

Service Manual

Professional Digital Audio Tape Deck

SV-3900



Color

(H)... Gray Type

Area

Country Code	Area	Color
(EB)	Great Britain/ Switzerland.	(H)
(EG)	F.R. Germany/Italy/ Continental Europe.	

SPECIFICATIONS

Signal Format

Tape recording system: Rotary head type DAT
Sampling frequencies:
 For recording: 48 kHz/44.1 kHz
 (analog/digital input)
 32 kHz (digital input only)
 For playback: 48 kHz/44.1 kHz/32 kHz
 (selected automatically)
No. of quantizing bits: 16-bit linear
No. of channels: 2 (stereo)

Audio Parameters (Recording and Playback System)

Frequency response:
 For 48 kHz: 10 Hz~22 kHz (± 0.5 dB)
 For 44.1 kHz: 10 Hz~20 kHz (± 0.5 dB)
Signal to noise ratio: Greater than 92 dB, DIN audio
 (dynamic range) weighted
 (22.4 Hz to 22.4 kHz bandpass)
Total harmonic distortion: Less than 0.05% (1 kHz, +4 dBu)
 Less than 0.007% (1 kHz, +22 dBu)
Wow and flutter: Unmeasurable

General

Power supply: AC 110 V/127 V/220 V/240 V
 50/60 Hz
Power consumption: 35 W
External dimensions: 43×12.2×31.5 cm
 (W×H×D)
Weight: 6.4 kg

Input/Output Jacks

Analog
Input jacks: XLR-3 type
Nominal input level/ +4 dBu (−18 dB rec level)/
Input impedance: 10 k Ω balanced
Output jacks: XLR-3 type
Nominal output level/ +4 dBu/−10 dBu (switch selectable)/
Output impedance: 75 Ω balanced
Phones output: Max. 30 mW/32 Ω
 (matching impedance 8~600 Ω)

Digital (AES/EBU type)

Input jacks: XLR-3 type/100 Ω balanced
Output jacks: XLR-3 type/20 Ω balanced
Digital (IEC TYPE II)
Input jack: RCA phono type (coaxial)/75 Ω
Output jack: RCA phono type (coaxial)/75 Ω

Remote Control

Parallel remote: 8 pin DIN connector
 (43 functions available)
Serial remote: 9 pin D-sub connector×2
 (for Input and Output)
 Based on ES-bus and P-2 protocols
 (switchable)
 *Controller SH-MK390 (option) is
 available for ES-bus mode
Machine number setting: Zero thru No. 31 (available in ES-bus
 mode)

Mechanism

Heads: Amorphous ferrite composite type
Cylinder diameter: 30 mm
Cylinder rotation speed: 2000 r.p.m.
 (recording and playback)
Tape speed: 8.15 mm/sec., 12.225 mm/sec.
 (selected automatically)
Search speed: Up to 250 times normal playback
 speed
FF/Rewind speed: Up to 400 times normal playback
 speed
FF/Rewind time: Approx. 27 sec. (2 hours DAT tape)

Note:
 Specifications are subject to change without notice.
 Weight and dimensions are approximate.

Panasonic

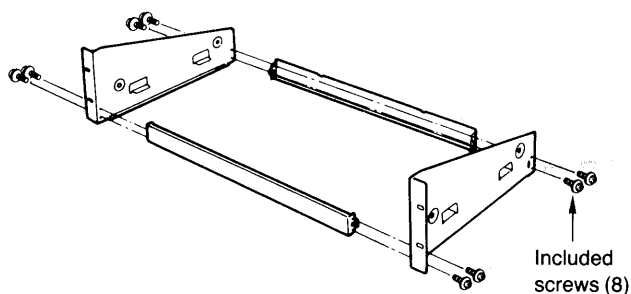
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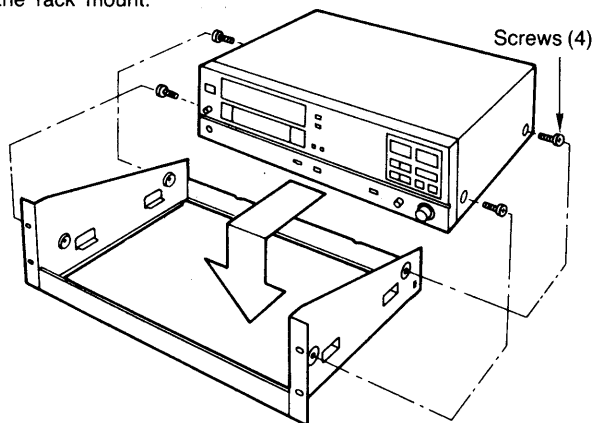
INSTALLATION

Installation of rack mount kit

1. Assemble the rack ears and panel, and tighten with screws included.



2. Remove the 4 screws on side enclosure, and attach the unit to the rack mount.



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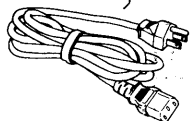
Notes on placement

- This unit is a precision instrument. Be sure to place it on a flat surface, or mounted level in a rack.
- Avoid places such as the following:
 - Near any equipment or device that generates strong magnetic field.
 - On any heat-generating equipment or device, or in any place where the temperature is high (35°C/95°F or higher).
 - Extremely cold locations (5°C/41°F or below).
 - Near an AM/FM tuner or TV.
(It may produce noise in the broadcast audio, or disturb the TV picture.)
 - For long periods of time in direct sunlight.
 - In dusty or smoky locations.
 - In locations prone to vibrations.
 - In locations where the rear panel is less than 10 cm (about 4") away from the wall or back of an audio rack.
- Do not place heavy objects, other than system components, on top of the unit.
- When carrying or storing the unit, handle it with care and do not subject to any strong bumps.
- To avoid problems due to vibration:
 - Do not place a book or similar object under this unit.
 - Do not route the connection cables (of this or other units) across the operation panel, across the top, or under the unit.

ACCESSORIES

- AC power supply cord 1

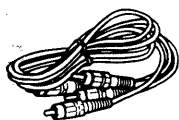
{ SJAD8 (EB)
RJA0003-K (EG) }



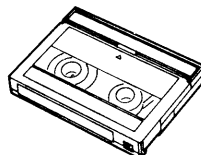
- Screws 8
(XYN3 + F10FZ)



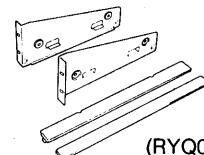
- Coaxial cable 1
(SJPD19-1E)



- Cleaning tape 1
(RT-RCLP)

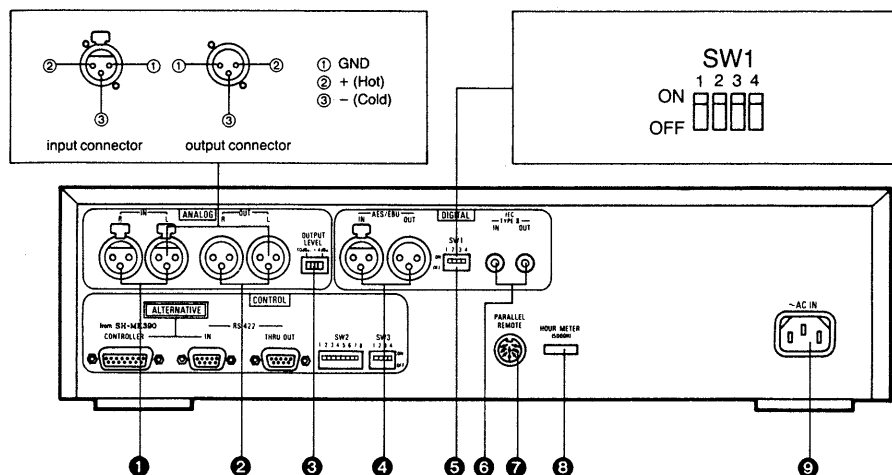


- Rack mount kit 1
(RYQ0059-1)



(RYQ0060-1)

CONNECTIONS



1 ANALOG IN terminals

These are balanced analog audio XLR input connectors.

2 ANALOG OUT terminals

These are balanced analog audio XLR output connectors.

3 OUTPUT LEVEL selector (+4 dBu/-10 dBu)

Select the nominal output level corresponding to a peak level meter display of -18 dB.

4 AES/EBU terminals (IN/OUT)

These terminals are for input or output of signals via the professional digital interface.

5 DIP switch settings (SW1)

These are used for the following settings:

- Digital Input Selection (IEC TYPE II or AES/EBU)
- SCMS ID 6 Status for AES/EBU Input
- Blank Skip Mode in Program Search Mode

(For further details, see page 6.)

6 IEC TYPE II (IEC 958) jacks (IN/OUT)

These terminals are for input or output of digital signals from/to a consumer unit.

7 REMOTE CONTROL jack (PARALLEL)

See page 28.

8 Hour meter (5000H)

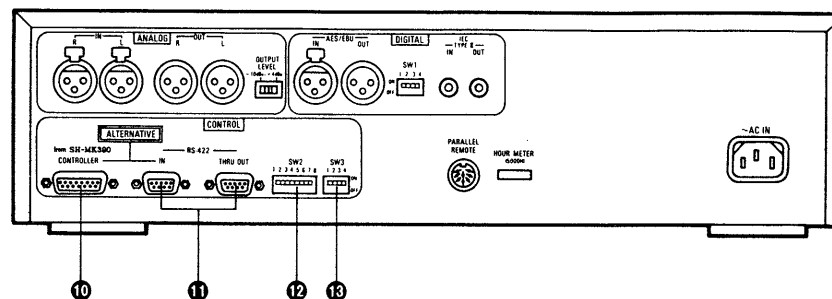
Shows the number of hours of head usage in recording and playback.

9 AC IN jack

Connect to the grounded AC outlet with the AC power supply cord included.

SETTING THE MACHINE NUMBER

Rear panel



10 Dedicated remote controller connector

This is a 15-pin serial connector used to connect an optional dedicated remote controller (SH-MK390).

11 Bus (RS-422) connectors

These two 9-pin connectors are used to connect the deck to a serial bus, or a computer. Connect it using only an RS-422 type cable.

Note:

This connector cannot be used to simultaneously connect the deck to a dedicated remote controller and a computer.

12 DIP switch settings (SW2)

These are used for the following settings:

- Machine Number Selection
- Device Type Selection
- Test Mode Selection

(For further details, see page 6.)

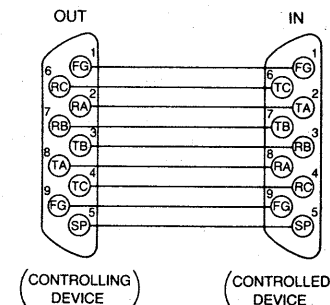
13 DIP switch settings (SW3)

These are used for the following settings:

- Maximum Search Speed Selection
- Protocol Selection
- Data Transmission Speed Setting

(For further details, see page 6.)

The pin connections are shown below.



CONNECTOR PIN ASSIGNMENT

FG: Frame ground	RC: Receive-signal common
RA: Receive "A"	RB: Receive "B"
TB: Transmit "B"	TA: Transmit "A"
TC: Transmit-signal common	
SP: Spare	

ES Bus

This format was developed jointly by the EBU (European Broadcasting Union) and the SMPTE (Society of Motion Picture & Television Engineers) for remote control of recording, production and broadcasting equipment.

The controller sends control messages along a serial bus, hence the cable connection is simple. This enables various equipment connected to the bus to be selected and controlled individually or collectively.

ES bus, Messages specific to a DAT (commands and responses) are not yet standardized. Hence the deck transmits messages in an escape mode in which messages specific to the deck can be defined. The mechanical and electrical interfaces of this deck are based on RS-422 D sub connector.

P-2 Serial

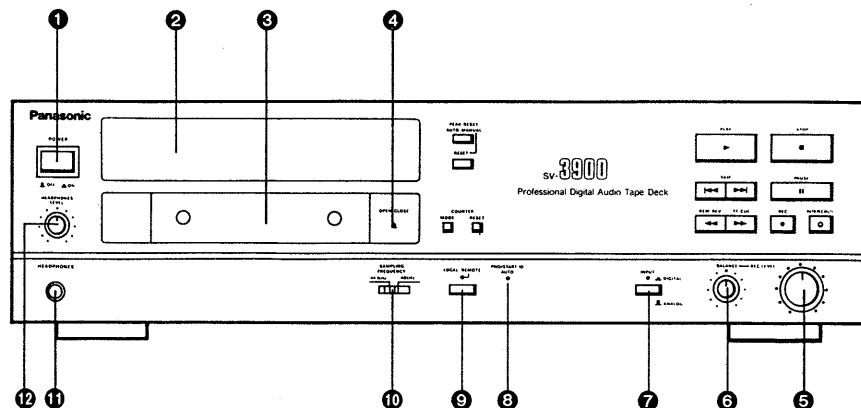
P-2 is an abbreviation of Protocol-2, which is a serial transmission protocol employing a 9-pin D sub connector. It is at present widely used as a control format between a VTR and a controller.

In this format, one VTR is connected to a single control input/output connector (9-pin D sub connector) of the controller.

ES bus and P-2 protocol can be selected by means of a DIP switch.

LOCATION OF CONTROLS

Front panel



1 POWER switch (POWER)

2 Display panel

See page 5.

3 Cassette holder

4 OPEN/CLOSE button (▲ OPEN/CLOSE)

5 REC LEVEL control (REC LEVEL)

Use to adjust the recording level of both left and right channels.

6 REC BALANCE control (BALANCE)

Use to adjust recording balance between left and right channels.

7 INPUT selector button/indicator (INPUT)

Use to select digital or analog recording input.

8 PNO/START ID AUTO indicator (PNO/START ID AUTO)

Indicates that the unit is set in the automatic mode for recording Program Number and Start ID.

The default mode on power up is set to off (manual recording mode).

9 LOCAL/REMOTE button (LOCAL/REMOTE)

Use to select local or remote operating mode.

The default setting on power up is the remote mode.

10 SAMPLING FREQUENCY selector

Select the sampling frequency when making analog recordings (44.1 kHz or 48 kHz).

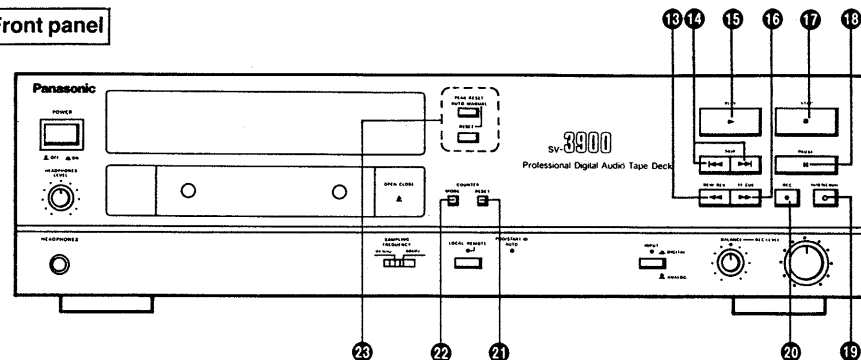
11 Phones jack (HEADPHONES)

A 1/4" connector for connecting standard stereo headphones.

12 Phone level control (HEADPHONES LEVEL)

Use this control to adjust output level to the headphones.

Front panel



13 REW/REV button (◀◀ REW/REV)

Use to rewind the tape, or for audible high-speed search in play mode (review).

14 SKIP buttons (◀◀•▶▶ SKIP)

Use the skip buttons to advance to the desired program. The ▶▶ button skips the program forward by one Start ID. The ◀◀ button skips the program backward by one Start ID. Repeated pressing of the Skip buttons causes the unit to skip forwards or backwards several IDs.

15 PLAY button/indicator (▶ PLAY)

Use to initiate recording or playback mode. Also used to record program numbers manually.

16 FF/CUE button (▶▶ FF/CUE)

Use to advance the tape rapidly, or for audible high-speed search in play mode (cue).

17 STOP button (■ STOP)

Use to stop all functions. This button also clears the program memory.

18 PAUSE button/indicator (|| PAUSE)

Use to temporarily interrupt playback or recording mode.

19 AUTO REC MUTE button

Use to automatically insert a silent passage approximately four seconds long during a recording.

20 RECORD button/indicator (● REC)

Use to place the unit in record standby mode.

21 COUNTER RESET button (COUNTER RESET)

Use to reset the tape counter to "0000" (when the display mode is set to tape counter).

22 COUNTER MODE button (COUNTER MODE)

Use to select the desired counter mode, between Absolute time, Program time, Time Remaining, TOC and Tape Counter.

23 PEAK RESET buttons (PEAK RESET AUTO/MANUAL/RESET)

The AUTO/MANUAL button is used to select the peak hold reset mode, auto or manual.

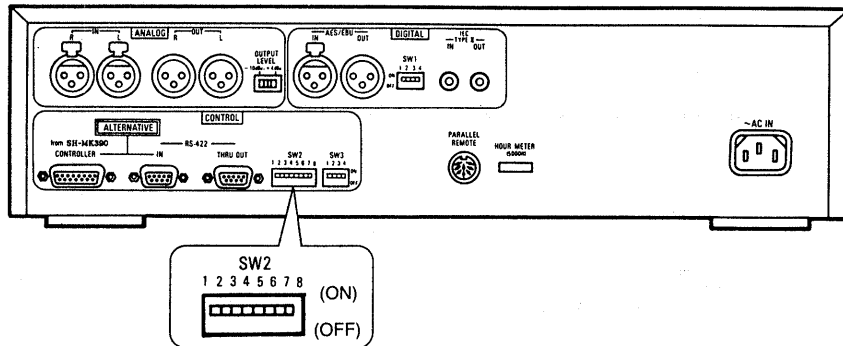
AUTO: The peak level of the source is held and displayed for approximately one second before being extinguished.

MANUAL: The peak level of the source is held and displayed continuously until the RESET button is pressed. The RESET button is used to reset the peak hold display in manual mode.

The default setting on power up is auto mode.

SETTING THE MACHINE NUMBER

Rear panel



For Network Control via ES Bus, the machine number of this deck can be set by using rear-panel DIP switch 2. The machine number is required to identify each deck when the RS-422 connectors of several SV-3900s are connected serially, and selected deck needs to be controlled in the ES bus mode. By using the optional SH-MK390 remote controller, a number of decks can be controlled via the ES bus.

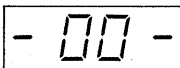
Set the machine number using DIP switches 2-1 thru 2-5 while referring to the table at right.

CAUTION!

Do not specify the same machine number as that of another deck already connected to serial controller. Switch OFF the power before setting the machine number. If you set the machine number with the power ON, switch the power OFF then ON again to reset the machine value.

Checking the machine number

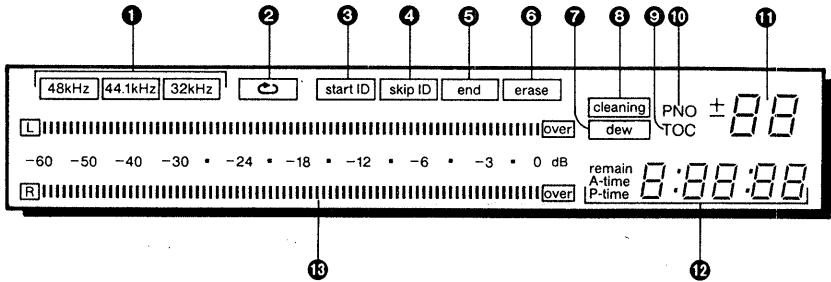
The SV-3900's machine number will appear on the counter display panel as shown below when either the cassette holder is opened, or the cassette holder is closed without loading a cassette tape.



(UP=ON=1, DOWN=OFF=0)

Machine No.	DIP SW2 settings				
	1	2	3	4	5
00	0	0	0	0	0
01	1	0	0	0	0
02	0	1	0	0	0
03	1	1	0	0	0
04	0	0	1	0	0
05	1	0	1	0	0
06	0	1	1	0	0
07	1	1	1	0	0
08	0	0	0	1	0
09	1	0	0	1	0
10	0	1	0	1	0
11	1	1	0	1	0
12	0	0	1	1	0
13	1	0	1	1	0
14	0	1	1	1	0
15	1	1	1	1	0
16	0	0	0	0	1
17	1	0	0	0	1
18	0	1	0	0	1
19	1	1	0	0	1
20	0	0	1	0	1
21	1	0	1	0	1
22	0	1	1	0	1
23	1	1	1	0	1
24	0	0	0	1	1
25	1	0	0	1	1
26	0	1	0	1	1
27	1	1	0	1	1
28	0	0	1	1	1
29	1	0	1	1	1
30	0	1	1	1	1
31	1	1	1	1	1

Display panel



1 Sampling frequency indicators

Displays sampling frequency of digital signals during recording or playback. Changes automatically depending on input or output signal.

2 Repeat indicator

This indicator is used for repeat loop-play function. Indicates that all programs or memorized programs can be played back repeatedly (REPEAT).

3 start ID indicator

Indicates that a Start ID is being or has been recorded.

4 skip ID indicator

Indicates that a Skip ID is being or has been recorded.

5 end indicator

Indicates that an End Mark is being or has been recorded.

6 erase indicator

Indicates that a Start ID or Skip ID is being erased.

7 dew indicator

Indicates the formation of dew within the unit.

8 cleaning indicator

Indicates that the DAT head assembly needs cleaning. (See page 8, 10.)

9 TOC (table of contents) indicator

Indicates the total program count and tape length of a commercial tape onto which the TOC information has been recorded.

10 PNO (program number) indicator

Indicates the number of the current program.

11 Program number display

Displays either the TOC information (when TOC indicator appears) or the number of the program (when PNO indicator appears).

12 Counter display panel

The following are displayed according to the setting of the counter mode button:

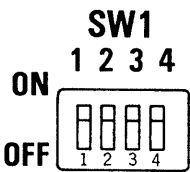
- 1) Absolute time
(This display is the default setting when power is first switched on.)
- 2) Program time (elapsed time since the last Start ID was encountered)
- 3) Remaining time (approximate time, in hours and minutes to the end of the DAT cassette)
- 4) TOC information
- 5) Tape counter

13 Peak level meter

Recording and playback levels are indicated by a bar graph. Standard I/O level of +4/-10 dBu is shown at -18 dB.

DIP SWITCH SETTINGS

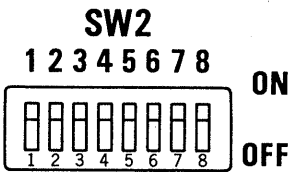
DIP Switches on the Rear Panel



The following settings can be made by using DIP switch 1.

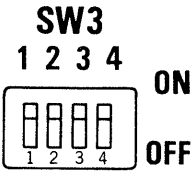
Switch Setting	Function
1 Digital Input/Output Selection	ON=IEC 958 OFF=AES/EBU
2 SCMS ID6 Status for AES/EBU Input	SW2 SW3 ID Meaning OFF — 00 Copy Free ON OFF 10 No further copies ON ON 11 One copy allowed
4 Blank Skip Mode in Program Search	ON=1 OFF=0 SV-3900 will advance to the next selection during Program Play mode, if approximately two seconds of silence are encountered.

Note:
IEC 958 is shown as IEC TYPE II on the rear panel of SV-3900.



The following settings can be made by using DIP switch 2.

Switch Setting	Function
1 Machine Number	For details on how to set the machine number, see page 10.
6 Device Type Setting	SW6 SW7 Device OFF OFF SV-3900 OFF ON MII VCR ON ON SONY VCR
8 Test Mode	OFF=Normal mode ON=Test mode



The following Settings can be made by using DIP switch 3.

Switch Setting	Function
1 Maximum Search Speed	OFF=Max. 250 times search speed possible ON=Max. 400 times search speed possible
2 Serial Protocol	OFF=ES BUS ON=P2
3 Data Transmission Speed	SW3 SW4 Transmission speed OFF OFF 38.4 kbps ON OFF 9600 bps OFF ON 4800 bps ON ON 2400 bps

SCMS Copy Protection

The Serial Copy Management System (SCMS) is designed to control digital-to-digital DAT copying that a consumer can perform on various digital audio material, including Compact Discs, pre-recorded DAT tapes, and other material via IEC 958 "consumer use" digital audio interfaces (also commonly referred to as "S/P DIF" and EIAJ CP-340). SCMS does not affect the ability to make copies using a DAT recorder's analog inputs and outputs, nor does it apply to digital-to-digital copies made via the AES/EBU professional digital audio interface.

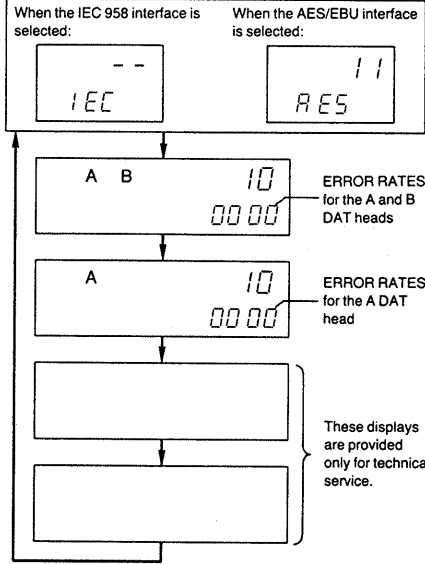
Only one serial (or generational) digital-to-digital copy can be made from a copyright protected source, such as a commercial CD or pre-recorded DAT. Serial Copy Management System labels are generated onto tape each time an SCMS-equipped consumer DAT machine records an audio signal to tape, no matter whether the source is from the analog or digital inputs.

Technically, the SCMS labels for DAT are encoded into the SubCode sections of the main digital data area, specifically "ID6". The SV-3900's rear-panel DIP switches allow the user to preset the SCMS status bits of ID6 onto the DAT recording. For legal reasons, the ID6 bits are only modified if the source input is the AES/EBU Digital I/O; during digital copying via the IEC "consumer use" input, the SV-3900 simply copies across the current status of SCMS codes indicated by the Channel Status. To prevent a master DAT tape being copied on a consumer deck, for example, the user might select switch setting for "ID6=10", which would prevent any further digital copying of this copyrighted cassette via a consumer DAT. Alternatively, you might select "ID6=00", so that any number of digital copies could be made on a consumer deck. Selection of "ID6=11" will designate a final copyright protected pre-recorded product, which would behave the same way on consumer SCMS-equipped DAT decks as a normal commercial release.

DISPLAYING SCMS STATUS AND ERROR RATES

The SCMS status of a DAT recording can be displayed on the SV-3900 by simultaneously pressing the front-panel COUNTER MODE, RESET and PAUSE buttons. Now shown within the normal Time Display window will be the type of digital interface that has been selected via the rear-panel DIP switch—AES/EBU or IEC 958 "consumer use"—while the PNO display now shows the ID6 value of the recording: 00, 10 or 11. If the COUNTER MODE button is pressed for a second time, the SV-3900 will display ERROR RATES; the mode can be cancelled by hitting the RESET button.

Each time the COUNTER MODE button is pressed, the display changes as follows:



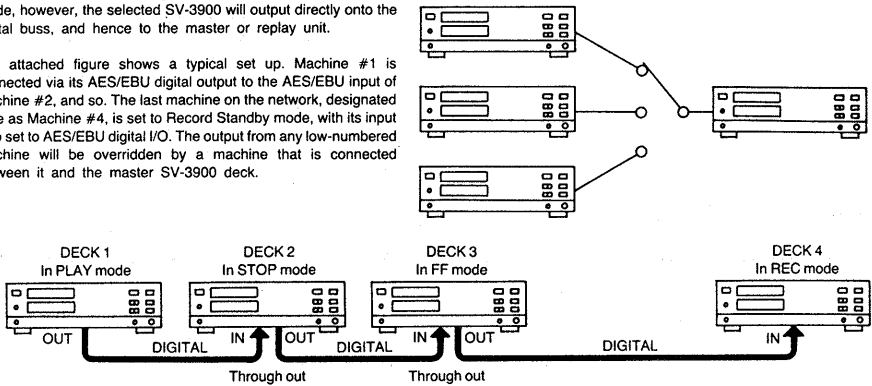
Note:
The display scheme described above will not be shown, when the machine number is being displayed.

DIGITAL THROUGH PUT FUNCTION

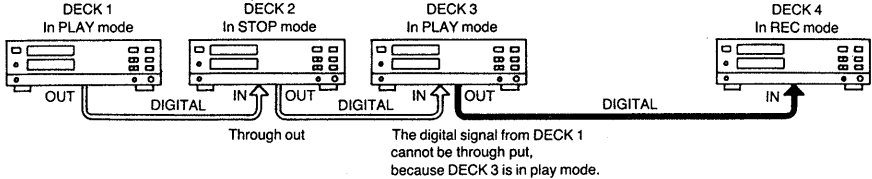
A special function provided on the SV-3900 Pro-DAT enables up to five machines to be connected together in a serial mode, whereby the digital output from any single machine on the network can be recorded onto a master SV-3900. In this way, a network array can be set up for digital dubbing and insert-editing between several replay DATs and a master recorder. For such applications as automated replay for broadcast or permanent-sound systems, a series of SV-3900s can be controlled from an external computer or SH-MK390 Remote Controller, to form a multi-machine replay system with a common digital or analog output. The digital input to any machine in the network that has been set to Digital Through Put mode will be automatically routed to its digital output. In replay mode, however, the selected SV-3900 will output directly onto the digital buss, and hence to the master or replay unit.

The attached figure shows a typical set up. Machine #1 is connected via its AES/EBU digital output to the AES/EBU input of machine #2, and so. The last machine on the network, designated here as Machine #4, is set to Record Standby mode, with its input also set to AES/EBU digital I/O. The output from any low-numbered machine will be overridden by a machine that is connected between it and the master SV-3900 deck.

Note:
This function will not work unless the decks are connected digitally.



If, however, deck 3 is put in the PLAY mode, as shown in the figure, the playback signals from deck 3 will be input to deck 4.



- Notes:**
- The digital through put function is not activated when the SV-3900 is first powered up.
 - When selecting the digital through put function, use the AES/EBU ports to connect digital signals. A maximum of five decks can be connected serially in this way.

- Use this digital through put function when using the SH-MK390 optional remote controller to perform program playback and program editing between a number of decks.

To initiate the Digital Through Put Function

- 1 Open the cassette drawer (select Local mode if necessary).
- 2 Press the RECORD button.
The Sampling Frequency indicator will now flash, indicating the Digital Through Put mode has been established. The SV-3900 will continue to respond normally to all transport controls. If the Play button is pressed, however, the output of the selected SV-3900 will pass directly via the Network Digital Buss to the master machine.

To cancel the Digital Through Put Function

- 1 Open the cassette drawer (select Local mode if necessary).
- 2 Press the AUTO REC MUTE button.
The Sampling Frequency indicator will now cease to flash, indicating the Digital Through Put mode has been cancelled.

OPERATION NOTES

Serial remote control using RS-422 ports

You can transmit messages (commands and responses) to and from the SV-3900 via the RS-422 interface (9-pin D-sub connector). Message transfer is based on switchable ES bus or P2 protocols; see page 6 for more details. Messages specific to a DAT (commands and responses) have not yet been standardized. By developing suitable software to run on a conventional PC or terminal, it is possible to create an automatic system that can control the SV-3900 in a variety of applications.

Condensation

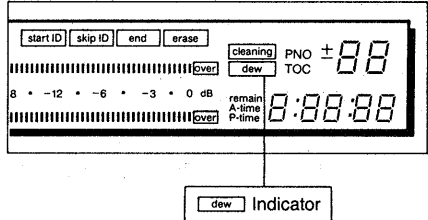
In winter, moisture droplets may form on the window panes of a heated room. This phenomenon is called condensation. Condensation may occur with this unit or with cassette tape in the following situations:

- in a room where a heater has just been turned on
- in a room where steam or excessive moisture are present
- when the unit is brought in suddenly from a cold place to a warm room
- when the unit is directly in the path of cold air from an air conditioner, etc.

In such cases, the unit will not operate correctly, and even if it does operate, the tape may be damaged. In particular, if moisture condenses on the rotating heads, the tape will stick. This will prevent the tape from running properly, and could damage it.

If Condensation Occurs

To protect the tape, this unit contains a built-in device so that when condensation occurs, the indicator on the display panel flashes. While the indicator is flashing, apart from the OPEN/CLOSE function, buttons on the unit will not operate.



If a cassette tape is loaded in the unit, remove it and leave the power switched on. Wait until the indicator goes out. The time required for moisture to evaporate will vary according to the environment, but it may be 60 minutes or longer if humidity is high. Condensation usually sets in gradually, so the indicator may not flash for the first 10~15 minutes. If room temperature or humidity changes abruptly, therefore, wait for about 20 minutes before switching on power to check that the indicator is not flashing.

Unloading Function

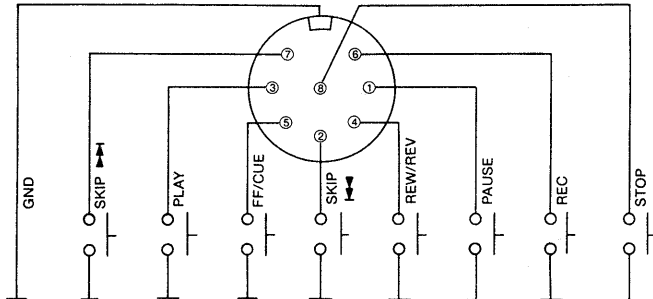
If the unit is in the stop, pause or record standby modes for more than 12 hours the cassette tape will be released automatically from the rotating head mechanism.

REMOTE CONTROL

This unit has three systems for remote control operation, using the optional SH-MK390 remote controller, the RS-422 serial remote control, and the 8-pin parallel input terminal.

Parallel Input Terminals

By connecting the following circuits, the SV-3900 can be operated by remote control using normal switches. This remote control operation functions in the Local mode only.



Expansion function

Connected via the Parallel Input Terminal to computer, the signals shown in the table below can be used to control the following 43 functions.

FUNCTION	DIN Jack Number	FUNCTION	DIN Jack Number
PAUSE	1 1 1 1 1 1 1 0	1	0 0 0 1 0 0 0 0
REC	1 1 1 1 1 1 0 1	2	0 0 0 1 0 0 0 1
REW	1 1 1 1 1 0 1 1	3	0 0 0 1 0 0 1 0
FWD SKIP	1 1 1 1 0 1 1 1	4	0 0 0 1 0 0 1 1
STOP/CLEAR	1 1 1 0 1 1 1 1	5	0 0 0 1 0 1 0 0
FF	1 1 0 1 1 1 1 1	6	0 0 0 1 0 1 0 1
REV SKIP	1 0 1 1 1 1 1 1	7	0 0 0 1 0 1 1 0
PLAY	0 1 1 1 1 1 1 1	8	0 0 0 1 0 1 1 1
(NO. KEY)	1 1 1 1 1 1 1 1	9	0 0 0 1 1 0 0 0
OPEN/CLOSE	0 0 0 0 0 0 0 1	0	0 0 0 1 1 0 0 1
AUTO REC MUTE	0 0 0 0 0 0 1 0	ID-ERASE	0 0 1 0 0 0 0 0
FADE IN	0 0 0 0 0 0 1 1	RENUMBER	0 0 1 0 0 0 0 1
FADE OUT	0 0 0 0 0 1 0 0	SKIP PLAY/OFF	0 0 1 0 0 0 1 0
COUNTER RESET	0 0 0 0 0 1 0 1	AUTO PNO/OFF	0 0 1 0 0 0 1 1
COUNTER MODE	0 0 0 0 0 1 1 0	MUSIC SCAN	0 0 1 0 0 1 0 0
MEMORY	0 0 0 0 1 0 0 0	DIRECT REC PAUSE	0 0 1 0 0 1 0 1
END SEARCH	0 0 0 0 1 0 1 0	DIRECT REC PLAY	0 0 1 0 0 1 1 0
REPEAT	0 0 0 0 1 0 1 1	UNLOAD	0 0 1 0 0 1 1 1
START-ID	0 0 0 0 1 1 0 0	ST-ID WRITE	0 0 1 0 1 0 0 0
SKIP-ID	0 0 0 0 1 1 0 1	SK-ID WRITE	0 0 1 0 1 0 0 1
END-ID	0 0 0 0 1 1 1 0	ST-ID ERASE	0 0 1 0 1 0 1 0
ID-WRITE	0 0 0 0 1 1 1 1	SK-ID ERASE	0 0 1 0 1 0 1 1

(ON=0, OFF=1)

(ON=0, OFF=1)

MAINTENANCE

To clean this unit, use a soft, dry cloth. If the surfaces are extremely dirty, use a soft cloth, dipped into a soap-and-water solution or a weak detergent solution. Wring the cloth well before wiping the unit. Wipe once again with a soft, dry cloth. Never use alcohol, paint thinner, benzene, nor a chemically treated cloth to clean this unit. Such chemicals may damage the finish of your unit.

Importance of Cleaning DAT Heads

As with any tape-based recorder, it is essential that the SV-3900 Pro-DAT's heads are kept perfectly clean. A Panasonic DAT Head Cleaning Tape (part number RT-RCLP, included) is available for your local dealer that automatically removes the dirt, dust and shed tape particles that gradually build up on the DAT heads.

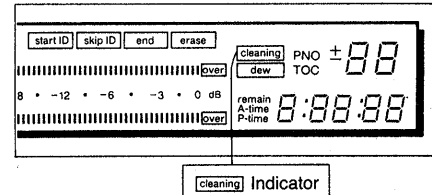
But how do you know that the heads need cleaning? In extreme conditions the audio output will mute, but long before that happens, the slow build up of dirt and oxide will "mask" the sound, and diminish the full 16-bit audio quality from this DAT machine by causing record as well as replay errors.

An ideal solution is to make yourself a "DAT Test Tape" whose error rate you can monitor on a daily or weekly basis (depending on how often you use the SV-3900). To prepare a Test Tape, first select a high-quality DAT cassette and then record a series of music selections. Rewind the DAT cassette and monitor the Error Rates during the first several minutes of tape.

Panasonic brand DAT tapes use high-quality formulations, binders, backings and calendaring process, to provide minimum abrasiveness with maximum stability of metal particles on the tape. It is specifically designed to maximize head life of your DAT machine.

Check the Error Rates at several points in the tape and average the values. (For details of how to display error rates on the SV-3900, see page 27.) If the Error Rates increase to around 300, a Panasonic Head Cleaner Tape can be used as follows: Play the cleaning tape through the SV-3900 for approximately 15 seconds, and remove it. **DO NOT REWIND** the cleaning tape, since this action might very well spread previously removed dirt and dust onto an otherwise clean head and transport. After the Head Cleaner Tape has been used up, dispose of it properly and start to use a new one.

If the DAT heads become very contaminated with dirt and dust, the CLEANING indicator within the display panel will flash. In this case, use a Head Cleaner Tape as described above.



- If playback quality improves after cleaning, but then deteriorates immediately after recording or playing back several times, the cassette tape has probably reached its useful lifetime. In this case, use a new tape.
- If sound quality does not improve even after cleaning, consult your dealer.
- Cleaning tapes cannot be used for recording or playback (be sure to read also the operating instructions supplied with the tape).

SV-3900 DAT MAINTENANCE CHART

REGULAR MAINTENANCE

The purpose of periodic maintenance as recommended is to keep the equipment in the best possible operating condition throughout its useful life. Observance of this maintenance schedule ensures that maximum performance and reliability is obtained from the machine.

Regular maintenance is necessary because the DAT Recorder is a high-technology piece of equipment, containing DC motors, head cylinder assemblies, and a complex mechanism. These components deteriorate over time. Dust and dirt can clog the head gap, which affects the sound. In light of this, it is very important that overall maintenance be performed according to the maintenance chart to avoid problems resulting from heavy image. Maintenance should also be performed after any repairs on the equipment.

Maintenance is particularly recommended for DAT Recorders used in commercial and broadcast applications for several reasons. Installation and application are frequently under less than ideal conditions, such as long usage times and poor environmental conditions. All of this adversely affects the life span and performance of the machine. Regular maintenance assures that the purchaser obtains maximum value for this expenditure.

Note: Refer to the hour meter to know when to perform the maintenance.

Part Name	Part Number	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
Upper Cylinder	VEH0460	○	●	○	●	○	●	○	●	○	●
Cylinder Unit	VEG0752	○	○	○	○	○	○	○	○	○	●
S. Load Arm Ass'y	RXL0052										●
T. Load Arm Ass'y	RXL0054										●
Load Cam	RDK0006-1						●				
Capstan Unit	REM0001	○	○	○	○	○	○	○	○	○	●
Post Roller	RXP0008	○	○	○	○	○	○	○	○	○	●
Guide Roller	RXP0027	○	○	○	○	○	○	○	○	○	●
Pinch Roller	1NB0001ZA	○	○	○	○	○	●	○	○	○	○
S. Reel Ass'y	RXR0006										●
T. Reel Ass'y	RXR0007										●
BT Lever	RXL0048										●
Tension Band Ass'y	RXL0036						●				
S. Brake Ass'y	RXL0049						●				
T. Brake Ass'y	RXL0050						●				
Idler Gear	RDG0071										●
Mode Motor Ass'y	REM0009								●		
Mode Cam	RDK0007-1										●
M Gear B	RDG0067										●
Drive Gear Ass'y	RXG0011						●				
Idler Gear (F)	RDG0069										●
Idler Gear (P)	RDG0068										●
Mode SW Ass'y	RES0002						●				
Load SW Ass'y	RES0001										●
Cassette SW	EVQWR4002										●
Earth Terminal	RUS740ZA										●
Loading Motor	MMN-6FBRC8S										●
Belt	SMQ20025										●
Leaf SW	SSPD18										●

● Replacement, ○ Cleaning

DAT Head and Tape Transport Cleaning

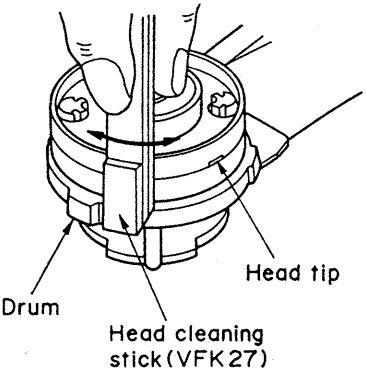
Through normal usage of any tape machine, dirt and debris from the tape accumulates on the heads, which eventually causes performance problems. By using a cleaning cassette regularly, dirt buildup can be minimized, prolonging the life of the tape heads, and also keeping tape posts, tape guides, and the pinch roller clean.

CLEANING

1. Play the cleaning cassette (Panasonic Part No. RT-RCLP) for 15-20 seconds.
2. Do not use the same part of the cleaning tape more than once.
3. Clean all tape contact surface, including A/C head upper and lower drum, thoroughly with a soft cloth soaked in alcohol.
4. Clean both heads by gently rubbing in a horizontal direction, as depicted, using a head cleaning stick (VFK27) or a lint free cloth moistened with alcohol.
5. Wipe all tape contact surfaces, including upper and lower drum, with a dry soft cloth to ensure that all residual moisture is removed from the tape contact surfaces.

Note:

1. When cleaning the upper drum, hold it secure with your finger tips.
2. Use solvents sparingly, excess alcohol will dilute and remove the bearing lubricant in the capstan motor and rotary guides.
3. Do not, under any circumstances, insert any object into the head tip slot of the head cylinder.



IMPORTANT

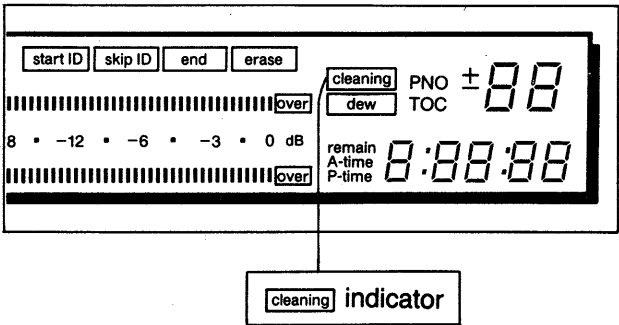
After cleaning the head and tape contact surfaces, check the error rate using the error rate reference tape (Part No. RD-ER01). Target error rate is less than 50. A unit with a new head cylinder should be capable of producing error rates below 10, as long as the reference tape is in good condition.

For information on how to display the error rate, see page 84.

REGARDING THE CLEANING INDICATOR...

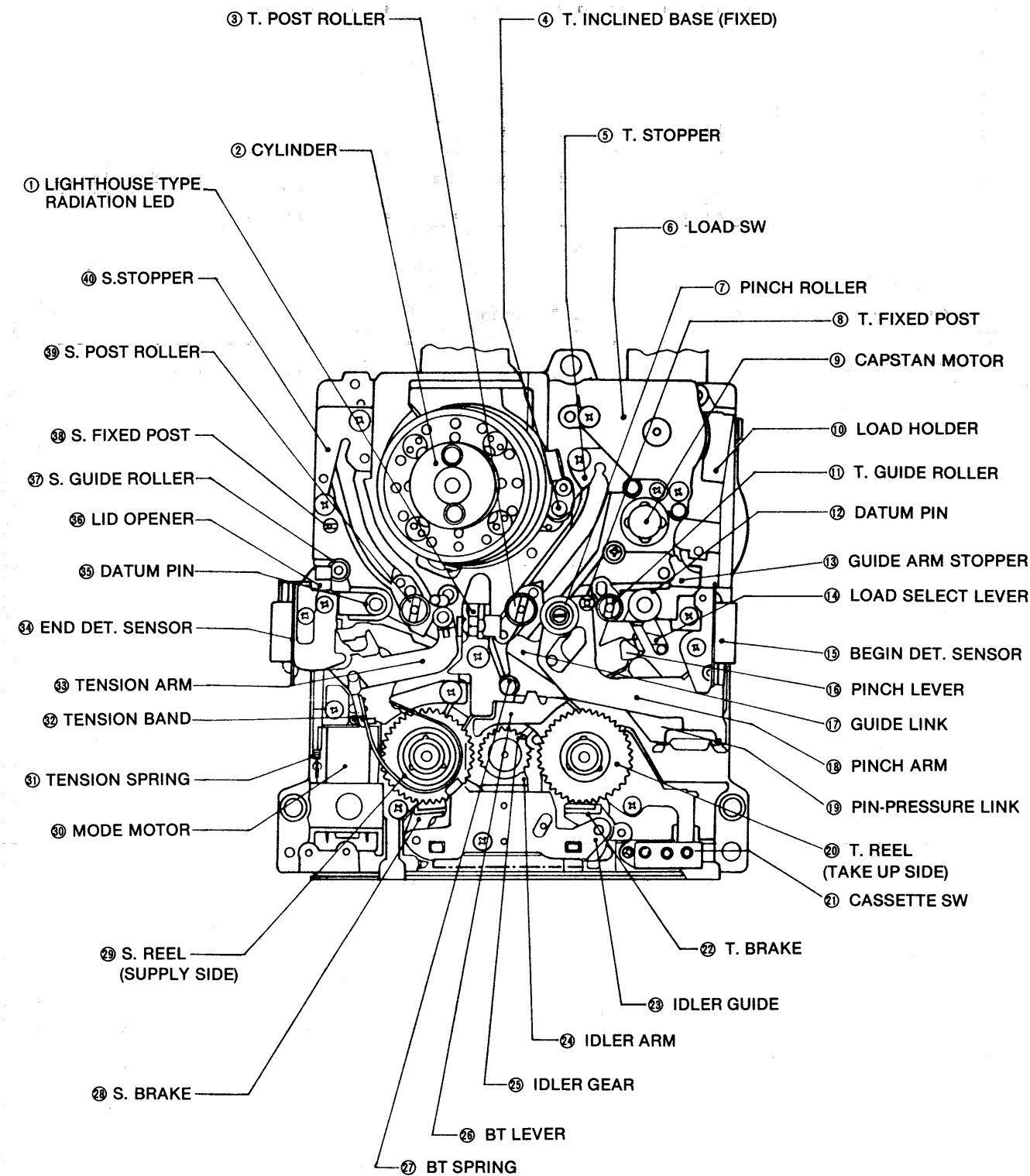
The cleaning indicator will illuminate when the error rate remains higher than 1000 for more than 10 seconds.

Although dirt and debris are the most common cause of an elevated error rate, there are other conditions that may cause it. Therefore, do not assume that a cleaning indication means that the head is dirty.

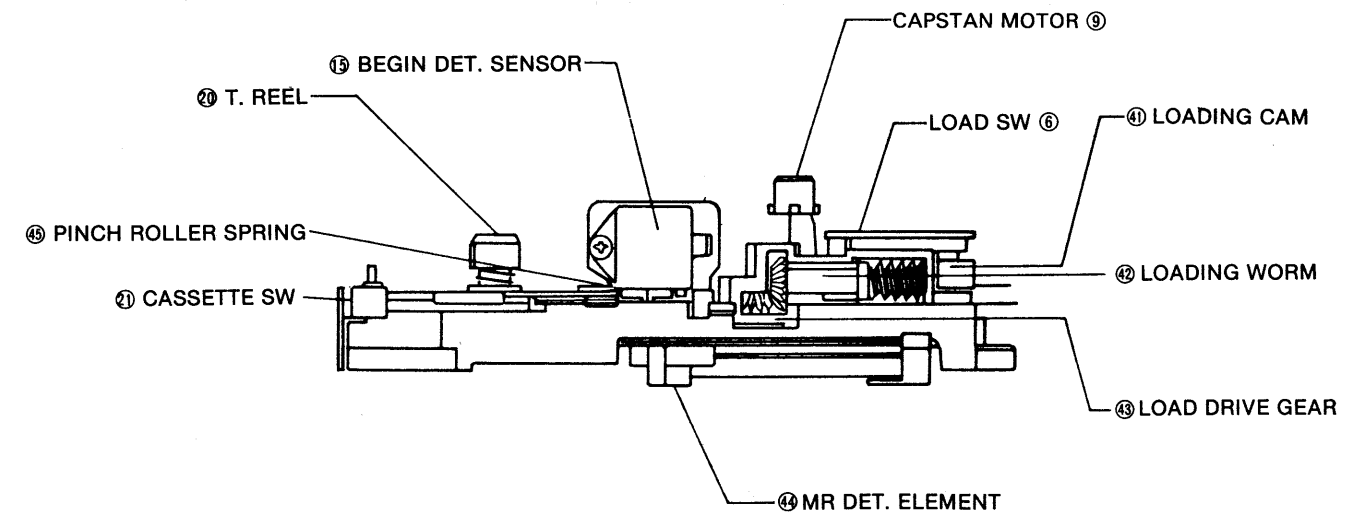


• MECHANISM COMPONENT LAYOUT

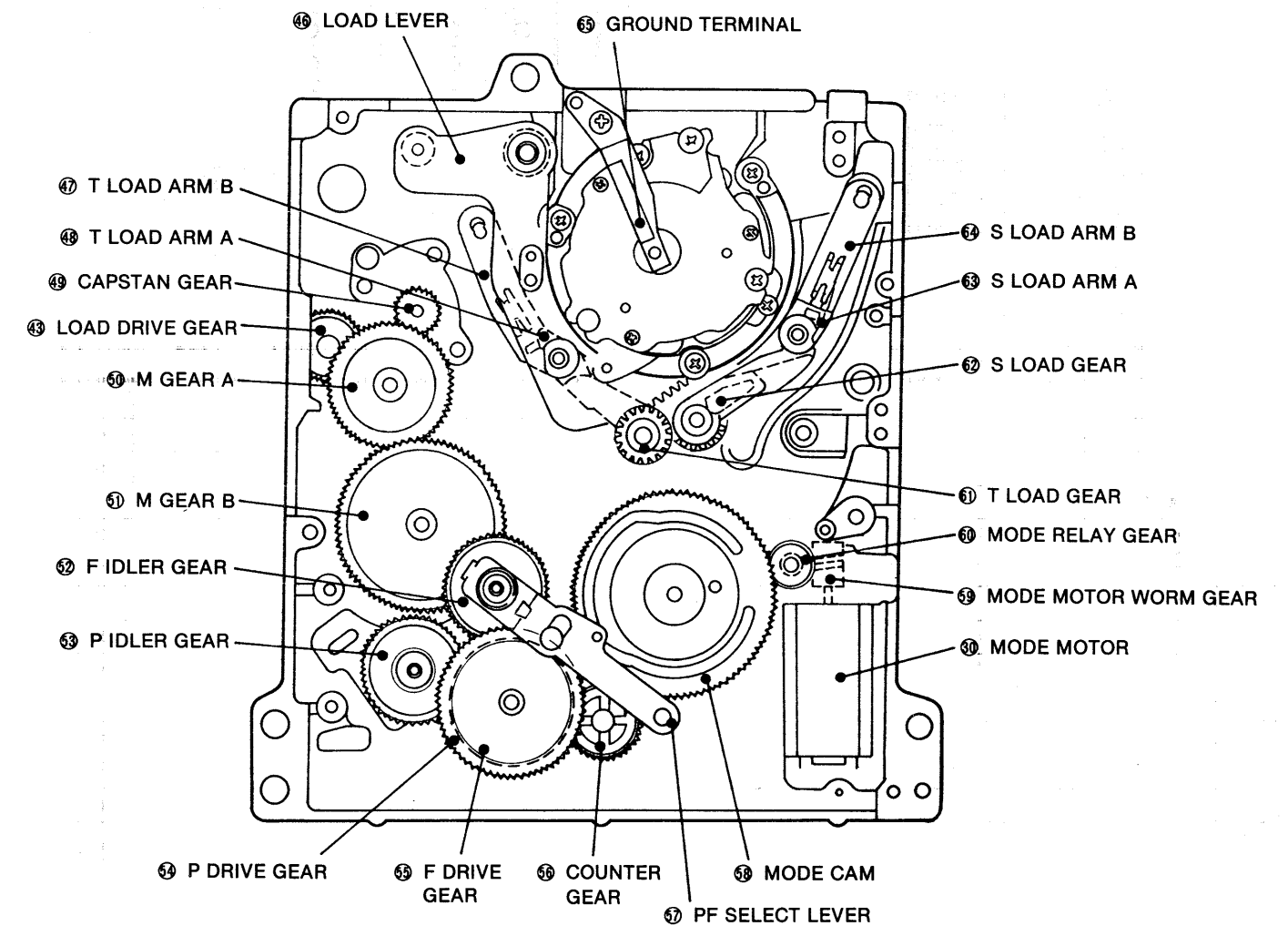
• Top view



• Side view



• Bottom view

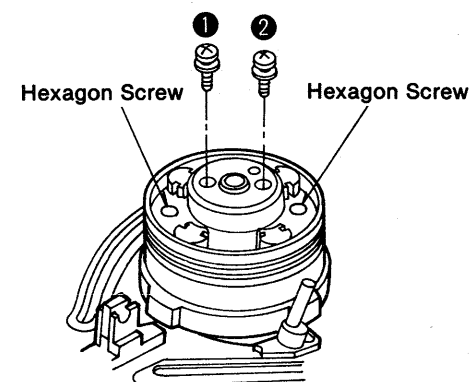


• MECHANISM CONTROLS AND FUNCTIONS

① LIGHT HOUSE TYPE RADIATION LED	Lighthouse-shaped, LEDs blink at start and end of tape.	②⑤ IDLER GEAR	Transmits movement to S and T reels in accordance with mode.
② CYLINDER	30mm in diameter, 40 FG pulses, maintains specified speed of 1000 to 3000rpm.	②⑥ BT LEVER	Applies back tension to T reel during review.
③ T. POST ROLLER	Regulates tape travel position (upper edge).	②⑦ BT SPRING	Provides pressure for back tension lever.
④ T. INCLINED BASE (FIXED)	Regulates angle (90°) at which tape is wound around cylinder (stationary).	②⑧ S. BRAKE	Presses brake shoe against S reel base gear to perform braking.
⑤ T. STOPPER	Determines position of T post roller base during loading.	②⑨ S. REEL (SUPPLY SIDE)	Supply reel base, 64 FG pulses.
⑥ LOAD SW	Two-bit rotary switch, detects loading position.	③⑩ MODE MOTOR	6.5V DC motor, switches mode by forward and reverse revolution.
⑦ PINCH ROLLER	Presses against tape during play and review.	③⑪ TENSION SPRING	Provides back tension force of tension regulator.
⑧ T. FIXED POST	Regulates tape travel position.	③⑫ TENSION BAND	Mounted to tension regulator, applies back tension to S reel base.
⑨ CAPSTAN MOTOR	1.5mm in diameter, 290 FG pulses.	③⑬ TENSION ARM	Detects tape condition and applies back tension during play and review.
⑩ LOAD HOLDER	Contains loading drive gear and worm gear, engages and disengages M gear A.	③⑭ END DET. SENSOR	Light-receiving element for LED (detection at end of tape).
⑪ T. GUIDE ROLLER	Regulates tape travel position (top edge).	③⑮ DATUM PIN	Regulates width and height (left side) during loading of cassette tape.
⑫ DATUM PIN	Regulates width and height (right side) during loading of cassette tape.	③⑯ LID OPENER	Opens cassette lid during loading of tape.
⑬ GUIDE ARM STOPPER	Determines position of T guide roller base K during loading.	③⑰ S. GUIDE ROLLER	Regulates tape travel position (bottom edge).
⑭ LOAD SELECT LEVER	Switches engagement and disengagement of loading gear in accordance with loading conditions.	③⑱ S. FIXED POST	Regulates tape travel (bottom edge).
⑮ BEGIN DET. SENSOR	Light-receiving element for LED (detection at start of tape).	③⑲ S. POST ROLLER	Regulates tape travel position (top edge).
⑯ PINCH LEVER	Presses pinch roller against tape during play and review.	④① S. STOPPER	Determines position of S post roller base during loading.
⑰ GUIDE LINK	Links T post roller base and guide roller base.	④② LOADING CAM	Uses movement transmitted from loading worm to move loading lever.
⑱ PINCH ARM	Comprised of pinch roller and T holding post, presses against the capstan.	④③ LOADING WORM	Transmits movement of loading drive gear and loading cam.
⑲ PIN-PRESSURE LINK	Connected by the pin pressure spring and the pinch arm.	④④ LOAD DRIVE GEAR	Transmits movement of M gear A and loading worm, engages and disengages in accordance with mode.
⑳ T. REEL (TAKE UP SIDE)	Take-up reel base, 64 FG pulses.	④⑤ MR DET. ELEMENT	Detects magnetic changes (290 pulses) of flywheel.
㉑ CASSETTE SW	Detects cassette information (mistaken erasure, cassette detection).	④⑥ PINCH ROLLER SPRING	Mounted to the pinch arm, returns the pinch roller.
㉒ T. BRAKE	Presses brake gear against reel base gear to perform braking.	④⑦ LOAD LEVER	Transmits movement of load cam and load gear.
㉓ IDLER GUIDE	Holding cover for idler arm and S and T brakes.	④⑧ T LOAD ARM B	Uses movement transmitted from T load gear to play loading.
㉔ IDLER ARM	Moves left or right in accordance with mode condition, transmits movement of counter gear to S and T reels.	④⑨ T LOAD ARM A	
		④⑩ CAPSTAN GEAR	Uses movement transmitted from capstan motor to move M gear A.

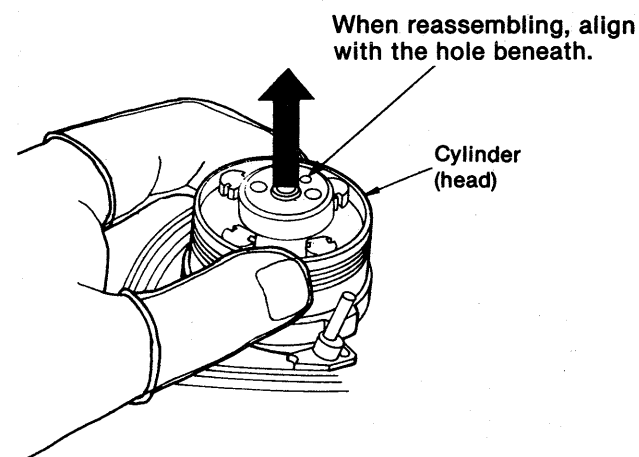
⑤⑩ M GEAR A	Transmits movement of capstan gear and load drive gear.	⑤⑩ MODE CAM	Uses movement transmitted from mode relay gear to detect mode positions.
⑤⑪ M GEAR B	Transmits movement of M gear A and F (R) idler gear, engages and disengages in accordance with mode.	⑤⑪ MODE MOTOR WORM GEAR	Transmits movement of mode motor and mode relay gear.
⑤⑫ F IDLER GEAR	Transmits movement of M gear B and F drive gear.	⑤⑫ MODE RELAY GEAR	Transmits movement of mode motor worm gear and mode cam.
⑤⑬ P IDLER GEAR	Transmits movement of M gear B and P drive gear.	⑤⑬ T LOAD GEAR	Transmits movement of load lever and S load gear.
⑤⑭ P DRIVE GEAR	Transmits movement of P idler gear and counter gear.	⑤⑭ S LOAD GEAR	Transmits movement of T load gear and S load arm A (B).
⑤⑮ F DRIVE GEAR	Transmits movement of F idler gear and counter gear.	⑤⑮ S LOAD ARM A	Uses movement transmitted from S load gear to play loading.
⑤⑯ COUNTER GEAR	Transmits movement of F (P) drive gear and idler gear, engages and disengages in accordance with mode.	⑤⑯ S LOAD ARM B	
⑤⑰ PF SELECT LEVER	Switches engagement and disengagement of F (P) idler gear in accordance with mode conditions.	⑤⑰ GROUND TERMINAL	Ground terminal for cylinder motor.

• REMOVAL OF THE UPPER CYLINDER



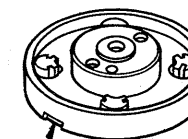
1. Remove the 2 screws (①, ②).

Caution: Please do not touch Hexagon screws.



2. Remove the cylinder (head) in the direction of the arrow.

Note: Do not touch the cylinder (head) with your bare hand; always be sure to wear a glove or other protection.

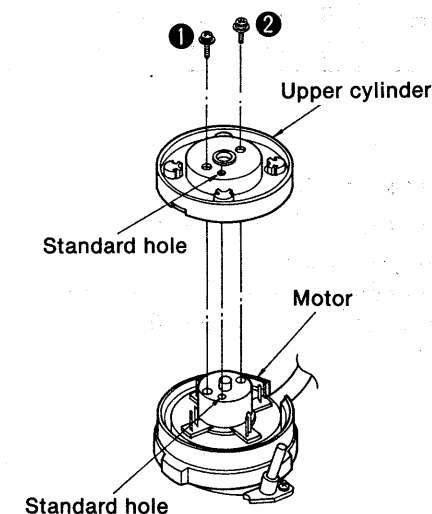


Be sure not to touch the head part.

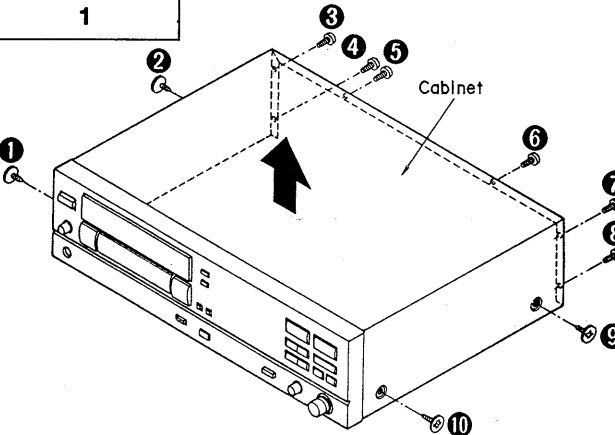
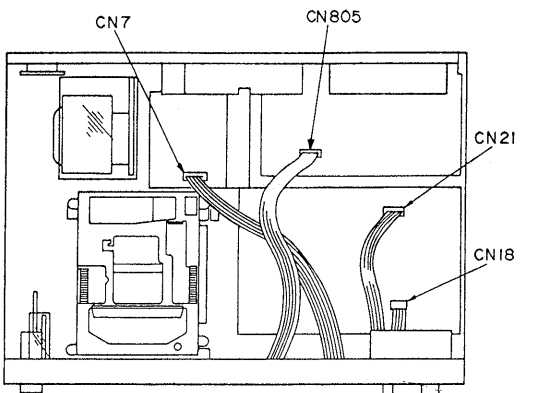
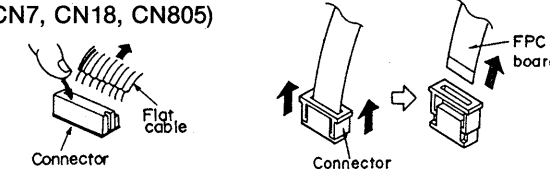
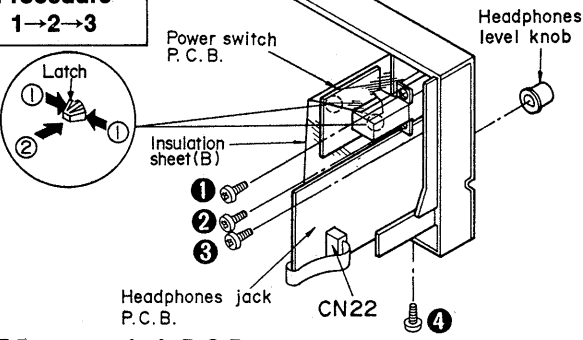
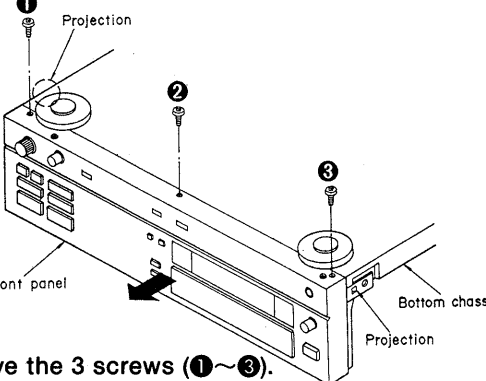
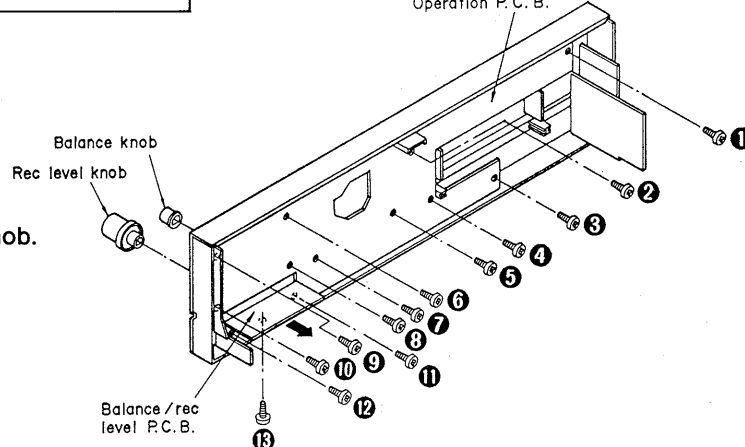
* When reassembling the cylinder (head), be sure that the direction is correct. (If it is assembled in the wrong direction, data read errors will occur.)

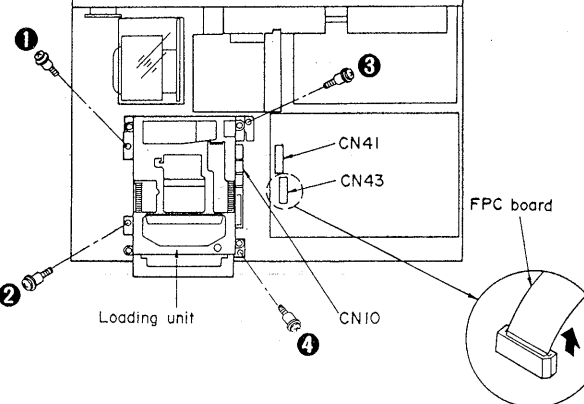
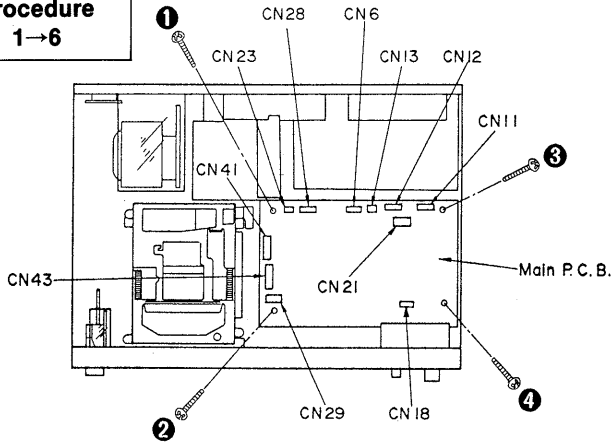
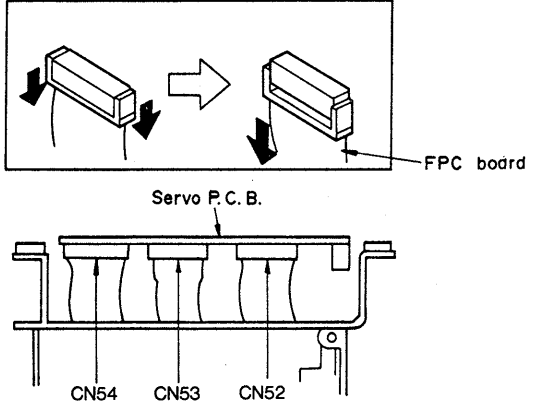
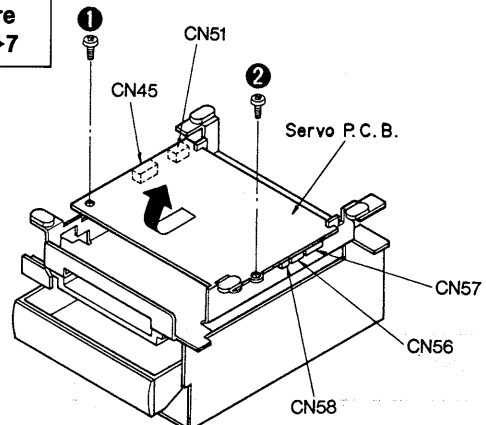
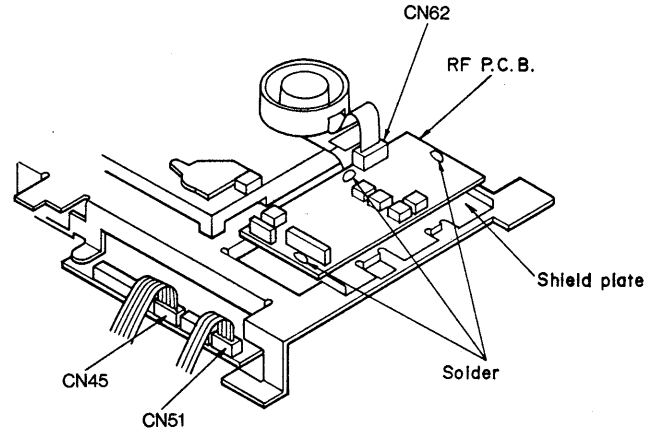
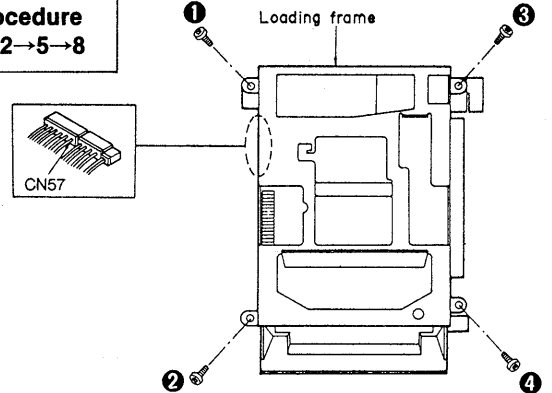
• UPPER CYLINDER MOUNTING

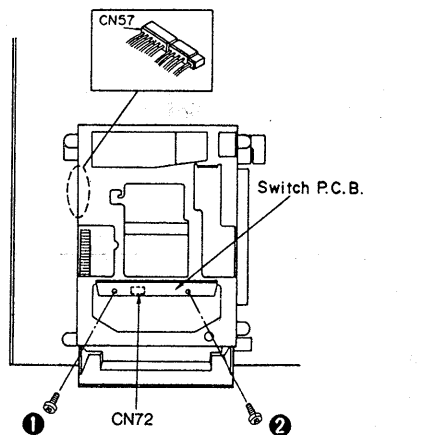
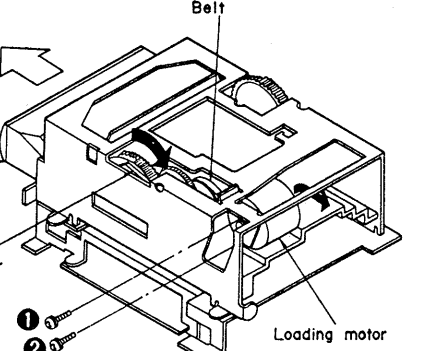
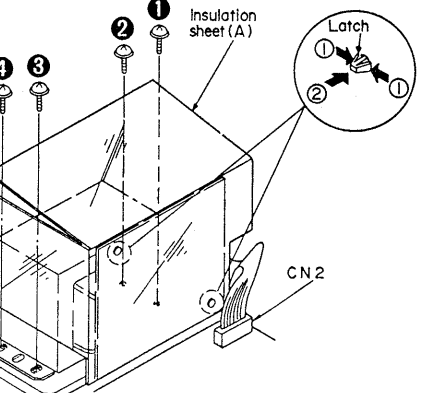
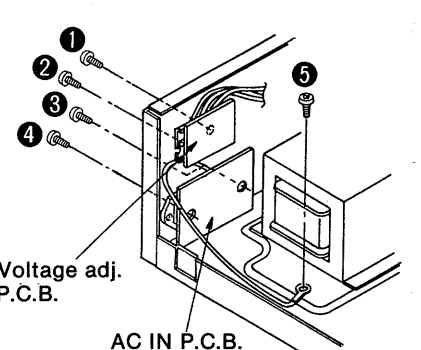
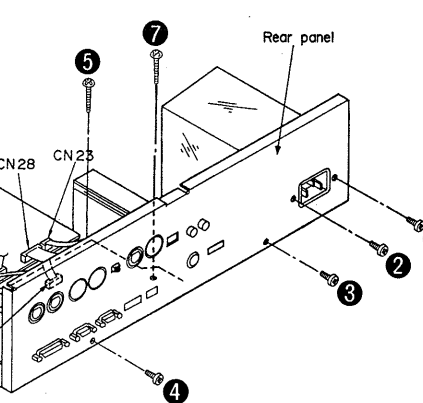
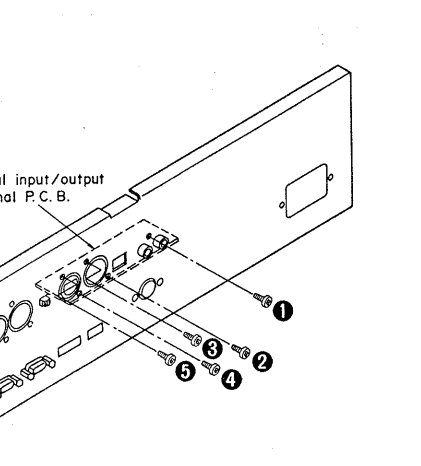
1. Mount the upper cylinder matching the motor's standard hole with the cylinder.
2. Insert the 2 screws (①, ②).

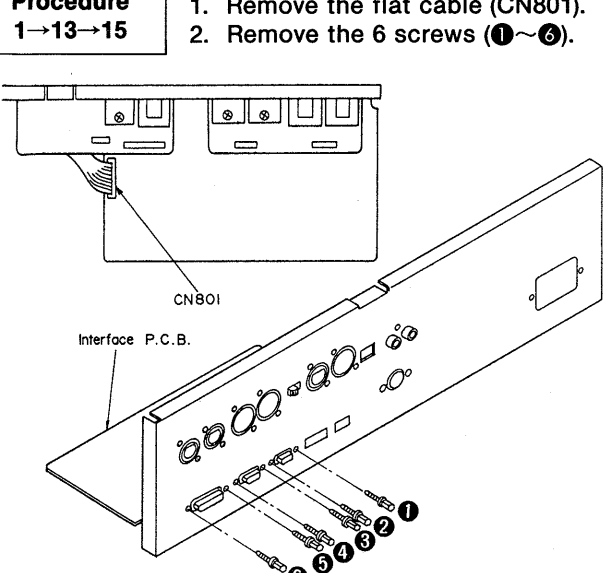
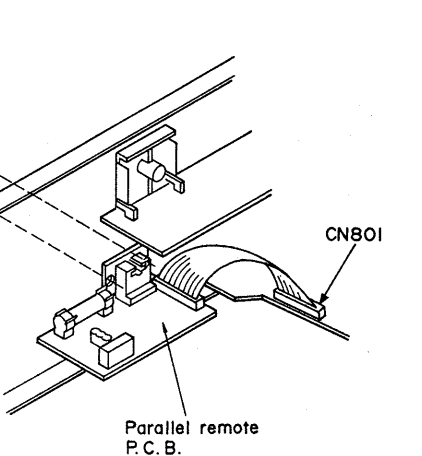
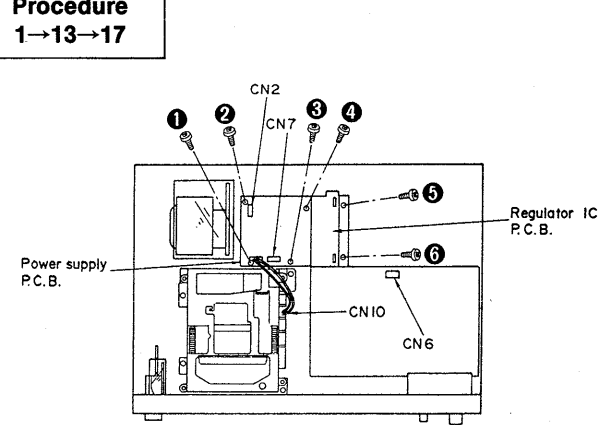
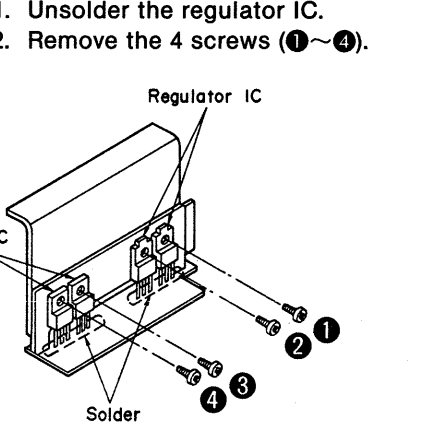
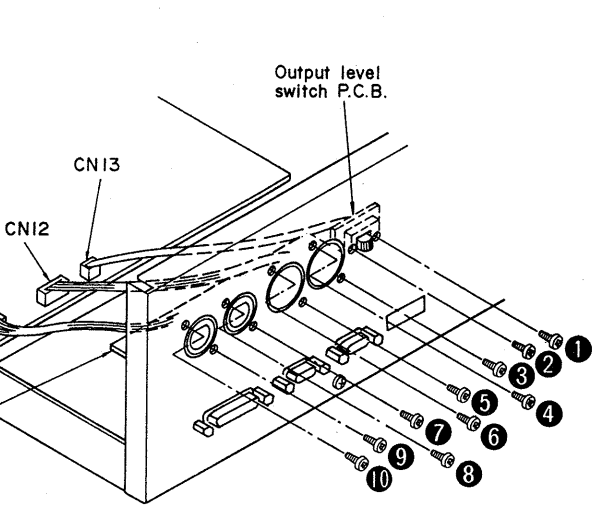


■ DISASSEMBLY INSTRUCTIONS

Ref. No. 1	Removal of the cabinet	Ref. No. 2	Removal of the front panel
Procedure 1	 • Remove the 10 screws (①~⑩).	Procedure 1→2 1. Remove the flat cables (CN7, CN18, CN805). 2. Remove the FPC board (CN21). 	
Ref. No. 3	Removal of the power switch P.C.B. and headphones jack P.C.B.	• Pull out the flat cable while pressing the connector. 1. Lift the connector. 2. Pull out the FPC board. (CN7, CN18, CN805) 	
Procedure 1→2→3	 Power switch P.C.B. - Remove the 2 screws (①, ②). - Remove the latch. - Remove the insulation sheet (B). Headphones jack P.C.B. - Remove the headphones level knob. - Remove the FPC board (CN22). - Remove the 2 screws (③, ④).	3. Remove the 3 screws (①~③). 4. Remove the front panel from the projection of the bottom chassis. 	
Ref. No. 4	Removal of the operation P.C.B. and balance/rec level P.C.B.	Procedure 1→2→4 Operation P.C.B. - Remove the 10 screws (①~⑩). Balance/rec level P.C.B. - Pull out the balance knob and rec level knob. - Remove the 3 screws (⑪~⑬). 	

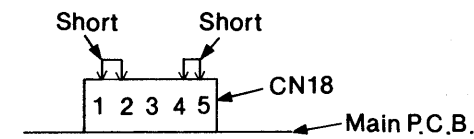
Ref. No. 5	Removal of the loading unit	Ref. No. 6	Removal of the main P.C.B.
Procedure 1→2→5	 1. Remove the FPC board (CN43). 2. Remove the connectors (CN10, CN41). 3. Remove the 4 screws (①~④).	Procedure 1→6  1. Remove the connectors (CN11, CN12, CN41). 2. Remove the flat cables (CN6, CN13, CN18, CN23, CN28, CN29). 3. Remove the FPC boards (CN21, CN43). 4. Remove the 4 screws (①~④).	
Ref. No. 7	Removal of the servo P.C.B.	 3. Remove the servo P.C.B. in the direction of the arrow. 4. Remove the FPC boards (CN52, CN53, CN54).	
Procedure 1→2→5→7	 1. Remove the connectors (CN45, CN51, CN56, CN57, CN58). 2. Remove the 2 screws (①, ②).		
Ref. No. 8	Removal of the RF P.C.B.	 4. Unsolder the shield plate. 5. Remove the FPC board (CN62). 6. Remove the connectors (CN45, CN51).	
Procedure 1→2→5→8	 1. Remove the 4 screws (①~④). 2. Remove the loading frame. 3. Remove the connector (CN57).		

Ref. No. 9	Removal of the switch P.C.B.	Ref. No. 10	Removal of the loading motor
Procedure 1→2→9	 1. Remove the 2 screws (1, 2). 2. Remove the connectors (CN57, CN72).	Procedure 1→2→10	 1. Roll the main gear in the direction of the arrow, and draw out the tray. 2. Remove the belt. 3. Remove the 2 screws (1, 2). 4. Remove the loading motor in the direction of the arrow.
Ref. No. 11	Removal of the power transformer	Ref. No. 12	Removal of the voltage adj. P.C.B. and AC IN P.C.B.
Procedure 1→11	 1. Remove the flat cable (CN2). 2. Remove the 4 screws (1~4). 3. Remove the latch. 4. Remove the insulation sheet (A).	Procedure 1→12	 ■ Removal of the voltage adj. P.C.B. • Remove the 2 screws (1, 2). ■ Removal of the AC IN P.C.B. • Remove the 3 screws (3~5).
Ref. No. 13	Removal of the rear panel	Ref. No. 14	Removal of the digital input/output terminal P.C.B.
Procedure 1→13	 1. Remove the connectors (CN11, CN12). 2. Remove the flat cables (CN13, CN23, CN28, CN805). 3. Remove the 7 screws (1~7).	Procedure 1→13→14	 • Remove the 5 screws (1~5).

Ref. No. 15	Removal of the interface P.C.B.	Ref. No. 16	Removal of the parallel remote P.C.B.
Procedure 1→13→15	 1. Remove the flat cable (CN801). 2. Remove the 6 screws (1~6).	Procedure 1→13→16	 1. Remove the flat cable (CN801). 2. Remove the 2 screws (1, 2).
Ref. No. 17	Removal of the power supply P.C.B. and regulator IC P.C.B.	Ref. No. 18	Removal of the regulator IC
Procedure 1→13→17	 1. Remove the connector (CN10). 2. Remove the flat cables (CN2, CN6, CN7). 3. Remove the 6 screws (1~6).	Procedure 1→13→17→18	 1. Unsolder the regulator IC. 2. Remove the 4 screws (1~4). • When mounting the regulator IC, apply silicone compound (SZZ0L15 or equivalent) to the rear of the regulator IC.
Ref. No. 19	Removal of the output level switch P.C.B. and analog input/output terminal P.C.B.		
Procedure 1→19	■ Output level switch P.C.B. 1. Remove the 2 screws (1, 2). 2. Remove the flat cable (CN13). ■ Analog input/output terminal P.C.B. 1. Remove the 8 screws (3~10). 2. Remove the flat cables (CN11, CN12).		

Ref. No. 20	How to check the main P.C.B.
Procedure 20	

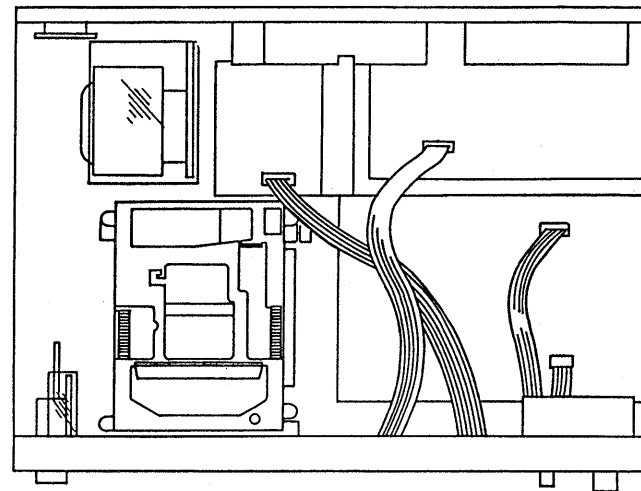
To gain access to the bottom of the main P.C.B., disconnect CN18 and CN21 in order to turn the board upward. Connect a jumper wire between pins 1 & 2 and between pins 4 & 5 of CN18 when operating the unit in this condition.



MEASUREMENTS AND ADJUSTMENTS

• PREPARATION

- (1) Remove the cabinet (Refer to Procedure 1 under "Disassembly Instructions").



■ If the loading unit is to be removed for adjustment, note the following.

(PREPARATIONS)

- (1) Remove the loading unit. (With the underside facing up.) (Refer to Procedure 5 under "Disassembly Instructions." However, leave the flat cable and the connector as they are.)
- (2) Open the cassette holder.
- (3) Move the slider opening/closing plate of the removed loading unit in the direction indicated by the arrow in Fig. 1, and hook it above the prong of the reinforcement plate.
Caution: The slider opening/closing plate will be deformed if it is left as is.
- (4) Place a tape with the slider lock released in the mechanism.
- (5) Switch on the power and check the loading operation.

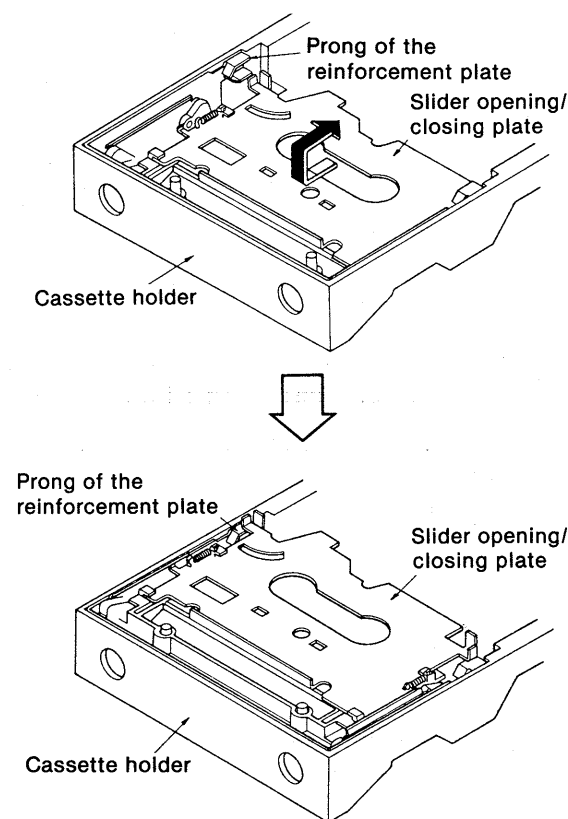
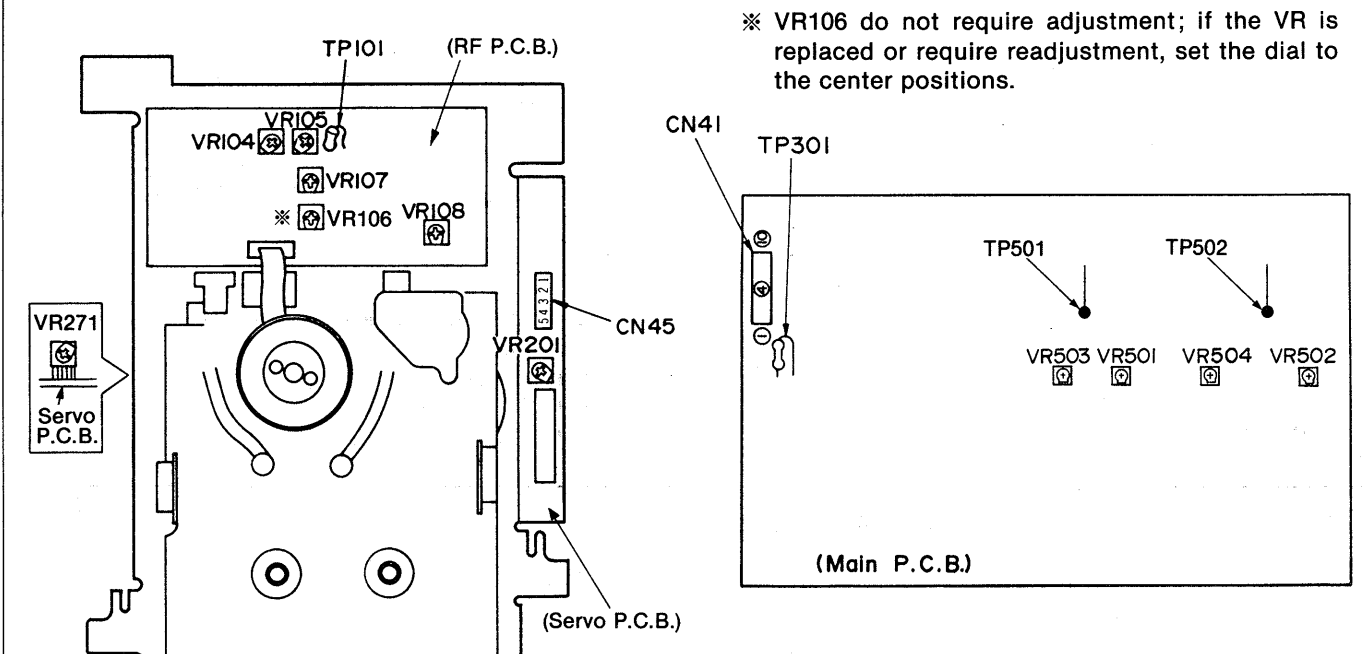


Fig. 1

• ELECTRICAL ADJUSTMENT

• Adjustment points



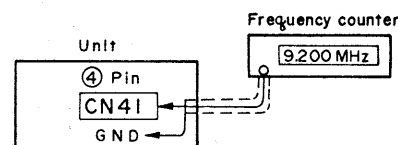
Equipment and Tools

- 2-channel 30MHz oscilloscope with external trigger and dual time base
- 2 oscilloscope probes (10 : 1)*
- Frequency counter
- AF oscillator (OSC)
- Distortion analyser
- DC electronic voltmeter (EVM)
- Post roller adjustment screwdriver : SZZV1102C
- Standard test tapes
 - : RD-PG01 (PG reference tape)
 - : RD-ER01 (Error rate tape)
 - : RD-LR02 (Linearity adjustment tape)
- Blank DAT cassette for recording and playback : RT-R60P, RT-R90P, RT-R120P
- Standard electrical tools and equipment

* **NOTE:** The oscilloscope voltage settings in the charts and the waveform examples assume use of the specified 10: 1 probes.

1. PLL Free Run Adjustment

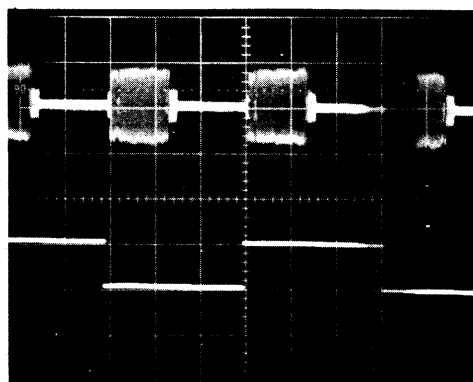
1. Connect the frequency counter as shown in figure.
2. Set the power switch to "ON".
3. Open the cassette holder drawer.
4. Adjust VR108 as required until the frequency counter reads 9.2 ± 0.2 MHz.



2. PG Phase Adjustment

1. Set up the oscilloscope and connect as shown below.

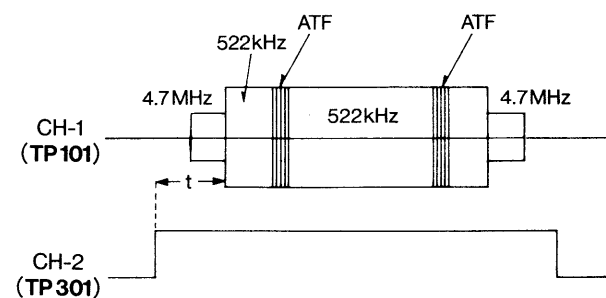
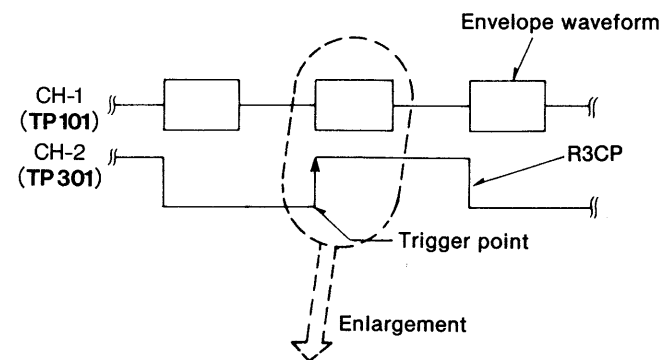
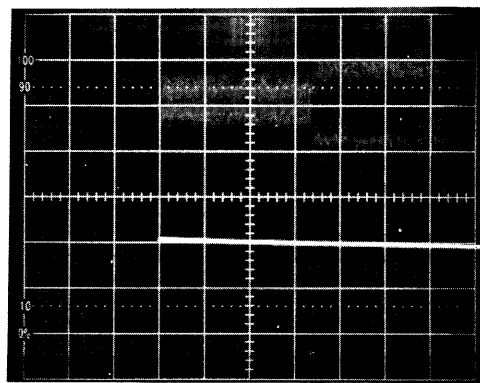
	CH-1	CH-2
Test point	TP101 (RPRF)	TP301 (R3CP)
Volts/Div.	50mV	0.5V
Time/Div.	5msec.	
Delay Time/Div.	50μsec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	VR201	



Note:

If the output levels of heads A and B are not equal, the "ATF RF Recording Level Adjustment" described in procedure 4 might be made improperly. Adjust the ATF RF Recording Level by following procedure 4 and then check the output level of the heads again. (At this time, it is not necessary to make adjustment described in procedure 2.)

2. Note the "t" time indicated on the PG reference tape (RD-PG01), then load and play the tape.
3. While the tape is being played, the waveform shown on the right should appear.
4. Adjust the delay time for the dual time base to display the leading edge of the CH-2 (R3CP) waveform.
5. The time from the leading edge of R3CP to the leading edge of the 522kHz portion of the RF waveform must be within $\pm 40\mu\text{sec}$ of the time indicated on the PG reference tape. Adjust VR201 as required, so that the time "t" (in the figure below), falls within specified limits.

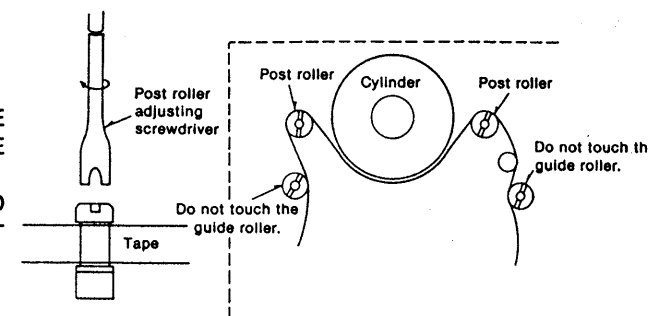


t: Value (μsec) indicated on the standard tape $\pm 40\mu\text{sec}$.

3. Linearity Adjustment

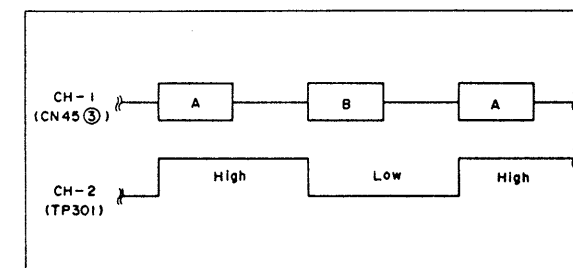
CAUTION:

ONLY THE POST ROLLERS ARE USED FOR THE LINEARITY ADJUSTMENT. DO NOT ADJUST THE GUIDE ROLLERS. THIS ADJUSTMENT IS VERY CRITICAL AND AFFECTS COMPATIBILITY WITH OTHER DAT RECORDERS.



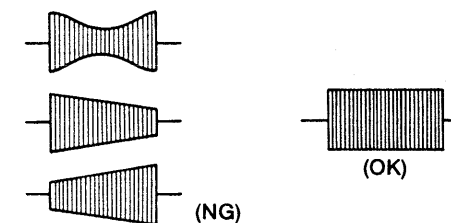
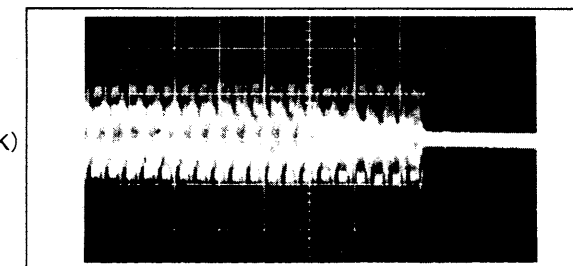
1. Connect and set up the oscilloscope as follows:

	CH-1	CH-2
Test point	CN45 ③ (PILOT)	TP301 (R3CP)
Volts/Div.	0.2V	2.0V
Time/Div.	① 5msec. ② 1msec. ③ 0.2msec.	
Delay Time/Div.	—	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	Post rollers (only)	



2. Load and play the linearity adjustment tape (RD-LR02). Please use the recorded signal portion on tape (after 600 count from beginning of tape)
3. Use the leading edge of the CH-2 (R3CP) waveform to trigger the oscilloscope to monitor the head "A" side of the RF signal envelope.
4. While the tape is playing, gradually adjust the height of the POST ROLLERS until the RF envelope (B) is rectangular.

(OK)



③

CAUTION 1:

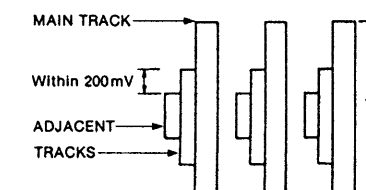
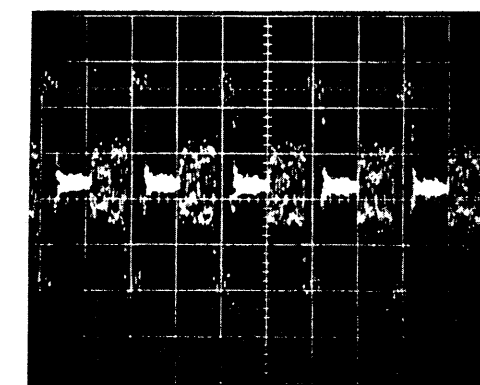
ADJUSTMENTS MUST BE MADE VERY GRADUALLY.

CAUTION 2:

DO NOT "OVER ADJUST" the POST ROLLERS. It is unlikely that the POST ROLLERS will require more than a QUARTER of a turn in either direction to make the waveform rectangular.

5. Adjust VR107 so that the amplitude (V_0) of the PILOT waveform ③ is 1.8Vp-p.
6. On the PILOT signal waveform ③, verify that the amplitude difference between adjacent tracks falls within 200mV (See figure below). If not, adjust the post rollers.
7. Play the standard test tape (RD-ER01), and perform the PG Phase adjustment and ATF gain adjustment again.

[However, perform the ATF gain adjustment only when adjusting the linearity.]

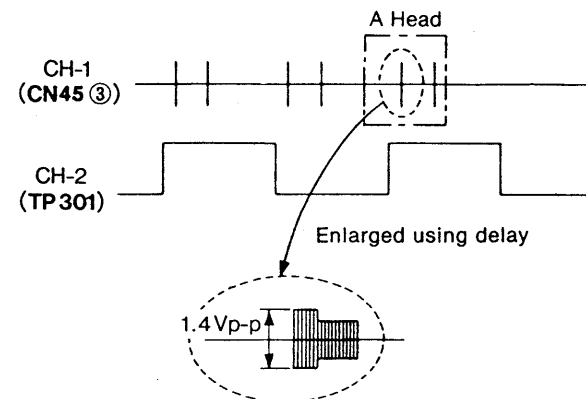
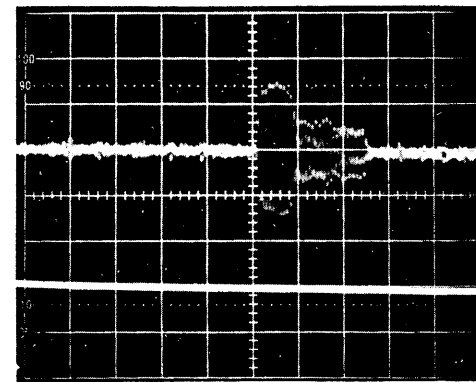


4. ATF Gain Adjustment

- Set up the oscilloscope and connect as shown below.

	CH-1	CH-2
Test point	CN45 ③ (PILOT)	TP301 (R3CP)
Volts/Div.	50mV	0.5V
Time/Div.	5msec.	
Delay	0.1msec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	VR107	

- Load and play the error rate tape (RD-ER01).
- Adjust the delay time for the dual time base to select and display the PILOT signal with the largest amplitude.
- Adjust VR107 so that the amplitude of the PILOT signal is $1.4 \pm 0.2V_{p-p}$. Check the amplitudes of the other PILOT signals to insure that they are a minimum of $1.2V_{p-p}$. If not optimize the adjustment of VR107 for the minimum signal level.



5. ATF RF Recording Level Adjustment

NOTE: This adjustment should only be made after confirming the playback "ATF Gain Adjustment" in step 3 above. Failing to do so will invalidate this adjustment.

- Make a "0" level recording:
 - Load a blank tape (RT-R60P etc.) into the unit.
 - Put the unit into RECORD mode.
 - Run the tape, recording for a minimum of 20 to 30 seconds.
 - Rewind the tape to the beginning of the "0" level signal recording.
- Connect and set up the oscilloscope as follows:

	CH-1	CH-2
Test point	CN45 ③ (PILOT)	TP301 (R3CP)
Volts/Div.	50mV	0.5V
Time/Div.	2msec.	
Delay Time/Div.	0.2msec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	VR104: Head A, VR105: Head B	

- While playing back the blank signal portion of the tape, verify that the signal amplitude falls in the range of $1.4 \pm 0.2V_{p-p}$.

Standard value: $1.4 \pm 0.2V_{p-p}$

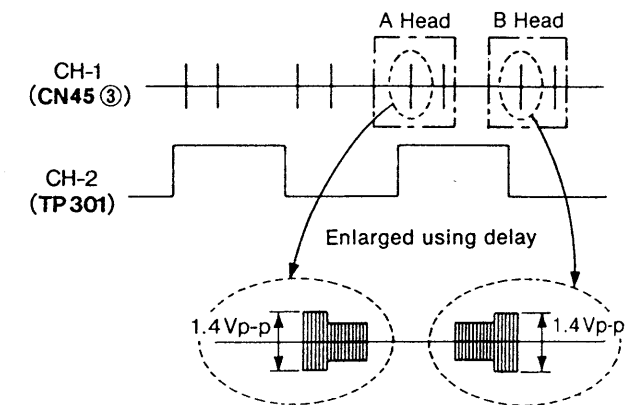
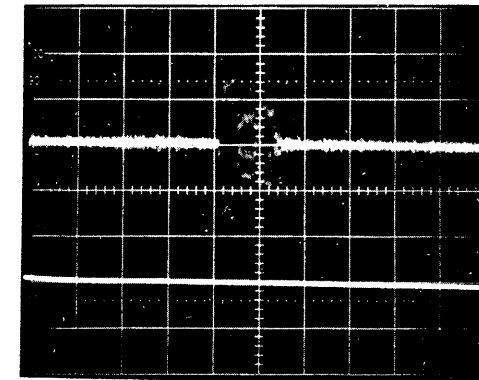
- If the ATF signal is not within specification press the stop button and adjust VR104 and VR105 accordingly. Making finer adjustments as the trials approach the specified level.

LEVEL/HEAD	A: VR104	B: VR105
More than 1.6V	Turn ⤵	Turn ⤵
Less than 1.4V	Turn ⤴	Turn ⤴

After making the adjustment, make another blank signal recording, on a different portion of the tape (use the END SEARCH feature), for 20 to 30 seconds. Rewind the tape to the beginning of the new recording and repeat from step 3 until the specification is met.

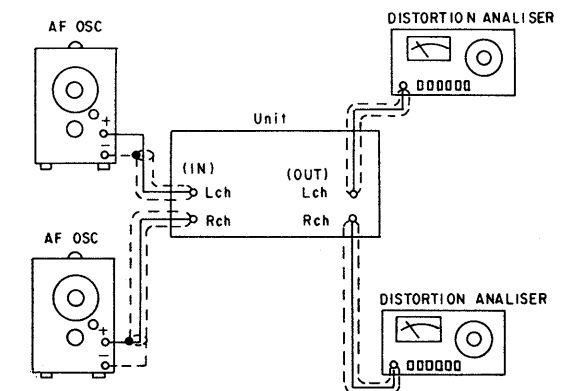
Note:

It is necessary to use a different portion of the tape for each trial because DAT does not erase the original signal, it "over writes" the new signal. Using a new portion of the tape will prevent maladjustment due to incomplete "over write" of the previously recorded signal.



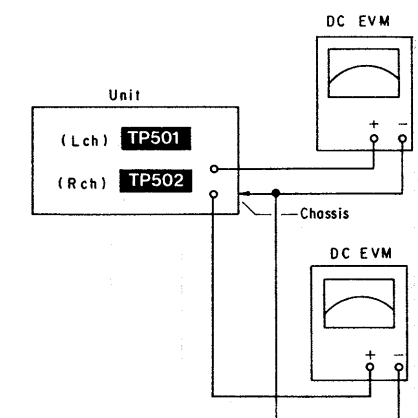
6. DAC Output Balance Adjustment

- Load a blank tape for recording.
- Use a signal generator to feed a 1kHz signal to ANALOG IN.
- Set the recorder to the record mode and adjust INPUT VR so that the level meter moves to $-20dB$.
- Adjust VR501 (Lch) and VR502 (Rch) to minimize the distortion rate. (Reference distortion rate of about 0.05%)
- After adjustment, check that the playback output is $-20dB \pm 0.2dB$ with respect to 0dB at 1kHz.



7. DAC Offset Adjustment

- Set the recorder to DIGITAL IN in the stop mode.
- Connect a digital voltmeter to TP501 (Lch) and TP502 (Rch).
- Adjust VR503 (Lch) and VR504 (Rch) so that the voltage at the test point above is $0 \pm 1mV$.



8. BOT/EOT Detection Sensitivity Verification and Adjustment

1. Make sure that the tape stops with the leader portion (the beginning and ending portion).

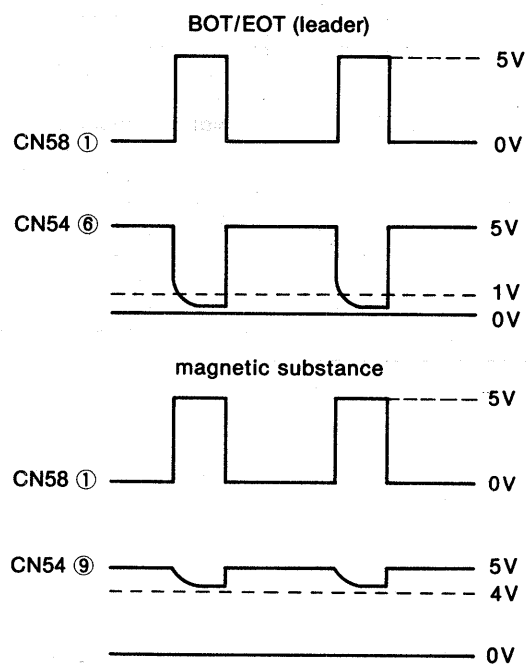
※ If the tape does not stop at the leader, make adjustment by following procedure outlined below.

① Insert a blank tape into the tape compartment of the set and press the playback button at the end of the tape.

② Set up the oscilloscope and connect as shown below.

	CH-1	CH-2
Test point	CN54 ⑥ (BOT/EOT) ⑨ (magnetic substance)	CN58 ①
Volts/Div.	0.2V	0.2V
Time/Div.	2msec.	
Delay	—	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	VR271	

③ Adjust the amplitude of waveform to less than 1V at the magnetic substance and more than 4V at the leader on VR271.



■ TERMINAL FUNCTION OF IC'S

• IC101 (AN7030SE2): RF AMP.

Pin No.	Mark	I/O Division	Function
1	V _{CC} 1	I	Power supply terminal
2	ACH FB	O	Playback feed back signal (Ach)
3	ACH IN	I	Playback amp. signal (Ach)
4	GND 1	—	GND terminal
5	BCH IN	I	Playback amp. signal (Bch)
6	BCH FB	O	Playback feed back signal (Bch)
7	AREC PCM	I	RF recording level adj. terminal
8	AREC PLT		
9	AREC ATF		
10	BREC ATF		
11	BREC PLT		
12	BREC PCM		
13	REC CNT 1	I	Track pitch signal
14	REC CNT 2	I	ATF area det. signal
15	SRRF IN	I	Recording signal
16	GND 2	—	GND terminal
17	VREF	O	Reference voltage terminal (Not used, open)
18	AREC OUT	O	Recording signal (Ach)
19	BREC OUT	O	Recording signal (Bch)
20	BTL REC	O	Recording control signal
21	V _{CC} 2	I	Power supply terminal
22	REC ON	O	Recording drive terminal (REC: "H")
	PLAY ON	O	Playback drive terminal (PLAY: "H")

Pin No.	Mark	I/O Division	Function
24	HSW	I	Head switching signal
25	AR/RSEL	I	Not used, connected to power supply
26	R/PSEL	I	Recording/playback select signal (REC: "H", PLAY: "L")
27	EQ OUT	O	Equalization signal
28	EQ IN 3	I	Equalization amp. signal
29	EQ IN 2		
30	EQ IN 1		
31	BF REQ	I	Equalization amplitude drive terminal (Bch)
32	B PHASE	I	Equalization phase drive terminal (Bch)
33	B GAIN	I	Equalization gain drive terminal (Bch)
34	AF REQ	I	Equalization amplitude drive terminal (Ach)
35	A PHASE	I	Equalization phase drive terminal (Ach)
36	A GAIN	I	Equalization gain drive terminal (Ach)
37	SV RF	O	Playback signal
38	GND 3	—	GND terminal
39	A INT	I	Playback amp. signal (Ach)
40	B INT	I	Playback amp. signal (Bch)
41	B INT IN	O	Playback amp. signal (Bch)
42	A INT IN	O	Playback amp. signal (Ach)

• IC801 (M37450M4-356): Microcomputer for interface

Pin No.	Mark	I/O Division	Function
1	NAESDO	I	D I/O select terminal ("L": AES/EBU)
2	NHMTR	O	Hour meter control
3	TXD/422 OUT	O	Transceiver drive terminal
4	RXD/422 IN	I	
5 8	DSW11 DSW8	I	DIP switch setting terminal

Pin No.	Mark	I/O Division	Function
9 16	DTIN7 DTIN0	I	S/P data input terminal
17	SDEN	O	Parallel data enable terminal ("H": enable)
18	PDEN	O	
19	OUTCONT	O	Transceiver drive enable terminal ("H": enable)
20	NC	—	Not used, open

Pin No.	Mark	I/O Division	Function
21	NCCLR	O	Full det. counter clear terminal ("L": clear)
22	RGFUL	I	S/P register full signal ("H" full)
23	BRK	I	Break det. terminal ("L": break)
24	NPRDY1	O	Ready signal ("L": ready)
25	R/W	O	Not used, open
26	SYNC		
27	GND	—	GND terminal
28	NRST2	I	Reset terminal ("L": reset)
29	XIN	I	Crystal OSC terminal (9.83MHz)
30	XOUT	O	
31	BRKCLK	O	Break det. clock signal
32	GND	—	GND terminal

• IC202 (MN53020SDQ): ATF

Pin No.	Mark	I/O Division	Function
1	NSNCOK	O	SYNC det. monitor terminal
2	SVAL	I	ATF select terminal
3	PCMOK	I	PCM playback monitor terminal
4	SPE	O	Starting pulse of counter track lock
5	SP 2	O	Sampling pulse signal for pilot signal of adjacent track
6	SP 1		
7	DCYLPG	I	Cylinder PG signal
8	DCAPFG 1	I	Capstan FG signal
9	DCAPFG 2		
10	DRLFMT	I	Take-up reel FG signal
11	DCYLFG	I	Cylinder FG signal
12	SYNC	I	ATF sync. det. terminal
13	NRST	I	Reset signal
14	R3CP	I	Timing signal for RF envelope signal control
15	ENVT		
16	FCH	I	System clock signal (9.408MHz)
17	V _{DD}	I	Power supply terminal
18	V _{SS}	—	GND terminal
19	MODE 1	I	SYNC det. select terminal (Not used, connected to GND)
20	HFCH	I	Clock signal for PLL off-set data
21	PLLOFS	I	PLL off-set data signal

Pin No.	Mark	I/O Division	Function
33	DINC1 DINC8	I	DIN input signal
41	DSW7 DSW0	I	DIP switch setting terminal
49	DTOUT7 DTOUT0	O	P/S data signal
57	AN2 AN0	—	Not used, connected to GND
60	DA2 DA1	O	Not used, open
62	VREF	—	GND terminal
63	AVSS		
64	VCC	I	Power supply terminal

Pin No.	Mark	I/O Division	Function
22	TEST 6	—	Not used, connected to GND
23	P MODE	I	Pulse width select terminal
24	TEST 1 TEST 5	I	Test terminal (Not used, connected to GND)
29	SPHT	—	Not used, open
30	HSWS	O	Head switching signal (33.33Hz)
31	HSWR		
32	SEL A	I	CAPFGTU signal select terminal
33	SEL B	I	R3TU signal select terminal
34	PLL 0	O	Output signal after decoded 4 bit parallel data of PLLOFS
35	PLL 1		
36	PLL 2		
37	PLL 3		
38	MODE 2	—	Not used, open
39	V _{SS} 2	—	GND terminal
40	V _{DD} 2	I	Power supply terminal
41	R3TU	O	Building-up edge signal of R3CP/DRLFMT
42	CAPFGTU	O	Capstan FG signal/Take-up reel FG signal
43	CAPER	O	Capstan rotative direction control signal
44	NLNROK	O	Track linearity monitor terminal

• IC201 (MN6742SDR): Servo processor

Pin No.	Mark	I/O Division	Function
1	OP10A	O	Cylinder rotative stop signal
2	SCK	I	Serial clock signal
3	SDA	I/O	Serial data signal
4	OSC 1	I	System clock (8MHz) signal
5	OSC 2	O	
6	NRST	I	Reset signal
7	NC	—	Not connection
8	OP20A	O	SSP ready signal
9	NC	—	Not connection
10	V _{SS}	—	GND terminal
11	VHS	—	Not used, open
12	OP 101	O	CAPFG/RLFMT select signal
13	TP 2	O	R3CP/RLFMT select signal
14	TP 3	I	PLL off-set/parallel data signal
15	TP 4		
16	TP 5		
17	TP 6		
18	TP 7	I	PLL off-set/data effective flag terminal
19	TP 8	I	Not used, connected to power supply
20	MOS	I	Serial port/strobe signal
21	TST	I	Test mode terminal (Normal, connected to GND)
22	ENC	—	Connected to GND terminal
23	NC	—	Not connection
24	NC		
25	V _{DD}	I	Power supply terminal
26	NC	—	Not connection
27	RSW	—	Not used, open
28	HAS	O	A/D input select signal
29	AVM	—	Not used, connected to GND
30	VLP	—	Not used, open
31	STM	I	R3TU or RLFMT (64 P/R) signal
32	STR	I	Comparator reference signal of STM input

Pin No.	Mark	I/O Division	Function
33	CAE	O	Capstan velocity control signal
34	CYE	O	Cylinder velocity control signal
35	END	I	VREF or ATFTER voltage signal
36	VSY	I	CYLPFG signal
37	ASH 1	I	Capstan FG or RLFMT signal after EXOR
38	NC	—	Not connection
39	AFB 1	O	Inverter amp. signal of ATFTER input (Not used, open)
40	NC	—	Not connection
41	AFG 1	I	ATF tracking error voltage terminal
42	ASH 2	O	Not used, connected to GND
43	AFB 2	O	Not used, open
44	NC	—	Not connection
45	AFG 2	I	Reference voltage terminal
46	VDA	I	Power supply terminal
47	VSA	—	GND terminal
48	ORE	O	Reference voltage terminal
49	IRE	I	
50	GND	—	GND terminal
51	IPL	O	Not used, open
52	NC	—	Not connection
53	CLP	I	Not used, connected to GND
54	CP 1	O	Not used, open
55	CP 2	I	Supply reel FG signal
56	NC	—	Not connection
57	NC		
58	CN 1	O	Not used, open
59	CN 2	I	Not used, connected to GND
60	CTL	O	Not used, open
61	PFG	I	Cylinder FG signal
62	PGM	I	Not used, connected to GND
63	CUL	O	Capstan rotative direction signal
64	NC	—	Not connection

• IC102 (AN7035SCE2): Playback PLL

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	LPF	O	Buffer amp. 1 reference terminal	16	V _{CC} 1	I	Power supply terminal
2	GND 1	—	GND terminal	17	VCOC 1	O	VCO terminal
3	ENVC	O	ENV time constant setting terminal	18	VCOC 2	O	VCO terminal
4	ENVR	I	ENV threshold voltage adj. terminal	19	V _{CC} 2	I	Power supply terminal
5	RSENV	O	RF envelope signal	20	PLL CP 1	O	Clock (2CK) signal (Not used, open)
6	RSENV	O	RSENV time constant setting terminal	21	PLL CP 2	O	Clock (CK) signal
7	RSRF	I	RF signal	22	DEMCOD	O	NRZI demodulated signal for playback signal with PLL
8	DELOUT	O	RF signal	23	SVSYNC	O	ATF sync. signal
9	DELIN 1	I	Delay (45°) signal	24	GND 2	—	GND terminal
10	DELIN 2	I	Delay (90°) signal	25	OP OUT 3	O	ATF 3 signal
11	PDOUT	O	Phase comparator signal	26	OP IN 3	I	ATF 3 signal
12	VREF 1	I	V/I converter reference voltage terminal	27	OP OUT 2	O	ATF 2 signal
13	VCOV	I	OSC frequency control terminal	28	OP IN 2	I	ATF 2 signal
14	R/P	I	Recording/playback select terminal (Not used, connected to GND)	29	OP OUT 1	O	ATF 1 signal
15	VCOR	I	OSC frequency adj. terminal	30	OP IN 1	I	ATF 1 signal
				31	VREF 2	I	Reference voltage terminal
				32	COMP 1	I	Output amp. 1 (+) signal

• IC405 (AK5326-VP): A/D converter

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	AGND	—	Analog GND terminal	15	SCLK	I	Serial data output clock terminal
2	AINL	I	L ch analog signal input terminal	16	SDATA	O	Serial data output terminal
3	ZEROL	I	L ch zero level input terminal	17	VD1+	I	Digital power supply terminal
4	VA+	I	Analog power supply terminal	18	VD2+		
5	VA-	I	Analog power supply terminal	19	DGND	—	Digital GND terminal
6	APD	I	Analog power down terminal	20	DCLKA	I	Digital system clock terminal
7	ACAL	I	Analog calibration terminal	21	NC	—	Not connected
8	NC	—	Not connected	22	ACLKA	O	Analog system clock terminal
9	DCAL	O	Digital calibration terminal	23	CLKIN	I	Master clock terminal
10	DPD	I	Digital power down terminal	24	LGND	—	Digital GND terminal
11	TST 1	I	Test terminal (Connected to GND)	25	VL+	I	Digital power supply terminal
12	TST 2			26	ZEROR	I	R ch zero level input terminal
13	TST 3			27	AINR	I	R ch analog signal input terminal
14	L/R	I	Input channel select terminal	28	VREF	O	Reference voltage terminal

• IC203 (AN8320NFA): Linear servo

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	FG1 AO	O	Capstan FG signal	26	LEDH 2	—	Constant current terminal (Not used, open)
2	FG1 AI	I	Capstan FG (–) signal	27	CYL FG	O	Cylinder FG signal
3	FG1 FI	—	Frequency characteristic setting terminal	28	CYF GSI	I	Cylinder schmidt comparator terminal
4	CYL PG	O	Cylinder PG signal	29	CYF GAO	O	Cylinder op. amp. terminal
5	PGVR	—	PG delay time adj. terminal	30	CYF GAI	I	Cylinder op. amp. (–) terminal
6	CYPGI	I	PG schmidt comparator terminal	31	NST BY	I	STAND BY signal (Not used, connected to power supply)
7	GND	—	GND terminal	32	TF GAI	I	Take-up reel op. amp. (–) terminal
8	SVRF	I	ATF terminal	33	TF GAO	I	Take-up reel op. amp. terminal
9	CPD	—	Det. capacity connection terminal	34	TF GSI	I	Take-up reel schmidt comparator terminal
10	CCI	O	Full-wave rectification buffer terminal	35	RLFGT	O	Take-up reel FG signal
11	CCO	I	Clamp circuit terminal	36	RLFGS	O	Supply reel FG signal
12	SP 1	I	SP 1 terminal	37	SF GSI	I	Supply reel schmidt comparator terminal
13	SP 2	I	SP 2 terminal	38	SF GAO	O	Supply reel op. amp. terminal
14	VSPE	—	SPE setting terminal	39	SF GAI	I	Supply reel op. amp. terminal
15	SPE	I	SPE terminal	40	V _{CC}	I	Power supply terminal
16	CSH	I	Hold capacity connection terminal	41	FG 2FI	—	Frequency characteristic setting terminal
17	ATFTER	O	ATF control command signal	42	FG 2AI	I	Capstan FG (–) signal
18	CFB	—	Phase compensation terminal	43	FG 2AO	O	Capstan FG signal
19	V _{CC}	I	Power supply terminal	44	FG 2SI	I	Capstan FG schmidt comparator terminal
20	ATFON	I	ATF ON terminal (Not used, connected to power supply)	45	CPFG 2	O	Capstan FG signal
21	PTBIA	—	Photo-transistor bias terminal (Not used, open)	46	FILSLD	I	Frequency characteristic DOWN terminal
22	VREF	O	Reference voltage terminal	47	CPFG 1	O	Capstan FG signal
23	LEDR 1	I	Bias voltage terminal	48	FG 1SI	I	Capstan FG schmidt comparator terminal
24	LEDH 1	—	Constant current terminal (Not used, open)				
25	LEDR 2	I	Bias voltage terminal				

• IC271 (MN17541SDN2): Mechanism control

Pin No.	Mark	I/O Division	Function
1	NSBOA	O	Serial data signal
2	NRST	I	Reset signal
3	NSYNC	—	Not used, open
4	X 2		
5	X 1		
6	V _{SS}	—	GND terminal
7	OSC 2	—	Not used, open
8	OSC 1	I	Clock signal
9	V _{DD}	I	Power supply terminal
10	NTC1B	I	Supply reel FG signal
11	NIRQ 0	I	Take-up reel FG signal
12	NIRQ 1	I	Transfer strobe signal of system control
13	P00 (MSTB)		
14	P01 (MRDY)	O	Transfer ready signal of system control
15	P02 (NSSTB)	O	Transfer strobe signal
16	P03 (NSRDY)	I	Transfer ready signal
17	P10 (ATFGT)	O	ATF gain ($\times 1/2$) select terminal
18	P11 (REWGT)	O	REW FG • PG gain select terminal
19	P12 (LPMOD)	—	Not used, open
20	P13 (MODMT0)	O	Mode motor control signal
21	P20 (MODMT1)		
22	P21 (MODMT2)		
23	P22	—	Not used, open
24	P23 (PLG)	O	Plunger control signal
25	P30	—	Not used, open
26	P31		
27	P32 (LOAD 1)	O	Tray motor control (+) terminal
28	P33 (LOAD 2)	O	Tray motor control (–) terminal
29	P40	—	Not used, open
30	P41 (DEW)	I	Dew sensor det. signal
31	P42 (EOT)	I	Tape end det. signal
32	P43 (BOT)	I	Tape begin det. signal
33	P50 (OPEN)	I	Cassette open det. signal

• IC301 (MN188161SDL): System control

Pin No.	Mark	I/O Division	Function
1	V _{DD}	I	Power supply terminal
2 3 9	P67 (SPDT 7) P60 (SPDT 0)	I/O	Signal processor transfer address and data bus terminal
10	P57 (SPRDY)	I	Signal processor data transfer command signal
11	P56 (PBLANK)	I	Blank skip select ("H": no skip, "L": skip)
12	P55 (R3CP)	I	Frame sync. signal
13	P54 (PMID6B)	—	Main ID6 select terminal
14	P53 (PMID6A)		
15	P52	I	Not used, connected to resistor
16	P51	I	Not used, connected to resistor
17	P50 (PDIOSEL)	I	D I/O select terminal ("H": AES/EBU, "L": IEC)
18	EXI	—	Not used, connected to GND
19	EXO	—	Not used, open
20	NRST 1	I	Reset signal ("L": RESET)
21	P47 (NSERVRST)	O	Reset signal to servo block
22	P46	—	Not used, open
23	P45	—	
24	P44	—	
25	P43 (SLAD)	O	DIGITAL IN PLL/crystal select terminal ("L": PLL, "H": crystal)
26	P42 (XCK32)	O	32kHz OSC control ("H": OSC, "L": STOP)
27	P41 (XCK44)	O	44.1kHz OSC control ("H": OSC, "L": STOP)
28	P40 (XCK48)	O	48kHz OSC control ("H": OSC, "L": STOP)
29	P27 (NPRDY)	I	Transfer ready signal from panel control
30	OSC 1	I	Crystal OSC terminal
31	OSC 2	O	
32	V _{SS}	—	GND terminal
33	XI	—	Not used, open
34	XO	—	
35	P26	—	Not used, connected to power supply
36	P25 (RF ENV)	I	RF envelope signal

Pin No.	Mark	I/O Division	Function
37	P37 (FLGCLK)	O	Clock signal of flag counter
38	P36 (FLGDT)	O	Data signal of flag counter
39	P35 (TP)	O	Track pitch signal ("L": normal)
40	P34 (UNLOCK)	O	DIGITAL-IN PLL unlock signal ("L": det.)
41	P33	—	Not used, open
42	P32 (DISCHG)	O	DIGITAL-IN PLL discharge signal
43	P31 (DINPLINH)	O	DIGITAL-IN PLL prohibition signal ("H": prohibition)
44	P30 (ANRST)	O	Reset signal ("H": RESET) to DAC
45	P21 (HSW)	I	Head switching pulse signal
46	P20 (NMRDY)	I	Transfer command signal from mechanism control
47	P01	—	Not used, open
48	P00	—	
49	P17 (PTXD)	O	Serial data transmission terminal
50	P16 (PRXD)	I	Serial data reception terminal
51	P15 (PCLK)	O	Serial data transmission/reception clock signal
52	P14	—	Not used, open
53 56	P13 (MDT 3) P10 (MDT 0)	I/O	Transfer data bus of mechanism control
57	P77	—	Not used, open
58	P76 (NDEMP)	O	de-emphasis signal
59	P75 (SGMTG)	O	Muting signal
60	P74 (DOUPTH)	O	Digital out through select ("H": through)
61	P73 (NRST 2)	O	Reset signal
62	P72 (MSTB)	O	Transfer command terminal of mechanism control
63	P71 (SPSTB)	O	Signal processor strobe signal
64	P70 (SPAW)	O	Signal processor address setting signal

• IC351 (MN6624): Digital signal processor

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	PCMCIF	O	Flag counter terminal	40	V _{DD}	I	Power supply terminal
2	IDPP			41	XO 1	O	Crystal OSC terminal
3	IDP	O	Test terminal	42	XI 1	I	
4	V _{DD}	I	Power supply terminal	43	V _{SS}	—	GND terminal
5	TESTS	—	Not used, connected to GND	44	PC OUT	—	Not used, open
6	V _{SS}	—	GND terminal	45	RAD 0	O	RAM address bus terminal
7	CKIO FS	—	Not used, open	46	RAD 1		
8	CKIO 128	O	Test terminal	47	RAD 2		
9	CKIO 512	—	Not used, open	48	RAD 3		
10	NDALOAD	—	Not used, open	49	RAD 4		
11	DADAT	O	DA data signal	50	RAD 5		
12	DALRCK	O	LR discrimination signal	51	RAD 6		
13	DABCK	O	Serial bit clock signal	52	RAD 7		
14	DAMCK	—	Not used, open	53	V _{DD}	I	Power supply terminal
15	V _{DD}	I	Power supply terminal	54	TEST 2	—	Not used, connected to GND
16	TEST 6	—	Not used, open	55	V _{SS}	—	GND terminal
17	V _{SS}	—	GND terminal	56	RAD C	O	RAM address bus terminal
18	ADDAT	I	AD data signal	57	RAD E	O	Write enable for memory
19	ADLRCK	O	LR discrimination signal	58	NWE	O	Write enable for memory
20	ADBCK	O	Serial bit clock signal	59	RAD D	O	RAM address bus terminal
21	ADMCK	O	External clock signal	60	RAD 8		
22	TX	O	Digital signal	61	RAD 9		
23	RX	I		62	RAD B		
24	VCOS L32	—	Not used, open	63	NOE	O	Output enable for memory
25	VCOS L44			64	RAD A	O	RAM address bus terminal
26	VCOS L48			65	V _{DD}	I	Power supply terminal
27	DIO REF	O	Digital signal (PLL control)	66	NCS	O	Chip select terminal for memory
28	DIO VAR	O		67	V _{SS}	—	GND terminal
29	V _{DD}	I	Power supply terminal	68	RDT 7	I/O	RAM data bus terminal
30	DI 512	I	Digital signal (512FS)	69	RDT 6		
31	V _{SS}	—	GND terminal	70	RDT 5		
32	XO 4	—	Not used, open	71	RDT 4		
33	XI 4	I	Crystal terminal (32kHz×512)	72	RDT 3		
34	TEST 0	—	Not used, connected to GND	73	RDT 2		
35	XO 3	—	Not used, open	74	RDT 1		
36	XI 3	I	Crystal terminal (44.1kHz×512)	75	RDT 0		
37	TEST 1	—	Not used, connected to GND	76	V _{SS}	—	GND terminal
38	XO 2	—	Not used, open	77	TEST 3	—	Not used, connected to GND
39	XI 2	I	Crystal terminal (48kHz×512)	78	V _{DD}	I	Power supply terminal

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
79	SPDT 7	I/O	Address and data bus terminal	102	V _{DD}	I	Power supply terminal
80	SPDT 6			103	SRPR	O	Recording/playback select signal (REC: "H", PLAY: "L")
81	SPDT 5			104	SRWND 2	O	ATF area det. signal
82	SPDT 4			105	SRWND 1	O	Track pitch signal
83	SPDT 3			106	PBDT	I	Playback signal
84	SPDT 2			107	PBCK	I	Playback envelope signal
85	SPDT 1			108	RFMSK	O	Not used, open
86	SPDT 0			109	PLLOFS	O	PLL off-set information signal
87	V _{SS}	—	GND terminal	110	HFCH	O	System clock signal
88	TEST 4	—	Not used, connected to GND	111	VFPLFS	O	PLL OFS effective information signal
89	V _{DD}	I	Power supply terminal	112	EXFCH	—	Not used, connected to GND
90	SPAW	I	Signal processor address setting terminal	113	EEMD	—	Not used, connected to GND
91	SPSTB	I	Signal processor strobe signal	114	V _{SS}	—	GND terminal
92	SPRDY	O	Data transfer command signal	115	SL NRZI	—	Not used, connected to GND
93	UNLOK	O	PLL unlock signal	116	SELF CH0		
94	DISYND	—	Not used, open	117	SELF CH1		
95	NSTBY	I	Not used, connected to power supply	118	V _{DD}	I	Power supply terminal
96	NRST	I	Reset signal	119	M9CP	O	Master clock signal
97	M7CK	—	Master clock signal (Not used, open)	120	HSW	I	Head switching signal
98	R6CP/ (ENV T)	O	Timing signal for RF envelope signal control	121	NR TRST	—	Not used, connected to power supply
99	R3CP			122	SUBWND	—	Not used, open
100	V _{SS}	—	GND terminal	123	IPF	O	Output terminal for flag counter
101	SRRF	O	Recording signal	124	SUBC 1		

• IC501 (YM3404B): Digital filter

Pin No.	Mark	I/O Division	Function	Pin No.	Mark	I/O Division	Function
1	SHL	O	1 DAC (ST="L"): Lch Deglitcher signal 2 DAC (ST="H"): L/Rch Deglitcher signal	9	DLO	O	1 DAC (ST="L"): L/Rch data output terminal 2 DAC (ST="H"): Lch data output terminal
2	X 0	O	Clock output	10	RDO	O	Rch data output (Not used, open)
3	X 1	I	Clock input	11	WCO	O	Output data word clock
4	VDD 2	I	Power supply terminal	12	BCO	O	Bit clock signal
5	BCI	I	Bit clock signal	13	VSS	I	GND terminal
6	SDSY	I	R/L signal	14	ST	I	1 DAC/2 DAC selector terminal
7	SDI	I	Data input	15	FEN	I	System clock selector terminal
8	VCC 1	I	Power supply terminal	16	SHR	O	1 DAC (ST="L"): R ch deglitch signal

• IC502 (MN53010PEH): Serial/Parallel converter

Pin No.	Mark	I/O Division	Function
1	WCO	O	Output data word clock (DALO, DBLO, DARO, DBRO)
2	DARO	O	Rch data output, (+) terminal
3	DBRO	O	Rch data output, (–) terminal
4	RST	I	Reset terminal, input data to "0"
5	SVDD	I	Power supply terminal
6	SVSS	I	GND terminal
7	F2DAC	I	"H": 2DAC 18-bit "L": 2DAC 17-bit
8	FLOAT	I	"H": 4DAC 18-bit "L": 4DAC 17-bit
9	PHASE	I	"H": Phase inversion "L": Normal mode
10	LRCK	I	Inverter input
11	NLRCK	O	LRCK signal inverter output
12	SIN	I	Data input
13	WCI	I	Input data word clock
14	BCI	I	Input data bit clock
15	VSS	I	GND terminal
16	NC	—	Not connected
17	VDD2	I	Power supply terminal
18	SHR	I	Rch Deglitcher signal

Pin No.	Mark	I/O Division	Function
19	SHL	I	Lch Deglitcher signal
20 31	NC	—	Not connected
			NORMAL MODE delay: 180ms TEST MODE delay: 1.45ms TEST MODE delay: 0.73ms TEST MODE delay: 0ms
32	NTEST 1	I	H L H L
33	NTEST 2	I	H H L L
34	NTEST 3	I	"H": Normal mode "L": Reset
35	DALO	O	Lch data output, (+) terminal
36	DBLO	O	Rch data output, (–) terminal
37	VDD	I	Power supply terminal
38	VSS2	I	GND terminal
39	NC	—	Not connected
40	GAIN	O	Gain selector signal [H: 0 ~ –12dB L: below –12dB]
41	SH	O	Deglitch signal [H: sample L: Hold]
42	BCO	O	Output data bit clock

• IC503~IC506 (PCM56P-J): D/A converter

Pin No.	Mark	I/O Division	Function
1	–VS	I	Power supply terminal
2	DG	—	GND terminal
3	+VL	I	Power supply terminal
4	NC	—	Not connection
5	CLK	I	Clock signal
6	LE	I	Latch enable control signal
7	DATA	I	Data signal
8	–VL	I	Power supply terminal
9	V OUT	O	Voltage output terminal

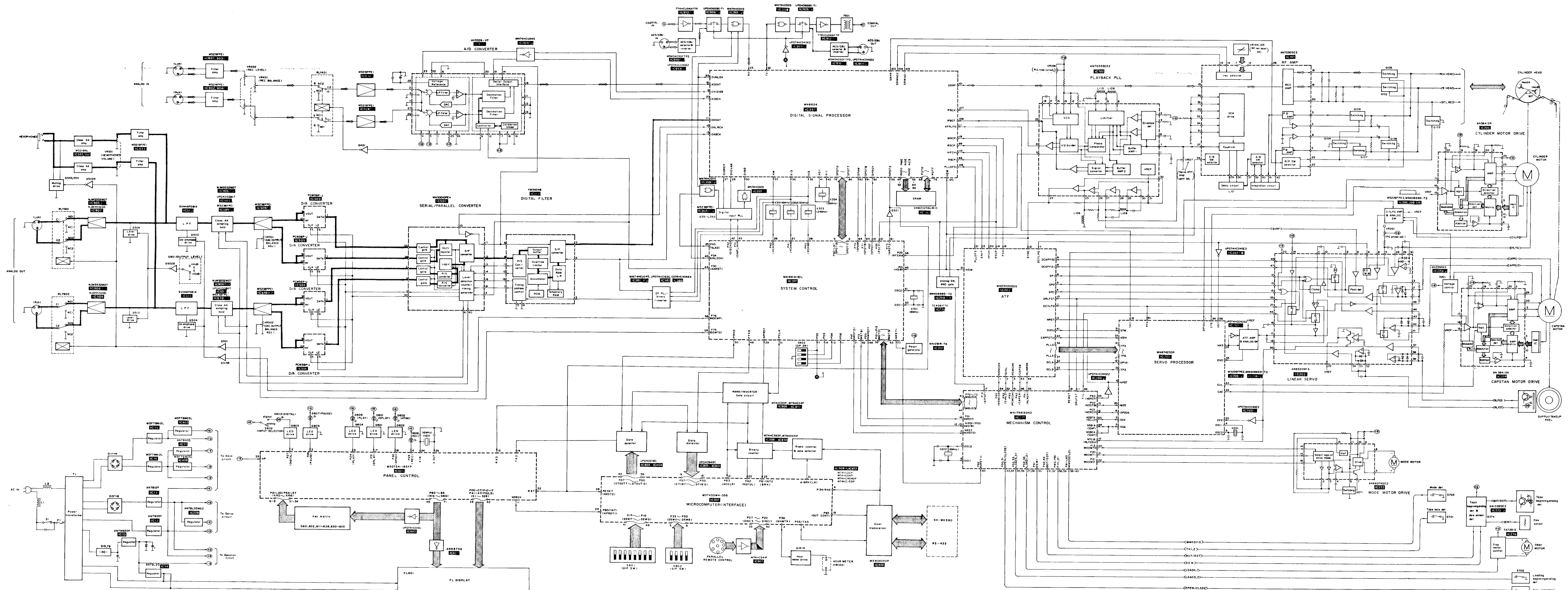
Pin No.	Mark	I/O Division	Function
10	RF	O	Data signal
11	SJ	I	Operation amp. supply terminal
12	A • G	—	GND terminal
13	I OUT	O	Current output terminal
14	MSB	I	MSB adj. terminal (Not used, open)
15	R IN	—	Not used, open
16	+VS	I	Power supply terminal

• IC601 (M50754-165FP): Panel control & FL drive

Pin No.	Mark	I/O Division	Function
1	V _{SS}	—	GND terminal
2	P 27	O	Input select signal (DIGITAL↔ANALOG)
3	P 26	O	LED display drive terminal (PAUSE)
4	P 25	O	LED display drive terminal (REC)
5	P 24	O	LED display drive terminal (PLAY)
6 7 8	P 23 P 21	I	Key return signal
9	P 20	O	Buffer control signal
10	NC	—	Not connection
11	NPRDY	O	Ready signal
12	NTRCLK	I/O	Serial data transmission/reception clock signal
13	RXD	O	Serial data transmission signal
14	TXD	I	Serial data reception signal
15 16	P 33 P 32	—	Not connection
17	P 31	O	LED display drive terminal (S. PLAY)
18	P 30	O	LED display drive terminal (A. PNO)
19	INT 1	I	Remote control signal
20	INT 2	I	Not used, connected to power supply
21	CNV _{SS}	—	GND terminal
22	RST	I	Reset signal ("L": RESET)
23	NC	—	Not connection
24	X IN	I	Master clock terminal (6MHz)
25	X OUT	O	
26	NC	—	Not connection
27	X CIN	—	Not used, connected to GND
28	X COUT	—	Not used, open
29	V _{SS}	—	GND terminal
30	NC	—	Not connection
31 32	P 57 P 56	I	Key return signal

Pin No.	Mark	I/O Division	Function
33	P 55	I	Key return signal
34	P 54		
35	VP	I	Power supply terminal for FL drive
36 37	P 51 P 50	O	Segment signal for FL drive
38 45	P 17 P 10		
46	NC		
47	P 07	O	Segment signal for FL drive
48	P 06		
49	P 05		
50	P 04		
51	P 03		
52	P 02		
53	P 01		
54	P 00		
55	P 47		
56	P 46		
57	P 45		
58	P 44		
59	P 43		
60	P 42		
61	P 41		
62	P 40		
63	V _{CC}	I	Power supply terminal
64	V _{CC}		
65	V _{SS}	—	GND terminal
66	P 65	O	Digit signal for FL drive and key scan signal
67	P 64		
68	P 63		
69	P 62		
70	P 61		
71	P 60		
72	NC	—	Not connection

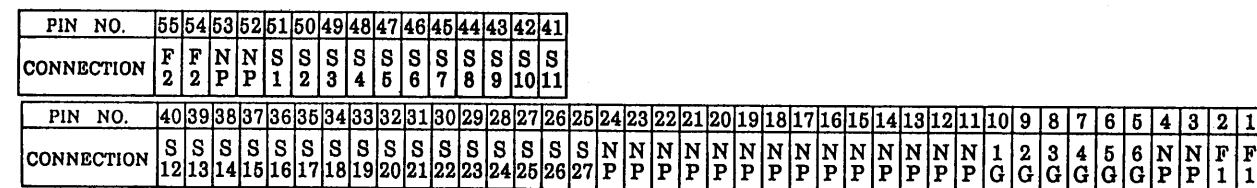
BLOCK DIAGRAM



Note)
• : Playback signal
• : Recording signal

■ SCHEMATIC DIAGRAM

- **Pin connection**



— 41 —

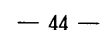
■ SCHEMATIC DIAGRAM

*** Do not touch the legs of IC or LSI with the fingers directly.**



■ SCHEMATIC DIAGRAM

*** Do not touch the legs of IC or LSI with the fingers directly.**







N



To **I** MAIN
CIRCUIT (CN41)
on page 49.

A

B

C

D

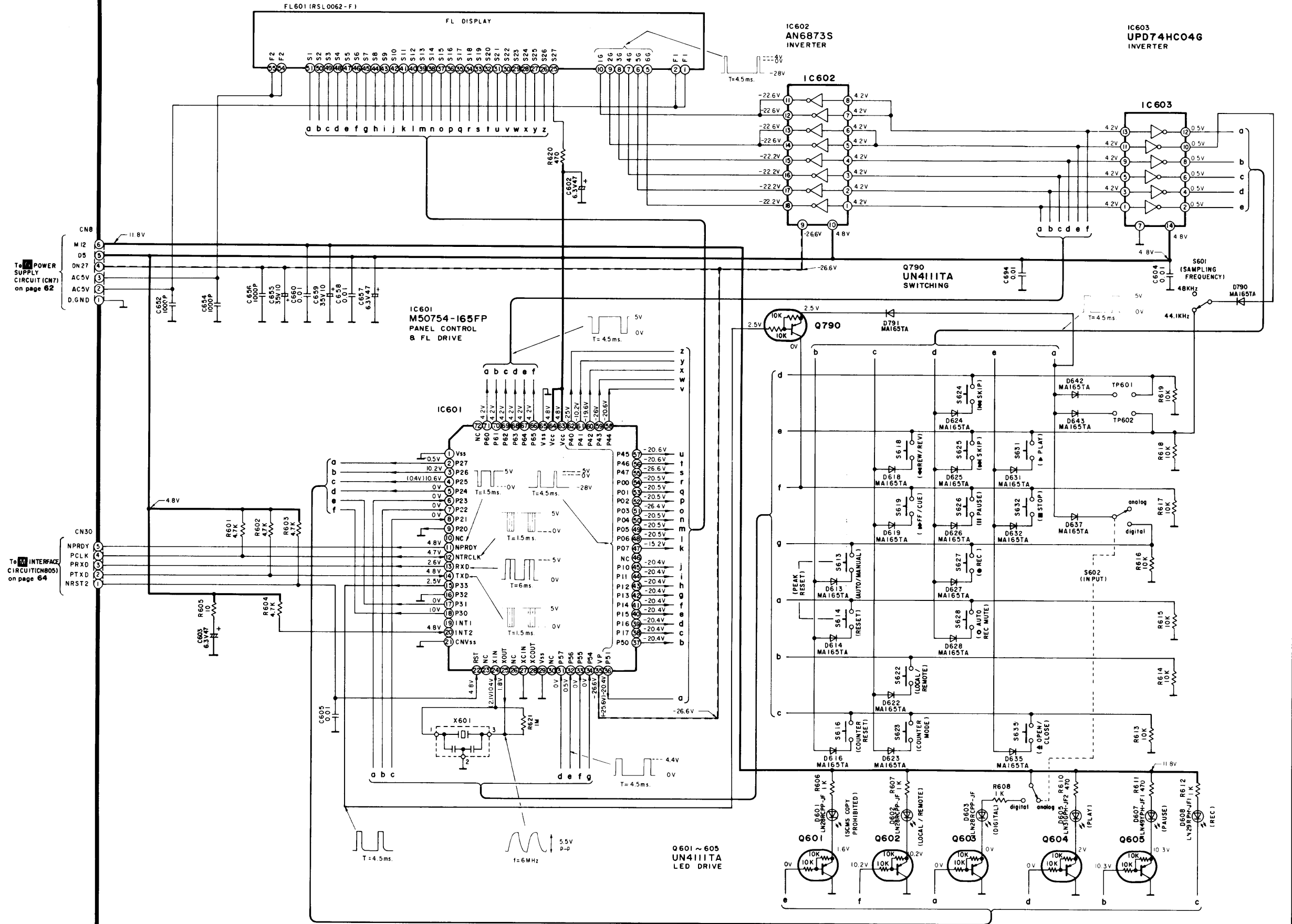
E

F

G

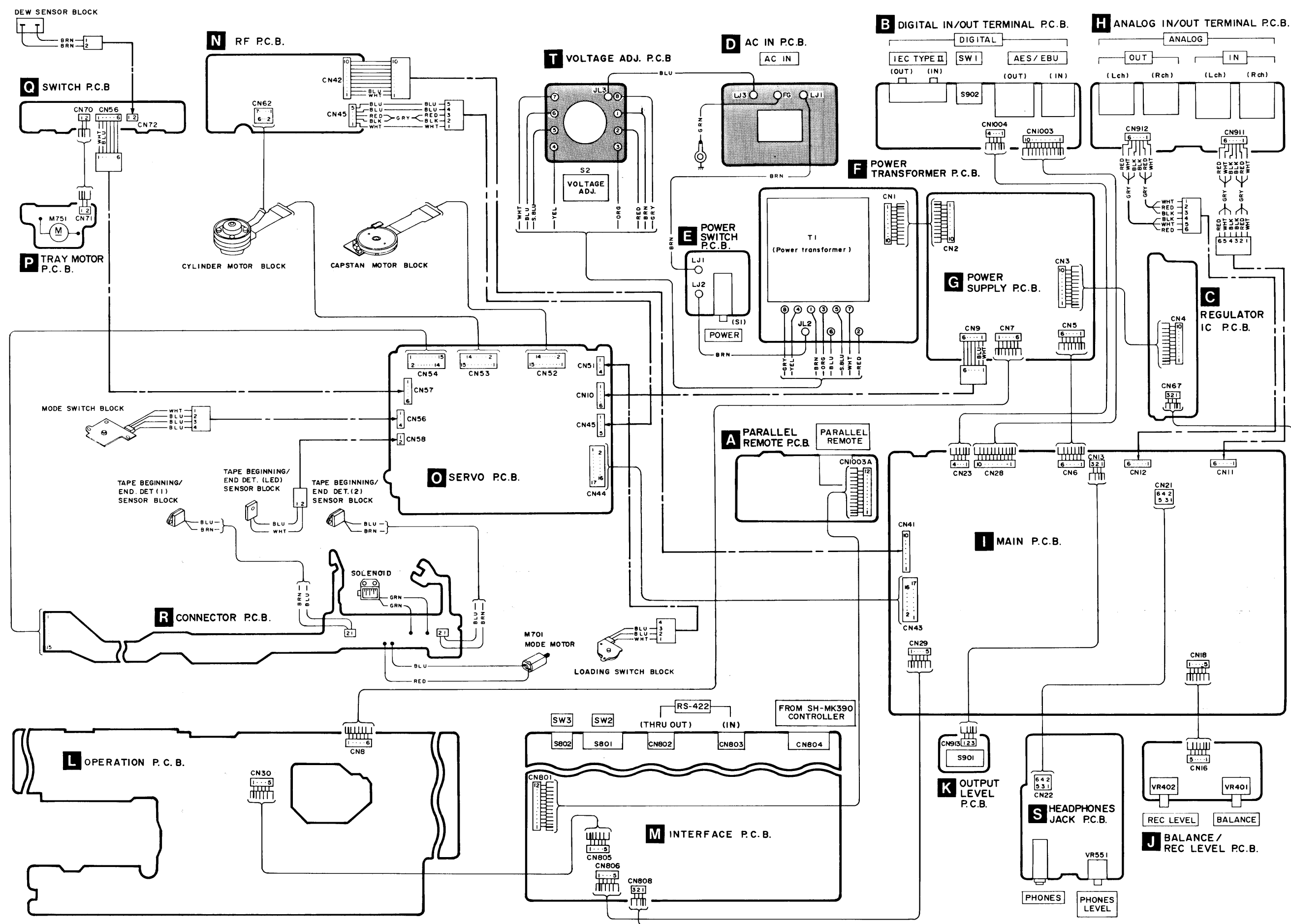
- Note 3:**
- **S1** : Power switch (POWER).
 - **S2** : Voltage adj. switch.
 - **S601** : Sampling frequency selector switch. (SAMPLING FREQUENCY) (44.1 kHz ↔ 48 kHz).
 - **S602** : Input selector switch (INPUT) (■ DIGITAL/■ ANALOG).
 - **S613, 614** : Peak reset switches (PEAK RESET). [S613: AUTO/MANUAL, S614: RESET]
 - **S616** : Counter reset switch (COUNTER RESET).
 - **S618** : Rew/rev switch (REW/REV).
 - **S619** : FF/cue switch (FF/CUE).
 - **S622** : Local/remote switch (LOCAL/REMOTE).
 - **S623** : Counter mode switch (COUNTER MODE).
 - **S624, 625** : Skip switches (SKIP). [S624: ◀◀, S625: ▶▶]
 - **S626** : Pause switch (PAUSE).
 - **S627** : Record switch (REC).
 - **S628** : Auto rec mute switch (AUTO REC MUTE).
 - **S631** : Play switch (PLAY).
 - **S632** : Stop switch (STOP).
 - **S635** : Open/close switch (OPEN/CLOSE).
 - **S801, 802** : DIP switches.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
() Voltage values at recording mode.
For measurement us EVM.
- Important safety notice
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- (—) Indicates +B (bias).
 - (- - -) Indicates -B (bias).
 - (———>) Indicates the flow of the playback signal.
 - (———>) Indicates the flow of the recording signal.

L OPERATION CIRCUIT



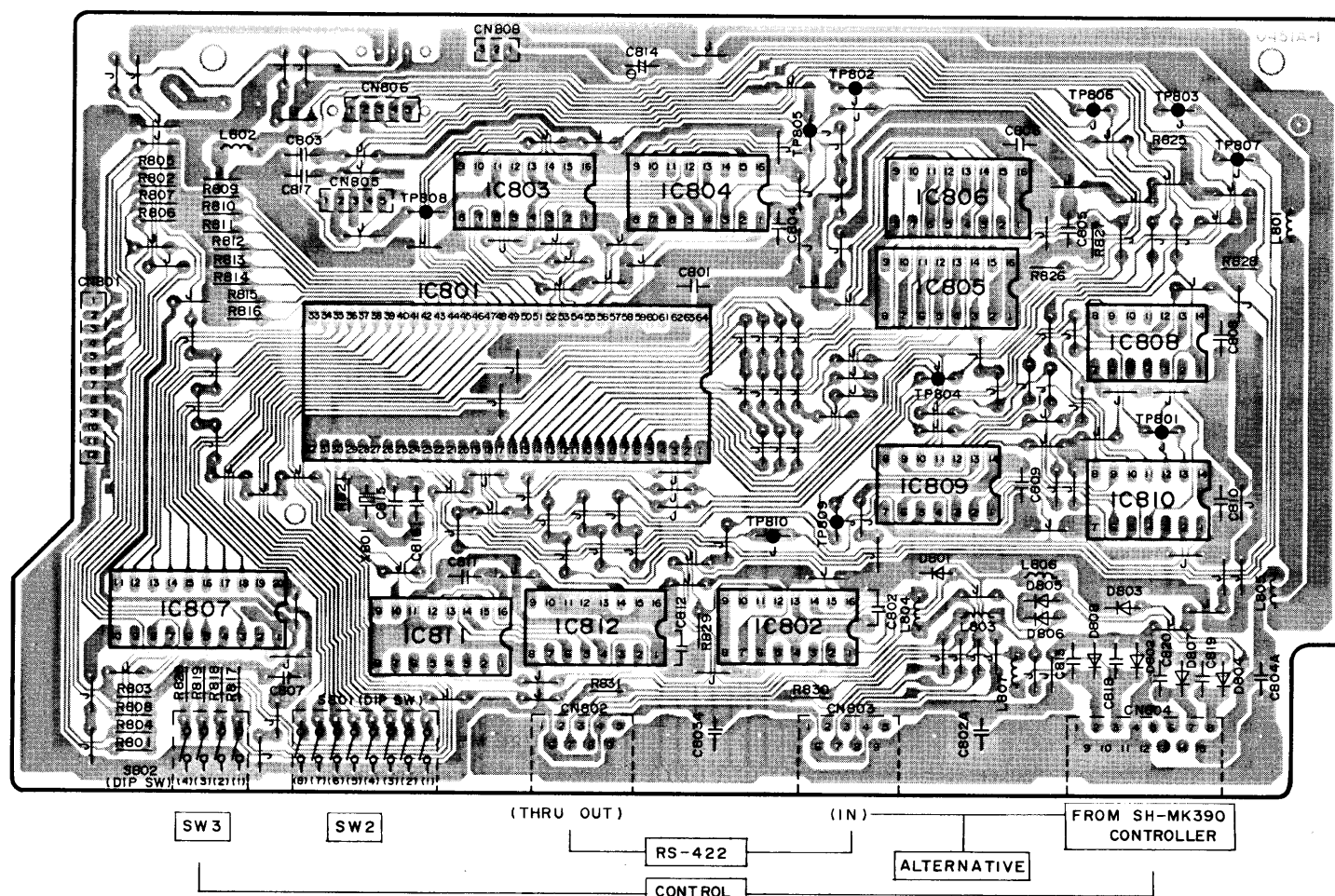
To **L** OPERATION
CIRCUIT (CN30)

WIRING CONNECTION DIAGRAM

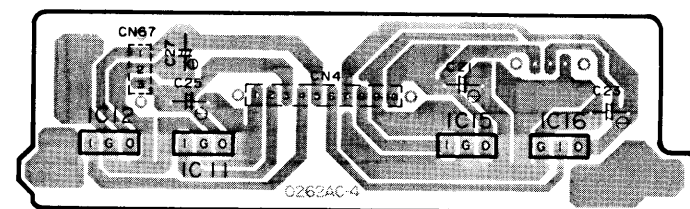


PRINTED CIRCUIT BOARDS

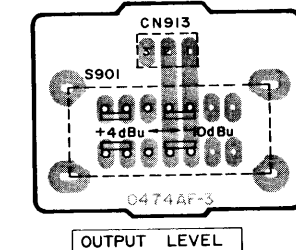
M INTERFACE P.C.B. (REP0737A)



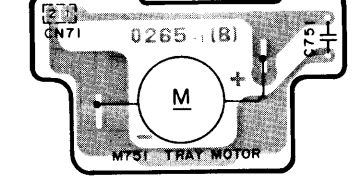
C REGULATOR IC P.C.B. (REP0693B)



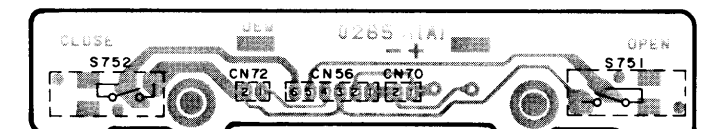
K OUTPUT LEVEL P.C.B. (RFKBV3900EBA)



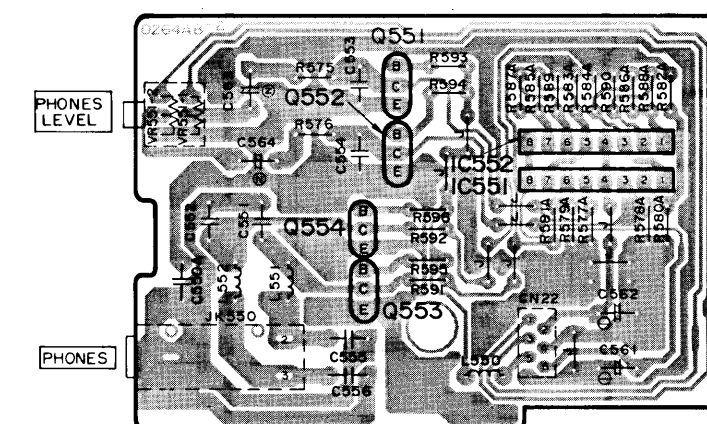
P TRAY MOTOR P.C.B. (REP0421A)



Q SWITCH P.C.B. (REP0421A)



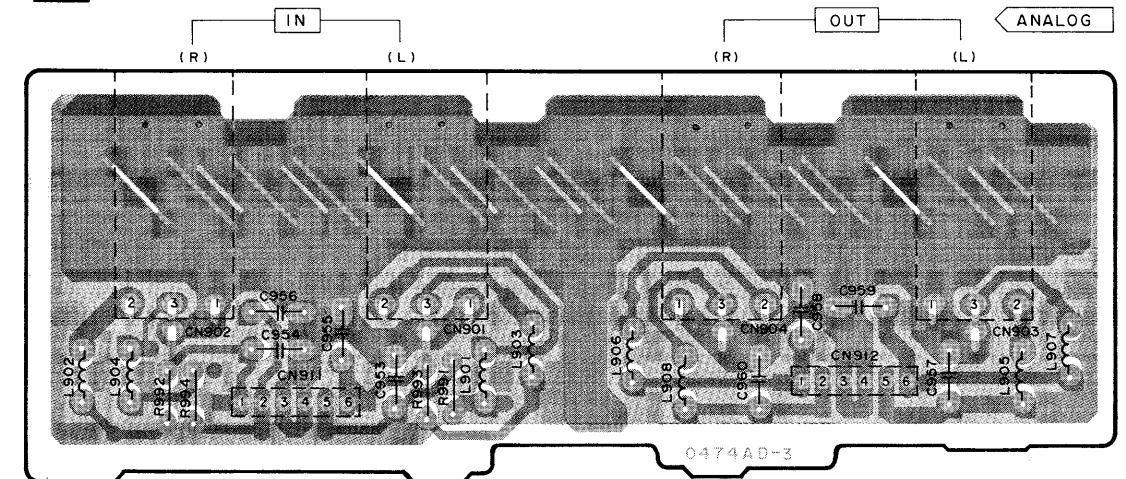
S HEADPHONES JACK P.C.B. (REP0694B)



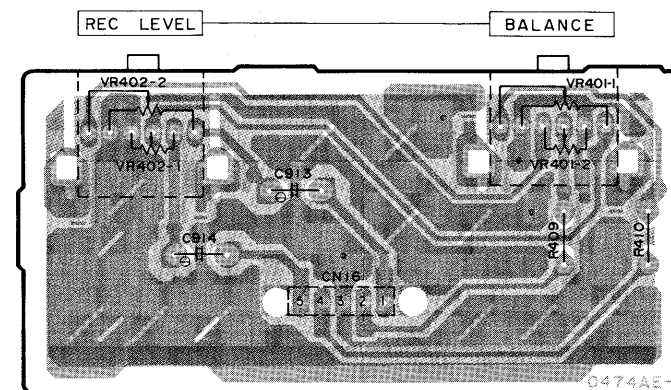
0474AA-3

- **This printed circuit board may be modified at any time with the developement of new technology.**

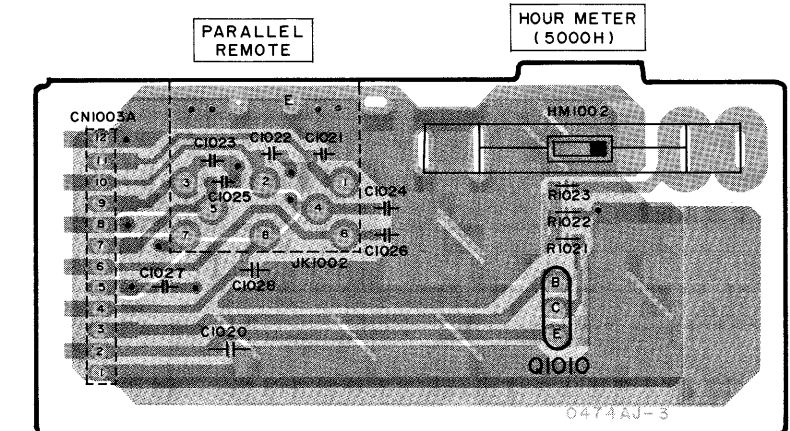
H ANALOG IN/OUT TERMINAL P.C.B. (RFKBV3900EBA)



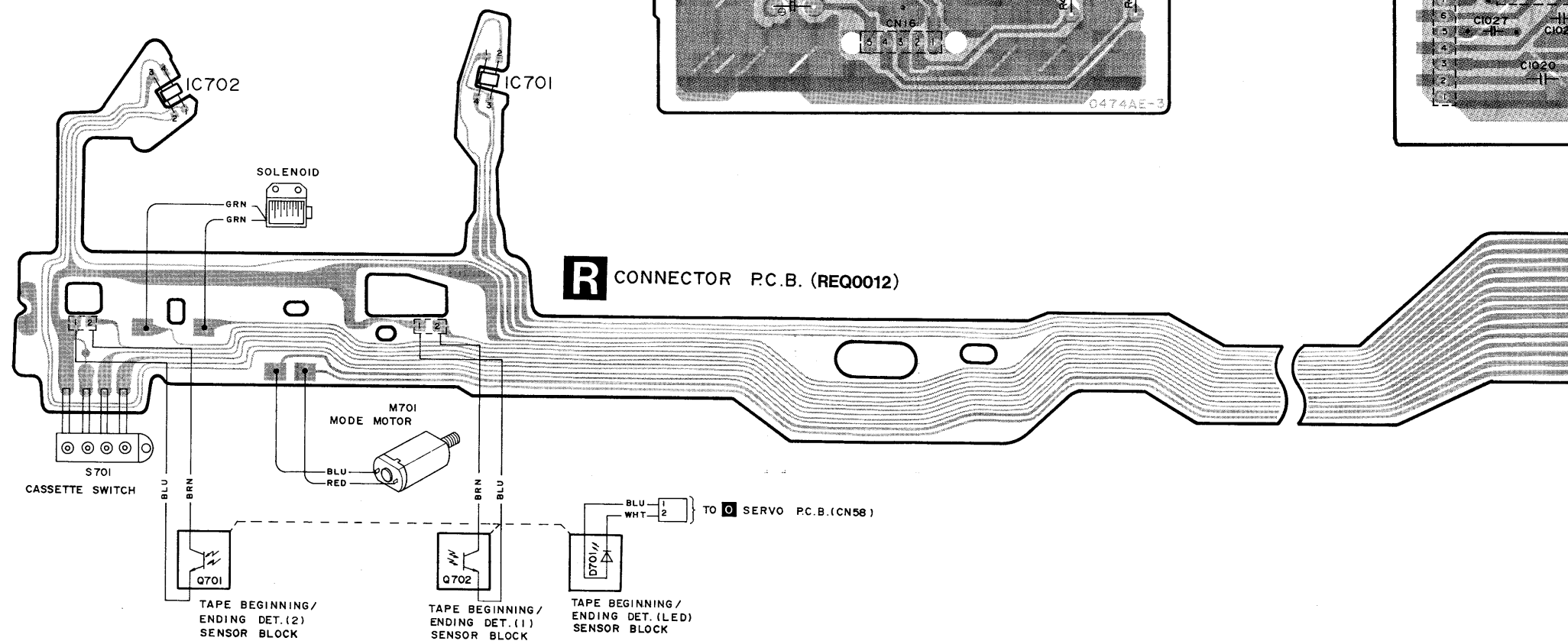
J BALANCE / REC LEVEL P.C.B. (RFKBV3900EBA)



A PARALLEL REMOTE P.C.B. (RFKBV3900EBA)



R CONNECTOR P.C.B. (REQ0012)

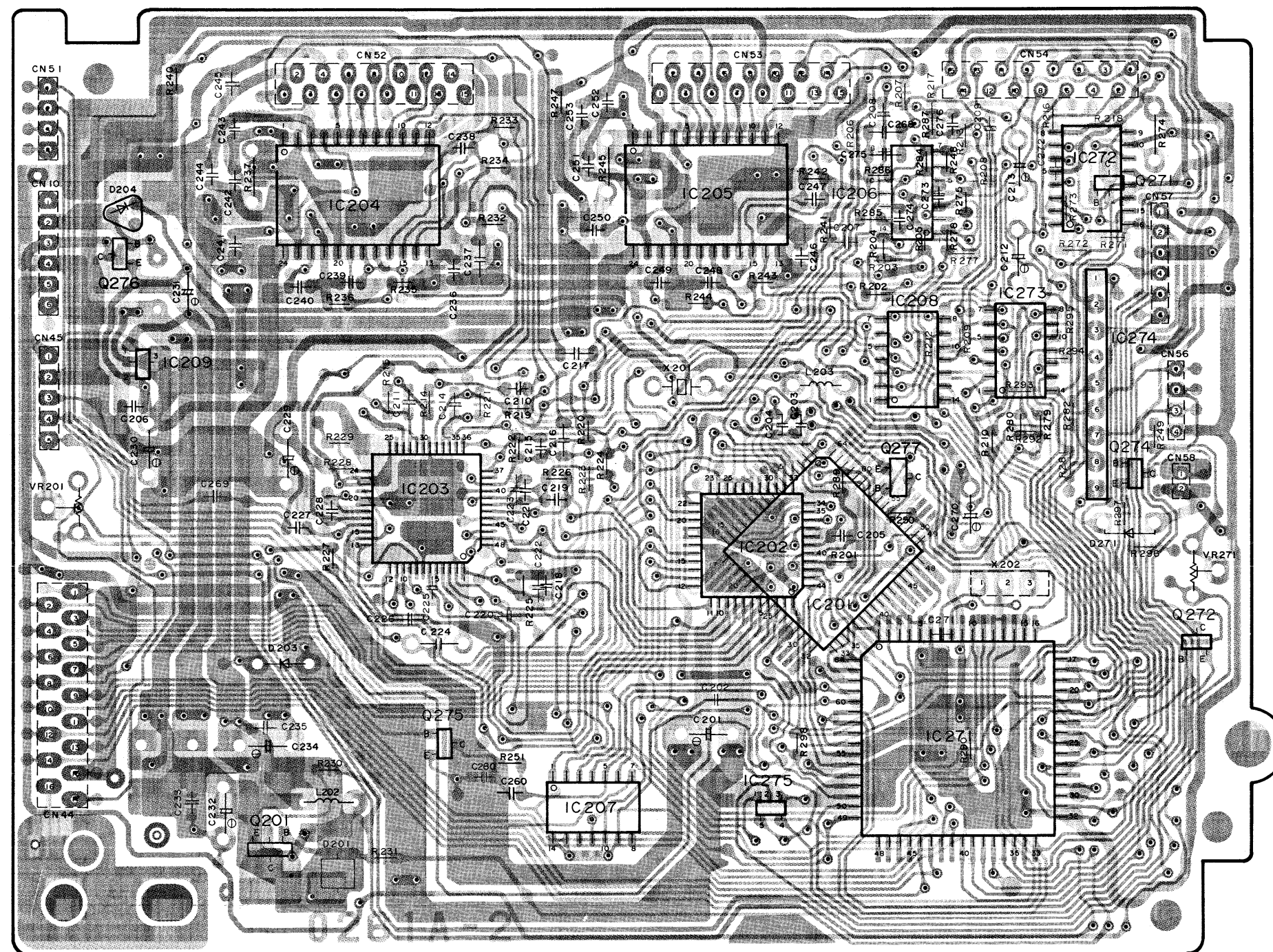


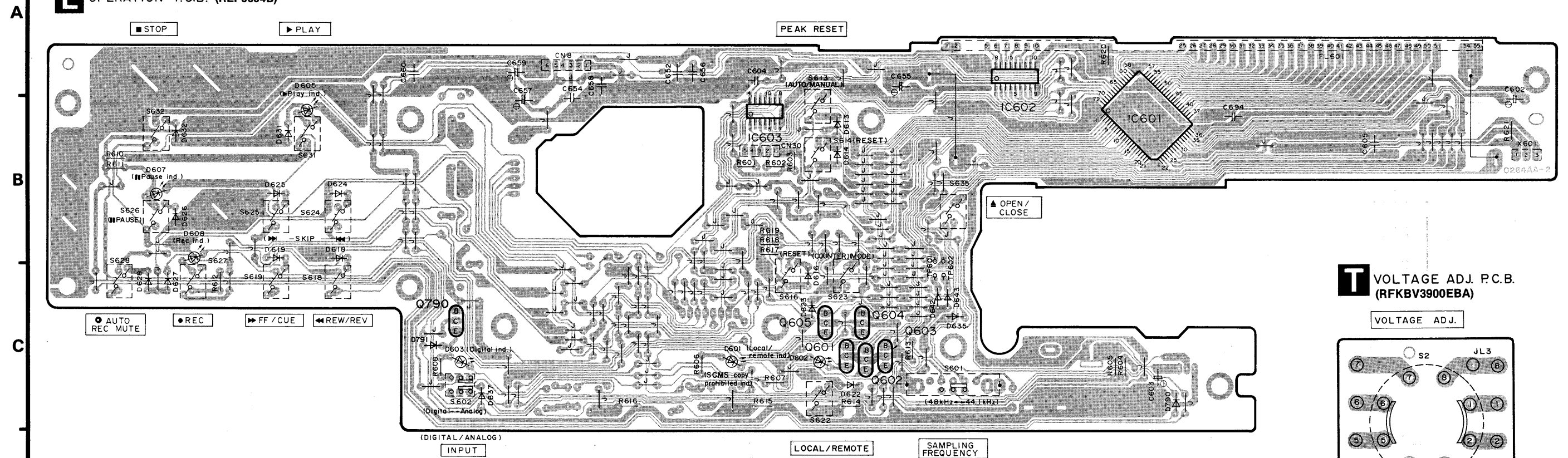
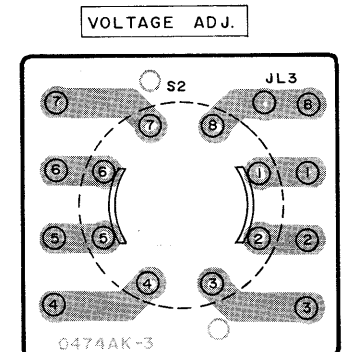
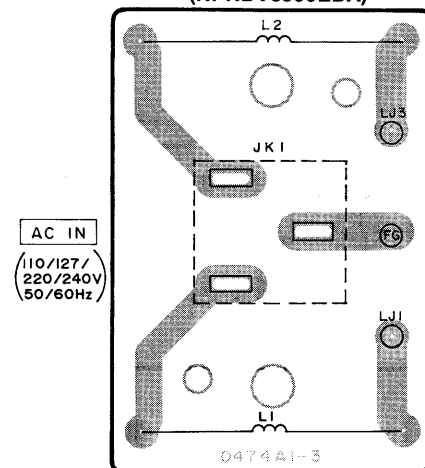
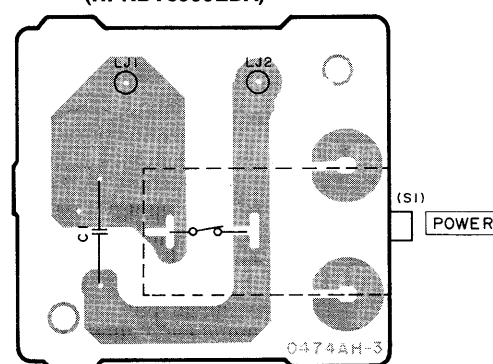
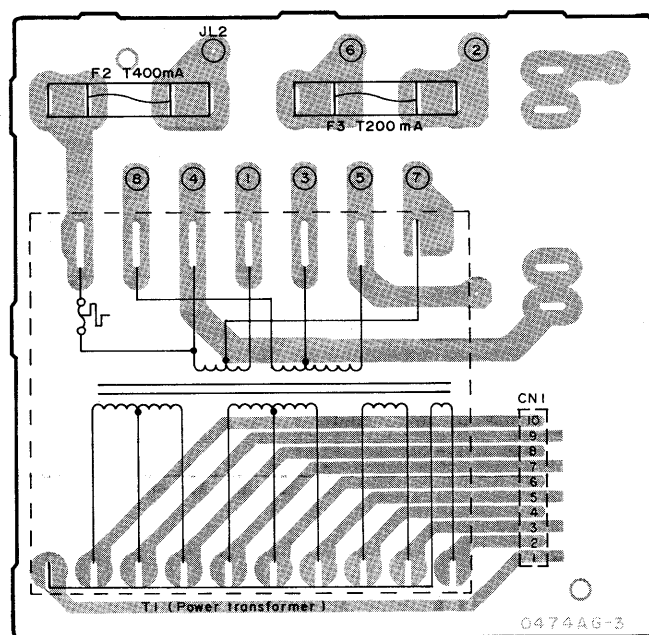
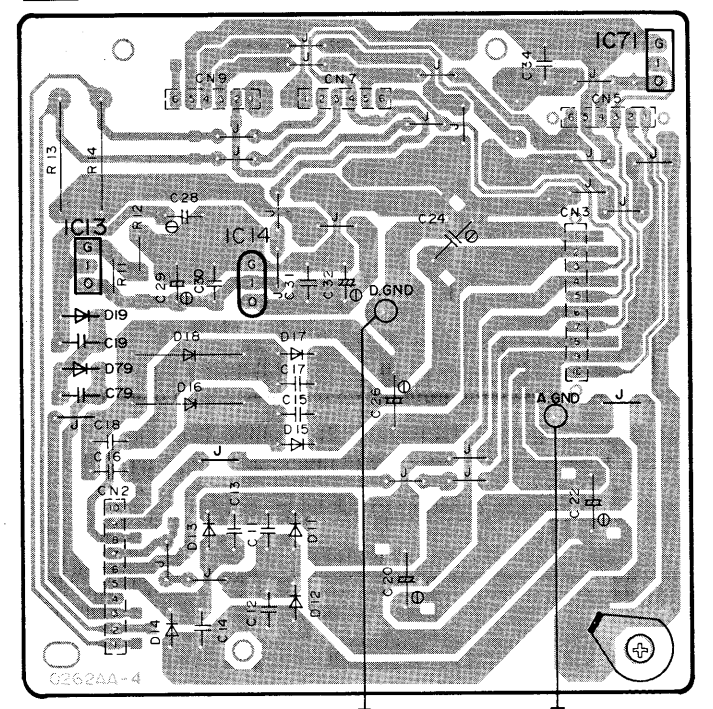
Notes:

1. The circuit shown in () on the conductor indicates printed circuit on the back side of the printed circuit board.
2. The circuit shown in () on the conductor indicates printed circuit on the front side of the printed circuit board.
3. The symbols (•) shown in the circuit board indicate connection points between conductors on the front side and back side of the circuit board.

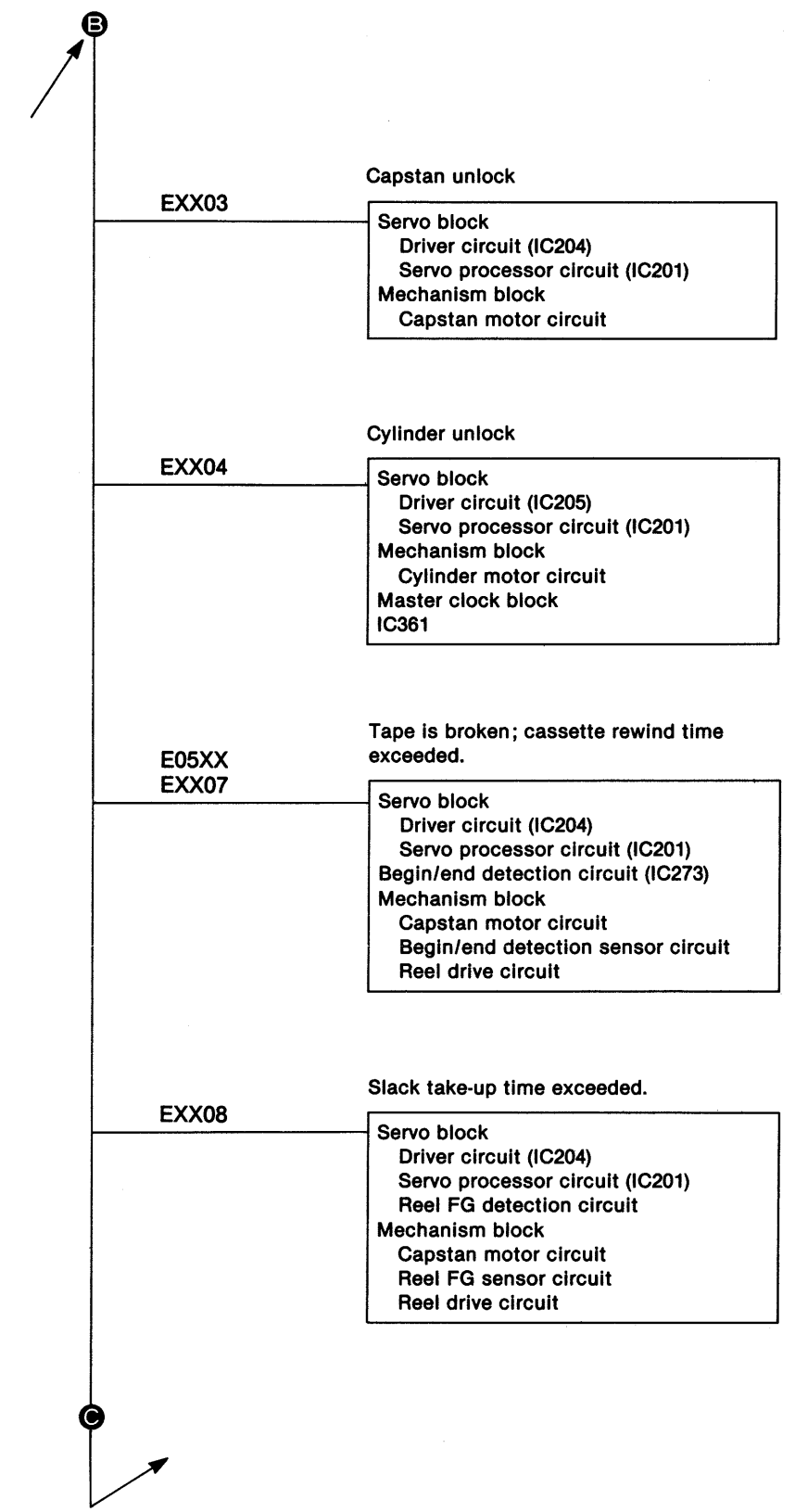
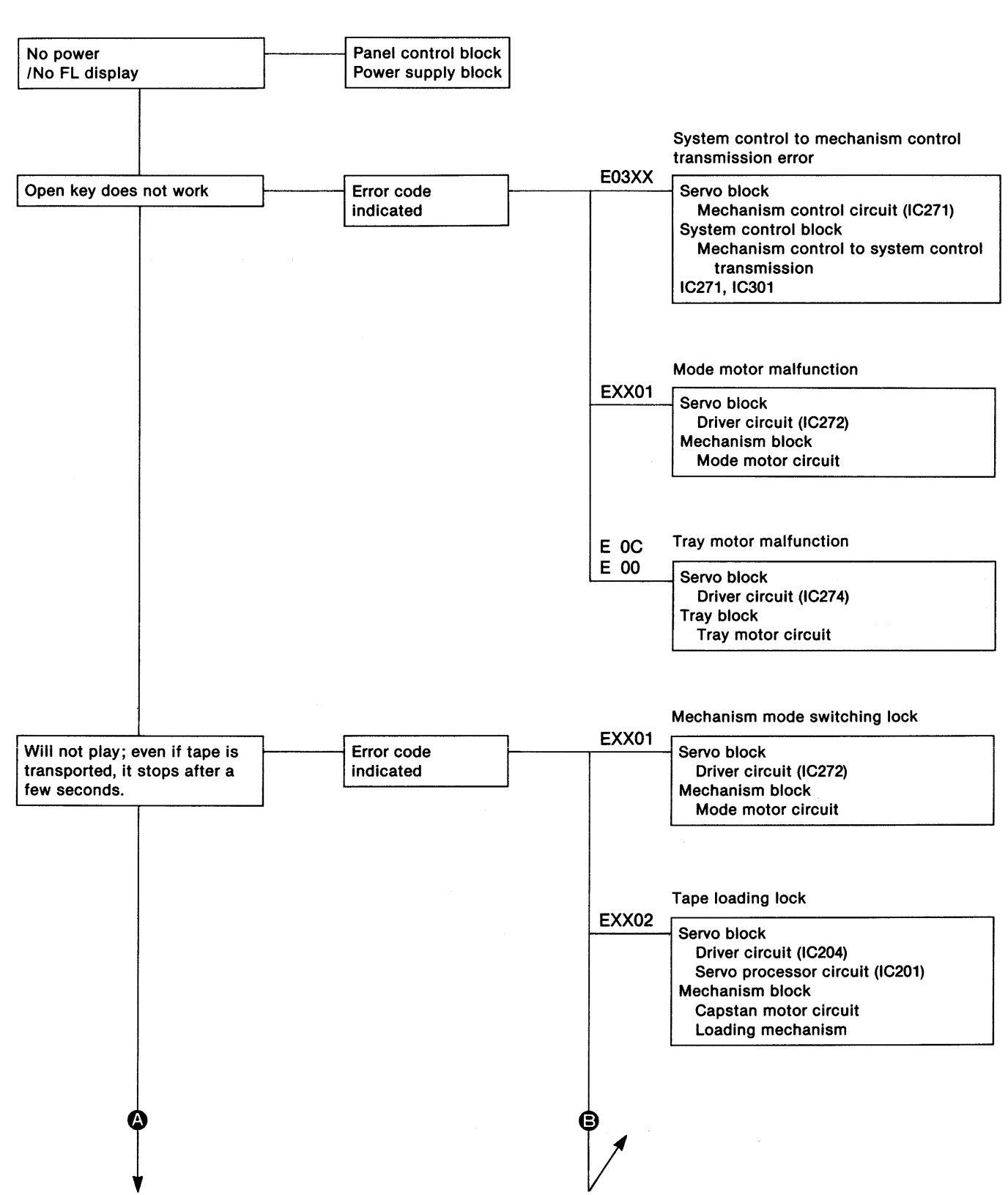
- This printed circuit board may be modified at any time with the developement of new technology.

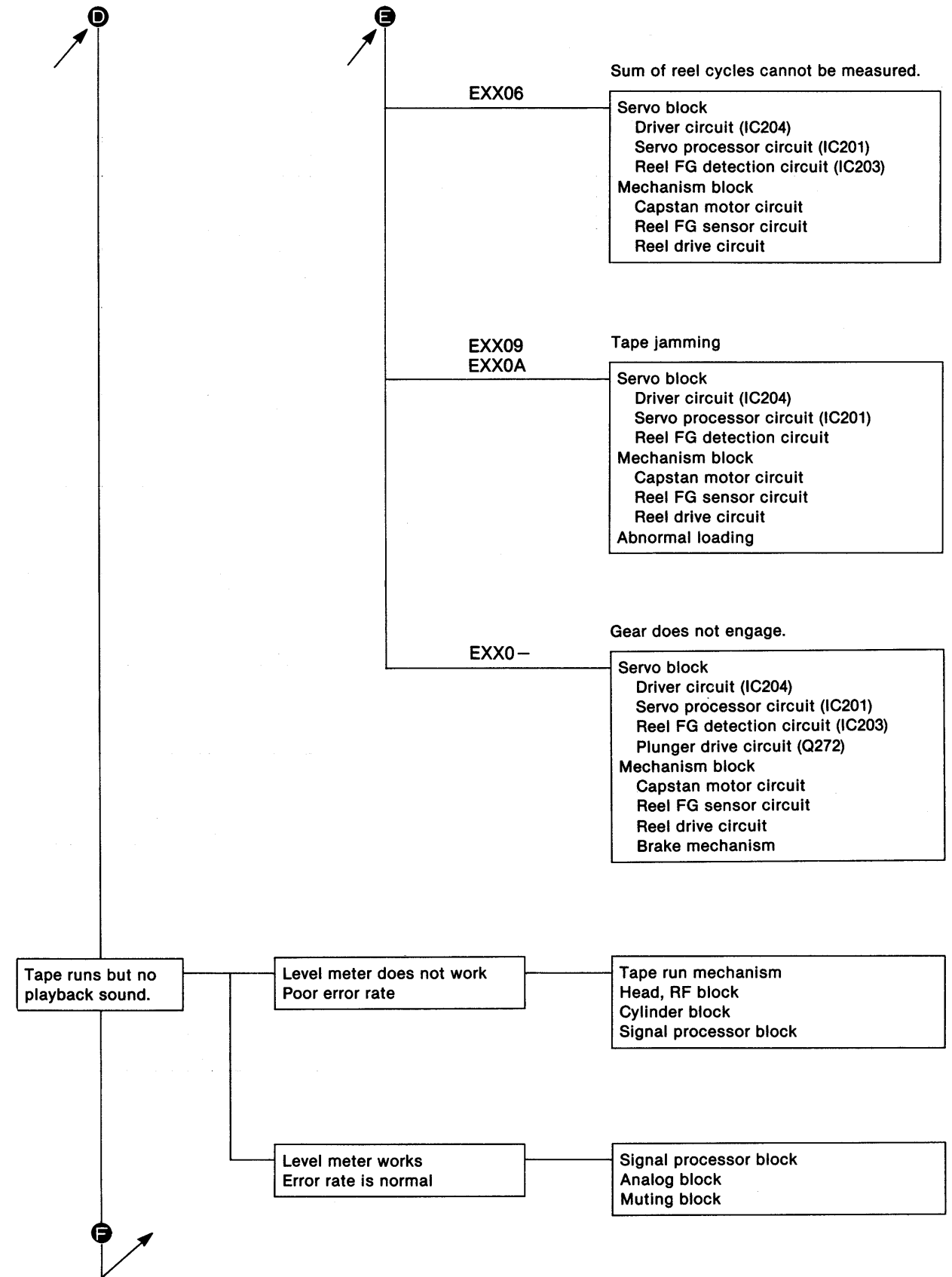
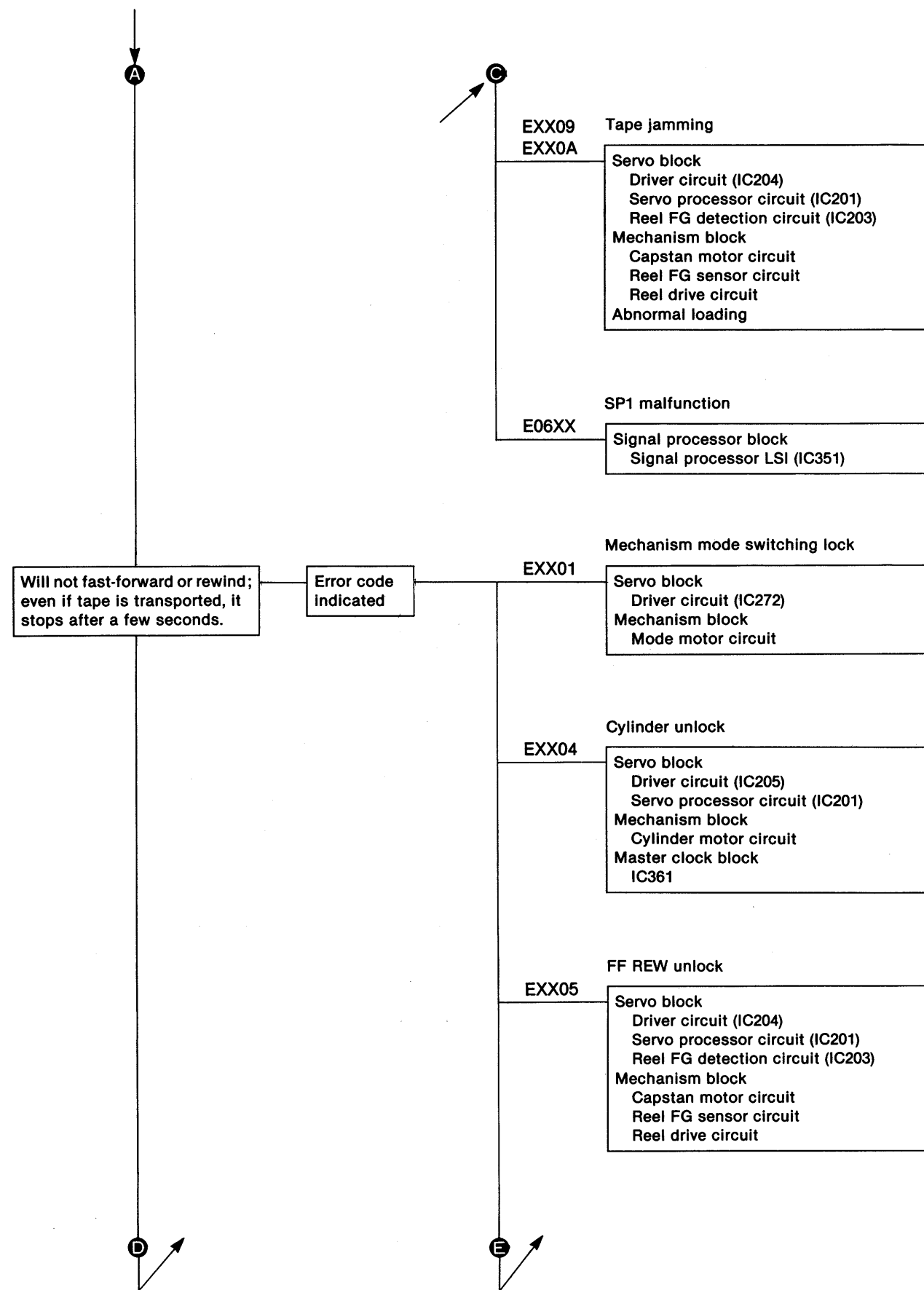
O SERVO P.C.B. (RFKBV3700-O)

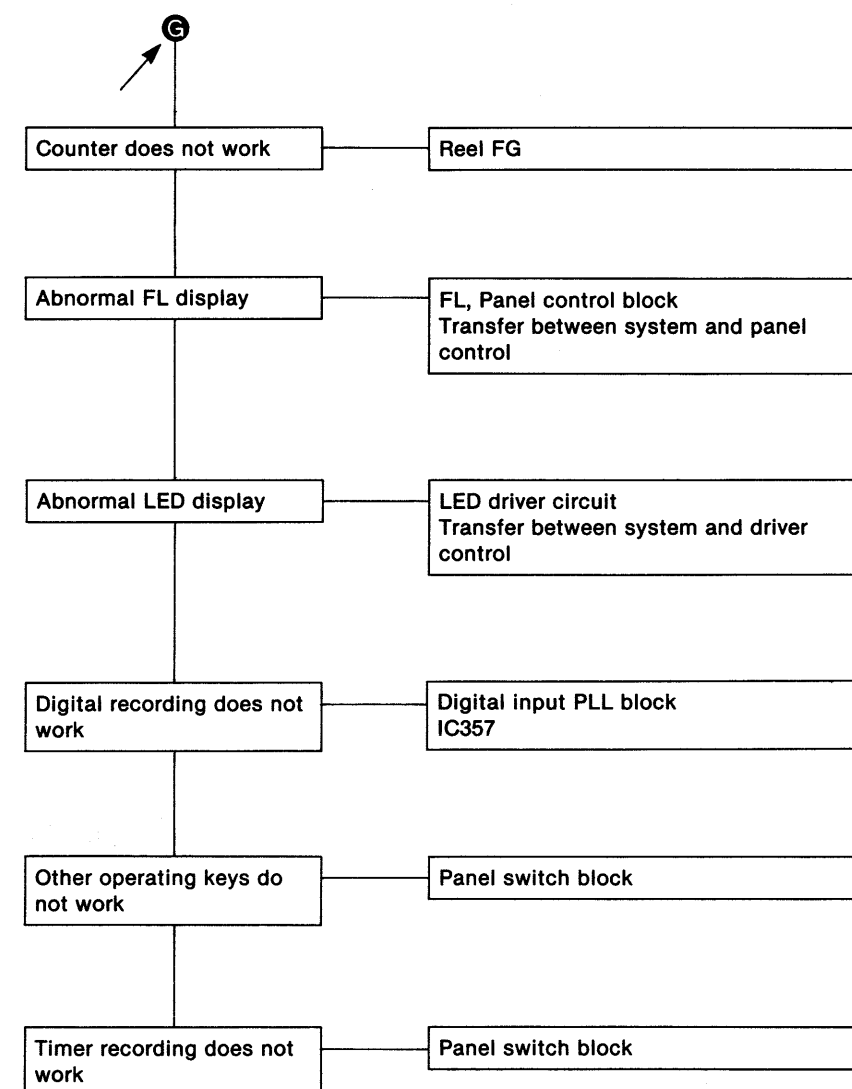
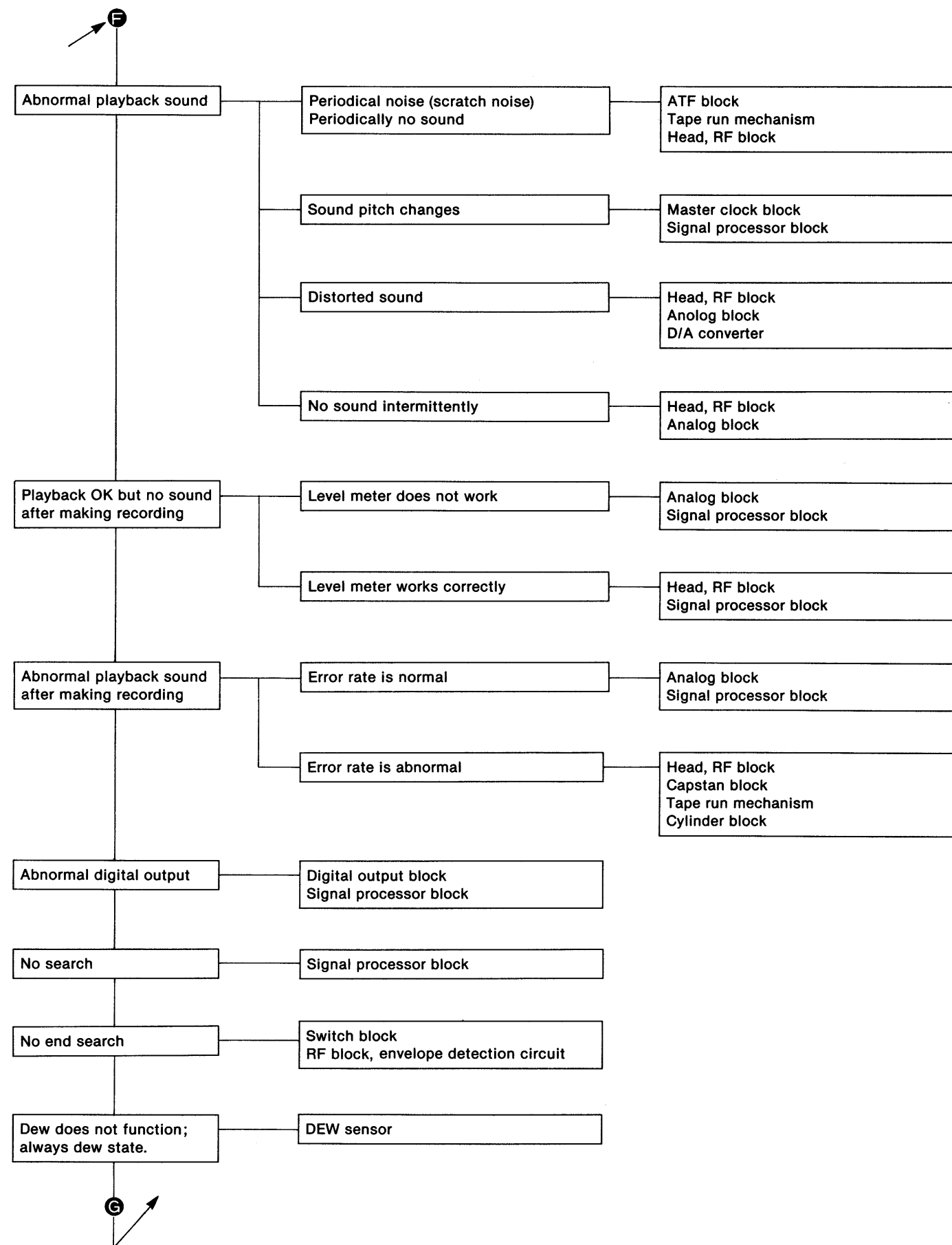


L OPERATION P.C.B. (REP0694B)**T** VOLTAGE ADJ. P.C.B. (RFKBV3900EBA)**D** AC IN P.C.B. (RFKBV3900EBA)**E** POWER SWITCH P.C.B. (RFKBV3900EBA)**F** POWER TRANSFORMER P.C.B. (RFKBV3900EBA)**G** POWER SUPPLY P.C.B. (REP0693B)

■ TROUBLESHOOTING







■ KEY POINTS FOR TROUBLESHOOTING

Mechanism block
 Loading mechanism
 Post roller
 Tension regulator
 Pinch roller
 Brake lever
 Brake mechanism
 Brake lever
 Solenoid
 Solenoid driver
 Mechanism switch block
 Tape hole detection switch
 Cassette detection switch
 Holder switch
 Reel FG block
 Detection photo transistor
 Detection LED
 Reel FG amp (servo P.C.B.)
 FPC & FPC connector

Mode motor block
 Mode motor
 Mode switch
 Mode motor driver circuit

Master clock block
 28MHz oscillator
 16MHz, 22MHz, 24MHz oscillate and select circuit

Panel switch block
 Switch
 Panel control IC

Head, RF block
 Head FPC & FPC connector
 Head dirty
 Head cracked or damaged
 RF recording current
 Playback eye pattern

Tape begin/end detection block
 Begin/end detection photo transistor
 Begin/end detection LED
 Comparator circuit
 FPC & FPC connector

Power supply block
 Power supply regulator output
 Fuse

Capstan block
 Capstan FG
 FG amp
 Motor driver output
 Motor current

Cylinder block
 Cylinder FG
 Cylinder PG
 FG amp
 PG amp
 Motor driver output
 Motor current

ATF block
 RF ATF output
 ATF SYNC output
 ATF select circuit
 ATF gate allay

Signal processor block
 Data & clock to D/A
 Data & clock to A/D
 All clocks

Digital output block
 Digital output PB

Panel control block
 Panel control block
 Transfer between panel and system control
 Panel control reset

Analog block
 Input amplifier
 Output amplifier
 Muting circuit
 A/D converter
 D/A converter

■ ABOUT THE ERROR RATE

If the error rate is normal, it can be judged that everything up to signal processing, meaning the operation of the RF head mechanism, is normal.

Thus, when there is a problem with playback, if the error is normal, it can be assumed that the origin of the problem is in the analog system.

■ ABOUT THE LEVEL METER

Just as for the error rate, if the level meter is operating normally, it indicates that the signal is reaching signal processing.

In other words, if there is no problem with the level meter during playback, it indicates that the head and the RF are outputting the signal.

In addition, if there is no problem with the level meter during recording, it indicates that the analog system (input amplifier and AD) is functioning normally.

■ ERROR RATE DISPLAY FUNCTION

1. Setting the error rate display mode

Simultaneously press the counter mode key, the counter reset key, and the pause key.

Note:

If the counter reset key is released before the other keys, the mode will not change to the error rate display mode.

(1) The digital input mode will be displayed:

If "AES" is displayed, it indicates the AES/EBU mode. If "IEC-2" mode is displayed, it indicates the IEC Type II mode.

2. Changing to the following displays

Press the counter mode key successively.

(2) The error rates for head A and head B will be displayed: FLs A and B will light up (max 9984).

(3) The error rate for head A will be displayed: FL A will light up (max 4992).

(4) The operation modes for the system control (left) and the mechanism control (right) will be displayed.

(5) The error codes for the system control (left) and the mechanism control (right) will be displayed. (If the tray is open, the error codes will be cleared.)

(6) The display will return to (1).

3. Returning to the normal mode

Press the counter reset key: the mode will change to the A time display mode.

ERROR CODE TABLE

Error code (Note. 1)	System control error code		Mechanism control error code	
	Processing (Note 2)	Contents	Processing (Note 2)	Contents
1	Test operation	R3CP clock malfunction	Unload	Mechanism mode switching lock
2	Test operation	HSW clock malfunction	Unload	Tape loading lock
3	Transmission omitted	Faulty transmission of the mechanism control	Unload	Capstan unlock
4	Unload	Still protection during operation	Unload	Cylinder unlock
5	Unload	Broken tape	Unload	Reel unlock
6	Unload	Faulty transmission of SP1	Unload	Sum of reel cycles cannot be measured.
7			Unload	In-cassette rewind time exceeded.
8			Unload	Slack tape-up time exceeded.
9			Unload	Tape jamming (Supply side)
A			Unload	Tape jamming (Take-up side)
B (—)			Unload	Gear does not engage.
C			Tray stop	Initial tray setting not possible.
O		—		No error
FF (blank)		No error		—

Note 1: Display mode

E	X1	X2
---	----	----

E: Indicates that mode is the error rate display mode.

X1: System control error code

X2: Mechanism control error code

Note 2: Processing when an error occurs

Test operation:

Internal clock of the system control temporarily connects for operation.

Transmission omitted:

Transmission processing stopped.

Unload:

Tape is unloaded.

REPLACEMENT PARTS LIST

Notes : * Important safety notice:

Components identified by $\triangle$ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

- * The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)		IC603	UPD74HC04G	IC, INVERTER	
IC11	AN7812F	IC, REGULATOR		IC801	M37450M4-356	IC, MICROCOMPUTER	
IC12	AN7805F	IC, REGULATOR		IC802	M5M34050P	IC, DUAL TRANSCEIVER	
IC13	AN79M20F	IC, REGULATOR		IC803, 804	UPD4021BC	IC, DATA DETECTOR	
IC14	AN79L20	IC, REGULATOR		IC805, 806	UPD4094BC	IC, DATA DETECTOR	
IC15	M5F78M12L	IC, REGULATOR		IC807	M74HC541P	IC, 3-STATE BUFFER	
IC16	M5F79M12L	IC, REGULATOR		IC808	M74HC393P	IC, 4-BIT BINARY COUNTER	
IC71	AN79N05	IC, REGULATOR		IC809	M74HC00P	IC, NAND GATE	
IC101	AN7030SE2	IC, RF AMP		IC810	M74HC04P	IC, INVERTER	
IC102	AN7035SCE2	IC, PLAYBACK PLL		IC811	M74HC4040P	IC, RIPPLE COUNTER	
IC201	MN6742SDR	IC, SERVO PROCESSOR		IC812	M74HC153P	IC, DATA SELECTOR	
IC202	MN53020SDQ	IC, ATF		IC901, 902	NJM5532MDT	IC, BUFFER AMP	
IC203	AN8320NFA	IC, LINEAR SERVO		IC903, 904	M5219FPE1	IC, BUFFER AMP	
IC204, 205	AN3841SR	IC, MOTOR DRIVE		IC905, 906	NJM5532MDT	IC, SAMPLING HOLD	
IC206	M5228FPE2	IC, ANALOG SWITCH		IC907, 908	NJM5532DD	IC, BUFFER AMP	
IC207	UPD74HC04GE2	IC, INVERTER		IC909	UPD4066BG-T1	IC, ANALOG SWITCH	
IC208	MN4066BS-T2	IC, ANALOG SWITCH		IC910	M5M34050FTP2	IC, AES/EBU SELECTOR	
IC209	AN78L05ME2	IC, REGULATOR		IC911	UPD74HC04GE2	IC, INVERTER	
IC271	MN17541SDN2	IC, MECHANISM CONTROL		IC912	T74HC004AFTP	IC, INVERTER	
IC272	AN6607NSE2	IC, MOTOR DRIVE				TRANSISTOR(S)	
IC273	AN1339SE2	IC, VOLTAGE CONTROL		Q102-105	UN5216-Q	TRANSISTOR	
IC274	TA7291S	IC, TRAY MOTOR CONTROL		Q106, 107	2SC3937TW	TRANSISTOR	
IC275	TC4S81FTX	IC, AND GATE		Q109	UN5216-Q	TRANSISTOR	
IC301	MN188161SDL	IC, SYSTEM CONTROL		Q201	2SB956R	TRANSISTOR	
IC302	MN1281R-TA	IC, RESET GENERATOR		Q271	2SD1280STW	TRANSISTOR	
IC351	MN6624	IC, DIGITAL SIGNAL PROCESSOR		Q272	DTA123JKTW	TRANSISTOR	
IC352	SRM20256LM10	IC, S. RAM		Q274	2SB709RTW	TRANSISTOR	
IC357	M5238FPE1	IC, DIGITAL INPUT PLL		Q275	DTC124EKTW	TRANSISTOR	
IC358, 359	MN74HC00S	IC, NAND GATE		Q276	DTB113ZKTW	TRANSISTOR	
IC360	CD74HC4046A	IC, DF PLL		Q277	DTA114EKTW	TRANSISTOR	
IC361	MN74HC04S	IC, INVERTER		Q301	XN1212TW	TRANSISTOR	
IC362	UPD74HC163G	IC, BINARY COUNTER		Q311-313	2SC3315CTA	TRANSISTOR	
IC405	AK5326-VP	IC, A/D CONVERTER		Q314, 315	XN1112TW	TRANSISTOR	
IC407	M5F78M05L	IC, REGULATOR		Q351	XN1212TW	TRANSISTOR	
IC408	M5F79M05L	IC, REGULATOR		Q352	2SA1309A-R	TRANSISTOR	
IC501	YM3404B	IC, DIGITAL FILTER		Q353	2SC1047DTA	TRANSISTOR	
IC502	MN53010PEH	IC, SERIAL/PARALLEL CONV.		Q401	UN4212TA	TRANSISTOR	
IC503-506	PCM56P-J	IC, D/A CONVERTER		Q501	UN4124TA	TRANSISTOR	
IC507, 508	UPD4053BGT	IC, SAMPLING HOLD		Q502	XN1112TW	TRANSISTOR	
IC509, 510	M5238FPE1	IC, OP. AMP		Q503, 504	2SC3315CTA	TRANSISTOR	
IC511	M5219FPE1	IC, BUFFER		Q509, 510	2SC3315CTA	TRANSISTOR	
IC513, 514	SVHHAFO614	IC, L. P. F.		Q511	2SC3311A-Q	TRANSISTOR	
IC551, 552	M5218L	IC, CLASS AA AMP		Q512	2SA1309A-R	TRANSISTOR	
IC601	M50754-165FP	IC, PANEL CONTROL		Q551-554	2SD1450RTA	TRANSISTOR	
IC602	AN6873S	IC, INVERTER		Q601-605	UN4111	TRANSISTOR	

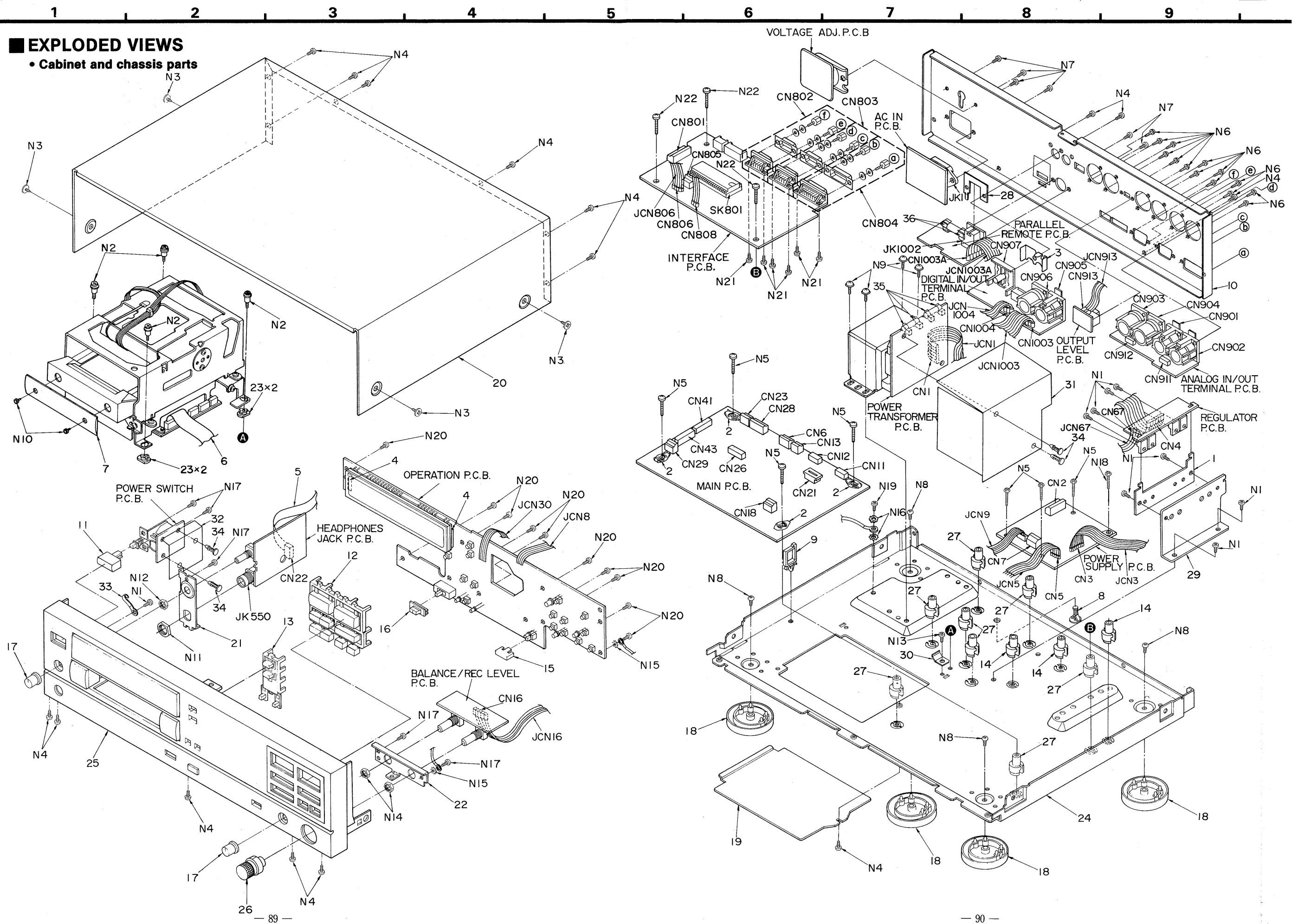
Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
Q790	UN4111	TRANSISTOR					
Q1010	UN4114TA	TRANSISTOR				COIL (S)	
		DIODE (S)		L1, 2	SLQX400-D	COIL	△
D11-15	1SR35200TB	DIODE	△	L101	ELJFA470KF	COIL	
D16	SVDS2V20	DIODE	△	L104	ELJFA180KF	COIL	
D17	1SR35200TB	DIODE	△	L106	ELJFA101KF	COIL	
D18	SVDS2V20	DIODE	△	L108	RLQZB471KT-D	COIL	
D19	1SR35200TB	DIODE	△	L109, 110	ELJFA180KF	COIL	
D79	1SR35200TB	DIODE	△	L120	RLQZB101KT-D	COIL	
D201	MA701TX	DIODE		L202	RLM9R001-Z	COIL	
D203	1N4606TR	DIODE		L203	RLQZB101KT-D	COIL	
D204	MA151ATW	DIODE		L351	RLQZB2R2KT-D	COIL	
D271	1S2473TR	DIODE		L352	RL03B002-M	COIL	
D351	RVDSVC321	DIODE		L550-552	EXCELD35V	COMBINATION PART	
D401	MA165	DIODE		L801-807	EXCELD35V	COMBINATION PART	
D503-506	MA165	DIODE		L901-908	EXCELD35V	COMBINATION PART	
D509, 510	MA719TA	DIODE		L919-922	EXCELD35V	COMBINATION PART	
D601-603	LN28RCPP-JF	L. E. D.				TRANSFORMER (S)	
D605	LN31GPH-JF2	L. E. D.					
D607	LN49YPH-JF1	L. E. D.		T1	SLT5M523	POWER TRANSFORMER	△
D608	LN29RPH-JF1	L. E. D.		T901	RLZ0006-0	TRANSFORMER	
D613, 614	MA165	DIODE				OSCILLATOR (S)	
D616	MA165	DIODE					
D618, 619	MA165	DIODE					
D622-628	MA165	DIODE		X201	RSXC8M00J01T	OSCILLATOR	
D631, 632	MA165	DIODE		X202	RSXY8M00M01T	OSCILLATOR	
D635	MA165	DIODE		X301	RSXY8M00M01T	OSCILLATOR	
D637	MA165	DIODE		X351	RSXC16M3J01	OSCILLATOR	
D642, 643	MA165	DIODE		X352	RSXC22M5J01	OSCILLATOR	
D790, 791	MA165	DIODE		X353	RSXC24M5J01	OSCILLATOR	
D801-808	MA165	DIODE		X354	RSXA28M2J01	OSCILLATOR	
D901-914	MA165	DIODE		X601	RSXY6M00M01T	OSCILLATOR	
D915-918	MA719TA	DIODE		X801	RSXB9M83M01	OSCILLATOR	
		VARIABLE RESISTOR (S)				DISPLAY TUBE	
VR104, 105	EVNDXAA00B53	V. R. RF RECORDING LEVEL ADJ.		FL601	RSL0062-F	DISPLAY TUBE	
VR106	EVNDXAA00B14	V. R. RF RECORDING LEVEL ADJ.				FUSE (S)	
VR107, 108	EVNDXAA00B13	V. R. ATF GAIN ADJ.					
VR201	EVNDXAA00B54	V. R. PG PHASE ADJ.					
VR271	EVNDCAA03B54	V. R. TAPE BEGIN/END DET. ADJ.		F2	XBA2C04TB0S	FUSE, 250V 400mA	△
VR401	EVJC51F04703	V. R. REC BALANCE		F3	XBA2C02TB0S	FUSE, 250V 200mA	△
VR402	EVJC20F02A24	V. R. REC LEVEL				SWITCH (ES)	
VR501, 502	EVNDXAA00B53	V. R. DAC OUTPUT BALANCE ADJ.					
VR503, 504	EVNDXAA00B15	V. R. DAC OFF-SET ADJ.					
VR551	EVU57A022A14	V. R. HEADPHONES LEVEL		S1	ESB8249V	SW, POWER	△
				S2	ESE37263	SW, VOLTAGE ADJ.	△
		COMPONENT COMBINATION (S)		S601	ESD1511201	SW, SAMPLING FREQ. SELECTOR	
				S602	ESB64801	SW, ANALOG/DIGITAL SELECTOR	
Z901, 902	EXCEMT471BT	COMPONENT COMBINATION		S613	EVQQTG05R	SW, AUTO/MANUAL	

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
S614	EVQQTG05R	SW, RESET		CN57	RJP6G28ZA	CONNECTOR (6P)	
S616	EVQQTG05R	SW, COUNTER RESET		CN58	RJT036W002	CONNECTOR (2P)	
S618	EVQQTG05R	SW, REW		CN62	RJS7Q11ZA	CONNECTOR (7P)	
S619	EVQQTG05R	SW, FF		CN67	RHR190ZA	CONNECTOR (3P)	
S622	EVQQTG05R	SW, LOCAL/REMOTE		CN801	SJSD1205	CONNECTOR (12P)	
S623	EVQQTG05R	SW, COUNTER MODE		CN802, 803	RJS1A5009	CONNECTOR (9P)	
S624	EVQQTG05R	SW, REVERSE SKIP		CN804	RJS1A5115	CONNECTOR (15P)	
S625	EVQQTG05R	SW, FORWARD SKIP		CN805	RJS5T4ZA	CONNECTOR (5P)	
S626	EVQQTG05R	SW, PAUSE		CN806	RHR193ZA	CONNECTOR (5P)	
S627	EVQQTG05R	SW, REC		CN808	RJS3T4ZA	CONNECTOR (3P)	
S628	EVQQTG05R	SW, AUTO REC MUTE		CN901, 902	RJ93MS02	ANALOG IN TERMINAL	
S631	EVQQTG05R	SW, PLAY		CN903, 904	RJ93MS01	ANALOG OUT TERMINAL	
S632	EVQQTG05R	SW, STOP		CN905	RJ93MS02	AES/EBU IN TERMINAL	
S635	EVQQTG05R	SW, OPEN/CLOSE		CN906	RJ93MS01	AES/EBU OUT TERMINAL	
S701	EVQWR4002	SW, TAPE HOLE DET.		CN907	SJF3057-7A-1	IEC TYPE2 IN/OUT TERMINAL	
S702	EVQWXM001	SW, LOAD DET.		CN911, 912	REZ0294A	CONNECTOR (6P)	
S703	EVQWXM001	SW, MODE DET.		CN913	RHR190ZA	CONNECTOR (3P)	
S751, 752	SSPD18-1	SW, LEAF (OPEN/CLOSE)		CN1003	REE0295	CONNECTOR (10P)	
S801	RST1H001	SW, DIP		CN1003A	RHR199ZA	CONNECTOR (12P)	
S802	RST1D001	SW, DIP		CN1004	RHR191ZA	CONNECTOR (4P)	
S901	SSS189	SW, OUTPUT LEVEL SELECTOR					
S902	RST1D001	SW, DIP				METER	
		JACK (S) & SOCKET (S)		HM1002	RSE0001	HOURLY METER	
JK1	SJVD06	AC INLET	△			CONNECTOR ASS'Y	
JK550	SJJD19	HEADPHONES					
JK1002	QJS1955H	PARALLEL REMOTE		JCN1	RWJ0710130QQ	CONNECTOR ASS'Y (10P)	
SK801	RJS1E0164	IC SOCKET		JCN3	RWJ0710110QQ	CONNECTOR ASS'Y (10P)	
				JCN5	RWJ0706200QQ	CONNECTOR ASS'Y (6P)	
				JCN8	RWJ1006400KQ	CONNECTOR ASS'Y (6P)	
		CONNECTOR (S) & TERMINAL (S)		JCN9	REZ0121A	CONNECTOR ASS'Y (6P)	
				JCN16	RWJ0705110QQ	CONNECTOR ASS'Y (5P)	
CN1	RHR197ZA	CONNECTOR (10P)		JCN30	RWJ1005310KQ	CONNECTOR ASS'Y (5P)	
CN2	SJSD1005	CONNECTOR (10P)		JCN42	REZ0125A	CONNECTOR ASS'Y (10P)	
CN3, 4	RHR197ZA	CONNECTOR (10P)		JCN45	REZ0126A	CONNECTOR ASS'Y (5P)	
CN5	RHR193ZA	CONNECTOR (6P)		JCN56	REZ0127A	CONNECTOR ASS'Y (6P)	
CN6, 7	RJS6T4ZA	CONNECTOR (6P)		JCN67	RWJ0703230QQ	CONNECTOR ASS'Y (3P)	
CN10-12	RJP6G27ZA	CONNECTOR (6P)		JCN70	REZ0138A-1	CONNECTOR ASS'Y (2P)	
CN13	RJS3T4ZA	CONNECTOR (3P)		JCN806	RWJ0705230QQ	CONNECTOR ASS'Y (5P)	
CN16	RHR192ZA	CONNECTOR (5P)		JCN913	RWJ0703230QQ	CONNECTOR ASS'Y (3P)	
CN18	RJS5T4ZA	CONNECTOR (5P)		JCN1003	RWJ0710150QQ	CONNECTOR ASS'Y (10P)	
CN21, 22	RJS6Q8ZA	CONNECTOR (6P)		JCN1003A	RWJ0712120QQ	CONNECTOR ASS'Y (12P)	
CN23	RJS4T4ZA	CONNECTOR (4P)		JCN1004	RWJ0704150QQ	CONNECTOR ASS'Y (4P)	
CN26	RJP8G27ZA	CONNECTOR (8P)					
CN28	RJP10G27ZA	CONNECTOR (10P)				RELAY (S)	
CN29	RJS5T4ZA	CONNECTOR (5P)					
CN41	RJP10G27ZA	CONNECTOR (10P)					
CN43, 44	SJSD1721	CONNECTOR (17P)		RLY401	AG80239	RELAY	
CN45	RJP5G27ZA	CONNECTOR (5P)		RLY901, 902	AG80239	RELAY	
CN51	RJP3G27ZA	CONNECTOR (3P)					
CN52-54	RJU051W015	CONNECTOR (15P)					
CN56	RJP4G28ZA	CONNECTOR (4P)					

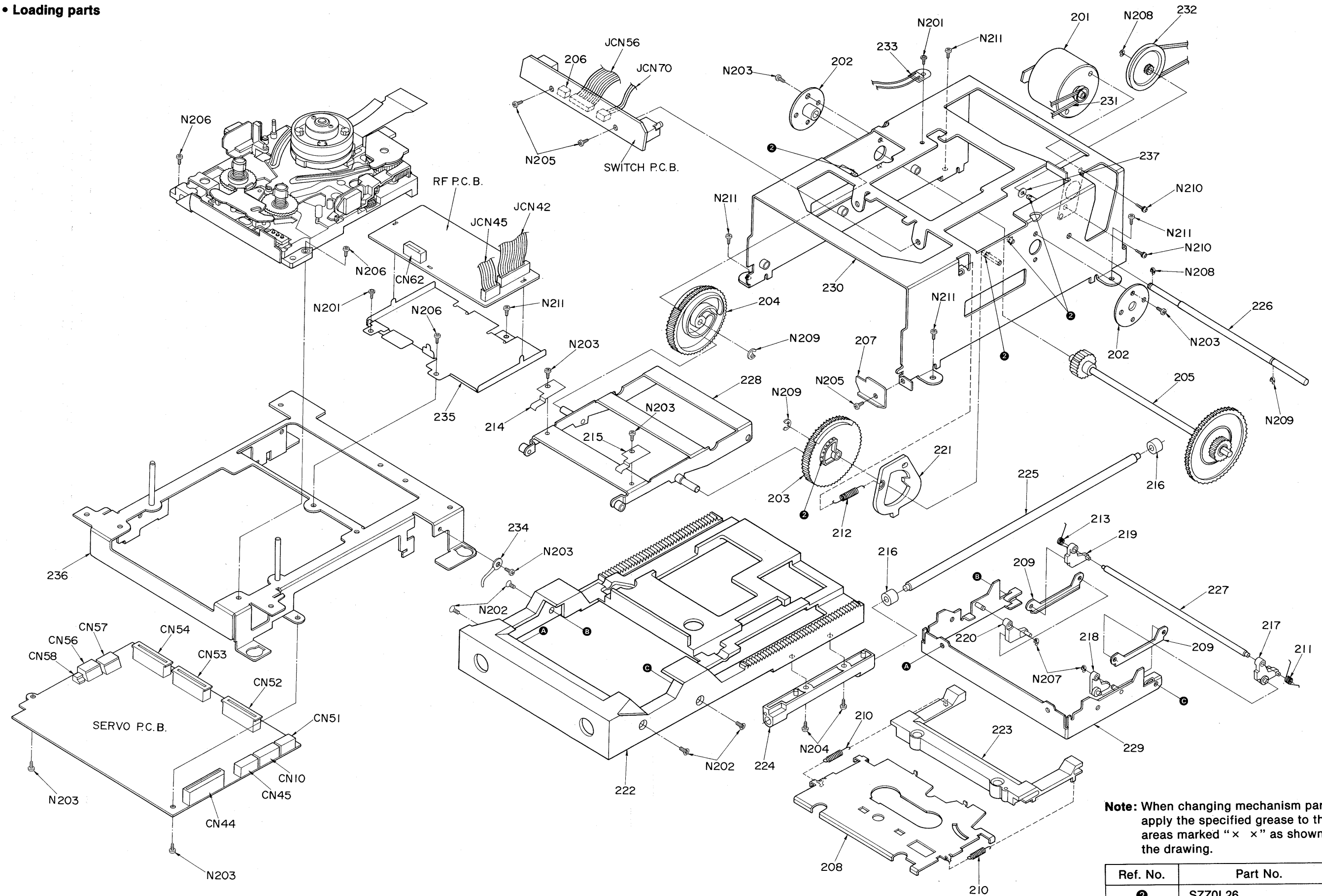
EXPLODED VIEWS

• Cabinet and chassis parts

A
B
C
D
E
F
G



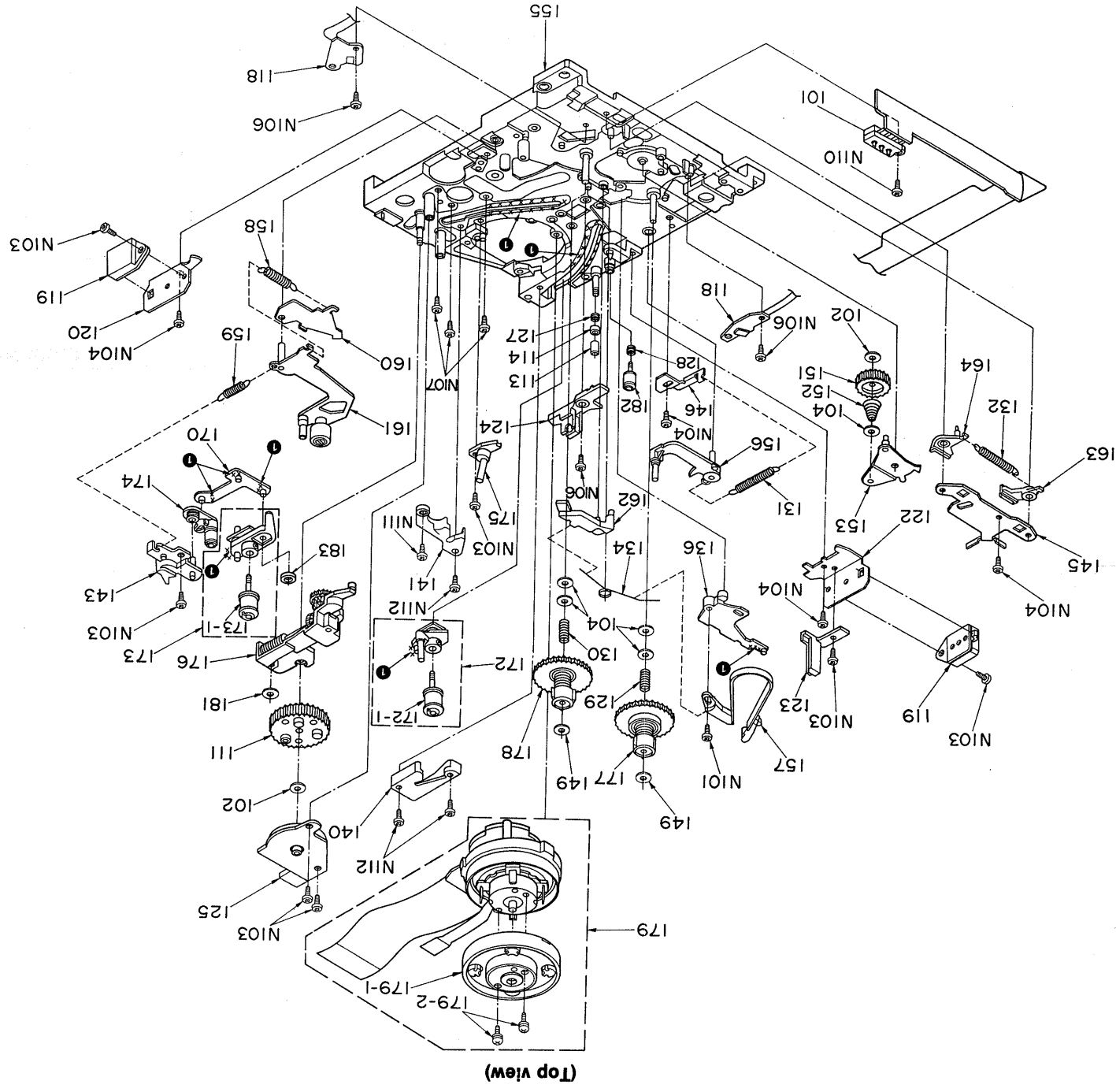
• Loading parts



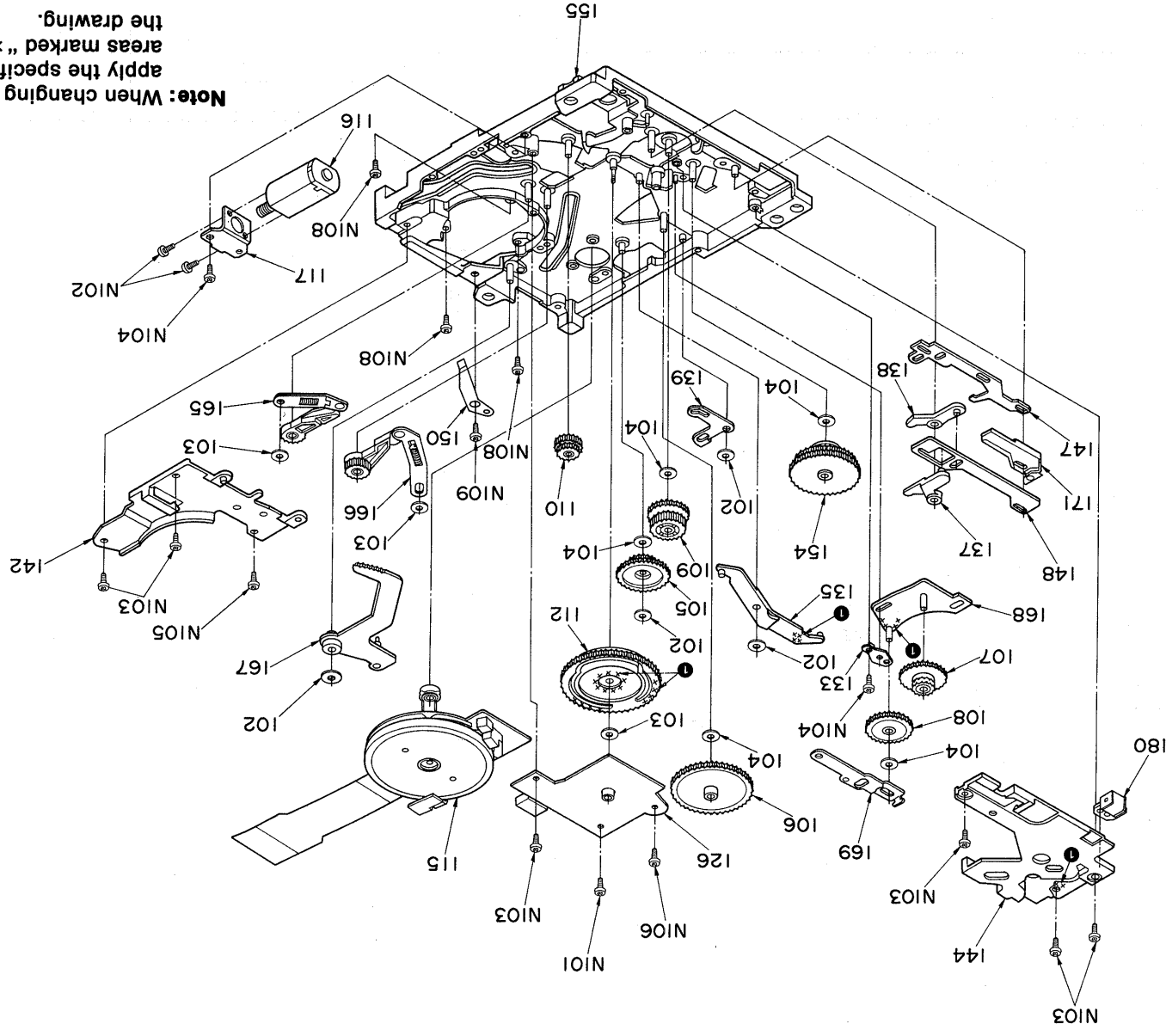
Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

Ref. No.	Part No.
②	SZZ0L26

- Mechanism parts (RAA1001)



(Bottom view)



Note: When changing mechanism parts, apply the specified grease to the areas marked "x" as shown in the drawing.

Ref. No.	Part No.
①	RZZZ01.06

REPLACEMENT PARTS LIST

Notes : * Important safety notice:
Components identified by  mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS					
1	RMY0030	RADIATOR		N5	XTB3+16JFR	SCREW	
2	SNE1004-1	GND PLATE		N6	XSN26+4FZ	SCREW	
3	SMN2080	EARTH PLATE		N7	XTBS3+8FFZ1	SCREW	
4	RMA0202	FL HOLDER		N8	XTV3+6G	SCREW	
5	REZ0136A	CONNECTOR		N9	XTW3+6T	SCREW	
6	REZ0137A	CONNECTOR		N10	XVE3A4FP	SCREW	
7	RGK0165A-H	TRAY ORNAMENT		N11	XNS12	NUT	
8	RGQ0059	CARD SPACER		N12	XNS7S	NUT	
9	RGQ0046	WIRE SADDLE		N13	XTB3+6F	SCREW	
10	RFKHV3900EBH	REAR PANEL ASS'Y	(EB)	N14	XNS9	NUT	
10	RFKHV3900EGH	REAR PANEL ASS'Y	(EG)	N15	XWC3B	WASHER	
11	RGU0030A	BUTTON, POWER		N16	XWC4B	WASHER	
12	RGU0235-H	BUTTON, OPERATION A		N17	XTB3+8GFR	SCREW	
13	RGU0236A-H	BUTTON, OPERATION B		N18	XYA3+CJ16FR	SCREW	
14	SHE181	P. C. B. SUPPORT		N19	XTB4+8F	SCREW	
15	RGU0238	BUTTON, SWITCH		N20	XTB3+10GFR	SCREW	
16	RGV0033	KNOB, SAMPLING FREQUENCY		N21	XSB3+8	SCREW	
17	RGW0055	KNOB, BALANCE/H. P. LEVEL		N22	XTB3+20JFR	SCREW	
18	RKA0009-K	FOOT					
19	RKF0089	HOLDER(SERVO P. C. B.)				MECHANISM PARTS	
20	RKM0076-H	CABINET					
21	RMA0192	HOLDER(HEADPHONES)		101	EVQWR4002	CASSETTE SW.	
22	RMA0193	HOLDER(BALANCE/REC LEVEL)		102	QBW2008	WASHER	
23	RMG0134	MECHANISM SUPPORT		103	QBW2030	WASHER	
24	RMK0068-2	CHASSIS		104	QBW2059	WASHER	
25	RFKGV3900PPH	FRONT PANEL ASS'Y		105	RDG0066-1	MAIN GEAR A	
26	RYQ0049-1	KNOB, REC LEVEL		106	RDG0067	MAIN GEAR B	
27	SHE185-1	P. C. B. SUPPORT		107	RDG0068	IDLER GEAR (P)	
28	RMA0408	ANGLE		108	RDG0069	IDLER GEAR (F)	
29	RMY0047-1	RADIATOR		109	RDG0070	COUNTER GEAR	
30	RMC0117	EARTH PLATE		110	RDG0073-1	MODE REPEATING GEAR	
31	RMZ0095-1	INSULATION SHEET (A)		111	RDK0006-1	LOAD CAM	
32	RMZ0096	INSULATION SHEET (B)		112	RDK0007-1	MODE CAM	
33	SHR330	BINDER		113	RDPO020	FIXED POST	
34	SHR9815	RIVET		114	RDPO021	FIXED POST FLANGE	
35	SJT347	FUSE HOLDER		115	REM0001	CAPSTAN UNIT	
36	SJT345	HOUR METER HOLDER		116	REM0009	MODE MOTOR ASS'Y	
				117	RMN0028	HOLDER, MODE MOTOR	
				118	REQ0012	INTERFACE P. C. B.	
				119	REQ0014	BEGIN/END DET. SENSOR ASS'Y	
				120	RMN0030	BEGIN DET. ANGLE	
		SCREWS		122	RMN0029	END DET. ANGLE	
				123	RMQ0059	LEAD OPENER	
N1	XTB3+8J	SCREW		124	REQ0018	BEGIN/END DET. LED ASS'Y	
N2	SHDD4-1	SCREW		125	EVQWXM001	LOAD SW ASS'Y	
N3	SNE2095-5	SCREW		126	EVQWXM001	MODE SW ASS'Y	
N4	XTBS3+8JFZ1	SCREW		127	RMB0061	SPRING, FIXED POST	

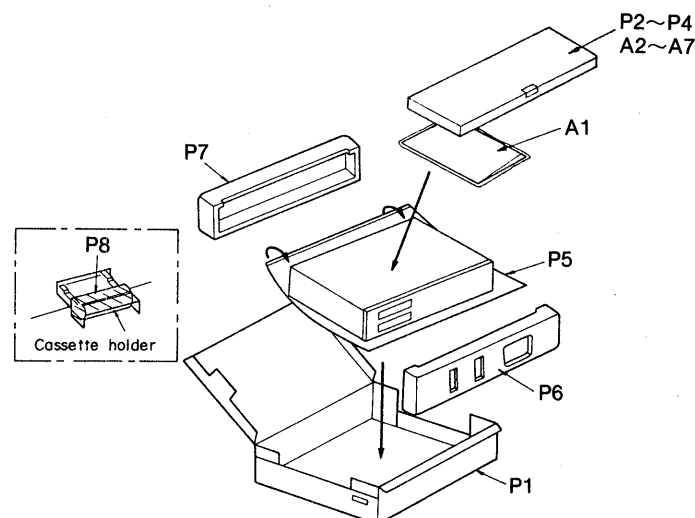
Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
128	RMB0063	SPRING, GUIDE ROLLER		178	RXR0007	T. REEL ASS'Y	
129	RMB0071	SPRING, S. REEL		179	VEG0752-1	CYLINDER UNIT	
130	RMB0073-1	SPRING, T. REEL		179-1	VEH0460	UPPER CYLINDER	
131	RMB0074	SPRING, TENSION		179-2	VHD0593	SCREW	
132	RMB0075	SPRING, BRAKE		180	RSJ0006	PLUNGER	
133	RMC0034	ANGLE		181	QBW2081A	WASHER	
134	RME0037-1	SPRING, BT		182	RXP0031	GUIDE ROLLER	
135	RML0088	LEVER, PINCH		183	RHW12009	GUIDE WASHER	
136	RML0090	LEVER, TENSION				SCREWS	
137	RML0094	LEVER, S. BRAKE					
138	RML0095	LEVER, T. BRAKE					
139	RML0103	LEVER, LOAD SELECT		N101	QH1371	SCREW	
140	RMQ0052	S. STOPPER		N102	XQN14+C16	SCREW	
141	RMQ0053	T. STOPPER		N103	RHQ0014	SCREW	
142	RMQ0055	LOAD GUIDE HOLDER		N104	RHQ0007	SCREW	
143	RMQ0056-1	GUIDE ARM STOPPER		N105	RHQ0015	SCREW	
144	RMQ0058	MODE GUIDE PLATE		N106	RHQ0016	SCREW	
145	RMQ0062	IDLER GUIDE		N107	RHQ0017	SCREW	
146	RMQ0063	TENSION SPRING HOOK		N108	XQN16+A45T	SCREW	
147	RMQ0064-1	S. BRAKE DRIVE PLATE		N109	XQN2+A2	SCREW	
148	RMQ0065-1	T. BRAKE DRIVE PLATE		N110	RHQ0018	SCREW	
149	RNW172ZA	WASHER		N111	RHQ0019	SCREW	
150	RUS740ZA	EARTH ANGLE		N112	RHQ0020	SCREW	
151	RDG0071	IDLER GEAR				LOADING PARTS	
152	RMB0069	IDLER SPRING					
153	RXL0051	IDLER ARM ASS'Y		201	RFKPVDA10-K	MOTOR ASS'Y	
154	RXG0011-2	DRIVE GEAR		202	RDB0032	HOLDER, GEAR SHAFT	
155	RXK0019	CHASSIS UNIT		203	RDG0120-2	MAIN GEAR	
156	RXL0035-4	TENSION ARM ASS'Y		204	RDG0122-1	MAIN GEAR	
157	RXL0036	TENSION BAND ASS'Y		205	RFKNVDA10BK	GEAR SHAFT ASS'Y	
158	RMB0066	PIN-PRESSURE SPRING		206	RJP2G27ZA	CONNECTOR (CN72)	
159	RMB0067	PINCH ROLLER SPRING		207	RMA0194	SHAFT FRAME	
160	RMN0036	PIN-PRESSURE LINK		208	RMA0486	ANGLE, CASSETTE HOLDER	
161	RXL0046	PINCH ARM ASS'Y		209	RMA0200	HOLDER ARM	
162	RXL0048	BT LEVER ASS'Y		210	RMB0110	SPRING	
163	RXL0049	S. BRAKE ASS'Y		211	RMB0111	SPRING	
164	RXL0050	T. BRAKE ASS'Y		212	RMB0131	SPRING	
165	RXL0052-1	S. LOAD ARM		213	RMB0144	SPRING	
166	RXL0054-1	T. LOAD ARM		214	RMC0050-1	ANGLE	
167	RXL0056-2	LOAD LEVER		215	RMC0051-1	ANGLE	
168	RXL0057	P. F. IDLER ASS'Y		216	RMG0090	RUBBER	
169	RXL0058	LEVER, P. F. SELECTION		217	RML0139-1	HOLDER, SHAFT	
170	RXM0018	GUIDE LINK ASS'Y		218	RML0140-1	HOLDER	
171	RXM0019	PLUNGER LINK ASS'Y		219	RML0141-1	HOLDER, SHAFT	
172	RXP0016-2	S. POST ROLLER ASS'Y		220	RML0142-1	HOLDER	
172-1	RXP0008	POST ROLLER		221	RML0150-1	HOLDER, MAIN GEAR	
173	RXP0017-1	T. POST ROLLER ASS'Y		222	RMRO206-H	TRAY	
173-1	RXP0008	POST ROLLER		223	RMRO207-H	CASSETTE HOLDER	
174	RXP0020-1	T. GUIDE ROLLER		224	RMRO209-1	SHAFT ANGLE	
175	RXQ0057	T. INCLINED BASE ASS'Y		225	RMS0158-1	SHAFT	
176	RXQ0079-1	LOAD HOLDER ASS'Y		226	RMS0160	SHAFT	
177	RXR0006	S. REEL ASS'Y					

Ref. No.	Part No.	Part Name & Description	Remarks
227	RMS0165	SHAFT	
228	RXA0046	SUB FRAME	
229	RXA0047	CASSETTE HOLDER	
230	RXK0059	FRAME	
231	SMQ20025	BELT	
232	SMQ40032	PULLY GEAR	
233	EYHS78R	DEW SENSOR	
234	SHE36-3	EARTH TERMINAL	
235	RSC0066	SHIELD PLATE	
236	RXA0060	MECHANISM FRAME	
237	RMX0044	WASHER	
		SCREWS	
N201	XSN2+3	SCREW	
N202	XSS26+4FZ	SCREW	
N203	XTB3+6J	SCREW	
N204	XTN3+10G	SCREW	
N205	XTN3+6B	SCREW	
N206	XTN3+8F	SCREW	
N207	XUC15FT	WASHER	
N208	XUC2FT	WASHER	
N209	XUC3FT	WASHER	
N210	XYN26+C33	SCREW	
N211	XTB3+6F	SCREW	
		PACKING MATERIAL	
P1	RPG0936	PACKING CASE	
P2	RPNO391-1	PAD	
P3	RPNO392	PAD	
P4	XZB09X10C03	PROTECTION BAG (SCREW)	
P5	RPF0017	PROTECTION BAG (UNIT)	
P6	RPNO221	PAD (FRONT)	
P7	RPNO222	PAD (BACK)	
P8	RPH065-1	TRAY COVER	
		ACCESSORIES	
A1	RQF1179	INSTRUCTION MANUAL	
A2	SJPD19-1E	COAXIAL CABLE	
A3	SJAD8	AC POWER SUPPLY CORD	△ (EB)
A3	RJA0003-K	AC POWER SUPPLY CORD	△ (EG)
A4	RYQ0059-1	RACK MOUNT KIT	
A5	RYQ0060-1	RACK MOUNT KIT	
A6	XYN3+F10FZ	SCREW	
A7	RT-RCLP	CLEANING TAPE	
		<PRINTED CIRCUIT BOARDS ASS'Y>	
PCB1	REP0814D	MAIN P. C. B. ASS'Y	(NLA)

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1-1	RFKBV3900EBA	PARALLEL REMOTE P. C. B.	(NLA)
		DIGITAL TERMINAL P. C. B.	(NLA)
		AC IN P. C. B.	(NLA)
		POWER SWITCH P. C. B.	(NLA)
		POWER TRANSFORMER P. C. B.	(NLA)
		ANALOG TERMINAL P. C. B.	(NLA)
		BALANCE/REC LEVEL P. C. B.	(NLA)
		OUTPUT LEVEL P. C. B.	(NLA)
		VOLTAGE ADJ. P. C. B.	(NLA)
PCB1-2	RFKBV3900EBI	MAIN P. C. B.	(NLA)
PCB2	REP0693B	REGULATOR IC P. C. B.	(NLA)
		POWER SUPPLY P. C. B.	(NLA)
PCB3	REP0694B	OPERATION P. C. B.	(NLA)
		HEADPHONES JACK P. C. B.	(NLA)
PCB4	REP0417A	RF P. C. B., SERVO P. C. B. ASS'Y	(NLA)
PCB4-1	RFKBV3700-N	RF P. C. B.	(NLA)
PCB4-2	RFKBV3700-0	SERVO P. C. B.	(NLA)
PCB5	REP0421A	TRAY MOTOR P. C. B.	(NLA)
		SWITCH P. C. B.	(NLA)
PCB6	REQ0012	CONNECTOR P. C. B.	(NLA)
PCB7	REP0737A	INTERFACE P. C. B.	(NLA)
		<MECHANISM ASS'Y>	
MECH1	RAA1001	MECHANISM UNIT	(NLA)

Note: Printed circuit board assembly and mechanism assembly with mark (NLA) is no longer available after discontinuation of the product.

PACKING



RESISTORS & CAPACITORS

Notes : * Capacity value are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
 * Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS						
R11	ERDS2TJ392T	1/4W 3.9K	R209	ERJ6GEYJ153V	1/10W 15K	R294-296	ERJ6GEYJ473V	1/10W 47K
R12	ERD25FJ102	1/4W 1K Δ	R210	ERJ6GEYJ102V	1/10W 1K	R297	ERJ6GEYJ220	1/10W 22
R13, 14	ERG1ANJP560S	1W 56	R212	ERJ6GEYJ105	1/10W 1M	R298	ERJ6GEYJ473V	1/10W 47K
R101, 102	ERJ6GEYJ221V	1/10W 220	R213	ERJ6GEYJ274V	1/10W 270K	R301-306	ERJ6GEYJ332V	1/10W 3.3K
R103, 104	ERJ6GEYJ681V	1/10W 680	R214	ERJ6GEYJ682V	1/10W 6.8K	R309-312	ERJ6GEYJ332V	1/10W 3.3K
R112, 113	ERJ6GEYJ332V	1/10W 3.3K	R215	ERJ6GEYJ184V	1/10W 180K	R313	ERJ6GEYJ331V	1/10W 330
R115	ERJ6GEYJ332V	1/10W 3.3K	R216	ERJ6GEYJ101V	1/10W 100	R314-320	ERJ6GEYJ561V	1/10W 560
R117	ERJ6GEYJ102V	1/10W 1K	R217, 218	ERJ6GEYJ472V	1/10W 4.7K	R321	ERJ6GEYJ331V	1/10W 330
R118	ERJ6GEYJ471V	1/10W 470	R219, 220	ERJ6GEYJ103V	1/10W 10K	R322	ERJ6GEYJ561V	1/10W 560
R123	ERJ6GEYJ822V	1/10W 8.2K	R221, 222	ERJ6GEYJ474V	1/10W 470K	R323	ERJ6GEYJ473V	1/10W 47K
R124	ERJ6GEYJ152V	1/10W 1.5K	R223, 224	ERJ6GEYJ222V	1/10W 2.2K	R324	ERJ6GEYJ331V	1/10W 330
R126	ERJ6GEYJ152V	1/10W 1.5K	R225, 226	ERJ6GEYJ184V	1/10W 180K	R325	ERJ6GEYJ561V	1/10W 560
R128	ERJ6GEYJ822V	1/10W 8.2K	R227	ERJ6GEYJ102V	1/10W 1K	R326	ERJ6GEYJ332V	1/10W 3.3K
R131	ERJ6GEYJ331V	1/10W 330	R228	ERJ6GEYJ222V	1/10W 2.2K	R331-333	ERJ6GEYJ105	1/10W 1M
R132, 133	ERJ6GEYJ221V	1/10W 220	R229	ERJ6GEYJ103V	1/10W 10K	R334-336	ERJ6GEYJ561V	1/10W 560
R134	ERJ6GEYJ102V	1/10W 1K	R230	ERJ6GEYJ681V	1/10W 680	R337-339	ERJ6GEYJ102V	1/10W 1K
R135, 136	ERJ6GEYJ471V	1/10W 470	R231	ERJ6GEYJ821V	1/10W 820	R340	ERJ6GEYJ332V	1/10W 3.3K
R150	ERJ6GEYJ102V	1/10W 1K	R232	ERJ6GEYJ333V	1/10W 33K	R341	ERJ6GEYJ561V	1/10W 560
R151, 152	ERJ6GEYJ471V	1/10W 470	R233	ERJ6GEYJ393V	1/10W 39K	R342	ERJ6GEYJ103V	1/10W 10K
R153	ERJ6GEYJ223V	1/10W 22K	R234	ERJ6GEYJ333V	1/10W 33K	R343	ERJ6GEYJ331V	1/10W 330
R154, 155	ERJ6GEYJ471V	1/10W 470	R235	ERJ6GEYJ473V	1/10W 47K	R344	ERJ6GEYJ223V	1/10W 22K
R156, 157	ERJ6GEYJ222V	1/10W 2.2K	R236	ERJ6GEYJ332V	1/10W 3.3K	R351, 352	RRJ6GCAD822T	1/10W 8.2K
R158	ERJ6GEYJ102V	1/10W 1K	R237	ERX12SJR33E	1/2W 0.33	R354	RRJ6GCAD822T	1/10W 8.2K
R159	ERJ6GEYJ223V	1/10W 22K	R240	ERJ6GEYJ151V	1/10W 150	R355	ERJ6GEYJ102V	1/10W 1K
R160	ERJ6GEYJ221V	1/10W 220	R241	ERJ6GEYJ333V	1/10W 33K	R356-358	ERJ6GEYJ103V	1/10W 10K
R162	ERJ6GEYJ472V	1/10W 4.7K	R242	ERJ6GEYJ103V	1/10W 10K	R359	ERJ6GEYJ102V	1/10W 1K
R164, 165	ERJ6GEYJ472V	1/10W 4.7K	R243	ERJ6GEYJ473V	1/10W 47K	R360	RRJ6GCAD183T	1/10W 18K
R167	ERJ6GEYJ332V	1/10W 3.3K	R244	ERJ6GEYJ102V	1/10W 1K	R361	RRJ6GCAD153T	1/10W 15K
R168	ERJ6GEYJ102V	1/10W 1K	R245	ERX12SJR33E	1/2W 0.33	R362	ERJ6GEYJ331V	1/10W 330
R169	ERJ6GEYJ471V	1/10W 470	R247	ERJ6GEYJ331V	1/10W 330	R363	ERJ6GEYJ103V	1/10W 10K
R172	ERJ6GEYJ102V	1/10W 1K	R248	ERJ6GEYJ822V	1/10W 8.2K	R364	ERJ6GEYJ105	1/10W 1M
R173, 174	ERJ6GEYJ222V	1/10W 2.2K	R249	ERJ6GEYJ472V	1/10W 4.7K	R365	ERJ6GEYJ331V	1/10W 330
R175	ERJ6GEYJ151V	1/10W 150	R250	ERJ6GEYJ153V	1/10W 15K	R366	RRJ6GCAD683T	1/10W 68K
R176	ERJ6GEYJ104V	1/10W 100K	R251	ERJ6GEYJ104V	1/10W 100K	R367	ERJ6GEYJ331V	1/10W 330
R178	ERJ6GEYJ820V	1/10W 82	R271, 272	ERJ6GEYJ103V	1/10W 10K	R368	ERJ6GEYJ561V	1/10W 560
R181	ERJ6GEYJ331V	1/10W 330	R273	ERJ6GEYJ681V	1/10W 680	R409, 410	ERDAS3J102T	1/4W 1K
R193-195	ERJ6GEYJ102V	1/10W 1K	R274	ERSB39JR82U	1/4W 0.82	R411, 412	ERDAS3J273T	1/4W 27K
R196	ERJ6GEYJ103V	1/10W 10K	R275	ERJ6GEYJ473V	1/10W 47K	R413, 414	ERDAS3J472T	1/4W 4.7K
R197	ERJ6GEYJ102V	1/10W 1K	R277, 278	ERJ6GEYJ333V	1/10W 33K	R415, 416	ERDAS3J273T	1/4W 27K
R201	ERJ6GEYJ102V	1/10W 1K	R279	ERJ6GEYJ683V	1/10W 68K	R417	ERJ6GEYJ331V	1/10W 330
R202, 203	ERJ6GEYJ223V	1/10W 22K	R280	ERJ6GEYJ333V	1/10W 33K	R419, 420	ERJ6GEYJ331V	1/10W 330
R204	ERJ6GEYJ103V	1/10W 10K	R281	ERJ6GEYJ332V	1/10W 3.3K	R421-424	ERJ6GEYJ225V	1/10W 2.2M
R205	ERJ6GEYJ683V	1/10W 68K	R282	ERJ6GEYJ682V	1/10W 6.8K	R447	ERJ6GEYJ561V	1/10W 560
R206	ERJ6GEYJ684V	1/10W 680K	R284	ERJ6GEYJ103V	1/10W 10K	R500	ERJ6GEYJ102V	1/10W 1K
R207	ERJ6GEYJ472V	1/10W 4.7K	R285	ERJ6GEYJ104V	1/10W 100K	R503-508	ERJ6GEYJ102V	1/10W 1K
R208	ERJ6GEYJ683V	1/10W 68K	R286	ERJ6GEYJ103V	1/10W 10K	R509, 510	ERJ6GEYJ473V	1/10W 47K
			R287	ERJ6GEYJ684V	1/10W 680K	R517-520	ERDAS3J472T	1/4W 4.7K
			R289, 290	ERJ6GEYJ473V	1/10W 47K	R521, 522	ERDS2TJ682T	1/4W 6.8K
			R292, 293	ERJ6GEYJ563V	1/10W 56K	R523, 524	ERDS2TJ103	1/4W 10K

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
R525, 526	ERDAS3J472T	1/4W 4.7K	R925, 926	ERJ6GEYJ105	1/10W 1M	C29	ECEA1WJ330	35V 33U
R527, 528	ERDAS3J332T	1/4W 3.3K	R927, 928	ERDAS3J332T	1/4W 3.3K	C30, 31	ECKR1H103ZF5	50V 0.01U
R529, 530	ERDAS3J152T	1/4W 1.5K	R929, 930	ERDAS3J562T	1/4W 5.6K	C32	ECEA1EU470	25V 47U
R531-534	ERDAS3J332T	1/4W 3.3K	R931-938	ERDS2TKF1002	1/4W 10K	C34	ECKR1H103ZF5	50V 0.01U
R535, 536	ERDAS3J152T	1/4W 1.5K	R939, 940	ERDS2TKF3903	1/4W 390K	C79	ECKR1H103ZF5	50V 0.01U
R537, 538	ERJ6GEYJ105	1/10W 1M	R941-944	ERDS2TKF2002	1/4W 20K	C101, 102	ECUV1H222KBN	50V 2200P
R569-572	ERJ6GEYJ124V	1/10W 120K	R945, 946	ERDAS3J122T	1/4W 1.2K	C103, 104	ECUV1H471KCN	50V 470P
R575, 576	ERDS2TJ102	1/4W 1K	R947, 948	ERDS2TKF5103	1/4W 510K	C105	ECUV1H470JCN	50V 47P
R577	ERDAS3J332T	1/4W 3.3K	R949, 950	ERDS2TKF2202	1/4W 22K	C107	ECUV1H222KBN	50V 2200P
R577A	ERDS2TJ103	1/4W 10K	R951-954	ERDS2TKF75R0	1/4W 75.0	C110	ECEA0JK221B	6.3V 220U
R578	ERDAS3J332T	1/4W 3.3K	R955, 956	ERDS2TKF5103	1/4W 510K	C123	ECUV1C105ZFM	16V 1U
R578A	ERDS2TJ103	1/4W 10K	R957, 958	ERDS2TKF2202	1/4W 22K	C124, 125	ECUV1H472KBN	50V 4700P
R579	ERDAS3J332T	1/4W 3.3K	R959-962	ERDAS3J103T	1/4W 10K	C126, 127	ECUV1H470JCN	50V 47P
R579A	ERDS2TJ123	1/4W 12K	R963, 964	ERJ6GEYJ473V	1/10W 47K	C129, 130	ECEA0JKS220B	6.3V 22U
R580	ERDAS3J332T	1/4W 3.3K	R965	ERDS2TJ221	1/4W 220	C131	ECUV1H222KBN	50V 2200P
R580A	ERDS2TJ123	1/4W 12K	R967, 968	ERDAS3J472T	1/4W 4.7K	C150	ECUV1H471KCN	50V 470P
R581A	ERDS2TJ104	1/4W 100K	R969-972	ERDS2TJ331	1/4W 330	C151	ECUV1H222KBN	50V 2200P
R581	ERJ6GEYJ472V	1/10W 4.7K	R973, 974	ERJ6GEYJ153V	1/10W 15K	C152	ECUV1H102KBN	50V 1000P
R582A	ERDS2TJ104	1/4W 100K	R975, 976	ERJ6GEYJ101V	1/10W 100	C154	ECUV1H220JCN	50V 22P
R582	ERJ6GEYJ472V	1/10W 4.7K	R977	ERD25FJ101	1/4W 100 Δ	C155, 156	ECUV1H102KBN	50V 1000P
R583A	ERDAS3G100T	1/4W 10	R978, 979	ERJ6GEYJ330V	1/10W 33	C157	ECUV1C105ZFM	16V 1U
R583	ERJ6GEYJ472V	1/10W 4.7K	R980	ERJ6GEYJ331V	1/10W 330	C159	ECUV1H220JCN	50V 22P
R584A	ERDAS3G100T	1/4W 10	R981	ERJ6GEYJ334V	1/10W 330K	C161	ECUV1H562KBN	50V 5600P
R584	ERJ6GEYJ472V	1/10W 4.7K	R982	ERJ6GEYJ473V	1/10W 47K	C163	ECUV1H562KBN	50V 5600P
R585A	ERDAS3G330T	1/4W 33	R983	ERJ6GEYJ332V	1/10W 3.3K	C166	ECUV1E153MBN	25V 0.015U
R585	ERJ6GEYJ472V	1/10W 4.7K	R984, 985	ERDS2TJ750	1/4W 75	C167	ECUV1H102KBN	50V 1000P
R586A	ERDAS3G330T	1/4W 33	R986	ERJ6GEYJ223V	1/10W 22K	C168	ECUV1H270JCN	50V 27P
R586	ERJ6GEYJ472V	1/10W 4.7K	R987-990	ERDAS3J392T	1/4W 3.9K	C169	ECUV1H100JCN	50V 10P
R587A	ERDAS3G332T	1/4W 3.3K	R991, 992	ERDAS3J101T	1/4W 100	C171, 172	ECUV1H680JCN	50V 68P
R587	ERJ6GEYJ472V	1/10W 4.7K	R992A	ERJ6GEYJ100	1/10W 10	C173	ECUV1H471KCN	50V 470P
R588A	ERDAS3G332T	1/4W 3.3K	R993, 994	ERDAS3J101T	1/4W 100	C174	ECUV1E104MBN	25V 0.1U
R588	ERJ6GEYJ472V	1/10W 4.7K	R995, 996	ERJ6GEYJ473V	1/10W 47K	C175	ECUV1H472KBN	50V 4700P
R589, 590	ERDAS3G102T	1/4W 1K	R997	ERJ6GEYJ223V	1/10W 22K	C176	ECUV1E333MDN	25V 0.033U
R591, 592	ERDS2EJ121	1/4W 120	R998	ERJ6GEYJ101V	1/10W 100	C177, 178	ECUV1H101KCN	50V 100P
R593-596	ERDS2TJ222	1/4W 2.2K	R999	ERJ6GEYJ223V	1/10W 22K	C179	ECUV1E104MBN	25V 0.1U
R601-604	ERDS2TJ472	1/4W 4.7K	R1021	ERJ6GEYJ272V	1/10W 2.7K	C181	ECUV1C105ZFM	16V 1U
R605	ERDS2TJ100	1/4W 10	R1022	ERJ6GEYJ271V	1/10W 270	C185, 186	ECUV1H331KCN	50V 330P
R606-608	ERDS2TJ102	1/4W 1K	R1023	ERJ6GEYJ394V	1/10W 390K	C187	ECUV1H470JCN	50V 47P
R610, 611	ERDS2TJ471	1/4W 470				C188	ECUV1H331KCN	50V 330P
R612	ERDS2TJ102	1/4W 1K			CAPACITORS	C190	ECUV1H180JCN	50V 18P
R613-619	ERDS2TJ103	1/4W 10K				C201	ECEA0JK470	6.3V 47U
R620	ERDS2TJ471	1/4W 470	C1	ECKWKC103PF2	400V 0.01U Δ	C202	ECUV1E104ZFN	25V 0.1U
R621	ERDS2TJ105T	1/4W 1M	C11-19	ECKR1H103ZF5	50V 0.01U	C203, 204	ECUV1H180JCN	50V 18P
R801-820	ERDS2TJ472	1/4W 4.7K	C20	ECEA1EPZ332E	25V 3300U	C205, 206	ECUV1E104ZFN	25V 0.1U
R821	ERDS2TJ105T	1/4W 1M	C21	ECEA1CU100	16V 10U	C207	ECUV1H271KCN	50V 270P
R825-831	ERDS2TJ472	1/4W 4.7K	C22	ECEA1EPZ332E	25V 3300U	C208	ECUV1H221KCN	50V 220P
R901-904	ERDAS3J392T	1/4W 3.9K	C23	ECEA1CU100	16V 10U	C209, 210	ECUV1E104MBN	25V 0.1U
R905-908	ERDAS3J102T	1/4W 1K	C24	ECES1EU682G	25V 6800U	C211	ECUV1H221KCN	50V 220P
R909-912	ERDAS3J392T	1/4W 3.9K	C25	ECEA1CU100	16V 10U	C212, 213	ECEA1CK220	16V 22U
R913-920	ERDAS3J332T	1/4W 3.3K	C26	ECEA1CU472E	16V 4700U	C214, 215	ECUV1H101KCN	50V 100P
R921, 922	ERDAS3J102T	1/4W 1K	C27	ECEA1CU100	16V 10U	C216, 217	ECUV1C105ZFM	16V 1U
R923, 924	ERD25FJ331	1/4W 330 Δ	C28	ECEA1HJ221B	50V 220U	C218, 219	ECUV1H390KCN	50V 39P

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
C220, 221	ECUV1H121KCN	50V 120P	C371	ECUV1E104ZFN	25V 0.1U	C656	ECBT1H102KB5	50V 1000P
C222, 223	ECUV1C105ZFM	16V 1U	C372	ECEA0JU330	6.3V 33U	C657	ECEA0JK470	6.3V 47U
C224	ECQV1H683JZ3	50V 0.68U	C373	ECUV1H103ZFN	50V 0.01U	C658	ECBT1E103ZF	25V 0.01U
C225, 226	ECUV1H332MBN	50V 3300P	C374	ECEA0JU330	6.3V 33U	C659	ECEA1VK100B	35V 10U
C227	ECUV1E333MDN	25V 0.033U	C376	ECUV1E103KBN	25V 0.01U	C660	ECBT1E103ZF	25V 0.01U
C228	ECUV1H181KCN	50V 180P	C377, 378	ECUV1E223MBN	25V 0.022U	C694	ECBT1E103ZF	25V 0.01U
C229	ECEA0JK221B	6.3V 220U	C379	ECUV1E104ZFN	25V 0.1U	C751	ECKW1H103ZF5	50V 0.01U
C230	ECEA0JK470	6.3V 47U	C385	ECUV1H103ZFN	50V 0.01U	C801, 802	ECKR1H103ZF5	50V 0.01U
C231	ECEA1AU470	10V 47U	C389	ECUV1E104ZFN	25V 0.1U	C802A	ECQV1H104JZ3	50V 0.1U
C232	ECEA1CK220	16V 22U	C390	ECUV1H103ZFN	50V 0.01U	C803	ECKR1H103ZF5	50V 0.01U
C233	ECUV1E104ZFN	25V 0.1U	C391	ECUV1E103KBN	25V 0.01U	C803A	ECQV1H104JZ3	50V 0.1U
C234	ECEA1CK470	16V 47U	C392-395	ECUV1H103ZFN	50V 0.01U	C804	ECKR1H103ZF5	50V 0.01U
C235, 236	ECUV1E104ZFN	25V 0.1U	C396	ECUV1H390JCN	50V 39P	C804A	ECQV1H104JZ3	50V 0.1U
C237	ECUV1C105ZFM	16V 1U	C397	ECUV1H103ZFN	50V 0.01U	C805-813	ECKR1H103ZF5	50V 0.01U
C238	ECUV1E223MBN	25V 0.022U	C401	ECUV1E104ZFN	25V 0.1U	C814	ECEA1CU220	16V 22U
C239	ECUV1E683MBN	25V 0.068U	C404, 405	ECUV1H220JCN	50V 22P	C815, 816	ECCR1H470K5	50V 47P
C240	ECUV1E153MBN	25V 0.015U	C407, 408	ECUV1H103ZFN	50V 0.01U	C817	ECCR1H100K5	50V 10P
C241	ECUV1E104MBN	25V 0.1U	C411, 412	ECEA1CPZ470B	16V 47U	C818-820	ECKR1H103ZF5	50V 0.01U
C242-246	ECUV1E104ZFN	25V 0.1U	C425-430	ECUV1E104ZFN	25V 0.1U	C901-904	ECEA1CPZ470B	16V 47U
C247, 248	ECUV1E333MDN	25V 0.033U	C431, 432	ECEA0JPZ221B	6.3V 220U	C905-912	ECUV1H220JCN	50V 22P
C249	ECUV1E153MBN	25V 0.015U	C433, 434	ECQB1H272JZ	50V 2700P	C913, 914	ECEA1CPZ470B	16V 47U
C250	ECUV1E104MBN	25V 0.1U	C435	ECUV1E104ZFN	25V 0.1U	C915, 916	ECEA1CPZ101B	16V 100U
C251-253	ECUV1E104ZFN	25V 0.1U	C438	ECEA0JU101B	6.3V 100U	C917, 918	ECUV1H103ZFN	50V 0.01U
C260	ECUV1E334ZFM	25V 0.33U	C439, 440	ECEA1CU220	16V 22U	C919, 920	ECUV1H220JCN	50V 22P
C268	ECUV1C105ZFM	16V 1U	C500	ECUV1H102KBN	50V 1000P	C921-924	ECUV1H150JCN	50V 15P
C269	ECUV1E103KBN	25V 0.01U	C501, 502	ECHR1H271JZ3	50V 270P	C925-928	ECEA1CPZ221B	16V 220U
C270	ECEA0JK470	6.3V 47U	C503, 504	ECUV1H103ZFN	50V 0.01U	C929, 930	ECUV1H103ZFN	50V 0.01U
C271	ECUV1E104ZFN	25V 0.1U	C505, 506	ECHR1H103JZ3	50V 0.01U	C931	ECEA0JU330	6.3V 33U
C272	ECUV1E223MBN	25V 0.022U	C507, 508	ECEA1CU101	16V 100U	C932, 933	ECUV1E224ZFN	25V 0.22U
C273	ECUV1H101KCN	50V 100P	C509, 510	ECEA1CPZ101B	16V 100U	C934-937	ECUV1H470KCN	50V 47P
C274	ECUV1E103KBN	25V 0.01U	C511-514	ECEA0JPZ221B	6.3V 220U	C938, 939	ECUV1E224ZFN	25V 0.22U
C275	ECUV1C105ZFM	16V 1U	C515-518	ECUV1H220JCN	50V 22P	C940-942	ECUV1H103ZFN	50V 0.01U
C276	ECUV1H221KCN	50V 220P	C519, 520	ECEA1CU101	16V 100U	C943	ECUV1H470KCN	50V 47P
C280	ECUV1C334ZFN	16V 0.33U	C521	ECUV1E104ZFN	25V 0.1U	C944	ECUV1H103ZFN	50V 0.01U
C301-307	ECUV1H103ZFN	50V 0.01U	C523, 524	ECUV1H103ZFN	50V 0.01U	C945	ECKW1H103ZF5	50V 0.01U
C341	ECUV1E104ZFN	25V 0.1U	C525	ECEA0JU101B	6.3V 100U	C946	ECUV1H101KCN	50V 100P
C342	ECUV1H103ZFN	50V 0.01U	C526	ECUV1H103ZFN	50V 0.01U	C947-950	ECUV1H103ZFN	50V 0.01U
C350	ECUV1H103ZFN	50V 0.01U	C545, 546	ECUV1H220JCN	50V 22P	C953-960	ECHR1H221JZ3	50V 220P
C351	ECUV1E473MBN	25V 0.047U	C547, 548	ECUV1H103ZFN	50V 0.01U	C966	ECUV1H103ZFN	50V 0.01U
C352	ECUV1H820JCN	50V 82P	C549	ECUV1H470KCN	50V 47P	C990	ECUV1H103ZFN	50V 0.01U
C353	ECUV1H471JCN	50V 470P	C550A	ECQV1H104JZ3	50V 0.1U	C991, 992	ECEA1CU331	16V 330U
C354, 355	ECUV1H221JCN	50V 220P	C550	ECUV1H470KCN	50V 47P	C995, 996	ECUV1H103ZFN	50V 0.01U
C356	ECUV1H151JCN	50V 150P	C551, 552	ECQV1H104JZ3	50V 0.1U	C1020-1028	ECUV1H103ZFN	50V 0.01U
C357	ECEA0JU330	6.3V 33U	C553, 554	ECKT1H101KB	50V 100P			
C358-361	ECUV1H180JCN	50V 18P	C555, 556	ECQV1H104JZ3	50V 0.1U			
C362, 363	ECUV1H150JCN	50V 15P	C561, 562	ECEA1CU220	16V 22U			
C364	ECUV1H050CCN	50V 5P	C563, 564	ECEA1CN100SB	16V 10U			
C365	ECUV1H102KBN	50V 1000P	C602, 603	ECEA0JK470	6.3V 47U			
C366	ECUV1H103ZFN	50V 0.01U	C604, 605	ECBT1E103ZF	25V 0.01U			
C367, 368	ECEA0JU330	6.3V 33U	C652	ECBT1H102KB5	50V 1000P			
C369	ECEA0JU221	6.3V 220U	C654	ECBT1H102KB5	50V 1000P			
C370	ECUV1H150JCN	50V 15P	C655	ECEA1VK100B	35V 10U			