

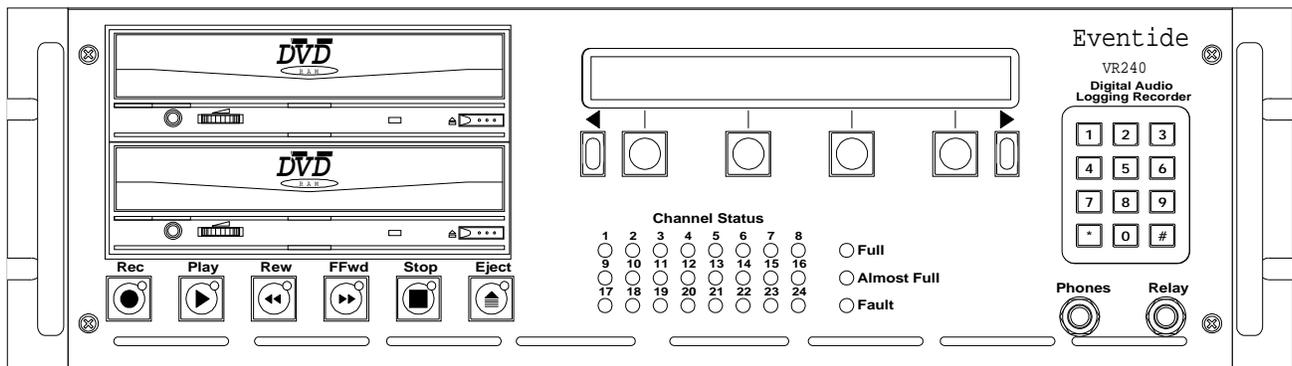
# Eventide®

the next step®

## OPERATOR'S MANUAL

### MODEL VR240

### AUDIO LOGGING RECORDER



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Little Ferry, NJ 07643  
United States of America  
[www.eventide.com](http://www.eventide.com)

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# BEFORE YOU BEGIN

FOR RELIABLE OPERATION OF THE VR240, PLEASE CLOSELY REVIEW THE FOLLOWING PROCEDURES AND CHECKS

Follow these recommendations in sequence to enhance the performance reliability of the VR240. This will prevent improper operation and malfunctions.

- Check input power settings (paragraph 2-7).
- Plan ahead for the installation of the VR240 in a convenient environment (paragraph 2-5).
- Perform the following in sequence upon powerup:
  - (1) Set the clock (paragraph 2-3.4)
  - (2) Perform System Configuration (Chapter 3, Section I)
  - (3) Perform Board Configuration (Chapter 3, Section II)
    - Perform media drive cleaning at the recommended intervals (paragraph 5-3). Tape drive equipped machines only.
    - After cleaning, reset the clean timer to 0:00 (paragraph 5-3.2)
    - Before installing new media for recording, ensure write protection is not activated (paragraph 5-20)
    - Know the differences between STOP-SUSPEND, STOP-STOP, RESUME-RECORD, and RECORD-RECORD. Refer to Section VI of Chapter 5.



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**Warranty Page**

# CHAPTER 1

## INTRODUCTION

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### Section I. GENERAL INFORMATION

#### 1-1. INTRODUCTION.

The Eventide VR240 Audio Logging Recorder is an enormous technological advance over the old-technology reel-to-reel loggers. The VR240 is more efficient and more convenient in almost every way. It uses less media, less electricity, and less space, yet it provides better quality and more features than previously possible.

All of these improvements are made possible by the digital technology employed in the VR240. Instead of recording an analog signal on physically cumbersome tapes, the VR240 converts all of its inputs to digital form and records them on, among others, “DDS” cassettes or Rewriteable DVD-RAM. These media will fit in the palm of your hand, yet each can hold up to 800 channel-hours of audio or more. The digital format also allows additional information to be stored, such as time codes and channel content information.

Despite its advanced features, the VR240 Audio Logging Recorder was designed for simple operation. In addition to the vacuum fluorescent display (VFD), there is a set of buttons directly under the media transport mechanism. These transport control keys emulate the familiar controls of an ordinary tape recorder. The square buttons under the VFD access a set of “menus” which control some of the more advanced features of the unit. These buttons are **soft keys** whose functions vary as you go through the different menus. On either side of the soft keys is rectangular keys marked by a left and right arrow. Pressing these keys will either move you through menu options or, when appropriate, move the cursor around options displayed on the screen. Finally, there is the **keypad** that facilitates the entry of parameters and a password. An LED array on the front panel indicates the status of each channel.

The VR240 is convenient and reliable to use, both for recording and for retrieving recordings once made. We hope you will enjoy using it.

#### 1-2. CONFIGURATIONS.

Your VR240 has several features and options that are determined when the unit is ordered. It may have one or two media drives. It may have 8, 16, or 24 audio input channels. In addition, the inputs may be configured differently depending upon your audio signal sources. Finally, an optional label printer provides a provision for automatic media labeling. As you unpack your VR240, please confirm that the unit you received is the unit you ordered. For your convenience, the following page is provided to record your unit’s configuration. We suggest that you complete it now. This information will be required if you should need to communicate with the factory about your VR240.

***Model VR240 Audio Logging Recorder***

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MODEL VR240, SERIAL NUMBER \_\_\_\_\_ NUMBER OF DRIVES **1** **2**  
(Serial number and options information appears on the rear panel data plate.)

DRIVE TYPE:     4MM DDS    DVD-RAM    8MM EXABYTE    MAGNETO-OPTICAL

FIRMWARE VERSION \_\_\_\_\_  
(On display during turn-on, accessible from the menus.)

If your unit is not configured as desired, or if you should need to change the configuration in the future, drives and channels can be added easily.

INPUT BOARD #1    Audio    or Telephone     8 Channel (channels 1-8)  
INPUT BOARD #2    Audio    or Telephone     8 Channel (channels 9-16)  
INPUT BOARD #3    Audio    or Telephone     8 Channel (channels 17-24)

LABEL PRINTER: **Y** **N**    STATUS PRINTER model \_\_\_\_\_

## **Section II. EQUIPMENT DESCRIPTION AND DATA**

### **1-3. PURPOSE AND FEATURES.**

#### **1-3.1 Purpose.**

The VR240 Audio Logging Recorder is a multi-channel, full-featured digital logging system. The recorder archives voice files on DDS-2 or DDS-3 cassettes, or Rewriteable DVD-RAM.

#### **1-3.2 Features.**

The VR240 has several features, capabilities, and options.

- Converts all inputs to digital format and records them on DDS-2 or DDS-3 cassettes, or Rewriteable DVD-RAM.
- Media fits in palm of hand, yet each can hold several hundred channel-hours of audio.
- Digital format allows additional information to be stored, such as time codes and channel content information.
- One or two media drives.
- May contain 8, 16, or 24 input channels.
- Input options allow different configurations depending upon the audio signal sources.
- Transport control keys emulate the familiar controls of an ordinary tape recorder.
- Easy-to-read VFD (vacuum florescent display).
- Four soft keys that access displayed functions located directly above them on the front panel display. These functions vary as you go through the different menus. The menus control some of the more advanced features of the unit.
- Contains a front panel keypad to facilitate the entry of parameters and a password.

## ***Model VR240 Audio Logging Recorder***

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### 1-4. EQUIPMENT DATA.

#### 1-4.1 Weight and Dimensions.

<b>Weight</b>	33 pounds (14.98 kg)
<b>Height</b>	5 inches (127 mm)
<b>Width</b> (main frame)	16-7/8 inches (428.6 mm)
<b>Width</b> (front panel)	17-1/4 inches (438.2 mm) (with 1 inch (25.4 mm) additional extension for each handle) (rack ears for 19-inch rack mount)
<b>Depth</b> (main frame)	17 inches (431.8 mm)

#### 1-4.2 Power Requirement.

The VR240 is factory-configured for the line voltage of the country of installation. Fuse type is 2A, 250V, time-delay, 20 mm (Eventide P/N 316054). Same type is used for 115 Vac or 230 Vac.

### 1-5. ACCESSORIES AND OPTIONS.

<u>Description</u>	<u>Part/Model Number</u>
Label Printer	Seiko Model SLP1000
Status Printer	Various (serial)
Accessory Playback Unit	Eventide model VR204 or VP204
DDS Cleaning Cartridge	Various (Sony recommended)
PC Remote Control	Eventide Part Number 110000
Satellite Chronometer	Eventide Part Number ECW-40
DVD-RAM Disk	Eventide Part Number 240011
90 Meter Tape (DDS-1)	Various (Sony recommended)
120 Meter Tape (DDS-2)	Various (Sony recommended)
125 Meter Tape (DDS-3)	Various (Sony or Fuji recommended)
Magneto-Optical Disk	Eventide Part Number 240009
Desktop Enclosure	Eventide Part Number 240002
Large Internal Hard Drive	Call Eventide to inquire about the latest size and design

## **CHAPTER 2**

# **PREPARATION FOR USE AND INSTALLATION**

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### **Section I. FAMILIARIZATION**

#### **2-1. GENERAL.**

This section will familiarize you with the VR240. You will learn how to format media, monitor live communications, begin the record process, enable/disable channels for playback, adjust the speaker volume, and scroll between the two archive drives and the internal hard disk. It is recommended that the initial setup be done prior to installing the unit in its permanent operating location. Chapter 3 of the Operator's Manual discusses the detailed configuration procedures for setting up your unit at your facility.

#### **NOTE**

It is assumed in this section that you have an audio input signal available to connect to the Channel One input of the VR240.

#### **2-2. INITIAL SETUP.**

##### **2-2.1 Telephone Board Connection (Phoenix Connector).**

Locate an active telephone line in the area you are working.

Connect the telephone line "tip" lead to pin 15 and the "ring" lead to pin 16 of the 16 contact input connector provided with the unit (note: input is not polarity sensitive). See Figure 2-1.

##### **2-2.2 Audio Board (Amphenol Connector).**

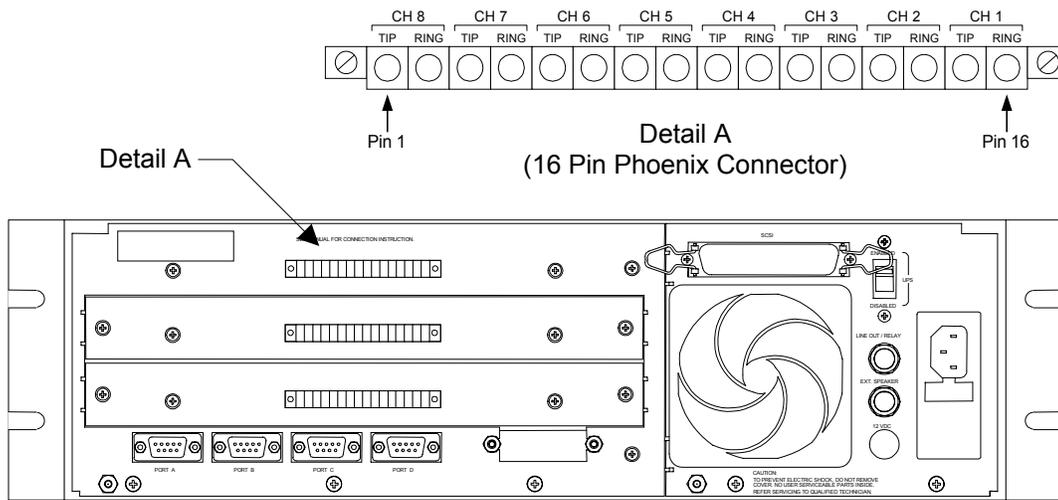
Obtain an approximately "line level" signal source. (Something as simple as a "Walkman" or portable CD player will do.)

Connect the signal source line output to pins 1 and 26 of the top connector on the rear of the VR240 (using the male 50-pin connector provided). See Figure 2-1.

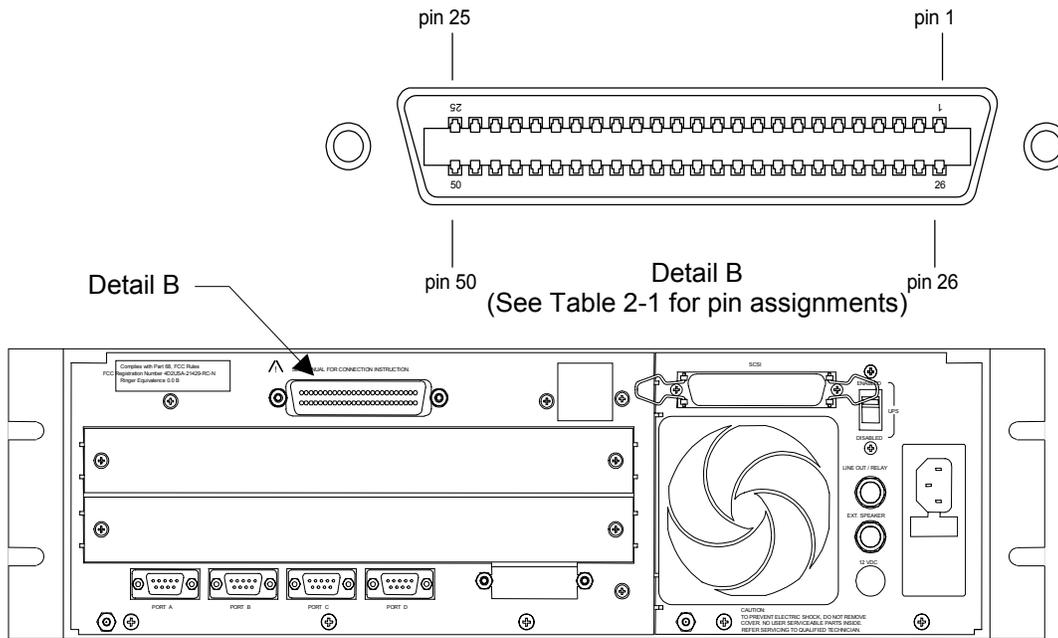
##### **2-2.3 Additional Hardware.**

One blank medium per drive is provided with each VR240. No other hardware is necessary for this exercise. Monitor the VR240 with its internal speaker. You can also use a set of headphones (with a mono or stereo phono plug).

# Model VR240 Audio Logging Recorder



VR240 with three 8-channel telephone boards



VR240 with one 8-Channel "audio" board

Figure 2-1. VR240 Connections

2-3 INITIAL TURN-ON.

NOTE

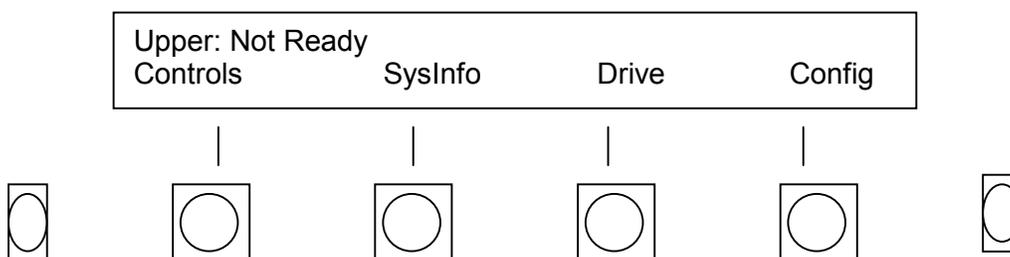
The VR240 is factory-configured for the line voltage of the country of installation. Fuse size is 2A, 250V. Refer to paragraph 2-7 for ensuring correct power.

2-3.1 Power.

The VR240 does not have an ON/OFF switch. To apply power, first plug the power cord into the rear panel power connector. Next, plug the other end of the cord into a power outlet. The logger turns on and operates continuously when plugged in.

2-3.2 Self Test.

The unit performs a self-test after power is applied. Then the following screen will appear on the VFD display:



2-3.3 Front Panel Controls.

There are three sets of controls on the VR240 front panel. The transport control keys are immediately underneath the drive(s). The keypad is on the right of the panel above the headphone jack. The soft keys are underneath the VFD display. Refer to Section III of this chapter for a more detailed description of the front panel controls and indicators.

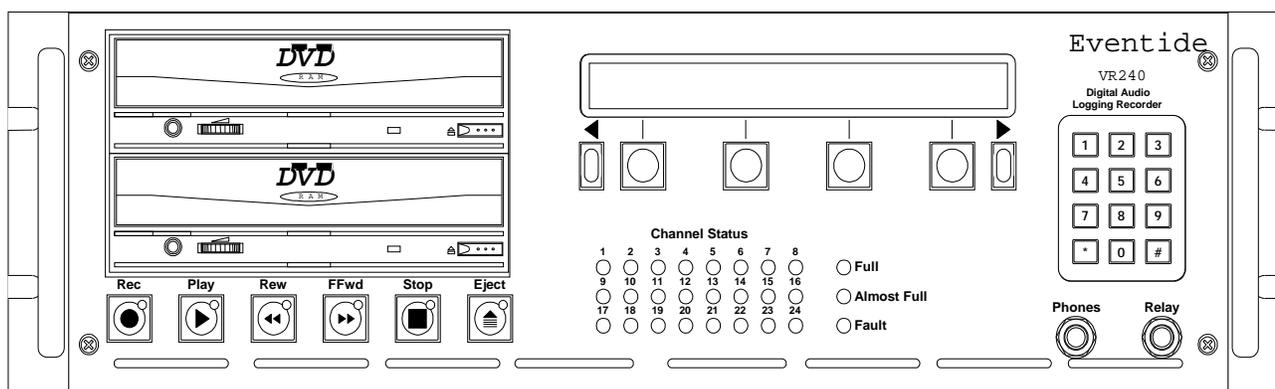
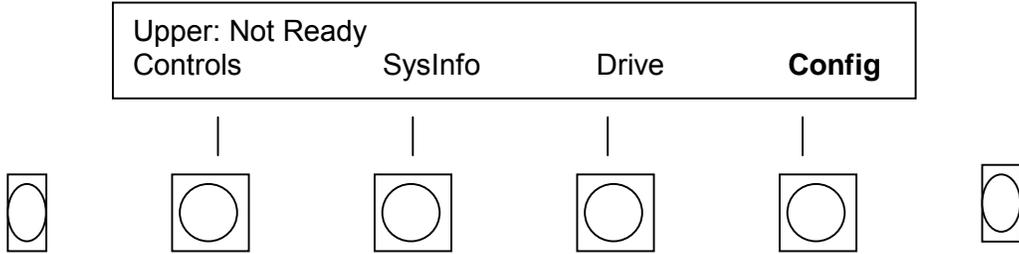


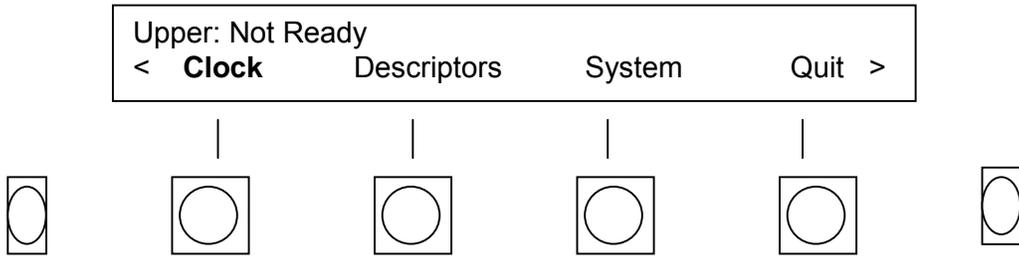
Figure 2-2. VR240 Front Panel

2-3.4 Setting the System Clock.

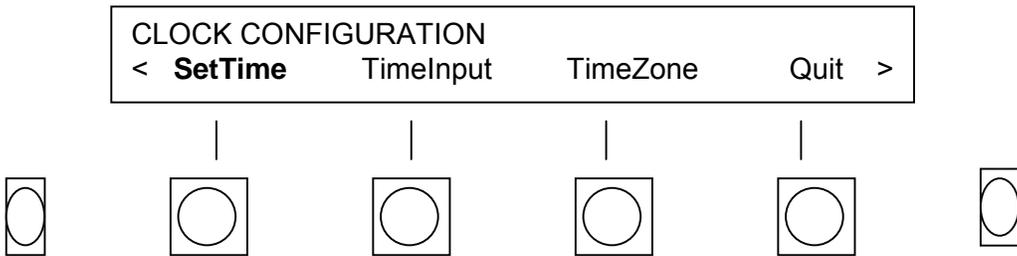
- a. Press the Config soft key



- b. Press the Clock soft key.

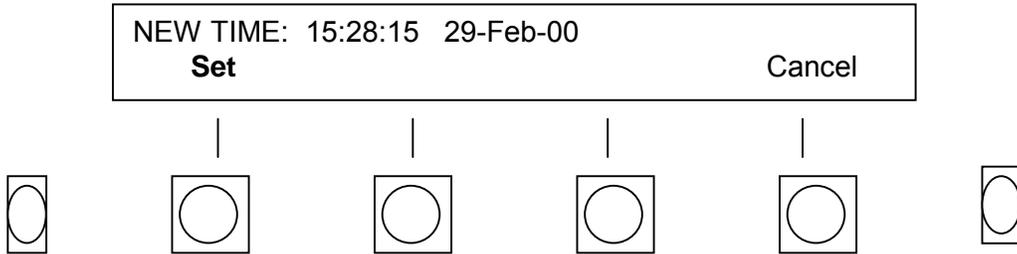


- c. Press the SetTime soft key



- d. Determine what the time and date will be in about a minute. For example, if it were now 3:27 PM on the 29th of February 2000, the number for 3:28 PM would be "15:28:00 29-FEB-00". Use the Cursor soft key to place the cursor under the parameter(s) you wish to change. To change the parameter, use either the Decrease and Increase soft keys or the keypad. When finished, press the Done soft key (you have not yet set the time).

- e. Wait for the second hand to come around to the minute and hit the Set soft key. (Or, if you made a mistake, hit Cancel and start over.) The clock is now set. If you are running on Greenwich Mean Time or UTC, you can set the clock to that instead of local time. To exit this menu without re-setting the time, press the Cancel soft key.

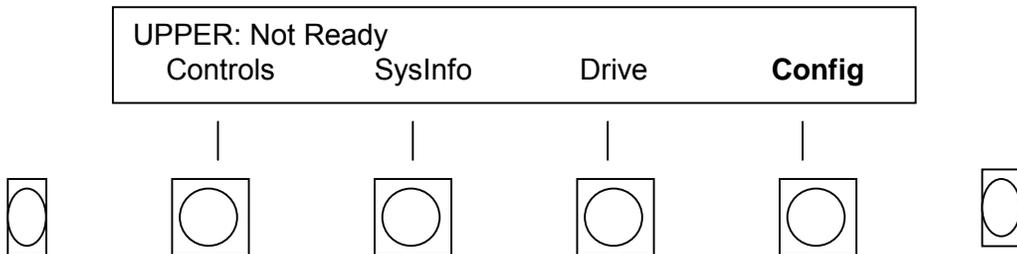


**NOTE**

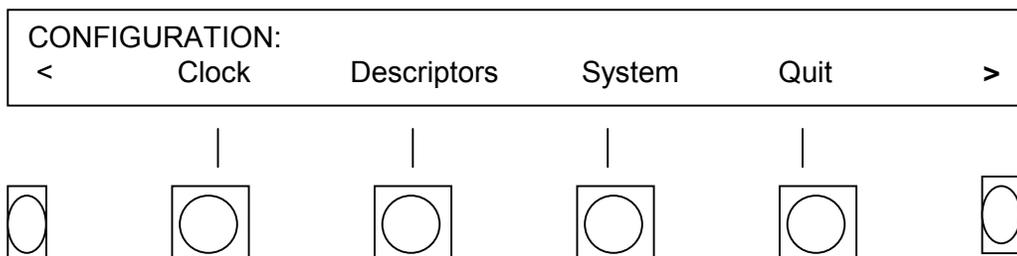
The display will give you the time and date as stored in the VR240. This may be accurate, or completely incorrect if never set. The VR240 uses 24-hour time and the “European” method of giving the date as DAY/MONTH/YEAR.

**2-3.5 Setting Up Input Channel 1 for Recording.**

- a. Press the Config soft key. (NOTE: Config is not available in hard disk menu. Use the Drive soft key to select either the upper or lower drive.)



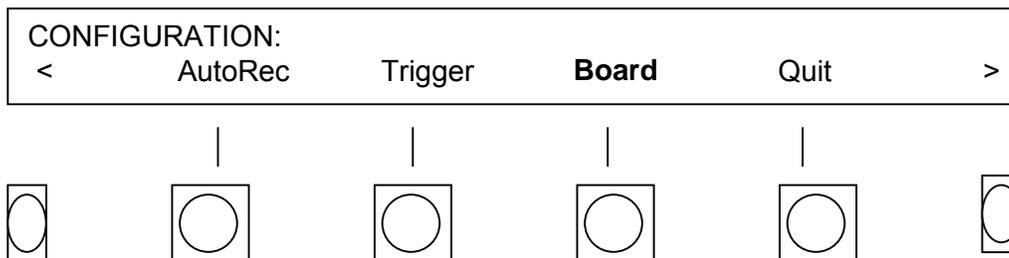
- b. Press the > function key.



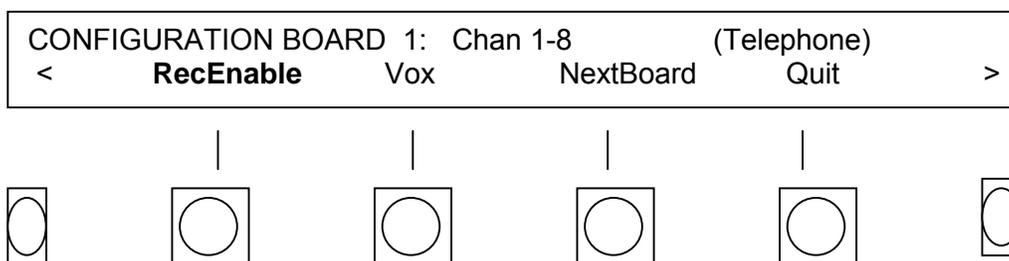
## Model VR240 Audio Logging Recorder

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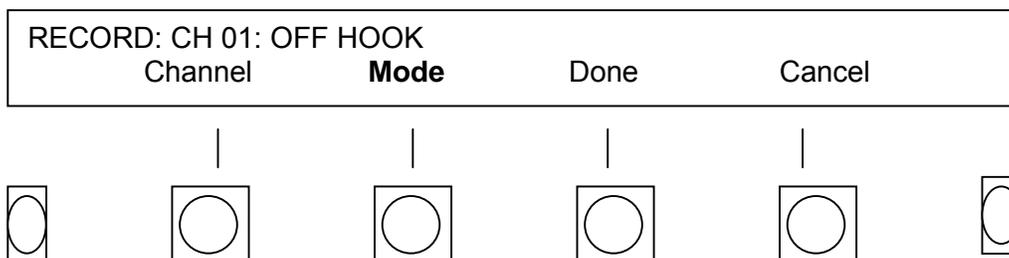
- c. Press the Board soft key



- d. Press the RecEnable soft key and you will see a display for board 1: CH1: followed by a mode description.



- e. Press Mode soft key and cycle through all the choices. Continue to cycle through the choices until OFF HOOK (for telephone input boards) or ACTIVE HIGH/OPEN (for audio boards) is displayed (if it was not displayed originally).



- f. Press the Done soft key to accept the OFF HOOK (telephone input boards) choice or ACTIVE HIGH/OPEN (audio input boards). There are many more system configuration choices, but the only important one at present is to make sure that Channel 1 is active when you record on it.

### 2-3.6 Media Loading and Formatting.

Before you can record on a drive, the media must be FORMATTED. This process writes an index and some machine-specific information on the media. The index is used to find specific times when searching, and also serves as a permanent identification if, for some reason, the physical label or box is missing. Recording will continue on the internal hard disk during the format process. You can format on either drive or both drives simultaneously.

#### Loading and formatting 4MM and 8MM data cartridges;

Be sure to use only *data grade* DDS tapes. *Do not use* audio grade (DAT) tapes. These will damage the tape drive and void all warranties. All DDS cartridges have a “write protect” mechanism, a small plastic latch that covers a hole on the back of the cartridge (except 8mm). The latch must cover the hole to allow the media to be written. Make sure this is the case before continuing. On 8mm data cartridges, make sure the hole is uncovered. Insert your new tapes in the VR240 by putting them in the slots, transparent side UP, write protect latch towards you, until a gentle resistance is encountered as the tape is almost fully inserted. Apply just enough pressure to overcome the resistance, and the drive will pull the tape in and begin the loading process.

#### Loading and formatting magneto-optical disks and rewriteable DVD-RAM:

Magneto-optical disks and DVD-RAM come packaged in a protective case. The whole case is loaded into the machine at once; do not try to remove the disk from the case. You will see a small plastic “write protect” mechanism located on the bottom left of each side of the protective case. The latch must be pushed all the way to the right (two red holes showing) to allow the disk to be written. Make sure this is done before continuing. Insert your new magneto-optical disks in the VR240 by putting them in the slots, either side up, with the write protect latch toward you, until a gentle resistance is encountered as the disk is almost fully inserted. Apply just enough pressure to overcome the resistance, and the drive will pull the disk in and begin the loading process. Unlike a DDS cartridge, the DVD-RAM and magneto-optical disk can record on both sides. When one side is full, turn the disk case over and reinsert it.

The VFD display will show the loading process for either the UPPER or LOWER drive. If you are using new, unformatted media, the display will show Unreadable. (If the display shows either drive to be Ready, it means that you have inserted formatted media. Since formatting destroys all data on the media, make sure that it does not have any important information on it before proceeding.)

All new media must be formatted before they can record. This takes about 4 minutes for a 4MM DDS or 8MM cassette and a few seconds for a rewriteable DVD-RAM or magneto-optical disk. You do not need to reformat the media to reuse it.

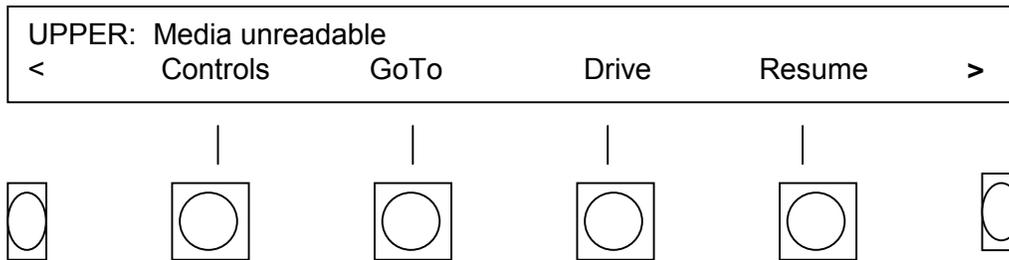
Follow this procedure to format new media:

- a. Load an unformatted Data Grade DDS tape or rewriteable DVD-RAM into an available drive. The drive status display will read Media unreadable.

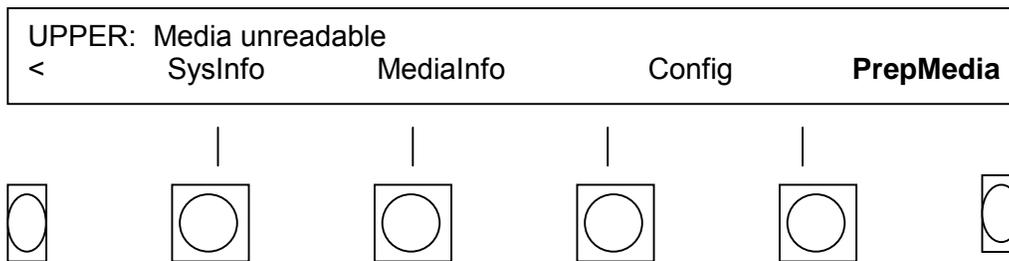
## Model VR240 Audio Logging Recorder

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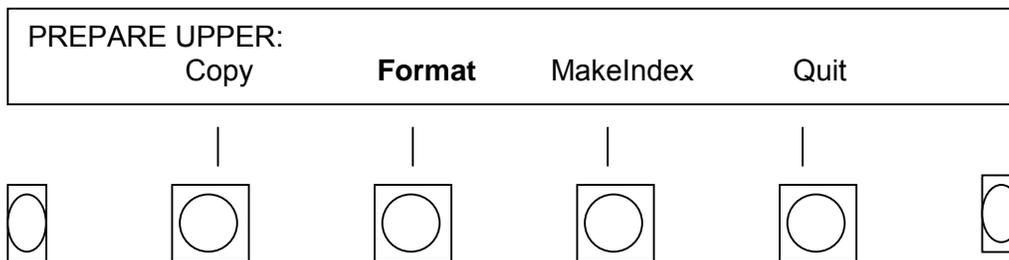
- b. Press the > (next) soft key



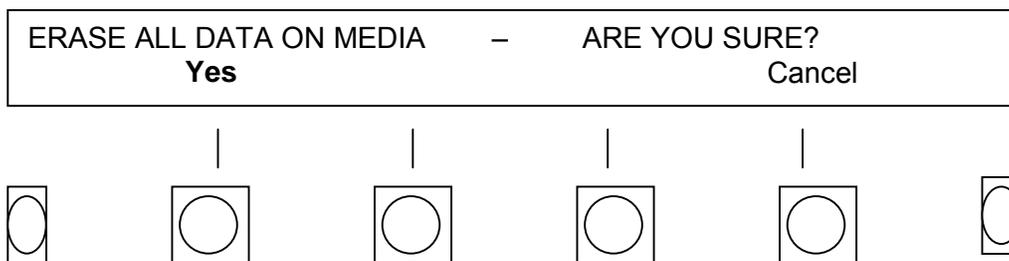
- c. Press the PrepMedia soft key.



- d. Press the Format soft key.



- e. The display will read 'ERASE ALL DATA ON MEDIA – ARE YOU SURE?' Press the Yes softkey.



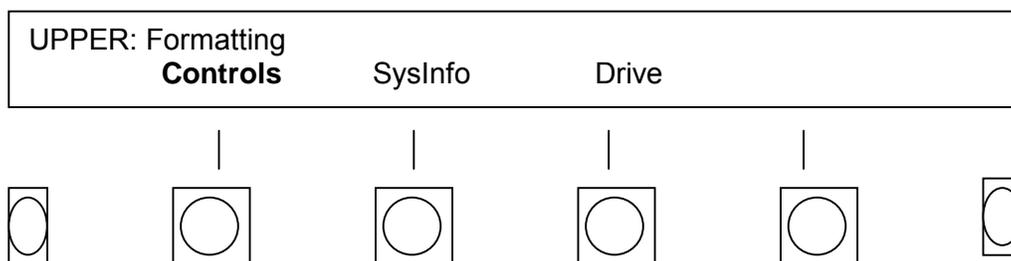
(Notice that you were given the opportunity to CANCEL this potentially dangerous operation.)

To format the media in the other drive, press the Drive soft key until the VFD display reads "LOWER: Not ready," then repeat the operation. (Both operations can be performed concurrently.)

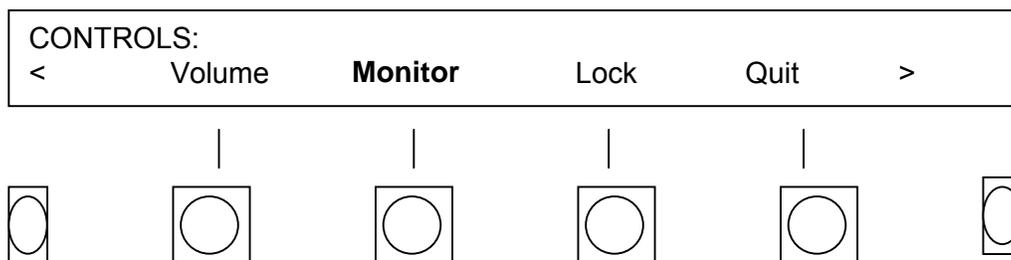
- f. Now that the media in the drive is formatted, notice another characteristic of the VR240. The menus are sometimes dependent upon the state of the unit. The loading of media caused new menu choices to become available.

**2-3.7 Recording to the Archive Drives.**

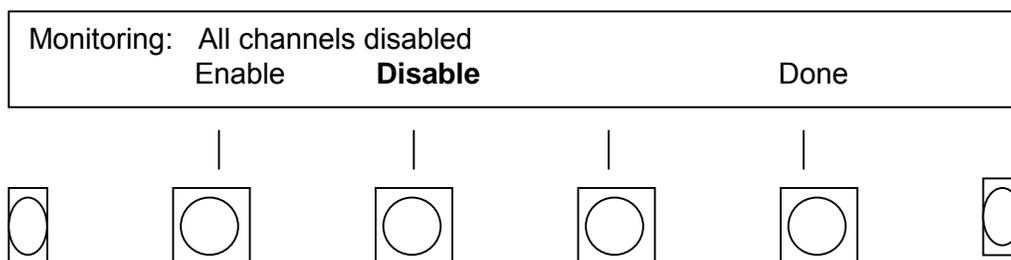
- a. Once the formatted media is in one or both drives, the VR240 is ready to record. The first thing to do is confirm that audio is present on channel 1.
- b. Press the Controls soft key.



- c. Press the **Monitor** soft key.



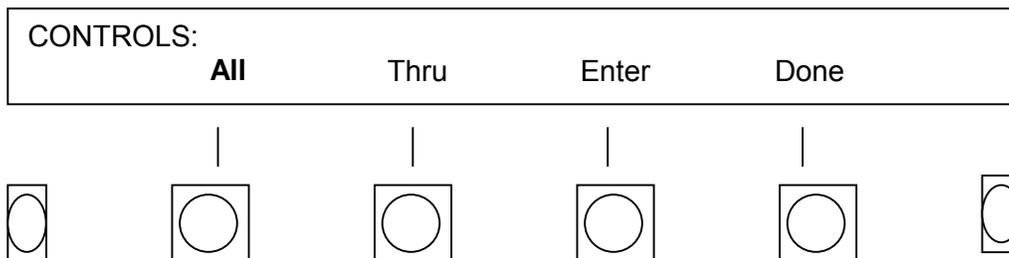
- d. Press the **Disable** soft key.



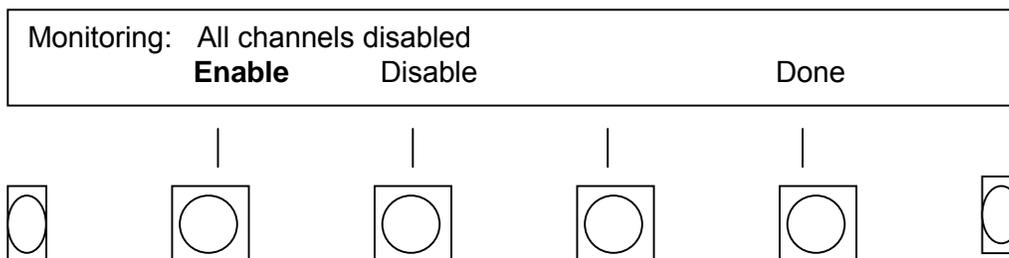
## Model VR240 Audio Logging Recorder

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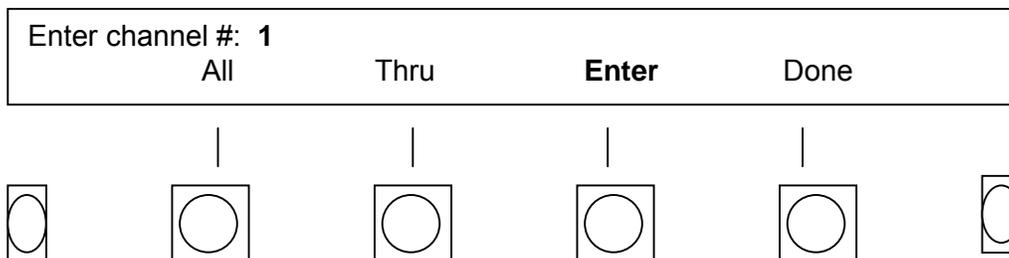
- e. Then press the **All** soft key.



- f. Press the Enable soft key



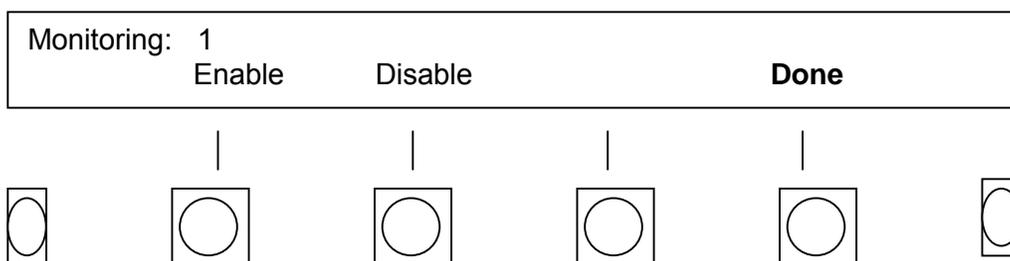
- g. Press the number "1" on the keypad followed by the **Enter** soft key.



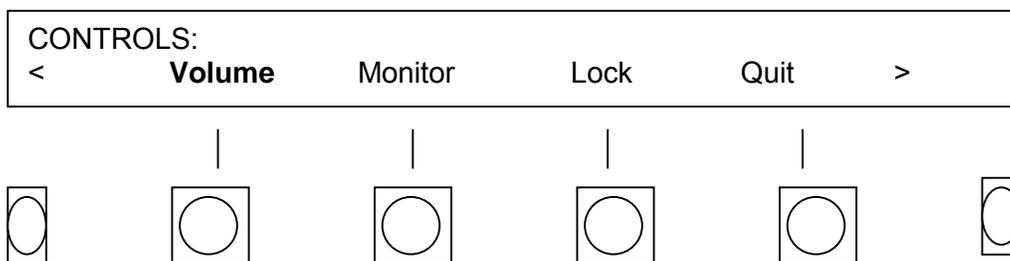
If your signal source is not on, turn it on now. The top row of LEDs on the Channel Status array serves as a level indicator. Adjust the output level of your signal source so that the input signal to the VR240 is as high on the "meter" as possible without "clipping", as indicated by red LEDs on the right of the array. It is OK if the rightmost set of asterisks flashes occasionally. (When the Monitor menu times out or you hit Done, the "meter" is disabled, and that line of the display reverts to its normal function, described in detail later on.) You can now hear your signal source through the VR240 speaker.

2-3.8 Adjust the speaker volume.

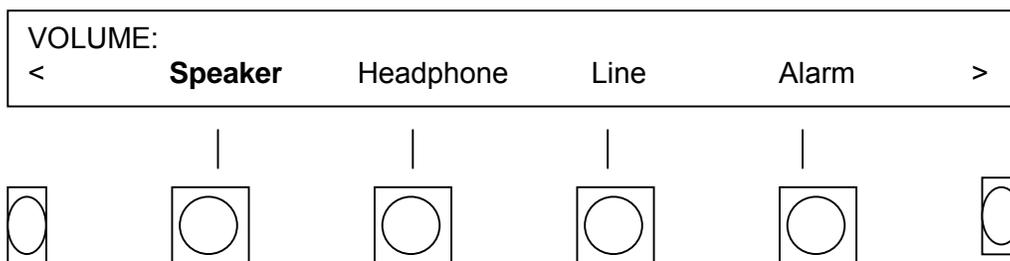
- a. Press the **Done** soft key.



- b. Press the **Volume** soft key.



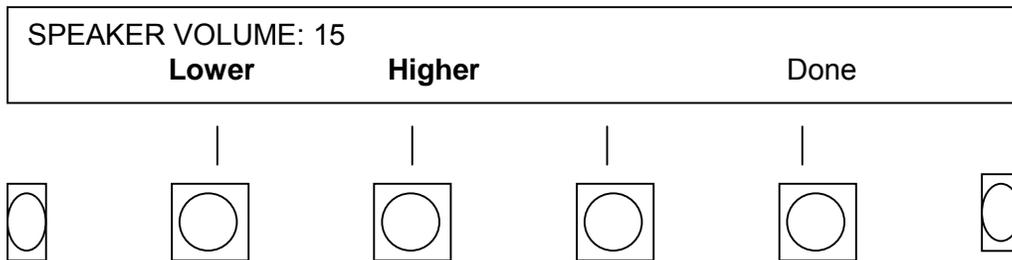
- c. Press the **Speaker** soft key.



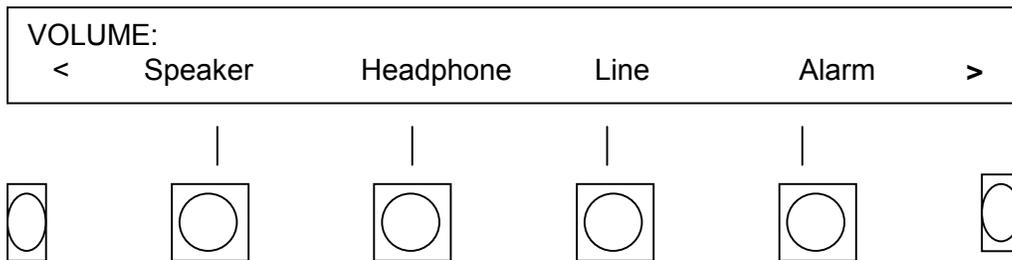
## Model VR240 Audio Logging Recorder

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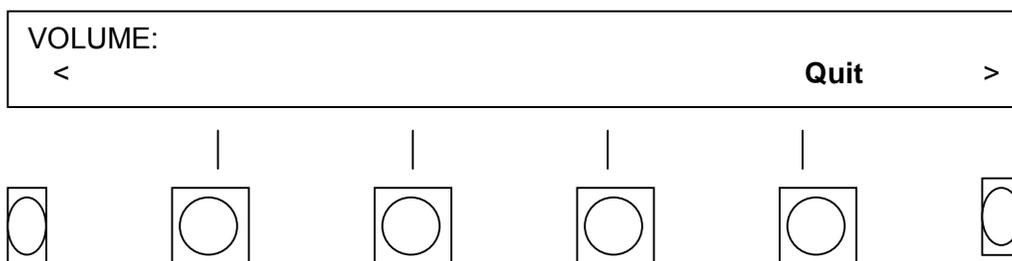
- d. Press the **Lower** or **Higher** key to decrease or increase the speaker volume. The increments are 0 (no volume) to 40 (maximum volume). To return to the VOLUME: screen, press the **Done** soft key.



- e. To quit this menu, press the > (next) soft key

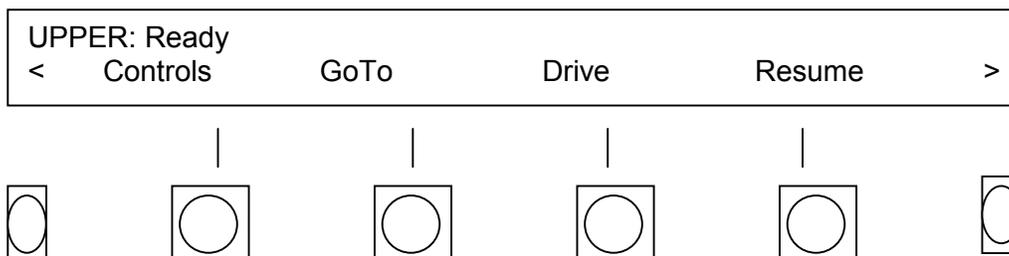


- f. Press the **Quit** soft key twice.

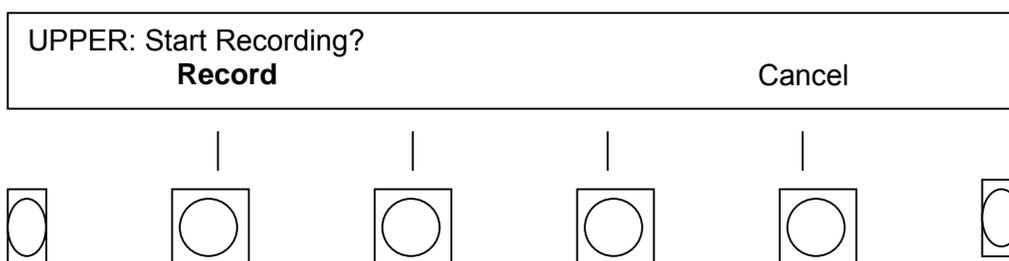


**2-3.9 To put the VR240 in record.**

- a. When you see UPPER: Ready, it means that the transport controls are active. To begin recording, press the **Rec** transport key located under the archive drives.

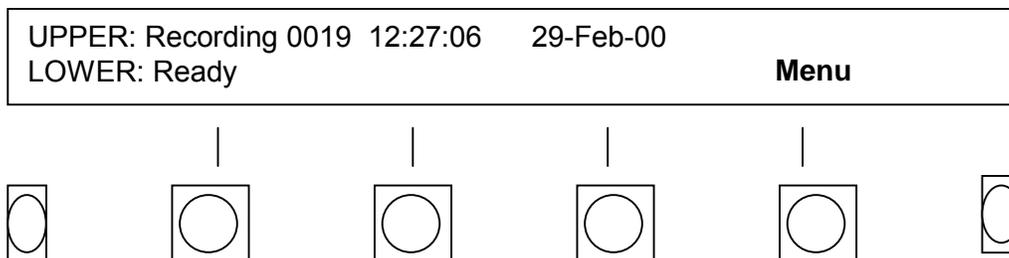


- b. The display will ask you to confirm if you wish to record on the selected drive (look to see that the desired drive is displayed, if not, use the **Drive** soft key to select the appropriate drive. Then press the **Record** soft key.



The display now shows (a) that you are recording, and (b) the status of the archive drive(s). The date and time is also displayed, along with the “media counter,” an electronic equivalent of the mechanical counter on analog decks. This counter is very important because it may be the only way you can tell how near the media is to completion. Let the recording run for a while.

Once you start recording, the menu structure changes. Note that when the recording drive is selected, the display gives you options that make sense while recording. Pressing the **Menu** soft key will give you access to additional menu options.



It is possible to record on both drives simultaneously. You can do this either by selecting the non-recording drive with the Drive soft key and repeating the last three steps. Or, if both drives are loaded and positioned for recording (Ready), press the > (next) function key and then the DualRec soft key.

**NOTE**

You have now set up the VR240 so it will be able to do its job. The rest of the operation's manual will be slightly less detailed.

Some of the menu choices you have while in the record mode include:

**SetMem** (Set memory) Save the location of the message on the medium so you can go back to that spot later.

**SaveMessage** Store a critical communication into one of 16 record buffers.

**Instant Recall** Instant Recall is accessed by pressing the Recall soft key. Recalling during record allows the replaying of a previous passage on any selected channel while the VR240 continues to record. This is particularly useful when the recording is being monitored in real time. When Recall is activated and the channel is selected, the available time frame to listen to is backed up 30 seconds from the current time. From there, selecting Pause, Rewind, or FastForward enables the operator to quickly locate a selection to listen to. Refer to the detail procedures in paragraph 5-12.

The following choices can be found by pressing the Controls soft key

**Volume** Press the Volume soft key for access to the speaker, headphone, line out and alarm volume controls.

**Monitor** Listen to what is being recorded as it is occurring.

**Lock** Used to prevent unauthorized access to all controls except instant recall.

**Time Adjust** Allows you to "spring ahead" to daylight savings time. Eventide recommends that you do not change the clock for daylight savings time. If you set the clock ahead in the spring you may have trouble in the fall. Setting the clock back will result in two hour-long sections of media with the same time, making searching difficult.

## Section II. INSTALLATION

### 2-4. INTRODUCTION.

This section describes the factors that must be considered in setting up the VR240 in your facility. Consideration of the appropriate physical location must be made for available power and audio sources. This includes connecting the unit to power, audio, and ancillary items (i.e., clock, label printer).

### 2-5. PLANNING.

Identify and allocate the inputs to be used as the signal sources for the VR240. Then determine if you have any channels remaining. If you do, bring them to a convenient patch field as you will probably find other applications for the VR240 in the future.

Determine the physical location for the VR240. The unit has removable rack mounts and can be installed in any convenient location that meets the temperature specifications for the unit and the drives. If you are going to mount it in a rack, do not rely only on the mounts for support – use a shelf or slide as well. The weight of the unit will exert significant torque on the mounting hardware. To avoid drive failures and unreliable data transfers the VR240 must be mounted horizontally not on an angle (such as in some consoles).

Some items to consider:

- |                      |   |
|----------------------|---|
| <b>Convenience</b>   | Select a location where changing media can be easily accomplished. If you do not plan to install remote alarms, locate the VR240 where the media almost-full, media full, and system fault alarms can be clearly heard.   |
| <b>Security</b>      | Do you need to be concerned that someone will want to “destroy the evidence,” so to speak? If so, how dedicated will that person be? The unit has security features, but a well-locked door is better!  |
| <b>Power</b>         | The Uninterruptable Power Supply will allow the unit to run briefly (approximately 30 seconds) on batteries while the generator comes up. If you have a generator, make sure the VR240 will be powered by it. Connect an inexpensive computer UPS to the logger if outages are frequent or typically last more than 30 seconds. |
| <b>Accessibility</b> | Will people continually be using the unit for playback, or will it almost always be making archival recordings?   |
| <b>Wiring</b>        | If almost all the signal sources are in one area, how much wiring do you want to do to get to the recorder?   |
| <b>Environment</b>   | For best reliability, the unit should be placed in a room with comfortable (for humans) temperature, no extremes of humidity, and as little dust or particulate matter as possible. A “no smoking” area is preferable.  |

**2-6. SYSTEM CONNECTION.**

Figure 2-1 shows the rear panel of the VR240. There can be up to three telephone or audio input connectors, depending upon the number of optional channel boards installed. Your primary job will be to connect the input channels to your signal sources. Additional tasks include providing power, audio output, and, if desired, PC remote control, and printer interface signals and connections.

**2-7. POWER CONNECTION.**

**AC Line** This connector provides power to the VR240 using the power cord provided. The chassis connector is internationally standardized. However, if the VR240 is being used outside the United States, the supplied power cable must be replaced with a local version.

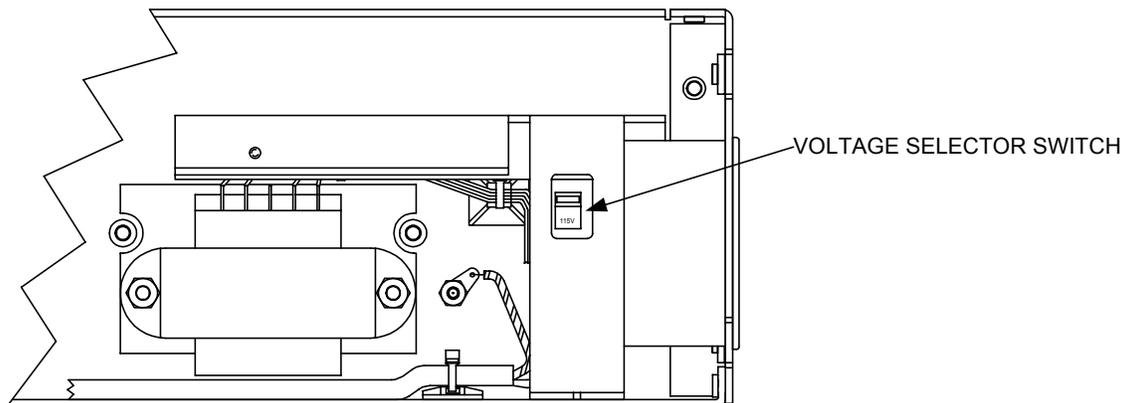
**Line Voltage** The VR240 is factory-configured for the line voltage of the country of installation. Fuse size is 2 amp, 250V.

If unsure that the power input setting is correct for the local supply, perform the following:

- a. Remove the top cover as follows:
  - (1) Remove fifteen #4 screws.
  - (2) Remove five #6 screws.
  - (3) Lift and remove the cover slowly and disconnect the speaker.
- b. Select the correct voltage selector switch position the on the power supply module (see Figure 2-3).

Pushing the switch in the UP position is for 115V ac.

Pushing the switch in the DOWN position is for 230V ac.



**Figure 2-3. Voltage Selector Switch**

- c. Replace the top cover as follows:
- (1) Position top cover on the top of the VR240.
  - (2) Plug in speaker connector.
  - (3) Install five #6 screws.
  - (4) Install fifteen #4 screws.

**NOTE**

Connect signal sources and mount the VR240 prior to connecting the power source to the unit. Refer to initial turn-on (paragraph 2-3).

**2-8. INPUT OPTIONS.**

Up to three input boards may be installed in each VR240 mainframe (see Figure 2-2). This manual describes the two board styles available.

- 1) Voice-quality audio input board (8 channels).
- 2) FCC-registered telephone board (8 channels).

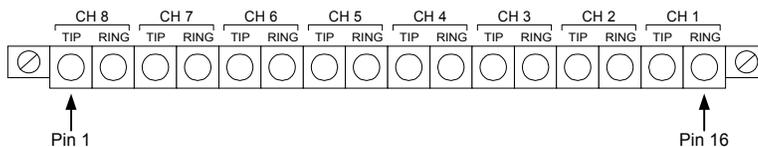
Other types of input boards (i.e. T1/E1) are described in supplements.

## Model VR240 Audio Logging Recorder

### 2-8.1 Connecting the Telephone Channel Inputs.

The connector comes with mating plugs. The mating plugs use crimp type screw terminals to secure the telephone lines (wires). The input impedance is 10kΩ. Looking at the rear of the unit, each 16-position connector is numbered as follows:

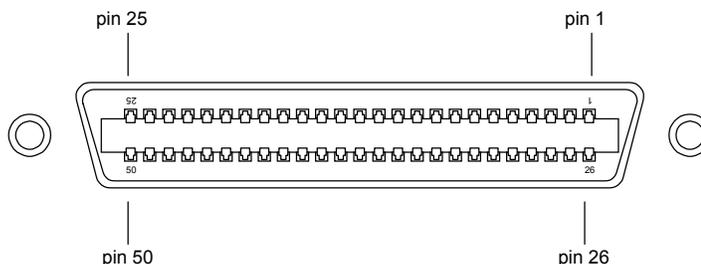
01	Line 8 "tip"
02	Line 8 "ring"
03	Line 7 "tip"
04	Line 7 "ring"
05	Line 6 "tip"
06	Line 6 "ring"
07	Line 5 "tip"
08	Line 5 "ring"
09	Line 4 "tip"
10	Line 4 "ring"
11	Line 3 "tip"
12	Line 3 "ring"
13	Line 2 "tip"
14	Line 2 "ring"
15	Line 1 "tip"
16	Line 1 "ring"



### 2-8.2 Connecting the Audio Channel Inputs.

There is one 50-position socket on the rear panel of each audio input board. The sockets are the industry standard telephone type, compatible with the Amphenol 57-series ("blue ribbon") connectors. Looking at the rear of the unit, each 50-position socket is numbered as follows:

25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01  
 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26



For each of the eight channels on an input board, there are six signals available at the 50-position socket: two signals for differential audio input, one for audio output, one for squelch or record enable control, and two grounds. If there are three input boards installed, the top board contains channels 1-8, the middle board contains channels 9-16, and the bottom board contains channels 17-24. Standard 25-pair color-coded cables may be used for system connections according to the following table 2-1:

**Table 2-1. Rear Panel Audio Connector Pin-Out**

PAIR	PIN	COLOR	SIGNAL	BOARD: CHANS	Top 01-08	Mid 09-16	Bot 17-24
1	26 1	WHT/blu BLU/wht	Audio in – Audio in +	Channel	01	09	17
2	27 2	WHT/org ORG/wht	Audio out Ground				
3	28 3	WHT/grn GRN/wht	Squelch Ground				
4	29 4	WHT/brn BRN/wht	Audio in – Audio in +	Channel	02	10	18
5	30 5	WHT/slt SLT/wht	Audio out Ground				
6	31 6	RED/blu BLU/red	Squelch Ground				
7	32 7	RED/org ORG/red	Audio in – Audio in +	Channel	03	11	19
8	33 8	RED/grn GRN/red	Audio out Ground				
9	34 9	Red/brn BRN/red	Squelch Ground				
10	35 10	RED/slt	Audio in – Audio in +	Channel	04	12	20
11	36 11	BLK/blu BLU/blk	Audio out Ground				
12	37 12	BLK/org ORG/blk	Squelch Ground				
13	38 13	BLK/grn GRN/blk	Audio in – Audio in +	Channel	05	13	21
14	39 14	BLK/brn BRN/blk	Audio out Ground				
15	40 15	BLK/slt SLT/blk	Squelch Ground				
16	41 16	YEL/blu BLU/yel	Audio in – Audio in +	Channel	06	14	22
17	42 17	YEL/org ORG/yel	Audio out Ground				
18	43 18	YEL/grn GRN/yel	Squelch Ground				
25	50 25	VLT/slt SLT/vlt	(not used) (not used)				

Color Legend:

WHT = white  
RED = red  
BLK = black  
YEL = yellow

VLT = violet  
BLU = blue  
ORG = orange  
GRN = green

BRN = brown  
SLT = slate  
WHT/blu = white wire with blue stripe

### 2-8.3 Squelch Requirements.

A “high” is either an open circuit, or a voltage level greater than 4 volts. A “low” is either a contact closure to ground or a voltage level lower than 2 volts.

### 2-8.4 Audio Board Front-End Options.

The following options are configurable from the front panel on a channel-by-channel basis:

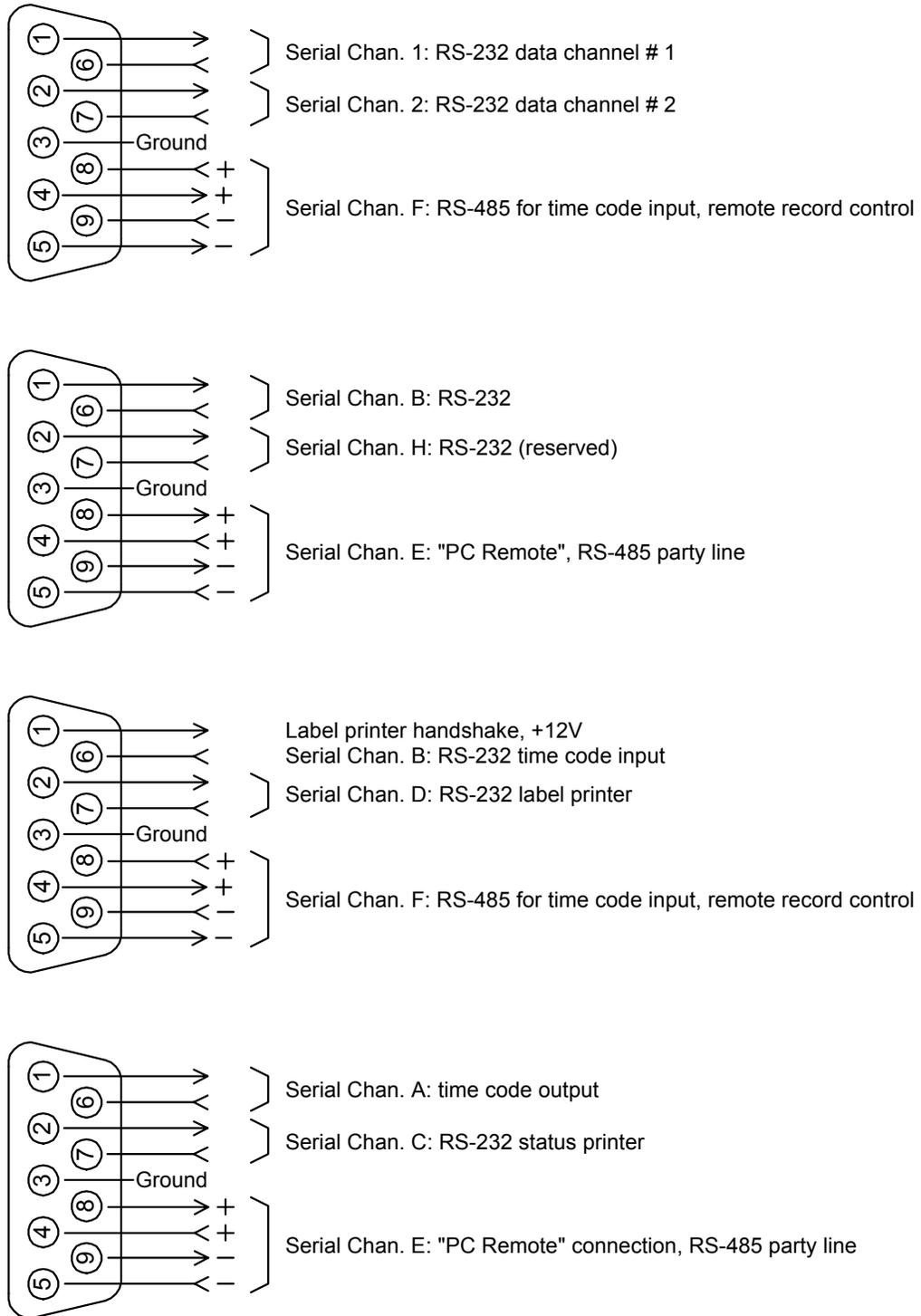
- 1) Balanced input, >10K ohm impedance, transformerless
- 2) Transformer balanced input, >10K ohm impedance @ 1kHz
- 3) Transformer balanced input, 600 ohm impedance

**WARNING**

**Do not connect Audio Board channels directly to the Public Switched Telephone Network. Use Eventide’s FCC-registered input boards for this purpose.**

### 2-8.5 Rear Panel Serial Port Connectors.

Connect the desired ancillary items (clock, label printer, status printer, etc.) to the rear panel serial port connectors. Refer to Figure 2-5.



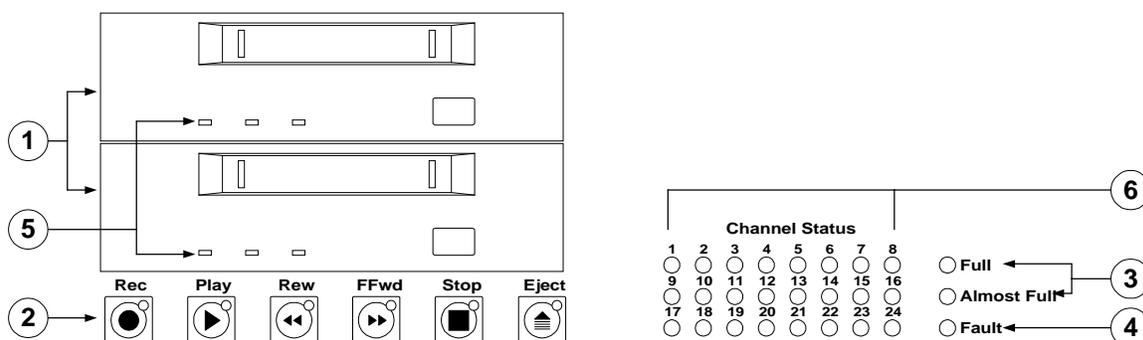
**Figure 2-5. VR240 CPU: Rear Panel Serial Port Connectors**



ITEM	CONTROL OR INDICATOR	DESCRIPTION
2	Soft Keys	<p>A maximum of four functions is displayed on this line. Each function corresponds to a soft key located directly under the display. From this screen, pressing the soft key labeled "Controls" will give you access to the submenu containing "Monitor," "Volume," and "Lock" screens.</p> <p>In some instances, more functions are available than can be shown at one time. When this is the case, the &lt; (previous) and &gt; (next) function key will be displayed. Press either soft key to step through additional menu selections.</p>

**2-10. DRIVES.**

Table 2-3 describes the Drive Controls and Indicators.



**Table 2-3. Drive Controls and Indicators**

ITEM	CONTROL OR INDICATOR	DESCRIPTION
1	Archive Drives	These may be 4MM DDS tape, rewriteable DVD-RAM, 8MM Exabyte cassette, or magneto-optical disk. The VR240 logger may be equipped with a single drive or, more commonly, with dual drives.
2	Transport Controls	You may use these controls to operate both the drives and the internal hard disk. Pressing the Rewind and FFwd (fast forward) transport keys multiple times can increase the speed of the rewind and fast forward functions.

## Model VR240 Audio Logging Recorder

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ITEM	CONTROL OR INDICATOR	DESCRIPTION
3	Full  Almost Full	Indicates that one of the archive drive media has been recorded on to capacity.  A yellow light indicates that the media in that drive has one half hour or less of record time available.
4	Fault	A yellow light indicates that an archive drive or internal hard disk failure may have occurred. It may also indicate that the “cleaning timers” must be reset.
5	Media Drive Indicator Lights	Different tape and disk drives have their own indicator lights. In most cases, ignore these lights. In general, the VR240 display provides more and better information.
6	Channel Status Array	These LEDs will light as required to report the current state of each installed channel. They will light under the following conditions:  <i>Red</i> – indicates that the channel is currently being recorded  <i>Yellow</i> – indicates the channel is currently being monitored.  <i>Green</i> – indicates 1. that channel is configured to record when signal is present but 2. there is currently no signal present.  <i>No light</i> – indicates that the channel has been disabled so that it will not record. A yellow light indicates that an archive drive or internal hard disk failure may have occurred. It may also indicate that the “cleaning timers” must be reset.

**2-11. KEYPAD AND FRONT PANEL PORTS,**

Table 2-5 describes the front panel controls and ports.

**Table 2-5. Front Panel Controls and Ports Description**

<b>ITEM</b>	<b>CONTROL OR INDICATOR</b>	<b>DESCRIPTION</b>
1	Numeric Keypad	The keypad can be used in place of the soft keys when entering numbers in the VR240. This will prove convenient when entering a time and date for a search or selecting a channel to monitor or play. The keypad is also used to enter a password.
2	* (asterisk)	Pressing the asterisk button during "auto-record" will cancel the timed recording.  To set the unit back to the factory defaults, press this key while the unit powers-up.
3	# (pound symbol)	In many instances, the # pound symbol may be used interchangeably with the <b>Enter</b> soft key.
4	Relay	The relay jack can be used to trigger a remote alarm. It can also be configured in conjunction with the line out jack for use with a stop/start, hand-held or other external cassette recorder.
5	Phones	Headphone jack for ¼" phone plug equipped headsets. The volume of this output is controlled by a soft key located in the <b>Controls</b> menu.



## CHAPTER 3 SOFTWARE CONFIGURATION

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### Section I. SETUP

#### 3-1. DESCRIPTION.

Setup is a configuration procedure performed from the front panel of the VR240. At this point, we assume that the unit is connected to power and audio, and is powered up. If so, you will be looking at a display with a legend indicating either **Ready** or **Not Ready** depending upon whether the drive is loaded. A “soft key” is the button immediately below the legend in bold. Saying “press the System soft key” means that there is a legend “System” on the display and you must press the key immediately below it.

#### 3-2. MENU OPERATION AND TIMEOUT.

To facilitate operation of the VR240, we have made some assumptions that cause the soft key menus to change depending upon circumstances. For example, the menu options while playing will be different than when the unit is in the record mode.

Another important aspect of menu operations is “time-out.” You are given a period of time to perform operations under the menus you select. Menus have levels. Refer to Appendix I. In computer terminology, the Home screen display is the “root.” **GoTo** is one selection on the next level, or one of the “branches.” Menus can have multiple levels, but you will eventually reach the last level (“leaf”) and will either perform or not perform the action on that level. In order to prevent the unit from continuously displaying an action, perhaps one you don’t want to perform, each menu times out to the next level, until eventually the root is reached. That way, the unit will eventually return to a known state, and if another user comes upon it, they won’t have to backtrack your operations to get it to do what they want.

The balance of this section describes in detail the steps performed under the **Config** menus. As shipped from the factory, each of the configuration items is set to a logical “default.” If the default is unsatisfactory, change it as needed.

#### NOTE

The unit cannot be configured when in record. Be sure you are not recording to the internal hard disk or either archive drive.

#### 3-3. SETTING THE CLOCK.

It is very important that the system clock be set to any legal date between 1 January 1989 and 31 December 2088. The clock can be set to local time or UTC, previously known as Greenwich Mean Time.

## ***Model VR240 Audio Logging Recorder***

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When setting the system clock, the display will give you the time and date as stored in the VR240. This may be very close to accurate, or completely incorrect if never set. The clock is powered by a lithium battery that allows it to keep time even if no power is applied to the VR240. If the battery is discharged, the date and time will be wrong. This will affect the playback functions when time and date is selected. With only the last two digits of the year displayed, the wrong clock setting may affect the re-recording of older media you may want to archive.

Refer to paragraph 2-3.4 for setting the system clock.

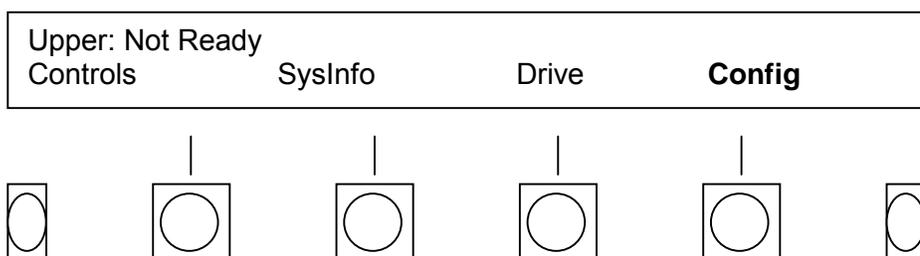
## Section II. GLOBAL SYSTEM CONFIGURATION

### 3-4. SYSTEM.

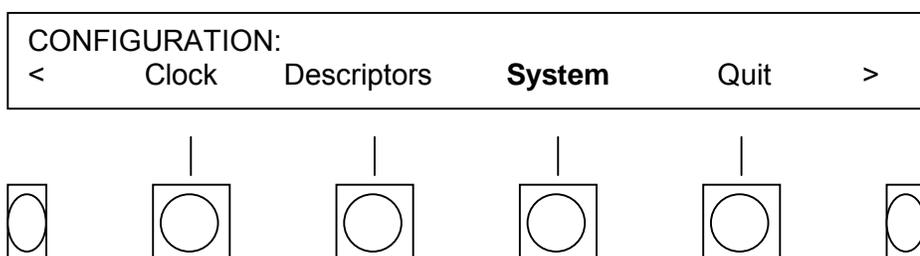
System configuration sets the various options that define recorder operation apart from the clock and the individual channels as described in section 1 and Chapter 2. Pressing the **Config** soft key accesses the **System** configuration menu.

The top line of the display must read either "UPPER" or "LOWER." If "DISK" appears on this line, press the **Drive** soft key to select an archive drive. The **Config** soft key is available from the first menu screen when there is no media loaded in the archive drives. If you have formatted media in an archive drive, press the > (next) soft key for access to **Config**. Again, this function is not available when the VR240 is recording. To view the **Config** screen:

- a. Press the **Config** soft key.



- b. Press the **System** soft key.



You have now reached the System Configuration menus.

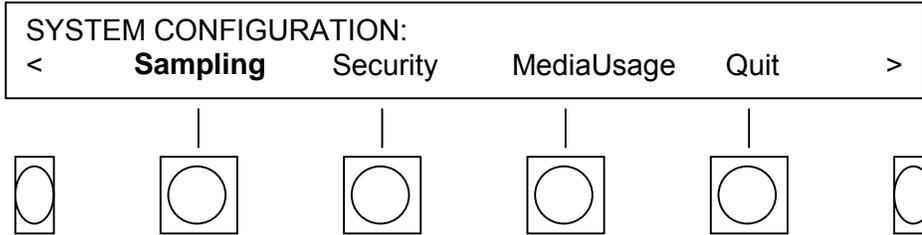
### 3-5. SAMPLING.

**Sampling** allows you to select the sampling rate of the recorder. The VR240 uses digital signal processing to compress the input audio. As discussed elsewhere in this manual, the number of samples determines the media usage. This is a linear function. Doubling the sampling rate reduces the recording time by half. The audio quality of the VR240 is dependent on the sampling rate.

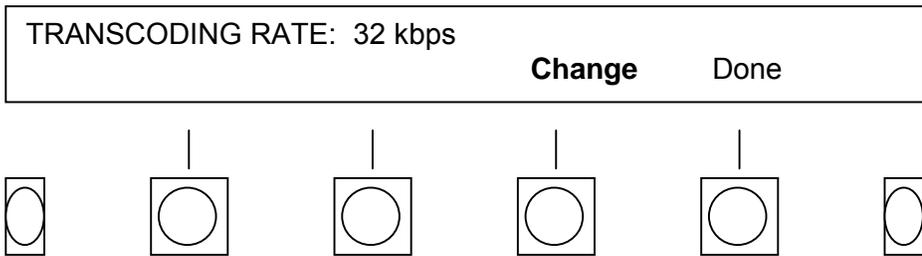
**Model VR240 Audio Logging Recorder**

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- a. After pressing the **Config** and **System** soft keys, press the **Sampling** soft key.



- b. Press the **Change** soft key to cycle through the available sampling rates.



**16 KBPS** (kilobits/second) is the slowest sampling rate available, and gives the full recording time available from a DDS media or magneto-optical disk. Normal voice signals are perfectly intelligible at this rate, but the signal sounds somewhat more harsh and noisy than the faster rates. This should be used when the media is to be played back only for human listeners.

**32 KBPS** is an intermediate rate that is generally satisfactory for recording all but facsimile and the highest speed modem transmissions.

**64 KBPS** should be used only for recording high-speed modem or facsimile transmissions. There is little or no audible difference between the 32 and 64 KBPS rates, and for broadcast logging, 64 KBPS simply uses media faster with no real benefit. 64K is not available in VR240s with more than 16 channels.

- c. Press the **Done** soft key to save your setting and return to the system configuration menu.

A technical note: Normally one would expect sampling rate to change frequency response. The VR240 has a fixed frequency response of slightly over 3 kHz. This would normally imply a sampling rate of about 8kHz and, in an 8-bit system like this one, a 64K (8 times 8) bit per second sampling rate would be required. Since that is the *highest* sampling rate used, you can see that something is being done to lower it. The DSP algorithms used at 32K and 16K, in effect, discard redundant information, and enable the full bandwidth to be reproduced with fewer bits per sample than would otherwise be required. The DSP algorithm is almost "lossless" at 32 KBPS, but does cause some degradation at 16 KBPS.

**3-6. SECURITY.**

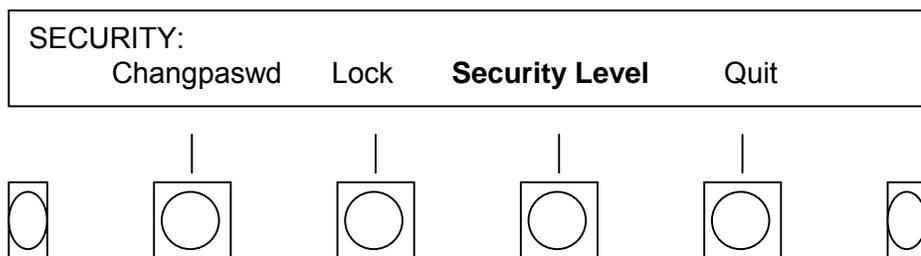
The VR240 has a security feature that is intended to prevent operation and, if desired, media removal, by unauthorized personnel. In several operational menus, you have the opportunity to **Lock** the unit by entering an 8-digit password. Once you have done this, the front panel controls will be unresponsive until the password is re-entered.

It also is possible to LOCK the unit in various states. From the CONFIG/SYSTEM/SECURITY menu, you can LOCK the VR240 in an inoperative state to prevent its being used at all. CONFIG/SYSTEM/SECURITY is also the menu that allows you to change the password.

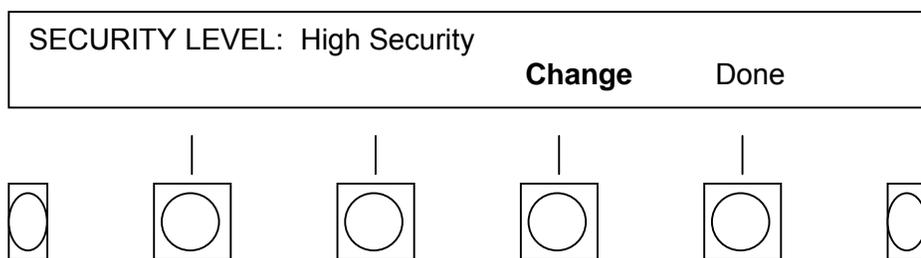
**3-6.1 Select Security Levels.**

There are two security levels with access options available at each.

- a. After pressing the **Config, System**, then **Security** soft keys press the **Security Level** soft key.



- b. Use the **Change** soft key to scroll through the two options. When finished, press the **Done** soft key. Whatever is showing on the display when you press **Done** will be the current setting.



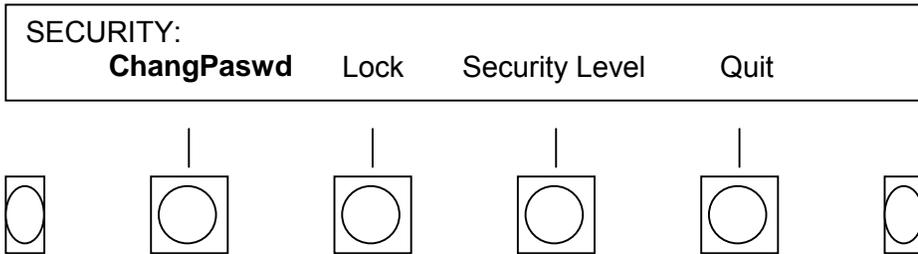
**High Security** Whether or not the VR240 is in a “locked” state, this level of security denies access to the Config menu. This will prevent accidental or unauthorized changes that would affect operation of the VR240. High security also password protects the TIME ADJUST and MEDIA USAGE menus during record.

**Low Security** When the VR240 is “locked” and in “Low Security” mode, you must use a password to unlock the unit. Once the unit is unlocked, access to all menus is available.

**3-6.2 Change user password.**

When the VR240 is shipped, it is initialized with an 8-digit password “00000000” (eight zeros). This will be the password unless you change it from this menu. When you press the the **ChangPaswd** soft key, the unit requests the original password, which you enter using the keypad. Once you enter the correct password, it will ask you for a new (8-digit) password. You are requested to enter the password *twice*, to prevent errors. If you enter the password twice and both versions are identical, the VR240 will accept the new password and the old one will then be invalid. If you do not enter the correct “old” password or if you make any mistakes during this procedure, it will abort and leave the password unchanged.

- a. After pressing the **Config, System**, then **Security** soft keys press **ChangPaswd**



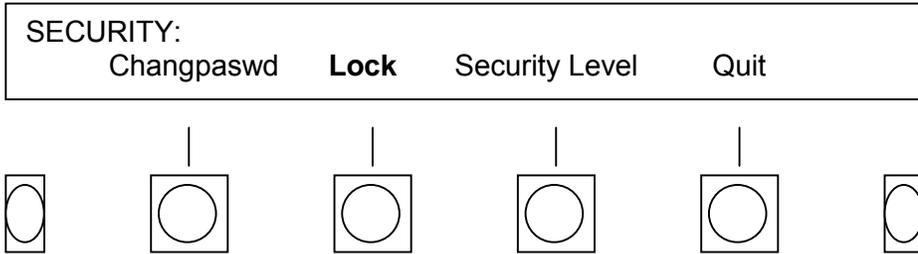
**IMPORTANT !**

If you do plan to use the security features of this unit, we strongly recommend that you change the password. As you can see, the initial password is printed in this manual and is also available by calling Eventide Technical Support. If you do change the password, **DON'T FORGET IT!** We have no way of knowing what your password is, and cannot help you if you lose it.

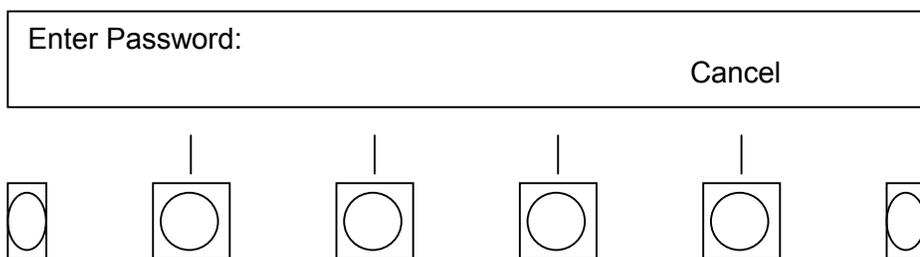
**3-6.3 Lock**

This key will lock the unit (once you have correctly entered the password as requested). If you lock the unit while in this menu - and you have set your security level to “low” - you will have no access to the controls until you unlock it.

- a. After pressing the Config, System, then Security soft keys press the Lock soft key.



- b. Use the keypad to enter your eight-digit password. The unit will now automatically lock. A legend indicating that the controls are locked will appear in the top right corner of the display.



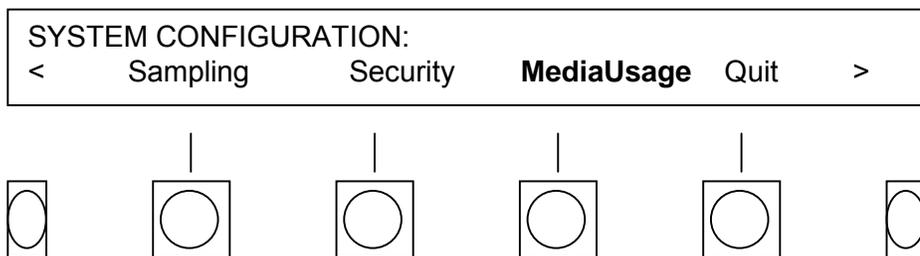
### 3-6.4 Unlock

Use the keypad to enter your 8-digit password. If the correct password is entered, the unit will automatically unlock with the last key press.

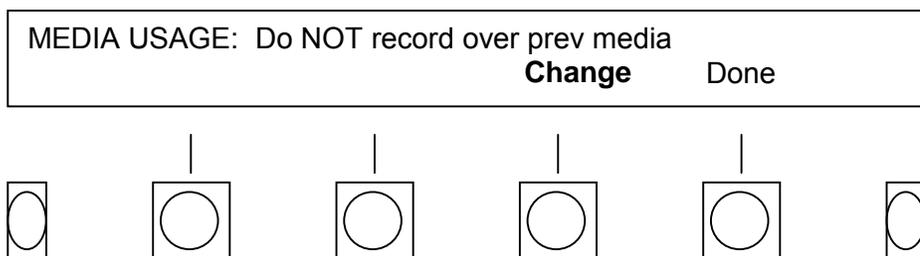
### 3-7. **MEDIA USAGE.**

**Media Usage** gives you the opportunity to decide whether to record over or prevent recording over previously recorded media. In a two-drive unit, you can load (and format, if necessary), two media simultaneously. When medium in one drive is full, recording automatically switches over to the other, ready drive. Pressing the **MediaUsage** key displays the option you have selected and gives you the opportunity to change it.

- a. After pressing the **Config** then **System** soft keys press the **MediaUsage** soft key.



- b. Use the **Change** soft key to scroll through the available options.



- c. Whatever is showing on the display when you press **Done** will be the current configuration.

**MEDIA USAGE: Record over previous media –**

If you have selected this option under **Media Usage**, when the media in the second drive is full, the recorder will switch back to recording on the first one, *whether or not you have removed the previously recorded media and inserted a fresh one*. This option should only be used if you are certain that nothing on that medium will ever be required.

In the **Record over** mode, and especially when you are recording many channels at a high sampling rate, it is possible to overuse a particular medium. Please be sure to adhere to recommendations about media lifetime and head cleaning. (Ignore this last statement if you are using disks as they can be rewritten indefinitely.)

On a **single drive** recorder, there is no automatic switch-over from one drive to another. On these units, selecting **Do NOT** requires you to physically remove the media and either insert a new one or reinsert the old one before you can continue recording. Selecting **Record over** will not restart the single drive once the medium has automatically rewound, but it will allow you to begin recording when the medium is ready, whether or not it has been changed. In other words, you do not have to remove and reinsert the medium (or new medium) before starting again if “Record over previous media” is set.

**MEDIA USAGE: Do NOT record over prev media –**

If you select this option, the system behaves as follows:

If the unit is **LOCKED**, the medium just recorded will not eject. You must manually unlock the recorder, eject the medium, and insert a new one. You can then **LOCK** the recorder if desired.

If the unit is **NOT LOCKED**, each medium will be ejected upon completion of recording.

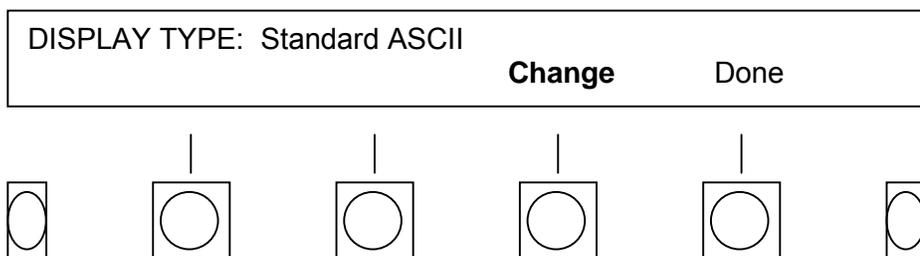
In the **Do NOT** mode, in order to record on a drive on which media has already been recorded, it is necessary to eject the old medium and insert another. When you insert medium, the unit does not check to make sure it is new, unrecorded or even a different medium. It just checks for the ejection.

**MEDIA USAGE: Disable transfer –**

On a dual-drive recorder, selecting **Disable transfer** prevents the completion of recording on one medium from starting the other medium in record, even if it is otherwise ready and can be started with a manual command.

### 3-8. DISPLAY ASCII CHARACTER ADJUSTMENT.

- a. After pressing the **Config**, **System**, and **>** (next) soft keys, press the **Display** soft key.



**Change** Toggle between the option of standard ASCII characters or ASCII with European characters (useful if you plan to use the VR240 in a language other than English).

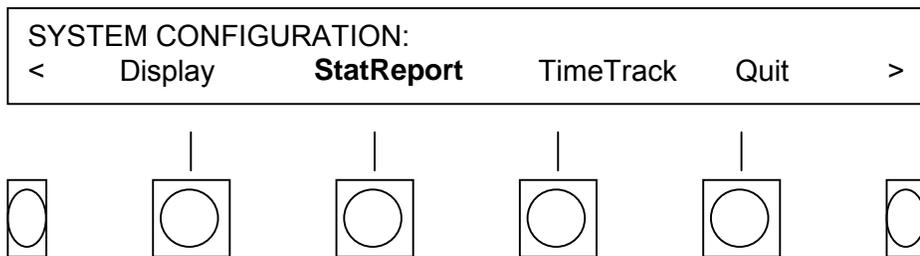
**Done** Whatever is showing on the display when you press the **Done** soft key will be the current configuration.

### 3-9. STATUS REPORT PRINT OUT.

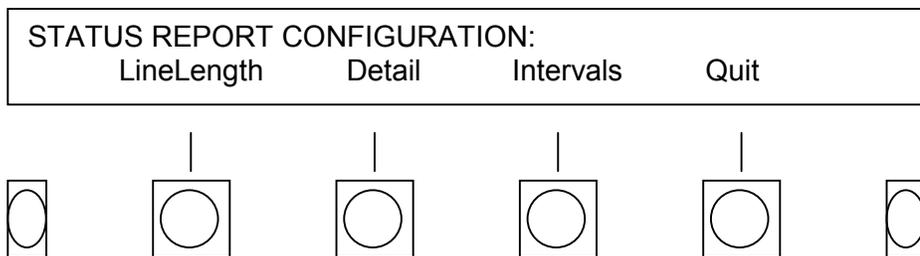
The StatReport (Status Report) selection controls the configuration of the optional status report printer. As shipped, the VR240 is configured for no status printer operation.

To configure a unit for printer operation:

- a. After pressing the **Config**, **System**, and **>** (next) soft keys, press the **StatReport** soft key.



- b. Press the appropriate soft keys to configure the options listed below:



The following menus are used to configure the status printer. If you have not connected a status printer, these settings should be left at their default values (Line Length: 78; Detailed Activity Report: CHAN 01: off, Intervals – Summary: None, PRINT: None, NEXT RPT: 00:00).

**LineLength** allows you to limit the length of each printed output line to correspond to the physical characteristics of your printer. The default is 78 characters per line, which is 2 fewer than the length of most letter size (8-1/2 x 11) printers. (Some printers may count carriage return or line feed characters as part of a line and skip a line if you set your line length to 80 characters.)

- Decrease** reduces the length to a minimum of 78 characters by pressing or holding the button. (The setting “wraps around” to 132 if you try to reduce the length below 78.)
- Increase** permits a line length of up to 132 characters to be selected by pressing or holding the button. (The setting “wraps around” to 78 if you try to exceed 132.)
- Done** accepts the new length and drops back to the printer configuration menu.
- Cancel** drops back to the printer configuration menu without changing the length.

**Detail** allows you to configure the printer to show individual “messages.” A new line is printed whenever a channel is activated automatically (by signal being present) or by the transition of its squelch input, either from off to on, or from on to off.

- Channel** selects the channel for which you wish to activate or deactivate the message reporting capability. Pressing this button scrolls through all 24 channels and shows their current status on the display. Press the **Channel** soft key to cycle through the channels displayed.
- Change** cycles the current status from **Off** to **On** to **Off**. Press the **Change** soft key to switch each Channel to **On** or **Off**.
- Done** accepts any changes you have made and drops back to the previous menu. Press the **Done** soft key after selecting the desired channel status (to be included or excluded in the status report printout).
- Cancel** drops back to the previous menu without changing the configuration.

**Intervals** allows you to select how often channel utilization is summarized, and how often the summaries are printed. It also gives you an opportunity to select the time of day of the summary printout. When you hit the **Intervals** soft key, the display shows the current setup as follows:

- Summary** shows you how often the summary data is collected. Possible values are **None, 5, 10, 15, 20, and 30 minutes, and 1, 2, 3, 4, 6, 8, 12, and 24 hours**. Each summary consists of a single line showing the activity during the summary interval.

- Print** shows you how often the summary data is printed. The possible values are the same as those for collection. Note that the VR240 will not allow you to select a print interval that is shorter than the collection interval. Each printout comprises a heading and shows the interval covered by the printout. Depending upon the ratio between the summary interval and the printout interval, from 1 to 288 lines of summary data will appear on each printout.
- NextRpt** (next report) shows you when the next summary will be printed. This is selected automatically for printer intervals up to 1 hour. If you select an interval longer than 1 hour, you have the opportunity to change the time that the report is printed.
- The soft keys under the display permit you to change the numbers in the display, hence the report characteristics.
- Cursor** selects which of the three items is presently under control. If **None** is selected, the cursor remains under **SUMMARY**. If a summary interval of up to 1 hour is selected, the cursor alternates between **SUMMARY** and **PRINT**. And if a **PRINT** interval of greater than an hour is selected, the cursor alternates among the three choices.
- Change** modifies the displayed time of the feature selected by **CURSOR**.
- Done** accepts the changes you have made and drops back to the previous menu.
- Cancel** returns to the previous menu without modifying the settings.
- Quit** returns to the **Config** menu from which you originally selected **StatReport**.

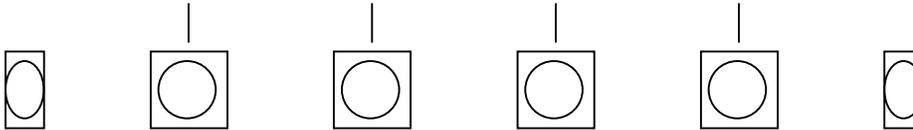
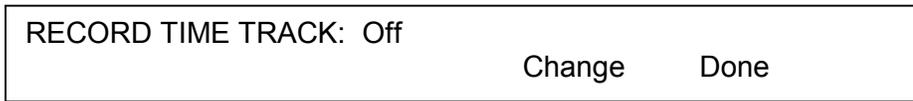
### **3-10. TIME TRACK.**

**Time Track** is a feature that can be enabled to assure that the media is “always running.” One of the main advantages to the VR240 is that no space on the media is used when there is nothing to record. In some applications, however, it is desirable to have a continuous time track to be able to prove that the media was running continuously and that no input was missed because it was temporarily stopped. Normally, simply recording a single channel on a continuous basis will accomplish this, even if all the other channels are intermittent. If, however, you are not recording continuously, you can turn the **Time Track** on to provide a record of continuous recording.

Selecting **Time Track** to **On** will put a time mark on the media once per second if no actual recording is being performed. There is a penalty in that this feature uses, at most, the equivalent of one-half of an audio channel (at the slowest sampling rate) of media time, even if nothing is being recorded. **Time Track** is only activated when necessary to provide a time mark. If at least one channel is being recorded most of the time, the “wasted media” penalty is substantially less. In the worst case, if nothing is being recorded at all, **Time Track** will fill the medium in about twice the number of hours that the medium has available in “channel hours.”

To turn on or off the Time Track feature:

- a. After pressing the **Config**, **System**, and **>** (next) soft keys, press the **TimeTrack** soft key.



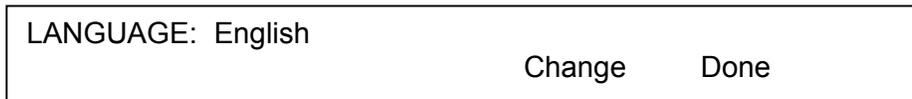
**Change** Cycles the feature from **Off** to **On** and back.

**Done** Exits the Time Track menu. Whatever is showing on the display when you press **Done** will be the current configuration.

### 3-11. LANGUAGE.

As of this printing, the only language available in the VR240 is English. From time to time you may want to check our web site or the local trade magazines for news of the availability of French and German languages.

- a. After pressing the **Config** and **System** soft keys, press the **>** (next) soft key *twice*. Then press the **Language** soft key.



**Change** When alternate languages are available, this key will scroll through them.

**Done** Exits the Language menu. Whatever is showing on the display when you press **Done** will be the current configuration.

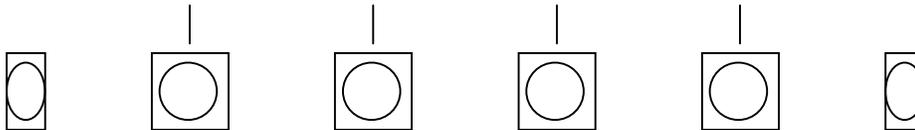
### 3-12. COPY CONFIGURATION.

Copy Configuration (**CopyConfig**) sets the VR208HF system-configuration parameters to match those found on the media in the archive drive. Best results are achieved when the archive media was recorded on a logger with the same software version and hardware configuration as the VR208HF.

**NOTE**

Some parameters will not be copied from the archive media. These are: Unit serial number, PC-Remote ID number, SCSI type and SCSI term settings.

- a. After pressing the **Config** and **System** soft keys, press the > (next) soft key *twice*. Then press the **CopyConfig** soft key.



Press the **Continue** soft key and the unit will automatically update its parameters with those on the archive media.

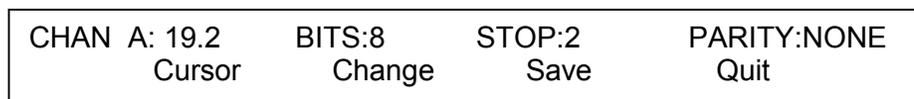
**3-13. SERIAL I/O PORT PARAMETERS.**

**Serial I/O** brings up a selection of data communication parameters for the RS-232 and RS-485 ports on the back of the unit. These ports are used to connect to printers (including the optional label printer), PC remote control, master clock systems, and other external control devices.

The VR240 supports two types of printers, an optional label printer, and an optional status printer. The label printer automatically prints a label that identifies media when it is ejected. The status printer lists and can depict graphically, activity on the individual channels. Separate appendices discuss each of these printer options.

Adjust the Serial I/O parameters as follows:

- a. After pressing the **Config**, **System**, and > (next) soft key *twice*, press the **SerialI/O** soft key.



- b. Choose parameters as follows:

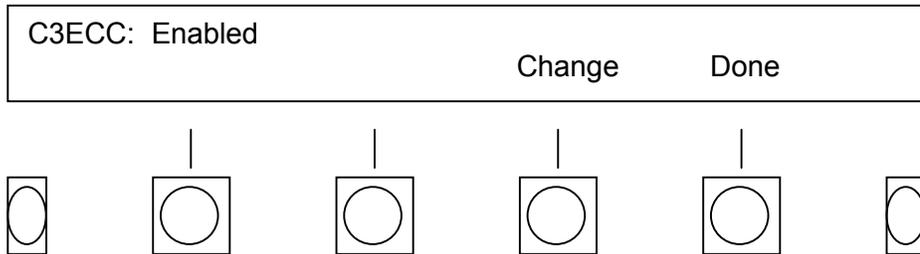
**Cursor** Use the vertical or side-to-side arrow keys to move the cursor through the Channel number, Bits, Stop, and Parity parameters

- Change**      Use the the **Change** soft key to scroll through the parameter options above the cursor.
  
- Save**        Whatever is showing on the display when you press the **Save** soft key will be the new configuration.
  
- Quit**        Drops back to the Serial I/O Configuration menu without saving your changes.

**3-14. C3ECC ERROR CORRECTION (Applies to DDS Tape Drives Only).**

**C3ECC** error correction can be enabled or disabled by this configuration option. By default, it is left disabled, because enabling it can significantly reduce the capacity of the media. There is typically no need for this additional level of error correction on audio because, unlike data, there is an enormous amount of redundancy built into speech, and if an error were to occur, it would likely not be noticeable. We recommend that it be left disabled.

- a. After pressing the **Config, System,** and **>** (next) soft key *three times*, press the **C3ECC** soft key.



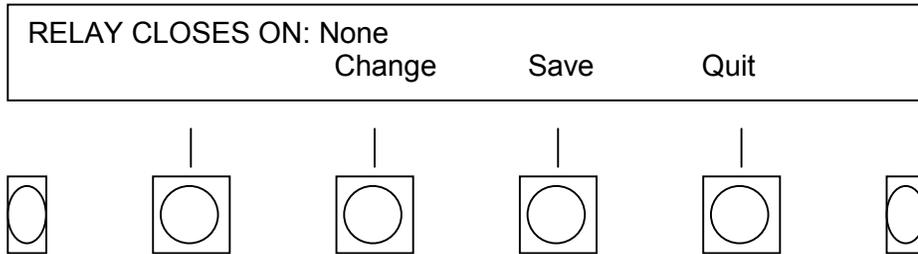
- b. Change C3ECC error correcting as follows:

- Change**      Use the **Change** soft key to toggle between “Enabled” and “Disabled” on the VFD display.
  
- Done**        Whatever is showing on the display when you press **Done** will be the new configuration.

**3-15. RELAY.**

**Relay** configures operation of the relay contacts connected to the front (mini-plug) and rear panel (1/4” phone jack). One contact of the relay is connected to ground (the connector sleeve). The other is connected to the tip on the front jack, the ring on the rear jack. The relay is “normally closed”, so that if no power is applied to the unit, there is continuity across the contacts. In this way, the relay unconditionally closes when the unit loses power and can provide a remote indication of this condition. The relay can also be programmed to **Close** under certain circumstances. When you hit the **Relay** soft key, the legend **RELAY CLOSES ON:** appears on the top line of the display and three soft keys appear on the bottom.

- a. After pressing the **Config** and **System** soft keys, press the > (next) soft key *three times*. Then press the **Relay** soft key.



- b. Press the **Change** soft key to scroll through the conditions for relay closure. They are:

- NOT Rec, Full, Fault
- NOT Rec, Media Full
- NOT Recording, Fault
- Fault, Media Full
- NOT Recording
- Media Full
- Fault
- Playing
- None

**NOT Recording** is a catchall situation. If the unit is not recording for *any* reason, even if it is been deliberately stopped, the relay will close. This is useful if the unit is configured to continue recording regardless of exogenous circumstances. Note that the “media almost full” condition that sounds the beep alarm is not included in this definition.

**Media Full** is analogous to the beep alarm. The relay will close when the media reaches the almost-full point and will remain closed until either a new media is inserted and started, or the media currently recording runs out.

**Fault** closes the relay only when the VR240 software detects that there is some problem with the unit, such as a defective drive. “Full media” is not considered a fault.

**Playing** allows the relay to be used for dubbing. If you connect it to the motor control input of a cassette or other recorder, it will activate the recording only when the VR240 media is playing.

**None** means that the relay will not close under any condition (except loss of power).

By pressing **Change**, you cycle through the above conditions. Note that **Playing** and **None** each appear by themselves on the display. However the other three can be selected in any *combination*. This allows you to select conditions that need to be called to your attention. For example, if you are in a location where you can hear the beeping alarm, you may wish to have the relay close only on a FAULT condition. On the other hand, if the unit is expected to always have the second drive loaded and ready to go, and it is in a remote location, you might want to be alerted to all three conditions.

- Save**            Accepts the relay configuration shown in the display and drops back to the previous menu.
- Cancel**        Ignores any new selection you have made and drops back to the previous menu without reconfiguring the relay.

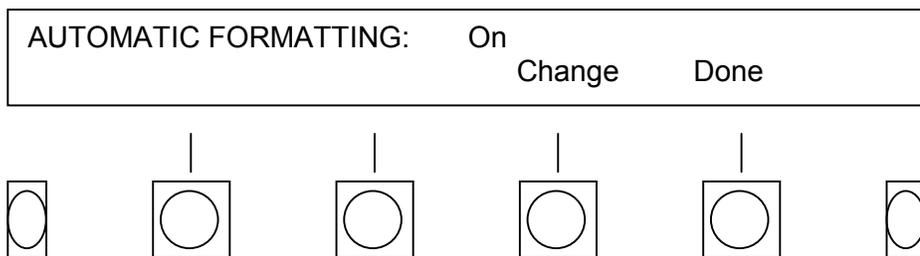
**3-16. LABEL TITLING.**

**Label** allows you to select a title that will appear on labels generated by the optional label printer. Eleven characters are available for the label title. Refer to Appendix F for the description of this feature.

**3-17. AUTOMATIC FORMATTING.**

**Automatic Formatting** permits you to defeat this feature of the recorder. Automatic formatting is a timesaving feature that will format media that is to be recorded on without a specific front panel command. However, it can also format media that you do not want to be formatted if that media is not write protected.

- a. After pressing the **Config** and **System** soft keys, press the > (next) soft key *four times*. Then press the **FORMAT** soft key.



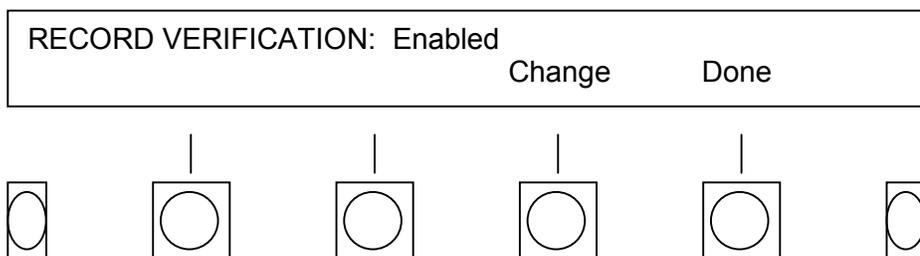
- b. Select **Automatic Formatting** option as follows:

- Change**        Pressing the **Change** soft key toggles between "On" and "Off."
- Done**         Pressing the **Done** soft key will save your change.

**3-18. RECORD VERIFY.**

**Record Verify** prevents media from being recorded without manual confirmation by the operator. Any operation that will put the unit in **Record** (e.g., **Resume** or pressing the **Record** button) will not perform its intended function. Instead, the display will ask you to verify the operation that you have just requested by pressing the **Yes** soft key (pressing the **No** soft key aborts the operation). You can also verify the operation by again pressing the **Record** transport key.

- a. After pressing the **Config** and **System** soft keys, press the > (next) soft key *four times*. Then press the **C3Ecc** soft key.



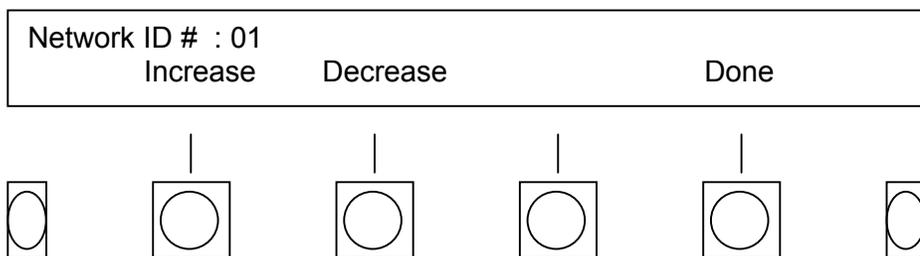
- b. Select the **Record Verify** option as follows:

**Change** Pressing the **Change** soft key toggles between “Enabled” and “Disabled.”  
**Done** Pressing the **Done** soft key will save your change.

### 3-19. SET ID #.

**Set ID#** (Set identification number) identifies each VR240 to the optional PC Remote control. The PC Remote control, a software program available from Eventide, gives you remote access to key front panel functions for search, playback, and channel configuration. Because this program can run up to 8 units, the program must know which unit it is speaking to. Even if you are only controlling a single VR240, you must set an ID#. The ID# must be sequential beginning with 01.

- a. After pressing the **Config** and **System** soft keys, press the > (next) soft key *four times*. Then press the **SetID#** soft key.



- b. Select the SetID# as follows:

**Choose ID#** by pressing the up arrow key located under the keypad.  
**Done** The new ID# will be whatever is showing on the display when you press the **Done** soft key.

**3-20. DISK CONTROL.**

This setting has meaning only if your VR240 has two removable archive drives. “DiskContrl” offers you a choice between two modes of operation. The two choices are:

- Separate Hard Disk Control for each Drv (**Separate Mode**)
- Automatic Disk Control (Public Safety) (**Automatic Mode**)

To understand the difference between **Separate** mode and **Automatic** mode, you need to know something about how the VR240’s internal hard disk is used.

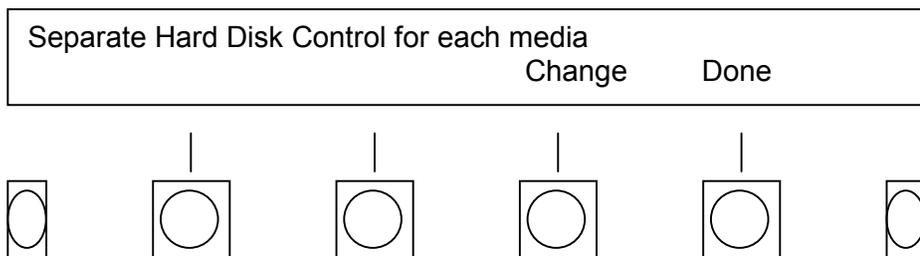
Whenever you start recording on the Upper archive drive, the VR240 creates a file on the hard disk. The file name will be something like UPRFILE. Audio from the input boards is accumulated in UPRFILE. When UPRFILE grows to a certain size, most of the data in it is transferred to the upper media drive, and the size of UPRFILE is decreased. If the media in the upper drive becomes full and the lower drive is not ready to record, audio will continue to accumulate in UPRFILE.

If you press **Stop** and select **Suspend**, the VR240 will stop transferring material to the upper drive but it will continue to accumulate material in UPRFILE.

The following table describes what happens when you load media in either drive and press **Record**.

ACTION	VR240 RESPONSE IN AUTOMATIC MODE	VR240 RESPONSE IN SEPARATE MODE	REMARKS
The VR240 is recording with no medium loaded in either drive.	Audio is being recorded and saved to UPRFILE on the hard drive.	Audio is being recorded and saved to UPRFILE on the hard drive.	No difference between Automatic and Separate Modes.
Medium is loaded in the upper drive and <b>RECORD</b> is pressed.	Contents of UPRFILE is transferred to the medium in the upper drive.	Contents of UPRFILE is transferred to the medium in the upper drive.	No difference between Automatic and Separate Modes.
Medium is loaded in the lower drive and <b>RECORD</b> is pressed.	UPRFILE is <u>renamed</u> LWRFILE. All accumulated material is transferred to the medium in the lower drive.  This means that under certain conditions with the VR240 in the <b>Automatic</b> mode, you do not need to remember which media drive the VR240 has been set up for saving material.	A new file called LWRFILE is created and used to accumulate and transfer material to the medium in the lower drive.  The VR240 tells you for each drive whether or not material is being saved for that drive. The screen display will show “Ready (disk recording)” or “Not Ready (disk Recording).” This way you know which drive the material will be saved to.	<b>Separate</b> Hard Disk Control is recommended.

- a. After pressing the **Config** and **System** soft keys, press the > (next) soft key *five times*. Then press the **DiskContrl** soft key.



- b. Change your disk control setting as follows:

**Change** Pressing the **Change** soft key toggles between the following two options:

**Separate Hard Disk Control for each Drv**  
**Automatic Disk Control (Public Safety)**

**Done** the hard disk control will be whatever is showing on the display when you press the **Done** soft key.

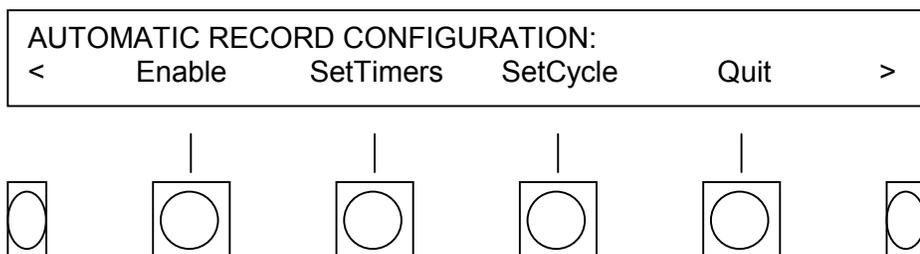
Note: "Separate Hard Disk Control" is recommended when using the "Dual Record" feature.

### 3-21. AUTOMATIC RECORDING CONFIGURATION.

The VR240 has the capability of starting and stopping a recording automatically. You can set the start time, stop time, and select a repeat cycle that will allow you, for instance, to record every day between the hours of 08:00 and 17:30.

Once all the timers and parameters are set, pressing the **Enable** soft key locks the keyboard and sets the unit to record as determined by the timers (see below). The only functions available while in **AutoRec** are live monitor, media info, lock, and the ability to review the autorecord settings. These functions are described in detail later on in this section. To regain keyboard control and *cancel* the **AutoRec** operation, press the \* (asterisk) key on the keypad. Canceling **AutoRec** after enabling it also has the effect of resetting the timers. If you wish to re-enter **AutoRec**, you must reset them.

- a. Press the **Config** and then the > (next) soft key. Then press the **AutoRec** soft key.



b. Select the timers and cycle parameters.

**SetTimers** allows you to set the time and date of three operations:

**StartRec** Sets the time that the recorder begins operation.

**SwapRec** Sets the time at which the drives on a two-drive recorder switch over. (The drives will switch automatically if this timer is not set.) This parameter is not available on **single drive** recorders.

**StopRec** Sets the time at which the unit will stop recording.

All three timer settings work in a manner identical to that of the **Clock**, discussed earlier in paragraph 2-3.5.

**SetCycle** gives you a display showing how often a recording will occur.

**Change** cycles through the following choices:

**Once** a recording will be made and **AutoRec** will be exited

**Weekly** the recording will be made once a week at the date and time indicated

**Daily** the recording will be made every day at the time indicated

**Weekdays** the recording will be made every day, at the time indicated, except on Saturday and Sunday

**Hourly** the recording will be made every hour at the start and end times indicated

#### **NOTE**

In order to perform the multiple recording function, the **Timers** are automatically reset by the increment specified after their function is activated. For instance, once you have started a **Daily** recording, the **Start Timer** is automatically incremented by a day.

**Done** exits the **SetCycle** choices and leaves the selection displayed at that time active.

**ClearTimers** clears any settings you may have entered in the timers and resets them to the current time. The **ClearTimers** soft key is accessed by pressing the > (next) soft key from the Automatic Record Configuration menu.

### **3-21.1 Notes on Auto Record Timer Settings.**

It is your responsibility to set the timers sensibly and appropriately. For example, you cannot make a two-hour recording “hourly,” and there is no point in stopping a recording before it starts. If you set the timers inappropriately, we try to use sensible defaults as explained below. Since these may not be what you intended, check your settings carefully.

The VR240 automatically gives you a **1-minute margin** on start and stop. It will start a minute before you program it to, and stop a minute after you program it to stop. If this is undesirable, take this margin into account when setting the timers.

You **MUST** set the **Start Time** before you can enable Auto Record. If the start time is earlier than the current time, then recording will begin as soon as **AutoRec** is enabled.

If you set the **SwapRec** time on a two-drive recorder, the drives will change over at the specified time. If you have selected a cycle other than **ONCE**, the swap timer will update by the increment time. If, however, the media reaches the end before the swap time is reached, it will swap without waiting for the swap time to be reached. **SwapRec** will be ignored if it is set to a time earlier than **StartRec** or later than **StopRec**.

If **Stop Time** is set earlier than **Start Time**, **Stop Time** will be ignored, and the unit will record continuously just as if the **Record** transport key had been pressed. The unit will drop out of **Auto Rec** should the media become full.

If you have not set a particular timer, it will show the current time when you select it. To have the timer register the current time or the current time as modified by the increment or decrement keys, you must hit **Set**, just as you would with any other time setting.

### 3-21.2 Options Available in Auto Record.

While in the **Auto Rec** mode, almost all keyboard functions are disabled, as explained above. It is possible, however, to *view* the current state of the timers and also to monitor the input signals. When the reverse-video **Auto Rec** legend appears on the display, and the unit is not **Locked** the following choices are offered.

- Monitor** Allows you to select which channels you wish to listen to through the internal speaker. This is explained in detail in paragraph 5-6 on recording.
- DispTimer** (Display timer) presents a menu showing the current settings of the three timers. Note that if you happen to be viewing a timer setting while an event (such as the beginning of a recording) takes place, the display will not be updated until you have dropped out of that display and requested it again.
- Start Timer** gives the time and date at which the next scheduled recording will start. If the **Cycle** is set to **ONCE** and recording has already begun, it will show the time at which the current recording started.
- Swap Timer** gives the time and date at which the recording will stop on the current drive and begin on the other. This selection appears only on dual-drive recorders

- Stop Timer** gives the time and date at which the current (if recording) or the next scheduled (if stopped) recording will stop.
- Quit** located on the keypad, drops back to the previous menu, as does simply waiting for timeout.
- DispCycle** Shows the cycle selection you have made. If **Once** is displayed, it means that Auto Rec will be canceled as soon as the stop time has been reached.
- ExitDrops** back to the previous menu, as does simply waiting for timeout.

Press the > (next) function key for access to:

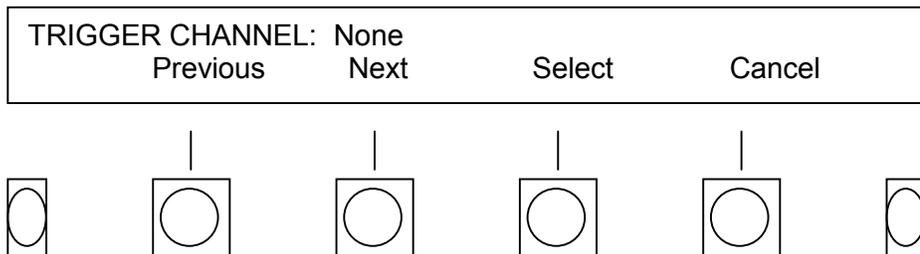
- MedialInfo** Sampling Rate, Descriptor Titles, Media Position, and Re-write information is available by pressing the **MedialInfo** soft key.
- Lock** You will be prompted to enter your password to lock the unit.

**3-22. TRIGGER.**

**Trigger** allows you to set one channel in such a way that when an action occurs on that channel (such as a contact closure or voltage drop) it begins to record and also “triggers” selected channels to record. Set the channels to “be triggered” using the instructions in the “Board Configuration.”

Set the “trigger” channel by following these instructions:

- a. Press the **Config** and then the > (next) soft key. Then press the **Trigger** soft key.



- b. Use the **Previous** and **Next** soft keys to display the channel desired to be the “trigger” channel “None” is an option to be selected.
- c. Press the **Select** soft key to select the displayed channel and return to the Configuration menu, or, press the **Cancel** soft key to exit the menu without setting a “trigger” channel.

**Section III. SYSTEM INFORMATION**

**3-23. SYSTEM INFORMATION.**

To find out the serial number, software version, history and error logs, and descriptors, you use the SysInfo menu. The SysInfo menu is found in one of three ways:

- a. If the upper line of the display is showing the status of the internal hard disk or a recording archive drive, press the > (next) soft key. Then press the SysInfo soft key.



- b. If the upper line of the display shows an archive drive in a “not ready” (no media) state press the SysInfo soft key displayed on the first menu page. Note: The Config soft key will be displayed if the VR240 is not recording, it will not be displayed if the VR240 is recording.



- c. If the upper line of the display shows an archive drive in a “ready” (media installed, not recording) press the > (next) soft key twice. Then press the SysInfo soft key.



## Model VR240 Audio Logging Recorder

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Select the following System Info options as required:

### Internal

- Sampling:** Reveals the transcoding rate.
- Descript:** (Descriptors) Allows you to cycle through the channel numbers and view the descriptors. Use the Channel # - (minus) and + (plus) soft keys to scroll through the descriptors. Use the < (previous) and > (next) soft keys to view descriptors that are longer than the display line.
- UnitNum:** (Unit Number) displays serial number and software version.

### DriveInfo

- ActvHours:** Displays the number of hours the drive has been active since it was installed. This will displayed the active status of the selected archive drive. To view the status of the other archive drive, go back a few menu pages until you find the Drive soft key. Press this soft key until the required drive status appears in the top line of the display. Then return to the SysInfo menu.
- Cleaned:** Keeps a record of the last time you reset your cleaning timers. You must reset these timers every time you clean a drive. Cleaning timers that have not been reset will cause the VR240 to light the front panel "fault" LED. Refer to paragraph 5-3, DATA DRIVE CLEANING.

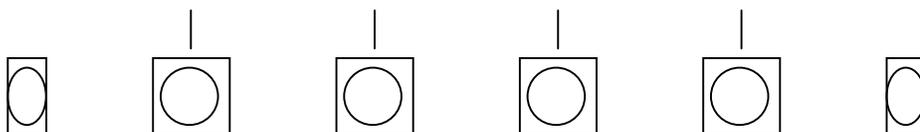
### SysLogs

- ErrorLog** displays unusual events that have occurred since power was most recently applied. Use the Older and Newer soft keys to scroll through the log. *This feature is presently used for factory diagnostic information. If you experience difficulty with the unit, note the Error Log information before turning the unit off.*
- HistoryLog** displays the events such as when media have started, stopped, loaded, and been ejected. This log can be viewed to determine a recent history of the unit's operation. Use the Older and Newer soft keys to scroll through the log.
- Quit** Press the Quit key on the keyboard to exit this screen or simply wait for a time-out to occur.
- Printout** Press the Printout soft key for a printed report of the Error and History Logs.

**3-24. MEDIA INFORMATION.**

Media information provides information about the media itself, which may have come from another recorder, and therefore may have different descriptors or a different sampling rate.

- a. Use the Drive soft key to select the archive drive that contains the required media.
- b. Press the > (next) soft key.
- c. Press the MediaInfo soft key

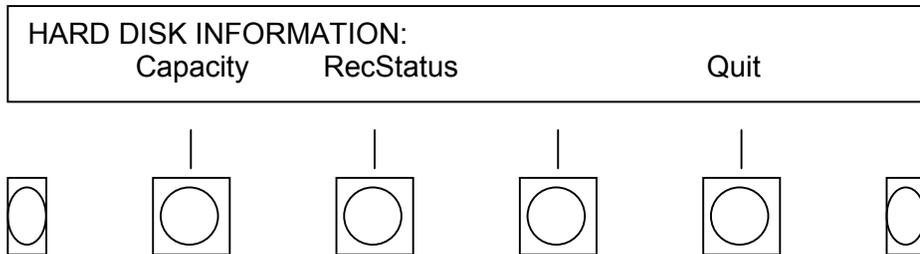


- Sampling** Shows the transcoding (sampling) rate at which the media was recorded; 16, 32, or, 64 KBPS. (Although rarely done, it is possible to change the sample rate of the media by stopping record, reconfiguring, and starting again. The display only shows the sampling rate at which the media began recording.)
- Descrip** (Descriptors) Use the Channel # - (minus) and + (plus) soft keys to scroll through the descriptors. Use the < (previous) and > (next) soft keys to view descriptors that are longer than the display line.
- Position** 1<sup>st</sup> Column display a tape counter for the media in both archive drives.
- RecTo** (Recorded to) the last recorded media position. This feature allows you to determine approximately how much more can be recorded on media without either going to the end or removing it from the drive to determine its capacity.
- Len** (Length) The length of the media or the memory capacity of the magneto-optical disk that is currently loaded in the drive.
- ReWrites** Percentage of the media used to compensate for errors. Reach this soft key by pressing the > (next) soft key.
- Quit** Press the Quit soft key to exit this screen or simply wait for a time-out to occur.

**3-25. DISK INFORMATION.**

Disk information provides information about the internal hard disk (capacity and recording status).

- a. Press the Drive soft key until "Disk: (status)" appears on the top line.
- b. Press the SysInfo soft key.
- c. Press the DiskInfo soft key.



**Capacity** Here you can read the capacity (size) of the internal hard disk

**RecStatus** (Record Status) This screen reports on whether or not the internal hard disk is currently recording.

**Quit** Press to exit this menu or wait for a time-out to occur.

## Section IV. BOARD/CHANNEL CONFIGURATION

### 3-26. BOARD/CHANNEL CONFIGURATION.

You must configure each audio input channel to correspond to the type of audio signal expected to be input. As factory default, each channel is set to record automatically when a signal is present, and to stop recording if the signal stops (VOX). This will be unsatisfactory in many applications, and you may want to take advantage of the choices presented. In addition, you have the option of providing a short “descriptor” of each channel that will be recorded on the media for identification or informational purposes. These descriptors can be displayed on the same or another VR240.

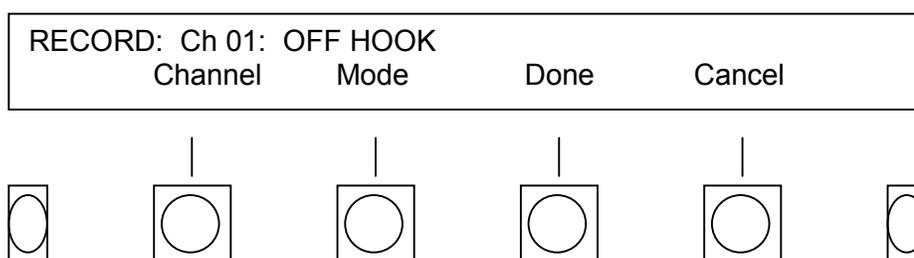
You may not configure the individual boards/channels if the VR240 is recording.

Pressing the **Config** soft key, then the > (next) soft key, then the **Board** soft key gives you access to the **RecEnable**, **Vox**, and **NextBoard** menus. Press the > (next) soft key again for access to the **AudioGain**, **Beep**, **Off Hook**, and **AGC** parameters.

The following instructions will step through the process of configuring the first 8 channels of your VR240. To configure higher channels, simply press the **NextBoard** soft key until the channels displayed on the screen are the ones you want to configure.

### 3-27. RECORD ENABLE (RecEnable).

- a. Press the **Config** and then the > (next) soft key. Then press the **Board** soft key.
- b. Press the **RecEnable** soft key.



**RecEnable** selects the record enable submenu, comprising the following keys:

- |                |   |
|----------------|---|
| <b>Channel</b> | Scrolls through the installed channels (1 through 8, 16, 32, 40, or 48, D1, D2) and shows you their current settings.                             |
| <b>Mode</b>    | Is used to select the operational mode of the selected channel. Each time you hit this key, the mode readout associated with the channel changes. |

**NOTE**

There are two different sets of **RecEnable** options available with the VR240. One set is used when the unit is equipped with a telephone board. A different set is used with an audio board. The differences are as follows:

**3-27.1 Telephone Board - RecEnable Modes.**

**VOX (Voice Activated)**, the factory default mode, records on a given channel when an audio signal is present on that channel. VOX options are described in detail in paragraph 3-28.

**Off Hook:** Records on a channel only when the DC voltage level drops below the off hook threshold (such as a decrease in voltage caused when the receiver is lifted from its cradle). Should be used to record pure analog or “central-office” type phone lines.

**Automatic (VOX and Off Hook):** Records on a given channel when an audio signal is above the VOX threshold level and there is a decrease in voltage detected. Inputs set on Automatic Mode will record continuously when there is no audio source connected to the input port.

**On Trigger:** Records on a channel only when the channel set as a “trigger channel” is recording. (Refer to the Installation section for information on the input signal requirements.) Instructions for setting a “trigger channel” are located in paragraph 3-22.

**Disabled**, prevents recording on the channel under any circumstances.

By proper selection of **Mode**, you can easily control when a channel records its input. The **VOX** mode is most effective when you are recording the output of a scanner or other piece of equipment that provides no indication (other than the audio signal itself) that there is a signal to record. This is ideal for non-critical applications in which, for instance, you are only interested in the content of a message and not interested in the timing, since the recording will shut off automatically during long pauses or interruptions. The **Off Hook** mode is most appropriate for recording telephone lines and assures that the recorder will continue operating even during periods of almost-silence, such as when a party to a call may be speaking very softly. The **Automatic (VOX and Off Hook)** mode records when both the **VOX** circuitry detects a signal and there is a sufficient voltage drop indicating an **Off Hook** condition. Note that you cannot change the individual channel modes while the VR240 is recording since the **Setup** functions are only available when the unit is in a **Ready** mode.

**NOTE**

Check with your local telephone provider to see what type of audio is available. Some digital systems may require special adapters.

**3-27.2 Audio Board - RecEnable Modes.**

**Automatic**, the factory default mode, records on a given channel when an audio signal is present on that channel. VOX options are described in detail in paragraph 3-28.

**Input: Active Low/Closed:** Records on the channel only when a control signal is either brought to a logic low level, or a contact to ground is closed. Audio board input options are described in paragraph 2-8.4.

**Input: Active High/Open:** Records on the channel only when a control signal is either brought to a logic high level, or no signal is connected at all.

**On Trigger:** Records on a channel only when the channel set as a “trigger channel” is recording. (Refer to the Installation section for information on the input signal requirements.) Instructions for setting a “trigger channel” are located in paragraph 3-22.

**Disabled,** prevents recording on the channel under any circumstances.

By proper selection of **Mode**, you can easily control when a channel records its input. The **Automatic** mode is most effective when you are recording the output of a scanner or other piece of equipment that provides no indication (other than the audio signal itself) that there is a signal to record. This is ideal for non-critical applications in which, for instance, you are only interested in the content of a message and not interested in the timing, since the recording will shut off automatically during long pauses or interruptions. The two input modes are most appropriate when a signal such as a telephone off-hook or receiver squelch output is available. Using the control inputs assures that the recorder will continue operating even during periods of almost-silence, such as when a party to a call may be speaking very softly. Note that you cannot change the individual channel Modes while the VR240 is recording since the **Setup** functions are only available when the unit is in a **Ready** mode. For this reason, when configuring the unit, rather than disabling the unused channels you may want to consider leaving them on **VOX** or, even better, provide hardware during installation for the capability of switching the channels on and off.

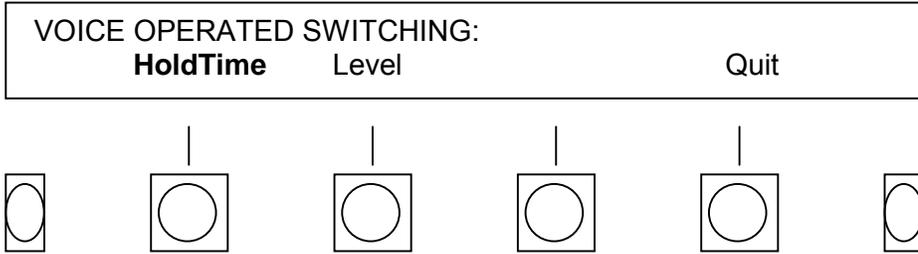
### **3-28. VOX (Voice Activated).**

#### **3-28.1 Setting the VOX Hold Time.**

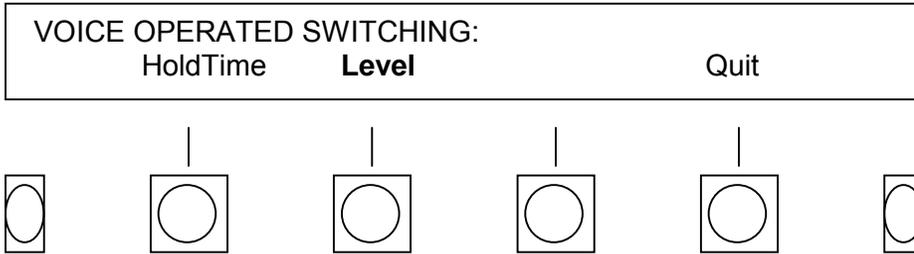
**Vox Hold Time** allows selection of the time that a channel set to **Automatic** or **Vox** continues recording after the input signal drops below the level needed to activate the input (or the squelch goes to the inactive state). This capability is useful in recording signals with long, almost-silent intervals, such as telephone calls, in which one party may pause for a long time.

In such cases, a long time setting (8 to 10 seconds is recommended) will allow the VR240 to continue recording the “conversation.” Cases where there is a definite end to a message, such as when a radio is squelched, will benefit from shorter delays. Settings from 1 second to 255 seconds are available in 1-second increments. The factory default setting is 1 second for all channels.

- a. After pressing the **Config** and the **>** (next) soft key, press the **Board** soft key. Then press the **VOX** soft key.



- b. Press the **HoldTime** soft key.



**Select the channel** for which the hold parameter is to be adjusted by pressing the **Channel** soft key. Its current value is shown on the upper line of the display.

**Decrease and Increase soft keys** –increments the current delay setting by one second. Incrementing above 255 seconds “wraps around” back to one second. Holding the button down rapidly increments the delay.

**Keypad entry** may be used to enter any number between 1 and 255, inclusive. Entering an illegal value causes the delay time to remain as it was before the attempted modification.

**Enter** saves your parameter change for that channel. You must press this soft key each time you make a change.

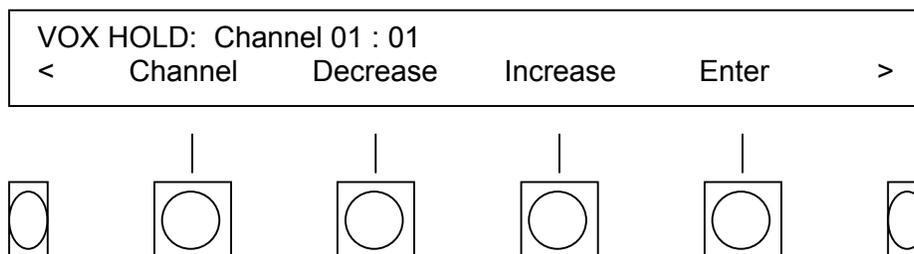
- c. To save your setting or cancel this operation, press the **>** (next) soft key.

**Save** drops back to the VOICE OPERATED SWITCHING menu and accepts all the changes you have made to the individual channel holdoff times.

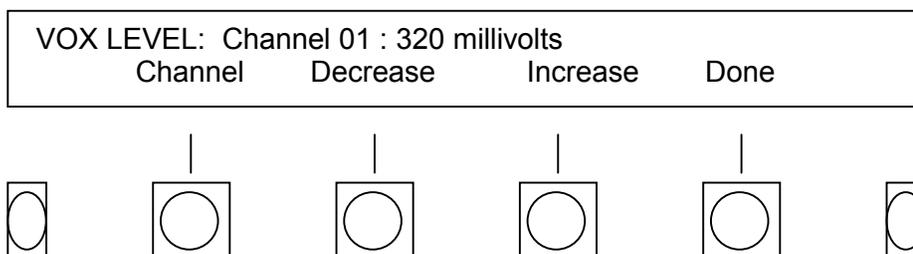
**Cancel** drops back to the VOICE OPERATED SWITCHING menu and ignores any changes you made to the holdoff times, leaving them as previously set.

**3-28.2 Setting the VOX Level.**

- a. After pressing the **Config** and the **>** (next) soft key, press the **Board** soft key. Then press the **VOX** soft key.



- b. Press the **Level** soft key.



**Channel** scrolls through the installed channels (1 through 8, 16, 32, or 48) and shows you their current settings. 320 millivolts is the factory default.

**Decrease and Increase** will change the VOX level settings.

**Done** save the setting that appears on the display and exits you from this screen.

**NOTE**

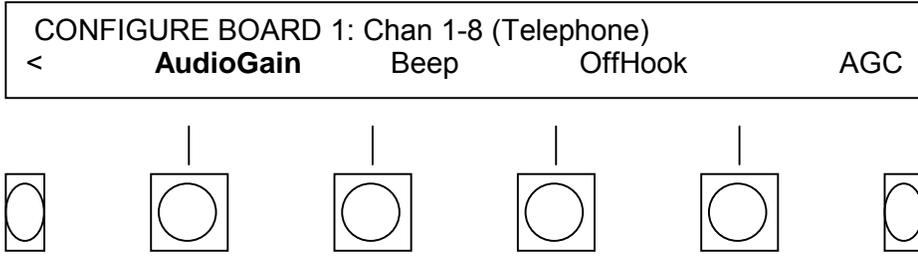
Voltage levels are only an approximation and will vary from line to line. Some experimentation will be necessary for optimum results.

**3-29. AUDIO GAIN.**

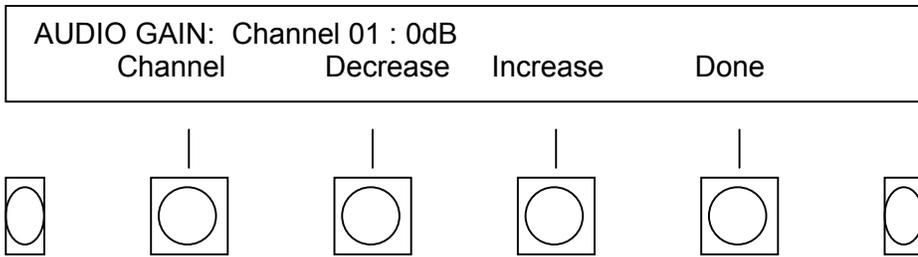
**AudioGain** sets the level of the signal being recorded on each input. If there is audio present on the channel you are setting, you will hear it during this configuration process.

**Model VR240 Audio Logging Recorder**

- a. After pressing the **Config** and the > (next) soft key, press the **Board** soft key. Then press the > (next) soft key. Then press the **AudioGain** soft key.



- b. Select channels and select audio gain as follows:



To select a channel press the **Channel** soft key.

To set the audio gain use the **Decrease** and **Increase** soft keys. The gain for each channel can be set for +24dB to -24dB in 3dB steps. 0dB is the factory default.

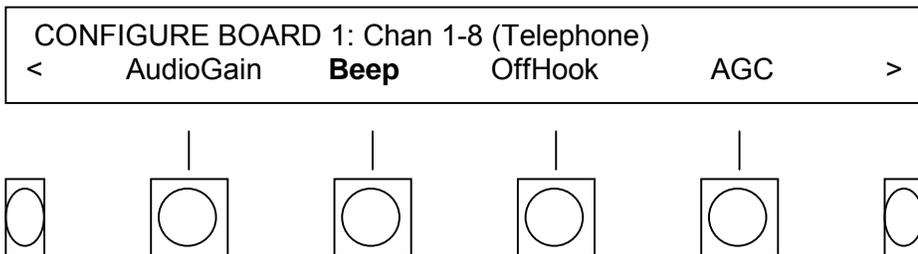
**Done** – saves the setting that appears on the display and exits you from this screen.

**3-30. BEEP.**

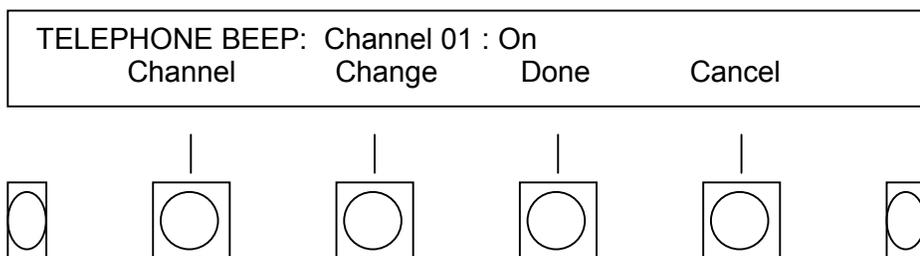
Beep allows you to enable or disable the sound (made by the VR240's beep generator) that lets all parties know a conversation is being recorded. Each channel has its own control.

To configure the beep tone:

- a. After pressing the **Config** and the > (next) soft key, press the **Board** soft key. Then press the > (next) soft key. Then press the **Beep** soft key.



- b. To set the beep tone:



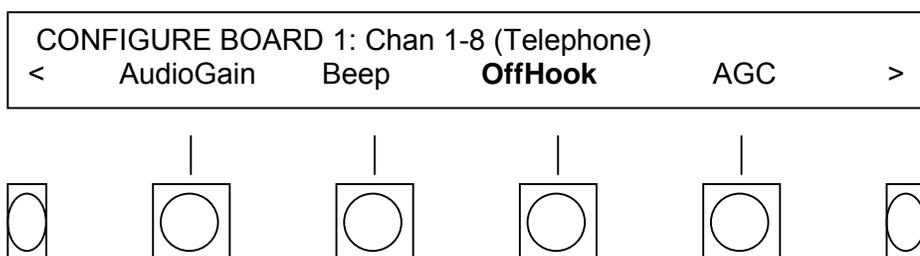
- Channel** Press the **Channel** soft key to scroll through the channels so that you may change each one individually.
- Change** Press the **Change** soft key to toggle between **On** and **Off**.
- Done** saves the setting that appears on the display and exits you from this screen.
- Cancel** exits you from this screen without saving your changes.

### 3-31. OFF HOOK.

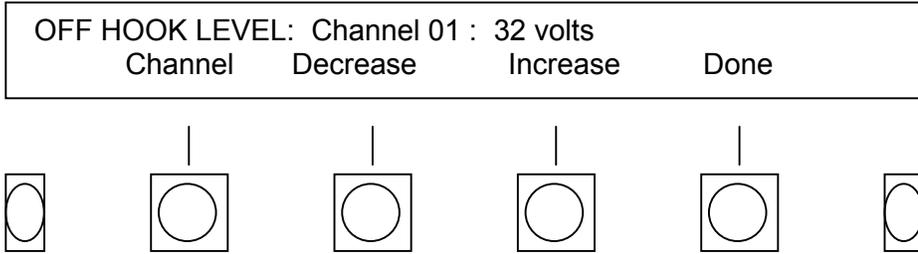
**OffHook** sets the level that the DC voltage on the telephone line must drop below for the VR240 to begin recording. The DC voltage on a telephone line is normally 48 volts. When a telephone is lifted off hook, the DC voltage drops as a result of the load that the telephone puts on the line. The OffHook circuit monitors the DC voltage and when the voltage drops below the threshold voltage you have selected (0-63 volts in 1 volt steps), and if you have selected OffHook as the channel configuration, the VR240 starts recording. The factory default is 32 volts.

To configure the off-hook setting:

- a. After pressing the **Config** and the **>** (next) soft key, press the **Board** soft key. Then press the **>** (next) soft key. Then press the **OffHook** soft key.



- b. To set the Off Hook level:



**Channel** selects the channel for which the off hook voltage is to be adjusted, and shows its current value on the upper line of the display. You may also use the vertical or side-to-side arrow keys located under the keypad to scroll through the channels.

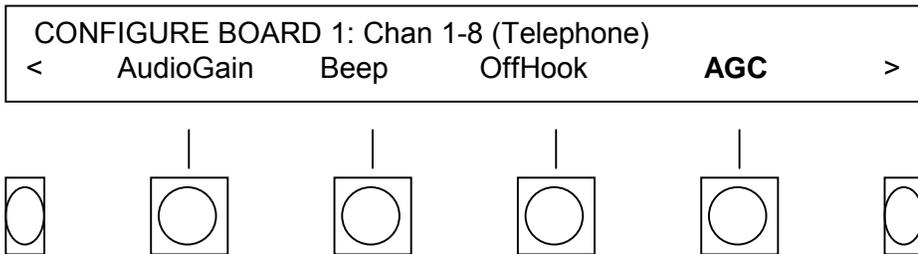
**Decrease** and **Increase** Adjust the Off Hook voltage using the **Decrease** and **Increase** soft keys.

**Done** saves your parameter change for that channel. You must press this soft key once for each board.

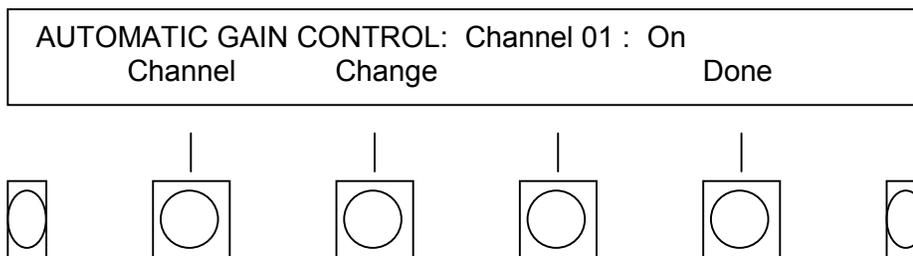
**3-32. AUTOMATIC GAIN CONTROL (AGC).**

AGC (Automatic Gain Control) enables or disables AGC on each record channel. The factory default is "On." Leaving AGC enabled for telephone channels is recommended to bring both sides of the conversation to a closer level. For radio channels we recommended that the AGC be disabled.

- a. After pressing the **Config** and the > (next) soft key, press the **Board** soft key. Then press the > (next) soft key. Then press the **AGC** soft key.



- b. Select channels to be enabled or disabled as follows:



**Channel** selects the channel for which the AGC is to be turned **On** or **Off** and shows its current value on the upper line of the display.

**Change** press this key to toggle between **On** and **Off**.

**Done** saves the setting that appears on the display and exits you from this screen.

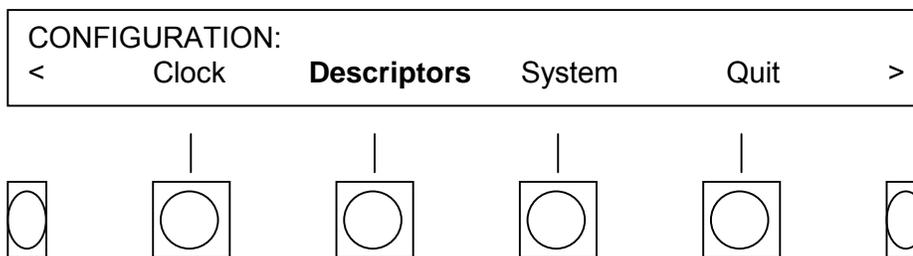
## Section V. DESCRIPTORS

### 3-33. FUNCTIONAL DESCRIPTION.

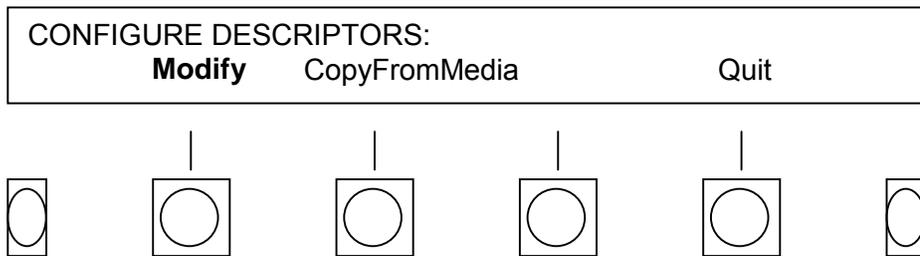
**Descriptors** activates the menu that enables you to create and edit the individual channel descriptors. There is an important distinction between descriptors that exist on the media and those that exist in the recorder. You can read the descriptors from media (if media is loaded) from the **Media Info** menus. **Descriptors** actually controls the information that will be *recorded* on the media when it is formatted. Therefore, they should be set to correspond with the audio inputs for the individual channels.

To modify the Descriptors:

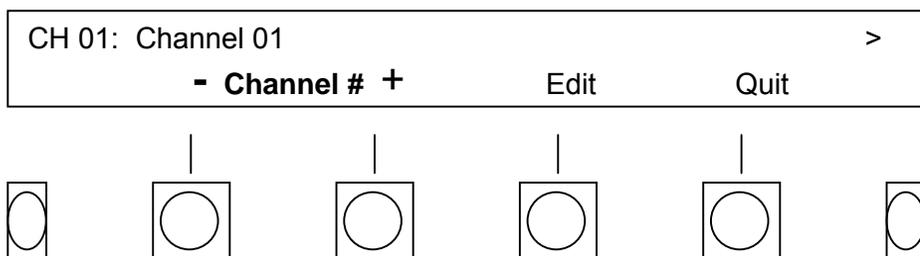
- a. Press the **Config** soft key then press the **Descriptors** soft key



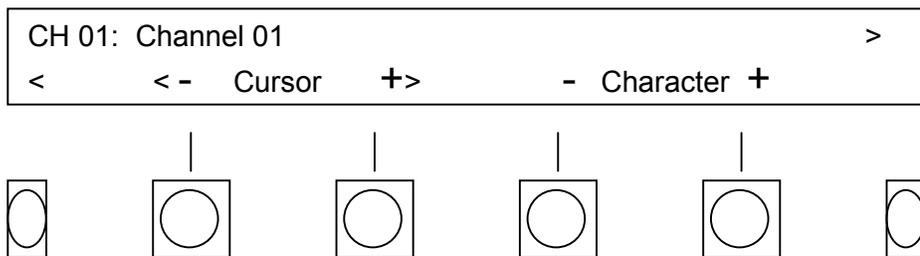
- b. Press the **Modify** soft key.



- c. **Select a channel to modify** using the – (minus) and + (plus) soft keys. Hitting these keys changes the display that shows the channel number and the descriptor currently valid for that channel. (The factory default for each channel is simply the legend “Channel #”, where # is the channel in question.)



- d. Once you have selected a channel to modify, press the **Edit** soft key.



The following keys appear under the **Edit** menu:

Using the **< (minus) and + (plus) Cursor >** soft keys, move the display cursor under the character you wish to modify. The descriptor may be up to 77 characters long. Arrows on the upper display line indicate that part of the descriptor is to the right (or to the left) of the visible portion of the display.

Using the **– (minus) and + (plus) Character** soft keys, change the character for the current cursor position. The characters ascend and descend in an ASCII sequence and it may take many presses to get the one you want. (The cursor and character keys auto-repeat. Holding them down will speed up the process quite a bit.) You can select punctuation and numbers as well as upper and lower case characters. When you first hit

a character key, the character already present on the line is used as a starting point. Any characters not used are actually space characters, which have an ASCII value of 32, the lowest value available. Here is the sequence you will see by starting with a space and pressing the up arrow key:

```
ASCII 32 - 47:  ! " # $ % & ` ( ) * + , - . /
ASCII 48 - 63:0 1 2 3 4 5 6 7 8 9 : ; < = > ?
ASCII 64 - 79:@ A B C D E F G H I J K L M N O
ASCII 80 - 95:P Q R S T U V W X Y Z [ ¥ ] ^ _
ASCII 96 -111:` a b c d e f g h I j k l m n o
ASCII 112-127:p q r s t u v w x y z { | } →
```

This character set differs slightly from standard ASCII in that character number 92, a backslash in the standard, is now a Yen symbol. And, character 126 is no longer the *tilde*, it is now a right-bracket.

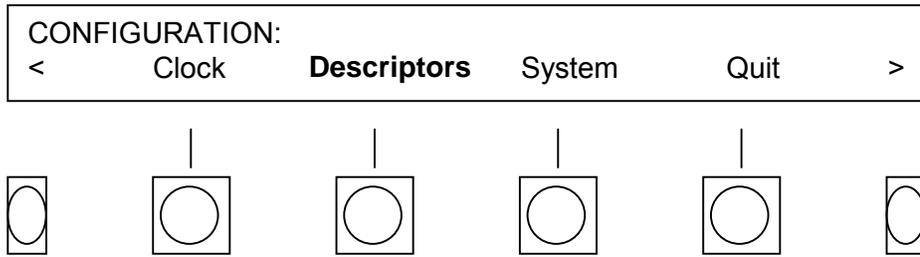
- a. Additional editing options are found by hitting the > (next) soft key:

- Insert** will insert a blank space at the cursor location, and “pushes” all characters to the right of the cursor one position to the right. (It is possible to push characters off the display; they will remain part of the descriptor providing that you haven’t pushed them beyond the 77-character limit.)
- Delete** deletes the character above the cursor, and “pulls” all characters after the cursor to the left by one character position.
- Save** will preserve the newly edited descriptor in the VR240’s non-volatile RAM. At this point you have completed the editing of one descriptor, and the menu drops back one level to the channel selection keys. You can now edit another channel if you wish.
- Cancel** will also drop you back to the channel selection menu, but it abandons all changes that you may have made during editing, and the descriptor is not changed.

### **3-34. COPY DESCRIPTORS.**

Descriptors (on the secondary menu) is a powerful and hence potentially “dangerous” option that will copy the channel descriptors from the media in the selected drive to the memory of the VR240. The “danger” lies in the fact that it is time consuming to enter descriptors manually and, once they have been changed, the only way to get the original ones back is to re-enter them, unless, of course, you have media with the original descriptors. The purpose of this feature is to allow you to substitute one VR240 for one that may be on temporary duty elsewhere or out of service for other reasons. This operation does *not* change other aspects of the machine configuration. It does not change serial numbers, or any user-configurable parameters. When you hit **CopyFromMedia**, you are given the opportunity to change your mind.

- a. Press the **Config** soft key then press the **Descriptors** soft key



- b. Press the **CopyFromMedia** soft key.  
c. Select from the options shown:

The display shows a legend: **UNIT DESCRIPTORS WILL BE LOST** and two soft keys **CONTINUE** and **CANCEL**.

To perform the copy operations, press the **CONTINUE** soft key. (If there is no media in the selected drive, hitting the **CONTINUE** soft key is the equivalent of hitting the **CANCEL** soft key.)

**CANCEL** drops back to the **CONFIGURE DESCRIPTORS** menu without copying the descriptors.

## **CHAPTER 4 THEORY OF OPERATION**

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### **Section I. PHILOSOPHY OF OPERATION**

#### **4-1. GENERAL.**

While the VR240 is similar in some ways to ordinary tape recorders, many of its features are unique to logging recorders in general and digital logging recorders in particular. This section explains aspects of the VR240 that may not be obvious, but with which you should be familiar in order to make the best use of the unit's capabilities.

#### **NOTE**

Most of the following discussion involves a comparison between analog and digital recording to tape. Once a signal is converted to digital form, recording amounts to simply storing data on the media (whatever it is). Therefore, much of the discussion applies to any type of media, including magneto-optical disks and DVD-RAM.

#### **4-2. COMPROMISES IN LOGGING RECORDERS.**

Ordinary recorders are judged mainly for sound quality, and are rarely called upon to record more than an hour at a time. Logging recorders are judged mainly for the ability to fit as much material as possible on a given amount of tape, and are rarely called upon to play more than an hour at a time. When we do listen to a logging recorder we listen for content and intelligibility rather than "audiophile quality." A logging recorder is a compromise, trading sound quality for quantity.

#### **4-3. ANALOG vs. DIGITAL RECORDING.**

In analog tape recording, audio is stored by magnetizing the tape in direct proportion to the audio signal. While this process can achieve excellent quality, anyone who has made a copy of a copy knows that some degradation is inevitable. The magnetization process is not precise, and any variation in tape speed is audible as unsteadiness in the sound.

To maximize sound quality in an analog recorder, you run tape at a high speed and you keep the tape tracks as wide as possible while maintaining separation to avoid crosstalk; in other words, you use a lot of tape. To maximize recording time and channels you do exactly the opposite: run the tape slowly and jam as many tracks as you can across the width of the tape; in other words, you use as little tape as possible. Reducing the amount of tape used to record an

audio signal is like using very grainy photographic film: the image (audio) becomes very fuzzy (noisy).

In digital recording, as used on the VR240, the audio signal is measured at regular intervals and converted to numbers. Instead of relying on the amount of magnetization on the tape to accurately represent an audio signal, digital recording relies on the magnetization to represent only two values – zero and one – needed to support binary numbers. Using the comparison with photography again, we can say that with digital recording we can tolerate very “grainy film” since we only need to distinguish light (one) from dark (zero). As long as we can store and reproduce the ones and zeros without error, the quality of the resulting audio depends on how we use the numbers.

To maximize sound quality in a digital recorder, you measure the audio signal very precisely and very often; in other words, you use a lot of tape. To maximize recording time, you cut back on accuracy and don’t measure so often. Audio quality is traded off, but with digital recording there is 1) more control, 2) no degradation when making digital copies, 3) no wow or flutter, and 4) no crosstalk from tape “tracks” too close together.

#### **4-4. AUDIO QUALITY CONSIDERATIONS AND TRADEOFFS.**

Audio quality in a tape recorder is usually determined by several measurable quantities:

- Frequency Response
- Dynamic Range
- Signal-to-Noise Ratio (SNR)
- Total Harmonic Distortion plus Noise (THD+N)
- Wow and Flutter
- Crosstalk

#### **4-5. FREQUENCY RESPONSE.**

Frequency response is the range of frequencies over which a machine can record and reproduce a sine wave such that the reproduced signal has the same relative amplitude as the input signal. “High fidelity” audio equipment should have a frequency response of 20Hz-20kHz  $\pm 1$ dB. It is commonly agreed that a frequency response of about 200-3000 Hz is necessary to faithfully reproduce human speech.

In an analog recorder, frequency response is directly proportional to tape speed, and is also related to the type of tape and the design and condition of the tape heads. It is truly remarkable how good a standard audio cassette deck can sound considering the tape speed is only 1 7/8 inches/second and that the format was designed for voice recording. Professional analog tape recorders used for music run at 15 or 30 inches/second.

In a digital recorder, frequency response is directly proportional to sampling rate, or the number of times per second that the analog signal is converted to a number. To the extent that each number requires a certain amount of space on the tape, the frequency response of a digital

recorder is also directly proportional to tape speed. The Nyquist Sampling Theorem states that the sampling rate must be greater than twice the highest frequency you want to process.

#### **4-6. SAMPLING RATE IN THE VR240.**

In the VR240, the recording time of a tape depends on the “sampling rate” chosen via the front panel. We chose the term “sampling rate” because it is more obviously related to digital audio than “transcoding rate”, which is a more accurate term. When you select a “sampling rate”, the actual sample rate does not change, and neither does the frequency response. What does change when you change the “sampling rate” from the front panel is actually the *data rate*, or the amount of digital information per channel that is stored on tape.

The input signals are sampled at 8000 times per second, and each sample occupies 8 bits. When you select 32kbps, you are selecting 8000 samples per second times 4 bits per sample. Likewise, at 16kbps you are selecting 2 bits per sample. The VR240 doesn't simply throw away bits to get the lower data rates. Various DSP operations are performed to eliminate redundant information in the audio signal.

#### **4-7. DYNAMIC RANGE, SNR, AND THD+N.**

Dynamic range is the ratio in dB of the largest undistorted signal to the smallest signal that can be heard above the noise. For analog tape recorders, the largest signal is limited by tape saturation and the smallest signal is limited by tape hiss. For digital systems, dynamic range is determined by the largest number that a sample can be, which depends on the number of bits in each sample.

Various tricks can be played to increase dynamic range. For analog signals, dynamic range expander circuits can make loud signals louder and soft signals softer. Similar tricks are possible with digital signals, which we play with numbers instead of voltages. The VR240 uses 8-bit samples, but these samples are *nonlinear*. The 8-bit samples used in the VR240 actually have a dynamic range equivalent to 13-bit linear samples, but the 13-bit values are especially coded into 8-bit quantities.

Signal-to-noise ratio is the ratio of the largest undistorted signal to the noise level with no signal present. This is not the same as dynamic range. There may be 2mV of noise voltage in an analog system, but it may be possible for a human to detect a 1mV audio signal even with the noise there; in this case the dynamic range would be 6dB greater than the SNR. The situation is even stranger for digital signals. Each sample is an approximation of an analog voltage. The more bits per sample, the better the approximation, but there is always some error, which is perceived as a combination of noise and distortion. You can measure the noise level in a digital audio system with no signal present, and this can be very quiet indeed, but to properly state the SNR of a digital audio system you must take the average sampling error into account. A 4-bit system may be nearly silent with no input signal, but as soon as there is a signal you'll hear quite a bit of noise.

THD+N is measured by applying a pure sine wave to the input of the system under test and subtracting a pure sine wave from the output; whatever is left over is the distortion plus noise.

Harmonic distortion by itself is that part of the output which is harmonically related to the input sine wave with the fundamental subtracted. Distortion is visible on an oscilloscope if the output waveform doesn't look like a sine wave. A common and severe form of distortion is clipping, which is visible as a flattening of the peaks of an audio waveform. In analog systems, clipping may be rounded and may actually sound pleasant up to a point. In digital systems, clipping means that the input to the analog-to-digital converter is above the maximum; the largest sample value is not large enough to serve as a measurement of the input signal. When reproduced, the waveform from a clipped digital signal is perfectly flat where the peaks could not be properly sampled, resulting in a very unpleasant sound.

### **4-8. WOW AND FLUTTER.**

In an analog recorder, wow and flutter are caused by variations in tape speed due to lack of mechanical precision, and they get worse as the absolute speed of the tape decreases. To avoid unacceptable wow and flutter, the tape mechanism must be kept meticulously clean and aligned. How much wow and flutter can be tolerated depends on the application. If the goal is to listen to a section of a recording and transcribe it, significant amounts can be tolerated. If the goal is to reproduce and analyze critical signals, even tiny amounts can seriously degrade the signal.

Because digital recording uses electronic clocking of its input and output, and electronic signals are much more precise than mechanical devices, a digital recorder like the VR240 will have so little wow and flutter that it will be unmeasurable. Digital audio is stable as long as the sampling interval is precise while recording and playing. Once sampling is done, steady timing is not important until the audio must be reproduced. During the recording process, each channel is sampled every 125 microseconds. Samples from all channels are accumulated in memory until a certain number is reached, at which time the accumulated samples are copied to tape at high speed. Playback is the reverse: every few seconds a large number of samples is copied from tape into memory; samples are then taken from memory, separated into the original channels, and converted to analog one at a time every 125 microseconds. Think of a bucket of water with a small hole in the bottom: water (samples) will drip out of the bucket (memory) at a fairly constant rate whether there is one inch or several inches of water in the bucket. This type of operation explains why the tape in the VR240 does not move steadily.

### **4-9. CROSSTALK.**

In an analog machine, channel separation is achieved by recording different channels on different areas of the tape, called tracks. There is always a compromise in tape head design: the closer together you put the heads, the more tracks you can get on a tape, but the greater will be the crosstalk between channels.

The VR240 has only one physical "track". Along with the number representing audio samples, the VR240 adds time and channel information so that when the tape is played back the samples are sent to the proper output channels. The only crosstalk in the VR240 is a result of proximity of electronic circuitry, and is easy to control.

#### **4-10. DEGRADATION.**

With continued use, analog recorders degrade in an analog fashion. The frequency response gets poorer, and wow and flutter increase. As the tape head wears, it becomes harder to align the mechanism for proper performance, and audio quality suffers.

While digital recorders also physically degrade in an analog fashion, their performance doesn't suffer in the same way. Rather, the "error rate" increases. In most cases this doesn't affect the signal quality at all. Instead, the amount of tape used increases to prevent the reproduced signal from losing integrity. Since the tapes have a built-in margin, this problem doesn't become evident until that margin is seriously encroached on. At that time, the drive must be realigned and serviced. As with analog recorders, continued high performance requires periodic cleaning of the tape heads.

#### **4-11. TAPE USAGE.**

The VR240 uses technology similar to that used in video recorders—the tape speed necessary for recording high-density information is obtained by using a rotating tape head. This increases the information storage density many fold over a fixed-head machine. This, along with the efficiency obtained by not wasting tape on unused channels, is responsible for the drastic decrease in tape usage and tape storage requirements of the VR240.

In an analog recorder, each channel is assigned to a separate track on the tape. The same amount of tape is used whether one channel is active or all channels are active. That's a lot of waste.

The VR240, however, "multiplexes" all channels onto a single data track. When there is no active signal on a channel, there is no data for that channel on the tape. Therefore, if only two channels are active, an 8-channel VR240 will use tape only one fourth as rapidly as an 8-channel analog recorder. This, along with the rotating head technology, digital signal processing, and the nature of the tape itself, is what allows us to record so many hours on such a small tape.

**Section II. THE VR240 CHANNEL HOUR CAPACITY**

**4-12. THE “CHANNEL HOUR”.**

The VR240’s capacity is measured in channel-hours: the number of hours of a single channel that can be recorded on one tape (see Table 4-1). That number, for a 120 meter DDS-2 cassette, is about 520 hours, or some 21 days. Of course, if you record more than one channel at a time, the tape will fill faster.

For example: You are recording your broadcast station 24 hours a day. You also are recording two additional morning shows 4 hours per day each. How long will the tape last? 24 plus 4 plus 4 equals 32 channel hours every day. You are entitled to 520 channel hours per tape, which comes out to 16.25 days.

In this example, you will need to change the tape every 16.25 days. As a matter of convenience, you would probably want to change it at the same time every 16 days or perhaps every 2 weeks, ignoring the trivial waste involved. Recording more sources adds to the channel-hour load, and you might find a tape lasting from a few days to more than two weeks.

**Table 4-1. Eventide Logging Recorder Channel Hours\* of Storage Chart**

	VR320, VR240, VR204			VR208HF, VR204HF		
	toll			toll	commentator	rebroadcast
<b>FREQUENCY RESPONSE</b>	<b>3.4kHz</b>			<b>3.5kHz</b>	<b>7kHz</b>	<b>14.4kHz</b>
<i>sample rate</i>	<i>8kHz</i>			<i>8kHz</i>	<i>16kHz</i>	<i>32kHz</i>
<i>data compression</i>	<i>16kbps</i>	<i>32kbps</i>	<i>64kbps</i>	<i>32kbps</i>	<i>64kbps</i>	<i>128kbps</i>
<b>ARCHIVE MEDIA</b>	<b>audio storage hours</b>			<b>audio storage hours</b>		
DDS-2 tape - 120M, 4GB	537	268	134	260	130	65
DDS-3 tape - 125M, 12GB	1600	800	400	780	390	195
DVD-RAM <sup>+</sup> - 5.2GB, re-writeable	686	343	171	335	167	83
Magneto-optical <sup>+</sup> - 5.2GB, 5.25"	712	356	178	348	174	87
<b>INTERNAL HARD DISK</b>	<b>audio storage hours</b>			<b>audio storage hours</b>		
4GB hard disk (standard)	540	270	135	260	130	65
9GB hard disk (optional)	1230	615	307	600	300	150
18GB hard disk (optional)	2460	1230	615	1200	600	300
one day = 24 hours, one week = 168 hours, one month = 672 hours						

\*Channel Hour equals one (1) channel recording continuously for one hour

#### **4-13. HARD DISK DRIVE.**

Each VR240 comes standard with an internal hard disk drive. As of the time of writing (Nov 99), the standard hard disk drive capacity is 4GB. The precise definition of GB (gigabyte) depends on the drive manufacturer. Everyone agrees that a KB (kilobyte) is 1024 bytes, but some say that a MB (megabyte) is 1000KB, some say it is 1024KB, and some might say it is 1,000,000 bytes. In this manual we say 1MB = 1024KB. In the VR240, each 100MB of storage on the hard disk drive represents about 14.5 channel-hours.

The VR240 stores the most recently recorded audio material on the hard disk drive. This provides three major operational benefits:

- 1) You can listen to material from the hard disk drive without disturbing tape drive operation ("instant recall" is simply a quick way to start playback from the hard disk).
- 2) If the VR240 runs out of tape, you have several hours of time to change tapes without any loss of material.
- 3) If you need to listen to material that is not on the hard disk, you can suspend recording on a tape drive, use the tape drive for playback, and resume recording without losing anything.

Another benefit of the hard disk drive in the VR240 is that it prolongs the life of the tape drives. Here's why: a DDS tape drive is either "streaming" (recording data on tape at a *fixed rate* of about 500KB per second) or it is stopped. If you back up your computer's disk drive to a DDS tape, your computer reads files from your disk (which is much faster than a tape drive) and sends them to the tape drive as fast as the tape drive can accept the data; a 1GB disk drive takes about 30 minutes to copy, and the tape "streams" the entire time, only stopping when the copy is finished. This is what the tape drive is designed for. In a logging recorder, the average rate of data from active channels is much less than the tape drive's streaming rate, which means the tape drive must start and stop many times before a tape is full. In the VR240, the hard disk is used to manage the data to maximize streaming and minimize the number of starts and stops, which prevents excessive wear of the tape transport. Eventide loggers provide this benefit – other loggers do not.

### **Section III. VR240 THEORY OF OPERATION**

#### **4-14. MAIN COMPONENTS.**

The main components of the VR240 are:

- Input Boards (signal conditioning, A/D and D/A conversion, data reduction)
- CPU Board (microprocessor, memory, SCSI, clock, Ethernet, communication ports)
- Removable-media Drives (tape, MO disk, DVD-RAM)
- Internal fixed hard disk drive
- Motherboard (backplane for CPU and Input boards, audio mixer)
- I/O Control Board (audio output and display control circuits)
- Front Panel Assembly (keyboard, display, status indicators)
- Switching Power Supply
- Uninterruptible Power Supply with Battery Charger

#### **4-15. GENERAL OPERATION.**

##### **NOTE**

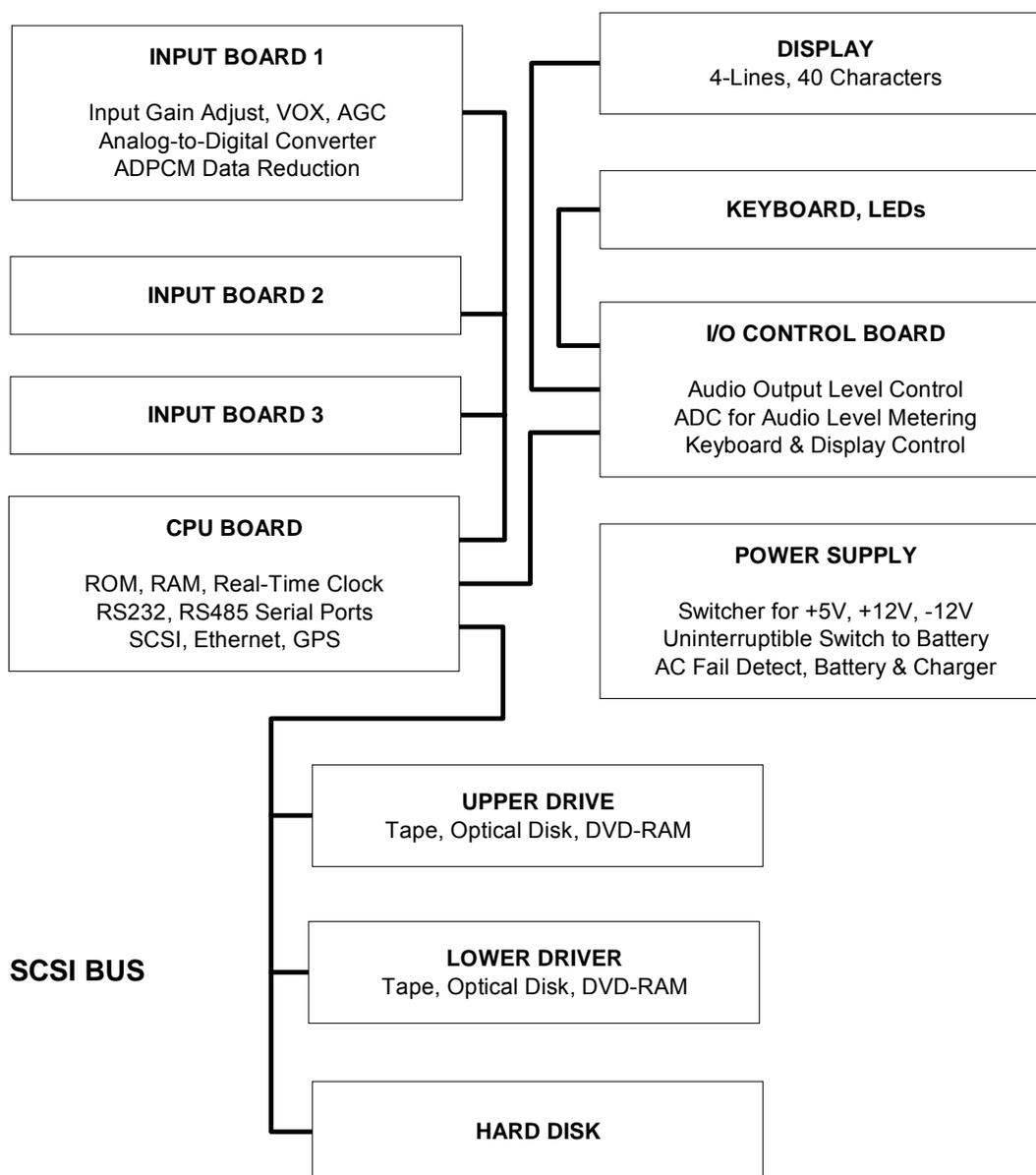
The following description assumes that standard telephone input boards are installed. See Figure 4-1.

Signals to be recorded are connected to the input boards. The front-end circuits condition the signals according to user settings for gain and AGC. The conditioned signals are filtered and converted from analog to digital. The digitized signals are pass through a data reduction algorithm (standard G.726 ADPCM), resulting in a data rate per channel of 64, 32, or 16 kilobits per second. Data from all channels is transferred from the input boards to memory on the CPU3 board. A decision is then made for each channel whether to save the data or ignore it, depending on the user setting for channel activity (OFF-HOOK, VOX, etc.). Data for active channels is transferred from memory to the fixed hard disk drive. After a certain amount of data is accumulated on the disk drive, it is then transferred from the hard disk to memory and then to the removable media. If the removable media is full or not loaded, data continues to accumulate on the hard disk. All data is time coded so as user can easily locate desired material by searching for a time and date.

Playback is the reverse of recording. Once the desired data is located (either on the hard disk or on a removable-media drive that is not in record mode), the data is transferred to memory and then to the input boards for playback. The data is converted to analog, and the signals from all enabled channels are mixed to a single channel and played through the speaker (or headphones) and the line-out jack.

The CPU board features a Motorola 68000-family microprocessor running a proprietary real-time multitasking operating system. System firmware is stored in Flash ROM and can be updated in the field. Updates are created periodically to add new features and to support different types of SCSI removable-media drives (such as the new DVD-RAM drives).

The VR240 can be controlled from the front panel or it can be operated remotely via RS-232/RS-485. Several connectors on the rear panel provide access to various functions including remote control, time code input/output, and outputs to a label printer and status printer.



**Figure 4-1. VR240 General Block Diagram**

**4-16. CONCLUSION.**

This chapter has attempted to explain the philosophy behind the VR240 digital logger. We hope that by knowing how the unit works you will not be surprised when the operation is not quite the same as an analog machine, and we hope you will come to appreciate the benefits of digital logging.

***Model VR240 Audio Logging Recorder***

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# CHAPTER 5 OPERATION

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## Section I. PREPARATION FOR OPERATION

### 5-1. GENERAL.

This chapter covers routine operation of the VR240. Topics covered include:

**Recording:** Normal record operation, and the menu options available while recording.

**Level setting:** Confirming and monitoring input signal presence and level.

**Playback:** Playing media loaded in the drive or playing from the hard disk including searching for a particular channel or time and date, and more complex message storage and retrieval options.

**Auxiliary:** Formatting media, copying media, and recreating the media index.

**Cleaning:** How and how often to clean the drives. (Applies to tape drives only.)

In this section, we assume that the VR240 has been both installed physically and configured using the software configuration menus. In other words, that the unit is set up and ready to begin operation at your facility. In addition, you should also have a supply of media (4MM DDS or rewriteable DVD-RAM) and, for those with DDS drives, a cleaning cartridge at hand.

### 5-2. MEDIA FORMATTING.

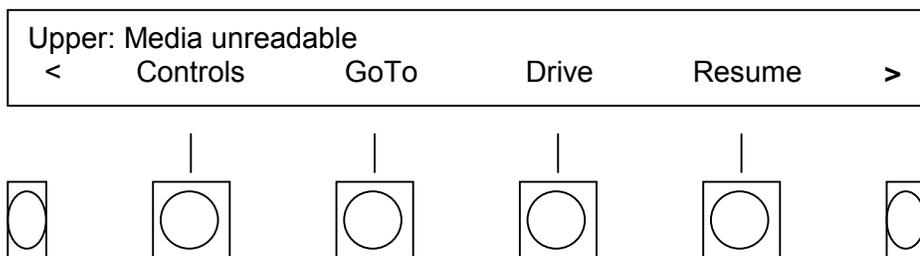
Before you can record on any media (4MM DDS or rewriteable DVD-RAM), it must be formatted. Formatting is a simple process. It takes a few minutes to format tapes, a few seconds to format a DVD-RAM disk. When media is formatted an index is created that gives information about the machine on which it was formatted. The descriptors entered during the configuration process are stored in this index, and whenever you access **Media Info**, this information is displayed. For this reason, *it is important to format media on the VR240 which will subsequently be used to record on it.* If you format media on a machine with different descriptors, when you load it you will get a message **Ready, descrip.dif**. This will not affect playback but you will not be able to record on that media unless it is reformatted on the correct machine. All VR240s have the same factory default descriptors. If you leave the default descriptors intact, media can be formatted on any VR240 and recorded on any other.

In the familiarization section of Chapter 2, the initial media loading process (paragraph 2-3.7) was discussed.

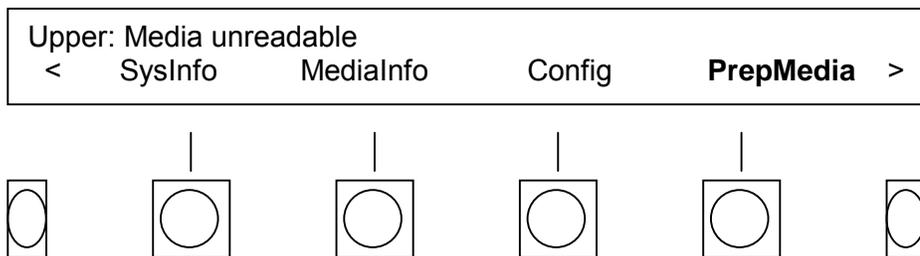
**NOTE**

Media can be formatted on one drive while the other drive is recording.

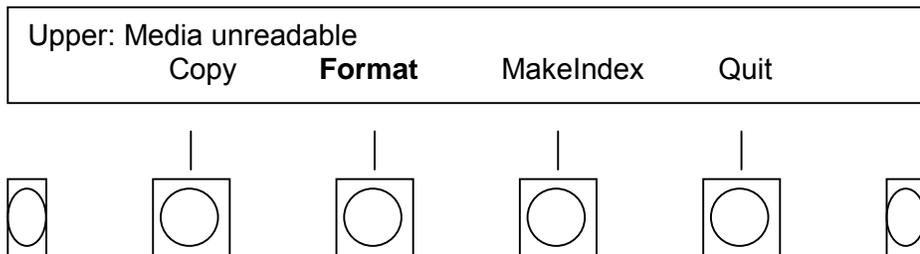
- a. Insert new media in the drive slowly until you feel resistance. Gently continue pressing forward. The drive will swallow the tape or disk and try to load it. (The display will show that the drive is loading, and, shortly thereafter, indicate that the media is “unreadable.”) Use the **Drive** soft key to select this drive.
- b. Press the > (next) soft key.



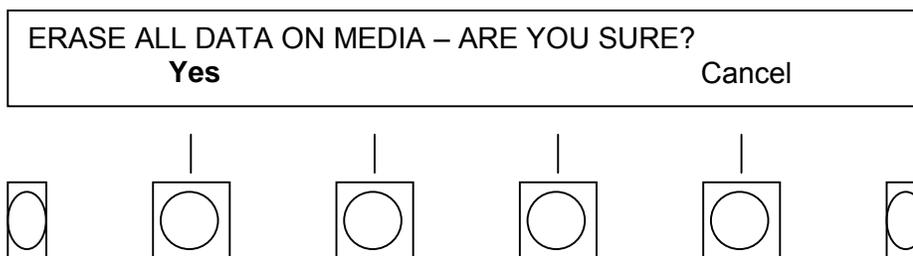
- c. Press the **PrepMedia** soft key).



- d. Press the Format soft key



- e. Press the **Yes** soft key.



(Notice that you were given the opportunity to **Cancel** this potentially dangerous operation.) To format the media in the other drive, press the **Drive** soft key until the other drive's status appears on the screen. (Both operations can be performed concurrently.)

The media will now be formatted, a process that requires approximately 4 minutes for a tape, 30 seconds for a rewriteable DVD-RAM disk. If you have a stack of media to format and a dual drive VR240, you can save time by formatting on both drives at once. While one drive is formatting, use the **Drive** function key to select the other drive, and repeat the above steps. You can also hit the **Eject** transport control as soon as the formatting process begins if you wish to remove the media after formatting instead of having it loaded. Otherwise, after being formatted, the media is automatically "loaded" in the same manner as already formatted media would be.

### **5-3. DDS DRIVE CLEANING.**

Recording and playback are critically dependent upon the cleanliness of the DDS drive mechanism. Even microscopic particles of magnetic material (shed from the media) or environmental pollutants such as cigarette smoke can adversely affect the performance of the drive mechanism. The Fault LED will light to indicate that the pre-set time between cleaning has elapsed. This is for reference only. For best results, follow the guidelines listed below rather than waiting for this light to alert you the drive must be cleaned. Clean the drive immediately if this light goes on.

- Time:** For every two weeks of operation, regardless of other circumstances, the drives should be cleaned.
- Tape:** After every pass of a complete DDS cassette over the heads, clean the drives.
- New & old tapes:** Brand new tapes and tapes that have exceeded their useful life of approximately 10 passes are more likely to shed particles than other. If you are using exclusively new tapes, clean the drives after every pass. If you are using tapes beyond their useful lives, clean more often or better, replace the tapes.
- Environment:** If your VR240 is in an unusually dusty or smoky environment, reduce the interval between cleanings by half.

5-3.1 Clean the DDS drive.

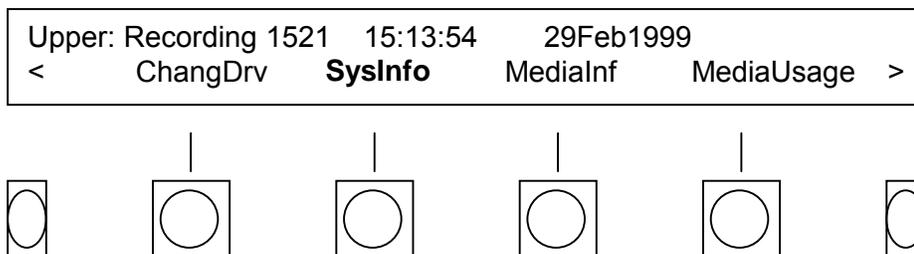
Insert a DDS cleaning cartridge, such as the one supplied with the VR240. Wait for it to pop out. Then reset the clean timers. That's it. (The drive recognizes the cleaning tape and will automatically eject it. Do NOT use an *audio grade* cleaning tape, which may not be recognized by the drive.)

**IMPORTANT**

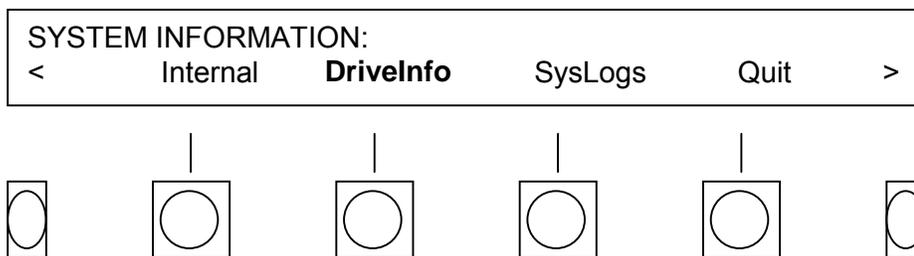
It is very important to reset the clean timer. Otherwise the VR240 will not know that the drive was cleaned and the **Fault** LED will come on sooner than the 100 hours of drive operation (because the clean drive timer was not reset to 0:00).

5-3.2 Reset the cleaning timers.

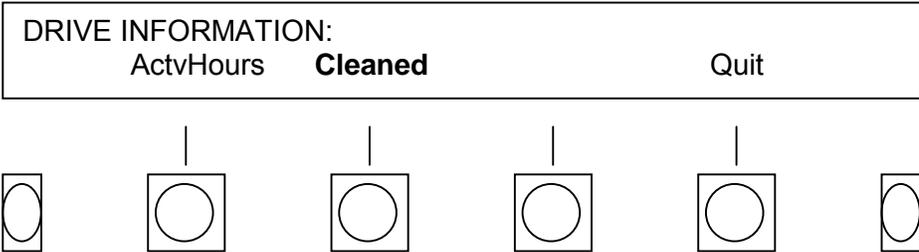
- a. Press the **SysInfo** soft key



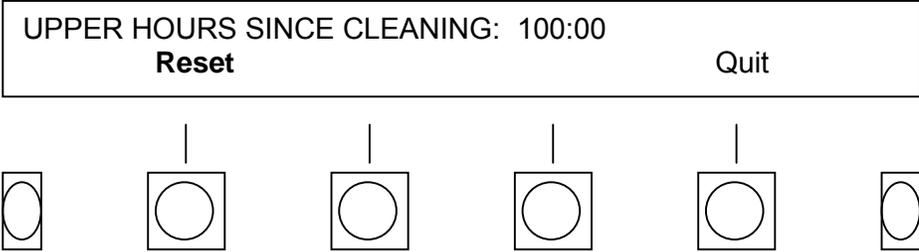
- b. Press the DriveInfo soft key



c. Press the **Cleaned** soft key



d. Press the **Reset** soft key.



## **Section II. TRANSPORT CONTROLS AND INDICATORS**

The operation of the soft keys and menus used during operation was covered in Chapter 3.

For most users, however, the actual transport controls will be more familiar and more frequently used. They are laid out in the familiar fashion immediately under the drive(s), and are screened with international icons. Refer to Chapter 2, paragraph 2-10 for illustrated descriptions. These controls are designed to be as close as possible in operation to those on a standard tape recorder. It is possible to operate the VR240 using these controls without reference to the menus at all.

### **5-4. TRANSPORT CONTROLS.**

Each transport control is a momentary action pushbutton. The buttons have no mechanical function, and any interlocks are electronic. As with an analog recorder, there is some interlocking of controls. To prevent media damage, you cannot go from **FFwd** directly to **Play** on a typical recorder. Older machines have a mechanical interlock to prevent you from pressing **Play** at the wrong time; newer ones automatically stop the media before going into **Play** even if you don't explicitly hit **Stop**. While media motion is not a problem in the VR240, there are several inappropriate operations that are locked out. For instance, **Eject** is not honored if the unit is in the process of recording.

**Record** The **Rec** button is used to begin a recording on the VR240. Before you can record, *all* of the following conditions must be true:

- The drive status indicator on the VFD screen must read **Ready** for the drive on which you wish to record.
- The media must be formatted and must not be write protected.
- The media must be positioned correctly – either at the very beginning of the media or at the end of all recorded material. (If the media is otherwise available to record but not positioned correctly, a message will be displayed briefly saying so.)
- The VR240 must be in the appropriate state if you have selected the **MEDIA USAGE** option **Do NOT record...**

With all of these requirements, the VR240 does its best to protect already-recorded archival media. We remind you again that the best protection is to never load valuable media unless it is write protected.

When you press **Record**, the LED on the record button illuminates red and remains lit as long as recording continues. If you perform a “stop-suspend,” the **Record** LED will blink, indicating that recording is taking place but a transfer of data will not occur on the suspended drive.

**Play** Unlike **Rec**, **Play** can be activated under many circumstances, and at any media position. Hitting **Play** will start the media or internal hard disk playing from its

current position. (**Play** is not “memorized.” If you are performing another operation, the VR240 will not automatically start playing when the operation is complete.)

While playing, the **Rew** and **FFwd** keys are redefined, as explained below. All the transport keys other than **Rec** and **Eject** are active during **Play**.

**Rewind** The **Rew** key is active both when the media is stopped and when the VR240 is playing. If you hit **Rew** while the media is stopped, the media will be moved from its current position to its beginning. The VR240 offers three rewind speeds. To speed up the Rewind task, press the key multiple times.

#### **NOTE**

Variable speed Rew/FFwd applies only to the hard drive.

If you hit **Rew** *while the media is playing or paused*, it will also be moved from its current position to the beginning of the media. However, instead of moving immediately to the beginning, the **position** will be shown on the display with the media usage counter, time and date. The display is updated at every index boundary, or each time approximately 2-3% of the media is passed, giving counter readings that decrease by about 250. In this way, you can get a quick overview of what times correspond to what positions, and how much of the media has been recorded.

While in this special **Rew** mode, **both** the **Play** and the **Stop** keys are active.

If you hit **Play**, the **Play** transport key LED starts blinking, and as soon as the media reaches an index boundary, it will begin playing at that point.

If you hit **Stop**, the **Stop** transport key LED starts blinking, and as soon as the media reaches an index boundary, the VR240 will enter the **Pause** mode. From **Pause** you can, as usual, hit **Play** to continue playing from that point or hit **Stop** twice to get exit from the play menu.

While in the normal **Rew** mode, the **Rew** transport key LED is illuminated and no keys are active until the media reaches the beginning.

**FForward** The **FFwd** key is active both when the media is stopped and when the VR240 is playing. If you hit **FFwd** while the media or optical disk is stopped, it will be moved from its current position to the end.

If you hit **FFwd** *while the media is playing or paused*, it will also be moved from its current position to the end of the recorded material. However, instead of moving irrevocably to the end, the position will be shown on the display with the media usage counter, time and date. The display is updated at every index boundary, or each time approximately 2-3% of the media is passed, giving counter readings that increase by about 250. In this way, you can get a quick overview of what times correspond to what media positions, and how much of the media has been recorded. The VR240 offers three fast forward speeds. To speed up the fast forward task, press the key multiple times.

While in this special **FFwd** mode, both the **Play** and the **Stop** keys are active, and the **FFwd** transport key LED is illuminated.

If you hit **Play**, the **Play** transport key LED starts blinking, and as soon as the media reaches an index boundary, it will begin playing at that point.

If you hit **Stop**, the **Stop** transport key LED starts blinking, and as soon as the media reaches an index boundary, the VR240 will enter the **Pause** mode. From **Pause** you can, as usual, hit **Play** to continue playing from that point or hit **Stop** twice to exit from the play menu.

While in the normal **FFwd** mode, the **FFwd** transport key blinks and no keys are active until the media reaches the end.

**Stop** Hitting **Stop** from **Play** returns to a paused mode.

When you **Stop** from **Rec**, the VR240 will ask if you wish to **Stop** (end all recording completely) or **Suspend** (temporarily suspend the transfer of data from the internal hard disk to the drive). If you **Stop** from **Record**, additional information must be written to index the media. If you hit **Stop** during **DualRec**, a soft key menu is displayed asking you to select which drive to stop or suspend.

If you **Stop** from normal **Rew** or **FFwd**, the operation will complete before **Ready** is displayed.

**Eject** The **Eject** button ejects the media from the currently selected drive. **Eject** is active when the media is stopped, or when in **FFwd** or **Rewind**. Note that **Eject** is shorthand for **Rewind/Eject** since the media is always rewound before it can be removed. Depending upon media location and status, it can take a significant amount of time to eject. This is especially true if you have just recorded on the DDS or DVD-RAM disk. Before media can be ejected, the index must be written, which takes even more time. The best case **Eject** time occurs with rewind, write-protected media. Worst case occurs when you have manually stopped a recording in process near the end of the media.

**Eject** can also be used to abort a media loading operation, or to have the media automatically released after a formatting operation is complete. Simply hit **Eject** at any time during either process. Load will be canceled; format will go to completion before the media is ejected.

While the media is in the process of being ejected or an **Eject** operation is pending completion of some other operation, the **Eject** transport control key is illuminated. The VFD display may not indicate **Ejecting** immediately, depending upon what other tasks must be performed by the VR240 first.

If the optional label printer is connected, a label will be printed and extruded, as described in Appendix F.

#### **5-5. TRANSPORT CONTROL REACTION TIME.**

It is important to be patient when operating the transport controls. With analog recorders you can see the spinning tape reels, and you know how long you will have to wait for an operation to complete. In the VR240, equipped with archive drives, you can not see the medium, and the recorder may have a queue of tasks to perform, so it might take longer to complete. The good news is that while operating the **Play**, **Rew**, **FFwd** and **Stop** transport controls to manipulate the internal hard disk, or if your unit is equipped with rewriteable DVD-RAM, the reaction time is faster.

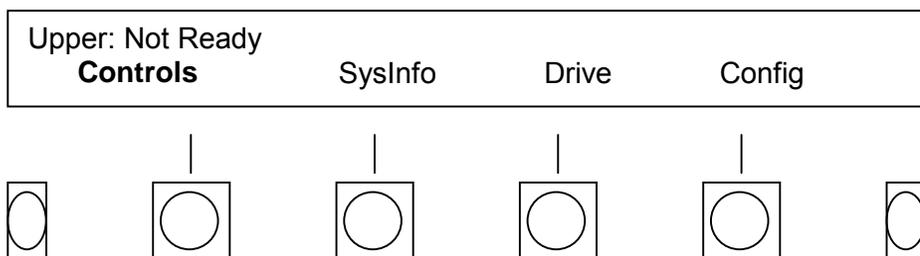
**Section III. SIGNAL MONITORING, LEVEL INDICATOR,  
AND CHANNEL STATUS**

In any recording system, it is important to make sure that the input level is correct. If the level is too high, it can cause distortion and clipping. If it is too low, you lose “dynamic range” and the signal may sound noisier than necessary. As with all logging recorders, the VR240 has a limited dynamic range. We do provide AGC (Automatic Gain Control) so that signals of wide level variation can be recorded effectively. (Whether a channel uses AGC is determined during configuration. Refer to paragraph 3-36.)

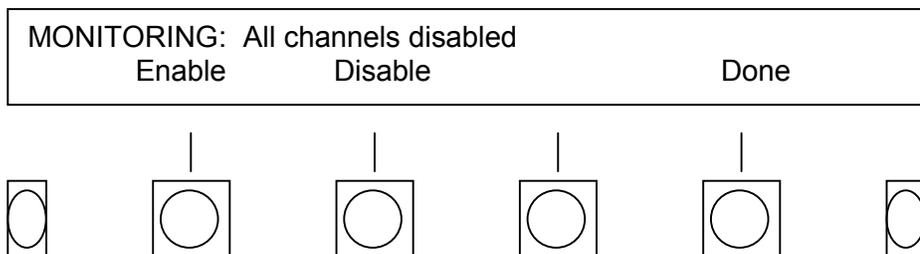
**5-6. MONITOR.**

You can confirm that your signals are present at the VR240 input and are of the correct level by using the **Monitor** function.

- a. Press the **Controls** soft key.



- b. Press the **Monitor** soft key.



The **Monitor** menu shows the keys **Enable**, **Disable**, and **Done**. The purpose of this submenu is to allow you to select the input channels you wish to monitor. As you enable individual or groups of channels, the signals applied to their inputs will become audible.

Enabling (and disabling) channels is an additive (and subtractive) process. If, for example, you enable channels 1 thru 3 and then enable channel 5, channels 1, 2, 3, and 5 will be audible

(your selection will be displayed as 1-3, 5). If you disable one of these channels, the remainder will still be audible.

Select the channel(s) you wish to monitor.

**a. Monitor a single channel as follows:**

- (1) Press the **Enable** soft key.
- (2) Use the keypad to enter the channel number desired.
- (3) Press the **Enter** soft key.
- (3) Press the **Done** soft key.

**b. Monitor all channels simultaneously as follows:**

- (1) Press the **Enable** soft key.
- (2) Press the **All** soft key.
- (3) Press the **Done** soft key. The VR240 will immediately begin playing all active channels.

**c. Monitor multiple channels as follows:**

- (1) Press the **Enable** soft key.
- (2) Use the keypad and the **Thru** soft key to select the first number of the desired sequential range of channels to monitor. Then select the second number on the keypad to complete the desired range.
- (3) Press the keypad **Enter** soft key.
- (4) Press the **Done** soft key. The VR240 will immediately begin playing the active channels selected.

**d. Monitor multiple channels which are not sequential as follows:**

- (1) Press the **Enable** soft key.
- (2) Press selected channel on keypad.
- (3) Press the **Thru** soft key and the second selected channel on the keypad.
- (4) Press the **Enter** soft key.
- (5) Repeat steps (1) thru (5) for additional channels to be monitored.
- (6) Press the **Done** soft key. The VR240 will immediately begin playing the active channels selected.

## **5-7. LEVEL INDICATOR.**

When you are in either the **Monitor** menu or in the channel selecting process, the top row of the **Channel Status** LEDs is redefined to be an audio level indicator. LEDs 1 through 6 turn on green as the signal level progressively increases. LED 7 indicates orange, and LED 8 indicates red. The input signal level is adjusted optimally when 1 through 7 are on most of the time, and 8 flashes occasionally. When you exit the **Monitor** menu, either through hitting the **Done** soft key or by waiting for the timeout, the LEDs revert to their normal function of indicating channel status.

**NOTE**

If you entered **Monitor** while you were recording, we make the assumption that you want to listen continuously to the signals selected, and the audible monitor remains active until you deliberately disable the channels you are monitoring. If you entered **Monitor** from a **Ready** indication, the logger assumes that you are only listening to the enabled channels to confirm their presence and level, and that you *do not* wish to listen to them while recording. Therefore, the audio is disabled when you start recording. If you *do* wish to continue monitoring the selected channels, reselect the **Monitor** menu and the channels you previously selected will again be connected to the audio output.

**5-8. CHANNEL STATUS DURING RECORD.**

The **Channel Status LED Array** located on the front panel shows the status (record, monitor, play, or level) of the individual audio channels during recording and playback. Their functions during **Record** are as follows:

- OFF:** The channel either is not physically present in the unit, or has not been enabled either for recording or for monitoring.
- RED:** The channel is recording, i.e., it is active because its control input is valid or an input signal is present
- GREEN:** The channel is enabled to record, but no input signal is present or its control signal is invalid.
- ORANGE:** The channel is enabled for record (whether or not it is actually being recorded) and it is also being monitored.
- FLASHING ORANGE:** The channel is being monitored, but it is disabled from recording.

Section IV. RECORD OPERATION

5-9. RECORD.

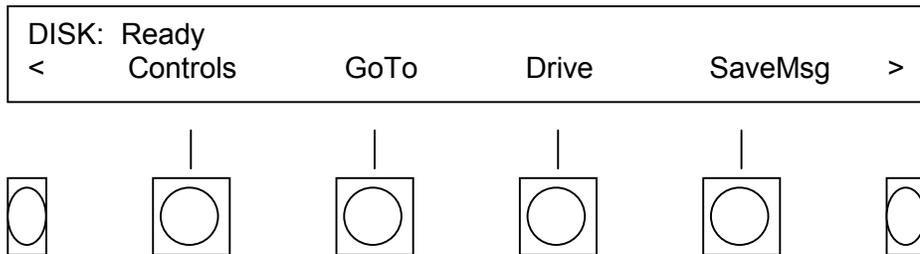
Once placed in the record mode, the VR240 logging recorder will record until it is stopped. Data is stored on the internal hard disk for 250, 500, or more channel hours depending on the size of the hard drive. Every three channel hours the internal hard disk automatically transfers data to a ready drive. If one drive becomes full and the other is in the ready state, the logger will automatically switch to record on the ready drive. If there is no available drive, the hard disk will continue to record to capacity until new media is loaded. You may search, play, record archived data to the disk, and store messages in memory locations without interrupting the record process.

An illuminated red light behind the **Record** transport key indicates that the logger is in the record mode. The channel status indicators on the top line of the display will shown an asterisk for each channel that is being recorded.

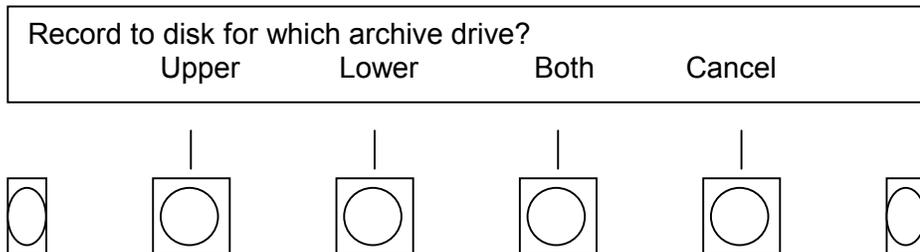
A steady red light behind the **Record** transport key means that the normal process of recording to the disk and then transferring to the drive is occurring. This red light will blink whenever there is an interruption to this process, such as when no drive is available for a data transfer, and data is recording to the hard disk only.

5-9.1 Begin Recording From The "Disk: Ready" Position.

- a. Press the **Drive** soft key until "Disk: Ready" appears on the VFD screen.



- b. Press the **Record** transport control key located under the archive drives.



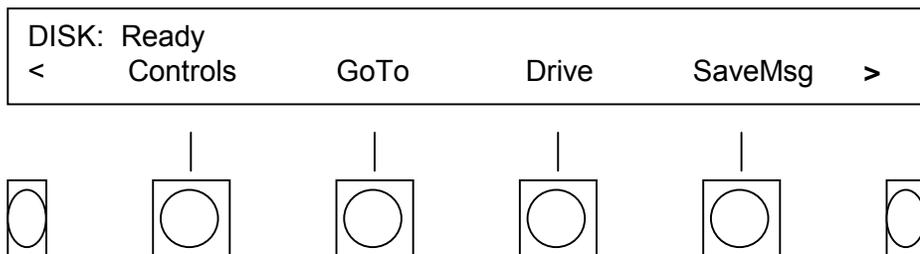
- c. Choose either (or both) ready drive(s). The hard disk will begin to record.

**NOTE**

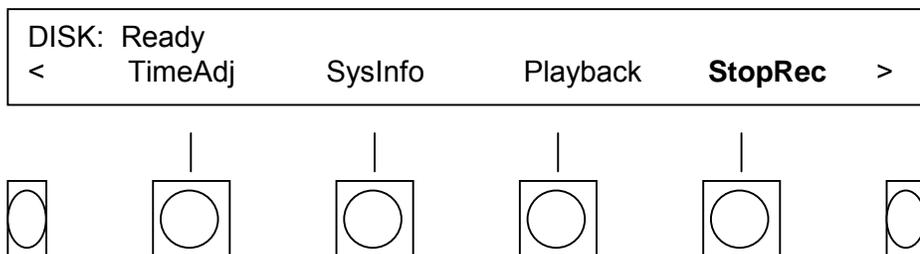
When you put the VR240 in record from the “Disk: Ready” position, the hard disk *will not* automatically transfer data to the archive drive(s). You must manually set the archive drive(s) to record.

**5-9.2 Stop Recording From The “Disk Select” Position.**

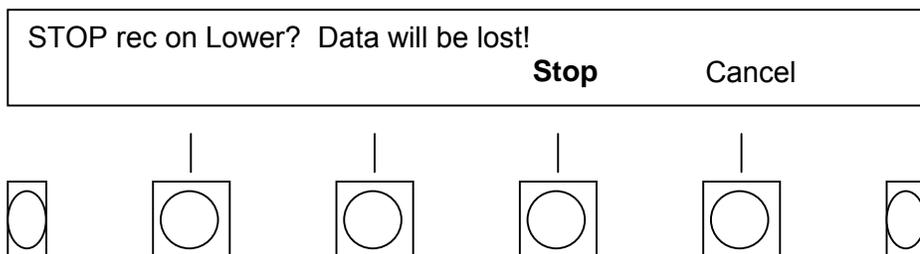
- a. Press the > (next) soft key.



- b. Press the StopRec (stop recording) soft key.

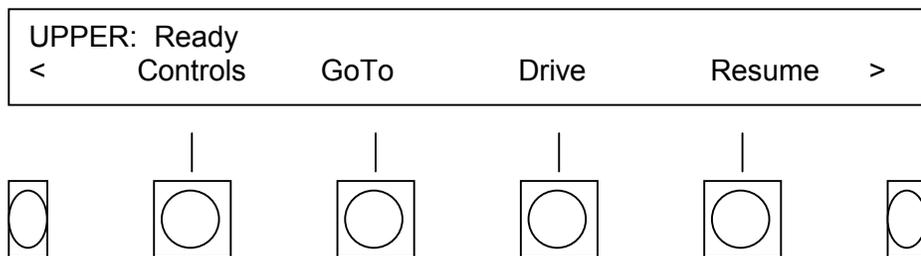


- c. Press the Stop soft key.

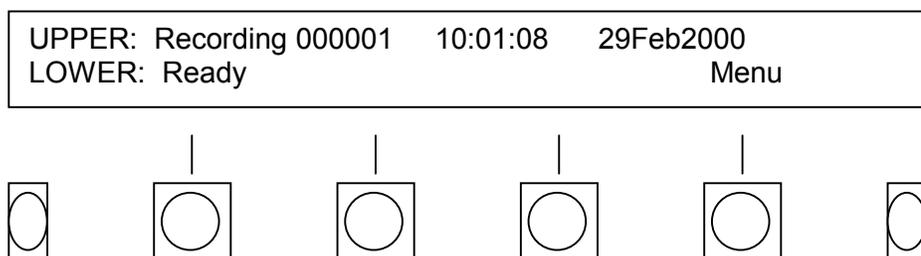


5-9.3 Begin Recording From The “Drive Select” Position.

- a. Load formatted media into an available drive.



- b. Press the **Record** transport control key.
- c. Choose the **Record** soft key.



**NOTE**

When you place the drive in the record mode, recording automatically begins on the hard disk.

For information about the “resume” function, please refer to paragraph 5-16.

To stop recording from the drive select position, press the **Stop** transport control key. The VFD screen displays **Suspend** and **Stop** above the soft keys. Recording continues until one of these two soft keys are pressed.

If the operator hits the **Suspend** soft key, recording stops on the media drive, but recording continues on the hard drive. The VFD screen displays that the selected drive is stopping. The drive can temporarily be used for other purposes.

Refer to paragraph 5-15 for procedures on the “Suspend” function.

If the operator hits the **Stop** soft key, the VFD screen displays that the selected drive is stopping.

## Model VR240 Audio Logging Recorder

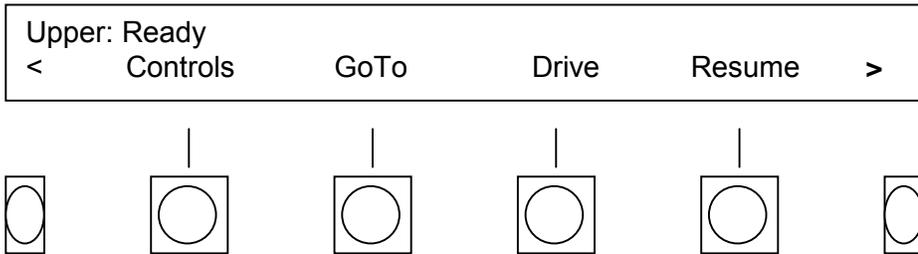
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When the operator performs the **Stop-Stop** steps, the VR240 buffer transfers information from the hard disk to the archive drive. If the buffer is in the process of transferring, it will complete the transfer before the VFD screen displays **Ready**. If you eject the media, it has recorded only up to the second you hit **Stop**. The VR240 is not recording anywhere.

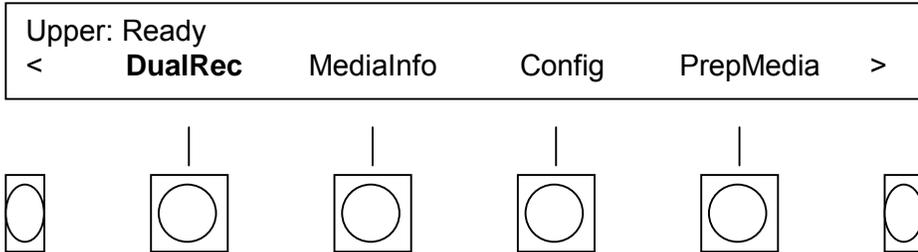
### 5-9.4 Begin The Dual Record Operation.

With both drives loaded and positioned for recording:

- a. Press the > (next) soft key.



- b. Press the **DualRec** soft key. To stop recording on both drives, press the **Stop** transport control key.



When you hit the **Stop** transport key while recording and then either the **Stop** or **Suspend** soft keys, *neither* drive stops. Instead, a new soft key menu appears giving you the options of **StopUpr (suspendUpr)**, **StopLwr (SuspendLwr)**, **Stop Both (Suspendboth)**. This is a safety feature. It prevents you from accidentally stopping all recording with a single key press.

## Section V. DETAILED DESCRIPTION OF RECORD OPERATION

Sections III and IV covered the operations you might want to do either while recording or before actually recording on the drives. When the recording is stopped, all of those operations and many others (including Config) are available. Once you start recording, the selections are limited. The reasons for this include the fact that it is undesirable or inappropriate to perform certain functions while a recording is in progress. For example, you cannot and should not change a descriptor in the middle of a recording. Once you press the **Rec** transport key, only these limited selections are available.

### 5-10. OPERATION DURING RECORD.

After hitting **Rec**:

The **Display** now shows the status of the upper and lower drives. At least one will be recording, and next to the display of the recording drive are these items:

**Time and Date:** This is simply the actual time and date being recorded on the media. It should agree with your local (or UTC) clock time depending upon how you set the clock.

**Media Counter:** This is a 4-digit number that reads 0000 at the beginning of the media, and progresses in proportion to the amount of data recorded. The counter shows how much data has actually been recorded. The number can be regarded as a percentage of the media available, with 9918 being approximately 100%. The counter takes storage capacity into account. A DDS cassette and Rewriteable DVD-RAM disk reach the end at about the same count even though the number of channel hours will vary.

### 5-11. MEDIA COUNTER AND DRIVE SWITCHOVER.

The media counter provides valuable information on how much media there is remaining. When the media counter reaches approximately 97%, (equal to approximately 500 channel hours on a 120M DDS), and *if you have another media in the second drive ready to record*, the VR240 will switch over to the second drive at this time. Note that this switchover occurs before the media is exhausted.

If you do not have another media ready to record, the VR240 will continue recording on the current drive until it cannot record any longer. After the media counter reads approximately 9000, the **Almost Full** LED next to the channel status array will blink and the unit will start to beep regularly (providing that the alarm volume is not set to 0) indicating that the media is **Almost Full**. Recording will continue as long as possible. Eventually the media will end and the unit will stop beeping and the **Full** LED will light indicating **Media Full**. (If recording ceases after the **Almost Full** point, the media will rewind and eject or not depending upon the setting of **Media Usage** and **Lock**.) Just as analog media have lengths that vary somewhat, digital media do not have identical capacities. Not only do media have slightly different lengths but, less obviously, the quality of the media also affects recording time. Tapes with more dropouts will require more retries, and will store less data. Thus, you cannot predict with certainty how high

over the programmed switchover point the counter will be able to go. As you become familiar with the operation of the unit, you will get a good idea of how much the counter advances between convenient manual switchover times. You can then plan the best time to change the media.

Note that the unit behaves as described above only when it has *been recording* and reaches the (Almost) Full point. You cannot start recording manually beyond this point. If you attempt to, the recorder will tell you that the media is already fully recorded.

A few more points about drive switch-over: If you do have a dual-drive unit but there is no media ready in one of the drives, it will record the same way as a single drive unit. However, you can, even while the drive **Full LED** is blinking, use the second drive to format and load new media. If you do, the drives will switch over just as soon as the media in the second drive is ready. If you have two VR240s, you can make a simple interconnect cable that will allow them to behave, in effect, as a dual-drive unit. When one stops recording, it sends a message to the other one telling it to start. The other one will start *only if it is in **Ready** mode with media loaded*. You need not be concerned during this process as the internal hard disk will continue to record to capacity while you load and format new media.

### **5-12. AUTOMATIC MEDIA FORMATTING.**

The VR240 permits you to use the second drive to manually format media while recording on the first. As an additional convenience, media will be automatically formatted under certain circumstances. If (and only if) one drive is recording, the second is primed to format media without manual intervention when blank media is inserted. This allows you to insert new media, walk away, and come back later to do another without wasting time waiting for it to be loaded. The automatic formatting feature may be defeated, if desired, by deselecting it during configuration. This manual assumes that it has NOT been defeated.

If you insert new media, it will be unreadable by the drive, and will be formatted immediately upon loading. If you insert media that was previously formatted on the same VR240, it does not need to be formatted (unless the descriptors are changed) and will be loaded.

If you insert media that was previously formatted on a different VR240 (or if the descriptors have changed), a message, **MEDIA WILL BE FORMATTED**, is displayed for several minutes, giving you a chance to change your mind and eject it. Because of this feature and other opportunities for accidents, we strongly recommend that you write protect any media that you do not wish to record on any time you insert it in the VR240. Write protecting the media unconditionally prevents it from being erased.

### **5-13. OTHER OPERATIONS DURING RECORD.**

In addition to the date, time, and counter, other functions are available while a unit is recording. Use the **Drive** soft key to select either drive or the internal hard disk. Different functions apply to and are available from the recording drive, the ready drive, and the internal hard disk. As you select each one, menu options on the VFD display will change to what is available from each position. Functions that apply to a second drive will only be available on dual-drive VR240s.

### 5-13.1 Operations Available During Record With The Recording Drive Selected.

Press the **Menu** soft key for access to these features:

**Recall** pressing the **Menu** soft key, then the **Recall** soft key accesses the **Instant Recall** feature. Recalling during record allows the replaying of a previous passage on any selected channel while the VR240 continues to record. This is particularly useful when the recording is being monitored in real time. When **Recall** is activated and a channel is selected, the available time frame to listen to is backed up 30 seconds from the current time. From there, selecting **Pause**, **Rew**, or **FForward** enables the operator to quickly locate a selection to listen to. Refer to the detail procedures in paragraph 5-25.

**Monitor** monitor activity on one, several, or all channels simultaneously. Refer to paragraph 5-6.

**SetMem** (Set Memory) marks a specific location on the media enabling you to locate that spot later using the Search/Memory# function. **SetMem** is a “scratchpad” memory that automatically records the time, date, and location-on-media of the material to which you’re currently listening. This mark is temporary in that once the media is ejected, the mark is erased.

You can activate the **SetMem** while recording, playing, or paused. When you do the bottom line of the display asks you to select one of the four memory locations available. Press the > (next) soft key, then the **Cancel** soft key to exit without setting a **SetMem** location. Refer to paragraph 5-26 for procedures to set a memory location.

You can think of the memories as “scratchpads” for recording the precise time and date of material of interest. Because the precise location of the material is known, the media can be directed to go directly to the data-block requested, instead of forcing it to scan the general area. This can greatly reduce the time required to locate the material.

There are four memories for each drive on a dual drive machine so that if you set **Memory1** for the upper and lower drive, they will find the correct material even if the times and dates are different for each media. The memories are cleared when the associated media is ejected. So if you wish to refer to the same material later, you should write down the information that you saved in the memories.

**SaveMessage** The VR240 has areas set aside for message storage buffers. These numbered locations can be used to store recorded material for future playback. The recorded audio from the command time backwards on the selected channel will be saved into the next vacant “Save Message” buffer. The re-recording will continue until 8 channel minutes of audio has been stored. If all sixteen buffers are full, the new message will be recorded over the oldest saved message.

## **Model VR240 Audio Logging Recorder**

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Press the **Menu** soft key, then the **>** soft key, for access to these additional features:

**ActvSumry** (Activity summary) Transmits a summary of record channel activity to the optional status printer (if the unit has been configured to use the status printer). Please refer to Appendix F for information on this feature.

**TimeAdj** (Time Adjustment) Use this to “spring ahead” the internal clock at daylight savings time. **DO NOT USE** this to “fall back” unless you have removed the recording media and stored it away. Setting the time “back” seriously disrupts the index process of the media and prevents you from searching both the drive and the internal hard disk for that period of time. Eventide recommends that you do not change the clock for daylight savings time. If you set the clock ahead in the spring, you may have trouble in the fall. Setting the clock back will result in two hour-long sections of media with the same time, making searching difficult.

**ChangDrv** (Change drive) tells the unit to switch to the second drive without waiting until the normal end of recording on the first drive. If you press this button when there is no media available to change to, the message “Cannot swap recording drive at this time” is briefly displayed. This option will not be displayed if you are in Dual Record mode.

**Lock** Under the **Controls** menu, **Lock** lets you prevent access to all functions except Instant Recall. You are asked to **Enter Password:** which is an eight-digit number, either “00000000”, or your password.

**Keypad Entry:** If you enter the correct digits, the unit will be locked and the controls rendered inaccessible until the same eight digits are re-entered, at which time **Lock** is canceled.

If you do not enter the correct digits, the message **Password incorrect-Keyboard NOT Locked** is briefly displayed.

**Cancel:** Hitting this key cancels the locking process and drops back to the main record menu after briefly displaying **Lock Canceled – Keyboard NOT Locked**.

While the unit is locked, it will continue recording normally, providing media continues to be available. You can tell that the unit is locked because the legend “Locked” appears along the top row of the VFD display. If a drive is not loaded, media can be inserted. It cannot, however, be removed.

### **NOTE**

If the unit is **LOCKED** and set to **Do NOT record over...**, media will not be ejected when it is fully recorded. This is true even though it normally would be ejected based on the setting of the **Config/System/Media Usage** menu. In order to continue recording, a person who knows the password must **UNLOCK** the unit, remove the media by selecting the drive and then pressing the **Eject** transport key, and either reinsert or insert new media as desired. Afterward, the unit may again be

**LOCKED** if desired. The only time that media will be ejected from a **LOCKED** unit is when the media is defective and cannot be recorded.

To **UNLOCK** the machine, simply enter the password on the keypad. You must press the correct 8 digits in the correct sequence; all other key-presses are ignored.

### 5-13.2 Operations Available During Record With The Idle Drive Selected.

**GoTo** You may search and play current or archive media in the Ready drive. Be sure that archive media is write-protected to avoid the risk of accidentally recording over it. Instructions for performing a search function are covered in detail later on in paragraph 5-18.

**PrepMedia** (Prepare media) accesses the formatting routine. New media or previously recorded media can be formatted on the ready drive without stopping the record process on the other drive or the internal hard disk. (Note: It is not necessary to reformat the media to reuse it.)

**Resume** When you have completed your review of the current or the archive media, you can continue recording on the current media by using the **Resume** soft key. When non-write-protected media is inserted in a drive, the **Resume** key acts just like the **Record** transport key except that it will automatically run the media to the end of the data area first. Thus, it will append data to the media instead of recording over it from the beginning. (If the media has been recorded beyond the **Almost Full** point, **Resume** will give you a message and exit.) If you hit the **Record** transport key instead of resume, the VR240 will ask if you wish to resume.

### 5-13.3 Operations Available During Record With The Internal Hard Disk Selected

**Playback:** The VR240's hard disk provides full record buffering and playback simultaneously. Therefore, you may search and play material from the hard disk while it continues to record and transfer data as normal. Use the **Drive** soft key to select the internal hard disk. The top line of the display will read "DISK: Ready." Press the > (next) soft key, then press the **Playback** soft key.

The transport keys will be active while playing from any of the locations listed below. You will find that the VR240 reacts to the Play, Pause, Fast Forward, Rewind and Stop commands in a way that is very similar to the reel-to-reel recorders you are accustomed to. You also have available advanced playback options like Scan, Next Message, and Search.

To play messages stored in the Record Buffer, a Save Message Buffer, or the Clipboard. Press the **Playback** soft key then use the **Previous** and **Next** soft keys to scroll through the options listed below. Finally, press the **Select** soft key. After a moment, the VR240 will return to the Playback menu. Press the **Play** transport key to begin playing.

**Record Buffer** – Selecting the Record Buffer allows you to search and play the last 550 channel hours of recorded data (or more if you have an optional, higher capacity hard disk installed). To begin playing audio from the start time of the record buffer, press the **Play** transport key. To first select a specific time/date to play, press the **GoTo** soft key. To end your Playback session, press the **Stop** transport key twice.

**Clipboard** – The clipboard is a temporary storage area on the hard drive. It is very useful for intense searching and playing archive material stored on DDS tape. It allows you to store the contents of the tape onto the “clipboard” section of the hard disk so that you may scrutinize the material quickly and easily. This feature is also useful for those with Rewriteable DVD-RAM drives even though the optical disks can be searched as quickly as the internal hard disk. For example, you may want to transfer data from the optical disk to the VR240 clipboard buffer so that you can return the disk to permanent storage. You may re-record up to 2.18 channel hours of data into the Clip Board. After pressing the **Playback** soft key, select the Clip Board option. You will find this feature most useful when an incident recorded on a DDS cassette needs to be reviewed in depth – this is easier to do from the hard disk. To begin playing audio from the start time of the Clip Board, press the **Play** transport key. To first select a specific time/date to play, press the **GoTo** soft key. To end your Playback session, press the **Stop** transport key twice.

**Saved Message Buffer** – While pressing the **Next** and **Previous** soft keys you will have the option of selecting Msg 01 through Msg 16. These are Save Message Buffer numbers assigned to previously stored material (see “SaveMsg” below for information about saving messages to these locations). To end your Playback session, press the **Stop** transport key twice.

**Monitor** You may monitor activity on one, several, or all channels simultaneously. Refer to paragraph 5-6 for step-by-step procedures.

**GoTo** Pressing the **Search** soft key from this position will give you instant access to the material recorded on the hard disk (if the Record Buffer has been previously selected during playback). Press **GoTo** and then enter the desired time/date and channel number.

**SaveMsg** The VR240 has areas set aside for buffers. These buffers can be used to store recorded material for future playback. The recorded audio from the command time backwards on the selected channel will be saved into the next vacant “Save Message” buffer. The re-recording will continue until 8 channel-minutes of audio has been stored. If all sixteen buffers are full, it will re-record over the oldest saved message.

**Lock** See this same heading located above under “Operations available during Record with the recording drive selected”.

**Time Adj** See this same heading located above under “Operations available during Record with the recording drive selected”.

#### **5-14. ROUTINE RECORD OPERATION.**

This completes the description of the **Record** mode. In normal operation, it is likely that almost none of this information will be used with any frequency. Once installed and operational, the VR240 requires essentially no attention. If your mode of operation is typical, you will simply press the **Record** transport button and periodically remove and replace media, a matter of a few seconds each. If you do not enable the security feature, all you have to do is establish the media replacement period, and this will probably become predictable after a few weeks of operation.

With a single drive unit, you will probably want to change the media on a fixed schedule without waiting for the “alarm” to alert you to an almost-full condition. At the change time, you will press the **Stop** transport key followed by the **Suspend** soft key, then the **Eject** transport key. Once ejected, you will insert one of the media you had previously formatted, wait for it to load, and hit **Record** again.

A dual drive unit is even less effort. Assuming you have selected **Do NOT record over prev media** under the **Media Usage** menu and have not **Locked** the recorder, all you have to do is periodically remove the recorded media that has been ejected and replace it with new or used media. (If you have configured “**on**” for Automatic Formatting and you insert media that needs to be formatted, it will even be formatted automatically, providing you are *recording on the other drive*. This applies to unformatted media as well as media formatted on other VR240s.)

And finally, if you have selected **Record over previous media** from the **MediaUsage** options on a dual drive unit, you need do nothing. In this case, recording will switch from deck to deck until it is stopped. If you are using DDS cassettes and select this mode, it is important to remember to change the media after approximately 10 passes, and to follow the recommendations for cleaning the drives. This will avoid the possibility of tape (and drive) degradation due to excessive wear. This is not the case with Rewritable DVD-RAM disks as you can re-record over them indefinitely and the drives do not require cleaning.

If the optional label printer is connected and media is ejected after having been recorded on, a label is printed for the media. A label can also be requested manually if desired. Operation of the optional label printer is described in Appendix E.

#### **5-15. SUSPEND RECORDING ON A DRIVE.**

There are certain occasions when it is desirable to suspend recording on a drive so that you may use it to search and play currently loaded or archive media or to format new media. This feature is particularly useful if:

- a. The logger is equipped with a single drive only.
- b. You are recording the same data on both drives simultaneously.
- c. You wish to search and play recorded material that is on the currently recording drive but no longer exists on the internal hard disk.
- d. It is time to clean the drive.

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The VR240 logger allows you to “suspend” recording on the drive so that you may temporarily use it for other purposes. You then “resume” recording when the drive is available.

During the normal course of operation, the logger buffers data onto the hard disk before transferring it to the drive. Once the drive is instructed to resume recording, the logger automatically prepares the media for the next data transfer. The “resume” command is sufficient to begin the record process. No further user intervention is required. The drive status on the display will first read “fast-forward to end”, then “Recording.”

The suspend/resume function is activated in the following manner:

- a. Press the **Drive** soft key until the desired drive is displayed on the top line of the VFD display.
- b. Press the **Stop** transport key.
- c. Press the **Suspend** soft key. The logger will now suspend recording to the drive. The hard disk continues to record.
- d. You may now search the drive or press the **Eject** transport control after the drive has stopped and the display indicates that the drive is ready. If desired, load archive media for search and playback or new media for formatting.

**Note: Be sure to write-protect your archive media to protect against accidental erasure.**

### **5-16. RESUME RECORDING ON A DRIVE.**

- a. When you are ready (and if applicable, you have reloaded the original media back into the drive), then press the **Resume** soft key.
- b. The logger now prepares the media for the next transfer of recorded material from the hard disk. The record process will automatically proceed.

### **5-17. DESCRIPTION OF SEARCH AND PLAYBACK OPERATION.**

As with recording, there is a special menu available during **Play** operation. Some of the sub-menus are similar to those available from the main **Ready** menu, and some are unique to the **Play** operation. The Play functions for playing media on a drive, and playing from the record buffer on the internal hard disk are virtually the same. Here we will describe the functions in detail. Step-by-step instructions on their use is described in greater detail in paragraphs 5-22 through 5-25.

#### **5-17.1 Channel Status LED Array During Playback.**

While playing the drive, the channel status display on the LED array takes on a somewhat different appearance during playback. Your indications are:

<b>Green</b>	Indicates that the channel is enabled but there is no activity on it.
<b>Red</b>	Indicates that the channel is not enabled and there is activity on it.
<b>Orange</b>	Indicates that the channel is enabled and there is activity on it.
<b>Off</b>	Indicates that the channel is not enabled and there is no activity on it.

The display will indicate:

**UPPER (or LOWER) Playing** identifies the media transport in use, and indicates that the media is, in fact, in motion.

The **Media Counter** shows the approximate percentage of media used/remaining. A count of 1000, for instance, indicates that you are roughly 10% into the media.

The **Time** and **Date** are the time and date at which the media was recorded. The time readout is to the nearest second.

#### 5-17.2 Display Status Indicators While Playing From The Internal Hard Disk.

While playing material from the internal hard disk the display will show that you are playing the:

<b>Record Buffer</b>	Indicating that you have access to the previous or 550 channel hours or more, depending on the size of your internal hard disk.
<b>Msg XX</b>	One of the 16 messages previously stored in the Save Message Buffers
<b>Clip Board</b>	Material previously stored in the Clip Board

It will also show the time and date at which the material was recorded.

#### 5-18. SEARCH AND PLAY FUNCTIONS.

Use the **Drive** soft key to select the drive to which you wish to listen or the internal hard disk. Next, press the **Play** key in the transport control section. Doing so starts the media or internal hard disk in motion and places the **Playing** menu on the display.

**PlayChan** (Play channel) puts you in the Channel Enable menu, which gives you the opportunity to select the channels to which you wish to listen. You enable and disable channels in a manner identical to the method used to Monitor during recording. **Monitor** is explained earlier in paragraph 5-6.

The purpose of this function is to restrict the audio to the channel(s) you wish to listen to regardless of how many have been recorded. In this way you avoid cacophony on playback.

**GoTo** This gives you the ability to find a location on the media before having to play it. It is likely that you will want to start playing at a certain time/date, and the VR240 makes this easy. Regardless of whether it is activated from **Ready** or while the media is playing, the **GoTo** menu operates the same way.

**GoTo** enables a submenu that allows you to search for a particular **Time and Date**, to locate the first and subsequent occurrences of information on an enabled **Channel**, or to return to one of 4 user-specified **SetMem** locations.

**Time/Date** To search for a particular time and date on the media, hit the **Time/Date** soft key and then enter the information requested. Use the **Cursor** and **Increase** or **Decrease** soft keys to enter the time and date. You may also use the **Cursor** soft key in conjunction with the keypad.

**Channel#** Operates identically to the other channel selection menus, such as **Monitor**. By selecting (enabling) specific channel(s) you can search for signals on them while ignoring others. If you use this option and have not made a channel selection, press the **PlayChan** soft key for access to the **Enable** menu. In order to use this feature, the media must have a full index. If the index is not present, or only the **FAST** option was used to recreate it, a message will instruct you to create a **FULL** index before performing a channel search.

**Memory#** Allows you to find a previously selected location on the media (not available for marking locations on the hard disk). If you have set one or more memory locations while playing media, you can return to them rapidly by using this feature. Refer to paragraph 5-26 for procedures on setting memory locations.

Hitting **Memory#** allows you to select one of four memories for which to search. If the memory has been set, it will display the time and date for which the search will be conducted. If the memory has not been set, this will be indicated.

Once you have entered the memory #, search time and/or channel #, you can hit one of two keys:

**Start** Commands the unit to search for the location selected. When it is found, the VR240 will stop searching. After pressing the **Play** transport key, the VR240 will begin playing. If you have entered a search time that is before the beginning of the stored material, the display will indicate **NOT Found** and drop back two levels to the main **Play** menu, at which time the media will be **Paused**. Because the media index contains the start time, this occurs immediately; you do not have to actually wait for the search to proceed and then fail. At this time, you can hit **Search** again if you wish. Selecting a time that is between the start and end time but is not actually present, as can happen if your recording is not continuous, will result in finding and playing the first material found

after the selected time. Finally, searching for a time after the end of the media will result in a **NOT Found** message, which may occur immediately, or may require an actual search to determine. Pressing **Cancel** after initiating a search aborts the search as quickly as possible, leaving the media at an undetermined location.

**Cancel** Returns you to the **Search** menu.

Note that when you select the **Search** menu, any play operation in progress is interrupted, just as it would be if you pressed the **Pause** key. If, however, the **Search** was unsuccessful, the unit will enter the **Pause** mode upon exiting search. You can resume playing by hitting the **Play** transport key, or by re-entering your search **Time/Date** and finding a location on the media. An additional indication that the media is **Paused** is the simultaneous illumination of the **Play** and **Stop** transport key LEDs.

The time required to **Search** for a particular location on media is not directly proportional to the distance away it is from the present media location. The media in the digital drive actually moves quite rapidly. A complete physical rewind requires well under a minute. However, additional overhead and media positioning is required. The combined effect is that a search for a nearby location might take longer than expected, and a search to the other end of the media might take less. Searching to any time on a 120-meter DDS typically requires under a minute. Searching can take significantly longer under two circumstances: If the media is very sparsely recorded, i.e., there are large time gaps between any information; or, if you are searching by channel and there is a long distance before any information on that channel. Searching the internal hard disk or a Rewriteable DVD-RAM disk uses completely different technology that allows a search point to be found almost immediately.

**NextMessage** Press this key to step through messages as they occurred from the search time forward. The VR240 looks for pauses between messages and uses them as an indication of where one message ends and another begins.

**Scan** **Scan** gives you the opportunity to perform a “local” fast forward and rewind, and to watch the time while doing so. Audio will play if present on the channel selected. Hitting **Scan** presents a submenu with the following choices:

**BackOneSec** (Back one second) Gives you the opportunity to move backwards and, if you wish, to replay a short segment of material. Because the digital drives will not play backwards, the VR240 stores the most recent segment of media information in a “buffer memory location” on the internal hard disk. Hitting **BackOneSec** steps backwards through this memory a second at a time. (Holding the key down steps backwards faster.)

You cannot step backwards beyond a certain number of seconds. This time period is determined, in part, by how many channels are stored in the buffer. The more channels, the shorter the period. At most, several minutes may be reviewed. If you press or hold the key and no more buffered data is available, the message **can NOT examine back any further, use GoTo** is briefly flashed on the display.

**Advance** Allows you to listen to the audio as you move forward at (relatively) high speed through the recording, starting at the point at which you hit **Advance**. The speed depends upon how many channels are recorded. If you have one or only a few channels, the scan will proceed many times faster than it would if you listened to the media.

The **Advance** key starts the media in motion and blanks the remainder of the **Scan** menu.

**Pause** stops the forward motion of the media and toggles back to the **Scan** menu from which you can again go forward or backward while watching/listening to the audio.

The media counter and time/date display operates erratically in **Scan**. This is because at any given time you can be examining data from the media (fast), or from the memory (very fast), or waiting for the media to reposition (slow).

Pressing the Play soft key starts the media playing from the location last shown. Note that, when you hit **Play**, the menu drops back one level to the main **Play** menu and the **Scan** soft key is available. Then while playing, the Pause soft key is available. This allows you to toggle between **Play** and **Scan** very conveniently. This feature, along with the **Reverse** soft key makes it easy to play and replay a particular segment of the media with a minimum of key presses. Example:

You have reached 17:19:30 while playing, and you heard something you want to listen to carefully. Being in the **Play** menu, you can hit **Scan**. Once done, hit (or hold) **BackOneSec** until you go back to what you heard. Now hit **Play** on the same menu, which will give you access to the **Scan** soft key. This procedure is easier done than said: You only have to press two keys to repeat a segment, and it becomes intuitive very quickly.

**SetMem** Allows you to “mark” a location on the media (not the internal hard disk) for subsequent relocation by **GoTo**. It is a “scratchpad” that automatically records the time, date, and location of the material to which you are currently listening. You can hit this key either while playing or when the media is paused. When you do so, the bottom line of the display gives you the option of selecting one of four memories in which to store the current location. You can select one or hit the > soft key, then **Cancel** if you change your mind. Doing either will return you to the **Play** menu. You can set up to four memories for each drive. Refer to paragraph 5-26.

## **5-19. SIMULTANEOUS PLAY AND RECORD, AND RESUME.**

You can, by selecting the appropriate **Drive**, play back on one drive while recording on the other. You also have the option of selecting the **Internal Hard Disk** on which you can play back without interrupting its record/ data transfer activity. If the selected drive or the internal hard disk is playing, the menu options appropriate for that operation will be displayed. If the selected

drive is recording, those menu items will be displayed. You can play archive media while you are concurrently recording. By using the **Dual Record** feature, you can record material on two media simultaneously. Should you need to review something before the media has run out, you can stop/suspend one, search its entire length for the needed material, and then resume recording on it. Meanwhile, the other media has continued recording uninterrupted.

To review media that has just been recorded using the **Dual Rec** mode, simply select the drive using the **Drive** soft key. Press the **Stop** transport key and then the **SuspendLwr** soft key. When you suspend a drive from recording it will be positioned at the end of the recorded portion. Hitting **Play** immediately will give a **Pause End** display. The rewind and **GoTo** operations work as usual once you have stopped recording. To review an archived media, you must first **Eject** the media that you have just suspended. (Ejecting recorded media will cause the label printer to generate a label. Since this is presumably not the media you wish to archive, you may want to temporarily turnoff the label printer before ejecting.) You can then insert the media you wish to review.

### **IMPORTANT**

While you are recording on one drive, there is always the possibility of uncommanded recording on the other drive as part of the normal sequential operation of the VR240. Be sure to set the write protect tab if you do not wish to record.

When you have completed your review of the current or the archive media, you can continue recording on the current media by using the **Resume** soft key. When non-write-protected media is inserted in a drive, the **Resume** soft key acts just like the **Record** transport key except that it will automatically run the media to the end of the data area first. Thus, it will append data to the media instead of recording over it from the beginning. (If the media has been recorded beyond the **Almost Full** point, **Resume** will give you a message and exit.)

This exhausts the options accessible while playing messages. The VR240 allows you quickly and easily to find and play back audio from any portion of the archive media.

### **5-20. IMPORTANT NOTE ABOUT WRITE-PROTECTION.**

**Write Protection:** The DDS cassettes and Rewriteable DVD-RAM disks have a write protect mechanism that unconditionally prevents their erasure by the VR240. By setting the plastic tab on the media, or properly positioning the switch on the optical disk, you can prevent any write operation. *As mentioned above, we recommended that whenever you are putting media that you do not want to record on the VR240, you set the write protect tab.* Under certain circumstances, the VR240 will automatically format media. It is always possible to hit the wrong button accidentally. Write protection is a specific defense against this particular version of Murphy's law, and is guaranteed to be safe and effective.

### **5-21. AUXILIARY OPERATIONS: COPY AND MAKE INDEX.**

The VR240 provides two additional capabilities. **Copy**, available on dual-drive VR240s, is an extremely convenient method of making digitally precise duplicates, including unit and serial

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number, of your archival media. This way you never have to relinquish control of your originals. Either single or dual drive recorders also allow you to recreate a media **Index** from media whose index is missing or corrupted, should circumstances so require.

### 5-21.1 Copy.

To have access to the Copy menu, one drive must be **Ready** and loaded with the source media, and the other **Ready** and loaded with the destination media. Use the **Drive** soft key to select the drive loaded with the source media, then press the **PrepMedia** soft key to access the **Copy** soft key and menu. As stated earlier, the menu options change as appropriate. In this case, you will not see the **Copy** soft key unless there is recorded media loaded in at least one drive and both drives are in the **Ready** state.

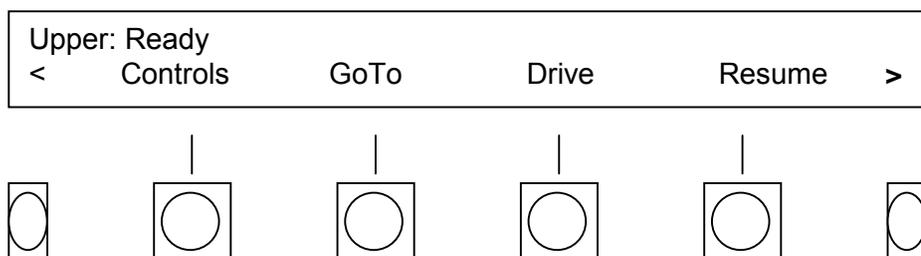
The **Copy** operation is a lengthy process. The destination media is formatted with the information on the source media, then data is read from the source in blocks and transferred to the destination. When this is complete, both media are rewound. If **WholeMedia** is selected, all data between the beginning and ending index times of the source material is copied to the destination, if possible. The time required to **Copy** is largely dependent upon how nearly full the source is.

The VR240 does not automatically prevent you from attempting to copy a larger medium to a shorter one. Of course, if you do this, it may not be possible to get all the data to the destination. Less obvious is the fact that a copy may not be complete under other circumstances. For example, if a media is recorded beyond the normal switch-over point (because there was no other media ready to record), the normal margin may be used up. In such a case, the destination media, even if nominally the same length may not have sufficient capacity to record everything on the source. If the destination media runs out before the copy is complete, it will still be usable but data will be missing at the end. The label and status printers, if used, will reflect the disparity in length between the media.

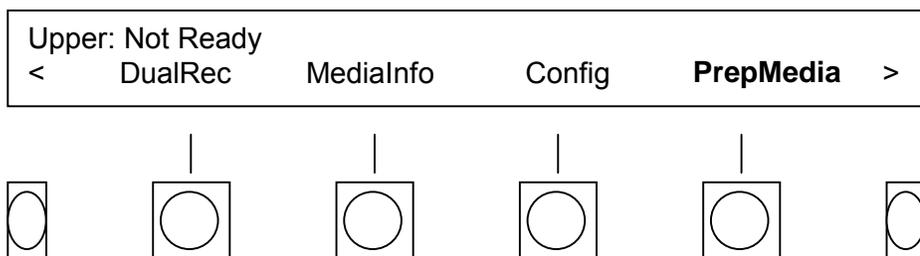
**Copy** selects as the source media that which is loaded in the drive selected using the Drive function key.

To access the **Copy** feature:

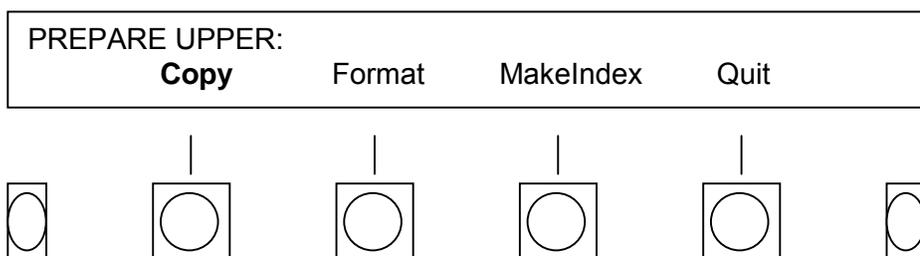
- a. Load your Source and Destination media into the drives.
- b. Use the **Drive** function key to select the drive in which the Source media is loaded.
- c. Press the > (next) soft key.



- d. Press the **PrepMedia** soft key.



- e. Press the **Copy** soft key

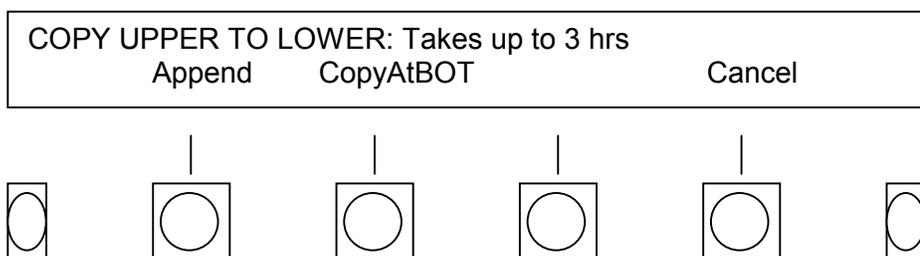


- f. The screen will now confirm that you have chosen to copy from the "UPPER TO LOWER" or visa-versa. If the screen does not display the copy path that you intended, quit the menu using the **Cancel** soft key. Use the **Drive** soft key to select the other drive.

**WARNING**

Accidentally selecting the source media as "destination" will irretrievably destroy any data on the source media. We strongly recommend that you write protect any archival media before you insert it in the VR240.

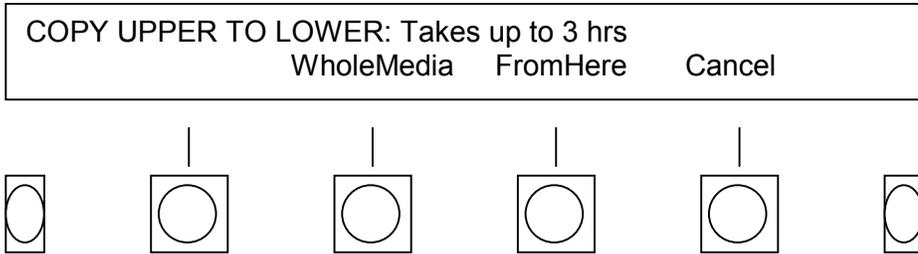
- g. The first two soft key options are:



**Append** In which case the source media is not rewound before the copy operation begins. If you position the source media at the beginning of a desired section, you can save the time and inconvenience of copying unnecessary material. This capability, along with the ability to cancel the copy before it is finished allows you to make digital copies of only a section of your source media. (Note that all recorded channels between the start and stop of the copy are transferred. You cannot copy material from selected channels only.) If you make a partial copy, the media counter on the source media will start from the “from here” location, while the destination will start at 0000. When the source reaches the media counter location corresponding to the last desired material on the media, you can hit the **Cancel** soft key. This stops the copy in an orderly way, leaving the destination media with a good index reflecting the new start and stop times of the desired material.

**CopyAtBOM** (Copy at beginning of media) In which case the destination media is rewound before the copy is initiated.

- h. Whichever of these two options you choose, your next screen will display your choice along with these two menu options:



**WholeMedia** In which case the entire source media is copied to the destination media.

**FromHere** In which case the copy begins from the current position of the source media.

- i. This selection, along with the direction of the copy will be displayed. At this point it is time to commit to the copy or cancel the procedure.

**Start** Begins the copy procedure.

**Cancel** Cancels the operation and the menu reverts back to the Home screen.

While **Copy** is in progress, you have access to the following functions:

**Lock** Allows you to prevent anyone from tampering with the unit while the copy is taking place. Hit this key followed by your password (or **Cancel** if you change your mind). If you **Lock** the unit during **Copy**, you must enter your security code again to unlock it.

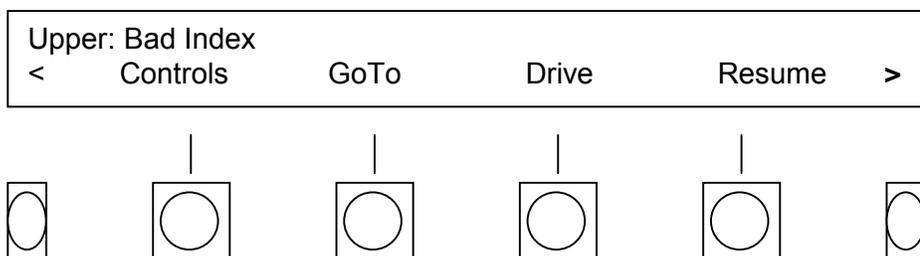
**CancelCopy** Stops the operation at the current point, and rewinds both media. The destination will have a valid index reflecting the beginning and ending times of the material copied, which may differ from those of the source media itself. If you attempt to cancel a copy at the very beginning of the operation, the destination media will not become Ready for several minutes as it is undergoing formatting.

5-21.2 Make Index.

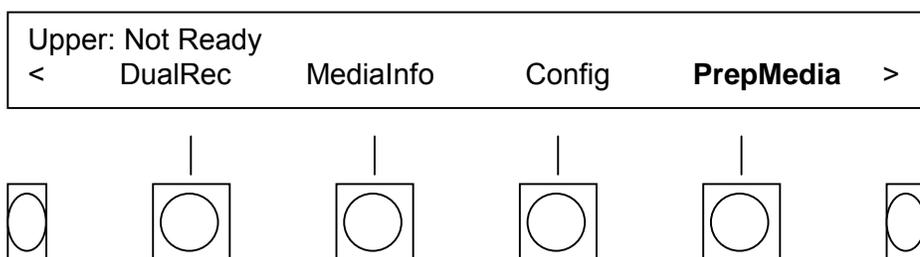
**Make Index** solves problems of media that has not been fully or properly recorded. Media can have a defective index when the recording is terminated abnormally. The most likely cause for this is a deliberate action such as shutting off power while recording. (The UPS does not protect against a deliberate shutdown.) It can also happen due to a hardware failure in a drive mechanism or if the UPS batteries are defective or discharged.

To access the **Make Index** feature:

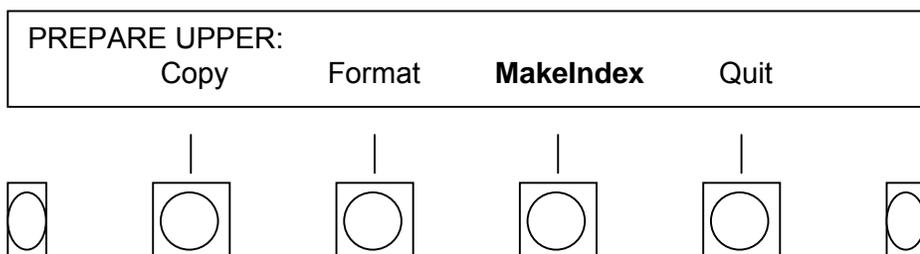
- a. Use the **Drive** soft key to select the drive in which the Source media is loaded. Press the > (next) soft key.



- b. Press the **PrepMedia** soft key.



- c. Press the **MakeIndex** soft key.



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Hitting **MakeIndex** gives you three choices, **Complete**, **Fast**, and **Quit**. It also displays a message, **INDEX UPPER: (LOWER:)** and, if the media has a valid index, **Already has a valid index**. Of course, if you see the **valid index** message, you should hit **Quit**.

**Complete** recreates the index just as it would be created if the media were actually being recorded. Nothing is left out. In order to do this, however, the entire media must be read, byte by byte, to ascertain channel activity in each media block.

**Fast** saves time by only indexing the beginning and ending of each media block. This prevents the necessity of reading every byte on the media. However, it does not pick up information about which channels have been recorded in each block. For this reason, you cannot search using the channel number option unless the **Complete** index has been created.

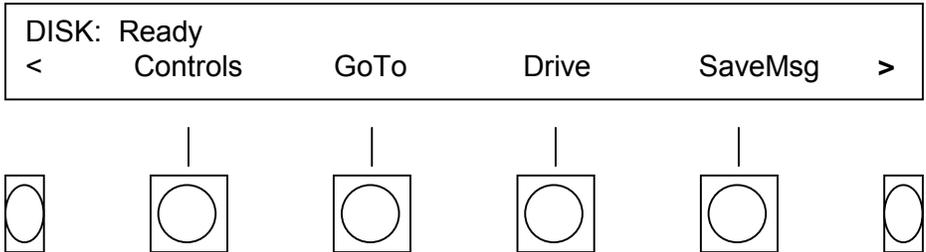
**Quit** cancels the **MakeIndex** operation.

Both **Copy** and **MakeIndex** recreate the index of a media whose index is bad or missing. (**Copy**, of course recreates it on the destination media.) Because **Copy** can be performed on a media that is write protected, while **MakeIndex** operates on the original media, you might prefer to use the former on an archival media to protect it from accidental damage. While damage is unlikely, the indexing operation is usually being performed on a “problem” media and it is impossible to guarantee that nothing will go wrong.

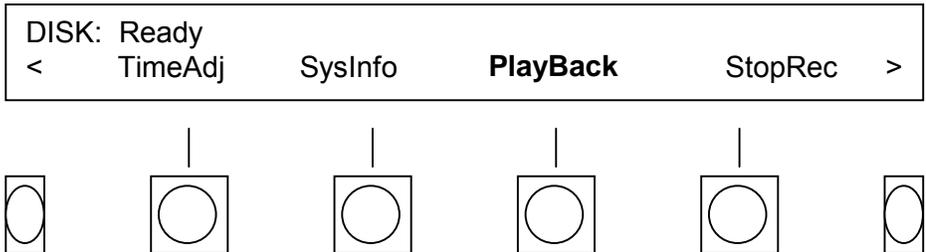
**5-22. PLAY BACK FROM THE HARD DISK.**

You may search and play the previous 550 or more channel hours (depending on the size of your internal hard disk) without interrupting the record process. While you are playing, the **Record** transport key will blink.

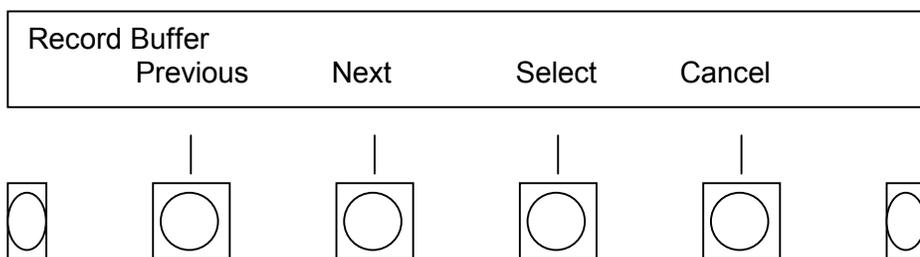
- a. Press the **Drive** soft key until “Disk: Ready” appears on the top line of the display. You have now selected the internal hard disk for playback. Press the > (next) soft key.



- b. Press the **Playback** soft key.



- c. If the display does not indicate **Record Buffer**, press the **Previous** and **Next** arrow keys until **Record Buffer** is displayed. Then press the **Select** soft key. After a moment, the display will indicate that the disk is ready and you may now search and/or play the hard disk.

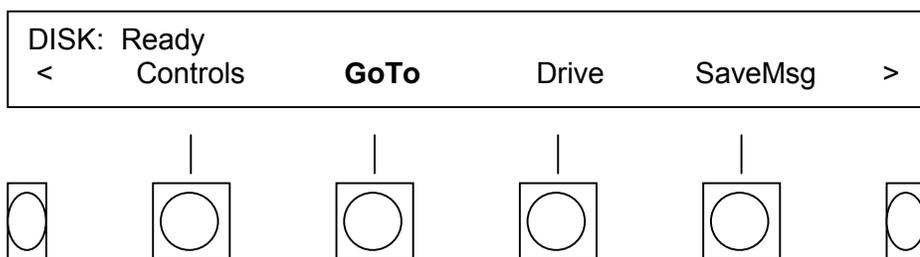


- d. To play from the beginning of the record buffer, press the **Play** transport control key. Then enable a channel or channels as explained in paragraph 5-23.

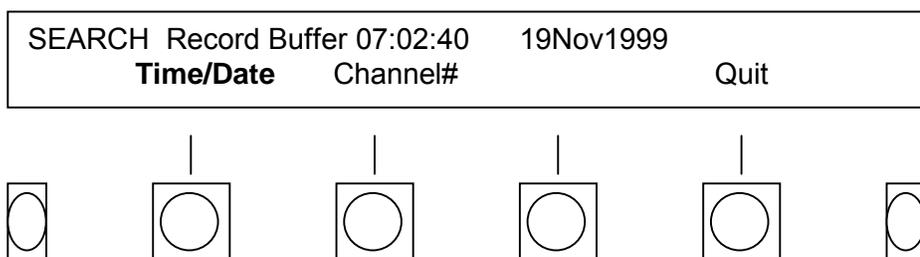
**5-23. SEARCH THE INTERNAL HARD DISK BY TIME, DATE, AND CHANNEL.**

With "DISK: Ready" shown on the top line of the display:

- a. Press the **GoTo** soft key.



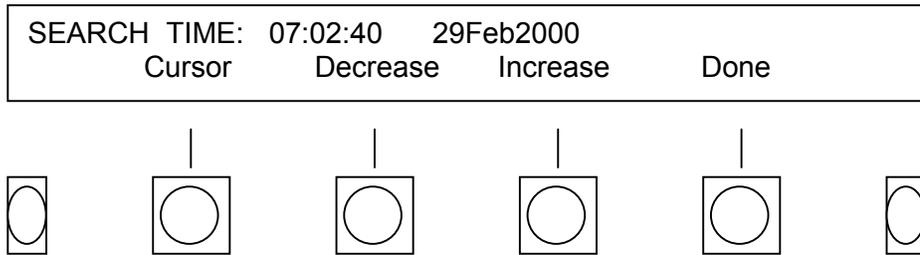
- b. Press the **Time/Date** soft key.



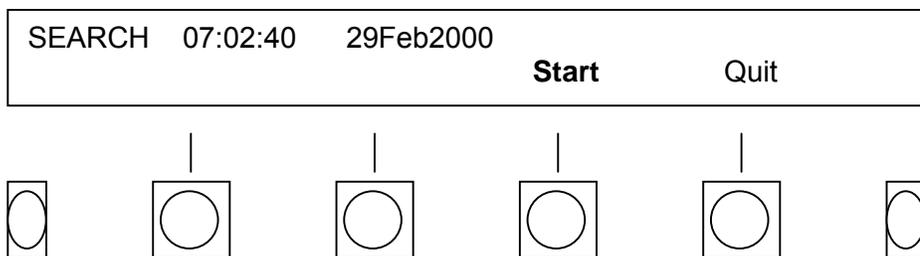
## Model VR240 Audio Logging Recorder

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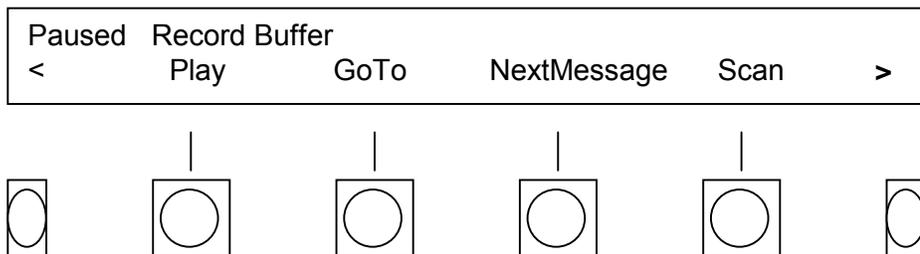
- c. Use the **Cursor** and **Decrease** or **Increase** soft key to enter the desired search time and date. The keypad may also be used to enter digits. Press the **Done** soft key.



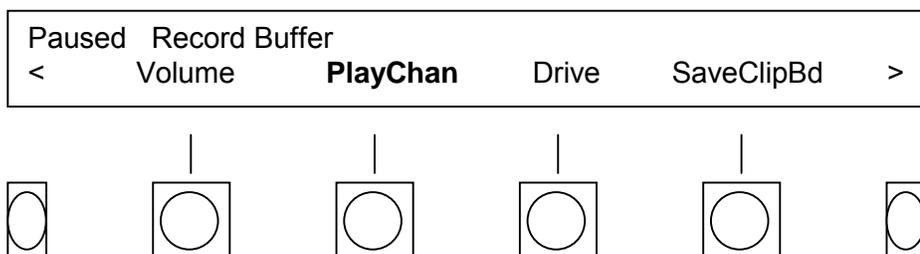
- d. Press the **Start** soft key.



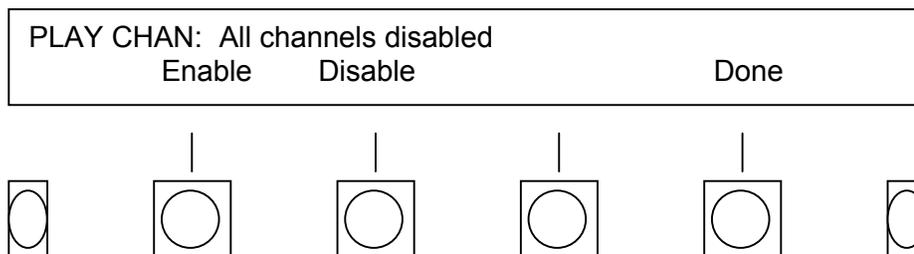
- e. Once the search time/date has been located, press > (next) soft key.



- f. Press the **PlayChan** soft key.



- g. Press the **Enable** soft key. Using a combination of the soft keys and the keypad, you may now choose a single or multiple channels for playback.



- (1) **To play a single channel**, select the channel number desired using the the keypad. Then press the **Enter** soft key.
  - (2) **To play back all channels simultaneously**, press the **All** soft key. Then press the **Enter** soft key.
  - (3) **To select multiple channels for playback**, use the keypad with the **Thru** soft key to choose a range of channels. You may use a combination of the **Enable** soft key and the **Thru** soft key to select individual as well as a range of channels to playback simultaneously. Individual channels will be separated on the display by a comma (for example 1,4,9); a range of channels will be separated by a dash (for example 1-5). Once you have selected your channels press the **Enter** soft key.
- h. Press the **Play** transport key to begin playing. Press the **Volume** soft key to adjust the speaker volume.
- i. To stop **Play Back**, press the **Stop** transport control key twice.

#### **5-24. PLAY BACK FROM THE ARCHIVE DRIVE.**

The VR240 allows you to play archive or currently loaded media without interrupting the record process. A unit equipped with dual drives typically has the benefit of an “extra” non-recording drive. Use this drive to search previously filled, archived media.

To search and play the drive, recording to the drive must be interrupted in the following two instances:

- You wish to play material that is present on the media in the archive drive, but is no longer stored on the internal hard disk.
- You have a single drive VR240.

In either of these cases, first follow the “stop-suspend” procedure instructions from paragraph 5-16 (SUSPEND RECORDING ON A DRIVE). This will notify the internal hard disk that the drive is not available for a data transfer. The internal hard disk will continue to record and store the information until the drive is ready to resume recording. You have 550 or more channel hours

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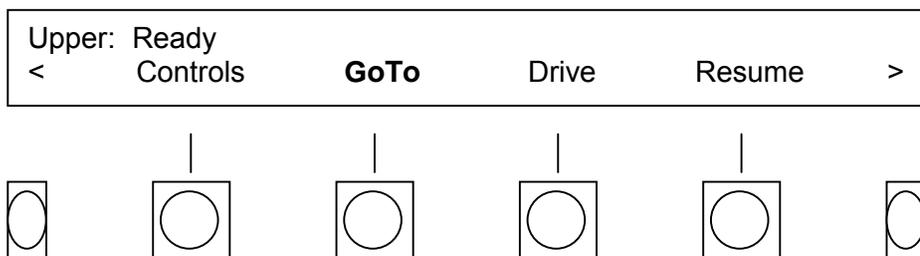
(depending on the size of your internal hard disk) to use the drive before the hard disk capacity is exceeded and data is lost.

### NOTE

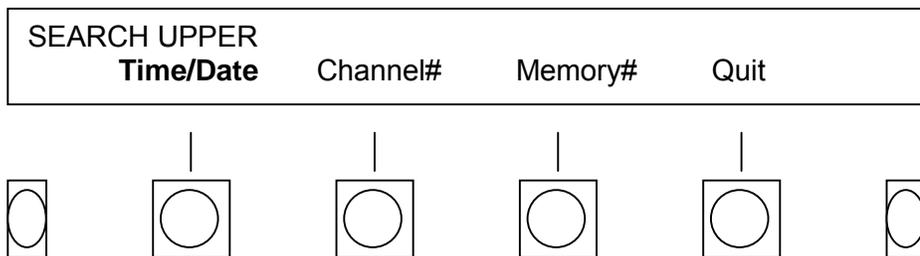
Be sure to write protect your archive media to protect against accidental erasure.

### 5-25. TO SEARCH THE ARCHIVE DRIVE BY TIME, DATE, AND CHANNEL:

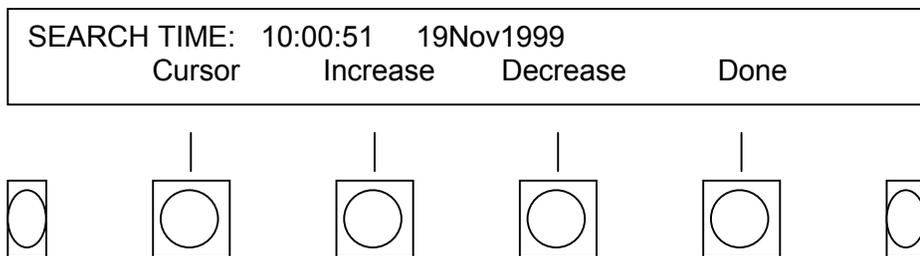
- a. Press the **Drive** soft key until the desired drive appears on the top line of the display. Press the **GoTo** soft key.



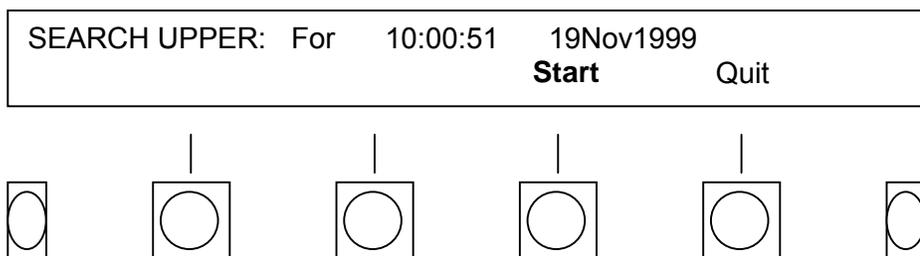
- b. Press the **Time/Date** soft key.



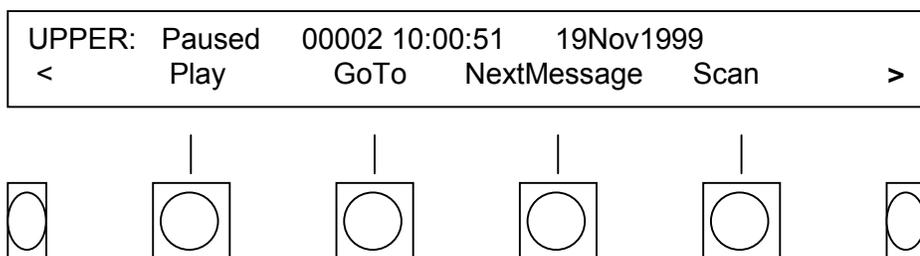
- c. Use the **Cursor** and **Decrease** or **Increase** soft key to enter the desired search time and date. The keypad may also be used to enter digits. Press the **Done** soft key.



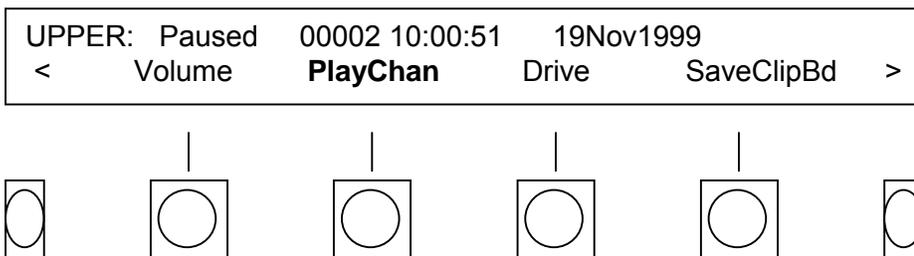
- d. Press the **Start** soft key.



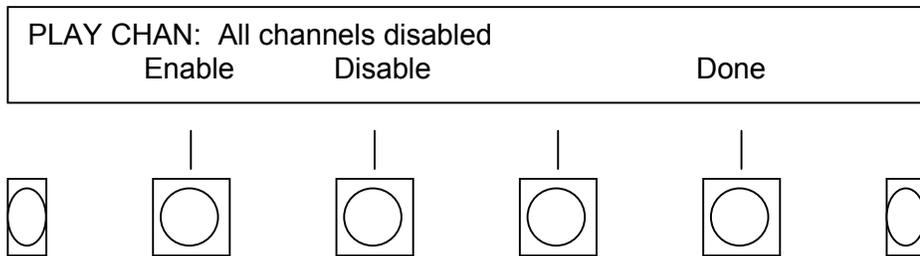
- e. Once the search time/date has been located, press the > (next) soft key.



- f. Press the **PlayChan** (play channel) soft key.



- g. Press the **Enable** soft key). You may now choose a single channel or multiple channels for playback.



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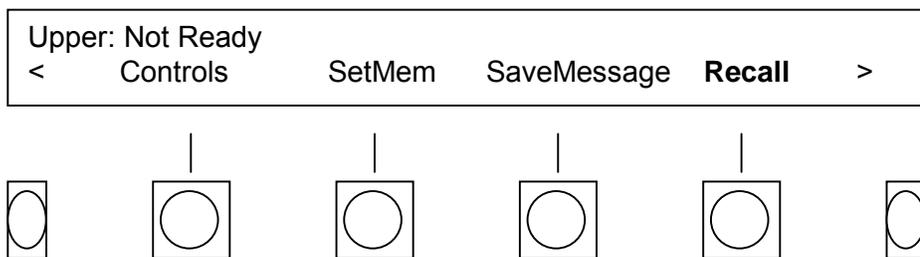
- (1) **To play a single channel**, select the channel number desired using the the keypad. Then press the **Enter** soft key.
  - (2) **To play back all channels simultaneously**, press the **All** soft key. Then press (the **Enter** soft key.
  - (3) **To select multiple channels for playback**, use the keypad with the **Thru** soft key to choose a range of channels. You may use a combination of the **Enable** soft key and the **Thru** soft key to select individual as well as a range of channels to playback simultaneously. Individual channels will be separated on the display by a comma (for example 1,4,9); a range of channels will be separated by a dash (for example 1-5). Once you have selected your channels press the **Enter** soft key.
- h. Press the **Play** transport key to begin playing. Press the **Volume** soft key to adjust the speaker volume.
- i. To stop **Play Back**, press the **Stop** transport control key twice.

### 5-26 INSTANT RECALL.

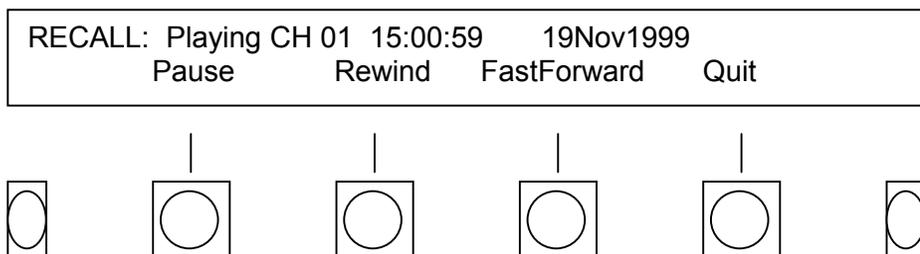
The Instant Recall feature is a convenient way to replay recent information from any channel. For Instant Recall you must be in the record mode with the recording drive showing on the top line of the VFD display. Use the **Drive** soft key to select the recording drive.

The following instructions will activate the Instant Recall feature:

- a. Press the **Recall** function key.



- b. The VR240 will automatically select channel 01 as the default. To select an alternate channel, use the **Previous** and **Next** soft keys. Once the desired channel appears on the display, press **Select** soft key.



**NOTE**

The VR240 will now search for 30 seconds back from the command time. Then it will begin playing on the channel selected.

You may now use the **Pause**, **Rewind** and **FastForward** soft keys or transport controls to review the selected material.

**NOTE**

- The rewind and fast forward speeds can be increased up to three increments by pressing the soft key or transport control key.
- Pressing the **Pause** soft key toggles **Playing** and **Paused** on the VFD display after **Recall**.

- c. To end your Instant Recall session, press the **Quit** soft key.

**5-27. SET MEMORY LOCATION.**

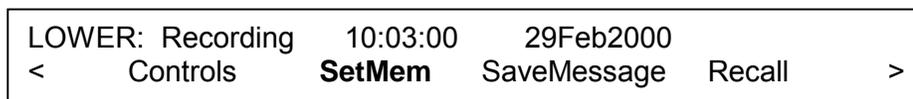
While recording or playing back on a drive you may mark a search point by using the **SetMem** (set memory) function. This selected point can be used as a search criterion when playing back from the drive.

**NOTE**

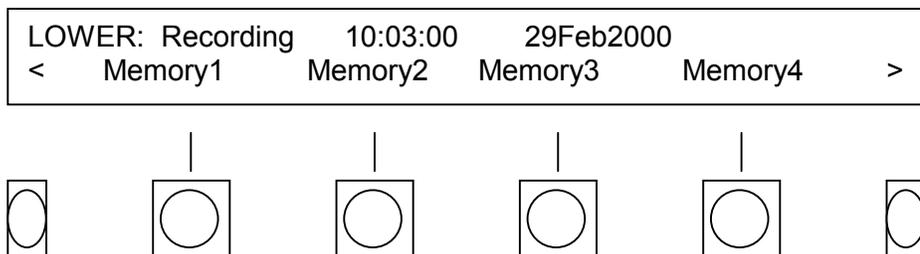
This is not a permanent mark on the media. Once you have ejected the media or disk, the mark is lost.

**5-27.1 To set a memory location.**

- a. Press the **Drive** soft key until the recording archive drive is shown on the top line of the VFD display. Play the drive and listen for the location you wish to mark. Once you reach the desired location, press the **SetMem** soft key.



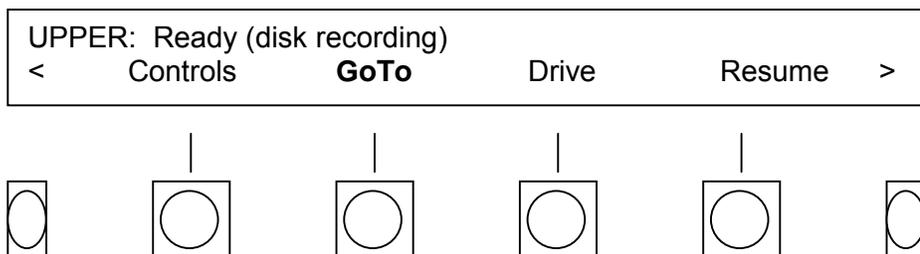
- b. Press the soft key under the memory location in which you wish to store the mark. You may want to note which location you choose, as you will be asked to select it when it comes time to search the drive.



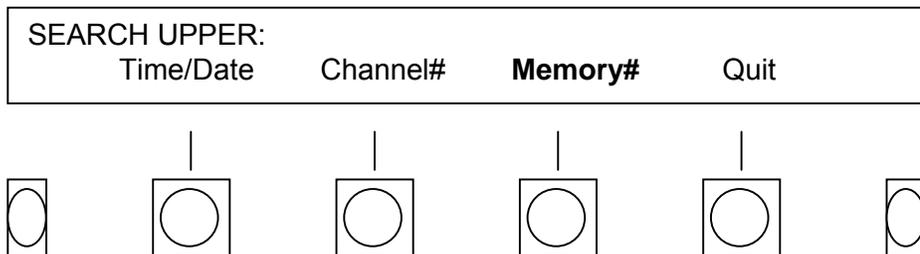
A mark is now made for the drive at the time, date and memory location you selected.

**5-27.2 To search and play a set memory location.**

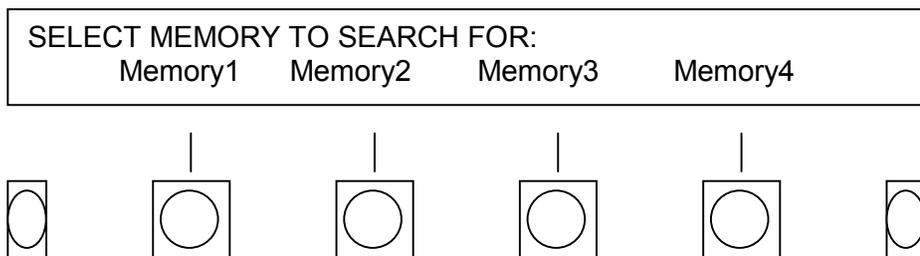
- a. Press the **Drive** soft key until the desired drive is shown on the top line of the VFD. NOTE: If the drive is currently recording, perform a stop-suspend routine by following the instructions given in paragraphs 5-15 and 5-16.
- b. Press the **GoTo** soft key.



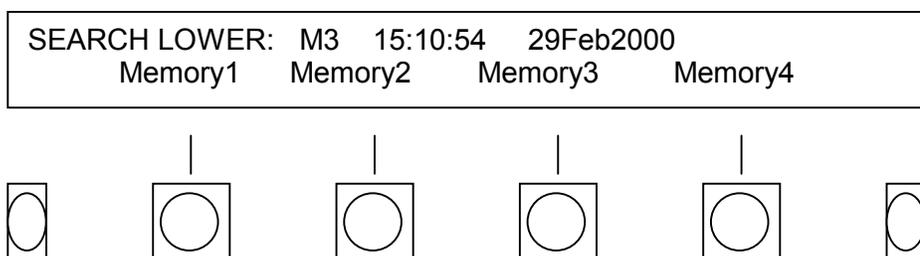
- c. Press the **Memory#** soft key.



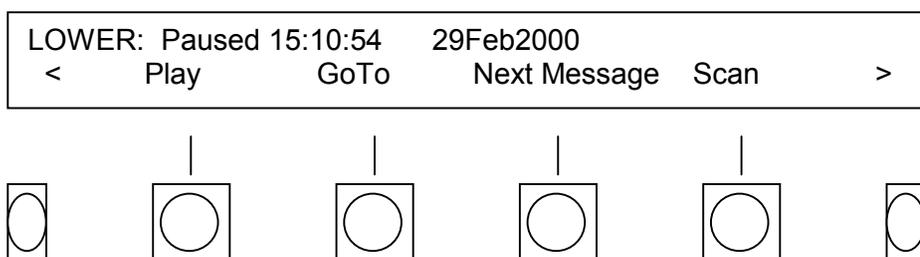
- d. Press the soft key under the memory location desired.



- e. Press the **Start** soft key. The VR240 will search for that location.



- f. Once the location is found, the screen will display the channel status along with the media location, time, and date of the memory location. Press the **Play** transport key to begin playing on previously selected channels.



- g. To select a specific channel for playback, press the > (next) soft key. Then press the **PlayChan** (play channel) soft key. Enable and disable channels as desired. This function is described in paragraph 5-24.
- h. To end your playback session, press the **Stop** transport control key twice. Then press the **Resume** soft key to return the drive to the record mode.

## **Section VI. KEY RECORD OPERATION FUNCTIONAL DESCRIPTIONS**

This section summarizes and highlights the differences in key recording operations.

### **RECORD-RECORD**

Record-Record is used when there is loaded formatted media in the selected drive. You are starting at the beginning of the media. When the **Record** transport control key is pressed, assuming you have enabled “record verify” during system configuration, VFD screen asks, “Start recording?” Recording begins when the **Record** soft key is pressed.

### **STOPPING RECORD OPERATION**

With the VR240 in Record Operation, the operator hits the **STOP** transport control key.

The VFD screen displays **Suspend** and **Stop** above the soft keys. Recording continues until one of these two soft keys is pressed.

### **STOP-SUSPEND**

With the **Stop-Suspend** feature, when the operator hits the **Suspend** soft key, recording stops on the media drive, but recording continues on the hard drive. The VFD screen displays that the selected drive is stopping. The drive can temporarily be used for other purposes.

### **RESUME-RECORD**

**Resume** is used to add on to media. When new formatted media is loaded, you do not want to use **Resume-Record**. You are starting at the beginning of the media. You are not adding to it.

If the **Resume** soft key is pressed, the logger prepares the media for the next transfer of recorded material from the hard drive. The VFD screen displays “Resume recording at the end of DDSa?”

If the **Record** soft key is pressed, the VR240 will fast forward to the end of the media and begin recording at the point where the media stopped.

### **STOP-STOP**

With the VR240 in Record Operation, the operator hits the drive control **STOP** key.

The LCD screen displays **Suspend** and **Stop** above the soft keys.

When the operator hits the **Stop** soft key, the VFD screen displays that the selected drive is stopping.

When the operator performs the **Stop-Stop** steps, the VR240 buffer transfers information from the hard disk to the archive drive. If the buffer is in the process of transferring, it will complete the transfer before the VFD screen displays “Ready.” If you eject the media, it has recorded only up to the second you hit **Stop**. The VR240 is not recording anywhere.

# APPENDIX A

## CLOCK ACCURACY, ADJUSTMENT AND TIME CODE INPUT

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### A-1. FUNCTIONAL DESCRIPTION.

Eventide manufactures a standalone, accessory clock/display unit. This clock obtains standard time from the Global Positioning System satellite constellation, and is usable anywhere in the world. It has a large, configurable display that shows a time display as setup by the user. The clock generates a time code for the VR240 that will keep the VR240 accurate with respect to UTC or local time indefinitely. Further information on this clock is available from Eventide. If you use this accessory clock, most of the information in Appendix A will be of little interest and can be disregarded.

The VR240 has a built-in battery operated clock. This clock maintains the time and date whether power is supplied to the recorder or not. It understands months with varying numbers of days and leap years, although it does not understand UTC leap seconds. Since knowing the time at which an event occurs or a signal is transmitted is central to the purpose of a logging recorder, we feel it appropriate to include this description on the performance of the VR240 clock.

The clock uses a crystal resonator operating at 32,768 Hz. This is divided digitally to create one-second ticks that are further used to count minutes, hours, etc. The accuracy of the clock is completely dependent upon the accuracy of the crystal oscillator. When we adjust the frequency of the oscillator at the factory, it is correct to better than .1 Hz, which corresponds to an accuracy of about 1 second every 4 days. Unfortunately, the crystal frequency is subject to drift over time, drift over temperature, and accidental miss adjustment. For these reasons, it is not reasonable to expect more than about 1 second per day accuracy. If the unit is being operated at unusually high or low temperatures, it could be significantly worse.

Your need for clock accuracy might range from absolute to unimportant. Of course, the relative timing between channels will remain essentially perfect regardless of the absolute difference between the VR240 clock and the Naval Observatory. If all you need is relative timing, errors of many seconds or even minutes might not matter.

There are several ways of increasing the accuracy of the time on the VR240. The most obvious is simply to set the clock against an absolute standard as often as necessary. To do this, you obviously need a standard. Here are several suggestions:

- a. If you are affiliated with a network or news service, they frequently provide time marks.
- b. Monitor one of the many short wave time standards available. Here are a few:

<u>STATION</u>	<u>LOCATION</u>	<u>FREQUENCY</u>
WWV	Boulder CO	5,10,15,20 MHz (exactly)
WWVH	Hawaii	15 MHz
WWVB	Boulder CO	60kHz (requires special receiver)

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CHU                      Canada                      7.335 MHz

- c. Call your local telephone company's time number.
- d. Log on to Internet at [www.bldrdoc.gov](http://www.bldrdoc.gov).

Another way is to adjust the internal clock for your location's temperature. You do not necessarily need an extremely accurate counter, although it should have very good resolution. Observe the clock for several days or weeks and note how much time it gains or loses. Let's say it is losing one second per day. This means that the frequency of the internal oscillator is 32768 multiplied by the number of seconds per day it is counting,  $(24 \times 3600) - 1$ , divided by the number of seconds in a day,  $(24 \times 3600)$ . Because the clock test point gives the frequency of the crystal divided by four, the frequency you should read will be 8191.905 Hz. If your counter reads this frequency as well, simply readjust the clock to give 8192. If your counter reads something else, just note the difference between the actual frequency (8191.905) and 8192, or .095 Hz. Readjust the oscillator to read .095Hz higher on your counter, regardless of what the actual frequency is.

Many modern frequency counters actually can read small fractions of a Hz quickly, by using a "multiple period average" time count and converting this count to frequency with their microprocessors. If your counter is an older model, you may have to explicitly use the multiple period average function if available, or a long "gate time" if it is not.

### **A-2. CLOCK FREQUENCY ADJUSTMENT PROCEDURE.**

Refer to the VR240 maintenance manual for the CPU-3 time clock adjustment procedure.

### **A-3. LITHIUM BATTERY VOLTAGE CHECK.**

A lithium battery that allows it to keep time even if no power is applied to the VR240 powers the clock. This battery also powers the non-volatile RAM that maintains unit configuration information such as channel descriptors. Since this battery has a nominal 5-year lifetime, and only provides power when the unit is turned OFF, it should last indefinitely. Nonetheless, as long as you have the unit open, you can, if you wish, check the battery voltage. Confirm that it is greater than 2.8V by measuring the voltage between the chassis ground and the top surface of the battery, using a high input impedance digital voltmeter. (Note: If the battery voltage is low, the VR240 will normally sense this during self-test and advise you to replace it.)

### **A-4. TIME CODE INPUT.**

The VR240 provides an input for a time code generator. By sending time data, the clock of the VR240 can be automatically updated and corrected so that it remains within two seconds of the generator at all times. The time code input overrides the internal clock; so that setting the clock (or clock frequency) as described in the VR240 maintenance manual is unnecessary. The time code generator should be connected to PORT B on the VR240 rear panel using an RS-232 serial connection. The input is on PIN 6; the return is on PIN 3. Note that PORT B is also used for the optional label printer and interconnection of two VR240s in the alternate recording mode. The PORT B pins used are different for each and it is possible to use any combination of

features simultaneously. Time code can also be input using an RS-485 or RS-422 interface. Connections can be made to PORT B or PORT D using serial channel F (see Figure 2-5). Time code can also be input using an RS-485 or RS-422 interface. Connections can be made to PORT B or PORT D using serial channel F (see Figure 2-5).

**A-5. RS-232 CONFIGURATION AND DATA FORMAT.**

**NOTE**

Configuration of either channel B (RS232) or channel F (RS485) may be used.

In order to receive time code data, the generator must create the data in the proper format, and the RS-232 parameters of the VR240 must match those of the generator, whose data is received on RS-232 channel B. To configure channel B, start out from the **Config** menu.

Hit **Config/ System/ >(Next)/ >(Next)/Serial I/O**. At this point, you will see the **Cursor** under **CHAN A**. Select **CHAN B** with the **Change** soft key, and use the **Cursor** key in conjunction with the **Change** key to select the speed, **BITS**, **STOP** bits, and **PARITY** to match your data stream. The factory defaults are 9600 baud, 8 data bits, 2 stop bits, and no parity. When you have completed your selection, hit **Save** to preserve your settings.

The data format of the time code input is an ASCII string containing 26 characters as follows:

<CR><LF><status><SP>WWW<SP>DDMMYY<SP>HH:MM:SS<CR><LF>

#	Character	Comments
1	<CR>	Carriage return, decimal 13, hex 0D
2	<LF>	Line feed, decimal 10, hex 0A
3	<SP ? *>	Either a space (decimal 32, hex 20), a question mark, or asterisk. Note that any of these characters is accepted; any other character is invalid.
4	<SP>	Space
5	<day char 1 A-Z>	First character of the day of the week
6	<day char 2 A-Z>	Second character of the day of the week
7	<day char 3 A-Z>	Third character of the day of the week
8	<SP>	Space
9	<day 10s digit>	Day of month 0 through 3 (or space for day 1 through 9)
10	<day 1s digit>	0 through 9. 1 through 28, 30, or 31 valid depending on month.
11	<month char 1>	Valid values are JAN, FEB, MAR, APR
12	<month char 2>	MAY, JUN, JUL, AUG
13	<month char 3>	SEP, OCT, NOV, DEC (values are language-invariant)
14	<year 10s digit>	Year, 00-99
15	<year 1s digit>	
16	<SP>	Space
17	<hour 10s digit>	Hour, 00-23
18	<hour 1s digit>	

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<b>#</b>	<b>Character</b>	<b>Comments</b>
19	<:>	Colon, decimal 58, hex 3A
20	<minute 10s digit>	Minute, 00-59
21	<minute 1s digit>	
22	<:>	Colon
23	<second 10s>	Second, 00-59
24	<second 1s>	
25	<CR>	
26	<LF>	

The character string is expected to be generated and received either once per minute or once per second. To prevent transient errors from accidentally setting the time on the VR240, two syntactically valid updates must be received sequentially before the internal clock is adjusted.

To be syntactically valid, all the conditions above must be satisfied. If any invalid value is received, that update is ignored. The day-of-week characters must be valid ASCII characters in the range A-Z. Any of these characters may be sent; the VR240 does its own day-of-week calculation and ignores the actual day, but it will check for valid alphabetic characters. The month abbreviation **is** used, and must be sent and spelled correctly. (Note that CR/LF sent BEFORE the message is required. It is not absolutely necessary to send the trailing CR/LF providing one is sent before the next time message.)

To be used, at least two updates, the second showing a time exactly one second or one minute later than the first, must be received. (Note that they need not be exactly one second or one minute apart in real time.) When the second update is received, it is compared with the VR240's internal clock. If there is a difference of at least two seconds, the internal clock is updated to match the data received from the time code generator.

It is normal for the VR240 internal time to differ from that of the time code generator by up to two seconds. It is also normal for the VR240 to require up to a minute before responding to time changes commanded by the generator.

### **A-6. VR240 CLOCK EXAMPLE.**

To set the VR240 clock to 13:14:00 on 16 December 1992, send the following character sequences:

```
<CR><LF>  
"SP SP DDD SP 06DEC92 SP 13:13:00"<CR><LF>
```

(time delay of approximately one minute)

```
<CR><LF>  
"SP SP DDD SP 06DEC92 SP 13:14:00"<CR><LF>
```

(or the following, after a time delay of approximately one second)

```
<CR><LF>  
"SP SP DDD SP 06DEC92 SP 13:13:01"<CR><LF>
```

(SP signifies a space character)

When the second sequence is received, the VR240 will synchronize with it.

This format is generated by Eventide's accessory clock, described at the beginning of this Appendix, and is also an available output format from the Spectracom NETCLOCK/2. Spectracom can be reached at (716) 381-4827.

#### **A-7. STATUS PRINTER INDICATION.**

When the internal timecode is resynchronized to an external source, the optional status printer, if connected, will indicate the old time and new time. The frequency and direction of these resynchronizations is a good indicator of how accurately the internal clock is adjusted



## **APPENDIX B**

### **4mm TAPE ISSUES**

---

#### **B-1. AVAILABILITY AND SELECTION.**

VR240s equipped with 4mm tape drives are designed to use “Helical Scan 4mm Data Cartridges” as a recording medium. These cartridges are colloquially and redundantly known as DAT tapes (Digital Audio Tape tapes). It is important to understand the differences among the tapes usable in the VR240. In some applications it may not matter which brand or quality you use; in others it may be critical. We strongly recommend that you use only tapes marked DDS, DDS-2, or DDS-3, depending on the types of drives installed in your VR240.

#### **B-2. TAPE TYPES AVAILABLE.**

The difference between DSS Data Cartridges and DAT tapes is primarily one of certified quality. While the tapes are physically compatible and interchangeable, the Data Cartridges are certified to have a limited number of defects and dropouts. DAT tapes primarily are used on audio applications, which are not so demanding as data storage. Although the VR240 is an audio logger, it logs the audio in data format. While it might be argued that a bad bit in the logged data is of little significance, our hardware and the drive assemblies do not see it that way. As described in Chapter 4, the drives employ error correction to make sure that there are no bad bits. If the tape has a defect or dropout, the data is re-recorded until it is completely correct. (And remember, we are also logging digital data, such as time, with the audio.)

If there is a dropout on the tape, it will not affect the data recorded, but it will waste tape. If there are many dropouts, a lot of tape will be wasted. If the wasted tape exceeds the margins built into the hardware and firmware, there will not be enough tape to record the full amount of data expected, and loss of data may result.

#### **B-3. SELECTING YOUR TAPE.**

Your Tape selection will depend primarily upon your application. Please remember that you use audio grade tapes essentially “at your own risk”. It has been our experience that their quality varies significantly, both from manufacturer to manufacturer and lot to lot. The only time audio grade tapes may be a good choice is when cost is of paramount importance and you know for certain that you will change the tape long before it is expected to be full. Another risk incurred in using audio or even non-approved data tapes is the possibility of oxide shedding and head clogging. Particles shed from a poor quality tape can become lodged in the head assembly of the drive and cause an increased error rate or even failure of the drive.

We therefore recommend data grade tapes in every case. While they are more costly, they will give more reliable and predictable performance.

**B-4. THE TAPE COUNTER AND TAPE CAPACITY.**

The VR240 recognizes and operates with 90, 120, 125 (DDS-3 equipped machines) meter DDS tapes. The tape counter is re-calibrated depending upon the length of the tape. Therefore, "tape full" will occur in the 9900-9999 range regardless of selected length. Tape changeover, in units so equipped and configured, usually occurs in the 9600-9900 range. As discussed earlier, poor quality or overused tapes may have reduced capacity. If the counter reads too low when you get a tape full indication or switchover, it probably means that the tape is bad or that the drives need cleaning.

**B-5. DATA CARE AND STORAGE.**

DDS tapes are small, convenient, and robust. There are no unusual precautions you need to take with respect to care and storage of either new or recorded tapes. Common sense and the manufacturer's specifications do dictate a minimum of care, however. Remember, your recorded tapes may be called upon to disgorge their data months or years after you have put them away. Something that might be benign for a short period can cause a loss of data over a long period.

**B-6. STORAGE TEMPERATURE AND HUMIDITY.**

The DDS standard calls for storing the tapes between 5°C and 32°C (41°F to 90°F). This comfortably encompasses the range of room temperature. Be careful not to store the tape in an area where the temperature changes radically. Window sills, radiators, and similar locations are right out.

The humidity standard is 40% to 60%, non-condensing. It is rather more difficult to assure this specification since most locations do not have humidity indicators available. Obvious suggestions include not storing your tapes in basements or rooms where there could be a major water spill.

Not stated in the specification, but perhaps even more important: Try to keep the environment relatively constant if possible. You will potentially do more damage to your tapes if you put them in an environment in which the temperature and humidity are constantly changing or cycling than if you simply leave them alone at either end of the spec.

**B-7. ACCIDENTAL ERASURE.**

DDS tapes store information magnetically, just like ordinary audio tapes. However, the magnetic formulation has a higher "coercivity," which means that it requires a stronger magnetic field to modify the information stored on the tape. While routine transportation and storage should have no effect on the information stored, we recommend that you avoid storing the tapes near objects that generate magnetic fields, such as loudspeakers, electric motors, television sets, etc. (There is nothing to fear from going through airport metal detectors.)

**B-8. DELIBERATE ERASURE.**

There should never be a need to deliberately erase a tape. Our formatting procedure will prevent access to previously recorded data. If you feel you must erase a tape for security reasons, you can use a standard audio DAT recorder to record over it. Alternatively, use the **COPY** function of a dual-drive VR240 to record non-critical data over the material to be erased.



## **APPENDIX C**

# **UNINTERRUPTABLE POWER SUPPLY (UPS)**

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### **C-1. FUNCTIONAL DESCRIPTION.**

The VR240 employs a UPS to prevent AC power problems from adversely affecting the operation of the recorder. The UPS derives its power from a multicell lead-acid storage battery in the VR240 chassis. The battery is charged whenever the VR240 is operating; the charge rate is normally very low (trickle charge), but increases significantly if the battery has become discharged. The battery has sufficient capacity to run the VR240 for about two minutes if AC power is interrupted.

The purpose of the UPS is *not* to allow the unit to continue operating during major power failures. The limited battery capacity precludes this in any event, and most facilities that employ logging recorders have a standby power source, usually a diesel-powered AC generator that comes on automatically when primary power fails. The UPS serves two purposes:

It prevents power problems during momentary AC interruptions. AC problems can be characterized by, among other things, their time duration. The most frequent type of problem lasts anywhere from a fraction of an AC cycle to a few cycles. These "glitches" are typically caused by load transients such as motors being switched on and off. Most well-designed electronic equipment can cope with these glitches without any special precautions. The next category is the line dropout that lasts from many cycles to a fraction of a minute. These problems can be caused by people accidentally switching off circuit breakers, lightning strikes, and other problems that cause a temporary interruption of service. And finally, there are serious outages, of from many minutes to many hours or even days, caused by accidents, natural disasters, etc. Against the first category, the VR240 needs no protection. Against the last category, the only protection that can be provided is your own backup power source; if you do not have one, the chances are you also have nothing to log! The middle category, multi-second power problems, are far more frequent than natural disasters, and could be very disruptive to a logger. Because the UPS is present, the VR240 can simply ignore brief power failures. It will continue operating until power comes back.

Equally important, the UPS prevents media and other problems during longer outages. As explained in Chapter 5 (paragraph 5-21), each digital media has index data recorded on it. This is usually recorded when the media is ejected. If power were simply shut off, the index data would be lost, and would require hours to recreate. Even worse, if the unit happened to be recording critical information when power was lost, the media could become irretrievable. The UPS incorporates a timer to determine whether a power failure can be ignored or requires action on the part of the VR240.

If the failure lasts for less than about 30 seconds, it is ignored. If the failure continues beyond 30 seconds, the VR240 automatically shuts down after writing index data. It also saves information on the cause of the shutdown and the fact that it was recording in its internal

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memory. That way, when power returns, it can resume recording from where it left off without human intervention.

The recorder is smart enough to know that if it is not recording or playing, it can shut off after 30 seconds without further action. In that event, reapplying power results in a normal startup.

### **C-2. UPS PRECAUTIONS.**

It is not impossible to defeat the UPS' utility. If your facility is subject to frequent power failures of many seconds duration, it is possible to discharge the batteries faster than they are automatically recharged. The unit protects itself by automatically shutting down if the battery voltage gets too low, notwithstanding the timeout period. If this happens, it may be necessary to reconstruct the media index.

Batteries have a limited service life and should be checked periodically by following the recommendations in the maintenance section.

## **APPENDIX D**

# **SOFTWARE UPDATE PROCEDURE**

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The VR240 is controlled by software contained in a pair of EPROMs on the CPU board. As with all complex software-controlled devices, it is probable that updates will be issued, both to resolve defects (“bugs”) and to enhance the product. If you receive an update from Eventide, the following procedure installs it.

- a. **Stop all recording on both drives and the internal hard disk.**
- b. Remove media from both drives.
- c. Load the software upgrade medium into either drive. It will take a few minutes to be recognized by the VR240.
- d. You will be asked to confirm if you wish to load the new software. Press the **Yes** soft key.
- e. After a few minutes the VR240 will eject the software upgrade media.

Now you not only have the latest software installed in your VR240 but you are richer by one piece of recordable media. Disable the write-protection the next time you load the media. When asked if you want to load the new software, press **Cancel**. The display will read “bad index.” Press the **Prepmedia** soft key. Format the medium and it is ready to use.



## APPENDIX E THE OPTIONAL LABEL PRINTER

### E-1. DESCRIPTION.

The label printer provides an extremely convenient method for permanently identifying media recorded by the VR240. Each time media is recorded on and then ejected, the printer will discharge a label giving information about the media. A label can also be printed on demand.

The printer, a Seiko model SLP1000(P), is a compact unit that requires under 10 watts provided by its low voltage adapter\*. Its thermal mechanism prints 6 lines on each label. The labels come on rolls of 130. A required adapter cable compatible with the PC (not Macintosh) version of the printer is available from Eventide. The printer and labels are available from Eventide and many computer dealers. The printer is connected to Port B on the rear of the VR240 using the Eventide cable.

The labels have two sections separated by a vertical line. The left hand section should be placed on the plastic media box. The right hand section should be placed on the upper surface of the media cartridge itself, where it may partially cover the window. Here is what the labels look like:

<b>Eventide</b>		30000097
Unit S/N 30000097		34
Media S/N34		06 : 38 : 30
<u>Start:</u>	<u>End:</u>	07 / 06 / 98
06 : 38 : 30	15 : 02 : 33	15 : 02 : 33
06-Jul-98	06-Jul-98	07 / 06 / 98

As you can see, both sides have essentially the same information. Due to size limitations, the right hand side is somewhat cryptic. Line-by-line, the information shown is:

Line	Left Side	Right Side
1	Our Logo, user defined title	Recorder serial number
2	Unit serial number	Media serial number
3	Media serial number	Start time
4	Start/End legend	Start date
5	Start/End time	Stop time
6	Start/End date	Stop date

The unit serial number is the serial number of the VR240 *on which the media was formatted, NOT the number of the VR240 on which the label was printed.* The media serial number is the number assigned to the media when it is formatted for the first time on a given machine. If it is reformatted on the same machine, it will keep its serial number. If it is reformatted on a different

## **Model VR240 Audio Logging Recorder**

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machine, a new serial number will be assigned. The start and end time and date is taken from the index on the media, and is normally the allowable range for SEARCH operations on that media.

\*The AC adapter we provide is for 115V, 50/60Hz only. If you will be using the printer on 230V and wish to purchase it from us, you will have to acquire an appropriate adapter locally. The adapter is rated 12VAC-1Amp output.

A label will be printed automatically when media is recorded and then ejected. If you want to print a label without recording or ejecting, the following control sequence allows you to do so:

Press the **Controls** soft key, then the > (next) soft key, then the **Label** soft key. A label will immediately be printed. (It takes the better part of a minute to print; during this period the legend "Label Being Printed" will appear briefly on the display.) There are several circumstances under which the label will *not* be printed:

If the printer is not connected or powered up, or,

If there is nothing to print, e.g., if there is no index (nothing recorded) on the media, or if no media is loaded, the **Label** soft key will disappear and the menu will revert to **Ready**.

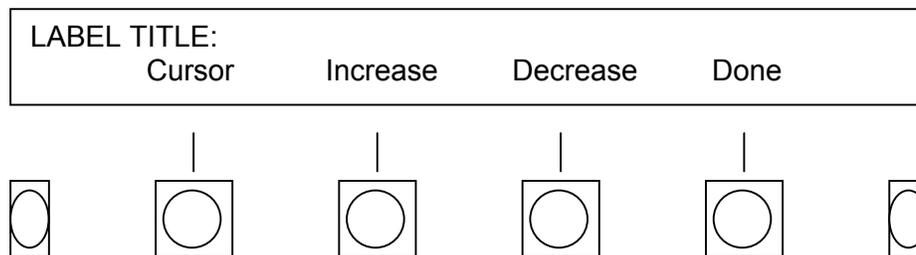
If you don't want to print a label after recording and ejecting, simply turn off the printer.

### **E-2. USER-DEFINED TITLE.**

You can "personalize" the labels printed by the label printer with your station's call letters or any other legend of up to 11 characters.

Access the "word processor" from the **Config** menu as follows:

- a. Press the **Config** soft key key.
- b. Press the > (next) soft key *three times*.
- c. Press the **Label** soft key .



**Cursor:** Moves the underline cursor forward through the 11 possible character positions of the title. (Prev. moves the cursor backwards.) The cursor "wraps around" if you exceed the title boundary.

**Decrease:** Selects the character at the cursor position, starting downward from ASCII character 127. (A character table appears in the section on channel descriptors.)

**Increase:** Selects the character at the cursor position, starting upward from ASCII character 32. (A character table appears in the section on channel descriptors.)

**Done:** Accepts the title and drops back to the previous menu.

Because the label title is so short, no provision is made for character insert or delete. To erase the title, use the **Decrease/Increase** keys to place spaces in all character positions. To allow the greatest number of characters, the title is left justified immediately adjacent to the Eventide Logo on the label. If you use fewer than 11 characters, we recommend adding one or two leading spaces to the title for better appearance.



## APPENDIX F THE STATUS PRINTER

The VR240 has a provision for creating a printed record of channel activity. In order to take advantage of this, you must provide a “line printer” and an appropriate cable. Because of the vast selection of printers on the market, Eventide does not provide either the printer or cable.

### F-1. PRINTER REQUIREMENTS.

The requirements for the printer are quite modest:

Its RS-232 interface must be capable of operation at 9600 baud, no parity, 8-bit data word, 2 stops-bits.

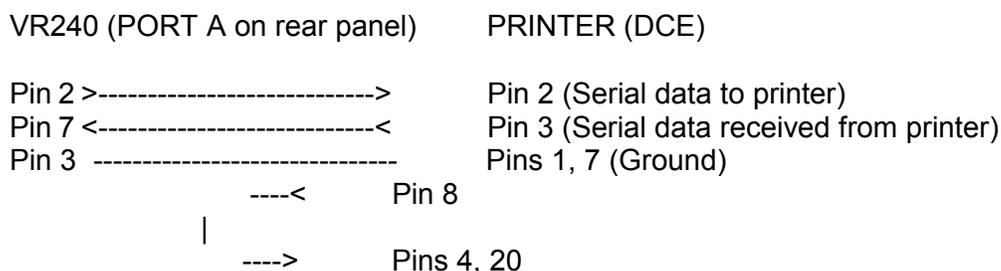
It must be capable of XON/XOFF data flow control and not REQUIRE a “hardware handshake.”

It should print at least 80 columns on fan-folded paper and have tractor feed capability. A wide carriage printer with 132-column capacity is preferable since 80 characters may be insufficient for some lines if you use long channel descriptors.

You have the choice of printing as little as one channel activity summary every 24 hours to as much as a summary every five minutes, along with a notation each time a channel is activated. Unless you plan on doing the latter, an inexpensive, light-duty printer should be satisfactory, as the output is unlikely to exceed a few pages per day.

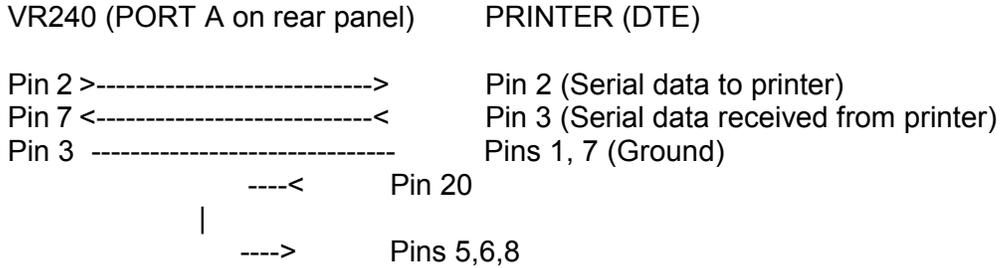
We specifically recommend that you *not* use a laser or other type of page printer, as it may require many hours to fill a page, and you won't be able to see the information until it is printed. Also, once information is sent to the printer, it is deleted from the VR240 memory, and if the printer suffers a power glitch, the information may be lost.

The VR240 provides no hardware handshake signals. If your printer requires handshake inputs to operate, connect them directly to one of the printer's handshake outputs. One of the two cables shown below will probably work, assuming your printer has a 25-pin connector and is either a “DCE” or “DTE”. Refer to your printer manual to determine which is appropriate, or how to wire a different connector.



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**F-2. CONFIGURING THE VR240 TO OUTPUT DESIRED SYSTEM STATUS REPORTS.**

**F-2.1 Detailed Activity Printouts.**

The VR240 can report start and stop times for each message. This feature can be enabled or disabled individually for each channel. Each activity report results in one line on the printer including time, date, input channel number, start/stop status, and descriptor. For example:

```
03:37:09 31-Oct-91 Ch 08 Start: Contest Line 2
03:39:44 31-Oct-91 Ch 08 Stop: Contest Line 2
```

```
\-----32 characters-----/\----- up to
66 characters_____/
```

The channel descriptor is printed last in order to minimize information lost due to printer line length limitations. If your longest descriptor is 48 characters or less, an 80-column printer will work fine. If you have long descriptors but your printer is not wide enough, you can let the printer continue on the next line, or you can specify a maximum number of characters per report and thereby restrict each report to one printed line.

**F-2.2 Activity Summaries.**

While recording, the VR240 can keep track of activity on each channel during a specified interval. This activity can be printed at the end of each interval or the information can be saved for printing at periods of up to only once a day. Summaries can also be printed on demand. You can specify the summary interval from a minimum of 5 minutes to a maximum of 24 hours. Each activity summary printout line includes time, date and an activity indicator. The activity indicator is separated into four groups of eight channels, with an asterisk indicating activity during the interval and a hyphen indicating no activity. The left-most position corresponds to channel 1 and the right-most position corresponds to channel 24. The following example shows activity with a 5 minute interval:

CHANNEL ACTIVITY REPORT

```
From: 14:15:00 22-Apr-91
To: 14:46:00 22-Apr-91

14:15:00 22-Apr-91 **----- -*----- -----
14:20:00 22-Apr-91 -*----- -*----- -----
```

```
14:25:00  22-Apr-91  -----  -*-----  -----*--
14:30:00  22-Apr-91  -----  -*-----  -----*--
14:35:00  22-Apr-91  -*-----  -*-----  -----*--
14:40:00  22-Apr-91  -*-----  -*-----  -----
14:45:00  22-Apr-91  -----  -*-----  -----
```

This format provides a clear picture of activity in your system. In the above example, it is immediately apparent that there is occasional activity on channels 1, 2, and 22, and constant activity on channel 10.

Each time a summary is printed, either automatically or “on demand”, the channel memory is cleared and the time summary starts new. This allows synchronization of the printout with human activities, such as shift endings. Both summary and individual channel printouts may be enabled, giving you an idea of system activity along with instant notice of activity on critical channels.

In addition to the individual channel activity and the activity summary, the status printer notes the time you start and stop recording.

```
14:13:22  22-Apr-91  Record  Start
14:46:20  22-Apr-91  Record  Stop
```

### F-2.3 Summary When Media Is Ejected.

When a media is ejected after data has been recorded on it, the descriptors of all channels are printed along with an activity indicator:

```
Unit S/N  00001124
Tape S/N  85
Start: 14:02:11  25-Sep-91
End:   14:13:52  26-Sep-91

* 01 MyStation
* 02 Competitor 1
  03 Competitor 2
  04 ENG
* 05 CB Channel 9
  06 Scanner
* 07 Contest Line 1
* 08 Contest Line 2
```

### F-2.4 Summary on Demand.

A printed summary can be requested at any time while the VR240 is recording. This summary is in addition to those programmed for automatic printing. Manually requesting a summary prints out the information available at the time it is requested, i.e., all summaries accumulated since the most recent programmed printout or manual request. While recording, the summary is obtained by hitting **Menu/ >** (next) **/Printout**. As with all summary printouts, any information

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buffered to be printed is erased after the printout occurs. The time for printing the next summary, however, is not modified. Summary data is only accumulated if the unit is configured to print a summary. (If you have not programmed this feature, hitting the ACTV SUMRY key will not generate a printout.)

For example, let's say you have configured the unit (see below) for a summary every 5 minutes, and a printout every hour. In this case, the programmed printout will occur every hour on the hour. If you manually request a summary printout at, say 12 minutes past 09:00, the printer will show summary lines for 09:00, 09:05, and 09:10. At 10:00, the programmed summary printout will show lines for 09:15, 09:20, and every five minutes until 09:55. Any information gathered before the manual request, including activity between 09:10 and 09:12, will already have been printed and will not be shown again.

## LIMITED WARRANTY

The Eventide VR240 is warranted against defects in material and workmanship for one year from the date of purchase by the original purchaser from Eventide or an authorized dealer. Within the warranty period, Eventide will replace or repair, at its option, a VR240 or subassembly that becomes defective during ordinary service. This warranty does not cover damage caused by mechanical or electrical abuse, such as physical damage, lightning, or connection to an inappropriate power source. It also does not cover additional damage caused by unsuccessful attempted repairs.

### EXCLUSION

**The recorder is not warranted to operate continuously or without error or interruption. Eventide specifically disclaims liability for consequential damaged caused by the unit failing to record. Our sole liability is to repair or replace the unit as described herein.**

#### Responsibility for Shipping

To obtain service under this warranty, it is the responsibility of the customer to notify Eventide of any defects, at which time Eventide will either send replacement hardware as it determines appropriate, or will request return of the unit or of the defective module for repair. All shipping charges to Eventide are the responsibility of the customer. Eventide will pay for normal return shipping to the customer within the United States, and premium shipping charges within the United States, if requested by the customer, are the responsibility of the customer.

#### Additional Information

*Please return your warranty card!* The warranty begins when you receive the unit, and is not affected by your filling in the card. However, if we don't receive your card, we don't know who you are and can't send you update information or software. We plan to implement additional features that can be added simply loading an upgrade tape or disk in an empty drive.

For our overseas customers, our time zone is GMT-5 (GMT-4 in the summer), and our official hours are 09:00 to 16:00. However, it is usually possible to call until 18:00 and still get useful information.

All return shipments from outside the United States shipments *must* be fully prepaid, including customs charges, to our door. We recommend using UPS (United Parcel Service) if it is available in your area. Our shipping address is:

Eventide Inc.  
One Alsan Way  
Little Ferry, New Jersey 07643  
United States of America

Our telephone number is: (201) 641-1200

Web site: [www.eventide.com](http://www.eventide.com)  
Our e-mail address: [loggers@eventide.com](mailto:loggers@eventide.com)