



Z-DR1



*Digital Dockable Recorder
For Hitachi Professional Cameras*

NTSC Operation Manual

Rev1.0 Jan-06

FOR YOUR PROTECTION

The model and serial numbers of your product are important for you to keep for convenience, protection and warranty. These numbers appear on the nameplate located on the bottom of the product.

Please record these numbers in the spaces provided below, and retain this manual for future reference.

Model: Z-DR1 Digital Disc Recorder

Serial Number: _____

Date Purchased: _____

Dealer: _____

Invoice Number: _____

SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual and safety Instructions on your equipment.
Follow recommended precautions and safe operating practices.

Safety alert symbol



This is the "Safety Alert Symbol." This symbol is used to call your attention to items or operations that could be dangerous to you or other persons using this equipment. Read these messages and follow these instructions carefully.

It is essential that you read the instructions and safety regulations before you attempt to assemble or use this equipment.

The definitions of signal words are as follows:



WARNING: Personal danger



WARNING: Warning notes indicate any condition or practice, which if not strictly observed, could result in personal injury or possible death.



CAUTION: Possible damage to equipment



CAUTION: Caution notes indicate any condition or practice, which if not strictly observed or remedied, could result in damage or destruction of the equipment.



NOTE: Notes indicate an area or subject of special merit, emphasizing either the product's capabilities or common errors in operation or maintenance. Vital instruction that must be adhered to in order for the equipment to work as specified.



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

General safety instructions

Read and Follow Instructions: All the safety and operating instructions should be read before the product is operated. All operating and use instructions should be followed.

Heed Warnings: All warnings on the product and the operating instructions should be adhered to.

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

Cleaning: Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

Attachments: Do not use attachments not recommended by the product manufacturer as they may cause hazards.

Water and Moisture: Do not use this product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool; and the like.

Accessories: Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

Moving: If the product is being transported on a cart or wheeled table, it should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and or cart combination to overturn and cause harm to yourself and others in the vicinity.

Ventilation: Slots and openings (if any) on the unit chassis are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product 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.

Power Sources: This product should be operated only from the type of power source recommended. If you are not sure of the type of power supply to use with your unit, consult your product dealer or local nNovia representative. For products intended to operate from battery power, or other sources, refer to the operating instructions.

Grounding or Polarization: This product is equipped with a three-wire grounding-type plug a plug having a third (grounding) pin. This plug will only 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.

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 at plug, convenience receptacles, and the point where they exit from the product.

Lightning: For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power-line surges.

Overloading: Do not overload wall outlets, extension cords or integral convenience receptacles as this can result in a risk of fire or electric shock.

Object and Liquid Entry: Never push objects of any kind into this product 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 on the product.

General safety instructions (cont.)

Inflammable and Explosive Substance: Avoid using this product where there are gases, and also where there are inflammable and explosive substances in the immediate vicinity.

Heavy Shock or Vibration: When carrying this product around, do not subject the product to heavy shock or vibration.

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

Damage Requiring Service: Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

When the power-supply cord or plug is damaged.

If liquid has been spilled, or objects have fallen into the product.

If the product has been exposed to rain or water.

If the product 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 product to its normal operation.

If the product has been dropped or damaged in any way.

When the product exhibits a distinct change in performance, this indicates a need for service.

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.

Safety Check: Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

Wall or Ceiling Mounting: The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

Heat: The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

Important notice

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



WARNING: Changes or modifications not expressly approved by Hitachi Kokusai Electric responsible for compliance could void the user's authority to operate the equipment.

Canadian Users:

This product does not exceed the class A/class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations.

Le present appareil n'emet pas de bruits radioelectriques depassant les limites applicable aux appareils numeriques de classe A prescrites dans le reglement sur le brouillage radioelectrique edicter par le ministere des communications du Canada.

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WARNINGS AND CAUTIONS FOR USE

Before using the Z-DR1, please read and fully understand the particular model of Hitachi camera that you will be using it with. If you do not have an operation manual for your current Hitachi camera, you may request one free-of-charge by filling out this [form on the Hitachi Kokusai Electric America website](#).

When connecting and disconnecting microphone and other cables, grasp the connectors by the body, not the attached cable. Cables can be damaged by pulling on them.

Do not disassemble or modify!



The camera and Z-DR1 recorder contains precision internal components. Do not open the cover or disturb switches and controls other than designated. There is risk of impaired performance and damage if doing so.

Note when transporting: When transporting by hand, use the carrying case optionally sold. If shipping by truck or other means, pack in the carrying case, then use further cushioning and pack in a sturdy carton.

Keep foreign objects from interior. Entry of water, metallic or other foreign materials can cause failure and damage.

Storage Locations: Avoid using or storing the equipment in the following types of locations. Impaired performance and damage can be caused.

- ◆ Extremely hot or cold locations (exceeding -10 to 40°C), such as in enclosed vehicles.
- ◆ Subject to strong vibration.
- ◆ Humid or dusty locations without external moisture protection cover.
- ◆ Salt spray or corrosive gases.
- ◆ Strong electromagnetic fields (e.g., near Cellular antennas, TV or radio transmitters).
- ◆ Where exposed directly to rain and water without rain-proof cover (optionally sold).
- ◆ Do not cover or otherwise obstruct camera heat dissipation during operation.

Mechanical Support: Use a recommended tripod and install the camera and recorder correctly so that it does not fall to the ground during use.

Cleaning: Use a photographer's air blower to clear dust from the lens and filters. Wipe the case with a soft dry cloth. Do not use volatile solvents, as these may deform the materials.

Fuse maintenance:



Important: The unit incorporates automatic re-set fuse when the overload condition is removed. In the event of non-operation when applying power, consult your Hitachi representative and have the unit serviced by authorized personnel only. There are no user serviceable parts inside the unit.

In event of difficulty: Disconnect from power and contact the nearest Hitachi authorized Dealer, Service Agency, Regional Sales Office or [Hitachi Kokusai Electric America Technical Support at headquarters](#).

STANDARD COMPOSITION ITEMS

The Z-DR1 Digital Disc Recorder is composed of, and is shipped with the following items:

Part Number	Description	Quantity
Z-DR1	Dockable Disc Recorder	1
HTS-6505-40	Mediapac 40GB Hard Disc Cartridge	1
C3MXLR	Mini XLR to Std XLR adapter cable, 12 inches long. For use with Z-DR1 Audio Line output.	2
MXR-8PA-6PB	Mating Plug connector (cable side) for the Remote Trigger Jack.	1
ZDR1-OPM	The current version of this Operation Manual	1

OPTIONAL ITEMS

The items below can be purchased from Hitachi Kokusai America, Ltd its dealers, sales representatives and Audavi Corporation. Please consult with your Hitachi sales representative for accessories you may need that are not listed below.

Part Number	Description
FS-4X1	nNovia NTSC/PAL Firewire Switch. 4X1 IEEE1394 Switcher. For switching or accessing multiple Mediapac HDDs.
SH-6	nNovia SH6 Smart Firewire Hub. Switchable 6 Port Hub. For connection of multiple Mediapac HDDs to a NLE PC.
IA-60	IDX Small Heavy duty A/C Adapter (13.5VDC/4.4 amp). For use with SK and Z series cameras, (4-pin XLR) includes power, AC cable.
ABWMK-KIT	Anton Bauer Side mount wireless microphone mounting kit. For use with Z-DR1 hard disc recorder. Requires DVC700BP, battery and wireless microphone system.
DVC700BP	Anton Bauer wireless microphone mounting backplate. For use with Z-DR1 hard disc recorder. Required for ABWMK-KIT.
QRWRB-25	Anton Bauer wireless slot mic receiver mount. For use with all dockable cameras, Z-DR1 configurations. Optionally requires: Sennheiser EK3041-U, RAMSA WX-RM770 or TSP WD-900R wireless mic receivers.
CC-4XLR	Anton Bauer 6-foot cable DC power cable. For connecting camera to power supply or charger. Includes: 4-pin standard power F-XLR.
DUAL-2722	Anton Bauer simultaneous two position power charger. Includes: LCD Display, built-in discharge module and 70w Power Supply.
QUAD-2702	Anton Bauer Four-position charger/discharge/diagnostics/Autocal for digital batteries. Includes: LCD Display, with 70-watt Power Supply. Charges all Anton batteries in one hour.
TITAN TWQ	Anton Bauer four position simultaneous InterActive battery charger.
TITAN T2	Anton Bauer TITAN T2 Two position simultaneous InterActive battery charger. Includes: w/ 70 watt camera output.
TITAN Twin	Anton Bauer TITAN TWIN Two position simultaneous InterActive battery charger.
TITAN70	Anton Bauer Gold mount 70 watt charger. Includes: power supply.
QR-HOTSWAP-GM	Anton Bauer "hot-swap" battery bracket. For changing batteries while camera is powered/ recording. For use with all Z-series cameras & Z-DR1 configurations.
Digital ProPac 14	Anton Bauer Logic Series Digital NiCad Battery, 14.4 volts, 60 watt hours. For use with all SK and Z-series cameras in ENG/ EFP configuration. (Requires battery bracket, charger)..
Digital TrimPac 14	Anton Bauer Logic Series Digital NiCad Battery, 14.4 volts, 43 watt hours. For use with all SK and Z-series cameras in ENG/ EFP configuration. (Requires battery bracket, charger).

OPTIONAL ITEMS (CONTINUED)

Part Number	Description
DIONIC 160	Anton Bauer DIONIC 160 Logic Series DIGITAL Battery, 14.4 volts, 160 watt hours. For use with all SK and Z-series cameras in ENG/ EFP configuration. (Requires battery bracket, charger).
DIONIC 90	Anton Bauer DIONIC 90 Logic Series DIGITAL Battery, 14.4 volts, 90 watt hours. For use with all SK and Z-series cameras in ENG/ EFP configuration. (Requires battery bracket, charger).
HyTron 120	Anton Logic Series Digital Ni-MH Battery, 14.4 volts, 120 watt Hours. For use with all SK and Z-series cameras in ENG/ EFP configuration. (Requires battery bracket, charger).
HyTron 50	Anton Bauer Logic Series Digital Ni-MH Battery, 14.4 volts, 50 watt hours. For use with all SK and Z-series cameras in ENG/ EFP configuration. (Requires battery bracket, charger).
ProPac 14	Anton Bauer Logic Series NiCad Battery 14.4 volts, 65 watt hours. For use with all SK and Z-series cameras in ENG/ EFP configuration. (Requires battery bracket, charger).
TrimPac 14	Anton Bauer Logic Series NiCad Battery , 14.4 volts 45 watt hours. For use with all SK and Z-series cameras in ENG/ EFP configuration. (Requires battery bracket, charger).
HB40CAM-C	Porta Brace Deluxe suede covered padded shoulder pad with universal camera mount clips. For use with current Z-series camera docked to ZDR1. (see SC-ZDR1carrying case).
SC-ZDR1	Porta Brace SC Series shoulder case. For use with current Z-series camera docked to ZDR1. (see HB40CAM-C shoulder strap).
HTS-6505-20	20GB /4200 rpm Mediapac Cartridge for Z-DR1.
HTS-6505-40	40GB /4200 rpm Mediapac Cartridge for Z-DR1.
HTS-6505-60	60GB /4200 rpm Mediapac Cartridge for Z-DR1.
HTS-6505-80	80GB /4200 rpm Mediapac Cartridge for Z-DR1.
HTS-6505-100	100GB /4200 rpm Mediapac Cartridge for Z-DR1.
HTS-6505-120	120GB /4200 rpm Mediapac Cartridge for Z-DR1.
HTS-6575-60	60GB /7200 rpm Mediapac Cartridge for Z-DR1.
HTS-6575-80	80GB /7200 rpm Mediapac Cartridge for Z-DR1.
HTS-6575-100	100GB /7200 rpm Mediapac Cartridge for Z-DR1.
STS-6510-04	4GB SolidTape Cartridge
STS-6510-08	8GB SolidTape Cartridge
HTS-6595-PCMKIT	PC Card (PCMCIA) Interface Cable Kit.
HTS-6595-USBKIT	USB 2.0/1.1 Interface Cable Kit.
HTS-6595-FWKIT	Fire Wire (IEEE 1394) Interface Cable Kit.
HTS-6595-ACDC5V	Mediapac AC to 5VDC power adapter. For use with Mediapac & laptop NLE.
HTS-6595-USBDC5V	Mediapac USB to 5VDC power cable. For use with Mediapac & laptop NLE.
HTS-6500-BAY-BK/BG	Mediapac Bay Kit with AT/IDE Interface (Black or Beige).
HTS-6500-BAY-USB-BK/BG	Mediapac Bay Kit with USB 2.0 Interface (Black or Beige).
HTS-6500-BAY-LT44-BK	Mediapac Bay Kit with 44-pin Laptop Connector (Black).

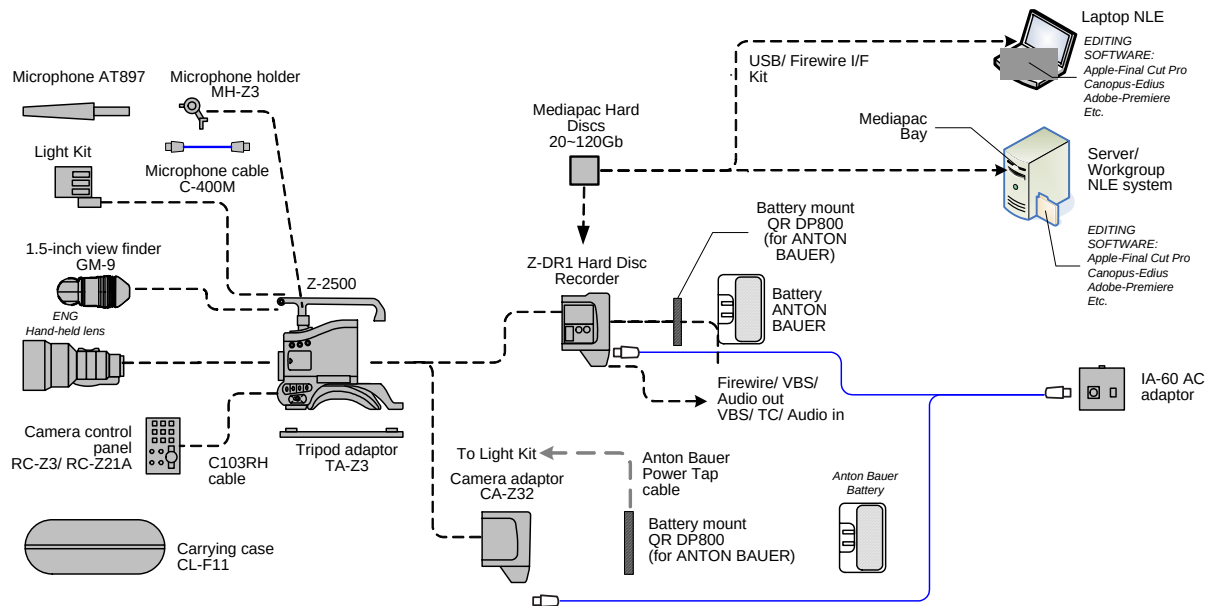
OPTIONAL ITEMS (CONTINUED)

Part Number	Description
HTS-6500-BAY-USFW-EXT	Mediapac Bay Kit External with USB/FW Interface.
HTS-6500-BAY-SC50-BK/BG	Mediapac Bay Kit with Narrow 50-pin SCSI Interface (Black or Beige)
HTS-6500-BAY-SC68-BK/BG	Mediapac Bay Kit with Wide 68-pin SCSI Interface (Black or Beige)
HTS-6500-BAY-SC50-EXT	Mediapac Bay Kit External with Narrow 50-pin SCSI Interface.
HTS-6500-BAY-SC68-EXT	Mediapac Bay Kit External with Wide 68-pin SCSI Interface.
HTS-6500-ADP-BK/BG	Mediapac Bay Adapter Bracket for CD/DVD Slot (Black or Beige)
HTS-6500-ADP-LCK-BK/BG	Mediapac Bay Key Lock Adapter Bracket (Black or Beige).

Example System Configuration Drawing:

The following diagram depicts the Hitachi Z-2500 camera as an example. All currently manufactured Hitachi NTSC camera models are fully compatible with the Z-DR1 dockable digital recorder:

Z-2500 ENG/ FIELD PRODUCTION CAMERA SYSTEM



OUTLINE AND FEATURES

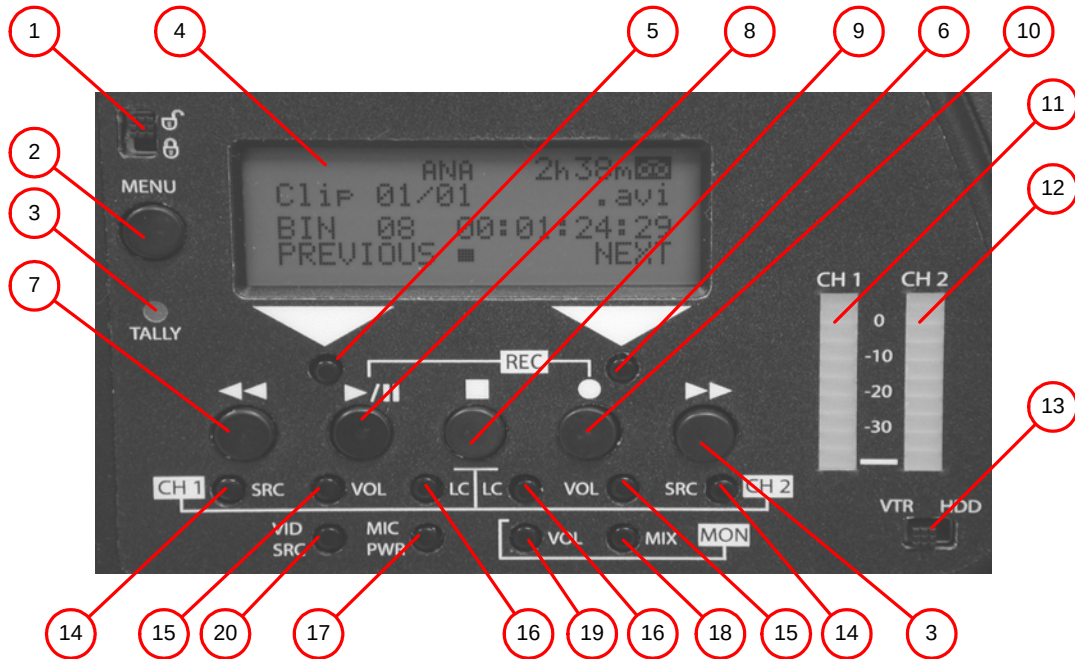
- ◆ Features rugged, reliable Hitachi TravelStar™ 2.5-inch hard disc drives, the industry standard in most laptop and portable media devices.
- ◆ Hard Disc storage of digital audio and video is presently the most cost-effective and practical method of recording from a camera.
- ◆ Mediapac™ is available in recording times ranging from 3 to 9 hours per drive.
- ◆ SolidTape™ is a solid-state version of the Mediapac™. It is available in 4GB and 8GB versions.
- ◆ Unsurpassed capacity-to-cost ratio compared to solid-state and optical disc.
- ◆ Metal case and special shock protection mounts ensure the Hard Disc Drive reliability.
- ◆ Leather case included for protection of the Mediapac™ exterior.
- ◆ Mediapac™ available directly from [Hitachi Kokusai Electric America, Ltd](#) and [Audavi Corporation](#).
- ◆ Can be used in docking bay for PC, stand-alone as portable media device, or with any of the PC interface adapters offered.
- ◆ Laptop IOs include PCMCIA, Firewire, USB, for great compatibility with currently available portable PCs.
- ◆ Records popular *.avi and *.mov file formats for use with most NLEs (non-linear editing suites) presently on the market.
- ◆ Provided are popular user features such as:
 - Loop record
 - Time-lapse (animation) record
 - External time code record
 - HDD emulation mode
 - Clip markers
 - Camera trigger/ tally system
 - Viewfinder monitoring.

GENERAL DESCRIPTION

The Z-DR1 is a video recorder with two modes of operation controlled by the slide switch at the rear of the unit. With the switch set to VTR, Z-DR1 behaves just like a VTR. Video can be captured in the DV format and played back using familiar VTR controls.

With the switch in the HDD position, the Z-DR1 appears to a PC or Mac computer as a hard drive with the video content set as files ready to edit, process etc. in a nonlinear manner. In addition it can act as a media converter to decode DV being recorded or played back into its composite video input BNC. It can also encode composite video into the DV format for recording or displaying.

DESCRIPTION OF CONTROL PANEL



1. **Panel Lock Switch** – Locks the control panel so that the buttons are inoperative as when placing the camera on shoulder for normal shooting. Turns the LCD Display illumination lamp ON when unlocked, OFF when locked.
2. **Menu Page Button** – Use this button to navigate through the various options offered by QuickCapture / A2D. The functions are called out in the bottom two rows of the LCD. Stepping through options is done by repeated pushes of the button, decisions on a particular option is done through the two soft keys below the LCD. Note: The menu button can be activated from a Stop or Idle mode or while playing..
3. **Record Tally LED** – Indicates Recording Mode when lit.
4. **LCD Display** – There are three lines in the LCD Display. The first line is used to display icons that reflect some of the current settings of the unit. These settings include:
 - ◆ Battery Level
 - ◆ ANA / DIG (Video Source is Analog / Digital)
 - ◆ Loop Play enabled
 - ◆ Time Remaining
 - ◆ Time Code (Runs only when in record or playback mode)

The second line will display the recording file type set for the selected bin (.MOV / .AVI). While playing or recording it also displays the current clip number and the total number of clips in the bin.

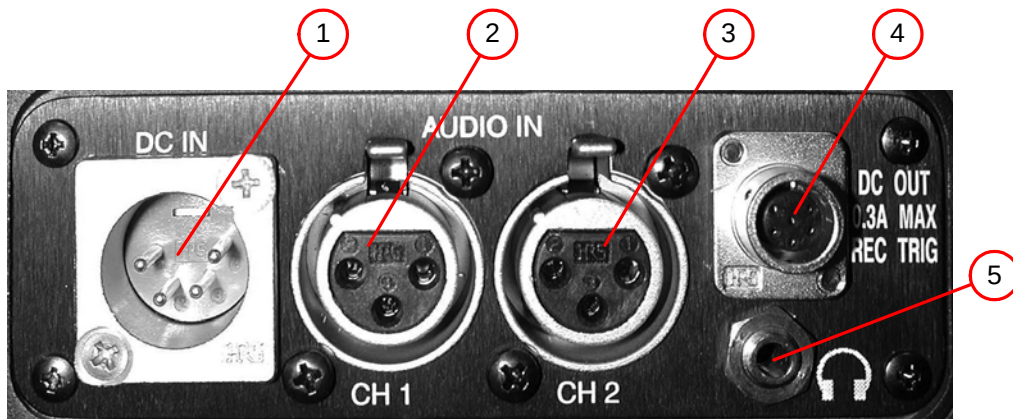
The third line will display the bin number (01-99) and a time number (Hr:Min:Sec:Frame). The time number has 4 options; it is the elapsed time while recording, the total time recorded when selecting a bin, the time code of the frame being played or the time code of the last frame played in the stop mode following a play mode.

5.

Menu Navigation Left soft key – The functions of the two Soft Keys found below the LCD are dependent upon the current operation mode. Each function changes with each different operation mode. The Soft Key's current functions are displayed on the bottom line of the LCD panel, directly above each respective left / right Soft Key.

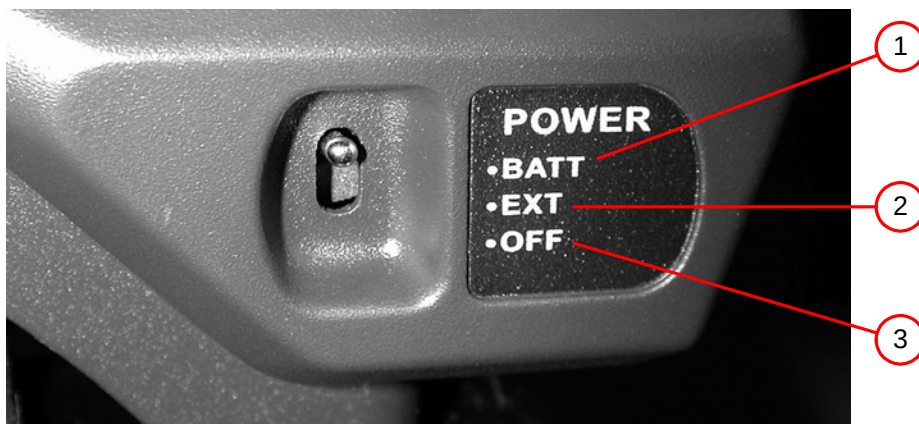
6. **Menu Navigation Right soft key** – (same as above)
7. **Fast Reverse, Rewind/ Fast Forward** – Activates RWD or FFWD mode. Each time pressed, speed increases UP to 32X in each direction.
8. **Play/ Pause** – From the Stop or Idle mode, pressing the 'PLAY' button plays back video from the selected Bin While playing, pressing the 'PLAY' button will toggle between 'PLAY' and 'PAUSE'.
9. **Stop** – In PLAY Mode, pressing the 'STOP' button will end play back and enter the Stop mode. In RECORD Mode, pressing the 'STOP' button will end recording and enter the Stop mode.
10. **Record** – In Idle Mode, pressing the 'PLAY' while the 'REC' button is held down will make the unit ready to record.
11. **Ch1/ Left audio channel** volume LEDs – Indicates the audio volume for Channel-1.
12. **Ch2/ Right audio channel** volume LEDs – Indicates the audio volume for Channel -2
13. **VTR/ HDD Mode Switch** – Switches between VTR and HDD operation modes.
14. **Audio Source selection** for Ch1/ Ch2 – Selects the source of the audio to be recorded in Chnl1 and Chnl2.
15. **Volume set for Ch1/ Ch2** – Sets the volume level for the audio source to be recorded in Chnl1 and Chnl2.
16. **Low Cut filter for Ch1/ Ch2** – Low frequency cut audio filter for the audio source to be recorded in Chnl1 and Chnl2.
17. **Phantom Power (48VDC) for Rear Microphones** – Applies phantom power to the rear microphones.
18. **Monitor Mix selection** – Allows R/L mix and R or L selection of the audio output from the ¼-inch rear jack.
19. **Monitor Volume** – Allows setting of the audio level to be output from the ¼-inch rear jack.
20. **Video Source Selection** – Provides the choices for video source selection.

DESCRIPTION OF REAR CONNECTION PANEL



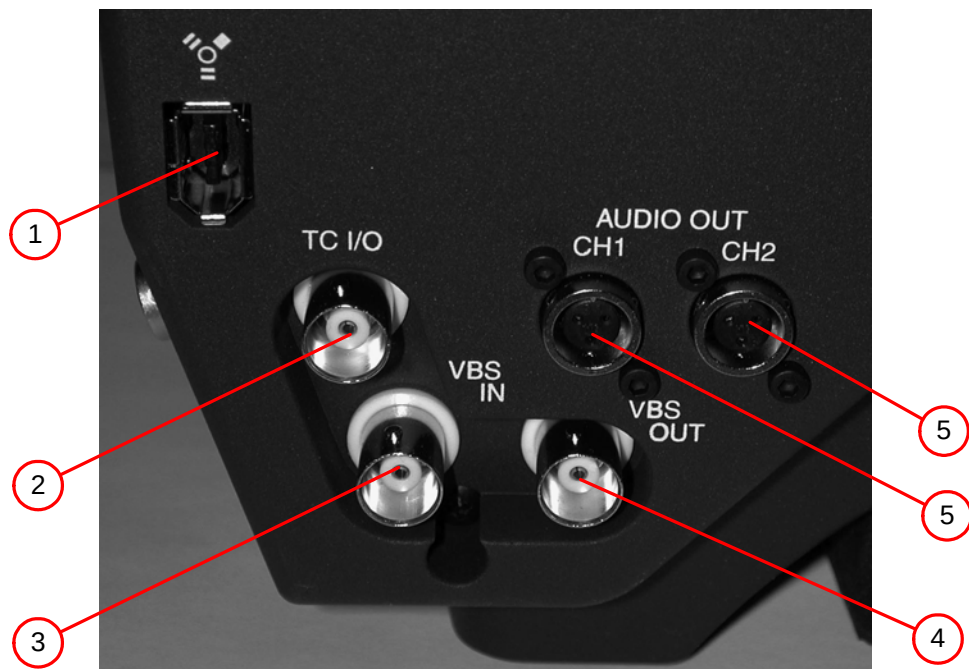
1. **DC Power Input Connector** – 4-pin Male XLR connector for input of 12VDC external power
2. **Audio Channel 1 Input Connector** – 2-pin Female XLR connector for input of External Audio. Line level or Mic level can be selected in the operation menu.
3. **Audio Channel 2 Input Connector** – 2-pin Female XLR connector for input of External Audio. Line level or Mic level can be selected in the operation menu.
4. **Remote Connector** – Multi-function 6-pin female connector. Allows remote trigger and provides 12VDC output for auxiliary devices such as wireless Microphone receivers.
5. **1/4-inch Monitor Audio Output Jack**: Outputs Monitor audio as mono (single) channel. Audio source mix can be selected in the menu.

DESCRIPTION OF MAIN POWER SWITCH SETTINGS



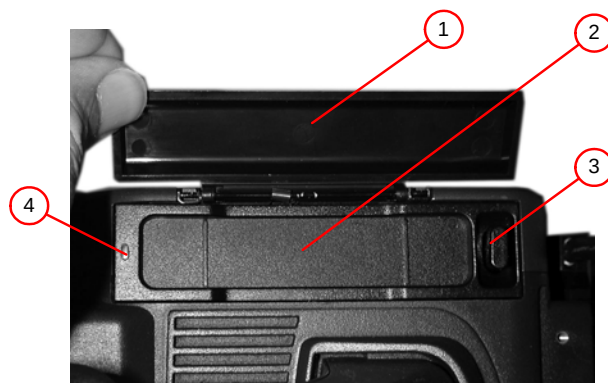
1. **Battery Power Switch Position** – The Z-DR1 recorder and Camera are provided power from the rear-mounted 12VDC Battery.
2. **External Power Switch Position** – The Z-DR1 recorder and Camera are powered via 12VDC input (1 above) on rear connector panel of the Z-DR1.
3. **OFF Power Switch Position** – The Z-DR1 recorder and Camera are powered off.

DESCRIPTION OF CHASSIS CONNECTION PANEL

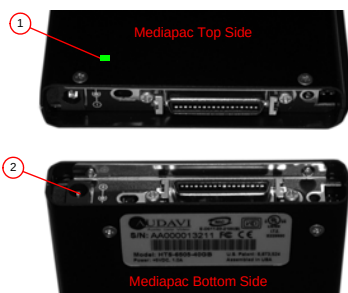


1. **Firewire Input/Output connector** – IEEE1394B (400Mbps) Six-pin IEEE1394 connector (unpowered) used to send and receive digital signals as well as to connect as an HDD to a computer.
2. **SMPTE Time Code Input/Output BNC connector** – Acts as Time Code input when unit is in record mode. Outputs Time Code when the unit is in playback mode.
3. **VBS Input BNC** – Composite video input BNC. Accepts an external analog composite video source for recording when selected in the operation menu.
4. **VBS Output BNC** – Provides composite video output when the unit is in playback or stand-by mode.
5. **3-pin Mini-XLR Audio Output connectors** – Provides program audio Channel-1 and Channel-2 depending on the Rec audio source selected in the operation menu.

DESCRIPTION OF MEDIAPAC & BAY



1. **Primary Bay Cover** – Spring loaded cover to protect against accidental ejection of the Mediapac removable drive.
2. **Secondary Bay Cover** – Automatically opens upon insertion of the Mediapac device. Protects against foreign objects being introduced to the interior of the Z-DR1 recorder.
3. **Mediapac Eject Button** – Press to eject the Mediapac drive. When the bay is empty (no Mediapac inserted), this button is normally in the down (depressed) position. Upon inserting a Mediapac, the button raises up.
4. **Bay Power LED** – Indicates that the Bay is providing power to the Mediapac and the Mediapac device is operating normally.



NOTE: Please observe the polarity of the Mediapac drive when inserting into the Bay. It should easily lock into position without any major force.

1. **Mediapac Power LED** – Indicates that the Mediapac device is operating normally. This LED cannot be seen when the drive is inserted in the Bay, it is only visible when using the Mediapac outside the Bay.
2. **Mediapac Power Jack** – 5VDC power input jack for Mediapac. Use only an Audavi approved power supply. Refer to the [Optional Items section](#) in this manual for part number.



INSTALLING THE Z-DR1 ON YOUR HITACHI CAMERA

The Z-DR1 Dockable Digital Recorder is been tested and guaranteed to work with the following Hitachi NTSC camera model numbers:

SK-555, SK-777, SK-888, SK-900
Z-3000, Z-3000W
Z-4000W

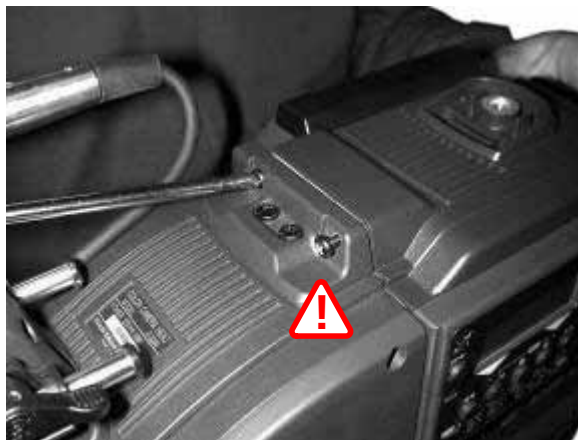
Camera-Recorder Mechanical Assembly



1. Align Z-DR1 with camera & support from bottom.



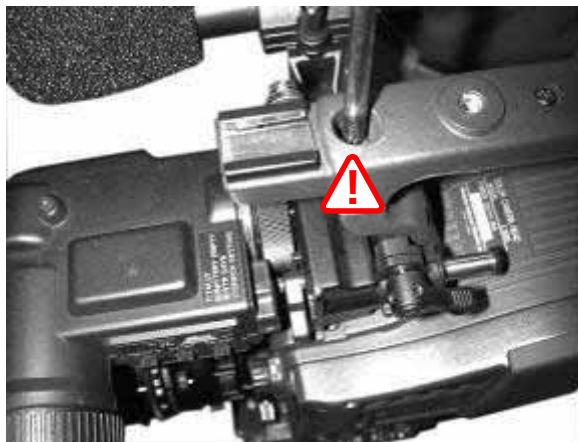
2. Side view showing mounting alignment.



3. Tighten 2 top screws on camera body into ZDR1.



4. Tighten bottom camera screw under shoulder pad.



5. Affix Carrying handle to camera body.



6. Tighten front and back screws of camera handle.

OPERATION PROCEDURES

Providing Power



The Z-DR1 comes with Anton Bauer QRDP800 Female Battery mounting plates affixed to the rear of the unit.

Install a freshly charged battery as shown.

IDX-style battery mounting plates are available as an option. (Inquire with your Hitachi dealer or Regional Sales Manager)

It is recommended that you have a Mediapac inserted in the Bay before power up. Not having one at this time, does not influence normal device operation.



Position the Main Power Switch as shown to power both, the ZDR1 and your Camera.

Make sure your Panel Lock switch is set to off (Control Panel Active) and observe the Menu screen which will light up confirming power-up.

If your camera does not power-up, check your camera power switch.



If you will be providing External Power via the 4-pin XLR on the rear panel, connect as shown and place the Main Power Switch in the EXT (middle) position.

Assure that the Power Supply being used to supply external power has at least 2A of current for proper operation.

Refer to the Technical Section of this manual for the correct polarity of the 4-Pin XLR connector used to provide 12VDC power to the unit

Using the Mediapac with the Z-DR1

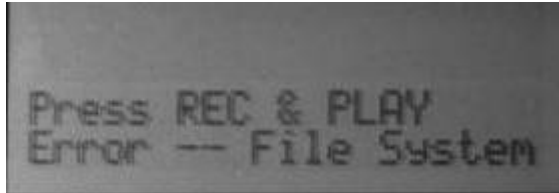
Observations for proper Mediapac insertion into the ZDR1

Refer to the section "[DESCRIPTION OF MEDIAPAC AND BAY](#)"

Formatting the Mediapac



If you should receive a message on the Z-DR1 display "Press REC/PLAY ERROR File System" upon the insertion of a freshly purchased drive, simply press "REC/PLAY" on the operation panel of the Z-DR1 to format the Mediapac drive for use.

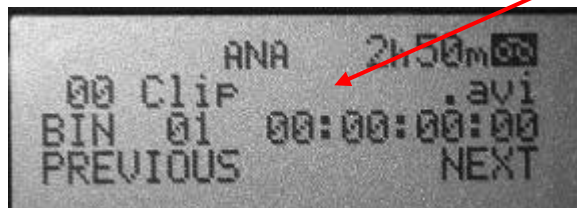


Press REC then PLAY to format a new Mediapac drive for use.



The message "INIT FILE SYSTEM PLEASE WAIT" will be displayed on the LCD screen for a few seconds.

The unit will then come up in normal operation mode.

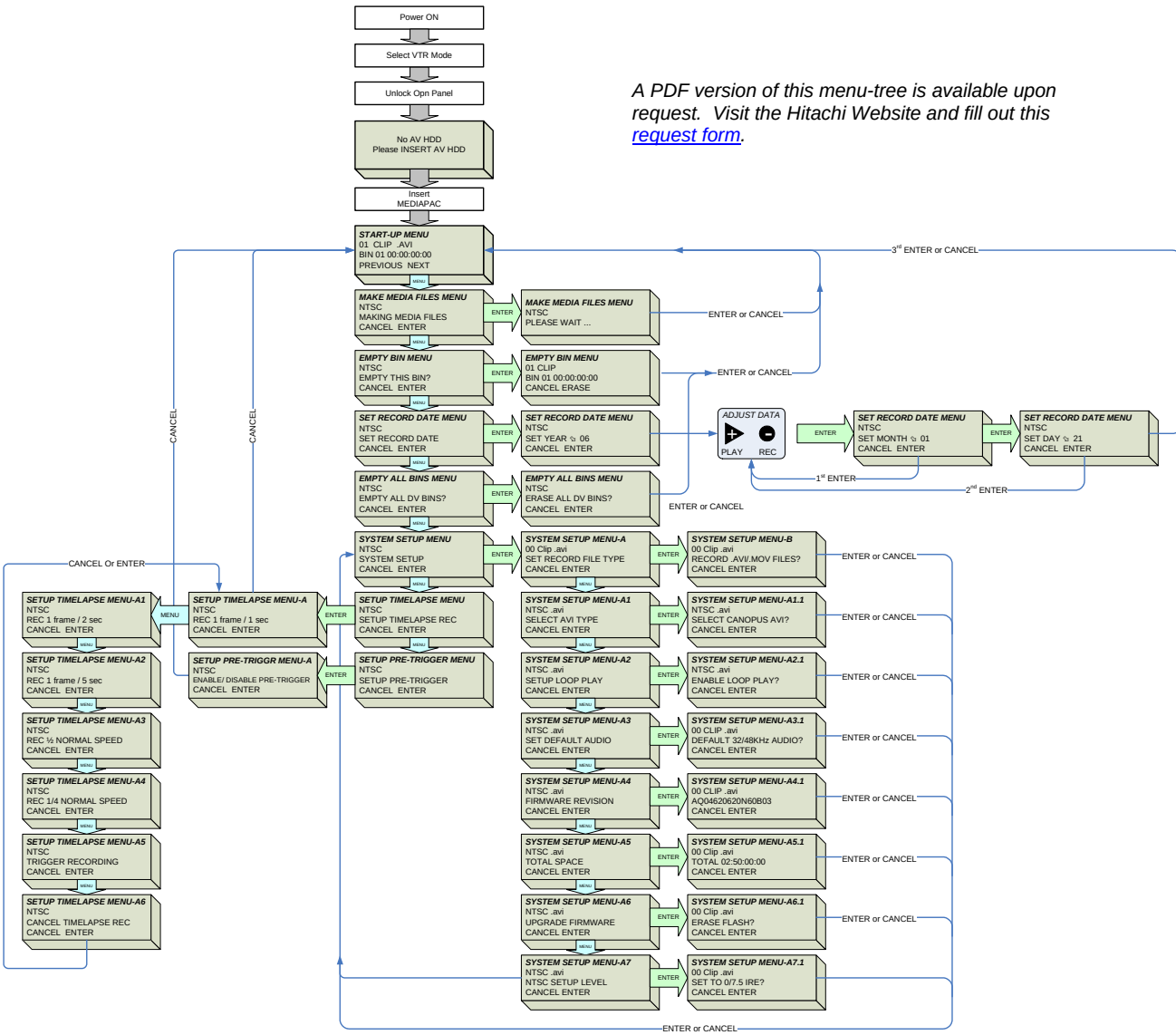


Setup Menu Navigation Map

Following is a menu navigation map for the Z-DR1 dockable digital recorder.

MENU SYSTEM TREE FOR Z-DR1 DIGITAL DOCKABLE RECORDER

Version 1.0 January 2006



Basic Menu includes:

1. Making Media Files
2. Empty This Bin
3. Set Record Date
4. Empty all DV Bins
5. *System Setup (Enters into System Setup Menu Options)
6. Setup Timelapse Record
7. Setup Pre-Trigger

System Setup Menu Options include:

1. Set Record File Type
2. Select AVI Type
3. Setup Loop Play
4. Set Default Audio
5. Firmware Revision
6. Total Space
7. Upgrade Firmware
8. NTSC Setup Level

File Organization

A recorded length of video between its start point and following pause or stop point is called a clip. A clip can be as short as one frame or as long as the whole storage capacity. Clips are stored in bins; a bin is analogous to a tape. 99 bins are made available; Clips can be added to any bin at any time as long as there is room available. The Z-DR1 always displays the clip number as well as the bin number.

After the media conversion is made, all bins that contained video will appear to the computer as folders named BINxx where xx represents the BIN number ranging from 01 to 99. Inside each folder, each clip will be represented as a file with an extension name .avi or .mov depending on the main type chosen prior to recording. Each file will be named BxxCnnyy where xx again represents the bin number; nn represents the Clip number ranging from 01 to 97. The number yy is explained below.

FAT 32 file size limitation

The HDD file format is "FAT 32", a format compatible with both Macs and PCs. This format limits the size of a file to a maximum of 2GB, in DV that translates to approximately 9+ minutes of video. A clip that lasts longer than 9min is broken into multiple files each 2GB long with the last one making up the remaining time. The split files make up the number yy in the naming convention in the previous paragraph and ranges from 01 to 40 for an 80GB storage capacity. If the split files are strung on the time line of an NLE, no frame is lost over the transition.

Clip Boundary Granularity

Although clip access in the VTR mode is frame accurate, the same is not true for the HDD mode.

Limitations in the file systems make the minimum file size approximately 2 seconds long. This has two effects; the first is that a clip boundary has a resolution of 2 seconds so the beginning of the first file of a clip is most likely to contain the end of the previous clip, up to 2 seconds' worth. Conversely the end of a clip is most likely to be found in the first file of the next clip.

The second effect is that if a clip is shorter than 2 seconds and it fits between two other clips inside the 2 second resolution then it will not be seen by the file media converter and will not be counted, it will considerate part of the previous clip and all subsequent clips will be numbered 1 less.

In this manner the total number of clips as seen in the HDD mode will be shorter by one for each such occurrence than the number of clips in the VTR mode. For an accurate correlation of clip numbers between the VTR and the HDD mode, it is best to keep each clip longer than 2 seconds and to have fewer than 97 per bin.

Trafficking Data

Once connected to and recognized by the computer, files can be edited directly on the Z-DR1's Mediapac or dragged and dropped into another drive as data is normally moved around in a computer.



Note that the Z-DR1 is primarily a capture device so although it can send data to a computer. Data stored back into the Z-DR1 cannot be played back in the VTR mode.

Note also that data stored back into the Z-DR1 may be recorded over by the next recording in the VTR mode.



Time Code Preservation

Most NLEs working with .avi or .mov files lose reference to the time code embedded in the video stream. The Z-DR1 has built in information, standard only to each NLE, to allow the most popular NLEs to maintain the time code reference.

OS Compatibility List

The Z-DR1 supports these Personal Computers with these Operating Systems:



The Z-DR1 also works with Apple, Macintosh computers with these Operating Systems:



OS-9

OS-X

Play Back Mode

Play mode can be entered by one of three ways, the most common is to press the PLAY button, and the other is by issuing a PLAY command through the IEEE-1394 interface.

When playing, the time displayed is that of the time code associated with the frame at the time of recording. When play is stopped, the time displayed is the time code of the last frame played.

When entering a play the soft keys will be FREV and FFWD for fast reverse and fast forward respectively.

Repeatedly pressing either soft key will cause the play to go repeatedly faster in the chosen direction up to 32x speed. A speed other than 1x is displayed in the bottom line.

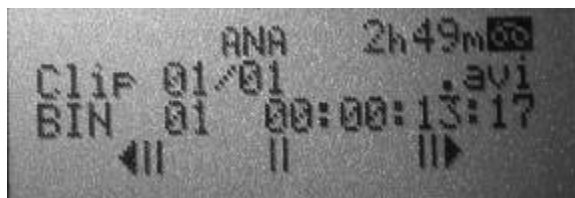


Also while playing pressing the Menu button will give an alternate set of soft keys; SLOW and FAST. These keys, while keeping the same current play direction, will extend the control of the speed down to the slow motion range of 1/32x. The menu button will toggle between the two sets of keys.

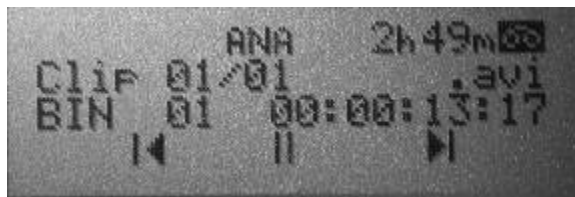


Pause and GoTo Mark, Clip advance

While playing, pressing the PLAY key will pause the image. Pressing Play again will return to 1x play in the forward direction. While in the play-pause mode, the soft keys will be <|| and ||> for frame stepping reverse and forward respectively. Holding either key down will cause a rapid stepping after an initial wait period.



Again, pressing the Menu key will present an alternate set of soft keys, these will be |< and >|. These keys allow direct access to the marks that are the starting and end frames of each clip.



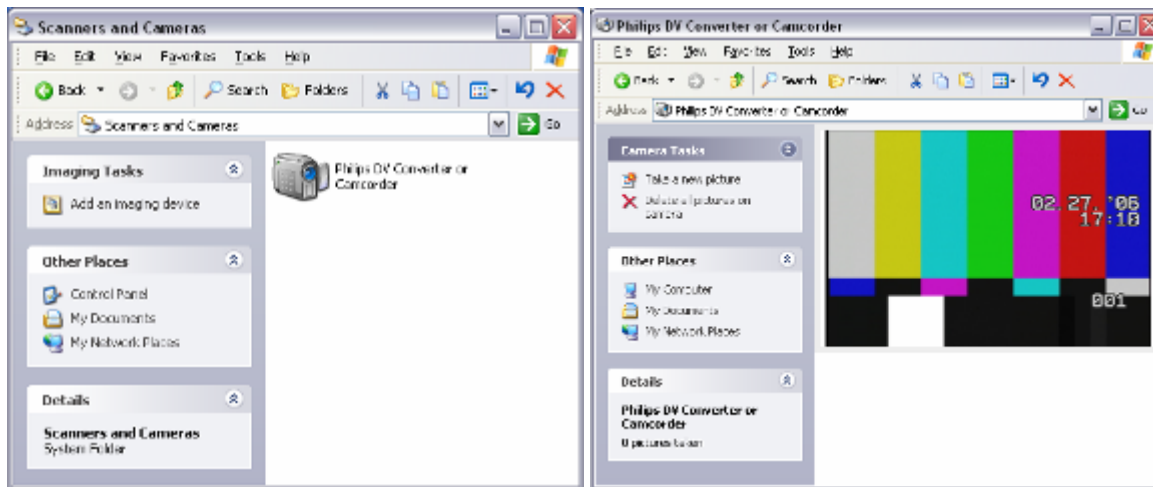
Counting the end frame of the last clip, there will always be one more mark than there are clips. In this mode, the clip number display will be substituted with a mark number display.

Remote Control through IEEE-1394

Various references were made about commands issued through the IEEE-1394 interface. While capturing, typically, a camera is a source of these commands but another source can be various editors and computers that normally command a VTR.

The Z-DR1 accepts the AV command set defined in the IEEE-1394 protocol and as such can be connected to most computers and stand alone editing equipment using that interface. At this stage, this command set does not allow the selection of different bins so this function must be manually made as if a tape were asked to be changed.

Below is an example of the Z-DR1 connected to a PC via Firewire and in VTR mode.



The AV command set also does not allow random access to the start of the clips but most editors will recognize the clip boundaries sequentially through the time code discontinuity likely to take place at the beginning of each clip.



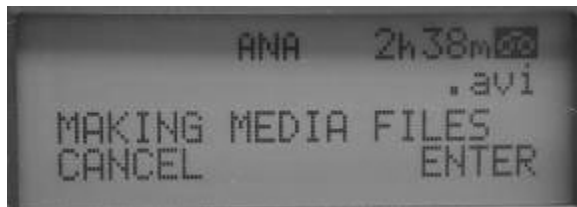
Note: That while a seamless time code clip boundary is created by pressing the Mark key while recording, it does not cause a time code discontinuity.



Note: The acquisition of video in the Z-DR1 is instantaneous so requires no pre-roll. This limits the random access of an early frame in a batch capture by an editor that is setup to ask for a minimum pre-roll greater than zero. That limit is equal to the number of frames in the minimum pre-roll time.

HDD Mode Preparation

Prior to turning on the Z-DR1 in the HDD mode and seeing your video as files instead of clips the MAKING MEDIA FILES process must be undertaken. See picture below & refer to operation menu.



Note: When connecting to a computer as a Hard Drive (HDD) care must be taken that there are no other HDDs on the IEEE-1394 bus connected to the computer or that the computer can recognize multiple HDDs on the same bus.

Menu Items' Setup

The Z-DR1 is setup through a set of menus made available through the MENU button from the Stop or Idle position. The menu of setups is divided into two groups, the Main Group with seven (7) options and the System Setup Group with eight (8) options.

Repeatedly pressing the Menu button will rotate through all the options for the particular group returning to the top. To access the System Setup Group press the Menu button until the System Setup option is offered and then press the soft ENTER key, next press the Menu button to rotate through the options of System Setup Group.

Some options naturally exit the Setup mode for the idle mode, others return to the previous level to allow further changes or to explicitly exit the Setup mode through the soft CANCEL key. All options are entered by pressing the soft ENTER key.

In general, a setup option has two choices, when the ENTER key is pressed the user is prompted to choose the alternate choice from the current, in this manner the current state is implied and the change is explicit. A choice to not proceed is always given by the soft CANCEL key.



ALL SETUP OPTIONS ARE RETAINED ACROSS POWER CYCLES.

The Main Menu Group offers the following options:

◆ MAKING MEDIA FILES

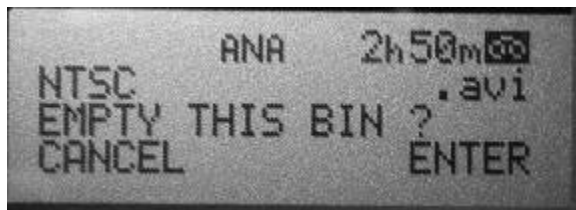
- This option prepares all clips within all bins to be seen as files in the HDD mode. It is the last operation required in the VTR mode prior to switching to the HDD mode to view newly recorded material. The conversion process does not prevent the captured video Clips from being viewed at any time in the VTR mode.



◆ EMPTY THIS BIN?



Warning! Proceeding with this option will erase the entire content of the selected BIN!

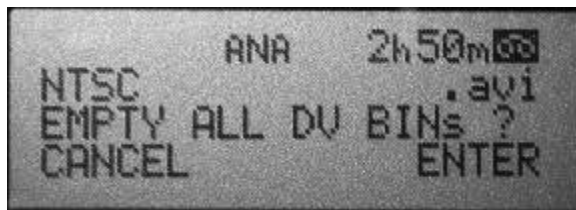


◆ EMPTY ALL DV BINS?

- This function is both a convenient way to erase all BINs at once and reinitialize the file system.
- None of the setup options are affected by that process.

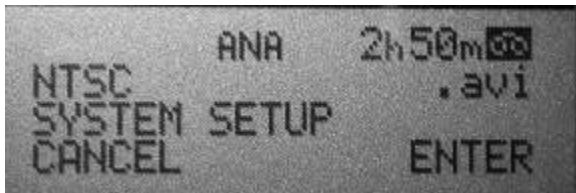


Warning! Proceeding with this option will erase ALL content in ALL Bins!



◆ SYSTEM SETUP

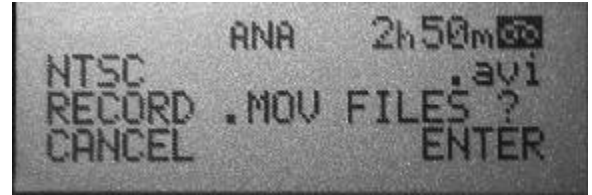
- Press the soft ENTER key to access the System Setup Group.



➤ The System Setup Group offers the following options:

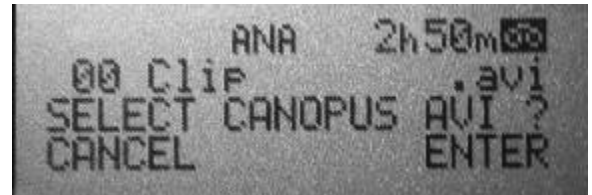
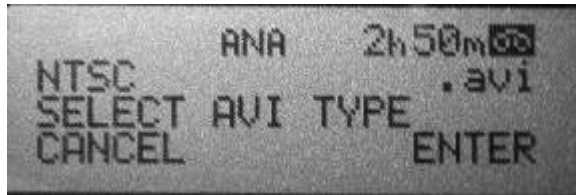
- SET RECORD FILE TYPE

- The Z-DR1 supports both the .AVI (Type 2) and .MOV video file formats. Selecting a particular file type applies to starting a recording in any of the empty bins. Once a clip has been recorded in a bin, the file type for that bin cannot be changed until that bin is erased. The second line of the display will indicate which type is chosen.



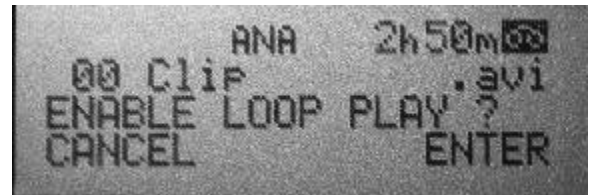
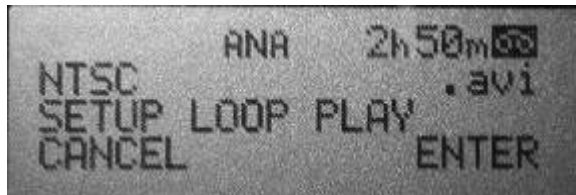
- SELECT AVI TYPE

- The Z-DR1 supports two types of the .AVI Type 2 format; the Microsoft type and the Canopus type. At any time after a recording and before 'MAKING MEDIA FILES', the choice between which type of avi file is prepared for the HDD mode can be made.



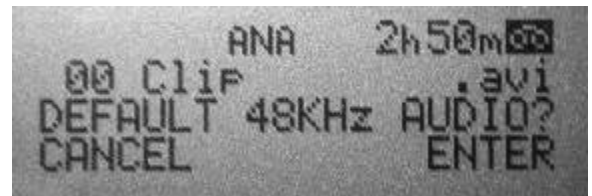
- SETUP LOOP PLAY

- With LOOP PLAY enabled, the contents of the selected BIN are played repeatedly when the PLAY button is pressed.



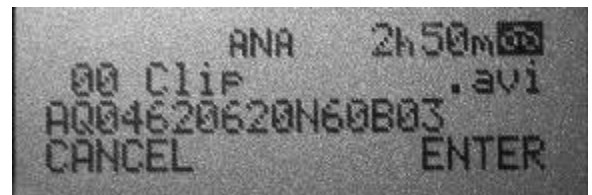
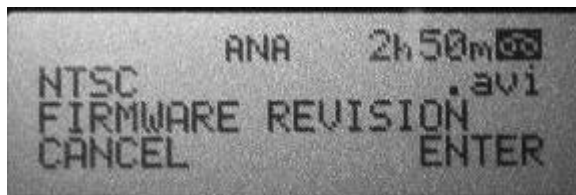
- SET DEFAULT AUDIO

- This option sets the predicted audio sampling rate. The audio sampling rate is decided by the video source and is automatically detected by the Z-DR1. This automatic detection process starts with the sampling rate set by this choice. If the predicted rate is the same as the actual then no data is corrupted, if it not the same then the audio data in the first frame may be corrupted. In the A2D this choice also sets the actual sampling rate in the analog section. The choices are 32 KHz or 48 KHz.



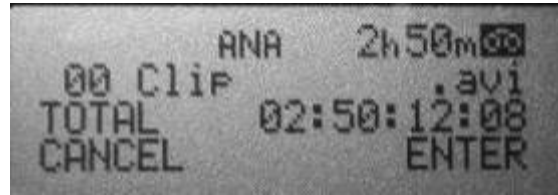
- FIRMWARE REVISION

- Selecting this option displays the current firmware revision of your Z-DR1.



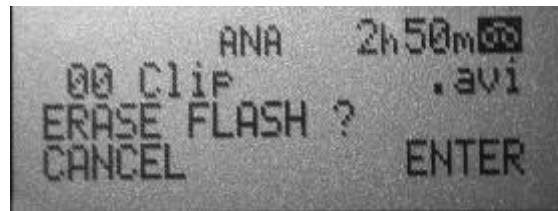
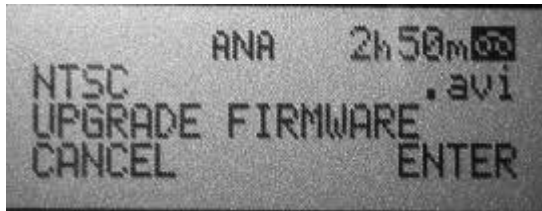
- TOTAL SPACE

- Displays the total recording capacity of Z-DR1 in total recording time: HH:MM:SS:FF.



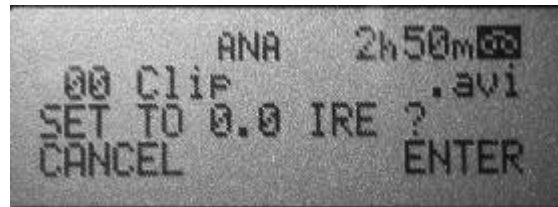
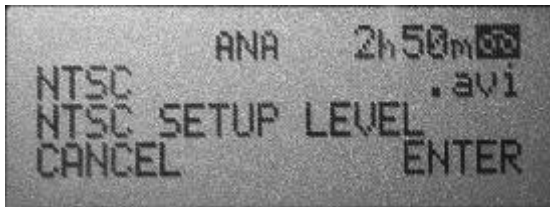
- UPGRADE FIRMWARE

- Used for loading upgrades and software patches to the Z-DR1.



- NTSC SETUP LEVEL

- This function enables the User to select the output analog video's setup level. The choices are 7.5IRE as used in the US or 0.0IRE as used in Japan. Since the Hitachi cameras sold in the US typically come with 7.5 IRE enabled, the Z-DR1 will be initially set to 0 IRE in order to produce a 7.5 IRE composite video output.



Idle and Stop

The Idle and Stop mode are essentially the same. The difference is that the Stop mode is indicated by the square icon in the middle of the bottom line and in the Stop mode following a Play mode, the time number displayed is the time code of the last frame played. From either mode, the Z-DR1 allows the menu selections described previously to be made. In addition, the soft keys PREVIOUS and NEXT control the selection of any particular bin.

Holding a soft key down will cause the numbers to advance rapidly. When selecting a new bin, the time displayed is the total time recorded in the bin in non-dropped frame timing. The Z-DR1 always defaults to BIN 01 upon power-up.

Media Conversion Mode

When Z-DR1 is not playing or recording, it is in a Media Conversion mode. The IEEE-1394 port outputs the DV conversion of the input video and audio. When the video source selection is DIG, the VBS (Composite Video) and audio outputs are conversions of the DV signal present at the IEEE-1394 port.

Recording Notes



Note: Prior to recording, the user must select which of the two main types of file format to record in, (.AVI or .MOV).

Note: Recording is done in a bin. A clip is automatically started at the beginning of a bin if the bin is empty or appended to the last clip in the bin. A clip is never inserted between other clips within a bin.

Note: When a bin is selected and the unit is in Stop mode, there are three ways to get ready to record.

The first and most common way is to press the REC button located on the camera lens zoom handle, there is also a REC button on the chassis of the Hitachi camera located just under the lens mount. Last, press the PLAY button while the REC button is held down.

The other two are by issuing a RECORD command through the IEEE-1394 interface or the serial port if it is enabled.

Note: When recording, the LCD shows the total time recorded in the bin and the current clip number.

Note: The Z-DR1 has an internal time code generator that is used with the camera video signals provided no SMPTE time code is connected. This generator starts at 00:00:00:00 when power is applied to the unit and stops when power is turned off. When the recording video source is the (FRONT) camera and there is no SMPTE time code applied then the time code recorded is that generated internal to the Z-DR1.

Note: It is possible to terminate a clip and start a new one on the fly, seamlessly, by pressing the soft key MARK while recording.

Note: Only the first 97 clips within a bin are numbered, the rest are considered part of the last clip.

Note: For good correlation of the clip number and file number in the HDD mode, the length of each clip should be kept at a minimum of 2 seconds.

Note: With the Z-DR1, the signal being recorded can always be viewed live at the VBS (composite video) output via the provided BNC connector.

Set Record Date:

In order to set the record date for the Z-DR1, press “ENTER” when the display reads “Set Record Date” – you can select CANCEL at any time to leave this setup option.



The display will then indicate “Set Year → 05”. In order to adjust the year, press the PLAY button to increase, or press the REC button to decrease the year number. When satisfied with the year number, press ENTER.

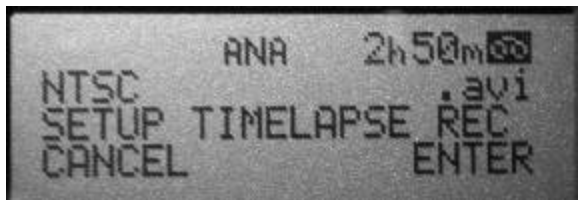
The display will then indicate “Set Month → 07”. In order to adjust the month, press PLAY button to increase, or press the REC button to decrease the month number. When satisfied with the month number, press ENTER.

The display will then indicate “Set Day → 15”. In order to adjust the day, press PLAY button to increase, or press the REC button to decrease the day number. When satisfied with the day number, press ENTER.

You have successfully set the record date; the display will return to an idle mode.

Set Up Timelapse Record:

In order to set up your timelapse recording press “ENTER” when the display reads “Setup Timelapse REC” – you can select CANCEL at any time to leave this setup option.



The display will then indicate “REC 1 frame / 1 sec”. Press ENTER if you want the camera to record 1 frame per second. If you wish to change the frequency to something other than 1 second, continue to press the MENU key and the display will cycle through the following options:

- REC 1 frame / 1 sec (records 1 frame per second)
- REC 1 frame / 2 sec (records 1 frame every 2 seconds)
- REC 1 frame / 5 sec (records 1 frame every 5 seconds)
- REC ½ Normal Speed (records every other frame)
- REC ¼ Normal Speed (records every fourth frame)
- Trigger Recording (records only when triggered by user)
- CANCEL Timelapse REC (cancels timelapse recording)

Press ENTER when the display reaches the desired recording frequency. The display will return to the setup option “Setup Timelapse REC” and will indicate the timelapse setting below the Time Remain display.



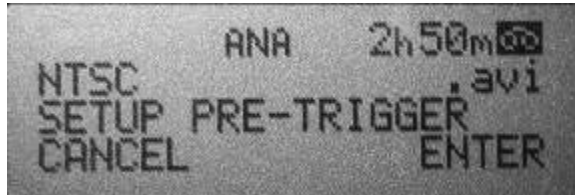
Note: 1, 2, and 5 frames per second will be indicated on the display with “1sf”, “2sf”, and “5sf” respectively. ½ and ¼ normal speed will be indicated on the display with “1/2” and “1/4” respectively. Trigger Recording will be indicated on the display with “Trg”.

As the display indicates, you have successfully set up timelapse recording.

Setup Pre-Trigger:

The Z-DR1 will pre-record the 8 seconds of footage prior to the camera's record trigger being engaged.

In order to set up your pre-trigger recording press "ENTER" when the display reads "Setup Pre-Trigger" – you can select CANCEL at any time to leave this setup option.

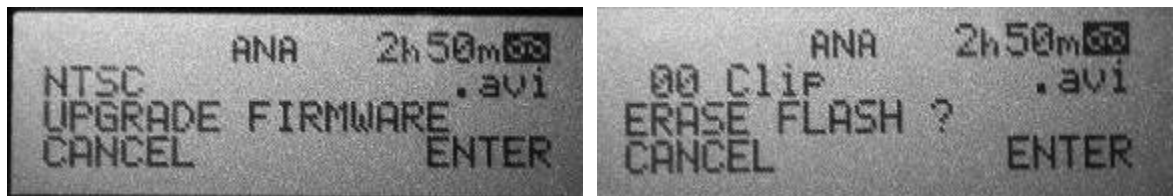


The display will read "Enable Pre-Trigger" if the camera's pre-trigger recording is currently turned OFF. To turn it on, press "ENTER"

If the camera's pre-trigger recording is currently turned ON, the display will read "Disable Pre-Trigger". To turn it off, press "ENTER".

Upgrade Firmware:

In order to upgrade the firmware of your Z-DR1, you must first copy a file of the latest firmware (flash.bin) onto the camera's hard drive in HDD mode. Then, in VTR mode, press "ENTER" when the display reads "Upgrade Firmware".

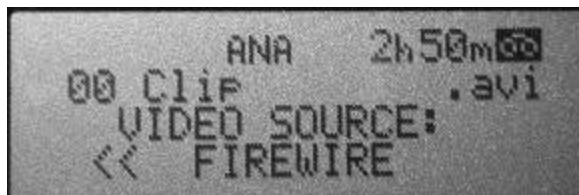
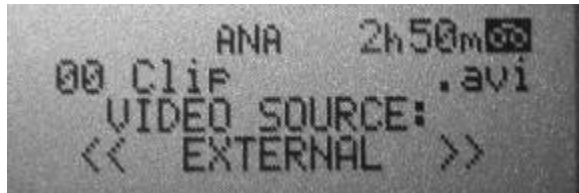
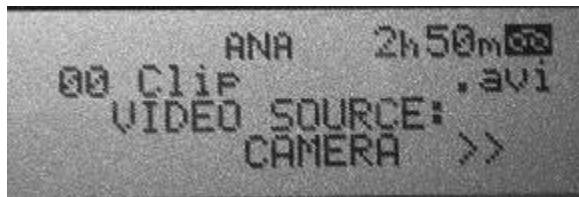


The display will read "ERASE FLASH", press "ENTER" to upgrade the firmware (or "CANCEL" to leave the set up option).

The display will indicate that the firmware is being updated, please wait for the process to complete before trying to perform any other function. When the firmware is updated the camera will reboot; you have then successfully updated the firmware.

External control panel operations

Video source input selection



Navigate the menu to the page shown on the right.

Select CAMERA when docked to a Hitachi Camera and the video source to be recorded is that produced by the camera.

The camera should be set to COMP100 for the VTR video output via its operation menu (refer to your camera operation manual for the procedure).

Select EXTERNAL when the video to be recorded is an analog input via the VBS or composite video BNC on the side panel of the Z-DR1.

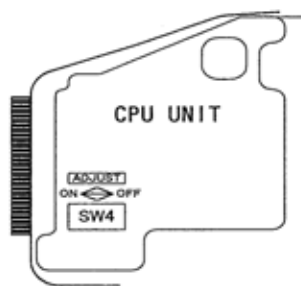
Select FIREWIRE when the video source to be recorded is that of a PC. In this mode, the Z-DR1 functions as a media converter. The FIREWIRE input will be converted to analog video and output via the VBS BNC connector.

Camera Video level adjustment

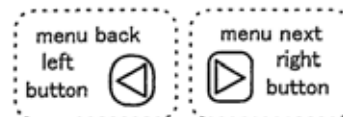
All Hitachi cameras compatible with the Z-DR1 have analog component level adjustments via the camera's ADJUST MENU. Refer to your camera's maintenance manual for the recommended procedure.

Monitoring both the VBS (Composite) video output from the Z-DR1 and the MON OUT video from the camera, adjust the component level out of the camera to obtain a proper composite video output waveform from the Z-DR1.

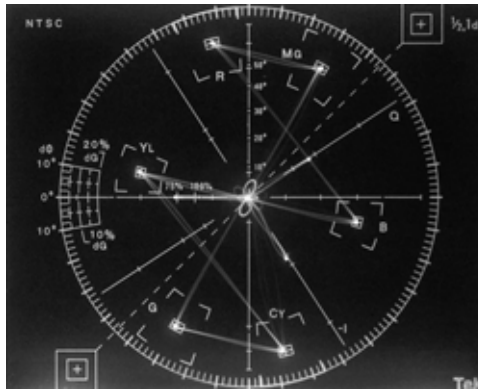
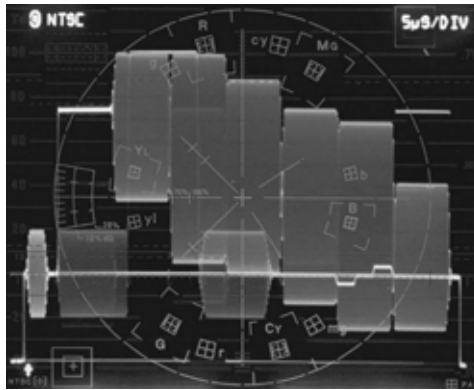
Turn off the camera, remove the camera side panel, set the CPU UNIT adjust switch (SW15) to ON. Turn on the camera and it will output color bars once it displays the ADJUST MODE 1 (BAR & D/A) menu page as seen on the video output of the MON OUT BNC on the camera.



■ ADJUST MODE1 (BAR&D/A)	
1. SET UP	: ON
2. VBS	Y LEV : 0
3.	C LEV : 0
4. RGB	G LEV : 0
5.	R LEV : 0
6.	B LEV : 0
7.COMP	Y LEV : 0
8.	R-Y LEV : 0
9.	B-Y LEV : 0
10.COMP75%	

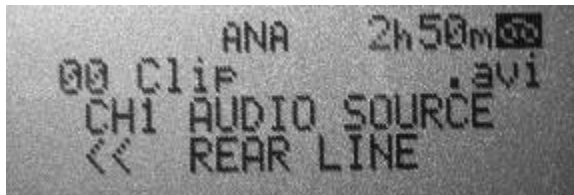


Navigate the cursor down to items 7, 8, 9 and make the data adjustments. Using a waveform monitor connected to the composite video output of the Z-DR1 adjust the Y LEV (camera menu item 7) above to obtain 100IRE luminance. Using a VECTORSCOPE, adjust R-Y LEV (camera menu item 8) above to position the color vectors within the boxes shown on the graticule of the Vectorscope. Repeat the procedure for B-Y LEV (camera menu item 9) until the color bar vectors are all within the markers on the vectorscope graticule.



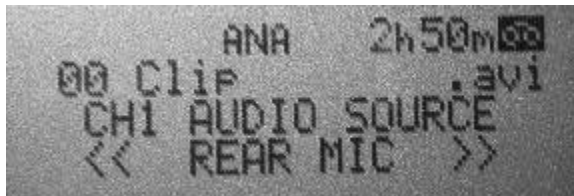
When the above adjustment is completed, turn OFF SW15 on the camera CPU module, turn off the camera and replace the side cover.

Audio source input selection

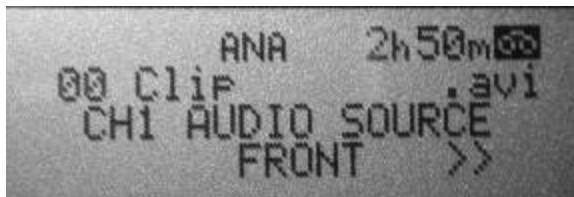


Press the CH1 SRC button on the Z-DR1 control panel.

Select REAR LINE when the audio to be recorded is the line level input (such as from a field audio mixer) via the Z-DR1 3-pin audio XLR connectors on the rear panel of the unit.



Select REAR MIC when the audio to be recorded is that from a wired or wireless microphone. As shown, the CH1 audio will be recorded from the rear MIC connector.



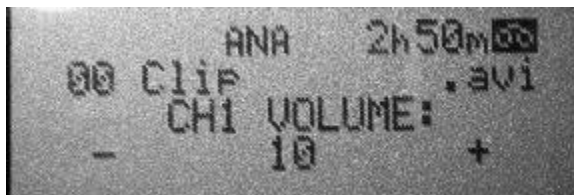
Select FRONT when the audio source to be recorded is that of the front mounted (shotgun) microphone used with the camera.

Remember to set audio level and phantom power with the camera audio setup menu.

Repeat the above procedure for the CH2 SRC audio.

Press the CH1 SRC or CH2 SRC function button again to enable the selection.

Audio input level adjustment



Press the CH1 VOL button on the Z-DR1 control panel.

Using the audio VU meter or listening via the MON out ¼-inch jack on the rear of the Z-DR1, adjust the volume using the soft-keys under the -/+ display to obtain a good level of sound.

Press the CH1 VOL or CH2 VOL function button again to enable the selection.

Audio output level adjustment

The audio output level of the Z-DR1 via the Mini 3-pin XLRs is fixed no volume control is provided. This output is LINE level and represents the TRUE level of the recorded audio. Should your recorded audio level be too low, use an external amplifier or processor to amplify it.

Audio Low-cut filter selection

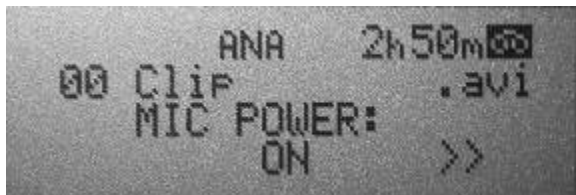


Press the CH1 LC button on the Z-DR1 control panel.

If you anticipate a noisy or “boomy” recording environment, enable the Low Cut Filter with this function. This will reduce the low audio frequency sensitivity of the CH1 audio. Using the soft keys under the << and >> button, select ON/OFF.

Press the CH1 LC or CH2 LC function button again to enable the selection.

Audio phantom power selection

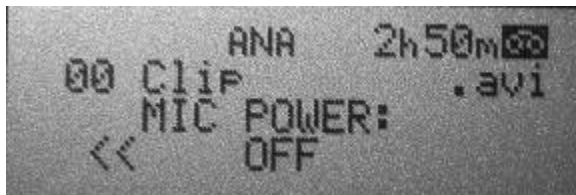


Press the MIC PWR button on the Z-DR1 control panel.

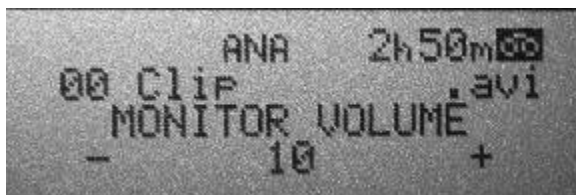
This function provides 48VDC phantom power to the MICROPHONE connected to the rear 3-pin XLR audio input connectors. Both CH1 and CH2 XLRs receive phantom power. Using the soft keys under the << and >> button, select ON/OFF.

Phantom Power to the rear XLR connectors is disabled if LINE or FRONT audio sources are selected.

Press the MIC PWR function button again to enable the selection.

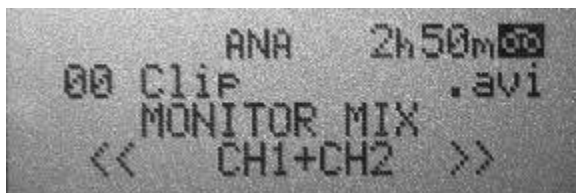


Audio Monitor level output adjustment



Press the MON VOL button on the Z-DR1 control panel.

Listening via the MON out ¼-inch jack on the rear of the Z-DR1, adjust the volume using the soft-keys under the -/+ display to obtain a good level of sound on your headset.

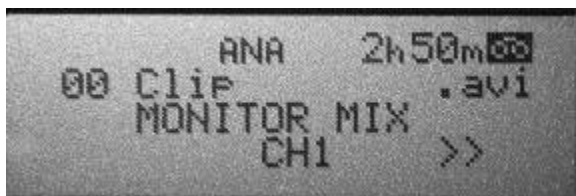


Press the MON MIX button to enable the selection menu of the audio channel(s) to be monitored via the ¼-inch jack.

Using the soft keys under the << and >> button, select the MON audio source.

The choices are CH1+CH2 MIX, CH1 only or CH2 only.

Press the MON MIX function button again to enable the selection.



BASIC PRE-SHOOT CAMERA PREPARATIONS

Camera mechanical integrity

Check that your Hitachi camera-Z-DR1 system is mechanically sound by inspecting all accessories for proper mechanical mounting. Inspect all fasteners and tighten if necessary.

Camera support

Should you be using your Z-DR1 camera-recorder system on your shoulder, assure that you have tightened the bayonet lens mount locking mechanism, that your lens servo drive is NOT loose, that your camera system has proper front-to-back balance and finally that you have good shoes as to not fall when using it.

Should you be using a tripod to support your camera system, assure that your tripod is of proper capacity (able to support between 20 to 30lbs), that it is mechanically sound, and that it is setup for use in manner that won't cause it to fail and drop to the floor during shooting.

Camera power

The Z-DR1/ Hitachi camera combination you are using requires reliable and ample power for consistent recording. Make sure that you have either properly charged fresh batteries or an external power supply capable of sustained 12VDC operation at the rated current (>2A).

Turning off your camera viewfinder and or camera head will substantially save battery power and prolong the time you make available for battery recording.

The environment

Be aware of environmental conditions that may endanger you, others and possibly cause your equipment to fail. Do not use near bodies of water or get the equipment wet. Use rain covers sold by Hitachi if you must shoot in rainy or wet conditions.

Avoid recording near strong RF or EMI sources such as in thunder storms, near TV transmitters, cellular towers, and microwave ovens. Being in the vicinity of such devices may cause personal physical harm and interference patterns or noise in your video recordings.

Lighting

Basic requirements of any shoot where balanced, shadow-free and faithful colors are required is that proper lighting be used to illuminate your subject or objects.

Generally it is undesirable to use camera gain provided you have ample illumination to achieve the desired depth of field or exposure needed. Should you need to use electronic gain to compensate for lack of light, be aware that typically with increased gain, you will record increased graininess or noise in the video.

Lens & optics

Associated with obtaining a good quality recording, the first and fundamental item of the recorder system is the lens or optics used with your camera. Prior to any recording, always check your lens for mechanical soundness, zoom and focus operation, camera back-focus and optics cleanliness.

Avoid using your lens in dusty, humid and situations where the temperature changes rapidly from cold to hot and vice-versa.

Camera settings

Check your camera settings for the desired result prior to actual use. Items you should check are; Optical filter in use, White/ Black Balance, Viewfinder contrast brightness, lens back-focus, Shotgun/ Wireless Microphone operation, ENG lighting attachments' operation, all camera operational items made available in the camera's menu system that may affect, or enhance your shoot.

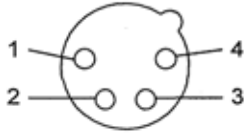
It is recommended that you anticipate your shooting conditions whenever possible. In the case that you cannot, the Hitachi cameras have scalable levels of exposure automation that may produce desirable results. Please always consult and read your camera operation manual to avoid erroneous operation and obtain the best picture quality video recording results.

EXTERIOR CONNECTOR TECHNICAL INFORMATION

(Connector pinout details)

Power XLR

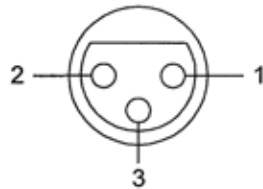
DC IN (4 pin male)



Pin	Signal
1	GND
2	NC
3	NC
4	+12V input

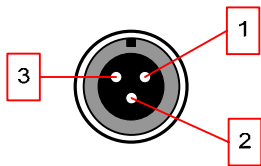
Audio XLR, balanced

MIC IN (3 pin female)



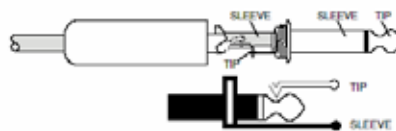
Pin	Signal
1	MIC GND
2	MIC(H) IN
3	MIC(C) IN

Audio Mini-XLR, balanced



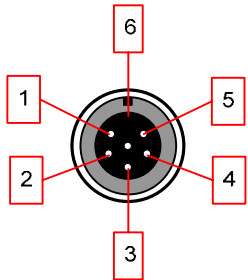
Pin	Signal
1	GND
2	(H) OUT

Audio Monitor (1/4-in jack)



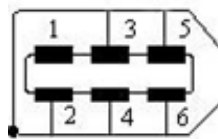
1/4" TS Unbalanced Wiring:
Sleeve = Shield
Tip = Hot (+)

AUX/ REMOTE multi-pin



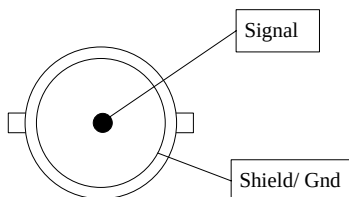
Pin	Signal
1	Trigger (contact closure)
2	Tally (ON=5V high)
3	Aux 12V (0.3A Max)
4	GND
5	N/C
6	GND

IEEE1392 (Firewire)



Pin	Signal
1	Power, 30Volts
2	Ground
3, 4	B Twisted Pair (-/+)
5, 6	B Twisted Pair (-/+)
	Cable Shield

BNC



FAQS & TROUBLESHOOTING

1. The Z-DR1 doesn't power-up.

Check your [power source](#). If you're using a rear-mounted battery, ensure that your battery is fully charged and in good condition. If you're using an external power supply, check that it has 12VDC and at least 2 amps in order to drive the camera, recorder and accessories. Last check your external power supply cable for continuity.

2. The Hitachi Camera doesn't power-up.

Check that the Z-DR1 is properly powered up. Next check your camera power switch. Assure that there is good mechanical mount between the camera and the Z-DR1 recorder. Check your camera fuse located on the PCB under the control panel side. Replace the camera fuse and or correct the condition that caused it to trip.

3. The Z-DR1's Control panel is inactive.

Check to assure that the Z-DR1 [control panel is unlocked](#) and the unit is in VTR mode.

4. The LCD display shows "AV HDD MEDIA" and the control panel is locked out.

Select VTR mode and make sure the [control panel is unlocked](#). Under HDD mode, the unit functions as a file transfer device via the Firewire connector.

5. There is no composite video signal output.

Power up the Z-DR1 and the camera. Select VTR mode and set the video input source to CAMERA. Enable the camera color bars or insert a Mediapac with content and play back any recorded video. There should be composite video output at all times under VTR mode.

6. The audio VU meter indicators are inactive.

Check the audio input source and provide an audio signal. Select VTR mode. The VU meters should function at all times provided there is an input. The VU meters do not function under HDD mode.

7. There is no audio output on the audio monitor out ¼-in jack.

Check that item 6 above is resolved. Adjust the MON out audio output levels and or select an audio channel that has recorded audio on it. Check your headset, audio monitor and connection to the Z-DR1.

8. There is no audio output on the 3-pin mini- XLRs.

The audio output should be present when in E to E mode, (monitoring the camera output video) or in playback mode. Check the VU meters and if indicating the presence of audio signals, check that the mini-XLR connections are correct and your MON audio via the ¼-inch jack.

9. The Z-DR1 won't record

Check that the [control panel is unlocked](#), that CAM or EXT video source is selected, that the Mediapac is properly inserted and the drive jumpers have not been tampered with. Make sure that there is a good mechanical connection between the camera and Z-DR1. Check the REC Trigger buttons located on the camera body and the lens servo for proper operation.

10. The Mediapac will not insert into bay

Check the insertion polarity of the Mediapac. Inspect the drive bay and clear any obstructions or foreign matter in the unit.

11. How to know when a Mediapac is bad.

The Mediapac HDD has a green operation light on the top side. In order to see this LED, use the USB or Firewire kit and connect to a PC that provides power over that interface. The green LED should light under normal drive conditions. Listen to the drive while operating. If inserting into the Z-DR1, the unit does not clear the FILE SYSTEM ERROR and REC/PLAY does not restore normal operation of the unit. Last, listen for any loose or broken parts inside the actual Mediapac. Always use the Mediapac protective cover supplied with the unit during transport to avoid rough handling.

12. The Z-DR1 setup changes when the camera system is placed on cameraman's shoulder.

Please [lock the operation control panel](#) when ready to record so that the control buttons are not accidentally operated while handling the camera for placement on shoulder.

13. The recorded video is too high or, too low or, wrong colors.

Perform the [video level adjustment procedure](#). Check that the camera has COMPONENT 100 as a setting for the VTR video signal output. Refer to your camera operation manual for procedure.

14. The recordings always capture 8 seconds of action before actually triggering.

Check that the [PRE-TRIGGER function](#) is disabled.

15. The recordings are NOT smooth or continuous.

Check that [TIMELAPSE RECORDING](#) is disabled.

16. When recording audio with 48 KHz sampling, the audio is distorted upon playback with a PC.

This is a known issue that has been resolved. Please ask your Hitachi representative for [firmware upgrade](#) # 0464 applicable only to units with serial numbers 3805001 to 3805045.

17. When recording .mov files and trying to playback on an Apple/MAC or edit on Final Cut Pro NLE, I receive a "Bad Movie Atom" error message.

This is a know issue and has been resolved with the firmware upgrade (# 0464) described in item 16 above.

SPECIFICATIONS

<u>Item</u>	<u>Specification</u>
Camera Connectivity:	Component Y, R-Y, B-Y via 128-pin interface.
Inputs & Outputs	Analog Composite Video In / Out. Genlock (Input) Black-Burst; internal from camera.
Digital Video In / Out:	IEEE 1394, 6-pin
Balanced Audio In / Out:	L/R input via 3-pin XLR, output via 3-pin mini-XLR.
SMPTE Time Code In:	BNC, 0.5v p-p
GPI Trigger:	Contact closure On/ Off.
Power output:	12VDC Accessory output.
Audio Monitor:	Mini-Jack, mono with user-selectable sources (L/R, L+R).
Audio:	2- modes user selectable • 32 kHz/ 12-bit/ 2-ch. • 48 kHz/ 16-bit/ 2-ch.
Recording Format:	DV25; NTSC
File Format:	*.avi type-2, *.mov
Recording Time	4.5 minutes per Gb of storage (Mediapac or SolidTape)
Power Consumption:	6 Watts Average Draw.
Power Requirement:	12 VDC
Size:	5.6" (L) X 6.6" (H) X 5.4 (W).
Weight:	Approximately 33 ounces. Power Requirements: 12 VDC via Camera Battery / External AC Adapter via industry std 4-pin XLR.
Recorder Shock Protection:	Anti-Shock Resistant Buffer & mechanical mounting. HDD Shock Protection
Operational Shock:	250G/2msec.
Operational Vibration:	1.0G (5-500 Hz)
Non-operational Shock:	5,000G/0.5msec.
Non-operational Vibration:	5.0G (10-500 Hz)
Backlit LCD display:	File Number, Time Code, Recording Time Remaining on HDD.
Temperature:	-40°F ~ +104°F Operational -40°F ~ +149°F Non-Operational.

SERVICE, SUPPORT & WARRANTY

HITACHI KOKUSAI ELECTRIC AMERICA, LTD. warrants your equipment to be free from defects in material and workmanship under normal use from the date of purchase for a period as follows:

ZDR1 DOCKABLE DIGITAL RECORDER (NTSC Version): 1 year-Parts/90 days Labor, excluding image sensors.

MEDIAPAC, ACCESSORIES AND BATTERIES:

Respective manufacturers warranty to extent transferable to customers.

Such defects will be corrected, by repair or replacement at the option of Hitachi Kokusai Electric America, provided the equipment is returned prepaid to our franchised service agency, and prior thereto, you make a request for instructions to your closest Hitachi regional office.

Northeast

150 Crossways Park Drive
Woodbury, New York 11797
T (516) 921-7200

Southeast

2715 36th Ave. N.
St. Petersburg, FL. 33713
T (813) 477-2683

Midwest

197 Great Oaks Trail, # 110
Wadsworth, OH 44281
T (330) 334-4115

West

371 Van Ness Way, Suite 120
Torrance, California 90501
T (310) 328-6116

Service and adjustments for normal use will be made without charge within the warranty period. Thereafter, repairs will be made at established factory prices.

THE HITACHI KOKUSAI ELECTRIC AMERICA WARRANTY APPLIES ONLY TO THE FIRST CUSTOMER PURCHASE FROM HITACHI DENSHI OR ITS DEALER, AND DOES NOT APPLY TO EQUIPMENT SHOWING ABUSE OR DAMAGE, OR TO BATTERY OR BATTERY CASE, OR TO PARTS WHICH IN THE JUDGMENT OF HITACHI KOKUSAI ELECTRIC AMERICA, LTD. ARE NOT DEFECTIVE. NOR DOES IT EXTEND TO ANY EQUIPMENT WHICH MAY HAVE BEEN TAMPERED WITH, ALTERED OR REPAIRED OUTSIDE OUR FACTORY OR AUTHORIZED SERVICE DEPOT.

Your unit must be returned properly packed to an authorized Hitachi Kokusai Electric America Service Station. Any damage caused by failure to observe proper packing or to observe instructions for installation, operation and maintenance as contained in this Operation Manual furnished with each unit, by accident in transit or elsewhere, will not be covered by the Warranty. Shipment to authorized Hitachi Kokusai Electric America Stations must be prepaid.

This Warranty is in lieu of all other Warranties expressed or implied, and no one is authorized to assume any liability on behalf of Hitachi Kokusai Electric America Ltd or impose any obligation on it in connection with the sale of any equipment other than is outlined above. In no event will responsibility be assumed or implied for consequential damages arising from interrupted operation or other causes.

Register your product within fourteen (14) days of purchase. Failure to register will not affect your rights under the warranty so long as you can otherwise substantiate the date and place of purchase. You may register your product and sign up for product support and update mailings by filing out a Product Registration form on the Hitachi Kokusai [Electric America website](#).

This product is manufactured under contract for Hitachi Kokusai Electric America, Ltd by [nNovia, Inc.](#) 1620 Oakland Rd., Suite D200, San Jose, CA 95131

Mediapac, HardTape and Solidtape are products manufactured by:

[AUDAVI Corporation](#), 1520 Montague Expwy., San Jose, CA 95131, Tel: 408-435-8100

Fax: 408-435-8101, Email: info@hardtape.com

