Panasonic

DVCPRO 50

Digital Video Cassette Recorder

AJ-D92P

Operating Instructions

IMPORTANT

indicates safety information.

■ Do not insert fingers or any objects into the video cassette 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

Introduction

The AJ-D92 is a portable video cassette recorder in the DVCPRO series.

While featuring the compact size, light weight and low power consumption characteristic of a DVCPRO, the AJ-D92 supports both the DVCPRO and DVCPRO 50 formats.

Needless to say, the DVCPRO series is suitable for a wide spectrum of applications when it is used in combination with an existing video camera.

An interactive system enables the unit's settings to be performed while monitoring the on-screen menus that appear on the TV monitor.

Features

High picture quality

Using tapes in the DVCPRO format, the product of the latest compression technology, the recording rate can be switched between 50 Mbps with higher picture quality and 25 Mbps with longer recording time.

Compact size and light weight

The unit is 11 $^{15}/_{16}$″ (303 mm) wide, 5 $^1/_2$″ (139 mm) high and 13 $^7/_{16}$″ (341 mm) deep, and weighs 12.98 lb (5.9 kg). It is equipped with grips which come in handy when the unit is to be carried.

Long-time recording and playback

When an L size cassette is used, the maximum recording and playback time is 92 minutes in the 50 Mbps mode and 184 minutes* in the 25 Mbps mode.

> * For AJ-5P92LP cassette tapes recorded using the DVCPRO (25 Mbps) mode, use a VTR supporting DVCPRO (25 Mbps) 184 minute tapes.

Both L and M size cassettes supported

This unit employs a front loading mechanism to support the recording or playback of DVCPRO or DVCPRO 50 format size L and M cassette tapes.

Frame-to-frame continuity function

By using the REC button and PAUSE button together—a combination which activates the auto back function—pictures can be joined smoothly with no disturbances.

Safety check function

The status of the video input signals can be checked on the signal level display window by pressing the METER button. This helps to prevent errors in input signal switching operations and mistakes in recording due to a cable disconnection, etc.

REC REVIEW function

The unit comes with a REC REVIEW function: this plays back the section immediately prior to the end of the previous recording, thereby enabling the operator to verify that the signals have been recorded properly.

On-screen menu settings

Detailed function settings tailored to the individual user can be performed on-screen.

Audio level controls featured

The levels of the signals for the four audio channels can be adjusted for recording and playback.

Built-in power supply for phantom microphone

An internal switch can be used to switch the power supply from +12 V to +48 V or vice versa.

Time codes

Incorporated inside the unit is a TCG/TCR (time code generator/time code reader). It is also possible to input time codes from an external source to enable regeneration with an external time code.

9-pin remote control

This unit comes with a 9-pin remote control connector so that the unit can be operated using an optional external remote controller (model AJ-A95).

System Configuration

Video camera

VTR or other unit

AC adapter (AJ-B75)

Component signals

Composite signals

Switching

Video input signals

Microphone

Tape recorder or other unit

Audio input signals ×4 channels (CH1 – CH4)

AJ-D92

Control signal ×1 channel

Video output signals ×3 channels (composite)

Remote controller (AJ-A95) or

Video monitor

Editor

VTR, FPU or other unit

Earphones

Headphones

Audio output signals ×5 channels

Stereo amplifier

Speakers

Parts and Their Functions

Front panel

The front panel consists of the following four areas:
1. **Operating area**
2. **Status display area**
3. **Control area**
4. **Time code setting area**
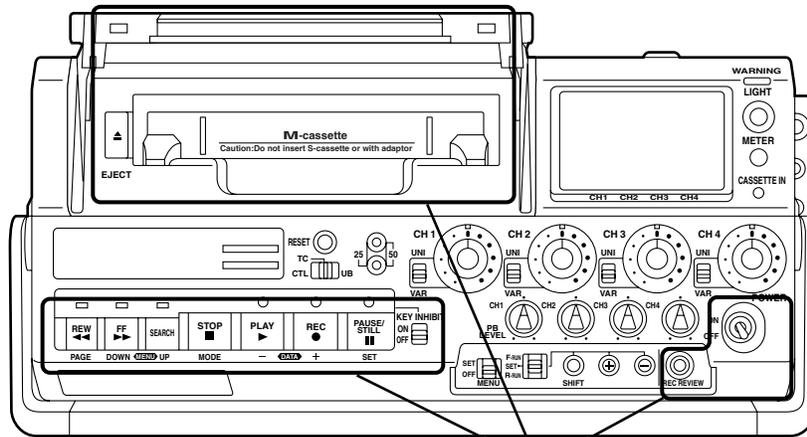
1. Operating area

2. Status display area
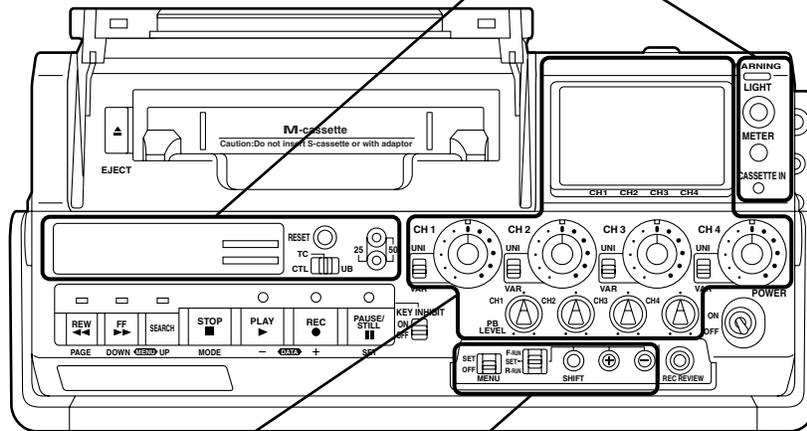
3. Control area　　　　**4. Time code setting area**

Parts and Their Functions

1. Operating area
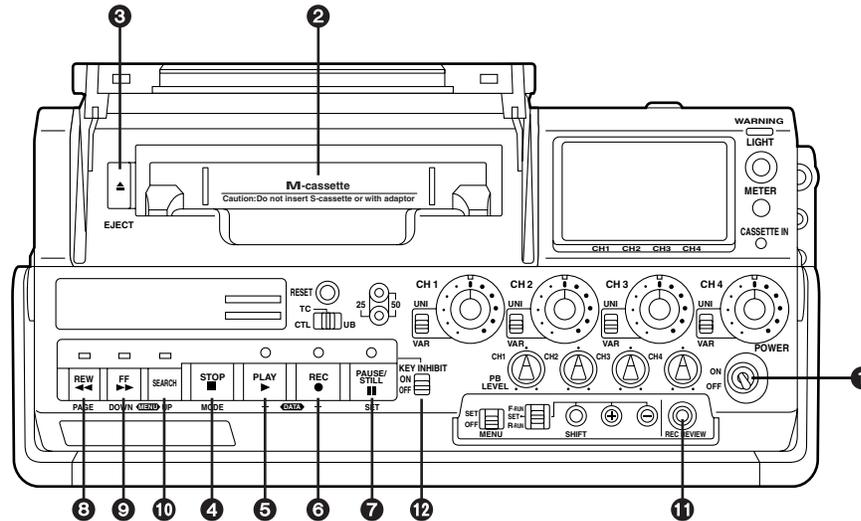
❶ POWER ON/OFF switch

This switch is used to turn the unit's power on and off.

When it is set to ON, the signal level display window and status display window are displayed.

The unit's power is turned on and off in tandem with the power of the units (camera and remote controller connected to the CAMERA terminal and DC OUT socket) whose power is supplied from the unit.

❷ Cassette insertion slot

Press the cassette insertion slot cover to open it, and then insert the cassette.

After the cassette has been inserted or ejected, the cover must be closed for use.

<Notes>
- News gathering cassettes and general-purpose cassettes are inserted into this slot.
  Do not insert DV cassettes which are designed for general consumer applications.
- Open the cassette insertion slot cover before issuing the EJECT command from a remote controller when a controller has been connected. The unit will not respond to the EJECT command if its cover is still closed.

❸ EJECT button

This button is pressed to eject the cassette.

When the cassette insertion slot cover is pressed and opened and the EJECT button is pressed, the tape is unloaded, and several seconds later it is automatically ejected.

❹ STOP button

This button is pressed to stop the tape travel.

The tape drum continues to rotate even in the stop mode, and the tape remains in close contact with the drum.

When the stop mode continues beyond the prescribed period of time, the unit is automatically set to the standby OFF (half-loading) mode in order to protect the tape.

The stop mode is established immediately after a cassette has been inserted into the unit.

This button functions as the MODE button when performing the on-screen menu setting.

❺ PLAY button and lamp

This button is pressed to commence playback.

Recording is commenced when it is pressed together with the REC button.

The button's lamp lights during playback, recording or pause.

This button functions as the DATA– button when performing the on-screen menu setting.

❻ REC button and lamp

Recording is commenced when this button is pressed together with the PLAY button.

During recording the button's lamp flashes; during rec-pause it lights.

E-E signals can be monitored when the button is pressed in the stop mode.

This button functions as the DATA+ button when performing the on-screen menu setting.

Parts and Their Functions

❼ PAUSE/STILL button and lamp

This button is pressed during recording or playback to temporarily stop (pause) the tape.

When it is pressed during recording, the tape stops temporarily. Recording is resumed when it is pressed again.

When it is pressed during playback, the still picture mode is established. Playback is resumed when it is pressed again.

Noise may be heard on the playback pictures: this is normal and not indicative of malfunctioning.

The button's lamp flashes during temporary stop.

When it is pressed again, temporary stop is released, and the lamp goes off.

The button functions as the SET button when performing the on-screen menu setting.

❽ REW button and lamp

This button is pressed to rewind the tape.

When it is pressed after pressing the SEARCH button, the tape will be reviewed at the speed which was set in setup menu item No. 100 and played.

When it is pressed after pressing the SEARCH button in the temporary stop (PAUSE/STILL) mode, the reverse linear 0.3× playback mode is initiated.

Noise will appear during linear 0.3× playback: this is normal and not indicative of malfunctioning.

The button's lamp lights during rewinding, review and reverse linear 0.3× playback.

When the respective operations are completed, the lamp goes off, and the operation concerned is stopped.

The button functions as the PAGE button when performing the on-screen menu setting.

❾ FF button and lamp

This button is pressed to fast forward the tape.

When it is pressed after pressing the SEARCH button, the tape will be cued at the speed which was set in setup menu item No. 100.

When it is pressed after pressing the SEARCH button in the temporary stop (PAUSE/STILL) mode, the forward linear 0.3× playback mode is initiated.

Noise will appear during linear 0.3× playback: this is normal and not indicative of malfunctioning.

The button's lamp lights during fast forwarding, cue and forward linear 0.3× playback.

When the respective operations are completed, the lamp goes off, and the operation concerned is stopped.

The button functions as the MENU-DOWN button when performing the on-screen menu setting.

❿ SEARCH button and lamp

This button is pressed to initiate cue, review, forward linear 0.3× playback or reverse linear 0.3× playback.

When it is pressed before pressing the FF button, the tape is cued; if the REW button is pressed instead of the FF button, the tape is reviewed.

The button's lamp lights during cue or review.

When the SEARCH button is pressed during cue, the fast forward mode is established, and when it is pressed during review, the rewind mode is established, and the lamp goes off.

When the FF button is pressed after the SEARCH button was pressed in the temporary stop (PAUSE/STILL) mode, the forward linear 0.3× playback mode is established; if the REW button is pressed instead of the FF button, the reverse linear 0.3× playback mode is established.

The button's lamp flashes during linear 0.3× playback.

When the SEARCH button is pressed during linear 0.3× playback, the temporary stop (PAUSE/STILL) mode is established.

The button functions as the MENU-UP button when performing the on-screen menu setting.

⓫ REC REVIEW button

When this button is pressed during REC PAUSE, the operator can monitor whether the portion of the tape immediately before the button was pressed has been recorded properly.

⓬ KEY INHIBIT switch

When this is set to ON, all the function buttons except for those which were set using setup menu item No. 000 can no longer be operated.

Under the default setting, none of the control buttons except for STOP and EJECT can be operated.

When the switch is set to OFF, all the control buttons are operational.

When connecting an external controller, set the KEY INHIBIT switch to OFF to enable its use.

2. Status display area

Operating status displays

Time data display

Warning displays

Remaining tape display

Battery level display

DF   SLAVE   TCG   WIDE

RF
SERVO
HUMID
SLACK

E   TAPE   F

E   BATT   F

h   min   s   frm
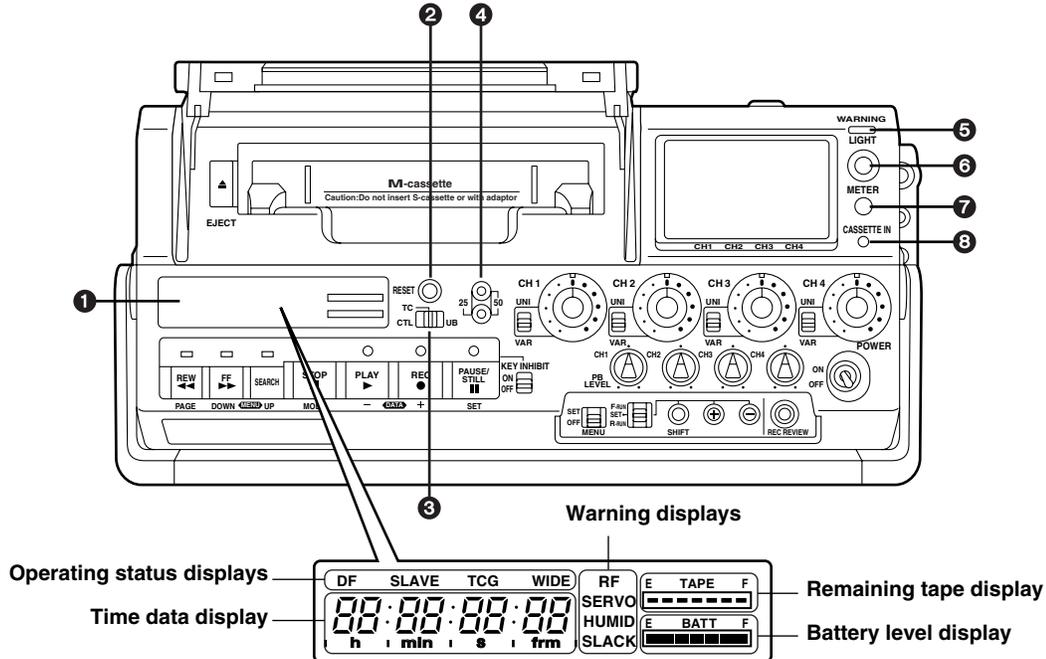
❶ **Status display window**

The warning displays, operating status displays, time data displays, remaining tape display and battery level display can be checked in the window.

Warning displays

These indicate operating failures of the unit.

RF: Recording or playback cannot be performed. Video head clogging or a circuit failure may be to blame.

SERVO: The drum servo and capstan servo have failed to lock.

HUMID: Condensation has formed.

SLACK: A problem has occurred in the tape wind-up operation.

Operating status displays

These indicate the unit's operating status.

DF: This indicates that the drop frame mode is established.

SLAVE: This indicates that the time code is locked to the external time code.

TCG: This indicates that the time code generator's signal is being output.

WIDE: This indicates that the wide mode is established.

Remaining tape display

This indicates the remaining tape time in segments.

● When all 7 segments light up, it means that there is more than 21 minutes of tape remaining. (This can be changed to more than 30 minutes using the setup menu item No. 905.)

● When the segment at the "E" (empty) end lights up, it means that 3 minutes of the tape are left. (This can be changed to 5 minutes using setup menu item No. 905.)

● When the segment at the "E" (empty) end starts flashing, it means that 2 minutes of the tape are left. (This can be changed to 3 minutes using setup menu item No. 904.)

  If this happens during recording, the WARNING lamp flashes, and a warning alarm sounds intermittently.

● When all 7 segments flash, the WARNING lamp remains lighted and the warning alarm sounds continuously, it means that the tape has come to its end.

<Notes>

● The warning alarm is output from the PHONE jack.

● The warning alarm can be set using setup menu items No. 902, 903 and 904.

Parts and Their Functions

Battery level display

This indicates the remaining battery charge in segments. (See page 18)

● When all 7 segments light up, it means that the battery has a full charge.
● As the battery continues to discharge, the segments go off one by one in sequence.
● When the segment at the "E" (empty) end starts flashing, the WARNING lamp also flashes, and the warning alarm sounds intermittently, it means that the battery will soon be fully discharged.
● When all 7 segments flash, the WARNING lamp remains lighted and the warning alarm sounds continuously, it means that the battery is now fully discharged.

<Note>

The warning alarm can be set using setup menu items No. 900 and 901.

❷ RESET button

When this button is pressed, the time data display is reset.
When it is pressed in the CTL mode, the display is reset to 00:00:00:00.
The time code display is reset to 00:00:00:00.
The user's bit is reset to 00 00 00 00.

❸ DISPLAY switch

This is used to switch what is displayed in the status display window.

CTL: The tape timer (control signal) is displayed.
TC: The time code is displayed.
UB: The user's bit is displayed.

What time data is to be displayed is determined in two stages: first by the position selected by the TCG selector switch, and second by the position of the DISPLAY switch.

TCG selector switch position	DISPLAY switch position	Information displayed
SET	TC or CTL	Time code
	UB	User's bit
F-RUN or R-RUN	CTL	CTL
	TC	Time code
	UB	User's bit

❹ 25 Mbps and 50 Mbps mode lamps

In the 25 Mbps mode, the bottom lamp lights.
In the 50 Mbps mode, the top and bottom lamps light.

❺ WARNING lamp

This lights or flashes when the remaining tape time is less than 2 minutes, when the battery had discharged or when a problem with the unit's operation has been detected.

❻ LIGHT button

Each time this button is pressed, the lighting for the signal level display window and status display window is turned ON or OFF.

❼ METER button

This is used to switch what is displayed in the signal level display window. Normally, the audio level is displayed but when the METER button is pressed, the display switches to the input video signal level.
When the button is pressed again, the audio level display is restored.
(Even when the input video signal level is displayed, the audio level display will be automatically restored after 5 seconds.)

❽ CASSETTE IN lamp

This lights when the cassette tape has been inserted. It flashes in the standby off (half-loading) mode.

10

Parts and Their Functions

3. Control area

Channel condition displays
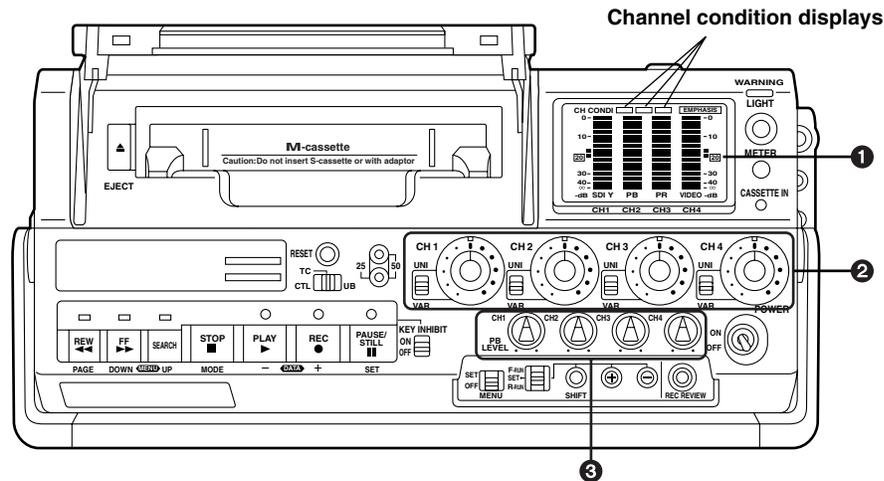
❶ Signal level display window

The audio levels are normally displayed here. However, when the METER button is pressed, the display switches to the input video signal levels.

When the METER button is pressed again, the audio level display is restored.

When the power is turned on, the audio levels are automatically displayed.

In the case of the audio level display, the three CH CONDI (channel condition) segments indicate the playback signal status.

CH CONDI lighting position	Playback signal status
0 or 1	Playback signals have an acceptable quality.
2	The playback signals have deteriorated in quality slightly but playback is still possible.
3	The playback signals have deteriorated in quality. When the segment on the left lights frequently, the heads must be cleaned and the unit's interior inspected.

❷ Recording level controls and UNI/VAR switch

These four controls are used to adjust the recording levels of the four audio channel (CH1—CH4) signals while monitoring the audio level display.

UNITY or VARIABLE can be selected using the UNI/VAR switch for the recording level of each control.

UNI: The input signals are recorded with their levels unchanged.
The levels cannot be adjusted using the controls.

VAR: The signals are recorded at the levels adjusted by the controls.

❷ PB LEVEL controls

These four controls are used to adjust the playback output levels of the four audio channel (CH1—CH4) signals.

<Note>

When the 25M mode has been set, the sound will be recorded and played back as two channels (CH1 and CH2).

4. Time code setting area
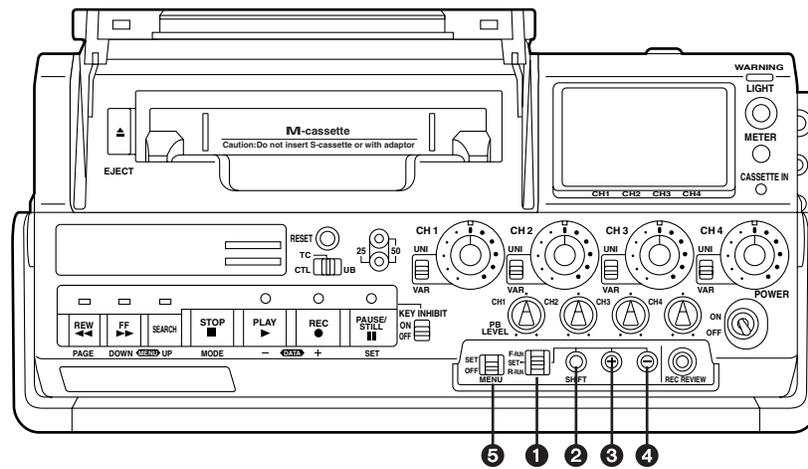
❶ TCG selector switch

This is used to set the advancing mode of the built-in time code generator.

F-RUN: This position is used to advance the time code continuously regardless of the unit's operation.

Set the switch here when aligning the time code with the actual time or locking the time code with an external signal.

SET: Set the switch to this position when the time code or user's bit is to be set.

R-RUN: Set the switch to this position to advance the time code only during recording. The time code will then be recorded continuously onto the tape where continuity has been ensured between the frames.

❷ SHIFT button

This button causes the setting digit to flash when the time code or user's bit is to be set.

It becomes operational when the TCG selector switch has been set to the SET position.

❸ "+" button

This is used to increase by 1 the figure for the setting digit when the time code or user's bit is to be set.

❹ "−" button

This is used to decrease by 1 the figure for the setting digit when the time code or user's bit is to be set.

❺ MENU switch

This is set to SET when performing settings using the on-screen menu items.

For normal operation, keep it at the OFF position.

Parts and Their Functions

Connector panel

The connector panel consists of the following three sections:

1. **Audio section**
2. **Video section**
3. **Power supply and other sections**

1. Audio section
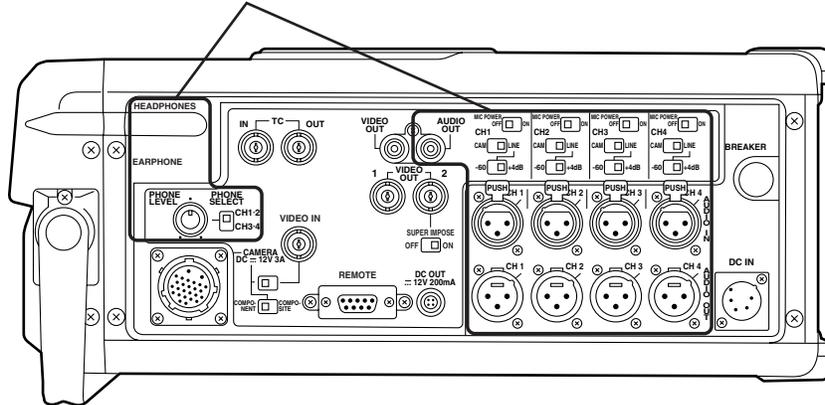
2. Video section
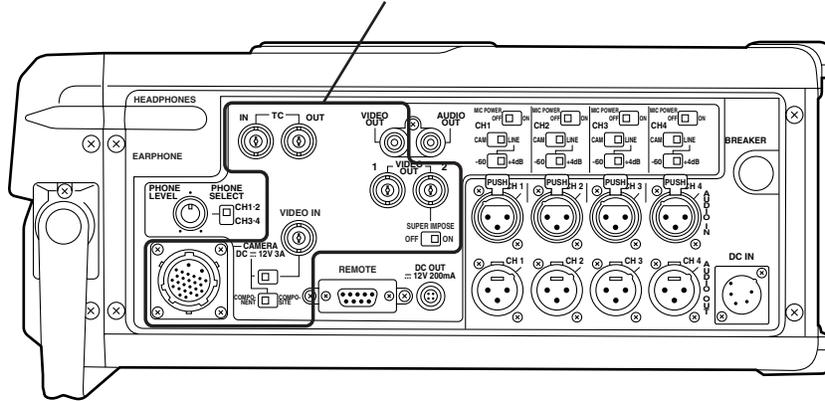
3. Power supply and other sections
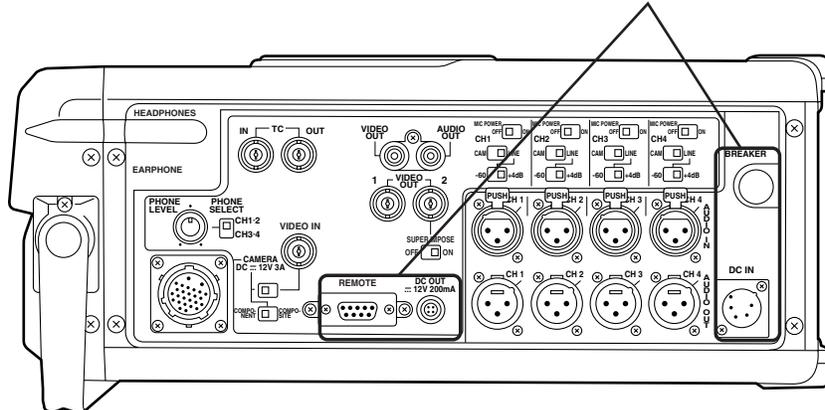
Parts and Their Functions

1. Audio section
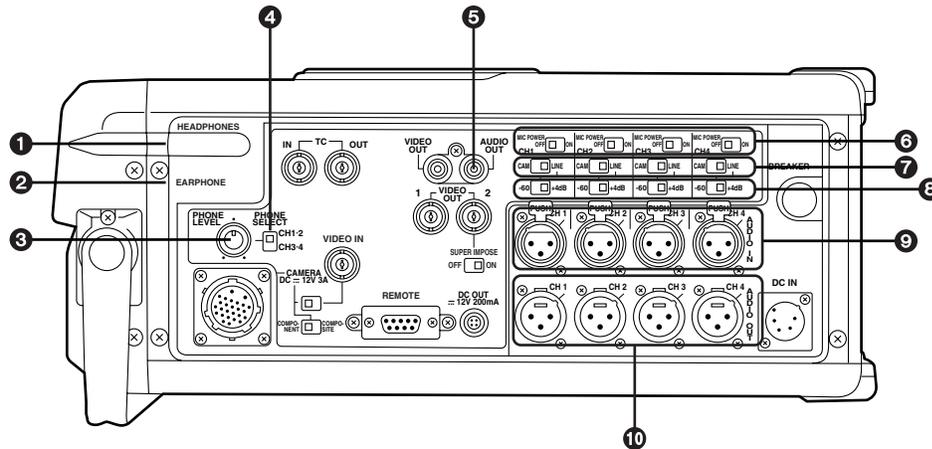
❶ HEADPHONES jack

When a pair of stereo headphones (with an 8-ohm impedance) are connected to this jack, the sound of the recording or playback and the warning alarms can be monitored through the headphones.
The sound to be monitored is set using the PHONE SELECT switch.

❷ EARPHONE jack

When earphones or a pair of stereo headphones equipped with a mini plug are connected to this jack, the sound of the recording or playback and the warning alarms can be monitored through the earphones.
The sound to be monitored is set using the PHONE SELECT switch.

❸ PHONE LEVEL control

This control is used to adjust the volume of the sound which is output from the HEADPHONES jack or EARPHONE jack.

❹ PHONE SELECT switch

This is used to select the sound to be monitored at the HEADPHONES jack or EARPHONE jack.
CH1/2: Sound of CH1 and CH2
CH3/4: Sound of CH3 and CH4

❺ AUDIO OUT connectors (PHONO)

The audio signals to be monitored are output through these connectors. Whether PCM sound or CUE sound is to be set as the audio output during playback can selected using setup menu item No. 705.
When PCM is selected, one of six kinds of channel outputs can be selected using setup menu item No. 731.

❻ MIC POWER switches

These turn the power (+48V) for the phantom microphones ON or OFF.
(The power can be switched to +12V using an internal switch. For further details, consult your dealer.)

❼ Audio input selector switches

These are used to switch the audio inputs of the four audio channels (CH1—CH4) individually.
CAM: Sound which is input from the CAMERA connector.
LINE: Sound which is input from the AUDIO IN connectors.

❽ Audio input level switches

These are used to switch the input level to –60 dBu or +4 dBu to match the level of the sound which is input from the AUDIO IN connectors. When the switches have been set to the –60 dBu position, the setting can be changed to –40 dBu using an internal switch.
(For further details, consult your dealer.)

❾ AUDIO IN connectors (XLR 3-pin)

These are used to connect a microphone or external device, and they enable the audio signals of up to four channels to be input.

❿ AUDIO OUT connectors (XLR 3-pin)

These are used to connect an external device, and they enable the audio signals of up to four channels to be output.

Parts and Their Functions

2. Video section
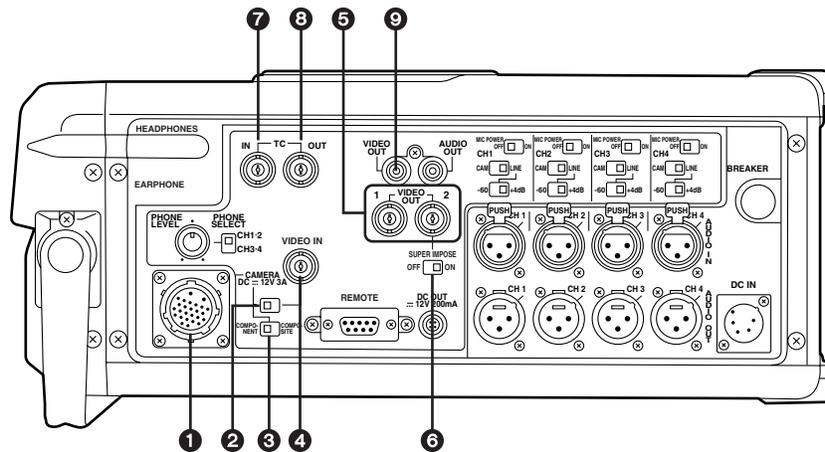
❶ CAMERA connector (26-pin)

This is used to connect a camera equipped with a multi connector.

It enables video signals, audio signals, control signals and other signals to be sent to and from the camera.

Power can also be supplied to the camera from the unit.

When the video input selector switch is set to the CAMERA position, the camera's video signals are input to the unit.

❷ Video input selector switch

This is used to select the input video signals.

VIDEO IN:
Composite video signals from the device which has been connected to the VIDEO IN connector.

CAMERA:
Component video signals or composite video signals from the camera which has been connected to the CAMERA connector.

❸ CAMERA input signal selector switch

This is used to select the input video signals from the CAMERA connector ❶.

COMPONENT: Component video signals from the camera

COMPOSITE: Composite video signals from the camera

❹ VIDEO IN connector (BNC)

The composite video signals are supplied to this connector.

When the video input selector switch is set to the VIDEO IN position, the video signals from the device connected to the VIDEO IN connector are input to the unit.

<Note>
When the unit is in the playback mode, supply standard signals to this connector. The playback output signals will then be synchronized with the input signals.

❺ VIDEO OUT 1, 2 connectors (BNC)

The composite video signals are output from these connectors.

When the SUPER IMPOSE switch is set to the ON position, the VTR's operating status or time code will be superimposed onto the video signals which are output from the VIDEO OUT 2 connector.

❻ SUPER IMPOSE switch

When this is set to ON, the VTR's operating status or time code will be superimposed onto the video signals which are output from the VIDEO OUT 2 connector.

❼ TC IN connector (BNC)

This connector is used for recording an external time code onto the tape.

❽ TC OUT connector (BNC)

During playback, the playback time code is output from this connector. During recording, the time code which is generated by the internal time code generator is output.

❾ VIDEO OUT connector (PHONO)

The composite video signals for monitoring purposes are output from this connector.

> **<Note>**
> The setup for the VIDEO IN and OUT connectors and CAMERA connector can be processed using the setup menu item No. 608 and 609 settings. (See page 50)

Parts and Their Functions

3. Power supply and other sections
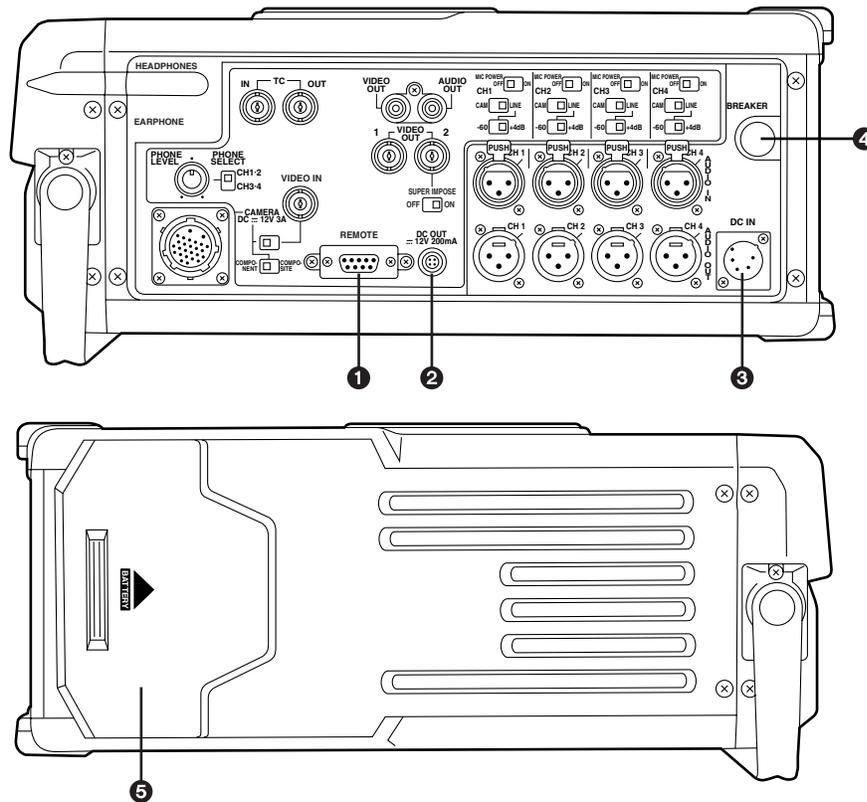
❶ REMOTE connector (9-pin)

When the dedicated external remote controller (AJ-A95: optional accessory) is connected to this connector, the unit can be operated from this external controller.

<Note>

This connector conforms to the RS-422A interface standard but it does not support any editing commands.

This unit does not have a phase-synchronizing function so that when it is used as a simple source VTR for editing applications, the phase synchronization of the source VTR (player) should be set to OFF for use.

❷ DC OUT socket

This is the DC 12V output socket.

It supplies power to the dedicated external remote controller (AJ-A95). The DC power cable is included with the AJ-A95.

❸ DC IN socket

This is the DC 12V input socket.

Use the AC adapter (AJ-B75) available as an optional accessory.

❹ BREAKER button

This shuts off the power when a problem has occurred.

As soon as the power is shut off, the BREAKER button pops out.

After checking the power connections, equipment connections and battery, push the BREAKER button back in. Power will be supplied if the problem no longer exists.

If the power fails to be supplied even after the BREAKER button has been pushed back in, consult your dealer.

❺ Battery compartment

The dedicated battery pack (AU-BP402: optional accessory) is installed inside the compartment.

16

Preparations

<Note>

This unit must be placed either on a level surface or upright for use.

It may not work properly if placed in any other position.
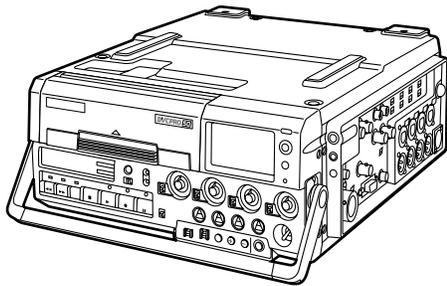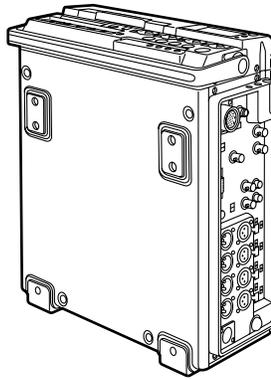
Flat   **Upright**

Preparing to supply power

1. When using an AC adapter

Use the dedicated AC adapter (AJ-B75: optional accessory).

<Notes>
- Switch off the unit's power before using the AC adaptor.
- Connect the AC adapter's power cord last of all.

1 **Connect the AC adapter's DC cable to the DC IN socket on the unit.**

2 **Connect the AC adapter's power cord, and set its power switch to the ON position.**

3 **Set the POWER switch on the unit's front panel to ON.**

DC IN connector

POWER switch

Power switch

AC adapter (AJ-B75)
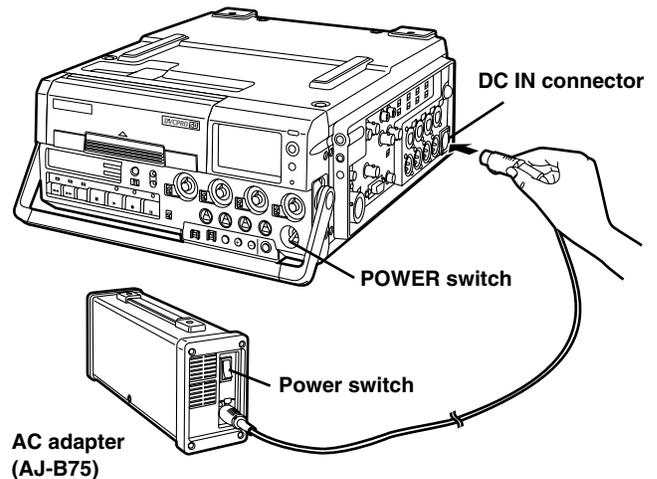
Preparations

2. When using a battery pack

Use the dedicated battery pack (AU-BP402: optional accessory). It is recommended that a spare battery pack be kept on hand.

1 **Open the cover of the battery compartment.**
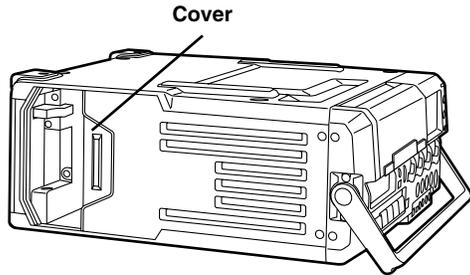
Cover

2 **Firmly insert the battery pack as far in as it will go.**

Battery pack
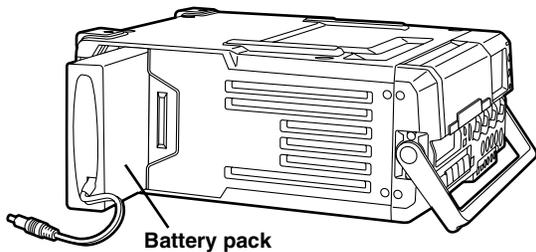
3 **Connect the plug, and stow any slack cord away inside the compartment.**

Plug
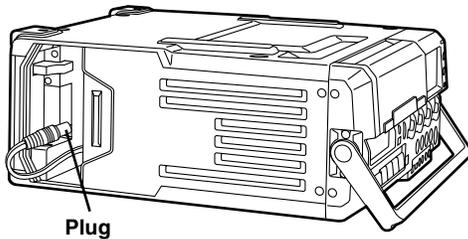
4 **Close the cover.**

5 **Set the POWER switch on the unit's front panel to ON.**

6 **Check the battery level.**
The battery level is displayed in the status display window.

Battery level display
This indicates the remaining battery charge in segments.
● When all 7 segments light up, it means that the battery has a full charge.
● As the battery continues to discharge, the segments go off one by one in sequence.
● When the segment at the "E" (empty) end starts flashing, the WARNING lamp also flashes, and the warning alarm sounds intermittently, it means that the battery will soon be fully discharged.
● When all 7 segments flash, the WARNING lamp remains lighted and the warning alarm sounds continuously, it means that the battery is now fully discharged.
<Note>
The warning alarm can be set using setup menu items No. 900 and 901.

Battery voltage and segment display
(with AU-BP402)

E	BATT	F
■ ■ ■ ■ ■ ■ ■		

Over 12.5 V
12.35 V to 12.5 V
12.25 V to 12.35 V
12.2 V to 12.25 V
12.05 V to 12.2 V
11.85 V to 12.05 V
11.4 V to 11.85 V
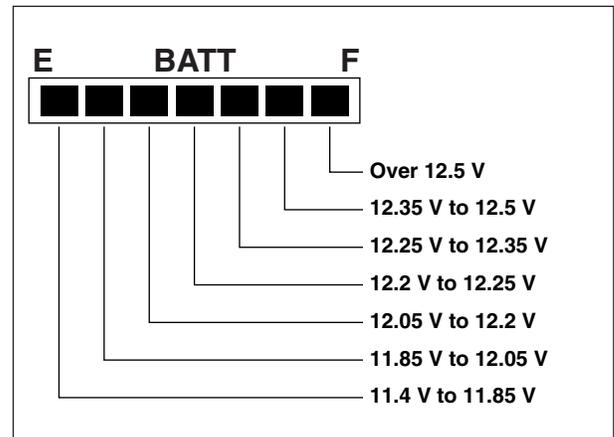
Preparations

Preparing the cassette tape

1. Concerning tapes

\<Note\>
DV tapes bearing either the "![DV]" or "![Mini DV]" logo for regular consumer applications cannot be used. Do not insert them into the unit.

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

M size cassette
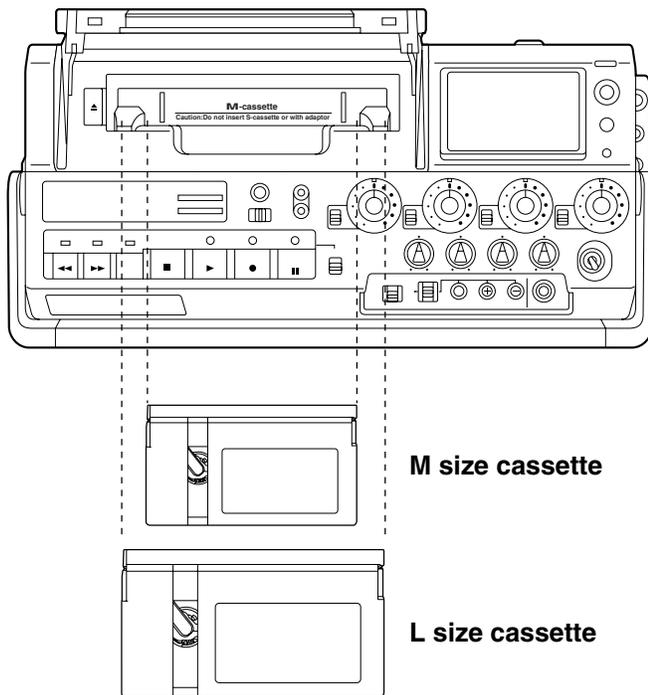
L size cassette

Types of tapes and their recording times

M size cassettes
- **50 Mbps mode**
  Tapes with a recording/playback length of up to 33 minutes:
- **25 Mbps mode**
  Tapes with a recording/playback length of up to 66 minutes:

AJ-P12MP, AJ-P24MP, AJ-P33MP, AJ-P46MP, AJ-P66MP

L size cassettes
- **50 Mbps mode**
  Tapes with a recording/playback length of up to 92 minutes:
- **25 Mbps mode**
  Tapes with a recording/playback length of up to 184 minutes:

AJ-P34LP, AJ-P66LP, AJ-P94LP, AJ-P126LP, AJ-5P92LP ∗

∗For AJ-5P92LP cassette tapes recorded using the DVCPRO (25 Mbps) mode, use a VTR supporting DVCPRO (25 Mbps) 184 minute tapes.

Preparations

2. How to insert the cassette tape

1 **Set the unit's POWER switch to ON.**

Status display window

POWER switch
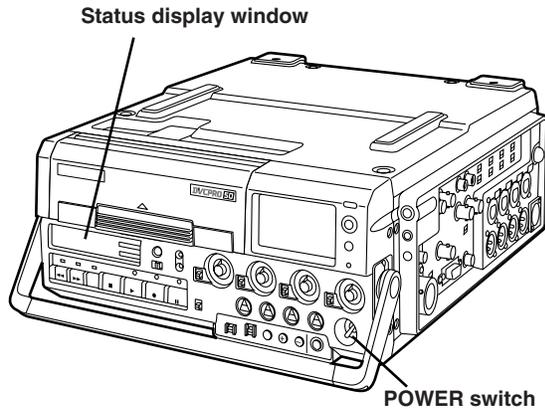
2 **Check that the "HUMID" display is not indicated on the status display window.**

<Note>
If "HUMID" is indicated, keep the power on, and wait until the indication is cleared.

3 **Press the cassette insertion slot cover to open it.**
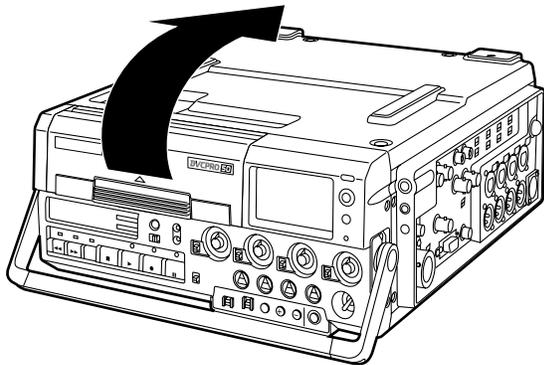
4 **Insert the cassette tape, and close the cassette insertion slot cover.**
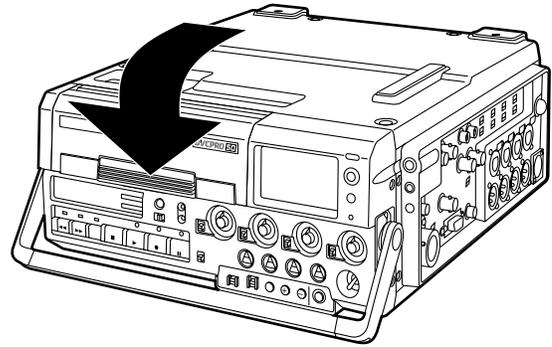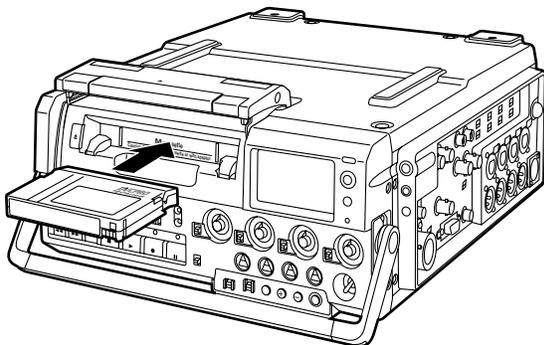
5 **Check the remaining tape.**
The remaining tape time is indicated on the status display window.

Remaining tape display
This indicates the remaining tape time in segments.
- When all 7 segments light up, it means that there is more than 21 minutes of tape remaining. (This can be changed to more than 30 minutes using setup menu item No. 905.)
- When the segment at the "E" (empty) end lights up, it means that 3 minutes of the tape are left. (This can be changed to 5 minutes using the setup menu item No. 905.)
- When the segment at the "E" (empty) end starts flashing, it means that 2 minutes of the tape are left. (This can be changed to 3 minutes using the setup menu item No. 904.)
  If this happens during recording, the WARNING lamp flashes, and a warning alarm sounds intermittently.
- When all 7 segments flash, the WARNING lamp remains lighted and the warning alarm sounds continuously, it means that the tape has come to its end.

<Notes>
- The warning alarm is output from the PHONE jack.
- The warning alarm can be set using setup menu items No. 902, 903 and 904.

Remaining tape and segment display

```
E          TAPE          F
■ ■ ■ ■ ■ ■ ■
```
- 18 to 21 minutes (or over 30 minutes)
- 15 to 18 minutes (or 25 to 30 minutes)
- 12 to 15 minutes (or 20 to 25 minutes)
- 9 to 12 minutes (or 15 to 20 minutes)
- 6 to 9 minutes (or 10 to 15 minutes)
- 3 to 6 minutes (or 5 to 10 minutes)
- Under 3 minutes (or under 5 minutes)
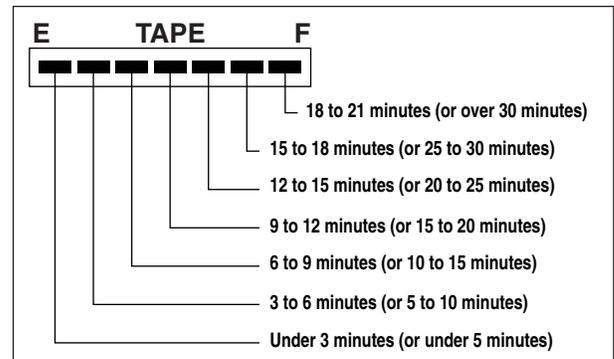
Preparations

3. How to eject the cassette tape

1 **Check that the unit's power has been turned on.**

2 **Press the cassette insertion slot cover to open it.**

3 **Press the EJECT button.**
The cassette tape is now ejected.

EJECT button
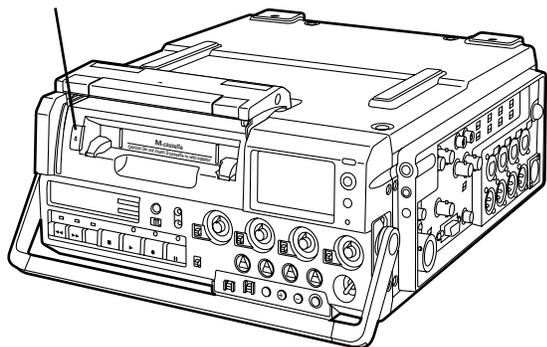
4 **Take out the cassette tape, and close the cassette insertion slot cover.**

Recording

Preparing to record

1. Connecting the equipment

Connect the camera, VTR, video monitor and other external devices.

Video monitor, VTR or other unit with composite input

Microphone, tape recorder, etc.

Stereo headphones

Earphones

Stereo amplifier or other device for audio monitoring

Remote controller, etc.

VTR, camera or other unit with composite output

Color video camera with component output or composite output
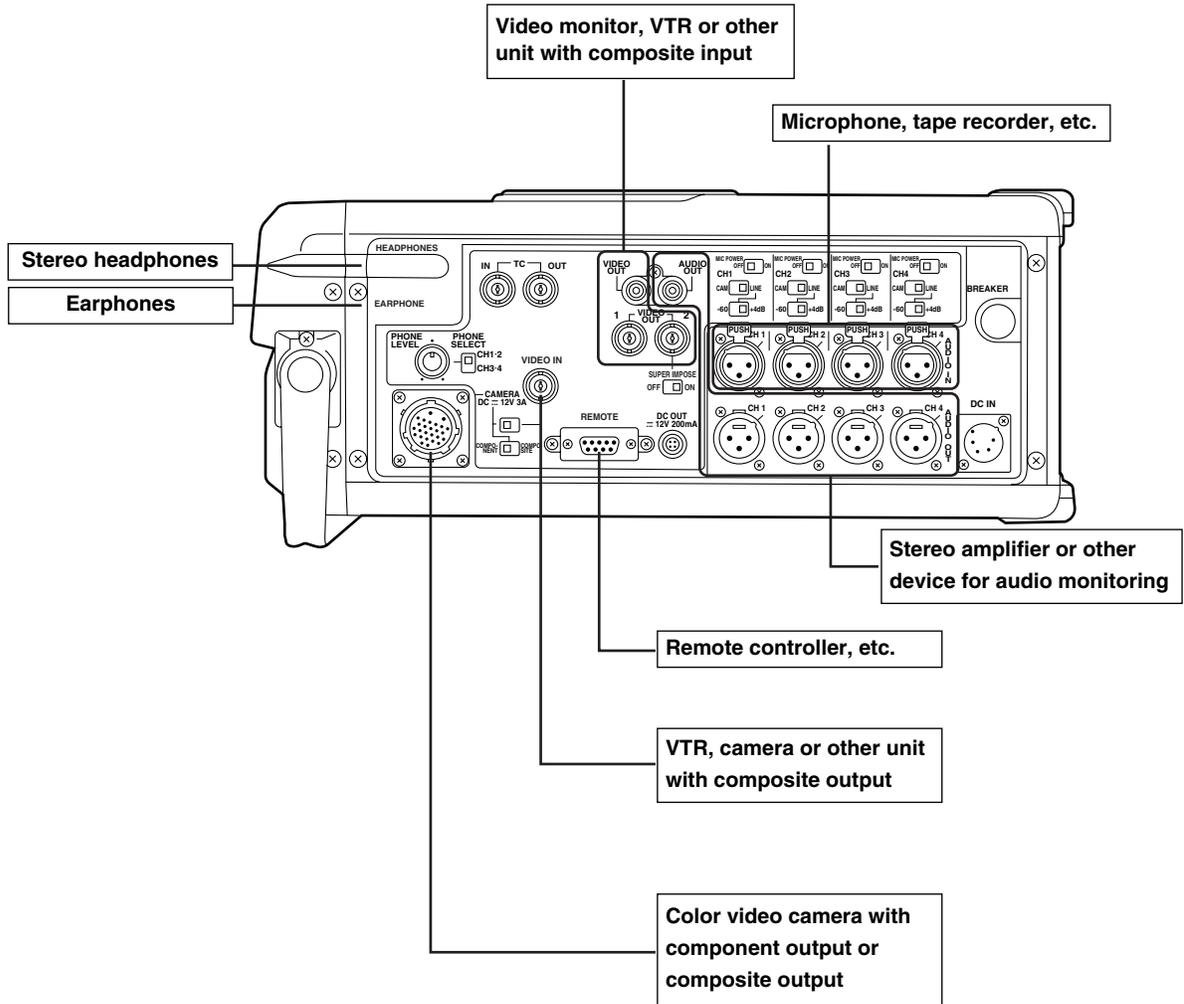
Recording

2. Setting the video inputs

Selecting the video input signals

The following three kinds of video signals can be supplied to the unit.

They are selected using the video input selector switch and camera input selector switch.

● To select the composite video signals which are to be supplied to the VIDEO IN connector, set the video input selector switch to the VIDEO IN position.

  <Note>

  Bear in mind that stable recording may not be possible if non-standard signals are supplied.

● To select the signals which are to be supplied to the CAMERA connector, set the video input selector switch to the CAMERA position.

  To select either component signals or composite signals as the video signals supplied from the camera, use the camera input selector switch.

Video input selector switch

VIDEO IN connector

Camera input selector switch

CAMERA connector

<Note>
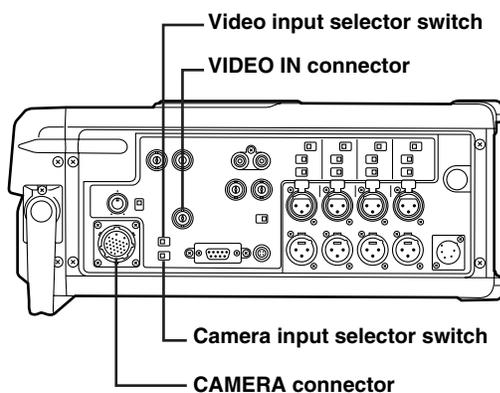
The camera's component signals are set to the Betacam component level. To set them to the MII level, first consult your dealer, and then set SW1 on the VIDEO JACK circuit board (located inside the connector panel) to the MII position.

Video input level display method

Whether the video input signals are being supplied can be monitored on the level meter of the signal level display window.

<Note>

Check the video input level using 75% SMPTE color bar signals. The level will not be displayed properly if other video signals are used.

Signal level display window
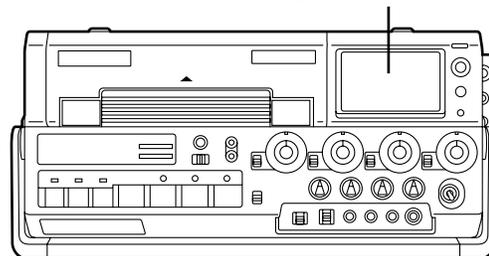
1 **Set the unit's POWER switch to ON, and insert a cassette tape on which signals can be recorded.**

The level meter now appears on the signal level display window.

2 **Press the METER button.**

The level meter normally displays the audio level but when the METER button is pressed, it displays the input video signal level instead. When it is pressed again, the audio level display is restored.

(Even when the input video signal level is displayed, the audio level display will be automatically restored in 5 seconds.)

When component signals from the camera are input

The Y, B-Y and R-Y signal levels are displayed in this order from the left.

The B-Y and R-Y levels deflect up to the –10 dB scale marking when 75 % SMPTE color bar signals are input.

```
CH CONDI  [    ] [    ] [    ]   EMPHASIS
  0-                               -0

 10-  ▮    ▮    ▮                  -10

 20 ■                           ■  20

 30-  ▮    ▮    ▮                  -30
 40-                              -40
 ∞-                               -∞
 -dB   Y    PB    PR               -dB
```
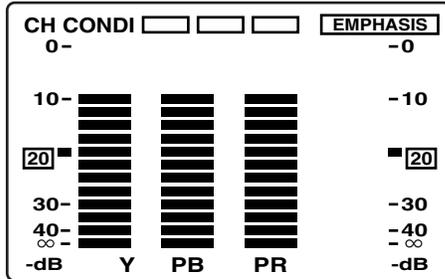
When composite signals from the camera are input

The video signal Y level is displayed.

```
CH CONDI  [    ] [    ] [    ]   EMPHASIS
  0-                               -0

 10-  ▮                            -10

 20 ■                           ■  20

 30-  ▮                            -30
 40-  ▮                            -40
 ∞-                               -∞
 -dB   Y                           -dB
```
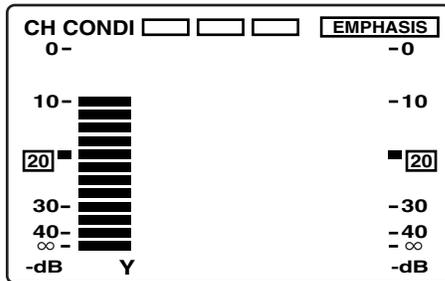
When signals are input to the VIDEO IN connector

The video signal level is displayed.

```
CH CONDI  [    ] [    ] [    ]   EMPHASIS
  0-                               -0

 10-              ▮                -10

 20 ■             ▮              ■  20

 30-             ▮                 -30
 40-             ▮                 -40
 ∞-                               -∞
 -dB          VIDEO                -dB
```

<Notes>

The level displays above are indicated when 75 % SMPTE color bar signals are supplied as the input signals and the PB and PR level is 0.7 V [p-p]. The display level drops by –20 dB when the signal level is reduced by about 6 dB.

Recording

3. Setting the audio inputs

Selecting the audio input signals
The audio signals to be supplied to the unit are selected using the audio input selector switch.
● To select the audio signals to be supplied to the AUDIO IN connector, set this switch to the LINE position.
● To select the audio signals to be supplied to the CAMERA connector, set this switch to the CAM position.

Audio input selector switch

CAMERA connector   **AUDIO IN connector**
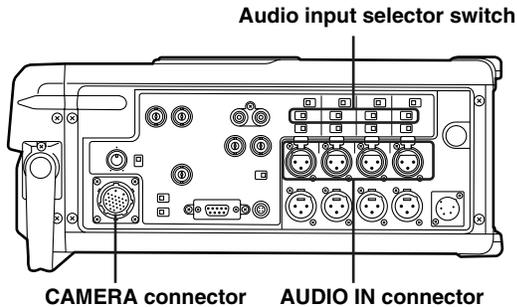
Adjusting the recording level
The audio levels of the audio signals supplied to the unit can be adjusted and the signals recorded at those levels.
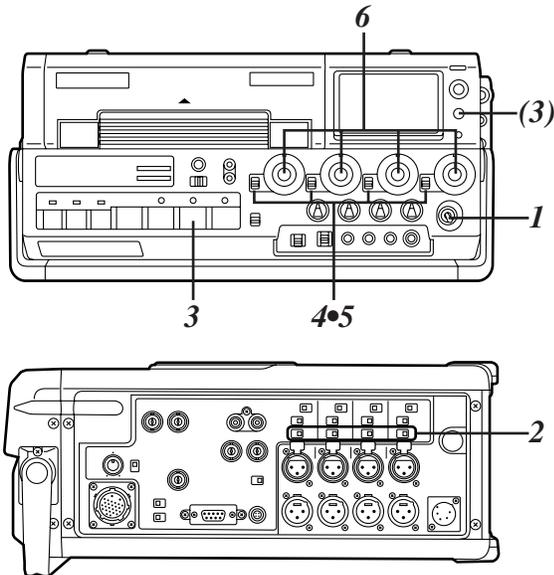
1 Set the unit's POWER switch to ON, and insert a cassette tape on which signals can be recorded.
The level meter now appears on the signal level display window.

2 Select the audio input level selector switch to a setting (–60 dBu or +4 dBu) that corresponds with the input level.

3 Set the UNI/VAR switch for the audio channel to be adjusted to the UNI position.
The audio input level is displayed as it stands.

4 Set the UNI/VAR switch for the audio channel to be adjusted to the VAR position.

5 While monitoring the level meter, adjust the recording levels using the recording level controls.

Using the emphasis function
Emphasis can be added to the input signals and the signals recorded with emphasis by means of the setup menu item No. 704 setting.
EMPHASIS appears on the audio level display when emphasis has been added to the input signals.

25

Recording

4. Setting the time data

How to set the time code
<Note>
If both the user's bit and time code are to be used, set the user's bit first.

If the time code is set first, the time code generator will stop while the user's bit is being set so that the time code setting will be off. The range in which the time code can be set extends from 00:00:00:00 to 23:59:59:29.

1   *2•5   4*
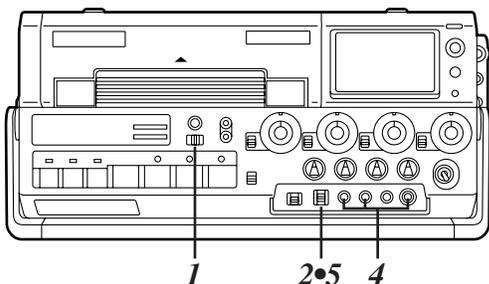
1 Set the DISPLAY switch to the TC position.

2 Set the TCG selector switch to the SET position.

3 Select DF or NDF as the setup menu item No. 510 (DF MODE) setting.
- **DF:** When the time code is to be advanced in the drop frame mode
- **NDF:** When the time code is to be advanced in the non-drop frame mode

4 Set the time code using the SHIFT button as well as the "+" and "–" buttons.
- **SHIFT button:**
  This causes the digit to be set to flash.
  Each time it is pressed, the flashing digit moves to the right.
- **"+" button:**
  This increases the flashing digit by 1.
- **"–" button:**
  This decreases the flashing digit by 1.

5 Set the TCG selector switch to the F-RUN or R-RUN position.
- **F-RUN:** When the time code is to be advanced in the free run mode
- **R-RUN:** When the time code is to be advanced in the rec run mode

<Notes>
- At the R-RUN position, the first recording to be made after the time code has been set starts from the value which was just set. However, if the time code was not set, recording starts at the value which continues on from the value which is read out from the tape.
- Select PRESET for the setup menu item No. 532 setting in order to prevent the time code from continuing on from the value which is read out from the tape when recording after the cassette has been inserted or after the stop mode has been established.

Concerning the time codes when the battery is replaced
The backup mechanism is still operational even when the battery is being replaced, and the time code generator continues operating for an extended period of time (approx. one year).

Recording

How set to the user's bit

By setting the user's bit, a memo (time or date) or other information using up to 8 hexadecimal digits can be recorded on the sub-code track.

1   2   4
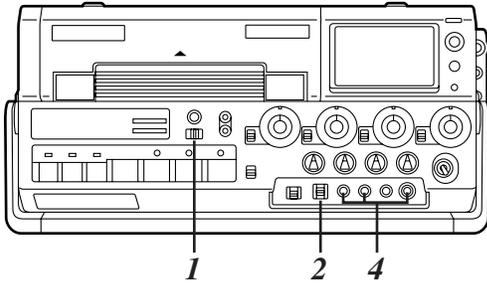
1 Set the DISPLAY switch to the UB position.

2 Set the TCG selector switch to the SET position.

3 Select USER as the setup menu item No. 530 (UB MODE) setting.

4 Set the user's bit using the SHIFT button as well as the "+" and "−" buttons.

   SHIFT button:
      This causes the digit to be set to flash.
      Each time it is pressed, the flashing digit moves to the right.
   "+" button:
      This increases the flashing digit by 1.
   "−" button:
      This decreases the flashing digit by 1.

● **A through F in hexadecimal notation are displayed as shown in the table below.**

Hexadecimal notation	A	B	C	D	E	F
Display	*A*	*b*	*C*	*d*	*E*	*F*

Concerning the user's bit memory function
The user's bit setting is automatically stored in the memory and retained even when the unit's power is turned off.

<Note>
When TIME or DATE has been selected with the UB MODE setting, the date or time which was set using setup menu item No. 540 (TIME/DATE) is entered in the user's bit.

● When TIME is selected, the hours, minutes and seconds are entered in the user's bit.
● When DATE is selected, the year, month, day and hours are entered in the user's bit.

Recording

Procedure for locking to the external time code

3   2   1
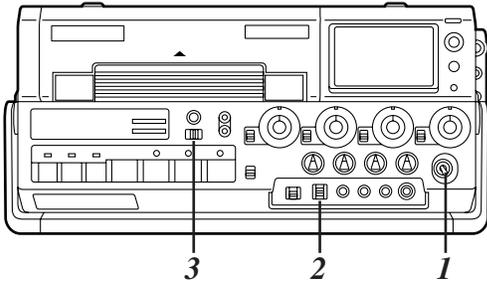
1 Set the unit's POWER switch to ON.

2 Set the TCG selector switch to the F-RUN position.

3 Set the DISPLAY switch to the TC position.

4 Supply the reference time code and reference video signals whose phase correlation meets the time code standard to the TC IN connector and VIDEO IN connector, respectively.

When connecting two or more AJ-D92 units and locking the time code
Set the TCG selector switch on each AJ-D92 unit to the F-RUN position.

<Note>
Once the operation to lock the time code to the external time code has been performed, the time code is instantly locked to the external time code, and the same value as the external time code value is displayed on the counter. Do not set the unit to the recording mode for the several seconds it takes until the time code stabilizes.

Concerning the user's bit setting while the time code is locked to the external time code
While the time code is locked to the external time code, only the time data is locked to the time data of the time code supplied from the external source.
This means that the user's bit can be set separately for each unit.
In order to lock the user's bit to the user's bit of the time code supplied from the external source, set it to the EXT mode which is set using setup menu item No. 530.

To release the time code from being locked to the external time code
First stop supplying the external time code, and then set the TCG selector switch to the R-RUN position.

When switching the power supply from the battery to AC adaptor while the time code is locked to the external time code
In order to ensure that the time code generator's power supply remains uninterrupted, first connect the AC adaptor to the DC IN socket, and then disconnect the battery pack. If the battery pack is disconnected first, no guarantees can be made for the continuity of the locking to the external time code.

Recording

Locking the time code to the external time code

The unit's time code generator can be locked to an external time code generator.

Example of connections used for locking to an external time code
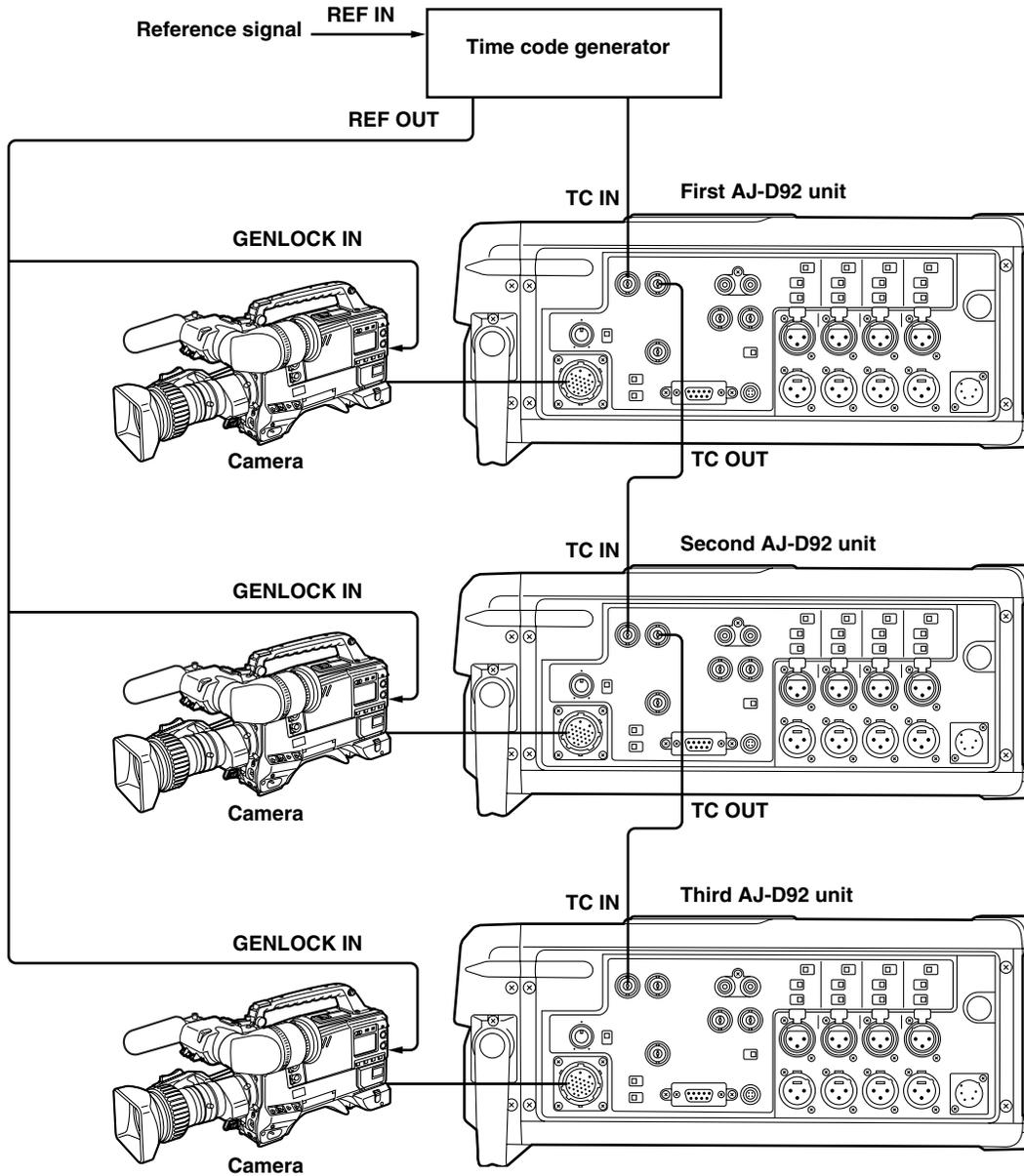
Recording

Recording Operations

1. Recording using the CAMERA connector

1

4 2

3
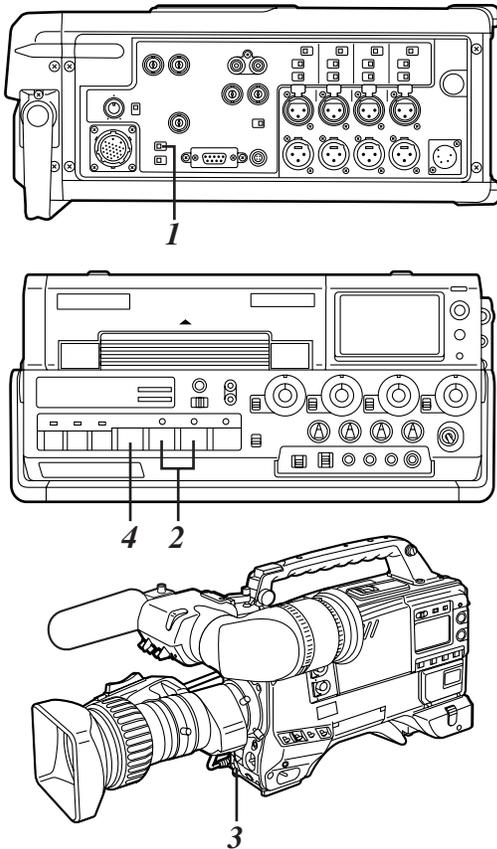
1 **Set the video input selector switch to the CAMERA position.**

2 **Press the REC button and PLAY button at the same time.**
The unit is now set to the standby mode.
<Note>
Since recording will start immediately at this point if the camera's VTR start/stop button is at the start setting, make sure that the button is at the stop setting.

3 **Press the camera's VTR start/stop button to start recording.**
When the REC lamp inside the viewfinder stops flashing and lights, recording is commenced.
<Note>
The frame-to-frame continuity mode is established when the VTR start/stop operations are performed at the camera. (This mode can be changed using setup menu item No. 110.)

4 **Press the unit's STOP button when recording is to be ended.**

<Notes>
● If the signals (component video signals or composite video signals) selected using the CAMERA input signal selector switch are not supplied to the CAMERA connector, the mismatching detector circuit is activated, the unit is set to the REC PAUSE mode, and recording is not commenced.
● The detector circuit is activated and the unit is set to the REC PAUSE mode also when the signals are interrupted during recording.
When the signals are restored, recording will automatically recommence.

When the detector circuit is activated in the above way and the REC PAUSE mode is established, error code [E-A0] and the time data will be displayed alternately in the status display window.

> However, recording will only be continued if ON has been selected as the setup menu item No. 130 (NO VIDEO REC) setting.
> In this case, input signal error is indicated by the warning lamp and alarm.

Recording

2. Recording using the VIDEO IN connector

1

3   2
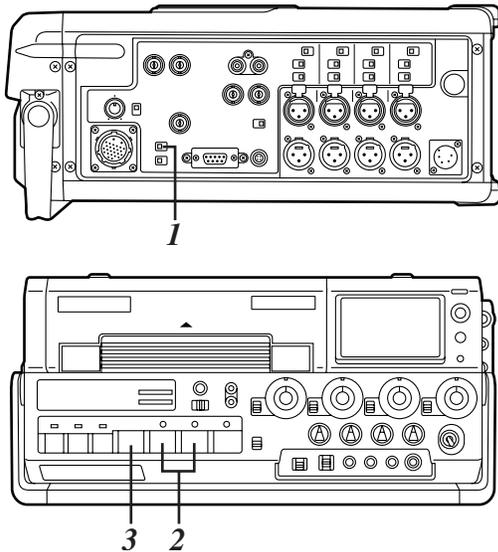
1 **Set the video input selector switch to the VIDEO IN position.**

2 **Press the REC button and PLAY button at the same time.**
Recording now starts.

3 **Press the unit's STOP button when recording is to be ended.**

<Notes>
- If the video signals are not supplied to the VIDEO IN connector, the mismatching detector circuit is activated, the unit is set to the REC PAUSE mode, and recording is not commenced.
- The detector circuit is activated and the unit is set to the REC PAUSE mode also when the signals are interrupted during recording.
  When the signals are restored, recording will automatically recommence.
  (The frame-to-frame continuity mode can be changed using setup menu item No. 110.)

When the detector circuit is activated in the above way and the REC PAUSE mode is established, error code [E-A0] and the time data will be displayed alternately in the status display window.

> **However, recording will only be continued if ON has been selected as the setup menu item No. 130 (NO VIDEO REC) setting.**
> **In this case, input signal error is indicated by the warning lamp and alarm.**

3. To stop the recording temporarily

1•2

(1•2)
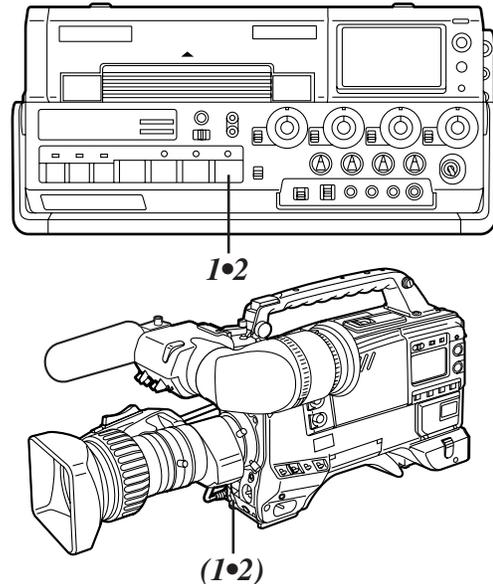
1 **Press the unit's PAUSE/STILL button or camera's VTR start/stop button.**
The unit is set to the REC PAUSE mode, and the PAUSE/STILL lamp flashes.

2 **To end the recording, press the unit's PAUSE/STILL button or camera's VTR start/stop button.**

<Notes>
- When recording was commenced using the camera's VTR start/stop button, the operation cannot be temporarily stopped using the unit's PAUSE/STILL button.
- When the REC PAUSE mode continues, the unit will reverse the tape for several frames every 2 minutes to protect the cylinder heads and tape.
  When the REC PAUSE mode has continued for 30 minutes, the tape is unloaded, the standby OFF (half-loading) mode is established, and the CASSETTE IN lamp flashes.

31

Recording

4. REC REVIEW function

This function serves to play back the part of the tape immediately before the end of the recording to check whether the recording was executed properly.
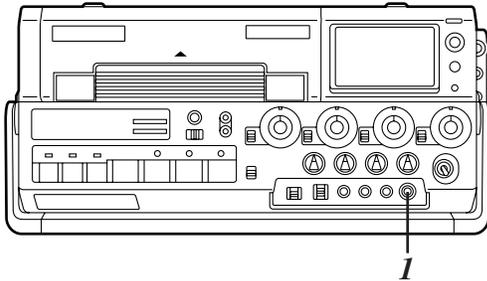
1 **Press the REC REVIEW button in the REC PAUSE mode.**
The tape is rewound at approximately –1× normal speed while the REC REVIEW button is held down.
The tape is rewound for a minimum of 2 or so seconds and a maximum of 10 or so seconds.
When the REC REVIEW button is released, playback automatically starts from the point where the button was released until the REC PAUSE position, and the REC PAUSE mode is established.

<Note>
When the temporary stop mode has been released during a REC REVIEW operation, the REC command is accepted but recording starts after the tape is rewound to the frame-to-frame continuity point.

5. Auto back function

In order to ensure frame-to-frame continuity, this function automatically rewinds the tape for approximately 1 second after REC PAUSE and stops the tape.
When recording is to be resumed, the tape begins its approach and after it is completely on-track, recording is resumed. In this way, continuous recording free from disruptions can be ensured.

To initiate frame-to-frame continuity after a break has been searched for in the playback mode
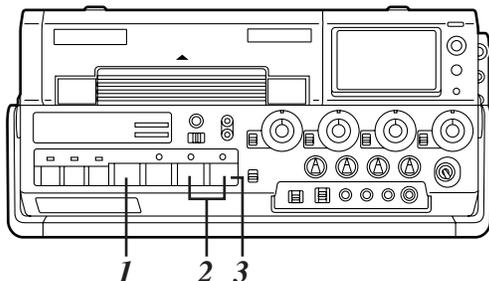
1 **In the playback mode, search for the break in the video recording, and press the STOP button within 1 to 2 seconds.**

2 **Press the REC button and PAUSE/STILL button at the same time.**
After the tape is rewound to the break in the video recording, the tape is further rewound by the auto back function, and the unit is set to the REC PAUSE mode.

3 **Press the PAUSE/STILL button to start recording.**
When recording is started, the tape begins its approach, and recording with frame-to-frame continuity can be conducted.

<Note>
It is recommended that REC be selected as the setup menu item No. 105 setting to transfer to the recording mode more quickly.

6. Preventing erroneous recording operations

● During recording, the unit will not respond to the pressing of any of the function buttons except STOP and PAUSE/STILL. (This is to prevent the transfer to another mode during recording.)
● When the KEY INHIBIT switch is set to ON, all the function buttons except for the ones set using setup menu item No. 000 will no longer work.
Under the initial settings, none of the function buttons except for STOP and EJECT will work.
When ENA has been selected as the setup menu item No. 000 setting, all the function buttons are made operable.

Playback

Preparing for playback

1. Selecting the sound to be monitored
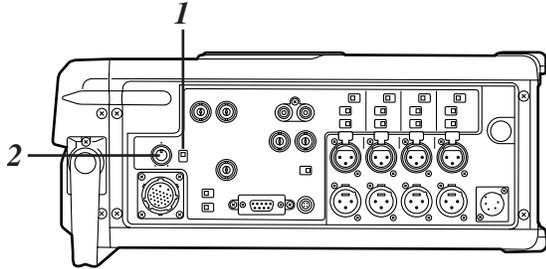
1 **Use the PHONE SELECT switch to set the sound which is to be monitored during playback at the HEADPHONES jack and EARPHONE jack.**

    CH 1/2: Sound of CH1 and CH2
    CH 3/4: Sound of CH3 and CH4

2 **Use the PHONE LEVEL control to adjust the output audio level.**

2. Playback in synchronization with the external signals

VIDEO IN connector

Video input selector switch
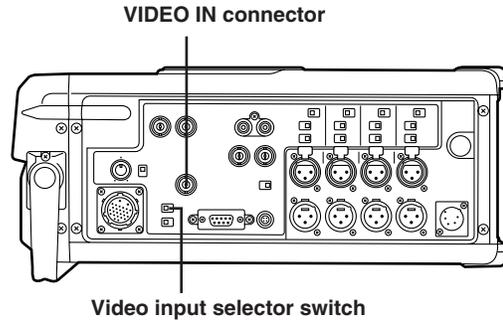
Connect the external signal, to which playback is to be synchronized, to the VIDEO IN connector, and set the video input selector switch to the VIDEO IN position. Playback is now initiated in synchronization with the signal which is connected to the VIDEO IN connector.
<Notes>
- If the VIDEO IN connector's signal is disconnected and re-connected during playback, the playback picture may be disturbed.
- It is recommended that a signal complying with the RS-170A standard be used as the reference signal for playback.

Playback

Playback Operations

1. Playback at the regular speed and still-picture playback
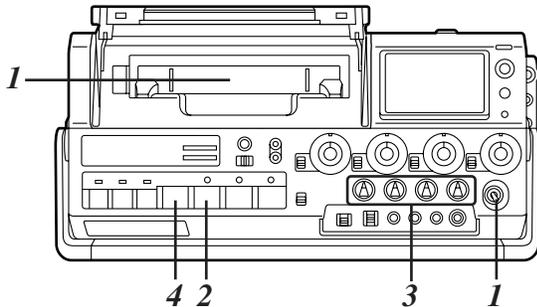
1 Set the unit's POWER switch to ON, and insert a cassette tape with signals already recorded on it.

2 Press the PLAY button.
The recorded pictures and sound will now be played back.

3 Use the PB LEVEL controls to adjust the playback output level of the sound.

4 Press the unit's STOP button to end the playback.

Temporarily stopping the playback
Press the PAUSE/STILL button during playback.
The PAUSE/STILL lamp flashes, the picture shown on the monitor is frozen, and the PLAY PAUSE mode is established.
Playback is resumed when the PAUSE/STILL button is pressed again.
When the PLAY PAUSE mode continues for 2 minutes, the unit will forward the tape for several frames to protect the cylinder heads and tape, and the STILL mode is established again.
When the STILL mode has continued for over 30 minutes, the standby OFF (half-loading) mode is automatically established in order to protect the tape.

<Notes>
● The PLAY PAUSE mode retention time can be set using setup menu item No. 400. When HALF has been selected as the setup menu item No. 401 setting, the tape is unloaded, and the standby OFF (half-loading) mode is established.
● Noise may appear on the still picture when the PAUSE/STILL button is pressed during playback.
● A still picture can be shown on the monitor in the STOP mode by selecting PB as the setup menu item No. 105 setting.
When the unit is used as a player, the playback picture can be made to appear more quickly by selecting PB as the setup menu item No. 105 setting.
It is recommended that PB be selected as the setup menu item No. 105 setting even when it is to be used as the source unit during editing.
If REC is selected, it may take some moments to achieve phase synchronization.

Playback

2. Cue playback and review playback

When the FF button or REW button is pressed in one of the search modes (search still, FWD search, REV search, FWD search still or REV search still), the tape is cued or reviewed at the speed which was selected for the setup menu item No. 100 setting.

Further, if the SEARCH button is pressed in the FF mode or REW mode, the tape is cued or reviewed at a reduced speed, namely, at the speed selected for the setup menu item No. 100 setting.

When the PAUSE/STILL button is pressed during cue or review playback, the tape will be temporarily stopped.

When it is pressed again, cue or review playback is resumed.

VTR operating mode	Function button	Transfer of VTR operation
PLAY or STOP	**SEARCH**	Search still
	FF or REW	FF or REW
FF	**PLAY or STOP**	PLAY or STOP
	SEARCH	FWD search (cue playback)
REW	**PLAY or STOP**	PLAY or STOP
	SEARCH	REV search (review playback)
Search still	**PLAY or STOP**	PLAY or STOP
	FF	FWD search (cue playback)
	REW	REV search (review playback)
FWD search (cue playback)	**SEARCH**	FF
	REW	REV search (review playback)
	PAUSE/STILL	FWD search still
REV search (review playback)	**SEARCH**	REW
	FF	FWD search (cue playback)
	PAUSE/STILL	REV search still
FWD search still	**PAUSE/STILL, SEARCH or FF**	FWD search (cue playback)
	REW	REV search (review playback)
REV search still	**PAUSE/STILL, SEARCH or REW**	REV search (review playback)
	FF	FWD search (cue playback)
Any mode	**PLAY**	PLAY
	STOP	STOP

35

Playback

3. Linear 0.3× speed playback

The slow still mode is established when the SEARCH button is pressed during still-picture playback (PLAY PAUSE).
Linear 0.3× speed playback is performed by pressing the FF or REW button in this mode.
When the PAUSE/STILL button is pressed during the linear 0.3× speed playback, the tape is temporarily stopped.
Linear 0.3× speed playback is restored when the PAUSE/STILL button is pressed again.
<Note>
Noise appears during linear 0.3× speed playback.

VTR operating mode	Function button	Transfer of VTR operation
PLAY	**PAUSE/STILL**	PLAY PAUSE
PLAY PAUSE	**PAUSE/STILL or PLAY**	PLAY
	SEARCH	Slow still
Slow still	**PLAY**	PLAY
	FF	FWD slow
	REW	REV slow
FWD slow	**REW**	REV slow
	SEARCH or PAUSE/STILL	FWD slow still
REV slow	**FF**	FWD slow
	SEARCH or PAUSE/STILL	REV slow still
FWD slow still	**PAUSE/STILL, SEARCH or FF**	FWD slow
	REW	REV slow
REV slow still	**PAUSE/STILL, SEARCH or REW**	REV slow
	FF	FWD slow
Any mode	**PLAY**	PLAY
	STOP	STOP
Any mode	**STOP →FF**	FF
	STOP →REW	REW

4. Variable speed playback
(When AJ-A95 is connected)

When the optional AJ-A95 remote controller is connected to the REMOTE connector, variable speed playback is enabled by operating the search dial on the AJ-A95.
<Notes>
● Noise appears on the screen during playback at any tape speed except the normal tape speed (1×).
● During variable speed playback, the sound recorded on the analog cue track is played back.

Playback

5. Reading and displaying the time data

The recorded time code and user's bit are read by the built-in time code reader during tape playback.
The time data which is read out can be displayed on the status display window or monitor screen.

Displaying the time data on the status display window

The time data to be displayed is selected by the TCG selector switch and DISPLAY switch positions.
What time data is to be displayed is determined in two stages: first by the position selected by the TCG selector switch, and second by the position of the DISPLAY switch.

Status display window

TCG selector switch
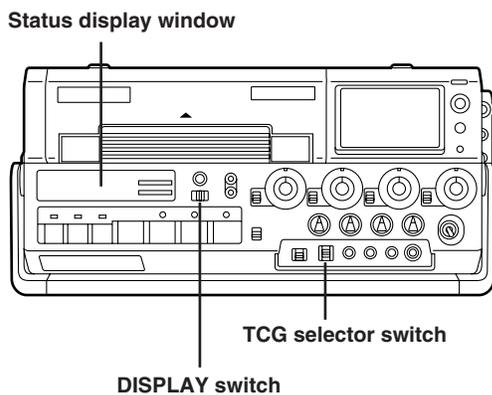
DISPLAY switch

TCG selector switch position	DISPLAY switch position	Data displayed
SET	TC or CTL	Time code
	UB	User's bit
F-RUN or R-RUN	CTL	CTL
	TC	Time code
	UB	User's bit

Displaying the time data on the monitor screen

When the time data is displayed in the status display window, connect the monitor's input connector to the VIDEO OUT 2 connector, and set the SUPER IMPOSE switch to ON.
The time data will now be displayed on the monitor screen.

VIDEO OUT 2 connector

SUPER IMPOSE switch
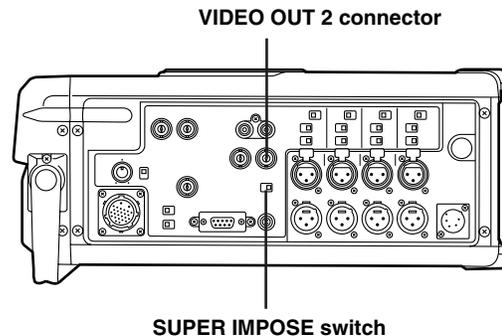
Outputting the playback time code from the TC OUT connector

When the unit is in the playback mode, the playback time code is output.

TC OUT connector
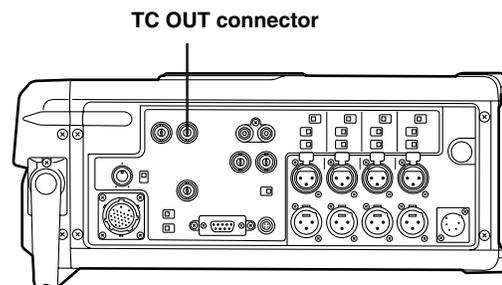
Superimposed Screens

When the unit's VIDEO OUT 2 connector has been connected to a TV monitor, the control signals, time codes, etc. can be displayed as abbreviations on the TV monitor screen.
This display can be set to ON or OFF using the SUPER IMPOSE switch.

TV monitor

No display:
Normally, no display.
P: Flashes when the DC supply voltage has dropped.
L: Flashes in "LOW RF" status.
N: Flashes in "NO RF" status.
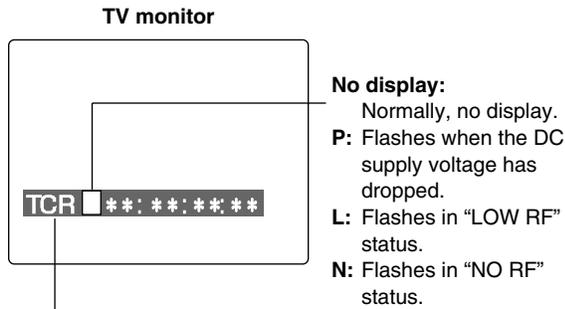
Abbreviations
CTL (control signal)
TCG (time code generator value)
TCR (playback value of time code)
UBG (user's bit generator value)
UBR (playback value of user's bit)

<Notes>
● The colon between the seconds and frames changes to a period when a drop frame time code is being read. The same time code also appears on the status display window, and the operating status display "DF" is indicated.
● When the time code signal is missing, it is automatically interpolated by the CTL signal.

The following appears on the display.

T * R   00 : 07 : 04 : 24

The colon between the seconds and frames changes to a period when a drop frame is read.
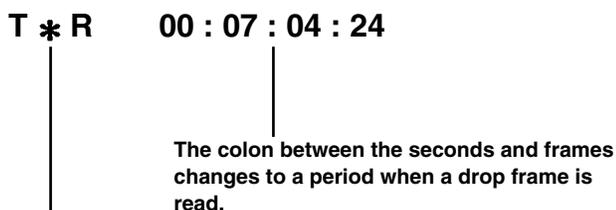
An asterisk (*) appears when the time code signal is missing. (For superimposing only)

Display characters
The background of the superimposed display characters can be changed by setting setup menu item No. 006 (CHARA TYPE).
(See page 45)

TV monitor   **TV monitor**
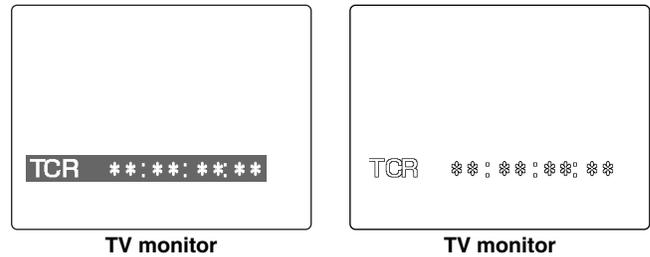
Display position
The position of the superimposed display can be changed by setting setup menu items No. 004 (CHARA H-POS) and No. 005 (CHARA-V.POS).
(See page 45)

TV monitor   **TV monitor**
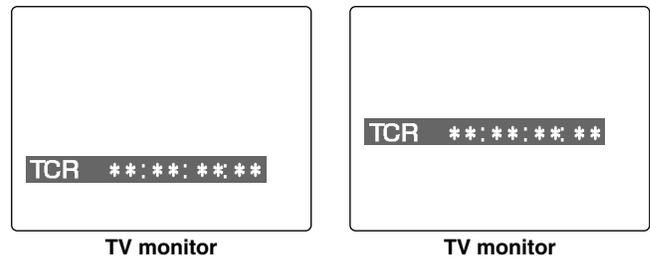
<Notes>
When the PAGE button and DATA+ button or DATA– button are pressed, the counter display appears temporarily on the TV monitor while these buttons are held down to enable the setting to be checked.
Even while the PAGE button is pressed, the settings can be performed using the DATA+ button or DATA– button while the actual status is checked.

Superimposed Screens

Operation modes

What is to be displayed on the screen can be selected by setting setup menu item No. 003 (DISPLAY SEL). (See page 45)

TIME: Counter value
T&STA: Counter value, VTR operation mode
T&R: Counter value, amount of remaining tape
T&S&R: Counter value, VTR operation mode, amount of remaining tape

TIME mode

```
TCR  **:**:**:**
```
— Counter value

TV monitor

T&STA mode

```
TCR  **:**:**:**
STOP
```
— Counter value
— VTR operation mode

TV monitor

T&R mode

```
TCR  **:**:**:**
REMAIN **** MIN
```
— Counter value
— Amount of remaining tape

TV monitor

T&S&R mode

```
TCR  **:**:**:**
   STOP
REMAIN **** MIN
```
— Counter value
— VTR operation mode
— Amount of remaining tape

TV monitor

<Notes>
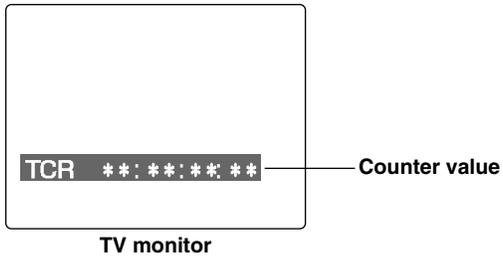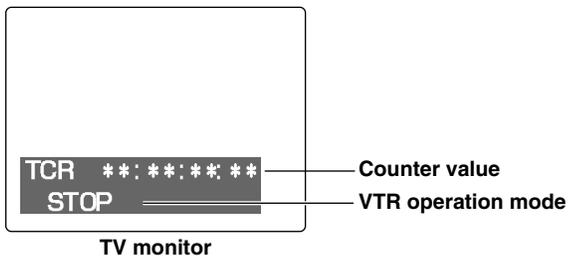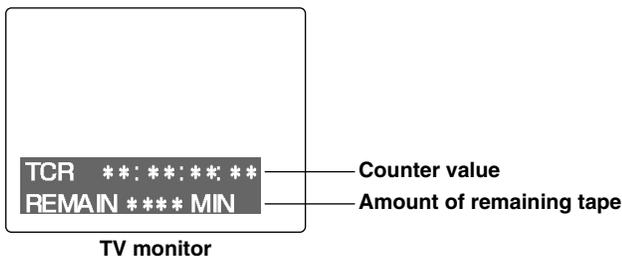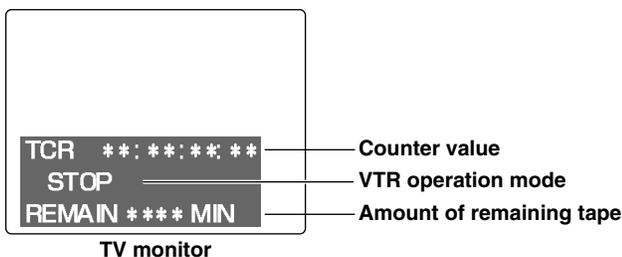
● When the beginning or end of the tape has been detected in the VTR operation mode, BOT (beginning of tape) or EOT (end of tape) is displayed at the beginning of the line.
Examples of what is displayed:
  EOT STOP
    (stop mode at end of tape)
  BOT STANDBY OFF
    (standby mode at beginning of tape)

● In the T&S&R mode, one of the following error displays appears on the third line (line where the amount of remaining tape is displayed).
[NO RF]:
  This appears when a blank section has been detected on the tape.
  At the same time, error code "E-09" and the warning display "RF" appear on the status display window.
[SERVO NOT LOCKED]:
  This appears when the servo is not locked.
  At the same time, error code "E-00" and the warning display "SERVO" appear on the status display window.
[LOW RF]:
  This appears when there is no head output.
  At the same time, error code "E-01" and the warning display "RF" appear on the status display window.
[HIGH ERROR RATE]:
  This appears when the error rate has deteriorated (when the 3 channel condition indicators are lighted).
  At the same time, error code "E-02" and the warning display "RF" appear on the status display window.

Setup (Initial Settings)

The unit's main settings can be performed and checked using the on-screen menus which are displayed on the video monitor connected to the unit.
It is also possible to perform and check the settings using the item numbers and setting numbers which appear on the front panel's display status area.
Two user setting memories are provided. The desired settings can be stored in these memories in advance for use during operation.

Setting method using on-screen menus

1 **Set the MENU switch to the ON position.**
The unit is now set to the menu setting mode, and the menu screen appears on the video monitor.

```
SETUP–MENU          MAIN
                         NO.000
    ∗ 000  BASIC
      100  OPERATION
      200  INTERFACE
      400  TAPE PROTECT
      500  TIME CODE
      600  VIDEO
      700  AUDIO
      900  WARNING&ALARM
           END
```

In the menu setting mode, the REW, FF, SEARCH, STOP, PLAY, REC and PAUSE/STILL function buttons serve as the PAGE, MENU-DOWN, MENU-UP, MODE, DATA–, DATA+ and SET buttons, respectively.

2 **Press the MENU-UP button or MENU-DOWN button to move the cursor (∗) to the menu whose settings are to be changed.**

3 **Press the MODE button to set each item in turn.**
To return to the menu screen, press the MODE button while holding down the PAGE button.

4 **Press the MENU-UP button or MENU-DOWN button to move the cursor (∗) to the menu item whose setting is to be changed.**
The page can be scrolled up or down by pressing the MENU-UP button or MENU-DOWN button while holding down the PAGE button.

5 **Press the DATA+ button or DATA– button to change the setting.**

6 **Press the SET button to enter the setting.**

To change more than one item on the menu, repeat steps *4*, *5* and *6* for each item.
<Note>
The setting can be canceled by pressing the MODE button.
When other items are to be changed without the setting having been entered, press the MODE button and then proceed with steps *4*, *5* and *6*.

7 **Set the MENU switch to the OFF position.**
This completes the menu settings.

Setup (Initial Settings)

How to set the time/date

1 **Set the unit to the menu setting mode, and move the cursor (∗) to 540.**

2 **Press the MODE button, and move the cursor to the TIME/DATE setting screen.**
To return to the menu screen, press the MODE button while holding down the PAGE button.

3 **Set the date and time.**

4 **Move the cursor to No. 05 and press the SET button.**
The screen for checking the settings now appears.

```
TIME/DATE SET OK?
     ∗ NO
       YES
```

5 **Press the MENU-UP button, set the cursor to the YES position, and press the SET button.**
As soon as the SET button is pressed, the date and time are entered, and the menu screen is restored.
● If the cursor was moved to NO instead and the SET button pressed, the menu screen is restored without the date and time having been entered.

How to return to the factory settings

1 **Set the MENU switch to the ON position.**
The unit is now set to the menu setting mode, and the menu screen appears on the video monitor.

2 **Press the RESET button.**
The unit is set to the default setting mode, and the default setting screen appears on the video monitor.

```
SELECT        MODE
          ∗ 0  ESCAPE
            1  LOAD
            2  SAVE
            3  PROTECT
```

3 **Press the MENU-UP button or MENU-DOWN button to move the cursor to the LOAD position, and press the SET button.**
The unit is set to the LOAD mode, and the load screen appears on the video monitor.

```
SET–UP MENU       <LOAD>

          ∗ NO
            FACTORY
            USER <1>
            USER <2>
```

4 **Press the MENU-UP button or MENU-DOWN button to move the cursor to FACTORY, and press the SET button.**
● When this operation is performed with the cursor moved to FACTORY, the factory settings will be restored.
● When this operation is performed with the cursor moved to NO instead, the factory settings are not restored, and operation is returned to the menu screen.

5 **Set the MENU switch to the OFF position.**
This completes the menu settings.

41

How to set the user default settings

1 **Set the MENU switch to the ON position.**
The unit is now set to the menu setting mode, and the menu screen appears on the video monitor.

2 **Perform steps *2* through *6* of "Setting method using on-screen menus" to change the items to the desired settings.**
(See page 40)

3 **Press the RESET button.**
The unit is set to the default setting mode, and the default setting screen appears on the video monitor.

```
SELECT         MODE
           * 0  ESCAPE
             1  LOAD
             2  SAVE
             3  PROTECT
```

4 **Press the MENU-UP button or MENU-DOWN button to move the cursor to the SAVE position, and press the SET button.**
The unit is set to the SAVE mode, and the save screen appears on the video monitor.

```
SET–UP MENU        <SAVE>
            * NO
              USER <1>
              USER <2>
```

5 **Press the MENU-UP button or MENU-DOWN button to move the cursor to USER1 or USER2, and press the SET button.**
● If this operation is performed with the cursor moved to NO instead, the settings are not updated, and operation is returned to the menu screen.

6 **The screen for checking the SAVE operation appears. Press the MENU-UP button or MENU-DOWN button to move the cursor to the YES position, and press the SET button.**
The settings are now saved in the memory.

```
SAVE OK?
           * NO
             YES
```

7 **Set the MENU switch to the OFF position.**
This completes the menu settings.

How to load the user settings

1 **Set the MENU switch to the SET position.**
The unit is now set to the menu setting mode, and the menu screen appears on the video monitor.

2 **Press the RESET button.**
The unit is set to the default setting mode, and the default setting screen appears on the video monitor.

```
SELECT         MODE
           * 0  ESCAPE
             1  LOAD
             2  SAVE
             3  PROTECT
```

3 **Press the MENU-UP button or MENU-DOWN button to move the cursor to the LOAD position, and press the SET button.**
The unit is set to the LOAD mode, and the load screen appears on the video monitor.

```
SET–UP MENU        <LOAD>

            * NO
              FACTORY
              USER <1>
              USER <2>
```

4 **Press the MENU-UP button or MENU-DOWN button to move the cursor to USER1 or USER2, and press the SET button.**
● If this operation is performed with the cursor moved to NO instead, no change is made to the user settings saved in the memory, and operation is returned to the menu screen.

5 **Set the MENU switch to the OFF position.**
This completes the menu settings.

How to protect the menus

Opening the setup menus can be prevented even when the MENU switch on the front panel is set to the SET position by setting the unit to the menu protect mode.

1 **Set the MENU switch to the SET position.**
The unit is now set to the menu setting mode, and the menu screen appears on the video monitor.

2 **Press the RESET button.**
The unit is set to the default setting mode, and the default setting screen appears on the video monitor.

```
SELECT        MODE
         * 0  ESCAPE
           1  LOAD
           2  SAVE
           3  PROTECT
```

3 **Press the MENU-UP button or MENU-DOWN button to move the cursor to the PROTECT position, and press the SET button.**
The unit is set to the menu protect setting mode, and a screen for verifying whether to protect the setup menus appears on the video monitor.

```
   MENU PROTECT OK?
          * NO
            YES
```

4 **Press the MENU-UP button or MENU-DOWN button to move the cursor to the YES position, and press the SET button.**
The menu screen is now displayed.

5 **Set the MENU switch to the OFF position.**
The unit is set to the menu protect mode.
Now, even if the MENU switch is set to the SET position, the menu setting mode will not be established, and "MENU PROTECTED" will appear on the video monitor screen.

<Note>
If, during the menu protect mode setting, the MENU switch is set to the SET position while holding down the METER button on the front panel, the menu setting mode will be established and the regular menu settings can be performed. Perform steps *2* through *7* of "Setting method using on-screen menus."
(See page 40)

How to release the menu protection

1 **Set the MENU switch to the SET position while holding down the METER button on the front panel.**
The unit is set to the menu setting mode, and the menu screen appears on the video monitor.

2 **Perform steps *2* and *3* of "How to protect the menus" above.**
The screen for verifying whether to protect the setup menus appears on the video monitor.

```
   MENU PROTECT OK?
          * NO
            YES
```

3 **Press the MENU-UP button or MENU-DOWN button to move the cursor to the NO position, and press the SET button.**
The menu protection is now released.

How to display the DIAG menu

This unit has a function for displaying an hours meter and software version on the video monitor.

1 **Set the MENU switch to the ON position while holding down the EJECT button.**
The unit is set to the diagnosis display mode, and "HOURS METER" appears on the video monitor.

```
DIAG–MENU        HOURS METER
Ser   *********
H00   OPERATION      00000H
H01   DRUM RUN       00000H
H02   TAPE RUN       00000H
H03   THREADING      00000T
H11   DRUM RUN r     00000H
H12   TAPE RUN r     00000H
H13   THREADING r    00000T
END
```

Any item with "r" can be reset when servicing is performed.

2 **While the hours meters screen is displayed, press the MENU-UP button or MENU-DOWN button while holding down the PAGE button.**
The software version is displayed on the video monitor.

```
DIAG–MENU    VERSION
<NTSC>
IF             1.**-**-*.**
AV-SYSCON      1.**-**-*.**
DV             1.**-**-*.**
CYLINDER       1.**-**-*.**
REEL           1.**-**-*.**
END
```

When the MENU-UP button or MENU-DOWN button is pressed again while holding down the PAGE button, operation returns to the hours meter display.

3 **Set the MENU switch to the OFF position.**
Operation now returns to the normal mode.

Setup Menus

BASIC menu

Item		Setting		Description of setting
No.	Superimposed display	No.	Superimposed display	
000	KEY-INH SEL			For setting the switches which can still be operated on the front panel when the KEY INHIBIT switch has been set to ON.
		0000	DIS	0: None of the switches can be operated.
		0001	ST&EJ	1: Only the STOP and EJECT switches can be operated.
		0002	ENA	2: All the switches can be operated.
003	DISPLAY SEL			For setting what is to be displayed by superimposing onto the video monitor output.
		0000	TIME	0: Only the time is displayed.
		0001	T&STA	1: The time and operation status are displayed.
		0002	T&R	2: The time and amount of remaining tape are displayed.
		0003	T&S&R	3: The time, operation status and amount of remaining tape are displayed.
004	CHARA H-POS	0000	0	For setting the character position in the horizontal direction for the superimposed display.
		:	:	
		0004	4	
		:	:	
		0008	8	
005	CHARA V-POS	0013	13	For setting the character position in the vertical direction for the superimposed display.
		:	:	
		0022	22	
006	CHARA TYPE			For setting the type of superimposed display and menu display.
		0000	WHITE	0: White characters are displayed on a black background.
		0001	W/OUT	1: White characters with black borders are displayed.
007	SYS FORMAT			For setting the unit's recording and playback format.
		0000	50M	0: 50 Mbps mode
		0001	25M	1: 25 Mbps mode
				<Note> When the 25 Mbps mode is set, the sound is recorded and played back on two channels (CH1 and CH2).
008	PB FORMAT			For setting the format during tape playback.
		0000	MANUAL	0: The format is based on the setting selected for menu item No. 007 (SYS FORMAT).
		0001	AUTO	1: The format recorded on the tape is used.
030	AUDIO P.SAVE			For setting the power save mode during recording.
		0000	ALLON	0: The audio outputs of all four channels (CH1, CH2, CH3 and CH4) are temporarily suspended.
		0001	3/4ON	1: The audio outputs of two channels (CH3 and CH4) are temporarily suspended.
		0002	OFF	2: All the sound is output.

The underlining indicates the factory setting.

<Notes>
If the PAGE button and DATA+ button or DATA– button are pressed when the CHARA H-POS or CHARA V-POS item has been set, the counter display appears temporarily while these buttons are held down to enable the setting to be checked.
Even while the PAGE button is pressed, the settings can be performed using the DATA+ button or DATA– button while the actual status is checked.

45

OPERATION menu

Item		Setting		Description of setting
No.	**Superimposed display**	**No.**	**Superimposed display**	
100	SEARCH SPEED			For setting the speed at which the tape is to be decelerated when the search switch on the front panel has been pressed.
		0000	X4.1	0: 4.1× normal tape speed
		0001	X8.4	1: 8.4× normal tape speed
101	SHTL MAX			For setting the maximum speed in the shuttle mode when the external controller connected to the 9-pin remote connector is used.
		0000	X8.4	0: 8.4× normal tape speed
		0001	X16	1: 16× normal tape speed
		0002	X32	2: 32× normal tape speed
102	FF. REW MAX			For setting the maximum fast forward and rewind speed.
		0000	X16	1: 16× normal tape speed
		0001	X32	2: 32× normal tape speed
		0002	X60	3: 60× normal tape speed
				\<Note\> When the 50 Mbps mode has been selected as the menu item No. 007 (SYS FORMAT) setting, the tape will run at 32× the normal tape speed even if 60× has been selected.
105	STOP MODE			For setting the mode of the digital circuit in the stop mode.
		0000	REC	0: The digital circuit serves as the REC circuit. It takes a shorter time for operation to transfer to the REC mode. At this point, the E-E mode is established.
		0001	PB	1: The digital circuit serves as the PB circuit. It takes a shorter time for operation to transfer to the playback mode.
106	HUMID OPE			For setting whether to ignore condensation when it has formed and continue with operation.
		0000	OFF	0: Unit does not continue to operate when condensation has formed.
		0001	ON	1: Unit continues to operate when condensation has formed, in which case it cannot be guaranteed that the unit will operate normally.
				\<Note\> Since the tape may be damaged with a "1" setting, this item should normally be set to 0 (no operation).
107	WIDE MODE			For setting whether to perform recording in the wide mode.
		0000	WIDE	0: Recording is performed in the wide mode.
		0001	NORMAL	1: Recording is performed in the 4:3 normal mode.
110	AUTO BACK			For setting the operation method of the frame-to-frame continuity function (for setting the operation of the auto back function for rewinding the tape for several seconds in order to eliminate disturbances in the recorded pictures).
		0000	OFF	0: Auto back function is disabled (no continuity between frames).
		0001	REC-P	1: In the REC PAUSE mode, the auto back function is activated to ensure frame-to-frame continuity.
		0002	ALL	2: Regardless of the VTR mode, the auto back function is activated to ensure frame-to-frame continuity.
111	AFTER CUE-UP			For setting the status after cue-up.
		0000	STOP	0: For stopping the tape in the stop mode.
		0001	STILL	1: For stopping the tape in the still mode.
113	BATTERY SEL			For setting the type of battery.
		0000	BP402	0: AU-BP402 (made by Matsushita Electric Industrial), 12 V nickel-cadmium battery
		0001	BPH90	1: BP-H90 (made by IDX), 12 V nickel-hydrogen battery
		0002	BPH100	2: BP-H10C (made by IDX), 13 V nickel-hydrogen battery
		0003	HP90	3: HP-H90 (made by PACO), 13 V nickel-hydrogen battery
		0004	HP90A	4: HP-H90A (made by PACO), 13 V nickel-hydrogen battery

The underlining indicates the factory setting.

OPERATION menu

Item		Setting		Description of setting
No.	Superimposed display	No.	Superimposed display	
128	BATT WARNING			For setting the voltage at which a warning is given when the battery is nearly discharged.

		0000	AUTO	0: The voltage is set by the battery which was set in setup menu item No. 113 (BATTERY SEL).
				    AU-BP402 : 11.4 V
				    BP-H90 : 11.0 V
				    BP-H100 : 11.6 V
				    HP-90 : 12.0 V
				    HP-90A : 11.4 V

		0001	MANUAL	1: The voltage setting can be changed to match the battery used. The change made to the setting is saved. Press the MODE button, and change the setting using the "00: BATT NEAR END" menu.

	00 BATT NEAR END	10.7
		:
		14.0
			10.7V
			:
			14.0V
				For changing in 0.1 V increments the voltage setting at which a warning is given when the battery is nearly discharged to match the battery used.
				● Initial voltage setting:
				    AU-BP402 : 11.2 V
				    BP-H90 : 10.9 V
				    BP-H100 : 11.6 V
				    HP-90 : 12.0 V
				    HP-90A : 11.4 V

129	BATT DISPLAY			For setting whether to display the battery voltage on the status display window when the METER button is pressed.
		0000	OFF	0: The voltage is not displayed in the status display window.
		0001	ON	1: The voltage is displayed in the status display window. ● Example of display shown: 11.2 V
				┌─────────────┐ │ bA 11_2 │ └─────────────┘
130	NO-VIDEO REC			For setting whether to proceed with recording when no video signals are input.
		0000	OFF	0: Recording is disabled. When the video signals are no longer input during recording, operation is transferred to the REC PAUSE mode.
		0001	ON	1: Recording is enabled.
131	LIGHT SET UP			For setting whether LCD backlight illumination status is to be stored in the memory when the power is switched off.
		0000	OFF	0: Status is not stored. When the power is turned back on, the backlight illumination will always be off.
		0001	ON	1: Status is stored.
132	26PIN REC			For setting whether to acknowledge the REC command when the camera's START/STOP button is used for control while connection is made to the CAMERA connector (26 pins).
		0000	ALL	0: The REC command is acknowledged regardless of the VTR mode.
		0001	REC-P	1: The REC command is acknowledged only when the REC PAUSE mode is established.
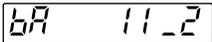
The underlining indicates the factory setting.

Setup Menus

INTERFACE menu

Item		Setting		Description of setting
No.	Superimposed display	No.	Superimposed display	
200	ID SEL			For setting the ID information to be returned to the controller.
		0000	OTHER	0: 20 25H is returned.
		0001	DVCPRO	1: The DVCPRO unit's own ID (F0 33H) is returned.

The underlining indicates the factory setting.

TAPE PROTECT menu

Item		Setting		Description of setting
No.	Superimposed display	No.	Superimposed display	
400	STILL TIMER	0000	0.5S	For setting the time taken until the tape protection mode is established
		0001	5S	when the unit has been left standing in the stop or still mode.
		0002	10S	(Unit: S = seconds, min = minutes)
		0003	20S	
		0004	30S	
		0005	40S	
		0006	50S	
		0007	1min	
		0008	2min	
401	SRC PROTECT			For setting the tape protection mode operation when the unit has been left standing in the still mode.
		0000	STEP	0: STEP FWD
		0001	HALF	1: STANDBY OFF (HALF LOADING)
				<Note>
				If STEP FWD has been selected, the unit is automatically transferred to the STANDBY OFF (HALF LOADING) mode when the total length of time it has been left standing in the still mode reaches 30 minutes.
402	DRUM STDBY			For setting the drum operation in the STANDBY OFF (HALF LOADING) mode.
		0000	OFF	0: The drum rotation is stopped.
		0001	ON	1: The drum rotation is continued.
403	STOP PROTECT			For setting the tape protection mode operation when the unit has been left standing in the stop mode.
		0000	STEP	0: STEP FWD
		0001	HALF	1: STANDBY OFF (HALF LOADING)
				<Note>
				If STEP FWD has been selected, the unit is automatically transferred to the STANDBY OFF (HALF LOADING) mode when the total length of time it has been left standing in the still mode reaches 30 minutes.

The underlining indicates the factory setting.

48

TIME CODE menu

Item		Setting		Description of setting
No.	**Superimposed display**	**No.**	**Superimposed display**	
509	TCG CF FLAG			For setting whether to add the CF flag of the TCG to the CF bit (color frame bit) of the TCG.
		<u>0000</u>	OFF	0: CF flag is not added. (LTC CF bit: 0)
		0001	ON	1: CF flag is added. (LTC CF bit: 1)
510	DF MODE			For setting the TCG drop frame mode.
		<u>0000</u>	DF	0: The unit is used in the drop frame mode.
		0001	NDF	1: The unit is used in the non-drop frame mode.
530	UB MODE			For setting the mode in which the user's bit is used.
		<u>0000</u>	USER	0: The user's bit is used for the user setting. (Fixed)
		0001	TIME	1: The user's bit is used for displaying hours, minutes and seconds in real-time operation.
		0002	DATE	2: The user's bit is used for displaying the year, month, day, and time in real-time operation.
		0003	EXT	3: The UBG value is slave-locked while the TC signal is input from an external source. (The user setting is used when no signal is input from an external source.)
531	TCG SET HOLD			For setting whether to make the TCG setting operable when recording is to be performed after the TCG is set, the power is turned off and back on again.
		<u>0000</u>	OFF	0: Recording is performed according to the FIRST REC TC setting in No. 532.
		0001	ON	1: The TCG setting is made operable, and recording starts from the value of the TCG displayed.
532	FIRST REC TC			For setting whether to record in the regeneration mode when recording for the first time after the cassette was inserted or from the STOP mode or power-on status.
		<u>0000</u>	REGEN	0: Recording is performed in regeneration mode.
		0001	PRESET	1: Recording is not performed in regeneration mode. (Recording starts from the value of the TCG displayed.)
540	TIME/DATE ➔			For setting the time and date.
	00 YEAR	<u>0000</u> : 0099	<u>00</u> : 99	For setting the year.
	01 MONTH	<u>0001</u> : 0012	<u>01</u> : 12	For setting the month.
	02 DAY	<u>0001</u> : 0031	<u>01</u> : 31	For setting the day.
	03 HOUR	<u>0000</u> : 0023	<u>00</u> : 23	For setting the hours.
	04 MINUTE	<u>0000</u> : 0059	<u>00</u> : 59	For setting the minutes.
	05 SET	——	——	For setting the date and time.

The underlining indicates the factory setting.

Setup Menus

VIDEO menu

Item		Setting		Description of setting
No.	Superimposed display	No.	Superimposed display	
601	V-MUTE SEL			For setting whether to mute the video signals when LOW RF or NO RF has occurred during playback.
		0000	N-MUTE	0: The video signals are not muted (the picture is frozen).
		0001	LOW RF	1: The video signal picture is muted (the screen turns gray).
608	SET UP 25 ➔			For setting the setup processing for the composite IN/OUT and component IN signals when the 25 Mbps mode is selected.
	00 CMPST IN			For setting the setup processing for the composite input signals.
		0000	THRU	0: The original signals are input as they stand.
		0001	CUT	1: The 7.5 % setup is eliminated from the input signals, which are then input.
	01 CMPST OUT			For setting the setup processing for the composite output signals.
		0000	THRU	0: The original signals are output as they stand.
		0001	ADD	1: The 7.5 % setup is added to the output signals, which are then output.
	02 CMPNT IN			For setting the setup processing for the component input signals.
		0000	THRU	0: The original signals are input as they stand.
		0001	CUT	1: The 7.5 % setup is eliminated from the input signals, which are then input.
609	SET UP 50 ➔			For setting the setup processing for the composite IN/OUT and component IN signals when the 50 Mbps mode is selected.
	00 CMPST IN			For setting the setup processing for the composite input signals.
		0000	THRU	0: The original signals are input as they stand.
		0001	CUT	1: The 7.5 % setup is eliminated from the input signals, which are then input.
	01 CMPST OUT			For setting the setup processing for the composite output signals.
		0000	THRU	0: The original signals are output as they stand.
		0001	ADD	1: The 7.5 % setup is added to the output signals, which are then output.
	02 CMPNT IN			For setting the setup processing for the component input signals.
		0000	THRU	0: The original signals are input as they stand.
		0001	CUT	1: The 7.5 % setup is eliminated from the input signals, which are then input.

The underlining indicates the factory setting.

Setup Menus

AUDIO menu

Item		Setting		Description of setting
No.	**Superimposed display**	**No.**	**Superimposed display**	
704	EMPHASIS	0000 0001	OFF ON	For setting the emphasis ON or OFF.
705	MONI SEL	0000 0001	PLYPCM PLYCUE	For setting the audio signals which are to be output from the AUDIO OUT connectors (PHONO), HEADPHONE jack and EARPHONE jack during PLAY (FWD ×1). 0: PCM audio signals are output. 1: Cue audio signals are output.
706	REC CUE	0000 0001 0002	CH1 CH2 CH1+2	For setting the audio input signals which are to be recorded on the cue track. 0: CH1 input signals are recorded. 1: CH2 input signals are recorded. 2: CH1 and CH2 input signals are mixed and recorded.
730	DOUBLE REC	0000 0001	OFF ON	For setting whether the CH1 and CH2 input signals are to be recorded simultaneously on CH3 and CH4. (This item is valid only in the 50 Mbps mode.) 0: The signals are not recorded simultaneously. 　(The CH3 and CH4 inputs signals are recorded on CH3 and CH4.) 1: The signals are recorded simultaneously.
731	MONI OUT	0000 0001 0002 0003 0004 0005	CH1 CH2 CH3 CH4 CH1+2 CH3+4	For setting the audio signals to be monitored at the AUDIO OUT connectors (PHONO) when PLYPCM has been selected as the No. 705 setting. The cue audio signals are always output when PLYCUE has been selected as the No. 705 setting. 0: The audio signals of CH1 are monitored. 1: The audio signals of CH2 are monitored. 2: The audio signals of CH3 are monitored. 3: The audio signals of CH4 are monitored. 4: The audio signals of CH1 and CH2 are mixed and monitored. 5: The audio signals of CH3 and CH4 are mixed and monitored.
732	LIMITER CH1	0000 0001	OFF ON	For setting the CH1 audio limiter operation. 0: The limiter does not operate. 1: The limiter operates.
733	LIMITER CH2	0000 0001	OFF ON	For setting the CH2 audio limiter operation. 0: The limiter does not operate. 1: The limiter operates.
734	LIMITER CH3	0000 0001	OFF ON	For setting the CH3 audio limiter operation. 0: The limiter does not operate. 1: The limiter operates.
735	LIMITER CH4	0000 0001	OFF ON	For setting the CH4 audio limiter operation. 0: The limiter does not operate. 1: The limiter operates.
736	MIC LOWCUT CH1	0000 0001	OFF ON	For setting the high-pass filter of the CH1 microphone ON or OFF.
737	MIC LOWCUT CH2	0000 0001	OFF ON	For setting the high-pass filter of the CH2 microphone ON or OFF.
738	MIC LOWCUT CH3	0000 0001	OFF ON	For setting the high-pass filter of the CH3 microphone ON or OFF.
739	MIC LOWCUT CH4	0000 0001	OFF ON	For setting the high-pass filter of the CH4 microphone ON or OFF.

The underlining indicates the factory setting.

Setup Menus

WARNING & ALARM menu

Item		Setting		Description of setting
No.	**Superimposed display**	**No.**	**Superimposed display**	
900	BATT NEAR END			For setting whether the warning alarm is to be sounded when the battery is nearly totally discharged.
		<u>0000</u>	<u>OFF</u>	0: The warning alarm is not sounded.
		0001	ON	1: The warning alarm is sounded.
901	BATT END			For setting whether the warning alarm is to be sounded when the battery is totally discharged.
		0000	OFF	0: The warning alarm is not sounded.
		<u>0001</u>	<u>ON</u>	1: The warning alarm is sounded.
902	TAPE NEAR END			For setting whether the warning alarm is to be sounded when the tape is approaching the end.
		<u>0000</u>	<u>OFF</u>	0: The warning alarm is not sounded.
		0001	ON	1: The warning alarm is sounded.
903	TAPE END			For setting whether the warning alarm is to be sounded when the tape has reached the end.
		0000	OFF	0: The warning alarm is not sounded.
		<u>0001</u>	<u>ON</u>	1: The warning alarm is sounded.
904	TAPE WARNING			For setting the timing at which the warning alarm is to be sounded when the tape is approaching the end.
		<u>0000</u>	<u>2min</u>	0: The warning alarm is sounded 2 minutes before the tape reaches the end.
		0001	3min	1: The warning alarm is sounded 3 minutes before the tape reaches the end.
905	TAPE REMAIN			For setting the remaining tape time indicated by one segment on the remaining tape display.
		<u>0000</u>	<u>3min</u>	0: Each segment is set to a remaining tape time of 3 minutes.
		0001	5min	1: Each segment is set to a remaining tape time of 5 minutes.
906	ALARM SOUND			For setting the tone of the warning alarm.
		<u>0000</u>	<u>NORMAL</u>	0: The warning alarm tone is changed according to the nature of the problem.
		0001	SIMPLE	1: The same warning alarm is sounded for all problems.

The underlining indicates the factory setting.

Replacing the Backup Battery

The backup battery is installed before the unit is shipped from the manufacturing plant.
When the battery is totally discharged, the "E-90" error code appears for 3 seconds in the status display window when the POWER switch is set to ON.
"00 : 00 : 00 : 00" is displayed as the TCG time code value, indicating that the time code can no longer be backed up. In this situation, the backup battery must be replaced.
Consult your dealer, and replace with a new battery (CR2032 or BR2032).

No. 5 VTR SYS board

VTR SYS

+
Panasonic
CR2032

Backup battery
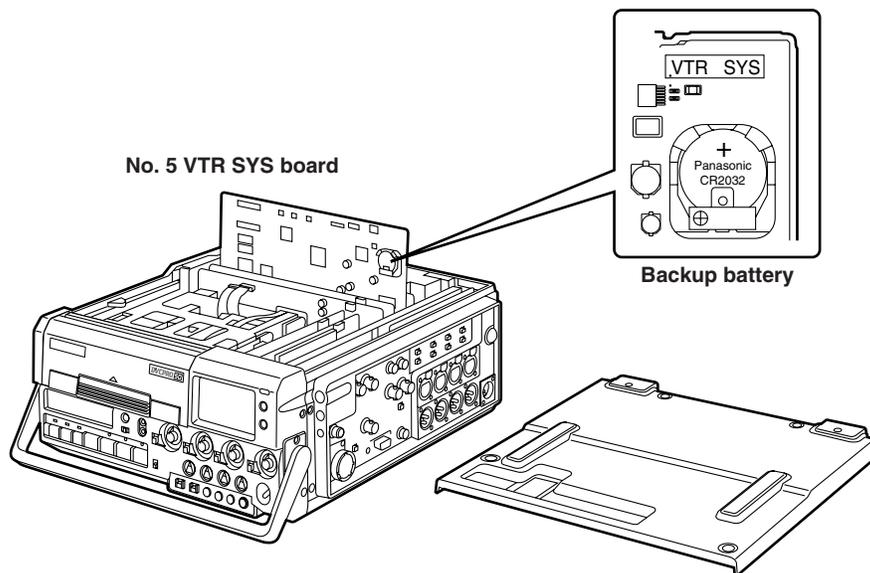
Error Messages

When a problem has occurred in the unit, one of the following error codes and warning displays will be displayed on the status display window.

Error code	Warning display	Description
— d —	HUMID	This appears when condensation (dew) has been detected. Even after the cancellation of condensation detection, "HUMID" continues to flash for 20 minutes and the unit does not respond to the control key in order to ensure safety.
E — 00	SERVO	This appears when the servo has failed to lock for more than 3 seconds. If "T&S&R" has been selected as the setup menu item No. 003 setting, "SERVO NOT LOCKED" is displayed on the third line (amount of remaining tape line) of the monitor screen.
E — 01	RF	This appears when there is no head output (due to clogging, etc.) for more than 3 seconds. "L" is displayed on the first line (counter line) of the monitor screen. If "T&S&R" has been selected as the setup menu item No. 003 setting, "LOW RF" is displayed on the third line (amount of remaining tape line) of the monitor screen.
E — 02	RF	This appears when the error rate has deteriorated (when the three channel condition segments have lighted up). If "T&S&R" has been selected as the setup menu item No. 003 setting, "HIGH ERROR RATE" is displayed on the third line (amount of remaining tape line) of the monitor screen.
E — 09	RF	This appears when a blank portion on the tape has been detected. "N" is displayed on the first line (counter line) of the monitor screen. If "T&S&R" has been selected as the setup menu item No. 003 setting, "NO RF" is displayed on the third line (amount of remaining tape line) of the monitor screen. When all the following conditions are satisfied, the part of the tape concerned is recognized as a blank part. ● When there is no output from any of the heads ● When no playback data can be read ● When there is no CTL signal
E — 11	SLACK	This appears when the reel base, which operates in accordance with the size of the tape, has locked up for more than 2.5 seconds.
E — 21	SLACK	This appears when the cassette down operation fails to take place even when 4 seconds have elapsed after the cassette was inserted. Alternatively, it appears when the cassette fails to be ejected even when 4 seconds have elapsed after its ejection operation was performed.
E — 31	SLACK	This appears when the loading operation fails to be completed within 4 seconds.
E — 32	SLACK	This appears when the unloading operation fails to be completed within 4 seconds.
E — 41	SLACK	This appears when the FG signal (rotational speed signal) fails to be output from the cylinder motor.
E — 42	SLACK	This appears when the PG signal (phase signal) fails to be output from the cylinder motor.
E — 43	SLACK	This appears when the cylinder motor's speed is abnormally high.
E — 44	SLACK	This appears when the cylinder motor's speed is abnormally low.
E — 51	SLACK	This appears when the FG signal (rotational speed signal) fails to be output from the capstan motor.
E — 52	SLACK	This appears when the capstan motor's speed is abnormally high.
E — 53	SLACK	This appears when the capstan motor's speed is abnormally low.
E — 61	SLACK	This appears when the supply reel motor has locked up.
E — 62	SLACK	This appears when the take-up reel motor has locked up.
E — 63	SLACK	This appears when the supply reel motor's speed is abnormally high.
E — 64	SLACK	This appears when the take-up reel motor's speed is abnormally high.

Error Messages

Error code	Warning display	Description
E — 65	SLACK	This appears when abnormal tension has been detected.
E — 66	SLACK	This appears when the start or end processing operation fails to be completed within 7 seconds.
E — 67	SLACK	This appears when there is a communication error between SERVO and AVSYS. There is a problem with the data.
E — 68	SLACK	This appears when there is a communication error between SERVO and AVSYS. The data is fixed to High or Low.
E — 69	SLACK	This appears when there is a problem in communication between SERVO and AVSYS when the power is turned on.
E — 6B	No display	This appears when there is a communication error between IF and AVSYS. There is a problem with the internal reference or external reference.
E — 80	No display	This appears when there is a problem with the supply voltage.
E — 90	No display	This appears when the backup battery has totally discharged.
E — A0	No display	This appears when there is no input of video signals or when video signals are cut off and the mismatching detector circuit has been activated. (The [E-A0] and the time data will be displayed alternately in the REC PAUSE mode.)
E — bA	BATT flashes	This appears when the input DC voltage has dropped to near the undercut voltage level (approx. 10.6 V).

Emergency Eject

Procedure for manually ejecting the tape in an emergency

If the cassette tape cannot be removed even when the EJECT button is pressed, it can be ejected by following the steps below.

● **Before proceeding, be absolutely sure to turn off the unit's power.**

❶ Remove the top panel.

❷ Use a Phillips head screwdriver to push in and turn the red plastic screw part counterclockwise.
(This screw needs to be rotated about 30 turns before unloading can be started.)

❸ Insert the take-up jig (packed with the unit) into the tape ejection slot (on the mechanism side of the VTR), and rotate the flange part (white gear) of the supply reel in the take-up direction to take up the tape slack using the rubber part of the take-up jig.

   <Note>
Take care not to damage the tape in any way.

❹ Once more use the Phillips head screwdriver to push in and turn the red plastic screw part counterclockwise. Again rotate the flange part of the supply reel in the take-up direction to take up the tape slack.
This two-step procedure needs to be repeated until the tape is completely housed in the cassette case (about 90 turns of the red plastic screw part).

❺ Use the Phillips head screwdriver to turn the red plastic screw part at the slot-in side clockwise to eject the cassette tape.
(This screw needs to be rotated through about 140 turns until the tape is ejected.)

   <Note>
Take care not to sandwich or catch the tape when closing the cassette cover.
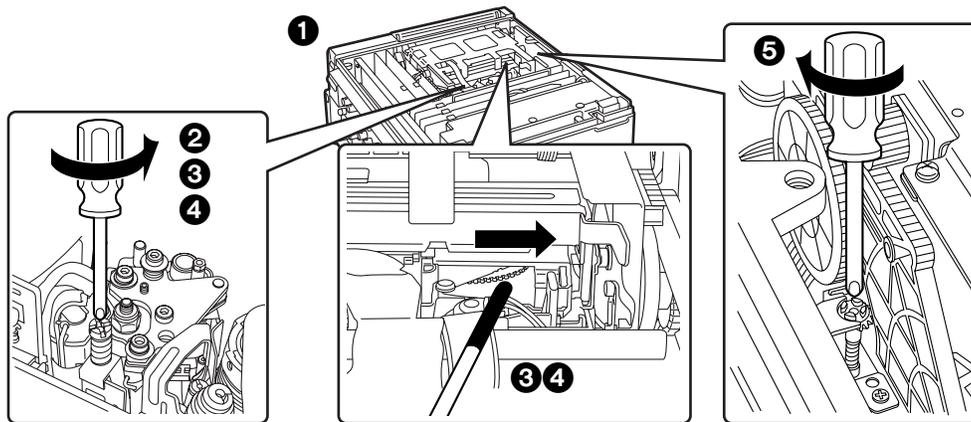
Warning Systems

When trouble is detected immediately after the power has been switched on or while operation is underway, the operator is alerted to its occurrence by the status display window (LCD), WARNING lamp and warning alarm from the EARPHONE jack.
The warning alarm can be changed to the same for all errors (using setup menu item No. 906).

Item	Status display window (LCD)				WARNING lamp	Warning alarm	Description of warning	Operation of unit	Remedial action
	Warning display	Warning display status	Battery charge display	Remaining tape display					
NO RF **LOW RF** **HIGH ERROR RATE**	RF	Lights *5)			Flashes 4 times a second	Sounds 4 times a second *3)	Video heads clogged, problem in recording system.	When head clogging has been detected, the warning alarm is sounded. It may not be possible to record properly in this status.	Clean the heads. If recording is still not possible even after the heads have been cleaned, turn off the power and contact your dealer.
SERVO	SERVO	Lights			Flashes 4 times a second	Sounds 4 times a second *3)	Servo disturbances.	Playback continues but it may not be possible to play back the tape properly in this status.	Turn off the power and contact your dealer. (The lamp may flash for a moment and then go off when the tape starts traveling: this is normal and not indicative of malfunctioning.)
HUMID	HUMID	Lights or flashes			Lights	Sounds 4 times a second *1) *3) / Sounds continuously *2)	Condensation Warning alarm sounds when ON was selected as setup menu item N.106 (HUMID OPE).	The tape is unloaded.	Stop the tape travel, and turn off the power. If the "HUMID" display is still not cleared when the power is turned back on, wait until it is cleared.
SLACK	SLACK	Lights			Flashes 4 times a second	Sounds continuously	Tape take-up problem.	An error code appears where the time code is displayed on the status display window. The unit stops operating.	Check the error code (see pages 54 and 55) on the status display window, and consult your dealer.
TAPE END	E TAPE F	Flashes		1 of 7 segments lights	Flashes once a second *1)	Sounds once a second *1) *4)	Tape is approaching the end.	Operation continues.	Replace the tape as necessary.
		Flashes		7 of 7 segments light	Lights	Sounds continuously *4)	Tape has reached the end.	Operation is stopped during recording, playback or fast forwarding.	Replace or rewind the tape.
BATTERY END	E BATT F	Flashes	1 of 7 segments lights		Flashes once a second	Sounds 4 times a second *3) *4)	The battery is nearly totally discharged.	Operation continues.	Replace the battery as necessary.
		Flashes	7 of 7 segments light		Lights	Sounds continuously *4)	The battery is totally discharged.	Operation is stopped.	Replace the battery.

* **1)** During recording
* **2)** At any time except during recording
* **3)** Once a second when SIMPLE has been selected as the setup menu item No. 906 setting.
* **4)** The alarm can be switched to ON or OFF using the alarm setup menu items No. 900 to No. 903.
* **5)** RF warning display will flash during REC and REC PAUSE modes. When the unit changes from REC and REC PAUSE modes, the RF warning display will turn off.

Warning Systems

Item	Status display window (LCD)				WARNING lamp	Warning alarm	Description of warning	Operation of unit	Remedial action
	Warning display	Warning display status	Battery charge display	Remaining tape display					
No display	No display				Flashes 4 times/second for 3 seconds	Sounds 4 times a second *1)	Memory status error between SYSCON and DV.	Error code [00:00:00:11] will be displayed for 5 seconds in the time code display position in the status display window. However, the main unit will be put into Enforced Recording mode and recording will continue.	Switch the power OFF and consult your local dealer.

* **1)** During recording
* **2)** At any time except during recording
* **3)** Once a second when SIMPLE has been selected as the setup menu item No. 906 setting.
* **4)** The alarm can be switched to ON or OFF using the alarm setup menu items No. 900 to No. 903.
* **5)** RF warning display will flash during REC and REC PAUSE modes. When the unit changes from REC and REC PAUSE modes, the RF warning display will turn off.

The warning system's priority sequence is as follows.

1 SLACK	6 SERVO
2 BATTERY END	7 LOW RF
3 TAPE END	8 HIGH ERROR RATE
4 HUMID	9 BATTERY NEAR END
5 NO RF	10 TAPE NEAR END

Connector Signals

CAMERA connector (26-pin)

Pin No.	Signal
1	COMPOSITE VIDEO
2	COMPOSITE VIDEO GND
3	Y GND
4	Y
5	P_R/C
6	P_R GND
7	P_B
8	P_B GND
9	CAMERA MIC (X)
10	CAMERA MIC (Y)
11	CAMERA MIC (G) GND
12	VTR START/STOP
13	BATTERY ALARM
14	TAPE REMAIN
15	REC/TALLY/WARNING
16	————
17	SHIELD
18	PLAYBACK VIDEO
19	PLAYBACK VIDEO GND
20	VTR SAVE/AUDIO MONITOR
21	————
22	COLOR FRAMING PULSE
23	————
24	————
A	POWER $+$ 12 V
B	POWER GND

DC IN connector (XLR 4-pin)

Pin No.	Signal
1	GND
2	————
3	————
4	+12 V

DC OUT connector (4-pin)

Pin No.	Signal
1	GND
2	————
3	————
4	+12 V

REMOTE connector (9-pin)

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

AUDIO IN/OUT connector (XLR 3-pin)

Pin No.	Signal
1	GND
2	HOT
3	COLD

Video Head Cleaning

This unit is equipped with an auto head cleaning function which automatically reduces the amount of dirt on the video heads. However, in order to maximize the unit's reliability, it is recommended that the video heads be cleaned as and when appropriate.
For further details on how to actually clean the heads, consult with one of our service companies or with your dealer.

Condensation

The same principle by which droplets of water form on a window pane of a heated room is responsible for the formation of condensation inside the unit. Condensation occurs in the unit or on the tape when it is moved from one location to another where there is a significant difference in temperature and humidity. More specifically, it forms:
● When the unit (or tape) is moved to a very humid location where the air is full of steam or to a room immediately after it has been heated
● When the unit (or tape) is abruptly moved from an air-conditioned location to a very warm or very humid location

When moving the unit to the kind of location described above, do not turn on its power immediately but leave it standing for about 10 minutes. If condensation has formed inside the unit, an error code (– d –) and warning display (HUMID) will light up on the status display window, and the cassette tape will be automatically ejected.
Leave the power on, and wait until the error code (– d –) and warning display (HUMID) are cleared.

Maintenance

Before proceeding with maintenance, be absolutely sure to set the power switch to OFF, and disconnect the plug from the power outlet.
Use a soft cloth to clean the cabinet. To remove stubborn dirt, dilute some kitchen detergent, soak a rag in the solution, wring it out well, and use it to wipe away the dirt. Wipe up any remaining moisture using a dry cloth. Do not use paint thinners or benzine.

Specifications

[GENERAL]

Supply voltage:
 DC 12 V (DC 11 V – 17V)
Power consumption:
 27 W (in power save mode) during recording
 33 W during playback

Ambient operating temperature:
 32 °F to 104 °F (0 °C to 40 °C)
Storage temperature:
 –4 °F to +140 °F (–20 °C to +60 °C)
Ambient operating humidity:
 Less than 85 % (relative humidity)
Weight:
 12.98 lb (5.9 kg)
Dimensions (W×H×D):
 11 15/16″×5 1/2″×13 7/16″ (303×139×341 mm)
Recording format:
 DVCPRO50 format/DVCPRO format switchable
Recording tracks:
- Digital video: 525i
- Digital audio
 DVCPRO50: 48 kHz, 16 bits, 4 channels
 DVCPRO: 48 kHz, 16 bits, 2 channels
- Time code: sub-code area
- Cue signal: 1 track
- Control (CTL) signal: 1 track

Tape speed:
- DVCPRO50: 67.640 mm/s
- DVCPRO: 33.820 mm/s

Recording time:
- 92 minutes (using AJ-5P92LP, DVCPRO50)
- 33 minutes (using AJ-P66MP, DVCPRO50)
- 184 minutes (using AJ-5P92LP, DVCPRO *)
- 66 minutes (using AJ-P66MP, DVCPRO)

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* For AJ-5P92LP cassette tapes recorded using the DVCPRO (25 Mbps) mode, use a VTR supporting DVCPRO (25 Mbps) 184 minute tapes.

Tape used:
 1/4″ thin magnetic layer metal tape
FF/REW time:
 Approx. 5 minutes (using AJ-5P92LP)
Continuous recording operation time:
 Approx. 110 minutes (using AU-BP402)

[VIDEO]

■ **Digital video**
 Sampling frequency:
  DVCPRO50
   Y: 13.5 MHz, P_B/P_R: 6.75 MHz
  DVCPRO
   Y: 13.5 MHz, P_B/P_R: 3.375 MHz
 Quantizing:
  8 bits
 Video compression system:
  DCT + variable length code
 Compression rate:
  3.3:1 (DVCPRO50)
  5:1 (DVCPRO)
 Error correction:
  Reed-Solomon product code
 Bit rate:
  50 Mbps (DVCPRO50)
  25 Mbps (DVCPRO)

■ **Camera component IN/composite OUT**
 Video band:
  Y: 30 Hz to 5.75 MHz (+1.0 dB/–3.0 dB)
 Signal-to-noise ratio:
  Better than 55 dB

■ **Composite IN/composite OUT**
 Video band:
  Y: 30 Hz to 4.5 MHz (±1.0 dB)
 Signal-to-noise ratio:
  Better than 50 dB
 Differential gain:
  Less than 6 %
 Differential phase:
  Less than 4.5 degrees
 Y/C delay:
  Less than 20 ns
 K factor (2T pulse):
  Less than 2 %

[AUDIO]

Sampling frequency:
 48 kHz (synchronization with video signals)
Quantizing:
 16 bits
Frequency response:
 20 Hz to 20 kHz ±1 dB (reference level)
Dynamic range:
 More than 85 dB (1 kHz, emphasis OFF, "A" weighted)
Distortion:
 Less than 0.1 % (1 kHz, emphasis OFF, reference level)
Wow & flutter:
 Below measurable limits

Specifications

[AUDIO]

Headroom:
20 dB
Emphasis:
T1 = 50 µs, T2 = 15 µs (ON/OFF switchable)

[INPUT/OUTPUT CONNECTORS]

■ **Input connectors**
VIDEO IN:
BNC×1, 1.0 V [p-p], 75 Ω
AUDIO IN:
● LINE:
XLR (3-pin)×4 (CH1, CH2, CH3, CH4)
–60/+4 dBu switchable
–60 dBu, 3 kΩ/+4 dBu, high impedance
(Switchable to 600 Ω using internal switch)
Phantom mic power supply (+48 V) ON/OFF
selectable when –60 dBu is selected
(Switchable to +12 V using internal switch)
● CAM:
Multi (26-pin), –60 dBu, 3 kΩ
CAMERA:
Multi (26-pin) ×1
COMPOSITE IN: 1.0 V [p-p], 75 Ω
Y: 1.0 V [p-p], 75 Ω
PB: 0.7 V [p-p], 75 Ω
PR: 0.7 V [p-p], 75 Ω
(75 % color bar, 7.5 % setup added)
TC IN:
BNC ×1, 0.5 V to 8.0 V [p-p], 8 kΩ

■ **Output connectors**
VIDEO OUT 1/2:
BNC ×2, 1.0 V [p-p], 75 Ω
(Superimposed displays ON/OFF selectable for
VIDEO OUT 2)
Monitor VIDEO:
PHONO ×1, 1.0 V [p-p], 75 Ω
AUDIO OUT:
XLR (3-pin) ×4 (CH1, CH2, CH3, CH4)
+4 dBu low impedance
PHONO ×1, –20 dBu, low impedance
TC OUT:
BNC ×1, 2.0 V [p-p], low impedance
PHONES:
M6 ×1, M3 ×1
Stereo, 8 Ω, CH1/CH2 and CH3/CH4
switchable, playback control supported

[INPUT/OUTPUT CONNECTORS]

■ **Other input/output connectors**
DC IN:
XLR (4-pin) ×1 (DC 11 V – 17 V)
DC OUT:
4 pins ×1 (DC 11 V – 17 V)
Maximum rated current: 200 mA
REMOTE:
D-sub, 9 pins (female) ×1 (for AJ-A95)
RS-422A interface standard complied with (no
editing functions)

[LCD DISPLAY TUBE]

■ **Status display window**
Counter:
8 digits (CTL/TC/UB switchable)
Warning displays:
RF, SERVO, HUMID, SLACK
Operating status:
DF, SLAVE, TCG, WIDE
Remaining tape, battery charge:
Segment display

■ **Signal level display window**
Audio level display/input video signal level display
switchable
16 steps + channel condition display

[OPTIONAL EXTRAS]

● **Battery pack**
AU-BP402
● **AC adapter**
AJ-B75
● **9-pin remote controller**
AJ-A95
● **9-pin remote cables**
AU-C5 (5 meters), AU-C10 (10 meters)

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

Panasonic

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