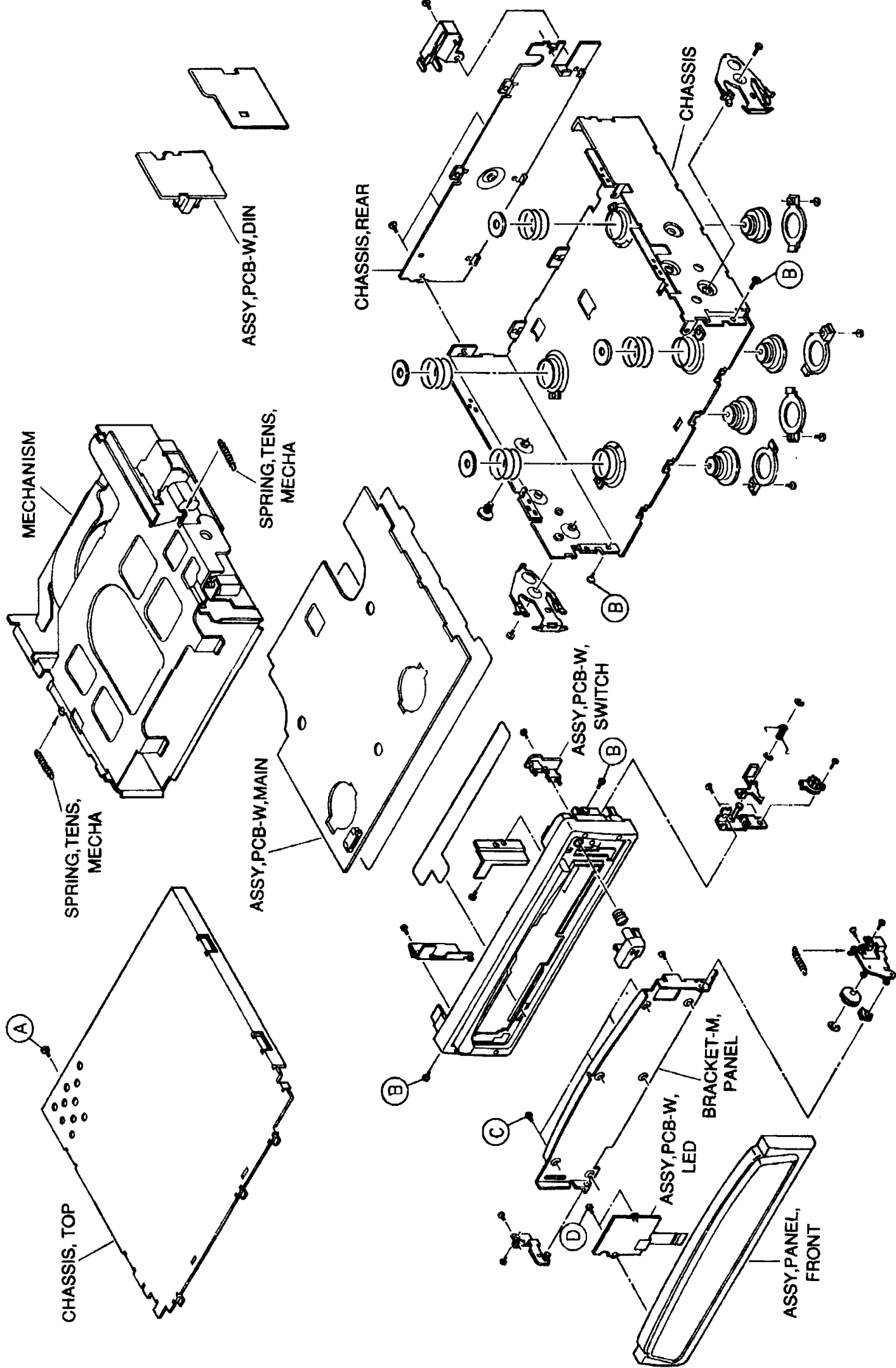
1. Dismount the two SPRING, TENS, MECHAs that hold the CD CHANGER MECHA and the CHASSIS.
2. Pull up the CD CHANGER MECHA and undo the four shafts below the MECHA from the DAMP.
3. Bridge the short round of FPC that comes out of the PICKUP.  
Undo the four FPCs that come out of the CD CHANGER MECHA, and the CD CHANGER MECHA comes off.

### **10.4 Assy, PCB-W, main**

1. Straighten the six hooks of the CHASSIS that hold the ASSY, PCB-W, MAIN, and the ASSY, PCB-W, MAIN comes off.

### **10.5 Assy, PCB-W, LED**

1. Undo the six (C) screws that hold the ASSY, PANEL, FRONT and the BRACKET-M, PANEL.
2. Undo the two (D) screws that hold the ASSY, PCB-W, LED, and the ASSY, PCB-W, LED comes off.



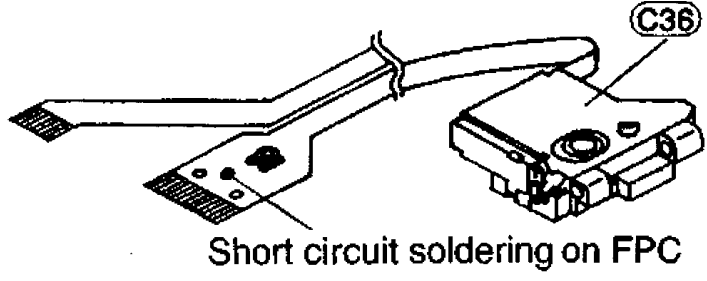


Fig.1

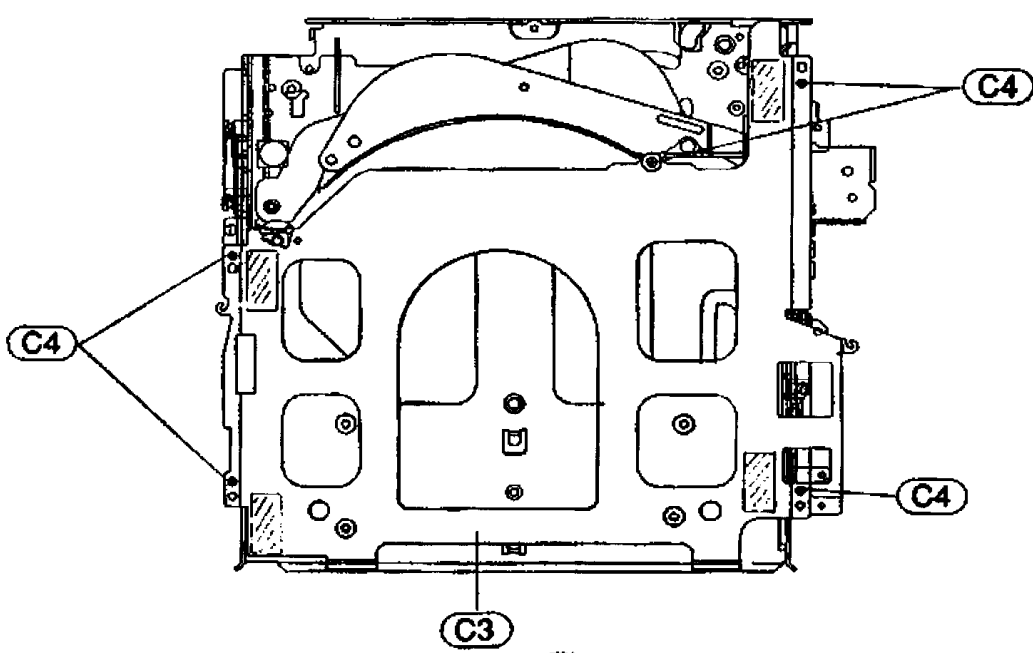


Fig.2

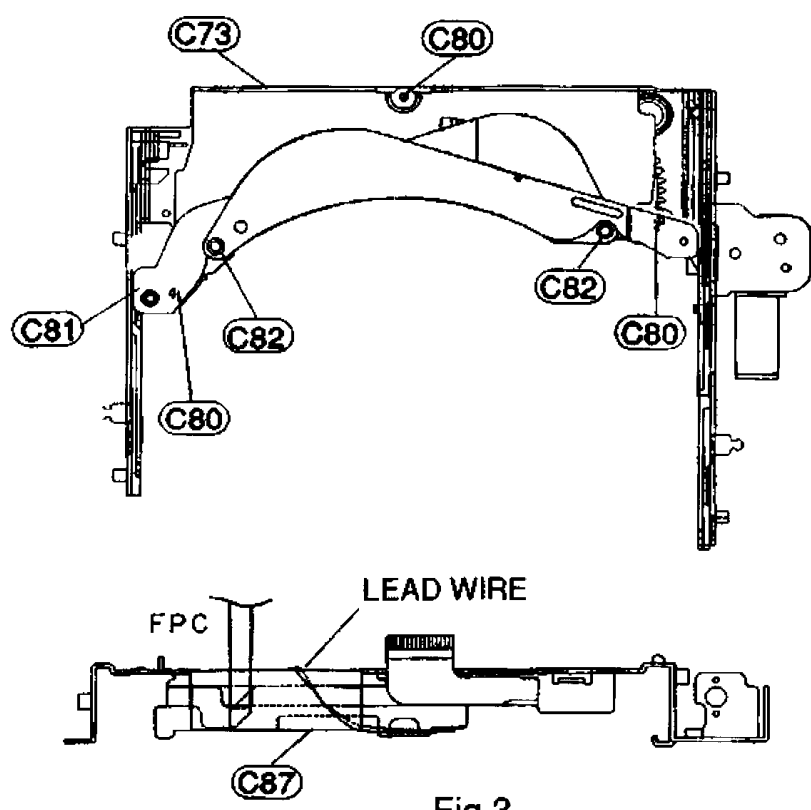


Fig.3

**10.6 CD Changer Mechanism**

- A. How to dismount the Pickup (C36): [Refer to Figures 1, 2, 3 and 4]
1. When dismounting the Mechanism from the set, bridge the short round of FPC that comes out of the Pickup.
  2. Undo the five special screws (C4) that hold the ASSY Chassis Top (C3).
  3. Remove the two Ring E 2 (C82) and then the Lever ASSY "PANTA" (C81).
  4. Undo the three special screws (C80) that mount the ASSY Chassis Top "ELV" (C73).
  5. Loosen the Mount-M "SCREW OUT" (C44) and remove the Gear "FB" (C47).
  6. Undo the two screws (C46) and the lead wire that comes out of the Feed Motor ASSY (C42). Remove the Mount-M "SCREW OUT" (C44).
  7. Dismount the Pickup (C36) and remove the Plate Spring "FEED" (C37), Mount-E "FEED" (C38), special screws (C39) (C40) and the Screw Shaft ASSY (C41).
  8. Remove the Sheet (C87) and the Pickup (C36) comes off.
- B. How to dismount the Rotary Motor ASSY (C74): [Refer to Figures 1,2,3,4, and 5]
1. Refer to instructions 1 to 4 of "A. How to dismount the Pickup".
  2. Undo the Mount-M "SPECIAL WASHER" Top Chassis Fix (C79) and remove the Gears "RA, RB, RC" (C76), (C77), (C78).
  3. Undo the two screws (C75). Remove the lead wire of the Rotary Motor ASSY (C74), and the Rotary Motor ASSY (C74) comes off.
- C. How to dismount the Feed Motor (C42) [Refer to Figures 1, 2, 3 and 4]:
1. Refer to instructions 1 to 6 of "A. How to dismount the Pickup".
  2. Undo the two screws (C43). And the Feed Motor ASSY (C42) comes off.
- D. How to dismount the Spindle Motor ASSY (C24) [Refer to Figures 1, 2, 3, 4 and 6]:
1. Refer to instructions 1 to 6 of "A. How to dismount the Pickup".
  2. Dismount the Pickup (C36) (with (C37) to (C41) attached).
  3. Undo the screw (C23) and remove the Mount-M "SCREW IN" (C20), the Lever "DISC SLEEVE" (C21), the Torsion Spring "CHUCK" (C22).
  4. Undo the screws (C46) (C27), unstick FPC of the Spindle Motor ASSY from the CD Chassis ASSY (C19) and dismount the Spindle Motor ASSY (C24). Undo the screw (C33) and dismount the Mount-M ASSY "DISC SLEEVE R" (C29). And the Spindle Motor ASSY (C24) comes off.
- E. How to dismount the Elevator Motor ASSY (C11) [Refer to Figures 1, 2 and 7]:
1. Refer to instructions 1 and 2 of "A. How to dismount the Pickup".
  2. Remove the Gear "EA" (C13) and the Gear "EB" (C14).
  3. Undo the two screws (C12) and the Elevator Motor ASSY (C11). When removing the lead wire, the Elevator Motor ASSY (C11) comes off.
- F. How to dismount the Elevator Motor ASSY (Magazine Motor ASSY) (C62) [Refer to Figure 8]:
1. Remove the Mount-M "SPECIAL WASHER" Top Chassis Fix (C69). Remove the Gears "MA, MB, MC, MD, ME" (C64), (C65), (C66), (C67), (C68).
  2. Undo the two screws (C63) and dismount the Elevator Motor ASSY (Magazine Motor ASSY) (C62).
  3. Remove the Sheet (C86) and the lead wire.  
And the Elevator Motor ASSY (Magazine Motor ASSY) (C62) comes off.



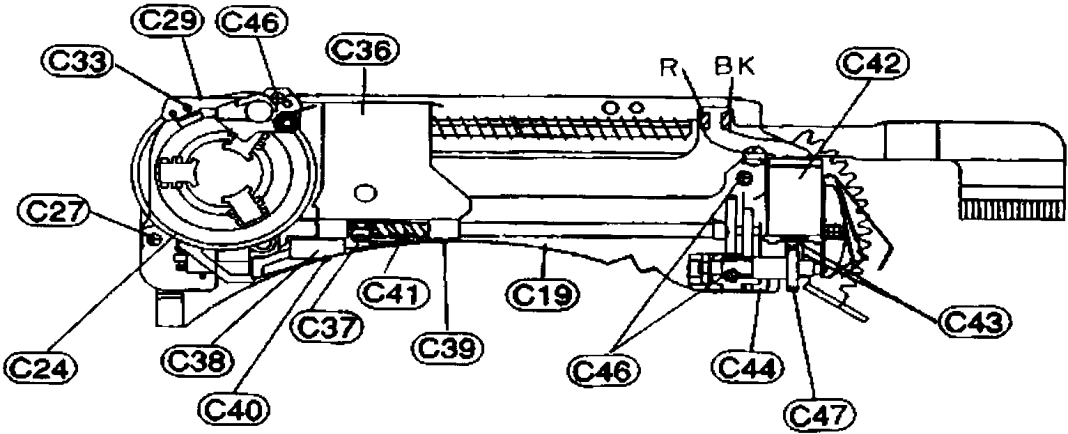


Fig.4

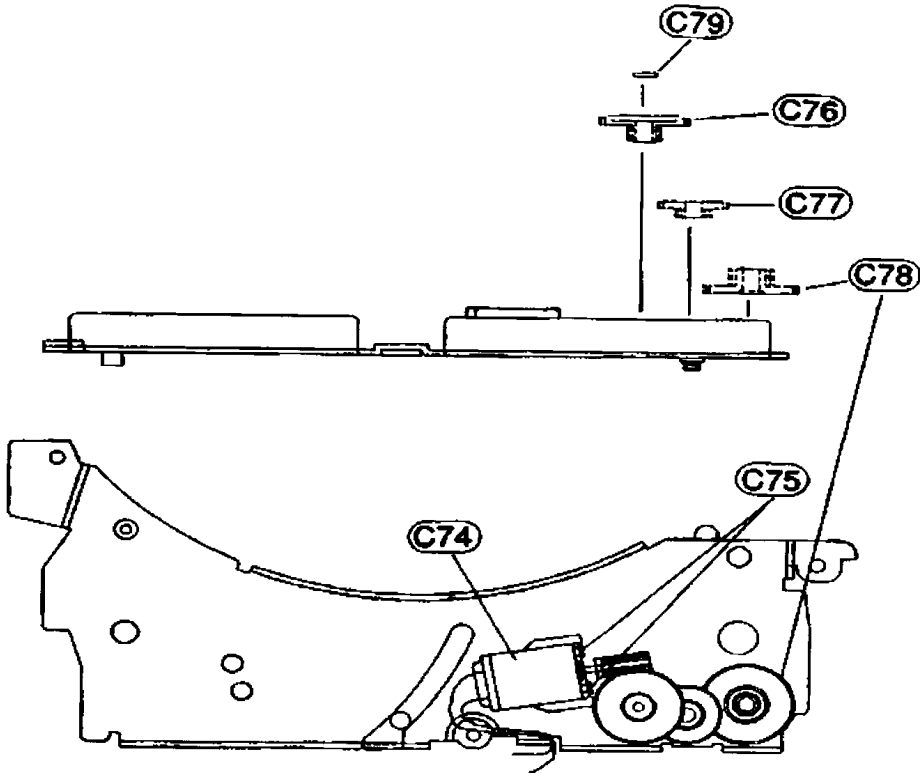


Fig.5

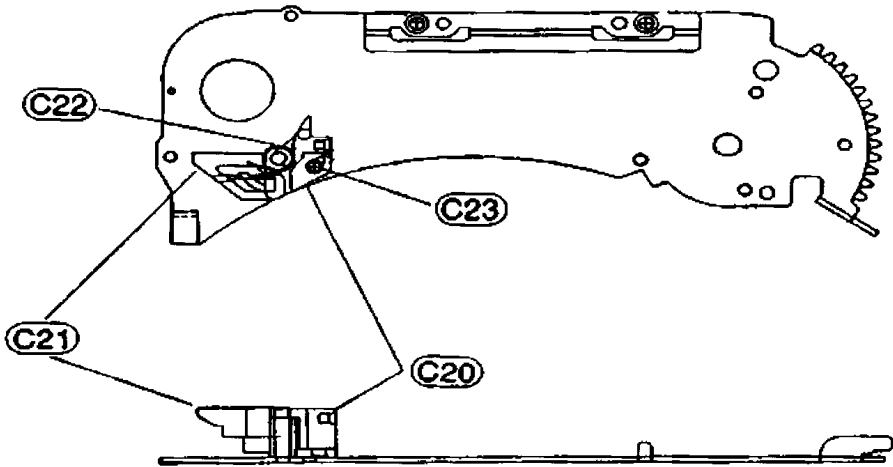


Fig.6

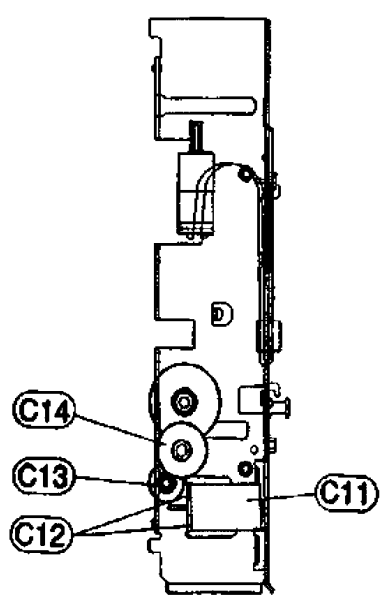


Fig.7

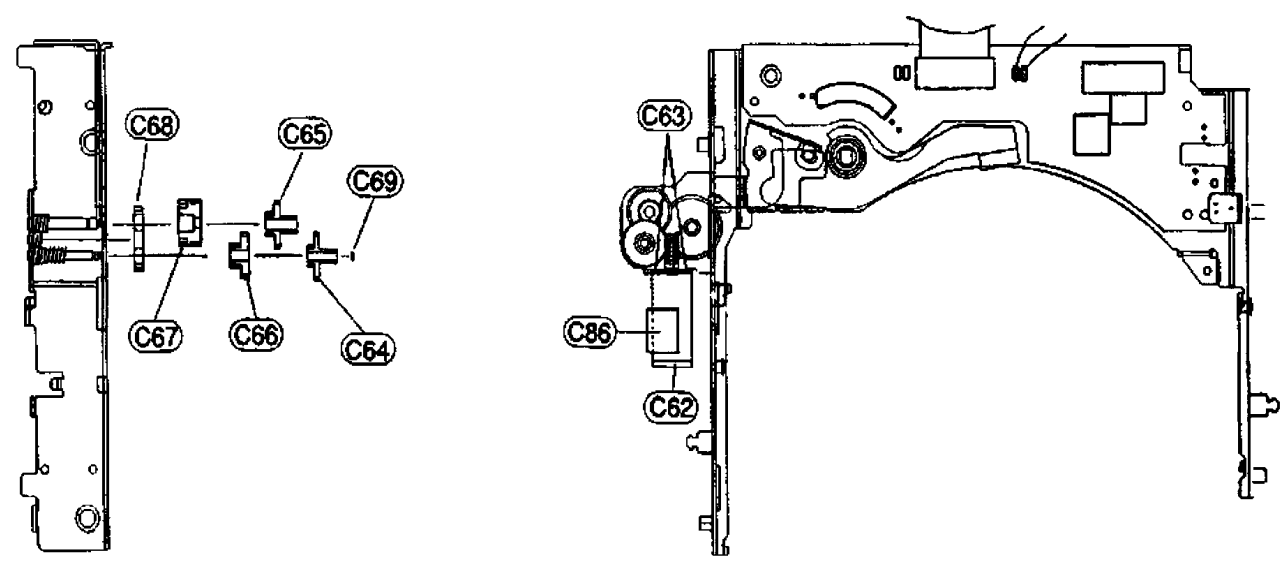


Fig.8

# 11. OSCILLOGRAM CHARTS AND REFERENCES

## Notes:

- All voltages given in these tables are average DC values, unless otherwise noted!
- 'Fig. ..-1 / -2 / ..' means: 'Fig. ..-channel 1 (lowest signal) / -channel 2 / ..' (etc.).

### IC601 – LC78620E

|        |         |
|--------|---------|
| 1:     | 0V      |
| 2:     | N.C.    |
| 3:     | 3.0V    |
| 4:     | 0V      |
| 5:     | 1.8V    |
| 6:     | 5.0V    |
| 7:     | 1.5V    |
| 8:     | 0V      |
| 9:     | N.C.    |
| 10:    | Fig.5-1 |
| 11:    | 2.5V    |
| 12:    | N.C.    |
| 13:    | Fig.5-3 |
| 14-15: | 0V      |
| 16-17: | N.C.    |
| 18-19: | 0V      |
| 20:    | Fig.5-4 |
| 21-22: | N.C.    |
| 23:    | 0V      |
| 24:    | Fig.5-2 |
| 25-26: | N.C.    |
| 27:    | 5.0V    |
| 28:    | Fig.6-1 |
| 29:    | Fig.6-2 |
| 30-37: | N.C.    |
| 38-41: | 0V      |
| 42:    | Fig.3-1 |
| 43:    | Fig.3-2 |
| 44:    | Fig.3-3 |
| 45:    | Fig.4-1 |
| 46:    | N.C.    |
| 47:    | 5.0V    |
| 48-49: | N.C.    |
| 50-51: | 0V      |
| 52-53: | N.C.    |
| 54:    | 5.0V    |
| 55-60: | N.C.    |
| 61:    | 0V      |
| 62:    | N.C.    |
| 63:    | Fig.1-1 |
| 64:    | Fig.4-4 |
| 65:    | Fig.4-3 |
| 66:    | Fig.4-2 |
| 67:    | Fig.1-2 |
| 68:    | 5.0V    |
| 69-70: | N.C.    |
| 71:    | Fig.3-4 |
| 72:    | Fig.2-1 |
| 73-74: | N.C.    |

|        |         |
|--------|---------|
| 75-76: | 0V      |
| 77:    | Fig.2-3 |
| 78:    | Fig.2-2 |
| 79:    | 5.0V    |
| 80:    | N.C.    |

### IC650 – LA9240M

|        |         |
|--------|---------|
| 1-21:  | 2.5V    |
| 22:    | 0V      |
| 23-31: | 2.5V    |
| 32:    | Fig.6-2 |
| 33:    | Fig.6-1 |
| 34:    | 5.0V    |
| 35:    | 0V      |
| 36:    | Fig.6-4 |
| 37:    | Fig.6-3 |
| 38-39: | 0V      |
| 40:    | Fig.7-3 |
| 41:    | Fig.7-1 |
| 42-44: | 2.5V    |
| 45:    | 0V      |
| 46-47: | 2.5V    |
| 48:    | N.C.    |
| 49:    | 0V      |
| 50:    | Fig.7-2 |
| 51:    | Fig.7-4 |
| 52:    | Fig.8-1 |
| 53:    | Fig.8-2 |
| 54:    | 5.0V    |
| 55:    | N.C.    |
| 56:    | 5.0V    |
| 57-60: | 2.5V    |
| 61:    | 2.0V    |
| 62:    | 3.8V    |
| 63:    | 0.2V    |
| 64:    | 0.5V    |

### IC651 – BA6999FP

|      |          |
|------|----------|
| 1-3: | 2.5V     |
| 4:   | N.C.     |
| 5-6: | 2.5V     |
| 7:   | 8.0V     |
| 8:   | 0V       |
| 9:   | 8.0V     |
| 10:  | 0V       |
| 11:  | 0.5V     |
| 12:  | 0V       |
| 13:  | Fig.10-2 |

|        |          |
|--------|----------|
| 14:    | Fig.10-1 |
| 15-16: | N.C.     |
| 17-19: | 0V       |
| 20:    | 8.0V     |
| 21-23: | 0V       |
| 24-25: | N.C.     |
| 26:    | 2.5V     |
| 27-28: | N.C.     |

### IC652 – LA6393M

|      |         |
|------|---------|
| 1:   | 0V      |
| 2:   | 3.0V    |
| 3:   | Fig.9-1 |
| 4:   | 0V      |
| 5-6: | 2.3V    |
| 7:   | Fig.9-2 |
| 8:   | 5.0V    |

### Q602 – DTC144

|    |         |
|----|---------|
| B: | 0V      |
| C: | Fig.9-1 |
| E: | 0V      |

### Q606 – DTC114

|    |         |
|----|---------|
| B: | Fig.9-2 |
| C: | Fig.9-1 |
| E: | 0V      |

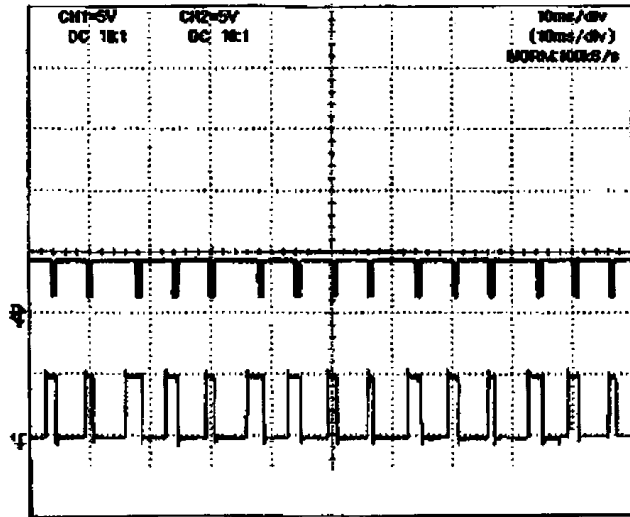


Fig1

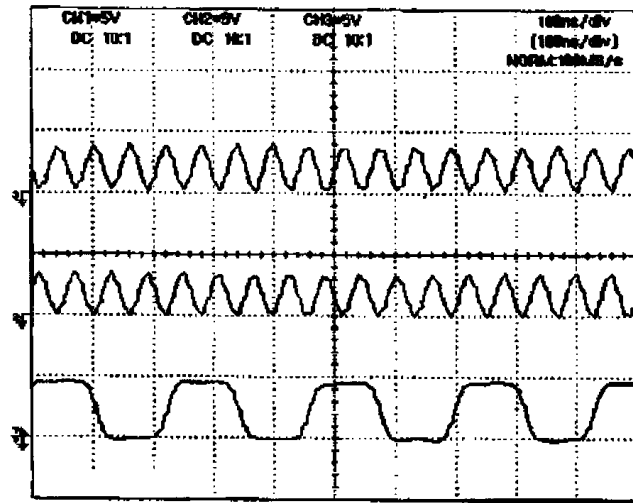


Fig2



Fig3

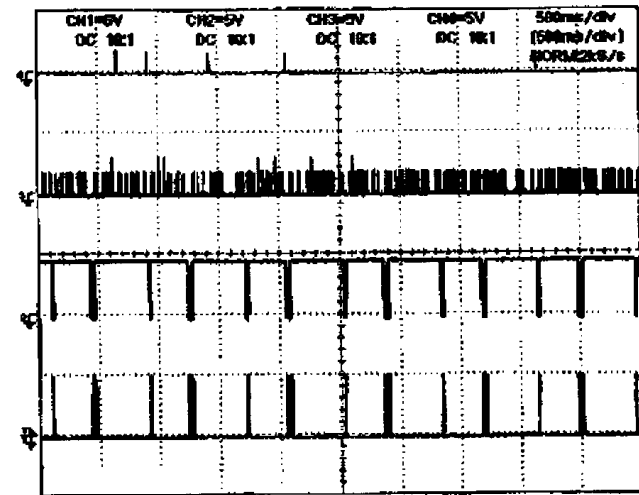


Fig4

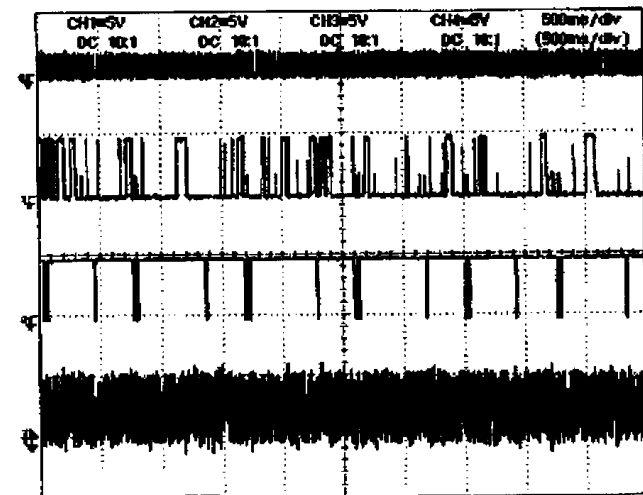


Fig5

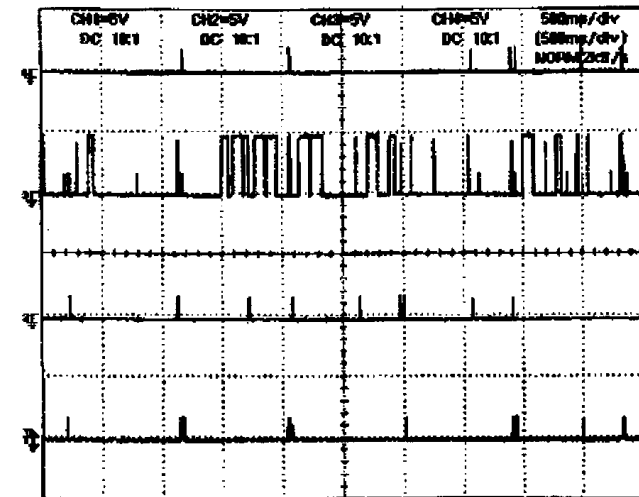


Fig6

**Note:**  
The lowest signal represents channel 1; the signal just over it is the channel 2 signal etc.  
This is valid for each oscillogram chart.

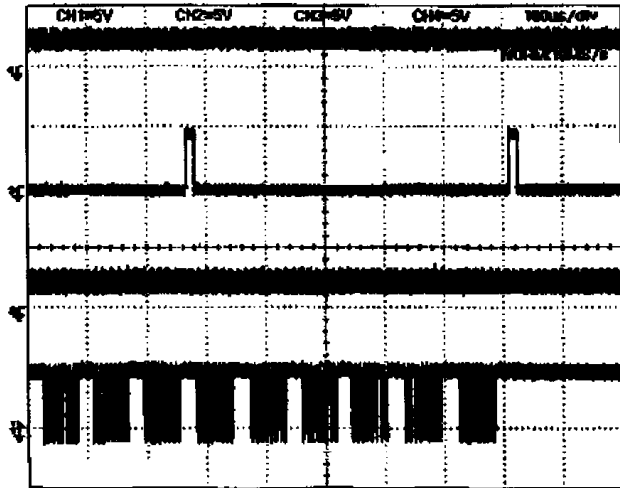


Fig7

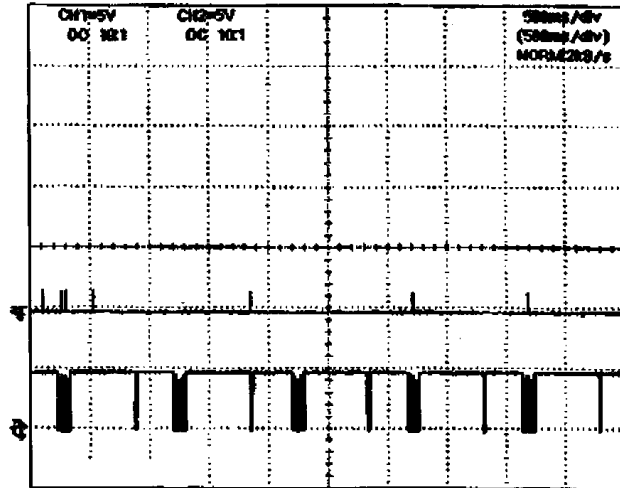


Fig8

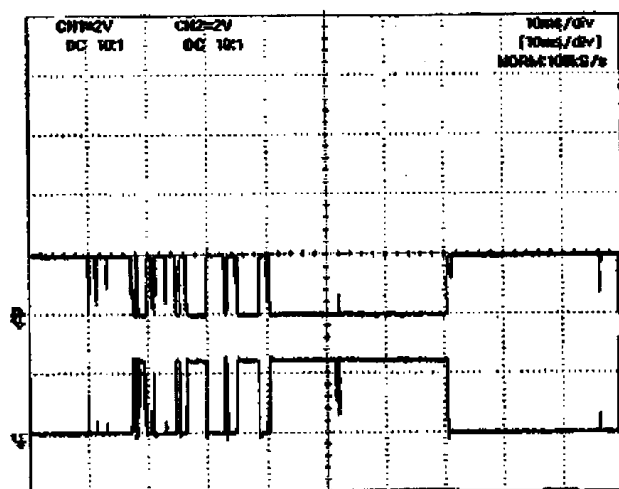


Fig9

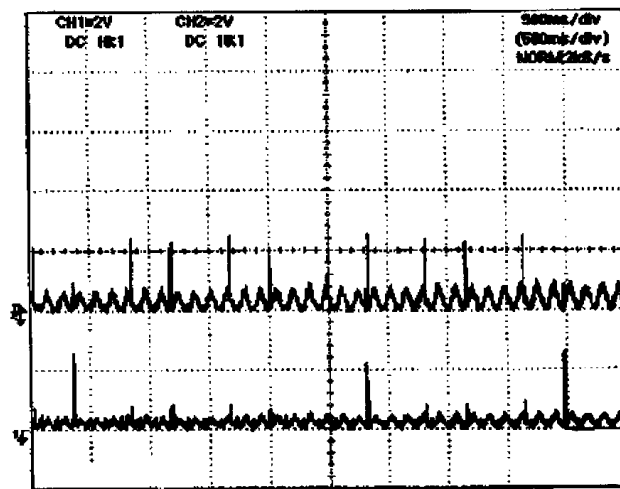


Fig10

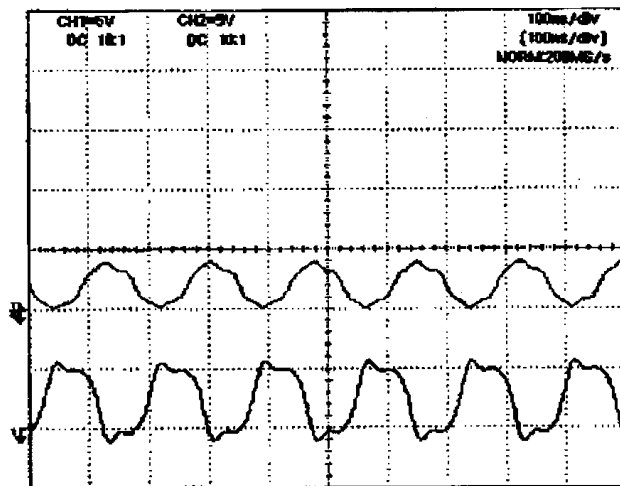


Fig11

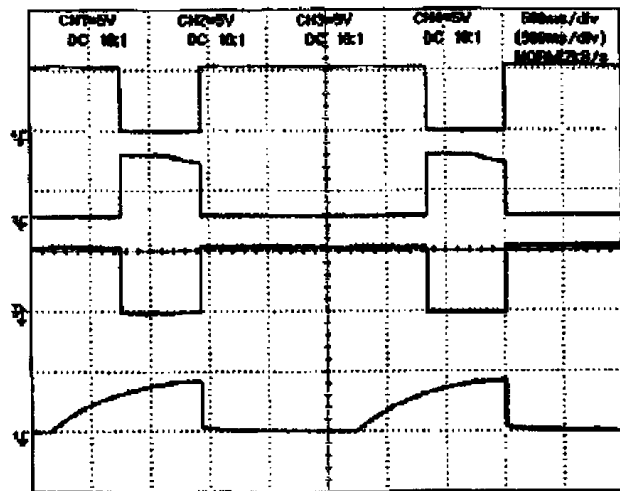


Fig12

**Note:**

*The lowest signal represents channel 1; the signal just over it is the channel 2 signal etc. This is valid for each oscillogram chart.*

**Notes:**

- All voltages given in these tables are average DC values, unless otherwise noted!
- 'Fig. ...-1 / -2 / ...' means: 'Fig. ...-channel 1 (lowest signal) / -channel 2 / ...' (etc.).

**IC1 –  
MSM514400D**

|        |          |
|--------|----------|
| 1:     | Fig.22-4 |
| 2:     | Fig.22-3 |
| 3:     | Fig.21-2 |
| 4:     | Fig.21-4 |
| 5:     | Fig.20-1 |
| 6-8:   | N.C.     |
| 9:     | Fig.18-2 |
| 10:    | Fig.18-1 |
| 11:    | Fig.19-4 |
| 12:    | Fig.19-3 |
| 13:    | 5.0V     |
| 14:    | Fig.19-2 |
| 15:    | Fig.19-1 |
| 16:    | Fig.20-4 |
| 17:    | Fig.20-3 |
| 18:    | Fig.20-2 |
| 19-21: | N.C.     |
| 22:    | Fig.21-1 |
| 23:    | Fig.21-3 |
| 24:    | Fig.22-2 |
| 25:    | Fig.22-1 |
| 26:    | 0V       |

**IC101 – MSM6307**

|        |          |
|--------|----------|
| 1-4:   | N.C.     |
| 5:     | 5.0V     |
| 6:     | 0V       |
| 7-8:   | 5.0V     |
| 9:     | Fig.17-4 |
| 10-12: | 0V       |
| 13:    | N.C.     |
| 14:    | 5.0V     |
| 15:    | Fig.17-3 |
| 16:    | 0V       |
| 17:    | 5.0V     |
| 18:    | N.C.     |
| 19-20: | 2.3V     |
| 21:    | 5.0V     |
| 22:    | N.C.     |
| 23:    | 5.0V     |
| 24:    | Fig.11-2 |
| 25:    | Fig.11-1 |
| 26:    | 5.0V     |
| 27-32: | N.C.     |

**IC701 –  
PCM1710U**

|        |          |
|--------|----------|
| 1:     | Fig.16-1 |
| 2:     | Fig.16-2 |
| 3:     | Fig.13-3 |
| 4:     | Fig.13-4 |
| 5:     | Fig.13-1 |
| 6:     | Fig.13-2 |
| 7:     | 0V       |
| 8-9:   | 5.0V     |
| 10:    | 0V       |
| 11-13: | 2.5V     |
| 14:    | 0V       |
| 15:    | 5.0V     |
| 16-18: | 2.5V     |
| 19:    | 0V       |
| 20-21: | 5.0V     |
| 22:    | 0V       |
| 23:    | 5.0V     |
| 24:    | 0V       |
| 25:    | 5.0V     |
| 26:    | 0V       |
| 27:    | 0V       |
| 28:    | 5.0V     |

**IC801 –  
UPD78P018FGC**

|        |          |
|--------|----------|
| 1:     | 5.0 / 0V |
| 2:     | 0 / 5.0V |
| 3:     | 5.0V     |
| 4-8:   | 5.0 / 0V |
| 9:     | 0V       |
| 10-11: | 5.0V     |
| 12-13: | 0V       |
| 14:    | Fig.4-4  |
| 15:    | Fig.4-2  |
| 16:    | Fig.1-2  |
| 17:    | 5.0V     |
| 18:    | Fig.4-3  |
| 19:    | Fig.1-1  |
| 20-21: | 5.0V     |
| 22:    | 0V       |
| 23:    | 5.0V     |
| 24-26: | 0V       |
| 27:    | 5.0V     |
| 28:    | 0V       |
| 29:    | 5.0V     |
| 30-31: | 0V       |
| 32:    | 5.0V     |

**33: 0V**

|        |          |
|--------|----------|
| 34-37: | 5.0V     |
| 38:    | 0V       |
| 39-40: | 5.0V     |
| 41:    | Fig.14-2 |
| 42:    | Fig.14-1 |
| 43:    | 0V       |
| 44:    | 5.0V     |
| 45-46: | 0V       |
| 47:    | 3.5V     |
| 48:    | 0V       |
| 49:    | Fig.4-1  |
| 50:    | 5.0V     |
| 51:    | Fig.17-2 |
| 52:    | Fig.17-3 |
| 53:    | Fig.17-1 |
| 54-57: | 5.0V     |
| 58-59: | 0V       |
| 60:    | 5.0V     |
| 61-62: | 0V       |
| 63:    | Fig.17-4 |
| 64:    | 5.0 / 0V |

**IC901 – LC89153**

|        |          |
|--------|----------|
| 1:     | 5.0V     |
| 2-3:   | 0V       |
| 4:     | 5.0V     |
| 5-10:  | N.C.     |
| 11:    | 0V       |
| 12:    | Fig.17-1 |
| 13:    | Fig.17-2 |
| 14:    | 5.0V     |
| 15-17: | 0V       |
| 18:    | Fig.3-2  |
| 19:    | Fig.3-1  |
| 20:    | Fig.3-3  |
| 21:    | Fig.4-1  |
| 22-23: | N.C.     |
| 24:    | 5.0V     |
| 25-27: | N.C.     |
| 28:    | 0V       |
| 29-30: | N.C.     |
| 31-32: | 5.0V     |
| 33:    | Fig.22-1 |
| 34:    | Fig.22-2 |
| 35:    | Fig.22-3 |
| 36:    | Fig.22-4 |
| 37:    | Fig.21-1 |
| 38:    | Fig.21-2 |

**39: Fig.21-3**

|        |          |
|--------|----------|
| 40:    | Fig.21-4 |
| 41:    | 5.0V     |
| 42-43: | N.C.     |
| 44:    | Fig.20-1 |
| 45:    | Fig.20-2 |
| 46:    | Fig.20-3 |
| 47:    | Fig.20-4 |
| 48:    | Fig.19-1 |
| 49:    | 0V       |
| 50:    | Fig.19-2 |
| 51:    | Fig.19-3 |
| 52:    | Fig.19-4 |
| 53:    | Fig.18-1 |
| 54:    | Fig.18-2 |
| 55:    | 0V       |
| 56:    | 5.0V     |
| 57-60: | 0V       |
| 61:    | 5.0V     |
| 62:    | Fig.16-2 |
| 63:    | Fig.16-1 |
| 64:    | Fig.13-3 |

**IC951 –  
TC74HC14AF**

|                                                               |          |
|---------------------------------------------------------------|----------|
| <b>(Note:<br/>all voltages<br/>measured at<br/>ACC = off)</b> |          |
| 1:                                                            | Fig.15-1 |
| 2:                                                            | Fig.15-2 |
| 3:                                                            | Fig.15-3 |
| 4:                                                            | Fig.15-4 |
| 5:                                                            | Fig.12-1 |
| 6:                                                            | Fig.12-2 |
| 7:                                                            | 0V       |
| 8:                                                            | Fig.12-3 |
| 9:                                                            | Fig.12-4 |
| 10:                                                           | N.C.     |
| 11:                                                           | 0V       |
| 12:                                                           | N.C.     |
| 13:                                                           | 0V       |
| 14:                                                           | 5.2V     |

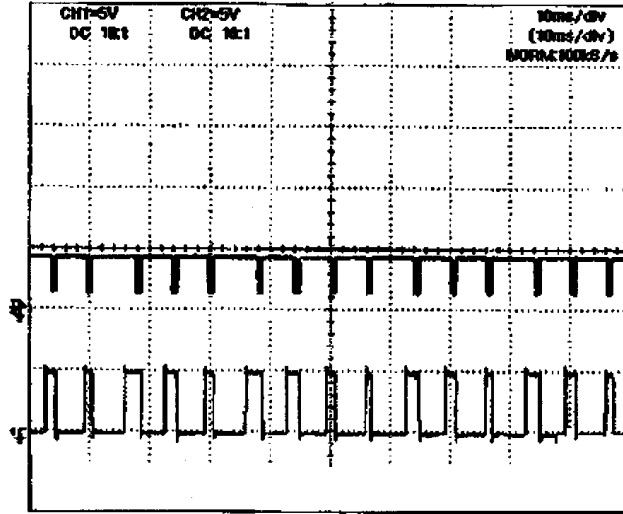


Fig1

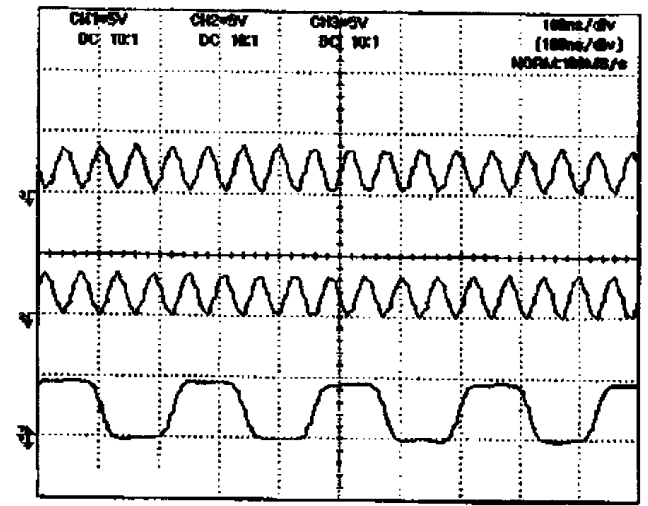


Fig2

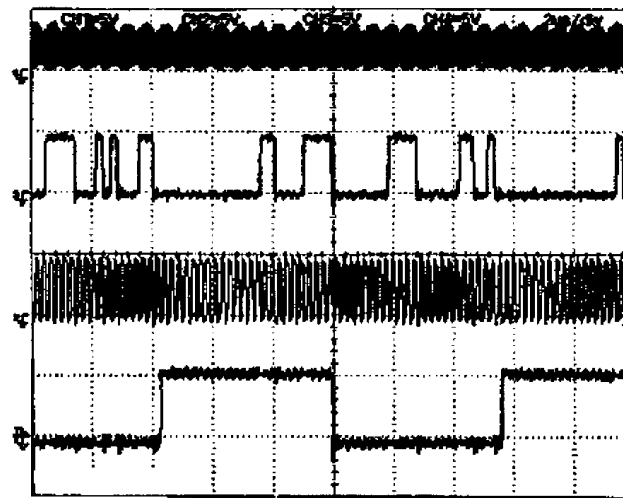


Fig3

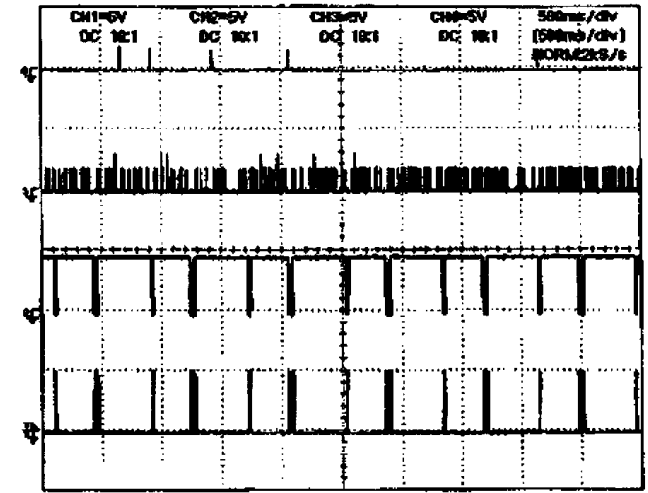


Fig4

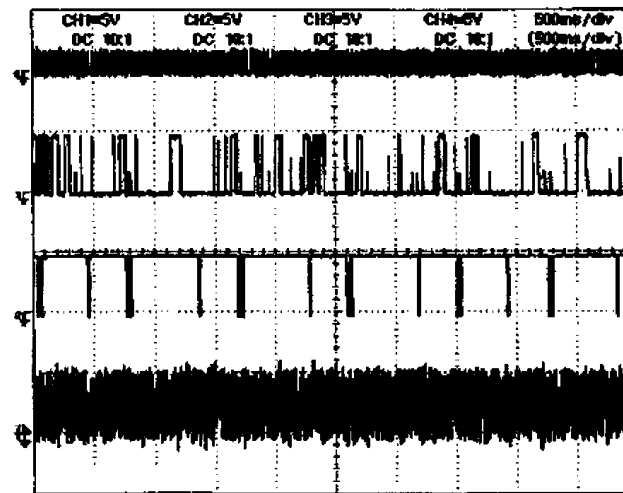


Fig5

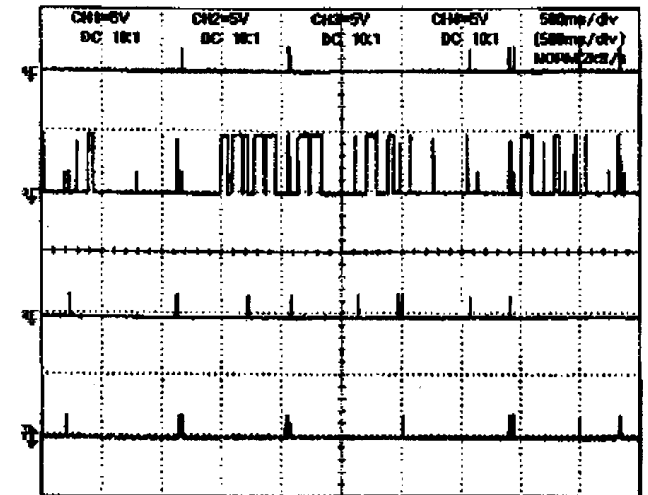


Fig6

**Note:**

The lowest signal represents channel 1; the signal just over it is the channel 2 signal etc. This is valid for each oscillogram chart.

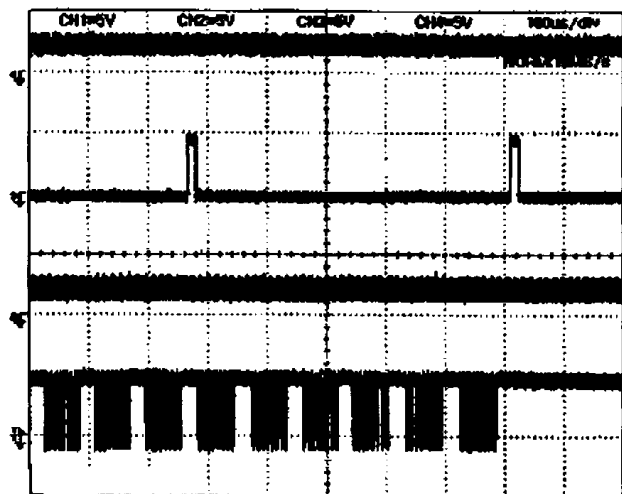


Fig7

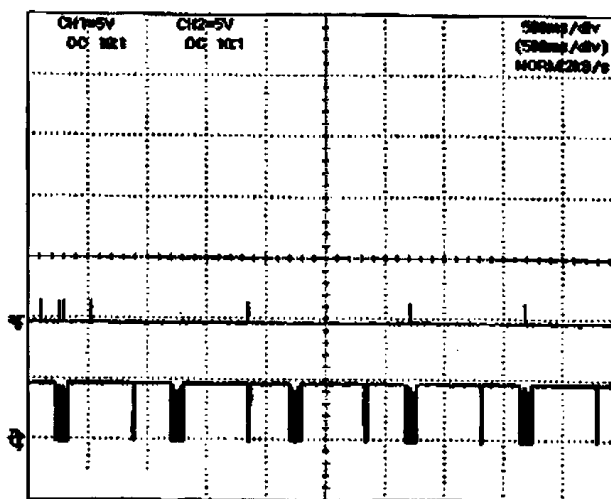


Fig8

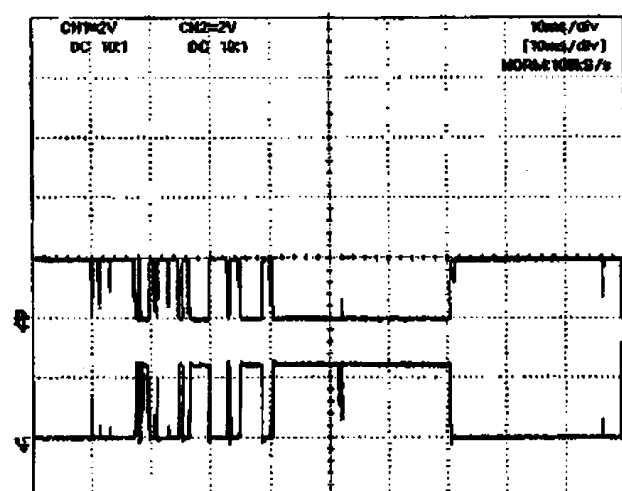


Fig9

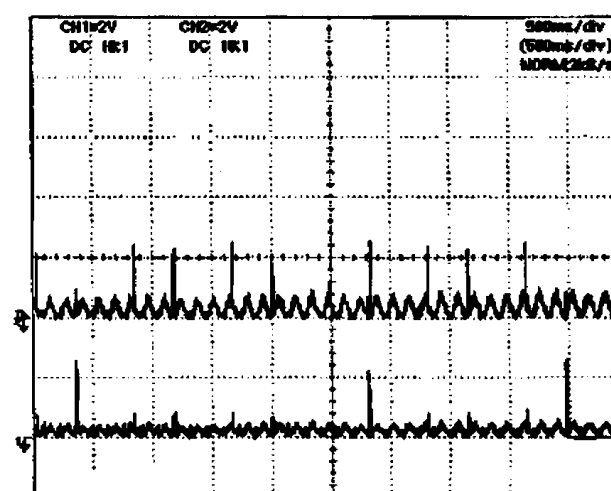


Fig10

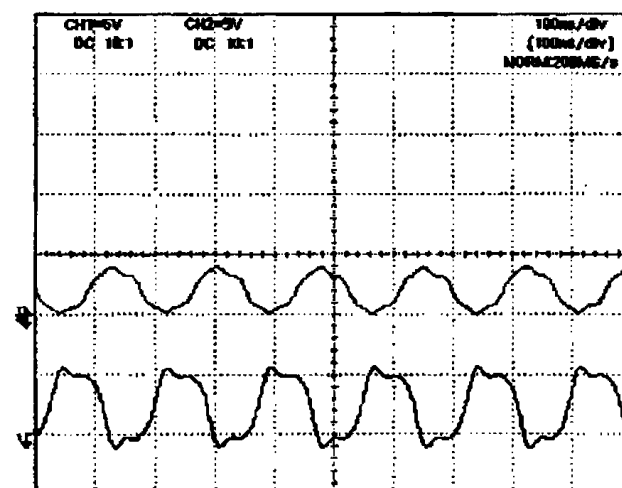


Fig11

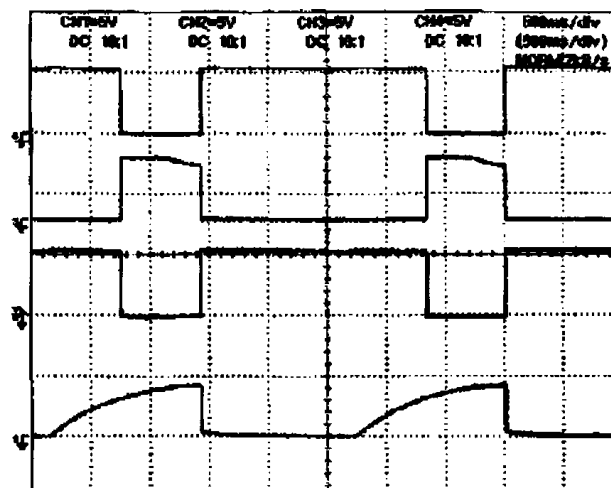


Fig12

**Note:**

The lowest signal represents channel 1; the signal just over it is the channel 2 signal etc. This is valid for each oscillogram chart.



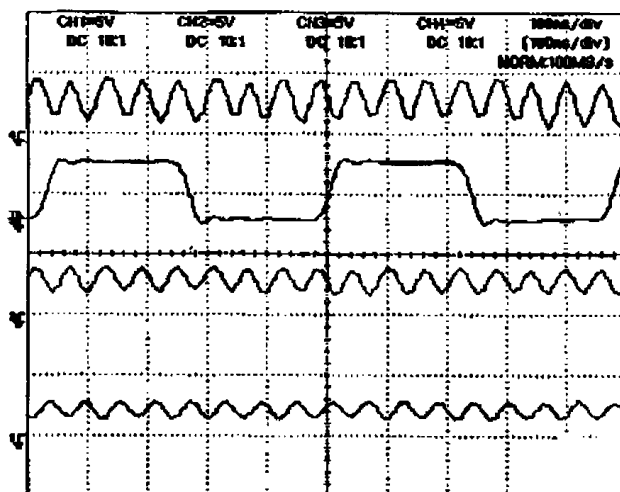


Fig13

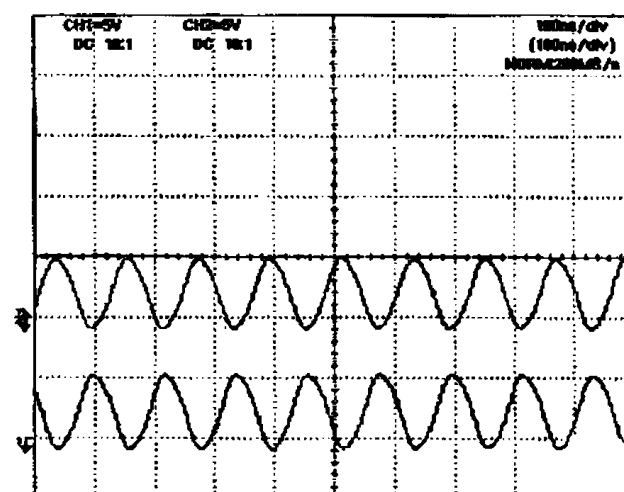


Fig14

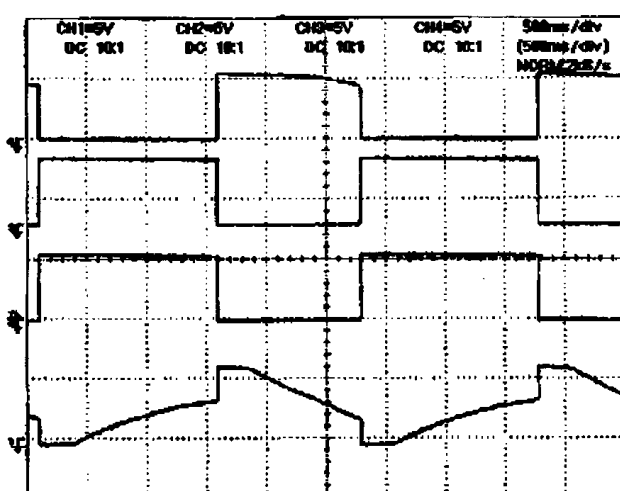


Fig15

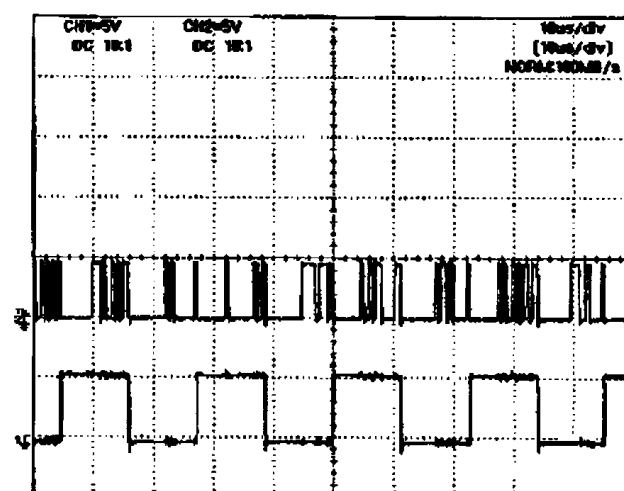


Fig16

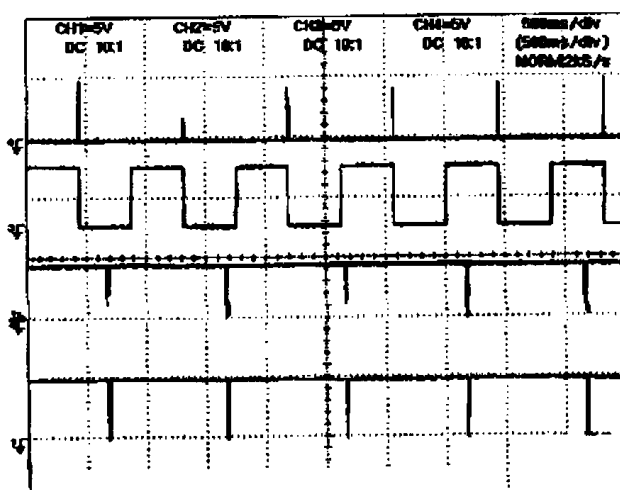


Fig17

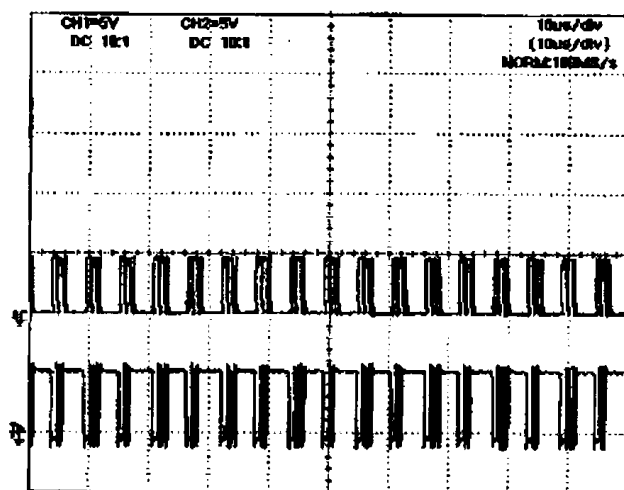


Fig18

**Note:**

*The lowest signal represents channel 1; the signal just over it is the channel 2 signal etc. This is valid for each oscillogram chart.*

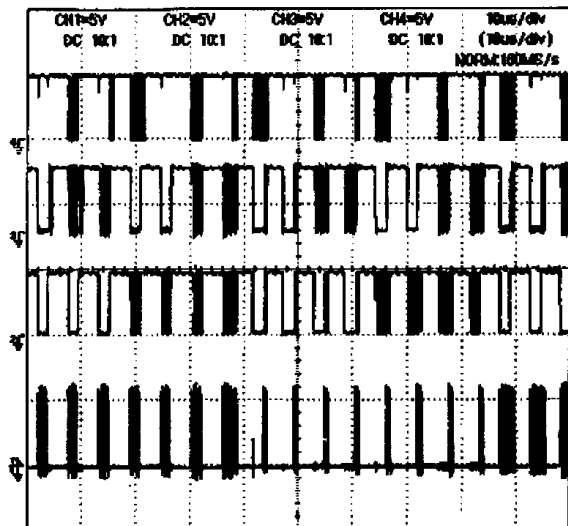


Fig19

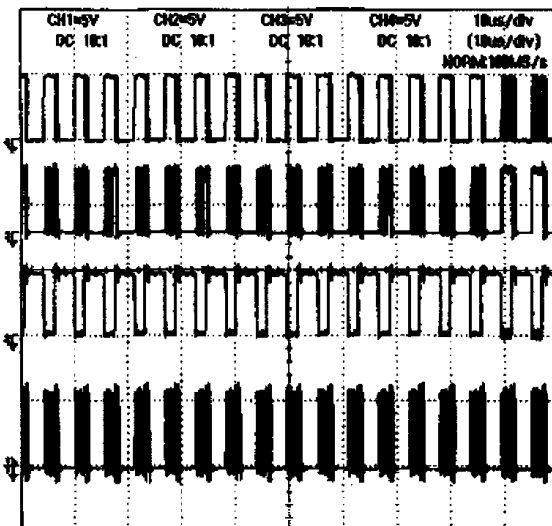


Fig20

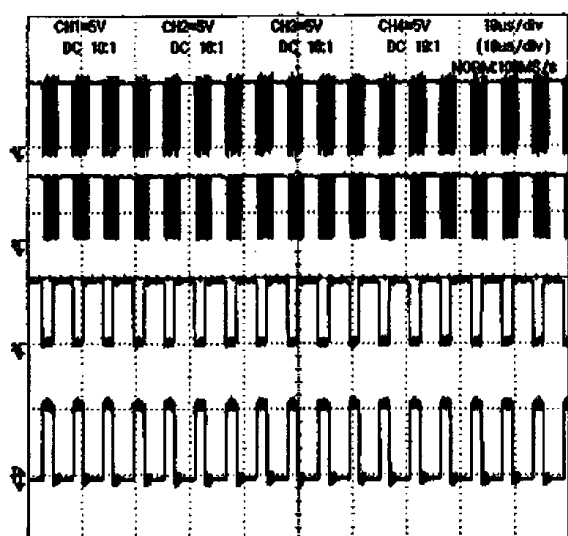


Fig21

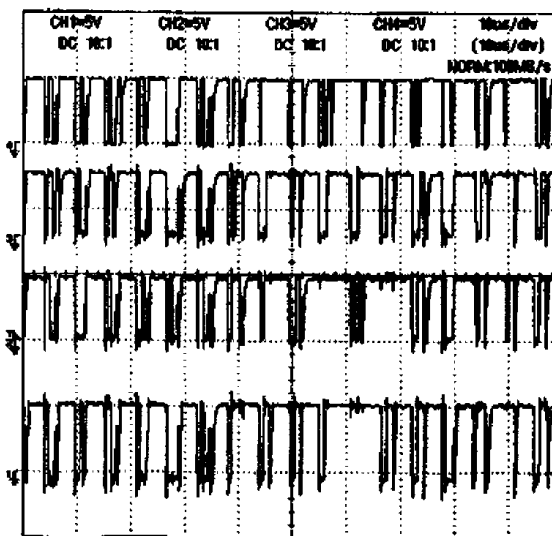
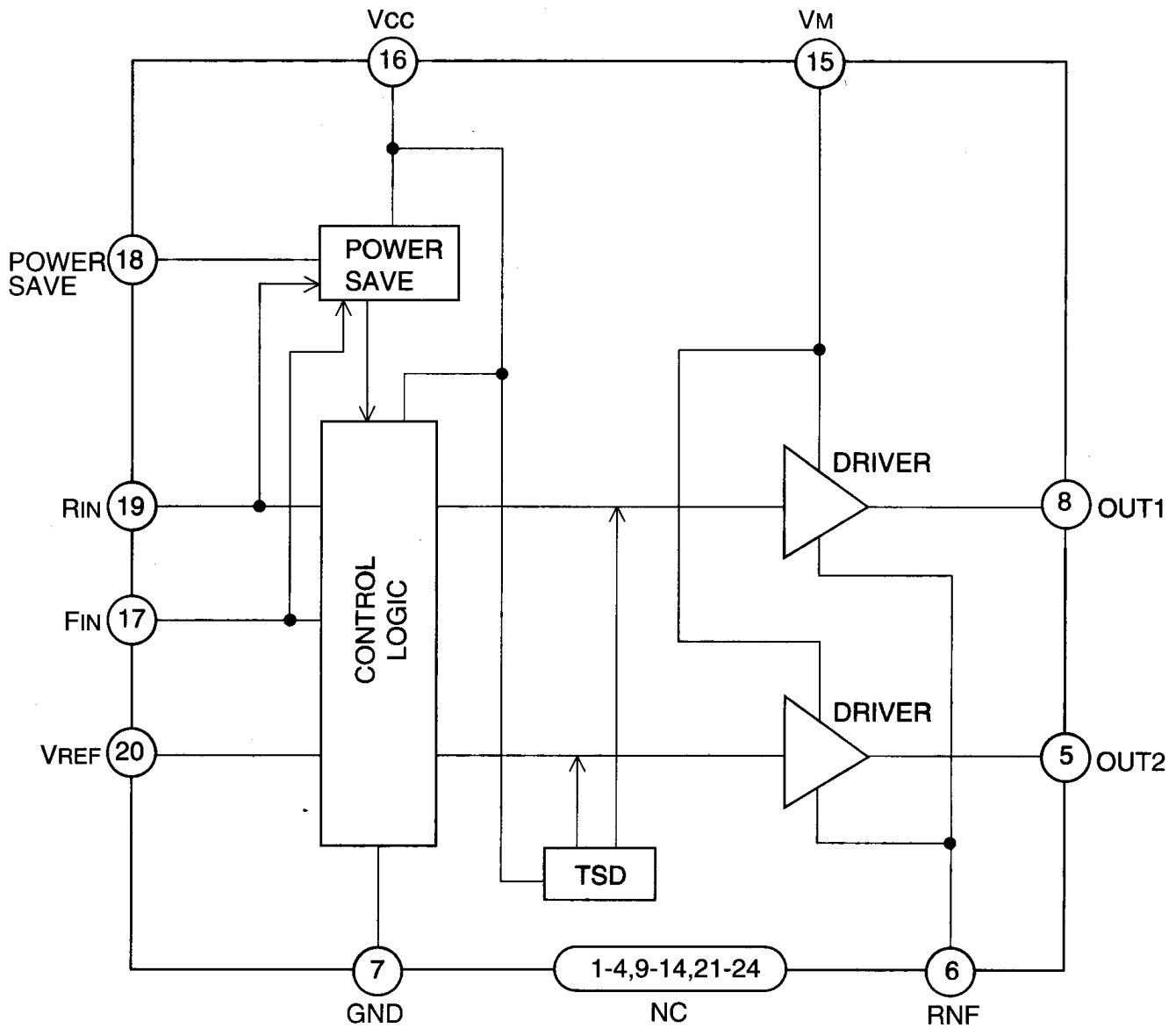


Fig22

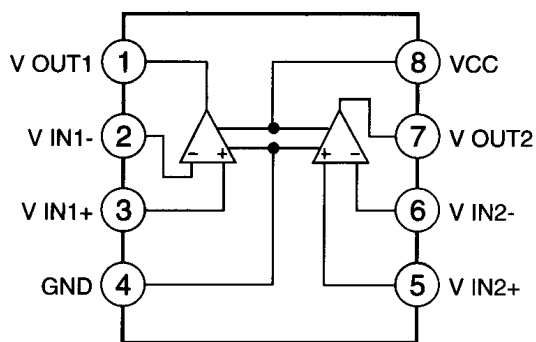
**Note:**  
*The lowest signal represents channel 1; the signal just over it is the channel 2 signal etc.  
 This is valid for each oscillogram chart.*

## 12. IC CIRCUIT DESCRIPTIONS AND IC CIRCUIT BLOCK DIAGRAMS

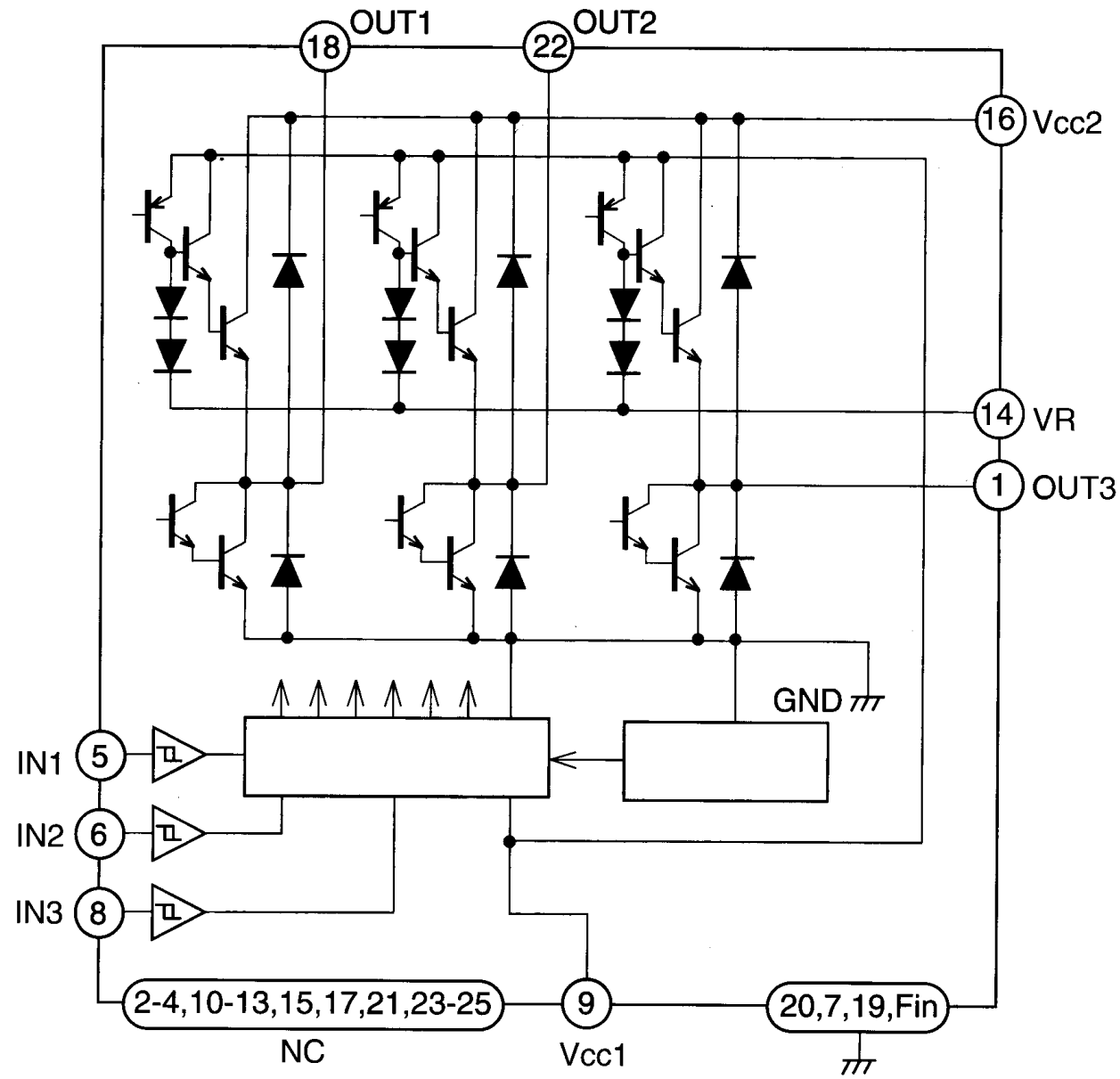
**IC502**  
**BA6285FP**



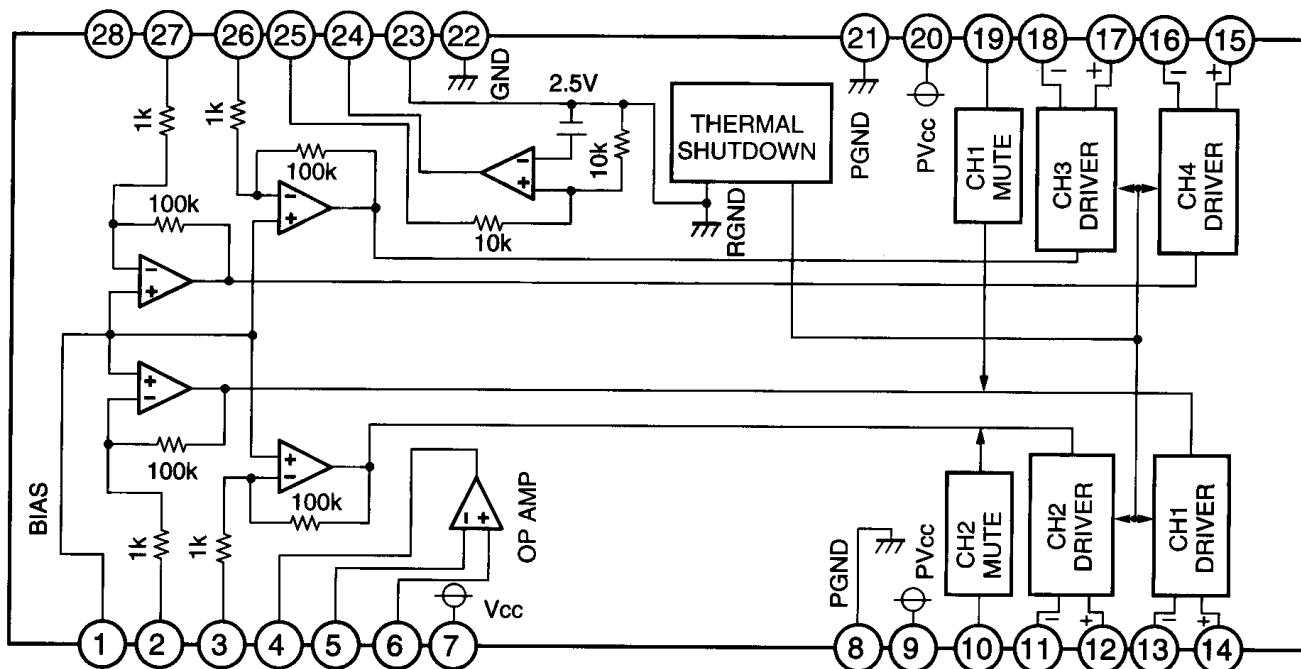
**IC652**  
**LA6393M**



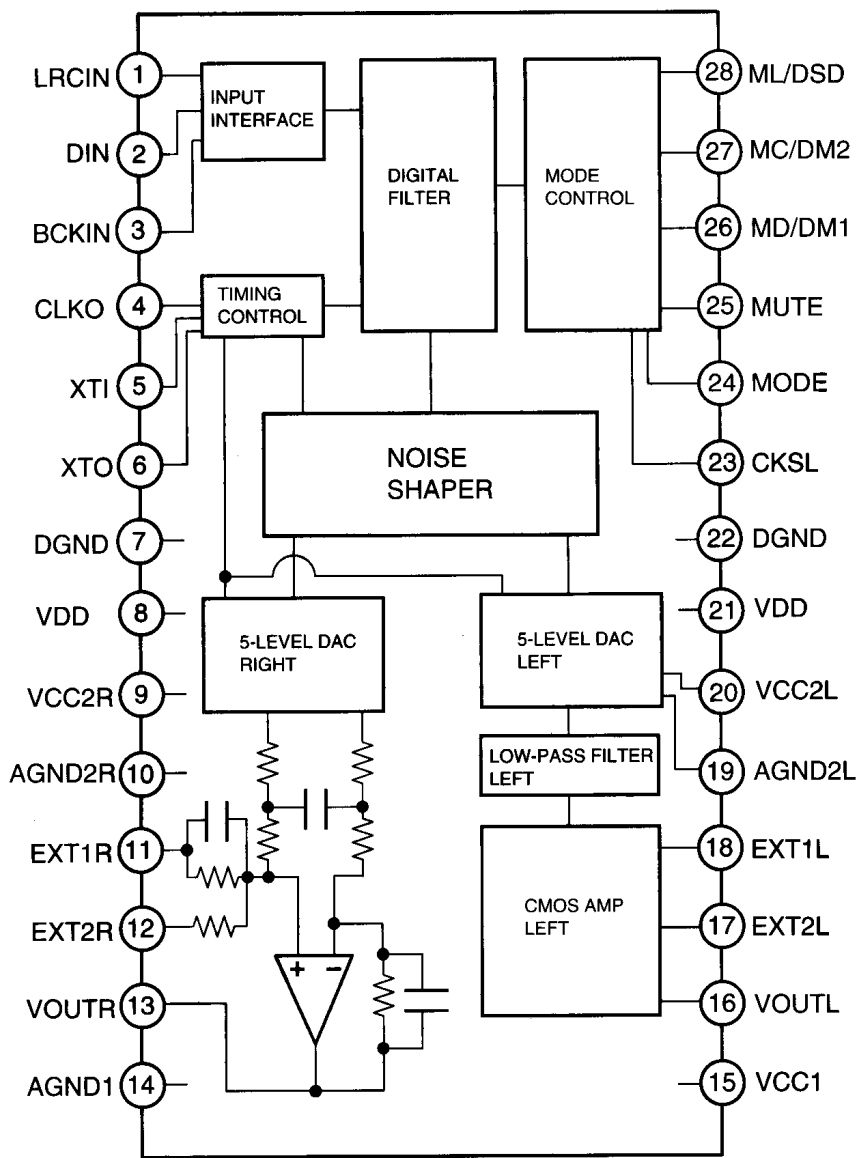
**IC503**  
BA6247FP-Y



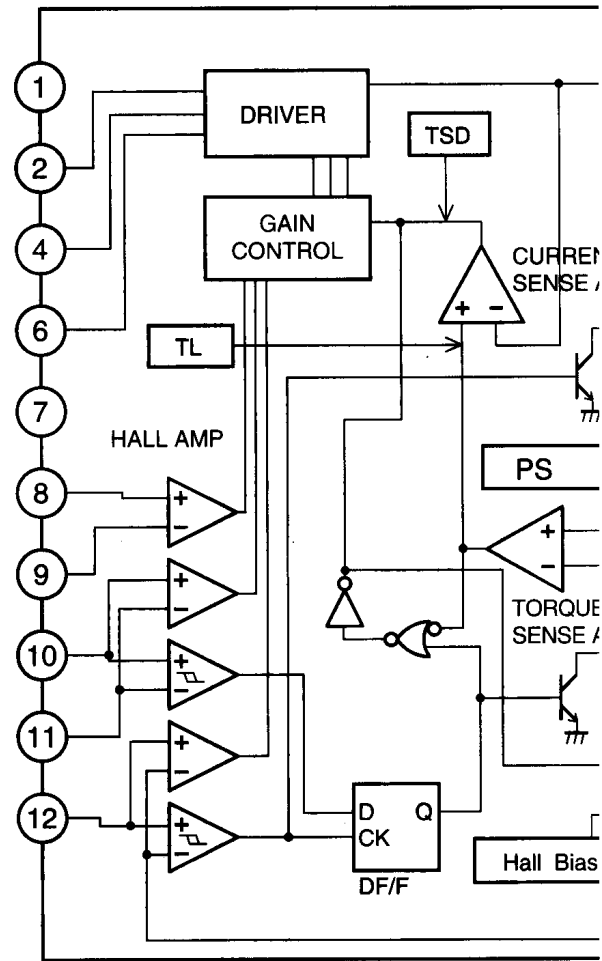
**IC651**  
BA6999FP



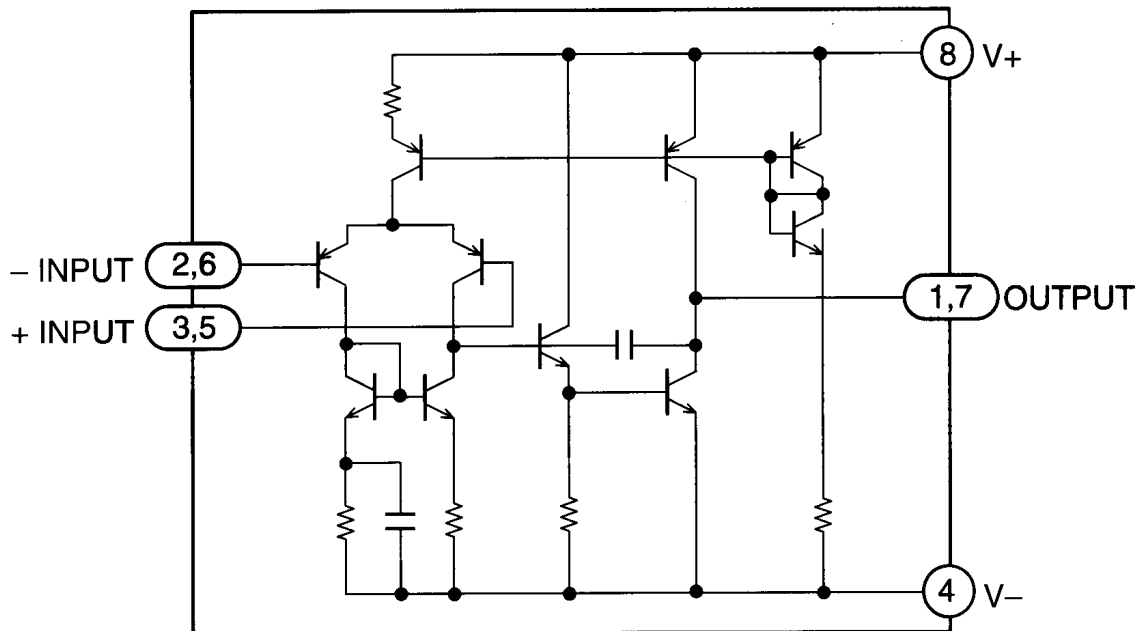
**IC701**  
PCM1710U



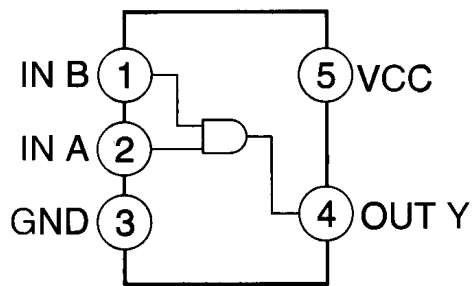
**IC751**  
BA6843AFS



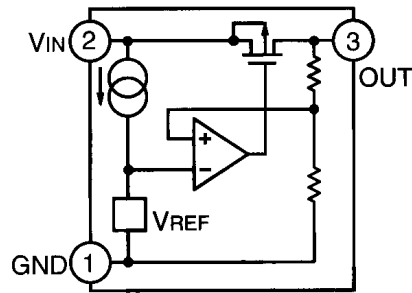
**IC702**  
NJM2100M



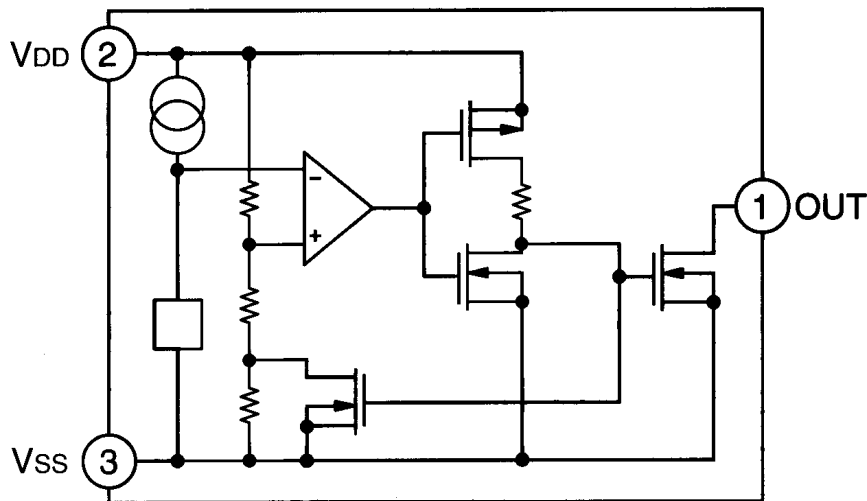
**IC752/781**  
TC7S08FU



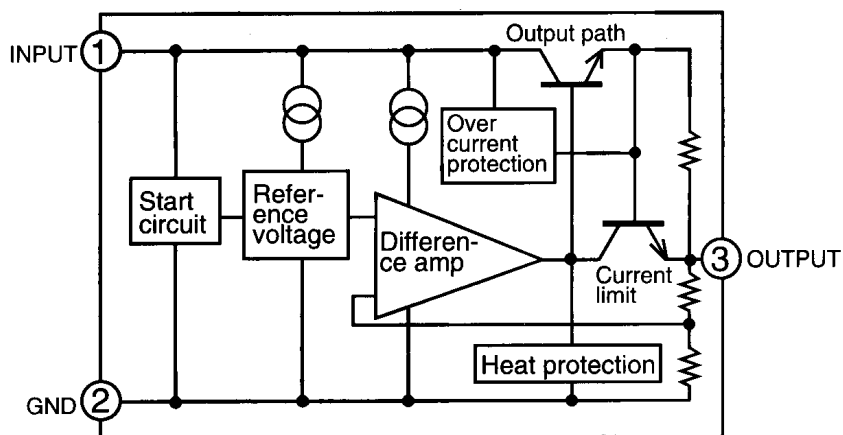
**IC804**  
S-81250HG-RD



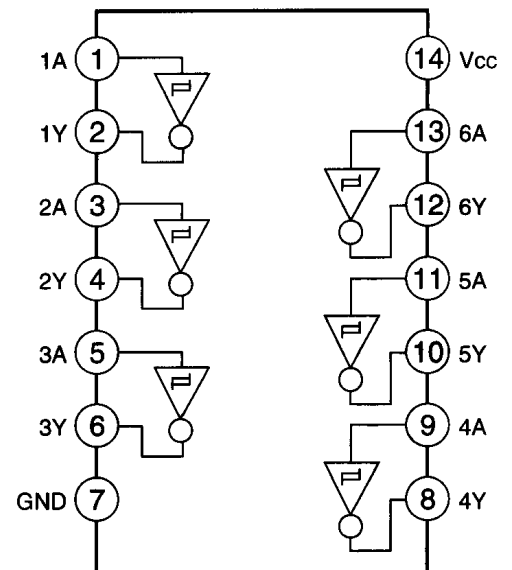
**IC802/803**  
S-80732AN



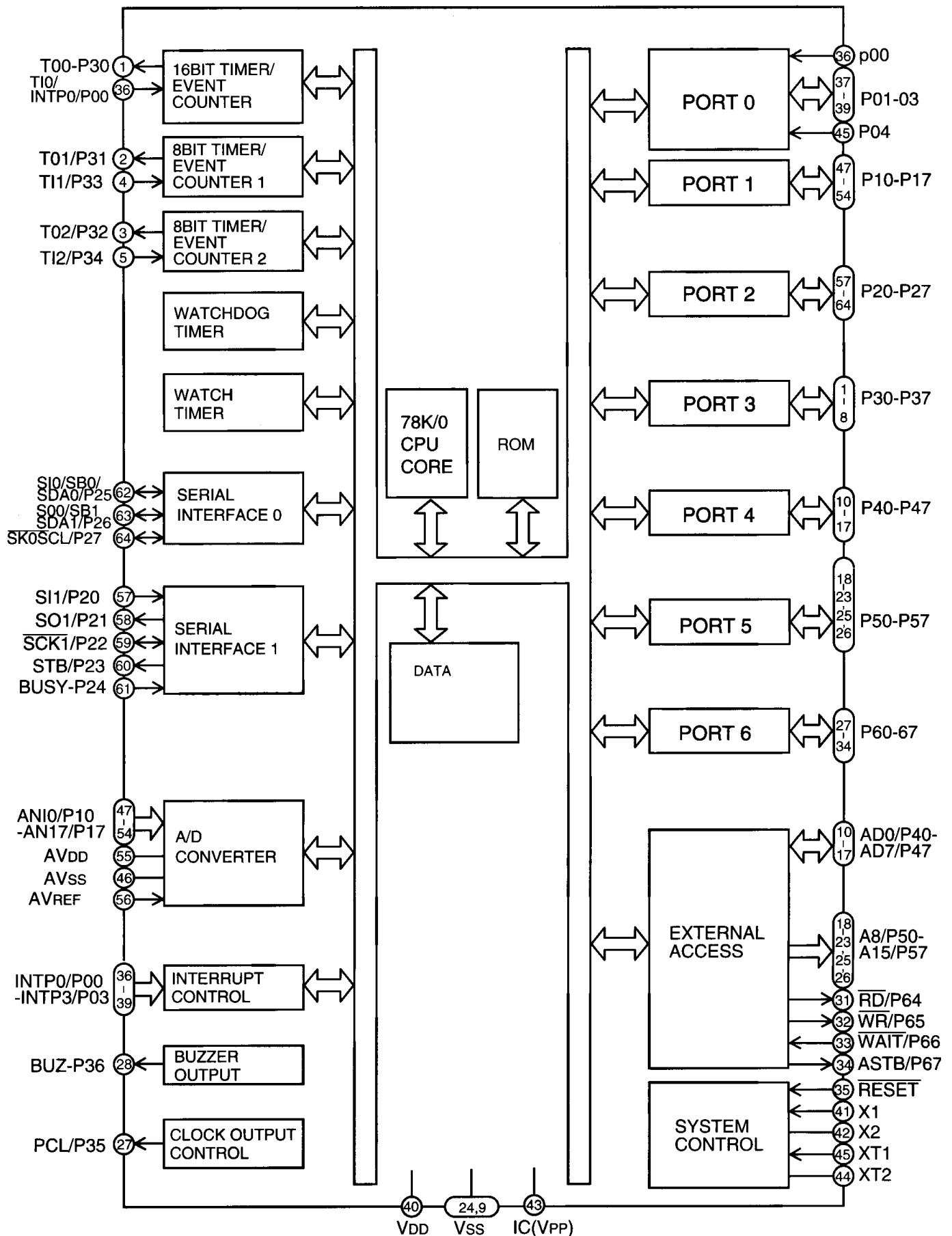
**IC851**  
L78M05T



**IC951**  
TC74HC14AP



**IC801**  
**UPD78P018FGC**



IC801 - UPD78P018FG

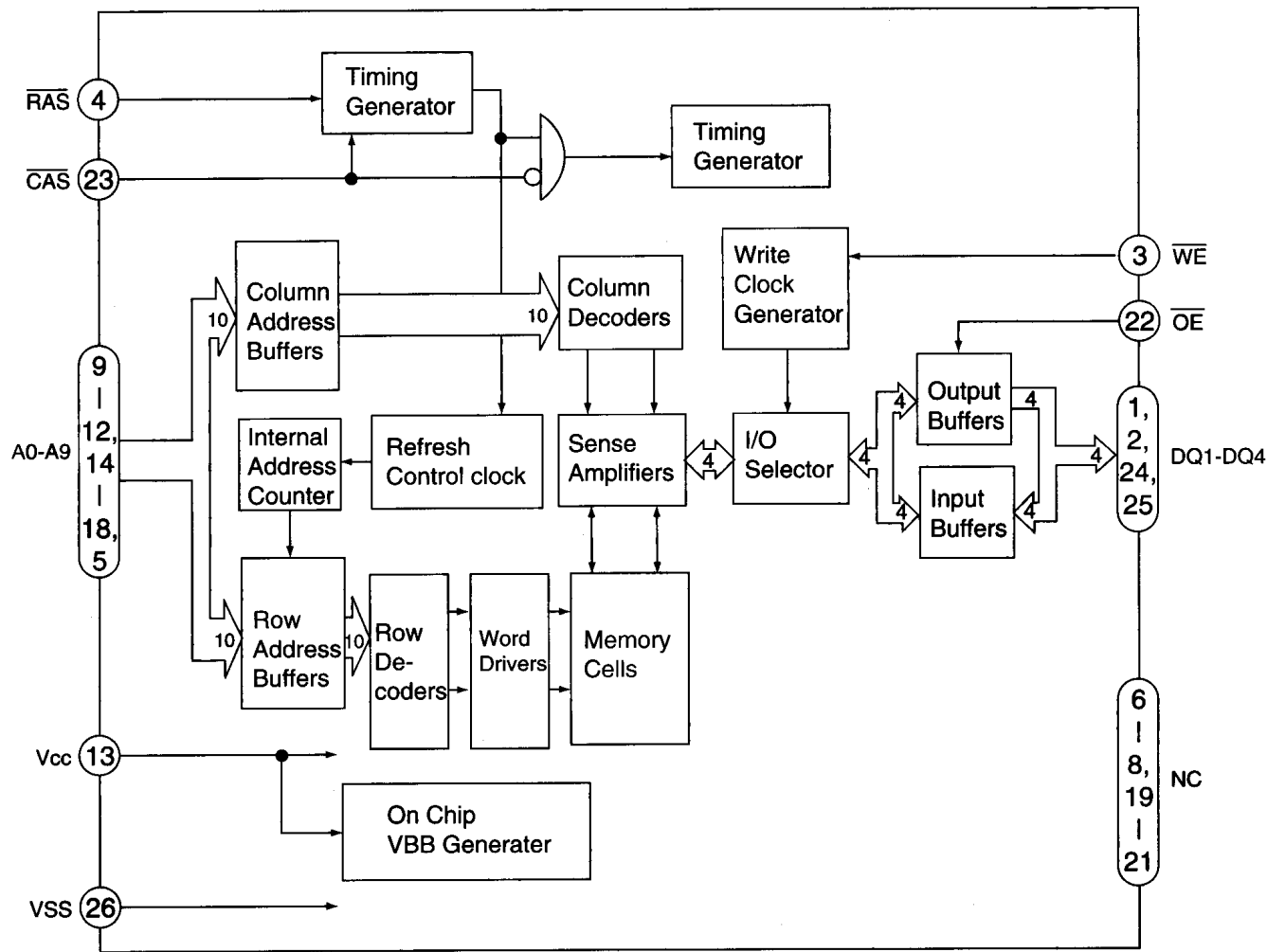
| PIN | PORT NAME | I/O | DESCRIPTION                                             |
|-----|-----------|-----|---------------------------------------------------------|
| 1   | LED6      | O   | LED for DISC No.2 exist or not exist                    |
| 2   | AFMUTE    | O   | Mute output terminal                                    |
| 3   | CD+B      | O   | Main power supply ON/OFF output                         |
| 4   | LED5      | O   | LED for DISC No.1 exist or not exist                    |
| 5   | LED4      | O   | LED for DISC No.4 chucking or not chucking              |
| 6   | LED3      | O   | LED for DISC No.3 chucking or not chucking              |
| 7   | LED2      | O   | LED for DISC No.2 chucking or not chucking              |
| 8   | LED1      | O   | LED for DISC No.1 chucking or not chucking              |
| 9   | VSS       |     | Ground                                                  |
| 10  | Fin       | O   | Rotary motor control signal output (toward inside)      |
| 11  | Rin       | O   | Rotary motor control signal output (toward outside)     |
| 12  | FEM+      | O   | Pickup moving-outside output signal                     |
| 13  | FEM-      | O   | Pickup moving-inside output signal                      |
| 14  | RWC       | O   | Interface with DSP (LC78620E)                           |
| 15  | COIN      | O   | Interface with DSP (LC78620E)                           |
| 16  | CQCK      | O   | Interface with DSP (LC78620E)                           |
| 17  | DSRST     | O   | Reset signal for DSP (LC78620E)                         |
| 18  | SQOUT     | I   | Interface with DSP (LC78620E)                           |
| 19  | WRQ       | I   | Interface with DSP (LC78620E)                           |
| 20  | INSIDE    | I   | Inner circle limit SW signal input                      |
| 21  | CHUCKOFF  | I   | Chuck off SW signal input                               |
| 22  | ROTIN     | I   | Rotary-in (toward inside) SW signal input               |
| 23  | ROTOUT    | I   | Rotary-out (toward outside) SW signal input             |
| 24  | VSS       |     | Ground                                                  |
| 25  | IN1       | O   | Mag/elv motor control signal output                     |
| 26  | IN2       | O   | Mag/elv motor control signal output                     |
| 27  | SENELV    | I   | Elevator position detection pulse input                 |
| 28  | LOW       | I   | Low SW signal input                                     |
| 29  | DA        | I/O | Interface with MSM6307                                  |
| 30  | IN3       | O   | Mag/elv motor control signal output                     |
| 31  | DRF       | I   | Focus OK signal input                                   |
| 32  | SENMG     | I   | Magazine position detection pulse input                 |
| 33  | MAGIN     | I   | Magazine open SW signal input                           |
| 34  | MAGOUT    | I   | Magazine close SW signal input                          |
| 35  | RESET     | I   | Reset signal input                                      |
| 36  | BATT      | I   | Battery LOW detection input                             |
| 37  | CE        | I   | ACC ON/OFF detection input                              |
| 38  | MAGON     | I   | Magazine SW signal input                                |
| 39  | EJECT     | I   | Eject SW signal input                                   |
| 40  | VDD       |     | Power supply (+5V)                                      |
| 41  | X1        | I   | Ceramic oscillator connection terminal for system clock |
| 42  | X2        | O   | Ceramic oscillator connection terminal for system clock |
| 43  | IC        | I   | Connection to ground                                    |
| 44  | XT2       | O   | No connection                                           |
| 45  | NC        | I   | Connection to ground                                    |
| 46  | AVSS      |     | Connection to ground                                    |
| 47  | TH        | I   | Temperature sensor ON/OFF signal input                  |
| 48  | 2SPEED    | O   | Spindle gain switching signal output                    |
| 49  | C2F       | I   | Interface with LC89153                                  |
| 50  | EMPN      | I   | Interface with LC89153                                  |
| 51  | CNTOK     | I   | Interface with LC89153                                  |
| 52  | CL        | O   | Interface with MSM6307                                  |
| 53  | OVR       | I   | Interface with LC89153                                  |
| 54  | FMT       | O   | Interface with LC89153                                  |
| 55  | AVDD      |     | Connection to vdd                                       |
| 56  | AVREF     |     | Connection to +5V                                       |
| 57  | SHOCK     | O   | Interface with LC89153                                  |
| 58  | PAUSEIN   | O   | Interface with LC89153                                  |



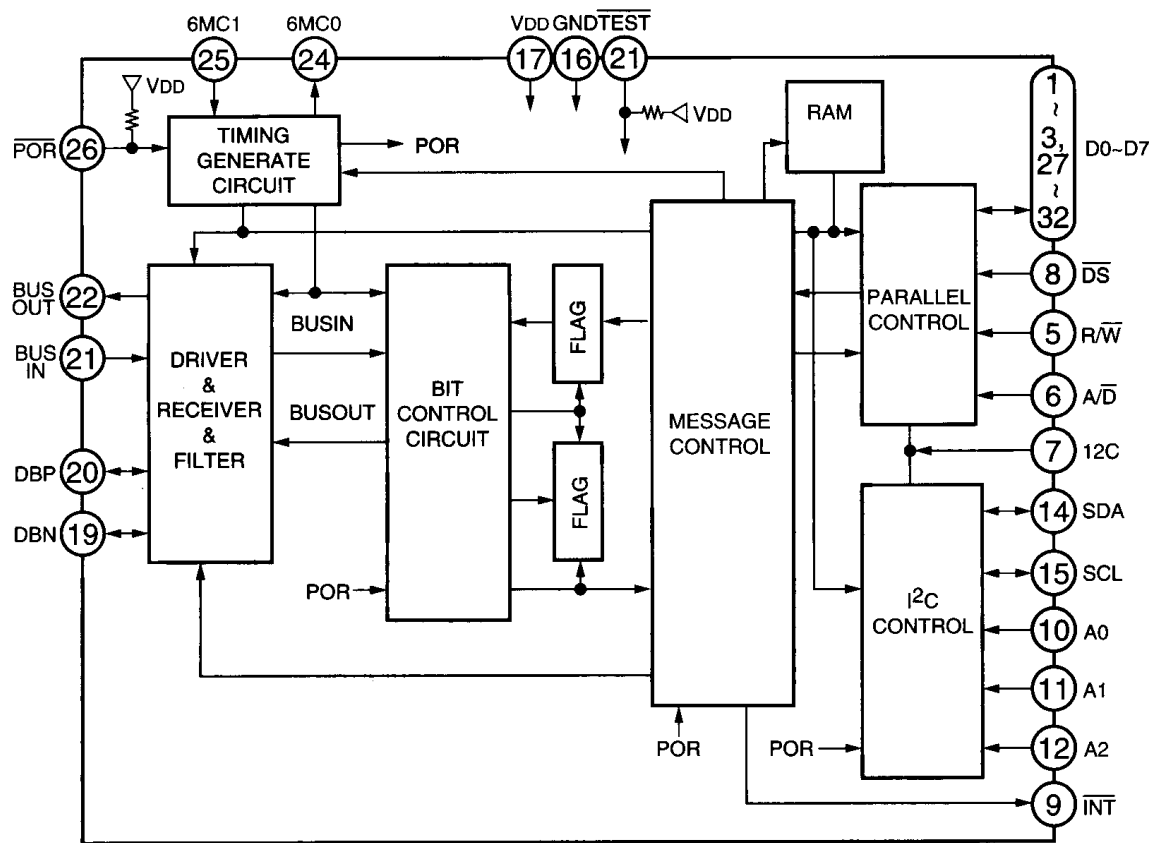
IC CIRCUIT DESCRIPTIONS AND IC CIRCUIT BLOCK DIAGRAMS (CONTINUED)

| PIN | PORT NAME | I/O | DESCRIPTION                           |
|-----|-----------|-----|---------------------------------------|
| 59  | WOK       | O   | Interface with LC89153                |
| 60  | ASRESET   | O   | Reset signal for LC89153              |
| 61  | LED8      | O   | LED for DISC No.4 exist or not exist  |
| 62  | OPEN      | I   | Door open SW signal input             |
| 63  | INT       | I   | Interface with MSM6307                |
| 64  | LED7      | O   | LED for DISC No.3 exist for not exist |

IC1  
MSM51440D



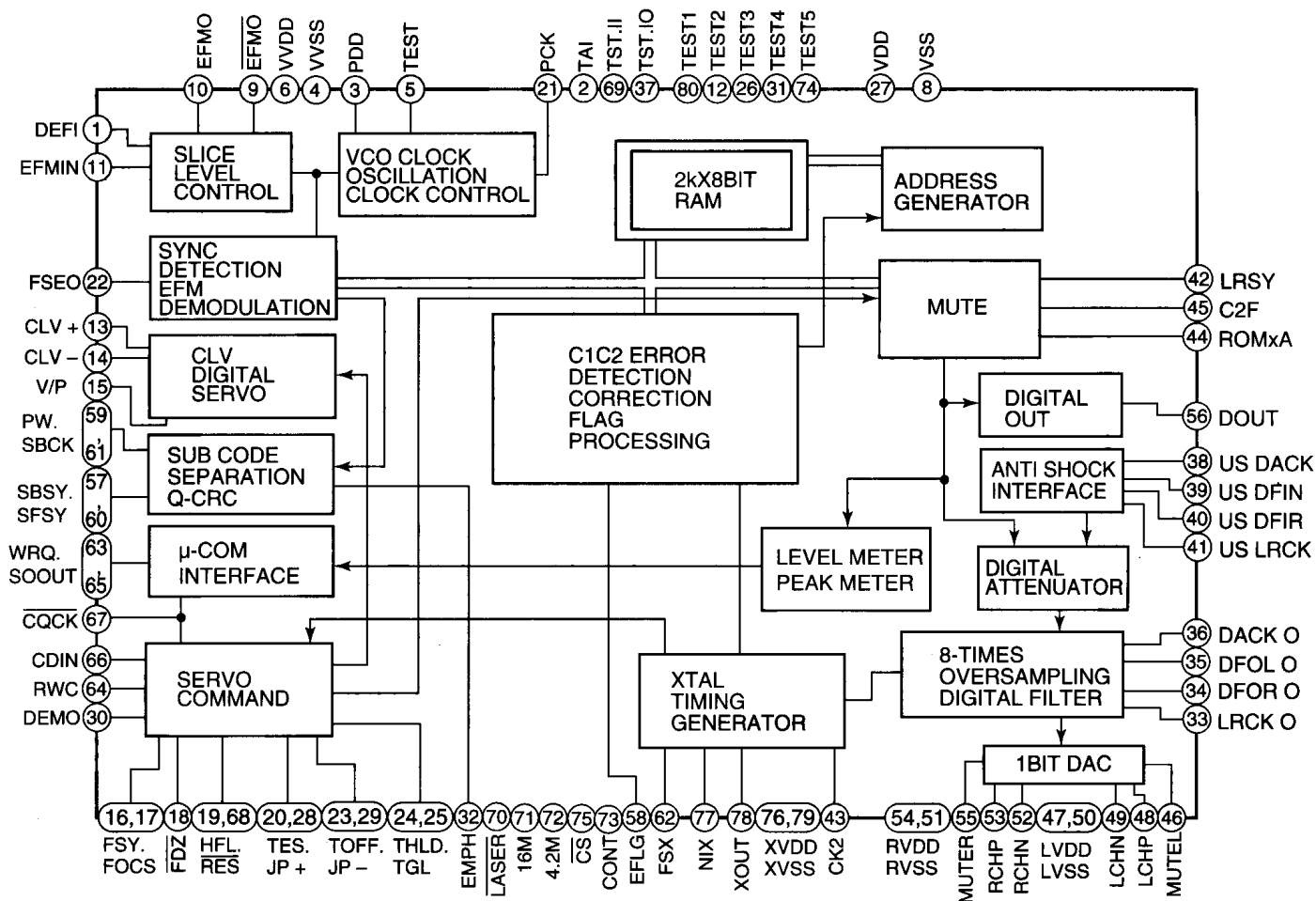
# IC101 - MSM6307GS



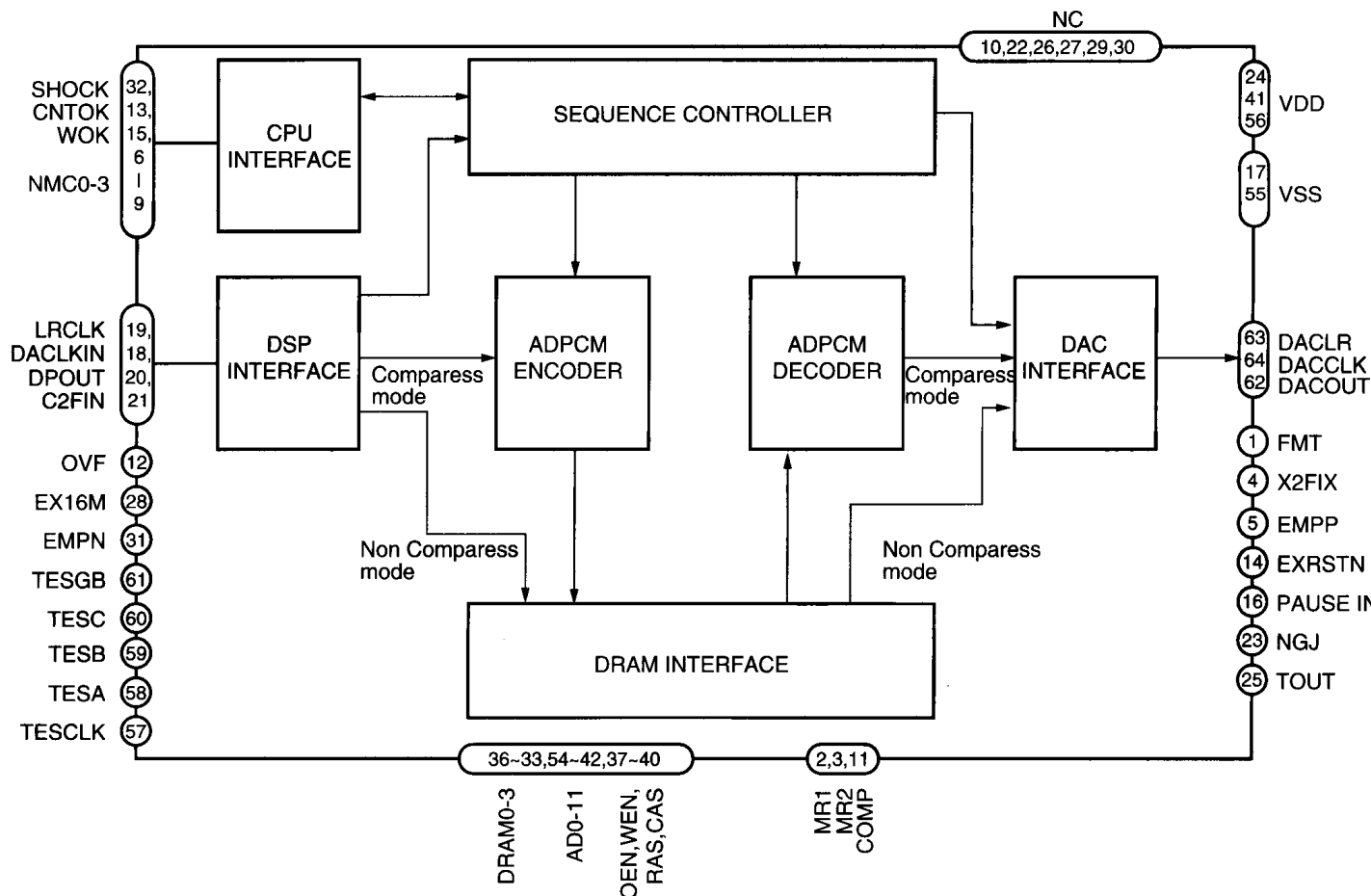
## MSM6307GS

| PIN | PORT NAME | I/O | DESCRIPTION                                            |
|-----|-----------|-----|--------------------------------------------------------|
| 1   | N.C       | -   |                                                        |
| 2   | N.C       | -   |                                                        |
| 3   | N.C       | -   |                                                        |
| 4   | N.C       | -   |                                                        |
| 5   | R/W       | I   | Read/Write selector                                    |
| 6   | A/D       | I   | Selects address or data on D0-D7                       |
| 7   | I2C       | I   | Selects I2C or parallel interface                      |
| 8   | DS        | I   | Data strobe to access data bus                         |
| 9   | INT       | O   | Interrupt output                                       |
| 10  | A0        | I   | Programmable I2C slave address                         |
| 11  | A1        | I   | Programmable I2C slave address                         |
| 12  | A2        | I   | Programmable I2C slave address                         |
| 13  | N.C       | -   |                                                        |
| 14  | SBA       | I/O | I2C data signal input/output                           |
| 15  | SCL       | I/O | I2C clock signal input/output                          |
| 16  | GND       | -   | GND                                                    |
| 17  | VDD       | -   | VDD(+5V)                                               |
| 18  | N.C       | -   |                                                        |
| 19  | DBN       | I/O | Differential D2B lines of the internal driver/receiver |
| 20  | DBP       | I/O | Differential D2B lines of the internal driver/receiver |
| 21  | TEST      | I   | Test mode of IC                                        |
| 22  | BUS OUT   | O   | D2B output (TTL level)                                 |
| 23  | BUS IN    | I   | D2B input (TTL level)                                  |
| 24  | 6CM0      | O   | Clock output 6HMz resonator                            |
| 25  | 6CM1      | I   | Clock input 6HMz resonator                             |
| 26  | POR       | I   | Power on reset                                         |
| 27  | N.C       | -   |                                                        |
| 28  | N.C       | -   |                                                        |
| 29  | N.C       | -   |                                                        |
| 30  | N.C       | -   |                                                        |
| 31  | N.C       | -   |                                                        |
| 32  | N.C       | -   |                                                        |

# IC601 LC78620E



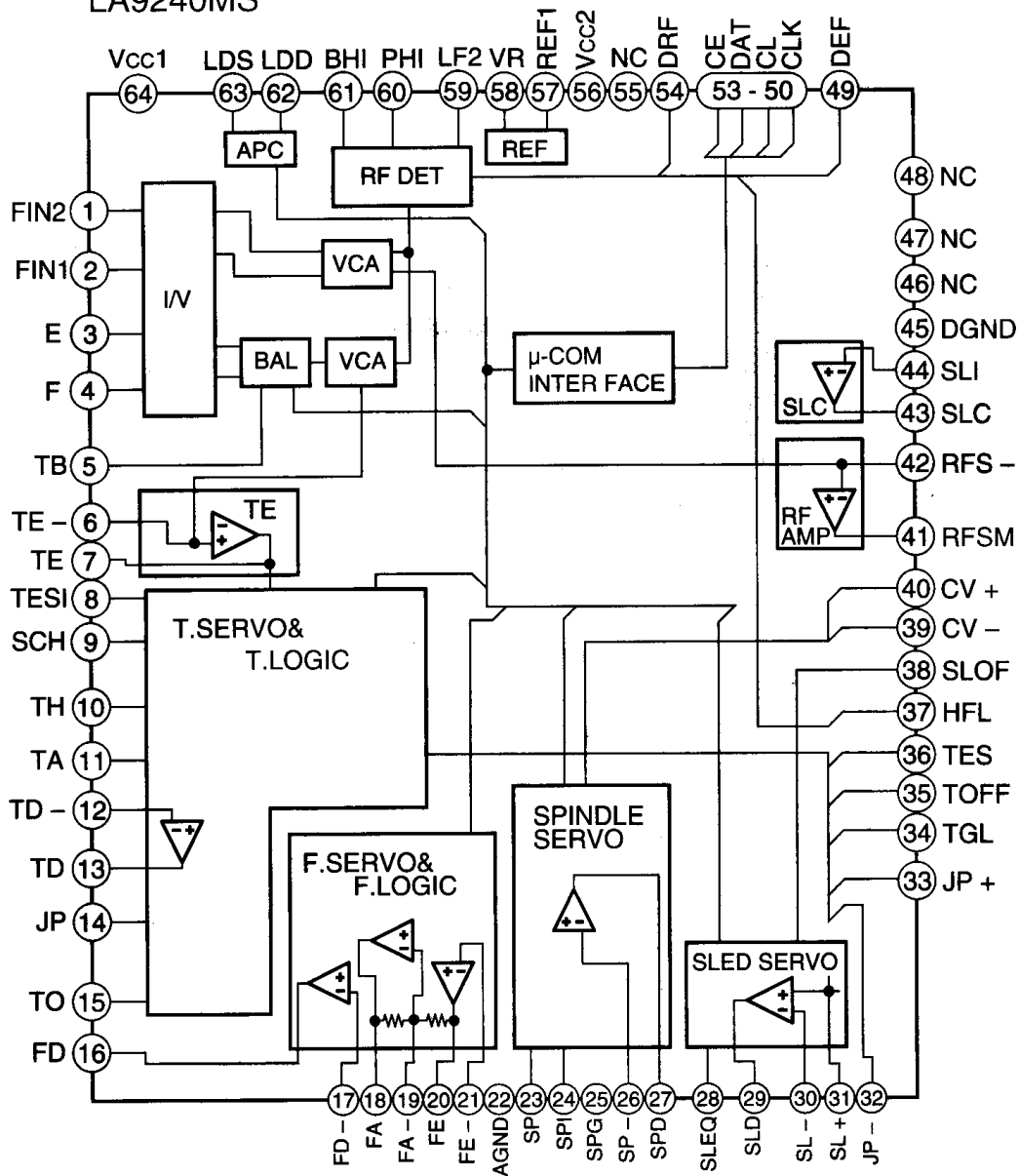
# IC901 LC89153



| Terminal Number | Terminal Code    | I/O | Function Explanation                                                                                                                                                                                                                                                                                                                |                                                                    |
|-----------------|------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| 1               | DEFI             | I   | Defect detection signal (DEF) input terminal. (When unused, "L".)                                                                                                                                                                                                                                                                   |                                                                    |
| 2               | TAI              | I   | For PLL                                                                                                                                                                                                                                                                                                                             | Input terminal for testing. Pulldown resistance is self-contained. |
| 3               | PDO              | O   |                                                                                                                                                                                                                                                                                                                                     | Phase comparison output terminal for outer VCO control.            |
| 4               | VVss             |     |                                                                                                                                                                                                                                                                                                                                     | Power supply terminal for self-contained VCO. Normally 0V.         |
| 5               | ISSET            | AI  |                                                                                                                                                                                                                                                                                                                                     | Resistance connecting terminal for PDO output current adjustment.  |
| 6               | VV <sub>DD</sub> |     |                                                                                                                                                                                                                                                                                                                                     | Earthing terminal for self-contained VCO. Normally 5V.             |
| 7               | FR               | AI  |                                                                                                                                                                                                                                                                                                                                     | For VCO range frequency adjustment.                                |
| 8               | Vss              |     | Earthing terminal for digital system. Normally 0V.                                                                                                                                                                                                                                                                                  |                                                                    |
| 9               | EFMO             | O   | For slice level control                                                                                                                                                                                                                                                                                                             | EFM signal reverse output terminal.                                |
| 10              | EFMO             | O   |                                                                                                                                                                                                                                                                                                                                     | EFM signal output terminal.                                        |
| 11              | EFMIN            | I   |                                                                                                                                                                                                                                                                                                                                     | EFM signal input terminal.                                         |
| 12              | TEST2            | I   | Input terminal for testing. Pulldown resistance is self-contained.                                                                                                                                                                                                                                                                  |                                                                    |
| 13              | CLV+             | O   | Output terminal for spindle servo control. Accelerates when CLV+ is "H", slows down when CLV- "H".                                                                                                                                                                                                                                  |                                                                    |
| 14              | CLV-             | O   |                                                                                                                                                                                                                                                                                                                                     |                                                                    |
| 15              | V/P              | O   | Output terminal for automatic switchover monitor by rough servo / phase control. "H" causes rough servo, "L" phase control mode.                                                                                                                                                                                                    |                                                                    |
| 16              | FOCS             | O   | Output terminal for focus servo on/off. "L" causes focus servo ON.                                                                                                                                                                                                                                                                  |                                                                    |
| 17              | FST              | O   | Output terminal for focus start pulse. Open drain output.                                                                                                                                                                                                                                                                           |                                                                    |
| 18              | FZD              | I   | Input terminal for focus error zero cross signal. (When unused, "L".)                                                                                                                                                                                                                                                               |                                                                    |
| 19              | HFL              | I   | Input terminal for track detecting signal. Schmidt input.                                                                                                                                                                                                                                                                           |                                                                    |
| 20              | TES              | I   | Input terminal for tracking error signal. Schmidt input.                                                                                                                                                                                                                                                                            |                                                                    |
| 21              | PCK              | O   | Clock monitoring terminal for EFM data playback. At the time of phase lock, 4.3218MHz.                                                                                                                                                                                                                                              |                                                                    |
| 22              | FSEQ             | O   | Output terminal for synchronous signal detection. When synchronous signal detected from EFM signal and synchronous signal occurring inside correspond, "H".                                                                                                                                                                         |                                                                    |
| 23              | TOFF             | O   | Output terminal for tracking OFF.                                                                                                                                                                                                                                                                                                   |                                                                    |
| 24              | TGL              | O   | Output terminal for tracking gain switchover. "L" raises gain.                                                                                                                                                                                                                                                                      |                                                                    |
| 25              | THLD             | O   | Output terminal for tracking hold.                                                                                                                                                                                                                                                                                                  |                                                                    |
| 26              | TESTS            | O   | Output terminal for testing. Pulldown resistance is self-contained.                                                                                                                                                                                                                                                                 |                                                                    |
| 27              | V <sub>DD</sub>  |     | Power supply terminal for digital system. Normally 5V.                                                                                                                                                                                                                                                                              |                                                                    |
| 28              | JP+              | O   | Output terminal for track jump. When JP+ is "H", accelerates at the time of outer track direction jump, or slows down at the time of inner track direction jump. When JP- is "H", accelerates at the time of inner track direction jump, or slows down at the time of outer track direction. 3 value output is possible by command. |                                                                    |
| 29              | JP-              | O   |                                                                                                                                                                                                                                                                                                                                     |                                                                    |
| 30              | DEMO             | I   | Input terminal for sound turn-on function at the time of set adjustment process. Pulldown resistance is self-contained.                                                                                                                                                                                                             |                                                                    |
| 31              | TEST4            | I   | Input terminal for testing. Pulldown resistance is self-contained.                                                                                                                                                                                                                                                                  |                                                                    |
| 32              | EMPH             | O   | Output terminal for deemphasis monitor. At the time of "H", deemphasis disc is in playback.                                                                                                                                                                                                                                         |                                                                    |
| 33              | LRCKO            | O   | Digital filter output.                                                                                                                                                                                                                                                                                                              | Word clock output.                                                 |
| 34              | DFORO            | O   |                                                                                                                                                                                                                                                                                                                                     | RCH data output.                                                   |
| 35              | DFOLO            | O   |                                                                                                                                                                                                                                                                                                                                     | LCH data output.                                                   |
| 36              | DACKO            | O   |                                                                                                                                                                                                                                                                                                                                     | Bit clock output.                                                  |
| 37              | TESTIO           | O   | Output terminal for testing. Open (Normally "L" output).                                                                                                                                                                                                                                                                            |                                                                    |
| 38              | USDACK           | I   | Anti-shock correspondence input. (unused, "L".)                                                                                                                                                                                                                                                                                     | Bit clock input.                                                   |
| 39              | USDFIN           | I   |                                                                                                                                                                                                                                                                                                                                     | LRch data.                                                         |

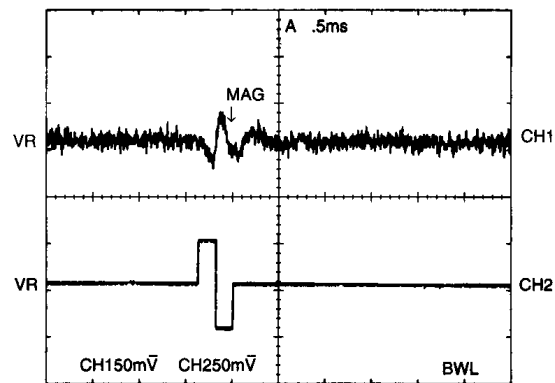
|    |                  |   |                                                                                                     |                                                                         |
|----|------------------|---|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 40 | USDFIR           | I | Anti-shock correspondence                                                                           | Input terminal for testing. Normally "L".                               |
| 41 | USLRCK           | I | input. (unused, "L".)                                                                               | Word clock output. (When unused, "L".)                                  |
| 42 | LRSY             | O | ROMXA correspondence input                                                                          | L/R clock output.                                                       |
| 43 | CK2              | O |                                                                                                     | Bit clock output. DACLK (At the time of RES)                            |
|    |                  |   |                                                                                                     | Polarity reverse (CK2CON mode)                                          |
| 44 | ROMAX            | O |                                                                                                     | Data output. Data (Supplement) (At the time of RES) ROMOUT (ROMXA mode) |
| 45 | C2F              | O | For 1bit DAC                                                                                        | C2 Flag output.                                                         |
| 46 | MUTEL            | O |                                                                                                     | Mute output terminal.                                                   |
| 47 | LV <sub>DD</sub> |   |                                                                                                     | Power supply terminal for L channel. Normally 5V.                       |
| 48 | LCHP             | O |                                                                                                     | L channel P output terminal.                                            |
| 49 | LCHN             | O |                                                                                                     | L channel N output terminal.                                            |
| 50 | LV <sub>SS</sub> |   |                                                                                                     | Earthing terminal for L channel. Normally 0V.                           |
| 51 | RV <sub>SS</sub> |   |                                                                                                     | Earthing terminal for R channel. Normally 0V.                           |
| 52 | RCHN             | O |                                                                                                     | R channel N output terminal.                                            |
| 53 | RCHP             | O |                                                                                                     | R channel P output terminal.                                            |
| 54 | RV <sub>DD</sub> |   |                                                                                                     | Earthing terminal for R channel. Normally 5V.                           |
| 55 | MUTER            | O |                                                                                                     | Mute output terminal.                                                   |
| 56 | DOUT             | O | Digital OUT output terminal.                                                                        |                                                                         |
| 57 | SBSY             | O | Output terminal for synchronous signal of sub-code block.                                           |                                                                         |
| 58 | EFLG             | O | Terminal for monitoring C1, C2, single, double correction.                                          |                                                                         |
| 59 | PW               | O | Output terminal for sub-code P, Q, R, S, T, U, W.                                                   |                                                                         |
| 60 | SFSY             | O | Output terminal for synchronous signal of sub-code frame. When sub-code is in standby, " = L".      |                                                                         |
| 61 | SBCK             | I | Input terminal for sub-code readout clock. Schmidt input.                                           |                                                                         |
| 62 | FSX              | O | Output terminal for 7.35KHz synchronous signal which is divided frequency from crystal oscillation. |                                                                         |
| 63 | WRQ              | O | Output terminal for sub-code Q output standby.                                                      |                                                                         |
| 64 | RWC              | I | Input terminal for read/write control.                                                              |                                                                         |
| 65 | SQOUT            | O | Sub-code Q output terminal.                                                                         |                                                                         |
| 66 | COIN             | I | Input terminal for command from micro computer.                                                     |                                                                         |
| 67 | CQCK             | I | Input terminal for command input intake clock, or sub-code offtake clock from SQOUT. Schmidt input. |                                                                         |
| 68 | RES.             | I | Chip reset input terminal. When power is supplied, changeover to "L" once.                          |                                                                         |
| 69 | TST11            | O | Input terminal for testing. Open (normally "L" output).                                             |                                                                         |
| 70 | LASER            | O | Output terminal for laser ON/OFF. Controls by serial data command from micro computer.              |                                                                         |
| 71 | 16M              | O | 16.9344MHz output terminal. But outputs 33.8688MHz, only in case of quadruple speed playback mode.  |                                                                         |
| 72 | 4.2M             | O | 4.2336MHz output terminal.                                                                          |                                                                         |
| 73 | CONT             | O | Spare output terminal. Controls by serial data command from micro computer.                         |                                                                         |
| 74 | TEST5            | I | Input terminal for testing. Pulldown resistance is self-contained.                                  |                                                                         |
| 75 | CS               | I | Chip select input terminal. Pulldown resistance is self-contained.                                  |                                                                         |
| 76 | XV <sub>SS</sub> |   | Earthing terminal for crystal oscillation. Normally 0V.                                             |                                                                         |
| 77 | X <sub>IN</sub>  | I | Connecting terminal for 16.9344MHz crystal oscillator.                                              |                                                                         |
| 78 | X <sub>OT</sub>  | O | Connects 33.8688MHz crystal oscillator, in case of quadruple speed playback system.                 |                                                                         |
| 79 | XV <sub>DD</sub> |   | Power supply terminal for crystal oscillation. Normally 5V.                                         |                                                                         |
| 80 | TEST1            | I | Input terminal for testing. Pulldown resistance is self-contained.                                  |                                                                         |

IC650  
LA9240MS

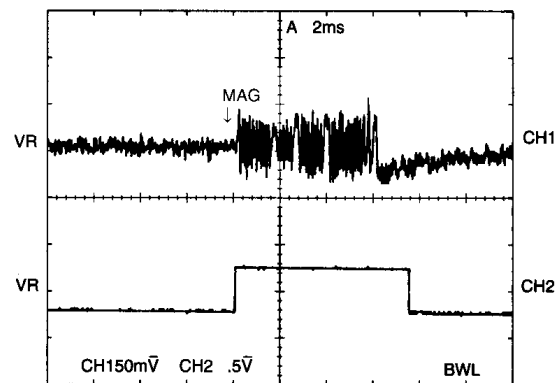


| PIN No. | PART NAME | EXPLANATION                                                                                               |
|---------|-----------|-----------------------------------------------------------------------------------------------------------|
| 1       | FIN2      | Pickup photo-diode connecting pin. Forms RF signal by addition to FIN1 pin, and FE signal by subtraction. |
| 2       | FIN1      | Pickup photo-diode connecting pin.                                                                        |
| 3       | E         | Pickup photo-diode connecting pin. Forms TE signal by subtraction from F pin.                             |
| 4       | F         | Pickup photo-diode connecting pin.                                                                        |
| 5       | TB        | Pin for inputting DC constituent of TE signal.                                                            |
| 6       | TE-       | Pin for connecting gain setting resistance of TE signal to TE pin.                                        |
| 7       | TE        | TE signal output pin.                                                                                     |
| 8       | TESI      | TES (TRACK ERROR SENCE) comparator input pin. Band Pass TE signal, and input.                             |
| 9       | SCI       | Input pin for shock detection.                                                                            |
| 10      | TH        | Constant setting pin at the time of tracking gain.                                                        |
| 11      | TA        | Pin for connecting high pass elimination condensor of servo.                                              |
| 12      | TD-       | Pin for constituting tracking phase compensation constant between TD and VR pin.                          |
| 13      | TD        | Pin for setting tracking phase compensation.                                                              |
| 14      | JP        | Pin for setting tracking jump signal (kick pulse) amplitude.                                              |
| 15      | TO        | Tracking control signal output pin.                                                                       |
| 16      | FD        | Focusing control signal output pin.                                                                       |
| 17      | FD-       | Pin for constituting focussing phase compensation constant between FD and FA pin.                         |
| 18      | FA        | Pin for constituting focussing phase compensation constant between FA- and FE- pin.                       |
| 19      | FA-       | Pin for constituting focussing phase compensation constant between FA and FE pin.                         |
| 20      | FE        | FE signal output pin.                                                                                     |
| 21      | FE-       | Pin for connecting FE signal gain setting resistance to TE pin.                                           |
| 22      | AGND      | GND for analog signal.                                                                                    |
| 23      | SP        | Single end output of CV+ and CV- pin input signal.                                                        |
| 24      | SPI       | Spindle amplifier input.                                                                                  |
| 25      | SPG       | Connecting pin for gain setting resistance at the time of spindle 12cm mode.                              |
| 26      | SP-       | Connecting pin for Spindle phase compensation constant together with SPD pin.                             |
| 27      | SPD       | Spindle control signal output pin.                                                                        |
| 28      | SLEQ      | Connecting pin for sled phase compensation constant.                                                      |
| 29      | SLD       | Sled control signal output pin.                                                                           |
| 30      | SL-       | Input pin for sled delivery signal from micro computer.                                                   |
| 31      | SL+       | Input pin for sled delivery signal from micro computer.                                                   |
| 32      | JP-       | Input pin for tracking jump signal from DSP.                                                              |
| 33      | JO+       | Input pin for tracking jump signal from DSP.                                                              |
| 34      | TGL       | Input pin for tracking gain control signal from DSP. Gain low in case of TGL="H".                         |
| 35      | TOFF      | Input pin for tracking off control signal from DSP. Off in case of TOFF="H".                              |
| 36      | TES       | Output pin of TES signal to DSP.                                                                          |
| 37      | HFL       | (HIGH FREQUENCY LEVEL) is used to judge whether main beam is located above pit or above mirror.           |
| 38      | SLOF      | Sled servo off control input pin.                                                                         |
| 39      | CV-       | Input pin for CLV error signal from DSP.                                                                  |
| 40      | CV+       | Input pin for CLV error signal from DSP.                                                                  |
| 41      | RFSM      | RF output pin.                                                                                            |
| 42      | RFS-      | Pin for setting RF gain and EFM signal 3T compensation constant together with RFSM pin.                   |
| 43      | SLC       | (SLICE LEVEL CONTROL) is output pin for controlling data slice level by RF waveshape DSP.                 |
| 44      | SLI       | Input pin for controlling data slice level by DSP.                                                        |
| 45      | DGND      | GND pin of digital system.                                                                                |
| 46      | NC        | NO CONNECT.                                                                                               |
| 47      | NC        | NO CONNECT.                                                                                               |
| 48      | NC        | NO CONNECT.                                                                                               |
| 49      | DEF       | Output pin for detecting disc defect.                                                                     |
| 50      | CLK       | Standard clock input pin. DSP4.23MHz is input.                                                            |
| 51      | CL        | Micro computer command clock input pin.                                                                   |
| 52      | DAT       | Micro computer command data input pin.                                                                    |
| 53      | CE        | Micro computer command chip enable input pin.                                                             |
| 54      | DRF       | (DEFECT RF) RF level detecting output.                                                                    |
| 55      | NC        | NO CONNECT.                                                                                               |
| 56      | VCC2      | VCC pin for servo system and digital system.                                                              |
| 57      | REF1      | Connection pin for standard voltage capacitor.                                                            |
| 58      | VR        | Standard voltage output pin.                                                                              |
| 59      | LF2       | Pin for setting constant at the time of detecting disc defect.                                            |
| 60      | PH1       | Pin for connecting condensor for RF signal peak hold.                                                     |
| 61      | BH1       | Pin for connecting condensor for RF signal bottom hold.                                                   |
| 62      | LDD       | APC circuit output pin.                                                                                   |
| 63      | LDS       | APC circuit input pin.                                                                                    |
| 64      | VCC1      | RF system VCC pin.                                                                                        |

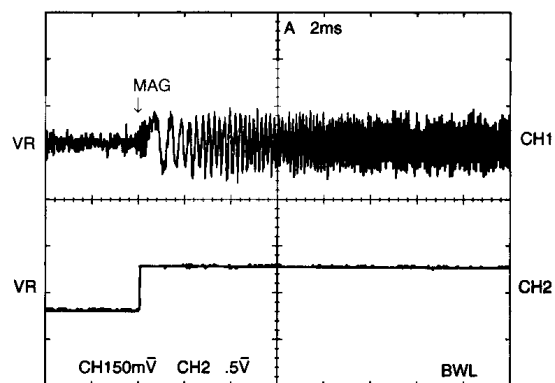
MODE PAUSE  
CH1 TE (TP, TE)  
CH2 TP (IC650 14PIN)



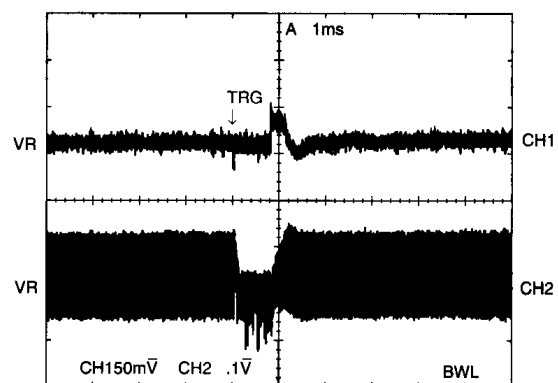
MODE FORWARD SEARCH (128 Track jump)  
CH1 TE (TP, TE)  
CH2 FEM+ (IC801 1PIN)



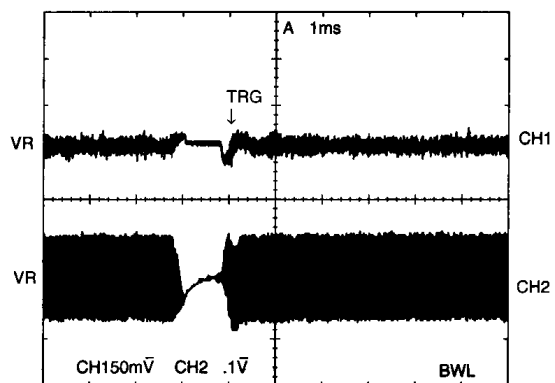
MODE FORWARD SEARCH (Track count)  
CH1 TE (TP, TE)  
CH2 FEM+ (IC801 1PIN)



MODE PLAY (The interruption part passes 1mm)  
CH1 TE (TP, TE)  
CH2 RF (TP, RF)



MODE PLAY (The black dots part passes 1mm)  
CH1 TE (TP, TE)  
CH2 RF (TP, RF)



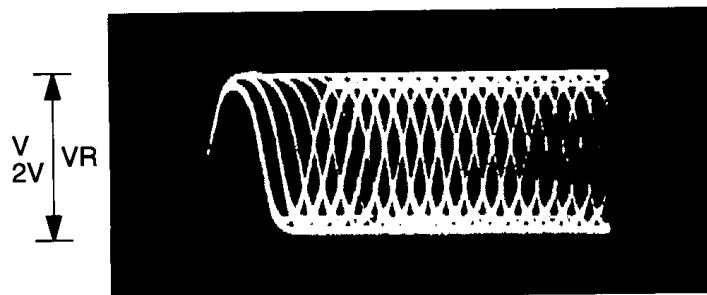


## WAVE FORMS

Note: Reference voltage VR → TP, VR (2.50)

MODE PLAY

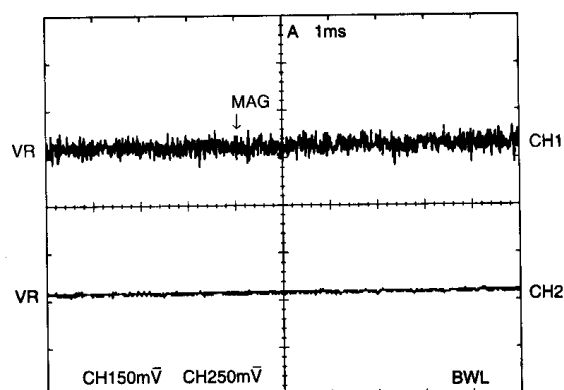
RF (TP, RF) 0.5μs



MODE PLAY

CH1 TE (TP, TE)

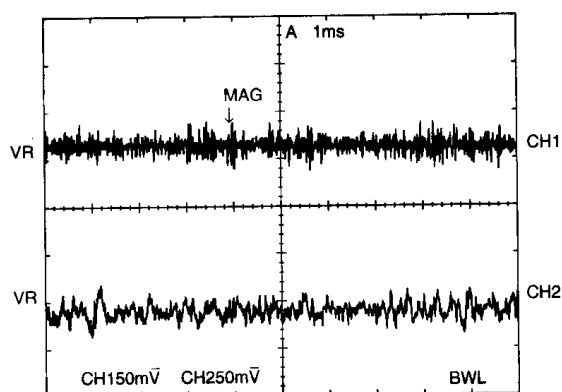
CH2 FE (TP, FE)



MODE PLAY

CH1 TO (IC650 15PIN)

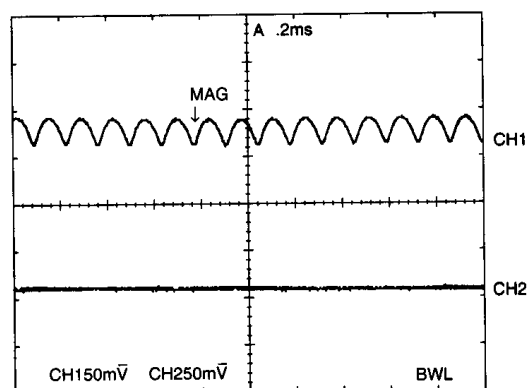
CH2 FD (IC650 16PIN)



MODE PLAY

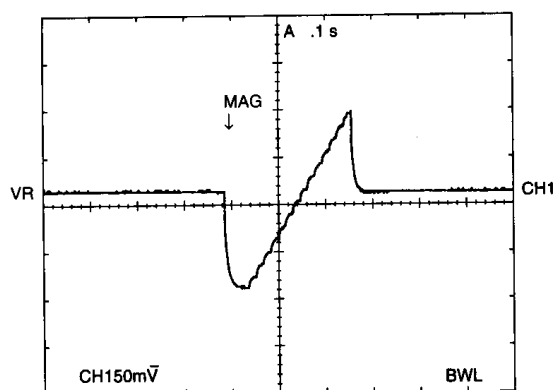
CH1 SPD (IC650 27PIN)

CH2 SLEQ (IC650 28PIN)



MODE FOCUS SEARCH

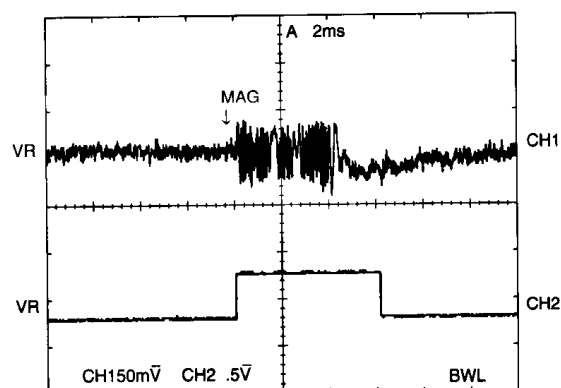
CH1 FD (IC650 16PIN)



MODE FORWARD SEARCH (64 Track jump)

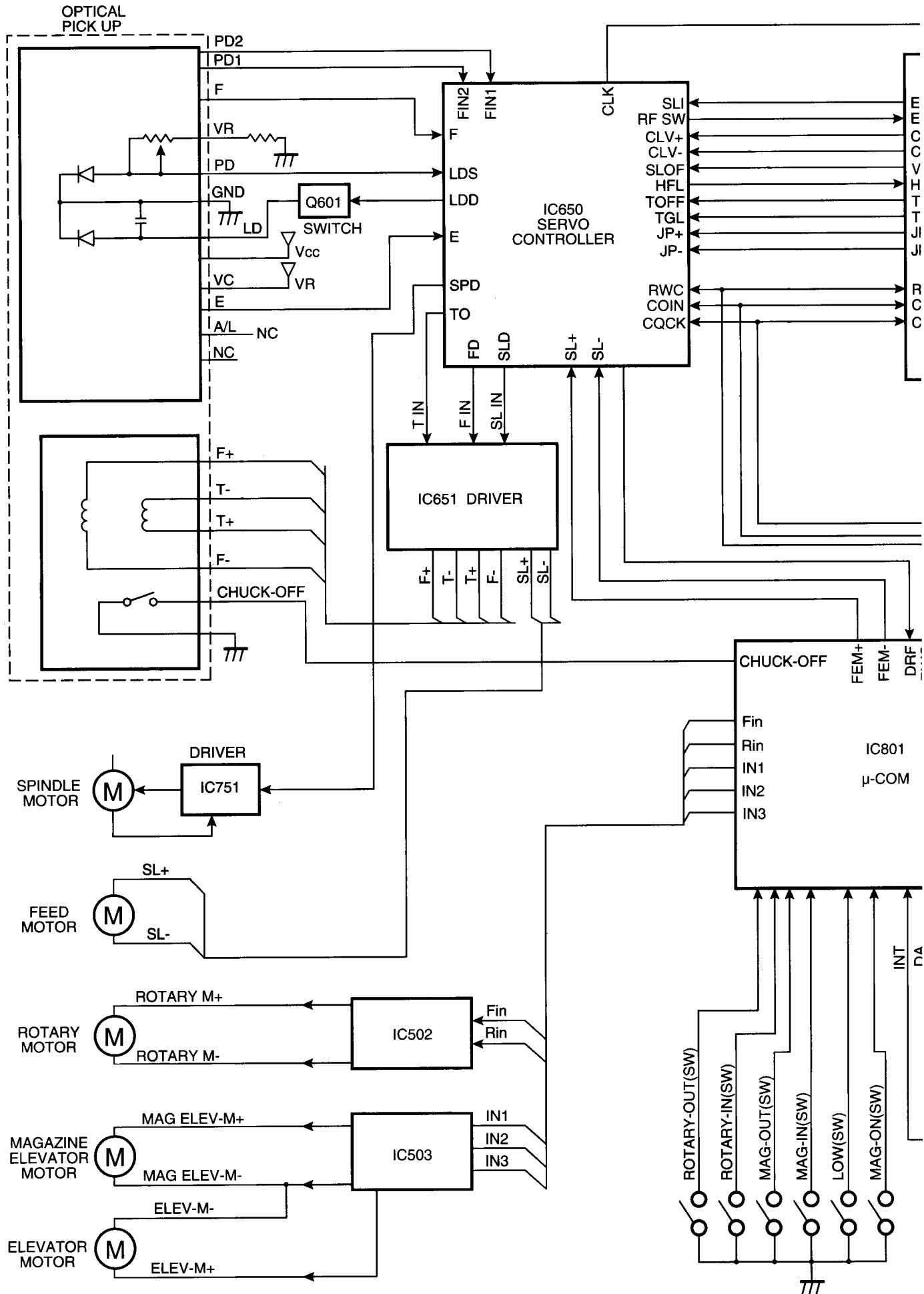
CH1 TE (TP, TE)

CH2 FEM+ (IC801 1PIN)



| SYMPTOM      | DEFECTIVE CIRCUIT              | DEFECTIVE POINT                                                |
|--------------|--------------------------------|----------------------------------------------------------------|
| Disc Turning | Inferiority Feed Motor Circuit | · Check inner circle limit SW and CS602 28pin                  |
|              |                                | · Check voltage of IC801                                       |
|              |                                | · Check voltage of IC651 17, 18pin                             |
|              |                                | · Check Feed Motor and Mechanism                               |
|              | Focus Search Circuit           | · Check voltage of IC650 16pin                                 |
|              |                                | · Check voltage of IC651 11, 12pin                             |
|              |                                | · Check CS602 18, 21pin                                        |
|              |                                | · Check pickup                                                 |
|              | APC                            | · Check Q601 short or open                                     |
|              |                                | · Check IC601 62,63pin                                         |
|              |                                | · Check pickup                                                 |
|              | Disc Motor Circuit             | · Check IC601 13pin and IC650 27pin                            |
|              |                                | · Check IC651 15, 16pin                                        |
|              |                                | · Check Disc Motor and Mechanism                               |
| Track Search | Power Supply Circuit           | · Check IC801 11,13pin                                         |
|              |                                | · Check Q803, Q804                                             |
|              |                                | · Check Q550 and IC551                                         |
|              |                                | · Check Q550 and IC551                                         |
|              | Tracking Servo Circuit         | · Check voltage of TP, TE and adjustment Inferiority of SVR651 |
|              |                                | · Check IC650 15pin and IC651 13,14pin                         |
|              |                                | · Check IC651 3, 4pin                                          |
|              |                                | · Check pickup                                                 |
|              | Kick Pulse Circuit             | · Check IC601 28, 29pin and IC650 14pin                        |
|              | Feed Motor Circuit             | · Check IC650 29pin                                            |
|              |                                | · Check Feed Motor and Mechanism                               |
| Noise        | RF Circuit                     | · Check waveform of TP RF                                      |
|              | Mechanism                      | · Check eccentricity of Mechanism and Disc rub                 |
|              | Audio Circuit                  | · Check IC701,702                                              |
|              |                                | · Check Q700~703                                               |
|              |                                | · Check CP501 6, 7, 8pin                                       |

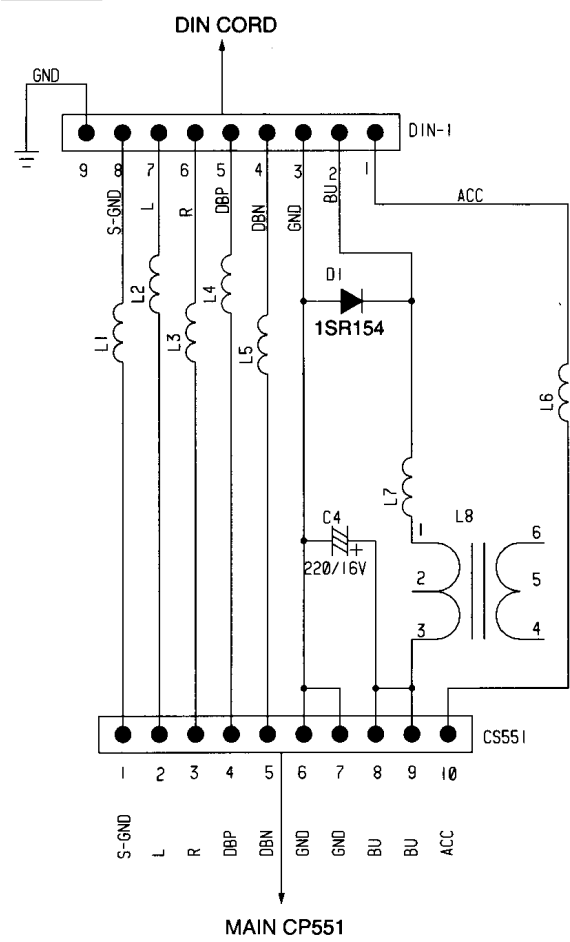
# 14. BLOCK DIAGRAM



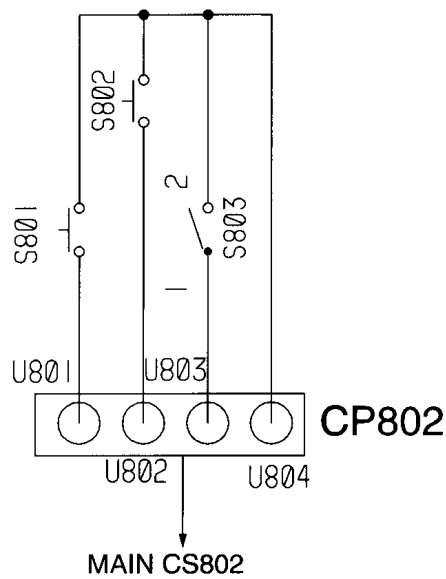


16. CIRCUIT DIAGRAMS (DIN- / LED- / SWITCH PCB)

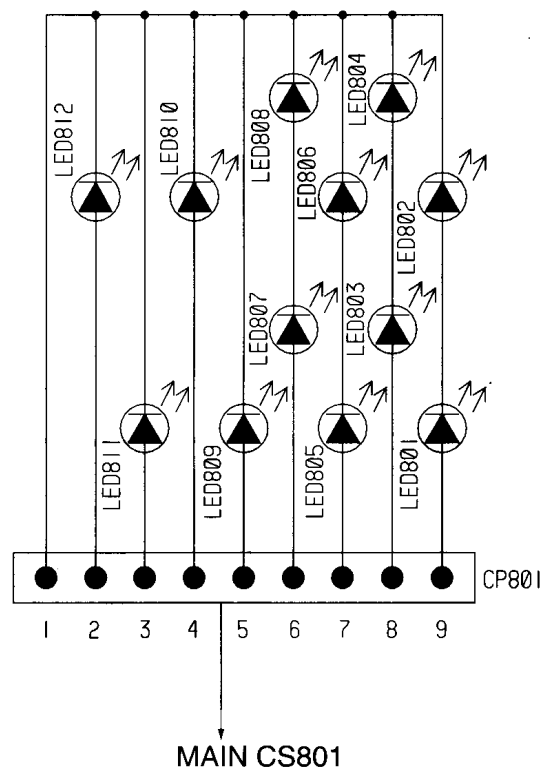
DIN



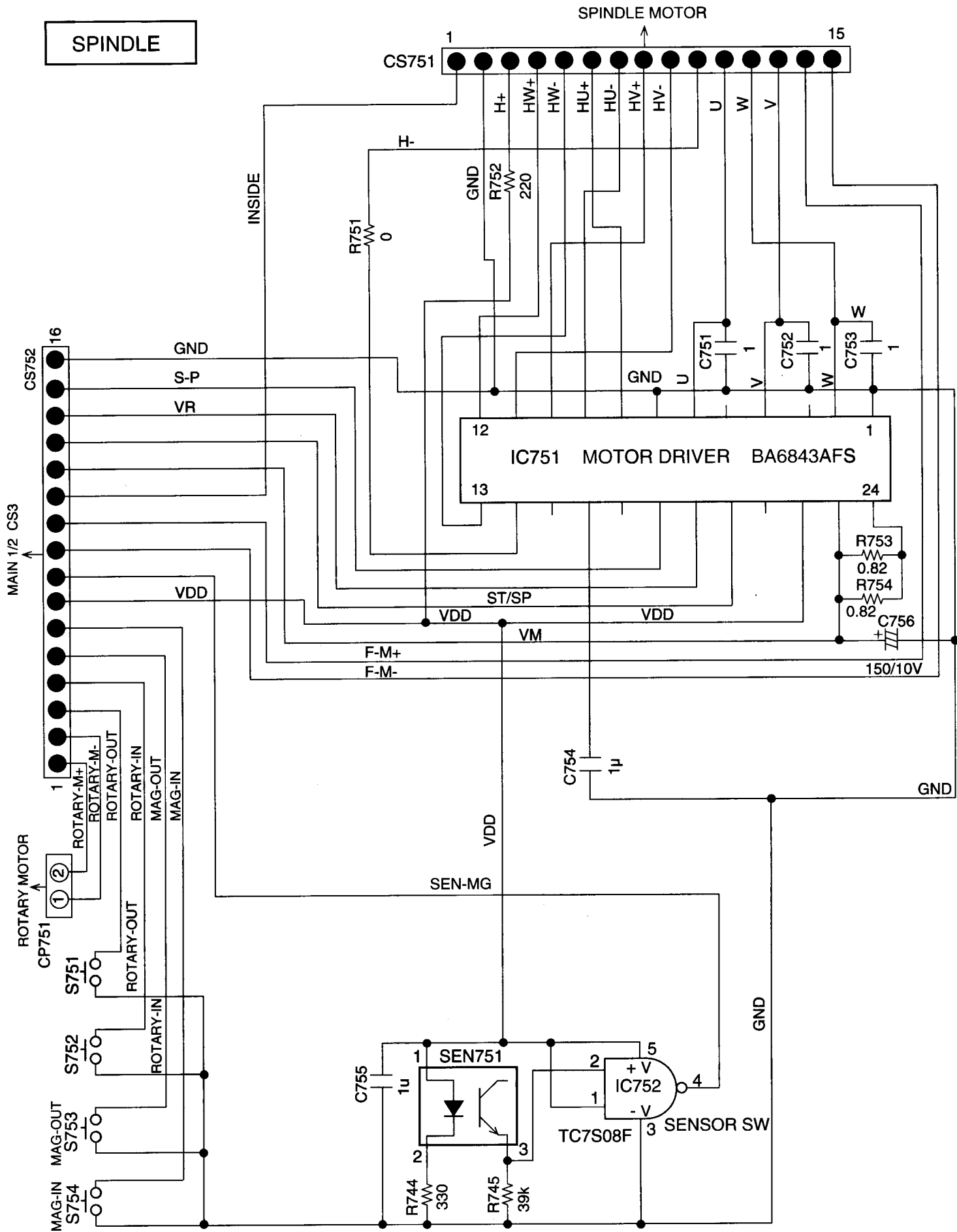
SWITCH

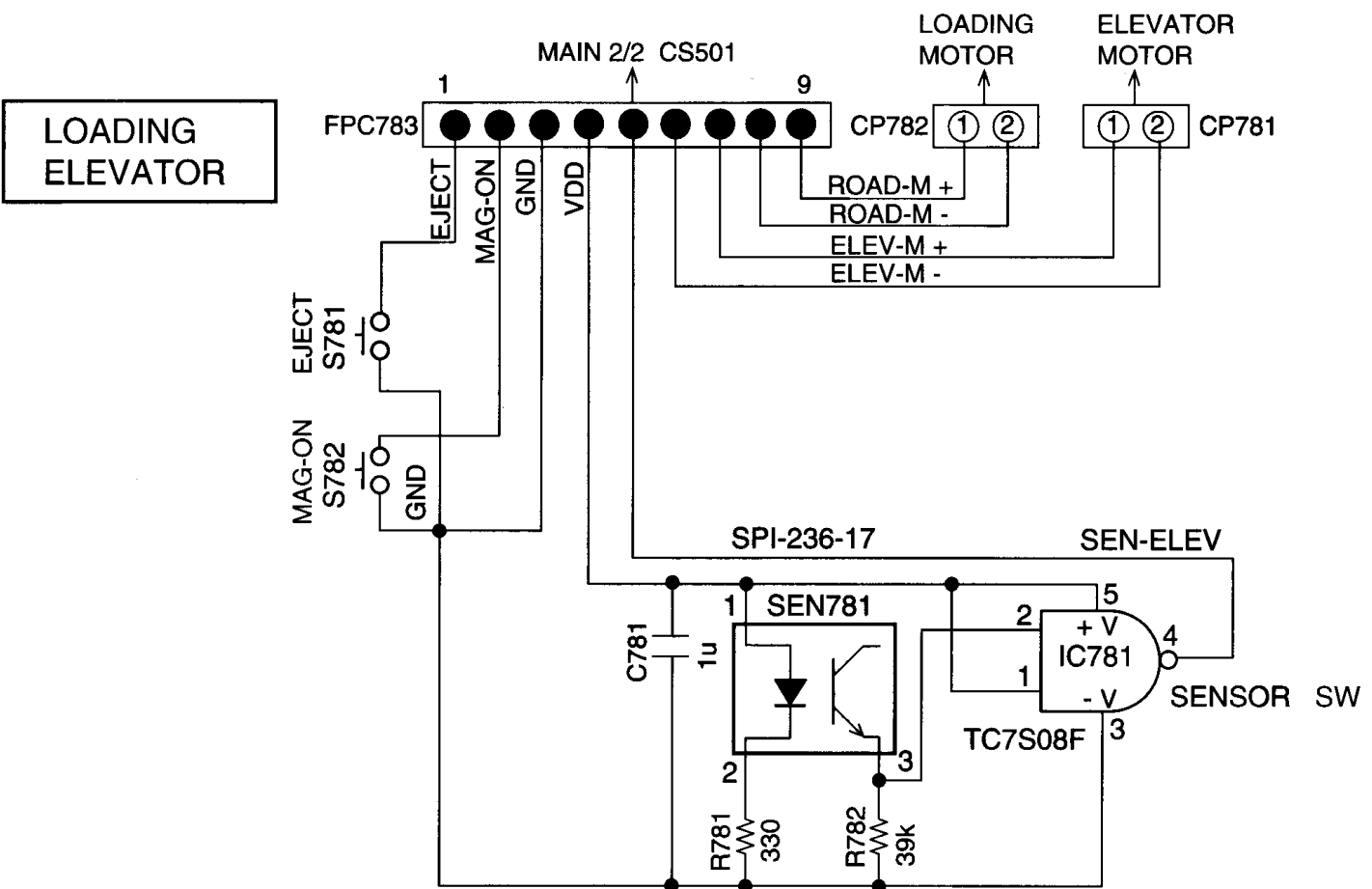


LED



# 18. CIRCUIT DIAGRAMS (SPINDLE & LOADING / ELEVATOR PCB)





**VOLTAGE MEASUREMENT TABLES**

(Note: all voltages given in these tables are average DC values, unless otherwise noted)

**IC751 – BA6843AFS**

- 1: 0V
- 2: PULSES
- 3: N.C.
- 4: PULSES
- 5: N.C.
- 6: PULSES
- 7: 0V
- 8-13: 1.7V
- 14: 1.1V
- 15: N.C.
- 16: 0.7V
- 17: N.C.
- 18: 2.7V
- 19: 2.6V
- 20: 5.1V
- 21: N.C.
- 22: 5.1V
- 23: 8.9V
- 24: 8.9V

**IC752 – TC7S08F**

- 1: 5.1V
- 2: 5.0V
- 3: 0V
- 4: 5.1V
- 5: 5.1V

**IC781 – TC7S08F**

- 1: 5.1V
- 2: 5.0V
- 3: 0V
- 4: 5.1V
- 5: 5.1V

**SEN751 – SPI-236-17**

- 1: 5.1V
- 2: 3.9V
- 3: 5.0V

**SEN781 – SPI-236-17**

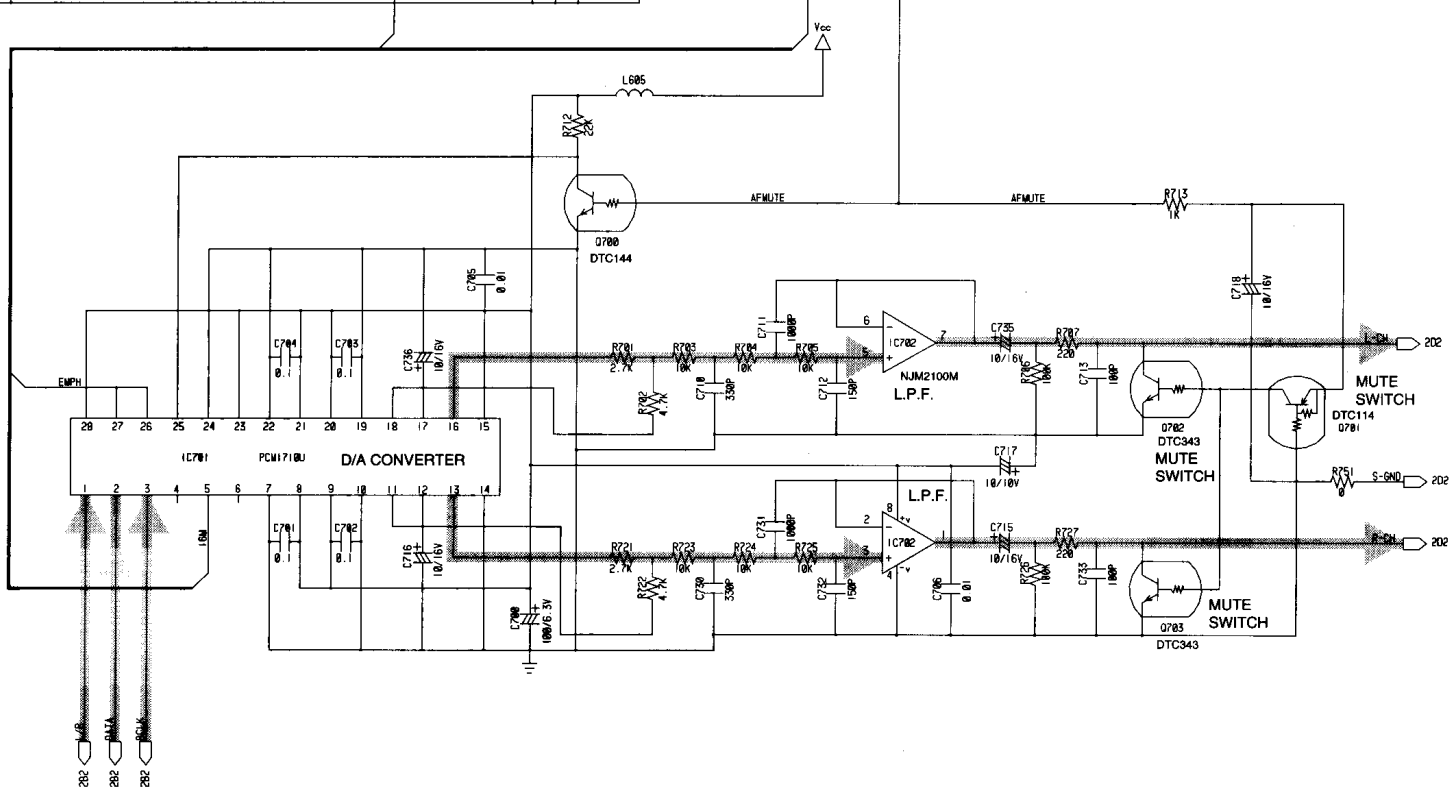
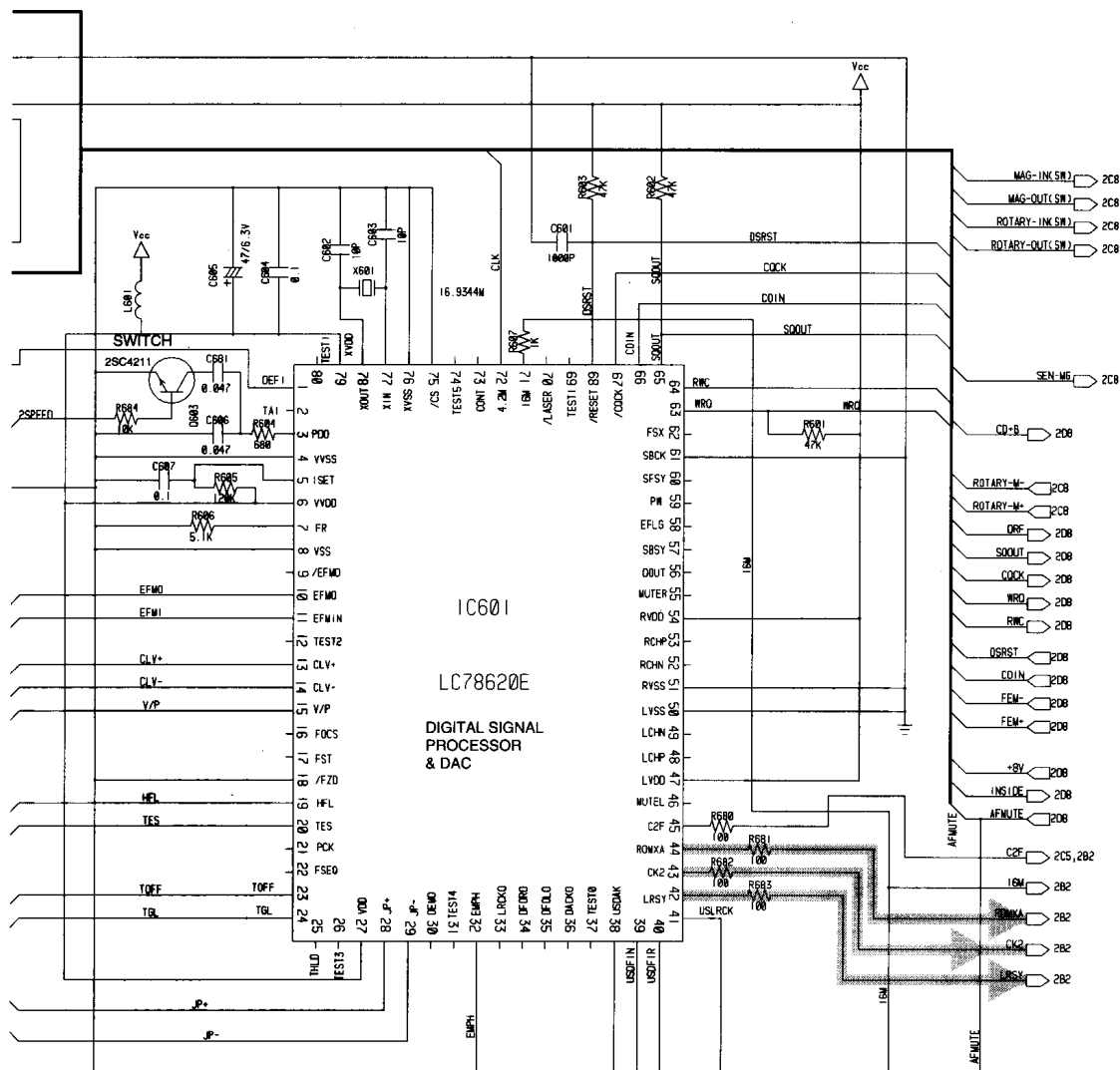
- 1: 5.1V
- 2: 3.9V
- 3: 5.0V

PCS 92 156

22RC047

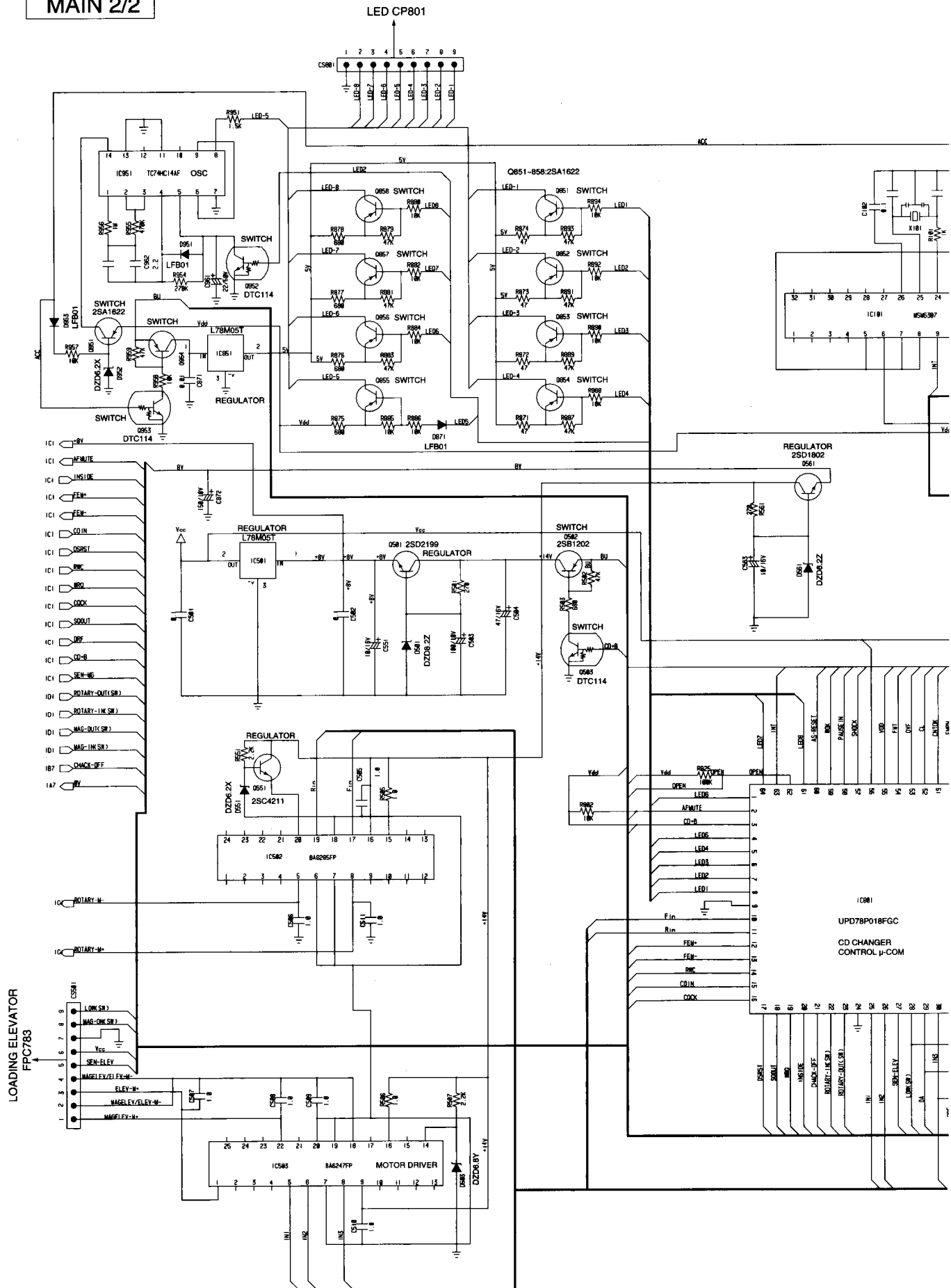




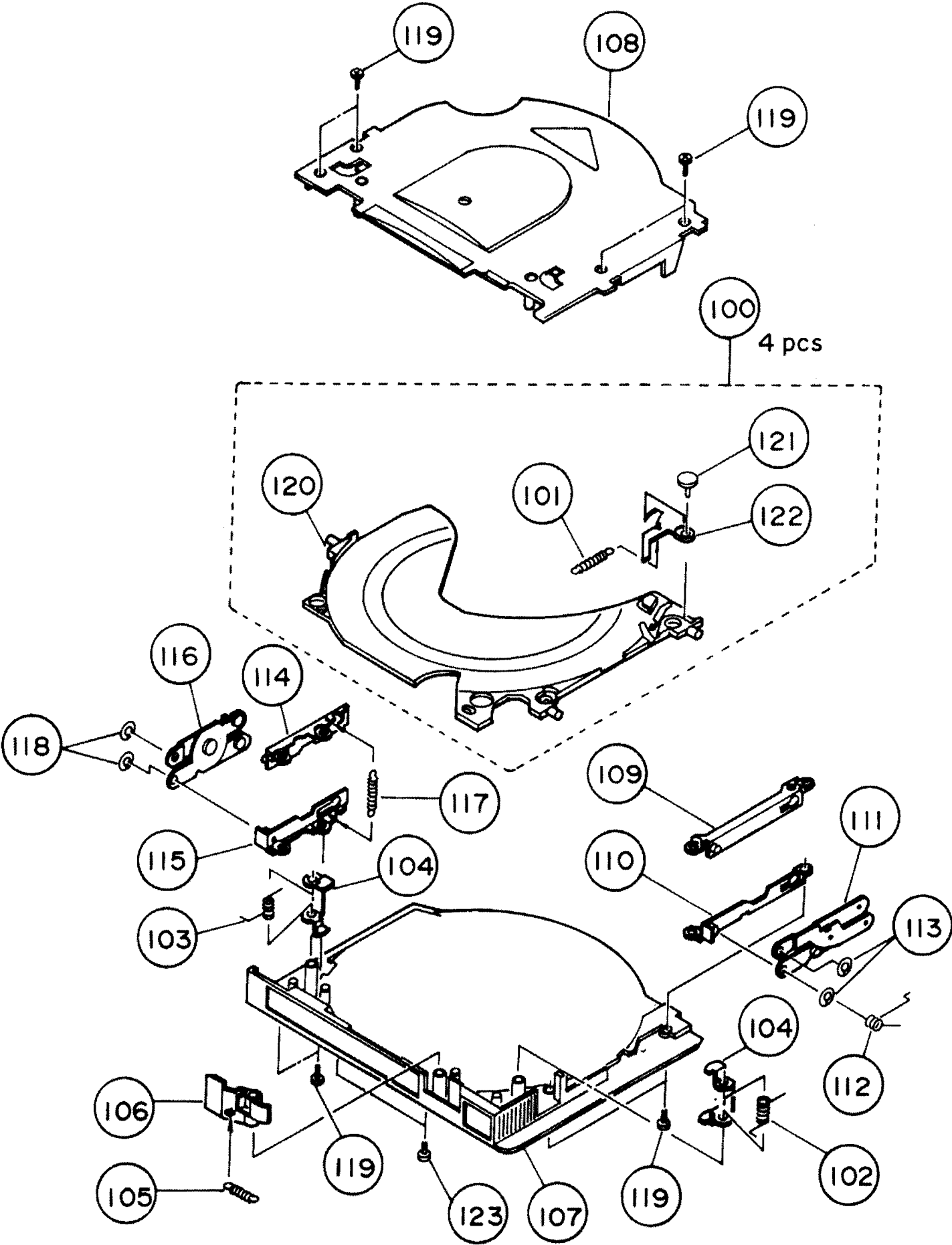


# 21. MAIN CIRCUIT DIAGRAM 2

MAIN 2/2







**Cabinet parts**

|    |                |                              |
|----|----------------|------------------------------|
| 1  | 4822 459 05076 | Front panel assy             |
| 2  | 4822 426 10683 | Rear panel                   |
| 3  | 4822 402 11136 | Lock lever bracket<br>assy   |
| 4  | 4822 410 11951 | Eject button                 |
| 5  | 4822 402 11137 | Lock lever                   |
| 6  | 4822 492 11677 | Lock lever torsion<br>spring |
| 8  | 4822 529 10409 | Gear damper                  |
| 15 | 4822 402 11138 | Bracket assy L               |
| 16 | 4822 402 11139 | Bracket assy R               |
| 17 | 4822 522 10717 | Gear, B                      |
| 20 | 4822 522 10718 | Gear, A                      |
| 37 | 4822 529 10411 | Damper assy FL,<br>RR, RL    |
| 39 | 4822 492 11679 | Damper spring 1<br>RR        |
| 40 | 4822 492 11681 | Damper spring 2<br>FL, FR    |
| 41 | 4822 492 11682 | Damper spring 3 RL           |
| 43 | 4822 532 13046 | Damper sheet                 |
| 44 | 4822 529 10412 | Damper assy FR               |

**Magazine parts**

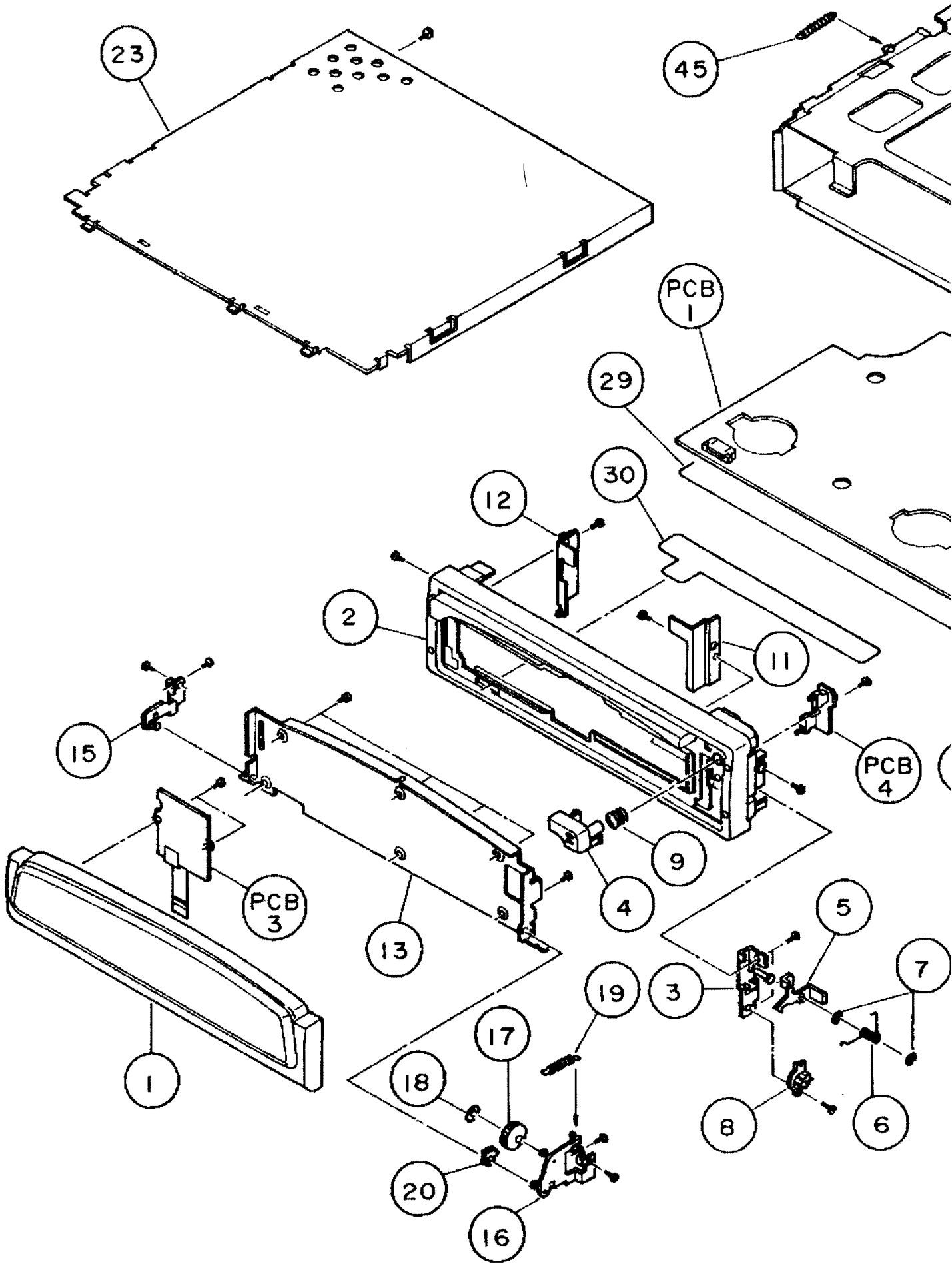
|     |                |                                 |
|-----|----------------|---------------------------------|
| 100 | 4822 464 10459 | Disc carrier assy               |
| 104 | 4822 402 11141 | Magazine lock lever             |
| 106 | 4822 402 11142 | Magazine eject<br>lever         |
| 107 | 4822 442 01492 | Magazine bottom                 |
| 108 | 4822 442 01493 | Magazine top                    |
| 109 | 4822 402 11143 | Magazine bracket<br>assy top    |
| 110 | 4822 402 11144 | Magazine bracket<br>assy bottom |
| 111 | 4822 402 11145 | Magazine link lever<br>assy     |
| 113 | 4822 532 13045 | Mount-M special<br>washer       |
| 114 | 4822 402 11146 | Magazine bracket<br>assy top    |
| 115 | 4822 402 11147 | Magazine bracket<br>assy bottom |
| 116 | 4822 402 11148 | Magazine link lever<br>assy     |
| 118 | 4822 532 13045 | Mount-M special<br>washer       |

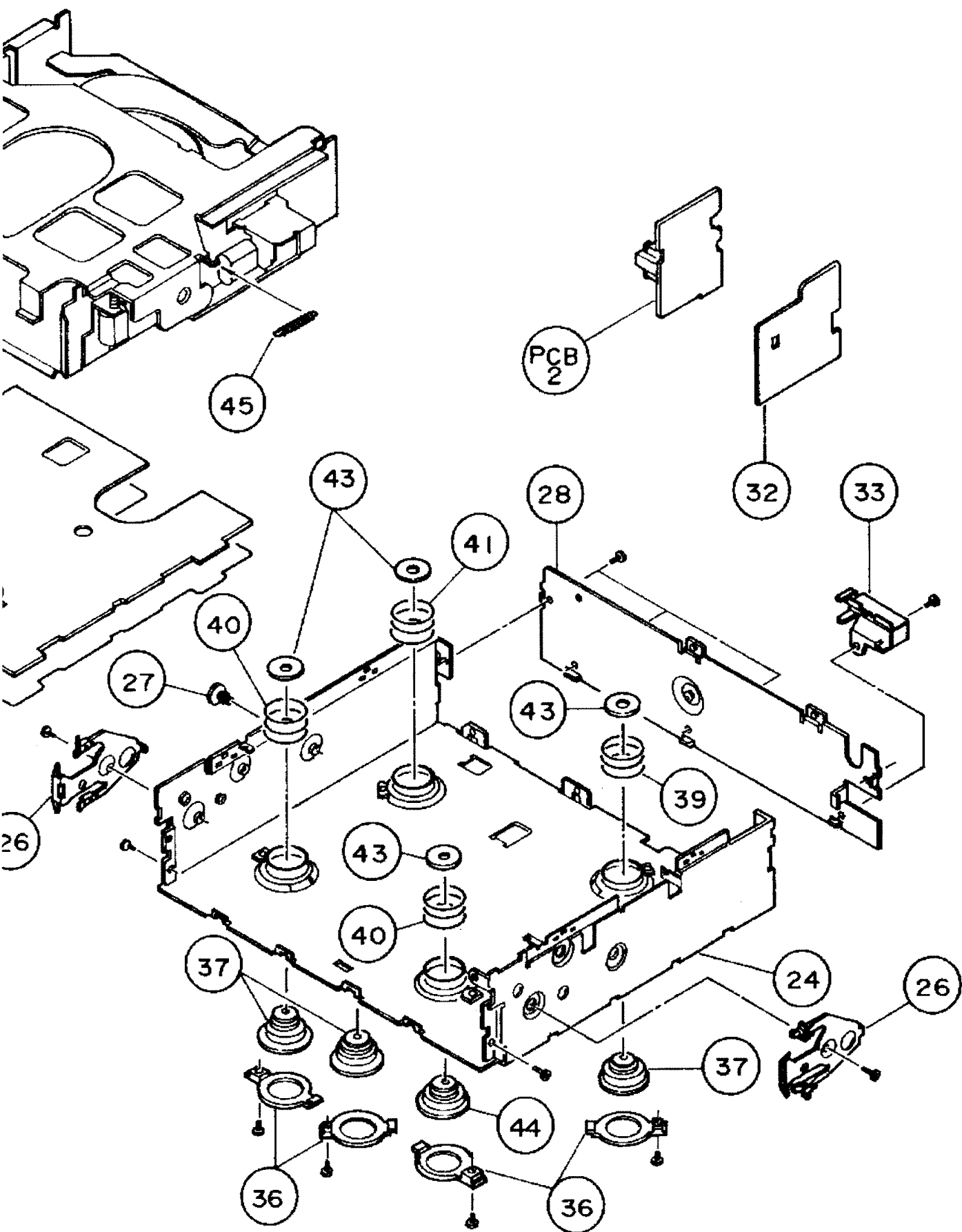
**Accessories**

|                |                            |
|----------------|----------------------------|
| 4822 736 16342 | Instructions for use       |
| 4822 441 12224 | Case assy                  |
| 4822 492 11678 | Shaft wire spring          |
| 4822 502 14606 | Special transport<br>screw |

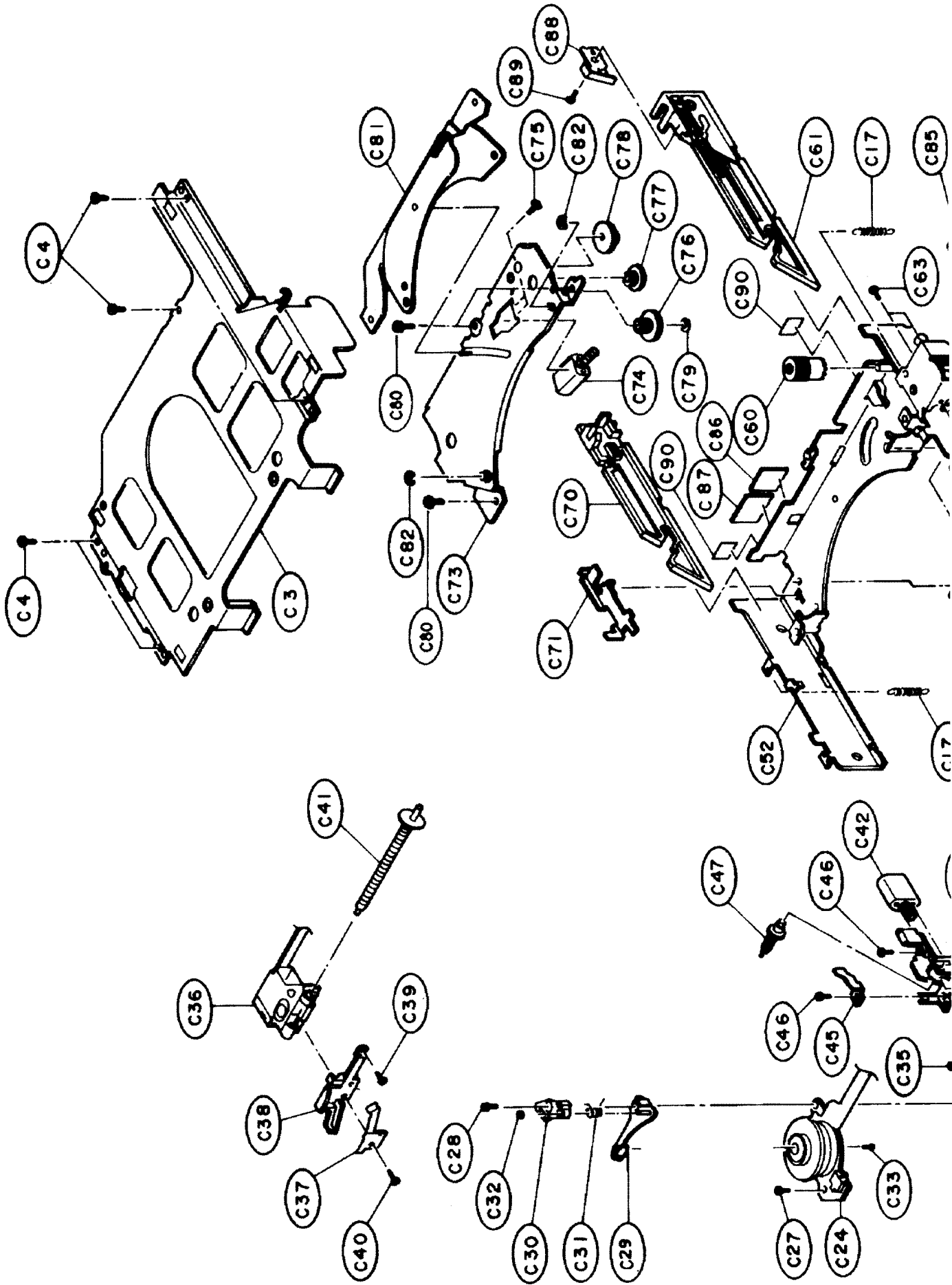
*(Note: all parts not mentioned here are NO  
service parts!)*

24. EXPLODED VIEW (CABINET PARTS)

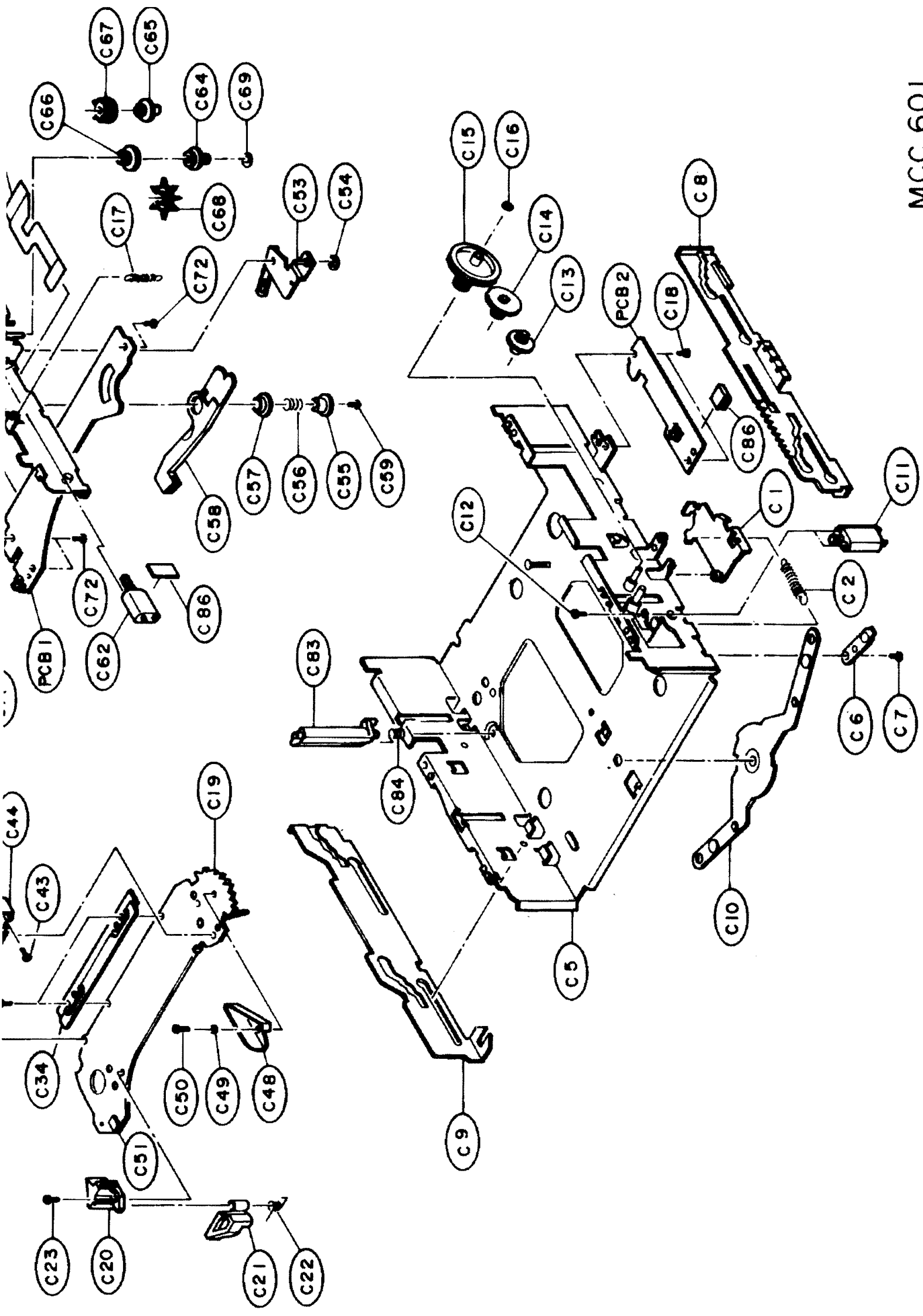




25. EXPLODED VIEW CD MECHANISM







| <b>Mechanical parts</b>                                                                                                       |                |                             |                                                                                   |                |                        |
|-------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------|-----------------------------------------------------------------------------------|----------------|------------------------|
| <i>(Note: All parts not mentioned here are NO service parts!)</i>                                                             |                |                             |                                                                                   |                |                        |
| C11                                                                                                                           | 4822 361 11102 | Elevator motor assy         | D503                                                                              | 4822 130 11349 | Zener 6.8V             |
| C13                                                                                                                           | 4822 522 10719 | Gear, EA                    | D551                                                                              | 4822 130 11355 | Zener 6.2V             |
| C14                                                                                                                           | 4822 522 10721 | Gear, EB                    | D561                                                                              | 4822 130 11348 | Zener 8.2V             |
| C15                                                                                                                           | 4822 522 10722 | Gear, EC                    | D571                                                                              | 4822 130 11354 | Diode LFB01            |
| C16                                                                                                                           | 4822 532 12295 | Mount-M special washer      | D601                                                                              | 4822 130 11354 | Diode LFB01            |
| C20                                                                                                                           | 4822 502 14607 | Mount-M special screw (in)  | D801                                                                              | 4822 130 11354 | Diode LFB01            |
| C21                                                                                                                           | 4822 402 11149 | Disc sleeve lever           | D803                                                                              | 4822 130 82557 | Diode MPG03B           |
| C24                                                                                                                           | 4822 361 11103 | Spindle motor assy          | D804                                                                              | 4822 130 11354 | Diode LFB01            |
| C32                                                                                                                           | 4822 532 12735 | Special washer              | D871                                                                              | 4822 130 11354 | Diode LFB01            |
| C36                                                                                                                           | 4822 691 10734 | Laser pick-up unit          | D951                                                                              | 4822 130 11354 | Diode LFB01            |
| C38                                                                                                                           | 4822 691 10735 | Mount-E feed                | D952                                                                              | 4822 130 11355 | Zener 6.2V             |
| C42                                                                                                                           | 4822 361 11104 | Feed motor assy             | D953                                                                              | 4822 130 11354 | Diode LFB01            |
| C44                                                                                                                           | 4822 502 14608 | Mount-M special screw (out) | LED561                                                                            | 4822 130 82018 | BR1102W                |
| C47                                                                                                                           | 4822 522 10723 | Gear, FB                    | LED801                                                                            | —              |                        |
| C60                                                                                                                           | 4822 522 10724 | Gear, RD                    | LED808                                                                            | 4822 130 11359 | BG1101W-730-C-TR       |
| C62                                                                                                                           | 4822 361 11102 | Mag. elevator motor assy    | LED809                                                                            | —              |                        |
| C64                                                                                                                           | 4822 522 10725 | Gear, MA                    | LED812                                                                            | 4822 130 82018 | BR1102W                |
| C65                                                                                                                           | 4822 522 10726 | Gear, MB                    |  |                |                        |
| C66                                                                                                                           | 4822 522 10727 | Gear, MC                    |                                                                                   |                |                        |
| C67                                                                                                                           | 4822 522 10728 | Gear, MD                    |                                                                                   |                |                        |
| C68                                                                                                                           | 4822 522 10729 | Gear, ME                    |                                                                                   |                |                        |
| C74                                                                                                                           | 4822 361 11105 | Rotary assy motor           |                                                                                   |                |                        |
| C76                                                                                                                           | 4822 522 10731 | Gear, RA                    |                                                                                   |                |                        |
| C77                                                                                                                           | 4822 522 10732 | Gear, RB                    |                                                                                   |                |                        |
| C78                                                                                                                           | 4822 522 10733 | Gear, RC                    |                                                                                   |                |                        |
| C79                                                                                                                           | 4822 532 12295 | Mount-m special washer      |                                                                                   |                |                        |
| C85                                                                                                                           | 4822 320 12432 | Flat foil PCB               |                                                                                   |                |                        |
| <b>Electrical parts</b>                                                                                                       |                |                             |                                                                                   |                |                        |
| <i>(Note: For all parts not mentioned here (common resistors / capacitors etc.) refer to a standard component catalogue.)</i> |                |                             |                                                                                   |                |                        |
|                                            |                |                             |                                                                                   |                |                        |
| D1                                                                                                                            | 4822 130 10655 | Diode 1SR154-400            | Q101                                                                              | 4822 130 60753 | Transistor 2SC2812L6   |
| D101                                                                                                                          | 4822 130 11347 | Zener 5.6V                  | Q501                                                                              | 4822 130 10786 | Transistor 2SD2199S    |
| D102                                                                                                                          | 4822 130 11347 | Zener 5.6V                  | Q502                                                                              | 4822 130 62912 | Transistor 2SB1202(ST) |
| D103                                                                                                                          | 4822 130 83765 | Zener 5.6V                  | Q503                                                                              | 4822 130 63886 | Transistor DTC114YU    |
| D501                                                                                                                          | 4822 130 11348 | Zener 8.2V                  | Q551                                                                              | 4822 130 11356 | Transistor 2SC4211-6   |
|                                                                                                                               |                |                             | Q561                                                                              | 4822 130 11351 | Transistor 2SD1802-S   |
|                                                                                                                               |                |                             | Q601                                                                              | 4822 130 10786 | Transistor 2SD2199S    |
|                                                                                                                               |                |                             | Q602                                                                              | 4822 130 11352 | Transistor DTC144TU    |
|                                                                                                                               |                |                             | Q603                                                                              | 4822 130 11356 | Transistor 2SC4211-6   |
|                                                                                                                               |                |                             | Q606                                                                              | 4822 130 63886 | Transistor DTC114YU    |
|                                                                                                                               |                |                             | Q700                                                                              | 4822 130 11352 | Transistor DTC144TU    |
|                                                                                                                               |                |                             | Q701                                                                              | 4822 130 11357 | Transistor DTA114YU    |
|                                                                                                                               |                |                             | Q702                                                                              | 4822 130 62861 | Transistor DTC343TK    |
|                                                                                                                               |                |                             | Q703                                                                              | 4822 130 62861 | Transistor DTC343TK    |
|                                                                                                                               |                |                             | Q801                                                                              | 4822 130 11356 | Transistor 2SC4211-6   |

|                                                                                   |                |                                             |                      |                |                                   |
|-----------------------------------------------------------------------------------|----------------|---------------------------------------------|----------------------|----------------|-----------------------------------|
| Q802                                                                              | 4822 130 11357 | Transistor<br>DTA114YU                      | IC901                | 4822 209 16797 | Shock detect /<br>correct LC89153 |
| Q851 -                                                                            |                |                                             | IC951                | 4822 209 61493 | Oscillator<br>HD74HC14P           |
| Q858                                                                              | 4822 130 11358 | Transistor<br>2SA1622-6                     | SEN751               | 4822 130 11353 | Photo coupler<br>SPI236-17        |
| Q951                                                                              | 4822 130 11358 | Transistor<br>2SA1622-6                     | SEN781               | 4822 130 11353 | Photo coupler<br>SPI236-17        |
| Q952                                                                              | 4822 130 63886 | Transistor<br>DTC114YU                      | <b>Miscellaneous</b> |                |                                   |
| Q953                                                                              | 4822 130 63886 | Transistor<br>DTC114YU                      | C808                 | 4822 124 12242 | Back-up capacitor<br>10mF / 5.5V  |
| Q954                                                                              | 4822 130 10785 | Transistor<br>2SA1179M6                     | CP551                | 4822 265 11376 | Socket 10-pole                    |
|  |                |                                             | CP802                | 4822 320 12463 | Cable assy                        |
| IC1                                                                               | 4822 209 16795 | Memory MSM51440                             | CS501                | 4822 265 11377 | Socket 9-pole                     |
| IC101                                                                             | 4822 209 32743 | D <sup>2</sup> B bus interface<br>MSM6307GS | CS551                | 4822 265 11382 | Plug 10-pole                      |
| IC501                                                                             | 4822 209 33094 | Voltage regulator<br>MC78M05                | CS751                | 4822 265 11379 | Socket 15-pole                    |
| IC502                                                                             | 4822 209 16792 | Rotary motor driver<br>BA6285FP             | CS752                | 4822 265 11381 | Socket 16-pole                    |
| IC503                                                                             | 4822 209 16793 | Elev. motor driver<br>BA6247FP              | CS801                | 4822 265 11377 | Socket 9-pole                     |
| IC601                                                                             | 4822 209 15225 | Dig. signal proces-<br>sor LC78620          | CS802                | 4822 265 11378 | Plug 4-pole                       |
| IC650                                                                             | 4822 209 15227 | Servo controller<br>LA9240M                 | DIN-1                | 4822 320 12431 | DIN cable                         |
| IC651                                                                             | 4822 209 15228 | Servo coil driver<br>BA6999FP               | FPC783               | 4822 320 12429 | Cable wire 9-pole<br>70mm         |
| IC652                                                                             | 4822 209 16794 | Comparator amp<br>LA6393M                   | FPC801               | 4822 320 12462 | Flexible foil PCB                 |
| IC701                                                                             | 4822 209 15226 | D/A converter<br>PCM1710U                   | L8                   | 4822 157 11124 | Coil SK 5mH                       |
| IC702                                                                             | 4822 209 30455 | Op-amp NJM2100M                             | L601                 | 4822 157 11703 | Core                              |
| IC751                                                                             | 4822 209 16798 | Motor driver<br>BA6843AFS                   | L605                 | 4822 157 11703 | Core                              |
| IC752                                                                             | 4822 209 63557 | Gate TC7S08F                                | L901                 | 4822 157 11703 | Core                              |
| IC781                                                                             | 4822 209 63557 | Gate TC7S08F                                | L951                 | 4822 157 11703 | Core                              |
| IC801                                                                             | 4822 209 16796 | μ-processor<br>UPD78P018FGC                 | R103                 | 4822 116 10078 | Thermistor<br>PTH60G01AR          |
| IC802                                                                             | 4822 209 33759 | Voltage check<br>S-80732AN-DW               | R104                 | 4822 116 10078 | Thermistor<br>PTH60G01AR          |
| IC803                                                                             | 4822 209 33759 | Voltage check<br>S-80732AN-DW               | S751                 | 4822 277 11802 | Micro switch                      |
| IC804                                                                             | 4822 209 33241 | Voltage regulator<br>S-81250HG              | S752                 | 4822 277 11802 | Micro switch                      |
| IC851                                                                             | 4822 209 33094 | Voltage regulator<br>MC78M05                | S753                 | 4822 277 11803 | Micro switch                      |
|                                                                                   |                |                                             | S754                 | 4822 277 11803 | Micro switch                      |
|                                                                                   |                |                                             | S781                 | 4822 277 11801 | Micro switch                      |
|                                                                                   |                |                                             | S782                 | 4822 277 11801 | Micro switch                      |
|                                                                                   |                |                                             | S801                 | 4822 276 14001 | Tact switch                       |
|                                                                                   |                |                                             | S802                 | 4822 277 11804 | Microswitch                       |
|                                                                                   |                |                                             | S803                 | 4822 277 11804 | Microswitch                       |
|                                                                                   |                |                                             | TH651                | 4822 116 10079 | Thermistor<br>NTH5G1M             |
|                                                                                   |                |                                             | TH801                | 4822 116 10081 | Thermistor                        |
|                                                                                   |                |                                             | X101                 | 4822 242 10942 | Crystal 5.75MHz                   |
|                                                                                   |                |                                             | X601                 | 4822 242 10941 | Crystal 16.9344MHz                |
|                                                                                   |                |                                             | X801                 | 4822 242 10943 | Crystal 8.3886MHz                 |