

SHARP SERVICE MANUAL

No. SX374IMDR420H

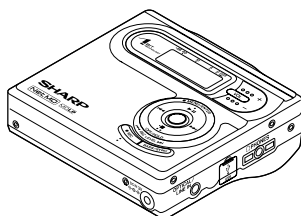


Illustration IM-DR400E

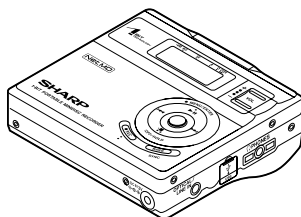


Illustration IM-DR410H/E

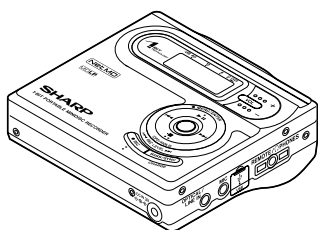


Illustration IM-DR420H

1-BIT PORTABLE MINIDISC RECORDER

IM-DR400E(S)

IM-DR410H/E(S)

MODEL IM-DR420H(S)

• In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.



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SAFETY PRECAUTION FOR SERVICE MANUAL

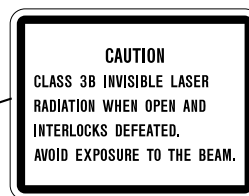
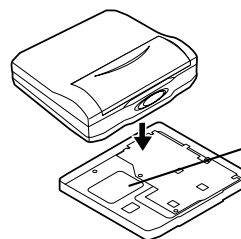
Precaution to be taken when replacing and servicing the Laser Pickup.

THE AEL (ACCESSIBLE EMISSION LEVEL) OF THE LASER POWER OUTPUT IS LESS THAN CLASS 1 BUT THE LASER COMPONENT IS CAPABLE OF EMITTING RADIATION EXCEEDING THE LIMIT FOR CLASS 1. THEREFORE IT IS IMPORTANT THAT THE FOLLOWING PRECAUTIONS ARE OBSERVED DURING SERVICING TO PROTECT YOUR EYES AGAINST EXPOSURE TO THE LASER BEAM.

- (1) When the cabinet has been removed, the power is turned on without a compact disc, and the Pickup is on a position outer than the lead-in position, the Laser will light for several seconds to detect a disc. Do not look into the Pickup Lens.
- (2) The Laser Power Output of the Pickup inside the unit and replacement service parts have already been adjusted prior to shipping.
- (3) No adjustment to the Laser Power should be attempted when replacing or servicing the Pickup.
- (4) Under no circumstances look directly into the Pickup Lens at any time.
- (5) **CAUTION** - Use of controls or adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Laser Diode Properties

- Material: GaAlAs
 - Wavelength: 785 nm
 - Pulse time:
- Read mode: 0.8 mW Continuous
Write mode: max 12 mW 0.5S
min cycle 1.5S
Repetition



English:

This product is classified as a CLASS 1 LASER PRODUCT.

German:

Dieses Produkt ist ein Laserprodukt der Klasse 1.

French:

Ce Produit est Classifié comme étant un PRODUCTO LASER DE CLASSE 1.

VARO ! Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.
VARNING! Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

Precaution to be taken when replacing and servicing the laser pickup.

The following precautions must be observed during servicing to protect your eyes against exposure to the laser.

Warning of possible eye damage when repairing:

If the AC adaptor or batteries are connected when the top housing (disc cover) of the unit is removed, and the PLAY key is pressed, the laser will light up during focus access (2-3 seconds). (Fig. 2-1) During the operation, the laser will leak from the opening between the magnetic head and the mechanical chassis (Fig. 2-2). In order to protect your eyes, you must not look at the laser during repair. Before repairing be sure to disconnect the AC adaptor and remove the batteries.

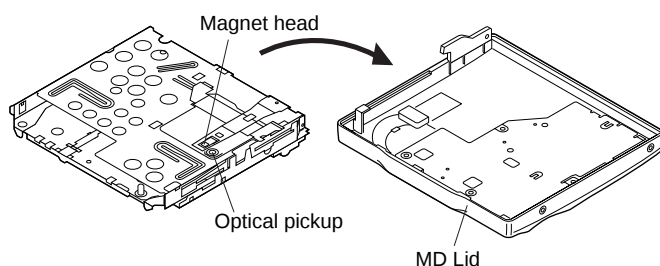


Figure 2-1

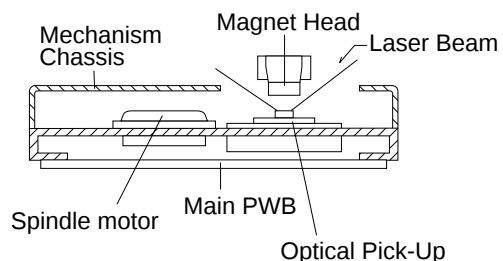


Figure 2-2

FOR A COMPLETE DESCRIPTION OF THE OPERATION OF THIS UNIT, PLEASE REFER TO THE OPERATION MANUAL.

SPECIFICATIONS

IM-DR400E/410H/E

Power source: DC 3 V: AC adaptor (AC 110 - 240 V, 50/60 Hz)
DC 1.5 V: Commercially available, "AA" size (LR6), alkaline battery x 1

Power consumption: 60 mA (AC adaptor)

Output power: RMS: 16 mW (8 mW + 8 mW)
(0.2 % T.H.D.)

Dimensions: Width: 83 mm (3-9/32")
Height: 28 mm (1-1/8")
Depth: 76 mm (3")
Excluding the projection around the USB connection terminal

Weight: 117 g (0.26 lbs.) without battery

Input socket: Line/optical digital

Output socket: Earphones (impedance: 32 ohms)

Type: Portable MiniDisc recorder

Signal readout: Non-contact, 3-beam semiconductor laser pickup

Audio channels: Stereo 2 channels/monaural 1 channel

Frequency response: 20 - 20,000 Hz (± 3 dB)

Rotation speed: Approx. 400 - 1,800 rpm CLV (Playback), approx. 400 - 2,700 rpm CLV (Recording)

Error correction: ACIRC (Advanced Cross Interleave Reed-Solomon Code)

Coding: ATRAC/ATRAC3 (Adaptive TRansform Acoustic Coding), 24-bit computed type

Recording method: Magnetic modulation overwrite method

Sampling frequency: 44.1 kHz (32 kHz and 48 kHz signals are converted to 44.1 kHz, and then recorded.)

Wow and flutter: Unmeasurable (less than ± 0.001 % W. peak)

Battery life:

	Stereo		2 times long		4 times long	
When using a commercially available, high capacity, "AA" size (LR6), alkaline battery	Continuous recording: Approx. 4 hours	Continuous play: Approx. 44 hours	Continuous recording: Approx. 7 hours	Continuous play: Approx. 62 hours	Continuous recording: Approx. 11 hours	Continuous play: Approx. 75 hours

- The continuous recording time is for analogue inputs when the volume level is set to "VOL 0".
- The continuous play time shows the value when the volume level is set to "VOL 15".
- The above values are the standard values when the unit is used at an ambient temperature of 25°C (77°F).
- The operating time when using an alkaline battery may be different, depending on the type and manufacturer of the battery, and on the operating temperature.

Input sensitivity:

	Reference input level	Input impedance
LINE	100 mV	20 k ohms

Output level:

	Specified output	Maximum output level	Load impedance
Ear-phones	-	8 mW + 8 mW	32 ohms
LINE	125 mV (-12 dB) *1	-	10 k ohms

*1 When using the supplied output conversion cable.

Specifications for this model are subject to change without prior notice

IM-DR420H

Power source:	DC 1.2 V: Rechargeable Nickel-Metal Hydride Battery (AD-N70BT) x 1 DC 3 V: AC adaptor (AC 110 - 240 V, 50/60 Hz) DC 1.5 V: Commercially available, "AA" size (LR6), alkaline battery x 1
Power consumption:	60 mA (AC adaptor)
Output power:	RMS: 16 mW (8 mW + 8 mW) (0.2 % T.H.D.)
Charging time:	Approx. 3.4 hours (90 %) Approx. 5.4 hours (fully charged)(When using the AC adaptor included with the unit)
Dimensions:	Width: 83 mm (3-9/32") Height: 28 mm (1-1/8") Depth: 76 mm (3") Excluding the projection around the USB connection terminal
Weight:	143 g (0.32 lbs.) with rechargeable battery
Input socket:	Line/optical digital, microphone (powered by the main unit)
Output socket:	Earphones (impedance: 32 ohms)/remote control
Type:	Portable MiniDisc recorder
Signal readout:	Non-contact, 3-beam semiconductor laser pickup
Audio channels:	Stereo 2 channels/monaural 1 channel
Frequency response:	20 - 20,000 Hz (± 3 dB)
Rotation speed:	Approx. 400 - 1,800 rpm CLV (Playback), approx. 400 - 2,700 rpm CLV (Recording)
Error correction:	ACIRC (Advanced Cross Interleave Reed-Solomon Code)
Coding:	ATRAC/ATRAC3 (Adaptive TRansform Acoustic Coding), 24-bit computed type
Recording method:	Magnetic modulation overwrite method
Sampling frequency:	44.1 kHz (32 kHz and 48 kHz signals are converted to 44.1 kHz, and then recorded.)
Wow and flutter:	Unmeasurable (less than ± 0.001 % W. peak)
Battery life:	

	Stereo		2 times long		4 times long	
When using the rechargeable battery (fully charged) included with the unit	Continuous recording: Approx. 8 hours	Continuous play: Approx. 33 hours	Continuous recording: Approx. 13 hours	Continuous play: Approx. 44 hours	Continuous recording: Approx. 18 hours	Continuous play: Approx. 51 hours
When using a commercially available, high capacity, "AA" size (LR6), alkaline battery	Continuous recording: Approx. 4 hours	Continuous play: Approx. 44 hours	Continuous recording: Approx. 7 hours	Continuous play: Approx. 62 hours	Continuous recording: Approx. 11 hours	Continuous play: Approx. 75 hours

- The continuous recording time is for analogue inputs when the volume level is set to "VOL 0".
- The continuous play time shows the value when the volume level is set to "VOL 15".
- The above values are the standard values when the unit is used at an ambient temperature of 25°C (77°F).
- The operating time when using an alkaline battery may be different, depending on the type and manufacturer of the battery, and on the operating temperature.

Input sensitivity:

	Reference input level	Input impedance
MIC H	0.25 mV	10 k ohms
MIC L	2.5 mV	10 k ohms
LINE	100 mV	20 k ohms

Output level:

	Specified output	Maximum output level	Load impedance
Ear-phones	-	8 mW + 8 mW	32 ohms
LINE	125 mV (-12 dB) *1	-	10 k ohms

*1 When using the supplied output conversion cable.

Specifications for this model are subject to change without prior notice

NAMES OF PARTS

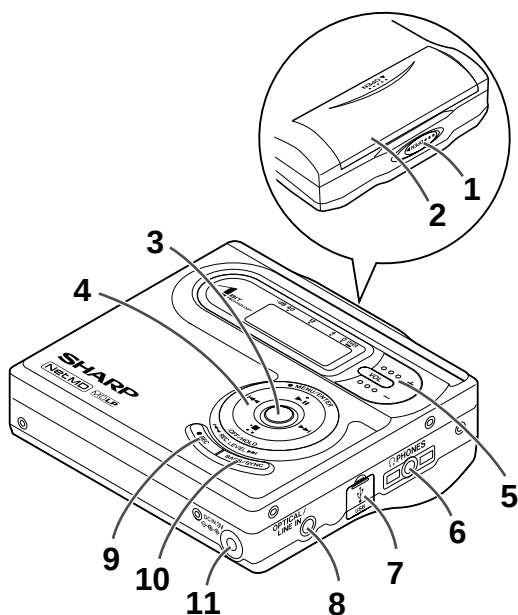


Illustration IM-DR400E

■ Main unit

1. Open Lever
2. Battery Cover
3. Menu/Enter Button
4. Play/Pause/Stop/Power Off/Hold/
Fast Forward/Fast Reverse/
Recording Level/Menu Select/
Name Select Button
5. Volume/Cursor Button
6. Earphones/Line Output Socket
7. USB Socket
8. Optical/Line Input Socket
9. Record/Track Mark Button
10. Bass/Delete/Synchro Button
11. 3 V DC Input Socket

Note:

When the battery cover comes off, attach the cover back as shown below.

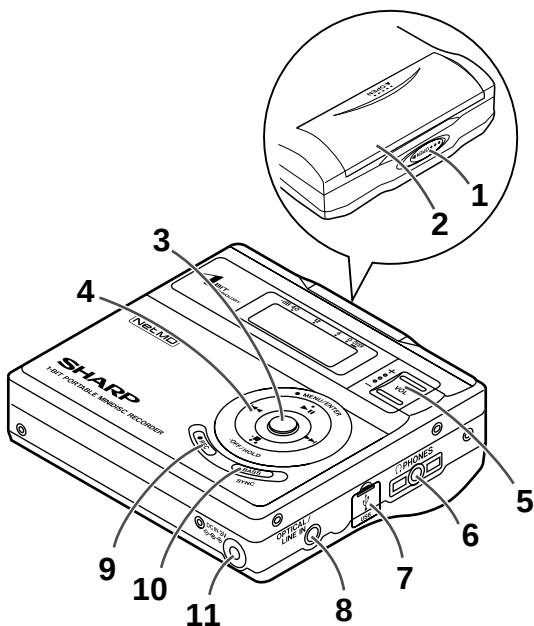
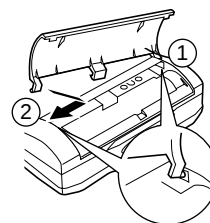


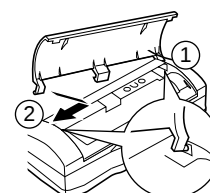
Illustration IM-DR410H/E

■ Main unit

1. Open Lever
2. Battery Cover
3. Menu/Enter Button
4. Play/Pause/Stop/Power Off/Hold/
Fast Forward/Fast Reverse/
Recording Level/Menu Select/
Name Select Button
5. Volume/Cursor Button
6. Earphones/Line Output Socket
7. USB Socket
8. Optical/Line Input Socket
9. Record/Track Mark Button
10. Bass/Delete/Synchro Button
11. 3 V DC Input Socket

Note:

When the battery cover comes off, attach the cover back as shown below.



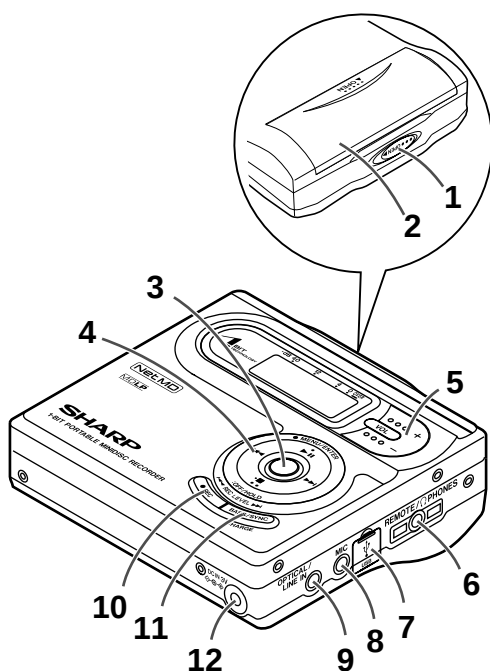


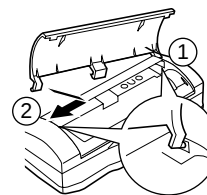
Illustration IM-DR420H

■ Main unit

1. Open Lever
2. Battery Cover
3. Menu/Enter Button
4. Play/Pause/Stop/Power Off/Hold/
Fast Forward/Fast Reverse/
Recording Level/Menu Select/
Name Select Button
5. Volume/Cursor Button
6. Remote Control/Earphones/
Line Output Socket
7. USB Socket
8. Microphone Input Socket
9. Optical/Line Input Socket
10. Record/Track Mark Button
11. Bass/Delete/Synchro/
Charge Button
12. 3 V DC Input Socket

Note:

When the battery cover comes off, attach the cover back as shown below.



■ Display panel

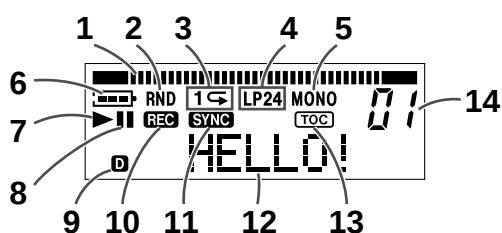
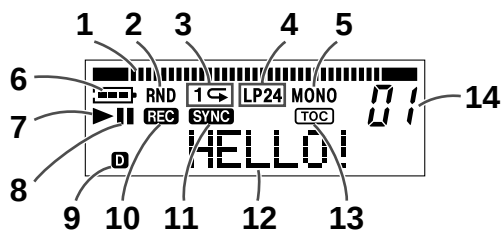


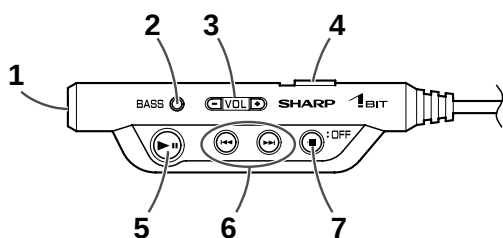
Illustration IM-DR400E/IM-DR410H/E

1. Level Meter
2. Random Indicator
3. Repeat Indicator
4. Long-Play/Recording Mode Indicator
5. Monaural Mode Indicator
6. Battery Indicator
7. Play Indicator
8. Pause Indicator
9. Disc Name Indicator
10. Record Indicator
11. Synchro Recording Indicator
12. Character/Time Information Indicator
13. TOC Indicator
14. Track Number Indicator



■ Display panel

1. Level Meter
2. Random Indicator
3. Repeat Indicator
4. Long-Play/Recording Mode Indicator
5. Monaural Mode Indicator
6. Battery Indicator
7. Play Indicator
8. Pause Indicator
9. Disc Name Indicator
10. Record Indicator
11. Synchro Recording Indicator
12. Character/Time Information Indicator
13. TOC Indicator
14. Track Number Indicator



■ Remote control unit

1. Earphones Socket
2. Bass/Delete/Track Mark Button
3. Volume/Cursor Buttons
4. Hold Switch
5. Play/Pause Button
6. Fast Forward/Fast Reverse/
Recording Level/Menu Select/
Name Select Buttons
7. Stop/Power Off Button

Illustration IM-DR420H

DISASSEMBLY

Cares before disassembling

When assembling the machine after disassembling or repair, observe the following requirements so as to ensure safety and performance.

1. Remove the batteries from the machine, and take out the mini-disc.
2. When assembling after repair, be sure to position the wires in the same location.
Use the specified screws to fix the cabinet and the mechanism unit. The use of the screws with length other than specified may cause contact with the mechanism unit resulting in malfunction.
3. When repairing, pay close attention so not to damage the IC from static electricity.

STEP	REMOVAL	PROCEDURE	FIGURE
1	Cabinet	1. Open the MD Lid. 2. Open the Battery Lid. 3. Screw (A1) x4 4. Screw (A2) x1 5. Flexible PWB (A3) x2	8-1 8-2
2	MD LID	1. Screw (B1) x2	8-2
3	Main PWB	1. Screw (C1) x4 2. Flexible PWB (C2) x2	8-2
4	Mechanism Unit	1. Screw (D1) x2 2. Screw (D2) x1	8-3
5	Bracket	1. Screw (E1) x3 2. Screw (E2) x1	8-4

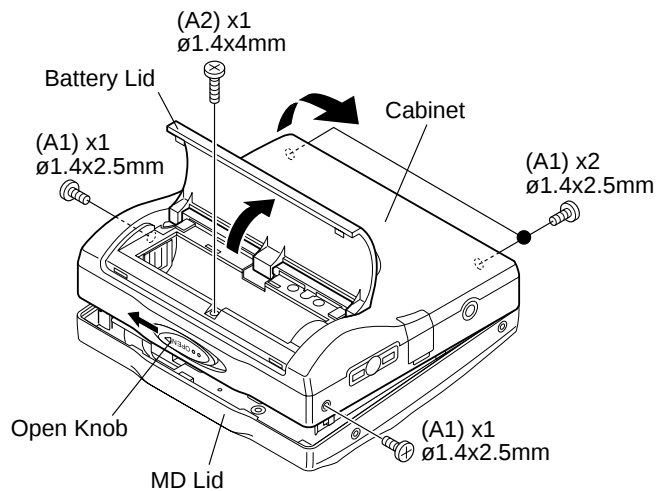
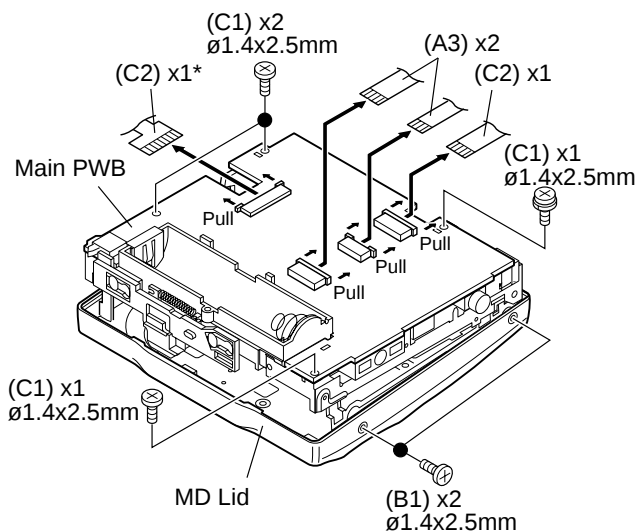


Figure 8-1

**Caution:**

Carefully handle the main PWB and flexible PWB. After removing the flexible PWB (1*) for the optical pickup from the connector, do not touch directly the front end of flexible PWB with your hand so as to prevent damage of optical pickup by static electricity.

Figure 8-2

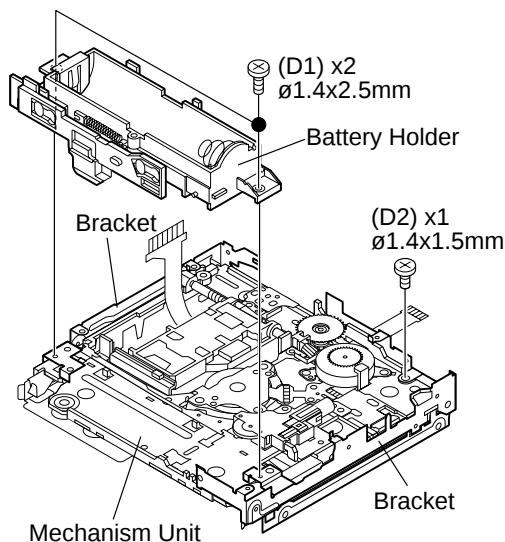


Figure 8-3

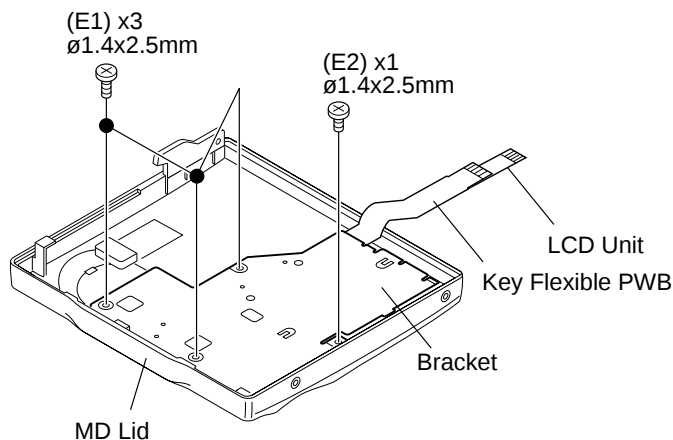


Figure 8-4

REMOVING AND REINSTALLING THE MAIN PARTS

Remove the mechanism according to the disassembling methods 1 to 4. (See Page 8.)

How to remove the magnetic head (See Fig. 9-1.)

1. Remove the solder joints (A1) x 2 of the head flexible plate.
2. Remove the screws (A2) x 2 pcs. of the magnetic head.

Note:

Mount carefully so as not to damage the magnetic head.

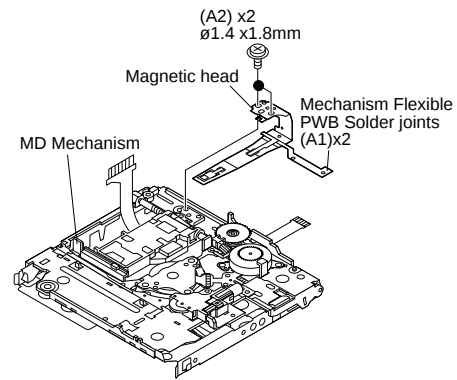


Figure 9-1

How to remove the spindle motor (See Fig. 9-2.)

1. Remove the solder joints (B1) x 4 of flexible PWB.
2. Remove the screws (B2) x 3 pcs., and remove the spindle motor.

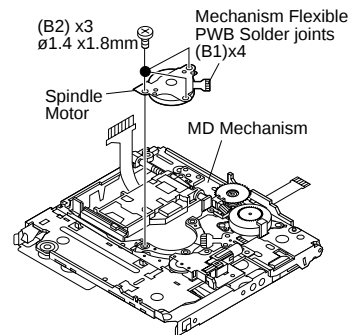


Figure 9-2

How to remove the sled motor (See Fig. 9-3.)

1. Remove the stop washer (C1) x 1 pc., and remove the drive gear (C2) x 1 pc.
2. Remove the solder joints (C3) x 3 of flexible PWB.
3. Remove the screws (C4) x 2 pcs., and remove the sled motor.

Note:

Take care so that the motor gear is not damaged.

(If the gear is damaged, noise is caused.)

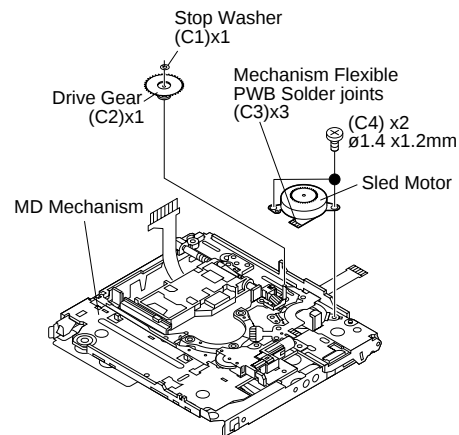


Figure 9-3

How to reinstall the optical pickup (See Fig. 9-4.)

1. Remove the screw (E1) x 1 pc., and remove the thrust spring.
2. Remove the screw (E2) x 1 pc., and remove the shaft guide.
3. Slowly raise the optical pickup.

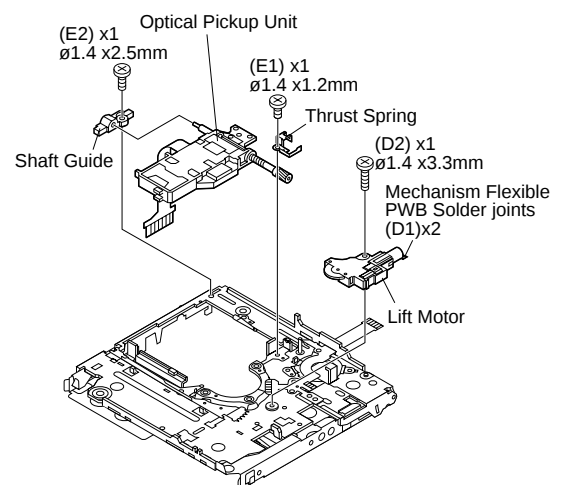


Figure 9-4

ADJUSTMENT

● Test disc

MD adjustment needs two types of disc, namely recording disc (low reflection disc) and playback-only disc (high reflection disc).

	Type	Test disc	Parts No.
1	High reflection disc	MMD-110 (TEAC Test MD)	88GMMD-110
2	Low reflection disc	MMD-212 (TEAC Test MD) 74-minute disc	88GMMD-212
3	Low reflection disc	MMD-213A (TEAC Test MD) 80-minute disc	88GMMD-213A
4	Low reflection disc	Recording minidisc	UDSKM0001AFZZ

Note: Use the low reflection disc on which music has been recorded.

● Entering the TEST mode

1. Setting at port (power nonconnected state)

(1) Set the port as follows.

TEST1 : "Low" (TP416)

TEST0 : "High"

(2) Turn the Power ON.

(3) Test Mode START [T E S T _]

2. Setting by special button operation (in standby state)

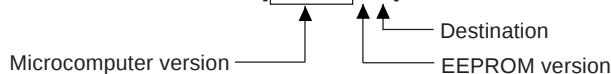
(1) Press the VOL.+ button and PLAY button. Continue to hold down the PLAY button to release the VOL.+ button and press the VOL.- button. (Perform this operation using the keys on the main unit.)

(2) Normal mode setting initialization (BASS setting, VOL setting, etc.)

*Since the unit is changed to the setting for production line inspection, be sure to set it to the default setting state in the following default setting procedure before returning it to the user.

(3) Test Mode START [T E S T _]

(4) When the VOL.+ button is pressed, indication of microcomputer version for one second [7 1 4 B d X]



(5) When the VOL.- button is pressed, whole LCD lighting for 2 seconds

● Leaving the TEST mode

(1) Press the STOP ■ button in the TEST mode stop state.

● Shipping setting method (Perform this operation using the keys on the main unit.)

Holding down simultaneously the VOLUME – Button and PLAY ► Button of the set unit without disc, supply the power from the DC IN plug. After the indication "INIT" -> "BYE OK" disappears, release the power supply of DC IN.

● Test Mode

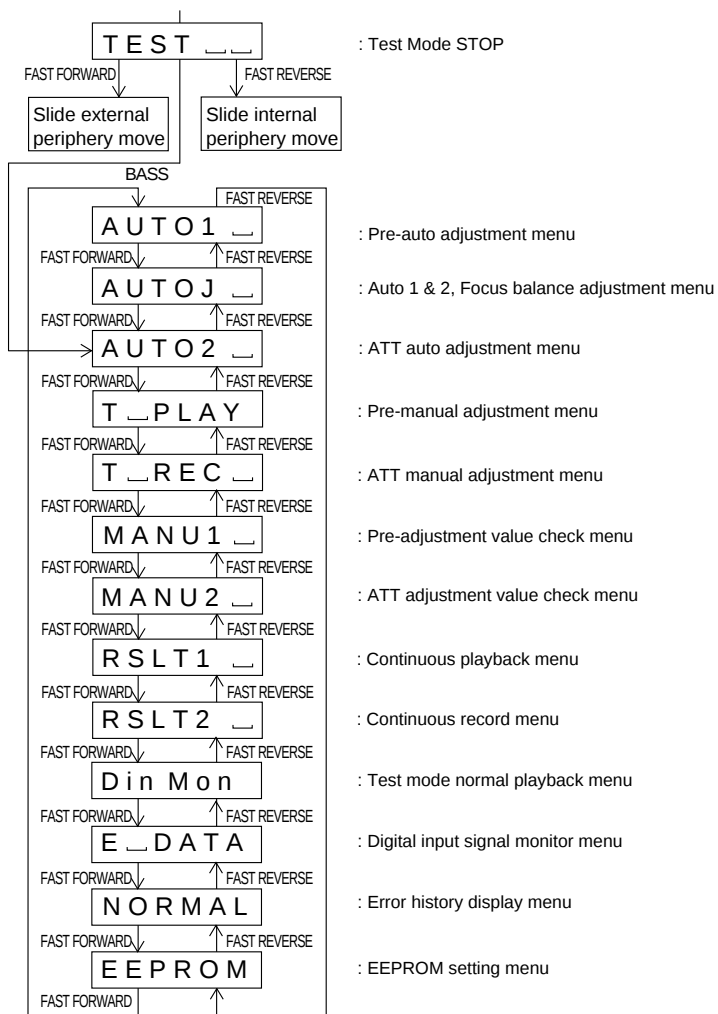
1. AUTO 1 Mode	- Perform preliminary automatic adjustment. - If the combination of mechanism and pickup PWB has been changed, be sure to start from AUTO1.
2. AUTO 2 Mode	- Perform ATT (attenuator) automatic adjustment. - Perform continuous playback (error rate display, jump test)
3. TEST-PLAY Mode	- Continuous playback from the specified address is performed. 1 line, 10 lines or 100 steps manual jump is performed. - C1 error rate display (pit section), ADIP error rate display (groove section) - The temperature correction is performed only when servo start is performed, but the posture correction is not performed during continuous playback.
4. TEST-REC Mode	- Continuous record from the specified address is performed. - Change of record laser output(servo gain is also changed according to laser output). - The temperature correction is performed only when servo start is performed, but the posture correction is not performed during continuous recording.
5. MANUAL 1 Mode	- Temperature is displayed. (Updating in real time) - Seeing the displayed adjustment value, perform preliminary manual adjustment. (Error rate indication, jump test)
6. MANUAL 2 Mode	- Temperature is displayed. (Updating in real time) - Seeing the displayed adjustment value perform manually the preliminary adjustment. (Error rate indication, jump test) - Continuous playback is performed (Error rate display, jump test).

7. RESULT 1 Mode	- The value adjusted in AUTO1 or MANUAL1 is indicated. (Execution in servo "OFF" state").
8. RESULT 2 Mode	- The value adjusted in AUTO 2 or MANUAL 2 is indicated. - Adjustment value is changed manually. (Error rate display, jump test).
9. DIGITAL INPUT Mode	Digital input information is displayed.
10. ERROR INFORMATION Mode	- Error information is displayed. - Error information is initialized
11. NORMAL Mode	- The mode is changed from the TEST mode to the normal mode without adjustment. - In the normal mode the internal operation mode, memory capacity, etc. are indicated. - In the normal mode both temperature correction and posture correction are performed.
12. EEPROM Mode	- Factors of digital servo are changed manually. (Each servo is turned on individually.) - Cut-off frequency of BASS1, BASS2 and BASS3 is selected manually. - Temperature detection terminal voltage is measured, and the reference value is set. - Defaults are selected and set. - Setting of EEPROM protect area is updated. (In case of protect releasing)
13. AUTO J Mode	AUTO 1/2, focus balance adjustment, TEST-PLAY (ADIP/C1 error check), EEPROM are updated sequentially.

● Operation in each TEST mode

Test Mode Change Chart

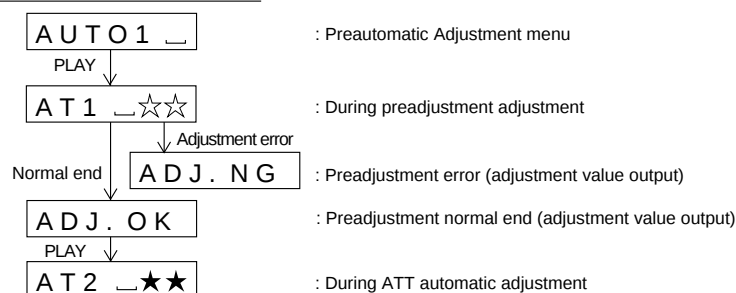
Test Mode Menu



* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.

* When the [PLAY ►] button operation is performed in the specific menu, the operation of this menu is executed.

Preautomatic Adjustment

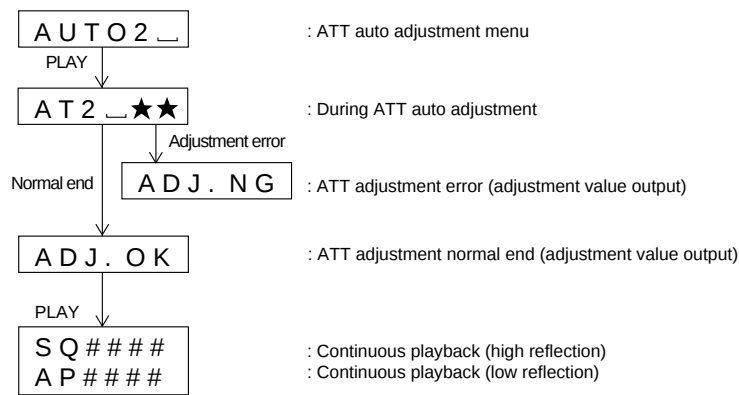


* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.

* "☆☆" represent the adjustment number as follows.

- 0 0 : Innermost periphery move
- 0 2 : ABEO offset tentative measurement
- 0 4 : ABMAXO measurement
- 0 5 : Focus ATT tentative setting
- 0 6 : LPFEFO measurement (bit)
- 0 7 : COUT level setting for pit section adjustment
- 0 8 : External periphery move
- 0 9 : LPFEFO measurement (groove)
- 1 0 : COUT level setting for groove section adjustment
- 1 1 : TCRSMIO measurement
- 1 2 : Tracking ATT initial setting
- 1 3 : LPFABO measurement
- 1 4 : Focus ATT initial setting
- 1 5 : ABEO offset measurement
- 1 6 : TCRS offset measurement

ATT Auto Adjustment



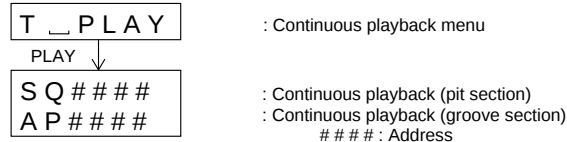
* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.

* "★★" represent the adjustment number as follows.

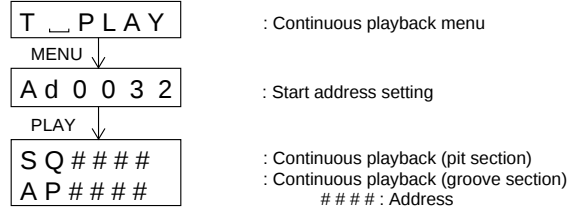
- 0 0 : Innermost periphery move
- 0 3 : Pit section tracking ATT setting
- 0 4 : Pit section focus ATT setting
- 0 6 : External periphery move (low reflection only)
- 0 7 : TCRS ATT setting (low reflection only)
- 0 8 : Groove section tracking ATT setting (low reflection only)
- 0 9 : Groove section focus ATT setting (low reflection only)

Continuous Playback

- Continuous playback from current pickup position

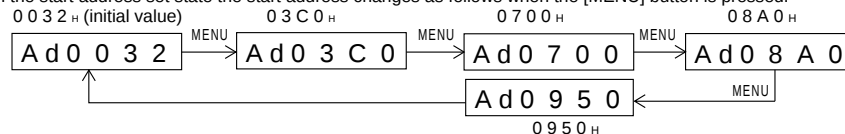


- Continuous playback from any address

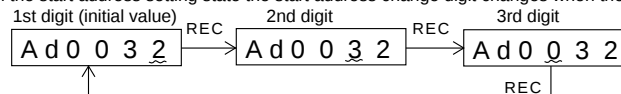


* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.

* In the start address set state the start address changes as follows when the [MENU] button is pressed.

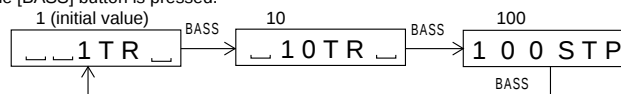


* In the start address setting state the start address change digit changes when the [REC] button is pressed.



* In the start address set state the value of selection digit changes in the range of "0h to Fh" when the [FAST FORWARD/REVERSE ►►/◄◄] button is pressed.

* In the continuous playback state the number of jump lines changes as follows shown the [BASS] button is pressed.



* When the [FAST FORWARD ►►] button is pressed in the continued playback mode, jump of specified number of lines occurs in the external periphery direction.

If the key is held down jump occurs continuously (100 ms cycle).

* When the [FAST REVERSE ◄◄] button is pressed in the continuous playback mode, jump of specified number of lines occurs in the internal periphery direction.

If the key is held down, jump occurs continuously (100 ms cycle).

- Whenever the MENU button is pressed in the continuous playback mode, the indication changes as follows.

- * Pre-mastered disc

Continuous playback (SUBQ address indication) [S Q]



Continuous playback (C1 error indication) [C E]



Continuous playback (SUBQ address indication) [S Q]

- * Recordabl disc

Continuous playback (ADIP address indication) [A P]



Continuous playback (C1 error indication) [C E]



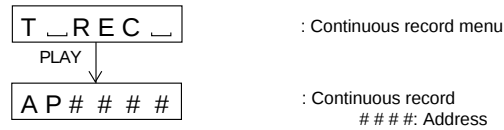
Continuous playback (ADIP error indication) [A E]



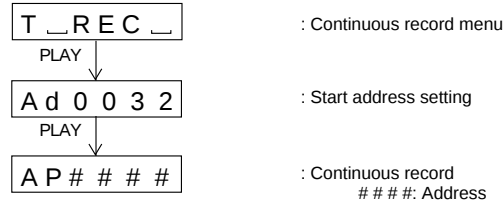
Continuous playback (ADIP address indication) [A P]

Continuous Record

- Continuous record from the current pickup position

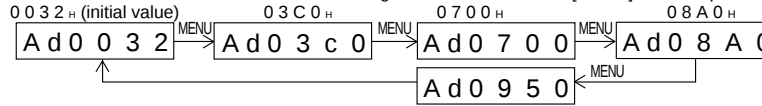


- Continuous record playback from any address

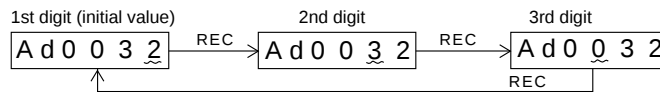


* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.

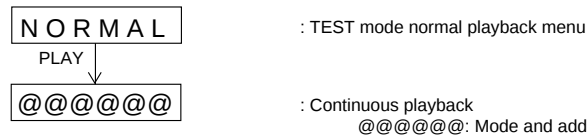
* In the start address set state the start address changes as follows when the [MENU] button is pressed.



* In the start address setting state the start address change digit changes when the [REC] button is pressed.



Test Mode Normal Playback



* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.

* When the NORMAL mode is canceled, the power is turned off.

● NORMAL Mode

- When the STOP ■ button is pressed while the NORMAL menu appears, the mode changes to the TEST mode stop state.
- Indication during operation
Indication of memory capacity on main unit LCD
[□ □ _ * * * * _ * *] + Level meter
□ □ : Internal mode
* * * * : Address (Cluster section)
* * : Address (Sector section)
- Selection of sound volume, BASS, etc. is possible (without indication)
- Recording is also possible.
- If the STOP ■ button is pressed during operation in the NORMAL mode, the NORMAL mode is canceled, and the power is turned off.

● Error data display Mode

- Reversing when FAST REVERSE ◀◀ button is pressed
- When the STOP ■ button is pressed while the error data indication menu appears or during error data indication, the mode changes to the TEST mode stop state.
- Error data 0 is the latest error.
- Error which occurred in the TEST mode is also stored in the memory.
- When the MENU button is pressed while the error data indication menu appears, the error data is initialized.
[C L E A R _]
- : Error Code

● Explanation of error history code

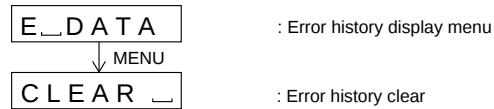
- 13h : Excessive number of retry to draw servo during its adjustment.
- 16h : COUT detection time over during servo adjustment.
- 17h : The level of input signal from the RF amplifier is out of the allowable range.
- 1Fh : Cannot clear the factor of ENDEC DINT.
- 21h : Cannot focus on the disc.
- 22h : Cannot start up the spindle.
- 23h : Track search time over.
- 32h : Cannot read P-TOC.
- 42h : Cannot read U-TOC.
- 44h : Cannot write U-TOC.
- 45h : Cannot perform write test of U-TOC.
- 52h : Cannot write SD. (Sound Data)
- 72h : Check sum error occurred when reading EEPROM.
- 73h : Cannot operate the recording head (by using the EJECT lever).
- 82h : DC-IN power voltage error.
- 83h : Temperature sensor input voltage error.
- 91h : The ambient temperature is out of the allowable range.

● Auto J Mode

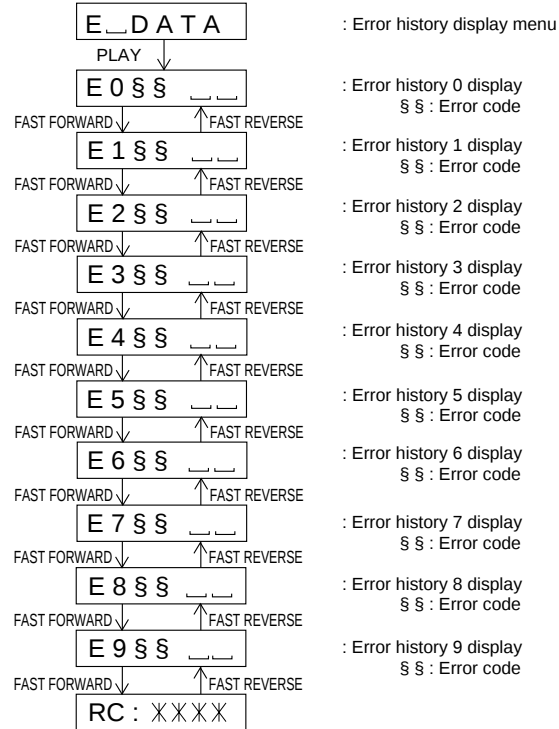
- AUTO 1/2, focus balance adjustment, TEST-PLAY (ADIP/C1 error check), EEPROM are updated sequentially.
- If the STOP button is pressed while processed, the same operation as the normal STOP button operation will be performed.

Error History Display

- Error history clear



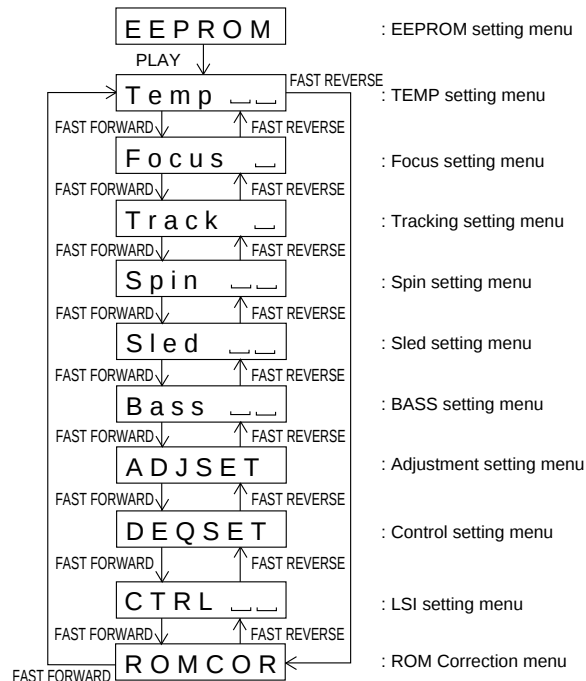
- Error history display



×××× : Total Recording Time

* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.

EEPROM Setting



* When the [STOP ■] button is pressed in specific menu, the "TEST MODE STOP" state is set.

* When the [PLAY ►] button operation is performed in the specific state, the specific setting menu is set.

EEPROM (IC402) writing procedure

1. Procedure to replace EEPROM and write initial value of microcomputer in EEPROM

- (1) Replace EEPROM.
- (2) Refer to the latest EEPROM data list.
- (3) Press the VOL.+ button and PLAY button. Continue to hold down the PLAY button to release the VOL.+ button and press the VOL.- button.
- (4) Press the VOL.+ button, version display.

[V e r . * * * * * X]

EEPROM version
Microcomputer ROM version

- (5) Press the VOL.- button, the whole LCD lights.
- (6) Test mode stop state.
[T E S T]
- (7) Press the "BASS" button, and press 3 times the "FAST REVERSE ◀◀" button.
[E E P R O M]
- (8) Perform the operation to display "EEPROM SETTING ENTER CHART", compare the EEPROM DATA LIST with the display, and set according to the EEPROM DATA LIST with the VOL.+ or VOL.- button.
- (9) Set the temperature reference. (Refer to the Temperature Reference Setting Method.)
- (10) Set according to the EEPROM DATA LIST.
- (11) Press the Stop ■ button.
[T E S T]
- (12) Press the Stop ■ button.
- (13) After data is written in EEPROM, turn off power .

2. Temperature reference setting method

[1] Measurement, calculation and setting procedure

- (1) Set the TEST mode. (Perform one of the following methods.)
 - Set TEST 1, 0 = '01', and turn on power (or set PLAY ON in standby state).
 - Press the VOL.+ button and PLAY button. Continue to hold down the PLAY button to release the VOL.+ button and press the VOL.- button.
- (2) Start the EEPROM mode 'Temp' menu.
 - Button operation in order of MENU, FAST REVERSE ◀◀ x 3 times, PLAY ▶, PLAY ▶ in the test mode STOP state.
 - 'TM\$\$○○' is displayed. (\$\$= Temperature code, ○○ = Temperature reference)
- (3) Once press FAST FORWARD ▶▶▶, and determine the displayed microcomputer TEMP input AD value.
 - 'TPin##' is displayed. (## = TEMP input AD value)
- (4) At the ambient temperature, determine the temperature corrected value from the temperature measurement value correction table.
- (5) Determine the temperature reference, using the following formula.
 - Temperature reference = Microcomputer TEMP input AD value + Temperature corrected value
- (6) Set the temperature reference value by button operation, and check whether the temperature code indication corresponds to "Temperature Code Identification Table".

[2] Temperature measurement value correction table

Ambient temperature	Temperature correction	Center temperature
+ 8°C ~ +10°C	- 05h	+ 8.5°C
+11°C ~ +13°C	- 04h	+ 11.6°C
+14°C ~ +16°C	- 03h	+ 14.6°C
+17°C ~ +19°C	- 02h	+ 17.6°C
+20°C ~ +22°C	- 01h	+ 20.6°C
+23°C ~ +25°C	± 00h	+ 23.6°C
+26°C ~ +28°C	+ 01h	+ 26.6°C
+29°C ~ +31°C	+ 02h	+ 29.6°C
+32°C ~ +34°C	+ 03h	+ 32.6°C

[3] Temperature code identification

Ambient temperature	Temperature correction	Center temperature
- 8°C ~ +10°C	08h	+ 0.5°C
+ 3°C ~ +21°C	07h	+ 12.0°C
+14°C ~ +33°C	06h	+ 23.6°C
+26°C ~ +44°C	05h	+ 35.0°C

● EEPROM DATA LIST (EEPROM version d) (IM-DR400/IM410H/E)

*No settings are required for the Reserve items.

ADDRESS		+00H		+01H	
HEX		ITEM	CODE	ITEM	CODE
0400	1	FG1	24h	FG2	58h
0402	3	FG3	90h	FF0	10h
0404	5	FF1	70h	FF2	E5h
0406	7	Ff0	10h	Ff1	48h
0408	9	Ff2	EAh	ff0	10h
040A	11	ff1	18h	ff2	ECh
040C	13	FZH	EDh	FLn	09h
040E	15	FLp	06h	DJG	0Ch
0410	17	FSS	0Ch	FTS	18H
0412	19	FSB	18h	FTB	28H
0414	21	FGM	66h	TVG	C0h
0416	23	TO1	2Ah	TO5	2Ah
0418	25	TOR	2Ah	PLE	8Bh
041A	27	RET	00h	FL1	0Fh
041C	29	FL2	1Fh	FGC	5Ah
041E	31	TVR	C0h	CHECK-SUM	* *h
0420	33	TG1	17h	TG2	40h
0422	35	TG3	66h	TF0	10h
0424	37	TF1	70h	TF2	E0h
0426	39	Tf0	10h	Tf1	40h
0428	41	Tf2	E4h	tF0	10h
042A	43	tF1	20h	tF2	E8h
042C	45	TFS	00h	TBo	20h
042E	47	TBt	34h	TKo	20h
0430	49	TKt	32h	TDo	67h
0432	51	TDt	0Eh	SCo	00h
0434	53	SCt	3Ah	SCm	48h
0436	55	CLp	24h	CLr	38h
0438	57	JPI	0Eh	TKL	40h
043A	59	THP	02h	THG	02h
043C	61	T0P	F0h	T0G	EFh
043E	63	T1P	18h	TKn	11h
0440	65	TKN	26h	TKT	16h
0442	67	TDT	16h	TDL	1Fh
0444	69	TGC	66h	TGM	66h
0446	71	SPW	0Fh	Reserve	00h
0448	73	Reserve	00h	CHECK-SUM	* *h
044A	75	SPG	0Ch	PG1	18h
044C	77	PG2	18h	RG2	1Ch
044E	79	RG3	1Ch	PGM	C0h
0450	81	SP1	10h	SP2	60h
0452	83	SP3	F2h	SP4	F2h
0454	85	S42	F2h	S43	F8h
0456	87	SP5	10h	SL1	7Fh
0458	89	SL2	7Fh	SD2	7Fh
045A	91	SPK	EBh	MP1	14h
045C	93	MP2	01h	SPL	60h
045E	95	SPB	11h	SRI	30h
0460	97	SRm	26h	SRO	1Eh
0462	99	SBR	60h	OSL	14h
0464	101	PJG	34h	BTR	78h
0466	103	SWT	44h	CHECK-SUM	* *h
0468	105	SKS	7Fh	SKL	7Fh
046A	107	SLC	42h	STL	08h
046C	109	STM	42h	STE	A6h
046E	111	SDV	60h	SJP	03h
0470	113	WTm	18h	SRV	60h
0472	115	SLT	58h	MVS	0Ah
0474	117	SLS	28h	SKE	25h

ADDRESS		+00H		+01H	
HEX		ITEM	CODE	ITEM	CODE
0476	119	SDE	2Dh	BPE	02h
0478	121	BPW	49h	BP1	86h
047A	123	BRE	93h	BRW	24h
047C	125	SRS	00h	SHC	42h
047E	127	SHS	28h	CHECK-SUM	* *h
0480	129	BS0	02h	BS1	01h
0482	131	BS2	12h	BS3	40h
0484	133	BS4	22h	BS5	22h
0486	135	BS6	03h	BS7	22h
0488	137	BS8	00h	CHECK-SUM	* *h
048A	139	COK	28h	FAT	C0h
048C	141	TAT	3Eh	CAT	40h
048E	143	FAB	64h	CHECK-SUM	* *h
0490	145	Reserve	00h	Reserve	00h
0492	147	Reserve	00h	Reserve	00h
0494	149	Reserve	00h	Reserve	00h
0496	151	Reserve	00h	Reserve	00h
0498	153	Reserve	00h	Reserve	00h
049A	155	Reserve	00h	Reserve	00h
049C	157	Reserve	00h	Reserve	00h
049E	159	Reserve	00h	Reserve	00h
04A0	161	Reserve	00h	CHECK-SUM	* *h
04A2	163	Reserve	04h	Reserve	03h
04A4	165	Reserve	54h	Reserve	0Dh
04A6	167	Reserve	54h	Reserve	0Dh
04A8	169	Reserve	25h	Reserve	04h
04AA	171	Reserve	55h	Reserve	04h
04AC	173	Reserve	00h	CHECK-SUM	* *h
04AE	175	HQ1	90h	HQ2	90h
04B0	177	HSG	11h	HSO	FFh
04B2	179	LQ1	90h	LQ2	90h
04B4	181	LSG	12h	LSO	00h
04B6	183	GQ1	98h	GQ2	84h
04B8	185	GSG	12h	ALS	3Fh
04BA	187	RCN	00h	EQR	00h
04BC	189	TM	★★h	CHECK-SUM	* *h
04BE	191	CT0	03h	CT1	01h
04C0	193	CT2	BBh	CT3	50h
04C2	195	USA	18h	RCE	94h
04C4	197	X2T	FFh	SDF	1Fh
04C6	199	FBO	FCh	BHS	00h
04C8	201	FBL	16h	MC2	00h
04CA	203	MC4	00h	L2H	81h
04CC	205	L4H	80h	BS0	3Ah
04CE	207	BS1	98h	BU0	01h
04D0	209	BD0	05h	BD1	DCh
04D2	211	BMK	1Eh	CST	69h
04D4	213	IJU	41h	IJD	55h
04D6	215	MCT	A1h	ERC	5Ah
04D8	217	CV0	00h	CV1	15h
04DA	219	SSK	00h	ACT	68h
04DC	221	C1E	52h	ADE	C0h
04DE	223	LCV	12h	wE3p	05h
04E0	225	wE3g	00h	wEA	16h
04E2	227	wEF	00h	RC0	D7h
04E4	229	RC1	D6h	R20	80h
04E6	231	R21	20h	R40	BFh
04E8	233	R41	02h	GUP	1Bh
04EA	235	SCG	00h	K10	0Fh

		+00H		+01H	
HEX		ITEM	CODE	ITEM	CODE
04EC	237	K11	8Eh	ATN	0Ch
04EE	239	ATU	0Ah	AHD	4Dh
04F0	241	ALD	60h	ACT	01h
04F2	243	PLG	22h	CRN	00h
04F4	245	Reserve	00h	Reserve	00h
04F6	247	Reserve	00h	CHECK-SUM	* *h
04F8	249	RM0	37h	RM1	31h
04FA	251	RM2	34h	RM3	42h
04FC	253	RM4	04h	RM5	0Ah
04FE	255	RM6	76h	RM7	60h
0500	257	RM8	FCh	RM9	64h
0502	259	RMA	76h	RMB	0Ah
0504	261	RMC	04h	RMD	0Ah
0506	263	RME	E6h	RMF	EDh
0508	265	RM10	FCh	RM11	F5h
050A	267	RM12	E6h	RM13	0Ah
050C	269	RM14	0Bh	RM15	0Bh
050E	271	RM16	E8h	RM17	28h
0510	273	RM18	E4h	RM19	0Eh
0512	275	RM1A	6Ah	RM1B	04h
0514	277	RM1C	03h	RM1D	96h
0516	279	RM1E	10h	RM1F	FCh
0518	281	RM20	2Bh	RM21	E8h
051A	283	RM22	0Bh	RM23	0Eh
051C	285	RM24	0Bh	RM25	3Fh
051E	287	RM26	BFh	RM27	4Ah
0520	289	RM28	61h	RM29	FDh
0522	291	RM2A	66h	RM2B	99h
0524	293	RM2C	0Ah	RM2D	FDh
0526	295	RM2E	20h	RM2F	A4h

		+00H		+01H	
ADDRESS	HEX	ITEM	CODE	ITEM	CODE
0528	297	RM30	0Ah	RM31	FCh
052A	299	RM32	C1h	RM33	3Fh
052C	301	RM34	0Bh	RM35	00h
052E	303	Reserve	00h	Reserve	00h
0530	305	Reserve	00h	Reserve	00h
0532	307	Reserve	00h	Reserve	00h
0534	309	Reserve	00h	Reserve	00h
0536	311	Reserve	00h	Reserve	00h
0538	313	Reserve	00h	Reserve	00h
053A	315	Reserve	00h	Reserve	00h
053C	317	Reserve	00h	Reserve	00h
053E	319	Reserve	00h	Reserve	00h
0540	321	Reserve	0Ah	Reserve	00h
0542	323	Reserve	0Ah	Reserve	00h
0544	325	Reserve	0Ah	Reserve	00h
0546	327	Reserve	0Ah	Reserve	00h
0548	329	Reserve	0Ah	Reserve	00h
054A	331	Reserve	0Ah	Reserve	00h
054C	333	Reserve	0Ah	Reserve	00h
054E	335	Reserve	0Ah	Reserve	00h
0550	337	Reserve	0Ah	Reserve	00h
0552	339	Reserve	0Ah	Reserve	00h
0554	341	Reserve	0Ah	Reserve	00h
0556	343	Reserve	0Ah	Reserve	00h
0558	345	Reserve	0Ah	Reserve	00h
055A	347	Reserve	0Ah	Reserve	00h
055C	349	Reserve	0Ah	CHECK-SUM	* *h

055D-07FF: DNK information

★★H: Please carry out temperature measurement and set up the value calculated by compensation TABLE.

TEST-MODE VERSION: ○○○○●◎

(○○○○: μ-ROM VERSION="714B", ●: EEPROM VERSION="d", ◎: DESTINATION CODE="X")

● EEPROM DATA LIST (EEPROM version s) (IM-DR420H)

*No settings are required for the Reserve items.

		+00H		+01H	
HEX		ITEM	CODE	ITEM	CODE
0400	1	FG1	24h	FG2	58h
0402	3	FG3	90h	FF0	10h
0404	5	FF1	70h	FF2	E5h
0406	7	Ff0	10h	Ff1	48h
0408	9	Ff2	EAh	ff0	10h
040A	11	ff1	18h	ff2	ECh
040C	13	FZH	EDh	FLn	09h
040E	15	FLp	06h	DJG	0Ch
0410	17	FSS	0Ch	FTS	18H
0412	19	FSB	18h	FTB	28H
0414	21	FGM	66h	TVG	C0h
0416	23	TO1	2Ah	TO5	2Ah
0418	25	TOR	2Ah	PLE	8Bh
041A	27	RET	00h	FL1	0Fh
041C	29	FL2	1Fh	FGC	5Ah
041E	31	TVR	C0h	CHECK-SUM	* *h
0420	33	TG1	17h	TG2	40h
0422	35	TG3	66h	TF0	10h
0424	37	TF1	70h	TF2	E0h
0426	39	Tf0	10h	Tf1	40h
0428	41	Tf2	E4h	tF0	10h
042A	43	tF1	20h	tF2	E8h
042C	45	TFS	00h	TBo	20h
042E	47	TBt	34h	TKo	20h
0430	49	TKt	32h	TDo	67h
0432	51	TDt	0Eh	SCo	00h
0434	53	SCt	3Ah	SCm	48h
0436	55	CLp	24h	CLr	38h
0438	57	JPI	0Eh	TKL	40h
043A	59	THP	02h	THG	02h
043C	61	T0P	F0h	T0G	EFh
043E	63	T1P	18h	TKn	11h
0440	65	TKN	26h	TKT	16h
0442	67	TDT	16h	TDL	1Fh
0444	69	TGC	66h	TGM	66h
0446	71	SPW	0Fh	Reserve	00h
0448	73	Reserve	00h	CHECK-SUM	* *h
044A	75	SPG	0Ch	PG1	18h
044C	77	PG2	18h	RG2	1Ch
044E	79	RG3	1Ch	PGM	C0h
0450	81	SP1	10h	SP2	60h
0452	83	SP3	F2h	SP4	F2h
0454	85	S42	F2h	S43	F8h
0456	87	SP5	10h	SL1	7Fh
0458	89	SL2	7Fh	SD2	7Fh
045A	91	SPK	EBh	MP1	14h
045C	93	MP2	01h	SPL	60h
045E	95	SPB	11h	SRi	30h
0460	97	SRm	26h	SRO	1Eh
0462	99	SBR	60h	OSL	14h
0464	101	PJG	34h	BTR	78h
0466	103	SWT	44h	CHECK-SUM	* *h
0468	105	SKS	7Fh	SKL	7Fh
046A	107	SLC	42h	STL	08h
046C	109	STM	42h	STE	A6h
046E	111	SDV	60h	SJP	03h
0470	113	WTm	18h	SRV	60h
0472	115	SLT	58h	MVS	0Ah
0474	117	SLS	28h	SKE	25h

ADDRESS		+00H		+01H	
HEX		ITEM	CODE	ITEM	CODE
0476	119	SDE	2Dh	BPE	31h
0478	121	BPW	77h	BP1	44h
047A	123	BRE	94h	BRW	24h
047C	125	SRS	00h	SHC	42h
047E	127	SHS	28h	CHECK-SUM	* *h
0480	129	BS0	02h	BS1	01h
0482	131	BS2	12h	BS3	40h
0484	133	BS4	22h	BS5	22h
0486	135	BS6	03h	BS7	22h
0488	137	BS8	00h	CHECK-SUM	* *h
048A	139	COK	28h	FAT	C0h
048C	141	TAT	3Eh	CAT	40h
048E	143	FAB	64h	CHECK-SUM	* *h
0490	145	Reserve	00h	Reserve	00h
0492	147	Reserve	00h	Reserve	00h
0494	149	Reserve	00h	Reserve	00h
0496	151	Reserve	00h	Reserve	00h
0498	153	Reserve	00h	Reserve	00h
049A	155	Reserve	00h	Reserve	00h
049C	157	Reserve	00h	Reserve	00h
049E	159	Reserve	00h	Reserve	00h
04A0	161	Reserve	00h	CHECK-SUM	* *h
04A2	163	Reserve	04h	Reserve	03h
04A4	165	Reserve	54h	Reserve	0Dh
04A6	167	Reserve	54h	Reserve	0Dh
04A8	169	Reserve	25h	Reserve	04h
04AA	171	Reserve	55h	Reserve	04h
04AC	173	Reserve	00h	CHECK-SUM	* *h
04AE	175	HQ1	90h	HQ2	90h
04B0	177	HSG	11h	HSO	FFh
04B2	179	LQ1	90h	LQ2	90h
04B4	181	LSG	12h	LSO	00h
04B6	183	GQ1	98h	GQ2	84h
04B8	185	GSG	12h	ALS	3Fh
04BA	187	RCN	00h	EQR	00h
04BC	189	TM	★★h	CHECK-SUM	* *h
04BE	191	CT0	12h	CT1	01h
04C0	193	CT2	BBh	CT3	50h
04C2	195	USA	18h	RCE	94h
04C4	197	X2T	FFh	SDF	1Fh
04C6	199	FBO	FCh	BHS	00h
04C8	201	FBL	16h	MC2	00h
04CA	203	MC4	00h	L2H	81h
04CC	205	L4H	80h	BS0	3Ah
04CE	207	BS1	98h	BU0	01h
04D0	209	BD0	05h	BD1	DCh
04D2	211	BMK	1Eh	CST	69h
04D4	213	IJU	41h	IJD	55h
04D6	215	MCT	A1h	ERC	5Ah
04D8	217	CV0	00h	CV1	15h
04DA	219	SSK	00h	ACT	68h
04DC	221	C1E	52h	ADE	C0h
04DE	223	LCV	12h	wE3p	05h
04E0	225	wE3g	00h	wEA	16h
04E2	227	wEF	00h	RC0	D7h
04E4	229	RC1	D6h	R20	80h
04E6	231	R21	20h	R40	BFh
04E8	233	R41	02h	GUP	1Bh
04EA	235	SCG	00h	K10	0Fh

ADDRESS		+00H		+01H	
HEX		ITEM	CODE	ITEM	CODE
04EC	237	K11	8Eh	ATN	0Ch
04EE	239	ATU	0Ah	AHD	4Dh
04F0	241	ALD	60h	ACT	01h
04F2	243	PLG	22h	CRN	00h
04F4	245	Reserve	00h	Reserve	00h
04F6	247	Reserve	00h	CHECK-SUM	* *h
04F8	249	RM0	37h	RM1	31h
04FA	251	RM2	34h	RM3	42h
04FC	253	RM4	04h	RM5	0Ah
04FE	255	RM6	76h	RM7	60h
0500	257	RM8	FCh	RM9	64h
0502	259	RMA	76h	RMB	0Ah
0504	261	RMC	04h	RMD	0Ah
0506	263	RME	E6h	RMF	EDh
0508	265	RM10	FCh	RM11	F5h
050A	267	RM12	E6h	RM13	0Ah
050C	269	RM14	0Bh	RM15	0Bh
050E	271	RM16	E8h	RM17	28h
0510	273	RM18	E4h	RM19	0Eh
0512	275	RM1A	6Ah	RM1B	04h
0514	277	RM1C	03h	RM1D	96h
0516	279	RM1E	10h	RM1F	FCh
0518	281	RM20	2Bh	RM21	E8h
051A	283	RM22	0Bh	RM23	0Eh
051C	285	RM24	0Bh	RM25	3Fh
051E	287	RM26	BFh	RM27	4Ah
0520	289	RM28	61h	RM29	FDh
0522	291	RM2A	66h	RM2B	99h
0524	293	RM2C	0Ah	RM2D	FDh
0526	295	RM2E	20h	RM2F	A4h

ADDRESS		+00H		+01H	
HEX		ITEM	CODE	ITEM	CODE
0528	297	RM30	0Ah	RM31	FCh
052A	299	RM32	C1h	RM33	3Fh
052C	301	RM34	0Bh	RM35	00h
052E	303	Reserve	00h	Reserve	00h
0530	305	Reserve	00h	Reserve	00h
0532	307	Reserve	00h	Reserve	00h
0534	309	Reserve	00h	Reserve	00h
0536	311	Reserve	00h	Reserve	00h
0538	313	Reserve	00h	Reserve	00h
053A	315	Reserve	00h	Reserve	00h
053C	317	Reserve	00h	Reserve	00h
053E	319	Reserve	00h	Reserve	00h
0540	321	Reserve	0Ah	Reserve	00h
0542	323	Reserve	0Ah	Reserve	00h
0544	325	Reserve	0Ah	Reserve	00h
0546	327	Reserve	0Ah	Reserve	00h
0548	329	Reserve	0Ah	Reserve	00h
054A	331	Reserve	0Ah	Reserve	00h
054C	333	Reserve	0Ah	Reserve	00h
054E	335	Reserve	0Ah	Reserve	00h
0550	337	Reserve	0Ah	Reserve	00h
0552	339	Reserve	0Ah	Reserve	00h
0554	341	Reserve	0Ah	Reserve	00h
0556	343	Reserve	0Ah	Reserve	00h
0558	345	Reserve	0Ah	Reserve	00h
055A	347	Reserve	0Ah	Reserve	00h
055C	349	Reserve	0Ah	CHECK-SUM	* *h

★★H: Please carry out temperature measurement and set up the value calculated by compensation TABLE.

TEST-MODE VERSION: ○○○○●◎

(○○○○: μ-ROM VERSION="714B", ●: EEPROM VERSION="s", ◎: DESTINATION CODE="X")

MD ERROR MESSAGE DISPLAY CONTENT LIST

Display content	Error content	Error code	Remarks
BLANK MD	Nothing is recorded. (Replace the disc with a recorded disc)		
BATT EMPTY	The battery has run down.		
Can't READ*	Readout of the information is not completed.	a: Auto-adjust ERROR f: Focus search time over r: READ ERROR s: Track search time over w: SD write time over p: Time over at spindle start-up u: UTOC READ ERROR	* indicates the detailed factor.
Can't READ*	Readout of the TOC information is not completed.		
Can't READ*	Readout of the U-TOC information is not completed.		
Can't LOCK	The EJECT lever cannot be locked.		
Can't COPY	You tried to record from a copy prohibited Mini Disc (Record using the analogue cable.) You tried to record signals other than music (such as data)		
Can't EDIT	A track cannot be edited. (Change the stop position of the track and then edit it.)		
Can't REC	Recording cannot be performed correctly due to vibration or shock.		
Can't PLAY	You tried to play back a track that cannot be played with this equipment.		Displayed when sound cannot be played. (Skipped automatically)
Can't WRITE	Cannot save the TOC information correctly to a Mini disc.		
Can't STAMP	Stamp function does not work. (Check the number of tracks.)		
DISC FULL	The disc is out of recording space.		
Er-MD41	Judged it abnormal by the U-TOC write test.		
Er-MD80	EEPROM readout Check sum error		
TOC FORM**	Abnormal data DISC detection	L*: UTOC SECTOR* is Loop a_: Address abnormal t_: FTNO > LTNO	* indicates the detailed factor.
TOC FULL	There is no space left for recording or editing.		
TOC FULL*	There is no space left for entering names.		* stands for the sector number.
TEMP OVER	The temperature is too high. (Turn off the power, and wait a while.)		
Tr.Protect	The track has been protected from being erased. (Edit the track with the device on which it was recorded.)		
HOLD	The unit is in the hold mode.		
LOCKED	You removed a Mini Disc whilst recording or editing (Turn off the power before removing the MiniDisc.)		
NAME FULL	The number of characters for names exceeds the specification limit.		
NO DISC	A disc has not been loaded.		
NO SIGNAL	Poor connection of the digital cable No output signal comes out from the connected unit (Use the AC power for the connected unit.) The input signal has improper sampling frequency.		
NOT AUDIO	A non-audio track was played.		Displayed when sound cannot be played.
OPEN	The disc compartment is open.		Open lid is detected while the system is running.
PLAY MD	You tried to record on a playback-only disc.		
PROTECTED	The write protection tab of a Mini Disc is set to the protected position.		Select one according to the displayable message length
POWER?	AC adaptor other than specified.		
?DISC	A disc which contains data other than music was played. (A disc which contains nonmusic data cannot be played.) There is an error in the signal recorded on the disc.		

NOTES ON SCHEMATIC DIAGRAM

- Resistor:

To differentiate the units of resistors, such symbol as K and M are used: the symbol K means 1000 ohm and the symbol M means 1000 kohm and the resistor without any symbol is ohm-type resistor. Besides, the one with "Fusible" is a fuse type.

- Capacitor:

To indicate the unit of capacitor, a symbol P is used: this symbol P means micro-micro-farad and the unit of the capacitor without such a symbol is microfarad. As to electrolytic capacitor, the expression "capacitance/withstand voltage" is used.

(CH), (TH), (RH), (UJ): Temperature compensation

(ML): Mylar type

- The indicated voltage in each section is the one measured by Digital Multimeter between such a section and the chassis with no signal given.

- Parts marked with "⚠" (⌚ = = = ⌚) are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

REF. NO	DESCRIPTION	POSITION
SW401	EJECT	ON—OFF
SW402	LID OPEN	ON—OFF
SW901	DISC PROTECT	ON—OFF

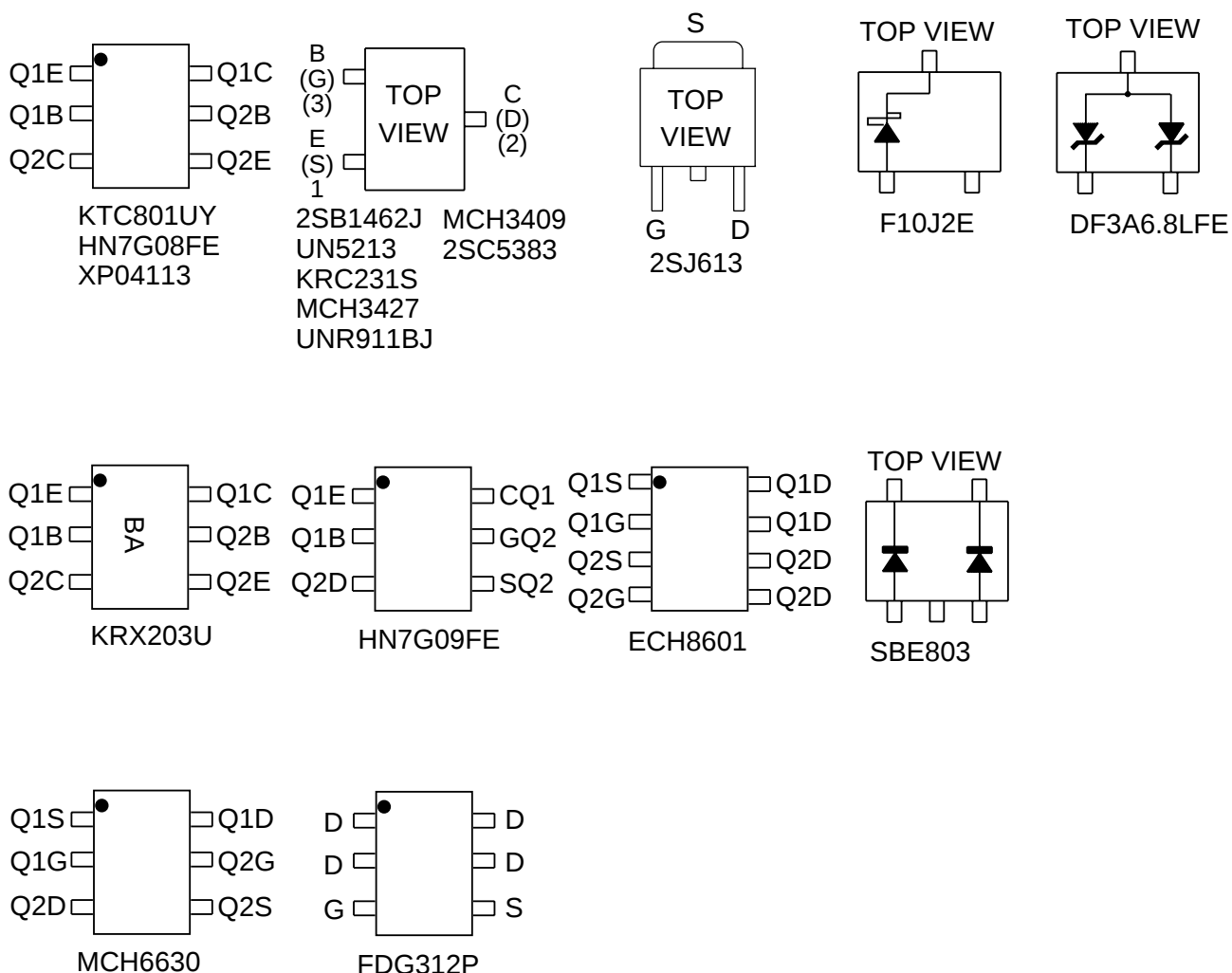


Figure 22 TYPES OF TRANSISTOR AND DIODE

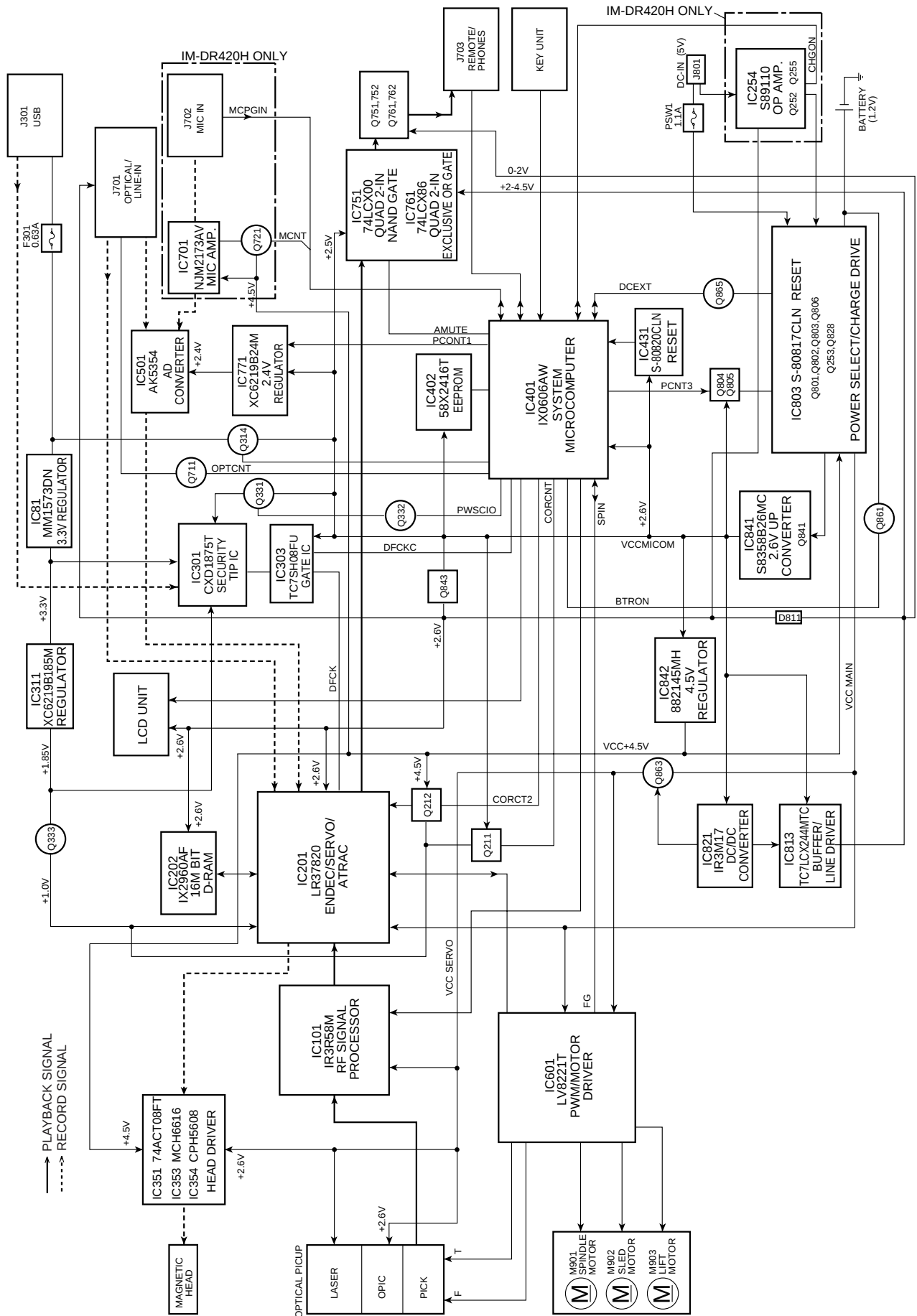


Figure 23 BLOCK DIAGRAM

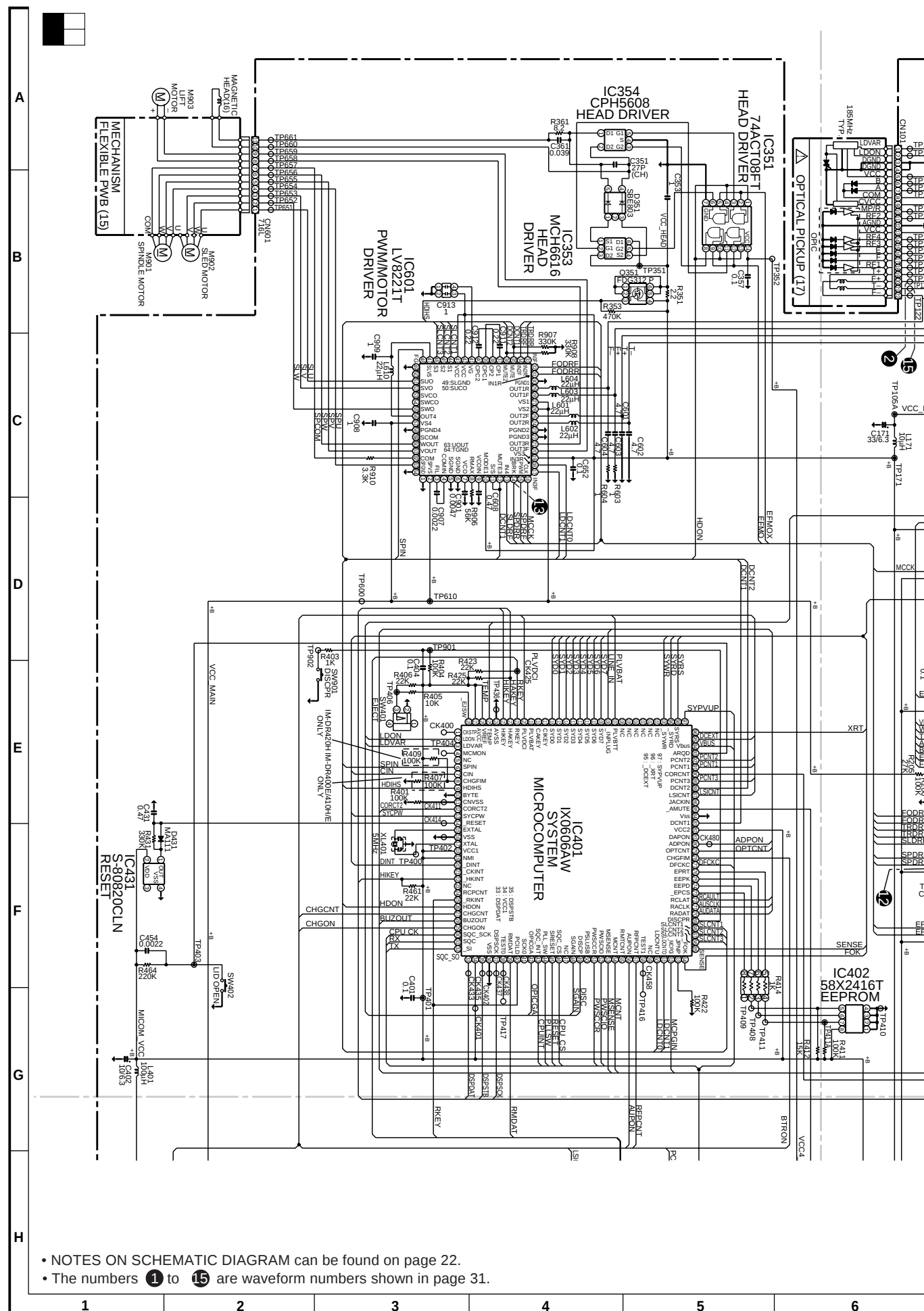


Figure 24 SCHEMATIC DIAGRAM (1/4)



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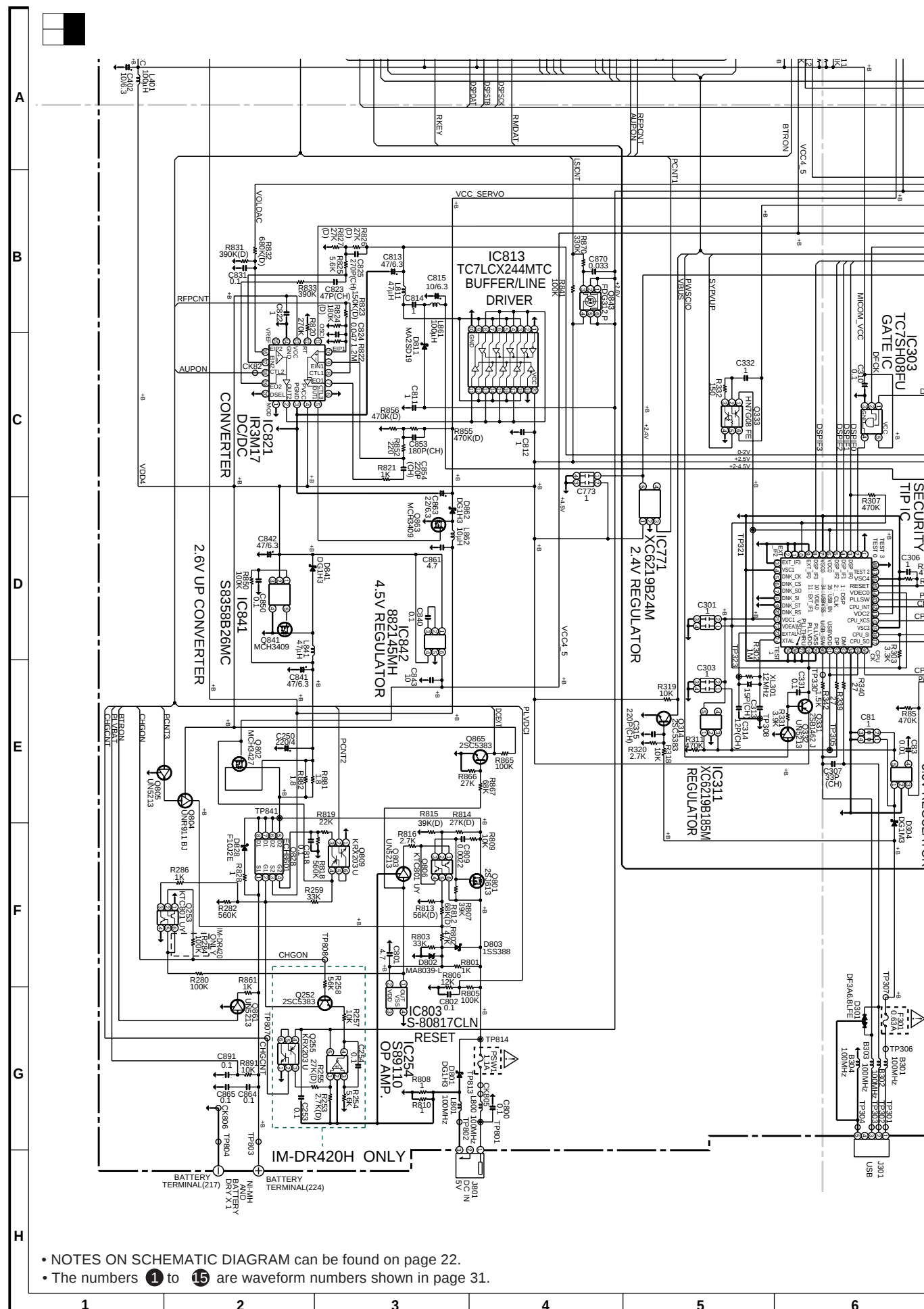


Figure 26 SCHEMATIC DIAGRAM (3/4)

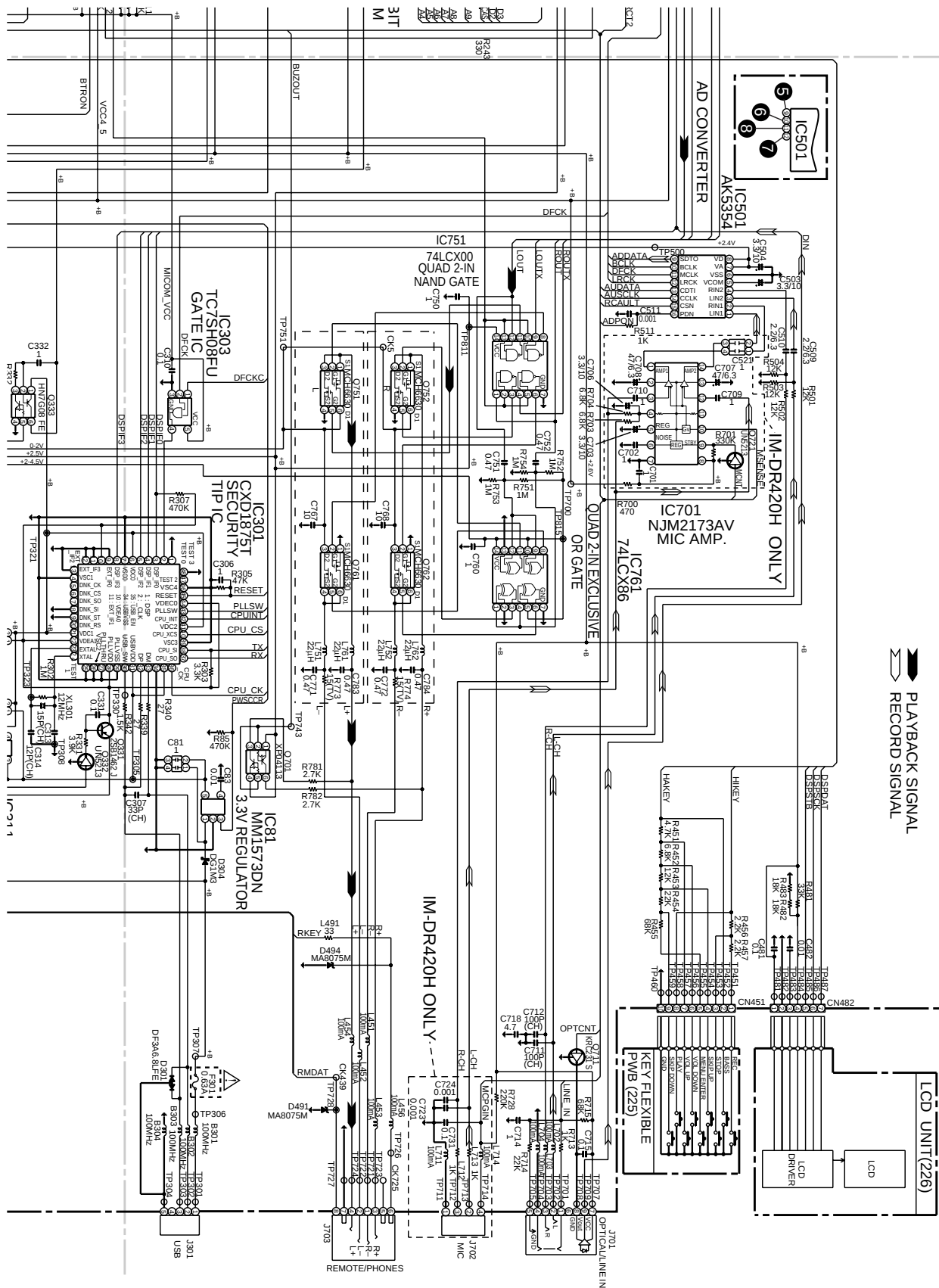
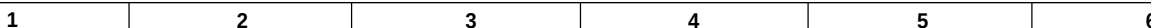


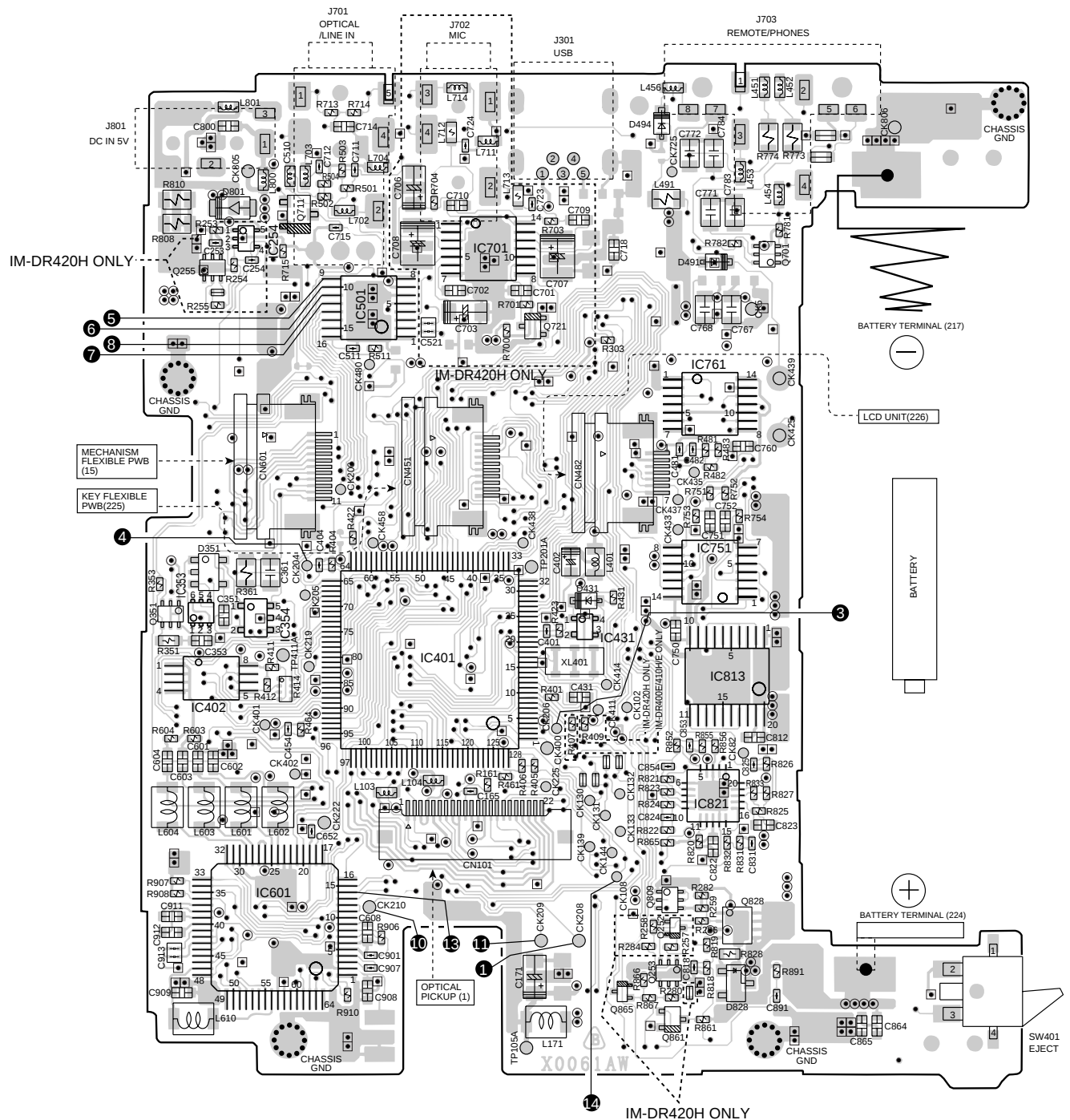
Figure 27 SCHEMATIC DIAGRAM (4/4)

IM-DR420H ONLY



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MAIN PWB-A (TOP VIEW)



7	8	9	10	11	12
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Figure 29 WIRING SIDE OF P.W.BOARD (2/3)

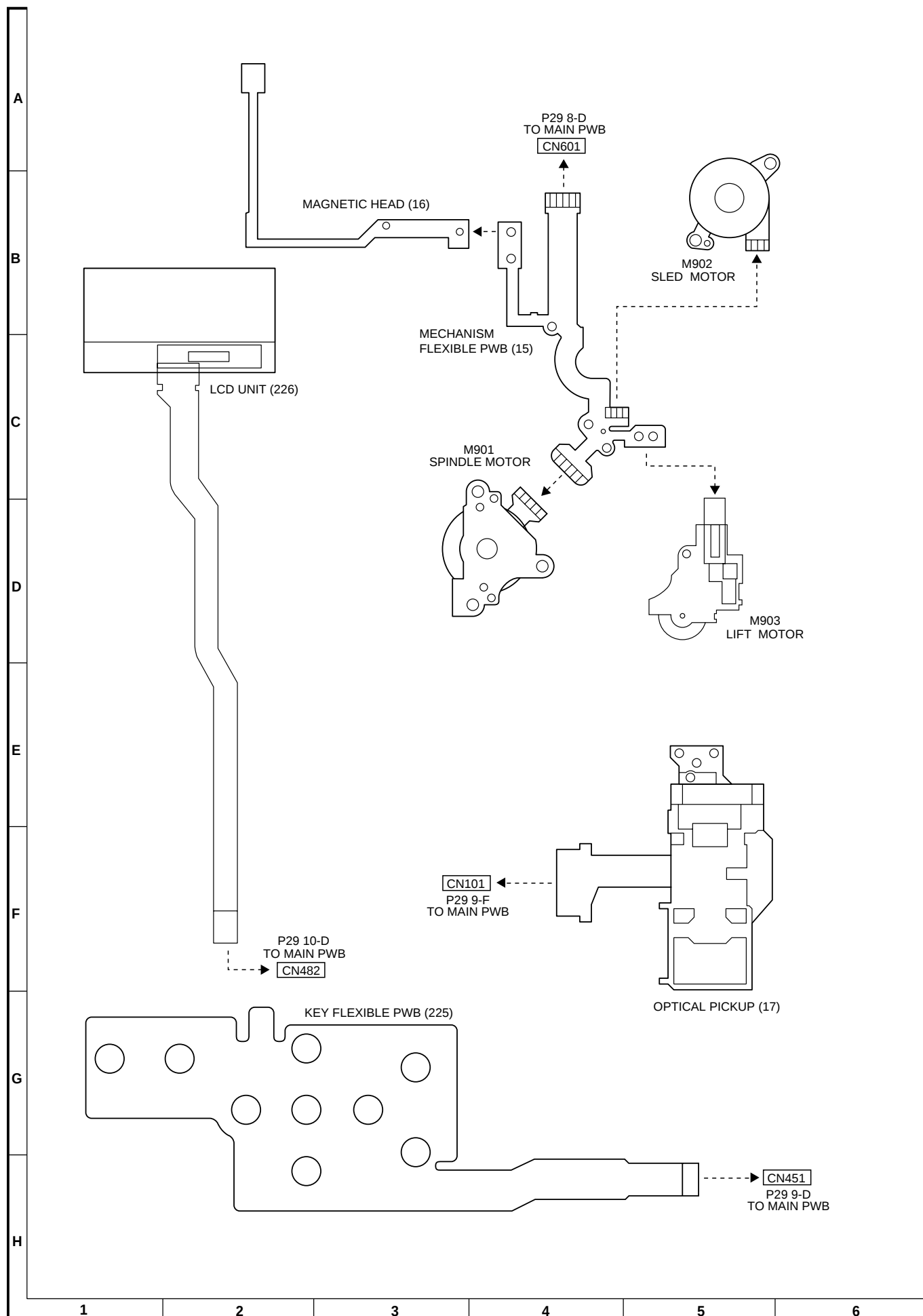
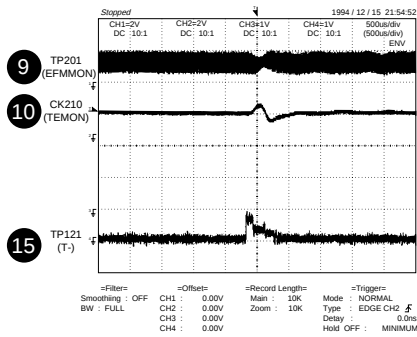
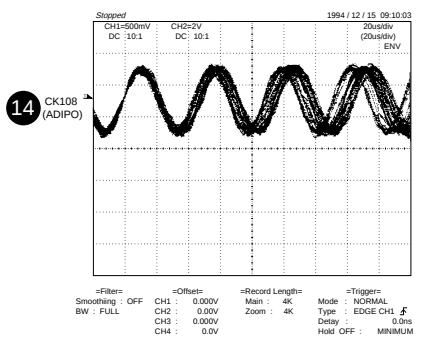
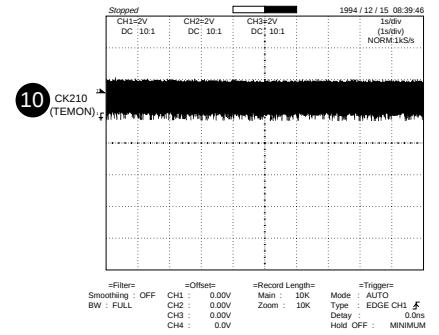
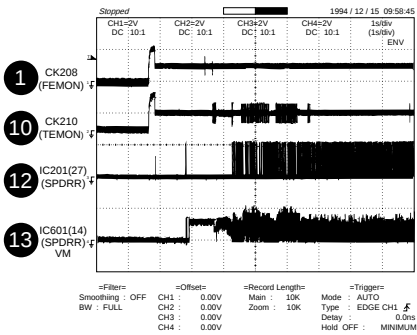
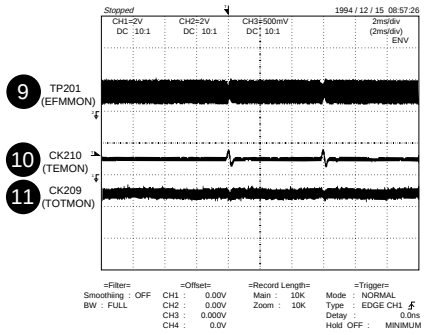
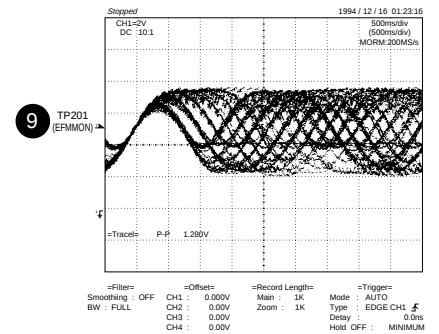
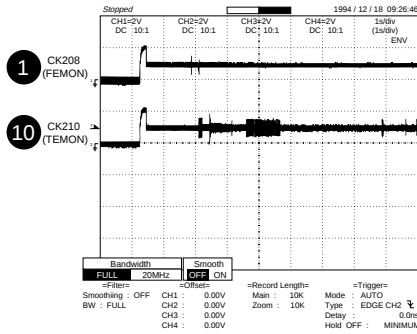
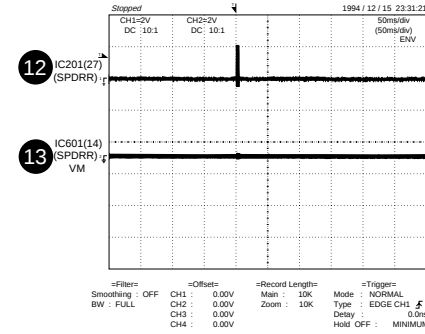
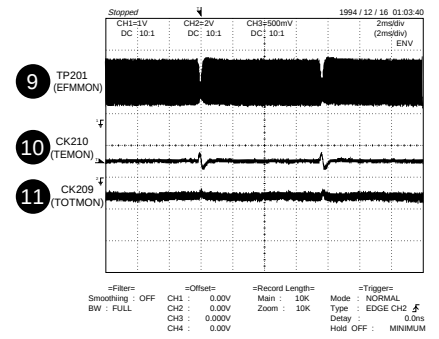
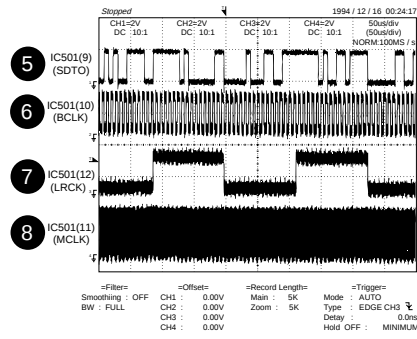
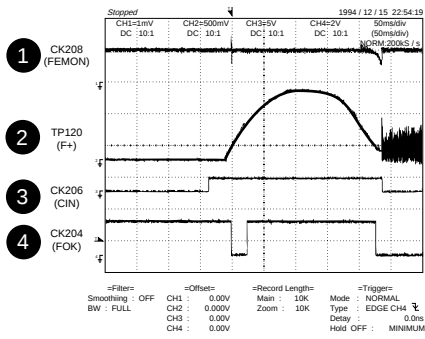


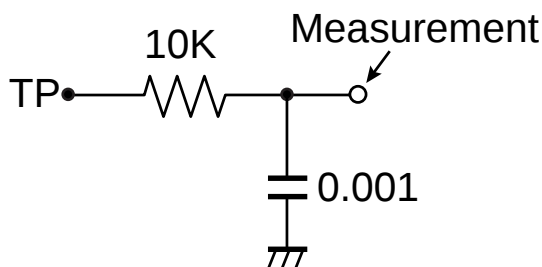
Figure 30 WIRING SIDE OF P.W.BOARD (3/3)

WAVEFORMS OF MD CIRCUIT



For TP208, TP209, and TP210, use the specific LPF, and observe the waveform.

When watching the EEM monitor (TP201) Set MSL from 00H to 80H with EEPROM control setting. After completion restore 00H.



VOLTAGE

IC81	
PIN NO.	VOLTAGE
1	4.76V
2	0V
3	2.57V
4	1.48V
5	3.27V

IC101	
PIN NO.	VOLTAGE
1	0.73V
2	0.73V
3	0.73V
4	0.73V
5	1.28V
6	1.28V
7	1.28V
8	1.28V
9	1.28V
10	1.28V
11	1.28V
12	1.28V
13	1.28V
14	1.28V
15	1.28V
16	1.28V
17	1.28V
18	1.28V
19	1.28V
20	1.28V
21	1.28V
22	1.28V
23	1.28V
24	0.73V
25	1.49V
26	2.57V
27	2.57V
28	2.63V
29	2.63V
30	1.71V
31	0V
32	1.29V
33	1.28V
34	0.58V
35	1.28V
36	1.28V
37	1.27V
38	1.26V
39	0.59V
40	2.63V
41	1.53V
42	0V
43	1.27V
44	0V
45	0.82V
46	1.27V
47	0.82V
48	0.73V

IC202	
PIN NO.	VOLTAGE
1	2.58V
2	1.30V
3	1.30V
4	2.58V
5	2.55V
6	0V
7	2.58V
8	2.58V
9	2.58V
10	2.58V
11	2.58V
12	2.58V
13	0V
14	0V
15	0V
16	2.58V
17	0V
18	2.58V
19	0V
20	0V
21	2.54V
22	1.29V
23	1.29V
24	0V

IC202	
PIN NO.	VOLTAGE
1	2.58V
2	1.30V
3	1.30V
4	2.58V
5	2.55V
6	0V
7	2.58V
8	2.58V
9	2.58V
10	2.58V
11	2.58V
12	2.58V
13	0V
14	0V
15	0V
16	2.58V
17	0V
18	2.58V
19	0V
20	0V
21	2.54V
22	1.29V
23	1.29V
24	0V

IC254	
PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V
5	2.59V

IC201					
PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
1	1.26V	51	2.58V	101	1.30V
2	2.58V	52	2.58V	102	1.32V
3	1.33V	53	2.58V	103	2.58V
4	0V	54	0V	104	0V
5	2.58V	55	2.53V	105	0V
6	0V	56	0V	106	0V
7	1.32V	57	0V	107	2.58V
8	1.33V	58	2.58V	108	2.58V
9	1.32V	59	2.54V	109	2.58V
10	1.32V	60	2.58V	110	0V
11	1.32V	61	0V	111	0V
12	1.32V	62	0V	112	0V
13	1.32V	63	0V	113	1.31V
14	1.62V	64	0V	114	2.58V
15	0V	65	0V	115	1.23V
16	0V	66	2.58V	116	0V
17	0V	67	0V	117	2.56V
18	0V	68	1.29V	118	1.14V
19	1.28V	69	1.29V	119	1.23V
20	0V	70	2.58V	120	1.23V
21	0V	71	0V	121	1.23V
22	0V	72	1.29V	122	1.23V
23	0V	73	1.29V	123	1.23V
24	0V	74	0V	124	1.23V
25	0V	75	2.58V	125	1.23V
26	0V	76	2.58V	126	2.56V
27	2.58V	77	1.11V	127	2.54V
28	2.58V	78	1.11V	128	0V
29	0V	79	2.56V		
30	2.48V	80	0V		
31	0V	81	2.58V		
32	2.01V	82	1.21V		
33	1.28V	83	1.14V		
34	1.28V	84	1.23V		
35	1.28V	85	0V		
36	0V	86	1.38V		
37	1.10V	87	0V		
38	1.28V	88	2.58V		
39	2.58V	89	0V		
40	0V	90	0V		
41	1.07V	91	0V		
42	0V	92	0V		
43	2.58V	93	1.49V		
44	2.58V	94	1.29V		
45	2.58V	95	0V		
46	2.58V	96	2.58V		
47	2.58V	97	0V		
48	2.58V	98	0V		
49	0V	99	0V		
50	0V	100	1.28V		

IC354	
PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V
5	0V

IC402	
PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V
5	2.57V
6	0V
7	2.57V
8	2.57V

IC431	
PIN NO.	VOLTAGE
1	2.57V
2	2.57V
3	0V
4	0V

IC821	
PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	2.60V
5	0.15V
6	0V
7	1.12V
8	2.57V
9	1.70V
10	0V
11	1.29V
12	1.25V
13	1.25V
14	0V
15	0V
16	0V
17	0V
18	0V
19	1.28V
20	0V

IC821	
PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V
5	0.50V
6	0V
7	1.12V
8	2.57V
9	1.70V
10	0V
11	1.29V
12	1.25V
13	1.25V
14	0V
15	0V
16	0V
17	0V
18	0V
19	1.28V
20	0V

IC351	
PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V
5	0V
6	0V
7	0V
8	0V
9	1.07V
10	0V
11	0V
12	1.07V
13	0V
14	4.51V

IC353	
PIN NO.	VOLTAGE
1	0V
2	0V
3	1.87V
4	0V
5	0V
6	1.87V

IC311	
PIN NO.	VOLTAGE
1	3.27V
2	0V
3	3.27V
4	1.86V
5	0V

IC841	
PIN NO.	VOLTAGE
1	2.07V
2	2.60V
3	0V
4	0V
5	0.50V

IC841	
PIN NO.	VOLTAGE
1	2.07V
2	2.60V
3	0V
4	0V
5	0.50V

IC841	
PIN NO.	VOLTAGE
1	2.07V
2	2.60V
3	0V
4	0V
5	0.50V

IC301	
PIN NO.	VOLTAGE
1	0V
2	0V
3	2.47V
4	0.65V
5	0.50V
6	1.86V
7	0V
8	0.55V
9	0V
10	2.59V
11	0V
12	0V
13	0V
14	0V
15	2.59V
16	2.59V
17	2.59V
18	0V
19	0V
20	2.59V
21	1.86V
22	2.59V
23	1.30V
24	1.25V
25	0V
26	0V
27	0V
28	2.57V
29	0V
30	0V
31	3.27V
32	0V
33	0V
34	0V
35	3.27V
36	2.57V
37	0V
38	2.57V
39	0V
40	2.57V
41	1.86V
42	0V
43	0V
44	2.57V
45	2.57V
46	0V
47	2.57V
48	0V

IC501	
PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V
5	0V
6	0V
7	2.40V
8	2.40V
9	0V
10	0V
11	0V
12	0V
13	2.57V
14	0V
15	2.57V
16	0V

IC813	
PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V
5	0V
6	0V
7	0V
8	0V
9	0V
10	0V
11	0V
12	0V
13	0V
14	0V
15	0V
16	0V
17	0V
18	0V
19	0V
20	2.60V

IC303	
PIN NO.	VOLTAGE
1	0V
2	0V
3	0V
4	0V
5	2.57V

Q751	
PIN NO.	VOLTAGE
1	0V
2	1.21V
3	0V
4	0V
5	2.60V
6	0V

Q861	
PIN NO.	VOLTAGE
B	0V
C	2.09V
E	0V

IC401					
PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
1	1.30V	51	0V	101	0V
2	0V	52	0V	102	0V
3	0V	53	0V	103	0V
4	0V	54	0V	104	0V
5	0V	55	0V	105	0V
6	2.63V	56	0V	106	0V
7	0V	57	2.56V	107	2.07V
8	1.27V	58	0V	108	2.56V
9	0V	59	0V	109	1.22V
10	0V	60	0V	110	1.22V
11	0V	61	0V	111	1.22V
12	0V	62	2.53V	112	1.22V
13	2.56V	63	0V	113	1.22V
14	2.48V	64	2.58V	114	1.22V
15	1.22V	65	0V	115	1.22V
16	0V	66	0V	116	1.22V
17	1.21V	67	0V	117	0V
18	2.56V	68	0V	118	0V
19	2.56V	69	2.53V	119	0V
20	2.58V	70	2.56V	120	0.34V
21	0V	71	0V	121	2.54V
22	0V	72	2.56V	122	2.54V
23	0V	73	2.56V	123	2.54V
24	0V	74	2.56V	124	0V
25	2.56V	75	0V	125	1.49V
26	0V	76	2.56V	126	2.56V
27	0V	77	0V	127	2.56V
28	2.56V	78	0V	128	2.56V
29	0V	79	0V		
30	0V	80	0V		
31	0V	81	0V		

TROUBLESHOOTING

It is advisable to use the TEST mode (refer to Error Data Display Mode, P9) indicating the causes of troubles before starting repair. Causes of operation errors (up to 10 errors) are recorded as error codes. This information is useful for repair.

When MD playback does not function

When the objective lens of the optical pickup is dirty, this section may not operate. Clean the objective lens, and check the playback operation. When this section does not operate even after the above step is taken, check the following items.

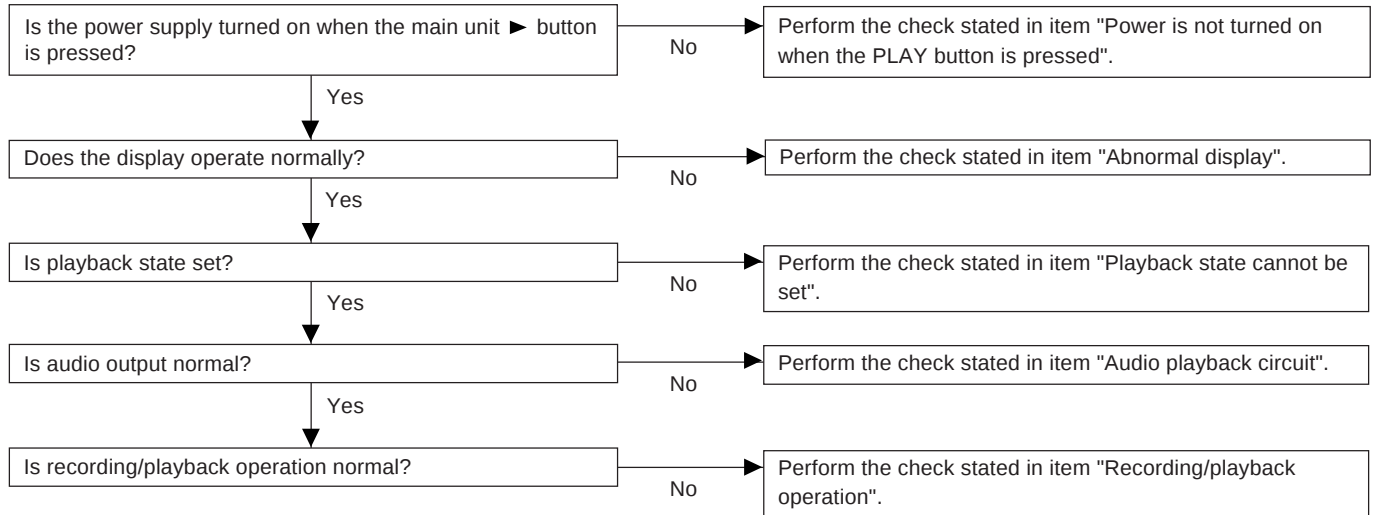
Remove the cabinet and follow the troubleshooting instructions.

"Track skipping and/or no TOC (Table Of Contents) may be caused by build up of dust other foreign matter on the laser pickup lens. Before attempting any adjustment make certain that the lens is clean. If not, clean it as mentioned below."

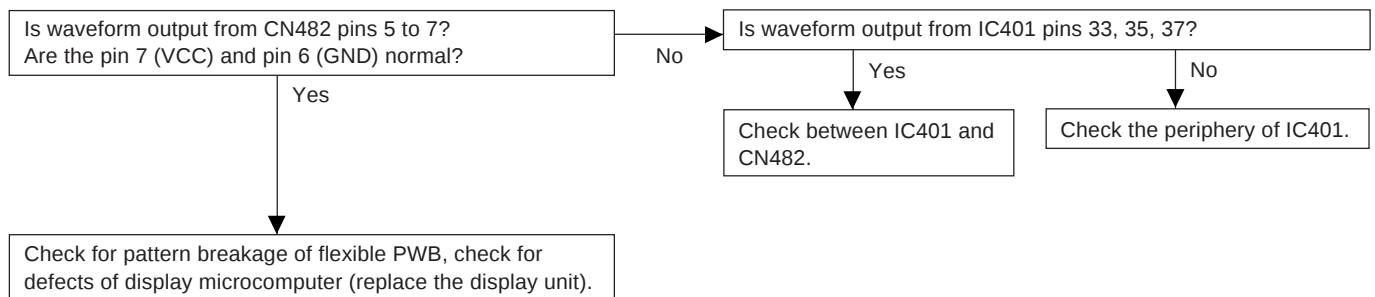
Turn the power off.

Gently clean the lens with a lens cleaning tissue and a small amount of lens cleaner on the market.

Do not touch the lens with the bare hand.

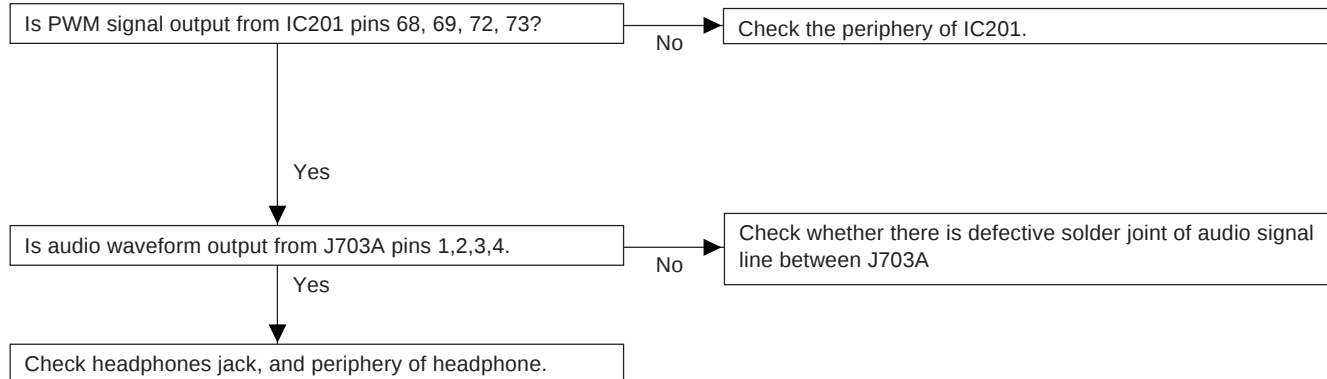


• Abnormal display

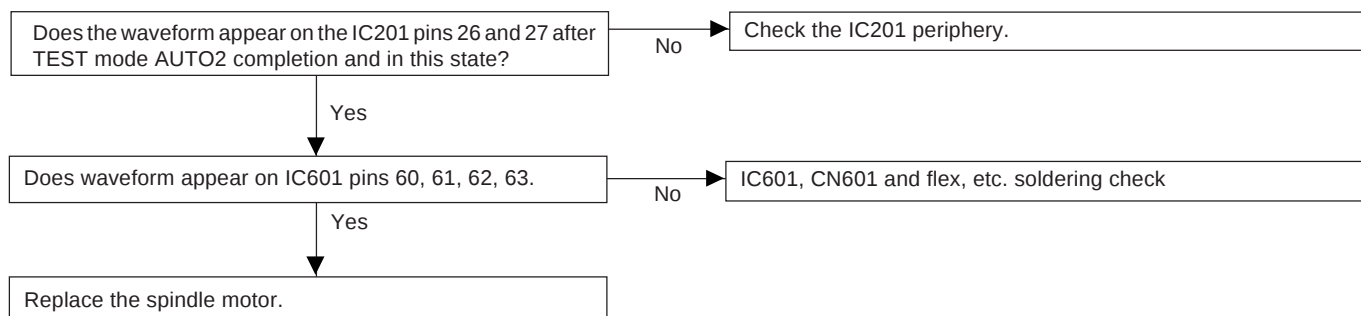


• Audio playback circuit

Although the playback time display is acting., no sound is given during playback in the normal mode.



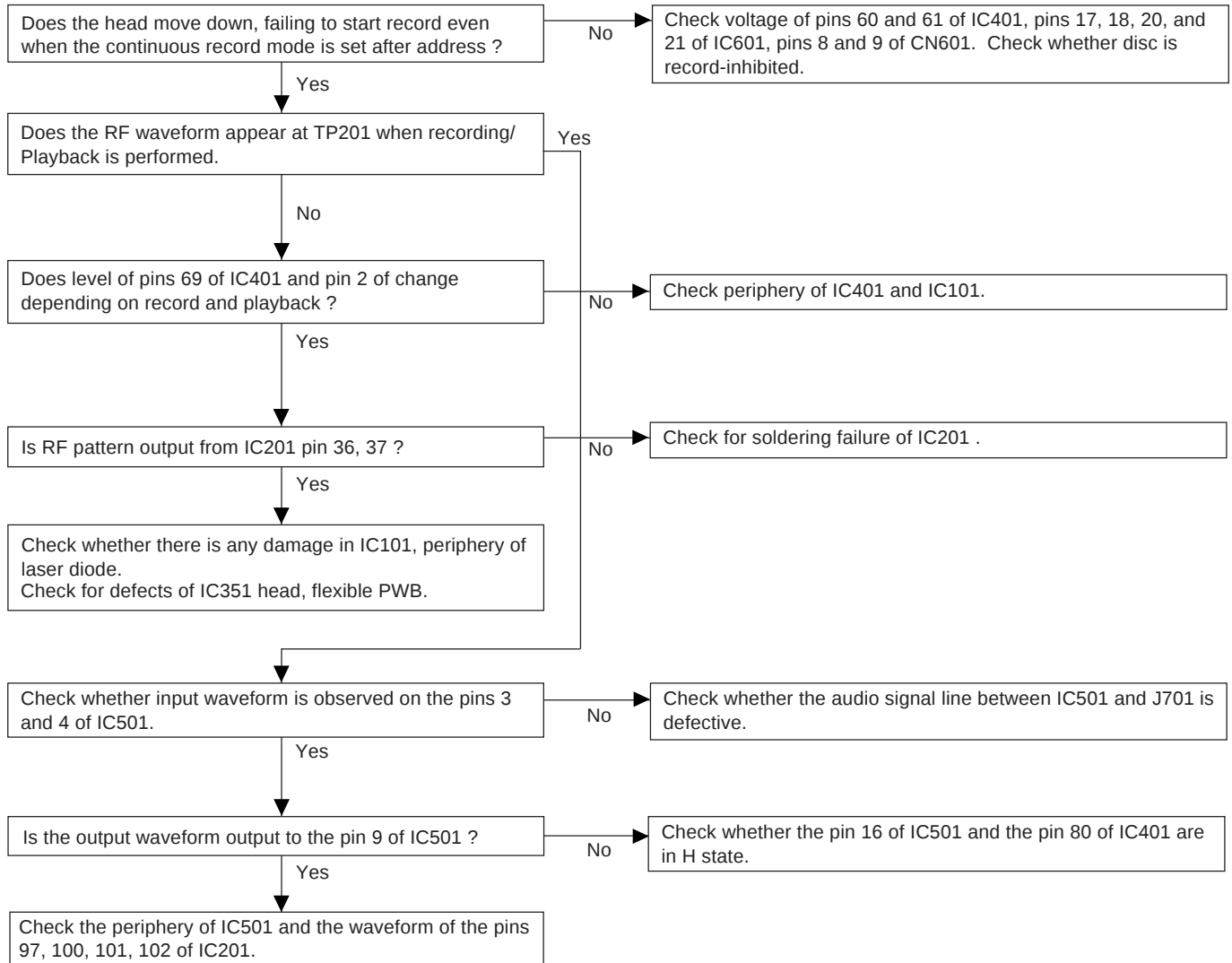
• The spindle motor fails to run. Does the head move



• Recording/playback operation.

Insert a low reflection disc, and ascertain audio output by normal playback, and then set TEST REC mode.

Change MSL from 00H to 80H by the control setting of EEPROM. After completing the operation, return in to 00H.



FUNCTION TABLE OF IC

IC401 RH-iX0606AW00 :System Microcomputer (IX0606AW) (1/3)

Pin No.	Port Name	Terminal Name	Input/Output	Function
1*	P96	CKSTP	Output	Microcomputer operation monitor output
2	P95	LDON	Output	P.U. laser ON/OFF control output
3	DA1	LDVAR	Output	P.U. laser power setting output
4*	DA0	MCMON	Output	Internal operation status monitor
5*	P92	NC	Output	Reserve
6	TB1IN	SPIN	Input	Spindle motor FG pulse detection input
7	TB0IN	CIN	Input	Track cross signal/focus drive detection
8	P141	CHGFIM	Input	Charging function presence/absence discrimination input
9	P140	HDIHS	Output	Recording current fast/normal speed switching
10*	BYTE	BYTE	Input	External data bus width selection input
11	CNVSS	CNVSS	—	Processor mode switching input
12	P87	CORCT2	Output	LSI Vdd1 PWM power SW ON/OFF
13	P86	SYCPW	Output	System LSI core power control output
14	RESET	RESET	Input	Microcomputer hard reset input
15	XOUT	EXTAL	—	Crystal oscillator connection terminal
16*	VSS	VSS	—	Ground potential
17	XIN	XTAL	—	Crystal oscillator connection terminal
18	VCC1	VCC1	—	Positive power supply
19	NMI	NMI	Input	Reserve
20	INT2	_DINT	Input	System LSI interruption
21*	P83	NC	Output	Reserve
22	P82/INT0	_HKINT	Input	Unit interruption key detection input
23*	P81	NC	Output	Reserve
24*	P80	RCPCNT	Output	Record circuit power control output
25	TA3IN	_RKINT	Input	Remote control interruption key detection input
26	P76	HDON	Output	Recording head current control output
27	P75	CHGCNT	Output	Charge control
28	TA2OUT	BUZOUT	Output	Beep sound pulse output
29	P73	CHGON	Output	Charge ON/OFF control output
30	CLK2	SQC_SCK	Output	Security chip clock output
31	RXD2	SQC_SI	Input	Security chip data input
32	TXD2	SQC_SO	Output	Security chip data output
33	TXD1	DSPDAT	Output	Unit display data output
34	VCC1	VCC1	—	Positive power supply
35	P66	DSPSTB	Output	Unit display strobe output
36	VSS	VSS	—	Ground potential
37	CLK1	DSPSCK	Output	Unit display data clock output
38	P64	TEST0	Input	Test mode setting input 0
39	TXD0	RMDAT	Output	Remote control display data
40	RXD0	PCLID	Input	Jig IF data input
41*	CLK0	SCK0	Output	Serial clock output (not used)
42	P60	OPICGA	Output	P.U. detection sensitivity switching output
43	P137	SQC_INT	Input	Security chip interruption
44	P136	PLL_SW	Output	Security chip PLL SW
45	P135	SRESET	Output	Security chip RESET
46	P134	SQC_CS	Output	Security chip CS
47*	P57	NC	Output	Reserve
48	P56	SGAIN	Input/Output	RF amp gain switching output
49	P55	DISCP	Input/Output	RF amp TE polarity switching output
50*	P54	PSLUSB	Output	Microcomputer power supply selection from USB

In this unit, the terminal with asterisk mark (*) is open terminal which is not connected to the outside.

IC401 RH-iX0606AW00 :System Microcomputer (IX0606AW) (2/3)

Pin No.	Port Name	Terminal Name	Input/Output	Function
51	P133	PWSCCR	Output	Security chip core power control
52	P132	PWSCIO	Output	Security chip IO power control
53	P131	MSENSE	Output	Microphone sensitivity switching output
54	P130	MCNT	Output	Microphone power control output
55*	P53	NC	Output	Reserve
56	P52	AUPON	Output	1-bit audio power ON/OFF
57	P51	RFCNT	Output	RF-LSI power ON/OFF control output
58*	P50	TEST1	Input	Test mode setting input 1
59*	P127	NC	Output	Reserve
60	P126	LDCNTU	Output	Recording head up/down control output U
61	P125	LDCNTD	Output	Recording head up/down control output D
62	P47	_MCPGI	Input	Microphone plug insertion detection input
63	P46	JPNP	Input	Kana conversion/kana input presence/absence discrimination
64	P45	_FOK	Input	Focus OK signal input
65	P44	SENSE	Input	System LSI servo sense input
66	P43	SLCNT3	Output	Stepping motor drive output 3
67	P42	SLCNT2	Output	Stepping motor drive output 2
68	P41	SLCNT1	Output	Stepping motor drive output 1
69	P40	DISCPR	Input	Disk record inhibition switch input
70	P37	RADAT	Output	Audio IC serial data output
71	P36	RACLK	Output	Audio IC data clock output
72	P35	RCLAT	Output	Record audio IC data latch output
73	P34	_EPCS	Output	EEPROM chip select output
74	P33	EEPD	Input/Output	EEPROM serial data input/output
75	P32	EEPK	Output	EEPROM serial clock output
76	P31	EPRT	Output	EEPROM write protection control output
77	P124	DFCKC	Output	Security IC clock input ON/OFF
78	P123	BTRON	Output	Battery load resistance ON/OFF control
79	P122	OPTCNT	Output	Optical digital input circuit ON/OFF control
80	P121	ADPON	Output	A/D converter operation control output
81*	P120	DAPON	Output	D/A converter operation control output
82	VCC2	VCC2	—	Positive power supply
83	P30	DCNT1	Output	Mechanism driver enable output
84*	VSS	VSS	—	Ground potential
85	P27	_AMUTE	Output	Audio output mute control
86*	P26	NC	Output	Reserve
87	P25	LSICNT	Output	2.5V system power ON/OFF control output
88	P24	DCNT2	Output	Head up/down motor driver P control
89	P23	PCNT3	Output	Power supply section reference voltage ON/OFF control
90	P22	CORCNT	Output	VDD1 bypass ON/OFF control
91	P21	PCNT1	Output	System power ON/OFF control output
92	P20	PCNT2	Output	Start Tr ON/OFF
93	P17	ARQD	Input	Disk lid open/close detection/rise request
94	P16	Vbas	Input	Vbas detection (security chip)
95	P15	_DCEXT	Input/Output	DC IN presence/absence detection
96	P14	_XRST	Output	System LSI hard reset output
97	P13	SYPVUP	Output	System LSI core power supply voltage control
98	P12	SYRS	Output	System LSI register selection output
99	P11	_SYRD	Output	System LSI read enable output
100	P10	_SYWR	Output	System LSI write enable output

In this unit, the terminal with asterisk mark (*) is open terminal which is not connected to the outside.

IC401 RH-iX0606AW00 :System Microcomputer (IX0606AW) (3/3)

Pin No.	Port Name	Terminal Name	Input/Output	Function
101*	P07	NC	Output	Reserve
102*	P06	NC	Output	Reserve
103*	P05	NC	Output	Reserve
104*	P04	NC	Output	Reserve
105*	P03	NC	Output	Reserve
106*	P02	NC	Output	Reserve
107	P01	PLVBTT	Input	Battery voltage detection (without amp)
108	AN10	_INPLUG	Input	Line/digital plug detection
109	P117	SYD7	Input/Output	System LSI parallel data bus
110	P116	SYD6	Input/Output	
111	P115	SYD5	Input/Output	
112	P114	SYD4	Input/Output	
113	P113	SYD3	Input/Output	
114	P112	SYD2	Input/Output	
115	P111	SYD1	Input/Output	
116	P110	SYD0	Input/Output	
117*	P107	NC	Output	Reserve
118*	P106	NC	Output	Reserve
119*	AN5	NC	Output	Reserve
120	AN4	PLVDCI	Input	DCIN voltage (error) detection input
121	AN3	RKEY	Input	Remote control button operation detection input
122	AN2	HAKEY	Input	Unit normal key detection input
123	AN1	HIKEY	Input	Unit interruption key detection input
124*	AVSS	AVSS	—	A/D, D/A converter ground potential
125	AN0	TEMP	Input	Ambient temperature detection input
126	Vref	Vref	—	A/D, D/A converter reference voltage
127	AVCC	AVCC	—	A/D, D/A converter positive power supply
128	P97	_EJSW	Input	Ejection lever operation detection input

In this unit, the terminal with asterisk mark (*) is open terminal which is not connected to the outside.

IC601 VHiLV8221T+-1 :PWM/Motor Driver (LV8221T)(1/2)

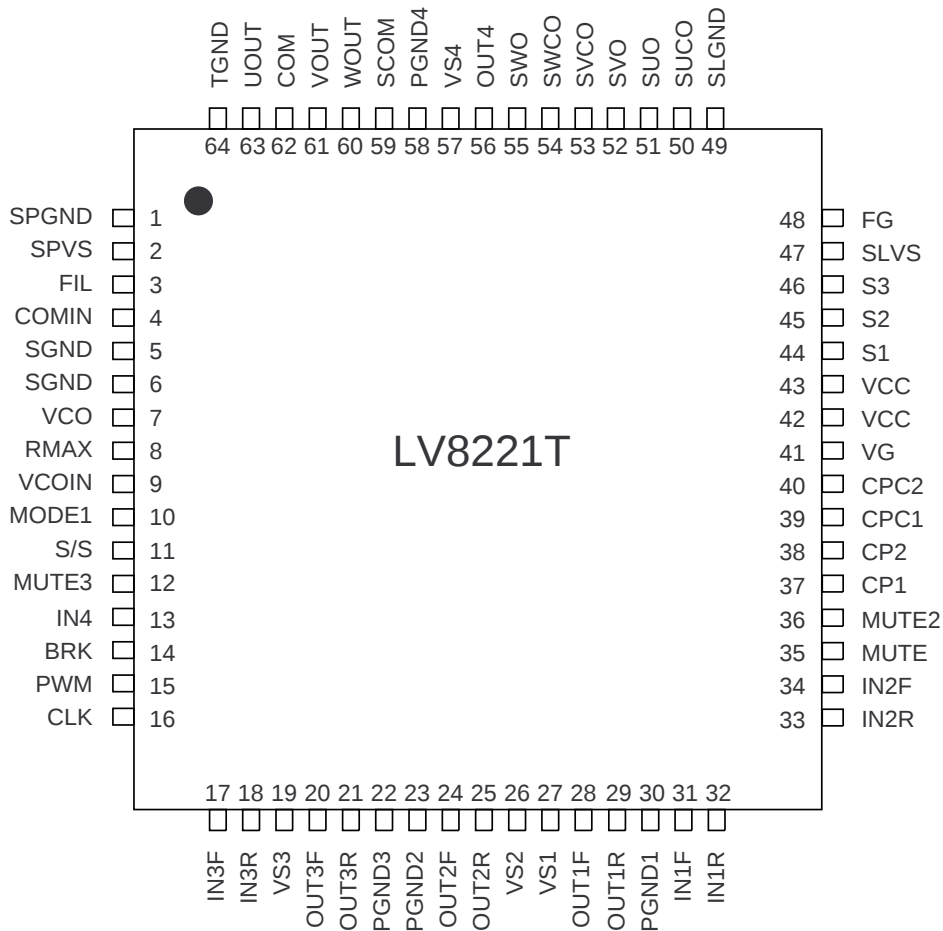
Pin No.	Terminal Name	Function
1	SPGND	Ground terminal of spindle output.
2	SPVS	Power supply terminal for spindle drive . The capacitor is connected to the GND terminal.
3	FIL	Position detection comparator filter terminal in the spindle motor. The capacitor is connected between this terminal and COMIN terminal (pin).
4	COMIN	Position detection comparator filter terminal in the spindle motor. The capacitor is connected between this terminal and FIL terminal (pin).
5, 6	SGND	Small signal GND terminal.
7	VCO	VCO oscillation terminal. The capacitor is connected to the GND terminal. VCO oscillation frequency is changed in accordance with the revolution speed of the motor (voltage at VCOIN terminal).
8	RMAX	VCO maximum frequency setting terminal. The resistor is connected to the GND terminal. The frequency rises by lowering the resistance.
9	VCOIN	VCO control voltage input terminal. The capacitor is connected to the GND terminal. Control output is generated according to the revolution speed of the motor inside the logic, and charged/discharged to the capacitor connected to the GND terminal. The voltage at this terminal controls the VCO oscillation frequency.
10	MODE1	PWM frequency switching input terminal. Select "H" when the CLK terminal (PIN) input frequency is 32 times as high as the spindle PWM frequency, and select "L" when it is 64 times as high.
11	S/S	Start/stop terminal in the spindle motor section. Started with "H" level input.
12	MUTE3	Half-bridge mute terminal. All output terminals of the above driver are set into a high impedance state at the entry of "L".
13	IN4	Half bridge control input terminal.
14	BRK	Brake terminal in the spindle motor section. Counter torque brake applied with "L" level input.
15	PWM	PWM signal input terminal TR is on with "H" level input.
16	CLK	Reference clock input terminal for logic operations. Enter a frequency 32 times or 64 times as high as the spindle PWM frequency.
17	IN3F	H bridge 3 logic input terminal.
18	IN3R	
19	VS3	H bridge 3 power supply terminal. The capacitor is connected to the GND terminal.
20	OUT3F	H bridge 3 forward output terminal.
21	OUT3R	H bridge 3 reverse output terminal.
22	PGND3	H bridge 3 output section GND terminal.
23	PGND2	H bridge 2 output section GND terminal.
24	OUT2R	H bridge 2 reverse output terminal.
25	OUT2F	H bridge 2 forward output terminal
26	VS2	H bridge 2 power supply terminal. The capacitor is connected to the GND terminal.
27	VS1	H bridge 1 power supply terminal. The capacitor is connected to the GND terminal.
28	OUT1F	H bridge 1 forward output terminal.
29	OUT1R	H bridge 1 reverse output terminal.
30	PGND1	H bridge 1 output section GND terminal.
31	IN1R	H bridge 1 logic input terminal.
32	IN1F	
33	IN2R	H bridge 2 logic input terminal.
34	IN2F	
35	MUTE	Mute terminal for H bridge 1-, 2-, 3-phase thread. Output terminals of drivers above have high impedance when L is input.
36	MUTE2	H bridge 3 mute terminal.
37	CP1	Charge pump booster output terminal. The capacitor is connected between this terminal and CPC1 terminal (pin).
38	CP2	Output terminal for charge pump booster pulse. The capacitor is connected between this terminal and CPC2 terminal (pin).
39	CPC1	Charge pump booster terminal. The capacitor is connected between this terminal and CP1 terminal (pin).
40	CPC2	Charge pump booster terminal. The capacitor is connected between this terminal and CP2 terminal (pin).
41	VG	Charge pump booster output terminal. The capacitor is connected to the GND terminal.
42, 43	VCC	Small signal power terminal. The capacitor is connected to the GND terminal.
44	S1	Logic input terminal in 3-phase thread section. Output from pin.
45	S2	
46	S3	

IC601 VHiLV8221T+-1 :PWM/Motor Driver (LV8221T)(2/2)

Pin No.	Terminal Name	Function
47	SLVS	Drive power terminal in 3-phase thread section. The capacitor is connected to the GND terminal.
48	FG	FG pulse output terminal (MOS output). It outputs the pulse equivalent to 3-hole.
49	SLGND	3-phase thread output section GND terminal.
50*	SUCO	Position detection comparator output terminal in the thread driver section.
51	SUO	3-phase thread U-phase output terminal.
52	SVO	3-phase thread V-phase output terminal.
53*	SVCO	Position detection comparator output terminal in the thread driver section.
54*	SWCO	Position detection comparator output terminal in the thread driver section.
55	SWO	3-phase thread W-phase output terminal.
56	OUT4	Half bridge output terminal
57	VS4	Power supply terminal for half bridge section. The capacitor is connected to the GND terminal.
58	PGND4	Half bridge output section GND terminal.
59*	SCOM	Input terminal for position detection comparator COM in the thread driver section.
60	WOUT	3-phase spindle W-phase output terminal. The motor coil is connected.
61	VOUT	3-phase spindle V-phase output terminal. The motor coil is connected.
62	COM	Input terminal for position detection comparator COM in the spindle driver section.
63	UOUT	3-phase spindle U-phase output terminal. The motor coil is connected.
64	TGND	Small signal GND terminal.

In this unit, the terminal with asterisk mark (*) is open terminal which is not connected to the outside.

IC601 VHiLV8221T+-1 :PWM/Motor Driver (LV8221T)



IC202 RH-IX2960AFZZ: 16M Bit D-RAM (IX2960AF)

Pin No.	Terminal Name	Function
1	Vcc	Power supply (2.6V)
2	I/O1	Data input/data output
3	I/O2	Data input/data output
4	WE	Write enable
5	RAS	Low address strobe
6*	NC	Not connected
7	A10	Address input
8-11	A0-A3	Address input
12	Vcc	Power supply (2.6V)
13	GND	Ground (0V)
14-19	A4-A9	Address input
20	OE	Output enable
21	CAS	Column address strobe
22	I/O3	Data input/data output
23	I/O4	Data input/data output
24	GND	Ground (0V)

In this unit, the terminal with asterisk mark (*) is open terminal which is not connected to the outside.

SHARP PARTS GUIDE

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Explanation of capacitors/resistors parts codes

Capacitors

VCC Ceramic type
VCK Ceramic type
VCT Semiconductor type
VC •• MF Cylindrical type (without lead wire)
VC •• MN Cylindrical type (without lead wire)
VC •• TV Square type (without lead wire)
VC •• TQ Square type (without lead wire)
VC •• CY Square type (without lead wire)
VC •• CZ Square type (without lead wire)
VC J .. The 13th character represents capacity difference.
("J" ±5%, "K" ±10%, "M" ±20%, "N" ±30%,
"C" ±0.25 pF, "D" ±0.5 pF, "Z" +80-20%.)

If there are no indications for the electrolytic capacitors, error is ±20%.

Resistors

VRD Carbon-film type
VRS Carbon-film type
VRN Metal-film type
VR •• MF Cylindrical type (without lead wire)
VR •• MN Cylindrical type (without lead wire)
VR •• TV Square type (without lead wire)
VR •• TQ Square type (without lead wire)
VR •• CY Square type (without lead wire)
VR •• CZ Square type (without lead wire)
VR J .. The 13th character represents error.
("J" ±5%, "F" ±1%, "D" ±0.5%.)

If there are no indications for other parts, the resistors are ±5% carbon-film type.

NOTE:

Parts marked with "△" are important for maintaining the safety of the set.

Be sure to replace parts with specified ones for maintaining the safety and performance of the set.

IM-DR400E/410H/E/420H

NO.	PART CODE	★	PRICE RANK	DESCRIPTION
INTEGRATED CIRCUITS				
IC81	VHIMM1573DN-1	J	AE	3.3V Regulator,MM1573DN
IC101	VHIIR3R58M/-1	J	AM	RF Signal Processor,IR3R58M
IC201	VHILR37820+-1	J	BK	Endec/Servo/Atrac,LR37820
IC202	RH-IX2960AFZZ	J	BB	16M Bit D-RAM,IX2960AF
IC254	VHIS89110AC-1	J	AH	OP Amp.,S89110 [IM-DR420H Only]
IC301	VHICXD1875T-1	J	BF	Security Tip IC,CXD1875T
IC303	VHITC7SH08U-1	J	AE	Gate IC,TC7SH08FU
IC311	VHI6219B185M1	J	AE	Regulator,XC6219B185M
IC351	VHI74ACT08T-1	J	AF	Head Driver,74ACT08FT
IC353	VSMCH6616+++1	J	AG	Head Driver,MCH6616
IC354	VHICPH5608/-1	J	AH	Head Driver,CPH5608
IC401	RH-IX0606AW00	J		System Microcomputer, IX0606AW
IC402	RUNTZA002AW01	J		EEPROM,58X2416T
IC431	VHI80820CLN-1	J	AD	Reset IC,S-80820CLN
IC501	VHIAK5354VT-1	J	AM	AD Converter,AK5354
IC601	VHILV8221T+-1	J	AY	PWM/Motor Driver,LV8221T
IC701	VHINJM2173AV1	J	AK	Mic Amp.,NJM2173AV [IM-DR420H Only]
IC751	VHI74LCX00MTC	J	AF	Quad 2-IN NAND Gate,74LCX00
IC761	VHI74LCX86T-1	J	AF	Quad 2-IN Exclusive OR Gate, 74LCX86
IC771	VHI6219B24M-1	J	AE	2.4V Regulator,XC6219B24M
IC803	VHI80817CLN-1	J	AE	Reset IC,S-80817CLN
IC813	VHI74LX244T-1	J	AH	Buffer/Line Driver, TC7LX244MTC
IC821	VHIIR3M17U6-1	J	AQ	DC/DC Converter,IR3M17
IC841	VHI8358B26C-1	J	AH	2.6V Up Converter, S8358B26MC
IC842	VHI882145MH-1	J	AK	4.5 V Regulator,882145MH

TRANSISTORS

Q211	VSKTC801UY+-1	J	AC	Silicon,NPN,2transistar, KTC801 UY
Q212	VSHN7G09FE+-1	J	AD	Digital MOS-FETx1 Trx1, HN7G09 FE
Q252	VS2SC5383F+-1	J	AC	Silicon,PNP,2SC5383 [IM-DR420H Only]
Q253	VSKTC801UY+-1	J	AC	Silicon,NPN,2transistar, KTC801 UY
Q255	VSKRX203U+++1	J	AC	Digital,2transistar,KRX203 U [IM-DR420H Only]
Q314	VS2SC5383F+-1	J	AC	Silicon,PNP,2SC5383
Q331	VS2SB1462J+-1	J	AC	Silicon,PNP,2SB1462 J
Q332	VSUN5213++++1	J	AC	Digital,NPN,UN5213
Q333	VSHN7G08FE+-1	J	AD	Digital,2-transistar,HN7G08 FE
Q351	VHIFDG312P/-1	J	AD	P-ch Power MOS,FDG312P
Q701	VSXP04113+-1	J	AC	Digital,PNP,2-transistar, XP04113
Q711	VSKRC231S+++1	J	AC	Digital,NPN,KRC231 S
Q721	VSUN5213++++1	J	AC	Digital,NPN,UN5213 [IM-DR420H Only]
Q751,752	VSMCH6630+++1	J	AH	FET,MCH6630
Q761,762	VSMCH6630+++1	J	AH	FET,MCH6630
Q801	VS2SJ613+++1	J	AG	P-MOS FET,2SJ613
Q802	VSMCH3427+++1	J	AF	MOS FET,MCH3427
Q803	VSUN5213+++1	J	AC	Digital,NPN,UN5213
Q804	VSUNR911BJ+-1	J	AB	Digital,PNP,UNR911 BJ
Q805	VSUN5213+++1	J	AC	Digital,NPN,UN5213
Q806	VSKTC801UY+-1	J	AC	Silicon,NPN,2transistar, KTC801 UY
Q809	VSKRX203U+++1	J	AC	Digital,2transistar,KRX203 U
Q828	VSECH8601+++1	J	AH	N-ch MOS FET,ECH8601
Q841	VSMCH3409+++1	J	AF	FET,MCH3409
Q843	VHIFDG312P/-1	J	AD	P-ch Power MOS,FDG312P
Q861	VSUN5213+++1	J	AC	Digital,NPN,UN5213
Q863	VSMCH3409+++1	J	AF	FET,MCH3409
Q865	VS2SC5383F+-1	J	AC	Silicon,PNP,2SC5383

DIODES

D301	VHE3A6R8LFE-1	J	AD	Zener,DF3A6.8LFE
D304	VHDDG1M3+++1	J	AC	Silicon,DG1M3
D351	VHDSBE803//--1	J	AD	Silicon,SBE803
D431	VHDMA1111//--1	J	AC	Silicon,MA111

NO.	PARTS CODE	★	PRICE RANK	DESCRIPTION
D491	VHEMA8075M/-1	J	AC	Zener,MA8075M
D494	VHEMA8075M/-1	J	AC	Zener,MA8075M
D801	VHDDG1H3+++1	J	AC	Silicon,DG1H3
D802	VHEMA8039L/-1	J	AB	Zener,MA8039-L
D803	VHD1SS388+-1	J	AC	Silicon,1SS388
D811	VHDMA2SD19+-1	J	AC	Silicon,MA2SD19
D828	VHDF10J2E//--1	J	AC	Silicon,F10J2E
D841	VHDDG1H3+++1	J	AC	Silicon,DG1H3
D862	VHDDG1H3+++1	J	AC	Silicon,DG1H3

COILS

B301	RCILZ0070AWZZ	J	AB	100 MHz,Tip Impeder, MPZ1608S221A
B302,B303	RCILC0352AFZZ	J	AB	100 MHz,Tip Impeder, MMZ1608S121A
B304	RCILZ0060AWZZ	J	AB	100 MHz,Tip Impeder
L100	RCILC0031AWZZ	J	AC	10 µH
L103,104	RCILZ0060AWZZ	J	AB	100 MHz,Tip Impeder
L171	RCILC0356AFZZ	J	AC	10 µH
L204	RCILC0353AFZZ	J	AB	Tip Solid Induction,100mA
L210	RCILC0358AFZZ	J	AC	47 µH,Choke
L401	RCILC0030AWZZ	J	AC	100µH
L451-454	RCILC0353AFZZ	J	AB	Tip Solid Induction,100mA
L456	RCILC0353AFZZ	J	AB	Tip Solid Induction,100mA
L601-604	RCILC0372AFZZ	J	AC	22 µH,Choke
L610	RCILC0372AFZZ	J	AC	22 µH,Choke
L702-704	RCILC0353AFZZ	J	AB	Tip Solid Induction,100mA
L711	RCILC0353AFZZ	J	AB	Tip Solid Induction,100mA [IM-DR420H Only]
L714	RCILC0353AFZZ	J	AB	Tip Solid Induction,100mA [IM-DR420H Only]
L751,752	RCILC0024AWZZ	J	AD	22 µH,Choke
L761,762	RCILC0024AWZZ	J	AD	22 µH,Choke
L800,801	RCILZ0070AWZZ	J	AB	100 MHz,Tip Impeder, MPZ1608S221A
L811	RCILC0358AFZZ	J	AC	47 µH,Choke
L841	RCILC0029AWZZ	J	AE	47 µH
L861	RCILC0030AWZZ	J	AC	100 µH
L862	RCILC0026AWZZ	J	AE	10 µH,Choke

VIBRATORS

XL201	RCRSC0028AFZZ	J	AH	Crystal,33.8688 MHz
XL301	RCRSC0011AWZZ	J	AL	Crystal,12 MHz
XL401	RCRM-0054AWZZ	J	AF	Ceramic,Oillator,5 MHz

CAPACITORS

C81	RC-KZ0015AWZZ	J	AB	1 µF,6.3V
C83	VCKYCY1CB103K	J	AB	0.01 µF,16V
C100	VCSAFP0JJ106M	J	AE	10 µF,6.3V,Electrolytic,Tantalum
C102	VCKYCY1AB104K	J	AB	0.1 µF,10V
C103	VCKYCY0JB105K	J	AC	1 µF,6.3V
C106	VCKYCY0JB105K	J	AC	1 µF,6.3V
C107	VCKYCY1AB333K	J	AB	0.033 µF,10V
C108,109	VCKYCY0JB105K	J	AC	1 µF,6.3V
C110	VCKYCY1AB224K	J	AB	0.22 µF,10V
C111	VCKYCY0JB105K	J	AC	1 µF,6.3V
C112	VCKYCY1AB333K	J	AB	0.033 µF,10V
C113	VCKYCY0JB105K	J	AC	1 µF,6.3V
C114	VCCCCZ1HH5R0C	J	AB	5 pF (CH),50V
C130,131	VCKYCY1AB104K	J	AB	0.1 µF,10V
C132,133	VCKYCY1AB224K	J	AB	0.22 µF,10V
C165	VCKYCY1AB333K	J	AB	0.033 µF,10V
C171	VCSAFA0JJ336M	J	AE	33 µF,6.3V,Electrolytic,Tantalum
C201	VCKYCY0JB105K	J	AC	1 µF,6.3V
C203	VCKYCY1AB104K	J	AB	0.1 µF,10V
C205	VCKYCY1AB104K	J	AB	0.1 µF,10V
C207	VCKYCY1AB104K	J	AB	0.1 µF,10V
C209	VCKYCY1AB104K	J	AB	0.1 µF,10V
C211,212	VCCCCZ1HH5R0C	J	AB	5 pF (CH),50V
C214	RC-KZ0015AWZZ	J	AB	1 µF,6.3V
C215,216	VCKYCY0JB105K	J	AC	1 µF,6.3V
C221	VCCCCZ1HH220J	J	AA	22 pF (CH),50V
C222	VCKYCY0JB105K	J	AC	1 µF,6.3V
C250	RC-EZ0143AWZZ	J	AD	220 µF,4V,Electrolytic
C253,254	VCKYCY1AB104K	J	AB	0.1 µF,10V [IM-DR420H Only]
C301	RC-KZ0015AWZZ	J	AB	1 µF,6.3V
C303	RC-KZ0015AWZZ	J	AB	1 µF,6.3V

NO.	PART CODE	★	PRICE RANK	DESCRIPTION	NO.	PARTS CODE	★	PRICE RANK	DESCRIPTION
C306	VCKYCY0JB105K	J	AC	1 μF, 6.3V		VRS-CZ1JB000J	J	AB	0 ohm, Jumper, 0.5×1.0mm
C307	VCCCCZ1HH330J	J	AB	33 pF (CH), 50V	L491	VRS-TV2AB330J	J	AA	33 ohms, 1/10W
C310	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	L712, 713	VRS-CY1JB102J	J	AA	1 kohm, 1/16W
C313	VCCCCZ1HH150J	J	AA	15 pF (CH), 50V					[IM-DR420H Only]
C314	VCCCCZ1HH120J	J	AA	12 pF (CH), 50V	R85	VRS-CZ1JB474J	J	AB	470 kohms, 1/16W
C315	VCCCCZ1HH221J	J	AB	220 pF (CH), 50V	R111	VRS-CZ1JB123J	J	AB	12 kohms, 1/16W
C331	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R112	VRS-CZ1JB224J	J	AA	220 kohms, 1/16W
C332	VCKYCY0JB105K	J	AC	1 μF, 6.3V	R131	VRS-CZ1JB154D	J	AA	150 kohms, 1/16W
C351	VCCCCY1HH270J	J	AA	27 pF (CH), 50V	R132	VRS-CZ1JB105D	J	AA	1 Mohm, 1/16W
C353	VCKYCY0JB105K	J	AC	1 μF, 6.3V	R133	VRS-CZ1JB154D	J	AA	150 kohms, 1/16W
C357	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R134	VRS-CZ1JB105D	J	AA	1 Mohm, 1/16W
C361	VCKYTV1HB393K	J	AB	0.039 μF, 50V	R135	VRS-CZ1JB473D	J	AA	47 kohms, 1/16W
C401	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R136	VRS-CZ1JB394D	J	AA	390 kohms, 1/16W
C402	VCSAFP0JJ106M	J	AE	10 μF, 6.3V, Electrolytic, Tantalum	R137	VRS-CZ1JB473D	J	AA	47 kohms, 1/16W
C404	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R138	VRS-CZ1JB394D	J	AA	390 kohms, 1/16W
C431	VCKYCY1AB474K	J	AC	0.47 μF, 10V	R139	VRS-CZ1JB393J	J	AB	39 kohms, 1/16W
C454	VCKYCZ1HB222K	J	AB	0.0022 μF, 50V	R140	VRS-CZ1JB564J	J	AA	560 kohms, 1/16W
C481	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R161	VRS-CZ1JB122J	J	AB	1.2 kohms, 1/16W
C482	VCKYCZ1CB103K	J	AB	0.01 μF, 16V	R204	VRS-CZ1JB102J	J	AB	1 kohm, 1/16W
C503, 504	VCSATA1AJ335M	J	AB	3.3 μF, 10V, Electrolytic, Tantalum	R205	VRS-CZ1JB273D	J	AA	27 kohms, 1/16W
C509, 510	VCKYCY0JF225Z	J	AC	2.2 μF, 6.3V	R206	VRS-CZ1JB104D	J	AA	100 kohm, 1/16W
C511	VCKYCZ1HB102K	J	AB	0.001 μF, 50V	R207	VRS-CZ1JB681J	J	AB	680 ohms, 1/16W
C521	RC-KZ0015AWZZ	J	AB	1 μF, 6.3V [IM-DR420H Only]	R212	VRS-CZ1JB103J	J	AA	10 kohm, 1/16W
C601-604	RC-KZ0013AWZZ	J	AC	4.7 μF, 6.3V	R214	VRS-CZ1JB104J	J	AA	100 kohm, 1/16W
C608	VCKYCY1AB474K	J	AC	0.47 μF, 10V	R216	VRS-CZ1JB470J	J	AB	47 ohms, 1/16W
C652	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R222	VRS-CZ1JB105J	J	AB	1 Mohm, 1/16W
C701, 702	VCKYCY0JB105K	J	AC	1 μF, 6.3V [IM-DR420H Only]	R243-245	VRS-CZ1JB331J	J	AB	330 ohms, 1/16W
C703	VCSATA1AJ335M	J	AB	3.3 μF, 10V, Electrolytic, Tantalum [IM-DR420H Only]	R253	VRS-CZ1JB272D	J	AA	2.7 kohms, 1/16W [IM-DR420H Only]
C706	VCSATA1AJ335M	J	AB	3.3 μF, 10V, Electrolytic, Tantalum [IM-DR420H Only]	R254	VRS-CZ1JB562J	J	AB	5.6 kohms, 1/16W [IM-DR420H Only]
C707, 708	VCSATE0JJ476M	J	AD	47 μF, 6.3V, Electrolytic, Tantalum [IM-DR420H Only]	R255	VRS-CZ1JB273D	J	AA	27 kohms, 1/16W [IM-DR420H Only]
C709, 710	VCKYCY0JB105K	J	AC	1 μF, 6.3V [IM-DR420H Only]	R257	VRS-CZ1JB103J	J	AA	10 kohm, 1/16W [IM-DR420H Only]
C711, 712	VCCCCZ1HH101J	J	AB	100 pF (CH), 50V	R258	VRS-CZ1JB563J	J	AA	56 kohms, 1/16W [IM-DR420H Only]
C714	VCKYCY0JB105K	J	AC	1 μF, 6.3V					
C715	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R259	VRS-CZ1JB333J	J	AB	33 kohms, 1/16W
C718	RC-KZ0013AWZZ	J	AC	4.7 μF, 6.3V	R280	VRS-CZ1JB104J	J	AA	100 kohm, 1/16W
C723, 724	VCKYCZ1HB102K	J	AB	0.001 μF, 50V [IM-DR420H Only]	R282	VRS-CZ1JB564J	J	AA	560 kohms, 1/16W
C731	VCKYCY1CB104K	J	AB	0.1 μF, 16V [IM-DR420H Only]	R284	VRS-CZ1JB104J	J	AA	100 kohm, 1/16W [IM-DR420H Only]
C750	VCKYCY0JB105K	J	AC	1 μF, 6.3V	R286	VRS-CZ1JB102J	J	AB	1 kohm, 1/16W
C751, 752	VCKYCY1AB474K	J	AC	0.47 μF, 10V	R302	VRS-CZ1JB105J	J	AB	1 Mohm, 1/16W
C760	VCKYCY0JB105K	J	AC	1 μF, 6.3V	R303	VRS-CZ1JB332J	J	AB	3.3 kohms, 1/16W
C767, 768	RC-KZ0014AWZZ	J	AD	10 μF, 6.3V	R305	VRS-CZ1JB473J	J	AA	47 kohms, 1/16W
C771, 772	VCKYTV1CB474K	J	AC	0.47 μF, 16V	R307	VRS-CZ1JB474J	J	AB	470 kohms, 1/16W
C773	RC-KZ0015AWZZ	J	AB	1 μF, 6.3V	R311	VRS-CZ1JB474J	J	AB	470 kohms, 1/16W
C783, 784	VCKYTV1CB474K	J	AC	0.47 μF, 16V	R318, 319	VRS-CZ1JB103J	J	AA	10 kohm, 1/16W
C800	VCKYCY1CB104K	J	AB	0.1 μF, 16V	R320	VRS-CZ1JB272J	J	AB	2.7 kohms, 1/16W
C801	RC-KZ0013AWZZ	J	AC	4.7 μF, 6.3V	R331	VRS-CZ1JB392J	J	AB	3.9 kohms, 1/16W
C802	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R332	VRS-CZ1JB151J	J	AA	150 ohms, 1/16W
C809	VCKYCZ1HB222K	J	AB	0.0022 μF, 50V	R339, 340	VRS-CZ1JB270J	J	AA	27 ohms, 1/16W
C811, 812	VCKYCY0JB105K	J	AC	1 μF, 6.3V	R342	VRS-CZ1JB152J	J	AB	1.5 kohms, 1/16W
C813	RC-SZ0010AWZZ	J	AH	47 μF, 6.3V, Electrolytic	R351	VRS-CY1JB2R2J	J	AA	2.2 ohms, 1/16W
C814	VCKYCY0JB105K	J	AC	1 μF, 6.3V	R353	VRS-CZ1JB474J	J	AB	470 kohms, 1/16W
C815	RC-SZ0013AWZZ	J	AF	10 μF, 6.3V, Electrolytic	R361	VRS-TV2AB8R2J	J	AA	8.2 ohms, 1/10W
C818	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R401	VRS-CZ1JB104J	J	AA	100 kohm, 1/16W
C822	VCKYCY0JB105K	J	AC	1 μF, 6.3V	R403	VRS-CZ1JB102J	J	AB	1 kohm, 1/16W
C823	VCCCCY1HH470J	J	AA	47 pF (CH), 50V	R404	VRS-CZ1JB104J	J	AA	100 kohm, 1/16W
C824	VCKYCZ1AB473K	J	AB	0.047 μF, 10V	R405	VRS-CZ1JB103J	J	AA	10 kohm, 1/16W
C825	VCCCCZ1HH271J	J	AB	270 pF (CH), 50V	R406	VRS-CZ1JB223J	J	AB	22 kohms, 1/16W
C831	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R407	VRS-CZ1JB104J	J	AA	100 kohm, 1/16W [IM-DR410H/E/400E Only]
C840	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R409	VRS-CZ1JB104J	J	AA	100 kohm, 1/16W [IM-DR420H Only]
C841, 842	RC-SZ0010AWZZ	J	AH	47 μF, 6.3V, Electrolytic					
C843	RC-KZ0014AWZZ	J	AD	10 μF, 6.3V	R411	VRS-CZ1JB104J	J	AA	100 kohm, 1/16W
C850	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R412	VRS-CZ1JB153J	J	AA	15 kohms, 1/16W
C853	VCCCCZ1HH181J	J	J	180 pF (CH), 50V	R414	VRS-CG1JF102J	J	AC	1 kohm, 1/16W
C854	VCCCCZ1HH221J	J	AB	220 pF (CH), 50V	R422	VRS-CZ1JB104J	J	AA	100 kohm, 1/16W
C861	RC-KZ0013AWZZ	J	AC	4.7 μF, 6.3V	R423	VRS-CZ1JB223J	J	AB	22 kohms, 1/16W
C863	RC-SZ0001AWZZ	J	AG	22 μF, 6.3V, Electrolytic	R425	VRS-CZ1JB223J	J	AB	22 kohms, 1/16W
C864, 865	VCKYCY1CB104K	J	AB	0.1 μF, 16V	R431	VRS-CZ1JB334J	J	AA	330 kohms, 1/16W
C870	VCKYCZ1CB333K	J	AB	0.033 μF, 16V	R451	VRS-CZ1JB472J	J	AB	4.7 kohms, 1/16W
C891	VCKYCZ1AB104K	J	AB	0.1 μF, 10V	R452	VRS-CZ1JB682J	J	AB	6.8 kohms, 1/16W
C901	VCKYCZ1EB472K	J	AB	0.0047 μF, 25V	R453	VRS-CZ1JB123J	J	AB	12 kohms, 1/16W
C907	VCKYCZ1HB222K	J	AB	0.0022 μF, 50V	R454	VRS-CZ1JB223J	J	AB	22 kohms, 1/16W
C908, 909	VCKYCY0JB105K	J	AC	1 μF, 6.3V	R455	VRS-CZ1JB683J	J	AB	68 kohms, 1/16W
C911, 912	VCKYCY1AB224K	J	AB	0.22 μF, 10V	R456, 457	VRS-CZ1JB222D	J	AA	2.2 kohms, 1/16W
C913	RC-KZ0015AWZZ	J	AB	1 μF, 6.3V	R461	VRS-CZ1JB223J	J	AB	22 kohms, 1/16W
					R464	VRS-CZ1JB224J	J	AA	220 kohms, 1/16W
					R481	VRS-CZ1JB333D	J	AA	33 kohms, 1/16W
RESISTORS									
	VRS-CY1JB000J	J	AA	0 ohm, Jumper, 0.8×1.55mm, Green					

IM-DR400E/410H/E/420H

NO.	PART CODE	★	PRICE RANK	DESCRIPTION
R482,483	VRS-CZ1JB183D	J	AA	18 kohms,1/16W
R501~504	VRS-CZ1JB123J	J	AB	12 kohms,1/16W
R511	VRS-CZ1JB102J	J	AB	1 kohm,1/16W
R603,604	VRS-CZ1JB1R0J	J	AA	1 ohm,1/16W
R700	VRS-CZ1JB471J	J	AA	470 ohms,1/16W
R701	VRS-CZ1JB334J	J	AA	330 kohms,1/16W
R703,704	VRS-CZ1JB682J	J	AB	[IM-DR420H Only] 6.8 kohms,1/16W [IM-DR420H Only]
R713	VRS-CZ1JB102J	J	AB	1 kohm,1/16W
R714	VRS-CZ1JB223J	J	AB	22 kohms,1/16W
R715	VRS-CZ1JB683J	J	AB	68 kohms,1/16W
R728	VRS-CZ1JB224J	J	AA	220 kohms,1/16W
R751~754	VRS-CZ1JB105J	J	AB	1 Mohm,1/16W
R773,774	VRS-TV2AB150J	J	AA	15 ohms,1/10W
R781,782	VRS-CZ1JB272J	J	AB	2.7 kohms,1/16W
R801	VRS-CZ1JB102J	J	AB	1 kohm,1/16W
R802	VRS-CZ1JB473J	J	AA	47 kohms,1/16W
R803	VRS-CZ1JB333J	J	AB	33 kohms,1/16W
R805	VRS-CZ1JB104J	J	AA	100 kohm,1/16W
R806	VRS-CZ1JB123J	J	AB	12 kohms,1/16W
R807	VRS-CZ1JB393J	J	AB	39 kohms,1/16W
R808	VRS-TV2AB1R0F	J	AB	1 ohm,1/10W
R809	VRS-CZ1JB103J	J	AA	10 kohm,1/16W
R810	VRS-TV2AB1R0F	J	AB	1 ohm,1/10W
R812	VRS-CZ1JB683D	J	AA	68 kohms,1/16W
R813	VRS-CZ1JB563D	J	AA	56 kohms,1/16W
R814	VRS-CZ1JB273D	J	AA	27 kohms,1/16W
R815	VRS-CZ1JB393D	J	AA	39 kohms,1/16W
R816	VRS-CZ1JB272J	J	AB	2.7 kohms,1/16W
R818	VRS-CZ1JB564J	J	AA	560 kohms,1/16W
R819	VRS-CZ1JB223J	J	AB	22 kohms,1/16W
R820	VRS-CZ1JB274J	J	AB	270 kohms,1/16W
R821	VRS-CZ1JB102J	J	AB	1 kohm,1/16W
R822	VRS-CZ1JB125J	J	AA	1.2 Mohms,1/16W
R823	VRS-CZ1JB154D	J	AA	150 kohms,1/16W
R824	VRS-CZ1JB184D	J	AB	180 kohms,1/16W
R825	VRS-CZ1JB562J	J	AB	5.6 kohms,1/16W
R826,827	VRS-CZ1JB273D	J	AA	27 kohms,1/16W
R828	VRS-CY1JB1R0J	J	AA	1 ohm,1/16W
R831	VRS-CZ1JB394D	J	AA	390 kohms,1/16W
R832	VRS-CZ1JB684D	J	AA	680 kohms,1/16W
R833	VRS-CZ1JB394J	J	AA	390 kohms,1/16W
R841	VRS-CZ1JB104J	J	AA	100 kohm,1/16W
R850	VRS-CZ1JB104J	J	AA	100 kohm,1/16W
R852	VRS-CZ1JB221J	J	AA	220 ohms,1/16W
R855,856	VRS-CZ1JB474D	J	AA	470 kohms,1/16W
R861	VRS-CZ1JB102J	J	AB	1 kohm,1/16W
R865	VRS-CZ1JB104J	J	AA	100 kohm,1/16W
R866	VRS-CZ1JB273J	J	AA	27 kohms,1/16W
R867	VRS-CZ1JB683J	J	AB	68 kohms,1/16W
R870	VRS-CZ1JB334J	J	AA	330 kohms,1/16W
R881,882	VRS-CY1JB1R8J	J	AA	1.8 ohms,1/16W
R891	VRS-CZ1JB103J	J	AA	10 kohm,1/16W
R906	VRS-CZ1JB563J	J	AA	56 kohms,1/16W
R907,908	VRS-CZ1JB334J	J	AA	330 kohms,1/16W
R910	VRS-CZ1JB332J	J	AB	3.3 kohms,1/16W

OTHER CIRCUITRY PARTS

CN101	QCNCW046XAWZZ	J	AM	Socket,22Pin
CN451	QCNCW804KAFZZ	J		Socket,10Pin
CN482	QCNCW716GAFZZ	J	AE	Socket,7Pin
CN601	QCNCW716LAFZZ	J	AF	Socket,11Pin
△ F301	QFS-L631AAWNZ	J	AE	Square Tip Type Fuse,0.63A
J301	QJAKZ0019AWZZ	J	AG	Socket,USB
J701	VHLGP1FD210-1	J	AM	Jack,Optical/Line In
J702	QJAKM0026AWZZ	J	AE	Jack,MIC [IM-DR420H Only]
J703	QJAKM0015AWZZ	J	AL	Jack,Remote/Phones
J801	QJAKC0008AWZZ	J	AE	Jack,DC IN
M901	RMOTV0064AWZZ	J	AT	Motor Ass'y [Spindle]
M902	RMOTS0002AWZZ	J	AT	Motor Ass'y [Sled]
M903	RMOTV0053AWZZ	J	AR	Motor Ass'y [Lift]
△ PSW1	VHHSMDM110V-1	J	AK	Conductive Restn Switch,1.1A
SW401	QSW-M0001AWZZ	J	AD	Switch,Push Type [Eject]
SW402	QSW-M0011AWZZ	J	AE	Switch,Push Type [Lid Open]
SW901	QSW-M0011AWZZ	J	AE	Switch,Push Type [Disc Protect]

MD MECHANISM PARTS

1	LANGK0211AWZZ	J	AC	Shaft Guide
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NO.	PARTS CODE	★	PRICE RANK	DESCRIPTION
2	LCHSM0189AWM1	J	AH	Main Chassis Ass'y
3	LHLDX3020AWM1	J	AH	Cartridge Holder Ass'y
4	MLEVF0087AWFW	J	AC	Protect Lever,Eject
5	MLEVF0110AWFW	J	AC	Lift Link Lever
6	MLEVF0111AWFW	J	AC	Lift Move Lever
7	MLEVF0112AWFW	J	AC	Lever,Lift
8	MSPRP0060AWFJ	J	AB	Spring,Thrust
9	MSPRP0067AWFJ	J	AB	Spring,Drive Grip
10	MSPRT0058AWFJ	J	AB	Spring,Eject Lever
11	NBRGC0004AWZZ	J	AB	Metal
12	NGERH0164AWZZ	J	AC	Gear,Drive
13	NGERH0165AWZZ	J	AB	Drive Wheel
14	NSFTD0011AWZZ	J	AG	Drive Screw
15	QPWBH0026AWZZ	J	AG	Mechanism Flexible PWB
16	RCILH0008AWM2	J	AQ	Magnetic Head Ass'y
△ 17	92LHPM282	J	BS	Optical Pickup Unit
501	LX-BZ0049AWZZ	J	AB	Screw,ø1.4×1.8mm
502	LX-BZ0050AWZZ	J	AB	Screw,ø1.4×2.5mm
503	LX-BZ0059AWZZ	J	AB	Screw,ø1.4×1.8mm
504	LX-BZ0072AWZZ	J	AB	Screw,ø1.4×3.3mm
505	LX-BZ0079AWZZ	J	AB	Screw,ø1.4×1.2mm
506	LX-BZ0823AFZZ	J	AA	Screw,ø1.4×1.2mm
507	LX-WZ9290AFZZ	J	AA	Washer,ø0.8×ø2.4×0.25mm
M901	RMOTV0064AWZZ	J	AT	Motor Ass'y [Spindle]
M902	RMOTS0002AWZZ	J	AT	Motor Ass'y [Sled]
M903	RMOTV0053AWZZ	J	AR	Motor Ass'y [Lift]

CABINET PARTS

201	GCAB-1246AWSA	J	AM	Cabinet [IM-DR410H]
201	GCAB-1247AWSA	J	AM	Cabinet [IM-DR420H]
201	GCAB-1248AWSA	J	AM	Cabinet [IM-DR400E]
201	GCAB-1249AWSA	J	AM	Cabinet [IM-DR410E]
202	GCOVD8001AWSA	J	AD	Cover,USB
203	GFTAB1055AWSA	J		Lid,Battery [IM-DR410H/E]
203	GFTAB1055AWSB	J		Lid,Battery [IM-DR420H/400E]
204	GFTAF1004AWSA	J	AP	MD Lid [IM-DR410H/E]
204	GFTAF1005AWSA	J	AN	MD Lid [IM-DR420H]
204	GFTAF1006AWSA	J	AP	MD Lid [IM-DR400E]
205	HDECQ1069AWSA	J	AG	Decoration Plate,Window [IM-DR410H/E]
205	HDECQ1070AWSA	J	AG	Decoration Plate,Window [IM-DR420H/400E]
206	HDECQ1071AWSA	J	AG	Decoration Ring,Operation [IM-DR420H/400E Only]
207	HPNLH1083AWSA	J	AG	Window,LCD [IM-DR410H/E]
207	HPNLH1084AWSA	J	AH	Window,LCD [IM-DR420H]
207	HPNLH1084AWSB	J	AG	Window,LCD [IM-DR400E]
208	JKNBZ0969AWSA	J	AH	Button,Enter
209	JKNBZ0968AWSA	J	AK	Button,Operation [IM-DR410H/E]
209	JKNBZ0970AWSA	J	AK	Button,Operation [IM-DR420H/400E]
210	JKNBZ0971AWSA	J	AE	Knob,Open
211	LANGT0147AWFW	J	AE	Bracket,Mechanism,Right
212	LANGT0158AWFW	J	AD	Bracket,Lid
213	LANGT0159AWFW	J	AF	Bracket,Mechanism,Left
214	LANGT0160AWFW	J	AE	Bracket,Operation
215	LHLDB1001AWZZ	J	AD	Holder,Battery
216	MLEVP0123AWZZ	J	AC	Eject Lever
217	MSPRC0040AWFQ	J	AB	Spring,Battery Terminal (-)
218	MSPRT0071AWFJ	J	AB	Spring,Eject Lever
219	PSHET0143AWZZ	J	AE	LCD Shield Sheet A [IM-DR420H/400E]
219	PSHETA003AWZZ	J		LCD Shield Sheet C [IM-DR410H/E]
220	PSHET0144AWZZ	J	AG	Shield Sheet
221	PSHETA002AWZZ	J		LCD Shield Sheet B [IM-DR420H/400E]
221	PSHETA004AWZZ	J		LCD Shield Sheet D [IM-DR410H/E]
222	PSHEZ0202AWZZ	J	AC	Tape,Window [IM-DR410H/E]
222	PSHEZ0203AWZZ	J	AC	Tape,Window [IM-DR420H/400E]
223	PSHEZ0205AWZZ	J	AC	Decoration Tape [IM-DR420H/400E Only]
224	QTANB9044AWFQ	J	AF	Battery Terminal (+)
225	RUNTK0027AWZZ	J	AM	Key Flexible PWB Ass'y
226	RUNTZ0059AWZZ	J	AZ	LCD Unit Ass'y
227	TCAUSA001AWZZ	J		Label,Class 3B
601	LX-BZ0048AWFN	J	AC	Screw,ø1.4×2.5mm

NO.	PART CODE	★	PRICE RANK	DESCRIPTION
602	LX-BZ0063AWFC	J	AB	Screw,ø1.4×2.5mm
603	LX-BZ0960AFFN	J		Screw,ø1.4×1.5mm
604	LX-CZ0010AWFC	J	AB	Screw,ø1.4×4mm
605	LX-CZ0016AWFN	J	AB	Screw,ø1.4×2.5mm
606	LX-JZA003AWFN	J		Screw,ø1.4×2.5mm

ACCESSORIES/PACKING PARTS

1	QCNWG0029AWZZ	J	AK	Connecting Cord,RCA Type
2	QCNWG0061AWZZ	J	AT	Conversion Cable
3	QCNWG0069AWZZ	J	AS	Connecting Cord,USB
4	QCNWG0422AFZZ	J	AQ	Optical Cable [IM-DR420H/410E Only]
△ 5	RADPA7065AWZZ	J	AY	AC Adapter [Except For U.K.]
△ 5	RADPA8066AWZZ	J	AY	AC Adapter [For U.K.]
△ 6	RPHOH0021AWZZ	J	AU	Earphones [IM-DR420H]
△ 6	RPHOH0026AWZZ	J	AU	Earphones [IM-DR410H/E/400E]
7	RRMCW0033AWSA	J	AY	Remote Control [IM-DR420H Only]
8	SPAKA0450AWZZ	J		Pad,Unit
9	SPAKC1690AWZZ	J		Packing Case [IM-DR410H]
9	SPAKC1691AWZZ	J		Packing Case [IM-DR420H]
9	SPAKC1699AWZZ	J		Packing Case [IM-DR400E]
9	SPAKC1700AWZZ	J		Packing Case [IM-DR410E]
10	SPAKZ0490AWZZ	J	AC	Spacer
11	SSAKH0033AWZZ	J	AB	Bag,Polyethylene [IM-DR410H/400E Only]
12	TCADS0005AWZZ	J	AB	Service Card [For U.K.Only]
13	TCAUH0099AWZZ	J		Caution Card,Open MG
14	TCAUZ0177AWZZ	J		License Form
15	TGANE0013AWZZ	J	AC	Warranty Card [For U.K. Only]
16	TINSE0550AWZZ	J	AG	Operation Manual [IM-DR410E]
16	TINSE0554AWZZ	J	AG	Operation Manual [IM-DR420H For U.K.]
16	TINSE0562AWZZ	J	AG	Operation Manual [IM-DR400E]
16	TINSZ0960AWZZ	J	AP	Operation Manual [IM-DR410H For Sweden]
16	TINSZ0961AWZZ	J	AP	Operation Manual [IM-DR410H For Europe]
16	TINSZ0964AWZZ	J	AP	Operation Manual [IM-DR420H For Sweden]
16	TINSZ0965AWZZ	J	AP	Operation Manual [IM-DR420H For Europe]
17	TINSE0553AWZZ	J		Operation Manual,Net MD [For U.K.]
17	TINSZ0963AWZZ	J		Operation Manual,Net MD [For Sweden]
17	TINSZ0975AWZZ	J		Operation Manual,Net MD [For Europe]
18	TINSE0551AWZZ	J	AD	Quick Guide [IM-DR410E]
18	TINSE0555AWZZ	J	AD	Quick Guide [IM-DR420H For U.K.]
18	TINSE0563AWZZ	J	AD	Quick Guide [IM-DR400E]
19	TLABM0193AWSA	J		Label,Pop
20	UBAGC0003AWZZ	J	AD	Battery Carrying Case [IM-DR420H Only]
21	UBAGC0007AWSB	J	AF	Carrying Bag [IM-DR420H/410E Only]
22	UBATM0003AWSA	J	AR	Rechargeable Nickel-Metal Hydride Battery [IM-DR420H Only]
23	UDSKA0004AWZZ	J	AP	CD Rom

P.W.B. ASSEMBLY (Not Replacement Item)

PWB-A 92LPWB5472MDSS J — Main

OTHER SERVICE PARTS

UDSKM0001AFZZ	J	AZ	Recording Mini Disc
88GMMD-110	J	BV	High Reflection Disc MMD-110 (TEAC Test MD)
88GMMD-212	J	BU	Low Reflection Disc MMD-212 (TEAC Test MD)
88GMMD-213A	J	BT	Low Reflection Disc MMD-213A (TEAC Test MD)

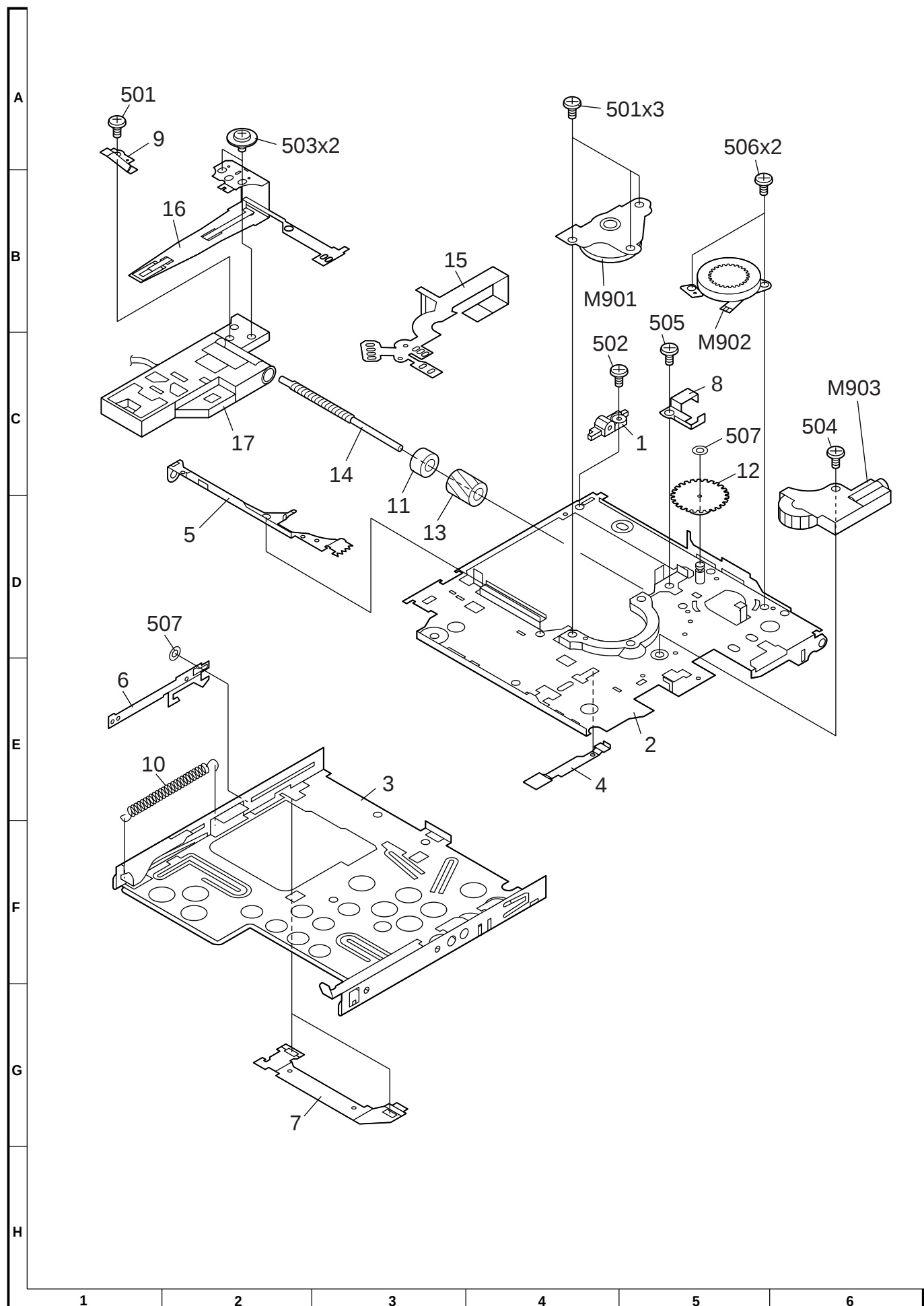


Figure 5 MD MECHANISM EXPLODED VIEW

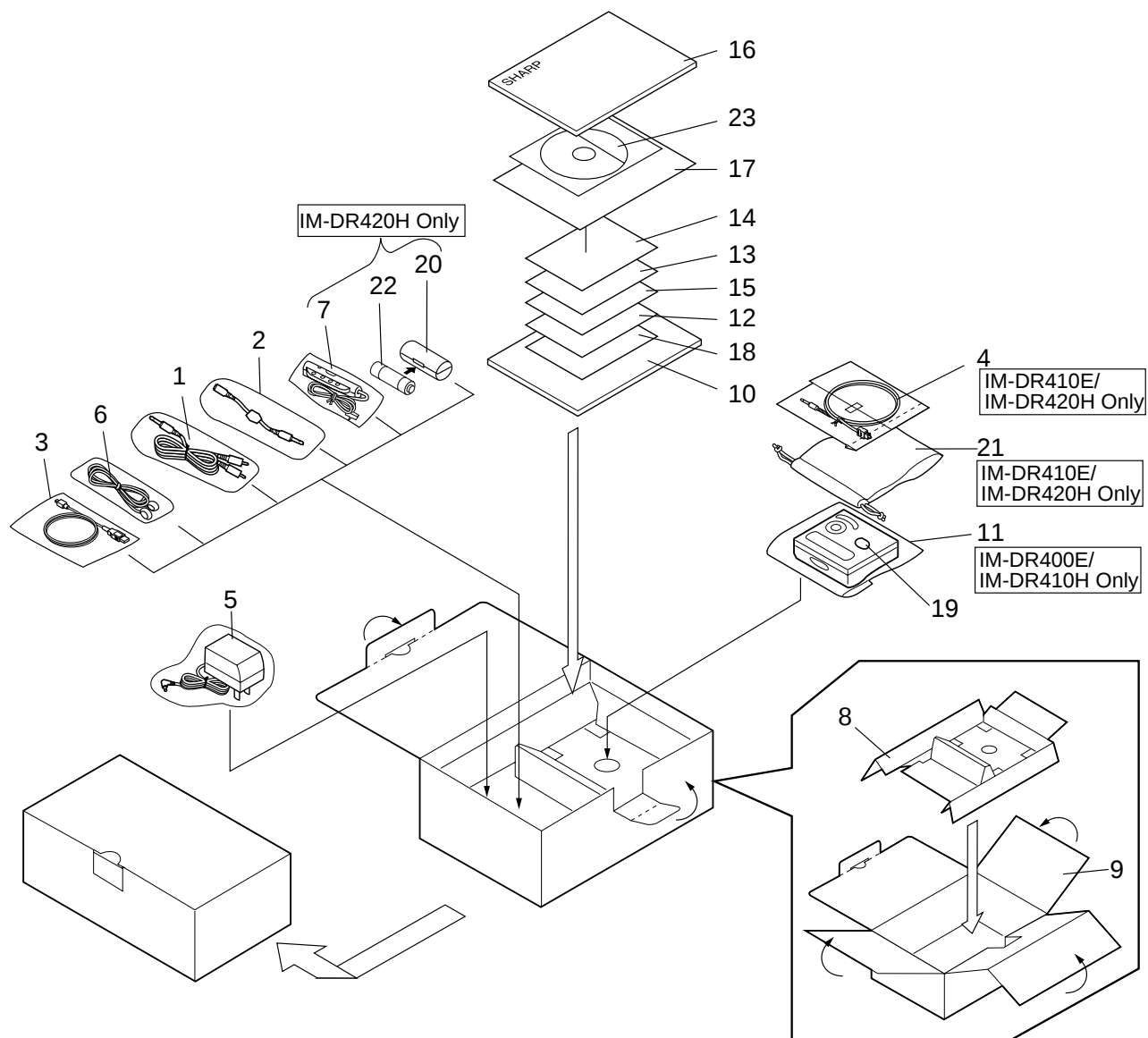
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PACKING OF METHOD (FOR U.K. ONLY)

1. Connecting Cord,RCA Type	QCNWG0029AWZZ	12. Service Card	TCADS0005AWZZ
2. Conversion Cable	QCNWG0061AWZZ	13. Caution Card,Open MG	TCAUH0099AWZZ
3. Connecting Cord, USB	QCNWG0069AWZZ	14. License Form	TCAUZ0177AWZZ
4. Optical Cable	QCNWG0422AFZZ	15. Warranty Card	TGANE0013AWZZ
[IM-DR420H/410E Only]		16. Operation Manual [IM-DR410E]	TINSE0550AWZZ
5. AC Adapter	RADPA8066AWZZ	16. Operation Manual [IM-DR420H]	TINSE0554AWZZ
6. Earphones [IM-DR420H]	RPHOH0021AWZZ	16. Operation Manual [IM-DR400E]	TINSE0562AWZZ
6. Earphones [IM-DR410H/E/400E]	RPHOH0026AWZZ	17. Operation Manual,Net MD	TINSE0553AWZZ
7. Remote Control [IM-DR420H]	RRMCW0033AWSA	18. Quick Guide [IM-DR410E]	TINSE0551AWZZ
8. Pad,Unit	SPAKA0450AWZZ	18. Quick Guide [IM-DR420H]	TINSE0555AWZZ
9. Packing Case [IM-DR410H]	SPAKC1690AWZZ	18. Quick Guide [IM-DR400E]	TINSE0563AWZZ
9. Packing Case [IM-DR420H]	SPAKC1691AWZZ	19. Label,Pop	TLABM0193AWSA
9. Packing Case [IM-DR400E]	SPAKC1699AWZZ	20. Battery Carrying Case	UBAGC0003AWZZ
9. Packing Case [IM-DR410E]	SPAKC1700AWZZ	[IM-DR420H Only]	
10. Spacer	SPAKZ0490AWZZ	21. Carrying Bag	UBAGC0007AWSB
11. Bag,Polyethylene	SPAKH0033AWZZ	[IM-DR420H/410E Only]	
[IM-DR410H/400E Only]		22. Rechargeable Nickel-Metal	UBATM0003AWSA
		Hydride Battery [IM-DR420H Only]	
		23. CD Rom	UDSKA0004AWZZ

Setting position of switches and knobs

Remote Control	HOLD OFF
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— M E M O —

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SHARP CORPORATION
AV Systems Group
Audio Systems Division
Higashihiroshima, Hiroshima 739-0192, Japan

Printed in Japan

A0309-267SS•HA•M

SG•SK•EX