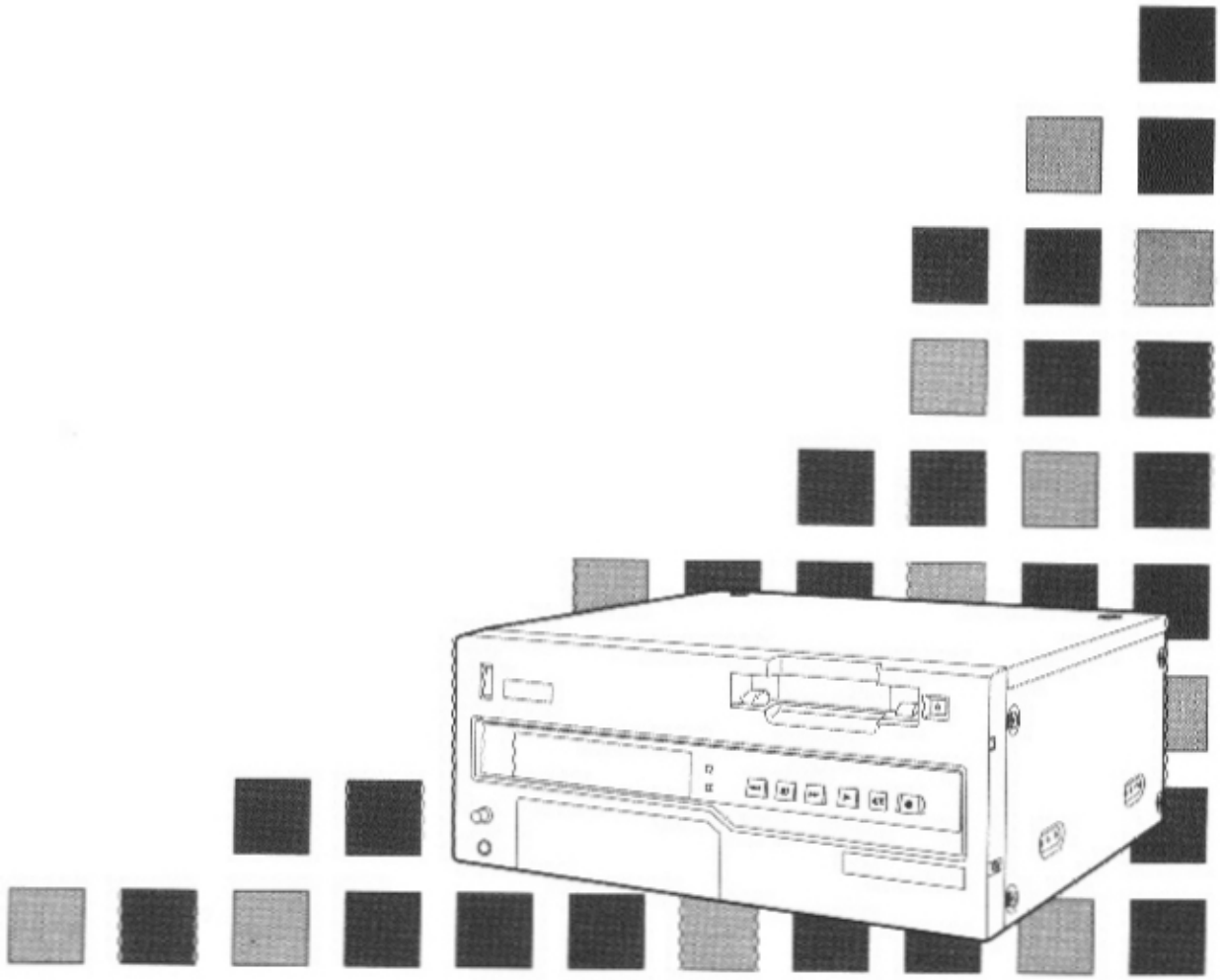
Panasonic

DV/CPRO
DIGITAL VIDEO CASSETTE

Digital Video Cassette Recorder

AJ-D780P

Operating Instructions



IMPORTANT

"Unauthorized recording of copyrighted television programs, video tapes and other materials may infringe the right of copyright owners and be contrary to copyright laws."

CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

CAUTION:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

WARNING:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

CAUTION:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, REFER MOUNTING OF THE OPTIONAL INTERFACE BOARD TO AUTHORIZED SERVICE PERSONNEL.

FCC Note:
This device complies with Part 15 of the FCC Rules. To assure continued compliance follow the attached installation instructions and do not make any unauthorized modifications.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

[ ] is the safety information.

- Do not insert fingers or any objects into the video casette holder.
- Avoid operating or leaving the unit near strong magnetic fields. Be especially careful of large audio speakers.
- Avoid operating or storing the unit in an excessively hot, cold, or damp environment as this may result in damage both to the recorder and to the tape.
- Do not spray any cleaner or wax directly on the unit.
- If the unit is not going to be used for a length of time, protect it from dirt and dust.
- Do not leave a cassette in the recorder when not in use.
- Do not block the ventilation slots of the unit.
- Use this unit horizontally and do not place anything on the top panel.
- Cassette tape can be used only for one-side, one direction recording. Two-way or two-track recordings cannot be made.
- Cassette tape can be used for either Color or Black & White recording.
- Do not attempt to disassemble the recorder. There are no user serviceable parts inside.
- If any liquid spills inside the recorder, have the recorder examined for possible damage.
- Refer any needed servicing to authorized service personnel.

Contents

Before operating this unit, check that all of its accessories are present and accounted for.

Power cord....1 pc

Option
- AJ-MA75P Rack mounting adaptor

This digital VTR comes with functions for playing back DVCPRO25 format tapes at 4 times normal speed and for transferring compressed DVCPRO25 data in its compressed form also at 4 times normal speed using an SDTI interface. It can also record 4 times normal speed digital compressed data which has been input from the SDTI interface at 4 times the normal speed.

FEATURES

Compact size and light weight

This digital 4× normal speed VTR has a 4U size: these are dimensions which enable it to be easily mounted in a 19-inch rack using the rack-mounting adaptors (option, AJ-MA75P).

DVCPRO cassette tapes used

The VTR uses either DVCPRO M size cassette tapes or L size cassette tapes. The tapes have a 1/4-inch compact design.

<Note>

Tapes other than DVCPRO format tapes (such as consumer-use DV cassette tapes) cannot be used.

SDTI (serial data transport interface)

The VTR comes with a compressed serial digital interface complying with the SMPTE 305M SDTI standard as a standard accessory. It enables DVCPRO compressed data to be transferred in its compressed form at 4 times the normal speed.

This makes it possible to reduce to one-fourth the time taken to transfer data to a server or other non-linear editor with no deterioration in picture or sound quality, and thereby to improve the efficiency of editing work by a significant margin.

Playback and recording at 4× normal speed

This VTR can play back DVCPRO25 format tapes at 4 times normal speed and also record onto tapes at 4 times normal speed. Storing data edited by a non-linear editor again on tape can also be completed four times more quickly than in the past. If two VTRs are connected, tapes can be digitally dubbed at 4 times normal speed free from any deterioration in quality.

CUE signal dubbing

When the CUE OUT connector of the player is connected to the CUE IN connector of the recorder, 4 times normal speed dubbing of the cue signals is possible.

<Note>

The CUE dubbing might lead to a deterioration in sound quality since the analog signals are transferred at 4 times normal speed.

External control functions

The deck can be controlled by RS-422A and RS-232C commands.

Monitoring functions

The VTR comes with a VIDEO MONITOR OUT (analog composite) connector and AUDIO MONITOR OUT (analog audio) connector. When data is transmitted at 4 times normal speed, both video and audio information equivalent to 1 frame is selected from 4 frames and output to the VIDEO MONITOR OUT connector. The output of each head is monitored at all times, and any trouble arising in the output is indicated on the error condition LED.

FEATURES

(continued)

1× normal speed monitoring

It is possible to simulate 1× normal speed playback by combining the information of all the heads.

<Note>

Since 1× normal speed playback is only simulated, no guarantees can be made for the quality of the picture and sound.

Time codes

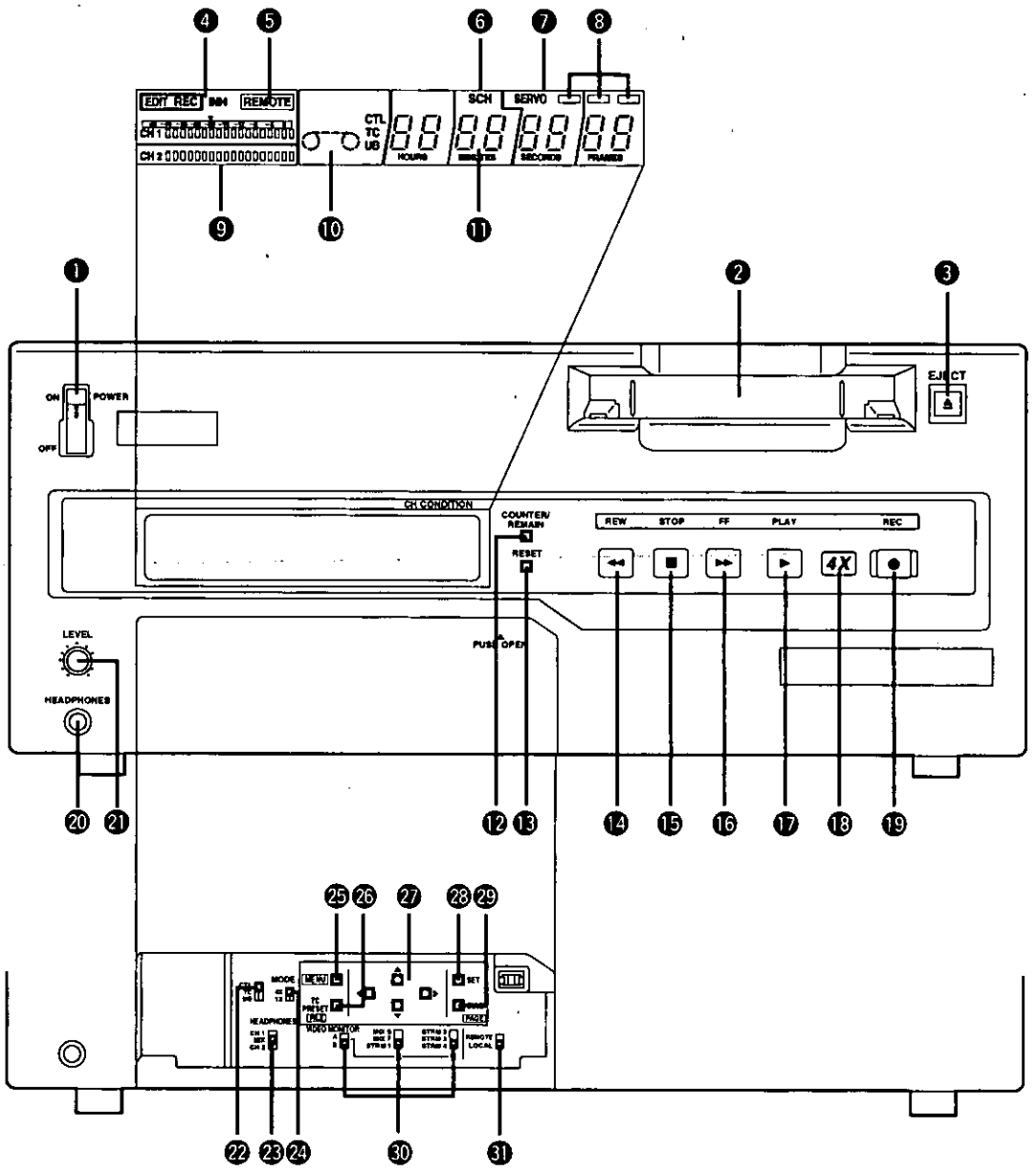
This VTR comes with a built-in time code generator/time code reader (TCG/TCR), and time codes can be preset even for 4× normal speed recording.

Menu-driven set-up

The set-up settings to be performed prior to operating the VTR are implemented while viewing the unit's counter display area or set-up menus on the TV monitor.

Front panel

Counter Display Section



❶ POWER switch
When the ON side is pressed, the power is switched on, and the counter display lights up.

❷ Cassette loading slot
This is where the M or L size cassette tapes are loaded.
<Note>
Tapes other than DVCPRO format tapes (such as consumer-use DV cassette tapes) cannot be used.

❸ EJECT button
When this is pressed, the tape is unloaded and several seconds later the cassette is automatically ejected. When the counter display indicates "CTL", the display is reset.

❹ REC/REC INH lamps
REC: This lights during recording.
REC INH: This lights when the accidental erasure prevention mode has been set for the cassette. In this state, recording is not possbile.

❺ REMOTE lamp
This lights when the REMOTE/LOCAL switch has been set to the REMOTE position.

❻ SCH lamp
This lights when the SCH of the reference video signal is within a specific range.

❼ SERVO lamp
This lights when the drum servo and capstan servo have locked.

❽ Channel condition lamps
One of these lamps lights in accordance with the error rate status. (Green→Blue→Red)
Green: This lights when the error rates for the video and audio playback signals are both acceptable.
Blue: This lights when the error rate for the video or audio playback signals has deteriorated.
The playback picture will remain normal even when this lamp lights.
Red: This lights when the video or audio signals are subject to concealment or interpolation.

❾ Level meters
These indicate the PCM audio signal CH1/CH2*.
The audio signal indicates the input signal levels during recording and EE selection, and the output signal levels during playback.
* The CUE signal level is displayed in accordance with the setup menu No. 702 (MONI CH SEL) and 703 (MONI OUT SEL) statuses.

❿ Cassette insertion display lamp
This lights when a cassette has been inserted into the unit.

⓫ Counter display
This displays the TC and CTL count values, on-screen information and other messages.

⑫ COUNTER/REMAIN button
This switches between the tape counter tape time indicator and the remaining tape indicator. [r ***] is displayed in the case of the remaining tape indicator. After the cassette tape is inserted, [r ---] (--- flashes) is displayed on the counter section until remaining tape is calculated, and [r EJ] (EJ flashes) when ejecting the tape.

⑬ RESET button
When this is pressed during CTL mode, the counter returns to the 00:00:00:00 display.
During menu setup, initial setting values are restored when the RESET button is pressed.

⑭ REW button*1)
The tape is rewound when this is pressed.
The unit goes into shuttle (SHTL) mode at approx. –10× normal tape speed when this button is pressed together with the PLAY button.

⑮ STOP button
When this is pressed, the tape stops traveling, and if the setup menu No. 105 (STOP EE SEL) is set to TAPE, still pictures can be monitored.
The drum continues to rotate even in the stop mode, and the tape remains in close contact with the drum.
If the stop mode continues for more than a certain period of time, the unit automatically switches to the standby OFF mode in order to protect the tape.
The stop mode is established immediately after a cassette has been inserted into the unit.

⑯ FF button*1)
The tape is fast forwarded when this is pressed.
The unit goes into shuttle (SHTL) mode at approx. 10× normal tape speed when this button is pressed together with the PLAY button.

⑰ PLAY button
Playback commences when this button is pressed.
Recording commences when the button is pressed together with the REC button.

⑱ 4× lamp
This lights during 4× speed playback or 4× speed recording.

⑲ REC button
Recording commences when this button is pressed together with the PLAY button.
When it is pressed during playback, search, fast forward or rewind, EE mode images and audio signals can be monitored for as long as it is kept depressed.
When it is pressed in the stop mode, EE mode images and sound can be monitored.
When the STOP button is pressed, the original picture and sound are restored.

⑳ Headphones jack
The sound being recorded or played back can be monitored on stereo headphones when they are connected to this jack.

㉑ Volume control
This is used to adjust the headphones volume.

㉒ CTL/TC/UB switch
Use this switch when selecting the counter display.
CTL: Tape timer (control signal) is displayed.
TC: Time code is displayed.
UB: User bit is displayed.

㉓ HEADPHONES switch
This is used to select the audio signals output to the headphones.

*1) The FF/REW speed can be selected on the setup menu No. 101 (FF. REW MAX), and it is set to the same speed.

㉔ 4×/1× switch

This is used to select 4× or 1× speed monitoring during playback.

4×: Set to this position for playback at 4× normal speed.

1×: Set to this position for playback at the normal (1×) speed.

<Notes>

- Since 1× playback is provided for monitoring purposes only, no guarantees can be made for the quality of the picture and sound at the 1× speed.
- Recording can be performed only at 4× normal speed.

㉕ MENU button

When this is pressed, the setup menu appears on the TV monitor using VIDEO MONITOR OUT 3 connector, and the setup menu No. appears on the display.

When it is pressed again, the setup mode is exited and the original operating mode is restored.

㉖ TC PRESET (FILE) button

When this is pressed, the time code setting mode is established.

User file can be selected when the cursor buttons (◀, ▶) are used during the setup menu mode. (For details, see setup menu items on page 21.)

<Note>

The time code cannot be preset when "SDTI" has been selected as the set-up menu No. 500 (TC MODE) setting.

㉗ Cursor buttons (◀, ▶, ▲, ▼)

These are used when setting time codes and settings at menu setup.

◀, ▶: These change the flashing digit in the time code indicators.
Each time they are pressed, the flashing indicator moves incrementally to the left or right.
◀ increments to the left; ▶ increments to the right.

▲, ▼: These change the flashing digit in the time code indicators.
Each time they are pressed, the indicated value increments and decrements.
▼ decrements the value; ▲ increments the value.

The flashing digit changes continuously when the button is continously pressed.

For details about operation during setup menu mode, see setup menu items (page 20).

㉘ SET button

When this is pressed, the data which has been set on the setup menu is entered. After data entry, the setup mode is exited and the original operating mode is restored.

㉙ DIAG button

When this is pressed, VTR information is displayed. When it is pressed again, the original display is restored.

There are two types of VTR information: "HOURS METER" information and "WARNING" information. Swithcing between these types is enabled by pressing the cursor buttons (◀, ▶).

Indicated on the "HOUR METER" screen are the power-on time, drum rotation time, tape travel time, loading count, etc.

Indicated on the "WARNING" screen are the warnings.

㉚ VIDEO MONITOR (selection of 6 types)

Group A or group B is selected using the A/B switch.

Group A

MIXS: One of the 4 streams is selected in compressed block increments and monitored.

MIXF: One of the 4 streams is selected in video frame increments and monitored.

STRM1: Only stream 1 among the four streams is monitored.

Group B

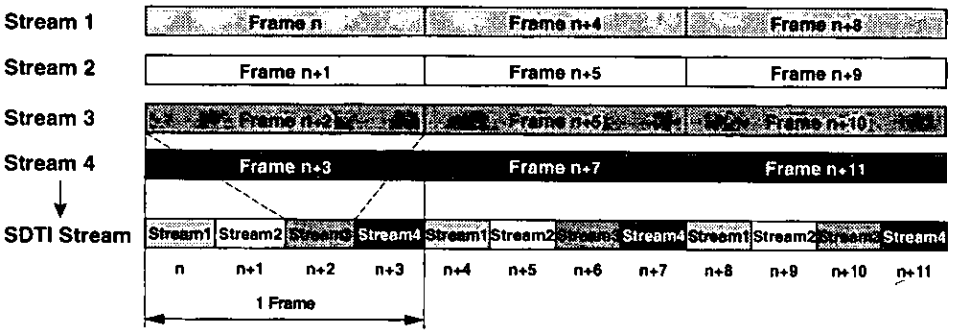
STRM2: Only stream 2 among the four streams is monitored.

STRM3: Only stream 3 among the four streams is monitored.

STRM4: Only stream 4 among the four streams is monitored.

(continued on next page.)

The 4X speed data compressed in accordance with the DVCPRO compression format consists of four streams which are transferred on one SDTI stream.



When "MIX S" has been selected as the VIDEO MONITOR type

- The streams are switched in increments smaller than a frame.
- What appears on the TV monitor screen is shown in Fig. 1 (for the NTSC system) and Fig. 2 (for the PAL system).
- This mode is suitable for checking all the streams but since the streams are switched within a frame, the switching position appears in the form of a mosaic pattern if the image displayed contains any dynamic motions.

Fig. 1 NTSC system display

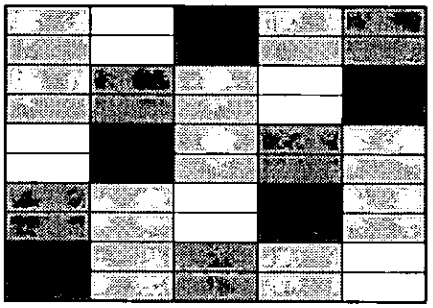
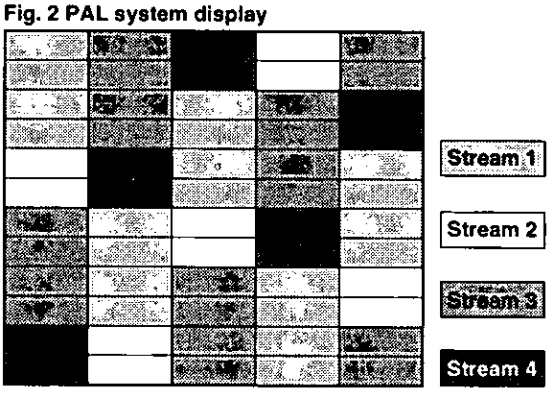
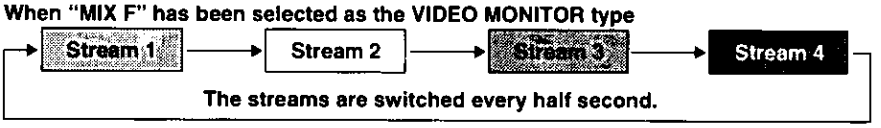


Fig. 2 PAL system display



When "MIX F" has been selected as the VIDEO MONITOR type



When "STREAM 1" has been selected as the VIDEO MONITOR type

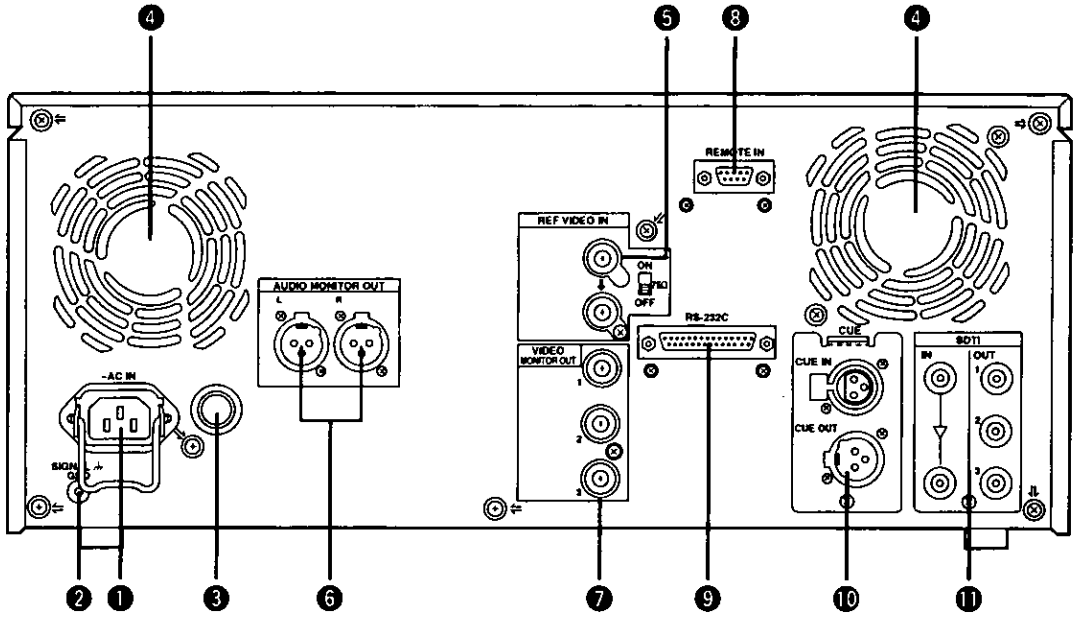
㉛ REMOTE/LOCAL switch

This switch is set when the unit is to be controlled from an external source using the REMOTE connector or RS-232C connector.

REMOTE: Set to this position when controlling the unit by a device connected using the 9-pin REMOTE connector or RS-232C connector.

LOCAL: Set to this position when controlling the unit using the controls on its own operation panel.

Connector area



<Connector area>

❶ AC IN connector
This is for connecting the unit to the power outlet using the power cord provided.

❷ SIGNAL GND terminal
This terminal is connected to the signa unit which is connected to the unit in order to reduce noise. It is not connected to ground for safety purposes.

❸ Fuse holder
This contains a fuse.

❹ Fan motor
This is for cooling the unit.
The error code is displayed on the counter section when trouble has caused the fan motor to stop. If the unit is still operated in the warning status, the temperature inside the deck will rise, and when it exceeds the safety temperature, all the unit's operations will be shut down.

❺ REF VIDEO IN connectors and 75Ω termination switch
These are the input connectors for the reference video signals. When the termination is required, set the switch to ON.

❻ AUDIO MONITOR OUT connectors
The analog audio signals are output from these connectors.

❼ VIDEO MONITOR OUT connectors
The analog composite video signals are output from these connectors.
The video signal with signals superimposed on it can be output from the VIDEO MONITOR OUT3 connector.
The superimpose function can be set ON or OFF on the setup menu No. 006 (SUPER).

❽ REMOTE connector
The unit can be controlled from an external source by connecting an external controller.

❾ RS-232C connector

❿ CUE connector

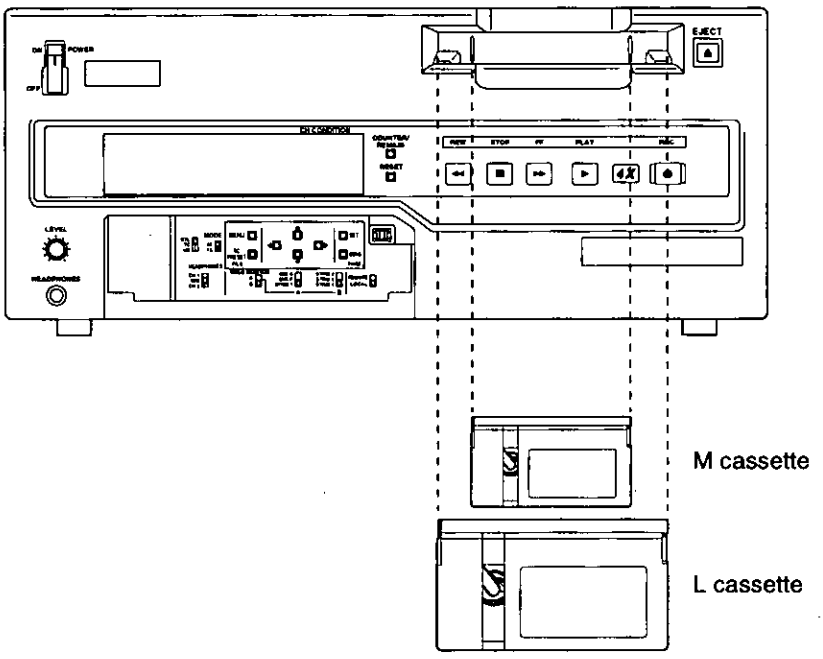
⓫ SERIAL DATA TRANSPORT INTERFACE (SDTI)
This is the compressed serial digital data signal input/output connector which complies with the SMPTE 305M standard.

Tapes

Two types of tapes can be used with the unit.

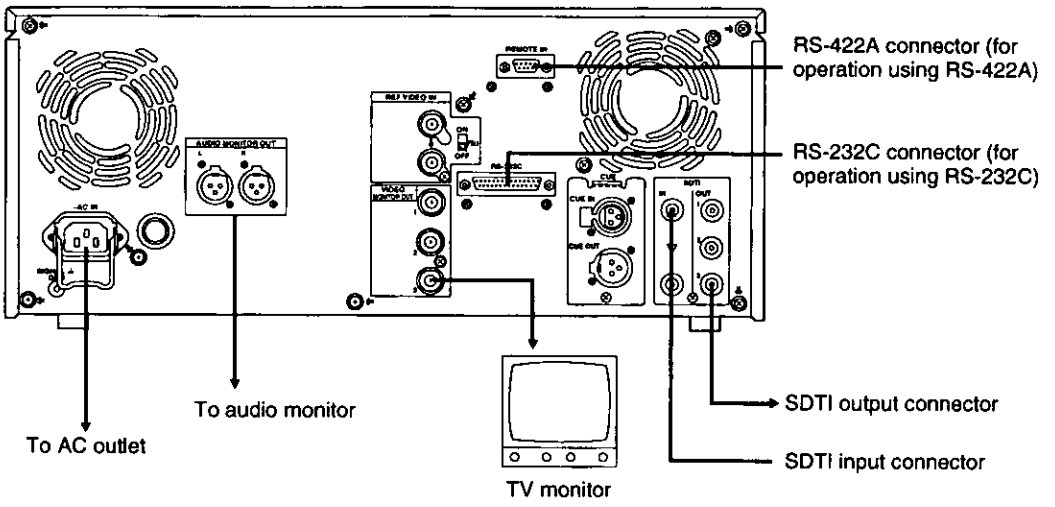
Type	Description
M cassette	Recording/playback tape with a maximum capacity of 66 minutes. (AJ-P12MP, AJ-P24MP, AJ-P33MP, AJ-P46MP, AJ-P66MP)
L cassette	Recording/playback tape with a maximum capacity of 126 minutes. (AJ-P34LP, AJ-P66LP, AJ-P94LP, AJ-P126LP)

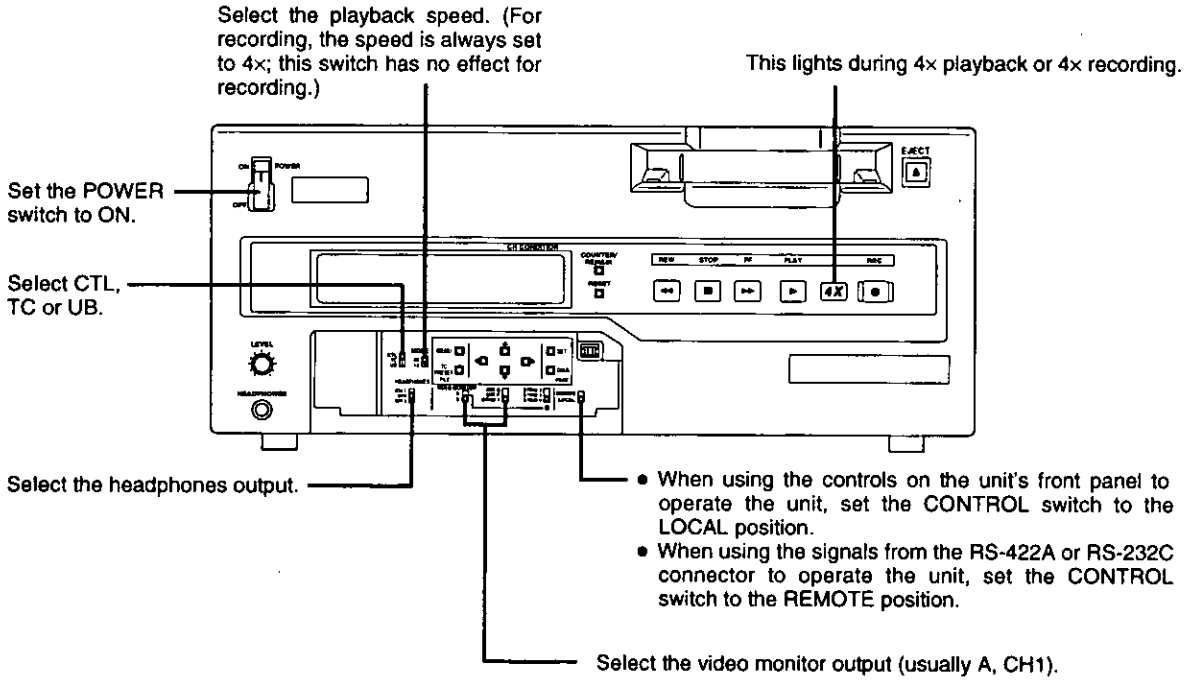
Align the cassette with the center of the insertion slot and push it in gently. The cassette tape is loaded automatically.



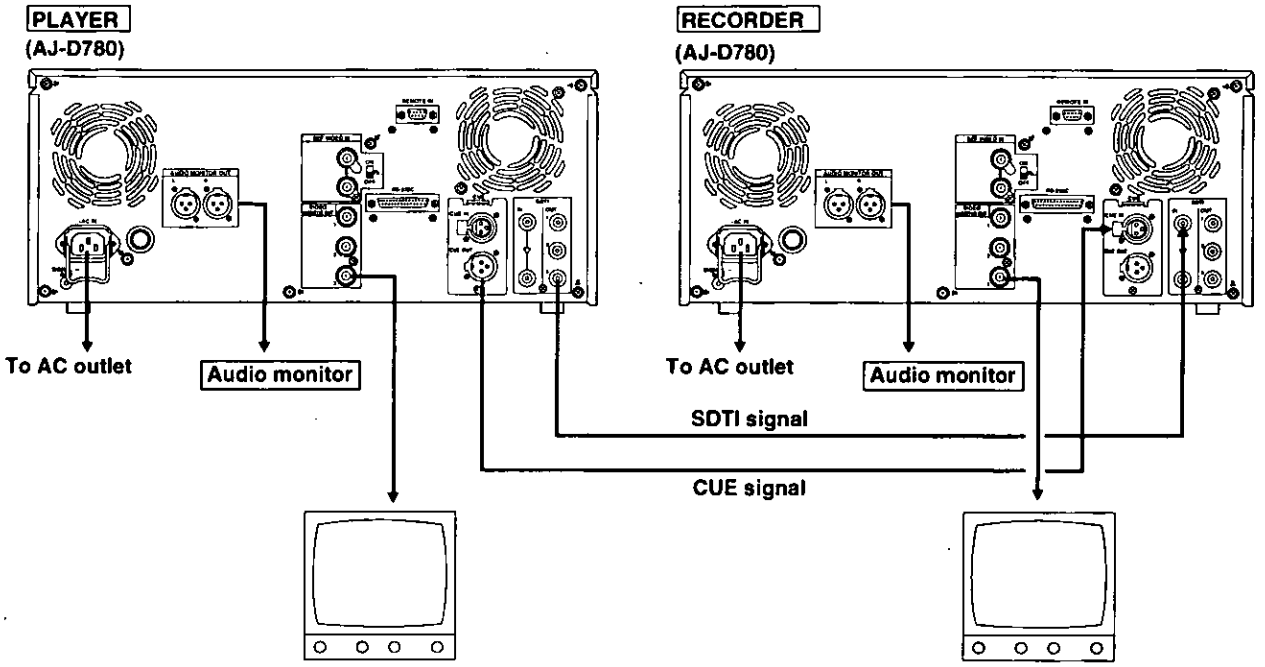
<Note>

Tapes other than DVCPRO 25 format tapes (such as consumer-use DV cassette tapes) cannot be used


RS-422A connector (for operation using RS-422A)
RS-232C connector (for operation using RS-232C)
To audio monitor
To AC outlet
TV monitor
SDTI output connector
SDTI input connector


Select the playback speed. (For recording, the speed is always set to 4×; this switch has no effect for recording.)
This lights during 4× playback or 4× recording.
Set the POWER switch to ON.
Select CTL, TC or UB.
Select the headphones output.
• When using the controls on the unit's front panel to operate the unit, set the CONTROL switch to the LOCAL position.
• When using the signals from the RS-422A or RS-232C connector to operate the unit, set the CONTROL switch to the REMOTE position.
Select the video monitor output (usually A, CH1).

High-speed dubbing with 2 units (deck to deck)



<Notes>

- The sound is not monitored during 1× (normal speed) transfer. (Recorder side only.)
- When making a perfectly identical copy of a tape on which the time code is identical to the original time code as well, select "SDTI" for the recorder VTR's setup menu No. 500 (TC MODE) setting.
- The CUE signal dubbing at 4 times normal speed might lead a deterioration in sound quality since the analog signals are recorded and played back.

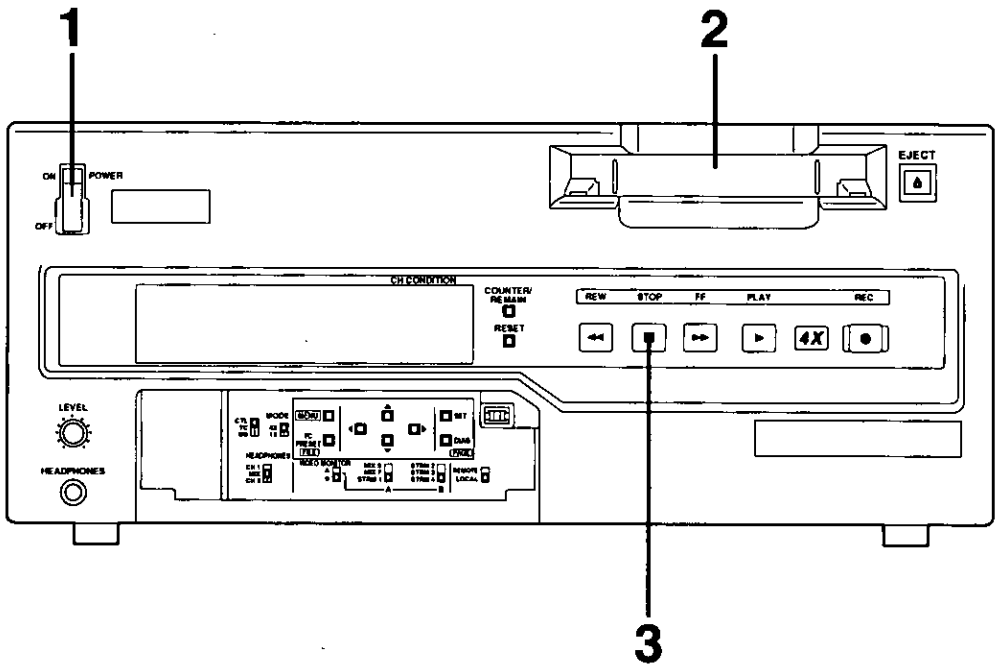
Switching on the power/inserting the cassette

Before starting to operate the unit, check whether the equipment has been connected properly.

1 Turn on the power.
Check that the error indicator is not displayed on the counter.

2 Insert the cassette tape.
Insert the tape at its proper position without force. (See page 13.)

3 Check that the STOP lamp is on.
When the tape is inserted, the drum rotates automatically, the tape is loaded and the unit goes into the stop mode.



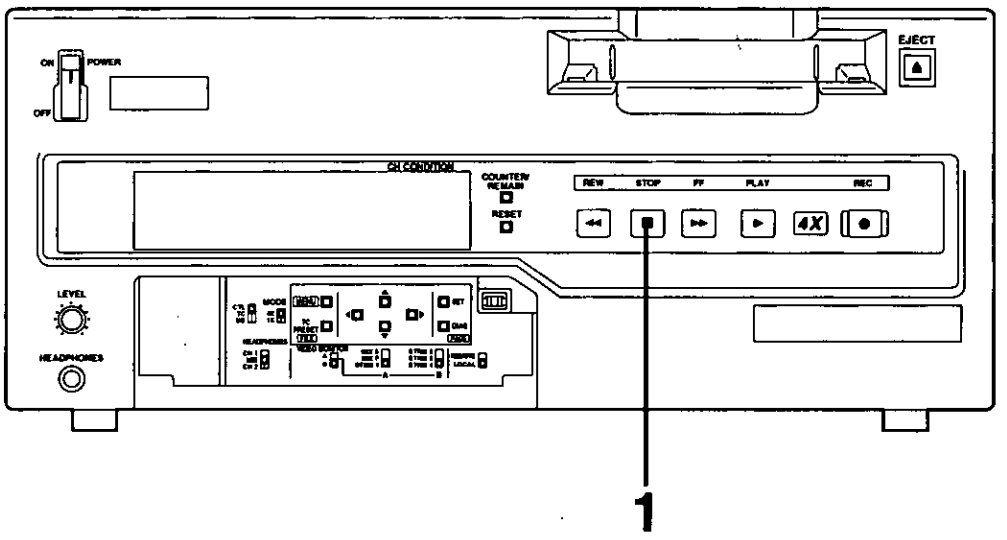
STOP mode

1 When the STOP button is pressed, the unit goes into the stop mode. The STOP lamp lights and the tape stops traveling.

- In order to protect the tape, the unit goes into the standby OFF mode after the time set by setup menu No. 400 (STILL TIMER) has elapsed. When the STOP, REW, FF or PLAY button is pressed, the unit will go into the appropriate mode.

Still Timer Setting

Page 28 indicates the settings for menu item 400-Still Timer set. Still Timer settings 4 and below will best protect the tape.



The speed is always set to 4× for recording.

1. Set the accidental erasure prevention tab on the cassette tape to the "recording" position and insert the tape.
2. Press the STOP button to place the unit in the stop mode.
3. Check that the REC INHIBIT lamp is off.
4. Connect the SDTI signals to be recorded.
   <Notes>
   - Recording can be performed properly only when 4× speed signal for DVCPRO 25 format is input.
   - When the signal other than 4× speed is input, only erase is functioned even though starting recording.
   - When the input is changed to other input than 4× speed signal of DVCPRO 25 format during recording, VTR will stop the recording.
5. Press the PLAY button while holding down the REC button. The REC and PLAY lamps light, and recording commences.
6. To end the recording, press the STOP button.
   Recording is ended, and the unit goes into the stop mode.

Playback

1. Insert the cassette tape, and place the unit in the stop mode.
2. Select the tape speed for monitoring at the 4× speed or 1× speed.
3. Press the PLAY button.
   Regular playback is now commenced.
4. To end playback, press the STOP button.
   The VTR now goes into the stop mode.

<Notes>

- Check that the SERVO lamp is lighted during 4× speed playback. The playback images will be disturbed if it is off or flashing.
- Since the 1× speed is for monitoring purposes only, no guarantees can be made for the quality of the picture and sound at this speed. The SERVO lamp does not light during 1× playback.

The unit's major settings are performed by making selections on menus.
The setting menus appear on the TV monitor when the TV monitor and VIDEO MONITOR OUT 3 connector in the unit's connector area are hooked up.

Changing the settings

1 Press the MENU button.
The setup menu appears on the TV monitor and setup menu No. appears on the counter display. (If the setup has already been performed, the screen showing the changes made last will appear.)

2 Press the cursor buttons (▲, ▼) and select the item to be set.
The cursor (*) on the menu screen moves and the item No. on the display flashes.
- When the ▼ button is pressed, the item No. is incremented for 001 → 002 → 003 → 004 → and so on; when the ▲ button is pressed, the item No. is decremented.

3 Press the cursor buttons (◀, ▶) at the position where the change is to be made.
The menu screen and display setting No. now flashes.
When the ▶ button is pressed, the setting No. is incremented; when the ◀ button is pressed , it is decremented.

4 Repeat steps 2 and 3 to change other items.

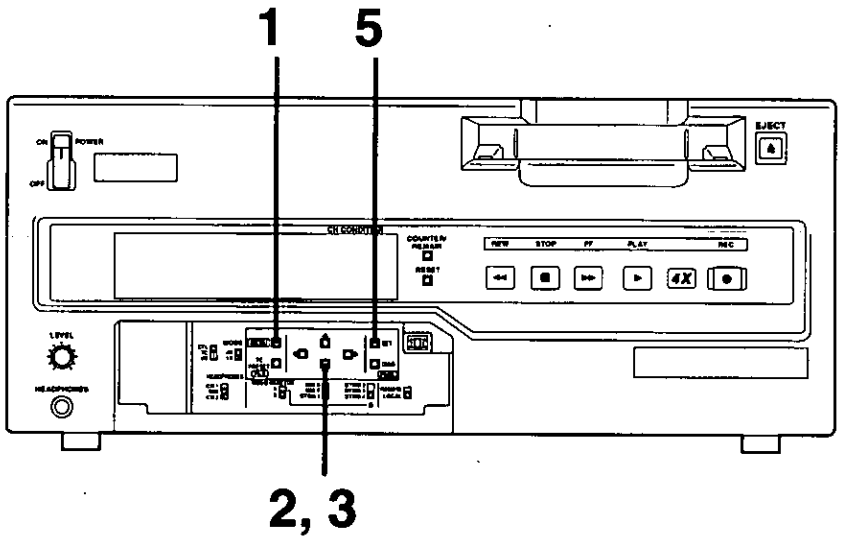
5 Press the SET button.
The changes are now stored in the memory.
- To return the items to the settings established before the changes were made, press the MENU button without pressing the SET button.

To return the setup settings to the factory (initial) settings, press the RESET button while the menu is displayed.

The following message is displayed.

SETUP-MENU INIT SET YES<PLAY>/NO<STOP>

When the PLAY button is pressed, the factory settings are restored.



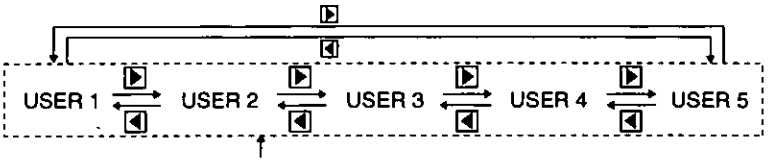
<Note>
- When the RESET button is pressed to return to the factory settings, the factory settings are restored only for the user file currently being used and other user files are not affected.

This unit can store up to 5 user files (user 1 to user 5) containing different menu settings, and these files can be selected and used.

Changing the file

1 Press the MENU button.

2 Hold down the FILE button and press the cursor button ▶ to switch to the next user file. Hold down the FILE button and press the cursor button ◀ to switch to the previous user file.



USER FILE
Each user file contains the following items.
- BASIC
- OPERATION
- INTERFACE
- TAPE PROTECT
- TIME CODE
- VIDEO
- AUDIO
- MENU

3 Repeat the operation in step 2 to select the user file to be used and press the SET button. The user file is changed and stored in the memory.

The lock mode can be set to protect the user file (USER2 – USER5) settings. The settings can no longer be changed once this mode is set.
The lock mode can be set and released by selecting the setup menu No. A03 (MENU LOCK) setting.

Setting and releasing the lock mode

1 Press the MENU button.

2 While pressing the FILE button, press the ◀ or ▶ button to select the user file for which the lock mode is to be set or released.

3 Press the ▲ or ▼ button to move the cursor (*) on the menu screen to No. A03 (MENU LOCK).

4 Press the ◀ or ▶ button to set the lock mode to "set" or "release."
Lock set: Select 0001 (ON) as the setting.
Lock release: Select 0000 (OFF) as the setting.

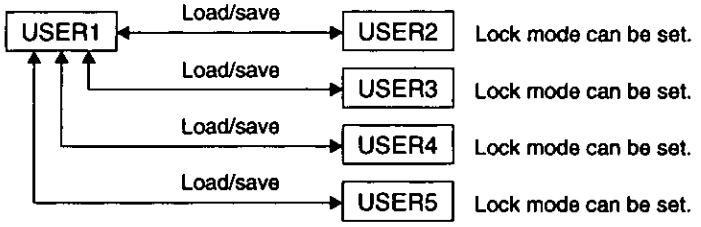
When the lock has been set, "LOCKED" flashes on the menu screen. The counter display area stops flashing and lights up.

```
SETUP-MENU  LOCKED
<USER2>     NO.000 - 0005
*000 P-ROLL TIME       5s
 001 CHARA H-POS        5
 002 CHARA V-POS       23
 003 DISPLAY SEL    T&STA
 004 LOCAL ENA      ST&EJ
 005 TAPE TIMER      +12h
 006 SUPER             ON
 007 CHARA TYPE     WHITE
 100 SHTL MAX         X32
```

5 Press the SET button. The setting is now stored in memory.

<Notes>
- The lock mode cannot be set for the USER1 file.
- The factory settings cannot be restored for user files once the lock mode has been set for them even if the RESET button is pressed.

The contents of files USER2 to USER5 can be copied (loaded) into USER1. The contents of USER1 can also be copied (saved) into files USER2 to USER5.



Loading a user file

1. Press the MENU button.
2. While pressing the FILE button, press the ◀ or ▶ button to select USER1.
3. Press the ▲ or ▼ button to move the cursor (*) on the menu screen to No. A00 (LOAD).

```
SETUP-MENU  MENU
<USER1>     NO.A00 - 0000
 703 MONI OUT SEL     PCM
*A00 LOAD            USER2
 A01 SAVE            USER2
 A02 P.ON LOAD        OFF
 END
```

4. Press the ◀ or ▶ button to select the user file whose settings are to be loaded into USER1.
5. Press the SET button. The following messages appear on the menu screen and counter display area.

Menu screen

```
SETUP-MENU LOAD

 USER2 → USER1 OK?
  YES<PLAY>/NO<STOP>
```

Counter display area

```
L U2 -U1
```

The number of the user file selected in step 4 is indicated at the shaded area.

6. Press the PLAY button. The settings in the user file selected in step 4 are loaded, and the USER1 menu is displayed. If the STOP button is pressed at this point, the settings are not changed, and the USER1 menu is displayed.
7. Press the ▲ or ▼ button to move the cursor (*) on the menu screen to an item other than No. A00 (LOAD) or No. A01 (SAVE).
8. Press the SET button. The USER1 settings are now stored in the memory.
   If the USER1 settings are not to be stored, do not press the SET button but the MENU button instead.

Saving a user file

1. Press the MENU button.
2. While pressing the FILE button, press the ◀ or ▶ button to select USER1.
3. Press the ▲ or ▼ button to move the cursor (*) on the menu screen to No. A01 (SAVE).

```
SETUP-MENU  MENU
<USER1>     NO.A00 - 0000
 703 MONI OUT SEL     PCM
 A00 LOAD           USER2
*A01 SAVE           USER2
 A02 P.ON LOAD        OFF
 END
```

4. Press the ◀ or ▶ button to select the user file in which the USER1 settings are to be saved. The user file for which the lock mode has been set is not displayed at this time. When the lock mode has been set for all the user files, "LOCKED" appears, and the files cannot be saved.
5. Press the SET button. The following messages appear on the menu screen and counter display area.

Menu screen

```
SETUP-MENU SAVE

 USER1 → USER2 OK?
  YES<PLAY>/NO<STOP>
```

Counter display area

```
S U1 -U2
```

The number of the user file selected in step 4 is indicated at the shaded area.

6. Press the PLAY button. The USER1 settings are saved in the user file selected in step 4. If the STOP button is pressed at this point, the settings are not changed, and the USER1 menu is displayed.
7. Press the ▲ or ▼ button to move the cursor (*) on the menu screen to an item other than No. A00 (LOAD) or No. A01 (SAVE).
8. Press the SET button. The USER1 settings are now stored in the memory.
   If the USER1 settings are not to be stored, do not press the SET button but the MENU button instead.

Automatic loading of user file when power is switched on

If the user file to be loaded is selected in advance using setup menu No. A02 (P.ON LOAD), it is automatically loaded into USER1 when the power is switched on.

User menu

<BASIC>

Item		Setting		Description
No.	Superimposed display	No.	Superimposed display	
000	P-ROLL TIME	0000 ⋮ 0005 ⋮ 0015	0s ⋮ 5s ⋮ 15s	This sets the preroll time. This time can be set in 1-second increments from 0 to 15 seconds.
001	CHARA H-POS	0000 ⋮ 0005 ⋮ 0012	0 ⋮ 5 ⋮ 12	This sets the character position in the horizontal direction for the time code or other superimposed display which is output from the VIDEO MONITOR OUT 3 connector. <Notes> 1: When this item has been set, the characters are output to the VIDEO MONITOR OUT 3 connector in the DISPLAY SEL mode even if SUPER OFF has been set. However, when the menu setting mode is exited, the display accords with the SUPER OFF or ON setting. The character type is output to OUT 3 in the menu set mode. 2: When the characters extend beyond the screen due to the DISPLAY SEL mode, the setting changes and the characters are automatically displayed at a position where they no longer extend beyond the screen.
002	CHARA V-POS	0000 ⋮ 0018 ⋮ 0022	0 ⋮ 18 ⋮ 22	This sets the character position in the vertical direction for the time code or other superimposed display which is output from the VIDEO MONITOR OUT 3 connector. <Notes> 1: When this item has been set, the characters are output to the VIDEO MONITOR OUT 3 connector in the DISPLAY SEL mode even if SUPER OFF has been set. However, when the menu setting mode is exited, the display accords with the SUPER OFF or ON setting. The character type is output to OUT 3 in the menu set mode. 2: When the characters extend beyond the screen due to the DISPLAY SEL mode, the setting changes and the characters are automatically displayed at a position where they no longer extend beyond the screen.
003	DISPLAY SEL	0000 0001 0002	TIME T&STA T&S&W	This selects what is to be displayed for the VIDEO MONITOR OUT 3 connector time code or other superimposed displays. 0: Only the time is displayed. 1: The time and operation mode are displayed. 2: The time, operation mode and warning are displayed.
004	LOCAL ENA	0000 0001 0002	DIS ST&EJ ENA	This selects the switches which can be operated on the front panel when the REMOTE/LOCAL switch is set to REMOTE. 0: None of the switches or buttons can be operated. 1: Only the STOP and EJECT buttons can be operated. 2: All the switches or buttons can be operated.
005	TAPE TIMER	0000 0001	±12h 24h	This selects whether the time is to be displayed in the CTL display area on a 12- or 24-hour basis. 0: Time is displayed on a 12-hour basis. 1: Time is displayed on a 24-hour basis.
006	SUPER	0000 0001	OFF ON	This selects whether to display the time code or other superimposed characters for the signals of the VIDEO MONITOR OUT 3 connector. 0: No superimposed characters are displayed. 1: Superimposed characters are displayed.
007	CHARA TYPE	0000 0001	WHITE W/OUT	Select the display type for the superimposed characters, set-up menu, etc. of the VIDEO MONITOR OUT 3 connector. 0: Characters are displayed in white against a black background. 1: Characters are displayed in white with black borders.

The underlining denotes the factory setting.

USER menu

<OPERATION>

Item		Setting		Description
No.	Superimposed display	No.	Superimposed display	
100	SHTL MAX	0000 0001 0002	×16 ×32 ×60	This sets the maximum speed in the shuttle mode. 0: 16× speed 1: 32× speed 2: 60× speed
101	FF. REW MAX	0000 0001 0002	×32 ×60 ×100	This sets the maximum speed in the FF or REW mode. 0: 32× speed 1: 60× speed 2: 100× speed
102	REF ALARM	0000 0001	OFF ON	This selects whether an alarm is to be indicated when the REF VIDEO signal has not been connected. 0: No alarm is displayed. 1: An alarm is indicated by the flashing STOP lamp.
103	EJECT EE SEL	0000 0001	EE BLACK	This selects whether the video monitor output is to be set to the EE mode or the picture is to be blacked out when a cassette tape is ejected. 0: EE mode is set. 1: The picture is blacked out and the sound is muted.
104	F/R EE SEL	0000 0001	EE TAPE	This selects whether the video monitor output is to be set to the EE mode or playback mode during fast forwarding or rewinding. 0: EE mode is set. 1: The playback mode is set.
105	STOP EE SEL	0000 0001	EE TAPE	This selects whether the video monitor output is to be set to the EE mode or playback mode when the stop mode is established. 0: EE mode is set. 1: The playback mode is set. **<Note>** The setting for this item is also valid in the STANDBY-OFF mode. However, when TAPE is selected, the picture turns gray and the sound is muted.
106	AUTO REW	0000 0001	OFF ON	This selects whether the tape is to be automatically rewound to its start when its end has been detected. 0: The tape is not rewound. 1: The tape is rewound.
107	MEMORY STOP	0000 0001	OFF ON	This selects whether to stop the tape transport automatically when the counter value reaches "0" during fast forwarding or rewinding in the CTL mode. 0: The tape is not stopped. 1: The tape is stopped. **<Notes>** 1: The AUTO REW function takes precedence when both the AUTO REW and MEMORY STOP functions have been selected at the same time. 2: The CUE UP command takes precedence when the CUE UP command is issued from the 9P.(RS-232C) connector.
108	REC INHIBIT	0000 0001	OFF ON	This selects whether to enable or inhibit the recording on the cassette tape. 0: The recording on the cassette tape is enabled provided that the cassette's accidental erasure prevention mechanism has been set to the recording enable position. 1: The recording on the cassette tape is inhibit. The REC INHIBIT lamp on the front panel now lights.

The underlining denotes the factory setting.

USER menu

<INTERFACE>

Item		Setting		Description
No.	Superimposed display	No.	Superimposed display	
200	9P SEL	0000 0001	OFF ON	This selects whether the 9P connector functions are to be enabled or disabled when the REMOTE/LOCAL switch is set to REMOTE. 0: 9P connector functions are disabled. 1: 9P connector functions are enabled.
202	RS232C SEL	0000 0001	OFF ON	This selects whether the RS-232C connector functions are to be enabled or disabled when the REMOTE/LOCAL switch is set to REMOTE. 0: RS-232C connector functions are disabled. 1: RS-232C connector functions are enabled.
203	BAUD RATE	0000 0001 0002 0003 0004 0005	300 600 1200 2400 4800 9600	This sets the RS-232C baud rate.
204	DATA LENGTH	0000 0001	7 8	This sets the RS-232C data length (in bit units).
205	STOP BIT	0000 0001	1 2	This sets the RS-232C stop bit length (in bit units).
206	PARITY	0000 0001 0002	NON ODD EVEN	This sets none, even or odd for the RS-232C parity bit. 0: "None" is selected when the parity bit is not going to be used. 1: "Odd" is selected for the parity bit. 2: "Even" is selected for the parity bit.
207	RETURN ACK	0000 0001	OFF ON	This sets whether the ACK code is to be returned when a command has been received from RS-232C. 0: The ACK code is not returned. 1: The ACK code is returned.

The underlining denotes the factory setting.

USER menu

<TAPE PROTECT>

Item		Setting		Description
No.	Superimposed display	No.	Superimposed display	
400	STILL TIMER	0000	0.5s	This selects the time to be taken to establish the tape protection mode when the unit has been left standing in the stop mode or search still mode (JOG, VAR or SHTL). (Unit s: seconds, min: minutes)
		0001	5s	
		0002	10s	
		0003	20s	
		0004	30s	
		0005	40s	
		0006	50s	
		0007	1min	
		0008	2min	
401	SRC PROTECT	0000	STEP	This selects the operation to be performed in the tape protection mode when the search mode (JOG, VAR or SHTL) has been left standing in the STILL status. 0: STEP FWD 1: HALF LOADING **<Note>** When STEP FWD is selected, the unit is automatically transferred to the HALF LOADING mode when it has been left standing in the STILL status for a total of 30 minutes.
		0001	HALF	
402	DRUM STDBY	0000	OFF	This selects the drum operation in the STANDBY OFF mode. 0: The drum stops rotating. 1: The drum continues to rotate.
		0001	ON	
403	STOP PROTECT	0000	STEP	When the unit is left in STOP mode, this selects the operation to be performed in the tape protection mode. **<Note>** When STEP FWD setting is selected, the unit will be automatically transferred to the HALF LOADING mode once the total time during which the unit has been left in STOP mode reaches 30 minutes.
		0001	HALF	

The underlining denotes the factory setting.

<TIME CODE>

Item		Setting		Description
No.	Superimposed display	No.	Superimposed display	
500	TC MODE	0000	INT	This selects whether the time code generated by the built-in time code generator or the time code supplied from SDTI is to be used. 0: Time code of built-in generator is used. 1: Time code from SDTI is used.
		0001	SDTI	
501	DF MODE	0000	DF	This select the DF or NDF mode for CTL and TCG. 0: The drop frame mode is selected. 1: The non-drop frame mode is selected. **<Note>** This item is valid when the LOCAL mode is established or when "ENA" has been selected as the set-up menu No. 004 (LOCAL ENA) setting in the REMOTE mode.
		0001	NDF	
502	RUN MODE	0000	REC	This selects the time code generator run mode. 0: The generator runs only while recording is in progress. 1: The generator runs all the time.
		0001	FREE	

The underlining denotes the factory setting.

USER menu

<VIDEO>

Item		Setting		Description
No.	Superimposed display	No.	Superimposed display	
601	VOUT SETUP	0000	THRU	This selects the composite output signal. 0: The signal is output without setup. 1: The signal is output with 7.5% setup.
		0001	ADD	

The underlining denotes the factory setting.

<AUDIO>

Item		Setting		Description
No.	Superimposed display	No.	Superimposed display	
700	MONIL OUT LV	0000	4 dB	This selects the reference setting for the audio monitor output (Lch).
		0001	0 dB	
		0002	–20 dB	
701	MONIR OUT LV	0000	4 dB	This selects the reference setting for the audio monitor output (Rch).
		0001	0 dB	
		0002	–20 dB	
702	MONI CH SEL	0000	AUTO 1	This selects the audio monitor output. 0: PCM AUDIO is output in the –0.43× to +0.43× speed range and normal play mode only; in all other cases, CUE is output automatically. 1: PCM AUDIO is output in the PLAY mode only; in all other cases, CUE is output automatically.
		0001	AUTO 2	
703	MONI OUT SEL	0000	AUTO	This selects the audio monitor output of the playback system. 0: The signal selected by the set-up menu No. 702 (MONI CH SEL) setting is output. 1: PCM is output at all times. 2: CUE is output at all times. **<Note>** The SDTI input PCM AUDIO is output at all times for the EE system.
		0001	PCM	
		0002	CUE	

The underlining denotes the factory setting.

USER menu

<MENU>

Item		Setting		Description
No.	Superimposed display	No.	Superimposed display	
A00	LOAD	<u>0000</u>	<u>USER2</u>	This selects the user file to be loaded in USER1. 0: The USER2 settings are loaded. 1: The USER3 settings are loaded. 2: The USER4 settings are loaded. 3: The USER5 settings are loaded. **<Note>** The setting is stored in the memory by pressing the SET button after the setting has been loaded. The setting remains unchanged if the MENU button is pressed instead.
		0001	USER3	
		0002	USER4	
		0003	USER5	
A01	SAVE	<u>0000</u>	<u>USER2</u>	This selects the user file in which the USER1 settings are be saved. 0: The USER1 settings are saved in USER2. 1: The USER1 settings are saved in USER3. 2: The USER1 settings are saved in USER4. 3: The USER1 settings are saved in USER5. 4: "LOCKED" is displayed when all the user files have been set to the change prohibit status. **<Notes>** • A user file which has been set to the lock mode cannot be selected. • "LOCKED" is displayed when all the user files are set to the lock mode, and no settings can be saved.
		0001	USER3	
		0002	USER4	
		0003	USER5	
		0004	LOCKED	
A02	P.ON LOAD	<u>0000</u>	<u>OFF</u>	The settings of the selected user file are loaded into USER1 when the power is switched on, and operation is started using these settings. 0: Operation is started using the previously set user file. 1: The USER2 settings are loaded into USER1 and operation is started up. 2: The USER3 settings are loaded into USER1 and operation is started up. 3: The USER4 settings are loaded into USER1 and operation is started up. 4: The USER5 settings are loaded into USER1 and operation is started up.
		0001	USER2	
		0002	USER3	
		0003	USER4	
		0004	USER5	
A03	MENU LOCK	<u>0000</u>	<u>OFF</u>	This selects whether to set or release the user file (USER2 – USER5) lock mode. 0: The lock mode is released (changes can be made). 1: The lock mode is set (changes are prohibited). **<Note>** The lock mode cannot be set for USER1.
		0001	ON	

The underlining denotes the factory setting.

<Notes>

- The No. A00 (LOAD), No. A01 (SAVE) and No. A02 (P.ON LOAD) items can be set for USER1 only. It is not displayed for USER2 – USER5.
- The No. A03 (MENU LOCK) item can be set for USER2 – USER5 only. It is not displayed for USER1.

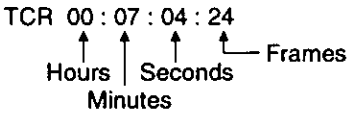
Time code/user bit

Time code

The time code is used when the time code signal generated by the time code generator (time code signal generator) is to be recorded on the tape, its values are to be read by the time code reader (time code signal reader), and the absolute position of the tape is to be displayed in increments of hours, minutes, seconds and frames.

The time code is written in the sub-code area (data area) of the helical track. This enables the VTR's playback speed to be read from the stop mode to slow-motion playback up to high-speed play (approx. 100X normal speed).

The time code values are indicated using the display and superimpose functions.



<Note>

Values appear as shown below on the front display.

Playback: Time code reader values

REC, EE: Time code generator values

Time code generator values can be checked when the REC button is pressed even during playback.

User bit

"User bit" refers to the 32-bit (8-digit) data frame among the time code signals which has been released to users. It enables operator numbers values to be recorded.

The alphanumeric characters which can be used for the user bit are the figures 0 to 9 and the letters A to F.

1. Setting the internal time code/user bit

1 Place the VTR in the stop mode.

2 Set the CTL/TC/UB switch to TC or UB.

3 Select "0(INT)" as the set-up menu No. 500 (TC MODE) setting. (The time code generated by the built-in time code generator is selected.)

4 Setting the RUN MODE. (set-up menu No. 502)
REC (RUN): The time code runs at the same time as the recording proceeds.
FREE (RUN): The time code runs in the same way as the time regardless of the VTR's operation.

5 Setting the time code or user bit start number

1 Press the TC PRESET button. The digit on the far left now flashes.

2 Align the flashing light and the digit to be set with the cursor buttons (◀, ▶).

3 Press the cursor button ▲ or ▼ to change the value.
Each time the button is pressed, the number changes. The setting range is given below.
- **Time code**
  00:00:00:00 – 23:59:59:29
- **User bit**
  00 00 00 00 – FF FF FF FF

4 Repeat steps 2 and 3 to change the value.

5 When the setting of the start number is completed, press the SET button. In the FREE RUN mode, the time code now starts running.

6 Proceed with the recording.

2. Setting the external time code (time code for SDTI)

1 Place the VTR in the stop mode.

2 Select "1(SDTI)" as the set-up menu No. 500 (TC MODE) setting. (The external time code is selected.)

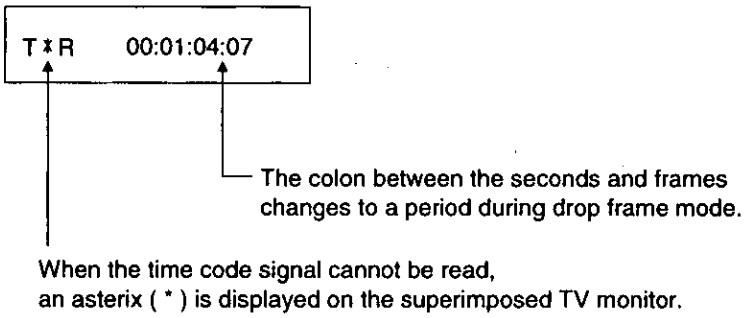
Reproducing the time code/user bit

1 Place the unit in the stop mode.

2 Set the CTL/TC/UB switch to TC or UB.
TC: The time code is displayed.
UB: The user bit is displayed.
- When it is no longer possible to read the time code, it is interpolated using the CTL signal.

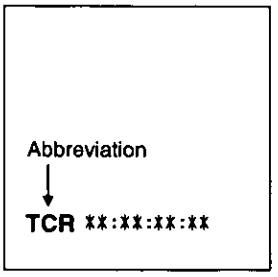
3 Press the PLAY button.
Playback now commences, and the time code appears on the display.
When setup menu No. 006 (SUPER) is ON, the time code value is superimposed onto the video signal from the VIDEO MONITOR OUT 3 connector.

<Notes>
- The colon between the seconds and frames changes to a period when the drop frame time code is read.
- When the time code signal cannot be read, the time code is automatically interpolated by the CTL signal.
The superimposed appears as shown below.



Superimpose screen

The control signals, time code, etc. are displayed using abbreviations.

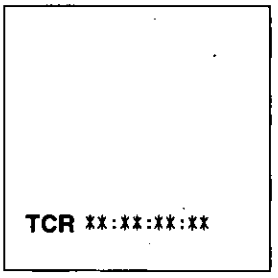


TV monitor

CTL = control signal
TCR = TC time code reading
UBR = TC user bit reading

Characters displayed

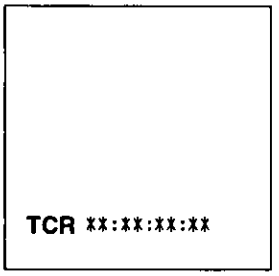
The background of characters superimposed on the display can be changed using setup menu No. 007 (CHARA TYPE).



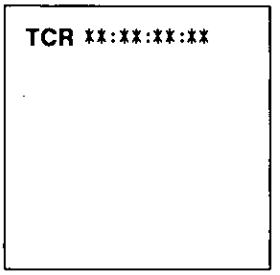
TV monitor

Display position

The position of the characters superimposed on the display can be changed using setup menus No. 001 (CHARA H-POS) and No. 002 (CHARA V-POS).



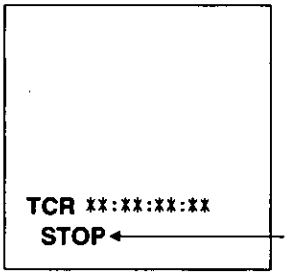
TV monitor



TV monitor

Operation mode

The VTR's operation mode can also be displayed using setup menu No. 003 (DISPLAY SEL).



VTR operation mode

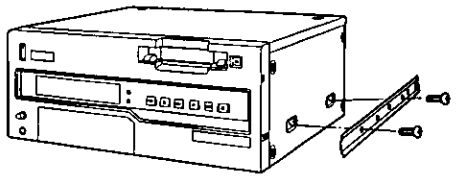
TV monitor

Rack mounting

The unit can be mounted into a 19-inch standard rack if the optional rack-mounting adaptors (AJ-MA75P) are used. For the installation rails, it is recommended that the rail and bracket for 18" length (model number CC3001-99-0400) of CHASSIS TRAK be used. (The complete slide rail and bracket unit is not available from Panasonic) For further details, consult with your dealer.

1 Remove the screws on the left and right sides of the unit.

2 Use the removed screw to attach the inner members of the slide rails.

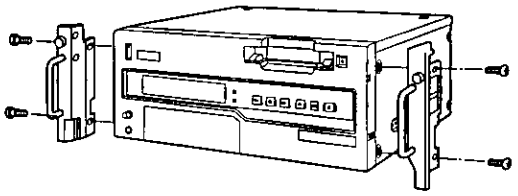


Inner member

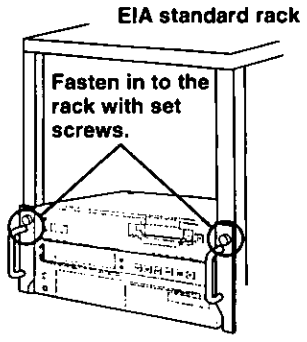
The length of the screws used is subject to restriction. If some of the mounting screws have been lost or misplaced, use screws which are less than 4" long in their place.
Use four screws to secure each inner member.

3 Attach the outer member brackets to the rack.
Check that the height is the same for the left and right brackets.

4 Attach the AJ-MA75P rack-mounting adaptors with included 4 screws.



5 Remove the 4 rubber legs from the bottom of the unit, and install the unit in the rack.
After the unit has been installed, check that it moves smoothly along the rails.



<Notes>

- Keep the temperature inside the rack to between +41°F (5°C) and +104°F (40°C).
- Bolt the rack securely to the floor so that it will not topple over when the VTR is drawn out.

Video head cleaning

This unit has an auto head cleaning function which automatically reduces the dirt on the heads. However, to further increase the unit's reliability, it is recommended that its video heads be cleaned every day.
Use the cleaning fluid designated by Panasonic.

Condensation

Condensation occurs due to the same principle involved when droplets of water form on a window pane of a heated room. It occurs when the unit or tape is moved between places where the temperature or humidity varies greatly or when, for instance:

- It is moved to a very humid place full of steam or a room immediately after it has been heated up.
- It is suddenly moved from a cold location to a hot or humid location.

When moving the unit to locations such as these, leave it standing for about 10 minutes rather than switching on the power immediately.
If condensation has formed on or in the unit, the "E-20" code flashes in the counter display and the cassette tape is automatically ejected.
Keep the power supplied and simply wait until the "E-20" code goes off.

Error messages

When a warning occurs in this unit, an error number appears at the counter display.
Opening the DIAG menu will display the error description on the monitor. Also, when an abnormal operation is detected in this unit, an error number flashes on the counter display.

DIAG menu

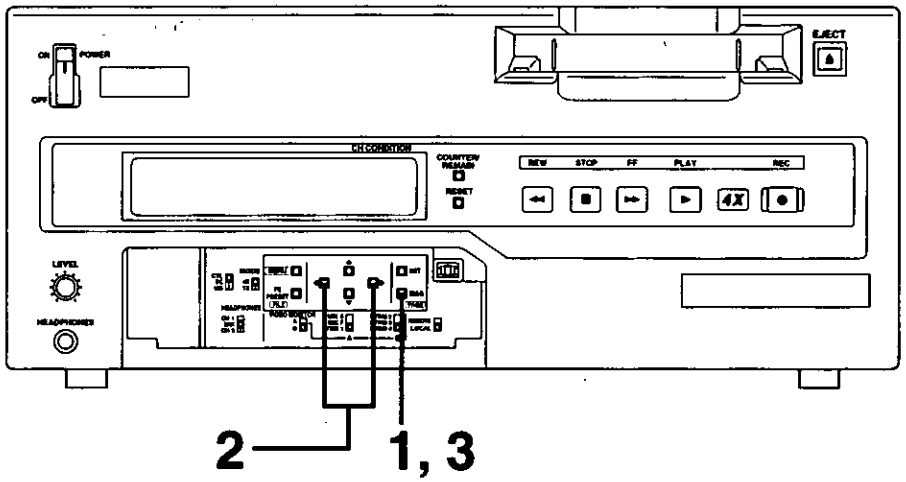
This display the VTR information.
VTR information includes "WARNING" information and "HOURS METER" (usage time) information. A DIAG menu appears on the monitor when the monitor is connected to the VIDEO MONITOR OUT 3 connector on the connector section.

Displaying the DIAG menu

1 Press the DIAG button.
The DIAG menu screen is displayed on the monitor, and the error number is displayed on the counter display.

2 The "WARNING" information and "HOURS METER" information can be switched by pressing the cursor buttons (◀, ▶).

3 Press the DIAG button again to return to the original display.



"WARNING" information display

- A warning message is displayed on the monitor whenever a warning occurs. When warnings have not been detected, "NO WARNING" is displayed on the monitor, and "Err–" is displayed on the counter display.
- When multiple warning occur, the descriptions for each warning can be checked by using the cursor buttons (▲, ▼).

Error messages

Displaying the "HOURS METER" information

Press the cursor buttons (▲, ▼) to move the cursor (*).
The number for the item where the cursor is located is shown on the counter display.

Item No.	Item	Description
H00	OPERATION	Displays the time that the power has been supplied in one-hour units (10-hour units at the counter display).
H01	DRUM RUN	Displays the time that the drum has been rotating in one-hour units (10-hour units at the counter display).
H02	TAPE RUN	Displays the time that the tape has been running during FF, REW, PLAY, SEARCH (JOG, VAR, SHTL) and REC modes (except for STILL in the JOG, VAR or SHTL mode) in one-hour units (10-hour units at the counter display).
H03	THREADING	Displays the number of times for threading/unthreading in single units (10-count units at the counter display).
H11	DRUM RUN r	Displays the time that the drum has been rotating in one-hour units (10-hour units at the counter display). (Can be reset)
H12	TAPE RUN r	Displays the time that the tape has been running during FF, REW, PLAY, SEARCH (JOG, VAR, SHTL) and REC modes (except for STILL in the JOG, VAR or SHTL mode) in one-hour units (10-hour units at the counter display). (Can be reset)
H13	THREADING r	Displays the number of times for threading/unthreading in single units (10-count units at the counter display). (Can be reset)

<Note>

- The resettable items in the "HOURS METER" information are reset by the service personnel when performing maintenance or other work.

If T&S&W is selected in the setup menu No. 003 (DISPLAY SEL), a message appears in the warning display whenever a warning or error occurs. When multiple events occur, the event with the highest priority is displayed.

Priority	Counter display and monitor display	Description
High ▲ ▼ Low	Error messages (See error message table)	When an abnormal operation is detected in this machine, an error number flashes on the counter display and an error message is displayed.
	NO INPUT	This display appears for 2 seconds when no input signals are supplied. The recording operation is stopped if this error has occurred during recording.
	Warning messages (See warning message table)	When a warning occurs in this unit, an error number appears at the counter display and warning message is displayed. When multiple warnings occur, the warning with the highest priority is displayed.

Warning

Priority	Error No.	TV monitor display*	Description
High ▲	**E-03* (Err-03)**	SDI SIG	This message appears when the input signal is an SDI signal. The recording operation is stopped if the error has occurred during recording.
	E-04* (Err-04)	UNKNOWN SIG	This message appears when the input signal does not comply with the DVCPRO25 format. The recording operation is stopped if the error has occurred during recording.
	E-06* (Err-06)	NOT 4X SIG	During recording, if the input signals are not 4X speed signals, this message appears, and the recording operation is stopped.
	E-07* (Err-07)	SDTI HIGH ERROR	This message appears when errors which cannot be corrected have occurred in the input signal. The recording operation is stopped if the error has occurred during recording.
	E-10* (Err-10)	FAN STOP	This message appears when the fan motor has been shut down.
	E-00* (Err-00)	SERVO NOT LOCKED	This message appears when the servo has been disengaged for 3 or more seconds during 4× speed playback or 4× speed recording.
	E-01* (Err-01)	LOW RF	This message appears when it is detected that the envelope level has remained at approximately one-third of its normal level for 1 or more seconds during 4× speed playback.
▼ Low	**E-02* (Err-02)**	HIGH ERROR RATE	This message appears when the error rate has deteriorated and concealment or interpolation is applied to the video or audio playback signals.

* This display appears when the DIAG button is pressed and the warning information is checked.

AUTO OFF mode

The following error number flashes on the counter display section.

Error No.	TV monitor display	Descriptions	VTR operation (VTR measures)
E-20	DEW	When condensation is detected, the error no. display flashes, and the unit goes into EJECT mode. The drum rotates after the cassette tape is ejected to remove condensation. When the condensation has been removed, the error no. display disappears and the VTR may be used. **<Note>** 1) The drum rotates as soon as condensation is detected when the unit is in EJECT mode. 2) When condensation is detected while a cassette tape is inserted, drum rotation stops, the cassette tape is ejected and the drum rotation begins again.	EJECT
E-29	FRONT LOAD MOTOR	The cassette does not move up even when 6 seconds have elapsed since the VTR was transferred to the eject mode. **<Note>** After inserting the cassette, the unit will go to EJECT mode if cassette is not loaded after six seconds.	Stop (POWER OFF→ON)
E-31	LOADING MOTOR	The unloading operation is not completed within 6 seconds. **<Note>** The unit will go to EJECT mode (unloading) if the loading operation is not completed within six seconds.	Stop (POWER OFF→ON)
E-35	SERVO CONTROL ERR	There is no response from the servo microcomputer for 1 or more seconds.	Stop (POWER OFF→ON)

Error messages

Error No.	TV monitor display	Descriptions	VTR operation (VTR measures)
E-36	SERVO ERROR	Only the servo microcomputer was reset in an instantaneous power failure.	Stop (POWER OFF→ON)
E-37	SERVO COMM ERROR	The servo microcomputer does not follow the instructions of the system control micorcomputer even when 10 seconds have elapsed.	Stop (POWER OFF→ON)
E-51	FRONT LOAD ERROR	The take-up reel has been rotating idly for a fixed period of time while the start/end processing operation during loading (half position) is being performed.	Stop (POWER OFF→ON)
E-52	W-UP REEL NOT ROTA	After the cassette has been inserted, the tape take-up reel has not wound up the tape while the total tape amount is not detected and while the tape is traveling.	Stop (POWER OFF→ON)
E-53	WINDUP ERROR	After the total tape amount has been detected, the amount of tape wound up on the take-up reel and the amount of tape supplied by the supply reel differ to an abnormal extent while the tape is traveling.	Stop (POWER OFF→ON)
E-55	UNLOAD ERROR	The tape has not been wound up during unloading.	Stop (POWER OFF→ON)
E-57	S-FF/REW TIMEOVER	The start/end processing operation is not completed even after 10 or more seconds have elapsed.	Stop (POWER OFF→ON)
E-59	DRUM ROTA TOO SLOW	The cylinder motor speed is abnormally low.	Stop (POWER OFF→ON)
E-60	DRUM ROTA TOO FAST	The cylinder motor speed is abnormally high.	Stop (POWER OFF→ON)
E-61	CAP ROTA TOO SLOW	The capstan motor speed is abnormally low.	Stop (POWER OFF→ON)
E-64	S REEL TOO FAST	The supply reel motor speed is abnormally high.	Stop (POWER OFF→ON)
E-67	T REEL TOO FAST	The tape-up reel motor speed is abnormally high.	Stop (POWER OFF→ON)
E-69	T REEL TORQUE ERR	An abnormal torque applied to the take-up reel motor is detected.	Stop (POWER OFF→ON)
E-70	S REEL TORQUE ERR	An abnormal torque applied to the supply reel motor is detected or if an abnormal current flowing to the current-sensing resistor is detected.	Stop (POWER OFF→ON)
E-71	CAP TENSION ERROR	An abnormal tension at the supply side is detected in the capstan mode.	Stop (POWER OFF→ON)
E-72	REEL TENSION ERROR	An abnormal tension at the supply side is detected in the reel mode.	Stop (POWER OFF→ON)
E-73	REEL DIR UNMATCH	The reel motor at the take-up side is running in the reverse direction.	Stop (POWER OFF→ON)
E-FF	E-FF	Tape start and end are detected simultaneously during loading or after loading is completed.	Stop (POWER OFF→ON)

RS-232C interface

1. Introduction

(1) The VTR can be operated by commands when the RS-232C interface is used.
(See command table on page 44 – 46.)

(2) Conditions for acknowledging commands from RS-232C interface
The front panel REMOTE/LOCAL switch must be at REMOTE.
The setup menu No. 202 "RS232C SEL" must be ON.

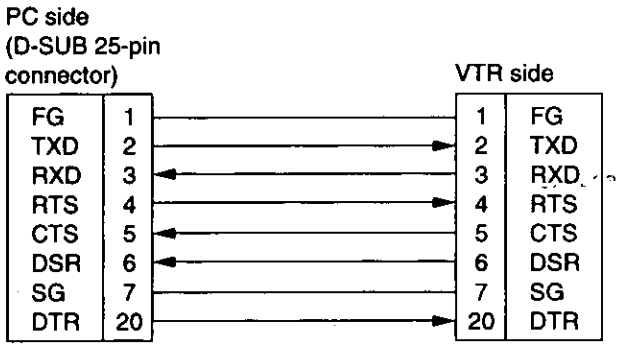
If the above conditions are not met, [ACK] + [STX]ER001[ETX] is returned to the external unit.
Whether the [ACK] code is returned depends on the setting which has been selected for setup menu No. 207 (RETURN ACK).

2. Hardware specifications

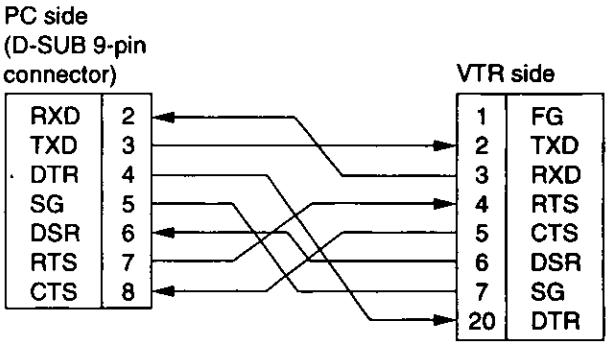
External interface specifications

- **Example of connection with controller (PC)**

■ Using straight cable with D-SUB 25-pin connectors



■ Using straight cable with D-SUB 9-pin connectors and 25-pin connectors



3. Software specifications

Protocol

1) Communication parameters

Communication system	Asynchronous, full duplex
Communication speed	300/600/1200/2400/4800/9600
Bit length	7 bit/8 bit
Stop bit	1 bit/2 bit
Parity bit	NONE/ODD/EVEN
ACK code	ACK code returned/ACK code not returned **<Note>** The ACK code is what is returned from the VTR to the controller when data has been successfully sent from the controller.

The underlining indicates the factory settings.

Any changes to the settings can be made using the setup menu items listed below.

Communication parameter	Setup menu item
Communication speed	No. 203 BAUD RATE
Bit length	No. 204 DATA LENGTH
Stop bit	No. 205 STOP BIT
Parity bit	No. 206 PARITY
ACK code	No. 207 RETURN ACK

2) Send format [controller (PC) → VTR]

■ **Data format**

[STX] [command] [:] [data] [ETX]
02h XX XX XX 3Ah XX-XX 03h ←(ASCII code: symbols, numbers upper-case letters)

20h<XX<7Fh

- [command]: Command identifier; a 3-byte identifier (ASCII code: symbols, numbers, upper-case letters) is sent as the command.
- [:]: This code serves as a delimiter between the command and data.
- [data]: Data (ASCII code: symbols, numbers, upper-case letters) can be added in the number of bytes required.

■ **Outline of send procedure from controller**

1. The send command starts with STX (start of text = 02h). The command is then identified by COMMAND which follows and the data is added as required.
   The format ends with ETX (end of text = 03h).
2. When a different command is to be sent, a response is awaited from the VTR, and then the command is sent. (See page 43.)
3. If STX is sent again before ETX is sent, the receive data buffer inside the VTR is cleared. A command error is returned to the controller, and the data is newly processed with STX which was received again at the head.

3) **Return format [VTR → controller (PC)]**
The following responses are made to the command. If necessary, more than one response is made.

■ **When the communication has terminated normally**

1. The receive completion message is returned.
   [ACK]
   06h

2. The execution completion message is returned.
   [STX] [command] [data] [ETX]
   02h XX XX XX XX-XX 03h

• [command]: This is the message (data) which is returned or the execution completion message identifier.
• [data]: This is the data to be returned. It can be omitted.

Example:	Send command		Return message (data)
	[STX] OPL [ETX]	→	[ACK] [STX] OPL [ETX]

■ **When the communication has terminated abnormally**
[NACK]
15h

■ **When processing is not possible due to incorrect data or trouble in the VTR**

1. The receive completion message is returned.
   [ACK]
   06h

2. An error code is returned.

   [STX] E R N_1 N_2 N_3 [ETX]
   02h Error code 03h

4. Error code table

ER001: Invalid command
- Unsupported command received.
- Error in command execution

ER002: Parameter error
ER102: VTR mode error (front loading motor)
ER103: VTR mode error (loading motor)
ER104: VTR mode error (drum, capstan system)
ER105: VTR mode error (reel system)
ER106: VTR mode error (tension system)
ER108: VTR dew error
ER1FF: VTR system error

5. Command table

(1) Commands relating to operation control

<Notes>

- As for the return (completion) message, [ACK] is first returned when data is received, and the execution message is subsequently returned. It is only the execution message which is listed in this table.
- In the case of commands not listed in the table, ER001 (invalid command) is returned after [ACK] has been returned.

VTR operation	Send command	Return (completion) message	Supplementary notes
STOP	[STX] OSP [ETX]	[STX] OSP [ETX]	This command is for stopping the tape travel. The resulting output picture and sound statuses differ according to the settings selected for the setup menu No. 105 (STOP EE SEL).
EJECT	[STX] OEJ [ETX]	[STX] OEJ [ETX]	This command is for ejecting the cassette tape. The resulting output picture and sound statuses differ according to the settings selected for the setup menu No. 103 (EJECT EE SEL).
PLAY	[STX] OPL [ETX]	[STX] OPL [ETX]	This command is for starting playback. 4× speed playback or 1× speed monitoring is selected using the 4×/1× switch.
REWIND	[STX] ORW [ETX]	[STX] ORW [ETX]	This command is for rewinding the tape. The resulting output picture and sound statuses differ according to the settings selected for the setup menu No. 104 (F/R EE SEL). The maximum tape speed differs according to the setting selected for setup menu No. 101 (FF. REW MAX).
FAST FORWARD	[STX] OFF [ETX]	[STX] OFF [ETX]	This command is for fast forwarding the tape. The resulting output picture and sound statuses differ according to the settings selected for the setup menu No. 104 (F/R EE SEL). The maximum tape speed differs according to the setting selected for setup menu No. 101 (FF. REW MAX).
REC	[STX] ORC [ETX]	[STX] ORC [ETX]	This command is for starting the recording.
SHTL FORWARD	[STX] OSF:data [ETX]	[STX] OSF [ETX]	This is the forward direction shuttle command.
	data = n: speed data 0: STILL 1: ×0.03 2: ×0.1 3: ×0.2 4: ×0.43 5: ×1 6: ×1.85 7: ×4.1 8: ×9.5 9: ×16 A: ×32 : This speed differs according to the setting selected for setup menu No. 100 (SHTL MAX).		

VTR operation	Send command	Return (completion) message	Supplementary notes
SHTL REVERSE	[STX] OSR:data [ETX]	[STX] OSR [ETX]	This is the reverse direction shuttle command.
	data = n: speed data 0: STILL 1: ×0.03 2: ×0.1 3: ×0.2 4: ×0.43 5: ×1 6: ×1.85 7: ×4.1 8: ×9.5 9: ×16 A: ×32 : This speed differs according to the setting selected for setup menu No. 100 (SHTL MAX).		
STANDBY OFF	[STX] OBF [ETX]	[STX] OBF [ETX]	This command is setting the VTR to standby OFF.
STANDBY ON	[STX] OBN [ETX]	[STX] OBN [ETX]	This command is setting the VTR to standby ON.

(2) Commands relating to inquiries

<Notes>

- As for the return (completion) message, [ACK] is first returned when data is received, and the execution message is subsequently returned. It is only the execution message which is listed in this table.
- In the case of commands not listed in the table, ER001 (invalid command) is returned after [ACK] has been returned.

VTR operation	Send command	Return (completion) message	Supplementary notes
CTL/TC DATA REQUEST	[STX] QCD [ETX]	[STX] CD data [ETX]	This command is for inquiring about the counter value.
		data = f w gh mm ss ff f = F w = S gh = CTL: g = SP (20h): for a plus display – (2Dh): for a minus display h = 0–9: hours TC: gh = 00–23: hours mm = 00–59: minutes ss = 00–59: seconds ff = 00–29: frames (NTSC) 00–24: frames (PAL)	CTL or TC is returned, whichever corresponds to the front display mode.
STATUS REQUEST	[STX] QOP [ETX]	[STX] xxx [ETX]	This command is for inquiring about the VTR's operation mode.
		xxx = OEJ: EJECT OFF: FAST FORWARD OPL: PLAY ORC: REC ORW: REWIND OSP: STOP (including the STANDBY ON) SRS: (IN/OUT) PREROLL OBF: STANDBY OFF OSF: SHTL FORWARD OSR: SHTL REVERSE OJG: JOG FORWARD/REVERSE OSW: VAR FORWARD/REVERSE	
ID (VTR No.) REQUEST	[STX] QID [ETX]	[STX] data [ETX]	This command is for inquiring about the VTR used.
		data = AJ-D780 (NTSC) AJ-D780E (PAL)	

(3) Microsoft QuickBASIC sample programme

```
CLS
STX$ = CHR$(&H2): ETX$ = CHR$ (&H3): NAK$ = CHR$(15): ACK$ = CHR$(&H6)
PRINT "*** RS-232C COMMUNICATION SAMPLE PROGRAM ***"
PRINT "Type Command 'QUIT' to quit."
PRINT

REM *** Communication Port Initial & Open ***
REM Port 1,9600Bps,No parity,8 bit data,1 stop bit
OPEN "COM1:9600,N,8,1" FOR RANDOM AS #1 LEN = 256

REM *** Input Command & Send Command ***
SendCmd:
INPUT "Input Command ="; SEND$
IF SEND$ = "QUIT" THEN GOTO ProgEnd
PRINT #1, STX$ + SEND$ + ETX$

REM *** Wait for Receive Command ***
WHILE LOC(1) = 0
        WAITKEY$ = INKEY$
        IF WAITKEY$ = "Q" THEN PRINT "*** Quit ***": GOTO ProgEnd
WEND

REM *** Receive Command ***
RecvCmd:
RECV$ = INPUT$(1, #1)
IF RECV$ = STX$ THEN RECV$ = "[Stx]"
IF RECV$ = ACK$ THEN RECV$ = "[Ack]"
IF RECV$ = NAK$ THEN RECV$ = "[Nak]"
IF RECV$ = ETX$ THEN BUFFER$ = BUFFER$ + "[Etx]": GOTO DispOut
BUFFER$ = BUFFER$ + RECV$
GOTO RecvCmd

REM *** Output Receive Command ***
DispOut:
PRINT "Receive Command ="; BUFFER$
PRINT
BUFFER$ = ""
GOTO SendCmd

REM *** End Program ***
ProgEnd:
CLOSE
END
```

Connector signals

VIDEO IN

SDTI IN (DIGITAL)	BNC × 2	Active through
REF VIDEO IN	BNC × 2	Loop-through, 75Ω termination switch provided

VIDEO OUT

SDTI OUT (DIGITAL)	BNC × 3
VIDEO MONITOR OUT	BNC × 3

AUDIO IN

SDTI IN (DIGITAL)	BNC × 2	Active through

AUDIO OUT

SDTI OUT (DIGITAL)	BNC × 3	
AUDIO MONITOR OUT (ANALOG)	XLR × 2	CH1, CH2
HEADPHONES (front)	1/4" phone × 1	

Pin No.	Signal
1	GND
2	HOT
3	COLD

CUE IN

CUE IN (ANALOG)	XLR × 1

Pin No.	Signal
1	GND
2	HOT
3	COLD

CUE OUT

CUE OUT (ANALOG)	XLR × 1

Pin No.	Signal
1	GND
2	HOT
3	COLD

RS-422A REMOTE (9P)

REMOTE

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	FRAME GROUND	4	RECEIVE COMMON	7	TRANSMIT B
2	TRANSMIT A	5	———	8	RECEIVE A
3	RECEIVE B	6	TRANSMIT COMMON	9	FRAME GROUND

RS-232C REMOTE

■ **25-pin D-SUB crossover cable supported**

Pin No.	Abbreviation	Circuit	Description
1	FRAME GROUND	Protective ground	Frame ground
2	TXD	Transmitted data	Receives data from the PC.
3	RXD	Received data	Sends data to the PC.
4	RTS	Request to send	Shorted with pin 4.
5	CTS	Clear to send	Shorted with pin 5.
6	DSR	Data set ready	Positive power output after communication enable status
7	GND	Signal ground	Signal ground
20	DTR	Data terminal ready	No processing

Specifications

GENERAL

Power supply:	AC 120V, 50 – 60 Hz
Power consumption:	200W

Operating ambient temperature:	41°F to 104°F (5°C to 40°C)
Operating ambient humidity:	10 to 90% (no condensation)
Weight:	35.2 lb (16 kg)
Dimensions (W × H × D):	$16^{3}/_{4}$" × $6^{15}/_{16}$" × $16^{3}/_{8}$" (424 × 175 × 415 mm)
Recording format:	Digital compression recording onto 1/4" tape
Recording tracks:	Digital video Time code: Recorded in sub-code area Audio: 2 channels Cue track: 1 track Control track: 1 track
Tape speed:	135.280 mm/sec
Tape used:	1/4" thin magnetic layer metal tape
Search speed:	0 to ±60× normal speed (color)
Digital slow motion:	±0.43× normal speed
Tape timer accuracy:	±1 frame (using continuous CTL signal)

VIDEO

Sampling frequencies:	Y: 13.5 MHz, P_B/P_R: 3.375 MHz
Quantizing:	8 bits/sample
Error correction:	Reed-Solomon product code

Monitor video output

Video bandwidth:	Y: 30 Hz to 5.5 MHz (+1.0 dB to –3.0 dB)
Differential gain:	Less than 4%
Differential phase:	Less than 3 degrees
Y/C delay:	Less than 20 ns
K factor:	Less than 3%

Video input connector

SDTI input:	Complies with SMPTE 305M standard BNC ×2, active through
Reference input:	Analog composite, BNC ×2, loop through, 75Ω on/off selectable

Video output connector

SDTI output:	BNC ×3, complies with SMPTE 305M standard
Video monitor output:	BNC ×3; video 1, video 2, video 3 (superimpose on/off)

AUDIO

Digital audio

Sampling frequency:	48 kHz
Quantizing:	16 bits/sample
Frequency response:	20 Hz to 20 kHz (+0.5 dB to –1.0 dB)

Audio monitor output

Dynamic range:	Better than 86 dB (1 kHz, emphasis OFF, "A" weighted)
Distortion:	Less than 0.1% (1 kHz, emphasis OFF, standard level)
Crosstalk:	Less than –80 dB (1 kHz, between 2 channels)
Wow and flutter:	Below measurable limits
Headroom:	20 dB
Emphasis:	T1=50 microsec., T2=15 microsec. (Automatic ON/OFF selection during playback)

Cue track

Frequency response:	300 Hz to 5 kHz ±4 dB

Audio input connector

SDTI input:	BNC, complies with SMPTE 305M standard
CUE input:	XLR ×1, 600 Ω/high impedance selectable, 0 dBu

Audio output connector

SDTI output:	BNC, complies with SMPTE 305M standard
Audio monitor output:	XLR ×2, low impedance, +4/0/–20 dBu selectable
Headphones output:	1/4" phone, 8 Ω, level adjustable
CUE output:	XLR ×1, low impedance, 0 dBu

OTHER INPUT/OUTPUT SIGNALS

Remote input:	D-sub 9-pin RS-422A interface
RS-232C:	D-sub 25-pin RS-232C interface

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

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