Before attempting to connect, operate or adjust this product, please read these instructions thoroughly.
Things You Should Know

Thank you for choosing Panasonic!
You have purchased one of the most sophisticated and reliable products on the market today. Used properly, we’re sure it will bring you and your family years of enjoyment. Please take time to fill in the information below. The serial number is on the tag located on the underside of your unit. Be sure to retain this manual as your convenient unit information source.

Date of Purchase
Dealer Purchased From
Dealer Address
Dealer Phone No.
Model No.
Serial No.

Safety Precautions

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

Your unit is designed to record and play back in Standard Play (SP) mode and Long (LP) mode. It is recommended that only cassette tapes that have been tested and inspected for use in VCR machines with the mark be used.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

The above markings are located on the appliance bottom cover.

CAUTION : TO PREVENT FIRE OR SHOCK HAZARD, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

WARNING : DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE.

FCC Warning: Any unauthorized changes or modifications to this equipment would void the user’s authority to operate.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with Part 15 and part 18 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when operated in a residential environment. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, use the equipment in another location and/or utilize an electrical outlet different from that used by the receiver. If necessary, consult the dealer or an experienced radio/TV technician for help. You may find the booklet, ‘Something About Interference’ available from FCC local regional offices helpful.

This product may cause interference to radio equipment and should not be installed near maritime safety communications equipment or other critical navigation or communication equipment operating between 0.45-30 MHz.

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

CAUTION : TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

WARNING : DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE.
Important Safeguards

Before Use

1. Read Instructions — All the safety and operating instructions should be read before the unit is operated.

2. Retain Instructions — The safety and operating instructions should be retained for future reference.

3. Heed Warnings — All warnings on the unit and in the operating instructions should be adhered to.

4. Follow Instructions — All operating and maintenance instructions should be followed.

5. Cleaning — Unplug this video unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a dry cloth for cleaning.

6. Attachments — Do not use attachments not recommended by the video product manufacturer as they may be hazardous.

7. Water and Moisture — Do not use this video unit near water — for example near a bathtub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, and the like.

8. Accessories — Do not place this video unit on an unstable cart, stand, tripod, bracket, or table. The video unit may fall, causing serious injury to a child or adult, and serious damage to the unit. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the video unit. Any mounting of the unit should follow the manufacturer’s instructions and should use a mounting accessory recommended by the manufacturer. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

9. Ventilation — Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the video unit and to protect it from overheating. These openings must not be blocked or covered. Never place the video unit on a bed, sofa, rug, or other similar surface, or near or over a radiator or heat register. This video unit should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer’s instructions have been adhered to.

10. Power Sources — This video unit should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your appliance dealer or local power company. For video units intended to be operated from battery power, or other sources, refer to the operating instructions.

11. Grounding or Polarization — This video unit may be equipped with either a polarized 2-wire AC (Alternating Current) line plug (a plug having one blade wider than the other) or 3-wire grounding type plug, a plug having a third (grounding) pin. The 2-wire polarized plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug. The 3-wire grounding type plug will fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding type plug.

12. Power-Cord Protection — Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords of plugs, convenience receptacles, and the point where they exit from the unit.

13. Outdoor Antenna Grounding — If an outside antenna or cable system is connected to the video unit, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Part 1 of the Canadian Electrical Code, in USA Section 810 of the National Electrical Code, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

14. Lightning — For added protection of this video unit receiver during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the video unit due to lightning and power-line surges.
15. Power Lines — An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

16. Overloading — Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.

17. Objects and Liquids — Never push objects of any kind into this video unit through openings as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind onto the video unit.

18. Servicing — Do not attempt to service this video unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

19. Damage Requiring Service — Unplug this video unit from the wall outlet and refer servicing to qualified service personnel under the following conditions:
   a. When the power-supply cord or plug is damaged.
   b. If any liquid has been spilled into, or objects have fallen onto, the video unit.
   c. If the video unit has been exposed to rain or water.
   d. If the video unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the video unit to its normal operation.
   e. If the video unit has been dropped or the cabinet has been damaged.
   f. When the video unit exhibits a distinct change in performance — this indicates a need for service.

20. Replacement Parts — When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

21. Safety Check — Upon completion of any service or repairs to this video unit, ask the service technician to perform safety checks to determine that the video unit is in safe operating order.

Precautions

USE & LOCATION

• **TO AVOID SHOCK HAZARD** ... Your unit and power supply should not be exposed to rain or moisture. Do not connect the power supply or operate your unit if it gets wet. Your unit has been designed for outdoor use, however, it is not designed to sustain direct exposure to water, rain, sleet, snow, sand, dust, or direct splashing from a pool or even a cup of coffee. This action could permanently damage the internal parts of your unit. Do not attempt to disassemble this unit. There are no user serviceable parts inside. Unplug your unit from the power supply before cleaning.

• **DO NOT EXPOSE YOUR UNIT TO EXTENDED HIGH TEMPERATURE** ... Such as, direct sunlight, inside a closed car, next to a heater, etc... This action could permanently damage the internal parts of your unit.

• **AVOID SUDDEN CHANGES IN TEMPERATURE** ... If the unit is suddenly moved from a cold place to a warm place, moisture may form on the tape and inside the unit.

• **DO NOT LEAVE YOUR UNIT OR THE POWER SUPPLY TURNED ON WHEN NOT IN USE.**

• **STORAGE OF YOUR UNIT** ... Store and handle your unit in a manner that will not subject it to unnecessary movement (avoid shaking and striking). Your unit contains a sensitive pick-up device which could be damaged by improper handling or storage.

CARE

• **TO CLEAN YOUR UNIT** ... Do not use strong or abrasive detergents when cleaning your unit body.

• **TO PROTECT THE FINISH OF YOUR UNIT** ... Before handling your unit, make sure your hands and face are free from any chemical products, such as suntan lotion, as it may damage the finish.

This class B digital apparatus complies with CANADIAN ICES-003.
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Before Using

**Accessories**
1 pc. AC Adaptor (DE-852D) with AC Cable and DC Cable
1 pc. Battery Pack (CGR-D08/CGR-D08R)
1 pc. A/V Cable
1 pc. SCREW Unit

**Record Speed/Playback Time**
Use only those tapes having the logo indicating the 6.35 mm digital standard.

<table>
<thead>
<tr>
<th>Record Speed/Playback time</th>
<th>SP</th>
<th>LP</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 minutes</td>
<td>45 minutes</td>
<td></td>
</tr>
<tr>
<td>60 minutes</td>
<td>90 minutes</td>
<td></td>
</tr>
<tr>
<td>80 minutes</td>
<td>120 minutes</td>
<td></td>
</tr>
</tbody>
</table>

**Erase Protection**
Cassettes have a sliding record tab to ensure recordings are not accidentally erased.

1. To prevent accidental erasure:
   - Slide the tab to the left (open).

2. To record again:
   - Slide the tab to the right (close).

**Easy Cassette Eject/Insertion**
- If this unit is connected to a power source, the cassette can be inserted and ejected without turning this unit on.

1. Press LCD-OPEN to unlock the LCD monitor, and swing it fully open.
2. Slide TAPE EJECT to open the Cassette Compartment Cover.
3. Insert a cassette record tab up, window side facing out.
4. Press PUSH CLOSE to close the Cassette Compartment Cover.

**To remove the cassette...**
Slide TAPE EJECT to open the Cassette Compartment Cover and pull the cassette tape straight out.

**Note**
- When inserting the cassette, make sure it is facing in the right direction and then push it in completely.
**Quick Guide**

**Before Use**

**Insert the Battery Pack**

1. Insert the Battery Pack and slide it down until it locks with a click.

**Before you begin**

* Charge the Battery. (p. 9)

**Insert Cassette**

1. Press LCD-OPEN to unlock the LCD monitor, and swing it fully open.

2. Set POWER to ON while pressing the white button.  
   - The POWER Lamp lights red.

3. Slide TAPE EJECT to open the Cassette Compartment Cover.

4. Insert a cassette record tab up, window side facing out.  
   - Make sure the record tab is closed. (p. 6)

**WARNING:**

* Do not lift, or carry, this unit by the LCD Monitor.

5. Press PUSH CLOSE mark to close the Cassette Compartment Cover.
**Quick Guide**

**Make a Recording**

1. Set POWER to ON while pressing the white button.  
   - The POWER Lamp lights red.

2. Press (REC) to start recording.

3. Press (STOP) to stop recording.

**Playback a Tape**

1. Set POWER to ON while pressing the white button.  
   - The POWER Lamp lights red.

2. Press LCD-OPEN to unlock the LCD monitor. Swing it fully open and adjust the angle.

3. Press (REW) to rewind the tape.

4. Press (PLAY) to start playback.

5. Press (STOP) to stop playback.

6. Before you begin  
   - Charge the Battery. (p. 9)
Before Use

Supplying Power

Charge the Battery Pack on the AC Adaptor

1. Connect and plug in the Power Cord as shown.
   - POWER Lamp will light.
   - Remove the DC Cable, if attached, from the adaptor.

2. Attach the Battery as shown to charge.
   - CHARGE Lamp lights up. It goes out when charging is complete (approx. 1 hour). Expect approx. 2 hours (LCD monitor is closed.) of operation when fully charged.

3. Remove the Battery.
   Slide the Battery out and then lift up.

Note

About the Flashing of the CHARGE Lamp
- Charge the Battery within an ambient temperature range of 10 °C (50 °F) and 30 °C (86 °F).
- If charging is done in extreme low or high temperatures, Battery charge time increases.
- CHARGE Lamp flashes when...
  - The Battery is being charged, but charging is taking longer than normal.
  - Charging is not possible. Remove the Battery once, wait a short time, then re-attach it for charging.

Insert the Battery Pack

1. Insert the Battery Pack and slide it down until it locks with a click.

Remove the Battery Pack

1. Remove the Battery Pack and slide the Battery upward while pushing the BATT RELEASE.
Supplying Power

Battery Care

Caution:
- Charge only with specified charger.
- Charge the Battery within an ambient temperature range of 10 °C (50 °F) and 30 °C (86 °F).
- The Battery may be warm after charging or just after use. This is normal.
- Do not use an insufficiently charged or worn out Battery.
- If charging is done in extreme low or high temperatures, Battery charge time increases.

Safety precautions:
- Do not place the Battery near, or dispose of in fire.
- Do not directly connect (short circuit) the positive (+) and negative (–) terminals.
- Never attempt to disassemble or reassemble the Battery.

To avoid damage to the Battery:
- Do not drop or jar the Battery.
- Use the Battery with specified models only.
- If the Battery is used in extremely high temperatures, a safety device will automatically prevent operation.

To ensure longer battery life:
- While not in use, remove Battery from this unit and AC Adaptor and store in a cool, dark, dry place. If you leave the Battery in this unit or on the AC Adaptor, the Battery will no longer be rechargeable.
- Keep the Battery terminals clean.

ATTENTION:

A lithium ion/polymer battery that is recyclable powers the product you have purchased. Please call 1-800-8-BATTERY for information on how to recycle this battery.

Use AC Adaptor

1. Slide the Battery upward while pushing BATT RELEASE to remove the Battery Pack. (p. 9)
2. Insert the DC Cable into the DC IN Terminal.
3. Connect the other end of the DC Cable to the AC Adaptor as shown.
4. Plug in the AC Adaptor.
   - The POWER Lamp on the AC Adaptor lights up.

Note
- When not in use, unplug the AC Adaptor from the AC outlet. (AC Adaptor consumes 1 W of electric power when plugged into an AC outlet even when not in use.)
Before Use

Setting the Clock

Before you begin
- Connect this unit to a power source. (pp. 9, 10)
- Set POWER to ON while pressing the white button.

1 Press MENU to display the MAIN MENU screen. (p. 12)

2 Press +/- to select CLOCK SET, and then press SET to display the DATE/TIME SETTING menu screen.

3 Press SET to select YEAR, then press +/- to set. Press SET to move to the next item. Likewise, set the month, day, hour, and minutes.

EXAMPLE:
- YEAR : 2002
  Push
- MONTH : JAN
  Push
- MONTH : FEB

Note
- To make corrections, press SET repeatedly to move back to an item and correct.
- A built-in Battery maintains clock operation. If this unit is not connected to a power source for a few months, the built-in battery may discharge and “CLOCK BATTERY” indication appears. (p. 28)

When DATE/TIME setting is completed, press MENU twice to start the clock and exit.
Using the Menu

- While the Menu screen is displayed, you cannot record on or play a tape.
- While recording, the Menu screen cannot be displayed.
- During playback, the Menu screen can be displayed.

**Before you begin**
- Connect this unit to a power source. (pp. 9, 10)
- Set POWER to ON while pressing the white button.

**Displaying the MENU**

1. Press MENU to display the MAIN MENU screen.
2. Press +/- to select a menu item.

**Setting the MENU Items**

A. Press SET to set your selection.
B. Press +/- to select a menu item.
C. Press SET to set your selection.
   - The “●” mark indicates selection.
D. Press MENU twice to exit the menu.

**MAIN MENU**

1. REC MODE
   - To select REC SPEED, AUDIO DUB, AUDIO REC, AV JACK, or AUDIO SEL.
2. PLAYBACK MODE
   - To select COLOR MODE, AUDIO, or B.SEARCH.
3. REMOTE
   - To select CONTROL MODE or REMOTE MODE.
4. DISPLAY
   - To select DISPLAY, LINE OUT, C.RESET, DATE/TIME, or COUNTER.
5. LCD
   - To select LCD BRIGHTNESS or LCD COLOR.
6. CLOCK SET
   - To display DATE/TIME SETTING menu.
Playback Your Recordings

**Before you begin**
- Connect this unit to a power source. (pp. 9, 10)
- Insert a recorded cassette.

1. Set the **POWER** to **ON** while pressing the white button.
   - The **POWER** lamp lights red.
   - Be sure **POWER** is fully turned to the **ON** position.

2. Press **LCD-OPEN** to unlock the LCD monitor and swing it fully open.

3. Press **REW** to rewind the tape.

4. Press **PLAY** to start playback.

5. Press **STOP** to stop playback.
   - When the tape reaches its beginning during rewind or rewind search, it will stop automatically.

**Note**
- When a tape recorded in LP mode on another digital video camera is played back on this unit, the picture may appear mosaic.
- Using the LCD monitor reduces battery operating time.
- You can place this unit on a table, etc. for viewing. Rotate the LCD Monitor 180° and swing it up against this unit body as shown.

**Basic Playback**
You can playback your recording.

**Connecting Earphone (not supplied)**

You can connect earphones (not supplied) to the **PHONE** Jack.
**Playback Your Recordings**

**Adjusting the Volume**

1. **Hold down** VOL +/- **for more than 0.5 second to adjust the volume of the built-in speaker in PLAY mode.**
   - The volume setting screen appears.
2. **Press “+” to increase the volume or press “−” to decrease the volume.**

**To adjust the LCD BRIGHTNESS or COLOR**

1. **Press** MENU **to display the MAIN MENU screen.**
2. **Press +/- to select** LCD, **then press SET to display the LCD screen.**

**Displaying the MENU**

1. **Press MENU to display the MAIN MENU screen.**
2. **Press +/- to select LCD, then press SET to display the LCD screen.**

**Setting the LCD**

A. **Press SET to select** LCD BRIGHTNESS or LCD COLOR. (Menu OSD: p. 30)
B. **Hold down +/- for more than 0.5 second to adjust.**
C. **Press MENU twice to exit the menu.**
**COLOR Mode**

You can select color (ON) or mono (OFF) playback with this feature.

1. Press **MENU**
2. Press **SET**

**Displaying the MENU**

1. Press **MENU** to display the MAIN MENU screen.
2. Press +/- to select PLAYBACK MODE, then press **SET** to display the PLAYBACK MODE menu screen.

**Setting the COLOR mode**

A. Press +/- to select COLOR MODE in the PLAYBACK MODE menu. (Menu OSD: p. 29)

B. Press **SET** to select ON or OFF.

C. Press **MENU** twice to exit the menu.
   - “MONO” will appear on the screen when selecting OFF.

**LCD Monitor**

*MONO*
Playback Your Recordings

Before you begin
- When using S-VIDEO Connector, insert the DC Cable into the DC IN Terminal. (p. 10)

1 Set POWER to ON while pressing the white button.
2 Press MENU to display the MAIN MENU screen.
3 Press +/- to select REC MODE, then press SET to display the REC MODE menu screen.
4 Press +/- to select AV JACK in the REC MODE menu. (Menu OSD: p. 29)
5 Press SET to select OUT/PHONES.
   • Press MENU twice to exit.
   • “DV IN” will appear on the screen.

Note
- Set LINE OUT: ON in the DISPLAY menu to display the OSD screen on your TV monitor.

6 Turn your TV ON and set it to LINE INPUT or S-VIDEO.
   Check your TV operating instructions for further information.

7 Start playback.
   • Make sure this unit and TV are turned off while connecting.
   • Please connect the A/V Cable securely.

Playback on your TV

[ TV with AUDIO/VIDEO IN Jacks ]

[ TV with S-VIDEO IN Jacks ]
For best Chrominance and Luminance, use the S-Video connection if available on your TV.

DC Cable
(Supplied)

S-Video Cable
(Not supplied)
Special Effect Features

**Rapid Visual Search**

**A.** Set POWER to ON while pressing the white button.

**B.** Press MENU to display the MAIN MENU screen.

**3.** Press +/- to select [PLAYBACK MODE], then press SET to display the PLAYBACK MODE menu screen.

**4.** Press +/- to select [B.SEARCH] in the PLAYBACK MODE menu. (Menu OSD: p. 29)

**5.** Press SET to select ON. • “BLANK” will appear on the screen.

**Still Picture**

**1.** Press II (PAUSE) during playback.

**2.** Press (PLAY) or II (PAUSE) to release.

**Note**

• When executing a rapid visual search, the picture may become bluish for an instant or mosaic. This is normal during this mode.

**Blank Search**

You can go directly to a blank portion of tape and start recording exactly where you left off.

**1.** Press POWER to ON while pressing the white button.

**2.** Press MENU to display the MAIN MENU screen.

**3.** Press +/- to select [PLAYBACK MODE], then press SET to display the PLAYBACK MODE menu screen.

**4.** Press +/- to select [B.SEARCH] in the PLAYBACK MODE menu. (Menu OSD: p. 29)

**5.** Press SET to select ON. • “BLANK” will appear on the screen.

**Note**

• Sound is muted during all special effects.

**Playback Features**

**A.** During playback, hold down ➪ (FAST FORWARD/SEARCH) or ◄ (REWIND/SEARCH). The search will continue for as long as the button is held down.

**OR**

**B.** Press ➪ (FAST FORWARD/SEARCH) or ◄ (REWIND/SEARCH) once for a continuous rapid visual search. Press (PLAY) to release.

**Note**

• When executing a rapid visual search, the picture may become bluish for an instant or mosaic. This is normal during this mode.
Special Effect Features

**Note**
- Sound is muted during all special effects.

**Fast Forward/Rewind Check**
Monitor normal picture playback during fast forward or rewind.

**Variable Speed Search**

1. Press (PLAY) to start playback.
2. Hold down SET for more than 1 second.
3. Press +/- repeatedly to adjust the speed for forward or reverse playback.
   - Press + for forward playback.
   - Press – for reverse playback.

**To return to normal playback:**
Press (PLAY). Playback will continue at normal speed.

**Frame Search**

1. During Still mode, press +/- to advance or reverse the picture one frame at a time.

**Note**
- The Variable Speed Search function offers a choice of six playback speeds (1/5X (LP mode: 1/3X), 1X, 2X, 5X, 10X, 20X) both in forward and reverse directions.
- During the Variable Speed Search (except 1X speed in forward direction), mosaic-like patterns will appear in the picture.
- During the Variable Speed Search, sound is muted.
Basic Recording

Before you begin
- Connect this unit to a power source. (pp. 9, 10)
- Insert a cassette with the record tab closed. (p. 6)

1. Set the POWER to ON while pressing the white button.
   - The POWER lamp lights red.
   - Be sure POWER is fully turned to the ON position.

2. Press MENU to display the MAIN MENU screen.

3. Press +/- to select REC MODE, then press SET to display the REC MODE menu screen.

4. Press +/- to select AV JACK in the REC MODE menu. Press SET to select IN. (Menu OSD: p.29)

5. Press +/- to select AUDIO SEL, then press SET to select LINE.
   - “LINE AV IN” will appear on the screen.

   **Note**
   - Set LINE OUT: ON in the DISPLAY menu to display the OSD screen on your TV monitor.

6. Press +/- to select REC SPEED in the REC MODE menu. Press SET to select “SP” or “LP”. (Menu OSD: p.29)
   - Press MENU twice to exit.

7. Turn your TV ON and set it to LINE INPUT or S-VIDEO.
   Check your TV operating instructions for further information.

8. Press • (REC) to start recording.
   - The REC Lamp lights red.

9. Press II (PAUSE) to pause.

10. Press ■ (STOP) to stop recording.

   **Note**
   - If left in Record/Pause for 5 minutes, this unit will automatically go into Stop mode.
   - Make sure this unit and TV are turned off while connecting.
   - Please connect the A/V Cable securely.
Audio Dubbing using the External Microphone or External Recording Source

The original sound can be replaced with new sound using an external microphone or external recording source.

The AUDIO REC setting in REC MODE menu should be as follows:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 bit</td>
<td>The original sound is recorded on ST (Stereo) 1, and the new sound will be recorded on ST (Stereo) 2.</td>
</tr>
<tr>
<td>16 bit</td>
<td>The original sound is replaced with the new sound.</td>
</tr>
</tbody>
</table>

- Select 12 bit if you do not want the original sound to be completely replaced during an audio dub.
- If you dub over a tape which has both 12 bit and 16 bit audio recordings on it, keep in mind that the original 16 bit audio portion will be completely replaced.

Before you begin
- Connect the external Microphone (if used).
- Connect this unit and the external recording source using the A/V Cable (if used).
- Turn on this unit.
- Insert a pre-recorded tape to be dubbed.

1. Set POWER to ON while pressing the white button.
2. Press ▶ (PLAY). Then press II (PAUSE) where you want dubbing to begin.
3. Press MENU to display the MAIN MENU screen.
4. Press +/- to select REC MODE, then press SET to display the REC MODE menu screen.

When using an External Microphone

5. Press +/- to select AV JACK, then press SET to select OUT/PHONES or IN.
   - When OUT/PHONES is selected, AUDIO SEL is automatically set to MIC.
6. Press +/- to select AUDIO SEL, and then press SET to select MIC.
   - Go to step 7 on page 21.
Recording Features

Follow the steps 1-4 on page 20.

5. Press +/- to select AV JACK, then press SET to select IN.

6. Press +/- to select AUDIO SEL, and then press SET to select LINE.

7. Press +/- to select AUDIO DUB, and then press SET to select ON.
   - This unit will go to Stand By mode, and “A.DUB” indication appears in the LCD monitor.
   - “LINE A IN” (LINE) or “MIC IN” (MIC) will appear in the LCD monitor.

8. Press II (PAUSE) to start Audio Dubbing.

   Only NTSC (National Television Standards Committee) recorded tapes can be audio dubbed. The following screen appears if the tape was not recorded in NTSC format.

9. Press II (PAUSE) to stop Audio Dubbing.

   • If the microphone used gets too near the speaker on your TV or on this unit, a howling noise (feedback) may occur. In this case, either move the mic farther away or turn the volume down. (p. 14)
   • If the tape position is in or was started in a blank section, you cannot use the A.DUB feature.
Recording Features

Before you begin
- Connect this unit and VCR to their power sources.
- Connect this unit to a VCR as illustrated left.
- Turn ON both units.
- Set the recording VCR’s Input Signal Selector to LINE.
- Before using S-VIDEO Connector, insert the DC Cable into the DC IN Terminal. (p. 10)

1 Insert a pre-recorded tape into the source (playing) unit and a blank tape, with record tab in place, into the target VCR (Recorder).
2 Press MENU to display the MAIN MENU screen.
3 Press +/- to select REC MODE, then press SET to display the REC MODE menu screen.
4 Press +/- to select AV JACK, then press SET to select OUT/PHONES.
   • Press MENU twice to exit.
   • “DV IN” will appear on the screen.
5 Press ▶ (PLAY) on this unit. When the tape reaches the point from which you want to start dubbing, press PAUSE.
6 Place the VCR into REC/PAUSE mode. (See VCR manual.)
7 Simultaneously, press PAUSE on both units to begin copying.
8 Press STOP on both units when copying is completed.

Note
- For technical reasons, dubbing a tape may reduce its quality.
- If the Time Code is displayed in the LCD monitor, it cannot be reset.
- Only the DATE/TIME, when displayed, will be recorded on the tape.

CAUTION:
Unauthorized exchanging and/or copying of copyrighted recordings may be copyright infringement.

Copying your Tapes to S-VHS or VHS Cassette

Source (Playing) unit

DC Cable (Supplied)
A/V Cable (Supplied)
S-Video Cable (not supplied)
VHF Connecting Cable (not supplied)

Recording: VCR (Rear)

Audio In Video In

To Audio In

To Video In

To S-Video In (If there is S-Video In)

Monitor with your TV
- Turn the TV ON and select its VCR channel (either CH3 or CH4).
- Set the VCR/TV Selector on the recording VCR to VCR.
Recording Features

Copying S-VHS or VHS Cassette to your Tapes

Before you begin
- Connect this unit and VCR to their power sources.
- Connect this unit to a VCR as illustrated left.
- Turn ON both units.
- Before using S-VIDEO Connector, insert the DC Cable into the DC IN Terminal. (p. 10)

1. Insert a pre-recorded tape into the source (playing) VCR and a blank tape with recorded tab closed in place into this unit.

2. Press MENU to display MAIN MENU screen.

3. Press +/- to select REC MODE, then press SET to display the REC MODE menu screen.

4. Press +/- to select AV JACK, then press SET to select IN.

5. Press +/- to select AUDIO SEL, then press SET to select LINE.
   - Press MENU twice to exit.
   - “LINE AV IN” is displayed on the LCD monitor. (p. 32)

6. Press PLAY on the VCR. When the tape reaches the point from which you want to start dubbing, press PAUSE.

7. First place this unit to play pause mode, and then press • (REC) for rec pause mode.

8. Simultaneously, press II (PAUSE) on both units to begin copying.

9. Press • (STOP) on both units when copying is completed.

CAUTION:
Unauthorized exchanging and/or copying of copyrighted recordings may be copyright infringement.

Note
- Do not connect A/V with S-Video on a different unit. The picture and sound may be abnormal.
- If both S-Video Cable and A/V Cable are used, the picture will come from the S-Video Cable.
- Do not connect the A/V Cable and S-Video Cable to other devices.
- If a recording is made by the VCR while the counter is displayed, it cannot be reset.
- Depending on the input signal, the closed caption signal may not be able to be recorded normally.
Recording Features

Copying from Digital Equipment (dubbing)

High quality digital-to-digital copying can be accomplished if this unit and a Palmcorder incorporate the DV Input/Output Connector (DV Interface cable is not supplied).

**Before you begin**
- Connect this unit and a source (Playing) unit to their power sources.
- Connect this unit and a source (Playing) unit using the DV Interface cable (4-pin to 4-pin).
- Turn ON both units.

1. Insert a pre-recorded tape into the source (playing) unit, and set POWER to VCR.
2. Insert a blank tape with the record tab closed into the target (recording) unit and set POWER to ON.
3. Press MENU to display MAIN MENU screen.
4. Press +/- to select REC MODE, then press SET to display the REC MODE menu screen.
5. Press +/- to select AV JACK, then press SET to set to OUT/PHONES. “DV IN” is displayed on the LCD monitor. (p. 32)
6. Press (PLAY) on the source (Playing) unit. When the tape reaches the point from which you want to start dubbing, press II (PAUSE).
7. First place the target (recording) unit to play pause mode and then press (REC) to pause the tape at the starting point of the dub.
8. Simultaneously, press II (PAUSE) on both units to begin dubbing.
9. Press (STOP) on the recording unit, and then press (STOP) on the playing unit to end dubbing.

**CAUTION:**
Unauthorized exchanging and/or copying of copyrighted recordings may be copyright infringement.
Notes On Operations

**How to use SCREW Unit**

Use only the supplied SCREW Unit when mounting the rear side of this unit to a rigid surface.

- **SCREW Unit (4 screws)** (Supplied)
- **Attachment Panel, etc**

![Diagram of SCREW Unit and Attachment Panel](image)

**Wire Remote Controller**

To Remote Terminal

<table>
<thead>
<tr>
<th>REC LED</th>
<th>REC/PAUSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø2.5</td>
<td></td>
</tr>
</tbody>
</table>

**Note**

- The REC LED lights up during REC Mode.
- The REC LED flashes during REC/PAUSE Mode.
- The REC LED lights out during other modes.
- When REC/PAUSE switch is closed from open, mode is changed.
- Refer to Menu OSD: p. 30.
- Please consult your local dealer.
## Specifications

**Power Source:**
- Digital Video Cassette Recorder: Input 7.9 V DC  
  AC Adaptor: Input 110/120/220/240 V AC, 50/60 Hz,  
  Output 7.8 V DC  
- Battery: Lithium-Ion Type Output DC 7.2 V

**Power Consumption:**
- Digital Video Cassette Recorder:  
  Input: 7.2 V/7.9 V DC 4.5 W (Rec mode)  
  (MAX 6.5 W: Rew mode)  
- AC Adaptor: 18 W  
  1 W (when not in use.)

**Digital Interface**
- DV Input/Output Terminal (IEEE1394, 4-pin)

**Video Signal:**
- EIA Standard (525 lines, 60 fields) NTSC color signal

**Video Recording System:**
- 2 rotary heads, helical scanning system

**Video Output Level:**
- Y Output: 1.0 Vp-p, 75 ohm  
- C Output: 0.286 Vp-p, 75 ohm

**Video Input Level:**
- Y Input: 1.0 Vp-p, 75 ohm  
- C Input: 0.286 Vp-p, 75 ohm

**Audio:**
- 12 bit (32 kHz) 4 tracks  
- 16 bit (48 kHz) 2 tracks

**Audio Output Level (Line):**
- -10 dBV Output Impedance 1 kohm  
  Load Impedance 10 kohm

**Audio Input Level (Line):**
- -10 dBV Input Impedance 47 kohm

**Audio Input Level (Mic):**
- -70 dBV Input Impedance 5600 ohm  
  Mic sensitivity -50 dB

**LCD Monitor:**
- 88.9 mm (3.5 inch) Liquid Crystal Display

**Operating Temperature:**
- 32 °F~104 °F (0 °C~40 °C)

**Operating Humidity:**
- 10 %~75 %

**Weight:**
- Digital Video Cassette Recorder: 0.5 kg  
  1.1 lbs.  
- AC Adaptor: 0.16 kg  
  0.35 lbs.

**Dimensions:**
- Digital Video Cassette Recorder:  
  143 (W) x 94.5 (H) x 69.7 (D) mm  
  5-5/8 (W) x 3-3/4 (H) x 2-5/8 (D) inch  
- AC Adaptor:  
  70 (W) x 45 (H) x 115 (D) mm  
  2-3/4 (W) x 1-3/4 (H) x 4-1/2 (D) inch

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

**Notice**

This product has a fluorescent lamp that contains a small amount of mercury. It also contains lead in some components. Disposal of these materials may be regulated in your community due to environmental considerations. For disposal or recycling information please contact your local authorities, or the Electronics Industries Alliance:  
Cleaning Care for Video Heads

(a) Video Head Cleaning: Normally, your unit will not require head cleaning. However, it is possible that the heads may become clogged due to dust in the air, playing damaged tapes, long term use, etc. If "NEED HEAD CLEANING" appears for 5 seconds in the LCD monitor, the heads may require cleaning.

(b) Cleaning the Heads: It is recommended that head cleaning be performed by a qualified service technician. Please contact your nearest Panasonic Servicenter. An alternate solution is to obtain a head cleaning cassette. Please use Panasonic cleaning cassette (AY-DVMCLA). Be sure to follow the cleaning instructions carefully. Excessive use of the head cleaning cassette could shorten video head life. Use this cassette only when a head clogging symptoms occur. Refer servicing to qualified service personnel.

Tape Operations Caution

• When you go from function to function (PLAY, FF, REW etc.), please note that the unit will not accept a new function operation until the previous operation is complete.
• The POWER Button and all function buttons, (PLAY, FF, REW, etc.) are only operational after the tape has been completely loaded.

If you have a problem with your unit, it may be something you can correct yourself. Check the list below for symptoms and corrections.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>No picture in the LCD Monitor</td>
<td>• Make sure the Power Source is connected. (pp. 9, 10)</td>
</tr>
<tr>
<td></td>
<td>• Make sure the POWER is set to ON. (pp. 13, 19)</td>
</tr>
<tr>
<td></td>
<td>• Check the Dew Indicator. (p. 28)</td>
</tr>
<tr>
<td></td>
<td>• Make sure the Battery is fully charged. (p. 9)</td>
</tr>
<tr>
<td></td>
<td>• Make sure all necessary cables are connected correctly and firmly. (p. 10)</td>
</tr>
<tr>
<td>Video cassette cannot be inserted...</td>
<td>• Make sure the Power Source is connected. (pp. 9, 10)</td>
</tr>
<tr>
<td></td>
<td>• Insert the cassette record tab up, window side facing out. (p. 7)</td>
</tr>
<tr>
<td>Video cassette cannot be removed...</td>
<td>• Make sure the Power source is connected. (pp. 9, 10)</td>
</tr>
<tr>
<td>No operation starts when operation buttons are pressed...</td>
<td>• Check the Dew Indicator. (p. 28)</td>
</tr>
<tr>
<td>Recording cannot be done...</td>
<td>• Make sure the record tab is closed. (p. 6)</td>
</tr>
<tr>
<td></td>
<td>• Check the Battery Indication. (p. 31)</td>
</tr>
<tr>
<td>Sound from microphone cannot be monitored...</td>
<td>• Make sure the unit is set to REC or REC/PAUSE mode.</td>
</tr>
<tr>
<td>Sound cannot be heard...</td>
<td>• Make sure the Audio on the PLAYBACK MODE is set to ST1. (pp. 21, 29)</td>
</tr>
</tbody>
</table>
On-Screen Displays (OSD)

The following warning displays appear in the LCD monitor.

<table>
<thead>
<tr>
<th>Indications</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAPE NOT INSERTED</td>
<td>If this unit is in ON mode without a cassette inserted, “<em>a</em>” will flash and “TAPE NOT INSERTED” will appear for 5 seconds. Recording will not start.</td>
</tr>
<tr>
<td>CHECK REC TAB</td>
<td>If this unit is Audio dub mode or Rec mode with the cassette sliding record tab opened, “<em>a</em>” will flash and “CHECK REC TAB” will appear for 5 seconds. Recording will not start.</td>
</tr>
<tr>
<td>CANNOT REC</td>
<td>When Audio dub is performed and the recording is other than NTSC format, “<em>a</em>” will flash and “CANNOT REC” will appear for 5 seconds.</td>
</tr>
<tr>
<td>INCOMPATIBLE TAPE</td>
<td>When an incompatible tape is detected, “INCOMPATIBLE TAPE” will appear for 5 seconds.</td>
</tr>
<tr>
<td>NEED HEAD CLEANING</td>
<td>If the video heads require cleaning, “NEED HEAD CLEANING” will appear for 5 seconds.</td>
</tr>
<tr>
<td>CANNOT REC LP-MODE</td>
<td>When an AUDIO DUB is attempted on a pre-recorded LP tape, “CANNOT REC LP-MODE” will appear for 5 seconds.</td>
</tr>
<tr>
<td>DEW DETECTED</td>
<td>If excessive moisture condenses in the unit, “WARNING” will flash, “DEW DETECTED” will appear, and this unit will automatically turn OFF in 15 seconds. In this case, wait until the indicator no longer flashes when your unit is turned ON again.</td>
</tr>
<tr>
<td>WARNING LOW BATTERY</td>
<td>When a battery recharge is necessary, “WARNING” will flash, “LOW BATTERY” will appear, and this unit will automatically turn OFF in 15 seconds. (p. 31)</td>
</tr>
<tr>
<td>CLOCK BATTERY</td>
<td>When the built-in lithium clock battery is discharged, “CLOCK BATTERY” will appear. To re-charge the lithium clock battery, connect the AC Adaptor to this unit. Recharging takes approx. 4 hours. Reset the clock after charging.</td>
</tr>
<tr>
<td>INCOMPATIBLE DATA</td>
<td>If you play a tape recorded in a format other than NTSC or you try to copy copy-protected data, “INCOMPATIBLE DATA” will appear.</td>
</tr>
</tbody>
</table>
**For Your Information**

**MAIN MENU Screen**

1. **REC MODE**
   - **REC SPEED** (p. 19)
     - **SP**: Normal recording speed mode.
     - **LP**: Recording time is 1.5 times as long as in the SP mode. For example, 120 minutes of recording is possible on an 80 minute tape.
   - **AUDIO DUB** (p. 21)
     - Set to AUDIO DUB "ON" in the Menu OSD to use the Audio Dub feature during this unit’s Play/Pause mode.
   - **AUDIO REC** (p. 20)
     - **12 bit**: The sound is recorded in the 12 bit/32 kHz mode.
     - **16 bit**: The sound is recorded in the 16 bit/48 kHz high-quality mode.
   - **AV JACK** (pp. 16, 19, 20~24)
     - To designate the A/V terminal as IN or OUT.
   - **AUDIO SEL** (pp. 20~21, 23)
     - To select LINE or MIC as the sound input when recording. (AV JACK should be IN to select.)

2. **PLAYBACK MODE**
   - **COLOR MODE** (p. 15)
     - Select OFF to playback in black and white.
   - **AUDIO** (p. 21)
     - To select the desired audio playback mode after performing audio dubbing in the 12 bit mode (SP mode only).
     - **ST1**: The original sound alone is played back.
     - **ST2**: The dubbed sound alone is played back.
     - **MIX**: The original sound and the dubbed sound are played back together.
   - **B.SEARCH (Blank Search)** (p. 17)
     - Select ON to go directly to a blank portion of the tape.
CONTROL MODE
Selecting LOCAL/REMOTE allows operation to be done at the unit and remote control. Selecting REMOTE ONLY allows operation at the remote control. Only the MENU Button, VOL +/- Button and POWER Switch will function at the unit.

REMOTE MODE
To assign the functions of the remote control button (REC/REC PAUSE or REC/STOP).

DISPLAY
To select the desired type of display on the LCD Monitor.

LINE OUT (p. 16)
Set to ON to display the OSD screen on your TV monitor, etc.

C.RESET (p. 32)
Setting to ON resets the counter to zero. (COUNTER should be LINEAR or MEMORY to select.)

DATE/TIME (p. 31)
To select the desired type of display on the screen.

COUNTER (p. 32)
To select LINEAR, MEMORY, or TC (Time Code) as the Counter indication.

DATE/TIME SETTING (p. 11)
The date and time can be set.
Here are some of the basic indications which will appear on the LCD Monitor. Only Date and Time indications will be recorded onto the tape.

- **Battery Remaining**
  - (Menu OSD: p. 29)
  - This display appears when OFF is selected in COLOR MODE menu.

- **Tape Remaining**
  - (30 minutes)
  - (60 minutes)
  - It will take several seconds for the tape remaining indicator to operate after the tape starts moving.

- **Color Mode**
  - (Menu OSD: p. 29)
  - The warning displays appear in the LCD monitor.

- **Volume Display**
  - (p. 14)
  - The volume bar appears when the volume of the built-in speaker is being adjusted.

- **Date and Time Indication**
  - (Menu OSD: p. 30)
  - As shown right, the date and time indication changes each time DATE/TIME is selected from the unit’s MENU.

- **Tape Speed Indication**
  - (Menu OSD: p. 29)
  - Indicates the tape speed (SP or LP).

- **WARNING Indication**
  - (p. 28)
  - Indicates the rec audio mode (12 bit or 16 bit).
LCD Monitor Indications

Display ON/OFF/AUTO and Counter/Time Code

The indication switches as shown below when the desired “DISPLAY” mode is selected from the menu. (Menu OSD: p. 30)

- In AUTO, the Tape Mode Indication appears for 5 seconds only when the action (PLAY, etc.) is done.

Tape Mode Indications

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>REC</td>
<td>Recording</td>
</tr>
<tr>
<td>REC II</td>
<td>Paused during recording</td>
</tr>
<tr>
<td>▶︎</td>
<td>Playback</td>
</tr>
<tr>
<td>▷</td>
<td>Still</td>
</tr>
<tr>
<td>STOP</td>
<td>Frame Advance (forward)</td>
</tr>
<tr>
<td>▼į</td>
<td>Frame Advance (reverse)</td>
</tr>
<tr>
<td>FF</td>
<td>Fast forward</td>
</tr>
<tr>
<td>REW</td>
<td>Rewind</td>
</tr>
<tr>
<td>▶︎</td>
<td>FF Search</td>
</tr>
<tr>
<td>&lt;į</td>
<td>REW Search</td>
</tr>
<tr>
<td>BLANK</td>
<td>Blank Search</td>
</tr>
<tr>
<td>A.DUB</td>
<td>Audio Dubbing</td>
</tr>
<tr>
<td>A.DUB II</td>
<td>Audio Dubbing Pause</td>
</tr>
</tbody>
</table>

Memory Counter M 0:00:00

This unit will stop whenever it reaches the point where the counter was previously set to M 0:00:00 during audio dub, fast forward, or rewind.

Time Code 0h00m00s00f

This unit calculates and displays exactly where you are on any tape in terms of hours, minutes, seconds, and frames (30 frames = 1 second).

- This display cannot be reset.

IMPORTANT NOTE:

- C.RESET does not work when COUNTER is set to TC.

Input Mode Indications

<table>
<thead>
<tr>
<th>Input Mode</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV JACK: IN</td>
<td>MIC IN</td>
</tr>
<tr>
<td>AUDIO SEL: MIC</td>
<td>LINE V IN</td>
</tr>
<tr>
<td>AV JACK: IN</td>
<td>LINE AV IN</td>
</tr>
<tr>
<td>AUDIO SEL: LINE</td>
<td>DV IN</td>
</tr>
<tr>
<td>AV JACK: OUT</td>
<td>LINE A IN</td>
</tr>
<tr>
<td>AV JACK: IN</td>
<td>LINE A IN</td>
</tr>
<tr>
<td>AUDIO SEL: LINE</td>
<td>DV IN</td>
</tr>
<tr>
<td>(A.DUB, A.DUB PAUSE)</td>
<td>LINE A IN</td>
</tr>
<tr>
<td>AV JACK: IN</td>
<td>MIC IN</td>
</tr>
<tr>
<td>AUDIO SEL: MIC</td>
<td>MIC IN</td>
</tr>
<tr>
<td>(A.DUB, A.DUB PAUSE)</td>
<td>MIC IN</td>
</tr>
</tbody>
</table>
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POWER Lamp
pp. 9, 10.

CHARGE Lamp
p. 9.

AC Power Cord
pp. 9, 10.

VCR DC Output Connector
p. 10.

AC Adaptor

CAUTION:
This unit will operate on 110/120/220/240 V AC. An AC plug adaptor may be required for voltages other than 120 V AC. Please contact either a local or foreign electrical parts distributor for assistance in selecting an alternate AC plug. We recommend using the accessory power plug adaptor (VJSS0070) in an area which has special AC outlets.
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