

DTC-77ES/87ES

SERVICE MANUAL

US Model

DTC-87ES

AEP Model

UK Model

DTC-77ES



Photo: DTC-87ES

| | |
|------------------------------------|---------------|
| Model Name Using Similar Mechanism | New Mechanism |
| Tape Transport Mechanism Type | DATM-51 |

SPECIFICATIONS

| | |
|------------------|--|
| Tape | Digital audio tape |
| Recording head | Rotary head |
| Recording time | Standard: 120 minutes. Long-play mode: 240 minutes (with DT-120) |
| Tape speed | Standard: 8.15 mm/s, Long play mode: 4.075 mm/s |
| Drum rotation | Standard: 2,000 rpm, Long-play mode: 1,000 rpm |
| Error correction | Double Read Solomon code |

| | |
|-------------------------------|--|
| Tape | |
| Track pitch | 13.6 μ m (20.4 μ m) |
| Sampling frequency | 48 kHz, 44.1 kHz, 32 kHz |
| Modulation system | 8-10 Modulation |
| Transfer rate | 2.46 Mbit/sec. |
| Number of channel | 2 channels, stereo |
| D/A conversion (Quantization) | Standard: 16-bit linear Long-play mode: 12-bit non-linear |
| Frequency response | Standard: 2-22,000 Hz (\pm 0.5 dB) Long-play mode: 2-14,500 Hz (\pm 0.5 dB) |

| | | DTC-77ES | DTC-87ES |
|-----------------------------------|----|-------------------|------------------|
| Signal to noise ratio | SP | more than 93 dB | more than 94 dB |
| | LP | | more than 93 dB |
| Dynamic range | SP | more than 93 dB | more than 94 dB |
| | LP | | more than 93 dB |
| Total harmonic distortion (1 kHz) | SP | less than 0.0045% | less than 0.004% |
| | LP | | less than 0.08% |

* SP: standard-play mode
LP: Long-play mode

| | |
|-----------------|---|
| Wow and flutter | Below measurable limit (\pm 0.001% W. PEAK) |
|-----------------|---|

— Continued on next page —

DIGITAL AUDIO TAPE DECK
SONY®



Input

| | Jack type | Impedance | Rated input level |
|-------------------|--------------|-----------|-------------------|
| LINE IN | phono jack | 47 kohms | -4 dBs |
| DIGITAL IN | phono jack | 75 ohms | 0.5 Vp-p, 20% |
| DIGITAL IN | optical jack | — | — |

Output

| | Jack type | Impedance | Rated output | Load impedance |
|-----------------|-------------------|-----------|--------------|--------------------|
| LINE OUT | phono jack | 470 ohms | -4 dBs | More than 10 kohms |
| PHONES | stereo phone jack | 220 ohms | 2.0 mW | 32 ohms |

DIGITAL OUT (optical jack): wavelength 660 nm

General

Power requirements US model: 120 V AC, 60 Hz
AEP model: 220/230 V AC, 50/60 Hz
UK model: 240 V AC, 50/60 Hz

Power consumption 37 W

Dimensions US, AEP model:
Approx. 470 × 135 × 350 mm (w/h/d)
(18⁵/₈ × 5³/₈ × 13⁷/₈ inches)
UK model:
Approx. 430 × 135 × 350 mm (w/h/d)
(17 × 5³/₈ × 13⁷/₈ inches)

Weight US, AEP model:
Approx. 11 kg (24 lb 5 oz)
UK model:
Approx. 10.2 kg (22 lb 8 oz)

Remote commander (supplied)
Remote control system Infrared control
Power requirements 3V DC, with two size AA (R6) batteries
Dimensions Approx. 63x19x175 mm (w/h/d)
(2 1/2 × 3/4 × 7 inches)
Weight Approx. 130 g (4 oz) incl. batteries.

Supplied accessories



Sony batteries SUM-3(NS) (2)
Audio connecting cords (2 phono plugs - 2 phono plugs, stereo for line inputs and outputs) (2)
Screws (4)

Design and specifications subject to change without notice.

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SAFETY-RELATED COMPONENT WARNING!!

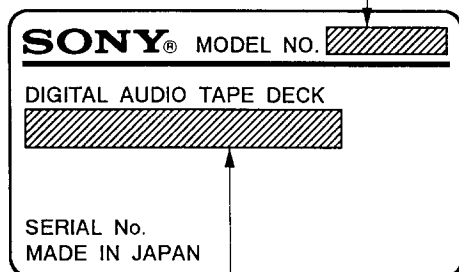
COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

MODEL IDENTIFICATION

- Specification Label -

DTC-77ES

DTC-87ES



US Model: AC: 120V 60Hz
 AEP Model: AC: 220 - 230V~50/60 Hz
 UK Model: AC: 240~50/60 Hz

CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

ADVARSEL !

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
 Udskiftning må kun ske med batteri
 af samme fabrikat og type.
 Lever det brugte batteri tilbage til leverandøren.

ADVARSEL

Lithiumbatteri - Eksplosjonsfare.
 Ved utskifting benyttes kun batteri som
 anbefalt av apparatfabrikanten.
 Brukt batteri returneres apparatleverandøren.

VARNING

Explosionsfara vid felaktigt batteribyte.
 Använd samma batterityp eller en ekvivalent
 typ som rekommenderas av apparattillverkaren.
 Kassera använt batteri enligt fabrikantens
 instruktion.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.
 Vaihda paristo ainoastaan laitevalmistajan suosittelemaan
 tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden
 mukaisesti.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

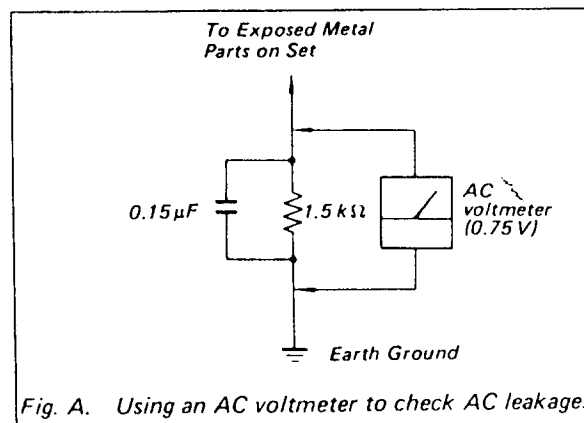


Fig. A. Using an AC voltmeter to check AC leakage.

SECTION 1 GENERAL

This section is extracted from
instruction manual.

Features

Serial copy management system

This unit utilizes the serial copy management system that permits digital-to-digital recording for one generation. You can record CD sound or other digital formats through a digital-to-digital connection.

4-Head, 4-DD Motor Mechanical Deck System

In addition to the standard two heads for recording and playback, this unit employs two additional heads for after-monitoring, forming a four-head system. This system allows after-monitoring of the recorded sound during recording in the same manner as with three-head cassette decks. In addition, the unit employs direct-drive motors for the drum, capstan, and reel drives, realizing silent and stable tape transport.

Date Function Automatically Records the Recording Date and Time

The year, month, day, day of the week, hour, minute and second are automatically recorded in the subcode area during recording, so that during playback you can display this data to check when the tape was recorded. This function is especially convenient when recording live performances, etc.

Three sampling frequencies

Recording/playback can be done with three sampling frequencies (48 kHz, 44.1 kHz and 32 kHz).
48 kHz: For analog and digital input signals in a standard mode.
44.1 kHz: For compact disc and pre-recorded DAT tape.
32 kHz: For analog input signals in a long-play mode.

Long Play mode

This unit can operate in a long-play mode. Analog input signals can be recorded or playback for up to four consecutive hours when the DT-120 DAT cassette tape is used. The sampling frequency will be 32 kHz in the long-play mode.

Visible cassette loading

You can view the tape operation through the lid of the cassette compartment.

Excellent sound quality

1-bit A/D converter

For the A/D converter section which converts analog input signals to digital signals, the unit employs a 1-bit A/D converter which theoretically generates no zero-cross distortion for a clear, elegant sound quality.

Pulse D/A converter

Superior playback performance is achieved through the combination of an 8X oversampling digital filter with a 1-bit D/A converter.

Independent Digital and Analog Power Sources

Since the design of the power source section is important for obtaining good sound quality, this unit incorporates two large-sized, large-capacity transformers for independently supplying power to the digital/mechanical deck sections and the analog section. This design eliminates from the source any interference introduced through the power supply.

Rich Variety of Subcode Information

This unit can record subcode information such as Start IDs, program numbers, Skip IDs, and absolute time data, enabling you to quickly locate tunes and display the playback time in the same manner as when playing compact discs.

High-Speed Search Function

Direct-drive reel motors and a software servo system enable you to locate tunes at high speeds up to 200-times the normal playback speed.

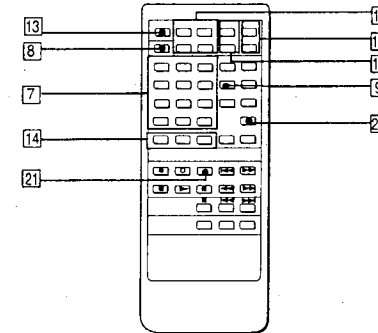
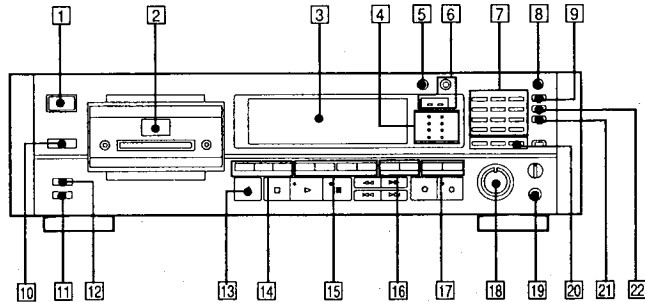
Digital fade-in/fade-out

Professional sounding fade-in/fade-out of either digital or analog signals can be accomplished by use of the FADER button.

Post edit recording of sub codes

You can record or rewrite the following sub codes after the audio signal recording has been completed.
Start ID: Signifies the beginning of a selection.
Program number: Gives a number to the selection.
Skip ID: Signifies the beginning of a portion to be skipped.
End ID: Signifies the end position of recording/playback.
Since sub codes are written on the tape separately from audio signals, the audio signals are not affected.

Location and Function of Controls



Front Panel/Remote Commander

1 POWER switch

Turns the power on and off.

2 Cassette compartment

Insert a cassette with the window side up and the safety tab facing you.

3 Display window

Display which ID button is pressed.

4 ID indicators

Display which ID button is pressed.

5 REC MODE selector

Normally set to STANDARD. When this selector is set to LONG, you can record analog input signals or digital signals with 32 kHz in the long-play mode.

6 REC MONITOR switch and indicators

Switch the output signals from the LINE OUT jack, DIGITAL OUT jack and PHONES jack during recording. In the SOURCE mode, the signal being input is output. In the TAPE mode, the signal to be recorded is output.

7 Music select buttons

Numeric buttons (0-9): Designate the desired program number to be played back before starting playback.
CLEAR: Use to cancel the program number which has been mistakenly entered.
MUSIC SCAN: Use this feature to listen to the beginning of each selection successively.

8 DISPLAY MODE button

Change the display mode. (Refer to page 10.)

9 REPEAT button

Press to play a desired portion repeatedly. Each time you press the button, the indication changes as follows: REPEAT 1 → REPEAT ALL → Nothing

10 Remote sensor

Receives the signal from the Remote Commander.

11 INPUT selector

Set according to the signal to be recorded.
ANALOG: For recording from the equipment connected to the LINE IN jacks.
OPTICAL: For recording from the equipment connected to the DIGITAL IN (OPTICAL) jack.
COAXIAL: For recording from the equipment connected to the DIGITAL IN (COAXIAL) jack.

12 TIMER switch

Normally set to OFF. Use start recording or playback at the desired time using a commercially available audio timer.

13 OPEN/CLOSE button

Press when inserting or removing the cassette.

14 COUNTER buttons

MODE: Selects the counter display in the display window among the linear counter (tape running time), absolute time, elapsed time of the selection, and total remaining time of tape. Each time you press the button, the display changes sequentially.

RESET: Resets the linear counter to "00 00S".

MEMORY: Press to search the position of the tape you want to listen to (Memory play, Memory stop).

15 START ID buttons

AUTO: Press to turn on and off the AUTO indicator. When the AUTO indicator is lit, the start ID will automatically be written during recording. When the AUTO indicator is not lit, press START ID WRITE at the point where you want to write a start ID.

WRITE: Press to write the start ID at the desired point during recording or playback.

ERASE: Press to erase a start ID. When a start ID and a program number are written on the tape, both codes are simultaneously erased by pressing this button.

RENUMBER: Press to renumber all programs on the tape. When only the start IDs are written, pressing this button will insert the proper program numbers beginning with "1". The tape will rewind and start from the beginning to accomplish this function.

16 SKIP ID buttons

WRITE: Press at the beginning of the portion you may wish to skip later. A skip ID will be written from the point where you pressed this button.

ERASE: Press to erase the nearest skip ID which is before the current position.

17 END ID buttons

WRITE: Press to write the ID signifying the end of playback or recording.

ERASE: Press to erase the end ID.

18 REC LEVEL (recording level) controls

Adjust the recording level for the analog input signals. The outer knob controls the L (left) channel level and the inner knob the R (right) channel level. The knobs can be adjusted together.

When recording digital signals, it is not necessary to adjust the recording level.

19 PHONES jack

20 CLOCK SET button

Press to adjust the time of the clock built in this unit. In this mode, The MUSIC SCAN button and the 0 button function as the + and - buttons respectively.

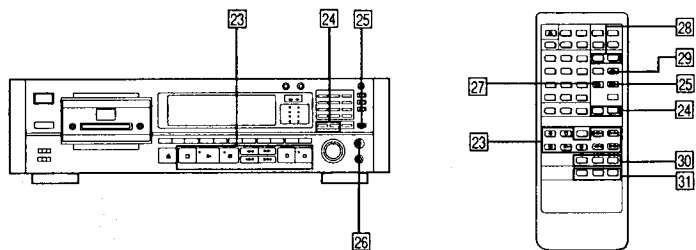
21 FADER button

Press to fade in or fade out during recording or playback.

22 SKIP PLAY button

Press to activate the skip ID code function. The portion of the tape previously marked will be skipped.

Location and Function of Controls



Front Panel/Remote Commander

23 Tape operating buttons

- (stop): Press to stop recording or playback.
- ▶ (play): Press to play back the tape.
- (recording): Press to start recording. After pressing this button, press **II** or **▶**.
- II** (pause): Press to stop for a moment during recording or playback. To restart recording or playback, press this button again or press **▶**.
If the unit is left in the pause mode for about 10 minutes, it will automatically be released and the deck will enter the stop mode. To restart recording or playback from the stop mode, press REC or **▶** respectively.

○ (record muting): Inserts a sound-muted portion (space).

◀▶ (AMS): Press to locate the beginning of the selection during the playback.

◀▶ (rewind/review, fast-forward/cue): In the stop mode, press to rewind/fast-forward the tape. During playback, press to rewind or fast-forward the tape while listening to the sound.

24 DATE button

RECORDED: Press to display the recording day of the tape being played.

PRESENT: Press to display the current time. Each time the RECORDED or PRESENT buttons are pressed, year, month, and day display or hour, minute and second display is switched respectively.

25 MARGIN RESET button

Press to reset the margin of peak level.

26 PHONE LEVEL control

The PHONE LEVEL control adjusts the headphones volume level.

27 TIME SEARCH button

Press to search the position of the tape you want to listen to by giving the time elapsed from the beginning of the tape.

28 RMS play buttons

ENTER: To program the selections in a desired order, press this button after pressing the numeric buttons.
CHECK: Press to check the programmed contents.

29 REPEAT A→B button

Press to play back a desired portion repeatedly.

30 CD operation buttons

Operative only for the Sony CD player equipped with a Remote Commander.

II (pause): Sets the CD player in the pause mode during playback. Press again to release pause. If pressed twice when the player is in the stop mode, playback starts.

◀▶ (AMS): Press to locate the desired selection on the Compact Disc during playback or in the stop mode.

31 CD SYNCHRO (CD synchronized recording) buttons

(The playback of the CD player equipped with a Remote Commander and the recording of the DAT deck can be performed simultaneously.)

STANDBY: Press to set the unit in the record-standby mode.

START: Press to start recording of the DAT deck and then playback of the CD player.

STOP: Press to stop the DAT deck recording and the CD player playback.

Remote Commander Operation

Each button on the Remote Commander functions in the same way as those having the same name on the front panel.

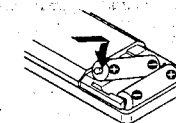
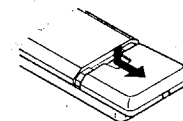
However, the following operations cannot be performed using the Remote Commander. Use the front panel controls instead.

- Turning the power on and off
- Selecting digital(optical/coaxial)/analog input source
- Adjust the recording level headphones level
- Setting the timer recording/playback
- Selecting the record mode (standard or long)
- Setting the REC MONITOR switch.

The following operations can be performed only with the Remote Commander.

- Activating CD synchronized recording using a Sony CD player and controlling the CD player
- Locating the desired selection on the Compact Disc or setting the CD player in the pause mode (possible only when a Sony CD player is used.)
- Repeat play (A-B)
- RMS* play
- *RMS: Random Music Sensor
- Time search (When locating the desired position of the tape by giving the time elapsed from the beginning of the tape.

Installing Batteries



Insert two size AA (R6) batteries with correct polarity, and close the lid.

Notes on remote control

- Do not expose the remote sensor on the deck to strong light such as direct sunlight, lighting apparatus, etc.
- Do not place any obstructions between the Remote Commander and the remote sensor, or else operations will not be performed correctly.
- The controllable range is limited. Point the Remote Commander directly at the remote sensor on the deck.
- When remote control operation distance becomes shorter, the batteries are weak. Replace both batteries with new ones.

To avoid battery leakage

When the commander will not be used for a long period of time, remove the batteries to avoid damage caused by battery leakage and corrosion.

Battery life

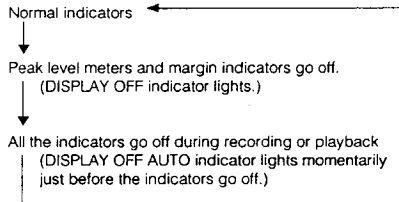
About half a year of normal operation can be expected when using the Sony SUM-3 (NS) batteries.

Location and Function of Controls

Display Window

To turn off the display window

When the power is turned on, the display window also is turned on. During recording or playback, all display or some parts of the display can be turned off. Each time the DISPLAY MODE button is pressed, the indicators changes as follows:



To change the brightness of the display window

While pressing COUNTER MODE, press one of the numeric buttons 1, 2 and 3. The greater number pressed, the darker the display window becomes. (When operating with the Remote Commander, also press COUNTER MODE.)

1 LONG PLAY mode indicator

Lights when recording or playback is being performed in the long play mode.

2 DATE indicator

Lights when pressing the RECORDED to display the recording day of the tape being played. Lights off when pressing PRESENT button to display the current time.

3 EMPHASIS indicator

Lights when a tape recorded with emphasis is played back, or when recording from a digital signal on which emphasis is applied. The emphasis function reduces the noise of the high frequency level by boosting the high frequency level during recording (Pre-emphasis function) and by lowering it during playback (De-emphasis function). This unit incorporates only the de-emphasis circuit. You can play or record the emphasized signal but newly applying emphasis cannot be performed.

4 COPY PROHIBIT indicator

Lights when recording the digital signal with the copy prohibit code. In this case, record with the LINE IN jack.

5 TOC (Table of contents) indicator

When a pre-recorded DAT cassette is played back, this indicator will light.

6 SKIP PLAY indicator

When this indicator is lit during playback, the portion marked by the skip ID is skipped and playback continues from the next start ID.

7 SAMPLING FREQ. (Sampling frequency) indicator

48 kHz: For recording/playback of analog input signals (standard mode)
44.1 kHz: For recording/playback of CD and a prerecorded DAT cassette
32 kHz: For recording/playback of analog input signals (long-play mode)

8 REPEAT indicators

REPEAT 1: Lights when a desired selection is played back repeatedly.
REPEAT ALL: Lights when all the selections are played back repeatedly.
REPEAT A-B: Lights when a desired portion is played back repeatedly.

9 STEP/PGM NO. indicator

Shows the program number of the selection being played. When programming the desired selection in the RMS operation (page 39), the display shows the step number of the programmed selection.

10 AMS (Automatic Music Sensor)/RMS (Random Music Sensor) indicators

Show the number of selections to be skipped ahead or behind in the AMS operation. When designating a selection directly by the numeric button and the ► button, the display shows the program number of the target selection while the selection is being searched for. When programming the desired selections in the RMS operation (page 39), the display shows the program number of the selection to be programmed.

11 CAUTION indicator

Lights when moisture condensation occurs. If this happens, the deck stops functioning automatically. (See page 4.)

12 MUSIC SCAN indicator

Lights after pressing the MUSIC SCAN button to listen to the beginning of each selection successively.

13 Fade IN/OUT indicator

FADE IN: Blinks when recording or playback fades in.
FADE OUT: Blinks when recording of playback fades out.

14 Indicator of the input selector

The OPTICAL or COAXIAL indicator lights according to the position of the INPUT selector. No indicator lights when the INPUT selector is set to ANALOG.

15 SKIP ID indicator

Lights when writing or erasing a skip ID code or when the skip ID is detected during playback.

16 START ID indicator

Blinks when writing (for 9 or 18 seconds) or erasing a start ID code, and lights when the start ID is detected during playback.

17 END ID indicator

Blinks when writing (for 9 or 18 seconds) or erasing an end ID code, and lights when the end ID is detected during playback.

18 TIME SEARCH indicator

Lights when searching the desired position of a tape by giving the time elapsed from the beginning of the tape.

19 REHEARSAL indicator

Lights while the rehearsal function is activated (page 27).

20 MARGIN indicator

Shows how much margin there is between the peak level of input audio signal and 0 dB.

21 Frequency map indicator

Bars indicating the sampling frequencies with which the tape was recorded appear on the peak level meters. (Refer to page 33.)

22 Peak level meters

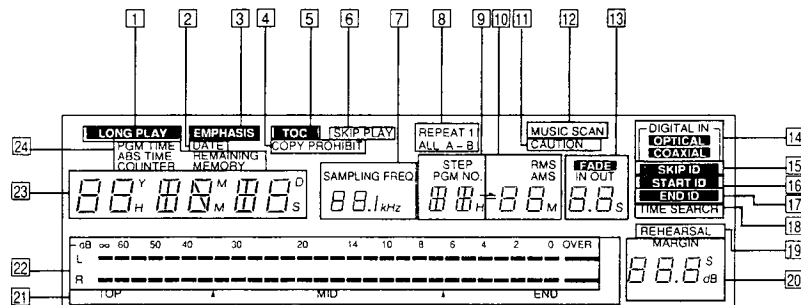
Indicate the peak value of the audio signal being recorded when the REC MONITOR switch is set to SOURCE or the peak value of the audio signal recorded on the tape when the REC MONITOR switch is set to TAPE.

23 Time indicator

Indicates the tape running time, absolute time, elapsed time of the current selection, remaining time or recording day. Each time the COUNTER TIME button is pressed, the display is changed.

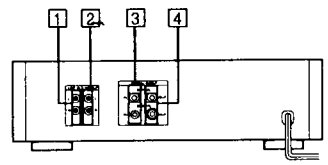
24 REMAINING (remaining time):

Lights when the counter shows the remaining time of the tape.
PGM TIME (program time): Lights when the counter shows the elapsed time of the current selection.
ABS TIME (absolute time) indicator: Lights when the counter shows the tape running time from the beginning.
COUNTER indicator: Lights when the counter shows the tape running time.
MEMORY indicator: Lights when the MEMORY function can be performed in the COUNTER mode.



Connections

Rear Panel Jacks



- 1 LINE IN (line input) jacks (phone jack)**
Connect to the recording outputs of an amplifier. Signals supplied by the amplifier can be recorded using the sampling frequency of 48 kHz in the normal play mode or 32 kHz in the long play mode.
- 2 LINE OUT (line output) jacks (phono jack)**
Connect to the DAT or tape inputs of an amplifier. The playback signal of this deck will be output.
- 3 COAXIAL/OPTICAL DIGITAL IN (digital input) jacks (coaxial phono jack/optical jack)**
Connect to the digital outputs of an amplifier having a built-in D/A converter or other digital source, such as a CD player for digital-to-digital recording.

4 COAXIAL OPTICAL DIGITAL OUT (digital output) jack (coaxial phono jack/optical jack)
Connect to the digital inputs of an amplifier having a built-in D/A converter or another DAT deck, for playback of a DAT cassette or digital-to-digital recording.

- Notes on connection**
- Use the connecting cords specified in the illustrations.
 - Turn off the power for all equipments before making connections.
 - Be sure to insert the plugs firmly into the jacks. Loose connections may cause hum and noise. When unplugging, grasp the plug and not the cord.

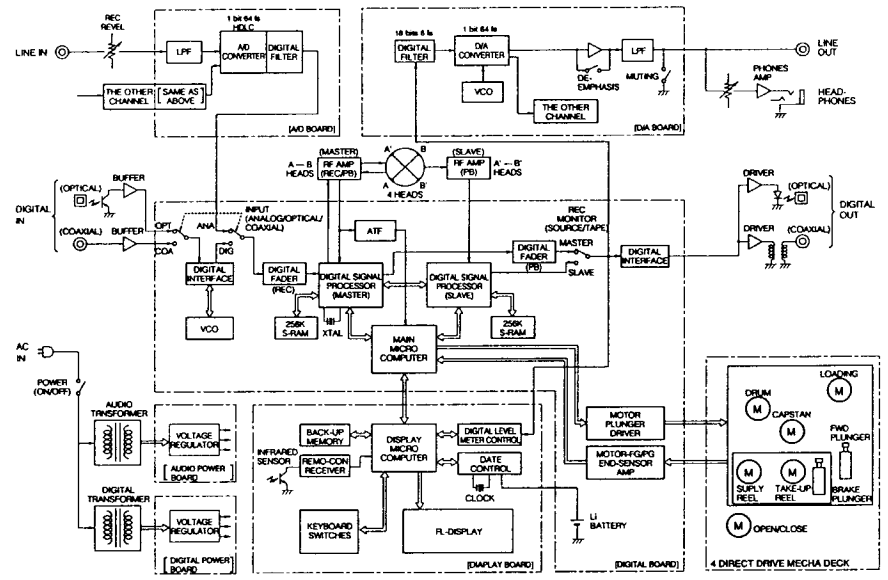
- Notes on the optical cable**
- Do not bend the cord. When the cord is not used, curl it with a diameter of more than 15 cm (5 7/8 inches).
 - Do not use it under high temperatures.
 - When the optical cable is not connected, cover the OPTICAL IN/OUT jacks with the supplied caps.

Note on sound signals
When connecting an optical cable to the DIGITAL IN/ DIGITAL OUT jacks, sound signals (L/R) are transmitted together through the cable.

Connecting Cord
There are following three types of connecting jacks at the rear of the deck. Each type of jack requires a different type of connecting cord.

| | |
|--|--|
| LINE IN/OUT (analog input/output) jacks | Audio signal connecting cord (supplied, or optional RK-C505KS etc.) LINE OUT White White LINE IN Left Left Right Right Red Red |
| COAXIAL IN/OUT (digital input/output) jacks | Coaxial digital connecting cord (optional VMC-1ES etc.) COAXIAL OUT COAXIAL IN |
| OPTICAL IN/OUT (optical transmission digital input/output) jacks | Optical cable (optional POC-15 etc.) OPTICAL OUT OPTICAL IN How to connect the optical cable Remove the cap. Plug in firmly. |

Block Diagram



Time Setting

This unit employs a built-in clock to keep track of the current date and time. Once you set the date and time, this information will be recorded on the tape along with the audio signal during recording. This function is very convenient because it allows you to check when the tape was recorded when playing the tape later.

Setting the date and time

Example: Setting the clock to 10:30:00 AM, July 4, 1991 (Thursday)

Setting the date

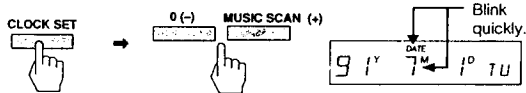
1 Display the current date.



2 Set the year.



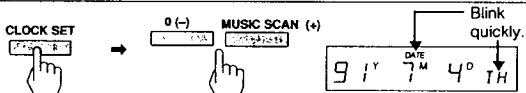
3 Set the month.



4 Set the day.



5 Set the day of the week.



6 Complete the setting procedure.



Note: In the time setting description, US model is used as an example.
On AEP, UK model 24 hours clock is used.

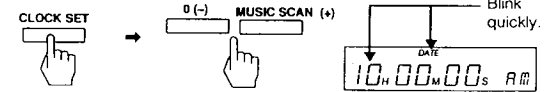
Time Setting

Setting the time

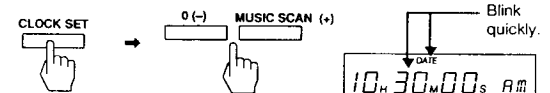
1 Display the current time.



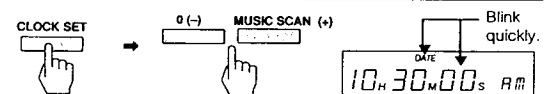
2 Set the hour.



3 Set the minutes.



4 Set the seconds to 0.



5 Start the clock simultaneously with the signal from a timecast (telephone, etc.).



To confirm the date or time

Press the PRESENT button to display the date or time. One press displays the date and two presses displays the time. To return to the original counter display, press the COUNTER button.

Time display

The time is displayed in 12-hour format.
Midnight and noon are displayed as follows:
Midnight: AM 12:00
Noon: PM 12:00

Built-in clock

This unit's built-in clock operates using a quartz oscillator, and time variations caused by changes in temperature, etc., may accumulate. For precise recording of hour, minute, and second data by the built-in date function, it is recommended that you set the clock once a week.

Precautions when setting the time

- Set the time while the tape is stopped.
- Although this unit's clock automatically adjusts for leap years and long and short months, do not enter a date which does not exist.

A The day of the week and AM/PM are displayed as follows.

| | | | |
|-----------|----|----|----|
| Sunday | SU | AM | AM |
| Monday | MO | PM | PM |
| Tuesday | TU | | |
| Wednesday | WE | | |
| Thursday | TH | | |
| Friday | FR | | |
| Saturday | SA | | |

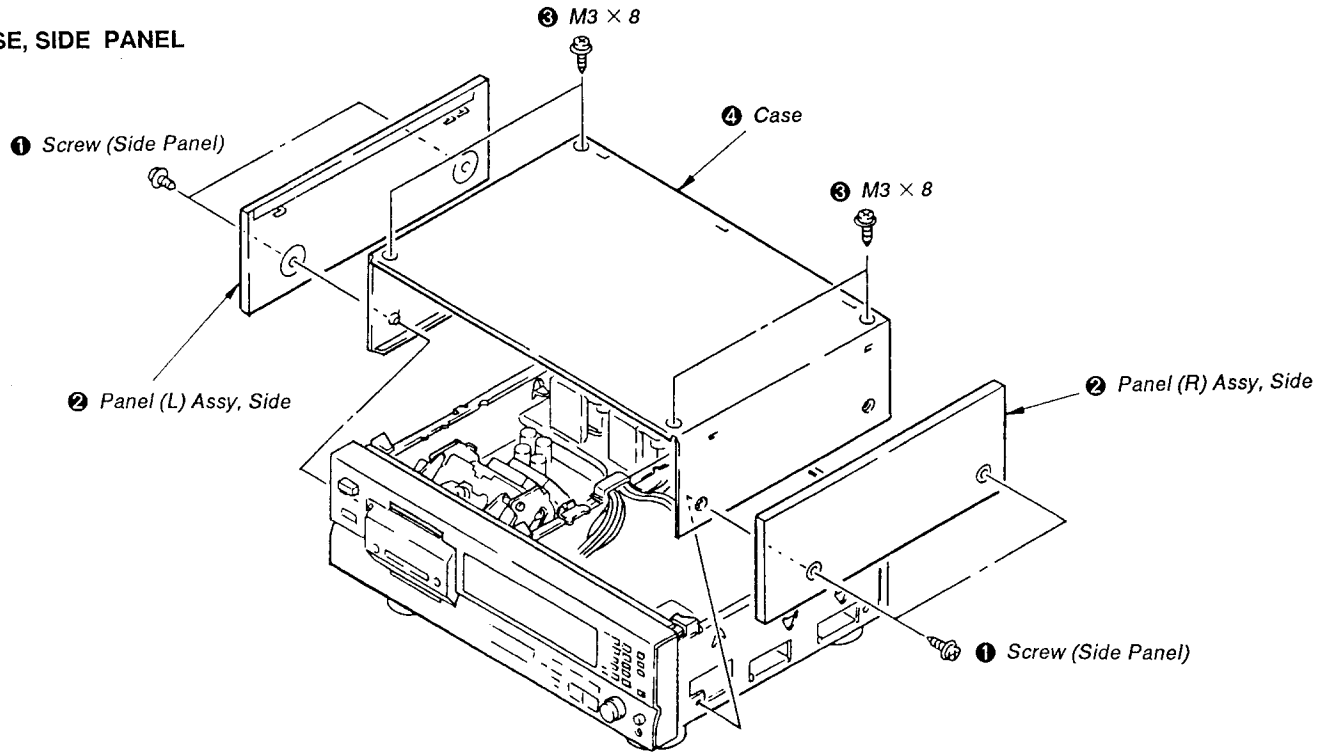
Note

This unit uses a back-up battery to keep the clock running when the power is turned off. The life of the battery under normal use is approximately five years. When the battery starts to run down, the clock will stop operating normally. When this occurs, have the battery replaced at your dealer or nearest Sony Service Center (a battery replacement fee is required).

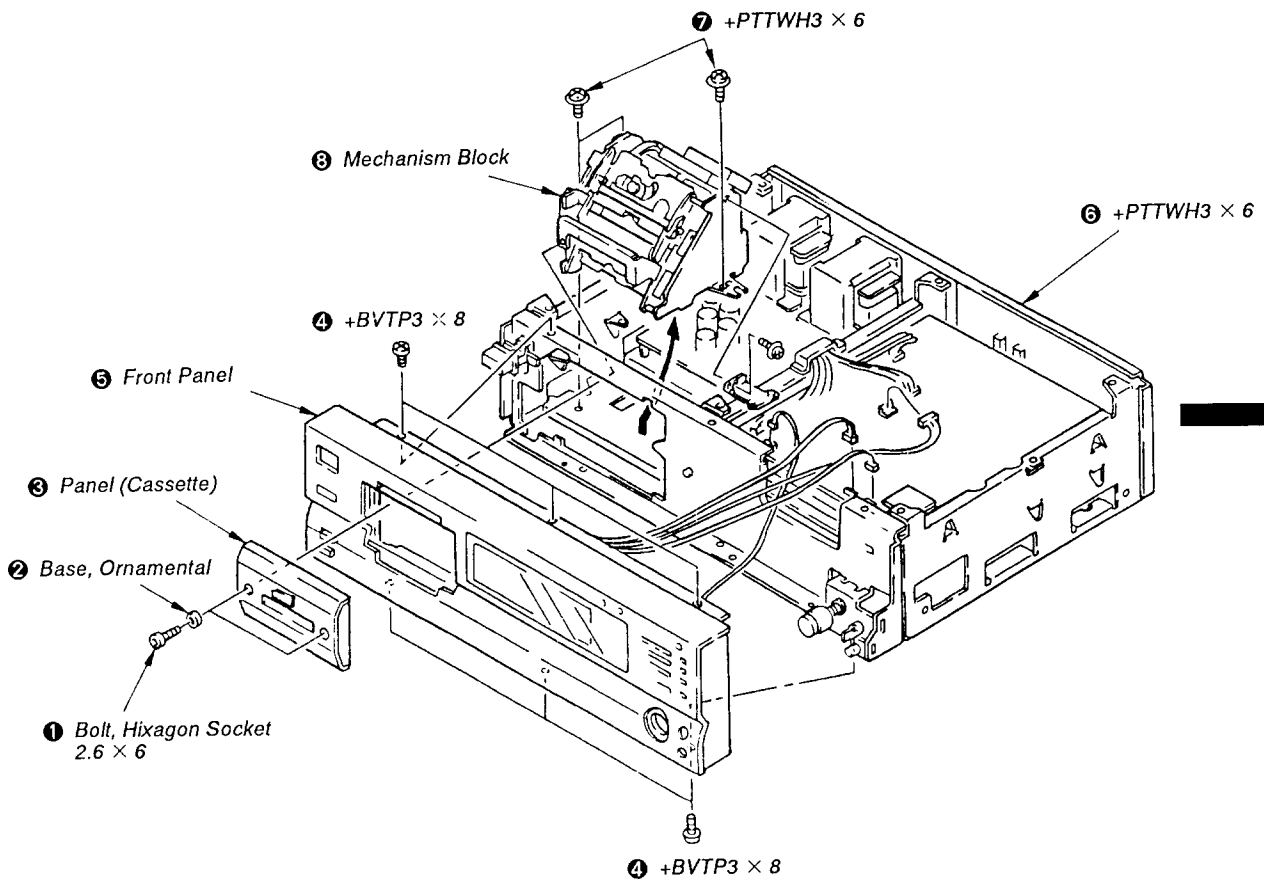
SECTION 2 DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

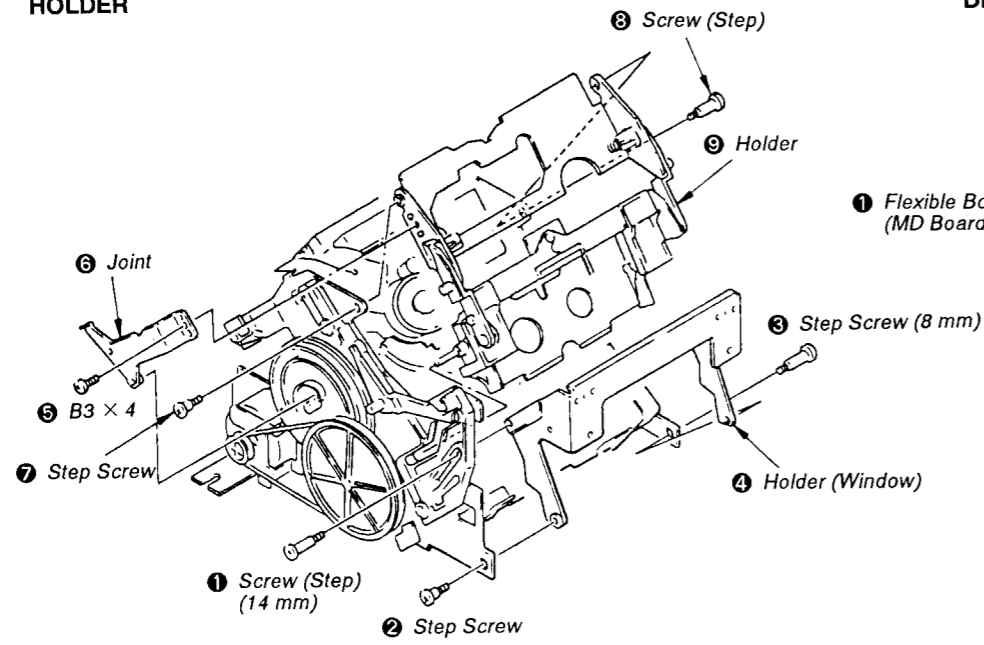
CASE, SIDE PANEL



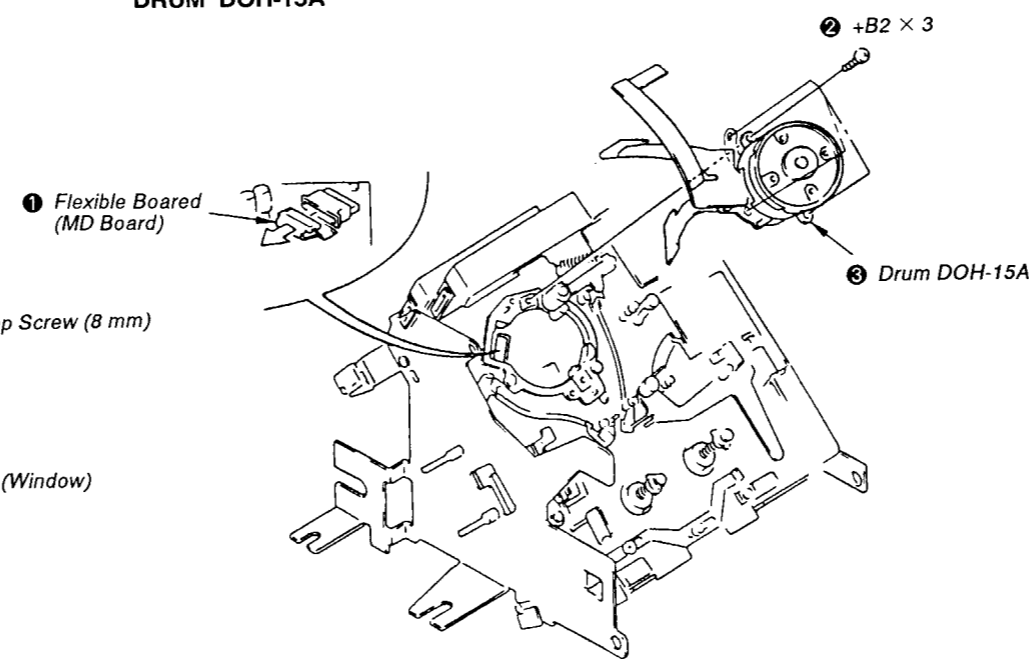
PANEL (CASSETTE), FRONT PANEL, MECHANISM BLOCK



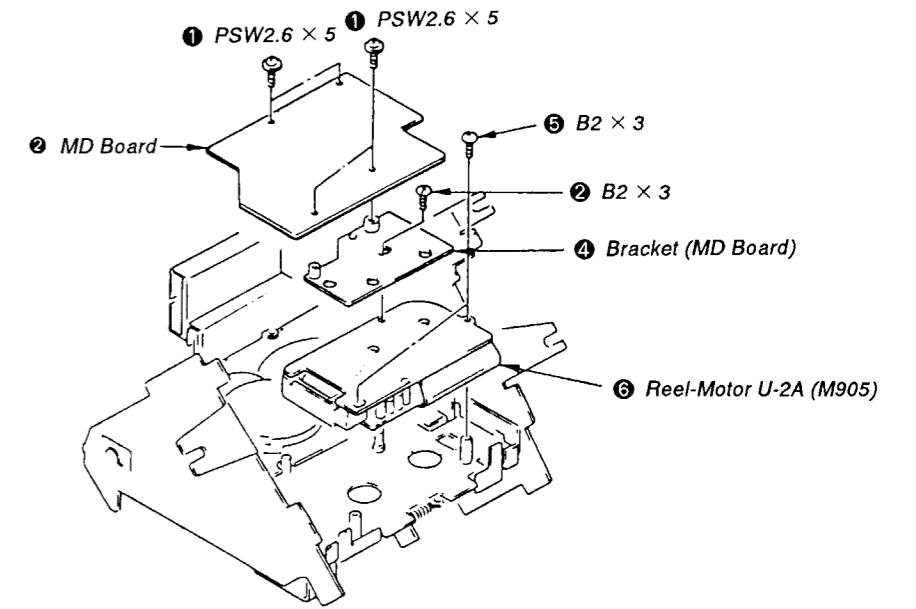
HOLDER



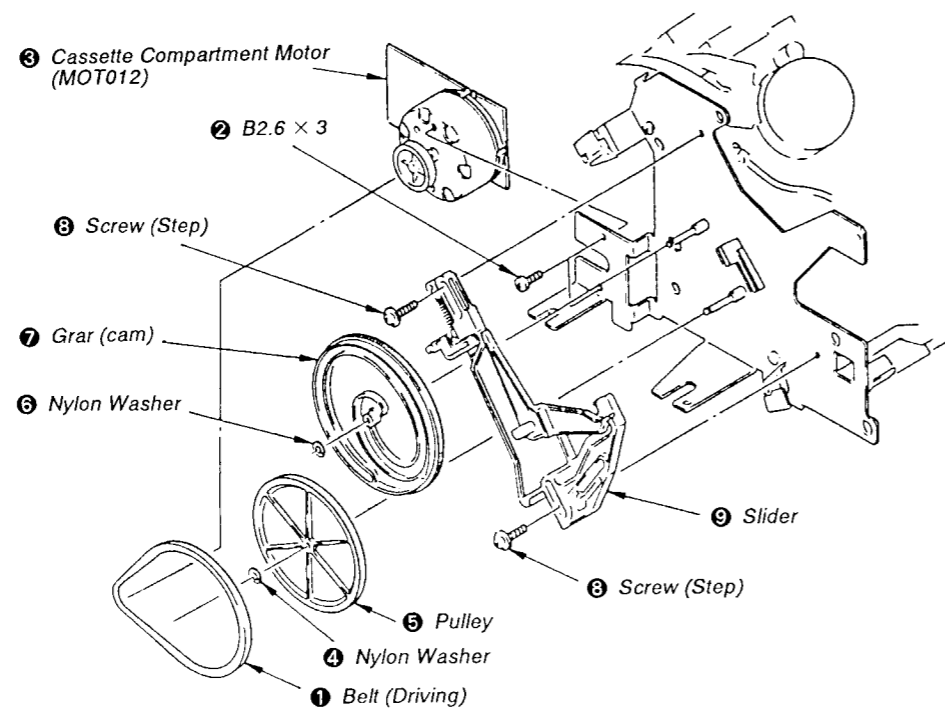
DRUM DOH-15A



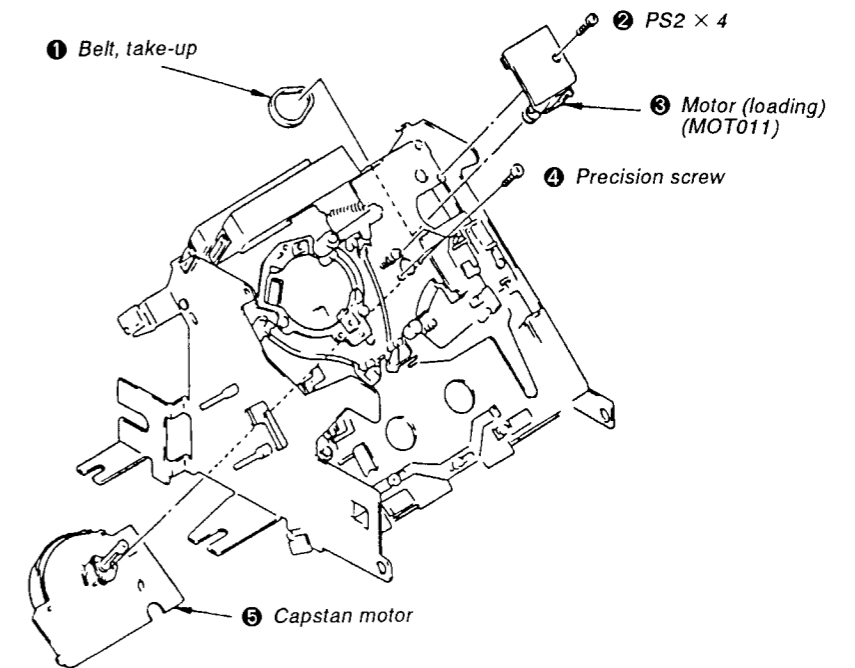
MD BOARD, REEL MOTOR U2-A (M905)



CASSETTE COMPARTMENT MOTOR (MOTO12), PULLEY, GEAR (CAM), SLIDER



LOADING MOTOR (MOTO11), CAPSTAN MOTOR U-17A (M902)



SECTION 3 ADJUSTMENTS

Notes When Making Adjustments

1. Adjustments should be performed in the order listed.
2. Use the following test tapes :

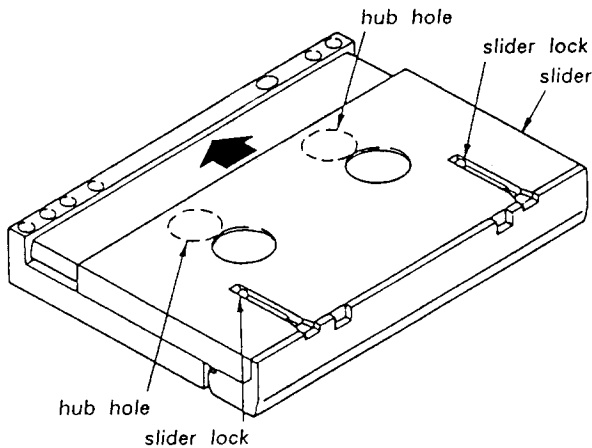
| | |
|------------------------------|-----------|
| TY-7111 (8-909-812-00) | Level |
| TY-7252 (8-909-822-00) | Tracking |
| TY-7551 (8-909-814-00) | Functions |
| TY-30B (8-892-358-00) | Blank |

Use the following torque meter :
 TW-7131 (8-909-708-71) FWD

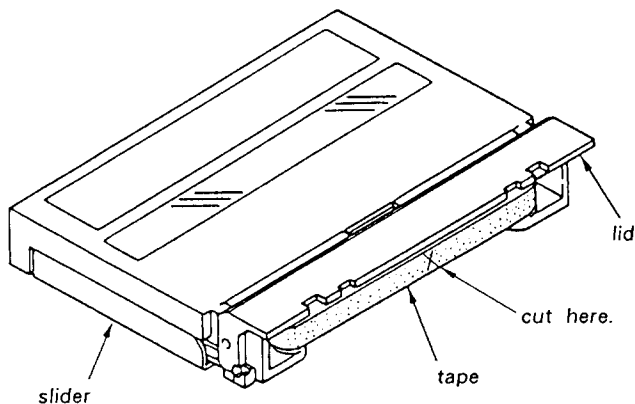
3. Switches and controls should be set as follows unless otherwise specified.

| | |
|------------------------|---------|
| TIMER switch : | OFF |
| REC MODE switch : | LONG |
| INPUT switch : | COAXIAL |
| REC LEVEL control : | Min. |
| PHONES LEVEL control : | Min. |

4. Creating an end sensor cassette
 - (1) Press the tape slider lock and move the slider in the direction indicated by the arrow.



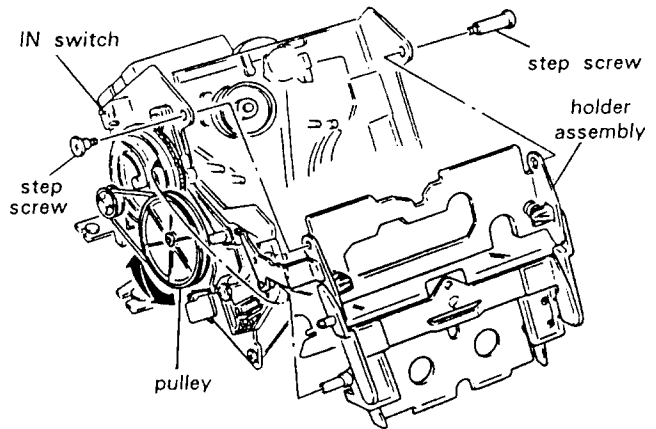
- (2) Open the lid and cut the tape.



- (3) Turn the hubs until the tape is completely inside the cassette (both T and S sides). The end sensor cassette for end sensor adjustment is now ready for use.

5. Be careful not to move RV951 and RV952 on the RF AMP board in the mechanism assembly.
6. To adjust the tape path and guides, remove the holder assembly as shown in the diagram and use the DAT holder jig (J-2000-002-A). This will make it easier to perform adjustments.

- First turning the pulley counterclockwise to put it in loading out status will make removal and reattachment of the holder assembly easier.
- To perform adjustments, turn the pulley clockwise to put it in loading in status, load the cassette tape and set the IN switch to the ON position.



7. Test mode

To set to the test mode, short-circuit between Pin ⑦ (XTEST) and Pin ⑥ (GND) of CN553 on the digital board. At this time, "TEST" letters turn on red on the fluorescent display. And at the same time, turning on the date on the fluorescent display, it becomes to the torque measurement mode.

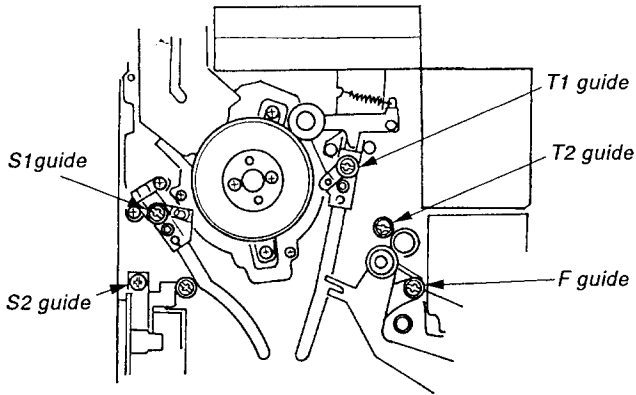
Test mode (Short-circuit between XTEST and GND)

- ① Turn off the date on the fluorescent display.
 (Press COUNTER MODE key)
 - S2, T2, F guides Adjustment
 - End Sensor Adjustment
 - Tape Path Adjustment
 - DPG Adjustment
 - ATF Pilot Adjustment
- ② Turn on the date on the fluorescent display.
 (Press DATE-RECORD key)
 - FWD Torque Adjustment
 - FWD Back-Tension Adjustment

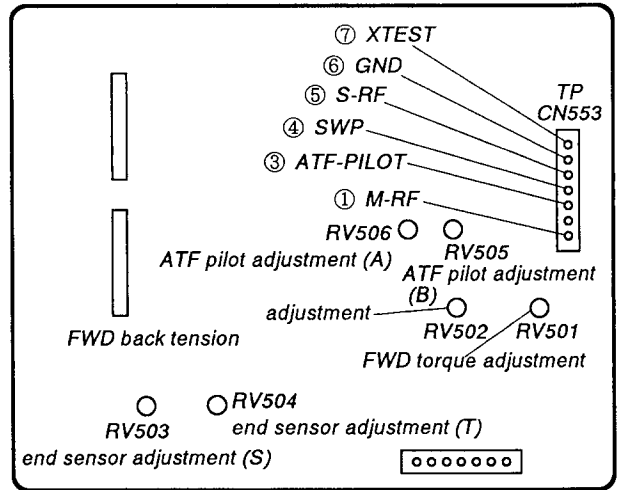
} Torque
Measurement
Mode

To release the test mode, release the short-circuit point between XTEST and GND, After the adjustments, be sure to release the test mode.

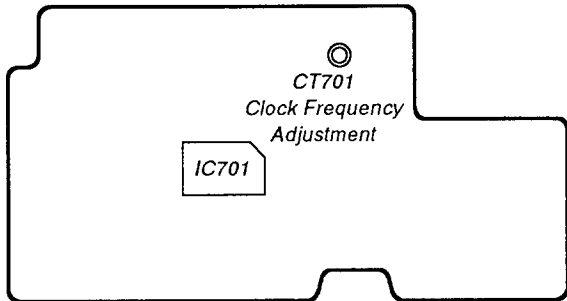
Adjust Parts Location
 – Mechanism assembly –



– Digital Board –
 – SIDE B –



– Control Board –
 – SIDE A –



3-1. MECHANICAL ADJUSTMENTS

After replacing the drum or related parts, adjust the S2, T2 and F guides and then perform the tape path (× 1.5 FWD mode) fine adjustment of electrical adjustments.,

S2, T2 Guide/F Guide Adjustment

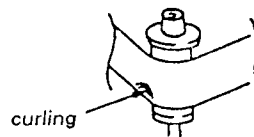
Adjustment Procedure :

1. Put the set into the test mode and load test tape TY-7252 (8-909-822-00).
2. Set the REC MODE switch to STANDARD (ATF : OFF) and press the AMS key.

Confirm there is no curling at the upper or lower flange of S2, T2, or F guides.

When there is curling, return higher S2, T2, F guides and adjust by screwing in.

* Curling :



"Curling" refers to distortion on the tape during FWD operation. It can be identified by directing a light at the tape.

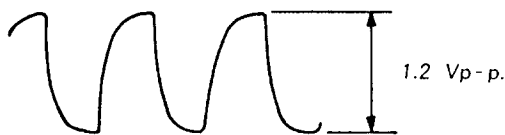
3-2. ELECTRICAL ADJUSTMENTS

End Sensor Adjustment

Perform the following adjustment when the holder has been removed or part of the mechanism deck section replaced.

Adjustment Procedure:

1. Connect an oscilloscope to CN554 pin ⑤ (SEND) (supply side) and CN554 pin ⑥ (TEND) (take-up side) on the digital board.
2. Load an end sensor cassette and put the set into the STOP (■) mode.
3. Adjust RV503 (supply side) and RV504 (take-up side) on the main board so that the oscilloscope waveform p-p value is 1.2 V_{p-p}.



Adjustment Point: digital board

FWD Torque Adjustment

Adjustment Procedure :

1. Put the set into the test mode and load the FWD torque meter TW-7131 (8-909-708-71).
2. Put the set into the PLAY (▶) mode.
3. Adjust RV501 so that the FWD torque value (take-up side rewinding torque) is between 10 – 15 g•cm (0.14 – 0.21 oz•inch).
4. Confirm that the value indicated by the torque meter is maintained for one full cycle.

Adjustment Point: digital board

FWD Back Tension Check

Check Procedure :

1. Put the set into the test mode and load the FWD torque meter TW-7131 (8-909-708-71).
2. Put the set into the PLAY (▶) mode.
3. Adjust RV502 so that the back tension (supply side) is between 8 – 9 g•cm (0.11 – 0.13 oz•inch).
4. Confirm that the value indicated by the torque meter is maintained for one full cycle.

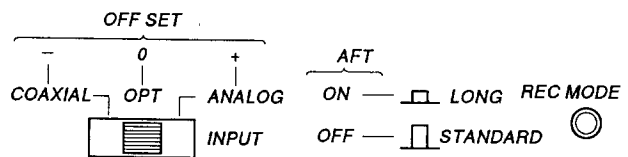
Tape Path Fine Adjustment (× 1.5 FWD Mode)

Perform the following adjustment when the drum has been replaced.

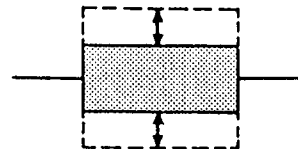
Adjustment Procedure:

1. Connect an oscilloscope CH-1 to CN553 pin ① (M-PF) and CH-2 to CN553 pin ④ (SWP) on the digital board.
2. Put the set into the test mode and load test tape TY-7252 (8-909-822-00).
3. Press the AMS (▶▶) key.

Each part of switches on Test Mode.

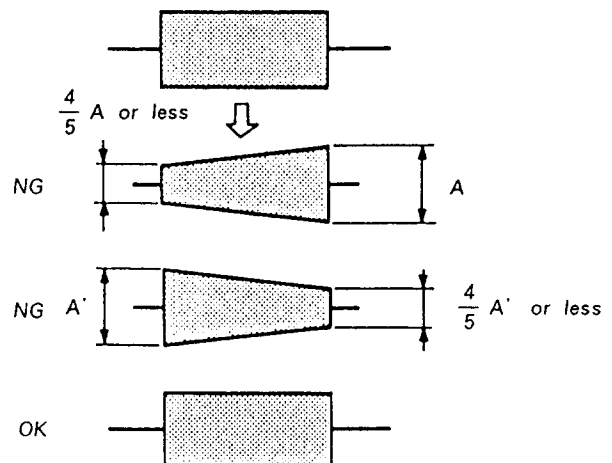


4. With the REC MODE switch set to STANDARD (ATF: OFF) and the INPUT switch set to ANALOG or COAXIAL (OFFSET: + or -), fine adjust the S1 and T1 guides so that the oscilloscope RF signal waveform remains the same when high-low is repeated.

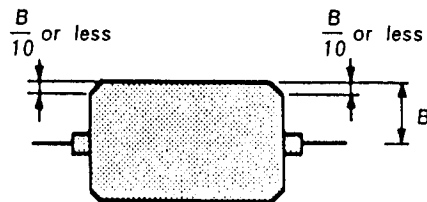


* Finish the adjustment by screwing in, and when there is curling at the upper or lower flange of S2, T2, or F guides, perform the guide adjustment.

5. Check the RF signal waveform with the REC MODE switch set to LONG (ATF: ON) and the INPUT switch set to ANALOG or COAXIAL (OFFSET: + or -).



6. Check the RF signal waveform with the REC MODE switch set to LONG (ATF: ON) and the INPUT switch set to OPTICAL (OFFSET: 0)
 - (1) Confirm that the RF signal waveform peak value is 60 mV or more.
 - (2) Confirm that the undershoot level of the RF signal waveform's flat portion is within 10%.



7. When the measured values are not within the above tolerances, repeat items 3 - 6 above.

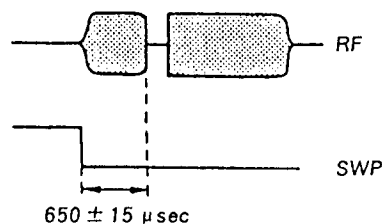
Adjustment Point : mechanism assembly

DPG Adjustment

Perform the following adjustment without fail when the drum has been replaced.

Adjustment Procedure :

1. Connect oscilloscope CH-1 to TP (RF) and CH-2 to TP (SWP) on the main board.(Use CH-2 as the trigger. When the CH-2 signal is inverted, the trailing edge can be used for synchronization.)
2. Put the set into the test mode and load test tape TY-7252 (8-909-822-00).
3. Set the REC MODE switch to LONG (ATF : ON) and the TIMER switch to OFF (OFFSET : 0).
4. Press the AMS (▶▶) key.
5. Press the ◀◀ and ▶▶ keys as appropriate so that the gap between the oscilloscope SWP and RF signals becomes $650 \pm 15 \mu\text{sec}$.(Hold the ◀◀ and ▶▶ keys down for more than 1 second to perform rough adjustment. Hold them down for approximately 0.2 seconds for fine adjustment.)

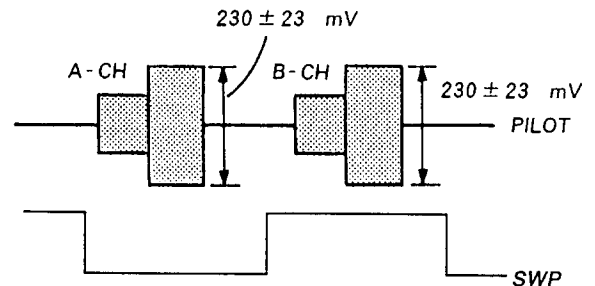


ATF Pilot Adjustment

Perform this adjustment after cleaning the heads with a cleaning cassette.

Adjust Procedure:

1. Connect oscilloscope CH-1 to CN553 pin ① (ATF-PILOT) and CH-2 to CN553 pin ④ (SWP) on the digital board. (Use CH-2 as the trigger.) When the CH-2 signal is inverted, the trailing edge can be used for synchronization.)
2. Put the set into the test mode and load test tape TY-7252 (8-909-822-00).
3. Put the set into the PLAY (▶) mode and adjust RV505 (B-CH) and RV506 (A-CH) on the main board so that the oscilloscope PILOT waveform P-P value is $230 \pm 23 \text{ mV}$.



Adjustment Point: digital board

3-3. CHECKS AND ADJUSTMENTS FOR DATE FUNCTION

Clock IC Back-up Check

- When there is the short-circuit position on the pattern around the lithium battery (BAT501) or the clock IC (IC712) or disconnecting CN573 on removing the front panel assembly the clock is reset.

(In spite of pressing PRESET button, the date indication becomes
 “_ _ Y _ _ M _ _ D ” “ _ _ H _ _ M _ _ S ”)

At this time, check the back-up function by the procedures given below.

- Connect DC voltmeter to CN554 pin ① (BATT+) and pin ② (BATT -) on the digital board.
- When the power is off, the voltage value of the item (1) should be less than +30 mV.

(When the voltage value becomes +30 mV or more, Check around IC712 or replace IC712.)

- When the power is on, the voltage value of the item (1) should be less than 0 mV (- (minus) indication).

(When the voltage value becomes + (plus) indication, Check around D718 or replace D718.)

- When the above voltage values are normal, set the preset date and time (year, month, day, day of the week, hour, minute, second) according to the instruction manual.
- After setting the time on the item (4), turn power off and turn power on several seconds later, and check the clock works normally.

Back-up Battery Replacement

The life of the back-up battery under normal use (normal temperature, normal humidity) is approximately ten years or more. (On the instruction manual, described “approximately five years”.)

Be carefull about the following points on the battery replacement.

- Repair the cause of the battery wastage by performing mentioned above “Clock IC Back-up Check”.
 - The open-circuit voltage of the replaced battery is 3.0 V or more as the new one, and when it is 2.0 V or less, it is completely consumed, replace it with new one.
 - After the battery replacement, perform “Clock IC Back-up Check” again and set the time*.
- * Time setting procedure described on page 9.

Clock Frequency Adjustment

Note:

- On normal repair, this adjustment is not necessary. Don't turn the trimmer capacitor CT701.
- Only when needing this adjustment (X702 replacement or so on), perform in the order given.
- Use the frequency counter with six digits or more.

Adjustment Procedure:

- Connect a frequency counter to the test land “OSC FREQ” on the display board.
- Turn power on and adjust with CT701 so that the reading on the frequency counter becomes 2048.00 ± 0.01 Hz (in normal temperature)
- Perform “Clock IC Back-up Check” described above.

SECTION 4
DIAGRAMS

• SEMICONDUCTOR LEAD LAYOUTS

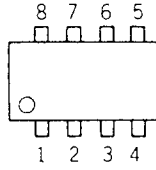
A1QH3020S



M5F7805L-720
M5F7808
TA7805S
μ PC2405HF
μ PC2406HF

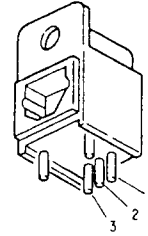


RC4560DD

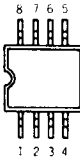


(Top view)

GP1F32R
GP1F32T

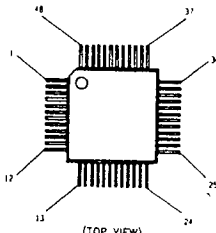


CXK1011M
LM358M
LM393M



(TOP VIEW)

CXA1045Q-Z
CXA1364R



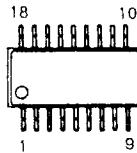
(TOP VIEW)

M5F7905L
TA7905S



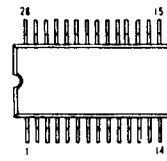
COMMON (GND) IN OUT

RF5C62



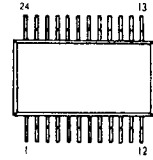
(TOP VIEW)

CXA1046M
CXK58257M-12L



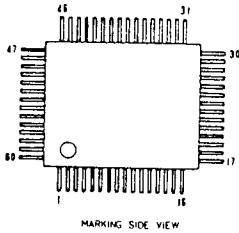
(TOP VIEW)

CXK5816M-12L



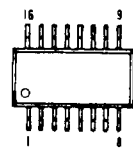
(TOP VIEW)

CXD1136Q



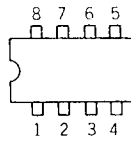
MARKING SIDE VIEW

MC14051BF
MSM6338MS-K



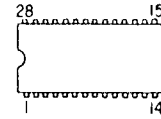
(TOP VIEW)

LM393P
M5239P
NE5532P
μ PC358C



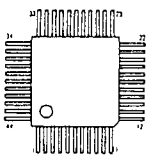
(Top view)

SM5813APT

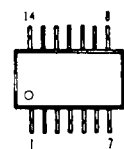


(Top view)

CXD2552Q-1

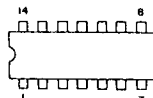


MC14069UBF



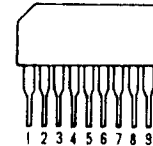
(TOP VIEW)

SN74HC393N
LC74HC08
SN74HCU04AN
SN74HC00AN
SN74HC04AN
SN74HC14AN
SN74HC74N
SN74LS624N
TC74HCU04AF
MC74AC74N

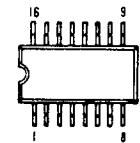


(TOP VIEW)

TC5081AP

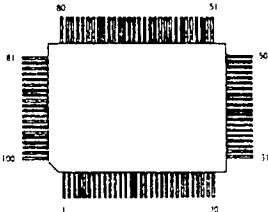


CX20115A

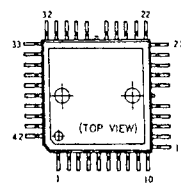


(TOP VIEW)

CXD2601AQ

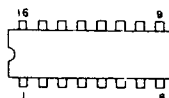


M50782FP



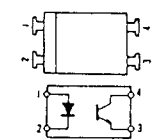
(TOP VIEW)

SN74HC157AN
SN74HC175AN
TC74HC123AP

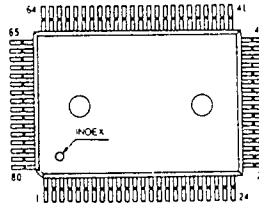


(TOP VIEW)

PC817-C

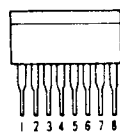


CXP80524-020Q
MSC62408-020GS-K

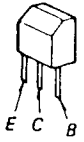


MARKING SIDE VIEW

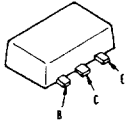
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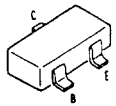
2SD1312-K



2SB798-DL
2SD1621-R



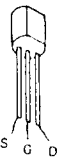
DTA114EK
DTC114EK
DTC124EK
DTC143TK
DTC144EK
2SC1623-L6



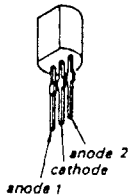
2SK241-GR



2SK246-GR
2SK30A-O



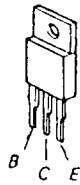
KV1320



DTA114ES
DTC114ES



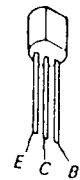
2SA985A-P
2SB1370-EF
2SC2275-P
2SD2061-EF



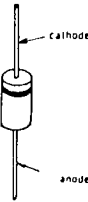
2SA1175-HFE
2SC2785-HFE



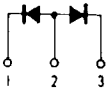
2SA1371-E
2SB1013-4
2SC3468-E
2SD1387-3



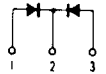
EQB01-08Q
HZ4BLL
10E2N
30DF2



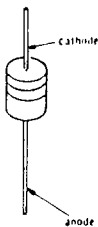
F10P20F



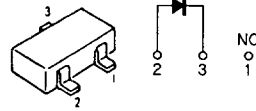
F10P20FR



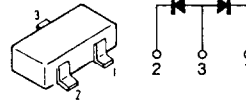
HZS6A1L
HZS33-1L
RD3.3ES-B2
RD3.9ES-B2
RD5.1JS-B2
1SS168
1SS202-1
11ES2



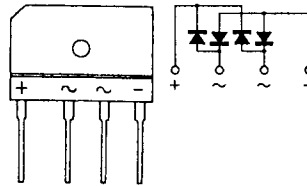
SB05-05CP



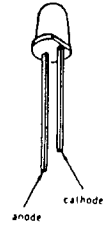
1S2836



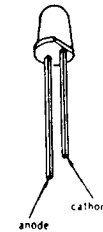
RBV-602-01



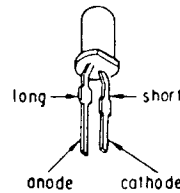
AA3432S



SLR-34MC3
SLR-34VC3



SEL2510W-D
GL-3PR9



4-1. PIN FUNCTION

IC501 MASTER microcomputer (CXP80524)



While exchanging data with the display microcomputer (IC701) by the serial communication, this IC controls the mechanism check servo and selects inputs DSP (IC502, 503) and the attenuator (IC504).

| PIN | SIGNAL NAME | I/O | LOGIC | | FUNCTION | | | | | | | | | | | | | | | |
|-----|-------------|-------|-----------------|-------------------|--|--|------|-------|-----|-----|-----|---|---|---|---|-----|---|---|---|---|
| | | | O | I | | | | | | | | | | | | | | | | |
| 1 | ATTEX | O | Outside (ATTCK) | Inside (1/8 LECK) | Attenuator (IC504) clock select output | | | | | | | | | | | | | | | |
| 2 | ATTCK | O | — | — | Attenuator (IC504) level set clock output | | | | | | | | | | | | | | | |
| 3 | FPON | O | OFF | ON | FWD plunger (PM002) ON/OFF output | | | | | | | | | | | | | | | |
| 4 | FPKI | O | OFF | ON | FWD plunger (PM002) KICK output | | | | | | | | | | | | | | | |
| 5 | TLOCK | O | ON | OFF | REEL T side LOCK output | | | | | | | | | | | | | | | |
| 6 | CPDIR | O | FWD | RVS | CAPSTAN DIRECTION select output | | | | | | | | | | | | | | | |
| 7 | BPON | O | OFF | ON | REEL BRAKE plunger (PM001) ON/OFF output | | | | | | | | | | | | | | | |
| 8 | BPKI | O | OFF | ON | REEL BRAKE plunger (PM001) KICK output | | | | | | | | | | | | | | | |
| 9 | DRON | O | OFF | ON | DRUM motor ON/OFF output | | | | | | | | | | | | | | | |
| 10 | DRDIR | O | NORM | RVS | DRUM DIRECTION select input | | | | | | | | | | | | | | | |
| 11 | OPT/COA | O | OPTICAL | COAXIAL | DIGITAL IN, OPTICAL/COAXIAL select output | | | | | | | | | | | | | | | |
| 12 | DIG/ANA | O | DIGITAL | ANALOG | INPUT/DIGITAL/ANALOG select output | | | | | | | | | | | | | | | |
| 13 | REC/PB | O | REC | PB | Mode REC/PB select input | | | | | | | | | | | | | | | |
| 14 | MST/SLV | O | SLAVE | MASTER | MONITOR MASTER/SLAVE (SOURCE/TAPE) select | | | | | | | | | | | | | | | |
| 15 | SLVMUT | O | OFF | MUTE | MUTE output so SLAVE DSP (IC503) | | | | | | | | | | | | | | | |
| 16 | MSTMUT | O | OFF | MUTE | MUTE output to MASTER DSP (IC502) | | | | | | | | | | | | | | | |
| 17 | FS1 | O | — | — | fs select <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td></td> <td>STOP</td> <td>44.1K</td> <td>32K</td> <td>48K</td> </tr> <tr> <td>FS1</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>FS0</td> <td>0</td> <td>1</td> <td>0</td> <td>1</td> </tr> </table> | | STOP | 44.1K | 32K | 48K | FS1 | 0 | 0 | 1 | 1 | FS0 | 0 | 1 | 0 | 1 |
| | STOP | 44.1K | 32K | 48K | | | | | | | | | | | | | | | | |
| FS1 | 0 | 0 | 1 | 1 | | | | | | | | | | | | | | | | |
| FS0 | 0 | 1 | 0 | 1 | | | | | | | | | | | | | | | | |
| 18 | FS0 | O | — | — | | | | | | | | | | | | | | | | |
| 19 | DFMUT | O | OFF | MUTE | MUTE output to DIG-FIL (IC312) | | | | | | | | | | | | | | | |
| 20 | DOCNT | O | OFF | ON | DIGITAL OUT (ON/OFF) CONTROL output | | | | | | | | | | | | | | | |
| 21 | LMEJ | O | OFF | ON | LOADING motor EJECT direction } BRAKE MODE LOADING motor LOAD direction } at ON-ON | | | | | | | | | | | | | | | |
| 22 | LMLD | O | OFF | ON | | | | | | | | | | | | | | | | |
| 23 | LINMUT | O | OFF | MUTE | Line mute (relay) output | | | | | | | | | | | | | | | |
| 24 | DISPSL | O | ON | OFF | DISPLAY microcomputer communication SELECT output | | | | | | | | | | | | | | | |
| 25 | TEND | I | — | — | T side END SENSOR TLED ON } DC (=): Magnetic part S side END SENSOR SLED ON } AC (⌋⌋⌋): Leader tape | | | | | | | | | | | | | | | |
| 26 | SEND | I | — | — | | | | | | | | | | | | | | | | |
| 27 | CMCL | O | OFF | ON | CAS-CON. motor CLOSE direction } BRAKE MODE CAS-CON. motor OPEN direction } at ON-ON | | | | | | | | | | | | | | | |
| 28 | CMOP | O | OFF | ON | | | | | | | | | | | | | | | | |
| 29 | TLED | O | OFF | ON | T side LED drive output } DUTY 50% S side LED drive output } DRIVE on T/S antiphase | | | | | | | | | | | | | | | |
| 30 | SLED | O | OFF | ON | | | | | | | | | | | | | | | | |
| 31 | MP | I | Inside ROM | Outside ROM | MICRO PROCESSOR MODE input (fixed to "0") | | | | | | | | | | | | | | | |
| 32 | XRST | I | RESET | RELEASE | RESET | | | | | | | | | | | | | | | |
| 33 | Vss | — | — | — | GND | | | | | | | | | | | | | | | |
| 34 | XTAL | — | — | — | NC | | | | | | | | | | | | | | | |
| 35 | EXTAL | — | — | — | Microcomputer external clock (=MCLK=9.408 MHz) | | | | | | | | | | | | | | | |
| 36 | DISPLSY | I | ON | OFF | DISPLAY microcomputer communication sync input | | | | | | | | | | | | | | | |
| 37 | DISPDI | I | — | — | DISPLAY microcomputer communication serial data input | | | | | | | | | | | | | | | |
| 38 | DISPDO | O | — | — | DISPLAY microcomputer communication serial data output | | | | | | | | | | | | | | | |

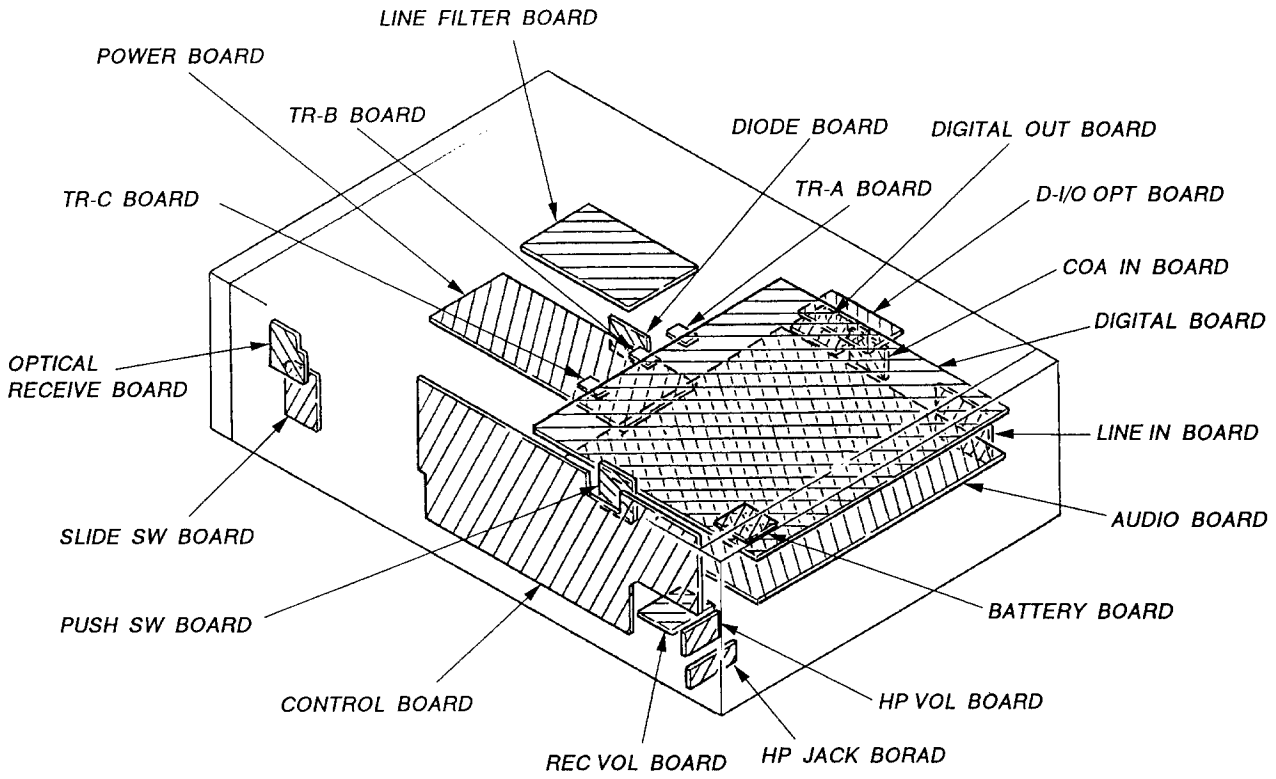
| PIN | SIGNAL NAME | I/O | LOGIC | | FUNCTION |
|-----|-------------|-----|------------------------|-----------------------------|--|
| | | | O | I | |
| 39 | DISPCK | I | — | — | DISPLAY microcomputer communication serial clock input |
| 40 | SBSY | I | ON (communicatable) | OFF (not communicatable) | Signal processing communication SUB DATA SYNC. input |
| 41 | SBDI | I | — | — | Signal Processing communication SUB DATA IN. input |
| 42 | SBDO | O | — | — | Signal Processing communication SUB DATA OUT. input |
| 43 | SDCK | O | — | — | Signal Processing communication SUB DATA CLOCK. input |
| 44 | AVss | — | — | — | Analogue input GND |
| 45 | AVref | — | — | — | Analogue input REFERENCE (+5 V) |
| 46 | AVdd | — | — | — | Analogue input +5 V |
| 47 | | I | | | Not used (Pull-up) |
| 48 | SWAD3 | I | — | — | SWITCH A/D input (CAS-CON system) |
| 49 | SWAD2 | I | — | — | SWITCH A/D input (LOADING system) |
| 50 | SWAD1 | I | — | — | SWITCH A/D input (RECGN system) |
| 51 | SWAD0 | I | — | — | SWITCH A/D input (RECGN system) |
| 52 | LEVSYN | I | NONE | MUSIC | LEVEL SYNC input (Write START-ID by the audio input) |
| 53 | MUTM | I | OFF | MUTE | MUTE monitor input from MASTER DSP (IC502) |
| 54 | ATFIN | I | — | — | ATF PILOT signal input |
| 55 | TFG | I | — | — | T-REEL FG input |
| 56 | SFG | I | — | — | S-REEL FG input |
| 57 | CFG | I | — | — | CAPSTAN FG input |
| 58 | DFG | I | — | — | DRUM FG input |
| 59 | DPG | I | — | — | DRUM PG input |
| 60 | DREF | I | — | — | DRUM REFERENCE $100/3, 50/3, 1.6k (Hz \pm \alpha)$ input SP LP SEARCH |
| 61 | MCLK | I | — | — | MASTER CLOCK (Fch=9.408 MHz) input |
| 62 | PBDT | I | — | — | PB (playback) DATA input |
| 63 | SWP | O | Ach | Bch | SWITCHING PULSE |
| 64 | DPWM | O | — | — | DRUM PWM output |
| 65 | CPWM | O | — | — | CAPSTAN PWM output |
| 66 | TPWM | O | — | — | T-REEL PWM output |
| 67 | SPWM | O | — | — | S-REEL PWM output |
| 68 | ADRES | O | RESET | ACTIVE | Reset output for AD converter |
| 69 | ERMN | I | RF is none and REC | RF exists | ERROR MONITOR (PBRF exists or not) input |
| 70 | XTEST | I | ON | OFF | TEST MODE input |
| 71 | POWDN | I | ON | OFF | POWER DOWN detect input (AC POWER OFF input) |
| 72 | VDD | — | — | — | +5 V |
| 73 | Vss | — | — | — | GND |
| 74 | NC | — | — | — | Not connected |
| 75 | ATFS2 | O | — | — | ATF Sync signal output to MASTER DSP (IC502) |
| 76 | DIVCO | O | OSC ON | OSC STOPS | Osc. ON/OFF select output to DIG-IN VCO (IC529) |
| 77 | ATFS3 | O | — | — | SYNC3/RF AMP MODE for ATF (IC505) |
| 78 | LP/SP | O | LP | SP | LONG PLAY/STANDARD PLAY select output |
| 79 | XDTR | O | ON | OFF | DATA RECORDER MODE (ON during LP after-recording or searching) |
| 80 | ATTMUT | O | OFF | MUTE | Attenuator (IC504) MUTE, (ON during fading) |

IC701 DISPLAY MICROCOMPUTER (MSC62408)

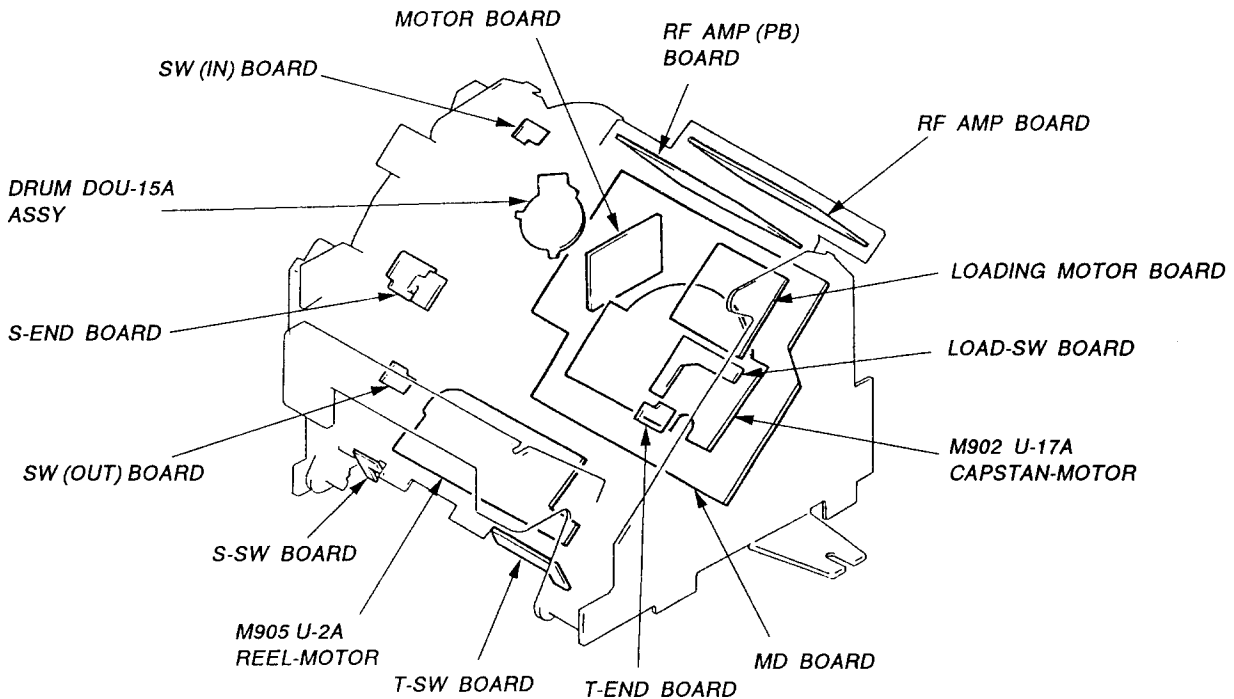
While serial communicating, this IC controls the fluorescent display tube, the level meter (IC709), the clock (IC712), the remote control signal, LED indication by the expansion port (IC707), key input scan, address set for SRAM (IC718).

| PIN | SIGNAL NAME | I/O | LOGIC | | FUNCTION |
|---------|-------------|-----|--|---|--|
| | | | O | I | |
| 1 - 2 | D6 - D7 | I/O | -- | -- | Data bus |
| 3 | PMODE0 | I | | | PORT MODE 0 } Mode setting input (normally open) for each processing |
| 4 | PMODE1 | I | | | |
| 5 | PMODE2 | I | | | |
| 6 | MMUTE | I | OFF | MUTE | Level meter muting input |
| 7 | ROMSI | I | -- | -- | Serial data input from E ² PROM (IC702) |
| 8 | ROMBY | I | ON | OFF | BUSY signal input from E ² PROM (IC702) |
| 9 | CMPIN | I | Vref < Vkey | Vref > Vkey | Comparator out input for KEY A/D |
| 10 | MSTAK | O | ON | OFF | Acknowledge output to the master microcomputer (IC501) |
| 11 | CPUSC | O | -- | -- | On the microcomputer communication, serial clock output |
| 12 | CPUSO | O | -- | -- | On the microcomputer communication, serial data output |
| 13 | CPUSI | I | -- | -- | On the microcomputer communication, serial data input |
| 14 | MOTUP | O | OFF | ON | UP output for the volume with motor |
| 15 | MOTDN | O | OFF | ON | DOWN output for the volume with motor |
| 16 | CLKCE | O | ON | OFF | Chip enable output to the real time clock (IC712) |
| 17 | RMC | I | -- | -- | Received remote control signal input |
| 18 | MSTSY | I | ON | OFF | Sync input from the master microcomputer (IC501) |
| 19 | TIMIN | I | ON | OFF | The real time clock (IC712) timing signal input |
| 20 | XRST | I | RESET | RELEASE | Microcomputer reset signal input |
| 21 | TEST | I | -- |  | Test mode (Normally GND level) |
| 22 | EXPST | O | LATCH | ACTIVE | Strobe signal output to the output expansion IC (IC707) |
| 23 | METCE | O |  ON | OFF | Chip enable signal output to the meter IC (IC709) |
| 24 | WR | O | ON | OFF | WRITE signal output to S-RAM (IC708) and the meter IC (IC709) |
| 25 | RD | O | ON | OFF | READ signal output to S-RAM (IC708) and the meter IC (IC709) |
| 26 | RAMCE | O | ON | OFF | Chip enable signal output to S-RAM (IC708) |
| 27 | ROMSO | O | -- | -- | Serial data output to E ² PROM (IC702) |
| 28 | ROMSC | O | -- | -- | Serial clock signal output to E ² PROM (IC702) |
| 29 | ROMCE | O | ON | OFF | Chip enable signal output to E ² PROM (IC702) |
| 30 | OSCI | O | -- | -- | Ceramic oscillator for clock connecting terminal (4.19 MHz) |
| 31 | OSCO | O | -- | -- | Ceramic oscillator for clock connecting terminal (4.19 MHz) |
| 32 | GND | O | -- | -- | GND |
| 33 - 40 | T0 - T7 | O | OFF | ON | FL grid output |
| 41 - 48 | S31 - S24 | O | OFF | ON | FL segment output |
| 49 | VFLT | -- | -- | -- | B+ for FL (+35 V) |
| 50 - 73 | S23 - S0 | O | OFF | ON | FL segment output |
| 74 | VDD | -- | -- | -- | +5 V power supply |
| 75 - 80 | D0 - D5 | I/O | -- | -- | Data bus |

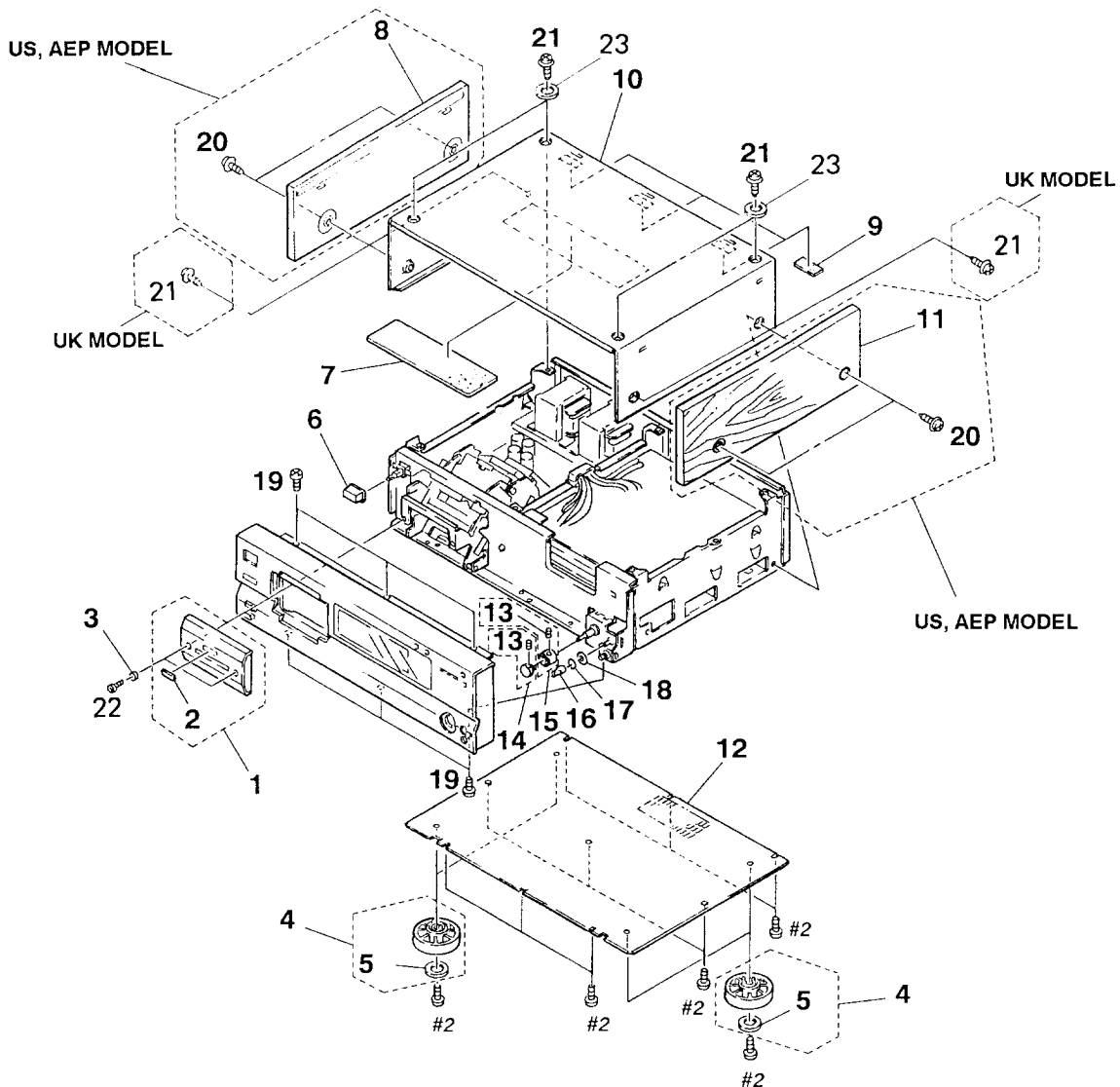
• CIRCUIT BOARDS LOCATION



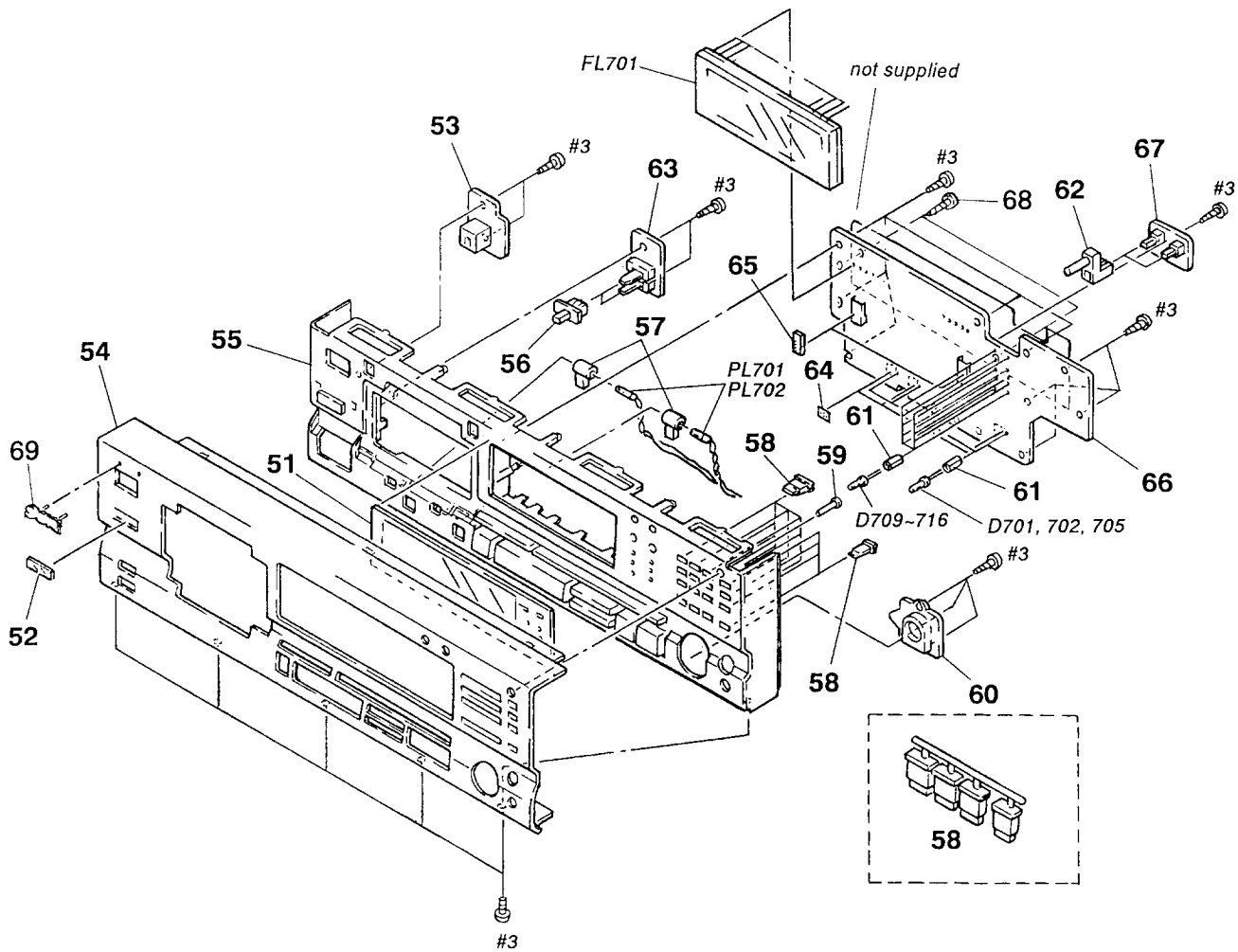
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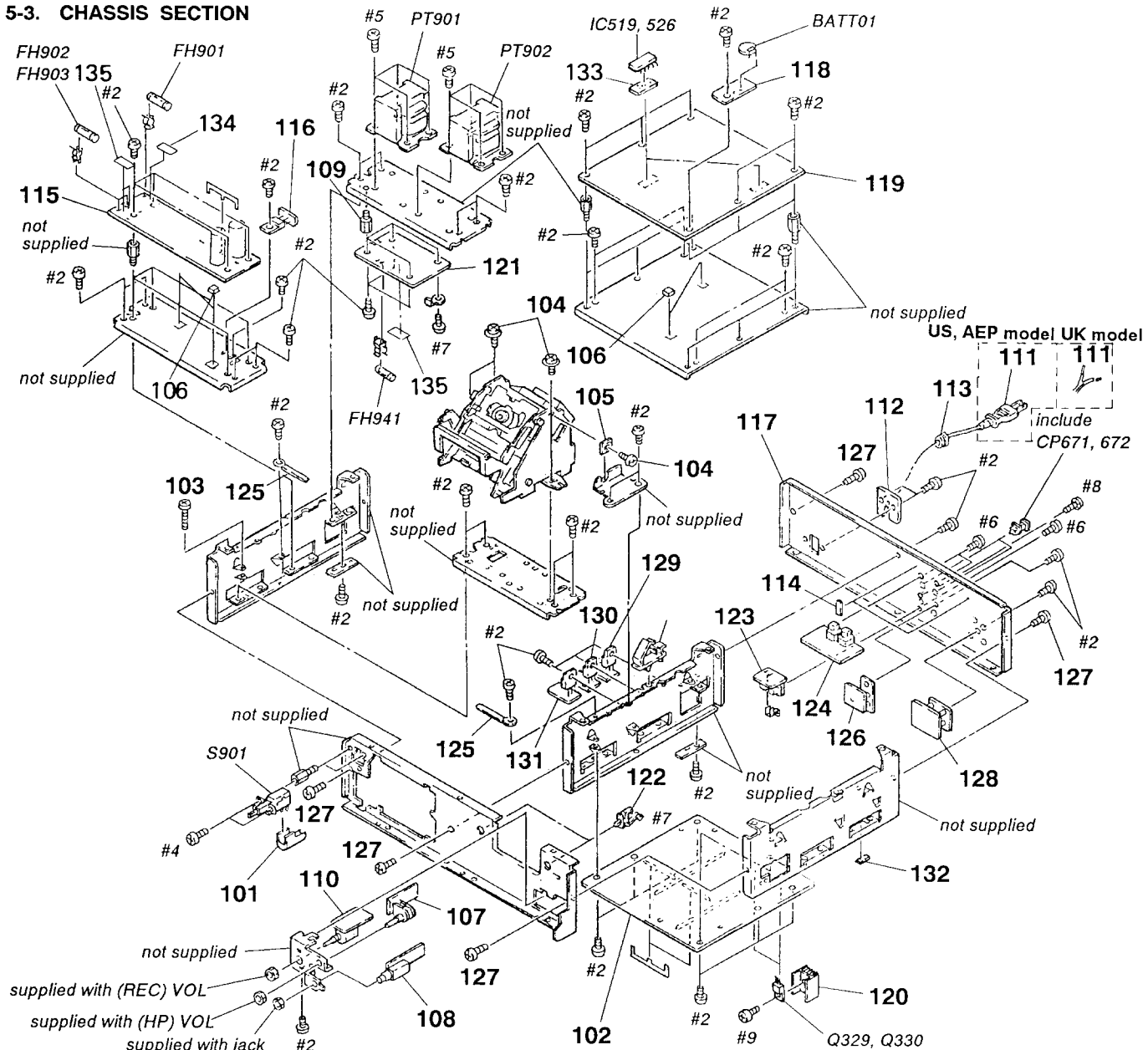
5-1. CABINET SECTION



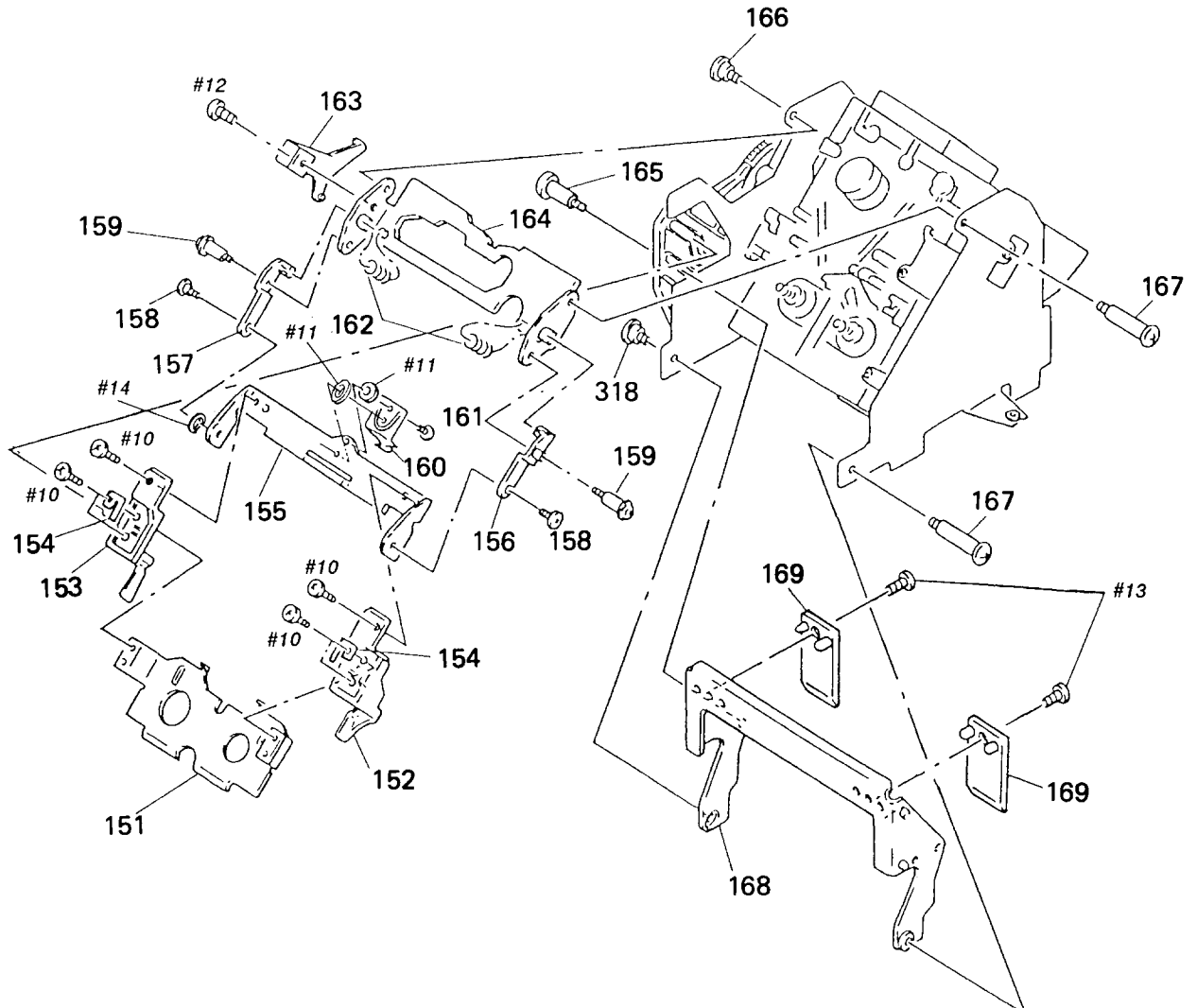
5-2. FRONT PANEL SECTION



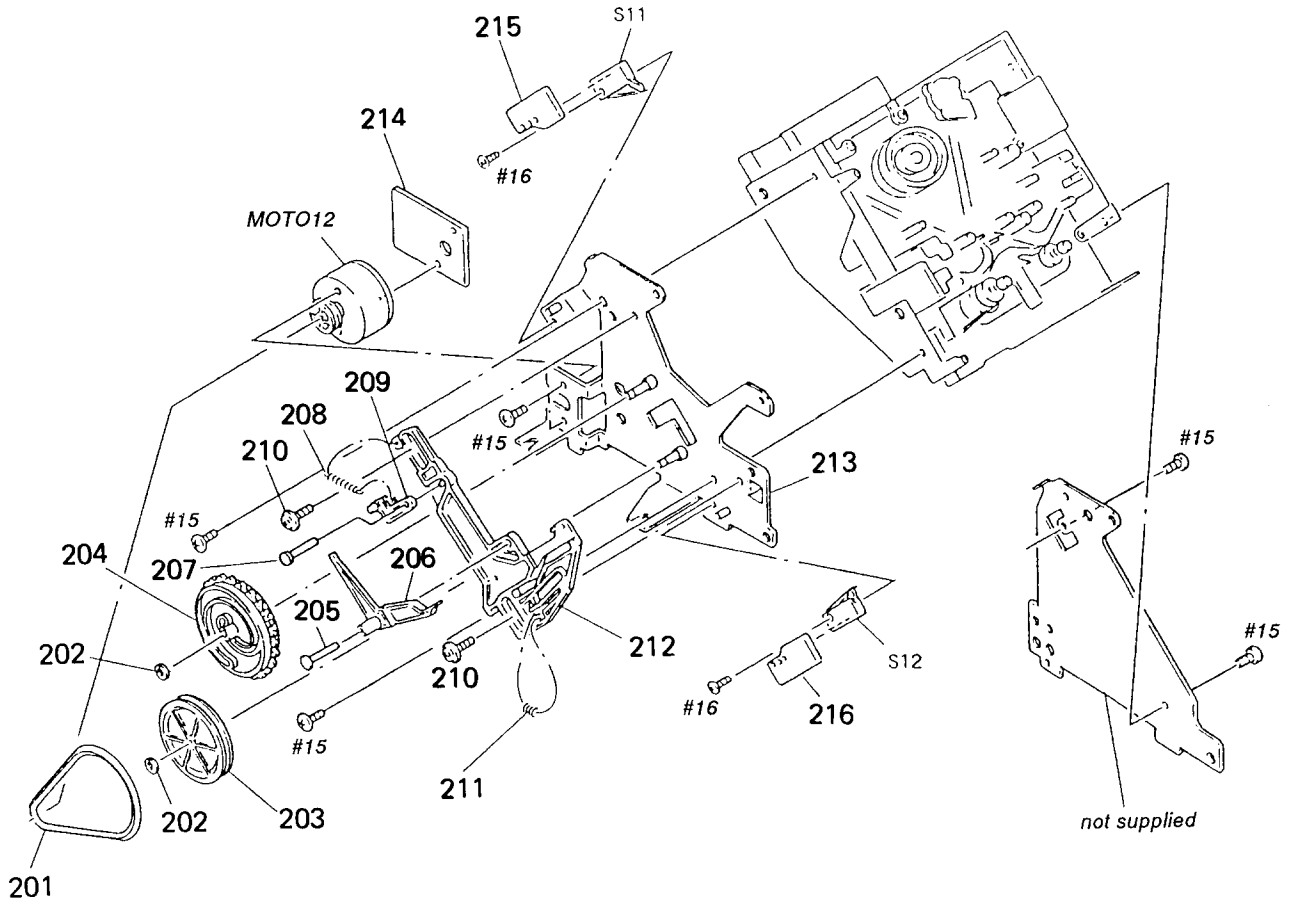
5-3. CHASSIS SECTION



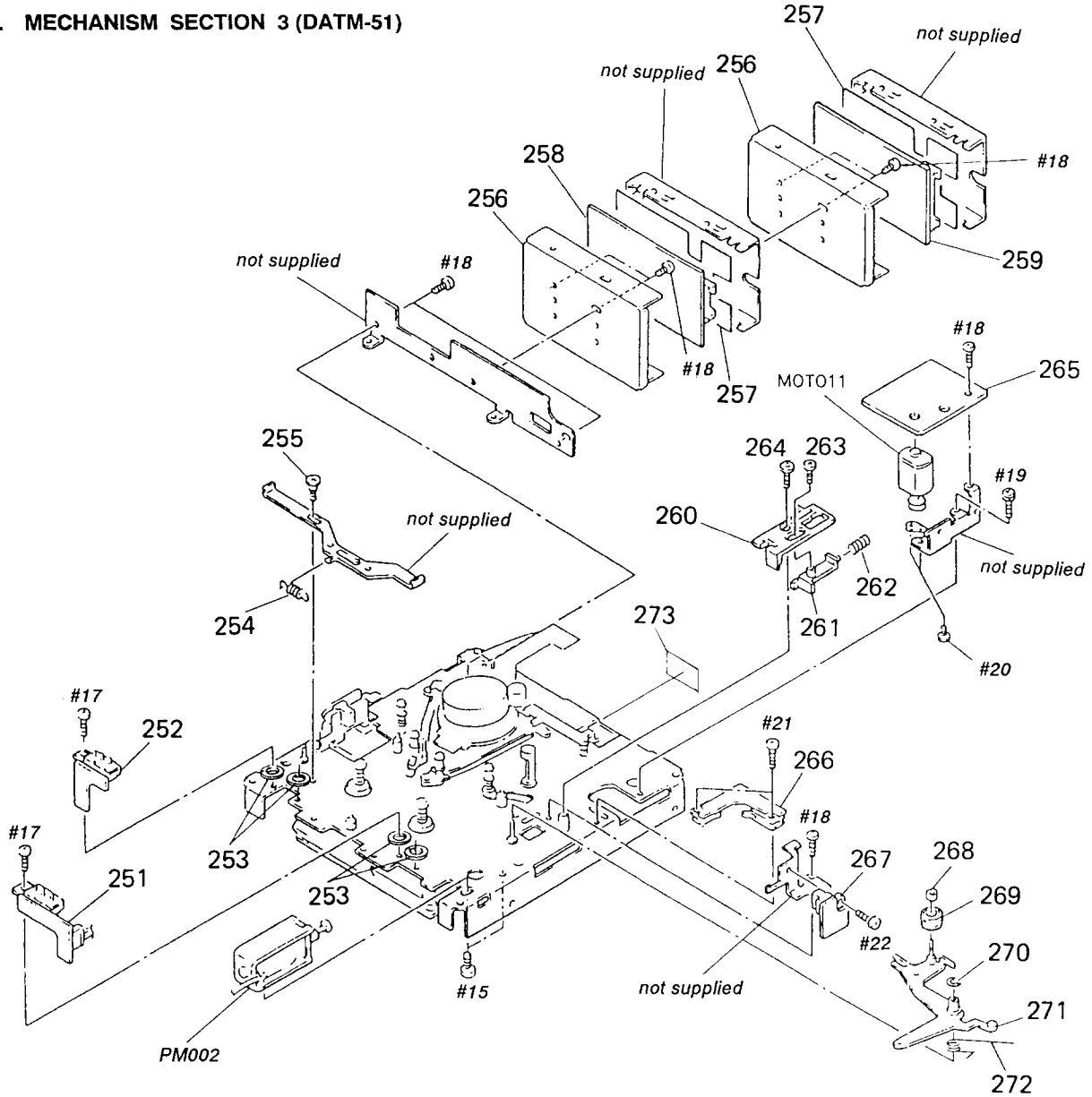
5-4. MECHANISM SECTION 1



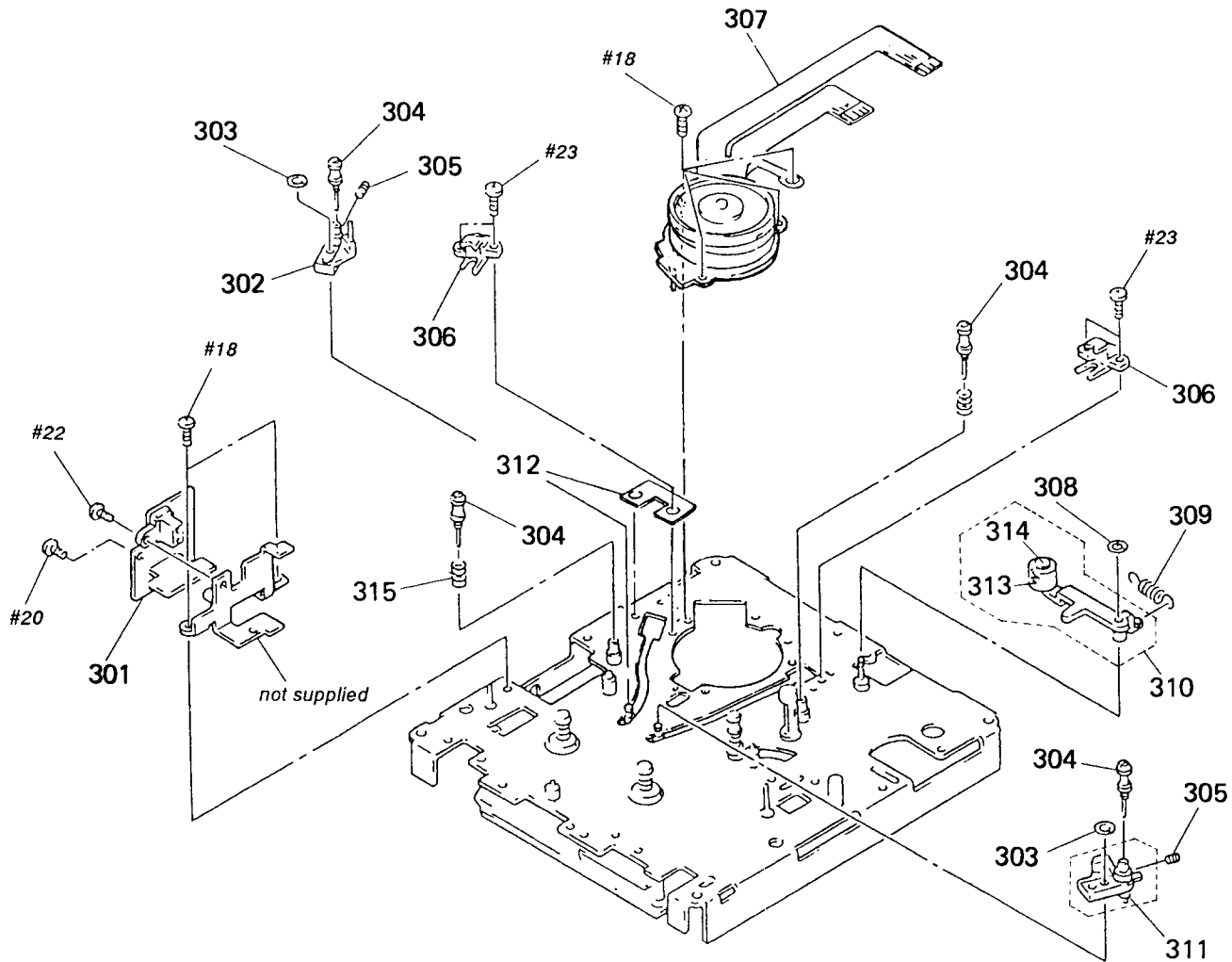
5-5. MECHANISM SECTION 2



5-6. MECHANISM SECTION 3 (DATM-51)



5-7. MECHANISM SECTION 4 (DATM-51)



5-8. MECHANISM SECTION 5 (DATM-51)

